



**WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION**

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Wood Buffalo Environmental Association

**JUNE 2023
MONTHLY REPORT**

CONTINUOUS MONITORING

July 31, 2023

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





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July 31, 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 June 2023
Wood Buffalo Environmental Association**

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

The continuous ambient air quality monitoring network stations are:

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

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



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

Pembina Institute

Environment and Climate Change Canada

Regional Municipality of Wood Buffalo

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

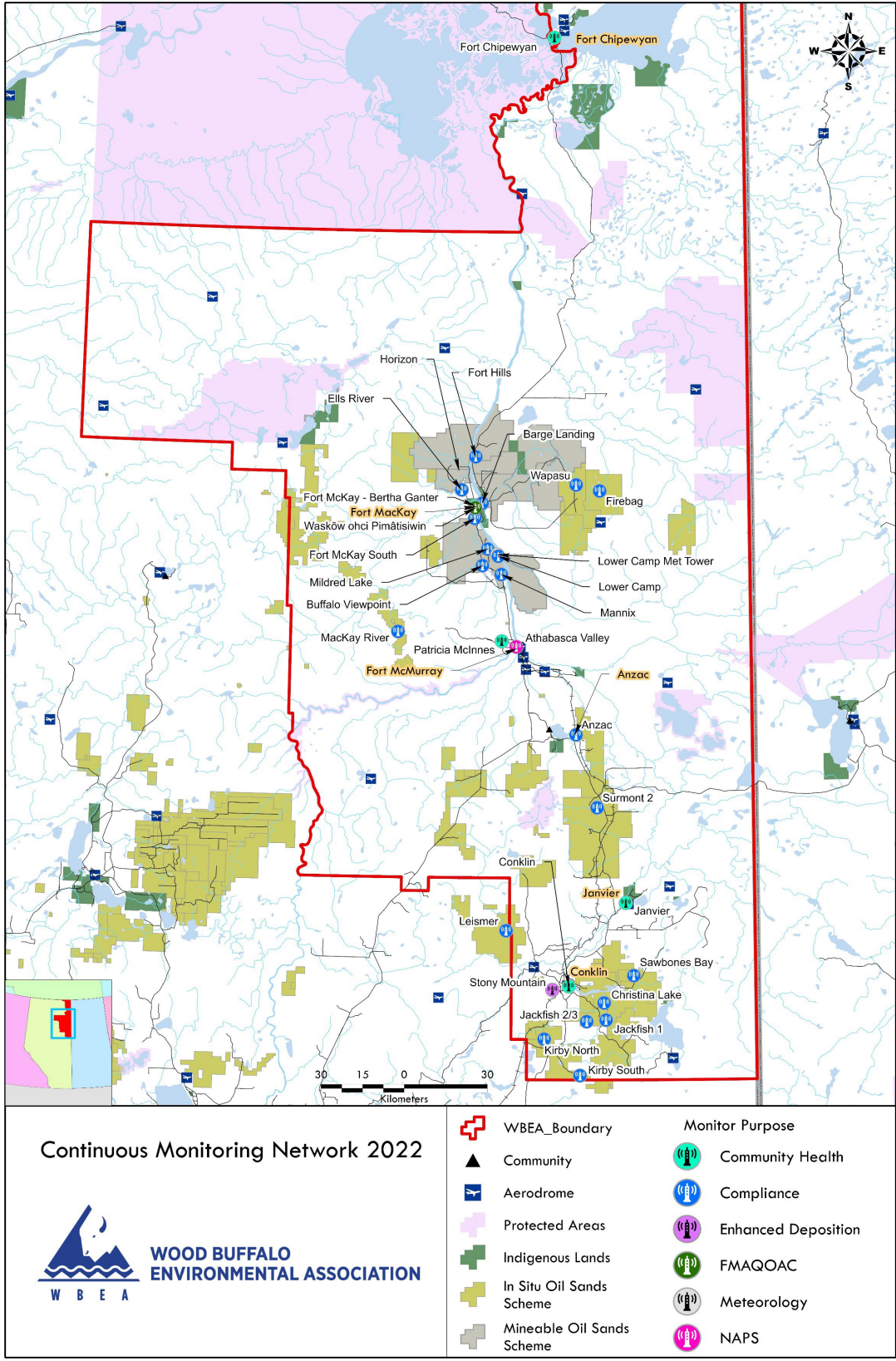


Figure 1: Map of WBEA Continuous Monitoring Network

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, TSP, and SO₂.

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

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

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

There were three ambient ground-level concentration in excess of the 1-hour O₃ objective reported to AEPA; following data validation and process, with two exceedances reported late.

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

During routine data review, it was identified that the Total Hydrocarbon (THC) baseline points for Firebag Air Monitoring Stations (AMS) had inadvertently been left unaccepted for April 2023. On June 21, 2023, THC data for Firebag AMS for April 2023 was resubmitted to the Electronic Transfer System to include baseline corrections.

3.0 Operational Status

3.1 Continuous Monitoring

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

1. The NO₂ analyzer at Bertha Ganter – Fort McKay AMS operated less than 90% of June 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 July 5, 2023 (reference number 415923).

Two issues affected the normal operation of the NO₂ analyzer, resulting in 88 hours of invalid data in June 2023. Details of the issues and mitigations are as follows:

- A. On June 16, the station experienced a power outage which resulted in 6 hours of invalid data of the NO₂ analyzer.
 - B. On June 18, the daily QA check failed to meet the AMD operational criteria. The WBEA determined it was due to a degrading sample pump and conducted maintenance to replace the sample pump the following day. After maintenance, the analyzer was left to stabilize overnight, and a multi-point calibration was conducted on June 20. Data was invalidated to the last acceptable span, on June 17, resulting in 82 hours of downtime.
2. The ambient temperature sensor at the 10-meter elevation (AT10) at Bertha Ganter – Fort McKay AMS operated less than 90% of June 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 July 5, 2023 (reference number 415924).
The AT10 sensor signal flatlined intermittently throughout the month of June. On June 26, the WBEA replaced the sensor, verified its performance, and resolved the issue. The unstable operations throughout June resulted in 81 hours of invalid data.
 3. The relative humidity (RH) sensor at the Mildred Lake air monitoring station (AMS) operated less than 90% of June 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. The RH sensor was operational for 89% of the reporting

period for June 2023. This incident was reported to Alberta Environment and Protected Areas (AEPA) on July 7, 2023 (reference number 416058).

During the monthly data validation process, the WBEA identified that the RH sensor data had been intermittently outside of the optimal range throughout the month of June due to high-humidity weather conditions. To mitigate the issue a new sensor was installed on July 12. A total of 88 hours of RH data were invalidated for the month of June.

4. The wind speed and wind direction sensor at Christina Lake AMS operated less than 90% of June 2023, which is a contravention of Clause DQ 4-C, of Chapter 6 of the Air Monitoring Directive (2016, as amended). The WS/WD sensor was operational for 46% of the reporting period for June 2023. This incident was reported to Alberta Environment and Protected Areas (AEPA) on July 10, 2023 (reference number 416167).

During the daily system check on June 15, the WBEA identified a communication issue with the WS/WD sensor and initiated a site visit that day. The WBEA determined the sensor had been damaged during recent storm activity and replaced the sensor. During the daily system check on June 30, the WBEA identified the wind direction was not comparing well with nearby sites and initiated a site visit that day. The WBEA determined a base screw had not been tightened fully during installation resulting in a gradual misalignment of the sensor. During the monthly data validation process, 367 hours of data were invalidated for the month of June due to these incidents.

5. The relative humidity (RH) sensor at the Surmont 2 air monitoring station (AMS) operated less than 90% of June 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. The RH sensor was operational for 78% of the reporting period for June 2023. This incident was reported to Alberta Environment and Protected Areas (AEPA) on July 10, 2023 (reference number 416241).

During the daily system check on June 20, the WBEA identified that the RH sensor data was outside of the optimal range and subsequently replaced the sensor on June 21. The WBEA monitored the operation of the replacement sensor throughout the following few days and noted it was experiencing intermittent communication issues. The WBEA replaced the sensor again on June 26, and normal operation resumed. During the monthly data validation process a total of 151 hours of RH data were invalidated for the month of June due to these incidents.

6. The PM2.5 analyzer at Patricia McInnes operated less than 90% of June 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. The PM2.5 analyzer was operational for 80% of the reporting period for June 2023. This incident was reported to Alberta Environment and Protected Areas (AEPA) on July 14, 2023 (reference number 416365).

On June 28, the WBEA's diagnostic program alerted staff of an issue with the analyzer flow. The WBEA visited the site that day to troubleshoot and determined the filter was clogged, potentially due to extreme smoke events throughout the month. The filter was replaced and normal operations resumed on June 28. During the monthly data validation process, the WBEA identified when the analyzer began to deviate from optimal performance and invalidated 139 hours of data due to this incident.

7. The relative humidity (RH) sensor at the Firebag air monitoring station (AMS) operated less than 90% of June 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. The RH sensor was operational for 87% of the reporting period for June 2023. This incident was reported to Alberta Environment and Protected Areas on July 17, 2023 (reference number 416509).

During daily system checks, the WBEA identified that the RH sensor data was operating outside of the optimal range, due to high-humidity weather conditions. To ensure optimal performance after multiple instances of over-ranging the sensor was replaced on June 20. During the monthly data validation process, a total of 94 hours of RH data were invalidated for the month of June.

3.2 Intermittent Monitoring

The results for time-integrated sampling of precipitation, PAH, VOC, ECOC, PM_{2.5}, and PM₁₀ will be submitted in the 2023 Annual Report.

3.3 General Network Notes

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

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

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

Station 1, Bertha Ganter – Fort McKay

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. Additional time is required for stabilization after exposure to high concentrations of NH₃ gas, and this is an inherent behavior in the NH₃ analyzer operations due to the properties of the NH₃ gas. Data for 1 to 3 hours following the daily spans have been reported as invalid for a total of 32 hours this month.

Unstable operation due to inconsistent response of the PM_{2.5} analyzer on June 1 and 2 resulted in 36 hours of invalid data.

Cleaning of the sample manifold on June 2 interrupted the normal operations of all gaseous analyzers, except for the O₃ analyzer, for 1 hour.

Station power failure on June 16 interrupted the normal operations of all parameters resulting in 6 hours of downtime.

Analyzer failure of the NO₂ analyzer due to a sample pump failure on June 17 to 19 resulted in 52 hours of invalid data. Subsequent maintenance to replace the NO₂ sample pump resulted in additional 28 hours of downtime.

A flatline in the output signal of the NH₃ analyzer on June 17 resulted in 11 hours of invalid data. Subsequent maintenance to either reboot the NH₃ analyzer on June 17 resulted in a further 1 hour of invalid data.

Maintenance to replace the H₂S analyzer's hydrocarbon kicker and a subsequent stabilization on June 27 and 28 resulted in 19 hours of downtime.

Cleaning of the sample manifold on June 27 interrupted the normal operations of all gaseous analyzers, except for the H₂S and TRS analyzers, for 1 hour.

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

The surface leaf wetness sensor operated out of range on June 5 and 28 resulting in 3 hours of downtime.

Failure to record data of the precipitation collector on June 16 resulted in 5 hours of invalid data.

Station operator activities on June 26 interrupted the normal operations of the wind sensor for 2 hours.

Intermittent flatlines in the output signal of the temperature sensor at the 10-meter elevation throughout the month resulted in 81 hours of invalid data. Subsequent maintenance to replace this sensor on June 26 resulted in additional 2 hours of downtime.

Station 2, Mildred Lake

Station power failure on June 16 and 17 interrupted the normal operations of all parameters resulting in 1 to 2 hours of downtime.

The relative humidity sensor operated out of range on throughout the month resulting in 80 hours of downtime.

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

The daily span check for the H₂S analyzer was outside the 10% AMD criteria on June 4 and 5 due to high atmospheric humidity.

Station 3, Lower Camp – Meteorology

Unstable operations due to excessive noise in the output signal of the wind sensor at the 163-meters elevation on June 13, 14, and 29 resulted in 7 hours of invalid data.

Station 4, Buffalo Viewpoint

Station power failure on June 22 affected the normal operations of NO₂ analyzer for 1 hour.

Cleaning of the sample manifold on June 23 interrupted the normal operations of the H₂S, NO₂, SO₂, and THC analyzers for 1 hour.

The daily span check for the H₂S analyzer was outside the 10% AMD criteria throughout the month due to high atmospheric humidity.

Station 5, Mannix

Cleaning of the sample manifold on June 15 interrupted the normal operations of the H₂S for 1 hour.

Failure to record data for the whole station on June 28 resulted in 3 hours of downtime.

The relative humidity sensors at 20-meter and 75-meter operated out of range throughout the month resulting in 15 hours of downtime.

The relative humidity sensor at 90-meter operated out of range throughout the month resulting in 44 hours of downtime.

Unstable operations due to inconsistent response in the output signal of the wind sensor at 90-meter throughout the month resulted in 11 hours of invalid data.

The daily span check for the H₂S analyzer was outside the 10% AMD criteria on June 4 through 9 due to high atmospheric humidity.

Station 6, Patricia McInnes

On January 3, 2023, the analyzer converter failed. Inadvertently, the converter was replaced with an H₂S converter that operates at 325 degrees, therefore, this AMS collected H₂S data instead of TRS data from January 3 - June 12, 2023. Collection of H₂S data from Patricia McInnes for this time period has been reviewed and validated through the WBEA's quality assurance process. To accurately reflect the data collected, the WBEA will be retracting the TRS data and reporting the data as H₂S at Patricia McInnes AMS for the aforementioned time period only. For the month of June, the TRS analyzer was not in service for 275 hours and the H₂S analyzer was not in service for 445 hours.

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. NH₃ analyzers require additional time for stabilization after being exposed to high concentrations, this is due to the physical properties of the NH₃ gas. Data for 1 to 4 hours following each daily span has been reported as invalid for a total of 71 hours this month.

Cleaning of the sample manifold on July 13 interrupted the normal operations of the NO₂, NH₃, SO₂, THC/NMHC/CH₄, and TRS analyzers for 1 hour.

Maintenance to replace the TRS external converter and a subsequent stabilization on June 12 and 13 resulted in 13 hours of invalid data.

Maintenance to replace the support gas cylinder on June 12 and 13 interrupted the normal operations of the THC/NMHC/CH₄ analyzer resulting in 21 hours of downtime.

Maintenance to verify the daily QA check on June 17 interrupted the normal operations of the NH₃ analyzer for 2 hours.

Maintenance to adjust the retention windows on June 19 affected the normal operation of the THC/NMHC/CH₄ for 2 hours.

Analyzer failure due to internal lamp failure of the PM_{2.5} instrument on June 22 through 28 resulted in 139 hours of invalid data.

Maintenance to replace the pump of the PM_{2.5} analyzer on June 28 resulted in 3 hours of downtime.

Unstable operations due to excessive baseline noise in the output signal of the THC/NMHC/CH₄ analyzers throughout the month resulting in 11 hours of invalid data.

Station 7, Athabasca Valley

Maintenance to replace the support gas cylinder of the THC/NMHC/CH₄ analyzer on June 8 resulted in 2 hours of downtime.

Unstable operations due to the THC/NMHC/CH₄ analyzer daily span being outside of AMD criteria for multiple days in June resulted in 58 hours of invalid data. Subsequent maintenance to replace the sample pump of the THC/NMHC/CH₄ on June 28 resulted in an additional 6 hours of downtime.

Cleaning of the sample manifold on June 29 interrupted the normal operations of all gaseous analyzers, except for the CO₂ analyzer, for 1 hour.

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

Station 8, Fort Chipewyan

Monthly routine calibrations were performed remotely for the month of June. The community was under an evacuation order due to the threat of a nearby wildfire for the majority of the month and staff were unable to access the site.

Maintenance to replace the sample filter on June 26 interrupted the normal operations of the PM_{2.5} analyzers for 1 hour.

The relative humidity sensor operated out of range throughout the month resulting in 64 hours of downtime.

Station 9, Barge Landing

Station power failure on June 16 and 17 interrupted the normal operations of all air quality analyzers resulting in 6 hours of downtime.

The relative humidity sensor operated out of range throughout the month resulting in 49 hours of downtime.

Station 11, Lower Camp

Cleaning of the sample manifold on June 28 interrupted the normal operations of the SO₂ and THC/NMHC/CH₄ for 1 hour.

The relative humidity sensor operated out of range on June 5 resulting in 9 hours of downtime.

A flatline in the output signal of the wind sensor on June 21 resulted in 2 hours of invalid data.

Station 13, Fort McKay South

Unstable operations due to excessive baseline noise in the output signal of the TRS analyzer on June 4 and 29 resulted in 55 hours of invalid data.

Station power failure on June 16 and 17 interrupted the normal operations of all parameters resulting in 5 to 6 hours of downtime.

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

Cleaning of the sample manifold on June 30 interrupted the normal operations of all gaseous analyzers for 2 hours.

A flatline in the output signal of the wind sensor on June 9 resulted in 1 hour of invalid data.

Station 14, Anzac

Station power failure on June 8, 13, and 14 interrupted the normal operations of all parameters resulting in 5 to 6 hours of downtime.

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

Unstable operation due to inconsistent response of the PM_{2.5} analyzer on June 14 resulted in 11 hours of invalid data.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH₄ analyzer on June 19 resulted in 3 hours of downtime.

Analyzer failure due to flash lamp failure of the TRS analyzer on June 30 and July 1 resulted in 22 hours of invalid data.

The relative humidity sensor operated out of range throughout the month resulting in 71 hours of invalid data.

Station 17, Wapasu

Maintenance to replace the NO₂ analyzer on June 6 and 7 resulted in 21 hours of downtime.

Cleaning of the sample manifold on June 21 interrupted the normal operations of the NO₂, O₃, SO₂, and THC analyzers for 2 hours.

The relative humidity sensor operated out of range on June 15 resulting in 2 hours of invalid data.

Station 18, Stony Mountain

Cleaning of the sample manifold on June 28 interrupted the normal operations of the CO, CO₂, SO₂, THC/NMHC/CH₄, and TRS analyzers for 2 hours.

Failure to record data of the precipitation collector on June 13 and 14 resulted in 34 hours of invalid data.

Station 19, Firebag

Maintenance to replace the uv lamp of the H₂S analyzer on June 12 resulted in 24 hours of downtime.

Cleaning of the sample manifold on June 22 interrupted the normal operations of the h₂S, SO₂, and THC analyzers for 1 hour.

Unstable operations due to excessive baseline drift in the output signal of the H₂S analyzer on June 29 and 30 resulted in 31 hours of invalid data.

Maintenance to replace the H₂S analyzer on June 30 resulted in 1 hours of downtime.

Station operator activities on June 30 interrupted the normal operations of the SO₂ and THC analyzers for 1 hour.

The relative humidity sensor operated out of range throughout the month resulting in 94 hours of invalid data.

Station 20, MacKay River

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

Station 21, Conklin

Cleaning of the sample manifold on June 7 interrupted the normal operations of all gaseous analyzers, except for the O₃ analyzer, for 1 hour.

Maintenance to adjust the retention window timing of the THC/NMHC/CH₄ analyzer on June 21 resulted in 3 hours of invalid data.

A flatline in the output signal of the wind sensor on June 2 and 8 resulted in 2 hours of invalid data.

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

Station 22, Janvier

Maintenance to remotely troubleshoot the NO₂ analyzer on June 16 resulted in 1 hour of downtime.

Unstable operations due to excessive baseline noise in the output signal of the O₃ analyzer from June 18 to June 22 resulted in 53 hours of invalid data.

Unstable operations due to excessive baseline drift in the output signal of the TRS analyzer on June 17 resulted in 4 hours of invalid data.

Maintenance to replace the TRS analyzer and a subsequent stabilization on June 19 and 20 resulted in 21 hours of invalid data.

Station power failure on June 21 interrupted the normal operations of all air quality analyzers for 5 hours.

Maintenance to verify the daily QA check on June 30 interrupted the normal operations of the TRS analyzer for 2 hours.

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

Station 23, Fort Hills

Unstable operations due to excessive baseline noise in the output signal of the NO₂ analyzer on June 25 resulted in 5 hours of invalid data.

Station 25, Waskōw ohci Pimâtisiwin

Analyzer failure due to inconsistent response of the SO₂ analyzer on June 14 and 15 resulted in 17 hours of invalid data.

Failure to record data for the whole station on June 16 resulted in 5 hours of downtime.

Maintenance to replace the H₂S converter and a subsequent stabilization period of the H₂S analyzer on June 20 and 21 resulted in 17 hours of downtime.

Maintenance to troubleshoot the converter efficiency on June 27, 29, and 30 interrupted the normal operations of the H₂S analyzer for 16 hours.

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

Station 26, Christina Lake

Failure to record data of all parameters due to disruptions in power distribution card on June 13 to 15 resulted in 21 to 46 hours of invalid data. Subsequent maintenance to replace the power distribution card on June 15 resulted in an additional 1 hour of downtime.

Cleaning of the sample manifold on June 14 interrupted the normal operations of the NO₂ and SO₂ analyzers for 1 hour.

Sensor failure of the wind direction sensor due to moisture damage on June 14 and 15 resulted in 27 hours of invalid data. Subsequent maintenance to replace the wind direction sensor on June 15 resulted in an additional 2 hours of downtime.

Unstable operations due to misalignment of the wind direction sensor from June 16 through 30 resulted in 336 hours of invalid data. Subsequent maintenance to realign the wind direction sensor on June 30 resulted in an additional 2 hours of downtime.

The daily span check for the SO₂ analyzer was outside the 10% AMD criteria on June 1 due to an interruption in the station calibrator configuration.

Station 27, Jackfish 2/3

Cleaning of the sample manifold on June 1 interrupted the normal operations of the H₂S and NO₂ analyzers for 2 hours.

Unstable operations due to excessive baseline drift in the output signal of the H₂S analyzer on June 5 and 22 resulted in 3 hours of invalid data.

Failure to record data of all parameters on June 12 and 13 resulted in 4 hours of invalid data.

Maintenance to replace the sample pump and a subsequent stabilization period of the NO₂ analyzer on June 14 and 15 resulted in 20 hours of downtime.

Maintenance to reset the logger and the modem on June 22 interrupted the normal operation of all parameters for 1 hour.

Station 29, Surmont 2

Maintenance to conduct a multi-point verification check of the SO₂ analyzer on June 1 resulted in 3 hours of downtime.

Maintenance to replace the sample pump and a subsequent stabilization period of the THC analyzer on June 1 and 2 resulted in 21 hours of downtime.

Maintenance to verify the daily QA check on June 19 interrupted the normal operations of the NO₂ analyzer for 1 hour.

Cleaning of the sample manifold on June 21 interrupted the normal operations of the H₂S, SO₂, and THC analyzers for 1 hour.

Failure to record data of all parameters on June 22 resulted in 2 hours of invalid data.

Intermittent flatlines in the output signal of the relative humidity and temperature sensor throughout the month resulted in 48 hours of invalid data. Subsequent maintenance to replace the relative humidity and temperature sensor on June 21 and 26 resulted in an additional 3 hours of downtime.

The relative humidity sensor operated out of range throughout the month resulting in 103 hours of invalid data.

Maintenance to replace the wind direction sensor on June 7 and 8 resulted 23 hours of downtime.

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

The daily span check for the NO₂ analyzer was outside the 10% AMD criteria on June 19 due to an interruption in the station calibrator configuration.

Station 30, Ells River

Cleaning of the sample manifold on June 2 interrupted the normal operations of the NO₂ and TRS analyzers for 2 hours.

Station power failure on June 16 and 17 interrupted the normal operations of all air quality analyzers for 21 to 22 hours.

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

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

Station 506, Jackfish 1

Cleaning of the sample manifold on June 28 interrupted the normal operations of the H₂S and NO₂ analyzers for 1 hour.

A flatline in the output signal of the wind sensor on June 3 resulted in 1 hour of invalid data.

Station 508, Kirby North

Maintenance to verify the daily QA check on June 2 and 30 interrupted the normal operations of the H₂S analyzer for 4 hours.

Maintenance to replace the H₂S analyzer's hydrocarbon kicker and a subsequent stabilization on June 14 and 15 resulted in 15 hours of downtime.

Unstable operations due to a flatline output signal of the NO₂ analyzer from June 15 through 23 resulted in 46 hours of invalid data.

Maintenance to reset the NO₂ analyzer on June 16 resulted in 2 hours of downtime.

Maintenance to replace the NO₂ analyzer and a subsequent stabilization on June 18 and 19 resulted in 18 hours of downtime.

Maintenance to reset the logger and the modem on June 19 interrupted the normal operation of all parameters, except NO₂, for 1 hour.

Cleaning of the sample manifold on June 19 interrupted the normal operations of the H₂S, SO₂, and THC analyzers for 1 hour.

Unstable operations due to excessive baseline drift in the output signal of the H₂S analyzer on June 21 through 26 resulted in 38 hours of invalid data.

Maintenance to adjust the H₂S baseline on June 28 resulted in 5 hours of downtime.

Maintenance to replace the relative humidity and temperature sensor on June 16 resulted in 1 hour of downtime.

The daily span check for the H₂S analyzer was outside the 10% AMD criteria for multiple days in June due to high atmospheric humidity.

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.

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



Dianne McIsaac
Stakeholder Engagement Coordinator

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

June 2023

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APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	6	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	99	36	0	6.6	0
48263-01-00	SO2(ppb)	2	100	25.3	0	4.5	0
224816-00-00	SO2(ppb)	4	100	46.7	0	12.8	0
151469-01-00	SO2(ppb)	5	100	34.2	0	6.2	0
189942-00-00	SO2(ppb)	6	100	10.5	0	4.1	0
206355-00-00	SO2(ppb)	7	100	10.4	0	2.8	0
46586-00-00	SO2(ppb)	8	100	2.7	0	1.4	0
73203-02-00	SO2(ppb)	9	99	25.4	0	5.5	0
216466-01-00	SO2(ppb)	11	100	90.2	0	7.9	0
137467-01-00	SO2(ppb)	13	99	39.6	0	8.4	0
236394-00-00	SO2(ppb)	14	99	12.0	0	2.7	0
254465-00-00	SO2(ppb)	17	100	12.8	0	2.9	0
094-03-00	SO2(ppb)	18	100	5.1	0	1.4	0
80105-01-00	SO2(ppb)	19	100	11.1	0	2.3	0
305529-00-00	SO2(ppb)	20	100	19.9	0	2.6	0
318401-00-00	SO2(ppb)	21	100	3.1	0	0.6	0
026-03-00	SO2(ppb)	22	99	2.6	0	0.4	0
364232-00-00	SO2(ppb)	23	100	16.3	0	5.7	0
228044-00-00	SO2(ppb)	25	97	33.4	0	6.4	0
247548-00-00	SO2(ppb)	26	97	19.0	0	3.0	0
231302-00-00	SO2(ppb)	27	99	8.8	0	2.9	0
153125-01-00	SO2(ppb)	29	99	5.4	0	1.0	0
	SO2(ppb)	30	97	22.6	0	4.7	0
	SO2(ppb)	506	100	6.9	0	1.8	0
	SO2(ppb)	508	100	14.5	0	3.3	0
	H2S(ppb)	1	96	2.1	0	0.7	0
	H2S(ppb)	2	100	7.3	0	1.3	0
	H2S(ppb)	4	100	4.4	0	0.8	0
	H2S(ppb)	5	100	5.1	0	1.5	0
	H2S(ppb)	6	100	1.7	0	0.4	0
	H2S(ppb)	11	100	12.7	1	1.6	0
	H2S(ppb)	17	100	1.0	0	0.5	0
	H2S(ppb)	19	92	3.6	0	0.4	0
	H2S(ppb)	20	100	2.7	0	0.6	0
	H2S(ppb)	25	95	2.1	0	0.7	0
	H2S(ppb)	26	97	3.5	0	0.6	0
	H2S(ppb)	27	99	2.0	0	0.4	0
	H2S(ppb)	29	100	0.6	0	0.2	0
	H2S(ppb)	506	100	10.5	1	0.7	0
	H2S(ppb)	508	91	0.5	0	0.3	0
	TRS(ppb)	1	99	2.5	0	1.0	0
	TRS(ppb)	6	97	1.5	0	0.8	0
	TRS(ppb)	7	100	1.9	0	0.7	0
	TRS(ppb)	8	100	1.5	0	0.7	0
	TRS(ppb)	9	99	1.9	0	0.8	0
	TRS(ppb)	13	91	3.7	0	1.3	0
	TRS(ppb)	14	96	1.1	0	0.5	0
	TRS(ppb)	18	100	0.5	0	0.3	0
	TRS(ppb)	21	100	0.8	0	0.6	0
	TRS(ppb)	22	96	1.4	0	0.6	0
	TRS(ppb)	23	100	1.3	0	0.8	0
	TRS(ppb)	30	97	2.5	0	1.1	0
	THC(ppm)	1	99	3.3	-	2.3	-
	THC(ppm)	2	100	4.6	-	2.6	-
	THC(ppm)	4	100	4.5	-	2.5	-
	THC(ppm)	5	100	4.4	-	2.5	-
	THC(ppm)	6	95	2.4	-	2.1	-
	THC(ppm)	7	91	2.5	-	2.1	-
	THC(ppm)	9	99	3.0	-	2.3	-
	THC(ppm)	11	100	3.3	-	2.3	-
	THC(ppm)	13	99	3.1	-	2.2	-
	THC(ppm)	14	98	2.5	-	2.1	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

June 2023

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REPORT DATE							
MONTH	YEAR						
6	2023	CONTINUOUS AMBIENT MONITORING					
APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE	
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
289664-00-00	THC(ppm)	17	100	2.6	-	2.5	-
241311-00-00	THC(ppm)	18	100	2.1	-	2.1	-
20809-02-00	THC(ppm)	19	100	2.7	-	2.5	-
149968-01-00	THC(ppm)	20	100	2.8	-	2.4	-
237382-00-00	THC(ppm)	21	99	4.1	-	2.4	-
48522-01-00	THC(ppm)	22	99	2.6	-	2.1	-
240008-00-00	THC(ppm)	23	100	3.7	-	2.6	-
48263-01-00	THC(ppm)	29	97	2.6	-	2.4	-
224816-00-00	THC(ppm)	30	97	3.8	-	2.5	-
151469-01-00	THC(ppm)	508	100	2.6	-	2.4	-
189942-00-00	O3(ppb)	1	99	76.6	1	41.5	-
206355-00-00	O3(ppb)	4	100	77.0	1	49.5	-
46586-00-00	O3(ppb)	6	100	75.5	0	51.3	-
73203-02-00	O3(ppb)	7	100	71.0	0	46.5	-
216466-01-00	O3(ppb)	8	100	83.4	1	57.6	-
137467-01-00	O3(ppb)	13	99	70.9	0	38.4	-
236394-00-00	O3(ppb)	14	99	70.9	0	46.5	-
254465-00-00	O3(ppb)	17	100	75.9	0	54.8	-
094-03-00	O3(ppb)	18	100	67.1	0	50.4	-
80105-01-00	O3(ppb)	21	100	73.9	0	50.5	-
305529-00-00	O3(ppb)	22	92	64.5	0	44.7	-
318401-00-00	NO2(ppb)	1	88	27.3	0	12.3	-
026-03-00	NO2(ppb)	4	100	42.5	0	10.0	-
364232-00-00	NO2(ppb)	6	100	21.8	0	7.1	-
228044-00-00	NO2(ppb)	7	100	23.7	0	7.4	-
247548-00-00	NO2(ppb)	8	100	12.6	0	2.4	-
231302-00-00	NO2(ppb)	9	99	29.3	0	11.2	-
153125-01-00	NO2(ppb)	13	99	24.5	0	9.5	-
	NO2(ppb)	14	99	8.7	0	3.1	-
	NO2(ppb)	17	97	15.2	0	3.5	-
	NO2(ppb)	18	100	4.2	0	2.2	-
	NO2(ppb)	19	100	12.2	0	4.3	-
	NO2(ppb)	20	100	12.5	0	3.4	-
	NO2(ppb)	21	100	9.7	0	3.4	-
	NO2(ppb)	22	99	5.4	0	2.0	-
	NO2(ppb)	23	99	42.9	0	17.3	-
	NO2(ppb)	26	97	15.2	0	4.9	-
	NO2(ppb)	27	96	7.2	0	2.0	-
	NO2(ppb)	29	100	7.4	0	2.6	-
	NO2(ppb)	30	97	29.9	0	13.2	-
	NO2(ppb)	506	100	9.4	0	3.1	-
	NO2(ppb)	508	91	5.1	0	2.0	-
	CO(ppm)	1	99	1.9	0	1.2	-
	CO(ppm)	7	100	1.5	0	0.7	-
	CO(ppm)	8	100	2.7	0	0.8	-
	CO(ppm)	18	100	1.2	0	0.5	-
	CO2(ppm)	1	99	524.0	-	444.2	-
	CO2(ppm)	8	100	425.2	-	404.5	-
	CO2(ppm)	18	100	461.4	-	434.0	-
	NH3(ppb)	1	93	63.7	0	31.5	-
	NH3(ppb)	6	90	23.4	0	12.9	-
	PM2.5(ug/m3)	1	94	308.3	68	180.6	8
	PM2.5(ug/m3)	4	100	226.3	84	168.0	10
	PM2.5(ug/m3)	6	80	197.3	43	129.1	8
	PM2.5(ug/m3)	7	100	272.7	69	170.7	9
	PM2.5(ug/m3)	8	100	503.1	64	197.7	7
	PM2.5(ug/m3)	9	99	297.1	80	178.6	11
	PM2.5(ug/m3)	13	99	322.8	100	207.7	12
	PM2.5(ug/m3)	14	97	233.5	73	143.8	8
	PM2.5(ug/m3)	17	100	365.3	92	220.1	9
	PM2.5(ug/m3)	18	100	162.6	58	88.0	10
	PM2.5(ug/m3)	21	100	189.9	66	100.6	10
	PM2.5(ug/m3)	22	99	572.4	78	130.1	10
	PM2.5(ug/m3)	23	100	369.8	81	211.2	11

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

June 2023
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APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE	
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
				289664-00-00	PM2.5(ug/m3)	29	100
241311-00-00	PM2.5(ug/m3)	30	97	353.2	77	199.3	11
20809-02-00	WS(km/h)	1	99	-	-	-	-
149968-01-00	WS(km/h)	2	100	-	-	-	-
237382-00-00	WS(km/h)	4	100	-	-	-	-
48522-01-00	WS(km/h)	5	100	-	-	-	-
240008-00-00	WS(km/h)	6	100	-	-	-	-
48263-01-00	WS(km/h)	7	100	-	-	-	-
224816-00-00	WS(km/h)	8	100	-	-	-	-
151469-01-00	WS(km/h)	9	100	-	-	-	-
189942-00-00	WS(km/h)	11	100	-	-	-	-
206355-00-00	WS(km/h)	13	100	-	-	-	-
46586-00-00	WS(km/h)	14	100	-	-	-	-
73203-02-00	WS(km/h)	17	100	-	-	-	-
216466-01-00	WS(km/h)	18	100	-	-	-	-
137467-01-00	WS(km/h)	19	100	-	-	-	-
236394-00-00	WS(km/h)	20	100	-	-	-	-
254465-00-00	WS(km/h)	21	100	-	-	-	-
094-03-00	WS(km/h)	22	99	-	-	-	-
80105-01-00	WS(km/h)	23	100	-	-	-	-
318401-00-00	WS(km/h)	25	99	-	-	-	-
026-03-00	WS(km/h)	26	46	-	-	-	-
364232-00-00	WS(km/h)	27	99	-	-	-	-
228044-00-00	WS(km/h)	29	96	-	-	-	-
247548-00-00	WS(km/h)	30	100	-	-	-	-
231302-00-00	WS(km/h)	506	100	-	-	-	-
153125-01-00	WS(km/h)	508	100	-	-	-	-
							
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 JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY - BERTHA GANTER (AMS01)
 JUNE 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	677	35	43	98.89	35.8	0	6.6	0
H2S(ppb) Average	653	41	67	96.39	2.1	0	0.7	0
TRS(ppb) Average	677	36	43	99.03	2.5	0	1	0
THC(ppm) Average	677	35	43	98.89	3.3	-	2.3	-
NMHC(ppm) Average	677	35	43	98.89	1.149	-	0.195	-
CH4(ppm) Average	677	35	43	98.89	2.6	-	2.2	-
O3 (ppb) Average	679	34	41	99.03	76.6	1	41.5	-
NO2 (ppb) Average	600	32	120	87.78	27.3	0	12.3	-
NO (ppb) Average	600	32	120	87.78	15.3	-	2.8	-
NOX (ppb) Average	600	32	120	87.78	31.8	-	13.6	-
NH3 (ppb) Average	627	41	93	92.78	63.7	0	31.5	-
PM2.5 (ug/m3) Average	676	2	44	94.17	308.3	68	180.6	8
CO(ppm) Average	678	34	42	98.89	1.9	0	1.2	0
CO2(ppm) Average	677	35	43	98.89	524	0	444.2	0
Temperature 2 m (C) Average	720	0	0	100	31.6	-	23.4	-
Temperature 10 m (C) Average	637	0	83	88.47	30.4	-	23.2	-
Relative Humidity (%) Average	720	0	0	100	99.2	-	94.9	-
Wind Speed 10 m (km/h) Average	710	0	10	98.61	30	-	23	-
Wind Direction 10 m (deg) Average	710	0	10	98.61	-	-	-	-
Precipitation (mm) Total	715	0	5	99.31	14.5	-	31.4	-
Leaf Wetness (% of range) Average	717	0	3	99.58	67.6	-	42	-
Global Solar Radiation (W/m2) Average	720	0	0	100	901.3	-	369.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT McKAY (AMS01)
 JUNE 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	677	1.3	4.1	-	0	0	0	0.1	0.3	2.9	35.8
H2S (ppb) Average	653	0.29	0.3	-	0	0	0.1	0.2	0.4	0.7	2.1
TRS (ppb) Average	677	0.61	0.3	-	0.3	0.3	0.4	0.5	0.7	1	2.5
THC (ppm) Average	677	2.14	0.2	-	1.9	2	2	2.1	2.3	2.4	3.3
NMHC(ppm) Average	677	0.078	0.097	-	0	0	0	0	0.1	0.2	1.149
CH4(ppm) Average	677	2.06	0.1	-	1.9	2	2	2	2.1	2.2	2.6
O3 (ppb) Average	679	22.7	14.2	-	0	5	11.4	21.7	32.4	41.1	76.6
NO2 (ppb) Average	600	4.72	4.5	-	0	0.5	1.6	3.4	6.3	10.3	27.3
NO (ppb) Average	600	1.01	2.2	-	0	0	0	0	0.9	3.2	15.3
NOX (ppb) Average	600	5.73	5.9	-	0	0.5	1.7	3.9	7.5	13.1	31.8
NH3 (ppb) Average	627	2.15	8.9	-	0	0	0	0	0	0	63.7
PM2.5 (ug/m3) Average	676	31.53	43.2	-	0.8	3.6	8	18.8	33.2	77.1	308.3
CO(ppm) Average	678	0.46	0.2	-	0.2	0.3	0.3	0.4	0.5	0.6	1.9
CO2(ppm) Average	677	428.77	21.6	-	402.2	410.5	413.6	421	437.3	459.7	524
Temperature 2 m (C) Average	720	17.51	5.5	-	5.1	10.7	12.8	17.4	21.6	25.1	31.6
Temperature 10 m (C) Average	637	18.18	5	-	8	11.5	14.2	18	21.8	24.8	30.4
Relative Humidity (%) Average	720	67.15	21.6	-	22.4	37.9	48.8	68.2	88.5	94.5	99.2
Wind Speed 10 m (km/h) Average	710	8	5	-	0	2	4	7	10	15	30
Wind Direction 10 m (deg) Average	710	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	715	-	-	126.88	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	717	8.44	16.8	-	0	0	0	0	6	38.9	67.6
Global Solar Radiation (W/m2) Average	720	239.34	278.9	-	0	0	3.1	102.1	448.8	711.8	901.3

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS (except O3)	02 Jun 2023 12:00	02 Jun 2023 12:00	1	Maintenance - sample manifold cleaned
ALL GASEOUS ANALYZERS (H2S/TRS)	27 Jun 2023 13:00	27 Jun 2023 13:00	1	Maintenance - sample manifold cleaned
AIR QUALITY ANALYZERS	16 Jun 2023 19:00	17 Jun 2023 00:00	6	Station power failure
PM2.5	01 Jun 2023 01:00	02 Jun 2023 12:00	36	Analyzer Failure - inconsistent response
NO2	17 Jun 2023 07:00	19 Jun 2023 10:00	52	Analyzer Failure - sample pump failure
NO2	19 Jun 2023 11:00	20 Jun 2023 14:00	28	Maintenance - stabilization post maintenance
NH3	17 Jun 2023 01:00	17 Jun 2023 11:00	11	Unstable Operation - flatline in analyzer output signal
NH3	17 Jun 2023 12:00	17 Jun 2023 12:00	1	Maintenance - analyzer rebooted
NH3	01 Jun 2023 02:00	30 Jun 2023 07:00	32	Stabilization after daily QA check
H2S	27 Jun 2023 15:00	28 Jun 2023 09:00	19	Maintenance - stabilization post maintenance
Temperature 10 m	01 Jun 2023 03:00	26 Jun 2023 06:00	81	Flat line in sensor output signal
Temperature 10 m	26 Jun 2023 13:00	26 Jun 2023 14:00	2	Maintenance - sensor replaced
Wind Speed, Wind Direction	03 Jun 2023 04:00	03 Jun 2023 04:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	09 Jun 2023 06:00	09 Jun 2023 06:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	23 Jun 2023 01:00	23 Jun 2023 03:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	23 Jun 2023 06:00	23 Jun 2023 06:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	23 Jun 2023 21:00	23 Jun 2023 22:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	26 Jun 2023 13:00	26 Jun 2023 14:00	2	Maintenance - station operator activities
Precipitation Collector	16 Jun 2023 19:00	16 Jun 2023 23:00	5	DAS Failure - data not recorded
Surface Leaf Wetness	05 Jun 2023 23:00	05 Jun 2023 23:00	1	Sensor operated out of range
Surface Leaf Wetness	28 Jun 2023 12:00	28 Jun 2023 13:00	2	Sensor operated out of range

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
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Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Fort McKay - Bertha Ganter - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 35.8 ppb on Jun 22 10:00	Maximum Daily Average: 6.6 ppb on Jun 9		Hours of Data:	677
Minimum Value: 0.0 ppb on Jun 1 19:00	Minimum Daily Average: 0.0 ppb on Jun 14		Hours of Missing Data:	43
Maximum Diurnal Average: 5.2 ppb at hour 10	Minimum Diurnal Average: 0.1 ppb at hour 2		Hours of Calibration:	35
Monthly Average: 1.30 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 2.9 P ₉₉ = 20.9		Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.3	0.2	0.2	Z	0.2	0.1	0.2	0.2	13.3	30.7	C	C	C	C	C	0.2	0.2	0.1	0.0	0.0	0.1	0.3	0.2	0.2	2.6	30.7
2-Jun	0.2	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.5	0.7	0.5	M	0.6	0.6	0.7	0.7	0.5	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.3	0.7
3-Jun	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
4-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.8	0.6	0.4	0.1	0.8
5-Jun	0.2	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2
6-Jun	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
7-Jun	0.2	0.3	0.4	Z	0.3	0.5	0.3	0.5	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.5
8-Jun	0.0	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3
9-Jun	0.1	0.2	0.1	0.1	0.2	Z	0.3	1.5	4.5	15.2	17.5	21.8	22.1	13.7	17.6	5.9	8.7	13.9	6.7	0.5	0.5	0.6	0.4	0.3	6.6	22.1
10-Jun	Z	0.2	0.0	0.1	0.2	0.4	2.3	3.1	15.6	12.5	8.9	3.0	1.5	3.9	3.2	3.5	4.4	15.0	14.4	10.1	7.8	1.9	1.1	7.3	5.2	15.6
11-Jun	3.8	Z	1.8	1.3	0.6	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.5	3.8
12-Jun	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.6	0.5	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
13-Jun	0.0	0.1	0.1	Z	0.0	0.1	0.1	0.7	2.6	11.9	12.3	30.7	22.1	1.6	7.6	7.5	1.8	0.6	0.7	0.6	0.3	0.0	0.0	0.0	4.4	30.7
14-Jun	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
15-Jun	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	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
16-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.7	9.7	20.6	10.0	1.3	0.2	0.2	0.1	0.1	0.0	PF	PF	PF	PF	PF	PF	--	20.6
17-Jun	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
18-Jun	0.1	0.1	Z	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	0.2	0.2	0.1	0.1	0.1	0.2
19-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
20-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
21-Jun	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
22-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	6.4	20.0	35.8	8.0	17.0	13.3	3.5	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	4.6	35.8
23-Jun	0.1	Z	0.1	0.1	0.0	0.1	0.3	3.2	4.4	11.9	19.1	10.1	10.7	7.5	10.9	8.6	4.1	2.1	3.2	2.1	1.6	1.1	0.8	0.7	4.5	19.1
24-Jun	0.5	0.2	Z	0.2	0.6	1.4	2.1	1.9	2.9	0.5	0.2	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.9
25-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.3	0.1	0.0	0.0	0.1	0.4
26-Jun	0.0	0.0	0.0	0.1	Z	0.2	1.1	1.9	3.6	2.9	4.0	2.5	1.7	0.5	0.2	0.0	0.0	0.1	0.0	0.2	0.1	0.3	0.2	0.0	0.9	4.0
27-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	M	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
28-Jun	Z	0.3	0.2	0.2	0.2	0.4	2.5	2.3	4.2	3.1	6.6	15.4	3.7	0.4	0.7	0.4	0.3	0.2	0.6	0.2	0.1	0.1	0.2	0.2	1.9	15.4
29-Jun	0.1	Z	0.1	0.1	0.0	0.1	0.2	0.2	0.7	20.4	17.5	23.7	7.7	1.0	0.3	0.4	0.3	0.3	0.5	1.2	0.9	0.8	0.3	0.2	3.3	23.7
30-Jun	0.2	0.2	Z	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3

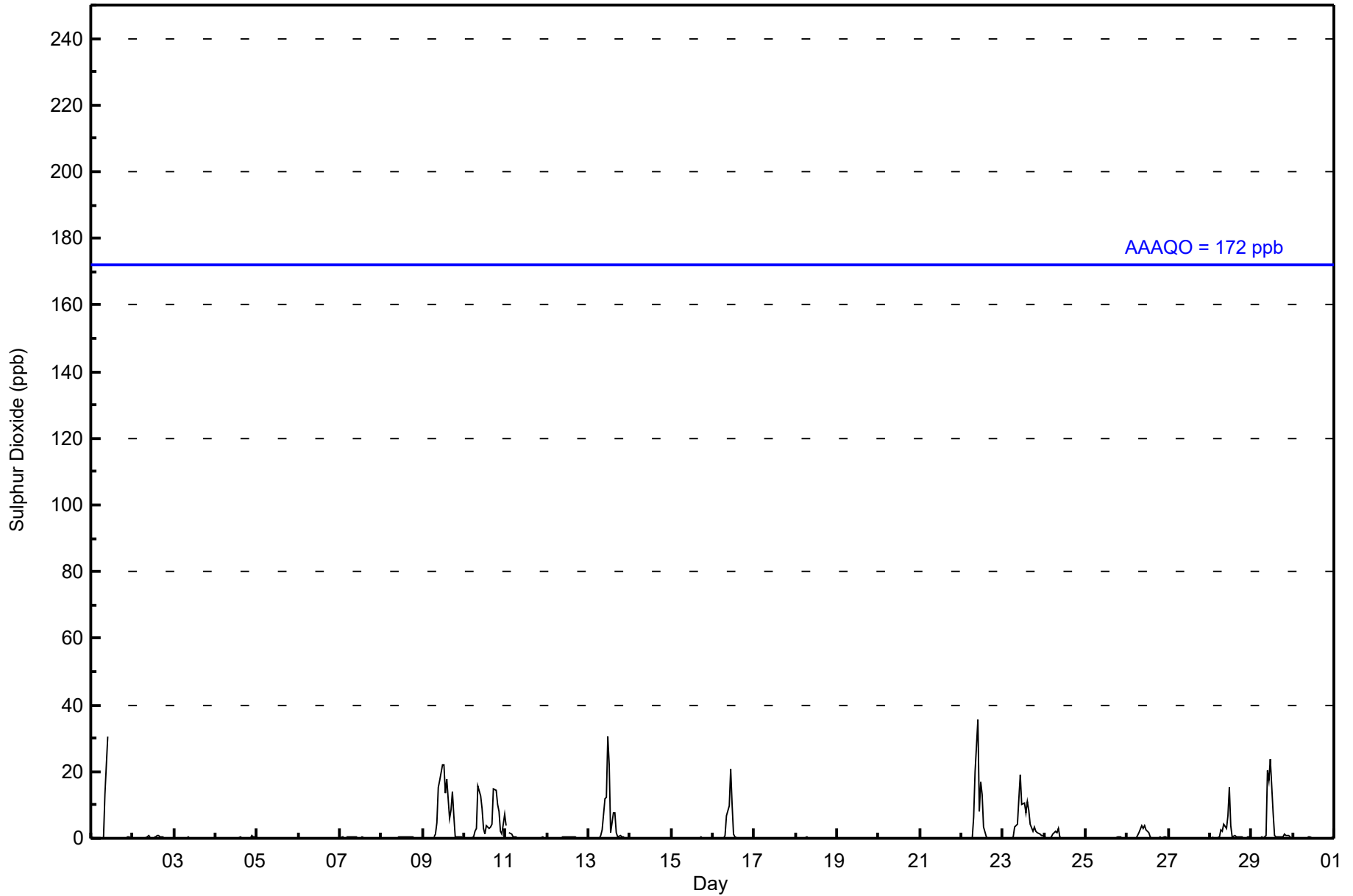
0.3	0.1	0.1	0.1	0.1	0.2	0.4	0.8	2.7	5.2	4.0	4.9	3.1	1.2	1.5	1.0	0.7	1.1	1.0	0.6	0.5	0.3	0.2	0.4	Diurnal Average	
3.8	0.3	1.8	1.3	0.6	1.4	2.5	6.4	20.0	35.8	20.6	30.7	22.1	13.7	17.6	8.6	8.7	15.0	14.4	10.1	7.8	1.9	1.1	7.3	Diurnal Maximum	

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 McKay - Bertha Ganter - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	647	95.57	95.57
11 - 20	22	3.25	98.82
21 - 60	8	1.18	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: 677

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter - June 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	124	76	29	11	7	5	8	63	64	33	37	30	23	36	39	54	639
11 - 20	0	0	0	0	1	0	4	13	4	0	0	0	0	0	0	0	22
21 - 60	0	0	0	0	0	0	2	4	1	0	0	0	0	1	0	0	8
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	124	76	29	11	8	5	14	80	69	33	37	30	23	37	39	54	669

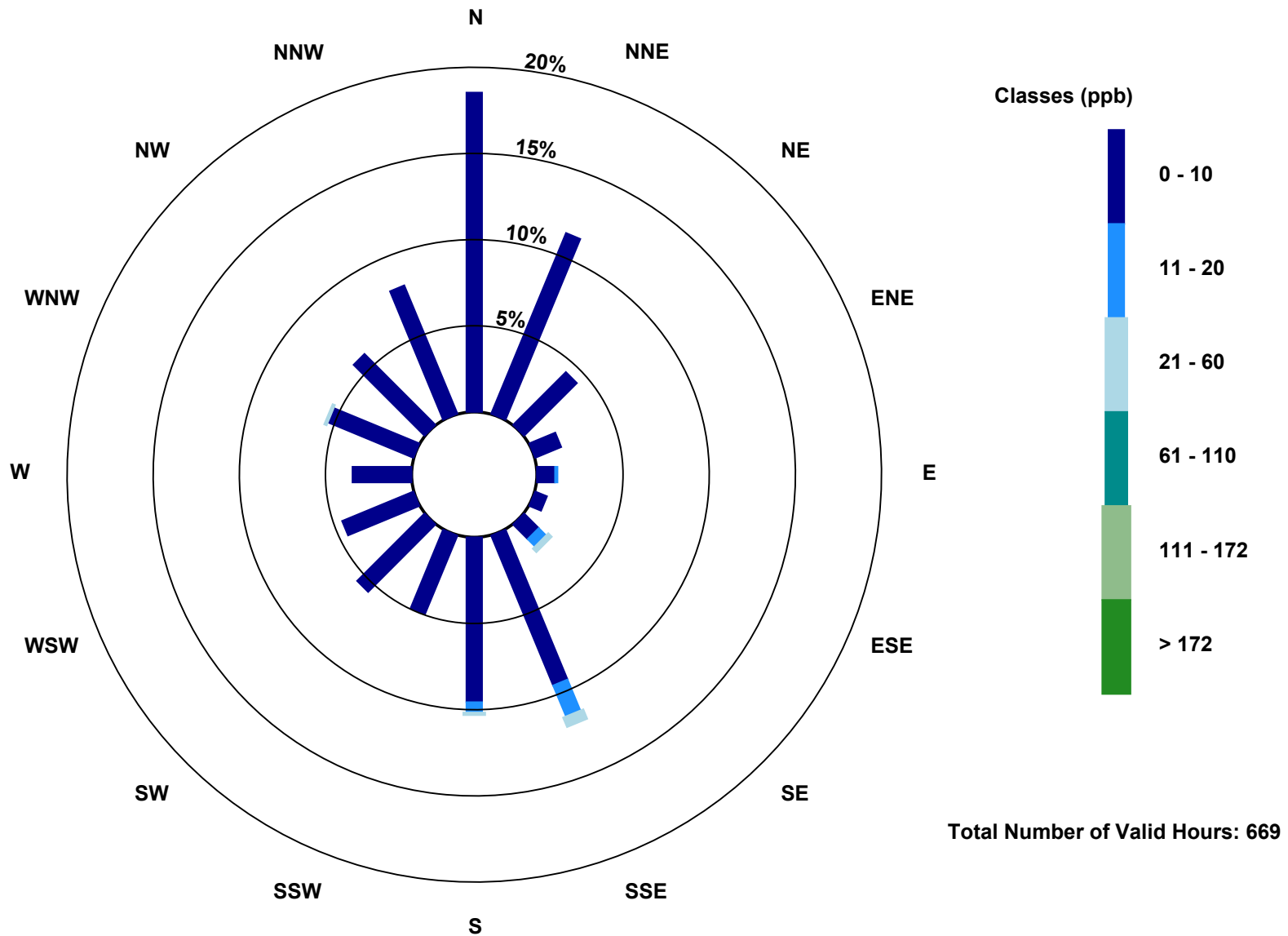
Total Number of Valid Hours: 669

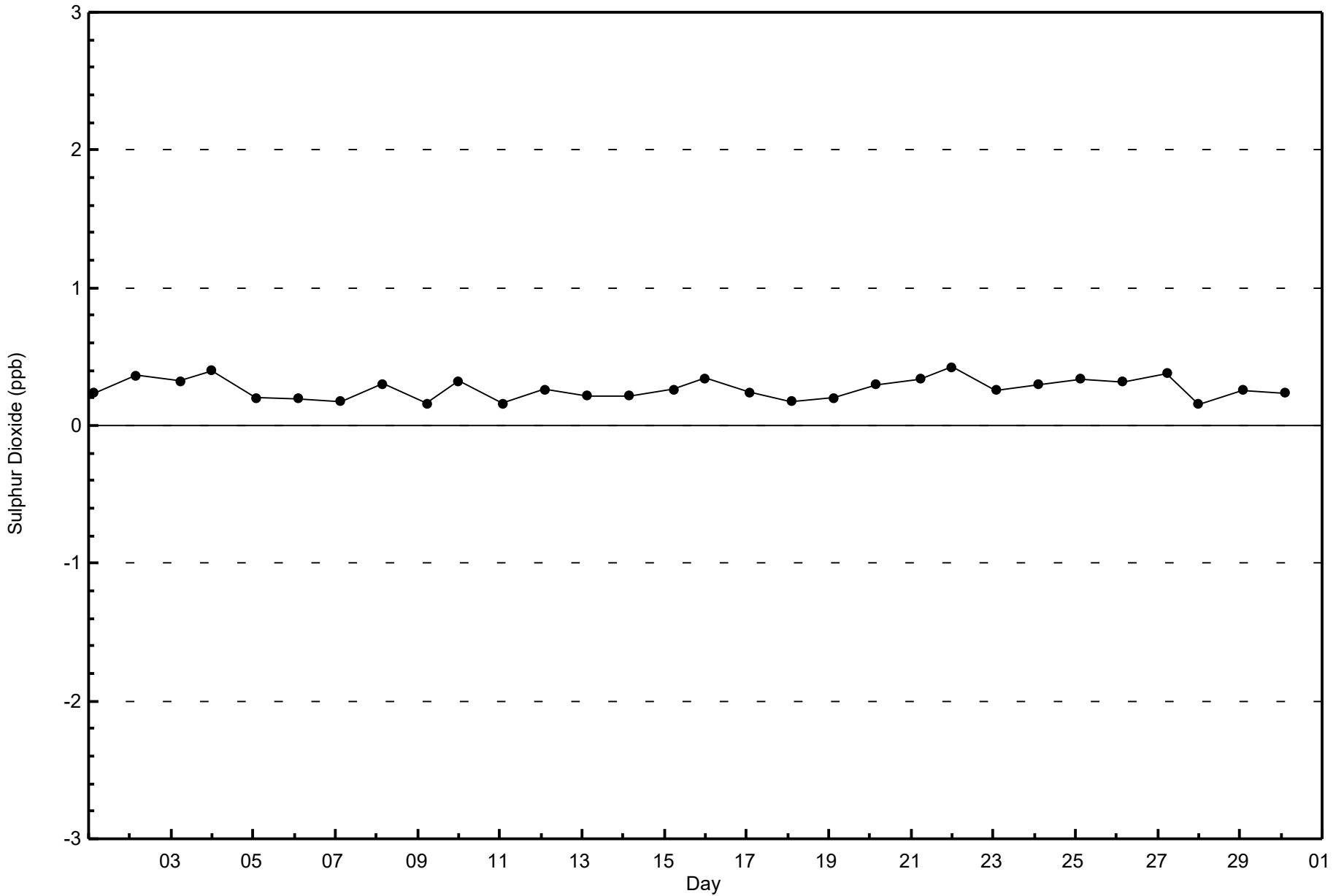
Total Number of Hours: 720

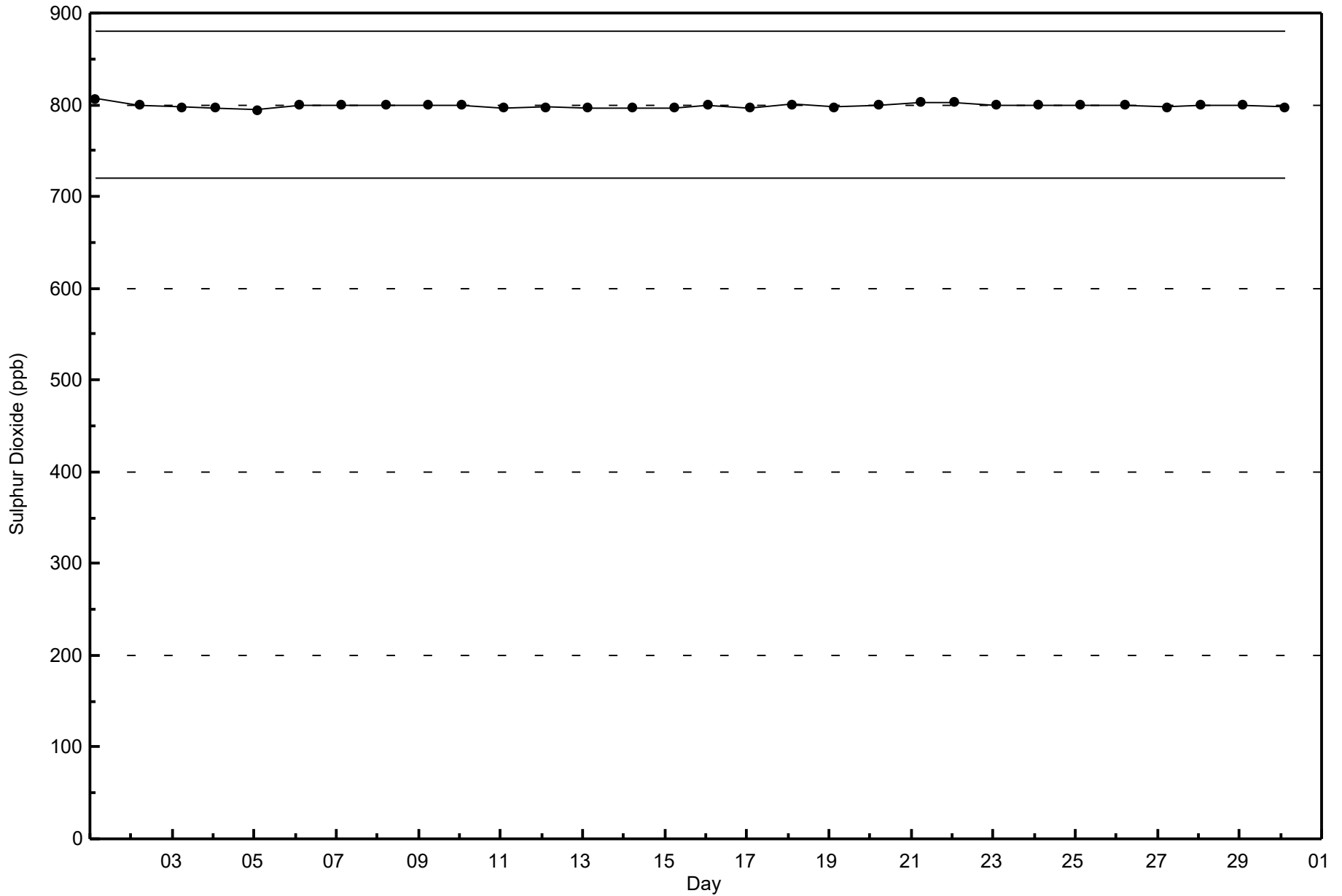


Wood Buffalo Environmental Association
Wind Rose Jun 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

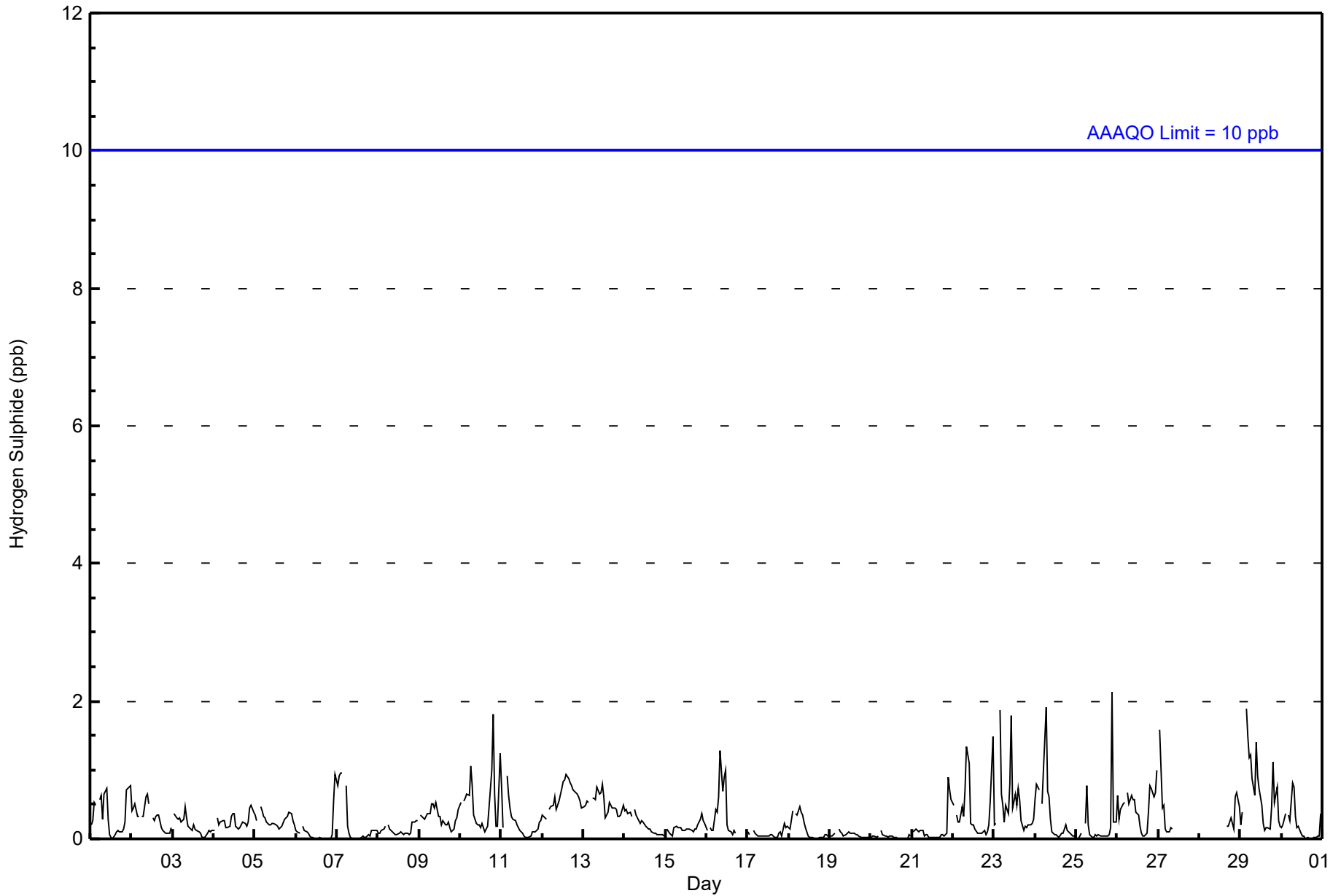
Fort McKay - Bertha Ganter - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720					
Maximum Value: 2.1 ppb on Jun 25 22:00		Maximum Daily Average: 0.7 ppb on Jun 29																	Hours of Data:	653							
Minimum Value: 0.0 ppb on Jun 1 14:00		Minimum Daily Average: 0.0 ppb on Jun 20																	Hours of Missing Data:	67							
Maximum Diurnal Average: 0.5 ppb at hour 4		Minimum Diurnal Average: 0.1 ppb at hour 17																	Hours of Calibration:	41							
Monthly Average: 0.29 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.5																	Percent Operational Time:	96.4							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.2	0.3	0.5	0.5	Z	0.6	0.6	0.3	0.7	0.7	0.3	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.7	0.8	0.3	0.8	
2-Jun	0.4	0.4	0.5	0.3	0.3	Z	0.3	0.3	0.6	0.7	0.5	M	0.3	0.3	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.7	
3-Jun	Z	0.4	0.3	0.3	0.3	0.2	0.3	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.5	
4-Jun	0.1	Z	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.4	0.3	0.5	
5-Jun	0.4	0.3	Z	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.3	0.5	
6-Jun	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.9	0.1	0.9	
7-Jun	0.8	0.9	1.0	1.0	Z	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	1.0		
8-Jun	0.1	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	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.1	0.3	
9-Jun	Z	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.5	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.4	0.3	0.5	
10-Jun	0.5	Z	0.5	0.6	0.6	0.6	1.1	0.8	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4	1.0	1.8	0.7	0.2	0.2	1.2	0.5	1.8	
11-Jun	0.8	0.2	Z	0.9	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.9		
12-Jun	0.3	0.3	0.3	Z	0.4	0.5	0.5	0.6	0.4	0.5	0.5	0.7	0.8	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.4	0.6	0.9	
13-Jun	0.5	0.5	0.5	0.5	Z	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.6	0.3	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.8		
14-Jun	0.4	0.4	0.4	0.4	0.3	Z	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.4	0.8	
15-Jun	Z	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.2	0.4	
16-Jun	0.1	Z	0.2	0.1	0.1	0.4	0.4	0.6	1.3	0.7	0.9	1.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	PF	PF	PF	PF	PF	PF	--	1.3
17-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.2	0.1	0.2
18-Jun	0.2	0.1	0.4	Z	0.4	0.3	0.5	0.4	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.5
19-Jun	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
20-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
21-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.9	0.7	0.6	0.1	0.9	
22-Jun	0.5	Z	0.4	0.2	0.3	0.5	0.3	0.7	1.3	1.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	1.5	0.4	1.5	
23-Jun	0.2	0.2	Z	1.9	0.7	0.5	0.2	0.5	0.4	0.8	1.8	0.4	0.6	0.5	0.7	0.6	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.9	
24-Jun	0.6	0.8	0.7	Z	0.5	1.0	1.9	0.7	0.6	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.4	1.9	
25-Jun	0.0	0.0	0.0	0.1	Z	0.2	0.8	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.1	0.2	0.2	0.2	2.1	
26-Jun	0.6	0.3	0.4	0.5	0.5	Z	0.7	0.5	0.6	0.6	0.6	0.4	0.3	0.2	0.1	0.0	0.0	0.1	0.4	0.8	0.7	0.6	0.7	1.0	0.5	1.0	
27-Jun	Z	1.6	0.5	0.5	0.1	0.1	0.1	0.2	0.1	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	M	--	1.6
28-Jun	M	M	M	M	M	M	M	M	M	C	C	C	C	C	C	C	C	0.2	0.2	0.3	0.2	0.1	0.6	0.7	0.5	--	0.7
29-Jun	0.2	0.4	Z	1.9	1.5	1.2	1.2	0.9	0.6	1.4	0.9	0.7	0.5	0.2	0.1	0.2	0.2	0.1	0.5	1.1	0.5	0.8	0.3	0.2	0.7	1.9	
30-Jun	0.2	0.2	0.4	Z	0.3	0.3	0.8	0.7	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	0.0	0.4	0.2	0.8	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.3 0.3 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.2 0.2 0.2 0.2 0.2 0.1 0.1 0.2 0.3 0.2 0.4 0.3 0.4			
																								0.8 1.6 1.0 1.9 1.5 1.2 1.9 0.9 1.3 1.4 1.8 1.0 0.8 0.8 0.9 0.9 0.8 0.8 1.0 1.8 0.7 2.1 0.7 1.5			
Z - zerspan 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
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

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

Total Number of Valid Hours: 653

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Fort McKay - Bertha Ganter - June 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	121	73	25	10	8	5	14	75	63	33	36	27	26	36	36	56	644
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	121	73	25	10	8	5	14	75	63	33	36	27	26	36	36	56	644

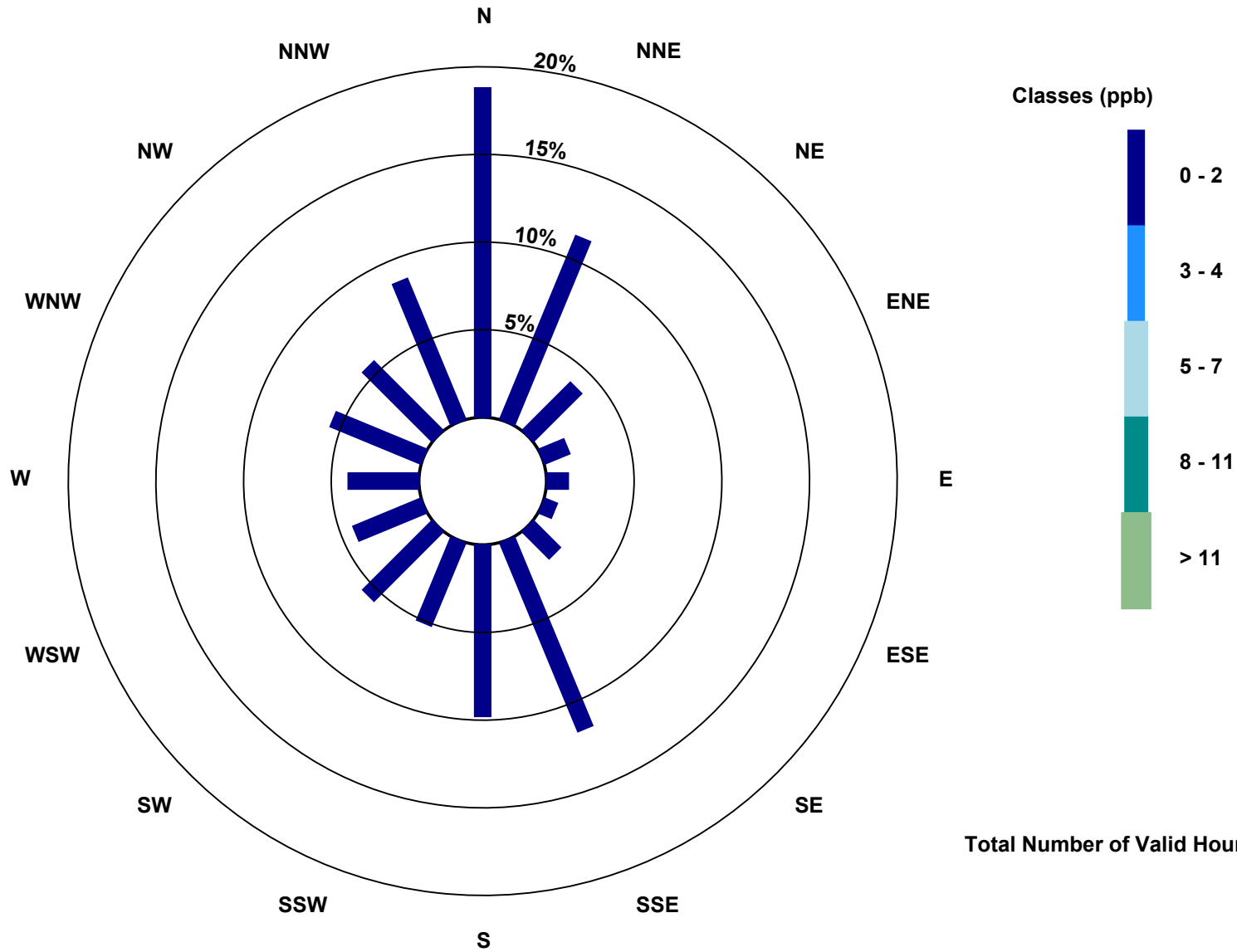
Total Number of Valid Hours: 644

Total Number of Hours: 720

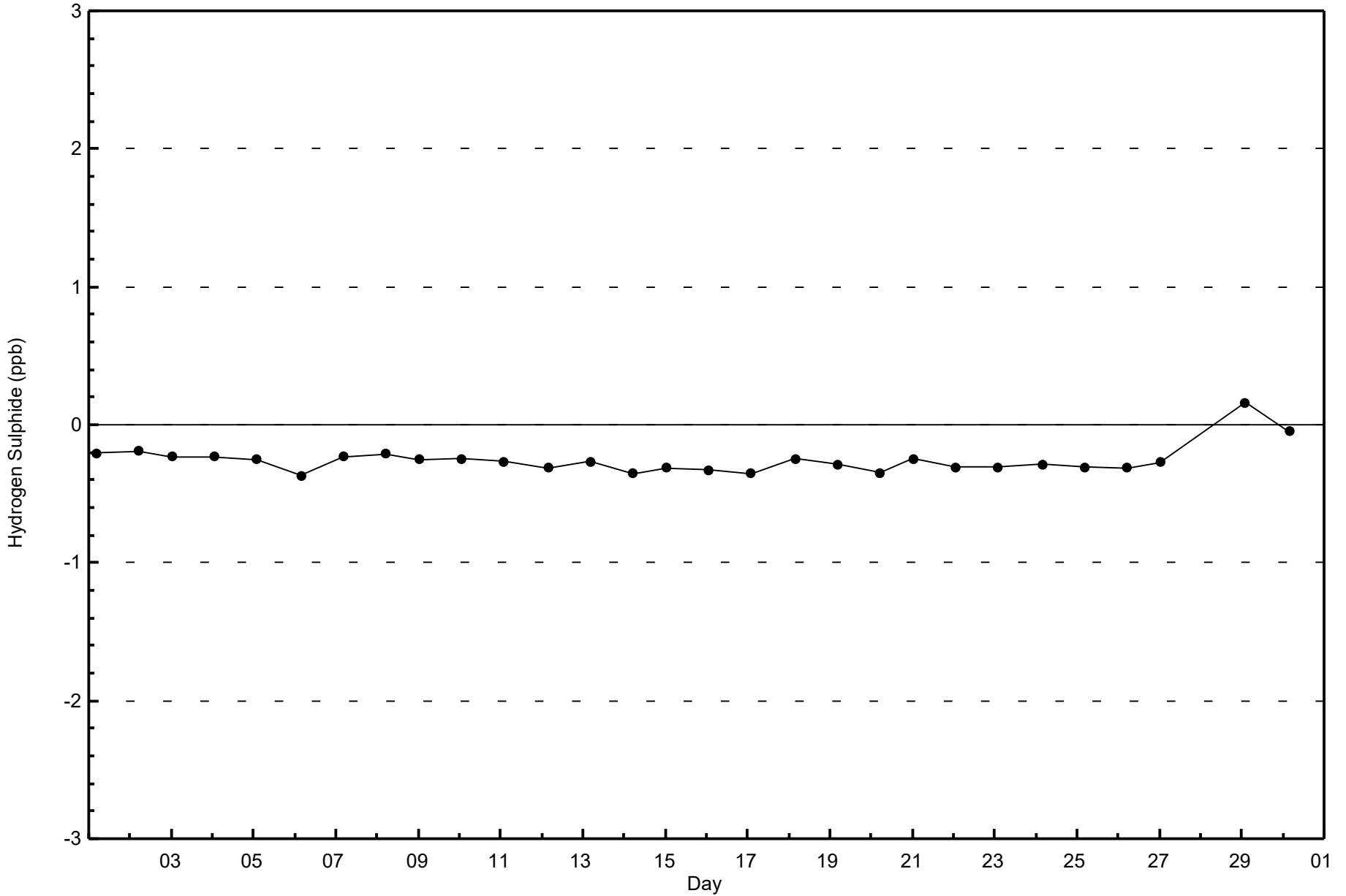


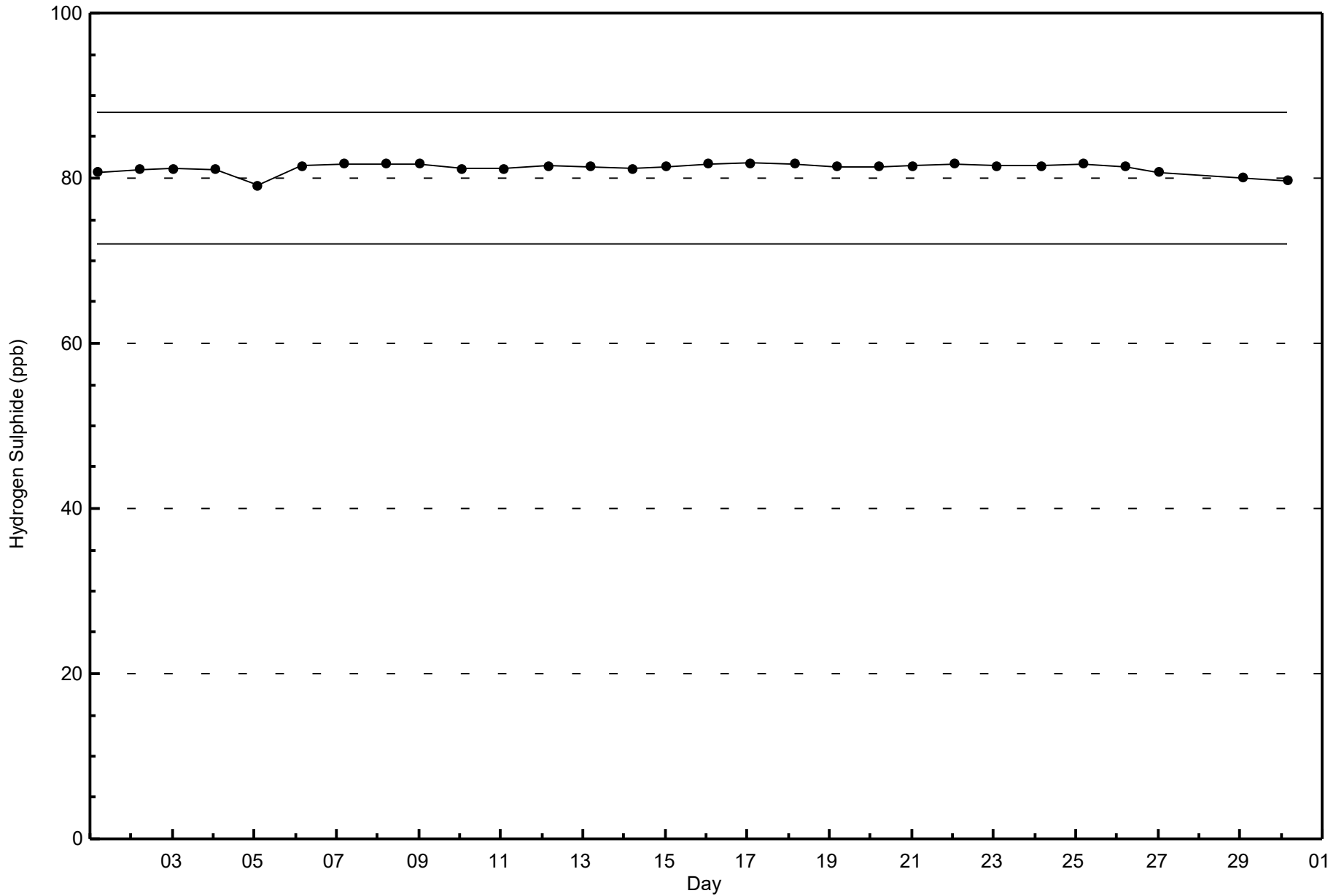
Wood Buffalo Environmental Association
Wind Rose Jun 2023

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



Total Number of Valid Hours: 644





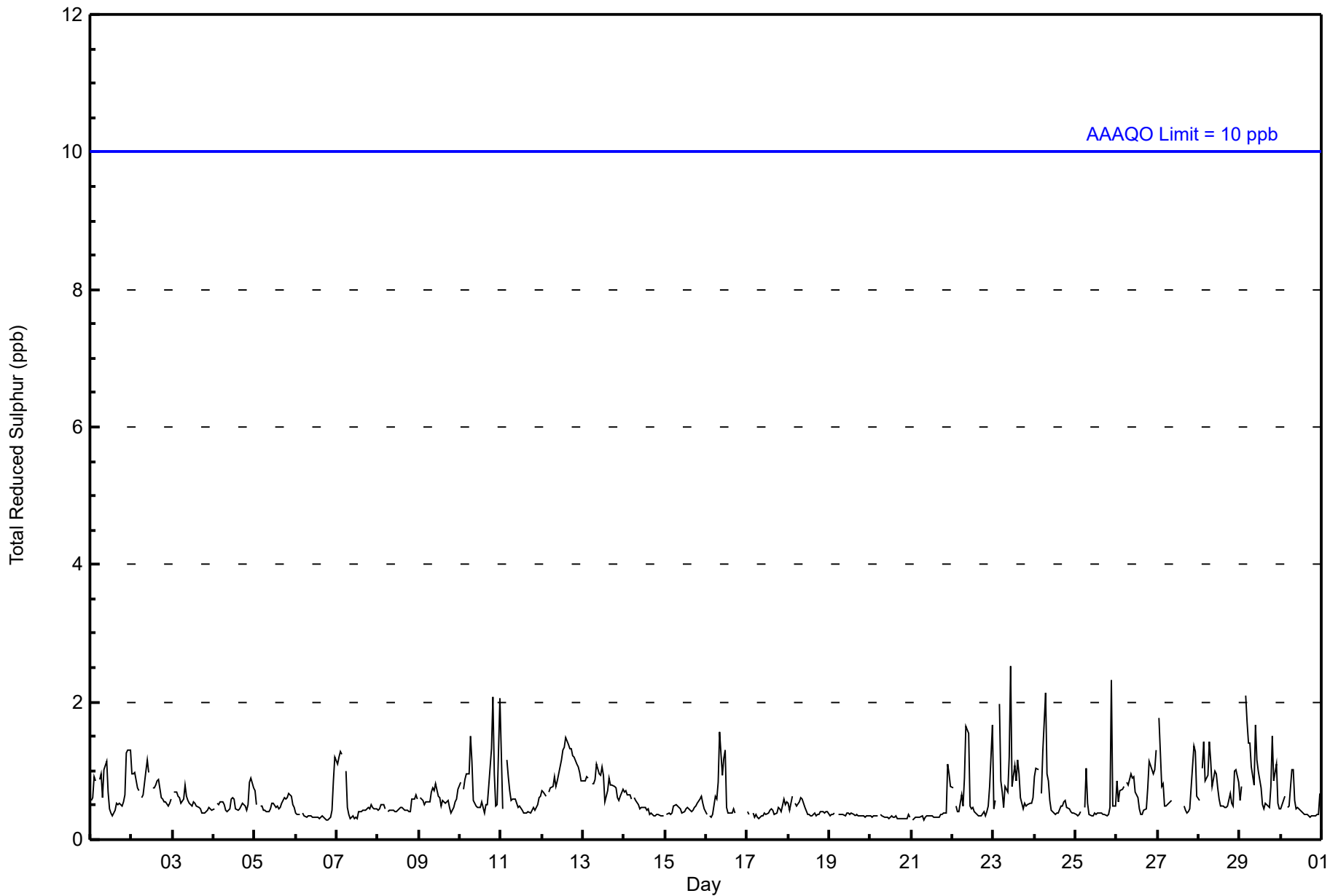


Wood Buffalo Environmental Association

Summary of Hour Averages

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.5 ppb on Jun 23 11:00 Minimum Value: 0.3 ppb on Jun 21 02:00 Maximum Diurnal Average: 0.8 ppb at hour 4 Monthly Average: 0.61 ppb		Maximum Daily Average: 1.0 ppb on Jun 12 Minimum Daily Average: 0.3 ppb on Jun 20 Minimum Diurnal Average: 0.5 ppb at hour 18 Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.7 P ₉₀ = 1.0 P ₉₉ = 1.8		Hours in Service: 720 Hours of Data: 677 Hours of Missing Data: 43 Hours of Calibration: 36 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-Jun	0.6	0.6	0.9	0.9	Z	0.9	1.0	0.6	1.0	1.1	0.7	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	1.3	1.3	1.3	0.7	1.3		
2-Jun	1.0	0.9	1.0	0.8	0.7	Z	0.6	0.6	1.0	1.2	1.0	M	0.8	0.8	0.8	0.9	0.9	0.6	0.6	0.5	0.5	0.5	0.6	0.8	1.2		
3-Jun	Z	0.7	0.7	0.6	0.6	0.5	0.6	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.8		
4-Jun	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.8	0.9	0.7	0.5	0.9	
5-Jun	0.7	0.5	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.5	0.5	0.7	0.7	
6-Jun	0.4	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	1.2	0.4	1.2	
7-Jun	1.1	1.2	1.3	1.2	Z	1.0	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.6	1.3	
8-Jun	0.4	0.4	0.5	0.5	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.5	0.6	
9-Jun	Z	0.6	0.6	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.4	0.5	0.5	0.6	0.7	0.6	0.8	
10-Jun	0.8	Z	0.7	0.9	1.0	1.0	1.5	1.1	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.8	1.3	2.1	1.0	0.5	0.5	2.1	0.9	2.1	
11-Jun	1.3	0.4	Z	1.2	0.9	0.7	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	0.5	0.4	0.5	0.6	0.6	0.6	1.3	
12-Jun	0.7	0.7	0.6	Z	0.7	0.8	0.8	0.9	0.8	0.8	1.0	1.2	1.3	1.3	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	0.8	1.0	1.5	
13-Jun	0.8	0.9	0.9	0.9	Z	0.8	0.8	0.9	1.1	1.0	0.9	1.1	0.9	0.6	0.7	0.9	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.8	1.1	
14-Jun	0.7	0.7	0.7	0.6	0.6	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.5	0.7	
15-Jun	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.6	
16-Jun	0.4	Z	0.3	0.3	0.4	0.6	0.6	0.8	1.6	0.9	1.2	1.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	PF	PF	PF	PF	PF	PF	--	1.6
17-Jun	0.4	0.4	Z	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.6	0.5	0.6	0.4	0.6
18-Jun	0.5	0.4	0.6	Z	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6
19-Jun	0.3	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	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
20-Jun	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4
21-Jun	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	1.1	0.9	0.8	0.4	1.1	
22-Jun	0.8	Z	0.5	0.4	0.4	0.6	0.5	0.9	1.7	1.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.8	1.7	0.6	1.7	
23-Jun	0.5	0.6	Z	2.0	0.8	0.7	0.5	0.8	0.7	1.2	2.5	0.8	1.1	0.9	1.2	1.0	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.8	2.5	
24-Jun	0.9	1.0	1.0	Z	0.7	1.3	2.1	1.0	0.9	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.7	2.1	
25-Jun	0.4	0.4	0.4	0.4	Z	0.5	1.0	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.5	2.3	0.5	0.5	0.5	2.3	
26-Jun	0.9	0.5	0.7	0.7	0.8	Z	0.8	0.8	1.0	0.9	0.9	0.7	0.6	0.4	0.4	0.4	0.4	0.5	0.7	1.1	1.1	1.0	1.0	1.3	0.8	1.3	
27-Jun	Z	1.8	0.8	0.8	0.5	0.5	0.5	0.6	C	C	C	C	C	C	C	0.5	0.4	0.4	0.4	0.4	1.1	1.4	1.3	0.6	--	1.8	
28-Jun	0.6	Z	1.0	1.4	0.9	0.9	1.4	1.1	0.8	1.0	1.0	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.5	1.0	1.0	0.8	0.8	1.4	
29-Jun	0.6	0.8	Z	2.1	1.7	1.4	1.4	1.1	0.8	1.7	1.2	1.0	0.8	0.5	0.5	0.5	0.5	0.5	0.8	1.5	0.8	1.1	0.5	0.5	1.0	2.1	
30-Jun	0.4	0.5	0.6	Z	0.5	0.5	1.0	1.0	0.6	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	0.4	0.7	0.5	1.0	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.6 0.6 0.6 0.8 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.7 0.6 0.7			
																								1.3 1.8 1.3 2.1 1.7 1.4 2.1 1.1 1.7 1.7 2.5 1.3 1.3 1.3 1.5 1.4 1.3 1.3 1.3 2.1 1.1 2.3 1.3 2.1			
Z - zerspan C - Calibration M - Maintenance PF - Power Failure Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	676	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: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - June 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	123	73	28	11	8	5	15	80	67	36	37	27	26	37	37	57	667
3 - 4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	123	73	28	11	8	5	15	81	67	36	37	27	26	37	37	57	668

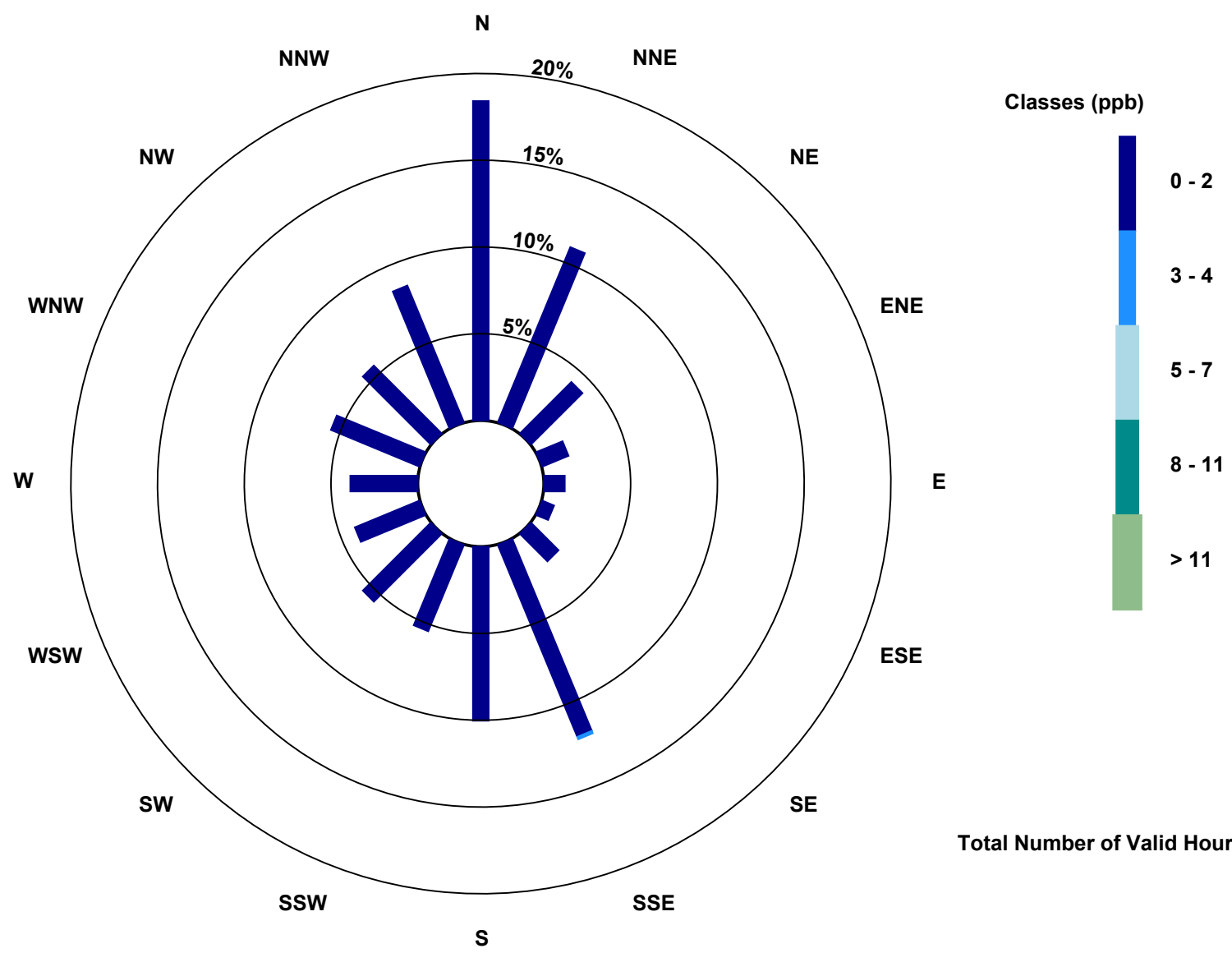
Total Number of Valid Hours: 668

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

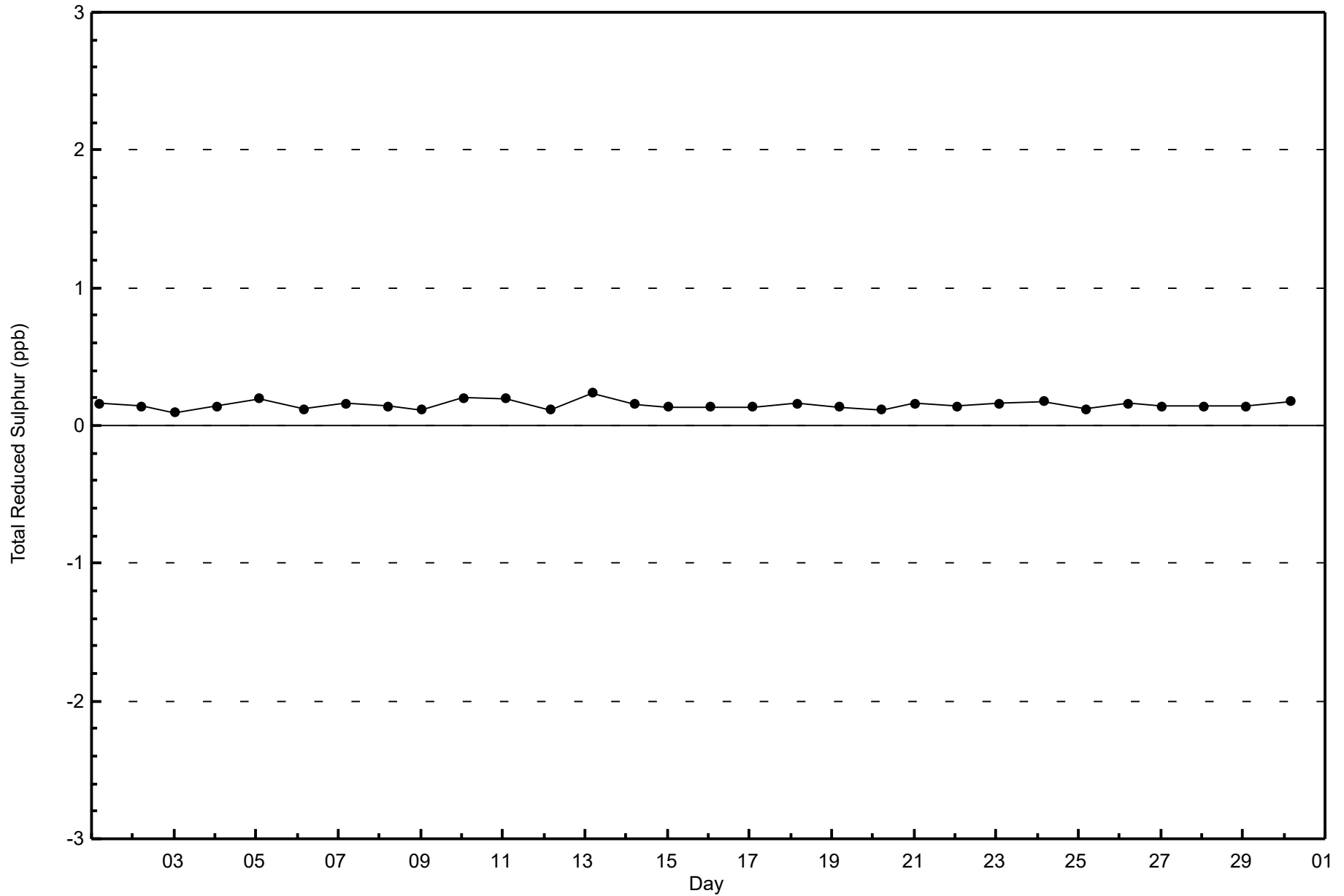


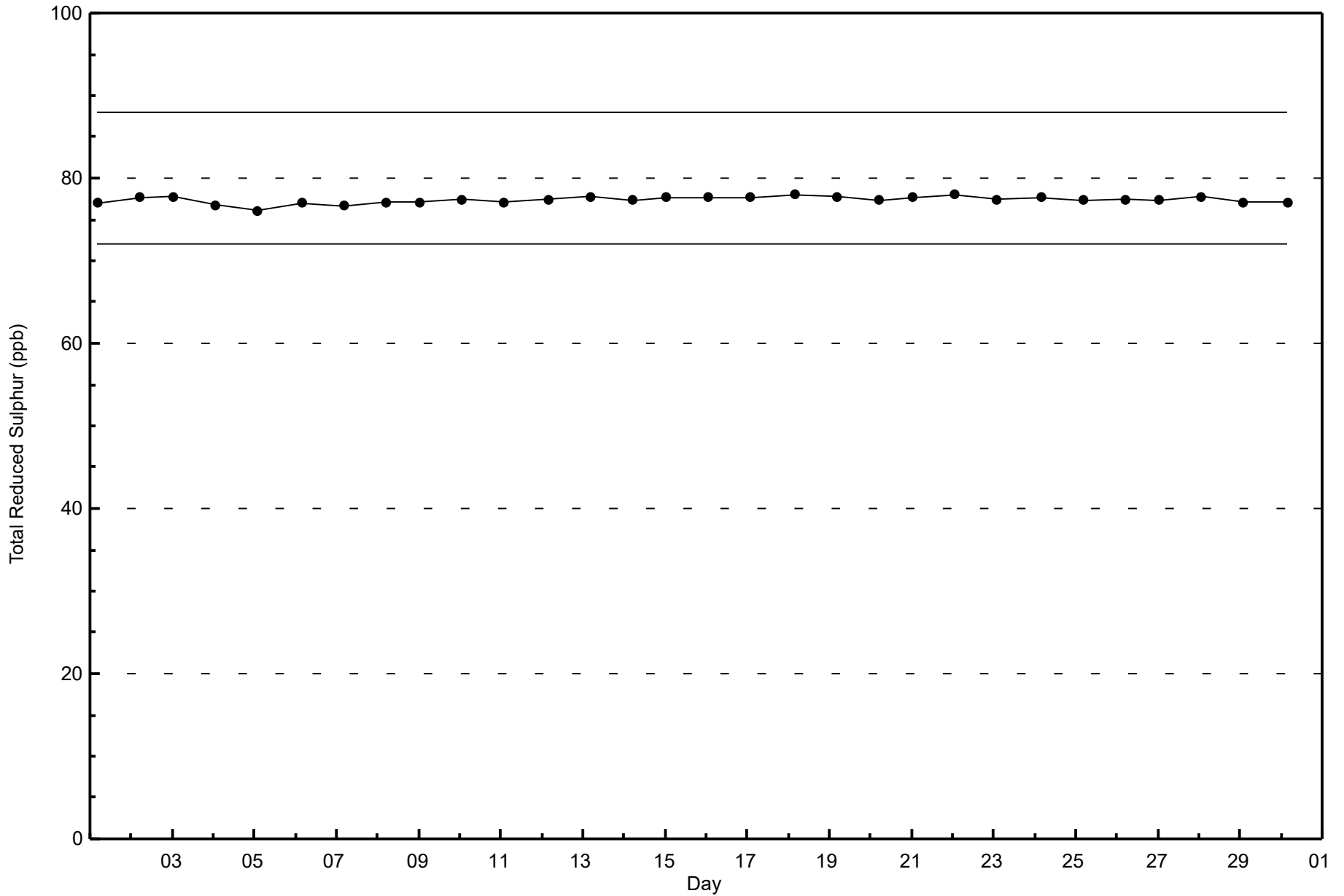
Total Number of Valid Hours: 668



Wood Buffalo Environmental Association
Zero Responses

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







Wood Buffalo Environmental Association
Summary of Hour Averages

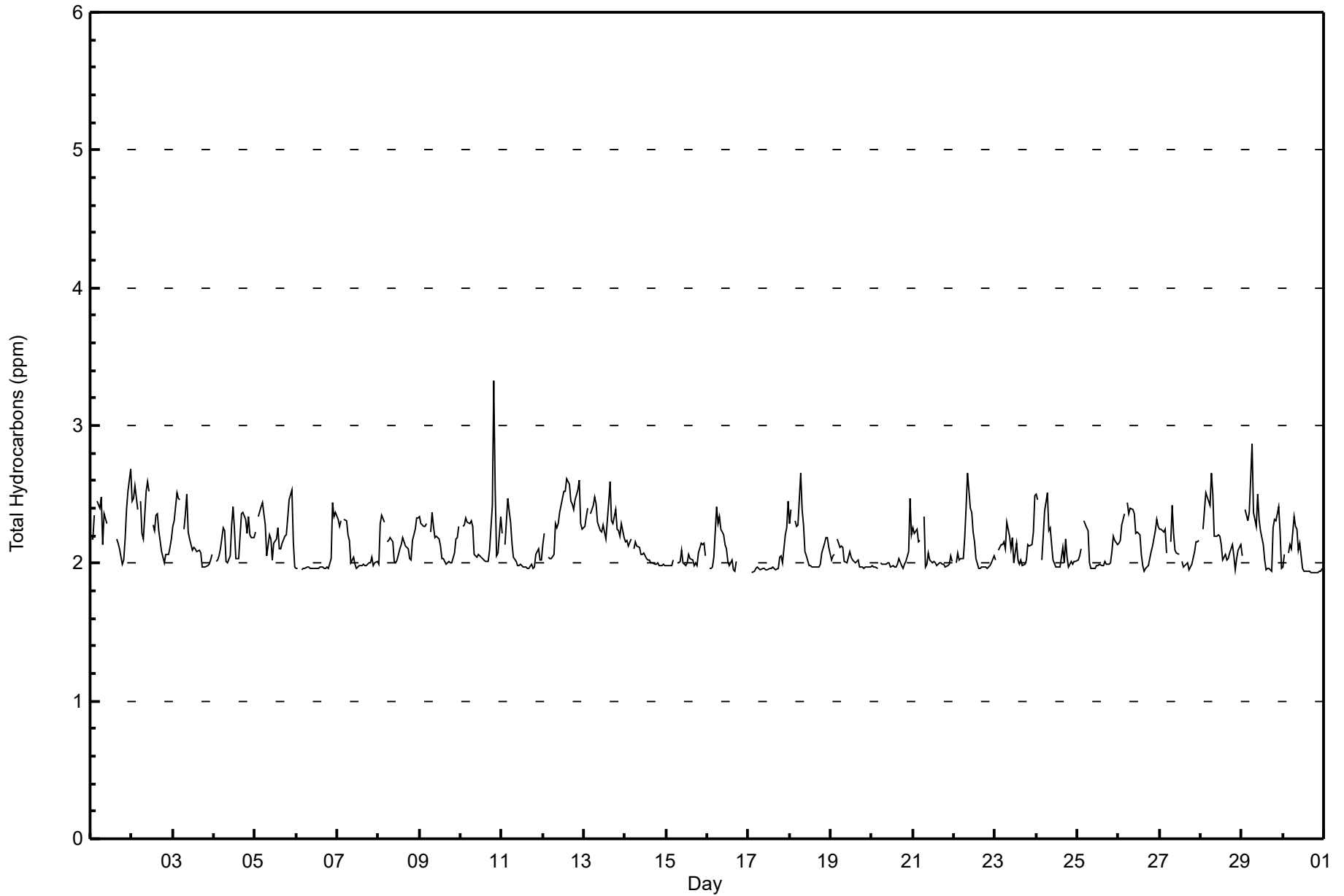
Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - June 2023

Maximum Value: 3.3 ppm on Jun 10 20:00		Maximum Daily Average: 2.3 ppm on Jun 12		Hours in Service: 720																							
Minimum Value: 1.9 ppm on Jun 17 01:00		Minimum Daily Average: 2.0 ppm on Jun 17		Hours of Data: 677																							
Maximum Diurnal Average: 2.3 ppm at hour 7		Minimum Diurnal Average: 2.1 ppm at hour 18		Hours of Missing Data: 43																							
Monthly Average: 2.14 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.6		Hours of Calibration: 35																							
				Percent Operational Time: 98.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	2.2	2.2	2.3	Z	2.4	2.4	2.5	2.1	2.4	2.3	C	C	C	C	2.2	2.1	2.1	2.0	2.0	2.2	2.4	2.5	2.7	2.3	2.7		
2-Jun	2.5	2.5	2.6	2.4	Z	2.4	2.2	2.2	2.5	2.6	2.5	M	2.3	2.2	2.3	2.4	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.6	
3-Jun	2.3	2.3	2.5	2.5	2.5	Z	2.3	2.4	2.5	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.5		
4-Jun	Z	2.0	2.0	2.1	2.1	2.3	2.2	2.0	2.0	2.1	2.3	2.4	2.2	2.0	2.0	2.2	2.4	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.4		
5-Jun	2.2	Z	2.3	2.4	2.4	2.4	2.3	2.1	2.2	2.2	2.0	2.1	2.2	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.5	2.5	2.2	2.0	2.5		
6-Jun	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	2.4	2.3	2.4	2.0	2.4		
7-Jun	2.3	2.3	2.3	Z	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	2.0	2.1	2.3		
8-Jun	2.0	2.3	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.2	2.2	2.3	2.3	2.2	2.4	
9-Jun	2.3	2.3	2.3	2.3	2.3	Z	2.2	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	2.2	2.2	2.3	2.2	2.4	
10-Jun	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.4	3.3	2.5	2.1	2.1	2.3	2.2	3.3	
11-Jun	2.2	Z	2.1	2.5	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.5	
12-Jun	2.1	2.2	Z	2.0	2.0	2.0	2.1	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.6	2.4	2.4	2.4	2.5	2.5	2.6	2.3	2.3	2.3	2.6	
13-Jun	2.3	2.3	2.4	Z	2.4	2.4	2.5	2.4	2.3	2.2	2.2	2.3	2.2	2.2	2.4	2.6	2.3	2.3	2.4	2.2	2.2	2.2	2.3	2.2	2.3	2.6	
14-Jun	2.2	2.2	2.1	2.2	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
15-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	
16-Jun	Z	2.0	2.0	2.0	2.0	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	1.9	1.9	2.0	PF	PF	PF	PF	PF	PF	--	2.4	
17-Jun	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.3	2.4	2.0	2.4
18-Jun	2.3	2.4	Z	2.3	2.3	2.3	2.7	2.4	2.3	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	2.2	2.2	2.1	2.2	2.7
19-Jun	2.0	2.1	2.1	Z	2.2	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
20-Jun	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	2.5	2.2	2.0	2.5	
21-Jun	2.3	2.2	2.2	2.2	2.2	Z	2.3	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.3	
22-Jun	Z	2.0	2.1	2.0	2.0	2.0	2.2	2.4	2.7	2.4	2.4	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.7	
23-Jun	2.0	Z	2.1	2.1	2.1	2.2	2.1	2.3	2.2	2.1	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.5	2.1	2.5	
24-Jun	2.5	2.5	Z	2.0	2.2	2.4	2.5	2.2	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	
25-Jun	2.0	2.1	2.1	Z	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.3	
26-Jun	2.1	2.2	2.3	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.2	2.2	2.2	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.2	2.4	
27-Jun	2.2	2.3	2.2	2.2	2.1	Z	2.2	2.4	2.2	2.1	2.1	2.1	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.4	
28-Jun	Z	2.2	2.4	2.5	2.5	2.4	2.7	2.5	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.7	
29-Jun	2.1	Z	2.4	2.3	2.4	2.6	2.9	2.4	2.3	2.5	2.3	2.2	2.1	2.0	2.0	2.0	2.0	1.9	2.3	2.3	2.3	2.4	2.2	2.0	2.3	2.9	
30-Jun	2.0	2.1	Z	2.1	2.1	2.1	2.3	2.3	2.3	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.3	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	293	43.28	43.28
2.1 - 3.0	383	56.57	99.85
3.1 - 10.0	1	0.15	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
Fort McKay - Bertha Ganter - June 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	55	31	16	6	2	1	3	20	12	22	29	22	13	20	16	24	292
2.1 - 3.0	69	45	13	5	6	4	11	60	56	11	8	8	10	17	23	30	376
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	124	76	29	11	8	5	14	80	69	33	37	30	23	37	39	54	669

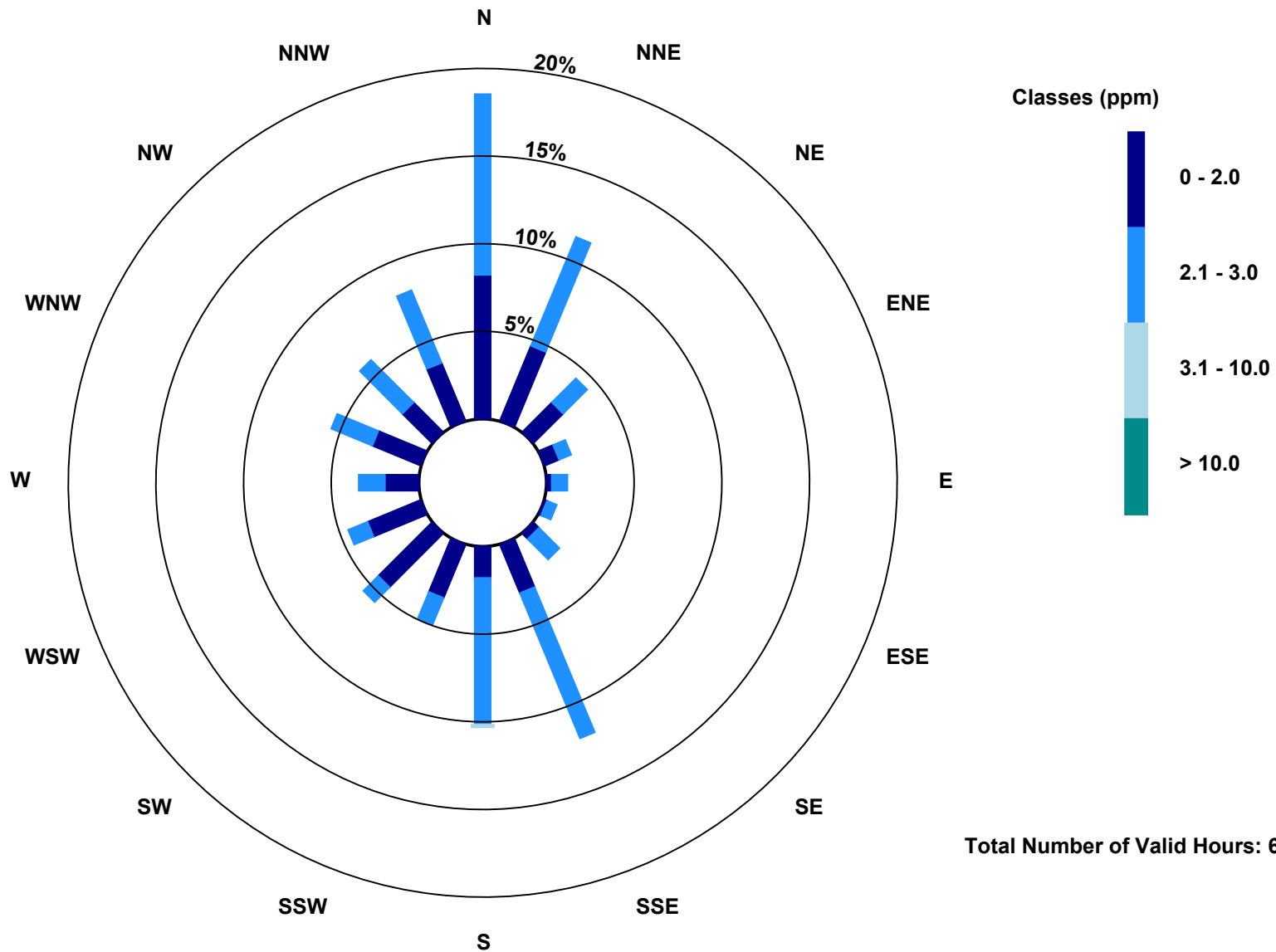
Total Number of Valid Hours: 669

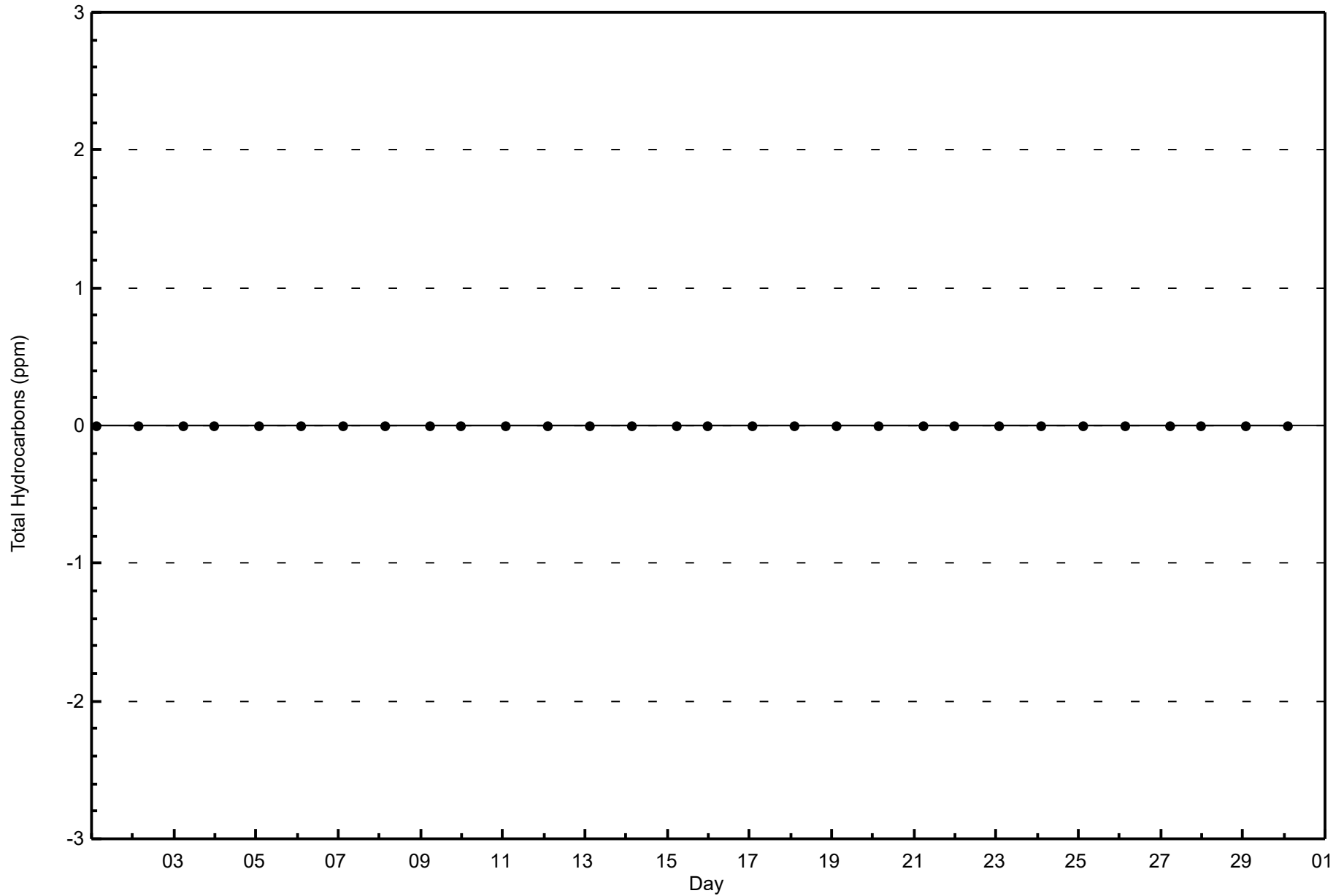
Total Number of Hours: 720

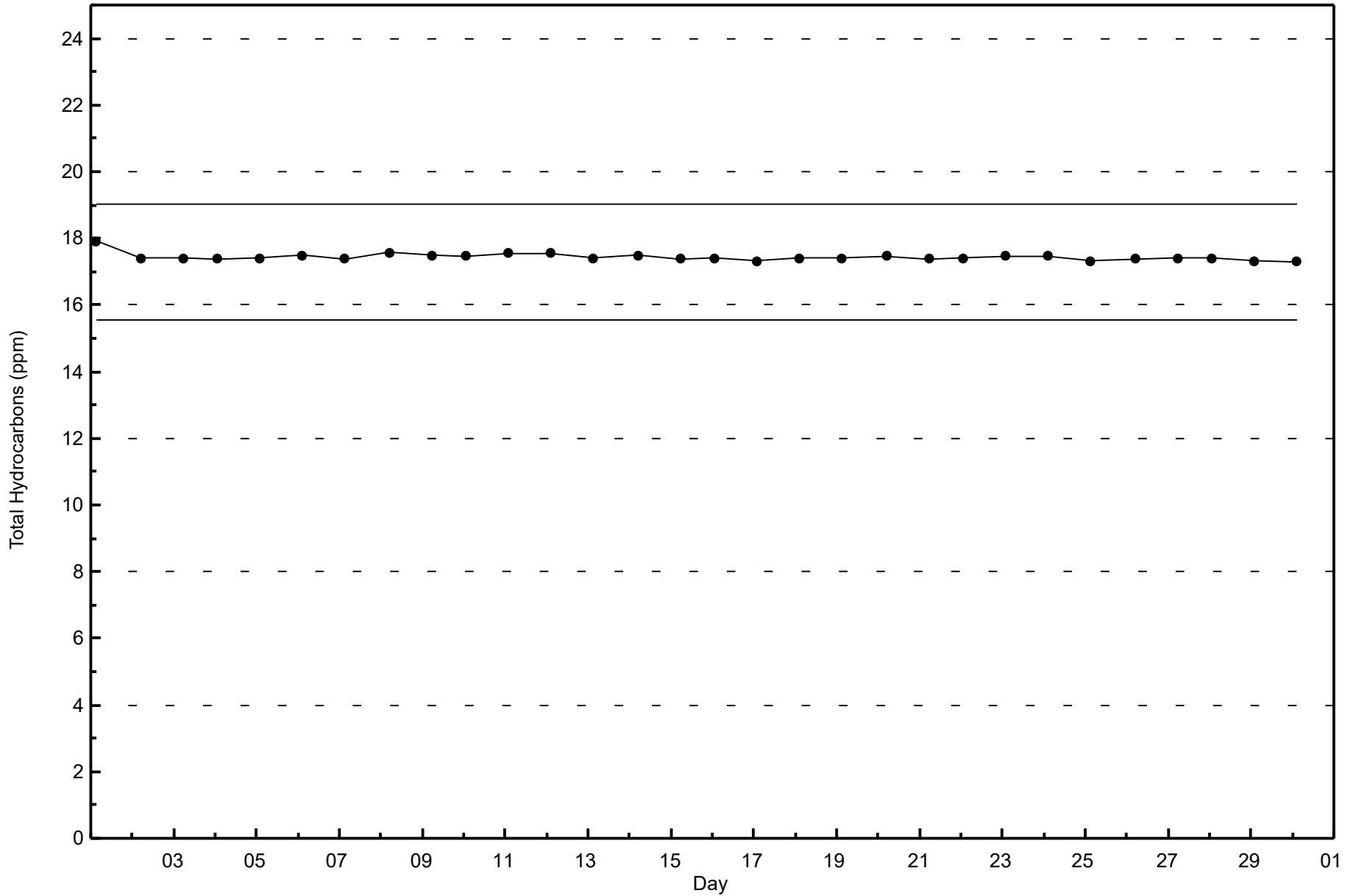


Wood Buffalo Environmental Association
Wind Rose Jun 2023

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









Wood Buffalo Environmental Association
Summary of Hour Averages

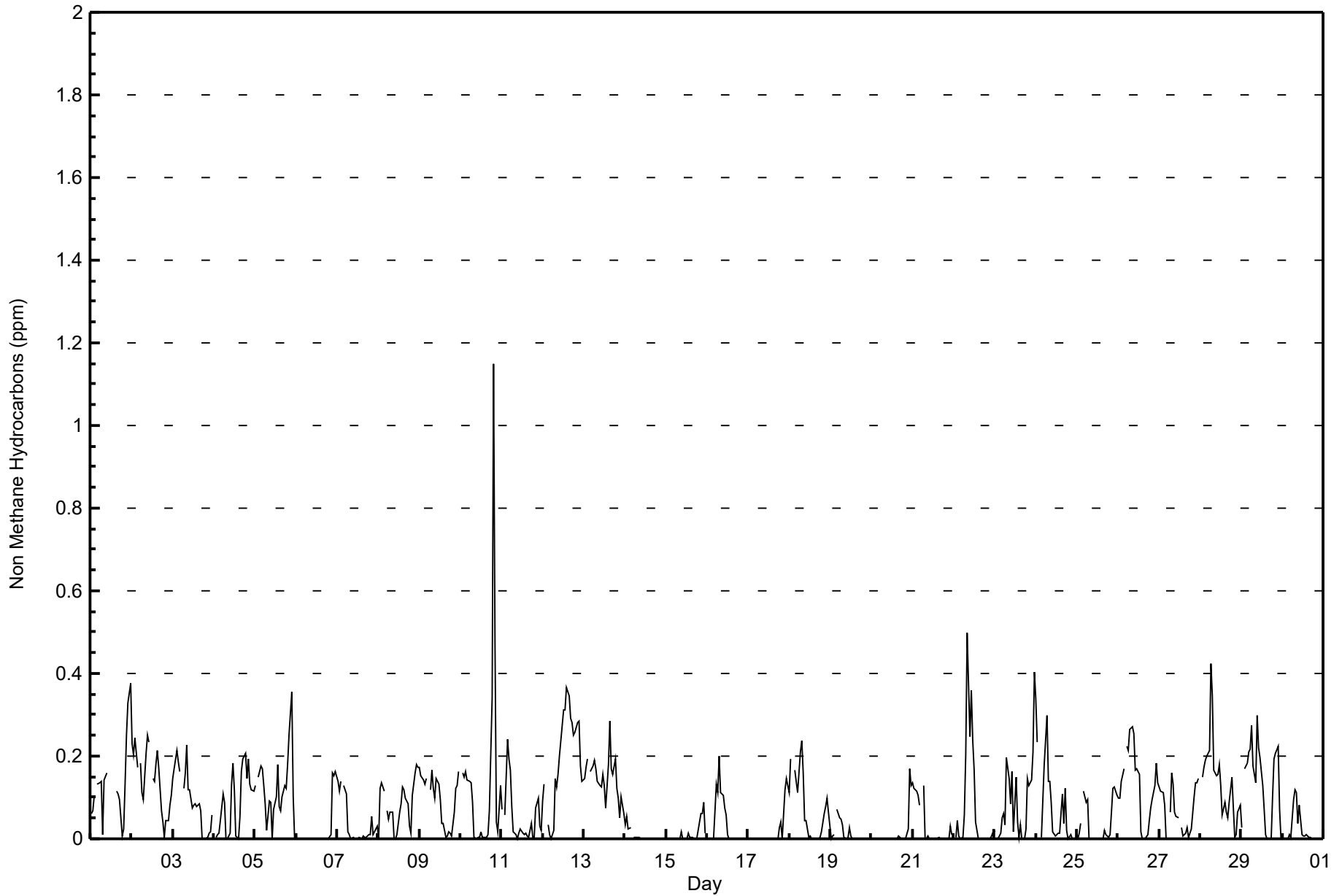
Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - June 2023

Maximum Value: 1.149 ppm on Jun 10 20:00		Maximum Daily Average: 0.195 ppm on Jun 12		Hours in Service: 720																																													
Minimum Value: 0.000 ppm on Jun 3 18:00		Minimum Daily Average: 0.006 ppm on Jun 14		Hours of Data: 677																																													
Maximum Diurnal Average: 0.107 ppm at hour 7		Minimum Diurnal Average: 0.041 ppm at hour 15		Hours of Missing Data: 43																																													
Monthly Average: 0.078 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: 35																																													
				Percent Operational Time: 98.9																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	0.062	0.067	0.106	Z	0.132	0.134	0.139	0.009	0.142	0.158	C	C	C	C	C	0.114	0.108	0.095	0.008	0.024	0.132	0.252	0.327	0.375	0.132	0.375																							
2-Jun	0.232	0.205	0.244	0.173	Z	0.182	0.113	0.096	0.206	0.252	0.235	M	0.145	0.139	0.181	0.215	0.172	0.068	0.039	0.003	0.043	0.043	0.082	0.104	0.144	0.252																							
3-Jun	0.147	0.170	0.212	0.186	0.164	Z	0.122	0.161	0.227	0.118	0.119	0.075	0.083	0.084	0.077	0.085	0.069	0.000	0.000	0.000	0.004	0.013	0.017	0.056	0.095	0.227																							
4-Jun	Z	0.005	0.009	0.013	0.045	0.109	0.087	0.000	0.000	0.013	0.133	0.184	0.117	0.006	0.000	0.053	0.162	0.194	0.205	0.146	0.194	0.132	0.120	0.116	0.089	0.205																							
5-Jun	0.128	Z	0.149	0.175	0.171	0.129	0.086	0.020	0.090	0.088	0.000	0.073	0.103	0.181	0.078	0.069	0.103	0.131	0.122	0.181	0.250	0.356	0.101	0.000	0.121	0.356																							
6-Jun	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	0.011	0.158	0.154	0.162	0.021	0.162																							
7-Jun	0.138	0.114	0.141	Z	0.128	0.108	0.016	0.011	0.000	0.002	0.000	0.000	0.000	0.003	0.001	0.005	0.002	0.003	0.010	0.010	0.054	0.010	0.017	0.032	0.035	0.141																							
8-Jun	0.001	0.121	0.134	0.115	Z	0.068	0.049	0.064	0.064	0.000	0.000	0.009	0.064	0.084	0.125	0.117	0.097	0.086	0.032	0.015	0.104	0.161	0.179	0.174	0.081	0.179																							
9-Jun	0.174	0.151	0.142	0.133	0.144	Z	0.119	0.167	0.123	0.100	0.147	0.133	0.096	0.039	0.036	0.003	0.006	0.019	0.012	0.007	0.064	0.123	0.129	0.164	0.097	0.174																							
10-Jun	Z	0.159	0.150	0.162	0.142	0.139	0.136	0.089	0.004	0.000	0.004	0.003	0.018	0.002	0.004	0.002	0.009	0.068	0.342	1.149	0.481	0.040	0.016	0.128	0.141	1.149																							
11-Jun	0.073	Z	0.057	0.242	0.193	0.165	0.078	0.016	0.010	0.000	0.012	0.024	0.014	0.010	0.013	0.006	0.004	0.036	0.003	0.004	0.075	0.098	0.029	0.020	0.051	0.242																							
12-Jun	0.092	0.131	Z	0.035	0.010	0.001	0.021	0.145	0.124	0.155	0.201	0.273	0.313	0.312	0.368	0.345	0.293	0.280	0.252	0.258	0.282	0.283	0.175	0.140	0.195	0.368																							
13-Jun	0.147	0.173	0.194	Z	0.163	0.178	0.189	0.170	0.139	0.130	0.126	0.158	0.130	0.073	0.179	0.285	0.168	0.155	0.193	0.121	0.099	0.051	0.103	0.060	0.147	0.285																							
14-Jun	0.036	0.055	0.023	0.026	Z	0.002	0.002	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	0.006	0.055																							
15-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.014	0.002	0.003	0.000	0.000	0.019	0.062	0.062	0.087	0.013	0.012	0.087																							
16-Jun	Z	0.000	0.000	0.000	0.000	0.133	0.113	0.200	0.111	0.106	0.075	0.057	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	PF	PF	PF	PF	PF	--	0.200																					
17-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.040	0.000	0.117	0.145	0.130	0.020	0.145																						
18-Jun	0.112	0.195	Z	0.166	0.139	0.112	0.212	0.239	0.160	0.046	0.043	0.004	0.007	0.001	0.000	0.000	0.000	0.000	0.003	0.018	0.062	0.078	0.099	0.063	0.076	0.239																							
19-Jun	0.001	0.006	0.010	Z	0.070	0.051	0.047	0.034	0.004	0.001	0.005	0.027	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.070																							
20-Jun	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	0.007	0.000	0.000	0.000	0.000	0.025	0.169	0.130	0.014	0.169																						
21-Jun	0.136	0.121	0.116	0.105	0.080	Z	0.128	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.009	0.032	0.136																							
22-Jun	Z	0.004	0.043	0.008	0.001	0.002	0.057	0.204	0.498	0.247	0.358	0.238	0.165	0.040	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.019	0.082	0.498																							
23-Jun	0.015	Z	0.001	0.012	0.052	0.060	0.033	0.195	0.147	0.085	0.162	0.018	0.150	0.041	0.002	0.034	0.000	0.000	0.023	0.145	0.128	0.142	0.209	0.403	0.089	0.403																							
24-Jun	0.338	0.234	Z	0.003	0.090	0.180	0.298	0.139	0.139	0.088	0.018	0.005	0.011	0.013	0.014	0.108	0.037	0.121	0.021	0.000	0.010	0.000	0.000	0.000	0.081	0.338																							
25-Jun	0.000	0.003	0.036	Z	0.114	0.087	0.095	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.020	0.009	0.004	0.011	0.064	0.123	0.124	0.107	0.035	0.124																							
26-Jun	0.098	0.100	0.138	0.170	Z	0.222	0.213	0.265	0.271	0.256	0.167	0.169	0.155	0.018	0.000	0.000	0.000	0.011	0.043	0.073	0.096	0.130	0.184	0.134	0.127	0.271																							
27-Jun	0.125	0.115	0.112	0.082	0.000	Z	0.063	0.159	0.131	0.065	0.053	0.051	M	0.026	0.006	0.013	0.028	0.003	0.014	0.024	0.102	0.135	0.134	0.146	0.072	0.159																							
28-Jun	Z	0.150	0.172	0.190	0.199	0.215	0.425	0.344	0.167	0.152	0.155	0.179	0.128	0.058	0.089	0.065	0.051	0.087	0.149	0.075	0.002	0.009	0.064	0.080	0.139	0.425																							
29-Jun	0.028	Z	0.170	0.185	0.210	0.219	0.276	0.176	0.136	0.297	0.220	0.196	0.129	0.070	0.012	0.000	0.000	0.001	0.102	0.194	0.207	0.223	0.072	0.000	0.136	0.297																							
30-Jun	0.000	0.000	Z	0.000	0.009	0.003	0.096	0.120	0.110	0.039	0.082	0.009	0.008	0.007	0.011	0.004	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.120																							
																								0.083	0.091	0.094	0.087	0.090	0.100	0.107	0.101	0.100	0.081	0.080	0.067	0.066	0.042	0.041	0.051	0.045	0.046	0.055	0.087	0.087	0.095	0.096	0.095	Diurnal Average	
																								0.338	0.234	0.244	0.242	0.210	0.222	0.425	0.344	0.498	0.297	0.358	0.273	0.313	0.312	0.368	0.345	0.293	0.280	0.342	1.149	0.481	0.356	0.327	0.403	Diurnal Maximum	
Z - zerospan		C - Calibration			M - Maintenance			PF - Power Failure																																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	230	33.97	33.97
0.006 - 0.05	124	18.32	52.29
0.06 - 0.1	192	28.36	80.65
> 0.1	131	19.35	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - June 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	57	23	9	3	2	1	1	14	12	15	25	20	10	11	8	18	229
0.006 - 0.05	22	16	9	3	0	1	1	10	10	6	6	3	4	11	12	8	122
0.06 - 0.1	30	22	5	3	5	3	8	23	26	8	5	7	4	10	14	16	189
> 0.1	15	15	6	2	1	0	4	33	21	4	1	0	5	5	5	12	129
Totals	124	76	29	11	8	5	14	80	69	33	37	30	23	37	39	54	669

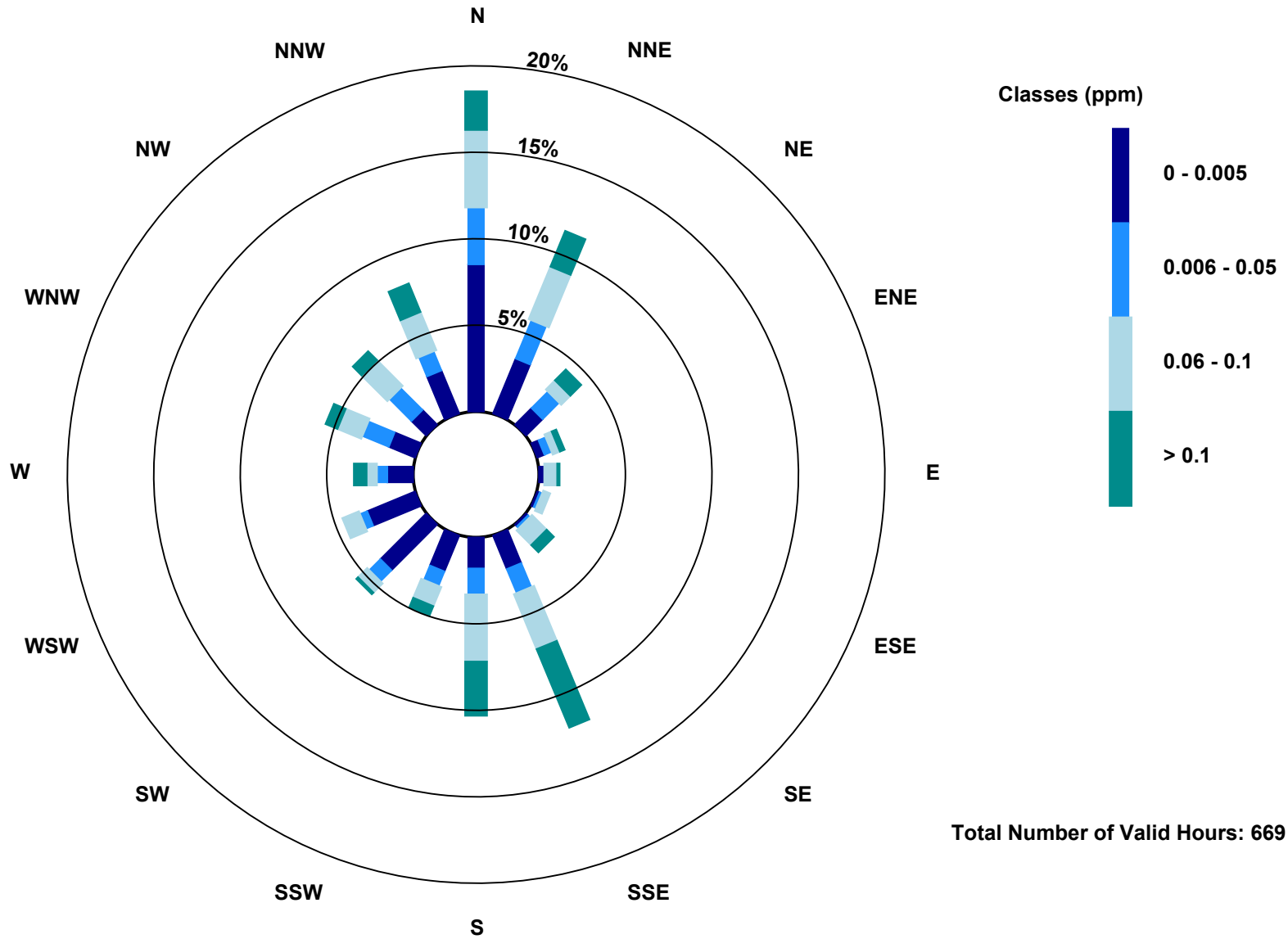
Total Number of Valid Hours: 669

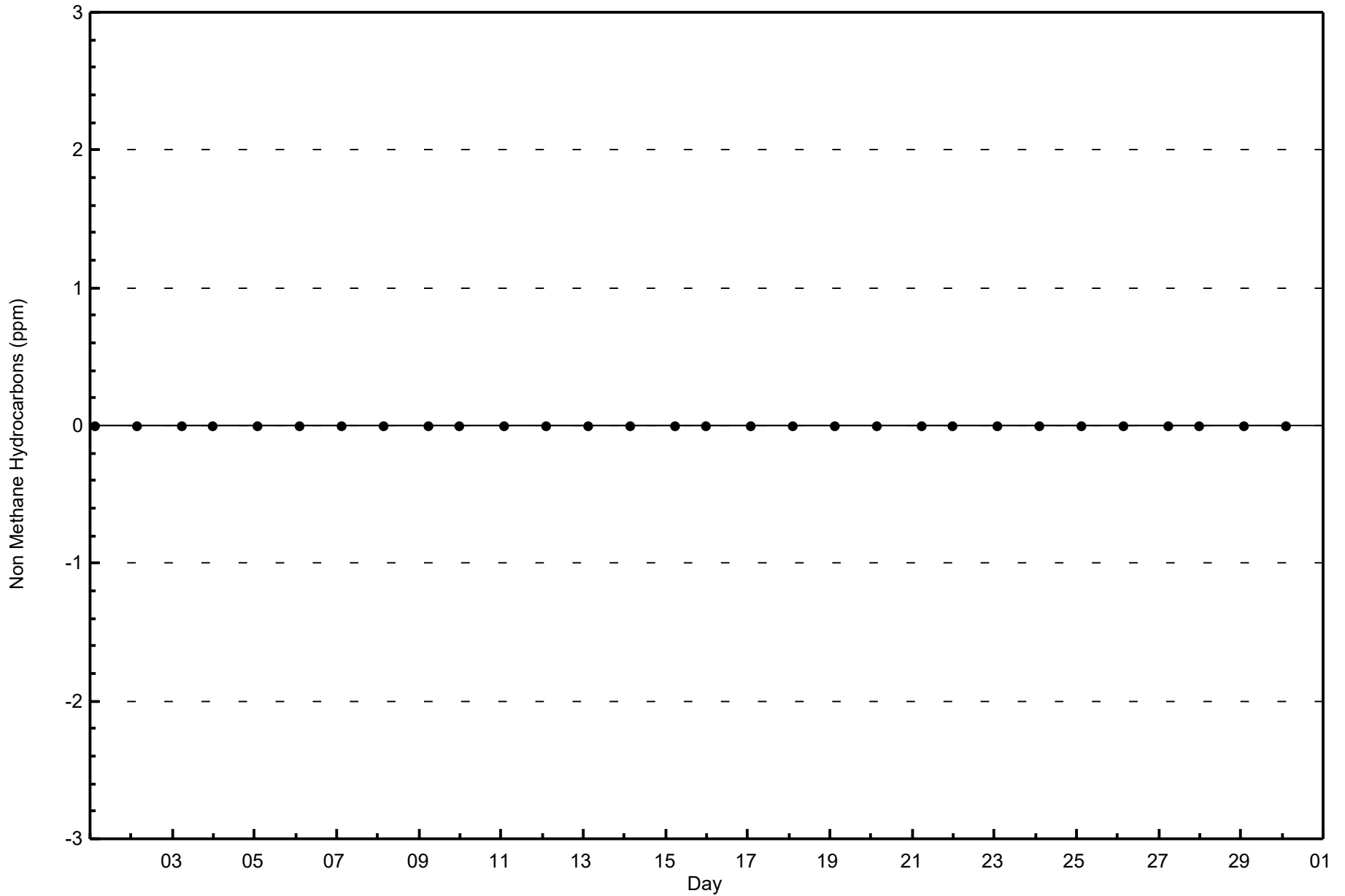
Total Number of Hours: 720

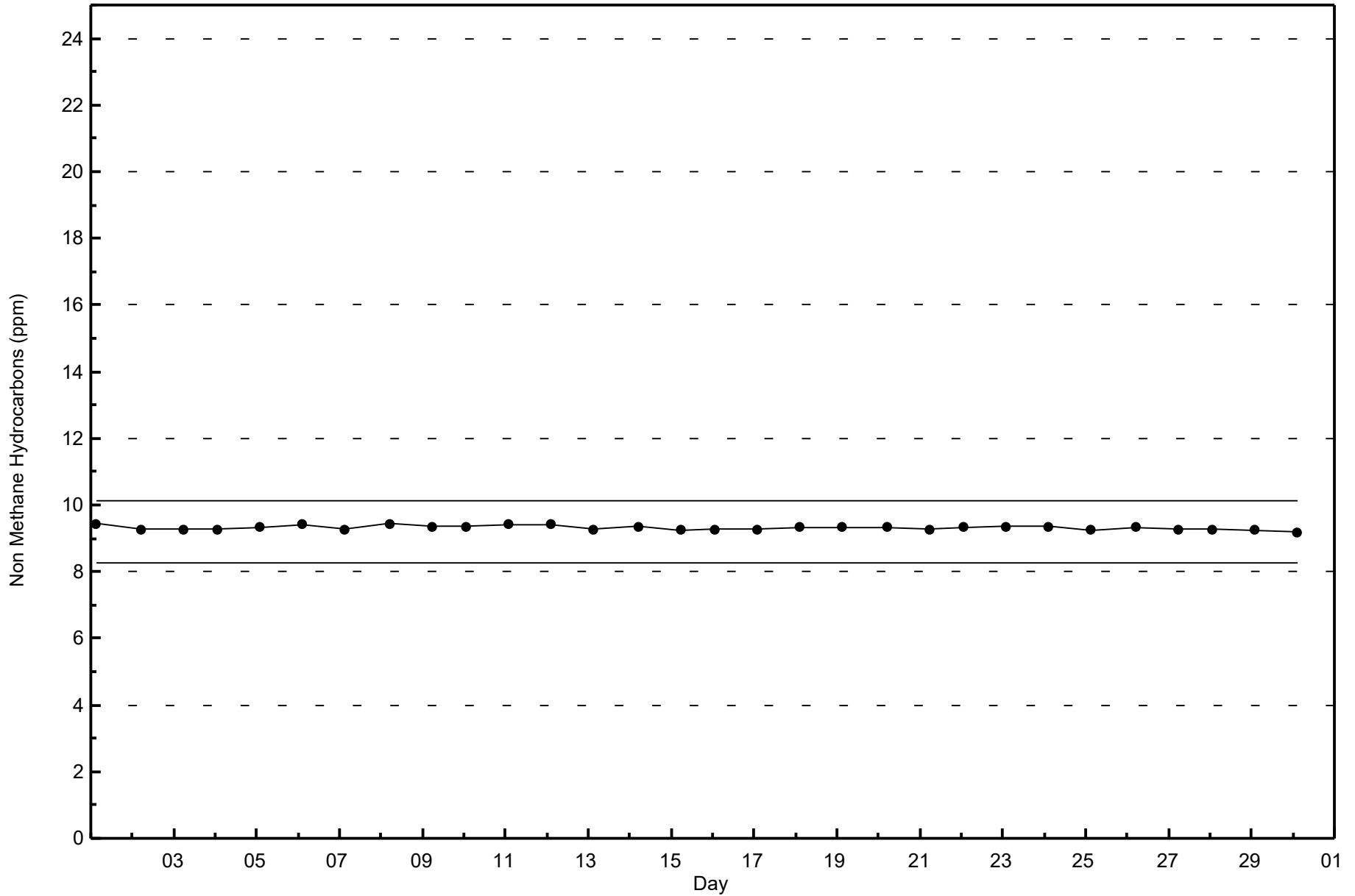


Wood Buffalo Environmental Association
Wind Rose Jun 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH4) - ppm

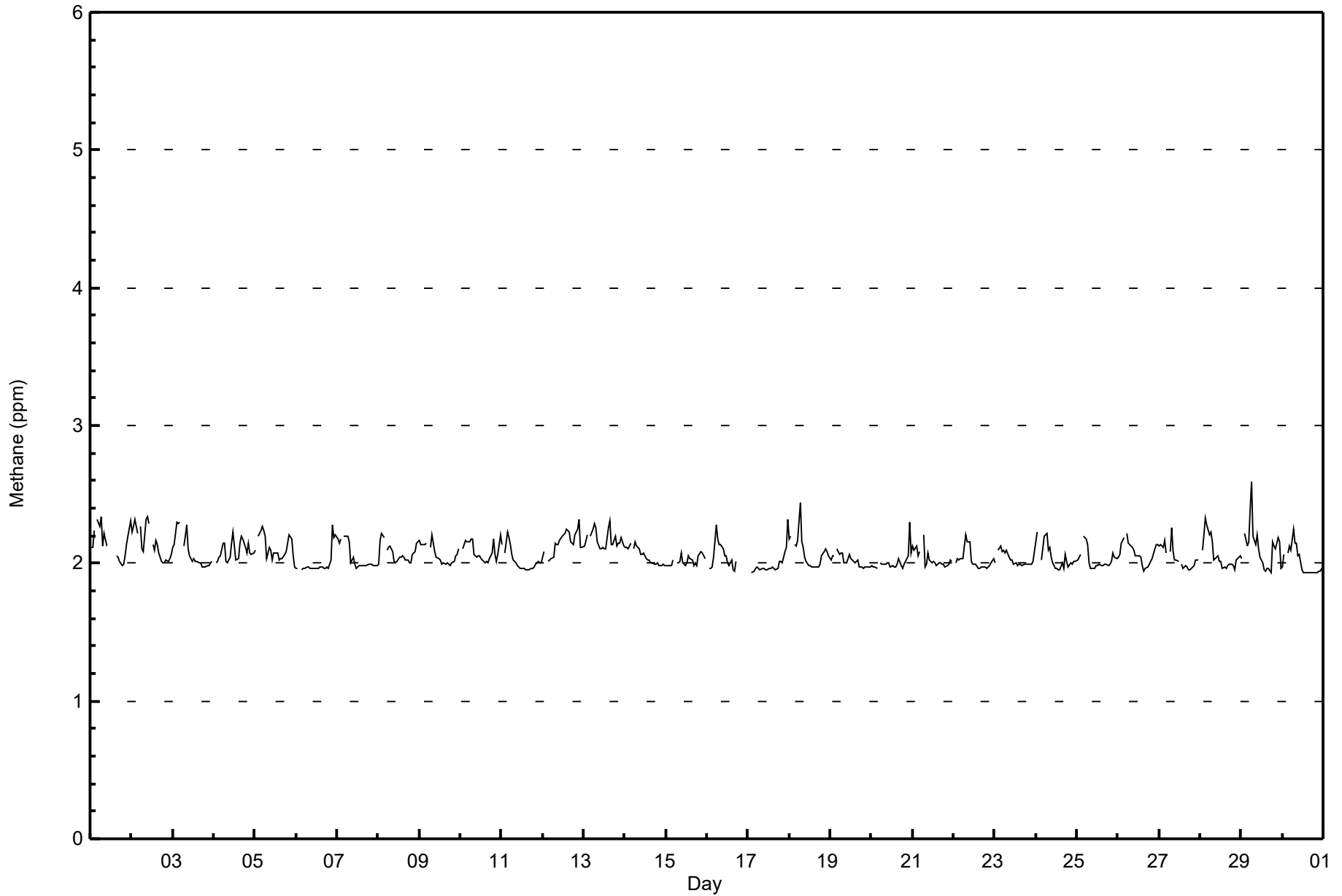
Fort McKay - Bertha Ganter - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.6 ppm on Jun 29 07:00	Maximum Daily Average: 2.2 ppm on Jun 13		Hours of Data:	677
Minimum Value: 1.9 ppm on Jun 17 01:00	Minimum Daily Average: 2.0 ppm on Jun 17		Hours of Missing Data:	43
Maximum Diurnal Average: 2.2 ppm at hour 7	Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Calibration:	35
Monthly Average: 2.06 ppm	Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.3		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-Jun	2.1	2.1	2.2	Z	2.3	2.3	2.3	2.1	2.2	2.1	C	C	C	C	C	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.3	
2-Jun	2.2	2.3	2.3	2.2	Z	2.3	2.1	2.1	2.3	2.3	2.3	M	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	
3-Jun	2.1	2.1	2.3	2.3	2.3	Z	2.1	2.2	2.3	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	2.3	
4-Jun	Z	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
5-Jun	2.1	Z	2.2	2.2	2.3	2.2	2.2	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.1	2.3	
6-Jun	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	2.3	2.2	2.2	2.0	2.3	
7-Jun	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
8-Jun	2.0	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.2	
9-Jun	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	
10-Jun	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.1	2.2	2.1	2.2	
11-Jun	2.1	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
12-Jun	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.1	2.1	2.1	2.3	
13-Jun	2.1	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.3	
14-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
15-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	
16-Jun	Z	2.0	2.0	2.0	2.0	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	2.0	PF	PF	PF	PF	PF	PF	PF	--	2.3
17-Jun	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.0	2.3
18-Jun	2.2	2.2	Z	2.1	2.1	2.2	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4
19-Jun	2.0	2.0	2.1	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
20-Jun	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	2.3	2.1	2.0	2.3	
21-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.2	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	2.2
22-Jun	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	2.0	2.0	2.0	2.0	2.0	2.2
23-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
24-Jun	2.2	2.2	Z	2.0	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
25-Jun	2.0	2.0	2.1	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2
26-Jun	2.0	2.1	2.1	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2
27-Jun	2.1	2.1	2.1	2.2	2.1	Z	2.1	2.3	2.1	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
28-Jun	Z	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3
29-Jun	2.0	Z	2.2	2.1	2.2	2.4	2.6	2.2	2.1	2.2	2.1	2.0	2.0	2.0	1.9	2.0	2.0	1.9	2.2	2.1	2.1	2.2	2.2	2.0	2.0	2.6	
30-Jun	2.0	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	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	2.2

2.1	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	2.1	2.1	2.1	Diurnal Average	
2.2	2.3	2.3	2.3	2.3	2.4	2.6	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	378	55.83	55.83
2.1 - 3.0	299	44.17	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

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter - June 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	63	46	21	8	6	3	8	32	21	24	32	25	14	23	21	27	374
2.1 - 3.0	61	30	8	3	2	2	6	48	48	9	5	5	9	14	18	27	295
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	124	76	29	11	8	5	14	80	69	33	37	30	23	37	39	54	669

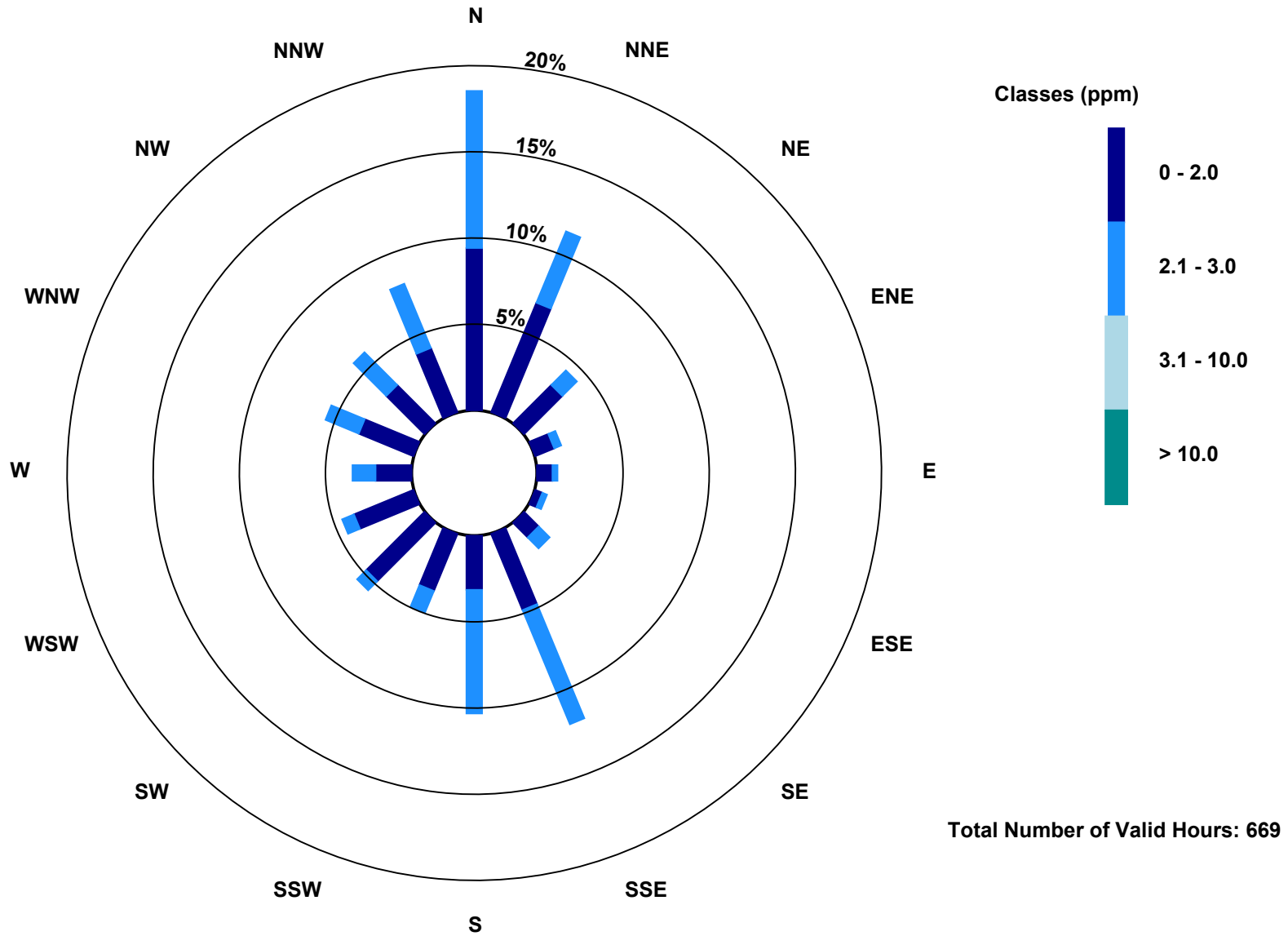
Total Number of Valid Hours: 669

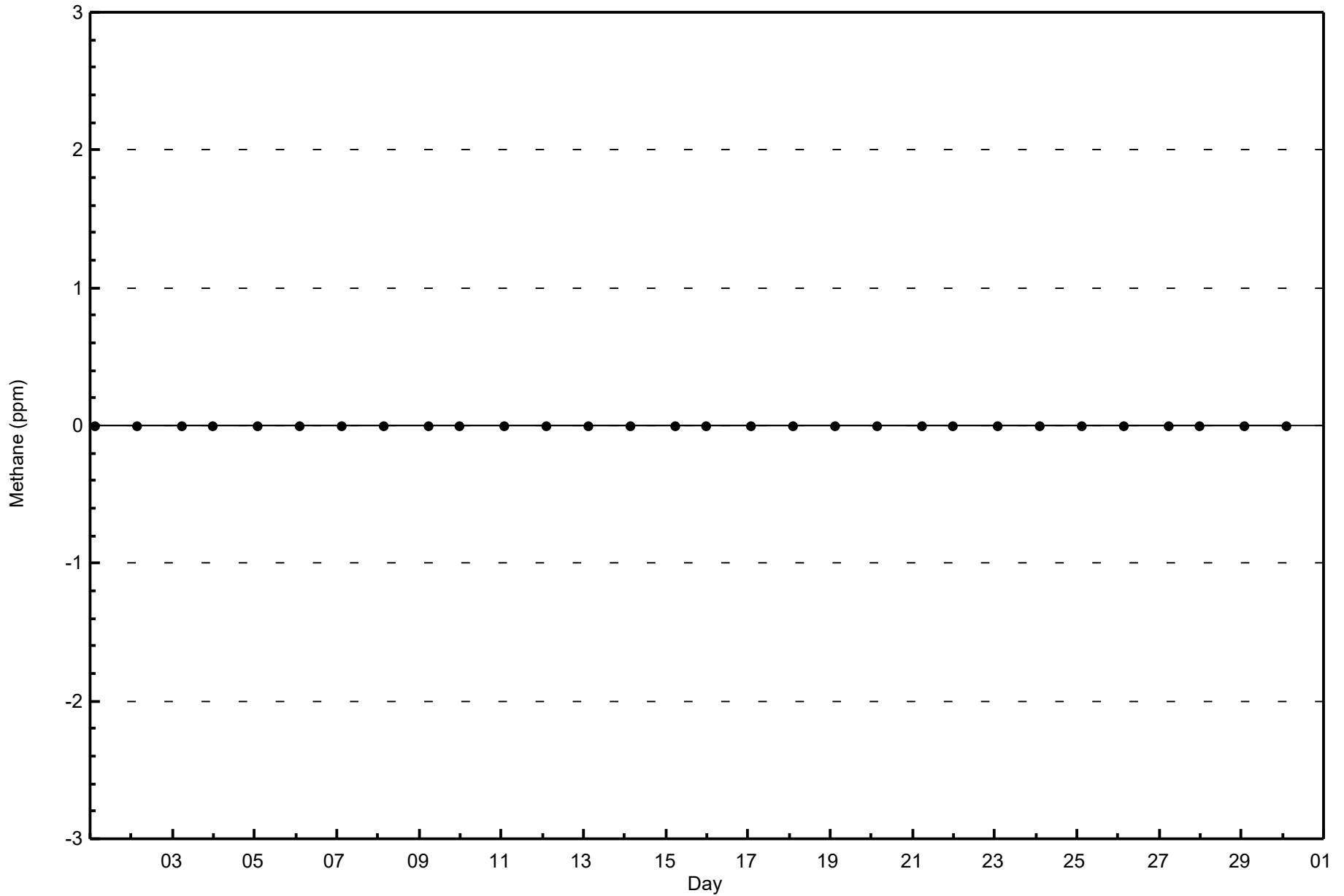
Total Number of Hours: 720

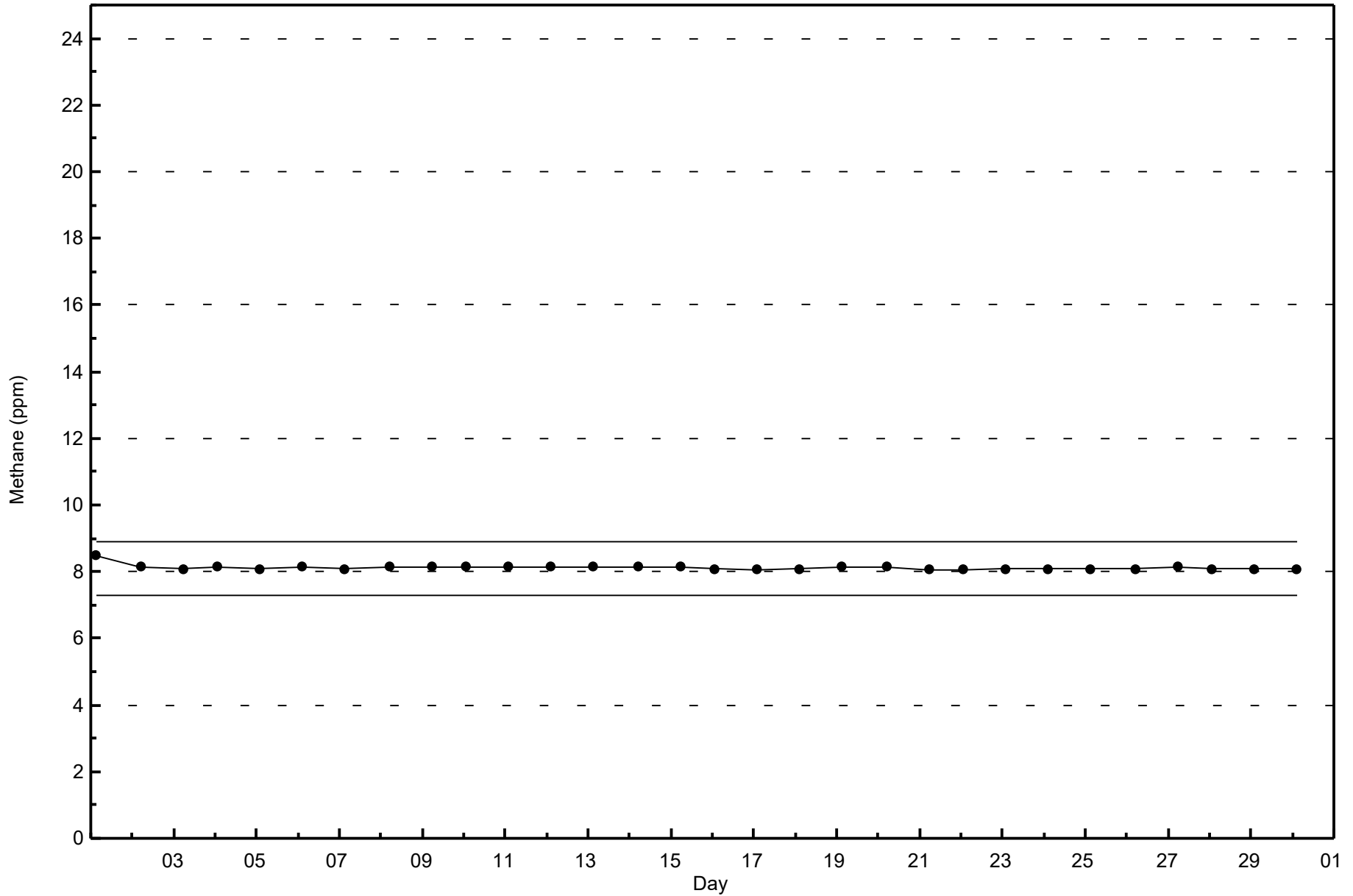


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

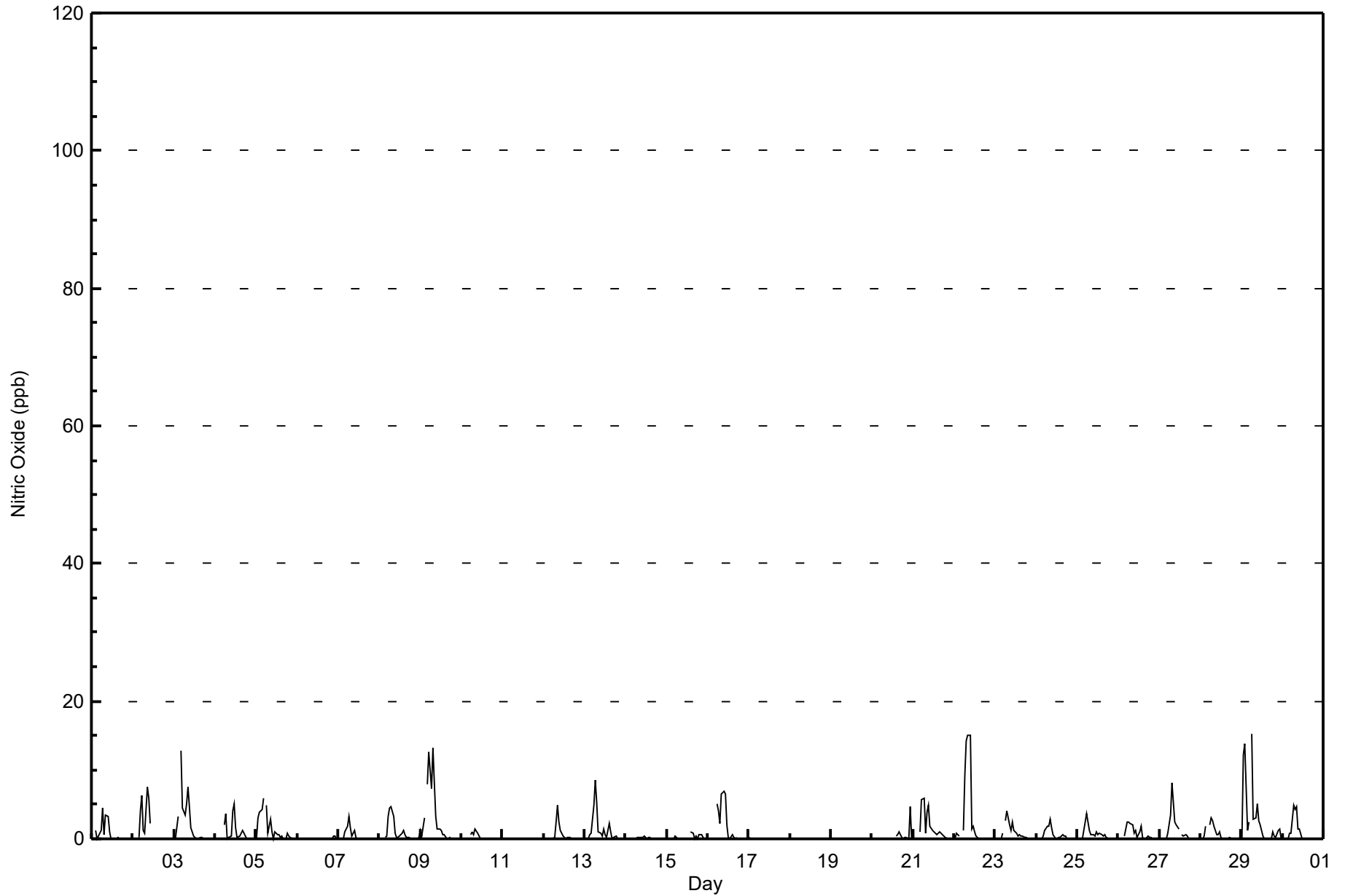
Fort McKay - Bertha Ganter - June 2023

Maximum Value: 15.3 ppb on Jun 29 07:00																								Hours in Service: 720		
Maximum Daily Average: 2.8 ppb on Jun 29																								Hours of Data: 600		
Minimum Value: 0.0 ppb on Jun 1 01:00																								Hours of Missing Data: 120		
Minimum Daily Average: 0.0 ppb on Jun 11																								Hours of Calibration: 32		
Maximum Diurnal Average: 3.8 ppb at hour 7																								Percent Operational Time: 87.8		
Minimum Diurnal Average: 0.0 ppb at hour 24																										
Monthly Average: 1.01 ppb																										
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.9 P ₉₀ = 3.2 P ₉₉ = 12.8																										
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-Jun	0.0	Z	1.2	0.0	0.4	1.3	4.4	0.6	3.4	3.2	1.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	4.4	
2-Jun	0.0	0.0	Z	0.1	4.0	6.2	1.2	0.8	7.5	5.8	2.3	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	7.5	
3-Jun	0.0	0.0	3.2	Z	12.8	4.4	3.4	5.1	7.5	4.6	1.7	0.4	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.9	12.8	
4-Jun	0.0	0.0	0.0	0.0	Z	2.1	3.8	0.0	0.2	0.4	4.2	5.1	1.7	0.3	0.4	0.8	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.9	5.1	
5-Jun	0.2	3.0	3.8	4.3	5.9	Z	4.9	0.9	2.8	1.0	0.0	1.0	0.5	0.6	0.1	0.5	0.0	0.0	0.8	0.5	0.3	0.0	0.0	1.3	5.9	
6-Jun	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	0.4	0.5	0.1	0.0	0.5
7-Jun	0.0	Z	0.0	0.0	1.1	1.8	3.2	1.7	0.3	1.2	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	0.4	3.2	
8-Jun	0.0	0.0	Z	0.1	0.4	3.3	4.4	4.6	3.3	0.8	0.3	0.3	0.7	0.9	1.2	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.9	4.6
9-Jun	1.3	0.4	3.0	Z	8.0	12.5	7.3	13.2	8.0	3.2	1.4	1.4	1.1	0.6	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.7	13.2	
10-Jun	0.0	0.0	0.0	0.0	Z	0.5	1.1	0.7	1.4	0.8	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	0.2	1.4	
11-Jun	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
12-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.2	2.4	5.0	2.5	1.1	0.4	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.0	
13-Jun	0.0	Z	0.0	0.5	0.8	4.8	8.6	5.3	1.1	0.9	0.4	1.4	0.6	0.2	2.2	1.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	1.2	8.6	
14-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
15-Jun	0.0	0.0	0.0	Z	0.0	0.3	0.0	0.0	0.0	0.0	C	C	C	C	C	0.9	0.8	0.0	0.5	0.0	0.6	0.6	0.2	0.0	0.0	0.2
16-Jun	0.0	0.0	0.0	0.0	Z	5.0	4.1	2.2	6.6	6.8	6.5	2.1	0.2	0.0	0.6	0.2	0.1	0.3	PF	PF	PF	PF	PF	PF	--	6.8
17-Jun	0.2	0.0	0.0	0.0	0.0	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.2
18-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
19-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
20-Jun	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0.4	0.7	1.0	0.3	0.0	0.2	0.2	0.1	4.6	0.0	--	4.6
21-Jun	0.0	0.0	0.0	Z	1.0	5.8	5.9	0.8	3.8	4.8	1.7	1.3	1.1	0.8	0.6	0.9	0.7	0.6	0.4	0.1	0.0	0.0	0.0	1.3	5.9	
22-Jun	0.0	0.8	0.5	0.3	Z	1.3	9.1	14.3	15.1	15.1	1.4	1.8	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	15.1	
23-Jun	0.0	0.0	0.0	0.0	0.8	Z	2.7	4.2	2.1	1.1	2.5	1.1	0.8	0.4	0.6	0.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.8	4.2	
24-Jun	Z	0.1	0.0	0.0	0.3	1.2	1.9	1.9	2.8	1.6	0.6	0.1	0.1	0.1	0.1	0.7	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.5	2.8	
25-Jun	0.0	Z	0.0	0.0	1.3	3.8	2.5	1.2	0.7	0.6	0.3	1.0	0.7	0.8	0.5	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.6	3.8	
26-Jun	0.0	0.0	Z	0.4	1.5	2.5	2.4	2.3	2.0	0.9	1.3	0.1	1.0	1.8	0.2	0.0	0.1	0.3	0.1	0.2	0.1	0.0	0.0	0.8	2.5	
27-Jun	0.0	0.0	0.0	Z	0.0	0.8	3.5	8.2	5.3	2.5	2.1	1.5	M	0.6	0.4	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.2	8.2	
28-Jun	0.0	0.0	0.5	1.8	Z	2.1	3.0	2.6	1.9	0.7	0.7	0.9	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.6	3.0	
29-Jun	0.0	12.3	13.8	1.3	2.4	Z	15.3	2.9	3.1	5.0	2.6	2.1	0.3	0.0	0.0	0.0	0.0	0.0	1.1	0.5	0.1	1.2	1.3	2.8	15.3	
30-Jun	Z	0.0	0.0	0.0	0.9	0.8	4.8	4.3	4.6	1.4	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	0.8	4.8	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	600	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: 600

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	90	57	28	11	8	5	15	80	67	33	33	23	25	36	35	46	592
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	90	57	28	11	8	5	15	80	67	33	33	23	25	36	35	46	592

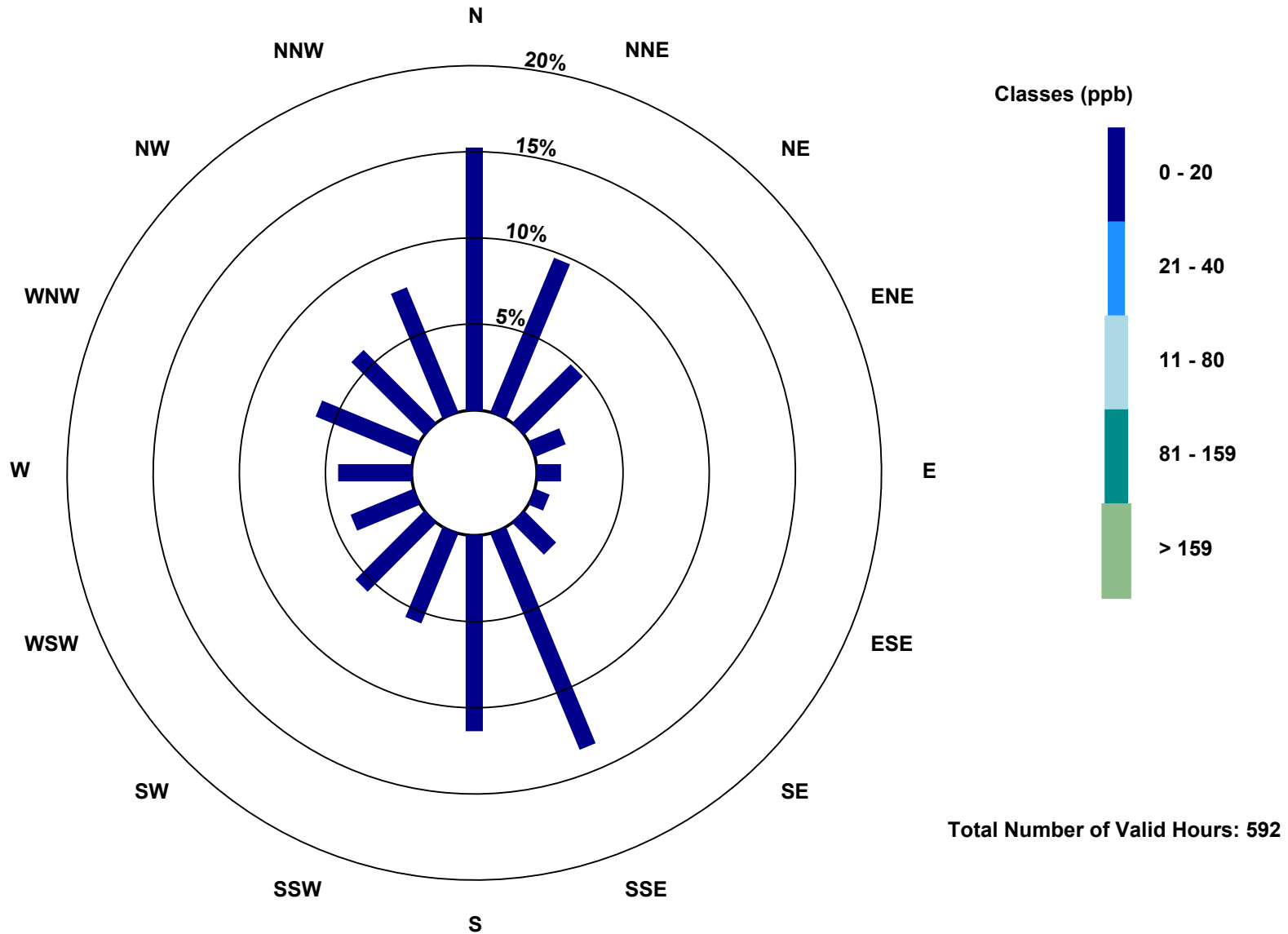
Total Number of Valid Hours: 592

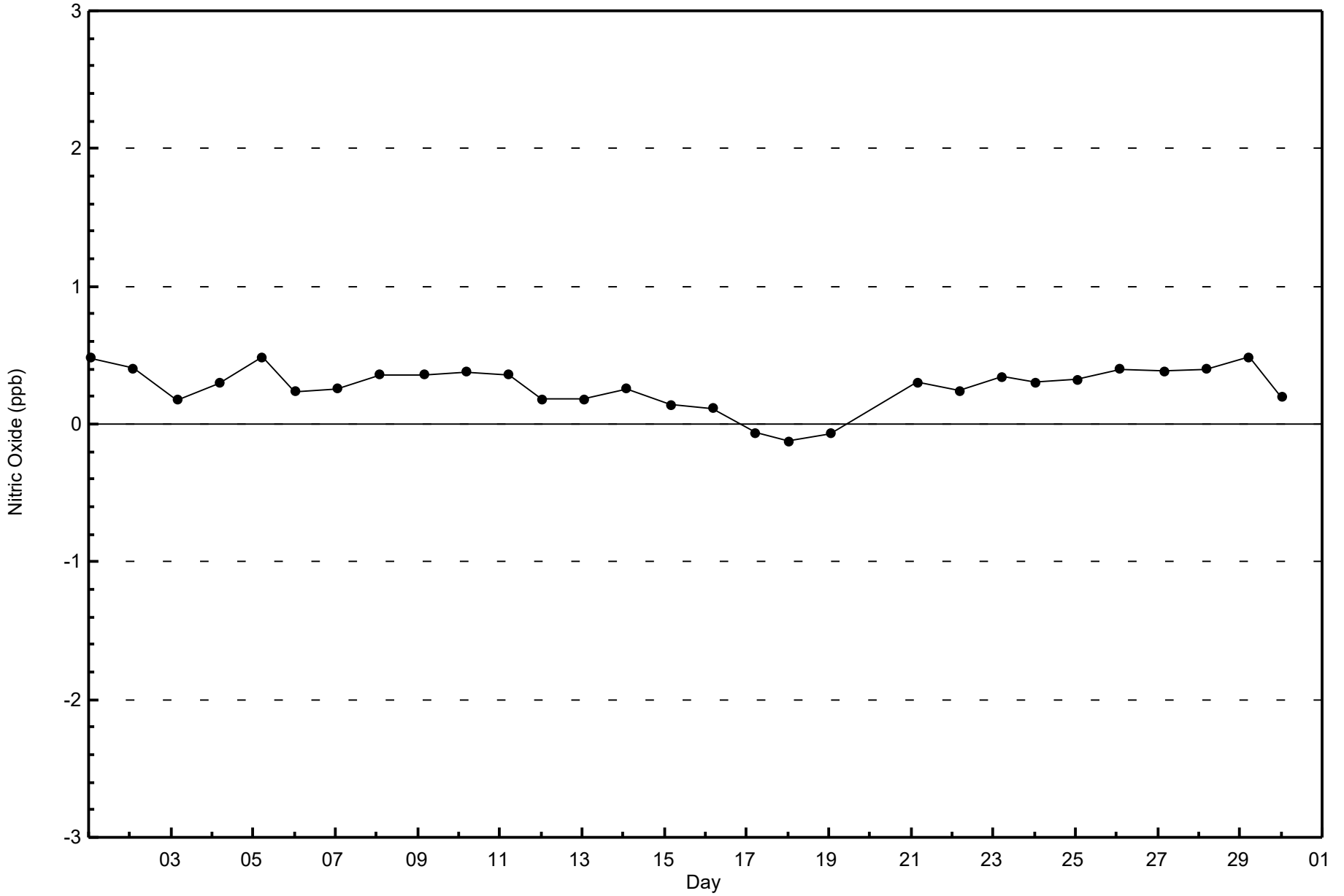
Total Number of Hours: 720

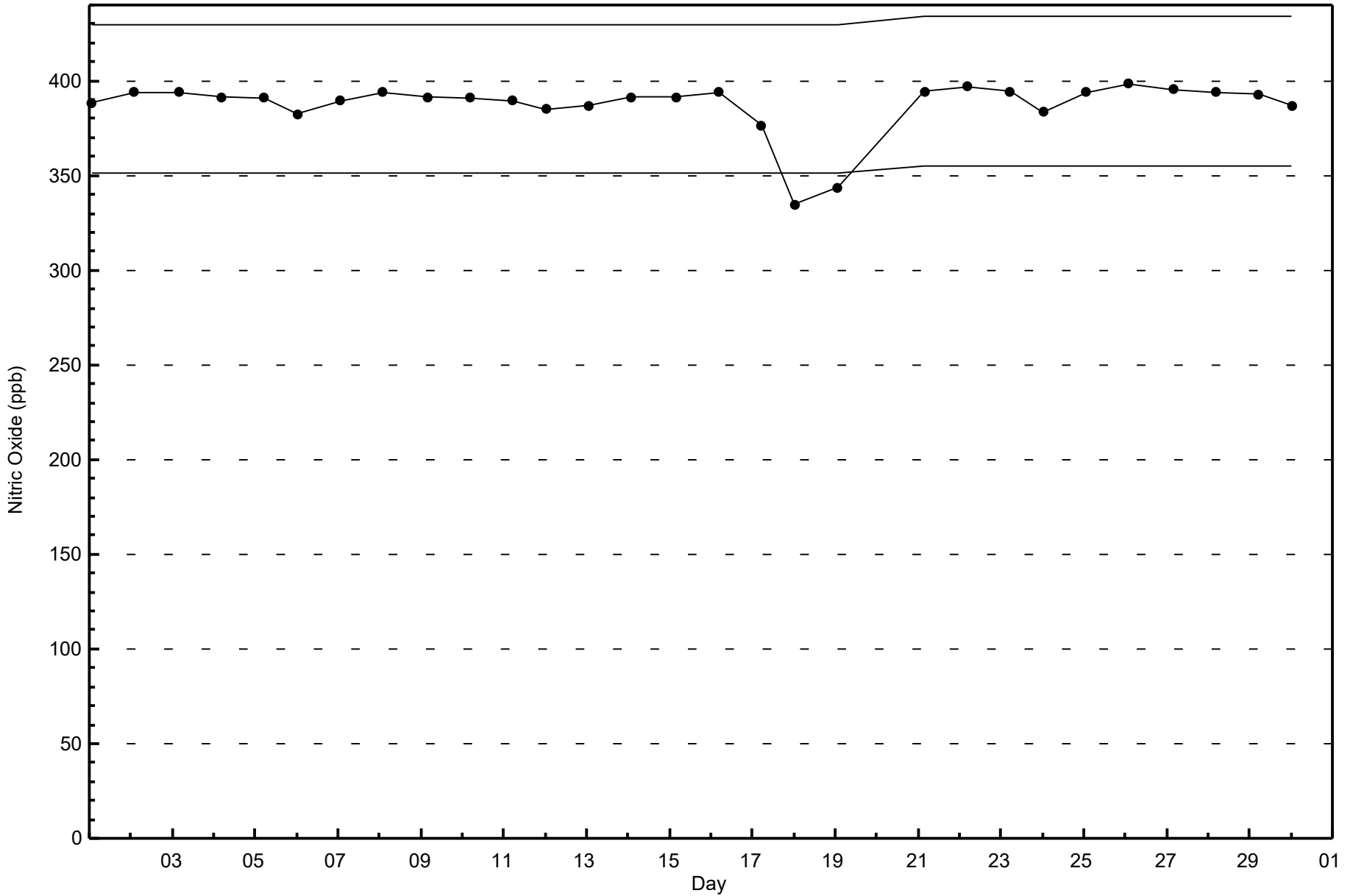


Wood Buffalo Environmental Association
Wind Rose Jun 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

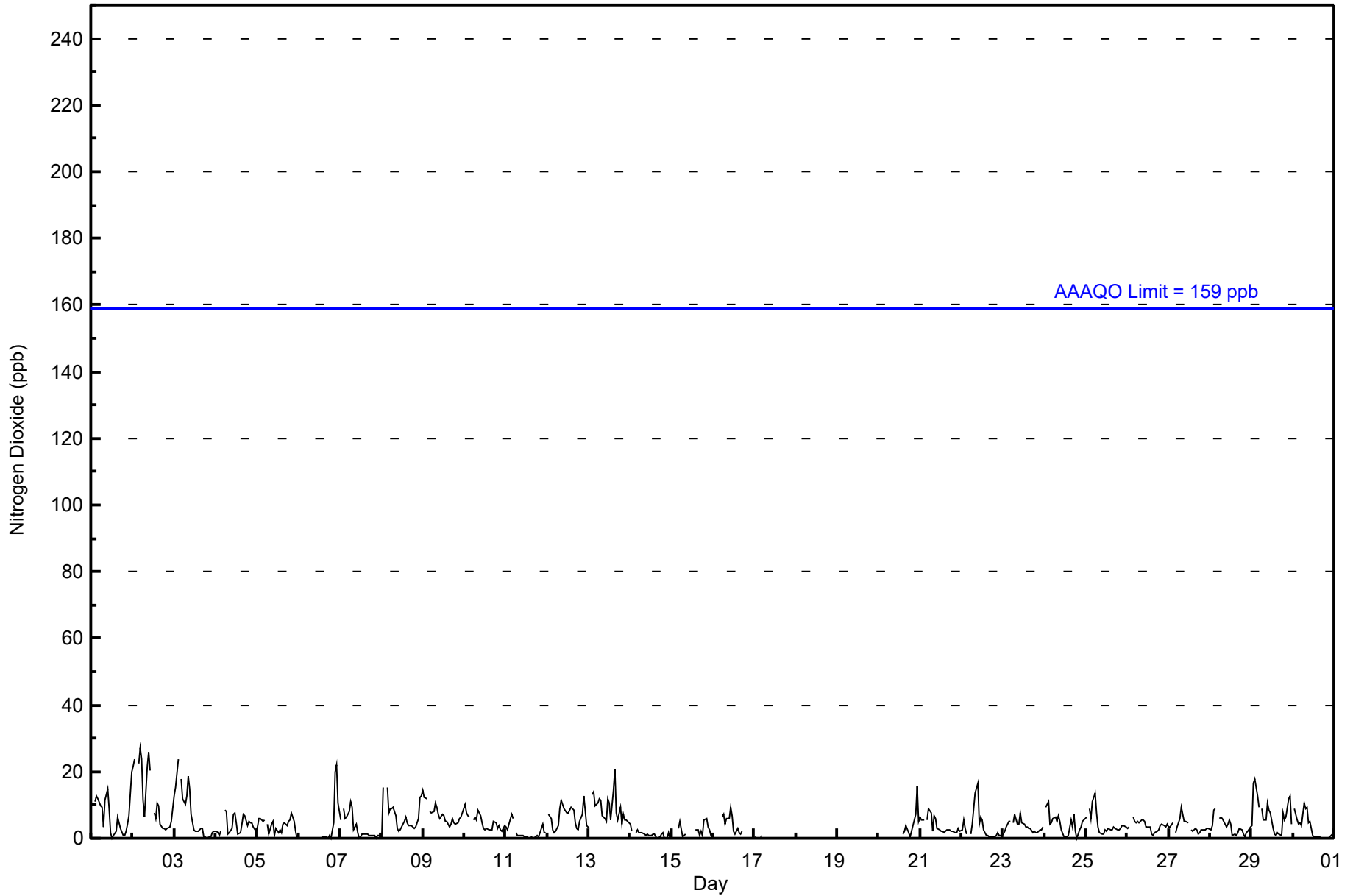
Fort McKay - Bertha Ganter - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 27.3 ppb on Jun 2 05:00		Maximum Daily Average: 12.3 ppb on Jun 2																	Hours of Data:	600																													
Minimum Value: 0.0 ppb on Jun 1 13:00		Minimum Daily Average: 1.3 ppb on Jun 14																	Hours of Missing Data:	120																													
Maximum Diurnal Average: 7.1 ppb at hour 6		Minimum Diurnal Average: 2.5 ppb at hour 20																	Hours of Calibration:	32																													
Monthly Average: 4.72 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.5 Q ₁ = 1.6 Median = 3.4 Q ₃ = 6.3 P ₉₀ = 10.3 P ₉₉ = 22.2																	Percent Operational Time:	87.8																													
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-Jun	6.2	Z	11.0	12.9	11.8	9.9	9.3	3.3	11.6	14.8	8.8	1.7	0.0	0.7	2.1	6.5	4.7	2.8	0.8	0.8	2.0	4.3	6.7	19.8	6.6	19.8																							
2-Jun	21.6	23.7	Z	22.5	27.3	23.6	11.3	6.4	21.7	25.8	20.4	M	7.6	5.8	10.8	9.7	4.4	3.1	2.8	2.7	3.1	3.2	5.1	8.8	12.3	27.3																							
3-Jun	12.7	15.4	23.8	Z	18.0	11.9	10.1	12.8	18.7	15.0	7.1	2.4	2.1	2.1	2.2	2.9	3.0	0.6	0.6	0.2	0.3	0.6	1.5	2.1	7.2	23.8																							
4-Jun	2.1	1.5	0.9	2.2	Z	8.5	8.2	1.4	1.7	3.0	7.4	7.8	4.5	1.4	1.8	4.3	7.3	6.8	4.0	5.0	4.8	4.8	3.6	2.1	4.1	8.5																							
5-Jun	3.6	6.0	6.1	5.2	5.3	Z	4.4	1.3	4.1	5.0	0.7	3.0	1.7	2.4	1.8	4.1	4.7	4.0	5.1	5.6	7.6	5.2	2.0	0.1	3.9	7.6																							
6-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.3	0.2	0.8	0.0	4.5	20.1	22.2	10.8	2.6	22.2																							
7-Jun	5.5	Z	8.9	5.8	6.4	7.9	11.0	9.4	2.4	4.3	1.6	0.1	0.4	1.2	1.2	1.3	1.1	1.0	1.0	0.8	1.0	0.2	0.7	0.8	3.2	11.0																							
8-Jun	0.6	15.4	Z	15.3	7.5	8.7	9.1	9.3	6.8	3.0	2.3	2.7	4.1	5.0	6.2	4.8	4.0	4.0	3.2	2.8	3.3	6.0	12.4	12.7	6.5	15.4																							
9-Jun	14.6	12.1	11.9	Z	8.1	7.6	8.2	10.7	9.4	7.4	6.1	7.2	6.6	4.9	5.2	3.3	4.1	6.0	4.6	4.2	4.6	6.0	6.3	7.6	7.2	14.6																							
10-Jun	10.0	7.8	6.9	6.4	Z	5.3	6.4	5.7	8.4	6.6	4.7	2.9	2.4	3.0	2.4	2.4	2.6	5.1	4.5	2.9	4.0	2.5	2.0	3.7	4.7	10.0																							
11-Jun	3.4	2.5	4.1	7.3	6.1	Z	1.8	1.0	1.0	0.8	0.7	0.5	0.4	0.1	0.1	0.3	0.2	0.3	0.7	0.4	1.6	4.3	1.6	1.8	1.8	7.3																							
12-Jun	Z	7.2	5.9	2.7	1.9	2.0	3.8	8.9	11.4	10.3	8.7	7.6	7.5	8.4	9.4	8.6	4.6	3.1	2.7	5.1	7.3	12.7	8.4	4.0	6.6	12.7																							
13-Jun	3.1	Z	13.0	14.1	9.9	10.5	11.7	11.3	6.7	6.1	5.1	11.9	10.8	5.5	14.3	20.7	7.5	5.3	9.2	4.2	7.0	5.7	5.3	4.7	8.9	20.7																							
14-Jun	4.2	2.3	Z	1.9	2.6	1.9	1.6	1.7	1.4	0.8	1.1	1.0	1.0	1.2	1.2	0.5	0.0	0.3	1.2	1.5	0.0	0.2	1.5	0.1	1.3	4.2																							
15-Jun	0.0	0.0	0.0	Z	3.0	4.9	0.6	0.9	1.1	C	C	C	C	C	2.7	2.5	0.8	2.1	1.0	5.6	5.9	3.4	2.6	0.8	2.1	5.9																							
16-Jun	0.2	0.0	0.0	0.0	Z	6.3	7.0	4.1	6.1	6.1	9.3	6.6	2.3	1.1	2.9	1.8	1.3	2.1	PF	PF	PF	PF	PF	PF	--	9.3																							
17-Jun	0.3	0.2	0.1	0.1	0.8	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.8																							
18-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
19-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																							
20-Jun	M	M	M	M	M	M	M	M	M	M	M	M	M	M	1.1	2.1	3.9	1.8	0.5	2.1	3.7	7.3	15.8	4.9	--	15.8																							
21-Jun	6.3	5.7	5.3	Z	5.4	8.9	7.6	2.0	6.6	6.0	2.9	2.5	2.3	2.1	1.7	2.6	2.5	2.4	2.1	2.0	1.7	1.9	3.0	2.3	3.7	8.9																							
22-Jun	2.5	5.7	2.9	1.4	Z	1.3	4.3	8.8	13.6	16.7	4.2	6.2	5.4	2.6	0.8	0.8	0.6	0.5	0.5	0.5	0.9	1.8	0.9	1.0	3.6	16.7																							
23-Jun	1.2	2.0	3.3	5.1	5.0	Z	4.5	7.2	4.3	4.1	7.7	4.8	4.3	3.2	3.4	2.9	2.8	1.9	2.0	1.7	1.9	2.5	2.7	3.4	3.6	7.7																							
24-Jun	Z	9.4	11.2	4.1	4.6	5.9	6.2	5.1	6.7	4.9	2.6	0.6	0.4	0.4	0.7	5.4	3.6	7.2	2.3	0.1	2.7	3.2	5.1	5.7	4.3	11.2																							
25-Jun	6.4	Z	8.8	5.9	11.0	13.5	7.8	3.2	1.8	1.4	1.2	2.4	2.3	2.8	2.5	2.6	3.3	2.8	2.6	2.6	2.9	3.9	3.9	3.2	4.3	13.5																							
26-Jun	3.0	3.3	Z	6.3	5.2	4.7	5.1	4.5	5.5	5.4	5.2	3.3	3.2	3.4	1.2	0.7	1.7	2.1	2.4	4.0	4.3	3.7	3.5	4.3	3.7	6.3																							
27-Jun	3.5	3.2	4.7	Z	1.8	3.4	6.0	9.4	7.2	5.0	4.9	4.6	M	2.5	2.3	3.1	2.7	1.4	1.5	2.4	2.6	2.7	3.1	2.9	3.7	9.4																							
28-Jun	2.6	3.9	8.4	9.1	Z	6.0	6.4	6.0	5.1	3.4	4.1	5.5	4.1	0.9	1.1	0.7	1.9	3.1	2.5	1.2	0.5	1.6	2.2	3.4	3.6	9.1																							
29-Jun	3.7	16.7	18.0	12.9	9.5	Z	9.1	5.5	5.6	10.7	8.3	7.7	3.1	1.3	0.8	1.6	1.4	0.9	7.7	5.4	6.3	11.8	12.8	4.4	7.2	18.0																							
30-Jun	Z	9.0	5.3	4.2	4.5	4.0	10.5	8.7	9.4	4.6	4.9	0.8	0.5	0.6	0.5	0.4	0.2	0.1	0.0	0.1	0.2	0.5	0.8	1.4	3.1	10.5																							
																								5.1	6.7	7.0	6.6	7.1	7.1	6.6	5.7	6.9	6.8	5.2	3.9	3.2	2.5	3.0	3.6	2.8	2.6	2.6	2.5	3.3	4.6	5.2	4.5	Diurnal Average	
																								21.6	23.7	23.8	22.5	27.3	23.6	11.7	12.8	21.7	25.8	20.4	11.9	10.8	8.4	14.3	20.7	7.5	7.2	9.2	5.6	7.6	20.1	22.2	19.8	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure PF - Power Failure																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	590	98.33	98.33
21 - 40	10	1.67	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: 600

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	87	56	28	11	8	5	15	79	67	33	33	23	24	36	35	42	582
21 - 40	3	1	0	0	0	0	0	1	0	0	0	0	1	0	0	4	10
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	90	57	28	11	8	5	15	80	67	33	33	23	25	36	35	46	592

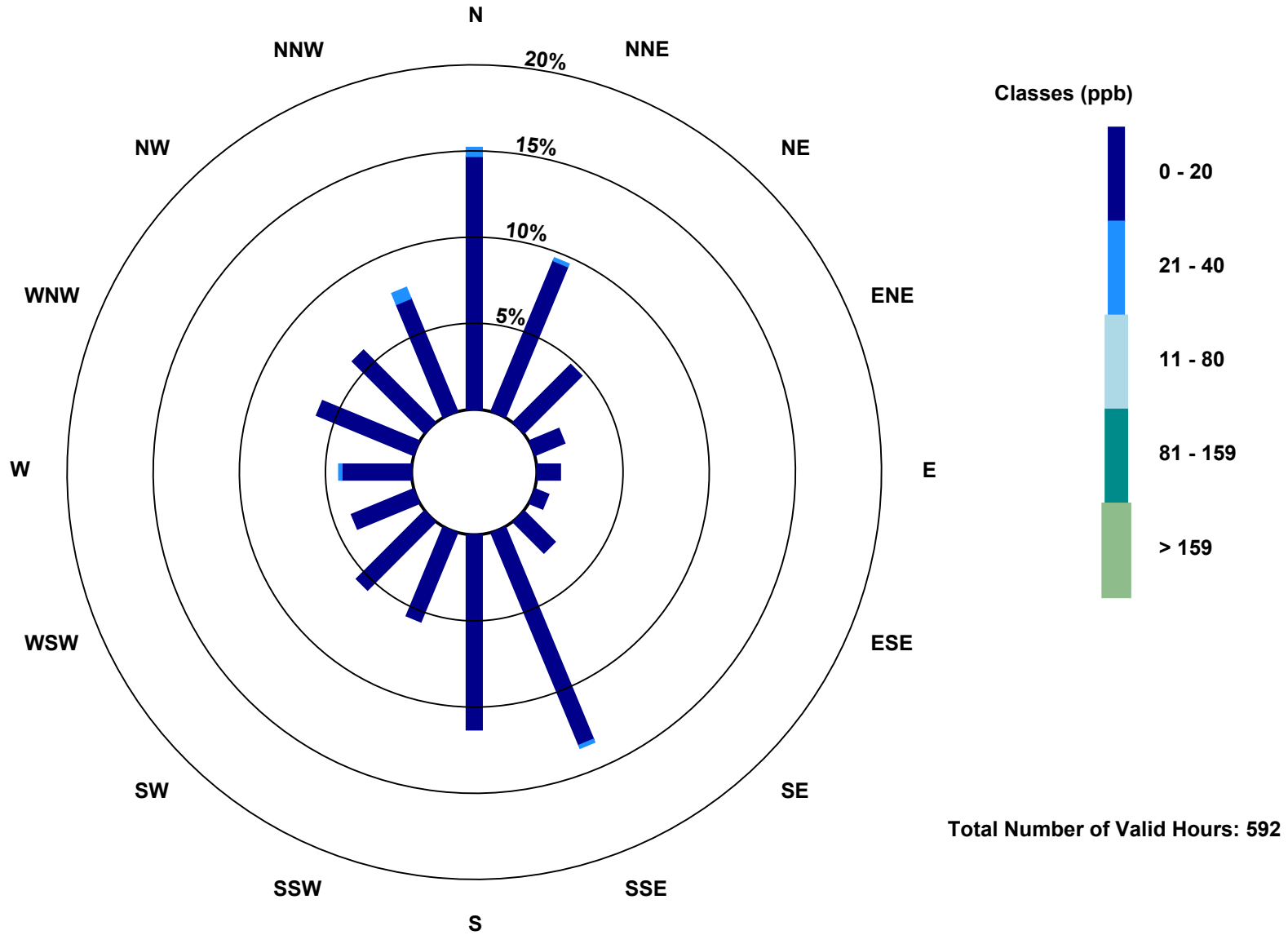
Total Number of Valid Hours: 592

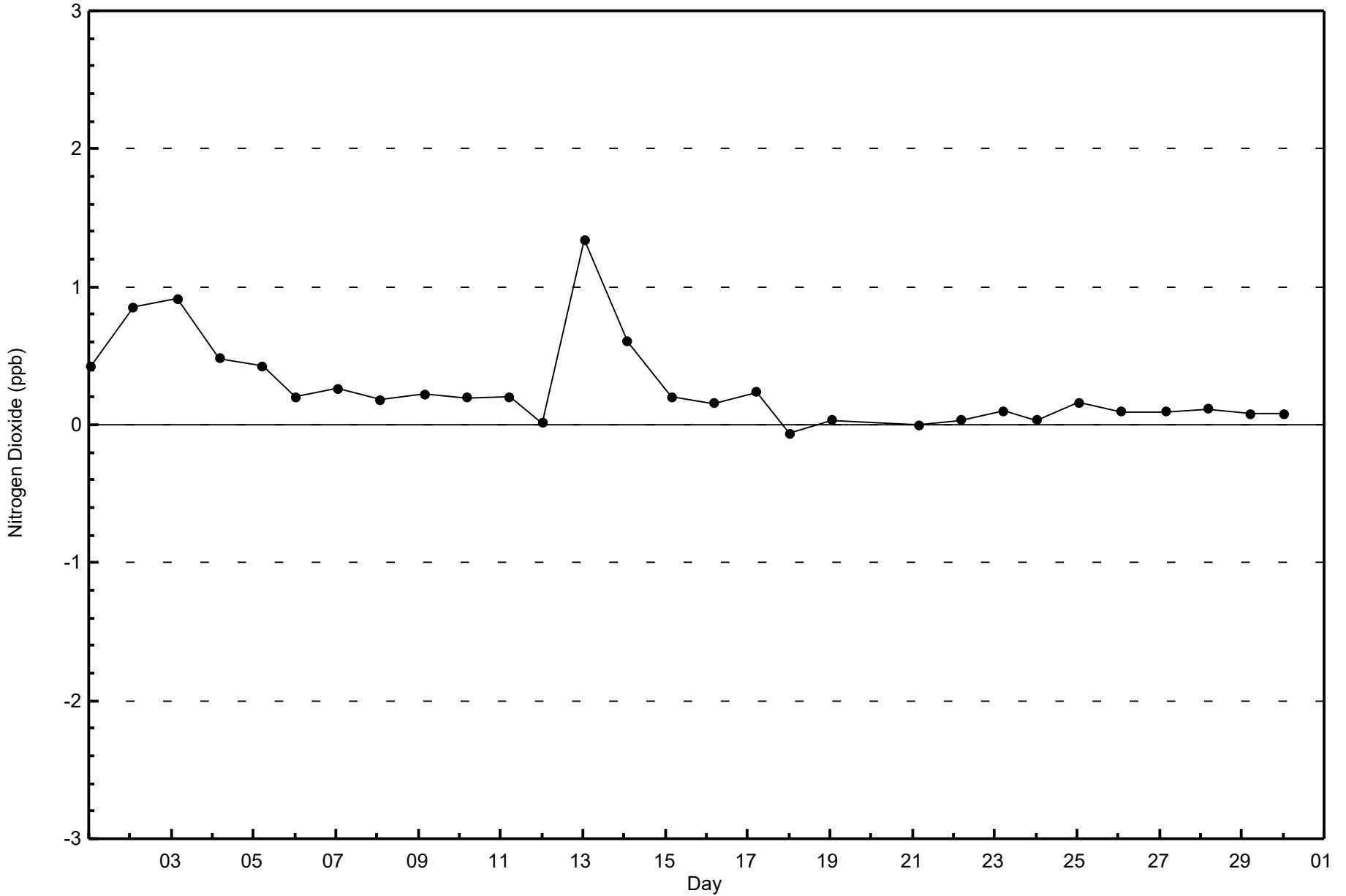
Total Number of Hours: 720

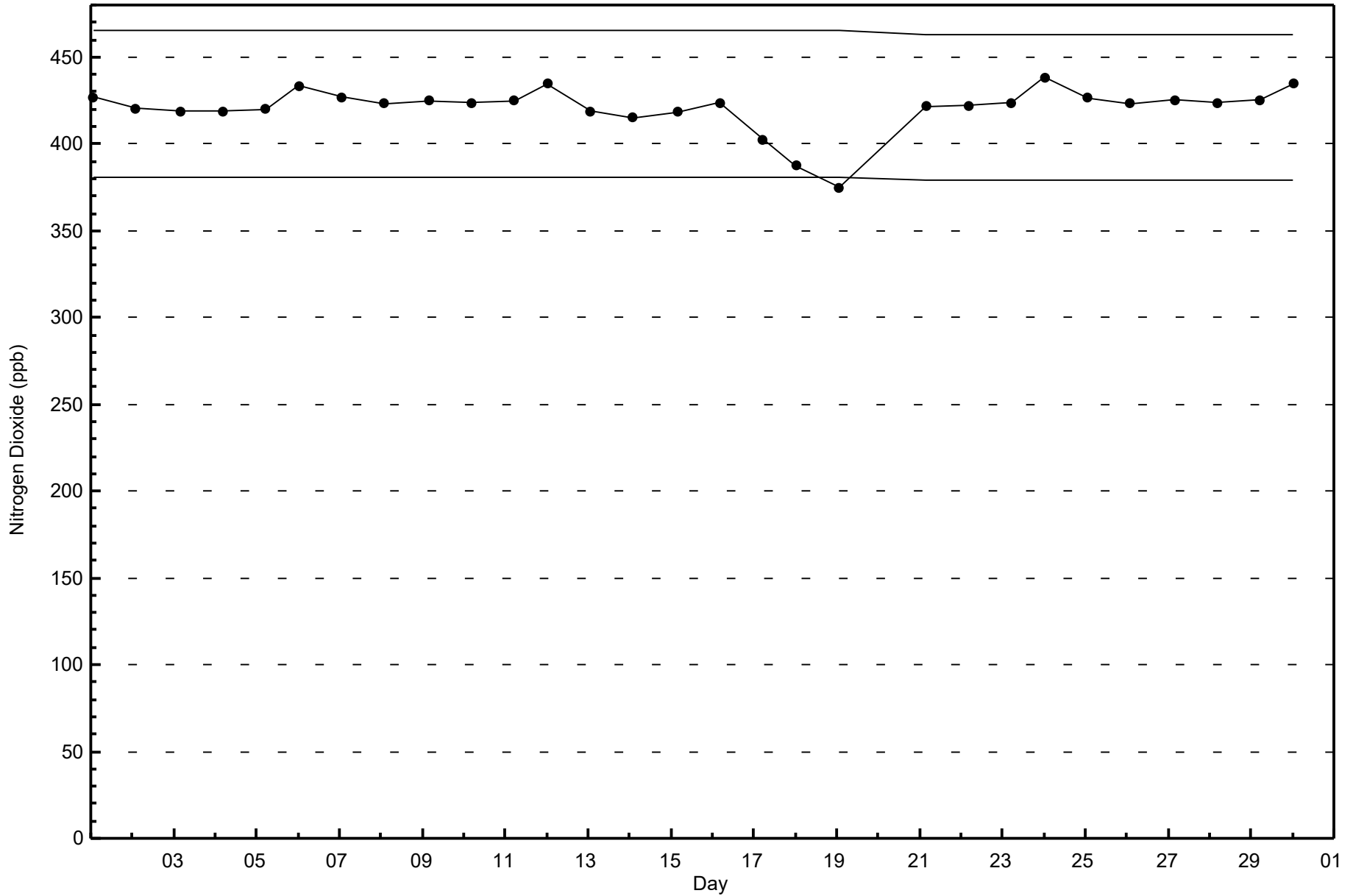


Wood Buffalo Environmental Association
Wind Rose Jun 2023

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









Wood Buffalo Environmental Association
Summary of Hour Averages

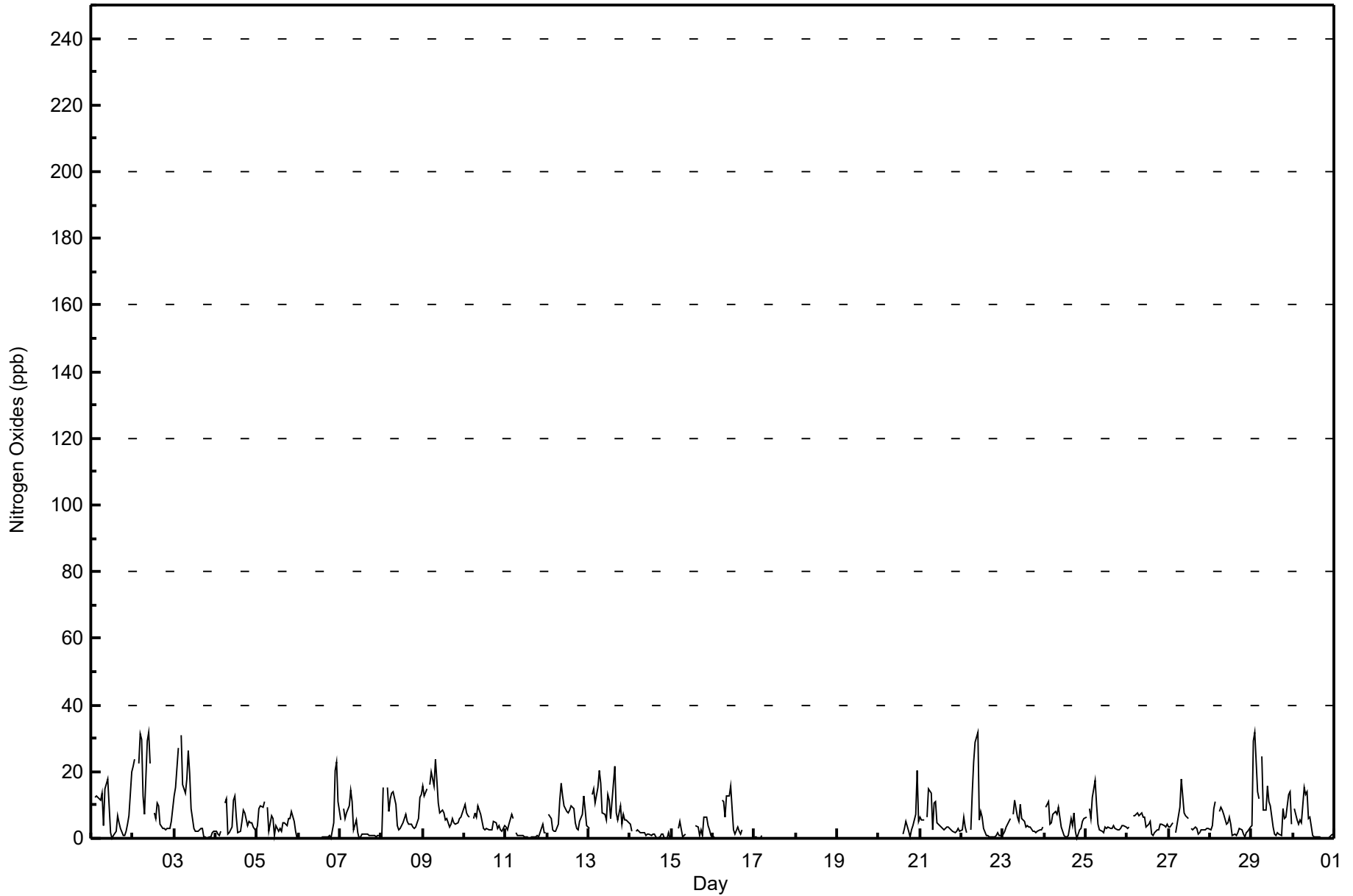
Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - June 2023

Maximum Value: 31.8 ppb on Jun 29 03:00																					Maximum Daily Average: 13.6 ppb on Jun 2					Hours in Service: 720																							
Minimum Value: 0.0 ppb on Jun 1 13:00																					Minimum Daily Average: 1.3 ppb on Jun 14					Hours of Data: 600																							
Maximum Diurnal Average: 10.4 ppb at hour 7																					Minimum Diurnal Average: 2.5 ppb at hour 20					Hours of Missing Data: 120																							
Monthly Average: 5.73 ppb																					Percentiles: P ₁ = 0.0 P ₁₀ = 0.5 Q ₁ = 1.7 Median = 3.9 Q ₃ = 7.5 P ₉₀ = 13.1 P ₉₉ = 29.2					Hours of Calibration: 32																							
																										Percent Operational Time: 87.8																							
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-Jun	6.2	Z	12.2	12.9	12.2	11.2	13.7	3.9	15.0	18.0	9.9	1.7	0.0	0.7	2.1	6.7	4.7	2.8	0.8	0.8	2.0	4.3	6.7	19.8	7.3	19.8																							
2-Jun	21.6	23.7	Z	22.6	31.3	29.8	12.5	7.2	29.2	31.6	22.7	M	7.6	5.8	10.8	9.7	4.4	3.1	2.8	2.7	3.1	3.2	5.1	8.8	13.6	31.6																							
3-Jun	12.7	15.4	27.0	Z	30.8	16.3	13.5	17.9	26.2	19.6	8.8	2.8	2.3	2.2	2.3	3.1	3.1	0.6	0.6	0.2	0.3	0.6	1.5	2.1	9.1	30.8																							
4-Jun	2.1	1.5	0.9	2.2	Z	10.6	12.0	1.4	1.9	3.4	11.6	12.9	6.2	1.7	2.2	5.1	8.6	7.6	4.0	5.0	4.8	4.8	3.6	2.1	5.1	12.9																							
5-Jun	3.8	9.0	9.9	9.5	11.2	Z	9.3	2.2	6.9	6.0	0.7	4.0	2.2	3.0	1.9	4.6	4.7	4.0	5.9	6.1	7.9	5.2	2.0	0.1	5.2	11.2																							
6-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.3	0.2	0.8	0.0	4.5	20.5	22.7	10.9	2.6	22.7																							
7-Jun	5.5	Z	8.9	5.8	7.5	9.7	14.2	11.1	2.7	5.5	1.8	0.1	0.4	1.2	1.2	1.3	1.1	1.0	1.0	0.8	1.0	0.2	0.7	0.8	3.6	14.2																							
8-Jun	0.6	15.4	Z	15.4	7.9	12.0	13.5	13.9	10.1	3.8	2.6	3.0	4.8	5.9	7.4	5.3	4.2	4.1	3.2	2.8	3.3	6.0	12.4	12.9	7.4	15.4																							
9-Jun	15.9	12.5	14.9	Z	16.1	20.1	15.5	23.9	17.4	10.6	7.5	8.6	7.7	5.5	5.8	3.3	4.1	6.1	4.6	4.2	4.6	6.0	6.3	7.6	9.9	23.9																							
10-Jun	10.0	7.8	6.9	6.4	Z	5.8	7.5	6.4	9.8	7.4	5.0	2.9	2.4	3.0	2.4	2.4	2.6	5.1	4.5	2.9	4.0	2.5	2.0	3.7	4.9	10.0																							
11-Jun	3.4	2.5	4.1	7.3	6.1	Z	1.8	1.0	1.0	0.8	0.7	0.5	0.4	0.1	0.1	0.3	0.2	0.3	0.7	0.4	1.6	4.3	1.6	1.8	1.8	7.3																							
12-Jun	Z	7.2	5.9	2.7	1.9	2.0	4.0	11.3	16.4	12.8	9.8	8.0	7.7	8.4	9.6	8.7	4.6	3.1	2.7	5.1	7.3	12.7	8.4	4.0	7.1	16.4																							
13-Jun	3.1	Z	13.0	14.6	10.7	15.3	20.3	16.6	7.8	7.0	5.5	13.3	11.4	5.7	16.5	21.7	7.5	5.5	9.6	4.2	7.0	5.7	5.3	4.7	10.1	21.7																							
14-Jun	4.2	2.3	Z	1.9	2.6	1.9	1.6	1.8	1.6	1.0	1.4	1.4	1.0	1.4	1.3	0.5	0.0	0.3	1.2	1.5	0.0	0.2	1.5	0.1	1.3	4.2																							
15-Jun	0.0	0.0	0.0	Z	3.0	5.2	0.6	0.9	1.1	C	C	C	C	C	3.6	3.3	0.8	2.6	1.0	6.2	6.5	3.6	2.6	0.8	2.3	6.5																							
16-Jun	0.2	0.0	0.0	0.0	Z	11.3	11.1	6.3	12.7	12.9	15.8	8.7	2.5	1.1	3.5	2.0	1.4	2.4	PF	PF	PF	PF	PF	PF	--	15.8																							
17-Jun	0.5	0.2	0.1	0.1	0.8	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.8																							
18-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
19-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																							
20-Jun	M	M	M	M	M	M	M	M	M	M	M	M	M	M	1.5	2.8	4.9	2.1	0.5	2.3	3.9	7.4	20.4	4.9	--	20.4																							
21-Jun	6.3	5.7	5.3	Z	6.4	14.7	13.5	2.8	10.4	10.8	4.6	3.8	3.4	2.9	2.3	3.5	3.2	3.0	2.5	2.1	1.7	1.9	3.0	2.3	5.1	14.7																							
22-Jun	2.5	6.5	3.4	1.7	Z	2.6	13.4	23.1	28.7	31.8	5.6	8.0	6.4	3.0	0.8	0.8	0.6	0.5	0.5	0.5	0.9	1.8	0.9	1.0	6.3	31.8																							
23-Jun	1.2	2.0	3.3	5.1	5.8	Z	7.2	11.4	6.4	5.2	10.2	5.9	5.1	3.6	4.0	3.3	3.3	2.1	2.1	1.8	1.9	2.5	2.7	3.4	4.3	11.4																							
24-Jun	Z	9.5	11.2	4.1	4.9	7.1	8.1	7.0	9.5	6.5	3.2	0.7	0.5	0.5	0.8	6.1	4.0	7.5	2.3	0.1	2.7	3.2	5.1	5.7	4.8	11.2																							
25-Jun	6.4	Z	8.8	5.9	12.3	17.3	10.3	4.4	2.5	2.0	1.5	3.4	3.0	3.6	3.0	3.1	3.8	3.0	2.6	2.6	2.9	3.9	3.9	3.2	4.9	17.3																							
26-Jun	3.0	3.3	Z	6.7	6.7	7.2	7.5	6.8	7.5	6.3	6.5	3.4	4.2	5.2	1.4	0.7	1.8	2.4	2.5	4.2	4.4	3.7	3.5	4.3	4.5	7.5																							
27-Jun	3.5	3.2	4.7	Z	1.8	4.2	9.5	17.6	12.5	7.5	7.0	6.1	M	3.1	2.7	3.6	3.1	1.4	1.5	2.4	2.6	2.7	3.1	2.9	4.8	17.6																							
28-Jun	2.6	3.9	8.9	10.9	Z	8.1	9.4	8.6	7.0	4.1	4.8	6.4	4.3	0.9	1.1	0.7	1.9	3.2	2.5	1.2	0.5	1.6	2.2	3.4	4.3	10.9																							
29-Jun	3.7	29.0	31.8	14.2	11.9	Z	24.4	8.4	8.7	15.7	10.9	9.8	3.4	1.3	0.8	1.6	1.4	0.9	8.8	5.9	6.4	13.0	14.1	4.4	10.0	31.8																							
30-Jun	Z	9.0	5.3	4.2	5.4	4.8	15.3	13.0	14.0	6.0	6.3	0.8	0.5	0.6	0.5	0.4	0.2	0.1	0.0	0.1	0.2	0.5	0.8	1.4	3.9	15.3																							
																								5.2	7.4	8.1	7.0	9.0	9.9	10.4	8.8	10.3	9.5	6.6	4.8	3.6	2.8	3.3	3.9	3.0	2.8	2.7	2.5	3.3	4.7	5.5	4.5	Diurnal Average	
																								21.6	29.0	31.8	22.6	31.3	29.8	24.4	23.9	29.2	31.8	22.7	13.3	11.4	8.4	16.5	21.7	8.6	7.6	9.6	6.2	7.9	20.5	22.7	19.8	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				AF - Analyzer Failure				PF - Power Failure													



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	579	96.50	96.50
21 - 40	21	3.50	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: 600

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	85	56	28	11	8	5	14	76	65	31	33	23	24	36	34	42	571
21 - 40	5	1	0	0	0	0	1	4	2	2	0	0	1	0	1	4	21
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	90	57	28	11	8	5	15	80	67	33	33	23	25	36	35	46	592

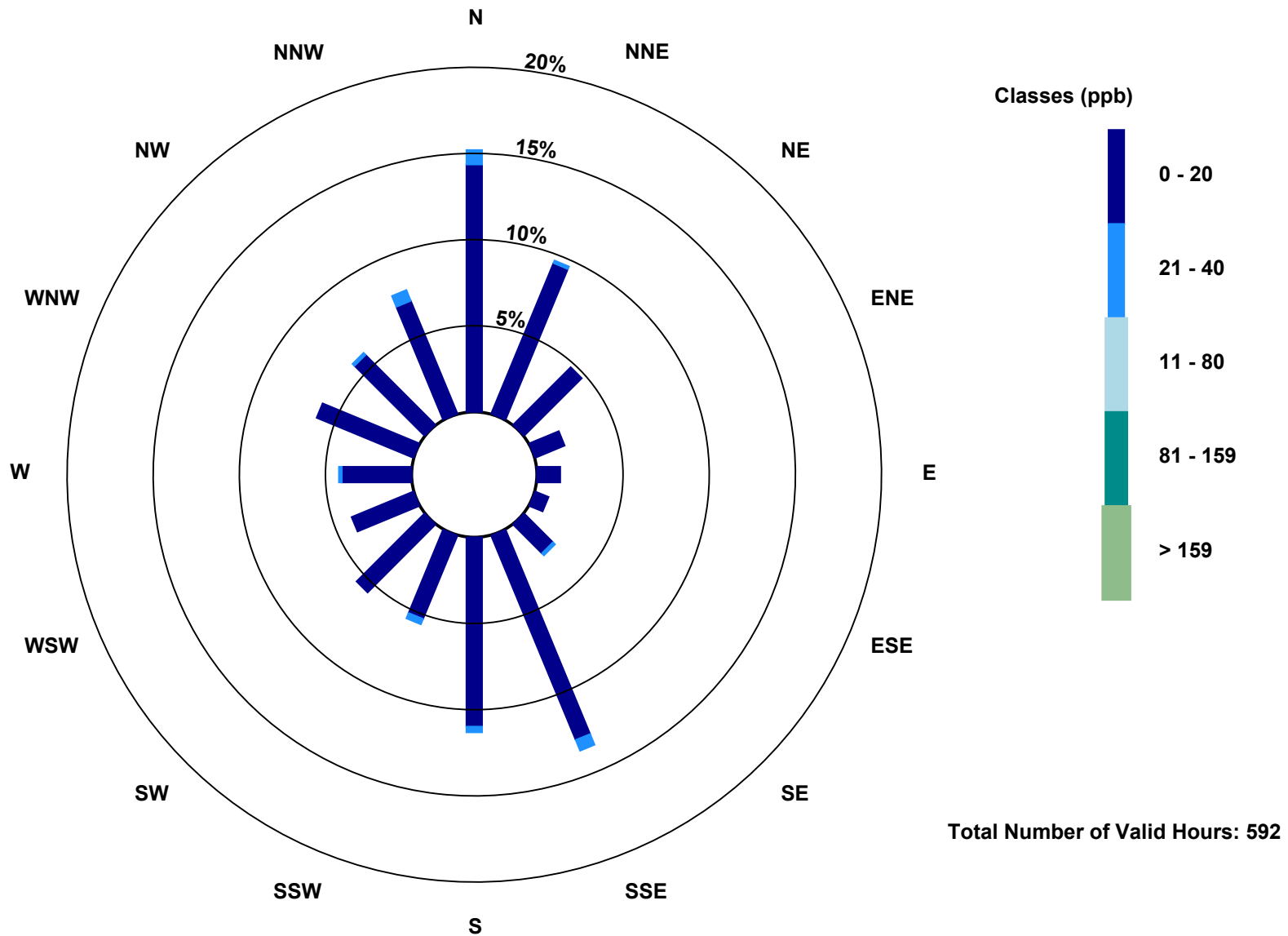
Total Number of Valid Hours: 592

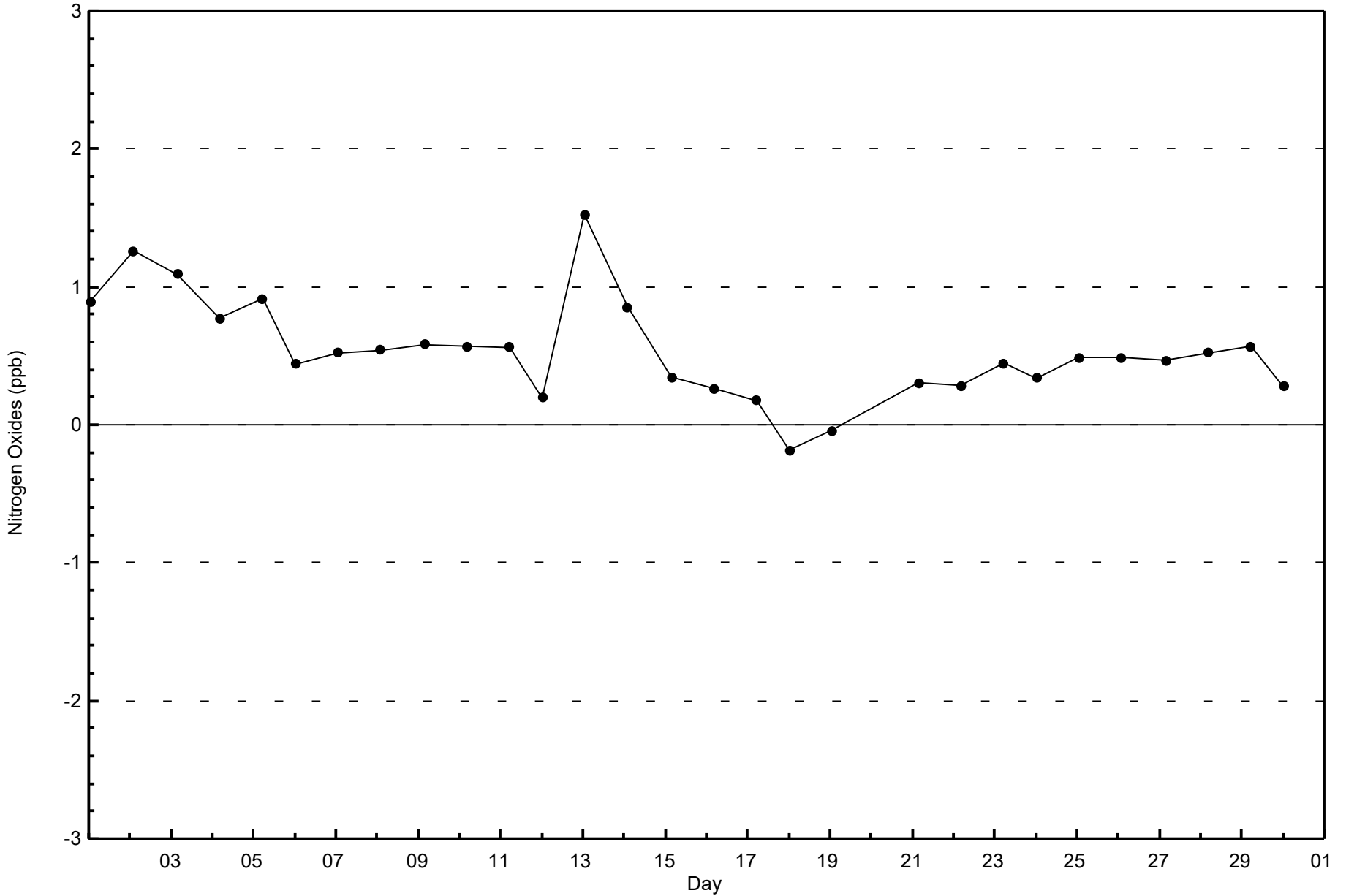
Total Number of Hours: 720

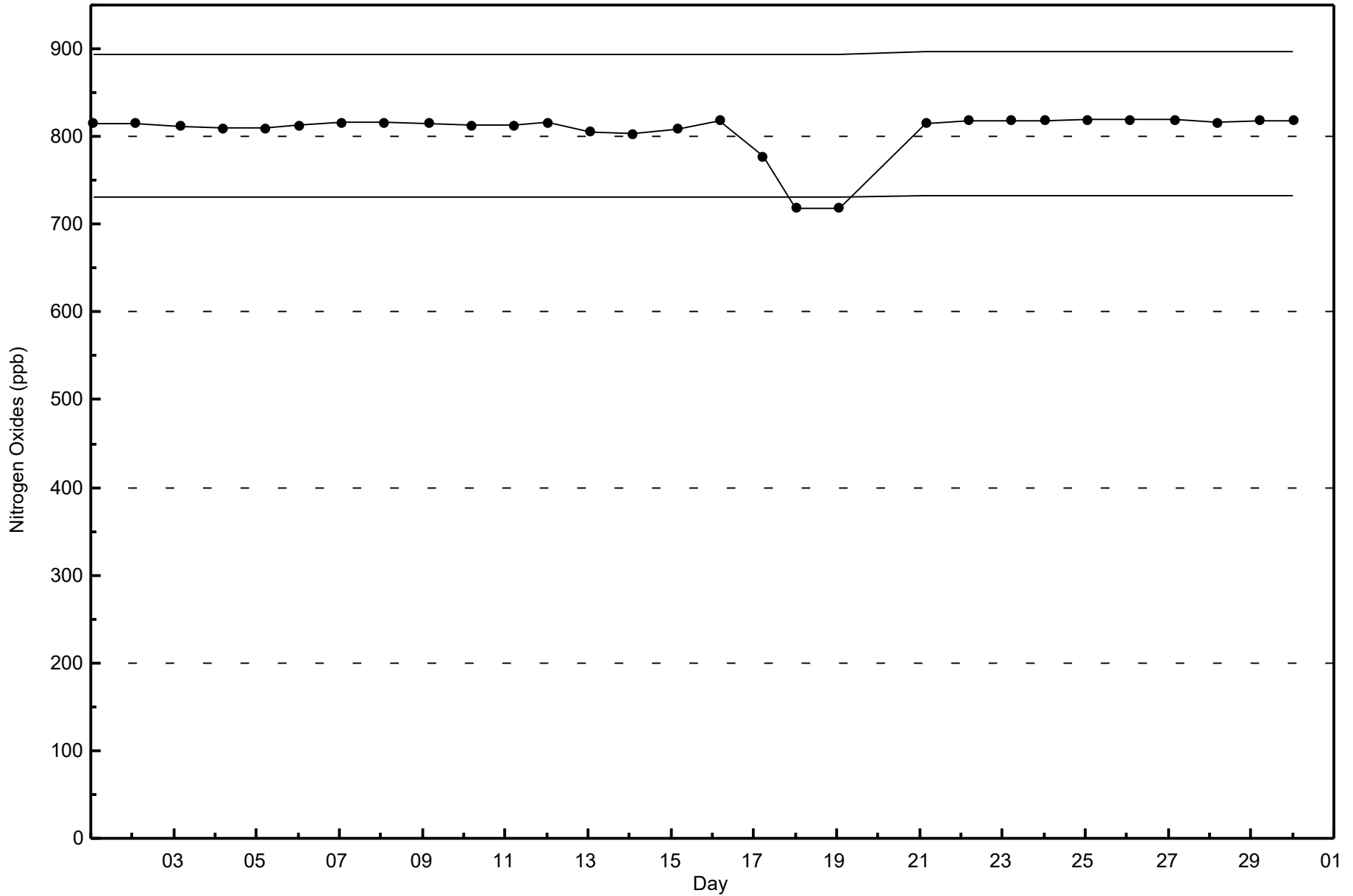


Wood Buffalo Environmental Association
Wind Rose Jun 2023

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









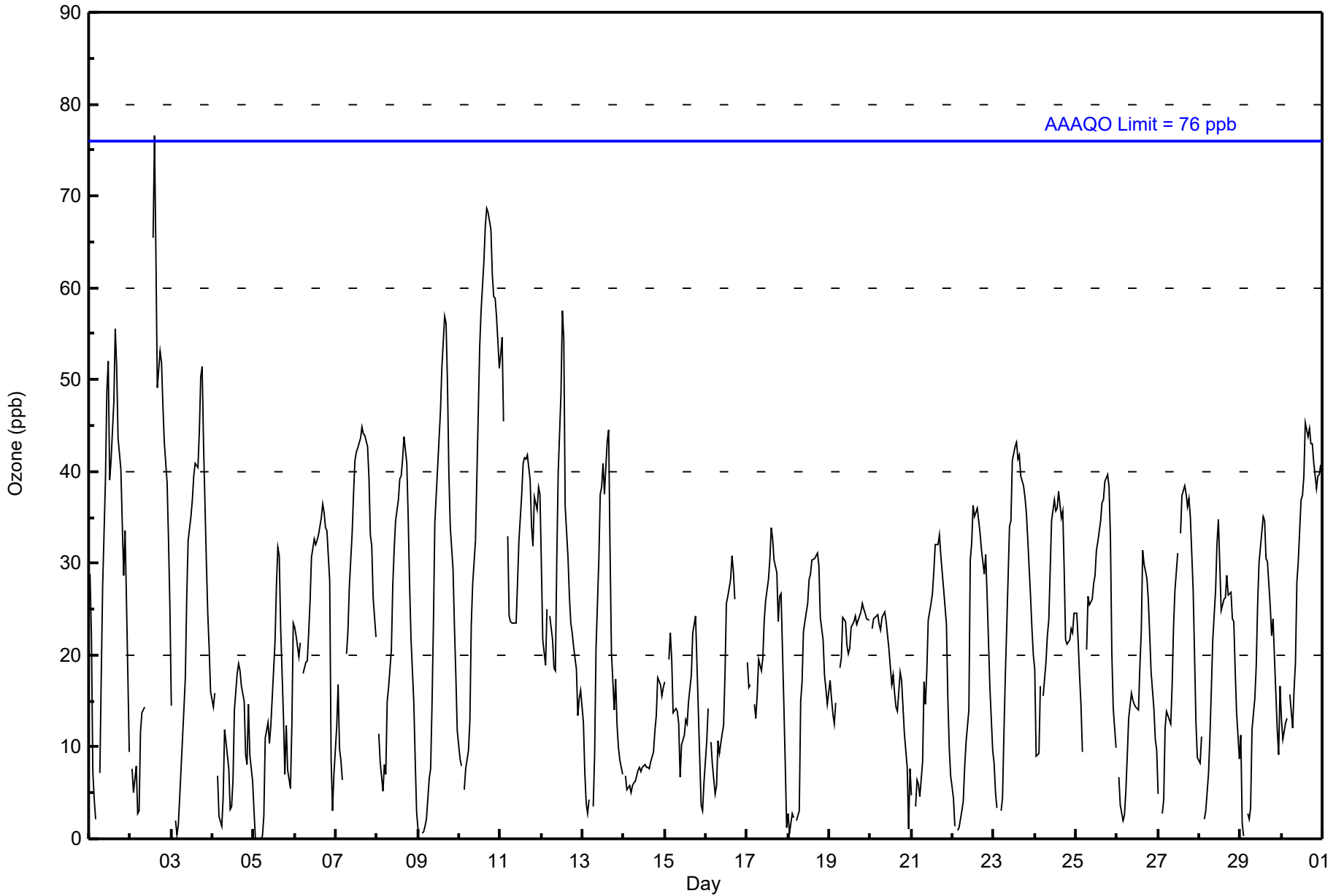
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort McKay - Bertha Ganter - June 2023

Number of Exceedences (AAAQO):		1-hr: 1	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 76.6 ppb on Jun 2 15:00		Maximum Daily Average: 41.5 ppb on Jun 10																	Hours of Data:	679																													
Minimum Value: 0.0 ppb on Jun 5 02:00		Minimum Daily Average: 9.2 ppb on Jun 14																	Hours of Missing Data:	41																													
Maximum Diurnal Average: 36.0 ppb at hour 16		Minimum Diurnal Average: 7.8 ppb at hour 5																	Hours of Calibration:	34																													
Monthly Average: 22.70 ppb		Percentiles: P ₁ = 0.6 P ₁₀ = 5.0 Q ₁ = 11.4 Median = 21.7 Q ₃ = 32.4 P ₉₀ = 41.1 P ₉₉ = 63.0																	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-Jun	28.9	22.1	7.3	4.2	2.1	Z	7.2	17.6	27.4	39.0	48.7	52.0	39.1	41.2	47.5	55.5	51.5	43.6	40.2	34.4	28.7	33.5	25.9	9.5	30.7	55.5																							
2-Jun	Z	7.6	5.1	7.9	2.7	3.1	11.5	13.8	14.4	C	C	C	C	65.4	76.6	63.6	49.1	53.2	51.8	47.1	43.1	38.7	32.6	25.2	32.2	76.6																							
3-Jun	14.5	Z	2.0	0.5	1.5	4.6	10.9	14.2	17.5	26.3	32.6	35.1	37.0	39.6	40.9	40.5	44.4	50.3	51.4	42.8	30.1	24.6	20.7	16.0	26.0	51.4																							
4-Jun	14.3	15.9	Z	6.9	2.5	1.4	4.5	11.9	10.5	7.6	3.2	3.5	6.4	14.0	18.1	19.1	18.3	16.7	14.9	9.2	8.1	14.6	9.2	6.3	10.3	19.1																							
5-Jun	3.0	0.0	0.0	Z	0.0	0.3	2.4	11.0	12.7	10.4	12.3	15.4	21.5	27.7	31.8	30.8	23.0	13.3	7.0	12.4	7.5	5.5	12.3	23.4	12.3	31.8																							
6-Jun	23.0	22.1	19.9	21.3	Z	18.1	19.2	19.4	22.4	25.9	30.7	32.6	32.1	32.5	33.1	35.0	36.5	35.6	33.9	33.5	28.1	8.7	3.1	7.0	24.9	36.5																							
7-Jun	12.2	16.7	9.8	8.5	6.4	Z	20.1	22.6	27.5	33.3	37.5	41.1	42.1	42.6	43.7	44.9	44.1	44.0	42.7	39.3	33.1	31.9	26.2	21.9	30.1	44.9																							
8-Jun	Z	11.4	8.4	5.2	8.0	7.1	15.0	16.5	20.6	27.5	31.6	34.7	36.9	39.3	39.5	41.4	43.8	40.9	35.0	27.6	21.8	14.8	8.6	2.9	23.4	43.8																							
9-Jun	1.0	Z	0.6	0.8	1.4	2.1	6.6	7.7	14.6	23.5	34.4	40.5	43.5	46.6	51.3	57.0	56.1	49.7	40.0	34.0	29.3	23.1	17.7	11.8	25.8	57.0																							
10-Jun	8.7	8.0	Z	5.4	7.6	9.7	12.8	23.4	27.8	32.5	39.6	46.5	53.6	57.4	62.9	66.7	68.6	68.2	66.4	61.4	59.0	58.9	57.0	51.3	41.5	68.6																							
11-Jun	52.8	54.5	45.5	Z	33.0	24.3	23.7	23.5	23.5	23.5	27.9	32.5	37.5	40.8	41.5	41.3	41.9	39.1	34.0	31.9	37.3	35.9	38.3	37.5	35.7	54.5																							
12-Jun	29.9	21.7	18.8	25.0	Z	24.3	21.7	18.7	18.3	30.3	39.8	48.5	57.5	54.4	36.1	30.6	26.3	23.4	22.5	20.9	18.4	13.4	15.2	16.2	27.5	57.5																							
13-Jun	12.6	7.2	3.8	2.7	4.3	Z	3.5	9.1	20.7	30.4	37.5	38.3	40.9	37.6	43.3	44.6	31.5	20.3	14.1	17.4	12.4	9.9	8.6	7.0	19.9	44.6																							
14-Jun	Z	6.8	5.3	5.8	5.0	5.7	6.1	6.2	7.4	7.7	7.4	7.8	8.1	7.8	7.8	7.6	8.4	9.5	11.8	13.4	17.6	16.7	15.5	16.4	9.2	17.6																							
15-Jun	17.1	Z	19.5	22.4	19.5	13.7	14.2	13.9	12.5	6.7	10.2	11.3	13.0	12.5	15.0	17.8	22.4	23.3	24.3	19.0	8.7	3.6	3.0	6.1	14.3	24.3																							
16-Jun	10.7	14.1	Z	10.5	8.0	4.8	5.8	10.8	9.3	11.5	12.4	17.9	25.6	26.4	28.2	30.8	29.1	26.1	PF	PF	PF	PF	PF	PF	PF	--	30.8																						
17-Jun	19.2	16.5	16.8	Z	14.7	13.1	15.7	19.5	18.3	19.7	23.9	26.0	28.2	30.4	33.9	32.6	30.4	29.0	23.7	26.4	26.7	14.6	8.1	1.2	21.2	33.9																							
18-Jun	2.7	0.5	2.8	2.3	Z	2.0	3.1	15.0	17.0	22.6	23.6	25.7	28.2	28.9	30.3	30.5	30.8	31.2	29.8	24.1	21.6	17.8	16.3	14.7	18.3	31.2																							
19-Jun	17.3	15.2	13.5	12.5	14.8	Z	18.6	19.7	24.1	23.6	21.1	20.2	20.8	23.1	23.7	24.3	23.3	23.8	24.8	25.7	25.0	24.6	23.9	23.8	21.2	25.7																							
20-Jun	Z	22.9	23.9	24.3	24.3	23.4	22.7	24.2	24.7	23.7	22.1	20.6	16.8	17.8	15.9	14.4	13.9	18.2	17.3	14.4	11.4	7.8	1.1	7.7	18.0	24.7																							
21-Jun	4.8	Z	3.4	6.4	5.9	4.6	8.4	17.2	14.6	18.3	23.8	25.6	26.8	29.1	32.0	32.0	33.2	30.9	29.0	27.2	23.4	15.3	9.9	6.9	18.6	33.2																							
22-Jun	4.4	1.4	Z	1.0	1.2	3.0	4.1	7.9	10.5	14.0	30.4	32.1	36.3	35.1	36.0	34.6	33.3	31.4	28.9	31.0	26.6	21.4	16.4	9.6	19.6	36.3																							
23-Jun	8.3	5.0	3.3	Z	3.1	4.4	11.4	17.6	28.6	34.1	34.6	41.1	42.8	43.1	41.3	41.7	39.5	38.5	37.3	35.5	32.7	26.4	22.9	20.1	26.7	43.1																							
24-Jun	18.5	9.0	9.3	16.7	Z	15.6	19.2	22.1	23.8	29.1	34.6	36.9	35.7	36.1	37.8	34.9	35.6	29.3	21.6	21.2	21.7	23.0	22.4	24.6	25.1	37.8																							
25-Jun	24.5	21.3	17.7	14.5	9.5	Z	20.6	26.4	25.4	26.1	27.8	28.7	31.4	32.3	34.6	36.6	36.9	39.0	39.7	38.3	32.8	20.1	14.1	10.0	26.4	39.7																							
26-Jun	Z	6.7	3.7	2.0	2.6	5.1	9.0	13.0	15.9	15.1	14.6	14.3	14.1	18.7	22.6	31.4	29.9	28.4	26.1	22.3	18.1	14.3	10.8	9.6	15.1	31.4																							
27-Jun	5.0	Z	2.8	4.3	12.0	13.8	13.0	12.5	16.6	23.0	26.9	31.1	M	33.2	37.4	38.5	37.6	36.2	37.0	35.2	27.2	19.9	12.7	8.9	22.0	38.5																							
28-Jun	8.2	11.1	Z	2.1	3.1	7.2	11.3	16.3	21.6	27.0	32.0	34.7	29.9	24.9	26.1	26.2	28.7	26.5	26.8	24.0	23.7	18.3	13.7	8.7	19.7	34.7																							
29-Jun	11.2	1.7	0.3	Z	2.7	2.1	3.3	11.9	15.3	18.8	25.5	30.0	33.4	35.0	34.6	30.5	30.2	25.3	22.1	23.9	19.8	11.9	9.2	16.7	18.1	35.0																							
30-Jun	13.0	10.8	12.7	13.1	Z	15.7	12.1	16.1	19.2	27.9	30.1	37.0	37.3	39.4	45.2	43.8	44.7	43.0	43.0	41.1	38.1	39.5	39.6	40.7	30.6	45.2																							
																								14.6	13.2	10.2	9.0	7.8	9.2	11.9	16.0	18.8	22.7	26.8	29.7	31.3	33.8	35.6	36.0	34.8	32.9	30.9	28.8	25.2	21.0	17.8	15.9	Diurnal Average	
																								52.8	54.5	45.5	25.0	33.0	24.3	23.7	26.4	28.6	39.0	48.7	52.0	57.5	65.4	76.6	66.7	68.6	68.2	66.4	61.4	59.0	58.9	57.0	51.3	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	321	47.28	47.28
21 - 50	330	48.60	95.88
51 - 82	28	4.12	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	73	17	4	1	0	2	4	39	35	11	21	11	9	17	25	44	313
21 - 50	53	52	22	8	7	3	11	33	23	19	18	19	15	20	15	10	328
51 - 82	0	4	3	2	0	0	0	9	8	2	0	0	0	0	0	0	28
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	126	73	29	11	7	5	15	81	66	32	39	30	24	37	40	54	669

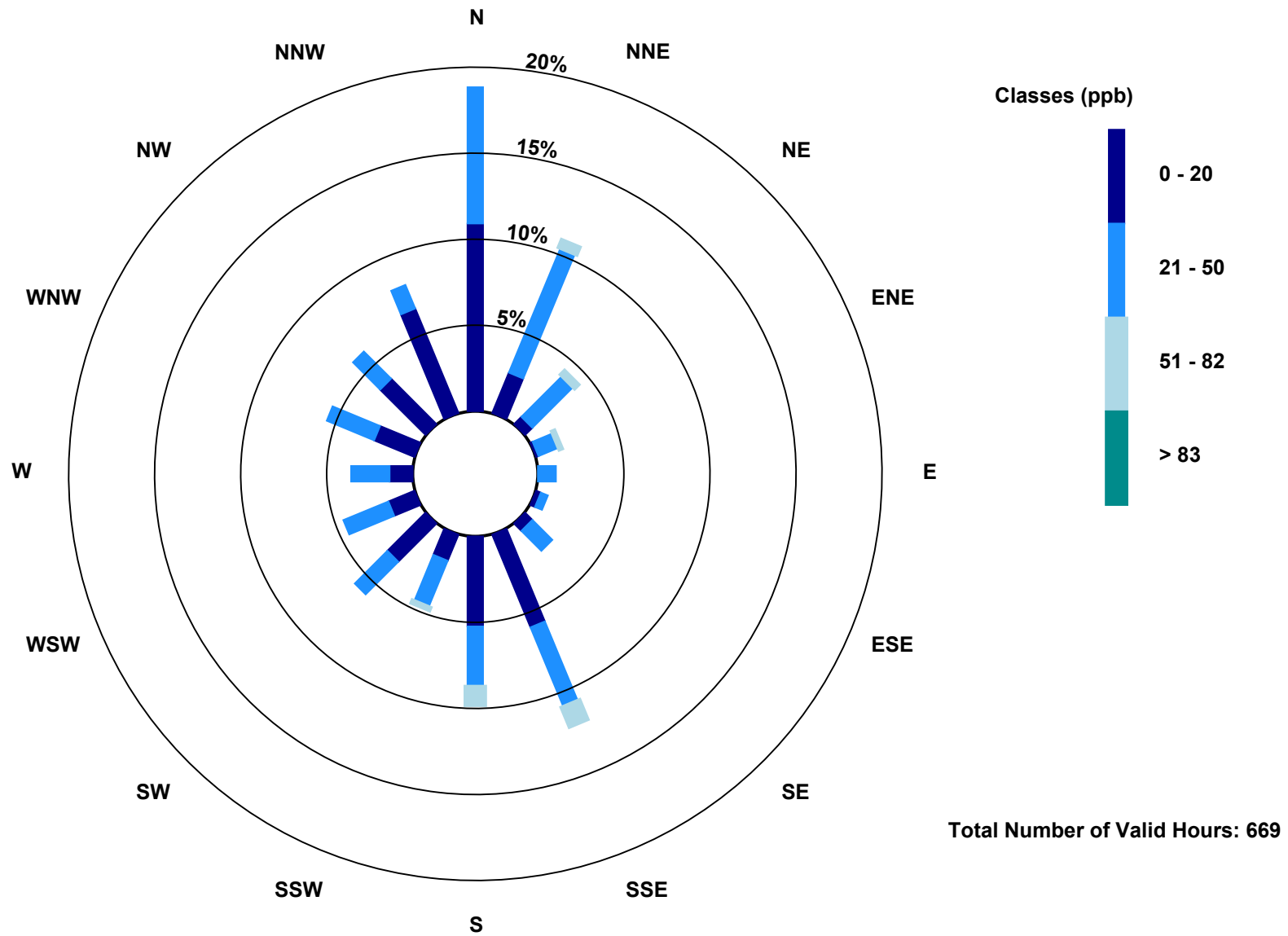
Total Number of Valid Hours: 669

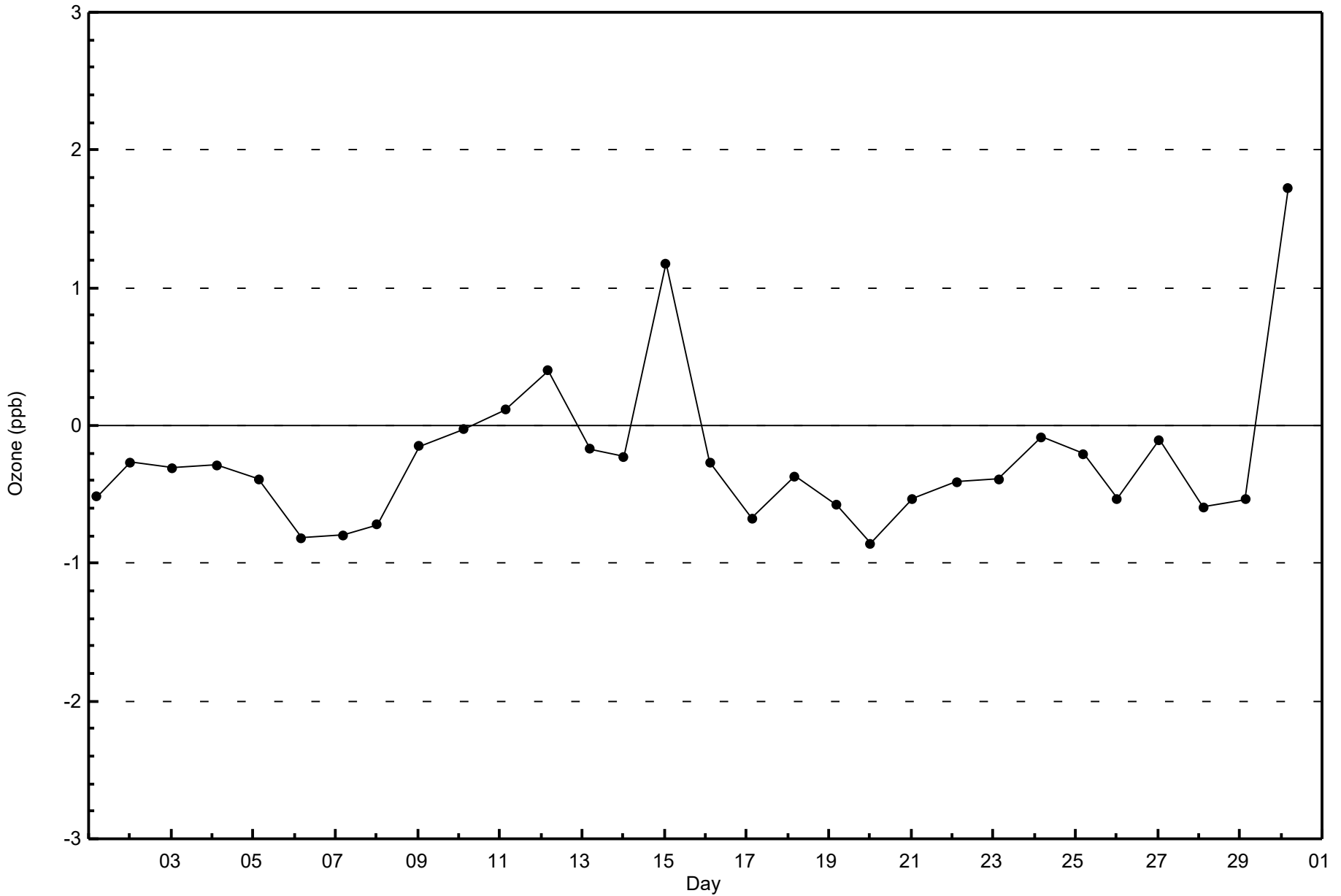
Total Number of Hours: 720

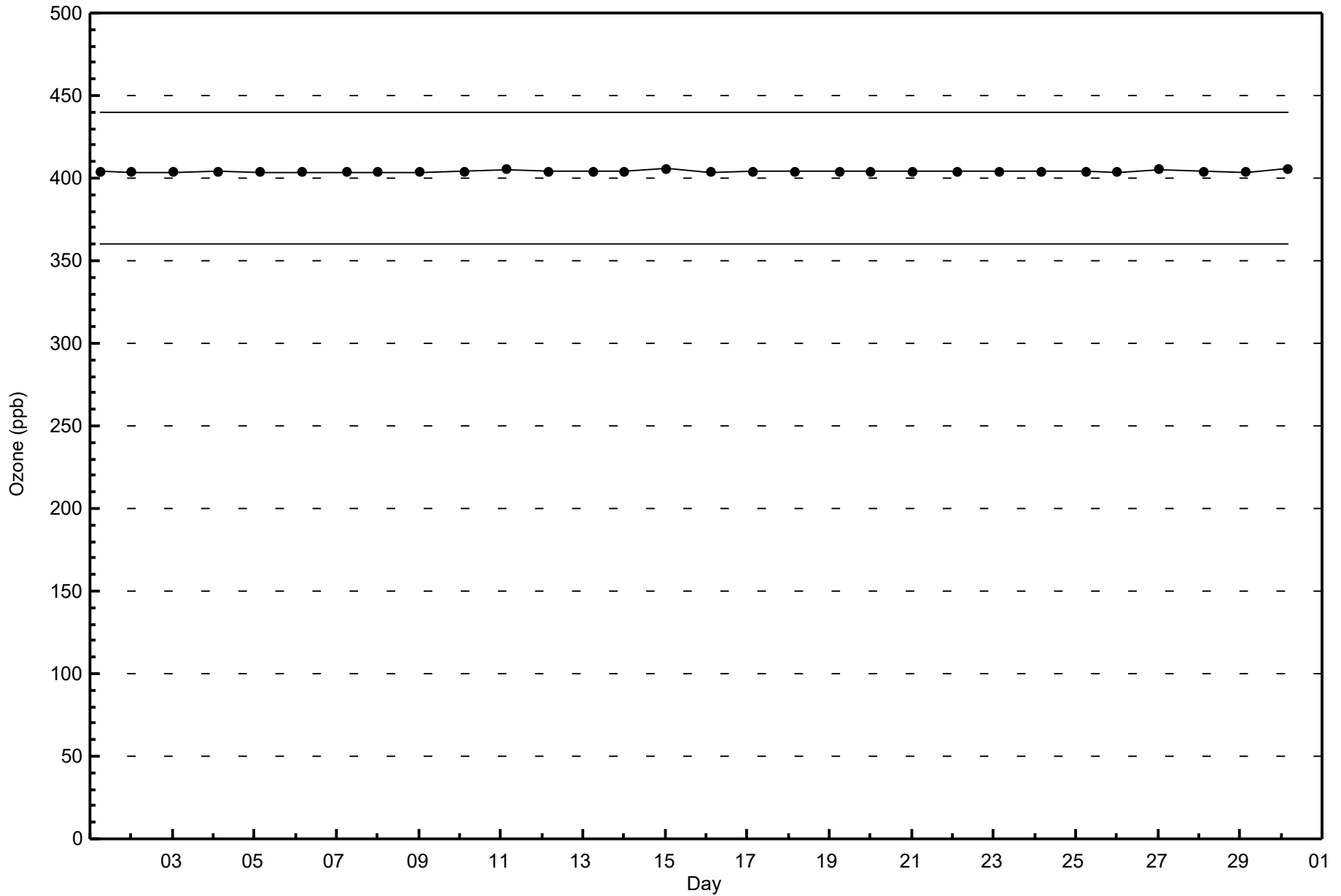


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association

Summary of Hour Averages

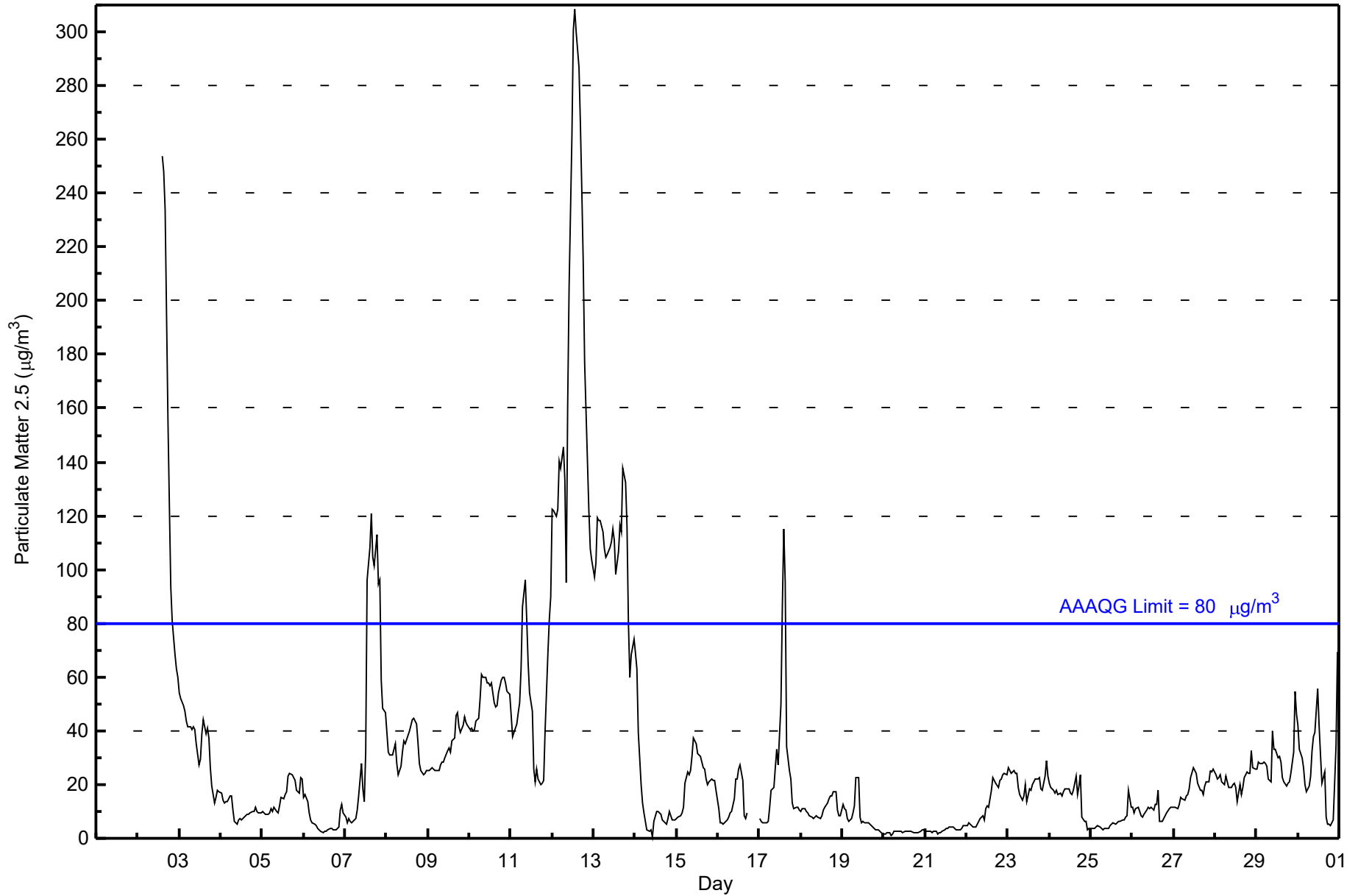
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Fort McKay - Bertha Ganter - June 2023

Number of Exceedences (AAAQO):	1-hr: 68	24-hr: 8	Hours in Service:	720
Maximum Value: 308.3 µg/m ³ on Jun 12 14:00	Maximum Daily Average: 180.6 µg/m ³ on Jun 12		Hours of Data:	676
Minimum Value: 0.8 µg/m ³ on Jun 14 11:00	Minimum Daily Average: 2.3 µg/m ³ on Jun 20		Hours of Missing Data:	44
Maximum Diurnal Average: 46.8 µg/m ³ at hour 15	Minimum Diurnal Average: 24.3 µg/m ³ at hour 4		Hours of Calibration:	2
Monthly Average: 31.53 µg/m ³	Percentiles: P ₁ = 1.8 P ₁₀ = 3.6 Q ₁ = 8.0 Median = 18.8 Q ₃ = 33.2 P ₉₀ = 77.1 P ₉₉ = 249.5		Percent Operational Time:	94.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																						
2-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	253.9	248.0	233.7	155.4	124.2	93.6	80.9	68.3	63.0	59.8	--	253.9																						
3-Jun	54.3	52.0	49.3	47.3	43.5	41.6	41.6	40.6	41.6	40.5	35.2	27.5	29.4	39.1	44.4	39.1	41.1	37.1	26.5	19.2	13.0	15.4	17.6	17.5	35.6	54.3																						
4-Jun	17.0	14.4	12.9	13.8	13.8	15.7	16.0	10.4	6.5	5.1	7.0	7.2	6.8	7.2	8.5	8.9	9.1	9.6	10.2	9.9	11.6	9.9	9.4	9.6	10.4	17.0																						
5-Jun	9.9	9.5	8.7	8.8	9.7	11.1	10.0	11.5	10.1	9.3	12.0	15.3	14.9	16.3	17.1	23.0	24.4	23.5	22.5	21.5	18.0	16.9	22.7	22.3	15.4	24.4																						
6-Jun	15.5	16.1	13.8	9.5	6.8	5.9	5.1	4.5	3.8	3.3	2.6	2.3	2.5	2.4	3.0	3.5	3.5	3.4	3.3	3.1	4.0	10.3	12.4	9.6	6.3	16.1																						
7-Jun	7.7	5.9	7.2	6.2	6.0	6.6	7.5	10.3	15.6	27.9	18.6	13.8	32.0	96.2	108.4	120.8	104.5	101.5	112.9	94.6	96.2	59.1	48.3	46.9	48.1	120.8																						
8-Jun	39.2	32.3	30.9	31.0	33.0	35.2	28.0	23.4	26.8	32.2	36.1	35.5	38.1	39.7	42.1	43.9	44.8	42.8	35.6	27.9	25.4	23.6	24.0	25.1	33.2	44.8																						
9-Jun	25.0	25.3	26.1	25.6	25.1	25.3	25.3	27.5	28.3	28.2	29.9	32.8	33.9	32.2	36.3	37.5	45.6	46.7	41.7	39.6	41.8	44.9	42.9	41.9	33.7	46.7																						
10-Jun	40.3	40.9	39.9	40.6	43.7	44.8	51.8	60.8	59.9	59.7	57.8	57.6	56.7	57.6	50.6	48.8	49.6	54.4	58.8	59.9	60.1	58.0	54.9	53.5	52.5	60.8																						
11-Jun	45.6	37.8	39.4	42.4	46.7	50.3	62.9	86.1	96.3	81.3	65.0	54.2	47.2	25.9	20.8	25.5	21.8	20.1	20.2	21.3	40.1	68.8	81.7	89.7	49.6	96.3																						
12-Jun	122.5	122.1	119.7	122.7	140.1	137.9	145.5	133.5	95.1	161.4	205.0	261.1	300.3	308.3	300.2	286.9	265.9	241.3	214.3	176.9	140.3	122.1	107.8	103.6	180.6	308.3																						
13-Jun	97.0	102.5	119.4	118.5	118.4	113.8	107.9	104.7	105.9	108.3	110.3	115.3	111.1	98.4	106.7	116.7	114.1	137.5	132.3	116.2	80.4	59.8	68.5	73.8	105.7	137.5																						
14-Jun	69.0	62.9	39.2	20.1	13.4	9.5	6.4	3.4	2.7	3.0	0.8	6.1	10.1	9.8	9.7	9.0	7.0	5.7	5.5	7.2	9.7	7.0	6.9	6.9	13.8	69.0																						
15-Jun	7.3	8.1	8.6	9.3	11.6	20.7	24.8	23.8	25.0	30.6	37.4	35.2	31.6	31.2	30.4	26.5	25.6	21.9	19.8	21.2	22.1	21.4	21.3	17.9	22.2	37.4																						
16-Jun	10.9	6.0	5.5	5.5	5.5	7.0	7.9	9.4	9.9	14.9	21.9	21.9	25.7	27.2	21.6	8.6	7.4	9.5	PF	PF	PF	PF	PF	PF	12.6	27.2																						
17-Jun	7.1	6.6	5.8	5.8	5.9	6.2	11.7	17.8	19.0	26.5	33.2	27.4	50.0	86.8	115.0	95.6	34.1	25.2	22.1	13.1	11.1	11.6	11.7	10.6	27.5	115.0																						
18-Jun	9.9	10.8	10.9	10.1	9.5	8.2	7.9	7.5	7.9	8.3	7.7	7.5	8.2	10.3	11.7	13.0	14.7	15.9	15.9	17.3	17.4	10.4	8.2	8.5	10.7	17.4																						
19-Jun	12.4	11.0	10.6	7.4	6.5	7.3	9.6	12.2	22.8	22.6	8.0	5.9	6.3	6.0	5.9	6.0	5.1	4.5	3.9	3.3	3.1	3.0	2.4	1.7	7.8	22.8																						
20-Jun	1.6	1.6	1.9	1.9	1.2	1.4	2.6	2.8	2.8	2.7	2.5	2.3	2.5	2.5	2.6	2.8	2.5	2.2	2.1	2.2	2.2	2.7	3.0	2.9	2.3	3.0																						
21-Jun	2.9	2.7	2.8	2.6	2.4	2.4	2.4	1.8	2.1	2.1	2.4	3.0	3.6	3.7	4.2	4.1	4.3	3.5	3.4	3.4	3.3	3.6	4.7	4.8	3.2	4.8																						
22-Jun	4.5	5.7	5.1	4.6	4.4	4.4	5.5	6.2	7.3	8.7	6.7	11.2	12.1	11.3	17.9	22.5	21.3	20.4	18.8	21.7	22.0	23.9	24.2	23.7	13.1	24.2																						
23-Jun	26.3	25.1	24.3	25.0	24.1	24.3	18.8	16.2	14.2	15.7	20.1	13.9	18.4	17.9	20.2	21.0	22.0	22.3	22.4	18.6	18.1	23.3	29.0	22.9	21.0	29.0																						
24-Jun	20.7	19.1	17.6	16.8	18.0	16.5	17.1	15.6	17.3	18.5	18.2	18.2	16.7	16.3	17.9	22.9	16.4	19.6	23.6	7.8	6.3	6.3	3.4	3.4	15.6	23.6																						
25-Jun	3.5	3.6	3.8	4.4	4.8	4.1	3.6	3.1	3.4	3.5	3.8	4.6	5.3	5.6	5.5	5.8	6.1	6.3	6.9	6.9	7.7	8.7	18.0	11.4	5.9	18.0																						
26-Jun	11.6	9.6	10.8	11.3	9.8	8.5	8.0	9.0	10.6	11.3	11.3	11.4	10.7	12.7	12.7	18.0	6.4	6.4	7.4	8.1	9.2	11.3	11.6	11.7	10.4	18.0																						
27-Jun	11.6	11.5	11.3	12.8	15.2	14.7	14.4	15.5	16.2	18.2	22.9	26.4	25.1	24.0	20.7	17.6	17.8	16.4	19.4	20.9	20.9	25.1	24.8	25.9	18.7	26.4																						
28-Jun	23.5	22.1	22.7	23.5	21.0	19.9	23.1	21.0	19.0	19.2	19.9	20.5	18.9	13.5	20.0	16.1	18.9	22.8	24.7	24.0	24.0	32.6	26.5	25.5	21.8	32.6																						
29-Jun	25.7	28.5	28.1	27.6	28.4	27.8	26.9	21.9	21.0	40.0	33.3	33.0	29.8	30.3	28.5	22.3	20.8	19.4	20.3	21.2	24.4	32.0	54.4	46.5	28.8	54.4																						
30-Jun	41.9	33.2	30.2	26.1	20.1	17.5	19.4	22.9	32.4	37.6	39.4	55.8	42.3	31.0	20.4	24.6	8.1	5.3	5.2	5.0	6.6	20.4	34.9	69.5	27.1	69.5																						
																								27.3	26.0	25.2	24.3	24.6	24.6	25.4	25.8	25.8	30.0	31.0	33.1	35.4	38.0	46.8	46.2	41.3	37.9	36.6	31.6	29.3	28.6	29.9	30.3	Diurnal Average
																								122.5	122.1	119.7	122.7	140.1	137.9	145.5	133.5	105.9	161.4	205.0	261.1	300.3	308.3	300.2	286.9	265.9	241.3	214.3	176.9	140.3	122.1	107.8	103.6	Diurnal Maximum

C - Calibration AF - Analyzer Failure 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 McKay - Bertha Ganter - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	101	14.94	14.94
6 - 15	187	27.66	42.60
16 - 25	161	23.82	66.42
26 - 80	160	23.67	90.09
> 81.0	67	9.91	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	35	14	3	2	2	0	0	2	2	5	9	5	1	2	9	10	101
6 - 15	51	23	4	1	1	2	2	19	19	11	10	6	3	5	8	20	185
16 - 25	18	10	7	3	0	1	5	29	20	7	9	10	10	7	9	10	155
26 - 80	15	12	6	2	4	1	5	27	27	12	11	4	5	13	7	7	158
> 81.0	5	13	8	2	0	1	1	2	2	0	0	3	7	13	5	5	67
Totals	124	72	28	10	7	5	13	79	70	35	39	28	26	40	38	52	666

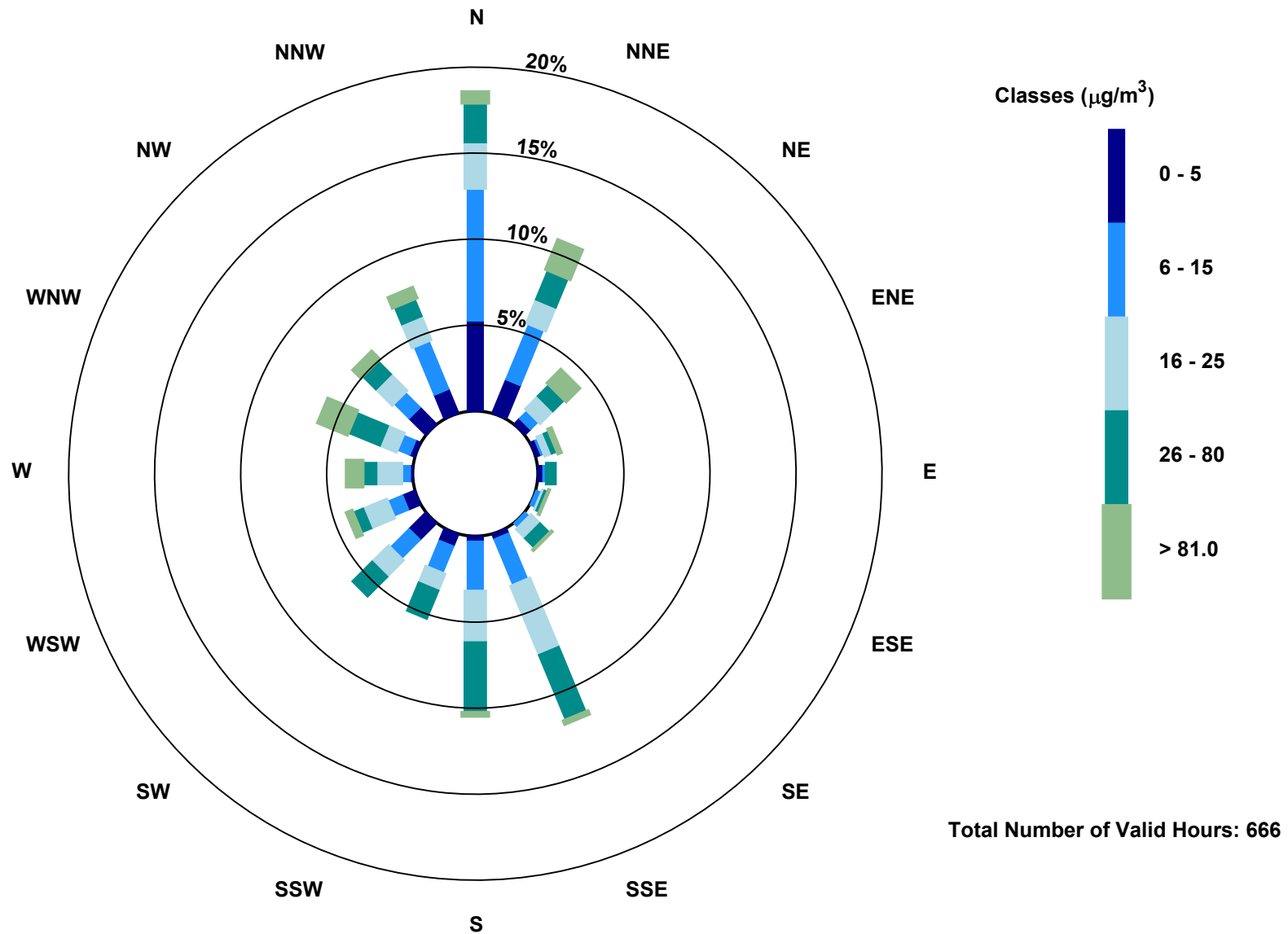
Total Number of Valid Hours: 666

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

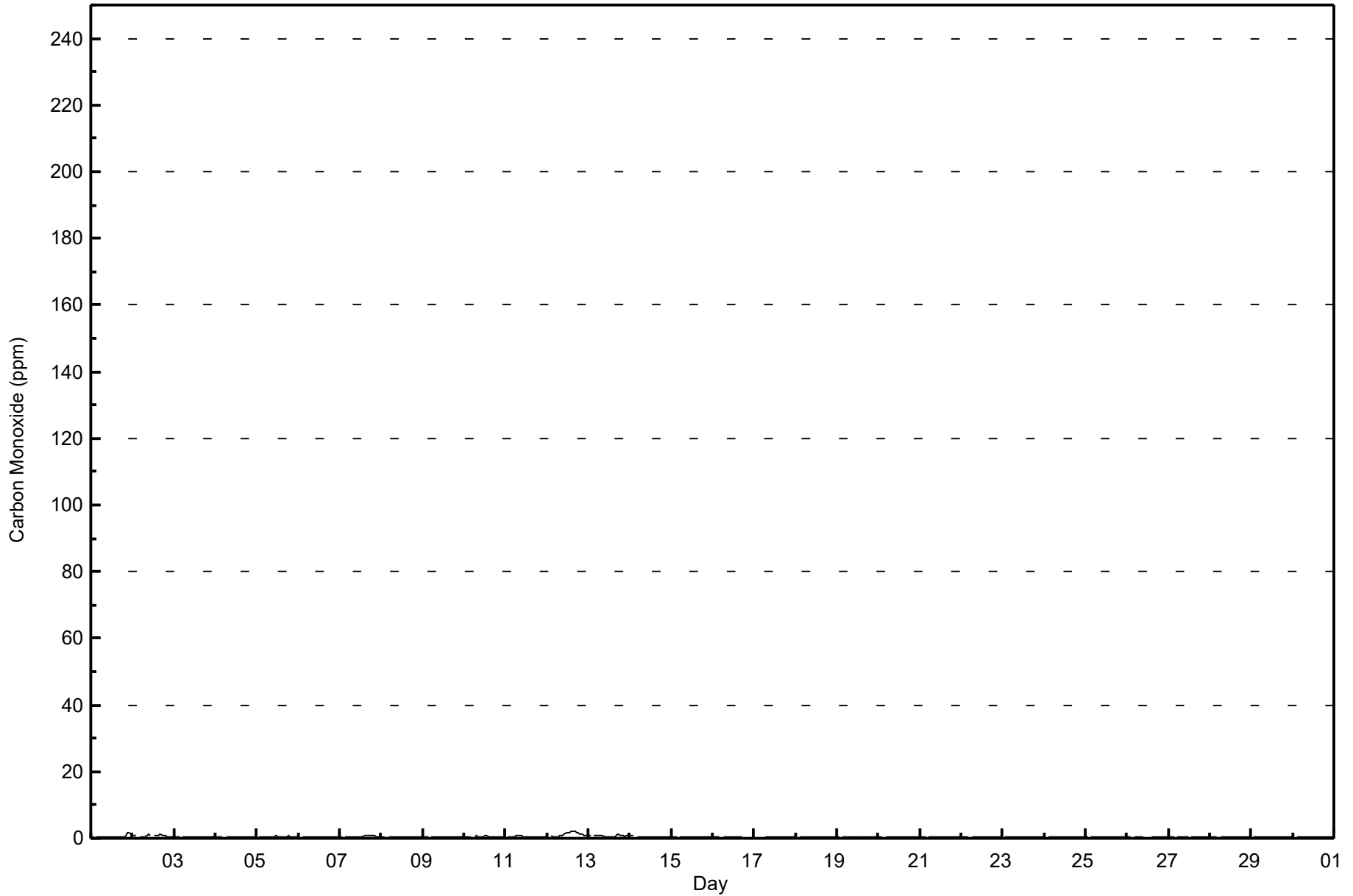
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	224	33.04	33.04
0.4 - 0.5	332	48.97	82.01
0.6 - 0.7	72	10.62	92.63
0.8 - 1.4	40	5.90	98.53
1.5 - 10	10	1.47	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - June 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	48	35	4	2	3	1	2	15	16	14	25	16	8	3	18	12	222
0.4 - 0.5	56	21	13	6	4	3	11	47	45	21	11	13	7	20	17	32	327
0.6 - 0.7	13	6	5	0	0	0	1	14	7	2	0	0	9	9	2	4	72
0.8 - 1.4	8	8	4	3	1	1	1	0	0	0	0	0	1	6	3	4	40
1.5 - 10	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	1	10
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	126	76	28	11	8	5	15	76	68	37	36	29	25	38	40	53	671

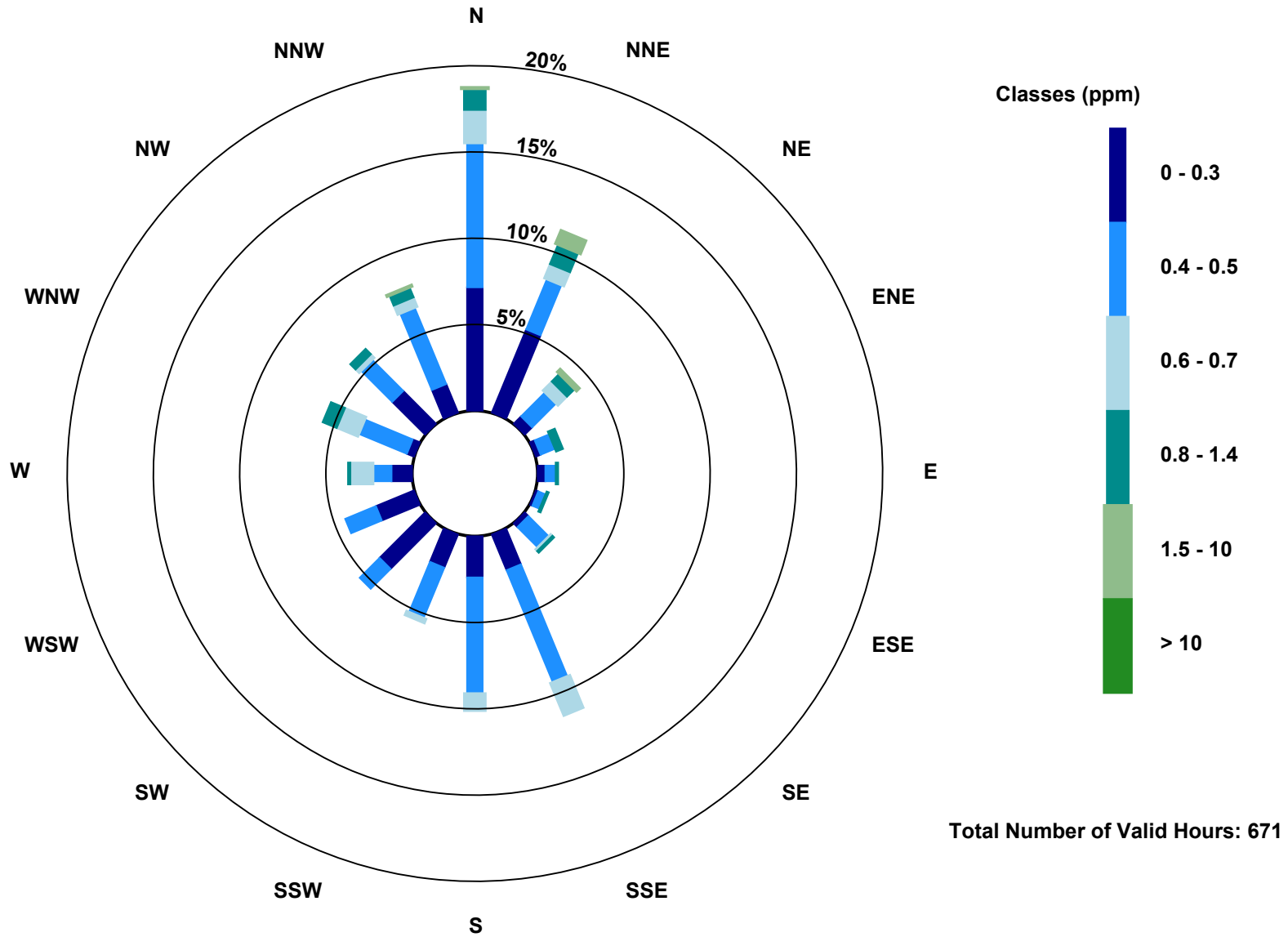
Total Number of Valid Hours: 671

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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 - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 524.0 ppm on Jun 28 04:00	Maximum Daily Average: 444.2 ppm on Jun 5		Hours of Data:	677
Minimum Value: 402.2 ppm on Jun 10 13:00	Minimum Daily Average: 417.1 ppm on Jun 6		Hours of Missing Data:	43
Maximum Diurnal Average: 462.5 ppm at hour 5	Minimum Diurnal Average: 411.6 ppm at hour 14		Hours of Calibration:	35
Monthly Average: 428.77 ppm	Percentiles: P ₁ = 405.0 P ₁₀ = 410.5 Q ₁ = 413.6 Median = 421.0 Q ₃ = 437.3 P ₉₀ = 459.7 P ₉₉ = 500.9		Percent Operational Time:	98.9

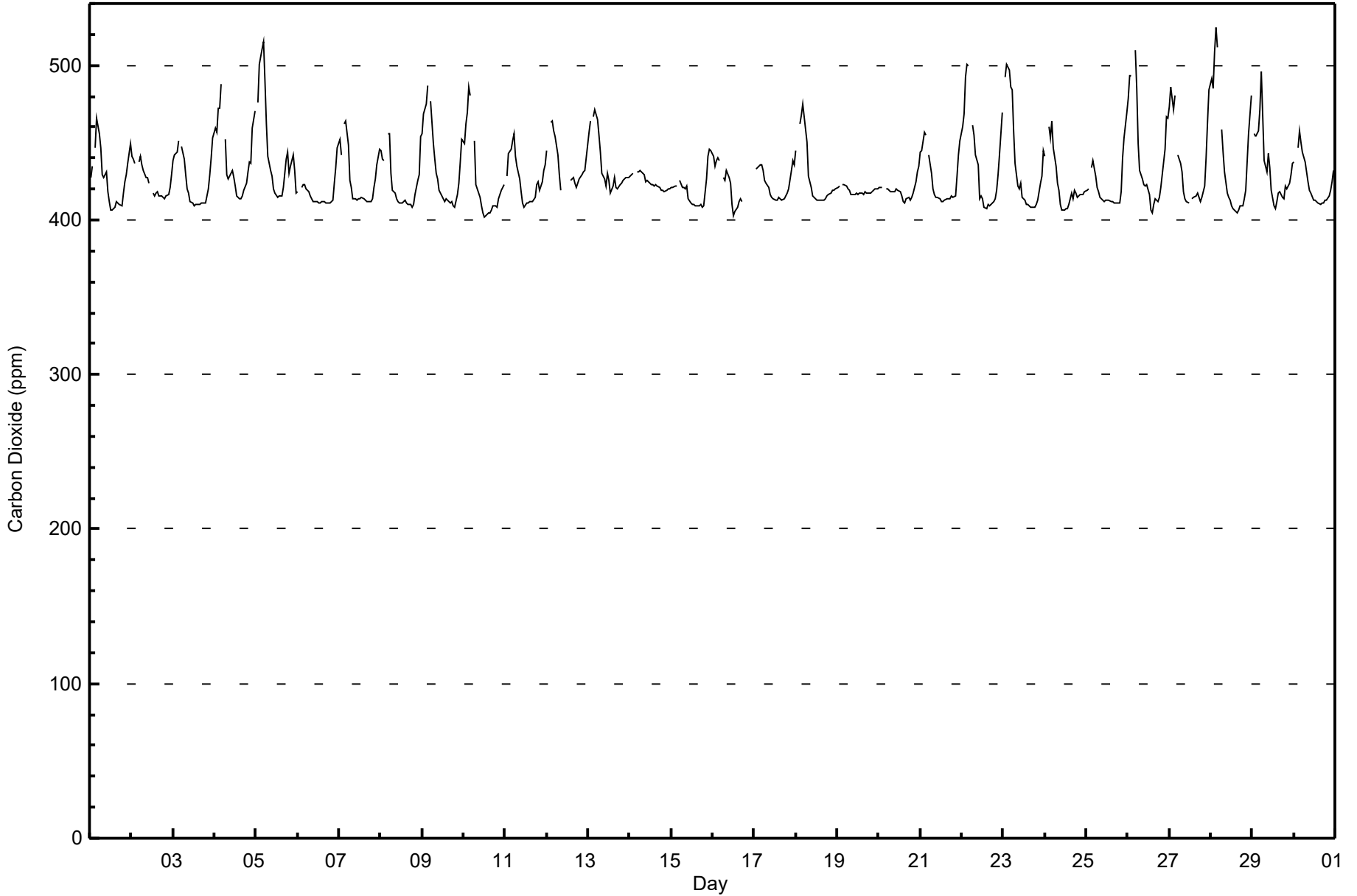
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	427.6	434.7	Z	446.5	465.7	455.5	446.3	429.6	427.4	431.2	417.8	411.5	406.2	406.8	408.6	411.4	411.1	409.8	409.5	417.1	424.6	429.3	436.6	449.6	426.7	465.7
2-Jun	441.2	439.3	436.8	Z	437.8	441.3	435.3	431.8	427.5	427.6	424.1	M	417.6	415.2	417.8	418.3	415.7	415.6	414.2	414.0	415.2	416.4	421.0	428.9	425.1	441.3
3-Jun	438.0	442.5	444.0	451.4	Z	447.8	439.0	429.0	420.3	417.3	411.9	410.9	409.2	409.9	410.1	409.6	410.6	410.6	410.7	411.1	420.3	428.8	440.5	453.5	425.1	453.5
4-Jun	459.2	456.7	472.3	472.2	487.4	Z	452.5	429.0	426.3	429.7	431.6	427.0	422.4	415.3	413.6	413.8	415.7	418.9	423.6	430.7	437.3	437.0	459.4	470.7	439.2	487.4
5-Jun	Z	476.3	500.8	510.9	515.4	489.6	462.4	440.9	432.4	427.9	420.5	417.8	415.0	415.6	415.4	415.7	421.3	439.4	443.5	430.2	434.4	441.9	432.1	417.3	444.2	515.4
6-Jun	418.6	Z	420.7	422.7	422.5	420.4	418.1	415.6	413.5	412.3	411.9	411.7	411.1	411.1	411.4	411.4	411.2	410.6	410.7	411.2	412.6	424.0	434.0	447.1	417.1	447.1
7-Jun	452.2	442.4	Z	461.8	464.4	448.0	426.0	420.7	413.6	413.4	413.0	413.9	413.6	414.3	414.1	413.2	411.6	411.4	412.0	413.5	421.0	426.7	435.7	446.0	426.2	464.4
8-Jun	444.6	439.2	438.3	Z	456.1	455.4	430.2	419.6	417.2	413.5	411.7	410.8	411.3	411.4	412.5	411.2	410.4	409.8	408.6	410.2	416.8	425.5	429.4	453.5	423.8	456.1
9-Jun	455.5	468.9	475.0	486.7	Z	476.8	449.6	439.4	430.4	426.5	419.2	415.9	413.6	411.7	413.9	411.9	411.1	411.9	408.7	408.2	416.6	423.9	437.5	451.9	433.3	486.7
10-Jun	449.5	461.9	469.1	486.0	480.3	Z	450.9	422.7	420.4	414.2	408.8	404.1	402.2	403.0	404.1	404.7	406.2	409.4	409.3	408.7	414.0	416.2	418.8	423.1	425.5	486.0
11-Jun	Z	427.9	442.9	445.8	451.2	456.2	441.2	435.2	426.4	418.4	410.9	408.6	410.8	411.2	411.8	411.9	412.0	414.3	422.8	425.1	419.5	424.9	431.6	435.6	425.9	456.2
12-Jun	444.4	Z	463.6	464.4	457.5	454.2	441.8	429.1	419.4	C	C	C	C	C	425.5	427.5	423.4	421.1	423.6	426.8	429.3	430.7	431.7	440.4	436.4	464.4
13-Jun	456.8	463.7	Z	466.6	471.1	464.5	454.8	444.1	430.1	426.1	422.3	429.8	425.8	417.2	422.0	427.3	421.3	419.7	422.5	424.1	425.2	426.4	427.6	427.3	435.5	471.1
14-Jun	427.9	429.2	430.3	Z	430.8	430.9	431.7	431.0	429.7	424.8	425.6	425.0	423.1	422.7	422.4	423.2	422.2	421.1	419.5	419.3	418.7	419.2	419.8	420.4	424.7	431.7
15-Jun	420.8	421.2	422.0	421.9	Z	425.5	421.4	421.3	420.5	421.6	414.0	411.3	410.5	410.5	408.7	409.5	408.9	409.8	408.1	409.0	426.1	441.6	445.9	445.1	419.8	445.9
16-Jun	441.2	435.2	438.3	440.5	438.8	Z	427.2	425.2	431.8	427.1	423.3	409.9	402.7	405.7	407.9	412.3	413.5	411.8	PF	PF	PF	PF	PF	PF	--	441.2
17-Jun	Z	433.0	434.3	435.7	435.7	431.9	425.8	423.4	420.7	416.7	414.9	413.4	412.5	412.6	414.2	413.3	412.9	414.0	415.7	417.3	420.0	432.0	438.3	435.9	422.8	438.3
18-Jun	444.9	Z	462.0	468.1	474.6	466.7	450.1	428.7	425.1	420.6	415.4	414.0	413.1	412.6	412.8	412.8	413.0	413.8	415.6	416.1	417.3	418.9	419.2	420.4	428.5	474.6
19-Jun	420.6	421.8	Z	422.6	422.7	421.7	420.0	418.8	416.7	416.7	416.8	417.1	416.9	417.1	417.0	416.5	418.0	417.1	417.2	417.7	418.3	419.3	419.8	420.3	418.7	422.7
20-Jun	421.0	421.0	421.1	Z	420.2	420.3	419.4	418.5	418.3	418.4	419.9	418.8	418.3	415.2	412.2	410.7	413.7	414.5	412.8	414.3	417.2	424.2	431.3	434.4	419.0	434.4
21-Jun	443.6	444.5	456.3	455.2	Z	441.7	430.1	419.6	416.9	414.9	414.6	413.4	412.3	412.2	412.4	413.3	413.5	413.6	415.2	414.3	415.4	428.5	442.4	451.0	425.9	456.3
22-Jun	460.5	468.3	492.5	500.4	499.6	Z	461.2	454.6	442.0	435.8	413.8	415.9	413.5	408.5	407.7	410.2	409.4	410.0	412.2	413.3	418.9	429.7	441.8	469.8	438.7	500.4
23-Jun	Z	492.0	501.0	497.1	485.6	484.2	457.6	436.2	421.5	419.8	423.3	414.7	413.0	410.5	409.6	408.8	408.2	408.4	408.6	409.7	412.9	424.1	428.5	444.9	435.7	501.0
24-Jun	441.2	Z	460.0	452.7	464.1	446.8	435.0	423.7	419.0	410.1	406.7	406.7	407.3	407.7	410.2	417.4	413.7	418.8	417.3	414.4	416.4	416.4	416.5	418.2	423.5	464.1
25-Jun	418.9	420.3	Z	433.6	438.3	428.8	421.1	418.4	414.2	412.7	412.3	412.9	412.8	412.4	412.1	411.7	411.2	411.0	411.0	411.1	418.2	440.0	453.1	469.1	422.0	469.1
26-Jun	479.0	493.2	493.5	Z	510.0	485.5	449.1	431.9	426.8	422.8	421.8	423.2	416.5	406.2	405.0	409.8	413.6	412.2	414.8	421.2	429.5	445.9	467.0	466.2	441.1	510.0
27-Jun	472.9	485.7	471.7	480.5	Z	442.2	436.8	431.2	417.9	413.5	411.5	410.8	M	413.6	414.6	415.3	417.1	414.3	411.8	414.2	422.3	439.8	463.3	483.9	435.7	485.7
28-Jun	491.5	485.4	509.1	524.0	511.6	Z	458.9	443.8	430.9	416.9	414.5	412.4	409.3	407.6	405.2	404.8	406.6	409.1	408.8	413.9	419.6	437.8	455.5	480.6	441.6	524.0
29-Jun	Z	455.9	454.0	457.7	471.6	496.3	467.3	438.1	431.4	442.8	433.9	419.6	409.2	407.3	411.7	417.0	418.4	414.7	413.3	421.8	419.9	423.8	429.1	436.2	434.4	496.3
30-Jun	437.6	Z	446.8	457.6	450.5	443.9	437.2	430.7	424.3	419.0	417.4	412.6	412.4	412.0	411.2	410.1	410.8	411.1	412.5	412.9	415.3	419.5	424.5	431.8	424.4	457.6
444.4 450.4 458.3 462.5 462.5 451.0 440.0 429.4 423.8 421.1 417.4 414.8 412.9 411.6 412.5 413.5 413.5 414.3 415.0 416.3 420.4 428.0 435.6 443.9																								Diurnal Average		
491.5 493.2 509.1 524.0 515.4 496.3 467.3 454.6 442.0 442.8 433.9 429.8 425.8 422.7 425.5 427.5 423.4 439.4 443.5 430.7 437.3 445.9 467.0 483.9																								Diurnal Maximum		

Z - zerspan	C - Calibration	M - Maintenance	PF - Power Failure
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Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	332	49.04	49.04
420 - 440	195	28.80	77.84
440 - 460	83	12.26	90.10
460 - 480	38	5.61	95.72
480 - 500	21	3.10	98.82
> 500	8	1.18	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - June 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	64	50	23	9	8	3	8	35	22	17	21	17	12	10	14	16	329
420 - 440	52	21	3	1	0	2	6	26	20	8	6	6	1	12	8	22	194
440 - 460	7	1	1	0	0	0	1	10	16	6	3	4	8	8	9	8	82
460 - 480	2	1	0	0	0	0	0	4	5	1	4	2	2	6	5	5	37
480 - 500	1	0	0	0	0	0	0	3	2	4	2	0	1	2	2	2	19
> 500	0	0	0	0	0	0	0	0	3	1	0	0	1	0	2	0	7
Totals	126	73	27	10	8	5	15	78	68	37	36	29	25	38	40	53	668

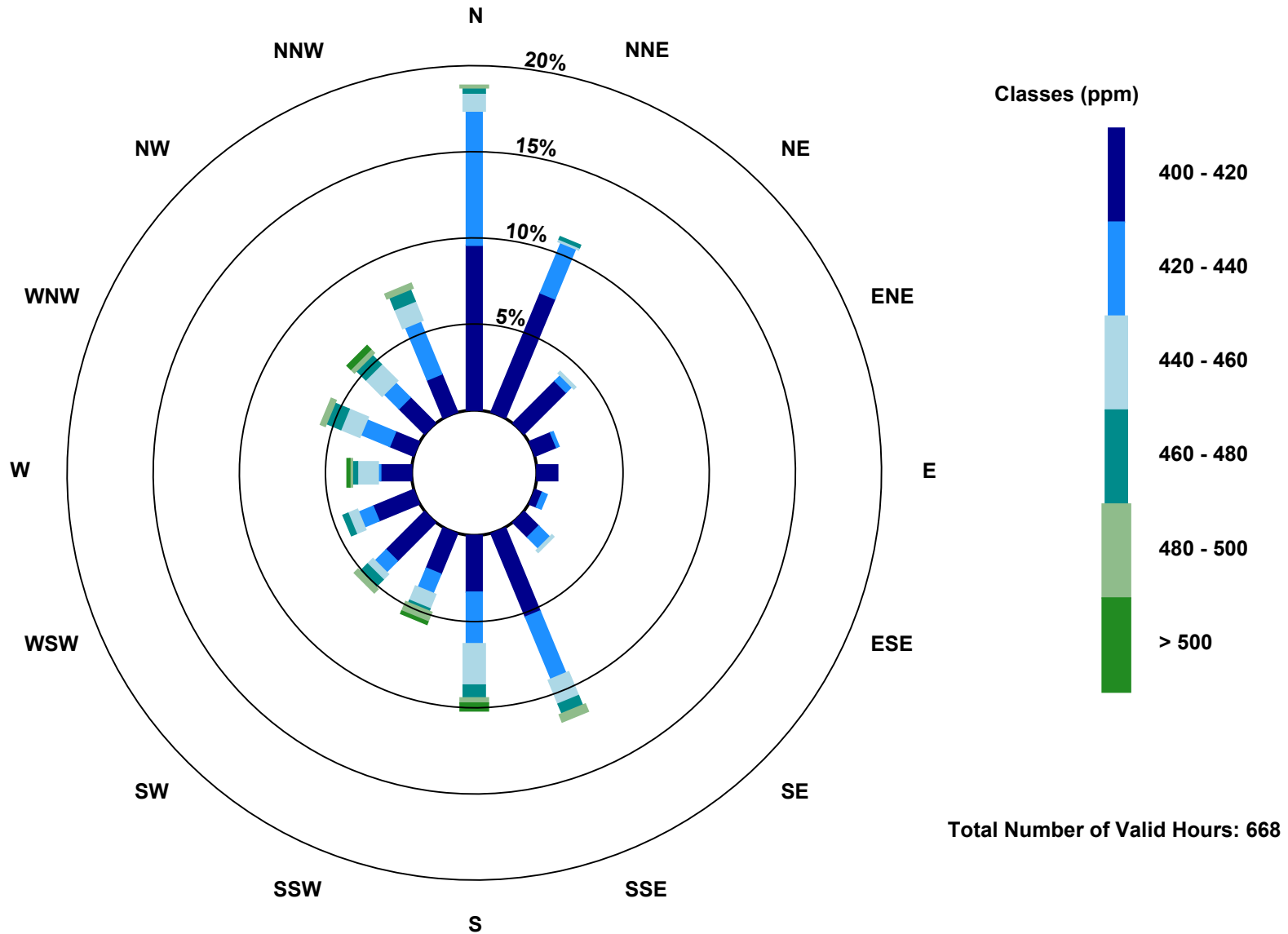
Total Number of Valid Hours: 668

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Number of Exceedences (AAAQO): 1-hr: 0	Maximum Value: 63.7 ppb on Jun 12 16:00	Maximum Daily Average: 31.5 ppb on Jun 12	Hours in Service: 720
Minimum Value: 0.0 ppb on Jun 1 04:00	Maximum Diurnal Average: 3.5 ppb at hour 15	Minimum Daily Average: 0.0 ppb on Jun 3	Hours of Data: 627
Monthly Average: 2.15 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 53.3	Minimum Diurnal Average: 0.0 ppb at hour 2	Hours of Missing Data: 93
			Hours of Calibration: 41
			Percent Operational Time: 92.8

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-Jun	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	22.0	31.1	28.7	3.9	31.1	
2-Jun	18.7	Z	RE	12.6	0.0	0.0	0.0	0.0	12.3	44.8	37.5	M	31.2	30.5	34.8	35.3	35.8	26.7	19.4	15.6	12.9	10.3	0.0	0.0	18.0	44.8	
3-Jun	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	
4-Jun	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	
5-Jun	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6-Jun	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	
7-Jun	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8-Jun	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9-Jun	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10-Jun	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11-Jun	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Jun	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	11.3	17.8	29.3	45.2	57.0	62.5	63.7	61.1	60.5	56.3	54.1	51.0	45.7	42.0	35.1	31.5	63.7	
13-Jun	Z	RE	27.3	24.8	22.3	20.1	17.7	15.9	13.5	11.3	10.2	0.0	0.0	0.0	0.0	0.0	0.0	12.3	11.9	10.7	0.0	0.0	0.0	0.0	9.0	27.3	
14-Jun	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	
15-Jun	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16-Jun	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	PF	PF	PF	PF	PF	PF	--	0.0
17-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
18-Jun	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Jun	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Jun	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Jun	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
22-Jun	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
23-Jun	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Jun	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Jun	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Jun	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27-Jun	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Jun	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Jun	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Jun	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

0.8	0.0	1.5	2.1	1.2	1.0	0.7	0.5	0.9	2.5	2.4	1.1	2.8	3.1	3.5	3.3	3.2	3.3	3.0	2.8	2.2	2.7	2.5	2.2	Diurnal Average	
18.7	0.0	27.3	24.8	22.3	20.1	17.7	15.9	13.5	44.8	37.5	29.3	45.2	57.0	62.5	63.7	61.1	60.5	56.3	54.1	51.0	45.7	42.0	35.1	Diurnal Maximum	

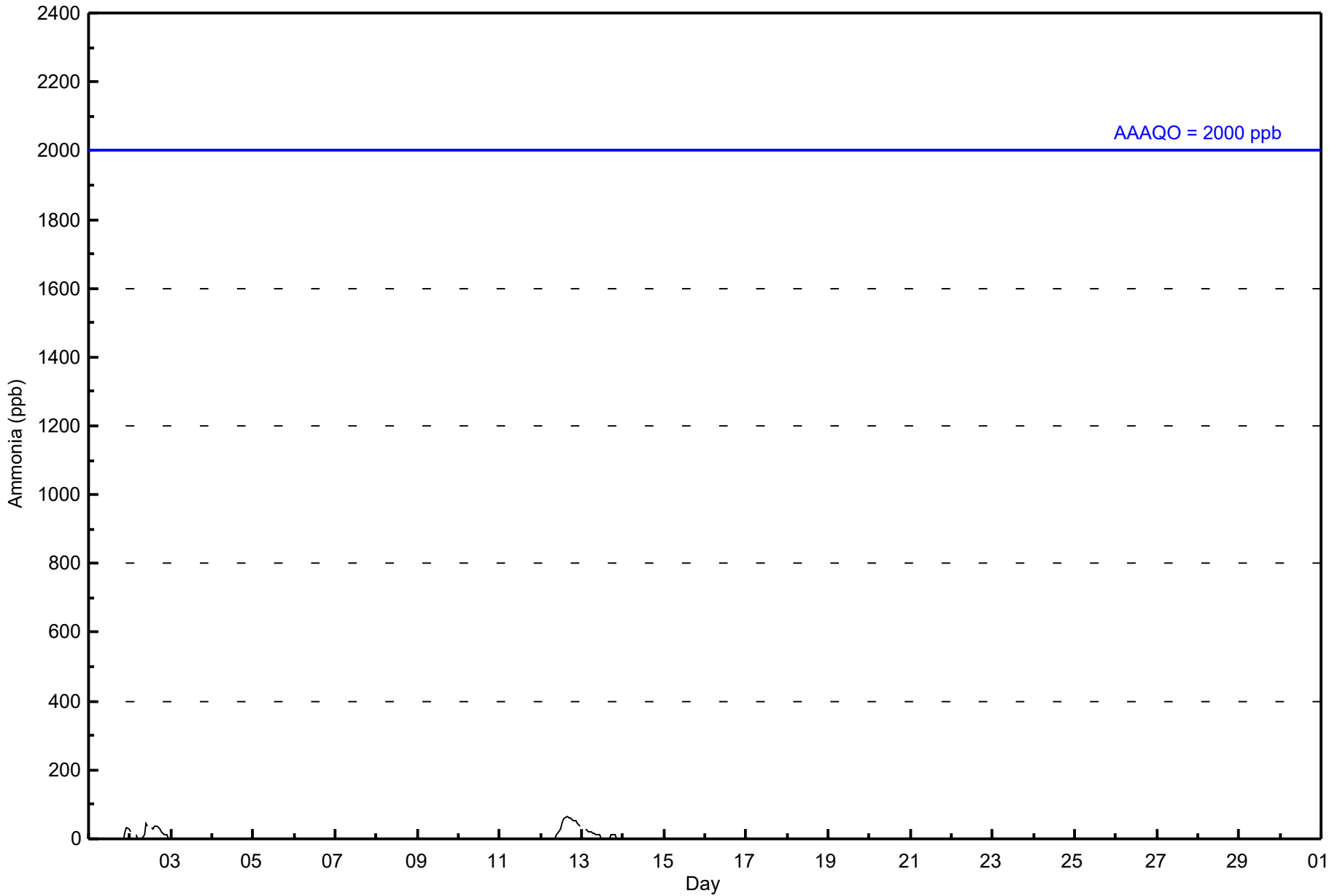
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure RE - Recovery

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	582	92.82	92.82
6 - 10	2	0.32	93.14
11 - 15	9	1.44	94.58
16 - 20	7	1.12	95.69
21 - 25	3	0.48	96.17
> 26	24	3.83	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - June 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	114	54	20	8	6	4	13	73	62	30	27	26	26	33	34	44	574
6 - 10	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
11 - 15	3	3	0	0	0	0	0	1	1	0	0	0	0	0	0	1	9
16 - 20	1	0	3	1	0	0	0	0	0	0	0	0	0	2	0	0	7
21 - 25	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
> 26	2	9	5	2	1	1	1	0	0	0	0	0	0	0	2	1	24
Totals	121	66	29	11	7	5	14	75	63	30	27	26	26	36	37	46	619

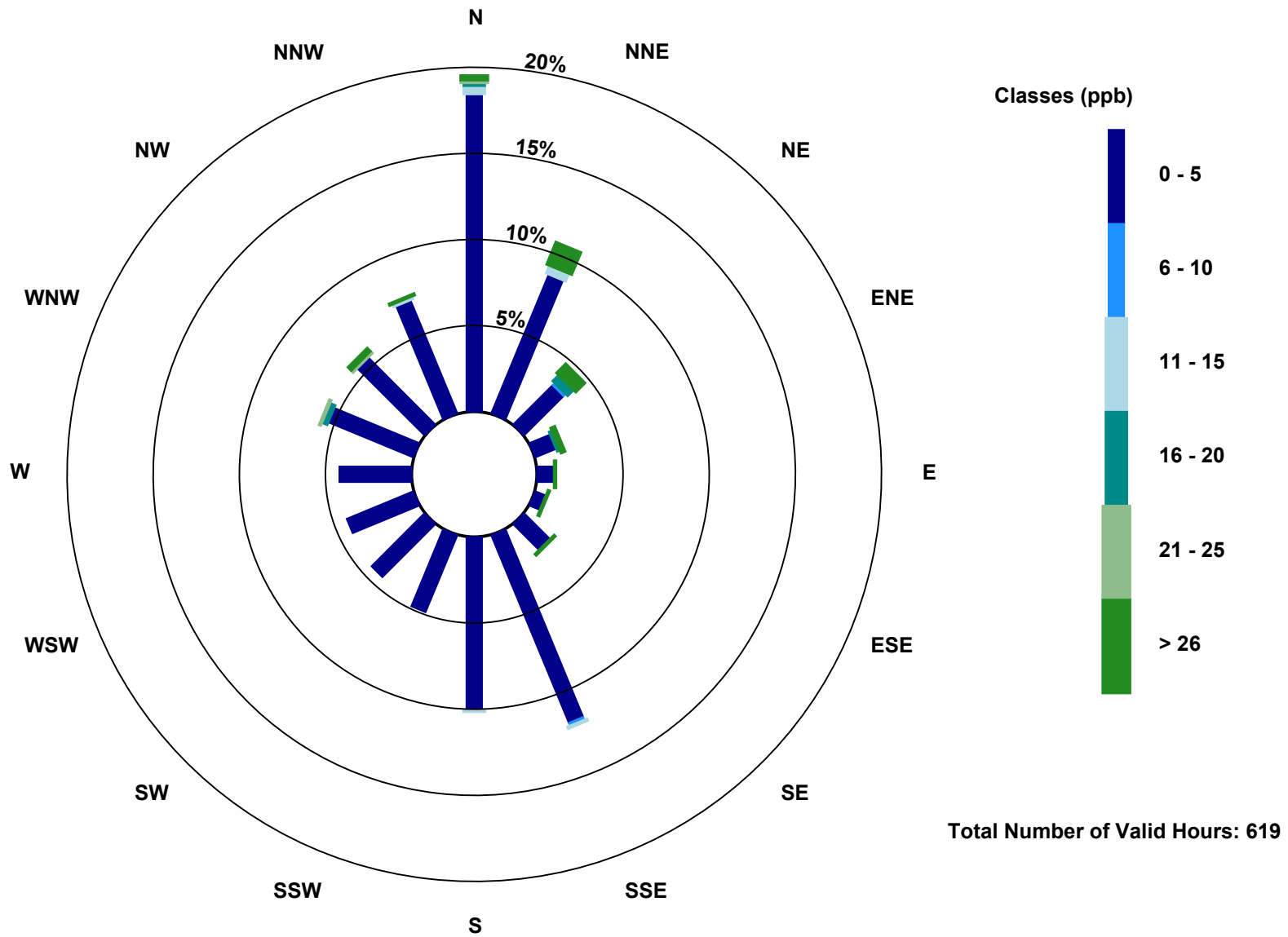
Total Number of Valid Hours: 619

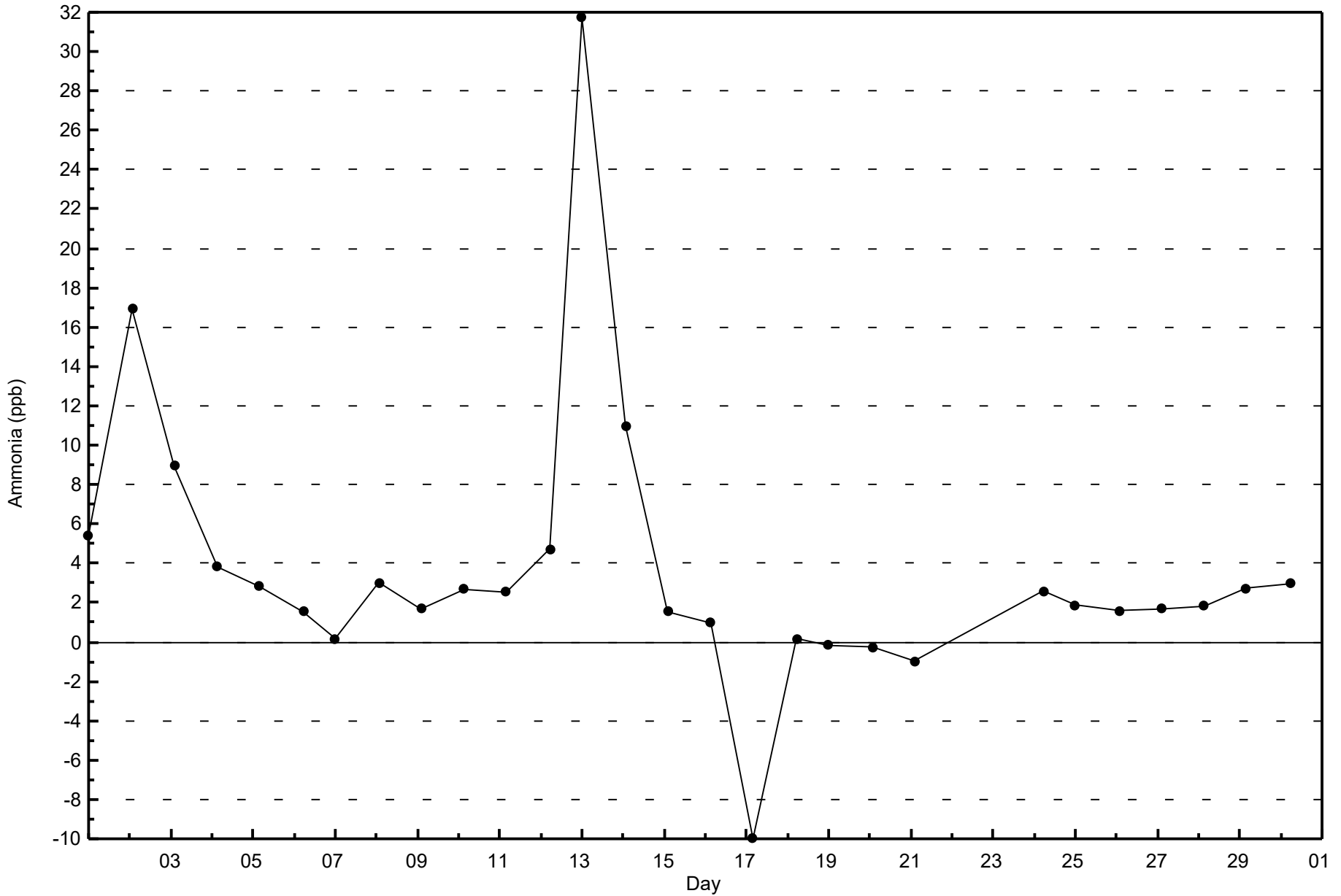
Total Number of Hours: 720

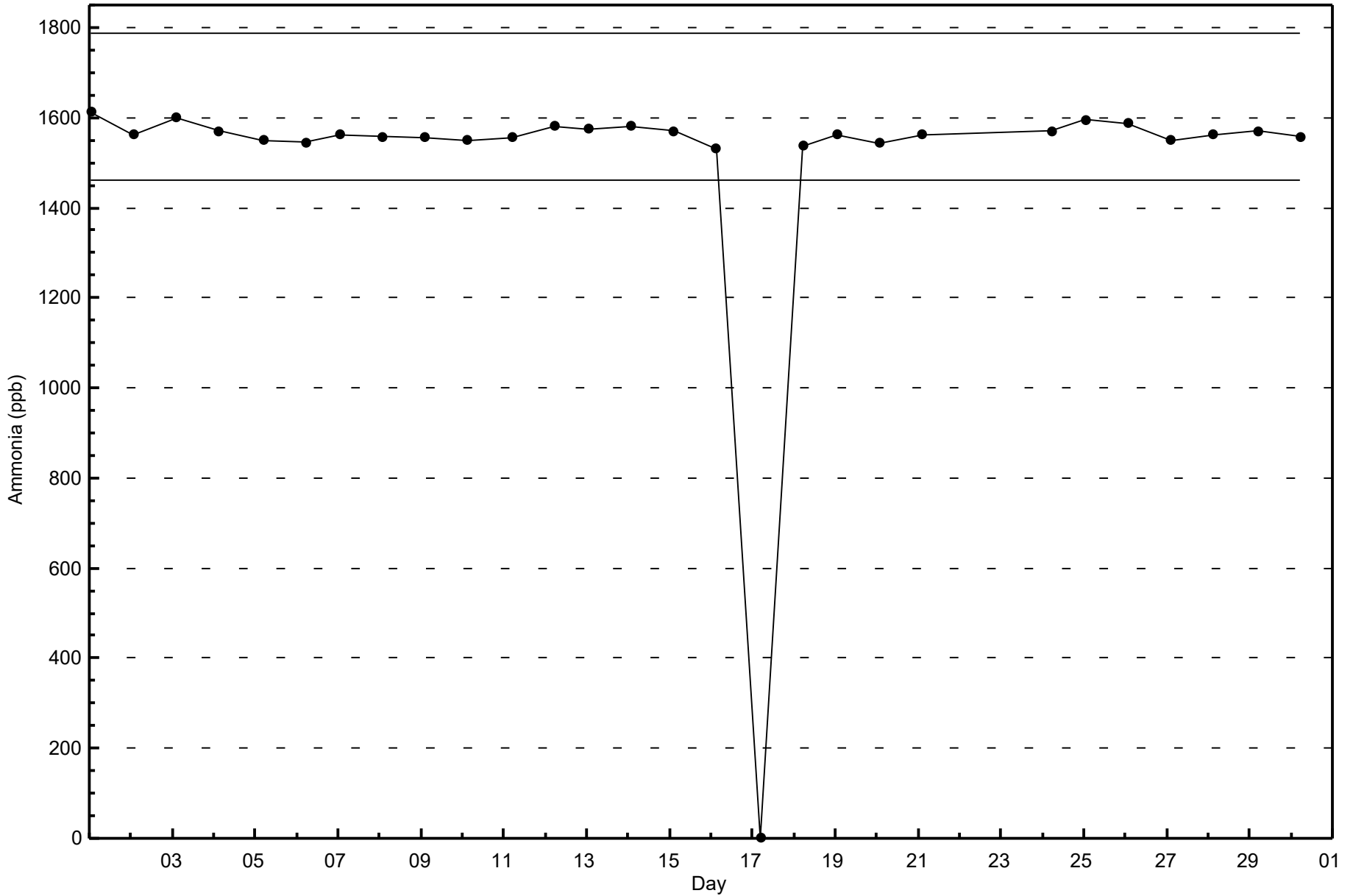


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association
Summary of Hour Averages

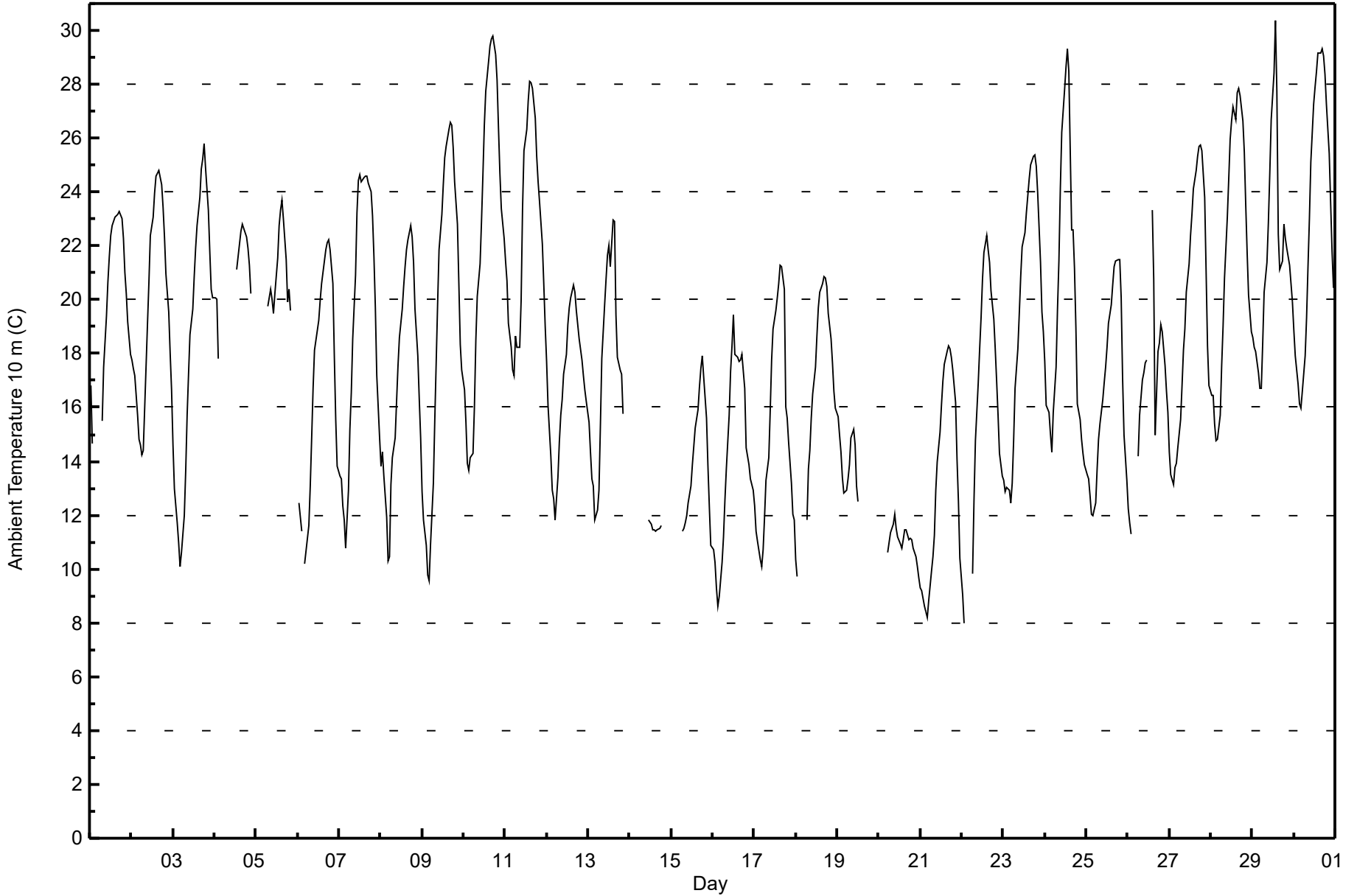
Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - June 2023

Maximum Value: 30.4 C on Jun 29 14:00		Maximum Daily Average: 23.2 C on Jun 30		Hours in Service: 720																																												
Minimum Value: 8.0 C on Jun 22 02:00		Minimum Daily Average: 11.0 C on Jun 20		Hours of Data: 637																																												
Maximum Diurnal Average: 22.3 C at hour 15		Minimum Diurnal Average: 12.5 C at hour 5		Hours of Missing Data: 83																																												
Monthly Average: 18.18 C		Percentiles: P ₁ = 9.0 P ₁₀ = 11.5 Q ₁ = 14.2 Median = 18.0 Q ₃ = 21.8 P ₉₀ = 24.8 P ₉₉ = 29.2		Hours of Calibration: 0																																												
				Percent Operational Time: 88.5																																												
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-Jun	16.8	14.6	UO	UO	UO	UO	UO	15.5	17.5	19.4	20.7	21.6	22.4	22.8	23.1	23.1	23.1	23.3	23.0	22.3	21.0	20.2	19.2	18.0	20.4	23.3																						
2-Jun	17.8	17.5	17.2	15.7	14.8	14.6	14.2	14.4	17.5	19.1	20.6	22.4	23.1	23.9	24.6	24.7	24.8	24.3	23.4	22.3	21.0	19.5	18.0	16.7	19.7	24.8																						
3-Jun	14.6	13.0	11.7	11.0	10.1	10.6	12.0	13.7	15.7	17.2	18.7	19.6	20.9	21.9	22.7	23.8	24.9	25.2	25.8	24.9	23.3	21.8	20.4	20.1	18.5	25.8																						
4-Jun	20.1	20.0	17.8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	21.1	22.1	22.5	22.8	22.6	22.3	21.9	21.3	20.2	UO	UO	UO	22.8																						
5-Jun	UO	UO	UO	UO	UO	UO	UO	UO	19.8	20.4	20.0	19.5	20.2	21.5	22.8	23.3	23.7	23.0	21.5	19.9	20.4	19.6	UO	UO	UO	23.7																						
6-Jun	UO	12.5	11.4	UO	10.2	10.7	11.6	13.1	14.9	16.7	18.1	18.8	19.2	20.0	20.6	21.4	21.9	22.1	22.2	21.9	20.6	17.9	15.5	13.8	17.1	22.2																						
7-Jun	13.5	13.3	12.4	11.8	10.8	12.9	15.2	16.5	18.5	20.9	23.2	24.4	24.6	24.4	24.5	24.6	24.6	24.3	24.0	23.1	21.6	19.7	17.2	14.9	19.2	24.6																						
8-Jun	13.8	14.4	13.5	11.9	10.3	10.5	13.1	14.1	14.9	16.3	17.6	18.6	19.6	20.5	21.2	21.9	22.3	22.8	22.3	21.4	19.6	17.9	16.4	14.9	17.1	22.8																						
9-Jun	12.9	11.8	10.9	9.8	9.5	10.9	13.2	15.5	17.7	19.9	21.8	23.2	24.3	25.3	25.7	26.3	26.6	26.5	25.7	24.4	22.8	20.6	18.3	17.4	19.2	26.6																						
10-Jun	16.6	15.5	13.9	13.7	14.1	14.3	16.0	18.5	20.1	21.3	22.9	24.6	26.5	27.8	28.9	29.4	29.7	29.8	29.1	28.2	26.4	24.7	23.4	22.3	22.4	29.8																						
11-Jun	21.5	20.7	19.1	18.2	17.4	17.2	18.7	18.2	18.2	20.0	23.4	25.5	26.3	27.4	28.1	28.1	27.8	26.7	25.3	24.4	23.6	22.1	20.6	19.0	22.4	28.1																						
12-Jun	17.7	16.1	14.2	12.9	12.6	11.8	13.4	14.7	15.7	16.3	17.2	18.0	19.1	19.7	20.1	20.5	20.3	19.6	19.1	18.6	17.7	17.2	16.6	16.2	16.9	20.5																						
13-Jun	15.5	14.3	13.4	13.1	11.8	12.2	12.9	15.3	17.8	19.8	20.8	21.7	22.0	21.2	22.9	22.9	19.5	17.9	17.4	17.3	15.8	UO	UO	UO	17.4	22.9																						
14-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	11.6	11.5	11.5	11.4	11.4	11.5	11.6	UO	UO	UO	UO	UO	--	11.8																						
15-Jun	UO	UO	UO	UO	UO	UO	11.4	11.5	11.7	12.0	12.5	13.1	13.8	14.6	15.2	15.9	16.8	17.4	17.9	17.1	15.6	13.8	12.3	10.9	14.1	17.9																						
16-Jun	10.7	10.3	9.3	8.6	9.0	10.3	11.2	12.6	13.7	15.7	17.3	18.3	19.4	18.0	17.9	17.7	17.8	18.0	16.7	14.5	14.2	13.9	13.4	12.9	14.2	19.4																						
17-Jun	12.3	11.4	11.0	10.3	10.1	10.7	11.9	13.3	14.1	15.9	17.8	18.9	19.6	20.1	20.6	21.3	21.2	20.4	16.0	15.6	14.7	13.2	12.0	11.8	15.2	21.3																						
18-Jun	10.4	9.7	UO	UO	UO	UO	11.8	13.7	14.4	15.6	16.5	17.5	18.6	19.7	20.3	20.6	20.9	20.8	20.5	19.5	18.6	17.6	16.6	16.0	17.0	20.9																						
19-Jun	15.6	15.0	14.4	13.4	12.8	12.9	13.4	13.9	14.8	15.2	14.6	13.1	12.5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	15.6																						
20-Jun	UO	UO	UO	UO	UO	10.6	11.0	11.3	11.7	12.1	11.5	11.2	11.0	10.8	11.1	11.5	11.5	11.1	11.1	11.1	11.1	10.8	10.5	10.1	9.6	11.0	12.1																					
21-Jun	9.3	9.2	8.6	8.4	8.2	8.8	9.9	10.4	11.3	12.9	14.0	15.1	16.1	17.0	17.6	18.1	18.3	18.2	17.9	17.4	16.2	14.1	12.5	10.4	13.3	18.3																						
22-Jun	9.0	8.0	UO	UO	UO	UO	9.8	12.5	14.8	16.9	18.2	19.3	20.7	21.7	22.4	21.9	21.4	20.3	19.3	18.2	17.0	15.7	14.3	13.5	16.7	22.4																						
23-Jun	13.3	12.9	13.0	12.9	12.5	13.2	14.8	16.7	18.2	19.5	20.9	21.9	22.5	23.2	23.9	24.5	25.0	25.3	25.4	25.0	23.9	21.4	19.5	18.8	19.5	25.4																						
24-Jun	17.7	16.1	15.8	15.0	14.4	15.8	17.5	19.7	21.5	24.1	26.2	27.8	28.6	29.3	28.5	22.6	22.6	21.2	19.0	16.2	15.6	14.8	14.3	13.9	19.9	29.3																						
25-Jun	13.5	13.3	12.7	12.0	12.0	12.5	13.7	14.8	15.4	16.3	16.9	17.5	18.2	19.1	19.8	20.6	21.2	21.5	21.5	20.1	17.1	15.0	13.3	13.3	16.6	21.5																						
26-Jun	12.2	11.7	11.3	UO	UO	UO	14.2	15.7	17.0	17.3	17.6	17.7	M	M	23.3	20.8	15.0	18.1	18.4	19.1	18.8	17.5	16.6	15.8	16.7	23.3																						
27-Jun	14.3	13.5	13.1	13.8	13.9	14.5	15.5	16.8	18.1	18.9	20.3	21.3	22.4	23.2	24.1	24.8	25.3	25.7	25.7	25.5	23.8	21.1	18.3	16.8	19.6	25.7																						
28-Jun	16.5	16.4	15.4	14.7	14.8	15.7	17.5	19.0	20.8	23.1	24.5	25.9	26.6	27.2	26.7	27.7	27.9	27.6	26.7	25.5	23.5	21.7	20.2	18.8	21.9	27.9																						
29-Jun	18.6	18.2	18.0	17.3	16.7	16.7	18.4	20.3	21.4	22.9	24.7	26.7	28.4	30.4	27.8	22.4	21.1	21.5	22.8	22.3	21.9	21.3	20.6	19.9	21.7	30.4																						
30-Jun	18.9	17.9	16.9	16.1	16.0	16.6	17.9	19.3	21.2	23.0	25.1	27.2	27.9	28.5	29.2	29.1	29.3	29.0	28.4	27.3	25.5	23.6	21.8	20.4	23.2	29.3																						
																								14.9	14.1	13.7	13.0	12.5	12.9	13.9	15.4	16.8	18.2	19.4	20.1	21.0	21.9	22.3	22.2	22.0	21.9	21.3	20.9	19.8	18.4	16.9	15.8	Diurnal Average
																								21.5	20.7	19.1	18.2	17.4	17.2	18.7	20.3	21.5	24.1	26.2	27.8	28.6	30.4	29.2	29.4	29.7	29.8	29.1	28.2	26.4	24.7	23.4	22.3	Diurnal Maximum
M - Maintenance																								UO - Unstable Operation																								



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	17	2.67	2.67
10 - 20	381	59.81	62.48
> 20	239	37.52	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

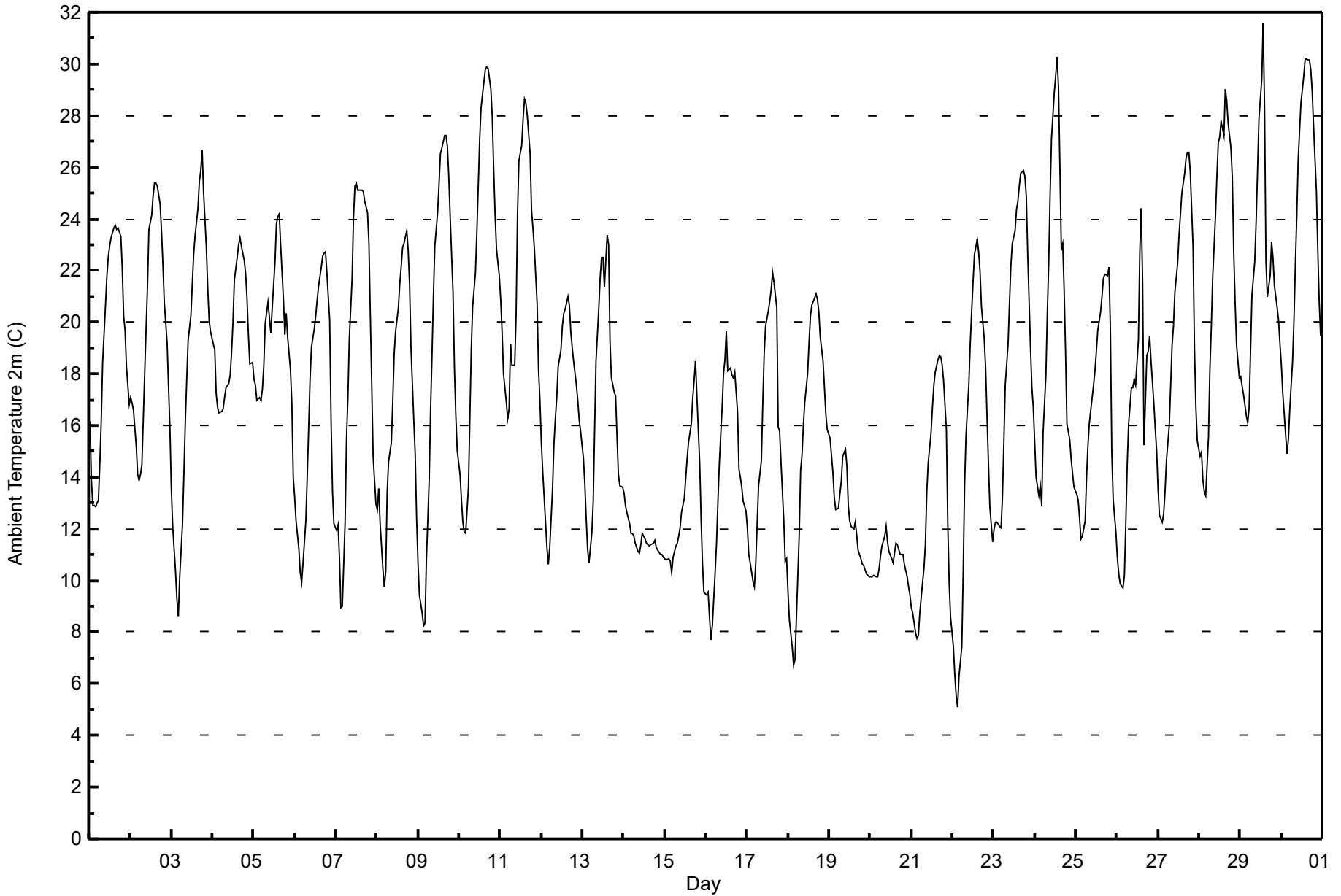
Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - June 2023

Maximum Value: 31.6 C on Jun 29 14:00		Maximum Daily Average: 23.4 C on Jun 30		Hours in Service: 720																						
Minimum Value: 5.1 C on Jun 22 04:00		Minimum Daily Average: 10.8 C on Jun 20		Hours of Data: 720																						
Maximum Diurnal Average: 22.6 C at hour 15		Minimum Diurnal Average: 11.5 C at hour 5		Hours of Missing Data: 0																						
Monthly Average: 17.51 C		Percentiles: P ₁ = 7.4 P ₁₀ = 10.7 Q ₁ = 12.8 Median = 17.4 Q ₃ = 21.6 P ₉₀ = 25.1 P ₉₉ = 29.8		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-Jun	16.1	13.9	12.9	12.9	12.9	13.1	14.6	16.2	18.4	20.6	21.8	22.5	23.0	23.3	23.7	23.8	23.6	23.7	23.3	22.1	20.3	19.7	18.3	16.8	19.0	23.8
2-Jun	17.1	16.9	16.6	15.2	14.1	13.9	14.1	14.5	18.0	19.7	21.4	23.6	24.1	24.9	25.4	25.4	25.3	24.6	23.6	22.3	20.7	19.2	17.5	15.9	19.7	25.4
3-Jun	13.6	12.1	10.3	9.3	8.6	10.1	12.2	14.2	16.2	17.8	19.3	20.3	21.5	22.7	23.4	24.4	25.4	25.9	26.7	25.0	22.9	21.3	20.0	19.6	18.5	26.7
4-Jun	19.2	19.0	17.3	16.7	16.5	16.5	16.6	17.1	17.4	17.7	18.0	18.8	20.0	21.6	22.5	23.0	23.3	22.9	22.4	21.9	21.0	19.5	18.4	18.4	19.4	23.3
5-Jun	17.8	17.6	17.0	17.1	17.0	17.4	18.4	19.9	20.8	20.2	19.6	20.5	22.3	23.8	24.1	24.2	23.0	20.9	19.5	20.3	19.4	18.2	16.9	14.0	19.6	24.2
6-Jun	13.2	12.3	11.2	10.3	9.9	10.7	12.3	14.1	15.9	17.8	19.0	19.8	20.2	20.9	21.4	22.1	22.6	22.7	22.7	21.9	20.1	16.1	13.4	12.2	16.8	22.7
7-Jun	11.9	12.2	10.8	9.0	9.0	12.3	15.5	17.1	19.3	21.7	24.1	25.3	25.4	25.1	25.1	25.1	25.1	24.7	24.3	23.1	20.2	17.6	14.8	13.0	18.8	25.4
8-Jun	12.7	13.6	12.2	10.4	9.8	10.4	13.4	14.6	15.3	16.9	18.8	19.6	20.5	21.5	22.1	22.9	23.1	23.5	22.8	21.5	19.0	16.2	14.9	12.4	17.0	23.5
9-Jun	10.7	9.5	8.7	8.2	8.3	10.8	13.9	16.7	18.7	21.0	23.0	24.3	25.3	26.5	26.8	27.2	27.2	26.8	25.6	24.0	21.1	18.2	16.4	15.0	18.9	27.2
10-Jun	14.1	13.1	12.3	11.9	11.8	13.6	16.3	18.9	20.6	21.9	23.5	25.3	27.1	28.3	29.3	29.8	29.9	29.8	29.0	27.9	25.9	24.2	22.8	21.8	22.0	29.9
11-Jun	20.9	19.7	18.0	16.9	16.3	16.6	19.1	18.3	18.3	20.3	24.2	26.2	26.8	27.9	28.6	28.5	28.0	26.5	24.4	23.6	22.9	20.7	18.2	17.0	22.0	28.6
12-Jun	15.4	14.2	12.3	11.3	10.6	11.3	13.6	15.3	16.3	17.1	18.3	18.9	19.8	20.3	20.5	21.0	20.7	19.6	19.0	18.5	17.6	17.0	16.2	15.8	16.7	21.0
13-Jun	14.7	13.8	12.4	11.2	10.7	11.8	13.0	15.8	18.5	20.6	21.8	22.5	22.5	21.4	23.3	23.0	19.2	17.8	17.3	17.1	15.6	14.1	13.7	13.6	16.9	23.3
14-Jun	13.4	12.9	12.6	12.2	11.9	11.8	11.7	11.4	11.1	11.1	11.4	11.8	11.6	11.4	11.4	11.3	11.4	11.6	11.3	11.2	11.0	11.0	11.0	10.9	11.6	13.4
15-Jun	10.9	10.8	10.8	10.7	10.3	10.9	11.4	11.4	11.7	12.0	12.7	13.2	13.9	14.7	15.4	16.0	17.1	17.7	18.5	17.2	14.6	12.3	10.7	9.5	13.1	18.5
16-Jun	9.4	9.5	8.6	7.7	8.3	10.3	11.4	13.1	14.5	16.7	18.0	18.5	19.7	18.1	18.2	17.9	17.9	18.1	16.5	14.3	14.0	13.6	13.1	12.7	14.2	19.7
17-Jun	12.1	11.0	10.7	10.0	9.8	10.7	12.2	13.7	14.7	16.9	18.7	19.9	20.4	20.8	21.3	21.9	21.5	20.6	15.9	15.8	14.6	12.3	10.7	10.8	15.3	21.9
18-Jun	9.6	8.4	7.4	6.7	6.9	8.6	11.8	14.2	14.9	16.0	16.9	18.0	19.2	20.3	20.7	20.9	21.1	20.9	20.4	19.4	18.5	17.5	16.4	15.8	15.4	21.1
19-Jun	15.5	14.8	14.2	13.3	12.7	12.8	13.3	13.8	14.8	15.1	14.4	12.9	12.3	12.1	12.0	12.2	11.7	11.2	10.8	10.7	10.6	10.4	10.3	10.1	12.6	15.5
20-Jun	10.2	10.1	10.2	10.1	10.1	10.5	11.0	11.3	11.7	12.1	11.5	11.1	10.9	10.7	11.1	11.5	11.4	11.0	11.0	11.0	10.6	10.2	9.8	9.4	10.8	12.1
21-Jun	8.9	8.7	8.0	7.7	7.8	8.7	9.9	10.5	11.4	13.4	14.5	15.7	16.7	17.5	18.1	18.5	18.7	18.6	18.4	17.7	15.8	12.1	9.9	8.6	13.2	18.7
22-Jun	7.4	6.3	5.5	5.1	6.3	7.4	10.4	13.7	15.6	17.6	19.1	20.4	21.6	22.6	23.2	22.7	22.0	20.6	19.3	18.2	16.3	14.5	12.9	11.5	15.0	23.2
23-Jun	12.0	12.3	12.2	12.1	12.0	13.2	15.4	17.6	19.1	20.7	22.2	23.0	23.6	24.3	24.7	25.3	25.8	25.9	25.7	24.9	22.7	19.1	17.4	16.7	19.5	25.9
24-Jun	15.4	14.0	13.3	13.6	12.9	15.7	17.9	20.4	22.3	25.0	27.1	28.9	29.5	30.2	29.1	22.8	23.1	21.2	18.9	16.0	15.5	14.7	14.2	13.6	19.8	30.2
25-Jun	13.3	13.1	12.4	11.6	11.7	12.3	14.0	15.3	16.1	17.1	17.6	18.1	18.9	19.7	20.4	21.0	21.7	21.9	21.8	22.1	19.7	15.0	13.1	11.8	16.7	22.1
26-Jun	10.9	10.3	9.9	9.7	10.2	12.2	14.5	16.0	17.4	17.5	17.8	17.6	19.3	22.7	24.4	21.5	15.2	18.7	18.8	19.5	18.5	16.9	15.9	15.0	16.3	24.4
27-Jun	13.5	12.6	12.3	12.6	13.5	14.7	16.0	17.5	19.1	19.8	21.2	22.3	23.4	24.2	25.0	25.8	26.4	26.6	26.6	25.8	22.9	19.0	16.7	15.4	19.7	26.6
28-Jun	14.8	15.0	13.9	13.5	13.3	15.6	18.2	19.8	21.8	24.1	25.6	26.9	27.2	27.8	27.2	29.0	28.6	27.7	26.7	25.6	22.7	20.8	19.2	17.8	21.8	29.0
29-Jun	17.9	17.5	17.2	16.4	16.1	16.7	18.9	21.1	22.4	23.9	25.9	27.9	29.4	31.6	28.2	22.4	21.0	21.8	23.1	22.5	21.4	20.6	20.1	19.1	21.8	31.6
30-Jun	18.3	17.3	15.7	14.9	15.4	16.7	18.5	20.1	22.3	24.2	26.3	28.6	29.0	29.5	30.2	30.1	30.2	29.8	28.9	27.5	25.1	22.8	20.8	19.5	23.4	30.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	42	5.83	5.83
10 - 20	435	60.42	66.25
> 20	243	33.75	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



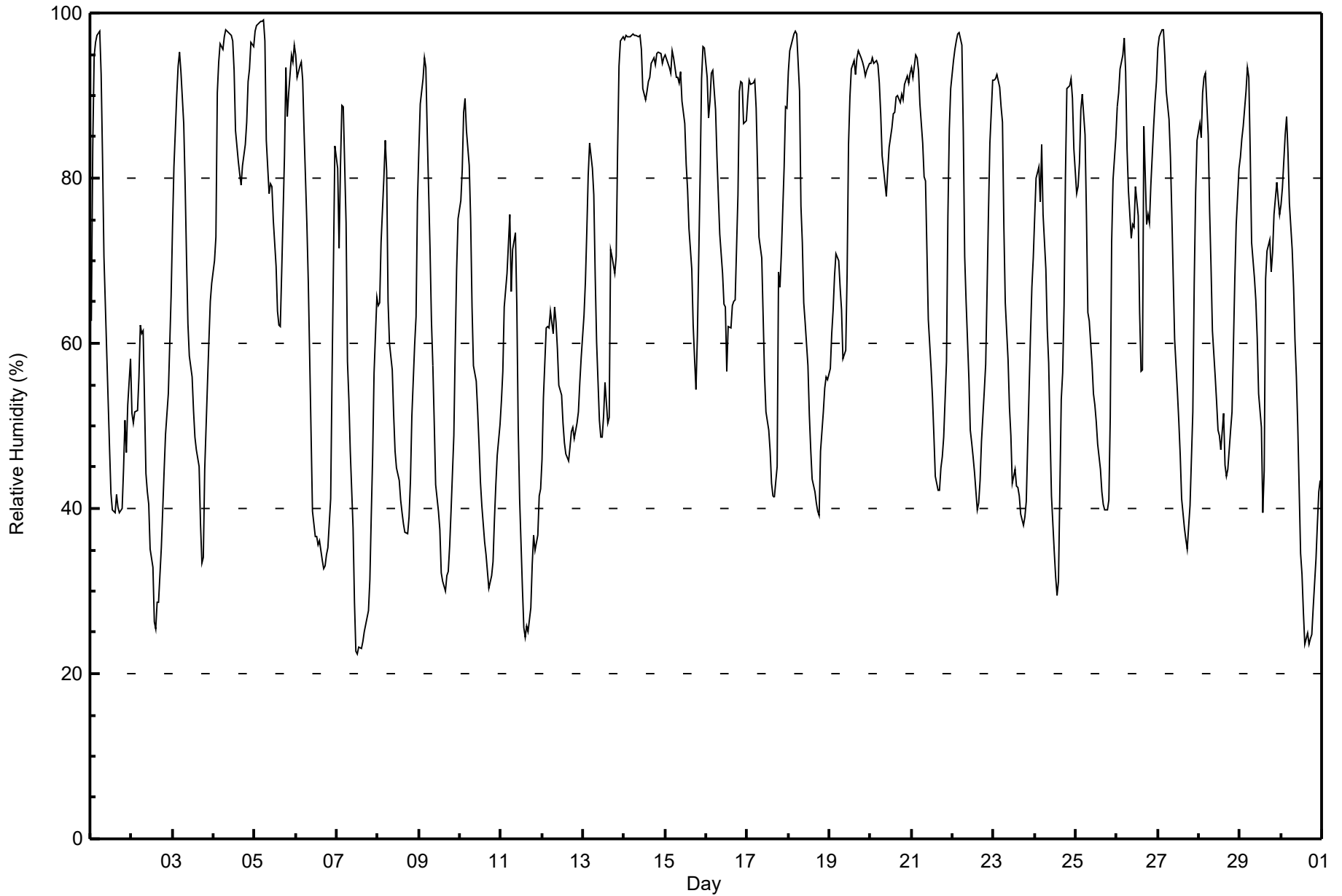
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - June 2023

Maximum Value: 99.2 % on Jun 5 06:00 Maximum Daily Average: 94.9 % on Jun 14																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 22.4 % on Jun 7 13:00 Minimum Daily Average: 45.8 % on Jun 2																						Hours of Missing Data: 0 Hours of Calibration: 0				
Maximum Diurnal Average: 88.7 % at hour 5 Minimum Diurnal Average: 48.6 % at hour 15																						Percent Operational Time: 100.0				
Monthly Average: 67.15 % Percentiles: P ₁ = 24.3 P ₁₀ = 37.9 Q ₁ = 48.8 Median = 68.2 Q ₃ = 88.5 P ₉₀ = 94.5 P ₉₉ = 97.9																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	62.8	83.7	94.8	96.5	97.4	97.7	92.6	82.4	70.4	58.9	53.0	47.4	41.9	39.8	39.5	41.8	40.1	39.5	40.1	44.8	50.7	46.8	52.5	58.1	61.4	97.7
2-Jun	51.6	50.3	51.8	51.9	56.0	62.3	61.2	61.6	44.3	42.1	40.6	35.1	32.9	26.4	25.4	28.6	28.7	35.3	39.9	44.6	48.9	53.8	59.9	65.8	45.8	65.8
3-Jun	74.1	81.4	89.9	93.5	95.2	92.9	86.7	79.3	70.4	62.4	58.5	55.9	51.8	48.6	47.1	45.1	38.1	33.3	34.1	44.8	55.3	60.3	65.1	67.4	63.8	95.2
4-Jun	70.0	72.9	90.3	94.1	96.3	95.7	97.1	97.9	97.8	97.4	97.3	96.7	93.1	85.7	82.1	80.4	79.1	81.5	84.1	86.8	91.7	93.1	96.4	95.9	89.7	97.9
5-Jun	97.7	98.5	98.7	98.9	99.1	99.2	96.7	84.6	78.2	79.4	79.0	74.9	69.3	63.9	62.2	62.0	68.6	82.7	93.5	87.4	90.4	95.0	94.1	96.1	85.4	99.2
6-Jun	95.0	92.2	93.5	94.1	91.9	85.6	74.5	67.5	58.3	49.0	39.7	36.7	36.7	35.7	36.1	33.7	32.8	33.1	34.4	35.2	41.2	56.4	69.9	83.9	58.6	95.0
7-Jun	81.1	71.5	81.5	88.8	88.7	74.6	57.9	53.1	47.0	37.6	28.7	22.7	22.4	23.1	23.0	23.8	25.1	25.9	27.5	31.3	39.2	46.5	56.4	65.6	47.6	88.8
8-Jun	64.5	65.0	72.2	80.0	84.6	80.8	65.0	60.1	56.8	51.4	47.0	45.0	43.4	40.9	39.6	38.2	37.2	37.0	38.9	43.4	51.1	59.9	63.2	77.1	55.9	84.6
9-Jun	83.4	89.0	92.0	94.5	93.4	85.5	71.4	62.7	57.3	50.3	42.9	39.7	37.4	32.2	31.2	30.1	31.8	32.4	35.4	39.6	48.8	59.7	69.1	75.0	57.7	94.5
10-Jun	77.4	81.0	87.9	89.7	85.7	81.5	75.1	64.3	57.3	55.4	51.8	47.8	43.2	40.3	35.8	34.4	32.4	30.4	31.8	33.6	38.6	42.9	46.4	50.1	54.8	89.7
11-Jun	53.0	56.7	64.4	68.5	72.1	75.5	66.3	71.3	73.5	64.6	49.7	41.2	30.4	25.7	24.5	25.8	25.1	27.9	33.2	36.8	34.9	36.8	41.6	42.4	47.6	75.5
12-Jun	46.0	53.5	61.9	62.1	61.9	63.9	61.1	64.4	62.5	59.3	54.9	53.7	50.4	48.0	46.6	45.7	47.5	49.4	49.8	48.5	50.4	51.6	55.3	58.4	54.5	64.4
13-Jun	63.4	67.4	73.6	80.4	84.2	81.3	77.9	68.2	60.1	50.7	48.7	48.6	51.2	55.3	50.4	51.0	71.3	70.5	68.4	70.5	83.1	93.6	96.5	97.2	69.3	97.2
14-Jun	96.8	97.3	97.2	97.2	97.3	97.4	97.2	97.2	97.2	97.3	95.6	90.9	89.4	90.6	91.6	92.3	93.8	94.6	93.7	95.1	95.2	95.0	94.0	94.6	94.9	97.4
15-Jun	95.0	94.5	93.4	92.6	95.4	94.5	92.1	92.2	91.6	92.8	89.3	86.7	81.8	78.6	73.8	68.9	62.2	58.1	54.4	60.9	80.6	92.0	95.9	95.8	83.9	95.9
16-Jun	92.3	87.4	89.3	92.7	93.0	88.4	82.6	77.8	73.2	68.5	64.8	64.4	56.7	62.0	61.9	64.6	65.1	65.2	78.0	90.4	91.7	91.5	86.7	87.0	78.1	93.0
17-Jun	89.6	91.8	91.3	91.6	91.8	88.4	81.2	72.9	70.3	63.3	56.1	51.7	49.5	46.9	43.1	41.5	41.3	45.0	68.7	66.8	70.8	81.4	88.6	88.4	69.7	91.8
18-Jun	92.9	95.4	96.8	97.5	97.9	97.5	90.6	76.5	72.2	65.0	62.6	57.4	51.4	47.2	43.6	42.1	40.7	39.6	39.2	46.9	51.8	54.6	55.9	55.6	65.4	97.9
19-Jun	57.0	61.1	64.0	68.2	70.9	70.1	66.8	64.1	58.2	59.1	68.5	84.1	89.9	93.2	94.3	92.6	94.6	95.4	94.6	94.2	93.3	92.4	93.1	94.0	79.7	95.4
20-Jun	94.0	94.6	93.9	94.2	93.7	91.5	87.8	82.7	79.5	77.8	80.8	83.8	86.1	87.8	88.0	89.8	89.9	89.2	90.1	89.6	91.3	92.4	91.5	92.7	88.9	94.6
21-Jun	93.4	92.3	95.0	94.6	93.0	88.9	84.2	80.3	79.6	71.3	62.9	57.0	53.5	48.8	43.9	42.2	42.2	45.0	46.3	48.7	57.7	75.4	86.0	90.9	69.7	95.0
22-Jun	94.3	95.6	96.7	97.4	97.7	96.2	85.6	70.5	65.1	55.8	49.5	48.0	46.3	44.3	39.8	40.7	43.4	48.1	54.2	57.5	66.4	75.9	84.3	91.8	68.5	97.7
23-Jun	91.9	92.1	92.6	91.1	88.7	86.8	74.1	64.8	58.0	52.2	48.9	43.1	44.7	42.8	42.5	41.4	39.4	37.9	39.0	40.9	47.7	60.8	66.9	70.3	60.8	92.6
24-Jun	75.2	80.0	81.4	77.1	84.1	75.6	68.9	61.8	57.6	49.3	41.6	34.8	31.8	29.5	31.2	53.2	56.4	64.5	80.3	90.9	91.2	92.0	89.7	83.6	65.9	92.0
25-Jun	78.1	78.9	81.9	88.4	90.2	85.2	75.4	63.7	62.6	57.4	54.0	52.5	50.5	47.8	44.7	42.0	40.5	39.8	39.9	41.0	51.0	72.2	79.9	84.8	62.6	90.2
26-Jun	88.7	90.4	93.3	95.0	97.0	92.8	83.6	78.4	72.7	74.4	74.1	78.9	75.4	63.7	56.7	56.9	86.3	74.5	75.6	74.5	79.2	86.3	89.4	91.8	80.4	97.0
27-Jun	95.8	97.1	98.0	97.9	94.7	90.5	87.1	82.5	75.7	68.0	60.5	54.1	50.5	46.4	41.3	37.6	36.3	35.2	37.7	40.3	51.8	67.3	78.1	84.6	67.0	98.0
28-Jun	86.7	84.9	90.3	92.2	92.7	85.3	76.2	69.4	61.5	55.9	52.8	49.5	48.9	47.1	51.5	45.3	43.9	44.8	49.4	51.7	59.6	67.8	74.5	81.2	65.1	92.7
29-Jun	82.6	84.8	86.2	90.5	93.4	92.1	83.1	72.2	67.9	65.2	60.7	54.0	49.8	39.5	44.5	67.8	71.2	72.6	68.7	71.1	75.6	79.4	77.5	75.7	71.9	93.4
30-Jun	76.9	78.9	85.2	87.5	83.1	77.0	71.3	66.8	60.4	55.9	49.9	34.6	32.0	27.5	23.6	25.0	23.5	24.3	24.7	27.9	33.9	38.1	42.1	43.3	49.7	87.5
																								Diurnal Average		
																								Diurnal Maximum		





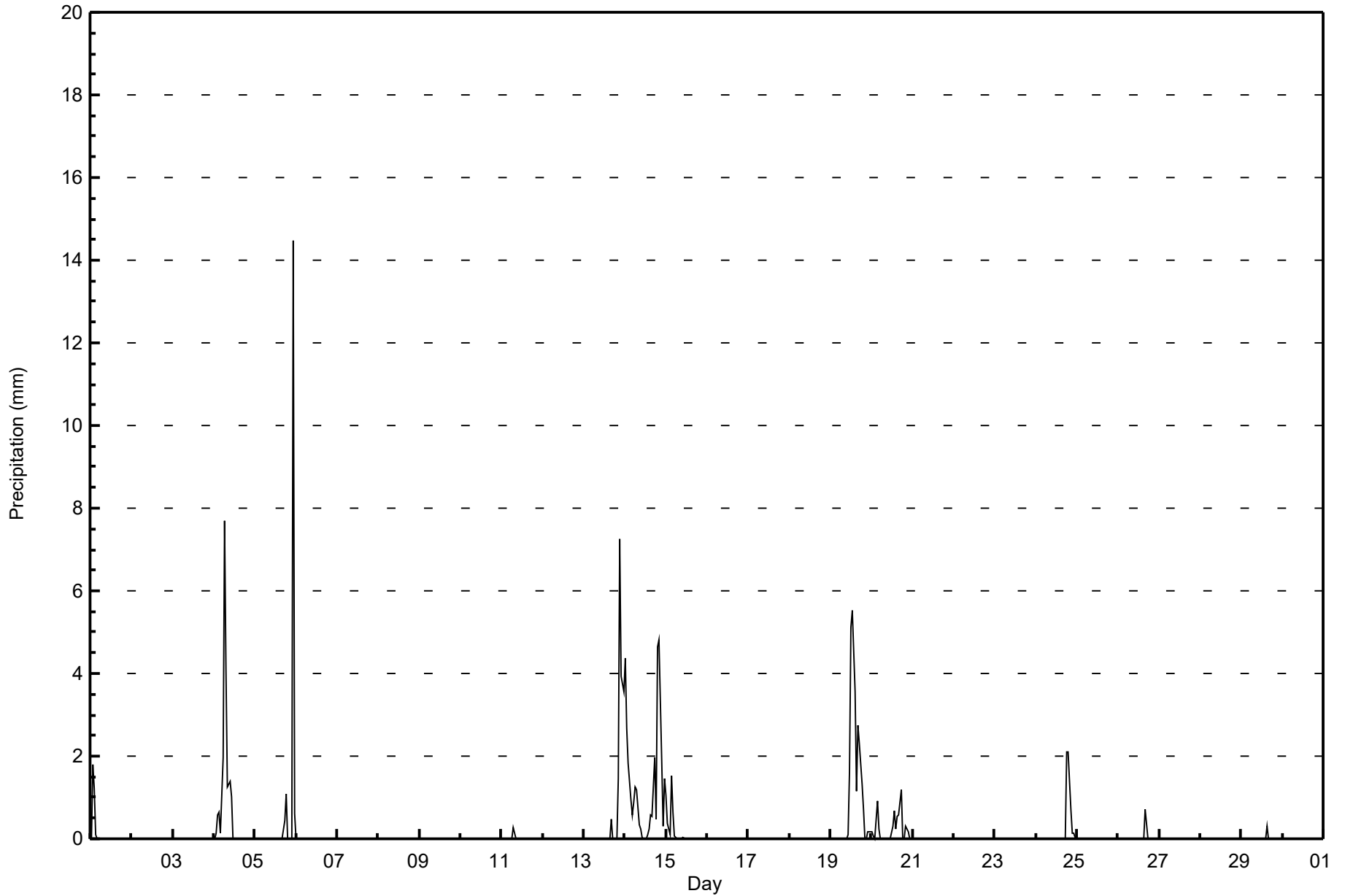
Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - June 2023

Maximum Value: 14.5 mm on Jun 5 23:00		Maximum Daily Total: 31.4 mm on Jun 14		Hours in Service: 720																							
Minimum Value: 0.0 mm on Jun 1 01:00		Minimum Daily Total: 0.0 mm on Jun 2		Hours of Data: 715																							
Maximum Diurnal Total: 19.0 mm at hour 23		Minimum Diurnal Total: 1.2 mm at hour 11		Hours of Missing Data: 5																							
Monthly Total: 126.88 mm		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 = 4.3		Hours of Calibration: 0																							
				Percent Operational Time: 99.3																							
Day	Hourly Period Ending At (MST)																								Daily Total	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.0	1.8	1.2	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	3.1	1.8	
2-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.1	0.6	0.6	0.1	2.0	7.7	4.1	1.3	1.4	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	19.0	7.7	
5-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1	0.0	0.0	0.0	14.5	0.6	16.6	14.5	
6-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	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	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
12-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.5	7.2	3.9	3.6	16.7	7.2	
14-Jun	4.4	2.7	1.8	1.0	0.6	0.9	1.3	1.2	0.3	0.2	0.1	0.0	0.0	0.1	0.2	0.6	0.5	2.0	0.5	4.7	4.8	1.9	0.3	1.5	31.4	4.8	
15-Jun	1.1	0.4	0.1	1.5	0.7	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	1.5	
16-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	
17-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.6	5.1	5.5	3.6	1.2	2.7	2.3	1.3	0.7	0.0	0.0	0.2	0.2	24.5	5.5	
20-Jun	0.2	0.1	0.0	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.2	0.6	0.6	1.2	0.0	0.0	0.3	0.2	0.0	0.0	5.4	1.2	
21-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	2.1	0.7	0.2	0.1	0.1	5.2	2.1
25-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	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	0.7	0.7	0.7
27-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	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	0.3	0.3	0.3
30-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		5.6	5.0	3.8	4.1	1.6	2.9	9.0	5.6	1.6	1.6	1.2	1.6	5.4	6.3	4.0	2.6	5.0	5.9	5.0	7.5	7.3	9.4	19.0	5.8	Diurnal Average	
		4.4	2.7	1.8	1.5	0.7	2.0	7.7	4.1	1.3	1.4	1.0	1.6	5.1	5.5	3.6	1.2	2.7	2.3	2.1	4.7	4.8	7.2	14.5	3.6	Diurnal Maximum	
DF - DAS Failure																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	658	92.03	92.03
0.4 - 0.5	5	0.70	92.73
0.6 - 0.7	12	1.68	94.41
0.8 - 1.4	14	1.96	96.36
1.5 - 10	23	3.22	99.58
> 10	1	0.14	99.72

Total Number of Valid Hours: 715

Total Number of Hours: 720



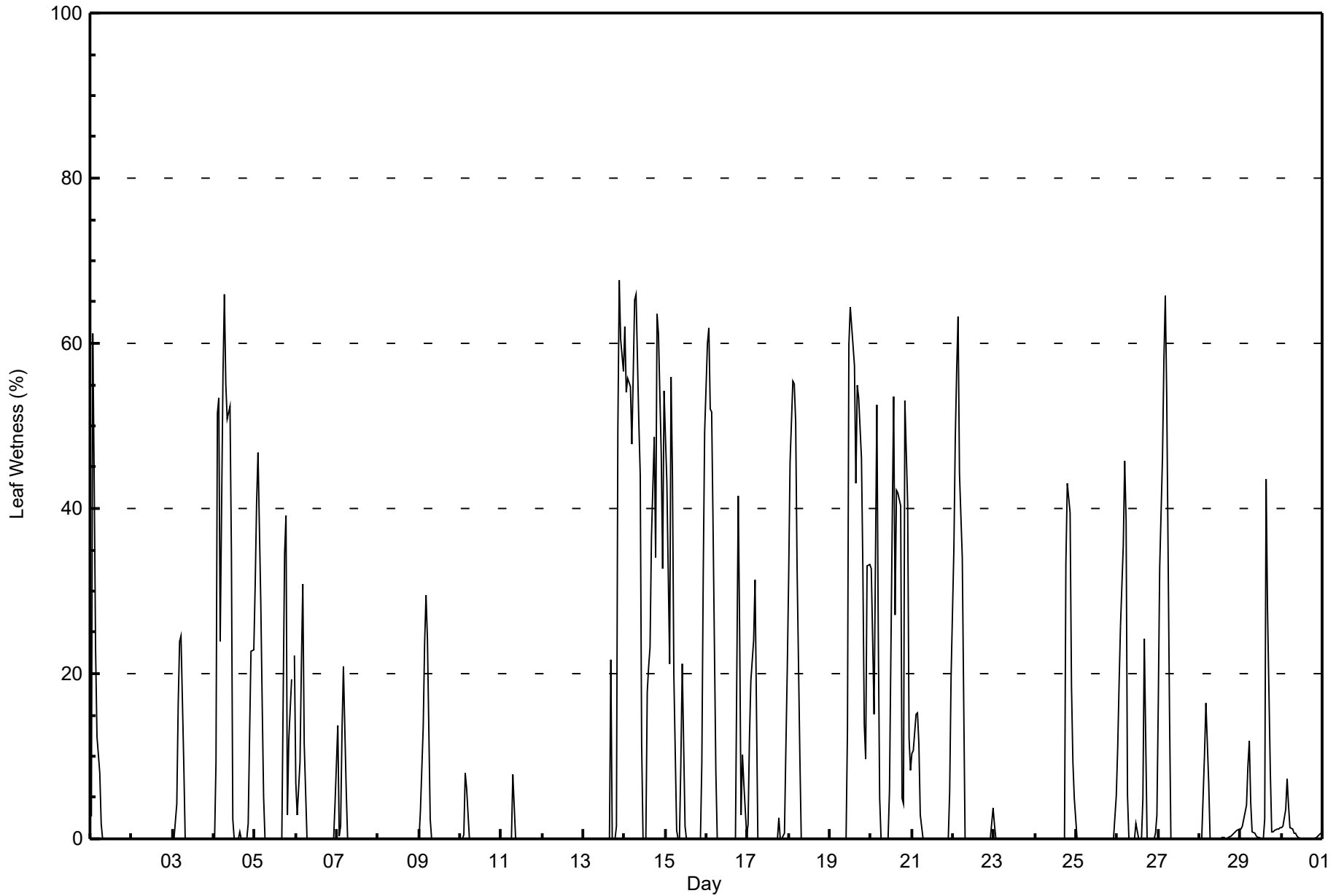
Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Fort McKay - Bertha Ganter - June 2023

Maximum Value: 67.6 % on Jun 13 22:00 Maximum Daily Average: 42.0 % on Jun 14																								Hours in Service: 720 Hours of Data: 717			
Minimum Value: 0.0 % on Jun 1 08:00 Minimum Daily Average: 0.0 % on Jun 2																								Hours of Missing Data: 3 Hours of Calibration: 0			
Maximum Diurnal Average: 22.5 % at hour 4 Minimum Diurnal Average: 2.5 % at hour 12																								Percent Operational Time: 99.6			
Monthly Average: 8.44 % Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 6.0 P ₉₀ = 38.9 P ₉₉ = 63.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	2.7	61.2	43.6	22.9	12.3	8.0	1.9	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	6.4	61.2	
2-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	4.3	16.3	23.9	24.6	9.1	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	3.3	24.6	
4-Jun	0.0	9.3	51.5	53.3	23.8	56.2	65.9	55.1	50.8	52.4	34.8	2.4	0.1	0.0	0.0	0.8	0.0	0.0	0.0	0.0	1.9	12.7	22.7	22.9	21.5	65.9	
5-Jun	30.8	40.7	46.8	28.5	16.3	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.5	39.1	2.8	12.0	19.4	OR	22.2	13.0	46.8	
6-Jun	6.8	2.9	9.3	21.1	30.9	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	4.2	3.6	30.9	
7-Jun	13.7	0.4	1.6	13.0	20.8	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	2.3	20.8	
8-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	3.4	13.6	23.8	29.4	24.2	2.4	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	4.0	29.4	
10-Jun	0.0	0.0	0.4	7.9	6.2	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	0.6	7.9	
11-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	7.8	
12-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.7	0.0	0.0	1.6	49.4	67.6	60.5	56.7	10.7	67.6	
14-Jun	62.1	54.1	55.7	54.7	47.8	56.2	65.2	65.9	50.4	44.1	11.5	0.0	0.0	17.7	20.8	23.3	36.4	48.6	34.0	63.6	61.1	46.7	32.7	54.3	42.0	65.9	
15-Jun	48.6	43.2	21.2	55.9	44.0	19.8	1.1	0.0	0.0	9.2	21.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	32.3	49.3	14.9	55.9	
16-Jun	59.9	61.9	52.0	51.7	37.9	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.6	24.9	2.9	10.1	6.6	0.4	14.9	61.9	
17-Jun	1.7	12.2	19.2	24.1	31.3	15.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.7	10.8	20.4	5.8	31.3	
18-Jun	31.6	45.6	55.4	55.0	50.5	33.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	55.4	
19-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	59.9	64.4	62.0	57.4	43.0	55.0	53.3	46.1	32.7	13.9	9.6	33.0	33.1	24.0	64.4	
20-Jun	32.7	24.0	15.1	52.5	25.2	5.0	0.0	0.0	0.0	0.0	0.0	5.7	38.7	53.6	27.2	42.1	41.9	40.3	5.0	4.3	53.0	40.5	12.1	8.4	22.0	53.6	
21-Jun	10.4	10.6	15.0	15.3	11.6	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	19.7	3.8	19.7	
22-Jun	35.0	48.5	56.8	63.2	44.2	34.0	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	12.6	63.2	
23-Jun	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.7	
24-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	43.1	39.5	18.4	9.3	4.8	6.2	43.1
25-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.2	5.2	
26-Jun	11.1	18.7	25.7	35.5	45.7	38.5	5.2	0.0	0.0	0.0	0.0	1.9	0.0	0.0	4.9	24.2	0.1	0.0	0.0	0.0	0.0	0.0	0.8	2.9	9.0	45.7	
27-Jun	16.6	32.8	46.3	57.9	65.7	53.7	15.4	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	12.0	65.7	
28-Jun	0.0	0.1	5.1	10.2	16.5	6.8	0.0	0.0	0.0	0.0	0.0	M	M	0.1	0.2	0.0	0.0	0.1	0.3	0.4	0.7	0.9	1.1	1.2	2.0	16.5	
29-Jun	1.3	1.5	2.3	4.0	8.9	11.8	4.5	0.8	0.7	0.4	0.2	0.1	0.0	0.0	2.3	43.5	27.9	8.2	0.8	0.9	1.1	1.2	1.3	1.3	5.2	43.5	
30-Jun	1.3	1.6	3.6	7.2	4.0	1.4	1.1	0.7	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.6	1.0	7.2	7.2	
12.3 15.8 18.1 22.5 19.9 14.1 6.6 4.3 3.4 3.5 2.7 2.5 3.6 4.4 3.6 5.3 6.9 6.2 6.8 5.8 7.9 7.9 7.9 10.4																								Diurnal Average			
62.1 61.9 56.8 63.2 65.7 56.2 65.9 65.9 50.8 52.4 34.8 59.9 64.4 62.0 57.4 43.5 55.0 53.3 46.1 63.6 61.1 67.6 60.5 56.7																								Diurnal Maximum			
M - Maintenance OR - Out of Range																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

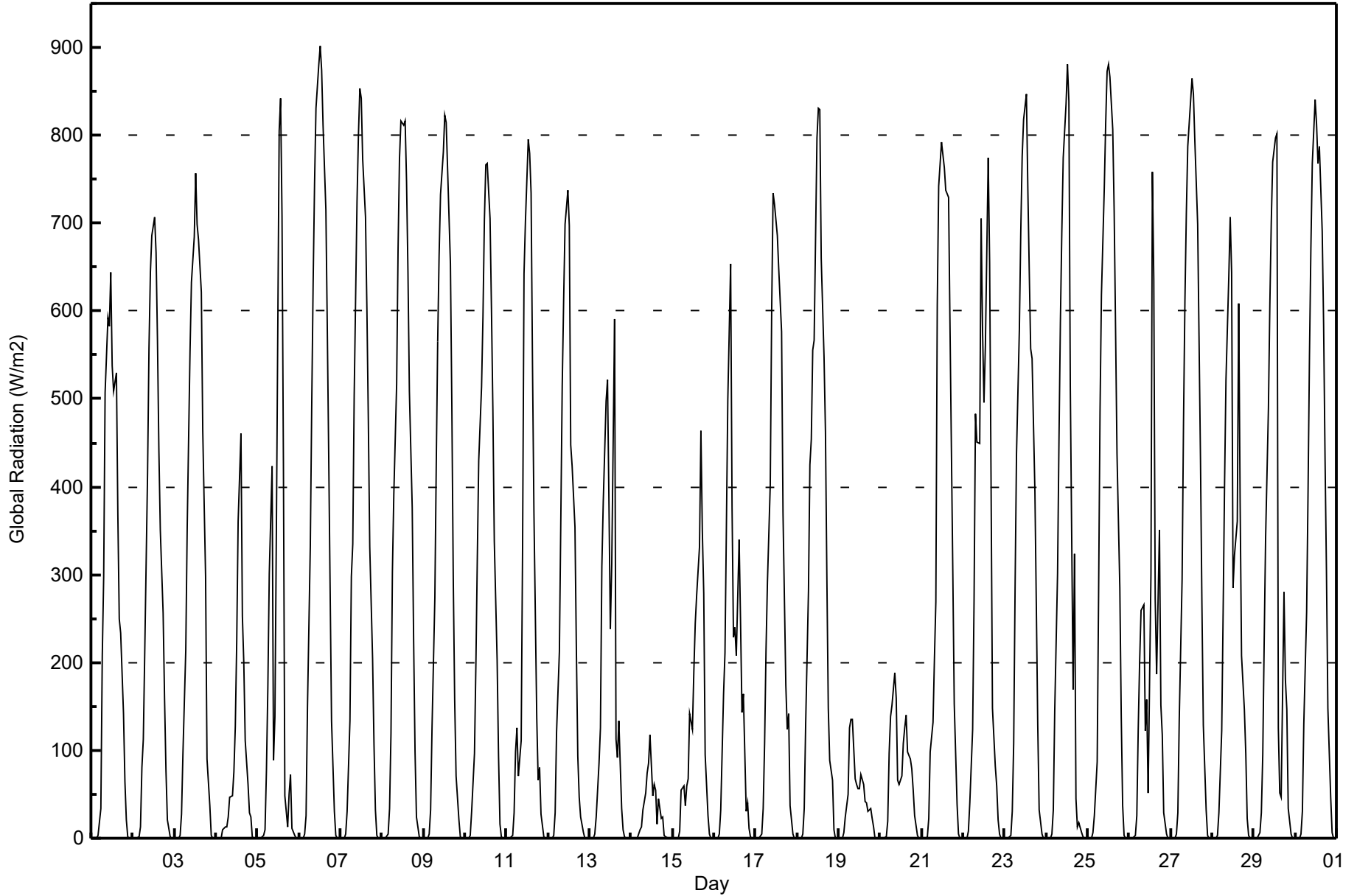
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	467	65.13	65.13
0.4 - 0.5	6	0.84	65.97
0.6 - 0.7	7	0.98	66.95
0.8 - 1.4	17	2.37	69.32
1.5 - 10	58	8.09	77.41
> 10	160	22.32	99.72

Total Number of Valid Hours: 717

Total Number of Hours: 720



Maximum Value: 901.3 W/m2 on Jun 6 13:00		Maximum Daily Average: 369.3 W/m2 on Jun 6																				Hours in Service:	720				
Minimum Value: 0.0 W/m2 on Jun 1 01:00		Minimum Daily Average: 27.7 W/m2 on Jun 14																				Hours of Data:	720				
Maximum Diurnal Average: 603.2 W/m2 at hour 14		Minimum Diurnal Average: 0.0 W/m2 at hour 24																				Hours of Missing Data:	0				
Monthly Average: 239.34 W/m2		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 3.1 Median = 102.1 Q ₃ = 448.8 P ₉₀ = 711.8 P ₉₉ = 863.3																				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-Jun	0.0	0.0	0.0	0.0	2.6	34.2	207.2	298.3	507.7	592.8	582.5	644.8	538.3	509.0	530.1	368.1	250.0	233.2	141.1	64.6	20.7	0.8	0.0	0.0	230.2	644.8	
2-Jun	0.0	0.0	0.0	1.2	13.2	81.2	111.9	211.3	415.1	557.9	644.5	685.4	706.3	666.8	567.4	441.4	350.7	256.0	160.1	77.9	20.3	1.4	0.0	0.0	248.8	706.3	
3-Jun	0.0	0.0	0.0	2.6	27.4	96.0	213.7	352.4	453.5	554.5	632.2	684.1	757.3	698.9	680.5	622.1	464.1	380.2	298.4	89.4	37.6	3.1	0.0	0.0	293.7	757.3	
4-Jun	0.0	0.0	0.0	0.5	9.9	12.3	13.0	24.3	47.4	48.9	76.2	127.6	224.5	361.4	460.1	252.6	199.4	111.0	60.9	29.6	23.7	1.9	0.0	0.0	86.9	460.1	
5-Jun	0.0	0.0	0.0	2.7	9.6	78.1	172.1	301.0	423.0	88.9	138.6	345.6	805.1	841.5	707.9	424.8	48.6	12.3	50.2	71.8	11.5	2.8	0.0	0.0	189.0	841.5	
6-Jun	0.0	0.0	0.0	4.3	25.4	149.6	333.2	492.6	633.1	744.9	831.5	881.3	901.3	874.0	811.9	714.7	579.1	434.6	283.4	134.4	30.7	3.3	0.0	0.0	369.3	901.3	
7-Jun	0.1	0.1	0.0	4.5	30.0	133.8	297.3	334.7	504.2	724.2	801.0	854.2	842.8	773.4	706.3	600.2	474.7	332.2	203.8	105.5	32.2	2.8	0.0	0.0	323.2	854.2	
8-Jun	0.0	0.0	0.0	4.3	34.1	118.5	302.2	391.1	516.9	670.1	773.2	816.7	811.8	816.8	747.6	644.7	509.2	377.1	225.3	98.8	24.0	2.0	0.0	0.0	328.5	816.8	
9-Jun	0.0	0.0	0.0	4.1	33.0	125.0	274.5	427.3	564.8	663.1	732.9	780.9	823.2	814.2	761.5	654.3	492.3	295.9	157.4	70.7	20.8	1.1	0.0	0.0	320.7	823.2	
10-Jun	0.0	0.0	0.0	2.4	30.7	97.3	198.8	318.3	430.1	513.9	594.4	704.3	766.7	768.1	705.2	602.1	488.3	338.3	202.9	93.5	16.1	2.0	0.0	0.0	286.4	768.1	
11-Jun	0.0	0.0	0.1	3.5	29.3	97.8	124.9	70.5	111.5	334.7	641.7	702.6	794.9	779.3	734.0	537.3	372.0	136.1	66.2	80.5	27.2	2.2	0.0	0.0	235.3	794.9	
12-Jun	0.0	0.0	0.0	2.5	28.3	120.5	211.8	363.0	515.9	611.7	698.7	738.0	696.5	448.4	423.1	354.1	214.2	93.7	46.5	23.7	6.7	0.5	0.0	0.0	233.2	738.0	
13-Jun	0.0	0.0	0.0	4.7	23.6	84.5	125.3	309.7	382.6	497.5	522.2	384.9	239.1	312.7	591.1	112.3	92.2	133.2	34.0	9.2	1.1	0.0	0.0	0.0	160.8	591.1	
14-Jun	0.0	0.0	0.0	0.6	4.3	9.9	12.7	32.1	51.7	74.7	84.6	117.0	48.7	60.5	55.4	16.0	45.1	23.2	23.6	3.4	1.7	0.3	0.0	0.0	27.7	117.0	
15-Jun	0.0	0.0	0.0	0.2	8.8	55.1	60.2	36.6	59.9	67.8	140.9	124.5	190.5	244.2	276.2	331.8	463.3	349.8	279.0	94.5	25.4	4.1	0.0	0.0	117.2	463.3	
16-Jun	0.0	0.0	0.1	5.3	32.4	164.2	210.6	354.5	498.9	653.9	376.3	227.9	240.1	207.2	339.1	245.8	143.6	164.5	30.3	39.6	11.1	1.1	0.0	0.0	164.4	653.9	
17-Jun	0.0	0.0	0.0	4.8	33.9	107.6	214.6	292.2	402.5	601.3	733.7	721.0	686.2	647.5	612.4	576.4	371.0	173.3	123.8	142.5	37.1	4.2	0.0	0.0	270.3	733.7	
18-Jun	0.0	0.0	0.0	5.1	34.4	129.0	281.8	424.6	453.7	555.4	567.5	797.8	830.6	828.6	659.9	547.9	461.9	296.2	147.4	89.2	66.3	8.9	0.0	0.0	299.4	830.6	
19-Jun	0.0	0.0	0.0	6.7	23.4	50.4	125.5	135.7	134.6	68.2	61.0	56.8	55.6	71.8	61.9	42.1	39.8	30.9	34.0	22.9	13.1	0.4	0.0	0.0	43.1	135.7	
20-Jun	0.0	0.0	0.0	1.0	18.9	97.0	138.0	151.6	188.8	159.3	65.4	60.4	70.1	107.1	125.8	139.6	97.7	89.8	79.2	54.7	25.8	3.1	0.0	0.0	69.7	188.8	
21-Jun	0.0	0.0	0.0	2.0	23.2	98.0	132.6	204.8	268.4	606.9	742.1	791.9	777.2	763.2	737.6	729.9	582.1	442.0	300.4	152.8	38.5	4.7	0.0	0.0	308.3	791.9	
22-Jun	0.0	0.0	0.0	7.8	40.1	123.9	271.1	483.5	450.7	450.0	704.9	578.0	495.4	560.2	774.8	654.9	409.3	148.1	81.9	59.4	20.7	4.4	0.0	0.0	263.3	774.8	
23-Jun	0.0	0.0	0.0	3.5	31.2	107.2	286.5	438.3	577.3	689.1	776.7	818.7	846.9	738.4	645.9	557.4	545.3	393.9	264.5	129.1	32.5	4.8	0.0	0.0	328.6	846.9	
24-Jun	0.0	0.0	0.0	5.5	32.0	144.7	301.6	453.1	588.0	689.8	774.0	836.3	881.4	839.3	514.7	168.4	323.8	45.3	13.4	17.6	6.7	1.0	0.0	0.0	276.5	881.4	
25-Jun	0.0	0.0	0.0	5.9	25.1	86.4	277.6	485.2	618.2	738.8	812.4	872.6	881.2	866.8	807.4	712.5	578.2	438.5	284.8	139.2	37.4	3.4	0.0	0.0	361.3	881.2	
26-Jun	0.0	0.0	0.0	3.6	26.4	124.5	201.7	259.3	265.1	122.5	158.1	50.8	301.6	758.9	636.1	271.5	186.6	350.3	150.8	117.9	28.4	4.3	0.0	0.0	167.4	758.9	
27-Jun	0.0	0.0	0.0	4.6	29.1	136.8	294.0	473.4	611.9	711.7	786.6	838.9	865.4	847.4	793.8	698.8	565.9	430.0	267.1	128.0	32.9	3.4	0.0	0.0	355.0	865.4	
28-Jun	0.0	0.0	0.0	4.0	29.2	121.7	257.2	402.4	521.5	639.4	706.5	644.4	284.7	321.7	360.7	609.4	384.0	207.2	145.8	97.1	22.9	4.0	0.0	0.0	240.2	706.5	
29-Jun	0.0	0.0	0.1	6.2	29.3	95.3	223.6	341.7	489.4	607.1	700.9	769.7	796.9	802.2	125.4	51.8	46.0	280.5	180.8	147.1	33.0	4.4	0.0	0.0	238.8	802.2	
30-Jun	0.0	0.0	0.0	4.2	30.6	130.8	257.8	394.9	549.7	671.9	767.4	839.7	813.5	767.4	787.5	690.2	584.1	433.7	303.7	147.7	46.9	6.5	0.0	0.0	342.8	839.7	
		0.0	0.0	0.0	3.6	25.0	100.4	204.4	308.6	407.9	490.4	554.3	583.2	599.1	603.2	558.0	445.8	345.4	247.7	154.7	84.4	25.1	2.9	0.0	0.0	Diurnal Average	
		0.1	0.1	0.1	7.8	40.1	164.2	333.2	492.6	633.1	744.9	831.5	881.3	901.3	874.0	811.9	729.9	584.1	442.0	303.7	152.8	66.3	8.9	0.0	0.0	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	236	32.78	32.78
21 - 100	124	17.22	50.00
101 - 300	122	16.94	66.94
301 - 600	116	16.11	83.06
601 - 900	121	16.81	99.86
> 900	1	0.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

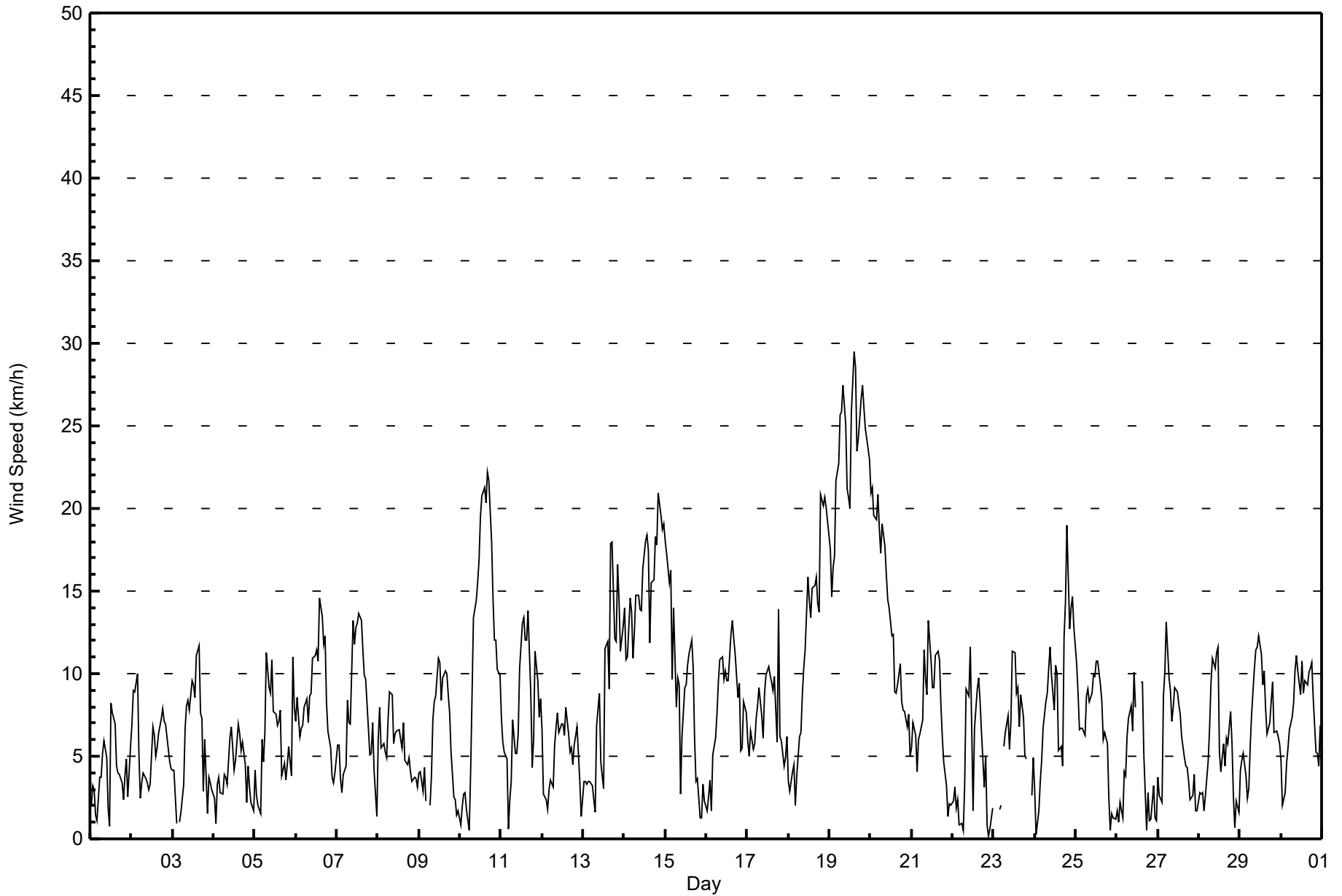


Maximum Speed: 30 km/h on Jun 19 15:00	Maximum Daily Speed Average: 23.2 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 22 22:00	Minimum Daily Speed Average: 0.7 km/h on Jun 24	Hours of Data: 710
Maximum Diurnal Speed Average: 3.6 km/h at hour 21	Minimum Diurnal Speed Average: 0.6 km/h at hour 12	Hours of Missing Data: 10
Monthly Average Velocity: 2.2 km/h 346.7 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 10 P ₉₀ = 15 P ₉₉ = 26	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-Jun	WSW2	SSW3	NNW3	S1	WSW1	SSE4	SSW4	S5	SSE6	SE5	SE2	SSE1	NW8	NNW8	N7	NNE4	NNE4	NE4	NE3	NNE2	N4	N5	NNW3	NW6	N1.0	NW8
2-Jun	N7	NNW9	NNW9	NNW10	NNW5	W2	NW3	NW4	N4	NNE3	N3	SE3	E7	ENE6	NE5	ENE5	NE6	NE7	NE8	NE7	NNE7	NE5	NNE5	N4	NNE4.3	NNW10
3-Jun	N4	NNW4	NNW1	UO	NW1	SSE2	N3	N7	N8	NNE8	NNE8	NNE10	NNE9	NNE9	N11	N12	NNE8	S7	SSW3	SE6	NE2	N4	N3	NNW3	NNE4.2	N12
4-Jun	NNW2	N1	NNW3	NNW4	N3	NNW3	N4	NE4	ENE3	N6	N7	N6	N4	NNW5	N7	N6	NNE5	N6	NNW5	NNW2	SSE4	S3	NNW2	N2	N3.2	N7
5-Jun	WNW4	WNW3	NW2	W1	NW6	NNW5	N6	N11	NNE9	N9	N11	NNE8	NE8	NE7	NNE7	NNE8	N4	NNW5	N4	N4	N6	W4	W11	WNW8	N4.8	N11
6-Jun	WSW7	W9	SSW6	SSW7	SSW7	SW8	SW8	SW7	SW9	SW9	WSW11	SW11	SW11	SW11	SSW15	SSW13	SSW12	SSW12	SSW8	SW7	S6	S4	SSE3	S4	SW8.0	SSW15
7-Jun	S6	S6	S4	SW3	SW4	S4	S8	S7	SSW7	S13	SSW12	WSW13	W13	W14	W13	W11	W10	WNW10	W7	WNW5	WNW5	WNW7	WNW4	NW1	WSW5.7	W14
8-Jun	NNW6	N8	NNW6	WNW6	WNW5	WNW5	N7	N9	N9	NE6	ESE6	ENE7	E7	ENE6	E6	E7	E5	NE4	NE5	NNE4	N3	NNW4	NNW4	W3	NNE3.3	N9
9-Jun	WNW4	WNW4	WNW3	WNW4	W2	UO	SE2	SE4	SSE7	SE8	SE9	SE11	SSE11	SSE8	SSE10	SSE10	SSE10	S9	SSW8	SSW5	S3	S2	SE1	S2	SSE4.5	SE11
10-Jun	W1	S2	S3	SSE3	SSE2	NE1	SSE4	SSE9	SSE13	SSE14	SSE15	SSE17	SSE19	SSE21	SSE21	SSE20	SSE22	S22	S18	S15	S12	S12	S10	S10	SSE11.8	SSE22
11-Jun	S7	SSW6	S5	SSW5	W1	SSW2	W3	WNW7	WNW5	WNW5	W6	WNW10	NW13	NW13	NW12	WNW12	NW14	NW9	WNW4	WNW6	NW11	NW10	WNW7	NW8	WNW6.1	NW14
12-Jun	NW7	WSW3	W2	NW2	NNW3	NW4	WNW3	NNE6	NNE7	NNE8	ENE6	NE7	NE7	NNE6	NNE8	NNE6	NE5	NNE6	NNE5	NNE6	N7	NNE5	SE4	ESE1	NNE3.9	NNE8
13-Jun	NNW3	NNW4	NW3	NW3	WNW3	WNW3	WNW2	NE2	SSE7	S9	SSE5	S4	WNW3	NNW12	N12	N9	NNW18	N18	NNE12	N12	N17	N15	NNE11	NNE13	N5.8	N18
14-Jun	NNE14	N11	N11	N15	N14	N11	N13	N15	N15	N14	N14	N16	N18	N18	N17	N12	N15	N16	N18	N18	N21	N20	N19	N19	N15.4	N21
15-Jun	NNW18	NNW17	NNW16	NNW16	NNW14	N8	NNW10	NW9	WSW3	WNW6	WNW9	NNW9	NNW11	NW11	NNW12	N10	N6	NE4	ESE4	SSE1	SW1	WSW3	NW2	NNW7.7	NNW18	
16-Jun	W2	WSW3	S4	SSW2	S5	SSE6	S8	SSE9	SSE11	SSE11	SSE10	SSE10	SSW10	S12	S13	S12	S11	SSW9	S9	SSW5	SW6	WSW8	WSW8	S7.2	S13	
17-Jun	SW6	SW5	SW7	SSW5	SW6	SSW7	SW8	WSW9	WSW7	SW6	SW9	SW10	SW10	WSW10	WSW9	W9	WNW10	NW6	N14	NE6	N6	NW4	NNW5	NNW6	WSW4.7	N14
18-Jun	NW3	SW3	NW4	NW4	W2	NNE4	NNE6	NNE6	NNE9	NNE10	NNE11	N16	NNE14	NNE13	NNE15	NNE15	NNE16	NNE14	NNE14	N21	N20	N21	N20	N19	N11.1	N21
19-Jun	NNE18	NNE15	N16	N17	N22	N23	N26	N26	NNE27	NNE25	NNE21	N21	N20	N26	N30	N29	N23	N24	N27	N27	N26	N25	N24	N23	N23.2	N30
20-Jun	N21	N21	N20	N19	N21	N19	N17	N19	N18	N16	N14	NNW14	NNW12	NNW12	NNW9	NNW9	NNW9	NNW11	NW8	NW8	NW8	NW7	NNW8	NW5	N13.2	N21
21-Jun	NW5	NW7	NW6	NW4	NNW6	N6	N7	N11	N10	NNE9	N13	NNE11	NNE9	NNE9	NNE11	NNE11	NNE11	NE8	ENE6	E5	E3	NNW1	WNW2	W2	N6.3	N13
22-Jun	WNW2	NW3	W2	SW2	S1	SSE1	SSE0	SSW3	SSE9	SSE9	SSE12	SE7	E2	SW7	WSW9	WSW10	W8	WSW6	W3	W5	WSW1	SSE0	SW1	SW2	SW2.8	SSE12
23-Jun	UO	UO	UO	NW2	NW2	UO	SSE6	SSE6	SE7	SE5	SSE7	SSE11	SSE11	SSE9	SSE9	SE7	SSE9	SSE7	SSE5	SSE5	UO	UO	S3	S5	SSE6.0	SSE11
24-Jun	S3	SSE0	W2	WSW4	S5	S7	SSE8	S9	S10	S12	SSW10	SW8	SSW11	SSW10	WNW5	ENE6	ENE4	N12	NNW14	N19	NNE13	N14	NNE15	NNE13	N0.7	N19
25-Jun	N11	NNE9	N7	N7	N7	NNE6	NNE9	NE9	NE8	ENE9	NNE10	NNE10	N11	N11	N9	N8	NNE6	N6	NNE6	NNE2	ESE1	WNW2	SW1	WSW1	NNE6.2	N11
26-Jun	SSW2	SW1	SSW2	SSE1	S4	SSE4	SSE6	SSE7	SSE8	SSE7	SSE10	SSE8	M	M	SSW10	NNW10	N5	NW1	NNE3	ESE1	S1	SSE3	S1	S1	S2.6	SSE10
27-Jun	NNW4	WNW3	NNW2	NNW9	NNW10	NNW13	N10	N9	NNE7	NNE8	N9	N9	NE8	NNE8	NE6	NE5	NE4	NE4	ENE3	N2	NW3	WNW4	SW2	SSW2	N5.0	NNW13
28-Jun	SSW3	S3	SSW3	S2	S3	S5	SSE7	SSE9	SSE11	SSE10	SSE11	SSE12	S5	NNW4	N6	SE4	SSE6	S6	S8	WSW6	SSE3	NE1	WSW2	SW2	S4.1	SSE12
29-Jun	S4	SSW5	S5	S4	SSE2	SSE3	SSE6	S8	SSE10	SSE11	SSE12	SSE12	SSE11	SSW9	SW10	SW8	WSW6	S7	SSE8	SSE9	SSE6	S7	SSW6	SW6	S6.5	SSE12
30-Jun	WSW5	SW2	S3	S5	S6	S7	S7	S8	S10	S11	S10	SW9	SW11	WSW9	W10	SW9	WSW10	WSW10	WSW11	WSW9	WSW5	SW5	SW4	WNW7	SW6.4	S11

NNW3.4	NNW3.0	NNW2.6	NNW2.9	NNW2.5	NNW2.1	N1.5	N1.8	ENE1.3	E1.8	E1.1	NNE0.6	N1.4	NNW2.8	NNW3.1	N2.7	NNW2.9	N2.3	N2.5	N2.7	N3.6	NNW3.5	NNW3.1	NNW3.3	Diurnal Average
N21	N21	N20	N19	N22	N23	N26	N26	NNE27	NNE25	NNE21	N21	N20	N26	N30	N29	N23	N24	N27	N27	N26	N25	N24	N23	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	258	36.34	36.34
6 - 11	317	44.65	80.99
12 - 19	100	14.08	95.07
20 - 28	33	4.65	99.72
29 - 38	2	0.28	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	19	12	16	4	4	4	9	22	35	17	14	13	15	27	21	26	258
6 - 11	45	45	14	7	4	1	7	47	28	17	26	18	9	12	17	20	317
12 - 19	39	16	0	0	0	0	0	9	9	5	0	1	3	1	4	13	100
20 - 28	25	3	0	0	0	0	0	4	1	0	0	0	0	0	0	0	33
29 - 38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	130	76	30	11	8	5	16	82	73	39	40	32	27	40	42	59	710

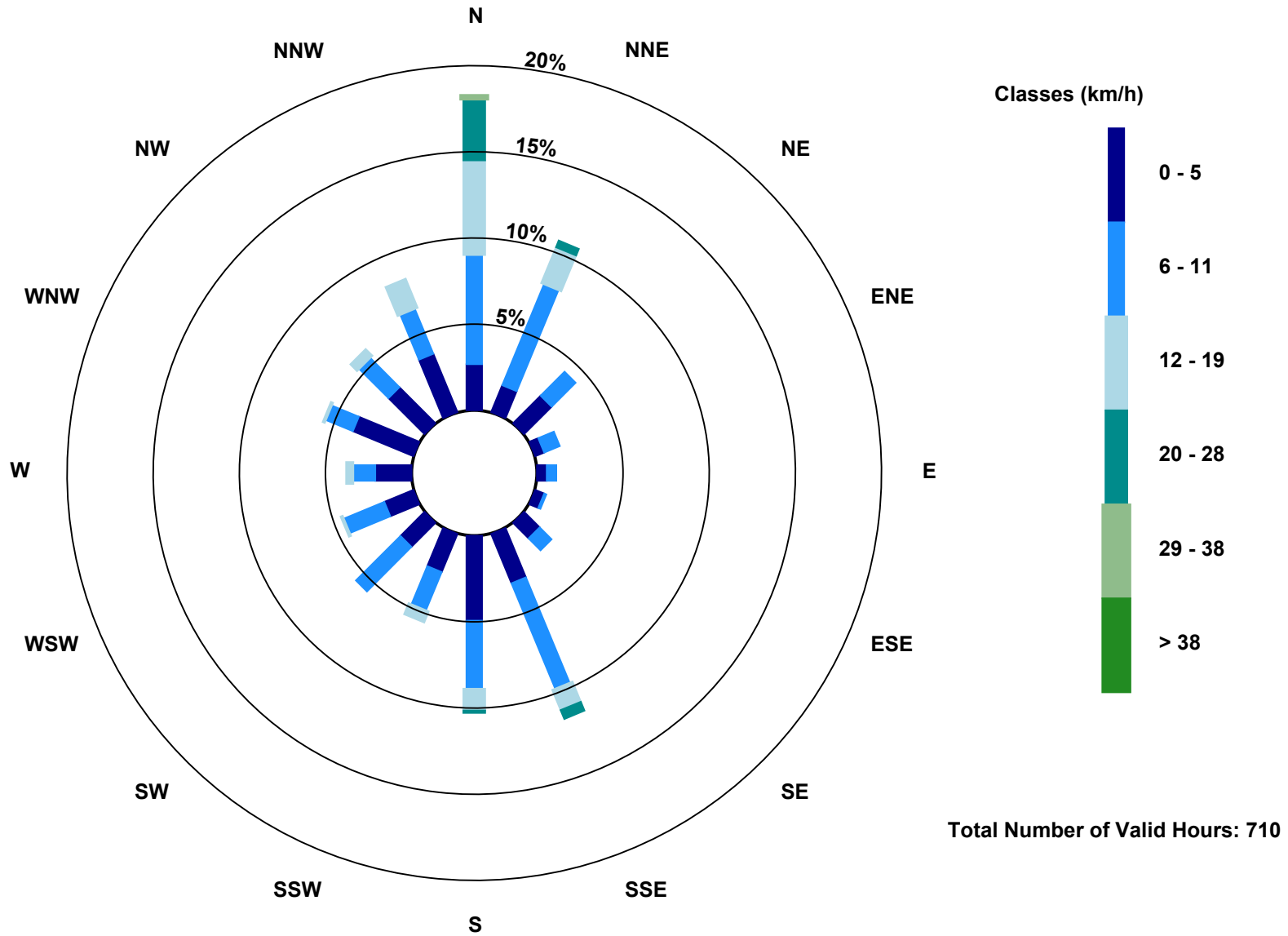
Total Number of Valid Hours: 710

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 13 km/h on Jun 26 16:00	Hours in Service: 720 Hours of Data: 710 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.6
Minimum Value: 1 km/h on Jun 21 03:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 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-Jun	3	2	3	2	1	1	1	2	2	2	2	3	3	3	3	2	2	2	2	1	1	1	1	2	3
2-Jun	2	1	1	2	3	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	2	1	1	3
3-Jun	1	1	1	UO	2	2	1	2	2	2	3	3	3	3	4	4	3	3	2	3	1	1	1	1	4
4-Jun	1	1	2	1	2	2	1	1	1	2	1	1	1	2	2	2	2	1	1	2	1	1	2	1	2
5-Jun	1	1	2	1	3	3	2	3	3	2	2	3	3	3	3	2	1	2	2	2	1	1	9	5	9
6-Jun	4	4	2	2	2	3	3	3	4	4	5	5	4	5	5	5	4	5	3	3	1	1	1	1	5
7-Jun	1	2	1	1	1	1	2	2	3	4	4	5	6	6	6	5	4	4	3	2	2	1	1	2	6
8-Jun	2	2	1	1	2	1	3	3	3	3	2	3	3	2	2	3	2	2	2	1	1	1	2	1	3
9-Jun	1	1	1	1	1	UO	1	1	2	2	2	3	3	3	3	2	2	3	2	1	2	1	1	2	3
10-Jun	1	2	1	1	1	1	1	3	3	3	3	3	4	4	5	5	5	5	5	3	2	2	2	2	5
11-Jun	2	2	3	3	2	1	2	4	2	2	3	5	4	5	4	5	5	5	1	2	2	2	2	1	5
12-Jun	1	1	1	1	1	2	1	2	3	3	3	3	2	2	2	2	2	2	1	2	2	2	1	2	3
13-Jun	1	1	1	1	1	1	1	1	2	3	2	2	5	2	3	4	7	5	4	3	3	5	3	4	7
14-Jun	4	3	3	3	3	3	3	5	4	3	3	4	5	6	5	3	5	4	4	4	5	4	4	3	6
15-Jun	4	3	3	4	2	3	4	2	3	1	2	2	2	2	3	3	3	2	2	1	1	2	1	1	4
16-Jun	2	2	1	1	1	2	2	2	2	2	2	3	3	3	4	4	4	3	4	2	2	3	4	3	4
17-Jun	2	2	4	2	2	2	2	4	4	3	3	4	5	4	4	4	4	7	5	2	2	2	1	1	7
18-Jun	3	2	2	1	1	2	2	2	3	4	4	5	5	5	5	6	5	4	5	5	5	5	4	5	6
19-Jun	5	5	4	4	5	5	6	6	7	7	6	5	6	6	6	7	5	5	6	5	6	5	5	5	7
20-Jun	4	4	5	4	4	4	4	5	4	5	3	3	2	2	2	2	2	2	1	1	1	2	1	1	5
21-Jun	1	1	1	2	1	1	2	2	2	3	4	4	3	4	4	4	4	3	2	2	2	1	1	1	4
22-Jun	1	1	1	1	1	2	1	2	2	2	2	3	2	3	4	4	4	3	2	3	1	1	2	2	4
23-Jun	UO	UO	UO	1	1	UO	1	2	2	3	3	3	3	3	4	4	2	2	2	2	UO	UO	1	1	4
24-Jun	2	1	2	1	2	2	2	2	2	3	4	3	4	4	8	5	2	6	7	4	4	4	4	4	8
25-Jun	3	2	1	1	1	1	3	3	3	3	4	4	4	4	4	3	3	3	2	2	1	1	1	1	4
26-Jun	2	1	1	2	1	1	2	2	2	1	2	2	M	M	4	13	4	1	1	2	1	3	2	2	13
27-Jun	1	2	1	2	1	2	3	3	2	3	3	3	3	3	3	2	2	2	1	2	1	2	2	2	3
28-Jun	1	2	2	2	1	1	2	2	2	2	2	2	4	2	2	2	2	2	3	2	1	1	1	1	4
29-Jun	1	1	2	1	1	1	2	2	3	2	2	3	4	4	6	4	4	2	2	2	1	1	2	2	6
30-Jun	2	2	1	2	2	2	2	2	3	3	3	4	5	4	5	4	5	4	5	4	2	2	1	2	5

Diurnal Maximum

M - Maintenance UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - June 2023

Direction of Maximum Speed: 2 deg on Jun 19 15:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 4.3 deg on Jun 19		Hours of Data:	710
Direction of Minimum Speed: 156 deg on Jun 22 22:00		Hours of Missing Data:	10
Direction of Minimum Daily Speed Average: 0.7 deg on Jun 24		Percent Operational Time:	98.6
Monthly Average Direction: 346.7 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-Jun	238	213	339	169	244	154	196	185	166	135	143	148	314	343	9	32	27	39	56	17	358	9	348	325	3.1
2-Jun	350	342	337	330	348	276	312	313	356	18	9	125	87	74	48	67	35	38	36	43	31	35	18	9	17.2
3-Jun	358	348	328	UO	312	148	356	6	4	13	30	18	31	17	7	9	18	172	198	138	52	349	358	348	15.3
4-Jun	345	6	340	342	351	348	9	36	66	4	1	354	350	345	356	3	14	358	329	348	162	183	297	354	357.9
5-Jun	295	289	315	261	305	341	354	0	20	11	359	19	49	53	25	15	349	340	357	10	354	279	275	290	351.2
6-Jun	258	261	208	199	204	230	219	226	232	218	239	231	221	224	196	206	206	201	207	219	188	177	163	171	215.5
7-Jun	175	178	185	227	214	188	175	185	200	186	211	253	266	265	271	275	279	287	272	290	300	296	285	313	244.1
8-Jun	330	355	335	298	283	301	354	10	358	52	109	76	82	78	93	99	83	50	49	29	350	341	328	276	21.3
9-Jun	294	297	295	292	269	UO	139	134	149	133	137	143	158	161	156	160	158	175	193	195	182	171	146	190	164.9
10-Jun	262	184	175	158	159	45	157	167	168	162	160	159	161	160	162	163	166	171	171	173	169	170	171	178	165.9
11-Jun	188	196	177	192	263	207	273	283	294	285	279	298	306	313	309	300	314	316	294	291	314	309	298	306	293.4
12-Jun	324	237	264	312	331	304	296	13	18	24	58	37	34	29	17	29	45	29	24	17	2	15	139	122	16.4
13-Jun	335	336	317	307	297	286	296	46	158	169	156	172	295	340	9	2	337	7	19	9	359	357	12	14	356.9
14-Jun	14	7	6	360	358	6	5	8	6	5	7	9	6	8	3	350	352	356	359	356	359	358	356	351	1.6
15-Jun	347	347	348	341	328	337	352	331	326	237	302	303	328	332	325	339	350	11	47	118	158	233	237	324	336.5
16-Jun	273	255	174	202	174	167	173	163	160	154	164	166	201	204	191	191	184	177	197	187	195	230	250	242	187.2
17-Jun	219	223	227	203	215	212	220	250	250	227	224	227	228	238	250	263	289	317	11	37	2	322	327	330	254.9
18-Jun	314	236	305	318	265	14	15	25	28	22	19	10	14	19	16	19	19	19	19	6	6	6	4	8	10.5
19-Jun	12	13	11	6	7	7	5	6	12	15	14	8	11	3	2	9	2	359	358	355	356	355	358	353	4.3
20-Jun	352	352	354	354	0	2	360	360	1	3	356	347	341	339	336	347	341	333	320	326	319	317	329	324	349.0
21-Jun	321	317	317	325	333	350	352	354	4	17	10	18	20	16	13	19	18	41	58	84	92	348	289	259	6.6
22-Jun	301	319	275	236	184	149	168	203	156	168	162	144	80	220	243	245	263	243	279	264	242	156	222	231	215.7
23-Jun	UO	UO	UO	308	322	UO	153	153	140	145	168	164	149	158	151	146	149	149	154	168	UO	UO	180	185	156.1
24-Jun	176	157	273	252	190	174	168	175	170	182	195	218	212	206	297	62	62	10	346	2	15	11	13	13	350.0
25-Jun	11	12	6	349	358	12	22	42	54	58	27	21	3	354	353	358	19	7	17	18	120	285	215	237	14.1
26-Jun	198	214	198	156	180	167	158	158	160	162	163	168	M	M	200	334	352	321	22	120	181	165	176	190	171.5
27-Jun	327	295	346	343	344	347	360	7	29	20	9	11	38	27	37	44	52	41	58	1	307	289	231	200	6.9
28-Jun	200	182	200	175	187	180	157	153	159	164	157	157	175	327	8	128	163	169	177	246	165	54	250	224	168.9
29-Jun	189	200	191	172	168	155	154	185	168	148	157	158	166	193	222	234	250	173	165	165	157	179	210	229	180.0
30-Jun	238	224	177	171	173	183	171	172	188	185	179	228	224	252	260	228	237	240	238	251	238	219	220	289	218.0

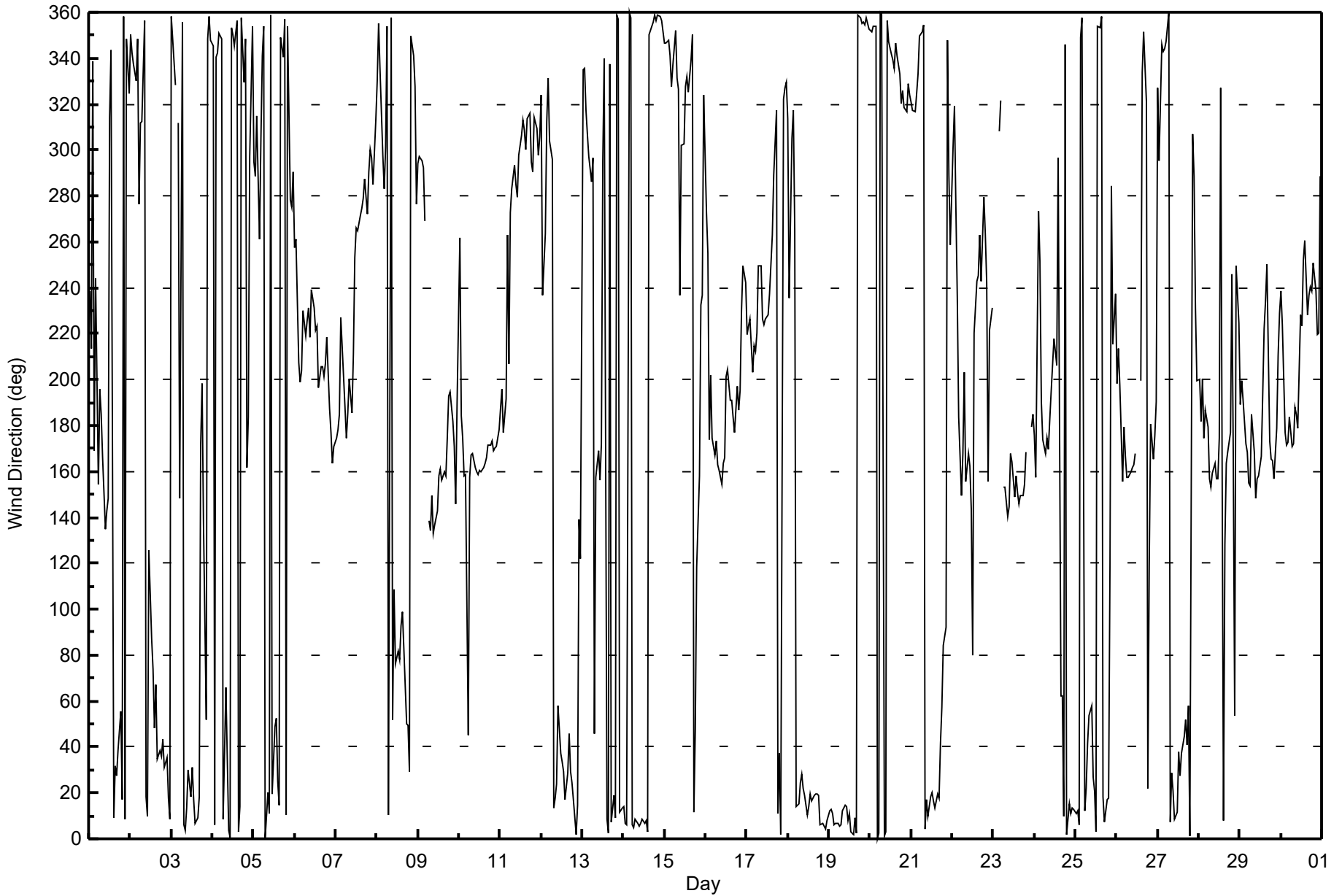
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Diurnal Average

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 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 103 deg on Jun 22 07:00	Hours of Data: 710
Minimum Value: 7 deg on Jun 21 02:00	Hours of Missing Data: 10
Percentiles: P ₁ = 10 P ₁₀ = 15 Q ₁ = 18 Median = 28 Q ₃ = 45 P ₉₀ = 59 P ₉₉ = 91	Hours of Calibration: 0
	Percent Operational Time: 98.6

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-Jun	79	69	63	66	65	27	42	41	32	39	92	93	39	46	39	42	39	42	37	16	20	28	56	14	93
2-Jun	16	11	9	10	20	43	35	28	42	62	75	75	32	36	43	41	37	37	38	46	35	34	25	21	75
3-Jun	11	20	29	UO	74	60	28	18	28	26	42	31	35	35	24	27	59	32	67	35	56	13	26	27	74
4-Jun	33	27	24	25	21	32	30	44	38	20	14	14	34	33	20	19	27	17	20	65	17	29	81	62	81
5-Jun	25	34	51	63	25	25	21	18	27	22	16	31	47	50	48	30	38	20	35	47	18	37	50	57	63
6-Jun	53	56	41	28	30	45	39	50	48	46	49	50	44	49	34	37	43	38	39	44	11	19	16	10	56
7-Jun	18	17	20	46	42	26	17	33	42	24	42	48	48	47	45	44	45	34	49	30	20	14	22	84	84
8-Jun	21	14	19	17	29	27	22	25	28	43	50	55	49	53	52	34	48	46	38	33	27	22	13	26	55
9-Jun	21	14	17	15	31	UO	67	29	24	15	16	20	28	38	24	19	18	23	22	19	68	43	63	50	68
10-Jun	76	58	26	25	62	81	24	18	16	14	15	15	14	15	15	15	15	15	16	15	12	11	11	14	81
11-Jun	16	31	25	56	94	56	55	44	49	48	56	38	27	29	33	28	24	22	21	18	12	14	12	17	94
12-Jun	13	52	50	85	42	46	32	30	37	40	50	41	39	34	24	33	41	32	28	27	35	27	50	73	85
13-Jun	28	28	19	26	13	17	49	59	23	27	49	54	81	21	20	24	18	17	33	21	15	18	20	19	81
14-Jun	20	21	19	14	15	16	16	18	18	17	17	18	17	21	20	19	17	17	17	17	15	16	15	15	21
15-Jun	15	14	14	13	11	12	24	15	13	53	23	16	14	15	14	19	21	21	45	20	50	82	37	68	82
16-Jun	95	91	33	74	21	18	15	19	16	18	15	18	38	32	27	24	19	17	25	20	46	45	49	48	95
17-Jun	42	47	49	35	38	31	34	48	60	66	50	48	47	47	55	51	41	62	20	38	20	12	19	17	66
18-Jun	54	64	28	18	48	27	23	32	32	31	27	23	26	28	25	26	25	25	25	18	18	18	17	17	64
19-Jun	19	20	17	18	18	17	18	17	19	20	20	18	19	17	18	19	18	17	19	17	18	17	18	17	20
20-Jun	17	17	18	16	17	16	17	16	17	18	19	17	13	13	11	17	13	12	11	10	11	18	15	18	19
21-Jun	8	7	7	29	20	15	17	17	17	36	27	32	34	34	30	30	31	37	41	41	36	43	31	51	51
22-Jun	31	26	55	43	77	77	103	60	17	23	19	30	76	55	51	52	53	54	45	42	53	81	74	54	103
23-Jun	UO	UO	UO	37	35	UO	16	16	20	39	30	22	19	22	21	22	18	23	14	11	UO	UO	11	12	39
24-Jun	17	83	59	30	25	14	14	21	21	23	39	55	48	49	73	50	50	23	26	17	21	19	19	20	83
25-Jun	17	18	16	13	16	19	25	40	45	43	39	35	28	31	31	25	41	29	29	32	85	34	70	83	85
26-Jun	61	75	31	69	17	25	19	16	17	13	13	13	M	M	36	76	69	98	48	68	86	73	93	89	98
27-Jun	23	35	23	10	9	12	17	23	37	36	27	32	44	39	50	57	57	47	36	68	21	28	79	73	79
28-Jun	28	50	40	82	42	18	19	14	13	20	14	15	53	38	35	40	36	18	16	49	57	83	60	75	83
29-Jun	28	14	16	19	34	32	15	26	20	15	15	15	39	40	47	48	63	19	16	12	11	16	30	39	63
30-Jun	61	86	57	31	25	20	17	19	26	24	33	55	49	56	54	56	49	50	46	51	50	40	45	30	86

95	91	63	85	94	81	103	60	60	66	92	93	81	56	73	76	69	98	67	68	86	83	93	89	
Diurnal Maximum																								

M - Maintenance UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS02 MILDRED LAKE JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
 JUNE 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	683	36	37	99.86	25.3	0	4.5	0
H2S (ppb) Average	682	36	38	99.72	7.3	0	1.3	0
THC (ppm) Average	682	36	38	99.72	4.6	-	2.6	-
NMHC(ppm) Average	682	36	38	99.72	1.612	-	0.406	-
CH4(ppm) Average	682	36	38	99.72	3	-	2.2	-
Temperature (C) Average	720	0	0	100	30.8	-	23.7	-
Relative Humidity (%) Average	640	0	80	88.89	99.8	-	92.3	-
Wind Speed 10 m (km/h) Average	717	0	3	99.58	29	-	21	-
Wind Direction 10 m (deg) Average	717	0	3	99.58	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
JUNE 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	683	0.97	2.6	-	0	0	0	0.2	0.5	1.7	25.3
H2S (ppb) Average	682	0.4	0.8	-	0	0	0.1	0.2	0.4	0.7	7.3
THC (ppm) Average	682	2.14	0.3	-	1.9	2	2	2	2.2	2.4	4.6
NMHC(ppm) Average	682	0.085	0.176	-	0	0	0	0	0.1	0.2	1.612
CH4(ppm) Average	682	2.06	0.1	-	1.9	2	2	2	2.1	2.2	3
Temperature 2 m (C) Average	720	17.73	5.2	-	5.3	10.8	13.5	17.7	21.4	24.7	30.8
Relative Humidity (%) Average	640	62.11	19.7	-	23.3	36.5	46	61.1	78.8	89.6	99.8
Wind Speed 10 m (km/h) Average	717	9.7	5	-	1	4	6	9	12	16	29
Wind Direction 10 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, THC/NMHC/CH4	16 Jun 2023 23:00	17 Jun 2023 00:00	2	Station power failure
SO2	16 Jun 2023 23:00	16 Jun 2023 23:00	1	Station power failure
Relative Humidity	01 Jun 2023 05:00	27 Jun 2023 07:00	80	Sensor operated out of range
Wind Speed, Wind Direction	05 Jun 2023 00:00	05 Jun 2023 00:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Jun 2023 01:00	22 Jun 2023 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	26 Jun 2023 00:00	26 Jun 2023 00:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Mildred Lake - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 25.3 ppb on Jun 30 16:00	Maximum Daily Average: 4.5 ppb on Jun 17		Hours of Data:	683
Minimum Value: 0.0 ppb on Jun 3 07:00	Minimum Daily Average: 0.0 ppb on Jun 19		Hours of Missing Data:	37
Maximum Diurnal Average: 2.6 ppb at hour 16	Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Calibration:	36
Monthly Average: 0.97 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.7 P ₉₉ = 14.2		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-Jun	0.5	0.4	0.4	0.2	0.1	Z	0.8	0.8	5.5	8.0	11.6	1.6	0.8	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.5	0.6	0.4	0.4	1.5	11.6
2-Jun	Z	0.4	0.3	0.4	0.3	0.3	0.5	0.5	0.6	0.6	0.6	1.1	0.7	0.6	0.7	0.8	0.7	0.5	0.3	0.2	0.3	0.4	0.3	0.2	0.5	1.1
3-Jun	0.1	Z	0.2	0.2	0.1	0.2	0.0	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.9	1.0	0.7	0.7	0.4	0.3	0.3	0.3	0.3	0.4	1.0	
4-Jun	0.3	0.3	Z	0.2	0.2	0.1	0.1	0.2	0.2	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	0.1	0.3
5-Jun	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
6-Jun	1.4	6.5	2.2	1.2	Z	0.6	1.6	8.7	8.7	6.8	0.5	0.2	0.6	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.2	0.1	1.8	8.7
7-Jun	0.1	0.0	0.1	0.0	0.1	Z	0.1	0.1	0.2	0.3	0.1	1.2	3.6	5.8	9.7	9.3	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.2	1.4	9.7
8-Jun	0.4	Z	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4
9-Jun	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.5	0.7	0.5	0.4	0.5	0.3	2.0	1.2	0.6	0.4	0.2	0.2	0.2	0.2	0.1	0.3	0.4	2.0
10-Jun	0.2	4.4	Z	9.5	16.8	15.6	3.6	1.8	1.4	1.1	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.4	2.7	16.8
11-Jun	0.5	3.8	2.4	Z	1.7	0.6	0.6	0.7	0.3	0.4	0.4	0.4	0.4	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.6	3.8
12-Jun	0.1	0.1	0.1	0.3	Z	0.3	0.2	0.1	0.2	0.2	0.2	0.5	0.3	0.4	2.9	2.3	0.9	0.6	0.5	0.2	0.2	0.1	0.2	2.9	0.6	2.9
13-Jun	4.6	3.3	7.9	9.7	11.6	Z	2.8	2.3	1.6	1.4	1.2	2.8	2.8	8.6	8.6	10.6	2.5	1.4	1.0	0.7	0.6	0.5	0.2	0.1	3.8	11.6
14-Jun	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
15-Jun	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	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.2
16-Jun	0.1	0.1	Z	0.0	0.0	0.0	0.1	0.3	0.3	1.5	1.4	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.7	PF	0.5	0.4	1.5
17-Jun	0.2	0.1	2.4	Z	0.5	0.4	7.7	19.6	5.1	10.4	1.4	0.6	0.7	11.2	14.9	14.1	9.3	3.2	0.5	0.4	0.3	0.2	0.3	0.2	4.5	19.6
18-Jun	0.2	0.2	0.1	0.1	Z	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
19-Jun	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
20-Jun	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Jun	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
22-Jun	0.1	0.0	Z	0.2	0.2	0.0	0.5	4.5	11.0	1.0	1.2	1.4	1.3	2.3	8.6	7.5	12.0	6.5	10.5	1.0	0.6	0.8	0.7	0.5	3.1	12.0
23-Jun	0.7	0.9	1.8	Z	1.4	1.1	2.7	1.0	0.7	2.5	9.1	1.2	0.4	0.6	1.2	0.3	0.1	0.6	1.0	0.1	0.2	0.2	0.1	0.1	1.2	9.1
24-Jun	0.0	0.1	0.0	0.7	Z	0.3	1.2	3.2	0.7	0.8	0.2	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.2
25-Jun	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	0.5	1.3	1.6	0.7	0.2	0.3	0.5	0.2	1.6
26-Jun	Z	0.8	1.2	0.4	0.2	0.2	0.9	1.5	1.4	0.7	0.4	0.3	0.1	0.1	0.1	0.3	0.1	0.1	1.5	1.1	0.6	0.2	0.3	0.4	0.6	1.5
27-Jun	0.3	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.3	0.1	0.3
28-Jun	0.4	0.3	Z	0.3	0.6	0.8	1.8	1.0	0.7	0.6	0.6	0.5	0.5	0.6	0.9	0.7	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.6	1.8
29-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	--	0.5
30-Jun	0.0	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	17.1	16.3	25.3	8.2	0.3	3.3	8.4	0.7	1.5	1.1	0.6	3.6	25.3

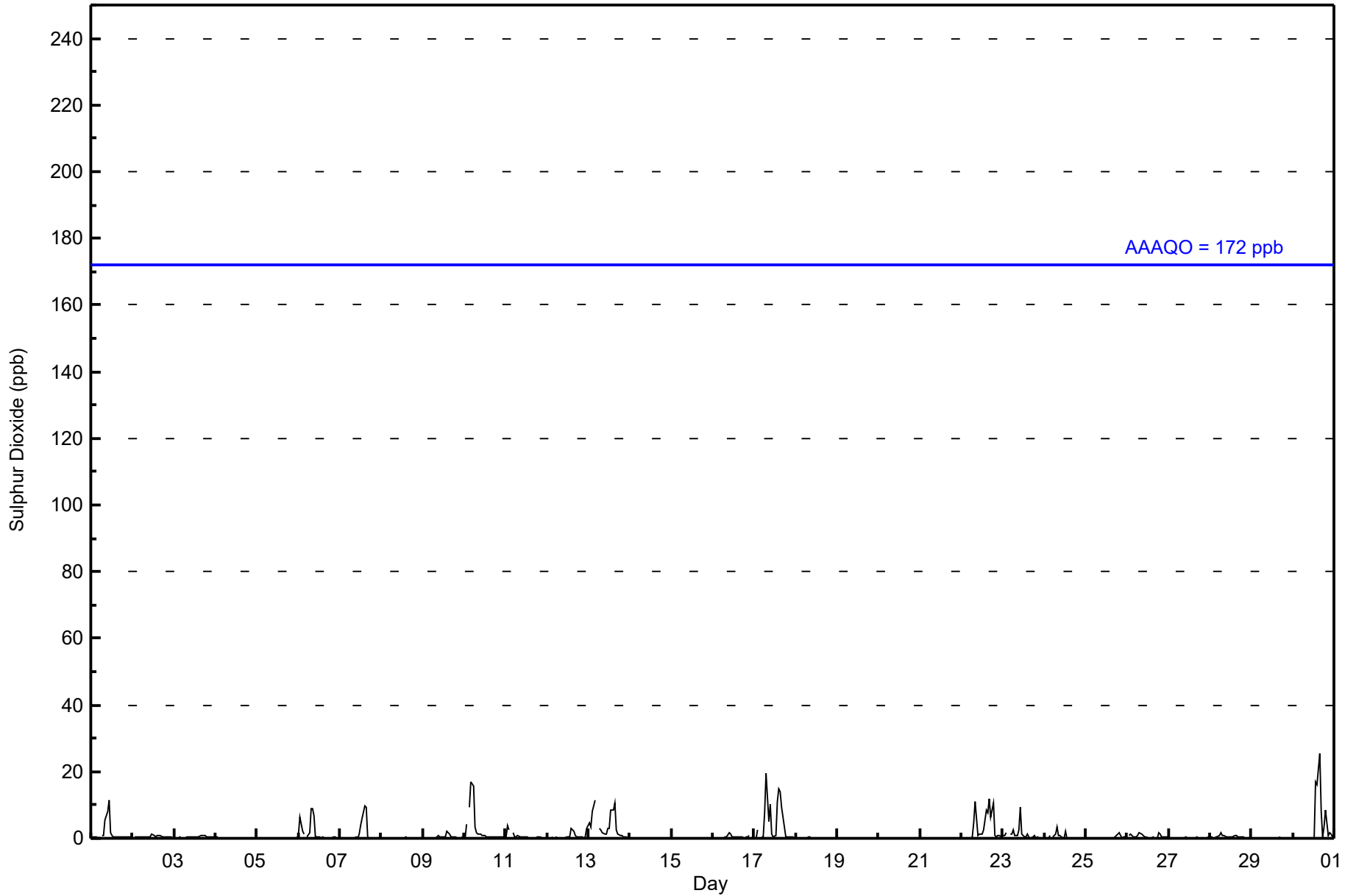
0.4	0.9	0.8	1.0	1.4	0.8	0.8	1.6	1.3	1.3	1.1	0.5	0.6	1.7	2.3	2.6	1.3	0.6	0.8	0.5	0.2	0.2	0.2	0.3	Diurnal Average	
4.6	6.5	7.9	9.7	16.8	15.6	7.7	19.6	11.0	10.4	11.6	2.8	3.6	17.1	16.3	25.3	12.0	6.5	10.5	8.4	0.7	1.5	1.1	2.9	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	669	97.95	97.95
11 - 20	13	1.90	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: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mildred Lake - June 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	139	45	18	17	18	21	30	85	50	31	53	19	15	22	22	81	666
11 - 20	0	0	0	0	0	0	2	2	0	0	0	6	1	1	0	1	13
21 - 60	0	0	0	0	0	0	0	0	0	0	0	1	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	139	45	18	17	18	21	32	87	50	31	53	26	16	23	22	82	680

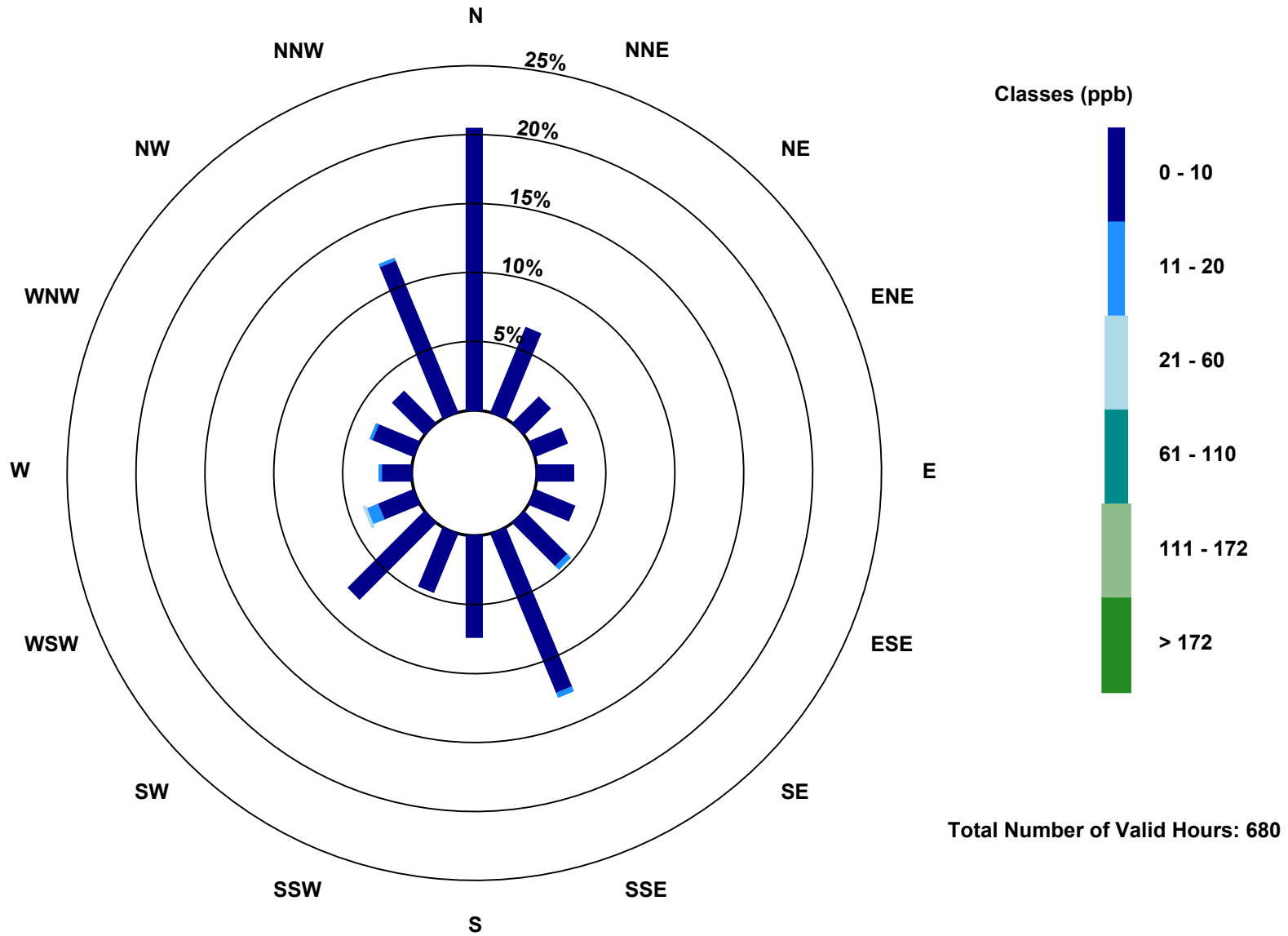
Total Number of Valid Hours: 680

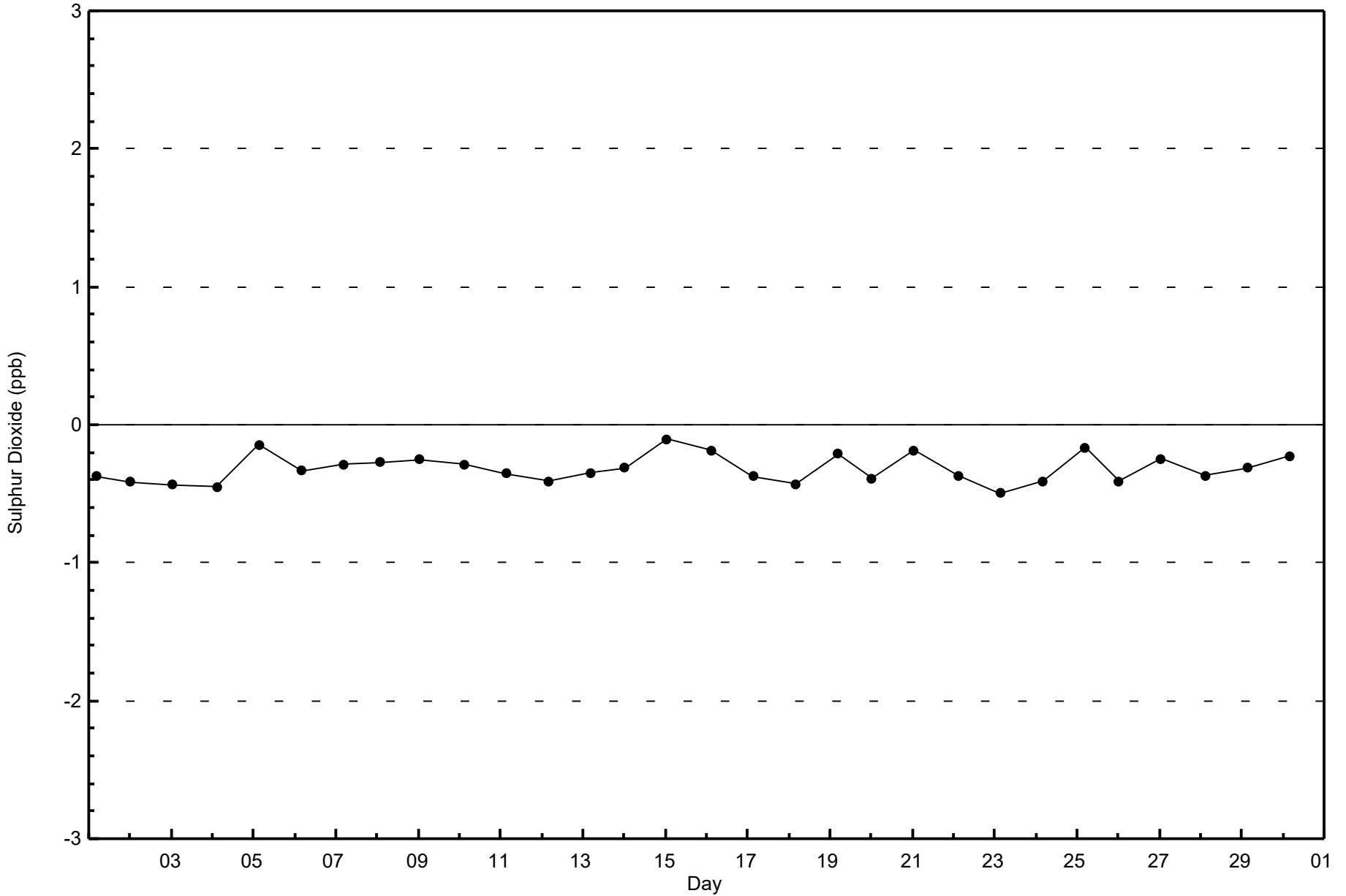
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Mildred Lake

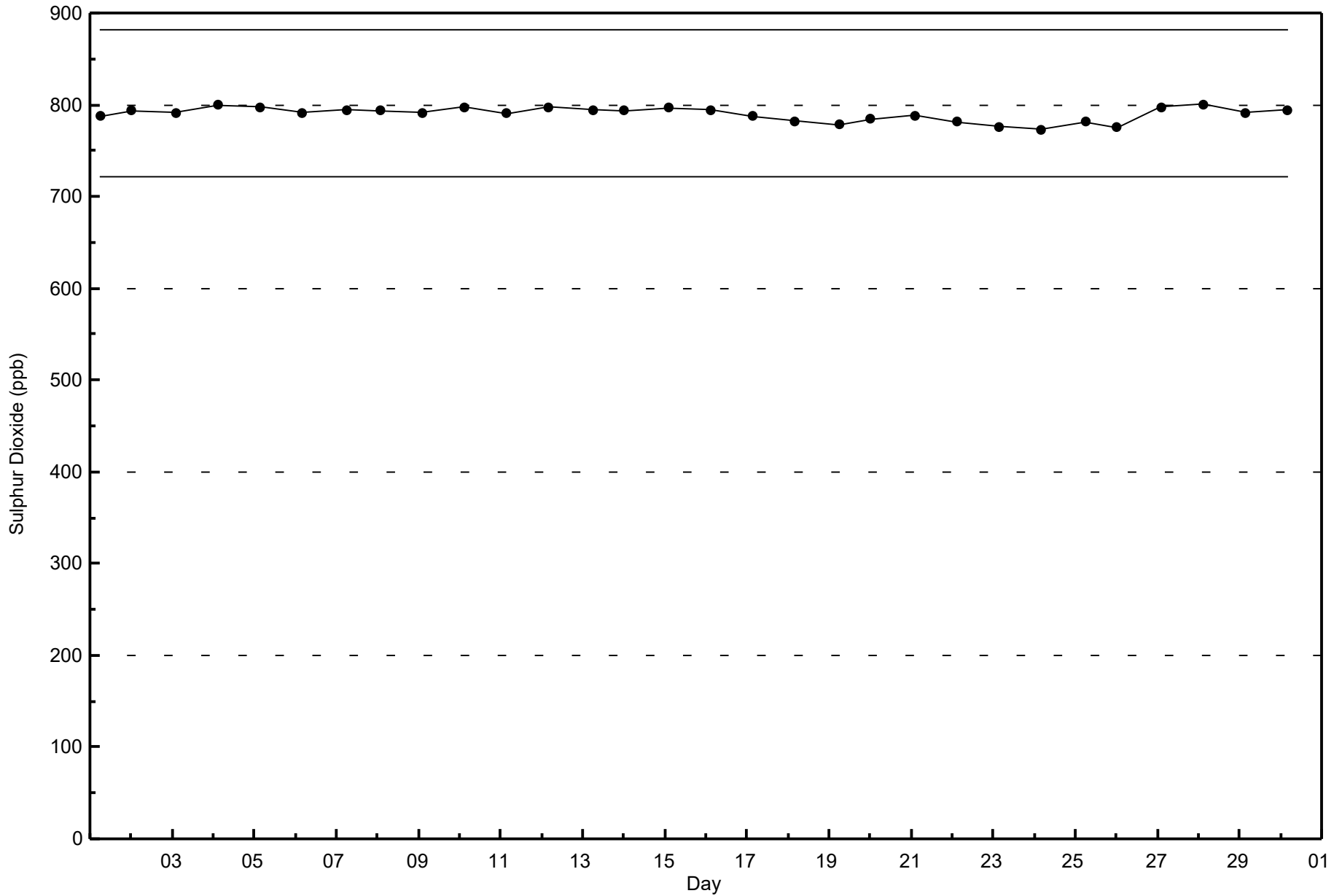






Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association
Summary of Hour Averages

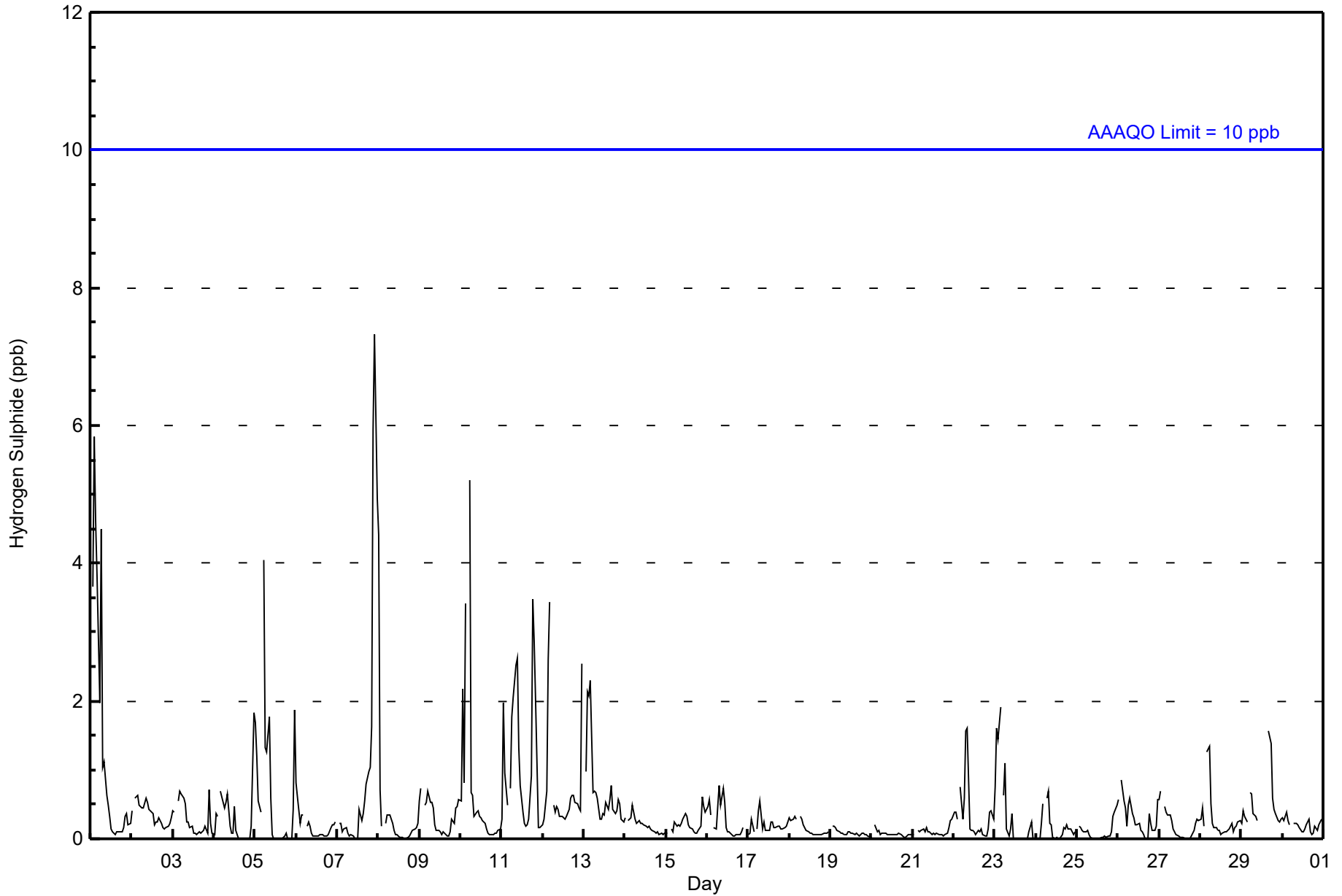
Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720					
Maximum Value: 7.3 ppb on Jun 7 23:00		Maximum Daily Average: 1.3 ppb on Jun 1																	Hours of Data:	682							
Minimum Value: 0.0 ppb on Jun 4 15:00		Minimum Daily Average: 0.1 ppb on Jun 20																	Hours of Missing Data:	38							
Maximum Diurnal Average: 0.8 ppb at hour 4		Minimum Diurnal Average: 0.1 ppb at hour 15																	Hours of Calibration:	36							
Monthly Average: 0.40 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 4.4																	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-Jun	Z	3.7	5.8	4.6	3.8	2.0	4.5	1.0	1.1	0.6	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.2	1.3	5.8	
2-Jun	0.4	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.6	
3-Jun	0.4	0.4	Z	0.5	0.7	0.6	0.6	0.5	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.7	0.2	0.1	0.3	0.7	
4-Jun	0.1	0.4	0.3	Z	0.7	0.5	0.5	0.5	0.6	0.2	0.1	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	0.3	1.8	
5-Jun	1.7	1.2	0.6	0.4	Z	4.0	1.3	1.3	1.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	1.9	0.7	4.0		
6-Jun	0.8	0.6	0.2	0.3	0.3	Z	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.8	
7-Jun	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.3	0.4	0.6	0.8	1.0	1.0	1.6	5.9	7.3	4.9	1.1	7.3	
8-Jun	4.4	0.7	0.2	Z	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	4.4		
9-Jun	0.5	0.7	Z	0.5	0.5	0.7	0.5	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.5	0.5	0.6	0.3	0.7	
10-Jun	0.6	2.2	0.8	3.4	Z	5.2	0.7	0.6	0.3	0.4	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	0.7	5.2	
11-Jun	0.3	2.0	1.0	0.5	Z	0.7	1.8	2.1	2.5	2.6	1.3	0.8	0.4	0.2	0.2	0.2	0.3	0.9	3.5	2.8	2.0	0.2	0.2	0.2	1.2	3.5	
12-Jun	0.2	0.3	0.7	2.6	3.4	Z	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.6	0.5	0.5	0.4	0.4	2.5	0.8	3.4	
13-Jun	Z	1.0	2.1	2.1	2.3	0.7	0.7	0.7	0.6	0.3	0.3	0.4	0.3	0.5	0.4	0.6	0.8	0.4	0.4	0.4	0.6	0.5	0.3	0.2	0.7	2.3	
14-Jun	0.3	Z	0.3	0.3	0.5	0.4	0.3	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	0.1	0.1	0.1	0.2	0.5	
15-Jun	0.1	0.1	Z	0.1	0.1	0.2	0.2	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	0.1	0.2	0.6	0.5	0.4	0.2	0.6
16-Jun	0.5	0.6	0.3	Z	0.2	0.1	0.5	0.8	0.5	0.7	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	PF	PF	0.3	0.8	
17-Jun	0.1	0.1	0.3	0.1	Z	0.1	0.4	0.5	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.5	
18-Jun	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	
19-Jun	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	
20-Jun	0.0	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	0.0	0.0	0.0	0.1	0.1	0.1	0.2	
21-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.3
22-Jun	0.4	0.4	0.3	Z	0.7	0.3	0.6	1.6	1.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.4	0.4	0.3	0.4	1.6	
23-Jun	0.7	1.6	1.4	1.9	Z	0.6	1.1	0.2	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.4	1.9	
24-Jun	0.0	0.0	0.0	0.2	0.5	Z	0.6	0.7	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.7	
25-Jun	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.4	0.5	0.1	0.5	
26-Jun	0.6	Z	0.8	0.5	0.4	0.2	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.4	0.2	0.1	0.1	0.2	0.6	0.3	0.8	
27-Jun	0.6	0.7	Z	0.5	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.7	
28-Jun	0.3	0.4	0.2	Z	1.3	1.3	0.5	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	0.2	0.2	0.3	0.3	0.3	1.3	
29-Jun	0.2	0.4	0.3	0.2	Z	0.7	0.6	0.4	0.3	0.3	C	C	C	C	C	C	1.6	1.4	0.6	0.4	0.4	0.3	0.2	0.3	--	1.6	
30-Jun	0.3	0.3	0.4	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.4	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.6 0.7 0.7 0.8 0.7 0.8 0.6 0.5 0.5 0.3 0.2 0.2 0.1 0.1 0.1 0.1 0.2 0.2 0.3 0.3 0.3 0.4 0.5 0.6			
																								4.4 3.7 5.8 4.6 3.8 5.2 4.5 2.1 2.5 2.6 1.3 0.8 0.5 0.5 0.4 0.6 1.6 1.4 3.5 2.8 2.0 5.9 7.3 4.9			
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

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	663	97.21	97.21
3 - 4	13	1.91	99.12
5 - 7	6	0.88	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**

**Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - June 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	138	45	19	17	15	22	32	85	50	29	51	26	14	17	21	79	660
3 - 4	0	0	0	0	1	1	1	0	0	2	0	0	1	5	0	2	13
5 - 7	1	0	0	0	0	0	0	1	0	0	1	0	0	2	0	1	6
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	139	45	19	17	16	23	33	86	50	31	52	26	15	24	21	82	679

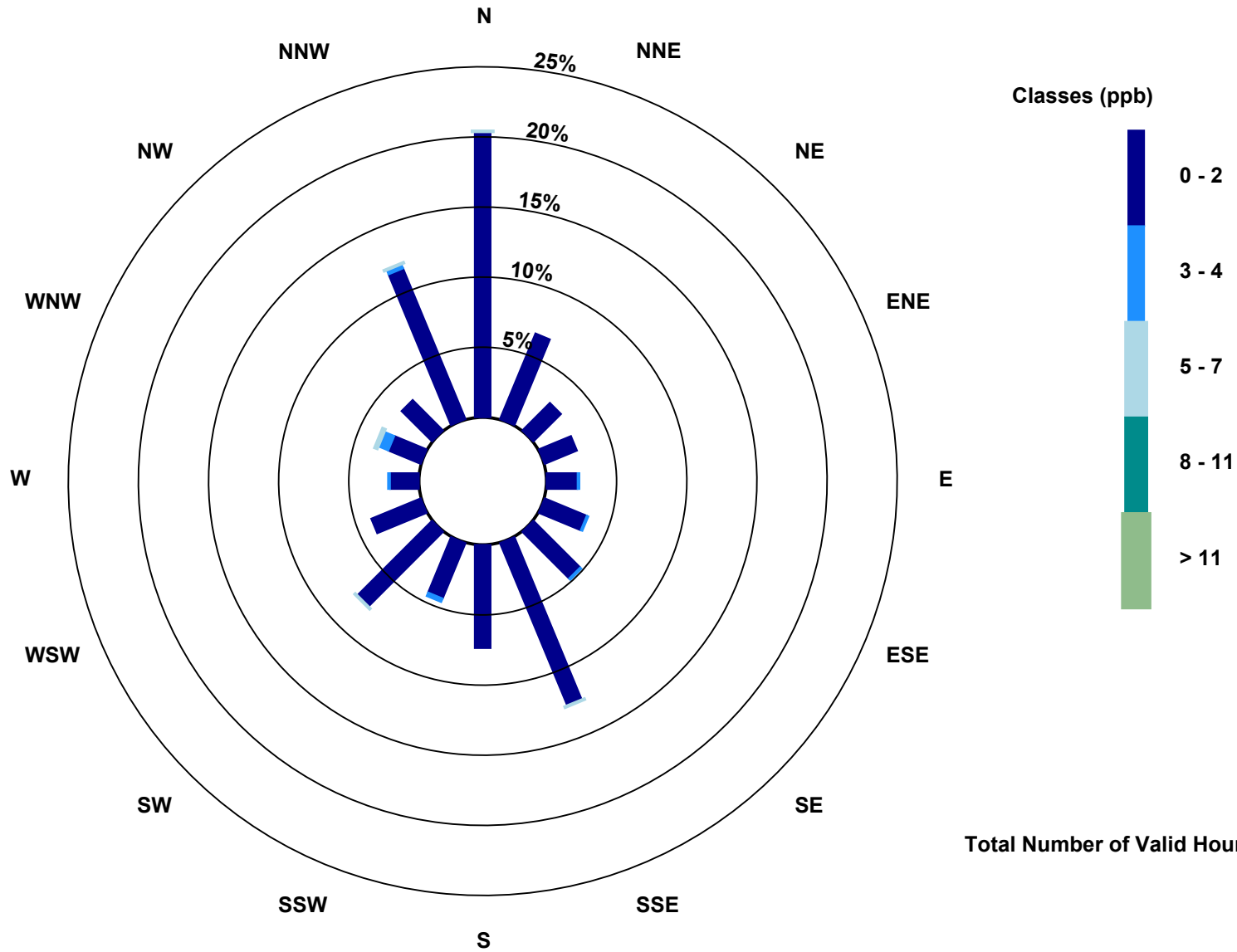
Total Number of Valid Hours: 679

Total Number of Hours: 720

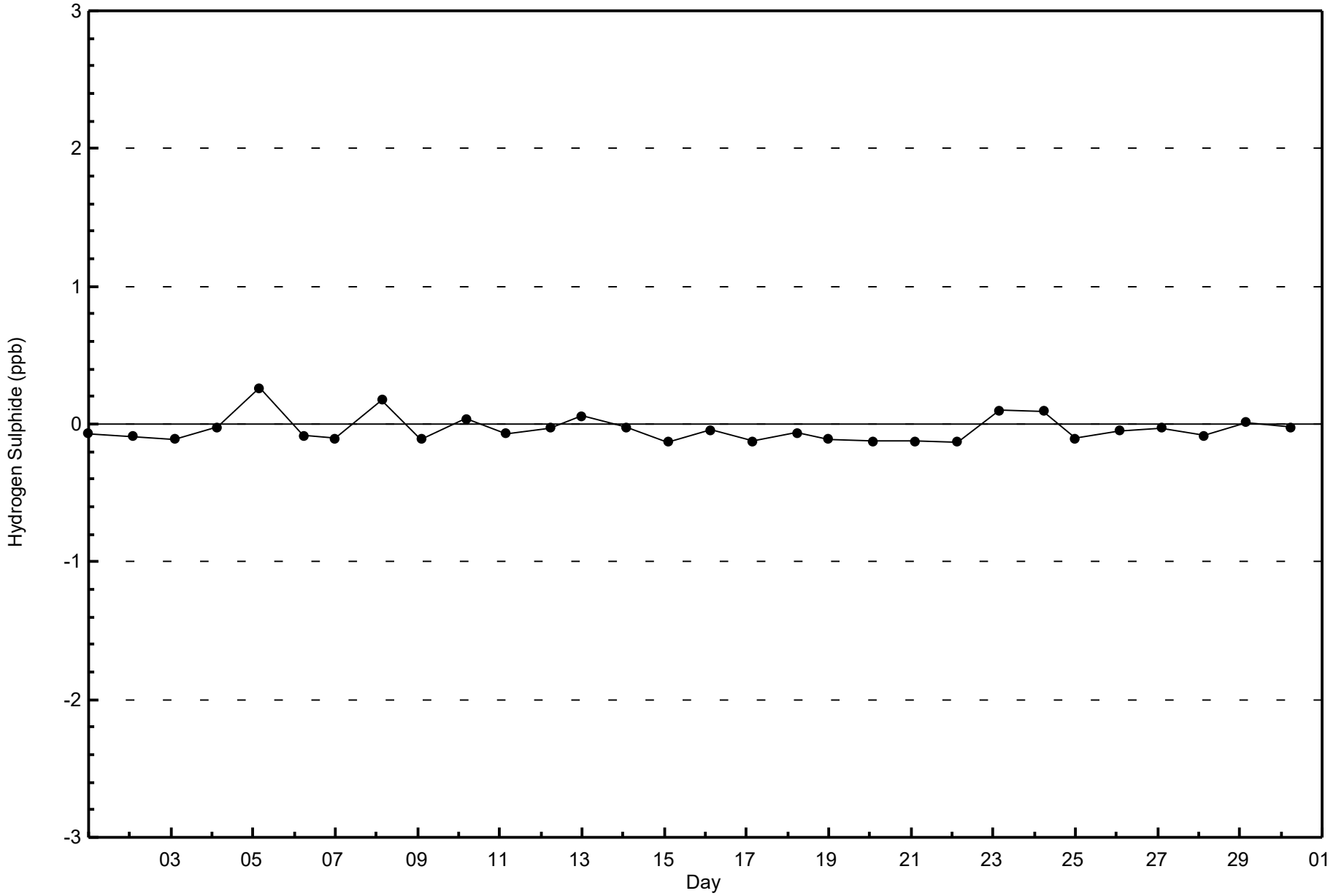


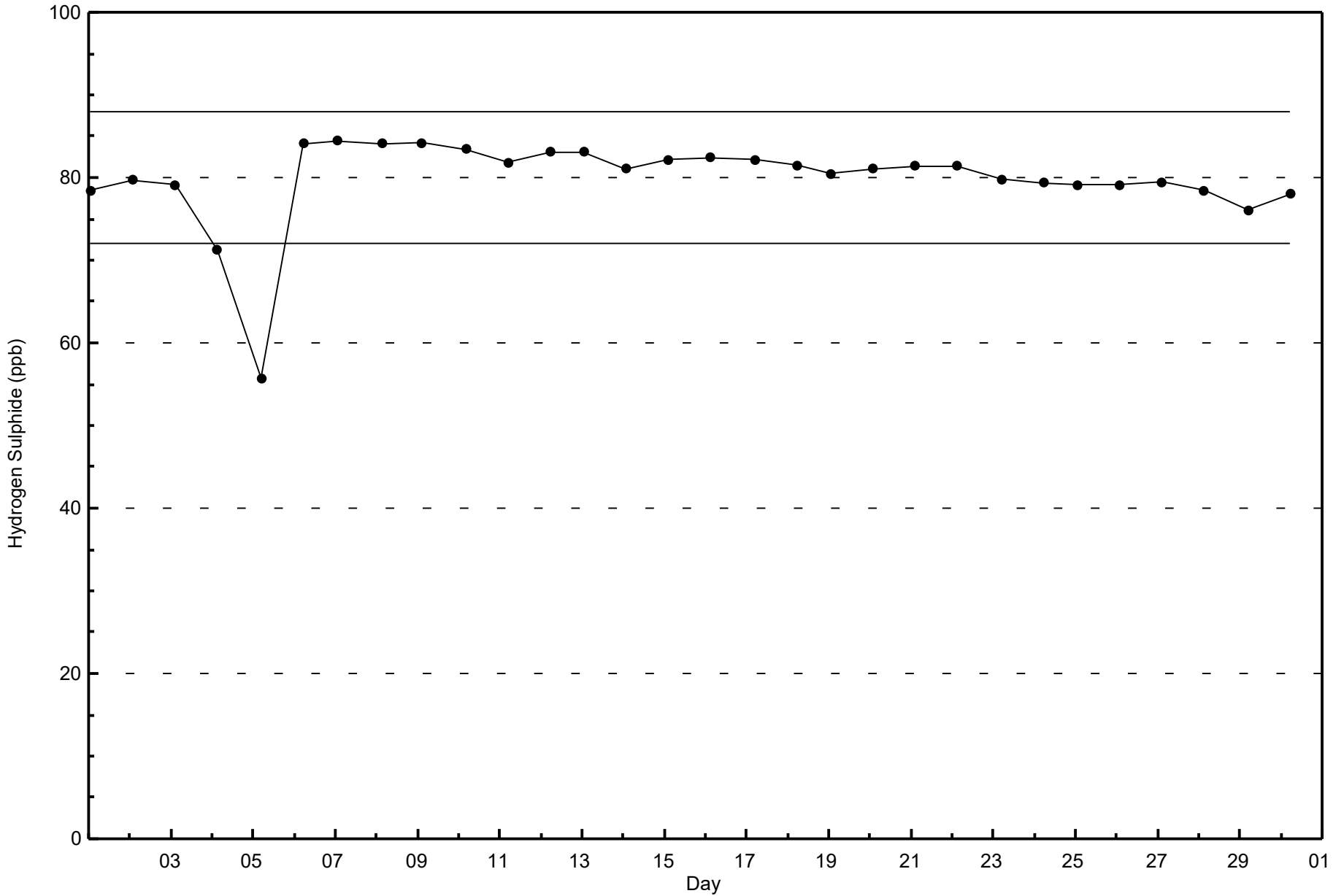
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake



Total Number of Valid Hours: 679



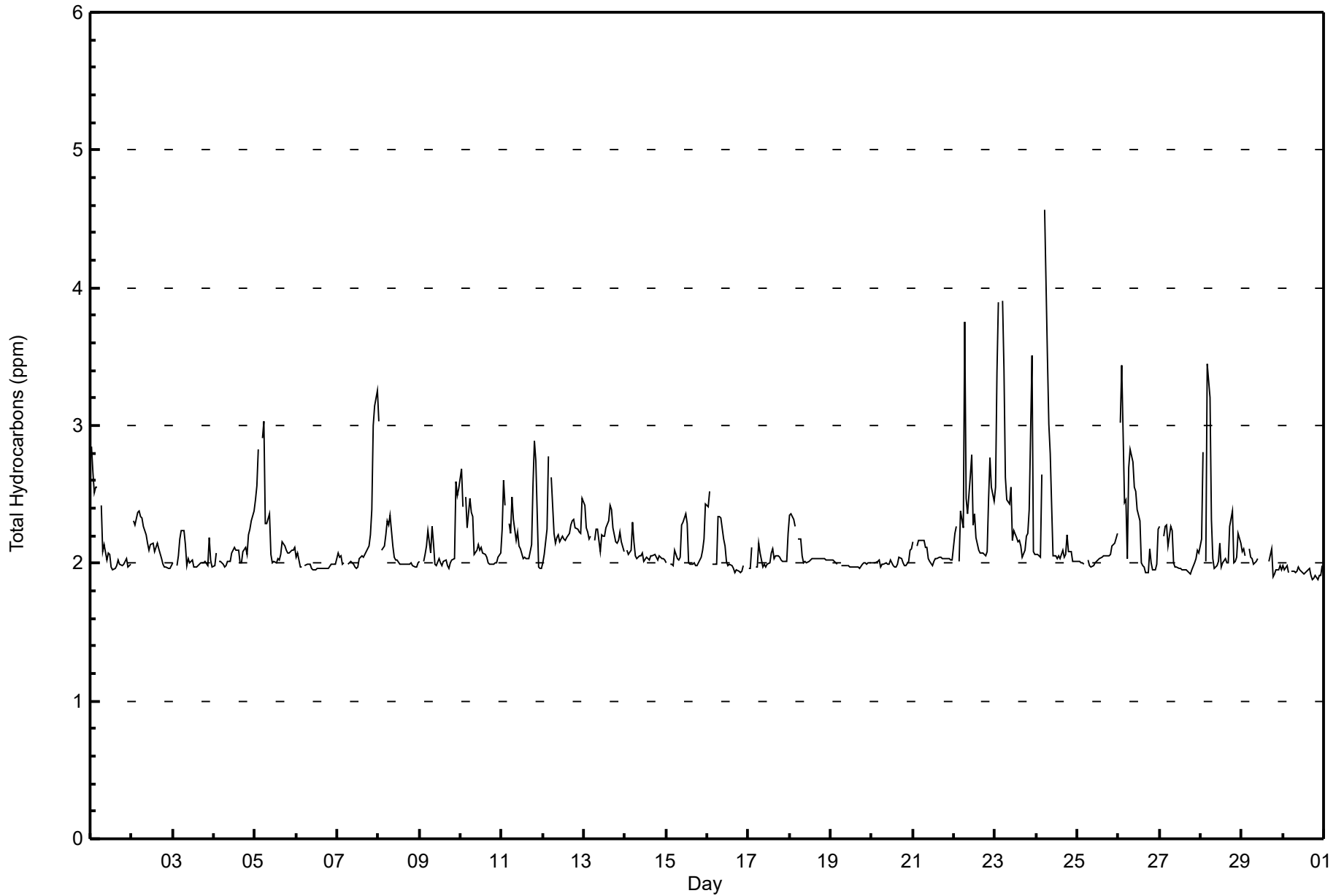




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 4.6 ppm on Jun 24 06:00		Maximum Daily Average: 2.6 ppm on Jun 23		Hours in Service: 720																							
Minimum Value: 1.9 ppm on Jun 30 21:00		Minimum Daily Average: 1.9 ppm on Jun 30		Hours of Data: 682																							
Maximum Diurnal Average: 2.4 ppm at hour 6		Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Missing Data: 38																							
Monthly Average: 2.14 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 3.4		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-Jun	2.8	2.7	2.5	2.6	2.5	Z	2.4	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.8	
2-Jun	Z	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
3-Jun	2.0	Z	2.0	2.1	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	2.2	2.0	2.0	2.0	2.2	
4-Jun	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.1	2.4	
5-Jun	2.5	2.6	2.8	Z	2.9	3.0	2.3	2.3	2.4	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	2.1	2.1	2.2	3.0	
6-Jun	2.0	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	2.0	2.0	2.0	2.0	2.0	2.1	
7-Jun	2.1	2.0	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.4	3.0	3.1	3.3	2.2	3.3	
8-Jun	3.0	Z	2.1	2.1	2.2	2.3	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	3.0	
9-Jun	2.0	Z	2.0	2.1	2.1	2.2	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6	2.5	2.5	2.1	2.6	
10-Jun	2.7	2.4	Z	2.5	2.3	2.5	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.7	
11-Jun	2.2	2.6	2.4	Z	2.3	2.2	2.5	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.6	2.9	2.7	2.0	2.0	2.0	2.2	2.9	
12-Jun	2.0	2.1	2.3	2.8	Z	2.6	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.5	2.3	2.8	
13-Jun	2.4	2.3	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.4	
14-Jun	Z	2.1	2.1	2.1	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.3	
15-Jun	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.3	2.3	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.1	2.4	
16-Jun	2.4	2.5	Z	2.0	2.0	2.0	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	PF	PF	2.1	2.5	
17-Jun	2.0	2.0	2.1	Z	2.0	2.0	2.1	2.1	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	2.2	2.0	2.2	
18-Jun	2.3	2.4	2.3	2.3	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
19-Jun	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
20-Jun	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	2.1	2.0	2.1	
21-Jun	2.2	Z	2.1	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	2.0	2.0	2.0	2.1	2.2
22-Jun	2.2	2.3	Z	2.0	2.4	2.3	3.8	2.5	2.4	2.6	2.8	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.5	2.8	2.6	2.4	2.4	3.8	
23-Jun	2.6	3.4	3.9	Z	3.9	3.4	2.6	2.5	2.4	2.6	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.2	2.2	2.4	3.5	2.1	2.1	2.6	3.9	
24-Jun	2.1	2.1	2.0	2.6	Z	4.6	3.5	3.0	2.8	2.4	2.1	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.3	4.6	
25-Jun	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.0	2.2	
26-Jun	Z	3.0	3.4	2.4	2.5	2.0	2.7	2.8	2.7	2.6	2.5	2.4	2.3	2.0	2.0	1.9	1.9	2.1	2.0	2.0	2.0	2.0	2.2	2.3	3.4		
27-Jun	2.3	Z	2.2	2.3	2.3	2.1	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	
28-Jun	2.2	2.8	Z	2.0	3.5	3.2	2.3	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.3	2.4	2.0	2.0	2.0	2.2	2.1	2.2	3.5	
29-Jun	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	C	C	C	C	C	C	2.0	2.1	1.9	1.9	2.0	2.0	2.0	2.0	--	2.1	
30-Jun	2.0	2.0	2.0	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration PF - Power Failure																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	358	52.49	52.49
2.1 - 3.0	311	45.60	98.09
3.1 - 10.0	13	1.91	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 - June 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	86	30	17	13	13	7	4	26	29	21	45	11	5	6	9	36	358
2.1 - 3.0	53	15	1	4	4	13	25	57	19	10	6	15	11	16	13	46	308
3.1 - 10.0	0	0	0	0	1	1	3	4	2	0	1	0	0	1	0	0	13
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	139	45	18	17	18	21	32	87	50	31	52	26	16	23	22	82	679

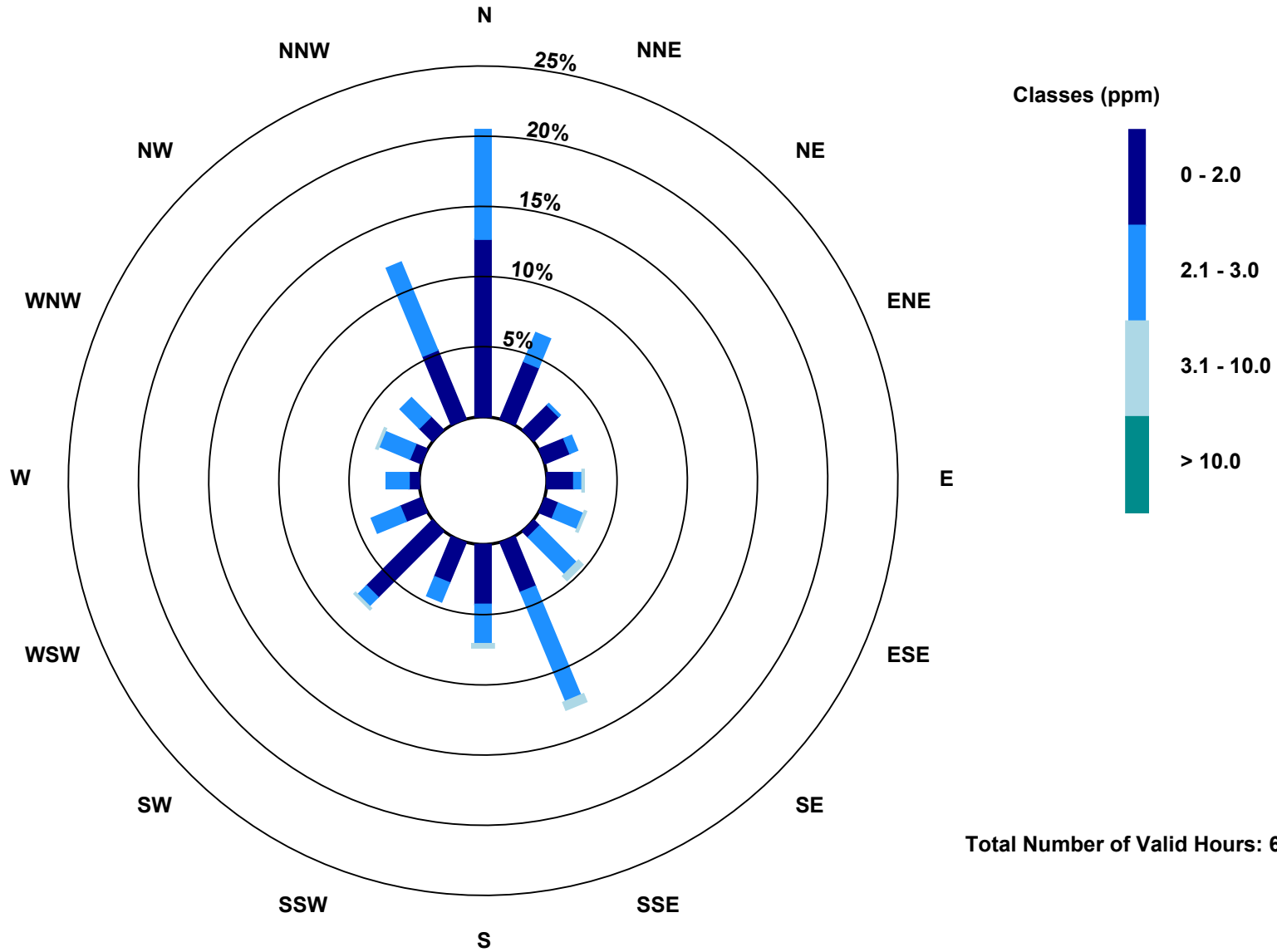
Total Number of Valid Hours: 679

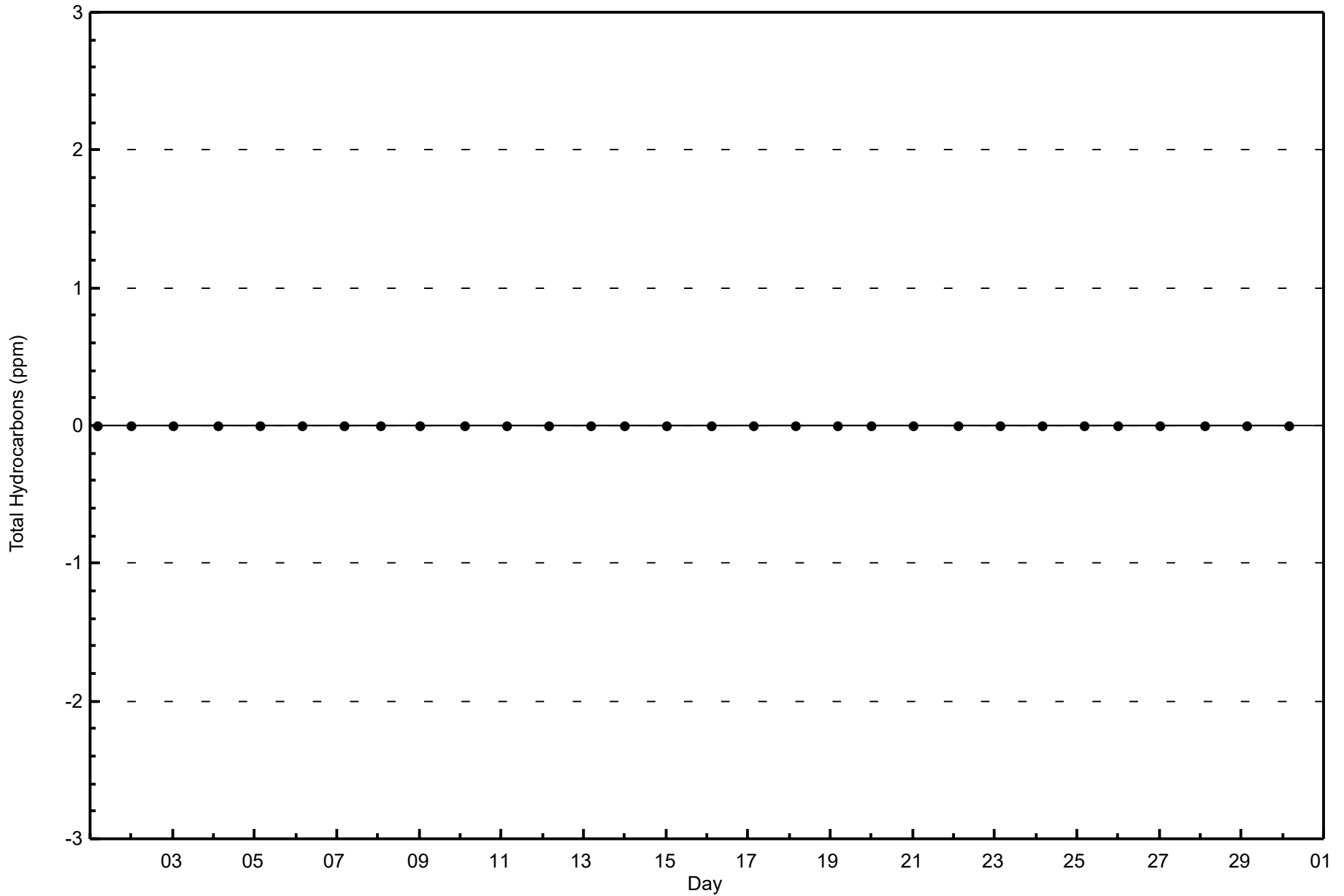
Total Number of Hours: 720

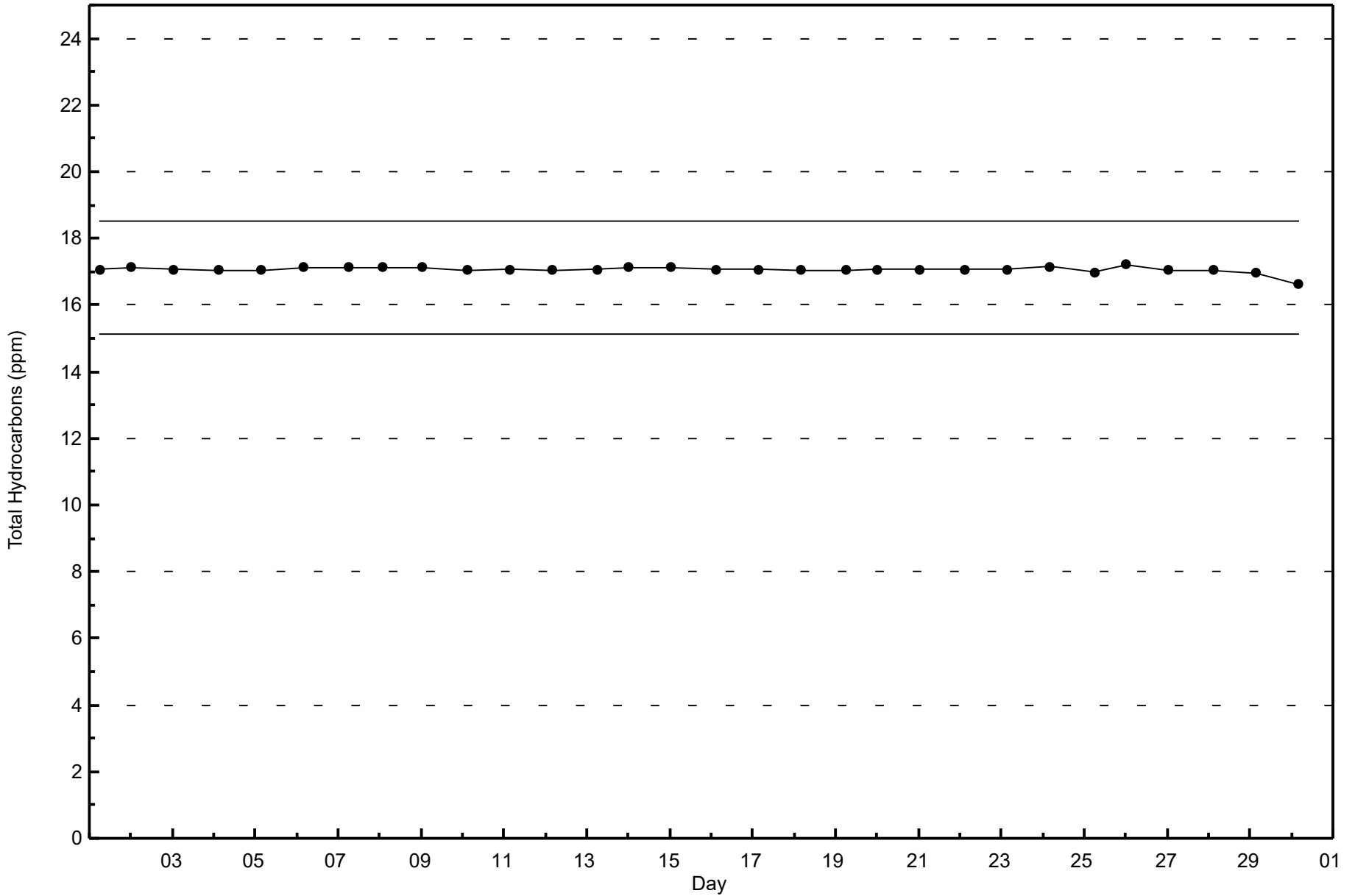


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Mildred Lake









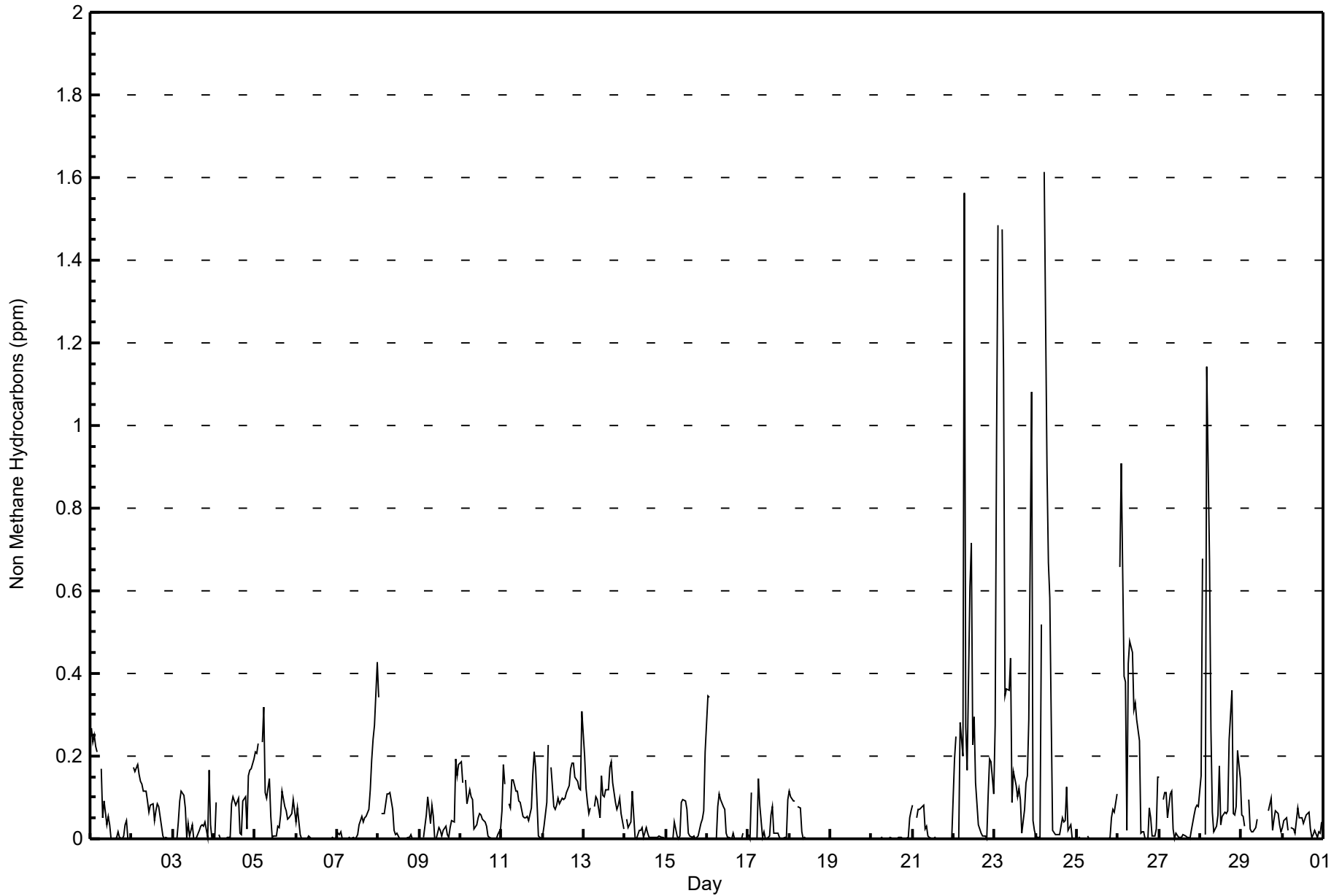
Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - June 2023

Maximum Value: 1.612 ppm on Jun 24 06:00		Maximum Daily Average: 0.406 ppm on Jun 23		Hours in Service: 720																							
Minimum Value: 0.000 ppm on Jun 1 13:00		Minimum Daily Average: 0.000 ppm on Jun 19		Hours of Data: 682																							
Maximum Diurnal Average: 0.206 ppm at hour 6		Minimum Diurnal Average: 0.033 ppm at hour 17		Hours of Missing Data: 38																							
Monthly Average: 0.085 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 = 1.0		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-Jun	0.267	0.235	0.252	0.224	0.210	Z	0.170	0.049	0.092	0.032	0.053	0.033	0.000	0.000	0.000	0.004	0.017	0.004	0.001	0.007	0.032	0.043	0.001	0.003	0.075	0.267	
2-Jun	Z	0.173	0.163	0.180	0.156	0.138	0.131	0.117	0.115	0.093	0.066	0.082	0.086	0.045	0.066	0.086	0.079	0.030	0.005	0.001	0.002	0.000	0.000	0.001	0.079	0.180	
3-Jun	0.003	Z	0.000	0.041	0.093	0.114	0.104	0.073	0.003	0.036	0.007	0.034	0.001	0.001	0.002	0.019	0.030	0.035	0.031	0.042	0.003	0.166	0.035	0.001	0.038	0.166	
4-Jun	0.001	0.087	Z	0.009	0.000	0.000	0.000	0.000	0.003	0.004	0.083	0.101	0.090	0.082	0.097	0.013	0.009	0.091	0.100	0.025	0.152	0.166	0.169	0.194	0.064	0.194	
5-Jun	0.211	0.207	0.230	Z	0.233	0.318	0.110	0.097	0.146	0.053	0.004	0.007	0.008	0.031	0.028	0.058	0.117	0.079	0.068	0.046	0.050	0.060	0.093	0.069	0.101	0.318	
6-Jun	0.040	0.074	0.011	0.000	Z	0.000	0.000	0.006	0.004	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.001	0.000	0.006	0.074	
7-Jun	0.015	0.010	0.016	0.000	0.000	Z	0.001	0.003	0.001	0.002	0.000	0.003	0.009	0.035	0.054	0.042	0.049	0.053	0.070	0.118	0.189	0.242	0.275	0.427	0.070	0.427	
8-Jun	0.343	Z	0.062	0.060	0.086	0.109	0.108	0.113	0.072	0.022	0.011	0.014	0.001	0.001	0.001	0.001	0.001	0.003	0.003	0.011	0.001	0.001	0.000	0.000	0.044	0.343	
9-Jun	0.002	Z	0.004	0.031	0.058	0.103	0.037	0.080	0.056	0.001	0.000	0.028	0.020	0.006	0.020	0.032	0.010	0.003	0.029	0.044	0.040	0.193	0.153	0.181	0.049	0.193	
10-Jun	0.185	0.134	Z	0.143	0.085	0.119	0.102	0.094	0.023	0.033	0.052	0.063	0.058	0.048	0.041	0.030	0.006	0.003	0.000	0.000	0.001	0.000	0.011	0.022	0.054	0.185	
11-Jun	0.067	0.178	0.131	Z	0.083	0.076	0.142	0.142	0.117	0.117	0.092	0.088	0.054	0.052	0.052	0.053	0.044	0.075	0.156	0.212	0.173	0.007	0.002	0.001	0.092	0.212	
12-Jun	0.005	0.030	0.089	0.227	Z	0.174	0.080	0.071	0.083	0.098	0.084	0.099	0.095	0.097	0.111	0.130	0.169	0.183	0.184	0.148	0.140	0.124	0.118	0.308	0.124	0.308	
13-Jun	0.200	0.121	0.088	0.061	0.073	Z	0.079	0.101	0.096	0.050	0.153	0.104	0.102	0.120	0.120	0.173	0.187	0.135	0.089	0.072	0.082	0.097	0.063	0.023	0.104	0.200	
14-Jun	Z	0.048	0.026	0.040	0.116	0.058	0.002	0.001	0.021	0.020	0.028	0.003	0.026	0.015	0.003	0.004	0.004	0.003	0.003	0.002	0.006	0.002	0.002	0.000	0.019	0.116	
15-Jun	0.000	Z	0.000	0.000	0.000	0.041	0.006	0.001	0.008	0.087	0.094	0.092	0.072	0.013	0.007	0.002	0.006	0.001	0.003	0.006	0.038	0.049	0.066	0.212	0.035	0.212	
16-Jun	0.347	0.341	Z	0.000	0.000	0.000	0.079	0.107	0.095	0.079	0.070	0.014	0.005	0.003	0.001	0.015	0.000	0.000	0.000	0.000	0.000	0.015	PF	PF	0.056	0.347	
17-Jun	0.012	0.000	0.113	Z	0.000	0.000	0.144	0.081	0.004	0.017	0.000	0.001	0.005	0.059	0.079	0.014	0.013	0.013	0.002	0.000	0.000	0.002	0.003	0.095	0.029	0.144	
18-Jun	0.117	0.103	0.093	0.092	Z	0.076	0.073	0.016	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	0.025	0.117	
19-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20-Jun	Z	0.001	0.001	0.000	0.002	0.001	0.002	0.000	0.000	0.001	0.000	0.003	0.001	0.000	0.000	0.000	0.004	0.005	0.001	0.000	0.000	0.003	0.052	0.069	0.006	0.069	
21-Jun	0.083	Z	0.049	0.070	0.071	0.076	0.080	0.025	0.031	0.007	0.003	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.022	0.083	
22-Jun	0.194	0.247	Z	0.000	0.281	0.201	1.561	0.273	0.166	0.609	0.716	0.227	0.295	0.136	0.033	0.024	0.014	0.008	0.006	0.000	0.106	0.195	0.187	0.107	0.243	1.561	
23-Jun	0.274	0.961	1.486	Z	1.475	1.132	0.347	0.364	0.359	0.437	0.087	0.164	0.130	0.101	0.123	0.093	0.014	0.071	0.135	0.154	0.289	1.080	0.043	0.019	0.406	1.486	
24-Jun	0.007	0.002	0.003	0.519	Z	1.612	0.894	0.668	0.584	0.296	0.019	0.010	0.012	0.011	0.009	0.052	0.041	0.045	0.125	0.021	0.035	0.001	0.000	0.001	0.216	1.612	
25-Jun	0.000	0.002	0.000	0.001	0.001	Z	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.002	0.051	0.070	0.063	0.107	0.013	0.107	
26-Jun	Z	0.658	0.908	0.393	0.381	0.020	0.424	0.477	0.450	0.311	0.327	0.290	0.238	0.014	0.017	0.018	0.000	0.000	0.073	0.051	0.007	0.008	0.024	0.148	0.228	0.908	
27-Jun	0.149	Z	0.094	0.111	0.113	0.050	0.110	0.114	0.025	0.001	0.014	0.004	0.002	0.003	0.009	0.007	0.003	0.002	0.000	0.020	0.059	0.076	0.082	0.077	0.049	0.149	
28-Jun	0.152	0.677	Z	0.010	1.143	0.671	0.266	0.063	0.017	0.030	0.057	0.176	0.033	0.055	0.065	0.062	0.069	0.241	0.361	0.062	0.059	0.079	0.213	0.147	0.205	1.143	
29-Jun	0.057	0.054	0.030	Z	0.095	0.024	0.018	0.017	0.026	0.047	C	C	C	C	C	C	C	0.069	0.099	0.020	0.046	0.067	0.060	0.034	0.018	--	0.099
30-Jun	0.028	0.046	0.050	0.021	Z	0.027	0.025	0.014	0.043	0.076	0.051	0.049	0.039	0.049	0.056	0.064	0.025	0.004	0.011	0.022	0.002	0.018	0.015	0.041	0.034	0.076	
		0.106	0.183	0.156	0.089	0.190	0.206	0.170	0.106	0.088	0.085	0.072	0.058	0.048	0.034	0.034	0.034	0.033	0.039	0.049	0.037	0.053	0.092	0.059	0.078	Diurnal Average	
		0.347	0.961	1.486	0.519	1.475	1.612	1.561	0.668	0.584	0.609	0.716	0.290	0.295	0.136	0.123	0.173	0.187	0.241	0.361	0.212	0.289	1.080	0.275	0.427	Diurnal Maximum	
Z - zerospan		C - Calibration		PF - Power Failure																							





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	234	34.31	34.31
0.006 - 0.05	176	25.81	60.12
0.06 - 0.1	174	25.51	85.63
> 0.1	98	14.37	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



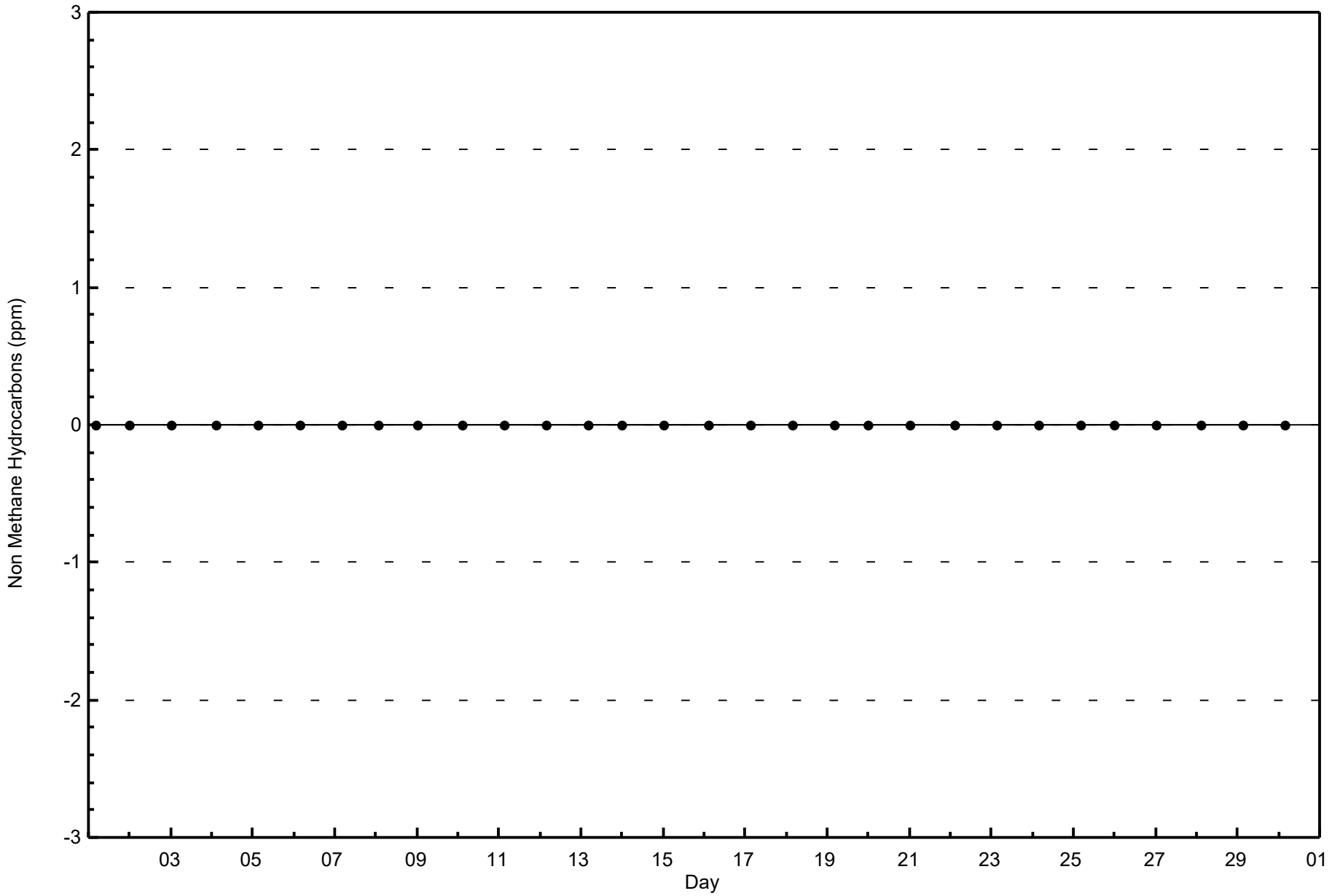
Wood Buffalo Environmental Association
Frequency Distribution

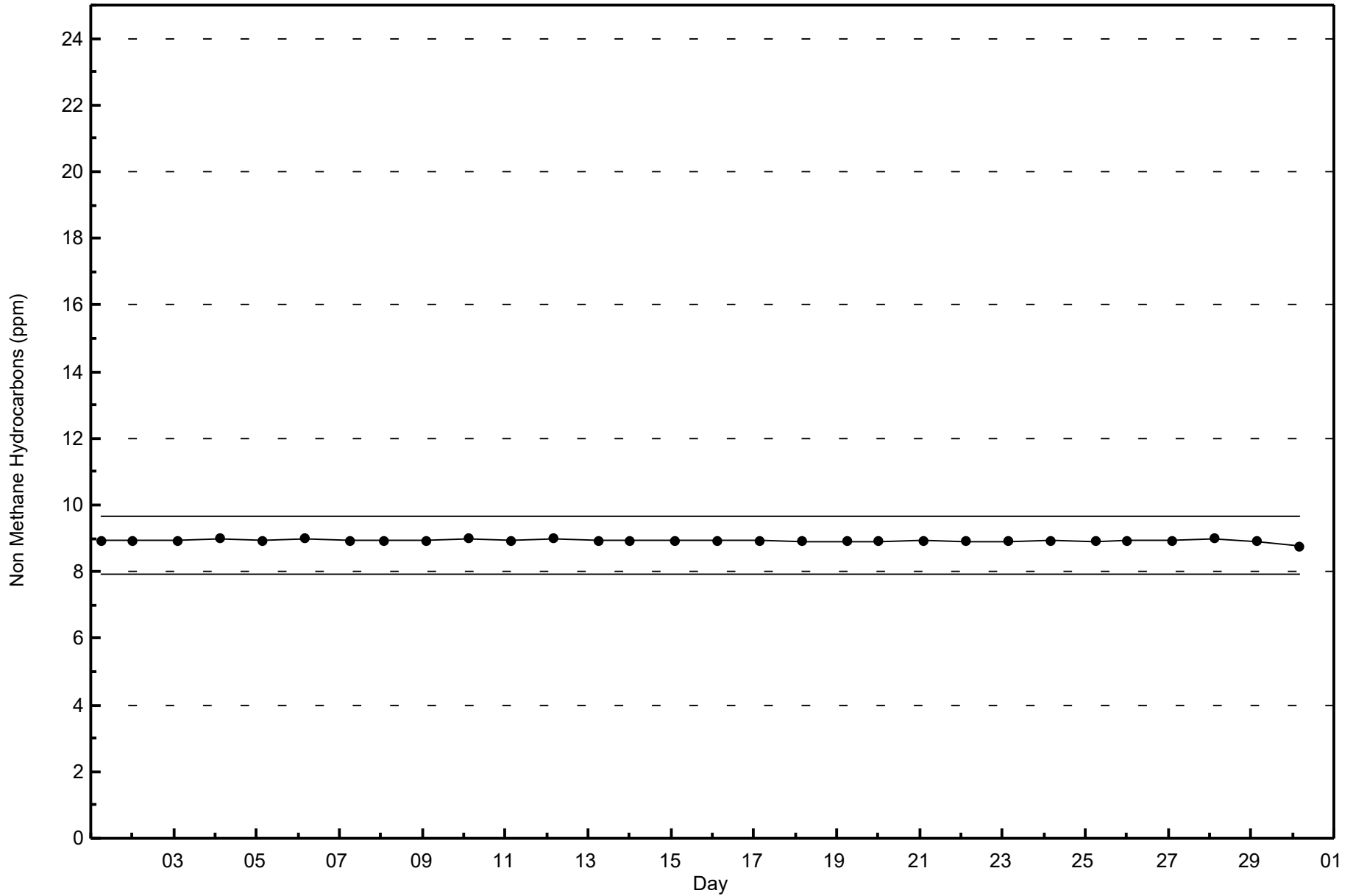
Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake - June 2023

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	78	24	13	11	8	1	2	8	14	6	29	2	0	0	7	31	234
0.006 - 0.05	24	11	4	2	5	7	1	27	17	16	16	10	7	9	5	15	176
0.06 - 0.1	34	7	0	2	3	7	19	17	11	7	5	12	7	7	7	28	173
> 0.1	3	3	1	2	2	6	10	35	8	2	2	2	2	7	3	8	96
Totals	139	45	18	17	18	21	32	87	50	31	52	26	16	23	22	82	679

Total Number of Valid Hours: 679

Total Number of Hours: 720







Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm Mildred Lake - June 2023

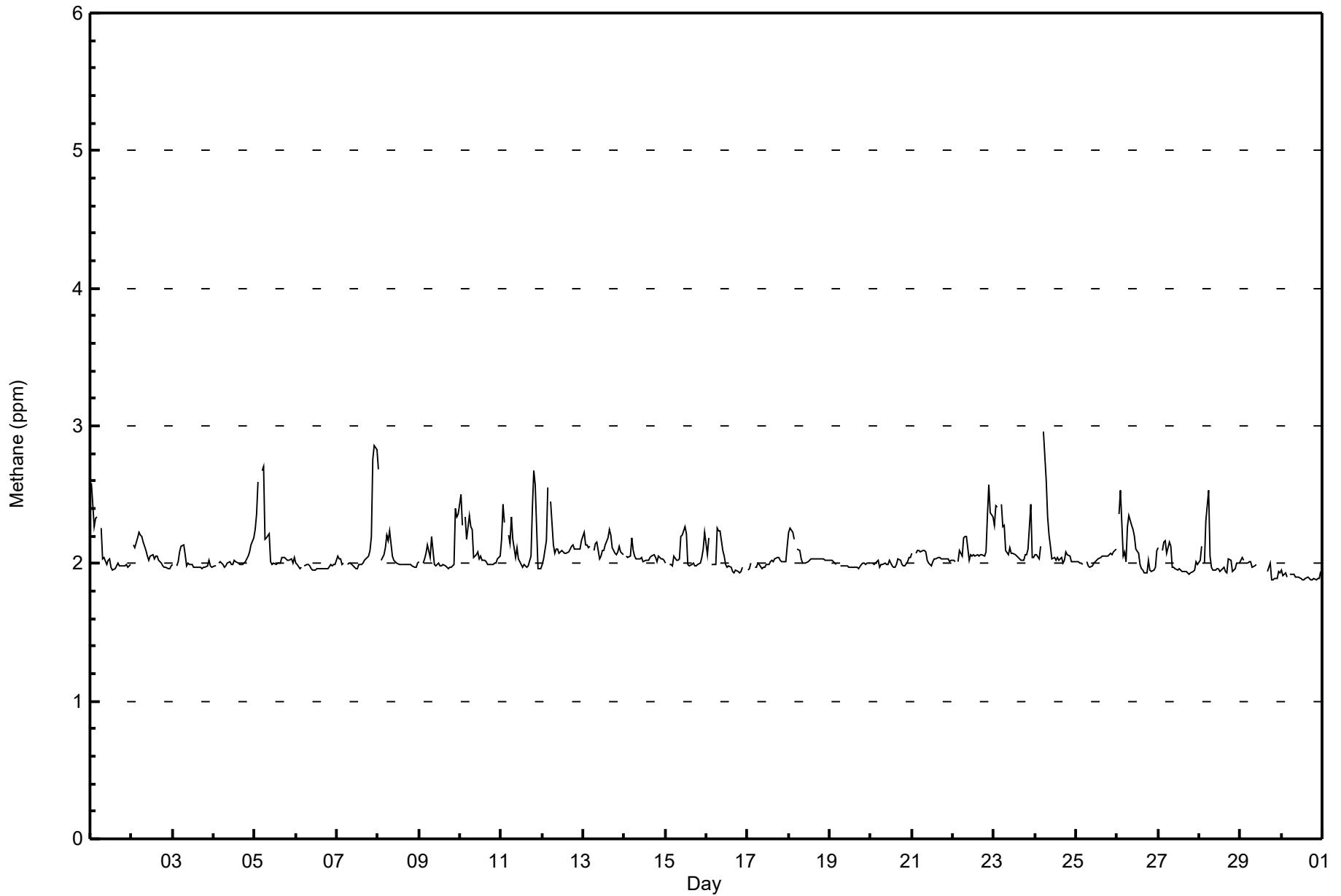
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum					
Maximum Value: 3.0 ppm on Jun 24 06:00		Maximum Daily Average: 2.2 ppm on Jun 23		Hours of Data: 682														2.1		2.6							
Minimum Value: 1.9 ppm on Jun 29 20:00		Minimum Daily Average: 1.9 ppm on Jun 30		Hours of Missing Data: 38														2.1		2.2							
Maximum Diurnal Average: 2.2 ppm at hour 6		Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Calibration: 36														2.0		2.1							
Monthly Average: 2.06 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.7		Percent Operational Time: 99.7														2.0		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-Jun	2.6	2.4	2.3	2.3	2.3	Z	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6	
2-Jun	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
3-Jun	2.0	Z	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	2.1	
4-Jun	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	2.1	2.1	2.2	2.0		
5-Jun	2.3	2.4	2.6	Z	2.7	2.7	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	2.0	2.0	2.0	2.0	2.1	2.7	
6-Jun	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	
7-Jun	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	2.1	2.1	2.2	2.8	2.9	2.8	2.1	2.9	
8-Jun	2.7	Z	2.0	2.1	2.1	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	2.0	2.1	2.7	
9-Jun	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.3	2.4	2.1	2.4	
10-Jun	2.5	2.3	Z	2.3	2.2	2.3	2.3	2.2	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	
11-Jun	2.2	2.4	2.3	Z	2.2	2.1	2.3	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.7	2.6	2.0	2.0	2.0	2.2	2.7		
12-Jun	2.0	2.0	2.2	2.6	Z	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.6	
13-Jun	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	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	2.1	2.1	2.2	
14-Jun	Z	2.1	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	
15-Jun	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.2	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.3	
16-Jun	2.1	2.2	Z	2.0	2.0	2.0	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	PF	PF	2.0	2.3
17-Jun	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	2.1	2.1
18-Jun	2.2	2.3	2.2	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	2.0	2.1	2.3	
19-Jun	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
20-Jun	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
21-Jun	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
22-Jun	2.0	2.0	Z	2.0	2.1	2.1	2.2	2.2	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.6	2.4	2.3	2.1	2.6
23-Jun	2.3	2.4	2.4	Z	2.4	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.4	2.0	2.0	2.2	2.4	
24-Jun	2.1	2.1	2.0	2.1	Z	3.0	2.6	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	3.0	
25-Jun	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	
26-Jun	Z	2.4	2.5	2.1	2.1	2.0	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.1	2.1	2.5	
27-Jun	2.1	Z	2.1	2.2	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2
28-Jun	2.0	2.1	Z	2.0	2.3	2.5	2.1	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.5
29-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	C	C	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	--	2.0	
30-Jun	2.0	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	
																								Diurnal Average		Diurnal Maximum	
																								2.1		2.7	
																								2.1		2.4	
																								2.1		2.6	
																								2.1		2.4	
																								2.0		3.0	
																								2.0		2.1	
																								2.1		2.5	
																								2.0		2.2	
																								2.0		2.5	
																								--		2.0	
																								1.9		2.0	
																								2.1		2.8	
																								2.1		2.9	
																								2.1		2.8	

Z - zerspan C - Calibration PF - Power Failure



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Mildred Lake - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Mildred Lake - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	447	65.54	65.54
2.1 - 3.0	235	34.46	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
Mildred Lake - June 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	96	36	17	13	14	16	6	41	39	26	49	16	10	12	12	43	446
2.1 - 3.0	43	9	1	4	4	5	26	46	11	5	3	10	6	11	10	39	233
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	139	45	18	17	18	21	32	87	50	31	52	26	16	23	22	82	679

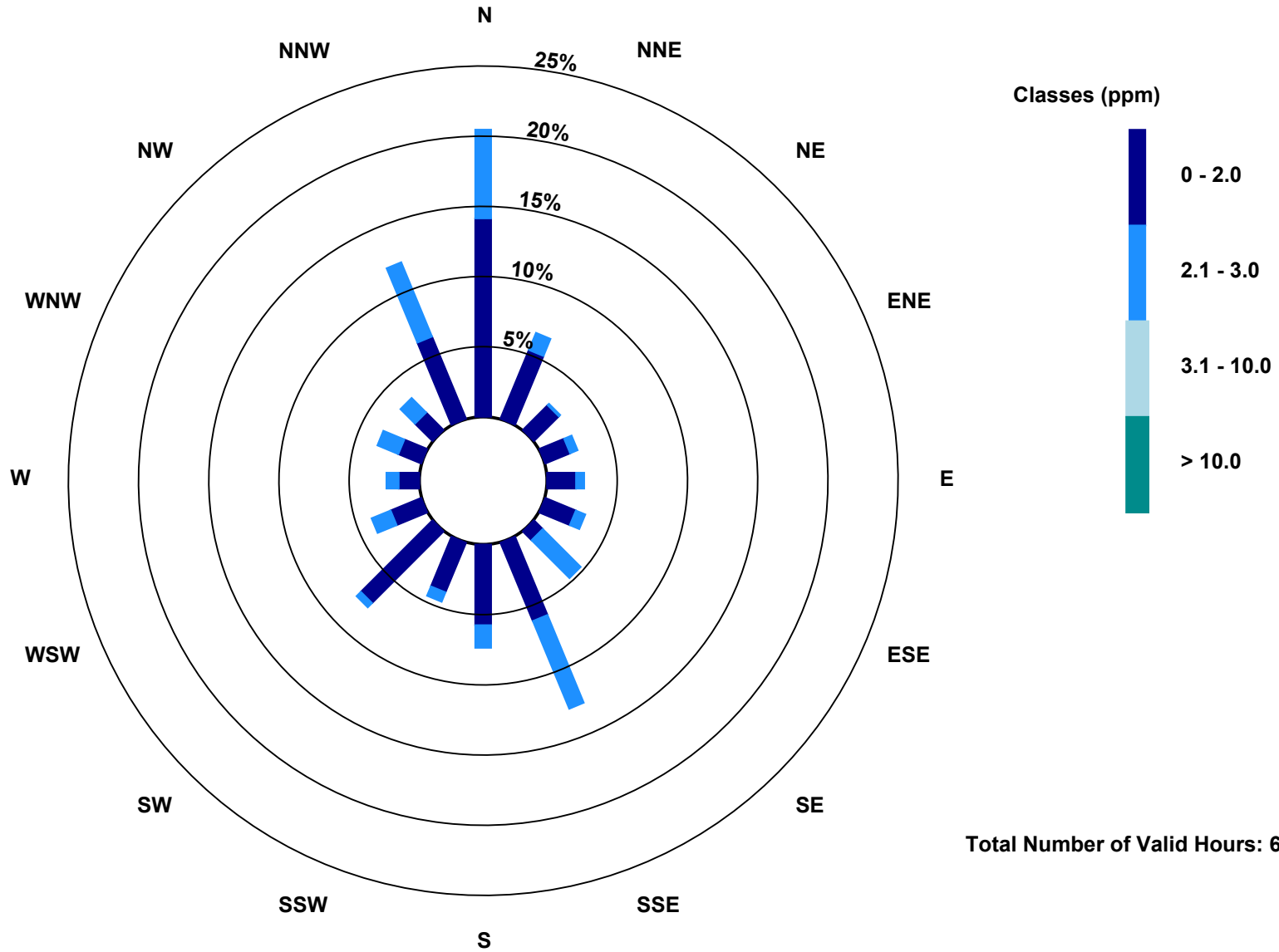
Total Number of Valid Hours: 679

Total Number of Hours: 720

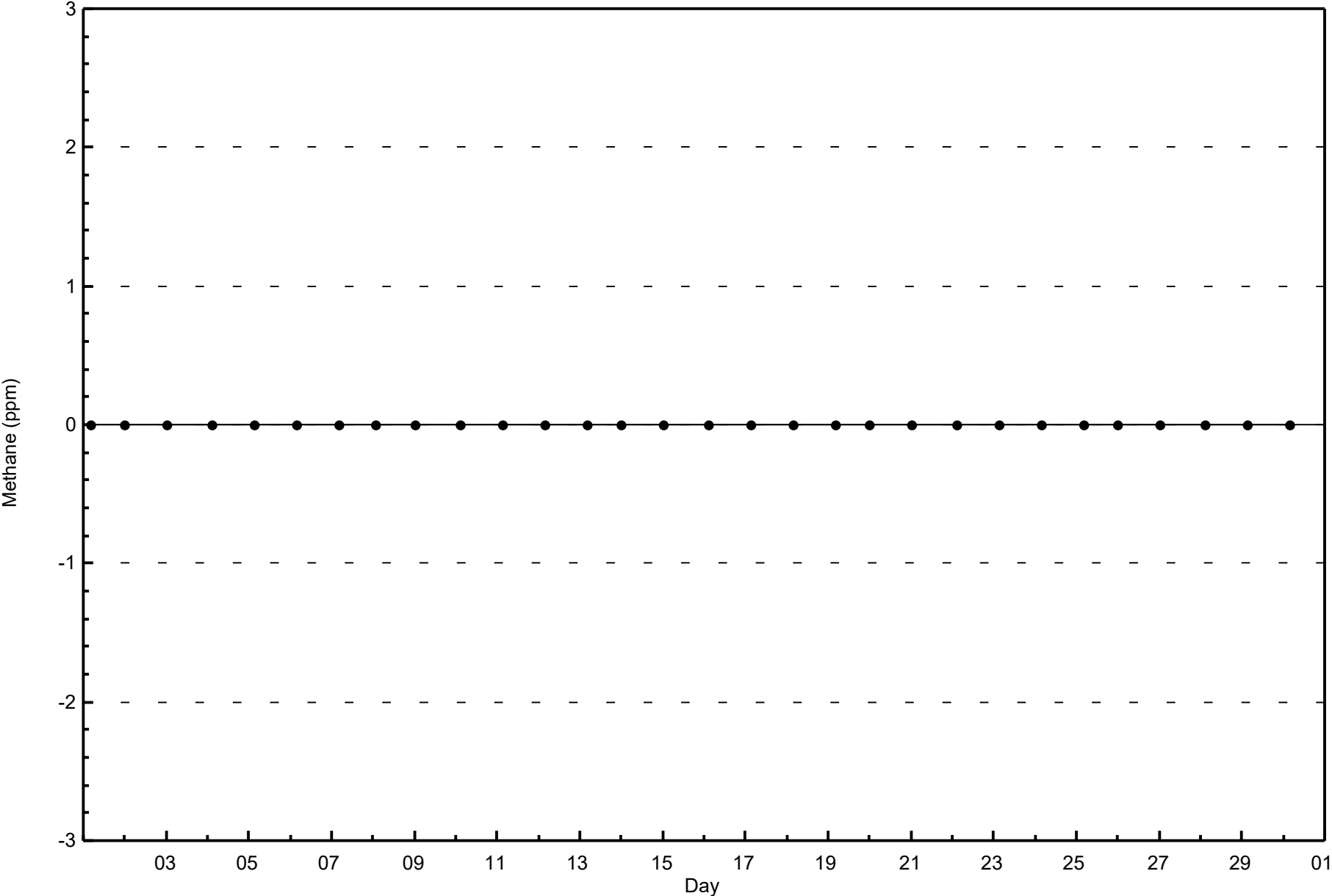


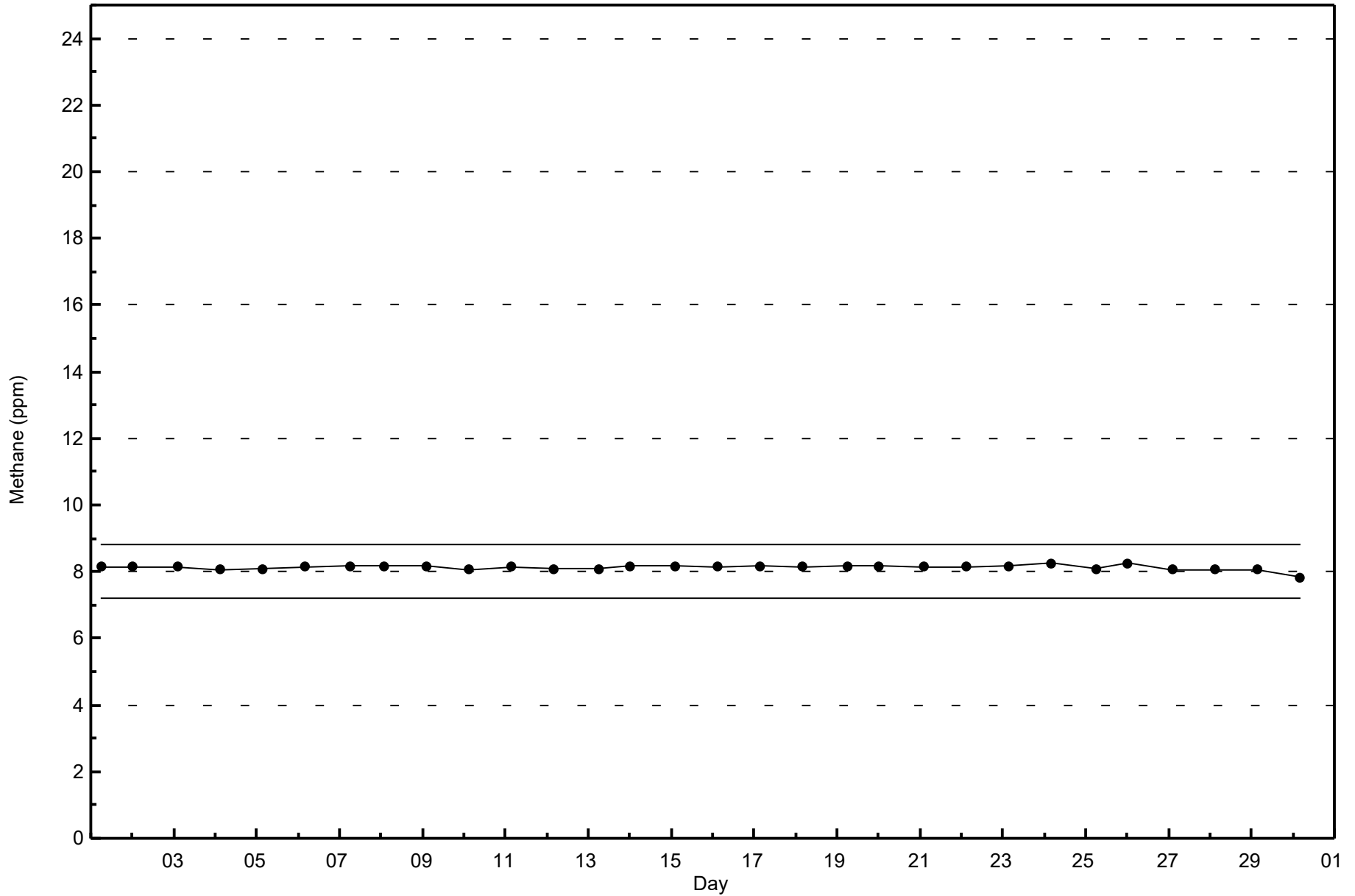
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Mildred Lake



Total Number of Valid Hours: 679







Wood Buffalo Environmental Association
Summary of Hour Averages

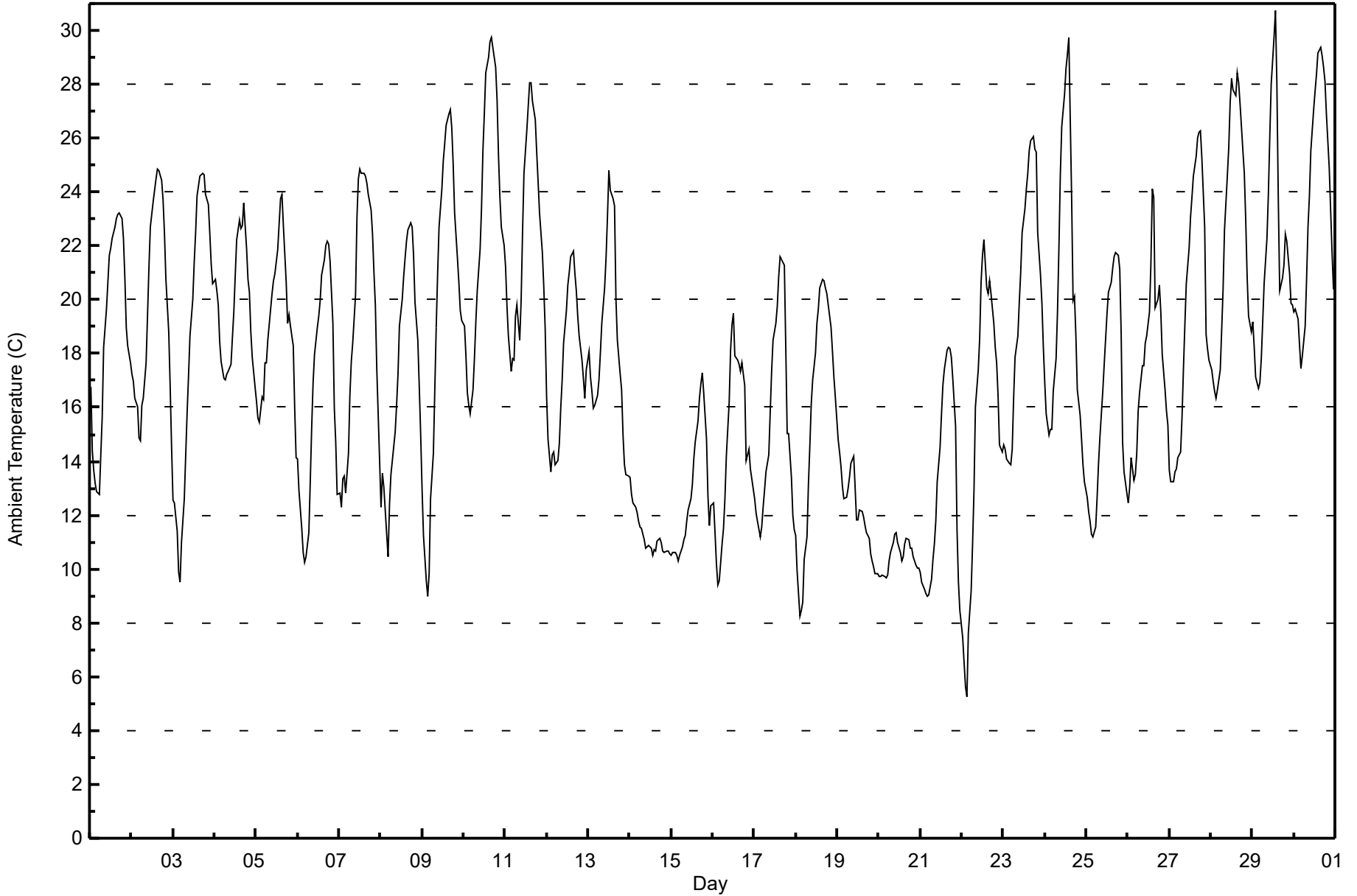
Ambient Temperature (AT) - C
Mildred Lake - June 2023

Maximum Value: 30.8 C on Jun 29 14:00		Maximum Daily Average: 23.7 C on Jun 30		Hours in Service: 720																						
Minimum Value: 5.3 C on Jun 22 04:00		Minimum Daily Average: 10.4 C on Jun 20		Hours of Data: 720																						
Maximum Diurnal Average: 22.2 C at hour 15		Minimum Diurnal Average: 12.9 C at hour 5		Hours of Missing Data: 0																						
Monthly Average: 17.73 C		Percentiles: P ₁ = 8.5 P ₁₀ = 10.8 Q ₁ = 13.5 Median = 17.7 Q ₃ = 21.4 P ₉₀ = 24.7 P ₉₉ = 29.1		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-Jun	16.8	14.4	13.7	13.2	12.9	12.8	14.3	15.7	18.2	19.6	20.6	21.7	21.9	22.3	22.7	23.0	23.2	23.2	23.0	22.3	20.8	19.0	18.3	17.6	18.8	23.2
2-Jun	17.2	17.0	16.3	16.0	14.9	14.8	16.1	16.3	17.7	19.4	21.2	22.7	23.6	24.1	24.5	24.8	24.8	24.4	23.7	22.4	20.8	18.8	16.8	14.6	19.7	24.8
3-Jun	12.5	12.4	11.4	9.9	9.5	11.0	12.6	14.2	15.8	17.2	18.7	20.0	21.4	22.5	23.9	24.6	24.6	24.7	24.6	23.9	23.5	22.5	21.4	20.6	18.5	24.7
4-Jun	20.7	20.3	19.8	18.5	17.7	17.1	17.0	17.2	17.3	17.6	18.6	19.6	20.9	22.2	23.0	22.6	22.7	23.6	21.9	20.8	20.3	18.8	17.9	16.8	19.7	23.6
5-Jun	16.2	15.6	15.4	16.4	16.3	17.7	17.7	18.5	19.7	20.2	20.7	21.0	21.9	22.8	23.7	23.9	22.7	20.7	19.1	19.4	19.0	18.3	16.0	14.1	19.0	23.9
6-Jun	14.1	12.9	11.5	10.6	10.2	10.5	11.4	13.3	15.2	16.9	18.0	19.0	19.4	20.0	20.9	21.5	22.0	22.2	22.1	21.4	19.1	16.0	14.7	12.8	16.5	22.2
7-Jun	12.8	12.3	13.3	13.5	12.8	14.3	16.4	17.7	18.4	20.2	23.1	24.5	24.9	24.7	24.7	24.6	24.3	23.9	23.3	22.4	21.0	19.8	17.5	14.0	19.4	24.9
8-Jun	12.3	13.5	13.0	11.3	10.5	12.4	13.5	14.1	15.1	16.1	17.2	19.0	20.0	20.8	21.5	22.2	22.6	22.9	22.7	21.7	19.9	18.5	16.8	15.0	17.2	22.9
9-Jun	13.0	11.2	9.6	9.0	9.9	12.6	14.3	16.6	19.0	21.0	22.7	24.1	25.1	25.8	26.5	26.9	27.1	26.4	25.0	23.2	21.5	20.7	19.6	19.2	19.6	27.1
10-Jun	19.0	17.9	16.5	16.1	15.8	16.7	17.8	19.2	20.3	21.8	23.4	25.5	26.9	28.4	29.0	29.6	29.7	29.4	28.7	27.4	25.4	23.8	22.7	22.0	23.0	29.7
11-Jun	21.2	19.8	18.7	17.4	17.8	17.7	19.4	19.8	18.5	20.0	22.5	24.7	26.3	27.2	28.1	28.1	27.4	26.7	25.5	24.4	23.2	21.7	20.5	18.9	22.3	28.1
12-Jun	16.4	14.8	13.6	14.3	14.3	13.9	14.0	14.6	16.0	17.0	18.4	19.6	20.5	21.0	21.6	21.8	21.0	20.3	19.4	18.7	17.8	17.1	16.3	17.4	17.5	21.8
13-Jun	18.1	17.1	16.6	16.0	16.1	16.5	17.0	18.0	19.1	20.5	21.6	23.1	24.8	24.1	23.8	23.5	20.0	18.5	17.3	16.7	15.0	13.9	13.5	13.4	18.5	24.8
14-Jun	13.4	12.8	12.4	12.3	12.1	11.7	11.6	11.5	11.1	10.8	10.8	10.9	10.8	10.5	10.7	10.7	11.0	11.1	11.0	10.7	10.6	10.7	10.7	10.6	11.3	13.4
15-Jun	10.5	10.6	10.6	10.5	10.3	10.5	10.8	11.1	11.3	11.8	12.2	12.6	13.2	14.1	14.7	15.5	16.4	16.9	17.3	16.5	14.8	12.7	11.6	12.3	12.9	17.3
16-Jun	12.4	11.3	10.2	9.4	9.6	10.9	11.5	12.6	14.2	16.2	18.1	19.1	19.5	17.9	17.8	17.6	17.4	17.6	16.8	14.0	14.2	14.5	13.7	13.0	14.6	19.5
17-Jun	12.6	12.1	11.8	11.2	11.6	12.3	12.9	13.6	14.2	15.8	17.3	18.5	19.1	19.8	20.9	21.6	21.5	21.3	18.3	15.0	15.0	13.4	12.0	11.5	15.6	21.6
18-Jun	11.2	10.0	8.2	8.5	8.8	10.4	11.2	13.1	14.5	16.1	17.0	18.0	19.1	19.6	20.4	20.8	20.7	20.4	20.2	19.8	19.0	18.1	17.1	16.4	15.8	20.8
19-Jun	14.8	14.4	13.8	13.1	12.6	12.7	13.0	13.4	13.9	14.2	13.1	11.8	11.8	12.2	12.1	11.9	11.6	11.3	11.1	10.6	10.3	10.1	9.8	9.8	12.2	14.8
20-Jun	9.7	9.7	9.8	9.7	9.7	9.7	10.3	10.6	11.0	11.3	11.3	11.0	10.6	10.3	10.5	10.9	11.1	11.1	10.7	10.8	10.5	10.2	10.0	10.1	10.4	11.3
21-Jun	9.9	9.5	9.2	9.1	9.0	9.0	9.6	10.3	10.9	11.8	13.3	14.5	15.7	16.8	17.4	18.1	18.3	18.2	17.9	17.1	15.3	11.4	9.5	8.4	12.9	18.3
22-Jun	7.5	6.5	5.6	5.3	7.6	9.2	10.9	12.9	16.0	17.4	18.5	20.7	21.7	22.2	20.4	20.2	20.7	20.3	19.1	18.2	17.7	16.4	14.6	14.4	15.2	22.2
23-Jun	14.6	14.5	14.1	13.9	13.9	14.4	16.3	17.9	18.7	19.9	21.0	22.5	23.4	24.1	24.7	25.5	25.9	26.1	25.6	25.5	22.5	20.9	19.9	18.2	20.2	26.1
24-Jun	16.9	15.7	15.0	15.2	15.2	16.6	17.8	19.6	21.9	24.7	26.4	27.6	28.6	29.1	29.7	23.8	20.0	20.1	18.7	16.7	15.7	14.8	13.9	13.2	19.9	29.7
25-Jun	12.7	12.2	11.8	11.3	11.2	11.5	12.7	13.9	14.9	16.6	17.6	18.6	19.5	20.3	20.7	21.2	21.6	21.7	21.6	21.1	18.7	14.7	13.6	12.8	16.4	21.7
26-Jun	12.4	13.0	14.1	13.3	13.5	14.3	15.9	16.6	17.5	17.6	18.4	18.7	19.5	21.3	24.1	23.8	19.7	20.0	20.5	19.6	18.0	16.7	15.9	15.4	17.5	24.1
27-Jun	13.7	13.2	13.3	13.6	13.7	14.1	14.3	15.7	17.4	19.1	20.6	21.9	23.1	23.8	24.6	25.3	26.0	26.2	26.3	25.3	22.7	18.7	18.2	17.8	19.5	26.3
28-Jun	17.4	17.0	16.6	16.4	16.7	17.4	18.9	20.4	22.6	24.6	25.7	27.3	28.2	27.8	27.6	28.4	28.0	27.3	25.6	24.7	22.9	20.9	19.4	18.8	22.5	28.4
29-Jun	19.2	18.2	17.1	16.7	16.9	17.8	19.2	20.6	22.3	23.9	26.0	28.0	29.7	30.8	28.1	23.8	20.3	20.8	21.3	22.5	22.2	21.0	19.9	19.8	21.9	30.8
30-Jun	19.5	19.7	19.3	18.4	17.4	17.9	19.0	20.8	22.7	23.9	25.5	27.1	27.7	28.4	29.2	29.4	29.1	28.6	28.1	26.9	24.9	23.3	21.8	20.4	23.7	29.4
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	34	4.72	4.72
10 - 20	441	61.25	65.97
> 20	245	34.03	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

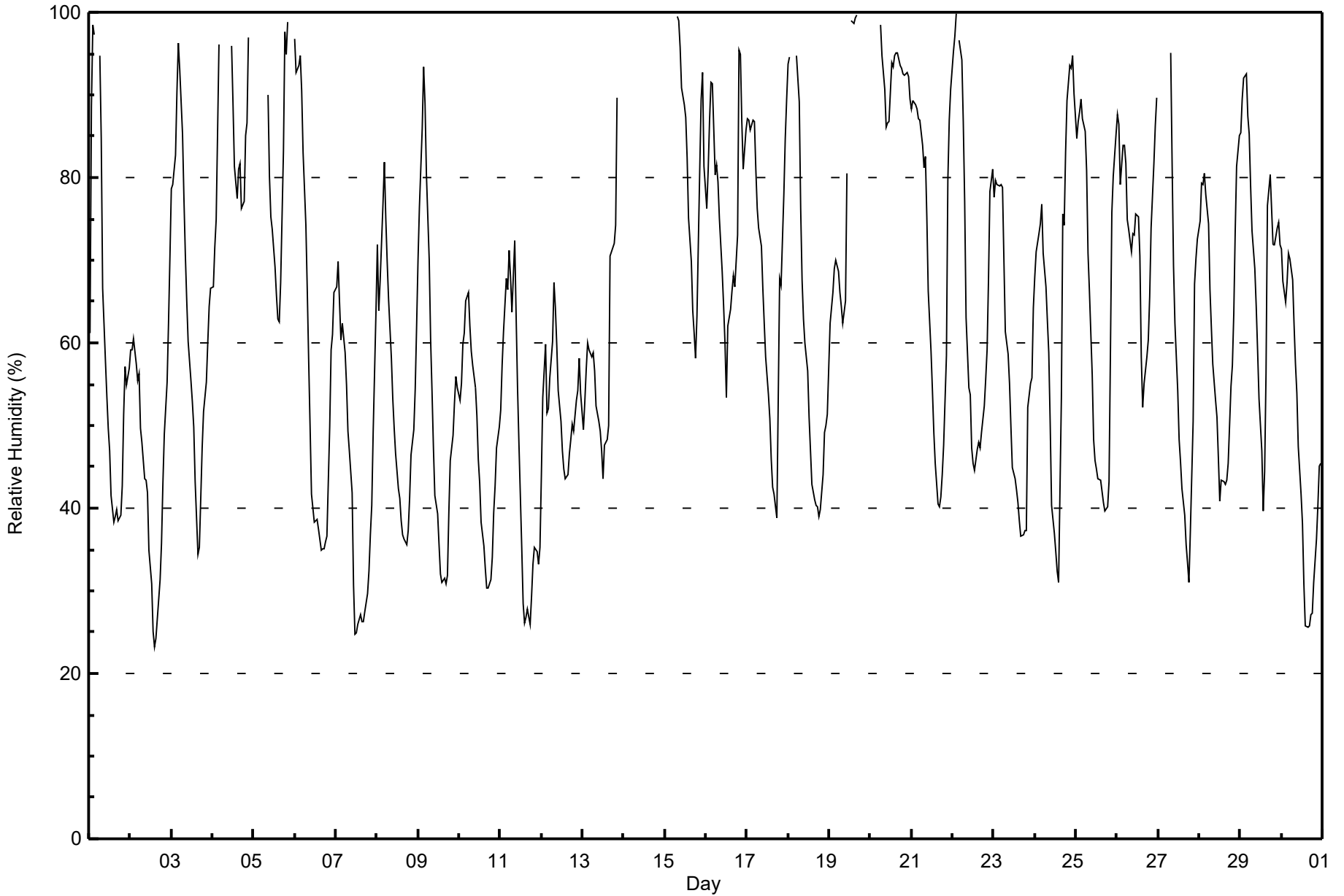


Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 99.8 % on Jun 22 03:00		Maximum Daily Average: 92.3 % on Jun 20		Hours in Service: 720																																													
Minimum Value: 23.3 % on Jun 2 15:00		Minimum Daily Average: 43.4 % on Jun 7		Hours of Data: 640																																													
Maximum Diurnal Average: 78.7 % at hour 5		Minimum Diurnal Average: 47.4 % at hour 15		Hours of Missing Data: 80																																													
Monthly Average: 62.11 %		Percentiles: P ₁ = 25.8 P ₁₀ = 36.5 Q ₁ = 46.0 Median = 61.1 Q ₃ = 78.8 P ₉₀ = 89.6 P ₉₉ = 98.7		Hours of Calibration: 0																																													
				Percent Operational Time: 88.9																																													
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-Jun	61.2	88.7	98.5	97.3	OR	OR	94.7	84.7	66.7	57.9	53.6	49.7	46.9	41.5	38.2	39.0	39.9	38.4	39.1	42.7	51.4	57.1	54.8	56.9	59.0	98.5																							
2-Jun	59.1	59.1	60.4	57.4	55.4	56.3	49.7	48.0	43.6	43.4	41.9	35.0	30.8	25.2	23.3	24.2	26.7	31.4	35.8	43.0	49.0	55.2	62.4	70.4	45.3	70.4																							
3-Jun	78.7	79.1	82.8	90.3	96.2	93.1	85.3	77.4	70.7	65.1	60.2	55.5	52.9	49.9	43.2	34.4	35.3	41.1	47.2	51.7	55.2	60.1	64.4	66.6	64.0	96.2																							
4-Jun	66.8	71.5	74.9	85.5	96.1	OR	OR	OR	OR	OR	OR	95.9	89.0	81.3	77.4	81.0	81.7	76.2	77.1	85.0	86.6	96.9	OR	OR	OR	--	96.9																						
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	90.1	80.2	75.3	73.8	69.1	65.7	62.8	62.6	67.3	83.3	97.6	95.0	98.8	OR	OR	OR	--	98.8																					
6-Jun	96.7	92.8	93.6	94.8	90.6	83.0	74.3	66.2	57.9	49.8	41.7	38.4	38.5	38.7	37.4	35.0	35.0	35.1	35.9	36.6	49.9	59.1	61.1	66.2	58.7	96.7																							
7-Jun	66.7	69.8	65.0	60.3	62.3	58.8	54.9	49.3	47.0	41.9	30.7	24.8	24.9	25.9	27.1	26.3	26.2	27.4	29.6	32.3	36.8	40.3	49.1	63.7	43.4	69.8																							
8-Jun	71.9	63.9	67.7	76.7	81.8	75.0	69.8	65.3	58.1	53.2	49.7	46.6	42.4	41.1	38.5	36.7	36.2	35.7	37.3	41.3	46.4	49.5	54.5	62.0	54.2	81.8																							
9-Jun	70.0	76.4	85.9	93.4	89.0	80.4	70.0	60.4	54.1	47.4	41.6	39.3	35.7	32.1	30.9	31.5	30.8	31.9	39.5	45.7	48.9	52.7	55.9	54.5	54.1	93.4																							
10-Jun	53.0	55.0	59.9	61.2	65.2	66.1	62.0	58.9	57.3	54.5	51.1	46.0	43.0	38.3	35.3	32.7	30.3	30.4	31.4	34.0	39.5	42.7	47.3	49.9	47.7	66.1																							
11-Jun	51.8	57.3	61.3	67.7	66.5	71.2	68.0	63.7	72.4	63.3	54.5	47.8	35.3	28.6	26.1	26.8	27.8	25.9	29.3	33.2	35.3	34.8	33.2	35.2	46.5	72.4																							
12-Jun	44.0	53.4	59.8	51.5	52.1	55.8	60.1	67.3	64.3	59.6	54.3	50.4	46.9	44.8	43.6	44.0	46.6	48.3	50.1	49.4	53.0	54.2	58.2	53.9	52.7	67.3																							
13-Jun	49.5	52.9	56.8	60.1	59.1	58.4	58.8	56.6	52.4	50.5	49.3	47.0	43.5	47.6	48.2	50.0	70.5	71.0	72.0	74.2	89.7	OR	OR	OR	58.0	89.7																							
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	--																						
15-Jun	OR	OR	OR	OR	OR	OR	OR	OR	99.5	99.0	95.7	90.9	88.8	87.3	82.4	75.0	69.8	63.9	61.2	58.1	63.3	80.9	89.5	92.7	81.4	--	99.5																						
16-Jun	76.2	80.9	86.9	91.5	91.3	80.4	81.6	79.4	75.1	68.6	64.5	60.0	53.5	62.1	64.1	66.2	68.1	66.7	73.0	95.4	95.0	86.8	81.1	85.8	76.4	95.4																							
17-Jun	87.1	87.0	85.7	86.9	86.7	81.0	76.2	73.9	71.6	66.5	62.4	58.4	53.7	50.9	45.9	42.6	41.7	38.8	53.3	67.8	66.9	78.0	84.8	89.5	68.2	89.5																							
18-Jun	93.8	94.7	OR	OR	OR	94.7	89.2	76.3	67.6	63.0	60.0	56.6	51.0	47.0	42.9	41.0	40.4	40.1	39.0	39.8	44.1	49.2	50.0	51.3	58.7	94.7																							
19-Jun	62.3	64.2	66.0	69.0	70.1	68.7	66.1	64.4	62.4	65.1	80.5	OR	OR	99.0	98.6	99.3	99.7	OR	OR	OR	OR	OR	OR	OR	--	99.7																							
20-Jun	OR	OR	OR	OR	OR	OR	98.6	94.7	90.7	86.1	86.7	86.8	93.9	93.4	94.8	95.2	95.1	93.6	93.2	92.6	92.4	92.7	92.2	89.6	92.3	98.6																							
21-Jun	88.2	89.2	88.8	88.3	87.2	87.0	83.9	81.2	82.6	75.2	66.3	59.0	54.2	49.1	45.4	40.5	40.2	41.3	44.1	47.6	58.5	79.7	86.9	90.7	69.0	90.7																							
22-Jun	95.3	97.1	99.8	OR	96.6	94.3	86.9	77.1	63.0	54.6	53.7	47.3	45.4	44.5	47.1	47.9	47.4	49.1	52.4	55.5	59.2	67.7	78.4	81.0	67.0	99.8																							
23-Jun	77.7	79.7	79.1	79.0	79.2	78.8	70.0	61.3	58.7	55.1	49.9	44.9	43.6	42.3	40.6	38.4	36.6	36.7	37.3	37.3	52.2	55.1	55.7	64.2	56.4	79.7																							
24-Jun	68.0	71.0	73.1	74.4	76.7	70.9	66.8	62.8	58.9	50.3	40.4	37.0	34.8	32.3	31.1	53.4	75.6	74.2	83.1	89.3	93.6	93.2	94.8	90.2	66.5	94.8																							
25-Jun	84.7	86.9	87.9	89.4	87.1	85.5	80.8	70.8	66.3	56.2	48.3	45.8	44.8	43.5	43.5	42.0	40.7	39.7	40.2	43.3	59.0	75.7	80.2	85.2	63.7	89.4																							
26-Jun	87.6	86.4	79.1	83.9	83.9	81.7	75.0	73.7	71.0	73.2	73.1	75.6	75.3	70.6	58.4	52.2	55.0	58.3	60.3	65.6	73.8	81.7	86.2	89.6	73.8	89.6																							
27-Jun	OR	OR	OR	OR	OR	98.6	OR	95.1	81.8	69.3	62.4	54.3	48.3	45.6	42.3	39.1	35.6	33.4	31.0	37.1	50.4	67.0	70.2	72.5	57.4	98.6																							
28-Jun	74.8	79.3	79.1	80.4	78.0	74.4	66.5	61.9	57.5	53.1	51.0	46.2	40.8	43.4	43.1	42.9	43.4	45.4	54.8	57.3	63.5	73.4	81.3	85.0	61.5	85.0																							
29-Jun	85.4	89.5	92.0	92.5	87.5	85.2	78.9	73.6	69.0	64.4	59.0	53.2	47.0	39.7	44.4	56.4	76.6	80.3	76.2	71.9	71.9	73.9	74.5	71.9	71.4	92.5																							
30-Jun	71.4	67.4	64.9	67.3	70.8	70.1	67.6	62.1	57.4	53.9	47.5	41.7	38.2	30.9	25.7	25.7	25.8	27.1	27.4	31.0	36.2	40.3	45.1	45.5	47.5	71.4																							
																								72.9	75.7	77.0	78.2	78.7	77.1	73.4	70.6	66.7	61.3	57.2	53.8	50.4	49.6	47.4	47.5	49.7	48.6	51.6	55.7	62.1	65.6	67.8	70.1	Diurnal Average	
																								96.7	97.1	99.8	97.3	96.6	98.6	98.6	99.5	99.0	95.7	90.9	95.9	93.9	99.0	98.6	99.3	99.7	93.6	97.6	95.4	98.8	96.9	94.8	90.7	Diurnal Maximum	

OR - Out of Range





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Speed: 29 km/h on Jun 19 14:00	Maximum Daily Speed Average: 21.0 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 5 01:00	Minimum Daily Speed Average: 0.4 km/h on Jun 24	Hours of Data: 717
Maximum Diurnal Speed Average: 4.4 km/h at hour 16	Minimum Diurnal Speed Average: 0.2 km/h at hour 11	Hours of Missing Data: 3
Monthly Average Velocity: 1.7 km/h 334.1 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 16 P ₉₉ = 24	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	W3	SSW3	NNW6	N5	E3	ESE4	SSW6	SW6	S6	SE4	WNW4	NW5	N8	NNW11	N8	N5	NNE7	NNE7	NE6	NE5	NE3	E5	E6	N6	NNE2.4	NNW11
2-Jun	N6	N6	NNW7	NNW9	NNW8	NNW9	NNW10	NNW7	N8	NNW3	SW2	WNW5	W4	N10	NNE9	N9	NNE9	NE9	NE9	NNE9	NNE6	NE6	NE5	NE5	N6.1	NNW10
3-Jun	NE3	N6	N6	N6	N5	NNE2	N4	N6	NNW7	N10	NNE9	NNE7	N9	N7	NE4	ESE8	ESE8	ESE9	ESE10	ESE9	E11	ESE7	E7	E8	NE4.4	E11
4-Jun	E10	ESE11	ESE10	E7	ENE6	ENE8	ENE10	ENE6	E8	E7	ESE6	ESE8	ESE10	ESE9	E7	E8	E8	ESE11	SSE8	ESE2	ENE5	ESE3	WNW1	UO	E6.9	ESE11
5-Jun	SSE1	ENE1	N2	NNW3	NW3	NNW8	NNW10	NNW9	N10	NNE12	NNE12	NNE11	N11	N10	N11	NNW12	NNW11	NNW8	N6	NNE6	NNW7	WSW6	W20	W14	NNW6.6	W20
6-Jun	W16	WSW14	SW12	SW11	SW11	SW14	SW12	SW10	SW11	SW13	SW15	SW15	SW15	SW15	SW15	SW15	SW14	SW14	SW12	SW11	S5	SSE5	S5	SSE3	SW11.3	W16
7-Jun	S5	SSE5	SSE10	S13	SSE10	SSE8	S8	SSW11	SW10	SSW11	SW15	SW18	WSW19	W16	W15	W17	WNW15	WNW15	WNW12	W10	WNW10	WNW9	WNW6	SW3	WSW7.9	WSW19
8-Jun	NNW4	N11	N7	NNW4	NNW5	NNW6	NNW8	N8	N8	NNW8	NW8	SSW7	WSW4	ESE6	E5	N3	ENE5	NNE6	NNE6	NNE6	NNE6	NNE6	NE6	ENE6	N4.2	N11
9-Jun	NE4	NNE4	N4	NNW2	N2	S2	SSW6	SSE7	SSE9	SSE8	SSE6	SSE8	S10	SSE8	SSE9	SSE10	SSE10	S11	SSW7	S5	SSE7	SSE8	SSE7	SSE8	SSE5.4	S11
10-Jun	SSE11	SE8	SSE7	SE11	SE10	SSE10	SSE13	SSE14	SSE13	SSE14	SSE17	SSE16	SSE19	SSE20	SSE22	SSE22	S23	S23	S23	S19	SSE12	SSE11	SSE10	SSE9	SSE14.6	S23
11-Jun	SE12	SE4	SE6	WSW2	WSW1	SSW4	WSW5	W10	W9	WNW8	WNW9	NNW10	NW15	NNW10	NNW12	NNW14	NNW13	NW13	WNW8	WNW8	NW11	NNW11	NW11	NW10	WNW6.7	NW15
12-Jun	NNW6	NNW5	NW5	WNW7	WNW7	NW4	NNW7	N9	NNW7	NNW7	NW6	NW5	N8	N4	N4	N7	NNE7	NE7	NNE6	NNE6	N7	N6	ENE6	ESE11	N4.6	ESE11
13-Jun	SSE11	SE8	SE9	SE10	SE13	SE14	SE11	SSE12	SSE11	SSE8	SSE6	SSE6	S2	NNW13	N14	NNW11	NNW19	N20	N15	N16	N14	N15	N14	NNE14	NE3.7	N20
14-Jun	NNE14	N13	N11	N15	N15	N13	N14	N15	N20	N19	N19	N17	N16	N17	N19	NNW18	NNW18	N19	N17	N18	N23	N20	NNW19	NNW20	N16.9	N23
15-Jun	NNW20	NNW19	NNW17	NNW18	NNW17	NNW14	NNW10	NNW13	NW7	NW8	WNW11	WNW11	NW11	NNW13	NNW14	NNW12	NNW12	N9	N5	ENE3	ESE2	SSE3	WSW3	W7	NNW9.8	NNW20
16-Jun	WSW6	SW6	SW7	SW5	S7	S9	SSE8	SE10	SE10	SE12	SE11	SSE13	SW13	SSW12	SW11	S14	S15	S13	SSW14	SSW9	S9	WSW11	SW14	SW14	S8.7	S15
17-Jun	SW14	SW11	SW12	SW8	SW9	SW13	SW13	WSW13	SW13	SW10	SSW14	SW15	SW15	WSW12	WSW11	W12	WNW10	W11	N13	NNE11	NE5	N2	NNW7	NNW7	WSW7.5	SW15
18-Jun	NNW8	N5	E3	N7	N6	N6	N8	N7	N8	N10	N13	N15	N17	N16	NNE16	NNE17	NNE17	NNE15	NNE17	NNE14	N13	N13	N17	N17	N11.6	N17
19-Jun	N13	N13	N14	N16	N17	N20	N24	N26	N26	NNE24	NNE22	NNE16	N23	N29	N28	N24	N23	N23	N22	N24	N22	N20	N21	NNW20	N21.0	N29
20-Jun	NNW19	N17	N16	N17	N18	N16	N17	N18	N16	N17	N15	NNW14	NNW11	NNW15	NNW12	NNW11	NNW10	NW12	NW10	NNW9	NW8	NW9	NW9	NW10	NNW13.2	NNW19
21-Jun	NNW9	NNW10	NNW9	NNW9	NNW10	NNW9	NNW10	NNW12	N11	N12	N12	N12	NNW10	N11	N12	N13	N11	N12	NNE9	ENE7	ENE5	ENE3	SE2	SE2	N8.1	N13
22-Jun	UO	NNE2	NE2	E3	SSE3	S5	S5	ESE5	SSE10	SSE13	SSE10	SSE9	SSE8	SSW9	W12	WSW12	WSW10	WSW9	SW8	WSW6	WSW3	WSW2	SSE2	E3	SSW4.0	SSE13
23-Jun	ESE3	SSE3	ESE4	SSE4	S4	E4	SE7	SSE8	SE7	SSE7	SE9	SSE10	SSE10	SE8	ESE5	SE3	WSW1	SSE5	SSE5	SSE4	SE4	SSE7	SSE7	S7	SSE5.3	SSE10
24-Jun	SSW5	S4	SSE6	SSE7	SE6	SSE8	SE9	SSE8	SSE8	S7	SSW12	SSW13	SSW12	SSW13	SSW12	NNE10	NE4	N12	NNW17	N22	NNE13	N16	N15	N14	NE0.4	N22
25-Jun	NNE10	N7	N8	N8	N9	N9	NNE10	NE10	ENE8	ENE10	NE11	NE8	NNW10	NNW10	NW11	NNW9	NW6	NNW4	NNW6	NNW5	N3	ENE4	SE2	UO	N6.4	NW11
26-Jun	S3	SSE3	SSE9	S6	SSE10	SSE7	SSE10	SE10	SE10	SE10	SSE13	SSE11	S8	S9	SSW11	WNW8	N19	N5	SSW6	S9	S6	SSE3	ENE2	NNE2	SSE4.9	N19
27-Jun	S1	NW3	NNW6	N9	N8	N8	N8	N9	N11	N11	NNW12	N11	NNE9	N8	NNW6	N5	NNE3	NNE5	NNW5	NNW6	NNW4	N3	S4	S4	N5.7	NNW12
28-Jun	SSE5	SSE5	S5	SSE5	SE5	SE8	SSE10	SSE11	SSE11	S9	SSE9	S8	S6	WSW2	NNW2	SW8	SSW8	SSE7	SSE9	SSW10	S6	SE3	S2	S4	S6.0	SSE11
29-Jun	SSW5	S6	SSE5	S6	S6	S8	S10	S10	SSE9	SSE10	SSE9	S11	S11	SSW10	WSW13	WSW16	W8	S7	S8	S7	S8	SSW7	SW5	SW6	S7.1	WSW16
30-Jun	SW8	SW9	SW9	SSW7	SSW5	SSW8	SSW8	SSW8	SSW8	SW9	SW11	SW10	SSW14	WSW13	WSW13	WSW13	SW15	SW15	SW14	WSW13	SW11	WSW8	SW8	WSW8	SW9.9	SW15

NNW1.4	NNW1.7	NNW1.2	NNW1.7	N1.2	N0.6	N0.8	N1.0	NE0.8	NE0.7	N0.2	SW1.1	W2.1	NW3.3	NW4.0	NW4.4	NNW3.9	NNW2.8	NNW2.2	N2.5	N2.4	N2.4	NNW2.2	NNW2.4	Diurnal Average	
NNW20	NNW19	NNW17	NNW18	N18	N20	N24	N26	NNE26	NNE24	NNE22	SW18	N23	N29	N28	N24	S23	S23	S23	N24	N23	N20	N21	NNW20	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 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 9 km/h on Jun 26 16:00	Hours of Data: 717
Minimum Value: 0 km/h on Jun 25 22:00	Hours of Missing Data: 3
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: 99.6

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

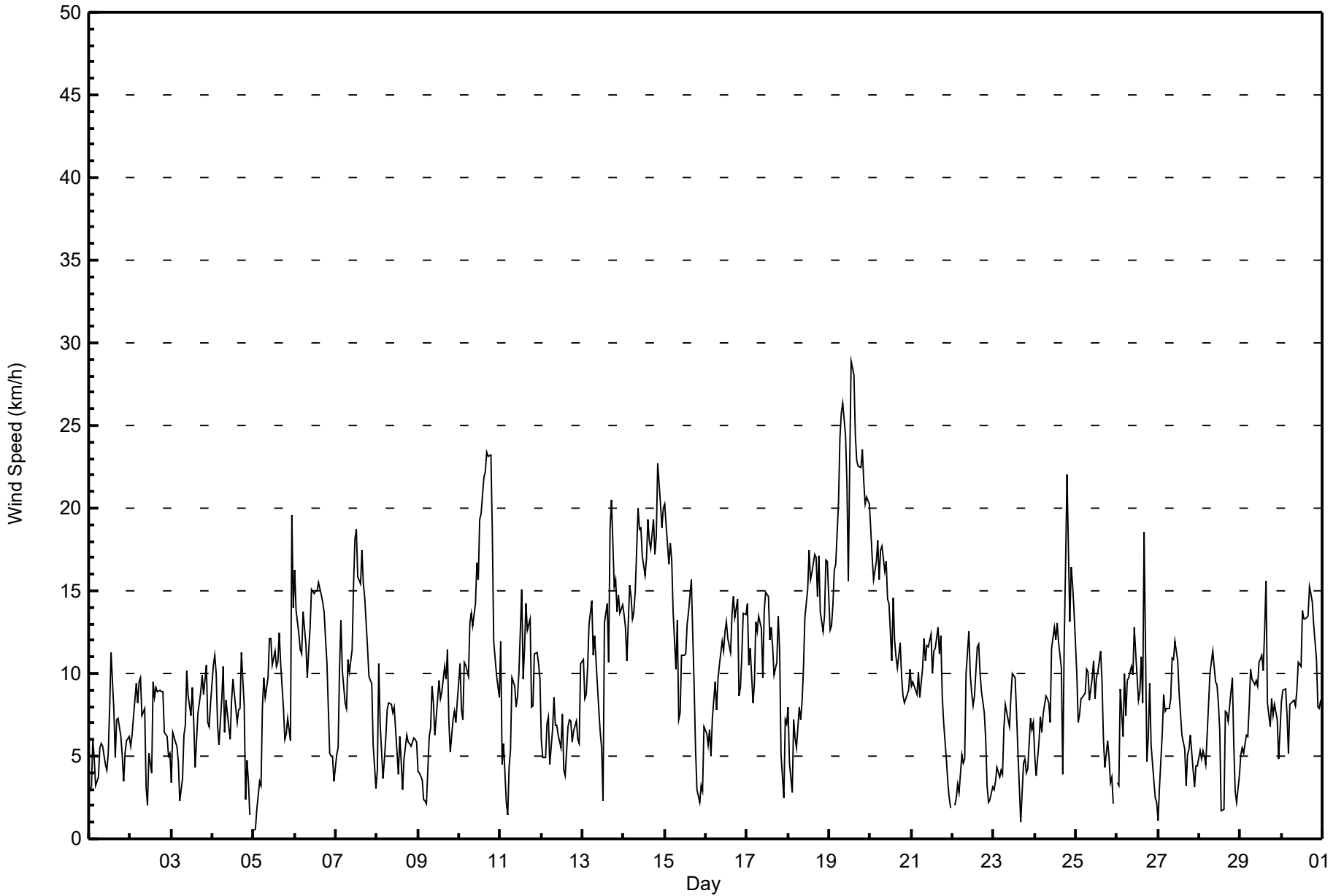
Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	141	19.67	19.67
6 - 11	367	51.19	70.85
12 - 19	177	24.69	95.54
20 - 28	31	4.32	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
Mildred Lake - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	17	6	10	8	7	8	9	18	17	5	4	9	2	3	6	12	141
6 - 11	53	26	9	9	11	15	21	59	29	19	25	8	6	15	14	48	367
12 - 19	56	12	0	0	0	0	4	12	5	9	28	12	7	6	3	23	177
20 - 28	18	3	0	0	0	0	0	3	3	0	0	0	1	0	0	3	31
29 - 38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	145	47	19	17	18	23	34	92	54	33	57	29	16	24	23	86	717

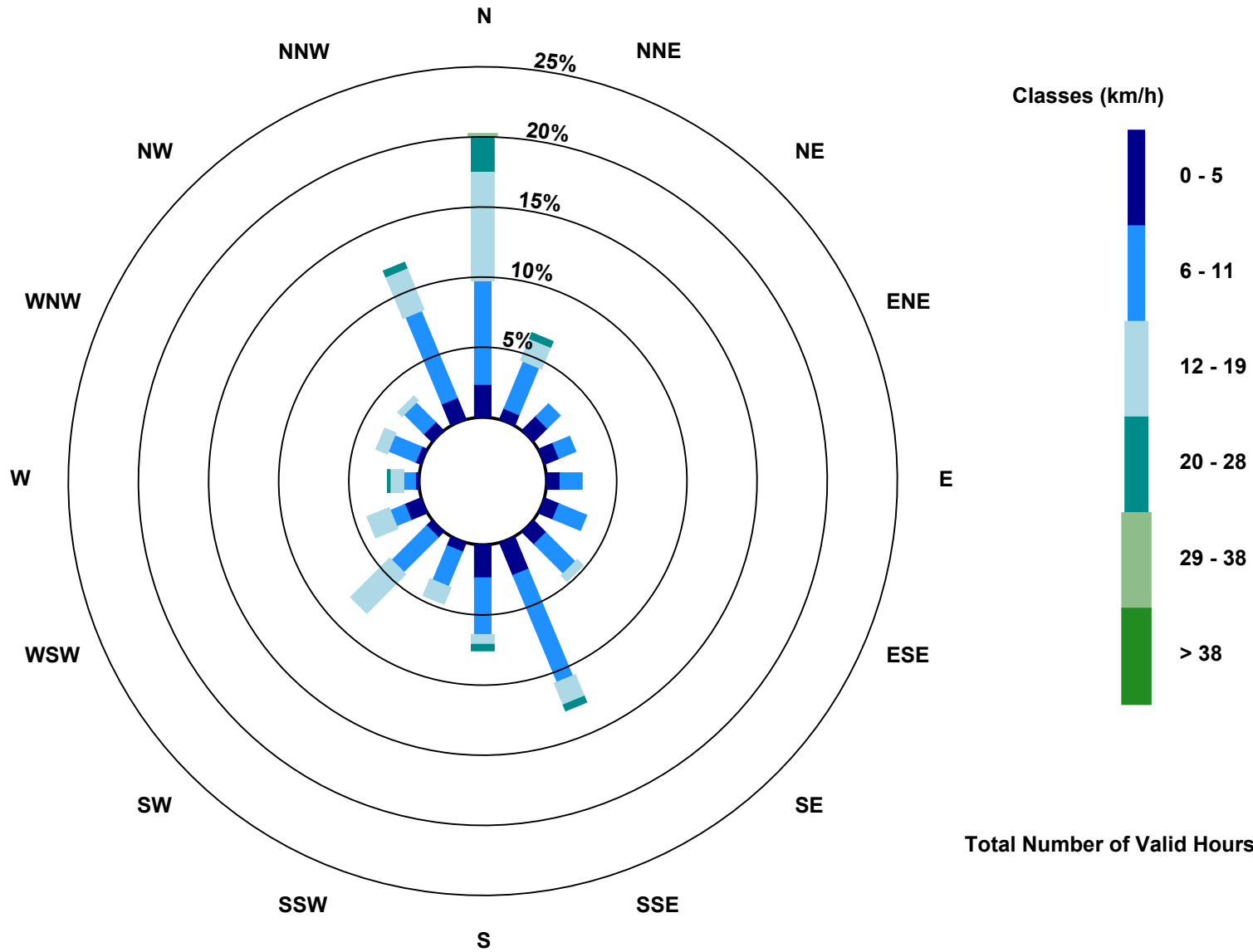
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Mildred Lake





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 1 deg on Jun 19 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 1.2 deg on Jun 19	Hours of Data: 717
Direction of Minimum Speed: 162 deg on Jun 5 01:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.4 deg on Jun 24	Percent Operational Time: 99.6
Monthly Average Direction: 334.1 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-Jun	271	199	332	0	82	120	198	214	189	142	293	324	4	343	352	349	23	19	43	51	35	79	81	8	12.1
2-Jun	357	6	344	329	344	336	341	346	1	345	232	288	274	350	15	353	17	44	35	29	29	48	45	44	1.4
3-Jun	39	357	359	356	10	14	349	359	346	353	27	24	7	9	50	120	116	108	115	107	101	111	82	91	51.3
4-Jun	100	109	105	87	69	77	69	66	83	81	108	116	111	102	96	98	83	122	149	106	74	120	289	UO	97.4
5-Jun	162	77	353	338	313	328	345	346	4	17	33	28	10	356	350	347	334	339	11	18	334	256	263	281	342.9
6-Jun	262	249	223	220	221	226	221	230	231	224	231	228	227	222	230	234	229	229	219	222	187	163	173	149	226.1
7-Jun	170	148	164	174	167	163	186	211	215	196	217	234	240	277	272	276	286	286	282	280	284	302	302	217	240.2
8-Jun	339	351	357	336	348	341	343	357	349	339	322	213	256	120	95	8	60	21	24	24	29	26	53	60	5.6
9-Jun	35	14	352	346	358	178	192	163	164	155	147	154	170	147	162	163	160	181	213	184	157	158	157	150	162.1
10-Jun	148	134	157	137	133	148	156	158	163	156	150	157	149	161	156	164	171	170	173	171	168	167	151	156	158.7
11-Jun	143	134	130	243	248	206	257	277	275	283	290	286	306	292	289	301	301	305	295	287	312	330	326	321	293.4
12-Jun	343	331	307	291	283	325	336	5	340	327	313	321	0	2	7	10	27	40	32	24	8	11	75	115	356.1
13-Jun	151	135	131	132	135	139	136	153	160	165	155	165	190	340	355	346	347	0	9	360	357	357	10	20	44.7
14-Jun	14	6	358	350	354	3	7	3	2	2	4	6	2	1	359	348	346	351	353	353	352	350	348	344	356.7
15-Jun	341	345	342	335	332	333	344	333	321	308	303	301	309	329	328	327	339	354	0	74	115	160	240	267	330.4
16-Jun	254	229	229	218	169	173	154	146	141	135	132	161	218	211	214	191	179	174	204	192	178	243	230	229	190.7
17-Jun	227	230	236	226	220	233	235	239	228	219	209	216	230	242	246	269	285	275	359	33	39	6	342	342	246.2
18-Jun	342	5	87	352	9	11	10	5	3	357	4	6	356	1	14	19	20	25	22	18	7	7	3	8	9.1
19-Jun	1	1	358	357	2	1	3	6	11	13	13	14	1	1	6	10	2	359	353	350	352	353	349	347	1.2
20-Jun	346	351	350	349	355	357	354	352	352	354	354	342	339	341	332	330	340	324	326	328	317	316	323	326	343.0
21-Jun	331	328	330	331	331	336	341	339	349	356	358	352	348	5	1	1	3	359	30	64	78	73	127	127	354.8
22-Jun	UO	30	42	98	160	187	188	123	149	155	149	151	158	211	264	240	249	247	218	248	256	258	152	83	194.5
23-Jun	121	160	115	160	175	100	137	163	145	161	138	152	156	141	114	143	250	157	154	156	132	154	164	191	149.8
24-Jun	204	186	152	161	144	151	144	149	148	174	212	202	208	207	209	14	54	4	347	355	21	3	8	6	53.2
25-Jun	18	8	5	359	6	6	21	34	63	74	45	43	347	334	324	327	315	346	342	348	2	70	141	UO	9.5
26-Jun	174	147	150	173	155	155	151	142	144	143	150	153	178	188	211	290	6	358	208	184	189	157	74	13	162.2
27-Jun	177	325	344	355	354	350	3	10	3	350	348	4	17	9	344	359	27	18	341	333	330	1	184	176	356.2
28-Jun	152	162	170	156	145	138	155	154	156	173	167	170	175	242	348	216	208	164	166	207	181	129	176	174	169.5
29-Jun	203	182	165	172	175	175	174	178	161	150	158	169	181	200	253	245	262	182	171	174	173	195	228	230	189.8
30-Jun	220	226	235	213	204	210	211	195	203	223	217	221	210	257	258	251	235	225	235	239	231	248	224	247	228.8

328.5 344.7 343.1 331.3 357.5 355.8 6.5 1.2 45.0 48.5 1.0 228.0 277.8 313.2 312.5 313.4 330.8 339.8 340.0 349.1 0.8 355.4 342.3 343.5

Diurnal Average

UO - Unstable Operation

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

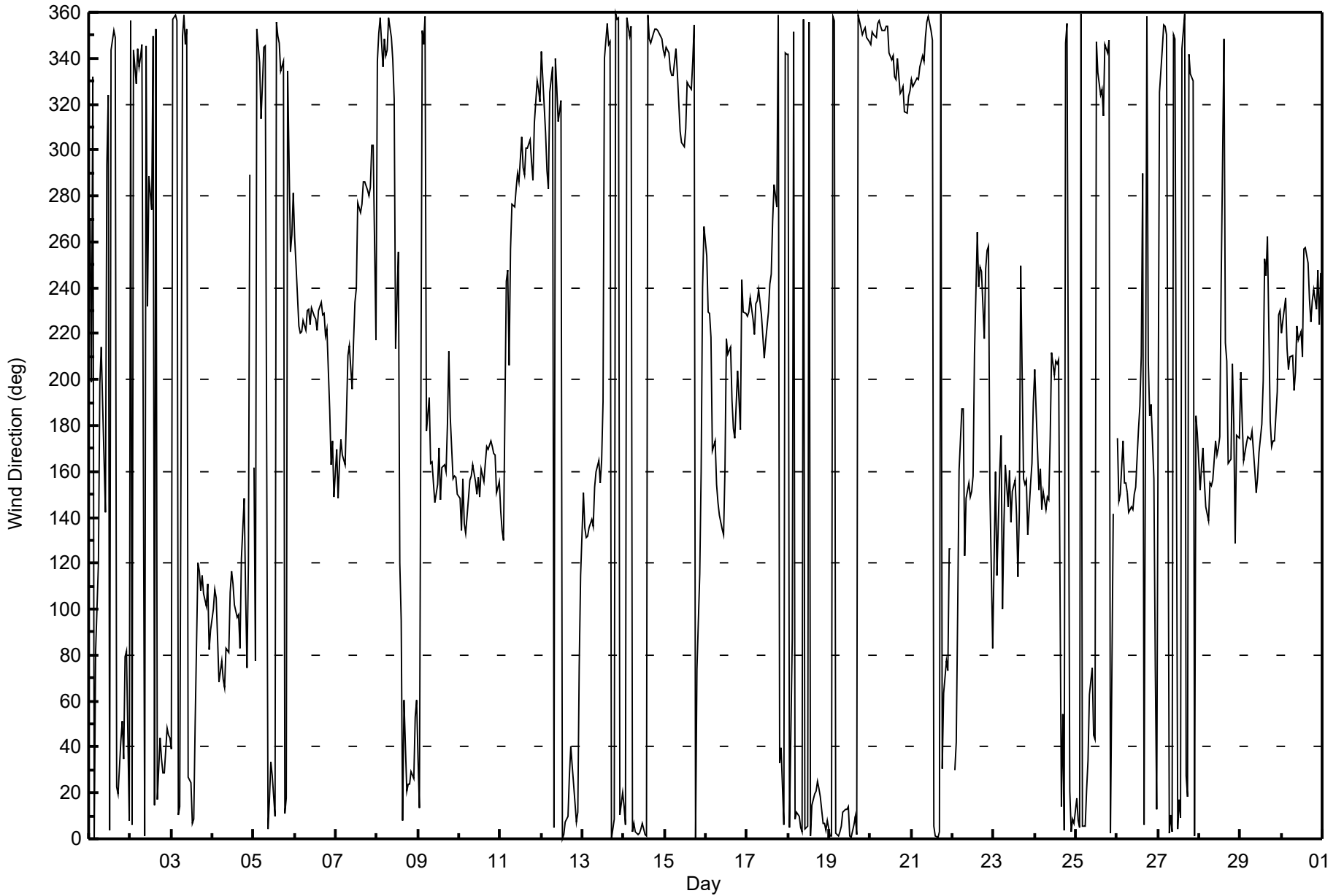
Wind Direction (WD) - deg
Mildred Lake - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																			Hours in Service: 720						
Maximum Value: 100 deg on Jun 23 17:00																			Hours of Data: 717						
Minimum Value: 7 deg on Jun 21 03:00																			Hours of Missing Data: 3						
Percentiles: P ₁ = 9 P ₁₀ = 14 Q ₁ = 17 Median = 22 Q ₃ = 29 P ₉₀ = 48 P ₉₉ = 85																			Hours of Calibration: 0						
																			Percent Operational Time: 99.6						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	72	68	19	25	19	28	20	34	33	58	75	67	41	22	45	57	31	32	22	16	16	25	33	28	75
2-Jun	26	16	14	10	18	11	13	17	22	87	87	59	80	28	34	31	27	26	21	20	19	18	17	17	87
3-Jun	33	11	10	9	16	31	17	19	32	29	37	49	47	52	76	52	30	21	23	17	14	17	17	12	76
4-Jun	16	17	16	12	21	19	15	17	15	25	28	21	21	23	25	18	16	24	20	57	19	19	64	UO	64
5-Jun	91	96	75	15	44	15	14	17	18	23	25	27	25	31	27	21	13	17	30	27	14	38	28	26	96
6-Jun	25	29	26	24	23	23	26	26	27	25	25	27	29	27	28	28	27	25	24	24	18	12	17	24	29
7-Jun	18	16	17	14	20	14	29	21	25	23	27	27	27	25	25	24	22	21	22	21	17	14	15	37	37
8-Jun	51	14	16	21	13	12	16	26	39	45	37	40	71	61	74	82	66	35	33	19	18	15	16	11	82
9-Jun	19	15	8	23	33	89	18	24	20	20	45	41	33	34	26	26	24	21	23	19	10	16	18	18	89
10-Jun	10	16	23	11	13	17	15	17	16	17	15	18	15	17	17	19	15	15	14	13	14	13	13	15	23
11-Jun	12	87	53	77	82	28	30	24	24	27	32	27	26	36	29	24	21	16	15	16	18	10	9	9	87
12-Jun	12	17	14	18	18	38	19	26	40	43	52	80	48	67	52	34	25	22	19	19	23	23	36	18	80
13-Jun	21	19	16	16	16	15	17	19	18	25	28	30	71	23	20	17	16	19	23	17	15	17	19	20	71
14-Jun	20	19	19	14	17	18	18	17	18	17	19	19	18	18	17	15	15	17	16	17	17	16	16	15	20
15-Jun	14	15	15	13	12	16	18	13	26	17	17	18	17	13	13	13	19	21	25	53	53	48	60	24	60
16-Jun	24	22	18	31	18	12	22	22	17	18	22	17	29	24	26	20	15	14	28	23	16	35	23	23	35
17-Jun	23	21	27	22	22	25	24	27	26	32	24	25	26	32	32	31	33	32	46	20	26	49	9	10	49
18-Jun	12	27	48	8	20	27	22	23	25	26	22	24	20	23	23	24	22	24	21	22	20	19	19	20	48
19-Jun	22	19	18	18	20	20	21	21	22	22	22	27	19	19	21	21	19	18	16	17	17	19	16	16	27
20-Jun	16	17	16	15	17	17	17	16	16	17	17	14	14	15	13	14	15	11	12	10	12	10	10	8	17
21-Jun	9	8	7	8	9	13	14	15	19	22	25	28	31	29	32	29	30	23	30	20	12	41	15	48	48
22-Jun	UO	33	27	23	45	24	32	31	21	18	20	26	25	43	29	26	28	26	26	32	50	56	61	35	61
23-Jun	27	28	15	24	19	21	28	21	29	37	30	28	29	42	58	85	100	58	33	20	14	12	13	15	100
24-Jun	26	34	28	16	38	17	15	16	17	38	25	22	26	23	27	68	59	22	14	17	24	20	19	18	68
25-Jun	20	19	16	14	17	19	21	25	32	31	33	50	34	33	21	35	51	60	42	18	25	12	55	UO	60
26-Jun	15	42	12	25	13	20	20	16	15	20	14	17	19	20	29	49	22	72	36	18	31	68	65	50	72
27-Jun	84	47	16	12	15	14	19	24	25	23	28	32	39	46	68	57	82	59	25	16	20	29	61	23	84
28-Jun	15	20	19	22	17	15	15	16	18	21	29	29	32	78	60	39	23	28	21	24	29	56	67	57	78
29-Jun	34	18	16	12	17	15	14	16	21	18	21	23	25	30	32	31	61	43	17	13	14	19	24	22	61
30-Jun	21	27	29	36	33	23	25	22	24	26	26	31	25	34	32	28	29	27	25	30	28	27	28	35	36
																			91 96 75 77 82 89 32 34 40 87 87 80 80 78 76 85 100 72 46 57 53 68 67 57						
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS03 LOWER CAMP METEOROLOGY JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
JUNE 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	30.1	-	23.6	-
Temperature 45 m (C) Average	720	0	0	100	29.9	-	23.7	-
Temperature 100 m (C) Average	720	0	0	100	29.4	-	23.7	-
Temperature 163 m (C) Average	720	0	0	100	28.8	-	23.3	-
Relative Humidity 20 m (%) Average	720	0	0	100	100	-	96.4	-
Relative Humidity 45 m (%) Average	720	0	0	100	100	-	96.9	-
Relative Humidity 100 m (%) Average	720	0	0	100	97.9	-	95.3	-
Relative Humidity 163 m (%) Average	720	0	0	100	100	-	98.6	-
Wind Speed 20 m (km/h) Average	720	0	0	100	31	-	20.0	-
Wind Speed 45 m (km/h) Average	720	0	0	100	43	-	31.0	-
Wind Speed 100 m (km/h) Average	720	0	0	100	52	-	38.0	-
Wind Speed 163 m (km/h) Average	713	0	7	99.03	58	-	44.0	-
Wind Direction 20 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 45 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 100 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 163 m (deg) Average	713	0	7	99.03	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	0	0	100	0.5	-	-0.1	-
Vertical Wind Speed 45 m (km/h) Average	720	0	0	100	1.8	-	0.3	-
Vertical Wind Speed 100 m (km/h) Average	720	0	0	100	2.3	-	0.7	-
Vertical Wind Speed 163 m (km/h) Average	713	0	7	99.03	4	-	1.0	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
 JUNE 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	18.18	5	-	7.3	11.5	14.1	18.2	21.7	24.8	30.1
Temperature 45 m (C) Average	720	18.19	4.9	-	7.7	11.4	14.1	18.2	21.8	24.6	29.9
Temperature 100 m (C) Average	720	18.02	4.8	-	8.8	11	14.1	18	21.4	24.3	29.4
Temperature 163 m (C) Average	720	17.75	4.7	-	9.1	10.8	14.1	17.8	21.1	23.9	28.8
Relative Humidity 20 m (%) Average	720	63.97	21.2	-	22.8	35.6	46.3	63.6	83.2	94	100
Relative Humidity 45 m (%) Average	720	63.01	20.9	-	22.6	35.8	45.5	62.6	81	93	100
Relative Humidity 100 m (%) Average	720	59.78	20.1	-	21.9	33.4	43.5	58.4	76.2	89.9	97.9
Relative Humidity 163 m (%) Average	720	61.26	20.2	-	23.7	35.6	45	59.8	77.5	92.6	100
Wind Speed 20 m (km/h) Average	720	9.3	6	-	0	2	5	8	13	18	31
Wind Speed 45 m (km/h) Average	720	13.3	8	-	0	4	7	12	18	24	43
Wind Speed 100 m (km/h) Average	720	16.9	9	-	0	6	10	15	23	30	52
Wind Speed 163 m (km/h) Average	713	19.6	11	-	0	7	12	18	27	35	58
Wind Direction 20 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	713	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	-0.38	0.3	-	-1.8	-0.9	-0.6	-0.3	-0.1	0	0.5
Vertical Wind Speed 45 m (km/h) Average	720	-0.09	0.4	-	-1.1	-0.6	-0.3	-0.1	0.1	0.3	1.8
Vertical Wind Speed 100 m (km/h) Average	720	0.04	0.5	-	-1.2	-0.6	-0.2	0	0.3	0.6	2.3
Vertical Wind Speed 163 m (km/h) Average	713	0.42	0.7	-	-2.1	-0.3	0	0.4	0.8	1.1	4

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed 163 m	13 Jun 2023 21:00	13 Jun 2023 22:00	2	Unstable Operation - excessive noise
Wind Speed, Wind Direction, Vertical Wind Speed 163 m	14 Jun 2023 19:00	14 Jun 2023 21:00	3	Unstable Operation - excessive noise
Wind Speed, Wind Direction, Vertical Wind Speed 163 m	29 Jun 2023 16:00	29 Jun 2023 17:00	2	Unstable Operation - excessive noise



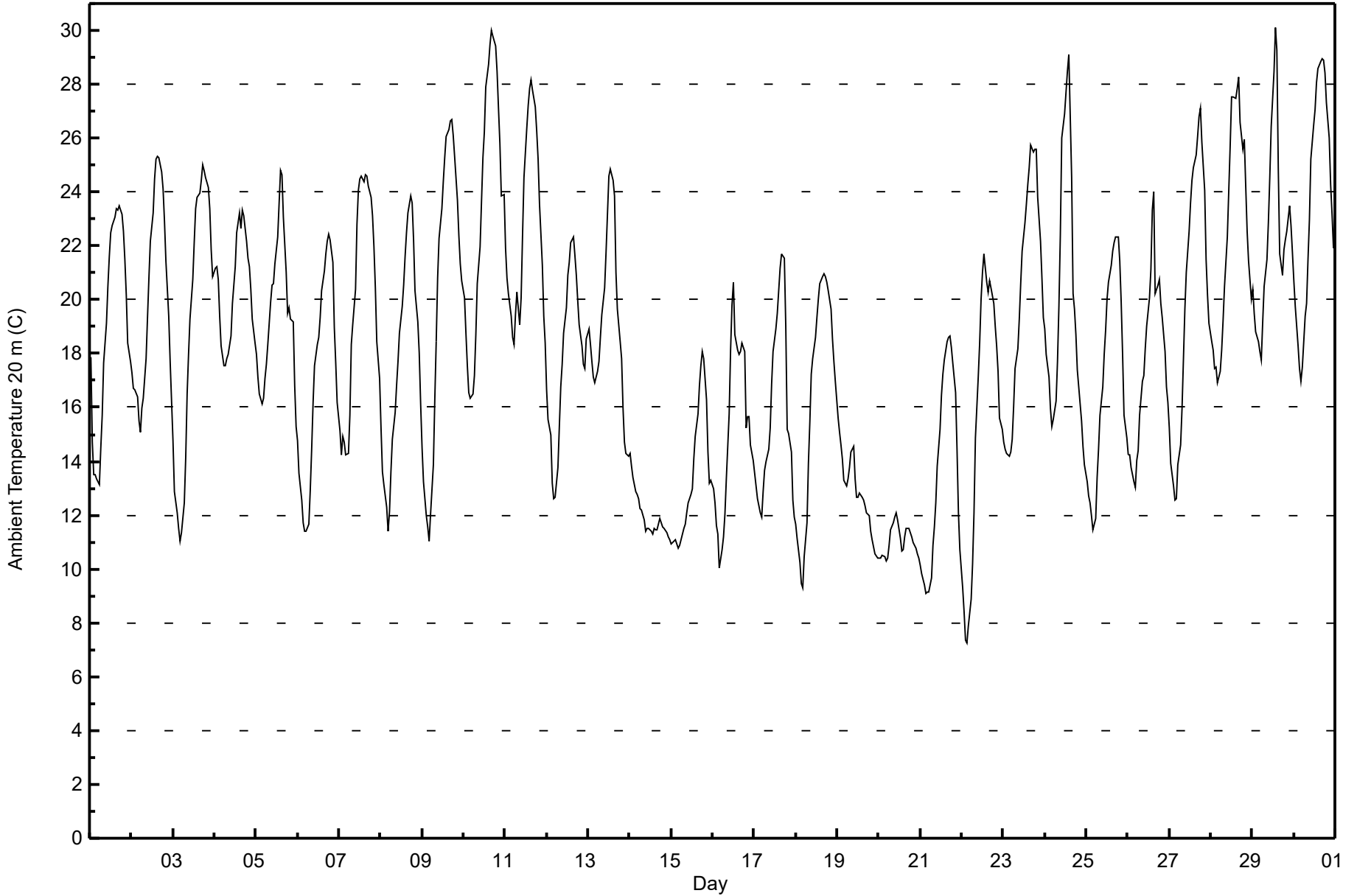
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - June 2023

Maximum Value: 30.1 C on Jun 29 14:00 Maximum Daily Average: 23.6 C on Jun 30																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 7.3 C on Jun 22 04:00 Minimum Daily Average: 11.0 C on Jun 20 Maximum Diurnal Average: 22.4 C at hour 15 Minimum Diurnal Average: 13.4 C at hour 5 Monthly Average: 18.18 C Percentiles: P ₁ = 9.2 P ₁₀ = 11.5 Q ₁ = 14.1 Median = 18.2 Q ₃ = 21.7 P ₉₀ = 24.8 P ₉₉ = 28.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	17.9	14.7	13.5	13.5	13.4	13.1	14.5	15.7	17.6	19.1	20.5	21.6	22.5	22.8	23.1	23.4	23.3	23.5	23.1	22.5	21.5	20.2	18.4	17.7	19.0	23.5
2-Jun	17.3	16.7	16.7	16.4	15.5	15.1	16.0	16.3	17.8	19.3	20.8	22.2	23.2	24.5	25.2	25.3	25.3	24.7	24.1	22.9	21.4	19.4	17.7	16.2	20.0	25.3
3-Jun	14.8	12.9	12.1	11.5	11.0	11.3	12.4	14.1	16.5	18.0	19.3	20.7	22.1	23.4	23.8	23.9	24.4	25.0	24.8	24.6	24.2	23.4	21.9	20.9	19.0	25.0
4-Jun	21.2	21.2	20.8	19.4	18.3	17.5	17.5	17.8	18.0	18.6	19.9	20.5	21.2	22.5	23.2	22.7	23.3	23.1	22.2	21.5	21.2	20.4	19.3	18.4	20.4	23.3
5-Jun	18.0	17.1	16.5	16.1	16.4	17.1	17.6	18.3	19.9	20.5	20.6	21.3	22.3	23.6	24.8	24.7	23.0	21.0	19.5	19.7	19.3	19.2	16.8	15.3	19.5	24.8
6-Jun	14.8	13.6	12.6	11.7	11.4	11.4	11.6	12.9	14.4	16.2	17.6	18.3	18.6	19.4	20.3	21.1	21.7	22.2	22.4	22.2	21.4	19.0	17.6	16.2	17.0	22.4
7-Jun	15.1	14.3	14.9	14.7	14.2	14.3	15.7	18.3	19.1	20.4	22.8	24.0	24.5	24.6	24.4	24.7	24.6	24.2	23.8	23.1	22.0	20.4	18.4	17.1	20.0	24.7
8-Jun	15.2	13.6	13.1	12.3	11.4	12.2	13.6	14.8	15.8	16.8	17.7	18.8	19.8	20.6	21.6	22.5	23.2	23.8	23.6	22.2	20.3	19.2	18.0	16.1	17.8	23.8
9-Jun	14.5	13.2	12.0	11.6	11.1	12.1	13.9	16.3	18.5	20.8	22.3	23.4	24.4	25.3	26.0	26.3	26.6	26.7	26.1	25.3	23.7	22.4	21.3	20.7	20.2	26.7
10-Jun	20.0	18.8	17.6	16.5	16.3	16.5	17.2	18.7	20.6	22.0	23.6	25.3	26.2	27.9	28.8	29.5	30.0	29.8	29.4	28.5	27.1	25.8	23.8	23.9	23.5	30.0
11-Jun	21.9	20.8	20.2	19.4	18.6	18.3	19.4	20.3	19.1	20.1	22.4	24.5	26.4	27.2	27.9	28.1	27.8	27.2	26.3	25.2	23.5	21.3	19.4	18.4	22.7	28.1
12-Jun	16.7	15.5	15.0	13.2	12.6	12.7	13.7	15.3	16.7	17.6	18.8	19.7	20.9	21.4	22.1	22.3	21.7	20.9	20.0	19.1	18.3	17.6	17.4	18.5	17.8	22.3
13-Jun	18.9	18.4	17.7	17.1	16.9	17.3	17.7	18.6	19.4	20.4	21.8	23.2	24.6	24.8	24.4	23.9	21.0	19.6	18.4	17.8	16.0	14.7	14.3	14.2	19.2	24.8
14-Jun	14.3	13.8	13.4	12.9	12.8	12.6	12.3	12.2	11.8	11.4	11.5	11.4	11.3	11.5	11.5	11.5	11.5	11.9	11.7	11.5	11.5	11.3	11.2	11.1	12.0	14.3
15-Jun	10.9	11.0	11.1	11.0	10.8	10.9	11.3	11.5	11.7	12.1	12.5	12.8	13.0	14.1	14.9	15.8	16.8	17.6	18.1	17.8	16.3	14.4	13.2	13.3	13.4	18.1
16-Jun	13.0	12.5	11.6	11.3	10.0	10.7	11.2	12.0	13.4	15.8	18.1	19.8	20.7	18.7	18.1	18.0	18.1	18.4	18.1	15.3	15.7	15.7	14.6	14.0	15.2	20.7
17-Jun	13.6	13.1	12.6	12.1	11.9	12.9	13.7	14.0	14.4	15.2	16.9	18.1	18.9	19.5	20.3	21.2	21.7	21.5	19.0	15.2	15.0	14.4	12.5	11.9	15.8	21.7
18-Jun	11.7	11.1	10.3	9.5	9.3	10.5	11.7	13.9	15.4	17.3	17.8	18.6	19.3	20.0	20.6	20.9	20.9	20.9	20.6	20.3	19.7	18.6	17.7	16.9	16.4	20.9
19-Jun	15.6	15.1	14.6	14.1	13.3	13.1	13.4	13.7	14.4	14.5	13.4	12.6	12.7	12.8	12.7	12.6	12.3	12.1	12.0	11.4	11.1	10.8	10.6	10.4	12.9	15.6
20-Jun	10.4	10.4	10.5	10.5	10.3	10.4	10.9	11.4	11.7	11.9	12.1	11.8	11.1	10.7	10.7	11.2	11.5	11.5	11.3	11.2	11.0	10.8	10.6	10.4	11.0	12.1
21-Jun	10.2	9.8	9.4	9.1	9.1	9.2	9.7	10.9	11.5	12.4	13.8	15.2	16.5	17.2	17.8	18.4	18.6	18.7	18.3	17.7	16.5	14.5	12.1	10.7	13.6	18.7
22-Jun	9.3	8.4	7.4	7.3	7.9	8.9	10.2	12.1	14.9	17.1	18.4	20.0	21.0	21.7	20.7	20.3	20.7	20.4	19.9	19.0	18.3	17.4	15.6	15.2	15.5	21.7
23-Jun	14.7	14.5	14.3	14.2	14.4	14.8	16.0	17.4	18.2	19.3	20.6	21.8	22.9	23.5	24.3	24.9	25.8	25.5	25.6	25.6	23.8	22.2	20.8	19.3	20.2	25.8
24-Jun	18.9	18.0	17.1	16.0	15.3	15.5	16.3	17.7	19.8	22.4	26.0	26.9	27.7	28.5	29.1	24.5	20.2	19.7	18.7	17.4	16.1	15.5	14.6	13.9	19.8	29.1
25-Jun	13.3	12.7	12.5	12.0	11.5	11.9	13.4	14.5	15.7	16.8	17.9	18.9	20.0	20.6	21.3	21.8	22.1	22.3	22.3	21.4	19.9	18.0	15.7	14.8	17.1	22.3
26-Jun	14.3	14.2	13.7	13.2	13.1	14.0	14.4	15.7	17.0	17.2	18.2	19.0	20.1	21.1	23.3	24.0	20.2	20.5	20.7	19.9	19.3	18.0	16.7	16.2	17.7	24.0
27-Jun	15.3	13.9	13.1	12.6	12.6	13.9	14.6	16.0	17.8	19.6	21.0	22.6	23.6	24.4	24.9	25.4	26.1	26.8	27.1	25.9	24.1	21.5	20.2	19.1	20.1	27.1
28-Jun	18.4	18.1	17.4	17.5	16.9	17.3	18.1	19.2	20.5	22.3	24.0	25.7	27.5	27.6	27.5	27.9	28.3	26.6	25.6	26.0	24.2	22.6	21.4	20.0	22.5	28.3
29-Jun	20.4	19.5	18.8	18.4	18.1	17.8	19.2	20.5	21.5	22.9	24.6	26.5	28.5	30.1	29.3	24.9	21.7	20.9	21.9	22.2	22.5	23.5	22.7	21.7	22.4	30.1
30-Jun	20.7	19.7	18.3	17.4	17.0	17.5	19.4	19.9	21.5	23.0	25.2	26.5	27.1	28.0	28.6	28.8	29.0	28.9	28.4	27.3	26.0	24.3	23.2	21.9	23.6	29.0
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	14	1.94	1.94
10 - 20	437	60.69	62.64
> 20	269	37.36	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

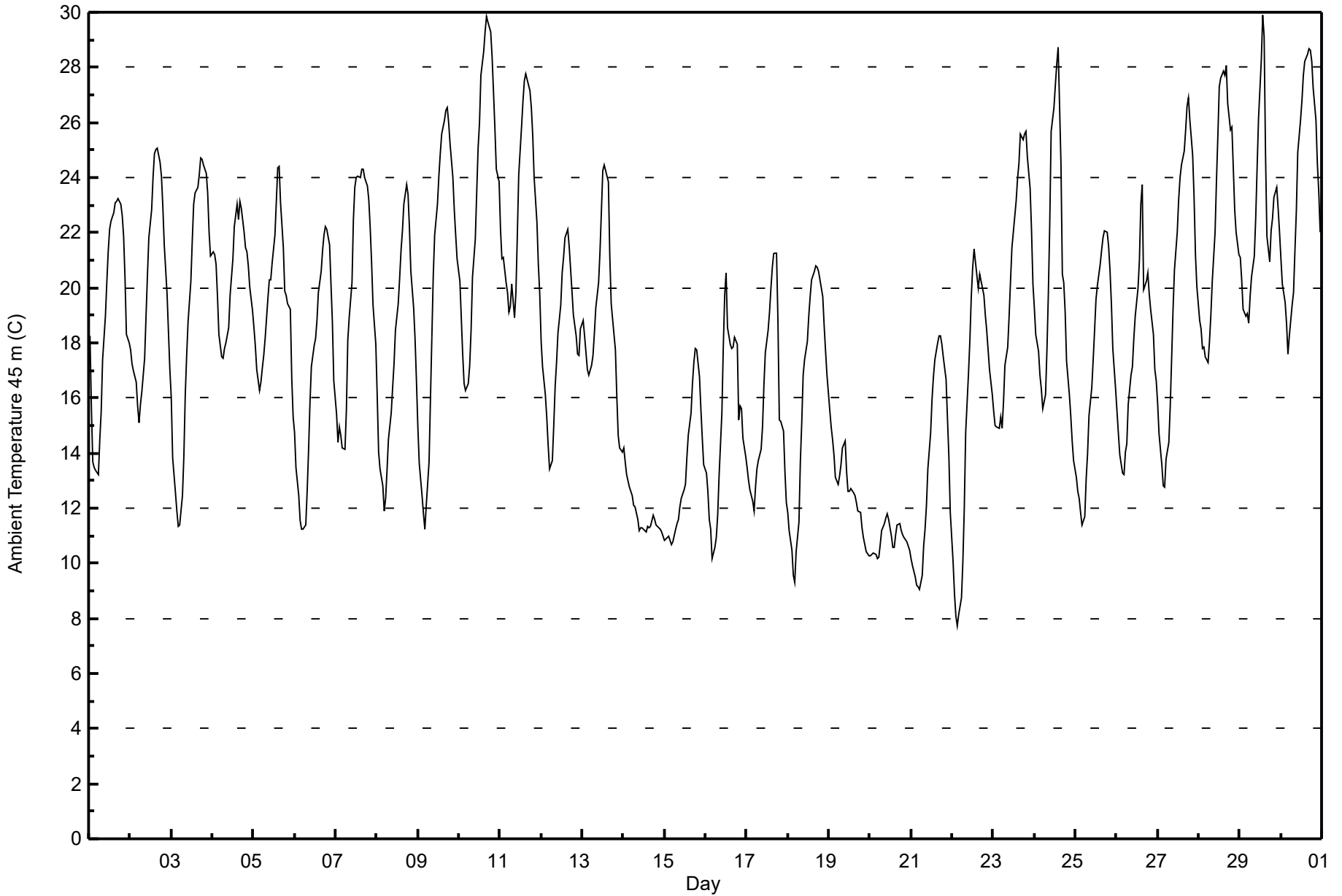


Maximum Value: 29.9 C on Jun 29 14:00 Maximum Daily Average: 23.7 C on Jun 30																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 7.7 C on Jun 22 04:00 Minimum Daily Average: 10.9 C on Jun 20 Maximum Diurnal Average: 22.1 C at hour 15 Minimum Diurnal Average: 13.7 C at hour 5 Monthly Average: 18.19 C Percentiles: $P_1 = 9.2$ $P_{10} = 11.4$ $Q_1 = 14.1$ Median = 18.2 $Q_3 = 21.8$ $P_{90} = 24.6$ $P_{99} = 28.7$																						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-Jun	18.2	15.7	13.7	13.5	13.4	13.2	14.5	15.5	17.4	18.9	20.2	21.3	22.1	22.4	22.7	23.1	23.1	23.2	23.0	22.6	21.9	20.3	18.3	18.0	19.0	23.2
2-Jun	17.7	17.2	17.0	16.6	15.7	15.1	15.8	16.2	17.5	18.9	20.4	21.8	22.8	24.0	24.9	25.0	25.1	24.6	24.1	22.9	21.6	19.8	18.4	17.1	20.0	25.1
3-Jun	16.0	13.8	12.6	11.9	11.3	11.4	12.5	13.9	16.1	17.5	18.8	20.2	21.7	23.0	23.4	23.7	24.1	24.7	24.5	24.1	23.5	22.0	21.2		19.0	24.7
4-Jun	21.3	21.2	20.9	19.7	18.3	17.5	17.4	17.8	18.0	18.5	19.7	20.4	21.1	22.2	23.1	22.5	23.2	22.9	22.0	21.4	21.3	20.8	20.0	19.2	20.4	23.2
5-Jun	18.5	17.9	17.0	16.3	16.6	17.1	17.5	18.1	19.6	20.3	20.3	20.9	21.9	23.2	24.4	24.4	23.1	21.5	19.9	19.7	19.4	19.2	16.7	15.3	19.5	24.4
6-Jun	14.7	13.5	12.4	11.5	11.2	11.2	11.4	12.6	14.1	15.8	17.2	17.9	18.1	18.8	19.8	20.6	21.4	21.9	22.2	22.1	21.6	20.1	18.8	16.6	16.9	22.2
7-Jun	15.4	14.4	14.9	14.6	14.2	14.1	15.6	18.1	18.9	20.2	22.5	23.6	24.0	24.1	24.0	24.3	24.3	24.0	23.7	23.2	22.2	20.9	19.4	18.0	19.9	24.3
8-Jun	16.0	14.1	13.4	12.8	11.9	12.3	13.4	14.5	15.5	16.4	17.3	18.4	19.4	20.3	21.3	22.1	23.0	23.7	23.4	22.2	20.6	19.2	18.1	16.6	17.8	23.7
9-Jun	15.0	13.6	12.4	11.8	11.2	12.1	13.7	16.0	18.2	20.5	21.9	23.0	24.0	24.9	25.6	26.1	26.5	26.6	26.0	25.2	24.0	22.8	21.9	21.0	20.2	26.6
10-Jun	20.3	18.9	17.6	16.5	16.3	16.5	17.2	18.5	20.4	21.8	23.4	25.1	26.0	27.7	28.6	29.3	29.8	29.7	29.3	28.4	27.1	25.8	24.3	23.9	23.4	29.8
11-Jun	22.1	21.1	21.1	20.2	19.8	19.1	19.3	20.1	18.9	19.8	21.9	24.1	25.8	26.7	27.5	27.8	27.6	27.2	26.5	25.6	24.0	22.4	20.8	19.8	22.9	27.8
12-Jun	18.1	17.1	16.1	15.3	14.3	13.4	13.7	15.0	16.4	17.3	18.3	19.4	20.5	21.1	21.8	22.1	21.5	20.7	19.9	19.0	18.3	17.6	17.6	18.5	18.0	22.1
13-Jun	18.8	18.3	17.6	17.0	16.8	17.2	17.5	18.4	19.3	20.2	21.3	22.8	24.3	24.4	24.1	23.9	21.1	19.4	18.3	17.7	16.1	14.7	14.2	14.1	19.1	24.4
14-Jun	14.2	13.7	13.2	12.7	12.6	12.4	12.1	12.0	11.6	11.2	11.3	11.3	11.2	11.1	11.3	11.3	11.3	11.7	11.6	11.4	11.4	11.2	11.1	11.0	11.8	14.2
15-Jun	10.8	10.9	11.0	10.9	10.7	10.8	11.2	11.4	11.6	12.1	12.4	12.7	12.9	13.9	14.7	15.5	16.5	17.3	17.8	17.7	16.8	15.6	14.5	13.6	13.5	17.8
16-Jun	13.3	12.6	11.6	11.2	10.2	10.6	10.9	11.8	13.2	15.4	17.9	19.7	20.5	18.6	17.9	17.8	17.9	18.2	17.9	15.2	15.7	15.6	14.5	13.9	15.1	20.5
17-Jun	13.5	13.0	12.6	12.2	11.9	12.8	13.4	13.7	14.1	14.9	16.5	17.6	18.5	19.1	20.0	20.8	21.2	21.2	18.8	15.2	15.2	14.8	13.3	12.2	15.7	21.2
18-Jun	11.8	11.2	10.5	9.6	9.3	10.4	11.5	13.7	15.1	16.9	17.4	18.0	19.0	19.7	20.3	20.6	20.8	20.8	20.6	20.3	19.7	18.6	17.7	16.9	16.3	20.8
19-Jun	15.5	15.0	14.5	13.9	13.1	12.9	13.2	13.6	14.2	14.4	13.3	12.6	12.6	12.7	12.6	12.5	12.2	11.9	11.8	11.3	10.9	10.7	10.4	10.3	12.8	15.5
20-Jun	10.3	10.3	10.4	10.3	10.2	10.2	10.7	11.2	11.4	11.7	11.8	11.6	11.0	10.6	10.6	11.0	11.4	11.4	11.2	11.0	10.9	10.8	10.6	10.5	10.9	11.8
21-Jun	10.2	9.9	9.5	9.2	9.1	9.0	9.5	10.6	11.2	12.1	13.4	14.8	15.9	16.8	17.4	18.0	18.2	18.3	18.0	17.5	16.7	15.2	13.9	11.9	13.6	18.3
22-Jun	10.1	8.9	8.1	7.7	8.1	8.8	10.0	12.0	14.8	16.9	18.1	19.7	20.7	21.4	20.4	20.0	20.5	20.3	19.7	19.0	18.5	17.7	17.0	16.1	15.6	21.4
23-Jun	15.5	15.0	15.0	14.9	15.3	14.9	15.9	17.2	17.8	18.9	20.3	21.5	22.6	23.1	23.9	24.5	25.6	25.4	25.6	25.7	24.7	23.6	22.0	20.2	20.4	25.7
24-Jun	19.3	18.3	17.7	16.8	16.3	15.6	16.1	17.7	19.8	22.3	25.7	26.5	27.4	28.1	28.7	24.5	20.5	20.2	19.1	17.3	16.1	15.4	14.4	13.7	19.9	28.7
25-Jun	13.1	12.6	12.4	11.9	11.4	11.7	13.1	14.0	15.3	16.4	17.4	18.5	19.6	20.1	20.8	21.3	21.8	22.1	22.0	21.5	20.6	19.4	17.8	16.3	17.1	22.1
26-Jun	15.5	14.7	14.0	13.3	13.2	14.0	14.3	15.8	16.8	17.1	18.2	19.0	20.0	21.0	23.0	23.8	19.9	20.2	20.6	19.8	19.2	18.3	17.0	16.6	17.7	23.8
27-Jun	15.8	14.7	13.6	12.8	12.8	13.8	14.4	15.7	17.4	19.2	20.6	22.0	23.2	24.0	24.4	25.0	25.8	26.6	26.9	26.1	24.8	23.3	21.2	20.0	20.2	26.9
28-Jun	18.8	18.5	17.8	17.8	17.5	17.3	18.0	19.0	20.2	22.0	23.9	25.5	27.3	27.6	27.8	27.7	28.1	26.7	25.7	25.9	24.3	22.9	22.0	21.2	22.7	28.1
29-Jun	21.1	20.3	19.2	18.9	19.1	18.7	19.7	20.4	21.1	22.5	24.3	26.1	28.3	29.9	29.1	24.9	21.9	20.9	22.1	22.5	23.3	23.6	22.9	22.0	22.6	29.9
30-Jun	21.0	20.1	19.5	18.7	17.6	18.2	19.4	19.8	21.3	22.8	24.9	26.1	26.8	27.7	28.2	28.5	28.7	28.6	28.2	27.3	26.1	24.5	23.5	22.0	23.7	28.7
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	13	1.81	1.81
10 - 20	436	60.56	62.36
> 20	271	37.64	100.00

Total Number of Valid Hours: 720

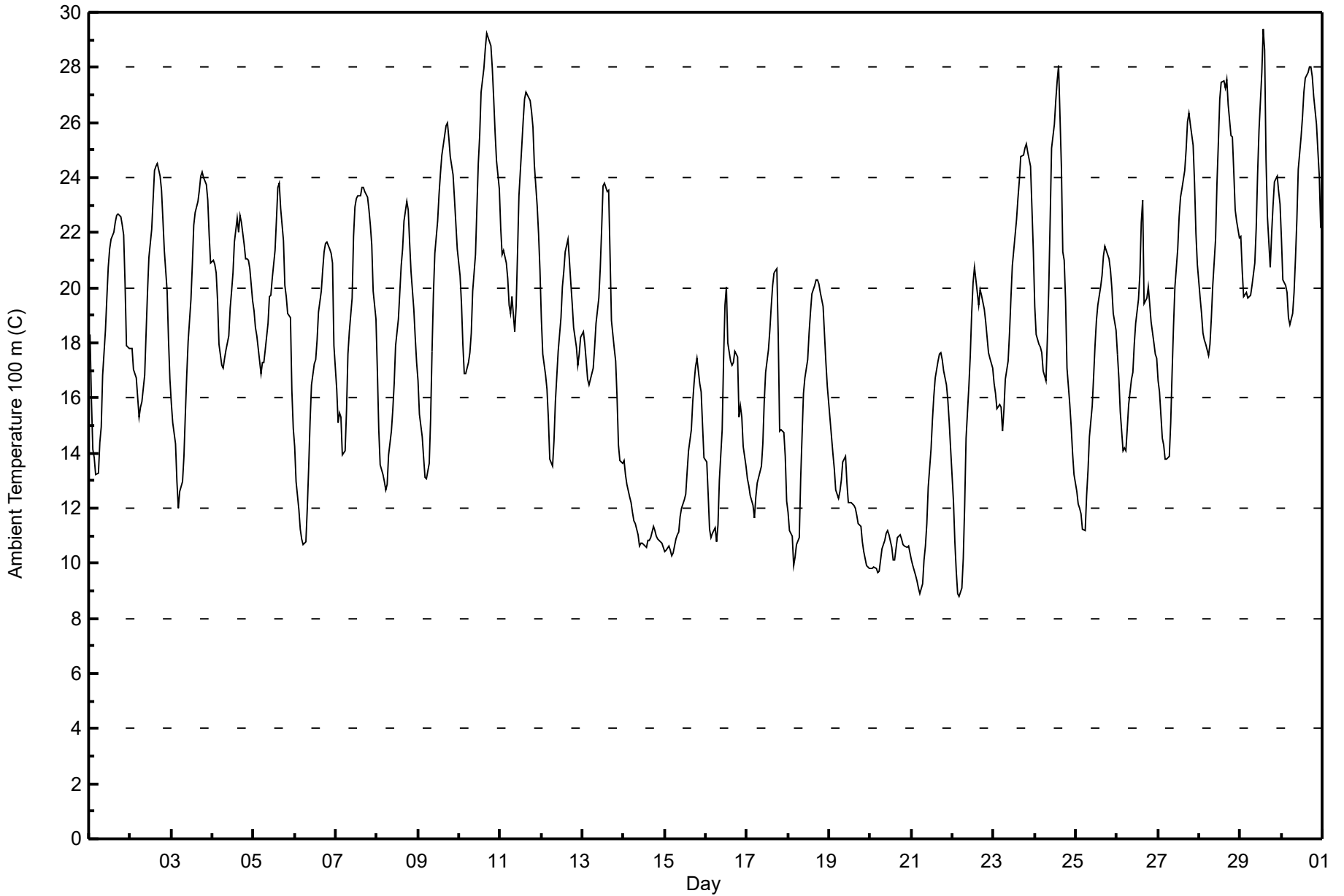
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 29.4 C on Jun 29 14:00		Maximum Daily Average: 23.7 C on Jun 30		Hours in Service: 720																						
Minimum Value: 8.8 C on Jun 22 05:00		Minimum Daily Average: 10.4 C on Jun 20		Hours of Data: 720																						
Maximum Diurnal Average: 21.5 C at hour 16		Minimum Diurnal Average: 13.9 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 18.02 C		Percentiles: P ₁ = 9.6 P ₁₀ = 11.0 Q ₁ = 14.1 Median = 18.0 Q ₃ = 21.4 P ₉₀ = 24.3 P ₉₉ = 28.0		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-Jun	18.3	15.9	14.1	13.9	13.2	13.3	14.4	15.0	16.8	18.5	19.6	20.8	21.4	21.7	22.0	22.4	22.6	22.7	22.6	22.3	21.9	20.1	17.9	17.8	18.7	22.7
2-Jun	17.8	17.8	17.0	16.7	16.0	15.3	15.7	15.9	16.8	18.4	19.8	21.1	22.1	23.2	24.2	24.4	24.5	24.0	23.6	22.5	21.4	19.9	18.1	16.7	19.7	24.5
3-Jun	15.8	15.1	14.3	13.0	12.0	12.6	13.0	13.9	15.4	16.8	18.1	19.6	20.8	22.3	22.7	23.1	23.5	24.0	24.2	24.0	23.8	23.2	21.9	20.9	18.9	24.2
4-Jun	21.0	20.9	20.5	19.5	17.9	17.2	17.1	17.5	17.8	18.3	19.3	19.9	20.5	21.7	22.5	22.0	22.6	22.4	21.6	21.0	21.0	21.0	20.7	19.5	20.1	22.6
5-Jun	19.2	18.6	18.2	17.3	16.9	17.3	17.3	17.7	18.7	19.7	19.7	20.3	21.3	22.5	23.6	23.8	22.9	21.7	20.1	19.7	19.1	18.9	16.3	14.9	19.4	23.8
6-Jun	14.2	12.9	11.9	11.2	10.9	10.7	10.8	12.0	13.5	15.1	16.5	17.2	17.4	18.1	19.1	19.9	20.7	21.3	21.6	21.7	21.4	21.3	20.9	17.9	16.6	21.7
7-Jun	16.3	15.1	15.4	15.3	13.9	14.1	15.6	17.6	18.4	19.6	21.9	23.0	23.2	23.3	23.3	23.7	23.7	23.5	23.3	22.8	22.3	21.5	19.9	18.8	19.8	23.7
8-Jun	17.0	14.8	13.6	13.2	13.0	12.6	12.9	13.9	14.8	15.6	16.5	17.9	18.9	19.8	20.8	21.4	22.4	23.1	22.8	21.7	20.6	19.2	18.2	17.3	17.6	23.1
9-Jun	16.6	15.4	14.6	13.8	13.1	13.1	13.6	15.3	17.7	19.8	21.2	22.4	23.4	24.1	24.8	25.5	25.9	26.0	25.4	24.7	24.1	23.3	22.3	21.4	20.3	26.0
10-Jun	20.4	19.4	17.9	16.9	16.9	17.3	17.7	18.3	19.9	21.2	22.9	24.5	25.5	27.1	28.0	28.7	29.2	29.1	28.8	28.0	26.9	25.6	24.6	23.6	23.3	29.2
11-Jun	22.2	21.2	21.3	20.9	20.3	19.4	19.1	19.7	18.4	19.3	21.3	23.4	25.1	26.0	26.9	27.1	27.0	26.8	26.4	25.8	24.5	23.0	22.0	20.7	22.8	27.1
12-Jun	18.9	17.6	16.8	16.3	15.2	13.8	13.5	14.5	15.9	16.8	17.7	18.9	20.1	20.6	21.3	21.8	21.0	20.2	19.4	18.6	17.8	17.2	17.6	18.2	17.9	21.8
13-Jun	18.4	17.9	17.3	16.7	16.5	16.9	17.1	17.9	18.7	19.6	20.7	22.1	23.7	23.8	23.5	23.5	21.2	18.8	17.8	17.4	16.0	14.3	13.7	13.6	18.6	23.8
14-Jun	13.7	13.2	12.8	12.4	12.2	11.9	11.5	11.5	11.0	10.6	10.7	10.7	10.6	10.6	10.8	10.8	10.9	11.3	11.2	11.0	10.9	10.8	10.7	10.6	11.4	13.7
15-Jun	10.4	10.5	10.6	10.5	10.3	10.4	10.9	11.0	11.1	11.7	12.0	12.3	12.5	13.3	14.1	14.9	15.8	16.6	17.1	17.4	16.5	16.2	15.0	13.8	13.1	17.4
16-Jun	13.7	12.5	11.2	10.9	11.1	11.3	10.8	11.4	13.0	14.9	17.4	19.4	20.0	18.0	17.3	17.2	17.3	17.7	17.5	15.3	15.7	15.3	14.3	13.5	14.9	20.0
17-Jun	13.1	12.8	12.5	12.1	11.6	12.4	12.9	13.1	13.5	14.3	15.9	17.0	17.7	18.5	19.3	20.1	20.5	20.7	18.3	14.8	14.8	14.8	13.9	12.3	15.3	20.7
18-Jun	11.8	11.2	11.0	9.9	10.2	10.7	10.9	13.1	14.6	16.2	16.7	17.4	18.4	19.1	19.8	20.1	20.3	20.3	20.1	19.8	19.3	18.3	17.3	16.4	16.0	20.3
19-Jun	15.2	14.6	14.0	13.4	12.7	12.4	12.6	13.0	13.7	13.9	12.9	12.2	12.2	12.2	12.1	12.0	11.7	11.5	11.3	10.8	10.4	10.2	9.9	9.8	12.3	15.2
20-Jun	9.8	9.8	9.8	9.8	9.7	9.7	10.1	10.5	10.8	11.1	11.2	11.0	10.6	10.1	10.1	10.5	11.0	11.0	10.9	10.7	10.6	10.6	10.6	10.4	10.4	11.2
21-Jun	10.1	9.9	9.5	9.4	9.1	8.9	9.3	10.1	10.6	11.5	12.8	14.1	15.2	16.1	16.7	17.3	17.6	17.7	17.4	17.0	16.5	15.9	15.1	14.1	13.4	17.7
22-Jun	12.2	10.8	9.7	8.9	8.8	9.1	10.2	12.1	14.5	16.4	17.6	19.1	20.2	20.8	19.8	19.4	19.9	19.7	19.2	18.8	18.2	17.6	17.4	17.1	15.7	20.8
23-Jun	16.5	16.2	15.6	15.8	15.7	14.8	15.6	16.7	17.3	18.4	19.6	20.8	21.9	22.5	23.3	23.9	24.8	24.8	25.1	25.2	24.9	24.4	22.9	21.3	20.3	25.2
24-Jun	19.3	18.3	17.9	17.8	17.7	17.0	16.6	18.2	20.0	22.5	25.1	25.9	26.8	27.5	28.1	24.4	21.3	21.0	19.5	17.1	15.7	14.9	14.0	13.2	20.0	28.1
25-Jun	12.6	12.2	12.0	11.8	11.3	11.2	12.5	13.4	14.6	15.7	16.8	17.9	18.8	19.4	20.0	20.5	21.1	21.5	21.2	21.0	20.6	20.0	19.1	18.5	16.8	21.5
26-Jun	17.6	16.7	15.5	14.1	14.2	14.1	14.9	15.8	16.7	17.0	17.9	18.7	19.6	20.5	22.4	23.2	19.4	19.6	20.0	19.4	18.8	18.0	17.6	17.4	17.9	23.2
27-Jun	16.7	16.2	14.6	14.3	13.8	13.8	13.9	15.1	16.9	18.6	20.0	21.4	22.6	23.3	23.6	24.3	25.0	26.1	26.4	26.0	25.2	23.8	22.0	20.8	20.2	26.4
28-Jun	19.6	19.1	18.4	18.1	18.0	17.6	17.9	18.9	20.1	21.8	23.8	25.3	26.9	27.5	27.5	27.3	27.6	26.6	25.5	25.5	24.2	22.8	22.4	21.8	22.7	27.6
29-Jun	21.9	20.7	19.7	19.8	19.6	19.7	19.7	20.1	20.9	22.2	24.2	25.7	27.8	29.4	28.6	24.7	22.6	20.7	22.0	23.0	23.9	24.0	23.5	23.0	22.8	29.4
30-Jun	21.8	20.3	20.1	19.9	18.9	18.6	19.1	19.8	21.1	22.5	24.3	25.5	26.2	27.1	27.6	27.8	28.0	28.0	27.7	26.9	25.9	25.0	24.0	22.2	23.7	28.0
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

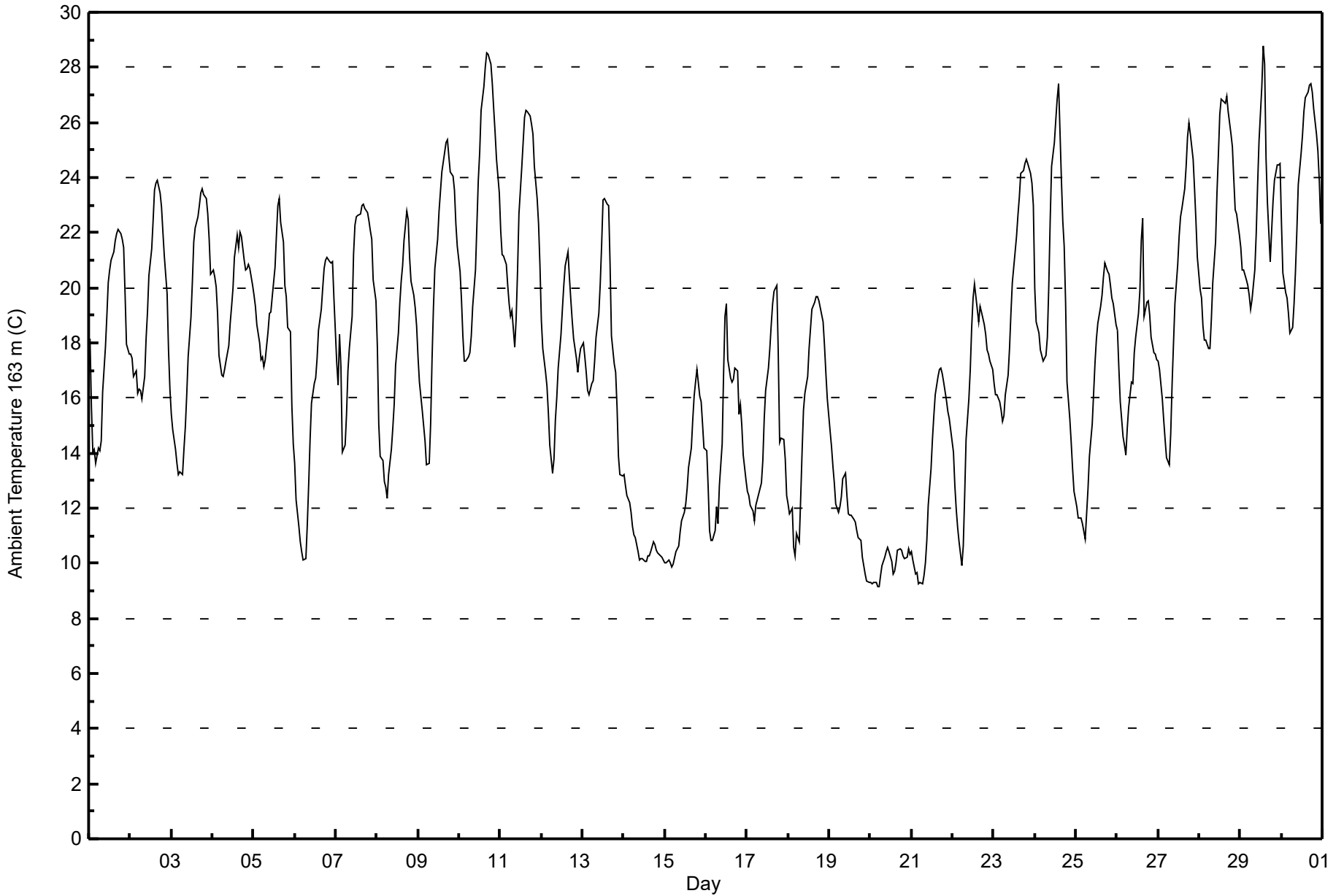
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	19	2.64	2.64
10 - 20	446	61.94	64.58
> 20	255	35.42	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 28.8 C on Jun 29 14:00																						Maximum Daily Average: 23.3 C on Jun 30																						Hours in Service: 720				
Minimum Value: 9.1 C on Jun 20 05:00																						Minimum Daily Average: 10.0 C on Jun 20																						Hours of Data: 720				
Maximum Diurnal Average: 20.9 C at hour 16																						Minimum Diurnal Average: 14.0 C at hour 6																						Hours of Missing Data: 0				
Monthly Average: 17.75 C																						Percentiles: P ₁ = 9.3 P ₁₀ = 10.8 Q ₁ = 14.1 Median = 17.8 Q ₃ = 21.1 P ₉₀ = 23.9 P ₉₉ = 27.4																						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-Jun	18.1	15.7	14.0	14.1	13.6	14.2	14.1	14.5	16.2	17.8	19.0	20.2	20.6	21.0	21.3	21.7	22.0	22.1	22.0	21.7	21.4	19.8	17.9	17.6	18.4	22.1																						
2-Jun	17.6	17.5	16.8	17.0	16.2	16.3	16.3	16.0	16.8	18.2	19.1	20.4	21.4	22.4	23.5	23.8	23.9	23.5	22.9	22.0	21.1	19.8	17.7	16.3	19.4	23.9																						
3-Jun	15.4	14.8	14.1	13.6	13.2	13.3	13.2	14.2	15.0	16.1	17.5	18.9	20.2	21.6	22.2	22.6	23.0	23.4	23.6	23.4	23.2	22.7	21.8	20.5	18.6	23.6																						
4-Jun	20.6	20.4	20.0	19.1	17.6	16.8	16.8	17.0	17.4	17.9	18.7	19.3	20.0	21.1	21.9	21.5	22.0	21.9	21.0	20.6	20.7	20.9	20.7	20.1	19.7	22.0																						
5-Jun	19.7	19.3	18.7	18.0	17.4	17.5	17.1	17.4	18.4	19.1	19.1	19.7	20.0	21.9	23.0	23.2	22.4	21.6	20.1	19.7	18.6	18.4	15.7	14.3	19.2	23.2																						
6-Jun	13.6	12.3	11.3	10.8	10.4	10.1	10.2	11.4	12.9	14.5	15.8	16.5	16.7	17.4	18.4	19.2	20.0	20.7	21.0	21.1	21.0	20.9	20.9	19.6	16.1	21.1																						
7-Jun	17.3	16.5	18.3	17.1	14.0	14.3	15.4	17.0	17.8	19.0	21.2	22.3	22.6	22.7	22.7	23.0	23.0	22.9	22.7	22.4	22.1	21.8	20.3	19.5	19.8	23.0																						
8-Jun	17.8	15.1	13.9	13.7	12.9	12.8	12.4	13.2	14.1	14.9	15.8	17.2	18.4	19.4	20.2	20.8	21.7	22.8	22.5	21.1	20.2	19.7	19.3	18.6	17.4	22.8																						
9-Jun	17.5	16.6	15.6	15.0	14.5	13.6	13.6	15.1	17.4	19.3	20.7	21.8	22.8	23.5	24.2	24.9	25.3	25.4	24.8	24.2	24.1	23.6	22.3	21.5	20.3	25.4																						
10-Jun	20.6	19.6	18.2	17.3	17.3	17.5	17.7	18.2	19.3	20.6	22.3	23.9	24.9	26.5	27.3	28.0	28.5	28.4	28.1	27.4	26.5	25.6	24.7	23.4	23.0	28.5																						
11-Jun	22.0	21.2	21.2	20.8	20.1	19.4	19.0	19.1	17.8	18.8	20.6	22.7	24.4	25.3	26.2	26.5	26.4	26.2	25.9	25.6	24.4	23.2	22.3	20.8	22.5	26.5																						
12-Jun	18.8	17.8	17.0	16.4	15.5	14.3	13.3	13.8	15.2	16.0	17.1	18.3	19.2	20.1	20.8	21.3	20.4	19.6	18.8	18.1	17.5	17.0	17.5	17.8	17.6	21.3																						
13-Jun	18.0	17.5	16.9	16.3	16.1	16.5	16.6	17.3	18.2	19.1	20.2	21.6	23.2	23.2	23.0	23.0	20.9	18.2	17.2	16.9	15.7	13.9	13.2	13.2	18.2	23.2																						
14-Jun	13.2	12.8	12.5	12.2	11.8	11.3	11.0	10.9	10.4	10.1	10.2	10.2	10.1	10.0	10.3	10.3	10.4	10.8	10.7	10.5	10.4	10.3	10.2	10.1	10.9	13.2																						
15-Jun	10.0	10.0	10.1	10.0	9.9	10.0	10.4	10.5	10.6	11.2	11.6	11.8	12.1	12.7	13.5	14.2	15.2	16.1	16.6	17.0	16.1	15.9	15.0	14.2	12.7	17.0																						
16-Jun	14.1	12.7	11.2	10.8	10.8	11.2	12.1	11.4	12.8	14.3	16.9	19.0	19.4	17.4	16.7	16.6	16.7	17.1	17.0	15.4	15.8	15.0	13.9	13.0	14.6	19.4																						
17-Jun	12.6	12.4	12.1	11.9	11.6	12.1	12.3	12.5	12.9	13.7	15.2	16.3	17.1	17.8	18.7	19.4	19.9	20.1	17.7	14.4	14.5	14.5	13.8	12.5	14.8	20.1																						
18-Jun	12.1	11.8	12.0	10.6	10.2	11.1	10.8	12.4	14.0	15.5	16.2	16.8	17.8	18.5	19.2	19.5	19.7	19.7	19.5	19.3	18.8	17.9	16.9	15.9	15.7	19.7																						
19-Jun	14.8	14.2	13.5	12.9	12.2	11.8	12.0	12.4	13.1	13.3	12.5	11.8	11.8	11.7	11.6	11.5	11.2	10.9	10.8	10.2	9.9	9.6	9.4	9.3	11.8	14.8																						
20-Jun	9.3	9.3	9.3	9.3	9.1	9.2	9.5	9.9	10.2	10.4	10.6	10.4	10.1	9.6	9.7	10.0	10.5	10.5	10.5	10.3	10.2	10.2	10.5	10.3	10.0	10.6																						
21-Jun	10.4	10.1	9.6	9.7	9.3	9.3	9.3	9.5	10.0	10.9	12.1	13.4	14.5	15.4	16.1	16.8	17.0	17.1	16.9	16.6	15.9	15.5	15.3	14.9	13.1	17.1																						
22-Jun	14.0	12.8	11.9	11.3	10.8	9.9	10.6	12.4	14.5	15.9	17.0	18.6	19.6	20.2	19.2	18.7	19.3	19.1	18.7	18.3	17.7	17.6	17.3	17.1	15.9	20.2																						
23-Jun	16.5	16.1	16.1	15.8	15.5	15.2	15.4	16.1	16.8	17.8	19.0	20.2	21.3	21.9	22.6	23.3	24.1	24.2	24.5	24.7	24.5	24.1	23.8	23.0	20.1	24.7																						
24-Jun	20.0	18.8	18.4	17.7	17.5	17.4	17.5	18.2	20.0	22.4	24.4	25.3	26.1	26.8	27.4	23.9	22.4	21.5	19.5	16.6	15.2	14.4	13.4	12.6	19.9	27.4																						
25-Jun	12.1	11.7	11.6	11.6	11.4	10.9	11.8	12.7	13.9	15.0	16.2	17.3	18.1	18.7	19.3	19.7	20.4	20.9	20.6	20.5	20.1	19.7	19.4	18.6	16.3	20.9																						
26-Jun	18.5	17.1	15.9	14.6	14.3	13.9	14.9	15.7	16.6	16.5	17.6	18.2	19.1	19.9	21.7	22.5	18.9	19.5	19.5	19.0	18.2	17.7	17.6	17.4	17.7	22.5																						
27-Jun	17.4	17.1	16.0	15.2	14.5	13.8	13.6	14.7	16.5	18.0	19.4	20.8	21.9	22.6	22.9	23.6	24.4	25.5	26.0	25.6	24.7	23.6	22.4	21.1	20.0	26.0																						
28-Jun	19.9	19.6	18.6	18.1	18.1	17.8	17.8	18.9	20.2	21.7	23.4	24.8	26.3	26.9	26.8	26.7	27.0	26.4	25.6	25.1	23.9	22.8	22.7	21.9	22.5	27.0																						
29-Jun	21.4	20.7	20.6	20.3	20.1	19.8	19.2	19.6	20.6	22.0	23.8	25.3	27.3	28.8	28.1	24.7	23.1	20.9	22.0	23.1	23.9	24.5	24.4	24.5	22.9	28.8																						
30-Jun	22.4	20.5	19.8	19.6	19.1	18.3	18.5	19.4	20.6	22.1	23.7	24.9	25.5	26.4	26.9	27.1	27.3	27.4	27.1	26.5	25.6	25.0	23.9	22.3	23.3	27.4																						
																								16.5	15.7	15.2	14.7	14.2	14.0	14.1	14.7	15.7	16.7	17.9	18.9	19.8	20.4	20.8	20.9	20.9	20.8	20.5	19.9	19.4	18.8	18.1	17.4	Diurnal Average
																								22.4	21.2	21.2	20.8	20.1	19.8	19.2	19.6	20.6	22.4	24.4	25.3	27.3	28.8	28.1	28.0	28.5	28.4	28.1	27.4	26.5	25.6	24.7	24.5	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	24	3.33	3.33
10 - 20	455	63.19	66.53
> 20	241	33.47	100.00

Total Number of Valid Hours: 720

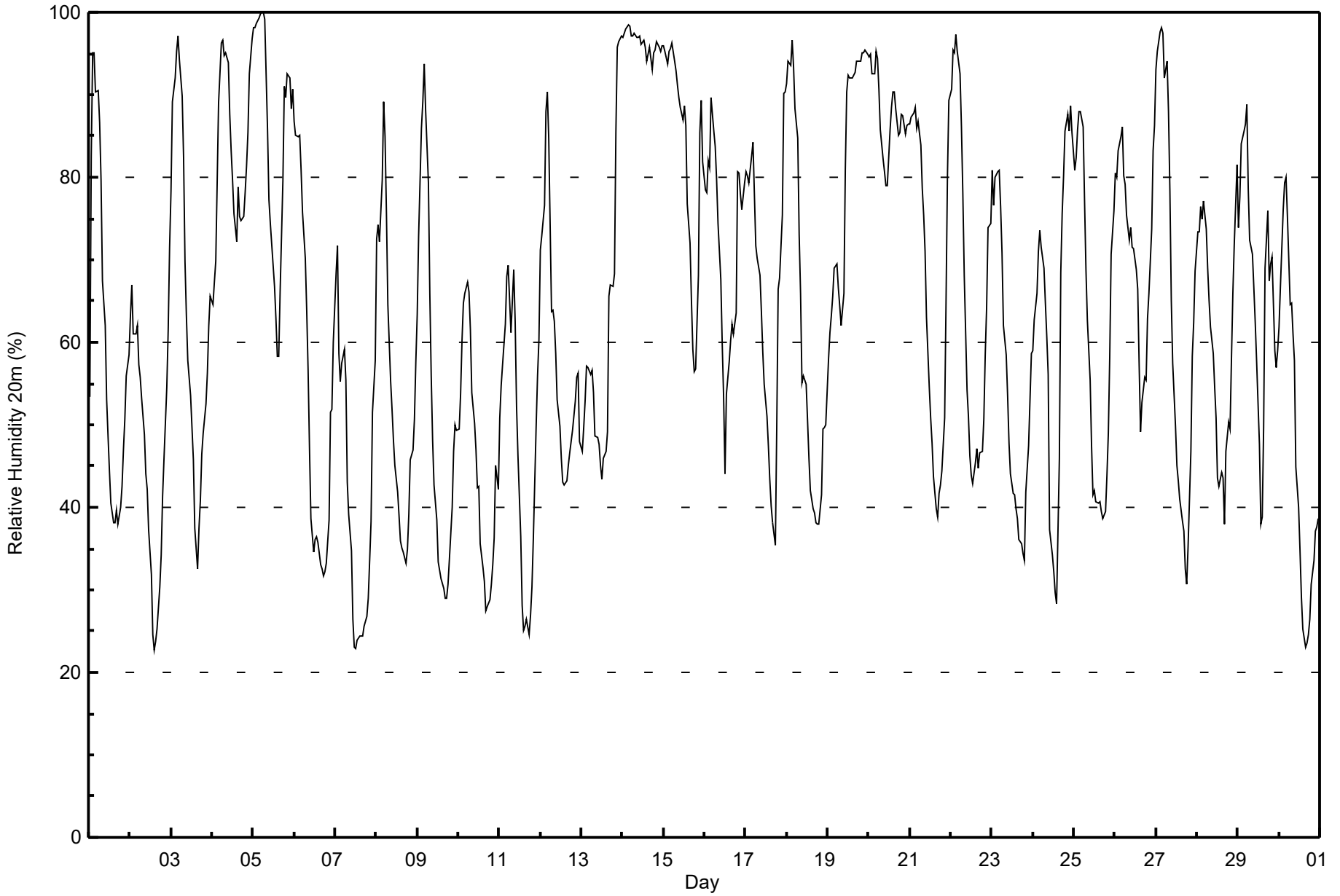
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 100.0 % on Jun 5 06:00 Maximum Daily Average: 96.4 % on Jun 14																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 22.8 % on Jun 2 15:00 Minimum Daily Average: 40.6 % on Jun 7																						Hours of Missing Data: 0 Hours of Calibration: 0																										
Maximum Diurnal Average: 83.9 % at hour 5 Minimum Diurnal Average: 46.8 % at hour 15																						Percent Operational Time: 100.0																										
Monthly Average: 63.97 % Percentiles: P ₁ = 24.4 P ₁₀ = 35.6 Q ₁ = 46.3 Median = 63.6 Q ₃ = 83.2 P ₉₀ = 94.0 P ₉₉ = 98.3																																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	53.4	82.6	95.2	95.1	90.4	90.5	86.6	79.6	67.5	62.1	53.1	48.6	44.4	40.4	38.2	38.2	39.6	38.0	40.0	42.5	47.0	50.7	55.9	58.5	59.9	95.2																						
2-Jun	63.2	66.9	61.1	61.1	62.1	57.2	55.8	53.2	48.8	44.0	42.3	37.3	31.8	24.6	22.8	23.7	25.3	30.4	34.2	41.4	46.0	54.6	61.5	71.5	46.7	71.5																						
3-Jun	78.3	89.2	92.0	95.3	97.2	94.2	89.8	82.4	69.9	63.1	57.9	53.6	49.7	45.7	37.5	32.6	37.4	40.8	46.4	48.9	52.5	56.2	62.1	65.6	64.1	97.2																						
4-Jun	64.6	67.2	69.8	79.4	89.1	96.3	96.7	94.8	95.1	94.0	87.6	83.2	79.6	75.6	72.3	78.8	75.2	74.7	75.2	78.1	81.4	85.4	92.6	96.8	82.6	96.8																						
5-Jun	98.2	98.2	98.6	99.4	99.9	100.0	100.0	99.2	85.8	77.3	74.5	71.9	66.8	62.8	58.3	58.4	66.2	79.7	91.1	89.7	92.5	92.0	88.3	90.8	85.0	100.0																						
6-Jun	86.8	85.1	85.0	85.0	80.9	75.8	70.2	64.0	56.6	47.1	38.6	34.6	36.2	36.5	35.8	33.1	32.5	31.7	32.2	33.2	38.4	51.5	51.8	59.9	53.4	86.8																						
7-Jun	68.3	71.7	58.6	55.3	57.5	59.1	55.5	43.1	39.1	34.7	26.4	23.1	22.9	23.9	24.4	24.4	24.4	25.6	26.7	29.0	33.6	38.4	51.5	57.8	40.6	71.7																						
8-Jun	72.5	74.3	72.3	79.7	89.2	84.9	75.6	64.5	55.2	51.8	48.1	45.1	41.9	39.0	36.0	35.0	34.7	33.3	35.0	39.2	45.7	47.0	50.7	57.7	54.5	89.2																						
9-Jun	63.3	72.9	86.0	89.2	93.7	88.2	79.4	66.0	55.9	48.1	42.7	38.4	33.3	32.4	31.4	30.2	29.0	28.9	30.8	33.8	40.0	46.8	50.0	49.2	52.5	93.7																						
10-Jun	49.5	53.8	60.2	64.8	65.9	67.4	66.1	61.6	54.0	50.2	46.9	42.3	42.5	35.7	32.7	30.9	27.4	28.0	28.8	30.7	33.1	36.3	45.1	42.2	45.7	67.4																						
11-Jun	50.9	54.7	57.3	62.2	67.9	69.4	65.3	61.2	68.7	62.6	52.1	46.3	36.5	28.1	25.1	25.5	26.4	24.6	26.9	30.3	36.3	49.8	55.9	60.3	47.7	69.4																						
12-Jun	71.1	72.9	76.7	88.0	90.4	84.8	63.7	63.9	62.5	58.6	53.0	49.8	45.9	43.0	42.7	43.3	45.0	46.6	48.0	49.3	52.9	55.7	56.2	48.0	58.8	90.4																						
13-Jun	46.9	49.6	52.9	57.1	56.9	56.2	56.6	53.9	48.7	48.5	47.6	45.2	43.4	45.8	46.8	49.2	65.6	67.0	66.7	68.3	85.5	95.8	96.4	97.0	60.3	97.0																						
14-Jun	97.0	97.5	97.9	98.5	98.3	97.1	97.2	97.4	97.0	97.0	97.2	96.2	96.6	95.8	94.0	95.0	95.8	93.0	95.1	95.4	96.4	95.8	95.3	96.0	96.4	98.5																						
15-Jun	95.9	95.2	93.8	95.3	95.6	96.2	94.0	93.0	91.2	89.6	88.6	86.9	88.7	86.3	76.8	72.0	65.0	59.2	56.4	56.8	68.2	85.5	89.3	81.8	83.4	96.2																						
16-Jun	78.5	78.2	82.0	81.2	89.7	85.6	83.7	79.7	74.4	67.6	59.9	53.3	44.0	53.8	57.6	60.2	62.3	61.0	63.6	80.7	80.5	78.0	76.2	79.3	71.3	89.7																						
17-Jun	80.7	80.1	79.4	82.5	84.3	78.0	71.7	70.2	68.1	63.7	58.8	55.0	51.0	47.4	43.4	40.2	38.1	35.4	50.1	66.5	67.8	75.4	90.1	90.3	65.3	90.3																						
18-Jun	91.4	94.0	93.5	96.6	93.5	88.4	84.7	73.1	65.8	55.1	55.9	54.9	50.4	46.0	42.1	39.9	39.4	38.2	38.0	38.0	41.5	49.4	49.6	50.1	61.2	96.6																						
19-Jun	57.9	61.2	63.2	65.6	68.9	69.4	66.6	64.4	62.0	65.9	81.0	90.4	92.4	92.1	92.0	92.4	92.8	94.1	94.0	94.1	95.1	95.0	95.4	95.0	80.9	95.4																						
20-Jun	94.5	94.8	92.5	92.5	95.2	94.3	90.7	85.8	82.2	80.6	79.0	79.1	85.8	88.5	90.3	90.4	88.3	85.0	85.5	87.7	87.5	85.3	86.2	86.4	87.8	95.2																						
21-Jun	86.5	87.3	87.8	88.5	86.0	86.8	83.9	78.7	75.3	71.1	63.1	54.6	50.9	47.8	43.7	39.8	38.8	41.7	42.7	44.4	50.9	65.2	80.2	89.3	66.0	89.3																						
22-Jun	90.6	95.5	95.1	97.3	95.2	92.5	86.2	78.0	68.2	54.3	51.0	46.3	44.0	42.9	45.4	47.1	44.7	46.5	46.7	50.7	58.5	64.2	74.0	74.4	66.2	97.3																						
23-Jun	80.8	76.6	79.9	80.7	80.8	76.4	70.8	62.0	58.5	53.5	47.9	44.1	41.7	41.5	39.8	38.6	36.1	35.6	34.5	33.5	41.9	47.5	53.0	58.6	54.8	80.8																						
24-Jun	59.0	62.6	65.9	71.0	73.5	71.5	69.0	64.8	60.7	56.2	37.3	34.2	32.2	29.7	28.3	45.9	68.6	75.6	80.1	85.7	87.6	85.6	88.6	85.4	63.3	88.6																						
25-Jun	80.9	82.3	85.8	88.0	88.0	86.1	77.1	68.8	62.6	55.4	47.4	41.6	42.0	40.7	40.5	40.7	39.5	38.6	39.5	43.9	49.0	58.4	70.7	76.0	60.1	88.0																						
26-Jun	80.4	80.0	83.2	84.9	86.1	80.1	79.2	75.3	72.4	74.0	71.4	71.4	68.8	66.5	57.5	49.2	52.8	55.7	55.5	62.8	66.0	73.7	83.2	86.3	71.5	86.3																						
27-Jun	93.1	95.3	97.6	98.1	97.4	92.0	94.1	87.9	78.2	65.0	57.5	49.8	45.1	43.2	41.0	38.4	37.2	32.5	30.7	35.3	46.8	58.3	62.3	68.6	64.4	98.1																						
28-Jun	73.3	73.4	76.5	75.0	77.2	73.8	69.0	65.1	61.9	58.6	54.6	50.8	43.6	42.6	44.2	43.5	38.0	46.9	50.3	49.5	57.9	65.9	71.9	81.6	60.2	81.6																						
29-Jun	73.8	77.7	84.0	85.6	86.5	88.9	78.6	72.4	70.6	66.6	62.4	57.6	47.7	38.0	38.9	49.7	69.0	76.0	67.4	69.5	70.3	59.0	56.9	59.0	66.9	88.9																						
30-Jun	61.8	66.8	76.2	79.4	80.0	75.3	64.6	64.8	61.1	57.7	44.9	39.9	34.7	29.1	25.2	23.0	23.6	24.6	26.5	30.7	33.6	37.1	37.6	38.7	47.4	80.0																						
																								74.8	77.9	80.0	82.4	83.9	81.9	77.4	72.3	67.3	62.5	57.6	54.2	51.2	48.8	46.8	47.0	48.6	49.6	51.3	54.6	59.5	64.6	69.3	71.7	Diurnal Average
																								98.2	98.2	98.6	99.4	99.9	100.0	100.0	99.2	97.0	97.0	97.2	96.2	96.6	95.8	94.0	95.0	95.8	94.1	95.1	95.4	96.4	95.8	96.4	97.0	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	119	16.53	16.53
40 - 60	206	28.61	45.14
60 - 80	189	26.25	71.39
80 - 100	204	28.33	99.72

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

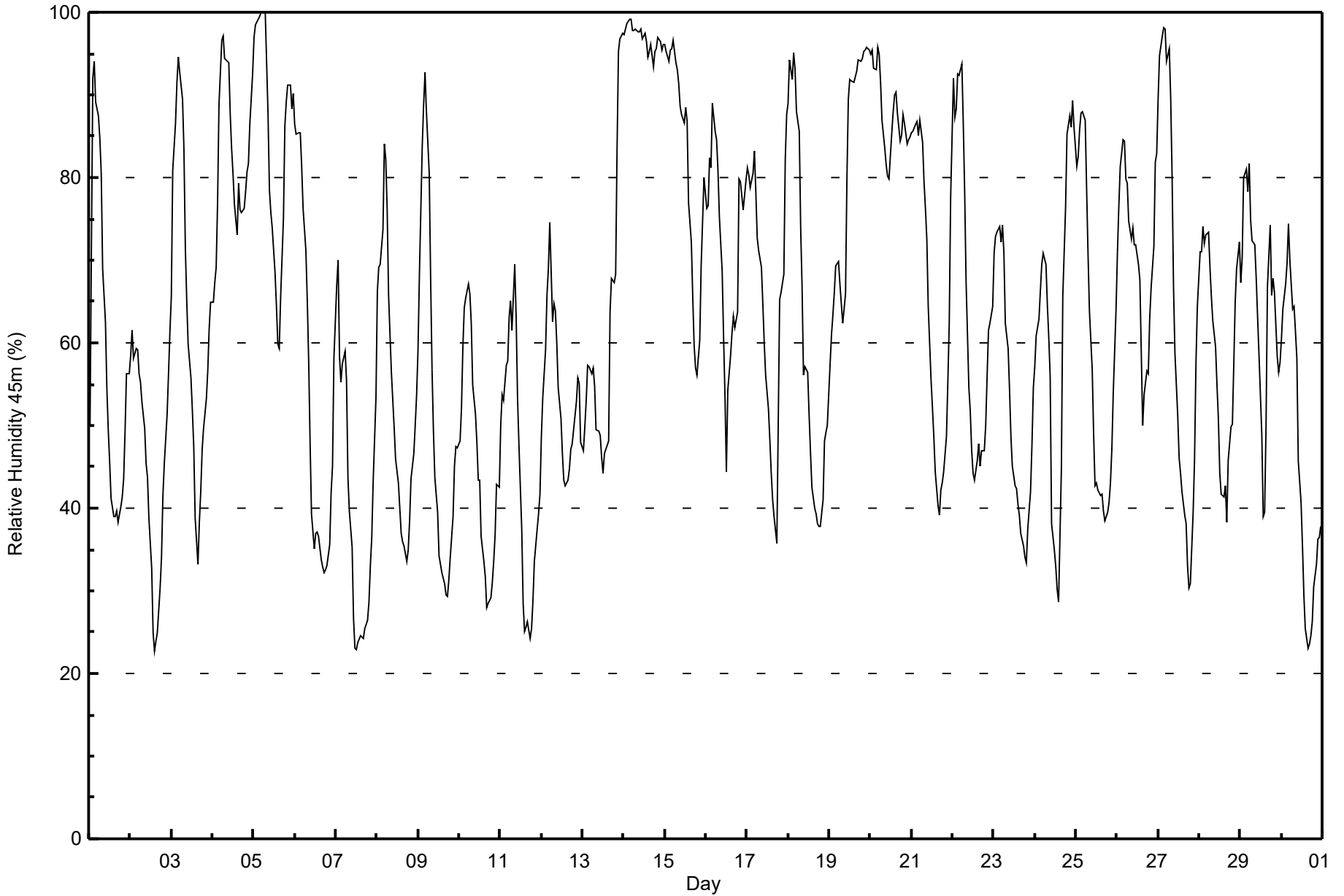
Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - June 2023

Maximum Value: 100.0 % on Jun 5 05:00 Maximum Daily Average: 96.9 % on Jun 14																						Hours in Service:	720																							
Minimum Value: 22.6 % on Jun 2 15:00 Minimum Daily Average: 39.9 % on Jun 7																						Hours of Data:	720																							
Maximum Diurnal Average: 81.2 % at hour 5 Minimum Diurnal Average: 47.3 % at hour 15																						Hours of Missing Data:	0																							
Monthly Average: 63.01 % Percentiles: P ₁ = 24.2 P ₁₀ = 35.8 Q ₁ = 45.5 Median = 62.6 Q ₃ = 81.0 P ₉₀ = 93.0 P ₉₉ = 98.7																						Hours of Calibration:	0																							
																						Percent Operational Time:	100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Jun	49.8	71.9	92.0	94.1	89.2	87.5	84.8	80.5	69.0	62.6	54.5	49.5	45.5	41.3	38.9	38.9	39.6	38.2	40.1	41.4	43.6	49.3	56.3	56.3	59.0	94.1																				
2-Jun	58.5	61.5	58.1	59.3	59.2	56.3	55.2	52.9	49.7	45.4	43.7	38.7	32.7	25.0	22.6	23.8	24.8	30.4	34.1	41.5	45.4	51.4	56.2	61.4	45.3	61.5																				
3-Jun	65.5	80.8	86.7	91.5	94.7	92.8	89.5	83.4	71.5	65.1	59.9	55.7	51.8	47.5	38.9	33.3	38.3	42.0	47.1	49.7	53.1	56.5	61.8	64.9	63.4	94.7																				
4-Jun	64.8	67.2	69.2	77.0	88.7	96.5	97.1	94.4	94.2	93.9	87.7	83.6	80.5	76.8	73.1	79.3	76.1	75.7	76.2	78.4	80.6	81.6	86.4	92.6	82.2	97.1																				
5-Jun	97.0	98.4	98.7	99.5	100.0	100.0	100.0	100.0	87.6	78.5	75.8	73.8	68.5	64.4	59.8	59.3	65.6	75.1	86.2	89.1	91.1	91.2	88.3	90.2	84.9	100.0																				
6-Jun	86.5	85.3	85.5	85.3	81.3	76.3	71.2	65.1	57.7	47.9	39.4	35.1	36.9	37.1	36.6	33.7	32.9	32.3	32.5	33.1	35.6	41.8	45.0	58.1	53.0	86.5																				
7-Jun	66.9	70.1	58.3	55.3	57.4	59.0	55.5	43.7	39.6	35.3	26.7	23.1	22.9	23.8	24.5	24.4	24.3	25.5	26.4	28.7	33.0	36.4	43.2	53.4	39.9	70.1																				
8-Jun	66.2	69.1	69.4	73.7	84.1	82.3	76.2	65.7	56.4	53.1	49.7	46.0	43.0	40.1	37.0	36.0	35.5	33.5	34.8	38.4	43.6	46.7	50.0	53.7	53.5	84.1																				
9-Jun	59.1	68.3	83.8	88.9	92.8	88.0	80.5	67.8	56.7	49.3	43.7	39.6	34.3	33.3	32.2	30.8	29.5	29.4	31.3	34.0	38.9	45.2	47.5	47.3	52.2	92.8																				
10-Jun	48.2	52.1	59.4	64.2	65.5	67.1	65.8	62.4	55.0	51.3	48.0	43.3	43.4	36.7	33.5	31.6	27.9	28.4	29.2	31.0	33.5	36.8	42.8	42.5	45.8	67.1																				
11-Jun	50.0	53.8	53.0	57.3	57.8	63.0	65.1	61.5	69.5	63.2	53.4	47.6	37.4	28.5	25.1	25.6	26.3	24.2	25.4	28.9	33.6	37.4	39.3	41.7	44.5	69.5																				
12-Jun	48.6	53.4	59.1	65.8	69.0	74.5	62.6	64.7	63.9	60.0	54.6	50.9	46.6	43.5	42.7	43.3	44.8	47.1	47.9	49.4	52.8	55.7	55.1	48.0	54.3	74.5																				
13-Jun	47.0	49.8	53.0	57.2	57.0	56.3	56.9	54.7	49.6	49.4	48.8	46.1	44.3	46.5	47.7	48.2	63.8	67.8	67.2	68.3	83.4	95.3	96.7	97.5	60.5	97.5																				
14-Jun	97.3	98.0	98.6	99.1	99.1	97.8	97.8	98.0	97.6	97.6	97.9	96.9	97.4	96.4	94.7	95.3	96.2	93.4	95.3	95.6	96.9	96.4	95.4	96.2	96.9	99.1																				
15-Jun	96.1	95.3	94.2	95.4	95.6	96.6	94.0	93.0	91.4	88.6	87.6	86.5	88.4	86.8	77.0	72.2	65.6	59.7	57.0	56.1	60.3	69.3	74.5	80.0	81.7	96.6																				
16-Jun	76.3	76.7	82.4	81.2	88.9	85.6	84.5	80.8	75.3	68.6	60.7	53.6	44.4	54.2	58.5	61.1	63.2	61.8	63.7	79.8	79.5	77.8	76.0	79.6	71.4	88.9																				
17-Jun	81.3	80.4	78.8	80.6	83.3	78.4	72.7	71.2	69.2	64.8	60.0	56.1	52.1	48.2	44.2	41.1	38.9	35.8	50.3	65.3	66.0	68.3	82.2	87.6	64.9	87.6																				
18-Jun	89.0	94.3	91.9	95.2	93.0	88.0	85.5	73.9	66.7	56.1	57.1	56.5	51.4	46.7	42.6	39.9	39.4	38.1	37.9	37.9	41.0	48.2	49.2	50.0	61.2	95.2																				
19-Jun	57.5	61.0	63.4	66.1	69.3	69.9	67.1	64.7	62.4	66.0	79.8	89.6	91.9	91.7	91.6	92.3	92.8	94.2	94.1	94.3	95.3	95.4	95.7	95.5	80.9	95.7																				
20-Jun	94.8	95.5	93.2	93.0	95.7	95.0	91.5	86.9	83.5	81.6	80.2	79.8	85.5	87.9	90.0	90.3	87.7	84.4	85.1	87.7	86.7	84.1	84.6	84.9	87.9	95.7																				
21-Jun	85.5	85.6	86.4	86.8	85.1	87.0	84.2	79.4	76.3	72.5	64.4	55.5	52.2	48.6	44.3	40.3	39.1	42.2	43.1	44.3	48.7	55.2	62.4	77.7	64.5	87.0																				
22-Jun	92.1	87.3	88.3	92.6	92.4	93.7	86.6	78.4	67.5	54.6	51.7	47.0	44.2	43.4	45.8	47.8	45.1	46.9	46.9	50.0	55.9	61.6	62.4	64.4	64.4	93.7																				
23-Jun	70.8	72.8	73.3	74.1	72.2	74.2	70.8	62.4	59.3	54.4	48.7	45.1	42.8	42.3	40.5	39.2	36.9	35.5	34.1	33.4	37.5	42.0	47.7	54.6	52.7	74.2																				
24-Jun	57.1	60.8	62.9	66.4	69.5	70.8	69.4	64.6	60.7	55.9	38.1	34.9	32.9	30.1	28.7	44.7	65.5	71.0	76.5	85.3	87.4	86.0	89.4	86.1	62.3	89.4																				
25-Jun	81.4	82.6	85.7	87.8	87.9	87.0	78.7	70.9	63.9	56.8	49.1	42.6	43.0	42.1	41.5	41.7	39.7	38.5	39.4	40.6	43.1	47.1	53.9	64.1	58.7	87.9																				
26-Jun	71.0	76.5	81.3	84.5	84.4	79.9	79.3	74.8	72.6	73.8	71.8	71.8	69.6	67.6	58.9	50.0	53.7	56.6	56.3	62.9	66.6	71.6	81.9	82.9	70.8	84.5																				
27-Jun	89.4	94.8	97.0	98.2	98.0	94.0	95.6	89.5	80.0	66.7	58.9	51.2	46.1	44.2	42.0	39.2	38.2	33.1	30.4	30.9	39.5	46.0	57.5	64.4	63.5	98.2																				
28-Jun	71.1	71.1	74.1	72.0	73.0	73.5	69.2	65.6	62.7	59.5	54.9	50.9	44.2	41.7	41.4	42.7	38.3	45.8	49.9	50.2	57.4	64.9	69.0	72.1	59.0	74.1																				
29-Jun	67.2	70.3	80.0	81.0	78.3	81.6	74.9	72.5	71.8	67.8	63.0	58.5	48.7	38.9	39.4	49.8	66.9	74.2	65.7	67.7	66.1	58.3	56.4	57.7	64.9	81.6																				
30-Jun	60.5	64.1	67.1	69.6	74.5	69.9	64.1	64.3	61.4	58.2	45.8	40.7	35.4	29.4	25.4	23.1	23.6	24.6	26.3	30.5	33.2	36.3	36.4	37.8	45.9	74.5																				
																						71.6	75.0	77.5	79.8	81.2	80.7	77.5	72.9	68.1	63.3	58.5	55.0	51.9	49.5	47.3	47.3	48.7	49.5	51.0	54.1	57.6	61.1	64.8	68.1	Diurnal Average
																						97.3	98.4	98.7	99.5	100.0	100.0	100.0	100.0	97.6	97.6	97.9	96.9	97.4	96.4	94.7	95.3	96.2	94.2	95.3	95.6	96.9	96.4	96.7	97.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	119	16.53	16.53
40 - 60	220	30.56	47.08
60 - 80	190	26.39	73.47
80 - 100	187	25.97	99.44

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

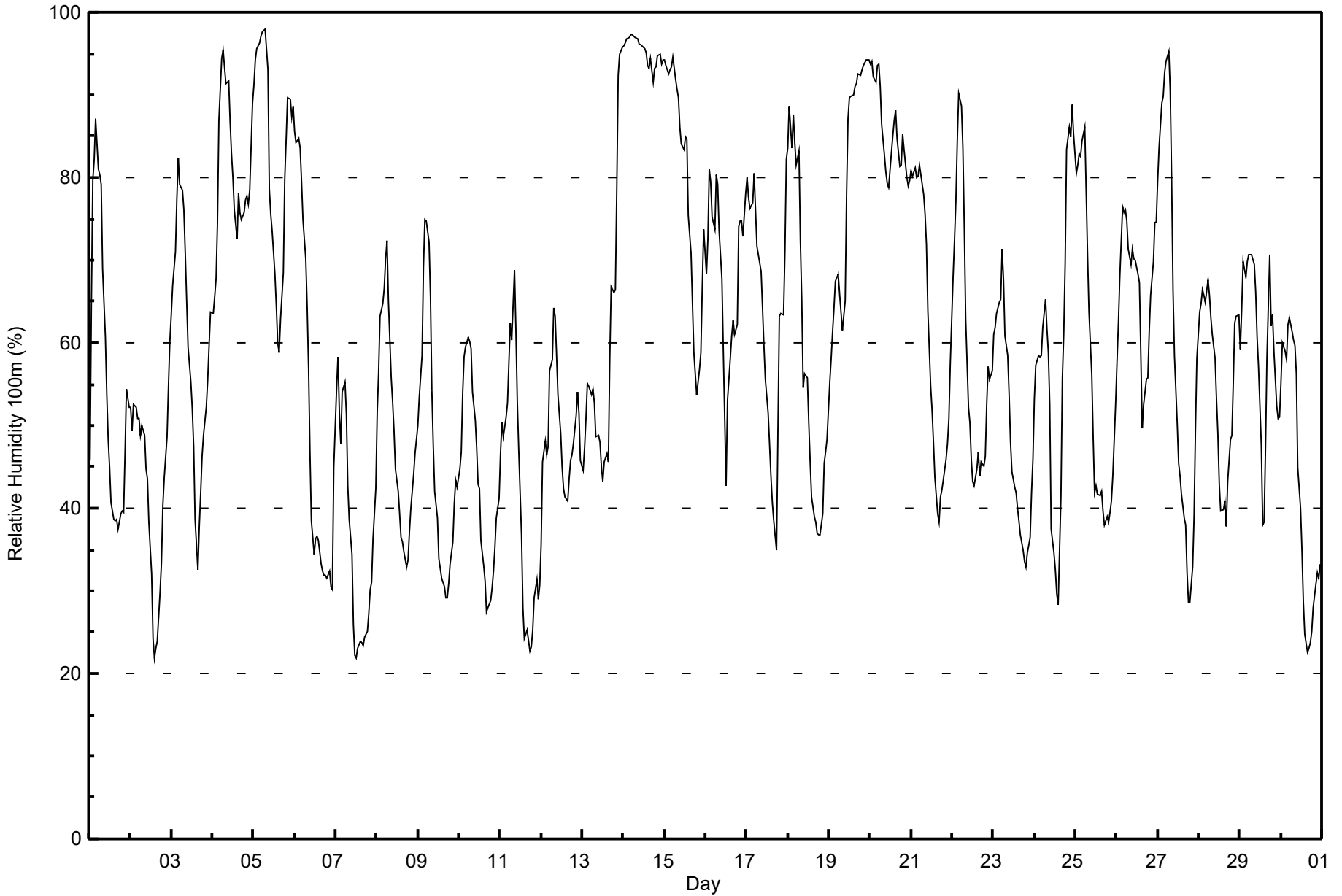
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - June 2023

Maximum Value: 97.9 % on Jun 5 08:00 Maximum Daily Average: 95.3 % on Jun 14																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 21.9 % on Jun 2 15:00 Minimum Daily Average: 36.2 % on Jun 7																						Hours of Missing Data: 0 Hours of Calibration: 0																										
Maximum Diurnal Average: 75.1 % at hour 6 Minimum Diurnal Average: 46.3 % at hour 16																						Percent Operational Time: 100.0																										
Monthly Average: 59.78 % Percentiles: P ₁ = 23.1 P ₁₀ = 33.4 Q ₁ = 43.5 Median = 58.4 Q ₃ = 76.2 P ₉₀ = 89.9 P ₉₉ = 97.0																																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	45.7	64.7	79.7	82.3	87.1	81.1	80.3	79.2	68.9	60.6	53.7	48.3	44.9	40.6	38.6	38.5	38.7	37.4	39.3	39.6	39.5	46.5	54.4	52.2	55.9	87.1																						
2-Jun	52.2	49.3	52.6	52.1	50.8	50.9	48.8	50.0	48.8	44.8	43.5	38.3	32.1	24.2	21.9	23.1	23.9	29.8	33.4	40.4	43.7	48.6	54.7	60.1	42.4	60.1																						
3-Jun	63.4	67.0	71.1	77.5	82.3	79.2	78.4	76.1	70.8	65.0	59.6	55.3	52.0	47.4	38.6	32.6	37.9	41.9	46.3	48.9	52.2	55.4	59.7	63.8	59.3	82.3																						
4-Jun	63.6	65.6	67.8	74.6	87.0	94.5	95.4	93.5	91.4	91.6	86.8	82.9	80.0	76.2	72.6	78.1	75.7	74.9	75.7	77.3	77.9	76.9	78.5	89.0	80.3	95.4																						
5-Jun	91.1	94.2	95.6	96.3	97.1	97.6	97.9	97.9	93.0	78.7	75.5	73.6	68.3	64.3	60.0	58.8	62.9	68.5	79.8	84.6	89.7	89.5	87.2	88.7	83.0	97.9																						
6-Jun	85.5	84.3	84.7	83.5	79.4	75.0	70.2	64.3	56.9	46.7	38.5	34.4	36.2	36.6	36.1	33.2	32.3	31.8	31.9	31.5	32.3	30.6	30.2	44.9	50.5	85.5																						
7-Jun	54.4	58.4	51.5	47.7	54.1	55.3	51.3	42.7	38.6	34.4	26.0	22.3	21.9	23.1	23.9	23.7	23.4	24.5	25.1	27.3	30.2	31.1	36.3	42.3	36.2	58.4																						
8-Jun	51.6	56.5	63.2	64.7	66.6	70.2	72.4	65.1	55.8	52.9	49.3	44.7	41.9	39.4	36.4	36.0	34.8	33.0	33.7	37.2	40.0	44.0	46.6	48.3	49.3	72.4																						
9-Jun	50.1	53.4	58.5	69.2	74.8	74.8	72.3	65.6	54.2	47.7	42.0	38.9	33.9	32.7	31.5	30.6	29.1	29.1	30.9	33.3	35.9	40.4	43.3	42.6	46.4	74.8																						
10-Jun	44.7	46.7	53.9	58.4	59.5	60.8	60.2	59.3	54.0	50.7	47.4	42.8	42.4	36.2	33.1	31.2	27.5	28.0	28.7	30.3	32.4	35.3	38.7	41.1	43.5	60.8																						
11-Jun	46.6	50.3	48.6	51.0	52.6	57.7	62.4	60.3	68.9	61.5	52.8	47.2	36.8	27.9	24.3	24.8	25.3	22.7	23.2	25.2	29.2	31.4	28.9	30.7	41.3	68.9																						
12-Jun	35.6	45.6	48.2	46.5	47.4	56.6	58.0	64.2	63.2	58.7	53.8	48.9	44.9	42.3	41.4	40.8	43.6	45.8	46.4	47.9	51.2	54.0	51.5	45.7	49.3	64.2																						
13-Jun	44.6	47.4	50.9	55.2	54.7	53.7	54.4	52.7	48.7	48.8	47.9	45.1	43.3	45.6	46.7	45.6	58.1	66.8	66.1	66.4	78.7	92.3	94.9	95.8	58.5	95.8																						
14-Jun	96.0	96.3	96.7	97.0	97.2	97.3	97.1	97.0	96.7	96.2	96.2	95.9	95.5	95.1	93.6	93.2	94.4	91.6	93.3	93.4	94.7	94.9	93.7	94.2	95.3	97.3																						
15-Jun	94.2	93.6	92.5	93.0	93.4	94.5	91.9	90.7	89.7	86.1	84.1	83.3	84.9	84.6	75.5	70.9	64.8	58.8	56.3	53.7	56.8	58.8	66.8	73.8	78.9	94.5																						
16-Jun	68.3	72.5	81.0	79.4	75.3	73.7	80.3	79.1	73.5	67.8	59.1	51.0	42.8	53.1	58.1	60.8	62.7	61.0	62.2	74.1	74.8	74.7	73.0	78.1	68.2	81.0																						
17-Jun	80.0	77.6	76.2	76.9	80.5	76.2	71.7	70.6	68.6	64.2	59.7	55.7	51.5	47.7	43.9	40.7	38.5	35.0	49.4	63.2	63.5	63.3	70.9	82.3	62.8	82.3																						
18-Jun	83.6	88.6	83.5	87.6	84.3	81.5	83.2	72.4	65.3	54.6	56.3	55.7	50.4	45.5	41.4	39.0	38.3	37.0	36.8	36.7	39.3	45.5	46.7	48.3	58.4	88.6																						
19-Jun	55.2	58.2	61.4	64.2	67.5	68.4	65.9	63.7	61.5	65.1	78.1	87.1	89.7	89.9	90.0	91.1	91.3	92.6	92.4	93.1	93.6	93.9	94.2	94.2	79.3	94.2																						
20-Jun	93.7	94.0	92.2	91.6	93.6	93.7	91.1	86.4	82.7	80.6	79.3	78.7	83.0	85.1	86.9	88.2	84.8	81.4	81.5	85.2	83.3	80.1	79.0	79.6	85.7	94.0																						
21-Jun	80.9	80.2	81.2	80.0	80.1	81.6	79.1	78.0	75.6	71.9	63.8	54.7	51.9	47.9	43.7	39.3	38.4	41.3	42.2	43.4	45.9	47.8	50.9	57.5	60.7	81.6																						
22-Jun	68.0	72.4	77.0	84.5	90.1	88.6	83.6	73.9	62.9	52.3	50.3	46.0	43.2	42.7	44.7	46.8	43.8	45.7	45.1	46.2	52.5	57.1	55.6	56.7	59.6	90.1																						
23-Jun	61.1	61.8	63.6	64.8	65.2	71.3	67.7	60.8	58.5	53.6	47.9	44.4	42.6	41.9	40.1	38.5	36.7	35.0	33.6	32.8	34.6	36.4	41.9	45.9	49.2	71.3																						
24-Jun	53.3	57.3	58.4	58.2	58.4	61.9	65.2	61.7	58.9	52.5	37.5	34.5	32.5	29.7	28.4	41.6	55.7	61.2	69.7	83.4	86.1	84.9	88.8	85.2	58.5	88.8																						
25-Jun	80.5	81.5	82.9	82.5	84.4	86.0	78.3	70.6	63.7	56.1	48.4	41.8	42.8	41.8	41.6	42.1	39.6	38.0	39.0	38.4	39.5	40.9	43.9	52.5	56.5	86.0																						
26-Jun	57.6	62.3	67.9	76.4	75.8	76.2	74.7	71.4	69.5	71.3	70.1	70.1	68.3	67.3	58.7	49.6	52.5	55.6	55.8	61.4	65.8	69.8	74.5	74.7	66.5	76.4																						
27-Jun	79.5	83.5	89.0	89.9	92.7	94.1	95.3	90.6	79.8	66.3	58.5	50.2	45.4	43.9	41.7	38.8	37.9	32.1	28.6	28.7	32.8	39.0	49.5	58.2	60.2	95.3																						
28-Jun	63.7	64.8	66.5	65.8	64.9	67.6	65.7	63.0	61.0	58.1	53.2	49.0	42.8	39.7	39.9	40.8	37.8	43.2	48.4	48.9	55.3	62.3	63.2	63.5	55.4	67.6																						
29-Jun	59.1	64.0	69.8	68.0	69.8	70.6	70.7	70.7	69.6	66.1	60.6	57.1	47.6	37.9	38.2	47.3	58.2	70.6	62.0	63.4	59.0	52.5	50.9	51.1	59.8	70.7																						
30-Jun	55.1	60.0	58.9	58.0	62.2	63.1	61.4	60.4	59.7	56.3	44.9	40.0	34.9	28.7	24.7	22.5	23.0	23.8	25.1	28.0	30.9	32.3	31.5	33.2	42.4	63.1																						
																								65.3	68.4	70.8	72.6	74.3	75.1	74.2	71.1	67.0	62.0	57.5	53.9	50.9	48.6	46.5	46.3	47.0	47.9	49.4	52.1	54.7	57.0	59.3	62.5	Diurnal Average
																								96.0	96.3	96.7	97.0	97.2	97.6	97.9	97.9	96.7	96.2	96.2	95.9	95.5	95.1	93.6	93.2	94.4	92.6	93.3	93.4	94.7	94.9	94.9	95.8	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	137	19.03	19.03
40 - 60	245	34.03	53.06
60 - 80	192	26.67	79.72
80 - 100	146	20.28	100.00

Total Number of Valid Hours: 720

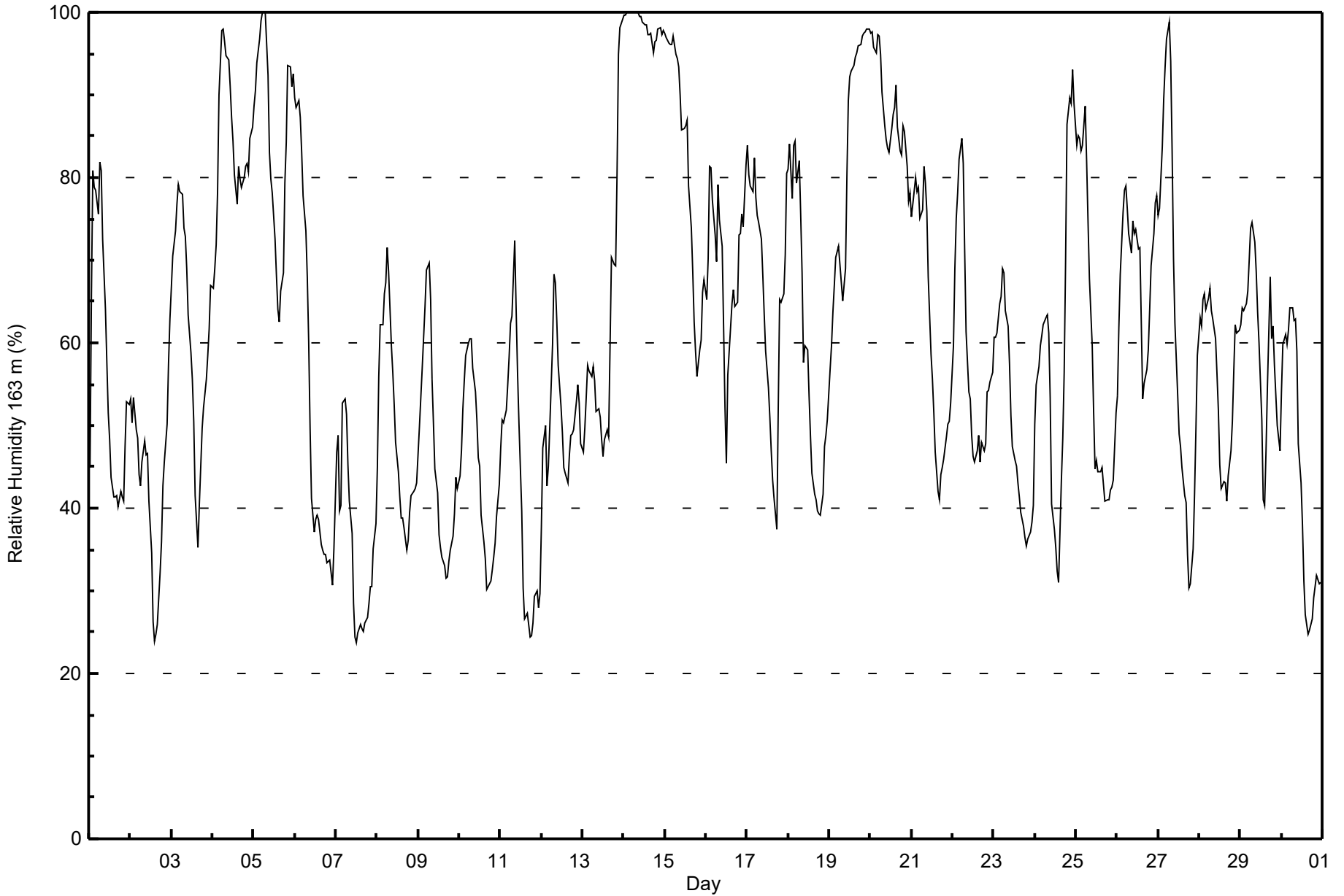
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 100.0 % on Jun 5 06:00 Maximum Daily Average: 98.6 % on Jun 14																						Hours in Service:	720			
Minimum Value: 23.7 % on Jun 7 13:00 Minimum Daily Average: 35.4 % on Jun 7																						Hours of Data:	720			
Maximum Diurnal Average: 74.8 % at hour 7 Minimum Diurnal Average: 48.9 % at hour 16																						Hours of Missing Data:	0			
Monthly Average: 61.26 % Percentiles: P ₁ = 25.0 P ₁₀ = 35.6 Q ₁ = 45.0 Median = 59.8 Q ₃ = 77.5 P ₉₀ = 92.6 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-Jun	45.0	65.8	80.9	78.9	78.6	75.6	81.8	80.9	72.5	64.0	57.7	51.5	48.4	43.7	41.3	41.3	41.5	40.1	42.0	41.4	40.9	47.5	52.9	52.6	56.9	81.8
2-Jun	53.2	50.3	53.3	49.6	48.5	44.0	42.7	45.6	48.1	46.5	46.7	40.9	34.5	26.2	24.0	24.8	25.9	32.2	35.9	42.7	45.6	50.2	57.4	62.9	43.0	62.9
3-Jun	66.7	70.5	73.6	76.7	79.1	78.3	78.0	73.9	72.9	68.9	63.3	58.9	55.5	50.6	41.5	35.2	40.6	45.1	49.6	52.3	55.5	58.5	61.7	67.0	61.4	79.1
4-Jun	66.7	69.0	71.9	78.4	90.0	97.9	98.0	96.5	94.8	94.3	91.1	87.2	84.4	80.3	76.9	81.3	79.8	78.8	80.1	81.4	81.7	80.7	84.8	86.2	83.8	98.0
5-Jun	88.6	90.6	93.9	96.8	98.9	100.0	100.0	100.0	92.4	83.1	79.9	78.1	72.5	68.1	64.0	62.5	66.4	68.4	79.3	84.2	93.5	93.4	91.0	92.6	84.9	100.0
6-Jun	89.7	88.5	89.3	87.3	83.0	77.8	73.6	67.9	60.2	49.7	41.2	37.1	38.7	39.1	38.6	35.6	34.9	34.4	34.4	33.4	33.7	32.2	30.6	35.1	52.8	89.7
7-Jun	46.8	48.9	39.7	40.3	52.7	53.2	51.3	45.3	40.8	36.9	28.4	24.3	23.7	25.0	25.9	25.5	25.1	26.2	26.8	28.4	30.4	30.5	35.1	38.2	35.4	53.2
8-Jun	44.9	55.9	62.3	62.2	65.9	67.2	71.6	68.6	59.7	56.5	52.6	47.9	44.4	41.4	38.8	38.7	37.6	34.9	36.0	39.5	41.5	42.0	42.3	43.0	49.8	71.6
9-Jun	46.4	49.8	57.0	60.6	64.5	68.8	69.7	65.3	55.7	50.4	44.7	41.9	36.7	35.2	34.0	33.1	31.6	31.7	33.5	35.0	36.6	39.3	43.7	42.3	46.1	69.7
10-Jun	44.0	46.9	52.0	55.4	58.5	60.0	60.6	60.5	57.0	54.0	50.7	46.0	45.1	39.2	36.0	33.9	30.1	30.5	31.2	32.6	34.0	35.7	38.9	42.9	44.8	60.6
11-Jun	47.2	50.7	50.3	51.8	54.9	58.4	62.4	63.2	72.4	64.0	56.5	50.3	39.6	30.4	26.6	26.9	27.3	24.5	24.6	26.2	29.3	29.9	28.0	29.6	42.7	72.4
12-Jun	37.7	47.3	50.1	42.7	45.0	49.8	59.9	68.4	67.3	62.7	57.3	52.4	49.1	44.9	44.3	43.1	46.4	48.7	48.9	49.6	52.9	54.9	52.8	47.8	51.0	68.4
13-Jun	46.8	49.7	53.4	57.3	56.6	55.9	57.0	55.4	51.6	52.1	51.0	48.3	46.2	48.4	49.5	48.7	59.4	70.3	69.5	69.4	80.6	94.8	98.2	99.1	61.2	99.1
14-Jun	99.6	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.4	98.8	98.5	98.6	97.3	97.3	97.5	95.1	96.5	96.6	98.0	98.2	97.3	97.8	98.6	100.0
15-Jun	97.5	97.0	96.3	96.1	96.1	97.2	95.0	94.4	93.4	89.9	85.8	85.9	86.3	86.9	79.0	73.9	68.6	62.5	59.0	55.9	59.2	60.4	66.1	67.7	81.2	97.5
16-Jun	65.2	70.2	81.3	81.2	77.3	73.0	69.9	79.1	74.9	71.7	62.0	52.2	45.4	56.1	61.9	64.7	66.4	64.4	65.0	73.1	73.2	75.5	74.1	81.5	69.1	81.5
17-Jun	83.9	80.3	79.0	78.3	82.4	77.6	75.4	74.5	72.6	68.1	63.4	59.0	54.6	51.0	46.9	43.4	41.1	37.4	52.1	65.2	64.9	65.9	70.7	80.5	65.3	83.9
18-Jun	81.0	84.0	77.4	83.9	84.5	79.3	82.0	75.6	68.4	57.6	59.6	59.1	53.6	48.6	44.2	41.7	41.0	39.6	39.4	39.1	41.7	47.5	48.9	50.7	59.5	84.5
19-Jun	56.7	59.7	63.8	66.9	70.3	71.6	69.4	67.3	65.1	68.9	80.3	89.3	92.2	92.9	93.6	94.6	95.1	96.0	96.1	97.1	97.4	97.7	97.9	98.0	82.4	98.0
20-Jun	97.4	97.6	95.7	95.2	97.4	97.1	94.9	90.3	86.3	84.7	83.5	83.0	86.0	87.6	88.5	91.2	86.1	83.1	82.7	86.3	85.5	81.4	77.1	78.2	88.2	97.6
21-Jun	75.3	76.7	80.0	78.4	78.9	75.1	76.1	81.3	79.4	75.9	68.0	58.6	55.6	51.6	46.7	42.1	41.1	44.1	44.9	45.9	48.7	50.1	50.5	52.7	61.6	81.3
22-Jun	59.6	68.9	75.2	78.2	82.2	84.8	81.8	71.3	61.4	54.1	53.2	48.9	46.2	45.7	47.0	48.8	45.7	47.9	47.0	47.8	54.0	54.2	55.3	56.5	59.0	84.8
23-Jun	60.7	60.7	61.3	64.7	65.6	69.1	68.4	63.9	62.0	57.4	51.3	47.4	45.7	45.0	43.1	41.4	39.4	37.8	36.4	35.4	36.3	37.2	38.3	40.4	50.4	69.1
24-Jun	50.1	54.9	57.1	59.7	60.8	62.1	63.0	63.3	61.2	53.4	40.5	37.4	35.3	32.4	31.0	43.5	48.5	56.4	69.8	86.4	89.6	89.0	93.0	89.0	59.5	93.0
25-Jun	84.0	85.1	84.7	83.2	83.9	88.6	82.1	74.8	67.9	59.7	51.6	44.8	45.8	44.5	44.4	45.0	42.9	40.9	41.0	41.0	42.2	42.6	43.4	51.6	59.0	88.6
26-Jun	53.6	61.8	68.3	75.8	78.5	78.9	76.2	73.2	70.9	74.7	73.3	73.7	71.3	71.5	62.6	53.2	55.2	56.7	59.2	64.1	69.3	73.1	76.9	77.8	68.7	78.9
27-Jun	75.4	76.3	83.8	89.4	93.5	96.8	98.8	94.1	83.2	70.2	62.4	53.6	49.0	47.4	44.9	41.5	40.7	34.5	30.3	30.8	35.1	41.6	49.7	58.5	61.7	98.8
28-Jun	63.1	62.1	65.3	65.9	64.1	65.4	66.5	63.9	62.8	60.5	56.2	51.9	45.3	42.4	43.2	43.0	40.8	43.9	46.9	50.5	56.6	62.1	61.1	61.5	56.0	66.5
29-Jun	62.2	64.3	64.0	64.7	66.2	70.0	73.9	74.5	72.2	68.7	63.7	60.0	50.8	41.1	40.3	46.9	54.7	67.9	60.5	62.0	57.4	50.0	48.5	47.0	59.6	74.5
30-Jun	54.1	59.9	61.1	59.8	61.5	64.2	64.2	62.7	62.9	59.0	47.8	43.1	38.0	31.2	27.1	24.7	25.3	25.9	26.7	29.1	31.9	31.4	30.9	31.0	43.9	64.2
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	107	14.86	14.86
40 - 60	257	35.69	50.56
60 - 80	202	28.06	78.61
80 - 100	145	20.14	98.75

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 31 km/h on Jun 10 17:00	Maximum Daily Speed Average: 19.8 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 17 22:00	Minimum Daily Speed Average: 0.5 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 4.5 km/h at hour 16	Minimum Diurnal Speed Average: 0.3 km/h at hour 11	Hours of Missing Data: 0
Monthly Average Velocity: 1.0 km/h 305.5 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 5 Median = 8 Q ₃ = 13 P ₉₀ = 18 P ₉₉ = 27	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	W1	ESE6	NNW4	N3	E3	ESE3	SSW2	SW9	SSW6	ESE4	SSW3	NNE7	NNW8	NNW9	NNW6	NNW5	N7	NNE6	NE5	NE3	ENE3	E5	NE2	NNW4	N1.8	SW9
2-Jun	NNW3	NNW4	NNW6	N5	NNW5	NNW6	NNW8	NNW4	NW4	WNW4	W4	W6	W6	NW8	NNW7	NNW8	N8	NE7	NNE8	NE8	NE5	NNE3	N4	NNE3	NNW4.5	NNW8
3-Jun	N3	N3	NNW2	N2	N2	NNW2	NNW3	N6	NNW4	NNW7	N8	NNE5	NNE3	ENE2	SE11	SSE13	SE10	SE6	SE11	ESE8	ESE9	ESE6	ENE3	N3	E2.2	SSE13
4-Jun	E2	SE9	SE5	N3	ESE2	NE2	ENE2	E3	E4	E4	SE10	SE13	ESE12	SE6	ESE8	ESE6	ESE8	SE12	SE9	SE5	NNE2	SE3	NNW1	NNW2	ESE4.8	SE13
5-Jun	SW0	ESE0	N2	NNW2	NNW2	N4	NNW6	NNW3	N9	N11	NNE12	N10	N11	NNW10	NNW10	NNW11	NNW9	NNW6	NNW4	NNW3	NW5WSW10	W26WNW12		NNW5.6	W26	
6-Jun	WSW19	W19WSW15	SW15	SW14	WSW21	WSW17	WSW16	WSW17	WSW17	WSW19	SW21	WSW20	WSW17	WSW17	WSW17	WSW19	SW20	SW17	SW12	SSW4	SE3	E3	E6	WSW14.2	SW21	
7-Jun	ESE3	SE8	SSE15	SSE24	SE7	E9	SE7	SSW12	SW13	S16	SW21	WSW21	W22	W16	W19	W17	WNW14	WNW13	NW14	WNW12	W12	NW7	SW2	WSW4	WSW7.1	SSE24
8-Jun	WNW2	NNW5	NNW5	NNW3	NNW1	NW3	N5	NNW7	N8	NNW6	NNW7	N6	N5	S2	SSE2	WSW3	NNW1	NNW5	NNW5	NE5	N4	NNW3	NE2	NE4	NNW3.5	NNW8
9-Jun	NNE3	NNW3	NW1	NNW2	NNW2	N0	ESE2	ESE3	ESE5	SE7	SE8	SE10	S10	SSE7	SE7	S12	S13	S16	SSW16	S11	SE9	SE8	SE9	SE10	SSE5.7	SSW16
10-Jun	SE11	SE12	SE8	SE10	SE10	SE8	SE11	SE8	SSE17	SSE19	SSE20	SSE24	SSE25	SSE30	SSE30	SSE28	S31	SSE30	SSE28	SSE22	SSE20	SSE21	SE18	SSE21	SSE18.9	S31
11-Jun	SE8	ESE3	SE6	SSW1	SE5	SE8	SW3	W11	WNW7	WNW7	WNW8	NW8	NW10	NW8	NW6	WNW11	NW12	NW13	NW9	WNW6	NNW7	N6	N3	WSW1	NW4.0	NW13
12-Jun	WSW2	NNW2	W2	N1	NE0	NNW4	NNW4	NNW6	N5	N7	N7	N9	N8	NNW5	N6	NNE5	NNE4	NNE4	N5	NNW4	NNW5	N3	E3	SE11	N3.5	SE11
13-Jun	SE13	SE10	SE9	SE10	SE13	SE12	SE10	SSE12	S15	SSE11	ESE6	ESE5	ENE2	NNW11	NNW13	NNW8	N14	N19	NNE14	N9	NNW8	NNW12	N9	N11	ENE3.0	N19
14-Jun	N9	N10	NNW5	NNW10	NNW10	N11	N11	N14	N18	N18	N14	N17	N16	N15	N16	NNW15	NNW14	NNW16	NNW15	NNW18	N16	NNW14	NNW14	NNW15	N13.6	N18
15-Jun	NNW15	NNW14	NNW15	NNW13	NNW13	NNW10	NNW9	NNW10	NW7	NW7	NW6	NNW5	NNE2	N4	NNW7	NNW7	NNW8	N7	NW4	NNW1	SE4	SE2	E0	SSE1	NNW6.4	NNW15
16-Jun	W5	NNW1	SSE2	SSE6	ESE8	SE9	SE9	SE12	SE17	SE12	SSE15	S17	SW19	SW19	SSW18	SSW22	S20	SSE19	SSW19	S17	S12	SW15	WSW17	WSW20	S11.0	SSW22
17-Jun	SW12	SW8	S9	SSE7	SSE6	WSW13	WSW14	WSW16	WSW17	WSW16	WSW14	WSW16	W16	WSW18	WSW20	WSW14	W11	W13	NNW10	N8	NNW4	SE0	N2	NNW3	WSW8.7	WSW20
18-Jun	NNW3	NNE1	ESE4	NNW5	N4	NNE3	NNW5	NNW6	NNW7	N8	N14	N15	N15	N15	N18	NNE18	NNE18	NNE15	NNE16	NNE16	N11	N13	N15	N15	N10.3	NNE18
19-Jun	N12	N11	N14	N15	N15	N19	N24	N26	NNE28	NNE24	NNE22	NNE13	N22	N26	N27	NNE24	N21	N21	N20	N23	NNW20	N20	NNW19	NNW17	N19.8	NNE28
20-Jun	NNW15	N15	N15	N17	N15	N17	N16	N19	NNW18	N17	N18	NNW13	NNW9	NNW11	NNW8	NW8	NNW8	NW10	NW8	NW6	NW6	NW7	NNW5	NNW6	NNW11.7	N19
21-Jun	NNW6	NNW4	NW4	NNW5	NNW7	NNW6	NW7	NNW8	NNW12	N10	N11	N10	NNW10	N10	NNW11	NNW12	N12	N9	NNE7	ENE5	E3	SSE1	WSW1	ESE0	NNW6.4	N12
22-Jun	N1	NNW2	NNW1	ESE0	E2	SE4	SE6	SSE3	SSE8	SSE12	SE10	SE9	SE7	WSW8	WSW17	WSW14	WSW14	WSW15	WSW13	WSW7	W3	SE1	ESE1	N1	SSW3.8	WSW17
23-Jun	NE1	E1	NE1	NNW1	ESE1	E3	SE4	SE8	SE9	SE9	SE9	SSE10	SSE10	SE9	SE8	ESE6	ESE3	SE7	SE5	SE5	ESE5	SE8	SE9	E4	SE5.3	SSE10
24-Jun	E6	ESE10	SE9	SE12	SE15	SE13	SE11	SE13	SE14	SE9	WSW12	WSW13	WSW14	WSW13	WSW13	N13	NNW3	N10	NNW11	NNW19	N10	N15	N12	N10	ESE0.5	NNW19
25-Jun	NNE9	N8	N7	N8	N7	NNW4	NNE8	NE7	NE2	ENE4	NNE8	NE6	WNW5	WNW5	NW7	NNW6	N8	N7	NNW6	NW5	N4	ESE2	SSE1	ESE1	N4.7	NNE9
26-Jun	SE5	SE6	ESE6	ESE5	SE8	SE6	SE9	SE9	SE10	SE9	SSE17	SSE19	S13	SSW12	SW11	WSW11	N18	NW4	SW8	SSE9	SSW4	SE5	E3	NNW3	SSE5.1	SSE19
27-Jun	NNE0	NNW3	NNW5	N3	NNE1	NNE1	NNW5	NNW10	NNW10	NNW11	NNW13	N9	N8	NNW8	NW8	WNW8	W4	WNW3	NNW3	NW4	NW2	N2	SE4	SE2	NNW4.4	NNW13
28-Jun	SE3	SE9	SE6	SE9	SE11	SE9	SE10	SE11	SE13	SE13	SE13	SE10	ESE4	NE3	NNW4	WSW10	WSW10	SE7	SSE10	S16	SSE7	ESE5	E2	W0	SE6.4	S16
29-Jun	S4	SSW4	SE7	SE8	SE5	SE9	SE11	SE11	SE9	SE8	SE10	ESE10	SSE13	SSW12	WSW16	WSW23	WSW9	SSE6	SSE12	SE9	SE7	SSW13	SW16	SW14	S7.1	WSW23
30-Jun	SW10	SSE4	SE12	SE12	SE8	SE9	S5	SE9	SSE10	SSE7	WSW10	WSW12	WSW18	WSW17	WSW18	WSW21	WSW20	WSW21	WSW16	WSW17	WSW14	WSW10	SW10	WSW11	WSW8.9	WSW21

NNW1.0	NE0.9	E0.9	E1.1	E1.7	E1.2	NE1.0	NNW0.4	ESE0.3	E0.7	NW0.3	SW0.6	W2.7	NNW3.8	NNW4.4	NNW4.5	NNW3.8	NNW2.2	NNW1.7	NW1.3	N1.1	NNW0.8	NW1.2	NW1.4		Diurnal Average
WSW19	W19	SSE15	SSE24	N15	WSW21	N24	N26	NNE28	NNE24	NNE22	SSE24	SSE25	SSE30	SSE30	SSE28	S31	SSE30	SSE28	N23	NNW20	SSE21	W26	SSE21		Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

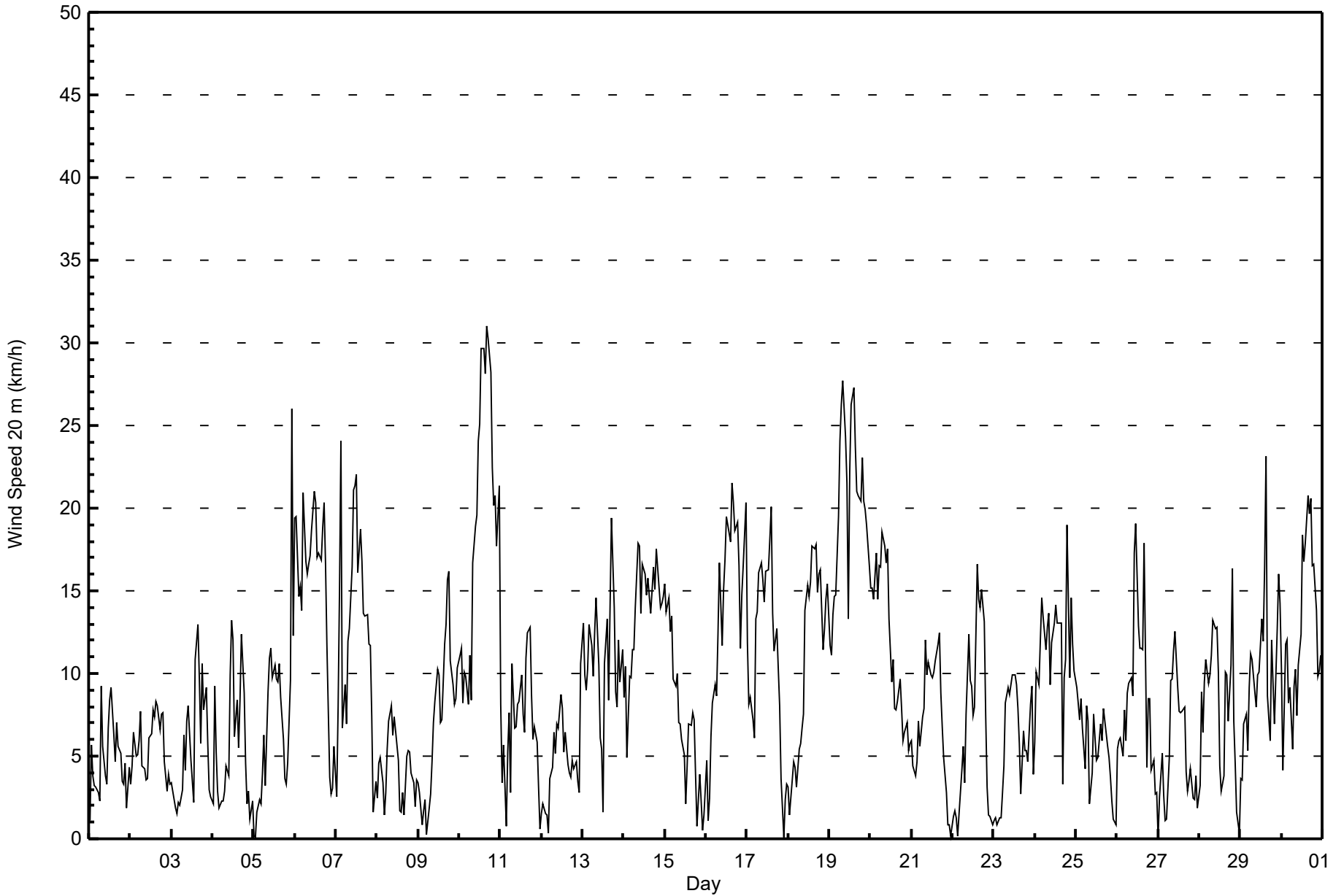
Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - June 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	224	31.11	31.11
6 - 11	267	37.08	68.19
12 - 19	184	25.56	93.75
20 - 28	41	5.69	99.44
29 - 38	4	0.56	100.00
> 38	0	0.00	100.00

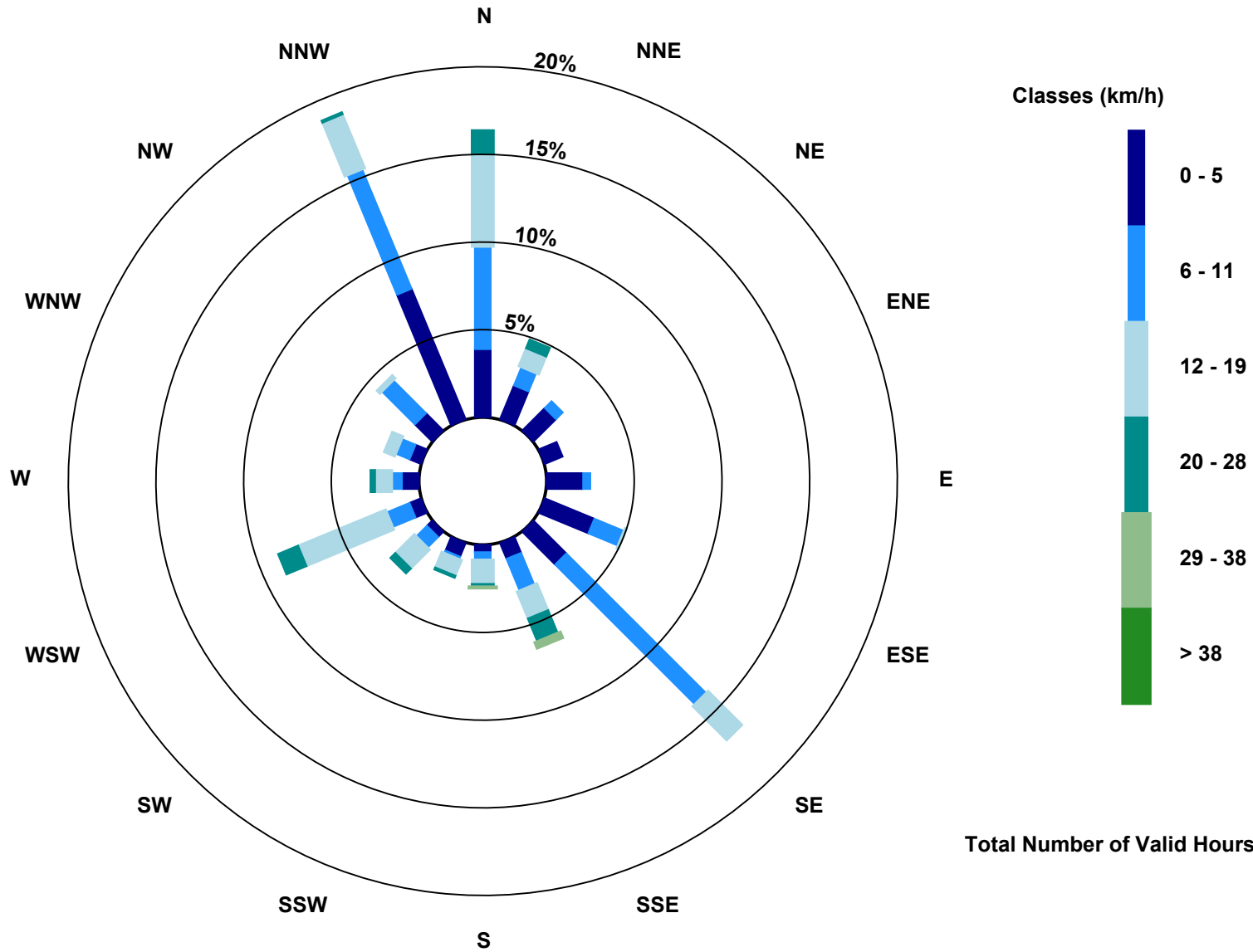
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Maximum Speed: 43 km/h on Jun 19 15:00	Maximum Daily Speed Average: 30.5 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 22 00:00	Minimum Daily Speed Average: 1.8 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 6.1 km/h at hour 16	Minimum Diurnal Speed Average: 0.6 km/h at hour 12	Hours of Missing Data: 0
Monthly Average Velocity: 1.9 km/h 332.2 deg	Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 7$ Median = 12 $Q_3 = 18$ $P_{90} = 24$ $P_{99} = 35$	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-Jun	W4	SE6	NNW6	N5	E3	ESE4	SSW5	SW11	SSW6	ESE4	SW3	N8	NNW11	NNW13	NNW9	NNW6	N10	NNE9	ENE8	ENE8	ENE8	E8	ENE4	NNW10	N2.9	NNW13
2-Jun	NNW7	N9	NNW13	NNW10	NNW12	NNW12	NNW11	NNW7	NW5	WNW5	WNW5	W7	W7	NW10	NNW10	NNW11	N12	NE12	NE14	NE15	NE9	NE6	NNE4	NE4	N7.2	NE15
3-Jun	NE3	N8	N4	N5	N4	NNW3	NNW4	NNW7	NNW5	NNW9	NNE11	NNE6	NNE5	NE3	SE13	SE15	SE12	SE7	SE16	ESE13	ESE16	ESE11	E6	E2	E3.8	SE16
4-Jun	ESE5	SE14	ESE11	ENE3	ESE4	ENE5	E5	ESE6	E9	ESE7	SE16	ESE20	ESE18	SE10	ESE14	ESE9	ESE14	SE19	SE12	SE7	ENE4	SE5	S0	NNW3	ESE8.5	ESE20
5-Jun	NNW2	WSW0	N2	NNW4	NW3	NNW7	NNW9	NNW5	N13	N18	NNE18	NNE14	N14	NNW13	NNW13	NNW15	NNW16	NNW13	N9	N6	NW8	WSW12	W35	W18	NNW8.7	W35
6-Jun	WSW28	WSW29	WSW21	SW19	SW17	WSW25	WSW20	WSW18	WSW19	WSW21	WSW23	SW25	WSW26	WSW22	WSW23	WSW21	WSW23	SW23	SW20	SW14	SSW7	S10	SSE8	ESE9	WSW18.2	WSW29
7-Jun	SE8	SE14	SSE20	SSE29	SE10	ESE14	SE9	SSW13	SW15	S17	SW25	WSW28	W31	W23	W26	W24	NNW20	NNW20	NNW21	NNW17	W18	NW15	WNW4	WSW8	WSW10.1	WSW31
8-Jun	W6	NNW10	NNW10	NNW9	NNW5	NNW5	N7	NNW9	N10	NNW9	NNW9	N8	N6	SSW1	SSE1	WSW3	NW1	NNW6	N8	NE11	NNE8	N6	ENE3	E4	N5.4	NE11
9-Jun	NE4	NNW5	NNW4	NW1	NNW4	NNE1	E2	ESE3	ESE6	SE9	SE10	SE12	S11	SSE8	SE9	S13	S14	S17	SSW17	S12	SSE12	SE13	SE14	SE16	SSE6.7	SSW17
10-Jun	SE17	SE18	SE13	SE17	SE16	SE13	SE16	SE13	SSE19	SSE21	SSE22	SSE27	SSE29	SSE32	SSE32	SSE31	S34	SSE33	SSE31	SSE26	SSE24	SSE24	SSE23	SSE25	SSE22.6	S34
11-Jun	SE13	ESE6	SE8	SSE3	S5	SE8	SW6	W16	W11	NNW10	NNW11	NNW11	NW15	NW11	NW10	NNW16	NW18	NW19	NNW14	NNW13	NW13	NNW12	NNW7	NNW6	WNW6.9	NW19
12-Jun	NNW4	NNW8	WNW3	WNW2	W2	NNW4	NNW7	NNW8	N6	N9	N8	N11	N10	NNW6	N8	N6	NE7	NE6	N7	N6	N7	N5	E6	SE17	N5.0	SE17
13-Jun	SE19	SE16	SE16	SE18	ESE22	SE20	SE17	SE16	SSE15	SSE11	ESE8	ESE7	E2	NNW15	NNW18	NNW15	N23	N28	NNE22	N16	NNW16	N18	N15	NNE18	ENE5.9	N28
14-Jun	N14	N15	NNW8	NNW17	NNW15	N17	N16	N20	N26	N26	N20	N25	N23	N23	N24	NNW23	NNW23	NNW25	N23	N26	N25	NNW21	NNW22	NNW24	N20.7	N26
15-Jun	NNW26	NNW24	NNW24	NNW22	NNW22	NNW16	NNW16	NNW18	NW12	NNW11	NW11	NNW8	N4	N6	NNW11	NNW11	NNW11	N10	NW6	NNW1	SE5	SE5	SSW3	SW3	NNW10.5	NNW26
16-Jun	WSW11	W4	SSW4	S7	SE12	SE13	SE13	SE16	SE19	SE15	SE20	S19	SW23	SW22	SSW20	SSW23	S22	SSE21	SSW23	SSW21	S15	SW20	WSW22	WSW26	S13.5	WSW26
17-Jun	SW16	SW11	SSW10	SSE9	SSE7	WSW19	WSW18	WSW21	WSW20	WSW18	WSW18	WSW21	WSW23	WSW22	WSW24	WSW18	W17	W18	N15	NNE13	N5	NE2	NNW5	NNW6	WSW11.2	WSW24
18-Jun	NNW7	N2	ESE4	N7	N7	NNE5	N7	NNW7	NNW9	NNE10	N19	N21	N21	N23	N26	NNE29	NNE28	NNE25	NNE27	NNE25	NNE18	N21	N24	N23	N15.9	NNE29
19-Jun	N19	N18	N21	N23	N22	N29	N37	NNE41	NNE42	NNE37	NNE33	NNE22	N34	N42	N43	NNE38	N33	N32	N30	N33	N30	N29	N27	NNW25	N30.5	N43
20-Jun	NNW24	N22	N22	N25	N21	N23	N24	N27	NNW26	N25	N26	NNW21	NNW17	NNW19	NNW14	NW12	NNW14	NW16	NW13	NNW11	NW11	NW12	NNW12	NNW12	NNW18.2	N27
21-Jun	NNW12	NNW10	NNW8	NNW9	NNW12	NNW10	NNW13	NNW13	N18	N14	N15	N14	NNW13	N14	NNW15	N16	N17	N13	NE11	ENE9	E6	E3	SW1	N0	N10.1	NNW18
22-Jun	WNW1	NNW3	NNW3	S1	ESE4	SE5	ESE6	SSE4	SE10	SSE15	SE12	SE11	SE10	WSW10	WSW22	WSW19	WSW19	WSW19	WSW16	WSW11	W6	SW2	SE3	E1	SSW4.8	WSW22
23-Jun	ESE2	ESE4	SE4	SSE2	SSE4	ESE6	SE7	SE10	SE12	SE10	SE11	SE11	SE12	SE10	ESE9	ESE3	SE8	SE7	SSE7	SE8	SSE13	SE16	SSE4	SE7.7	SE16	
24-Jun	E7	ESE12	SE12	SE16	SE18	SE20	SE18	SE18	SE12	WSW15	WSW16	WSW16	WSW16	WSW16	N20	N4	N17	NNW20	N29	N16	N22	N18	N16	NE1.8	NNW29	
25-Jun	NNE14	N13	N11	N14	N12	N7	NNE11	NE11	NE4	ENE6	NE10	NE8	NW7	WNW7	NW10	NW8	NNW10	NNW9	NNW9	NNW9	NNW6	E2	SE4	SE4	N6.7	NNE14
26-Jun	SE11	SE13	SE13	SE9	SE12	SE9	SE12	SE13	SE16	SE14	SSE21	SSE23	S15	SSW12	SW14	W15	N26	NNW5	SW9	SSE11	SSW5	SSE6	ESE5	N3	SSE7.3	N26
27-Jun	W0	NNW4	NNW9	N6	N4	NNW3	NNW7	NNW12	NNW12	NNW14	NNW16	N12	N10	NNW10	NW10	NNW10	WNW5	WNW4	NW5	NW8	WNW6	NNW4	SSE5	SE5	NNW6.4	NNW16
28-Jun	SE8	SE14	SE12	SE13	SE14	SE15	SE13	SE15	SE19	SE19	SE17	SE14	ESE6	ENE3	N5	WSW12	WSW12	SE10	SSE13	SSW18	SSE9	SE6	SSE3	S3	SE9.4	SE19
29-Jun	S8	S6	SE10	SE10	SSE7	SE12	SSE14	SE14	SE14	SE11	SE13	ESE14	SSE15	SSW14	WSW22	WSW30	WSW13	S7	SSE13	SE11	SSE11	SSW17	SW22	SW20	S9.8	WSW30
30-Jun	SW15	SSE6	SE14	SE12	SE10	SSE8	S6	SE10	SSE12	SSE8	WSW13	WSW16	WSW22	WSW22	WSW22	WSW26	WSW25	WSW26	WSW22	WSW23	WSW19	WSW15	SW15	WSW16	SW12.4	WSW26

NNW1.3	NNE1.8	ENE1.5	ENE1.6	ENE2.1	ENE1.8	NE2.1	NNE1.5	NE1.4	ENE1.8	N1.2	NNW0.6	NNW3.5	NNW5.3	NNW6.1	NNW6.1	NW5.7	NW3.8	NNW3.0	NNW3.0	N2.3	NNW1.5	NNW1.4	NW2.0	Diurnal Average
WSW28	WSW29	NNW24	SSE29	N22	N29	N37	NNE41	NNE42	NNE37	NNE33	WSW28	N34	N42	N43	NNE38	S34	SSE33	SSE31	N33	N30	N29	W35	WSW26	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

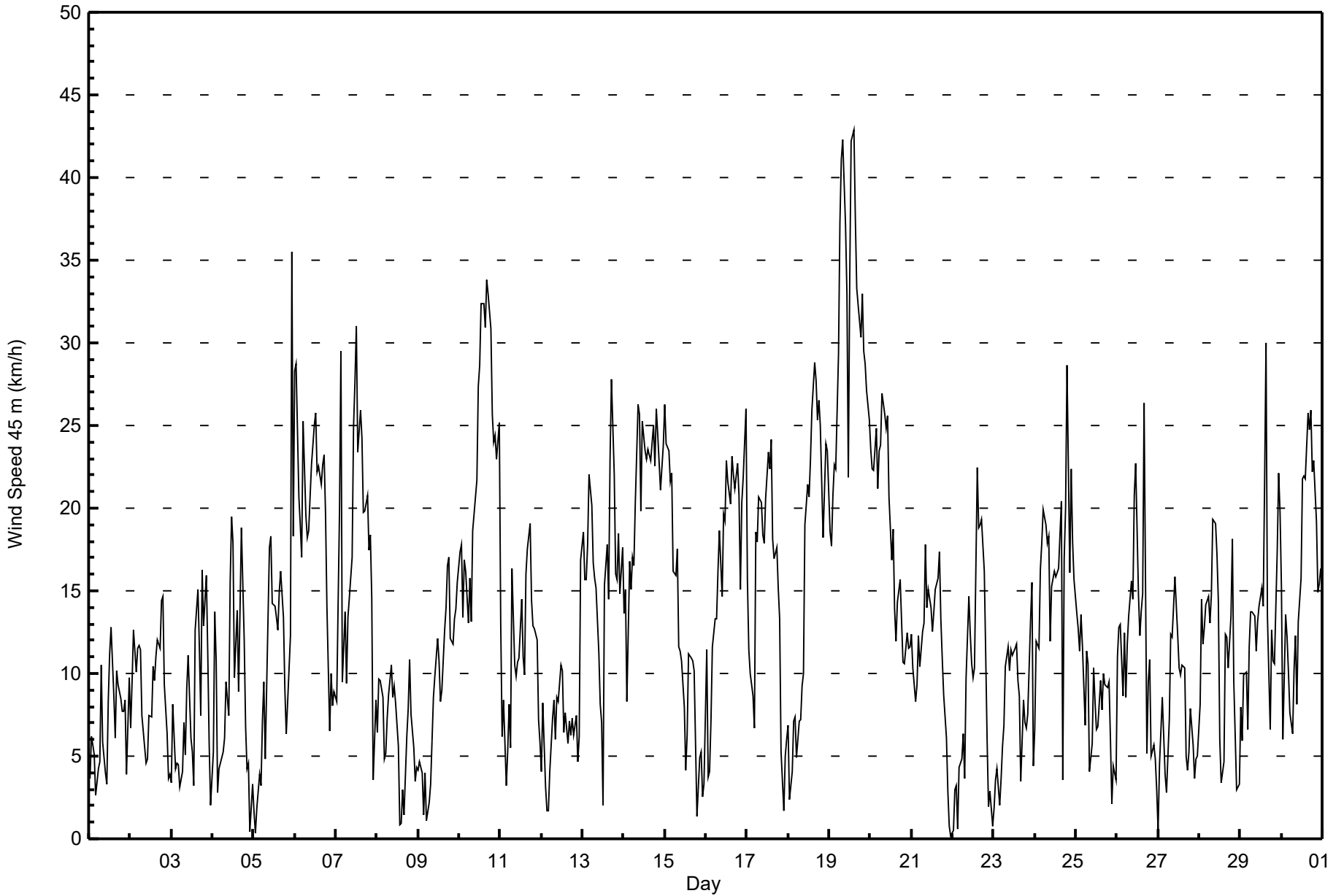
Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - June 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	121	16.81	16.81
6 - 11	214	29.72	46.53
12 - 19	230	31.94	78.47
20 - 28	125	17.36	95.83
29 - 38	26	3.61	99.44
> 38	4	0.56	100.00

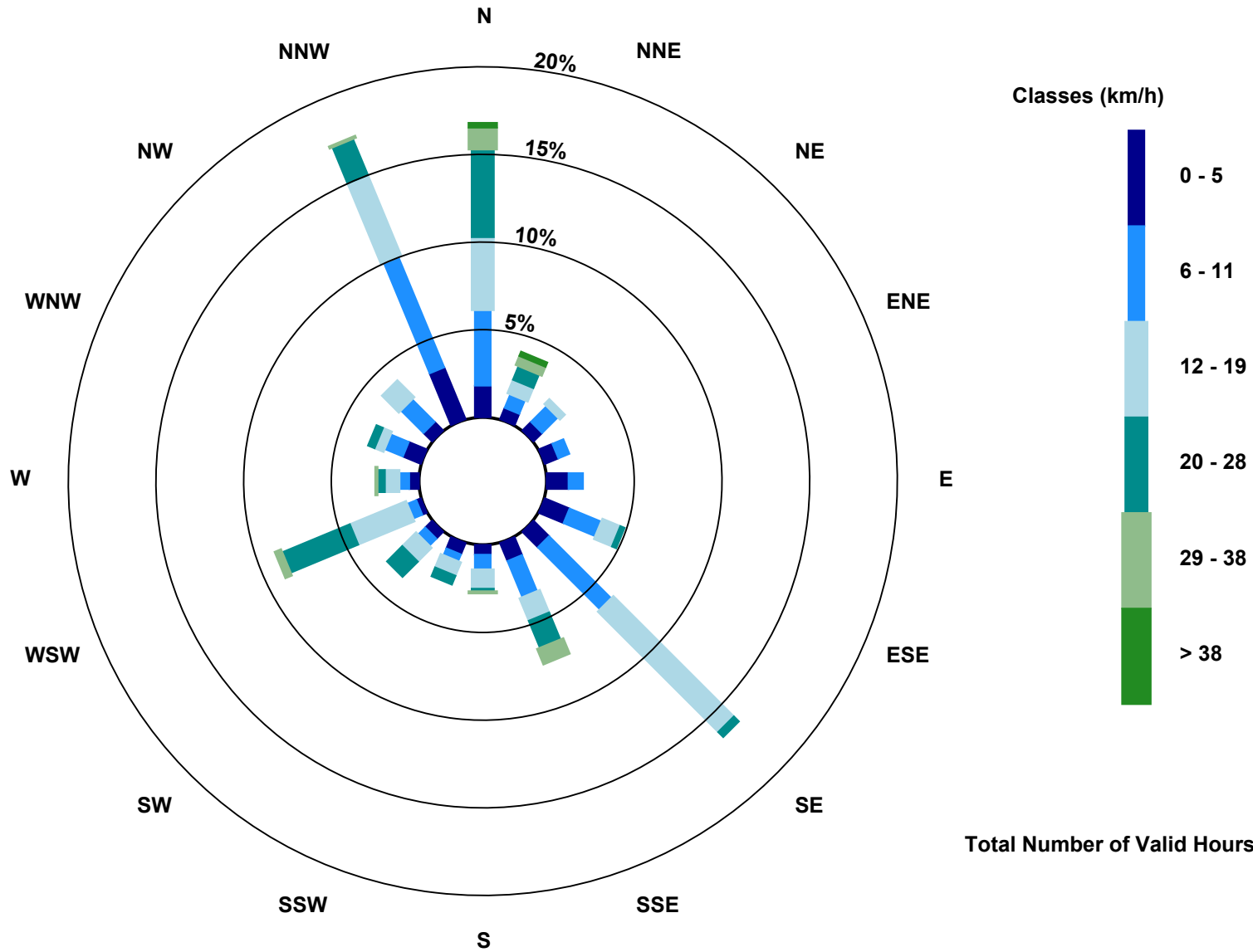
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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



Total Number of Valid Hours: 720



Maximum Speed: 52 km/h on Jun 19 14:00	Maximum Daily Speed Average: 37.6 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 9 03:00	Minimum Daily Speed Average: 2.1 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 7.0 km/h at hour 16	Minimum Diurnal Speed Average: 0.8 km/h at hour 2	Hours of Missing Data: 0
Monthly Average Velocity: 2.4 km/h 326.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 6 Q ₁ = 10 Median = 15 Q ₃ = 23 P ₉₀ = 30 P ₉₉ = 42	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	WNW7	SSE5	NNW5	NNW8	ESE1	ESE7	SSW7	SW12	SSW6	SE3	WSW4	N9	NNW13	NNW15	NW10	NW7	N11	NNE11	NE10	ENE11	ENE12	E12	ENE8	N12	N3.5	NNW15
2-Jun	NNW10	N17	N19	NNW18	NNW14	NNW18	NNW17	NNW11	NW6	NW5	WNW5	WNW8	W8	NW12	NNW11	NNW13	N14	NE13	NE17	NE20	ENE15	ENE12	ENE7	ENE6	N9.6	NE20
3-Jun	E5	NE8	NNE11	NNE6	NNE3	ESE3	NE3	N7	NNW6	NNW11	NNE13	NNE8	NE7	NE3	SE13	SE14	SE12	SE9	SE20	ESE16	ESE22	ESE17	E13	ESE5	E6.1	ESE22
4-Jun	ESE11	SE19	ESE16	ESE8	ESE9	E10	E10	E10	ESE16	ESE16	SE20	ESE23	ESE20	SE13	ESE16	ESE12	ESE17	SE22	SE14	SE6	ENE5	ESE5	SE4	W5	ESE12.0	ESE23
5-Jun	W3	W1	SE1	NW5	WNW5	NW12	NNW14	NNW8	N17	N21	NNE21	NNE16	N16	NNW15	NNW13	NNW17	NNW22	NNW21	NNE17	NNE15	NNW9	W12	W42	W23	NNW11.1	W42
6-Jun	WSW34	WSW34	WSW25	WSW25	WSW21	WSW29	WSW21	WSW19	WSW20	WSW22	WSW25	SW27	WSW29	WSW25	WSW26	WSW24	SW26	SW25	SW22	SW18	SW10	SSW17	SSW22	SSE15	WSW22.2	WSW34
7-Jun	SE21	SSE22	S26	S40	SSE13	SE13	SSE12	SSW15	SW16	SSW18	SW27	WSW31	WSW36	W27	W30	W29	WNW24	WNW25	WNW26	WNW22	W24	NW26	NW9	W10	WSW14.0	S40
8-Jun	WNW8	N19	N15	N14	N14	N11	N10	NNW10	N12	NNW10	NNW11	N10	N7	NNW1	NW1	WSW2	NNW3	N6	N8	NE14	NE16	NE11	E9	ESE10	N7.9	N19
9-Jun	ESE7	SE3	SSW0	SE4	ESE1	WSW1	SSW2	SE6	SE8	SE9	SE10	SE13	S11	SSE10	SE10	S14	S15	S17	SSW18	S15	SSE20	SSE19	SE19	SE22	SSE9.8	SSE22
10-Jun	SE20	SE24	SE19	SE23	SE24	SE20	SE21	SE21	SSE20	SSE22	SSE23	SSE29	SSE32	SSE35	SSE36	SSE34	S38	SSE37	S35	S32	S33	SSE33	SSE32	SSE33	SSE27.7	S38
11-Jun	SSE22	SSE10	S10	S6	SW8	SSW6	WSW10	W20	W14	WNW13	WNW12	NNW13	NW17	NW13	NW12	NW19	NW21	NW25	WNW20	WNW23	NW23	NNW22	NNW19	NW16	WNW10.8	NW25
12-Jun	NNW13	N12	NW7	W5	WNW8	NNW10	NNW10	N9	N7	N9	N10	N10	N11	N7	N7	N5	NE7	NE8	NNE9	NNE8	N9	NE6	ESE13	SE23	N6.1	SE23
13-Jun	SE25	SE24	SE24	SE26	SE30	SE28	SE25	SE21	SSE16	SSE11	ESE9	ESE7	ESE3	NNW16	N20	N18	N33	N33	NNE29	NNE22	N22	N25	N19	NNE23	ENE8.3	N33
14-Jun	N18	N19	N13	NNW22	N20	N21	N21	N25	N33	N32	N26	N31	N31	N30	N30	N30	NNW31	N33	N30	N33	N32	N28	NNW30	NNW33	N27.0	N33
15-Jun	NNW36	NNW33	NNW32	NNW32	NNW32	NNW32	NNW23	NNW25	NNW17	NW15	NW17	NW13	NNW8	NNW10	NNW15	NNW13	N12	NNW7	N2	ESE4	SSE9	SSW7	WSW13	NNW15.1	NNW36	
16-Jun	WSW20	WSW11	SW9	SSW10	S13	SSE13	SE15	SE17	SE16	SE16	SE23	SSE24	SW27	SW25	SSW22	SSW26	S24	S25	SSW28	SSW30	SSW23	SW28	WSW29	WSW32	SSW17.3	WSW32
17-Jun	SW21	SW18	SW14	SSW11	SSW9	WSW26	WSW21	WSW22	SW22	SW19	WSW19	WSW23	WSW27	WSW25	WSW26	WSW21	W19	W20	N18	NNE18	NNE10	NNE5	NNW10	N11	WSW13.3	WSW27
18-Jun	N11	N8	E8	N9	NNE13	NNE9	NNE10	N8	N10	NNE13	N21	N25	N25	N27	N30	NNE33	NNE33	NNE30	NNE33	NNE31	NNE23	N27	N30	NNE29	NNE20.0	NNE33
19-Jun	NNE25	NNE23	N27	NNE29	N28	NNE36	NNE44	NNE48	NNE48	NNE43	NNE41	NNE29	N42	N52	N51	NNE44	N40	N40	N38	N41	N38	N36	N34	NNW33	N37.6	N52
20-Jun	N31	N30	N29	N32	N28	N30	N29	N34	N32	N31	N32	N27	NNW25	NNW27	NNW23	NNW17	NNW20	NNW21	NNW20	NNW16	NW15	NW19	NNW20	NNW19	NNW24.8	N34
21-Jun	NNW20	NNW18	NNW15	NNW17	NNW19	NNW18	NNW20	NNW19	N21	N17	N18	N17	NNW14	NNW16	NNW18	N18	N20	N16	NNE13	NE9	ENE8	E8	E7	SE6	N13.5	N21
22-Jun	SE8	ESE8	ESE4	SE8	SE9	SSE6	SE9	SE8	SE15	SSE17	SE14	SE10	SE10	WSW12	WSW26	WSW22	WSW22	WSW23	WSW19	WSW15	WNW8	W3	SSE3	ESE5	SSW6.4	WSW26
23-Jun	SE7	SSE11	SE11	SSE11	SSE10	SE8	SE11	SSE12	SE11	SE10	SE12	SE13	SSE13	SE12	SE11	ESE9	SE4	SE9	SE7	SSE8	S12	SSE24	S24	SSW19	SSE10.9	S24
24-Jun	S6	SSE10	S10	S12	SSE15	SSE17	SE18	SE13	SE15	SSE12	WSW17	WSW18	WSW17	WSW18	WSW19	N24	NE6	N22	N30	N37	NNE22	N28	N22	N19	NNW2.1	N37
25-Jun	NNE17	NNE18	NNE16	N20	NNE20	NNE11	NNE14	NE12	NE5	ENE7	NE12	NE9	NW7	WNW6	NW10	NW9	NNW10	NNW9	NW11	NNW8	ENE5	ESE7	SSE9	N8.5	N20	
26-Jun	SSE15	SSE19	SSE20	SSE15	SSE17	SSE13	SE13	SE13	SE19	SE17	SSE24	SSE27	S19	SSW12	SW16	W16	N33	N6	SW11	S12	SSW6	S7	SSE6	E2	SSE10.0	N33
27-Jun	WSW1	WNW3	NNW11	N15	NNW13	NNW12	NNW10	N14	NNW13	NNW15	N18	N14	N11	NNW10	NW12	NW11	WNW5	NW4	NNW7	NW8	NNW10	NNE6	S9	SSE10	NNW8.1	N18
28-Jun	SE16	SSE19	SSE13	SSE10	SSE14	SE15	SSE15	SE16	SE19	SE19	SSE16	SE15	SE6	NE3	N4	WSW14	SW13	SSE11	SSE16	SSW21	S12	SSE9	SSW9	S10	SSE11.1	SSW21
29-Jun	SSW13	SSW11	SSE9	SSE13	S12	S16	S16	SSE14	SE14	SE13	SSE13	SE16	SSE17	SSW16	WSW26	WSW37	WSW20	SSW8	SSE14	S10	SSW17	SW28	SW32	SW32	SSW14.0	WSW37
30-Jun	SW25	SW11	SSE7	SSW10	SSW7	SW9	SW9	SSE8	S13	S8	WSW15	WSW17	WSW23	WSW24	WSW24	WSW28	WSW27	WSW29	WSW27	WSW30	WSW26	WSW23	WSW24	WSW25	SW17.6	WSW30

W1.1	NE0.8	NE1.3	NNE1.1	NNE1.3	NNE1.3	NNE2.1	NNE2.0	NE1.6	NE2.1	N1.6	NW0.9	NNW4.1	NNW6.2	NNW6.9	NNW7.0	NW7.0	NNW5.0	NNW4.3	NNW4.3	N3.1	NNW2.0	W2.0	W2.1	Diurnal Average
NNW36	WSW34	NNW32	S40	NNW32	NNE36	NNE44	NNE48	NNE48	NNE43	NNE41	WSW31	N42	N52	N51	NNE44	N40	N40	N38	N41	N38	N36	W42	NNW33	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

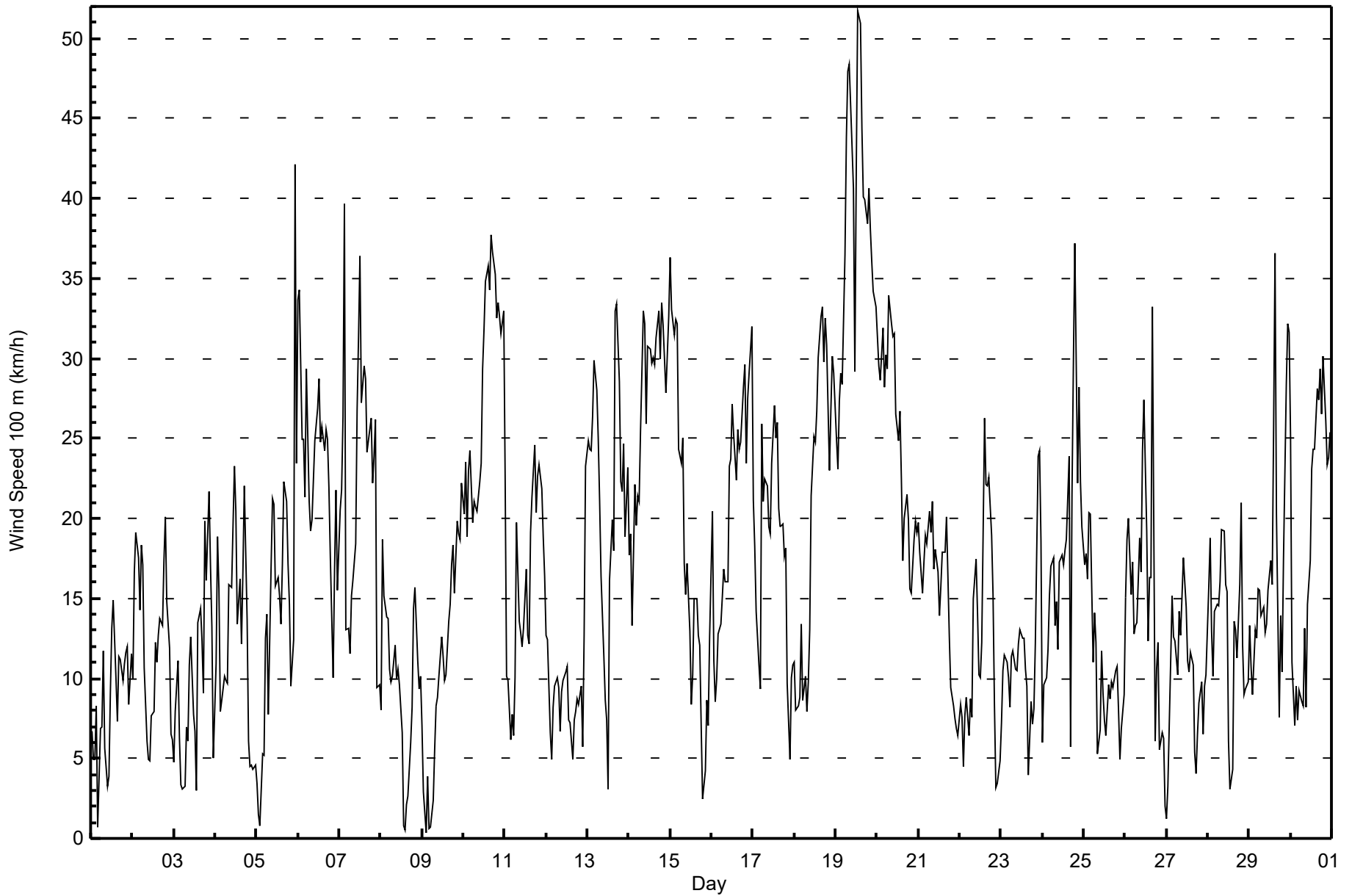
Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - June 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	52	7.22	7.22
6 - 11	192	26.67	33.89
12 - 19	223	30.97	64.86
20 - 28	158	21.94	86.81
29 - 38	81	11.25	98.06
> 38	14	1.94	100.00

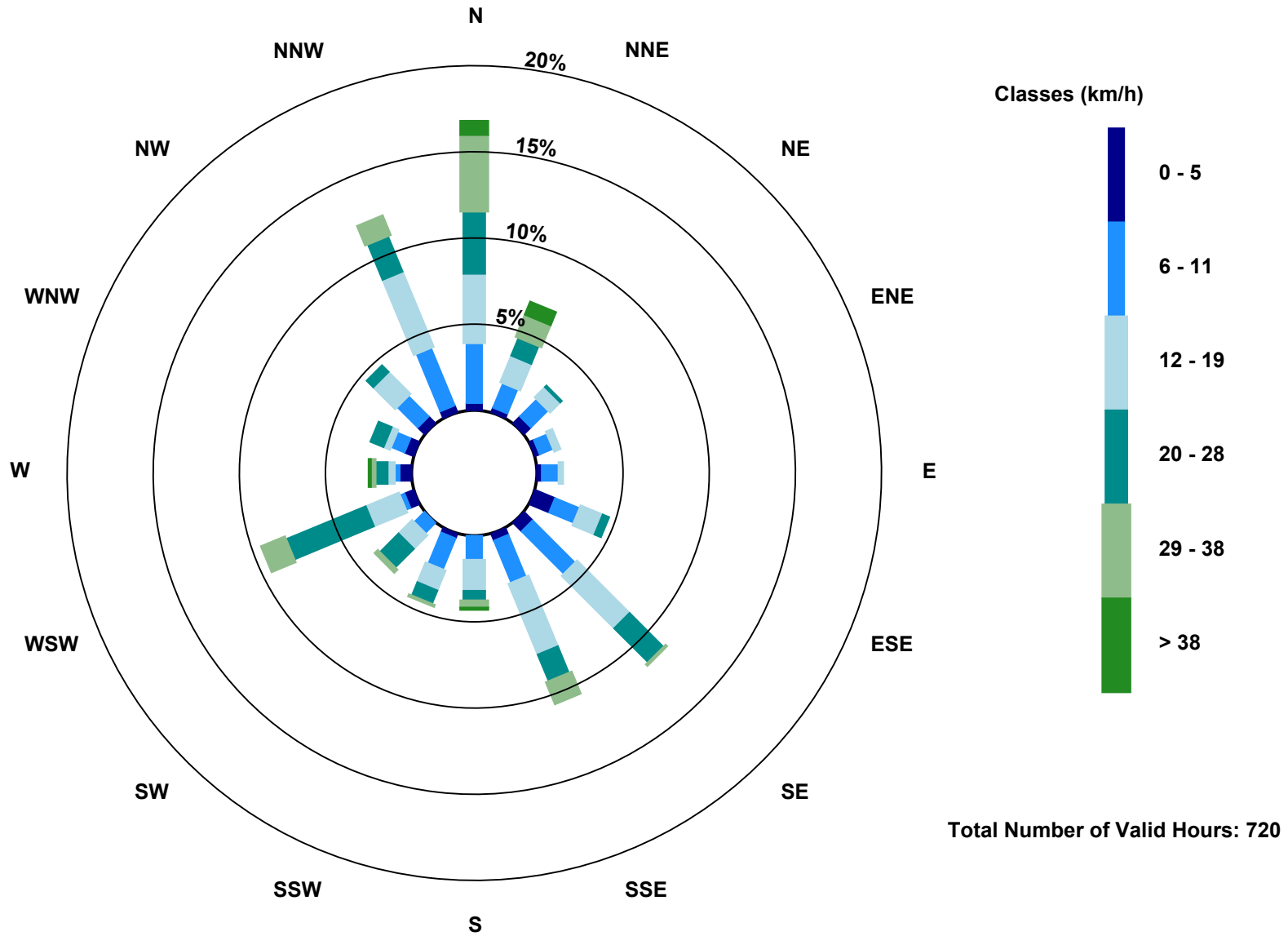
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower - June 2023

Maximum Speed: 58 km/h on Jun 19 14:00	Maximum Daily Speed Average: 43.7 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 8 15:00	Minimum Daily Speed Average: 3.8 km/h on Jun 24	Hours of Data: 713
Maximum Diurnal Speed Average: 7.4 km/h at hour 17	Minimum Diurnal Speed Average: 0.3 km/h at hour 2	Hours of Missing Data: 7
Monthly Average Velocity: 2.5 km/h 329.8 deg	Percentiles: P ₁ = 3 P ₁₀ = 7 Q ₁ = 12 Median = 18 Q ₃ = 27 P ₉₀ = 35 P ₉₉ = 50	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-Jun	NW9	SSW2	NNW8	NNW11	NE5	E5	SSW7	SW13	SSW6	S4	WSW4	N9	NNW14	NNW16	NNW10	NNW8	NNE12	NE11	ENE10	ENE11	ENE13	E13	ENE14	NNE15	NNE4.5	NNW16
2-Jun	N12	NNE20	N22	N24	N17	N24	NNE24	NNE15	N7	NNW4	WNW5	WNW8	WNW8	NNW13	NNW11	NNW13	NNE14	NE13	NE19	NE24	ENE17	E14	E10	E8	NNE11.6	N24
3-Jun	ESE10	E6	ENE7	ENE7	ESE8	SE8	SE5	NNE5	N7	N11	NNE12	NNE8	NE7	ENE3	SE12	SE14	SE13	SE10	SE20	ESE19	ESE26	SE22	ESE21	ESE14	ESE8.5	ESE26
4-Jun	ESE19	SE24	SE21	ESE14	ESE17	E17	E14	ESE15	ESE21	ESE21	SE21	SE25	SE22	SE16	ESE17	ESE15	ESE18	SE23	SE13	SE4	NE5	ESE5	SE9	W4	ESE15.1	SE25
5-Jun	W3	NNW5	ENE3	N3	WNW5	NW17	NNW19	N12	N18	NNE22	NNE22	NNE16	NNE16	N14	N13	N17	N23	N27	NNE24	NE25	NNE10	W12	W48	NNW28	NNW12.3	W48
6-Jun	W37	W38	WSW28	WSW27	WSW23	WSW32	WSW22	WSW20	WSW21	WSW24	WSW26	SW28	WSW30	WSW26	WSW27	WSW26	WSW27	SW26	SW23	WSW20	SW13	SW18	SW22	S24	WSW24.5	W38
7-Jun	S28	S33	SSW41	SSW50	S20	S15	SSW17	SW17	SW18	SSW19	SW28	WSW32	WSW38	W29	W31	W31	WNW26	WNW28	WNW29	WNW26	WNW28	NW32	NW19	NW13	WSW18.8	SSW50
8-Jun	NW14	N27	NNE26	NNE22	NNE19	N19	N13	N11	N13	NNW10	NNW11	N10	N7	N1	ESE0	W2	N3	N5	N7	NE16	NE20	NE23	ENE18	ESE22	NNE11.1	N27
9-Jun	SE17	SE11	SSW4	SSE5	SSE4	SSW4	S8	SSE7	SSE11	SSE8	SSE11	SSE12	S12	SSE10	SE11	S14	S15	S18	SSW19	S20	SSE27	SSE28	SSE23	SSE28	SSE12.8	SSE28
10-Jun	SSE26	SSE25	SSE24	SSE26	SSE27	SSE26	SSE25	SSE22	SSE22	SSE23	SSE24	SSE30	SSE33	SSE35	SSE37	SSE36	S40	S39	S38	S37	S41	S40	S39	S41	SSE31.1	S41
11-Jun	SSE30	SSE18	SSW13	SSW10	W8	SW5	W12	W20	WNW15	WNW15	WNW12	WNW14	NW18	NW13	NW14	NW20	NW23	NW27	WNW23	NW27	NW31	NNW29	NNW29	NNW25	WNW12.9	NW31
12-Jun	N19	N19	N10	WNW10	WNW13	NW14	NNW13	N10	N7	N9	N10	N10	N9	N7	N7	N3	ENE7	NE9	NE11	NE14	NE13	E10	SE19	SE29	NNE6.8	SE29
13-Jun	SE27	SE28	SE29	SE32	SE34	SE30	SE28	SE21	SSE16	SSE11	SE8	SE8	SE4	NNW15	N20	N19	N36	N35	NNE34	NNE28	UO	UO	NNE22	NNE31	E10.3	N36
14-Jun	NNE22	NNE20	NNE17	N22	N21	N22	N23	N27	N36	N36	N28	N36	N36	N34	N35	N33	N36	N38	UO	UO	UO	N33	N35	N38	N29.6	N38
15-Jun	NNW42	N39	N36	NNW39	NNW39	NNW31	N27	N28	NNW21	NW17	NW22	NW17	NW14	NNW15	NNW17	NNW19	NNW13	N12	NNW8	NNE4	SE2	S9	SW10	W18	NNW18.5	NNW42
16-Jun	W22	W18	WSW18	SW14	SSW12	SSW12	SSE12	SSE15	SSE15	SE16	SSE25	SSE27	SW29	SW28	SSW23	SSW27	S27	S28	SSW32	SW34	SW30	WSW33	WSW36	WSW37	SSW19.5	WSW37
17-Jun	WSW26	SW23	SW19	SW18	SW20	WSW34	WSW24	WSW24	WSW23	WSW20	WSW19	WSW25	WSW28	WSW27	WSW27	WSW22	W20	W20	N18	NNE26	NE17	NE7	N9	NNE17	WSW14.6	WSW34
18-Jun	NNE16	NNE14	E14	ENE5	NE11	NNE12	NE16	NE9	NNE10	NNE14	N21	N25	N24	NNE27	NNE30	NNE35	NNE35	NE33	NNE36	NNE37	NNE28	NNE32	NNE36	NNE36	NNE22.4	NNE37
19-Jun	NNE33	NNE29	NNE33	NNE37	NNE35	NNE43	NNE51	NNE54	NNE54	NNE50	NNE50	NNE37	NNE49	N58	NNE58	NNE52	NNE47	NNE46	N43	N45	N43	N40	N39	N37	NNE43.7	N58
20-Jun	N36	N35	N34	N37	N35	N35	N33	N37	N36	N35	N34	N28	N30	NNW31	NNW28	NNW21	N24	NNW24	NNW22	NNW18	NNW19	NNW24	NNW27	NNW26	N29.0	N37
21-Jun	NNW27	N24	NNW21	N22	NNW22	N27	NNW27	N22	N22	N17	N18	N17	NNW13	N16	NNW18	N18	N21	NNE17	NNE13	NE9	E7	E6	ESE8	SE10	N15.5	NNW27
22-Jun	SSE12	SSE10	SE6	SSE8	SSE11	SSE8	SSE10	SE15	SE19	SSE19	SE13	SE9	SE10	WSW14	WSW27	WSW25	WSW24	WSW24	WSW20	WSW17	WNW11	WSW8	SSW5	S3	SSW8.2	WSW27
23-Jun	SSE8	SSE14	SE15	SSE14	S13	SE14	SSE15	SSE12	SE10	SE10	SE12	SSE14	SSE13	SE13	SE11	ESE9	SE4	SE8	SSE8	SSE8	S12	SSE25	S29	SW34	SSE12.4	SW34
24-Jun	SSW23	SSW22	SSW17	SSW13	SSW13	SSW17	S15	S12	S12	S12	WSW18	WSW19	WSW18	WSW19	WSW20	N25	NE8	NNE23	N35	N41	NNE27	NNE32	NNE26	NNE22	WNW3.8	N41
25-Jun	NNE22	NNE24	NNE23	NNE27	NNE28	NNE21	NE17	NE13	NE6	ENE7	NE13	NE9	NNW7	WNW6	NW9	NW9	NNW9	NNW9	NNW11	NNW11	N8	ENE5	ESE8	SSE11	NNE10.3	NNE28
26-Jun	S17	S23	SSE26	SSE22	SSE22	S15	SSE15	SSE13	SSE18	SSE18	SSE26	SSE29	S23	SSW13	SW18	W17	NNE37	NNE10	SW10	S12	SSW8	SSW9	SSW2	NNE5	S11.2	NNE37
27-Jun	NNW4	NW6	N12	NNE25	N21	N16	N12	N14	N12	N16	N18	N15	N11	NNW10	NW12	NW11	NW5	NW4	NNW6	NNW7	N10	NE9	S16	S20	N8.5	NNE25
28-Jun	S20	S27	S18	S14	S15	S18	S16	S16	SSE16	SSE16	SSE15	SSE15	SSE6	NE2	NNW4	WSW15	SW13	S13	S20	SSW22	S14	SSW11	SSW12	SSW12	S13.0	S27
29-Jun	SSW12	SSW14	S16	S14	S16	S19	S17	S14	SSE14	SSE12	SSE14	SSE16	S18	SSW17	WSW29	UO	UO	SW8	S15	SSW16	SW24	SW35	WSW41	WSW40	SSW16.4	WSW41
30-Jun	WSW35	WSW21	SW10	SW12	WSW14	SW15	SW11	SSW9	S13	SSW10	WSW16	WSW18	WSW23	WSW26	WSW26	WSW30	WSW29	WSW31	WSW29	WSW34	WSW31	W28	WSW29	WSW34	WSW21.6	WSW35

W1.2	SE0.3	E0.6	N1.2	NNE1.7	N1.8	NNE2.2	NNE2.0	NNE1.6	NE1.9	N1.6	NW0.9	NNW4.2	NW6.3	NW7.1	NW6.9	NNW7.4	NNW5.5	NNW3.8	NNW4.1	N1.8	NW1.9	NNW2.6	W2.5	Diurnal Average	
NNW42	N39	SSW41	SSW50	NNW39	NNE43	NNE51	NNE54	NNE54	NNE50	NNE50	NNE37	NNE49	N58	NNE58	NNE52	NNE47	NNE46	N43	N45	N43	S40	W48	S41	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

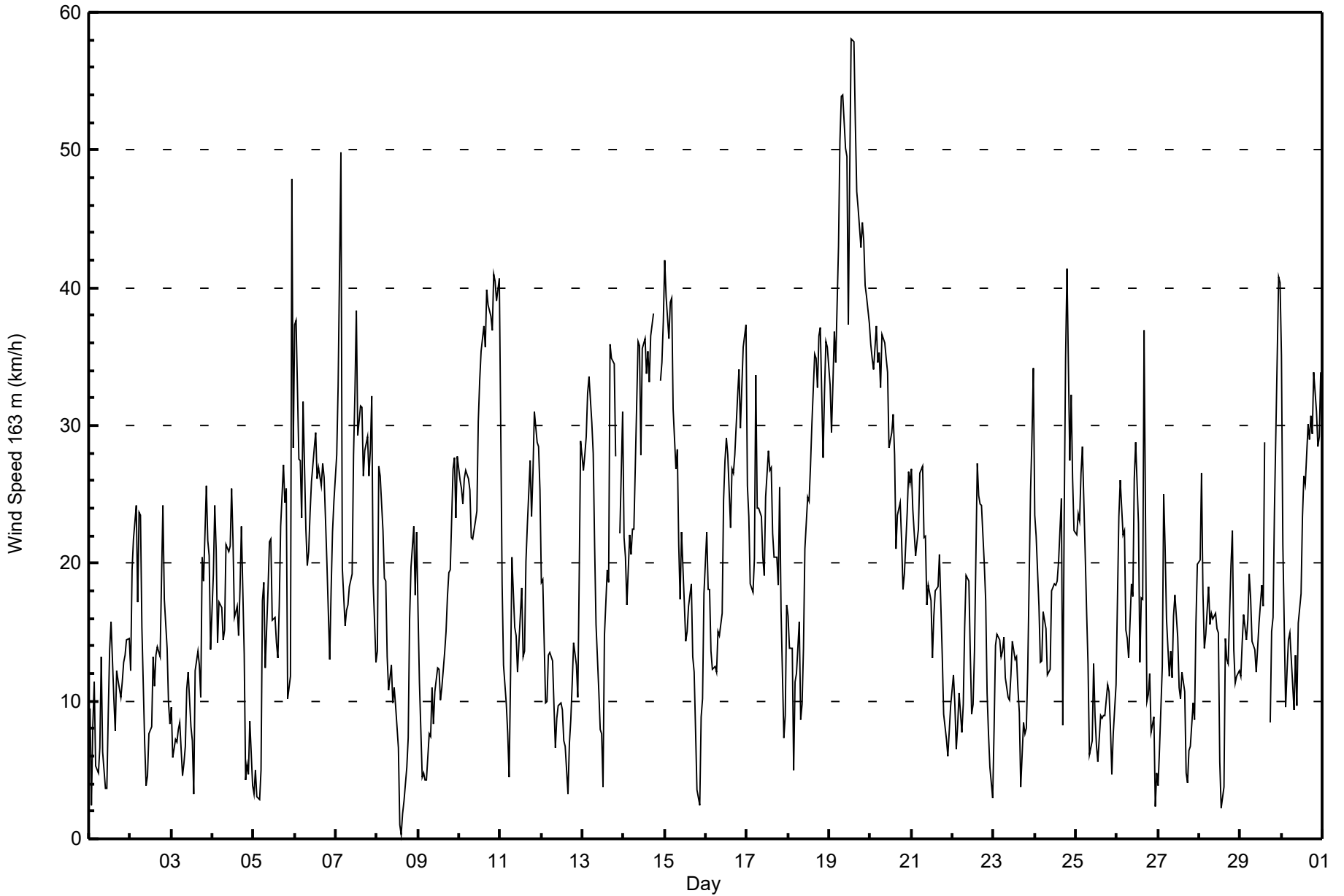
Wind Speed 163 m (WS163m) - km/h
Lower Camp Met Tower - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 15 km/h on Jun 26 17:00	Hours of Data: 713
Minimum Value: 1 km/h on Jun 22 22:00	Hours of Missing Data: 7
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 10	Hours of Calibration: 0
	Percent Operational Time: 99.0

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-Jun	3	3	3	3	1	2	2	3	3	2	3	5	4	4	2	2	4	2	3	1	3	4	4	3	5
2-Jun	3	3	4	3	3	1	2	4	2	2	2	3	3	3	4	4	3	3	4	3	3	2	3	3	4
3-Jun	3	2	1	2	3	2	2	3	2	3	3	4	5	4	6	3	2	3	5	3	2	3	4	4	6
4-Jun	8	5	3	3	6	8	5	4	3	4	4	5	5	3	2	4	4	4	7	2	2	3	3	2	8
5-Jun	2	1	1	2	5	3	1	3	3	4	4	3	4	3	3	4	2	3	4	6	4	11	8	7	11
6-Jun	5	6	6	4	3	5	7	3	3	3	5	4	3	5	5	4	5	4	4	3	2	2	2	2	7
7-Jun	4	5	5	3	12	4	5	5	3	4	8	6	4	4	5	5	5	5	4	4	3	3	4	2	12
8-Jun	4	2	2	4	4	3	2	2	2	3	3	3	2	2	2	2	2	2	2	3	1	2	4	3	4
9-Jun	3	3	1	1	1	1	2	1	3	3	3	4	4	3	3	4	4	3	3	3	2	3	4	4	4
10-Jun	4	3	4	3	3	4	3	4	5	4	4	6	6	5	6	5	6	6	5	4	3	2	3	2	6
11-Jun	5	5	6	3	3	2	3	5	6	4	3	4	6	5	6	5	4	3	2	2	3	3	3	2	6
12-Jun	2	4	2	3	2	3	2	2	3	3	2	2	3	2	2	2	3	2	4	4	4	4	6	4	6
13-Jun	5	4	4	4	3	3	5	3	3	3	2	2	2	5	3	3	7	5	7	10	UO	UO	6	6	10
14-Jun	4	4	4	4	3	3	4	3	5	4	5	4	5	5	7	10	5	6	UO	UO	UO	7	5	4	10
15-Jun	4	4	5	4	5	5	6	6	8	3	3	4	3	3	3	3	4	2	3	3	2	2	3	4	8
16-Jun	3	3	3	2	2	2	3	2	2	2	5	4	7	8	3	4	4	4	10	3	7	5	4	4	10
17-Jun	4	3	4	4	3	4	5	3	3	4	4	5	3	4	5	4	4	4	7	8	3	5	5	3	8
18-Jun	2	2	5	4	2	5	6	2	2	4	4	4	5	5	5	6	6	7	6	6	5	3	5	6	7
19-Jun	5	4	6	8	8	8	8	8	9	8	10	9	6	8	8	9	7	6	5	5	5	5	6	5	10
20-Jun	6	5	5	6	5	4	5	6	5	7	5	6	3	3	3	2	3	3	2	1	2	2	1	1	7
21-Jun	1	2	1	1	1	1	1	4	3	3	4	4	5	5	4	4	4	3	3	4	2	1	1	1	5
22-Jun	2	2	1	2	1	2	2	2	3	5	3	3	3	7	5	3	3	3	2	2	2	1	1	1	7
23-Jun	2	2	3	2	2	1	3	3	2	1	4	3	5	4	4	3	3	3	3	1	3	2	1	3	5
24-Jun	5	2	3	2	2	2	2	2	2	4	4	4	3	4	4	11	7	9	6	5	7	5	7	6	11
25-Jun	4	3	3	2	2	4	4	4	3	4	5	5	4	3	4	3	2	2	1	1	1	1	2	2	5
26-Jun	4	2	2	3	3	3	2	4	3	3	2	4	4	3	4	12	15	6	5	4	4	4	2	2	15
27-Jun	2	2	5	2	2	2	2	3	2	2	3	4	4	4	3	3	2	3	2	2	1	2	9	4	9
28-Jun	4	3	5	3	1	3	4	3	2	2	3	3	5	2	1	6	3	4	8	10	2	3	2	1	10
29-Jun	2	3	3	1	1	1	4	3	2	2	3	3	4	6	8	UO	UO	3	3	2	4	4	1	1	8
30-Jun	4	6	3	4	3	2	4	4	3	4	3	5	3	6	3	4	4	5	3	3	2	2	3	3	6

8	6	6	8	12	8	8	8	8	9	8	10	9	7	8	8	12	15	9	10	10	7	11	9	7	
Diurnal Maximum																									

UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	45	6.31	6.31
6 - 11	128	17.95	24.26
12 - 19	223	31.28	55.54
20 - 28	184	25.81	81.35
29 - 38	100	14.03	95.37
> 38	33	4.63	100.00

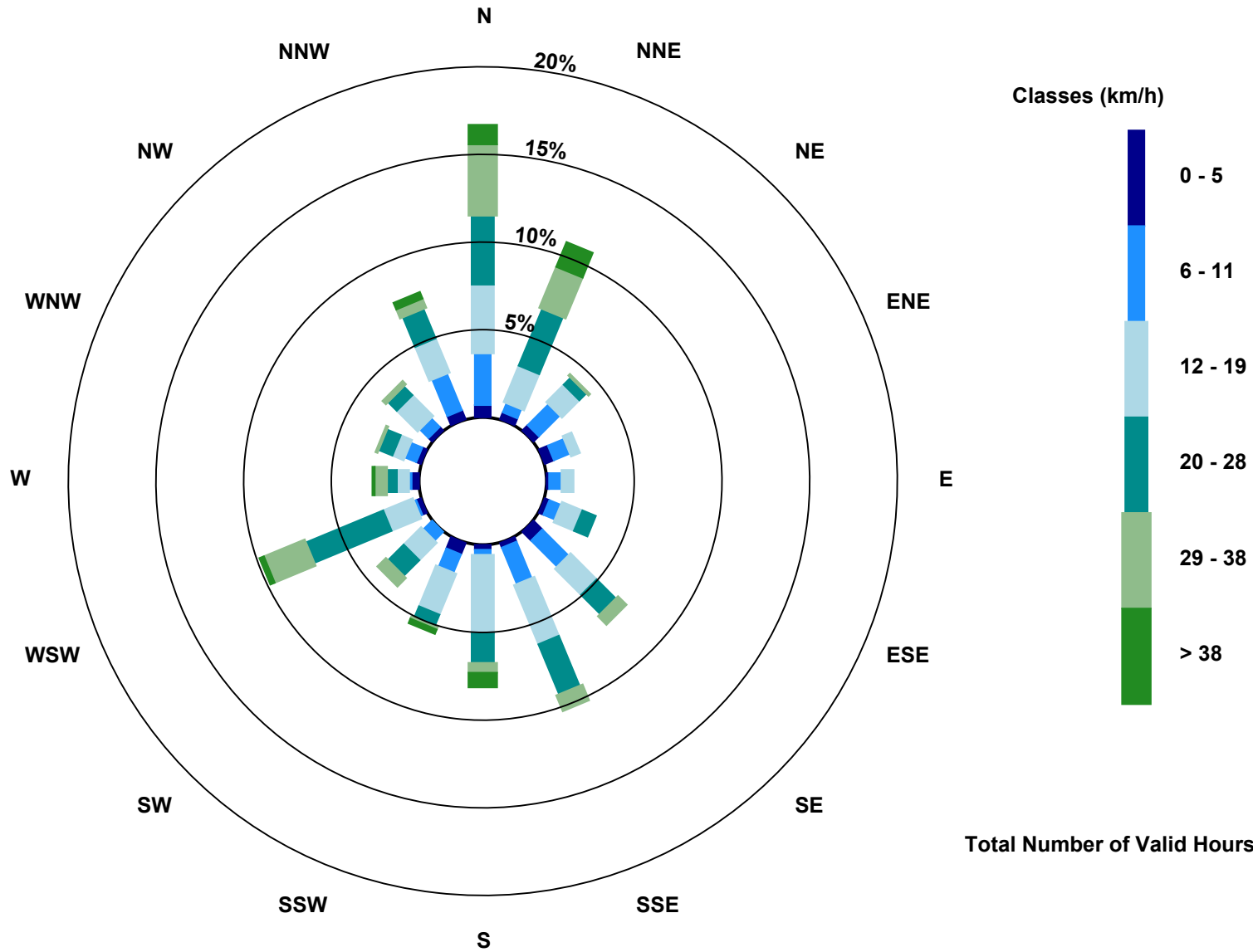
Total Number of Valid Hours: 713

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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 - June 2023

Direction of Maximum Speed: 170 deg on Jun 10 17:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 3.0 deg on Jun 19	Hours of Data: 720
Direction of Minimum Speed: 126 deg on Jun 17 22:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.5 deg on Jun 24	Percent Operational Time: 100.0
Monthly Average Direction: 305.5 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-Jun	279	119	346	3	88	123	194	229	205	119	211	13	340	342	329	334	358	23	53	53	61	92	50	340	9.8
2-Jun	339	347	336	352	336	338	348	327	321	294	276	276	268	322	345	335	359	36	32	34	45	18	5	22	345.0
3-Jun	11	349	338	1	350	331	335	349	339	341	8	15	24	58	139	147	145	145	137	116	115	109	66	7	84.4
4-Jun	95	143	124	4	102	50	76	100	79	97	128	124	123	134	116	113	111	136	141	125	32	144	333	346	118.4
5-Jun	222	119	352	342	335	354	342	330	357	3	21	11	356	342	343	344	330	330	344	337	310	250	260	282	328.9
6-Jun	258	260	244	226	223	238	239	237	238	244	245	235	250	249	251	248	238	226	231	234	212	142	100	97	239.5
7-Jun	116	138	154	157	128	100	126	208	234	191	231	244	260	276	273	277	288	302	304	294	280	317	230	247	242.1
8-Jun	299	334	342	346	337	324	352	346	349	335	342	6	358	190	151	237	331	338	345	34	357	336	52	52	348.2
9-Jun	20	340	321	338	330	359	102	102	114	139	133	145	170	161	130	173	176	184	197	183	142	131	126	135	156.2
10-Jun	132	132	138	139	138	137	142	142	162	165	160	157	155	162	159	160	170	165	168	166	161	154	146	154	156.9
11-Jun	129	102	145	205	133	127	232	274	287	300	295	304	316	315	311	303	311	313	307	297	338	353	355	251	305.2
12-Jun	258	339	281	357	50	334	327	343	5	11	1	7	8	346	9	14	25	25	1	344	340	353	84	132	4.2
13-Jun	145	140	128	131	126	131	135	151	169	161	114	110	71	343	345	344	350	350	13	0	340	345	354	7	60.8
14-Jun	358	349	344	336	342	351	353	353	353	355	360	2	358	354	351	345	337	344	347	348	352	344	339	337	349.3
15-Jun	334	337	338	332	331	331	329	332	320	308	322	345	16	1	331	332	348	359	340	342	128	139	98	155	335.3
16-Jun	277	339	168	163	118	129	129	140	144	143	147	172	217	216	212	194	182	167	208	185	169	229	239	240	186.8
17-Jun	225	215	184	147	148	238	243	246	239	240	245	249	260	244	243	258	275	265	344	9	335	126	353	341	247.5
18-Jun	341	27	120	347	5	15	348	343	341	8	350	354	356	3	6	21	19	26	21	19	11	3	360	7	7.2
19-Jun	4	359	359	5	359	7	9	10	15	17	18	13	2	2	9	13	7	0	352	349	348	349	346	342	3.0
20-Jun	342	349	350	349	355	351	354	349	346	354	352	344	333	332	328	322	331	321	324	324	316	320	334	338	342.4
21-Jun	334	337	323	330	339	327	324	334	346	352	349	354	346	352	337	348	351	6	31	60	100	158	252	108	348.4
22-Jun	7	340	344	110	101	132	125	158	148	161	143	135	132	243	254	248	248	245	239	252	269	141	109	352	211.0
23-Jun	53	88	35	343	111	97	136	145	138	146	140	151	158	132	134	114	110	130	135	133	117	133	131	88	132.9
24-Jun	94	115	135	134	138	134	136	139	137	139	244	245	239	242	248	356	327	352	343	346	2	356	2	5	105.6
25-Jun	17	5	358	355	2	347	17	34	47	62	31	45	302	294	325	328	349	355	333	325	354	117	157	106	0.5
26-Jun	134	126	123	117	131	138	136	142	138	137	147	155	175	195	230	256	359	315	221	167	211	146	98	343	159.2
27-Jun	25	346	348	7	22	20	346	348	345	345	347	354	354	330	305	299	278	283	331	313	310	352	132	140	337.3
28-Jun	136	132	136	141	139	140	137	136	134	134	132	133	113	56	344	249	240	126	149	189	152	121	90	261	145.8
29-Jun	185	198	140	138	125	128	139	141	132	132	138	123	164	203	251	246	249	168	150	129	130	201	218	229	176.5
30-Jun	235	149	127	128	125	130	169	138	151	156	250	256	240	255	243	247	244	244	248	250	237	240	233	256	225.8

325.8	38.1	83.5	85.4	82.8	80.4	43.6	344.8	103.9	98.1	308.8	233.5	268.8	282.8	283.7	281.8	299.6	298.7	287.4	316.6	352.8	337.4	308.6	321.3	
Diurnal Average																								

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

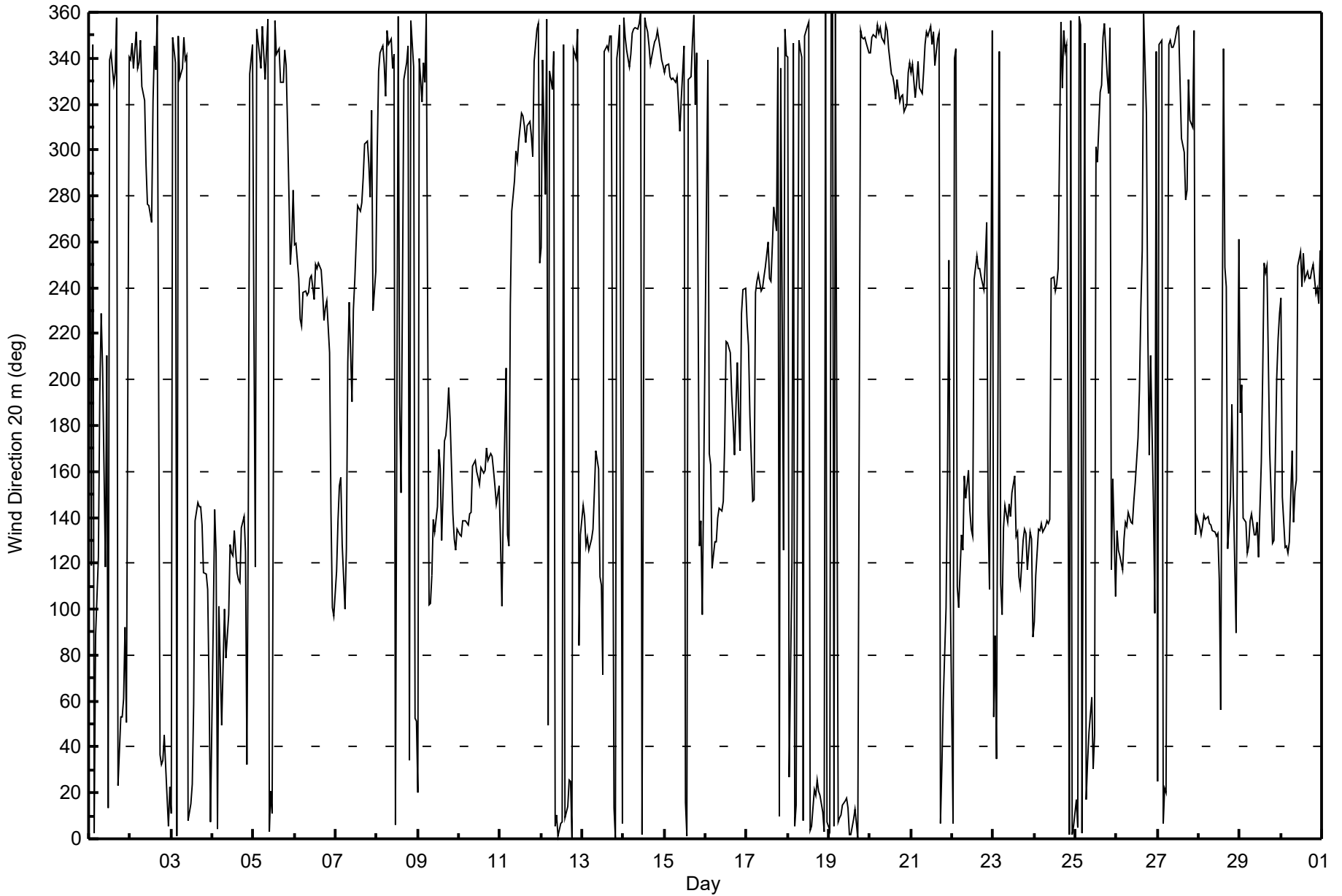
Wind Direction 20 m (WD20m) - deg
Lower Camp Met Tower - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 104 deg on Jun 5 02:00 Minimum Value: 6 deg on Jun 10 22:00 Percentiles: P ₁ = 9 P ₁₀ = 14 Q ₁ = 18 Median = 23 Q ₃ = 35 P ₉₀ = 61 P ₉₉ = 94		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-Jun	93	48	37	60	23	36	80	19	40	47	83	50	30	24	29	35	21	38	33	21	19	37	76	28	93	
2-Jun	25	25	15	33	29	20	18	23	31	47	63	52	43	29	26	29	22	38	31	28	23	32	39	33	63	
3-Jun	37	58	34	54	54	42	33	18	26	26	32	60	73	93	30	12	14	24	20	22	20	45	36	93		
4-Jun	87	14	48	34	67	63	86	56	27	39	23	20	20	29	32	24	24	19	17	55	67	55	94	70	94	
5-Jun	102	104	69	41	60	37	19	41	22	28	26	32	23	24	23	18	19	27	56	41	22	28	23	27	104	
6-Jun	17	18	24	10	12	14	13	14	13	17	19	19	18	20	21	21	17	15	19	11	30	24	47	17	47	
7-Jun	84	22	15	8	60	21	41	27	16	13	22	23	20	26	21	24	27	22	19	19	16	30	61	38	84	
8-Jun	65	24	18	24	73	33	22	23	24	37	35	33	46	91	85	69	92	23	17	31	24	34	60	32	92	
9-Jun	35	25	68	46	31	86	36	34	24	22	24	22	27	46	30	23	21	15	10	14	11	12	13	13	86	
10-Jun	12	12	16	18	16	16	13	22	13	14	13	12	12	11	11	10	10	9	9	8	6	10	7	22	22	
11-Jun	47	64	67	84	44	14	80	24	33	29	36	30	34	35	61	31	21	16	18	32	16	26	17	87	87	
12-Jun	48	64	58	60	89	45	30	22	34	29	35	25	23	32	16	23	38	38	31	35	33	44	53	18	89	
13-Jun	16	23	28	27	23	22	27	19	11	21	27	22	77	20	16	18	23	17	36	58	39	25	30	22	77	
14-Jun	25	24	65	20	22	20	20	18	18	18	20	19	20	24	21	23	21	19	20	20	19	21	20	21	65	
15-Jun	22	21	20	22	20	23	22	20	28	20	24	32	38	29	23	25	26	22	32	96	22	58	88	70	96	
16-Jun	56	78	78	22	13	18	22	17	9	14	21	11	23	14	12	10	11	9	30	11	22	35	13	11	78	
17-Jun	20	13	14	27	21	22	19	17	13	15	19	20	19	16	16	22	26	19	51	36	42	100	67	25	100	
18-Jun	37	72	28	34	34	81	28	24	24	35	16	19	22	21	24	26	24	29	22	22	20	16	18	19	81	
19-Jun	22	17	19	23	20	19	18	19	20	20	36	18	18	19	19	19	19	18	18	15	16	17	17	18	36	
20-Jun	20	21	21	17	19	17	18	19	17	20	18	21	21	21	23	17	21	17	18	17	13	14	18	18	23	
21-Jun	18	19	20	17	16	21	19	24	20	22	24	23	40	22	29	23	25	30	33	30	34	68	73	104	104	
22-Jun	61	46	35	89	84	22	28	25	18	18	20	17	22	62	16	16	17	15	15	21	31	81	76	76	89	
23-Jun	59	58	80	46	80	48	31	17	18	16	21	21	29	24	29	35	71	29	27	16	16	17	18	23	80	
24-Jun	20	9	12	10	9	12	18	14	12	35	23	21	18	24	23	44	89	30	19	17	31	21	21	22	89	
25-Jun	21	20	16	15	21	33	26	38	89	60	32	41	71	51	39	39	19	15	17	16	18	56	87	94	94	
26-Jun	19	28	29	38	24	28	23	16	18	18	10	11	15	16	34	36	25	51	26	32	42	52	71	31	71	
27-Jun	96	77	11	34	63	67	31	19	17	16	15	25	30	30	36	32	53	56	32	15	40	52	49	66	96	
28-Jun	32	17	26	10	10	16	17	14	15	16	15	19	60	71	39	36	19	56	24	19	31	31	78	101	101	
29-Jun	27	31	20	9	14	20	11	14	19	23	18	19	26	40	26	20	67	68	11	11	31	11	10	10	68	
30-Jun	13	36	9	12	18	15	36	13	20	54	27	26	15	20	17	16	18	14	15	13	13	10	12	22	54	
		102	104	80	89	89	86	86	56	89	60	83	60	77	93	85	69	92	68	56	96	67	100	94	104	
		Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 9 deg on Jun 19 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 4.9 deg on Jun 19	Hours of Data: 720
Direction of Minimum Speed: 352 deg on Jun 22 00:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.8 deg on Jun 24	Percent Operational Time: 100.0
Monthly Average Direction: 332.2 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-Jun	274	132	345	359	94	122	201	228	208	123	227	4	338	339	327	329	359	29	58	59	60	93	57	340	9.7
2-Jun	340	357	343	347	336	339	344	330	321	292	282	279	274	320	344	335	2	38	39	39	54	52	32	53	352.5
3-Jun	51	360	359	359	354	334	348	345	336	340	14	14	26	50	132	140	138	136	131	115	114	112	90	92	81.9
4-Jun	113	135	122	67	107	75	83	104	95	102	126	120	120	124	114	113	109	130	135	124	58	139	180	329	116.1
5-Jun	344	248	350	338	307	341	344	335	357	8	23	16	2	342	343	344	332	337	360	3	323	257	260	280	333.5
6-Jun	257	258	245	228	227	239	239	237	238	244	245	235	250	249	251	248	239	226	231	232	209	178	168	118	238.4
7-Jun	130	135	155	160	137	106	130	211	232	191	231	244	259	274	273	275	286	301	301	289	279	305	295	247	245.0
8-Jun	274	344	338	339	345	341	352	346	349	338	339	358	352	197	147	238	325	341	349	37	19	355	70	87	350.2
9-Jun	40	338	343	317	337	14	100	108	121	130	132	142	169	154	126	173	175	183	198	184	153	136	133	136	153.0
10-Jun	133	130	133	131	134	134	136	132	159	162	156	155	152	160	158	159	170	165	168	167	163	156	150	155	154.0
11-Jun	137	115	146	160	191	145	232	269	281	299	296	302	312	315	311	302	308	311	302	288	323	339	333	331	299.1
12-Jun	333	334	300	282	277	331	337	345	2	6	1	6	4	348	7	7	36	34	9	356	353	2	99	128	5.8
13-Jun	136	129	124	124	123	127	128	139	162	159	117	116	98	340	345	348	350	354	17	5	343	349	358	13	56.7
14-Jun	1	352	348	337	344	355	358	357	356	359	3	4	1	356	354	347	339	347	351	351	355	347	342	338	351.9
15-Jun	335	338	338	333	333	331	333	335	326	303	317	335	359	352	328	330	347	356	324	336	125	142	201	232	333.5
16-Jun	256	271	193	172	131	131	128	134	140	135	141	171	216	217	211	194	183	168	209	192	179	232	238	240	188.5
17-Jun	229	219	200	163	162	238	244	244	238	238	243	248	258	242	243	256	275	263	351	16	358	34	345	339	250.0
18-Jun	341	2	115	356	3	14	356	348	343	12	353	358	358	8	8	24	20	28	24	22	14	3	3	10	10.2
19-Jun	7	4	2	7	3	9	10	12	15	17	17	13	3	4	9	12	8	3	356	352	352	353	349	343	4.9
20-Jun	344	354	353	354	359	356	356	353	347	358	356	347	337	335	332	323	335	325	325	327	319	322	331	334	344.5
21-Jun	333	337	335	336	337	334	328	337	349	354	350	353	343	349	338	352	352	9	34	59	79	88	218	352	350.5
22-Jun	293	347	338	180	120	136	121	151	135	154	135	129	127	243	252	248	248	245	239	250	272	226	130	88	212.3
23-Jun	122	121	128	155	147	107	126	140	135	137	133	144	157	131	133	117	114	132	137	151	146	159	144	157	138.1
24-Jun	99	116	130	134	138	133	133	137	134	137	245	245	240	242	248	6	349	357	345	349	6	359	4	6	52.9
25-Jun	19	8	359	356	4	354	22	41	49	63	40	46	310	294	321	324	343	347	329	325	335	98	134	127	1.9
26-Jun	133	130	131	129	136	144	132	136	132	132	149	154	174	195	235	259	3	333	220	166	209	158	118	5	152.1
27-Jun	275	327	333	350	349	338	340	348	345	346	348	356	355	331	308	301	284	294	324	316	303	332	157	131	334.5
28-Jun	131	131	133	136	139	133	133	132	131	131	132	130	114	60	357	248	240	133	150	192	153	138	150	175	143.2
29-Jun	190	190	137	144	154	146	149	145	129	127	135	123	161	203	253	246	252	176	151	133	160	204	216	221	180.2
30-Jun	225	168	132	139	133	153	184	136	153	156	248	253	239	253	244	247	243	242	245	247	237	239	232	252	227.3

324.0 28.1 57.0 57.7 67.0 68.2 40.6 18.6 49.7 57.2 9.9 327.9 286.1 296.9 295.2 295.5 314.9 326.0 326.8 339.5 352.7 335.7 298.4 318.5

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

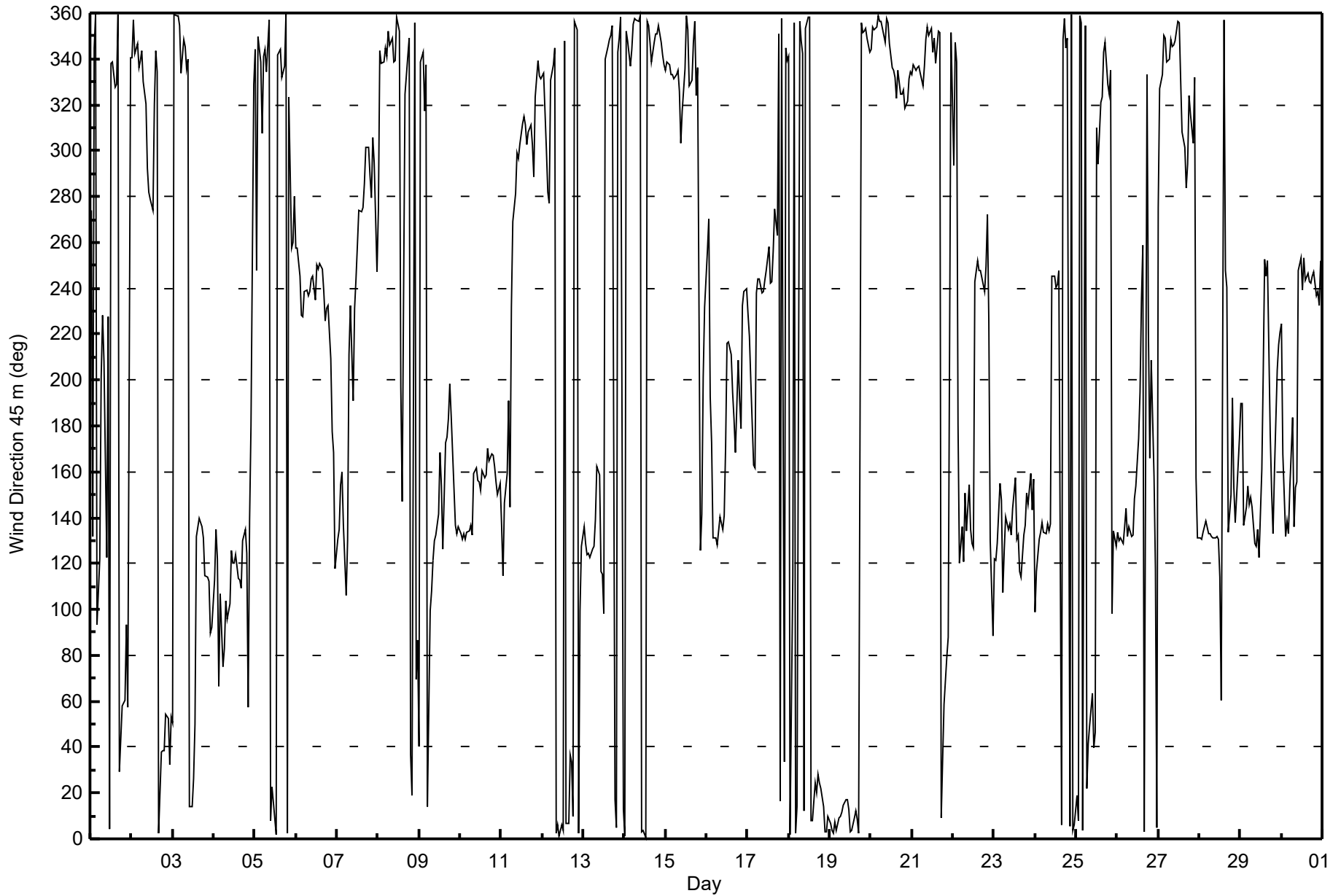
Wind Direction 45 m (WD45m) - deg
Lower Camp Met Tower - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Jun 22 00:00 Minimum Value: 3 deg on Jun 24 05:00 Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 11 Median = 15 Q ₃ = 24 P ₉₀ = 47 P ₉₉ = 89		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-Jun	77	61	31	52	34	29	29	13	41	42	89	57	24	17	19	26	15	26	24	10	10	21	56	11	89	
2-Jun	14	14	11	17	16	9	9	14	22	33	43	39	38	20	19	23	13	25	16	13	13	16	51	36	51	
3-Jun	28	7	13	12	20	39	17	15	22	22	23	50	57	79	24	10	10	18	12	13	10	10	23	61	79	
4-Jun	84	9	19	45	48	48	75	32	12	20	14	11	11	20	15	14	14	11	13	28	44	19	96	27	96	
5-Jun	72	100	81	15	49	23	10	28	16	17	15	21	18	14	15	12	11	12	35	22	15	28	18	22	100	
6-Jun	10	10	18	9	10	10	10	10	10	11	14	17	13	14	15	15	14	14	16	8	20	9	22	11	22	
7-Jun	26	14	10	6	61	15	39	22	14	12	19	18	13	18	15	16	20	15	11	14	8	22	45	14	61	
8-Jun	42	11	11	7	11	14	15	20	16	25	32	24	42	99	91	73	98	15	12	17	15	21	52	22	99	
9-Jun	28	14	12	49	14	61	31	31	22	15	19	16	28	39	22	23	18	14	9	11	13	8	7	10	61	
10-Jun	8	6	9	9	8	7	8	15	14	13	12	11	11	12	10	10	9	9	8	8	8	6	8	7	15	
11-Jun	33	59	52	59	27	13	46	14	23	20	27	22	26	28	46	20	13	10	11	15	16	6	13	20	59	
12-Jun	17	8	44	70	70	49	14	17	28	26	30	15	16	28	13	15	28	24	19	26	29	59	43	10	70	
13-Jun	11	15	16	15	10	11	15	16	13	18	18	18	79	14	9	13	14	11	28	29	17	17	20	15	79	
14-Jun	14	14	56	10	12	13	14	11	11	11	14	11	13	16	14	15	11	12	14	15	13	14	12	12	56	
15-Jun	11	11	11	11	11	13	11	10	19	13	14	28	29	23	13	15	19	14	22	92	23	20	58	50	92	
16-Jun	39	84	49	23	7	12	13	12	5	9	18	10	21	12	10	9	11	8	28	9	19	31	9	8	84	
17-Jun	13	10	12	25	21	16	13	12	10	10	14	14	12	11	11	15	15	13	51	24	36	61	47	14	61	
18-Jun	21	73	24	32	13	65	26	19	15	28	10	14	16	16	16	14	16	15	12	10	12	7	10	12	73	
19-Jun	13	11	13	15	13	12	10	10	11	11	10	25	10	10	10	10	10	10	11	10	10	10	11	11	25	
20-Jun	11	13	14	11	12	11	12	11	11	14	11	15	11	11	12	10	12	9	10	8	7	7	8	8	15	
21-Jun	7	7	8	9	8	10	10	15	11	14	17	15	30	18	19	18	17	24	22	20	16	71	81	103	103	
22-Jun	83	40	17	88	19	18	19	21	15	17	16	11	14	58	11	10	10	10	13	17	21	66	21	81	88	
23-Jun	49	24	16	37	31	15	21	15	12	14	16	20	25	19	23	21	60	25	25	13	19	14	11	36	60	
24-Jun	28	9	10	5	3	5	8	6	5	34	18	16	13	18	17	46	88	22	11	11	20	15	15	14	88	
25-Jun	13	13	10	9	10	21	21	26	64	46	25	45	62	39	31	25	14	13	11	7	11	59	31	17	64	
26-Jun	7	9	12	17	13	20	9	8	9	9	9	11	14	13	30	33	18	76	27	28	32	48	51	38	76	
27-Jun	88	30	8	9	25	47	17	10	12	10	11	20	25	26	24	21	46	40	22	7	27	53	38	17	88	
28-Jun	14	8	14	6	6	6	10	8	7	6	9	13	52	64	23	29	14	51	22	20	30	24	46	36	64	
29-Jun	16	20	10	15	19	14	11	12	9	14	13	12	27	39	24	18	54	66	12	14	27	9	8	6	66	
30-Jun	9	36	7	15	12	24	31	14	20	59	20	19	12	15	12	11	13	9	9	9	8	6	9	19	59	
		88	100	81	88	70	65	75	32	64	59	89	57	79	99	91	73	98	76	51	92	44	71	96	103	
		Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 5 deg on Jun 19 14:00 Direction of Maximum Daily Speed Average: 7.5 deg on Jun 19	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 211 deg on Jun 9 03:00 Direction of Minimum Daily Speed Average: 2.1 deg on Jun 24	Percent Operational Time: 100.0
Monthly Average Direction: 326.3 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-Jun	284	154	339	336	121	109	195	222	212	146	238	356	335	335	324	326	5	31	56	58	61	96	69	360	10.5
2-Jun	348	9	355	343	347	343	343	343	325	306	289	282	276	323	341	338	7	42	38	42	62	70	73	77	1.3
3-Jun	93	38	31	30	24	115	49	354	334	343	16	14	34	54	127	139	136	136	130	115	117	119	99	119	90.9
4-Jun	116	129	122	113	105	94	88	101	108	111	125	122	122	124	115	113	109	129	139	128	58	122	137	266	117.5
5-Jun	266	263	133	325	303	320	342	337	358	8	23	18	7	346	344	347	341	347	12	22	345	264	260	281	337.3
6-Jun	257	256	245	237	238	242	241	238	239	243	244	233	249	246	247	245	236	226	230	233	224	202	199	157	237.4
7-Jun	145	158	174	176	159	131	164	210	227	192	231	243	256	272	272	273	288	300	298	285	280	305	313	272	243.4
8-Jun	291	350	356	356	352	353	351	348	351	341	338	357	353	338	309	257	340	349	358	40	37	36	79	108	2.6
9-Jun	120	146	211	130	118	250	193	126	145	132	141	146	169	149	130	174	172	183	199	185	166	154	146	146	158.9
10-Jun	143	138	142	138	138	145	146	140	159	159	154	156	153	161	158	159	171	165	170	170	169	166	159	162	157.0
11-Jun	152	154	172	173	234	202	245	269	280	294	297	300	309	314	313	304	307	310	300	293	317	332	327	326	295.5
12-Jun	347	356	326	259	288	334	337	350	360	1	355	3	357	350	4	4	43	35	21	23	10	46	119	129	7.7
13-Jun	138	134	130	129	129	131	132	139	156	160	123	121	117	336	350	357	352	358	21	13	355	356	5	21	66.2
14-Jun	10	359	360	347	352	359	5	358	356	360	3	5	1	358	357	351	344	352	354	355	356	352	346	343	355.4
15-Jun	340	344	343	337	336	338	344	342	334	309	313	323	328	338	330	328	342	352	328	7	119	153	212	251	333.9
16-Jun	256	254	229	206	173	166	142	144	146	132	142	168	216	217	210	194	184	172	209	206	198	235	241	242	198.9
17-Jun	236	226	216	206	212	240	244	241	236	236	240	246	254	241	242	255	273	264	355	25	31	23	347	349	251.7
18-Jun	351	1	96	1	25	22	17	8	355	17	355	360	2	8	10	24	21	30	26	25	18	9	9	16	14.7
19-Jun	15	12	9	12	10	12	12	12	17	18	18	14	6	5	10	14	11	5	358	354	355	355	352	348	7.5
20-Jun	349	355	355	356	359	359	356	355	350	357	357	349	343	340	337	329	343	329	333	333	325	325	329	329	346.4
21-Jun	333	334	332	331	333	340	335	343	352	353	352	352	341	347	340	352	352	9	30	53	76	88	88	126	351.7
22-Jun	126	123	118	130	143	147	136	125	134	154	138	128	128	239	252	248	247	245	238	253	288	272	155	122	197.0
23-Jun	129	148	136	147	157	125	133	150	137	137	128	142	157	133	132	117	124	136	140	160	170	167	171	198	149.3
24-Jun	191	168	171	169	167	157	143	150	146	158	241	242	241	238	244	8	49	8	350	353	12	5	9	9	339.0
25-Jun	21	15	12	8	12	13	26	40	51	63	42	39	319	294	320	320	336	341	326	326	348	67	107	150	9.6
26-Jun	152	152	151	153	157	162	141	142	142	140	158	156	173	197	234	259	6	358	216	175	194	183	147	94	162.2
27-Jun	244	293	333	351	341	336	346	351	348	347	349	1	357	332	313	308	291	311	330	323	337	12	176	151	338.7
28-Jun	140	157	156	155	159	143	147	144	138	138	147	141	134	55	358	243	236	159	166	201	169	167	193	187	160.8
29-Jun	198	200	167	164	176	173	169	160	141	140	147	133	167	206	251	245	249	192	162	179	195	217	226	226	197.4
30-Jun	232	219	167	196	210	223	214	168	170	177	242	247	237	252	242	245	242	242	244	246	242	249	245	251	235.8

276.1 41.9 54.0 18.6 27.5 17.2 29.9 11.8 35.7 44.8 358.4 323.9 289.3 300.7 298.4 299.4 321.9 332.8 333.7 338.8 351.9 328.0 270.5 276.2

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

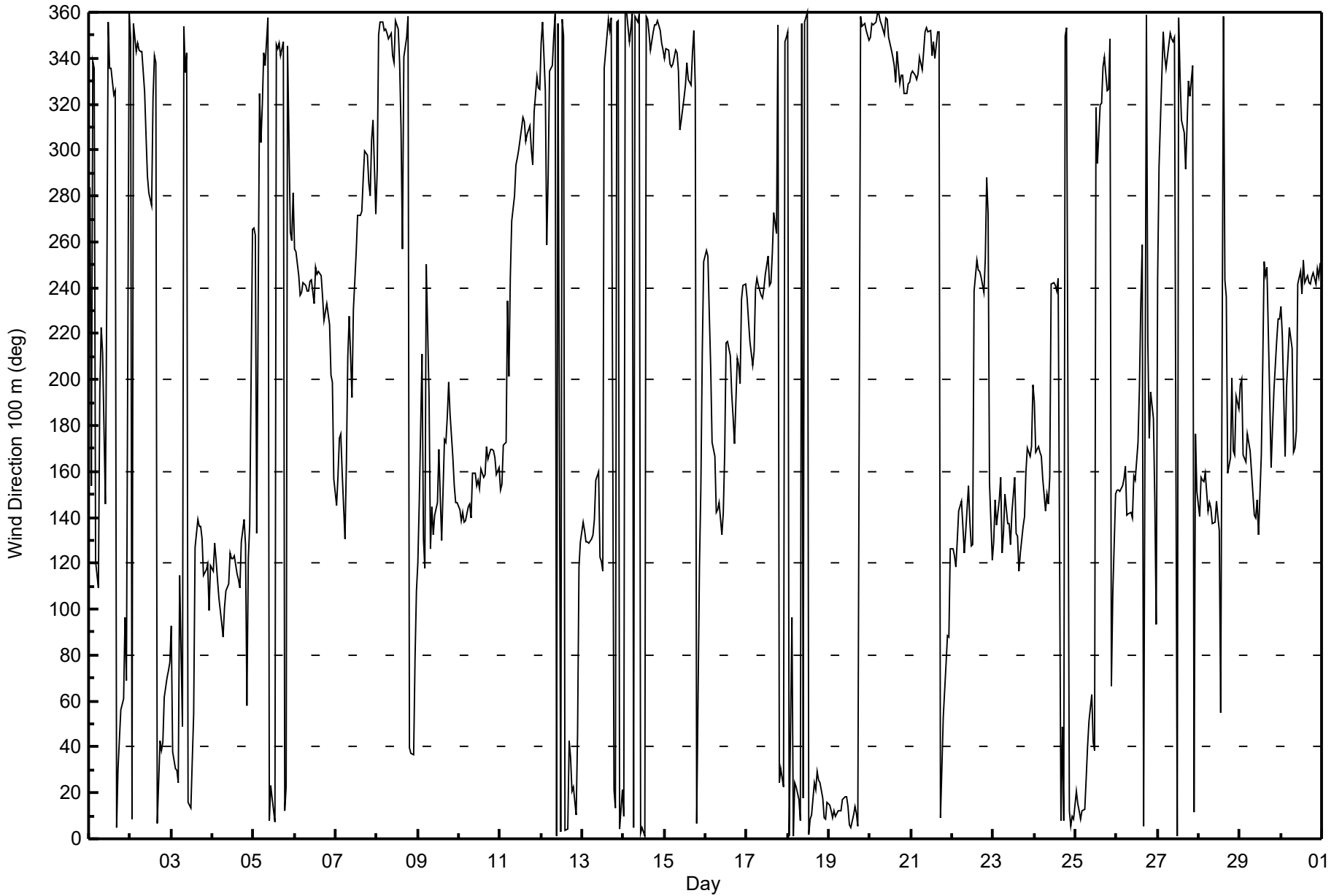
Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 105 deg on Jun 8 14:00 Minimum Value: 2 deg on Jun 21 03:00 Percentiles: P ₁ = 4 P ₁₀ = 6 Q ₁ = 8 Median = 12 Q ₃ = 18 P ₉₀ = 31 P ₉₉ = 78																	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-Jun	44	64	43	18	72	25	25	11	56	58	78	68	17	12	13	21	14	22	19	5	7	12	36	13	78		
2-Jun	12	9	9	5	4	4	5	12	17	31	39	32	36	15	15	19	14	22	12	9	11	8	25	22	39		
3-Jun	18	15	6	14	29	45	31	9	17	20	21	37	54	78	21	9	8	13	8	9	7	6	11	45	78		
4-Jun	28	7	8	18	25	24	20	10	8	12	9	8	8	12	10	10	10	6	17	55	23	23	50	24	55		
5-Jun	25	64	91	15	16	12	6	17	10	12	13	18	14	13	13	11	8	6	18	15	20	32	17	19	91		
6-Jun	8	6	11	6	7	7	9	9	8	8	11	14	10	11	12	11	11	12	13	6	14	6	5	19	19		
7-Jun	10	10	8	4	38	16	32	16	14	11	18	15	10	16	12	12	17	10	7	14	8	9	9	15	38		
8-Jun	31	6	9	10	10	8	8	12	12	21	26	16	27	105	103	88	74	17	11	12	4	12	23	12	105		
9-Jun	16	37	92	29	88	64	49	15	15	13	20	17	24	34	16	19	16	14	8	9	7	8	8	9	92		
10-Jun	9	4	6	4	5	7	7	7	12	10	11	10	10	10	9	9	8	8	8	6	5	4	5	6	12		
11-Jun	12	28	32	46	16	18	16	11	19	14	23	17	23	26	41	17	10	7	7	5	12	4	4	5	46		
12-Jun	10	7	28	19	14	19	14	12	22	22	21	13	12	23	15	18	25	17	17	22	23	33	31	6	33		
13-Jun	7	8	7	7	5	5	6	9	14	15	12	13	78	12	6	10	7	7	23	13	9	11	14	12	78		
14-Jun	11	7	24	7	8	7	8	7	5	6	9	6	6	10	9	9	8	7	9	9	8	8	8	7	24		
15-Jun	6	7	7	7	7	10	8	7	13	8	8	16	14	14	8	11	15	11	18	62	26	14	34	9	62		
16-Jun	9	36	32	23	11	12	9	10	7	7	16	10	19	11	8	8	9	7	26	5	13	25	7	6	36		
17-Jun	8	7	13	23	19	9	10	11	8	9	12	10	7	8	8	12	13	12	52	17	22	18	11	9	52		
18-Jun	12	21	24	48	14	26	19	20	14	24	9	10	13	11	12	11	12	12	9	8	10	5	7	9	48		
19-Jun	10	8	8	10	11	9	7	7	8	8	8	16	7	7	7	8	8	6	7	6	6	6	7	8	16		
20-Jun	8	8	9	7	7	7	7	7	7	8	7	9	7	7	6	7	9	6	6	5	5	5	3	4	9		
21-Jun	3	3	2	2	4	4	5	10	7	9	14	12	25	16	14	16	14	20	21	19	12	5	7	14	25		
22-Jun	7	9	13	6	9	9	18	13	9	15	11	12	13	51	7	7	7	6	11	11	17	48	29	19	51		
23-Jun	12	13	7	11	14	10	11	16	14	13	12	18	25	16	22	18	58	28	28	9	9	3	7	12	58		
24-Jun	65	20	15	9	6	9	7	9	10	30	16	12	11	15	13	48	66	24	6	8	19	11	11	11	66		
25-Jun	11	10	8	5	5	14	15	20	53	43	21	43	54	37	30	19	14	11	8	7	12	23	24	8	54		
26-Jun	6	6	6	9	8	10	8	9	8	7	8	7	13	12	25	31	13	63	25	22	36	54	30	59	63		
27-Jun	62	27	7	5	10	6	8	7	10	9	9	17	22	22	17	19	39	39	12	10	7	21	34	15	62		
28-Jun	10	12	14	11	5	9	12	10	7	7	13	12	72	70	23	22	13	39	18	20	22	12	11	12	72		
29-Jun	9	12	15	10	8	4	10	12	10	12	14	14	23	32	21	18	48	55	12	14	11	6	3	4	55		
30-Jun	4	31	20	20	29	16	23	27	17	54	14	15	10	12	10	8	11	8	6	5	4	4	9	13	54		
																	65 64 92 48 88 64 49 27 56 58 78 68 78 105 103 88 74 63 52 62 36 54 50 59										
Diurnal Maximum																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 11 deg on Jun 19 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 14.6 deg on Jun 19	Hours of Data: 713
Direction of Minimum Speed: 116 deg on Jun 8 15:00	Hours of Missing Data: 7
Direction of Minimum Daily Speed Average: 3.8 deg on Jun 24	Percent Operational Time: 99.0
Monthly Average Direction: 329.8 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-Jun	311	205	335	340	36	85	194	220	210	172	250	355	336	337	329	333	12	36	59	65	67	93	78	31	16.2
2-Jun	1	21	8	358	8	9	12	13	356	331	289	297	286	329	344	345	15	49	44	50	74	83	85	88	17.2
3-Jun	111	92	60	64	106	135	137	20	351	350	25	20	35	74	126	136	135	135	131	118	121	124	107	114	104.9
4-Jun	118	126	124	120	106	98	91	106	118	118	125	126	124	125	117	116	110	130	146	146	35	112	143	273	119.1
5-Jun	265	329	63	11	297	323	345	352	4	16	28	26	17	354	350	354	351	360	24	38	17	262	265	285	347.8
6-Jun	261	259	250	248	250	250	249	244	243	246	245	236	250	246	247	247	238	229	232	238	231	216	215	186	241.8
7-Jun	174	183	199	197	185	178	194	214	230	200	234	246	257	273	274	275	290	299	299	287	287	314	322	311	247.0
8-Jun	326	9	21	25	19	11	5	355	356	341	340	359	355	358	116	278	349	359	9	45	45	51	75	102	21.5
9-Jun	125	128	212	157	166	199	187	154	167	149	154	152	173	152	138	177	173	186	200	184	168	158	154	153	163.7
10-Jun	153	148	156	151	151	157	155	153	163	160	156	158	156	164	159	162	174	169	174	175	176	179	173	172	164.0
11-Jun	163	166	192	202	273	236	266	277	283	291	297	300	313	317	310	306	308	312	301	304	326	339	334	335	300.2
12-Jun	4	10	351	294	289	307	346	360	359	359	357	355	350	354	0	6	57	46	36	47	42	80	126	131	17.3
13-Jun	142	139	138	136	136	139	139	146	156	163	133	131	126	338	359	5	360	5	30	27	UO	UO	19	31	86.3
14-Jun	25	14	15	1	3	6	10	6	3	6	8	9	7	4	2	356	351	357	UO	UO	UO	358	355	350	2.9
15-Jun	347	351	350	344	343	344	353	350	342	318	317	316	320	333	333	331	342	351	337	12	134	171	229	266	337.5
16-Jun	270	265	249	235	207	199	168	159	158	135	149	166	218	219	211	197	188	178	213	223	220	243	248	248	211.9
17-Jun	244	236	232	230	230	246	248	243	241	238	240	246	255	244	246	257	276	266	1	33	47	53	6	13	255.2
18-Jun	18	33	97	73	36	33	38	37	16	26	3	7	10	15	18	28	28	35	31	31	27	18	18	25	25.5
19-Jun	26	27	21	23	20	21	19	18	22	23	23	20	13	11	16	21	18	13	5	359	0	359	358	355	14.6
20-Jun	356	1	0	2	5	7	2	0	356	2	1	354	350	348	346	341	353	339	348	345	335	335	341	340	353.6
21-Jun	345	349	348	351	348	349	346	354	356	355	354	354	343	349	345	355	354	13	33	53	79	94	105	130	357.9
22-Jun	160	149	144	150	157	168	161	136	139	158	145	130	132	242	256	252	252	249	242	257	295	257	203	174	204.8
23-Jun	158	167	145	155	171	140	152	163	146	139	128	148	160	139	136	117	131	142	150	164	174	168	180	217	160.4
24-Jun	209	206	211	210	198	194	184	179	175	189	242	244	240	245	8	38	19	357	1	21	15	19	18		298.7
25-Jun	29	27	27	25	29	26	38	47	51	60	47	42	333	297	322	321	334	341	334	333	358	63	110	147	22.0
26-Jun	171	169	160	162	163	172	155	157	154	152	168	161	174	202	236	261	12	22	220	180	198	205	203	20	171.7
27-Jun	331	317	356	12	8	357	3	1	1	354	355	11	5	334	320	313	305	325	341	333	359	45	189	182	352.5
28-Jun	173	180	186	186	188	172	171	171	161	157	162	157	152	44	348	241	235	177	182	212	188	193	208	209	183.8
29-Jun	207	202	191	178	179	177	179	174	163	165	164	148	175	210	255	UO	UO	226	183	207	215	235	242	241	205.2
30-Jun	242	241	225	232	243	236	220	200	188	201	237	245	238	253	244	248	247	245	247	250	249	259	255	258	243.3

261.0 132.5 83.1 10.7 24.8 356.4 26.1 17.2 26.5 36.2 357.9 320.1 293.9 304.6 303.8 314.5 336.0 341.6 339.1 348.1 352.4 324.7 283.1 280.8

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

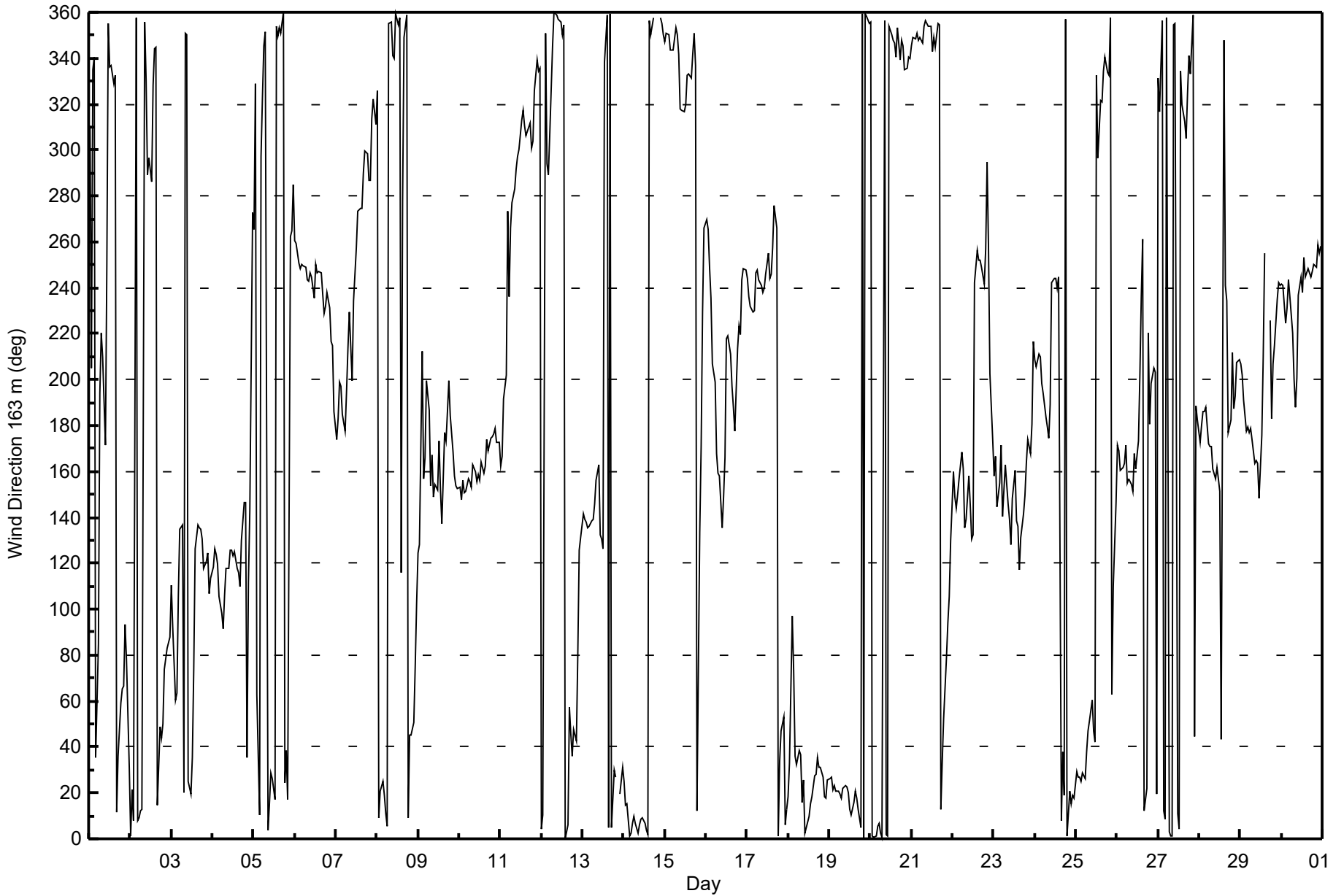
Wind Direction 163 m (WD163m) - deg
Lower Camp Met Tower - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 115 deg on Jun 8 15:00	Hours of Data: 713
Minimum Value: 1 deg on Jun 21 06:00	Hours of Missing Data: 7
Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 16 P ₉₀ = 25 P ₉₉ = 74	Hours of Calibration: 0
	Percent Operational Time: 99.0

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-Jun	21	80	19	17	17	30	27	10	47	59	74	68	16	11	11	18	15	21	17	4	5	12	18	14	80
2-Jun	17	9	11	4	5	5	4	5	16	39	34	27	37	13	16	16	18	21	11	8	9	4	10	9	39
3-Jun	11	14	13	18	12	12	16	23	18	19	22	36	39	82	22	12	7	11	8	7	5	5	6	13	82
4-Jun	13	6	6	8	11	9	9	9	6	6	7	7	8	9	9	8	9	20	48	34	34	33	30	48	
5-Jun	29	19	18	25	36	10	7	9	10	11	12	16	15	13	15	11	8	9	11	9	24	33	15	18	36
6-Jun	7	5	8	6	7	5	9	8	8	6	9	12	8	9	11	11	10	10	11	6	10	5	2	18	18
7-Jun	7	8	4	2	21	14	17	11	14	11	18	14	7	14	10	11	16	9	6	11	7	9	6	7	21
8-Jun	15	7	5	4	6	3	6	11	11	22	21	16	22	94	115	86	56	19	13	9	2	6	10	4	115
9-Jun	10	16	18	22	30	20	12	11	13	17	21	20	21	31	18	19	15	14	9	7	3	5	7	7	31
10-Jun	5	6	7	7	7	7	7	9	9	9	10	8	9	9	9	8	8	8	6	4	3	2	4	3	10
11-Jun	6	12	29	36	42	42	12	10	15	12	18	14	20	24	32	16	10	5	6	7	7	4	4	4	42
12-Jun	10	5	20	12	6	14	18	12	23	21	17	17	21	19	17	34	25	15	15	11	21	19	13	5	34
13-Jun	8	6	5	5	5	5	6	8	11	15	16	18	74	12	8	9	6	8	20	11	UO	UO	11	8	74
14-Jun	10	8	16	5	6	8	7	6	5	5	6	5	5	8	8	7	6	6	UO	UO	UO	7	7	6	16
15-Jun	5	5	5	5	5	8	7	7	10	7	5	8	10	9	7	8	14	10	14	33	34	15	36	12	36
16-Jun	12	12	9	21	9	11	10	7	13	8	15	9	19	9	8	7	7	6	24	6	10	21	5	5	24
17-Jun	7	6	11	10	9	5	6	10	7	9	11	8	5	6	7	11	12	11	55	11	9	16	30	8	55
18-Jun	12	13	14	53	15	13	14	21	19	22	10	12	13	11	11	10	11	11	8	7	9	4	7	8	53
19-Jun	7	7	7	9	10	8	7	7	7	7	6	11	6	6	7	7	7	6	7	6	6	6	6	7	11
20-Jun	6	8	8	7	6	6	7	6	6	8	7	7	5	5	4	6	9	7	5	5	4	4	2	2	9
21-Jun	4	2	3	3	2	1	3	8	7	11	14	11	20	15	12	15	14	18	19	20	11	7	7	14	20
22-Jun	6	9	6	8	11	17	12	7	7	14	14	13	15	44	6	4	5	5	9	10	13	22	29	31	44
23-Jun	14	9	10	13	10	5	14	20	15	14	13	17	23	18	21	19	57	29	24	8	4	3	8	6	57
24-Jun	8	5	11	7	8	9	15	12	10	28	15	11	10	14	11	50	68	19	7	7	18	11	11	10	68
25-Jun	9	6	7	3	3	8	13	17	44	36	20	37	42	36	29	18	14	10	6	9	13	21	20	8	44
26-Jun	13	4	4	6	8	7	9	11	10	9	7	5	11	12	21	31	14	41	32	15	25	44	94	18	94
27-Jun	18	14	15	3	3	6	9	8	11	8	9	17	26	24	13	18	38	42	19	13	10	20	35	7	42
28-Jun	7	5	7	8	6	6	13	11	10	10	13	14	83	65	42	18	12	26	10	20	13	12	5	10	83
29-Jun	6	7	7	3	4	4	9	10	10	14	14	17	19	30	20	UO	UO	47	17	7	7	5	1	3	47
30-Jun	3	8	23	18	11	8	17	23	14	49	13	13	9	11	9	7	9	7	5	4	4	3	8	11	49
	29	80	29	53	42	42	27	23	47	59	74	68	83	94	115	86	68	47	55	48	34	44	94	31	

Diurnal Maximum

UO - Unstable Operation





Maximum Value: 0.5 km/h on Jun 23 23:00 Maximum Daily Average: -0.1 km/h on Jun 23																						Hours in Service:	720						
Minimum Value: -1.8 km/h on Jun 10 17:00 Minimum Daily Average: -1.0 km/h on Jun 10																						Hours of Data:	720						
Maximum Diurnal Average: -0.2 km/h at hour 4 Minimum Diurnal Average: -0.6 km/h at hour 11																						Hours of Missing Data:	0						
Monthly Average: -0.38 km/h Percentiles: P ₁ = -1.3 P ₁₀ = -0.9 Q ₁ = -0.6 Median = -0.3 Q ₃ = -0.1 P ₉₀ = 0.0 P ₉₉ = 0.1																						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-Jun	-0.2	0.0	-0.1	-0.1	0.0	-0.2	-0.1	-0.5	-0.3	-0.1	-0.3	-0.1	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.1	0.0	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	0.0		
2-Jun	-0.1	-0.1	-0.3	-0.2	-0.2	0.0	-0.3	-0.2	-0.1	-0.1	-0.4	-0.1	-0.4	-0.3	-0.5	-0.4	-0.1	-0.7	-0.2	-0.2	-0.2	0.0	0.0	0.1	-0.2	0.1	-0.2	0.1	
3-Jun	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.4	0.1	-0.5	-0.3	-0.3	0.0	-0.1	-0.4	-1.0	-0.6	-0.3	-0.7	-0.5	-0.3	-0.3	-0.1	0.1	-0.2	0.1	-0.2	0.1	
4-Jun	-0.2	-0.3	-0.3	0.1	0.0	-0.1	-0.1	-0.2	0.0	-0.1	-0.4	-0.8	-0.8	-0.2	-0.5	-0.3	-0.3	-0.4	-0.5	-0.2	-0.1	0.1	0.0	0.0	-0.2	0.1	-0.2	0.1	
5-Jun	0.0	0.0	0.0	-0.2	0.0	0.0	-0.3	-0.3	-0.2	-0.3	-0.3	-0.4	-0.6	-0.4	-0.4	-0.6	-0.2	-0.1	-0.2	-0.2	-0.2	-0.4	-1.6	-0.7	-0.3	0.0	-0.3	0.0	
6-Jun	-1.1	-1.1	-0.7	-0.5	-0.7	-1.0	-1.0	-1.0	-1.0	-1.0	-1.1	-1.2	-1.3	-0.8	-1.1	-0.8	-1.0	-1.2	-0.8	-0.4	-0.1	-0.1	0.1	-0.1	-0.8	0.1	-0.8	0.1	
7-Jun	0.1	-0.5	-0.1	-0.5	-0.5	-1.2	-0.7	-0.6	-0.8	-0.7	-1.1	-1.1	-1.2	-0.6	-1.2	-0.5	-0.6	-0.6	-0.7	-0.6	-0.6	-0.2	0.0	0.0	-0.6	0.1	-0.6	0.1	
8-Jun	-0.1	-0.2	-0.1	-0.1	0.0	-0.2	-0.2	-0.5	-0.4	-0.2	-0.5	-0.2	-0.3	-0.2	0.1	0.0	0.1	-0.4	-0.2	-0.1	0.1	-0.1	0.0	-0.1	-0.2	0.1	-0.2	0.1	
9-Jun	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	-0.1	-0.1	-0.7	-0.6	-0.2	-0.2	-0.8	-0.7	-0.9	-0.9	-0.4	-0.1	-0.1	-0.3	-0.6	-0.3	0.1	-0.3	0.1	
10-Jun	-0.6	-0.8	-0.5	-0.8	-0.4	-0.4	-0.5	-0.2	-0.9	-1.0	-1.1	-1.3	-1.5	-1.7	-1.4	-1.3	-1.8	-1.6	-1.7	-1.0	-1.0	-0.8	-0.8	-0.9	-1.0	-0.2	-1.0	-0.2	
11-Jun	-0.3	-0.3	-0.1	-0.1	0.1	0.1	-0.1	-0.5	-0.4	-0.5	-0.4	-0.5	-0.3	-0.2	-0.4	-0.6	-0.9	-0.7	-0.5	-0.2	-0.2	0.1	0.0	0.0	-0.3	0.1	-0.3	0.1	
12-Jun	0.0	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.4	-0.4	-0.3	-0.4	-0.2	0.1	-0.5	-0.2	-0.1	-0.2	-0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.4	-0.2	0.1	-0.2	0.1	
13-Jun	-0.7	-0.3	-0.4	-0.4	-0.6	-0.4	0.0	-0.5	-0.8	-0.5	-0.2	0.0	-0.1	-0.3	-1.1	-0.2	-0.5	-1.0	-0.3	-0.1	-0.2	-0.5	-0.2	-0.3	-0.4	0.0	-0.4	0.0	
14-Jun	-0.3	-0.4	-0.2	-0.2	-0.4	-0.5	-0.4	-0.6	-0.6	-0.8	-0.4	-0.6	-0.7	-0.4	-0.6	-0.4	-0.2	-0.6	-0.6	-0.5	-0.7	-0.5	-0.4	-0.3	-0.5	-0.2	-0.5	-0.2	
15-Jun	-0.2	-0.1	-0.5	-0.1	-0.4	-0.1	-0.1	-0.1	-0.3	-0.3	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.4	-0.4	-0.2	0.0	0.1	0.1	0.0	0.0	-0.1	0.1	-0.1	0.1	
16-Jun	0.0	0.0	0.0	-0.2	-0.3	-0.5	-0.4	-0.9	-1.2	-0.8	-0.8	-1.0	-1.0	-0.9	-0.7	-1.2	-1.3	-0.9	-1.0	-0.9	-0.4	-0.9	-0.6	-0.8	-0.7	0.0	-0.7	0.0	
17-Jun	-0.6	-0.3	-0.4	0.2	0.0	-0.6	-0.5	-0.9	-0.8	-1.0	-0.7	-1.0	-0.7	-1.0	-1.1	-0.7	-0.4	-0.9	-0.2	-0.3	-0.2	0.0	0.0	-0.1	-0.5	0.2	-0.5	0.2	
18-Jun	-0.1	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.9	-0.8	-0.7	-0.5	-0.9	-0.7	-0.5	-0.6	-0.4	-0.4	-0.3	-0.4	-0.5	-0.4	-0.4	0.0	-0.4	0.0	
19-Jun	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.5	-0.5	-0.7	-0.7	-0.7	-0.7	-0.4	-0.8	-0.3	-0.4	-0.3	-0.5	-0.5	-0.8	-1.0	-0.9	-0.9	-0.8	-0.5	-0.6	-0.3	-0.6	-0.3
20-Jun	-0.5	-0.4	-0.5	-0.8	-0.6	-0.8	-0.7	-0.8	-0.9	-0.8	-0.7	-0.5	0.1	-0.2	0.0	-0.4	-0.2	-0.4	-0.2	-0.2	-0.3	-0.1	0.0	0.0	-0.4	0.1	-0.4	0.1	
21-Jun	-0.1	0.0	-0.1	-0.2	-0.3	-0.1	-0.1	-0.3	-0.6	-0.4	-0.5	-0.3	-0.4	-0.5	-0.5	-0.8	-0.7	-0.3	-0.3	-0.3	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	0.0	
22-Jun	0.0	0.0	0.0	0.0	0.0	-0.2	-0.4	-0.3	-0.4	-0.6	-0.5	-0.4	-0.4	-0.5	-0.9	-0.7	-0.6	-0.8	-0.6	-0.3	-0.1	0.0	0.1	0.0	-0.3	0.1	-0.3	0.1	
23-Jun	0.0	0.0	0.0	0.1	0.1	0.0	-0.3	-0.3	-0.4	-0.5	-0.5	-0.5	-0.7	-0.2	-0.3	-0.1	0.0	-0.3	-0.1	0.1	0.1	0.5	0.5	0.3	-0.1	0.5	-0.1	0.5	
24-Jun	-0.1	-0.4	-0.1	-0.1	-0.4	-0.7	-0.5	-0.8	-0.9	-0.4	-0.8	-1.0	-1.0	-0.8	-0.9	-0.2	0.0	-0.2	-0.2	-0.6	-0.1	-0.6	-0.4	-0.3	-0.5	0.0	-0.5	0.0	
25-Jun	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.4	-0.4	0.3	-0.1	-0.4	-0.6	-0.1	-0.4	-0.3	-0.1	-0.4	-0.2	-0.1	-0.2	-0.1	0.1	0.0	0.1	-0.2	0.1	-0.2	0.3	
26-Jun	0.1	-0.4	-0.3	-0.2	-0.5	-0.4	-0.6	-0.6	-0.5	-0.5	-0.9	-0.9	-0.6	-0.6	-0.5	-0.6	-0.7	-0.3	-0.4	-0.3	0.0	-0.3	0.1	0.0	-0.4	0.1	-0.4	0.1	
27-Jun	0.0	0.0	-0.2	0.0	0.0	0.0	-0.1	-0.5	-0.6	-0.9	-1.1	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	-0.2	0.0	-0.2	0.0	
28-Jun	0.0	-0.2	0.0	-0.3	-0.4	-0.6	-0.6	-0.7	-0.6	-0.7	-0.8	-0.5	-0.3	0.0	0.0	-0.6	-0.5	-0.5	-0.5	-0.8	-0.2	0.0	0.0	0.0	-0.4	0.0	-0.4	0.0	
29-Jun	-0.1	-0.1	-0.1	-0.4	0.0	0.0	-0.5	-0.6	-0.4	-0.1	-0.5	-0.5	-0.5	-0.6	-0.6	-1.3	-0.3	-0.5	-0.6	-0.2	0.1	-0.1	-0.5	-0.4	-0.4	0.1	-0.4	0.1	
30-Jun	-0.3	-0.1	-0.3	0.1	0.1	0.0	0.0	-0.7	-0.6	-0.7	-0.7	-0.7	-1.0	-1.0	-0.9	-1.1	-1.1	-1.2	-0.9	-0.9	-0.4	-0.4	-0.3	-0.7	-0.6	0.1	-0.6	0.1	
																								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 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1 Maximum Value: 5.6 km/h on Jun 19 15:00 Minimum Value: 0.1 km/h on Jun 22 04:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 1.0 Median = 1.7 Q ₃ = 2.3 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-Jun	0.6	0.7	0.5	0.6	0.4	0.5	0.6	1.3	1.2	1.4	1.7	1.8	2.1	2.1	1.6	1.2	1.5	1.5	1.4	0.7	0.4	1.1	1.0	0.7	2.1	
2-Jun	0.5	0.8	1.0	0.9	1.0	1.3	1.4	1.0	1.3	1.4	1.5	1.9	1.8	2.1	1.8	1.9	1.8	1.8	2.0	2.1	1.1	0.5	0.6	0.5	2.1	
3-Jun	0.5	0.5	0.3	0.3	0.3	0.4	0.8	1.2	1.4	1.7	2.0	1.8	1.7	1.9	2.2	1.8	1.6	1.5	2.2	1.8	2.1	1.2	0.8	0.6	2.2	
4-Jun	1.3	1.5	1.2	0.5	0.9	1.1	1.2	0.8	1.2	1.2	2.4	2.6	2.5	1.7	2.0	1.3	2.1	2.8	1.9	0.8	0.5	0.4	0.3	0.3	2.8	
5-Jun	0.2	0.2	0.2	0.4	0.5	0.9	1.2	1.0	2.0	2.4	2.8	2.4	2.1	2.1	2.2	2.1	1.7	1.2	1.0	0.9	0.7	1.3	4.1	2.6	4.1	
6-Jun	3.4	3.6	2.6	1.7	1.6	2.6	2.1	2.0	2.0	2.6	2.7	2.9	3.3	3.1	3.0	2.7	2.5	2.4	2.0	1.3	0.4	0.5	0.5	0.8	3.6	
7-Jun	1.4	1.8	1.9	2.2	1.8	1.9	1.8	1.8	1.6	2.2	2.8	3.4	4.2	3.6	3.5	3.5	2.9	2.8	2.7	2.3	1.9	1.4	0.3	0.7	4.2	
8-Jun	0.7	0.8	0.8	0.5	0.3	0.6	1.3	1.7	1.9	1.9	2.0	2.0	1.9	1.7	1.6	1.7	1.5	1.1	1.0	1.4	0.7	0.5	0.7	0.7	2.0	
9-Jun	0.5	0.3	0.2	0.1	0.3	0.4	0.7	1.1	1.4	1.9	2.0	2.1	2.0	2.0	2.0	1.8	1.7	1.6	1.6	1.1	0.8	1.0	1.2	1.3	2.1	
10-Jun	1.7	1.7	1.3	2.1	2.0	1.5	1.8	2.1	2.1	2.2	2.3	2.6	2.9	2.9	3.1	2.8	2.9	2.9	2.6	2.2	1.9	1.6	1.8	2.0	3.1	
11-Jun	1.8	1.0	0.9	0.5	0.5	0.8	1.2	2.2	1.7	1.6	2.1	2.1	2.5	2.2	2.1	2.4	2.3	2.3	1.3	1.3	1.1	0.8	0.4	0.3	2.5	
12-Jun	0.3	0.3	0.2	0.3	0.3	0.6	1.0	1.5	1.5	1.8	1.9	2.1	2.0	1.3	1.4	1.2	1.2	1.1	1.0	0.9	1.1	0.8	0.9	2.2	2.2	
13-Jun	2.3	2.2	2.3	2.7	3.0	2.9	2.5	2.3	1.7	1.6	1.8	1.6	1.4	2.2	2.3	1.7	2.8	3.4	3.6	2.5	1.9	2.4	2.2	2.6	3.6	
14-Jun	1.9	2.0	1.6	2.0	2.1	2.3	2.4	2.7	3.5	3.5	2.9	3.5	3.2	3.1	3.3	3.1	3.1	3.1	3.0	3.6	3.2	2.8	2.9	3.2	3.6	
15-Jun	3.4	3.0	3.0	2.9	3.1	2.3	2.0	2.2	1.7	1.3	1.3	1.0	0.6	1.2	1.6	1.8	1.8	1.6	1.0	0.5	0.3	0.3	0.5	0.7	3.4	
16-Jun	1.6	1.2	1.0	1.0	1.3	1.7	1.9	2.3	2.0	2.1	2.4	1.7	2.5	2.1	2.1	2.1	2.0	1.9	2.4	1.7	1.3	2.4	2.1	2.4	2.5	
17-Jun	1.6	1.1	0.8	1.2	0.8	2.2	2.1	2.3	2.1	2.1	2.3	2.7	3.4	2.6	2.7	2.7	2.7	2.3	3.3	2.2	0.7	0.3	0.3	0.4	3.4	
18-Jun	0.7	0.4	0.5	1.0	0.8	1.0	1.3	1.3	1.5	1.9	2.4	2.9	2.9	3.3	3.6	4.1	4.1	3.9	3.6	3.3	2.4	2.4	3.1	3.2	4.1	
19-Jun	2.5	2.3	2.8	3.2	3.0	4.0	5.0	5.5	5.6	5.1	4.3	3.0	4.3	5.4	5.6	4.9	4.3	4.1	3.9	3.9	3.6	3.6	3.6	3.4	5.6	
20-Jun	3.2	3.1	2.9	3.2	2.7	3.1	3.3	3.7	3.4	3.5	3.5	2.8	2.3	2.6	2.0	1.6	1.9	1.9	1.6	1.2	0.9	1.2	1.1	1.1	3.7	
21-Jun	1.2	0.9	0.6	0.8	1.3	1.2	1.7	1.9	2.3	2.1	2.4	2.4	2.4	2.2	2.5	2.4	2.5	2.2	1.8	1.3	0.5	0.2	0.2	0.2	2.5	
22-Jun	0.2	0.2	0.1	0.1	0.4	0.7	1.1	0.8	1.4	1.8	2.0	1.9	1.7	2.1	2.8	2.5	2.4	2.1	1.6	1.1	0.4	0.2	0.2	0.2	2.8	
23-Jun	0.3	0.3	0.3	0.2	0.3	0.5	0.9	1.5	1.8	1.6	1.9	1.9	2.0	2.2	1.9	1.8	1.3	1.2	1.0	0.5	0.4	0.8	1.2	0.7	2.2	
24-Jun	1.3	0.9	0.7	1.3	1.9	2.2	2.4	2.3	2.0	1.9	2.1	2.2	1.9	2.2	2.3	3.4	1.2	1.8	2.0	3.4	2.2	2.9	2.5	2.2	3.4	
25-Jun	2.0	1.5	1.2	1.4	1.3	1.3	2.0	2.0	1.7	1.5	2.0	2.0	2.0	1.8	1.9	1.8	1.4	1.3	1.2	0.9	0.3	0.2	0.2	0.3	2.0	
26-Jun	0.5	1.4	1.6	1.1	1.4	1.1	1.6	1.7	2.0	1.8	2.0	1.9	1.4	1.3	2.2	2.6	3.9	1.4	1.3	1.6	1.1	0.8	0.6	0.3	3.9	
27-Jun	0.2	0.4	0.6	0.5	0.4	0.4	1.2	1.7	1.7	2.0	2.1	2.1	1.9	1.9	2.0	2.0	1.4	1.1	0.8	0.5	0.2	0.3	0.4	0.3	2.1	
28-Jun	0.8	1.5	1.5	1.0	1.2	1.8	1.6	1.7	2.6	2.6	2.3	2.0	1.5	0.8	0.4	1.8	1.6	1.8	1.6	1.8	1.0	0.6	0.5	0.3	2.6	
29-Jun	0.4	0.5	0.8	0.7	0.7	1.2	1.5	1.6	2.0	2.0	1.9	2.2	2.2	2.2	2.6	3.1	1.9	1.2	1.1	0.7	0.9	1.6	1.8	1.6	3.1	
30-Jun	1.2	0.8	1.3	1.5	1.1	1.1	1.2	1.3	1.7	2.0	2.0	2.3	2.4	3.0	2.5	2.9	2.8	2.7	2.5	2.4	1.7	1.0	1.0	1.7	3.0	
	3.4	3.6	3.0	3.2	3.1	4.0	5.0	5.5	5.6	5.1	4.3	3.5	4.3	5.4	5.6	4.9	4.3	4.1	3.9	3.9	3.6	3.6	4.1	3.4		
Diurnal Maximum																										



Maximum Value: 1.8 km/h on Jun 23 23:00 Maximum Daily Average: 0.3 km/h on Jun 29																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: -1.1 km/h on Jun 7 19:00 Minimum Daily Average: -0.6 km/h on Jun 19 Maximum Diurnal Average: 0.1 km/h at hour 4 Minimum Diurnal Average: -0.3 km/h at hour 18 Monthly Average: -0.09 km/h Percentiles: P ₁ = -0.9 P ₁₀ = -0.6 Q ₁ = -0.3 Median = -0.1 Q ₃ = 0.1 P ₉₀ = 0.3 P ₉₉ = 0.9																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	-0.2	0.3	-0.1	-0.1	0.1	-0.2	0.1	0.3	0.0	0.1	0.0	-0.3	-0.4	-0.5	-0.4	-0.2	-0.3	-0.3	-0.3	-0.1	0.0	0.1	-0.2	0.0	-0.1	0.3
2-Jun	-0.2	-0.1	-0.2	-0.2	-0.3	-0.2	-0.4	-0.2	-0.2	0.3	-0.3	0.5	0.3	0.0	-0.6	-0.3	-0.3	-0.5	-0.3	-0.3	-0.2	-0.1	0.0	0.1	-0.2	0.5
3-Jun	0.1	0.3	0.1	0.1	0.1	0.0	0.0	-0.4	0.0	-0.5	-0.4	0.0	0.3	0.3	0.0	0.0	0.2	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.3
4-Jun	0.0	0.3	0.2	0.1	0.1	-0.1	0.2	-0.2	0.1	0.2	0.3	0.1	0.1	0.4	0.1	0.1	0.1	0.4	0.1	0.0	-0.2	0.2	0.1	0.0	0.1	0.4
5-Jun	0.1	0.1	0.1	-0.1	-0.1	-0.1	-0.3	-0.2	-0.2	-0.4	-0.6	-0.2	-0.7	-0.5	-0.7	-0.7	-0.5	-0.3	-0.1	-0.1	-0.1	0.0	-0.8	-0.4	-0.3	0.1
6-Jun	-0.4	-0.4	-0.1	0.4	0.0	0.2	-0.2	0.0	-0.1	-0.2	-0.2	-0.1	-0.4	0.0	-0.3	-0.1	0.2	-0.1	0.2	0.3	0.1	-0.1	0.1	0.2	0.0	0.4
7-Jun	0.7	0.2	1.2	0.9	0.0	-1.0	-0.4	0.3	-0.3	0.5	0.1	-0.2	-0.4	-0.6	-0.9	-0.3	-0.4	-0.4	-1.1	-0.6	-0.7	-0.4	0.0	0.4	-0.1	1.2
8-Jun	-0.1	-0.2	-0.3	-0.1	0.0	-0.2	-0.4	-0.6	-0.6	-0.1	-0.5	-0.6	-0.4	0.2	0.3	0.6	0.3	-0.5	-0.1	-0.3	0.1	-0.2	-0.1	0.0	-0.2	0.6
9-Jun	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.3	0.3	-0.1	0.0	0.3	0.1	-0.2	0.0	0.1	0.3	0.3	0.4	0.5	0.2	0.1	0.1	0.5
10-Jun	0.1	-0.1	0.1	-0.1	0.2	0.3	0.1	0.1	0.0	0.0	0.3	0.0	0.3	-0.1	0.3	0.2	-0.4	-0.4	-0.5	-0.2	-0.3	0.2	0.4	0.2	0.0	0.4
11-Jun	0.5	0.1	0.4	0.1	0.1	0.5	0.2	-0.3	0.0	-0.2	-0.2	-0.4	-0.4	-0.6	-0.4	-0.5	-1.1	-0.9	-0.7	-0.2	-0.3	0.0	0.0	0.0	-0.2	0.5
12-Jun	0.0	-0.1	0.1	0.1	0.0	-0.1	-0.3	-0.7	-0.2	-0.2	-0.4	-0.2	-0.2	-0.5	-0.3	0.0	-0.2	0.0	-0.3	-0.2	-0.1	-0.1	0.0	0.3	-0.1	0.3
13-Jun	0.4	0.5	0.4	0.5	0.4	0.6	0.8	0.6	0.2	0.1	0.1	0.2	0.0	-0.4	-0.9	-0.2	-0.7	-0.9	-0.5	0.1	-0.2	-0.3	-0.3	-0.4	0.0	0.8
14-Jun	-0.5	-0.2	0.1	-0.4	-0.3	-0.3	-0.1	-0.5	-0.5	-0.6	-0.2	-0.6	-0.2	0.4	-0.5	-0.5	-0.5	-0.4	-0.6	-0.7	-0.4	-0.5	-0.3	-0.3	-0.4	0.1
15-Jun	-0.7	-0.5	-0.8	-0.2	-0.6	-0.4	-0.2	-0.4	-0.4	-0.5	-0.3	-0.3	-0.1	0.0	-0.4	-0.2	-0.3	-0.3	-0.2	0.0	0.4	0.3	0.0	-0.2	-0.3	0.4
16-Jun	0.8	0.4	0.0	-0.1	0.4	-0.1	0.2	0.1	0.2	0.0	0.1	-0.4	0.3	0.4	0.3	0.2	0.0	-0.3	0.2	0.2	0.3	-0.1	0.3	0.3	0.2	0.8
17-Jun	0.1	0.3	0.2	0.7	0.3	0.2	0.0	-0.2	0.1	-0.2	-0.2	-0.1	-0.3	-0.1	-0.1	-0.2	-0.2	-0.5	-0.3	-0.4	-0.1	0.1	0.0	-0.2	0.0	0.7
18-Jun	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.4	-0.6	-0.3	-0.8	-1.1	-0.3	-0.6	-0.7	-0.7	-0.6	-0.4	-0.5	-0.5	-0.3	-0.6	-0.6	-0.6	-0.4	0.0
19-Jun	-0.5	-0.5	-0.6	-0.5	-0.6	-0.8	-0.7	-0.8	-0.5	-0.7	-0.9	-0.7	-0.8	-0.6	-0.9	-0.5	-0.3	-0.5	-0.4	-0.5	-0.4	-0.7	-0.7	-0.6	-0.6	-0.3
20-Jun	-0.4	-0.5	-0.4	-0.5	-0.2	-0.3	-0.6	-0.7	-0.6	-0.5	-0.7	-0.7	-0.3	-0.3	-0.2	-0.5	-0.3	-0.8	-0.4	-0.4	-0.4	-0.4	-0.2	-0.3	-0.4	-0.2
21-Jun	-0.3	-0.2	-0.1	-0.1	-0.4	-0.2	-0.4	-0.2	-0.8	-0.5	-0.8	-0.6	-0.1	-0.5	-0.9	-0.6	-0.8	-0.2	-0.4	-0.5	0.1	0.1	0.0	0.1	-0.3	0.1
22-Jun	0.1	0.1	0.0	0.1	0.2	0.2	0.0	0.0	0.1	0.3	0.2	0.1	0.1	-0.1	-0.2	0.0	0.0	-0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.3
23-Jun	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	-0.4	-0.1	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.9	1.8	0.3	0.2	1.8
24-Jun	0.1	-0.1	0.5	1.0	1.0	0.3	0.5	0.5	0.2	0.2	0.0	-0.2	-0.1	-0.3	-0.5	-0.4	0.0	-0.2	-0.3	-0.6	-0.3	-0.6	-0.3	-0.4	0.0	1.0
25-Jun	-0.2	-0.3	-0.3	-0.3	-0.1	-0.2	-0.3	-0.3	0.4	0.2	-0.6	-0.6	0.1	-0.2	-0.4	0.0	-0.2	-0.3	-0.3	-0.3	-0.2	0.2	0.2	0.1	-0.2	0.4
26-Jun	0.8	0.5	0.3	-0.1	0.3	-0.1	0.0	0.0	0.2	0.2	0.4	0.1	0.1	0.3	0.3	-0.1	-0.4	0.0	0.1	0.4	0.1	0.1	0.3	0.0	0.2	0.8
27-Jun	0.1	-0.1	-0.2	-0.1	0.1	0.0	0.1	-0.6	-0.7	-1.0	-1.1	-0.3	-0.4	-0.5	-0.1	-0.4	0.3	0.2	0.1	-0.2	-0.1	0.1	0.2	0.2	-0.2	0.3
28-Jun	0.5	0.7	1.0	0.5	0.5	0.1	0.0	-0.1	0.2	0.2	-0.1	0.1	0.0	-0.1	0.0	0.1	0.1	0.0	0.1	0.4	0.2	0.3	0.2	0.0	0.2	1.0
29-Jun	0.1	0.2	0.4	0.1	0.1	0.7	0.2	0.0	0.1	0.3	0.1	0.3	0.2	0.6	-0.3	0.0	0.2	-0.1	-0.2	0.2	0.6	1.2	0.7	0.5	0.3	1.2
30-Jun	0.3	0.3	0.2	0.9	0.9	0.4	0.6	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.4	-0.1	-0.2	0.0	-0.2	-0.2	-0.1	0.2	0.1	0.2	-0.3	0.1	0.9
																								Diurnal Average		
																								Diurnal Maximum		



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1 Maximum Value: 4.9 km/h on Jun 19 09:00 Minimum Value: 0.2 km/h on Jun 22 03:00 Percentiles: $P_1 = 0.2$ $P_{10} = 0.5$ $Q_1 = 1.1$ Median = 1.7 $Q_3 = 2.3$ $P_{90} = 3.0$ $P_{99} = 4.0$																				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-Jun	0.6	0.8	0.6	0.5	0.4	0.5	0.7	1.3	1.6	1.2	1.7	1.9	2.2	1.9	1.7	1.3	1.3	1.4	1.3	0.6	0.4	1.3	1.3	1.0	2.2
2-Jun	0.5	1.0	0.9	0.8	0.8	1.2	1.1	1.0	1.4	1.6	1.8	2.5	2.1	2.4	1.8	1.9	1.6	1.8	1.9	1.9	1.2	0.7	0.8	0.7	2.5
3-Jun	0.7	0.7	0.5	0.5	0.3	0.4	0.8	1.0	1.6	1.7	2.1	2.1	2.1	2.2	2.1	1.5	1.4	1.4	1.8	1.5	1.9	1.0	0.9	0.8	2.2
4-Jun	1.6	1.5	1.2	0.7	1.1	1.4	1.5	0.9	1.2	1.4	2.2	2.1	2.1	1.7	1.1	2.0	2.4	1.5	0.5	0.5	0.5	0.4	0.4	2.4	
5-Jun	0.3	0.2	0.2	0.3	0.4	0.8	0.9	1.0	1.9	2.3	2.2	2.2	2.0	2.1	1.9	1.8	1.5	1.0	1.2	1.2	0.8	1.2	4.0	2.6	4.0
6-Jun	3.1	3.2	2.5	1.7	1.6	2.4	2.0	2.1	2.0	2.5	2.7	3.0	3.0	3.0	3.1	3.0	2.7	2.4	2.2	1.5	0.6	0.8	1.1	1.1	3.2
7-Jun	1.7	2.0	1.9	2.4	2.0	1.5	2.1	2.0	1.7	2.8	2.9	3.3	4.0	3.4	3.4	3.5	3.2	3.1	2.6	2.2	1.7	1.4	0.4	1.2	4.0
8-Jun	0.8	0.9	0.9	0.5	0.5	0.6	1.1	1.5	1.8	2.2	2.3	2.0	2.0	2.0	1.8	1.9	1.7	1.1	0.9	1.3	0.9	0.9	1.0	0.9	2.3
9-Jun	0.7	0.3	0.2	0.2	0.3	0.4	0.7	1.1	1.4	1.8	2.0	2.2	2.6	2.2	2.1	2.3	2.2	2.2	2.0	1.3	1.1	1.2	1.1	1.4	2.6
10-Jun	1.3	1.2	1.3	1.9	1.7	1.2	1.4	2.3	2.6	2.6	2.7	3.0	3.3	3.4	3.6	3.6	3.6	3.5	3.0	2.6	2.3	1.9	1.9	2.3	3.6
11-Jun	2.2	1.3	1.0	0.5	0.5	0.9	1.3	2.1	2.0	1.8	2.2	2.2	2.8	2.2	2.3	2.4	2.2	2.2	1.2	1.3	1.2	0.6	0.5	0.5	2.8
12-Jun	0.5	0.3	0.3	0.4	0.5	0.7	1.0	1.5	1.7	1.9	2.1	2.0	1.9	1.1	1.1	1.2	1.1	1.2	1.2	1.1	1.2	0.8	1.1	1.9	2.1
13-Jun	2.2	2.3	2.2	2.5	2.5	2.5	2.5	2.5	2.0	1.7	1.7	1.4	1.3	1.9	1.8	1.3	2.4	3.0	3.4	2.5	1.7	2.2	2.1	2.5	3.4
14-Jun	2.0	1.7	1.6	2.0	1.9	2.2	2.2	2.4	3.1	3.1	2.8	3.3	3.1	2.9	2.9	2.8	2.9	3.2	2.8	3.2	3.0	2.7	3.0	3.2	3.3
15-Jun	3.3	3.1	3.0	3.2	3.2	2.3	2.1	2.3	1.8	1.1	1.5	1.1	0.8	1.2	1.7	1.9	1.8	1.5	1.1	0.5	0.4	0.4	0.9	1.0	3.3
16-Jun	1.9	1.7	1.5	1.3	1.1	1.4	1.8	1.9	1.4	1.9	2.4	1.9	2.7	2.3	2.4	2.5	2.3	2.2	2.5	2.0	1.5	2.5	2.0	2.1	2.7
17-Jun	1.7	1.2	0.9	1.5	1.1	2.2	1.9	2.2	2.1	2.0	2.4	2.9	3.0	2.4	2.4	2.7	2.7	2.1	3.4	2.2	0.8	0.4	0.4	0.4	3.4
18-Jun	0.7	0.5	0.6	0.9	0.9	1.0	1.3	1.2	1.5	2.0	2.1	2.5	2.8	2.9	3.2	3.5	3.7	3.5	3.3	3.1	2.1	1.9	2.6	3.1	3.7
19-Jun	2.5	2.2	2.7	3.3	2.8	3.9	4.6	4.8	4.9	4.5	3.9	2.8	3.7	4.6	4.8	4.2	4.1	3.6	3.4	3.4	3.2	3.2	3.1	3.1	4.9
20-Jun	2.9	2.9	2.8	3.0	2.6	2.8	2.9	3.2	3.0	3.3	3.1	2.6	2.2	2.5	2.1	1.6	1.8	1.8	1.5	1.2	0.8	1.0	1.1	1.0	3.3
21-Jun	1.1	0.9	0.6	0.6	1.0	1.3	1.6	1.8	2.0	2.0	2.3	2.3	2.6	2.4	2.5	2.3	2.2	2.2	1.8	1.1	0.5	0.3	0.3	0.2	2.6
22-Jun	0.3	0.2	0.2	0.2	0.4	0.8	1.0	0.7	1.3	2.0	1.9	1.7	1.5	2.0	2.4	2.3	2.2	1.8	1.5	1.0	0.5	0.3	0.3	0.2	2.4
23-Jun	0.3	0.4	0.4	0.4	0.4	0.5	0.9	1.7	1.4	1.4	1.8	2.3	2.3	2.1	2.0	1.8	1.3	1.2	1.0	0.7	0.6	1.0	1.3	1.2	2.3
24-Jun	1.4	1.1	0.8	0.8	0.7	1.2	2.0	1.5	1.2	1.7	2.4	2.4	2.2	2.4	2.3	3.2	1.3	1.3	1.7	3.0	2.3	2.7	2.5	2.2	3.2
25-Jun	1.8	1.6	1.1	1.1	1.1	1.4	2.0	2.1	1.8	1.7	2.1	1.9	2.0	2.2	2.1	2.2	1.4	1.2	1.2	0.6	0.2	0.3	0.4	0.3	2.2
26-Jun	0.6	1.3	1.5	1.1	1.1	1.2	1.2	1.1	1.7	1.5	1.7	1.9	1.6	1.9	2.6	2.6	3.7	1.4	1.5	1.7	1.5	1.0	0.6	0.3	3.7
27-Jun	0.2	0.3	0.4	0.6	0.4	0.6	1.2	1.5	1.5	1.6	1.7	2.0	1.9	2.0	2.2	2.0	1.6	1.4	0.8	0.4	0.3	0.3	0.7	0.7	2.2
28-Jun	1.0	1.1	1.3	0.8	0.8	1.5	1.4	1.5	1.8	1.9	1.8	1.9	1.6	0.7	0.4	1.9	1.5	1.5	1.7	2.1	1.1	0.7	0.9	0.5	2.1
29-Jun	0.6	0.7	0.9	0.6	0.8	1.0	1.4	1.5	1.7	1.7	1.6	1.9	2.7	2.6	2.6	3.0	1.9	1.2	1.2	0.8	1.2	2.1	2.0	1.7	3.0
30-Jun	1.4	1.1	1.0	1.4	1.3	1.2	1.4	1.1	1.7	2.0	2.2	2.3	2.5	2.9	2.4	2.9	2.8	2.4	2.1	2.2	1.4	0.8	1.0	1.8	2.9
	Diurnal Maximum																								



Maximum Value: 2.3 km/h on Jun 13 08:00																				Maximum Daily Average: 0.7 km/h on Jun 13					Hours in Service: 720	
Minimum Value: -1.2 km/h on Jun 29 19:00																				Minimum Daily Average: -0.4 km/h on Jun 6					Hours of Data: 720	
Maximum Diurnal Average: 0.3 km/h at hour 2																				Minimum Diurnal Average: -0.2 km/h at hour 15					Hours of Missing Data: 0	
Monthly Average: 0.04 km/h																				Percentiles: P ₁ = -1.1 P ₁₀ = -0.6 Q ₁ = -0.2 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 1.6					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-Jun	-0.1	0.1	0.0	-0.1	0.0	0.2	0.1	0.3	0.4	0.3	-0.1	-0.5	-0.1	-0.3	-0.4	-0.1	0.3	0.2	-0.1	0.2	0.3	0.8	0.4	0.2	0.1	0.8
2-Jun	-0.1	0.3	0.0	-0.1	-0.1	0.0	-0.2	-0.1	0.0	0.4	0.1	0.9	0.6	-0.1	-0.7	0.0	0.4	0.3	0.3	0.3	0.4	0.4	0.0	0.0	0.1	0.9
3-Jun	0.2	0.5	0.7	0.5	0.2	0.1	0.1	-0.1	0.2	-0.1	-0.2	0.4	0.9	0.9	0.3	-0.4	-0.3	0.3	0.1	0.3	0.4	0.3	0.6	0.2	0.2	0.9
4-Jun	0.4	0.0	0.4	0.5	0.3	0.8	0.5	-0.5	0.0	-0.8	0.8	0.2	0.0	1.0	0.3	0.3	0.4	0.3	0.0	-0.1	0.0	0.2	0.3	0.0	0.2	1.0
5-Jun	0.0	0.1	0.1	0.0	-0.1	-0.2	-0.2	0.1	0.4	0.3	-0.2	0.3	-0.3	-0.3	-0.4	-0.3	-0.1	-0.1	0.3	0.6	0.0	0.0	-1.2	-0.3	-0.1	0.6
6-Jun	-0.8	-1.1	-0.4	-0.5	-0.6	-0.6	-0.7	-0.3	-0.6	-0.7	-0.5	-0.6	-1.0	-0.4	-0.5	-0.2	-0.2	-0.4	0.0	-0.1	-0.1	-0.2	0.1	-0.1	-0.4	0.1
7-Jun	1.9	1.6	1.5	0.1	0.3	-1.1	-0.2	-0.1	-0.7	0.2	-0.5	-0.8	-1.0	-1.0	-0.9	-0.4	-0.5	-0.3	-1.1	-0.7	-0.9	-0.6	-0.1	0.4	-0.2	1.9
8-Jun	-0.2	-0.1	-0.1	0.1	0.2	0.1	-0.1	-0.2	-0.5	0.3	-0.2	-0.8	-0.9	0.1	0.3	1.0	0.5	-0.4	0.1	0.3	0.5	0.0	0.1	0.6	0.0	1.0
9-Jun	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.0	-0.1	0.2	0.2	0.0	0.0	0.7	0.1	-0.3	-0.2	-0.1	0.2	0.2	0.2	0.3	0.1	0.5	0.1	0.7
10-Jun	0.1	-0.3	0.2	0.2	-0.2	0.4	0.3	0.6	-0.2	0.3	1.0	-0.1	0.6	-0.3	-0.3	0.1	-0.9	-0.7	-1.0	-1.0	-1.1	-0.9	-0.2	-0.2	-0.1	1.0
11-Jun	0.7	-0.1	-0.2	0.0	-0.2	0.0	0.1	-0.1	0.4	0.0	-0.3	-0.4	0.0	0.1	-0.4	-0.7	-1.2	-1.1	-0.8	-0.1	-0.4	-0.1	-0.2	-0.1	-0.2	0.7
12-Jun	0.1	0.1	0.1	0.0	-0.4	0.0	-0.3	-0.5	-0.1	0.2	-0.2	-0.1	-0.5	-0.6	-0.6	-0.1	0.3	0.2	0.0	0.0	0.3	0.2	0.3	0.4	0.0	0.4
13-Jun	1.0	1.6	1.1	1.5	0.7	0.8	1.3	2.3	1.4	-0.2	0.2	0.0	0.2	0.2	-0.3	0.4	0.1	0.2	0.7	1.8	0.5	0.4	0.4	0.7	0.7	2.3
14-Jun	0.1	0.7	0.5	0.0	0.6	0.7	-0.3	-0.1	0.1	-0.5	0.1	0.3	0.9	0.5	0.8	0.4	-0.2	0.5	0.4	0.6	0.7	0.8	0.2	-0.1	0.3	0.9
15-Jun	-0.4	0.0	-0.3	-0.4	-0.7	-0.4	-0.2	-0.4	-0.5	-0.7	-0.3	-0.1	-0.1	0.6	-0.4	-0.1	0.0	0.1	0.0	-0.1	0.3	0.2	-0.1	-0.3	-0.2	0.6
16-Jun	1.6	1.6	0.6	-0.6	-0.2	0.0	0.9	0.3	-0.2	-0.1	0.2	-0.7	-0.2	0.0	-0.3	-0.4	-0.3	-0.6	-0.3	-0.1	0.0	-0.4	-0.4	-0.3	0.0	1.6
17-Jun	0.1	0.1	0.0	0.5	0.5	-0.1	-0.1	-0.6	-0.3	-0.8	-0.4	-0.7	-0.8	-0.7	-0.6	-0.4	-0.6	-0.6	1.0	0.5	0.1	0.2	0.0	0.0	-0.2	1.0
18-Jun	0.0	0.1	0.2	0.1	0.2	0.1	0.2	-0.1	-0.1	0.5	-0.1	-0.2	0.9	0.8	0.7	0.2	1.3	0.7	0.2	0.6	0.4	0.3	0.4	0.4	0.3	1.3
19-Jun	0.3	0.3	0.0	0.5	0.3	0.5	1.0	0.6	1.1	0.6	0.2	0.1	0.3	0.6	0.5	0.7	0.9	0.7	0.6	0.5	0.5	0.5	0.4	0.0	0.5	1.1
20-Jun	0.1	0.6	0.4	0.4	0.6	0.4	0.1	-0.1	0.0	0.5	-0.1	-0.1	-0.2	-0.4	-0.4	-0.6	-0.1	-0.7	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.1	0.6
21-Jun	-0.2	-0.1	0.0	-0.2	-0.4	-0.1	-0.3	-0.2	-0.1	-0.3	-0.6	-0.8	0.4	-0.2	-0.7	0.1	-0.5	0.8	0.1	-0.3	0.3	0.3	0.2	0.2	-0.1	0.8
22-Jun	0.2	0.3	0.1	0.2	0.3	0.1	0.0	0.4	0.3	0.2	0.3	-0.1	0.1	-0.2	-0.6	-0.5	-0.3	-0.4	-0.1	-0.3	0.0	0.1	0.2	0.3	0.0	0.4
23-Jun	0.3	0.3	0.3	0.3	0.0	0.1	-0.1	0.4	-0.2	0.1	0.2	0.4	-0.5	-0.6	0.0	0.5	0.4	0.0	-0.2	0.0	-0.1	0.7	1.1	1.5	0.2	1.5
24-Jun	0.2	-0.4	-0.3	-0.2	-0.3	-0.1	0.8	0.3	-0.2	0.2	0.1	-0.4	-0.5	-0.6	-1.0	0.8	0.1	0.4	0.0	0.0	0.5	0.3	0.5	0.3	0.0	0.8
25-Jun	0.3	0.2	0.3	0.1	0.7	0.2	0.6	0.3	1.2	0.9	-0.2	0.4	0.9	-0.2	-0.3	0.2	-0.2	-0.4	-0.2	-0.4	-0.1	0.1	0.3	0.3	0.2	1.2
26-Jun	0.4	1.2	2.0	-0.1	0.0	-0.2	0.7	0.1	0.5	0.1	-0.1	-0.1	-0.4	0.4	0.2	-0.1	0.7	0.3	0.0	0.6	-0.1	-0.1	0.3	0.2	0.3	2.0
27-Jun	0.0	0.0	-0.2	0.1	0.2	-0.1	0.1	-0.5	-0.4	-0.6	-0.6	0.3	0.2	-0.2	0.1	-0.4	0.6	0.4	0.1	-0.1	0.1	0.3	0.1	0.2	0.0	0.6
28-Jun	1.0	0.5	0.9	-0.1	-0.1	-0.3	-0.5	-0.7	-0.4	-0.4	-0.4	0.0	0.2	-0.2	-0.1	0.1	0.0	0.4	0.0	0.3	0.1	-0.3	-0.2	-0.2	0.0	1.0
29-Jun	0.0	-0.3	-0.2	-0.5	-0.6	-0.2	-0.3	-0.3	0.3	0.1	-0.2	0.3	0.3	1.3	-0.6	-0.6	0.3	-0.3	-1.2	-0.5	0.2	0.9	0.1	0.1	-0.1	1.3
30-Jun	0.0	0.0	-0.2	0.0	0.1	-0.1	0.4	0.1	0.2	0.0	-0.4	-0.1	-0.5	-0.6	-0.6	-0.7	-0.3	-0.9	-0.7	-0.6	-0.4	-0.6	-0.5	-0.7	-0.3	0.4
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1																				Hours in Service: 720					
Maximum Value: 5.5 km/h on Jun 19 09:00																				Hours of Data: 720					
Minimum Value: 0.1 km/h on Jun 5 03:00																				Hours of Missing Data: 0					
Percentiles: P ₁ = 0.3 P ₁₀ = 0.6 Q ₁ = 1.1 Median = 1.7 Q ₃ = 2.4 P ₉₀ = 2.9 P ₉₉ = 4.3																				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-Jun	0.6	0.8	0.4	0.5	0.3	0.8	0.8	1.3	2.1	1.2	1.8	2.1	2.3	2.1	2.0	1.5	1.5	1.8	1.6	0.5	0.3	1.6	1.6	1.3	2.3
2-Jun	0.7	1.2	0.8	0.6	0.6	0.6	0.7	0.8	1.2	1.8	2.3	3.0	2.8	2.5	2.1	2.1	2.0	2.3	2.0	1.8	1.1	0.7	1.2	1.1	3.0
3-Jun	0.8	0.9	0.7	0.5	0.5	0.3	0.5	0.6	1.6	2.2	2.3	2.6	2.5	2.3	2.4	1.8	1.5	1.4	1.5	1.4	1.5	0.9	1.2	1.4	2.6
4-Jun	2.1	1.7	1.5	1.0	1.6	1.9	1.8	1.0	1.0	1.8	2.1	2.1	1.7	1.6	1.1	1.9	1.7	1.6	0.4	0.5	0.6	0.5	0.4	2.1	
5-Jun	0.5	0.3	0.1	0.2	0.4	0.6	0.8	1.2	1.9	2.0	2.2	2.7	2.2	2.2	2.2	1.8	0.8	0.7	1.4	1.7	1.2	1.1	3.8	2.8	3.8
6-Jun	2.6	2.5	2.4	1.3	1.5	2.2	2.0	2.1	2.1	2.5	2.8	3.2	2.7	3.2	3.1	3.2	2.8	2.8	2.3	1.4	0.4	0.5	0.6	1.4	3.2
7-Jun	2.1	2.0	1.6	1.3	2.4	1.7	2.3	2.2	2.1	3.0	3.2	3.1	3.2	3.4	3.8	3.8	3.2	3.0	2.4	2.1	1.6	1.1	0.7	0.9	3.8
8-Jun	0.7	0.9	1.2	0.9	0.6	0.6	1.0	1.8	2.1	2.6	2.5	2.0	2.0	2.2	2.0	2.0	2.1	1.2	1.0	1.3	0.6	1.3	1.8	1.2	2.6
9-Jun	1.0	0.5	0.2	0.2	0.2	0.2	0.7	1.0	1.4	1.5	2.0	2.6	3.2	2.8	2.2	3.0	2.8	2.7	2.5	1.6	1.2	1.6	1.5	2.0	3.2
10-Jun	1.8	1.2	1.4	1.4	1.5	1.6	1.6	1.9	2.8	3.3	3.7	3.7	4.0	4.2	4.3	4.1	3.8	3.9	3.2	2.6	1.8	1.3	1.7	2.2	4.3
11-Jun	2.8	1.9	1.2	0.8	0.6	0.6	1.3	1.8	2.0	1.6	2.6	2.5	3.4	2.8	2.4	2.7	2.1	1.9	1.1	0.9	1.2	0.6	0.7	0.7	3.4
12-Jun	0.7	0.5	0.3	0.9	0.9	0.8	0.8	1.4	2.1	2.2	1.9	1.7	1.7	1.0	1.1	1.1	1.3	1.3	1.5	1.6	1.5	1.3	1.1	1.7	2.2
13-Jun	1.9	2.1	2.2	2.5	1.9	1.8	1.9	2.0	2.8	2.2	1.5	1.2	1.4	1.8	1.5	1.3	1.7	3.1	3.8	3.1	1.4	1.7	2.1	2.8	3.8
14-Jun	2.1	1.7	1.8	1.2	1.8	2.0	2.2	2.1	2.1	2.1	2.6	2.7	2.4	2.6	2.8	2.2	2.6	2.7	2.6	3.0	2.8	2.7	2.6	2.6	3.0
15-Jun	2.6	2.6	2.5	2.7	2.5	2.2	2.0	2.0	1.8	1.1	1.3	1.4	1.1	1.4	1.4	2.1	1.9	1.3	1.3	0.5	0.4	0.5	1.4	1.3	2.7
16-Jun	1.8	1.9	1.7	1.4	1.1	1.3	1.4	1.7	1.4	1.8	2.4	2.0	2.9	2.4	2.4	2.6	2.5	2.1	2.4	1.3	1.5	2.2	1.8	1.8	2.9
17-Jun	1.5	1.2	1.2	1.8	1.6	1.9	2.0	2.2	2.3	2.0	2.7	2.8	2.2	2.7	2.6	2.5	2.8	2.2	3.6	2.3	1.2	0.5	0.4	0.6	3.6
18-Jun	0.7	0.6	0.7	0.8	0.8	0.7	1.1	1.3	1.5	2.5	1.9	2.5	3.2	3.2	3.5	3.6	4.0	3.7	3.5	3.4	2.4	1.8	2.5	3.3	4.0
19-Jun	2.9	2.2	2.9	3.7	3.2	4.1	4.6	4.7	5.5	5.1	4.2	2.9	3.5	4.6	5.0	4.7	4.2	3.4	2.7	3.0	2.8	2.8	2.8	2.8	5.5
20-Jun	2.7	2.7	2.6	2.7	2.6	2.6	2.8	2.8	2.9	3.4	2.7	2.4	2.0	2.0	1.6	1.2	1.9	1.3	1.1	0.7	0.8	1.0	0.8	0.8	3.4
21-Jun	0.5	0.5	0.3	0.5	0.5	0.7	1.3	1.9	1.9	1.7	2.5	2.3	2.9	2.5	2.8	2.3	2.2	2.9	2.3	1.2	0.4	0.3	0.5	0.3	2.9
22-Jun	0.3	0.3	0.3	0.3	0.6	0.7	0.9	0.8	1.3	2.3	1.7	1.3	1.7	2.1	1.9	1.9	1.9	1.5	1.1	0.6	0.6	0.3	0.5	0.4	2.3
23-Jun	0.5	1.2	0.7	0.8	0.7	0.7	1.3	2.2	1.3	1.3	2.0	2.4	2.9	2.8	2.3	1.8	1.8	1.5	1.4	0.8	0.6	0.7	1.2	1.9	2.9
24-Jun	1.8	1.7	1.1	0.9	0.8	0.9	1.1	1.0	1.1	2.0	2.9	2.8	2.9	3.2	2.5	3.4	2.1	1.3	1.1	2.8	2.5	2.7	3.1	2.4	3.4
25-Jun	2.3	1.7	1.2	0.7	1.0	1.6	2.7	2.6	2.3	2.1	2.7	2.6	2.3	2.4	2.7	2.7	1.6	1.2	1.2	0.5	0.2	0.3	0.6	0.6	2.7
26-Jun	0.8	1.2	1.4	1.3	1.4	1.3	1.1	1.1	1.3	1.5	1.7	1.7	1.6	2.3	2.8	3.0	3.6	1.5	1.6	1.9	1.7	1.2	0.9	0.5	3.6
27-Jun	0.3	0.4	0.3	0.5	0.4	0.7	0.9	1.2	1.5	1.7	1.8	2.3	2.2	2.5	2.5	2.1	2.0	1.6	0.9	0.5	0.4	0.7	1.0	1.3	2.5
28-Jun	1.6	1.6	1.0	0.7	0.8	1.3	1.5	1.6	1.3	1.5	2.0	2.0	2.0	1.0	0.7	2.3	1.8	1.6	2.1	2.2	1.3	0.8	1.5	0.9	2.3
29-Jun	0.5	1.0	1.1	0.6	0.9	0.8	1.6	1.6	1.5	1.4	1.7	2.0	3.0	3.4	2.6	2.6	1.4	1.4	1.6	1.0	1.3	1.1	0.9	1.0	3.4
30-Jun	0.7	1.1	1.2	1.6	1.6	1.3	1.9	1.4	2.2	2.0	2.4	2.5	3.0	2.8	2.8	2.8	2.9	2.3	1.8	1.6	0.9	0.5	0.9	1.6	3.0
	Diurnal Maximum																								
	2.9 2.7 2.9 3.7 3.2 4.1 4.6 4.7 5.5 5.1 4.2 3.7 4.0 4.6 5.0 4.7 4.2 3.9 3.8 3.4 2.8 2.8 3.8 3.3																								



Maximum Value: 4.0 km/h on Jun 16 02:00		Maximum Daily Average: 1.0 km/h on Jun 13		Hours in Service: 720																						
Minimum Value: -2.1 km/h on Jun 29 19:00		Minimum Daily Average: 0.0 km/h on Jun 10		Hours of Data: 713																						
Maximum Diurnal Average: 0.8 km/h at hour 2		Minimum Diurnal Average: 0.0 km/h at hour 12		Hours of Missing Data: 7																						
Monthly Average: 0.42 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.3 Q ₁ = 0.0 Median = 0.4 Q ₃ = 0.8 P ₉₀ = 1.1 P ₉₉ = 2.6		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-Jun	0.3	0.1	0.3	0.3	0.2	0.1	0.4	0.9	0.7	0.0	0.3	-0.8	0.5	0.1	-0.4	0.0	0.5	-0.1	-0.5	-0.2	-0.1	0.8	1.0	0.4	0.2	1.0
2-Jun	0.3	0.7	0.4	0.4	0.1	0.4	0.5	0.4	0.1	0.3	0.3	0.8	0.9	-0.1	-0.2	0.7	0.7	0.5	0.3	-0.3	0.0	0.3	-0.1	-0.1	0.3	0.9
3-Jun	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.5	-0.7	0.0	1.1	1.2	0.0	-0.9	-0.8	-0.1	-0.3	-0.1	0.1	0.1	0.4	0.1	0.1	1.2
4-Jun	0.3	-0.4	0.1	0.5	0.2	0.9	0.8	-0.2	0.0	0.2	0.8	-0.1	-0.4	0.9	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.1	0.1	0.4	0.2	0.2	0.9
5-Jun	0.1	0.2	0.0	0.1	0.2	0.3	0.4	0.5	0.8	1.1	-0.5	0.1	-0.1	0.2	0.2	0.2	0.6	0.4	0.6	1.1	0.3	0.9	1.2	1.1	0.4	1.2
6-Jun	1.2	1.0	0.9	0.5	0.3	0.6	0.5	0.4	0.1	0.4	0.5	0.1	0.4	0.6	0.8	1.4	0.7	0.7	1.3	0.8	0.4	0.5	0.9	-0.3	0.6	1.4
7-Jun	2.1	3.6	4.0	1.5	1.2	-1.1	0.3	0.7	-0.3	0.6	0.5	0.4	0.8	0.1	0.4	1.2	0.8	0.7	-0.2	0.6	0.5	0.5	0.3	0.4	0.8	4.0
8-Jun	0.1	0.1	0.3	0.9	0.8	0.4	0.4	0.0	-0.3	0.8	0.0	-1.1	-1.8	-0.5	0.2	1.6	0.8	-0.7	0.0	0.1	0.3	-0.4	-0.3	0.1	0.1	1.6
9-Jun	0.1	0.3	0.1	0.1	0.1	0.1	0.2	-0.2	-0.2	-0.3	-0.2	0.2	0.4	0.7	-0.5	-0.3	-0.6	0.2	0.4	0.1	1.0	1.0	0.5	0.8	0.2	1.0
10-Jun	0.3	-0.1	1.1	0.2	0.3	0.5	0.7	0.8	-0.2	0.3	0.9	-0.4	0.9	-0.2	-0.3	-0.1	-0.7	-0.3	-0.7	-0.6	-1.1	-1.0	-0.6	-0.1	0.0	1.1
11-Jun	1.4	0.1	-0.1	0.2	0.2	0.2	0.7	0.9	1.7	1.0	0.1	0.1	0.6	1.0	0.3	0.0	-0.5	-0.3	0.0	0.8	0.5	1.0	0.9	0.8	0.5	1.7
12-Jun	0.5	0.5	0.5	0.2	0.3	0.5	0.1	-0.2	-0.1	0.3	0.2	-0.4	-0.6	-0.5	-1.0	-0.2	0.4	0.1	-0.3	-0.2	0.3	0.0	0.2	0.4	0.0	0.5
13-Jun	1.0	2.2	1.5	2.3	1.0	1.1	1.7	2.8	2.1	-0.4	0.0	-0.4	0.1	0.7	-0.1	0.6	0.5	0.9	0.9	2.6	UO	UO	0.6	1.2	1.0	2.8
14-Jun	0.2	0.9	1.1	0.4	0.9	0.7	1.1	0.9	0.8	0.5	1.2	0.2	0.8	0.7	0.9	1.1	0.9	1.3	UO	UO	UO	1.6	1.3	1.2	0.9	1.6
15-Jun	1.1	1.0	0.7	0.9	0.9	1.0	0.6	0.6	0.3	-0.1	0.5	0.5	0.2	1.3	0.4	0.5	0.5	0.5	0.3	0.0	0.1	0.1	0.2	1.0	0.5	1.3
16-Jun	3.1	4.0	2.5	0.0	-0.3	0.2	0.9	0.2	-0.4	-0.6	0.2	-0.4	0.9	0.9	0.3	-0.1	-0.2	-0.3	0.6	1.0	1.1	0.9	1.2	1.2	0.7	4.0
17-Jun	1.3	1.3	0.5	1.5	1.4	1.7	1.0	0.7	0.7	-0.1	0.6	0.2	0.5	0.2	0.8	0.5	0.3	0.4	2.3	0.4	-0.2	0.0	0.2	0.6	0.7	2.3
18-Jun	0.3	0.3	0.0	0.1	0.1	0.4	0.4	0.1	0.3	0.5	0.3	0.2	1.3	0.7	1.1	-0.1	1.4	0.7	0.5	0.6	0.7	0.8	0.8	0.9	0.5	1.4
19-Jun	0.7	0.8	0.5	0.8	0.8	1.0	1.3	1.1	1.2	0.8	1.0	0.5	0.7	0.8	0.8	1.0	1.4	1.0	1.2	1.5	1.2	1.2	1.1	1.3	1.0	1.5
20-Jun	1.4	1.3	1.0	1.0	0.8	0.9	0.8	0.5	0.7	0.9	0.1	0.5	0.4	0.5	0.6	0.4	0.5	0.5	0.4	0.4	0.5	0.6	0.8	0.7	0.7	1.4
21-Jun	0.8	0.8	0.7	0.5	0.5	0.8	0.5	0.4	0.4	-0.1	-0.1	-0.6	1.1	0.4	-0.6	0.5	0.0	1.2	0.0	-0.6	0.1	0.2	0.2	0.3	0.3	1.2
22-Jun	0.2	0.3	0.1	0.2	0.2	0.1	0.2	0.7	0.3	0.3	0.5	-0.5	-0.5	0.4	0.9	0.5	0.9	0.5	0.8	0.4	0.5	0.5	0.3	0.1	0.3	0.9
23-Jun	0.2	-0.1	0.5	0.3	-0.1	0.2	0.0	0.3	-0.4	-0.2	0.1	0.1	-0.7	-1.5	-0.5	0.2	0.3	-0.1	-0.4	-0.3	0.0	1.2	1.8	4.0	0.2	4.0
24-Jun	1.1	-0.1	0.1	-0.1	-0.1	0.0	1.1	0.4	-0.3	0.2	0.9	0.3	-0.2	0.0	0.0	1.4	0.4	0.7	0.7	0.6	0.6	0.9	1.0	0.6	0.4	1.4
25-Jun	0.4	0.5	0.5	0.7	1.6	1.0	0.6	0.0	1.6	1.3	-0.4	0.4	1.7	-0.4	-0.4	-0.2	0.4	-0.2	0.2	-0.2	0.2	0.0	0.2	0.4	0.4	1.7
26-Jun	0.0	1.3	2.7	0.1	0.1	-0.2	1.0	0.5	0.6	0.0	-0.1	0.1	-0.3	0.9	1.2	0.5	1.7	0.1	0.3	1.0	-0.6	0.2	0.1	0.1	0.5	2.7
27-Jun	0.1	0.1	0.2	0.5	0.4	0.4	0.3	0.0	-0.2	-0.1	-0.4	0.5	0.4	0.3	0.8	-0.2	0.7	0.6	0.4	0.1	0.4	0.2	0.3	0.4	0.3	0.8
28-Jun	0.6	0.9	0.7	-0.6	-0.3	-0.5	-0.9	-0.9	-0.5	-0.5	-1.0	-0.2	0.2	-0.2	-0.1	0.9	0.7	1.0	0.1	1.2	0.6	-0.2	0.1	0.2	0.1	1.2
29-Jun	0.3	0.1	-0.4	-0.4	-0.3	-0.1	0.0	-0.3	0.2	0.1	-0.4	-0.1	0.9	2.0	0.6	UO	UO	-0.1	-2.1	-0.4	1.1	1.9	1.3	1.5	0.2	2.0
30-Jun	1.3	0.8	-0.4	-0.1	0.5	0.3	0.8	0.4	0.5	0.1	0.0	0.8	0.5	0.8	0.5	0.7	0.9	0.1	0.4	0.9	0.7	0.9	0.8	0.7	0.5	1.3
																								Diurnal Average		
																								Diurnal Maximum		
																								UO - Unstable Operation		



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1																	Hours in Service: 720																																																
Maximum Value: 5.5 km/h on Jun 19 09:00																	Hours of Data: 718																																																
Minimum Value: 0.2 km/h on Jun 5 04:00																	Hours of Missing Data: 7																																																
Percentiles: P ₁ = 0.3 P ₁₀ = 0.6 Q ₁ = 1.0 Median = 1.8 Q ₃ = 2.6 P ₉₀ = 3.2 P ₉₉ = 4.7																	Hours of Calibration: 0																																																
Percent Operational Time: 99.0																																																																	
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-Jun	0.6	0.7	0.5	0.5	0.4	0.4	0.8	1.2	2.3	1.4	2.7	2.4	2.7	2.4	2.0	1.7	1.7	2.2	1.8	0.6	0.5	1.7	1.5	1.4	2.7																																								
2-Jun	1.0	1.6	0.8	0.7	0.6	0.7	0.6	0.8	1.1	1.6	2.3	3.5	3.1	2.4	2.3	2.6	2.7	2.8	2.0	1.2	0.7	0.6	1.1	0.9	3.5																																								
3-Jun	0.9	0.8	0.8	0.4	0.4	0.4	0.4	0.4	1.6	2.5	2.8	2.9	3.5	3.0	2.8	2.3	1.7	1.7	1.8	1.2	1.0	0.9	1.0	2.0	3.5																																								
4-Jun	2.6	1.9	1.7	1.2	1.7	1.6	1.5	1.3	1.1	1.5	2.2	2.2	2.2	1.8	1.6	1.0	1.8	1.9	1.9	0.6	0.7	0.7	0.7	0.6	2.6																																								
5-Jun	0.7	0.4	0.2	0.2	0.3	0.5	0.6	1.3	1.9	2.4	2.2	2.8	2.7	2.4	3.0	2.1	1.5	2.6	1.9	1.7	1.5	1.4	3.3	2.8	3.3																																								
6-Jun	2.1	2.4	2.5	1.8	1.9	2.0	1.9	2.4	2.2	2.3	2.9	3.4	3.0	3.2	3.3	3.4	3.3	3.1	2.7	1.4	0.5	0.5	0.4	1.4	3.4																																								
7-Jun	1.7	1.6	1.5	1.2	3.0	2.4	2.5	2.4	2.3	3.0	3.5	3.1	3.2	3.7	3.9	3.9	3.5	3.1	2.2	1.8	1.4	0.8	0.8	0.7	3.9																																								
8-Jun	0.8	1.0	1.2	0.7	1.0	0.5	0.7	1.8	2.4	3.2	3.0	2.5	1.9	2.2	2.3	2.3	2.3	1.6	1.0	0.9	0.3	0.9	1.0	1.0	3.2																																								
9-Jun	1.0	0.8	0.4	0.3	0.3	0.2	0.6	0.9	1.8	1.7	2.4	3.2	4.1	3.4	2.5	3.5	3.0	3.3	2.6	1.3	0.7	1.6	1.9	2.2	4.1																																								
10-Jun	1.8	1.7	1.7	2.1	2.4	2.3	2.3	2.5	2.9	3.8	4.2	4.0	4.7	4.5	4.6	4.2	4.1	3.6	3.0	2.3	1.4	0.9	1.1	1.5	4.7																																								
11-Jun	1.9	2.0	1.6	1.1	0.9	0.6	1.2	1.7	1.9	1.8	3.0	3.1	3.9	3.5	3.0	3.0	2.3	1.6	1.0	0.8	1.2	0.5	0.8	0.7	3.9																																								
12-Jun	0.9	0.6	0.3	1.2	0.9	0.8	0.8	1.6	2.7	2.3	2.4	2.1	2.1	1.2	1.2	1.2	1.5	1.5	1.4	1.9	1.7	1.4	1.1	1.8	2.7																																								
13-Jun	2.4	2.4	2.3	2.7	2.2	2.4	2.4	2.0	3.3	2.7	1.6	1.4	1.4	1.9	1.5	1.3	1.7	3.5	3.4	3.4	UO	UO	2.6	2.4	3.5																																								
14-Jun	2.4	1.8	1.7	1.6	1.8	2.1	2.3	2.3	2.4	2.2	2.6	2.6	2.9	2.6	3.0	2.4	2.4	2.9	UO	UO	UO	2.9	3.0	2.3	3.0																																								
15-Jun	2.4	2.4	2.3	2.3	2.0	2.0	1.9	2.2	1.7	1.4	1.2	1.5	1.4	1.8	1.3	1.7	2.1	1.6	1.6	0.5	0.4	0.5	1.6	1.4	2.4																																								
16-Jun	2.0	2.1	1.7	1.1	1.1	1.2	1.3	1.5	1.7	1.9	2.2	2.0	3.3	2.5	2.6	2.5	2.1	2.0	2.7	1.7	1.2	2.0	1.4	1.7	3.3																																								
17-Jun	1.8	1.5	1.7	2.1	1.4	1.5	1.9	2.1	2.3	2.2	2.8	2.9	2.1	2.8	2.8	2.7	2.9	2.3	3.9	2.3	0.9	0.5	0.4	1.0	3.9																																								
18-Jun	0.9	0.6	0.6	1.1	0.6	0.7	1.3	1.4	1.8	2.9	2.3	3.1	3.5	3.9	4.1	3.7	4.4	3.6	3.2	3.2	2.5	2.1	3.1	3.6	4.4																																								
19-Jun	2.9	2.5	3.0	4.1	3.8	4.7	5.0	5.0	5.5	5.1	4.3	3.4	3.9	4.9	5.4	5.1	4.6	3.5	3.1	3.0	3.1	3.0	3.0	3.0	5.5																																								
20-Jun	2.8	2.9	2.7	2.9	2.8	2.7	3.1	2.9	2.6	3.7	2.9	2.2	1.9	1.9	1.3	1.1	2.3	1.4	0.9	0.7	0.7	0.7	0.4	0.4	3.7																																								
21-Jun	0.5	0.5	0.4	0.3	0.3	0.4	0.9	2.0	2.0	2.1	3.0	2.6	3.7	2.9	3.1	2.8	2.5	3.5	2.7	1.3	0.5	0.5	0.3	0.3	3.7																																								
22-Jun	0.6	0.5	0.4	0.3	0.4	0.6	0.7	0.7	1.3	2.5	2.1	1.5	2.1	2.5	1.7	1.3	1.3	1.0	0.7	0.3	0.8	0.5	0.6	0.3	2.5																																								
23-Jun	0.7	1.0	0.9	1.0	0.6	0.9	1.7	2.5	1.5	1.4	2.2	2.8	4.2	3.3	2.9	2.3	2.2	1.7	1.9	0.9	0.5	0.7	0.7	0.8	4.2																																								
24-Jun	2.3	1.2	1.3	1.0	1.0	1.0	1.1	1.2	1.2	2.6	3.1	3.3	3.1	3.8	3.0	3.7	2.8	1.6	1.0	2.7	2.8	2.9	3.5	3.1	3.8																																								
25-Jun	2.6	1.5	1.3	0.6	0.6	1.6	2.9	2.8	3.2	2.4	3.6	3.3	3.1	2.5	3.1	2.9	2.1	1.5	1.0	0.6	0.3	0.3	0.6	0.9	3.6																																								
26-Jun	0.7	1.0	1.3	1.9	1.8	1.4	1.3	1.0	1.3	1.7	1.6	1.8	1.4	2.6	3.2	3.2	4.1	1.5	1.5	2.6	2.0	1.3	0.7	0.6	4.1																																								
27-Jun	0.5	0.4	0.5	0.6	0.6	0.7	0.7	1.1	1.3	1.6	2.0	2.8	2.6	3.4	3.2	2.5	2.7	2.2	1.1	0.7	0.5	0.8	1.1	1.1	3.4																																								
28-Jun	1.3	1.1	1.2	0.8	0.7	1.2	1.8	1.9	1.8	1.8	2.3	2.2	2.4	1.4	0.8	2.5	2.3	2.0	1.7	2.0	1.3	0.8	1.1	0.8	2.5																																								
29-Jun	0.5	0.8	1.0	0.4	0.5	0.6	1.8	1.7	1.6	1.8	1.9	2.5	3.7	4.2	2.1	UO	UO	1.8	1.8	1.1	1.2	0.7	0.4	0.5	4.2																																								
30-Jun	0.7	1.4	2.0	2.4	1.6	1.1	1.8	1.4	2.4	2.5	2.8	3.0	3.6	2.9	3.0	2.5	3.0	2.0	1.4	1.1	1.0	0.8	1.1	1.4	3.6																																								
																	2.9		2.9		3.0		4.1		3.8		4.7		5.0		5.0		5.5		5.1		4.3		4.0		4.7		4.9		5.4		5.1		4.6		3.6		3.9		3.4		3.1		3.0		3.5		3.6		
Diurnal Maximum																																																																	
UO - Unstable Operation																																																																	



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS04 BUFFALO VIEWPOINT JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
 JUNE 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	46.7	0	12.8	0
H2S (ppb) Average	684	35	36	99.86	4.4	0	0.8	0
THC (ppm) Average	686	33	34	99.86	4.5	-	2.5	-
NMHC(ppm) Average	686	33	34	99.86	2.302	-	0.336	-
CH4(ppm) Average	686	33	34	99.86	3.2	-	2.2	-
O3(ppb) Average	686	34	34	100	77	1	49.5	-
NO2(ppb) Average	683	35	37	99.72	42.5	0	10	-
NO(ppb) Average	683	35	37	99.72	25.8	-	4.8	-
NOX(ppb) Average	683	35	37	99.72	54.9	-	12.6	-
PM2.5(ug/m3) Average	719	1	1	100	226.3	84	168	10
Temperature (C) Average	720	0	0	100	30.7	-	23.3	-
Relative Humidity (%) Average	720	0	0	100	98.5	-	97.7	-
Wind Speed 10 m (km/h) Average	720	0	0	100	35	-	26	-
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 - BUFFALO VIEWPOINT (AMS04)
 JUNE 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	1.54	5	-	0	0	0.1	0.2	0.6	2.7	46.7
H2S (ppb) Average	684	0.28	0.4	-	0	0	0.1	0.2	0.3	0.6	4.4
THC (ppm) Average	686	2.21	0.3	-	2	2	2.1	2.1	2.3	2.5	4.5
NMHC(ppm) Average	686	0.118	0.169	-	0	0	0	0.1	0.1	0.3	2.302
CH4(ppm) Average	686	2.1	0.1	-	2	2	2	2.1	2.1	2.2	3.2
O3(ppb) Average	686	27.65	13.7	-	1	10.7	17.8	26.2	35.4	44.1	77
NO2(ppb) Average	683	3.06	4.7	-	0	0	0.2	1.3	3.7	8.9	42.5
NO(ppb) Average	683	0.79	2.7	-	0	0	0	0	0.5	1.6	25.8
NOX(ppb) Average	683	3.85	6.5	-	0	0	0.3	1.4	4.2	10.7	54.9
PM2.5(ug/m3) Average	719	32.96	41.5	-	1.6	4.2	8	18.6	36.3	90.4	226.3
Temperature 2 m (C) Average	720	17.7	5.2	-	6.1	11	13.5	17.6	21.4	24.8	30.7
Relative Humidity (%) Average	720	65.46	21.1	-	22.9	37	47.1	64.9	84.7	95.6	98.5
Wind Speed 10 m (km/h) Average	720	9.8	6	-	1	4	6	8	12	18	35
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, NO2, SO2, THC	23 Jun 2023 07:00	23 Jun 2023 07:00	1	Maintenance - sample manifold cleaned
NO2	22 Jun 2023 07:00	22 Jun 2023 07:00	1	Station power failure



Wood Buffalo Environmental Association

Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 46.7 ppb on Jun 8 17:00	Maximum Daily Average: 12.8 ppb on Jun 8		Hours of Data:	686
Minimum Value: 0.0 ppb on Jun 4 14:00	Minimum Daily Average: 0.1 ppb on Jun 16		Hours of Missing Data:	34
Maximum Diurnal Average: 3.6 ppb at hour 14	Minimum Diurnal Average: 0.3 ppb at hour 5		Hours of Calibration:	33
Monthly Average: 1.54 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 2.7 P ₉₉ = 28.1		Percent Operational Time:	99.9

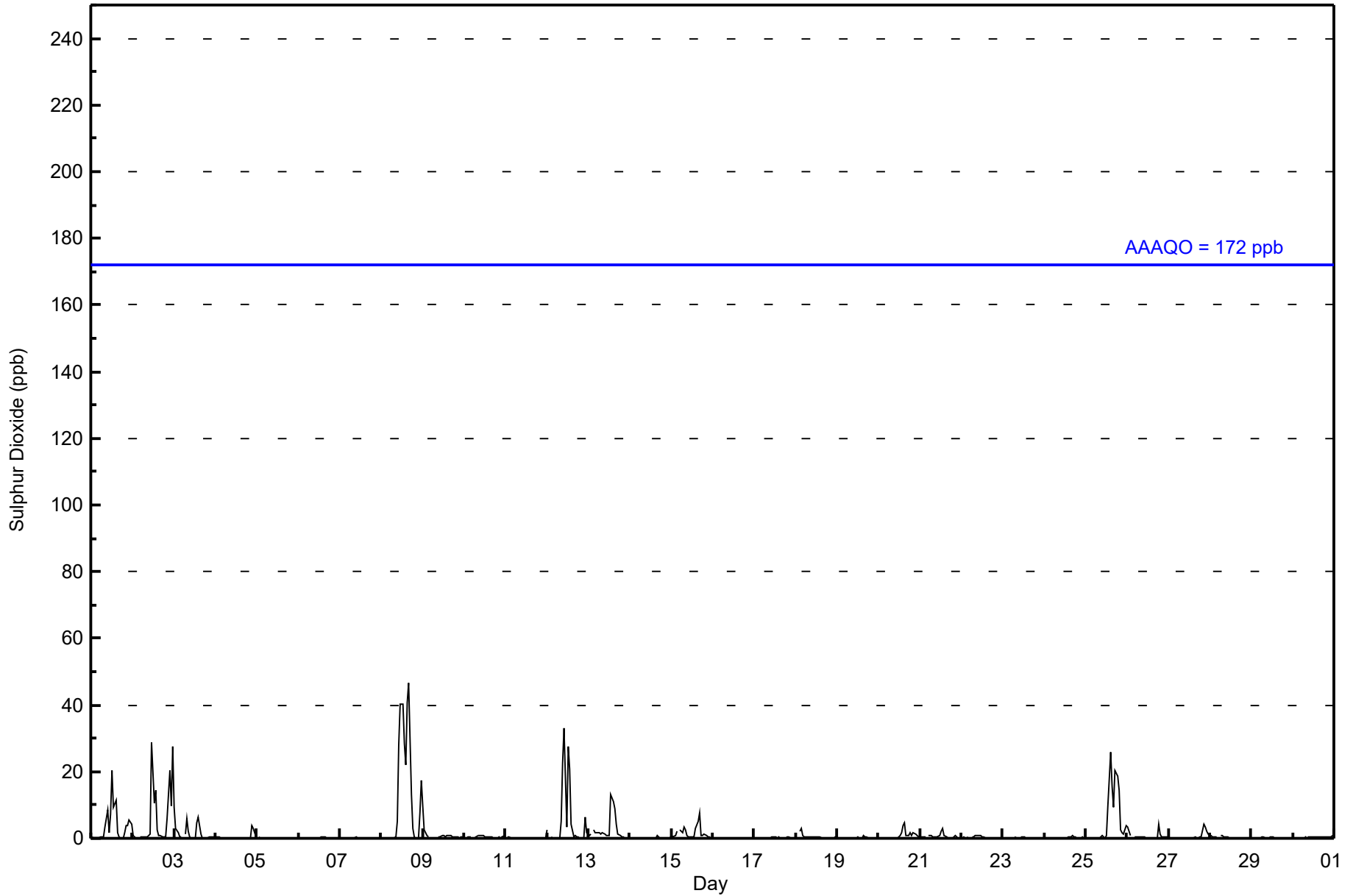
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	0.3	0.1	Z	0.1	0.2	0.5	0.4	0.5	3.5	8.4	1.9	7.2	20.4	9.3	11.4	1.5	0.6	0.2	0.0	1.8	3.7	3.8	5.5	4.1	3.7	20.4																						
2-Jun	0.7	0.3	0.2	Z	0.5	0.4	0.4	0.3	0.6	0.8	1.5	28.7	10.5	14.3	2.7	0.7	0.7	0.5	0.5	0.3	5.9	20.2	9.6	27.5	5.6	28.7																						
3-Jun	9.5	3.0	1.7	0.5	0.5	Z	1.3	6.1	1.9	0.4	0.2	0.1	0.2	4.5	6.2	1.5	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.3	1.7	9.5																						
4-Jun	0.3	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	3.6	3.2	0.6	0.4	0.4	3.6																						
5-Jun	Z	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																					
6-Jun	0.0	Z	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3																					
7-Jun	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.3	0.1	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	0.1	0.1	0.3																					
8-Jun	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	5.0	28.0	40.4	40.1	28.5	22.1	40.6	46.7	13.1	2.8	0.4	0.2	0.1	7.8	17.3	12.8	46.7																						
9-Jun	9.7	2.6	1.0	0.4	Z	0.5	C	C	C	0.6	0.5	0.7	0.7	0.6	0.8	0.8	0.8	0.6	0.4	0.5	0.4	0.2	0.2	0.2	1.1	9.7																						
10-Jun	0.2	0.1	0.3	0.3	0.3	Z	0.5	0.6	0.6	0.7	0.6	0.7	0.4	0.4	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.7	0.4	0.7																						
11-Jun	Z	0.5	0.4	0.1	0.1	0.0	0.2	0.1	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5																						
12-Jun	2.6	Z	0.2	0.0	0.1	0.1	0.0	0.0	5.2	22.6	33.0	3.5	27.5	20.8	4.3	0.3	0.7	0.3	0.5	0.1	0.1	0.1	6.4	1.9	5.7	33.0																						
13-Jun	1.0	1.1	Z	2.3	1.9	1.9	1.6	1.5	1.6	1.2	1.0	1.0	0.9	13.2	11.2	8.7	4.3	1.3	0.6	0.6	0.3	0.1	0.0	0.0	2.5	13.2																						
14-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.8																						
15-Jun	1.0	0.6	0.7	2.2	Z	2.5	1.6	3.2	2.5	0.9	0.5	0.3	0.4	0.6	2.8	5.3	7.8	0.8	0.7	1.3	0.7	0.5	0.4	0.2	1.6	7.8																						
16-Jun	0.1	0.0	0.1	0.1	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	0.0	0.0	0.0	0.1	0.1	0.1																						
17-Jun	Z	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.6	0.2	0.4	0.2	0.2	0.1	0.2	0.4	0.5	0.1	0.1	0.2	0.2	0.6																						
18-Jun	0.2	Z	2.2	3.0	0.7	0.5	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.5	3.0																						
19-Jun	0.1	0.1	Z	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.7	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.7																						
20-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.7	3.7	4.5	1.0	1.1	1.6	0.9	1.9	1.4	0.7	0.4	0.9	4.5																						
21-Jun	0.3	0.5	0.3	0.3	Z	0.8	0.7	0.4	0.3	0.3	0.2	0.8	2.3	2.9	1.0	0.5	0.2	0.1	0.1	0.0	0.6	0.3	0.2	0.1	0.6	2.9																						
22-Jun	0.1	0.4	0.2	0.1	0.3	Z	0.5	0.5	0.8	0.8	0.9	0.7	0.5	0.3	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.3	0.9																						
23-Jun	Z	0.2	0.0	0.0	0.1	0.0	M	0.3	0.2	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																						
24-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.3	0.3	0.9	0.6	0.4	0.0	0.0	0.0	0.2	0.1	0.1	0.9																						
25-Jun	0.2	0.1	Z	0.1	0.0	0.0	0.0	0.2	0.2	0.8	0.4	0.1	0.7	9.5	25.7	15.7	9.3	20.3	18.5	14.6	2.4	1.6	1.1	3.8	5.4	25.7																						
26-Jun	3.5	2.1	0.7	Z	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.0	0.1	4.1	1.1	0.6	0.3	0.3	0.2	0.7	4.1																						
27-Jun	0.2	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.2	4.1	3.4	2.2	1.4	0.6	4.1																						
28-Jun	1.0	0.6	0.3	0.6	0.5	Z	0.7	0.7	0.4	0.5	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0																						
29-Jun	Z	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.0	0.0	0.1	0.3	0.3	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4																						
30-Jun	0.0	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.5	0.3	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.8	0.3	0.8																						
																								1.2	0.5	0.4	0.4	0.3	0.4	0.4	0.6	0.7	1.5	2.4	2.9	3.6	3.6	3.2	2.8	2.5	1.4	1.1	0.8	0.8	1.2	1.3	2.0	Diurnal Average
																								9.7	3.0	2.2	3.0	1.9	2.5	1.6	6.1	5.2	22.6	33.0	40.4	40.1	28.5	25.7	40.6	46.7	20.3	18.5	14.6	5.9	20.2	9.6	27.5	Diurnal Maximum

Z - zerspan 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
Buffalo Viewpoint - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	660	96.21	96.21
11 - 20	12	1.75	97.96
21 - 60	14	2.04	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 - June 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	119	57	24	10	8	26	40	79	63	32	38	47	31	25	24	37	660
11 - 20	2	1	1	1	0	0	0	0	0	0	0	0	0	0	2	5	12
21 - 60	2	4	2	1	0	0	0	0	0	0	0	0	1	3	1	0	14
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	123	62	27	12	8	26	40	79	63	32	38	47	32	28	27	42	686

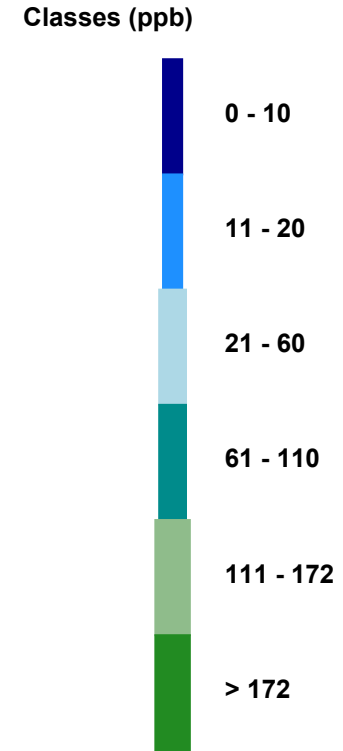
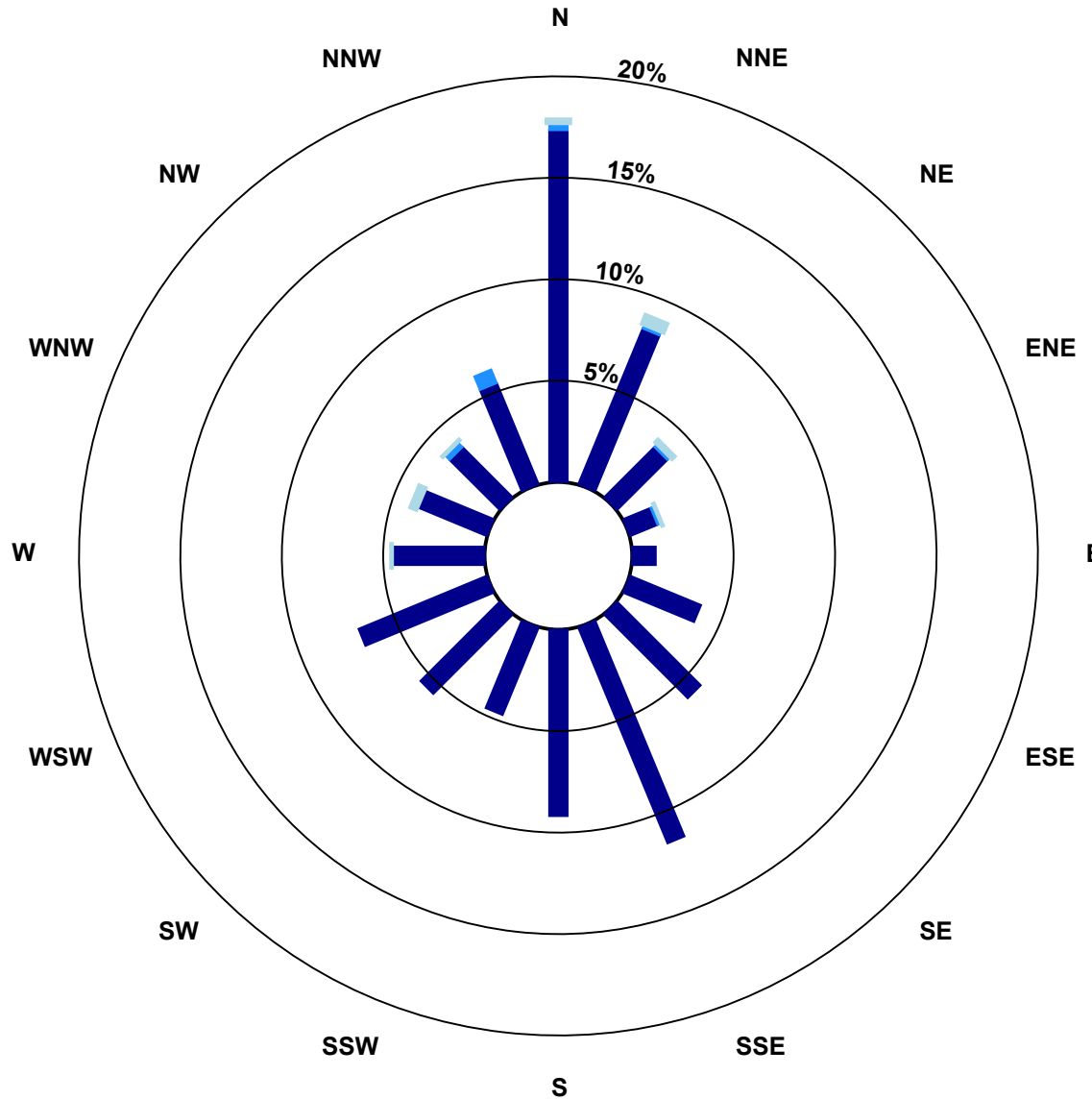
Total Number of Valid Hours: 686

Total Number of Hours: 720

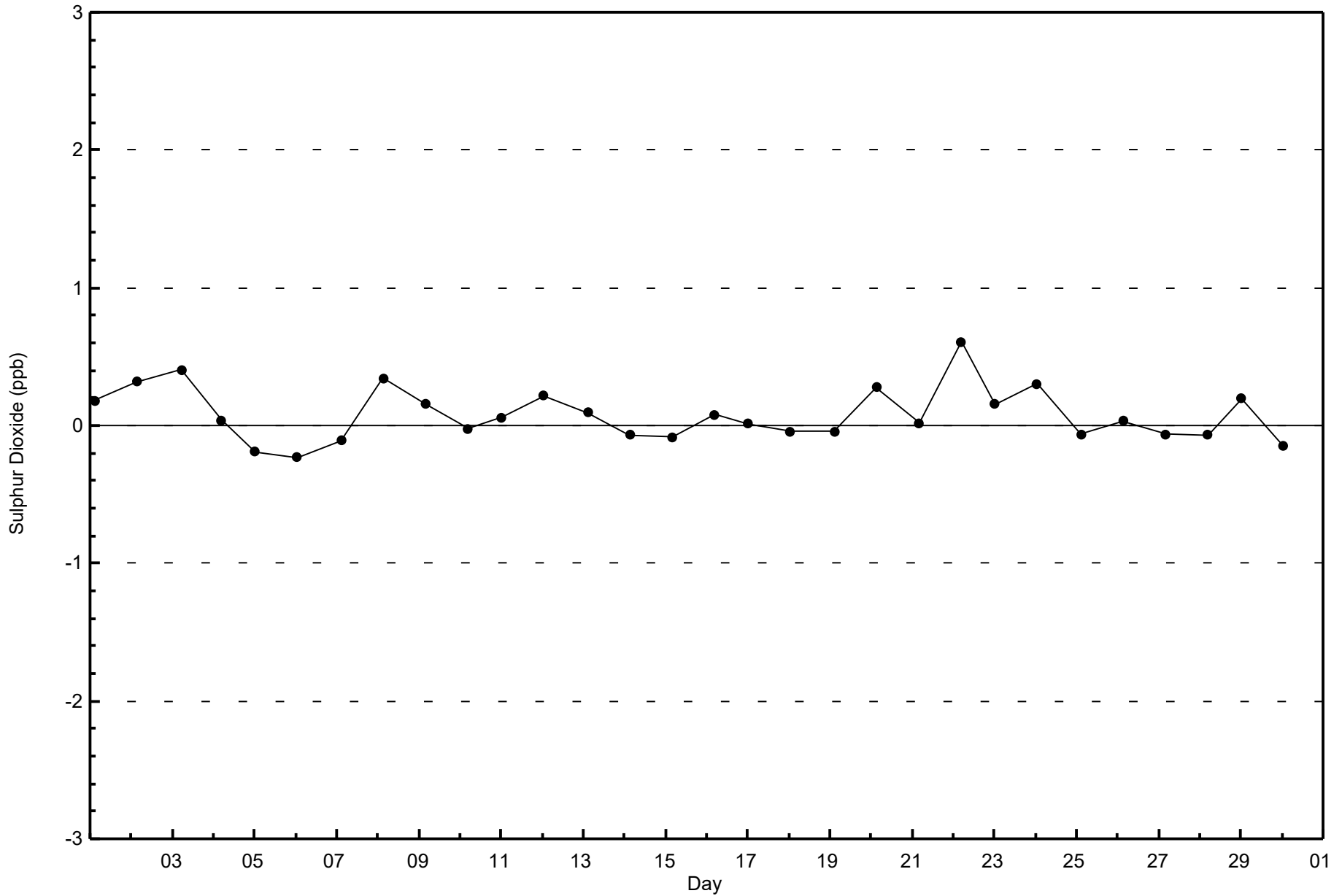


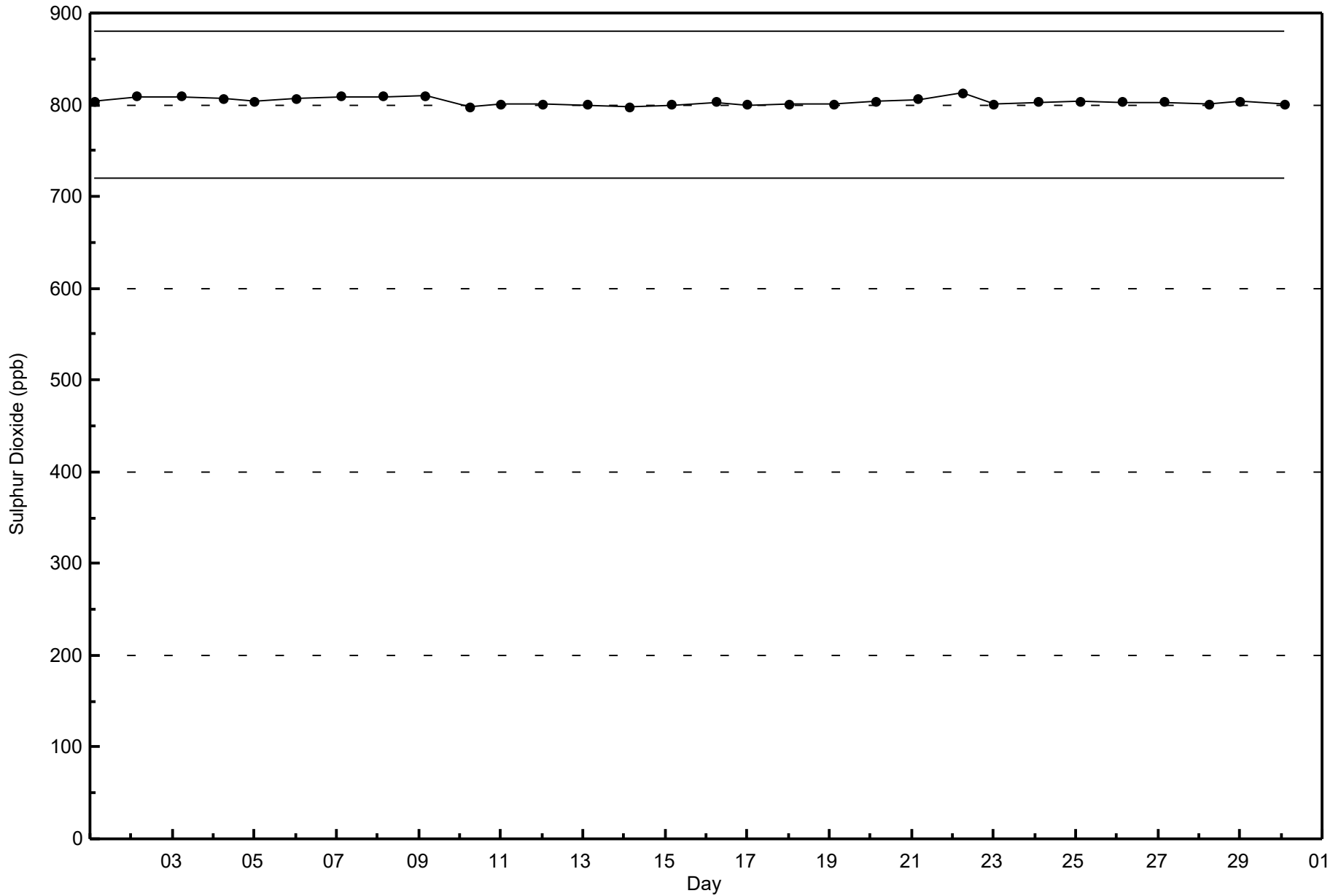
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint



Total Number of Valid Hours: 686







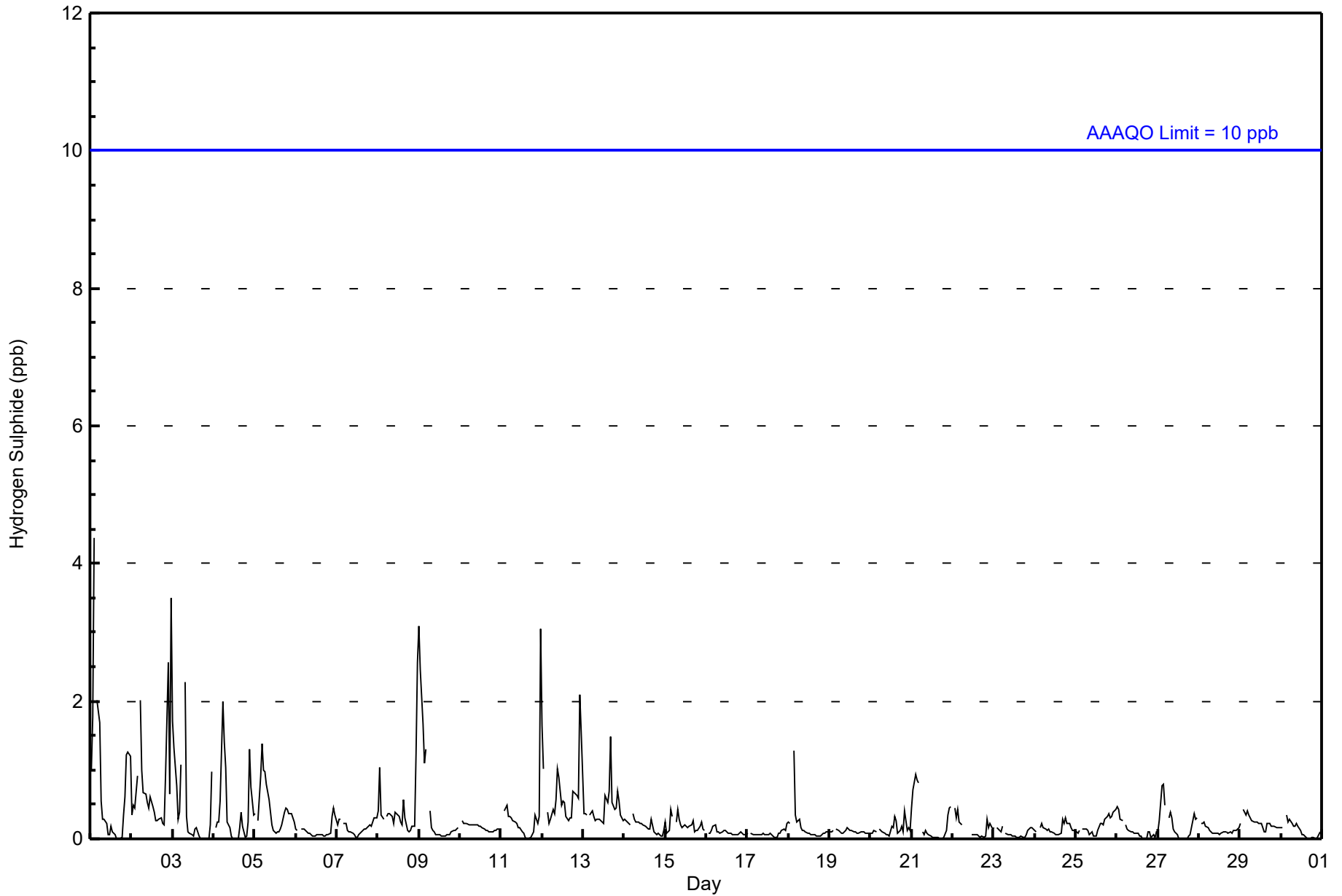
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	720																												
Maximum Value: 4.4 ppb on Jun 1 03:00		Maximum Daily Average: 0.8 ppb on Jun 2																	Hours of Data:		684																												
Minimum Value: 0.0 ppb on Jun 1 16:00		Minimum Daily Average: 0.1 ppb on Jun 17																	Hours of Missing Data:		36																												
Maximum Diurnal Average: 0.6 ppb at hour 24		Minimum Diurnal Average: 0.1 ppb at hour 18																	Hours of Calibration:		35																												
Monthly Average: 0.28 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 = 2.3																	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-Jun	1.0	1.8	4.4	Z	2.0	1.7	0.5	0.3	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.6	1.2	1.3	1.2	0.8	4.4																							
2-Jun	0.4	0.5	0.5	0.9	Z	2.0	1.0	0.7	0.7	0.5	0.4	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.9	2.6	0.6	3.5	0.8	3.5																							
3-Jun	1.7	1.3	0.8	0.3	0.4	1.1	Z	2.3	0.3	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.4	2.3																							
4-Jun	Z	0.2	0.2	0.2	0.6	2.0	1.4	1.0	0.3	0.2	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.0	0.0	0.2	1.3	0.8	0.3	0.4	2.0																								
5-Jun	0.4	Z	0.3	0.9	1.4	1.0	1.0	0.8	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.4	0.4	0.3	0.2	0.4	1.4																								
6-Jun	0.1	0.1	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	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.4	0.3	0.1	0.4																							
7-Jun	0.2	0.3	0.3	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3																							
8-Jun	0.4	1.0	0.4	0.3	Z	0.3	0.4	0.4	0.3	0.2	0.4	0.4	0.3	0.2	0.2	0.6	0.3	0.1	0.1	0.1	0.2	0.2	1.2	2.6	0.5	2.6																							
9-Jun	3.1	2.5	1.7	1.1	1.3	Z	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	3.1																							
10-Jun	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3																							
11-Jun	0.2	Z	0.4	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.3	3.0	0.3	3.0																							
12-Jun	1.6	1.0	Z	0.4	0.2	0.3	0.4	0.4	0.6	1.0	0.9	0.5	0.6	0.5	0.3	0.3	0.3	0.3	0.7	0.7	0.6	0.6	2.1	1.6	0.7	2.1																							
13-Jun	0.4	0.4	0.3	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.6	0.5	0.7	1.5	0.5	0.4	0.4	0.7	0.6	0.3	0.3	0.4	1.5																							
14-Jun	0.3	0.3	0.2	0.2	Z	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4																							
15-Jun	0.2	0.1	0.1	0.4	0.3	Z	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.4																							
16-Jun	Z	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																						
17-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2																							
18-Jun	0.2	0.2	Z	1.3	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	1.3																							
19-Jun	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
20-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.4	0.1	0.2	0.1	0.1	0.4																							
21-Jun	0.4	0.7	0.9	0.9	0.8	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.2	0.9																							
22-Jun	Z	0.4	0.3	0.4	0.2	0.2	C	C	C	C	C	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.1	0.2	0.4																							
23-Jun	0.2	Z	0.2	0.1	0.1	0.2	M	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2																							
24-Jun	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	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3																							
25-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.2	0.4																							
26-Jun	0.5	0.4	0.3	0.3	Z	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	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.5																							
27-Jun	0.1	0.3	0.8	0.8	0.5	Z	0.3	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.2	0.8																							
28-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2																							
29-Jun	0.2	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	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4																							
30-Jun	0.2	0.2	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3																							
																								0.5	0.5	0.5	0.4	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.4	0.6	Diurnal Average	
																								3.1	2.5	4.4	1.3	2.0	2.0	1.4	2.3	0.7	1.0	0.9	0.6	0.6	0.6	0.5	0.7	1.5	0.5	0.7	0.7	0.9	2.6	2.1	3.5	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

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

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - June 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	120	64	26	10	9	25	38	73	68	33	38	46	32	27	29	40	678
3 - 4	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	2	6
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	120	64	27	12	9	25	38	73	68	34	38	46	32	27	29	42	684

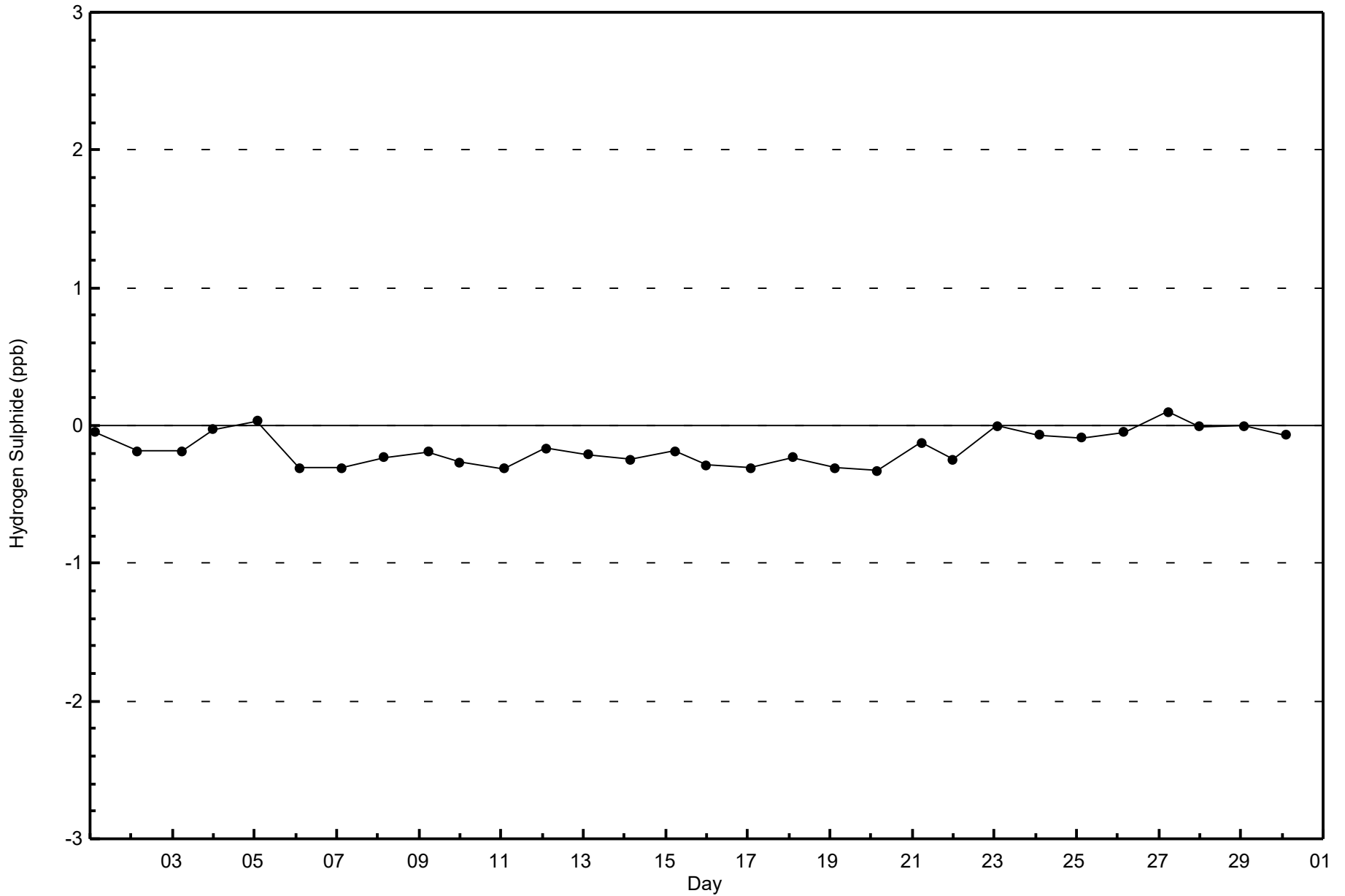
Total Number of Valid Hours: 684

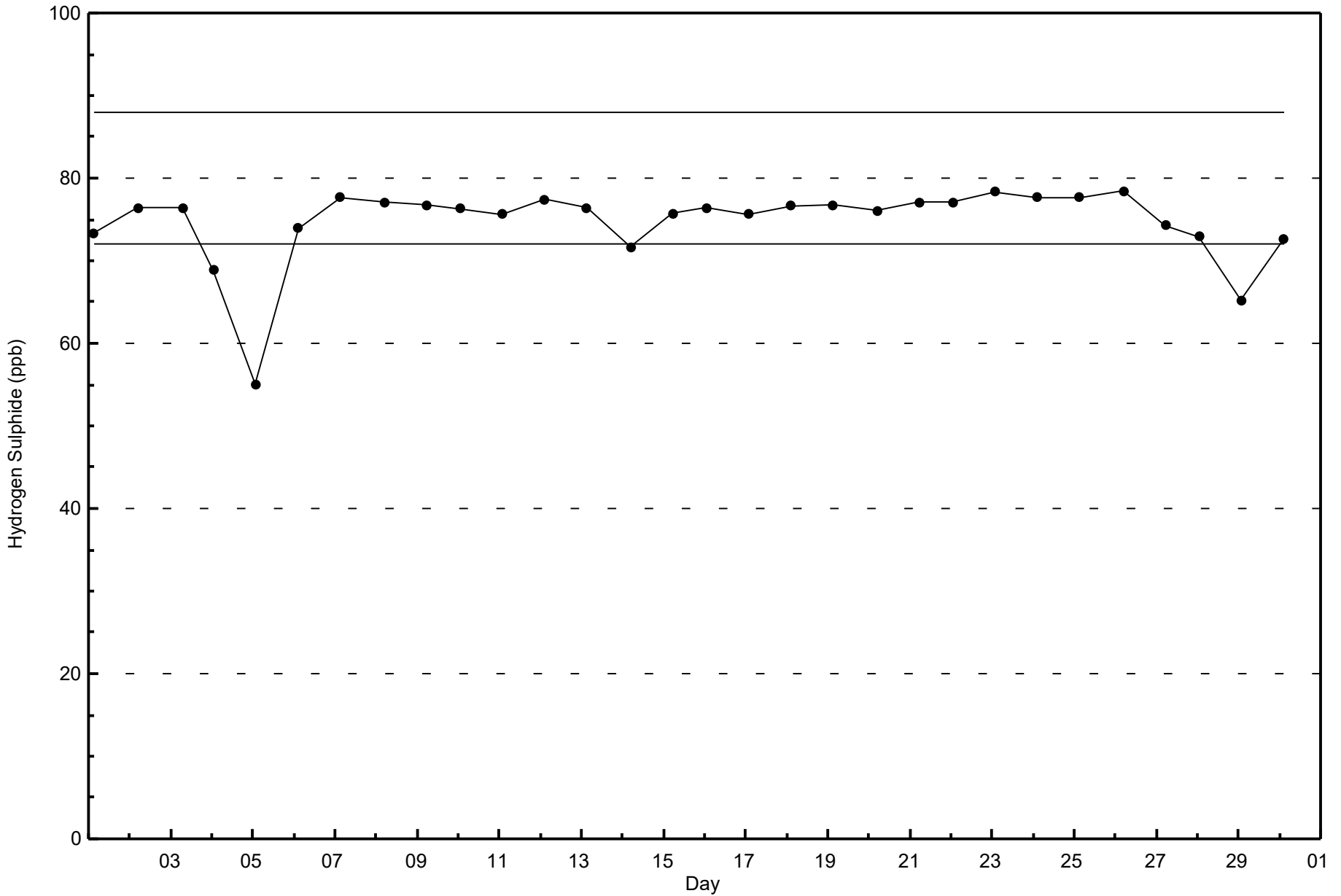
Total Number of Hours: 720



Wood Buffalo Environmental Association
Zero Responses

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







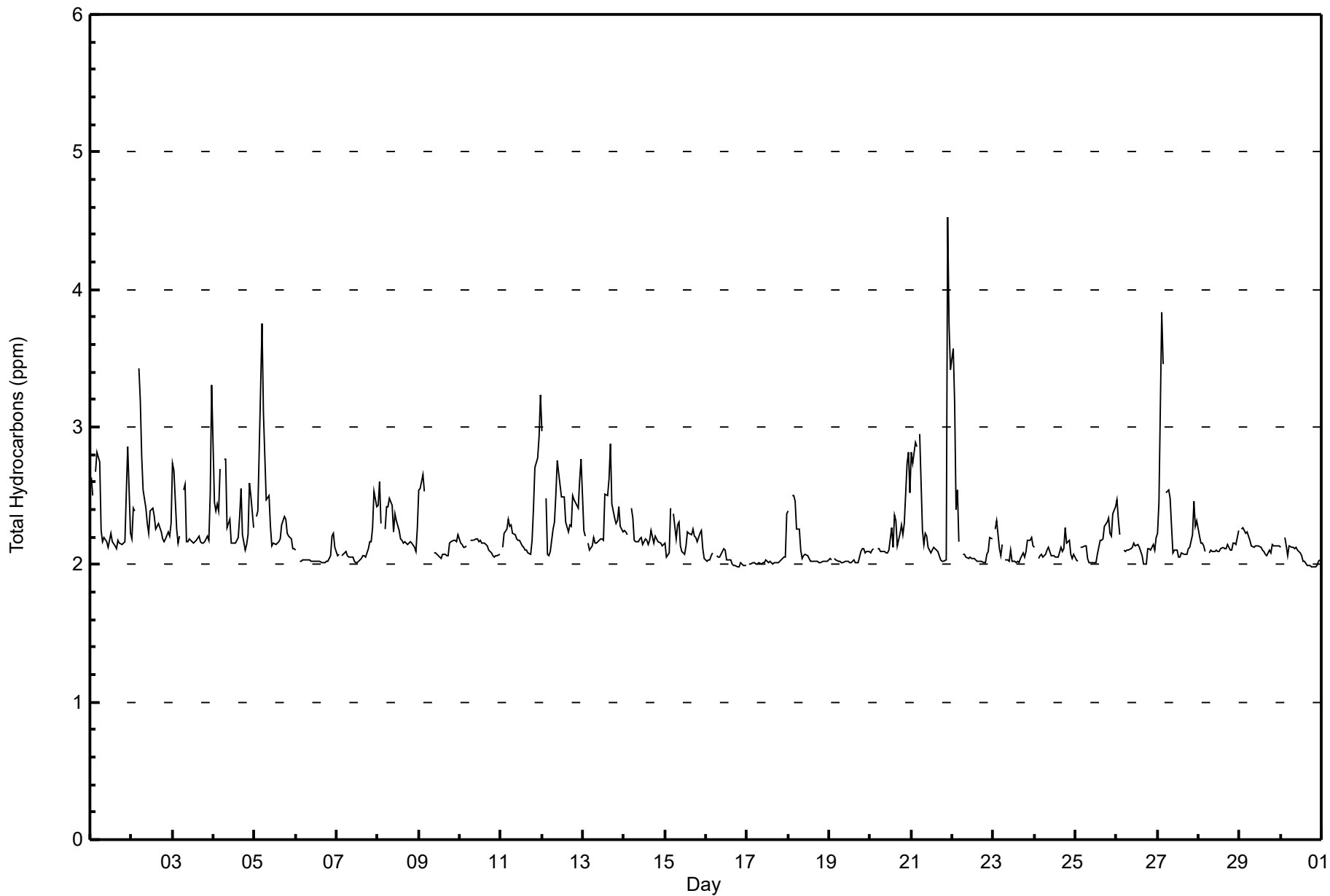
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - June 2023

Maximum Value: 4.5 ppm on Jun 21 22:00		Maximum Daily Average: 2.5 ppm on Jun 21		Hours in Service: 720																																													
Minimum Value: 2.0 ppm on Jun 30 20:00		Minimum Daily Average: 2.0 ppm on Jun 17		Hours of Data: 686																																													
Maximum Diurnal Average: 2.4 ppm at hour 1		Minimum Diurnal Average: 2.1 ppm at hour 18		Hours of Missing Data: 34																																													
Monthly Average: 2.21 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 = 3.4		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-Jun	2.6	2.5	Z	2.7	2.8	2.7	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.5	2.9	2.2	2.3	2.9																							
2-Jun	2.2	2.4	2.4	Z	3.4	3.2	2.8	2.5	2.4	2.3	2.2	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	3.4																							
3-Jun	2.7	2.7	2.3	2.2	2.2	Z	2.5	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	3.3	2.3	3.3																							
4-Jun	2.4	2.4	2.4	2.4	2.7	Z	2.8	2.8	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.2	2.1	2.1	2.2	2.6	2.5	2.3	2.4	2.8																							
5-Jun	Z	2.4	2.4	3.3	3.7	3.1	2.8	2.5	2.5	2.3	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.4	3.7																								
6-Jun	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.2																							
7-Jun	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	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.5	2.4	2.1	2.5																							
8-Jun	2.4	2.6	2.3	Z	2.3	2.4	2.4	2.5	2.4	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.3	2.3	2.6																							
9-Jun	2.5	2.6	2.7	2.5	Z	2.5	C	C	C	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.7																							
10-Jun	2.2	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
11-Jun	Z	2.1	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.7	2.8	2.9	3.2	2.3	3.2																							
12-Jun	3.0	Z	2.5	2.1	2.1	2.1	2.3	2.3	2.5	2.8	2.7	2.5	2.5	2.5	2.3	2.2	2.3	2.3	2.5	2.5	2.4	2.4	2.6	2.8	2.4	3.0																							
13-Jun	2.3	2.2	Z	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.6	2.9	2.4	2.3	2.3	2.3	2.4	2.3	2.2	2.3	2.9																							
14-Jun	2.3	2.2	2.2	Z	2.4	2.3	2.2	2.2	2.2	2.2	2.2	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	2.2	2.4																							
15-Jun	2.2	2.1	2.1	2.4	Z	2.4	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.1	2.0	2.2	2.4																							
16-Jun	2.0	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1																						
17-Jun	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	2.4	2.0	2.4																							
18-Jun	2.4	Z	2.5	2.5	2.5	2.3	2.3	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5																							
19-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1																							
20-Jun	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.4	2.3	2.1	2.2	2.3	2.2	2.3	2.7	2.8	2.5	2.2	2.8																							
21-Jun	2.8	2.7	2.9	2.9	Z	3.0	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	4.5	3.7	3.4	2.5	4.5																							
22-Jun	3.6	3.2	2.4	2.5	2.2	Z	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	3.6																							
23-Jun	Z	2.3	2.3	2.1	2.1	2.1	M	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	2.2	2.2	2.2	2.1	2.1	2.3																							
24-Jun	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.1	2.0	2.1	2.3																							
25-Jun	2.0	2.0	Z	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	2.3	2.3	2.3	2.2	2.2	2.4	2.4	2.1	2.4																							
26-Jun	2.5	2.3	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.5																							
27-Jun	2.2	2.4	3.8	3.5	Z	2.5	2.5	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.3	2.3	2.3	3.8																							
28-Jun	2.2	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.2																							
29-Jun	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
30-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2																							
																								2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	Diurnal Average		
																								3.6	3.2	3.8	3.5	3.7	3.2	2.8	2.8	2.5	2.8	2.7	2.5	2.5	2.5	2.5	2.6	2.9	2.4	2.5	2.5	2.7	4.5	3.7	3.4	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	139	20.26	20.26
2.1 - 3.0	533	77.70	97.96
3.1 - 10.0	14	2.04	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 - June 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	25	16	5	2	1	1	5	4	6	6	20	34	11	2	0	1	139
2.1 - 3.0	98	46	22	10	6	25	34	72	56	26	18	13	21	26	24	36	533
3.1 - 10.0	0	0	0	0	1	0	1	3	1	0	0	0	0	0	3	5	14
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	123	62	27	12	8	26	40	79	63	32	38	47	32	28	27	42	686

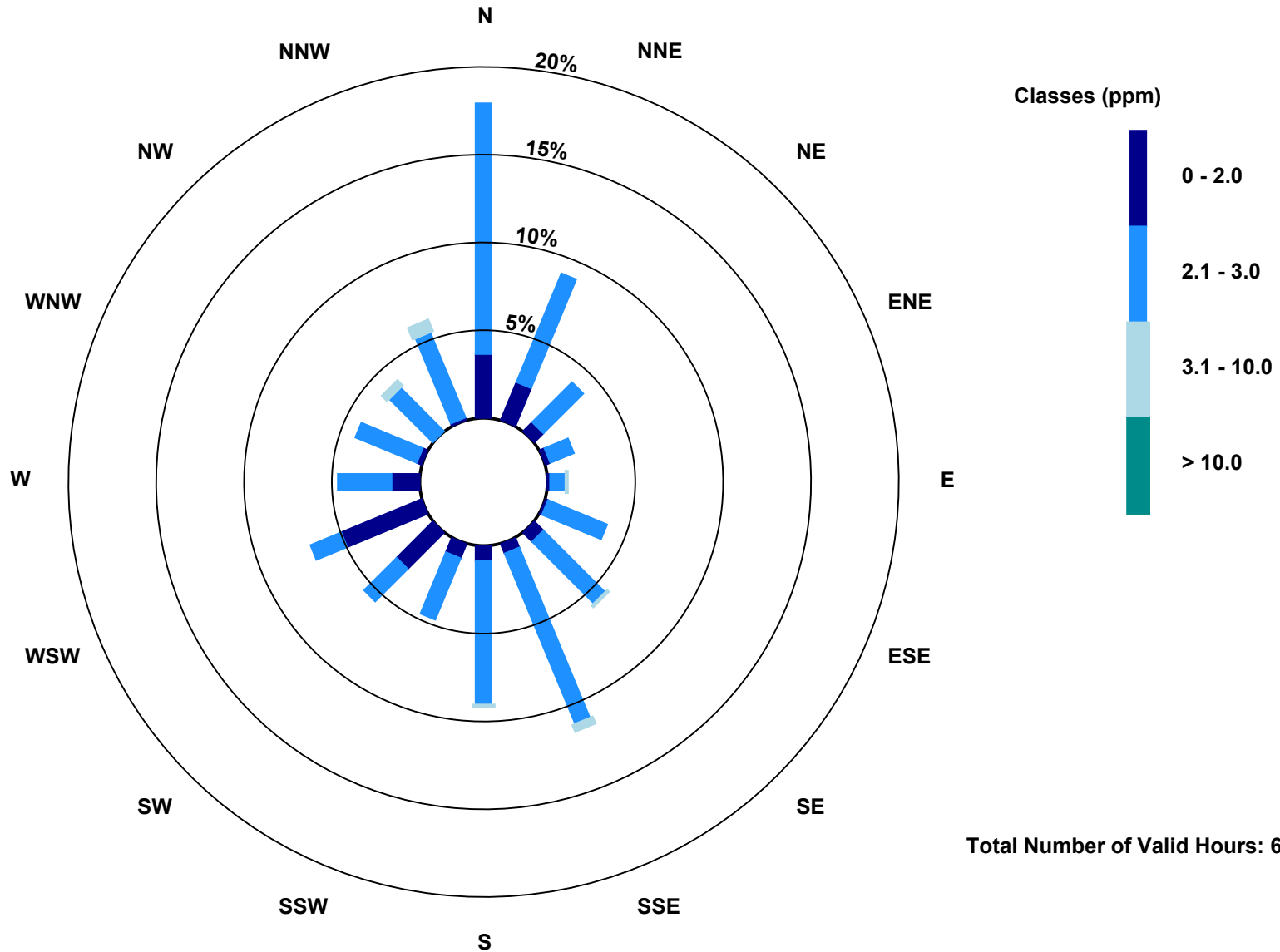
Total Number of Valid Hours: 686

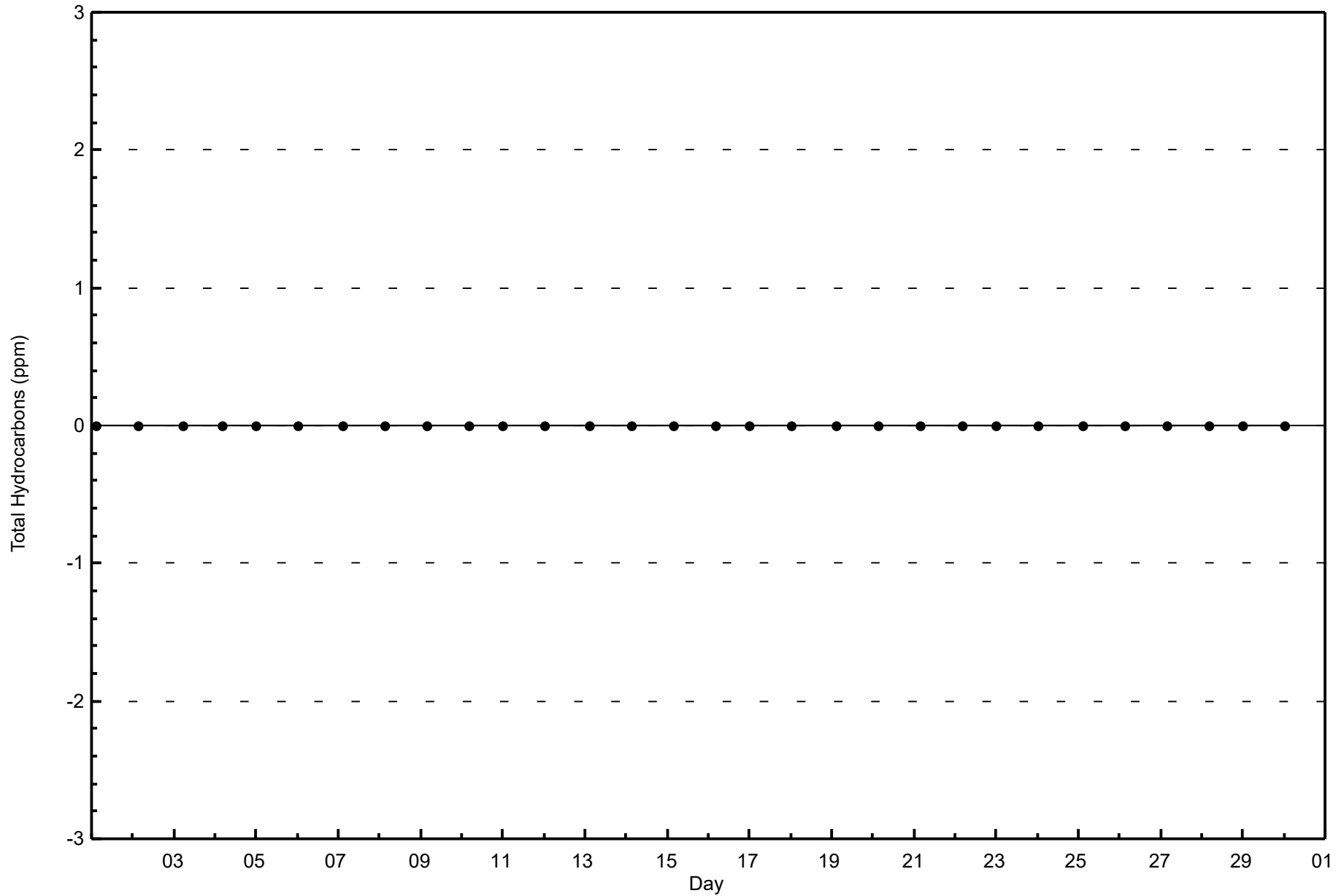
Total Number of Hours: 720

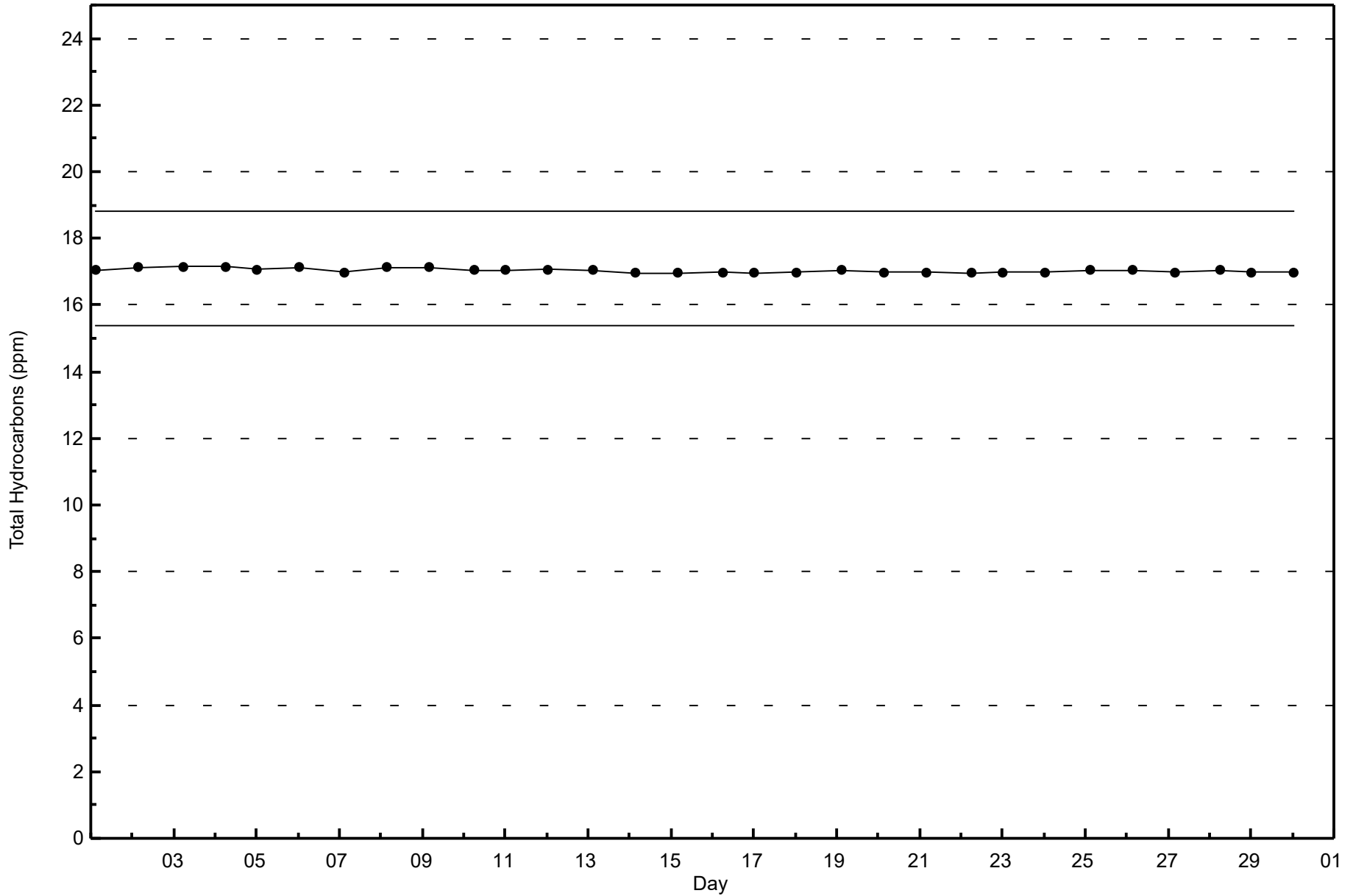


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint

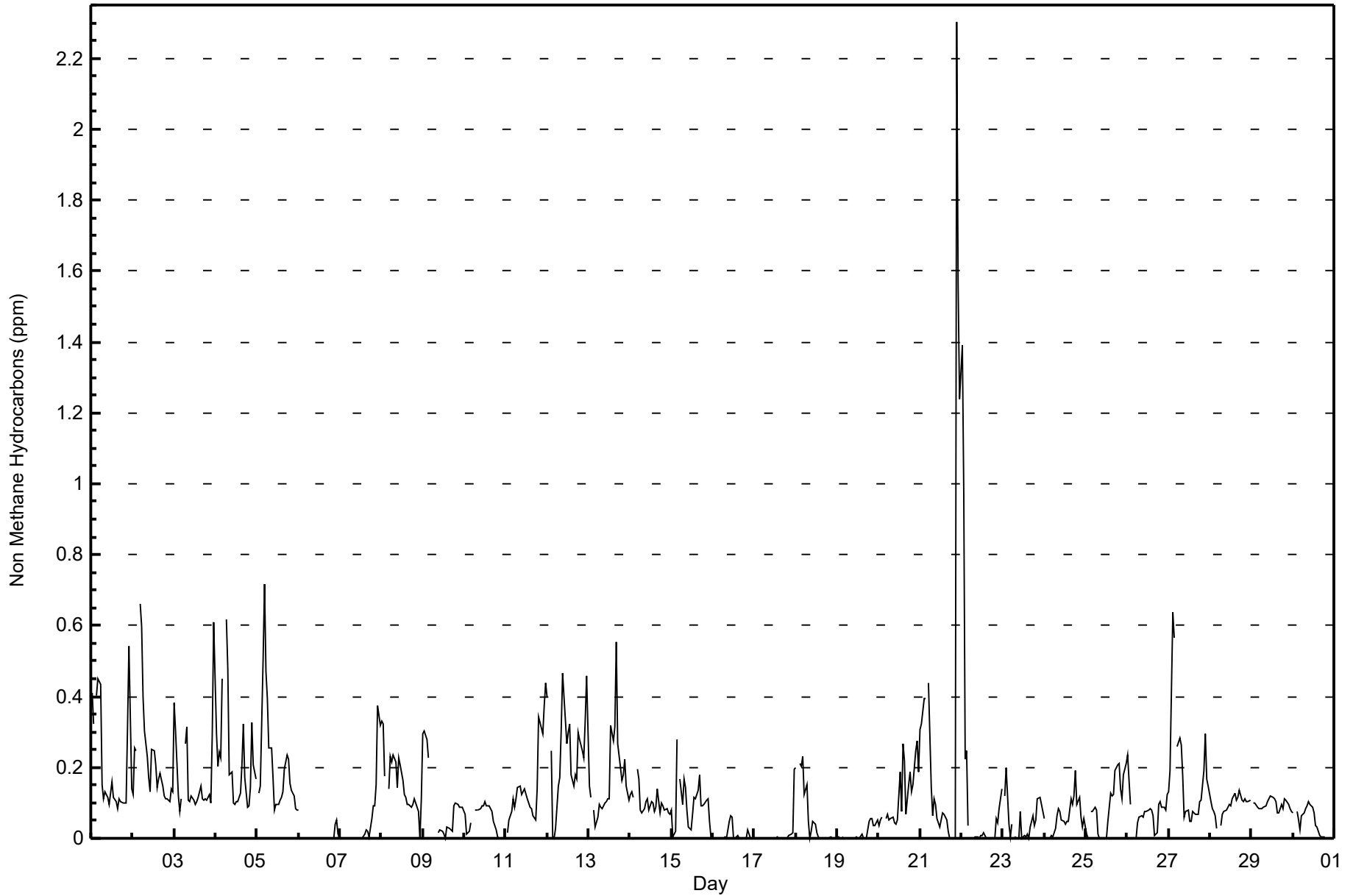








Maximum Value: 2.302 ppm on Jun 21 22:00																				Maximum Daily Average: 0.336 ppm on Jun 21					Hours in Service: 720		
Minimum Value: 0.000 ppm on Jun 6 04:00																				Minimum Daily Average: 0.008 ppm on Jun 6					Hours of Data: 686		
Maximum Diurnal Average: 0.211 ppm at hour 1																				Minimum Diurnal Average: 0.077 ppm at hour 12					Hours of Missing Data: 34		
Monthly Average: 0.118 ppm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.3 P ₉₉ = 0.6					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-Jun	0.412	0.321	Z	0.401	0.450	0.435	0.152	0.112	0.130	0.115	0.097	0.126	0.159	0.115	0.103	0.082	0.113	0.105	0.098	0.099	0.099	0.310	0.542	0.138	0.205	0.542	
2-Jun	0.122	0.254	0.248	Z	0.660	0.596	0.397	0.301	0.233	0.173	0.133	0.252	0.249	0.209	0.145	0.167	0.181	0.148	0.120	0.111	0.110	0.102	0.141	0.131	0.225	0.660	
3-Jun	0.383	0.304	0.120	0.077	0.110	Z	0.266	0.313	0.109	0.103	0.119	0.106	0.097	0.103	0.117	0.147	0.110	0.107	0.112	0.109	0.124	0.098	0.296	0.609	0.176	0.609	
4-Jun	0.296	0.202	0.243	0.229	0.451	Z	0.616	0.479	0.180	0.188	0.099	0.097	0.105	0.103	0.126	0.209	0.323	0.172	0.089	0.090	0.145	0.328	0.206	0.168	0.224	0.616	
5-Jun	Z	0.128	0.148	0.506	0.719	0.469	0.394	0.256	0.256	0.173	0.081	0.095	0.094	0.109	0.117	0.132	0.195	0.236	0.223	0.157	0.137	0.119	0.085	0.080	0.213	0.719	
6-Jun	0.078	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	0.040	0.051	0.013	0.008	0.078	
7-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011	0.024	0.018	0.005	0.056	0.092	0.091	0.153	0.373	0.318	0.050	0.373	
8-Jun	0.332	0.325	0.175	Z	0.140	0.230	0.215	0.234	0.214	0.145	0.226	0.209	0.164	0.122	0.114	0.096	0.097	0.089	0.094	0.111	0.101	0.074	0.000	0.113	0.157	0.332	
9-Jun	0.296	0.301	0.280	0.228	Z	0.213	C	C	C	0.015	0.022	0.021	0.012	0.000	0.032	0.027	0.023	0.019	0.092	0.100	0.095	0.088	0.087	0.086	0.102	0.301	
10-Jun	0.066	0.013	0.015	0.022	0.043	Z	0.079	0.080	0.079	0.085	0.092	0.093	0.105	0.091	0.093	0.084	0.075	0.047	0.023	0.004	0.001	0.000	0.000	0.003	0.052	0.105	
11-Jun	Z	0.017	0.052	0.075	0.113	0.089	0.111	0.145	0.146	0.124	0.130	0.141	0.112	0.099	0.086	0.084	0.065	0.050	0.138	0.341	0.327	0.296	0.374	0.438	0.154	0.438	
12-Jun	0.397	Z	0.248	0.005	0.000	0.026	0.146	0.172	0.304	0.465	0.397	0.268	0.300	0.323	0.181	0.148	0.178	0.167	0.298	0.279	0.249	0.228	0.331	0.459	0.242	0.465	
13-Jun	0.149	0.115	Z	0.079	0.030	0.058	0.094	0.087	0.085	0.099	0.105	0.113	0.111	0.320	0.277	0.313	0.553	0.269	0.200	0.162	0.178	0.223	0.146	0.108	0.168	0.553	
14-Jun	0.123	0.131	0.116	Z	0.197	0.167	0.079	0.072	0.082	0.103	0.111	0.080	0.102	0.100	0.076	0.089	0.138	0.071	0.098	0.090	0.081	0.083	0.071	0.069	0.101	0.197	
15-Jun	0.081	0.005	0.020	0.280	Z	0.166	0.096	0.166	0.142	0.080	0.032	0.024	0.067	0.114	0.111	0.134	0.177	0.091	0.091	0.094	0.109	0.113	0.047	0.005	0.098	0.280	
16-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.002	0.000	0.047	0.065	0.058	0.000	0.001	0.006	0.000	0.000	0.000	0.000	0.001	0.023	0.010	0.000	0.000	0.009	0.065	
17-Jun	Z	0.000	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	0.001	0.001	0.000	0.000	0.007	0.013	0.016	0.194	0.010	0.194	
18-Jun	0.199	Z	0.213	0.202	0.233	0.122	0.152	0.046	0.000	0.019	0.047	0.038	0.016	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.056	0.233	
19-Jun	0.004	0.003	Z	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.001	0.014	0.000	0.000	0.000	0.047	0.057	0.055	0.038	0.037	0.050	0.014	0.057
20-Jun	0.038	0.051	0.061	Z	0.055	0.069	0.052	0.056	0.059	0.043	0.038	0.054	0.187	0.075	0.269	0.218	0.068	0.150	0.185	0.130	0.152	0.249	0.275	0.189	0.118	0.275	
21-Jun	0.307	0.324	0.394	0.394	Z	0.437	0.142	0.064	0.111	0.096	0.057	0.032	0.051	0.073	0.067	0.050	0.019	0.001	0.000	0.000	0.000	2.302	1.561	1.238	0.336	2.302	
22-Jun	1.391	0.976	0.224	0.247	0.035	Z	0.000	0.001	0.002	0.004	0.001	0.008	0.007	0.017	0.001	0.000	0.000	0.000	0.000	0.000	0.055	0.043	0.082	0.139	0.141	1.391	
23-Jun	Z	0.120	0.199	0.038	0.003	0.041	M	0.002	0.001	0.000	0.074	0.000	0.007	0.002	0.012	0.001	0.032	0.064	0.036	0.053	0.110	0.116	0.097	0.075	0.049	0.199	
24-Jun	0.056	Z	0.000	0.001	0.007	0.003	0.026	0.063	0.083	0.077	0.052	0.048	0.039	0.047	0.048	0.110	0.096	0.121	0.192	0.097	0.117	0.058	0.031	0.057	0.062	0.192	
25-Jun	0.010	0.001	Z	0.076	0.076	0.086	0.082	0.012	0.000	0.000	0.000	0.000	0.000	0.049	0.129	0.120	0.124	0.192	0.206	0.211	0.140	0.111	0.180	0.213	0.088	0.213	
26-Jun	0.235	0.162	0.095	Z	0.000	0.002	0.044	0.061	0.062	0.061	0.075	0.075	0.080	0.083	0.078	0.062	0.008	0.015	0.097	0.105	0.087	0.089	0.082	0.123	0.077	0.235	
27-Jun	0.130	0.190	0.638	0.567	Z	0.260	0.281	0.264	0.174	0.059	0.077	0.081	0.047	0.047	0.075	0.068	0.069	0.066	0.104	0.108	0.192	0.296	0.168	0.148	0.179	0.638	
28-Jun	0.104	0.082	0.075	0.063	0.027	Z	0.034	0.068	0.074	0.081	0.088	0.095	0.093	0.113	0.127	0.108	0.116	0.136	0.108	0.103	0.111	0.102	0.104	0.108	0.092	0.136	
29-Jun	Z	0.101	0.099	0.088	0.084	0.084	0.085	0.087	0.093	0.103	0.112	0.119	0.116	0.110	0.104	0.072	0.073	0.098	0.085	0.113	0.109	0.096	0.084	0.076	0.095	0.119	
30-Jun	0.071	Z	0.074	0.052	0.024	0.063	0.074	0.085	0.091	0.105	0.096	0.088	0.073	0.037	0.034	0.007	0.004	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.043	0.105	
																								Diurnal Average			
																								Diurnal Maximum			
0.211 0.165 0.149 0.145 0.133 0.151 0.129 0.111 0.093 0.085 0.081 0.077 0.080 0.082 0.085 0.085 0.095 0.081 0.093 0.094 0.100 0.193 0.182 0.178																								Diurnal Average			
																								1.391 0.976 0.638 0.567 0.719 0.596 0.616 0.479 0.304 0.465 0.397 0.268 0.300 0.323 0.277 0.313 0.553 0.269 0.298 0.341 0.327 2.302 1.561 1.238		Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	149	21.72	21.72
0.006 - 0.05	94	13.70	35.42
0.06 - 0.1	287	41.84	77.26
> 0.1	156	22.74	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 - June 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	20	14	4	1	1	2	7	17	9	6	22	30	11	3	0	2	149
0.006 - 0.05	24	5	2	2	0	4	8	14	9	4	2	9	3	4	3	1	94
0.06 - 0.1	50	27	16	6	2	10	19	39	38	15	13	5	13	14	8	12	287
> 0.1	29	16	5	3	5	10	6	9	7	7	1	3	5	7	16	27	156
Totals	123	62	27	12	8	26	40	79	63	32	38	47	32	28	27	42	686

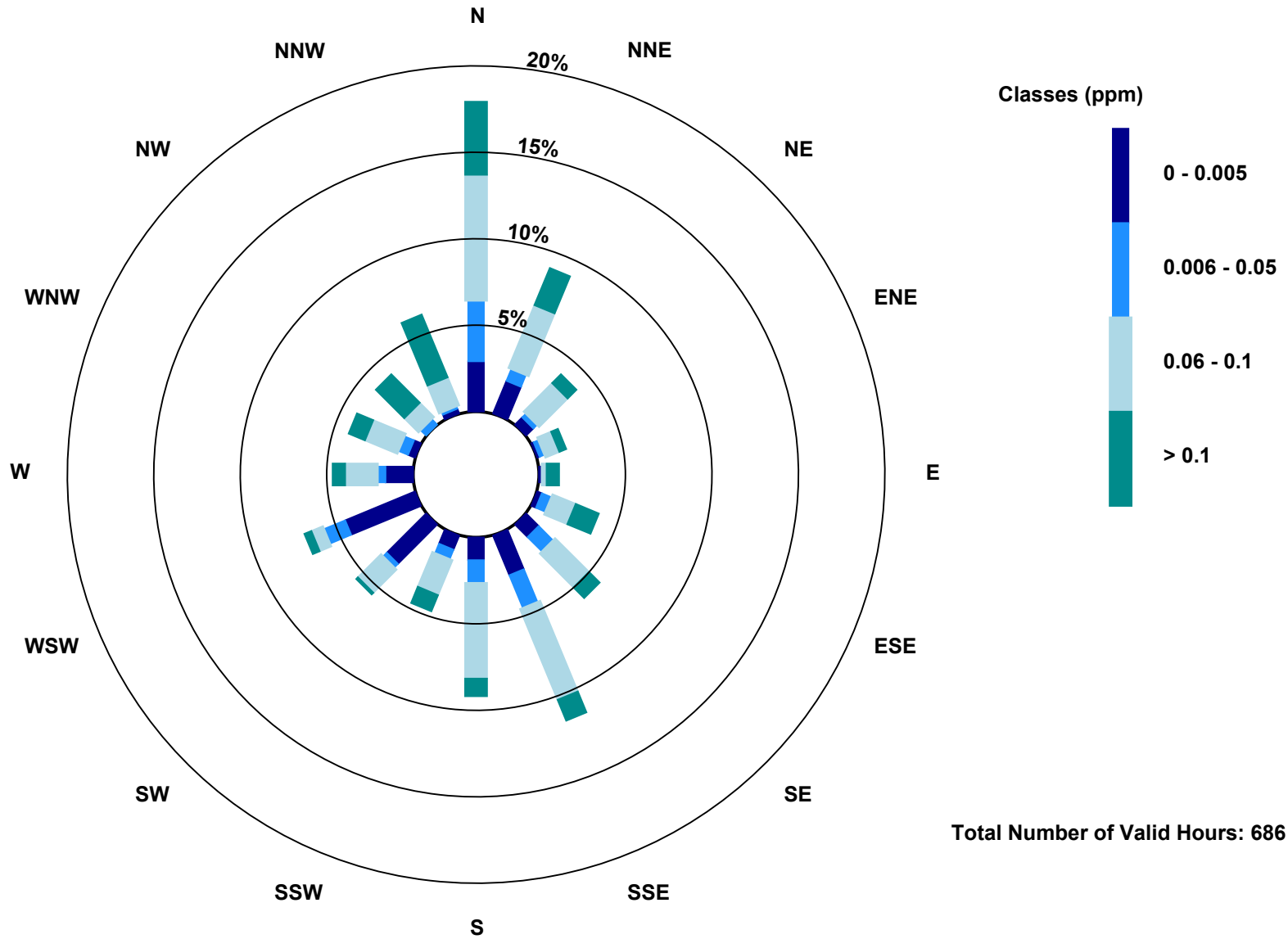
Total Number of Valid Hours: 686

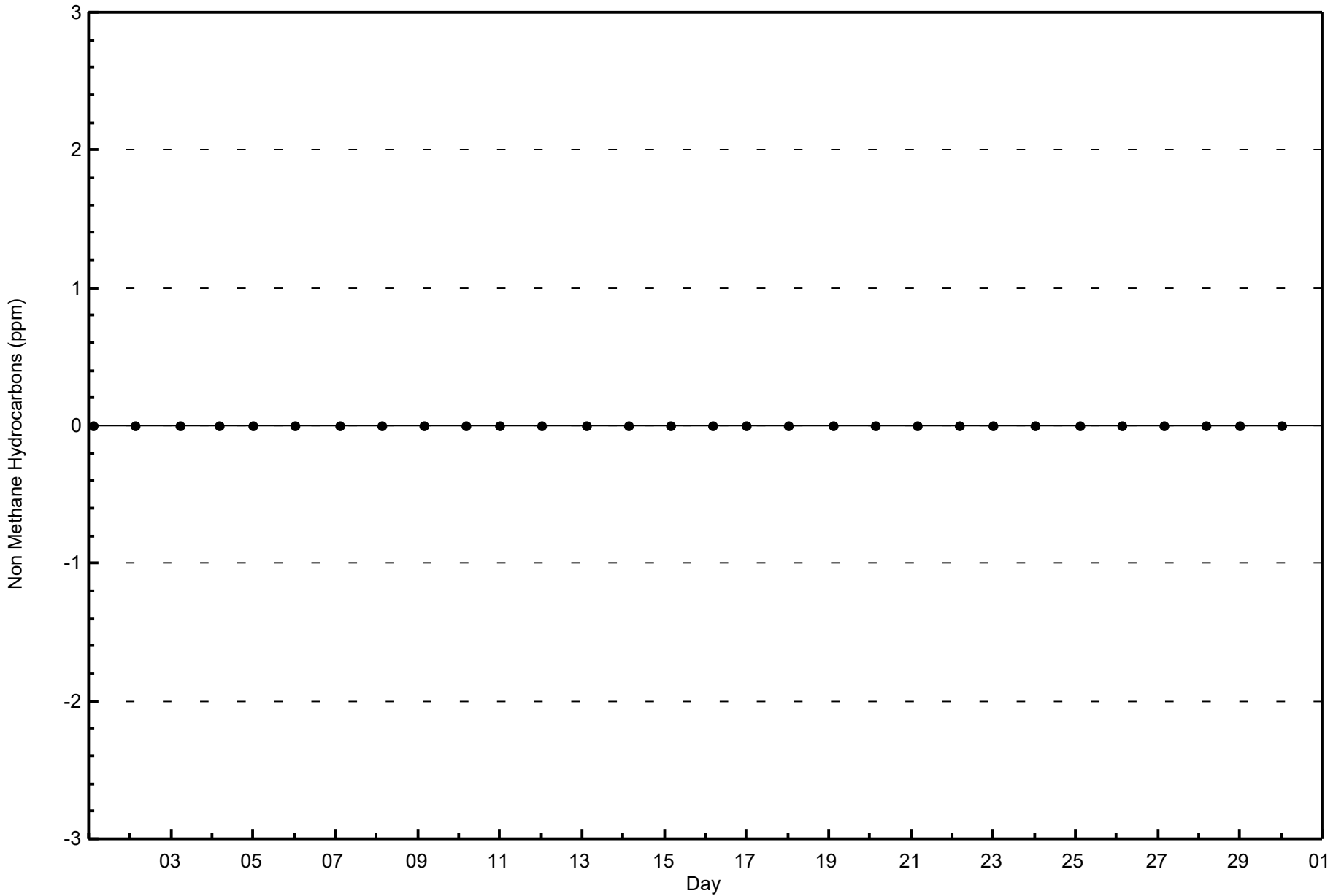
Total Number of Hours: 720

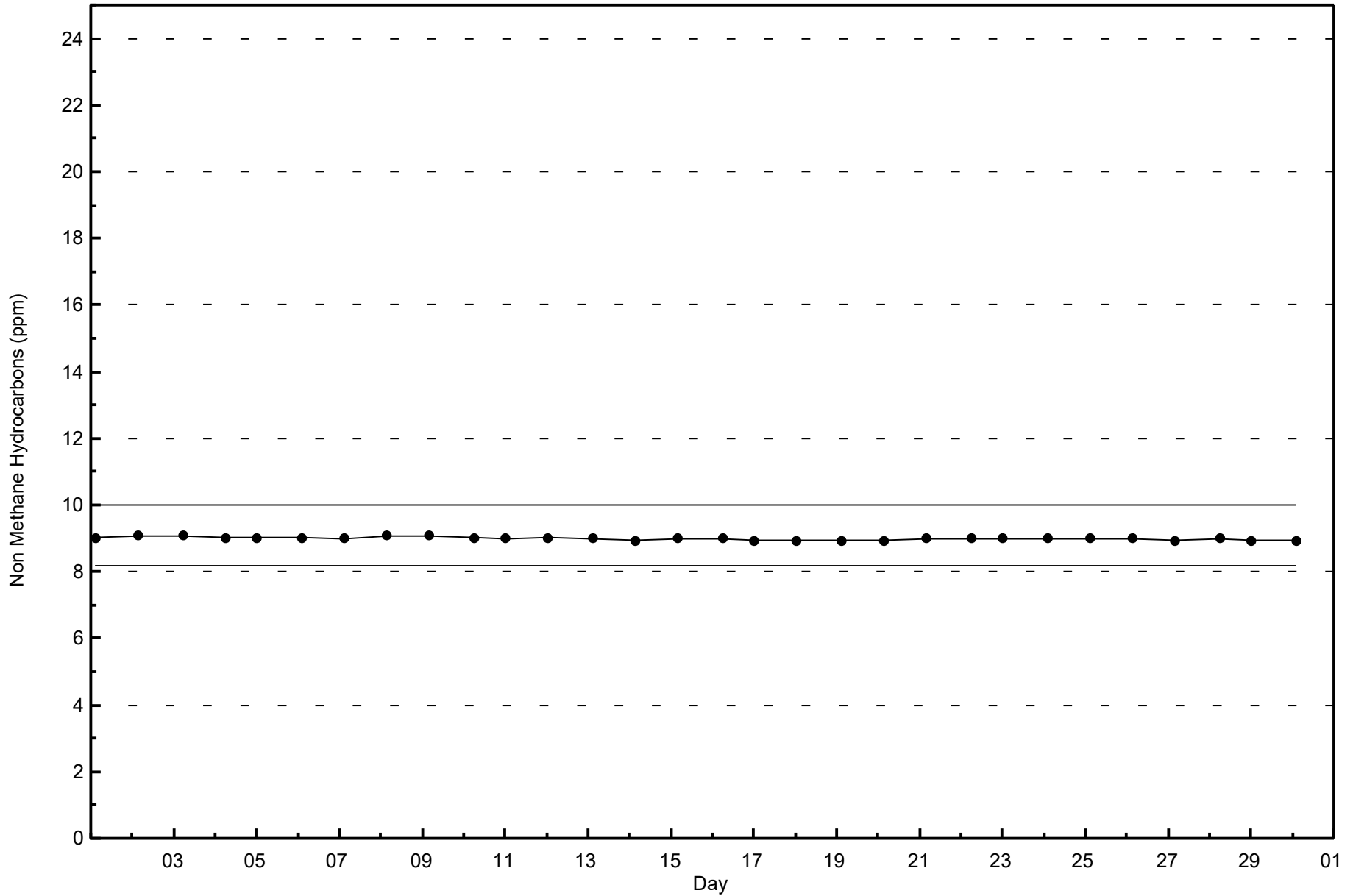


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.2 ppm on Jun 27 03:00	Maximum Daily Average: 2.2 ppm on Jun 5		Hours of Data:	686
Minimum Value: 2.0 ppm on Jun 30 19:00	Minimum Daily Average: 2.0 ppm on Jun 30		Hours of Missing Data:	34
Maximum Diurnal Average: 2.2 ppm at hour 3	Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Calibration:	33
Monthly Average: 2.10 ppm	Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.6		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	2.2	2.2	Z	2.3	2.4	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.4
2-Jun	2.1	2.2	2.1	Z	2.8	2.6	2.4	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	2.1	2.1	2.1	2.2	2.1	2.8
3-Jun	2.4	2.4	2.1	2.1	2.1	Z	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.7	2.1	2.7
4-Jun	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.0	2.0	2.1	2.1	2.3	2.3	2.1	2.1	2.3
5-Jun	Z	2.2	2.2	2.8	3.0	2.6	2.4	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	2.1	2.0	2.0	2.2	3.0
6-Jun	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	2.1	2.2	2.2	2.1	2.0	2.2
7-Jun	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2
8-Jun	2.1	2.3	2.1	Z	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	2.1	2.1	2.1	2.2	2.1	2.3
9-Jun	2.2	2.3	2.4	2.3	Z	2.3	C	C	C	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	2.4
10-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11-Jun	Z	2.1	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	2.0	2.1	2.4	2.5	2.6	2.8	2.2	2.8
12-Jun	2.6	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.6
13-Jun	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	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.3
14-Jun	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
15-Jun	2.1	2.0	2.1	2.1	Z	2.2	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	2.0	2.1	2.2
16-Jun	2.0	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
17-Jun	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	2.2	2.0	2.2
18-Jun	2.2	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	2.0	2.0	2.0	2.0	2.1
19-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1
20-Jun	2.0	2.0	2.1	Z	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	2.5	2.5	2.3	2.1	2.5
21-Jun	2.5	2.4	2.5	2.5	Z	2.5	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	2.2	2.2	2.2	2.2	2.5
22-Jun	2.2	2.2	2.2	2.3	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	2.1	2.1	2.0	2.1	2.3
23-Jun	Z	2.1	2.1	2.1	2.1	2.1	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1
24-Jun	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	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1
25-Jun	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
26-Jun	2.2	2.2	2.1	Z	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.2
27-Jun	2.1	2.3	3.2	2.9	Z	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.2	2.2	3.2
28-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1
29-Jun	Z	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2
30-Jun	2.1	Z	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1

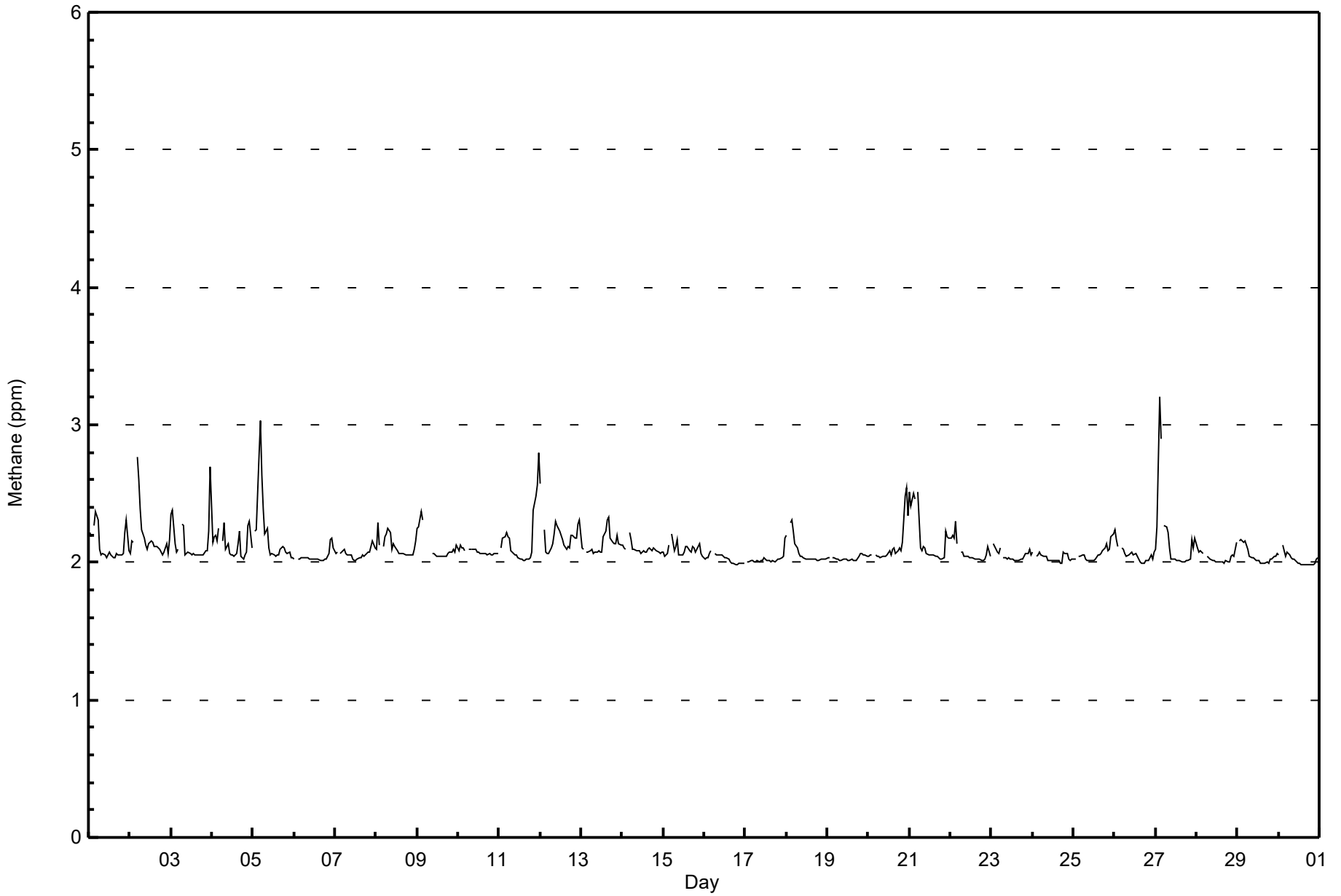
2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.5	2.6	2.8	Diurnal Average
2.6	2.4	3.2	2.9	3.0	2.6	2.4	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.4	2.5	2.6	2.8	Diurnal Maximum					

Z - zerspan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Buffalo Viewpoint - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	271	39.50	39.50
2.1 - 3.0	414	60.35	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
Buffalo Viewpoint - June 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	51	24	6	2	1	9	11	12	25	16	30	43	18	18	1	4	271
2.1 - 3.0	72	38	21	10	7	17	29	67	38	16	8	4	14	10	26	37	414
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	123	62	27	12	8	26	40	79	63	32	38	47	32	28	27	42	686

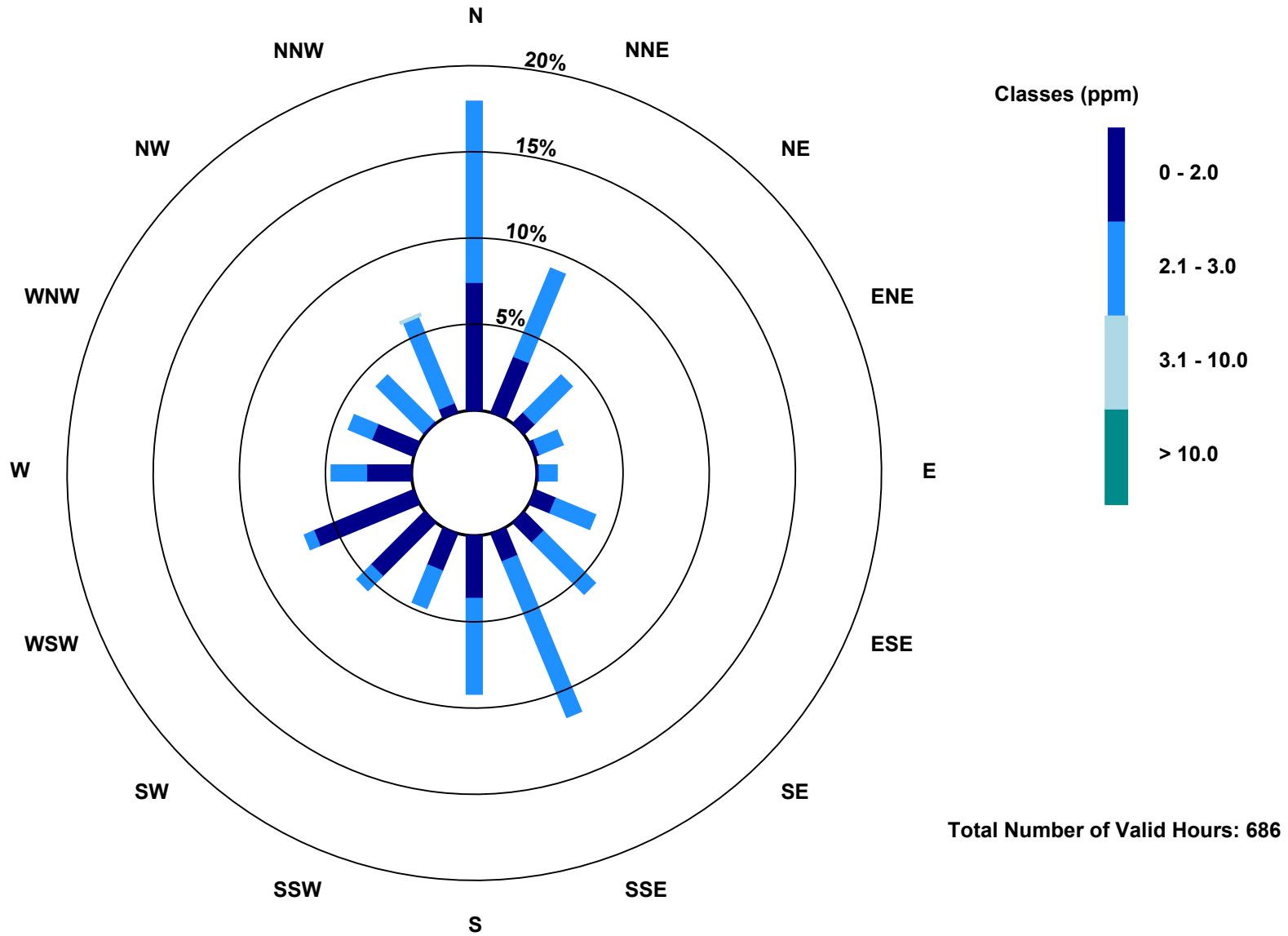
Total Number of Valid Hours: 686

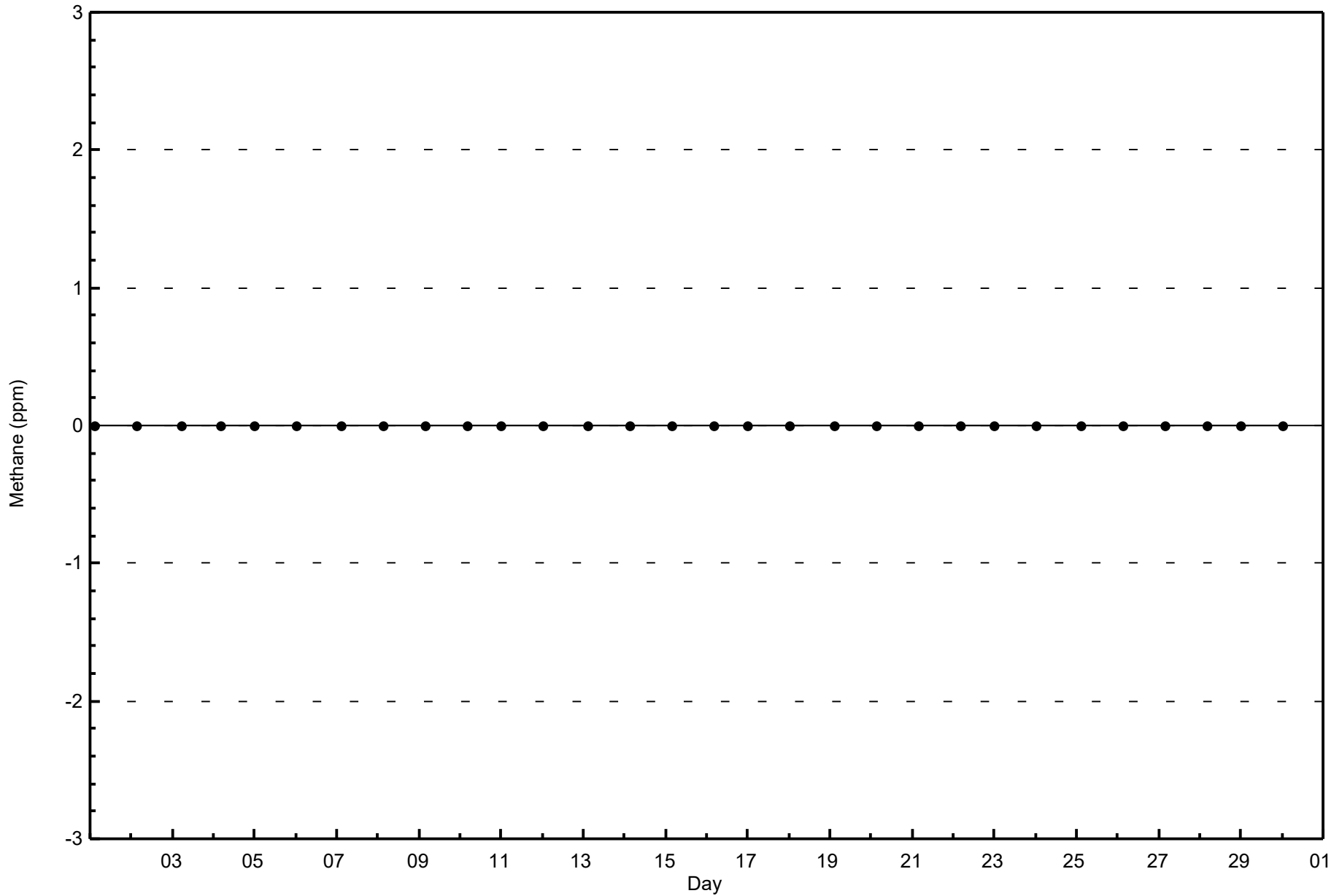
Total Number of Hours: 720

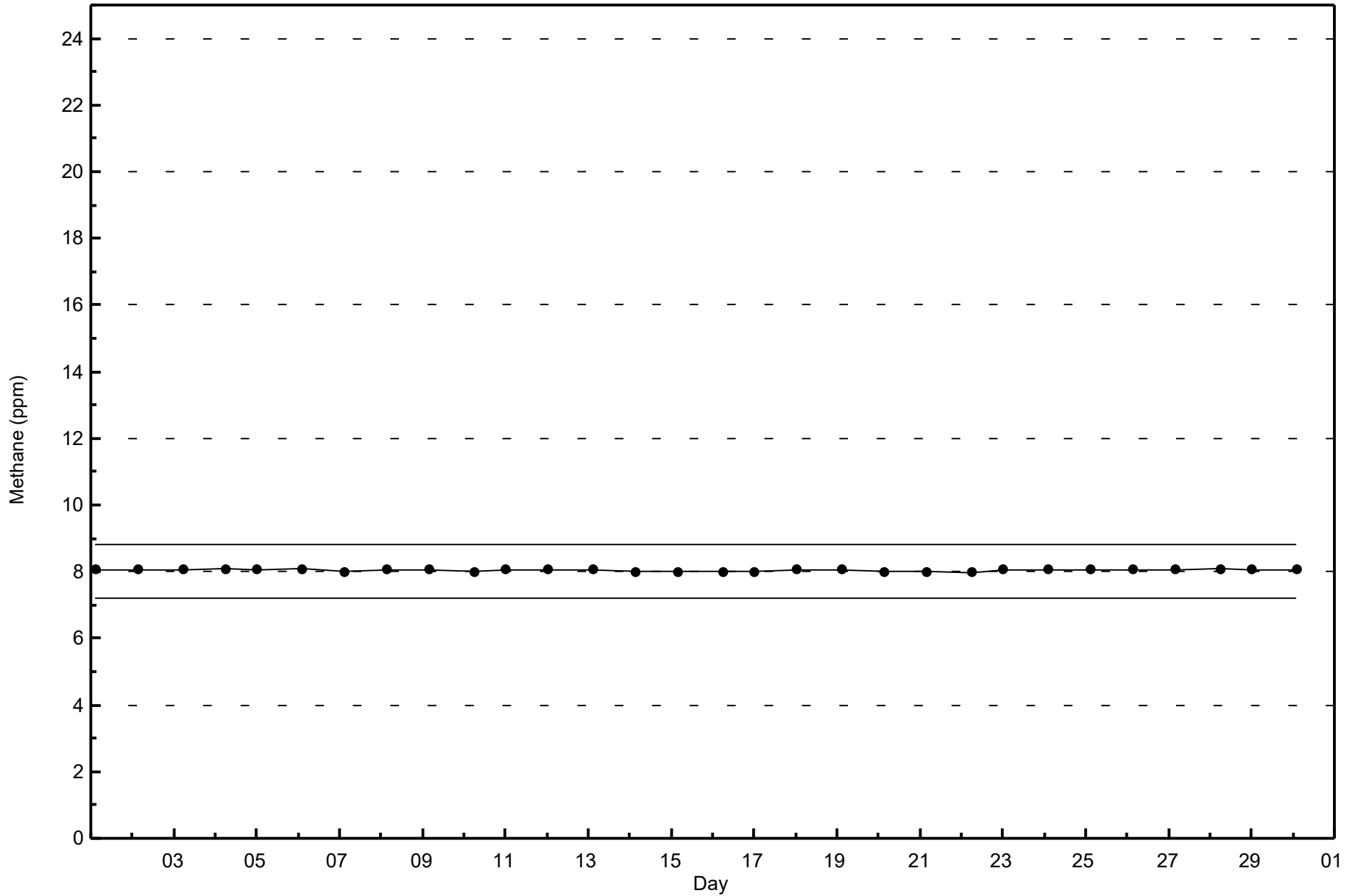


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Buffalo Viewpoint







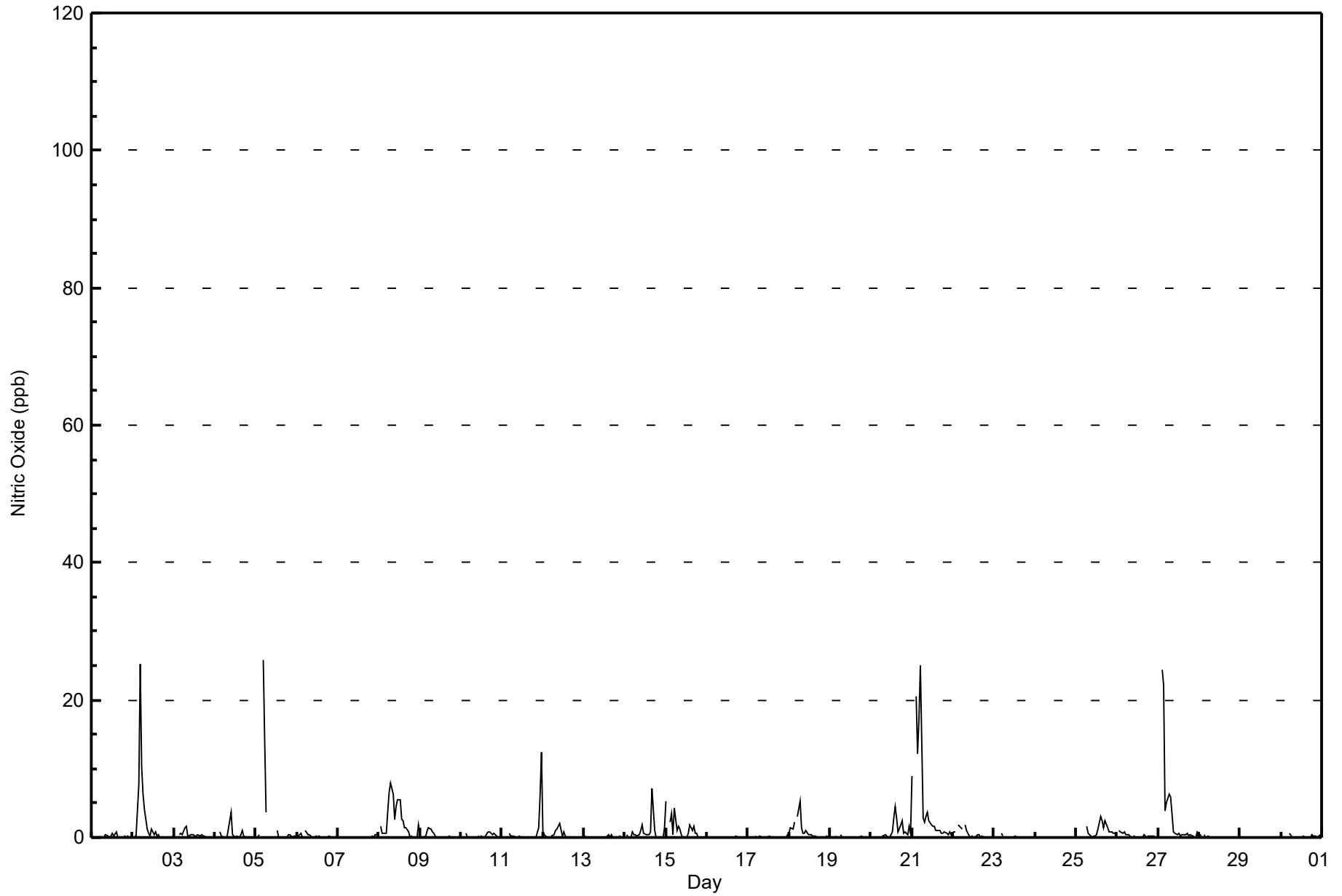


Maximum Value: 25.8 ppb on Jun 5 05:00		Maximum Daily Average: 4.8 ppb on Jun 21		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 1 01:00		Minimum Daily Average: 0.0 ppb on Jun 29		Hours of Data: 683																						
Maximum Diurnal Average: 3.2 ppb at hour 5		Minimum Diurnal Average: 0.1 ppb at hour 21		Hours of Missing Data: 37																						
Monthly Average: 0.79 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.5 P ₉₀ = 1.6 P ₉₉ = 14.8		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-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.3	0.2	0.0	0.1	0.6	0.1	0.8	0.0	0.1	0.0	0.0	0.1	0.0	0.3	0.0	0.2	0.1	0.8
2-Jun	Z	0.3	0.1	7.7	25.2	10.3	6.3	4.1	1.3	0.6	0.2	1.2	0.5	0.7	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.6	25.2
3-Jun	0.1	0.0	Z	0.3	0.6	0.4	1.4	1.6	0.1	0.3	0.4	0.4	0.2	0.1	0.5	0.2	0.5	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.3	1.6
4-Jun	0.1	0.0	Z	0.7	0.2	0.0	0.0	0.0	1.1	3.6	0.4	0.2	0.0	0.2	0.0	0.5	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.6
5-Jun	0.0	0.0	0.4	Z	25.8	14.2	3.7	C	C	C	C	C	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.3	0.3	2.6	25.8
6-Jun	0.3	0.2	0.6	0.0	Z	1.0	0.4	0.4	0.1	0.0	0.0	0.2	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	1.0
7-Jun	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	0.0	0.3	0.4	0.0	0.4
8-Jun	Z	1.6	0.6	0.6	0.7	3.7	6.5	7.9	6.3	2.6	4.4	5.4	5.5	2.7	2.3	1.4	1.4	0.7	0.1	0.1	0.0	0.0	0.0	1.9	2.4	7.9
9-Jun	0.5	Z	0.2	0.1	0.8	1.5	1.2	0.7	0.5	0.3	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	0.3	1.5
10-Jun	0.0	0.0	Z	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.3	0.6	0.8	0.8	0.5	0.6	0.3	0.2	0.0	0.0	0.2	0.8
11-Jun	0.0	0.0	0.0	Z	0.7	0.2	0.2	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	6.1	12.4	0.9	12.4
12-Jun	0.9	0.3	0.1	0.0	Z	0.2	0.3	1.1	1.2	1.5	2.0	0.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.0
13-Jun	0.2	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.1	0.0	0.0	0.3	0.0	0.1	0.1	0.4
14-Jun	Z	0.3	0.0	0.0	0.9	0.4	0.5	0.1	0.4	1.1	1.8	0.7	0.5	0.5	0.9	7.1	1.1	0.1	0.1	0.1	0.0	0.0	0.0	1.4	0.8	7.1
15-Jun	5.3	Z	2.3	3.4	0.5	4.2	1.0	1.6	1.3	0.3	0.0	0.0	0.0	0.6	1.9	1.0	1.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	1.1	5.3
16-Jun	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
17-Jun	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4
18-Jun	0.7	1.3	1.2	2.2	Z	3.0	5.2	1.5	0.6	0.6	1.0	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.8	5.2
19-Jun	0.0	0.0	0.0	0.0	0.2	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
20-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.1	0.0	0.8	2.9	4.6	2.9	0.9	1.8	2.4	0.7	0.8	0.4	1.5	0.5	0.9	4.6
21-Jun	9.0	Z	20.5	12.2	17.3	25.0	2.9	2.2	3.1	3.7	2.4	1.9	1.6	1.7	1.1	1.0	1.0	0.6	0.7	0.9	0.5	0.5	0.8	0.4	4.8	25.0
22-Jun	0.8	0.7	Z	1.8	1.6	1.2	PF	1.8	1.1	0.1	0.1	0.1	0.0	0.0	0.3	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	1.8
23-Jun	0.0	0.0	0.0	Z	0.5	0.3	M	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	0.5
24-Jun	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	0.1	0.0	0.0	0.0	0.1
25-Jun	0.0	0.0	0.0	0.0	0.1	Z	1.7	0.6	0.3	0.0	0.1	0.2	0.4	1.2	3.0	2.4	1.4	2.3	1.4	0.9	0.9	0.7	0.6	0.6	0.8	3.0
26-Jun	Z	1.0	0.7	0.6	0.8	0.5	0.4	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.2	1.0
27-Jun	0.0	Z	24.5	22.1	3.8	5.1	6.3	6.0	3.5	0.8	0.7	0.4	0.6	0.3	0.4	0.5	0.4	0.6	0.1	0.5	0.3	0.1	0.1	0.8	3.4	24.5
28-Jun	0.4	0.2	Z	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
29-Jun	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
30-Jun	0.0	0.0	0.0	0.0	Z	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.2	0.1	0.0	0.2	0.5	0.1	0.5
																								Diurnal Average		
																								Diurnal Maximum		
0.7 0.2 2.1 2.1 3.2 2.9 1.4 1.1 0.7 0.6 0.5 0.4 0.4 0.4 0.5 0.4 0.6 0.3 0.2 0.2 0.1 0.1 0.3 0.7																								Diurnal Average		
9.0 1.6 24.5 22.1 25.8 25.0 6.5 7.9 6.3 3.7 4.4 5.4 5.5 2.9 4.6 2.9 7.1 2.3 2.4 0.9 0.9 1.5 6.1 12.4																								Diurnal Maximum		
Z - zerspan C - Calibration M - Maintenance PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	677	99.12	99.12
21 - 40	6	0.88	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
Buffalo Viewpoint - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	124	59	24	12	9	26	39	80	67	32	38	44	30	28	27	38	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	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	124	59	24	12	9	26	39	80	67	32	38	44	30	28	28	43	683

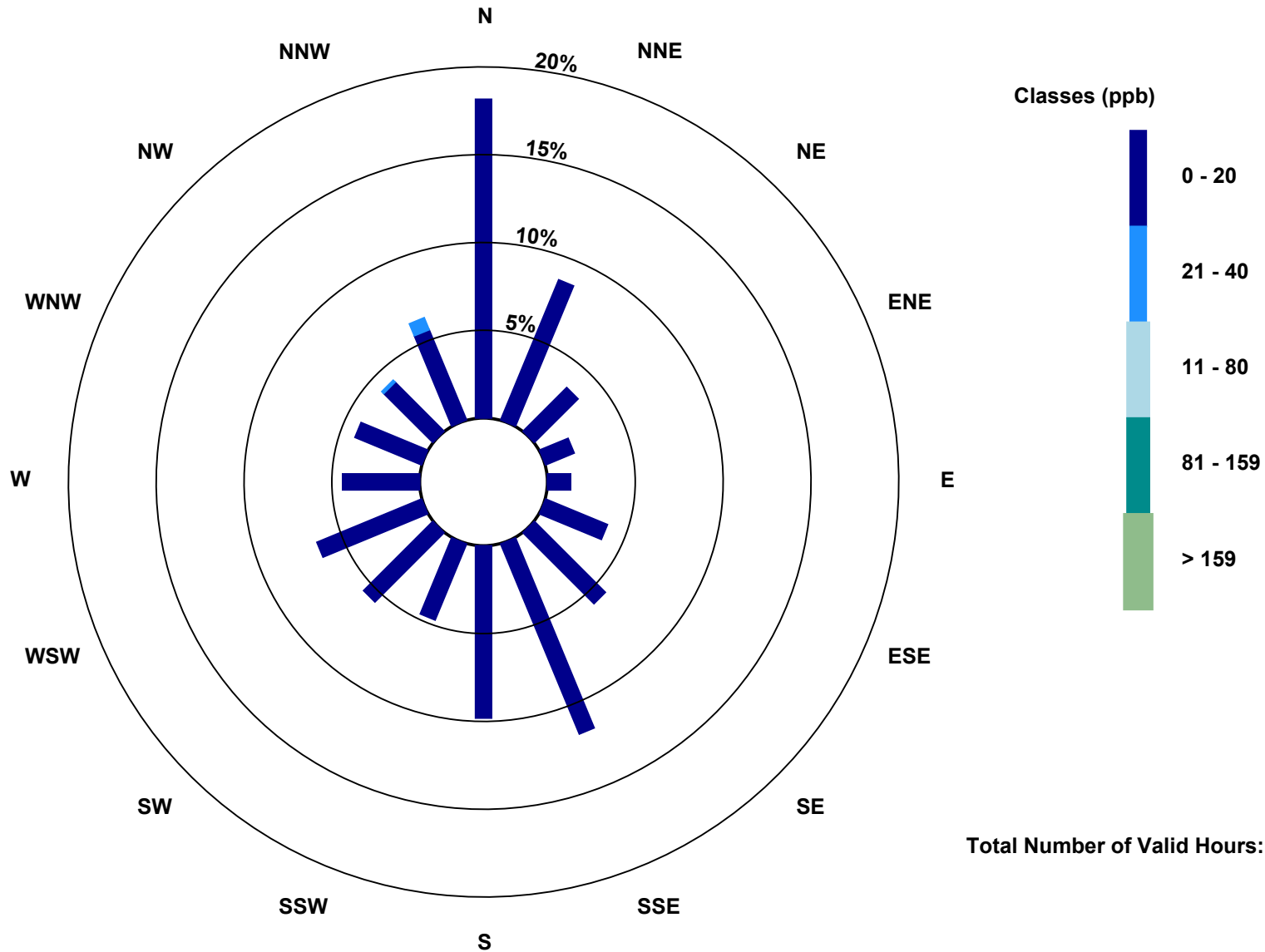
Total Number of Valid Hours: 683

Total Number of Hours: 720

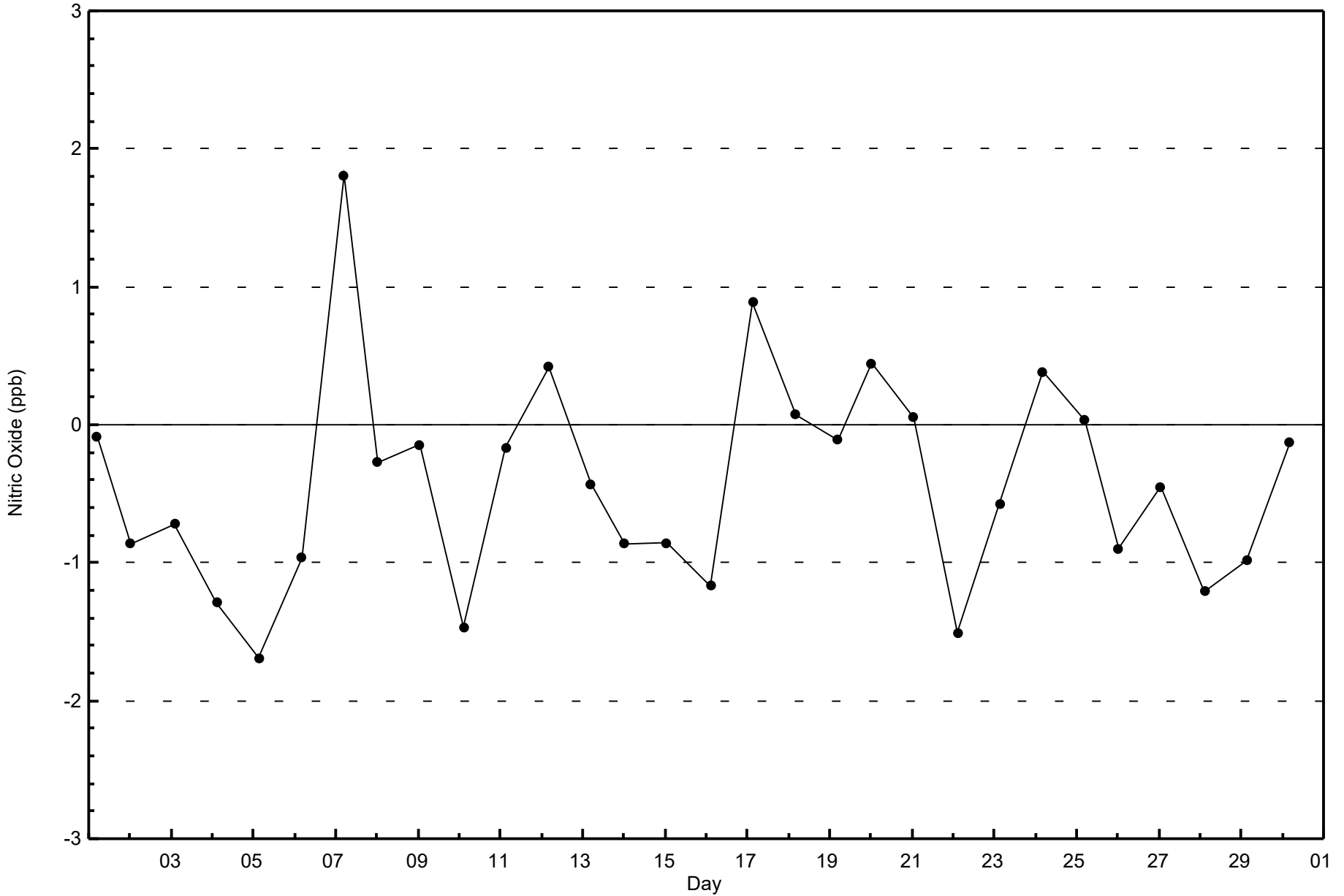


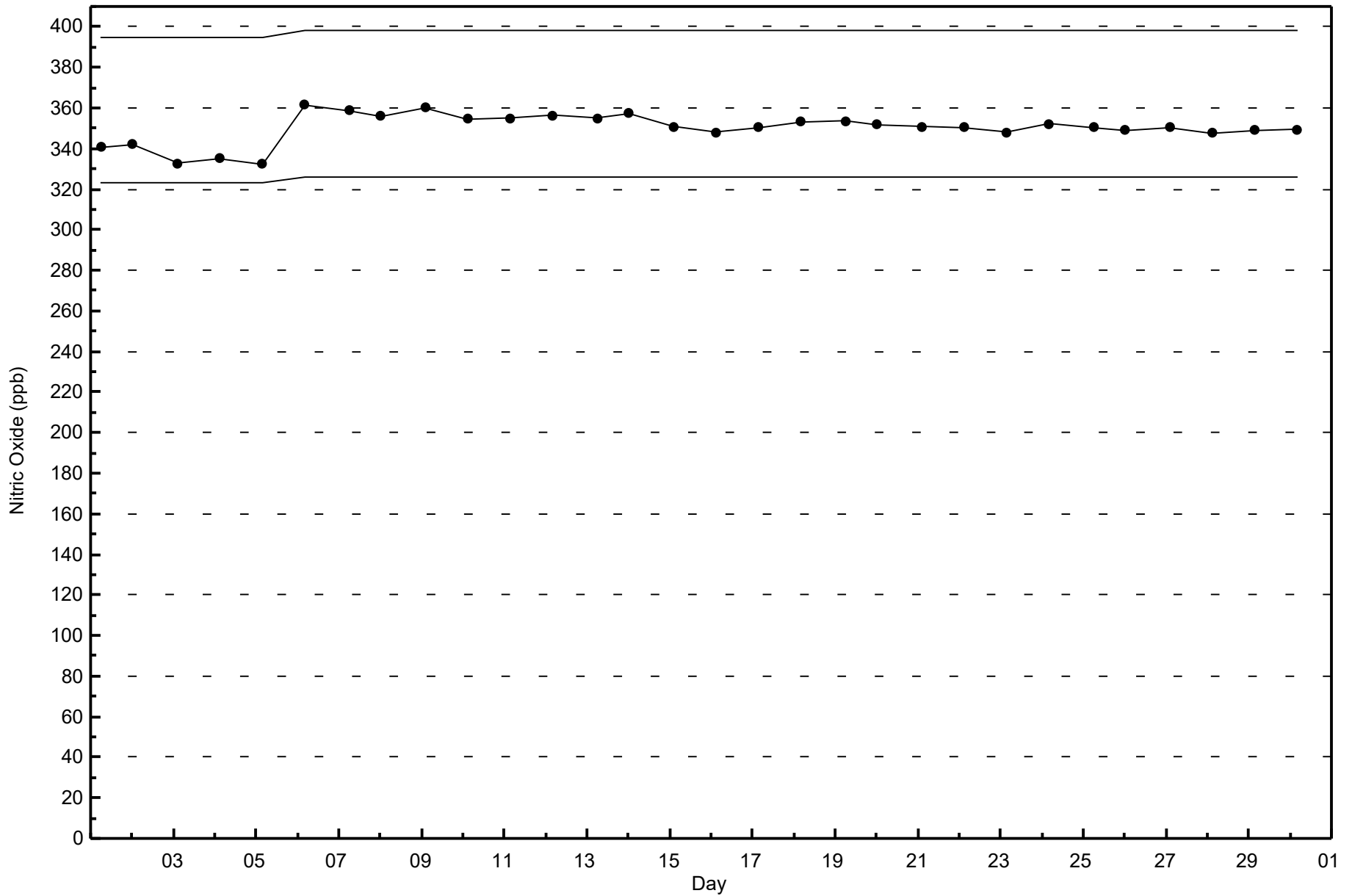
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Buffalo Viewpoint



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

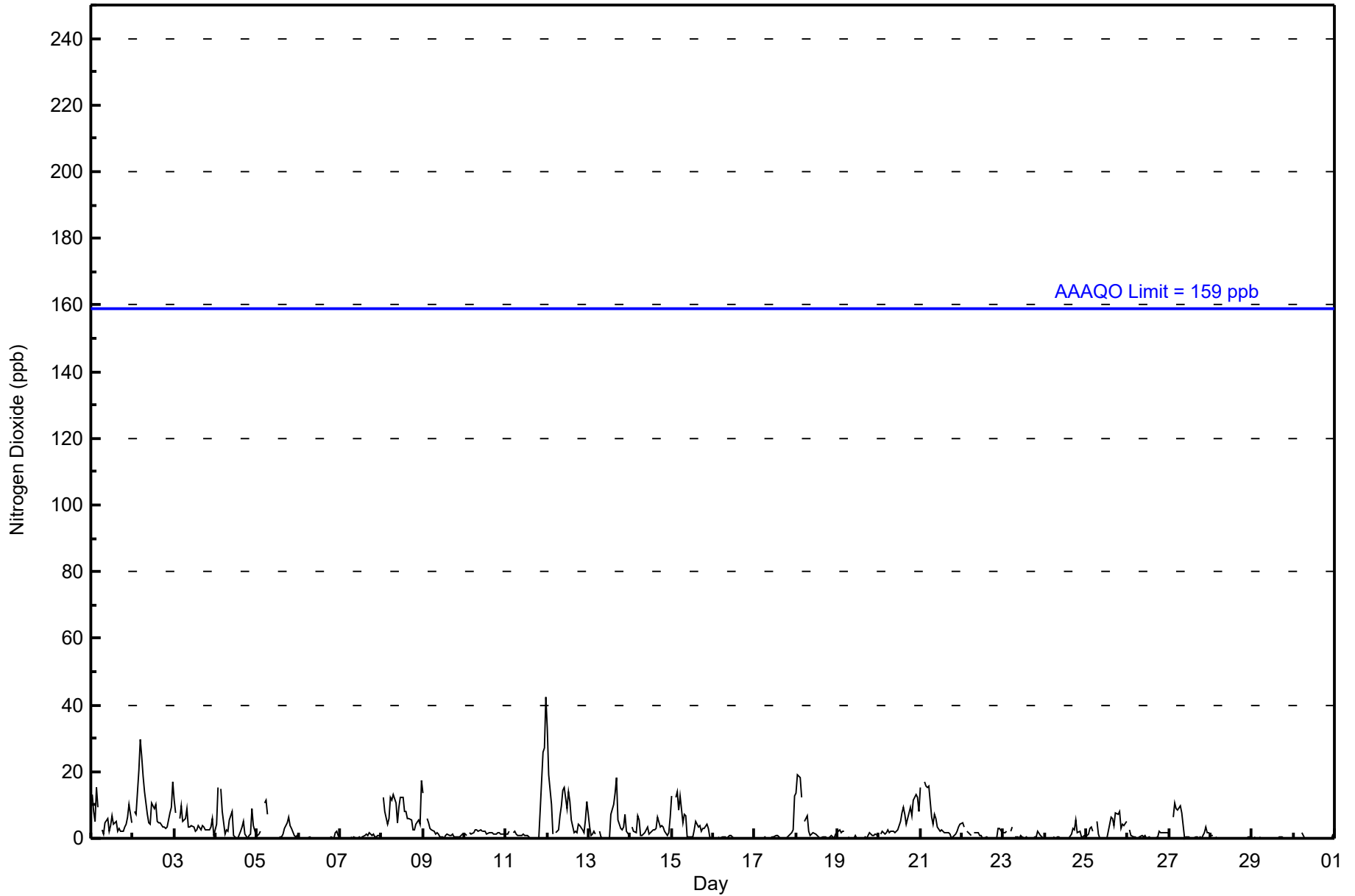
Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	720						
Maximum Value: 42.5 ppb on Jun 12 00:00		Maximum Daily Average: 10.0 ppb on Jun 2		Hours of Data:																	683						
Minimum Value: 0.0 ppb on Jun 4 19:00		Minimum Daily Average: 0.1 ppb on Jun 29		Hours of Missing Data:																	37						
Maximum Diurnal Average: 5.4 ppb at hour 1		Minimum Diurnal Average: 1.8 ppb at hour 20		Hours of Calibration:																	35						
Monthly Average: 3.06 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 1.3 Q ₃ = 3.7 P ₉₀ = 8.9 P ₉₉ = 19.3		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-Jun	13.0	8.0	5.1	15.4	9.4	Z	2.5	1.1	4.6	6.1	2.0	3.7	6.8	4.4	5.1	2.2	3.0	2.3	2.0	3.4	4.1	6.4	10.0	4.7	5.4	15.4	
2-Jun	Z	8.0	7.1	20.2	29.6	24.6	18.5	14.0	7.4	4.8	4.1	10.5	9.1	10.2	5.1	4.7	4.5	3.3	3.6	3.0	3.3	7.6	9.4	17.0	10.0	29.6	
3-Jun	11.3	7.6	Z	6.0	9.9	4.9	5.9	9.1	3.3	3.2	3.8	3.4	2.2	2.4	3.7	2.6	4.0	3.5	2.4	2.4	2.6	3.6	6.1	0.7	4.5	11.3	
4-Jun	4.2	15.4	Z	14.7	8.0	1.3	2.5	2.1	5.7	8.1	0.9	0.3	0.1	0.2	2.1	3.3	5.1	1.1	0.0	0.8	1.3	8.9	3.8	0.8	3.9	15.4	
5-Jun	0.8	1.1	2.0	Z	10.6	11.3	7.4	C	C	C	C	C	0.0	0.3	0.5	1.1	3.0	4.5	6.5	3.9	2.8	1.0	0.3	0.7	3.2	11.3	
6-Jun	0.1	0.0	0.0	0.0	Z	0.1	0.4	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	1.5	2.0	0.7	0.3	2.0	
7-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.5	0.1	0.4	0.0	0.0	0.3	0.0	0.4	1.0	1.2	1.0	1.5	0.8	1.2	0.6	0.6	1.0	0.9	0.5	1.5	
8-Jun	Z	12.3	8.0	4.4	5.8	12.4	11.6	13.3	10.4	4.7	9.3	12.2	12.1	8.2	8.0	6.0	6.1	5.3	2.7	2.7	4.2	5.4	4.4	17.2	8.1	17.2	
9-Jun	13.4	Z	5.9	4.8	3.1	2.4	2.0	1.3	1.6	1.2	0.6	0.5	0.2	1.0	1.1	0.9	0.8	1.1	0.5	0.4	0.3	0.6	0.7	1.1	2.0	13.4	
10-Jun	1.4	0.8	Z	1.5	1.3	1.5	2.4	2.5	2.1	2.4	2.3	2.2	2.0	1.4	1.8	1.5	1.5	1.2	1.4	1.6	1.8	1.2	1.1	1.1	1.7	2.5	
11-Jun	1.3	1.4	2.1	Z	1.9	2.2	1.2	0.9	0.9	1.0	1.2	0.8	0.9	0.5	0.0	0.0	0.0	0.0	0.1	0.0	8.6	25.9	27.2	42.5	5.2	42.5	
12-Jun	33.2	19.1	10.0	1.3	Z	1.9	2.6	6.8	9.6	14.2	15.1	8.7	14.0	11.0	5.4	1.9	2.3	1.7	4.1	3.9	2.5	1.5	5.3	10.9	8.1	33.2	
13-Jun	3.6	1.0	1.1	2.1	1.3	Z	2.1	0.4	0.0	0.0	0.0	0.0	0.0	7.0	10.2	13.7	18.1	5.6	3.1	2.4	3.6	7.1	2.0	1.0	3.7	18.1	
14-Jun	Z	3.2	2.3	1.6	6.7	5.3	0.8	1.0	1.5	2.7	3.2	1.4	2.1	2.4	2.4	2.9	6.3	3.6	3.7	3.6	2.3	1.0	1.7	6.3	3.0	6.7	
15-Jun	12.7	Z	12.3	14.0	8.6	12.6	4.5	7.0	6.7	0.4	0.3	0.5	0.3	2.5	4.9	3.2	3.9	2.0	2.9	3.0	4.3	3.1	0.5	0.1	4.8	14.0	
16-Jun	0.0	0.0	Z	0.3	0.0	0.5	0.3	0.5	0.1	0.9	1.0	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	
17-Jun	0.0	0.0	0.0	Z	0.1	0.0	0.5	0.0	0.0	0.2	0.3	0.3	0.7	0.9	0.4	0.1	0.0	0.0	0.0	0.3	0.7	1.7	2.7	12.7	0.9	12.7	
18-Jun	13.7	18.9	18.1	12.4	Z	5.0	6.7	2.3	0.8	1.4	1.5	1.2	0.9	0.5	0.2	0.5	0.6	0.5	0.1	0.0	1.0	0.4	0.2	1.2	3.8	18.9	
19-Jun	2.2	2.4	1.7	2.3	2.2	Z	0.3	0.2	0.0	0.1	0.9	0.2	0.0	0.0	0.0	0.0	0.4	0.1	1.5	1.2	0.7	0.9	1.1	0.9	0.8	2.4	
20-Jun	Z	1.2	2.1	1.4	1.8	2.4	1.8	2.2	2.2	1.8	2.1	2.4	5.0	7.7	9.2	7.3	4.4	7.6	9.5	6.9	11.3	13.0	12.4	7.9	5.4	13.0	
21-Jun	15.3	Z	16.9	15.8	15.3	15.7	6.5	4.4	7.1	5.9	3.4	2.3	2.6	2.3	1.7	1.7	1.8	1.1	0.2	0.4	1.3	2.2	3.3	4.4	5.7	16.9	
22-Jun	4.7	3.3	Z	2.1	1.6	0.8	PF	1.9	1.8	1.5	0.7	0.7	0.0	0.2	0.5	0.0	0.2	0.1	0.0	0.2	0.0	2.9	3.0	1.8	1.3	4.7	
23-Jun	1.9	1.7	2.1	Z	2.0	3.4	M	0.6	0.3	0.0	0.7	0.4	0.2	0.4	0.1	0.0	0.1	0.0	0.4	0.5	2.1	0.8	0.4	0.1	0.8	3.4	
24-Jun	0.0	0.0	0.0	0.0	Z	0.5	0.1	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.1	2.5	5.6	1.7	2.2	0.5	0.4	0.8	0.9	5.6	
25-Jun	0.8	1.2	2.9	3.3	2.3	Z	5.1	1.2	0.0	0.0	0.0	0.0	0.0	2.0	6.2	5.9	3.7	7.5	7.0	8.1	3.0	4.3	3.7	5.2	3.2	8.1	
26-Jun	Z	2.6	1.0	0.6	0.4	0.2	0.0	0.3	0.8	0.3	0.9	0.0	0.3	0.0	0.0	0.0	0.2	0.3	2.3	1.7	1.5	1.5	1.6	1.5	0.8	2.6	
27-Jun	1.1	Z	6.5	10.7	9.1	8.3	9.8	7.8	3.7	0.1	0.6	0.5	0.0	0.1	0.1	0.3	0.3	0.2	0.3	0.1	1.5	3.6	1.9	1.7	3.0	10.7	
28-Jun	0.7	0.8	Z	0.5	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	0.3	0.6	0.1	0.8	
29-Jun	0.0	0.0	0.4	Z	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
30-Jun	0.0	0.0	0.0	0.0	Z	1.7	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	1.2	0.1	1.7	
		5.4	4.2	4.5	5.4	5.3	4.8	3.4	2.8	2.5	2.1	1.9	1.8	2.0	2.2	2.3	2.1	2.5	1.9	2.0	1.8	2.3	3.6	3.6	4.9	Diurnal Average	
		33.2	19.1	18.1	20.2	29.6	24.6	18.5	14.0	10.4	14.2	15.1	12.2	14.0	11.0	10.2	13.7	18.1	7.6	9.5	8.1	11.3	25.9	27.2	42.5	Diurnal Maximum	
Z - zerospan		C - Calibration		M - Maintenance		PF - Power Failure																					
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr		159 ppb																							



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	677	99.12	99.12
21 - 40	5	0.73	99.85
41 - 80	1	0.15	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
Buffalo Viewpoint - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	124	59	24	12	9	26	39	80	67	32	38	44	30	28	26	39	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	59	24	12	9	26	39	80	67	32	38	44	30	28	28	43	683

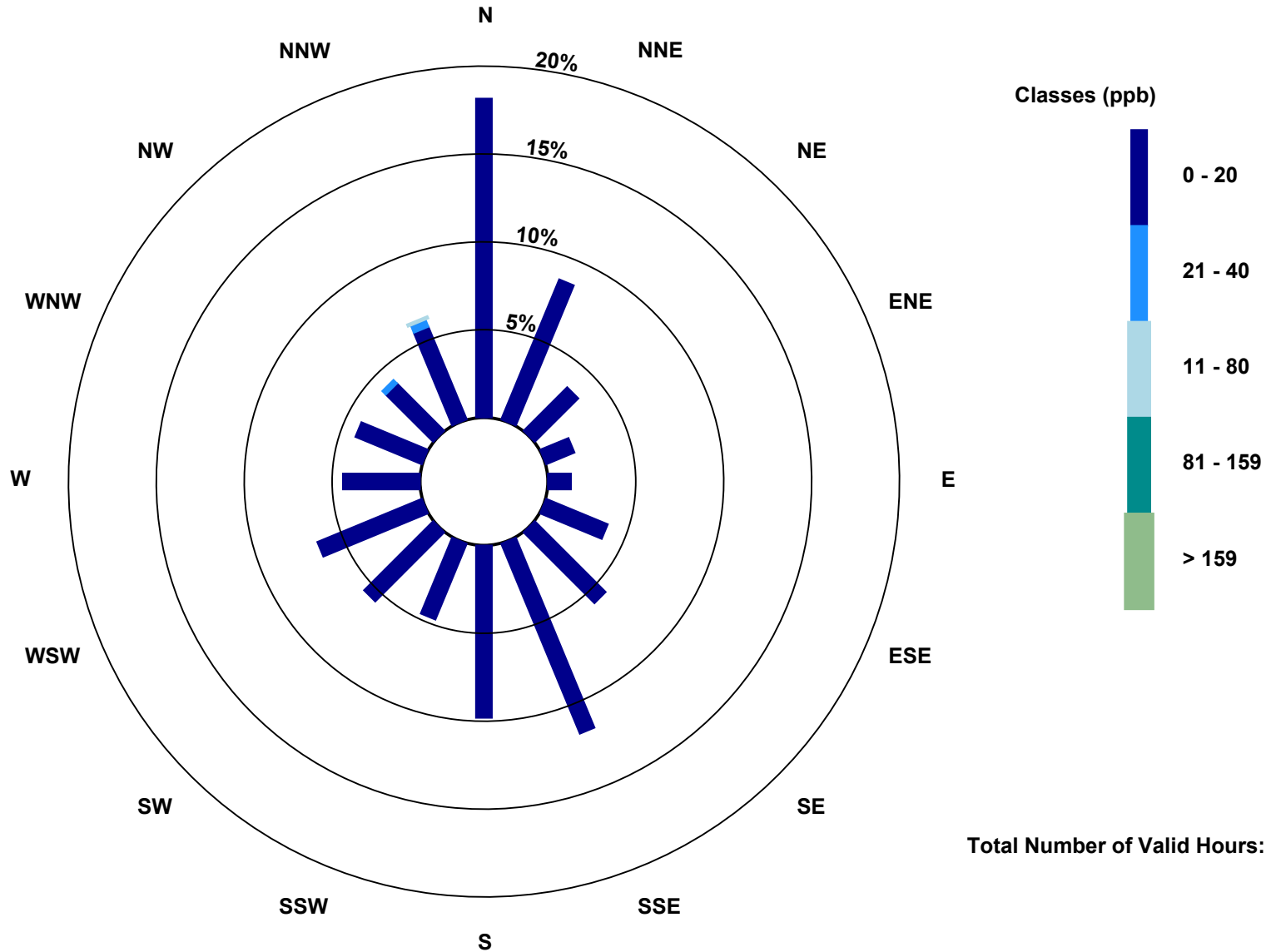
Total Number of Valid Hours: 683

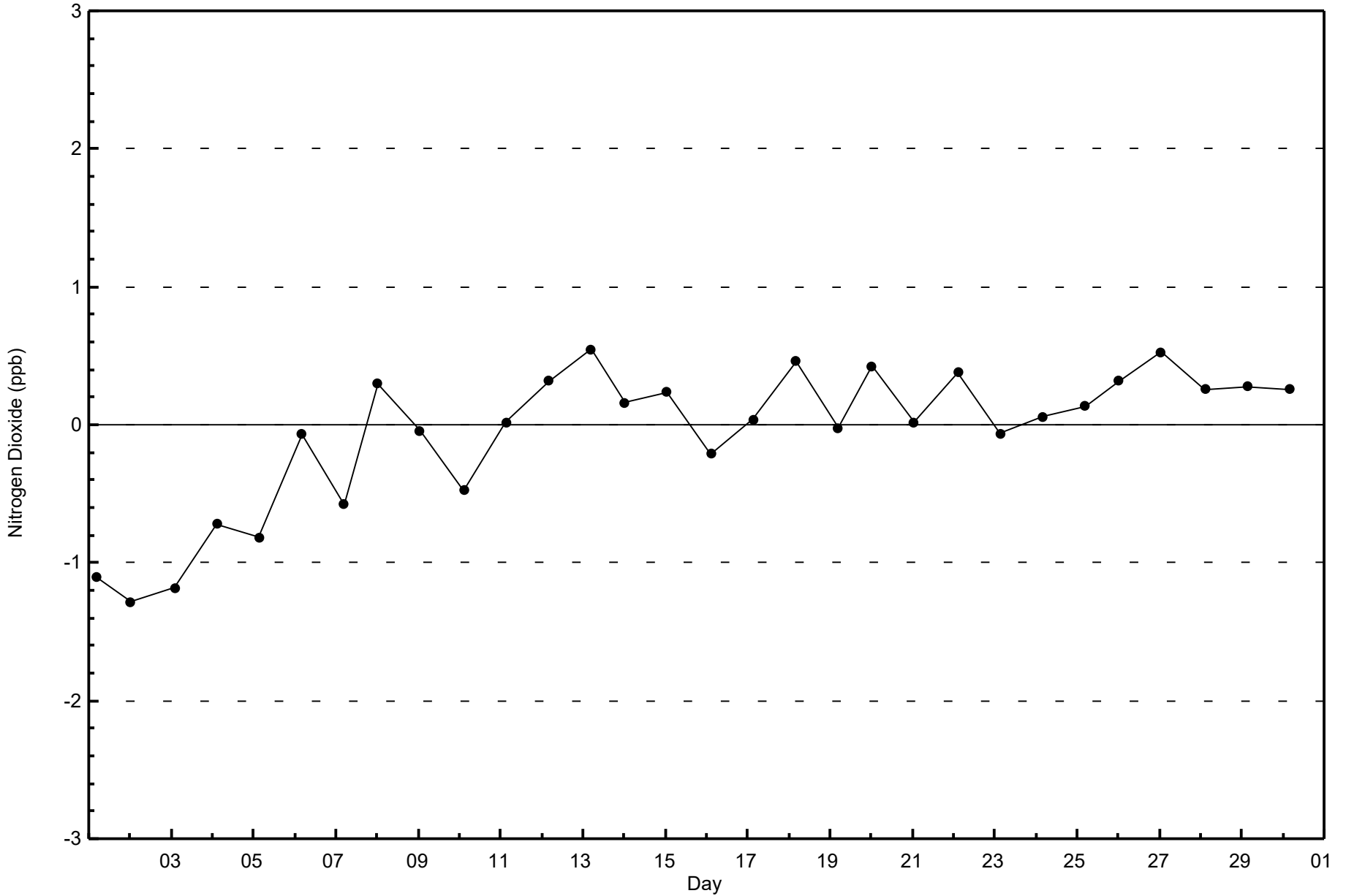
Total Number of Hours: 720

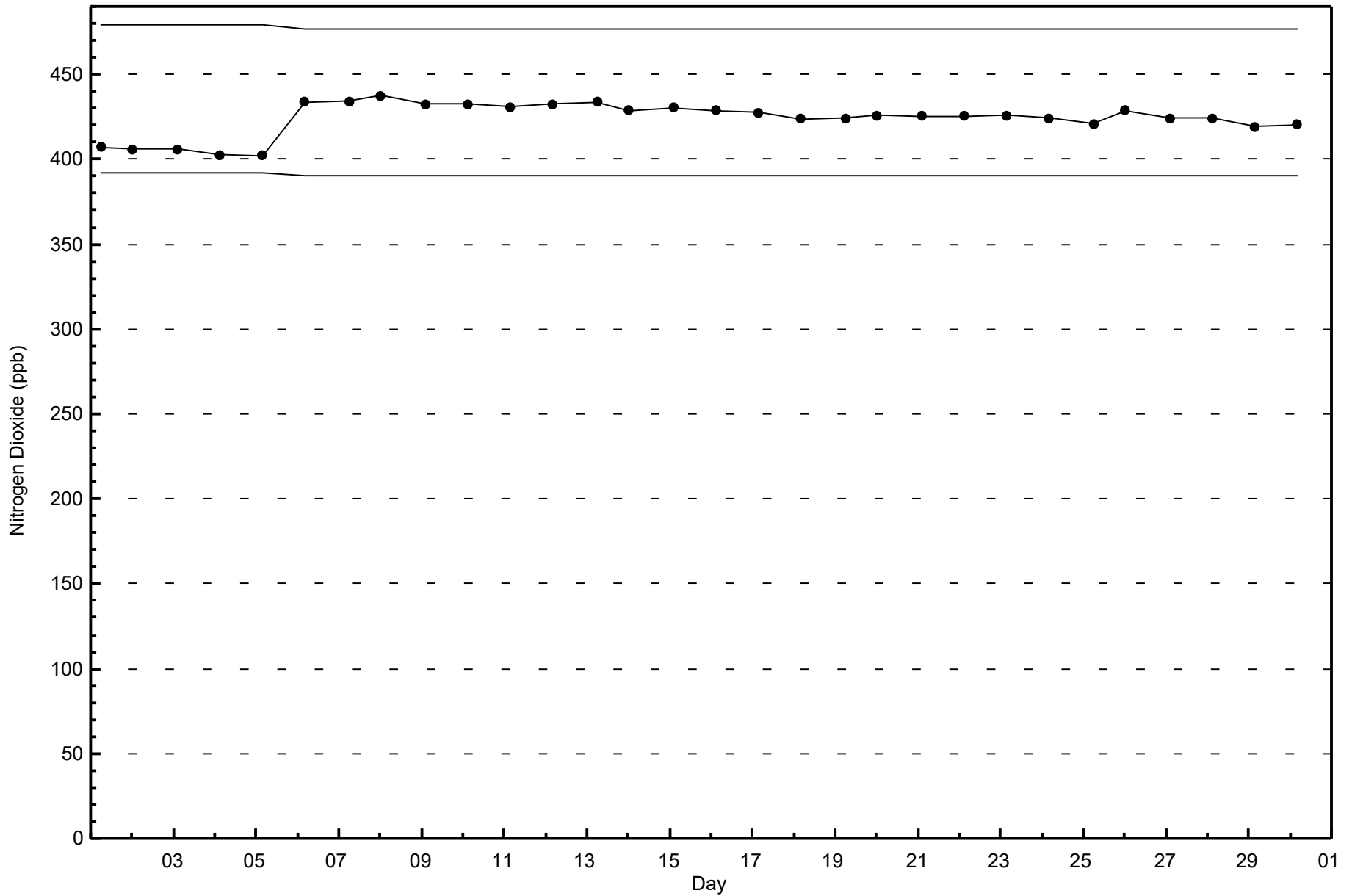


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 54.9 ppb on Jun 12 00:00	Maximum Daily Average: 12.6 ppb on Jun 2		Hours of Data:	683
Minimum Value: 0.0 ppb on Jun 4 19:00	Minimum Daily Average: 0.1 ppb on Jun 29		Hours of Missing Data:	37
Maximum Diurnal Average: 8.5 ppb at hour 5	Minimum Diurnal Average: 2.0 ppb at hour 20		Hours of Calibration:	35
Monthly Average: 3.85 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 1.4 Q ₃ = 4.2 P ₉₀ = 10.7 P ₉₉ = 33.4		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-Jun	13.0	8.0	5.1	15.4	9.4	Z	2.6	1.1	4.9	6.3	2.0	3.8	7.4	4.5	5.9	2.2	3.1	2.3	2.0	3.5	4.1	6.7	10.0	4.9	5.6	15.4
2-Jun	Z	8.3	7.2	27.9	54.8	34.9	24.8	18.1	8.7	5.4	4.3	11.7	9.6	10.9	5.4	5.0	4.6	3.3	3.7	3.0	3.3	7.6	9.4	17.0	12.6	54.8
3-Jun	11.4	7.6	Z	6.3	10.5	5.3	7.3	10.7	3.4	3.5	4.2	3.8	2.4	2.5	4.2	2.8	4.5	3.8	2.7	2.5	2.6	3.6	6.1	0.7	4.9	11.4
4-Jun	4.3	15.4	Z	15.4	8.2	1.3	2.5	2.1	6.8	11.7	1.3	0.5	0.1	0.4	2.1	3.8	6.1	1.2	0.0	0.8	1.3	8.9	3.8	0.8	4.3	15.4
5-Jun	0.8	1.1	2.4	Z	36.4	25.5	11.1	C	C	C	C	C	1.0	0.3	0.5	1.1	3.0	4.5	6.5	4.2	3.2	1.0	0.6	1.0	5.8	36.4
6-Jun	0.4	0.2	0.6	0.0	Z	1.1	0.8	0.6	0.3	0.0	0.0	0.2	0.2	0.3	0.0	0.2	0.1	0.0	0.0	0.4	0.0	1.5	2.0	0.7	0.4	2.0
7-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.5	0.1	0.4	0.0	0.0	0.3	0.0	0.4	1.0	1.2	1.0	1.5	0.8	1.2	0.7	0.6	1.3	1.3	0.5	1.5
8-Jun	Z	13.9	8.6	5.0	6.5	16.1	18.1	21.2	16.7	7.3	13.7	17.6	17.6	10.9	10.3	7.4	7.5	6.0	2.8	2.8	4.2	5.4	4.4	19.1	10.6	21.2
9-Jun	13.9	Z	6.1	4.9	3.9	3.9	3.2	2.0	2.1	1.5	0.6	0.5	0.2	1.0	1.1	0.9	0.8	1.3	0.5	0.4	0.3	0.6	0.7	1.1	2.2	13.9
10-Jun	1.4	0.8	Z	2.0	1.3	1.5	2.4	2.5	2.1	2.4	2.6	2.2	2.1	1.4	2.1	2.1	2.3	2.0	1.9	2.2	2.1	1.4	1.1	1.1	1.9	2.6
11-Jun	1.3	1.4	2.1	Z	2.6	2.4	1.4	1.2	0.9	1.0	1.4	0.8	0.9	0.5	0.0	0.0	0.0	0.0	0.1	0.0	8.6	27.4	33.3	54.9	6.2	54.9
12-Jun	34.1	19.4	10.1	1.3	Z	2.1	2.9	7.9	10.8	15.7	17.1	8.8	14.7	11.2	5.4	1.9	2.3	1.7	4.1	3.9	2.5	1.5	5.3	10.9	8.5	34.1
13-Jun	3.8	1.0	1.1	2.2	1.3	Z	2.1	0.4	0.0	0.0	0.0	0.0	0.0	7.0	10.5	13.7	18.5	5.6	3.2	2.4	3.6	7.4	2.0	1.1	3.8	18.5
14-Jun	Z	3.5	2.3	1.6	7.6	5.7	1.3	1.1	1.9	3.8	5.0	2.1	2.6	2.9	2.9	3.8	13.4	4.7	3.8	3.7	2.3	1.0	1.7	7.7	3.8	13.4
15-Jun	18.0	Z	14.6	17.4	9.1	16.8	5.5	8.6	8.0	0.7	0.3	0.5	0.3	3.1	6.8	4.2	5.5	2.6	3.5	3.0	4.3	3.1	0.5	0.1	5.9	18.0
16-Jun	0.0	0.0	Z	0.3	0.0	0.5	0.3	0.5	0.1	0.9	1.0	0.3	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0
17-Jun	0.0	0.0	0.0	Z	0.3	0.0	0.5	0.3	0.0	0.2	0.3	0.3	0.8	0.9	0.4	0.1	0.0	0.0	0.0	0.3	0.7	1.7	2.7	13.1	1.0	13.1
18-Jun	14.4	20.2	19.3	14.6	Z	8.0	11.9	3.8	1.4	2.0	2.5	1.5	1.2	0.8	0.5	0.8	0.7	0.5	0.1	0.0	1.0	0.4	0.4	1.2	4.7	20.2
19-Jun	2.2	2.4	1.7	2.3	2.4	Z	0.6	0.2	0.0	0.1	0.9	0.2	0.0	0.0	0.0	0.0	0.4	0.1	1.6	1.2	0.7	0.9	1.1	0.9	0.9	2.4
20-Jun	Z	1.2	2.1	1.4	1.8	2.4	1.8	2.4	2.6	2.1	2.2	2.4	5.8	10.6	13.8	10.2	5.3	9.4	11.9	7.6	12.1	13.4	13.9	8.4	6.3	13.9
21-Jun	24.3	Z	37.4	28.0	32.6	40.7	9.4	6.6	10.2	9.6	5.8	4.2	4.2	4.0	2.8	2.7	2.8	1.7	0.9	1.3	1.8	2.7	4.1	4.8	10.5	40.7
22-Jun	5.5	4.0	Z	3.9	3.2	2.0	PF	3.7	2.9	1.6	0.8	0.8	0.0	0.2	0.8	0.4	0.2	0.2	0.1	0.2	0.0	2.9	3.0	1.8	1.7	5.5
23-Jun	1.9	1.7	2.1	Z	2.5	3.7	M	0.6	0.3	0.0	0.7	0.4	0.4	0.4	0.1	0.0	0.1	0.0	0.4	0.5	2.1	0.8	0.4	0.1	0.9	3.7
24-Jun	0.0	0.0	0.0	0.0	Z	0.5	0.1	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.1	2.5	5.6	1.7	2.2	0.6	0.4	0.8	0.9	5.6
25-Jun	0.8	1.2	2.9	3.3	2.4	Z	6.8	1.8	0.3	0.0	0.1	0.2	0.4	3.2	9.2	8.3	5.1	9.8	8.4	9.0	3.9	5.0	4.3	5.8	4.0	9.8
26-Jun	Z	3.6	1.7	1.2	1.2	0.7	0.4	0.7	0.8	0.3	1.0	0.0	0.3	0.0	0.0	0.0	0.6	0.4	2.5	1.9	1.6	1.6	1.6	1.5	1.0	3.6
27-Jun	1.1	Z	31.0	32.8	12.9	13.4	16.1	13.8	7.2	0.9	1.3	0.9	0.6	0.4	0.5	0.8	0.7	0.8	0.4	0.6	1.8	3.7	2.0	2.5	6.3	32.8
28-Jun	1.1	1.0	Z	1.0	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.2	1.1
29-Jun	0.0	0.0	0.4	Z	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.5
30-Jun	0.0	0.0	0.0	0.0	Z	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.4	0.2	0.1	0.0	0.2	1.7	0.2	2.2

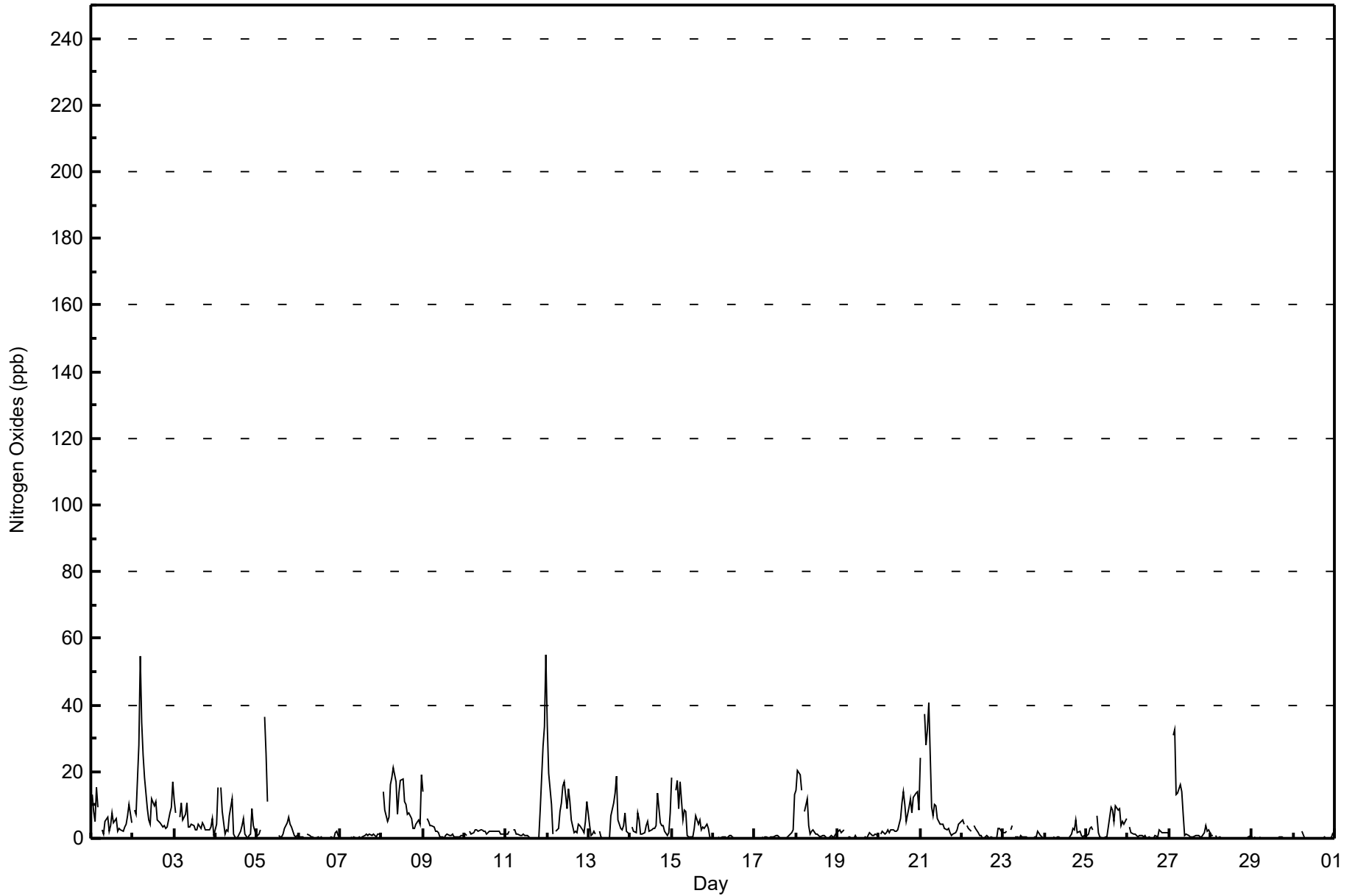
6.1	4.5	6.6	7.5	8.5	7.7	4.8	3.9	3.2	2.7	2.4	2.2	2.4	2.6	2.9	2.5	3.1	2.2	2.3	2.0	2.4	3.7	3.9	5.5	Diurnal Average	
34.1	20.2	37.4	32.8	54.8	40.7	24.8	21.2	16.7	15.7	17.1	17.6	17.6	11.2	13.8	13.7	18.5	9.8	11.9	9.0	12.1	27.4	33.3	54.9	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	665	97.36	97.36
21 - 40	15	2.20	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**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	123	59	24	12	9	26	39	80	67	32	38	44	30	28	22	32	665
21 - 40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8	15
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	59	24	12	9	26	39	80	67	32	38	44	30	28	28	43	683

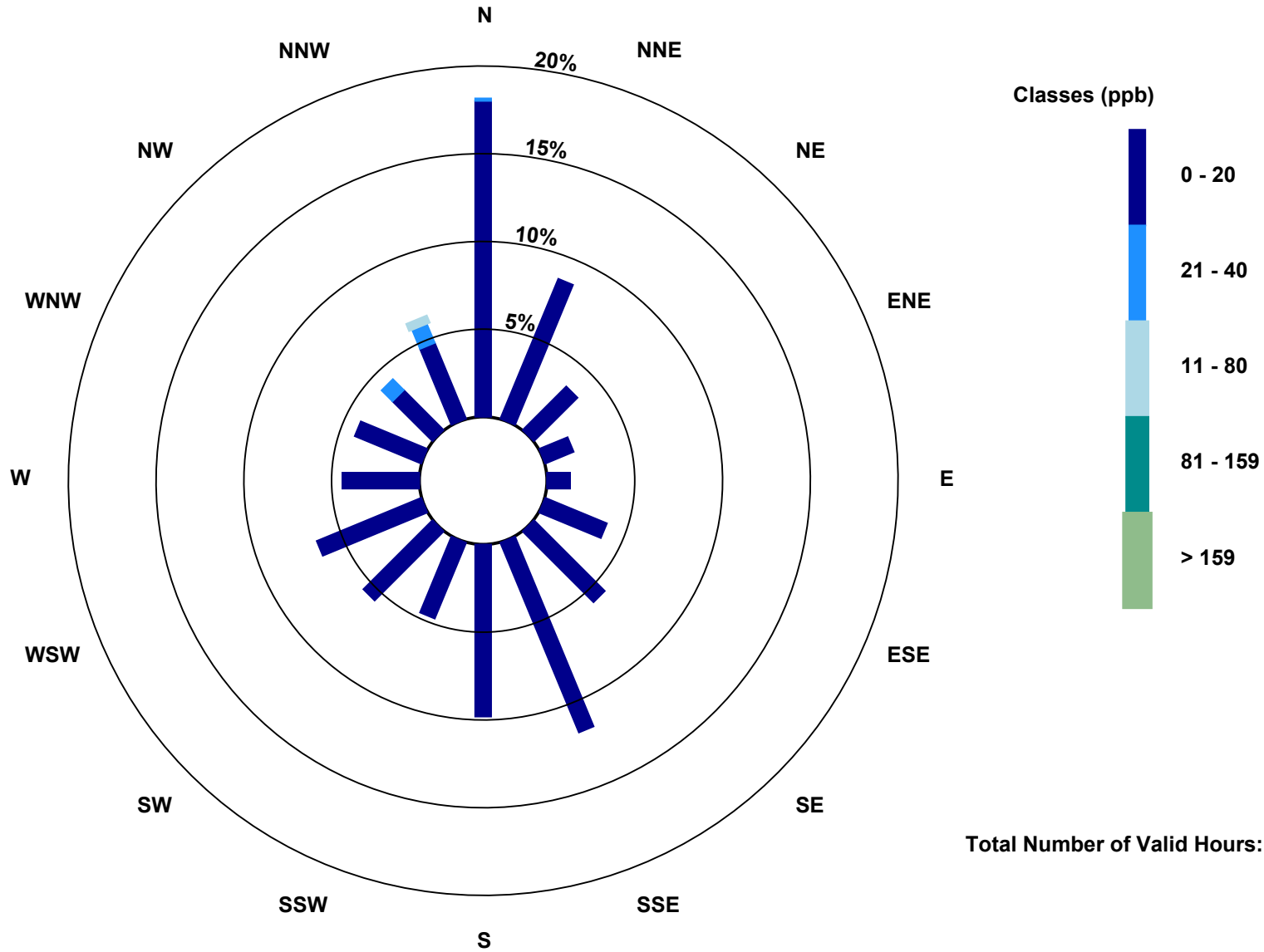
Total Number of Valid Hours: 683

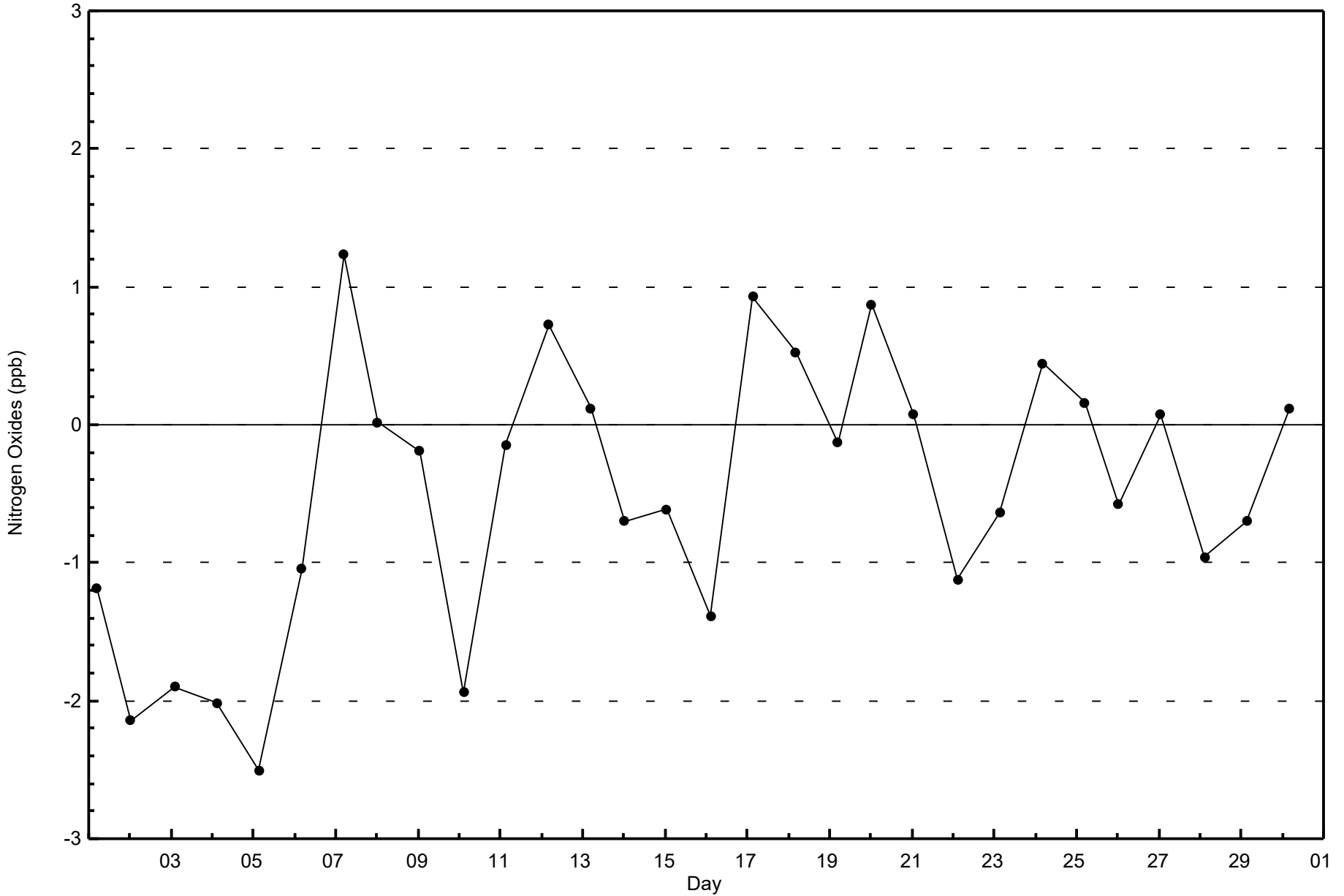
Total Number of Hours: 720

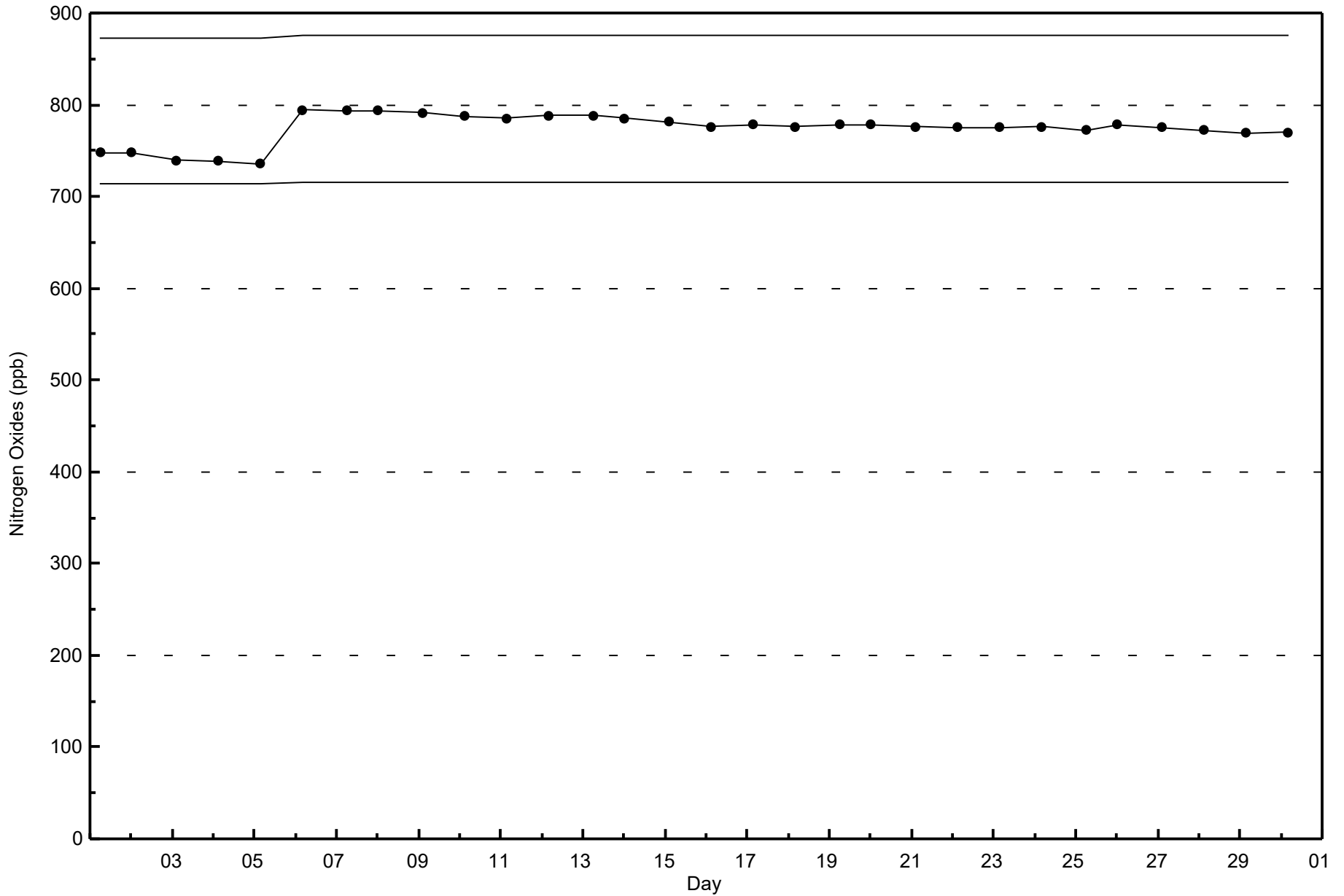


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

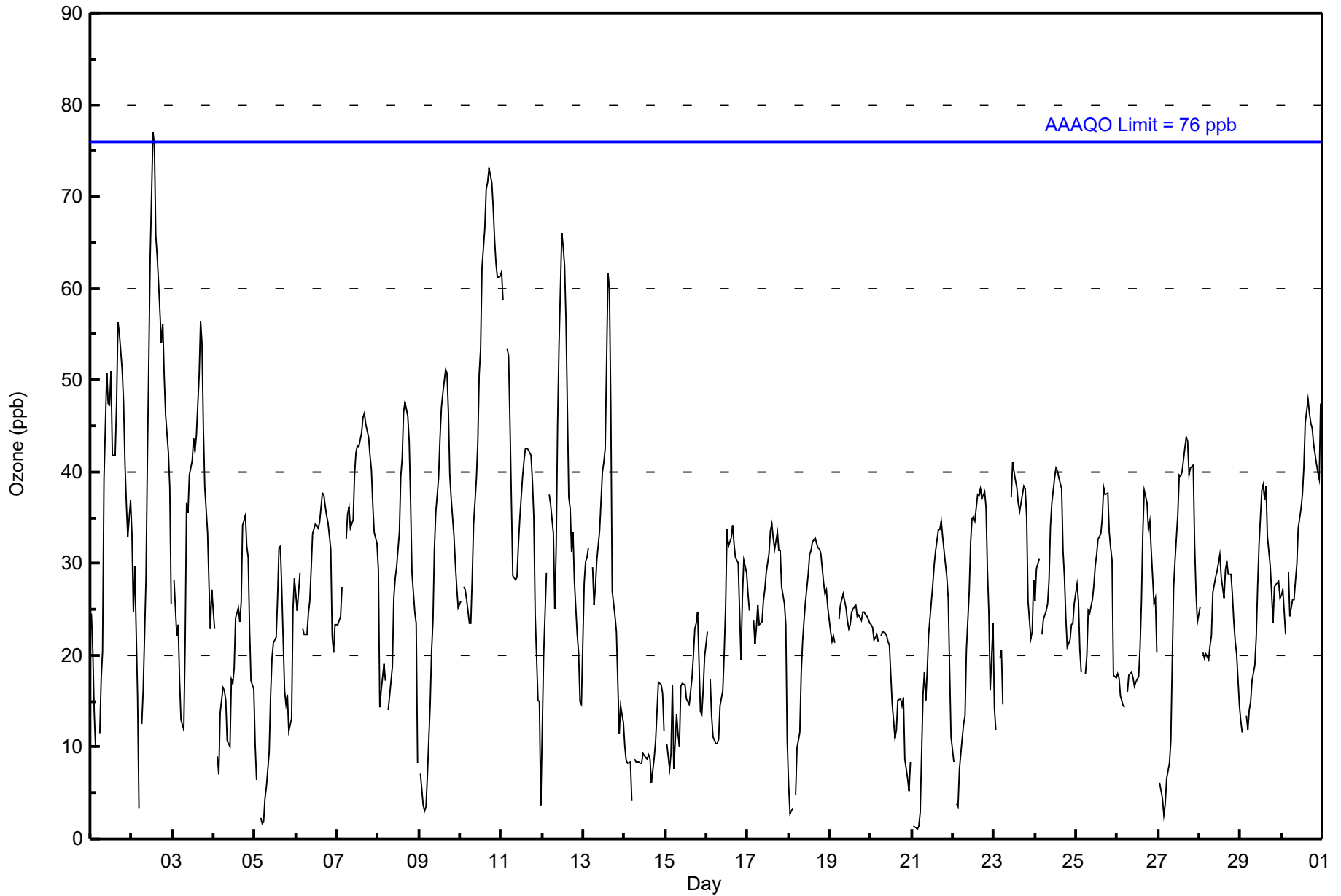
Ozone (O₃) - ppb

Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 0	Hours in Service:	720
Maximum Value: 77.0 ppb on Jun 2 13:00	Maximum Daily Average: 49.5 ppb on Jun 10		Hours of Data:	686
Minimum Value: 1.0 ppb on Jun 21 04:00	Minimum Daily Average: 9.9 ppb on Jun 14		Hours of Missing Data:	34
Maximum Diurnal Average: 38.1 ppb at hour 16	Minimum Diurnal Average: 16.3 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 27.65 ppb	Percentiles: P ₁ = 2.5 P ₁₀ = 10.7 Q ₁ = 17.8 Median = 26.2 Q ₃ = 35.4 P ₉₀ = 44.1 P ₉₉ = 66.8		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-Jun	24.5	20.7	13.9	10.0	Z	11.4	17.4	20.4	39.3	50.7	47.4	47.3	51.0	41.8	41.8	47.5	56.3	55.1	51.1	47.5	40.9	36.4	33.0	36.9	36.6	56.3																						
2-Jun	33.1	24.8	29.7	15.6	3.4	Z	12.5	16.1	28.2	41.2	51.9	63.3	77.0	75.7	65.7	63.5	60.5	54.0	56.1	50.5	46.3	42.1	38.4	25.6	42.4	77.0																						
3-Jun	Z	28.3	22.1	23.4	17.3	13.0	11.8	21.7	36.6	35.5	39.7	41.2	43.7	42.2	44.0	50.7	56.5	54.0	44.7	38.2	33.4	27.8	22.9	27.2	33.7	56.5																						
4-Jun	22.9	Z	8.9	7.1	13.8	16.4	16.2	15.2	10.7	10.1	17.4	16.9	18.5	24.1	25.1	23.6	25.7	34.2	35.2	31.8	30.7	22.9	17.3	16.4	20.0	35.2																						
5-Jun	10.2	6.5	Z	2.2	1.7	1.8	4.4	5.6	9.4	15.5	19.7	21.4	22.0	26.2	31.8	31.9	27.2	16.2	14.6	15.7	11.8	13.2	25.0	28.4	15.8	31.9																						
6-Jun	26.7	24.8	28.9	Z	22.9	22.3	22.3	24.5	25.9	29.4	33.3	34.4	34.1	33.8	34.5	37.6	37.5	36.4	35.2	34.4	31.6	22.1	20.2	23.3	29.4	37.6																						
7-Jun	23.3	23.8	24.3	27.5	Z	32.7	35.4	36.2	33.8	34.8	39.9	42.1	42.9	42.7	44.3	45.9	46.3	45.2	43.8	41.8	40.2	36.4	33.3	32.1	36.9	46.3																						
8-Jun	29.3	14.3	16.2	19.0	17.3	Z	14.0	15.5	18.8	26.2	28.4	29.5	33.5	39.6	41.6	46.6	47.6	46.0	43.3	36.8	28.9	24.7	23.5	8.2	28.2	47.6																						
9-Jun	Z	7.1	3.7	3.1	3.6	6.9	14.7	20.5	23.8	31.6	35.5	39.4	43.7	47.0	48.4	51.1	50.8	46.5	39.7	37.0	32.9	29.9	27.2	25.1	29.1	51.1																						
10-Jun	25.9	Z	27.5	27.2	26.1	23.5	23.5	28.4	34.3	39.2	43.1	50.6	53.3	62.3	66.5	70.7	71.5	73.1	71.5	68.7	65.3	62.7	61.2	61.3	49.5	73.1																						
11-Jun	61.8	58.7	Z	53.4	52.7	45.2	36.9	28.6	28.2	28.5	32.0	35.0	39.5	41.2	42.6	42.6	42.4	41.8	39.1	35.1	24.4	15.2	15.0	3.6	36.7	61.8																						
12-Jun	11.6	19.8	29.0	Z	37.6	36.5	33.3	25.1	31.9	45.2	53.7	66.1	64.5	62.4	56.4	37.3	36.0	31.3	33.3	28.1	22.3	20.2	14.9	14.7	35.3	66.1																						
13-Jun	27.9	30.2	30.7	31.7	Z	29.6	25.5	27.4	30.4	33.5	36.7	40.0	41.1	42.5	61.7	60.0	47.2	27.0	24.2	22.6	17.0	11.5	14.5	12.6	31.5	61.7																						
14-Jun	10.1	8.5	8.3	8.3	4.2	Z	8.7	8.4	8.4	8.3	8.2	9.3	8.9	8.7	9.1	8.7	6.2	8.8	10.7	13.8	17.0	16.7	15.9	11.7	9.9	17.0																						
15-Jun	Z	10.4	7.6	9.3	16.7	7.7	13.6	11.4	10.1	16.6	16.9	16.8	15.2	15.0	14.7	17.6	19.9	22.9	23.5	24.7	13.8	13.6	16.4	19.9	15.4	24.7																						
16-Jun	22.6	Z	17.4	13.4	11.2	10.4	10.3	10.9	14.5	16.1	20.3	25.3	33.7	31.9	32.8	34.2	32.2	30.7	30.1	24.7	19.5	26.4	30.4	29.0	23.0	34.2																						
17-Jun	26.7	24.9	Z	23.9	21.1	23.0	25.4	23.4	23.6	26.0	27.1	29.0	31.1	33.6	34.3	32.9	31.6	33.4	31.4	31.4	27.5	25.6	23.3	10.7	27.0	34.3																						
18-Jun	5.9	2.8	3.3	Z	4.7	10.0	11.5	18.1	21.5	23.8	25.8	28.8	31.0	31.4	32.4	32.8	32.1	31.8	31.6	31.1	27.9	26.7	27.1	25.2	22.5	32.8																						
19-Jun	22.6	21.6	22.1	21.4	Z	24.0	25.5	26.1	26.7	25.2	23.7	22.9	23.4	24.7	25.3	25.5	24.2	24.4	23.8	24.7	24.8	24.5	24.2	23.6	24.1	26.7																						
20-Jun	23.3	23.1	21.7	22.3	21.5	Z	22.2	22.6	22.5	22.1	21.5	21.1	14.7	12.8	11.0	12.0	15.1	15.2	14.5	15.4	8.8	6.5	5.2	8.4	16.7	23.3																						
21-Jun	Z	1.4	1.2	1.0	1.4	2.9	15.7	18.1	15.1	18.2	22.2	25.9	27.7	29.9	31.5	33.7	33.7	34.6	33.0	31.4	28.5	26.2	18.5	11.2	20.1	34.6																						
22-Jun	8.4	Z	3.8	3.5	7.7	11.1	12.5	13.5	20.6	27.0	32.4	34.9	35.1	34.6	37.5	37.4	38.1	37.1	37.8	36.1	29.3	24.7	16.1	23.5	24.4	38.1																						
23-Jun	14.1	11.8	Z	19.6	20.6	14.6	C	C	C	C	37.2	41.0	39.0	38.3	36.6	35.7	36.7	38.5	38.2	35.1	25.9	21.8	22.6	28.3	29.2	41.0																						
24-Jun	25.9	29.4	30.5	Z	22.2	24.0	24.9	25.6	28.3	34.0	36.6	39.3	40.4	40.1	39.4	38.1	31.5	28.5	24.2	20.8	21.7	23.3	23.5	25.7	29.5	40.4																						
25-Jun	27.7	25.9	20.6	18.1	Z	18.0	19.9	24.9	24.6	26.1	27.6	29.8	30.9	32.6	33.3	34.9	38.3	37.5	37.7	33.3	31.8	30.4	17.8	17.6	27.8	38.3																						
26-Jun	18.0	17.5	15.5	14.6	14.4	Z	16.0	17.8	18.1	17.5	16.6	17.1	17.7	20.7	25.7	33.4	38.0	36.6	33.7	34.7	31.4	25.7	26.2	20.3	22.9	38.0																						
27-Jun	Z	6.1	4.5	2.5	3.8	6.6	8.3	10.7	19.1	27.5	30.4	35.4	39.6	39.6	40.0	42.5	43.8	43.3	39.7	40.4	40.7	32.0	26.9	23.6	26.4	43.8																						
28-Jun	25.3	Z	20.3	19.8	20.2	19.5	21.0	22.1	26.9	28.6	29.2	30.0	30.9	28.5	26.3	29.3	30.2	28.8	28.8	26.6	23.7	21.5	20.1	14.5	24.9	30.9																						
29-Jun	12.8	11.6	Z	13.4	11.9	14.0	14.9	17.3	18.8	21.9	27.5	32.1	38.0	38.6	36.8	38.5	32.9	29.8	26.9	23.5	27.5	28.0	28.1	26.2	24.8	38.6																						
30-Jun	26.6	27.1	22.2	Z	29.1	24.2	26.1	26.1	28.1	29.9	33.9	36.0	37.5	40.5	45.3	47.9	46.4	45.3	44.7	43.1	40.9	40.0	39.3	47.4	36.0	47.9																						
																								22.7	19.2	17.4	16.4	16.3	18.0	18.8	20.1	23.4	27.2	30.5	33.4	35.3	36.1	37.2	38.1	37.9	36.3	34.7	32.6	28.9	26.0	24.3	22.7	Diurnal Average
																								61.8	58.7	30.7	53.4	52.7	45.2	36.9	36.2	39.3	50.7	53.7	66.1	77.0	75.7	66.5	70.7	71.5	73.1	71.5	68.7	65.3	62.7	61.2	61.3	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Buffalo Viewpoint - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	204	29.74	29.74
21 - 50	438	63.85	93.59
51 - 82	44	6.41	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
Buffalo Viewpoint - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	42	15	4	1	4	6	11	30	22	9	1	4	1	2	17	35	204
21 - 50	76	45	17	10	5	16	23	42	39	21	33	43	29	23	7	9	438
51 - 82	4	3	6	0	0	2	1	8	8	2	2	0	1	3	4	0	44
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	122	63	27	11	9	24	35	80	69	32	36	47	31	28	28	44	686

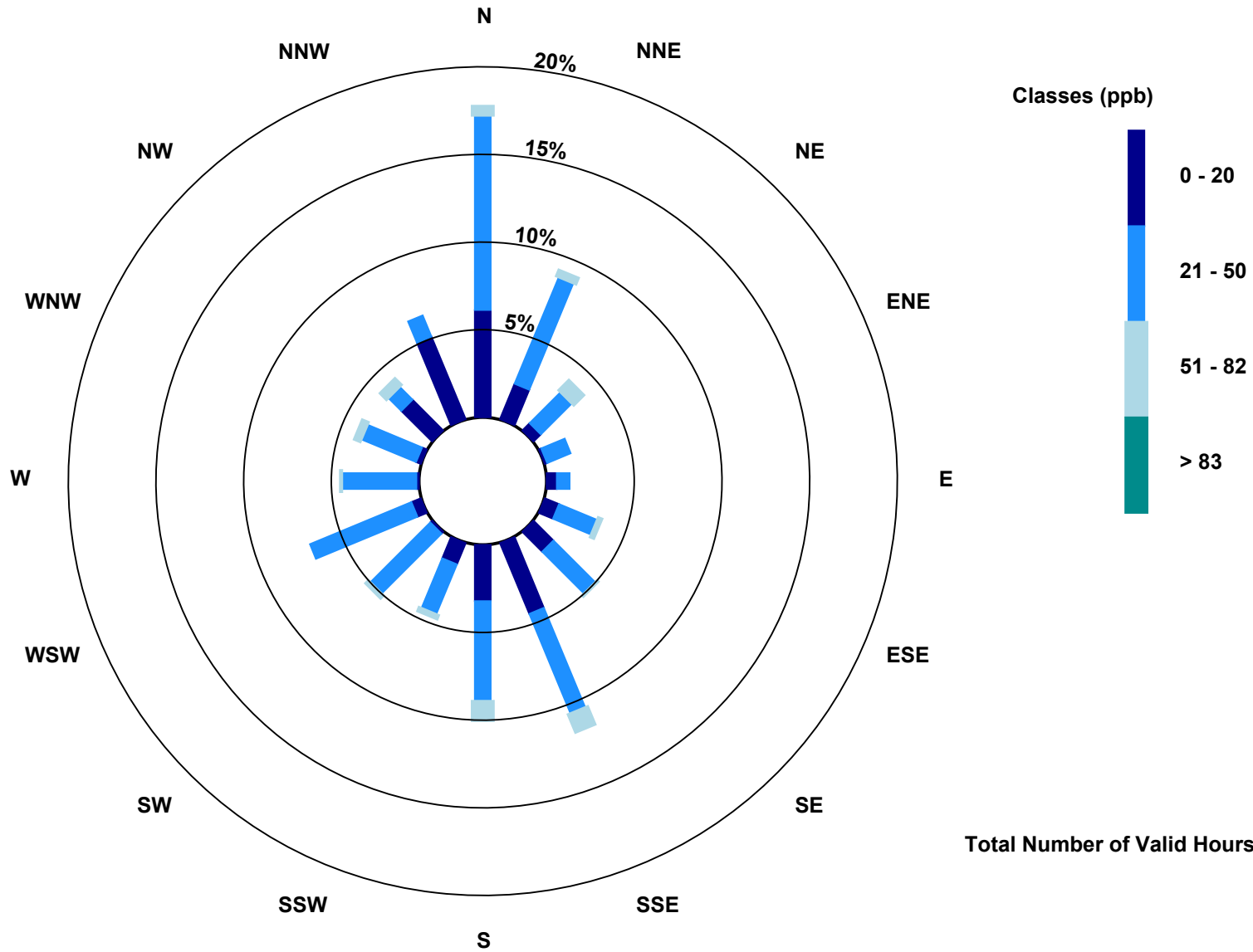
Total Number of Valid Hours: 686

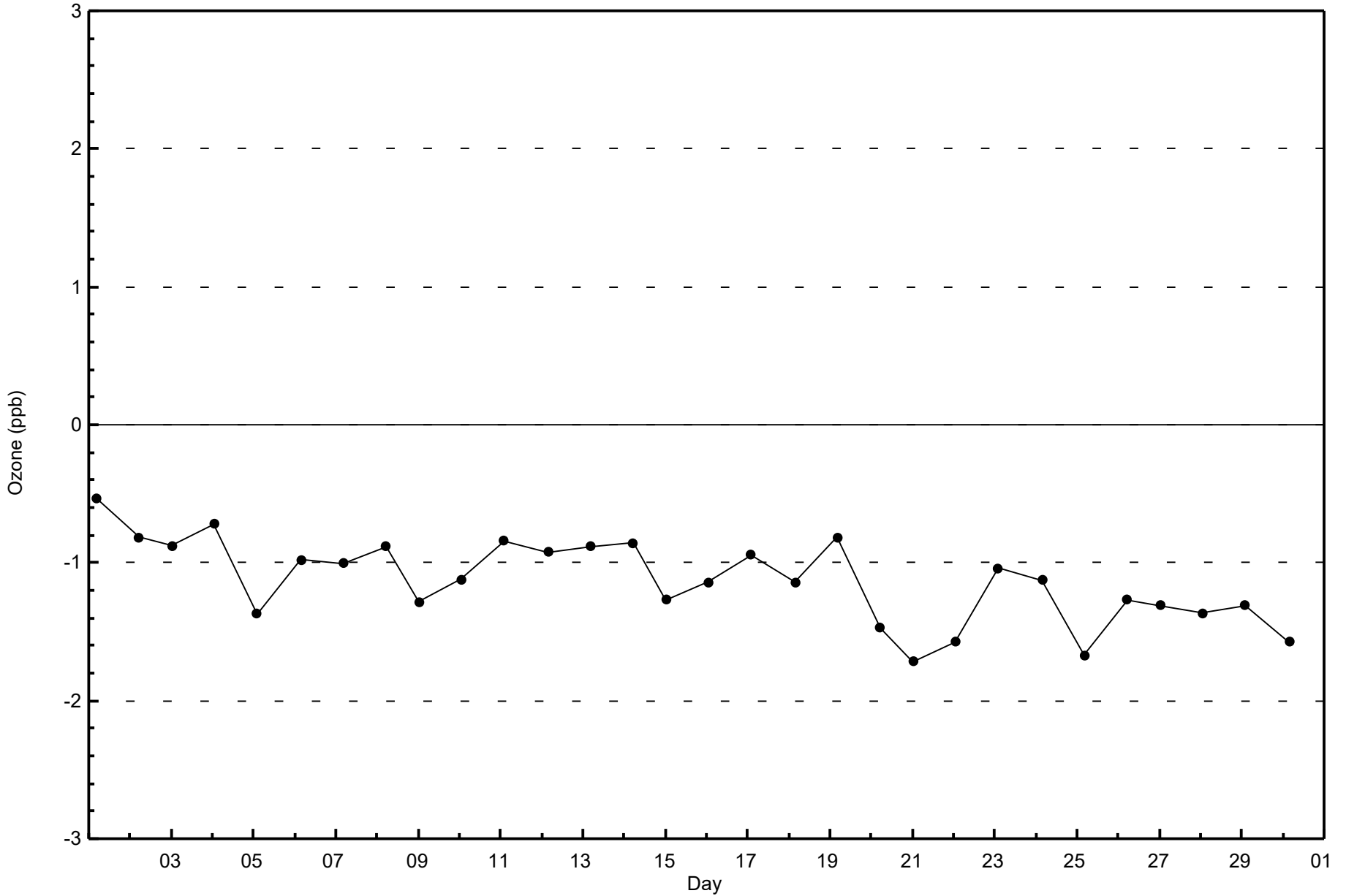
Total Number of Hours: 720

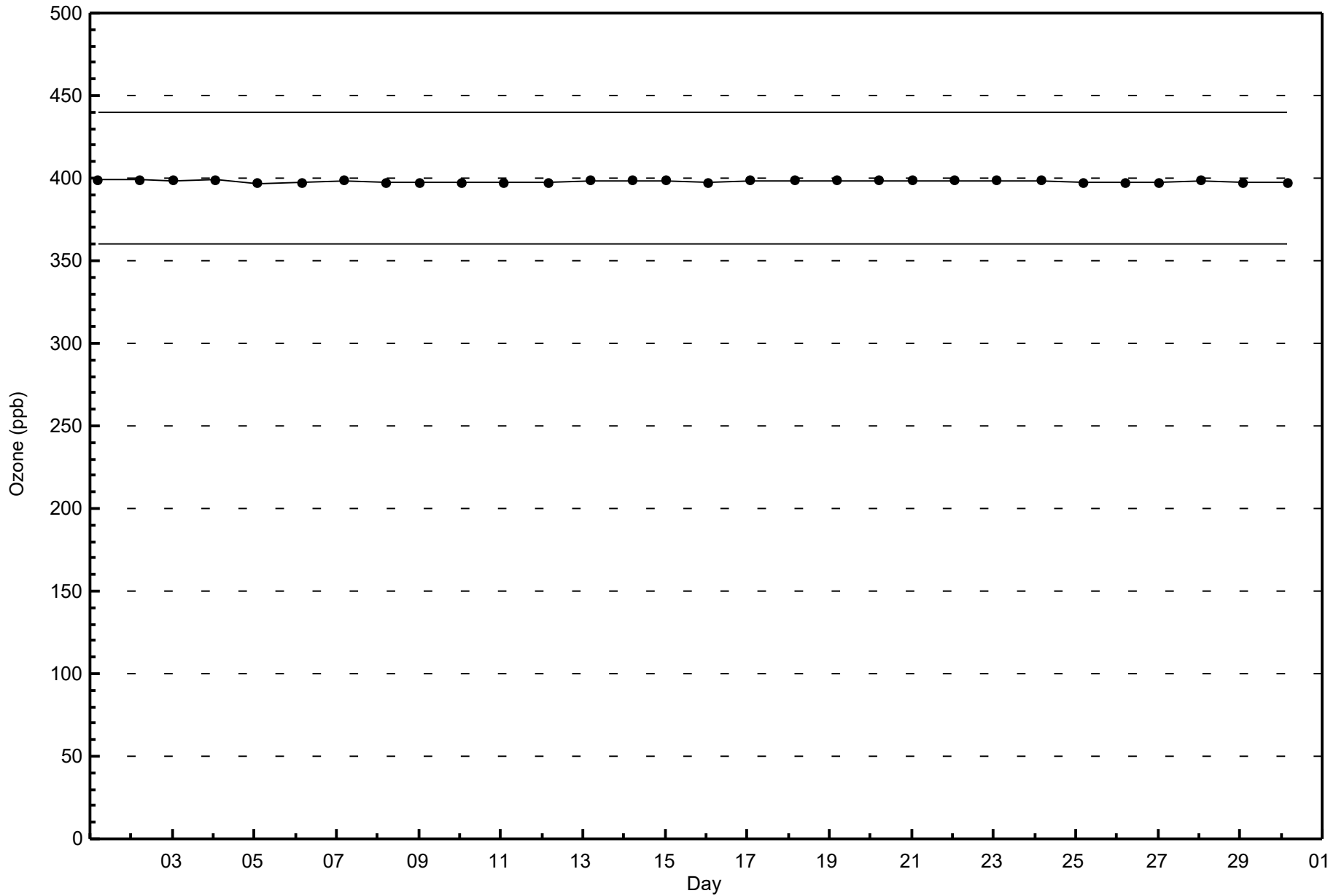


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Buffalo Viewpoint





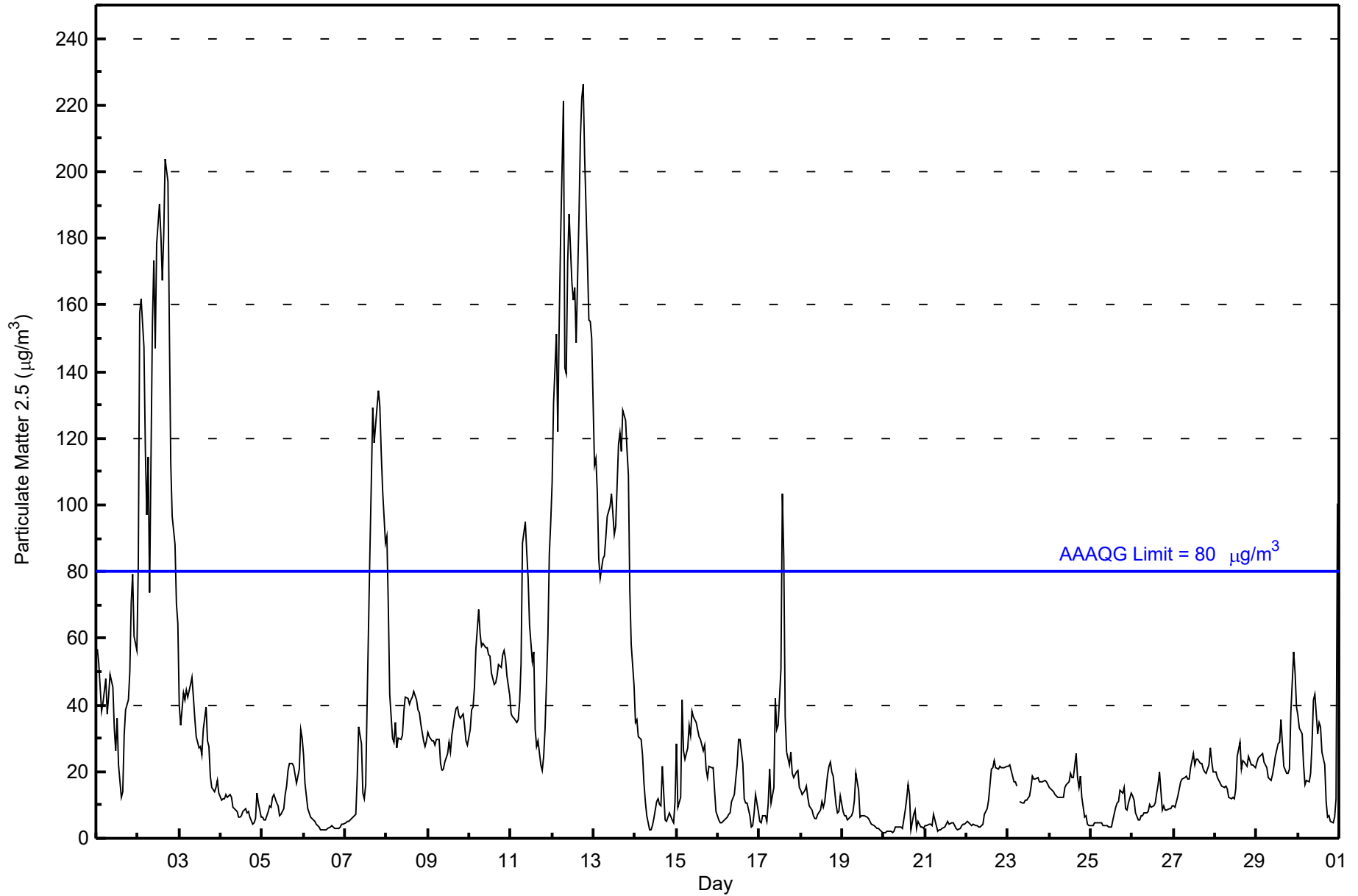




Summary of Hour Averages

Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO): 1-hr: 84 24-hr: 10 Maximum Value: 226.3 µg/m ³ on Jun 12 19:00 Minimum Value: 1.6 µg/m ³ on Jun 20 06:00 Maximum Diurnal Average: 40.1 µg/m ³ at hour 17 Monthly Average: 32.96 µg/m ³		Maximum Daily Average: 168.0 µg/m ³ on Jun 12 Minimum Daily Average: 3.8 µg/m ³ on Jun 21 Minimum Diurnal Average: 27.3 µg/m ³ at hour 5 Percentiles: P ₁ = 2.3 P ₁₀ = 4.2 Q ₁ = 8.0 Median = 18.6 Q ₃ = 36.3 P ₉₀ = 90.4 P ₉₉ = 189.6		Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 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-Jun	56.7	52.4	45.2	38.0	40.5	47.8	37.1	43.0	49.2	45.4	33.1	26.5	36.1	21.9	12.1	13.9	31.1	38.6	41.5	49.8	70.7	79.2	60.5	56.3	42.8	79.2
2-Jun	82.2	157.5	162.0	147.6	116.5	96.9	114.2	73.8	154.5	173.4	146.9	178.2	190.1	181.1	167.2	181.1	203.9	196.8	152.4	112.1	96.5	88.1	70.5	64.6	137.8	203.9
3-Jun	40.0	34.0	43.6	41.7	44.3	42.3	46.2	48.3	42.3	36.1	30.5	27.1	27.5	25.1	32.6	39.4	29.1	27.4	18.6	15.1	14.1	15.3	17.4	13.6	31.3	48.3
4-Jun	11.5	11.7	12.1	13.3	12.3	13.2	12.2	9.4	8.9	8.0	6.5	6.3	6.6	8.1	9.1	7.8	8.2	6.3	4.2	4.6	5.8	13.5	10.7	6.4	9.0	13.5
5-Jun	6.4	5.5	5.7	8.1	9.8	9.4	12.3	13.1	10.6	9.8	7.0	7.4	8.9	13.1	15.8	20.4	22.6	22.6	21.8	19.0	16.5	21.0	32.5	30.2	14.6	32.5
6-Jun	24.9	16.5	9.0	7.5	6.4	5.8	5.1	4.4	4.0	3.4	2.5	2.4	2.6	2.7	2.9	3.6	3.8	3.5	3.1	3.2	3.0	3.4	4.3	4.4	5.5	24.9
7-Jun	4.7	5.0	5.1	5.5	6.0	6.7	7.0	18.2	33.4	28.4	13.4	11.8	16.0	40.3	86.6	107.2	129.2	118.7	129.1	134.2	129.6	115.8	104.1	88.4	56.0	134.2
8-Jun	90.5	69.9	43.2	30.2	28.9	34.7	27.2	30.2	29.9	30.8	38.0	42.4	41.9	40.3	41.4	42.4	44.1	41.4	38.6	37.7	34.3	29.3	27.6	29.3	39.3	90.5
9-Jun	32.0	30.4	29.4	29.2	28.1	29.6	29.5	22.5	20.2	20.6	22.9	25.4	28.8	26.0	31.0	36.8	39.0	39.4	36.7	35.9	37.5	33.8	29.2	27.9	30.1	39.4
10-Jun	32.6	38.7	39.4	45.3	56.7	68.8	61.4	57.6	58.4	57.2	57.2	55.3	54.7	49.7	46.2	46.7	48.8	51.9	51.2	54.9	56.5	53.6	48.5	42.7	51.4	68.8
11-Jun	37.5	36.6	35.9	34.9	35.4	41.0	52.7	88.5	95.0	85.9	78.0	64.2	52.9	56.0	32.8	27.7	29.4	22.2	20.5	24.4	33.1	60.6	85.1	94.8	51.0	95.0
12-Jun	106.7	130.4	151.1	121.9	154.5	180.1	221.4	141.0	139.3	173.0	187.3	166.6	161.3	165.4	148.6	186.5	210.3	221.9	226.3	204.7	173.2	155.4	155.0	149.9	168.0	226.3
13-Jun	111.9	114.1	103.4	84.0	78.2	83.8	84.7	90.4	96.6	99.7	103.3	97.6	91.1	93.5	118.1	121.7	116.2	128.3	125.4	116.3	108.8	74.1	58.2	45.8	97.7	128.3
14-Jun	34.9	35.5	30.4	29.6	25.1	16.7	11.0	6.6	2.6	2.6	3.7	5.9	11.1	12.0	10.1	9.9	21.7	5.7	5.1	6.2	7.5	5.4	4.5	11.1	13.1	35.5
15-Jun	28.2	9.3	12.3	41.6	26.2	23.9	27.0	33.9	31.0	38.1	36.5	34.7	32.6	30.7	29.8	26.1	28.0	21.0	18.0	21.7	21.0	21.3	14.2	8.0	25.6	41.6
16-Jun	5.5	4.6	4.7	5.3	5.5	6.2	7.1	7.5	11.2	13.3	17.7	21.9	29.8	29.6	22.3	11.9	10.5	10.7	6.6	3.5	4.0	7.6	13.3	8.1	11.2	29.8
17-Jun	5.1	4.7	6.7	6.6	5.0	10.7	20.6	10.6	15.4	41.8	32.6	33.9	51.0	103.3	84.4	36.6	26.0	22.2	26.0	19.5	18.0	19.7	20.3	15.1	26.5	103.3
18-Jun	14.5	13.3	14.4	15.5	12.1	9.8	8.5	6.7	5.9	6.1	7.4	8.6	11.0	9.4	11.1	19.0	21.5	22.7	20.1	18.7	10.4	7.8	8.0	12.8	12.3	22.7
19-Jun	8.2	6.7	7.0	5.5	5.8	6.9	8.0	11.6	19.6	14.3	6.2	6.8	6.7	6.7	6.2	6.1	5.2	4.2	3.9	3.4	3.1	2.9	2.4	1.8	6.6	19.6
20-Jun	1.7	1.7	2.3	2.1	1.9	1.6	2.2	3.2	3.5	3.4	3.4	3.0	8.3	11.8	16.1	13.0	2.6	7.4	8.5	3.2	5.3	3.5	3.5	3.0	4.8	16.1
21-Jun	3.6	3.8	4.4	4.0	4.0	7.1	3.7	2.3	2.7	2.4	2.8	3.4	4.4	5.0	4.4	4.5	4.5	3.9	3.0	2.5	2.9	3.9	4.2	4.2	3.8	7.1
22-Jun	4.9	4.8	4.3	4.0	4.2	3.9	3.7	3.5	3.4	4.3	7.1	7.8	8.9	11.3	20.7	21.3	23.4	21.3	20.8	21.7	21.1	21.2	21.1	21.8	12.1	23.4
23-Jun	21.5	21.9	20.2	16.8	16.9	15.6	C	10.9	10.8	10.5	11.3	11.4	12.6	15.4	18.5	17.9	17.6	18.2	16.9	17.1	16.9	17.3	16.9	16.1	16.0	21.9
24-Jun	15.4	14.8	14.0	13.2	12.9	12.3	12.2	12.1	15.5	15.9	17.0	19.5	18.2	18.0	25.5	18.3	15.2	18.7	12.5	6.6	6.6	6.6	4.2	3.7	13.9	25.5
25-Jun	3.9	4.0	4.6	4.7	4.8	4.8	4.5	3.8	3.8	3.7	3.4	3.3	3.5	5.4	9.1	10.5	11.1	14.6	13.6	15.3	8.8	8.5	10.6	13.5	7.2	15.3
26-Jun	12.9	11.4	7.6	5.7	5.5	6.7	6.6	7.5	7.8	7.9	10.1	9.2	9.8	10.4	13.8	16.1	19.9	8.6	9.8	8.3	8.7	8.9	9.1	9.6	9.7	19.9
27-Jun	9.7	9.5	12.7	15.0	16.9	17.6	18.2	18.8	17.8	17.6	21.3	25.5	22.1	23.5	23.9	22.5	22.3	20.9	19.7	19.3	22.2	27.3	23.0	19.9	19.5	27.3
28-Jun	20.0	18.3	17.3	16.6	15.6	15.3	15.6	14.9	12.1	12.0	12.5	12.0	15.0	24.7	28.7	20.6	23.2	23.1	21.5	24.4	23.2	21.9	22.2	21.1	18.8	28.7
29-Jun	23.0	24.3	24.6	25.2	22.8	22.2	21.2	18.1	17.3	18.9	21.5	24.5	28.4	28.9	35.5	28.2	21.5	19.4	19.6	20.6	37.7	56.0	49.6	39.4	27.0	56.0
30-Jun	36.8	33.1	31.3	22.1	16.0	17.2	16.9	19.4	28.2	41.3	43.2	31.2	34.7	33.7	26.0	22.1	10.9	6.5	7.0	5.1	4.5	6.2	11.9	100.4	25.2	100.4
29.6 30.8 30.1 28.0 27.3 28.6 31.0 27.7 31.6 34.2 32.8 32.4 34.3 36.8 37.4 38.2 40.1 38.8 36.9 34.5 33.4 33.0 31.4 32.1																								Diurnal Average		
111.9 157.5 162.0 147.6 154.5 180.1 221.4 141.0 154.5 173.4 187.3 178.2 190.1 181.1 167.2 186.5 210.3 221.9 226.3 204.7 173.2 155.4 155.0 149.9																								Diurnal Maximum		
C - Calibration																										
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	115	15.99	15.99
6 - 15	198	27.54	43.53
16 - 25	141	19.61	63.14
26 - 80	181	25.17	88.32
> 81.0	84	11.68	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}) - μg/m³
Buffalo Viewpoint - June 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	44	8	4	0	1	0	5	13	7	1	9	10	2	0	6	5	115
6 - 15	38	17	4	0	4	17	21	24	14	11	12	11	4	1	3	17	198
16 - 25	17	13	2	2	1	5	11	15	26	6	5	13	9	5	3	8	141
26 - 80	16	19	9	9	2	4	2	26	21	14	11	10	6	13	9	10	181
> 81.0	11	8	8	1	1	0	3	7	3	2	2	3	12	9	8	6	84
Totals	126	65	27	12	9	26	42	85	71	34	39	47	33	28	29	46	719

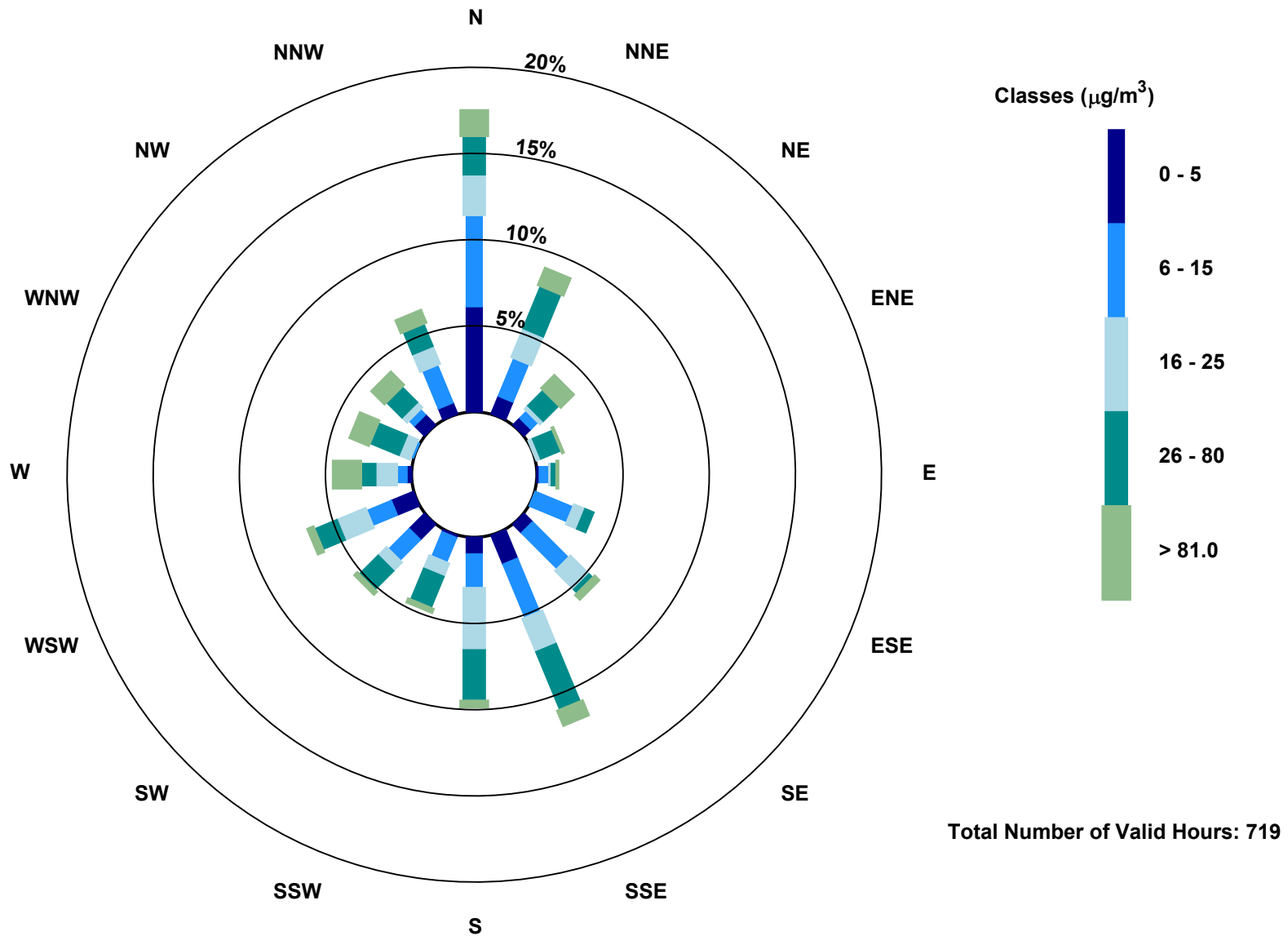
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

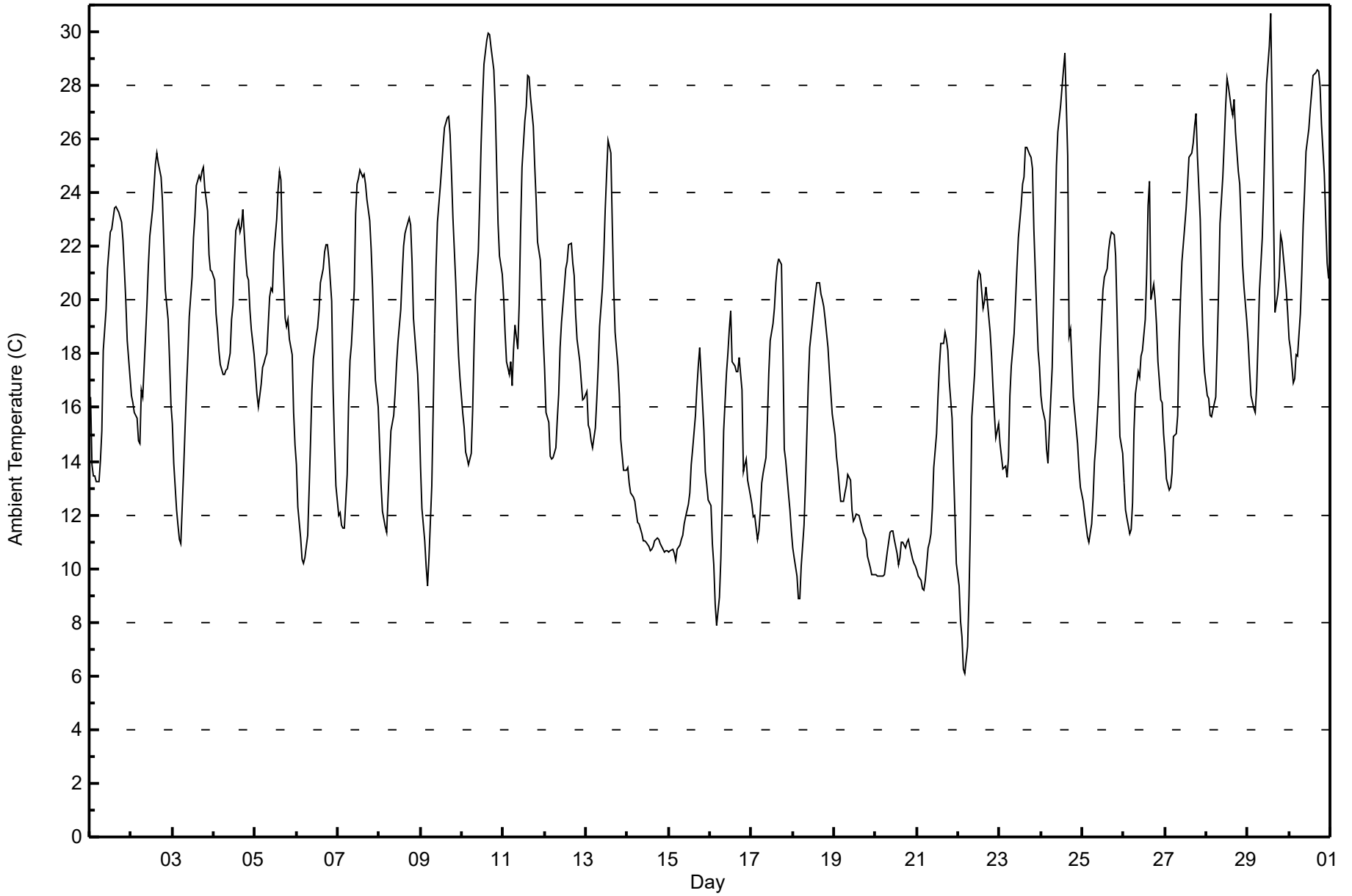




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 30.7 C on Jun 29 14:00 Maximum Daily Average: 23.3 C on Jun 30																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 6.1 C on Jun 22 05:00 Minimum Daily Average: 10.5 C on Jun 20 Maximum Diurnal Average: 22.4 C at hour 15 Minimum Diurnal Average: 12.6 C at hour 5 Monthly Average: 17.70 C Percentiles: $P_1 = 8.9$ $P_{10} = 11.0$ $Q_1 = 13.5$ Median = 17.6 $Q_3 = 21.4$ $P_{90} = 24.8$ $P_{99} = 28.7$																						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-Jun	16.4	13.9	13.4	13.4	13.3	13.2	14.0	15.1	18.1	19.7	21.2	21.9	22.6	22.6	23.4	23.5	23.4	23.3	22.9	22.2	21.1	20.0	18.5	17.1	18.9	23.5
2-Jun	16.4	16.2	15.8	15.6	14.8	14.6	16.7	16.4	18.7	19.9	21.3	22.4	23.4	24.2	25.1	25.5	25.1	24.6	23.7	22.1	20.4	19.3	17.8	16.1	19.8	25.5
3-Jun	15.4	13.9	12.2	11.6	11.1	11.0	13.7	15.2	16.6	17.9	19.4	20.9	22.3	23.1	24.3	24.6	24.5	24.8	25.0	24.2	23.3	21.7	21.1	21.0	19.1	25.0
4-Jun	20.7	19.5	18.9	18.1	17.6	17.2	17.3	17.4	17.4	18.0	19.3	19.8	21.4	22.6	23.0	22.5	22.7	23.4	21.6	20.9	20.8	19.7	18.9	18.0	19.9	23.4
5-Jun	17.2	16.5	16.0	16.9	17.5	17.7	17.8	18.0	20.1	20.4	20.3	21.7	23.0	24.1	24.8	24.5	22.2	19.3	19.0	19.3	18.6	18.0	15.8	14.6	19.3	24.8
6-Jun	13.9	12.3	11.1	10.4	10.2	10.4	11.2	12.9	14.7	16.7	17.8	18.7	19.0	19.6	20.7	21.2	21.8	22.1	22.1	21.6	19.9	16.7	14.7	13.1	16.4	22.1
7-Jun	12.0	12.1	11.6	11.5	11.5	13.5	16.2	17.8	18.3	20.4	23.2	24.3	24.5	24.9	24.6	24.7	24.3	23.7	22.9	21.9	20.5	18.6	17.0	16.0	19.0	24.9
8-Jun	14.6	13.2	12.1	11.6	11.3	12.6	13.9	15.1	15.7	16.6	17.6	18.4	19.7	20.9	22.0	22.5	22.7	23.1	22.8	21.5	19.3	17.9	17.2	15.9	17.4	23.1
9-Jun	13.8	12.2	11.0	10.1	9.4	10.4	13.1	15.9	18.7	21.2	22.9	24.2	24.9	25.8	26.4	26.8	26.9	26.2	24.7	23.1	20.6	19.2	17.9	17.1	19.3	26.9
10-Jun	15.8	15.3	14.4	14.1	13.9	14.3	15.9	18.3	20.2	21.8	23.8	25.9	27.5	28.8	29.7	29.9	29.9	29.4	28.6	27.2	25.0	22.9	21.7	21.0	22.3	29.9
11-Jun	20.1	18.8	17.7	17.2	17.7	16.8	18.2	19.1	18.2	19.9	22.7	25.0	26.7	27.2	28.4	28.3	27.6	26.5	25.0	23.7	22.2	21.5	20.1	18.7	22.0	28.4
12-Jun	17.4	15.8	15.4	14.2	14.1	14.2	14.5	15.5	16.5	18.2	19.2	20.5	21.2	21.5	22.0	22.1	21.4	20.9	19.5	18.6	17.7	16.9	16.3	16.4	17.9	22.1
13-Jun	16.6	15.4	15.2	14.7	14.5	15.2	16.3	17.5	19.0	20.4	21.7	23.4	24.7	25.9	25.5	22.8	20.5	18.8	17.6	16.5	14.8	14.2	13.7	13.6	18.3	25.9
14-Jun	13.8	13.2	12.8	12.7	12.5	12.1	11.7	11.3	11.0	11.0	10.8	10.7	10.8	10.7	10.8	11.1	11.2	11.1	10.9	10.8	10.6	10.7	10.7	10.7	11.4	13.8
15-Jun	10.6	10.7	10.7	10.6	10.3	10.7	10.9	11.1	11.2	11.7	11.9	12.4	12.8	13.9	14.5	15.7	16.7	17.6	18.2	17.2	15.1	13.6	13.1	12.6	13.1	18.2
16-Jun	12.3	11.0	10.2	8.7	7.9	9.0	10.4	12.6	15.1	17.3	18.0	18.9	19.6	17.7	17.5	17.4	17.3	17.8	16.7	13.6	13.8	14.1	13.3	12.7	14.3	19.6
17-Jun	12.4	11.9	12.0	11.1	11.4	12.1	13.2	13.6	14.1	15.5	17.3	18.5	19.1	19.7	20.7	21.3	21.6	21.3	18.2	14.5	14.0	12.8	12.2	11.4	15.4	21.6
18-Jun	10.8	10.4	9.7	8.9	8.9	10.1	11.6	13.1	15.0	16.9	18.2	19.2	19.7	20.2	20.6	20.6	20.2	20.0	19.8	19.3	18.2	17.3	16.6	15.7	15.9	20.6
19-Jun	15.0	14.2	13.7	13.1	12.5	12.5	12.8	13.1	13.5	13.3	12.2	11.8	11.9	12.1	12.0	11.8	11.6	11.4	11.1	10.5	10.2	10.0	9.8	9.8	12.1	15.0
20-Jun	9.8	9.7	9.7	9.7	9.7	9.8	10.2	10.6	11.4	11.4	11.4	11.1	10.6	10.1	10.4	11.0	11.0	10.8	11.0	11.1	10.8	10.4	10.2	10.1	10.5	11.4
21-Jun	9.9	9.7	9.5	9.3	9.2	9.6	10.8	11.0	11.3	12.3	13.8	15.0	16.4	17.5	18.4	18.4	18.8	18.5	18.1	16.9	15.6	13.8	12.0	10.2	13.6	18.8
22-Jun	9.4	8.1	7.5	6.2	6.1	7.1	9.0	11.6	15.7	17.3	18.7	20.7	21.1	21.0	19.7	19.9	20.5	20.0	18.8	17.9	16.8	15.8	14.9	15.4	15.0	21.1
23-Jun	14.7	14.2	13.7	13.8	13.4	14.2	16.4	17.5	18.8	20.0	21.2	22.3	23.5	24.3	24.6	25.7	25.7	25.4	25.3	24.9	22.7	19.5	18.1	17.5	19.9	25.7
24-Jun	16.4	16.0	15.5	14.5	13.9	15.2	17.5	20.0	22.6	25.0	26.3	27.2	28.0	28.6	29.2	25.4	18.6	18.9	17.7	16.4	15.3	14.6	13.7	13.0	19.6	29.2
25-Jun	12.5	12.0	11.6	11.2	11.0	11.7	12.6	14.0	14.7	16.6	18.2	19.3	20.4	20.9	21.2	21.9	22.3	22.5	22.4	21.7	19.5	17.2	14.9	14.3	16.9	22.5
26-Jun	13.2	12.2	11.9	11.3	11.5	12.5	15.1	16.5	17.3	17.1	17.9	18.1	19.3	21.0	23.5	24.4	20.0	20.6	20.0	19.1	17.7	16.3	16.2	15.0	17.0	24.4
27-Jun	14.3	13.3	12.9	13.0	13.5	14.9	15.0	15.7	18.4	20.0	21.4	22.7	23.4	24.3	25.3	25.5	25.9	26.5	27.0	25.4	23.0	20.6	18.3	17.3	19.9	27.0
28-Jun	16.5	16.3	15.7	15.7	15.9	16.4	18.2	20.3	22.9	24.6	25.9	27.2	28.3	28.0	27.2	26.9	27.5	26.3	24.8	24.3	22.9	21.3	20.5	19.2	22.2	28.3
29-Jun	18.5	17.4	16.4	16.0	15.8	16.8	18.4	20.3	22.3	24.1	26.2	28.0	29.5	30.7	27.2	23.2	19.5	20.2	20.8	22.4	22.2	21.0	20.4	19.5	21.5	30.7
30-Jun	18.5	18.2	16.9	17.1	18.0	17.9	19.5	21.0	22.8	24.1	25.5	26.4	27.1	27.7	28.4	28.5	28.6	28.5	27.9	26.5	24.7	23.0	21.4	20.8	23.3	28.6
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	28	3.89	3.89
10 - 20	450	62.50	66.39
> 20	242	33.61	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

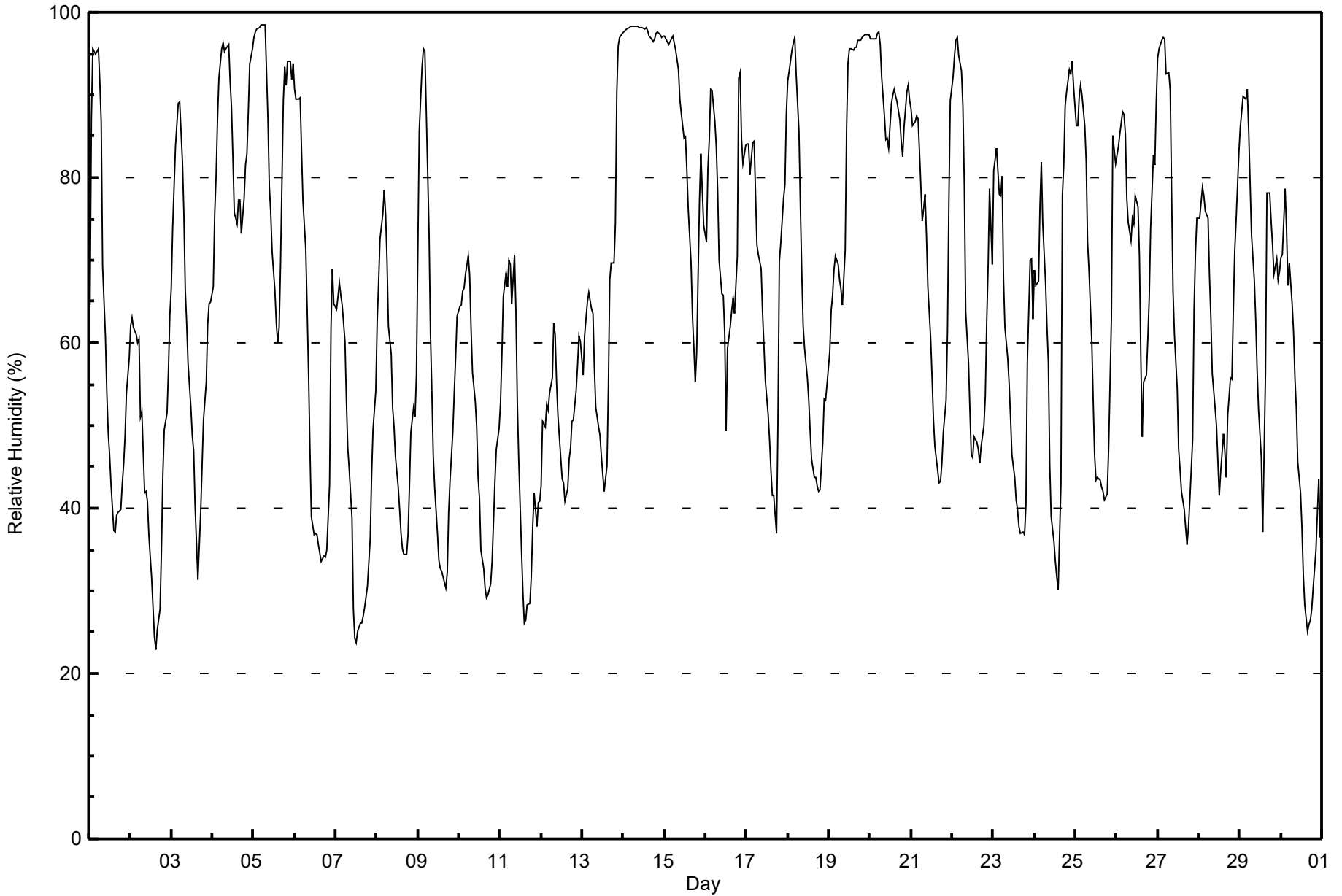
**Relative Humidity (RH) - %
Buffalo Viewpoint - June 2023**

Maximum Value: 98.5 % on Jun 5 07:00																						Maximum Daily Average: 97.7 % on Jun 14				Hours in Service: 720																					
Minimum Value: 22.9 % on Jun 2 16:00																						Minimum Daily Average: 42.8 % on Jun 7				Hours of Data: 720																					
Maximum Diurnal Average: 83.2 % at hour 4																						Minimum Diurnal Average: 48.1 % at hour 16				Hours of Missing Data: 0																					
Monthly Average: 65.46 %																						Percentiles: P ₁ = 26.0 P ₁₀ = 37.0 Q ₁ = 47.1 Median = 64.9 Q ₃ = 84.7 P ₉₀ = 95.6 P ₉₉ = 98.2				Hours of Calibration: 0																					
																										Percent Operational Time: 100.0																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jun	64.6	87.0	95.5	95.2	94.9	95.6	91.7	86.7	69.4	60.9	54.1	49.1	46.4	42.9	37.2	37.1	39.1	39.5	39.8	42.8	45.3	48.6	53.9	58.1	61.5	95.6																					
2-Jun	62.0	63.0	61.8	61.1	60.0	60.5	51.0	51.7	41.9	42.0	40.8	36.7	31.6	27.9	24.4	22.9	25.2	27.7	34.8	44.0	49.5	51.5	56.9	63.5	45.5	63.5																					
3-Jun	66.6	73.8	83.7	86.5	89.0	89.2	81.9	75.7	66.4	62.4	57.5	52.2	48.8	46.9	40.4	31.4	35.4	39.4	45.0	50.7	55.2	62.3	64.8	64.9	61.2	89.2																					
4-Jun	66.8	75.7	80.2	87.0	92.0	95.6	96.2	95.2	95.6	96.1	91.7	88.5	82.4	75.8	74.5	77.3	77.3	73.1	77.4	81.5	82.9	87.9	93.7	95.6	85.0	96.2																					
5-Jun	97.0	97.6	97.9	98.2	98.4	98.5	98.5	98.4	87.2	79.1	75.8	71.0	66.3	62.4	60.0	61.9	69.4	89.3	93.3	91.2	94.1	94.1	91.9	93.7	86.1	98.5																					
6-Jun	90.7	89.5	89.5	89.6	83.3	77.2	71.4	64.0	56.3	47.2	39.0	36.8	37.0	36.8	35.7	33.5	33.9	34.2	34.1	34.9	42.9	61.7	69.0	64.7	56.4	90.7																					
7-Jun	64.0	65.6	67.3	65.8	64.6	60.2	53.1	47.2	44.8	38.7	27.8	24.3	23.6	25.1	26.1	26.1	26.9	28.0	30.6	33.3	36.2	44.0	49.5	54.3	42.8	67.3																					
8-Jun	62.6	67.3	72.5	75.5	78.5	75.6	70.1	62.1	58.6	52.2	49.8	46.3	42.6	39.9	36.9	35.1	34.5	34.5	36.8	42.6	49.2	52.2	51.0	56.1	53.4	78.5																					
9-Jun	70.9	85.6	93.4	95.7	95.3	88.2	73.4	61.2	54.2	46.4	42.5	36.9	33.8	32.7	32.4	31.0	30.3	32.2	39.5	43.4	49.2	54.1	58.4	63.3	56.0	95.7																					
10-Jun	64.4	64.6	66.2	66.7	68.2	70.5	68.2	61.6	56.5	53.0	49.9	43.7	41.2	34.9	32.8	30.4	29.1	29.5	30.8	33.5	38.3	43.2	47.0	49.7	48.9	70.5																					
11-Jun	52.8	58.6	65.7	68.6	66.8	70.0	69.4	64.8	70.6	63.9	53.0	46.0	34.9	29.9	26.1	26.4	28.2	28.4	31.9	37.8	41.8	37.8	40.6	40.9	48.1	70.6																					
12-Jun	42.7	50.6	49.9	52.6	51.8	53.8	55.8	62.4	61.1	55.2	51.2	46.0	43.5	43.0	40.9	42.4	45.9	47.3	50.5	50.6	54.2	57.2	60.8	60.2	51.2	62.4																					
13-Jun	56.1	60.8	62.9	65.0	66.1	64.1	63.6	57.0	52.2	49.8	48.8	46.3	44.1	42.0	45.1	54.6	67.6	69.7	69.6	74.5	90.3	96.0	97.0	97.4	64.2	97.4																					
14-Jun	97.6	97.7	97.9	98.1	98.2	98.3	98.3	98.3	98.2	98.1	98.1	98.1	98.0	98.1	97.7	97.1	97.0	96.5	96.8	97.4	97.6	97.4	97.0	97.1	97.7	97.7	98.3																				
15-Jun	97.1	96.7	96.2	96.5	96.8	97.0	95.4	94.2	93.1	89.6	87.8	84.7	84.9	80.8	76.1	69.7	63.1	59.5	55.3	58.9	77.1	82.8	78.4	74.2	82.7	97.1																					
16-Jun	72.2	81.1	84.6	90.7	90.5	86.8	83.8	78.3	70.0	66.0	65.7	61.2	49.4	59.4	62.1	64.0	65.4	63.5	70.4	92.0	92.6	84.7	81.8	83.8	75.0	92.6																					
17-Jun	84.0	84.1	80.4	84.2	84.4	78.1	71.8	70.6	69.0	63.7	59.6	55.5	51.3	48.2	44.5	41.6	41.5	37.0	50.3	69.8	72.1	77.4	79.1	87.9	66.1	87.9																					
18-Jun	91.7	93.0	95.5	96.2	97.0	92.6	85.7	76.6	68.6	62.0	59.4	55.8	53.1	49.4	45.8	43.7	43.7	42.8	42.0	42.3	48.1	53.2	53.1	54.9	64.4	97.0																					
19-Jun	58.9	63.9	65.8	68.8	70.4	69.5	67.6	66.5	64.5	71.3	86.0	93.9	95.5	95.6	95.4	95.8	95.8	96.6	96.7	97.0	97.1	97.3	97.3	97.3	83.5	97.3																					
20-Jun	96.8	96.8	96.8	96.8	97.4	97.7	96.1	92.3	87.5	84.6	84.8	83.6	89.1	90.0	90.6	89.8	89.1	86.9	84.4	82.5	86.1	90.4	91.1	89.3	90.4	97.7																					
21-Jun	88.4	86.3	86.8	87.4	87.2	83.2	74.8	76.3	78.0	73.0	66.8	60.5	55.7	50.6	47.5	44.6	43.0	43.2	45.5	49.1	53.1	61.4	77.0	89.4	67.0	89.4																					
22-Jun	92.2	94.8	96.6	97.0	94.8	92.9	88.7	79.1	63.7	57.6	51.9	46.4	46.1	48.7	48.0	47.0	45.4	47.5	50.1	53.5	62.6	69.2	78.7	69.4	67.6	97.0																					
23-Jun	80.8	82.2	83.6	77.9	77.7	80.2	67.6	61.8	58.1	55.0	51.1	46.5	43.8	41.0	39.8	37.7	37.0	37.1	36.7	40.4	57.5	69.9	70.2	62.9	58.2	83.6																					
24-Jun	68.7	67.0	67.5	76.5	81.8	74.3	67.3	62.0	57.5	45.2	39.0	35.9	33.6	31.7	30.1	42.8	77.7	81.5	88.7	90.4	93.1	92.5	94.1	91.0	66.3	94.1																					
25-Jun	86.2	86.2	89.6	91.2	90.1	86.3	82.1	72.2	68.7	60.2	53.1	46.5	43.4	43.8	43.3	42.5	42.0	41.1	41.8	47.0	54.9	62.9	85.0	81.6	64.2	91.2																					
26-Jun	82.8	83.8	85.2	88.0	87.7	85.2	77.5	74.5	72.4	75.1	74.4	77.7	76.4	70.6	58.4	48.7	55.2	56.1	60.6	65.5	73.9	82.6	81.6	89.0	74.3	89.0																					
27-Jun	94.5	95.6	96.5	97.0	96.9	92.5	92.7	90.5	78.0	66.2	61.1	54.4	47.1	44.7	42.1	39.8	37.6	35.5	37.7	41.0	48.4	64.1	70.8	75.2	66.7	97.0																					
28-Jun	75.1	77.0	78.8	77.8	75.9	75.2	68.1	63.0	56.3	52.3	50.0	45.7	41.6	44.4	49.0	46.8	43.7	51.3	55.8	55.7	63.6	71.0	74.8	83.0	61.5	83.0																					
29-Jun	86.1	88.0	89.8	89.5	90.7	85.7	79.3	73.1	67.7	62.8	56.8	52.1	46.1	37.1	46.8	56.5	78.2	78.2	74.8	71.9	68.2	70.2	67.7	68.7	70.2	90.7																					
30-Jun	70.3	70.7	78.7	73.7	66.9	69.6	64.8	61.4	55.8	52.0	45.5	41.9	37.7	31.9	28.3	25.1	26.0	26.5	27.7	30.3	34.9	39.4	43.5	36.5	47.5	78.7																					
																						76.2	79.5	81.9	83.2	83.1	81.5	76.9	72.6	67.4	62.7	59.1	55.5	52.3	50.2	48.6	48.1	50.8	51.8	54.3	58.2	63.7	68.6	71.9	73.1	Diurnal Average	
																						97.6	97.7	97.9	98.2	98.4	98.5	98.5	98.4	98.2	98.1	98.1	98.1	98.0	98.1	97.7	97.1	97.0	96.6	96.8	97.4	97.6	97.4	97.3	97.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association

Summary of Hour Averages

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

Maximum Speed: 35 km/h on Jun 19 14:00	Maximum Daily Speed Average: 25.6 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 5 03:00	Minimum Daily Speed Average: 1.9 km/h on Jun 1	Hours of Data: 720
Maximum Diurnal Speed Average: 5.4 km/h at hour 17	Minimum Diurnal Speed Average: 1.1 km/h at hour 3	Hours of Missing Data: 0
Monthly Average Velocity: 2.5 km/h 333.3 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 12 P ₉₀ = 18 P ₉₉ = 28	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	WSW3	S3	NNW6	NNW6	ESE2	SSE4	SSW4	SSW4	SSW3	SW5	WNW7	WNW8	NW5	NW8	NNW6	N5	NNE8	NE8	NE6	ENE6	ENE6	E7	ENE5	NNE6	N1.9	NW8
2-Jun	N6	NNE6	N6	NW7	NNW6	NNW6	NNW7	NW6	N7	N4	NW5	WNW7	WNW5	NW3	NNE6	NNE9	NE9	NE9	NE10	NE10	NE8	ENE9	ENE9	ENE7	NNE5.2	NE10
3-Jun	ENE7	ENE4	NE5	NE8	ENE6	S3	NNE1	N5	NNE6	N8	N8	NNE9	N8	NNE6	E7	ESE10	SE8	ESE6	SE8	ESE6	SE5	SE5	ESE5	E6	ENE4.0	ESE10
4-Jun	SE7	SE6	SSE3	ESE3	ESE2	E8	E9	E8	ESE8	ESE6	SE10	SE9	ESE8	ESE7	ESE6	ESE6	ESE11	SE6	SE2	NE3	ESE5	SSW4	W3	ESE5.5	ESE11	
5-Jun	SSW2	S3	SSW1	NW3	NW6	NW7	NNW9	NNW6	N11	NNE12	NE13	NE12	NNE12	N11	N9	NNW11	NNW12	N9	NNE6	N4	NNW5	WSW9	W21	W15	NNW5.9	W21
6-Jun	W18	W18	WSW13	SW11	SW9	WSW11	WSW10	W12	WSW13	WSW13	WSW17	SW16	WSW17	WSW18	WSW16	WSW16	SW14	SW14	SW11	SW8	SSW5	SSE6	SSE7	SSE6	WSW11.4	W18
7-Jun	S6	SSE7	SSE7	SSE9	SE8	SE8	S6	SW8	SW8	SSW11	SW16	WSW18	W23	WNW17	W18	W17	WNW15	WNW15	WNW13	W10	W11	WNW8	W9	WSW6	WSW7.8	W23
8-Jun	W8	N8	N7	N6	N6	NNE5	N7	N8	NNE7	NNE5	WNW7	NNE4	NE5	NNE5	NNE7	NNE6	NE6	NNE6	NNE6	NNE5	NE7	NE7	ENE8	NE6	NNE5.3	ENE8
9-Jun	SSW2	WSW2	SSW3	SSW5	S5	SSE4	S4	SSE6	S7	S7	S6	S8	SSW9	SSW9	ESE8	S9	SSW9	SSW9	SSW7	SSE4	SSE4	SSE5	SSE5	S5	S5.4	SSW9
10-Jun	SSE4	SSE6	SSE9	SSE10	SSE8	S7	SSE8	SSE9	S10	SSE12	SSE11	SSE13	SSE14	S17	SSE15	S17	S16	S17	S15	S12	SSE10	SSE8	SSE10	SSE12	SSE11.2	S17
11-Jun	SSE10	S3	SE5	W3	SSW5	SSE5	SW5	W13	W9	W9	NNW10	NNW11	NNW13	NNW10	NNW10	NNW12	NNW14	NNW12	WNW8	W7	NW11	NW12	NW9	NNW10	WNW6.6	WNW14
12-Jun	NNW7	NW6	WNW7	W9	W10	NNW10	NW9	N7	NNE5	NW5	WNW7	NW7	N5	N4	SW2	SSW6	SSW5	SSE1	NE8	NE8	NNE8	NE8	E4	SE7	NNW3.2	WNW10
13-Jun	S7	SSE5	SE7	SSE8	SSE6	S5	S4	SSE7	SSE8	SSE7	SSE5	SE4	SW4	NNW9	N12	N11	N18	N23	NNE19	NNE15	N14	N14	NNE15	NNE16	NNE4.2	N23
14-Jun	NNE12	N12	N12	N13	N12	N13	N14	N15	N18	N18	N18	N18	N18	N18	N20	N22	NNW22	N22	N21	N23	N27	N26	N24	NNW24	N18.3	N27
15-Jun	NNW27	NNW23	NNW20	NNW20	NNW17	NNW17	N16	NNW17	NW10	NNW12	NW13	NW15	NW14	NW15	NNW14	NNW15	NNW12	NW10	NW6	E3	SE5	SSW5	SW6	WSW8	NNW11.4	NNW27
16-Jun	W12	W7	WSW6	S6	SSE6	S5	SSE6	SSE7	SSE8	ESE9	SE10	SSE8	SW14	SW13	SSW12	SSW13	S11	S11	SW13	S7	S7	WSW13	SW13	SW13	SSW7.4	SW14
17-Jun	SW10	SW10	SW10	SSW8	SW10	WSW14	WSW12	WSW16	WSW13	WSW12	SW11	WSW13	WSW15	WSW16	W15	W13	WNW11	W13	NNW9	NE14	NNE5	ENE2	NNE5	NNE8	WSW7.7	WSW16
18-Jun	NNE6	NNE5	SE3	N4	NNE8	NE8	NNE11	NNE8	N7	N9	N13	N16	N16	N17	N18	NNE20	NNE20	NNE19	NNE20	NNE18	N15	N16	N20	NNE24	NNE13.0	NNE24
19-Jun	NNE17	N16	NNE17	N18	N20	NNE24	N27	N30	NNE30	NNE30	NNE27	N20	N27	N35	N35	N30	N28	N28	N27	N28	N27	N25	N25	N27	N25.6	N35
20-Jun	N26	N22	N21	N22	N19	N17	N21	N22	N22	N20	N18	N20	NNW16	NNW20	NNW15	NNW13	N16	NNW16	NNW12	NNW10	NW9	NW10	NW10	NW10	N16.7	N26
21-Jun	NW9	NNW10	NNW9	NNW10	NNW10	NNW10	N17	N19	N14	N13	N13	N11	N7	N8	N11	N9	N12	N11	NNE9	NE8	E5	SE4	SSE5	SSE5	N8.2	N19
22-Jun	SSE6	S3	S4	S5	SSE6	SSE6	SSE6	SE6	SE9	SSE8	ESE8	SE7	SE5	W8	W16	WSW15	W16	WSW13	WSW7	WSW5	WNW3	SE3	SSE5	SE4	SSW3.9	W16
23-Jun	S4	SSE4	SE4	SE3	S3	SE4	SSE6	S7	SE6	ESE6	SE7	SSE6	SSE6	S5	SSW3	ENE2	ESE6	ESE5	ESE4	ESE5	SE5	SSE5	SSE7	SE4.4	SE7	
24-Jun	SSE8	SE8	SSE8	SE7	SE6	SSE7	SSE7	SSE6	SE5	SW10	SW10	WSW11	WSW11	WSW12	WSW11	NNE12	NNE11	NNE13	N16	N24	NNE16	N19	N15	N15	N2.1	N24
25-Jun	NNE13	NNE10	NNE8	N9	NNE10	NNE10	NNE11	NE10	NE7	NE8	N10	NNE10	N9	NW8	W9	NNW8	N7	NNW6	NNW5	N3	NNE4	ESE5	S5	SSE5	NNE6.0	NNE13
26-Jun	SSE6	S5	SSE5	SSE7	SSE6	SSE7	SSE5	SSE5	SE7	SE6	SSE8	SSE9	S5	SSW6	SW11	W11	N20	N6	SSW6	S9	SSW6	SE5	ESE5	WNW2	SSE3.7	N20
27-Jun	SW3	SSW2	NNW7	NNW6	NNW5	N6	N7	N7	N9	N9	N11	N8	NE9	NNE5	N6	NNE5	N3	N4	NNW4	WSW3	WNW4	W3	S6	S5	N3.9	N11
28-Jun	SSE5	SSE6	S6	SSE5	SSE5	SE7	SSE7	SSE8	S9	S8	S8	S8	SSW4	WNW3	W4	SW10	SW7	SE5	S5	SW7	S5	SSE5	SSE4	S5	S5.3	SW10
29-Jun	SSW6	S6	SSE6	S6	S6	S6	S7	S8	S7	S7	S8	S9	S10	SW12	WSW12	WSW17	W7	SSW6	S8	SSE5	S7	S8	SSW9	S8	SSW6.8	WSW17
30-Jun	S8	S6	SSE7	SE6	WSW4	S4	SSW5	S5	SW7	SW8	SW9	SW11	WSW13	WSW16	WSW14	WSW17	WSW15	WSW13	WSW14	WSW14	SW10	SW9	SW9	WSW12	SW8.6	WSW17

NW1.4	NNW1.3	NNW1.1	N1.4	NNW1.1	N1.1	N2.1	NNW2.2	N1.8	NNW1.5	NW2.1	NW2.2	WNW3.7	NW5.2	NW4.9	NW4.6	NNW5.4	NNW4.1	NNW3.5	N3.4	N3.1	N2.1	NNW1.6	NNW2.0	Diurnal Average
NNW27	NNW23	N21	N22	N20	NNE24	N27	N30	NNE30	NNE30	NNE27	N20	N27	N35	N35	N30	N28	N28	N27	N28	N27	N26	N25	N27	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

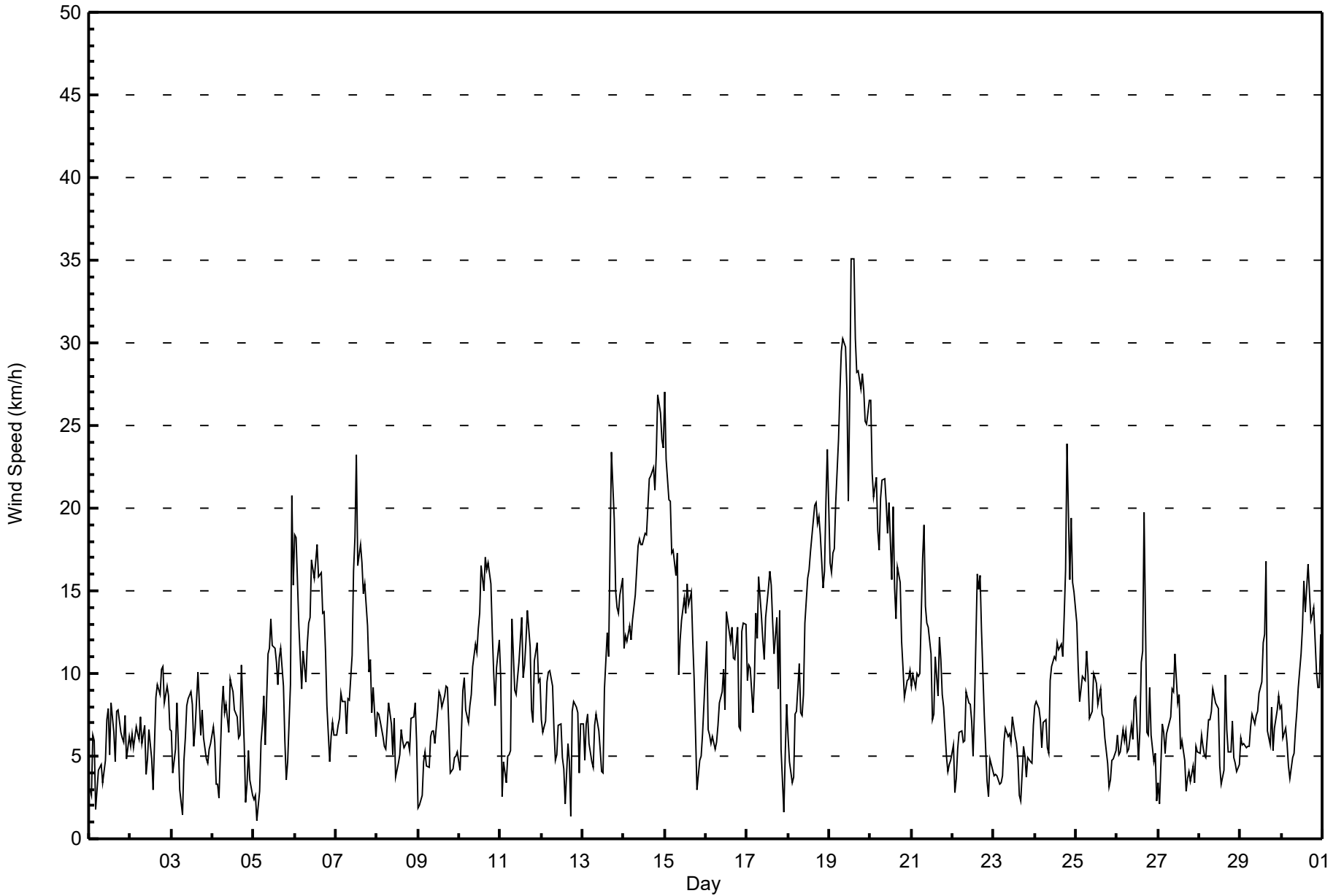
Wind Speed (WS) - km/h
Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jun 19 15:00 Minimum Value: 1 km/h on Jun 23 05:00 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-Jun	2	2	1	1	2	1	1	1	1	2	2	2	2	3	2	2	2	2	2	2	1	3	2	2	3
2-Jun	1	1	1	2	2	1	2	2	2	2	2	2	3	2	4	3	3	2	3	3	2	2	2	1	4
3-Jun	1	1	1	2	2	1	1	2	2	3	3	3	3	4	3	3	3	2	3	2	2	1	2	1	4
4-Jun	3	3	1	1	2	3	2	2	3	2	3	3	3	2	3	2	2	4	3	1	1	1	1	1	4
5-Jun	1	1	1	1	4	3	2	2	3	4	3	3	3	3	3	3	3	2	2	2	1	5	7	4	7
6-Jun	5	5	4	3	3	4	3	3	5	4	5	4	6	6	4	5	5	4	3	3	1	1	1	1	6
7-Jun	2	2	2	2	2	2	2	3	2	3	5	6	7	5	5	5	4	4	4	3	2	1	1	1	7
8-Jun	2	2	2	1	1	2	2	2	2	2	2	3	2	3	2	3	2	2	2	2	1	1	1	2	3
9-Jun	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	1	1	1	1	1	3
10-Jun	1	2	3	3	2	2	2	3	4	4	4	5	5	6	5	6	6	5	5	4	3	2	3	3	6
11-Jun	3	3	3	2	2	1	3	5	3	3	3	3	4	3	4	4	4	3	2	2	3	3	3	2	5
12-Jun	3	1	1	2	2	3	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	3	3
13-Jun	2	1	3	3	2	1	1	3	3	2	2	2	2	4	3	4	5	6	6	5	3	5	4	4	6
14-Jun	4	3	3	3	3	3	3	4	4	5	4	4	5	6	6	6	6	5	6	6	7	6	6	6	7
15-Jun	7	6	5	6	5	5	4	5	4	4	3	4	4	4	4	4	4	3	2	1	1	2	2	3	7
16-Jun	3	2	1	1	1	2	2	2	3	3	4	3	4	4	3	4	3	4	5	2	2	4	3	4	5
17-Jun	3	3	5	3	3	4	4	5	4	4	3	4	5	5	5	4	4	4	7	5	2	1	2	2	7
18-Jun	2	2	1	1	2	3	3	2	3	3	4	4	5	5	5	6	6	5	5	5	4	4	6	6	6
19-Jun	4	4	4	5	5	7	7	8	8	8	7	6	7	9	9	8	7	7	6	7	6	6	6	7	9
20-Jun	6	6	6	5	5	5	6	6	6	5	5	5	5	6	5	4	4	5	3	3	2	2	2	2	6
21-Jun	2	2	2	2	2	2	6	5	4	4	4	4	3	3	3	4	4	3	2	2	1	1	1	1	6
22-Jun	1	1	1	1	1	1	1	3	3	3	3	2	2	4	4	4	4	4	3	1	1	3	1	1	4
23-Jun	1	1	2	1	1	1	2	2	2	2	3	3	3	3	3	2	2	2	2	1	1	1	1	1	3
24-Jun	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	8	5	4	5	7	4	5	4	4	8
25-Jun	4	3	2	2	2	3	3	3	2	2	3	3	3	3	3	3	3	2	2	1	1	1	1	1	4
26-Jun	1	1	1	1	2	2	2	2	2	2	3	3	2	2	3	3	9	4	3	3	2	1	1	1	9
27-Jun	1	2	1	1	1	2	2	2	3	3	3	3	3	3	3	2	2	2	1	1	1	2	1	1	3
28-Jun	1	2	1	1	1	2	2	2	3	2	2	3	2	1	3	3	2	3	2	3	1	1	1	1	3
29-Jun	1	1	1	1	1	1	2	2	2	2	2	3	3	3	6	6	3	3	2	1	1	1	2	1	6
30-Jun	1	2	2	3	3	1	2	2	2	2	2	4	4	4	5	5	5	4	4	4	3	2	2	3	5
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	158	21.94	21.94
6 - 11	355	49.31	71.25
12 - 19	153	21.25	92.50
20 - 28	48	6.67	99.17
29 - 38	6	0.83	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
Buffalo Viewpoint - June 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	13	3	4	3	10	18	27	25	17	5	5	4	5	5	4	158
6 - 11	38	29	21	8	6	16	24	54	40	15	24	10	14	14	19	23	355
12 - 19	41	15	3	0	0	0	0	5	6	2	10	32	13	9	5	12	153
20 - 28	33	6	0	0	0	0	0	0	0	0	0	0	2	0	0	7	48
29 - 38	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	126	65	27	12	9	26	42	86	71	34	39	47	33	28	29	46	720

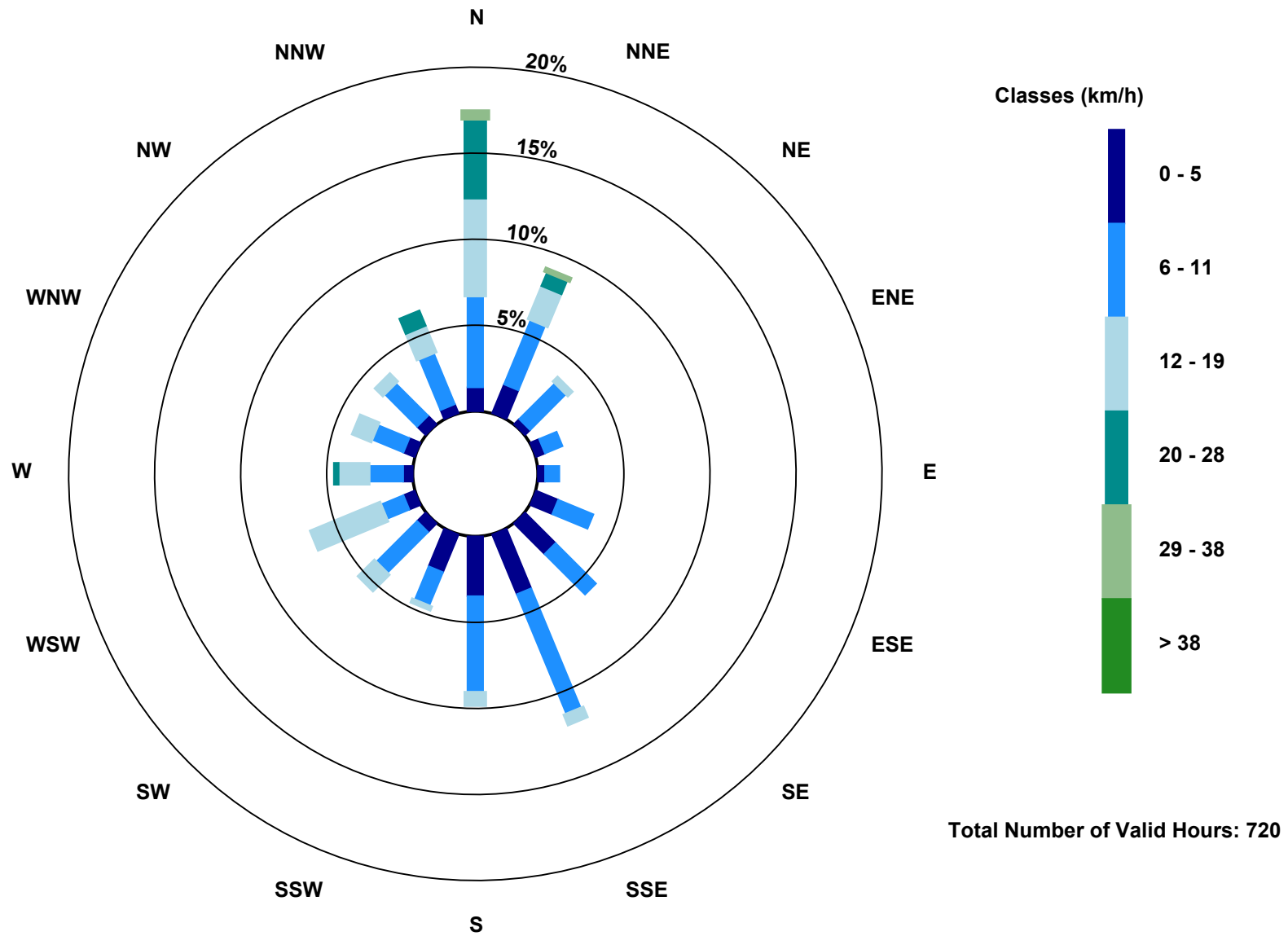
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Buffalo Viewpoint





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 2 deg on Jun 19 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 4.8 deg on Jun 19	Hours of Data: 720
Direction of Minimum Speed: 206 deg on Jun 5 03:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.9 deg on Jun 1	Percent Operational Time: 100.0
Monthly Average Direction: 333.3 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-Jun	238	176	341	328	107	156	207	203	204	219	301	291	311	325	342	0	18	38	39	58	66	99	68	25	359.9
2-Jun	11	14	2	322	333	330	337	317	356	1	304	294	291	321	31	26	36	39	35	34	56	73	69	60	12.8
3-Jun	75	60	37	51	70	176	31	9	19	351	9	23	4	28	80	123	131	123	128	123	129	128	103	96	70.2
4-Jun	125	140	167	110	105	84	84	99	108	121	124	131	124	120	116	116	102	122	145	138	51	123	207	264	118.0
5-Jun	213	181	206	314	309	315	332	348	1	19	34	37	16	4	353	346	348	352	22	2	340	247	268	279	340.6
6-Jun	261	260	241	231	235	244	243	261	247	243	237	233	252	255	237	244	230	225	230	233	193	153	148	154	238.3
7-Jun	171	158	156	153	143	139	178	217	224	205	232	245	264	285	277	280	295	301	300	277	269	282	277	257	252.2
8-Jun	277	358	357	1	0	16	7	3	17	27	284	18	37	27	18	22	36	30	19	31	41	50	60	54	16.3
9-Jun	204	244	198	196	178	154	177	153	173	183	183	183	202	206	122	186	192	200	201	166	157	162	151	182	181.0
10-Jun	166	157	161	153	162	175	164	159	169	160	158	168	155	171	166	170	177	177	176	170	162	159	154	152	165.2
11-Jun	147	175	136	274	193	160	236	276	277	280	292	296	303	287	289	302	303	301	291	274	318	322	322	330	290.4
12-Jun	329	325	294	276	279	287	307	10	17	312	303	320	6	2	219	201	201	165	44	38	25	37	90	138	329.3
13-Jun	171	151	145	149	162	179	185	167	161	165	147	128	221	337	0	352	354	7	21	16	11	355	22	24	24.8
14-Jun	16	9	7	360	1	2	5	2	2	1	1	3	358	355	357	350	348	351	351	350	352	349	350	346	356.1
15-Jun	345	347	346	342	333	332	352	334	322	300	308	305	315	322	327	330	328	308	313	95	126	194	222	247	327.5
16-Jun	263	273	248	176	160	177	152	150	150	120	131	168	220	219	213	198	184	179	216	185	177	243	236	235	200.6
17-Jun	236	215	223	200	214	241	242	249	246	240	230	240	251	251	261	268	291	271	330	36	28	68	12	31	253.7
18-Jun	12	32	137	355	29	34	33	23	8	1	356	5	7	3	11	16	16	24	22	22	10	8	9	17	14.6
19-Jun	14	11	13	11	11	12	8	8	12	15	16	9	3	2	5	9	4	2	355	354	354	355	352	351	4.8
20-Jun	352	355	351	353	356	359	355	354	353	356	359	354	345	348	342	345	349	346	344	341	324	319	320	318	348.8
21-Jun	320	330	327	328	327	332	352	354	355	1	7	3	349	355	359	10	2	9	24	42	86	129	154	160	356.4
22-Jun	153	182	183	171	167	163	160	140	130	148	123	124	131	264	260	258	264	258	245	252	294	138	155	131	201.8
23-Jun	180	152	138	146	172	126	157	175	139	114	124	129	168	167	176	213	78	111	112	112	122	143	160	165	145.1
24-Jun	148	144	149	144	146	150	155	151	146	214	231	239	250	238	239	17	13	16	350	356	17	4	360	7	351.8
25-Jun	22	18	15	9	16	23	31	43	38	35	2	18	359	318	281	344	350	345	334	351	29	113	179	164	11.5
26-Jun	149	170	164	152	159	149	158	152	142	137	151	159	188	201	226	262	10	8	206	183	193	131	109	285	168.1
27-Jun	220	198	330	348	345	358	4	4	6	3	352	9	37	15	351	15	357	351	334	251	296	270	170	176	352.7
28-Jun	167	166	173	162	162	146	161	164	180	184	181	185	200	289	266	220	219	129	178	227	175	156	165	176	181.3
29-Jun	204	190	160	174	184	182	172	175	171	177	172	182	182	214	256	238	277	196	172	167	186	188	200	180	194.8
30-Jun	176	179	156	134	246	176	204	180	215	232	231	233	239	258	242	252	243	242	251	249	235	231	216	241	230.8

318.7 339.7 341.3 349.7 339.7 355.3 357.7 346.9 0.8 340.9 322.9 309.5 302.8 305.9 307.1 310.1 334.6 342.3 343.4 358.4 5.7 2.0 344.9 343.8
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

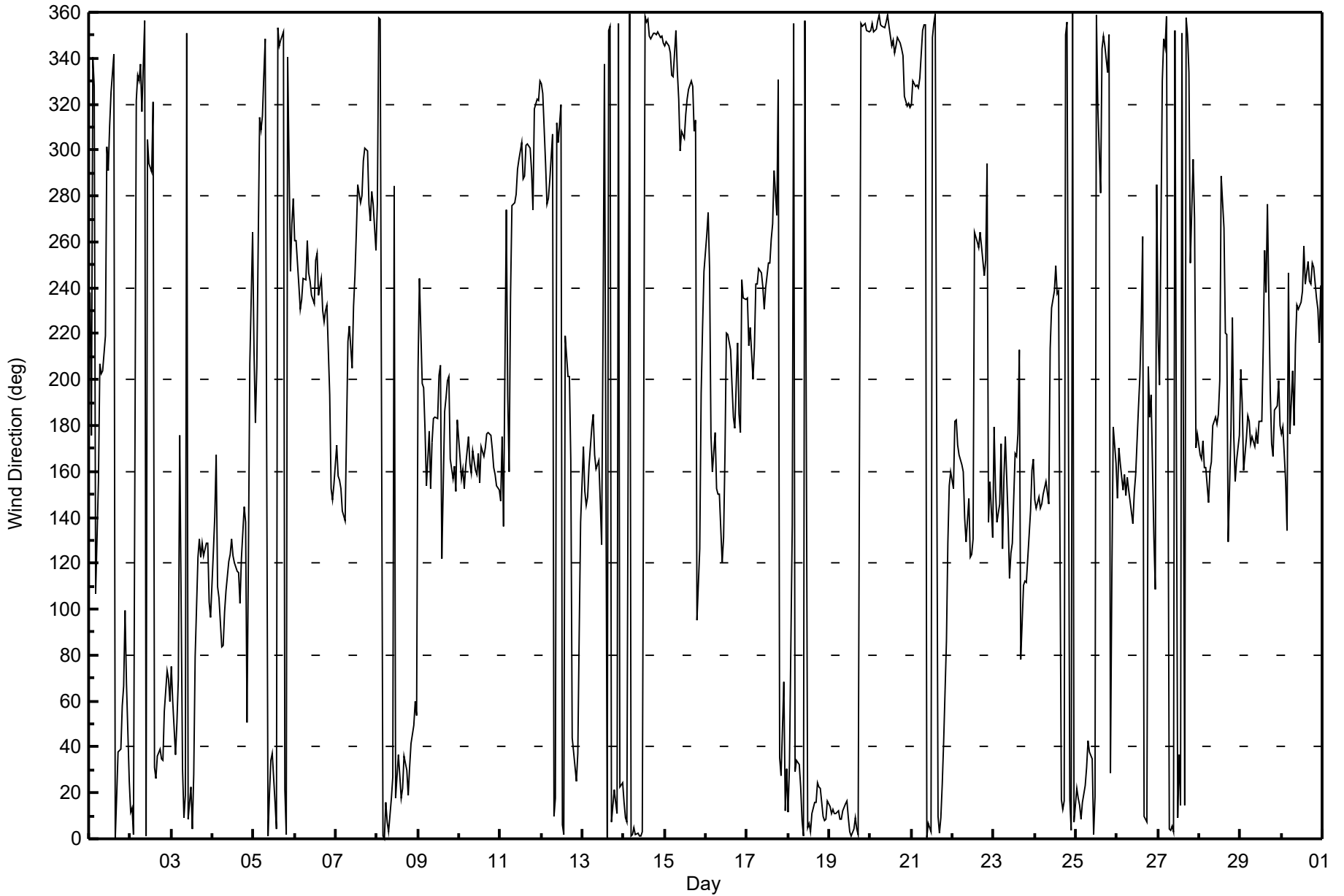
Wind Direction (WD) - deg
Buffalo Viewpoint - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 90 deg on Jun 12 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: 8 deg on Jun 9 05:00																									
Percentiles: P ₁ = 11 P ₁₀ = 17 Q ₁ = 21 Median = 24 Q ₃ = 32 P ₉₀ = 46 P ₉₉ = 80																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	63	80	22	19	63	24	20	24	47	52	37	33	48	28	38	55	32	23	23	18	11	26	36	29	80
2-Jun	32	21	28	23	26	15	22	23	22	62	48	39	68	83	70	30	27	23	21	20	24	10	15	14	83
3-Jun	12	42	15	11	31	30	80	27	34	28	32	33	42	76	57	29	31	37	31	27	29	19	20	21	80
4-Jun	26	26	41	35	77	16	16	20	21	28	29	28	30	29	25	30	27	25	29	61	31	20	41	52	77
5-Jun	55	47	79	56	23	22	24	25	21	22	21	26	29	27	26	21	19	19	34	54	23	25	21	23	79
6-Jun	16	16	21	17	22	20	22	21	22	23	24	24	26	23	24	24	24	22	21	17	17	16	11	16	26
7-Jun	28	36	33	28	20	18	33	26	23	23	24	23	17	25	22	22	24	23	22	18	13	25	15	20	36
8-Jun	15	29	14	18	17	25	30	22	27	60	38	72	73	72	37	58	56	31	24	21	15	14	10	18	73
9-Jun	64	28	50	10	8	20	28	37	35	43	51	44	38	37	47	39	33	28	23	25	33	33	31	30	64
10-Jun	33	30	29	29	30	27	29	33	32	33	33	36	35	33	33	32	29	30	29	27	28	32	27	28	36
11-Jun	30	84	67	59	46	25	36	20	22	25	28	24	22	24	29	23	22	21	23	24	16	16	16	14	84
12-Jun	19	17	16	14	17	21	21	32	48	53	36	39	43	46	90	34	45	88	18	18	24	15	47	32	90
13-Jun	29	31	31	35	40	30	33	34	36	41	46	70	58	29	22	21	22	23	25	19	20	23	22	21	70
14-Jun	25	19	21	20	20	21	21	21	22	23	21	22	23	21	22	20	20	20	20	21	22	21	20	20	25
15-Jun	20	20	20	20	19	19	21	20	23	21	20	20	20	19	20	19	23	22	35	50	10	44	26	24	50
16-Jun	17	18	21	15	13	34	25	29	31	27	31	35	21	19	18	23	28	31	29	25	20	27	19	20	35
17-Jun	22	17	38	34	21	19	23	20	21	25	26	24	25	22	20	22	28	20	60	21	22	72	8	18	72
18-Jun	23	32	34	64	15	23	21	21	28	28	23	24	25	24	24	22	22	23	22	22	19	20	22	21	64
19-Jun	20	20	21	21	22	22	23	22	24	23	22	24	23	26	24	24	24	23	24	23	20	23	21	22	26
20-Jun	21	21	20	20	23	21	22	21	21	22	21	21	20	20	19	20	20	19	19	21	17	16	15	17	23
21-Jun	15	15	15	13	15	16	20	20	22	22	23	24	38	39	26	30	25	25	29	19	26	28	19	16	39
22-Jun	14	59	26	15	18	23	24	30	28	35	36	35	33	36	15	17	17	19	22	38	76	34	29	76	
23-Jun	12	24	40	25	24	26	33	33	37	37	61	46	50	66	56	88	80	36	28	12	12	20	23	12	88
24-Jun	14	12	15	16	25	21	22	31	34	21	27	25	29	26	26	56	39	25	20	24	27	23	23	23	56
25-Jun	21	22	20	19	19	20	21	25	29	31	31	34	35	39	28	39	31	30	32	31	15	35	21	14	39
26-Jun	15	20	27	18	24	22	36	36	33	33	34	28	29	21	27	27	27	42	57	25	23	30	31	63	63
27-Jun	25	58	19	14	21	17	21	23	25	26	23	41	30	59	56	55	69	58	27	35	27	46	17	16	69
28-Jun	30	30	25	27	24	26	27	28	26	29	32	36	60	46	43	15	27	29	28	31	32	33	23	28	60
29-Jun	16	24	18	23	14	23	27	26	29	33	32	35	36	25	31	24	44	42	20	26	16	12	17	18	44
30-Jun	20	29	34	46	70	50	33	29	25	23	24	25	24	21	21	21	23	21	20	17	18	16	13	21	70
	64	84	79	64	77	50	80	37	48	62	61	72	73	83	90	88	80	88	60	61	38	76	47	63	
	Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS05
MANNIX
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
JUNE 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	34.2	0	6.2	0
H2S (ppb) Average	684	35	36	99.86	5	0	1.5	0
THC (ppm) Average	686	34	34	100	4.4	-	2.5	-
NMHC(ppm) Average	686	34	34	100	1.996	-	0.315	-
CH4(ppm) Average	686	34	34	100	3	-	2.2	-
Temperature 2 m (C) Average	717	0	3	99.58	31.4	-	22.6	-
Temperature 20 m (C) Average	717	0	3	99.58	29.7	-	23	-
Temperature 45 m (C) Average	717	0	3	99.58	29.1	-	23.1	-
Temperature 75 m (C) Average	717	0	3	99.58	28.7	-	23.1	-
Temperature 90 m (C) Average	717	0	3	99.58	28.6	-	23.1	-
Relative Humidity 2 m (%) Average	717	0	3	99.58	99	-	97	-
Relative Humidity 20 m (%) Average	702	0	18	97.5	99	-	97	-
Relative Humidity 45 m (%) Average	717	0	3	99.58	99	-	96	-
Relative Humidity 75 m (%) Average	702	0	18	97.5	100	-	88	-
Relative Humidity 90 m (%) Average	673	0	47	93.47	100	-	87	-
Wind Speed 20 m (km/h) Average	717	0	3	99.58	37	-	27	-
Wind Speed 45 m (km/h) Average	717	0	3	99.58	50	-	37	-
Wind Speed 75 m (km/h) Average	717	0	3	99.58	56	-	42	-
Wind Speed 90 m (km/h) Average	706	0	14	98.06	59	-	44	-
Wind Direction 20 m (deg) Average	717	0	3	99.58	-	-	-	-
Wind Direction 45 m (deg) Average	717	0	3	99.58	-	-	-	-
Wind Direction 75 m (deg) Average	717	0	3	99.58	-	-	-	-
Wind Direction 90 m (deg) Average	706	0	14	98.06	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	717	0	3	99.58	1.6	-	0.9	-
Vertical Wind Speed 45 m (km/h) Average	717	0	3	99.58	1.9	-	1	-
Vertical Wind Speed 75 m (km/h) Average	717	0	3	99.58	2.1	-	0.5	-
Vertical Wind Speed 90 m (km/h) Average	706	0	14	98.06	2.2	-	1.2	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)

JUNE 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	1.63	3.9	-	0	0.1	0.1	0.3	1	4.9	34.2
H2S (ppb) Average	684	0.51	0.7	-	0	0.1	0.1	0.2	0.5	1.3	5.1
THC (ppm) Average	686	2.16	0.3	-	1.9	2	2	2.1	2.2	2.4	4.4
NMHC(ppm) Average	686	0.121	0.183	-	0	0	0	0.1	0.2	0.3	1.996
CH4(ppm) Average	686	2.04	0.1	-	1.9	2	2	2	2	2.1	3
Temperature 2 m (C) Average	717	17.57	5.3	-	6.6	10.6	13.1	17.5	21.5	24.9	31.4
Temperature 20 m (C) Average	717	17.8	4.8	-	8.5	10.9	14	17.8	21.1	24.1	29.7
Temperature 45 m (C) Average	717	17.7	4.7	-	8.9	10.9	13.9	17.8	21	23.9	29.1
Temperature 75 m (C) Average	717	17.62	4.7	-	9.2	10.7	13.9	17.8	21	23.7	28.7
Temperature 90 m (C) Average	717	17.63	4.6	-	9.3	10.9	14	17.8	20.9	23.7	28.6
Relative Humidity 2 m (%) Average	717	67.3	21	-	25	39	49	67	87	96	99
Relative Humidity 20 m (%) Average	702	61.8	21	-	21	35	45	61	79	91	99
Relative Humidity 45 m (%) Average	717	60.9	20	-	21	35	44	59	78	91	99
Relative Humidity 75 m (%) Average	702	60.3	20	-	22	35	44	59	77	90	100
Relative Humidity 90 m (%) Average	673	58.5	19	-	22	34	44	56	74	86	100
Wind Speed 20 m (km/h) Average	717	11.2	6	-	1	5	7	10	14	20	37
Wind Speed 45 m (km/h) Average	717	16.4	8	-	1	7	10	15	21	28	50
Wind Speed 75 m (km/h) Average	717	18.6	10	-	0	8	11	17	25	32	56
Wind Speed 90 m (km/h) Average	706	19.3	10	-	1	8	12	18	26	33	59
Wind Direction 20 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	706	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	717	0.08	0.5	-	-1.4	-0.6	-0.2	0.1	0.4	0.7	1.6
Vertical Wind Speed 45 m (km/h) Average	717	0.04	0.5	-	-1.3	-0.6	-0.3	0	0.4	0.7	1.9
Vertical Wind Speed 75 m (km/h) Average	717	0.23	0.4	-	-1.1	-0.2	0	0.2	0.4	0.7	2.1
Vertical Wind Speed 90 m (km/h) Average	706	0.2	0.6	-	-2	-0.5	-0.2	0.2	0.5	1.1	2.2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	28 Jun 2023 09:00	28 Jun 2023 10:00	2	DAS Failure - data not recorded
ALL PARAMETERS	28 Jun 2023 12:00	28 Jun 2023 12:00	1	DAS Failure - data not recorded
H2S	15 Jun 2023 13:00	15 Jun 2023 13:00	1	Maintenance - sample manifold cleaned
Relative Humidity 20m	04 Jun 2023 06:00	06 Jun 2023 00:00	15	Sensor operated out of range
Relative Humidity 75m	05 Jun 2023 06:00	27 Jun 2023 07:00	15	Sensor operated out of range
Relative Humidity at 90m	01 Jun 2023 05:00	27 Jun 2023 08:00	44	Sensor operated out of range
Wind Speed, Wind Direction, Vertical Wind Speed 90 m	05 Jun 2023 18:00	05 Jun 2023 19:00	2	Unstable Operation - inconsistent response
Wind Speed, Wind Direction, Vertical Wind Speed 90 m	13 Jun 2023 21:00	14 Jun 2023 02:00	6	Unstable Operation - inconsistent response
Wind Speed, Wind Direction, Vertical Wind Speed 90 m	14 Jun 2023 13:00	14 Jun 2023 13:00	1	Unstable Operation - inconsistent response
Wind Speed, Wind Direction, Vertical Wind Speed 90 m	29 Jun 2023 16:00	29 Jun 2023 17:00	2	Unstable Operation - inconsistent response



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Mannix - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 34.2 ppb on Jun 12 13:00	Maximum Daily Average: 6.2 ppb on Jun 13		Hours of Data:	686
Minimum Value: 0.0 ppb on Jun 7 22:00	Minimum Daily Average: 0.0 ppb on Jun 30		Hours of Missing Data:	34
Maximum Diurnal Average: 3.2 ppb at hour 12	Minimum Diurnal Average: 0.4 ppb at hour 24		Hours of Calibration:	34
Monthly Average: 1.63 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.0 P ₉₀ = 4.9 P ₉₉ = 20.3		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-Jun	0.7	0.2	Z	0.2	0.3	0.3	0.2	0.2	1.1	7.0	6.2	20.1	3.0	1.5	0.4	1.3	0.9	0.2	0.2	0.4	0.4	0.3	0.4	0.4	2.0	20.1
2-Jun	7.2	6.2	6.0	Z	6.0	8.0	30.8	10.0	4.8	1.7	9.5	5.8	8.1	3.5	2.3	1.5	0.6	0.6	0.4	0.3	0.8	1.0	0.6	0.4	5.0	30.8
3-Jun	0.4	0.3	0.3	0.2	Z	0.3	0.3	0.3	0.9	5.0	5.7	1.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.8	5.7
4-Jun	0.2	0.3	0.2	0.2	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.2	0.2	0.2	0.3
5-Jun	Z	0.2	0.2	0.3	0.2	0.2	0.3	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.9	1.8	1.9	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.4	1.9
6-Jun	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
7-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.2
8-Jun	0.0	8.6	32.1	10.0	6.1	Z	2.7	5.5	6.8	4.1	1.6	1.3	2.4	7.0	11.2	9.1	13.3	5.3	1.0	0.6	0.3	0.4	0.5	0.5	5.7	32.1
9-Jun	0.5	0.6	0.5	0.4	Z	0.5	0.5	0.5	0.5	0.8	0.7	0.8	0.6	0.7	0.8	0.8	0.7	0.6	0.4	0.4	0.3	0.3	0.4	0.2	0.6	0.8
10-Jun	0.3	0.2	0.1	0.3	0.3	Z	0.4	0.5	0.6	0.6	0.5	0.4	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.6
11-Jun	Z	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.3	1.4	1.9	1.3	2.8	0.2	0.1	0.7	0.1	0.1	0.1	0.4	0.3	0.2	0.2	0.5	2.8
12-Jun	0.4	Z	4.5	0.4	0.3	0.2	1.5	12.7	11.1	11.0	6.8	30.7	34.2	12.1	2.7	0.7	0.7	0.6	0.6	0.4	0.7	0.7	0.6	0.5	5.8	34.2
13-Jun	0.5	0.6	Z	1.2	1.9	1.5	1.6	1.7	1.3	1.2	1.0	0.9	0.8	3.1	25.3	16.6	12.9	27.3	9.8	1.4	1.8	13.4	14.1	1.9	6.2	27.3
14-Jun	0.9	0.8	0.6	Z	1.1	8.8	11.7	12.7	12.6	8.5	10.5	12.3	15.5	6.3	5.1	2.4	1.5	1.2	1.0	1.1	0.8	1.5	1.1	1.0	5.2	15.5
15-Jun	0.7	0.6	0.6	0.5	Z	0.5	0.4	0.4	0.3	C	C	C	C	0.9	0.5	0.4	0.4	1.3	1.7	2.8	1.3	0.6	0.4	0.2	0.8	2.8
16-Jun	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2
17-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.5	0.1	0.1	0.1	1.6	0.2	1.6
18-Jun	0.8	Z	0.5	0.3	0.6	0.5	0.5	0.4	0.3	0.3	0.5	7.5	1.3	4.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	7.5
19-Jun	2.0	4.7	10.8	Z	0.6	0.3	0.2	0.2	0.1	0.2	0.1	0.2	4.7	5.9	2.8	0.9	0.5	2.1	21.2	6.1	2.3	1.6	0.8	0.7	3.0	21.2
20-Jun	0.6	1.0	2.9	Z	6.7	7.8	8.9	3.4	2.9	1.9	4.9	2.0	1.7	1.0	0.7	0.5	0.6	1.1	0.5	1.7	0.7	0.5	0.3	0.3	2.3	8.9
21-Jun	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.7	2.1	1.7	1.7	2.1	1.0	0.9	0.8	1.5	0.6	1.5	0.2	0.3	0.3	0.2	0.2	0.2	0.8	2.1
22-Jun	0.1	0.1	0.3	0.1	0.2	Z	0.2	0.2	0.4	0.5	0.9	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.9
23-Jun	Z	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4
24-Jun	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	0.2	0.5	1.0	2.2	2.8	2.7	4.2	2.9	1.1	0.9	4.2
25-Jun	0.6	0.5	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	6.1	6.5	8.2	3.6	1.2	7.4	1.9	1.0	1.4	1.8	8.2
26-Jun	0.7	0.4	0.3	Z	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	4.6	3.2	4.4	0.8	0.4	0.3	0.2	0.2	0.8	4.6
27-Jun	0.2	0.4	0.3	0.8	Z	1.3	2.2	5.0	13.6	11.3	6.7	1.9	0.9	1.4	11.1	6.0	6.4	2.2	0.5	1.2	1.4	1.9	1.8	1.0	3.5	13.6
28-Jun	0.8	0.6	0.4	0.4	0.4	Z	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.8
29-Jun	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
30-Jun	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	0.1	0.0	0.1

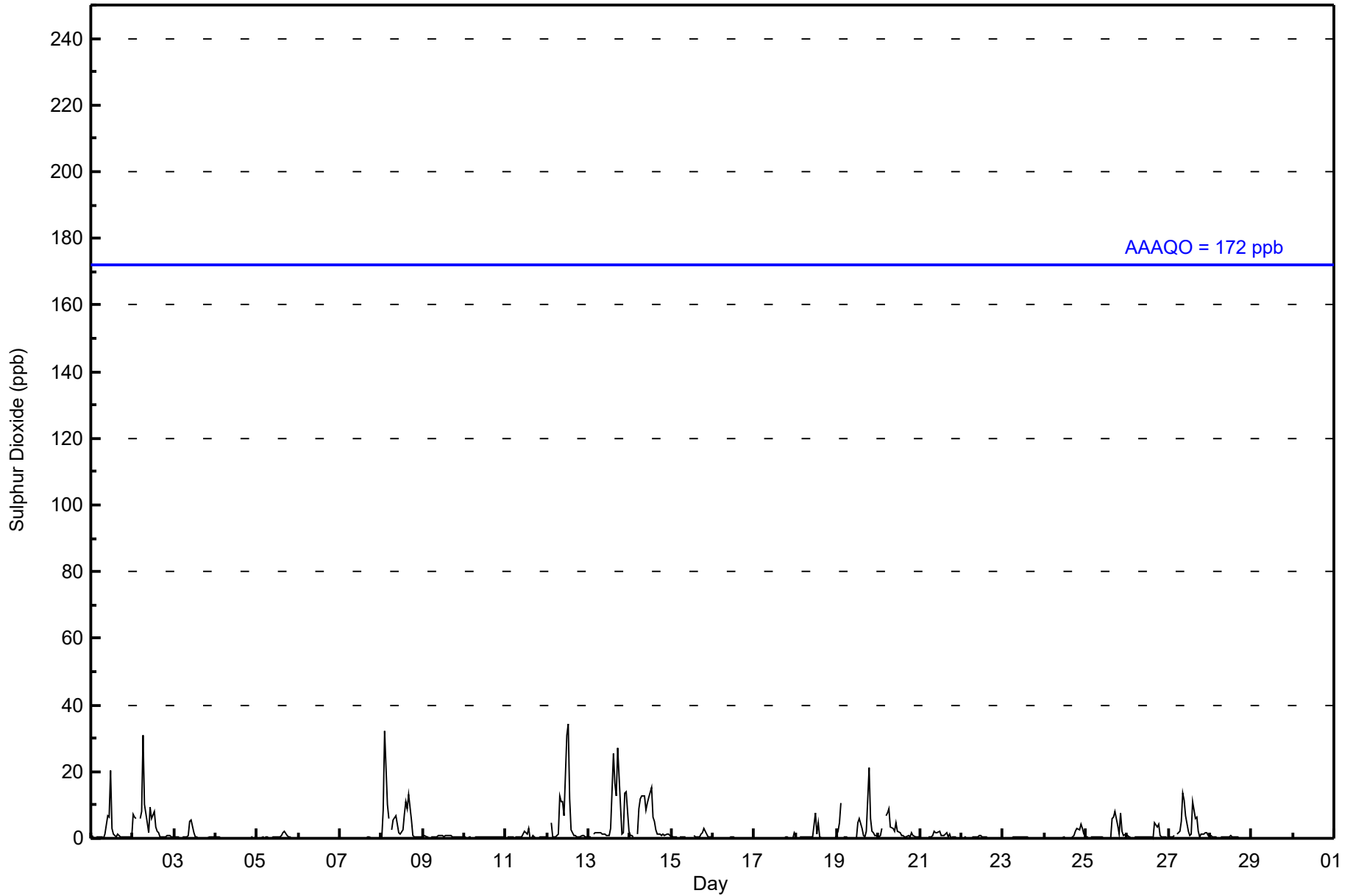
0.7	1.1	2.4	0.7	1.0	1.3	2.2	1.9	2.1	2.0	2.1	3.2	2.8	1.8	2.3	1.7	1.8	2.0	1.7	0.8	0.8	1.0	0.9	0.4	Diurnal Average	
7.2	8.6	32.1	10.0	6.7	8.8	30.8	12.7	13.6	11.3	10.5	30.7	34.2	12.1	25.3	16.6	13.3	27.3	21.2	6.1	7.4	13.4	14.1	1.9	Diurnal Maximum	

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 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mannix - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	659	96.06	96.06
11 - 20	20	2.92	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: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mannix - June 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	67	29	17	19	17	49	114	36	25	43	38	37	20	20	80	656
11 - 20	12	1	1	1	0	0	0	0	0	0	0	0	1	0	2	2	20
21 - 60	5	0	0	0	0	0	0	0	0	0	0	0	0	2	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	62	68	30	18	19	17	49	114	36	25	43	38	38	22	22	82	683

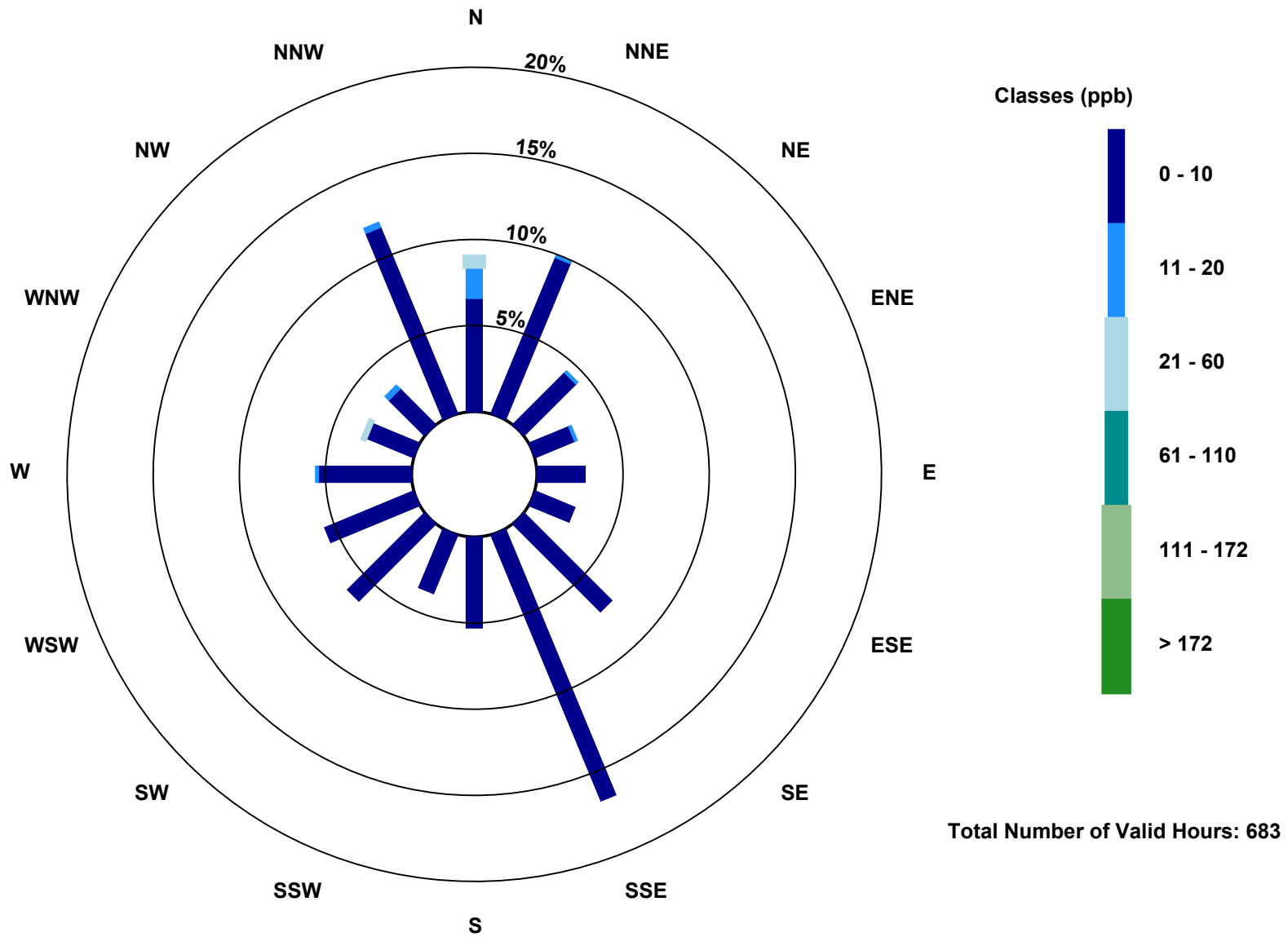
Total Number of Valid Hours: 683

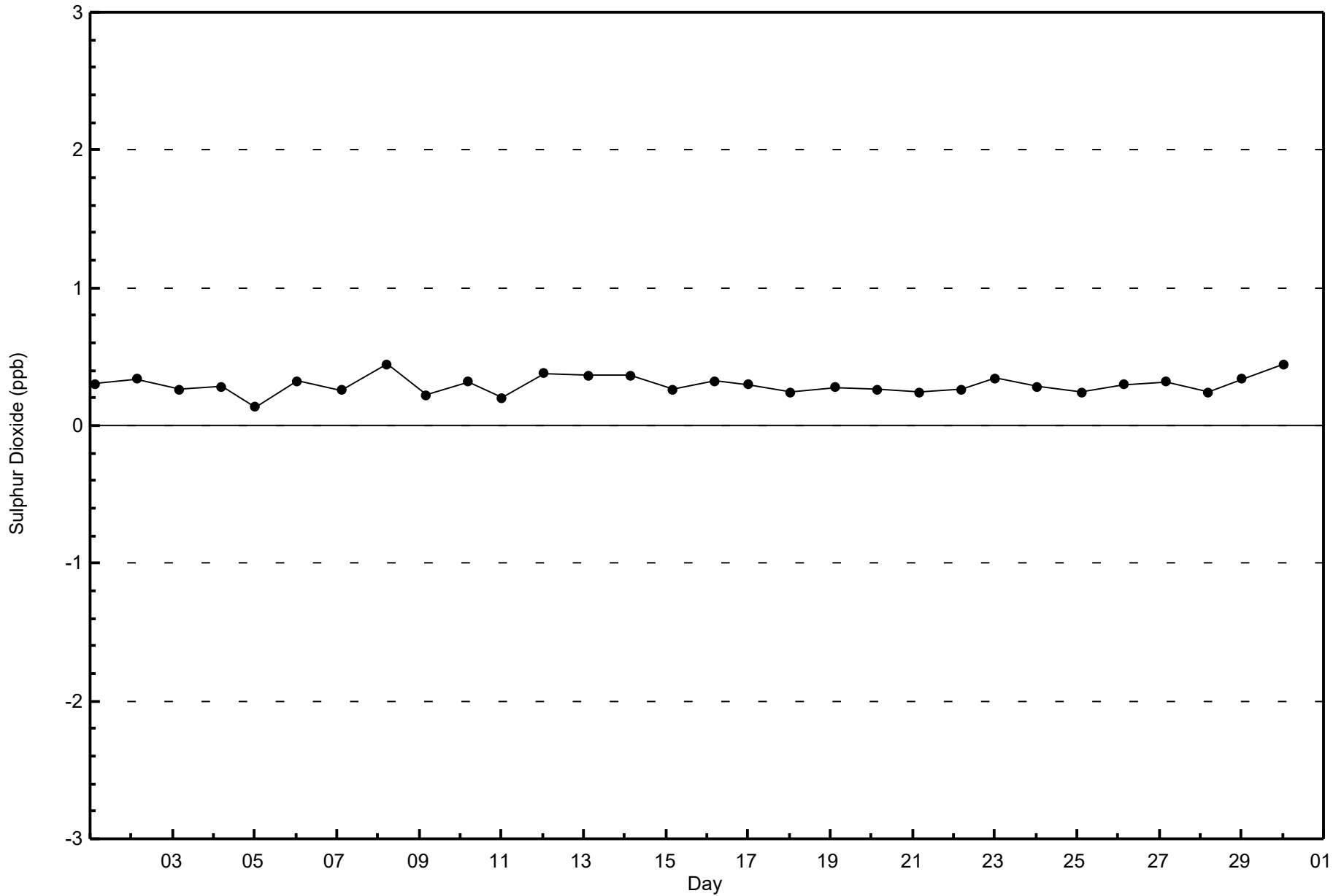
Total Number of Hours: 720

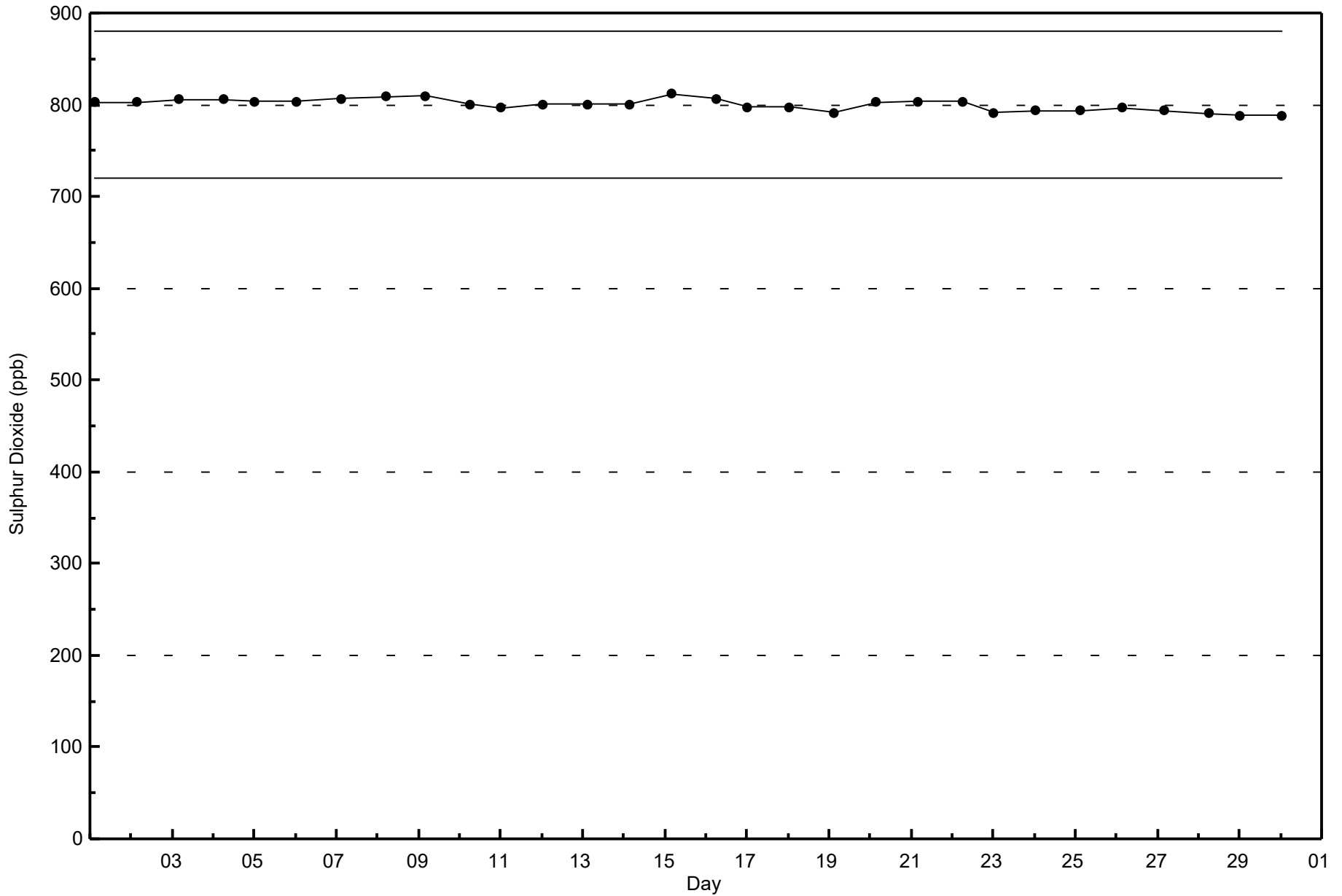


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Mannix

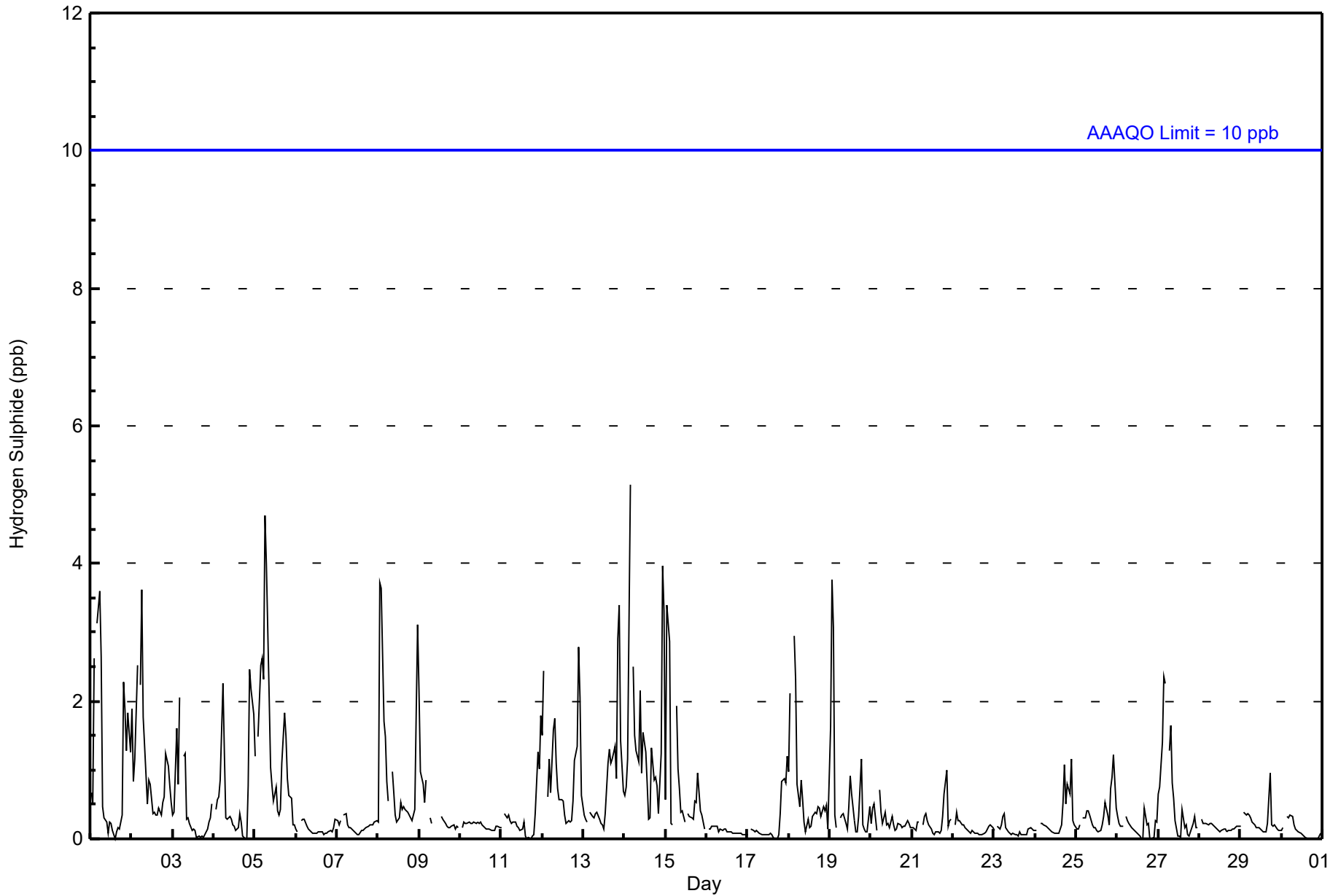








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 5.1 ppb on Jun 14 04:00		Maximum Daily Average: 1.5 ppb on Jun 14																	Hours of Data:	684																													
Minimum Value: 0.0 ppb on Jun 1 15:00		Minimum Daily Average: 0.1 ppb on Jun 30																	Hours of Missing Data:	36																													
Maximum Diurnal Average: 1.0 ppb at hour 3		Minimum Diurnal Average: 0.2 ppb at hour 15																	Hours of Calibration:	35																													
Monthly Average: 0.51 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.3 P ₉₉ = 3.6																	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-Jun	0.7	0.5	2.6	Z	3.1	3.6	2.6	0.5	0.3	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.2	0.4	2.3	1.9	1.3	1.8	1.3	1.1	3.6																							
2-Jun	1.9	0.8	1.2	2.5	Z	2.2	3.6	1.8	0.9	0.5	0.9	0.8	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.6	1.2	1.1	0.8	0.5	1.1	3.6																							
3-Jun	0.4	0.4	1.6	0.8	2.0	Z	1.2	1.2	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.4	2.0																							
4-Jun	Z	0.4	0.6	0.6	0.9	2.3	1.2	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.8	2.5	2.2	1.8	0.7	2.5																							
5-Jun	1.2	Z	1.5	2.5	2.6	2.3	4.7	4.0	2.0	1.0	0.8	0.5	0.8	0.4	0.3	0.4	1.1	1.8	1.5	0.9	0.6	0.6	0.2	0.2	1.4	4.7																							
6-Jun	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3																							
7-Jun	0.3	0.2	0.3	Z	0.4	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	0.2	0.2	0.2	0.2	0.3	0.2	0.4																							
8-Jun	0.2	3.7	3.6	1.7	1.5	0.8	0.5	Z	1.0	0.7	0.4	0.3	0.3	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	1.8	3.1	1.0	3.7																							
9-Jun	2.2	1.0	0.8	0.5	0.9	Z	0.3	0.2	C	C	C	C	C	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	2.2																							
10-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3																							
11-Jun	0.2	Z	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.3	1.0	1.8	0.3	1.8																							
12-Jun	1.5	2.5	Z	0.6	1.2	0.7	1.6	1.7	1.1	0.7	0.6	0.6	0.6	0.3	0.2	0.3	0.2	0.3	0.6	1.1	1.3	2.8	2.1	0.6	1.0	2.8																							
13-Jun	0.3	0.3	0.2	Z	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.4	1.1	1.3	1.1	1.2	1.3	0.9	2.9	3.4	1.4	0.7	0.8	3.4																							
14-Jun	0.6	0.8	1.2	5.1	Z	2.5	1.5	1.3	1.1	2.2	1.0	1.5	1.3	0.8	0.3	0.3	1.3	0.9	0.9	0.8	0.4	1.2	4.0	3.3	1.5	5.1																							
15-Jun	0.6	3.4	2.9	0.2	0.2	Z	1.9	1.0	0.7	0.4	0.4	0.3	M	0.4	0.3	0.3	0.3	0.6	0.5	1.0	0.4	0.3	0.2	0.1	0.7	3.4																							
16-Jun	Z	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	0.1	0.1	0.1	0.1	0.1	0.2	0.2																						
17-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4	0.8	0.9	0.8	1.2	0.2	1.2																							
18-Jun	1.0	2.1	Z	3.0	2.3	0.8	0.5	0.8	0.6	0.2	0.1	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.4	0.3	0.5	0.4	0.5	0.1	0.7	3.0																							
19-Jun	1.6	3.8	3.1	0.3	0.2	Z	0.3	0.3	0.4	0.2	0.2	0.5	0.9	0.7	0.3	0.1	0.1	0.3	1.2	0.2	0.2	0.1	0.1	0.5	0.7	3.8																							
20-Jun	0.2	0.4	0.5	0.1	Z	0.7	0.4	0.2	0.4	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.7	0.7																						
21-Jun	0.2	0.2	0.1	0.3	0.2	Z	0.2	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.6	1.0	0.2	0.3	0.3	0.2	1.0	0.2																						
22-Jun	Z	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.4	0.1																						
23-Jun	0.1	Z	0.2	0.1	0.2	0.3	0.4	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	0.2	0.1	0.1	0.1	0.4	0.1																						
24-Jun	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	1.1	0.5	0.8	0.7	1.2	0.3	0.2	0.2	0.3	1.2	0.3																						
25-Jun	0.1	0.1	0.2	Z	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.4	0.2	0.7	0.9	1.2	0.4	1.2	0.3																						
26-Jun	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5	0.2	0.2	0.0	0.0	0.0	0.3	0.2	0.2	0.5	0.2																						
27-Jun	0.7	0.8	1.4	2.4	2.3	Z	1.3	1.6	0.8	0.6	0.3	0.0	0.0	0.0	0.4	0.2	0.2	0.1	0.0	0.1	0.2	0.3	0.2	0.2	0.6	2.4	0.6																						
28-Jun	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3																						
29-Jun	0.2	Z	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	1.0	0.2	0.2	0.2	0.1	0.1	0.1	0.2	1.0	0.2																						
30-Jun	0.1	0.2	Z	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3																						
																								0.6	0.9	1.0	0.9	0.8	0.8	0.9	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.7	0.7	0.6	Diurnal Average	
																								2.2	3.8	3.6	5.1	3.1	3.6	4.7	4.0	2.0	2.2	1.0	1.5	1.3	0.8	1.1	1.3	1.3	1.8	1.5	2.3	2.9	3.4	4.0	3.3	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 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	659	96.35	96.35
3 - 4	23	3.36	99.71
5 - 7	2	0.29	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
Mannix - June 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	55	66	29	17	19	15	48	109	36	26	42	38	37	21	23	75	656
3 - 4	8	1	1	2	0	1	0	0	0	0	1	0	1	2	0	6	23
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	63	67	30	19	19	16	48	109	36	26	43	38	38	23	23	83	681

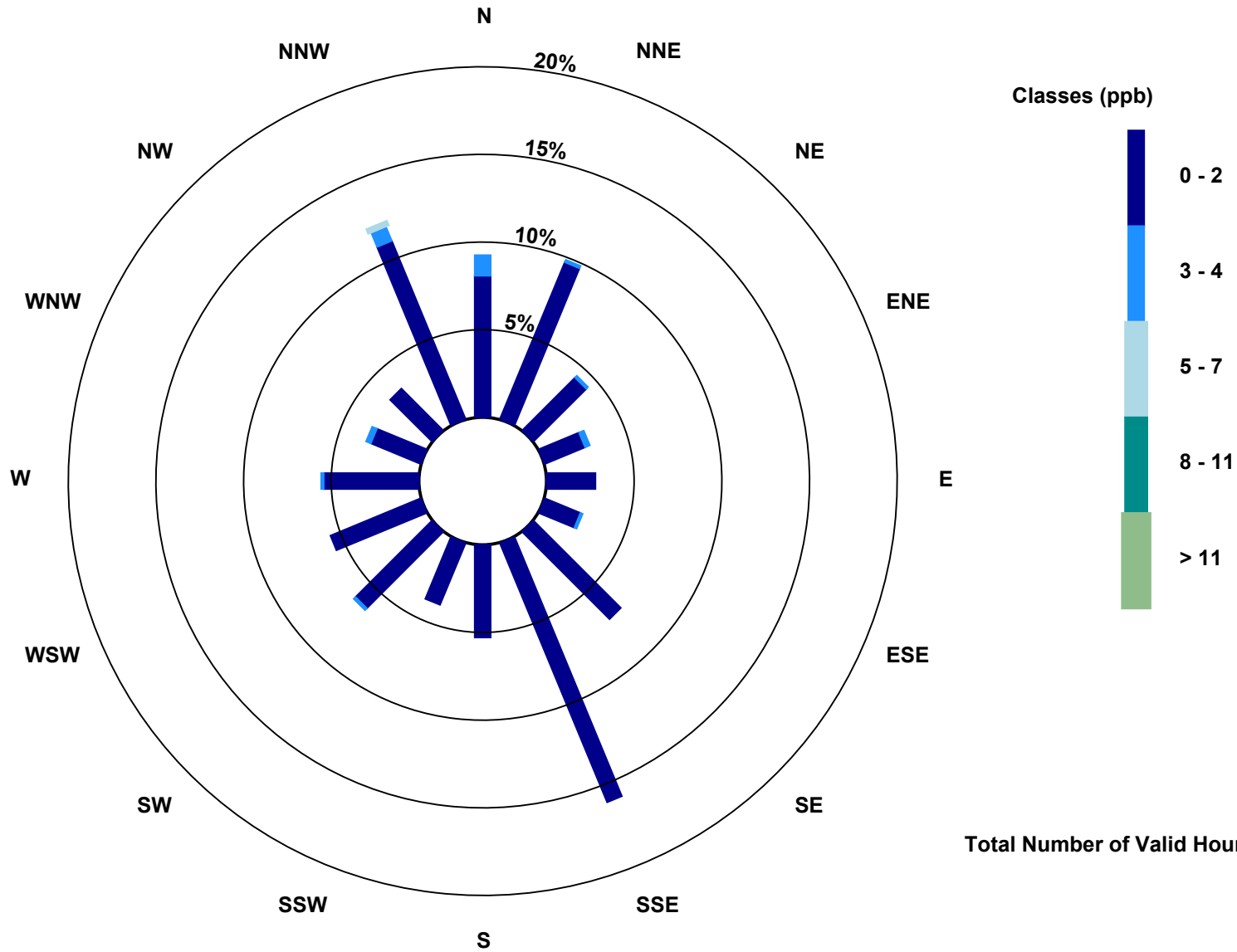
Total Number of Valid Hours: 681

Total Number of Hours: 720

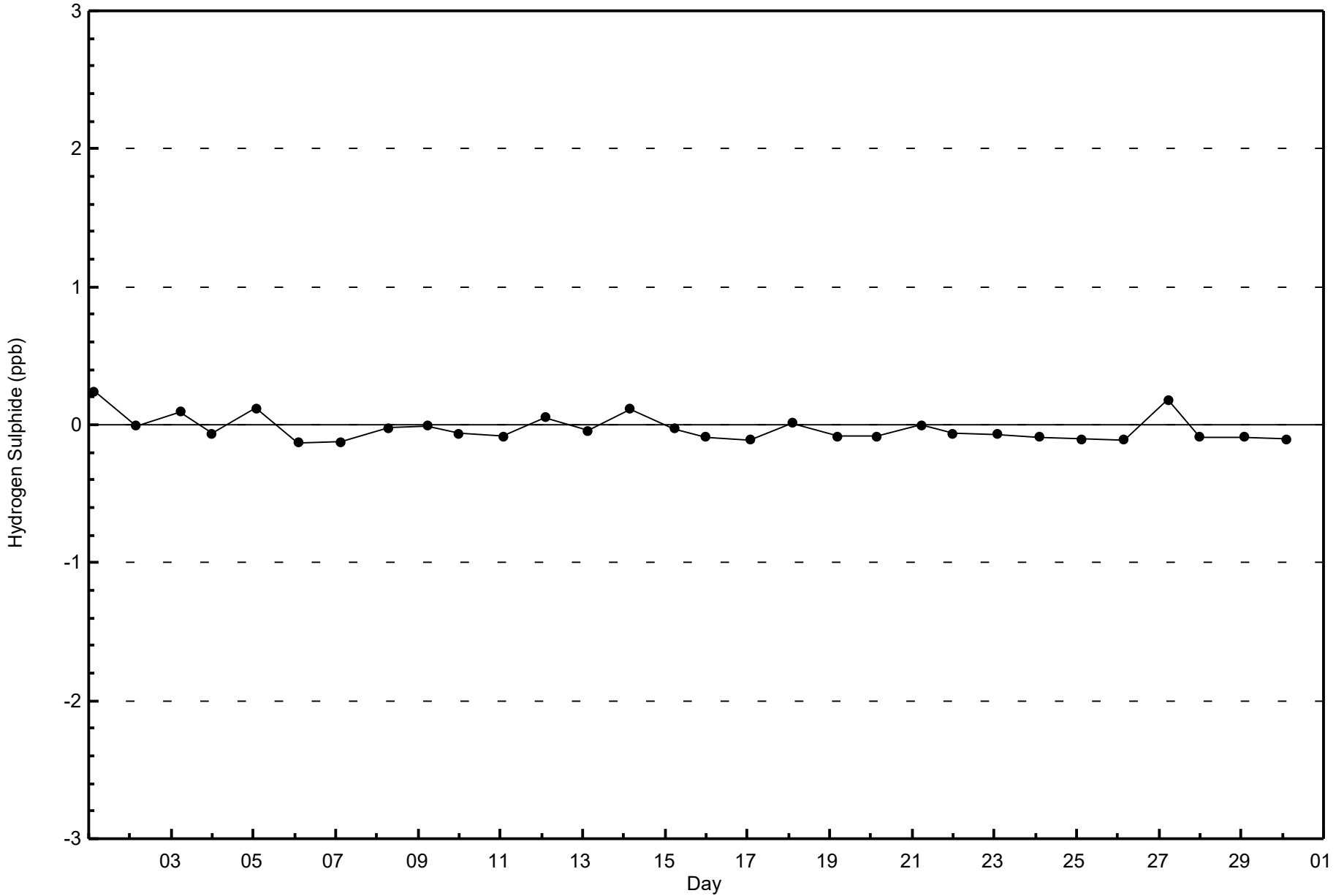


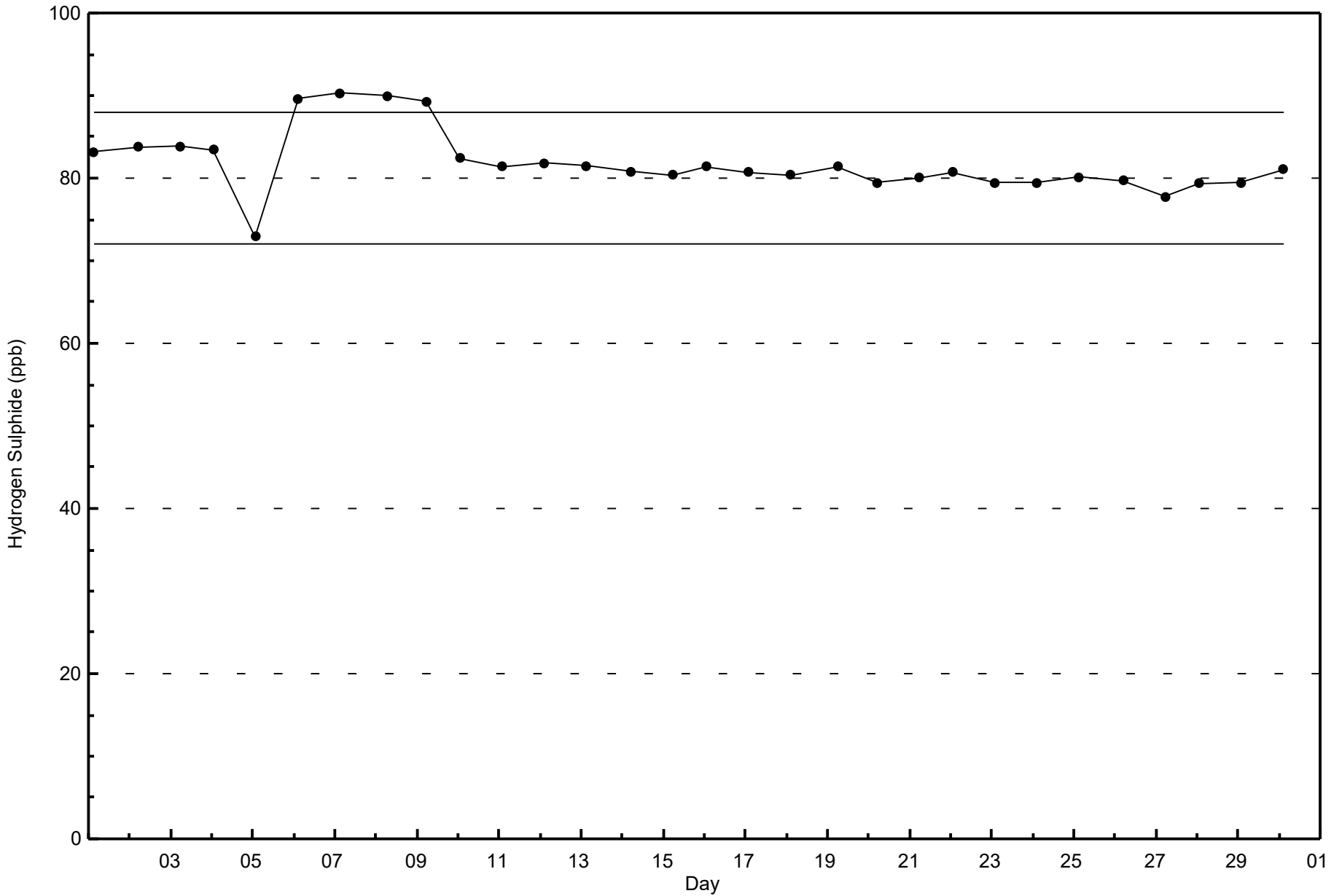
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Mannix



Total Number of Valid Hours: 681







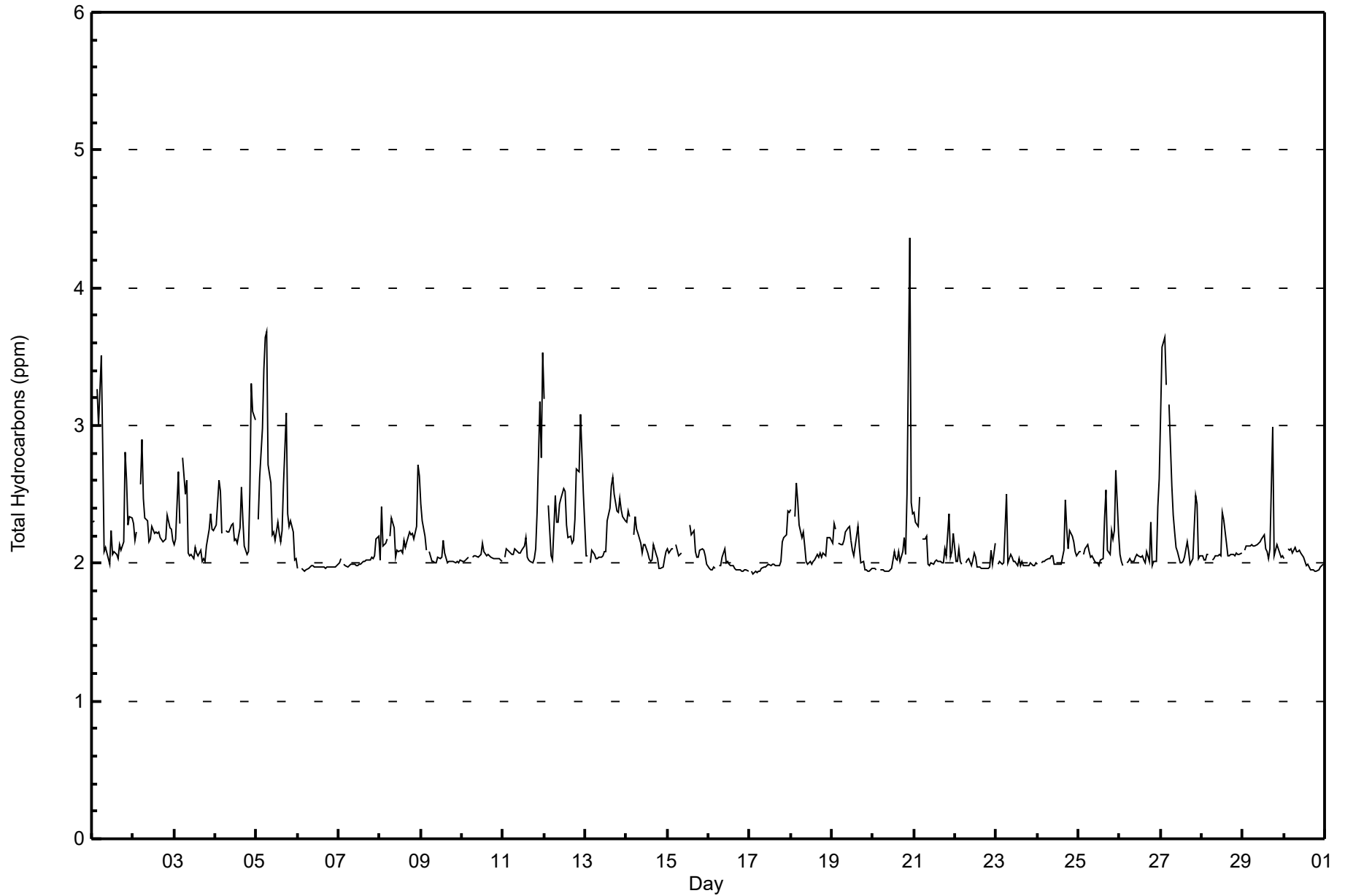
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - June 2023

Maximum Value: 4.4 ppm on Jun 20 22:00																				Maximum Daily Average: 2.5 ppm on Jun 5					Hours in Service: 720		
Minimum Value: 1.9 ppm on Jun 17 03:00																				Minimum Daily Average: 2.0 ppm on Jun 6					Hours of Data: 686		
Maximum Diurnal Average: 2.3 ppm at hour 6																				Minimum Diurnal Average: 2.1 ppm at hour 10					Hours of Missing Data: 34		
Monthly Average: 2.16 ppm																				Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 3.4					Hours of Calibration: 34		
																									Percent Operational Time: 100.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	2.3	2.3	Z	3.3	3.0	3.5	2.8	2.1	2.1	2.0	2.0	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.8	2.6	2.3	2.3	2.3	2.4	3.5	
2-Jun	2.3	2.2	2.2	Z	2.6	2.9	2.5	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.9
3-Jun	2.1	2.2	2.7	2.3	Z	2.8	2.5	2.6	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.4	2.2	2.2	2.2	2.8	
4-Jun	2.3	2.4	2.6	2.5	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.3	2.6	2.3	2.1	2.1	2.1	2.5	3.3	3.1	3.0	2.4	3.3	
5-Jun	Z	2.3	2.6	3.0	3.4	3.6	3.7	2.7	2.6	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.6	3.1	2.4	2.3	2.3	2.2	2.0	2.0	2.5	3.7	
6-Jun	2.0	Z	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7-Jun	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	2.2	2.2	2.0	2.2	
8-Jun	2.0	2.4	2.1	2.1	2.2	Z	2.2	2.3	2.3	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.7	2.6	2.2	2.7	
9-Jun	2.4	2.3	2.2	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
10-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
11-Jun	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.4	3.2	2.8	3.5	2.2	3.5	
12-Jun	3.2	Z	2.4	2.2	2.1	2.0	2.5	2.3	2.3	2.4	2.5	2.5	2.5	2.3	2.2	2.2	2.1	2.2	2.3	2.7	2.7	3.1	2.8	2.5	2.4	3.2	
13-Jun	2.1	2.1	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.4	2.6	2.6	2.5	2.4	2.4	2.5	2.4	2.3	2.3	2.2	2.6	
14-Jun	2.3	2.4	2.3	Z	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	
15-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	C	C	C	C	2.3	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.3	
16-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.1	
17-Jun	Z	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	2.2	2.2	2.4	2.4	2.0	2.4	
18-Jun	2.4	Z	2.3	2.6	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.6	
19-Jun	2.1	2.3	2.3	Z	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.2	2.3	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.1	2.3	
20-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.5	4.4	2.4	2.4	2.2	4.4	
21-Jun	2.4	2.3	2.3	2.5	Z	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	2.0	2.1	2.2	2.1	2.5	
22-Jun	2.0	2.0	2.1	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	2.1	2.0	2.1	2.0	2.1	
23-Jun	Z	2.0	2.0	2.0	2.0	2.3	2.5	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	2.5	
24-Jun	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	2.1	2.5	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.5	
25-Jun	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.5	2.1	2.1	2.2	2.2	2.2	2.7	2.2	2.1	2.7	
26-Jun	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.3	2.0	2.0	2.0	2.4	2.6	2.1	2.6	
27-Jun	3.1	3.6	3.6	3.3	Z	3.2	2.6	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	2.5	2.4	2.0	2.1	2.4	3.6	
28-Jun	2.0	2.0	2.0	2.1	2.1	Z	2.0	2.0	2.1	2.0	2.1	2.1	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
29-Jun	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.0	2.1	3.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	3.0	
30-Jun	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	294	42.86	42.86
2.1 - 3.0	374	54.52	97.38
3.1 - 10.0	18	2.62	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



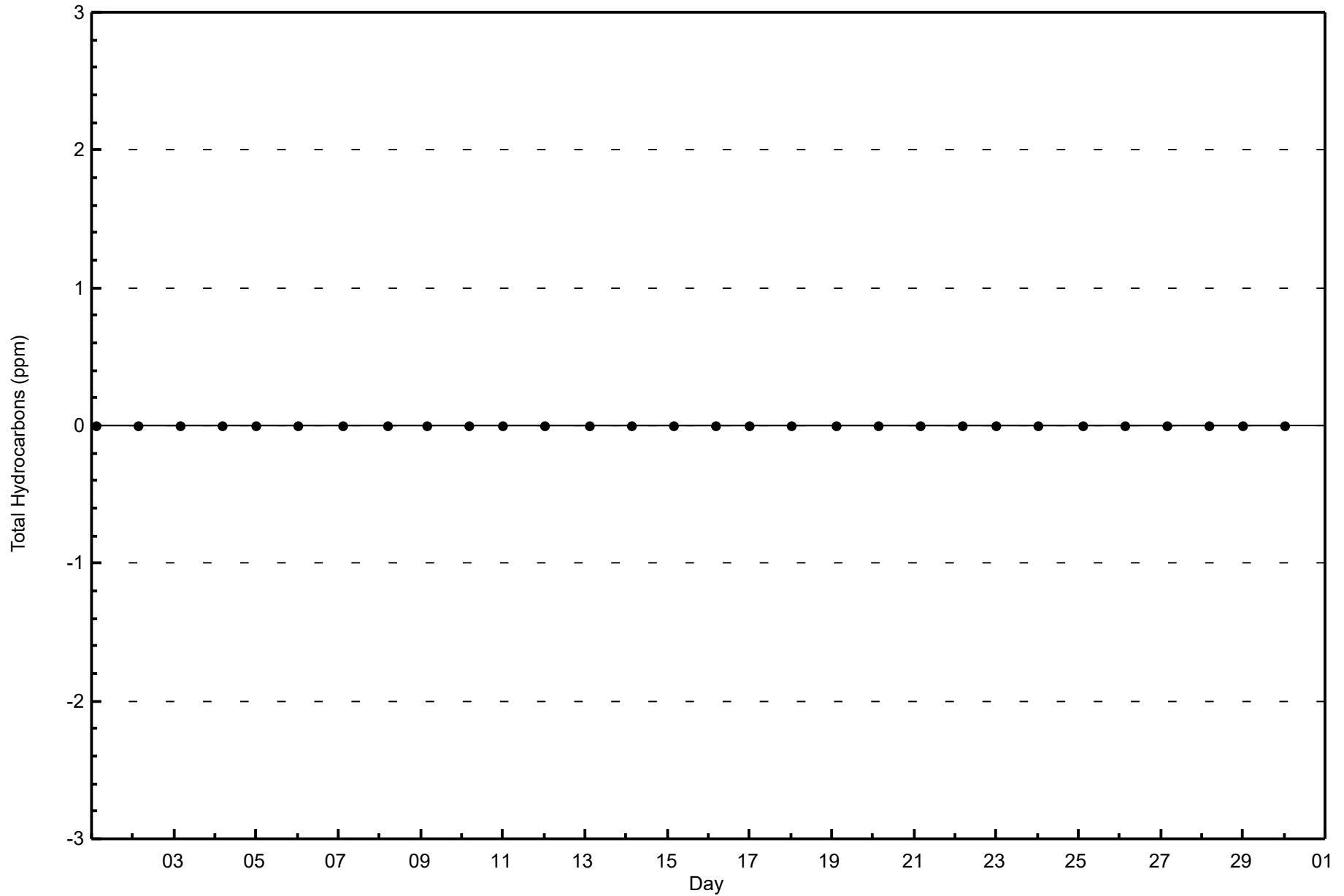
**Wood Buffalo Environmental Association
Frequency Distribution**

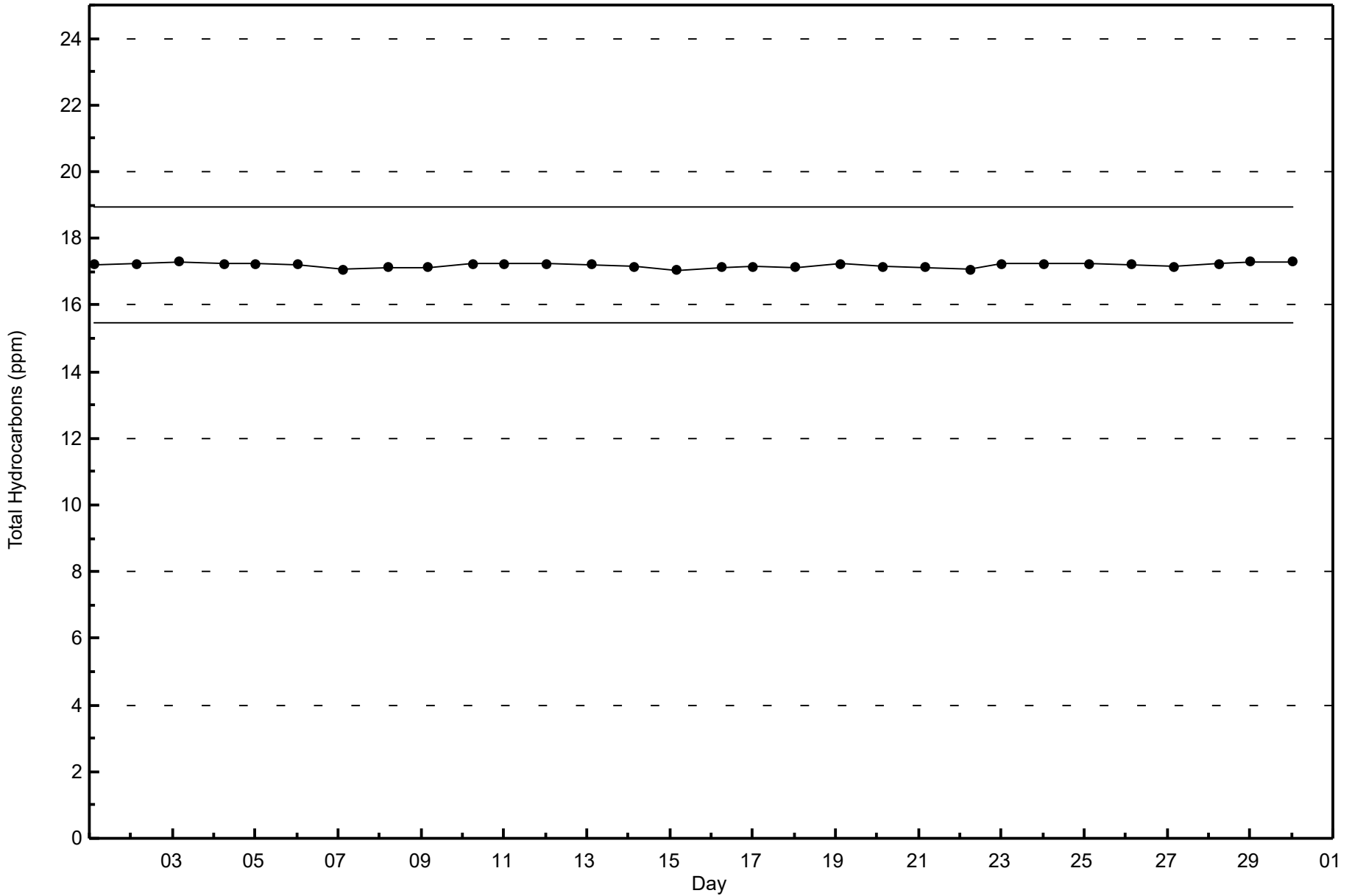
**Total Hydrocarbons (THC) - ppm
Mannix - June 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	13	9	5	4	3	2	24	72	19	14	32	31	22	10	2	31	293
2.1 - 3.0	49	59	24	14	16	13	25	41	17	11	11	7	14	10	18	43	372
3.1 - 10.0	0	0	1	0	0	2	0	1	0	0	0	0	2	2	2	8	18
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	68	30	18	19	17	49	114	36	25	43	38	38	22	22	82	683

Total Number of Valid Hours: 683

Total Number of Hours: 720







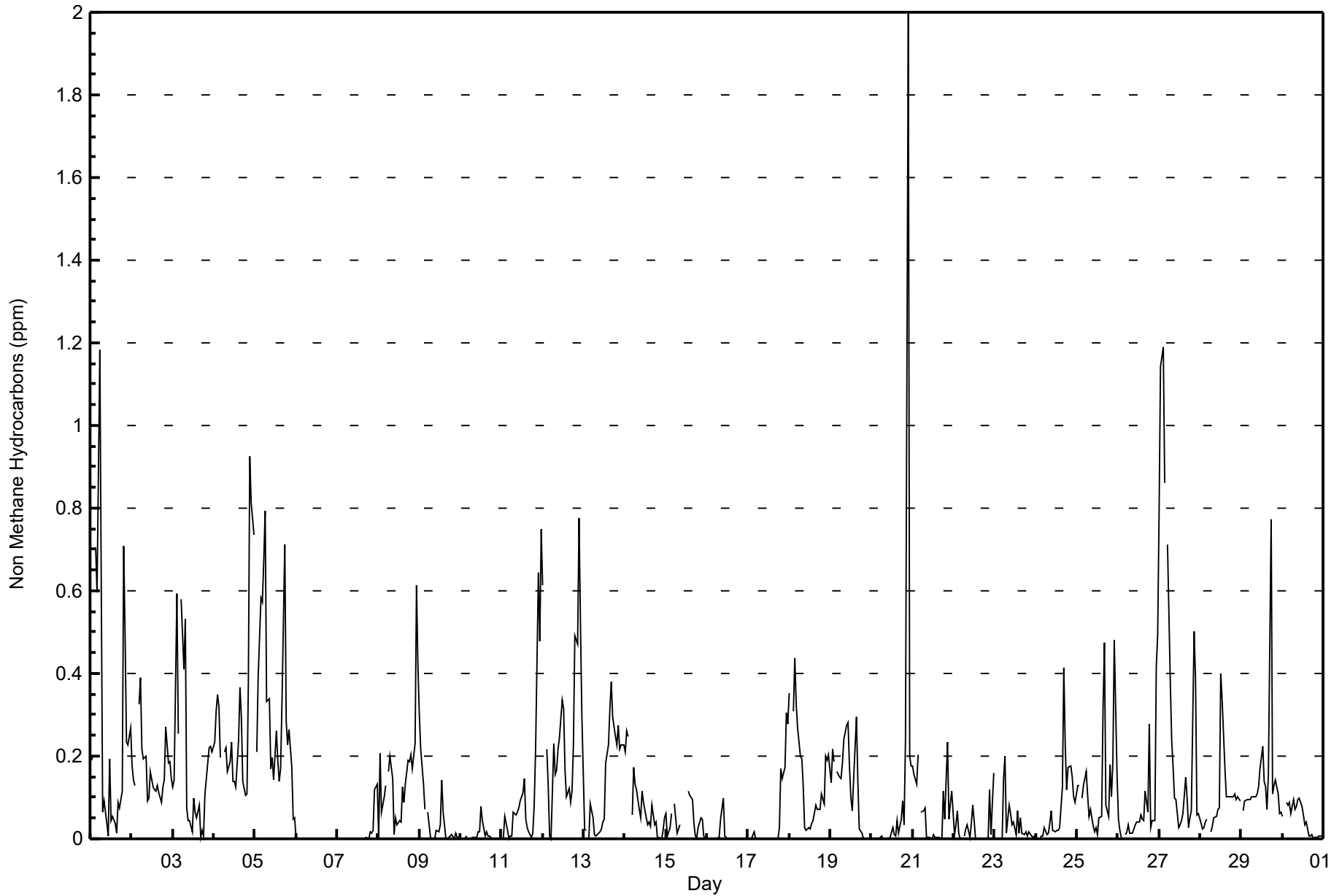
Summary of Hour Averages

Mannix - June 2023

Maximum Value: 1.996 ppm on Jun 20 22:00	Maximum Daily Average: 0.315 ppm on Jun 5	Hours in Service: 720
Minimum Value: 0.000 ppm on Jun 6 03:00	Minimum Daily Average: 0.000 ppm on Jun 6	Hours of Data: 686
Maximum Diurnal Average: 0.240 ppm at hour 22	Minimum Diurnal Average: 0.063 ppm at hour 10	Hours of Missing Data: 34
Monthly Average: 0.121 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.8	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-Jun	0.190	0.199	Z	0.704	0.598	1.183	0.617	0.066	0.091	0.036	0.007	0.193	0.043	0.054	0.038	0.012	0.087	0.074	0.116	0.710	0.496	0.235	0.227	0.268	0.271	1.183																							
2-Jun	0.175	0.142	0.127	Z	0.327	0.390	0.218	0.192	0.200	0.091	0.097	0.164	0.126	0.120	0.116	0.131	0.111	0.088	0.124	0.141	0.272	0.183	0.186	0.146	0.168	0.390																							
3-Jun	0.125	0.143	0.592	0.253	Z	0.580	0.411	0.533	0.076	0.043	0.044	0.018	0.098	0.064	0.051	0.082	0.005	0.022	0.007	0.108	0.183	0.220	0.223	0.211	0.178	0.592																							
4-Jun	0.232	0.307	0.348	0.317	0.196	Z	0.209	0.221	0.163	0.187	0.235	0.139	0.139	0.125	0.236	0.367	0.295	0.138	0.104	0.110	0.381	0.927	0.815	0.736	0.301	0.927																							
5-Jun	Z	0.210	0.392	0.584	0.574	0.674	0.795	0.332	0.338	0.168	0.197	0.141	0.262	0.190	0.139	0.171	0.331	0.712	0.283	0.226	0.266	0.173	0.049	0.050	0.315	0.795																							
6-Jun	0.005	Z	0.000	0.000	0.000	0.000	0.000	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	0.005																							
7-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.003	0.001	0.019	0.015	0.019	0.119	0.134	0.014	0.134																						
8-Jun	0.005	0.206	0.064	0.103	0.130	Z	0.163	0.201	0.145	0.012	0.050	0.034	0.045	0.039	0.126	0.087	0.133	0.191	0.186	0.202	0.171	0.231	0.613	0.420	0.155	0.613																							
9-Jun	0.303	0.215	0.131	0.070	Z	0.066	0.002	0.001	0.001	0.000	0.021	0.018	0.033	0.143	0.063	0.000	0.000	0.003	0.006	0.010	0.001	0.014	0.002	0.005	0.048	0.303																							
10-Jun	0.000	0.000	0.000	0.003	0.006	Z	0.001	0.003	0.005	0.002	0.015	0.017	0.078	0.044	0.008	0.018	0.008	0.007	0.000	0.001	0.000	0.000	0.000	0.000	0.009	0.078																							
11-Jun	Z	0.005	0.054	0.020	0.000	0.007	0.006	0.064	0.059	0.063	0.074	0.092	0.111	0.147	0.047	0.026	0.018	0.003	0.013	0.082	0.217	0.645	0.477	0.749	0.130	0.749																							
12-Jun	0.614	Z	0.217	0.127	0.006	0.000	0.232	0.156	0.165	0.218	0.243	0.337	0.316	0.167	0.102	0.121	0.089	0.116	0.227	0.492	0.471	0.778	0.525	0.302	0.262	0.778																							
13-Jun	0.023	0.022	Z	0.000	0.085	0.050	0.009	0.008	0.011	0.015	0.023	0.041	0.048	0.182	0.226	0.312	0.378	0.294	0.248	0.228	0.276	0.217	0.226	0.227	0.137	0.378																							
14-Jun	0.211	0.262	0.248	Z	0.059	0.172	0.132	0.119	0.071	0.052	0.116	0.087	0.053	0.033	0.041	0.029	0.080	0.034	0.039	0.000	0.002	0.000	0.020	0.051	0.083	0.262																							
15-Jun	0.062	0.006	0.028	0.060	Z	0.084	0.012	0.025	0.035	C	C	C	C	0.116	0.105	0.097	0.036	0.008	0.004	0.028	0.051	0.047	0.007	0.001	0.043	0.116																							
16-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.004	0.002	0.049	0.099	0.006	0.003	0.001	0.000	0.000	0.002	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.007	0.099																							
17-Jun	Z	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.169	0.147	0.172	0.303	0.278	0.048	0.303																							
18-Jun	0.352	Z	0.307	0.436	0.326	0.267	0.200	0.193	0.130	0.028	0.019	0.029	0.023	0.036	0.043	0.082	0.070	0.073	0.073	0.110	0.086	0.201	0.190	0.204	0.151	0.436																							
19-Jun	0.136	0.216	0.186	Z	0.164	0.148	0.146	0.185	0.242	0.276	0.283	0.177	0.100	0.066	0.220	0.294	0.139	0.024	0.014	0.000	0.000	0.000	0.000	0.000	0.131	0.294																							
20-Jun	0.000	0.000	0.000	Z	0.002	0.003	0.005	0.000	0.000	0.000	0.000	0.004	0.029	0.009	0.008	0.046	0.014	0.049	0.091	0.034	0.241	1.996	0.200	0.177	0.126	1.996																							
21-Jun	0.176	0.155	0.133	0.205	Z	0.066	0.069	0.074	0.004	0.002	0.003	0.000	0.009	0.004	0.002	0.003	0.000	0.003	0.117	0.048	0.234	0.046	0.086	0.115	0.067	0.234																							
22-Jun	0.009	0.034	0.069	0.013	0.000	Z	0.005	0.023	0.032	0.002	0.036	0.083	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.120	0.009	0.159	0.028	0.159																							
23-Jun	Z	0.000	0.002	0.001	0.000	0.146	0.200	0.014	0.080	0.060	0.035	0.042	0.010	0.068	0.015	0.050	0.012	0.010	0.018	0.008	0.017	0.006	0.004	0.008	0.035	0.200																							
24-Jun	0.000	Z	0.001	0.005	0.006	0.026	0.011	0.015	0.036	0.067	0.020	0.017	0.021	0.020	0.026	0.127	0.413	0.226	0.117	0.173	0.175	0.149	0.103	0.089	0.080	0.413																							
25-Jun	0.128	0.130	Z	0.098	0.129	0.164	0.107	0.056	0.071	0.029	0.019	0.028	0.010	0.052	0.053	0.314	0.474	0.082	0.054	0.179	0.100	0.183	0.481	0.154	0.135	0.481																							
26-Jun	0.046	0.020	0.002	Z	0.009	0.018	0.032	0.012	0.012	0.024	0.035	0.039	0.042	0.059	0.047	0.044	0.115	0.065	0.277	0.027	0.045	0.045	0.417	0.495	0.084	0.495																							
27-Jun	0.789	1.143	1.190	0.859	Z	0.712	0.381	0.237	0.173	0.098	0.093	0.027	0.033	0.044	0.060	0.150	0.099	0.027	0.050	0.066	0.500	0.385	0.059	0.062	0.315	1.190																							
28-Jun	0.036	0.024	0.028	0.041	0.046	Z	0.018	0.031	0.050	0.054	0.073	0.075	0.401	0.336	0.171	0.102	0.100	0.103	0.101	0.100	0.108	0.095	0.101	0.091	0.099	0.401																							
29-Jun	Z	0.068	0.090	0.094	0.095	0.095	0.101	0.102	0.103	0.109	0.125	0.169	0.223	0.141	0.127	0.072	0.157	0.773	0.107	0.128	0.144	0.108	0.063	0.065	0.142	0.773																							
30-Jun	0.056	Z	0.090	0.082	0.087	0.060	0.096	0.072	0.077	0.096	0.098	0.077	0.057	0.034	0.040	0.008	0.005	0.009	0.001	0.004	0.002	0.006	0.007	0.008	0.047	0.098																							
																								0.147	0.140	0.165	0.164	0.114	0.204	0.139	0.098	0.081	0.063	0.068	0.071	0.081	0.076	0.070	0.091	0.106	0.105	0.080	0.113	0.153	0.240	0.184	0.173	Diurnal Average	
																								0.789	1.143	1.190	0.859	0.598	1.183	0.795	0.533	0.338	0.276	0.283	0.337	0.401	0.336	0.236	0.367	0.474	0.773	0.283	0.710	0.500	1.996	0.815	0.749	Diurnal Maximum	

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	162	23.62	23.62
0.006 - 0.05	172	25.07	48.69
0.06 - 0.1	173	25.22	73.91
> 0.1	179	26.09	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Mannix - June 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	0	0	0	0	0	5	40	11	10	26	22	14	5	0	22	162
0.006 - 0.05	11	8	4	5	4	3	21	45	11	4	6	8	8	4	6	22	170
0.06 - 0.1	21	21	15	2	4	4	14	23	13	9	9	5	8	4	7	13	172
> 0.1	23	39	11	11	11	10	9	6	1	2	2	3	8	9	9	25	179
Totals	62	68	30	18	19	17	49	114	36	25	43	38	38	22	22	82	683

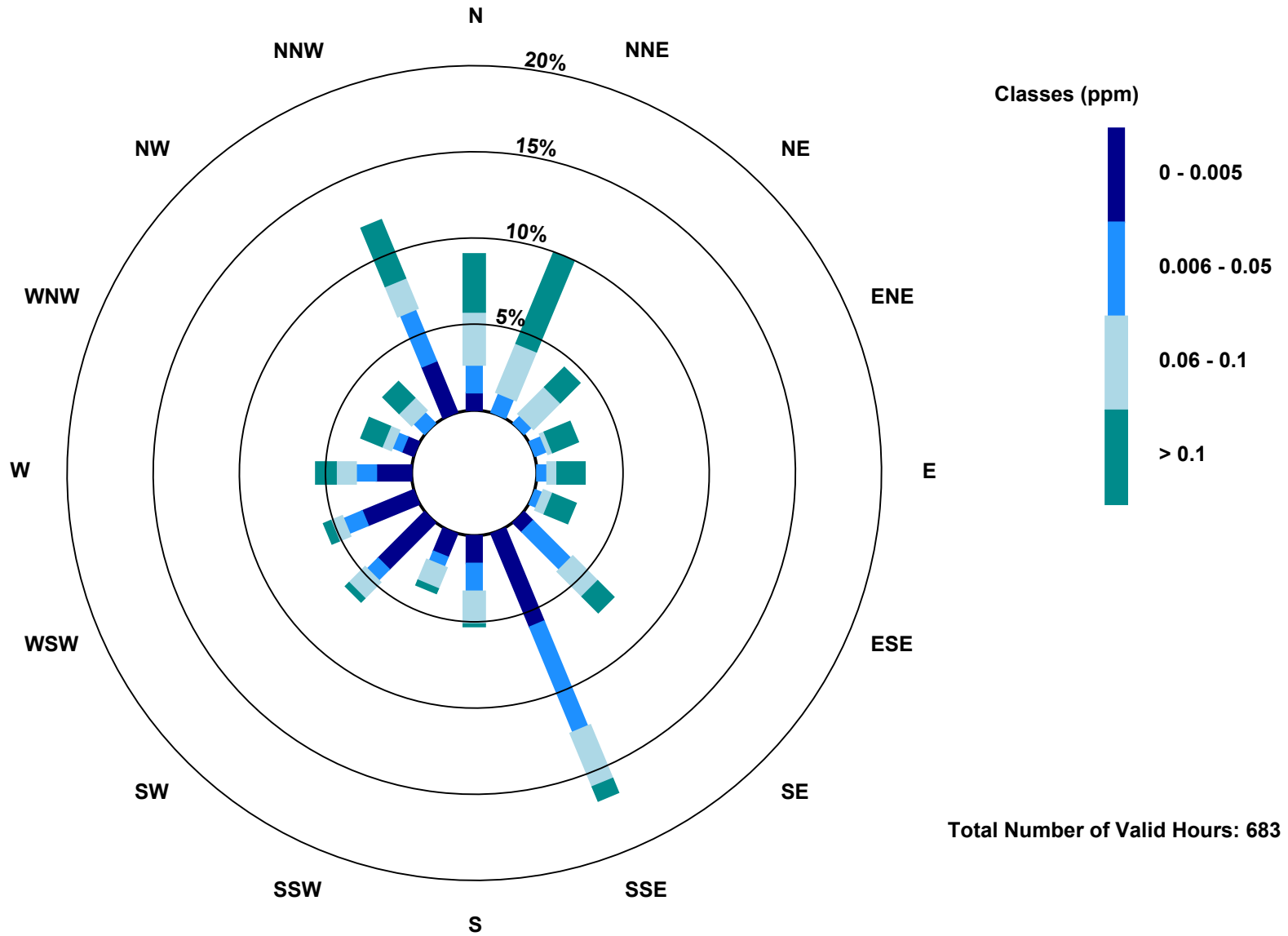
Total Number of Valid Hours: 683

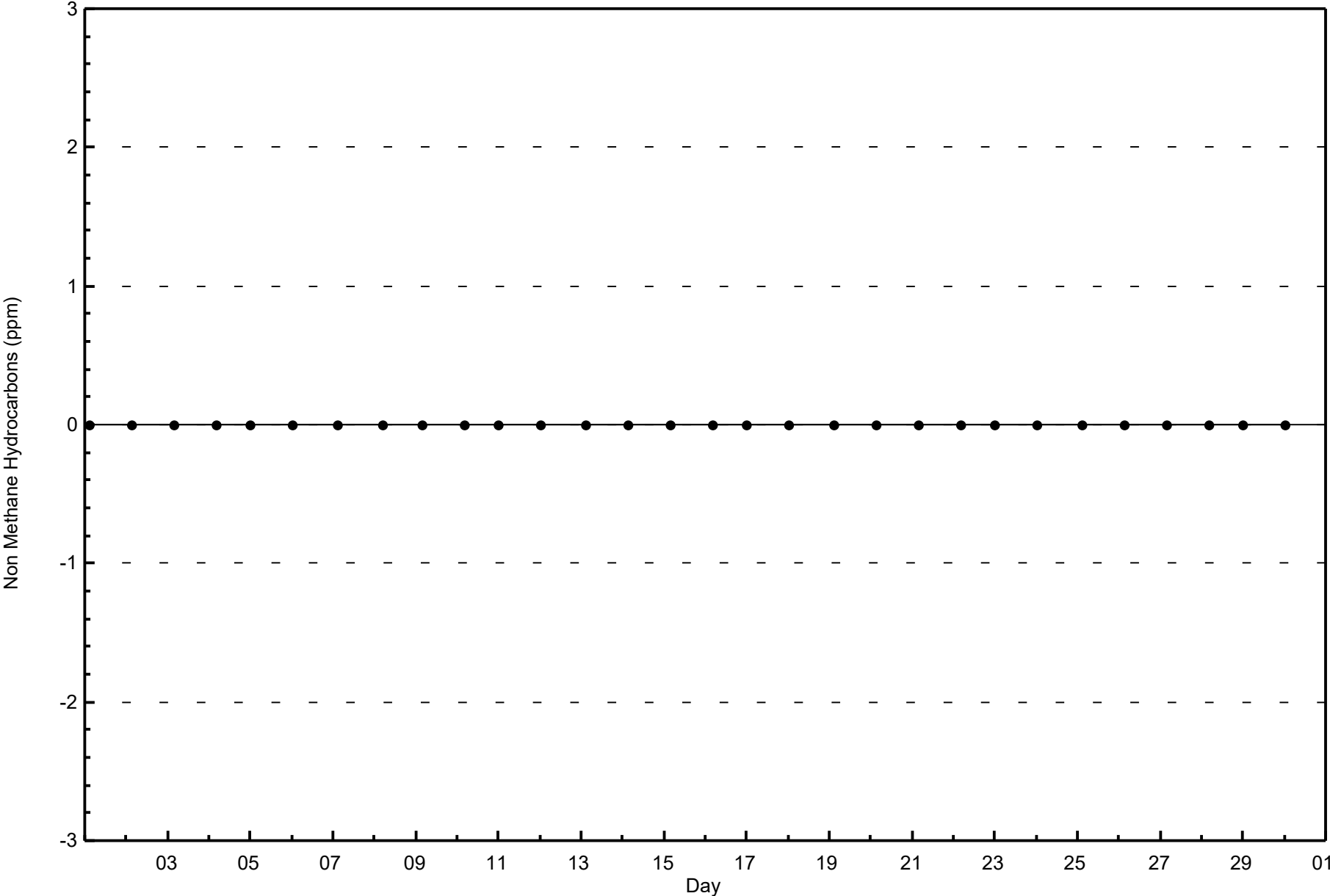
Total Number of Hours: 720

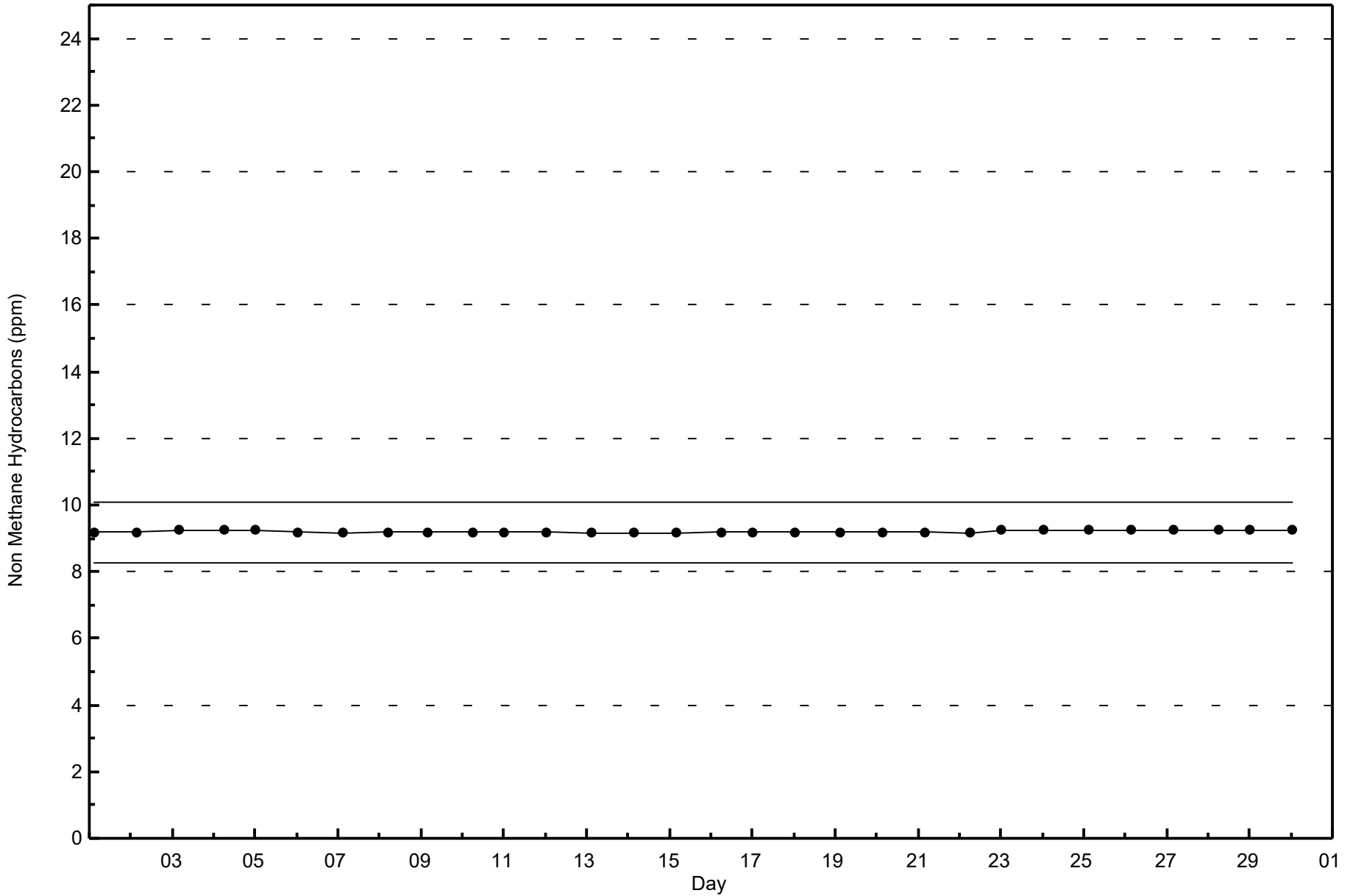


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mannix









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

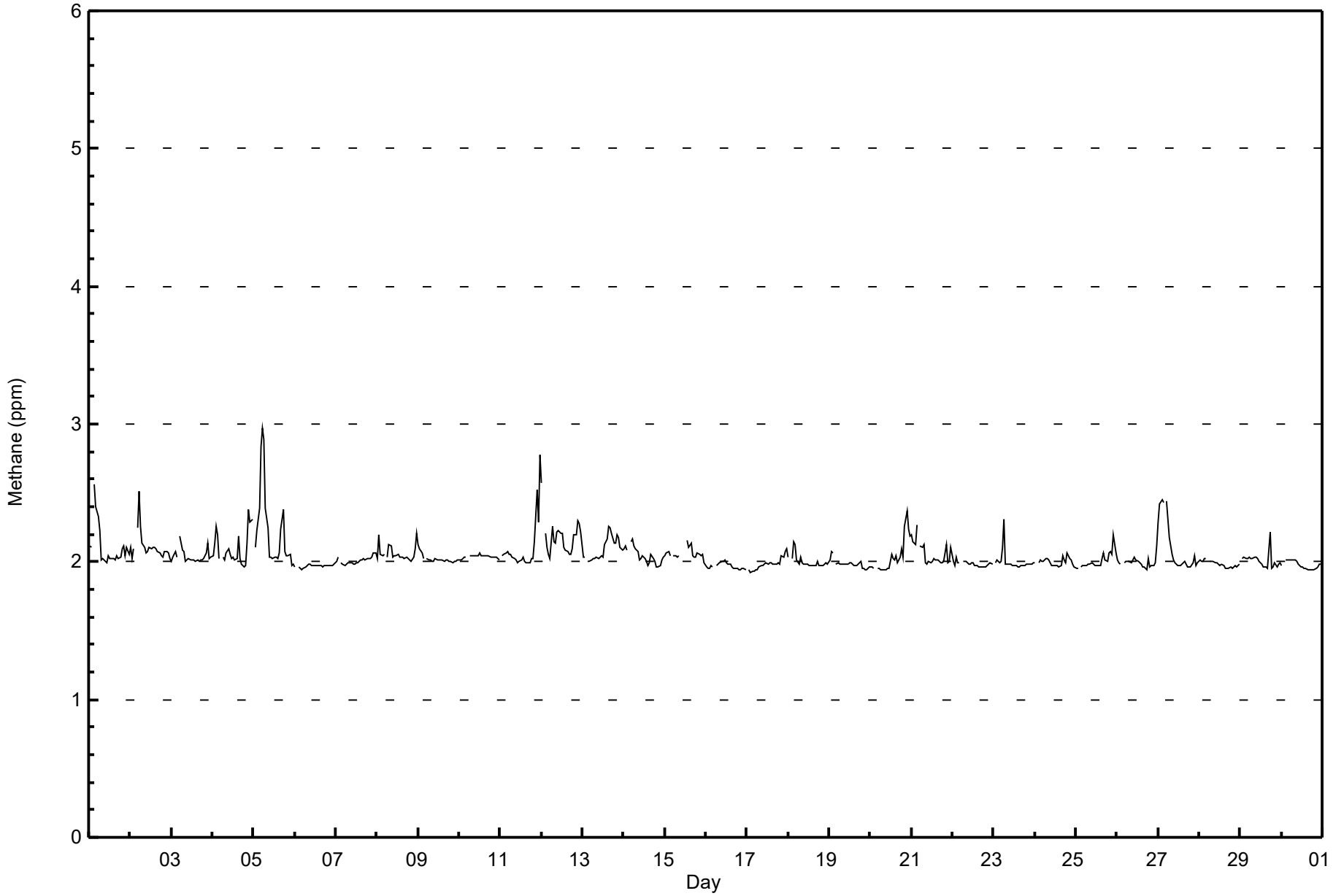
Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 720																																															
Maximum Value: 3.0 ppm on Jun 5 06:00		Maximum Daily Average: 2.2 ppm on Jun 5																																															
Minimum Value: 1.9 ppm on Jun 17 03:00		Minimum Daily Average: 2.0 ppm on Jun 16																																															
Maximum Diurnal Average: 2.1 ppm at hour 6		Minimum Diurnal Average: 2.0 ppm at hour 19																																															
Monthly Average: 2.04 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 = 2.5																																															
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-Jun	2.1	2.1	Z	2.6	2.4	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.6																		
2-Jun	2.1	2.0	2.1	Z	2.2	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.5																		
3-Jun	2.0	2.0	2.1	2.0	Z	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2																		
4-Jun	2.0	2.1	2.3	2.2	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.1	2.4	2.3	2.3	2.0	2.1	2.4	2.3	2.3	2.1	2.4																		
5-Jun	Z	2.1	2.2	2.4	2.8	3.0	2.9	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	3.0																		
6-Jun	2.0	Z	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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-Jun	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1																	
8-Jun	2.0	2.2	2.1	2.0	2.1	Z	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.2																
9-Jun	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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															
10-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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														
11-Jun	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.3	2.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.8	2.8															
12-Jun	2.6	Z	2.2	2.1	2.1	2.0	2.3	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	2.2	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	2.6														
13-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3															
14-Jun	2.1	2.1	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2														
15-Jun	2.0	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	C	C	C	C	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2														
16-Jun	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	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														
17-Jun	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1														
18-Jun	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1													
19-Jun	2.0	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	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	2.1	2.1													
20-Jun	2.0	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.3	2.4	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.4													
21-Jun	2.2	2.1	2.1	2.3	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	2.0	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	2.3													
22-Jun	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	2.0	2.0	2.0	2.0												
23-Jun	Z	2.0	2.0	2.0	2.0	2.1	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3												
24-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1												
25-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2												
26-Jun	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	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1												
27-Jun	2.3	2.4	2.4	2.4	Z	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4												
28-Jun	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	2.0	2.0	2.0	2.0	2.0											
29-Jun	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	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2												
30-Jun	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	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0											
																								2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	Diurnal Average	
																								2.6	2.4	2.4	2.6	2.8	3.0	2.9	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.1	2.2	2.3	2.5	2.3	2.8	Diurnal Maximum	
Z - zerspan C - Calibration																																																	



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Mannix - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	515	75.07	75.07
2.1 - 3.0	171	24.93	100.00
3.1 - 10.0	0	0.00	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
Mannix - June 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	37	51	20	10	16	9	41	107	33	20	39	32	30	14	6	47	512
2.1 - 3.0	25	17	10	8	3	8	8	7	3	5	4	6	8	8	16	35	171
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	62	68	30	18	19	17	49	114	36	25	43	38	38	22	22	82	683

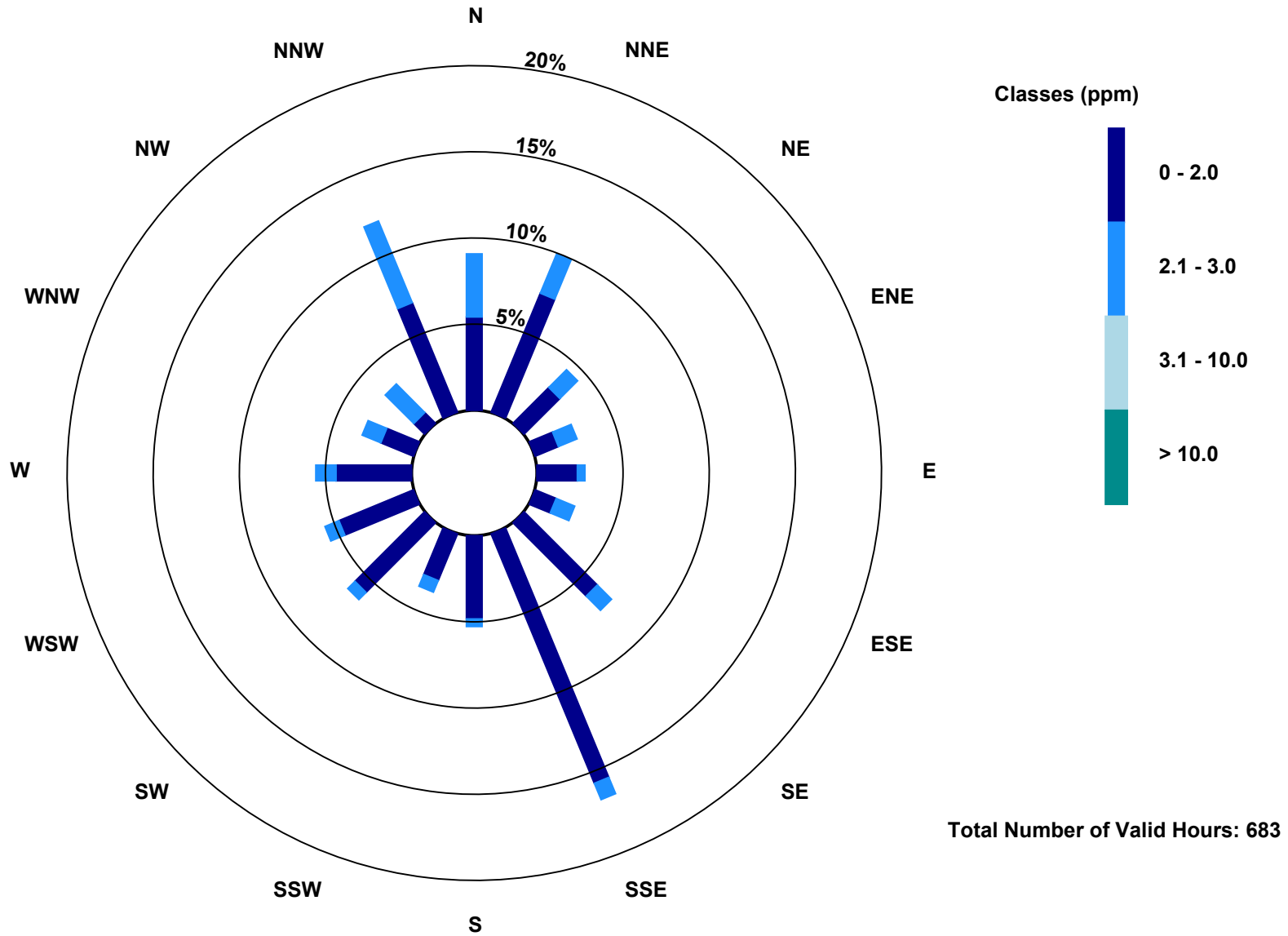
Total Number of Valid Hours: 683

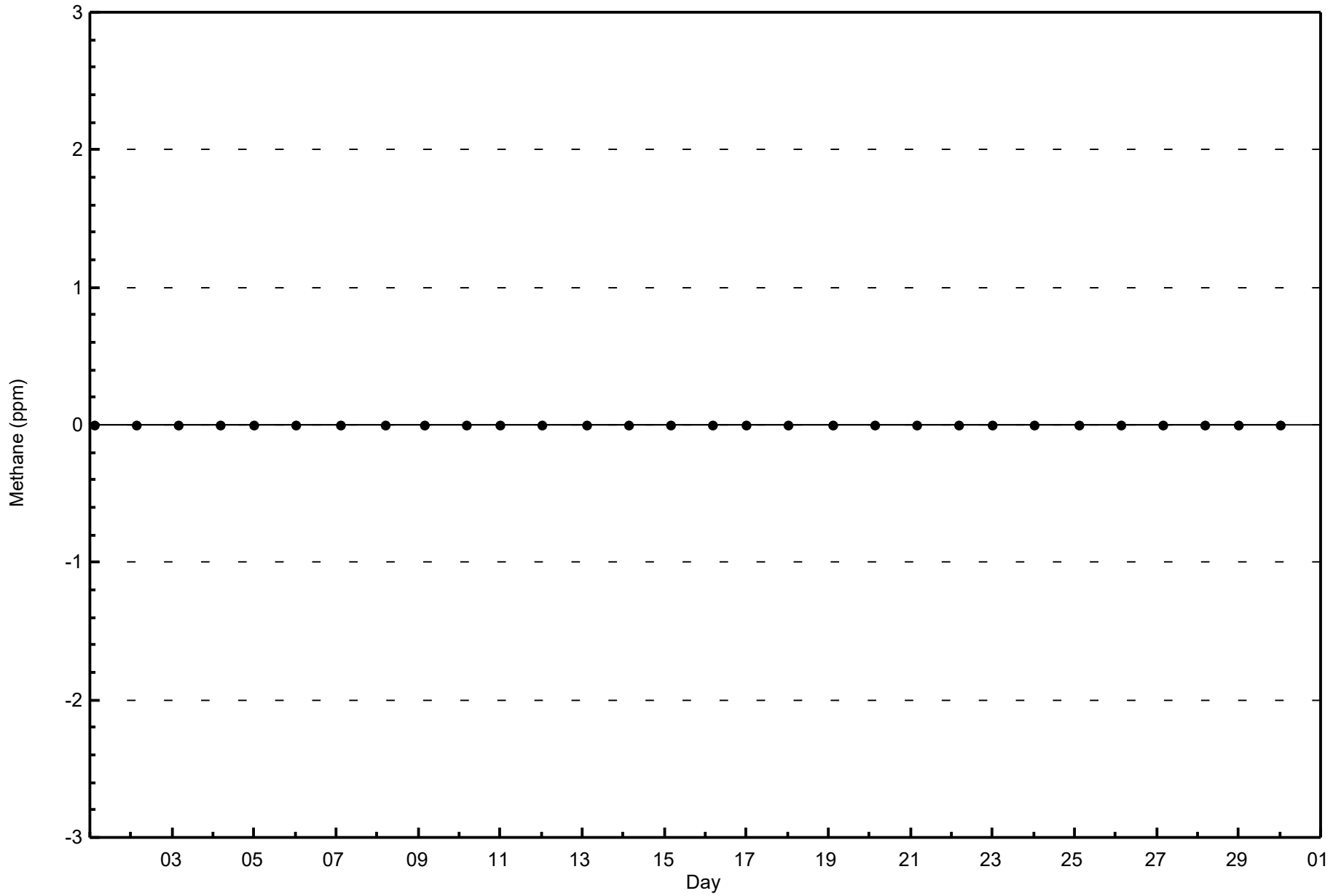
Total Number of Hours: 720

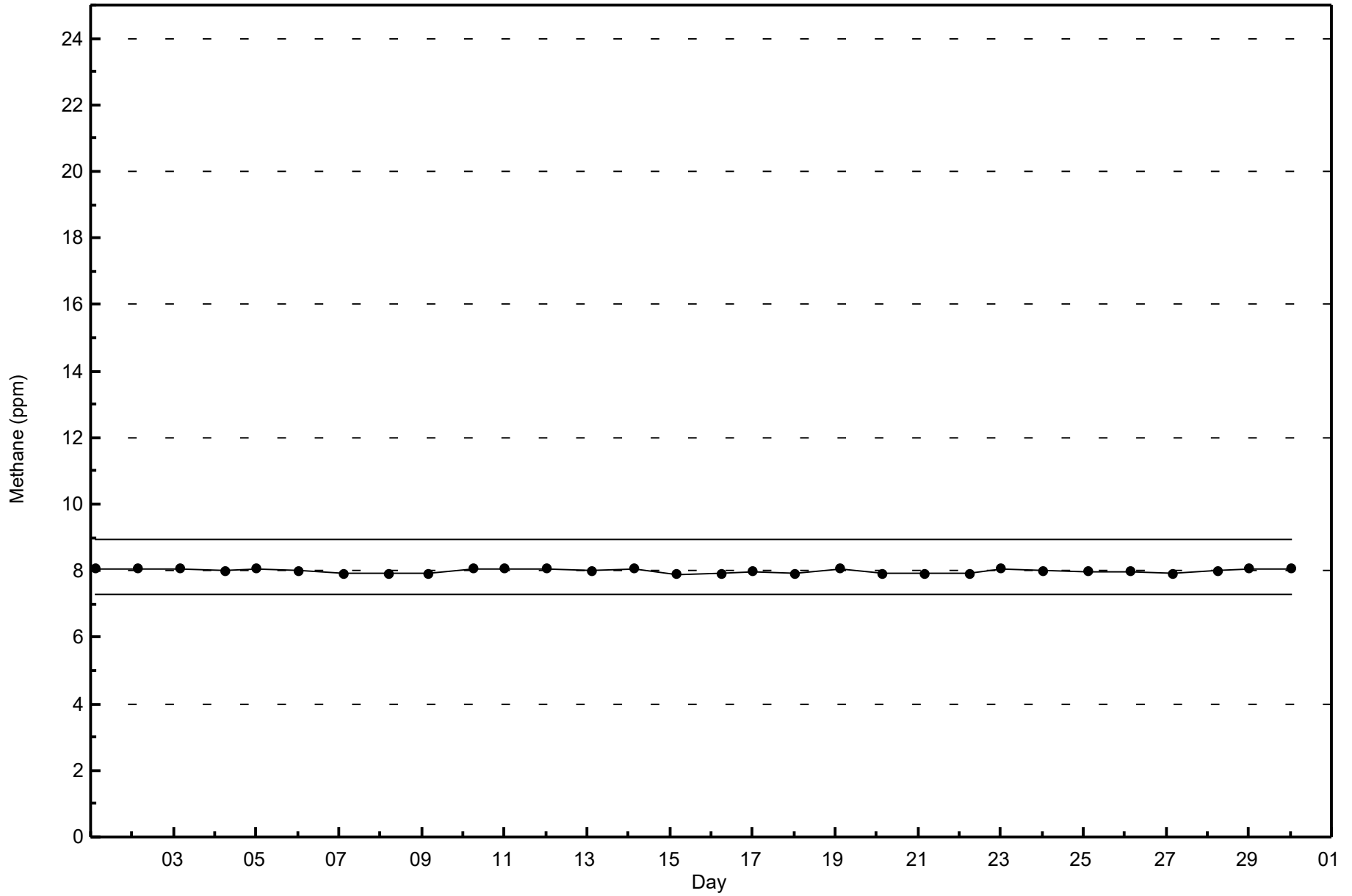


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Mannix

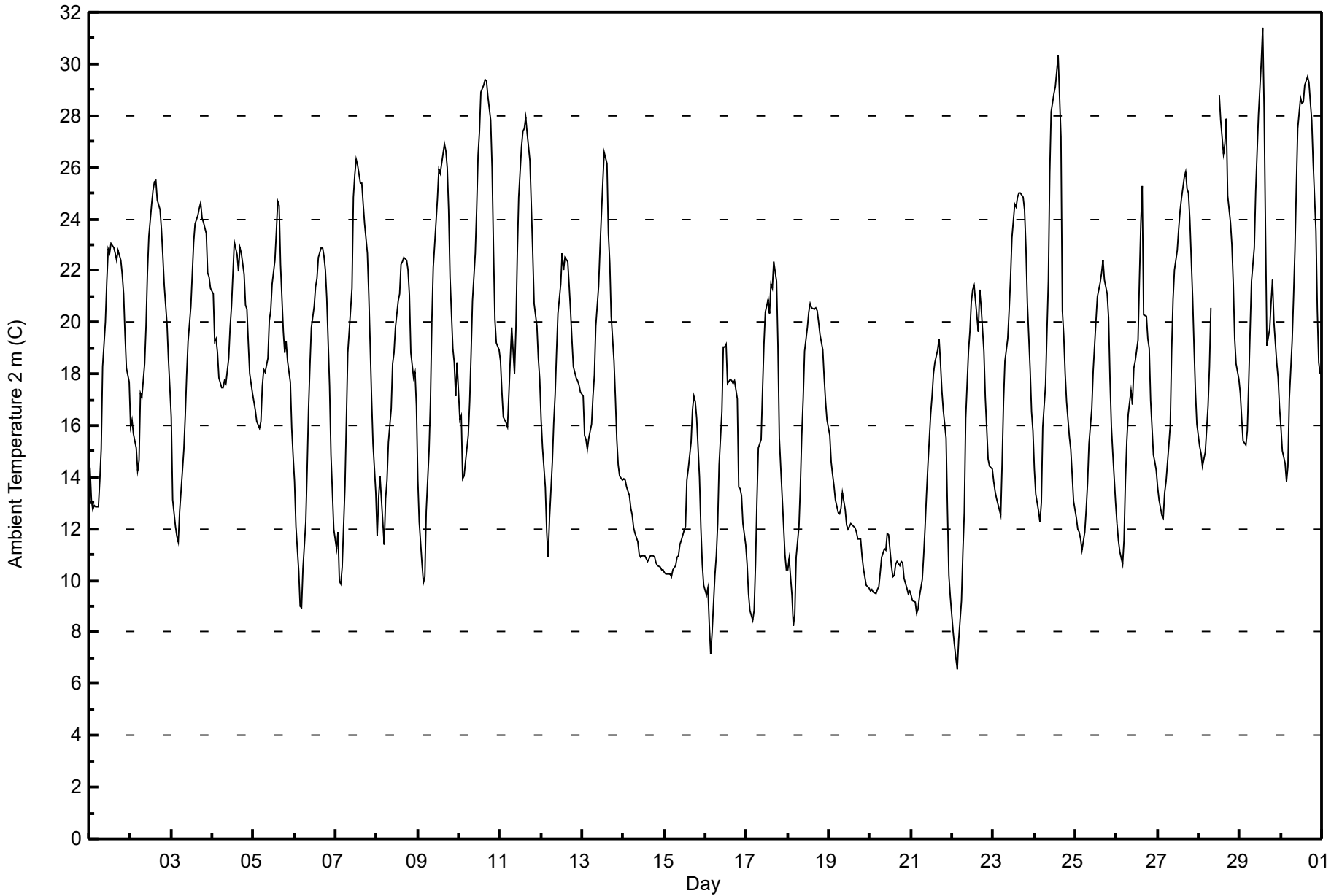








Maximum Value: 31.4 C on Jun 29 14:00		Maximum Daily Average: 22.6 C on Jun 30		Hours in Service: 720																						
Minimum Value: 6.6 C on Jun 22 04:00		Minimum Daily Average: 10.3 C on Jun 20		Hours of Data: 717																						
Maximum Diurnal Average: 22.5 C at hour 15		Minimum Diurnal Average: 12.1 C at hour 4		Hours of Missing Data: 3																						
Monthly Average: 17.57 C		Percentiles: P ₁ = 8.2 P ₁₀ = 10.6 Q ₁ = 13.1 Median = 17.5 Q ₃ = 21.5 P ₉₀ = 24.9 P ₉₉ = 29.3		Hours of Calibration: 0																						
				Percent Operational Time: 99.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	14.4	13.1	12.7	12.9	12.8	12.9	13.9	15.1	18.3	20.0	21.6	22.9	22.7	23.1	22.9	22.7	22.4	22.8	22.4	21.9	21.1	19.5	18.2	17.7	18.7	23.1
2-Jun	16.0	16.2	15.7	15.1	14.3	14.7	17.2	17.1	18.4	19.8	21.9	23.3	24.6	25.1	25.4	25.5	24.8	24.3	23.6	22.6	21.4	19.9	18.5	17.4	20.1	25.5
3-Jun	16.3	13.1	12.1	11.7	11.5	12.7	14.3	15.1	16.4	17.9	19.3	20.6	21.8	23.1	23.8	24.1	24.4	24.6	24.0	23.9	23.4	21.9	21.7	21.3	19.1	24.6
4-Jun	21.1	19.3	19.3	18.8	17.9	17.4	17.5	17.7	17.6	18.6	19.8	20.6	21.9	23.1	22.6	22.0	22.9	22.7	21.8	20.7	20.5	19.2	18.0	17.2	19.9	23.1
5-Jun	16.9	16.6	16.2	15.9	16.2	17.5	18.2	18.1	18.6	20.1	20.4	21.5	22.4	23.5	24.7	24.5	22.2	19.6	18.8	19.3	18.5	17.7	15.9	14.8	19.1	24.7
6-Jun	13.9	12.1	10.4	9.0	9.0	10.5	12.3	14.3	16.6	18.4	19.8	20.6	21.4	21.7	22.5	22.9	22.9	22.6	22.0	20.9	17.5	14.8	13.5	12.0	16.7	22.9
7-Jun	11.2	11.9	10.0	9.9	10.5	13.7	16.2	18.8	19.6	21.3	24.9	25.7	26.3	26.1	25.4	25.4	24.6	23.8	22.7	21.0	19.1	17.0	15.3	13.4	18.9	26.3
8-Jun	11.7	13.2	14.0	12.2	11.4	13.2	13.9	15.4	16.6	18.4	18.8	19.8	20.8	21.1	22.2	22.3	22.5	22.4	22.0	21.1	18.8	17.9	18.1	16.8	17.7	22.5
9-Jun	13.9	12.3	10.7	9.9	10.2	12.7	15.0	16.9	20.0	22.1	23.0	24.8	25.9	25.8	26.1	26.9	26.6	26.0	24.3	21.8	19.0	18.5	17.1	18.5	19.5	26.9
10-Jun	16.2	16.4	13.9	14.1	14.6	15.6	16.9	18.8	20.8	22.6	24.4	26.5	27.4	28.9	29.2	29.4	29.4	28.8	27.8	26.0	22.9	20.1	19.2	18.9	22.0	29.4
11-Jun	18.5	17.3	16.3	16.1	16.0	17.3	18.6	19.8	18.0	19.8	22.6	24.8	26.8	27.4	27.5	27.9	27.3	26.3	24.5	22.7	20.7	19.9	18.6	17.8	21.4	27.9
12-Jun	16.2	15.1	13.6	11.9	10.9	12.4	14.6	16.1	17.2	18.8	20.3	21.5	22.7	22.0	22.5	22.3	21.4	20.5	19.3	18.3	17.8	17.7	17.6	17.3	17.8	22.7
13-Jun	17.1	15.6	15.5	15.1	15.5	16.1	17.1	18.0	19.8	21.3	22.8	24.1	25.4	26.6	26.2	23.4	22.3	20.2	18.5	17.1	15.4	14.5	14.1	13.9	19.0	26.6
14-Jun	14.0	13.9	13.6	13.3	12.8	12.5	12.1	11.8	11.5	11.0	10.9	10.9	11.0	10.8	10.7	10.9	11.0	11.0	10.9	10.7	10.6	10.5	10.4	10.4	11.5	14.0
15-Jun	10.3	10.2	10.3	10.2	10.1	10.4	10.6	10.9	11.0	11.4	11.6	12.0	12.1	13.9	14.3	15.3	16.6	17.2	16.9	16.3	14.0	12.0	10.7	9.8	12.4	17.2
16-Jun	9.4	9.7	8.3	7.1	8.0	10.2	11.0	12.2	14.5	16.5	19.0	19.1	19.1	17.6	17.8	17.8	17.6	17.7	17.0	13.6	13.6	13.3	12.2	11.4	13.9	19.1
17-Jun	10.6	9.5	8.8	8.5	8.9	10.6	13.1	15.1	15.5	17.4	19.1	20.4	20.9	20.4	21.5	21.3	22.3	21.6	19.1	15.5	14.4	12.2	11.0	10.4	15.3	22.3
18-Jun	10.4	10.8	9.4	8.2	8.7	10.9	12.1	13.6	15.6	17.0	18.9	19.8	20.4	20.7	20.6	20.5	20.5	20.4	20.0	19.5	18.9	17.8	16.9	16.2	16.2	20.7
19-Jun	15.6	14.6	14.1	13.7	13.1	12.6	12.6	12.8	13.4	12.8	12.1	12.0	12.1	12.2	12.1	12.0	11.9	11.6	11.6	10.9	10.5	10.1	9.8	9.7	12.2	15.6
20-Jun	9.6	9.6	9.6	9.5	9.7	9.8	10.3	10.9	11.2	11.2	11.8	11.8	10.6	10.1	10.2	10.7	10.7	10.6	10.7	10.7	10.1	9.7	9.5	9.6	10.3	11.8
21-Jun	9.4	9.2	9.1	8.7	8.9	9.4	10.0	11.0	12.0	13.3	14.4	16.4	17.2	18.0	18.5	18.9	19.4	18.5	17.4	16.6	15.5	12.7	10.2	9.4	13.5	19.4
22-Jun	8.0	7.5	7.0	6.6	7.7	9.2	11.1	12.6	16.3	18.9	19.7	20.8	21.3	21.4	20.2	19.7	21.3	20.6	18.9	17.1	15.9	14.7	14.4	14.3	15.2	21.4
23-Jun	13.8	13.5	13.2	12.7	12.5	14.5	16.9	18.5	19.4	20.5	21.7	23.2	24.6	24.5	24.9	25.0	25.0	24.9	24.4	22.9	20.8	18.2	16.5	15.8	19.5	25.0
24-Jun	14.3	13.4	12.7	12.3	13.0	15.9	17.6	19.7	21.6	25.7	28.1	28.8	29.1	29.7	30.3	27.2	20.5	19.5	18.0	16.9	15.6	15.1	14.1	13.1	19.7	30.3
25-Jun	12.4	12.0	11.9	11.6	11.2	11.9	12.7	13.8	15.3	16.6	18.1	19.1	20.1	21.0	21.5	21.9	22.4	21.7	21.1	20.2	17.8	15.9	14.9	13.0	16.6	22.4
26-Jun	12.2	11.6	11.1	10.6	11.6	13.8	15.4	16.5	17.4	16.8	18.2	18.5	19.3	21.6	23.8	25.3	20.3	20.2	19.4	19.0	17.0	14.9	14.6	14.3	16.8	25.3
27-Jun	13.6	13.1	12.5	12.4	13.4	13.8	15.2	16.0	18.9	20.9	22.0	22.8	23.6	24.3	24.8	25.6	25.8	25.2	25.0	24.0	20.9	19.0	17.3	16.1	19.4	25.8
28-Jun	15.2	14.9	14.4	14.7	15.0	16.8	18.3	20.5	DF	DF	26.5	DF	28.8	27.8	26.5	26.9	27.9	24.9	23.9	23.0	21.5	19.4	18.4	17.8	21.1	28.8
29-Jun	17.2	16.2	15.4	15.2	15.8	17.6	19.6	21.6	22.9	25.1	26.6	28.0	30.1	31.4	28.3	23.5	19.1	19.8	20.7	21.6	20.0	18.5	17.8	16.7	21.2	31.4
30-Jun	15.9	15.0	14.5	13.9	14.4	17.0	19.2	20.9	22.8	25.2	27.5	28.7	28.5	28.5	29.2	29.5	29.3	28.5	27.8	26.2	23.5	20.5	18.5	18.0	22.6	29.5
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	42	5.86	5.86
10 - 20	435	60.67	66.53
> 20	240	33.47	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



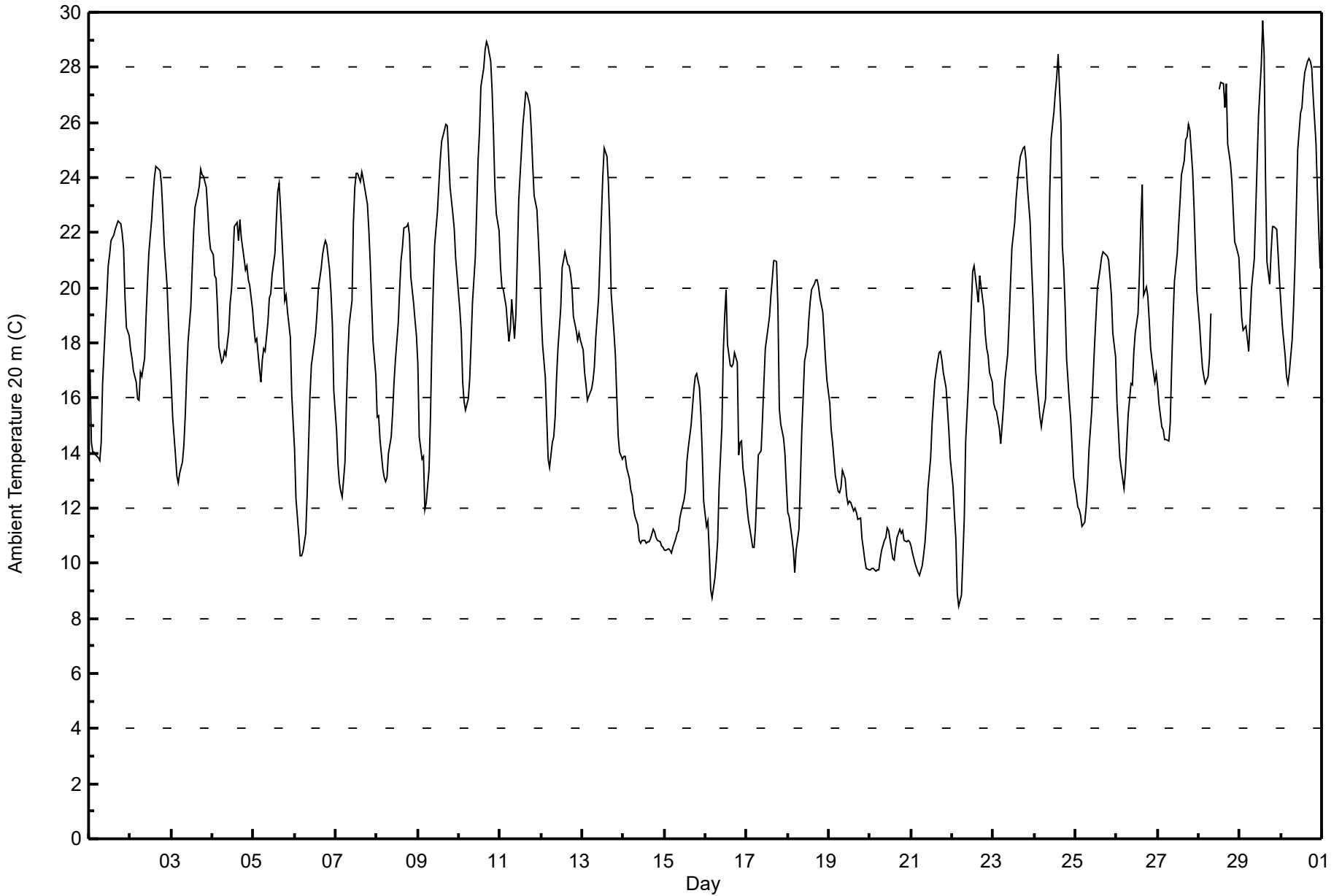
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 20 m (AT20m) - C

Mannix - June 2023

Maximum Value: 29.7 C on Jun 29 14:00 Maximum Daily Average: 23.0 C on Jun 30																						Hours in Service: 720 Hours of Data: 717				
Minimum Value: 8.5 C on Jun 22 05:00 Minimum Daily Average: 10.5 C on Jun 20 Maximum Diurnal Average: 21.6 C at hour 16 Minimum Diurnal Average: 13.4 C at hour 5 Monthly Average: 17.80 C Percentiles: P ₁ = 9.7 P ₁₀ = 10.9 Q ₁ = 14.0 Median = 17.8 Q ₃ = 21.1 P ₉₀ = 24.1 P ₉₉ = 28.2																						Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	17.0	14.4	14.0	14.1	14.0	13.8	13.8	14.4	16.5	18.7	19.7	20.8	21.2	21.7	21.9	22.1	22.3	22.4	22.3	22.0	21.4	19.6	18.6	18.2	18.5	22.4
2-Jun	17.8	17.5	17.0	16.6	16.0	15.9	16.9	16.8	17.4	18.9	20.1	21.2	22.5	23.3	24.0	24.4	24.4	24.2	23.7	22.7	21.6	20.1	18.8	17.6	20.0	24.4
3-Jun	16.5	15.3	13.9	13.2	12.9	13.3	13.7	14.3	15.4	16.8	18.0	19.3	20.8	22.1	22.9	23.4	23.7	24.3	24.1	24.0	23.7	22.8	21.9	21.4	19.1	24.3
4-Jun	21.2	20.4	20.3	19.3	17.8	17.3	17.4	17.7	17.5	18.4	19.4	19.9	20.9	22.2	22.4	21.7	22.5	21.8	21.1	20.6	20.8	20.3	20.1	19.2	20.0	22.5
5-Jun	18.5	18.1	18.2	17.0	16.6	17.4	17.8	17.7	18.8	19.6	19.8	20.5	21.3	22.5	23.5	23.8	22.9	20.8	19.5	19.8	19.1	18.2	16.1	15.1	19.3	23.8
6-Jun	14.1	12.4	11.0	10.3	10.3	10.4	11.1	12.5	14.3	16.1	17.2	17.9	18.3	19.0	20.0	20.7	21.2	21.5	21.7	21.5	20.6	19.8	18.6	16.2	16.5	21.7
7-Jun	14.8	13.6	12.9	12.6	12.4	13.7	15.7	17.5	18.6	19.5	22.4	23.6	24.1	24.1	23.9	24.2	23.9	23.7	23.1	22.1	20.9	19.5	18.0	16.8	19.2	24.2
8-Jun	15.3	15.4	14.5	13.4	13.1	13.0	13.1	14.0	14.6	15.4	16.6	17.4	18.7	19.9	21.0	21.5	22.1	22.2	22.3	21.9	20.4	19.4	18.8	18.3	17.6	22.3
9-Jun	17.2	14.6	13.8	13.9	11.9	12.2	13.4	15.3	18.0	20.0	21.6	22.8	23.7	24.7	25.3	25.8	25.9	25.9	24.8	23.7	22.7	22.1	21.0	20.4	20.0	25.9
10-Jun	19.1	18.4	16.6	15.9	15.6	16.0	16.7	18.0	19.5	21.1	22.8	24.7	25.7	27.3	28.0	28.7	28.9	28.8	28.2	27.1	25.6	23.7	22.7	22.0	22.5	28.9
11-Jun	20.8	20.0	19.9	19.3	18.7	18.0	18.5	19.6	18.1	19.1	21.1	23.2	25.0	25.9	26.5	27.1	27.1	26.6	25.7	24.4	23.4	22.8	21.7	20.7	22.2	27.1
12-Jun	19.1	17.9	16.7	15.2	13.8	13.5	14.4	14.6	15.3	16.7	17.8	19.3	20.7	21.0	21.3	20.8	20.8	20.5	20.0	19.0	18.4	18.1	18.4	18.1	18.0	21.3
13-Jun	17.7	17.0	16.5	15.9	16.0	16.3	16.6	17.1	18.2	19.6	21.1	22.6	24.1	25.1	24.8	23.8	22.2	19.8	18.3	17.5	16.0	14.6	14.0	13.8	18.7	25.1
14-Jun	13.9	13.9	13.5	13.1	12.6	12.5	11.9	11.7	11.4	10.8	10.7	10.8	10.8	10.7	10.8	10.8	10.9	11.2	11.1	10.9	10.9	10.8	10.6	10.6	11.5	13.9
15-Jun	10.5	10.5	10.5	10.5	10.4	10.6	10.9	11.1	11.2	11.6	11.9	12.3	12.7	13.7	14.2	15.0	15.7	16.3	16.8	16.9	16.4	15.4	14.0	12.2	13.0	16.9
16-Jun	11.3	11.5	10.4	9.0	8.7	9.4	10.1	10.8	12.8	15.0	17.6	19.0	19.9	18.0	17.2	17.1	17.3	17.6	17.3	13.9	14.4	14.5	13.5	12.7	14.1	19.9
17-Jun	12.0	11.6	11.3	10.6	10.6	11.4	12.6	13.9	14.1	15.3	16.6	17.8	18.6	19.0	19.8	20.4	21.0	21.0	19.3	15.6	15.0	14.5	14.0	12.9	15.4	21.0
18-Jun	11.8	11.7	10.9	10.5	9.7	10.5	11.2	13.0	14.7	16.0	17.3	17.9	18.8	19.5	19.9	20.1	20.3	20.3	20.0	19.6	19.1	18.3	17.3	16.6	16.0	20.3
19-Jun	15.8	14.8	14.4	13.8	13.2	12.6	12.5	12.7	13.4	13.1	12.5	12.1	12.2	12.2	11.9	12.0	11.8	11.6	11.6	10.9	10.5	10.1	9.8	9.8	12.3	15.8
20-Jun	9.8	9.8	9.8	9.7	9.8	9.8	10.2	10.5	10.8	11.0	11.3	11.2	10.5	10.2	10.1	10.6	10.9	11.2	11.1	11.2	10.8	10.8	10.8	10.8	10.5	11.3
21-Jun	10.6	10.4	9.9	9.8	9.7	9.6	9.9	10.3	10.8	11.5	12.6	13.8	15.0	15.8	16.7	17.3	17.6	17.7	17.4	16.9	16.4	15.6	14.8	13.8	13.5	17.7
22-Jun	12.8	11.7	10.9	8.9	8.5	8.8	10.2	11.7	14.4	16.5	18.0	19.3	20.6	20.8	19.9	19.5	20.4	20.1	19.2	18.3	17.8	17.5	16.9	16.6	15.8	20.8
23-Jun	15.8	15.6	15.5	14.9	14.3	15.0	15.7	16.6	17.6	18.8	20.2	21.5	22.4	23.2	23.9	24.4	24.7	25.1	25.1	24.7	23.7	22.4	20.9	19.6	20.1	25.1
24-Jun	18.1	16.9	15.9	15.3	15.0	15.4	16.0	17.6	19.9	23.5	25.4	26.4	27.1	27.6	28.4	26.0	21.5	20.7	19.3	17.4	15.8	15.2	14.2	13.1	19.7	28.4
25-Jun	12.5	12.1	11.9	11.8	11.4	11.5	12.0	12.9	14.2	15.5	16.8	18.0	19.0	20.0	20.7	21.1	21.3	21.2	21.2	21.0	20.4	19.8	18.4	17.5	16.7	21.3
26-Jun	15.8	14.9	13.9	13.1	12.7	13.3	14.4	15.4	16.5	16.5	17.6	18.3	19.1	20.5	22.3	23.7	19.8	20.0	19.7	18.8	17.8	16.9	16.6	16.9	17.3	23.7
27-Jun	16.4	15.7	15.0	14.9	14.5	14.5	14.5	15.1	17.1	18.9	20.2	21.2	22.3	23.1	24.1	24.6	25.3	25.5	25.9	25.7	24.2	22.9	21.3	19.9	20.1	25.9
28-Jun	18.6	17.8	17.1	16.8	16.5	16.8	17.4	19.1	DF	DF	24.2	DF	27.2	27.4	27.4	26.5	27.4	25.2	24.5	23.9	22.7	21.7	21.5	21.1	21.9	27.4
29-Jun	20.1	18.9	18.4	18.6	18.1	17.7	18.9	20.0	21.0	22.8	24.5	26.2	28.1	29.7	28.5	24.0	21.0	20.1	21.3	22.2	22.2	22.1	21.2	20.2	21.9	29.7
30-Jun	19.4	18.6	17.6	16.8	16.5	16.9	18.1	19.3	20.8	22.9	25.0	26.3	26.6	27.3	27.8	28.2	28.3	28.2	28.0	26.9	25.3	23.6	22.1	20.7	23.0	28.3
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	20	2.79	2.79
10 - 20	456	63.60	66.39
> 20	241	33.61	100.00

Total Number of Valid Hours: 717

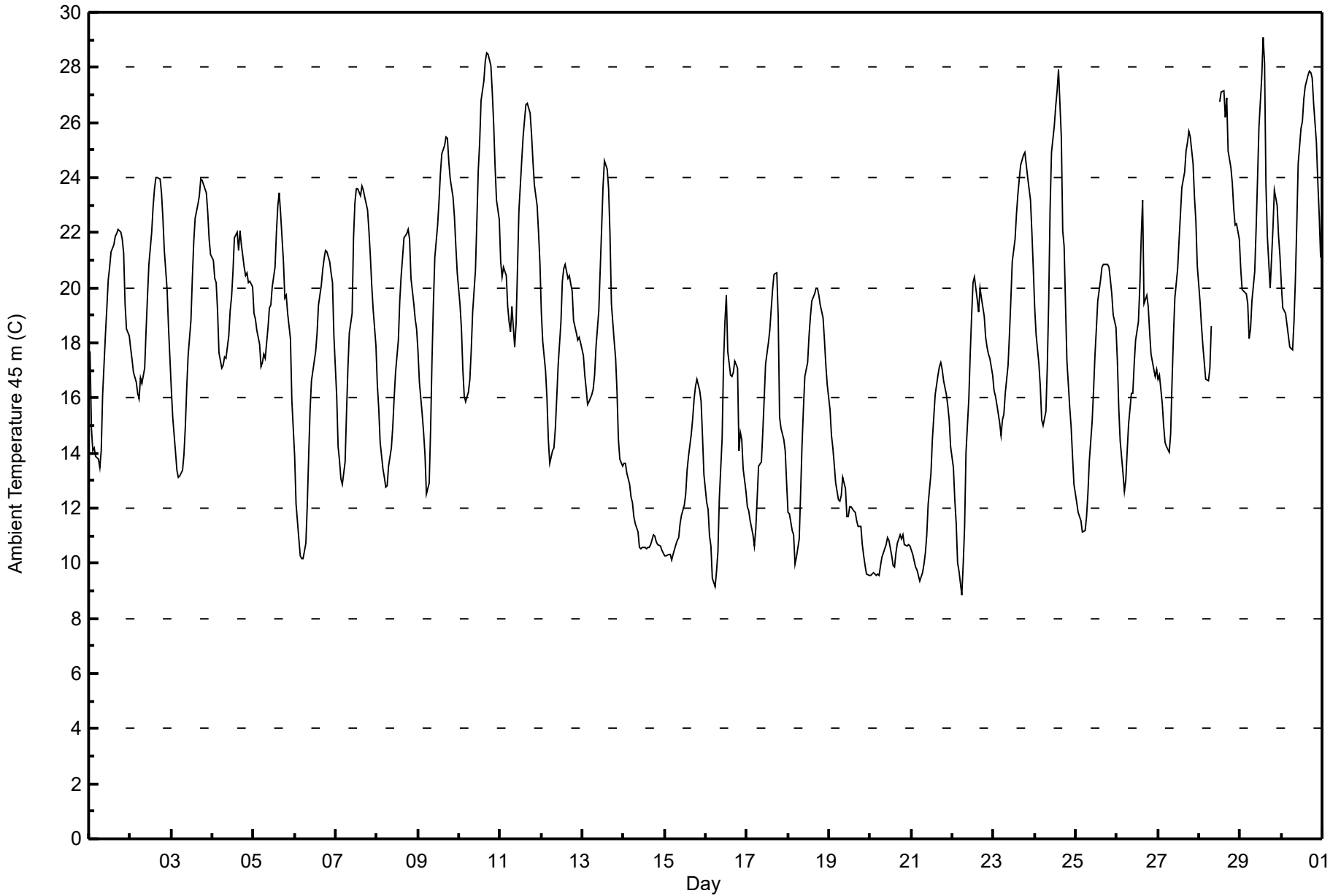
Total Number of Hours: 720



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 29.1 C on Jun 29 14:00		Maximum Daily Average: 23.1 C on Jun 30		Hours in Service: 720																							
Minimum Value: 8.9 C on Jun 22 06:00		Minimum Daily Average: 10.3 C on Jun 20		Hours of Data: 717																							
Maximum Diurnal Average: 21.3 C at hour 16		Minimum Diurnal Average: 13.5 C at hour 6		Hours of Missing Data: 3																							
Monthly Average: 17.70 C		Percentiles: P ₁ = 9.6 P ₁₀ = 10.9 Q ₁ = 13.9 Median = 17.8 Q ₃ = 21.0 P ₉₀ = 23.9 P ₉₉ = 27.9		Hours of Calibration: 0																							
				Percent Operational Time: 99.6																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	17.7	14.9	14.1	14.2	13.9	13.8	13.5	14.1	16.1	18.3	19.3	20.3	20.7	21.3	21.6	21.8	22.0	22.1	22.0	21.8	21.3	19.4	18.5	18.3	18.4	22.1	
2-Jun	17.8	17.4	17.0	16.6	16.2	16.0	16.7	16.5	17.1	18.5	19.7	20.9	22.0	22.9	23.6	24.0	24.0	24.0	23.5	22.5	21.3	19.9	18.6	17.4	19.7	24.0	
3-Jun	16.3	15.3	14.1	13.4	13.1	13.2	13.4	13.9	15.0	16.4	17.5	18.8	20.4	21.7	22.5	23.0	23.3	23.9	23.9	23.7	23.5	22.7	21.7	21.2	18.8	23.9	
4-Jun	21.0	20.4	20.2	19.2	17.7	17.1	17.2	17.5	17.4	18.3	19.2	19.7	20.6	21.8	22.0	21.4	22.1	21.6	20.7	20.4	20.6	20.2	20.3	20.0	19.8	22.1	
5-Jun	19.1	18.9	18.5	17.9	17.2	17.3	17.6	17.4	18.6	19.3	19.4	20.0	20.8	22.0	23.0	23.4	22.7	21.0	19.6	19.7	19.1	18.2	15.9	14.9	19.2	23.4	
6-Jun	13.9	12.2	10.9	10.3	10.2	10.1	10.7	12.1	13.9	15.6	16.6	17.4	17.7	18.4	19.4	20.1	20.6	21.0	21.3	21.3	20.9	20.6	20.2	18.2	16.4	21.3	
7-Jun	16.1	14.2	13.8	13.1	12.8	13.7	15.4	17.1	18.3	19.1	21.8	23.1	23.6	23.6	23.4	23.7	23.5	23.3	22.8	22.0	21.1	20.1	19.2	17.9	19.3	23.7	
8-Jun	16.5	15.6	14.4	13.4	13.1	12.8	12.8	13.5	14.2	14.9	16.0	16.9	18.1	19.6	20.5	21.1	21.8	21.9	22.1	21.7	20.3	19.4	18.9	18.5	17.4	22.1	
9-Jun	17.7	16.6	15.4	14.7	13.9	12.5	12.9	14.9	17.4	19.4	21.1	22.3	23.1	24.1	24.8	25.2	25.5	25.4	24.6	23.9	23.3	22.6	21.5	20.5	20.1	25.5	
10-Jun	19.4	18.5	17.1	16.1	15.9	16.2	16.7	17.8	19.1	20.7	22.4	24.2	25.2	26.8	27.5	28.2	28.5	28.5	28.1	27.1	25.9	24.4	23.2	22.5	22.5	28.5	
11-Jun	21.0	20.4	20.7	20.4	19.3	18.8	18.4	19.3	17.9	18.7	20.7	22.8	24.6	25.5	26.1	26.7	26.7	26.3	25.6	24.6	23.8	23.0	22.0	20.9	22.3	26.7	
12-Jun	19.1	18.1	17.0	16.0	14.5	13.6	14.1	14.2	14.9	16.0	17.2	18.8	20.3	20.7	20.8	20.3	20.4	20.2	19.9	18.8	18.3	18.1	18.2	18.0	17.8	20.8	
13-Jun	17.5	16.8	16.3	15.8	15.9	16.1	16.3	16.8	17.9	19.1	20.6	22.1	23.7	24.6	24.3	23.6	21.9	19.4	18.0	17.5	16.2	14.5	13.8	13.5	18.4	24.6	
14-Jun	13.7	13.6	13.3	12.8	12.4	12.2	11.7	11.5	11.1	10.6	10.5	10.6	10.6	10.5	10.6	10.6	10.7	11.0	11.0	10.8	10.7	10.6	10.5	10.4	11.3	13.7	
15-Jun	10.3	10.3	10.3	10.3	10.1	10.3	10.7	10.8	10.9	11.4	11.7	12.1	12.5	13.4	13.9	14.7	15.3	16.0	16.4	16.7	16.3	15.9	14.6	13.2	12.8	16.7	
16-Jun	12.2	12.0	11.0	10.6	9.5	9.1	9.7	10.4	12.3	14.6	17.3	18.8	19.7	17.7	16.8	16.8	16.9	17.3	17.1	14.1	14.8	14.5	13.4	12.6	14.1	19.7	
17-Jun	12.1	11.9	11.6	11.0	10.6	11.2	12.3	13.5	13.7	14.8	16.0	17.2	18.0	18.5	19.2	19.9	20.5	20.5	19.0	15.3	14.9	14.5	14.1	12.9	15.1	20.5	
18-Jun	11.8	11.8	11.2	11.0	10.0	10.2	10.9	12.6	14.3	15.6	16.8	17.3	18.3	19.0	19.5	19.8	20.0	20.0	19.7	19.4	18.9	18.1	17.2	16.5	15.8	20.0	
19-Jun	15.6	14.6	14.2	13.6	12.9	12.3	12.2	12.5	13.1	12.7	11.7	11.7	12.1	12.1	11.9	11.8	11.6	11.3	11.4	10.7	10.3	9.9	9.6	9.6	12.1	15.6	
20-Jun	9.6	9.6	9.6	9.6	9.6	9.6	9.9	10.2	10.5	10.7	10.9	10.8	10.3	9.9	9.9	10.4	10.7	11.0	10.9	11.0	10.7	10.6	10.7	10.6	10.3	11.0	
21-Jun	10.5	10.3	9.9	9.8	9.5	9.3	9.7	9.9	10.4	11.1	12.1	13.3	14.5	15.3	16.1	16.8	17.1	17.3	17.0	16.6	16.1	15.7	15.2	14.3	13.2	17.3	
22-Jun	13.5	12.3	11.5	10.0	9.7	8.9	10.0	11.3	14.0	16.0	17.6	19.0	20.2	20.4	19.6	19.1	20.0	19.6	19.0	18.2	17.8	17.6	17.4	16.9	15.8	20.4	
23-Jun	16.3	16.1	15.8	15.1	14.7	15.2	15.4	16.1	17.2	18.3	19.6	21.0	21.8	22.7	23.4	23.9	24.4	24.8	24.9	24.5	24.0	23.2	22.0	20.7	20.0	24.9	
24-Jun	19.3	18.3	17.3	16.4	15.2	15.0	15.5	17.1	19.5	22.9	24.9	25.9	26.6	27.1	27.9	25.5	22.1	21.5	19.4	17.3	15.7	15.0	13.9	12.9	19.7	27.9	
25-Jun	12.2	11.8	11.7	11.6	11.2	11.2	11.7	12.5	13.7	15.1	16.3	17.6	18.5	19.5	20.3	20.7	20.8	20.8	20.8	20.7	20.3	19.8	19.0	18.5	16.5	20.8	
26-Jun	17.4	15.6	14.4	13.3	12.6	13.0	14.1	15.0	16.2	16.2	17.3	18.1	18.8	20.0	21.8	23.2	19.4	19.7	19.3	18.4	17.6	17.0	16.8	17.0	17.2	23.2	
27-Jun	16.7	16.8	15.8	15.0	14.4	14.2	14.0	14.7	16.6	18.3	19.6	20.7	21.7	22.7	23.6	24.2	24.9	25.3	25.7	25.5	24.5	23.3	22.4	20.8	20.1	25.7	
28-Jun	19.5	18.6	17.9	17.3	16.7	16.6	17.1	18.6	DF	DF	23.6	DF	26.7	27.1	27.1	26.2	26.9	24.9	24.3	23.8	22.9	22.3	22.3	21.7	22.0	27.1	
29-Jun	20.7	19.9	19.9	19.8	19.4	18.1	18.5	19.5	20.6	22.2	24.0	25.8	27.6	29.1	28.2	23.8	21.9	20.0	21.0	22.2	23.5	23.0	21.9	21.2	22.2	29.1	
30-Jun	20.1	19.3	19.0	18.7	18.3	17.9	17.7	18.8	20.3	22.3	24.5	25.8	26.1	26.9	27.3	27.7	27.9	27.8	27.6	26.7	25.3	23.8	22.6	21.1	23.1	27.9	
		16.1	15.4	14.8	14.2	13.7	13.5	13.9	14.7	15.6	16.8	18.2	19.1	20.2	20.8	21.2	21.3	21.1	20.9	20.6	19.9	19.3	18.6	17.9	17.1	Diurnal Average	
		21.0	20.4	20.7	20.4	19.4	18.8	18.5	19.5	20.6	22.9	24.9	25.9	27.6	29.1	28.2	28.2	28.5	28.5	28.1	27.1	25.9	24.4	23.2	22.5	Diurnal Maximum	
DF - DAS Failure																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	25	3.49	3.49
10 - 20	455	63.46	66.95
> 20	237	33.05	100.00

Total Number of Valid Hours: 717

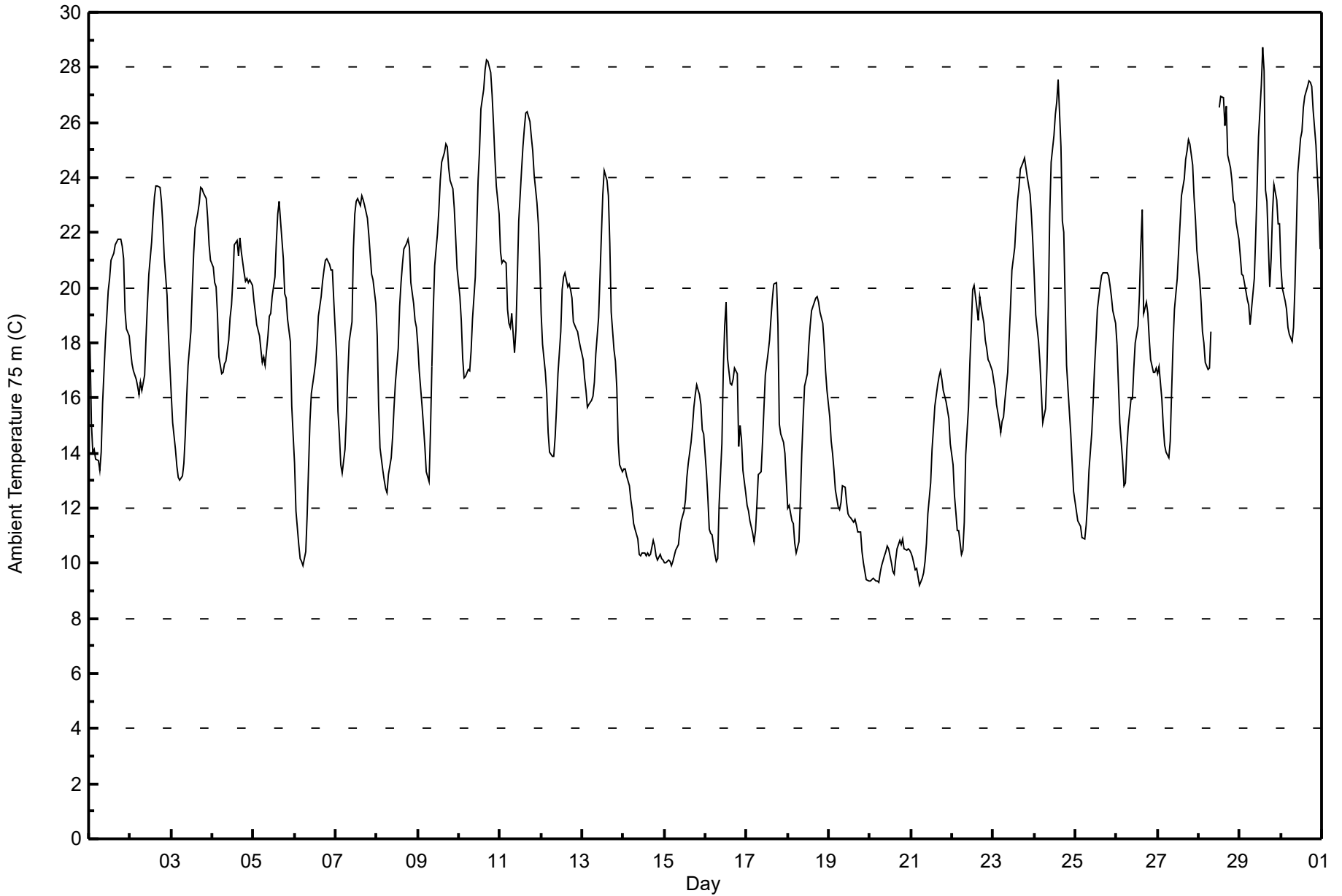
Total Number of Hours: 720



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 28.7 C on Jun 29 14:00 Maximum Daily Average: 23.1 C on Jun 30																						Hours in Service: 720 Hours of Data: 717																										
Minimum Value: 9.2 C on Jun 21 06:00 Minimum Daily Average: 10.1 C on Jun 20 Maximum Diurnal Average: 21.0 C at hour 16 Minimum Diurnal Average: 13.7 C at hour 6 Monthly Average: 17.62 C Percentiles: P ₁ = 9.4 P ₁₀ = 10.7 Q ₁ = 13.9 Median = 17.8 Q ₃ = 21.0 P ₉₀ = 23.7 P ₉₉ = 27.5																						Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	18.0	15.1	14.0	14.2	13.8	13.7	13.4	14.0	15.8	18.1	19.0	19.9	20.4	21.0	21.2	21.6	21.7	21.8	21.7	21.5	21.1	19.2	18.5	18.2	18.2	21.8																						
2-Jun	17.7	17.3	17.0	16.7	16.4	16.1	16.6	16.3	16.8	18.2	19.4	20.5	21.7	22.6	23.3	23.7	23.7	23.6	23.1	22.3	21.1	19.7	18.3	17.2	19.5	23.7																						
3-Jun	16.1	15.1	14.1	13.5	13.1	13.0	13.1	13.6	14.6	16.0	17.2	18.4	20.0	21.2	22.2	22.7	23.1	23.6	23.6	23.5	23.2	22.5	21.6	21.0	18.6	23.6																						
4-Jun	20.7	20.2	20.0	19.0	17.5	16.9	16.9	17.2	17.3	18.1	18.9	19.4	20.3	21.6	21.7	21.1	21.8	21.3	20.5	20.3	20.3	20.2	20.3	20.1	19.7	21.8																						
5-Jun	19.5	19.1	18.6	18.3	17.8	17.3	17.5	17.2	18.2	19.0	19.1	19.7	20.4	21.6	22.7	23.1	22.4	21.0	19.8	19.6	18.9	18.1	15.7	14.6	19.1	23.1																						
6-Jun	13.6	11.9	10.7	10.2	10.0	9.9	10.4	11.8	13.5	15.2	16.2	16.9	17.3	18.0	18.9	19.7	20.2	20.7	21.0	21.1	20.9	20.6	20.7	19.6	16.2	21.1																						
7-Jun	17.5	15.5	14.7	13.6	13.3	14.1	15.3	16.8	18.1	18.8	21.4	22.7	23.2	23.2	23.0	23.3	23.2	23.0	22.5	21.9	21.2	20.5	20.3	19.4	19.4	23.3																						
8-Jun	18.2	15.7	14.2	13.4	13.0	12.7	12.5	13.2	13.8	14.6	15.7	16.6	17.8	19.3	20.2	20.9	21.4	21.6	21.7	21.4	20.2	19.4	18.8	18.5	17.3	21.7																						
9-Jun	17.9	17.0	15.7	15.0	14.3	13.3	13.0	14.7	17.1	19.2	20.8	22.0	22.9	23.9	24.6	24.9	25.2	25.1	24.4	23.9	23.6	22.9	21.8	20.7	20.2	25.2																						
10-Jun	19.7	18.8	17.4	16.7	16.8	17.1	17.0	17.7	18.9	20.4	22.1	23.9	24.9	26.5	27.2	27.9	28.2	28.2	27.8	27.0	26.0	24.7	23.7	22.7	22.6	28.2																						
11-Jun	21.3	20.9	21.0	20.9	19.2	18.7	18.6	19.1	17.6	18.4	20.3	22.4	24.2	25.1	25.8	26.4	26.4	26.0	25.5	25.0	24.1	23.1	22.3	21.0	22.2	26.4																						
12-Jun	19.1	17.9	16.9	16.2	14.7	14.0	13.9	13.9	14.6	15.7	16.9	18.4	20.0	20.4	20.5	20.0	20.1	19.9	19.6	18.8	18.5	18.4	18.1	17.8	17.7	20.5																						
13-Jun	17.4	16.8	16.3	15.7	15.8	15.9	16.1	16.6	17.6	18.9	20.4	21.9	23.4	24.3	23.9	23.3	21.6	19.1	17.7	17.4	16.4	14.4	13.6	13.3	18.2	24.3																						
14-Jun	13.4	13.4	13.2	12.8	12.3	12.0	11.5	11.2	10.9	10.3	10.3	10.4	10.4	10.2	10.4	10.3	10.3	10.8	10.6	10.3	10.1	10.3	10.2	10.1	11.1	13.4																						
15-Jun	10.0	10.0	10.1	10.1	9.9	10.1	10.5	10.6	10.7	11.2	11.5	11.9	12.3	13.1	13.6	14.4	14.9	15.6	16.1	16.5	16.1	15.8	14.9	14.7	12.7	16.5																						
16-Jun	13.3	12.4	11.2	11.1	11.1	10.3	10.1	10.2	12.1	14.3	17.0	18.6	19.5	17.4	16.5	16.5	16.7	17.1	16.9	14.2	15.0	14.5	13.4	12.5	14.2	19.5																						
17-Jun	12.1	11.9	11.6	11.1	10.8	11.2	12.1	13.2	13.3	14.4	15.6	16.8	17.6	18.1	18.9	19.6	20.2	20.2	18.7	15.0	14.7	14.4	14.0	13.0	14.9	20.2																						
18-Jun	12.0	12.1	11.5	11.4	10.7	10.4	10.8	12.3	14.0	15.2	16.4	16.9	17.9	18.6	19.1	19.4	19.6	19.7	19.5	19.1	18.7	17.9	17.0	16.3	15.7	19.7																						
19-Jun	15.3	14.4	14.0	13.3	12.7	12.0	12.0	12.2	12.8	12.8	12.2	11.8	11.7	11.6	11.5	11.6	11.4	11.1	11.1	10.4	10.0	9.7	9.4	9.3	11.9	15.3																						
20-Jun	9.4	9.4	9.4	9.3	9.4	9.3	9.7	9.9	10.3	10.4	10.6	10.5	10.0	9.7	9.6	10.1	10.5	10.8	10.7	10.9	10.5	10.5	10.5	10.5	10.1	10.9																						
21-Jun	10.4	10.2	9.8	9.8	9.5	9.2	9.5	9.7	10.0	10.7	11.8	12.9	14.1	14.9	15.7	16.5	16.8	17.0	16.7	16.3	15.9	15.6	15.2	14.3	13.0	17.0																						
22-Jun	13.6	12.4	11.8	11.2	11.2	10.3	10.5	11.5	13.9	15.7	17.3	18.6	19.9	20.1	19.3	18.8	19.7	19.3	18.7	18.1	17.8	17.4	17.3	17.0	15.9	20.1																						
23-Jun	16.6	16.3	15.7	15.2	14.7	15.2	15.3	15.9	16.9	18.2	19.3	20.6	21.5	22.4	23.1	23.6	24.3	24.6	24.7	24.4	24.0	23.4	22.6	21.6	20.0	24.7																						
24-Jun	20.3	19.0	18.0	17.3	16.2	15.1	15.6	17.1	19.3	22.7	24.6	25.5	26.3	26.8	27.6	25.1	22.4	22.0	19.5	17.2	15.5	14.7	13.6	12.6	19.8	27.6																						
25-Jun	11.9	11.6	11.5	11.3	11.0	10.9	11.4	12.2	13.4	14.7	15.9	17.1	18.1	19.2	20.1	20.4	20.6	20.6	20.5	20.5	20.1	19.7	19.2	18.7	16.3	20.6																						
26-Jun	18.0	16.5	15.1	13.7	12.8	12.9	14.1	15.0	15.9	16.0	17.1	18.0	18.6	19.7	21.5	22.8	19.1	19.5	19.1	18.1	17.4	16.9	17.0	17.1	17.2	22.8																						
27-Jun	16.9	17.1	16.0	15.0	14.3	14.0	13.8	14.5	16.3	17.9	19.2	20.3	21.4	22.3	23.3	24.0	24.7	25.0	25.4	25.2	24.4	23.3	22.5	21.3	19.9	25.4																						
28-Jun	20.3	19.5	18.4	18.0	17.3	17.1	17.1	18.4	DF	DF	23.3	DF	26.5	26.9	26.9	25.9	26.6	24.8	24.3	23.9	23.2	23.0	22.3	21.8	22.2	26.9																						
29-Jun	21.2	20.5	20.4	19.9	19.6	19.4	18.7	19.2	20.3	21.9	23.6	25.5	27.4	28.7	27.9	23.6	23.2	20.0	21.1	22.7	23.8	23.2	22.3	22.3	22.3	28.7																						
30-Jun	20.8	20.0	19.5	19.2	18.6	18.3	18.1	18.6	20.0	22.1	24.2	25.4	25.7	26.5	27.0	27.3	27.5	27.5	27.3	26.4	25.2	24.1	23.1	21.4	23.1	27.5																						
																								16.4	15.6	14.9	14.4	13.9	13.7	13.8	14.5	15.3	16.5	17.9	18.7	19.8	20.5	20.9	21.0	20.9	20.7	20.3	19.8	19.3	18.6	17.9	17.3	Diurnal Average
																								21.3	20.9	21.0	20.9	19.6	19.4	18.7	19.2	20.3	22.7	24.6	25.5	27.4	28.7	27.9	27.9	28.2	28.2	27.8	27.0	26.0	24.7	23.7	22.7	Diurnal Maximum
DF - DAS Failure																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature 75 m (AT75m) - C
Mannix - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	21	2.93	2.93
10 - 20	462	64.44	67.36
> 20	234	32.64	100.00

Total Number of Valid Hours: 717

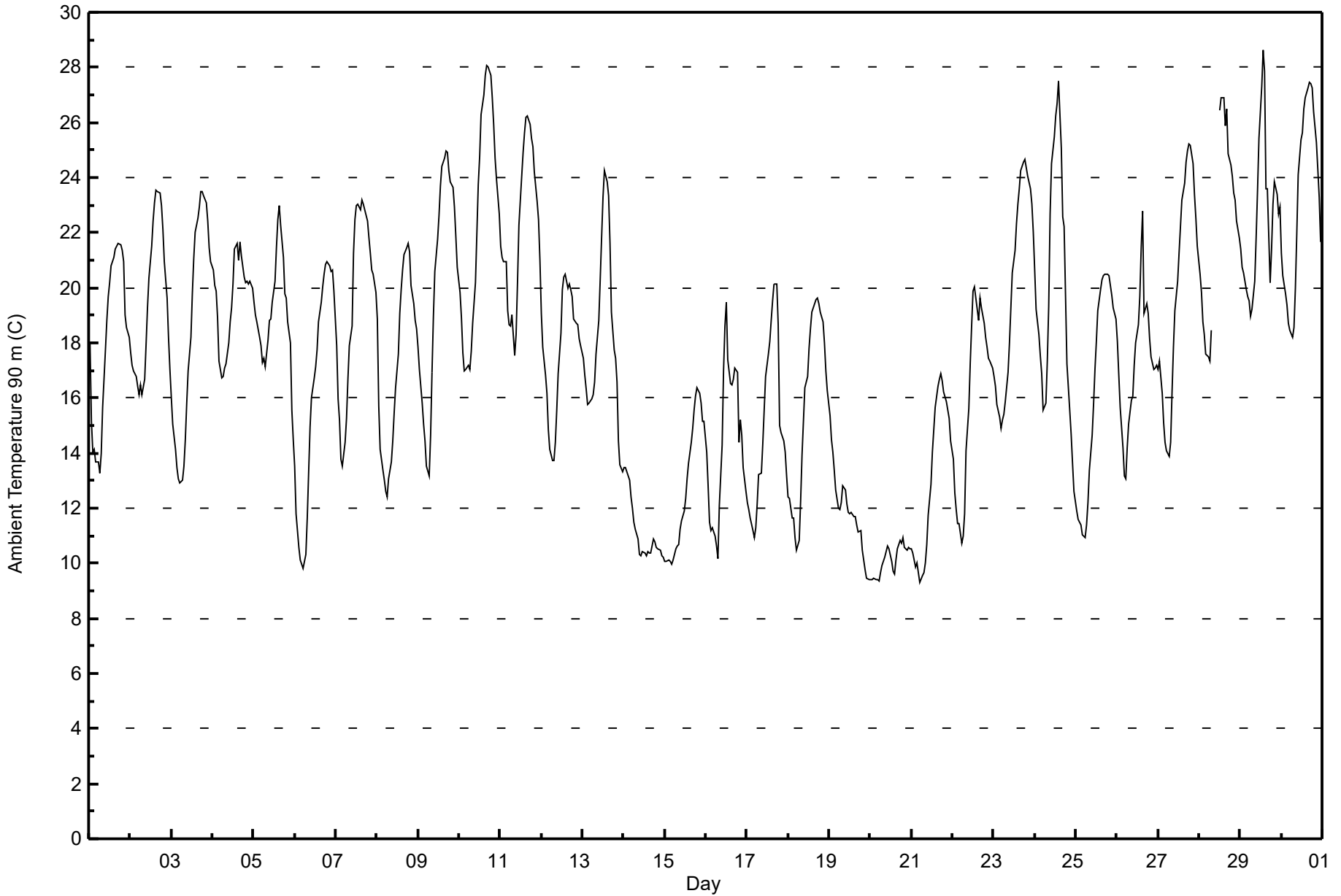
Total Number of Hours: 720



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 28.6 C on Jun 29 14:00		Maximum Daily Average: 23.1 C on Jun 30		Hours in Service: 720																						
Minimum Value: 9.3 C on Jun 21 06:00		Minimum Daily Average: 10.1 C on Jun 20		Hours of Data: 717																						
Maximum Diurnal Average: 20.9 C at hour 16		Minimum Diurnal Average: 13.8 C at hour 6		Hours of Missing Data: 3																						
Monthly Average: 17.63 C		Percentiles: P ₁ = 9.5 P ₁₀ = 10.9 Q ₁ = 14.0 Median = 17.8 Q ₃ = 20.9 P ₉₀ = 23.7 P ₉₉ = 27.4		Hours of Calibration: 0																						
				Percent Operational Time: 99.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	18.0	15.1	14.0	14.1	13.7	13.7	13.3	14.0	15.7	17.7	18.8	19.7	20.2	20.8	21.1	21.4	21.5	21.6	21.6	21.4	20.9	19.0	18.5	18.2	18.1	21.6
2-Jun	17.6	17.2	17.0	16.8	16.4	16.1	16.5	16.1	16.7	17.9	19.3	20.3	21.5	22.4	23.1	23.5	23.5	23.5	23.0	22.1	21.0	19.6	18.2	17.0	19.4	23.5
3-Jun	16.0	15.0	14.1	13.5	13.0	12.9	13.0	13.5	14.5	15.8	17.0	18.2	19.8	21.0	22.0	22.5	22.9	23.5	23.3	23.1	22.4	21.5	20.9	18.5	18.5	23.5
4-Jun	20.6	20.1	19.9	18.9	17.4	16.7	16.8	17.1	17.2	18.0	18.8	19.3	20.2	21.4	21.6	21.0	21.7	21.2	20.4	20.2	20.3	20.1	20.3	20.0	19.5	21.7
5-Jun	19.5	19.0	18.7	18.2	17.9	17.3	17.4	17.1	18.1	18.8	18.9	19.5	20.2	21.5	22.5	23.0	22.3	21.1	19.8	19.6	18.8	18.0	15.6	14.5	19.1	23.0
6-Jun	13.5	11.8	10.6	10.1	10.0	9.8	10.3	11.6	13.3	15.0	16.0	16.7	17.1	17.8	18.8	19.5	20.0	20.5	20.8	20.9	20.8	20.6	20.6	19.9	16.1	20.9
7-Jun	17.9	16.0	15.2	13.8	13.5	14.4	15.2	16.7	17.9	18.6	21.2	22.5	23.0	23.0	22.8	23.2	23.0	22.8	22.4	21.8	21.2	20.6	20.5	19.8	19.5	23.2
8-Jun	18.9	15.7	14.1	13.4	13.0	12.6	12.4	13.1	13.7	14.5	15.5	16.4	17.6	19.1	19.9	20.6	21.2	21.4	21.6	21.3	20.1	19.4	18.8	18.5	17.2	21.6
9-Jun	17.8	17.0	15.8	15.1	14.4	13.5	13.2	14.6	16.9	18.9	20.6	21.8	22.6	23.7	24.4	24.7	25.0	24.9	24.2	23.8	23.6	23.0	21.9	20.7	20.1	25.0
10-Jun	19.8	18.9	17.6	17.0	17.0	17.2	17.0	17.7	18.7	20.2	21.9	23.7	24.8	26.3	27.0	27.7	28.0	28.0	27.7	26.9	25.9	24.7	23.9	22.7	22.5	28.0
11-Jun	21.5	21.1	21.0	20.9	19.2	18.7	18.6	19.0	17.5	18.3	20.2	22.3	24.1	24.9	25.6	26.2	26.2	25.9	25.4	25.1	24.2	23.1	22.4	21.0	22.2	26.2
12-Jun	19.1	17.9	16.9	16.2	14.8	14.1	13.8	13.7	14.4	15.5	16.9	18.3	19.9	20.4	20.5	20.0	20.1	19.9	19.7	18.9	18.7	18.7	18.2	17.9	17.7	20.5
13-Jun	17.4	16.8	16.3	15.8	15.8	15.9	16.1	16.6	17.6	18.8	20.3	21.8	23.3	24.2	23.8	23.3	21.6	19.1	17.7	17.5	16.6	14.4	13.6	13.3	18.3	24.2
14-Jun	13.5	13.5	13.3	13.0	12.4	12.0	11.5	11.3	10.9	10.3	10.3	10.4	10.4	10.3	10.4	10.4	10.4	10.9	10.8	10.6	10.5	10.5	10.3	10.2	11.2	13.5
15-Jun	10.0	10.1	10.1	10.1	10.0	10.1	10.5	10.6	10.7	11.2	11.6	11.9	12.4	13.1	13.6	14.4	14.9	15.6	16.1	16.4	16.1	15.8	15.2	15.2	12.7	16.4
16-Jun	14.0	12.8	11.5	11.2	11.3	11.0	10.6	10.2	12.1	14.3	17.0	18.6	19.5	17.4	16.5	16.5	16.7	17.1	16.9	14.4	15.2	14.6	13.5	12.6	14.4	19.5
17-Jun	12.2	12.0	11.6	11.2	10.9	11.3	12.2	13.2	13.3	14.3	15.6	16.8	17.6	18.1	18.8	19.5	20.1	20.2	18.7	15.0	14.8	14.4	14.0	13.2	15.0	20.2
18-Jun	12.4	12.4	11.7	11.6	10.9	10.5	10.8	12.3	13.9	15.2	16.4	16.8	17.8	18.5	19.1	19.4	19.6	19.6	19.4	19.1	18.7	18.0	17.0	16.3	15.7	19.6
19-Jun	15.3	14.5	14.0	13.4	12.7	12.0	12.0	12.2	12.8	12.6	12.1	11.8	11.8	11.8	11.7	11.7	11.4	11.2	11.2	10.5	10.1	9.8	9.5	9.4	11.9	15.3
20-Jun	9.4	9.4	9.5	9.4	9.4	9.3	9.7	9.9	10.2	10.4	10.6	10.5	10.0	9.7	9.6	10.1	10.5	10.8	10.7	10.9	10.6	10.5	10.6	10.5	10.1	10.9
21-Jun	10.5	10.4	9.9	10.0	9.7	9.3	9.5	9.6	10.0	10.7	11.7	12.8	14.0	14.9	15.6	16.4	16.7	16.9	16.6	16.2	15.9	15.6	15.3	14.5	13.0	16.9
22-Jun	13.8	12.5	11.9	11.4	11.4	10.7	11.0	11.8	14.1	15.6	17.2	18.6	19.9	20.0	19.2	18.8	19.6	19.3	18.7	18.2	17.9	17.5	17.3	17.1	16.0	20.0
23-Jun	16.8	16.4	15.8	15.3	14.9	15.2	15.4	15.9	16.9	18.0	19.3	20.6	21.4	22.3	23.0	23.6	24.2	24.5	24.7	24.3	24.1	23.6	23.0	22.0	20.0	24.7
24-Jun	20.7	19.2	18.3	17.5	16.9	15.5	15.8	17.3	19.3	22.7	24.5	25.5	26.2	26.7	27.5	25.1	22.6	22.2	19.7	17.2	15.5	14.7	13.6	12.6	19.9	27.5
25-Jun	11.9	11.6	11.5	11.4	11.0	10.9	11.4	12.2	13.4	14.6	15.8	17.0	18.0	19.2	19.9	20.3	20.4	20.5	20.5	20.4	20.1	19.7	19.3	18.8	16.2	20.5
26-Jun	18.1	16.8	15.7	14.2	13.1	13.1	14.2	15.0	15.9	16.0	17.2	18.0	18.7	19.7	21.4	22.8	19.1	19.4	19.0	18.1	17.5	17.0	17.1	17.2	17.3	22.8
27-Jun	17.0	17.4	16.2	15.1	14.4	14.1	13.9	14.4	16.2	17.8	19.1	20.3	21.3	22.2	23.2	23.8	24.5	25.0	25.2	25.1	24.5	23.4	22.5	21.5	19.9	25.2
28-Jun	20.5	19.8	18.8	18.3	17.6	17.5	17.4	18.5	DF	DF	23.2	DF	26.5	26.9	26.9	25.9	26.5	24.9	24.5	24.0	23.4	23.2	22.4	21.8	22.3	26.9
29-Jun	21.4	20.7	20.6	19.9	19.7	19.5	19.0	19.2	20.3	21.8	23.5	25.4	27.3	28.6	27.9	23.6	23.6	20.2	21.4	23.0	23.9	23.4	22.7	22.9	22.5	28.6
30-Jun	21.2	20.4	19.8	19.4	18.7	18.5	18.2	18.6	20.0	22.0	24.1	25.4	25.6	26.5	26.9	27.3	27.5	27.4	27.3	26.4	25.3	24.3	23.3	21.6	23.1	27.5
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	21	2.93	2.93
10 - 20	467	65.13	68.06
> 20	229	31.94	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



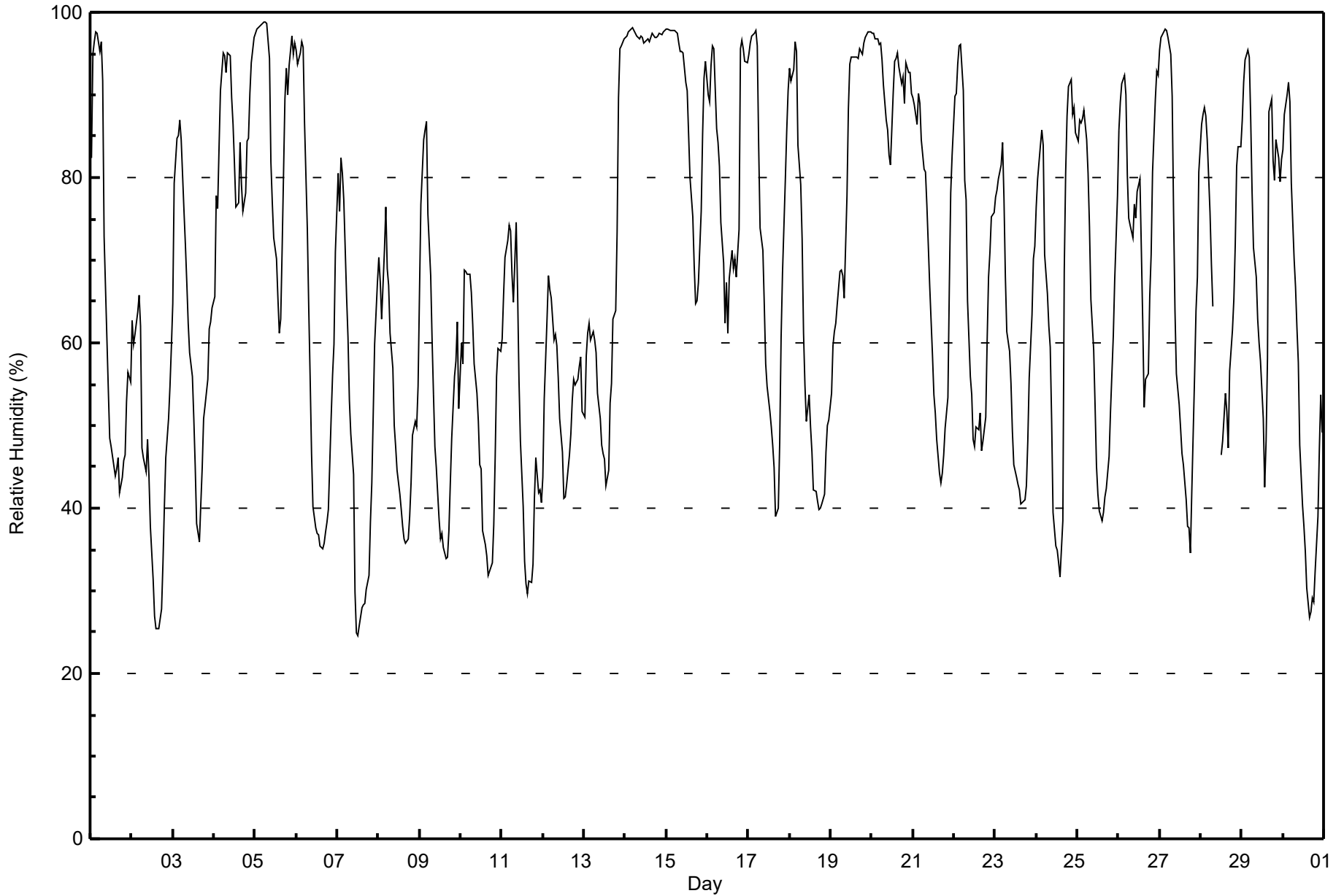
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mannix - June 2023

Maximum Value: 99 % on Jun 5 06:00 Maximum Daily Average: 97.2 % on Jun 14																		Hours in Service: 720 Hours of Data: 717																																
Minimum Value: 25 % on Jun 7 13:00 Minimum Daily Average: 45.4 % on Jun 2 Maximum Diurnal Average: 86.3 % at hour 5 Minimum Diurnal Average: 50.4 % at hour 16 Monthly Average: 67.3 % Percentiles: P ₁ = 27 P ₁₀ = 39 Q ₁ = 49 Median = 67 Q ₃ = 87 P ₉₀ = 96 P ₉₉ = 98																		Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Jun	82	95	97	98	97	95	96	92	73	61	54	48	48	46	44	45	46	42	44	46	46	53	56	55	65.0	98																								
2-Jun	63	60	61	64	66	62	47	46	44	48	44	38	31	27	25	25	25	28	33	40	46	51	55	60	45.4	66																								
3-Jun	65	79	85	85	87	84	76	72	67	62	59	56	51	45	38	36	41	45	51	52	56	62	63	64	61.7	87																								
4-Jun	66	78	76	84	90	95	95	93	95	95	90	86	82	76	77	84	79	76	78	84	85	90	94	97	85.2	97																								
5-Jun	98	98	98	98	99	99	99	99	99	94	82	77	73	70	65	61	63	71	90	93	90	94	97	95	96	87.4	99																							
6-Jun	95	94	95	96	96	87	74	64	56	47	40	38	37	37	35	35	36	37	38	40	51	56	60	71	58.9	96																								
7-Jun	81	76	82	80	77	66	61	53	49	44	30	25	25	26	28	28	28	30	32	38	43	51	60	67	49.2	82																								
8-Jun	70	68	63	71	76	69	67	61	57	50	47	45	42	40	38	36	36	36	39	43	49	50	50	55	52.4	76																								
9-Jun	66	77	85	86	87	76	68	60	54	47	45	39	36	37	35	34	34	37	43	48	56	58	63	52	55.1	87																								
10-Jun	60	58	69	69	68	68	66	62	58	54	51	45	45	37	36	34	32	32	33	38	46	56	59	59	51.4	69																								
11-Jun	60	66	70	72	74	74	68	65	75	66	55	48	40	34	31	30	31	31	33	41	46	42	42	41	51.5	75																								
12-Jun	44	53	63	68	66	65	60	61	60	56	51	47	41	41	43	46	49	53	56	55	56	57	58	52	54.2	68																								
13-Jun	51	58	61	62	60	61	60	59	54	51	48	47	46	43	45	53	55	63	64	73	90	96	96	97	62.2	97																								
14-Jun	97	97	98	98	98	98	97	97	97	97	97	96	97	97	96	97	98	97	97	97	98	97	98	98	97.2	98																								
15-Jun	98	98	98	98	98	98	97	96	95	95	95	92	91	85	80	75	69	65	65	67	76	85	92	94	87.6	98																								
16-Jun	90	89	94	96	96	86	84	81	75	70	62	67	61	68	71	69	70	68	74	96	97	96	94	94	81.1	97																								
17-Jun	95	96	97	97	98	96	84	74	71	65	57	55	52	50	48	45	39	40	48	61	68	80	86	91	70.5	98																								
18-Jun	93	92	93	96	95	84	79	73	61	55	51	54	50	47	42	42	41	40	40	41	42	47	50	51	60.7	96																								
19-Jun	54	60	61	62	65	69	69	68	65	78	88	94	95	95	95	95	94	96	95	96	97	97	98	98	82.6	98																								
20-Jun	98	97	97	97	96	96	94	91	87	86	83	81	90	94	94	95	93	91	92	89	94	93	93	90	92.2	98																								
21-Jun	90	89	86	90	89	85	81	81	77	72	67	59	54	52	48	44	43	44	47	50	53	67	78	83	67.8	90																								
22-Jun	90	90	94	96	96	90	80	77	65	56	54	48	47	50	50	51	47	48	51	60	68	71	75	76	68.0	96																								
23-Jun	78	79	80	81	84	77	68	61	59	55	49	45	44	43	42	41	41	41	43	48	56	63	70	72	59.2	84																								
24-Jun	76	80	84	86	84	71	66	62	60	51	40	35	35	33	32	39	69	81	87	91	92	88	89	85	67.2	92																								
25-Jun	84	87	87	87	88	85	81	74	65	59	52	45	42	40	38	40	41	42	46	52	56	61	68	78	62.4	88																								
26-Jun	86	89	91	92	90	80	75	74	73	77	75	78	80	71	63	52	56	56	66	71	81	89	93	92	77.1	93																								
27-Jun	95	97	98	98	98	97	95	90	76	64	56	53	50	47	45	41	38	38	35	42	56	64	68	81	67.5	98																								
28-Jun	87	88	88	87	85	76	69	64	DF	DF	53	DF	46	48	54	52	47	57	62	65	72	81	84	84	69.0	88																								
29-Jun	87	92	94	95	95	87	78	71	68	63	60	58	51	42	48	58	88	89	82	80	84	82	80	82	75.6	95																								
30-Jun	83	88	90	91	89	79	70	67	62	58	48	40	38	35	30	27	28	29	29	32	39	47	54	49	54.2	91																								
																								79.4	82.2	84.5	86.1	86.3	81.8	76.8	73.0	68.6	64.2	59.3	56.4	53.8	51.7	50.4	50.4	52.2	54.1	56.5	60.9	66.4	70.9	73.9	75.4	Diurnal Average		
																								98	98	98	98	99	99	99	99	99	97	97	97	96	97	97	96	97	98	97	97	98	97	98	98	98	Diurnal Maximum	
DF - DAS Failure																																																		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Mannix - June 2023

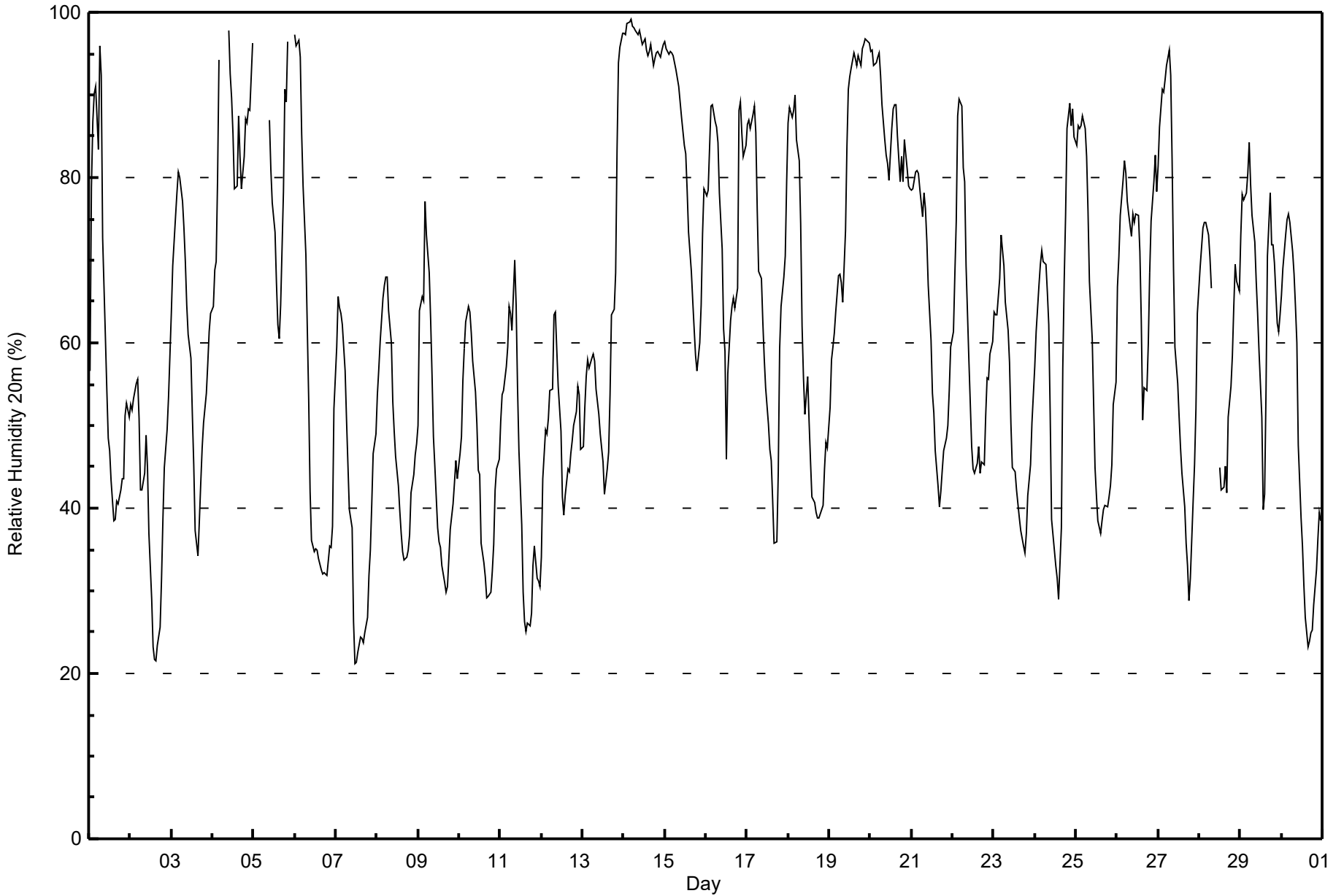
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	79	11.02	11.02
40 - 60	209	29.15	40.17
60 - 80	182	25.38	65.55
80 - 100	247	34.45	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Maximum Value: 99 % on Jun 14 05:00		Maximum Daily Average: 96.5 % on Jun 14		Hours in Service: 720																																													
Minimum Value: 21 % on Jun 7 12:00		Minimum Daily Average: 40.1 % on Jun 7		Hours of Data: 702																																													
Maximum Diurnal Average: 78.3 % at hour 5		Minimum Diurnal Average: 47.5 % at hour 16		Hours of Missing Data: 18																																													
Monthly Average: 61.8 %		Percentiles: P ₁ = 23 P ₁₀ = 35 Q ₁ = 45 Median = 61 Q ₃ = 79 P ₉₀ = 91 P ₉₉ = 98		Hours of Calibration: 0																																													
				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-Jun	57	79	87	90	91	83	96	92	73	61	54	49	47	43	39	39	41	40	42	44	44	51	53	51	60.2	96																							
2-Jun	53	52	53	55	56	51	42	42	44	49	45	37	29	23	22	22	23	26	31	39	45	49	53	58	41.6	58																							
3-Jun	64	69	75	78	81	80	77	74	70	65	61	58	51	45	37	34	39	43	47	50	54	57	61	64	59.8	81																							
4-Jun	64	69	70	80	94	OR	OR	OR	OR	OR	98	98	90	85	79	79	87	83	79	83	87	87	88	88	96	84.6	98																						
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	87	81	77	73	67	62	60	65	78	91	89	96	OR	OR	OR	--	96																							
6-Jun	97	96	97	95	85	79	71	62	53	42	36	35	35	35	34	33	32	32	32	32	35	35	38	52	53.0	97																							
7-Jun	60	66	64	64	62	57	51	45	40	38	26	21	21	23	24	24	24	25	27	32	35	41	47	49	40.1	66																							
8-Jun	54	57	60	65	67	68	68	64	60	53	49	46	43	40	37	35	34	34	35	37	42	44	46	48	49.4	68																							
9-Jun	50	64	66	65	77	73	68	63	56	49	45	38	36	35	33	31	30	31	34	37	41	43	46	44	48.1	77																							
10-Jun	47	49	55	59	63	64	64	61	58	54	50	45	44	36	33	32	29	29	30	32	36	42	45	46	45.9	64																							
11-Jun	51	54	54	57	60	64	64	62	70	65	55	47	38	30	26	25	26	26	27	33	35	32	31	30	44.2	70																							
12-Jun	34	44	50	49	51	54	54	63	64	59	55	49	41	39	42	45	44	47	48	50	52	55	54	47	49.6	64																							
13-Jun	48	52	56	58	57	58	59	58	54	51	49	47	46	42	45	47	54	63	64	68	83	94	96	97	60.3	97																							
14-Jun	98	97	99	99	99	98	98	98	97	98	97	96	97	95	95	95	96	94	94	95	95	95	95	96	96	96.5	99																						
15-Jun	96	96	95	95	95	95	93	92	91	89	87	84	83	78	73	69	65	62	58	57	60	65	73	79	80.4	96																							
16-Jun	78	78	83	89	89	87	86	84	78	71	62	59	46	56	63	64	65	64	67	88	89	85	82	84	75.0	89																							
17-Jun	86	87	86	88	89	85	76	69	68	63	58	55	50	47	46	41	36	36	44	59	64	68	70	79	64.6	89																							
18-Jun	87	88	87	88	90	85	82	74	62	56	51	56	51	46	41	41	40	39	39	39	40	45	48	47	59.2	90																							
19-Jun	52	58	60	61	64	68	68	67	65	74	84	91	92	93	95	94	93	95	94	96	96	97	97	96	81.2	97																							
20-Jun	95	95	93	94	95	95	92	89	85	83	82	80	86	88	89	89	85	80	83	79	85	81	79	79	86.6	95																							
21-Jun	78	79	81	81	81	79	75	78	76	72	67	60	54	51	47	43	40	42	45	47	48	50	54	60	62.0	81																							
22-Jun	61	68	75	87	90	89	81	79	69	58	53	47	45	44	45	47	44	46	45	51	56	56	59	60	60.7	90																							
23-Jun	64	63	63	68	73	71	69	65	61	58	50	45	44	42	41	39	37	35	35	37	42	45	50	54	52.2	73																							
24-Jun	57	61	67	69	71	70	70	66	62	51	39	35	33	31	29	38	57	67	75	86	89	86	88	85	61.8	89																							
25-Jun	84	86	86	86	87	86	83	76	67	61	53	45	41	38	37	38	40	40	40	41	43	45	52	55	58.9	87																							
26-Jun	67	70	75	80	82	80	77	76	73	76	75	76	75	71	63	51	55	54	60	69	75	79	83	78	71.6	83																							
27-Jun	81	86	91	90	92	94	95	92	82	69	59	55	51	47	44	40	36	33	29	32	41	45	52	64	62.5	95																							
28-Jun	69	72	74	75	75	73	70	67	DF	DF	56	DF	45	42	42	45	42	51	55	58	64	69	67	66	60.8	75																							
29-Jun	73	78	77	78	81	84	79	75	72	67	64	59	51	40	42	54	70	78	72	72	70	62	61	63	67.7	84																							
30-Jun	66	69	73	75	76	74	71	68	64	60	48	39	35	31	27	23	24	25	25	28	33	36	39	38	47.8	76																							
																								67.9	71.8	74.2	76.5	78.3	76.6	74.3	72.4	67.3	64.6	59.4	55.8	52.3	49.3	47.7	47.5	48.3	49.8	51.7	55.5	59.1	60.1	62.4	64.4	Diurnal Average	
																								98	97	99	99	99	98	98	98	97	98	97	96	97	95	95	95	96	95	94	96	96	97	97	97	Diurnal Maximum	
DF - DAS Failure		OR - Out of Range																																															





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	117	16.67	16.67
40 - 60	226	32.19	48.86
60 - 80	196	27.92	76.78
80 - 100	163	23.22	100.00

Total Number of Valid Hours: 702

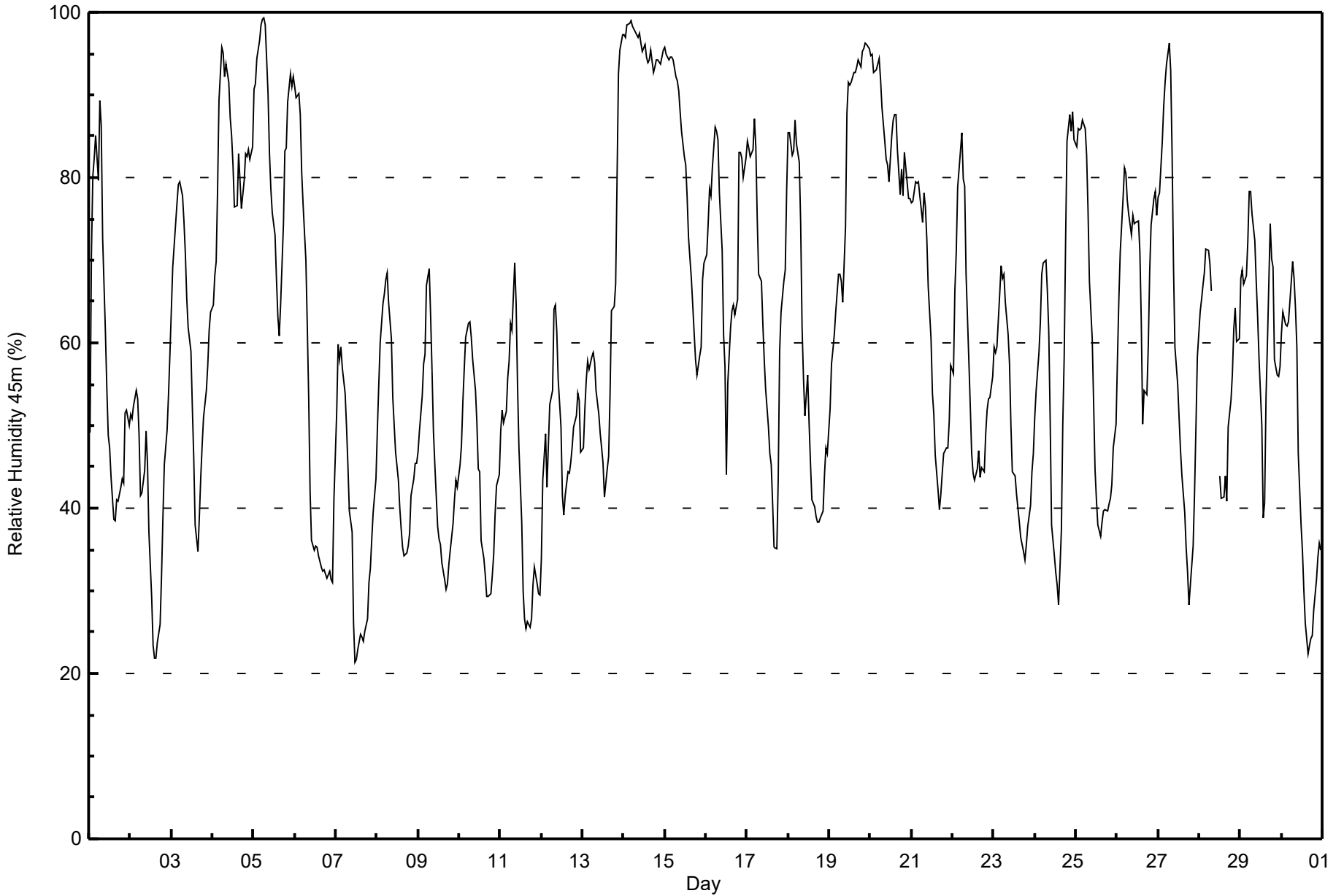
Total Number of Hours: 720



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 99 % on Jun 5 07:00																		Maximum Daily Average: 95.9 % on Jun 14																		Hours in Service: 720	
Minimum Value: 21 % on Jun 7 12:00																		Minimum Daily Average: 38.0 % on Jun 7																		Hours of Data: 717	
Maximum Diurnal Average: 76.1 % at hour 6																		Minimum Diurnal Average: 47.0 % at hour 16																		Hours of Missing Data: 3	
Monthly Average: 60.9 %																		Percentiles: P ₁ = 24 P ₁₀ = 35 Q ₁ = 44 Median = 59 Q ₃ = 78 P ₉₀ = 91 P ₉₉ = 98																		Hours of Calibration: 0	
																																				Percent Operational Time: 99.6	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Jun	49	71	80	82	85	80	89	86	73	61	54	49	47	44	39	38	41	41	43	43	43	51	52	50	58.0	89											
2-Jun	51	51	52	54	53	49	41	42	45	49	45	37	29	23	22	22	24	26	32	39	45	49	54	59	41.5	59											
3-Jun	64	69	74	77	79	79	78	75	71	65	62	59	52	46	38	35	39	44	48	51	54	57	62	64	60.1	79											
4-Jun	65	68	70	79	89	96	95	92	94	92	87	85	82	76	77	83	80	76	80	83	83	83	82	84	82.5	96											
5-Jun	91	91	94	97	98	99	99	98	90	83	79	76	73	68	63	61	65	74	83	84	89	93	91	92	84.7	99											
6-Jun	91	90	90	88	81	77	70	62	53	42	36	35	35	35	34	33	32	33	32	32	32	31	31	41	50.7	91											
7-Jun	52	60	58	59	57	54	50	45	40	37	26	21	22	23	25	24	24	25	27	31	33	36	39	44	38.0	60											
8-Jun	50	55	60	65	66	68	68	65	61	53	50	47	43	40	37	35	34	35	35	37	42	44	45	45	49.2	68											
9-Jun	47	49	53	57	59	67	69	63	57	49	45	38	36	36	33	31	30	31	33	35	38	41	43	42	45.2	69											
10-Jun	45	48	53	57	61	62	63	61	58	54	50	45	44	36	34	32	29	29	30	32	34	39	43	44	45.2	63											
11-Jun	49	52	50	52	56	58	62	62	70	65	55	47	38	30	27	25	26	26	27	31	33	31	30	30	42.9	70											
12-Jun	34	43	49	43	48	53	54	64	65	61	56	50	42	39	42	44	44	46	47	50	51	54	53	47	49.1	65											
13-Jun	47	52	55	58	57	58	59	58	54	51	49	47	45	41	45	46	54	64	64	67	80	92	95	97	59.9	97											
14-Jun	97	97	98	99	99	98	98	98	97	98	96	95	96	95	94	94	95	93	93	94	94	94	95	95	95	95.9	99										
15-Jun	96	95	94	95	95	94	92	92	91	88	86	83	82	78	73	68	65	61	58	56	58	59	68	70	78.9	96											
16-Jun	71	74	79	78	81	86	86	85	78	71	61	57	44	55	62	64	65	63	65	83	83	82	80	82	72.3	86											
17-Jun	84	84	83	83	87	84	75	68	67	62	58	54	50	47	45	40	35	35	44	59	64	67	69	79	63.5	87											
18-Jun	85	85	83	83	87	84	82	74	62	56	51	56	50	45	41	40	39	38	38	39	40	44	47	47	58.2	87											
19-Jun	52	58	59	61	64	68	68	67	65	74	88	91	91	91	93	93	93	94	93	95	96	96	96	96	81.0	96											
20-Jun	95	95	93	93	94	94	92	88	84	82	81	80	85	87	88	88	83	78	81	78	83	79	77	77	85.7	95											
21-Jun	77	77	80	79	80	78	75	78	76	72	67	60	54	51	46	42	40	42	44	47	47	47	51	57	61.2	80											
22-Jun	56	66	71	79	81	85	80	79	68	58	52	47	44	43	45	47	44	45	44	49	52	53	53	56	58.3	85											
23-Jun	59	59	60	66	69	68	68	65	61	57	50	44	44	42	40	38	36	35	34	36	38	40	44	47	50.0	69											
24-Jun	51	54	59	63	68	70	70	66	61	51	38	34	32	31	28	37	50	58	72	84	88	86	88	85	59.4	88											
25-Jun	84	86	86	86	87	86	83	76	68	60	53	45	41	38	37	38	40	40	40	41	41	43	47	50	58.1	87											
26-Jun	58	65	71	77	81	81	77	76	73	75	74	75	75	71	62	50	54	54	60	69	74	77	78	76	70.2	81											
27-Jun	78	78	84	89	91	94	96	93	83	69	59	55	51	47	44	39	35	32	28	31	35	42	50	58	60.9	96											
28-Jun	64	65	67	68	71	71	70	66	DF	DF	55	DF	44	41	41	44	41	50	53	56	62	64	60	61	57.8	71											
29-Jun	68	69	67	68	72	78	78	76	72	67	63	58	50	39	41	53	60	74	70	69	58	56	56	57	63.4	78											
30-Jun	61	64	62	62	62	65	70	68	64	59	47	38	35	30	26	22	23	24	25	28	31	34	36	35	44.7	70											
																								Diurnal Average													
																								Diurnal Maximum													
65.7 69.0 71.2 73.2 75.3 76.1 75.3 72.9 69.0 64.3 59.2 55.5 51.9 49.0 47.4 47.0 47.4 48.9 50.8 54.2 56.7 58.9 60.5 62.2																																					
97 97 98 99 99 99 99 98 97 98 96 95 96 95 94 94 95 94 93 95 96 96 96 96 97																																					
DF - DAS Failure																																					





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	127	17.71	17.71
40 - 60	240	33.47	51.19
60 - 80	193	26.92	78.10
80 - 100	157	21.90	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



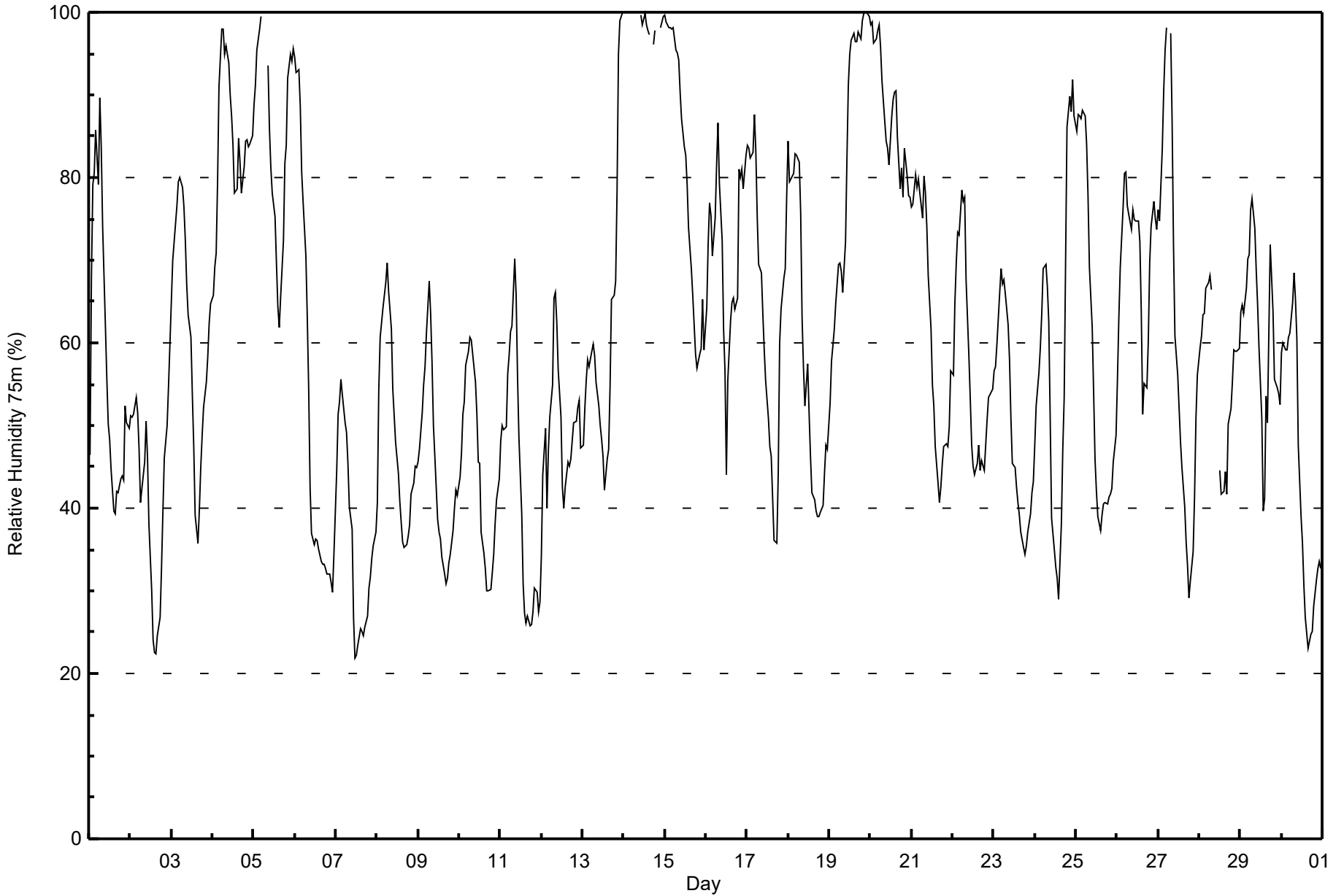
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 75m (RH75m) - %

Mannix - June 2023

Maximum Value: 100 % on Jun 14 00:00														Maximum Daily Average: 87.9 % on Jun 20														Hours in Service: 720	
Minimum Value: 22 % on Jun 7 12:00														Minimum Daily Average: 36.3 % on Jun 7														Hours of Data: 702	
Maximum Diurnal Average: 73.5 % at hour 5														Minimum Diurnal Average: 46.2 % at hour 17														Hours of Missing Data: 18	
Monthly Average: 60.3 %														Percentiles: P ₁ = 24 P ₁₀ = 35 Q ₁ = 44 Median = 59 Q ₃ = 77 P ₉₀ = 90 P ₉₉ = 100														Hours of Calibration: 0	
																												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-Jun	46	68	79	81	86	79	90	84	74	62	56	50	48	45	40	39	42	42	43	44	43	52	50	50	58.0	90			
2-Jun	51	51	51	53	52	47	41	42	46	51	46	38	30	24	23	22	25	27	33	40	46	50	55	60	41.8	60			
3-Jun	65	70	74	77	80	80	79	76	72	67	63	61	54	47	39	36	40	45	49	52	55	58	62	65	61.1	80			
4-Jun	66	69	71	79	91	98	98	95	96	94	90	87	84	78	79	85	82	78	81	84	85	84	84	85	84.3	98			
5-Jun	89	91	95	98	99	OR	OR	OR	94	86	81	78	75	70	64	62	66	72	82	84	92	95	94	96	84.0	99			
6-Jun	95	93	93	89	81	77	71	63	54	43	37	36	36	35	34	33	33	33	33	32	32	31	30	34	51.2	95			
7-Jun	45	51	53	56	54	50	49	45	40	37	27	22	22	23	25	25	25	26	27	30	32	34	35	37	36.3	56			
8-Jun	41	54	61	64	66	67	70	66	62	54	51	48	44	41	38	36	35	36	37	38	42	43	45	45	49.3	70			
9-Jun	46	47	52	55	57	61	67	64	58	50	46	39	37	36	34	32	31	31	33	34	37	40	42	42	44.7	67			
10-Jun	44	47	51	53	57	59	61	60	59	55	51	46	45	37	35	33	30	30	30	32	34	38	41	44	44.7	61			
11-Jun	48	50	49	50	56	58	61	62	70	66	56	48	39	31	27	26	27	26	26	28	30	30	28	29	42.6	70			
12-Jun	34	44	50	40	47	51	55	65	66	63	57	51	43	40	42	46	45	46	48	50	50	52	53	47	49.4	66			
13-Jun	48	52	55	58	57	59	60	59	55	52	50	48	46	42	46	47	55	65	66	67	78	95	99	100	60.8	100			
14-Jun	100	100	OR	OR	OR	OR	OR	OR	OR	OR	100	98	100	98	98	97	OR	96	98	OR	OR	98	99	99	-	100			
15-Jun	100	99	98	98	98	98	95	95	94	90	87	84	83	79	74	69	66	62	59	57	59	65	59	59	80.3	100			
16-Jun	64	72	77	75	71	75	81	87	79	72	62	57	44	56	63	65	65	64	65	81	80	81	79	83	70.7	87			
17-Jun	84	84	82	83	88	83	75	69	69	63	59	55	51	47	46	41	36	36	44	60	64	68	69	78	64.0	88			
18-Jun	84	79	80	80	83	83	82	76	63	57	52	58	51	46	42	41	40	39	39	39	40	44	48	47	58.1	84			
19-Jun	53	58	60	62	65	70	70	69	66	72	82	91	95	97	98	96	96	98	97	99	100	100	100	100	82.9	100			
20-Jun	99	99	96	97	98	98	96	92	87	84	84	82	87	90	90	91	85	79	81	78	84	80	78	78	87.9	99			
21-Jun	76	77	80	79	80	78	75	80	78	74	68	62	55	52	47	43	41	43	45	47	48	47	50	57	61.8	80			
22-Jun	56	65	70	73	73	78	77	78	68	58	53	48	45	44	45	48	45	46	45	48	51	53	54	54	57.3	78			
23-Jun	57	57	60	66	69	67	68	66	62	58	51	45	45	43	41	39	37	35	34	35	37	39	42	43	49.9	69			
24-Jun	48	52	56	60	64	69	69	67	63	51	39	35	33	31	29	38	47	53	70	86	90	88	92	87	59.0	92			
25-Jun	86	88	87	87	88	88	84	78	69	62	54	46	42	39	37	39	41	41	41	41	42	42	46	49	59.0	88			
26-Jun	56	63	69	76	80	81	77	76	74	76	75	75	75	72	64	51	55	55	60	70	74	77	75	74	69.9	81			
27-Jun	76	75	84	91	95	98	OR	97	87	72	61	56	52	48	45	40	36	33	29	31	35	41	51	56	60.4	98			
28-Jun	59	61	63	64	67	67	68	66	DF	DF	56	DF	45	42	42	44	42	50	52	55	59	59	59	59	56.2	68			
29-Jun	64	65	64	67	70	71	76	77	74	69	65	59	51	40	41	54	50	72	68	64	56	55	54	53	61.5	77			
30-Jun	59	60	59	59	61	61	65	68	65	60	48	39	36	31	27	23	24	25	25	28	31	33	34	33	43.9	68			
																								Diurnal Average					
																								Diurnal Maximum					
																								DF - DAS Failure OR - Out of Range					





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	124	17.66	17.66
40 - 60	249	35.47	53.13
60 - 80	185	26.35	79.49
80 - 100	140	19.94	99.43

Total Number of Valid Hours: 702

Total Number of Hours: 720



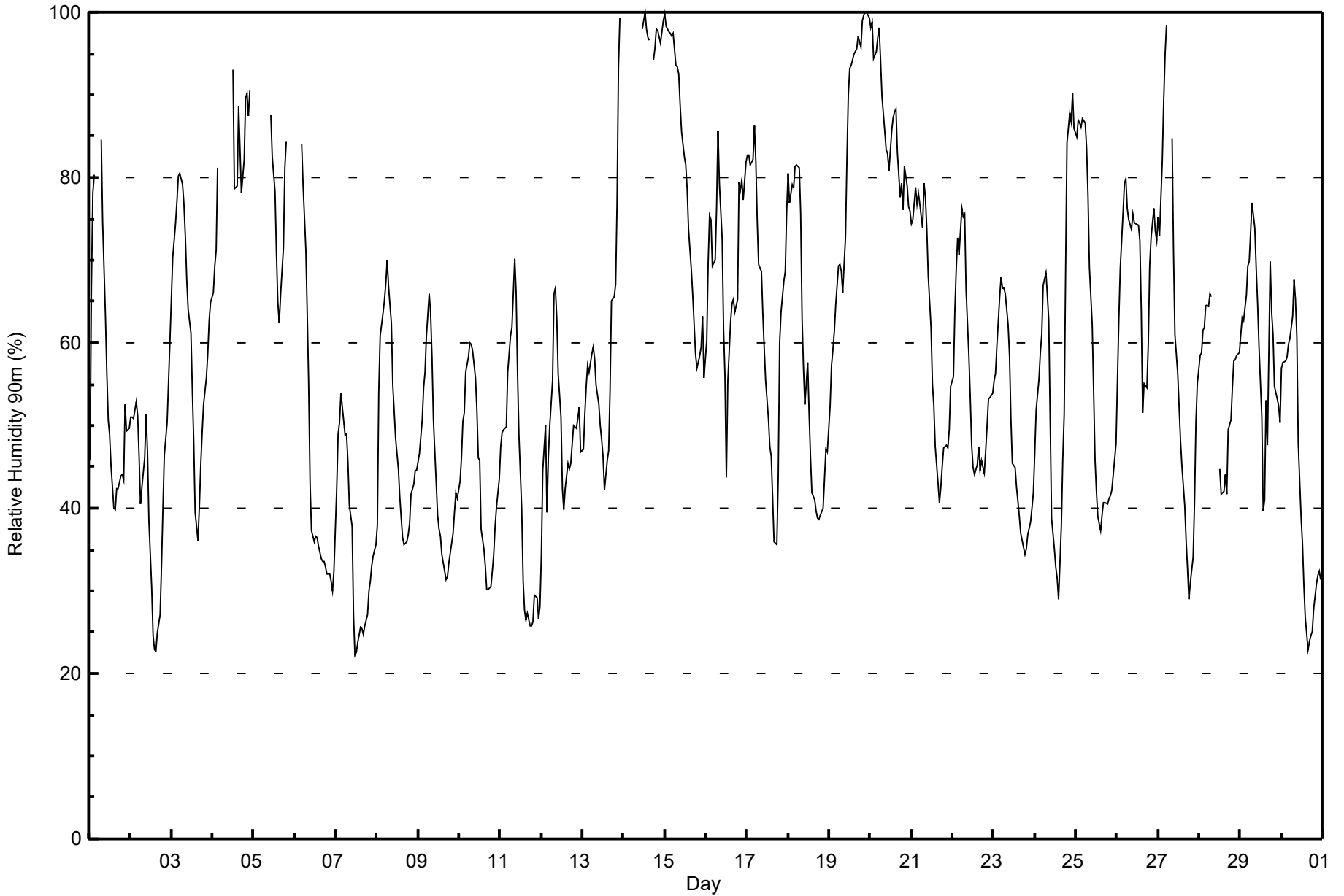
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 90m (RH90m) - %

Mannix - June 2023

Maximum Value: 100 % on Jun 14 13:00																	Maximum Daily Average: 86.5 % on Jun 20										Hours in Service: 720	
Minimum Value: 22 % on Jun 7 12:00																	Minimum Daily Average: 35.7 % on Jun 7										Hours of Data: 673	
Maximum Diurnal Average: 71.6 % at hour 6																	Minimum Diurnal Average: 46.1 % at hour 17										Hours of Missing Data: 47	
Monthly Average: 58.5 %																	Percentiles: P ₁ = 24 P ₁₀ = 34 Q ₁ = 44 Median = 56 Q ₃ = 74 P ₉₀ = 86 P ₉₉ = 99										Hours of Calibration: 0	
																											Percent Operational Time: 93.5	
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-Jun	46	67	78	80	OR	80	OR	85	75	63	56	51	49	45	40	40	42	42	44	44	43	53	49	50	55.5	85		
2-Jun	51	51	51	53	51	46	41	43	46	51	47	39	30	25	23	23	25	27	33	40	46	50	55	60	42.0	60		
3-Jun	65	70	74	77	80	80	79	77	73	68	64	61	54	48	40	36	40	45	49	53	56	59	63	65	61.5	80		
4-Jun	66	69	71	81	OR	OR	OR	OR	OR	OR	OR	OR	93	79	79	89	83	78	82	90	90	87	90	OR	--	93		
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	88	83	78	71	65	62	66	71	81	84	OR	OR	OR	--	88		
6-Jun	OR	OR	OR	OR	84	79	71	63	55	43	37	36	37	36	35	34	34	34	33	32	32	31	30	32	43.5	84		
7-Jun	42	49	50	54	52	49	49	46	40	38	27	22	23	24	26	25	25	26	27	30	31	33	34	36	35.7	54		
8-Jun	38	54	61	64	65	67	70	67	62	55	52	48	45	41	39	36	36	36	37	38	42	43	45	45	49.4	70		
9-Jun	46	47	51	55	56	61	66	64	58	51	47	39	37	37	34	32	31	32	33	35	37	40	42	41	44.6	66		
10-Jun	43	46	51	52	56	58	60	60	59	56	52	46	46	37	35	33	30	30	30	32	34	38	40	44	44.6	60		
11-Jun	47	49	50	50	56	59	61	62	70	66	56	49	40	31	28	26	27	26	26	26	30	29	27	28	42.5	70		
12-Jun	34	45	50	40	46	50	55	66	67	63	56	51	42	40	42	45	45	45	48	50	50	51	52	47	49.2	67		
13-Jun	47	51	55	57	56	59	59	58	55	52	50	48	46	42	46	47	54	65	66	67	77	93	99	OR	58.8	99		
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	98	100	98	97	97	OR	94	96	98	98	96	98	99	--	100		
15-Jun	100	98	98	98	97	97	94	93	93	89	86	83	82	79	74	69	66	62	59	57	59	60	63	56	79.5	100		
16-Jun	60	70	75	75	69	70	76	86	79	73	62	56	44	55	63	65	65	64	65	79	78	80	77	82	69.5	86		
17-Jun	83	83	82	82	86	82	75	69	69	64	59	56	51	47	46	41	36	36	44	60	64	68	69	76	63.6	86		
18-Jun	81	77	79	79	81	81	81	76	63	57	52	58	52	46	42	41	40	39	39	39	40	44	47	47	57.5	81		
19-Jun	52	57	59	61	65	69	70	69	66	73	82	90	93	94	95	95	96	97	96	99	100	100	100	99	82.4	100		
20-Jun	98	99	94	95	97	98	94	90	86	83	83	81	86	87	88	88	83	78	79	76	81	79	76	76	86.5	99		
21-Jun	74	75	79	77	78	77	74	79	78	74	68	62	55	52	47	43	41	43	45	47	48	47	49	55	61.1	79		
22-Jun	56	64	69	73	71	76	75	76	66	59	53	48	45	44	45	47	45	46	44	47	50	53	53	54	56.6	76		
23-Jun	55	56	60	66	68	67	67	66	62	58	51	45	45	43	41	39	37	35	34	35	37	38	40	42	49.5	68		
24-Jun	47	52	56	59	61	67	68	66	63	51	39	35	33	31	29	38	46	51	68	84	88	87	90	86	58.1	90		
25-Jun	85	87	87	86	87	87	84	78	69	62	54	46	42	39	37	39	41	41	40	41	41	42	44	48	58.6	87		
26-Jun	55	63	69	76	79	80	76	75	74	76	75	74	74	72	64	52	55	55	60	69	73	76	74	72	69.5	80		
27-Jun	75	73	82	89	95	99	OR	OR	85	71	61	56	52	48	45	40	36	33	29	31	34	41	51	55	58.2	99		
28-Jun	59	59	61	62	65	64	66	66	DF	DF	56	DF	45	42	42	44	42	50	51	55	58	58	59	59	55.2	66		
29-Jun	61	63	63	66	69	70	73	77	74	69	65	59	51	40	41	53	48	70	64	61	55	53	52	50	60.3	77		
30-Jun	57	58	58	58	60	61	63	68	65	61	48	39	36	31	27	23	24	25	25	28	31	32	32	31	43.3	68		
																								Diurnal Average				
																								Diurnal Maximum				
60.2 64.1 67.1 69.0 70.5 71.6 69.9 70.0 67.3 62.5 58.1 55.7 53.5 50.1 48.5 48.1 46.1 49.1 50.9 54.3 55.2 57.3 58.7 56.8																												
100 99 98 98 97 99 94 93 93 89 88 98 100 98 97 97 96 97																												
DF - DAS Failure OR - Out of Range																												





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 90m (RH90m) - %
Mannix - June 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	125	18.57	18.57
40 - 60	253	37.59	56.17
60 - 80	189	28.08	84.25
80 - 100	104	15.45	99.70

Total Number of Valid Hours: 673

Total Number of Hours: 720



Maximum Speed: 37 km/h on Jun 19 14:00	Maximum Daily Speed Average: 26.1 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 18 04:00	Minimum Daily Speed Average: 1.9 km/h on Jun 12	Hours of Data: 717
Maximum Diurnal Speed Average: 5.2 km/h at hour 16	Minimum Diurnal Speed Average: 0.2 km/h at hour 2	Hours of Missing Data: 3
Monthly Average Velocity: 1.5 km/h 332.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 14 P ₉₀ = 20 P ₉₉ = 31	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-Jun	WSW6	S3	NNW5	NNW4	ENE1	ESE4	SW7	SW6	SW5	SSW1	W5	NNW7	N9	NW11	NW9	NNW6	NNE7	NE11	NE9	ENE8	E9	ENE8	NE7	N2.6	NW11	
2-Jun	NNW5	NNE9	NNW10	N9	NNW8	NNW9	N13	N10	NNE8	NE2	W3	WNW8	NW10	NW10	NNW9	NNW9	NE11	NE10	NE11	NE12	ENE13	ENE12	E13	E13	NNE6.8	E13
3-Jun	E12	ESE3	NNE5	NNE7	ENE5	E3	ENE4	NE6	NNE6	NNE9	NNE7	NNE6	E6	ENE8	E9	ESE7	SSE8	SE5	SE13	ESE10	ESE11	SE9	E9	E8	E5.6	SE13
4-Jun	ESE12	SE8	SE9	E12	E14	E8	ENE9	E11	ESE12	ESE13	ESE13	SE14	SE12	SE8	E10	ESE7	E13	SE14	SSE8	S2	NE3	ESE1	SSE3	W4	ESE8.2	E14
5-Jun	W2	W4	NNE3	WNW4	WNW5	WNW7	NNW7	NNW7	NNE10	NNE13	NNE15	NE15	ENE13	NE10	N6	NNW9	NNW11	NNW11	NNE11	NNE12	NNE3	WSW13	W28	W17	NNW5.7	W28
6-Jun	WSW18	WSW20	SW11	SW10	SW9	SW12	WSW12	WSW12	WSW11	WSW18	WSW18	WSW20	SW19	WSW17	SW15	SW17	SW19	SW19	SW15	SW12	SSW6	S8	S9	SSE12	SW13.4	WSW20
7-Jun	SSE15	SSE15	SSE12	SSE14	SSE11	SSE11	SSW10	SSW10	SW10	SSW9	SW19	WSW24	WSW25	W23	W23	W21	WNW22	WNW17	WNW16	WNW11	W12	W12	W9	WSW9	WSW10.5	WSW25
8-Jun	W5	N14	N17	N9	N10	N12	NNE10	NNE8	NNW6	NW9	NNW9	NW7	NW5	NE2	NW2	NNE3	ENE6	ENE9	E7	NE7	NNE8	NNE8	NE9	ENE8	NNE6.3	N17
9-Jun	S2	WSW5	SSW3	SE4	SW4	S3	S5	SE7	SSE6	SSE8	SE6	SSE8	SSE8	SE6	SE7	S10	SSE11	S10	SSW10	S8	SSE10	SSE12	SSE12	SSE14	SSE6.9	SSE14
10-Jun	SSE12	SE12	SSE10	SE13	SE13	SSE12	SSE11	SSE13	SSE15	SSE15	SSE16	SSE18	SSE17	SSE24	SSE24	SSE23	SSE24	SSE23	SSE21	SSE18	SSE16	SSE14	SSE14	SSE14	SSE16.1	SSE24
11-Jun	SSE13	SSE8	SSE5	S7	SW5	S5	WSW9	W16	W14	W14	W14	W13	WNW15	WNW13	W14	WNW15	WNW17	WNW16	WNW11	W10	WNW10	NNW12	NNW12	NW11	W8.7	WNW17
12-Jun	NNW7	N8	WNW6	WSW5	SW5	WSW4	NW7	N6	NNW4	NW6	NW7	WNW7	WNW8	W6	SW5	SSW8	SSW8	SSW5	NNW2	NNE8	NNE7	NE7	SE10	SE15	WNW1.9	SE15
13-Jun	SE15	SE11	SE11	SE15	SE16	SE14	SE13	SE12	SSE11	SSE7	SE7	SSE5	S3	NNW8	N13	N12	N19	N28	NNE21	NNE15	N15	N17	NNE18	NNE17	ENE5.2	N28
14-Jun	NNE12	NNE12	N10	NNW10	N11	N13	N17	N21	N18	N17	N22	N23	N16	N21	N21	NNW21	NNW20	NNW22	NNW23	NNW26	N25	NNW23	NNW22	NNW21	N18.2	NNW26
15-Jun	NNW22	NNW21	NNW19	NNW21	NNW17	NNW15	NNW18	NNW12	NNW11	WNW12	WNW13	WNW13	WNW13	NW14	NW14	NW15	NNW12	NNW10	NNW6	N2	ESE3	S6	SW8	WSW10	NNW11.2	NNW22
16-Jun	WSW12	W13	SSW7	SSE9	SSE8	SSE10	SSE7	SE9	SE9	SE10	SSE13	SSE10	SW16	SW17	SSW12	SSW13	S11	S12	SW15	SSW8	S8	SW12	WSW13	SW15	SSW8.9	SW17
17-Jun	SSW6	SSW8	S8	S6	SSW8	SW9	SW9	SW11	WSW15	SW12	SW14	SW16	SW16	W23	W18	W18	W18	W15	NW14	NNE18	NE9	NE3	NNE7	N8	WSW7.5	W23
18-Jun	N9	NNE8	NNE6	W1	NNE9	NNE10	NNE10	NE7	NE10	NE10	N10	N15	NNE14	N18	NNE19	NNE21	NNE21	NE20	NNE20	NNE20	NNE17	NNE15	NNE21	NNE24	NNE13.7	NNE24
19-Jun	NNE17	NNE16	N17	NNE20	NNE25	NNE26	N31	N32	NNE33	NNE29	NNE31	N28	N31	N37	N36	NNE31	N28	N26	N27	NNW23	N23	NNW22	NNW23	NNW23	N26.1	N37
20-Jun	NNW23	NNW18	NNW24	NNW21	N18	N19	N18	NNW22	NNW20	NNW22	N17	NNW19	NNW17	NNW16	NNW15	NNW13	NNW16	NNW15	NW12	NNW9	NW9	NW10	NW13	NW12	NNW16.2	NNW24
21-Jun	NNW10	NNW8	N7	NNW9	NNW9	NNW9	NNW13	NNW12	NNW13	NNW13	NNW11	NNW11	NNW10	NNW9	NNW11	NNW10	NNW12	N11	NE11	ENE10	ENE8	E7	E3	SSE4	N7.9	NNW13
22-Jun	SSE8	SE5	SE4	SSE3	S4	S5	SSE8	SSE4	SSE8	SSE11	SSE9	ESE7	SE5	WSW11	W20	W14	W15	W17	WSW12	WSW6	WNW2	WNW2	S4	SE5	SSW4.4	W20
23-Jun	SSE6	SSE7	SSE8	SSE7	SSE6	SE7	SE8	SSE8	SE7	SE5	ESE8	SE9	S8	SE8	SSE6	E7	SE6	SE7	SE6	SSE6	SSE7	SSE9	SSE11	S10	SSE7.0	SSE11
24-Jun	S10	SSE9	SSE9	SSE8	SSE8	SSE8	SE8	SE8	SE8	S9	SW12	WSW12	WSW11	SW13	SW14	N14	N12	N13	N19	N23	N19	NNE22	NNE21	NNE18	N2.0	N23
25-Jun	NNE15	NNE11	NNE13	NNE15	NNE14	NNE13	NNE14	NE9	NE9	ENE6	ENE9	ENE8	ENE4	SE4	E5	NNE3	NW4	N6	N8	NNW6	N6	NE4	SSE4	SSE8	NNE6.3	NNE15
26-Jun	SSE9	SSE9	SSE12	SSE8	SSE5	SSE6	SSE9	SSE7	SSE11	SSE11	SSE12	SSE13	S6	SSW7	SSW11	WSW14	N23	NNE6	SW8	S7	SSW7	SSE3	ESE3	SE3	SSE5.4	N23
27-Jun	W4	W4	NNW4	NNW4	NNW4	NNW5	NW6	NNW4	N7	N8	NNE10	NNE8	NE6	NNE6	NE3	NNW5	NNW2	ESE6	NE3	WNW4	WNW7	SSW6	S10	S8	NNW2.4	NNE10
28-Jun	SSE10	SSE10	SSE9	SSE9	SSE8	SSE10	SSE12	SSE9	DF	DF	SSE10	DF	SSE8	ESE1	W5	SW13	SSW8	SSE11	SSE11	S10	SSE8	S9	S8	S7	S7.9	SW13
29-Jun	SSW5	SSW5	SSE7	SSE8	S7	S8	S8	SSE9	SSE10	SSE8	SSE8	SE9	SSE11	SSW12	WSW16	WSW26	W11	SSW5	SSE7	SSE6	S8	SSW10	SW11	SW11	SSW7.4	WSW26
30-Jun	SW9	SSW6	SSE8	SSE8	SSE8	SSE7	SSE7	SSE9	SSE9	SSE7	SW9	SW14	WSW15	WSW20	W18	W20	WSW21	WSW18	WSW20	WSW17	WSW13	WSW11	SW10	WSW11	SW9.8	WSW21

SSW0.3	NW0.2	NE1.0	ENE1.2	NE1.2	NE1.2	NNE1.5	NNE1.6	NE1.4	NNE0.7	NW0.6	NNW1.7	W2.6	NNW4.5	NNW4.5	NNW5.2	NW4.6	NNW3.0	NNW2.8	N3.5	NNE2.5	N1.3	NNW1.1	NNW0.7	Diurnal Average
NNW23	NNW21	NNW24	NNW21	NNE25	NNE26	N31	N32	NNE33	NNE29	NNE31	N28	N31	N37	N36	NNE31	N28	N28	N27	NNW26	N25	NNW23	W28	NNE24	Diurnal Maximum

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

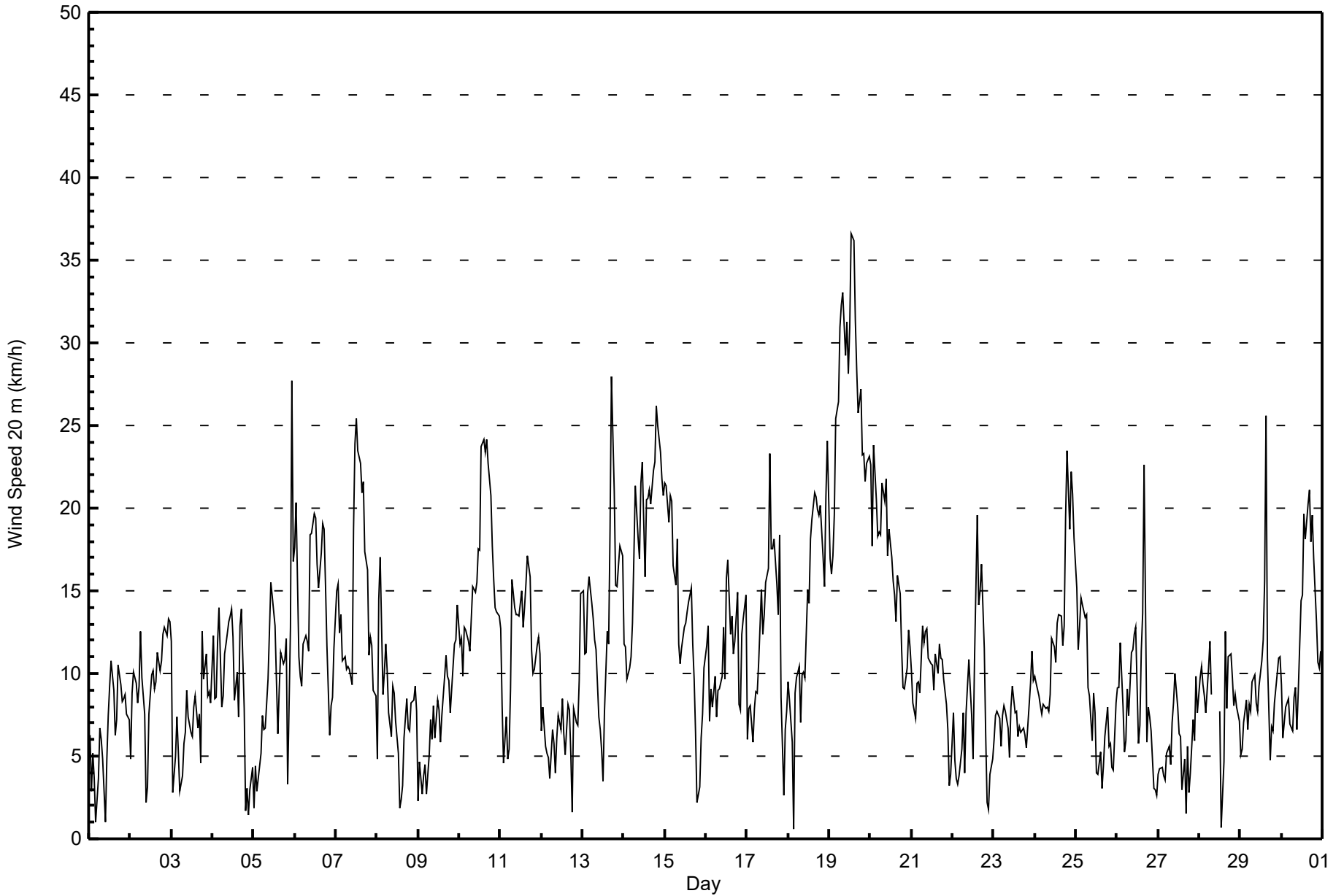


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 11 km/h on Jun 26 17:00	Hours of Data: 717
Minimum Value: 1 km/h on Jun 5 03:00	Hours of Missing Data: 3
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 4 Q ₃ = 5 P ₉₀ = 7 P ₉₉ = 9	Hours of Calibration: 0
	Percent Operational Time: 99.6

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

Diurnal Maximum

DF - DAS Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	98	13.67	13.67
6 - 11	334	46.58	60.25
12 - 19	205	28.59	88.84
20 - 28	71	9.90	98.74
29 - 38	9	1.26	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 20 m (WS20m) - km/h
Mannix - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1	5	7	4	3	6	9	10	9	6	5	3	10	5	3	12	98
6 - 11	19	28	20	12	11	7	27	79	27	19	16	10	4	9	14	32	334
12 - 19	26	22	2	3	6	4	14	27	1	3	23	18	18	10	6	22	205
20 - 28	14	12	1	0	0	0	0	6	0	0	0	8	7	1	0	22	71
29 - 38	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	71	30	19	20	17	50	122	37	28	44	39	39	25	23	88	717

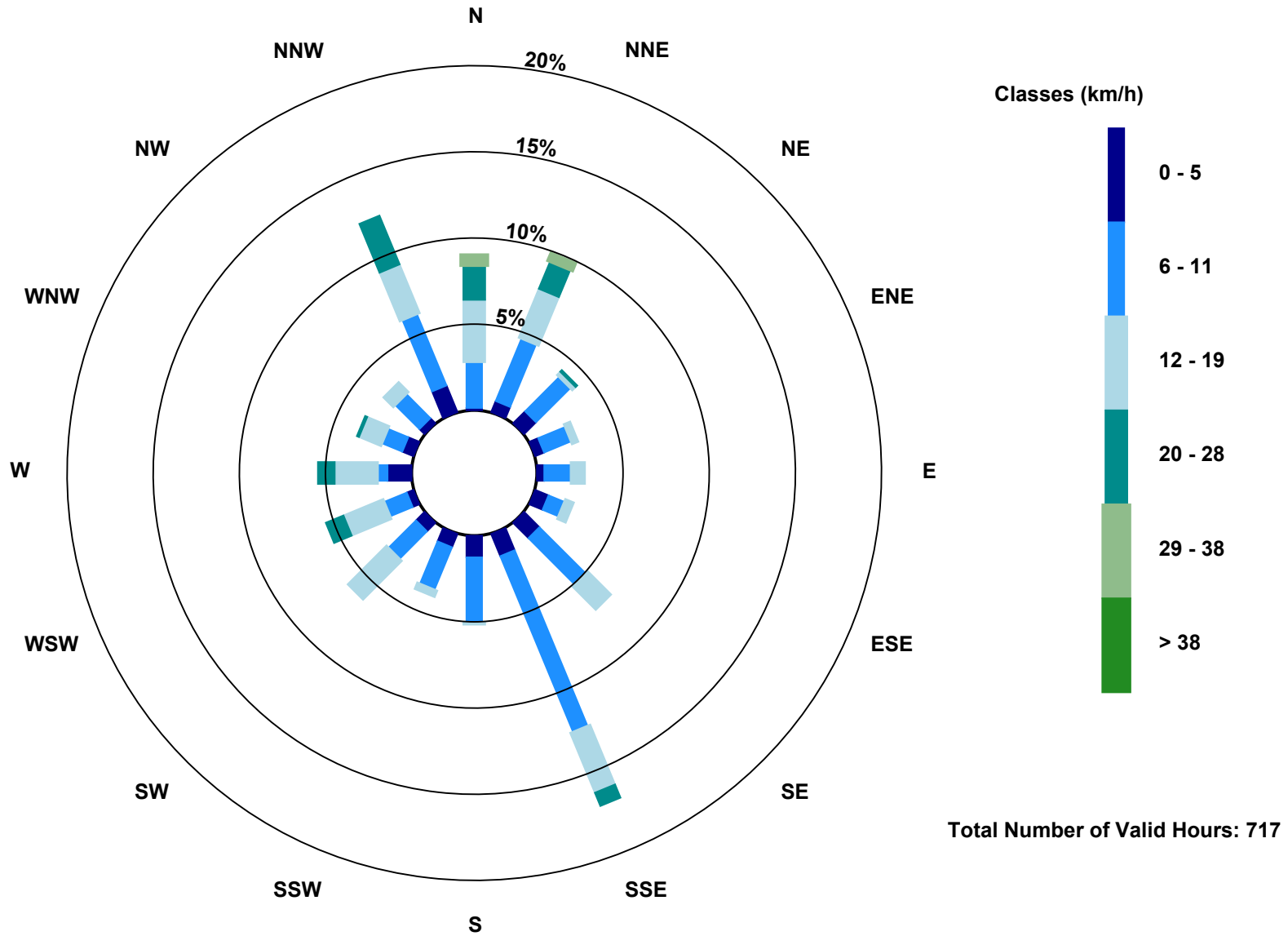
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Maximum Speed: 50 km/h on Jun 19 14:00	Maximum Daily Speed Average: 36.3 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 1 05:00	Minimum Daily Speed Average: 2.3 km/h on Jun 24	Hours of Data: 717
Maximum Diurnal Speed Average: 6.7 km/h at hour 16	Minimum Diurnal Speed Average: 0.5 km/h at hour 24	Hours of Missing Data: 3
Monthly Average Velocity: 1.9 km/h 327.0 deg	Percentiles: P ₁ = 2 P ₁₀ = 7 Q ₁ = 10 Median = 15 Q ₃ = 21 P ₉₀ = 28 P ₉₉ = 41	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-Jun	W8	SSW3	NNW8	NNW8	NNE1	ESE5	SSW9	SW8	SW6	S2	W6	NW11	N13	NW15	NW13	NNW9	N10	NE13	NE11	NE10	ENE11	E10	ENE11	NE11	N4.0	NW15	
2-Jun	N8	N13	NNW17	NNW16	NNW15	NNW16	N18	N14	NNE10	NE3	WNW3	WNW9	NW13	NW14	NNW13	NNW14	NNE15	NE13	NNE15	NE18	ENE16	ENE16	ENE16	E16	N10.2	N18	
3-Jun	E14	ENE4	NNE8	NNE12	NE9	E4	ENE5	NE7	NNE8	N12	N10	NNE8	ENE7	NE9	E10	ESE8	SE10	ESE5	SE16	ESE12	ESE14	ESE12	E12	E11	ENE7.2	SE16	
4-Jun	ESE15	SE12	SE12	E15	E17	ENE11	ENE11	E13	ESE15	ESE17	ESE10	SE19	ESE15	SE11	E12	E9	E14	SE18	SE11	S2	NE3	ENE2	SSE3	WSW4	ESE10.5	SE19	
5-Jun	W4	W5	NE5	NNW5	WNW8	WNW13	NNW11	NNW11	N14	NNE17	NNE21	NNE18	NE15	NE11	N8	NNW13	NNW18	NNW19	N19	NNE19	NNE6	WSW17	W33	W22	NNW8.8	WSW33	
6-Jun	WSW23	WSW26	SW16	SW16	SW14	SW16	WSW16	WSW15	WSW15	WSW23	SW24	SW25	SW25	SW22	SW20	SW24	SW26	SW26	SW21	SW16	SSW13	SSW16	S20	SSE22	SW18.8	WSW26	
7-Jun	SSE27	SSE28	SSE24	SSE24	S20	S20	S18	SSW16	SSW14	S16	SW26	WSW30	WSW32	W28	W28	W26	W27	WNW24	WNW23	W17	W19	W19	WNW16	W12	SW14.7	WSW32	
8-Jun	W12	N22	N25	N14	N15	N17	NNE14	NNE10	NNW9	NW13	NW12	NW10	NW7	NNE2	NW4	NNE4	ENE7	NE9	E7	NE8	NNE12	NNE13	NE14	ENE10	N8.9	N25	
9-Jun	SE6	SSE9	SSE10	SE9	SSE9	SSE8	S8	SE10	SSE9	SSE11	SE8	SSE12	SSE11	SE7	SE10	SSE14	SSE15	S15	S16	S16	SSE19	SE21	SE21	SE23	SSE11.9	SE23	
10-Jun	SE20	SE20	SE17	SE22	SE22	SE21	SE18	SE19	SSE21	SSE21	SSE22	SSE25	SE24	SSE33	SSE33	SSE33	SSE33	SSE33	SSE33	SSE30	SSE27	SSE26	SSE24	SSE25	SSE24	SSE24.4	SSE33
11-Jun	SSE22	SSE16	SSE8	S16	WSW8	SSW11	WSW12	W18	W18	W16	W17	W16	W18	WNW17	W16	WNW20	WNW24	W22	WNW18	W16	WNW20	NW21	NW22	NW21	W11.9	WNW24	
12-Jun	NNW11	N12	NW7	W9	W8	W8	NW10	NNW8	NNW6	NW9	NW10	WNW8	WNW11	W7	SSW8	SSW13	SSW12	SSW9	N1	NNE9	NNE10	NE10	ESE14	SE20	WNW2.8	SE20	
13-Jun	SE22	SE18	SE18	SE22	SE22	SE21	SE19	SE17	SE15	SSE10	SE9	SSE7	S5	NW11	N17	N17	N27	N38	NNE30	N22	N23	N25	NNE25	NNE24	ENE7.7	N38	
14-Jun	NNE17	N16	N14	NNW17	N18	N19	N25	N31	N27	N25	N31	N33	N24	N30	N30	NNW32	NNW30	NNW33	NNW34	NNW38	NNW36	NNW35	NNW32	NNW30	N26.9	NNW38	
15-Jun	NNW32	NNW32	NNW29	NNW31	NNW31	NNW25	NNW24	NNW27	NNW19	NW17	WNW19	WNW19	WNW21	NW22	NW22	NW24	NW18	NNW13	NNW9	NNW3	ESE4	SSE10	SW12	WSW18	NW17.3	NNW32	
16-Jun	WSW20	W20	SW12	SSE14	SSE13	SSE15	SE11	SE13	SE12	SE13	SSE18	SSE15	SSW23	SW24	SSW20	SSW22	S20	SSE19	SSW23	SSW16	S16	SW19	SW20	SW22	SSW14.1	SW24	
17-Jun	SW12	SSW15	SSW16	S11	SSW15	SW14	SW13	SW14	SW19	SW17	SW18	SSW22	SW22	WSW28	W21	W22	W22	W19	NW17	NNE26	NNE13	NE4	NNE9	N11	WSW10.5	WSW28	
18-Jun	N14	NNE13	NE8	ENE2	NNE13	NNE15	NNE14	NE9	NE12	NE12	N13	N20	N19	N24	NNE26	NNE28	NNE29	NNE27	NNE28	NNE28	NNE25	NNE22	N29	NNE34	NNE19.1	NNE34	
19-Jun	N24	N22	N25	NNE27	NNE34	N35	N41	N44	NNE45	NNE41	NNE43	N39	N43	N50	N49	NNE42	N39	N37	N38	NNW33	N33	NNW31	NNW33	NNW33	N36.3	N50	
20-Jun	NNW33	NNW26	NNW34	NNW30	N28	N28	N27	NNW31	NNW29	NNW32	N25	NNW27	NNW24	NNW23	NNW23	NW20	NNW24	NNW23	NW18	NNW15	NW15	NW17	NW20	NW19	NNW24.3	NNW34	
21-Jun	NW17	NNW15	NNW11	NNW17	NNW16	NNW15	NNW20	NNW18	NNW18	NNW18	NNW17	NNW15	NNW14	NNW13	NNW16	NNW14	NNW17	N15	NE14	NE12	ENE10	E9	E7	SE8	NNW11.9	NNW20	
22-Jun	SE13	SE9	SE7	SE10	SE10	SSE10	SSE12	SE6	SE10	SSE16	SSE12	ESE9	SE6	WSW13	W23	WSW17	WSW18	WSW20	WSW15	WSW10	W4	WNW3	S6	SE9	SSW6.1	W23	
23-Jun	SSE12	SSE14	SE14	SE14	SE10	SE12	SE13	SSE10	SE9	SE6	ESE10	SE12	SSE11	SE11	SSE9	E8	SE8	SE9	SE8	SSE8	SSE13	SSE18	SSE22	S20	SE11.2	SSE22	
24-Jun	S18	S17	S15	SSE14	SSE14	SE13	SE12	SE10	S13	SSW16	SW15	WSW13	SW17	SW17	N18	N19	N21	N30	N35	N27	N32	N29	N25	N25	N2.3	N35	
25-Jun	NNE21	N17	N18	N21	N20	NNE18	NNE17	NE12	NE11	ENE7	NE11	ENE9	NE5	ESE4	E5	N3	NW7	N9	NNW11	NW8	N8	NE7	SE7	SSE14	NNE8.6	NNE21	
26-Jun	SSE19	SSE19	SSE21	SSE16	SSE11	SSE9	SE13	SE11	SSE15	SSE17	SSE18	SSE20	S10	SSW10	SSW16	WSW18	N31	N8	SSW12	S12	SSW10	S6	ESE3	ESE3	SSE9.0	N31	
27-Jun	W1	WNW4	NNW8	N8	N7	NNW8	NW9	NNW7	N9	N11	N13	NNE10	NNE8	NNE8	NNE4	NNW5	NW3	E6	NE4	WNW5	WNW11	SSW7	S20	S19	NNW3.3	S20	
28-Jun	SSE21	SSE21	SSE19	SSE17	SSE14	SSE18	SSE19	SSE13	DF	DF	SSE13	DF	SSE11	E1	W6	SW16	SSW12	SSE16	SSE18	S17	SSE16	S19	S15	S14	SSE14.0	SSE21	
29-Jun	S11	SSW13	S15	SSE12	SSE13	SSE14	S13	SSE14	SSE13	SSE12	SSE11	SE13	SSE16	SSW18	WSW20	WSW33	W18	SSW7	SSE12	S10	S15	SSW20	SW21	SW22	S12.7	WSW33	
30-Jun	SW19	SSW14	S12	S11	S11	S9	SSE9	SSE12	SSE12	SSE9	SSW12	SW19	SW19	WSW24	WSW22	WSW25	WSW26	SW24	WSW24	WSW23	WSW20	WSW18	SW19	WSW19	SW14.8	WSW26	

S1.2	SSE0.8	E1.3	E1.9	ENE1.7	ENE1.5	NNE2.0	NNE2.3	NNE2.2	NNE1.1	NNW1.0	NNW2.1	W3.4	NNW5.9	NNW5.9	NNW6.7	NW6.5	NNW4.4	NNW3.9	NNW4.6	N3.1	NNW1.5	NW0.9	W0.5	Diurnal Average
NNW33	NNW32	NNW34	NNW31	NNE34	N35	N41	N44	NNE45	NNE41	NNE43	N39	N43	N50	N49	NNE42	N39	N38	N38	NNW38	NNW36	NNW35	WSW33	NNE34	Diurnal Maximum

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

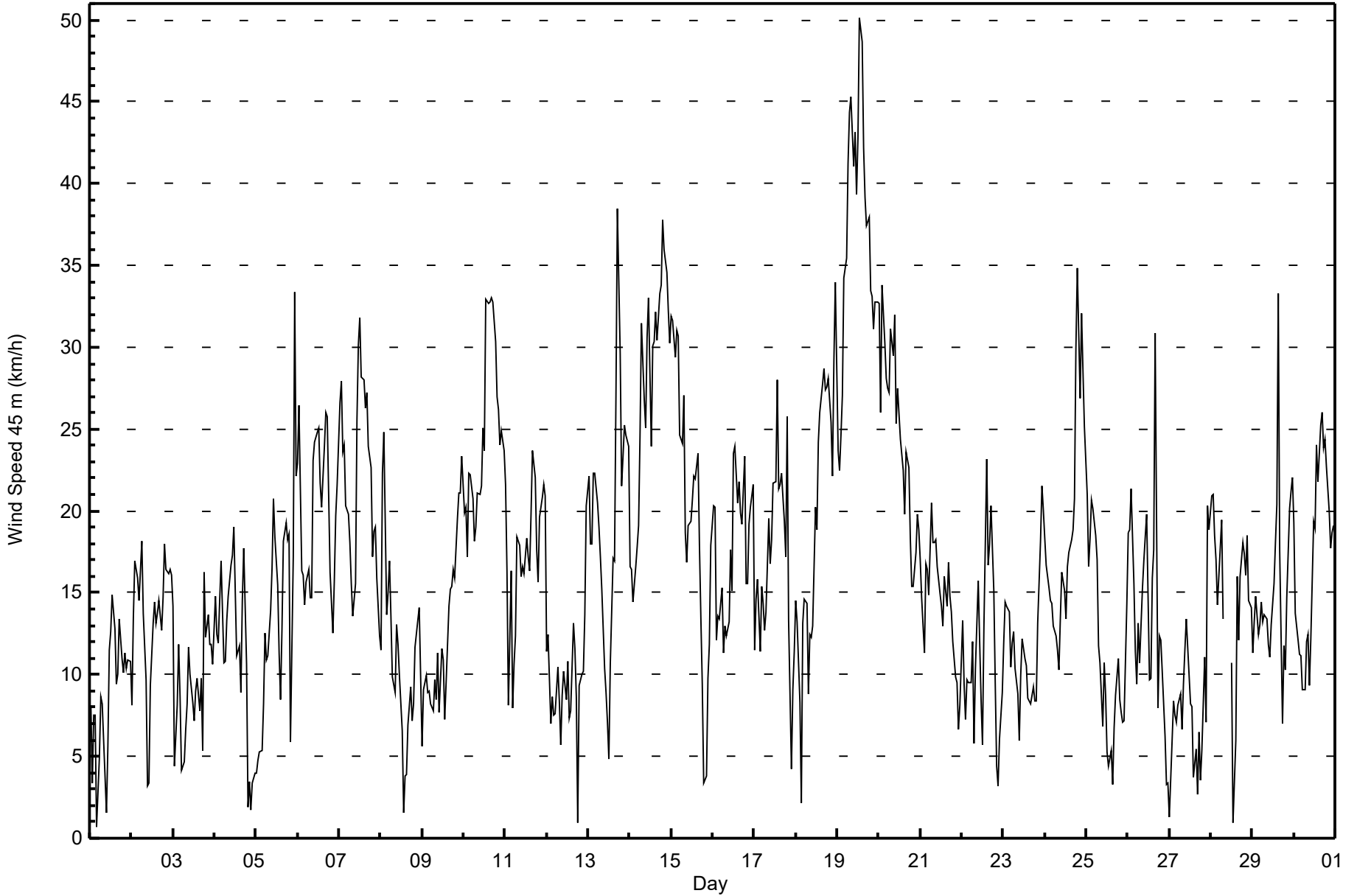


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 13 km/h on Jun 26 17:00	Hours of Data: 717
Minimum Value: 1 km/h on Jun 29 04:00	Hours of Missing Data: 3
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 3 Q ₃ = 5 P ₉₀ = 6 P ₉₉ = 9	Hours of Calibration: 0
	Percent Operational Time: 99.6

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

Diurnal Maximum

DF - DAS Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	44	6.14	6.14
6 - 11	173	24.13	30.27
12 - 19	285	39.75	70.01
20 - 28	150	20.92	90.93
29 - 38	54	7.53	98.47
> 38	11	1.53	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - June 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	4	6	4	3	6	0	1	2	2	0	1	4	4	2	3	44
6 - 11	10	14	14	10	8	4	29	23	10	8	2	2	7	5	11	16	173
12 - 19	26	17	10	4	7	9	26	48	21	18	23	14	15	6	14	27	285
20 - 28	23	13	0	0	0	0	14	20	5	7	17	14	11	6	8	12	150
29 - 38	14	4	0	0	0	0	0	6	0	0	0	4	0	0	0	26	54
> 38	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Totals	82	56	30	18	18	19	69	98	38	35	42	35	37	21	35	84	717

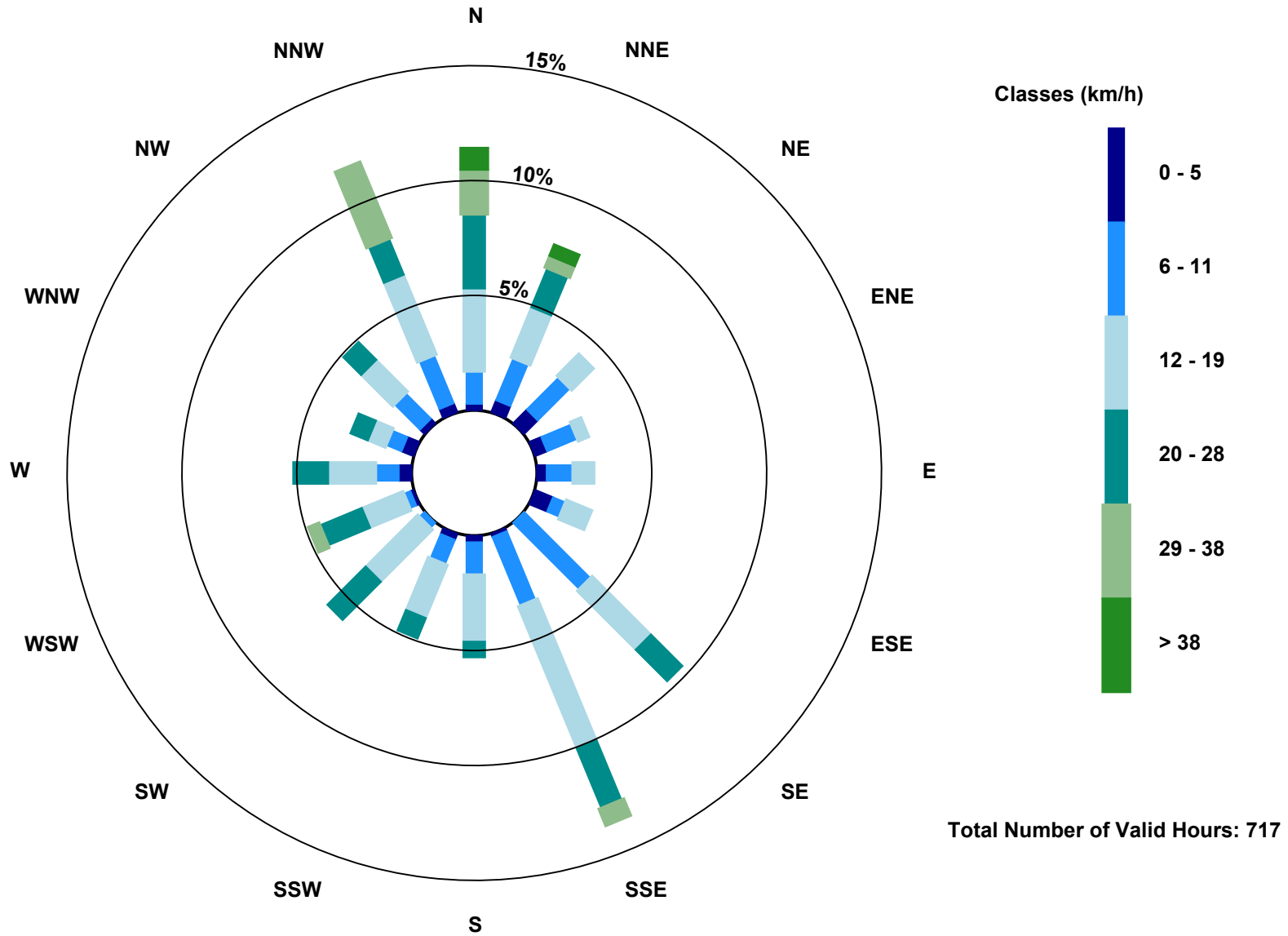
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Maximum Speed: 56 km/h on Jun 19 14:00	Maximum Daily Speed Average: 41.2 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 26 23:00	Minimum Daily Speed Average: 3.0 km/h on Jun 24	Hours of Data: 717
Maximum Diurnal Speed Average: 7.1 km/h at hour 17	Minimum Diurnal Speed Average: 1.0 km/h at hour 3	Hours of Missing Data: 3
Monthly Average Velocity: 2.1 km/h 328.6 deg	Percentiles: P ₁ = 2 P ₁₀ = 8 Q ₁ = 11 Median = 17 Q ₃ = 25 P ₉₀ = 32 P ₉₉ = 48	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-Jun	WNW9	SSW2	N8	NNW9	NNW1	E5	SSW10	SW11	SW6	SSW2	W6	NW12	N13	NW15	NW13	NNW10	N10	NE15	NE12	ENE12	ENE13	E10	ENE16	NE13	N4.6	ENE16	
2-Jun	N10	NNE16	N21	N20	N18	N21	N21	N15	NNE10	NE3	WNW3	WNW9	NW13	NW15	NNW13	NNW14	NNE16	NE14	NE16	NE22	ENE19	ENE19	E17	E17	NNE11.8	NE22	
3-Jun	E14	ENE7	NE11	NE12	ENE9	E4	ENE5	NE7	NNE9	NNE12	NNE11	NNE9	ENE7	ENE9	E10	ESE8	SE10	ESE6	SE15	ESE11	ESE11	ESE10	E11	E11	ENE7.5	SE15	
4-Jun	ESE12	SE9	SE9	ESE12	E17	E12	E12	ESE11	ESE12	ESE14	SE15	ESE12	SE10	E11	ESE8	E13	SE13	SSE11	SSW2	NNE3	NE2	SSE5	SW3	ESE9.1	E17		
5-Jun	SW2	WNW2	NE6	NNE5	NW5	NNW15	NNW13	NNW13	N16	NNE19	NNE23	NNE20	NE16	NE12	N9	N14	NNW21	NNW25	NNE24	NNE23	NNE8	WSW18	W37	W24	N10.0	W37	
6-Jun	WSW25	WSW30	SW19	SW20	SW18	WSW18	WSW18	WSW16	WSW15	WSW25	SW26	SW27	SW26	SW23	SW22	SW26	SW28	SW28	SW23	SW18	SW15	SSW19	SSW22	S27	SW21.4	WSW30	
7-Jun	SSE32	SSE31	S31	SSE30	S27	S27	SSW23	SSW17	SW15	S17	SW27	WSW33	WSW34	W29	W29	W27	WNW28	WNW25	WNW25	W21	W24	WNW24	NW20	NNW16	SW17.3	WSW34	
8-Jun	WNW18	N27	N29	N18	N18	N20	NNE15	NNE11	NNW9	NW14	NNW13	NW10	NW7	NNE1	NNW4	N3	ENE7	ENE10	E7	NE9	NNE16	NE18	ENE17	E9	N10.4	N29	
9-Jun	ESE7	SE9	SE9	SE6	SE8	SSE9	SSE10	SSE12	SSE10	SSE12	SE7	SSE12	SSE11	SE7	SE9	SSE15	SSE16	S17	S19	S20	SSE25	SE27	SE27	SE30	SSE13.5	SE30	
10-Jun	SE26	SE26	SSE24	SE29	SE30	SE28	SE25	SE24	SSE22	SSE22	SSE23	SSE27	SSE24	SSE35	SSE35	SSE35	SSE36	SSE36	SSE34	SSE31	SSE32	SSE30	SSE33	SSE30	SSE28.7	SSE36	
11-Jun	SSE29	SSE25	S9	S21	WSW9	SSW10	WSW14	W19	W20	W16	W17	W17	WNW19	NNW18	W17	WNW20	WNW24	WNW25	WNW21	W21	NW25	NNW27	NNW29	NW26	W13.2	SSE29	
12-Jun	NNW15	N14	NW8	WNW11	WNW11	WNW12	NW11	N9	NNW6	NW9	NW10	WNW9	NNW11	W7	SSW8	S13	SSW12	SSW10	NE1	NE9	NE10	ENE12	ESE13	SE16	NW3.1	SE16	
13-Jun	SE25	SE22	SE23	SE26	SE24	SE22	SE21	SE20	SE16	SSE10	SE9	SSE7	S5	NW10	N18	N19	N31	N41	NNE34	NNE24	N26	N30	NNE28	NNE29	ENE9.1	N41	
14-Jun	NNE20	NNE18	NNE17	NNW19	N21	N22	N27	N34	N30	N29	N35	N38	N28	N34	N35	NNW37	NNW35	NNW39	N39	N43	N41	N39	NNW38	NNW35	N30.9	N43	
15-Jun	NNW37	NNW36	NNW34	NNW36	NNW36	NNW28	NNW28	NNW31	NNW21	NNW19	NW21	WNW22	WNW23	NW24	NW24	NW26	NNW19	NNW14	NNW10	NNW3	ESE3	SSE10	SW14	W26	NW19.8	NNW37	
16-Jun	W28	W25	WSW16	S11	SSW12	SSE16	SSE14	SE14	SE13	SE13	SSE19	SSE18	SSW27	SW27	SSW23	SSW24	S23	S22	SSW27	SSW21	SSW21	SW24	SW25	SW27	SSW16.7	W28	
17-Jun	SW17	SW18	SSW20	SSW16	SW22	SW19	SW16	SW15	WSW21	SW18	SW19	SW23	SW24	WSW30	W22	W22	W23	W20	NW18	NNE29	NE16	ENE6	NE9	N13	WSW11.9	WSW30	
18-Jun	NNE18	NNE17	ENE9	ESE4	NNE12	NNE17	NNE16	NE10	NE13	NE13	NNE14	N22	NNE21	NNE26	NNE29	NNE30	NNE32	NNE31	NNE32	NNE33	NNE30	NNE27	NNE34	NNE39	NNE21.5	NNE39	
19-Jun	NNE27	NNE26	NNE28	NNE31	NNE39	NNE39	NNE46	N50	NNE52	NNE48	NNE51	N45	N49	N56	N54	NNE48	N44	N42	N43	N38	N37	N34	N37	NNW38	N41.2	N56	
20-Jun	NNW37	N30	NNW38	N34	N32	N31	N31	N35	N33	N36	N29	NNW30	NNW27	NNW27	NNW26	NNW22	NNW27	NNW26	NNW21	NNW19	NW18	NW20	NNW23	NNW22	NNW27.7	NNW38	
21-Jun	NNW22	NNW20	NNW15	NNW22	NNW21	NNW20	NNW25	NNW20	NNW20	NNW20	NNW18	NNW15	NNW15	NNW14	NNW17	NNW15	NNW18	N16	NE15	NE13	ENE11	E9	E6	SE9	N14.0	NNW25	
22-Jun	SE16	SE11	SE9	SE11	SE13	SE12	SE15	SE8	SE12	SSE16	SSE12	ESE7	SE5	WSW13	W24	WSW18	WSW19	WSW22	WSW17	WSW13	WSW6	WNW3	S5	SSE10	S6.8	W24	
23-Jun	SSE14	SSE17	SE16	SE17	SE14	SE10	SE13	SSE11	SE8	SE5	ESE9	SE12	SSE12	SE10	SSE9	E8	SE7	SE10	SE8	SSE10	SSE16	SSE23	S27	SSW25	SSE12.1	S27	
24-Jun	SSW23	SSW20	SSW16	S14	SSE20	SSE17	SSE15	SSE13	SE11	S15	SSW17	SE16	WSW14	SW18	SW18	N20	NNW21	N24	N36	N41	N32	NNE37	NNE32	NNE28	NNW3.0	N41	
25-Jun	NNE24	NNE19	NNE22	NNE24	NNE24	NNE22	NNE19	NE12	NE11	ENE7	NE12	ENE10	ENE6	ESE4	ESE5	N3	NNW7	N9	N11	NNW9	N8	NE8	ESE8	SSE15	NNE10.0	NNE24	
26-Jun	S20	SSE24	SSE28	SSE23	SSE18	SSE13	SSE17	SSE12	SSE16	SSE20	SSE21	SSE24	S13	SSW11	SSW17	WSW18	N34	NNE9	SSW14	S13	SSW13	SSW8	ENE0	E3	SSE11.3	N34	
27-Jun	NNW3	NNW5	NNW11	N12	N10	NNW10	NNW8	N7	N10	N12	N15	NNE11	NNE9	NNE9	NNE4	N6	NNW3	E6	NE4	WNW5	WNW11	SSW6	S23	S26	N3.8	S26	
28-Jun	SSE25	S27	S22	S21	S20	SSE23	SSE23	SSE16	DF	DF	SSE14	DF	SSE10	ENE1	W6	SW17	SSW13	SSE18	SSE22	S20	S20	S20	SSW15	S15	S16.5	S27	
29-Jun	S15	S18	S16	SSE12	SSE14	SSE19	S19	SSE15	SSE14	SSE12	SSE12	SSE14	SSE16	SSW20	WSW22	WSW38	W20	S7	SSE15	SSW15	SSW18	SSW26	SW29	SW33	SSW15.5	WSW38	
30-Jun	SW28	SW20	SSW13	SSW12	SSW9	SSW8	S9	S12	SSE13	S10	SSW13	SW21	SW20	WSW25	WSW23	WSW27	WSW27	WSW26	WSW27	WSW26	WSW27	WSW26	WSW25	WSW25	WSW26	SW18.1	SW28
SSW1.8 SSE1.0 E1.0 E1.4 ENE1.6 ENE1.5 NE1.9 NNE2.3 NNE2.6 NNE1.5 NNW1.3 NNW2.2 W3.6 NNW6.1 NNW6.2 NNW6.9 NW7.1 NNW5.0 NNW4.4 N5.1 N3.2 NNW1.9 NNW1.3 W1.4																								Diurnal Average			
NNW37 NNW36 NNW38 NNW36 NNE39 NNE39 NNE46 N50 NNE52 NNE48 NNE51 N45 N49 N56 N54 NNE48 NNE44 N42 N43 N43 N41 N39 NNW38 NNE39																								Diurnal Maximum			

DF - DAS Failure

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

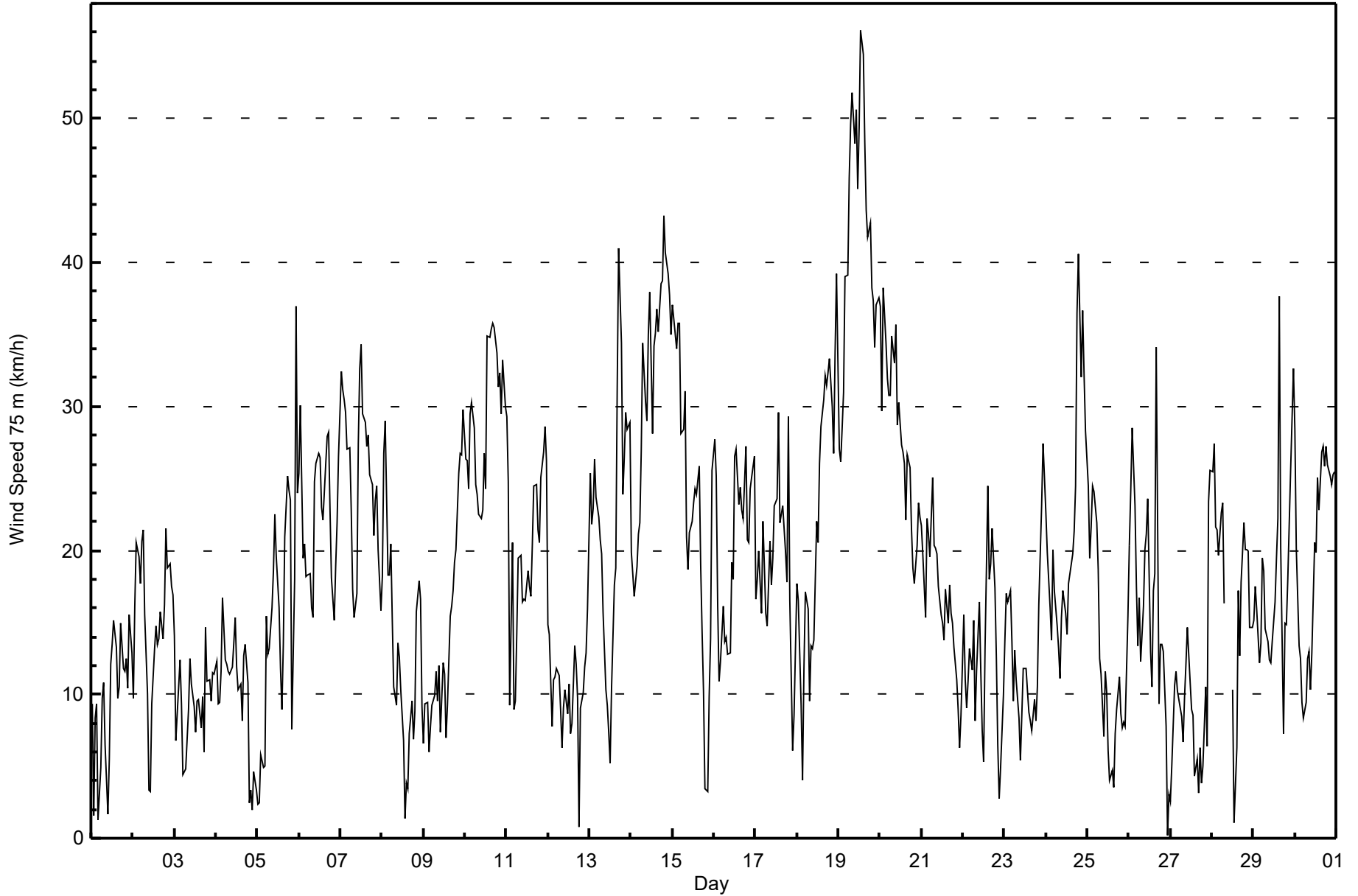


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 13 km/h on Jun 26 17:00	Hours of Data: 717
Minimum Value: 1 km/h on Jun 22 21:00	Hours of Missing Data: 3
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 4 Q ₃ = 5 P ₉₀ = 6 P ₉₉ = 9	Hours of Calibration: 0
	Percent Operational Time: 99.6

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

7	6	6	6	7	6	7	8	9	8	9	6	7	9	9	12	13	7	8	9	7	10	6	7	
Diurnal Maximum																								

DF - DAS Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	41	5.72	5.72
6 - 11	148	20.64	26.36
12 - 19	224	31.24	57.60
20 - 28	197	27.48	85.08
29 - 38	84	11.72	96.79
> 38	23	3.21	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 75 m (WS75m) - km/h
Mannix - June 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	4	4	3	3	4	2	1	2	4	1	0	0	4	1	6	41
6 - 11	12	10	10	12	11	11	24	13	5	9	2	2	3	7	8	9	148
12 - 19	14	17	16	7	8	6	18	38	14	18	16	14	5	6	9	18	224
20 - 28	14	19	1	0	0	0	15	22	16	14	21	17	14	11	8	25	197
29 - 38	25	14	0	0	0	0	3	15	1	0	2	5	3	0	0	16	84
> 38	13	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	23
Totals	80	73	31	22	22	21	62	89	38	45	42	38	25	28	26	75	717

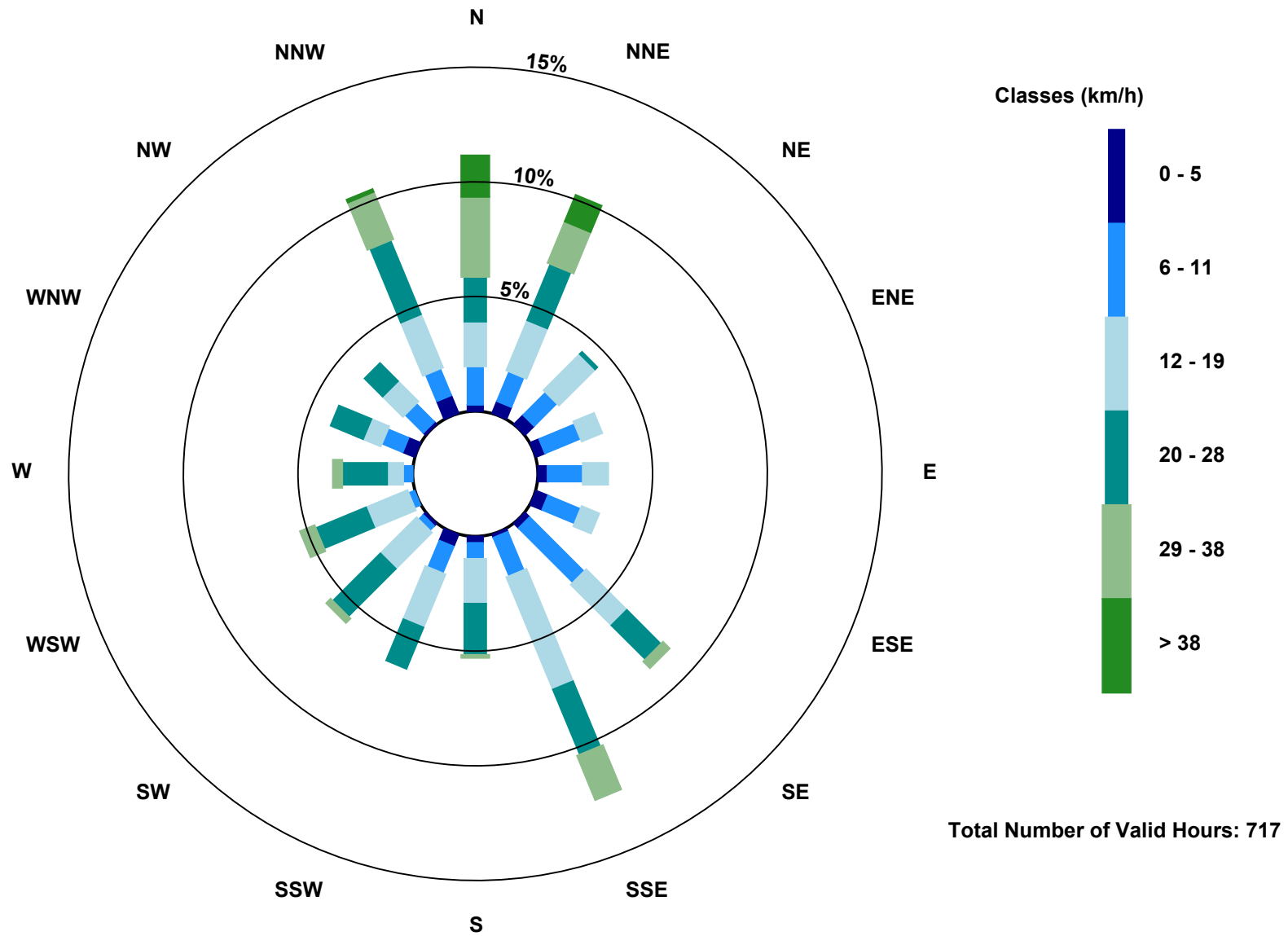
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Maximum Speed: 59 km/h on Jun 19 14:00	Maximum Daily Speed Average: 43.1 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 12 19:00	Minimum Daily Speed Average: 3.4 km/h on Jun 12	Hours of Data: 706
Maximum Diurnal Speed Average: 7.7 km/h at hour 17	Minimum Diurnal Speed Average: 0.4 km/h at hour 3	Hours of Missing Data: 14
Monthly Average Velocity: 2.5 km/h 320.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 8 Q ₁ = 12 Median = 18 Q ₃ = 26 P ₉₀ = 33 P ₉₉ = 50	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	WNW10	WSW1	NNW9	NNW10	NNW2	E5	SSW10	SW12	SW7	SSW1	W6	NW12	N14	NW15	NW14	NNW10	N11	NE15	NE12	NE13	ENE13	E12	ENE18	NE14	N5.0	ENE18
2-Jun	N11	NNE17	N22	N21	N19	N22	N23	N17	N10	NE3	WNW3	WNW9	NW14	NW15	NNW14	NNW14	NNE16	NE14	NNE17	NE22	ENE20	ENE20	E19	E18	NNE12.4	N23
3-Jun	E16	ENE8	NE11	NE12	ENE9	E5	ENE5	NE7	NNE9	N13	NNE11	NNE9	ENE8	ENE10	E10	ESE8	SE10	ESE6	SE15	ESE13	ESE15	ESE11	E15	E15	E8.3	E16
4-Jun	ESE18	ESE11	ESE11	ESE15	E21	E14	E13	E15	ESE16	ESE17	ESE17	ESE14	SE11	E12	ESE10	E15	SE15	SSE11	SSW3	NNE3	NE2	SSE6	SSW3	ESE11.1	E21	
5-Jun	SSW2	WNW2	NNE5	NNE5	NNW4	WNW17	NNW14	NNW14	N17	NNE19	NNE23	NNE19	NE16	NE11	N9	NNW14	NNW22	UO	UO	NNE25	NNE9	WSW18	W38	W25	NNW9.4	W38
6-Jun	WSW26	WSW31	SW21	SW22	WSW20	WSW19	WSW19	WSW17	WSW15	WSW25	SW26	SW27	SW27	SW23	SW22	SW26	SW28	SW29	SW23	SW19	SW16	SSW20	SSW22	S26	SW22.0	WSW31
7-Jun	S32	S32	S33	S31	S30	S29	SSW24	SSW18	SW16	SSW17	SW28	WSW33	WSW35	W30	W29	W28	W28	WNW26	WNW26	WNW23	W26	WNW27	NW22	WNW16	WSW18.5	WSW35
8-Jun	WNW20	N29	N31	NNE21	N20	N21	NNE16	N11	NNW9	NW14	NNW13	NW11	NW7	NNE1	NNW4	N3	ENE7	ENE9	E8	NE9	NNE17	NE19	ENE18	E11	N11.0	N31
9-Jun	ESE7	SE9	SE8	ESE6	SE6	SE8	SSE11	SSE12	SSE9	SSE12	SE7	SSE12	SSE11	SE7	SE9	SSE15	SSE16	S17	S19	S21	SSE26	SE28	SE28	SE31	SSE13.4	SE31
10-Jun	SE28	SE27	SSE27	SE31	SE32	SE30	SE26	SE25	SSE23	SSE22	SSE23	SSE26	SE24	SSE34	SSE34	SSE35	SSE36	SSE35	SSE34	S32	S34	SSE31	SSE35	SSE31	SSE29.3	SSE36
11-Jun	SSE32	SSE27	S9	S21	WSW10	SSW8	W15	W20	W21	W17	W17	W17	WNW19	WNW18	W17	WNW21	WNW25	WNW26	WNW23	WNW22	NW27	NNW30	NNW31	NW29	W14.1	SSE32
12-Jun	NNW17	N15	NNW8	NNW12	WNW14	WNW15	NW12	N9	NNW7	NW9	NW10	WNW9	WNW11	W7	SSW8	S13	SSW12	SSW10	NE1	NE9	NE9	ENE12	ESE15	ESE19	NW3.4	ESE19
13-Jun	SE26	SE23	SE24	SE28	SE26	SE24	SE21	SE20	SE16	SSE10	SE9	SSE7	S5	NW11	N18	N20	N33	N42	NNE36	NNE24	UO	UO	UO	UO	E8.5	N42
14-Jun	UO	UO	NNE17	N19	N22	N23	N27	N35	N31	N30	N36	N40	UO	N37	N37	NNW39	NNW37	NNW41	N41	NNW46	N43	NNW41	NNW40	NNW38	N33.8	NNW46
15-Jun	NNW39	NNW39	NNW36	NNW38	NNW38	NNW30	NNW31	NNW33	NNW22	NW20	NNW22	WNW23	WNW25	NW25	NW25	NW27	NNW20	NNW15	NNW11	NNW4	ESE3	SSE9	SW14	W26	NW21.2	NNW39
16-Jun	W30	W28	WSW19	SSW10	SSW12	SSE14	SSE14	SSE14	SSE13	SE13	SSE19	SSE19	SSW27	SW28	SSW24	SSW25	S23	S23	SSW28	SW23	SSW22	SW26	WSW27	SW28	SSW17.2	W30
17-Jun	SW18	SW19	SSW21	SSW17	SW24	WSW21	WSW17	SW15	WSW21	SW18	SW19	SW23	SW24	WSW30	W22	W23	W23	W20	NW18	NNE30	NE18	ENE7	NE8	N13	WSW12.6	NNE30
18-Jun	N19	NNE17	E9	ESE7	NNE10	NNE16	NNE16	NE10	NE13	NE13	NNE14	N22	NNE21	N26	NNE29	NNE31	NNE33	NNE32	NNE34	NNE35	NNE32	NNE29	NNE35	NNE41	NNE22.1	NNE41
19-Jun	NNE28	NNE27	NNE30	NNE32	NNE40	NNE40	N47	N51	NNE54	NNE50	NNE53	N48	N52	N59	N57	NNE51	N46	N44	N44	N41	N39	N37	NNW40	NNW40	N43.1	N59
20-Jun	NNW39	N31	NNW40	N36	N33	N32	N32	NNW36	NNW35	N37	N30	NNW31	NNW29	NNW29	NNW28	NNW23	NNW28	NNW27	NNW23	NNW21	NW19	NW22	NNW25	NNW24	NNW29.3	NNW40
21-Jun	NNW24	NNW23	NNW18	NNW25	NNW24	NNW22	NNW28	NNW22	NNW22	NNW21	NNW18	NNW16	NNW15	NNW14	NNW18	NNW15	NNW18	N16	NE15	NE13	ENE11	E9	E7	SE9	N15.0	NNW28
22-Jun	SSE16	SE12	SE10	SE13	SE14	SE13	SE17	SE10	SE12	SSE16	SSE12	ESE8	SE5	WSW13	W25	WSW18	WSW19	WSW22	WSW18	WSW14	WSW7	WNW3	S4	SSE9	S6.9	W25
23-Jun	S13	SSE17	SE16	SE18	SSE15	SE11	SE14	SSE11	SE9	SE5	ESE9	SE12	SSE12	SE11	SSE8	E8	SE8	SE10	SE8	SSE11	SSE16	SSE24	S28	SSW28	SSE12.2	S28
24-Jun	SSW24	SSW22	SSW18	SSW15	S18	SSE19	SE16	SSE14	SSE11	S16	SSW17	SW16	WSW14	SW18	SW19	N20	NNW22	N26	N38	N43	N34	NNE38	N33	NNE29	NW4.1	N43
25-Jun	NNE25	NNE21	NNE23	NNE26	NNE26	NNE24	NNE19	NE12	NE11	ENE7	NE12	NE10	ENE6	ESE4	ESE5	N4	NW8	N9	NNW11	NW9	N8	NE8	ESE8	SE15	NNE10.4	NNE26
26-Jun	S19	SSE23	SSE29	SSE25	SSE20	SSE15	SSE18	SSE13	SSE16	SSE21	SSE22	SSE24	S14	SSW11	SSW17	WSW19	N35	N10	SSW13	S14	SSW14	SSW8	W1	ENE3	S11.5	N35
27-Jun	NNW4	NNW7	NNW12	N14	N12	NNW11	NNW9	N7	N10	N12	N15	NNE11	NNE9	NNE9	NNE4	N6	NNW4	E7	NE4	WNW5	NW11	SW6	S23	S26	N4.4	S26
28-Jun	S25	S28	S22	S23	S20	S23	S25	S17	DF	DF	SSE14	DF	SSE10	ENE1	W7	SW18	SSW12	SSE18	SSE23	S20	S20	S18	SSW14	S14	S16.6	S28
29-Jun	S15	SSW18	S16	SSE12	SSE13	S18	S20	SSE14	SSE13	SSE12	SSE12	SSE14	S16	SSW19	WSW23	UO	UO	SSW7	S16	SSW16	SSW19	SW28	SW33	SW36	SSW16.0	SW36
30-Jun	SW32	SW23	SW14	SW14	SW9	SW8	SSW9	S12	SSE13	S10	SW13	SW21	SW20	WSW25	WSW23	WSW27	WSW27	WSW26	WSW27	WSW27	WSW27	WSW27	WSW27	WSW27	SW19.2	SW32

SW2.5	SSW1.4	NE0.4	E0.9	NE1.3	NNE1.4	NNE1.8	NNE2.2	NNE2.8	N1.8	NNW1.7	NW2.6	W3.9	WNW6.6	NNW6.7	NW7.0	NW7.7	NNW4.9	NNW4.6	NNW5.7	NNW2.8	NW1.7	W2.0	WSW2.4	Diurnal Average
NNW39	NNW39	NNW40	NNW38	NNE40	NNE40	N47	N51	NNE54	NNE50	NNE53	N48	N52	N59	N57	NNE51	N46	N44	N44	NNW46	N43	NNW41	NNW40	NNE41	Diurnal Maximum

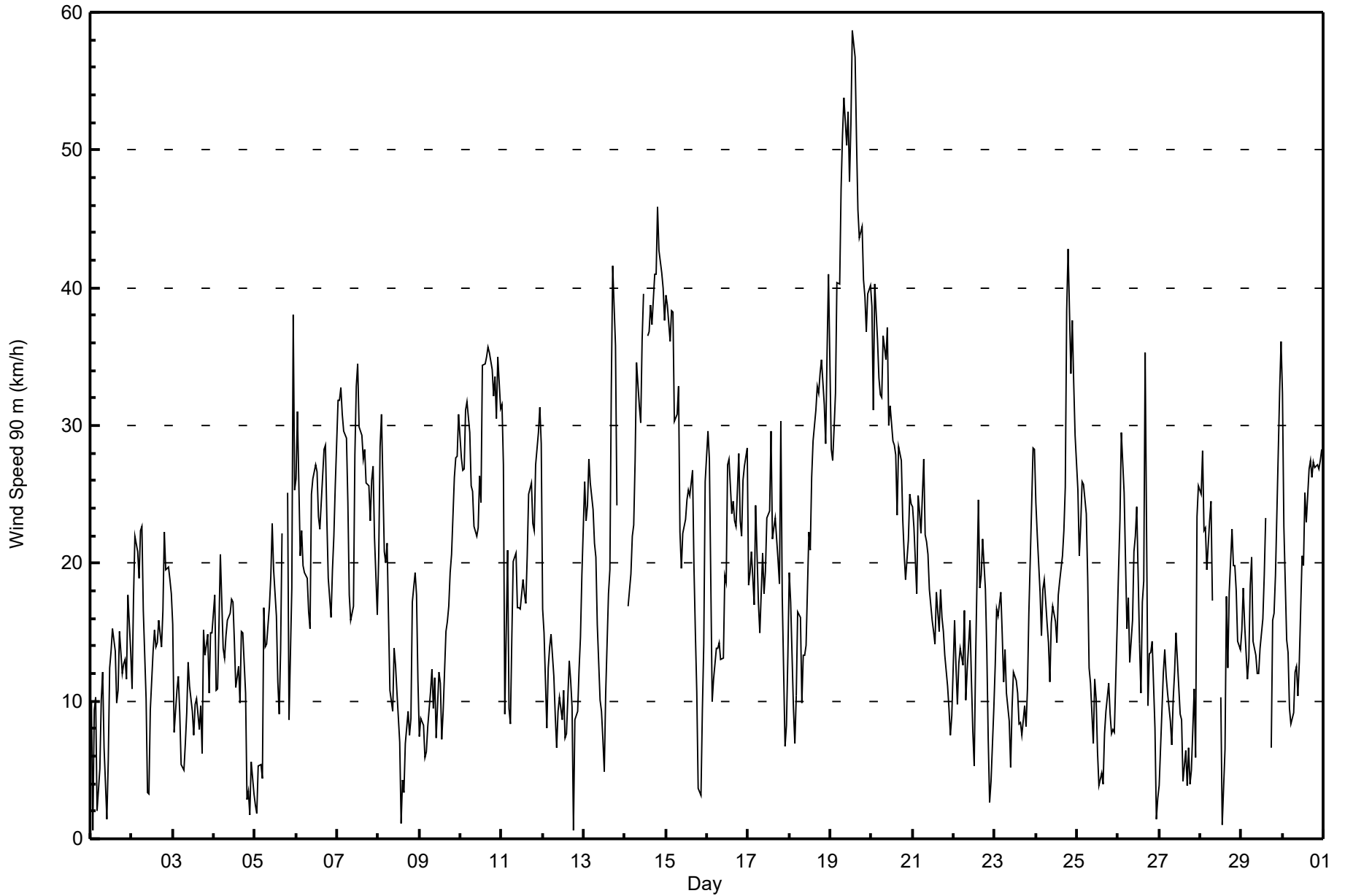
DF - DAS Failure UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 13 km/h on Jun 26 17:00 Minimum Value: 1 km/h on Jun 29 05:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 5 P ₉₀ = 6 P ₉₉ = 9																		Hours in Service: 720 Hours of Data: 706 Hours of Missing Data: 14 Hours of Calibration: 0 Percent Operational Time: 98.1							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	4	3	2	4	2	2	2	3	3	2	4	4	4	4	3	3	3	3	2	3	3	3	5	4	5
2-Jun	3	4	4	4	4	3	4	5	3	2	3	4	4	5	4	4	3	3	3	3	3	3	5	3	5
3-Jun	4	3	1	1	1	2	2	2	3	2	3	4	4	3	4	5	4	3	4	3	5	4	3	4	5
4-Jun	5	4	3	5	4	4	4	4	5	4	5	4	4	4	3	3	3	5	5	2	2	1	2	1	5
5-Jun	1	2	1	1	4	4	6	3	5	4	3	3	3	4	3	5	4	UO	UO	3	6	11	6	4	11
6-Jun	6	4	5	4	3	4	4	4	4	4	6	5	5	5	5	6	6	5	4	2	1	1	1	3	6
7-Jun	2	2	2	2	4	2	4	4	3	4	9	6	6	6	4	5	4	4	4	2	2	2	2	1	9
8-Jun	2	6	4	3	4	4	4	3	3	3	4	4	4	3	4	3	3	2	2	4	1	1	3	2	6
9-Jun	3	2	2	2	2	1	2	2	3	4	3	4	4	3	4	3	3	3	2	2	2	1	2	3	4
10-Jun	1	2	3	1	1	1	1	3	3	4	5	4	5	6	6	6	6	5	4	3	3	3	2	3	6
11-Jun	3	7	6	5	2	2	4	4	3	3	3	3	4	4	4	4	4	3	2	2	4	3	3	3	7
12-Jun	6	2	3	3	2	3	2	2	2	3	3	4	3	3	4	3	2	2	2	1	3	3	5	6	6
13-Jun	5	3	3	4	6	5	4	3	4	3	2	3	3	5	4	5	7	6	6	5	UO	UO	UO	UO	7
14-Jun	UO	UO	4	3	2	4	5	4	5	6	7	5	UO	6	6	8	7	7	7	7	7	7	6	6	8
15-Jun	6	6	6	6	6	6	6	6	6	5	3	3	2	4	4	4	5	4	3	2	2	2	2	3	6
16-Jun	1	4	6	3	2	5	3	2	2	2	4	5	6	5	5	5	4	3	8	4	5	4	2	3	8
17-Jun	6	3	2	4	2	2	4	5	5	4	4	6	4	5	5	5	4	4	7	5	5	3	3	3	7
18-Jun	2	3	2	4	4	2	5	3	4	4	5	4	5	4	6	7	6	6	6	5	5	4	5	7	7
19-Jun	6	4	5	6	6	6	7	8	9	8	6	6	7	8	8	7	7	6	8	6	6	5	5	6	9
20-Jun	6	6	6	6	7	6	8	7	7	7	7	5	5	5	4	4	6	4	4	3	2	2	3	3	8
21-Jun	3	3	3	4	3	4	4	5	4	4	4	5	4	4	4	4	4	4	3	3	2	1	2	3	5
22-Jun	1	2	1	1	1	3	4	3	3	3	3	3	3	9	4	5	6	6	3	2	1	2	3	4	9
23-Jun	2	1	2	2	2	3	2	3	2	2	3	5	5	4	4	3	3	3	2	2	2	3	1	2	5
24-Jun	2	2	3	2	3	2	2	2	2	3	4	4	5	4	5	12	7	4	7	9	6	5	6	5	12
25-Jun	3	3	3	2	3	3	4	3	3	3	3	4	4	4	3	3	4	4	3	2	2	1	1	2	4
26-Jun	1	2	2	2	3	3	4	4	3	2	2	4	4	3	5	4	13	6	8	4	2	3	3	3	13
27-Jun	2	2	3	4	5	2	2	2	3	3	3	4	4	4	3	5	3	3	2	4	1	6	1	2	6
28-Jun	1	1	2	2	1	2	2	4	DF	DF	3	DF	4	2	4	5	3	2	5	3	1	2	2	2	5
29-Jun	2	1	2	1	1	3	2	3	2	2	3	3	4	4	9	UO	UO	4	3	2	3	2	2	1	9
30-Jun	2	3	2	2	2	1	1	3	2	2	4	5	5	6	5	4	6	5	5	4	3	2	3	3	6
Diurnal Maximum																									
DF - DAS Failure UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	39	5.52	5.52
6 - 11	137	19.41	24.93
12 - 19	223	31.59	56.52
20 - 28	186	26.35	82.86
29 - 38	87	12.32	95.18
> 38	34	4.82	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 90 m (WS90m) - km/h
Mannix - June 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	4	3	2	3	2	0	2	4	0	1	1	4	0	6	39
6 - 11	10	10	11	10	8	12	19	14	1	10	4	2	3	4	7	12	137
12 - 19	14	14	15	4	11	12	14	35	17	18	17	14	5	7	9	17	223
20 - 28	14	13	1	2	1	0	15	15	18	12	22	19	12	13	8	21	186
29 - 38	21	15	0	0	0	0	4	11	8	0	4	4	4	0	1	15	87
> 38	16	7	0	0	0	0	0	0	0	0	0	0	0	0	0	11	34
Totals	77	64	31	19	22	27	54	75	46	44	47	40	25	28	25	82	706

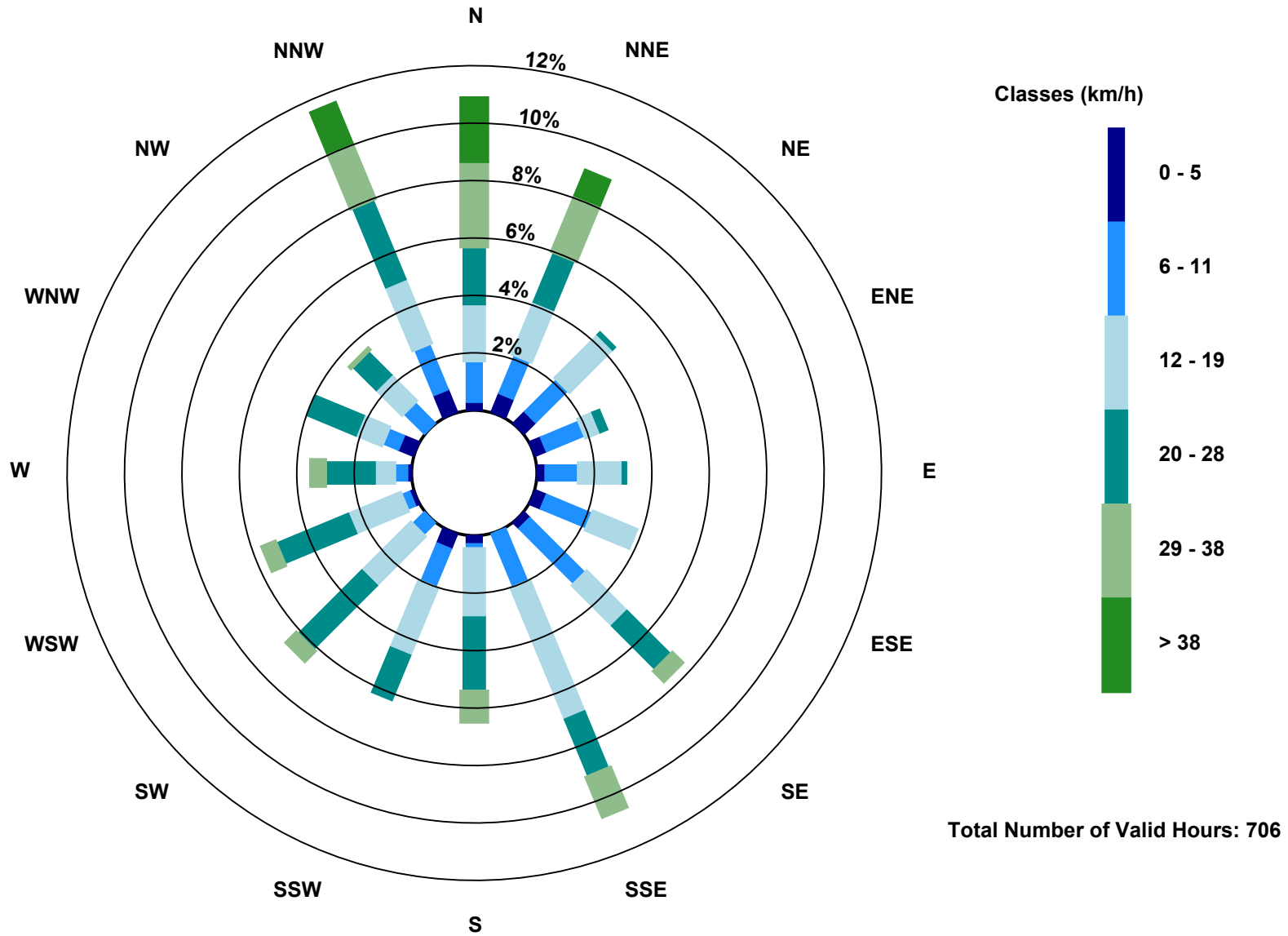
Total Number of Valid Hours: 706

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Direction of Maximum Speed: 7 deg on Jun 19 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 7.2 deg on Jun 19	Hours of Data: 717
Direction of Minimum Speed: 274 deg on Jun 18 04:00	Direction of Minimum Daily Speed Average: 1.9 deg on Jun 12
Direction of Minimum Speed: 274 deg on Jun 18 04:00	Hours of Missing Data: 3
Monthly Average Direction: 332.5 deg	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	251	169	347	327	76	111	223	232	219	196	268	330	359	319	319	339	12	44	56	54	68	96	71	38	10.3
2-Jun	342	14	348	353	345	338	356	5	22	51	278	283	312	318	338	337	35	46	41	43	74	73	81	82	15.7
3-Jun	86	102	17	33	58	89	63	47	28	20	18	23	90	61	91	119	150	127	138	112	116	126	90	93	83.7
4-Jun	112	144	136	100	93	79	77	96	114	120	123	132	128	130	97	103	94	131	152	178	50	121	165	279	114.5
5-Jun	268	270	31	295	282	297	340	344	12	33	32	35	62	51	1	347	333	338	14	29	15	244	264	275	343.9
6-Jun	254	253	233	227	230	236	241	246	245	244	238	237	234	239	233	224	228	224	228	236	208	190	181	163	231.9
7-Jun	161	159	161	161	168	168	195	205	218	192	229	246	248	268	280	275	283	289	290	282	277	277	279	246	241.9
8-Jun	277	0	8	8	3	11	15	22	342	311	330	321	306	50	321	31	74	63	93	37	21	33	55	64	12.6
9-Jun	178	238	208	134	217	184	185	144	159	151	136	157	160	138	138	170	167	184	199	180	155	150	151	147	163.1
10-Jun	149	142	157	146	146	150	151	152	161	157	152	154	149	161	153	157	161	164	168	168	167	161	160	161	157.0
11-Jun	154	161	163	176	216	188	244	272	274	276	280	278	283	292	272	285	292	284	285	275	300	328	329	322	276.7
12-Jun	338	357	292	256	228	243	313	357	330	309	306	295	292	274	216	200	206	199	330	15	21	48	125	135	294.3
13-Jun	145	141	143	140	136	138	139	145	149	156	144	153	178	328	358	352	6	7	19	12	3	359	21	29	60.1
14-Jun	27	14	9	345	356	5	10	11	4	1	10	10	357	355	353	344	341	345	348	347	349	346	344	340	355.5
15-Jun	339	342	340	337	336	333	339	337	331	306	299	293	297	323	325	321	330	342	339	359	116	177	225	252	325.1
16-Jun	251	263	208	159	155	158	147	141	138	135	153	164	218	222	205	198	184	170	216	205	173	233	237	236	196.1
17-Jun	213	194	191	173	211	229	235	235	238	228	227	218	232	264	268	268	268	275	313	23	37	35	20	357	253.5
18-Jun	6	24	30	274	16	33	27	50	51	45	11	6	13	10	29	26	28	35	28	24	28	16	13	18	23.5
19-Jun	14	14	11	13	16	12	11	11	19	19	15	9	6	7	11	15	10	4	4	348	350	347	344	344	7.2
20-Jun	345	348	346	348	353	354	355	347	348	348	351	343	338	336	333	329	335	331	326	339	314	314	326	326	341.2
21-Jun	328	338	2	332	336	346	336	342	343	341	342	337	339	329	346	347	332	6	45	57	76	89	88	160	352.3
22-Jun	148	134	136	163	176	170	158	151	150	162	152	121	127	255	265	261	261	261	257	250	286	303	191	139	211.5
23-Jun	160	162	148	151	162	138	137	154	142	142	123	139	170	131	149	99	136	140	145	155	167	159	166	178	148.9
24-Jun	171	168	163	154	153	147	142	145	135	186	217	239	244	236	236	3	359	8	350	353	9	13	13	16	355.2
25-Jun	19	14	15	14	14	17	27	41	48	74	59	66	71	135	99	25	318	354	350	332	4	45	158	160	28.9
26-Jun	159	155	163	150	156	154	149	149	155	156	157	155	186	201	210	254	7	17	214	183	212	162	115	135	167.9
27-Jun	275	264	342	348	336	343	323	343	1	357	13	27	34	24	50	347	330	111	38	294	284	212	186	178	346.9
28-Jun	163	163	164	160	150	159	163	155	DF	DF	159	DF	155	118	278	234	201	156	168	174	166	171	186	184	171.2
29-Jun	205	210	162	158	187	170	169	165	158	163	156	142	167	199	247	254	269	197	164	166	171	200	217	224	194.8
30-Jun	229	200	152	153	154	159	155	162	159	162	221	231	237	257	263	261	248	242	254	253	245	244	235	242	230.3

198.4 317.4 44.7 77.9 48.9 56.2 26.2 28.0 38.3 26.4 318.6 294.8 275.1 294.2 298.8 297.8 318.6 335.8 334.0 355.6 12.8 357.9 337.5 340.1

Diurnal Average

DF - DAS Failure

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

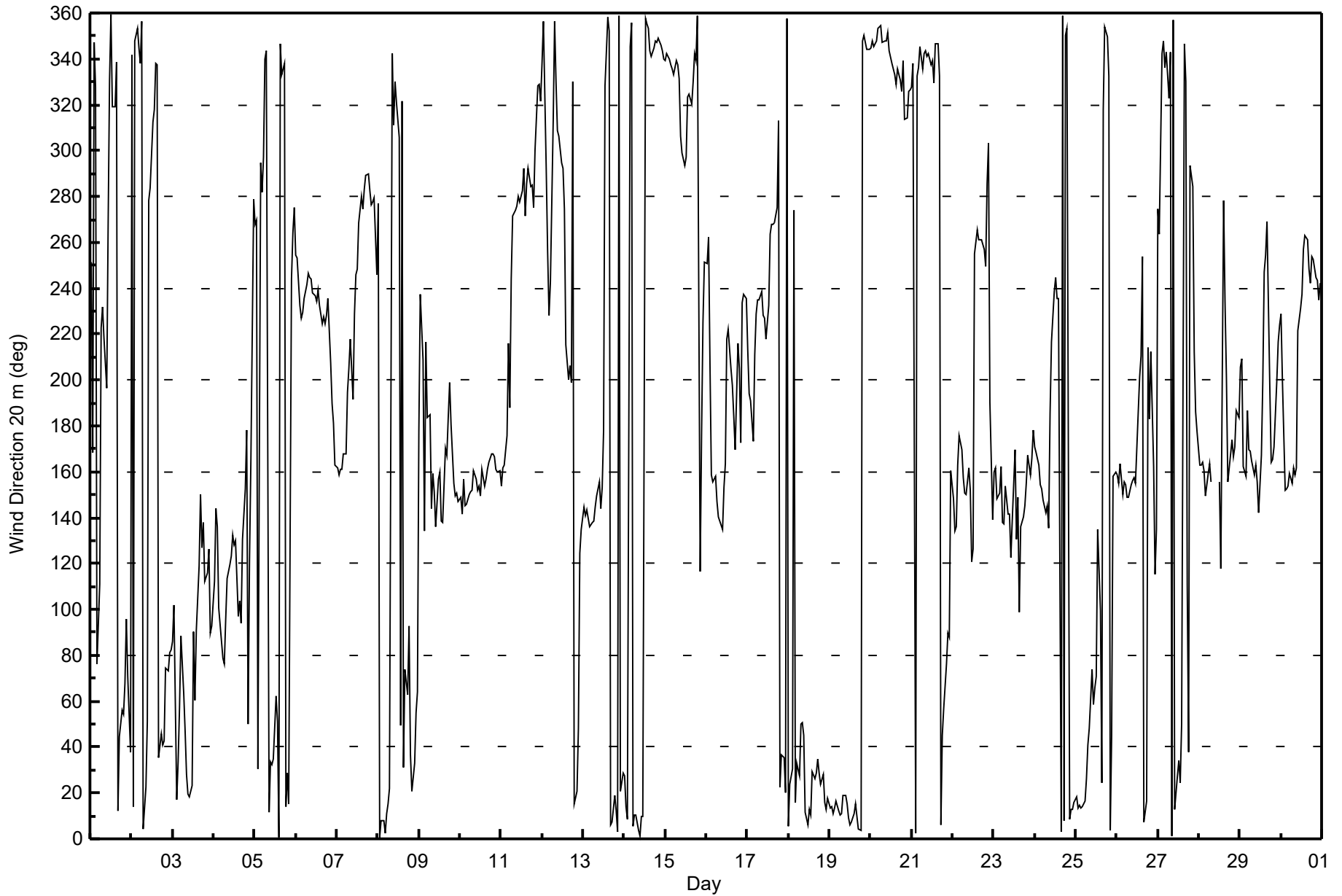
Wind Direction 20 m (WD20m) - deg
Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 103 deg on Jun 8 14:00	Hours of Data: 717
Minimum Value: 6 deg on Jun 7 22:00	Hours of Missing Data: 3
Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 14 Median = 17 Q ₃ = 27 P ₉₀ = 42 P ₉₉ = 82	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	39	79	35	43	82	44	23	28	33	97	54	41	33	29	25	30	38	18	15	15	22	16	24	32	97
2-Jun	27	18	20	21	19	15	16	21	18	79	75	36	35	30	39	38	22	25	17	15	12	12	15	13	79
3-Jun	11	46	31	12	22	56	32	26	31	23	34	47	48	34	35	43	36	56	14	22	18	22	12	20	56
4-Jun	15	17	15	13	10	17	18	14	20	19	18	15	17	23	13	18	11	16	23	71	54	53	47	17	71
5-Jun	65	22	45	17	15	24	38	20	25	19	20	20	20	37	42	30	18	17	22	24	46	11	14	16	65
6-Jun	14	12	19	14	13	16	16	16	21	15	21	20	18	25	28	24	18	17	17	11	13	9	8	7	28
7-Jun	9	11	10	11	13	13	20	17	18	21	23	18	17	22	16	15	13	13	12	10	7	6	8	11	23
8-Jun	36	18	13	13	12	12	15	32	41	28	38	47	54	103	90	89	37	24	22	27	11	13	15	10	103
9-Jun	55	21	49	19	28	36	28	16	30	29	29	30	37	49	39	25	19	23	15	14	9	11	10	11	55
10-Jun	10	11	13	11	11	10	11	11	13	14	15	16	18	15	12	14	14	12	12	11	11	9	11	11	18
11-Jun	11	42	74	43	38	21	13	11	13	12	14	14	20	30	17	19	17	11	11	9	17	13	13	15	74
12-Jun	17	12	28	13	15	75	31	32	58	48	38	36	33	40	55	23	20	19	80	10	31	17	31	12	80
13-Jun	13	12	13	12	12	11	12	14	15	28	27	42	63	45	22	17	17	15	19	12	15	18	17	15	63
14-Jun	18	12	22	18	17	16	14	12	18	17	14	14	19	18	16	14	16	15	14	14	15	15	15	15	22
15-Jun	14	14	15	14	13	15	18	16	20	17	14	13	14	17	16	16	22	22	22	33	29	29	18	6	33
16-Jun	8	8	29	9	11	14	17	15	16	15	19	18	22	16	20	18	20	15	28	20	16	35	12	14	35
17-Jun	37	15	15	21	20	17	23	20	15	19	23	21	22	13	17	18	18	16	47	14	20	44	11	17	47
18-Jun	14	12	14	88	18	15	17	24	23	24	31	20	23	19	16	16	15	15	14	14	14	13	12	13	88
19-Jun	15	13	14	15	12	12	11	13	14	13	12	12	12	12	12	12	13	14	14	15	14	13	14	14	15
20-Jun	13	15	14	17	16	17	17	15	17	16	17	16	15	15	15	15	16	17	16	19	15	16	13	14	19
21-Jun	15	18	13	17	17	20	16	20	19	19	22	29	35	30	26	33	26	30	20	16	14	10	27	24	35
22-Jun	7	15	19	27	21	19	14	21	18	20	22	36	44	59	11	12	16	14	13	13	33	67	37	24	67
23-Jun	14	10	8	13	14	15	15	23	21	32	28	35	40	41	62	42	28	24	18	14	10	7	9	12	62
24-Jun	9	8	8	11	10	14	15	17	15	35	24	26	25	22	23	63	34	22	14	19	26	16	14	14	63
25-Jun	13	14	13	11	12	14	14	23	27	40	33	44	73	67	51	79	77	36	24	21	14	24	36	10	79
26-Jun	10	10	11	11	18	17	14	18	13	14	13	14	30	26	30	27	30	71	42	22	16	47	45	80	80
27-Jun	16	20	45	34	41	20	23	42	36	32	29	39	44	47	74	65	95	33	58	65	17	68	11	12	95
28-Jun	9	10	11	13	10	13	13	19	DF	DF	25	DF	28	94	43	16	31	12	15	15	15	12	11	10	94
29-Jun	23	20	14	9	10	12	18	18	17	23	28	19	28	24	27	17	44	62	19	15	16	11	10	8	62
30-Jun	10	28	12	8	12	11	16	17	18	29	32	25	26	20	18	18	18	18	12	12	10	7	8	11	32

65	79	74	88	82	75	38	42	58	97	75	47	73	103	90	89	95	71	80	71	54	68	47	80	
Diurnal Maximum																								

DF - DAS Failure





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - June 2023

Direction of Maximum Speed: 3 deg on Jun 19 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 4.0 deg on Jun 19	Hours of Data: 717
Direction of Minimum Speed: 12 deg on Jun 1 05:00	Direction of Minimum Daily Speed Average: 2.3 deg on Jun 24
Direction of Minimum Speed: 12 deg on Jun 1 05:00	Hours of Missing Data: 3
Monthly Average Direction: 327.0 deg	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	273	193	346	328	12	104	212	229	218	191	264	324	352	317	317	337	3	37	49	53	59	87	64	34	359.9
2-Jun	351	11	347	348	345	342	354	1	12	42	285	285	312	317	331	335	27	38	32	37	69	67	76	79	9.2
3-Jun	81	76	30	32	54	83	57	38	23	11	11	16	78	56	86	120	143	121	130	107	109	119	88	90	76.8
4-Jun	108	130	127	98	88	74	73	93	111	115	116	125	121	125	91	101	91	125	146	189	35	74	165	248	109.8
5-Jun	261	278	35	340	298	298	336	338	5	27	25	28	55	43	355	345	329	334	11	22	19	242	259	274	341.4
6-Jun	251	249	229	225	229	235	239	242	241	238	232	229	230	232	226	217	221	218	222	231	210	197	191	159	225.5
7-Jun	155	157	161	158	172	172	190	201	213	188	222	239	243	264	276	270	280	286	286	279	272	278	290	267	232.7
8-Jun	281	355	4	5	1	6	12	13	335	312	325	319	304	31	326	14	66	56	86	34	22	29	53	75	5.9
9-Jun	127	160	156	137	161	166	178	145	159	149	134	153	160	134	134	164	163	179	191	172	150	144	145	142	155.2
10-Jun	143	136	146	142	139	142	142	144	155	152	147	148	144	157	149	152	156	160	164	165	164	158	154	157	151.6
11-Jun	150	156	168	169	238	197	243	268	271	273	278	275	281	290	267	282	289	281	285	274	299	325	325	319	273.5
12-Jun	334	357	311	279	267	270	311	347	328	310	310	293	295	275	206	193	200	192	351	18	20	51	117	125	303.4
13-Jun	139	135	138	134	130	131	134	138	141	150	140	150	176	323	355	352	2	3	15	9	2	357	15	22	56.8
14-Jun	22	10	6	342	353	1	5	6	0	359	5	6	355	352	351	342	338	343	346	345	348	345	341	337	352.5
15-Jun	335	339	337	333	331	330	336	334	328	304	298	292	295	319	321	316	325	337	340	343	114	163	220	256	321.1
16-Jun	255	265	231	166	160	155	146	136	135	131	150	158	211	216	200	192	182	167	209	205	181	224	234	230	194.4
17-Jun	219	204	196	189	213	230	231	230	235	223	221	213	227	257	263	262	264	270	310	17	31	49	24	356	245.9
18-Jun	2	15	44	75	13	26	21	44	43	38	7	2	10	7	24	22	23	29	23	20	23	12	10	15	19.2
19-Jun	11	11	8	12	12	9	8	8	14	15	12	6	3	3	7	12	7	1	0	346	349	346	342	341	4.0
20-Jun	342	347	343	346	351	352	353	344	344	346	349	341	334	331	330	325	333	328	325	337	314	313	323	324	338.5
21-Jun	325	334	347	331	333	340	332	338	340	337	339	336	335	327	342	342	329	360	38	48	68	81	89	142	346.9
22-Jun	140	126	125	146	145	156	148	139	141	156	147	114	127	247	259	254	255	255	251	248	265	302	172	141	192.9
23-Jun	155	158	143	141	144	125	131	152	137	134	117	139	163	128	150	97	129	134	140	150	161	151	161	185	146.1
24-Jun	177	179	169	159	149	146	143	144	131	182	211	233	237	229	227	358	350	5	349	350	4	9	9	11	350.3
25-Jun	15	11	11	10	11	14	23	35	41	64	48	57	52	118	101	4	315	349	345	326	354	43	136	151	23.1
26-Jun	157	150	154	147	152	155	144	144	149	151	152	151	177	197	205	249	3	11	203	180	208	177	103	104	162.1
27-Jun	272	301	341	354	355	340	325	341	355	352	4	19	27	17	29	341	321	99	36	289	290	207	179	170	345.9
28-Jun	159	160	163	163	151	155	159	157	DF	DF	156	DF	150	88	273	228	194	150	162	171	167	169	189	179	167.6
29-Jun	185	192	173	154	158	163	169	162	154	159	154	141	164	193	241	247	263	194	161	175	188	205	214	216	190.5
30-Jun	220	212	173	178	169	176	159	162	156	161	213	223	231	251	257	254	242	236	248	247	241	241	235	238	225.6

179.6 150.9 84.9 95.7 59.5 60.4 28.2 21.2 25.1 21.7 326.7 294.6 274.5 292.5 296.1 294.1 315.6 332.2 331.5 347.2 359.5 348.5 305.2 259.5

Diurnal Average

DF - DAS Failure

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

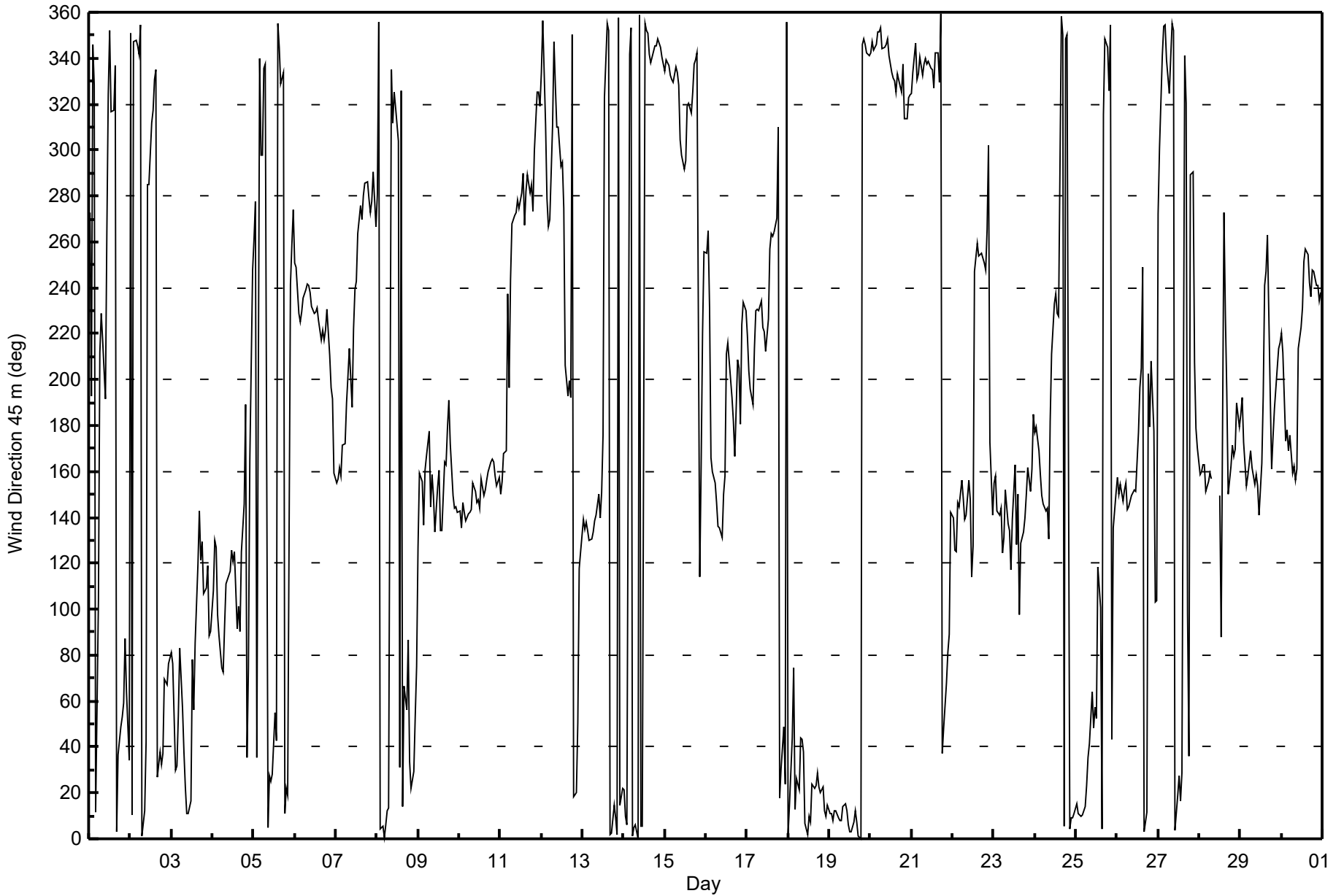


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 103 deg on Jun 8 14:00	Hours of Data: 717
Minimum Value: 2 deg on Jun 23 22:00	Hours of Missing Data: 3
Percentiles: P ₁ = 4 P ₁₀ = 7 Q ₁ = 9 Median = 12 Q ₃ = 20 P ₉₀ = 33 P ₉₉ = 83	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	64	83	32	37	90	40	22	20	30	83	48	28	21	25	19	22	33	13	11	11	18	14	17	24	90
2-Jun	22	13	15	15	11	10	10	11	13	58	77	30	30	20	31	29	15	20	14	10	10	10	13	10	77
3-Jun	8	37	16	6	15	24	28	20	22	15	23	38	37	32	32	45	31	50	9	18	14	16	11	19	50
4-Jun	12	12	10	11	9	16	15	12	15	13	14	10	13	19	12	14	9	11	16	65	54	40	38	20	65
5-Jun	21	32	32	32	27	18	27	13	19	13	14	14	15	31	33	22	13	10	14	18	32	11	13	14	33
6-Jun	11	9	13	9	9	12	12	12	16	11	17	16	13	20	22	18	13	11	12	7	7	4	5	7	22
7-Jun	3	4	5	6	8	6	13	10	12	13	18	14	15	21	13	13	10	9	7	7	4	5	6	9	21
8-Jun	13	17	7	8	7	7	11	23	32	20	29	36	45	103	76	77	33	19	21	24	8	8	12	11	103
9-Jun	29	15	9	8	4	10	15	11	21	19	23	24	31	42	32	19	13	15	8	8	5	5	5	6	42
10-Jun	5	6	6	5	5	5	6	7	8	8	10	11	13	10	9	10	10	8	7	6	5	4	5	6	13
11-Jun	6	32	55	34	28	13	10	9	10	9	10	11	18	28	15	14	12	7	7	8	12	8	7	8	55
12-Jun	11	8	25	11	10	30	19	24	49	32	28	34	28	33	44	11	12	8	88	8	24	16	27	8	88
13-Jun	8	6	8	7	7	6	7	8	10	22	19	29	52	38	14	12	13	10	15	8	9	11	10	9	52
14-Jun	11	7	16	13	10	9	7	6	11	11	8	7	12	13	12	10	9	9	11	8	9	9	9	10	16
15-Jun	9	9	10	8	9	10	11	10	14	10	7	8	7	10	10	9	14	14	13	26	30	21	27	4	30
16-Jun	5	4	23	7	11	8	11	8	10	9	16	13	19	10	12	10	10	9	24	12	12	31	8	10	31
17-Jun	22	11	9	20	12	10	18	15	9	14	15	15	17	11	13	16	16	13	47	9	13	34	9	14	47
18-Jun	10	7	13	82	12	10	14	18	18	21	21	11	16	13	10	10	10	10	9	9	8	8	7	8	82
19-Jun	10	7	9	10	8	8	7	8	9	8	7	7	7	7	8	8	8	7	9	9	9	8	8	9	10
20-Jun	9	10	10	11	11	12	12	10	11	9	11	10	9	9	9	10	11	12	11	13	9	9	8	8	13
21-Jun	9	10	10	10	10	11	9	13	11	13	14	21	27	22	18	25	18	25	15	10	12	7	21	10	27
22-Jun	6	6	8	8	18	13	11	15	11	12	18	30	43	57	8	9	14	11	10	8	17	68	32	14	68
23-Jun	8	5	4	6	9	6	8	15	17	25	22	29	29	35	55	34	23	19	14	10	8	2	7	8	55
24-Jun	8	6	7	9	5	7	7	9	8	28	17	20	21	17	21	61	30	17	9	15	22	11	9	9	61
25-Jun	8	9	7	7	7	8	10	17	19	39	27	37	58	62	55	83	63	25	17	15	16	18	36	8	83
26-Jun	7	3	5	7	10	13	9	9	9	9	7	10	24	18	24	25	28	57	42	14	9	47	42	64	64
27-Jun	53	34	24	21	22	13	14	25	25	20	22	29	33	34	76	71	97	28	46	50	11	69	6	4	97
28-Jun	4	7	4	9	6	6	5	13	DF	DF	16	DF	23	88	35	14	25	7	10	7	10	4	9	6	88
29-Jun	11	8	10	4	5	5	11	12	11	15	18	12	23	16	25	16	41	58	11	9	9	4	6	3	58
30-Jun	4	13	14	12	10	15	11	10	13	23	25	21	21	17	15	15	15	15	8	8	7	5	6	9	25

64	83	55	82	90	40	28	25	49	83	77	38	58	103	76	83	97	58	88	65	54	69	42	64	
Diurnal Maximum																								

DF - DAS Failure





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 7 deg on Jun 19 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 8.4 deg on Jun 19	Hours of Data: 717
Direction of Minimum Speed: 64 deg on Jun 26 23:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 3.0 deg on Jun 24	Percent Operational Time: 99.6
Monthly Average Direction: 328.6 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-Jun	295	204	350	331	347	94	202	228	225	196	268	325	354	322	322	342	5	38	53	59	62	84	70	43	6.5
2-Jun	8	14	358	355	356	355	360	5	15	50	289	290	315	324	335	342	30	42	35	42	74	72	81	83	15.9
3-Jun	87	70	49	43	68	97	64	40	24	12	15	22	74	60	86	119	144	120	131	108	112	119	93	97	77.9
4-Jun	112	124	125	103	90	81	79	98	115	117	118	128	123	127	93	105	93	127	148	205	28	55	154	214	111.4
5-Jun	222	299	38	15	316	302	340	341	5	30	27	31	56	47	1	349	334	342	16	26	32	243	260	277	348.9
6-Jun	252	251	233	230	233	239	241	243	243	239	233	229	230	232	227	218	221	218	222	233	215	208	204	172	227.7
7-Jun	166	168	174	166	181	184	194	204	214	191	222	240	243	265	277	270	282	288	289	281	275	285	308	289	234.3
8-Jun	295	360	8	11	6	10	15	15	339	319	332	322	309	29	337	4	68	62	87	39	29	36	62	91	9.8
9-Jun	119	141	142	131	136	154	166	152	164	153	140	156	163	135	135	166	165	180	190	172	152	145	146	145	154.6
10-Jun	145	139	148	144	142	143	142	146	156	153	149	150	147	159	152	155	159	162	166	168	168	165	160	164	154.2
11-Jun	157	160	183	181	247	206	255	271	274	275	280	277	284	292	269	284	292	284	290	281	308	332	329	326	277.2
12-Jun	341	3	326	287	283	285	312	353	332	317	312	293	300	276	207	190	199	193	47	36	41	71	123	126	311.6
13-Jun	140	138	140	138	134	135	136	140	141	154	144	157	179	324	1	358	5	5	18	16	11	2	17	26	61.0
14-Jun	25	15	15	348	359	5	7	8	3	2	8	8	359	356	355	347	343	348	351	350	353	350	346	342	356.8
15-Jun	339	343	342	336	335	334	342	339	333	310	304	296	300	323	325	320	328	341	343	338	120	165	226	263	325.0
16-Jun	262	267	246	190	192	163	157	145	144	139	153	161	211	216	202	193	184	170	209	212	195	226	236	232	202.4
17-Jun	228	215	205	205	220	235	234	231	237	224	223	215	227	257	264	262	265	271	312	21	37	65	37	4	246.2
18-Jun	12	24	72	110	21	33	25	47	47	41	14	5	15	12	26	24	26	32	25	23	27	16	14	19	23.9
19-Jun	17	17	14	18	16	13	12	11	18	18	16	10	7	7	11	16	11	5	4	352	353	352	349	346	8.4
20-Jun	348	352	348	351	356	357	357	349	350	351	353	345	338	336	335	331	340	333	334	345	322	320	328	330	343.9
21-Jun	332	340	345	341	344	344	339	343	345	343	343	343	339	331	346	345	334	5	39	52	69	86	95	141	351.2
22-Jun	146	134	133	134	135	136	140	136	140	158	151	113	137	249	260	254	255	255	251	249	257	290	176	152	191.1
23-Jun	166	163	143	142	146	129	136	156	140	134	117	145	165	131	151	99	129	138	144	156	164	153	169	205	152.3
24-Jun	203	205	201	190	166	158	158	156	142	187	212	232	239	230	228	2	348	9	354	354	9	13	12	14	327.5
25-Jun	19	16	15	14	15	19	29	39	45	64	52	58	58	115	102	0	323	352	349	328	354	47	119	147	27.0
26-Jun	169	158	159	155	157	163	147	151	150	153	156	153	175	201	207	250	6	14	202	180	206	195	64	89	166.3
27-Jun	337	331	343	4	3	346	338	350	356	0	8	24	28	22	24	354	327	95	44	291	301	209	178	170	359.0
28-Jun	167	171	176	180	169	166	168	166	DF	DF	159	DF	151	72	273	229	197	157	166	177	174	182	201	185	175.7
29-Jun	188	190	185	163	164	168	174	166	159	162	158	149	167	193	243	249	259	191	166	199	204	213	218	217	196.5
30-Jun	223	226	205	212	201	213	188	172	161	170	213	223	231	252	256	254	242	237	249	247	243	246	240	243	231.8

206.9 168.0 89.5 96.0 64.6 60.3 41.3 24.7 21.3 17.3 340.1 302.5 280.6 297.2 300.7 297.8 320.8 338.4 338.3 349.1 1.6 344.4 300.8 260.1

Diurnal Average

DF - DAS Failure

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

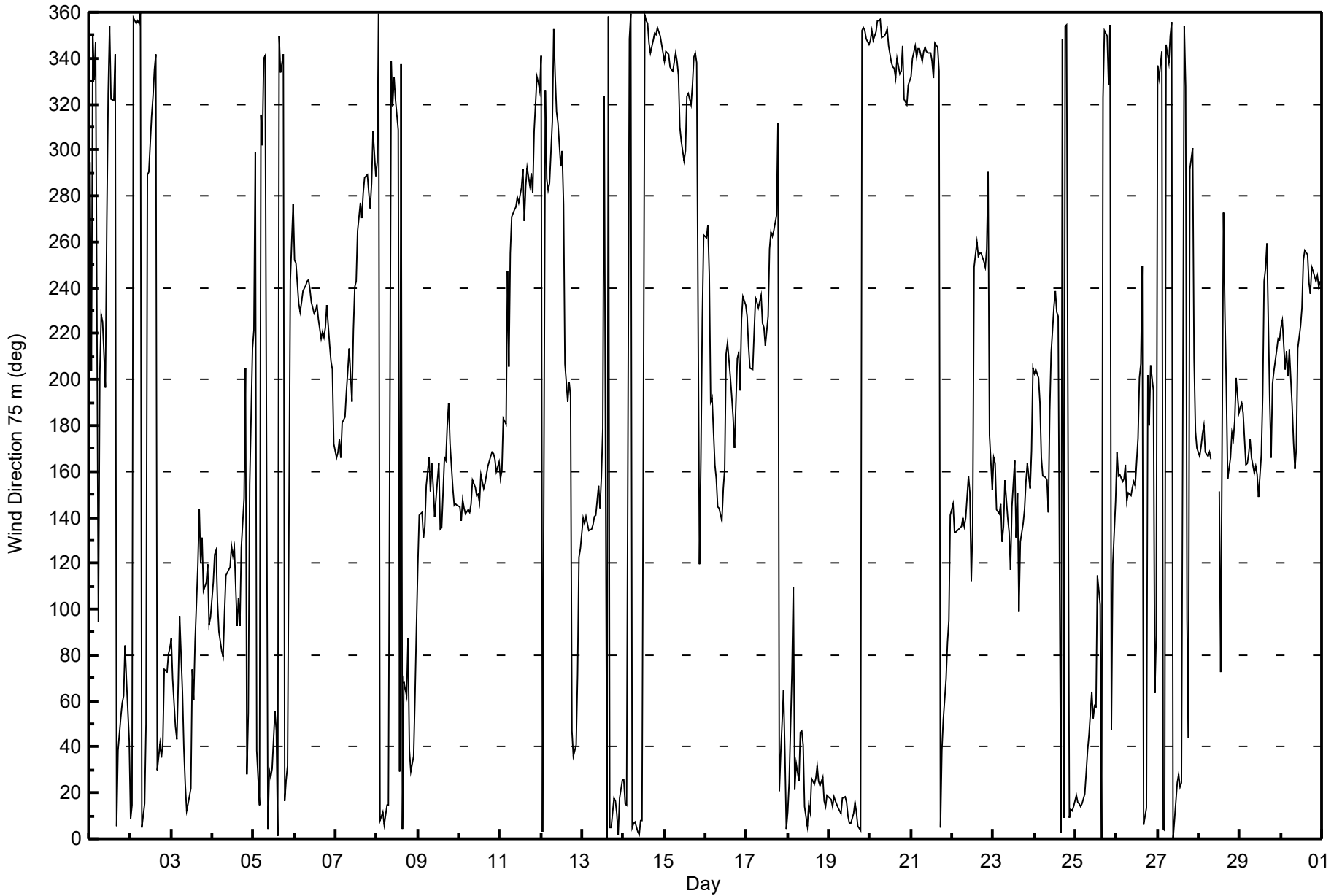
Wind Direction 75 m (WD75m) - deg
Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 102 deg on Jun 8 14:00	Hours of Data: 717
Minimum Value: 2 deg on Jun 23 22:00	Hours of Missing Data: 3
Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 7 Median = 11 Q ₃ = 18 P ₉₀ = 30 P ₉₉ = 84	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	33	92	31	28	82	34	25	14	24	76	54	27	19	24	17	21	32	10	10	9	16	15	12	17	92
2-Jun	20	12	13	10	8	8	8	10	12	48	85	30	27	19	30	27	14	18	13	9	8	8	11	9	85
3-Jun	8	21	12	6	14	21	27	17	18	11	19	34	36	28	29	38	28	41	10	18	15	15	12	16	41
4-Jun	14	15	12	13	10	14	14	12	15	14	14	11	14	18	12	15	10	11	14	58	52	42	25	34	58
5-Jun	41	51	26	34	48	15	21	10	19	11	13	12	13	26	28	19	11	8	10	17	27	11	12	14	51
6-Jun	11	8	11	6	7	10	10	11	14	8	15	15	11	18	19	17	12	10	11	6	6	3	4	8	19
7-Jun	3	5	5	4	7	6	11	10	11	13	18	12	13	22	13	13	9	8	6	5	3	8	7	12	22
8-Jun	12	16	6	6	6	5	10	20	30	17	27	33	44	102	73	84	27	15	21	22	5	6	13	12	102
9-Jun	21	9	5	14	6	7	12	10	14	14	23	21	26	35	27	16	11	13	7	6	4	3	3	4	35
10-Jun	3	3	4	3	3	2	3	5	7	7	9	10	11	9	7	9	9	7	7	5	4	4	3	5	11
11-Jun	4	22	56	23	16	11	12	9	10	9	9	11	19	28	13	13	11	6	5	8	11	7	4	5	56
12-Jun	9	6	24	10	6	18	15	20	43	31	24	35	26	34	42	11	10	6	91	8	21	12	22	11	91
13-Jun	6	4	6	5	7	5	6	7	8	18	16	26	47	39	13	11	11	8	14	7	10	8	9	7	47
14-Jun	9	6	14	11	6	6	5	4	9	9	6	5	9	11	10	8	7	8	9	7	7	8	8	9	14
15-Jun	8	8	8	7	7	9	10	9	13	10	7	7	7	9	8	8	12	12	13	25	33	18	34	5	34
16-Jun	5	5	13	9	12	6	9	8	10	9	14	11	18	9	9	9	9	8	23	10	10	26	7	9	26
17-Jun	11	11	8	14	8	7	14	14	9	13	15	14	15	9	12	15	15	13	48	8	11	23	14	12	48
18-Jun	10	7	13	62	9	11	14	14	15	18	20	10	13	10	9	9	8	8	7	7	6	7	6	7	62
19-Jun	10	7	8	9	6	7	6	7	8	7	5	6	6	6	6	6	7	6	7	7	7	7	7	7	10
20-Jun	7	9	8	9	9	10	10	8	9	8	9	8	8	9	8	8	11	12	11	10	10	7	6	6	12
21-Jun	7	7	9	7	8	8	8	12	9	10	12	19	23	19	17	22	15	23	14	9	10	9	17	12	23
22-Jun	5	5	9	5	4	5	9	14	12	11	16	30	44	54	8	8	13	10	8	6	13	58	31	17	58
23-Jun	8	6	5	5	9	9	8	14	16	23	19	29	26	32	45	30	23	19	12	8	6	2	9	6	45
24-Jun	6	5	9	14	7	6	6	8	9	21	14	20	20	15	19	62	28	15	7	12	21	11	7	7	62
25-Jun	6	8	6	5	5	7	9	15	15	36	24	24	45	69	61	83	37	21	17	15	17	14	32	10	83
26-Jun	7	4	5	5	5	8	9	7	8	6	6	8	21	15	23	25	27	59	45	13	8	69	95	44	95
27-Jun	29	14	12	13	13	12	15	22	21	16	18	21	32	31	69	65	92	29	39	55	7	75	7	3	92
28-Jun	3	4	4	7	4	5	4	10	DF	DF	14	DF	23	86	28	14	23	6	9	6	11	5	6	5	86
29-Jun	5	4	8	4	5	5	7	9	10	13	15	13	21	15	24	15	44	61	8	10	5	3	4	2	61
30-Jun	3	6	11	10	11	16	16	10	12	19	21	20	19	16	14	14	14	13	7	7	5	4	6	7	21

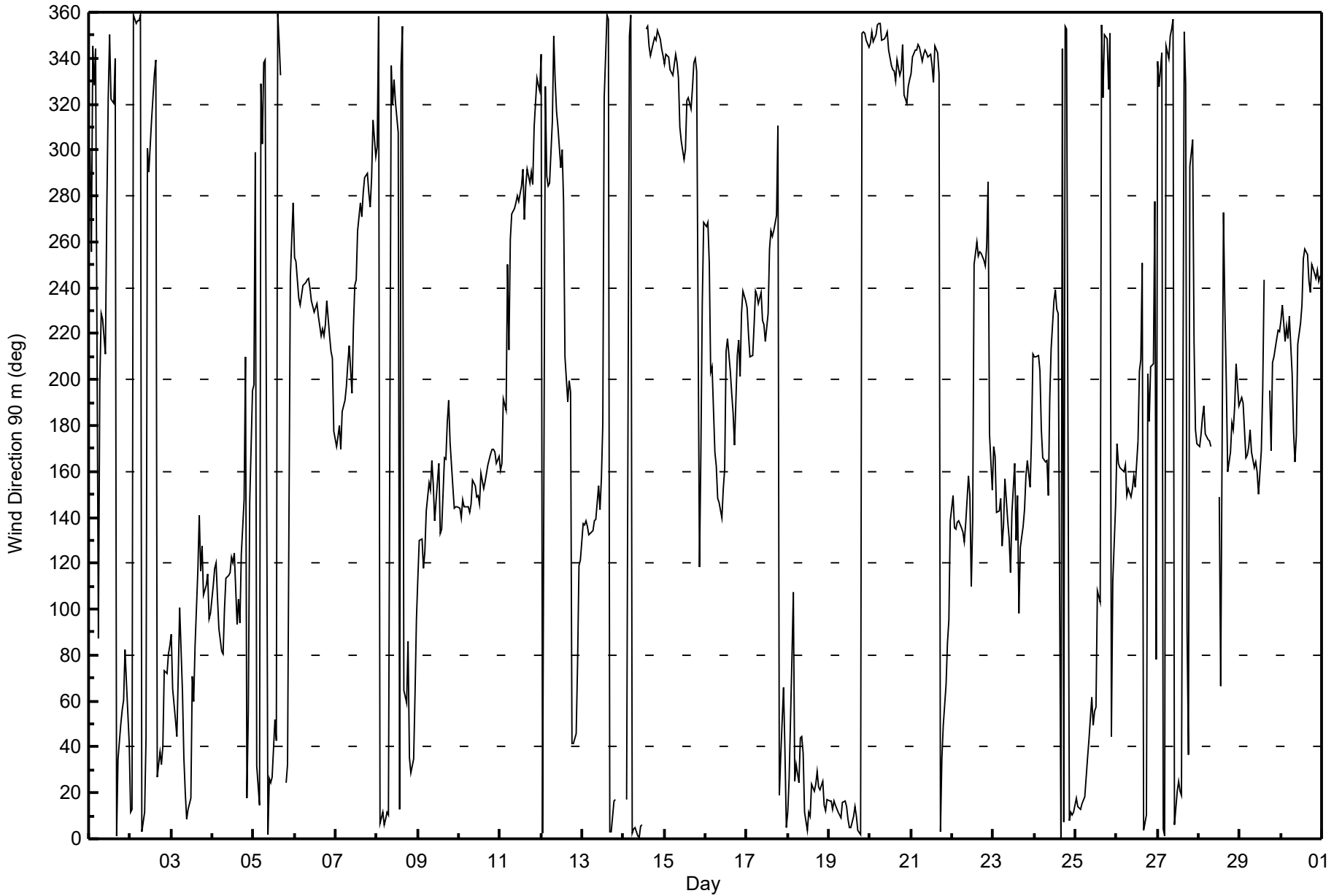
41	92	56	62	82	34	27	22	43	76	85	35	47	102	73	84	92	61	91	58	52	75	95	44	
Diurnal Maximum																								

DF - DAS Failure





Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 102 deg on Jun 8 14:00 Minimum Value: 1 deg on Jun 30 00:00 Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 17 P ₉₀ = 28 P ₉₉ = 74																		Hours in Service: 720 Hours of Data: 706 Hours of Missing Data: 14 Hours of Calibration: 0 Percent Operational Time: 98.1																								
Day	Hourly Period Ending At (MST)																								Daily Maximum																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																		
1-Jun	25	94	28	19	61	33	26	10	22	73	49	24	18	23	16	19	31	10	9	8	16	14	11	15	94																	
2-Jun	19	11	12	7	7	7	8	9	11	43	73	28	24	18	28	26	13	17	12	9	9	8	12	9	73																	
3-Jun	8	17	10	7	15	18	28	14	16	11	17	29	33	27	28	38	28	38	10	16	11	12	11	13	38																	
4-Jun	11	14	11	10	9	14	14	11	11	9	11	9	11	16	10	12	9	9	14	52	50	45	20	34	52																	
5-Jun	40	64	27	23	46	14	16	10	19	10	12	11	14	25	27	18	10	UO	UO	16	24	11	12	13	64																	
6-Jun	10	7	9	6	6	8	10	10	14	8	14	15	11	18	18	16	12	8	11	6	6	3	4	10	18																	
7-Jun	4	5	6	4	8	7	10	9	10	13	18	11	13	21	12	12	9	8	6	5	3	9	6	10	21																	
8-Jun	9	15	5	4	6	4	10	19	28	15	26	30	37	102	64	86	28	15	19	22	3	5	16	9	102																	
9-Jun	17	9	8	13	8	9	11	9	14	14	24	22	25	34	26	16	11	13	7	7	4	3	3	4	34																	
10-Jun	3	2	4	2	2	2	2	5	7	8	9	10	12	9	7	9	10	8	7	5	4	3	4	5	12																	
11-Jun	4	19	61	19	12	14	12	9	9	9	9	10	19	27	12	12	10	5	5	7	10	7	3	4	61																	
12-Jun	8	5	23	8	6	15	12	20	39	26	22	31	23	28	42	10	10	6	91	7	20	11	17	8	91																	
13-Jun	7	5	6	5	6	5	6	6	8	18	17	25	47	38	11	10	10	7	13	7	UO	UO	UO	UO	47																	
14-Jun	UO	UO	15	11	5	5	5	4	8	8	6	4	UO	9	8	7	7	9	7	8	7	8	7	8	15																	
15-Jun	7	7	7	6	6	8	9	8	12	9	7	6	6	7	8	7	12	11	11	20	35	18	37	5	37																	
16-Jun	5	6	9	10	9	11	10	8	11	9	15	11	18	8	9	9	8	8	22	8	9	24	6	8	24																	
17-Jun	8	10	8	12	8	6	13	13	9	12	14	13	14	9	12	15	15	12	47	8	10	21	16	11	47																	
18-Jun	10	9	13	34	12	11	14	13	14	17	19	9	13	10	8	8	8	8	7	6	6	6	5	6	34																	
19-Jun	9	7	8	9	6	7	6	6	7	6	5	6	5	5	6	6	6	6	7	7	7	7	7	7	9																	
20-Jun	7	8	8	9	9	10	10	8	9	8	9	8	8	8	7	8	11	12	10	9	11	6	5	6	12																	
21-Jun	6	6	8	6	7	7	7	11	8	10	12	17	21	18	16	21	14	22	14	9	10	7	13	13	22																	
22-Jun	5	4	6	5	4	8	6	11	12	11	17	29	45	54	7	8	13	10	8	5	12	52	33	20	54																	
23-Jun	8	6	5	5	12	8	8	15	16	27	17	28	26	31	41	29	22	17	13	9	6	3	11	5	41																	
24-Jun	4	4	6	12	9	6	6	8	9	19	13	19	19	13	18	61	28	15	6	12	20	10	7	7	61																	
25-Jun	6	7	5	4	4	6	9	14	15	35	24	22	45	65	66	74	32	19	16	14	17	12	29	12	74																	
26-Jun	6	5	7	6	5	7	9	7	8	6	7	7	20	14	22	24	26	58	45	12	6	50	72	65	72																	
27-Jun	35	11	12	10	9	11	14	17	19	16	17	20	29	29	61	46	80	30	33	55	7	79	7	3	80																	
28-Jun	3	5	4	6	4	5	3	8	DF	DF	15	DF	23	90	24	14	22	6	9	7	11	6	5	6	90																	
29-Jun	5	4	8	4	6	7	6	9	10	13	15	14	22	14	23	UO	UO	60	8	10	5	3	4	1	60																	
30-Jun	3	4	9	8	10	14	17	12	13	19	20	20	19	15	13	13	13	12	7	6	5	4	6	7	20																	
																		40	94	61	34	61	33	28	20	39	73	73	31	47	102	66	86	80	60	91	55	50	79	72	65	
Diurnal Maximum																																										
DF - DAS Failure UO - Unstable Operation																																										





Summary of Hour Averages

Mannix - June 2023

Maximum Value: 1.6 km/h on Jun 10 15:00		Maximum Daily Average: 0.9 km/h on Jun 10		Hours in Service: 720																						
Minimum Value: -1.4 km/h on Jun 19 07:00		Minimum Daily Average: -0.9 km/h on Jun 19		Hours of Data: 717																						
Maximum Diurnal Average: 0.2 km/h at hour 10		Minimum Diurnal Average: 0.0 km/h at hour 17		Hours of Missing Data: 3																						
Monthly Average: 0.08 km/h		Percentiles: P ₁ = -1.1 P ₁₀ = -0.6 Q ₁ = -0.2 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.2		Hours of Calibration: 0																						
				Percent Operational Time: 99.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.1	0.1	-0.2	-0.2	0.1	0.3	0.1	0.3	0.0	0.4	0.1	0.0	0.0	-0.5	-0.3	0.0	0.1	0.3	0.4	0.5	0.4	0.5	0.4	0.0	0.1	0.5
2-Jun	-0.3	-0.3	-0.3	-0.3	-0.4	-0.3	-0.7	-0.2	-0.1	0.2	0.0	-0.2	-0.1	-0.2	-0.1	-0.3	0.1	0.3	0.2	0.1	0.5	0.5	1.0	0.9	0.0	1.0
3-Jun	0.7	0.1	-0.3	-0.1	0.1	0.3	0.3	0.3	0.1	0.0	0.0	0.2	0.3	0.5	0.7	0.8	0.4	0.3	0.5	0.9	1.1	0.9	0.5	0.7	0.4	1.1
4-Jun	0.9	0.7	0.6	1.2	1.0	0.7	0.6	1.0	0.8	1.2	1.2	0.9	0.9	0.7	0.9	1.0	1.2	0.9	0.4	0.1	0.2	0.0	0.1	-0.1	0.7	1.2
5-Jun	-0.1	-0.1	0.0	-0.3	0.0	-0.1	-0.2	-0.1	-0.2	0.1	0.1	0.0	0.7	0.3	0.0	-0.2	-0.4	-0.4	-0.3	-0.1	0.0	0.2	0.0	0.2	0.0	0.7
6-Jun	0.2	0.3	0.2	0.1	0.1	-0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.3	0.5	0.3	0.3	0.2	0.0	0.3	0.2	0.1	0.1	0.2	0.7	0.2	0.7
7-Jun	0.9	1.0	0.8	0.8	0.6	0.6	0.4	0.1	0.0	0.2	0.3	0.2	0.1	-0.1	-0.3	0.1	-0.3	-0.3	-0.3	0.1	0.2	0.1	-0.1	0.0	0.2	1.0
8-Jun	0.0	-0.6	-0.8	-0.3	-0.4	-0.3	-0.2	0.2	-0.1	-0.3	-0.2	-0.1	0.2	0.3	0.3	0.0	0.7	0.4	0.5	0.1	-0.2	-0.1	0.2	0.4	0.0	0.7
9-Jun	0.1	-0.1	0.1	0.2	-0.1	0.3	0.3	0.1	0.5	0.4	0.4	0.4	0.6	0.9	0.7	0.4	0.4	0.4	0.1	0.2	0.7	0.6	0.8	0.9	0.4	0.9
10-Jun	0.7	0.5	0.6	0.6	0.5	0.6	0.6	0.7	0.8	1.0	1.0	1.2	1.1	1.2	1.6	1.4	1.2	1.1	0.9	0.8	0.8	0.8	0.9	0.8	0.9	1.6
11-Jun	0.8	0.5	0.2	0.4	0.0	0.1	0.0	0.1	0.1	0.0	0.0	-0.2	0.0	-0.1	-0.1	-0.3	-0.4	-0.1	-0.1	0.1	-0.3	-0.6	-0.6	-0.5	0.0	0.8
12-Jun	-0.3	-0.3	-0.1	0.0	-0.1	0.0	-0.2	0.0	0.1	-0.1	-0.1	0.0	-0.1	0.0	0.1	0.4	0.1	0.2	-0.1	-0.3	-0.1	0.2	0.6	0.7	0.0	0.7
13-Jun	0.7	0.6	0.7	0.6	0.5	0.8	0.6	0.5	0.5	0.4	0.4	0.3	0.2	-0.3	-0.3	-0.4	-0.6	-1.1	-0.3	-0.7	-0.5	-0.7	-0.3	-0.2	0.1	0.8
14-Jun	0.0	-0.3	-0.2	-0.4	-0.2	-0.3	-0.6	-0.6	-0.6	-0.5	-0.6	-0.7	-0.5	-0.7	-0.8	-0.7	-0.8	-1.0	-1.1	-1.2	-1.0	-1.0	-0.8	-0.9	-0.6	0.0
15-Jun	-1.0	-0.7	-0.6	-1.1	-0.9	-0.9	-0.5	-0.9	-0.4	-0.3	-0.3	-0.4	-0.4	-0.5	-0.6	-0.7	-0.4	-0.5	-0.3	0.0	0.2	0.1	-0.1	-0.1	-0.5	0.2
16-Jun	-0.1	0.0	-0.1	0.4	0.4	0.6	0.5	0.6	0.5	0.5	0.7	0.5	0.2	0.0	0.4	0.1	0.4	0.7	0.2	0.1	0.3	0.2	0.1	0.2	0.3	0.7
17-Jun	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.4	0.2	0.2	0.1	0.0	0.1	0.0	-0.1	0.1	-0.3	-0.4	-0.1	0.0	-0.2	-0.3	0.0	0.4
18-Jun	-0.4	-0.1	-0.1	0.0	-0.2	0.1	0.0	0.2	0.3	0.3	-0.1	-0.5	-0.1	-0.7	-0.3	-0.4	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4	-0.7	-0.6	-0.2	0.3
19-Jun	-0.5	-0.5	-0.5	-0.6	-0.9	-0.9	-1.4	-1.2	-0.9	-0.5	-0.9	-0.8	-1.2	-1.3	-1.2	-0.7	-0.9	-0.8	-1.0	-0.8	-1.0	-0.9	-0.9	-1.1	-0.9	-0.5
20-Jun	-1.0	-0.7	-1.1	-0.7	-0.4	-0.5	-0.4	-0.7	-0.8	-0.7	-0.5	-0.7	-0.9	-0.6	-0.5	-0.6	-0.8	-0.6	-0.6	-0.3	-0.3	-0.5	-0.7	-0.5	-0.6	-0.3
21-Jun	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.5	-0.3	-0.5	-0.4	-0.2	-0.3	-0.2	-0.3	-0.4	-0.2	-0.5	-0.3	0.3	0.5	0.7	0.5	0.1	0.2	-0.1	0.7
22-Jun	0.4	0.3	0.2	0.2	0.4	0.3	0.5	0.4	0.2	0.6	0.5	0.6	0.3	0.3	0.2	0.1	0.0	0.0	0.2	0.1	-0.1	-0.1	0.1	0.3	0.2	0.6
23-Jun	0.4	0.5	0.4	0.4	0.3	0.6	0.6	0.4	0.4	0.2	0.9	0.9	0.5	0.7	0.5	0.9	0.5	0.4	0.3	0.3	0.3	0.6	0.6	0.3	0.5	0.9
24-Jun	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.1	0.1	0.0	0.0	0.1	0.0	-0.3	-0.5	-0.8	-1.0	-0.6	-0.8	-0.8	-0.6	0.0	0.5
25-Jun	-0.3	-0.2	-0.3	-0.6	-0.5	-0.3	-0.4	0.0	0.1	0.5	0.5	0.2	0.4	-0.1	0.7	0.1	0.0	-0.1	-0.3	-0.1	-0.2	0.0	0.1	0.5	0.0	0.7
26-Jun	0.6	0.6	0.7	0.5	0.4	0.3	0.5	0.5	0.6	0.7	0.8	0.8	0.3	0.3	0.1	0.1	-0.9	0.0	0.2	0.4	0.1	0.1	0.1	0.1	0.3	0.8
27-Jun	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	0.0	0.2	0.1	0.2	0.2	0.3	-0.1	-0.1	0.3	0.2	0.0	0.3	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.3
28-Jun	0.7	0.7	0.6	0.6	0.5	0.8	0.9	0.6	DF	DF	0.6	DF	0.5	0.0	0.1	0.0	0.4	0.7	0.5	0.4	0.5	0.4	0.1	0.2	0.5	0.9
29-Jun	0.0	0.0	0.3	0.4	0.1	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.2	0.2	0.3	0.0	0.2	0.5	0.3	0.2	0.1	0.0	0.0	0.7
30-Jun	0.0	0.0	0.3	0.3	0.3	0.2	0.5	0.7	0.5	0.5	0.2	0.0	0.1	0.1	0.0	0.3	0.1	0.1	0.0	0.3	0.2	0.1	0.0	0.1	0.2	0.7
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1 Maximum Value: 5.1 km/h on Jun 19 14:00		Hours in Service: 720 Hours of Data: 717 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																							
Minimum Value: 0.2 km/h on Jun 22 22:00																									
Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.2 Median = 1.7 Q ₃ = 2.2 P ₉₀ = 3.0 P ₉₉ = 4.2																									
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-Jun	0.4	0.6	0.6	0.7	0.4	0.7	1.0	1.0	1.2	1.3	1.7	2.1	2.1	2.1	1.9	1.4	1.6	1.7	1.5	1.3	1.1	1.2	1.2	1.2	2.1
2-Jun	0.8	1.4	1.7	1.5	1.2	1.7	2.2	1.9	1.5	1.4	1.6	1.9	2.2	2.3	2.2	2.1	1.9	1.7	1.7	1.9	1.8	1.6	1.7	1.7	2.3
3-Jun	1.4	0.7	0.6	0.8	0.7	0.6	1.0	1.3	1.7	1.8	1.9	2.1	1.9	2.0	2.0	1.7	1.7	1.3	2.0	1.6	1.9	1.5	1.4	1.6	2.1
4-Jun	2.2	1.7	1.4	1.5	1.7	1.4	1.6	1.6	1.6	2.0	2.4	2.3	2.1	1.6	1.4	1.4	1.7	2.1	1.4	0.6	0.7	0.2	0.3	0.4	2.4
5-Jun	0.2	0.2	0.4	0.6	0.7	1.5	1.5	1.4	1.8	2.2	2.6	2.4	2.4	2.0	1.8	1.9	2.1	1.8	1.7	1.9	0.8	1.5	2.9	2.1	2.9
6-Jun	2.2	2.7	1.8	1.4	1.3	1.7	2.0	1.9	1.9	2.5	2.9	2.9	2.9	2.8	2.6	2.9	3.0	2.9	2.3	1.5	0.7	0.6	0.8	1.1	3.0
7-Jun	1.7	2.0	1.6	1.8	1.5	1.7	1.9	1.9	1.6	2.0	3.0	3.3	3.3	2.9	2.7	2.5	2.5	2.4	2.3	1.5	1.1	0.8	0.5	0.3	3.3
8-Jun	0.4	2.3	2.6	1.2	1.4	1.8	1.7	1.7	1.6	2.0	2.2	2.0	1.9	1.9	1.9	1.6	1.6	1.6	1.2	1.0	1.0	1.0	1.3	0.7	2.6
9-Jun	0.6	0.4	0.3	0.4	0.3	0.6	1.2	1.3	1.5	1.7	1.7	1.9	2.1	1.8	1.9	1.9	1.7	1.9	1.7	1.0	1.1	1.3	1.4	2.0	2.1
10-Jun	1.4	1.7	1.2	1.7	1.7	1.5	1.5	1.8	2.2	2.2	2.4	2.6	2.6	3.2	3.0	3.1	3.1	3.1	2.9	2.4	2.1	1.5	1.8	1.8	3.2
11-Jun	1.6	1.4	0.9	1.0	0.6	0.7	1.1	1.6	1.7	1.6	1.9	1.8	2.4	2.2	1.8	2.2	2.5	2.1	1.5	0.8	1.6	2.0	2.0	1.9	2.5
12-Jun	1.1	0.9	0.6	0.4	0.5	0.6	1.4	1.5	1.6	1.8	2.0	1.9	1.9	1.3	1.6	1.8	1.4	1.0	0.8	0.7	1.0	0.9	1.5	2.3	2.3
13-Jun	2.1	1.7	1.7	2.3	2.3	2.1	2.0	1.9	1.8	1.6	1.6	1.5	1.3	1.9	2.3	2.0	3.2	3.8	3.5	2.0	2.1	2.8	2.8	2.7	3.8
14-Jun	1.9	1.6	1.5	1.8	2.0	2.2	2.7	3.1	3.0	2.9	3.4	3.5	2.9	3.5	3.6	3.7	3.3	3.8	3.9	4.1	4.0	3.7	3.8	3.5	4.1
15-Jun	3.6	3.5	3.3	3.3	3.3	2.9	2.9	3.2	2.2	1.8	1.8	1.9	2.0	2.5	2.4	2.5	2.4	1.8	1.3	0.5	0.3	0.6	0.7	0.6	3.6
16-Jun	0.9	1.1	0.7	1.0	1.0	1.5	1.3	1.6	1.6	1.6	2.0	1.6	2.5	2.5	2.5	2.5	2.1	2.0	2.5	1.3	1.1	1.9	1.7	1.9	2.5
17-Jun	1.0	1.1	1.2	0.8	1.3	1.3	1.6	1.7	2.1	2.1	2.4	2.7	2.5	2.6	2.2	2.2	2.4	2.0	2.4	2.8	1.3	0.5	0.4	0.7	2.8
18-Jun	1.0	0.9	0.5	0.5	1.0	1.5	1.7	1.4	1.9	2.0	2.2	2.7	2.7	2.9	2.9	3.2	3.2	3.0	3.2	3.0	2.8	2.1	2.9	3.5	3.5
19-Jun	2.5	2.2	2.6	3.0	3.4	3.6	4.2	4.5	4.8	4.2	4.3	3.9	4.3	5.1	5.0	4.3	4.2	3.8	4.2	3.8	3.8	3.4	3.6	3.6	5.1
20-Jun	3.4	3.0	3.6	3.5	3.3	3.4	3.2	3.6	3.5	3.8	3.2	3.0	2.7	2.6	2.6	2.2	2.7	2.6	2.1	1.8	1.5	1.8	2.0	2.0	3.8
21-Jun	1.8	1.6	1.1	1.7	1.8	1.8	2.3	2.5	2.3	2.4	2.4	2.4	2.4	2.2	2.4	2.3	2.3	2.1	1.9	1.6	1.0	0.7	0.4	0.4	2.5
22-Jun	0.6	0.6	0.4	0.4	0.8	0.9	1.2	0.9	1.6	1.9	1.7	1.7	1.5	1.8	2.0	1.6	2.0	2.0	1.4	0.6	0.2	0.2	0.4	0.7	2.0
23-Jun	0.7	0.8	0.8	0.9	0.6	1.3	1.5	1.4	1.5	1.5	1.8	2.1	1.9	2.1	1.8	1.7	1.6	1.3	1.1	0.7	0.7	0.9	1.2	1.1	2.1
24-Jun	1.0	0.9	0.8	0.7	0.9	1.3	1.5	1.5	1.4	2.0	2.2	2.1	1.9	2.1	2.2	3.1	2.0	1.8	3.0	3.8	2.9	3.4	3.1	2.9	3.8
25-Jun	2.2	1.8	1.8	2.0	1.9	2.0	1.9	1.7	1.8	1.7	2.0	2.0	1.9	1.7	1.8	1.7	1.8	1.4	1.4	1.0	0.5	0.4	0.6	0.7	2.2
26-Jun	1.0	1.0	1.6	1.2	1.0	1.0	1.5	1.3	1.6	1.6	1.8	1.9	1.2	1.5	2.2	2.2	3.6	1.5	1.7	1.5	1.0	0.4	0.4	0.5	3.6
27-Jun	0.3	0.2	0.4	0.7	0.8	1.0	1.3	1.2	1.9	2.1	2.3	2.2	2.0	1.9	1.5	2.1	1.5	1.4	0.8	0.7	0.7	0.8	1.0	0.8	2.3
28-Jun	1.2	1.4	1.1	1.1	1.0	1.6	1.9	1.6	DF	DF	1.8	DF	1.7	1.0	0.9	1.8	1.8	1.5	1.7	1.5	1.1	1.2	0.7	0.7	1.9
29-Jun	0.3	0.4	0.6	0.5	0.6	1.1	1.4	1.7	1.6	1.7	1.6	1.7	2.1	2.4	2.2	3.1	1.8	1.2	1.2	0.9	0.8	1.2	1.2	1.0	3.1
30-Jun	0.8	0.5	0.6	0.6	0.8	0.8	1.1	1.5	1.6	1.5	2.0	2.6	2.4	2.5	2.3	2.6	2.8	2.6	2.7	2.3	1.8	0.9	0.8	1.0	2.8
	3.6	3.5	3.6	3.5	3.4	3.6	4.2	4.5	4.8	4.2	4.3	3.9	4.3	5.1	5.0	4.3	4.2	3.8	4.2	4.1	4.0	3.7	3.8	3.6	
	Diurnal Maximum																								
DF - DAS Failure																									



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 1.9 km/h on Jun 4 11:00		Maximum Daily Average: 1.0 km/h on Jun 10		Hours in Service: 720																						
Minimum Value: -1.3 km/h on Jun 15 08:00		Minimum Daily Average: -0.6 km/h on Jun 20		Hours of Data: 717																						
Maximum Diurnal Average: 0.3 km/h at hour 10		Minimum Diurnal Average: -0.1 km/h at hour 23		Hours of Missing Data: 3																						
Monthly Average: 0.04 km/h		Percentiles: P ₁ = -1.1 P ₁₀ = -0.6 Q ₁ = -0.3 Median = 0.0 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.5		Hours of Calibration: 0																						
				Percent Operational Time: 99.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	-0.3	-0.1	-0.2	-0.3	-0.1	0.3	-0.1	-0.1	-0.2	0.6	-0.2	0.5	0.0	-0.4	-0.4	0.3	0.3	0.4	0.6	1.0	0.4	0.3	0.4	0.1	0.1	1.0
2-Jun	-0.2	0.0	-0.5	-0.4	-0.5	-0.4	-0.8	0.0	-0.2	0.2	-0.1	-0.3	-0.1	0.1	0.1	-0.2	0.4	0.3	0.4	0.3	0.6	0.5	0.9	1.0	0.1	1.0
3-Jun	0.6	0.4	-0.1	0.1	0.5	0.3	0.2	0.2	0.1	0.0	-0.1	0.2	0.5	0.4	0.8	0.8	0.3	0.2	0.4	0.9	1.6	1.5	0.0	0.3	0.4	1.6
4-Jun	1.1	1.4	0.9	1.2	0.7	0.7	0.4	0.6	0.8	1.4	1.9	1.0	0.9	1.1	0.6	1.1	0.8	1.0	0.2	0.0	0.2	-0.1	0.0	-0.3	0.7	1.9
5-Jun	-0.2	-0.4	0.0	-0.2	-0.4	-0.4	-0.2	-0.2	0.1	0.4	0.4	0.2	0.7	0.6	0.1	-0.2	-0.5	-0.6	-0.2	0.0	0.0	-0.3	-0.7	-0.2	-0.1	0.7
6-Jun	-0.5	-0.6	-0.3	-0.4	-0.5	-0.6	-0.4	-0.2	0.1	-0.6	-0.2	-0.1	-0.4	0.4	0.1	0.1	-0.3	-0.5	-0.4	-0.4	-0.3	-0.3	-0.3	0.6	-0.2	0.6
7-Jun	1.0	1.1	0.8	0.9	0.3	0.5	0.1	-0.3	-0.3	0.1	-0.3	-0.7	-0.5	-0.5	-0.3	0.1	-0.7	-0.4	-0.5	-0.3	-0.4	-0.5	-0.7	-0.4	-0.1	1.1
8-Jun	-0.2	-0.6	-0.4	-0.3	-0.4	-0.3	0.0	0.5	0.1	-0.2	-0.1	-0.1	0.3	0.8	0.7	-0.3	0.8	0.6	0.5	0.2	0.1	0.1	0.3	0.2	0.1	0.8
9-Jun	0.2	0.3	0.4	0.3	0.1	0.3	0.3	0.0	0.5	0.4	0.4	0.3	0.8	1.7	1.1	0.7	0.2	0.3	-0.2	0.1	0.7	0.7	0.8	1.0	0.5	1.7
10-Jun	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.8	0.9	1.6	1.2	1.3	1.2	1.2	1.8	1.6	1.4	1.2	1.0	0.7	0.8	0.8	0.9	0.7	1.0	1.8
11-Jun	0.8	0.5	0.1	0.4	-0.3	-0.2	-0.5	-0.2	-0.4	-0.3	-0.3	-0.5	-0.2	-0.2	-0.5	-0.7	-0.5	-0.4	-0.4	-0.4	-0.5	-0.9	-1.0	-0.8	-0.3	0.8
12-Jun	-0.5	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	0.2	0.2	-0.2	-0.3	0.4	-0.1	0.0	0.0	0.1	-0.2	-0.3	0.1	-0.1	-0.1	0.2	0.7	0.7	0.0	0.7
13-Jun	0.8	0.5	0.7	0.6	0.5	0.7	0.5	0.8	0.5	0.5	0.3	0.1	0.1	-0.2	0.1	-0.2	-0.2	-0.8	0.3	-0.5	-0.4	-0.6	0.1	0.5	0.2	0.8
14-Jun	0.1	-0.1	-0.1	-0.5	-0.3	0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.4	0.1	-0.5	-0.4	-1.1	-1.0	-1.0	-1.0	-1.2	-0.9	-1.1	-1.1	-1.0	-0.5	0.2
15-Jun	-1.1	-0.9	-0.8	-1.3	-1.0	-0.9	-0.6	-1.3	-0.6	-0.4	-0.4	-0.6	-0.4	-0.6	-0.8	-0.6	-0.5	-0.5	-0.6	-0.1	0.2	0.2	-0.3	-0.6	-0.6	0.2
16-Jun	-0.7	-0.4	-0.3	0.1	0.1	0.5	0.6	0.6	0.5	0.6	0.6	0.7	-0.4	-0.5	0.2	-0.3	0.2	0.5	-0.4	-0.4	0.0	-0.2	-0.6	-0.5	0.0	0.7
17-Jun	-0.2	-0.2	-0.1	-0.1	-0.4	-0.4	-0.2	-0.1	-0.4	0.0	-0.3	-0.3	-0.3	-0.6	-0.4	-0.5	-0.4	-0.1	-0.6	0.1	0.1	0.1	0.0	-0.4	-0.2	0.1
18-Jun	-0.3	-0.1	0.0	0.0	-0.1	0.0	0.1	0.1	0.4	0.5	0.2	-0.3	0.4	-0.3	0.1	0.5	0.3	0.5	0.4	0.4	0.0	-0.1	-0.6	-0.1	0.1	0.5
19-Jun	0.0	-0.2	-0.3	0.0	-0.2	-0.5	-0.5	-0.5	-0.1	0.2	0.0	-0.4	-0.7	-0.8	-0.5	-0.1	-0.5	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0	-1.2	-0.4	0.2
20-Jun	-0.9	-0.4	-1.1	-0.8	0.1	0.2	0.0	-0.7	-0.5	-0.7	-0.3	-0.9	-1.0	-0.8	-1.0	-0.8	-1.0	-0.7	-0.8	-0.5	-0.4	-0.5	-0.8	-0.9	-0.6	0.2
21-Jun	-0.4	-0.2	-0.4	-0.2	-0.3	0.0	-0.8	-0.3	-0.3	-0.4	-0.3	0.2	-0.1	-0.6	-0.3	0.1	-0.5	0.3	0.5	0.8	0.7	0.5	0.1	0.4	-0.1	0.8
22-Jun	0.5	0.5	0.3	0.5	1.0	0.1	0.2	0.5	0.2	0.3	0.5	0.5	0.3	-0.2	-0.1	-0.3	-0.4	-0.5	-0.3	-0.3	-0.2	-0.2	0.0	0.4	0.1	1.0
23-Jun	0.5	0.3	0.4	0.5	0.3	0.8	0.5	0.5	0.4	0.0	1.7	1.1	0.7	0.9	0.7	1.2	0.8	0.5	0.0	0.1	0.3	0.6	0.5	-0.1	0.6	1.7
24-Jun	0.0	0.1	0.2	0.2	0.5	0.5	0.5	0.6	0.4	0.3	0.0	0.0	-0.4	-0.9	0.0	0.4	-0.2	-0.2	-0.9	-0.9	-0.3	-0.3	-0.4	-0.3	0.0	0.6
25-Jun	-0.2	0.0	0.0	-0.4	-0.4	-0.1	-0.2	0.1	0.0	0.8	0.4	0.2	0.0	-0.3	1.2	-0.2	-0.2	-0.1	-0.4	0.0	-0.2	0.0	0.2	0.5	0.0	1.2
26-Jun	0.5	0.7	0.8	0.9	0.5	0.3	0.6	0.6	0.5	0.7	0.9	0.7	0.1	0.0	-0.1	-0.2	-0.6	0.1	-0.1	0.4	-0.3	0.0	0.0	0.0	0.3	0.9
27-Jun	-0.2	-0.2	-0.2	-0.3	-0.4	-0.2	0.0	0.1	0.1	0.4	0.6	0.3	-0.3	-0.1	0.5	0.2	-0.1	-0.1	0.0	0.0	-0.2	-0.1	0.2	0.3	0.0	0.6
28-Jun	0.7	0.6	0.6	0.5	0.5	0.8	0.8	0.7	DF	DF	0.7	DF	0.8	-0.1	-0.1	-0.7	0.4	0.8	0.5	0.1	0.4	0.1	-0.2	0.0	0.4	0.8
29-Jun	-0.1	-0.1	0.1	0.1	0.2	0.1	0.4	0.7	0.7	0.6	0.7	0.9	0.7	0.3	0.1	-0.9	-0.6	0.0	0.4	0.1	-0.2	-0.5	-0.6	-0.7	0.1	0.9
30-Jun	-0.5	-0.5	-0.1	-0.1	0.0	-0.1	0.4	0.9	0.7	0.8	0.1	0.0	-0.4	-0.5	-0.5	-0.2	-0.4	-0.5	-0.6	-0.5	-0.6	-0.6	-0.6	-0.6	-0.2	0.9
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										



Summary of Hour Standard Deviations

Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1 Maximum Value: 5.0 km/h on Jun 19 09:00 Minimum Value: 0.2 km/h on Jun 22 21:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 1.1 Median = 1.9 Q ₃ = 2.5 P ₉₀ = 3.2 P ₉₉ = 4.1																								Hours in Service: 720 Hours of Data: 717 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6	
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	0.3	0.5	0.4	0.5	0.5	0.7	0.8	1.1	1.6	1.8	2.1	2.9	2.6	2.5	2.2	2.0	1.8	1.8	1.7	1.5	1.3	1.6	1.6	1.3	2.9
2-Jun	1.0	1.7	1.6	1.3	1.3	1.8	2.2	2.0	1.7	1.9	2.0	2.3	2.8	2.9	2.6	2.6	2.2	2.0	1.8	1.8	1.9	1.7	2.2	1.9	2.9
3-Jun	1.4	1.1	0.8	0.7	0.8	0.8	1.1	1.5	2.1	2.1	2.3	2.5	2.3	2.5	2.3	2.4	2.1	1.8	2.0	1.8	2.3	1.8	1.6	2.0	2.5
4-Jun	2.9	2.2	1.8	1.7	1.9	1.8	2.1	2.1	1.7	2.3	3.0	2.5	2.3	2.1	1.6	1.6	2.0	2.5	1.6	0.6	0.7	0.4	0.3	0.3	3.0
5-Jun	0.3	0.2	0.4	0.2	0.4	1.2	1.6	1.6	2.1	2.3	2.5	2.4	2.7	2.6	2.2	2.1	2.0	1.6	1.6	1.7	1.0	1.4	3.2	2.1	3.2
6-Jun	2.4	2.9	1.8	1.3	1.5	1.7	2.2	2.3	2.5	2.9	3.1	3.3	3.3	3.3	3.0	3.2	2.9	2.7	2.3	1.5	0.5	0.3	0.3	0.6	3.3
7-Jun	0.7	1.0	0.9	1.1	1.2	1.3	1.9	1.7	1.8	2.3	3.3	3.6	3.7	3.3	2.9	2.8	2.4	2.4	2.1	1.3	0.9	0.5	0.3	0.2	3.7
8-Jun	0.3	2.1	2.4	1.4	1.3	1.5	2.0	2.1	2.2	2.5	2.9	2.7	2.5	2.4	2.2	2.2	2.1	2.1	1.5	1.3	1.2	1.2	1.2	0.8	2.9
9-Jun	0.8	0.4	0.3	0.5	0.3	0.7	1.3	1.3	1.9	2.1	2.2	2.7	2.7	2.3	2.5	2.6	2.0	2.0	1.2	0.6	0.8	1.0	1.2	1.9	2.7
10-Jun	1.3	1.5	1.1	1.4	1.5	1.3	1.5	1.9	2.2	2.5	2.6	2.9	3.1	3.2	3.5	3.3	3.2	3.1	2.5	2.3	1.6	0.9	1.5	1.5	3.5
11-Jun	1.6	1.5	1.1	0.9	0.6	0.4	0.9	1.7	1.5	1.7	2.1	2.3	2.6	2.7	2.3	2.2	2.3	1.9	1.3	0.6	1.3	1.9	1.7	1.6	2.7
12-Jun	1.2	0.7	0.6	0.7	0.5	0.8	1.4	2.0	2.0	2.3	2.5	2.6	2.2	1.9	1.8	1.5	1.1	0.7	0.9	0.7	0.8	0.8	1.5	2.3	2.6
13-Jun	2.2	1.7	1.7	2.2	2.3	2.0	2.0	2.2	2.1	2.1	2.1	1.9	1.8	2.4	2.8	1.9	2.9	3.2	3.7	1.8	1.6	2.9	2.7	2.7	3.7
14-Jun	1.9	1.5	1.3	1.4	1.8	2.2	2.3	2.5	3.0	3.0	3.2	3.2	3.1	3.4	3.5	3.7	3.5	3.9	4.1	3.9	4.1	4.0	3.8	3.7	4.1
15-Jun	3.7	3.7	3.6	3.6	3.5	3.0	3.4	3.2	2.3	1.7	1.4	1.8	1.6	2.4	2.2	2.5	2.4	2.1	1.5	0.7	0.4	0.4	0.7	0.5	3.7
16-Jun	0.5	0.6	0.5	0.4	0.5	0.9	1.2	1.5	1.5	1.7	2.2	1.8	2.5	2.3	2.3	2.1	2.1	1.8	2.4	1.0	0.9	2.1	1.5	1.8	2.5
17-Jun	1.1	1.1	1.1	1.0	1.1	1.3	1.8	2.1	2.3	2.3	2.6	2.8	2.9	3.0	2.6	2.5	2.5	2.1	2.3	2.5	1.2	0.5	0.4	0.6	3.0
18-Jun	0.7	0.9	0.5	0.6	0.9	1.3	1.6	1.6	2.1	2.4	2.4	3.1	3.1	2.9	2.7	3.3	3.2	3.0	3.1	3.4	2.8	2.2	2.8	3.6	3.6
19-Jun	2.7	2.2	2.5	3.2	3.4	3.6	4.2	4.5	5.0	4.5	4.0	3.7	4.1	4.5	4.8	4.1	3.7	3.7	4.2	3.8	3.8	3.5	3.6	3.7	5.0
20-Jun	3.7	3.1	3.6	3.7	3.5	3.5	3.6	3.6	3.7	3.6	3.4	3.0	2.7	2.7	2.7	2.1	3.0	2.8	2.1	2.0	1.4	1.6	1.9	1.9	3.7
21-Jun	1.8	1.7	1.5	1.8	1.8	2.0	2.4	2.7	2.7	2.8	2.5	3.2	3.0	2.7	2.8	2.9	2.7	2.5	2.0	1.6	1.0	0.6	0.5	0.4	3.2
22-Jun	0.3	0.6	0.5	0.5	0.5	0.6	1.1	1.1	1.8	2.1	2.0	2.1	1.9	1.9	2.1	1.9	2.1	2.1	1.4	0.4	0.2	0.2	0.4	0.6	2.1
23-Jun	0.3	0.3	0.4	0.7	0.4	1.2	1.4	1.9	2.0	1.9	2.5	2.7	2.7	2.7	2.6	2.3	2.1	1.8	1.2	0.8	0.5	0.6	0.5	0.8	2.7
24-Jun	0.4	0.4	0.6	0.6	0.9	1.2	1.2	1.4	1.5	2.1	2.7	2.7	2.4	2.5	2.9	3.3	2.0	1.5	2.6	3.5	3.0	3.0	3.1	2.9	3.5
25-Jun	2.2	1.7	2.0	1.8	1.9	1.9	1.8	2.0	2.0	2.3	2.7	2.5	2.4	2.2	2.3	2.2	2.5	2.0	1.6	1.0	0.5	0.5	0.8	0.3	2.7
26-Jun	0.4	0.7	1.1	1.1	1.1	1.1	1.5	1.4	1.7	1.6	1.8	1.8	1.3	1.8	2.5	2.2	3.7	1.8	1.6	1.3	0.9	0.3	0.4	0.5	3.7
27-Jun	0.2	0.2	0.5	1.1	1.0	1.2	1.3	1.4	2.3	2.6	2.6	2.9	2.4	2.2	2.1	2.3	2.0	1.7	1.2	0.7	0.4	0.9	0.3	0.6	2.9
28-Jun	0.6	0.7	0.5	0.6	0.8	1.3	1.4	1.7	DF	DF	2.1	DF	2.4	1.5	1.2	1.9	1.9	1.6	1.2	1.0	0.7	0.6	0.2	0.3	2.4
29-Jun	0.3	0.3	0.3	0.2	0.2	0.7	1.4	2.0	2.0	2.2	2.3	2.4	2.7	2.7	2.2	3.2	1.5	1.1	1.1	0.8	0.7	0.6	0.8	0.7	3.2
30-Jun	0.7	0.5	0.6	0.6	0.6	0.5	0.8	1.5	1.9	2.2	2.4	3.1	3.1	2.7	2.7	2.9	3.1	2.7	2.9	2.6	1.8	0.9	0.8	0.9	3.1
	3.7	3.7	3.6	3.7	3.5	3.6	4.2	4.5	5.0	4.5	4.0	3.7	4.1	4.5	4.8	4.1	3.7	3.9	4.2	3.9	4.1	4.0	3.8	3.7	
	Diurnal Maximum																								
DF - DAS Failure																									



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 2.1 km/h on Jun 9 14:00		Maximum Daily Average: 0.5 km/h on Jun 10		Hours in Service: 720																						
Minimum Value: -1.1 km/h on Jun 24 14:00		Minimum Daily Average: -0.1 km/h on Jun 19		Hours of Data: 717																						
Maximum Diurnal Average: 0.5 km/h at hour 15		Minimum Diurnal Average: 0.0 km/h at hour 23		Hours of Missing Data: 3																						
Monthly Average: 0.23 km/h		Percentiles: P ₁ = -0.6 P ₁₀ = -0.2 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.4		Hours of Calibration: 0																						
				Percent Operational Time: 99.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.1	0.1	0.2	0.1	0.2	0.2	0.2	-0.1	0.0	1.1	0.2	0.8	0.2	0.4	0.0	1.0	0.6	0.4	0.6	1.0	0.1	0.1	0.1	0.2	0.3	1.1
2-Jun	0.3	0.1	-0.1	0.0	-0.1	0.1	-0.3	0.3	0.0	0.3	-0.2	0.4	0.4	0.5	0.8	0.2	0.4	0.3	0.4	0.3	0.4	0.2	0.3	0.6	0.2	0.8
3-Jun	0.1	0.5	0.2	0.2	0.6	0.3	0.5	0.4	0.3	0.0	-0.1	0.4	0.8	0.3	1.0	0.5	0.2	0.2	-0.2	0.6	1.5	1.5	-0.5	-0.3	0.4	1.5
4-Jun	0.8	1.1	0.5	0.9	-0.2	0.3	0.4	0.2	0.3	0.9	1.7	0.2	0.6	0.9	0.2	1.0	0.1	0.4	0.0	0.2	0.3	0.0	0.2	0.0	0.5	1.7
5-Jun	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.6	0.4	0.6	0.0	0.4	1.1	0.5	0.2	0.0	0.0	0.2	0.1	0.2	0.1	0.7	0.3	1.1
6-Jun	0.2	0.1	0.2	0.2	-0.3	-0.2	0.0	0.2	0.6	-0.4	0.4	0.4	0.2	0.9	0.5	0.7	0.2	-0.4	0.1	0.0	-0.1	-0.2	-0.3	0.4	0.1	0.9
7-Jun	0.8	0.9	0.6	0.7	0.1	0.3	0.1	-0.2	0.1	0.3	0.1	0.0	0.3	0.5	0.6	1.1	0.0	0.6	0.4	0.4	0.3	0.3	0.0	0.2	0.3	1.1
8-Jun	0.4	-0.1	0.1	0.0	-0.2	0.0	0.3	1.0	0.5	0.1	0.8	0.4	0.6	1.6	1.4	-0.5	0.9	0.4	0.5	0.4	0.3	0.2	0.1	-0.2	0.4	1.6
9-Jun	0.3	0.4	0.3	0.2	0.1	0.5	0.3	-0.1	0.4	0.5	0.4	0.2	0.8	2.1	1.4	0.8	0.1	0.5	0.0	0.4	0.5	-0.1	0.1	0.1	0.4	2.1
10-Jun	-0.1	-0.2	0.3	-0.2	-0.2	-0.1	-0.1	0.2	0.6	1.2	0.5	0.8	0.3	0.7	1.0	1.0	1.1	1.1	1.0	0.6	0.6	0.7	1.0	0.6	0.5	1.2
11-Jun	0.7	0.6	0.2	0.4	0.1	-0.1	0.0	0.5	0.3	0.3	0.3	0.1	0.7	0.6	0.1	-0.1	0.4	0.4	0.3	0.2	0.4	-0.4	-0.5	-0.3	0.2	0.7
12-Jun	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.5	0.6	-0.2	0.1	1.4	0.3	0.4	0.4	0.1	-0.1	0.0	0.4	0.0	0.3	0.3	0.3	0.0	0.2	1.4
13-Jun	-0.2	-0.1	0.0	-0.2	-0.5	-0.2	-0.3	0.2	-0.2	0.5	0.1	-0.2	0.1	-0.1	0.4	0.4	0.5	-0.3	0.5	-0.3	0.0	-0.1	0.1	0.6	0.0	0.6
14-Jun	0.3	0.1	0.3	0.2	0.0	0.7	0.3	0.1	0.7	0.8	0.4	-0.3	0.8	0.1	0.5	-0.5	-0.6	-0.3	-0.4	-0.6	0.1	-0.6	-0.6	-0.4	0.0	0.8
15-Jun	-0.4	-0.4	-0.4	-0.5	-0.3	-0.2	-0.1	-0.6	-0.3	0.4	0.4	0.3	0.4	0.2	-0.1	0.1	0.0	-0.3	-0.3	0.2	0.3	0.2	0.0	-0.1	-0.1	0.4
16-Jun	-0.1	0.1	0.1	0.2	0.1	0.4	0.4	0.4	0.2	0.2	0.1	0.7	0.0	-0.3	0.2	-0.2	0.3	0.5	-0.1	-0.2	-0.1	0.1	-0.1	-0.2	0.1	0.7
17-Jun	0.2	0.1	-0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.5	0.0	0.1	0.1	0.0	0.2	0.1	0.3	1.0	0.1	0.2	0.3	0.3	0.2	-0.1	0.2	1.0
18-Jun	0.1	0.1	0.1	0.3	0.2	0.1	0.3	0.2	0.3	0.6	0.6	-0.1	0.9	0.0	-0.1	0.8	0.2	0.3	0.4	0.4	0.1	0.1	0.0	0.2	0.3	0.9
19-Jun	0.4	-0.1	0.1	0.2	0.0	-0.1	-0.3	-0.3	-0.2	0.1	-0.2	0.0	-0.4	-0.4	0.0	0.3	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	-0.4	-0.7	-0.1	0.4
20-Jun	-0.5	0.5	-0.4	-0.1	1.0	1.0	0.8	0.0	0.2	0.0	0.6	-0.5	-0.6	-0.6	-0.6	-0.4	-0.4	-0.1	-0.3	-0.1	0.1	-0.1	-0.3	-0.2	-0.1	1.0
21-Jun	0.0	0.3	0.2	0.4	0.5	0.7	-0.2	0.2	0.0	-0.1	0.3	1.0	0.3	-0.5	0.0	0.5	-0.1	0.4	0.5	0.9	0.5	0.4	0.1	0.3	0.3	1.0
22-Jun	0.2	0.0	0.1	0.0	0.3	0.0	0.1	0.6	0.0	0.0	0.6	0.4	0.1	0.0	0.6	0.2	0.4	0.1	0.2	0.1	0.1	0.1	0.1	0.5	0.2	0.6
23-Jun	0.5	0.3	0.1	0.1	0.2	0.1	-0.2	0.6	0.2	0.1	1.7	0.9	0.7	0.9	0.9	1.3	1.1	0.3	-0.1	0.3	0.5	0.5	0.5	-0.3	0.5	1.7
24-Jun	-0.1	-0.1	0.1	0.1	0.6	0.4	0.2	0.4	0.1	0.6	0.2	0.4	0.2	-1.1	0.4	0.5	0.2	0.2	-0.3	-0.5	-0.2	0.0	-0.3	-0.1	0.1	0.6
25-Jun	-0.1	0.1	0.0	-0.2	-0.3	-0.1	-0.1	0.2	-0.2	1.0	-0.1	0.1	-0.1	0.1	1.6	-0.1	0.0	0.1	-0.2	0.5	0.1	0.2	0.1	0.2	0.1	1.6
26-Jun	0.5	0.8	0.7	1.0	0.8	0.4	0.2	0.5	0.2	0.5	0.6	0.3	0.2	0.0	0.1	0.3	-0.2	0.4	0.0	0.6	-0.1	0.1	0.1	0.0	0.3	1.0
27-Jun	0.1	0.1	0.2	-0.1	-0.2	-0.1	0.3	0.2	0.2	1.0	0.9	0.5	-0.1	0.0	0.8	0.6	0.1	-0.3	0.1	0.2	0.3	0.1	0.4	0.4	0.2	1.0
28-Jun	0.6	0.5	0.6	0.4	0.4	0.7	0.5	0.7	DF	DF	0.6	DF	0.8	0.0	0.4	-0.4	0.6	0.6	0.5	0.2	0.5	0.3	-0.1	0.2	0.4	0.8
29-Jun	0.2	0.1	0.1	0.2	0.3	0.3	0.4	0.9	0.7	0.6	0.6	0.8	0.5	0.3	0.6	-0.1	-0.1	0.2	0.6	0.0	-0.2	-0.3	-0.3	-0.4	0.2	0.9
30-Jun	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.3	1.0	0.7	0.7	0.6	0.4	-0.2	0.4	0.1	0.4	0.3	0.1	0.4	0.0	-0.1	-0.1	-0.1	-0.1	0.2	1.0
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										



Summary of Hour Standard Deviations

Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1 Maximum Value: 4.6 km/h on Jun 19 15:00 Minimum Value: 0.2 km/h on Jun 22 21:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 1.0 Median = 2.0 Q ₃ = 2.8 P ₉₀ = 3.3 P ₉₉ = 4.0																								Hours in Service: 720 Hours of Data: 717 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6	
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	0.6	0.4	0.4	0.5	0.6	0.8	0.7	0.8	1.6	2.0	2.4	3.1	3.0	2.9	2.6	2.4	2.0	1.8	1.7	1.5	1.4	2.2	1.8	1.3	3.1
2-Jun	1.3	1.9	1.5	1.1	1.5	1.8	2.3	2.2	1.9	1.9	2.0	2.7	3.2	3.5	3.0	2.9	2.5	2.0	1.7	1.5	2.0	1.5	2.6	2.4	3.5
3-Jun	1.8	1.1	0.8	0.5	0.8	1.1	1.3	1.6	2.2	2.1	2.8	2.9	2.8	2.7	3.0	2.6	2.4	2.3	2.0	2.5	3.1	2.3	2.2	2.6	3.1
4-Jun	3.5	2.4	2.1	2.6	2.4	2.4	2.5	2.8	2.7	3.0	3.3	2.7	2.8	2.6	2.3	2.3	2.4	2.7	1.6	0.6	0.8	0.4	0.5	0.5	3.5
5-Jun	0.4	0.3	0.4	0.2	0.4	1.0	1.6	1.6	2.0	2.3	2.2	2.4	3.0	3.1	2.4	2.4	1.9	1.3	1.2	1.4	1.2	1.4	3.1	2.2	3.1
6-Jun	2.3	2.7	2.0	1.3	1.5	1.8	2.3	2.5	2.7	2.6	3.2	3.5	3.5	3.5	3.4	3.5	3.0	2.6	2.3	1.4	0.5	0.2	0.2	0.4	3.5
7-Jun	0.6	0.8	1.0	1.0	1.3	1.2	1.9	1.9	1.9	2.6	3.4	3.7	3.7	3.7	3.1	3.0	2.6	2.6	2.1	1.3	0.9	0.6	0.3	0.4	3.7
8-Jun	0.4	2.0	2.3	1.3	1.4	1.2	2.0	2.4	2.5	2.8	3.5	3.1	3.0	2.8	2.7	2.4	2.5	2.3	1.9	1.5	1.0	0.9	1.3	1.4	3.5
9-Jun	1.2	0.7	0.3	0.7	0.5	0.4	1.0	1.3	2.0	2.4	2.4	2.9	2.9	2.8	3.1	3.0	2.4	2.1	1.1	0.5	0.5	0.7	0.9	1.3	3.1
10-Jun	0.8	0.8	1.1	0.7	0.7	0.6	1.0	1.4	2.2	2.7	3.0	3.0	3.2	3.3	3.5	3.3	3.2	2.9	2.6	2.1	1.6	1.0	1.1	1.4	3.5
11-Jun	1.2	1.2	1.4	1.2	0.7	0.4	0.6	1.9	1.4	1.9	2.2	2.6	3.0	3.0	2.6	2.5	2.5	1.9	1.3	0.5	1.3	1.5	1.1	1.3	3.0
12-Jun	1.3	0.8	0.6	1.1	0.7	0.8	1.7	2.2	2.2	2.5	2.8	3.0	2.6	2.2	2.1	1.6	1.1	0.5	0.9	0.7	0.6	0.7	1.9	2.5	3.0
13-Jun	2.0	1.4	1.5	1.9	2.1	1.8	1.8	1.9	2.0	2.3	2.3	2.1	2.0	2.6	3.2	1.8	2.7	3.0	3.3	1.7	1.4	2.8	2.4	2.5	3.3
14-Jun	1.9	1.2	1.2	1.2	1.4	2.0	1.9	2.0	2.8	2.9	2.9	2.6	3.0	3.4	3.6	3.4	3.3	3.8	4.0	3.6	3.9	3.9	3.8	3.7	4.0
15-Jun	3.6	3.8	3.3	3.1	3.4	2.8	3.3	3.1	2.5	1.9	1.4	1.7	1.6	2.3	2.2	2.4	2.5	2.0	1.6	0.8	0.5	0.4	0.7	0.4	3.8
16-Jun	0.4	0.5	0.5	0.6	0.6	0.7	0.9	1.3	1.3	1.8	2.1	1.8	2.7	2.3	2.2	2.3	2.2	1.7	2.2	1.1	0.9	1.8	1.5	1.8	2.7
17-Jun	1.1	1.3	1.1	1.1	0.9	1.3	1.8	2.3	2.3	2.6	2.9	2.8	3.0	3.0	2.9	2.8	2.8	2.4	2.3	2.3	1.0	0.7	0.5	0.6	3.0
18-Jun	0.6	0.6	0.5	1.1	0.5	0.7	1.4	1.8	2.1	2.9	2.9	3.2	3.5	3.2	2.7	3.4	2.9	2.8	3.0	3.2	2.6	2.0	2.6	3.5	3.5
19-Jun	2.9	2.2	2.6	3.5	3.3	3.6	3.9	4.4	4.6	4.1	3.7	3.3	3.8	4.5	4.6	4.0	3.6	3.5	4.3	3.6	3.8	3.5	3.3	3.5	4.6
20-Jun	3.6	3.4	3.4	3.6	3.7	3.6	3.7	3.5	3.9	3.5	3.6	2.9	2.8	2.7	2.5	2.1	3.0	2.7	2.3	2.0	1.4	1.5	1.6	1.9	3.9
21-Jun	1.7	1.7	1.7	1.7	1.7	2.1	2.3	2.6	2.5	3.0	3.0	3.7	3.6	3.0	3.3	3.4	3.0	2.6	2.1	1.6	0.9	0.8	0.8	0.5	3.7
22-Jun	0.3	0.7	0.6	0.6	0.7	0.6	1.0	1.1	1.8	2.2	2.2	2.3	2.2	2.2	2.2	1.8	2.3	2.2	1.3	0.3	0.2	0.2	0.4	0.6	2.3
23-Jun	0.4	0.3	0.3	0.4	0.6	1.3	1.3	2.0	2.2	2.2	2.8	3.0	3.0	3.1	3.2	2.8	2.4	1.9	1.3	0.6	0.4	0.5	0.4	1.0	3.2
24-Jun	0.4	0.6	0.8	0.9	0.9	1.1	1.0	1.1	1.2	2.2	3.0	3.1	3.0	2.9	3.4	3.3	2.1	1.4	1.9	3.2	2.8	2.6	3.3	2.6	3.4
25-Jun	1.8	1.5	1.7	1.7	1.6	1.8	1.7	2.2	2.4	2.8	3.0	3.1	2.8	2.6	2.8	2.4	2.9	2.4	1.8	1.2	0.5	0.5	0.8	0.4	3.1
26-Jun	0.3	0.5	0.8	0.9	0.9	1.0	1.1	1.1	1.5	1.3	1.5	1.5	1.2	1.8	2.6	2.4	3.6	1.9	1.4	1.3	0.7	0.3	0.4	0.6	3.6
27-Jun	0.2	0.2	0.7	1.5	1.0	1.3	1.5	1.7	2.5	3.1	3.0	3.2	3.1	2.6	2.7	2.4	2.4	2.0	1.5	0.9	0.6	0.9	0.4	0.4	3.2
28-Jun	0.4	0.4	0.5	0.6	0.6	0.9	1.0	1.7	DF	DF	2.4	DF	2.8	1.8	1.4	1.8	2.1	1.3	1.0	0.9	0.6	0.5	0.3	0.4	2.8
29-Jun	0.2	0.2	0.4	0.2	0.2	0.4	1.3	1.9	2.0	2.3	2.5	2.5	3.2	3.2	2.3	3.0	1.4	1.0	0.8	0.8	0.8	0.6	0.6	0.4	3.2
30-Jun	0.5	0.3	0.7	1.0	0.7	0.5	0.7	1.6	1.9	2.1	2.7	3.3	3.4	3.2	3.0	3.0	3.4	2.6	2.8	2.5	1.6	0.7	0.7	0.9	3.4
3.6 3.8 3.4 3.6 3.7 3.6 3.9 4.4 4.6 4.1 3.7 3.7 3.8 4.5 4.6 4.0 3.6 3.8 4.3 3.6 3.9 3.9 3.8 3.7																									
Diurnal Maximum																									
DF - DAS Failure																									



Summary of Hour Averages

Mannix - June 2023

Maximum Value: 2.2 km/h on Jun 9 14:00		Maximum Daily Average: 1.2 km/h on Jun 19		Hours in Service: 720																						
Minimum Value: -2.0 km/h on Jun 24 14:00		Minimum Daily Average: -0.5 km/h on Jun 6		Hours of Data: 706																						
Maximum Diurnal Average: 0.4 km/h at hour 11		Minimum Diurnal Average: -0.1 km/h at hour 23		Hours of Missing Data: 14																						
Monthly Average: 0.20 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.5 Q ₁ = -0.2 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.1 P ₉₉ = 1.8		Hours of Calibration: 0																						
				Percent Operational Time: 98.1																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.0	0.0	0.2	0.1	0.1	0.1	-0.1	-0.6	-0.3	1.0	-0.1	0.6	0.3	0.3	-0.1	1.1	0.8	0.8	0.8	1.1	0.3	0.2	0.4	0.5	0.3	1.1
2-Jun	0.6	0.5	0.3	0.3	0.2	0.4	0.2	0.6	0.1	0.2	-0.7	0.2	0.2	0.4	0.8	0.3	0.6	0.6	0.9	0.9	0.8	0.7	0.7	1.0	0.5	1.0
3-Jun	0.4	0.7	0.5	0.4	0.8	0.2	0.4	0.4	0.5	0.0	0.0	0.4	1.1	0.4	1.2	0.2	-0.1	0.0	-0.1	0.8	1.7	1.6	-0.2	-0.1	0.5	1.7
4-Jun	0.7	1.1	0.5	1.0	0.2	0.5	0.5	0.3	0.4	0.9	1.9	0.0	0.5	0.9	0.4	1.2	0.2	0.3	-0.2	0.0	0.3	-0.1	0.0	-0.2	0.5	1.9
5-Jun	0.0	0.0	0.1	0.2	0.0	0.1	0.3	0.4	0.9	0.9	1.2	0.6	0.7	1.7	0.5	0.3	0.0	UO	UO	1.0	0.3	-0.4	-0.7	0.1	0.4	1.7
6-Jun	-0.4	-0.8	-0.4	-0.6	-0.9	-0.8	-0.6	-0.4	0.1	-1.3	-0.3	-0.3	-0.5	0.1	-0.1	0.0	-0.5	-1.4	-0.6	-0.7	-0.5	-0.7	-0.9	-0.3	-0.5	0.1
7-Jun	-0.1	0.0	-0.3	-0.2	-0.7	-0.6	-0.6	-0.9	-0.5	-0.3	-0.6	-0.8	-0.6	-0.3	0.1	0.4	-0.5	0.1	0.0	-0.1	-0.2	-0.1	-0.1	0.0	-0.3	0.4
8-Jun	0.3	0.6	1.0	0.6	0.3	0.6	0.7	1.3	0.6	-0.1	0.9	0.2	0.5	1.6	1.5	-0.8	0.9	0.4	0.4	0.5	0.7	0.8	0.5	-0.1	0.6	1.6
9-Jun	0.3	0.4	0.3	0.1	0.0	0.2	0.1	-0.3	0.1	0.3	0.3	-0.2	0.6	2.2	1.4	0.5	-0.4	0.0	-0.6	-0.1	0.1	0.1	0.4	0.4	0.3	2.2
10-Jun	0.3	0.7	0.3	0.2	0.4	0.3	0.5	0.3	0.3	0.8	0.4	0.8	0.2	0.0	0.5	0.6	0.6	0.4	0.2	-0.1	-0.2	-0.1	0.2	-0.1	0.3	0.8
11-Jun	0.2	0.0	0.0	-0.2	-0.3	-0.4	-0.3	0.0	-0.3	-0.1	-0.1	-0.3	0.4	0.3	-0.4	-0.6	-0.1	-0.1	-0.1	-0.2	0.2	-0.2	-0.3	-0.2	-0.1	0.4
12-Jun	0.2	0.3	0.0	0.0	-0.1	-0.1	0.2	0.5	0.7	-0.6	-0.1	1.5	0.2	0.2	0.1	-0.3	-0.5	-0.4	0.4	0.1	0.4	0.5	0.3	-0.5	0.1	1.5
13-Jun	0.1	0.5	0.3	0.5	-0.2	0.2	0.2	0.4	-0.3	0.3	-0.1	-0.4	-0.1	-0.1	0.7	0.9	1.4	0.8	1.7	0.4	UO	UO	UO	UO	0.4	1.7
14-Jun	UO	UO	0.8	0.5	0.6	1.3	1.1	1.2	1.7	2.0	1.7	0.8	UO	0.6	1.5	0.4	0.0	0.5	0.4	0.1	1.1	0.4	0.1	0.2	0.8	2.0
15-Jun	0.2	0.3	0.1	-0.1	0.1	0.1	0.3	-0.2	-0.3	0.3	0.3	-0.1	0.1	0.2	-0.1	0.1	0.0	-0.3	-0.3	0.1	0.3	-0.1	-0.4	-0.6	0.0	0.3
16-Jun	-0.6	-0.5	-0.3	-0.3	-0.4	0.0	0.1	0.5	0.1	0.3	-0.1	0.2	-0.8	-1.1	-0.5	-0.9	-0.3	-0.1	-0.9	-1.0	-0.8	-0.7	-1.0	-1.0	-0.4	0.5
17-Jun	-0.2	-0.6	-0.7	-0.5	-0.6	-0.5	-0.4	-0.3	-0.6	0.0	-0.7	-0.4	-0.7	-0.9	-0.3	-0.4	-0.3	0.5	0.1	1.0	0.8	0.3	0.3	0.2	-0.2	1.0
18-Jun	0.6	0.5	0.2	0.3	0.3	0.5	0.6	0.4	0.6	1.0	0.9	0.3	1.6	0.7	0.8	1.8	1.1	1.4	1.4	1.4	1.1	0.9	1.1	1.4	0.9	1.8
19-Jun	1.3	0.8	1.1	1.1	1.4	1.2	1.2	1.2	1.5	1.8	1.6	1.6	1.2	1.5	1.9	2.0	1.4	1.1	1.1	1.1	0.9	0.7	0.5	-0.1	1.2	2.0
20-Jun	0.3	1.4	0.4	0.6	2.1	2.1	1.7	0.9	0.9	0.8	1.4	0.1	-0.2	-0.4	-0.3	-0.4	-0.3	0.1	-0.1	0.1	0.1	-0.2	-0.3	0.0	0.5	2.1
21-Jun	0.2	0.7	0.6	0.9	0.9	1.3	0.2	0.4	0.2	0.1	0.6	1.3	0.4	-0.7	0.1	0.6	-0.1	0.9	0.9	1.3	0.6	0.6	0.2	0.3	0.5	1.3
22-Jun	0.2	0.3	0.3	0.3	0.7	0.1	0.4	0.8	-0.1	-0.4	0.5	0.4	-0.1	-0.5	0.1	-0.4	-0.1	-0.6	-0.3	-0.2	-0.2	0.0	-0.1	0.3	0.1	0.8
23-Jun	0.0	-0.2	0.3	0.4	0.1	0.0	0.0	0.4	0.0	-0.1	1.8	0.7	0.3	0.9	0.7	1.4	1.2	0.2	-0.4	0.0	-0.1	0.1	-0.3	-1.0	0.3	1.8
24-Jun	-0.8	-0.7	-0.5	-0.5	0.1	-0.1	-0.3	0.0	-0.1	0.2	-0.3	-0.2	-0.3	-2.0	-0.3	1.1	0.6	0.9	0.6	0.5	0.7	1.1	0.9	0.8	0.1	1.1
25-Jun	0.7	0.7	0.6	0.6	0.4	0.6	0.3	0.5	-0.2	1.0	0.1	0.2	-0.3	-0.1	1.6	-0.4	-0.3	0.0	-0.2	0.4	0.1	0.3	0.1	0.3	0.3	1.6
26-Jun	-0.1	0.0	0.0	0.5	0.5	0.1	0.3	0.2	0.1	0.2	0.1	0.1	-0.2	-0.4	-0.4	-0.2	0.7	0.5	-0.6	0.1	-0.6	-0.2	0.0	0.0	0.0	0.7
27-Jun	0.0	0.1	0.3	0.1	-0.1	-0.1	0.3	0.3	0.2	1.3	1.3	0.7	-0.1	-0.1	0.8	0.6	-0.2	-0.6	-0.1	-0.1	0.2	-0.1	-0.1	-0.1	0.2	1.3
28-Jun	-0.1	-0.2	-0.2	-0.3	-0.1	0.1	-0.1	0.1	DF	DF	0.4	DF	0.5	-0.3	0.2	-1.0	0.1	0.0	-0.1	-0.5	-0.2	-0.4	-0.6	-0.3	-0.1	0.5
29-Jun	-0.3	-0.4	-0.4	-0.2	-0.2	-0.2	-0.2	0.5	0.3	0.2	0.3	0.6	0.2	-0.3	-0.1	UO	UO	-0.2	0.2	-0.5	-0.8	-1.0	-1.2	-1.3	-0.2	0.6
30-Jun	-0.9	-0.7	-0.5	-0.5	-0.4	-0.3	-0.1	0.4	0.3	0.4	0.2	-0.2	-0.8	-0.4	-0.6	-0.4	-0.3	-0.7	-0.3	-0.7	-0.9	-0.7	-0.8	-0.8	-0.4	0.4
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure UO - Unstable Operation																										



Summary of Hour Standard Deviations

Mannix - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1 Maximum Value: 7.7 km/h on Jun 29 16:00		Hours in Service: 720 Hours of Data: 708 Hours of Missing Data: 12 Hours of Calibration: 0 Percent Operational Time: 98.3																							
Minimum Value: 0.2 km/h on Jun 6 23:00																									
Percentiles: $P_1 = 0.2$ $P_{10} = 0.5$ $Q_1 = 1.0$ Median = 2.0 $Q_3 = 2.9$ $P_{90} = 3.5$ $P_{99} = 4.3$																									
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-Jun	0.6	0.5	0.4	0.6	0.6	0.8	0.7	0.7	1.7	2.3	2.7	3.5	3.3	3.1	2.9	2.7	2.1	2.0	1.7	1.5	1.4	2.3	1.8	1.4	3.5
2-Jun	1.5	2.1	1.6	1.1	1.6	1.9	2.4	2.3	2.0	2.1	2.3	3.1	3.6	3.8	3.2	3.2	2.6	2.1	1.7	1.4	1.9	1.5	2.6	2.2	3.8
3-Jun	1.5	1.2	0.9	0.5	0.9	1.2	1.3	1.8	2.4	2.2	3.1	3.1	3.1	3.1	3.2	3.0	2.7	2.8	2.1	2.4	2.7	2.2	1.6	2.4	3.2
4-Jun	3.3	2.5	2.3	2.3	1.8	2.4	2.5	2.3	2.2	2.7	3.3	2.7	3.0	2.9	2.1	2.2	1.9	2.9	1.7	0.6	0.7	0.4	0.6	0.6	3.3
5-Jun	0.4	0.3	0.4	0.3	0.3	0.9	1.6	1.5	2.1	2.3	2.3	2.6	3.3	3.5	2.8	2.6	1.7	UO	UO	1.3	1.3	1.3	3.1	2.2	3.5
6-Jun	2.4	2.5	2.1	1.3	1.6	1.9	2.3	2.8	2.9	2.6	3.4	3.6	3.9	3.7	3.6	3.6	3.2	2.6	2.4	1.4	0.5	0.2	0.2	0.3	3.9
7-Jun	0.4	0.8	1.1	1.0	1.4	1.1	1.7	1.8	2.0	2.6	3.7	4.0	3.8	3.7	3.3	3.2	2.6	2.6	2.1	1.1	0.9	0.6	0.4	0.3	4.0
8-Jun	0.5	2.0	2.2	1.1	1.3	1.0	1.9	2.5	2.7	3.0	4.0	3.3	3.5	3.1	3.2	3.0	2.9	2.5	2.0	1.6	0.8	0.7	1.2	1.1	4.0
9-Jun	1.3	0.9	0.5	0.6	0.5	0.4	0.9	1.2	2.2	2.5	2.6	3.3	3.2	3.1	3.5	3.2	2.6	2.3	1.0	0.4	0.3	0.6	0.9	1.2	3.5
10-Jun	0.7	0.8	1.0	0.6	0.8	0.6	0.8	1.3	2.3	2.9	3.2	3.3	3.5	3.6	3.7	3.4	3.3	3.1	2.7	2.2	1.5	1.0	0.9	1.5	3.7
11-Jun	1.1	1.1	1.7	1.3	0.7	0.4	0.5	1.9	1.3	1.9	2.3	2.7	3.3	3.1	2.7	2.6	2.6	1.7	1.2	0.5	1.3	1.3	0.9	1.1	3.3
12-Jun	1.3	0.8	0.6	1.1	0.8	0.8	1.8	2.4	2.4	2.8	3.2	3.3	2.9	2.5	2.5	1.7	1.1	0.5	1.0	0.7	0.6	0.6	1.9	2.6	3.3
13-Jun	2.0	1.4	1.4	1.8	2.1	1.8	1.7	1.7	2.0	2.4	2.6	2.3	2.3	2.9	3.3	1.9	2.5	3.2	3.3	1.8	UO	UO	UO	UO	3.3
14-Jun	UO	UO	1.2	1.1	1.3	2.0	1.9	2.1	2.9	2.9	3.1	2.6	UO	3.3	3.7	3.4	3.2	3.7	4.5	4.0	4.0	4.0	4.0	3.7	4.5
15-Jun	3.4	3.7	3.3	3.2	3.2	2.8	3.5	3.3	2.5	2.0	1.4	1.6	1.6	2.3	3.3	2.4	2.6	2.1	1.6	0.9	0.5	0.4	0.8	0.4	3.7
16-Jun	0.3	0.4	0.4	0.6	0.6	0.6	0.8	1.1	1.3	1.8	2.2	2.0	2.9	2.2	2.2	2.2	2.1	1.7	2.1	1.0	0.9	1.8	1.4	1.9	2.9
17-Jun	1.2	1.5	1.2	1.2	0.9	1.3	1.9	2.4	2.4	2.9	3.0	3.0	3.2	3.1	3.1	3.0	3.0	2.6	2.4	2.2	1.0	0.9	0.6	0.6	3.2
18-Jun	0.7	0.6	0.5	0.8	0.6	0.6	1.4	2.0	2.4	3.3	3.2	3.3	3.8	3.4	2.9	3.4	2.8	2.8	2.9	3.1	2.5	2.0	2.5	3.5	3.8
19-Jun	3.0	2.2	2.9	3.6	3.3	3.7	4.0	4.4	4.6	4.1	3.5	4.2	3.9	4.8	4.8	4.0	3.7	3.8	4.3	3.6	4.0	3.6	3.5	3.6	4.8
20-Jun	3.7	3.5	3.6	3.8	4.1	4.0	4.0	3.5	3.9	3.7	3.7	3.0	2.9	2.8	2.4	2.0	3.1	2.8	2.2	2.1	1.5	1.4	1.6	1.8	4.1
21-Jun	1.6	1.7	1.8	1.6	1.7	2.0	2.2	2.6	2.4	2.9	3.2	4.0	4.0	3.1	3.5	3.8	3.0	2.8	2.2	1.6	1.0	0.7	0.7	0.5	4.0
22-Jun	0.3	0.5	0.4	0.4	0.3	0.5	0.9	1.2	1.9	2.4	2.4	2.8	2.7	2.3	2.2	1.8	2.5	2.2	1.2	0.3	0.2	0.2	0.5	0.5	2.8
23-Jun	0.4	0.3	0.4	0.4	0.5	1.3	1.3	2.1	2.4	2.5	3.1	3.4	3.2	3.4	3.7	3.0	2.8	2.2	1.5	0.7	0.4	0.4	1.0	3.7	
24-Jun	0.4	0.7	0.9	0.9	0.8	1.0	0.9	1.0	1.1	2.3	3.4	3.3	3.3	3.2	3.7	3.5	2.3	1.5	1.8	3.2	2.9	2.5	3.2	2.5	3.7
25-Jun	1.7	1.6	1.5	1.5	1.4	1.6	1.8	2.4	2.6	3.1	3.2	3.5	3.2	3.0	3.1	2.8	3.3	2.9	1.9	1.3	0.5	0.5	0.8	0.4	3.5
26-Jun	0.2	0.4	0.8	0.6	0.8	0.9	0.9	1.0	1.5	1.2	1.4	1.4	1.2	1.9	2.9	2.6	3.7	1.9	1.3	1.2	0.6	0.4	0.4	0.5	3.7
27-Jun	0.3	0.3	0.8	1.6	1.0	1.3	1.7	1.9	2.6	3.4	3.4	3.7	3.7	3.0	2.9	2.7	2.8	2.1	1.7	0.9	0.7	1.0	0.3	0.4	3.7
28-Jun	0.3	0.3	0.6	0.6	0.4	0.6	0.8	1.7	DF	DF	2.5	DF	3.3	2.1	1.7	1.8	2.3	1.2	0.9	1.0	0.6	0.5	0.3	0.4	3.3
29-Jun	0.2	0.2	0.4	0.3	0.2	0.4	1.1	2.0	2.1	2.5	2.8	2.5	3.5	3.4	2.3	7.7	7.5	1.1	0.8	0.8	0.9	0.6	0.5	0.3	7.7
30-Jun	0.3	0.3	0.9	1.1	0.7	0.5	0.7	1.7	2.0	2.2	2.9	3.4	3.6	3.4	3.2	3.1	3.6	2.6	2.8	2.5	1.4	0.7	0.8	0.9	3.6
	3.7	3.7	3.6	3.8	4.1	4.0	4.0	4.4	4.6	4.1	4.0	4.2	4.0	4.8	4.8	7.7	7.5	3.8	4.5	4.0	4.0	4.0	4.0	3.7	
	Diurnal Maximum																								
DF - DAS Failure		UO - Unstable Operation																							



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS06
PATRICIA MCINNES
JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
 JUNE 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	10.5	0	4.1	0
TRS (ppb) Average	410	21	35	96.85	1.5	0	0.8	0
H2S(ppb) Average	261	14	14	100	1.7	0	0.4	0
THC (ppm) Average	649	36	71	95.14	2.4	-	2.1	-
NMHC(ppm) Average	649	36	71	95.14	0.163	-	0.025	-
CH4(ppm) Average	649	36	71	95.14	2.3	-	2.1	-
O3 (ppb) Average	686	34	34	100	75.5	0	51.3	-
NO2 (ppb) Average	684	35	36	99.86	21.8	0	7.1	-
NO (ppb) Average	684	35	36	99.86	11.4	-	1.7	-
NOX (ppb) Average	684	35	36	99.86	25.7	-	8.2	-
NH3 (ppb) Average	603	44	117	89.86	23.4	0	12.9	-
PM2.5 (ug/m3) Average	577	1	143	80.28	197.3	43	129.1	8
Temperature 2 m (C) Average	720	0	0	100	29.6	-	22.4	-
Relative Humidity (%) Average	720	0	0	100	98.7	-	95.9	-
Wind Speed 10 m (km/h) Average	720	0	0	100	34	-	25	-
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)

JUNE 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	0.73	1.6	-	0	0	0.1	0.1	0.5	1.7	10.5
TRS (ppb) Average	410	0.42	0.2	-	0.2	0.3	0.3	0.3	0.4	0.7	1.5
H2S (ppb) Average	261	0.21	0.2	-	0	0	0.1	0.1	0.2	0.5	1.7
THC (ppm) Average	649	1.97	0.1	-	1.8	1.9	1.9	2	2	2.1	2.4
NMHC(ppm) Average	649	0.004	0.017	-	0	0	0	0	0	0	0.163
CH4(ppm) Average	649	1.97	0.1	-	1.8	1.9	1.9	2	2	2.1	2.3
O3 (ppb) Average	686	30.68	13	-	4.9	14.7	21.6	29.5	38.5	48.1	75.5
NO2 (ppb) Average	684	2.48	2.5	-	0	0.2	0.8	1.8	3.4	5.5	21.8
NO (ppb) Average	684	0.56	1	-	0	0	0.1	0.2	0.6	1.4	11.4
NOX (ppb) Average	684	3.05	3.2	-	0	0.3	1	2.2	4	6.7	25.7
NH3 (ppb) Average	603	0.86	3.5	-	0	0	0	0	0	0	23.4
PM2.5 (ug/m3) Average	577	27.48	34	-	0.8	2.8	5.2	18.4	32.4	57.9	197.3
Temperature 2 m (C) Average	720	17.54	5.3	-	4.8	10.6	13.1	17.5	21.5	24.9	29.6
Relative Humidity (%) Average	720	64.32	21.4	-	20.5	35.6	45.1	63.7	85.5	93.7	98.7
Wind Speed 10 m (km/h) Average	720	11.1	6	-	0	4	7	10	15	20	34
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, TRS, NO2, NH3, NMHC	13 Jun 2023 14:00	13 Jun 2023 14:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	12 Jun 2023 14:00	13 Jun 2023 10:00	21	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	19 Jun 2023 00:00	19 Jun 2023 02:00	3	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	19 Jun 2023 04:00	19 Jun 2023 10:00	7	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	19 Jun 2023 11:00	19 Jun 2023 12:00	2	Maintenance - adjust retention windows
THC/NMHC/CH4	29 Jun 2023 18:00	29 Jun 2023 18:00	1	Unstable Operation - excessive baseline drift
TRS	01 Jun 2023 01:00	12 Jun 2023 11:00	275	Not in Service
TRS	12 Jun 2023 15:00	13 Jun 2023 03:00	13	Stabilization period after converter replacement
H2S	12 Jun 2023 12:00	01 Jul 2023 00:00	445	Not in Service
PM2.5	22 Jun 2023 15:00	28 Jun 2023 09:00	139	Analyzer Failure - sample pump failure
PM2.5	28 Jun 2023 10:00	28 Jun 2023 12:00	3	Maintenance - replaced sample pump
NH3	17 Jun 2023 10:00	17 Jun 2023 10:00	1	Maintenance - verify daily QA response
NH3	01 Jun 2023 07:00	30 Jun 2023 08:00	71	Stabilization after daily span



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

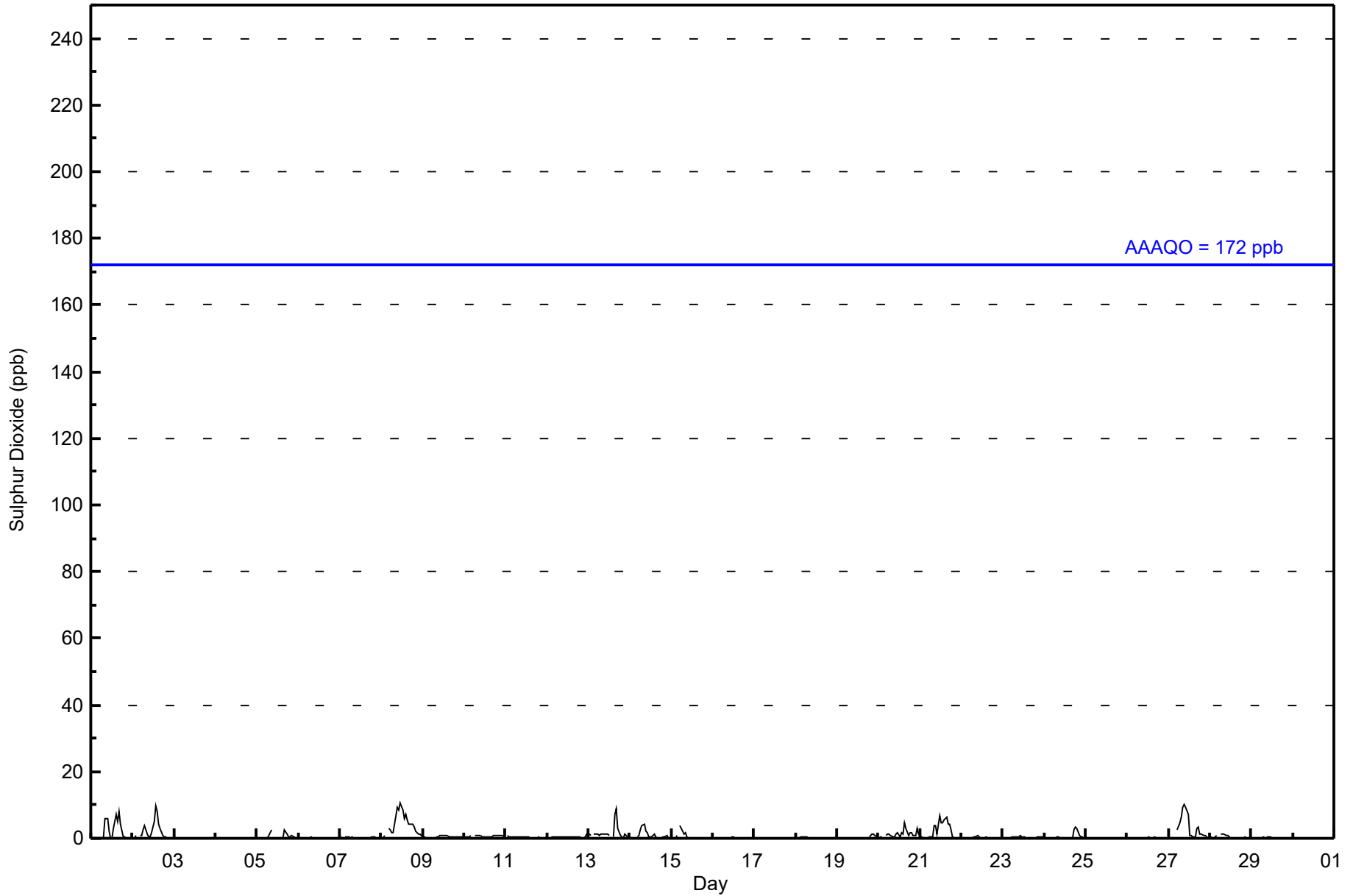
Patricia McInnes - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														720							
Maximum Value: 10.5 ppb on Jun 8 12:00		Maximum Daily Average: 4.1 ppb on Jun 8		Hours of Data: 685														685									
Minimum Value: 0.0 ppb on Jun 3 03:00		Minimum Daily Average: 0.0 ppb on Jun 25		Hours of Missing Data: 35														35									
Maximum Diurnal Average: 1.4 ppb at hour 9		Minimum Diurnal Average: 0.2 ppb at hour 2		Hours of Calibration: 34														34									
Monthly Average: 0.73 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.5 P ₉₀ = 1.7 P ₉₉ = 8.6		Percent Operational Time: 99.9														99.9									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.2	0.1	Z	0.1	0.1	0.0	0.0	0.3	6.1	5.9	2.0	0.1	0.1	3.0	7.3	4.9	7.8	4.4	0.5	0.3	0.2	0.1	0.1	0.1	1.9	7.8	
2-Jun	0.1	0.2	1.0	Z	0.7	0.7	2.5	3.7	1.4	0.6	0.3	1.8	5.1	9.9	8.2	4.2	2.8	1.1	0.6	0.5	0.2	0.2	0.1	0.1	2.0	9.9	
3-Jun	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1
4-Jun	0.1	0.0	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
5-Jun	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.8	2.4	C	C	C	C	0.2	0.1	0.1	2.4	1.3	0.5	0.6	0.9	0.3	0.0	0.0	0.5	2.4	
6-Jun	0.1	Z	0.2	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	
7-Jun	0.2	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	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.2	0.3	
8-Jun	0.0	0.0	1.0	Z	2.8	2.4	1.5	1.7	7.0	9.3	8.3	10.5	8.5	6.1	7.0	5.4	4.3	4.4	4.2	3.3	2.3	1.3	1.1	0.8	4.1	10.5	
9-Jun	0.4	0.2	0.1	0.1	Z	0.1	0.1	0.2	0.4	0.5	0.7	0.9	0.8	0.6	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.9	
10-Jun	0.2	0.3	0.4	0.5	0.7	Z	0.9	0.9	0.8	0.8	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.6	0.8	0.6	1.0	1.0	0.8	0.4	0.6	1.0	
11-Jun	Z	0.7	0.5	0.4	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.7	
12-Jun	0.7	Z	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.1	0.0	0.5	1.5	0.4	1.5	
13-Jun	1.3	0.8	Z	1.2	1.1	1.1	0.9	1.2	1.1	1.1	1.2	1.1	0.9	M	0.2	7.0	9.1	3.1	1.0	0.4	0.1	1.3	1.0	0.0	1.7	9.1	
14-Jun	0.0	0.0	0.0	Z	0.5	0.9	2.8	3.7	4.1	2.2	1.8	0.5	0.3	0.7	1.4	0.4	0.0	0.0	0.1	0.3	0.3	0.7	0.1	0.0	0.9	4.1	
15-Jun	0.4	0.1	0.1	0.8	Z	3.6	2.2	1.1	1.7	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.6	
16-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
17-Jun	Z	0.0	0.1	0.0	0.0	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
18-Jun	0.6	Z	0.6	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	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.6	
19-Jun	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.2	1.2	0.7	0.2	0.2	1.2	
20-Jun	0.1	0.3	0.5	Z	0.7	1.3	1.4	0.8	0.5	0.5	1.3	1.5	0.4	1.5	1.3	4.7	2.9	0.6	1.6	1.7	0.9	0.9	3.0	1.4	1.3	4.7	
21-Jun	0.8	0.3	0.1	0.1	Z	0.2	0.5	0.3	3.6	4.0	1.4	6.9	4.7	4.8	5.5	6.2	4.4	4.4	2.5	0.4	0.1	0.1	0.1	0.0	2.2	6.9	
22-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.3	0.5	0.8	0.4	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.8	
23-Jun	Z	0.2	0.1	0.2	0.1	0.3	0.4	0.4	0.6	0.6	0.8	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.8	
24-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.3	3.4	2.9	1.0	0.2	0.6	0.1	0.6	3.4	
25-Jun	0.1	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
26-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	
27-Jun	0.0	0.1	0.1	0.1	Z	2.4	4.5	6.4	9.2	10.1	9.5	7.3	0.7	0.8	0.4	0.5	2.9	3.6	1.3	1.4	0.8	0.7	0.4	0.2	2.8	10.1	
28-Jun	0.3	0.2	0.1	0.2	0.7	Z	1.3	1.3	1.3	0.9	0.9	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.2	0.1	0.0	0.4	1.3	
29-Jun	Z	0.0	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.3	
30-Jun	0.1	Z	0.0	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	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Patricia McInnes - June 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	81	37	20	12	26	35	48	46	47	41	65	50	28	25	44	79	684
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	82	37	20	12	26	35	48	46	47	41	65	50	28	25	44	79	685

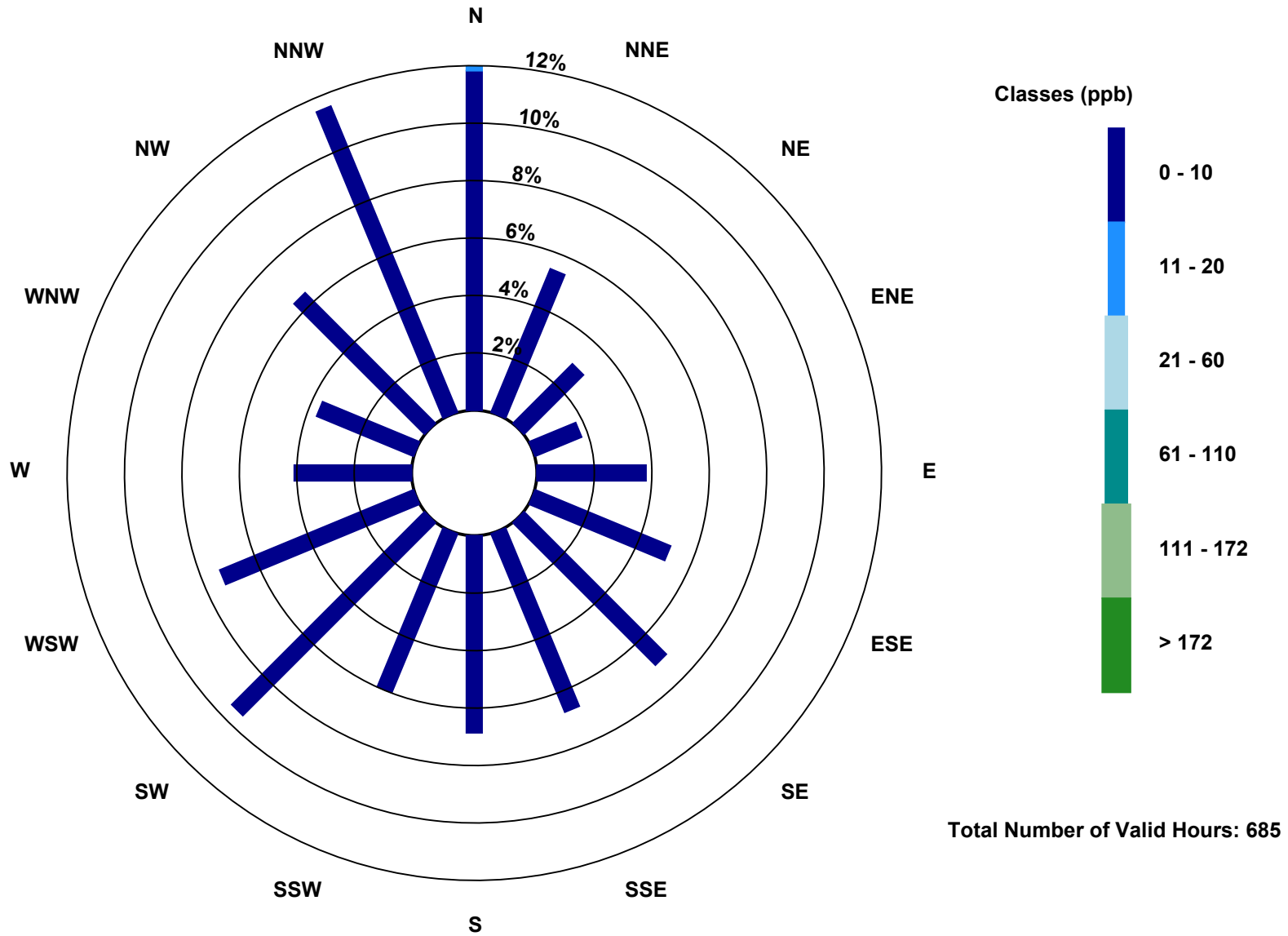
Total Number of Valid Hours: 685

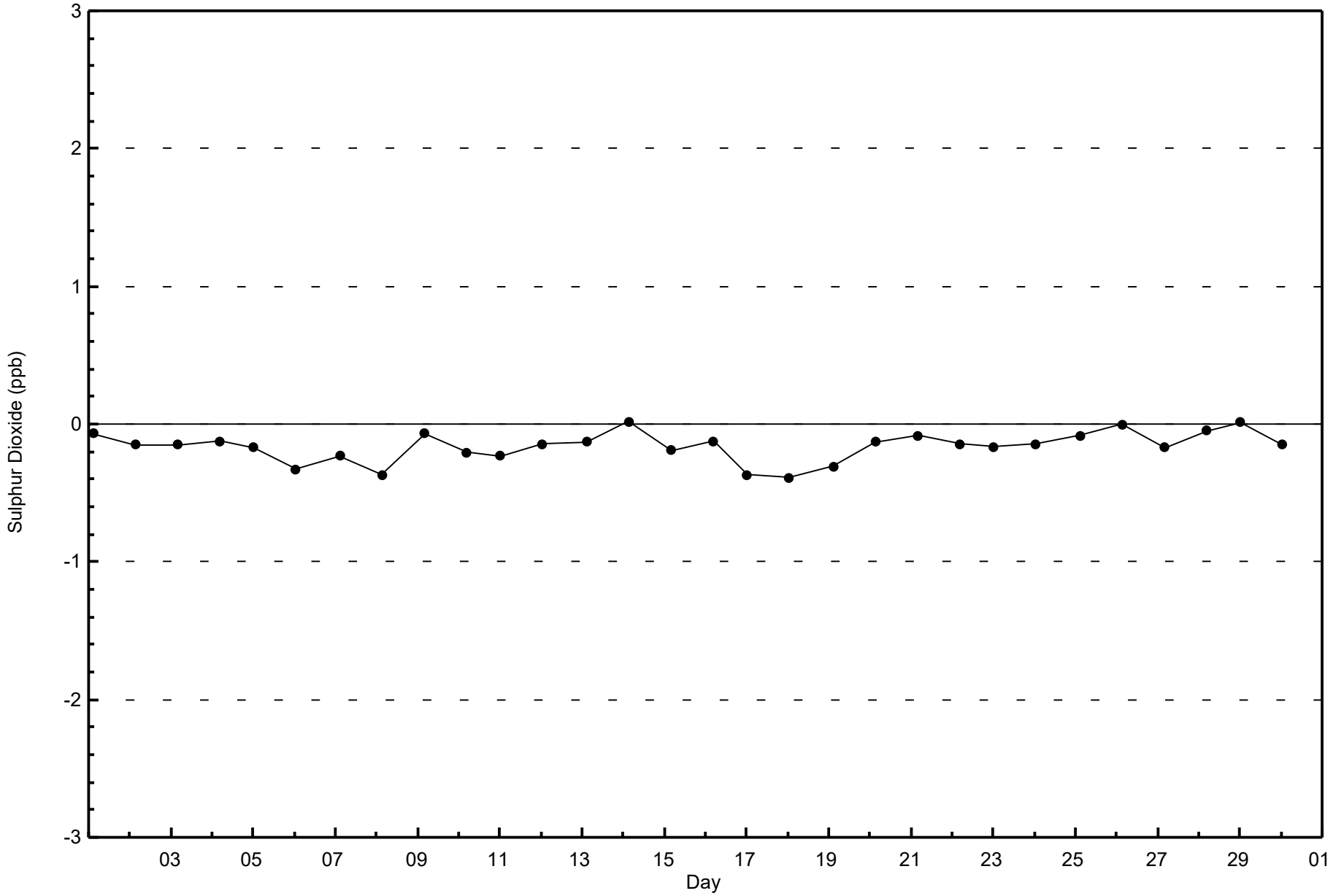
Total Number of Hours: 720

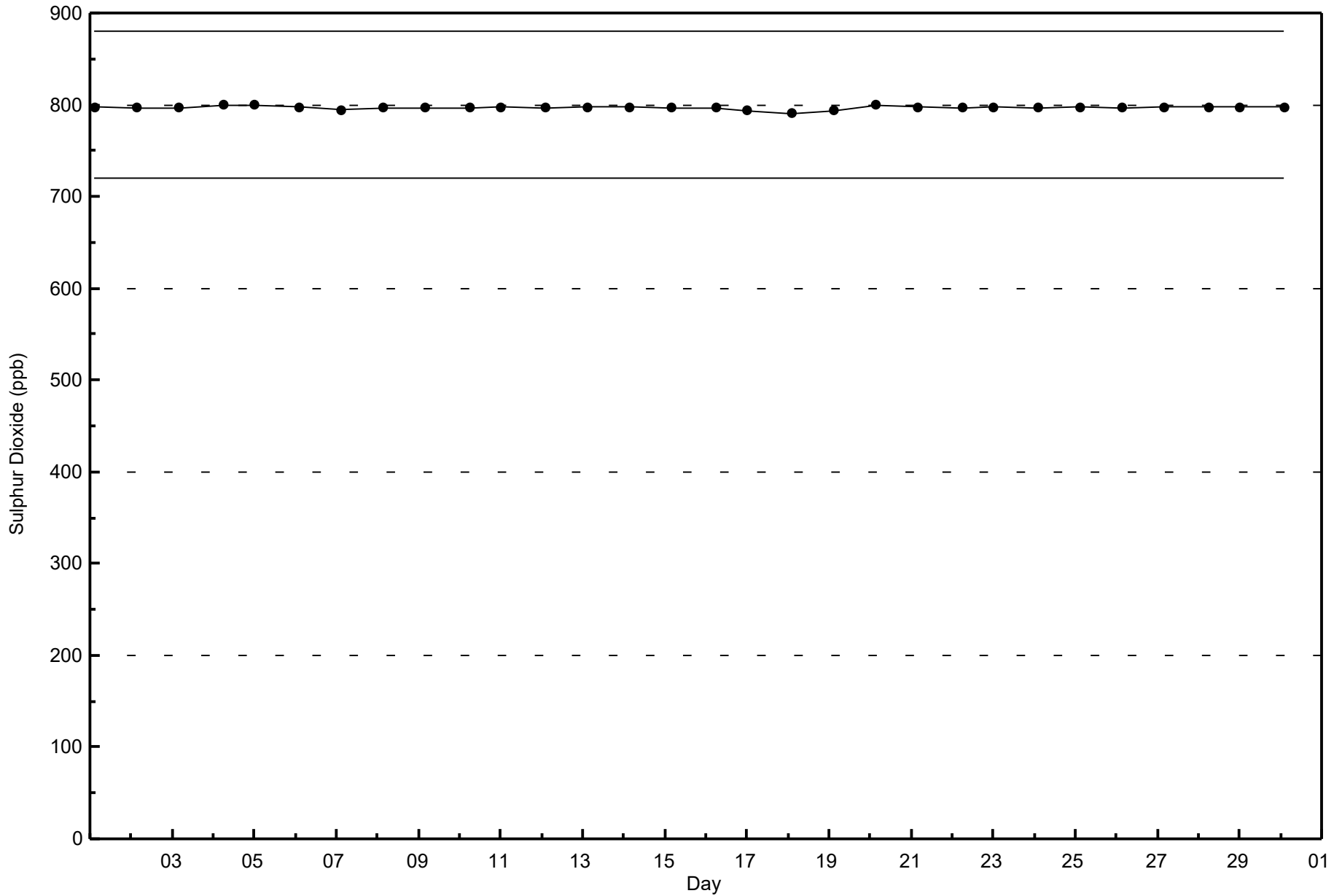


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

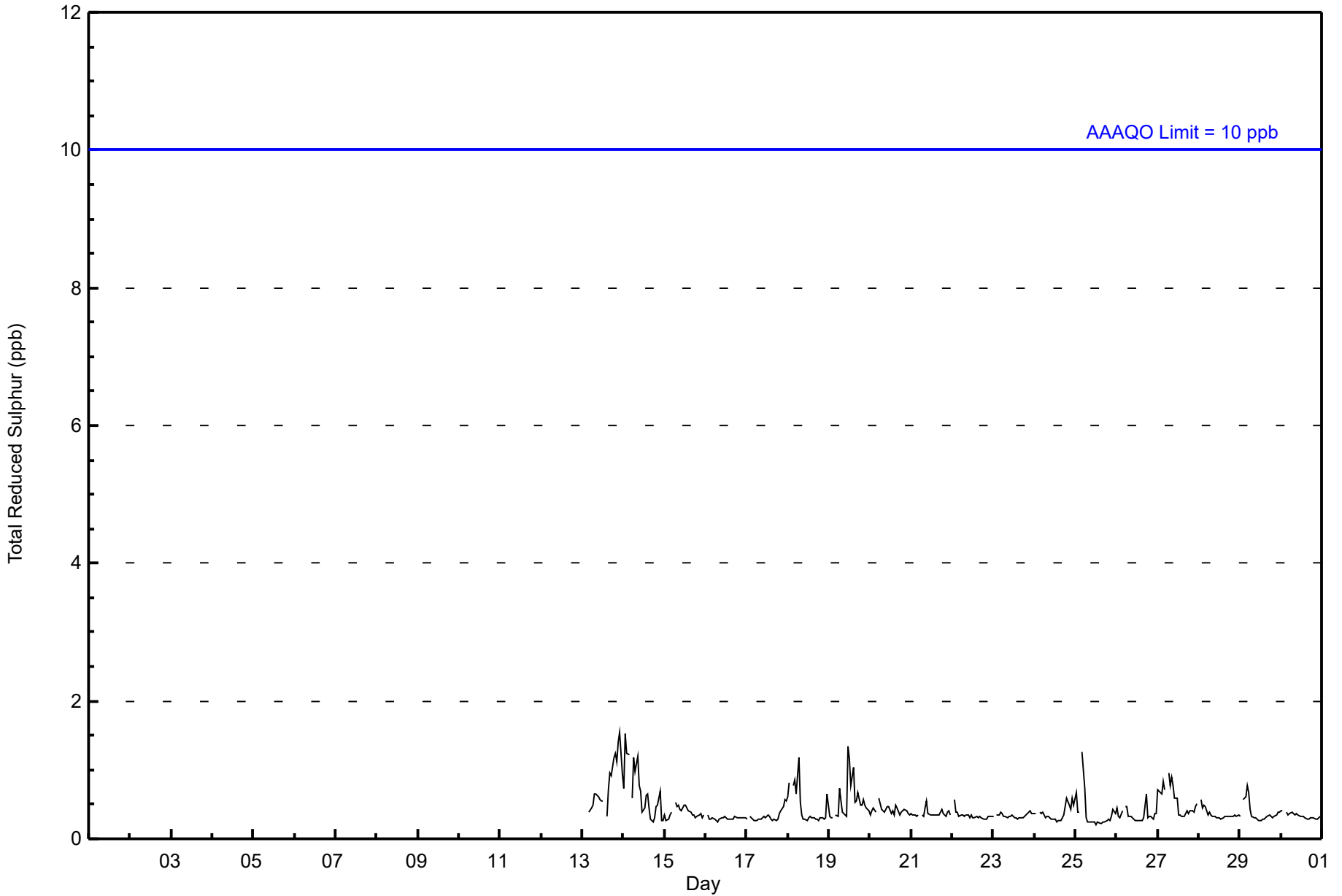
Patricia McInnes - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 445																			
Maximum Value: 1.5 ppb on Jun 13 23:00										Maximum Daily Average: 0.8 ppb on Jun 13										Hours of Data: 410									
Minimum Value: 0.2 ppb on Jun 25 13:00										Minimum Daily Average: 0.3 ppb on Jun 16										Hours of Missing Data: 35									
Maximum Diurnal Average: 0.5 ppb at hour 2										Minimum Diurnal Average: 0.4 ppb at hour 16										Hours of Calibration: 21									
Monthly Average: 0.42 ppb										Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.3 Median = 0.3 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.3										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-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
2-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
3-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
4-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
5-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
6-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
7-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
8-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
9-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
10-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
11-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
12-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	--	--			
13-Jun	RE	RE	RE	Z	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	M	0.3	0.7	1.0	0.9	1.2	1.2	1.1	1.4	1.5	0.9	0.8	1.5			
14-Jun	0.7	1.5	1.2	1.2	Z	0.6	1.2	1.0	1.2	0.8	0.7	0.4	0.5	0.6	0.7	0.4	0.3	0.2	0.3	0.5	0.5	0.7	0.3	0.3	0.7	1.5			
15-Jun	0.3	0.3	0.3	0.4	0.4	Z	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.5			
16-Jun	Z	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
17-Jun	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	0.4	0.4	0.5	0.6	0.5	0.3	0.6		
18-Jun	0.6	0.8	Z	0.8	0.8	0.6	1.2	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	0.3	0.3	0.7	0.5	1.2			
19-Jun	0.3	0.3	0.3	Z	0.3	0.3	0.7	0.6	0.4	0.3	0.3	1.3	1.2	0.8	1.0	0.5	0.6	0.7	0.5	0.5	0.6	0.5	0.5	0.4	0.6	1.3			
20-Jun	0.3	0.4	0.5	0.4	Z	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6			
21-Jun	0.4	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.5			
22-Jun	Z	0.6	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6			
23-Jun	0.3	Z	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4			
24-Jun	0.4	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.5	0.4	0.6	0.5	0.4	0.6		
25-Jun	0.7	0.4	0.4	Z	1.3	0.7	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	0.4	0.4	0.4	1.3			
26-Jun	0.5	0.3	0.3	0.4	Z	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.6			
27-Jun	0.7	0.7	0.6	0.8	0.7	Z	1.0	0.8	0.9	0.8	0.6	0.6	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	1.0			
28-Jun	Z	0.6	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6			
29-Jun	0.3	Z	0.6	0.6	0.8	0.7	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	0.4	0.4	0.8			
30-Jun	0.4	0.4	Z	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan C - Calibration M - Maintenance NS - Not in Service RE - Recovery																													
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
Patricia McInnes - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	410	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: 410

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - June 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	67	26	12	2	4	12	26	28	39	25	47	29	15	6	22	50	410
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	67	26	12	2	4	12	26	28	39	25	47	29	15	6	22	50	410

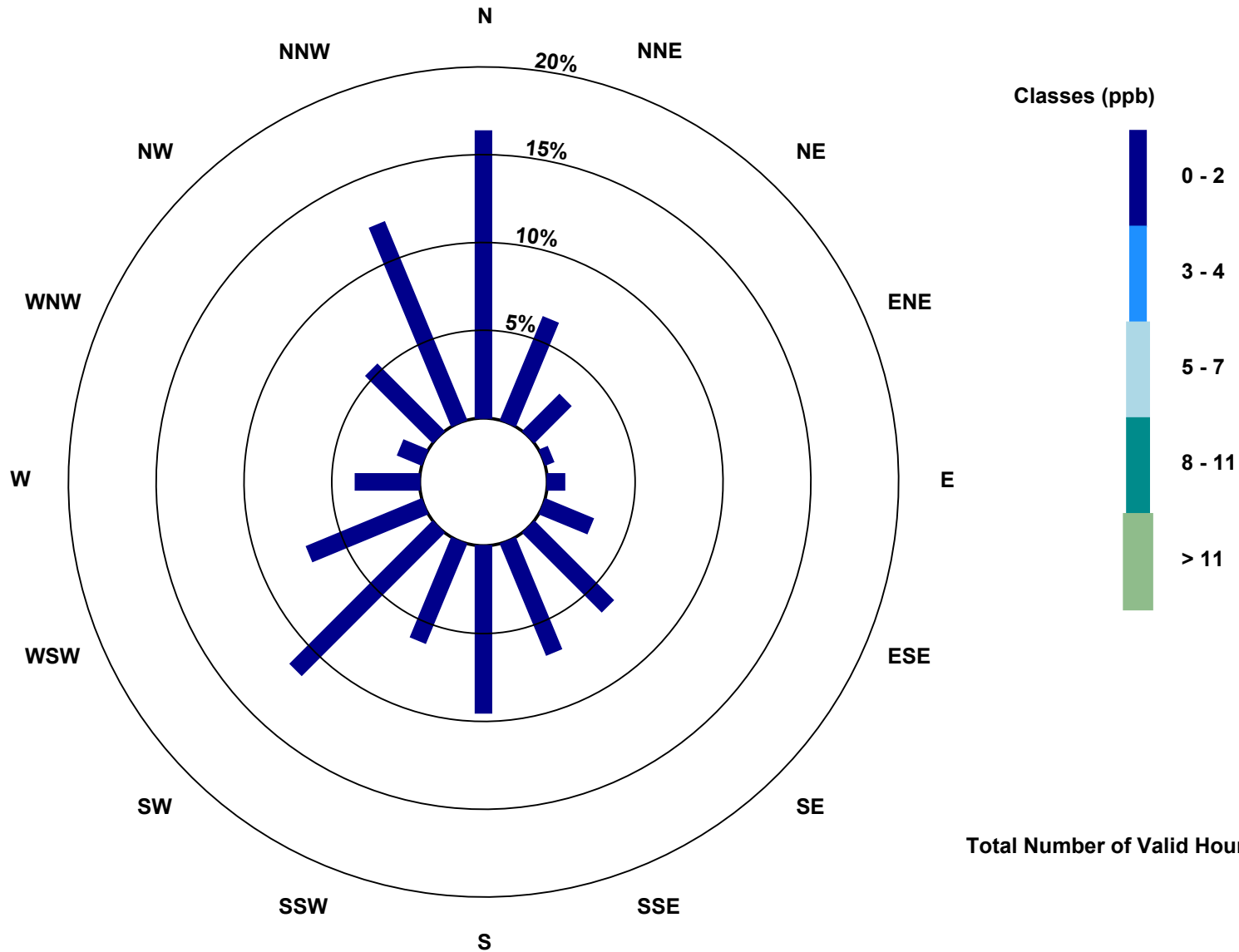
Total Number of Valid Hours: 410

Total Number of Hours: 720

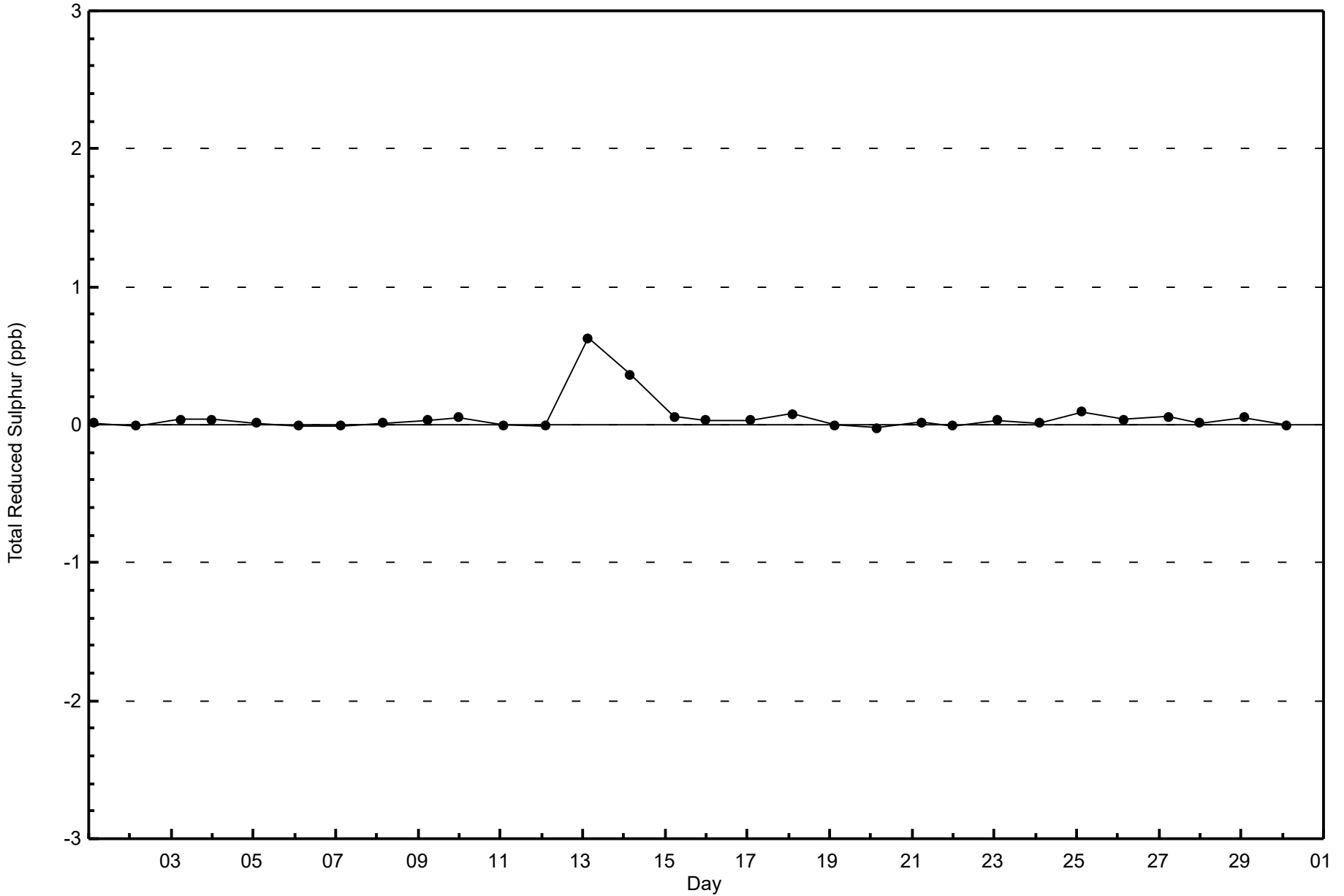


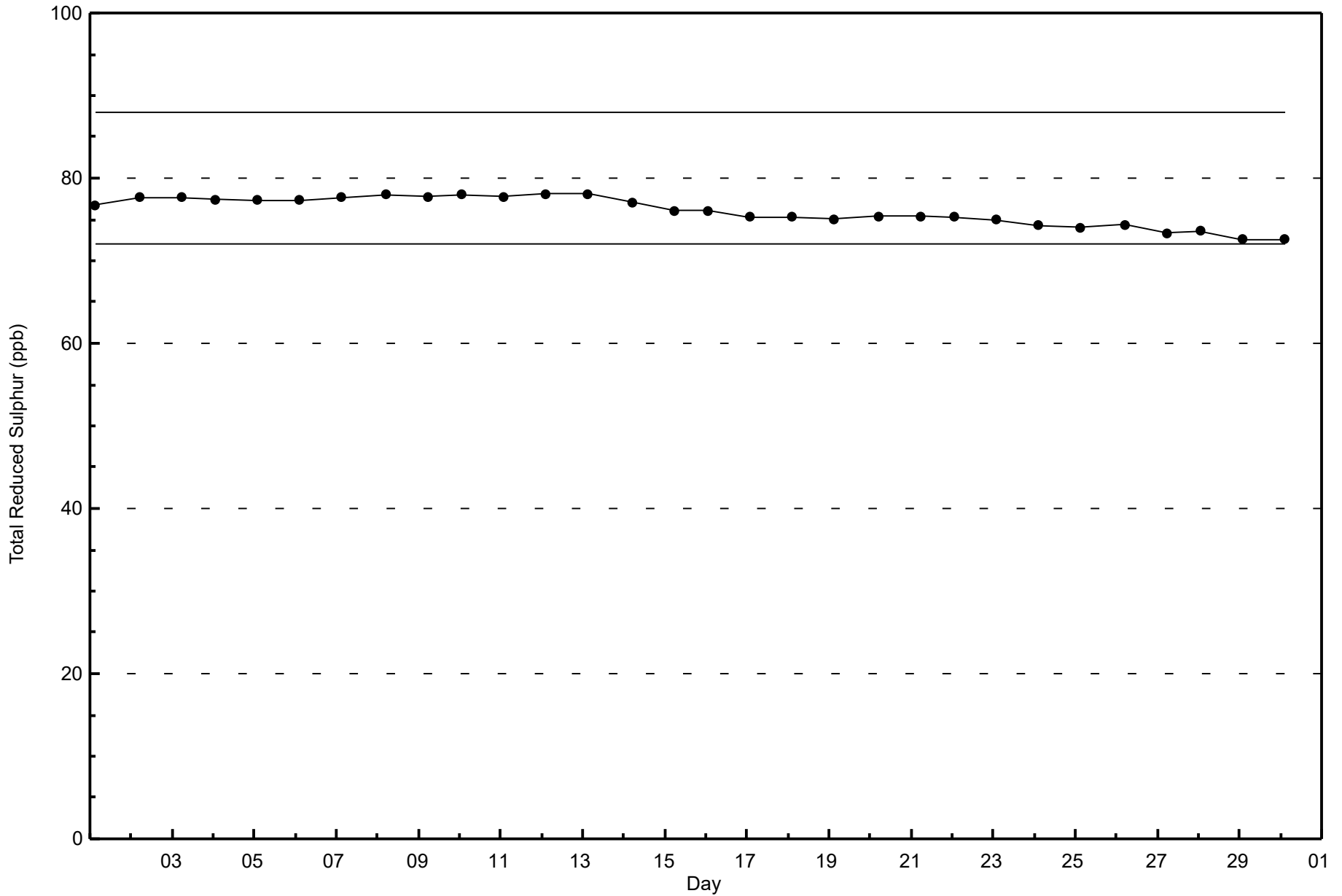
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes



Total Number of Valid Hours: 410







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

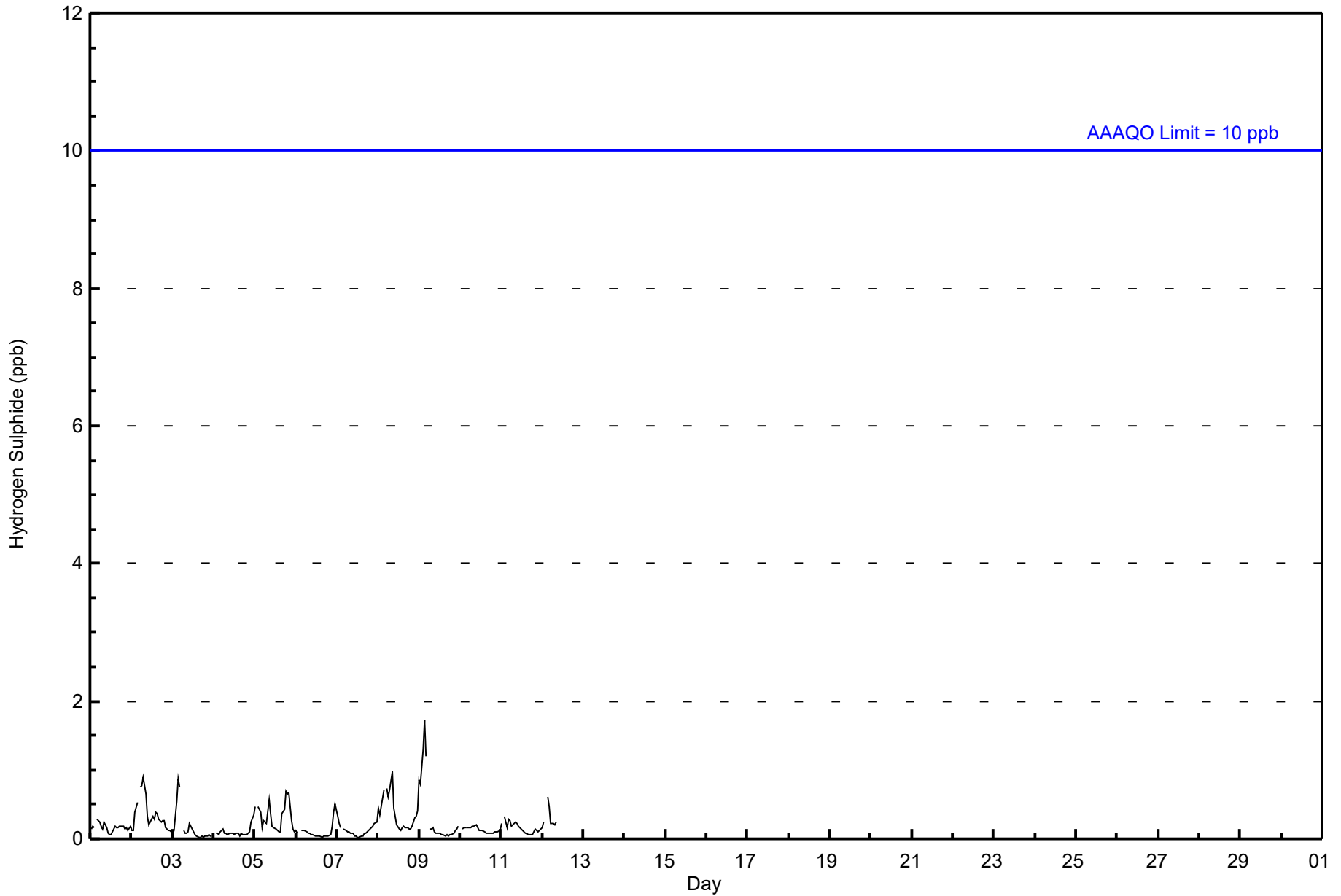
Patricia McInnes - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		275																		
Maximum Value: 1.7 ppb on Jun 9 04:00		Maximum Daily Average: 0.4 ppb on Jun 8				Hours of Data:		261																		
Minimum Value: 0.0 ppb on Jun 3 16:00		Minimum Daily Average: 0.1 ppb on Jun 4				Hours of Missing Data:		14																		
Maximum Diurnal Average: 0.5 ppb at hour 4		Minimum Diurnal Average: 0.1 ppb at hour 14				Hours of Calibration:		14																		
Monthly Average: 0.21 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 1.1				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-Jun	0.1	0.2	0.2	Z	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.3
2-Jun	0.1	0.1	0.4	0.5	Z	0.8	0.8	0.9	0.6	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.3	0.9
3-Jun	0.1	0.1	0.5	0.9	0.8	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.9
4-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3
5-Jun	0.5	Z	0.5	0.4	0.2	0.3	0.2	0.2	0.6	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.4	0.7	0.7	0.7	0.3	0.1	0.1	0.3	0.7
6-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.1	0.5
7-Jun	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.3
8-Jun	0.4	0.3	0.5	0.7	Z	0.7	0.6	0.7	1.0	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.4	0.4	1.0
9-Jun	0.9	0.8	1.3	1.7	1.2	Z	0.1	0.1	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	0.2	0.3	1.7
10-Jun	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
11-Jun	0.2	Z	0.3	0.2	0.3	0.3	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	0.1	0.1	0.1	0.1	0.2	0.3
12-Jun	0.2	0.2	Z	0.6	0.5	0.2	0.2	0.2	0.2	C	C	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	0.6
13-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
18-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Jun	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
																								Diurnal Average		
																								Diurnal Maximum		
0.3 0.2 0.4 0.5 0.4 0.3 0.2 0.3 0.3 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.2 0.2																										
0.9 0.8 1.3 1.7 1.2 0.8 0.8 0.9 1.0 0.4 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.7 0.7 0.7 0.3 0.4 0.5																										
Z - zerospan C - Calibration NS - Not in Service																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	261	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: 261

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Patricia McInnes - June 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	15	15	9	10	21	19	17	20	9	12	15	21	12	18	21	27	261
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	15	15	9	10	21	19	17	20	9	12	15	21	12	18	21	27	261

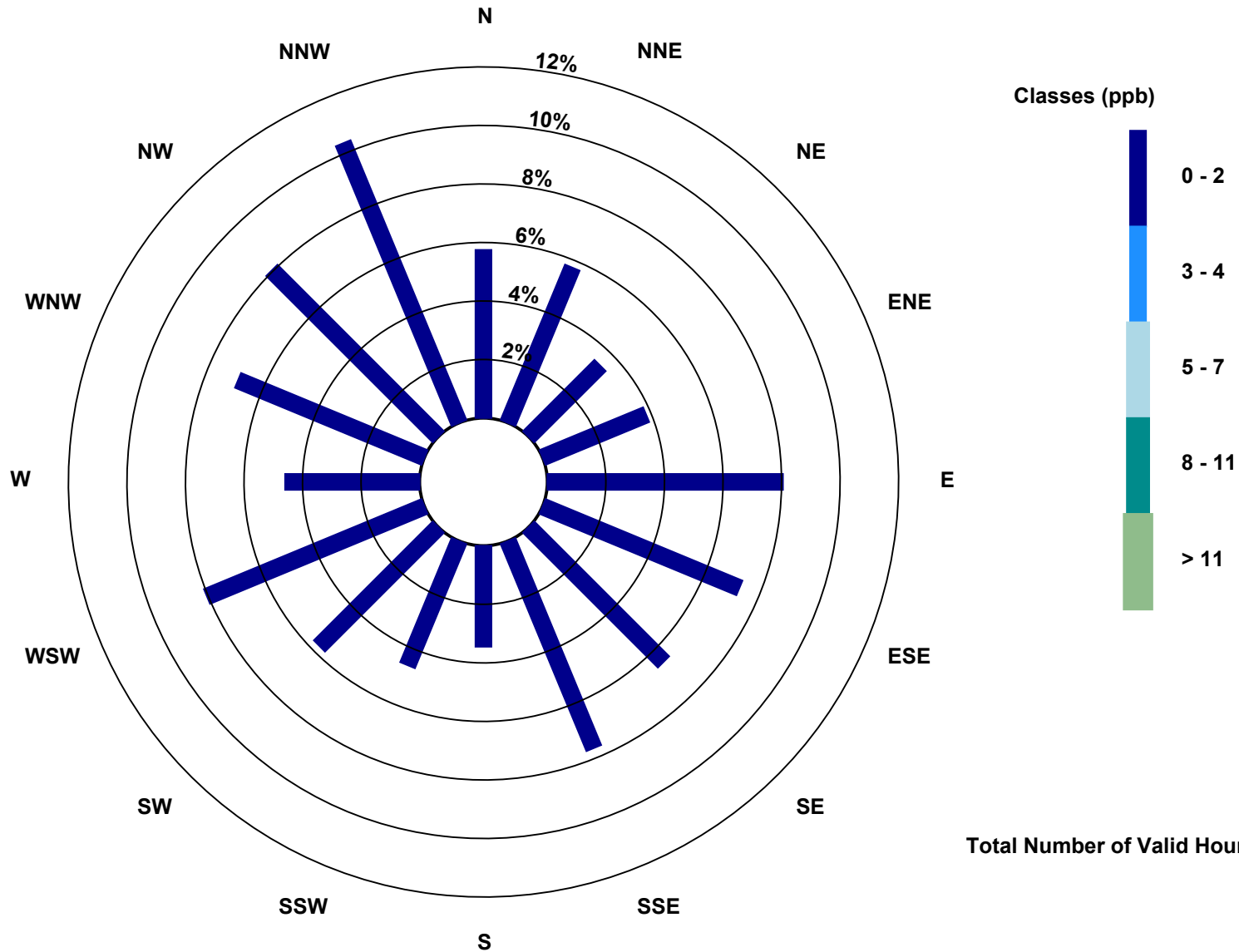
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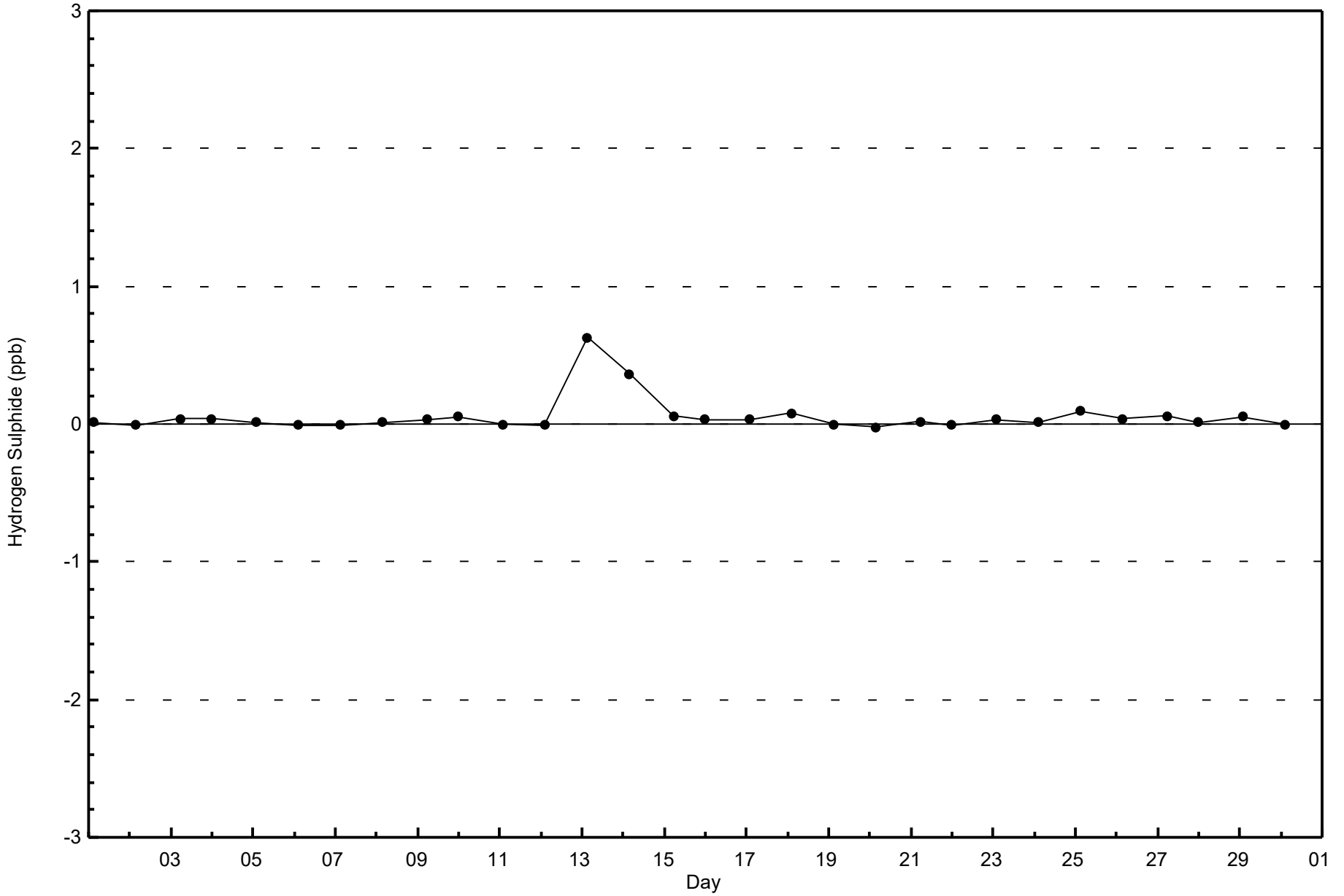
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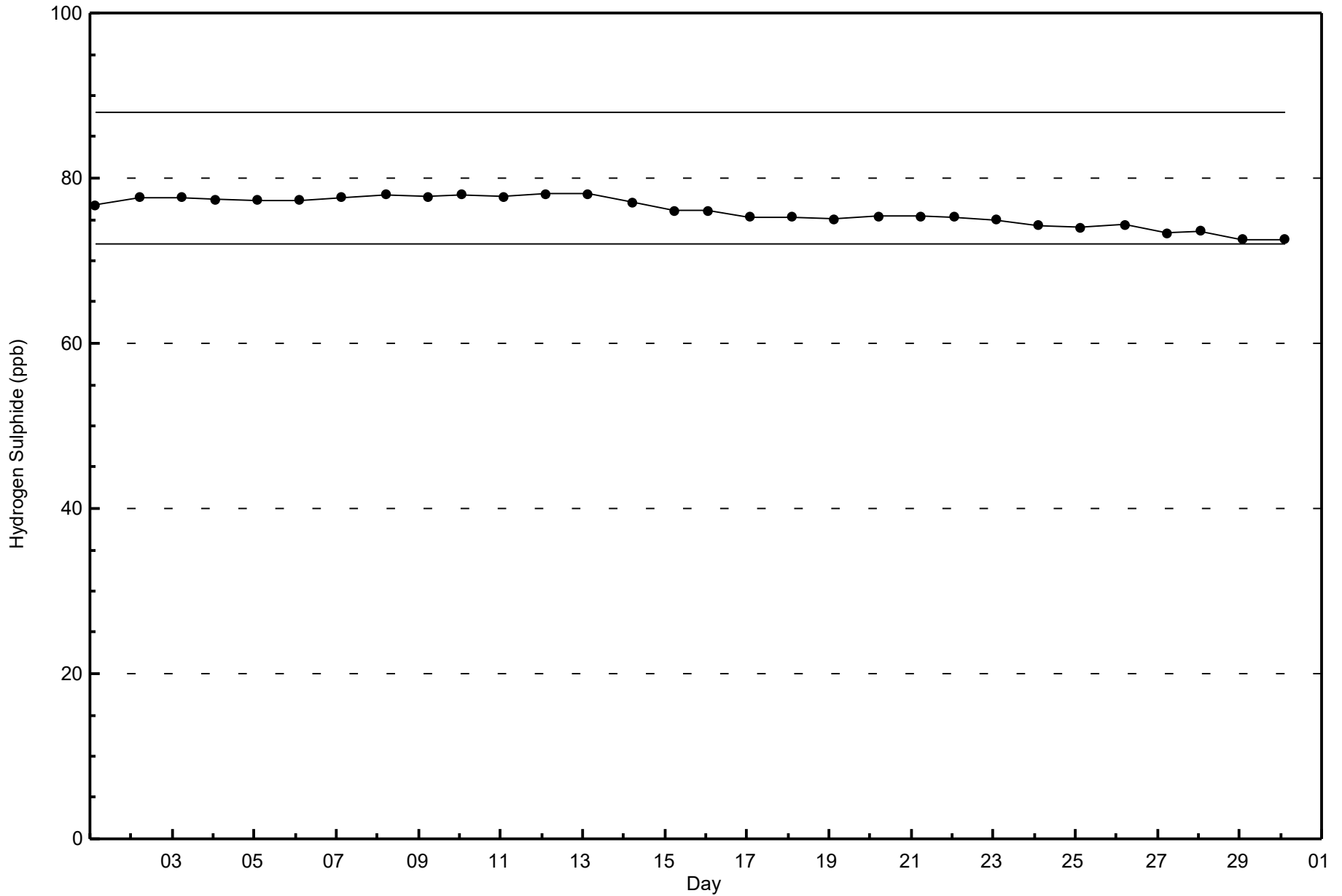


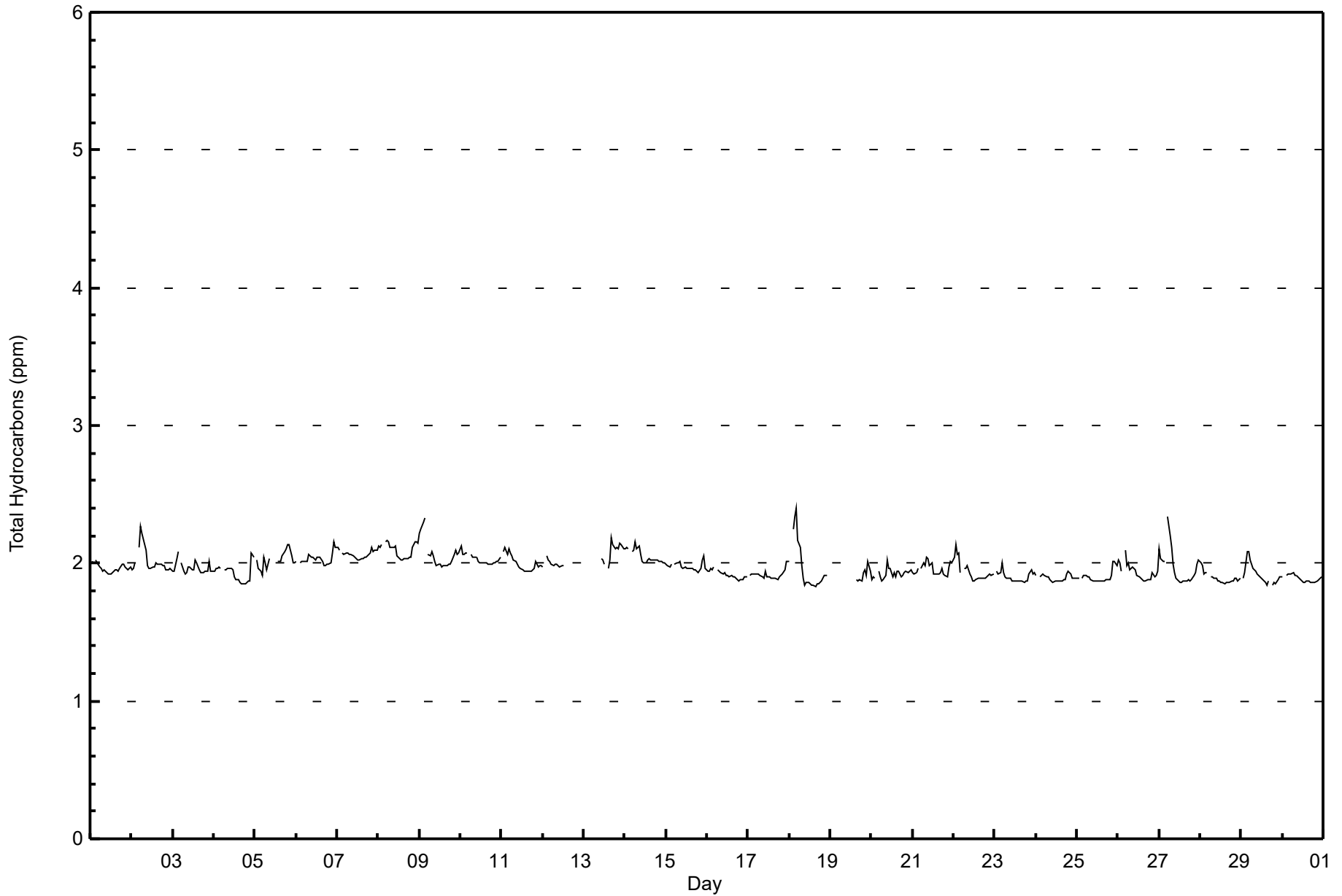
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Patricia McInnes











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	543	83.67	83.67
2.1 - 3.0	106	16.33	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 649

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Patricia McInnes - June 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	56	29	20	11	24	25	34	37	43	28	59	44	25	16	36	56	543
2.1 - 3.0	17	2	0	0	1	3	8	9	2	11	4	6	3	9	8	23	106
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	73	31	20	11	25	28	42	46	45	39	63	50	28	25	44	79	649

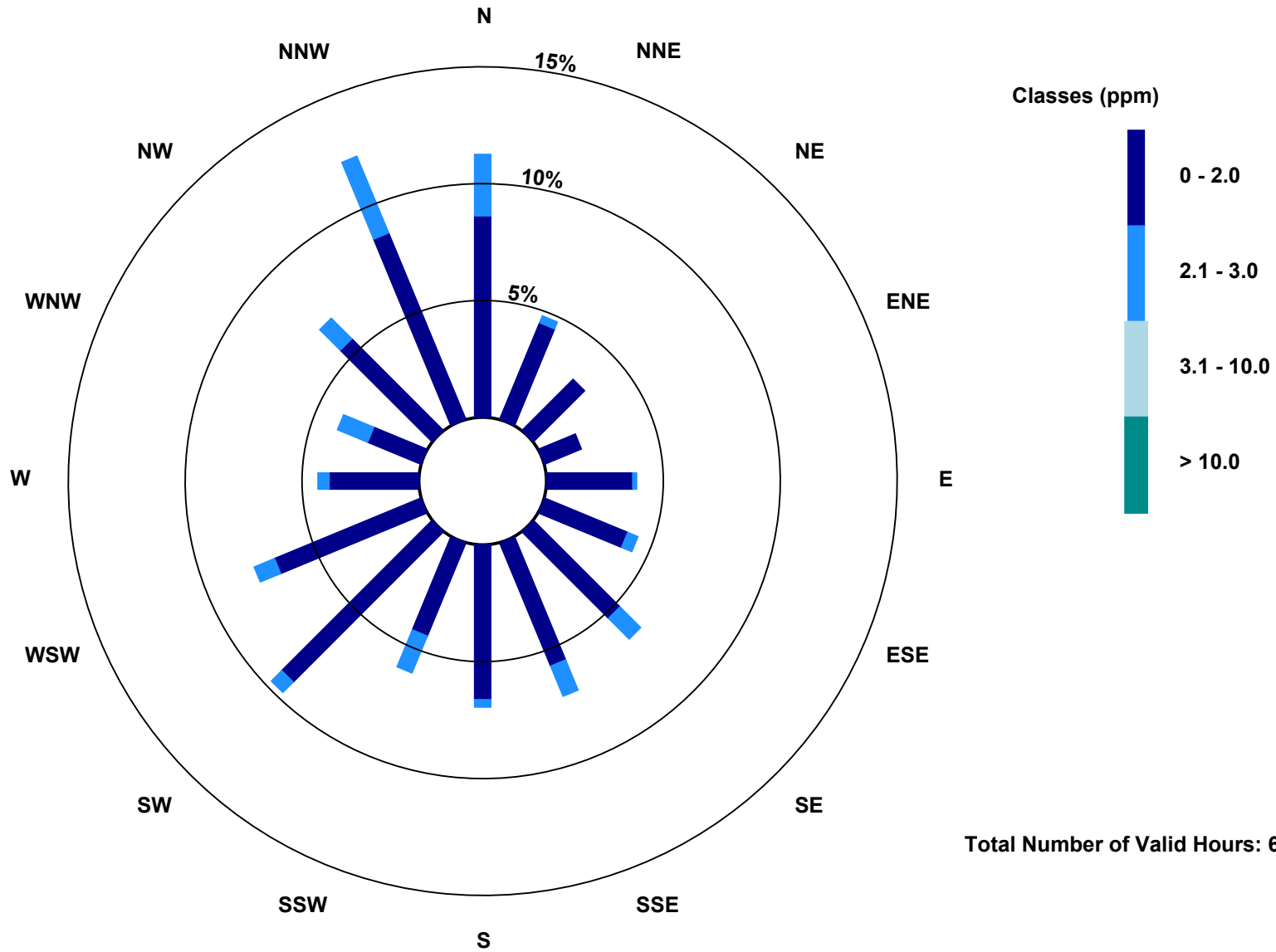
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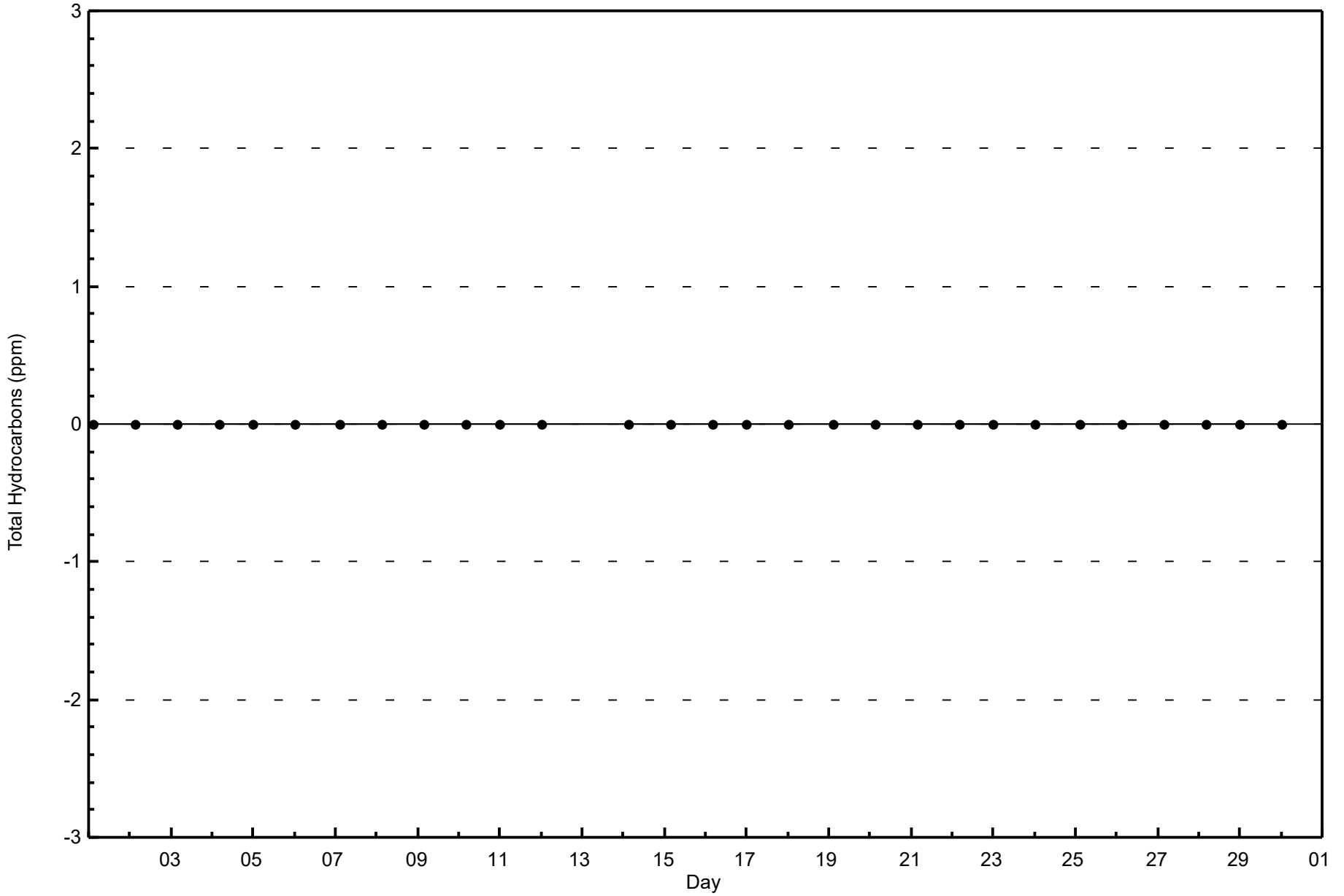
Total Number of Hours: 720

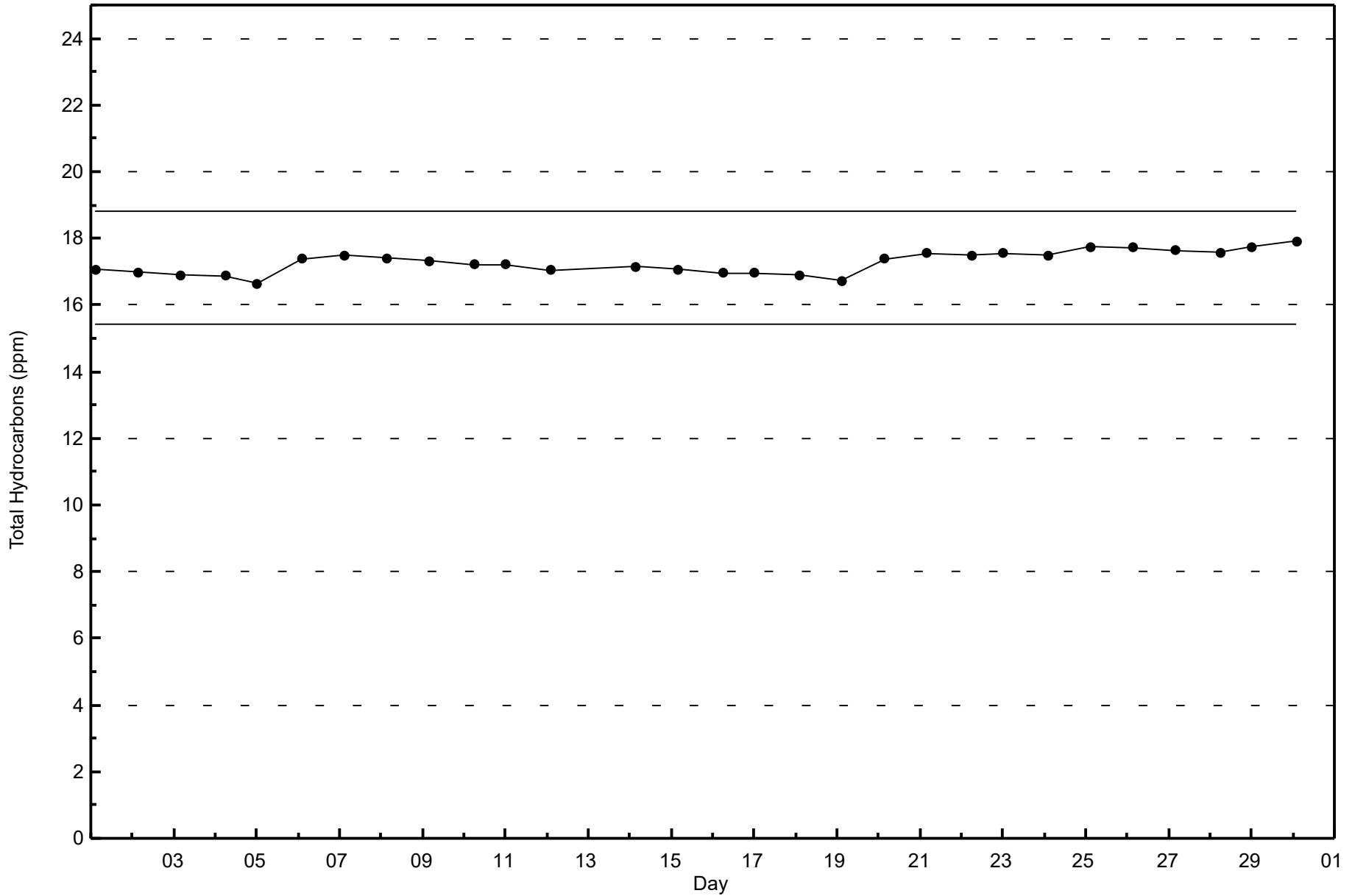


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Patricia McInnes





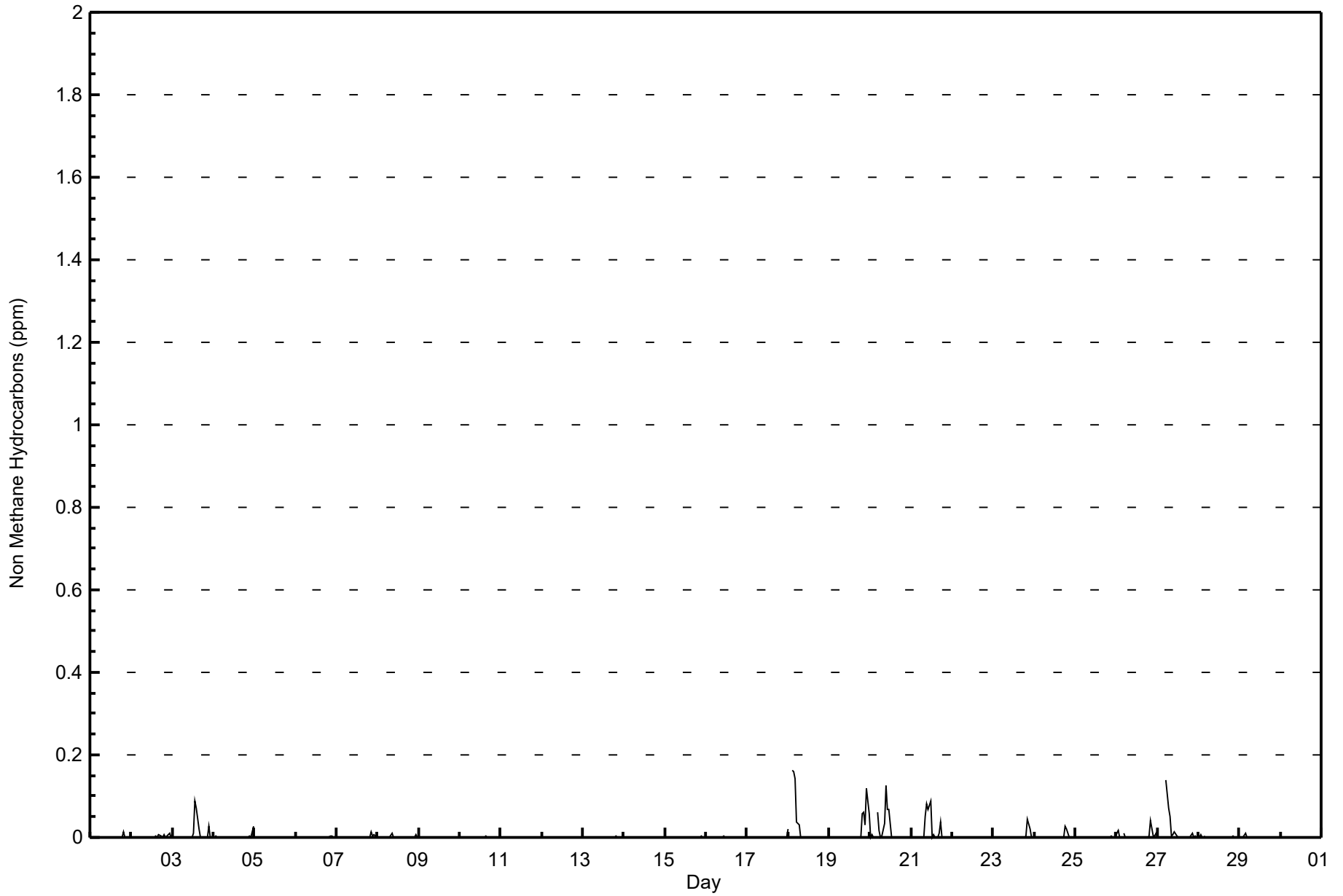




Maximum Value: 0.163 ppm on Jun 18 03:00	Maximum Daily Average: 0.025 ppm on Jun 18	Hours in Service: 720
Minimum Value: 0.000 ppm on Jun 1 01:00	Minimum Daily Average: 0.000 ppm on Jun 9	Hours of Data: 649
Maximum Diurnal Average: 0.010 ppm at hour 5	Minimum Diurnal Average: 0.000 ppm at hour 13	Hours of Missing Data: 71
Monthly Average: 0.004 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.1	Hours of Calibration: 36
		Percent Operational Time: 95.1

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-Jun	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	0.014	0.000	0.000	0.000	0.000	0.001	0.014																							
2-Jun	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	0.004	0.000	0.006	0.005	0.000	0.008	0.000	0.007	0.009	0.000	0.002	0.009																							
3-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.089	0.070	0.021	0.000	0.000	0.001	0.000	0.000	0.028	0.000	0.000	0.010	0.089																							
4-Jun	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	0.000	0.000	0.000	0.000	0.002	0.000	0.028	0.001	0.028																							
5-Jun	Z	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	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001																							
6-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.000	0.000	0.000	0.003																							
7-Jun	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	0.013	0.003	0.008	0.000	0.001	0.013																							
8-Jun	0.000	0.000	0.000	Z	0.000	0.001	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.001	0.010																							
9-Jun	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																							
10-Jun	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002																							
11-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	M	M	M	M	M	M	M	M	M	M	M	M																							
13-Jun	M	M	M	M	M	M	M	M	M	M	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002																							
14-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001																							
15-Jun	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	0.004																							
16-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002																							
17-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.021	Z	0.163	0.159	0.143	0.037	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.163																							
19-Jun	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	0.000	0.000	0.000	0.000	0.058	0.063	0.032	0.118	0.057	--	0.118																							
20-Jun	0.000	0.008	0.000	Z	0.062	0.017	0.000	0.003	0.035	0.126	0.068	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.126																							
21-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.050	0.083	0.068	0.087	0.000	0.007	0.001	0.001	0.011	0.038	0.001	0.000	0.000	0.002	0.000	0.000	0.015	0.087																							
22-Jun	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																							
23-Jun	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	0.002	0.044	0.022	0.000	0.000	0.003	0.044																							
24-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.019	0.000	0.000	0.000	0.000	0.002	0.028																							
25-Jun	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	0.003	0.000	0.000	0.000	0.003																							
26-Jun	0.009	0.017	0.000	Z	0.011	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.040	0.002	0.002	0.010	0.004	0.040																							
27-Jun	0.000	0.000	0.000	0.000	Z	0.139	0.071	0.050	0.004	0.007	0.014	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.003	0.000	0.013	0.139																							
28-Jun	0.000	0.008	0.000	0.000	0.003	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.001	0.008																							
29-Jun	Z	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	UO	0.000	0.000	0.000	0.000	0.000	0.001	0.011																							
30-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.007	0.007	0.010	0.008	0.004	0.002	0.004	0.008	0.005	0.006	0.000	0.004	0.003	0.001	0.001	0.002	0.001	0.004	0.006	0.004	0.005	0.003	Diurnal Average	
																								0.021	0.017	0.163	0.159	0.143	0.139	0.071	0.050	0.050	0.126	0.068	0.087	0.011	0.089	0.070	0.021	0.011	0.038	0.028	0.058	0.063	0.032	0.118	0.057	Diurnal Maximum	

Z - zerospan	C - Calibration	M - Maintenance	UO - Unstable Operation
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Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	592	91.22	91.22
0.006 - 0.05	39	6.01	97.23
0.06 - 0.1	16	2.47	99.69
> 0.1	2	0.31	100.00

Total Number of Valid Hours: 649

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - June 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	54	29	19	8	20	26	38	44	44	38	62	50	27	21	43	69	592
0.006 - 0.05	10	2	1	3	3	2	4	2	1	1	1	0	1	3	0	5	39
0.06 - 0.1	9	0	0	0	2	0	0	0	0	0	0	0	0	1	0	4	16
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Totals	73	31	20	11	25	28	42	46	45	39	63	50	28	25	44	79	649

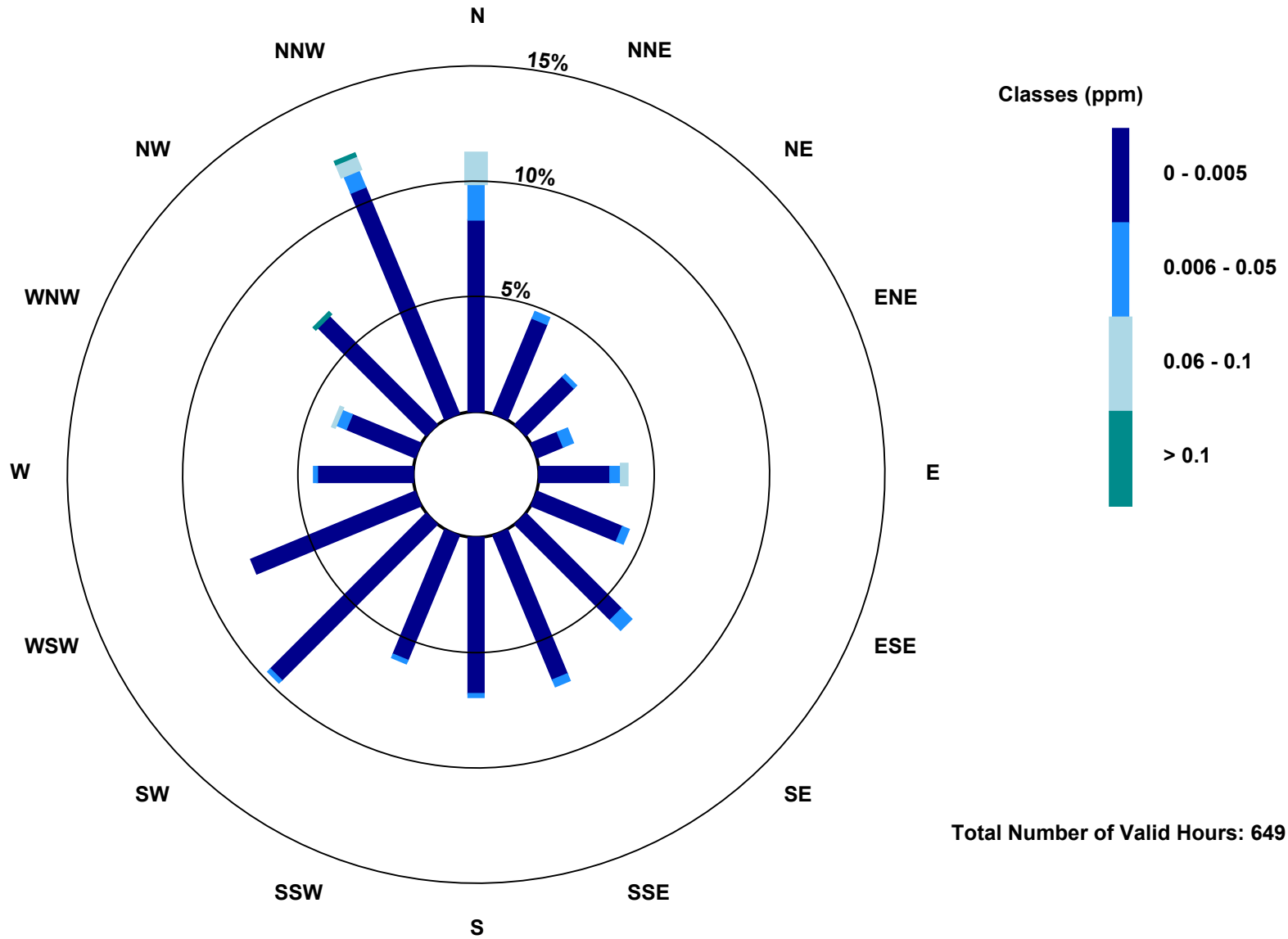
Total Number of Valid Hours: 649

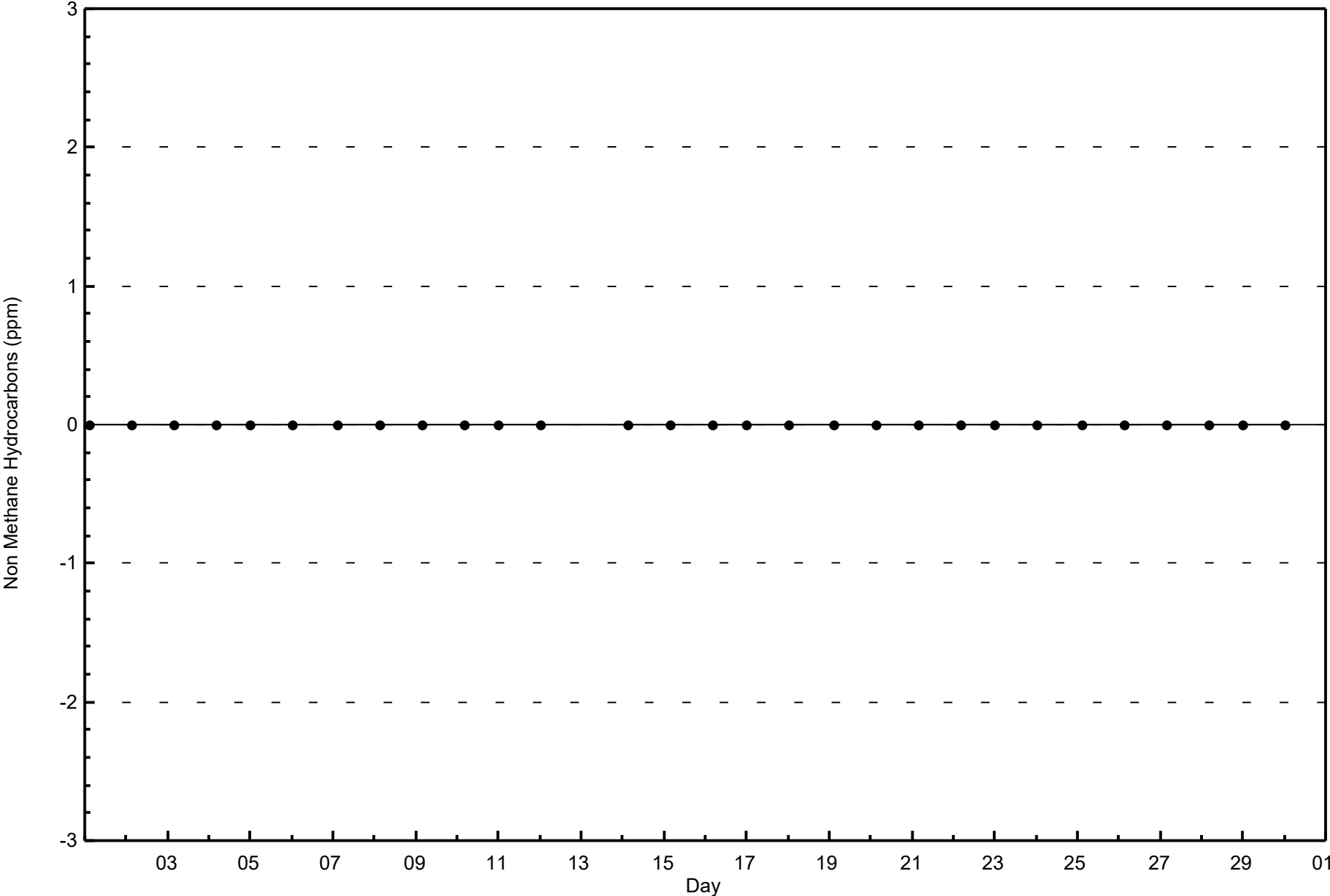
Total Number of Hours: 720

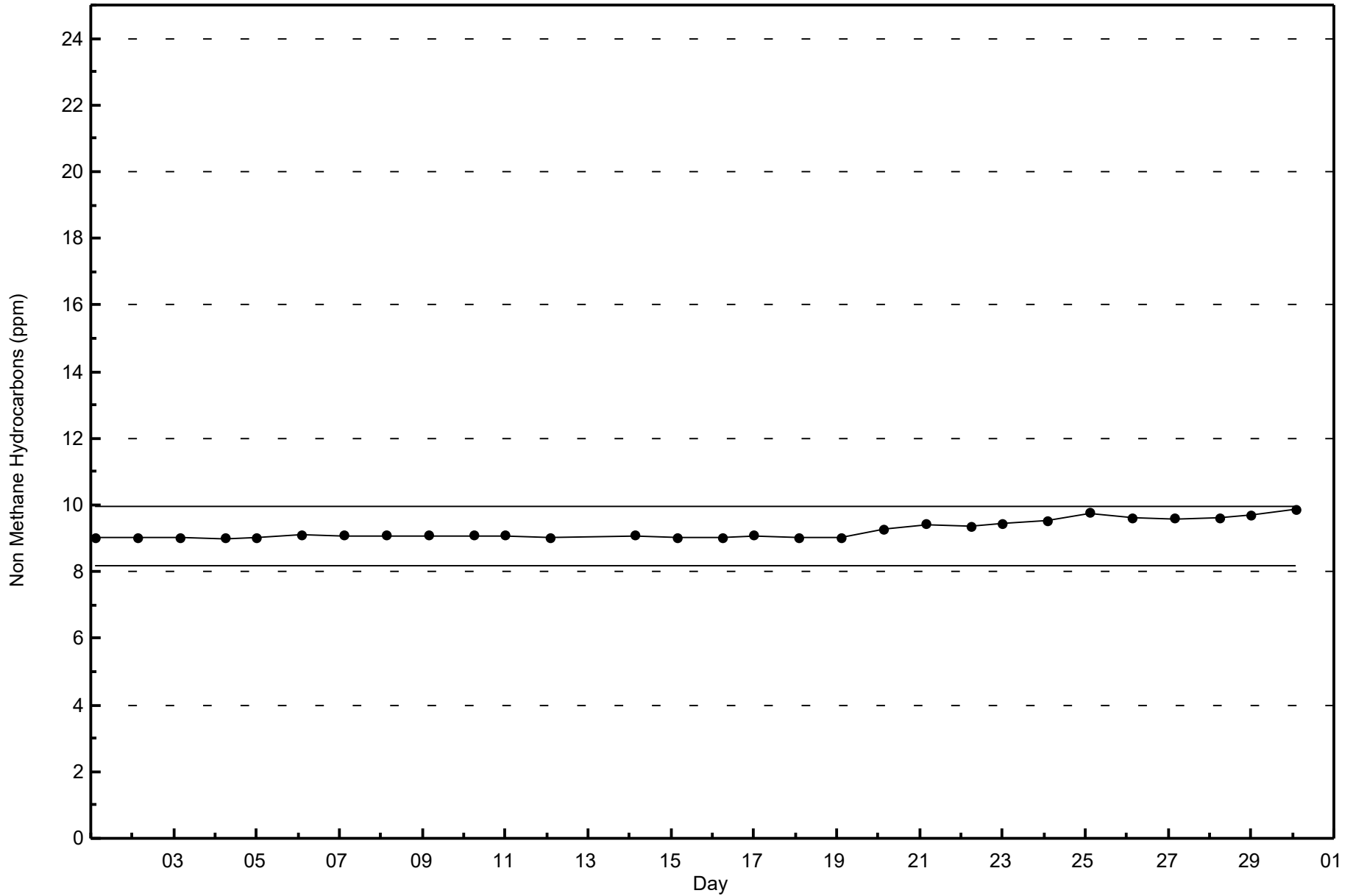


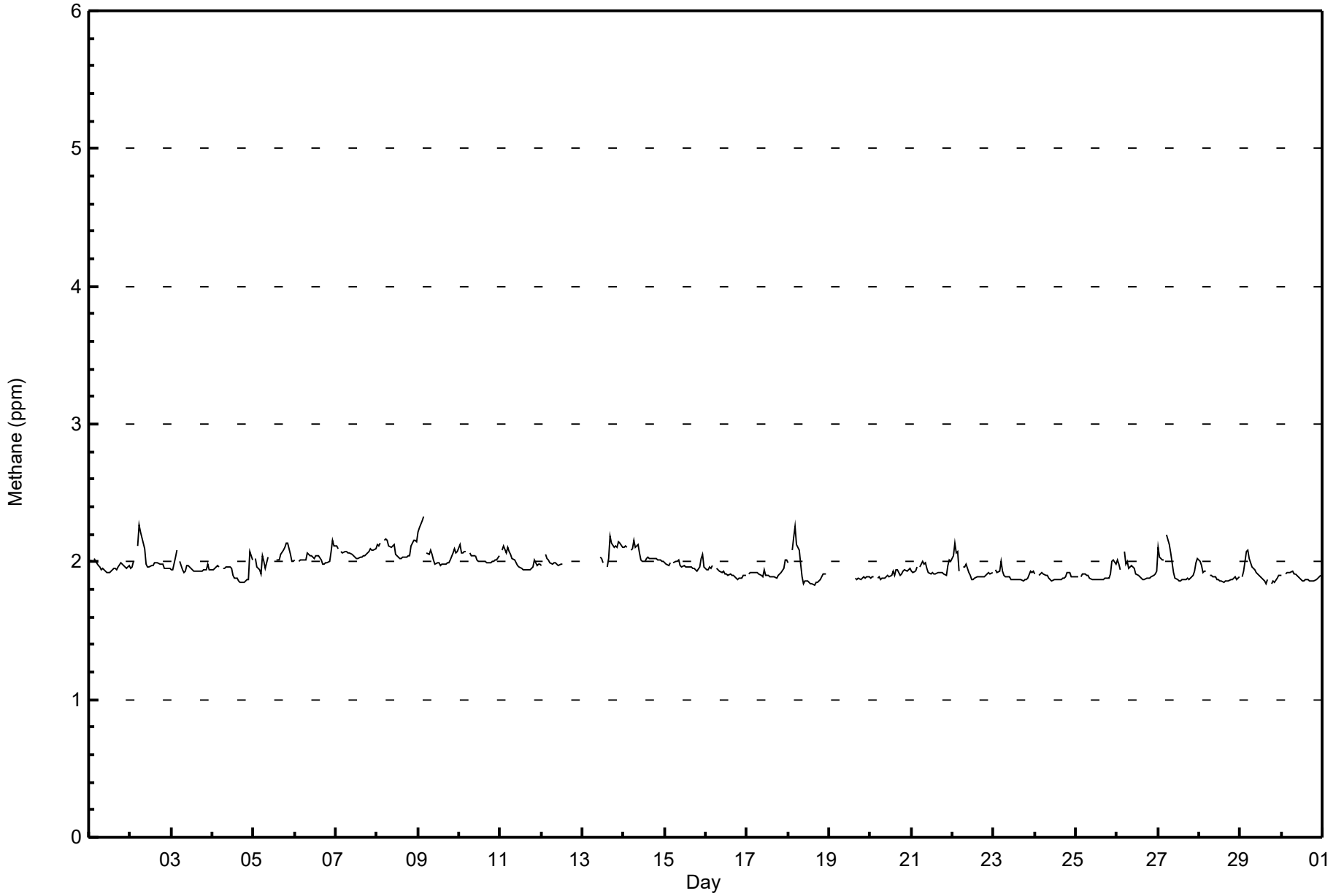
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	543	83.67	83.67
2.1 - 3.0	106	16.33	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 649

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Patricia McInnes - June 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	56	29	20	11	24	25	34	37	43	28	59	44	25	16	36	56	543
2.1 - 3.0	17	2	0	0	1	3	8	9	2	11	4	6	3	9	8	23	106
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	73	31	20	11	25	28	42	46	45	39	63	50	28	25	44	79	649

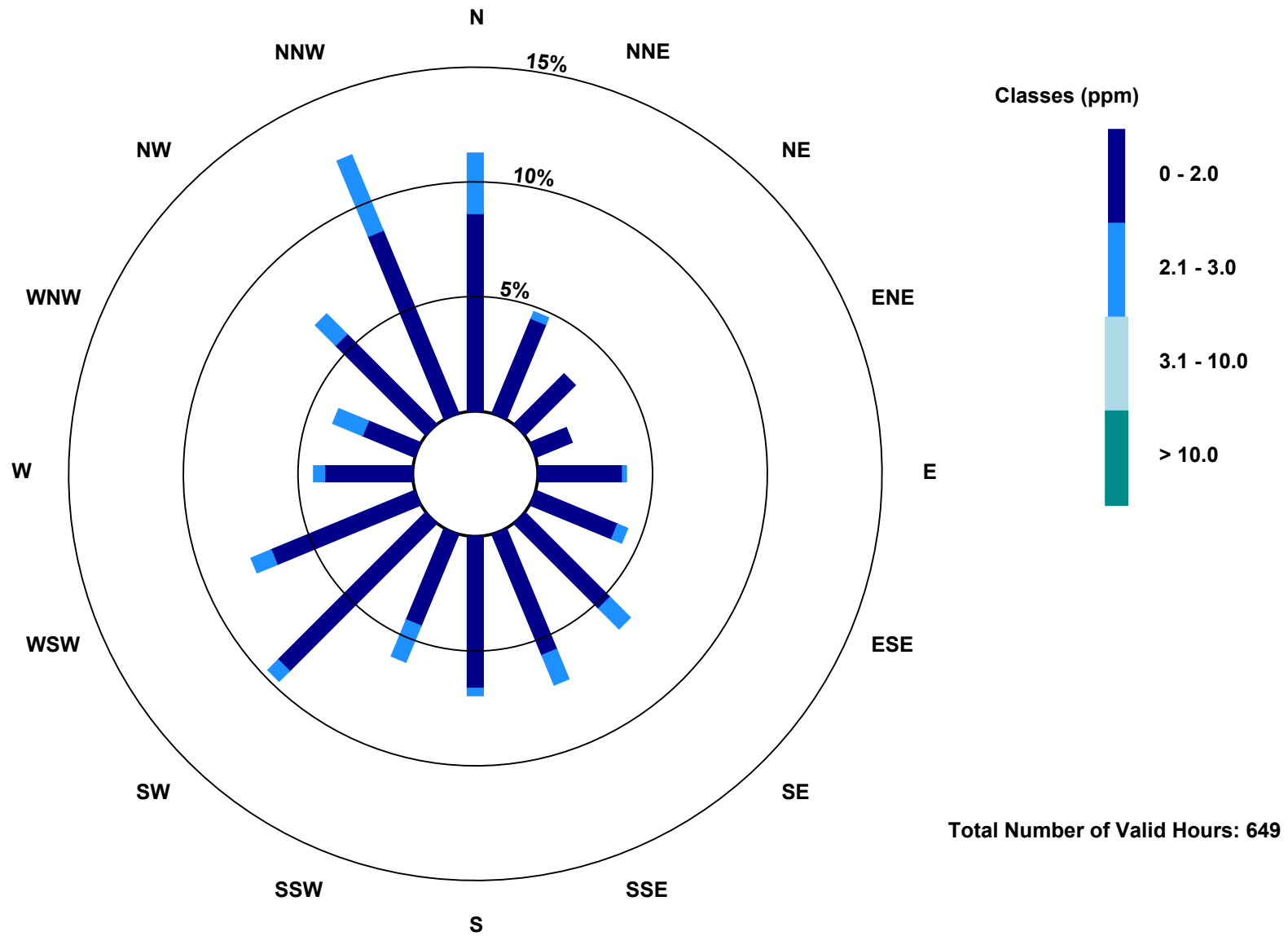
Total Number of Valid Hours: 649

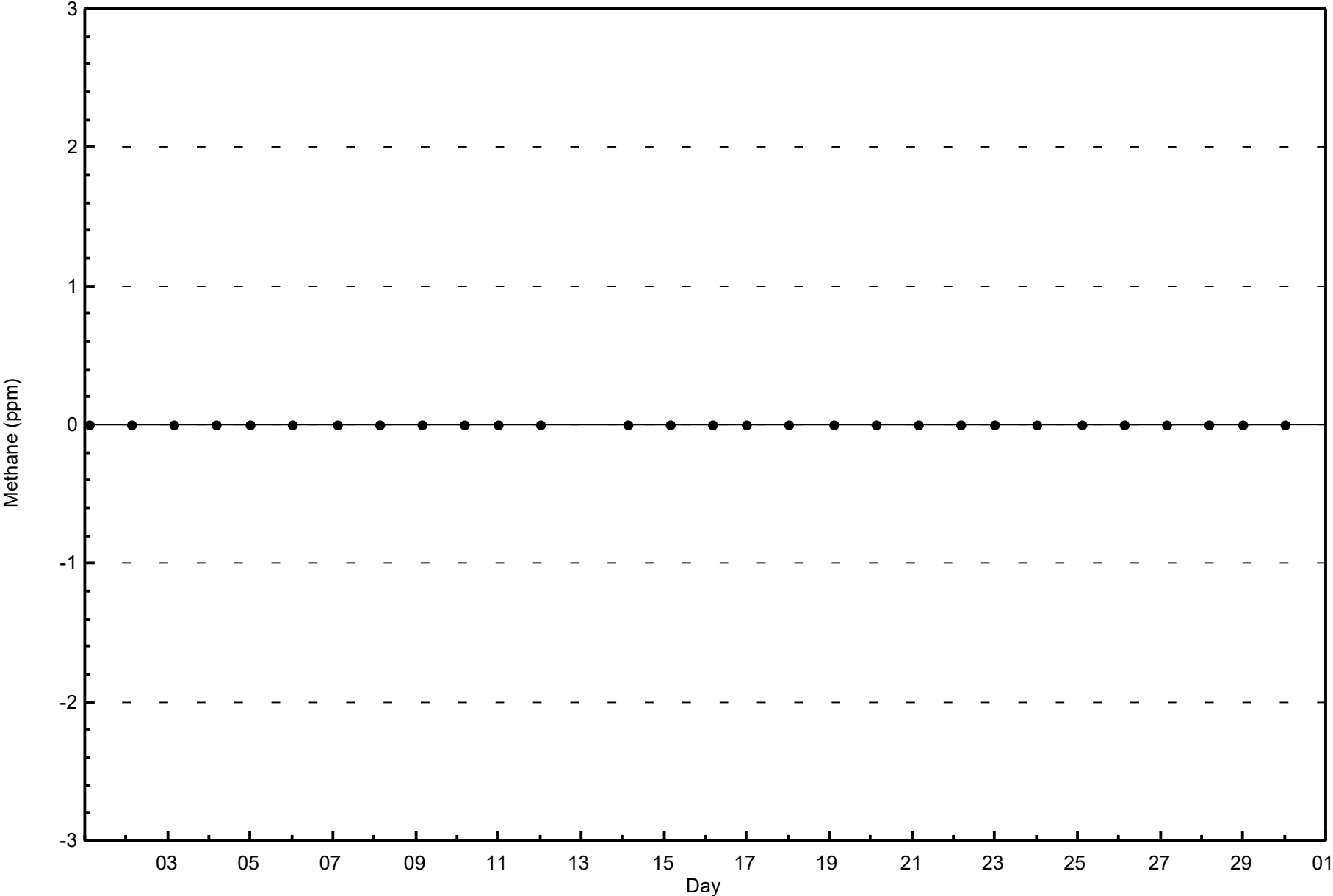
Total Number of Hours: 720

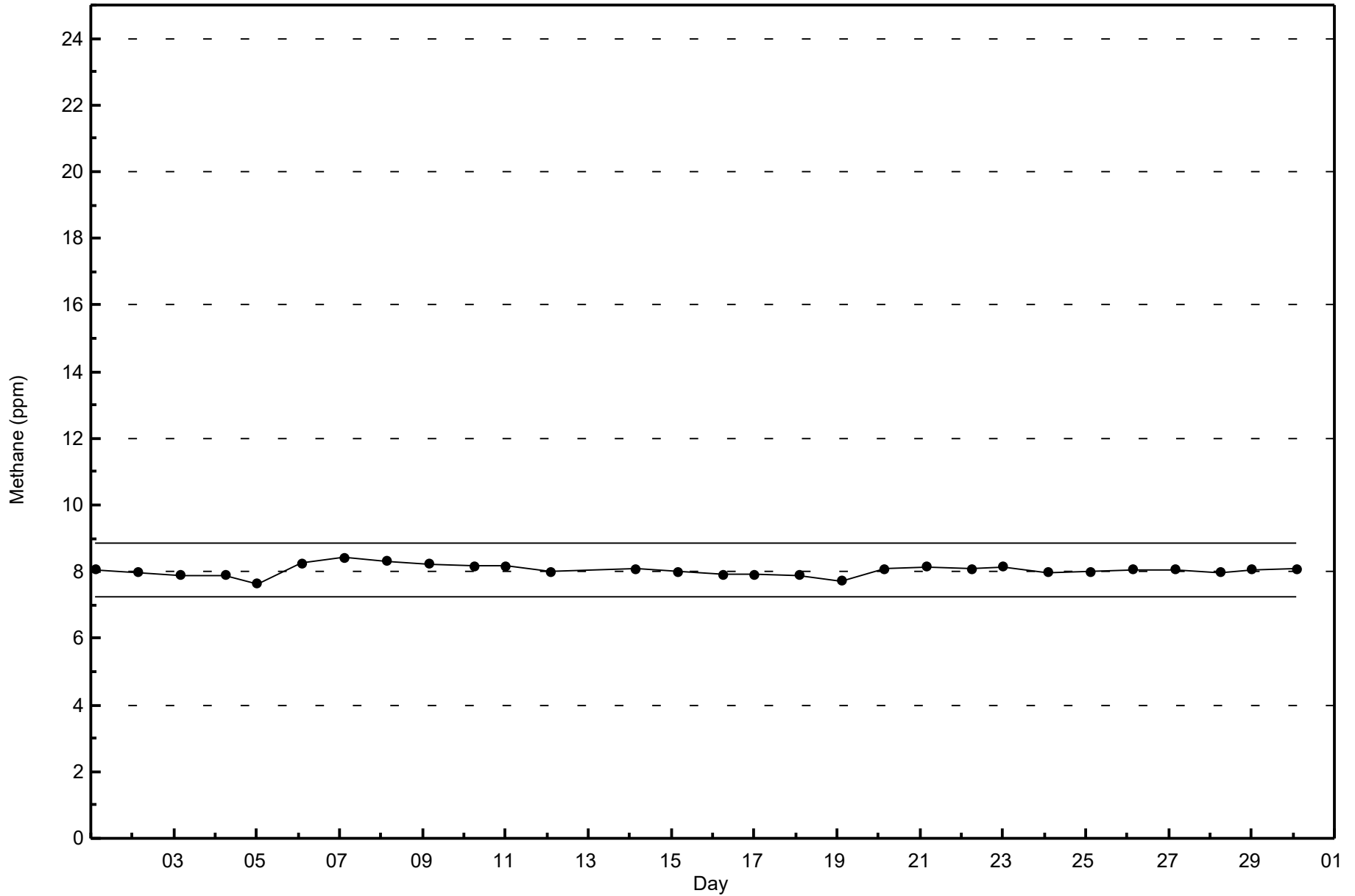


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

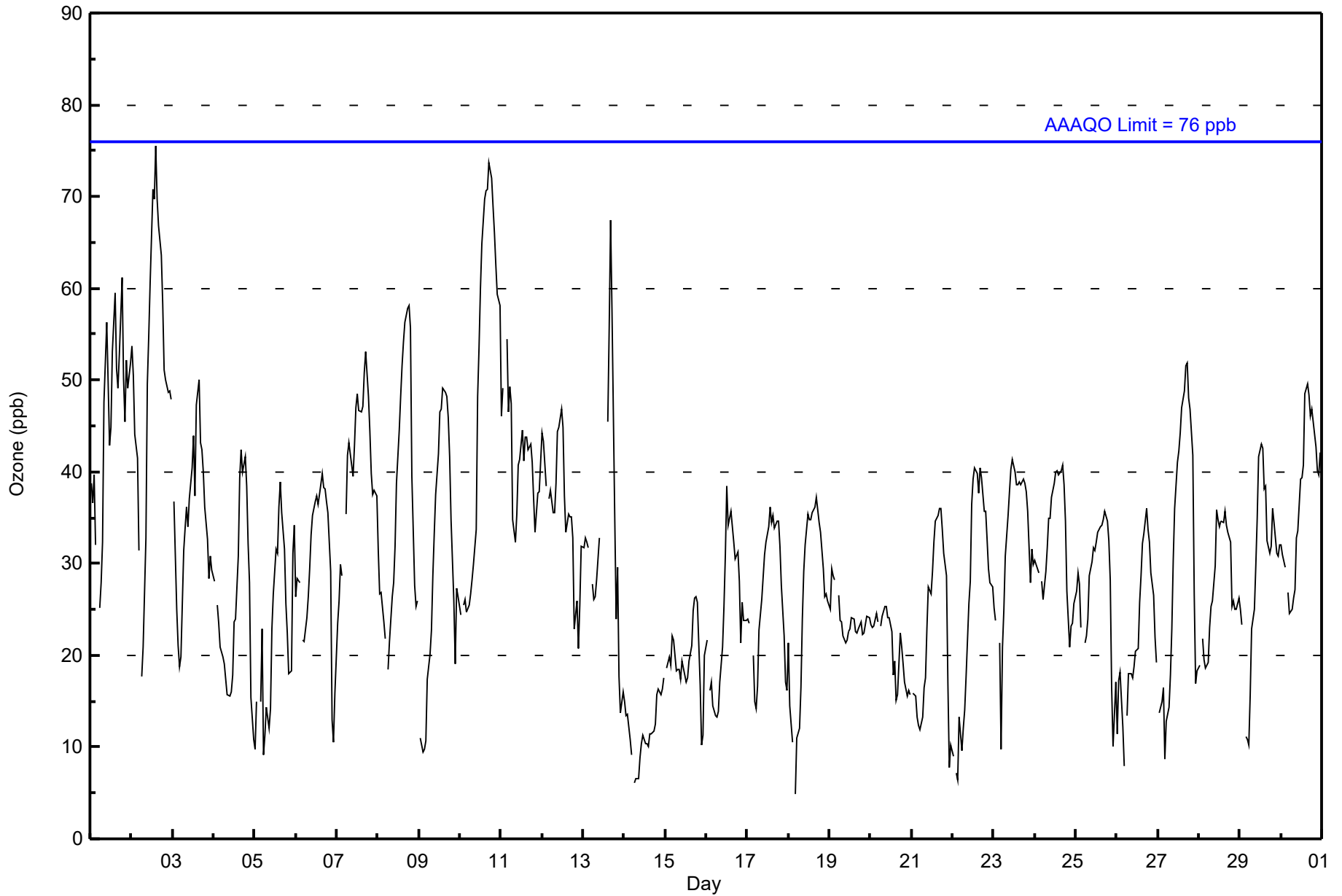
Patricia McInnes - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 75.5 ppb on Jun 2 15:00	Maximum Daily Average: 51.3 ppb on Jun 2		Hours of Data:	686
Minimum Value: 4.9 ppb on Jun 18 05:00	Minimum Daily Average: 11.8 ppb on Jun 14		Hours of Missing Data:	34
Maximum Diurnal Average: 40.5 ppb at hour 17	Minimum Diurnal Average: 19.3 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 30.68 ppb	Percentiles: P ₁ = 7.9 P ₁₀ = 14.7 Q ₁ = 21.6 Median = 29.5 Q ₃ = 38.5 P ₉₀ = 48.1 P ₉₉ = 69.8		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-Jun	38.7	36.6	39.6	32.1	Z	25.2	27.9	32.3	47.6	56.2	49.7	42.9	44.8	53.1	59.5	51.2	49.2	52.8	61.1	50.2	45.5	52.2	49.1	51.8	45.6	61.1
2-Jun	53.7	50.5	44.1	41.5	31.5	Z	17.8	20.9	32.9	49.6	54.8	60.6	70.8	69.7	75.5	69.8	66.8	63.6	58.3	51.1	50.0	48.7	48.9	47.9	51.3	75.5
3-Jun	Z	36.8	25.0	21.1	18.8	19.8	31.4	33.8	36.2	33.9	37.0	40.4	44.0	37.4	47.3	50.0	43.2	42.4	39.9	36.1	32.6	28.4	30.8	29.3	34.6	50.0
4-Jun	28.1	Z	25.5	23.5	20.9	19.8	19.1	17.3	15.7	15.5	16.0	17.8	23.7	23.9	30.9	39.3	42.4	40.0	41.6	38.5	32.2	27.8	15.5	10.9	25.5	42.4
5-Jun	9.7	15.0	Z	14.9	22.9	9.2	11.3	14.3	12.1	14.1	22.8	26.7	31.6	31.2	36.1	38.9	35.6	31.6	25.6	22.4	17.9	18.3	31.1	34.2	22.9	38.9
6-Jun	26.4	28.4	27.9	Z	21.7	21.5	24.1	26.4	29.4	33.1	35.2	36.7	37.4	36.4	37.5	39.8	38.3	38.1	36.8	35.5	29.1	12.9	10.5	15.9	29.5	39.8
7-Jun	23.4	25.9	29.9	28.7	Z	35.4	41.8	43.2	41.9	39.5	42.8	46.9	48.5	46.7	46.5	47.1	50.8	53.1	48.2	44.4	39.8	37.6	37.9	37.4	40.8	53.1
8-Jun	31.5	26.7	26.9	23.7	21.8	Z	18.4	21.6	26.4	27.8	31.9	38.8	44.5	48.2	51.5	54.2	56.3	57.8	58.0	55.7	39.5	27.7	25.3	26.0	36.5	58.0
9-Jun	Z	10.9	9.5	9.7	10.7	17.4	20.1	22.8	28.6	33.3	37.5	42.0	46.5	46.9	49.2	48.6	48.3	45.9	41.6	34.8	26.0	19.1	27.2	26.4	30.6	49.2
10-Jun	24.4	Z	25.5	26.1	24.7	25.5	26.7	28.2	29.9	33.7	48.2	53.6	60.0	64.8	69.8	70.6	70.8	73.7	72.0	69.0	66.0	62.6	59.3	58.1	49.7	73.7
11-Jun	46.0	49.1	Z	54.5	46.5	49.2	47.4	34.7	32.4	35.5	40.7	41.4	44.6	41.2	43.8	43.7	42.5	42.9	41.1	37.1	33.3	37.7	37.9	41.1	41.9	54.5
12-Jun	44.3	43.3	38.5	Z	37.0	38.0	35.5	35.5	38.7	44.4	44.8	46.9	44.9	37.4	33.4	35.4	35.1	35.0	32.7	22.8	25.9	20.7	25.5	31.9	36.0	46.9
13-Jun	31.7	32.8	32.3	31.7	Z	27.8	26.1	26.4	28.2	32.8	C	C	C	C	45.4	55.6	67.5	57.5	34.7	24.0	29.6	17.7	13.8	16.0	33.2	67.5
14-Jun	15.0	13.4	13.5	10.8	9.2	Z	6.1	6.6	6.5	8.8	10.4	11.3	10.3	10.1	11.4	11.4	11.7	12.5	15.7	16.3	15.7	16.2	17.5	11.8	17.5	
15-Jun	Z	18.6	19.8	18.9	22.1	21.7	18.3	18.5	18.4	17.3	19.4	17.9	17.0	17.6	19.3	21.0	24.9	26.2	26.4	25.8	16.8	10.3	11.3	20.0	19.5	26.4
16-Jun	21.7	Z	16.1	17.1	14.5	13.4	13.2	13.9	17.2	20.9	25.4	31.0	38.5	34.2	35.7	34.0	32.4	30.5	31.2	28.0	21.4	25.8	23.8	23.7	24.5	38.5
17-Jun	24.0	23.4	Z	20.0	15.0	14.1	16.7	22.7	26.1	28.6	30.9	32.4	33.9	36.2	34.4	35.3	33.9	34.6	34.6	31.8	27.7	22.2	17.1	16.1	26.6	36.2
18-Jun	21.3	14.5	10.5	Z	4.9	11.1	12.0	16.5	23.9	29.1	32.0	35.4	34.8	34.8	35.6	36.1	37.2	35.9	34.5	33.4	29.4	26.4	26.6	25.9	26.2	37.2
19-Jun	25.0	29.4	28.7	28.2	Z	26.5	23.8	23.7	22.1	21.4	21.6	22.6	22.9	24.1	23.9	22.5	22.5	22.9	23.7	22.3	22.4	23.3	24.3	24.1	24.0	29.4
20-Jun	23.4	23.0	23.2	24.6	23.7	Z	23.2	24.2	25.3	25.3	24.1	24.1	22.5	17.8	19.4	15.2	15.7	22.4	20.9	19.0	17.1	15.5	16.1	15.7	20.9	25.3
21-Jun	Z	15.9	15.6	13.3	12.3	11.9	13.3	16.4	17.6	22.9	27.4	26.7	29.1	32.4	34.6	35.2	36.0	36.0	33.7	31.0	28.6	16.9	7.8	10.1	22.8	36.0
22-Jun	9.0	Z	7.1	6.4	13.3	9.6	12.0	14.0	17.7	25.6	28.1	36.4	39.2	40.4	39.8	37.7	40.5	39.3	35.8	35.7	32.6	29.4	27.9	27.4	26.3	40.5
23-Jun	25.2	23.8	Z	21.4	9.7	20.9	25.1	30.8	35.2	37.8	40.3	41.4	40.0	38.6	38.6	38.9	38.5	39.3	38.7	37.8	35.7	27.9	31.5	29.8	32.5	41.4
24-Jun	30.4	29.9	28.9	Z	28.1	26.1	29.1	31.8	34.9	34.9	37.2	38.8	39.9	40.1	39.7	40.1	40.7	38.5	34.6	27.0	20.9	23.2	23.5	25.6	32.3	40.7
25-Jun	27.0	28.9	27.8	23.0	Z	21.4	22.1	24.0	28.7	30.2	31.7	31.4	32.4	33.3	34.0	34.2	34.8	35.7	34.6	32.5	28.2	16.4	10.1	17.1	27.8	35.7
26-Jun	11.5	17.3	18.2	12.1	7.9	Z	13.5	18.0	18.0	17.6	18.8	20.5	20.7	25.8	28.6	32.2	33.3	36.0	33.7	32.4	29.0	26.5	21.9	19.2	22.3	36.0
27-Jun	Z	13.7	14.9	16.4	8.6	12.8	14.3	17.9	22.9	30.3	35.9	41.1	42.2	44.2	47.0	48.8	51.6	51.9	48.1	46.9	41.8	26.8	16.9	18.2	31.0	51.9
28-Jun	18.9	Z	21.8	19.5	18.7	19.2	23.0	25.3	25.9	29.8	35.9	34.8	34.0	34.7	34.5	35.7	34.2	33.3	32.4	25.4	26.0	25.1	25.0	26.3	27.8	35.9
29-Jun	25.1	23.3	Z	11.1	10.8	10.2	15.7	22.9	25.1	29.7	34.9	41.6	42.9	42.6	38.1	38.4	32.6	31.2	31.9	36.0	34.5	31.0	30.8	32.0	29.2	42.9
30-Jun	32.0	31.0	29.5	Z	26.9	24.5	25.1	26.3	27.2	32.8	33.6	39.3	39.4	40.7	48.5	49.6	48.3	46.0	46.8	45.5	42.8	40.2	39.6	42.1	37.3	49.6

26.7	26.5	24.0	22.0	19.3	21.3	21.8	23.7	26.4	29.8	32.7	35.2	37.3	37.4	39.6	40.4	40.5	40.2	38.2	34.9	31.3	27.1	26.1	27.3	Diurnal Average
53.7	50.5	44.1	54.5	46.5	49.2	47.4	43.2	47.6	56.2	54.8	60.6	70.8	69.7	75.5	70.6	70.8	73.7	72.0	69.0	66.0	62.6	59.3	58.1	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	155	22.59	22.59
21 - 50	484	70.55	93.15
51 - 82	47	6.85	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
Patricia McInnes - June 2023

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	1	1	4	5	14	13	6	10	7	2	7	7	20	37	155
21 - 50	59	32	19	6	19	25	33	26	35	31	56	47	20	16	23	37	484
51 - 82	6	5	1	6	1	1	1	9	6	1	0	1	0	2	0	7	47
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	82	41	21	13	24	31	48	48	47	42	63	50	27	25	43	81	686

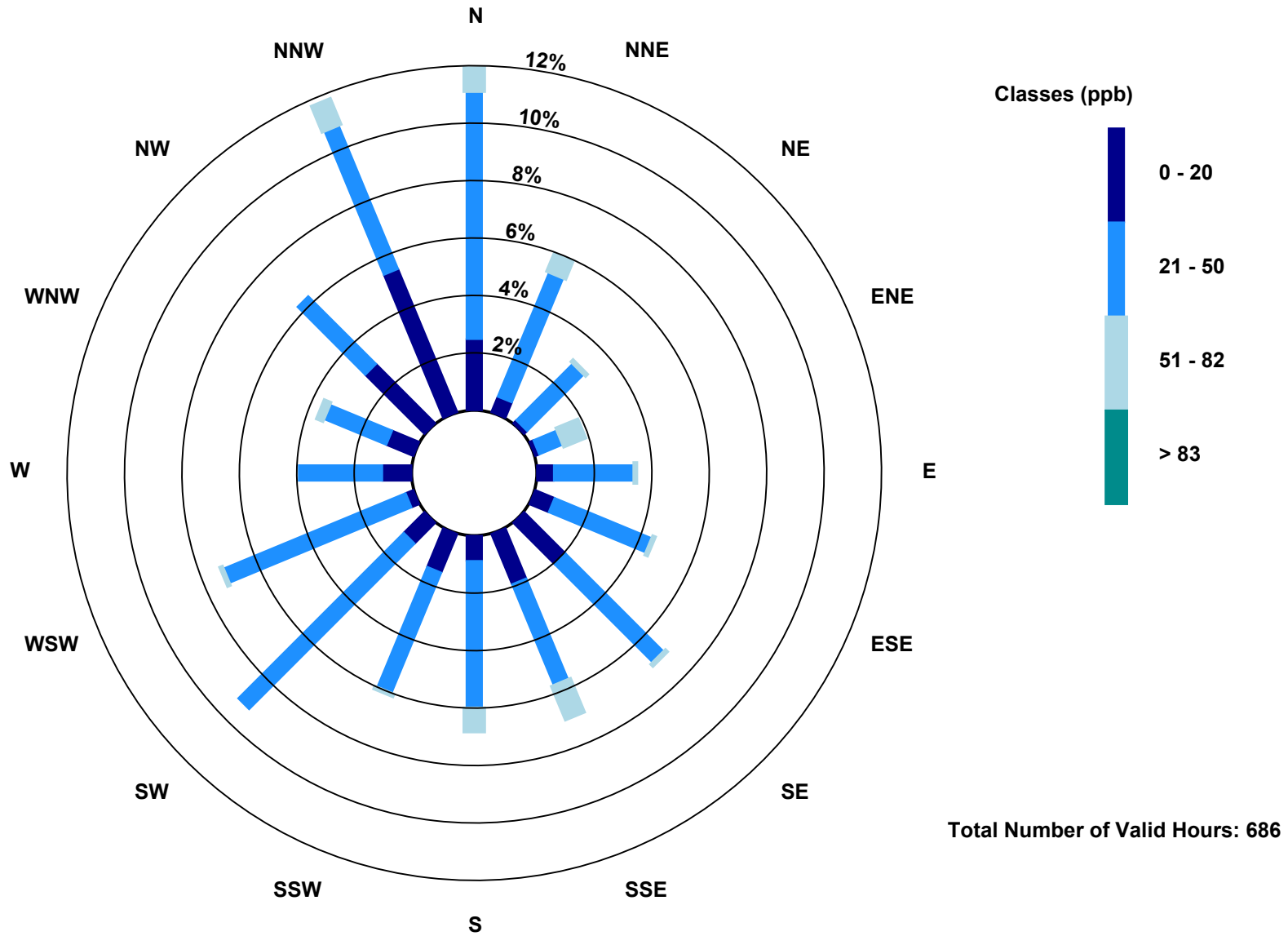
Total Number of Valid Hours: 686

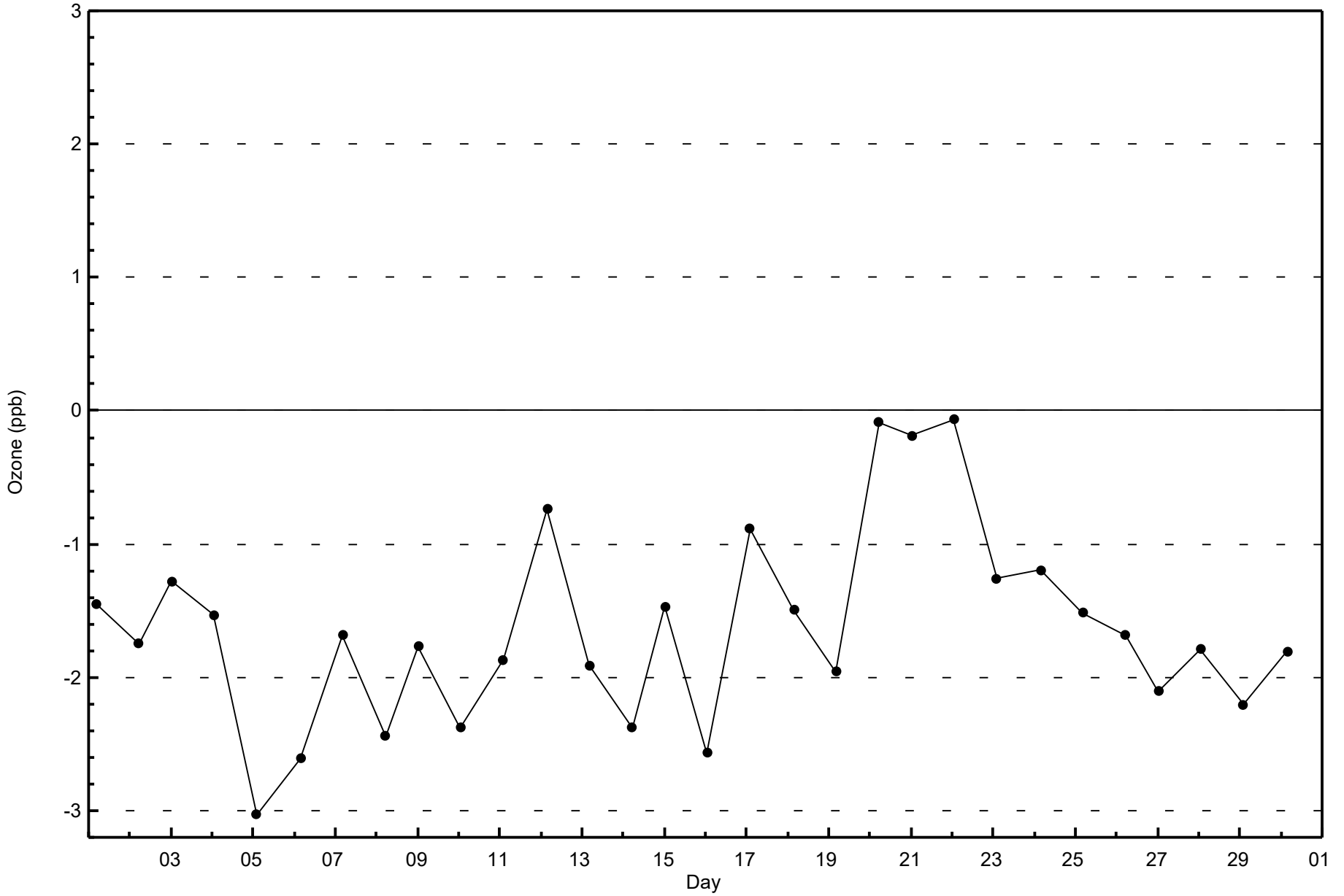
Total Number of Hours: 720

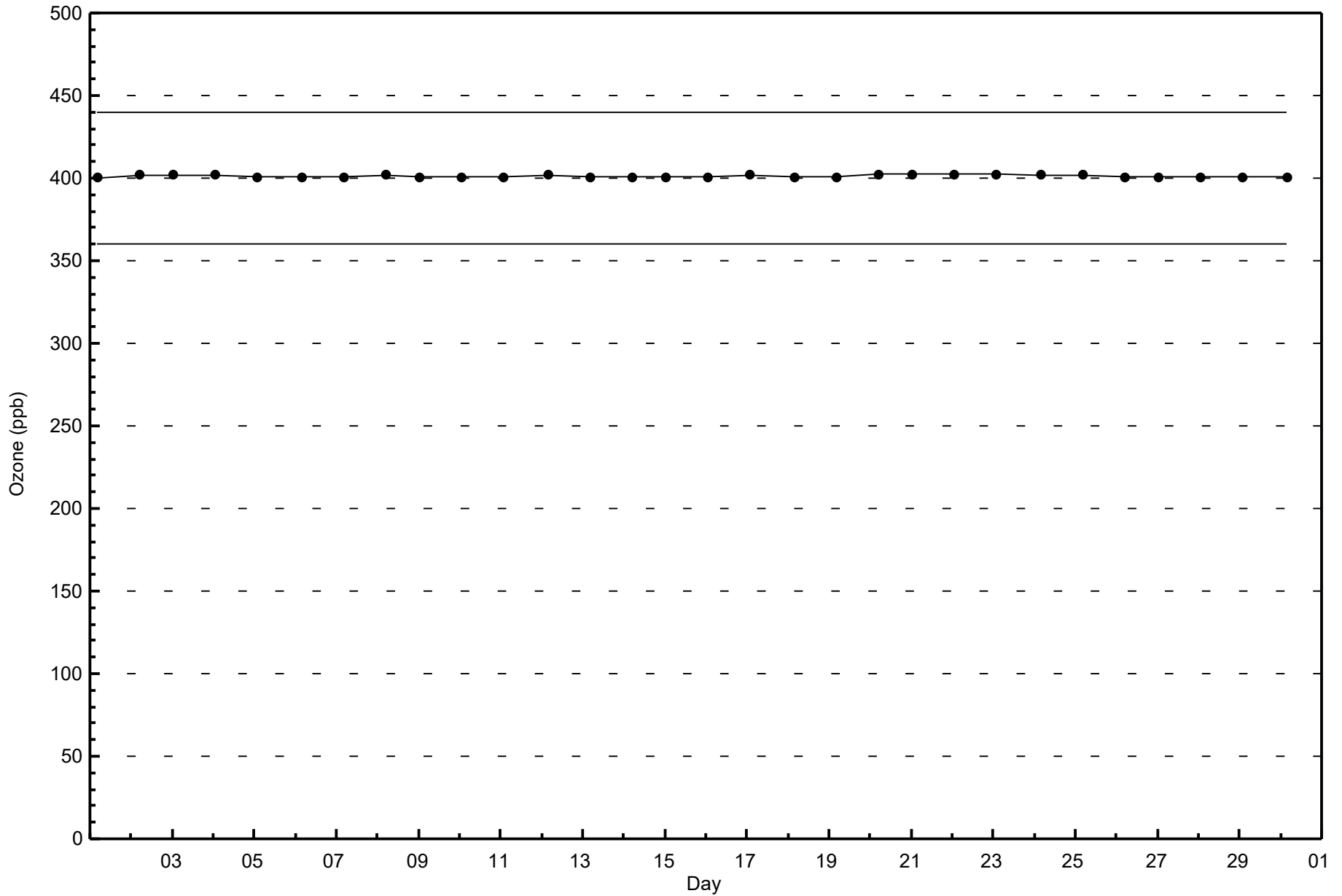


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

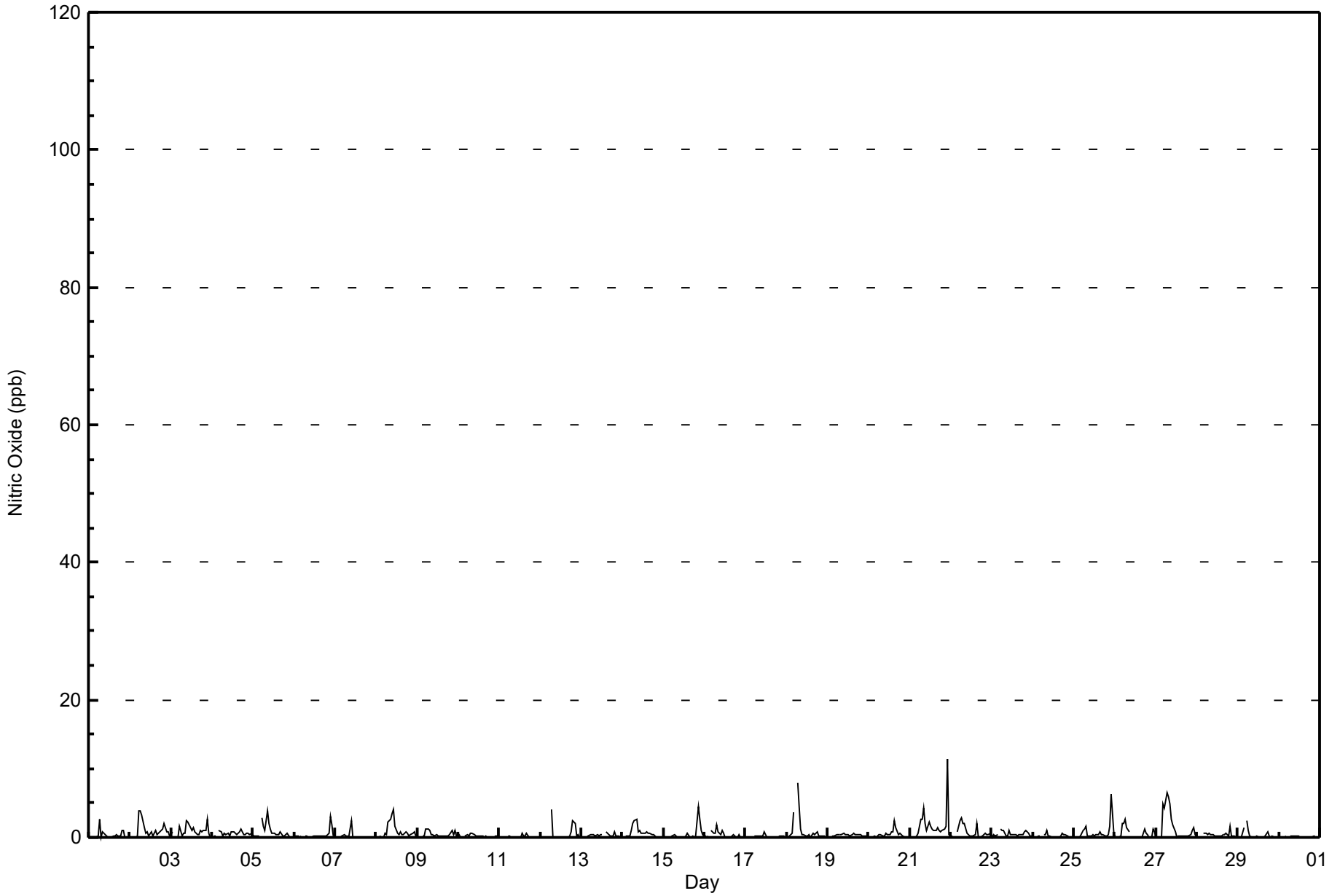
Nitric Oxide (NO) - ppb
Patricia McInnes - June 2023

Maximum Value: 11.4 ppb on Jun 21 23:00		Maximum Daily Average: 1.7 ppb on Jun 21		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Jun 1 02:00		Minimum Daily Average: 0.1 ppb on Jun 30		Hours of Data: 684																							
Maximum Diurnal Average: 1.5 ppb at hour 7		Minimum Diurnal Average: 0.1 ppb at hour 1		Hours of Missing Data: 36																							
Monthly Average: 0.56 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 1.4 P ₉₉ = 4.5		Hours of Calibration: 35																							
				Percent Operational Time: 99.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	0.0	0.0	0.0	0.0	0.2	2.6	0.1	0.8	0.4	0.2	0.0	0.1	0.1	0.1	0.2	0.3	0.1	0.1	1.1	0.9	0.0	0.0	0.1	0.3	2.6	
2-Jun	0.0	Z	0.1	0.0	0.3	3.9	3.9	3.3	1.5	0.5	0.7	0.2	0.7	0.3	0.6	1.1	0.5	0.7	1.0	1.1	2.1	0.8	0.9	0.2	1.1	3.9	
3-Jun	0.4	0.9	Z	0.1	0.1	1.6	0.2	0.6	0.6	2.4	2.2	1.4	1.0	1.4	0.9	0.5	0.3	1.1	0.8	0.9	1.1	2.7	0.5	0.0	1.0	2.7	
4-Jun	0.0	0.1	0.3	Z	1.1	0.8	0.2	0.7	0.4	0.6	0.3	0.7	0.7	0.7	0.4	0.6	0.8	1.3	0.5	0.4	0.7	0.5	0.3	0.6	0.5	1.3	
5-Jun	0.3	0.1	0.2	0.2	Z	2.8	1.7	1.0	3.8	2.0	1.3	0.7	0.7	0.4	0.4	0.3	0.8	0.2	0.3	0.4	0.6	0.1	0.0	0.0	0.8	3.8	
6-Jun	0.0	0.1	0.1	0.1	0.3	Z	0.1	0.2	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.6	3.0	1.8	0.1	0.4	3.0	
7-Jun	Z	0.1	0.0	0.1	0.1	0.3	0.2	0.1	0.1	2.5	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	0.2	2.5	
8-Jun	0.0	Z	0.1	0.0	0.0	0.7	0.4	2.1	2.7	3.5	4.1	1.6	0.6	0.5	0.8	0.3	0.4	0.9	0.7	0.2	0.5	0.6	0.9	0.1	0.9	4.1	
9-Jun	0.1	0.1	Z	0.2	0.3	1.3	1.1	1.1	0.4	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.4	1.0	0.5	1.0	0.3	0.4	1.3	
10-Jun	0.4	0.0	0.0	Z	0.2	0.4	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.5	
11-Jun	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.1	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
12-Jun	0.1	0.0	0.0	0.0	0.0	Z	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.4	2.0	0.2	0.4	0.0	0.4	4.0	
13-Jun	Z	0.0	0.0	0.0	0.1	0.5	0.5	0.5	0.3	0.4	0.3	0.5	0.4	M	0.9	0.6	0.5	0.2	0.2	0.8	0.2	0.2	0.1	0.1	0.3	0.9	
14-Jun	0.1	Z	0.2	0.2	0.2	1.0	2.1	2.5	2.7	0.8	1.0	0.6	0.6	0.6	0.8	0.6	0.6	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.7	2.7	
15-Jun	0.0	0.1	Z	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.1	0.6	0.1	0.6	0.1	0.0	0.1	4.4	2.6	0.9	0.4	0.5	4.4	
16-Jun	0.1	0.1	0.2	Z	1.0	0.5	0.6	1.9	0.7	0.3	1.0	0.6	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.1	0.4	0.0	0.0	0.0	0.4	1.9	
17-Jun	0.0	0.0	0.0	0.0	Z	0.3	0.2	0.1	0.2	0.1	0.2	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.7	
18-Jun	0.0	0.0	0.5	0.6	3.6	Z	7.9	4.5	1.2	0.3	0.5	0.3	0.3	0.4	0.1	0.5	0.5	0.6	0.7	0.2	0.2	0.2	0.1	0.0	1.0	7.9	
19-Jun	Z	0.1	0.0	0.3	0.2	0.4	0.3	0.5	0.4	0.6	0.5	0.5	0.5	0.3	0.4	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.6	
20-Jun	0.1	Z	0.1	0.1	0.0	0.3	0.4	0.4	0.1	0.2	0.5	0.5	0.4	0.8	0.7	2.5	1.5	0.4	0.7	0.4	0.1	0.0	0.0	0.0	0.4	2.5	
21-Jun	0.0	0.0	Z	0.0	0.2	0.7	2.7	2.7	4.3	2.1	0.9	2.2	1.7	1.2	0.9	0.9	1.4	1.1	0.9	0.9	1.2	1.6	11.4	0.5	1.7	11.4	
22-Jun	0.1	0.1	0.1	Z	0.7	2.4	2.9	1.9	2.0	0.7	0.3	0.3	0.2	0.3	0.4	2.0	0.3	0.1	0.2	0.4	0.5	0.4	0.4	0.5	0.7	2.9	
23-Jun	0.0	0.3	0.1	0.3	Z	1.2	1.0	1.0	0.2	0.3	1.0	0.4	0.3	0.4	0.5	0.3	0.4	0.5	0.4	0.9	0.9	0.6	0.1	0.2	0.5	1.2	
24-Jun	0.0	0.0	0.0	0.1	0.2	Z	0.3	0.4	1.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.3	0.5	0.5	0.4	0.1	0.0	0.0	0.0	0.2	1.0	
25-Jun	Z	0.0	0.0	0.1	0.2	1.0	1.3	1.7	0.3	0.3	0.3	0.4	0.2	0.3	0.4	0.8	0.4	0.3	0.2	0.3	0.3	1.7	6.2	0.5	0.7	6.2	
26-Jun	0.2	Z	0.1	0.2	2.0	2.1	2.6	1.3	0.8	C	C	C	C	C	0.0	0.0	0.0	1.2	0.7	0.4	0.0	0.0	1.2	0.8	0.8	2.6	
27-Jun	0.0	0.0	Z	0.0	4.8	4.4	6.5	5.9	4.9	2.7	1.8	0.8	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.4	1.0	1.5	0.3	1.6	6.5	
28-Jun	0.0	0.0	0.1	Z	0.6	0.6	0.4	0.5	0.4	0.4	0.2	0.2	0.2	0.3	0.2	0.4	0.4	0.6	0.2	1.6	0.2	0.2	0.2	0.0	0.3	1.6	
29-Jun	0.0	0.0	0.0	1.4	Z	2.3	1.1	0.3	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.9	0.1	0.0	0.1	0.1	0.0	0.0	0.3	2.3	
30-Jun	0.0	0.0	0.0	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.1 0.1 0.1 0.2 0.7 1.2 1.5 1.2 1.0 0.8 0.6 0.5 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.3 0.5 0.6 0.6 1.0 0.2			
																								0.4 0.9 0.5 1.4 4.8 4.4 7.9 5.9 4.9 3.5 4.1 2.2 1.7 1.4 0.9 2.5 1.5 1.3 1.0 2.4 4.4 3.0 11.4 0.8			
Z - zerspan																								C - Calibration		M - Maintenance	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	79	42	21	13	25	34	45	48	47	39	65	50	25	25	44	82	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	79	42	21	13	25	34	45	48	47	39	65	50	25	25	44	82	684

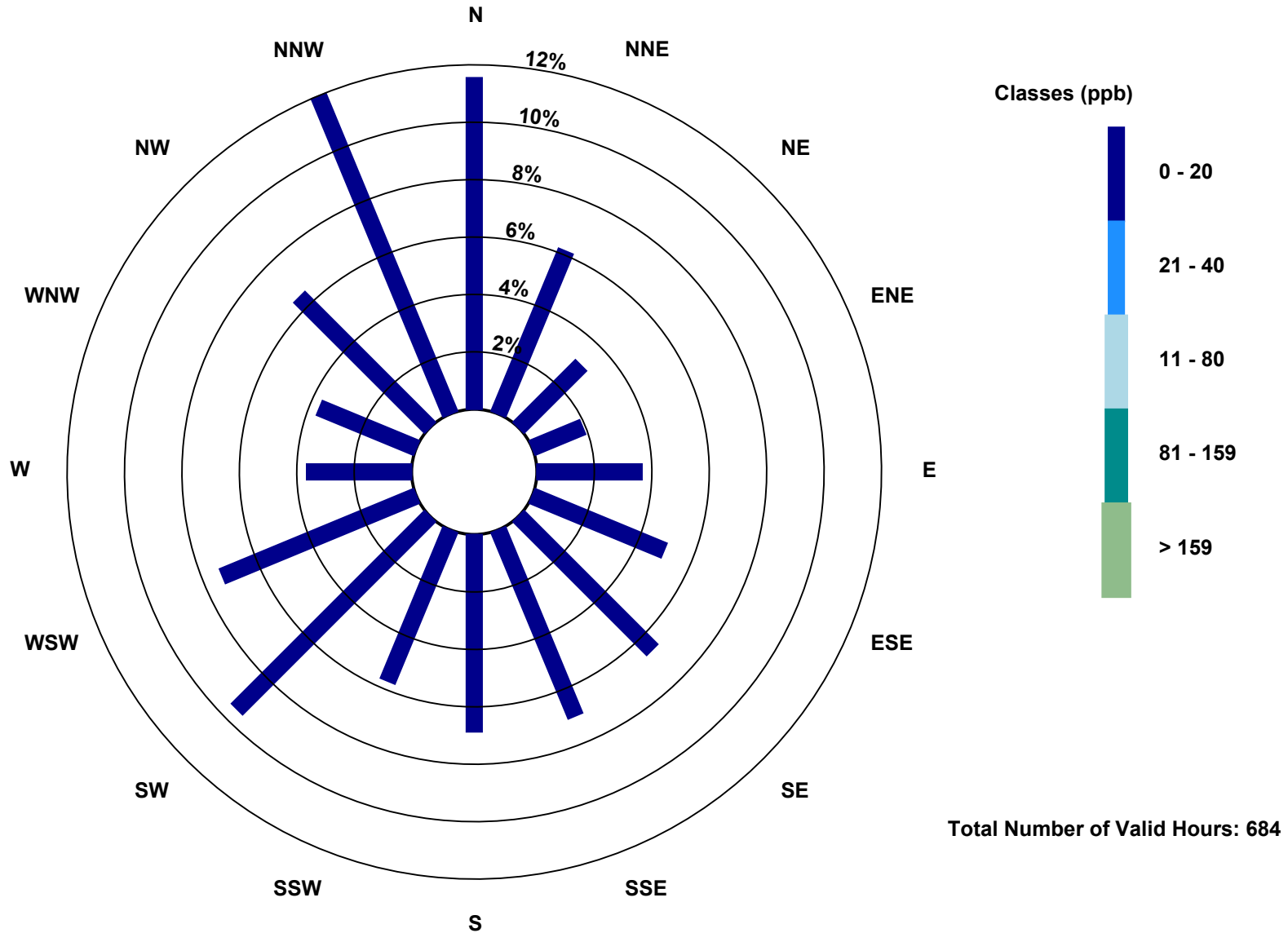
Total Number of Valid Hours: 684

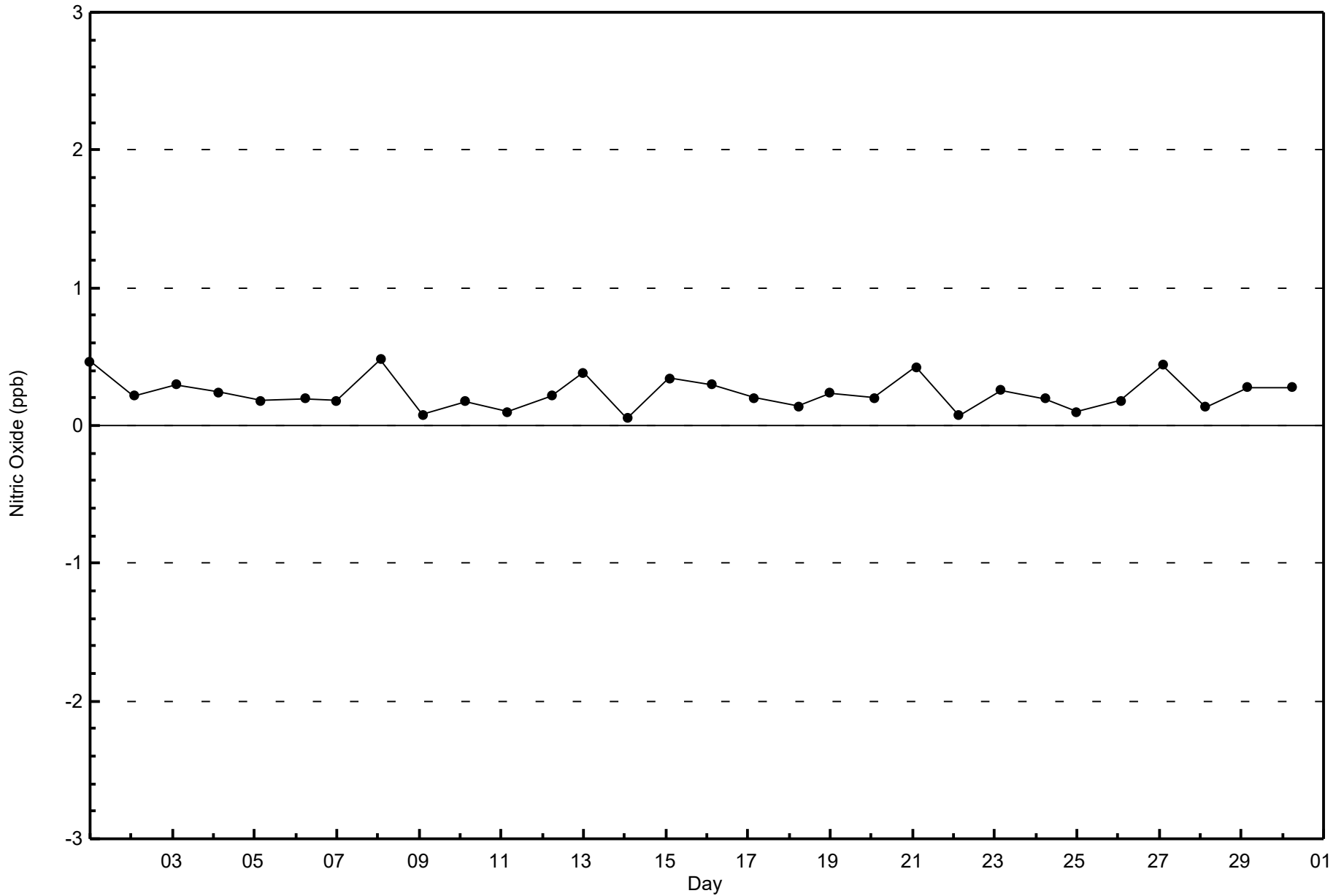
Total Number of Hours: 720

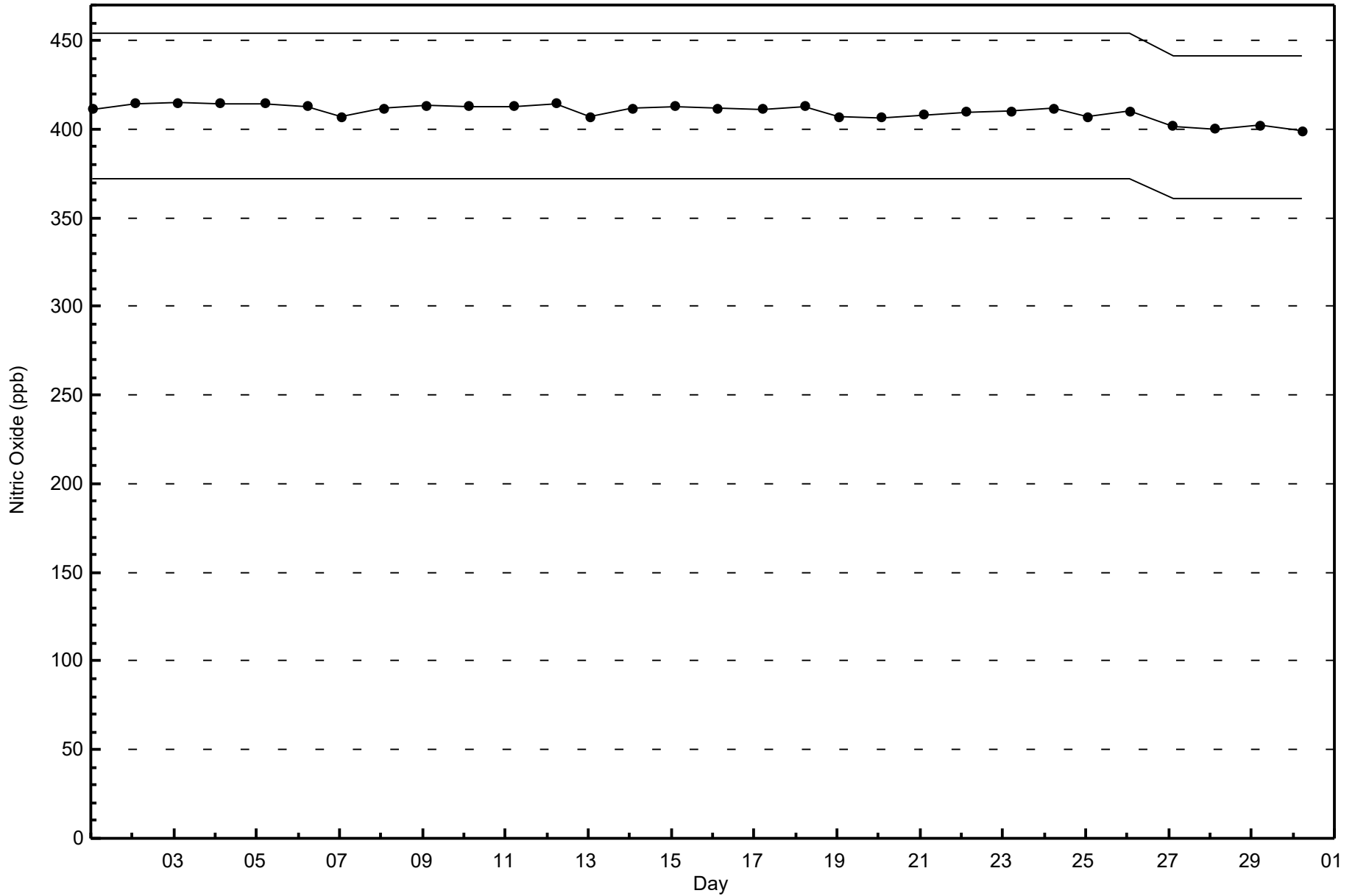


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

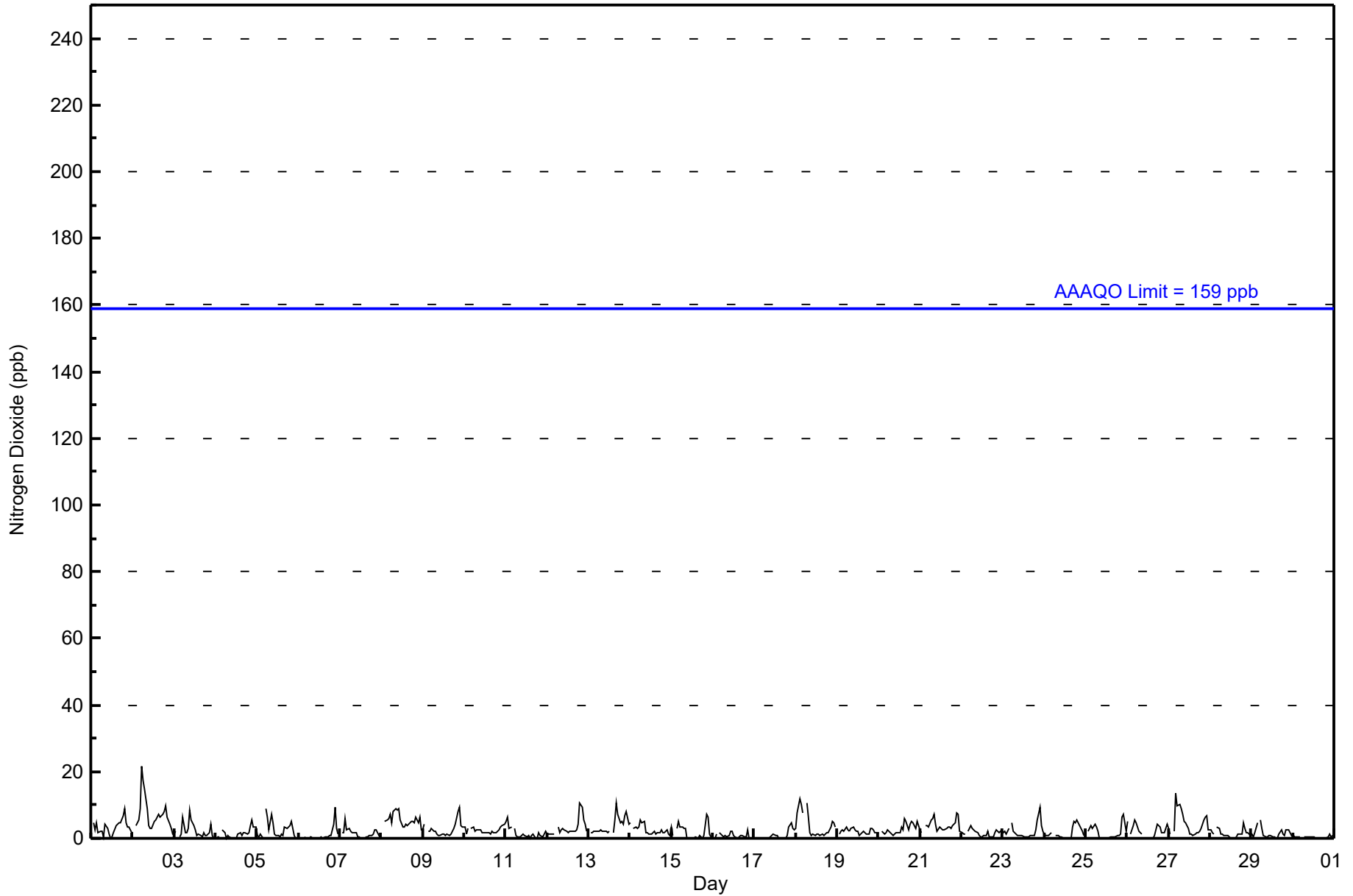
Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																																											
Maximum Value: 21.8 ppb on Jun 2 06:00		Maximum Daily Average: 7.1 ppb on Jun 2														Hours of Data: 684																																	
Minimum Value: 0.0 ppb on Jun 4 00:00		Minimum Daily Average: 0.4 ppb on Jun 30														Hours of Missing Data: 36																																	
Maximum Diurnal Average: 4.6 ppb at hour 6		Minimum Diurnal Average: 1.2 ppb at hour 13														Hours of Calibration: 35																																	
Monthly Average: 2.48 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.8 Median = 1.8 Q ₃ = 3.4 P ₉₀ = 5.5 P ₉₉ = 10.6														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-Jun	Z	4.7	2.5	4.6	1.9	2.2	2.0	0.5	4.1	2.9	1.2	0.1	0.3	1.8	3.7	4.3	4.6	4.6	6.6	8.9	4.6	3.4	3.3	1.7	3.2	8.9																							
2-Jun	1.6	Z	3.7	5.5	8.9	21.8	17.3	15.0	8.8	3.9	3.0	3.1	5.0	5.3	6.3	7.4	6.5	7.2	8.2	9.9	6.5	4.3	3.0	1.2	7.1	21.8																							
3-Jun	1.1	2.1	Z	0.6	1.3	6.5	1.6	1.5	2.8	8.6	5.6	3.8	2.6	1.0	1.1	0.8	0.6	1.7	0.9	1.0	1.8	4.3	0.9	0.0	2.3	8.6																							
4-Jun	0.1	0.3	0.3	Z	2.4	1.9	0.2	0.8	0.5	0.2	0.0	0.1	0.1	1.1	1.8	1.0	1.5	1.5	1.4	1.7	3.9	5.5	3.5	3.4	1.4	5.5																							
5-Jun	0.9	0.5	1.4	0.1	Z	8.9	6.3	2.7	7.3	4.5	1.2	0.8	0.8	0.6	1.2	0.9	3.4	3.0	3.2	3.9	5.1	0.8	0.0	0.0	2.5	8.9																							
6-Jun	0.0	0.0	0.0	0.2	0.4	Z	0.3	0.3	0.1	0.1	0.0	0.1	0.2	0.3	0.2	0.4	0.4	0.5	0.7	0.9	4.4	9.3	3.1	1.4	1.0	9.3																							
7-Jun	Z	1.7	1.9	5.8	2.5	2.8	2.0	1.8	1.7	1.9	0.5	0.6	0.2	0.2	0.1	0.3	0.6	0.8	0.7	1.3	2.7	2.6	1.6	0.1	1.5	5.8																							
8-Jun	0.1	Z	4.9	5.7	5.9	7.4	4.5	8.0	8.8	8.3	9.0	5.4	3.5	3.5	4.2	3.8	4.2	5.1	5.1	4.8	6.4	4.7	6.3	2.4	5.3	9.0																							
9-Jun	2.7	4.1	Z	2.1	2.3	2.9	2.2	2.3	1.3	0.9	0.7	1.2	1.4	0.9	1.1	1.0	1.1	2.2	2.8	4.4	8.1	9.5	3.7	3.3	2.7	9.5																							
10-Jun	3.4	1.4	3.0	Z	2.8	3.2	2.2	2.4	2.5	2.6	1.8	1.6	1.5	1.5	1.5	1.3	2.0	1.8	1.9	2.2	2.4	3.4	4.0	4.2	2.4	4.2																							
11-Jun	4.9	6.2	2.9	3.5	Z	2.9	0.9	0.6	0.5	0.7	1.1	0.9	0.4	0.7	0.2	0.8	1.1	0.0	0.0	1.6	0.8	0.3	1.2	2.1	1.5	6.2																							
12-Jun	1.2	1.3	1.2	1.1	1.3	Z	3.6	1.8	2.4	2.9	2.4	2.3	1.8	2.2	2.3	2.1	2.2	2.6	4.2	10.7	9.4	5.4	4.4	2.3	3.1	10.7																							
13-Jun	Z	1.9	1.5	2.0	2.2	2.2	2.1	2.4	2.0	2.3	2.1	1.8	2.0	Z	1.8	5.3	10.7	7.4	4.8	5.1	4.2	6.8	8.0	4.1	3.8	10.7																							
14-Jun	4.5	Z	3.1	3.6	2.9	3.6	5.5	4.8	5.2	1.5	1.7	1.2	1.2	1.7	2.1	1.1	1.8	1.6	2.4	1.6	1.8	2.5	1.3	1.0	2.5	5.5																							
15-Jun	3.3	0.8	Z	2.8	5.1	3.5	3.5	3.0	3.0	0.1	0.0	0.0	0.0	0.1	0.5	0.2	0.7	0.4	0.1	0.8	7.2	6.2	1.3	0.3	1.9	7.2																							
16-Jun	0.0	0.0	1.1	Z	1.9	0.7	0.5	1.0	0.4	0.7	2.0	2.3	1.0	0.3	0.2	0.3	0.7	0.8	0.3	0.5	2.5	0.1	0.0	0.0	0.8	2.5																							
17-Jun	0.0	0.0	0.0	0.1	Z	0.2	0.0	0.2	0.2	0.6	0.9	1.2	0.9	0.9	0.2	0.1	0.0	0.0	0.0	0.8	3.5	4.6	3.1	2.4	0.9	4.6																							
18-Jun	3.1	7.7	11.7	10.0	7.7	Z	10.6	6.2	1.7	0.7	1.1	0.9	1.2	1.2	0.7	1.2	1.0	1.4	1.6	1.5	3.6	5.0	4.5	3.3	3.8	11.7																							
19-Jun	Z	1.2	2.2	2.4	2.0	3.2	2.7	2.3	3.1	3.3	2.7	2.1	2.0	1.0	1.8	2.3	1.7	1.2	1.2	2.8	3.1	2.7	1.9	1.9	2.2	3.3																							
20-Jun	1.8	Z	2.2	1.2	1.5	2.5	2.3	1.5	1.0	1.3	1.9	1.5	1.8	3.6	2.5	5.9	5.0	2.5	4.4	5.1	4.8	3.1	5.2	4.0	2.9	5.9																							
21-Jun	2.7	1.8	Z	3.9	4.0	3.2	5.3	5.9	7.3	4.2	2.0	3.6	3.0	2.6	2.5	2.9	3.3	3.5	3.1	3.9	4.5	7.6	7.4	2.0	3.9	7.6																							
22-Jun	1.6	1.1	1.1	Z	2.1	4.0	3.0	2.6	2.2	1.5	0.8	0.4	0.4	0.8	0.8	2.1	0.5	0.4	0.6	1.8	2.5	2.2	1.8	2.5	1.6	4.0																							
23-Jun	1.9	2.0	1.2	2.9	Z	4.7	2.3	1.6	0.8	0.8	1.0	0.9	0.6	0.6	0.6	1.0	0.8	0.8	2.5	5.7	9.5	3.9	2.3	2.1	9.5	5.4																							
24-Jun	1.4	0.9	1.0	1.1	1.7	Z	0.7	0.7	0.9	0.4	0.4	0.2	0.1	0.2	0.2	0.2	3.2	5.2	4.5	5.4	3.7	2.8	2.2	0.9	1.7	5.4																							
25-Jun	Z	2.2	2.9	3.7	2.9	4.2	3.6	2.0	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.2	6.3	7.0	2.3	1.9	7.0																							
26-Jun	5.1	Z	1.4	3.9	5.4	4.6	3.5	2.0	1.4	C	C	C	C	C	0.1	0.1	0.9	4.1	3.7	3.5	1.6	1.8	2.9	4.3	2.8	5.4																							
27-Jun	3.0	1.4	Z	2.1	13.5	9.7	10.0	9.0	7.0	5.2	4.7	3.1	1.1	1.2	1.0	1.3	1.5	1.9	2.0	2.8	5.7	6.2	6.7	2.6	4.5	13.5																							
28-Jun	2.4	1.9	1.3	Z	3.3	3.0	1.2	1.3	1.0	0.9	0.7	0.3	0.2	0.2	0.2	0.6	1.2	1.4	1.4	4.6	3.1	1.9	1.9	0.9	1.5	4.6																							
29-Jun	1.1	0.6	1.6	4.6	Z	5.7	3.1	0.9	0.5	0.5	0.7	0.8	0.6	0.4	0.2	0.2	1.3	2.7	1.2	1.0	2.6	2.5	1.5	1.0	1.5	5.7																							
30-Jun	1.3	0.4	0.4	0.4	0.5	Z	0.6	0.5	0.4	0.4	0.4	0.5	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.4	1.1	0.5	0.8	0.4	1.3																							
																								Diurnal Average																									
																								Diurnal Maximum																									
																								Z - zerospan		C - Calibration		M - Maintenance																					
																								Alberta Ambient Air Quality Objectives (AAAQO):		1-hr		159 ppb																					



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	79	42	21	13	25	34	45	48	47	39	65	50	25	25	44	81	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	79	42	21	13	25	34	45	48	47	39	65	50	25	25	44	82	684

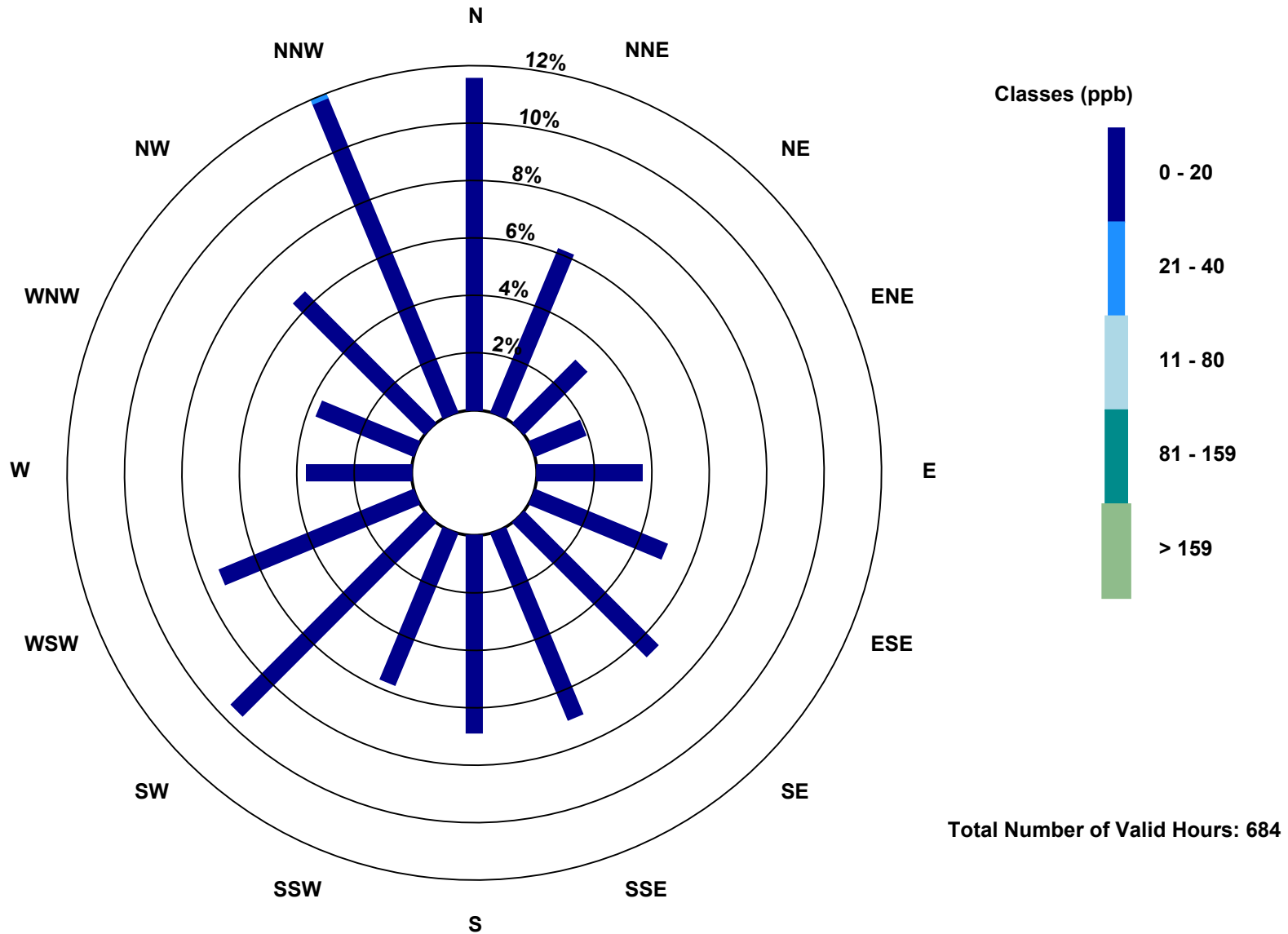
Total Number of Valid Hours: 684

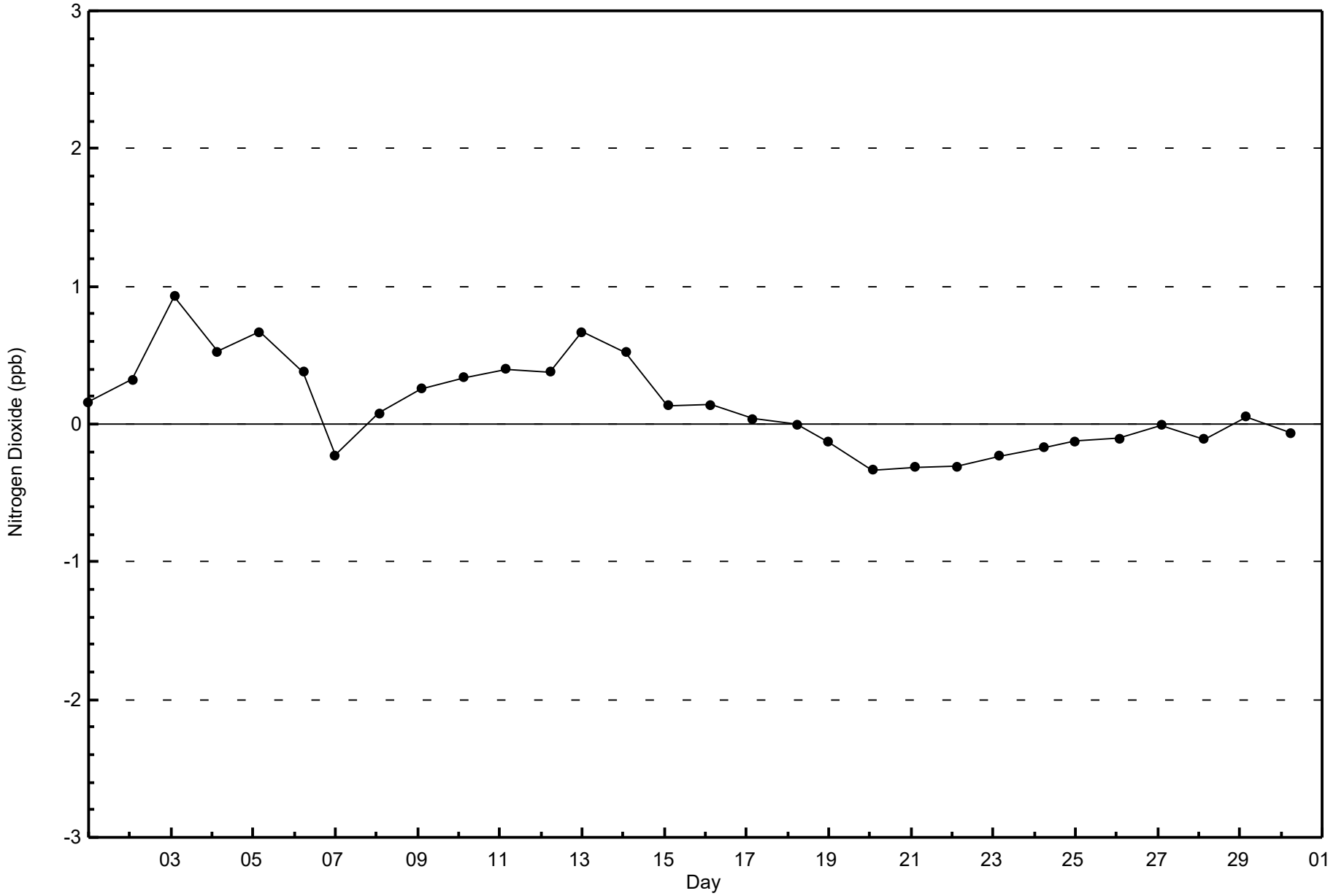
Total Number of Hours: 720

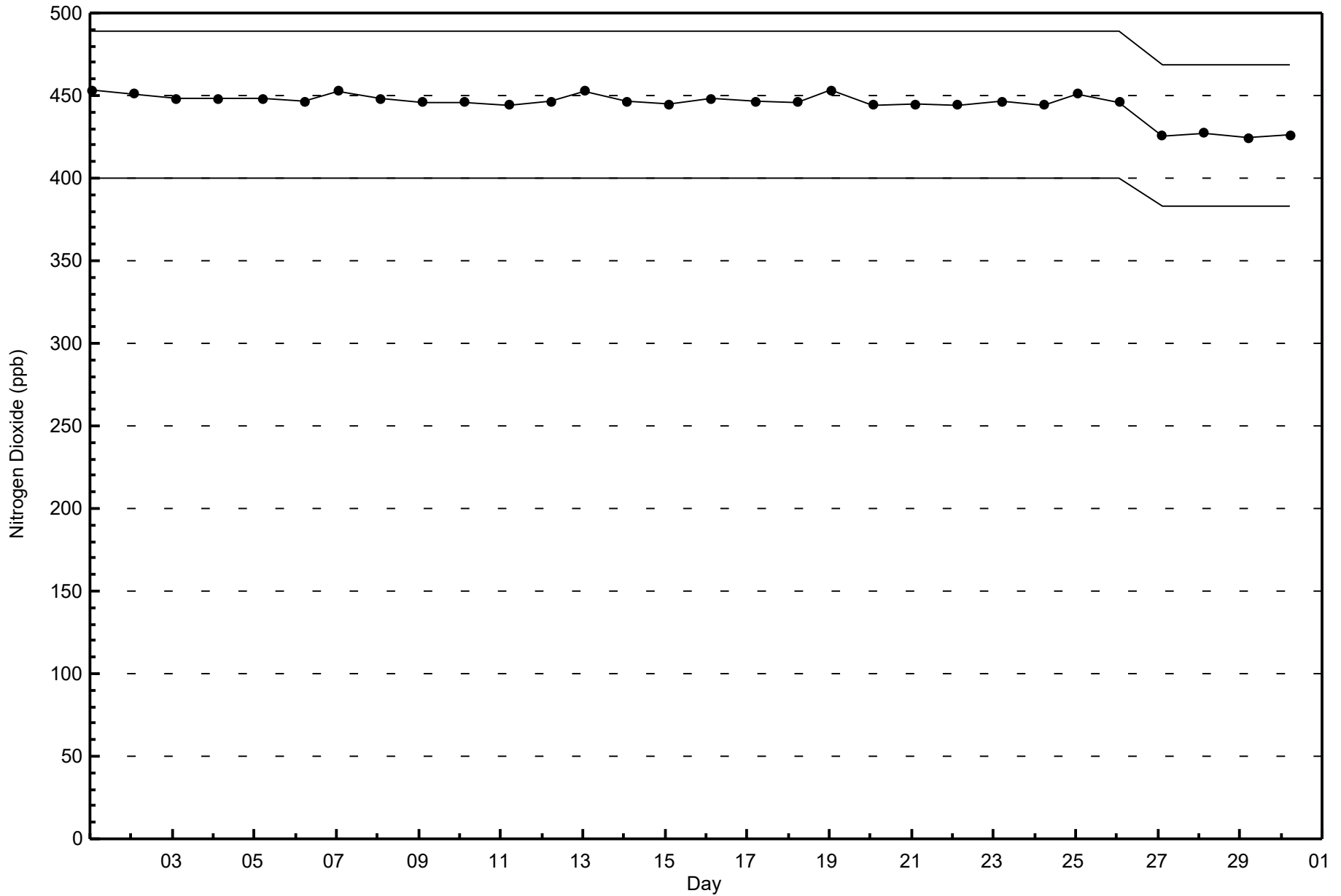


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

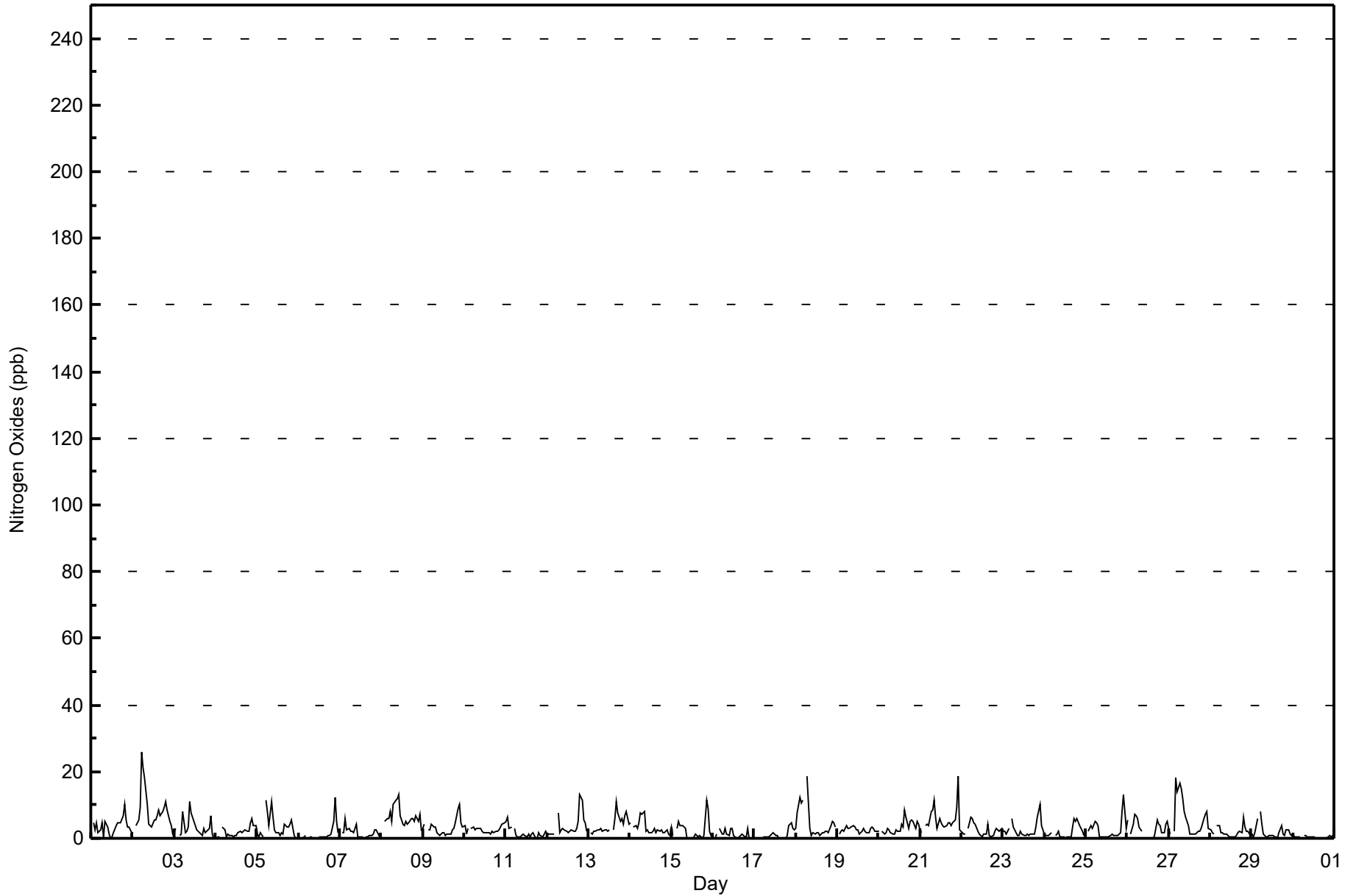
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - June 2023

Maximum Value: 25.7 ppb on Jun 2 06:00																				Maximum Daily Average: 8.2 ppb on Jun 2					Hours in Service: 720								
Minimum Value: 0.0 ppb on Jun 4 00:00																				Minimum Daily Average: 0.5 ppb on Jun 30					Hours of Data: 684								
Maximum Diurnal Average: 5.8 ppb at hour 6																				Minimum Diurnal Average: 1.5 ppb at hour 13					Hours of Missing Data: 36								
Monthly Average: 3.05 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 1.0 Median = 2.2 Q ₃ = 4.0 P ₉₀ = 6.7 P ₉₉ = 15.1					Hours of Calibration: 35								
																				Percent Operational Time: 99.9													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Jun	Z	4.7	2.5	4.6	1.9	2.4	4.6	0.6	4.9	3.3	1.4	0.1	0.4	1.9	3.8	4.5	4.9	4.7	6.7	10.0	5.5	3.4	3.3	1.8	3.6	10.0							
2-Jun	1.6	Z	3.8	5.5	9.2	25.7	21.2	18.3	10.3	4.4	3.7	3.3	5.7	5.6	6.9	8.5	7.0	7.9	9.2	11.0	8.6	5.1	3.9	1.4	8.2	25.7							
3-Jun	1.5	3.0	Z	0.7	1.4	8.1	1.8	2.1	3.4	11.0	7.8	5.2	3.6	2.4	2.0	1.3	0.9	2.8	1.7	1.9	2.9	7.0	1.4	0.0	3.2	11.0							
4-Jun	0.1	0.4	0.6	Z	3.5	2.7	0.4	1.5	0.9	0.8	0.3	0.8	0.8	1.8	2.2	1.6	2.3	2.8	1.9	2.1	4.6	6.0	3.8	4.0	2.0	6.0							
5-Jun	1.2	0.6	1.6	0.3	Z	11.7	8.0	3.7	11.1	6.5	2.5	1.5	1.5	1.0	1.6	1.2	4.2	3.2	3.5	4.3	5.7	0.9	0.0	0.0	3.3	11.7							
6-Jun	0.0	0.1	0.1	0.3	0.7	Z	0.4	0.5	0.2	0.1	0.0	0.2	0.4	0.4	0.3	0.6	0.6	0.7	0.9	1.2	5.0	12.3	4.9	1.5	1.4	12.3							
7-Jun	Z	1.8	1.9	5.9	2.6	3.1	2.2	1.9	1.8	4.4	0.5	0.6	0.2	0.2	0.1	0.3	0.6	0.8	0.7	1.3	2.7	2.6	1.6	0.1	1.7	5.9							
8-Jun	0.1	Z	5.0	5.7	5.9	8.1	4.9	10.1	11.5	11.8	13.1	7.0	4.1	4.0	5.0	4.1	4.6	6.0	5.8	5.0	6.9	5.3	7.2	2.5	6.2	13.1							
9-Jun	2.8	4.2	Z	2.3	2.6	4.2	3.3	3.4	1.7	1.2	1.0	1.5	1.6	1.0	1.3	1.2	1.3	2.4	3.1	4.8	9.1	10.0	4.7	3.6	3.1	10.0							
10-Jun	3.8	1.4	3.0	Z	3.0	3.6	2.5	2.9	3.0	3.0	2.1	1.9	1.7	1.8	1.7	1.4	2.2	1.9	2.0	2.3	2.4	3.4	4.2	4.5	2.6	4.5							
11-Jun	5.0	6.3	2.9	3.5	Z	3.0	1.0	0.6	0.5	0.7	1.2	0.9	0.4	1.2	0.3	1.1	1.7	0.0	0.0	1.6	0.8	0.3	1.2	2.1	1.6	6.3							
12-Jun	1.3	1.3	1.2	1.1	1.3	Z	7.6	1.8	2.4	2.9	2.4	2.3	1.8	2.2	2.3	2.1	2.2	2.8	5.0	13.1	11.4	5.6	4.8	2.3	3.5	13.1							
13-Jun	Z	1.9	1.5	2.0	2.3	2.7	2.6	2.9	2.3	2.7	2.4	2.3	2.4	M	2.7	5.9	11.2	7.6	5.0	5.9	4.4	7.0	8.1	4.2	4.1	11.2							
14-Jun	4.6	Z	3.3	3.8	3.1	4.6	7.6	7.3	7.9	2.3	2.7	1.8	1.8	2.3	2.9	1.7	2.4	2.1	2.7	1.8	1.8	2.5	1.3	1.0	3.2	7.9							
15-Jun	3.3	0.9	Z	2.9	5.2	3.7	3.8	3.3	3.1	0.1	0.0	0.0	0.1	0.2	1.1	0.3	0.7	0.5	0.1	0.9	11.6	8.8	2.2	0.7	2.3	11.6							
16-Jun	0.1	0.1	1.3	Z	2.9	1.2	1.1	2.9	1.1	1.0	3.0	2.9	1.0	0.3	0.2	0.3	0.9	1.2	0.4	0.6	2.9	0.1	0.0	0.0	1.1	3.0							
17-Jun	0.0	0.0	0.0	0.1	Z	0.5	0.2	0.3	0.4	0.7	1.1	1.9	1.0	0.9	0.2	0.1	0.0	0.0	0.0	0.9	3.7	4.8	3.2	2.5	1.0	4.8							
18-Jun	3.1	7.7	12.2	10.6	11.3	Z	18.5	10.7	2.9	1.0	1.6	1.2	1.5	1.6	0.8	1.7	1.5	2.0	2.3	1.7	3.8	5.2	4.6	3.3	4.8	18.5							
19-Jun	Z	1.3	2.2	2.7	2.2	3.6	3.0	2.8	3.5	3.9	3.2	2.6	2.5	1.3	2.2	2.9	2.2	1.6	1.6	3.1	3.3	2.9	2.1	2.1	2.6	3.9							
20-Jun	1.9	Z	2.3	1.3	1.5	2.8	2.7	1.9	1.1	1.5	2.4	2.0	2.2	4.4	3.2	8.4	6.5	2.9	5.1	5.5	4.9	3.1	5.2	4.0	3.4	8.4							
21-Jun	2.7	1.8	Z	3.9	4.2	3.9	8.0	8.6	11.6	6.3	2.9	5.8	4.7	3.8	3.4	3.8	4.7	4.6	4.0	4.8	5.7	9.2	18.8	2.5	5.6	18.8							
22-Jun	1.7	1.2	1.2	Z	2.8	6.4	5.9	4.5	4.2	2.2	1.1	0.7	0.6	1.1	1.2	4.1	0.8	0.5	0.8	2.2	3.0	2.6	2.2	3.0	2.3	6.4							
23-Jun	1.9	2.3	1.3	3.2	Z	5.9	3.3	2.6	1.0	1.1	2.0	1.3	0.9	1.0	1.1	0.9	1.4	1.3	1.2	3.4	6.6	10.1	4.0	2.5	2.6	10.1							
24-Jun	1.4	0.9	1.0	1.2	1.9	Z	1.0	1.1	1.9	0.5	0.5	0.2	0.2	0.3	0.3	0.2	3.5	5.7	5.0	5.8	3.8	2.8	2.2	0.9	1.8	5.8							
25-Jun	Z	2.2	2.9	3.8	3.1	5.2	4.9	3.7	0.5	0.4	0.4	0.6	0.3	0.5	0.7	1.2	0.9	0.9	0.9	1.2	1.5	8.0	13.2	2.8	2.6	13.2							
26-Jun	5.3	Z	1.5	4.1	7.4	6.7	6.1	3.3	2.2	C	C	C	C	C	0.1	0.1	0.9	5.3	4.4	3.9	1.6	1.8	4.1	5.1	3.5	7.4							
27-Jun	3.0	1.4	Z	2.1	18.3	14.1	16.5	14.9	11.9	7.9	6.5	3.9	1.2	1.4	1.2	1.4	1.6	2.0	2.2	2.9	6.1	7.2	8.2	2.9	6.0	18.3							
28-Jun	2.4	1.9	1.4	Z	3.9	3.6	1.6	1.8	1.4	1.3	0.9	0.5	0.4	0.5	0.4	1.0	1.6	2.0	1.6	6.2	3.3	2.1	2.1	0.9	1.9	6.2							
29-Jun	1.1	0.6	1.6	6.0	Z	8.0	4.2	1.2	0.5	0.6	0.7	0.9	0.7	0.4	0.2	0.2	1.5	3.6	1.3	1.0	2.7	2.6	1.5	1.0	1.8	8.0							
30-Jun	1.3	0.4	0.4	0.5	0.6	Z	0.8	0.7	0.6	0.5	0.6	0.6	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.5	1.1	0.5	0.8	0.5	1.3							
																								Diurnal Average									
																								Diurnal Maximum									
Z - zerspan C - Calibration M - Maintenance																																	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	79	42	21	13	25	34	45	48	47	39	65	50	25	25	44	80	682
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	79	42	21	13	25	34	45	48	47	39	65	50	25	25	44	82	684

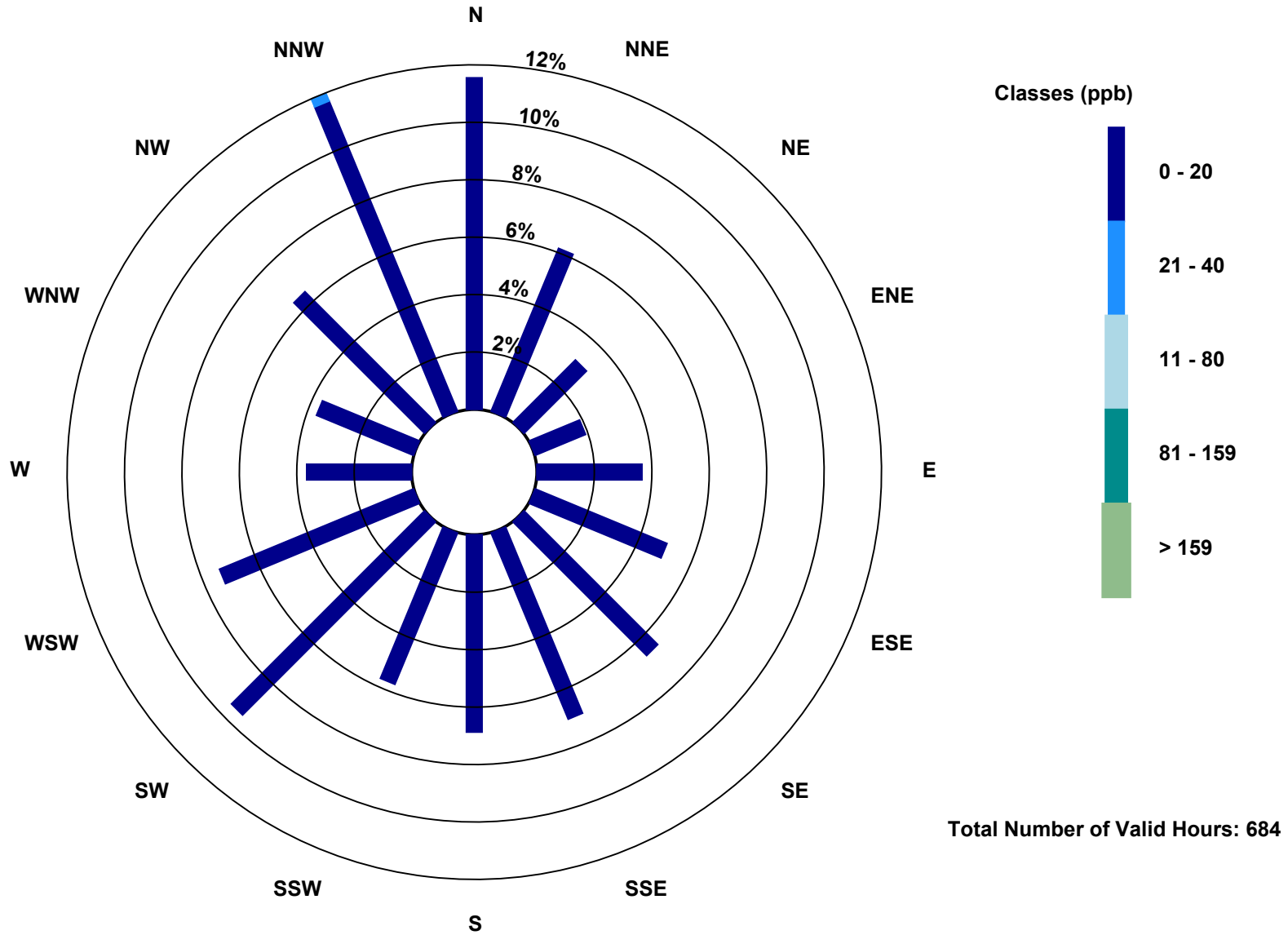
Total Number of Valid Hours: 684

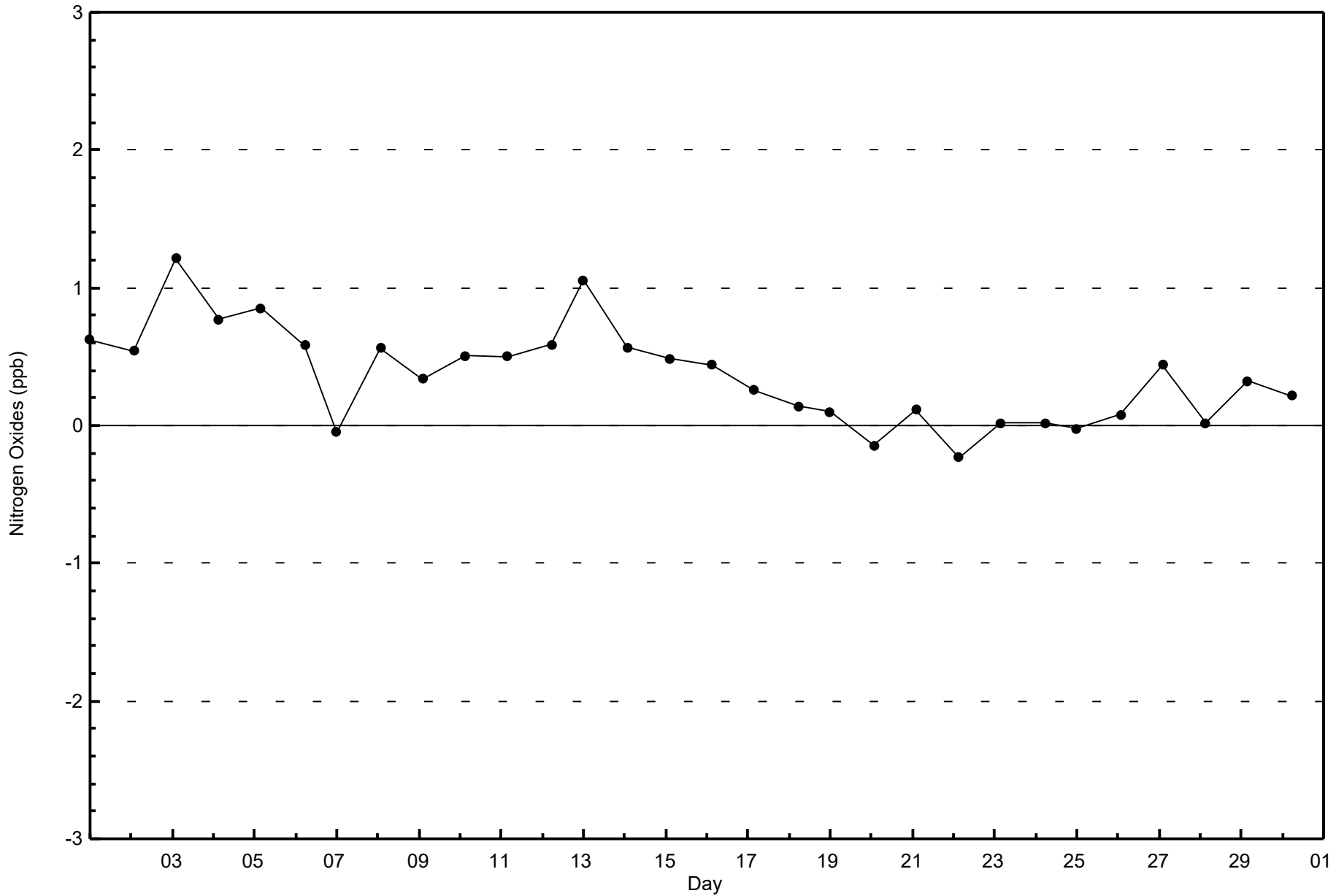
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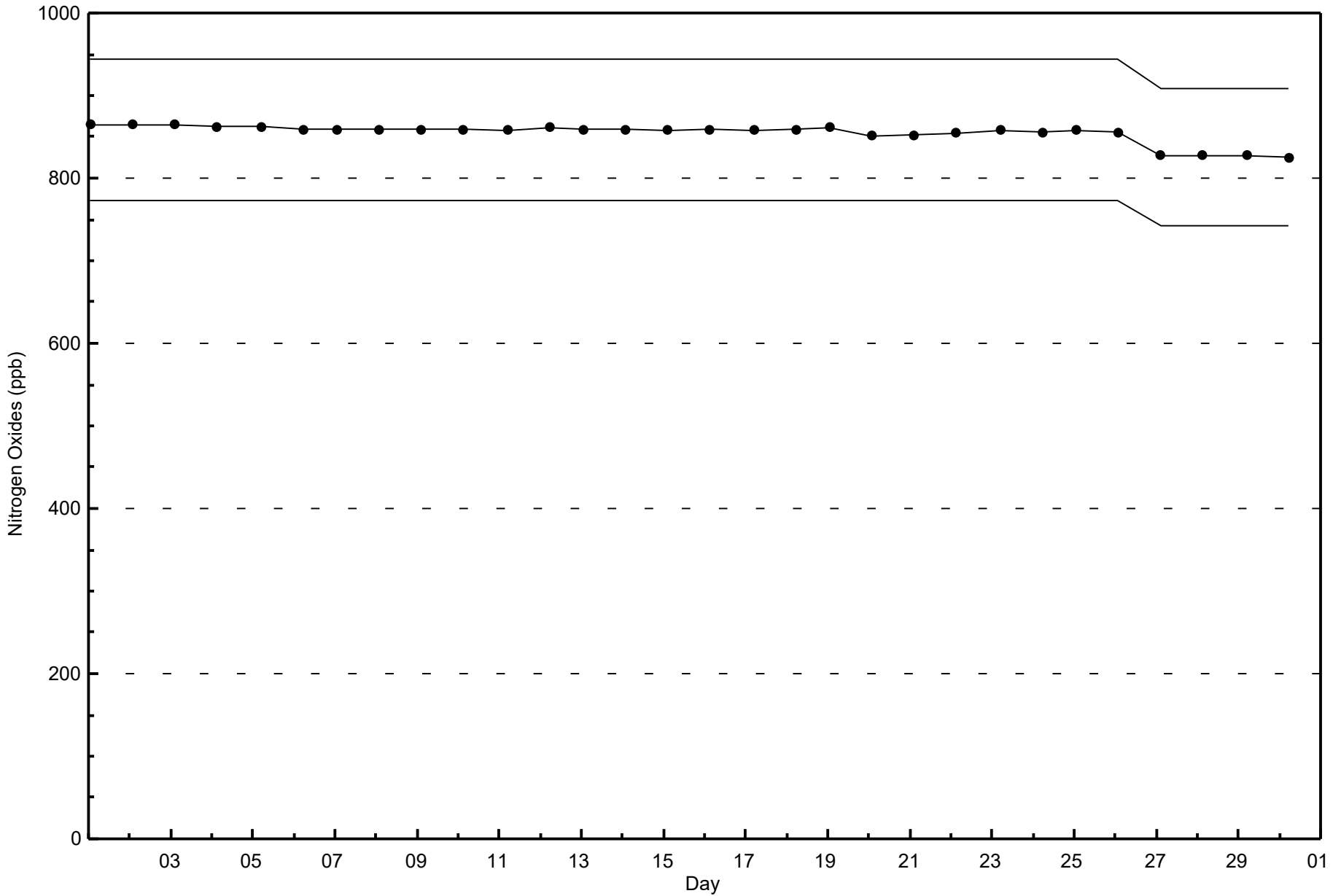


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes



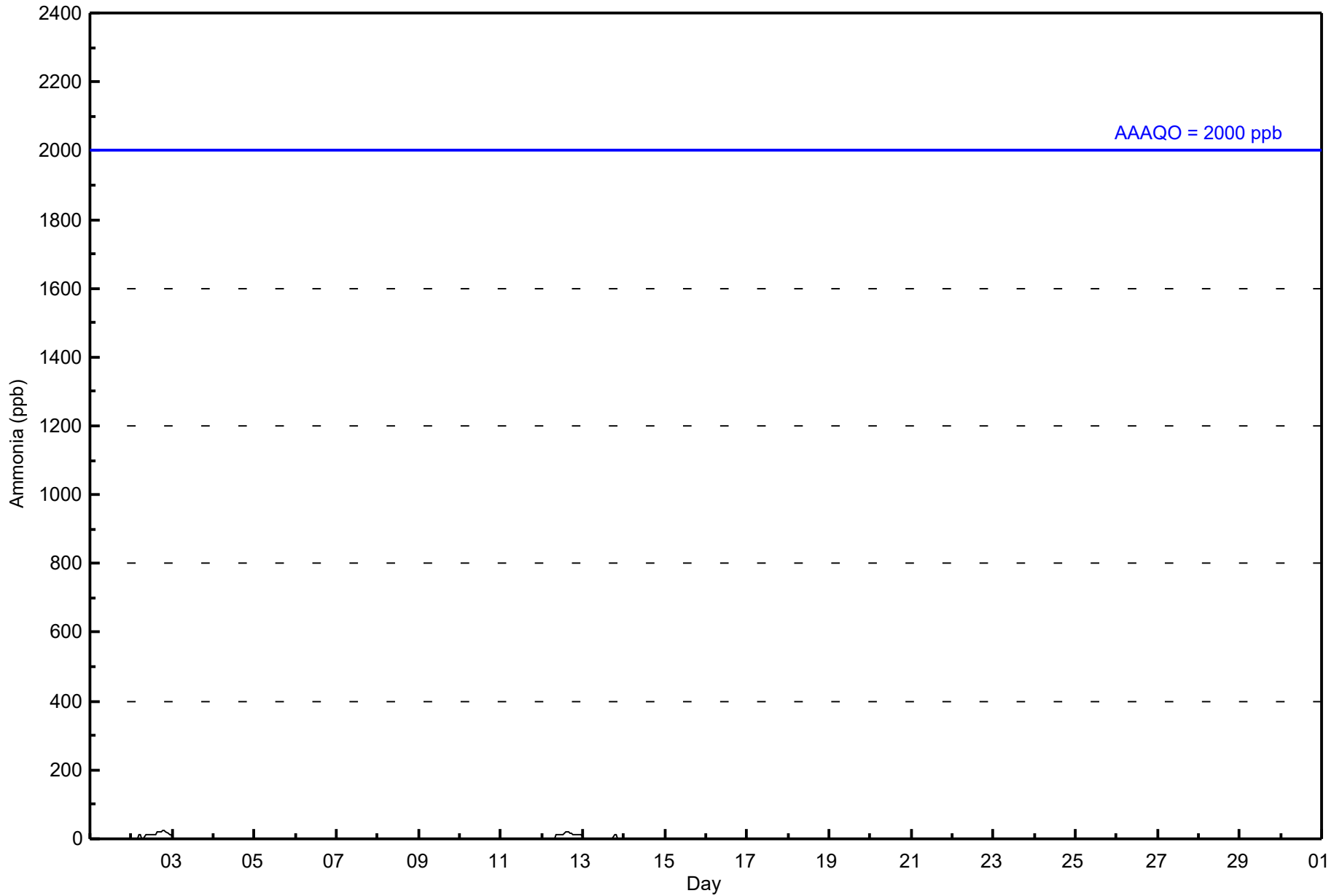






Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Patricia McInnes - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	567	94.03	94.03
6 - 10	0	0.00	94.03
11 - 15	26	4.31	98.34
16 - 20	5	0.83	99.17
21 - 25	5	0.83	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 603

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ammonia (NH₃) - ppb
Patricia McInnes - June 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	68	34	18	9	19	26	39	41	41	30	54	48	21	21	38	60	567
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	3	2	1	1	4	3	1	0	1	1	0	0	1	1	0	7	26
16 - 20	0	1	0	0	1	0	0	0	0	2	1	0	0	0	0	0	5
21 - 25	0	0	1	3	0	0	0	0	0	0	1	0	0	0	0	0	5
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	37	20	13	24	29	40	41	42	33	56	48	22	22	38	67	603

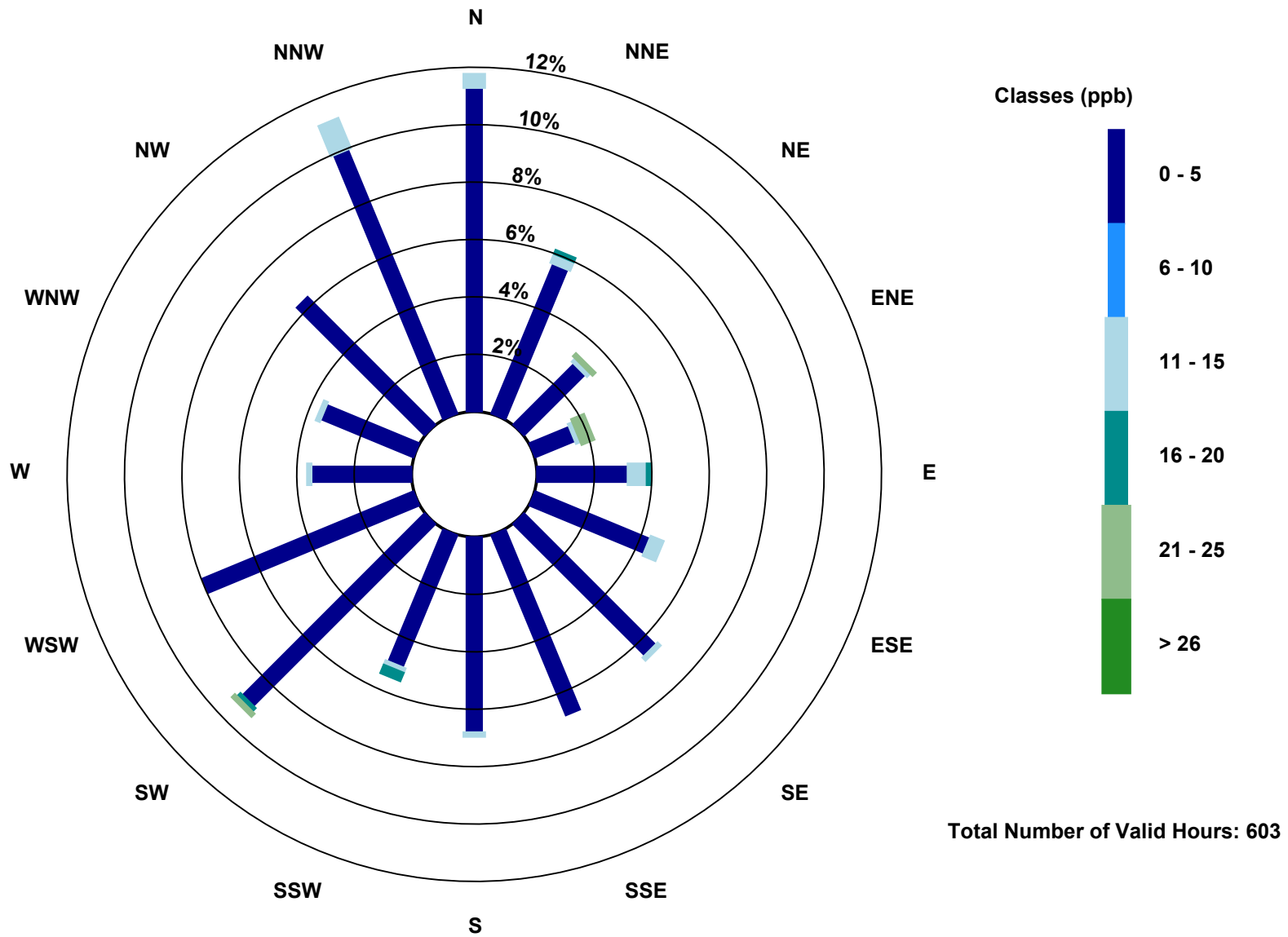
Total Number of Valid Hours: 603

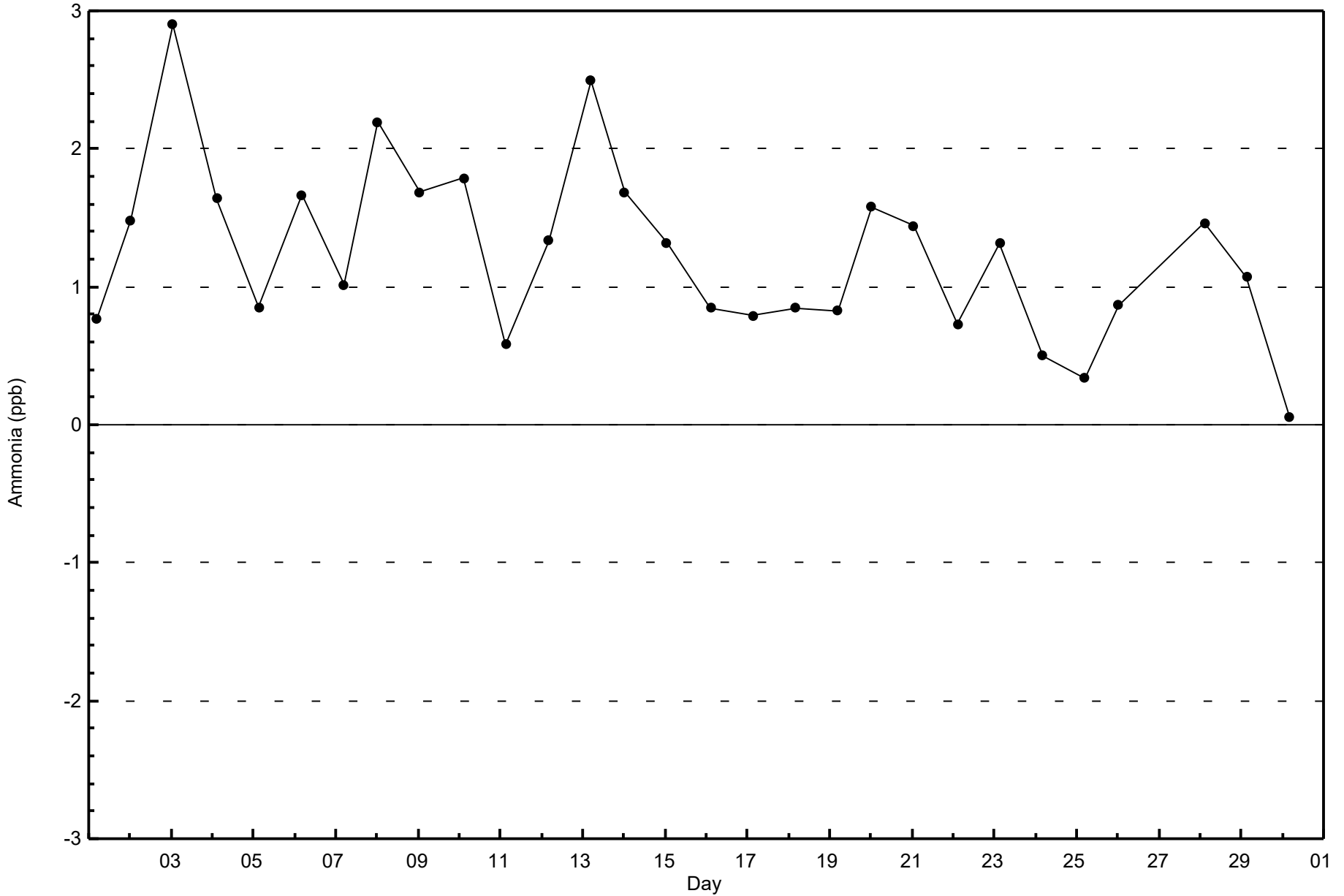
Total Number of Hours: 720

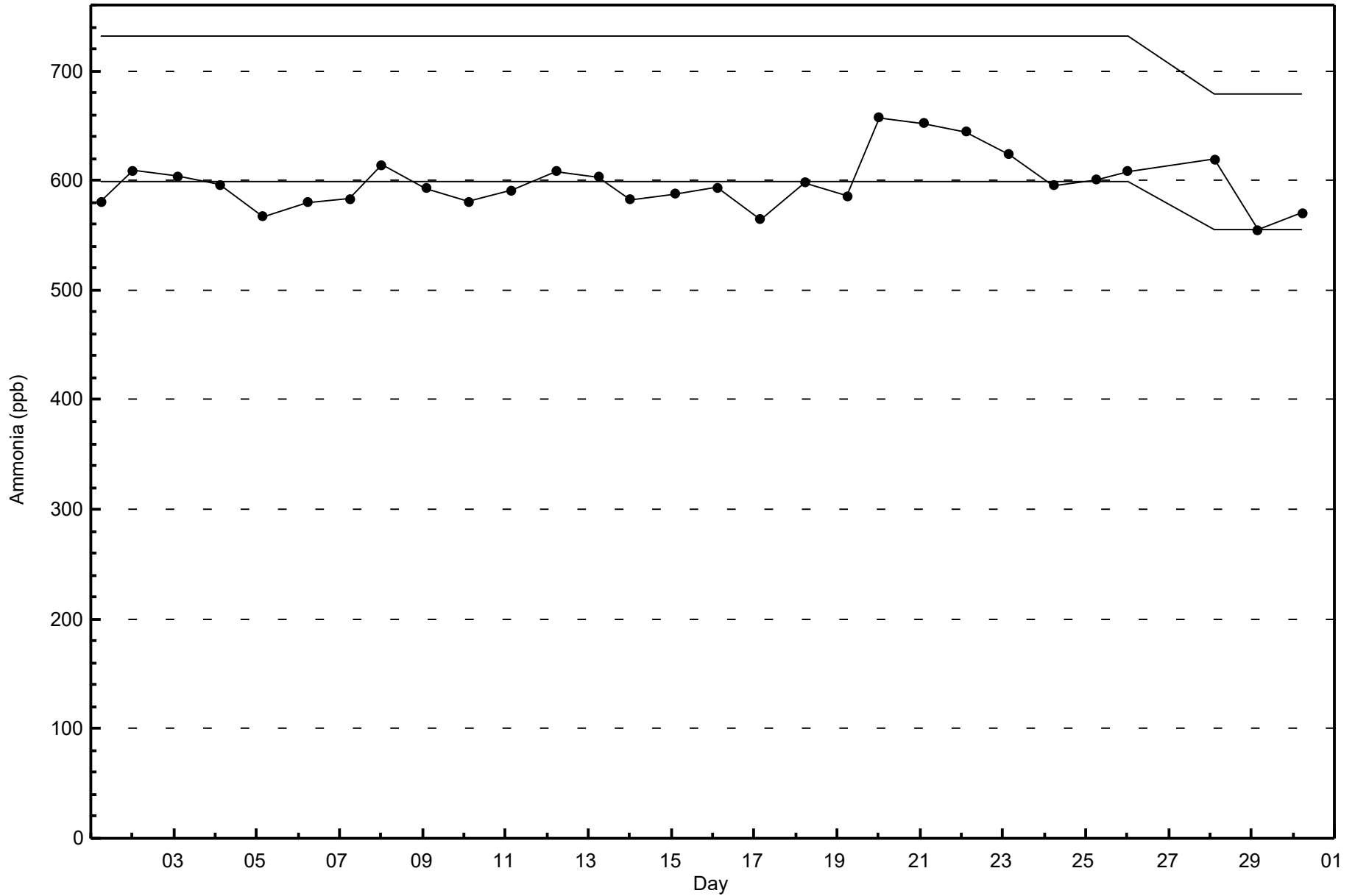


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ammonia (NH₃) - ppb
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

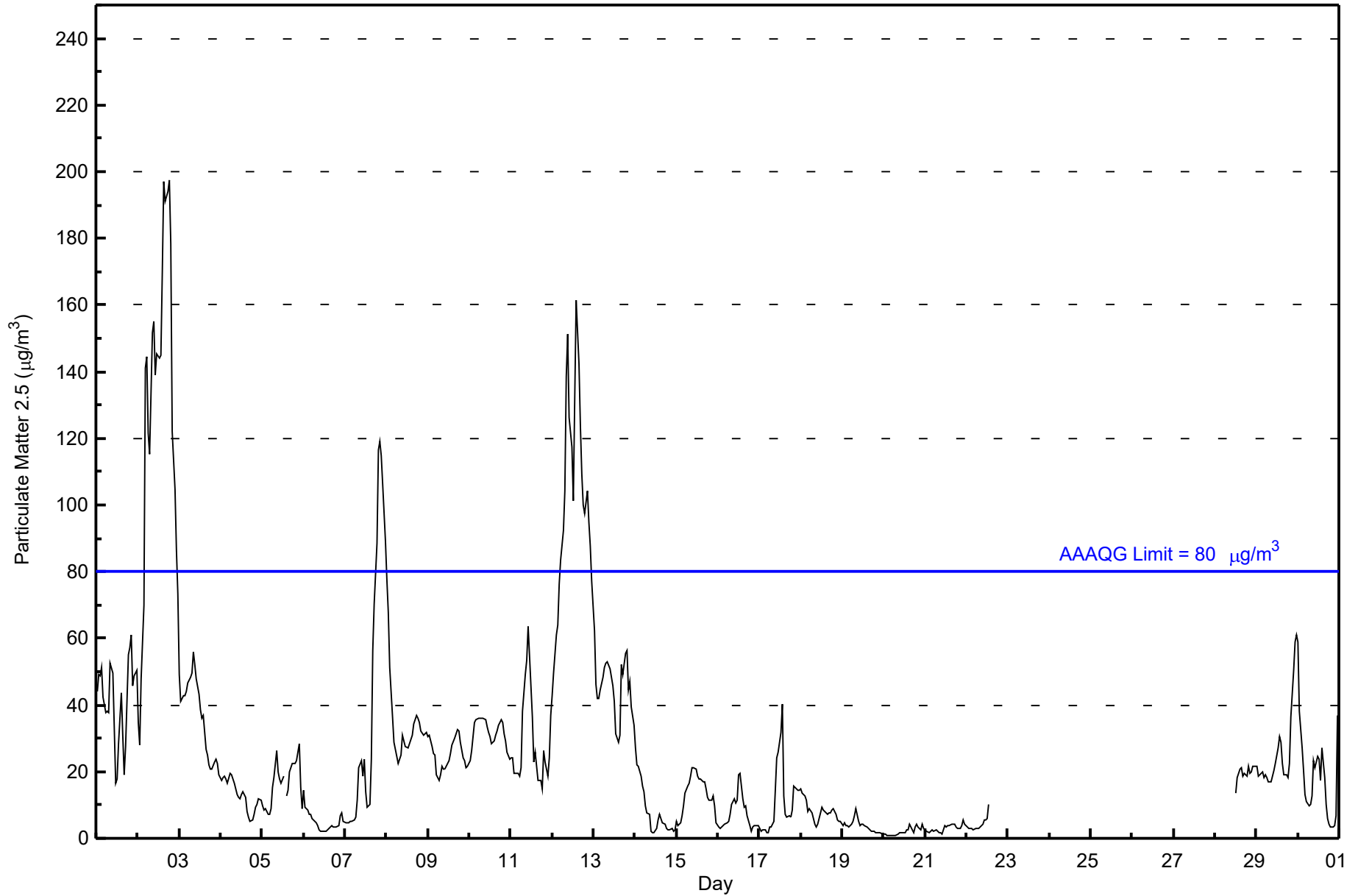
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Patricia McInnes - June 2023

Number of Exceedences (AAAQO):	1-hr: 43	24-hr: 8	Hours in Service:	720
Maximum Value: 197.3 µg/m ³ on Jun 2 19:00	Maximum Daily Average: 129.1 µg/m ³ on Jun 2		Hours of Data:	577
Minimum Value: 0.8 µg/m ³ on Jun 20 07:00	Minimum Daily Average: 2.1 µg/m ³ on Jun 20		Hours of Missing Data:	143
Maximum Diurnal Average: 32.3 µg/m ³ at hour 20	Minimum Diurnal Average: 21.4 µg/m ³ at hour 3		Hours of Calibration:	1
Monthly Average: 27.48 µg/m ³	Percentiles: P ₁ = 1.1 P ₁₀ = 2.8 Q ₁ = 5.2 Median = 18.4 Q ₃ = 32.4 P ₉₀ = 57.9 P ₉₉ = 163.3		Percent Operational Time:	80.3

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-Jun	44.2	49.2	48.9	51.1	42.2	37.7	38.0	37.5	52.6	49.4	33.1	16.4	17.7	28.4	43.8	31.0	19.1	27.4	55.1	57.1	60.9	45.6	48.8	50.4	41.1	60.9
2-Jun	34.7	27.9	48.0	69.9	140.9	144.4	121.8	115.3	151.8	155.0	139.2	145.5	144.1	144.9	170.0	197.1	191.1	194.3	197.3	178.4	122.1	104.5	86.5	73.4	129.1	197.3
3-Jun	49.1	41.0	42.6	43.0	44.2	46.6	48.2	49.6	56.0	52.2	48.0	43.1	38.8	35.8	36.7	26.7	25.2	22.0	20.7	20.9	22.9	23.9	22.4	19.0	36.6	56.0
4-Jun	17.2	18.2	18.7	17.6	16.7	19.6	18.9	18.0	16.6	13.1	12.4	12.1	13.0	14.0	12.3	7.9	6.2	5.0	5.4	7.1	9.2	10.3	11.8	11.4	13.0	19.6
5-Jun	9.9	8.4	8.7	7.2	7.2	8.7	15.2	18.4	26.2	20.1	18.0	16.3	18.5	C	12.7	14.5	19.7	22.6	22.6	23.5	28.3	15.4	8.9	16.2	28.3	
6-Jun	14.4	9.3	8.3	7.3	7.1	6.1	5.2	4.5	3.7	2.5	2.0	1.9	2.1	2.0	2.6	3.4	3.6	3.3	3.3	3.3	3.8	6.8	7.7	5.2	5.0	14.4
7-Jun	4.5	4.6	4.7	5.1	5.2	5.5	6.2	11.5	21.2	23.2	18.8	23.5	14.0	9.2	10.1	23.7	56.4	70.2	88.7	116.6	119.1	114.7	106.2	88.9	39.7	119.1
8-Jun	77.7	67.7	51.2	36.3	28.6	26.8	24.7	22.6	24.9	31.0	29.4	27.7	27.1	28.5	29.6	31.1	34.3	37.0	36.1	34.9	32.2	30.8	31.2	31.6	34.7	77.7
9-Jun	30.5	30.9	27.6	25.3	25.2	19.2	17.3	19.2	21.4	20.9	20.6	22.3	23.5	25.4	27.8	30.2	31.2	32.6	32.4	28.8	24.3	23.1	21.1	21.4	25.1	32.6
10-Jun	23.3	26.4	30.6	34.9	35.7	36.1	35.9	35.9	36.0	35.4	33.5	31.7	30.6	28.4	29.2	31.0	32.4	33.7	35.5	34.9	31.5	29.1	25.8	23.6	31.7	36.1
11-Jun	24.0	24.2	19.6	19.4	19.6	18.6	21.2	38.2	49.0	53.3	63.5	54.6	36.6	22.8	25.7	21.7	17.5	17.3	14.8	26.4	22.9	18.5	24.1	36.8	28.8	63.5
12-Jun	42.6	49.4	61.0	64.1	76.2	83.7	92.3	104.1	138.4	151.3	126.1	117.4	101.1	132.3	161.2	142.5	123.8	109.3	99.8	97.4	104.4	95.0	87.9	77.2	101.6	161.2
13-Jun	62.4	46.4	41.8	41.9	44.4	48.4	51.2	52.5	53.0	51.0	48.2	45.8	41.0	31.2	28.9	31.0	52.1	49.1	55.3	56.4	44.4	46.9	39.4	33.8	45.7	62.4
14-Jun	27.3	21.8	21.8	18.6	15.5	13.8	9.6	7.6	7.1	2.2	1.6	1.9	3.1	5.3	7.2	5.8	4.6	4.1	3.1	2.6	2.5	2.9	2.1	2.7	8.1	27.3
15-Jun	5.0	4.0	4.5	6.7	9.6	13.7	15.5	16.6	18.4	21.3	21.3	20.8	18.5	17.9	17.7	16.8	17.0	14.8	12.3	11.6	11.5	12.5	9.9	4.7	13.4	21.3
16-Jun	3.2	3.1	3.5	3.9	4.4	4.6	5.0	7.1	10.2	11.7	10.7	11.6	19.0	19.6	11.9	9.5	9.6	6.7	3.8	2.2	3.2	3.9	3.9	3.9	7.4	19.6
17-Jun	3.0	2.1	2.7	2.6	1.8	1.8	3.5	3.3	4.9	14.4	24.3	25.6	31.8	40.1	12.6	7.0	6.4	6.7	6.2	8.3	15.7	14.7	14.6	14.5	11.2	40.1
18-Jun	14.7	13.6	12.7	11.2	8.1	8.9	7.7	5.8	4.2	3.4	4.3	7.5	9.1	8.5	7.9	7.3	7.6	7.6	8.3	9.1	7.3	5.4	4.9	5.0	7.9	14.7
19-Jun	4.0	4.5	3.8	3.8	3.6	4.3	5.0	6.9	8.8	5.3	3.9	4.1	4.3	3.8	3.3	2.8	2.7	2.2	1.9	1.9	1.8	1.6	1.5	1.3	3.6	8.8
20-Jun	1.2	1.1	1.0	0.9	0.9	0.9	0.8	0.9	1.2	1.8	1.7	1.7	1.5	2.4	2.7	4.3	3.5	1.7	3.3	4.2	3.3	2.7	4.4	3.0	2.1	4.4
21-Jun	2.4	2.3	1.9	2.2	2.4	2.2	2.7	2.3	1.7	1.6	1.5	3.6	3.6	3.8	3.7	4.1	4.1	4.2	3.5	3.0	2.8	3.9	5.5	4.3	3.0	5.5
22-Jun	3.5	2.9	2.9	2.9	2.7	3.0	3.0	3.0	3.4	4.1	5.3	5.7	6.1	10.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	10.2
23-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
24-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
25-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
26-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
27-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
28-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	13.5	18.1	20.7	21.1	18.8	19.4	18.6	21.5	19.6	20.0	21.8	21.6	--	21.8
29-Jun	21.7	18.8	19.2	19.7	18.3	19.3	18.1	16.9	17.1	18.5	20.2	22.3	26.9	30.5	28.8	22.5	18.9	19.2	18.1	22.6	36.4	50.3	58.9	61.1	26.0	61.1
30-Jun	59.1	38.1	27.1	20.2	13.2	11.2	9.8	10.1	12.6	23.3	21.1	24.5	23.8	17.3	27.0	18.1	10.1	5.9	4.1	3.4	3.4	3.6	6.7	36.8	17.9	59.1
																								Diurnal Average		
																								Diurnal Maximum		

C - Calibration M - Maintenance AF - Analyzer Failure
 Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	152	26.34	26.34
6 - 15	107	18.54	44.89
16 - 25	122	21.14	66.03
26 - 80	153	26.52	92.55
> 81.0	43	7.45	100.00

Total Number of Valid Hours: 577

Total Number of Hours: 720



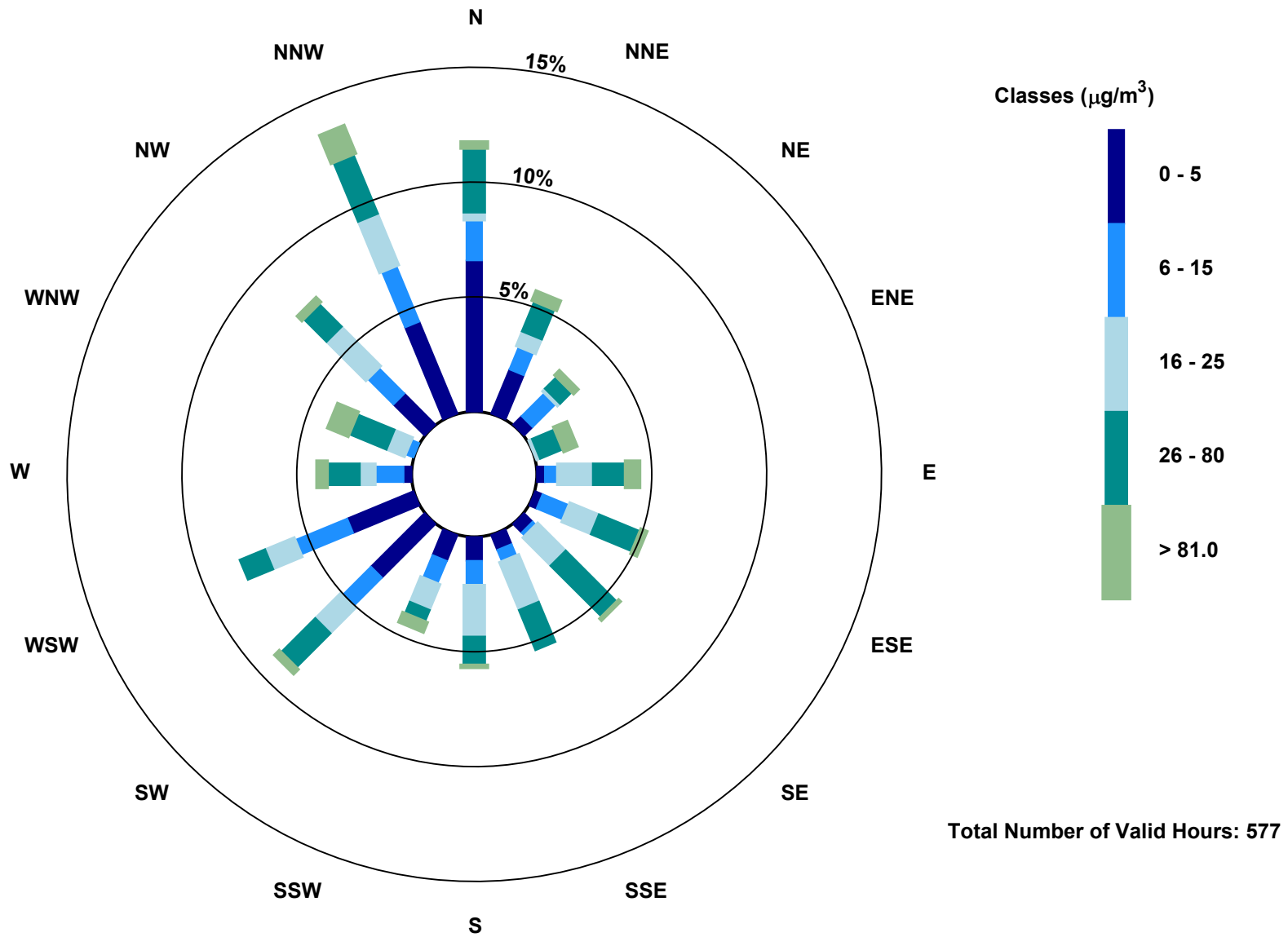
Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Patricia McInnes - June 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	38	12	3	0	2	2	3	4	6	7	19	18	2	0	11	25	152
6 - 15	10	6	8	0	3	7	1	3	6	6	10	14	7	2	9	15	107
16 - 25	2	4	1	1	9	8	10	13	13	7	9	8	4	5	14	14	122
26 - 80	16	8	4	6	8	11	18	11	7	3	12	7	8	10	8	16	153
> 81.0	2	3	2	4	4	2	1	0	1	3	2	0	3	6	2	8	43
Totals	68	33	18	11	26	30	33	31	33	26	52	47	24	23	44	78	577

Total Number of Valid Hours: 577

Total Number of Hours: 720





Wood Buffalo Environmental Association
Summary of Hour Averages

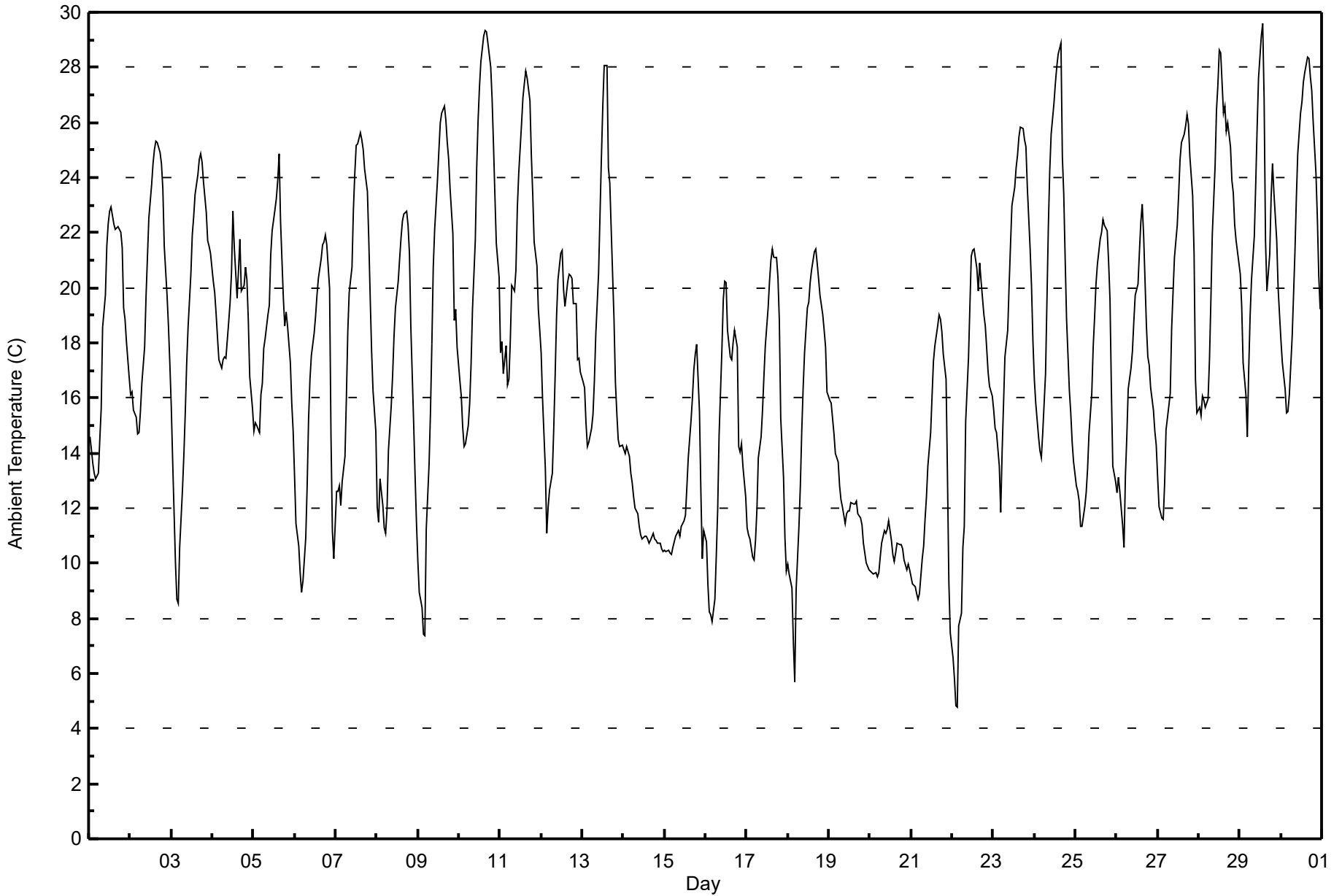
Ambient Temperature (AT) - C
Patricia McInnes - June 2023

Maximum Value: 29.6 C on Jun 29 14:00		Maximum Daily Average: 22.4 C on Jun 30		Hours in Service: 720																						
Minimum Value: 4.8 C on Jun 22 04:00		Minimum Daily Average: 10.3 C on Jun 20		Hours of Data: 720																						
Maximum Diurnal Average: 22.1 C at hour 16		Minimum Diurnal Average: 12.0 C at hour 5		Hours of Missing Data: 0																						
Monthly Average: 17.54 C		Percentiles: P ₁ = 7.4 P ₁₀ = 10.6 Q ₁ = 13.1 Median = 17.5 Q ₃ = 21.5 P ₉₀ = 24.9 P ₉₉ = 28.6		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	14.6	14.1	13.6	13.3	13.1	13.3	14.5	15.6	18.5	19.7	21.5	22.3	22.8	22.9	22.3	22.1	22.2	22.2	22.0	21.5	19.3	18.9	18.0	16.7	18.5	22.9
2-Jun	16.1	16.2	15.6	15.3	14.7	14.7	15.5	16.5	17.9	19.7	21.1	22.5	23.7	24.5	25.0	25.3	25.3	24.9	24.5	23.6	21.5	19.7	18.6	17.2	20.0	25.3
3-Jun	15.7	13.7	10.0	8.7	8.6	10.6	12.6	13.9	15.5	17.2	18.6	20.5	21.9	22.6	23.4	24.1	24.7	24.9	24.5	23.9	22.7	21.7	21.5	21.3	18.4	24.9
4-Jun	20.2	19.8	19.1	18.2	17.4	17.1	17.4	17.5	17.5	18.8	19.5	20.6	22.8	21.4	19.6	20.7	21.8	19.9	20.1	20.8	20.3	18.8	16.8	15.6	19.2	22.8
5-Jun	14.8	15.1	15.0	14.7	16.1	16.5	17.8	18.2	19.0	19.4	21.2	22.1	22.8	23.2	23.9	24.9	22.4	19.6	18.6	19.1	18.6	17.3	15.8	14.8	18.8	24.9
6-Jun	13.2	11.5	10.6	9.6	8.9	9.4	10.9	12.8	15.2	16.7	17.6	18.3	19.0	19.7	20.4	21.1	21.5	21.6	21.9	21.6	20.0	14.6	11.2	10.2	15.7	21.9
7-Jun	12.6	12.6	12.8	12.1	13.0	13.9	16.0	18.4	19.8	20.7	22.8	24.2	25.2	25.2	25.6	25.3	25.0	24.3	23.5	21.7	19.6	17.7	16.2	14.8	19.3	25.6
8-Jun	12.1	11.5	13.1	12.1	11.3	11.1	11.9	14.1	15.7	16.8	18.3	19.2	20.3	21.1	21.8	22.4	22.7	22.8	22.3	21.2	18.6	15.1	13.2	11.5	16.7	22.8
9-Jun	10.1	8.9	8.4	7.4	7.4	11.2	13.6	15.5	17.9	20.7	22.1	23.9	25.0	26.0	26.3	26.6	26.1	25.3	24.7	23.6	21.9	18.8	19.2	17.8	18.7	26.6
10-Jun	16.6	16.1	14.9	14.3	14.3	15.0	15.8	17.2	19.2	21.7	24.4	26.1	27.3	28.2	29.1	29.4	29.3	28.9	28.0	26.9	25.2	23.3	21.6	20.4	22.2	29.4
11-Jun	17.6	18.0	16.9	17.9	16.5	16.7	18.1	20.1	19.9	20.7	22.9	24.2	25.9	26.9	27.4	27.9	27.6	26.8	24.8	23.4	21.7	20.8	19.2	18.5	21.7	27.9
12-Jun	17.7	16.0	13.4	11.1	12.0	12.7	13.3	14.9	16.9	19.0	20.3	21.3	21.4	19.9	19.3	20.3	20.5	20.4	20.3	19.4	19.4	17.4	17.4	17.0	17.5	21.4
13-Jun	16.6	16.4	15.1	14.2	14.4	14.9	15.4	16.6	18.3	20.5	22.7	24.7	26.6	28.0	28.1	24.4	23.8	22.1	18.8	16.6	15.5	14.5	14.2	14.3	19.0	28.1
14-Jun	14.2	14.0	14.2	13.9	13.3	12.9	12.4	12.0	11.8	11.3	11.0	10.9	11.0	11.0	10.9	10.7	10.9	11.1	10.9	10.8	10.7	10.8	10.5	10.4	11.7	14.2
15-Jun	10.5	10.4	10.5	10.4	10.3	10.6	11.0	11.1	11.2	11.0	11.4	11.6	11.8	12.8	13.8	15.2	16.0	17.0	17.6	17.9	15.5	12.6	10.2	11.2	12.6	17.9
16-Jun	10.8	9.2	8.2	8.1	7.9	8.7	10.3	11.9	14.7	17.8	19.6	20.2	20.2	18.5	17.5	17.4	18.0	18.5	17.8	14.3	14.0	14.3	13.5	12.4	14.3	20.2
17-Jun	11.3	11.0	10.9	10.2	10.1	10.8	11.9	13.8	14.6	15.5	16.8	17.9	19.3	20.2	21.0	21.4	21.1	21.1	20.4	18.8	15.2	13.1	10.9	9.7	15.3	21.4
18-Jun	10.0	9.6	9.1	7.2	5.7	9.0	11.3	12.8	14.8	16.4	17.6	19.3	19.5	20.2	20.7	21.3	21.4	20.9	20.3	19.8	19.0	18.4	17.9	16.2	15.8	21.4
19-Jun	15.9	15.8	15.2	14.7	14.0	13.7	12.8	12.3	12.1	11.4	11.8	11.9	11.9	12.2	12.2	12.2	12.2	11.8	11.6	11.4	10.8	10.4	10.0	9.8	12.4	15.9
20-Jun	9.7	9.7	9.6	9.7	9.5	9.7	10.2	10.7	11.2	11.1	11.2	11.5	10.8	10.3	10.1	10.4	10.7	10.7	10.7	10.5	10.1	9.7	10.0	9.7	10.3	11.5
21-Jun	9.5	9.2	9.2	8.9	8.7	8.9	10.2	10.6	11.6	12.4	13.5	14.7	16.1	17.3	17.9	18.6	19.0	18.9	18.4	17.6	16.7	13.2	9.3	7.5	13.2	19.0
22-Jun	6.5	5.8	4.8	4.8	7.8	8.2	10.6	11.3	15.1	17.4	19.3	21.2	21.4	21.4	20.7	19.9	20.9	20.2	19.0	18.6	17.8	16.9	16.4	16.1	15.1	21.4
23-Jun	15.6	14.9	14.8	13.5	11.9	14.0	15.8	17.5	18.4	20.1	21.6	23.0	23.6	24.4	24.8	25.5	25.8	25.8	25.4	25.1	23.6	21.4	20.1	18.0	20.2	25.8
24-Jun	16.7	15.8	14.6	14.1	13.8	14.7	16.9	19.5	22.2	24.3	25.6	26.7	27.4	28.0	28.5	28.9	24.8	23.4	21.0	18.9	16.3	15.5	14.4	13.7	20.2	28.9
25-Jun	12.8	12.6	12.3	11.3	11.3	12.1	12.5	13.4	14.7	16.2	17.9	18.9	20.1	20.9	21.8	22.0	22.5	22.3	22.1	21.0	19.6	16.2	13.5	13.0	16.7	22.5
26-Jun	12.5	13.1	12.6	11.4	10.6	13.2	14.6	16.3	17.1	17.7	18.7	19.7	20.1	21.3	22.4	23.0	21.9	18.6	17.5	17.2	16.4	15.6	14.8	14.3	16.7	23.0
27-Jun	13.1	12.1	11.6	11.6	12.9	14.8	15.7	16.2	18.5	19.9	21.1	22.3	23.4	24.7	25.3	25.6	25.9	26.3	25.9	24.8	23.4	21.3	16.7	15.5	19.5	26.3
28-Jun	15.7	15.4	16.1	15.9	15.7	16.0	17.4	19.5	21.9	24.4	26.5	27.3	28.6	28.5	26.3	26.6	25.7	26.0	25.1	23.9	23.4	22.3	21.7	20.9	22.1	28.6
29-Jun	20.5	19.3	17.3	16.1	14.6	17.0	18.9	20.3	21.9	23.8	25.8	27.6	29.1	29.6	26.9	21.7	19.9	21.2	23.3	24.5	23.4	21.7	20.0	19.0	21.8	29.6
30-Jun	18.1	17.3	16.3	15.5	15.5	16.1	18.2	19.8	21.3	23.3	24.9	26.3	26.7	27.4	27.8	28.4	28.3	27.7	27.2	26.0	24.2	22.5	20.4	19.2	22.4	28.4
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	45	6.25	6.25
10 - 20	426	59.17	65.42
> 20	249	34.58	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

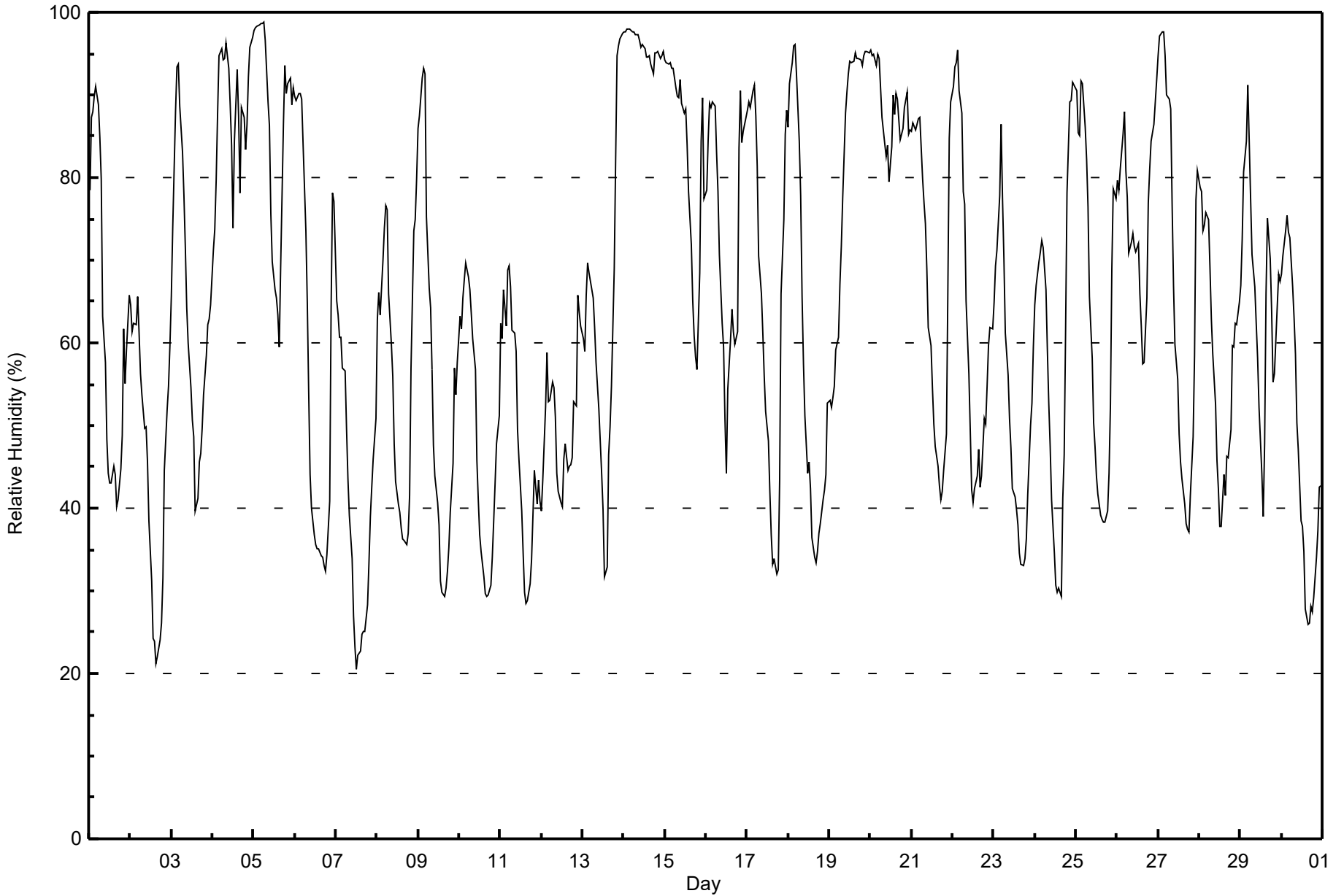
Relative Humidity (RH) - %
Patricia McInnes - June 2023

Maximum Value: 98.7 % on Jun 5 07:00 Maximum Daily Average: 95.9 % on Jun 14																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 20.5 % on Jun 7 13:00 Minimum Daily Average: 40.0 % on Jun 7 Maximum Diurnal Average: 83.0 % at hour 5 Minimum Diurnal Average: 47.9 % at hour 16 Monthly Average: 64.32 % Percentiles: P ₁ = 24.1 P ₁₀ = 35.6 Q ₁ = 45.1 Median = 63.7 Q ₃ = 85.5 P ₉₀ = 93.7 P ₉₉ = 97.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	78.5	87.2	87.9	89.9	91.1	88.8	84.9	79.8	63.3	57.6	48.3	44.2	43.0	43.1	45.1	44.1	40.2	41.0	44.7	48.9	61.7	55.2	59.2	65.8	62.2	91.1																						
2-Jun	64.6	61.3	62.4	62.2	65.6	61.2	56.2	53.7	49.6	49.8	45.6	38.4	31.2	24.2	23.9	21.3	22.1	24.1	26.1	31.5	44.6	51.9	54.7	59.6	45.2	65.6																						
3-Jun	65.5	73.9	88.0	93.4	93.7	88.7	83.1	77.9	71.6	64.2	60.0	54.6	50.7	48.7	39.7	41.2	45.6	46.5	49.7	53.7	58.4	62.2	62.9	64.6	64.1	93.7																						
4-Jun	71.3	73.7	79.7	87.7	94.8	95.6	94.2	94.4	96.4	93.3	88.8	83.8	73.9	84.5	93.1	87.5	78.1	88.6	87.4	83.4	86.4	92.2	95.7	97.0	87.6	97.0																						
5-Jun	97.7	98.2	98.3	98.4	98.6	98.7	98.7	96.6	89.2	86.2	75.5	69.8	66.4	65.4	63.3	59.5	69.1	86.6	93.5	90.3	91.3	92.1	88.8	90.8	86.0	98.7																						
6-Jun	89.8	89.4	90.1	90.2	89.6	84.1	73.5	65.0	54.0	44.1	39.9	36.8	35.5	35.1	35.0	34.2	34.1	33.0	32.4	34.3	40.9	64.2	78.2	77.1	57.5	90.2																						
7-Jun	65.2	63.4	60.6	60.7	56.9	56.6	49.7	43.5	39.2	33.9	26.9	23.2	20.5	22.2	22.7	24.7	25.0	25.0	28.3	33.4	39.0	42.5	45.9	50.9	40.0	65.2																						
8-Jun	62.9	66.1	63.3	70.0	74.0	76.7	76.1	66.0	59.9	56.0	47.9	43.3	40.5	39.4	37.7	36.3	36.1	35.7	36.9	41.4	57.0	73.6	75.0	79.9	56.3	79.9																						
9-Jun	85.9	87.5	92.0	93.2	92.5	75.2	66.6	64.2	56.9	47.6	43.9	40.6	37.9	31.3	29.8	29.3	30.3	32.3	35.2	39.5	45.4	57.0	53.8	57.6	55.2	93.2																						
10-Jun	63.2	61.8	65.5	67.7	69.7	67.9	66.5	63.6	60.6	56.9	45.8	41.1	36.8	34.7	31.6	29.7	29.4	29.5	30.7	34.1	38.4	43.1	47.7	51.1	48.6	69.7																						
11-Jun	62.3	60.5	66.4	62.1	68.9	69.4	66.8	61.5	61.2	59.0	49.5	45.9	39.7	34.6	29.8	28.4	28.9	30.9	33.8	39.1	44.5	40.5	43.4	40.9	48.7	69.4																						
12-Jun	39.7	43.4	52.2	58.8	52.9	53.1	55.2	54.5	51.0	44.3	42.0	40.7	40.2	46.0	47.9	44.6	45.1	45.2	46.2	52.9	52.3	65.8	63.8	62.1	50.0	65.8																						
13-Jun	60.6	59.0	65.8	69.6	68.4	66.5	65.4	61.8	57.6	52.1	48.2	44.3	39.8	31.7	32.9	46.5	49.9	54.8	69.0	82.2	94.8	96.0	96.7	97.4	63.0	97.4																						
14-Jun	97.6	97.7	97.9	97.9	97.8	97.6	97.6	97.4	97.3	96.5	95.8	96.1	95.5	94.6	94.5	94.8	93.7	92.5	95.1	95.1	95.3	94.3	94.7	95.3	95.9	97.9																						
15-Jun	94.3	93.9	93.7	93.9	93.3	93.2	90.8	89.9	89.7	91.9	89.0	87.8	88.2	83.9	78.3	71.8	65.0	60.8	58.2	56.8	68.4	84.3	89.7	77.5	82.7	94.3																						
16-Jun	78.5	84.6	89.1	88.5	89.2	88.7	83.1	78.2	70.7	62.4	59.5	50.7	44.2	54.4	60.5	64.0	61.4	59.9	61.3	83.5	90.5	84.2	85.6	87.3	73.3	90.5																						
17-Jun	88.2	89.1	88.6	90.5	91.2	87.4	81.4	70.5	65.9	61.1	55.9	51.8	48.1	42.0	36.7	33.2	33.9	32.1	32.5	43.4	65.9	75.0	85.3	88.2	64.1	91.2																						
18-Jun	86.0	91.3	93.9	95.9	96.1	92.5	84.5	77.7	65.6	57.5	51.2	44.2	45.6	42.4	36.4	34.1	33.4	34.7	37.0	38.2	41.1	42.2	44.0	52.6	59.1	96.1																						
19-Jun	53.0	52.1	53.4	54.8	59.1	60.7	67.2	71.8	77.6	87.7	90.4	92.5	94.0	93.9	94.1	95.1	94.4	94.4	94.2	93.5	94.8	95.2	95.3	95.1	81.4	95.3																						
20-Jun	95.4	94.7	95.0	93.6	95.0	94.4	90.9	87.4	84.1	82.6	84.0	79.6	83.7	90.0	87.7	90.1	89.4	84.7	85.3	86.0	88.4	90.4	85.3	85.8	88.5	95.4																						
21-Jun	85.6	86.6	85.8	86.4	87.2	87.3	79.8	76.9	74.4	68.9	61.9	59.6	54.5	50.1	47.4	45.2	42.7	41.0	42.0	44.6	49.1	66.3	84.8	89.2	66.6	89.2																						
22-Jun	91.1	93.3	93.8	95.4	90.5	87.8	78.4	76.8	65.0	56.2	49.4	42.2	40.6	42.3	43.8	47.2	42.6	43.9	50.9	50.2	54.8	59.7	61.9	61.7	63.3	95.4																						
23-Jun	64.9	69.3	71.1	77.8	86.5	77.4	70.2	61.3	56.0	50.9	47.3	42.4	41.3	39.8	37.9	34.6	33.2	33.1	33.8	36.3	41.7	50.0	52.7	59.4	52.9	86.5																						
24-Jun	64.6	66.9	69.9	71.1	72.3	71.6	66.5	59.2	52.8	47.5	41.1	34.5	30.7	29.8	30.3	29.3	41.2	46.5	61.4	78.2	89.2	89.4	91.5	91.2	59.4	91.5																						
25-Jun	90.5	85.4	85.1	91.6	91.3	86.1	82.2	76.5	65.5	58.1	50.3	47.5	43.9	41.7	39.2	38.7	38.4	38.3	39.7	44.2	52.5	69.0	78.7	77.4	63.0	91.6																						
26-Jun	79.7	78.4	81.1	85.3	88.0	80.8	77.6	70.8	72.2	73.2	71.7	71.0	72.1	65.9	62.1	57.5	57.6	65.4	76.9	81.1	84.4	86.4	89.2	91.9	75.8	91.9																						
27-Jun	94.7	97.1	97.6	97.6	94.7	90.1	89.5	88.3	76.7	66.9	59.8	55.6	48.9	45.7	43.5	40.5	38.1	37.4	37.1	41.6	48.6	58.5	77.3	80.8	67.0	97.6																						
28-Jun	78.8	78.3	73.5	74.3	75.8	74.8	69.2	62.8	58.6	52.6	45.8	42.3	37.8	37.9	44.1	41.6	46.3	46.0	49.5	59.6	59.4	62.3	62.2	64.9	58.3	78.8																						
29-Jun	67.0	72.6	80.7	84.5	91.2	84.5	77.5	70.6	66.7	62.4	58.1	52.2	44.3	38.9	47.8	65.9	75.1	70.1	63.9	55.2	56.3	64.4	68.3	67.4	66.1	91.2																						
30-Jun	68.4	70.4	73.5	75.4	73.3	72.7	66.8	63.1	58.7	50.4	47.1	38.5	37.9	34.8	27.8	25.9	26.1	28.1	27.4	29.2	34.0	37.4	42.5	42.7	48.0	75.4																						
																								76.2	77.6	79.9	81.9	83.0	80.3	76.3	72.1	66.9	62.4	57.4	53.2	50.3	49.0	48.2	47.9	48.2	49.4	52.0	56.0	62.3	68.2	71.8	73.4	Diurnal Average
																								97.7	98.2	98.3	98.4	98.6	98.7	98.7	97.4	97.3	96.5	95.8	96.1	95.5	94.6	94.5	95.1	94.4	94.4	95.1	95.1	95.3	96.0	96.7	97.4	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - June 2023

Maximum Speed: 34 km/h on Jun 19 14:00	Maximum Daily Speed Average: 24.8 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 27 19:00	Minimum Daily Speed Average: 3.0 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 4.5 km/h at hour 16	Minimum Diurnal Speed Average: 1.5 km/h at hour 6	Hours of Missing Data: 0
Monthly Average Velocity: 2.5 km/h 315.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 10 Q ₃ = 15 P ₉₀ = 20 P ₉₉ = 27	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	W8	NNE4	NNW8	NW5	NW4	SSW3	SW8	W9	NW3	WSW3	NNW9	NNW14	NNW15	NNW13	NNW12	NNW11	NNW10	N9	NNE8	ENE9	E10	ENE8	ENE7	E14	N4.7	NNW15
2-Jun	NNW8	N7	NNW7	NNW7	NNW10	NNW11	NNW11	N9	NNW10	NE5	NNE6	N7	NNW9	NNW14	NNE10	NNE12	NE9	ENE7	ENE8	ENE7	E9	E9	E11	E10	NNE6.5	NNW14
3-Jun	E8	ESE2	WNW2	N4	NNE4	NNE5	NNE6	NE6	NNE7	NNE10	NE10	NE7	ENE8	E10	E10	ESE7	E7	ESE12	E13	ESE14	ESE9	E6	ESE10	E9	E6.2	ESE14
4-Jun	E8	ESE9	ESE7	E9	E8	ENE12	E11	E10	E9	ESE13	ESE15	ESE13	ESE13	ESE9	NE7	NE11	E12	ESE11	ESE9	ESE4	E5	E3	NNW2	W2	E8.1	ESE15
5-Jun	NW4	NNW4	NNE1	WNW5	NW6	NW7	NNW5	NNW13	N14	NNE12	NNE16	NNE15	NE14	NNE13	N11	N13	NW15	NW11	NNW12	NNW8	WNW5	WSW20	W21	W15	NNW7.6	W21
6-Jun	WSW19	WSW17	SW12	SW12	SW11	WSW16	WSW15	WSW14	WSW17	WSW18	WSW19	WSW22	SW19	SW18	SW19	SW19	SW20	SW20	SW15	WSW10	SW4	SSW4	SSW3	SSW5	WSW14.2	WSW22
7-Jun	SSW7	SSW7	SSW9	SSW7	S9	S8	SSW10	SW15	SW15	SW16	SW21	WSW25	WSW25	WSW27	WSW23	WNW20	WNW22	WNW20	NW16	NW11	WNW8	WNW9	WNW9	WNW8	WSW11.8	WSW27
8-Jun	WSW1	N6	NNW14	NNW10	NW4	SW3	NW5	N6	NNE5	N7	N11	N12	N11	NE12	ENE12	ENE8	SE7	SE9	SSE7	SSW5	WSW4	NW3	WNW2	W2	N3.4	NNW14
9-Jun	WNW3	W3	N2	NNW2	SSE2	SE7	SSE8	SSE5	SSE5	SSE5	SSW6	SE8	SE7	SE10	SE11	SE10	SSE11	S10	SSE8	SE6	SE6	SSE5	SE9	SSE5	SSE5.3	SE11
10-Jun	SE7	ESE8	SE6	SE9	SE9	SE10	SE12	SE13	SE11	SE10	SSE14	SSE14	SSE18	SSE19	SSE20	S20	S19	S20	S18	S14	S12	SSE8	SSE6	SSE7	SSE11.9	SSE20
11-Jun	SE5	SSE6	SE1	SSE6	SSW4	SSW5	WSW11	W11	WNW14	WNW12	NW12	NNW11	NW10	NW14	NW14	NW10	NW14	NW17	NW11	WNW7	WNW8	NW11	NW9	NNW13	NW7.5	NW17
12-Jun	NNW13	WNW6	WNW6	W7	W9	W12	W12	WNW8	W8	WNW8	NNW7	NNW5	SSW2	SW12	SW11	SSW9	SSW6	S5	SE4	E4	ENE5	ESE1	ESE9	ESE11	WSW3.3	NNW13
13-Jun	SE10	SE12	SE9	SE11	ESE11	ESE11	SE10	ESE12	SE11	ESE8	SE8	SE9	ESE9	E8	E8	NNE13	N20	N25	N17	N5	NNW11	NNW15	N16	N13	ENE5.4	N25
14-Jun	NNW10	NNW7	NNW5	NNW9	NNW11	NNW15	NNW15	NNW18	NNW19	NNW21	N24	N21	N23	N21	N21	N24	NNW28	NNW26	N25	N25	N23	NNW23	NNW23	NNW26	N19.1	NNW28
15-Jun	NNW28	NNW26	NNW24	NNW26	NNW27	NNW18	NNW22	NNW16	NNW13	WNW11	NW15	WNW17	NW18	NW14	NW15	NW16	NNW16	NNW11	NW8	N4	SE1	SW3	W4	W10	NNW13.9	NNW28
16-Jun	WSW11	WSW9	S7	SW10	S6	SSW7	S7	S8	S8	SE8	ESE9	SSE8	SW17	WSW17	SW17	SW15	SSW12	S12	SW11	WSW8	S4	SW14	SW13	SW14	SSW9.1	WSW17
17-Jun	SW15	SW16	SW17	SW13	SW12	SW15	SW16	WSW18	WSW18	SW17	SW20	SW22	SW19	WSW22	WSW19	WSW20	WSW18	W19	W16	NW10	N12	N4	NW4	NW6	WSW13.6	WSW22
18-Jun	NNW9	NNW10	NNW5	NW1	WNW3	N8	NNE7	NE8	NE10	NNE12	NNE16	NNE16	N19	NNE17	NE14	NE15	NE18	NE18	NE20	NNE19	NNE17	NNE18	N17	N17	NNE12.3	NE20
19-Jun	NNE19	NNE21	NNE24	NNE23	NNE27	NNE27	N24	N28	N26	N24	NNE27	N28	N32	N34	N31	N25	N25	N24	N25	N23	N22	N21	NNW22	NNW23	N24.8	N34
20-Jun	NNW23	NNW22	N19	N20	N18	N19	N22	N22	N22	N19	N20	N21	NNW20	NNW17	NNW20	NNW14	NNW16	NNW18	NNW14	NNW10	NW9	NW9	NW10	NW9	NNW16.9	NNW23
21-Jun	NW9	NW9	NW9	NW9	NW7	NW7	NW10	NNW13	NNW15	NNW15	N17	N15	N12	N11	N12	NNW11	N11	N13	NNE13	NE11	NE7	E2	W2	WSW2	NNW8.9	N17
22-Jun	W1	E1	SSW1	SSE3	SE7	SSE4	SE7	SSE6	SE8	SSE7	S8	WSW17	SW18	WSW13	W19	W16	WSW19	W17	WSW7	SW8	SW7	SSW4	S5	SSE4	SW6.1	WSW19
23-Jun	S3	SE4	SE6	SE5	SE3	ESE6	SE7	SE7	SSW8	SSE7	SSE8	SSE4	S8	S7	S9	SSE11	SSE11	S8	SSW9	SE6	SE6	SSE6	SSW6	SSW6	SSE6.1	SSE11
24-Jun	SSW7	SW8	SW7	SW8	SSW6	S7	S7	S9	SSW10	S10	SW11	SW11	SW10	SW11	SW13	WSW13	NNE17	NNE12	NNW20	N21	N19	N11	NNW16	N13	W3.0	N21
25-Jun	N15	NNE14	NNE11	N9	N12	NNE13	NNE13	NNE13	NE13	NE11	ENE11	E9	NNE7	SE5	ESE7	ESE7	ESE5	NE3	SSE2	SSW7	WSW5	WNW2	SW3	SSW4	NE5.1	N15
26-Jun	SE4	SE7	SSE5	SE4	SE3	SSE4	SE4	SE7	SE9	SE6	ESE6	SE9	SE6	SW6	SW11	SSW17	WNW6	ENE9	SSE6	S5	SW9	SW7	SSE5	SSE3	SSE4.5	SSW17
27-Jun	NNW1	WNW5	W6	NW7	N2	NNW6	N11	N11	N11	NNW14	N11	NNW11	NNE8	N6	N6	N7	NNW6	N4	NW0	SW4	S4	SSE5	SSW2	SSW3	NNW4.5	NNW14
28-Jun	SSW4	SSW4	SSW6	S5	SSE5	SSE6	S7	S9	S10	SSE10	SSE9	S7	SSE4	WSW5	W14	WSW13	S11	S10	S9	SE7	S6	S5	SSE6	S4	S6.3	W14
29-Jun	S6	SSW6	S4	ESE2	SSW3	SSE4	SSE6	S9	S9	S11	SSW10	S10	SSW12	SW15	WSW16	W23	WSW7	S6	SW6	WSW8	SW7	SW7	SW8	SW7	SW6.9	W23
30-Jun	SW9	SW11	SW11	SW10	SW10	SSW6	S7	S10	SSW12	SW15	SSW13	SW18	WSW15	W17	W18	W17	W16	WSW17	WSW22	WSW18	WSW11	WSW9	WSW11	WSW10	WSW12.1	WSW22

NNW2.8	NW2.1	NW2.2	NW2.2	NW1.8	NNW1.5	NW1.7	NW2.1	NW1.9	NNW1.8	NNW2.2	NW2.7	NNW3.1	NNW3.9	NNW4.4	NNW4.5	NW4.0	NW3.3	NW3.1	NNW2.3	N1.8	NW2.1	NW2.4	NW2.4	Diurnal Average	
NNW28	NNW26	NNW24	NNW26	NNW27	NNE27	N24	N28	N26	N24	NNE27	N28	N32	N34	N31	NNE25	NNW28	NNW26	N25	N25	N23	NNW23	NNW23	NNW26	Diurnal Maximum	

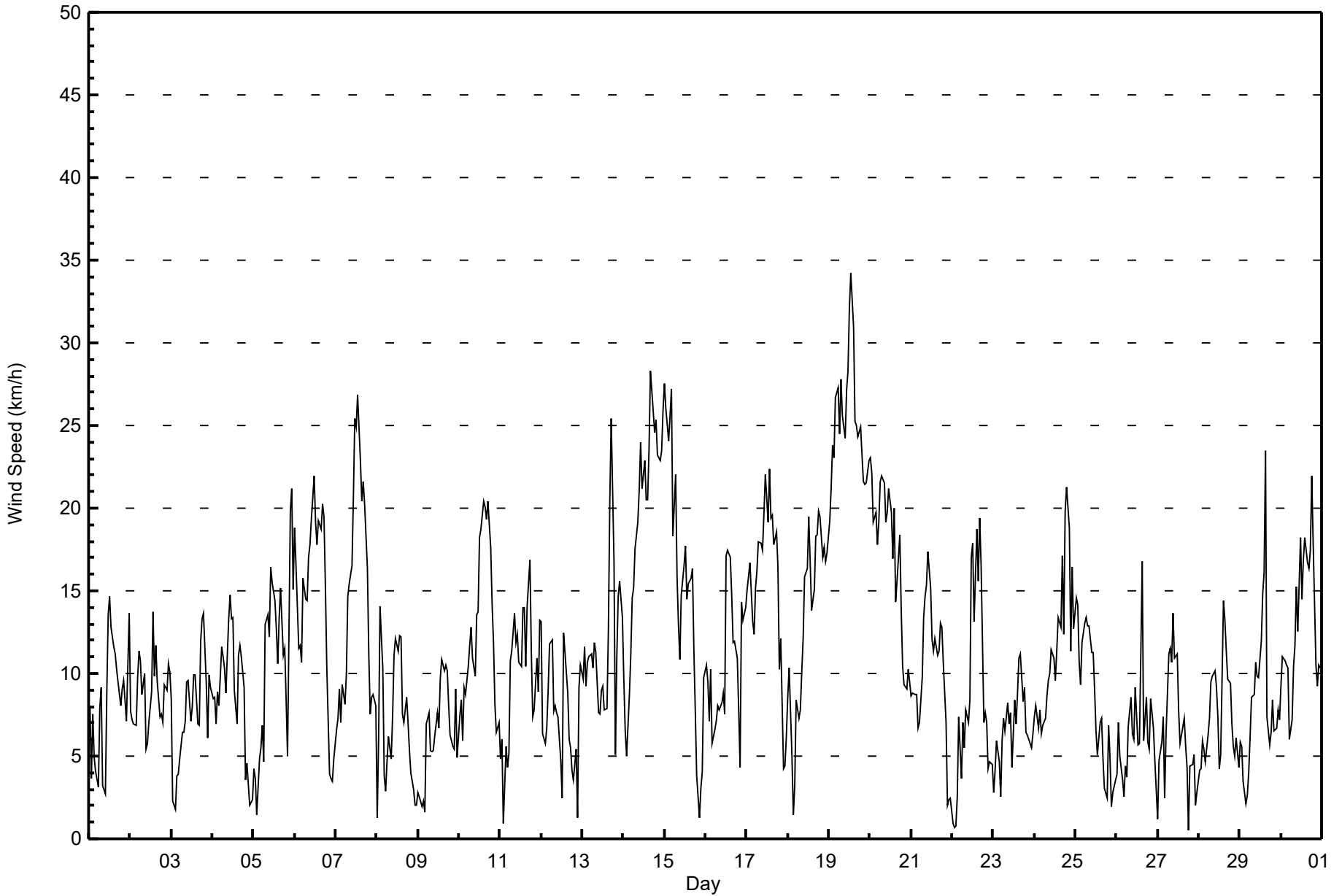
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	125	17.36	17.36
6 - 11	324	45.00	62.36
12 - 19	190	26.39	88.75
20 - 28	78	10.83	99.58
29 - 38	3	0.42	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 - June 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	5	2	1	5	5	11	20	10	16	5	6	6	8	10	8	125
6 - 11	22	10	11	10	19	22	39	24	32	22	28	12	8	12	24	29	324
12 - 19	23	21	7	2	3	8	2	4	5	5	30	24	12	3	12	29	190
20 - 28	29	7	1	0	0	0	0	1	2	0	5	9	2	3	0	19	78
29 - 38	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	84	43	21	13	27	35	52	49	49	43	68	51	28	26	46	85	720

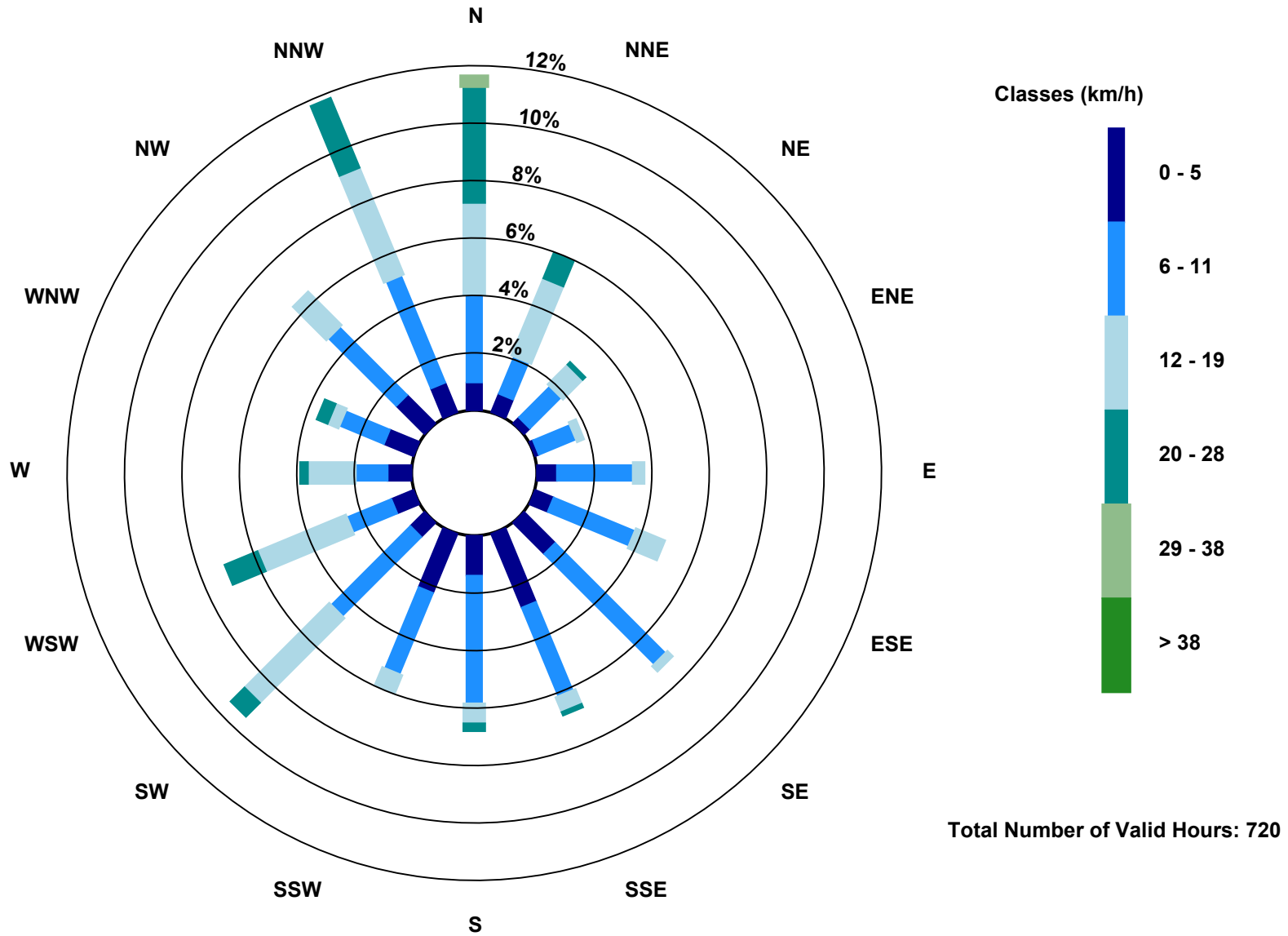
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Patricia McInnes





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 3 deg on Jun 19 14:00 Direction of Maximum Daily Speed Average: 6.0 deg on Jun 19	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 326 deg on Jun 27 19:00 Direction of Minimum Daily Speed Average: 3.0 deg on Jun 24	Percent Operational Time: 100.0
Monthly Average Direction: 315.5 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-Jun	272	24	348	326	312	211	223	260	307	251	346	342	338	346	336	330	337	360	19	69	92	73	65	87	352.1
2-Jun	348	1	337	339	332	330	337	350	342	39	26	352	339	337	19	19	48	63	58	66	89	84	80	93	15.9
3-Jun	95	118	300	350	19	12	24	36	30	12	40	50	75	88	97	102	93	113	100	113	116	96	104	99	79.0
4-Jun	101	102	107	94	82	77	93	100	96	113	115	111	114	105	48	54	91	113	115	123	94	94	336	272	98.0
5-Jun	316	331	15	298	314	306	340	341	350	22	22	27	35	29	4	359	324	319	344	333	284	250	269	259	335.3
6-Jun	255	253	233	228	223	240	242	238	251	249	239	244	236	226	234	230	231	231	230	238	225	196	197	202	236.7
7-Jun	203	193	193	198	191	189	210	223	223	234	226	242	242	249	250	283	282	293	313	316	288	282	286	297	250.2
8-Jun	253	354	341	342	316	220	320	355	26	351	351	351	354	41	69	78	124	124	159	209	253	315	288	271	5.8
9-Jun	295	271	352	330	151	137	149	168	167	165	199	134	128	130	137	139	168	187	164	140	125	163	133	154	152.3
10-Jun	141	123	146	130	131	131	124	127	125	124	156	156	160	162	164	176	178	178	179	180	175	166	153	155	156.5
11-Jun	143	150	135	167	202	213	244	281	292	291	316	330	317	314	319	316	325	324	307	286	294	321	325	331	304.2
12-Jun	331	294	290	269	268	262	266	287	269	299	341	340	213	220	231	211	195	178	146	85	67	111	111	122	257.1
13-Jun	137	135	131	127	123	121	124	123	126	122	135	126	120	97	90	27	358	7	356	357	328	333	8	8	66.6
14-Jun	345	346	346	332	338	341	343	342	345	345	359	357	0	354	355	349	345	348	355	357	355	347	345	344	349.4
15-Jun	346	345	345	342	339	342	345	339	328	303	305	300	305	317	321	325	339	330	325	354	146	214	260	263	329.3
16-Jun	252	241	189	219	189	197	188	175	171	145	120	168	222	237	219	216	198	189	232	239	181	228	234	235	211.2
17-Jun	232	229	231	231	230	236	235	249	243	234	225	226	231	246	240	245	251	262	263	309	357	0	308	316	245.1
18-Jun	332	336	347	314	299	6	18	35	53	25	20	24	6	12	34	41	52	44	37	31	27	22	10	3	21.9
19-Jun	15	26	19	24	24	16	2	6	9	7	12	7	3	3	9	11	3	358	359	353	352	351	348	343	6.0
20-Jun	342	345	349	350	352	354	357	352	356	356	351	350	347	338	335	328	336	340	335	331	310	306	320	322	343.4
21-Jun	315	310	318	324	323	312	324	346	346	344	355	357	357	6	360	344	2	352	19	43	56	93	267	253	348.7
22-Jun	267	95	201	155	139	157	132	156	141	157	191	237	230	256	277	262	251	260	253	223	222	200	186	163	226.5
23-Jun	169	125	131	146	129	118	127	136	196	159	150	152	180	178	187	165	167	182	199	146	128	156	197	207	163.1
24-Jun	204	216	222	221	197	191	191	184	197	191	228	229	227	216	223	237	21	29	345	351	11	5	345	3	275.0
25-Jun	5	20	18	357	3	17	17	25	50	56	70	91	19	129	107	120	119	51	154	210	247	285	229	197	37.9
26-Jun	133	145	163	145	128	147	139	143	145	133	123	140	142	215	229	208	291	67	156	190	226	231	163	150	168.7
27-Jun	348	292	275	311	350	345	350	357	350	343	4	338	20	10	349	7	342	349	326	234	175	163	197	201	342.8
28-Jun	198	211	203	186	167	165	190	190	172	152	154	186	163	249	262	237	173	175	187	132	187	180	168	183	187.4
29-Jun	170	196	180	118	200	163	166	178	175	190	201	180	207	223	252	277	248	174	220	237	227	220	220	230	214.0
30-Jun	225	232	230	232	226	200	173	190	209	232	212	230	237	265	273	274	262	250	253	248	244	237	248	251	240.0

313.0 317.3 316.1 313.8 325.5 329.3 324.0 326.0 325.1 326.3 343.8 311.6 302.4 295.4 292.5 295.2 315.8 325.2 321.5 333.5 350.6 309.4 319.4 316.5

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

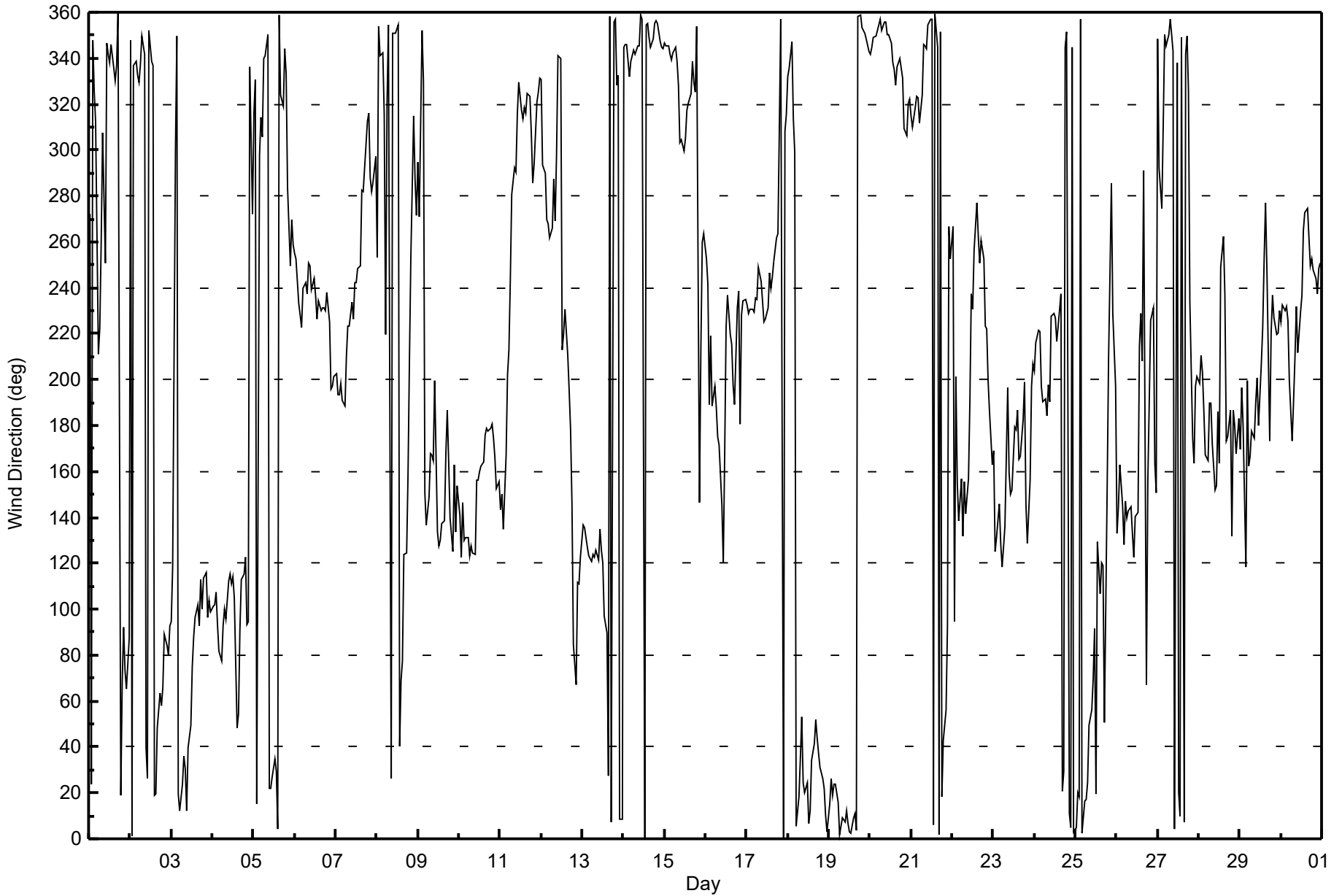
Wind Direction (WD) - deg
Patricia McInnes - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 104 deg on Jun 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: 7 deg on Jun 12 03:00																									
Percentiles: P ₁ = 8 P ₁₀ = 12 Q ₁ = 14 Median = 18 Q ₃ = 27 P ₉₀ = 43 P ₉₉ = 80																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	21	70	18	18	28	45	19	22	62	89	34	25	25	24	17	13	13	21	16	21	13	20	28	13	89
2-Jun	33	21	11	21	13	8	13	16	14	43	51	43	42	32	32	29	27	26	18	25	14	12	13	15	51
3-Jun	17	63	54	19	20	11	16	21	31	28	30	45	45	33	32	70	44	18	17	16	16	14	13	13	70
4-Jun	13	14	13	15	16	13	15	13	14	15	14	15	17	27	38	29	23	17	24	47	17	23	28	62	62
5-Jun	22	40	67	28	24	21	36	15	16	17	18	20	21	23	28	21	12	31	20	27	33	12	14	14	67
6-Jun	12	12	14	14	17	11	12	15	14	18	19	17	25	22	21	20	19	17	15	12	19	14	17	13	25
7-Jun	12	15	17	22	21	18	18	14	17	19	18	14	16	14	23	14	14	13	13	10	15	8	10	9	23
8-Jun	43	62	12	12	52	20	21	29	56	40	30	31	29	29	27	40	49	26	24	30	22	49	80	44	80
9-Jun	23	41	37	29	71	18	18	33	38	44	41	36	53	31	27	30	28	16	17	19	15	10	15	16	71
10-Jun	14	14	12	10	11	12	12	12	15	18	18	22	18	18	18	17	16	16	14	14	14	15	11	8	22
11-Jun	11	12	93	39	58	22	17	12	11	18	17	26	24	25	18	33	17	10	12	8	12	9	11	9	93
12-Jun	8	20	7	8	7	8	8	21	21	35	38	59	83	14	14	22	28	25	30	33	27	73	13	13	83
13-Jun	16	15	17	12	13	14	14	14	15	27	26	30	28	41	37	38	18	16	16	63	46	27	22	16	63
14-Jun	19	38	47	25	15	13	14	13	15	15	17	17	17	17	18	17	14	16	18	19	18	15	15	15	47
15-Jun	15	15	15	12	13	14	15	17	23	15	11	11	12	11	11	14	15	21	16	22	57	32	24	11	57
16-Jun	14	14	30	14	18	19	18	17	21	26	19	28	27	14	14	16	19	18	41	28	45	20	15	11	45
17-Jun	10	11	10	12	13	11	14	14	15	16	13	15	18	17	20	20	19	14	14	47	18	52	32	12	52
18-Jun	8	8	27	78	26	16	20	23	23	21	17	21	18	18	19	22	18	15	14	13	13	12	15	16	78
19-Jun	13	13	15	12	13	15	17	17	15	15	15	17	17	19	16	15	17	17	17	18	17	17	16	13	19
20-Jun	13	15	16	16	16	17	17	18	18	16	16	15	15	14	12	12	11	12	11	10	13	9	11	10	18
21-Jun	10	9	10	10	11	10	18	16	17	19	21	21	28	34	27	28	30	25	19	17	22	64	31	18	64
22-Jun	83	70	75	66	17	35	19	26	23	28	30	21	19	28	14	13	15	15	12	14	11	20	16	17	83
23-Jun	38	21	12	13	41	14	17	34	25	38	56	85	48	57	33	22	23	31	21	24	10	18	13	13	85
24-Jun	13	12	13	15	18	17	18	18	22	23	25	37	33	38	27	28	36	19	16	21	25	34	23	16	38
25-Jun	15	15	15	17	14	14	13	16	22	25	27	45	54	70	55	41	68	75	80	21	23	48	26	24	80
26-Jun	11	16	10	24	34	39	52	22	17	21	16	20	28	26	17	19	67	50	64	40	11	19	29	30	67
27-Jun	84	23	19	15	62	18	16	17	22	17	28	31	62	62	56	47	60	60	104	40	19	16	18	27	104
28-Jun	15	20	23	15	19	16	22	19	22	22	31	53	77	59	43	28	17	19	17	16	19	34	15	21	77
29-Jun	16	16	12	50	34	14	18	20	19	21	24	26	27	21	16	17	45	35	26	12	12	10	11	8	50
30-Jun	10	9	9	9	11	28	20	21	22	15	23	19	27	22	16	20	19	14	12	12	9	7	9	10	28
	84	70	93	78	71	45	52	34	62	89	56	85	83	70	56	70	68	75	104	63	57	73	80	62	
	Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS07 ATHABASCA VALLEY JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
 JUNE 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	10.4	0	2.8	0
TRS (ppb) Average	684	35	36	99.86	1.9	0	0.7	0
THC (ppm) Average	621	32	99	90.69	2.5	-	2.1	-
NMHC (ppm) Average	621	32	99	90.69	0.371	-	0.073	-
CH4(ppm) Average	621	32	99	90.69	2.3	-	2.1	-
O3 (ppb) Average	684	35	36	99.86	71	0	46.5	-
NO2 (ppb) Average	683	36	37	99.86	23.7	0	7.4	-
NO (ppb) Average	683	36	37	99.86	8.5	-	1.6	-
NOX (ppb) Average	683	36	37	99.86	29.4	-	8.5	-
PM2.5 (ug/m3) Average	718	2	2	100	272.7	69	170.7	9
CO(ppm) Average	685	35	35	100	1.5	0	0.7	-
Temperature 2 m (C) Average	720	0	0	100	30.6	-	23.3	-
Relative Humidity (%) Average	720	0	0	100	99.1	-	94.3	-
Barometric Pressure (inHg) Average	720	0	0	100	29.3	-	29.2	-
Wind Speed 10 m (km/h) Average	720	0	0	100	31	-	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 - ATHABASCA VALLEY (AMS07)
 JUNE 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	0.53	1.2	-	0	0	0.1	0.1	0.4	1.2	10.4
TRS (ppb) Average	684	0.26	0.2	-	0.1	0.1	0.1	0.2	0.3	0.4	1.9
THC (ppm) Average	621	2.04	0.1	-	1.9	2	2	2	2.1	2.1	2.5
NMHC (ppm) Average	621	0.017	0.036	-	0	0	0	0	0	0.1	0.371
CH4(ppm) Average	621	2.03	0.1	-	1.9	2	2	2	2	2.1	2.3
O3 (ppb) Average	684	28.36	13.2	-	5.3	12	18	27.1	36.8	46.4	71
NO2 (ppb) Average	683	3.87	2.8	-	0.2	1.2	1.9	3.3	5	7.4	23.7
NO (ppb) Average	683	0.83	1.2	-	0	0.1	0.2	0.4	0.9	2.1	8.5
NOX (ppb) Average	683	4.69	3.5	-	0.4	1.5	2.3	3.9	6	8.7	29.4
PM2.5 (ug/m3) Average	718	30.81	41.2	-	1.2	3.6	6.8	16.8	35.2	76.9	272.7
CO(ppm) Average	685	0.25	0.2	-	0.1	0.1	0.1	0.2	0.3	0.4	1.5
Temperature 2 m (C) Average	720	18.29	5.1	-	6.7	11.9	14	18	21.9	25.5	30.6
Relative Humidity (%) Average	720	65.65	20.9	-	20.5	35.5	47.5	67.6	84.4	91.9	99.1
Barometric Pressure (inHg) Average	720	28.92	0.1	-	28.6	28.7	28.8	28.9	29	29.1	29.3
Wind Speed 10 m (km/h) Average	720	9.5	6	-	0	3	5	8	13	19	31
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, O3, SO2, TRS, THC/NMHC/CH4	29 Jun 2023 13:00	29 Jun 2023 13:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	08 Jun 2023 10:00	08 Jun 2023 11:00	2	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	15 Jun 2023 06:00	16 Jun 2023 09:00	28	Unstable Operation - out of compliance
THC/NMHC/CH4	27 Jun 2023 06:00	28 Jun 2023 11:00	30	Unstable Operation - out of compliance
THC/NMHC/CH4	28 Jun 2023 12:00	28 Jun 2023 17:00	6	Maintenance - sample pump replaced



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 10.4 ppb on Jun 1 14:00	Maximum Daily Average: 2.8 ppb on Jun 8		Hours of Data:	685
Minimum Value: 0.0 ppb on Jun 3 04:00	Minimum Daily Average: 0.0 ppb on Jun 25		Hours of Missing Data:	35
Maximum Diurnal Average: 1.0 ppb at hour 14	Minimum Diurnal Average: 0.1 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 0.53 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 1.2 P ₉₉ = 6.0		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-Jun	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	1.0	2.2	3.3	2.3	2.4	10.4	6.0	5.7	3.7	3.5	1.8	0.6	0.2	0.1	0.1	0.1	1.9	10.4
2-Jun	0.1	0.0	0.0	Z	0.2	0.4	1.0	1.5	1.2	0.5	0.3	0.3	6.2	5.9	4.8	2.5	1.6	0.7	0.5	0.3	0.1	0.1	0.1	0.1	1.2	6.2
3-Jun	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
4-Jun	0.1	0.1	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
5-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.4	1.3	0.4	0.3	0.3	0.2	0.1	0.1	0.2	1.3
6-Jun	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1
7-Jun	0.1	0.2	Z	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.3
8-Jun	0.0	0.0	0.1	Z	0.1	0.1	0.5	0.5	1.2	5.2	7.1	9.3	6.6	5.8	5.6	5.2	4.0	4.2	3.5	2.9	1.7	0.7	0.5	0.4	2.8	9.3
9-Jun	0.3	0.2	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.5	0.7	0.6	0.7	1.0	0.9	0.8	0.8	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.4	1.0
10-Jun	0.2	0.2	0.2	0.3	0.4	Z	0.6	0.7	0.8	0.8	0.6	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.6	0.4	0.8
11-Jun	Z	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.4	0.2	0.3	0.4	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.6
12-Jun	1.6	Z	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.6	1.1	1.2	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.4	1.6
13-Jun	0.8	0.8	Z	0.9	0.7	0.6	0.6	0.9	1.2	1.4	1.6	1.4	0.8	0.4	0.3	1.8	6.4	2.7	1.4	0.6	0.3	0.6	0.6	0.2	1.2	6.4
14-Jun	0.1	0.1	0.1	Z	0.3	1.2	1.7	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.7	1.2	1.0	0.5	0.7	0.5	2.6	2.6	0.7	
15-Jun	1.0	1.3	1.9	0.6	Z	0.3	1.3	1.2	1.5	0.4	0.2	0.2	0.1	0.1	0.1	0.2	1.9	2.2	1.0	0.6	0.3	0.2	0.1	0.1	0.7	2.2
16-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
17-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
18-Jun	0.1	Z	0.2	0.1	0.1	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	0.0	0.1	0.1	0.1	0.2
19-Jun	0.1	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	0.1	0.1	0.5	1.2	0.1	1.2	
20-Jun	1.6	1.5	0.7	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6	0.1	0.3	0.4	0.5	1.0	0.8	1.2	1.1	1.1	2.3	2.0	0.7	2.3
21-Jun	0.9	0.6	0.3	0.2	Z	0.3	0.7	1.1	1.3	0.6	2.5	3.5	3.2	4.6	5.6	5.0	4.5	5.5	1.8	0.4	0.1	0.2	0.1	0.1	1.9	5.6
22-Jun	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.6	0.8	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.8
23-Jun	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.5	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.7
24-Jun	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4	4.0	0.6	0.6	0.2	0.1	0.1	0.4	4.0
25-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Jun	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3
27-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	1.0	4.0	5.9	3.5	0.8	0.4	0.3	0.2	0.2	1.3	2.2	1.8	1.3	0.6	0.4	0.3	0.2	1.1	5.9
28-Jun	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.3	0.4	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7
29-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	M	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
30-Jun	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1

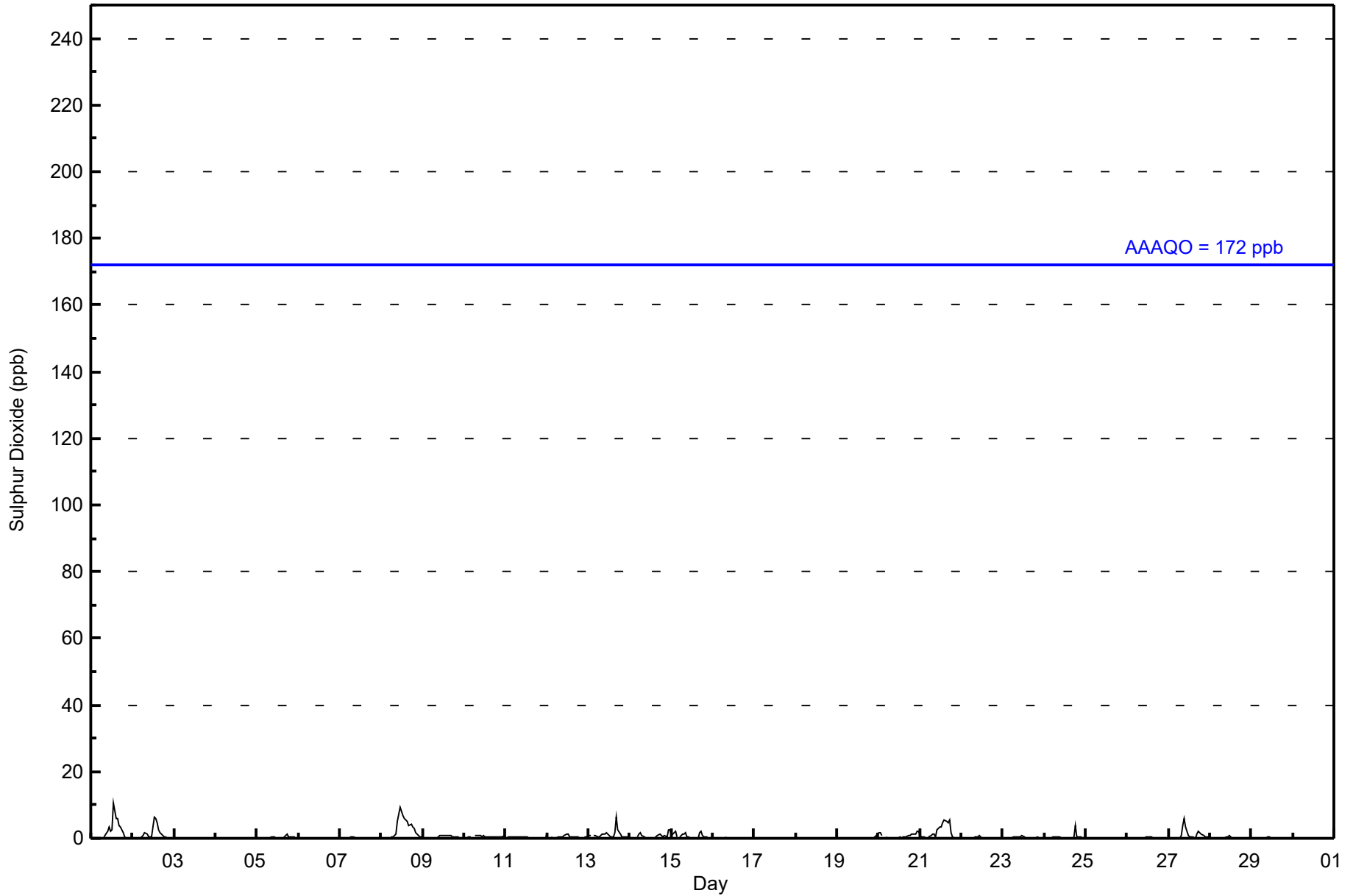
0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.8	0.9	1.0	0.9	0.8	0.9	0.9	0.7	0.4	0.3	0.2	0.3	0.3	Diurnal Average	
1.6	1.5	1.9	0.9	0.7	1.2	1.7	1.5	4.0	5.9	7.1	9.3	6.6	10.4	6.0	5.7	6.4	5.5	4.0	2.9	1.7	1.1	2.6	2.6	Diurnal Maximum	

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
Athabasca Valley - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	55	21	16	18	23	35	94	50	20	30	63	58	19	23	30	130	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	55	21	16	18	23	35	94	50	20	30	63	58	19	23	30	130	685

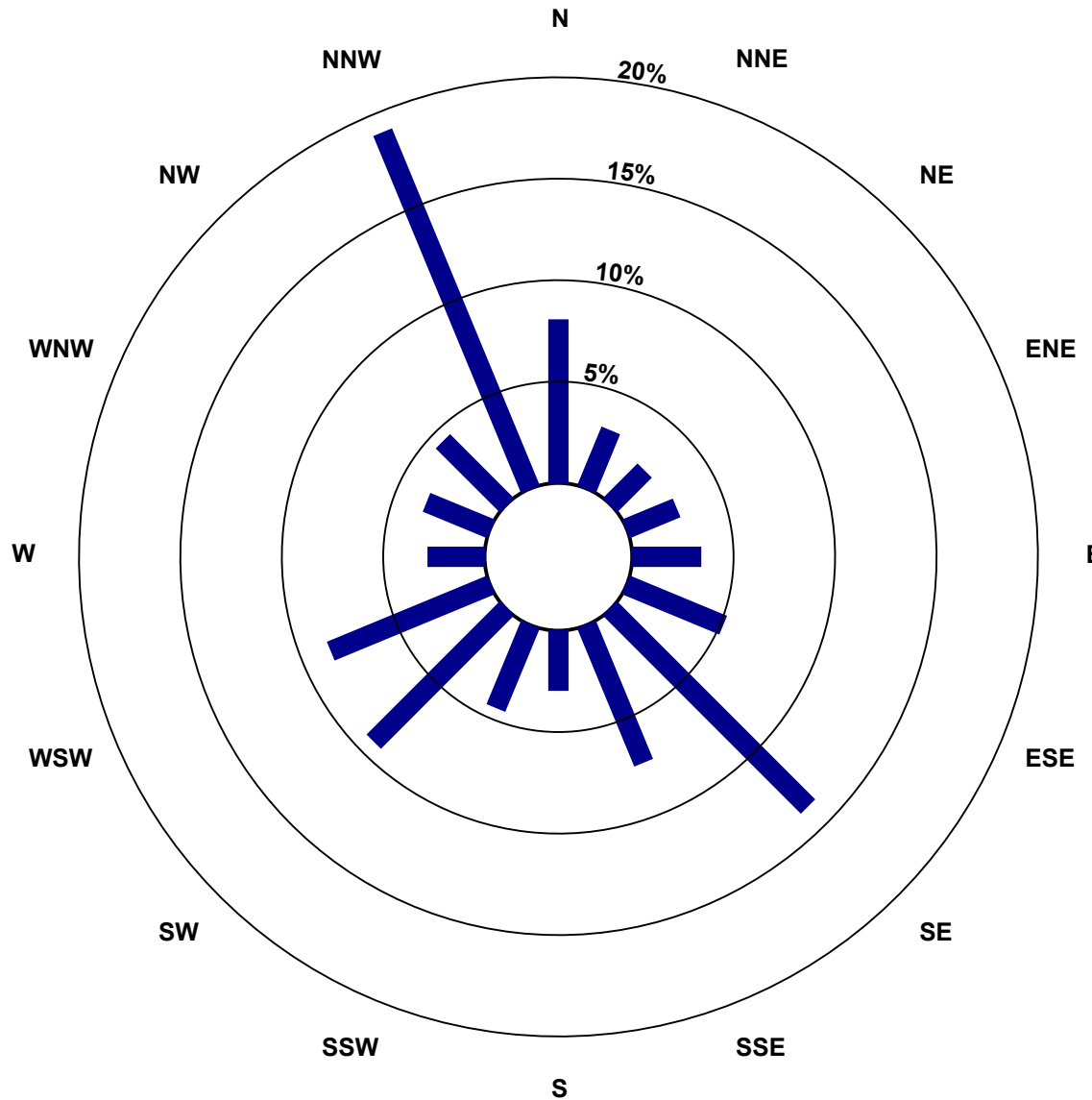
Total Number of Valid Hours: 685

Total Number of Hours: 720

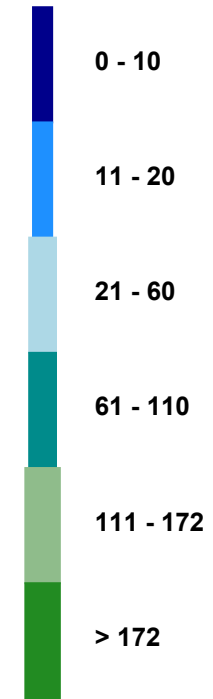


Wood Buffalo Environmental Association
Wind Rose Jun 2023

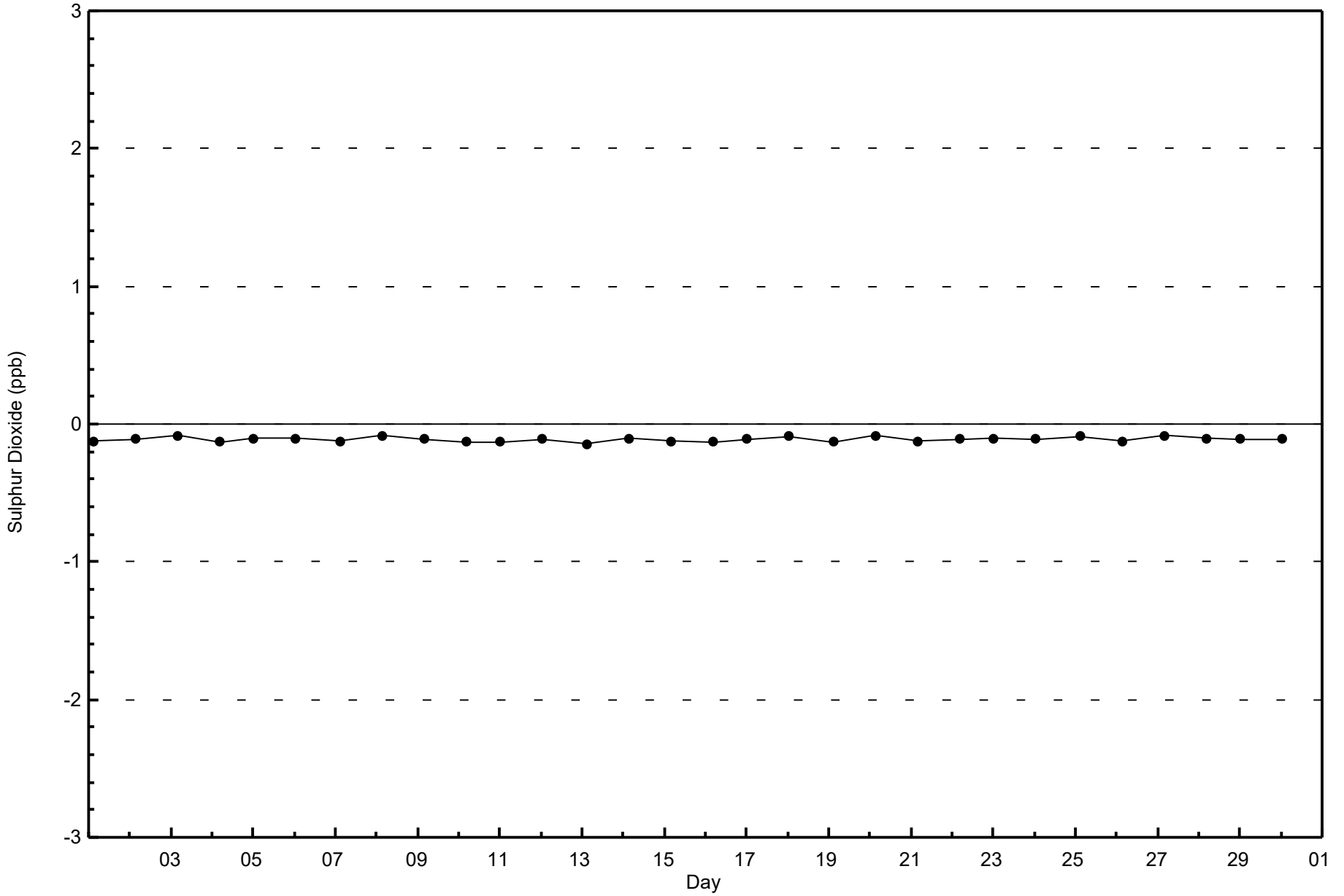
Sulphur Dioxide (SO₂) - ppb
Athabasca Valley

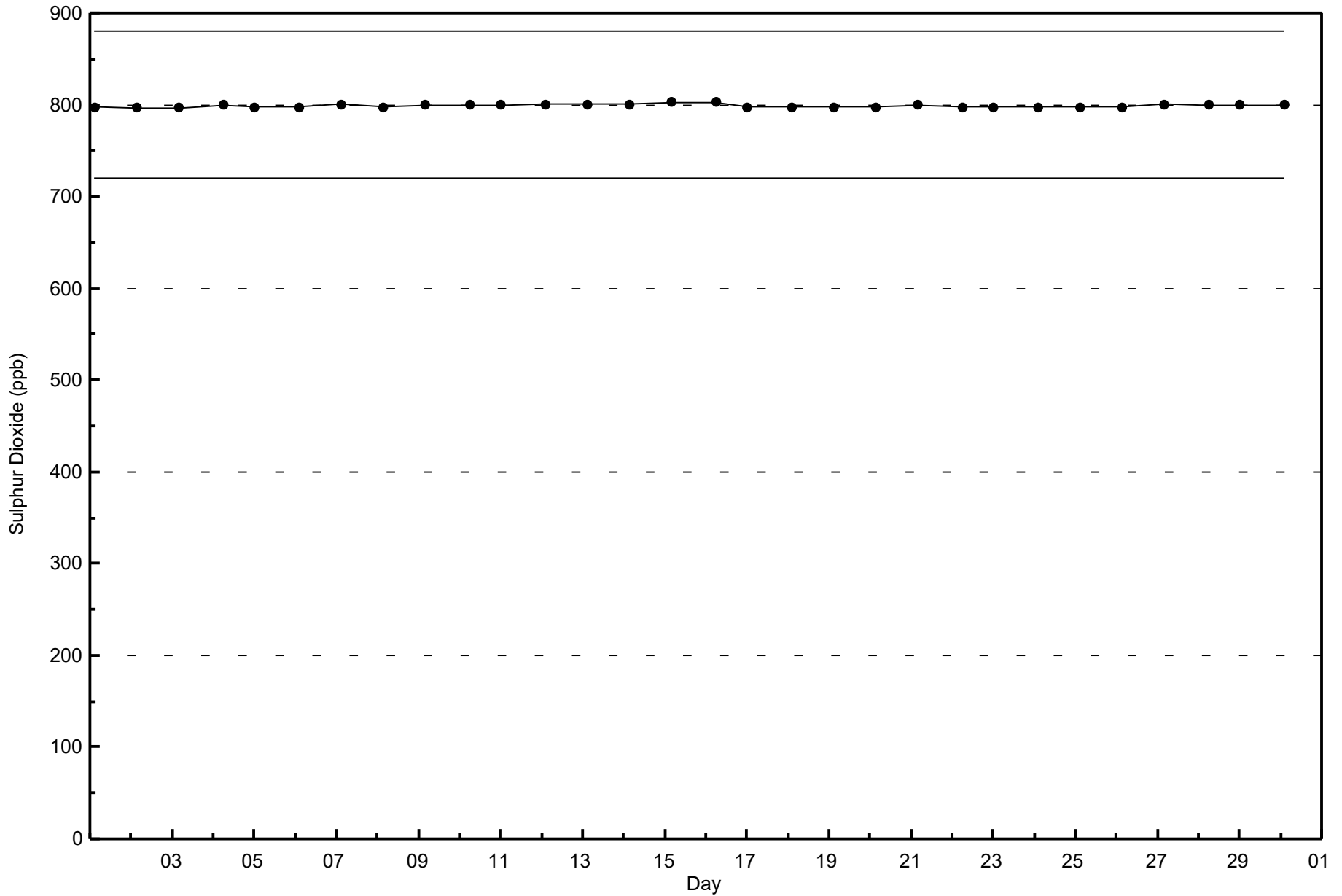


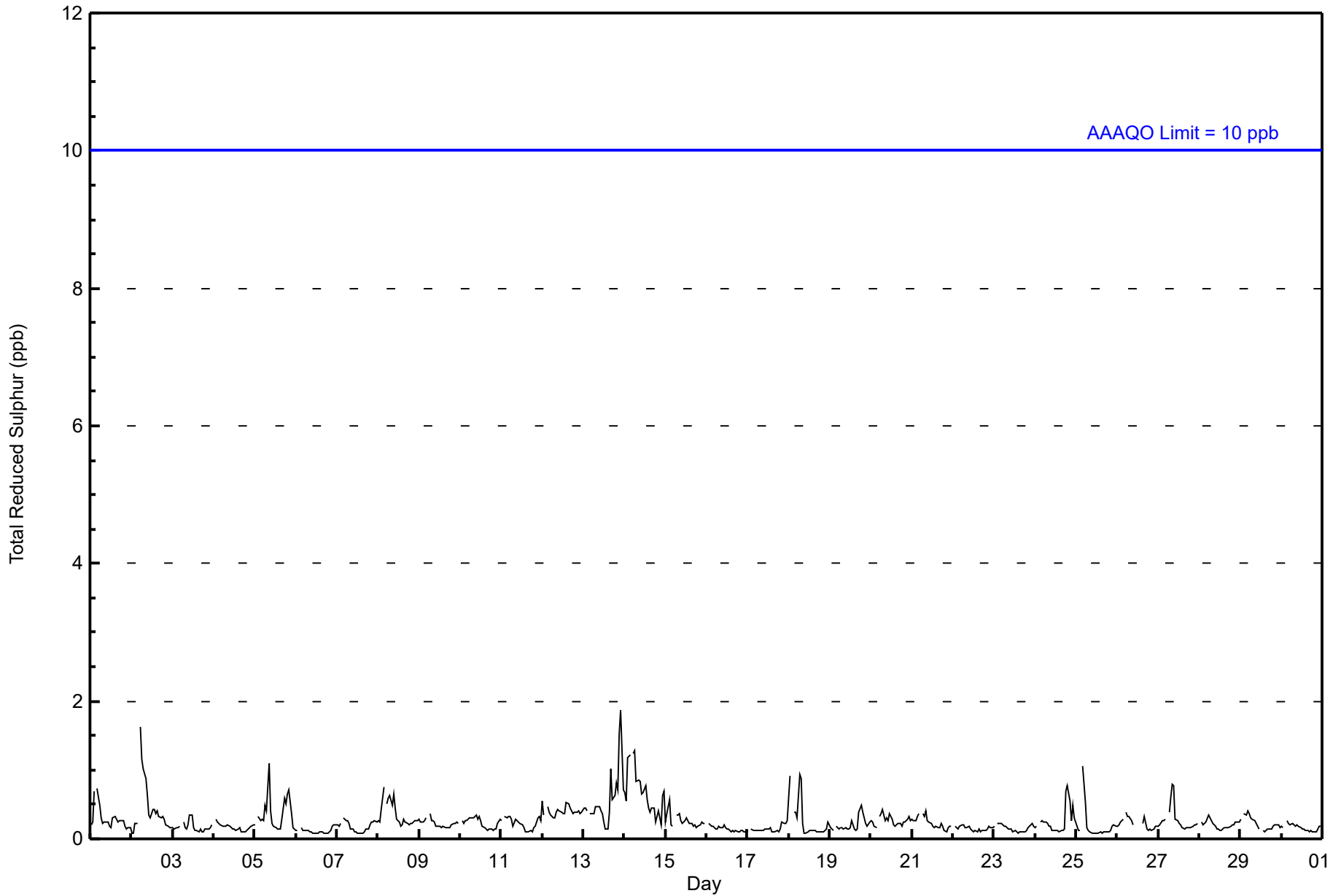
Classes (ppb)



Total Number of Valid Hours: 685









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	54	22	16	18	22	33	98	50	21	27	65	57	19	24	30	128	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	54	22	16	18	22	33	98	50	21	27	65	57	19	24	30	128	684

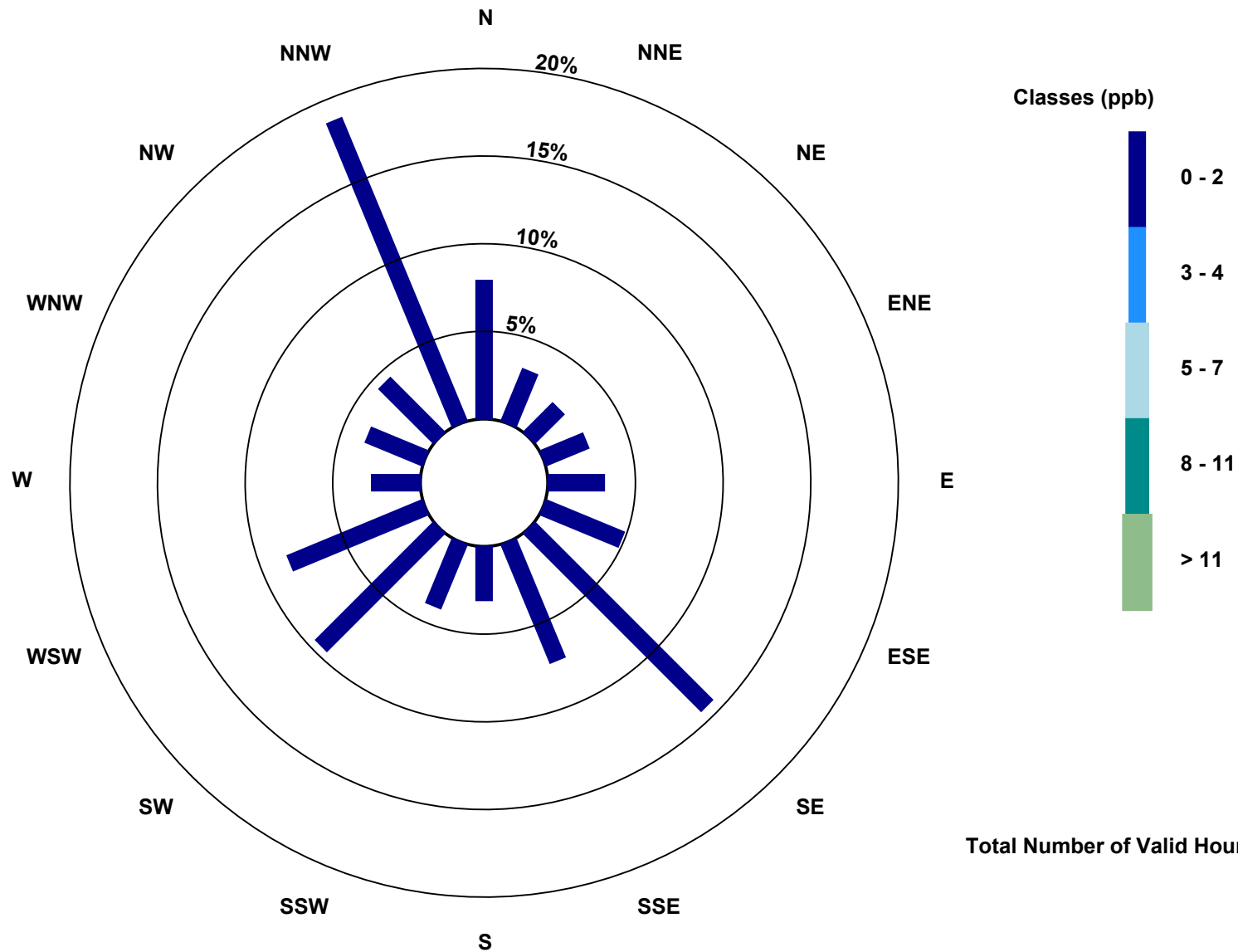
Total Number of Valid Hours: 684

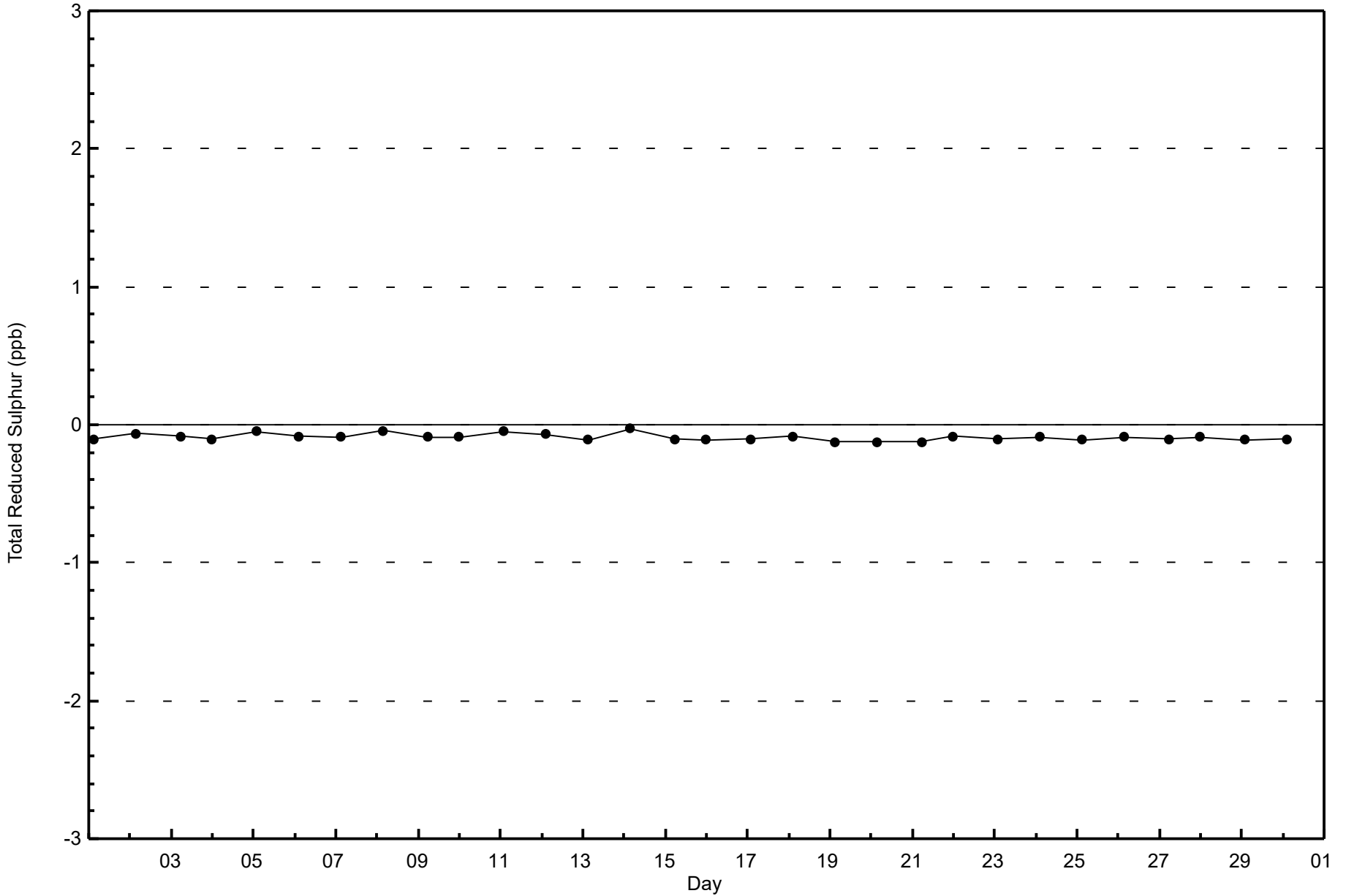
Total Number of Hours: 720

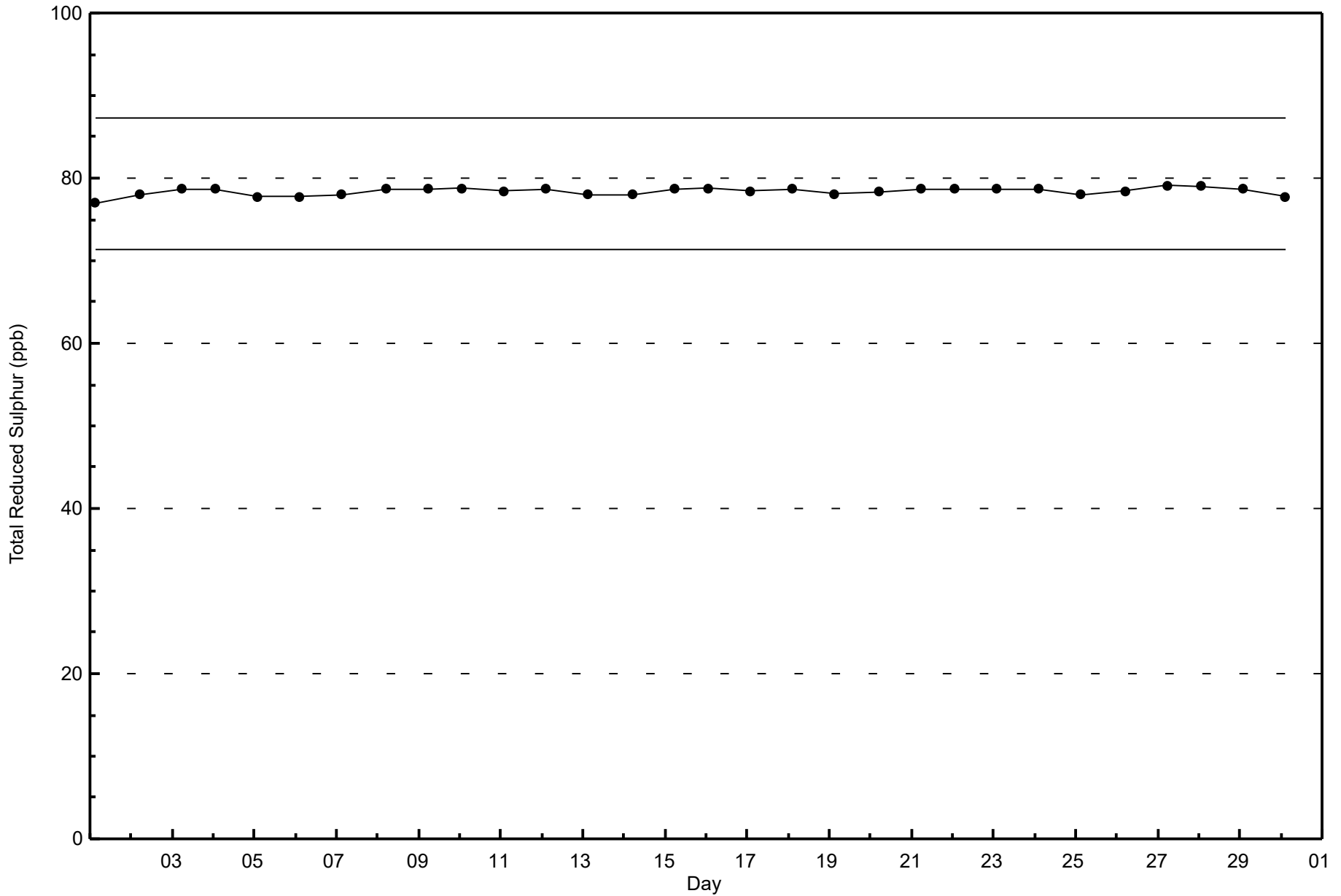


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley



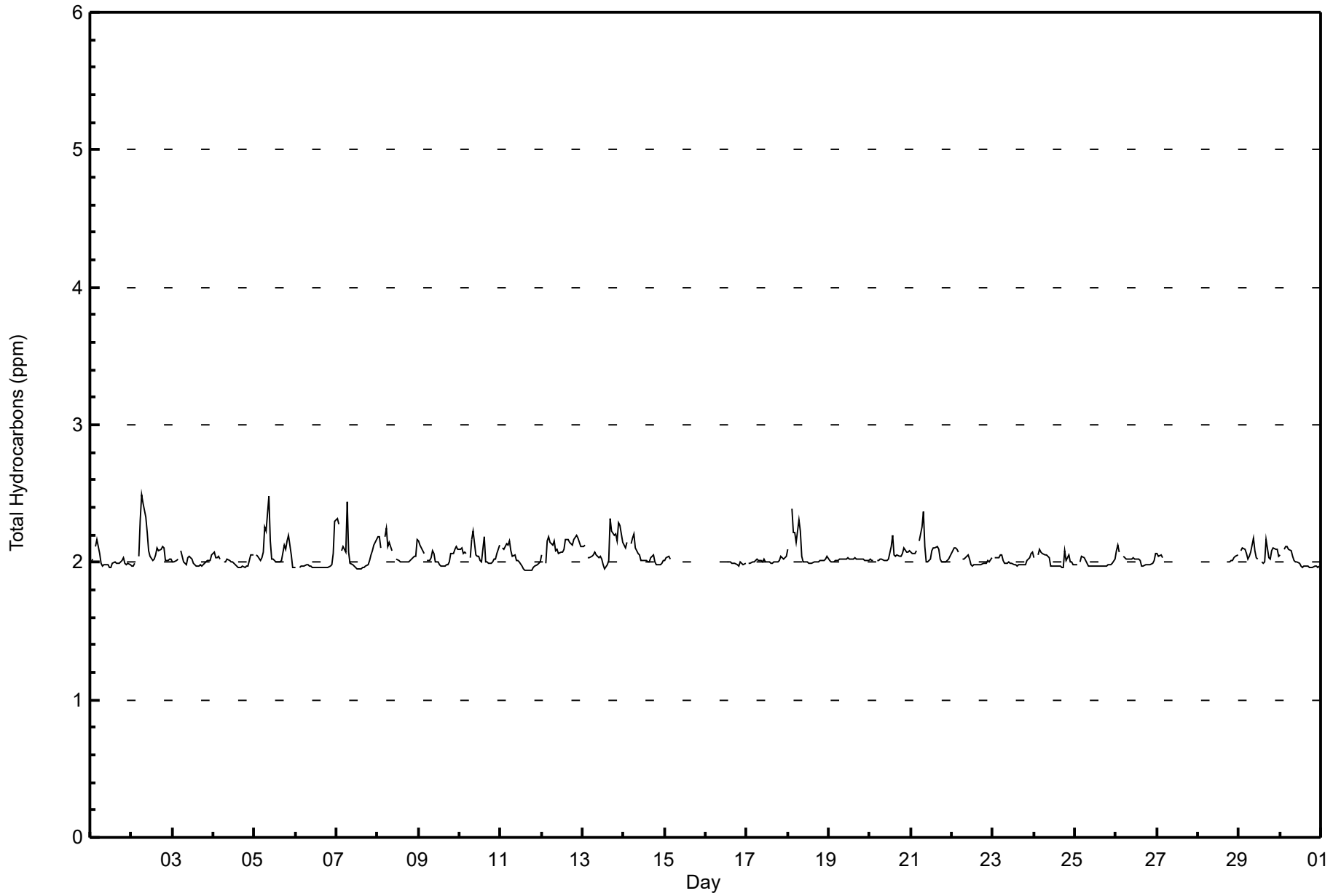






Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	424	68.28	68.28
2.1 - 3.0	197	31.72	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 621

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Athabasca Valley - June 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	38	17	11	16	12	18	39	26	14	20	54	49	15	13	10	72	424
2.1 - 3.0	14	4	5	2	11	15	43	21	3	2	7	5	3	6	17	39	197
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	52	21	16	18	23	33	82	47	17	22	61	54	18	19	27	111	621

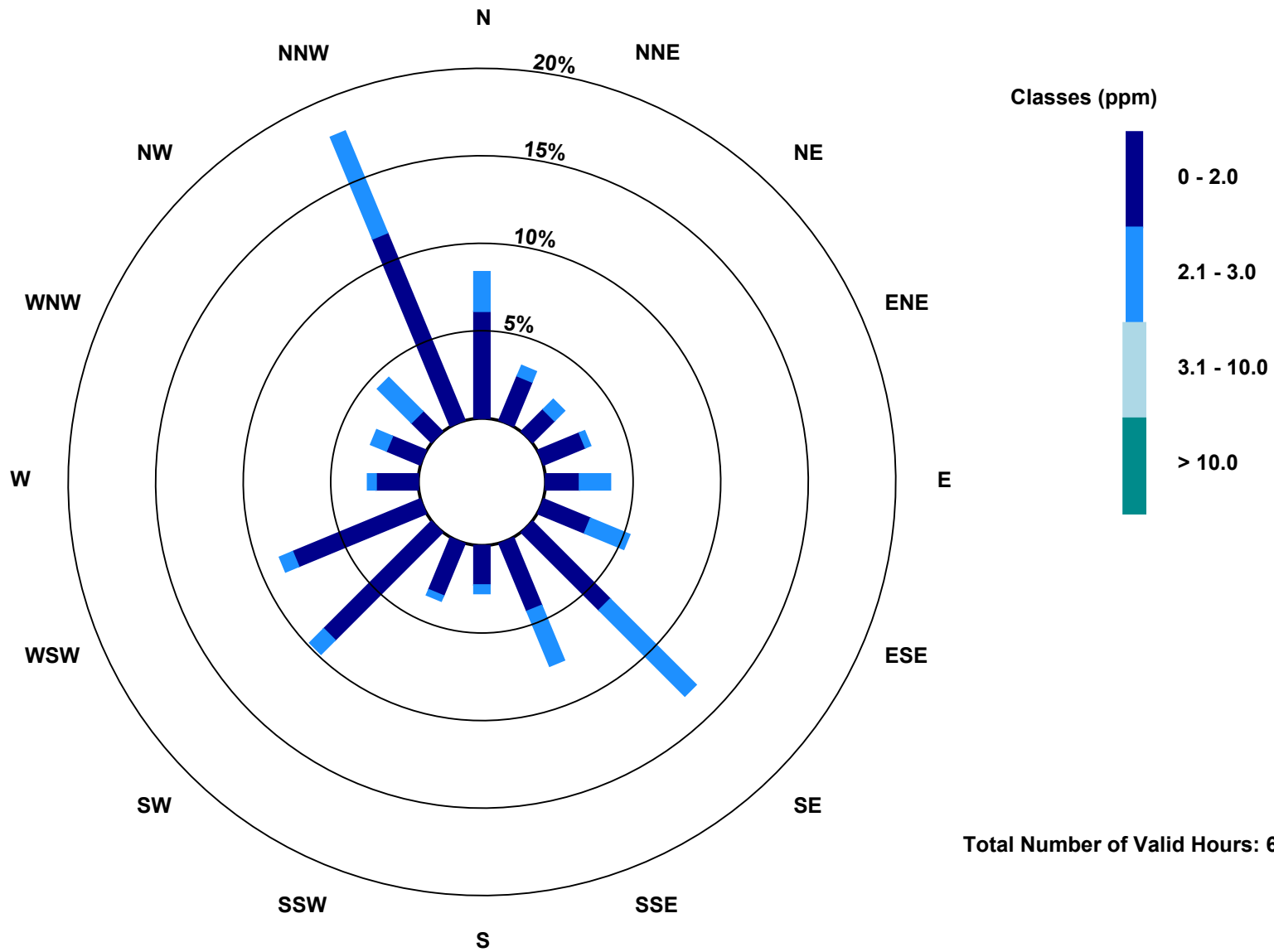
Total Number of Valid Hours: 621

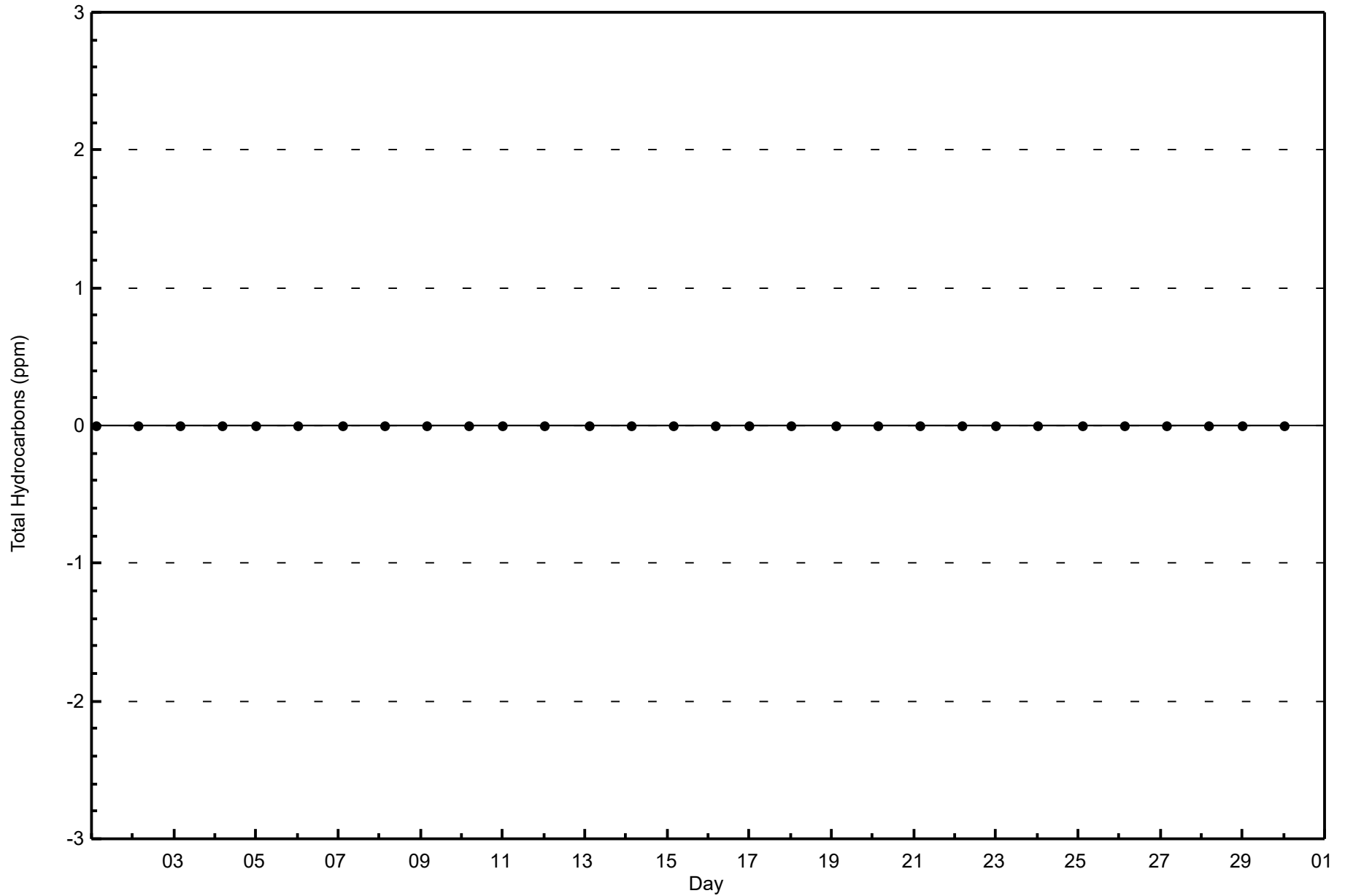
Total Number of Hours: 720

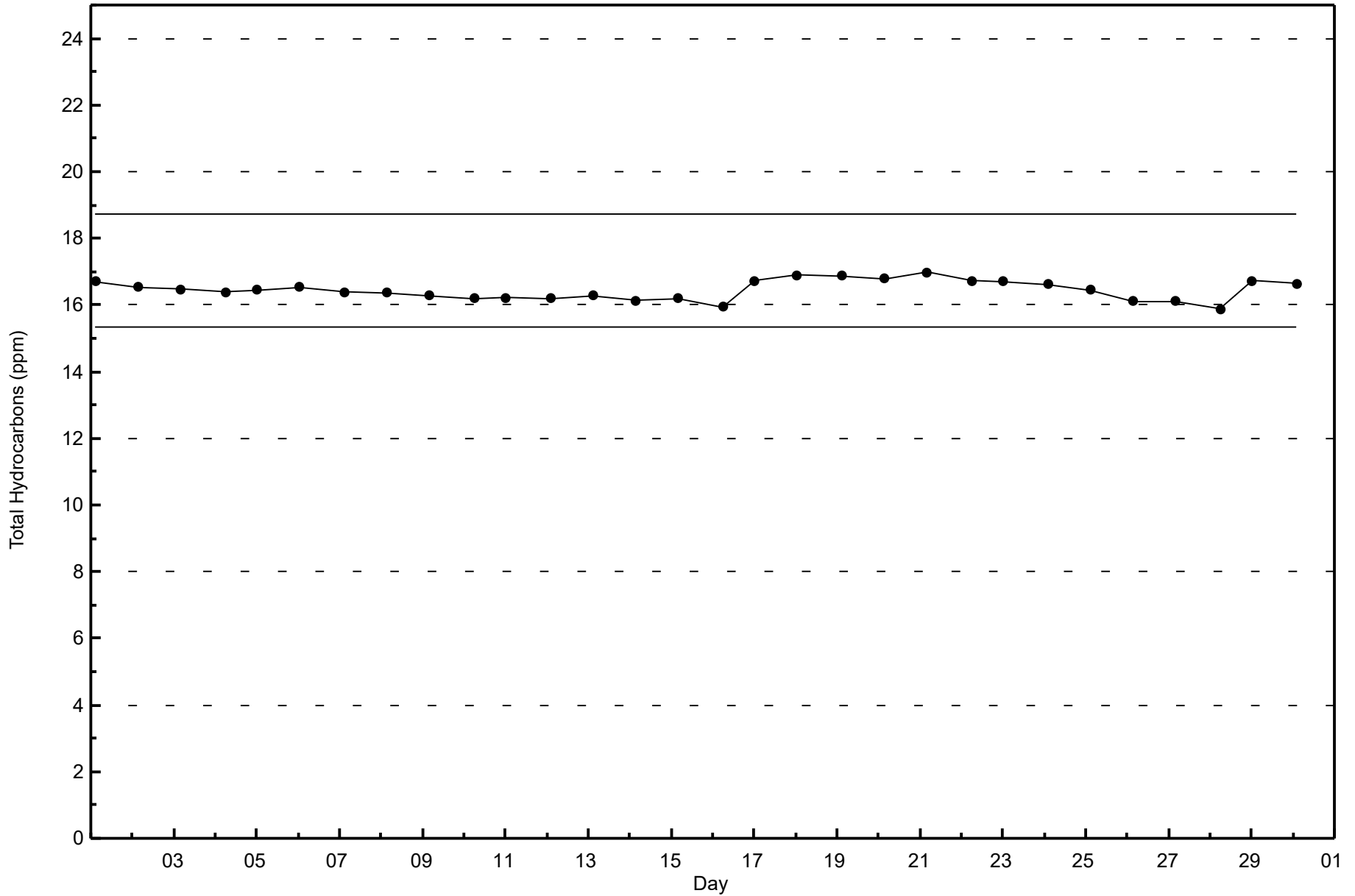


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Athabasca Valley







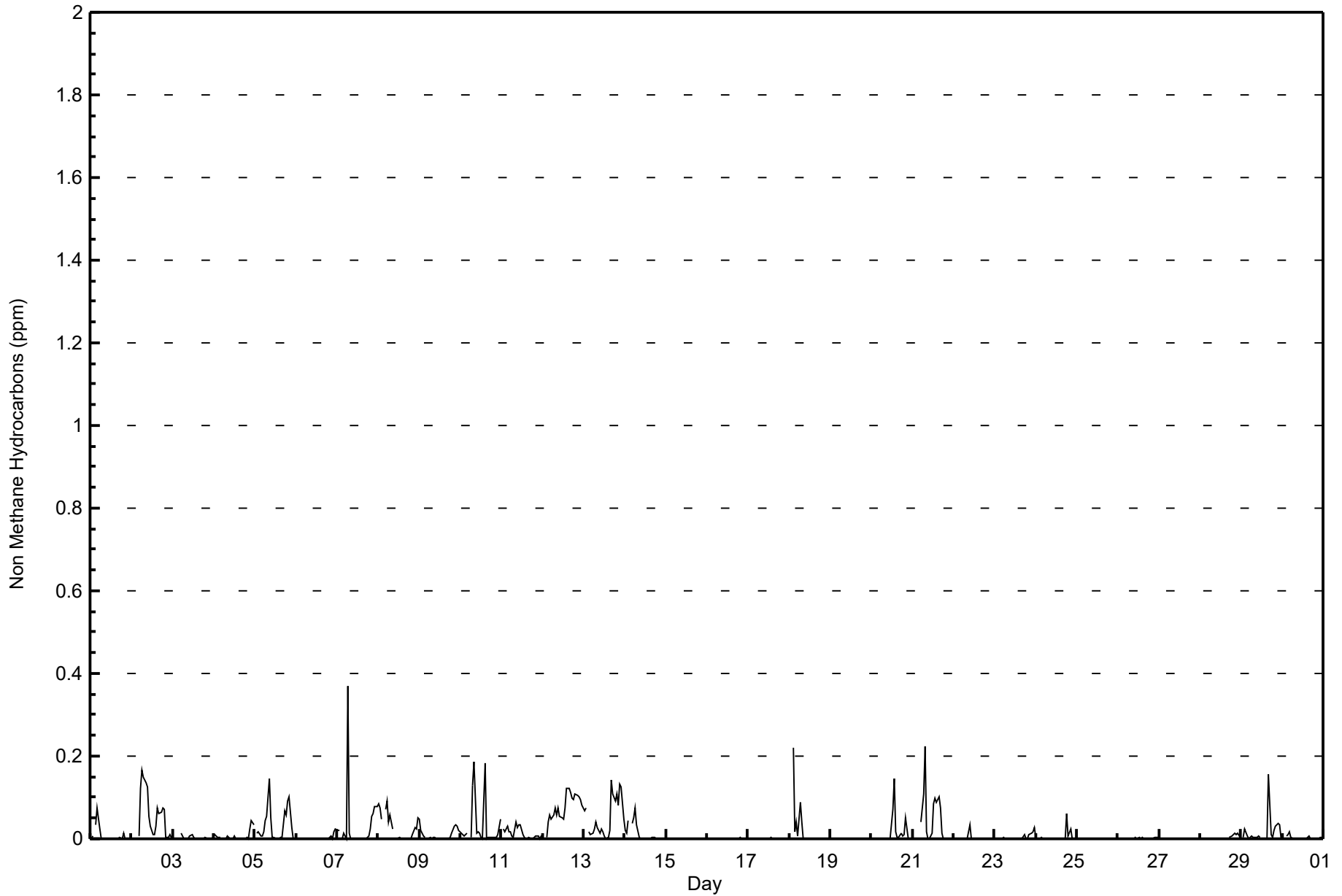


Maximum Value: 0.371 ppm on Jun 7 07:00	Maximum Daily Average: 0.073 ppm on Jun 12	Hours in Service: 720
Minimum Value: 0.000 ppm on Jun 1 08:00	Minimum Daily Average: 0.000 ppm on Jun 19	Hours of Data: 621
Maximum Diurnal Average: 0.038 ppm at hour 7	Minimum Diurnal Average: 0.007 ppm at hour 12	Hours of Missing Data: 99
Monthly Average: 0.017 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: 32
		Percent Operational Time: 90.7

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-Jun	0.002	0.006	Z	0.034	0.074	0.025	0.001	0.000	0.002	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.013	0.002	0.000	0.001	0.000	0.007	0.074	
2-Jun	0.000	0.000	0.000	Z	0.006	0.123	0.165	0.148	0.137	0.124	0.056	0.031	0.012	0.011	0.029	0.076	0.062	0.065	0.075	0.070	0.002	0.005	0.012	0.003	0.053	0.165	
3-Jun	0.001	0.001	0.000	0.001	Z	0.015	0.001	0.000	0.000	0.000	0.006	0.011	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.001	0.002	0.015	
4-Jun	0.011	0.006	0.003	0.003	0.002	Z	0.001	0.000	0.006	0.001	0.001	0.001	0.006	0.000	0.000	0.000	0.000	0.002	0.002	0.003	0.000	0.025	0.043	0.034	0.006	0.043	
5-Jun	Z	0.014	0.016	0.006	0.005	0.018	0.045	0.053	0.145	0.050	0.002	0.005	0.001	0.000	0.001	0.003	0.004	0.069	0.058	0.093	0.101	0.028	0.002	0.001	0.031	0.145	
6-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.016	0.023	0.002	0.023	
7-Jun	0.020	0.021	Z	0.001	0.012	0.001	0.371	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.023	0.055	0.062	0.077	0.078	0.032	0.371	
8-Jun	0.084	0.076	0.046	Z	0.071	0.093	0.040	0.057	0.025	M	M	0.001	0.002	0.000	0.001	0.000	0.002	0.000	0.001	0.002	0.011	0.028	0.023	0.052	0.029	0.093	
9-Jun	0.046	0.020	0.006	0.005	Z	0.001	0.003	0.001	0.002	0.002	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.003	0.014	0.032	0.035	0.031	0.020	0.010	0.046	
10-Jun	0.013	0.009	0.007	0.011	0.013	Z	0.004	0.127	0.187	0.014	0.016	0.013	0.005	0.002	0.184	0.000	0.003	0.002	0.002	0.004	0.002	0.002	0.011	0.048	0.029	0.187	
11-Jun	Z	0.025	0.017	0.031	0.016	0.017	0.006	0.003	0.040	0.029	0.035	0.033	0.010	0.003	0.001	0.000	0.002	0.000	0.000	0.004	0.007	0.005	0.001	0.006	0.013	0.040	
12-Jun	0.007	Z	0.003	0.041	0.058	0.046	0.058	0.075	0.057	0.073	0.055	0.051	0.047	0.076	0.123	0.121	0.111	0.099	0.095	0.110	0.104	0.102	0.095	0.082	0.073	0.123	
13-Jun	0.069	0.074	Z	0.016	0.009	0.015	0.023	0.039	0.028	0.013	0.025	0.016	0.007	0.001	0.004	0.022	0.144	0.107	0.092	0.109	0.080	0.133	0.126	0.046	0.052	0.144	
14-Jun	0.020	0.015	0.043	Z	0.037	0.050	0.075	0.034	0.004	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.003	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.013	0.075	
15-Jun	0.000	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.000
16-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	--	0.002	
17-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002
18-Jun	0.004	Z	0.219	0.016	0.042	0.006	0.088	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018	0.219	
19-Jun	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-Jun	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	0.071	0.145	0.019	0.004	0.002	0.012	0.008	0.010	0.050	0.000	0.014	0.145	
21-Jun	0.001	0.000	0.000	0.000	Z	0.041	0.108	0.223	0.017	0.000	0.000	0.014	0.084	0.098	0.089	0.101	0.076	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.223	
22-Jun	0.001	0.001	0.000	0.000	0.000	Z	0.000	0.000	0.001	0.034	0.000	0.000	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	0.034	
23-Jun	Z	0.000	0.000	0.001	0.000	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.001	0.010	0.014	0.018	0.004	0.026	
24-Jun	0.003	Z	0.002	0.003	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	0.000	0.061	0.008	0.025	0.000	0.000	0.000	0.004	0.061	
25-Jun	0.000	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
26-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.001	0.005	0.001	0.004	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.005	0.005	0.001	0.005	
27-Jun	0.003	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.003
28-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	0.002	0.006	0.009	0.014	0.010	0.015	--	0.015
29-Jun	Z	0.003	0.022	0.005	0.000	0.004	0.006	0.005	0.003	0.003	0.008	0.003	M	0.002	0.002	0.000	0.155	0.010	0.002	0.022	0.032	0.037	0.035	0.004	0.016	0.155	
30-Jun	0.006	Z	0.007	0.011	0.018	0.004	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.018	

0.013	0.012	0.017	0.008	0.016	0.020	0.038	0.032	0.025	0.014	0.008	0.007	0.010	0.013	0.017	0.012	0.021	0.014	0.015	0.018	0.019	0.017	0.018	0.016	Diurnal Average	
0.084	0.076	0.219	0.041	0.074	0.123	0.371	0.223	0.187	0.124	0.056	0.051	0.084	0.145	0.184	0.121	0.155	0.107	0.095	0.110	0.104	0.133	0.126	0.082	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 - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	416	66.99	66.99
0.006 - 0.05	136	21.90	88.89
0.06 - 0.1	62	9.98	98.87
> 0.1	7	1.13	100.00

Total Number of Valid Hours: 621

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	34	17	12	15	12	18	42	28	14	19	50	49	13	13	10	70	416
0.006 - 0.05	8	1	0	1	9	10	34	18	2	2	5	4	4	4	11	23	136
0.06 - 0.1	8	3	4	2	2	5	4	0	1	0	6	1	1	2	6	17	62
> 0.1	2	0	0	0	0	0	2	1	0	1	0	0	0	0	0	1	7
Totals	52	21	16	18	23	33	82	47	17	22	61	54	18	19	27	111	621

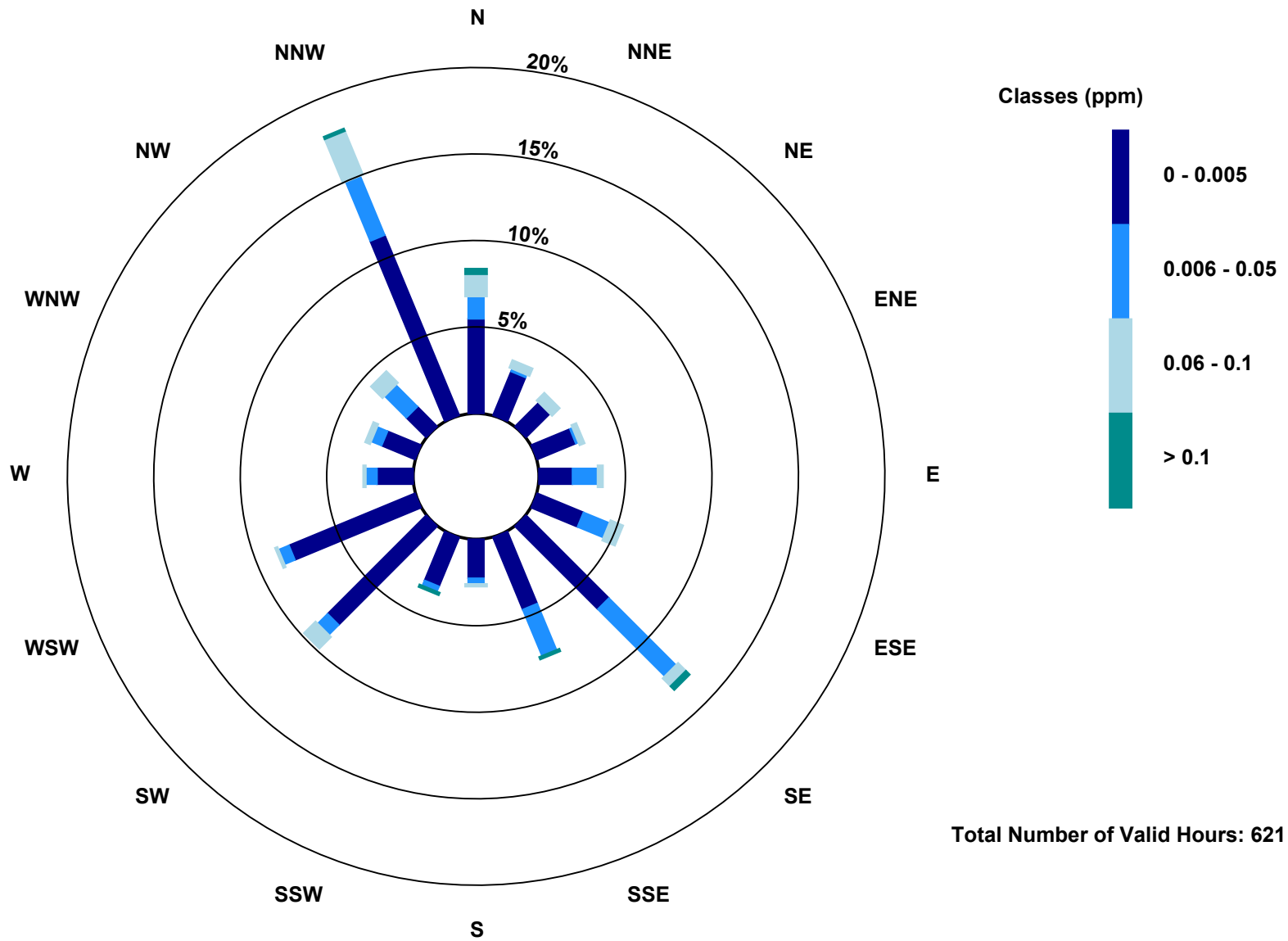
Total Number of Valid Hours: 621

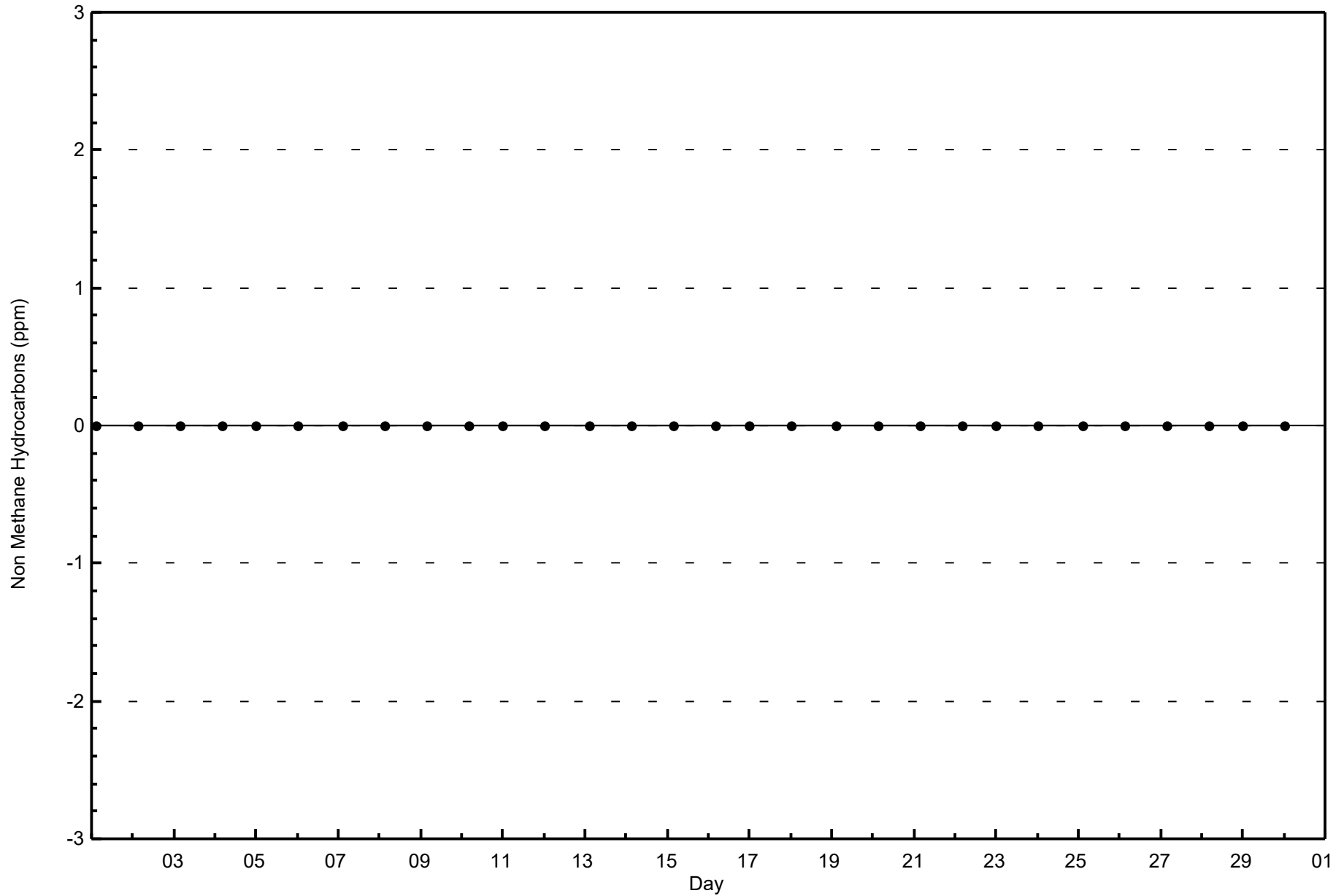
Total Number of Hours: 720

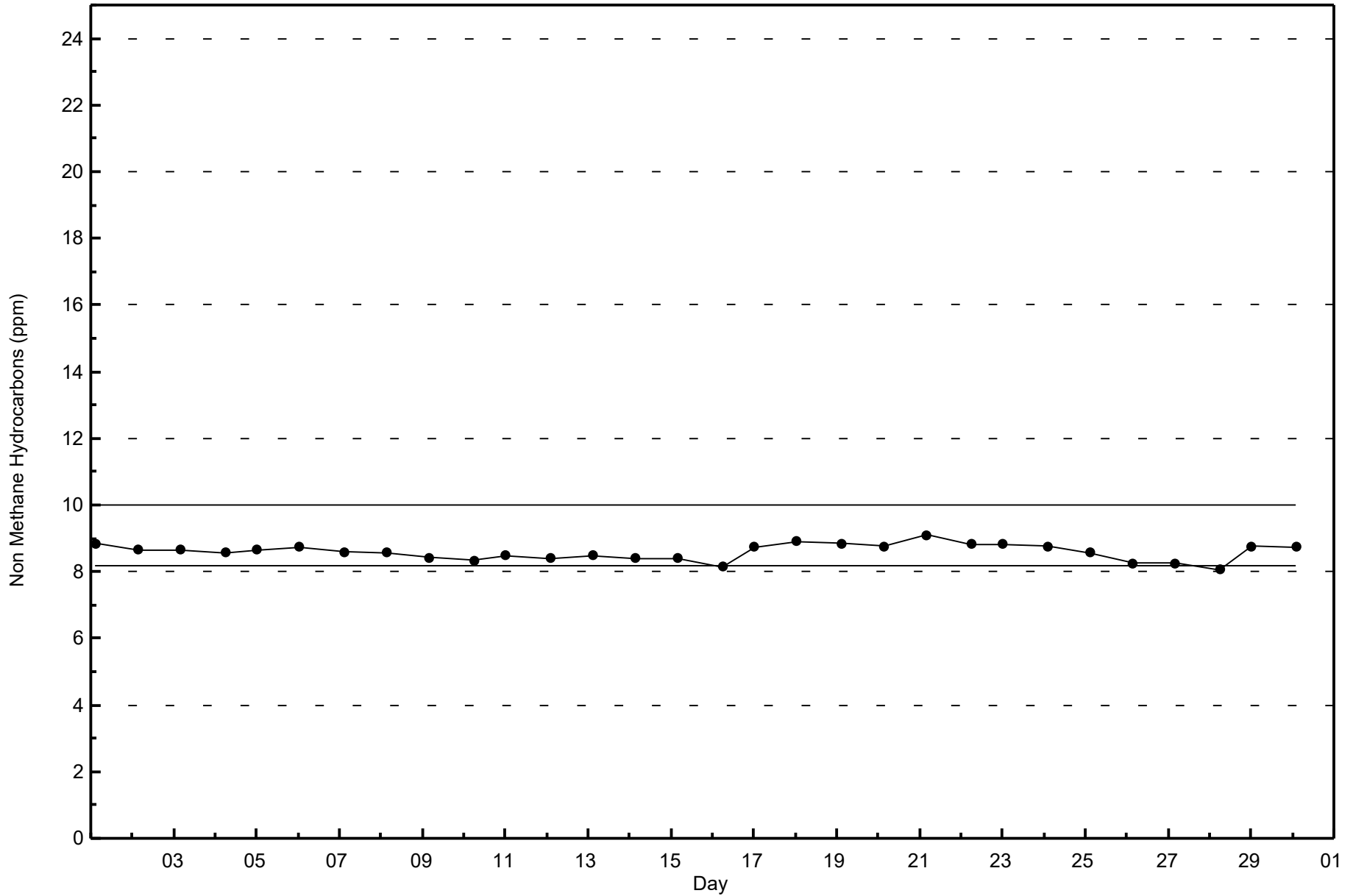


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley







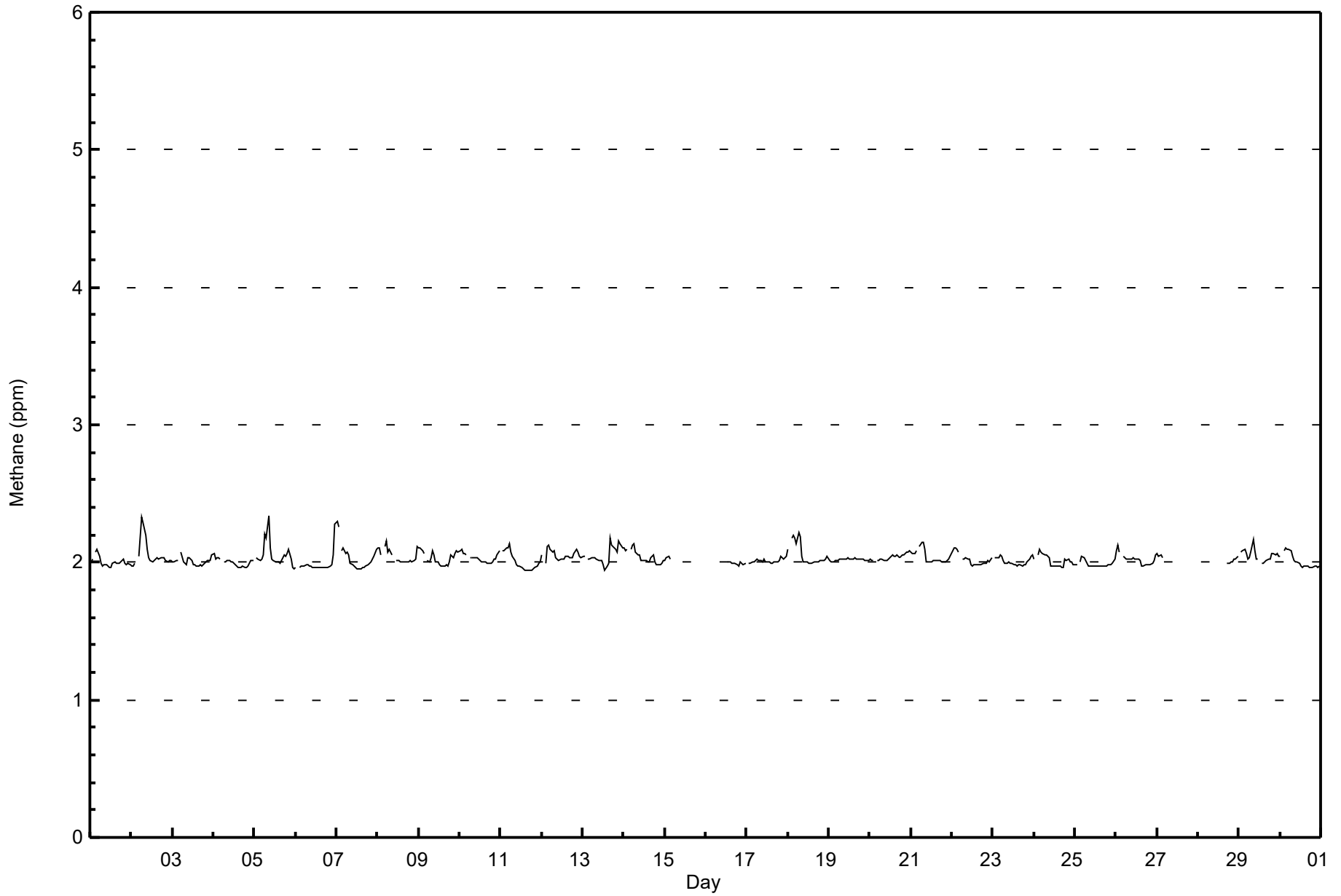


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720									
Maximum Value: 2.3 ppm on Jun 5 09:00		Maximum Daily Average: 2.1 ppm on Jun 2																			Hours of Data:	621									
Minimum Value: 1.9 ppm on Jun 11 15:00		Minimum Daily Average: 2.0 ppm on Jun 6																			Hours of Missing Data:	99									
Maximum Diurnal Average: 2.1 ppm at hour 6		Minimum Diurnal Average: 2.0 ppm at hour 16																			Hours of Calibration:	32									
Monthly Average: 2.03 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.2																			Percent Operational Time:	90.7									
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-Jun	2.0	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1			
2-Jun	2.0	2.0	2.0	Z	2.0	2.2	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	2.0	2.0	2.0	2.1	2.3	
3-Jun	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1		
4-Jun	2.1	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
5-Jun	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.1	2.0	2.0	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	2.0	2.1	2.3		
6-Jun	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	2.3	2.0	2.3			
7-Jun	2.3	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	2.0	2.0	2.1	2.0	2.0	2.3	2.3		
8-Jun	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.1	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.2		
9-Jun	2.1	2.1	2.1	2.1	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	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1		
10-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1		
11-Jun	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	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	2.1	2.1	
12-Jun	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1		
13-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2		
14-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
15-Jun	2.0	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	
16-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
17-Jun	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	
18-Jun	2.1	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
19-Jun	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
20-Jun	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	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	
21-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
22-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
23-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
24-Jun	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
25-Jun	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
26-Jun	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
27-Jun	2.1	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO
28-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
29-Jun	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2
30-Jun	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
																								Diurnal Average							
																								Diurnal Maximum							
Z - zerspan																															
C - Calibration																															
M - Maintenance																															
UO - Unstable Operation																															



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Athabasca Valley - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Athabasca Valley - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	480	77.29	77.29
2.1 - 3.0	141	22.71	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 621

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Athabasca Valley - June 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	48	18	12	16	16	23	50	29	14	22	60	49	16	14	15	78	480
2.1 - 3.0	4	3	4	2	7	10	32	18	3	0	1	5	2	5	12	33	141
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	52	21	16	18	23	33	82	47	17	22	61	54	18	19	27	111	621

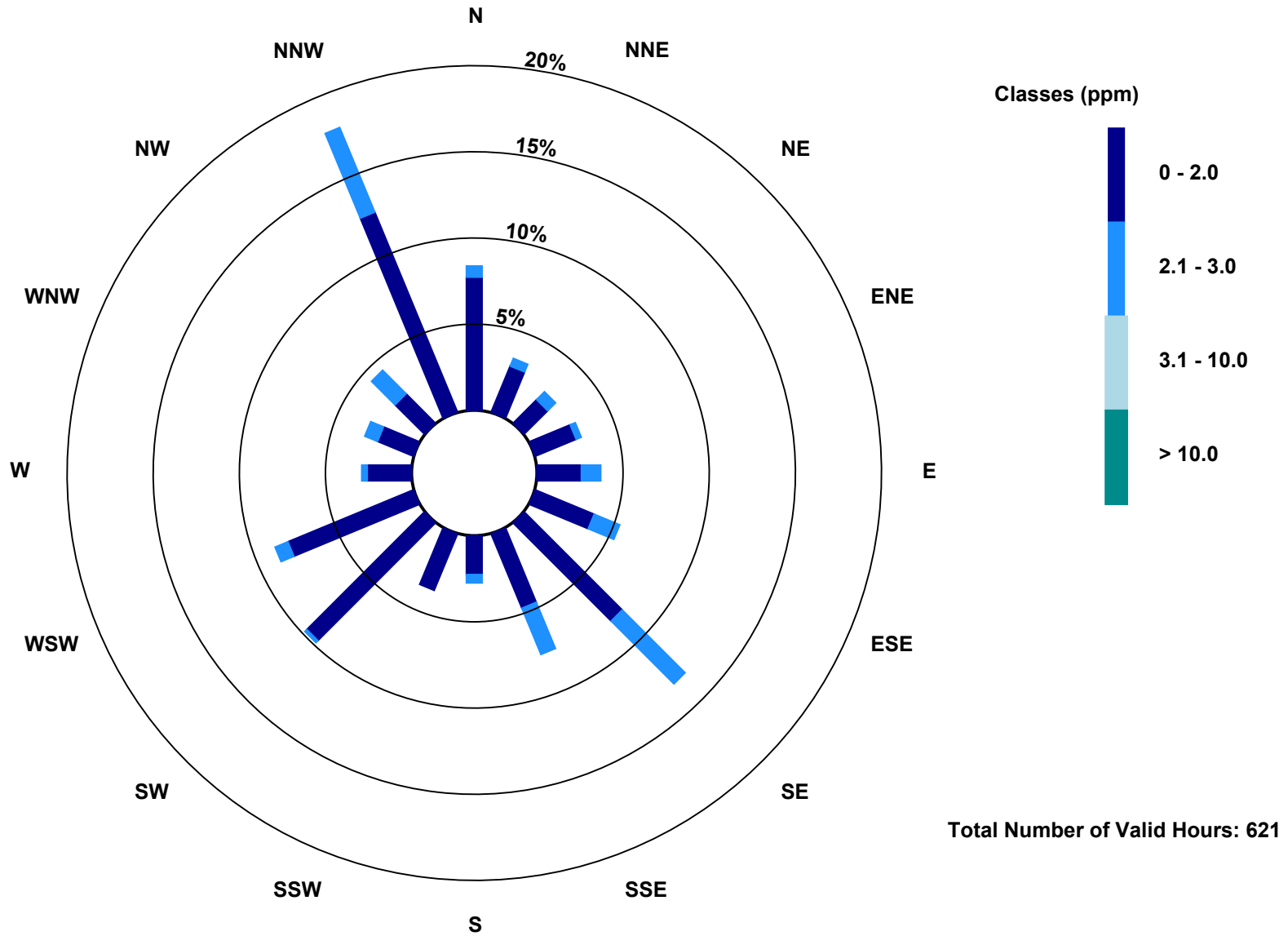
Total Number of Valid Hours: 621

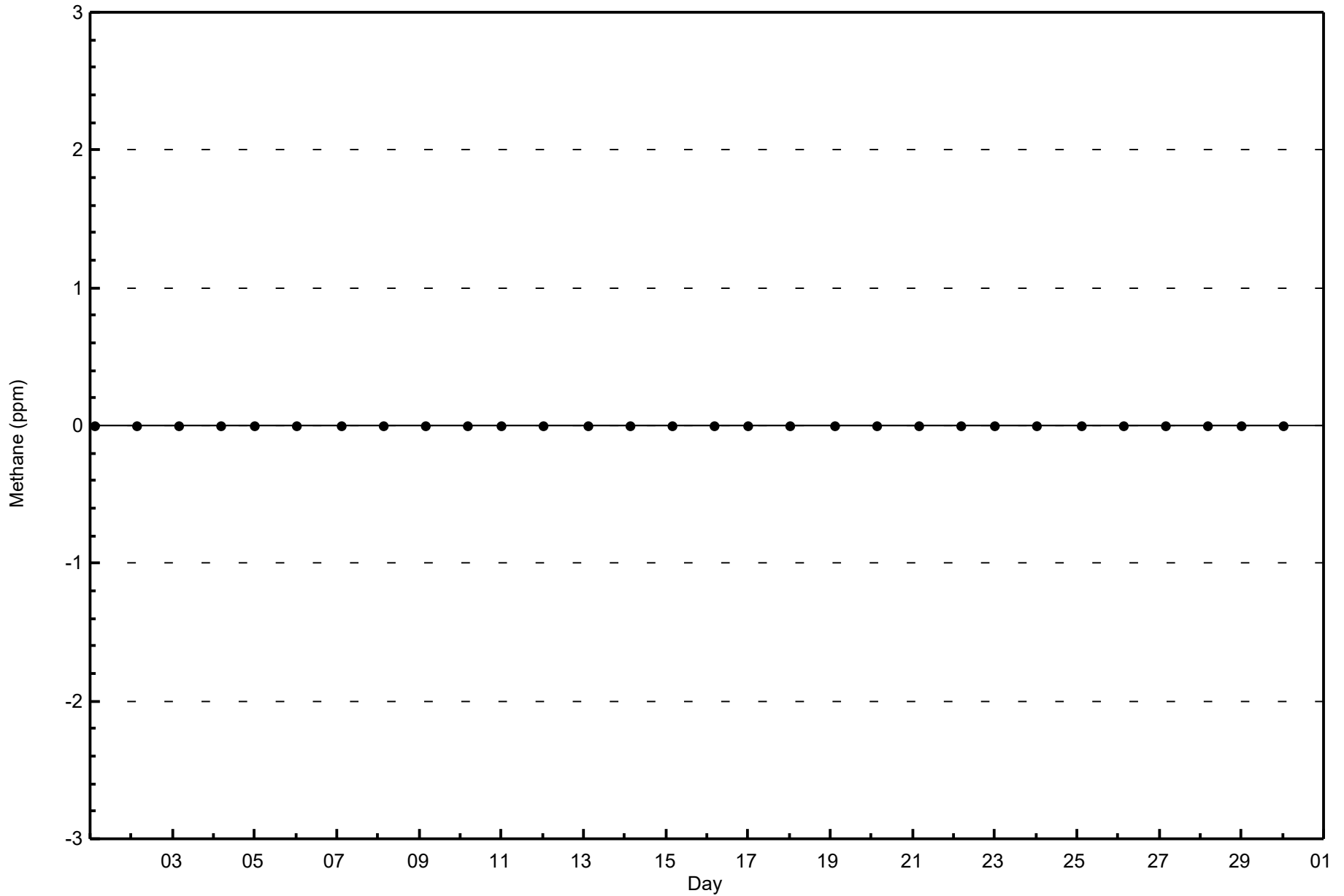
Total Number of Hours: 720

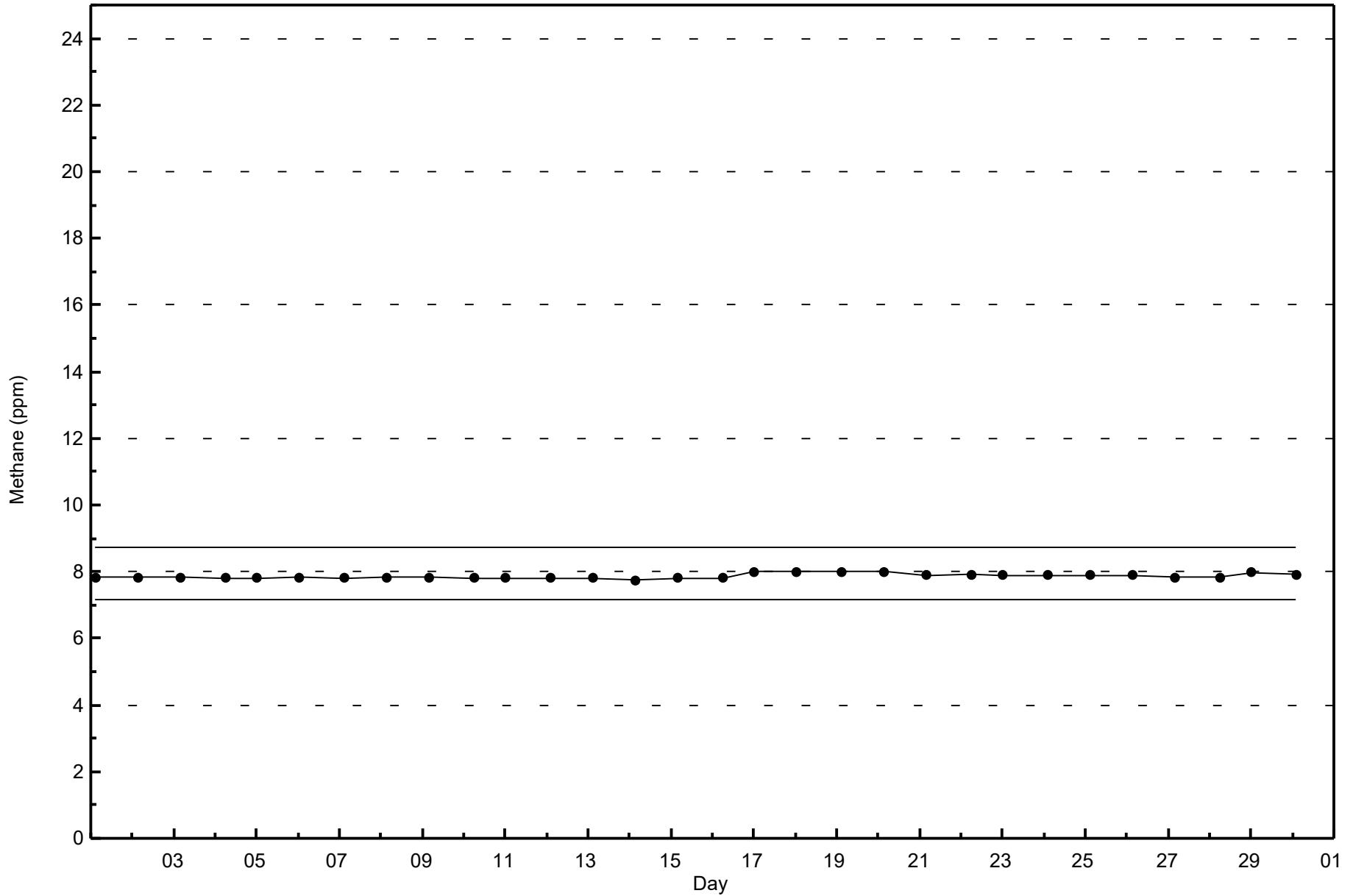


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Athabasca Valley









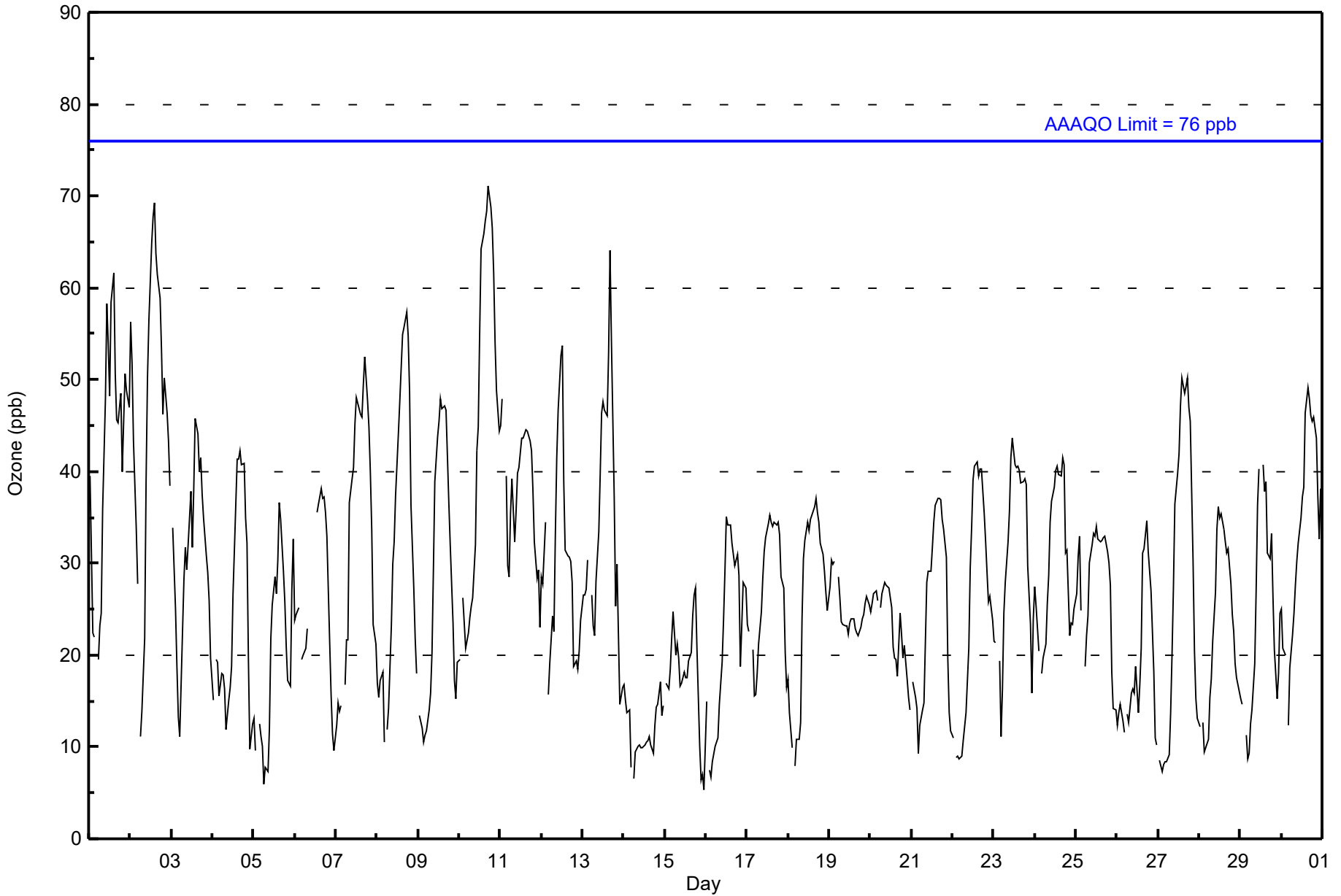
Wood Buffalo Environmental Association
Summary of Hour Averages

Ozone (O₃) - ppb
Athabasca Valley - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 71.0 ppb on Jun 10 18:00	Maximum Daily Average: 46.5 ppb on Jun 2		Hours of Data:	684
Minimum Value: 5.3 ppb on Jun 16 00:00	Minimum Daily Average: 11.8 ppb on Jun 14		Hours of Missing Data:	36
Maximum Diurnal Average: 39.4 ppb at hour 16	Minimum Diurnal Average: 14.4 ppb at hour 5		Hours of Calibration:	35
Monthly Average: 28.36 ppb	Percentiles: P ₁ = 7.4 P ₁₀ = 12.0 Q ₁ = 18.0 Median = 27.1 Q ₃ = 36.8 P ₉₀ = 46.4 P ₉₉ = 66.1		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-Jun	39.6	31.1	22.5	21.9	Z	19.5	23.3	24.5	35.8	47.9	58.3	53.8	48.3	58.4	61.6	50.6	45.7	45.3	48.5	39.9	45.5	50.6	48.8	47.1	42.1	61.6																						
2-Jun	56.2	51.7	43.4	33.7	27.8	Z	11.1	13.8	21.9	38.9	50.1	56.5	64.8	67.7	69.2	63.8	61.5	59.0	53.2	46.2	50.2	46.4	43.3	38.5	46.5	69.2																						
3-Jun	Z	33.9	25.0	18.8	13.2	11.1	22.6	28.2	31.7	29.3	32.1	37.8	31.7	38.1	45.8	44.1	40.0	41.5	37.5	34.9	30.8	29.0	25.9	19.7	30.6	45.8																						
4-Jun	15.0	Z	19.5	19.1	15.5	18.0	17.8	16.3	11.8	15.2	16.4	18.7	26.6	31.5	41.4	41.3	42.3	40.7	40.8	34.9	32.1	19.7	9.7	12.6	24.2	42.3																						
5-Jun	13.2	9.7	Z	12.4	11.2	10.0	6.0	7.8	7.4	12.0	21.8	25.5	28.5	26.7	30.4	36.6	34.7	29.1	25.8	21.0	17.2	16.6	27.1	32.6	20.1	36.6																						
6-Jun	23.8	24.4	25.1	Z	19.6	19.9	20.8	22.9	C	C	C	C	C	35.6	36.5	38.2	37.1	37.3	35.6	32.9	21.4	15.7	11.4	9.6	26.0	38.2																						
7-Jun	12.3	14.9	13.9	14.6	Z	16.8	21.7	21.6	36.7	39.2	40.4	45.2	48.0	47.5	46.3	45.9	49.4	52.4	47.7	44.8	39.9	33.7	23.3	21.3	33.8	52.4																						
8-Jun	17.0	15.4	17.2	18.2	10.5	Z	11.9	14.3	23.1	29.9	32.4	37.4	44.0	47.6	51.2	54.9	55.7	57.4	54.7	48.6	36.3	27.3	21.8	17.9	32.4	57.4																						
9-Jun	Z	13.4	12.0	10.5	11.3	11.7	14.0	15.8	20.2	29.3	38.9	43.7	45.4	47.9	46.8	47.2	46.7	41.7	36.7	32.0	23.5	17.3	15.3	19.2	27.9	47.9																						
10-Jun	19.6	Z	26.3	23.4	20.7	22.4	24.0	25.3	26.3	32.0	42.2	44.8	55.1	64.2	66.0	67.3	68.3	71.0	68.8	66.4	61.6	54.0	48.9	44.4	45.3	71.0																						
11-Jun	44.9	47.9	Z	39.5	29.7	28.6	35.4	39.2	32.4	35.8	39.8	40.4	43.7	43.6	44.0	44.5	44.4	43.3	42.2	38.0	32.3	28.4	29.3	23.0	37.8	47.9																						
12-Jun	28.6	27.8	34.5	Z	15.7	19.1	24.3	22.6	33.1	41.5	46.7	52.6	53.8	38.9	31.4	30.8	30.7	30.2	27.9	18.7	19.3	18.5	20.5	23.8	30.0	53.8																						
13-Jun	26.5	26.5	27.2	30.4	Z	26.6	23.2	22.1	28.1	33.5	39.6	46.3	47.7	46.6	46.0	52.9	64.1	54.2	37.2	25.3	29.8	22.3	14.6	16.5	34.2	64.1																						
14-Jun	16.8	15.1	13.7	14.1	7.8	Z	6.6	9.4	10.0	10.2	10.0	9.9	10.2	10.5	10.7	11.2	10.2	9.4	12.4	14.4	14.7	17.1	13.5	14.5	11.8	17.1																						
15-Jun	Z	17.0	16.3	18.4	21.9	24.7	20.0	21.2	19.7	16.6	16.9	18.1	17.5	17.6	19.3	20.2	24.2	26.5	27.4	20.9	10.1	6.3	6.9	5.3	18.0	27.4																						
16-Jun	14.9	Z	7.5	6.8	8.3	10.1	10.6	11.0	14.7	19.2	23.7	29.2	35.1	34.2	34.2	32.2	31.0	29.7	30.9	28.7	18.7	23.2	28.0	27.4	22.1	35.1																						
17-Jun	23.4	22.6	Z	20.6	15.5	15.7	18.0	21.2	24.7	28.4	31.3	32.9	34.4	35.2	34.5	34.0	34.4	34.1	34.5	33.2	28.6	27.3	20.2	16.5	27.0	35.2																						
18-Jun	17.4	13.7	10.0	Z	8.0	10.9	10.8	12.7	24.0	30.4	32.5	34.5	33.6	34.8	35.2	36.2	37.1	35.6	34.4	32.2	30.9	29.1	26.9	24.9	25.9	37.1																						
19-Jun	27.5	30.3	29.9	30.1	Z	28.6	26.3	23.6	23.3	23.2	23.1	22.3	23.5	23.9	23.9	22.9	22.4	22.1	23.0	24.0	24.5	25.6	26.4	25.4	25.0	30.3																						
20-Jun	24.8	25.7	26.6	27.0	25.9	Z	25.2	26.7	27.9	27.6	27.4	27.4	25.2	20.9	19.7	19.5	17.7	24.5	22.2	19.6	21.0	17.4	15.4	14.0	23.0	27.9																						
21-Jun	Z	17.1	15.4	14.1	9.3	12.4	14.1	14.7	21.3	27.9	29.1	29.1	31.8	34.5	36.3	37.1	37.1	37.0	34.9	33.7	30.7	19.6	13.7	11.8	24.5	37.1																						
22-Jun	11.0	Z	8.9	9.0	8.6	9.1	10.6	12.1	13.8	20.8	29.4	33.8	39.0	40.5	41.1	39.5	40.3	40.2	35.4	32.3	29.0	25.8	26.3	23.8	25.2	41.1																						
23-Jun	21.5	21.4	Z	19.4	11.1	16.3	24.5	27.9	32.4	35.7	41.5	43.7	40.7	40.5	40.5	40.1	38.7	39.0	39.2	38.6	29.8	23.4	15.8	24.0	30.7	43.7																						
24-Jun	27.5	25.4	20.4	Z	18.1	19.7	21.3	25.6	28.6	34.5	36.8	38.4	40.1	40.6	39.7	39.5	41.5	40.7	31.1	31.5	22.1	23.6	23.4	25.1	30.2	41.5																						
25-Jun	26.7	30.6	33.0	24.9	Z	18.7	22.1	24.3	30.0	32.0	33.3	33.0	34.0	32.7	32.4	32.5	32.8	32.9	31.3	30.1	27.6	18.1	14.2	14.0	27.9	34.0																						
26-Jun	12.3	13.7	14.6	12.8	11.6	Z	13.5	12.7	15.9	16.3	15.9	18.7	13.8	16.7	20.8	31.1	31.6	34.6	31.2	29.2	27.1	18.2	11.0	10.2	18.8	34.6																						
27-Jun	Z	8.6	7.3	8.1	8.4	8.4	9.1	13.8	20.1	27.5	36.5	39.8	42.0	47.1	50.2	48.6	49.3	50.3	47.0	45.5	30.2	20.5	15.3	13.1	28.1	50.3																						
28-Jun	12.2	Z	12.6	9.4	9.9	10.8	15.4	17.5	21.5	26.8	33.6	36.1	34.9	35.5	33.8	32.3	31.2	31.6	27.8	24.5	22.5	19.0	17.5	16.0	23.1	36.1																						
29-Jun	15.2	14.7	Z	11.3	8.7	9.3	12.4	14.0	19.1	27.0	36.4	40.3	M	40.8	37.8	38.8	31.2	30.5	33.2	26.5	20.6	15.3	18.0	24.6	23.9	40.8																						
30-Jun	25.0	20.8	20.0	Z	12.3	18.6	22.3	24.6	27.6	30.2	32.2	35.0	37.2	38.3	46.4	49.2	47.9	46.1	45.4	45.9	43.6	37.4	32.7	38.2	33.8	49.2																						
																								22.9	22.9	20.1	18.7	14.4	16.7	18.0	19.6	23.6	28.2	32.7	35.3	36.8	38.0	39.1	39.4	39.3	38.9	36.6	33.1	29.0	24.9	22.2	21.8	Diurnal Average
																								56.2	51.7	43.4	39.5	29.7	28.6	35.4	39.2	36.7	47.9	58.3	56.5	64.8	67.7	69.2	67.3	68.3	71.0	68.8	66.4	61.6	54.0	48.9	47.1	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	217	31.73	31.73
21 - 50	430	62.87	94.59
51 - 82	37	5.41	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 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	2	4	3	8	17	49	25	3	9	11	8	1	10	14	47	217
21 - 50	47	17	10	13	15	19	44	19	15	19	51	47	17	13	16	68	430
51 - 82	3	2	2	2	0	0	3	5	3	0	0	2	0	1	1	13	37
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	21	16	18	23	36	96	49	21	28	62	57	18	24	31	128	684

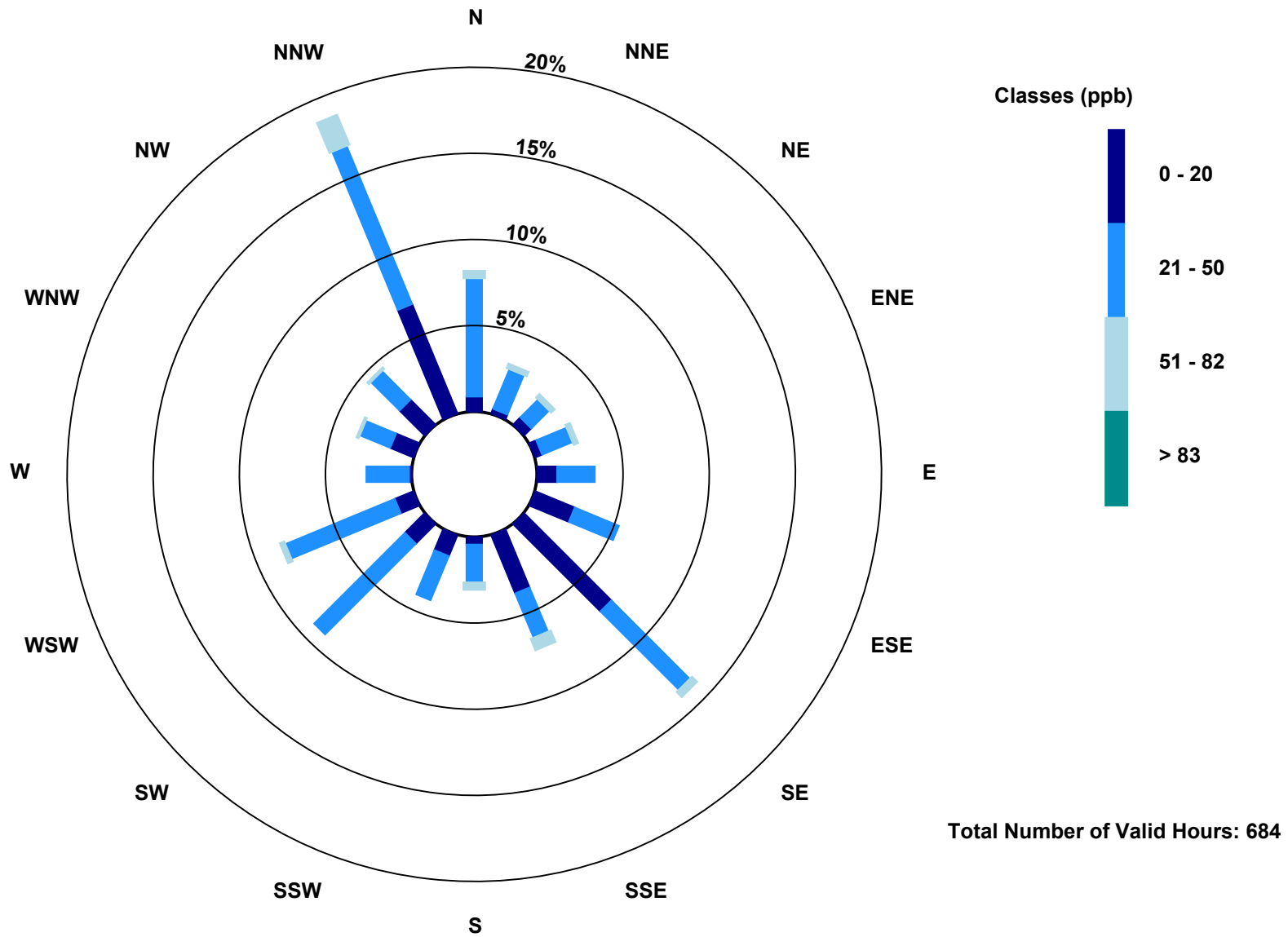
Total Number of Valid Hours: 684

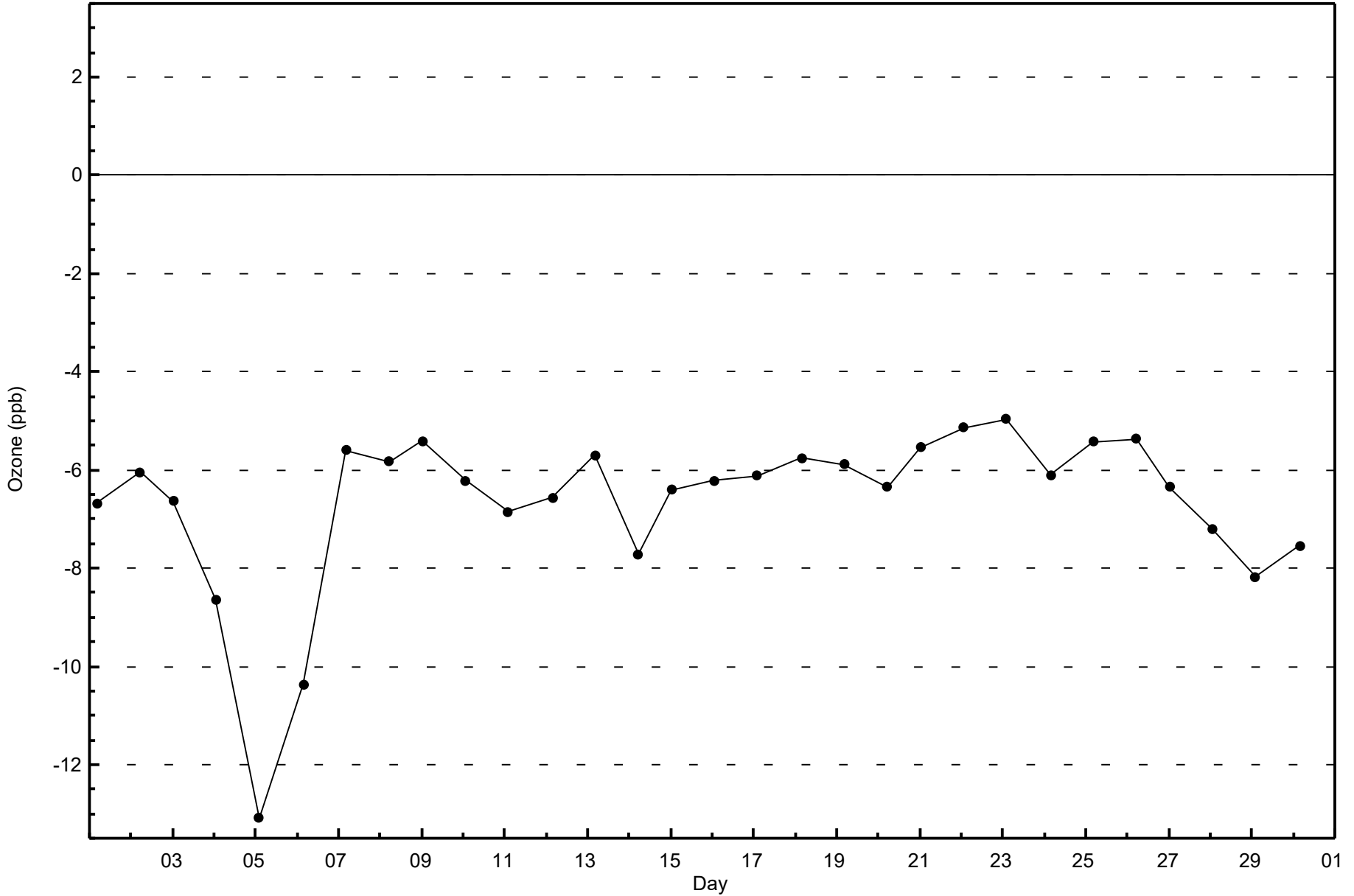
Total Number of Hours: 720

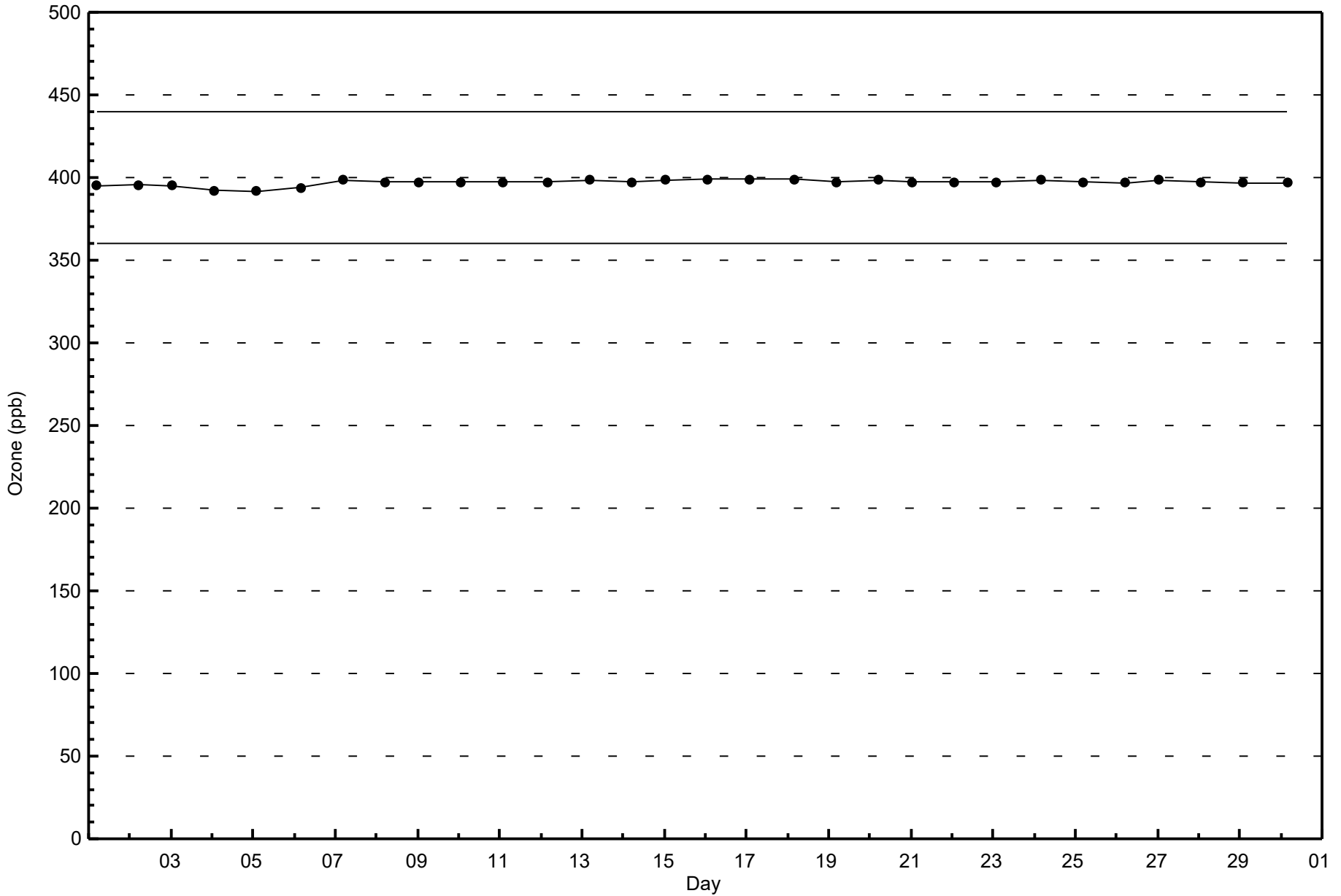


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

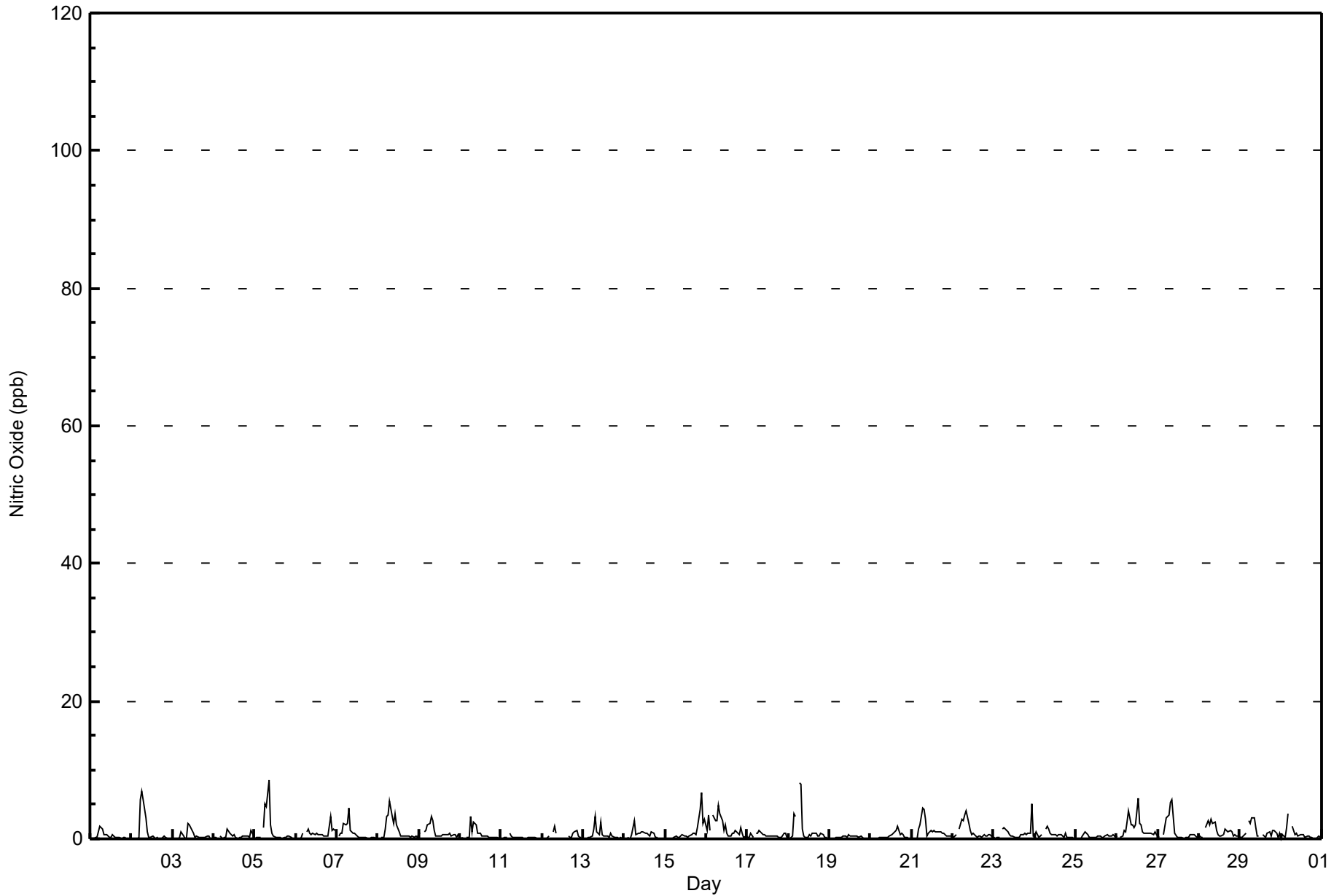
Nitric Oxide (NO) - ppb
Athabasca Valley - June 2023

Maximum Value: 8.5 ppb on Jun 5 09:00		Maximum Daily Average: 1.6 ppb on Jun 16		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 11 02:00		Minimum Daily Average: 0.2 ppb on Jun 11		Hours of Data: 683																						
Maximum Diurnal Average: 2.6 ppb at hour 8		Minimum Diurnal Average: 0.2 ppb at hour 1		Hours of Missing Data: 37																						
Monthly Average: 0.83 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.4 Q ₃ = 0.9 P ₉₀ = 2.1 P ₉₉ = 5.7		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-Jun	Z	0.1	0.1	0.1	0.3	1.8	1.7	1.5	0.6	0.5	0.4	0.1	0.2	0.5	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.4	1.8
2-Jun	0.0	Z	0.0	0.0	0.2	5.6	6.9	5.7	3.2	1.0	0.2	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.1	1.1	6.9
3-Jun	0.1	0.0	Z	0.0	0.2	1.1	0.5	0.1	0.2	2.3	2.1	1.3	0.7	0.2	0.5	0.2	0.1	0.2	0.2	0.2	0.4	0.4	0.0	0.0	0.5	2.3
4-Jun	0.1	0.1	0.1	Z	0.4	0.0	0.2	0.3	1.4	0.9	0.6	0.5	0.5	0.2	0.1	0.2	0.2	0.4	0.3	0.4	0.3	0.3	1.2	0.5	0.4	1.4
5-Jun	0.1	0.1	0.2	0.2	Z	1.6	5.1	4.7	8.5	2.1	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.4	0.3	0.1	0.1	1.2	8.5
6-Jun	0.1	0.1	0.1	0.2	0.8	Z	1.0	1.3	0.9	0.7	0.9	0.6	0.9	0.7	0.7	0.6	0.5	0.4	0.5	0.4	3.3	1.1	1.5	1.3	0.8	3.3
7-Jun	Z	0.5	0.8	0.9	2.1	2.0	2.3	4.5	1.1	0.8	0.9	0.7	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.8	4.5
8-Jun	0.1	Z	0.1	0.2	1.5	3.2	3.4	5.5	3.3	2.3	3.7	2.0	0.9	0.5	0.3	0.4	0.4	0.3	0.4	0.3	0.4	0.2	0.5	0.3	1.3	5.5
9-Jun	0.8	0.8	Z	1.1	1.3	2.0	2.2	3.3	2.6	1.2	0.3	0.5	0.4	0.3	0.6	0.6	0.6	0.7	0.9	0.4	0.7	0.6	0.3	0.6	1.0	3.3
10-Jun	0.1	0.1	0.0	Z	0.3	0.3	3.3	1.0	2.5	2.0	0.8	0.8	0.7	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.6	3.3
11-Jun	0.0	0.0	0.1	0.1	Z	0.9	0.4	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	0.1	0.1	0.1	0.2	0.9
12-Jun	0.0	0.1	0.1	0.1	0.5	Z	1.0	1.9	0.8	C	C	C	C	C	C	0.4	0.3	0.2	0.8	1.1	1.1	0.3	0.2	0.1	--	1.9
13-Jun	Z	0.1	0.1	0.3	0.2	0.4	1.4	3.3	0.9	0.6	2.5	0.6	0.4	0.5	0.4	0.3	0.8	0.4	0.1	0.2	0.2	0.1	0.1	0.1	0.6	3.3
14-Jun	0.1	Z	0.1	0.1	0.5	1.7	2.7	0.6	0.8	0.7	1.1	1.0	0.9	0.8	0.6	0.4	1.0	0.8	0.2	0.1	0.1	0.0	0.0	0.0	0.6	2.7
15-Jun	0.0	0.0	Z	0.1	0.1	0.1	0.5	0.2	0.3	0.4	0.6	0.3	0.3	0.3	0.3	0.5	0.8	0.8	0.6	1.6	4.2	6.7	2.2	2.8	1.0	6.7
16-Jun	1.2	3.4	1.1	Z	3.5	2.6	2.6	4.8	3.7	2.7	1.2	2.0	0.9	0.4	0.5	0.8	0.9	1.1	0.7	0.6	1.6	0.7	0.2	0.4	1.6	4.8
17-Jun	0.3	0.1	0.8	0.3	Z	0.8	0.9	1.2	0.7	0.6	0.6	0.3	0.4	0.5	0.3	0.5	0.3	0.4	0.3	0.2	0.2	0.8	0.8	0.2	0.5	1.2
18-Jun	0.1	0.1	0.4	3.7	3.3	Z	8.1	8.0	1.4	0.4	0.3	0.2	0.5	0.3	0.7	0.7	0.7	0.5	0.5	0.8	0.6	0.3	0.1	0.0	1.4	8.1
19-Jun	Z	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.6	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.2	0.6
20-Jun	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.6	0.9	1.1	1.1	1.8	0.7	0.7	0.7	0.2	0.1	0.1	0.1	0.4	1.8
21-Jun	0.0	0.0	Z	0.1	1.5	2.0	4.4	4.3	2.8	0.4	0.9	1.3	1.1	1.1	1.0	1.0	1.0	1.0	0.8	0.8	0.4	0.5	0.3	0.3	1.2	4.4
22-Jun	0.2	0.4	0.7	Z	1.5	2.8	2.6	3.4	4.0	2.3	1.3	0.7	0.8	0.7	0.2	0.4	0.5	0.2	0.6	0.3	0.4	0.6	0.6	0.2	1.1	4.0
23-Jun	0.1	0.1	0.1	0.3	Z	1.4	1.6	1.4	1.1	0.7	0.4	0.3	0.2	0.3	0.2	0.3	0.6	0.5	0.8	0.7	0.8	0.7	5.2	0.3	0.8	5.2
24-Jun	0.3	1.0	0.1	0.4	0.6	Z	1.4	1.7	1.5	0.9	0.5	0.6	0.5	0.4	0.6	0.6	0.3	0.1	0.8	0.2	0.2	0.1	0.1	0.1	0.6	1.7
25-Jun	Z	0.1	0.1	0.1	0.3	1.0	0.8	0.6	0.2	0.2	0.1	0.2	0.3	0.5	0.4	0.2	0.3	0.4	0.6	0.3	0.3	0.4	0.5	0.2	0.4	1.0
26-Jun	0.4	Z	0.2	0.5	1.1	1.0	2.4	4.0	2.1	2.0	1.6	2.1	6.0	2.2	2.0	1.0	0.8	0.8	0.7	0.9	0.8	0.6	1.0	0.6	1.5	6.0
27-Jun	0.4	0.2	Z	0.6	1.9	3.1	3.4	5.3	5.7	3.3	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.7	0.6	0.4	0.2	1.2	5.7
28-Jun	0.4	0.2	0.1	Z	1.7	2.6	2.1	2.9	2.2	2.4	1.1	0.5	0.3	0.3	0.6	1.4	1.3	1.0	1.2	1.1	0.5	0.6	0.4	0.4	1.1	2.9
29-Jun	0.2	0.1	0.3	0.8	Z	2.6	2.2	3.1	3.0	1.5	0.4	0.4	M	0.5	0.3	0.2	0.9	1.0	0.5	1.2	1.3	0.9	0.1	0.9	1.0	3.1
30-Jun	0.1	0.6	0.2	1.7	3.7	Z	1.9	1.2	0.7	0.8	0.5	0.5	0.7	0.6	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.3	0.5	0.1	0.7	3.7
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerospan C - Calibration M - Maintenance		



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	22	15	19	24	36	96	49	19	30	63	57	19	24	30	128	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	52	22	15	19	24	36	96	49	19	30	63	57	19	24	30	128	683

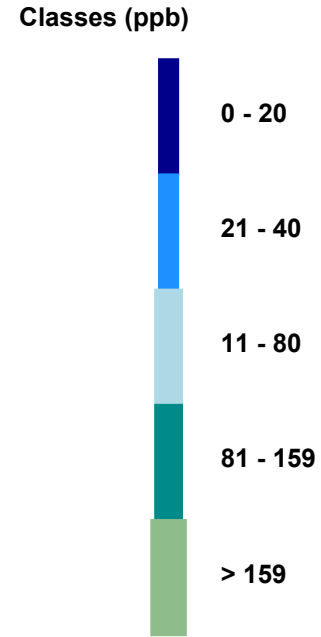
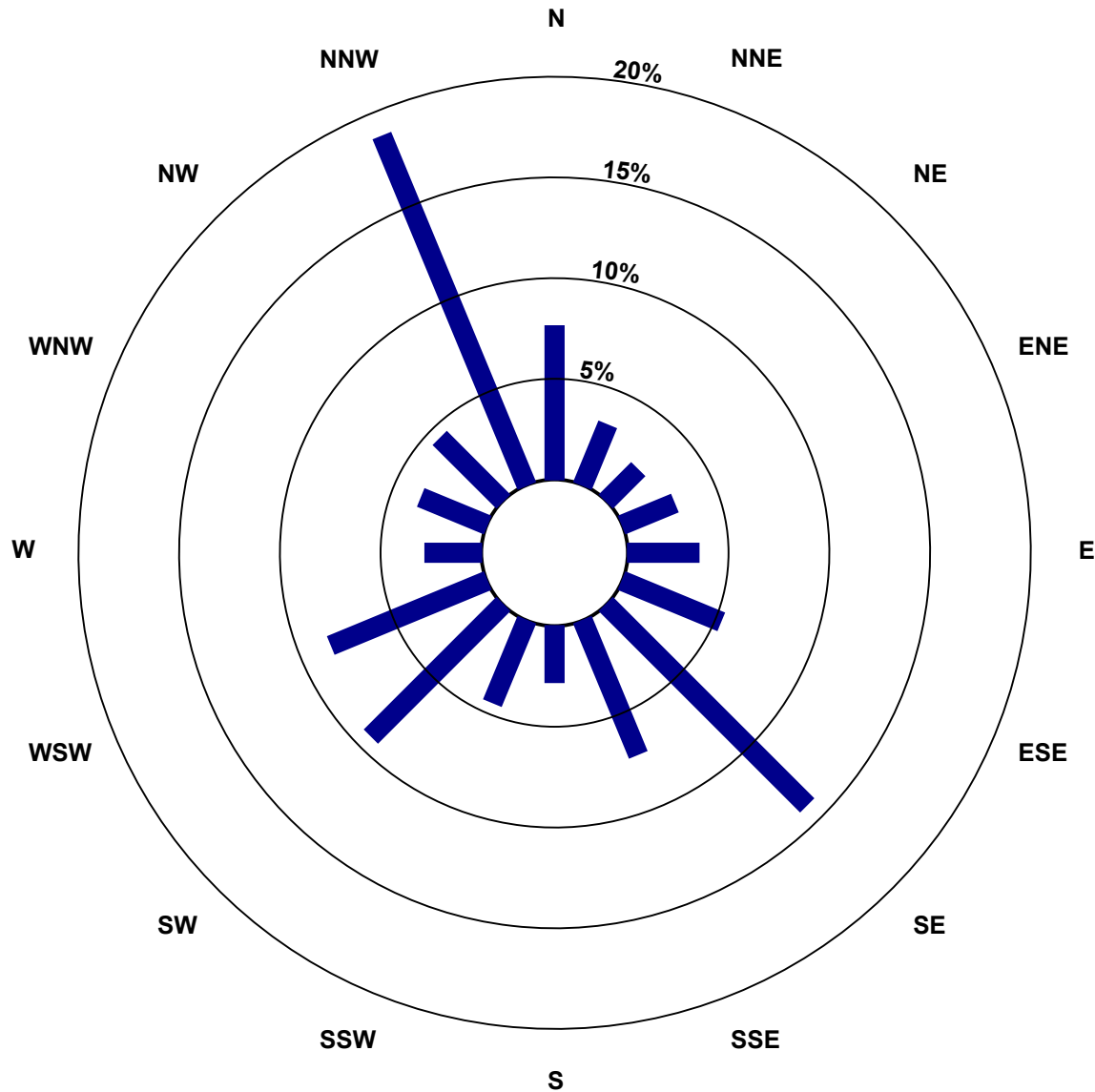
Total Number of Valid Hours: 683

Total Number of Hours: 720

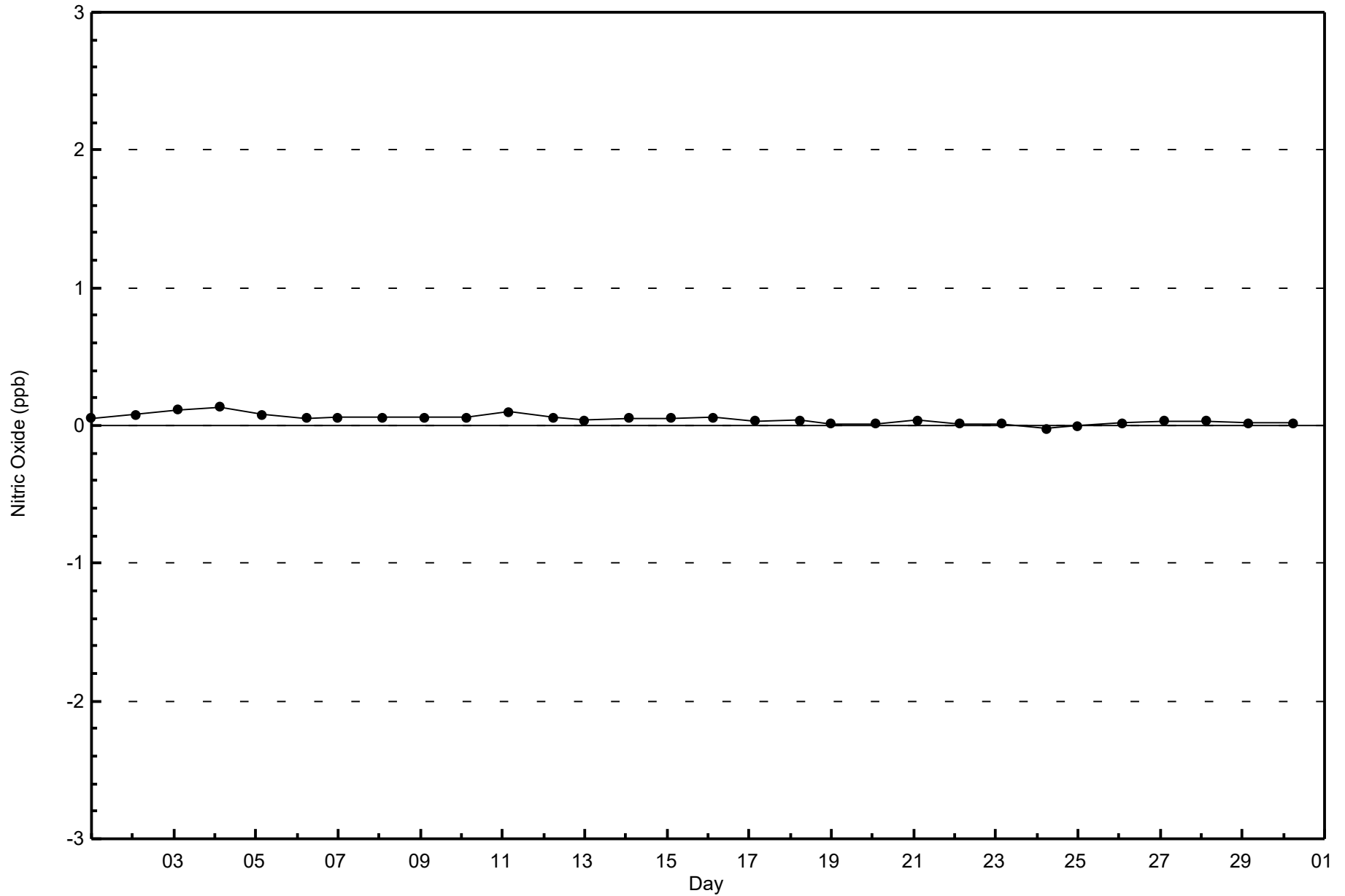


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Athabasca Valley



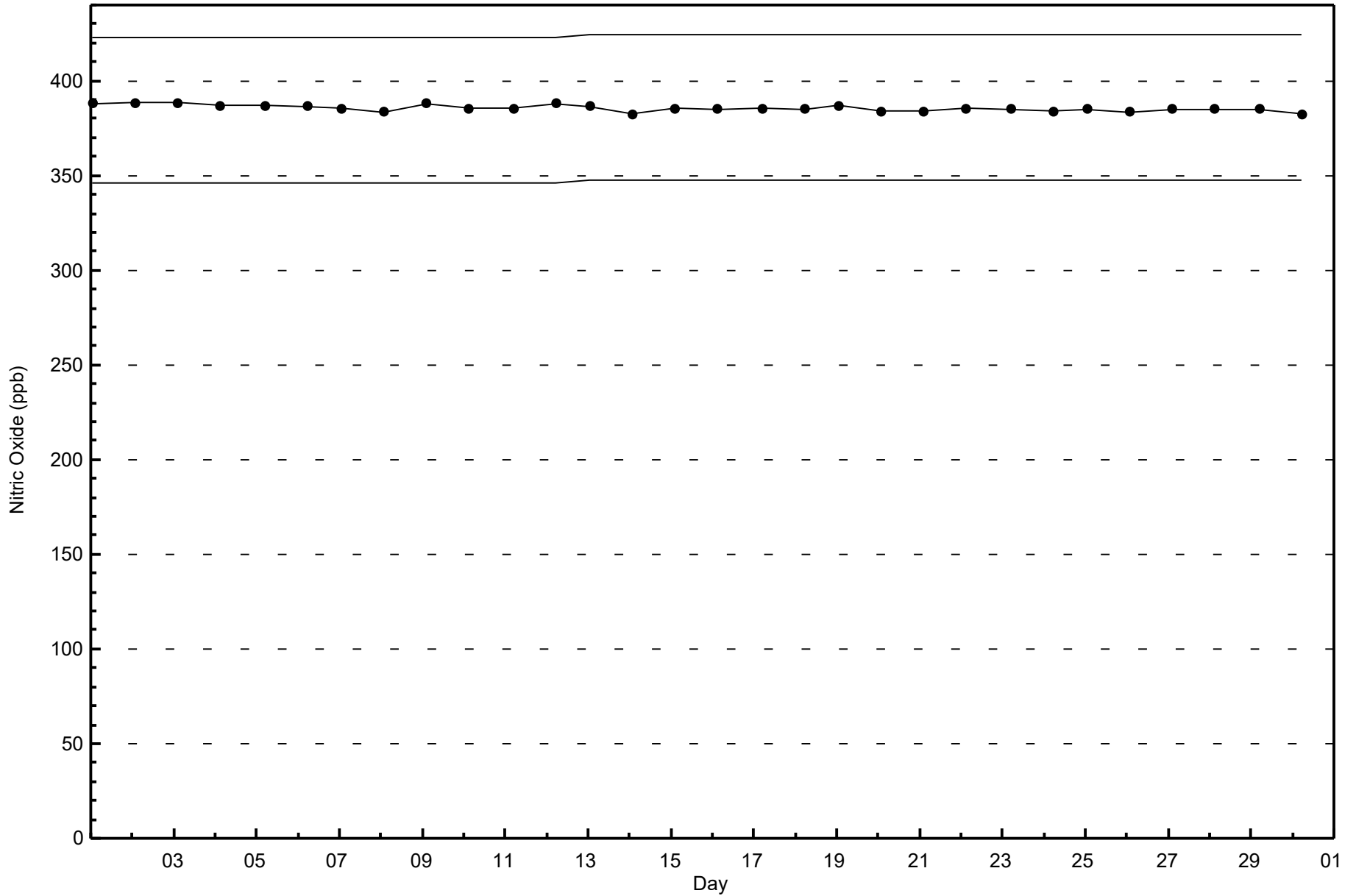
Total Number of Valid Hours: 683





Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

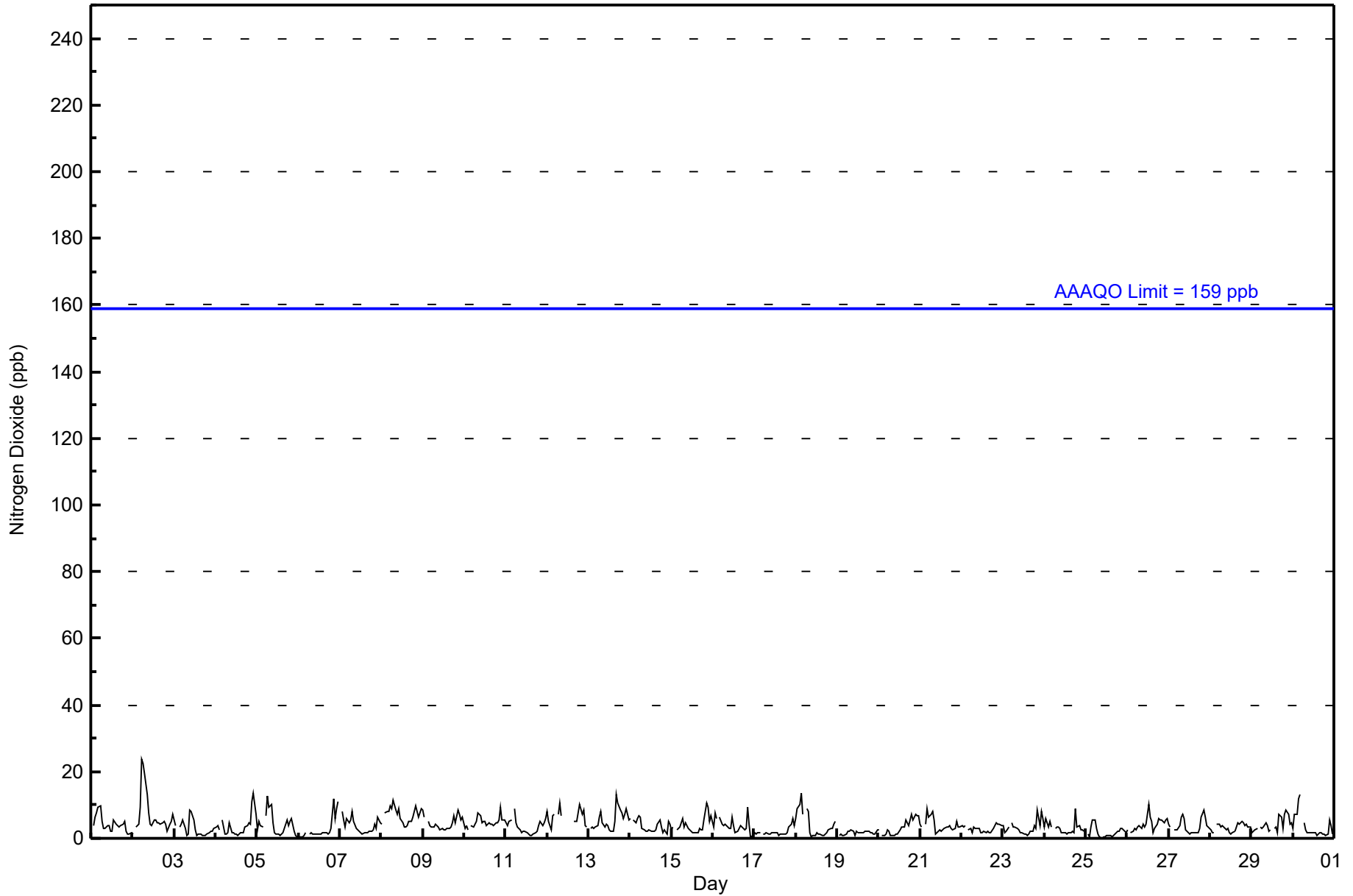
Athabasca Valley - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																																									
Maximum Value: 23.7 ppb on Jun 2 06:00		Maximum Daily Average: 7.4 ppb on Jun 2		Minimum Value: 0.2 ppb on Jun 25 10:00		Minimum Daily Average: 1.7 ppb on Jun 19		Hours of Data: 683																																									
Maximum Diurnal Average: 5.4 ppb at hour 21		Minimum Diurnal Average: 2.2 ppb at hour 15		Hours of Missing Data: 37		Hours of Calibration: 36		Hours of Calibration: 36																																									
Monthly Average: 3.87 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 1.2 Q ₁ = 1.9 Median = 3.3 Q ₃ = 5.0 P ₉₀ = 7.4 P ₉₉ = 13.2		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-Jun	Z	4.0	6.2	7.5	9.3	9.8	4.9	3.1	3.0	3.7	3.7	2.2	2.0	5.3	4.3	3.7	3.4	4.0	4.2	5.0	2.0	1.4	1.2	1.8	4.2	9.8																							
2-Jun	1.3	Z	3.2	4.3	9.2	23.7	22.5	19.5	13.2	7.7	4.1	3.8	5.7	5.3	4.6	4.8	4.1	4.5	5.1	4.3	2.2	4.2	4.9	7.4	7.4	23.7																							
3-Jun	5.3	3.7	Z	3.5	4.2	5.5	3.1	0.8	1.2	8.3	8.2	5.7	2.5	1.0	1.3	1.4	0.9	0.8	0.8	1.2	1.6	2.3	2.0	3.0	3.0	8.3																							
4-Jun	3.6	4.0	2.4	Z	5.5	1.4	1.1	1.9	4.8	1.9	1.5	1.1	1.3	1.0	1.7	1.6	1.8	3.5	3.9	4.7	4.1	11.0	13.7	7.1	3.7	13.7																							
5-Jun	2.7	5.1	3.7	3.4	Z	6.8	12.7	9.5	10.3	4.8	1.9	1.4	1.3	0.9	1.1	1.5	3.1	5.4	3.8	5.2	6.0	2.1	0.7	0.6	4.1	12.7																							
6-Jun	0.4	0.4	0.5	0.7	1.9	Z	1.3	1.7	1.3	1.3	1.4	1.3	1.4	1.3	1.5	1.7	1.5	1.4	1.9	3.1	11.9	6.1	8.8	11.0	2.8	11.9																							
7-Jun	Z	8.0	5.6	3.6	6.0	4.7	5.4	7.9	4.9	3.1	2.6	2.3	1.9	1.3	1.5	1.6	1.7	2.0	2.3	2.7	4.3	3.0	6.4	4.6	3.8	8.0																							
8-Jun	4.3	Z	7.7	8.0	8.1	9.8	9.0	11.5	8.6	7.1	8.9	6.1	4.6	3.5	3.3	4.0	4.9	4.9	6.3	8.0	9.6	6.4	7.6	8.7	7.0	11.5																							
9-Jun	8.5	6.3	Z	5.1	3.8	3.6	3.3	4.4	4.0	3.3	2.4	3.0	2.6	2.6	2.9	2.9	3.6	4.8	6.7	4.7	8.4	7.1	5.6	6.4	4.6	8.5																							
10-Jun	3.0	3.7	2.6	Z	3.7	3.6	4.2	5.1	7.5	6.6	4.7	5.2	5.2	3.9	4.5	4.2	4.1	4.0	4.6	4.8	5.7	9.2	5.6	5.4	4.8	9.2																							
11-Jun	4.6	3.8	4.9	5.6	Z	8.8	4.7	3.3	2.6	1.8	2.2	2.1	1.8	1.1	0.8	0.9	1.3	1.5	2.0	3.9	5.2	3.9	4.5	5.9	3.4	8.8																							
12-Jun	8.1	5.1	2.4	6.7	7.4	Z	7.4	10.5	6.9	C	C	C	C	C	C	4.9	4.9	5.1	7.7	10.1	7.4	8.5	3.9	3.4	--	10.5																							
13-Jun	Z	3.0	3.3	2.9	3.4	3.9	6.2	7.9	4.5	3.2	4.1	4.0	2.7	2.1	2.0	4.9	13.3	10.6	8.3	7.8	6.1	7.2	8.7	5.4	5.5	13.3																							
14-Jun	5.9	Z	5.3	4.7	6.0	6.8	6.2	2.9	2.4	2.3	2.1	2.6	2.3	2.2	2.3	2.4	4.1	5.4	3.3	1.8	2.7	1.4	4.9	4.4	3.7	6.8																							
15-Jun	2.5	3.4	Z	2.6	3.0	3.2	5.8	3.2	4.7	3.8	3.1	2.0	1.7	1.8	1.7	1.8	2.8	2.7	2.4	5.6	10.4	9.4	5.0	6.9	3.9	10.4																							
16-Jun	3.3	7.6	6.1	Z	6.2	4.1	4.0	4.4	3.7	3.1	2.9	6.2	3.9	1.8	2.0	2.9	3.7	3.5	2.5	3.1	9.4	4.2	0.6	0.9	3.9	9.4																							
17-Jun	1.9	1.3	1.8	1.6	Z	1.1	1.2	1.6	1.2	1.4	1.7	1.5	1.5	1.9	1.0	1.1	1.1	1.1	1.1	1.7	3.5	4.4	5.8	4.0	1.9	5.8																							
18-Jun	5.8	8.8	10.0	13.6	7.2	Z	8.8	7.9	1.9	0.6	0.7	0.9	1.5	1.2	1.1	0.8	0.9	1.3	1.5	2.6	2.9	2.9	4.1	5.0	4.0	13.6																							
19-Jun	Z	0.7	1.1	0.7	0.7	1.3	2.2	2.3	2.6	2.1	1.0	2.3	1.6	1.8	1.7	1.9	2.1	2.3	2.2	1.7	1.6	1.3	1.4	2.4	1.7	2.6																							
20-Jun	2.5	Z	0.9	0.7	1.3	2.7	2.0	1.0	0.9	1.0	1.1	1.2	2.5	3.3	3.6	3.6	5.6	3.8	5.4	7.0	5.4	7.0	6.6	6.8	3.3	7.0																							
21-Jun	4.2	3.3	Z	4.3	8.8	6.4	7.2	8.1	5.4	1.2	1.6	2.4	2.2	2.7	3.1	3.2	3.3	3.7	3.0	2.5	2.9	5.2	3.4	3.5	4.0	8.8																							
22-Jun	4.0	3.5	3.9	Z	2.6	2.8	1.7	3.4	3.0	3.0	3.1	1.5	1.8	2.1	1.7	2.3	1.8	1.5	3.1	4.0	4.8	4.1	4.3	3.9	3.0	4.8																							
23-Jun	4.0	1.7	2.0	3.3	Z	4.7	3.3	3.2	2.8	2.4	1.9	1.7	1.2	1.3	0.9	1.2	2.0	2.2	4.0	3.1	8.4	3.9	8.2	5.9	3.2	8.4																							
24-Jun	3.5	6.0	3.2	4.9	3.6	Z	3.1	3.6	3.3	3.0	1.6	1.7	1.5	1.2	1.5	1.7	2.2	1.9	9.0	3.6	4.0	2.5	2.7	2.0	3.1	9.0																							
25-Jun	Z	1.3	0.5	3.6	5.7	5.3	2.9	1.4	0.3	0.2	0.3	0.4	0.7	1.0	0.8	0.5	0.7	1.3	2.1	2.2	2.9	3.1	2.7	1.7	1.8	5.7																							
26-Jun	2.7	Z	1.8	2.1	2.9	2.7	3.4	3.7	3.0	4.2	3.3	4.3	10.0	6.5	4.9	1.9	3.0	4.2	5.8	5.6	5.3	4.5	5.5	5.8	4.2	10.0																							
27-Jun	4.4	3.2	Z	2.6	2.6	2.5	3.9	6.2	7.1	6.0	2.6	1.6	1.4	1.9	1.9	1.5	1.9	1.9	3.1	6.4	8.5	6.5	3.8	3.4	3.7	8.5																							
28-Jun	2.7	1.8	1.9	Z	4.2	4.3	3.4	3.9	3.5	2.4	3.0	1.9	1.4	1.6	2.0	3.4	4.5	4.2	4.9	4.5	3.8	4.1	3.4	3.3	3.2	4.9																							
29-Jun	1.9	2.1	2.4	3.1	Z	3.6	3.0	3.6	4.7	3.9	2.3	2.4	M	3.0	3.5	1.7	7.2	6.5	2.8	7.4	8.3	7.1	4.1	4.7	4.1	8.3																							
30-Jun	3.1	7.2	7.0	12.0	13.2	Z	4.6	2.6	1.9	1.9	1.5	1.5	1.7	1.6	1.0	1.7	1.5	1.2	1.2	0.8	1.3	5.3	4.0	1.1	3.4	13.2																							
																								3.8	4.0	3.6	4.4	5.2	5.3	5.1	5.0	4.2	3.3	2.7	2.6	2.5	2.3	2.2	2.4	3.2	3.4	3.8	4.3	5.4	5.0	4.8	4.5	Diurnal Average	
																								8.5	8.8	10.0	13.6	13.2	23.7	22.5	19.5	13.2	8.3	8.9	6.2	10.0	6.5	4.9	4.9	13.3	10.6	9.0	10.1	11.9	11.0	13.7	11.0	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
Athabasca Valley - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	51	22	15	19	24	36	96	49	19	30	63	57	19	24	30	127	681
21 - 40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	52	22	15	19	24	36	96	49	19	30	63	57	19	24	30	128	683

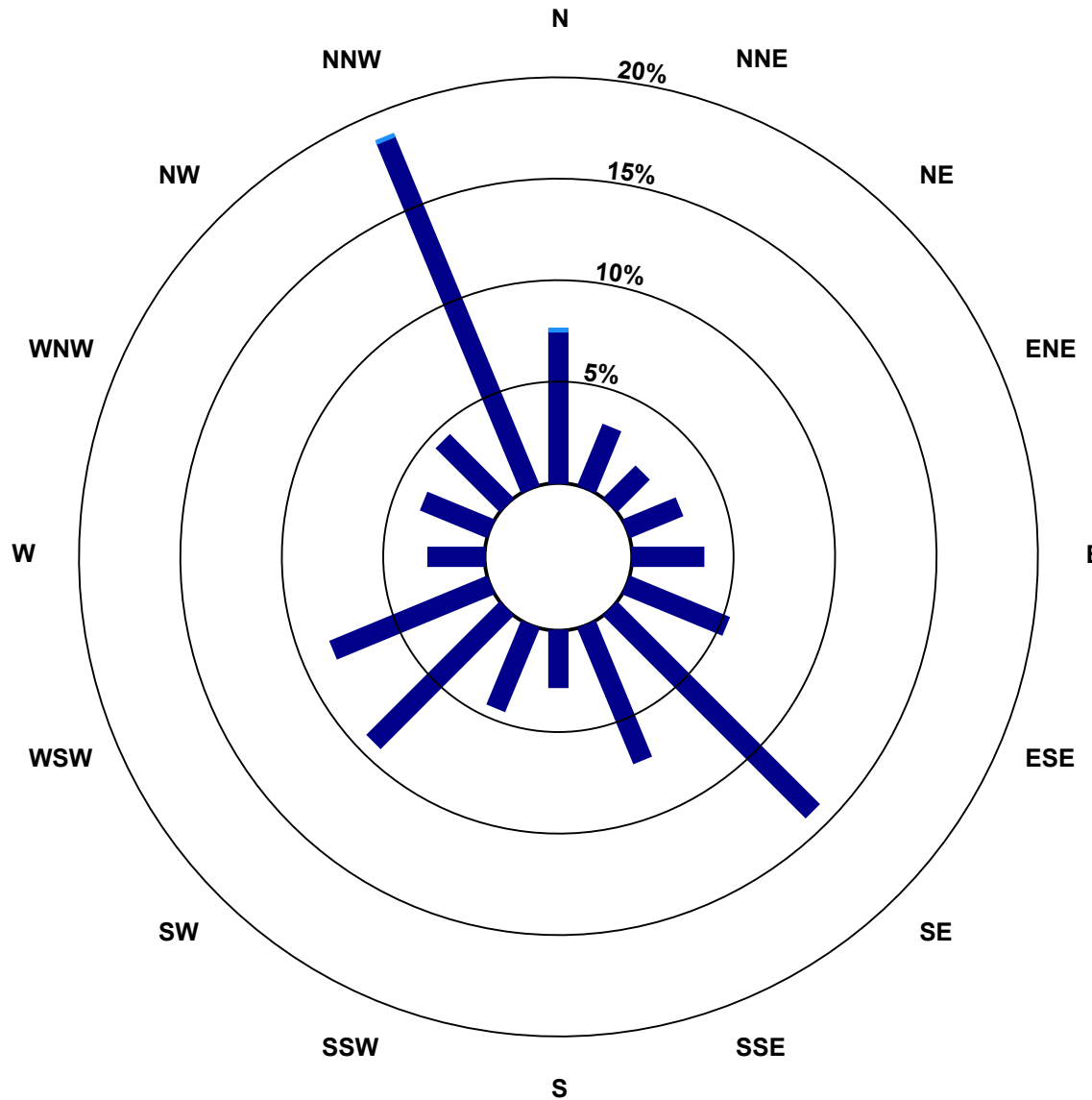
Total Number of Valid Hours: 683

Total Number of Hours: 720

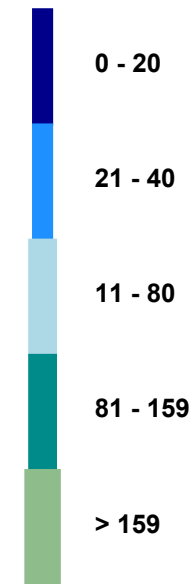


Wood Buffalo Environmental Association
Wind Rose Jun 2023

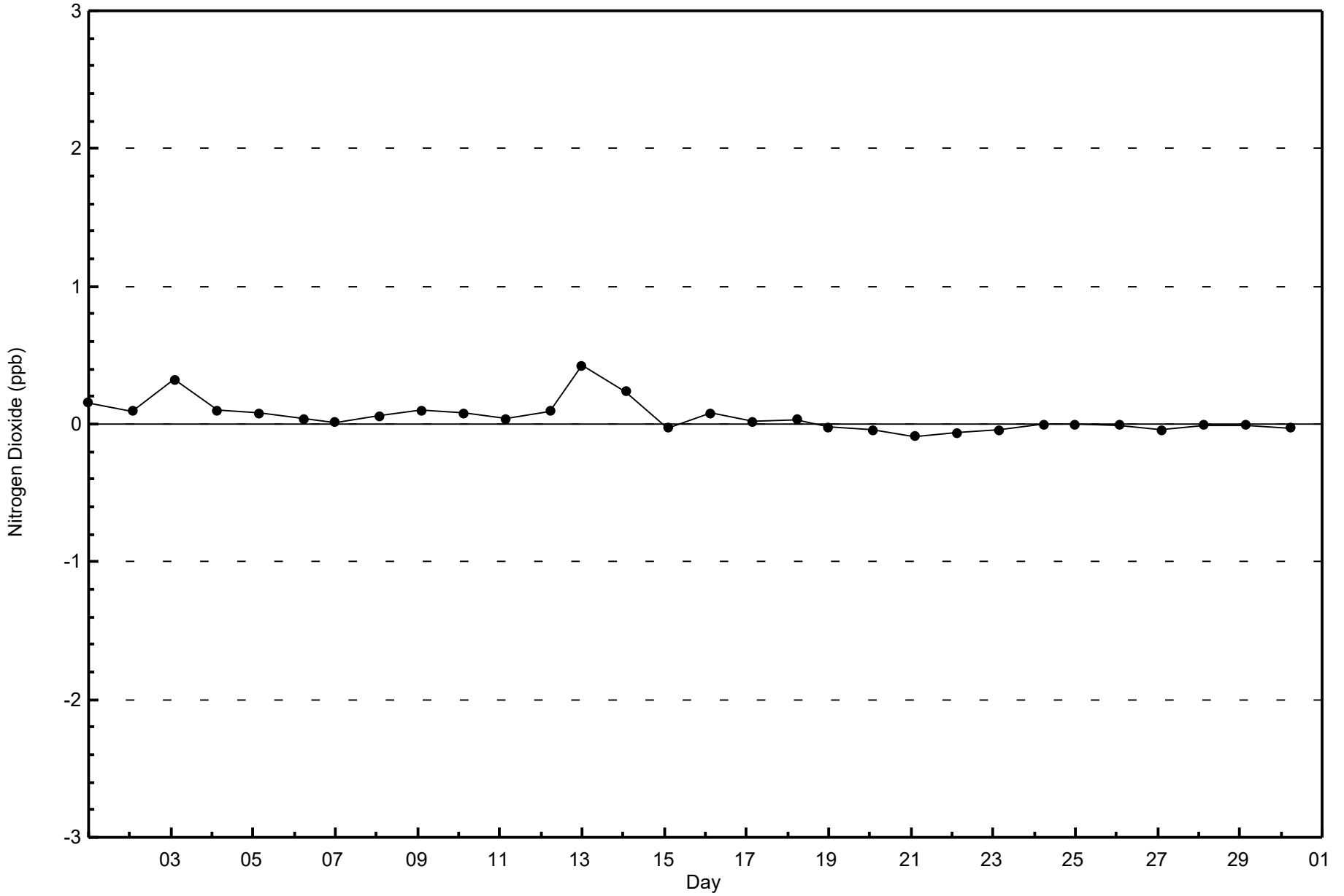
Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley



Classes (ppb)



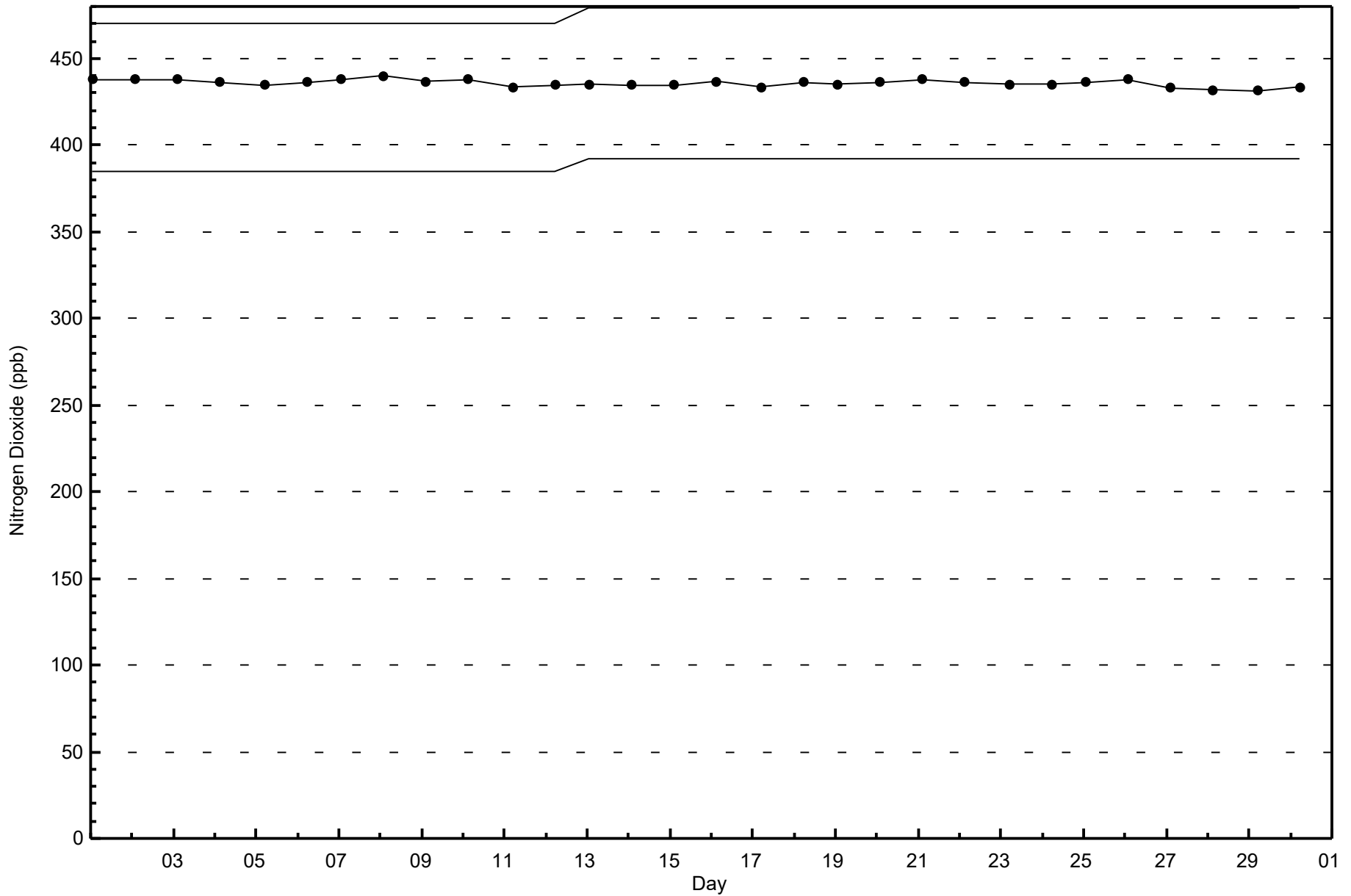
Total Number of Valid Hours: 683





Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association
Summary of Hour Averages

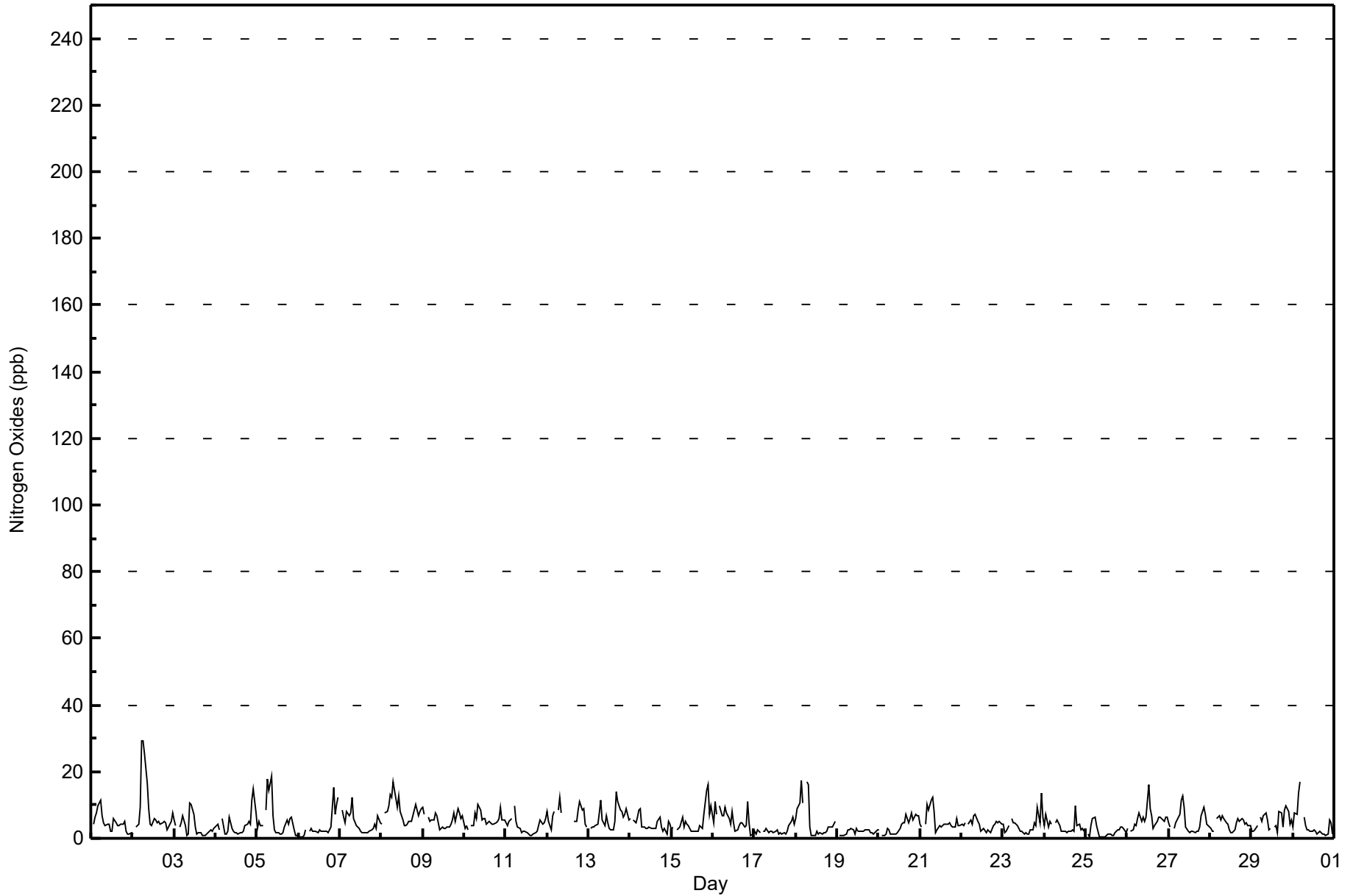
Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - June 2023

Maximum Value: 29.4 ppb on Jun 2 07:00		Maximum Daily Average: 8.5 ppb on Jun 2		Hours in Service: 720																							
Minimum Value: 0.4 ppb on Jun 25 10:00		Minimum Daily Average: 1.9 ppb on Jun 19		Hours of Data: 683																							
Maximum Diurnal Average: 7.6 ppb at hour 8		Minimum Diurnal Average: 2.7 ppb at hour 15		Hours of Missing Data: 37																							
Monthly Average: 4.69 ppb		Percentiles: P ₁ = 0.6 P ₁₀ = 1.5 Q ₁ = 2.3 Median = 3.9 Q ₃ = 6.0 P ₉₀ = 8.7 P ₉₉ = 16.9		Hours of Calibration: 36																							
				Percent Operational Time: 99.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	4.1	6.3	7.6	9.6	11.6	6.6	4.6	3.6	4.2	4.1	2.3	2.2	5.8	4.5	3.9	3.6	4.2	4.3	5.2	2.2	1.4	1.2	1.8	4.6	11.6	
2-Jun	1.3	Z	3.2	4.3	9.4	29.3	29.4	25.2	16.4	8.7	4.3	3.9	6.1	5.5	4.7	4.9	4.2	4.6	5.2	4.7	2.4	4.3	5.0	7.5	8.5	29.4	
3-Jun	5.4	3.7	Z	3.5	4.4	6.6	3.6	0.9	1.4	10.6	10.3	7.0	3.2	1.2	1.8	1.6	1.0	1.0	1.0	1.4	2.0	2.7	2.0	3.0	3.5	10.6	
4-Jun	3.7	4.1	2.5	Z	5.9	1.4	1.3	2.2	6.2	2.8	2.1	1.6	1.8	1.2	1.8	1.8	2.0	3.9	4.2	5.1	4.4	11.3	14.9	7.6	4.1	14.9	
5-Jun	2.8	5.2	3.9	3.6	Z	8.4	17.8	14.2	18.8	6.9	2.6	1.8	1.6	1.1	1.3	1.7	3.2	5.6	4.1	5.7	6.4	2.4	0.8	0.7	5.3	18.8	
6-Jun	0.5	0.5	0.6	0.9	2.7	Z	2.3	3.0	2.2	2.0	2.3	1.9	2.3	2.0	2.2	2.3	2.0	1.8	2.4	3.5	15.2	7.2	10.3	12.3	3.6	15.2	
7-Jun	Z	8.5	6.4	4.5	8.1	6.7	7.7	12.4	6.0	3.9	3.5	3.0	2.3	1.6	1.8	1.8	1.8	2.1	2.4	2.8	4.4	3.1	6.7	4.7	4.6	12.4	
8-Jun	4.4	Z	7.8	8.2	9.6	13.0	12.4	17.0	11.9	9.4	12.6	8.1	5.5	4.0	3.6	4.4	5.3	5.2	6.7	8.3	10.0	6.6	8.1	9.0	8.3	17.0	
9-Jun	9.3	7.1	Z	6.2	5.1	5.6	5.5	7.7	6.6	4.5	2.7	3.5	3.0	2.9	3.5	3.5	4.2	5.5	7.6	5.1	9.1	7.7	5.9	7.0	5.6	9.3	
10-Jun	3.1	3.8	2.6	Z	4.0	3.9	7.5	6.1	10.0	8.6	5.5	6.0	5.9	4.3	5.0	4.6	4.4	4.2	4.8	4.9	5.9	9.3	5.7	5.4	5.5	10.0	
11-Jun	4.6	3.8	5.0	5.7	Z	9.7	5.1	3.5	2.8	1.9	2.3	2.2	1.9	1.2	0.9	1.0	1.4	1.6	2.2	4.0	5.4	4.0	4.6	6.0	3.5	9.7	
12-Jun	8.1	5.2	2.5	6.8	7.9	Z	8.4	12.4	7.7	Z	Z	Z	Z	Z	Z	5.3	5.2	5.3	8.5	11.2	8.5	8.8	4.1	3.5	--	12.4	
13-Jun	Z	3.1	3.4	3.2	3.6	4.3	7.6	11.2	5.4	3.8	6.6	4.6	3.1	2.6	2.4	5.2	14.1	11.0	8.4	8.0	6.3	7.3	8.8	5.5	6.1	14.1	
14-Jun	6.0	Z	5.4	4.8	6.5	8.5	8.9	3.5	3.2	3.0	3.2	3.6	3.2	3.0	2.9	2.8	5.1	6.2	3.5	1.9	2.8	1.4	4.9	4.4	4.3	8.9	
15-Jun	2.5	3.4	Z	2.7	3.1	3.3	6.3	3.4	5.0	4.2	3.7	2.3	2.0	2.1	2.0	2.3	3.6	3.5	3.0	7.2	14.6	16.1	7.2	9.7	4.9	16.1	
16-Jun	4.5	11.0	7.2	Z	9.7	6.7	6.6	9.2	7.4	5.8	4.1	8.2	4.8	2.2	2.5	3.7	4.6	4.6	3.2	3.7	11.0	4.9	0.8	1.3	5.5	11.0	
17-Jun	2.2	1.4	2.6	1.9	Z	1.9	2.1	2.8	1.9	2.0	2.3	1.8	1.9	2.4	1.3	1.6	1.4	1.5	1.4	1.9	3.7	5.2	6.6	4.2	2.4	6.6	
18-Jun	5.9	8.9	10.4	17.3	10.5	Z	16.9	15.9	3.3	1.0	1.0	1.1	2.0	1.5	1.8	1.5	1.6	1.8	2.0	3.4	3.5	3.2	4.2	5.0	5.4	17.3	
19-Jun	Z	0.7	1.1	0.8	0.8	1.4	2.4	2.6	2.9	2.5	1.3	2.9	2.0	2.3	2.1	2.3	2.5	2.6	2.5	1.8	1.7	1.4	1.5	2.4	1.9	2.9	
20-Jun	2.6	Z	1.0	0.8	1.4	2.9	2.3	1.3	1.2	1.2	1.4	1.5	3.1	4.2	4.7	4.7	7.4	4.5	6.1	7.7	5.6	7.1	6.7	6.9	3.8	7.7	
21-Jun	4.2	3.3	Z	4.4	10.3	8.4	11.6	12.4	8.2	1.6	2.5	3.7	3.3	3.8	4.1	4.2	4.3	4.7	3.8	3.3	3.3	5.7	3.7	3.8	5.2	12.4	
22-Jun	4.2	3.9	4.6	Z	4.1	5.6	4.3	6.8	7.0	5.3	4.4	2.2	2.6	2.8	1.9	2.7	2.3	1.7	3.7	4.3	5.2	4.7	4.9	4.1	4.1	7.0	
23-Jun	4.1	1.8	2.1	3.6	Z	6.1	4.9	4.6	3.9	3.1	2.3	2.0	1.4	1.6	1.1	1.5	2.6	2.7	4.8	3.8	9.2	4.6	13.4	6.2	4.0	13.4	
24-Jun	3.8	7.0	3.3	5.3	4.2	Z	4.5	5.3	4.8	3.9	2.1	2.3	2.0	1.6	2.1	2.3	2.5	2.0	9.8	3.8	4.2	2.6	2.8	2.1	3.7	9.8	
25-Jun	Z	1.4	0.6	3.7	6.0	6.3	3.7	2.0	0.5	0.4	0.4	0.6	1.0	1.5	1.2	0.7	1.0	1.7	2.7	2.5	3.2	3.5	3.2	1.9	2.2	6.3	
26-Jun	3.1	Z	2.0	2.6	4.0	3.7	5.8	7.7	5.1	6.2	4.9	6.4	16.0	8.7	6.9	2.9	3.8	5.0	6.5	6.5	6.1	5.1	6.5	6.4	5.7	16.0	
27-Jun	4.8	3.4	Z	3.2	4.5	5.6	7.3	11.5	12.8	9.3	3.4	1.9	1.5	2.0	2.0	1.6	2.0	2.0	3.3	6.9	9.2	7.1	4.2	3.6	4.9	12.8	
28-Jun	3.1	2.0	2.0	Z	5.9	6.9	5.5	6.8	5.7	4.8	4.1	2.4	1.7	1.9	2.6	4.8	5.8	5.2	6.1	5.6	4.3	4.7	3.8	3.7	4.3	6.9	
29-Jun	2.1	2.2	2.7	3.9	Z	6.2	5.2	6.7	7.7	5.4	2.7	2.8	Z	M	3.5	3.8	1.9	8.1	7.5	3.3	8.6	9.6	8.0	4.2	5.6	9.6	
30-Jun	3.2	7.8	7.2	13.7	16.9	Z	6.5	3.8	2.6	2.7	2.0	2.0	2.4	2.2	1.2	2.0	1.8	1.4	1.4	0.9	1.4	5.6	4.5	1.2	4.1	16.9	
																								Diurnal Average			
																								Diurnal Maximum			
																								4.0 4.3 3.9 4.9 6.3 7.0 7.3 7.6 6.1 4.5 3.6 3.2 3.2 2.8 2.7 2.8 3.8 3.8 4.3 4.8 6.0 5.6 5.4 4.9			
																								9.3 11.0 10.4 17.3 16.9 29.3 29.4 25.2 18.8 10.6 12.6 8.2 16.0 8.7 6.9 5.3 14.1 11.0 9.8 11.2 15.2 16.1 14.9 12.3			
Z - zerospan																								C - Calibration		M - Maintenance	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	51	22	15	19	24	36	96	49	19	30	63	57	19	24	30	126	680
21 - 40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	52	22	15	19	24	36	96	49	19	30	63	57	19	24	30	128	683

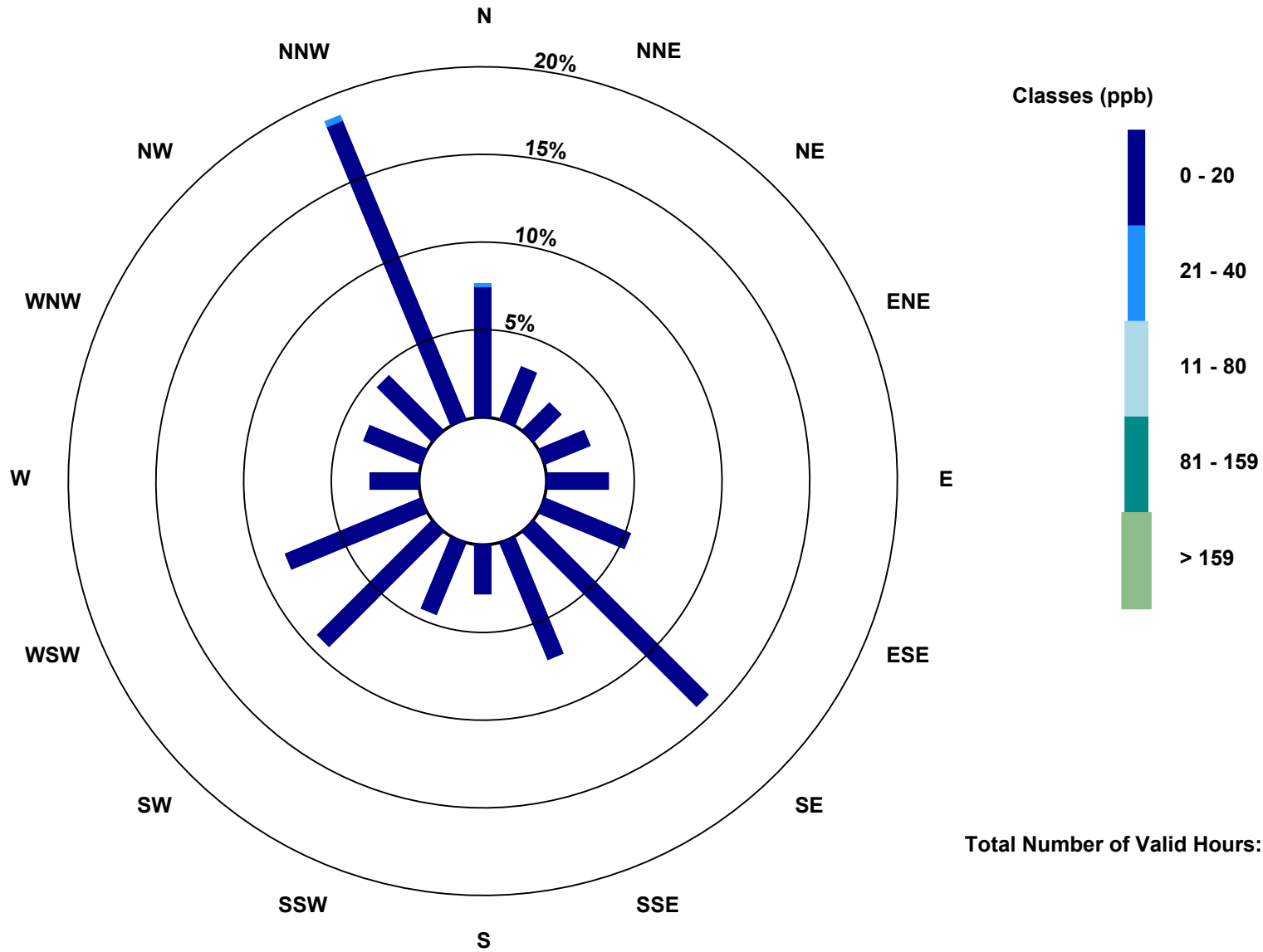
Total Number of Valid Hours: 683

Total Number of Hours: 720

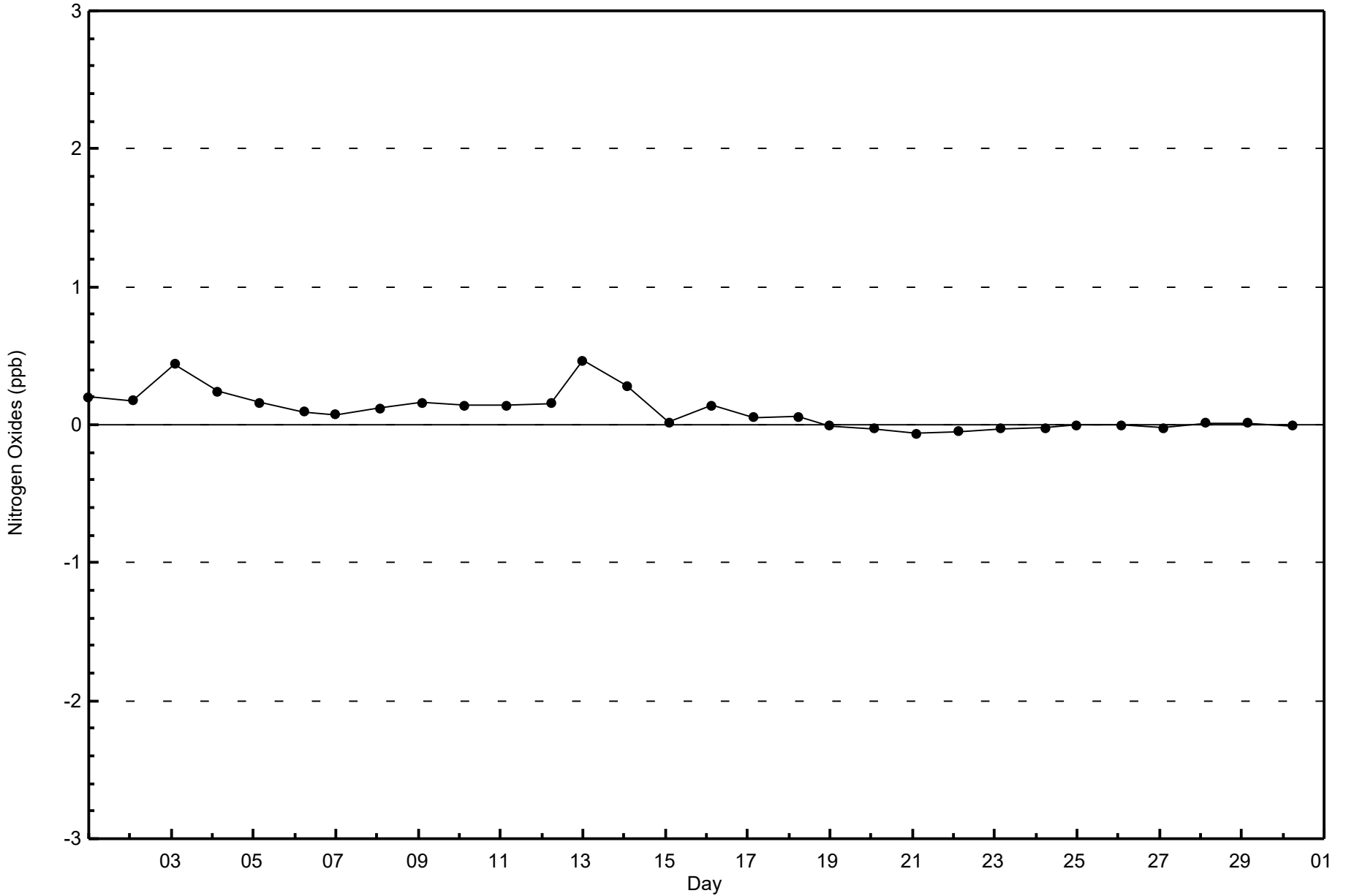


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley



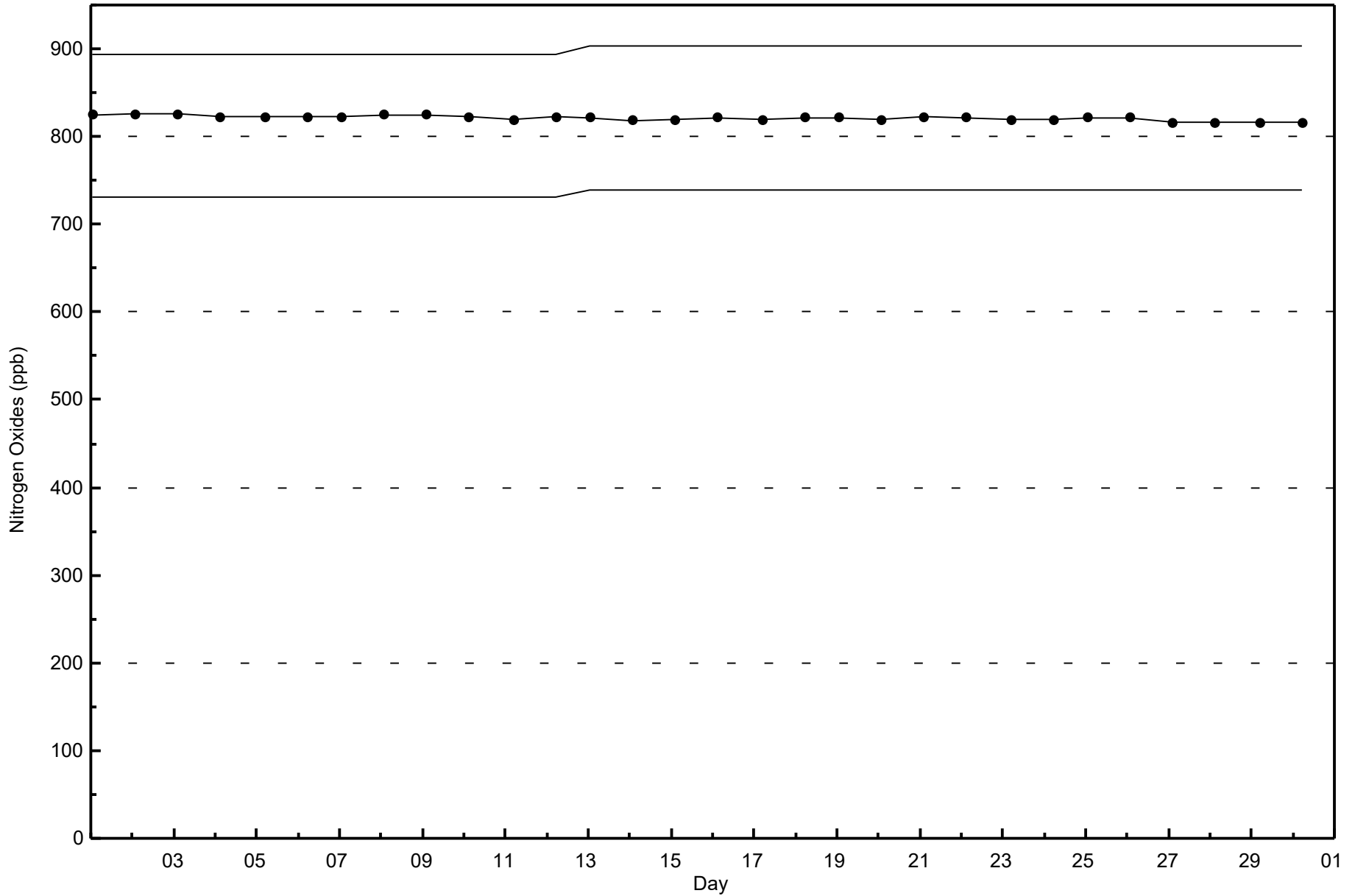
Total Number of Valid Hours: 683





Wood Buffalo Environmental Association
Span Responses

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





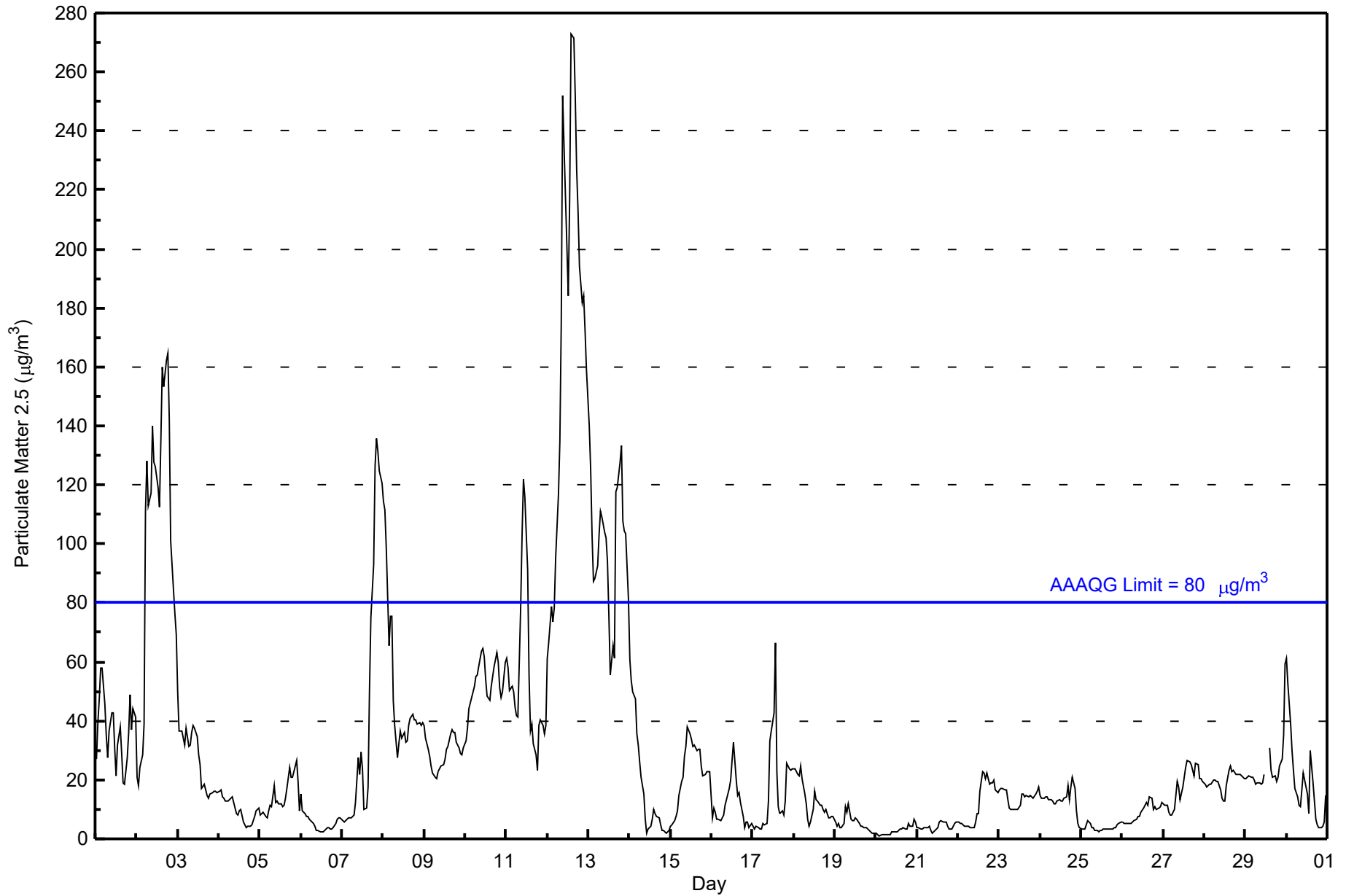
Summary of Hour Averages

Athabasca Valley - June 2023

Number of Exceedences (AAAQO):	1-hr: 69	24-hr: 9	Hours in Service:	720
Maximum Value: 272.7 µg/m ³ on Jun 12 15:00	Maximum Daily Average: 170.7 µg/m ³ on Jun 12		Hours of Data:	718
Minimum Value: 1.2 µg/m ³ on Jun 20 03:00	Minimum Daily Average: 2.9 µg/m ³ on Jun 20		Hours of Missing Data:	2
Maximum Diurnal Average: 35.1 µg/m ³ at hour 20	Minimum Diurnal Average: 24.3 µg/m ³ at hour 4		Hours of Calibration:	2
Monthly Average: 30.81 µg/m ³	Percentiles: P ₁ = 1.7 P ₁₀ = 3.6 Q ₁ = 6.8 Median = 16.8 Q ₃ = 35.2 P ₉₀ = 76.9 P ₉₉ = 210.7		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-Jun	27.2	39.2	47.6	58.0	57.9	45.4	35.2	27.4	36.4	42.6	42.9	30.8	21.4	32.0	38.0	28.9	18.8	18.3	27.4	36.1	49.0	37.0	44.2	41.3	36.8	58.0																						
2-Jun	20.7	18.1	24.0	28.7	39.0	110.9	128.1	113.2	117.3	140.1	127.8	126.4	119.3	112.3	135.2	160.0	153.2	162.2	164.8	142.5	101.2	84.3	76.3	69.5	103.1	164.8																						
3-Jun	49.6	36.6	36.5	34.4	31.6	37.6	31.3	31.8	36.0	38.3	37.5	34.7	28.6	25.0	17.3	18.6	16.4	14.7	13.9	15.2	15.8	16.3	16.1	15.7	27.1	49.6																						
4-Jun	16.3	16.4	14.3	13.7	12.7	13.0	13.3	13.6	14.1	10.4	8.5	8.2	9.5	9.8	5.7	4.5	3.9	4.4	4.2	5.0	6.1	7.6	9.3	10.5	9.8	16.4																						
5-Jun	8.2	8.5	9.2	7.6	7.3	9.3	11.4	10.9	17.9	12.4	12.8	11.8	12.1	11.1	5.3	13.8	17.2	24.1	20.7	20.7	22.6	26.7	19.7	9.3	14.0	26.7																						
6-Jun	15.1	9.5	8.4	7.8	7.4	6.6	5.8	5.2	4.4	3.0	2.8	2.3	2.4	2.3	2.7	3.6	3.6	3.2	3.3	3.6	5.1	6.4	7.1	7.2	5.4	15.1																						
7-Jun	6.1	5.8	6.4	6.6	7.2	7.0	7.6	7.9	12.3	27.6	21.8	29.2	23.5	10.1	10.5	17.8	49.9	74.9	93.1	126.1	135.8	131.6	124.9	120.4	44.3	135.8																						
8-Jun	114.2	111.6	98.7	65.5	75.5	75.5	46.9	38.4	27.8	32.4	36.7	34.3	36.0	32.6	33.3	38.5	40.9	42.4	40.1	40.1	38.9	39.3	38.5	39.3	50.7	114.2																						
9-Jun	38.6	34.1	30.3	27.9	24.8	22.2	21.1	20.3	22.9	23.9	24.5	25.1	27.2	30.5	31.2	35.8	37.1	36.2	36.2	32.9	30.8	29.1	28.5	30.9	29.3	38.6																						
10-Jun	33.2	37.7	44.3	46.2	47.9	51.8	55.2	55.3	58.2	63.8	64.3	61.5	54.1	48.3	46.9	51.5	55.0	58.2	62.9	59.8	51.2	47.7	50.0	59.9	52.7	64.3																						
11-Jun	61.1	57.9	50.3	51.7	49.9	44.7	41.6	41.1	78.3	102.9	121.8	115.7	91.0	55.1	36.6	38.8	32.4	28.4	23.0	38.6	40.5	38.6	35.4	38.6	54.7	121.8																						
12-Jun	61.1	66.6	78.7	73.7	78.4	95.6	116.6	135.0	175.3	252.0	234.5	201.3	184.0	216.7	272.7	271.3	251.7	226.9	212.6	194.3	181.7	184.1	172.2	159.1	170.7	272.7																						
13-Jun	140.2	125.3	103.1	87.1	88.4	92.5	103.0	111.1	109.1	103.9	102.0	94.0	76.1	55.4	65.3	61.0	117.9	119.0	127.8	133.2	107.6	104.4	103.3	81.2	100.5	140.2																						
14-Jun	60.9	53.5	50.0	47.4	35.4	31.6	26.1	20.6	15.4	6.8	2.0	3.1	4.1	6.5	9.8	8.3	7.5	6.9	4.5	3.1	2.9	2.0	2.5	3.0	17.2	60.9																						
15-Jun	4.1	4.9	6.2	7.7	9.6	14.5	19.3	21.1	28.1	31.3	37.9	35.8	33.5	31.6	31.8	30.1	30.5	30.4	24.9	21.5	22.0	22.6	22.7	22.9	22.7	37.9																						
16-Jun	7.3	10.6	9.2	6.8	6.6	6.2	7.1	8.1	11.6	15.3	17.0	20.1	26.5	32.7	20.0	14.9	15.7	12.4	7.6	3.8	5.9	5.7	3.9	5.1	11.7	32.7																						
17-Jun	4.5	3.4	4.1	4.0	3.1	3.4	5.3	4.8	5.0	13.0	33.4	36.7	42.7	66.6	23.0	10.7	8.8	9.6	7.9	13.0	25.7	23.5	23.4	23.8	16.6	66.6																						
18-Jun	23.7	23.6	22.0	21.4	24.6	20.6	15.2	12.0	6.4	4.2	5.6	10.1	15.9	13.1	12.9	11.2	11.2	10.1	8.8	9.9	7.2	7.1	7.7	7.6	13.0	24.6																						
19-Jun	5.9	4.2	5.0	3.8	3.9	5.2	11.0	9.2	11.7	6.9	6.2	6.4	7.1	6.9	5.1	4.3	4.5	3.9	3.7	3.5	2.9	2.5	2.1	1.9	5.3	11.7																						
20-Jun	1.8	1.5	1.2	1.6	1.4	1.5	1.3	1.2	1.4	2.4	2.5	2.2	2.4	2.9	3.3	3.5	4.0	3.1	3.2	5.3	4.4	4.3	6.6	5.8	2.9	6.6																						
21-Jun	4.0	3.6	3.5	3.3	3.7	3.6	3.8	4.0	2.7	2.0	2.4	3.2	3.9	5.5	6.0	5.8	5.6	5.5	4.3	3.5	3.2	4.4	5.4	5.8	4.1	6.0																						
22-Jun	5.5	5.3	5.0	4.7	4.5	4.3	4.1	3.9	4.0	4.0	5.7	8.6	8.6	16.2	22.9	22.2	20.5	22.4	18.3	18.8	19.1	19.9	16.6	15.7	11.7	22.9																						
23-Jun	16.4	17.1	16.9	16.8	16.4	13.5	10.5	10.2	10.2	10.1	9.8	9.8	11.4	15.1	15.0	14.0	14.6	14.4	14.8	14.4	14.0	15.1	16.1	17.6	13.9	17.6																						
24-Jun	14.6	13.6	13.6	14.3	14.0	13.2	13.1	12.6	11.9	11.9	12.7	13.2	12.7	12.9	13.7	14.3	17.8	13.1	17.6	21.0	16.9	9.3	5.2	3.6	13.2	21.0																						
25-Jun	3.4	3.4	3.3	4.6	6.0	5.1	4.0	3.6	3.0	2.7	2.6	2.8	3.0	3.1	3.2	3.3	3.3	3.4	3.5	3.6	3.7	4.8	5.4	5.6	3.8	6.0																						
26-Jun	5.7	5.2	5.0	5.0	5.3	5.3	5.5	6.0	6.6	7.7	7.5	8.9	10.4	11.3	12.2	11.3	14.4	13.8	9.9	10.8	9.9	10.3	10.8	12.5	8.8	14.4																						
27-Jun	11.7	11.3	11.5	9.2	8.3	7.9	9.8	14.7	19.2	17.5	13.4	17.6	20.8	24.3	26.6	26.3	25.4	23.1	21.4	25.4	25.0	20.5	20.2	19.5	17.9	26.6																						
28-Jun	18.7	17.8	17.8	18.3	18.4	19.8	20.0	19.6	19.3	16.8	13.8	12.9	13.0	18.0	23.1	24.8	22.8	23.4	21.7	21.8	22.0	21.8	21.2	20.4	19.5	24.8																						
29-Jun	20.2	21.1	21.2	20.8	20.8	20.0	18.4	18.9	18.9	18.4	18.8	21.7	C	C	31.0	23.4	20.8	21.3	19.7	21.1	24.6	26.9	35.2	59.2	23.7	59.2																						
30-Jun	61.2	52.7	38.8	30.1	23.1	17.1	14.2	11.6	10.8	16.8	22.4	17.6	15.2	8.8	30.0	18.8	13.0	6.5	5.0	3.6	3.6	4.3	5.6	14.6	18.5	61.2																						
																								28.7	27.3	26.2	24.3	24.4	26.8	26.9	26.5	29.9	34.7	35.0	33.5	31.6	31.6	33.2	33.0	34.6	34.5	34.2	35.1	33.3	31.9	31.2	30.9	Diurnal Average
																								140.2	125.3	103.1	87.1	88.4	110.9	128.1	135.0	175.3	252.0	234.5	201.3	184.0	216.7	272.7	271.3	251.7	226.9	212.6	194.3	181.7	184.1	172.2	159.1	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}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	142	19.78	19.78
6 - 15	201	27.99	47.77
16 - 25	139	19.36	67.13
26 - 80	167	23.26	90.39
> 81.0	69	9.61	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 - June 2023

Concentration Ranges (µg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	15	7	1	5	1	4	7	8	3	5	15	15	3	0	10	43	142
6 - 15	18	10	5	5	6	14	34	11	5	8	27	22	3	6	3	24	201
16 - 25	10	0	3	2	3	5	30	14	5	12	5	13	8	5	3	21	139
26 - 80	7	3	3	6	11	7	23	21	7	5	13	8	4	11	10	28	167
> 81.0	6	3	4	1	4	6	11	0	1	0	6	0	1	2	6	18	69
Totals	56	23	16	19	25	36	105	54	21	30	66	58	19	24	32	134	718

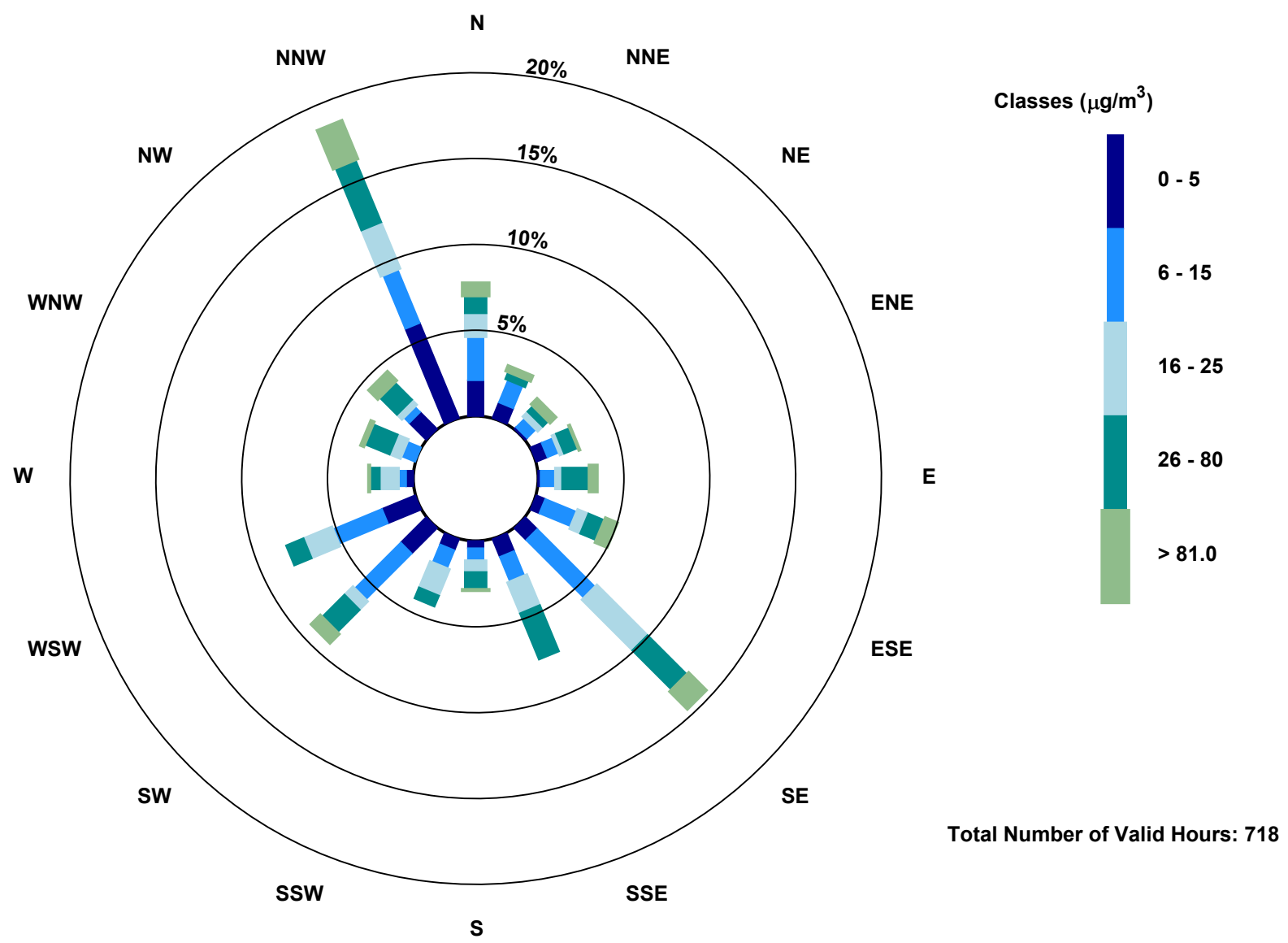
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1.5 ppm on Jun 12 15:00	Maximum Daily Average: 0.7 ppm on Jun 12		Hours of Data:	685
Minimum Value: 0.1 ppm on Jun 17 02:00	Minimum Daily Average: 0.1 ppm on Jun 20		Hours of Missing Data:	35
Maximum Diurnal Average: 0.3 ppm at hour 21	Minimum Diurnal Average: 0.2 ppm at hour 3		Hours of Calibration:	35
Monthly Average: 0.25 ppm	Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.4 P ₉₉ = 0.9		Percent Operational Time:	100.0

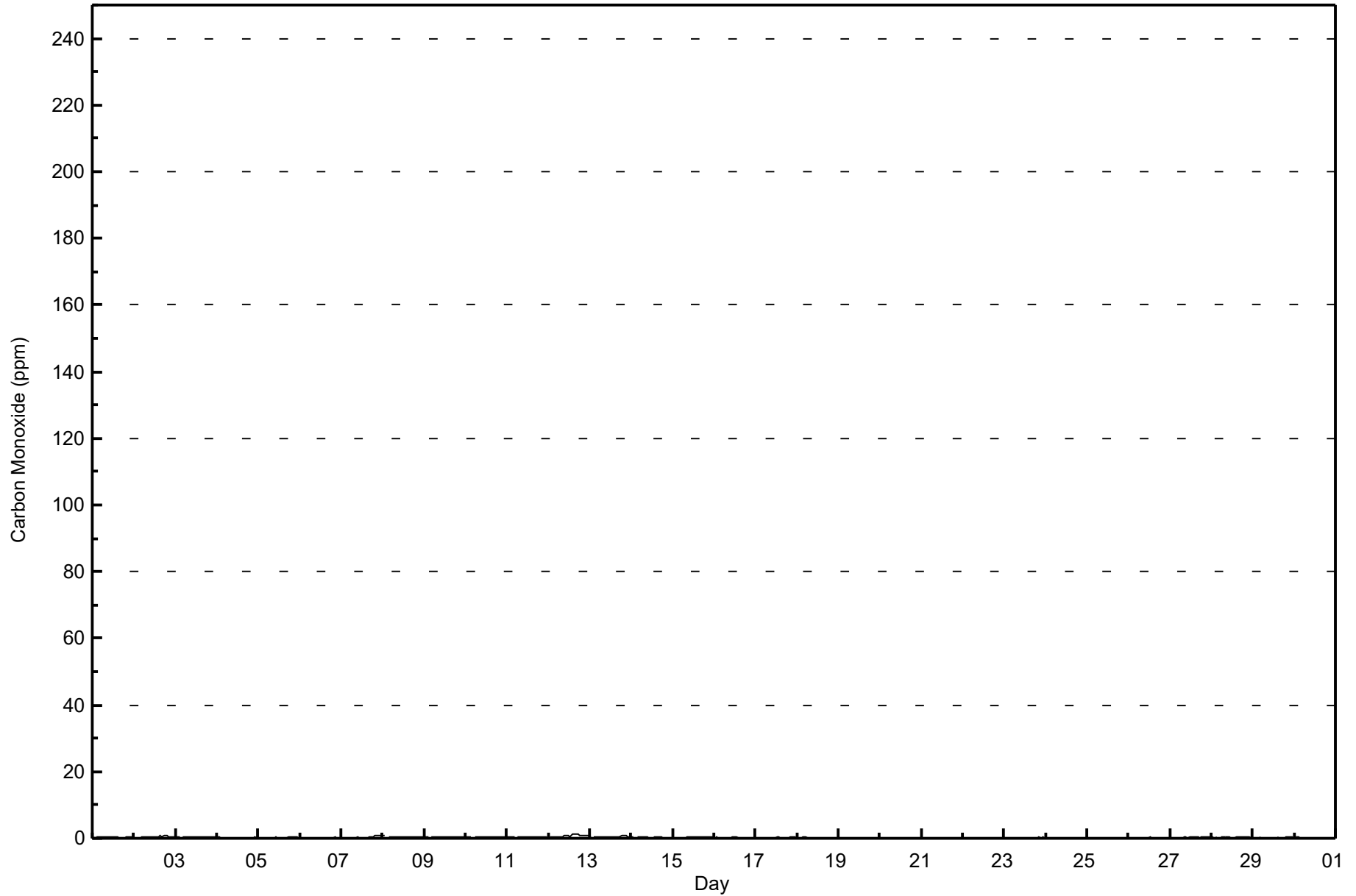
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.2	Z	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3
2-Jun	0.2	0.2	Z	0.2	0.3	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.5	0.7
3-Jun	0.3	0.3	0.3	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4
4-Jun	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	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.3
5-Jun	0.1	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3
6-Jun	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	0.2	0.2	0.2	0.2	0.1	0.2
7-Jun	0.2	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.8	0.8	0.8	0.8	0.3	0.8
8-Jun	0.8	0.7	Z	0.5	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8
9-Jun	0.3	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4
10-Jun	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4
11-Jun	0.4	0.4	0.4	0.4	0.4	Z	0.3	0.3	0.5	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.6
12-Jun	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.8	0.7	0.7	0.6	0.9	1.5	1.4	1.3	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.7	1.5
13-Jun	0.6	Z	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.5	0.5	0.7	0.9	0.7	0.7	0.6	0.5	0.9	
14-Jun	0.4	0.4	Z	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.5
15-Jun	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.4
16-Jun	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3
17-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.3
18-Jun	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	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2
19-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
20-Jun	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
21-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2
22-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
23-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
24-Jun	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	0.1	0.1	0.1	0.2	0.2
25-Jun	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	0.2	0.1	0.1	0.1	0.2
26-Jun	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
27-Jun	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3
28-Jun	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	0.3	0.2	0.3	0.2	0.2	0.3
29-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	C	C	C	C	C	C	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
30-Jun	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3
																								Diurnal Average		
																								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 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	582	84.96	84.96
0.4 - 0.5	59	8.61	93.58
0.6 - 0.7	28	4.09	97.66
0.8 - 1.4	15	2.19	99.85
1.5 - 10	0	0.00	99.85
> 10	0	0.00	99.85

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Athabasca Valley - June 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	49	18	11	17	18	26	74	47	19	30	57	54	17	17	24	104	582
0.4 - 0.5	2	1	1	0	4	5	20	4	2	0	1	1	0	3	1	14	59
0.6 - 0.7	4	0	2	1	1	2	3	0	0	0	0	0	0	1	4	10	28
0.8 - 1.4	0	2	1	1	1	2	0	0	0	0	5	0	1	1	1	0	15
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	21	15	19	24	35	97	51	21	30	63	55	18	22	30	128	684

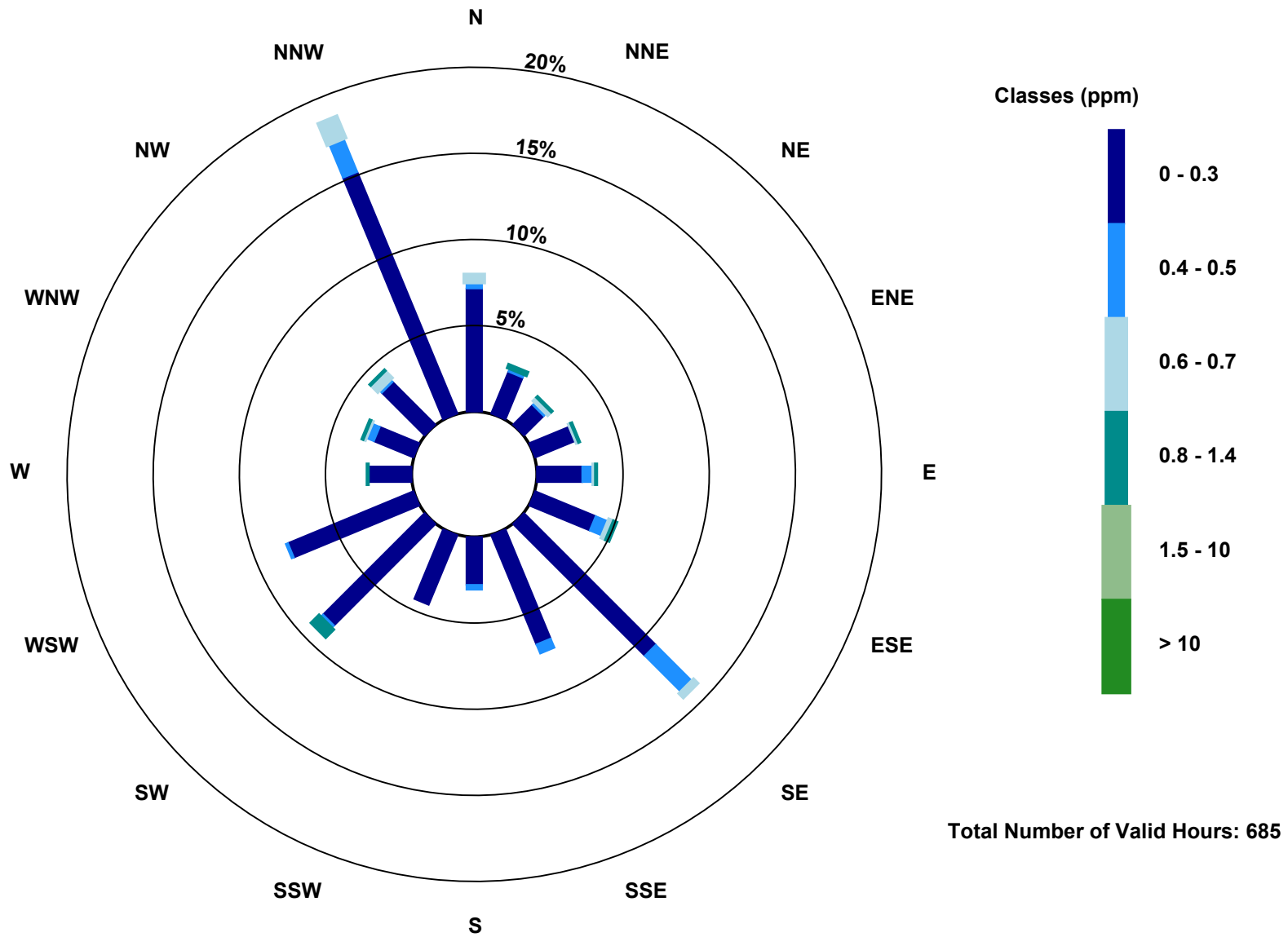
Total Number of Valid Hours: 685

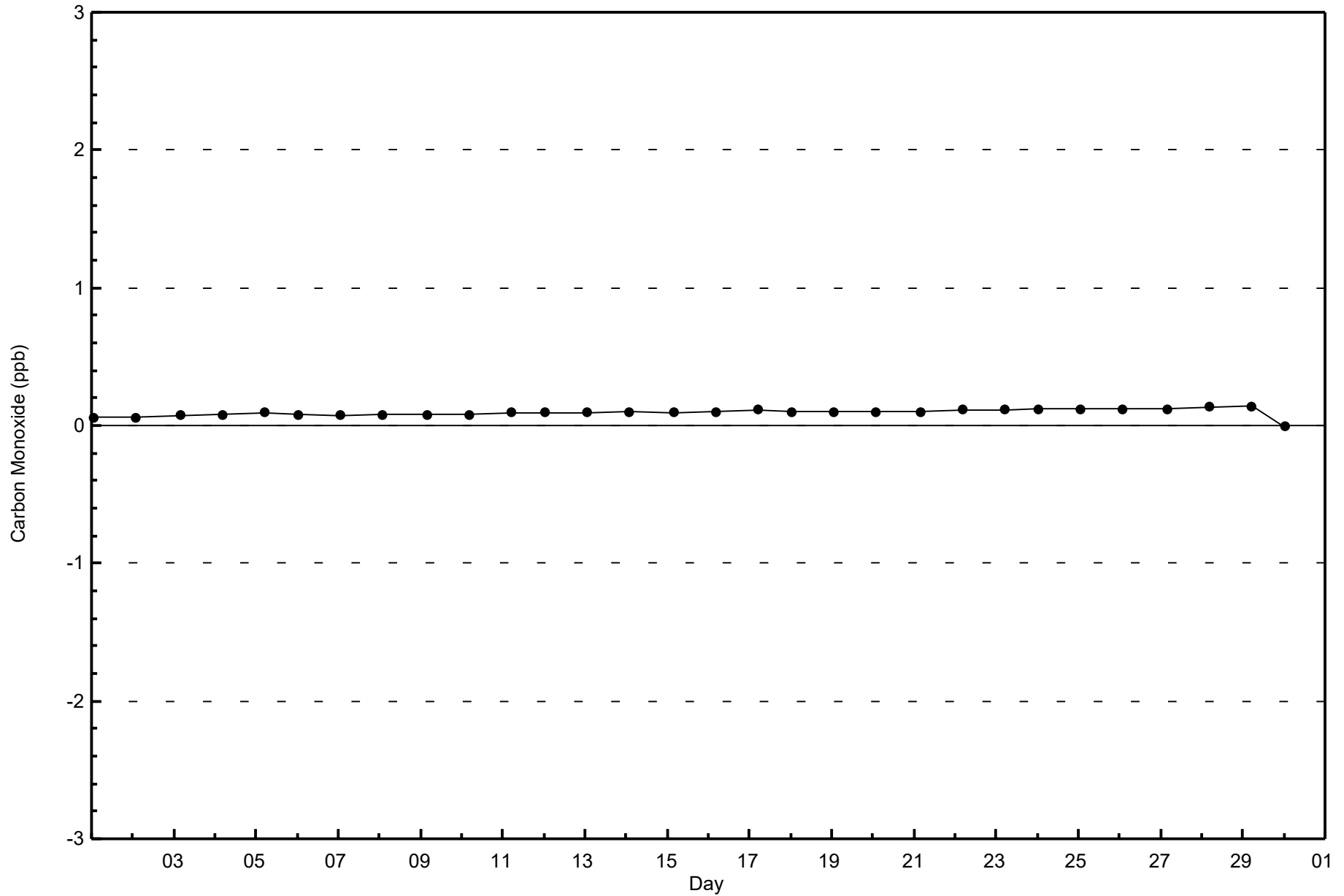
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Carbon Monoxide (CO) - ppm
Athabasca Valley

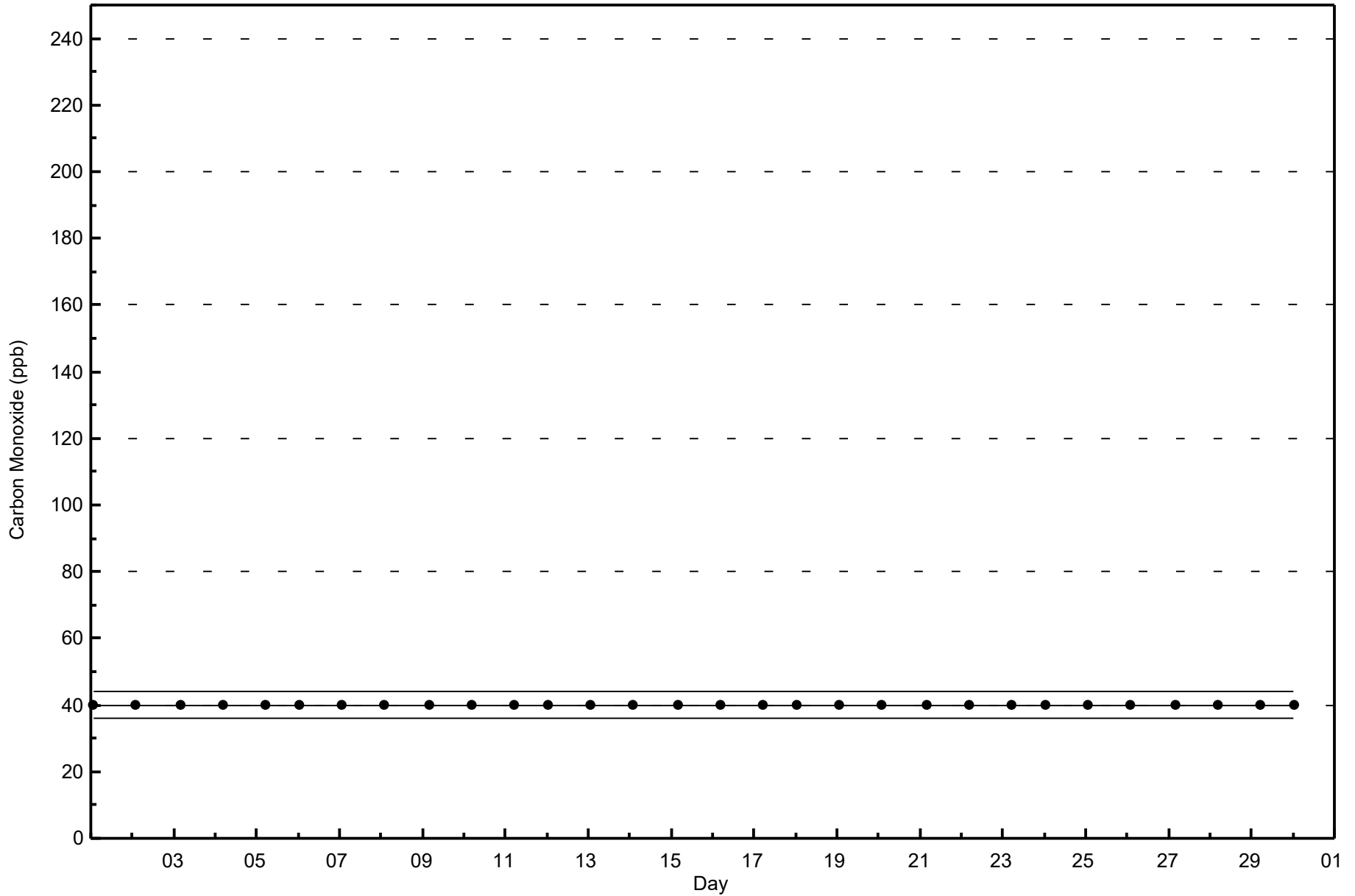






Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association
Summary of Hour Averages

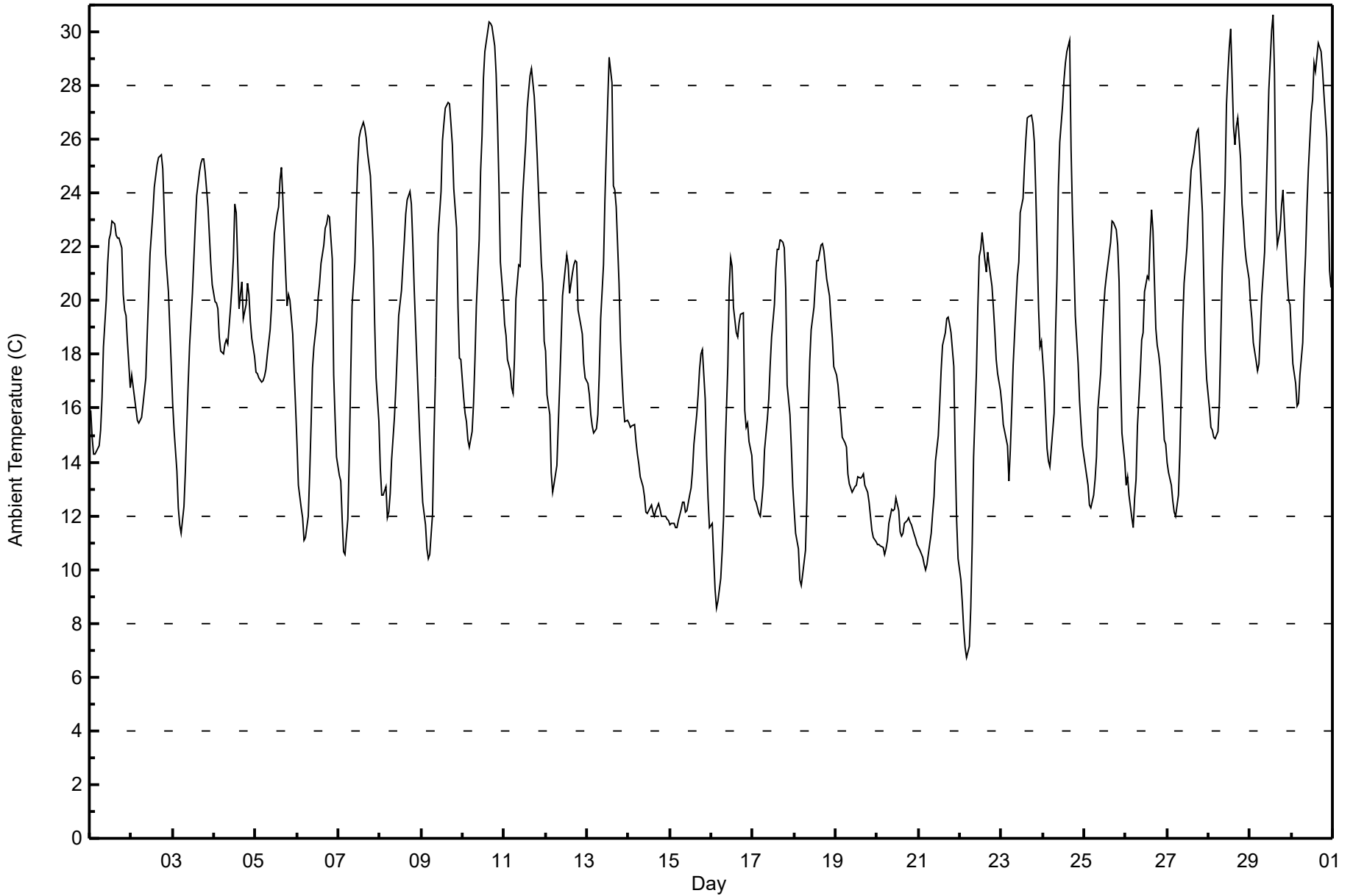
Ambient Temperature (AT) - C
Athabasca Valley - June 2023

Maximum Value: 30.6 C on Jun 29 14:00 Maximum Daily Average: 23.3 C on Jun 30																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 6.7 C on Jun 22 05:00 Minimum Daily Average: 11.5 C on Jun 20 Maximum Diurnal Average: 22.7 C at hour 16 Minimum Diurnal Average: 13.0 C at hour 5 Monthly Average: 18.29 C Percentiles: $P_1 = 8.9$ $P_{10} = 11.9$ $Q_1 = 14.0$ Median = 18.0 $Q_3 = 21.9$ $P_{90} = 25.5$ $P_{99} = 29.7$																						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-Jun	15.9	14.9	14.3	14.3	14.4	14.6	15.2	16.4	18.3	20.0	21.4	22.3	22.5	23.0	22.8	22.4	22.4	22.3	21.9	20.2	19.7	19.5	18.4	16.8	18.9	23.0
2-Jun	17.2	16.8	16.4	15.6	15.4	15.5	15.7	16.1	17.1	18.8	20.2	21.7	23.3	24.2	24.7	25.1	25.4	25.4	24.9	23.3	21.8	20.3	19.0	17.6	20.1	25.4
3-Jun	16.2	15.2	13.6	12.3	11.6	11.3	12.4	13.7	15.3	16.9	18.3	20.3	21.6	22.8	23.9	24.8	25.1	25.3	25.3	24.8	23.5	22.5	21.4	20.6	19.1	25.3
4-Jun	20.0	19.9	19.7	18.7	18.1	18.0	18.4	18.5	18.4	19.7	20.5	21.6	23.6	23.3	19.7	20.2	20.7	19.4	19.9	20.7	20.2	19.3	18.6	17.9	19.8	23.6
5-Jun	17.3	17.3	17.1	17.0	17.0	17.2	17.5	18.0	18.9	19.8	21.4	22.5	23.2	23.5	24.5	25.0	23.8	21.0	19.8	20.2	20.0	18.7	17.3	16.1	19.8	25.0
6-Jun	14.7	13.1	12.3	11.9	11.1	11.2	12.0	13.6	15.4	17.5	18.3	19.2	20.1	20.7	21.4	22.1	22.7	22.9	23.2	23.1	21.6	17.2	15.6	14.2	17.3	23.2
7-Jun	13.5	13.3	11.9	10.7	10.6	11.9	14.1	17.1	19.8	21.4	23.5	25.0	26.0	26.3	26.7	26.4	26.0	25.5	24.6	23.4	21.9	19.2	17.1	15.5	19.6	26.7
8-Jun	13.8	12.8	12.8	13.1	11.9	12.1	12.8	14.1	15.6	16.8	18.1	19.4	20.4	21.3	22.2	23.2	23.7	24.1	23.6	22.1	20.5	17.6	16.2	14.9	17.6	24.1
9-Jun	13.6	12.5	11.7	10.8	10.4	10.6	12.1	14.9	17.1	20.2	22.5	24.1	25.9	26.6	27.2	27.4	27.3	26.6	25.8	24.2	22.7	19.7	17.9	17.8	19.6	27.4
10-Jun	16.4	15.8	15.5	14.8	14.5	15.1	16.2	17.8	19.8	22.3	24.8	26.1	28.3	29.3	30.0	30.4	30.3	30.2	29.5	28.4	26.6	24.3	21.4	20.0	22.8	30.4
11-Jun	19.2	18.7	17.8	17.4	16.8	16.5	17.8	20.1	21.4	21.3	23.0	24.1	25.9	27.1	27.8	28.4	28.6	27.6	26.6	25.5	24.0	21.4	20.6	18.5	22.3	28.6
12-Jun	18.1	16.5	15.8	13.6	12.9	13.2	13.9	15.4	16.9	18.5	20.2	21.2	21.7	21.4	20.3	21.0	21.3	21.5	21.4	19.7	19.1	18.8	17.6	17.1	18.2	21.7
13-Jun	16.9	16.5	15.7	15.4	15.1	15.2	15.8	17.3	19.3	21.3	23.8	25.7	27.4	29.1	28.1	24.3	24.1	23.5	20.7	18.5	17.3	16.2	15.5	15.6	19.9	29.1
14-Jun	15.4	15.3	15.3	15.4	14.8	14.3	13.9	13.4	13.1	12.7	12.2	12.1	12.3	12.4	12.1	12.0	12.2	12.4	12.3	12.0	12.0	12.0	11.9	11.8	13.1	15.4
15-Jun	11.7	11.7	11.7	11.6	11.6	11.8	12.3	12.5	12.5	12.1	12.2	12.8	13.0	13.7	14.6	15.8	16.5	17.4	18.0	18.2	16.4	14.2	12.6	11.6	13.6	18.2
16-Jun	11.7	10.5	9.2	8.6	8.8	9.7	10.7	11.9	14.3	17.5	20.5	21.6	21.3	19.7	18.8	18.6	19.2	19.5	19.5	15.9	15.3	15.4	14.8	14.3	15.3	21.6
17-Jun	13.2	12.6	12.5	12.1	12.0	12.5	13.2	14.4	15.6	16.4	17.6	18.7	19.9	21.2	21.9	21.9	22.3	22.2	22.0	20.5	16.9	15.8	14.5	13.1	16.8	22.3
18-Jun	12.2	11.3	10.7	9.6	9.4	9.8	10.7	12.6	15.9	17.8	18.9	19.8	20.6	21.5	21.5	22.1	22.1	21.9	21.3	20.8	20.2	19.4	18.6	17.6	16.9	22.1
19-Jun	17.3	16.9	16.2	15.6	14.9	14.7	14.6	13.6	13.2	12.9	13.0	13.1	13.4	13.4	13.5	13.5	13.1	12.9	12.5	12.0	11.4	11.2	11.0	13.6	17.3	
20-Jun	10.9	10.9	10.9	10.8	10.6	10.8	11.1	11.7	12.3	12.2	12.2	12.6	12.2	11.4	11.3	11.3	11.7	11.8	11.9	11.8	11.7	11.3	11.2	10.9	11.5	12.6
21-Jun	10.8	10.7	10.5	10.2	10.0	10.2	11.0	11.4	12.1	12.7	14.1	15.0	16.1	17.4	18.3	18.8	19.3	19.4	19.1	18.8	17.5	14.2	11.8	10.4	14.2	19.4
22-Jun	9.6	8.8	7.8	7.1	6.7	7.1	8.5	10.9	14.2	17.3	19.8	21.7	21.9	22.6	21.5	21.1	21.8	21.3	20.5	19.8	18.9	17.8	17.3	16.7	15.9	22.6
23-Jun	16.1	15.4	15.2	14.6	13.3	14.4	16.0	17.6	19.9	20.9	21.4	23.3	23.8	25.0	26.0	26.8	26.8	26.9	26.6	25.9	24.1	19.7	18.3	18.5	20.7	26.9
24-Jun	17.7	17.0	14.5	14.0	13.8	14.5	15.8	18.8	20.8	24.2	25.9	27.3	28.2	28.8	29.3	29.7	25.6	23.2	21.4	19.5	17.7	16.3	15.4	14.6	20.6	29.7
25-Jun	13.9	13.5	13.1	12.4	12.3	12.8	13.3	14.2	16.0	17.4	18.7	19.6	20.4	20.9	21.7	22.2	23.0	22.9	22.7	22.1	20.7	17.4	15.1	14.0	17.5	23.0
26-Jun	13.1	13.4	12.8	12.0	11.6	12.6	13.4	15.3	17.3	18.6	18.8	20.3	20.9	20.8	22.3	23.4	22.6	19.0	18.3	18.0	17.6	15.8	14.8	14.7	17.0	23.4
27-Jun	14.0	13.6	13.1	12.5	12.1	12.0	12.8	14.3	16.7	19.1	20.6	21.9	23.1	24.0	24.9	25.5	25.9	26.3	26.4	25.5	23.3	20.6	18.2	17.1	19.3	26.4
28-Jun	16.0	15.3	15.2	14.9	14.9	15.1	16.3	18.6	21.1	24.4	27.3	28.5	29.4	30.1	26.5	25.8	26.5	26.8	25.3	23.6	22.9	22.0	21.5	20.8	22.0	30.1
29-Jun	19.9	19.3	18.5	17.8	17.4	17.6	18.9	20.2	21.8	23.7	25.7	27.9	30.0	30.6	28.5	23.5	22.1	22.6	23.5	24.1	23.0	20.8	20.0	19.8	22.4	30.6
30-Jun	18.7	17.7	16.9	16.1	16.2	17.2	18.5	20.4	21.7	23.5	24.9	27.0	27.5	28.8	28.5	29.6	29.4	29.3	28.6	27.7	26.1	23.8	21.1	20.5	23.3	29.6
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	15	2.08	2.08
10 - 20	434	60.28	62.36
> 20	271	37.64	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



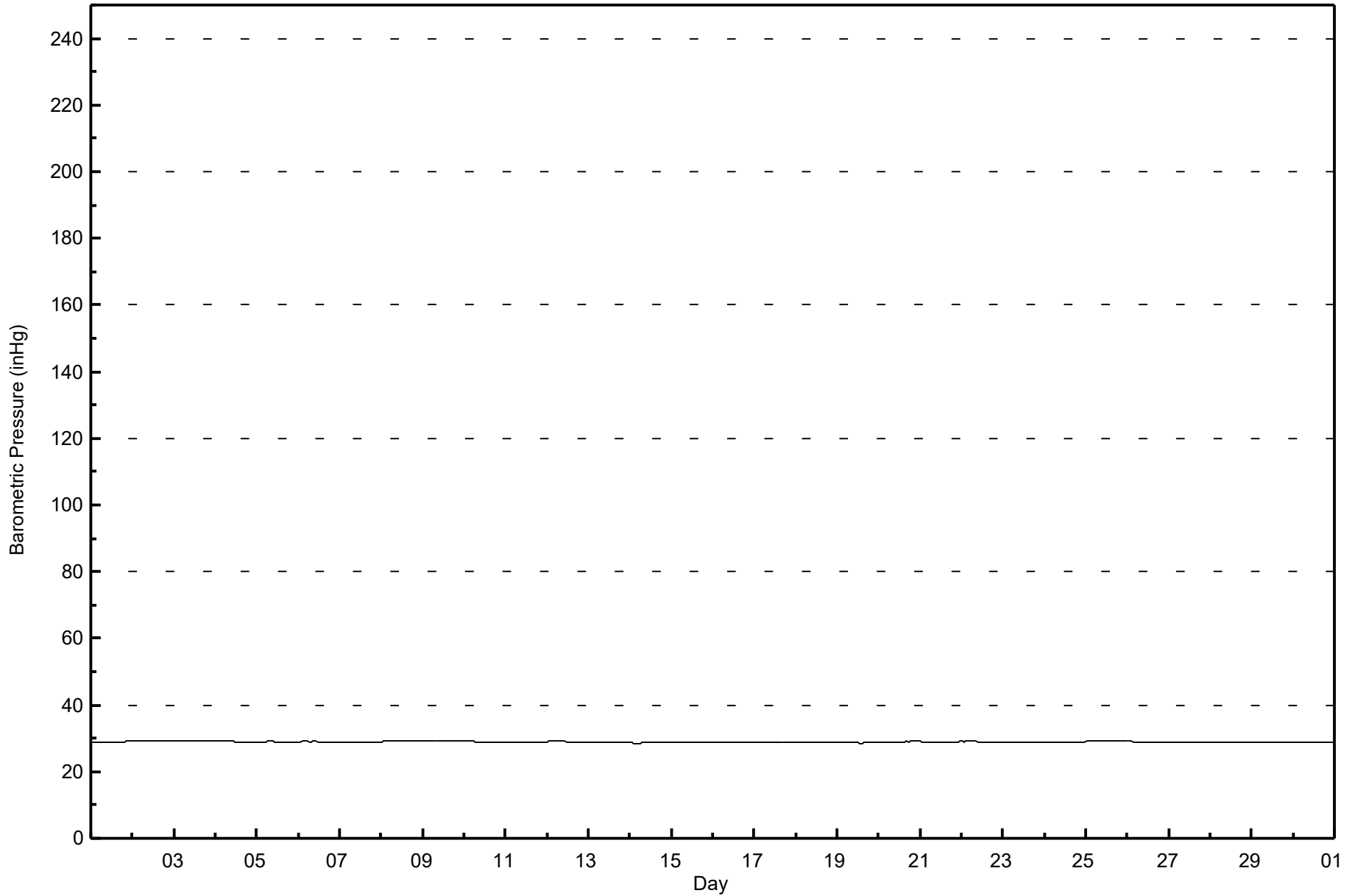
Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

Athabasca Valley - June 2023

Maximum Value: 29.3 inHg on Jun 3 07:00 Maximum Daily Average: 29.2 inHg on Jun 3																						Hours in Service:	720					
Minimum Value: 28.6 inHg on Jun 14 04:00 Minimum Daily Average: 28.6 inHg on Jun 14																						Hours of Data:	720					
Maximum Diurnal Average: 28.9 inHg at hour 9 Minimum Diurnal Average: 28.9 inHg at hour 19																						Hours of Missing Data:	0					
Monthly Average: 28.92 inHg Percentiles: P ₁ = 28.6 P ₁₀ = 28.7 Q ₁ = 28.8 Median = 28.9 Q ₃ = 29.0 P ₉₀ = 29.1 P ₉₉ = 29.2																						Hours of Calibration:	0					
																						Percent Operational Time:	100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Jun	28.9	28.9	28.9	29.0	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.0	29.1			
2-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.1	29.2		
3-Jun	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3		
4-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	
5-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	
6-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1		
7-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	28.9	29.0		
8-Jun	29.0	29.0	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.1	29.2		
9-Jun	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	29.0	29.0	29.0	29.0	29.1	29.0	29.1	29.2		
10-Jun	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.1		
11-Jun	28.8	28.8	28.8	28.8	28.9	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	29.0	29.0	28.9	29.0	29.0		
12-Jun	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1		
13-Jun	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	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.9		
14-Jun	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	28.6	28.7		
15-Jun	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.9		
16-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.7	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9		
17-Jun	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	28.8	28.8	28.7	28.8		
18-Jun	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		
19-Jun	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.7	28.8	
20-Jun	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0		
21-Jun	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	29.0	29.0	29.0		
22-Jun	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	29.0	29.0	29.0		
23-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0		
24-Jun	28.9	28.9	28.9	28.9	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.0	28.9	29.0		
25-Jun	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.2		
26-Jun	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0		
27-Jun	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.8	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	28.9	28.8	28.9	
28-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	
29-Jun	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	28.9	28.9	28.8	28.9
30-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	
																						Diurnal Average						
																						Diurnal Maximum						

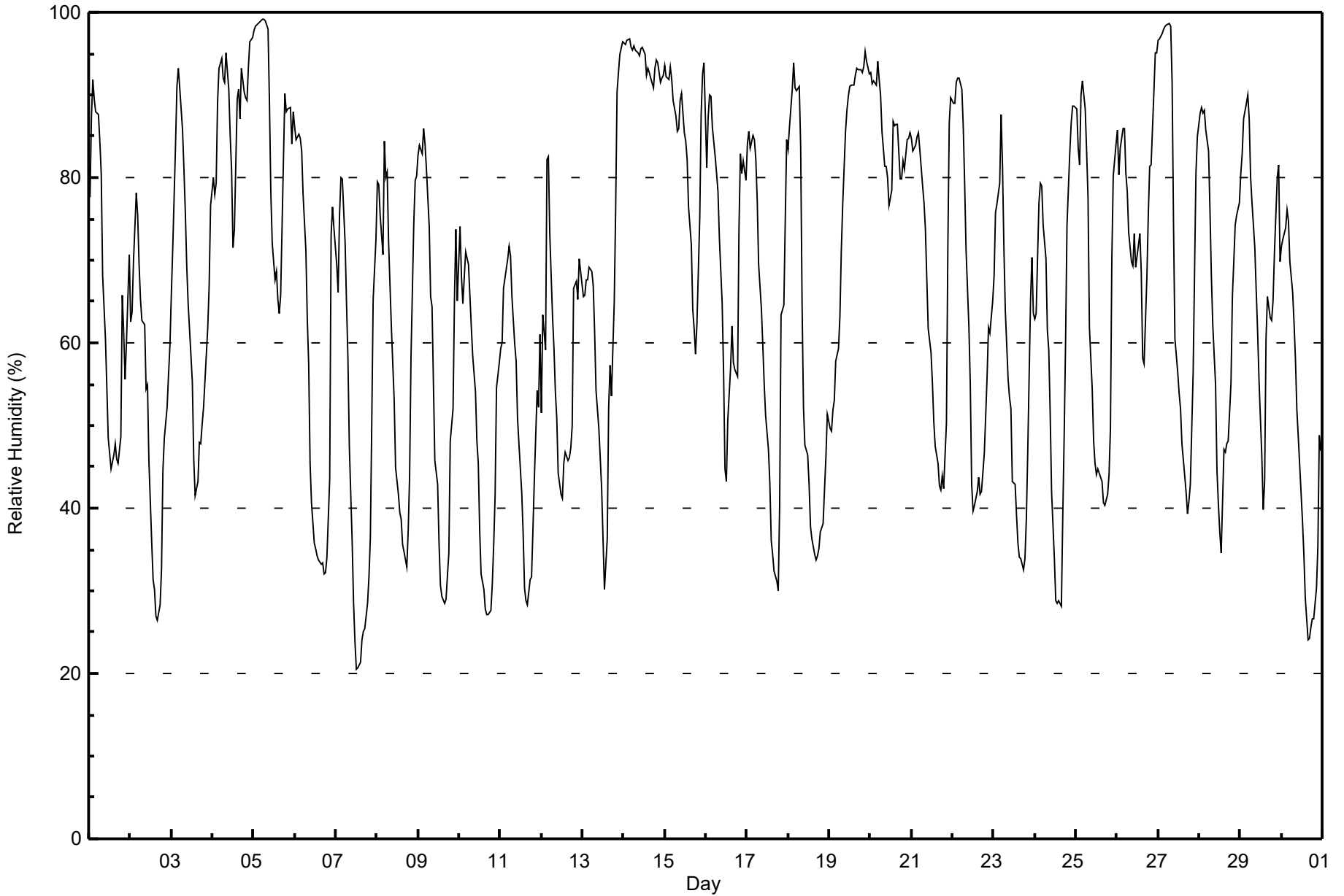




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 99.1 % on Jun 5 07:00 Maximum Daily Average: 94.3 % on Jun 14																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 20.5 % on Jun 7 13:00 Minimum Daily Average: 46.8 % on Jun 7																						Hours of Missing Data: 0																										
Maximum Diurnal Average: 84.8 % at hour 5 Minimum Diurnal Average: 48.3 % at hour 17																						Hours of Calibration: 0																										
Monthly Average: 65.65 % Percentiles: P₁ = 25.1 P₁₀ = 35.5 Q₁ = 47.5 Median = 67.6 Q₃ = 84.4 P₉₀ = 91.9 P₉₉ = 98.5																						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-Jun	77.6	87.3	91.9	89.5	87.9	87.6	84.4	80.6	68.1	60.5	54.6	48.4	46.7	44.8	46.4	47.7	46.0	45.4	48.7	65.7	61.4	55.6	60.2	70.6	64.9	91.9																						
2-Jun	62.5	63.8	69.7	78.2	75.4	69.6	65.3	62.7	62.1	54.3	54.9	45.8	35.9	31.3	30.2	27.0	26.4	28.2	32.6	44.6	48.5	52.2	56.1	59.7	51.5	78.2																						
3-Jun	65.7	71.3	83.9	91.1	93.2	90.9	85.8	81.0	75.7	69.3	64.7	58.5	55.2	46.0	41.5	43.2	48.0	47.7	50.2	52.3	58.7	61.8	66.9	76.6	65.8	93.2																						
4-Jun	80.0	78.0	79.4	89.1	93.3	94.4	92.0	91.6	95.1	90.6	85.1	80.8	71.5	73.7	89.4	90.7	87.1	93.1	90.4	89.7	89.3	93.5	96.4	97.0	88.0	97.0																						
5-Jun	97.8	98.3	98.6	98.8	99.0	99.1	99.1	99.0	98.0	89.2	78.1	72.1	67.7	68.7	65.3	63.6	65.8	82.2	90.2	88.0	88.4	88.5	84.1	88.0	86.1	99.1																						
6-Jun	86.1	84.7	85.2	84.7	83.3	78.0	71.2	62.9	57.5	45.4	40.7	35.8	35.1	34.3	33.8	33.2	33.4	32.0	32.3	34.0	43.6	73.1	76.4	73.8	56.3	86.1																						
7-Jun	69.5	66.1	75.5	80.0	79.8	72.0	64.8	58.1	47.5	36.1	28.7	24.0	20.5	20.7	21.4	24.1	25.0	25.4	28.5	31.6	36.5	50.4	65.3	72.6	46.8	80.0																						
8-Jun	79.4	79.1	75.5	70.6	84.4	80.1	80.7	72.2	61.9	57.5	53.1	45.0	41.7	39.4	38.6	35.6	34.7	32.8	37.3	43.8	58.4	74.6	79.7	80.3	59.8	84.4																						
9-Jun	82.7	83.9	82.8	86.0	84.1	81.0	74.1	65.5	64.3	55.2	45.7	42.8	35.8	30.6	29.2	28.4	29.0	31.9	34.5	48.1	52.0	65.2	73.8	65.2	57.2	86.0																						
10-Jun	74.0	68.0	64.7	67.9	71.1	69.4	65.8	62.1	58.5	54.1	48.1	45.4	37.2	32.0	30.2	27.8	27.2	27.2	27.6	30.9	35.5	41.5	54.6	57.6	49.1	74.0																						
11-Jun	59.4	60.1	66.6	69.0	70.1	71.6	70.5	65.5	59.8	57.8	50.9	47.7	41.8	37.0	30.3	28.8	28.3	31.4	31.7	37.4	43.5	54.2	52.1	60.9	51.1	71.6																						
12-Jun	51.5	63.4	59.2	82.3	82.6	73.1	63.1	59.3	54.0	50.9	44.3	41.8	41.2	45.4	46.8	45.8	46.2	47.3	49.9	66.7	67.4	65.3	70.2	68.7	57.8	82.6																						
13-Jun	65.7	65.8	67.6	67.7	69.1	68.7	67.0	61.4	54.2	49.7	46.1	42.4	36.3	30.2	36.2	52.0	57.2	53.5	64.9	76.0	90.3	92.8	95.0	96.4	62.8	96.4																						
14-Jun	96.3	96.1	96.6	96.7	95.8	95.5	95.9	95.4	95.1	94.7	95.7	95.8	95.0	92.4	93.3	92.8	92.0	90.8	93.2	94.2	93.9	91.6	92.0	92.4	94.3	96.7																						
15-Jun	93.6	92.2	91.8	93.5	91.8	89.3	87.5	85.6	86.0	89.3	90.3	85.4	84.4	82.2	76.4	71.9	64.1	61.6	58.6	62.4	75.1	87.7	92.6	93.8	82.8	93.8																						
16-Jun	81.3	87.4	90.1	89.8	86.1	82.5	80.6	78.3	72.7	64.8	56.4	44.7	43.3	50.7	56.9	62.0	57.6	56.8	56.0	73.9	82.9	80.5	82.1	79.7	70.7	90.1																						
17-Jun	84.1	85.6	83.6	85.0	84.5	82.1	77.2	69.4	64.0	59.7	55.0	51.2	47.1	43.1	36.0	34.4	32.3	31.2	30.1	40.3	63.4	64.6	74.8	84.7	61.0	85.6																						
18-Jun	83.4	86.2	90.7	93.9	90.8	90.5	90.9	83.7	64.8	52.2	47.7	46.4	42.9	37.8	36.3	34.4	33.8	34.2	35.1	37.2	38.2	42.3	46.1	51.3	57.9	93.9																						
19-Jun	49.6	49.3	51.8	53.0	57.8	59.3	63.2	71.2	76.8	85.6	88.2	89.8	91.0	91.2	91.2	92.3	93.2	93.0	93.0	92.6	93.4	95.2	94.0	92.6	79.5	95.2																						
20-Jun	92.7	91.4	91.7	91.2	94.0	91.8	90.1	85.7	81.3	81.4	80.0	76.6	78.5	86.7	86.3	86.4	86.4	86.4	79.9	79.9	82.0	81.0	84.5	84.8	85.5	85.4	94.0																					
21-Jun	84.7	83.2	83.9	84.8	85.4	83.5	79.0	77.0	73.7	67.6	61.7	58.9	55.1	50.3	47.5	45.5	42.7	42.1	43.8	42.4	50.4	71.6	86.6	89.6	66.3	89.6																						
22-Jun	89.0	89.0	91.5	92.0	92.1	90.7	86.0	79.2	71.2	62.1	55.0	42.8	39.6	40.3	42.0	43.7	41.6	42.1	46.5	51.1	55.9	61.9	61.2	65.1	63.8	92.1																						
23-Jun	68.1	75.8	76.7	79.3	87.6	81.4	71.4	63.8	55.6	53.4	52.1	43.2	42.9	39.2	35.8	34.0	33.8	32.6	33.9	38.6	46.8	65.3	70.3	63.6	56.0	87.6																						
24-Jun	62.9	63.6	77.0	79.3	78.9	74.3	70.1	61.5	59.1	51.5	42.0	34.0	28.7	28.4	28.9	28.2	39.1	48.9	60.1	74.2	83.1	86.6	88.7	88.6	59.9	88.7																						
25-Jun	88.3	83.6	81.6	90.1	91.7	88.2	83.3	77.6	61.9	54.4	48.2	45.5	44.0	44.8	43.8	43.2	40.7	40.4	41.6	44.1	49.7	70.2	80.2	84.0	63.4	91.7																						
26-Jun	85.8	80.4	83.5	85.9	86.0	80.5	78.3	73.4	69.8	69.3	73.3	69.1	71.9	73.2	68.5	58.2	57.4	67.9	75.5	81.3	81.6	90.4	95.2	95.1	77.1	95.2																						
27-Jun	96.6	96.7	97.4	98.0	98.3	98.5	98.6	98.3	91.5	74.4	60.6	56.4	53.9	52.0	47.8	43.9	41.8	39.3	40.8	42.8	56.3	68.4	80.5	84.9	71.6	98.6																						
28-Jun	87.8	88.5	87.8	88.2	85.7	83.3	76.0	68.1	62.2	54.9	44.5	40.4	37.1	34.5	47.1	46.9	47.9	48.1	55.1	65.5	69.8	74.2	75.5	76.9	64.4	88.5																						
29-Jun	80.5	82.9	87.2	89.0	90.0	87.2	80.0	77.0	71.5	66.2	61.4	55.5	46.2	39.8	43.2	60.5	65.7	63.1	62.7	65.2	70.8	80.0	81.5	69.9	69.9	90.0																						
30-Jun	71.7	72.5	73.9	76.1	74.7	69.8	66.0	62.3	57.9	51.9	48.6	41.9	38.4	34.4	29.1	24.1	24.3	25.5	26.7	26.6	30.4	35.4	48.8	46.9	48.2	76.1																						
																								78.3	79.1	81.2	84.0	84.8	82.1	78.6	74.3	69.1	63.5	58.5	53.6	50.2	48.5	48.3	48.3	48.3	49.2	51.7	57.4	63.2	70.6	75.5	77.1	Diurnal Average
																								97.8	98.3	98.6	98.8	99.0	99.1	99.1	99.0	98.0	94.7	95.7	95.8	95.0	92.4	93.3	92.8	93.2	93.1	93.2	94.2	93.9	95.2	96.4	97.0	Diurnal Maximum





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Speed: 31 km/h on Jun 14 16:00	Maximum Daily Speed Average: 21.3 km/h on Jun 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 27 01:00	Minimum Daily Speed Average: 1.1 km/h on Jun 12	Hours of Data: 720
Maximum Diurnal Speed Average: 6.6 km/h at hour 15	Minimum Diurnal Speed Average: 0.4 km/h at hour 7	Hours of Missing Data: 0
Monthly Average Velocity: 2.3 km/h 308.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 8 Q ₃ = 13 P ₉₀ = 19 P ₉₉ = 27	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Jun	S4	NNE2	NW7	NNW3	NW2	SSW3	SW7	SW8	W1	ENE4	NNE3	NNW8	N12	N10	NNW11	NNW10	NNW7	NNW7	NNW5	ENE4	E10	ENE11	ENE11	E5	N3.0	N12		
2-Jun	ENE14	NNW4	NNW3	E1	NNW5	NNW7	N6	NNW6	NNW7	NNW6	NW5	NNW8	NNW10	NNW12	NNW11	NNW12	NNW7	N5	NE4	E6	E9	ESE4	SSE2	SSE4	N4.5	ENE14		
3-Jun	SSE4	SE2	E1	NE3	ENE3	E4	NE3	N5	NW7	NNW9	NNW11	NW4	SSE7	E6	ESE7	SE4	NE4	ESE10	E11	ESE11	E6	E3	NE2	NE1	ENE2.7	NNW11		
4-Jun	SE3	SE3	SE3	SE3	SW1	E4	E6	ESE5	SE1	SE7	ESE11	ESE10	SE10	N4	NNW13	NNE5	ESE9	ESE9	SSE7	N0	ESE5	SE2	ESE1	ESE3	ESE3.5	NNW13		
5-Jun	NNE1	NW2	W3	WNW3	NNW2	NNW2	WSW3	NNW4	NNW11	N10	N12	NNE10	NNE9	NNW14	NNW13	NNW16	NNW17	WNW14	NNW13	NW9	WSW4	SW22	W21	WSW11	NW6.7	SW22		
6-Jun	WSW18	WSW15	WSW11	WSW13	SW9	WSW15	WSW14	SW12	SW11	WSW16	SW18	SW20	SW19	SW19	SW18	WSW17	WSW17	WSW17	SW11	WSW6	SSW2	SSW2	SE2	SE3	SW12.3	SW20		
7-Jun	SSE6	SSE7	SE10	SE8	SE11	SE11	SE7	ESE6	SSW7	SW15	WSW15	SW21	WSW22	WSW25	WSW25	WNW22	WNW25	WNW24	NW20	NW15	W11	SW6	ESE3	E3	WSW7.5	WNW25		
8-Jun	ENE4	NE4	NNW7	WNW3	ESE2	ENE3	SW4	W4	NW5	N7	NNW9	N11	N11	N11	NNW8	NE3	WSW3	SE2	WSW5	SW6	WSW2	WSW1	SW3	SSE3	NNW2.5	N11		
9-Jun	SSE3	ESE4	SSE4	SE5	SE7	SE7	SE7	S4	WSW4	WSW5	W4	WNW4	NNE1	SSE6	SSE9	S10	SSW10	SSW9	S7	ESE2	SE6	E1	E2	SSE3	S3.8	SSW10		
10-Jun	E1	SSE3	SSE7	SE9	SE8	SE10	SE11	SE12	SE12	SE12	SE12	SE13	SSE13	SSE18	SSE18	SSE19	S20	S17	S13	SSE14	SE11	SE8	ESE6	SE7	SSE10.9	S20		
11-Jun	SE9	SE10	SE5	SE8	SE4	SE7	SSE4	SSW4	WNW9	WNW14	NNW9	N8	N5	NNW10	NNW13	NW11	NNW10	NW19	NW16	WNW7	W3	WNW5	NNW3	W2	NW3.6	NW19		
12-Jun	WNW4	SW5	SW7	E4	ESE2	SE1	S4	NE3	NNW3	NW5	N6	N10	NW5	SW10	SW13	SW8	SW5	SW3	NNE2	NNE1	NE2	ESE4	ESE9	SE10	SW1.1	SW13		
13-Jun	SE10	SE8	SE9	SE9	SE9	SE9	SE11	SE11	SE11	ESE10	E8	ESE8	ESE8	ESE4	E8	NNW14	NNW13	N17	NNW14	WNW7	NNW10	NW15	NNW12	NNW9	ENE3.1	ENE17		
14-Jun	NNW9	NNW6	NNW7	NNW9	NNW14	NNW17	NNW15	NNW21	NNW27	NNW26	NNW24	NNW21	NNW22	NNW24	NNW31	NNW27	NNW25	NNW27	NNW24	NNW27	NNW29	NNW26	NNW29	NNW21.3	NNW31			
15-Jun	NNW25	NNW27	NNW25	NNW22	NNW27	NNW25	NNW26	NNW22	NNW17	NW11	NNW8	WNW17	WNW23	NW20	NW15	NW15	NNW19	N9	N5	NNW3	WSW1	SE1	SSE2	SE4	NNW14.2	NNW27		
16-Jun	SSW6	SE5	SE6	SE7	SE7	SE7	SE7	SE7	SE7	SE8	ESE7	SE10	SSE10	SW12	WSW16	SW13	SW9	SSW10	SSE9	SW10	WSW5	SSE4	SSW9	SW16	WSW17	S6.4	WSW17	
17-Jun	S5	SSE4	SSW11	S7	S7	SW10	SW11	SW12	SSW14	SW17	SE17	WSW20	SW19	SW17	WSW19	WSW16	WSW17	WSW16	WSW16	WNW17	NNW15	N6	N3	WNW4	WSW10.2	WSW20		
18-Jun	NNW9	NNW10	N4	E3	ESE4	N6	NNW7	NNW7	NE7	ENE9	NNE9	N12	N11	NNE10	ENE12	ENE16	ENE18	NE17	NE16	NE13	NNE13	N11	N9	N10	NNE8.4	ENE18		
19-Jun	NNE14	NNE14	NNE14	NNE18	NNE18	NNE21	N18	N17	N16	NNE17	NNE20	N20	N24	N24	N19	N16	NNW17	NNW19	NNW20	NNW23	NNW22	NNW24	NNW26	NNW26	N18.6	NNW26		
20-Jun	NNW27	NNW26	NNW24	NNW21	NNW22	NNW23	NNW21	NNW20	NNW22	NNW22	NNW21	NNW21	NNW22	NNW20	NW18	NW16	NNW16	NNW20	NNW14	NW10	NW11	NW9	NW8	NW8	NNW18.2	NNW27		
21-Jun	NNW8	NNW8	NNW7	NW9	NW8	NW8	NNW11	NNW11	NNW17	NNW17	NNW15	N13	N11	N10	N11	N11	N10	N11	N9	NNE8	ENE6	WSW3	ESE1	SSE1	NNW8.3	NNW17		
22-Jun	ESE4	SE6	SE4	SE5	SE8	SE8	SE8	SSE8	ESE2	E3	SW2	SW15	SW19	SW14	W23	W17	SW18	W16	SW9	SSW5	SSW5	S6	SSE6	SE3	SW5.7	W23		
23-Jun	SSE5	ESE5	SE7	SE3	WSW1	ESE3	SE7	SE7	ENE2	NE1	NNW4	SW2	W7	WSW5	WSW4	SW5	WSW6	SW7	S6	ESE5	SSE4	SW4	SSE3	S7	S2.4	SE7		
24-Jun	SSE9	SSE6	E1	SE5	SE10	SE11	SE9	SE5	SW2	E2	SSW9	SW12	SW13	SW12	SW12	SW10	N9	N6	N13	NNW20	N15	WNW7	NW16	N10	WSW1.5	NNW20		
25-Jun	N9	N9	N8	N7	NNW7	N8	N8	N9	NE10	ENE9	ENE11	ENE9	SSW3	SW8	WSW7	W6	W5	W5	WSW6	WSW6	SW6	SW2	SSW4	SSW4	NNW2.3	ENE11		
26-Jun	SSE4	SSE6	SSE9	SSE9	SSE8	SSE7	SE8	SE8	SE7	SE6	ENE1	SE7	SSE5	NNW1	SSW4	SW16	W8	SE3	S6	SSE4	S4	SW3	E1	ESE1	SSE4.2	SW16		
27-Jun	NNE0	WNW1	SW2	WSW4	SW5	SW5	W1	NNW6	NNW8	NNW10	NNW13	NNW11	NNW11	NNW12	NNW10	NNW9	NNW8	NW5	W4	SSW7	S5	SSW3	SSW2	SSE3	NW3.8	NNW13		
28-Jun	SSW3	SSW5	SSW3	SSE2	SE9	SE8	SE8	SE7	ESE7	ESE7	S7	SW6	WSW4	WSW4	WSW8	SSW12	S8	SSE6	SE12	SE10	SE10	SE8	SE8	SSE7	SSE5.6	SE12		
29-Jun	SE7	SE6	SE6	SE5	SSE6	SE4	SSE5	S3	WNW3	W4	NW4	WSW5	SW6	WSW9	WSW16	W29	SSW5	SSE5	SE2	SE5	SE5	S4	SSE3	S6	SSW3.4	W29		
30-Jun	E3	SE4	SSE5	SSE6	SSE4	SE6	SE9	S6	SSW8	SW12	SSW7	SW15	SW16	SW16	W20	WSW16	WSW17	WSW17	WSW17	WSW17	WSW17	WSW17	WSW12	SW7	SW8	WSW10	WSW8.6	WNW20

N0.9	N1.0	NW0.7	E0.7	ENE0.8	NE0.8	E0.4	N0.9	NNW2.8	NNW2.8	NNW3.4	NW3.5	NNW4.2	NNW5.5	NNW6.6	NNW6.5	NNW5.3	NW4.2	NW3.7	NW2.8	NNW1.5	NNW1.9	NW1.9	NNW1.2	Diurnal Average											
NNW27	NNW27	NNW25	NNW22	NNW27	NNW25	NNW26	NNW22	NNW27	NNW26	NNW26	NNW24	N24											WSW25	WSW25	NNW31	NNW27	NNW25	NNW27	NNW24	NNW27	NNW29	NNW26	NNW29	Diurnal Maximum	

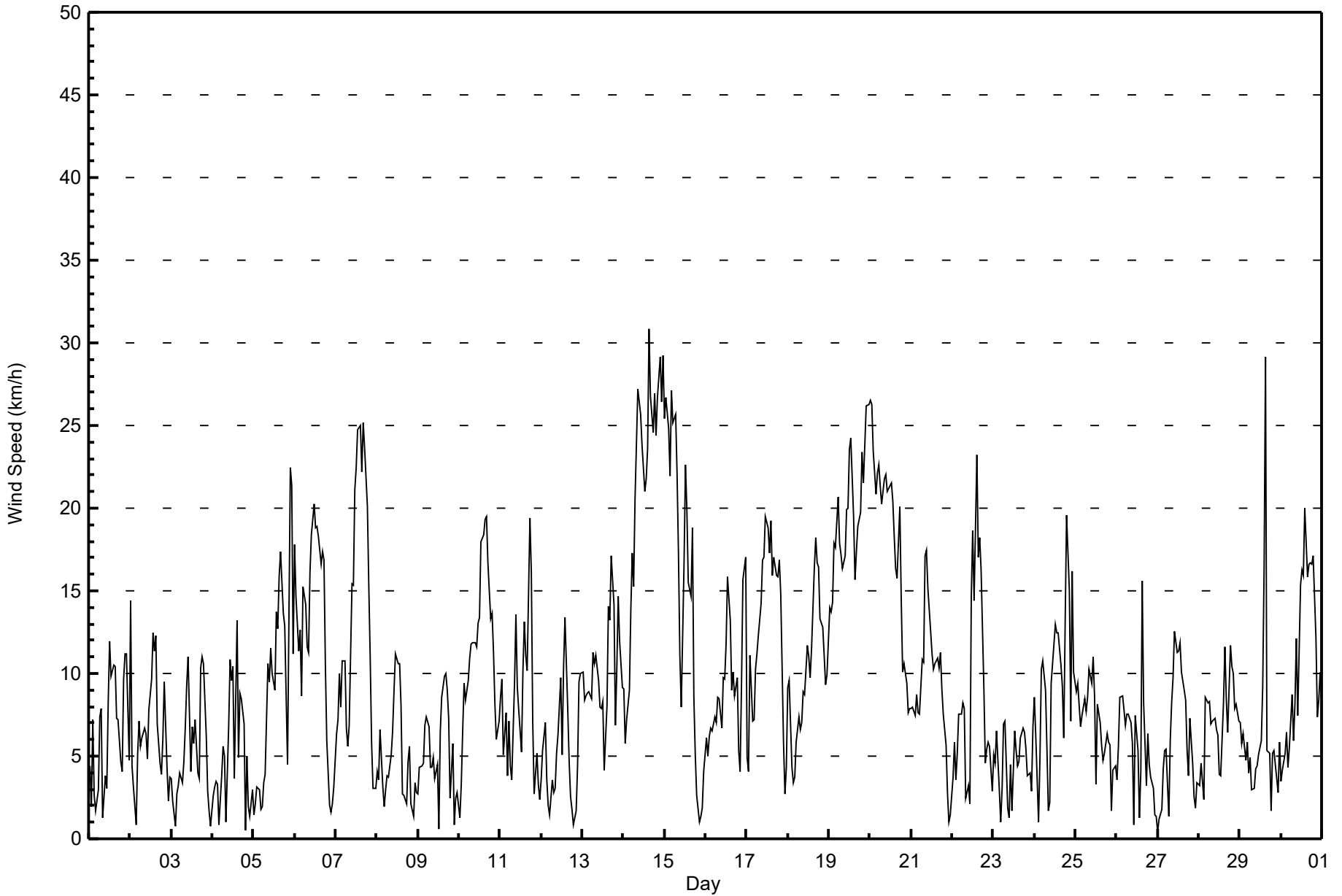
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	227	31.53	31.53
6 - 11	287	39.86	71.39
12 - 19	136	18.89	90.28
20 - 28	66	9.17	99.44
29 - 38	4	0.56	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
Athabasca Valley - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	8	8	11	7	17	20	31	27	7	16	16	18	10	10	8	13	227
6 - 11	34	5	2	8	8	16	68	22	11	12	21	12	4	4	14	46	287
12 - 19	11	8	3	4	0	0	6	5	2	2	27	25	2	4	9	28	136
20 - 28	3	2	0	0	0	0	0	0	1	0	3	4	2	6	1	44	66
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	4
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	23	16	19	25	36	105	54	21	30	67	59	19	24	32	134	720

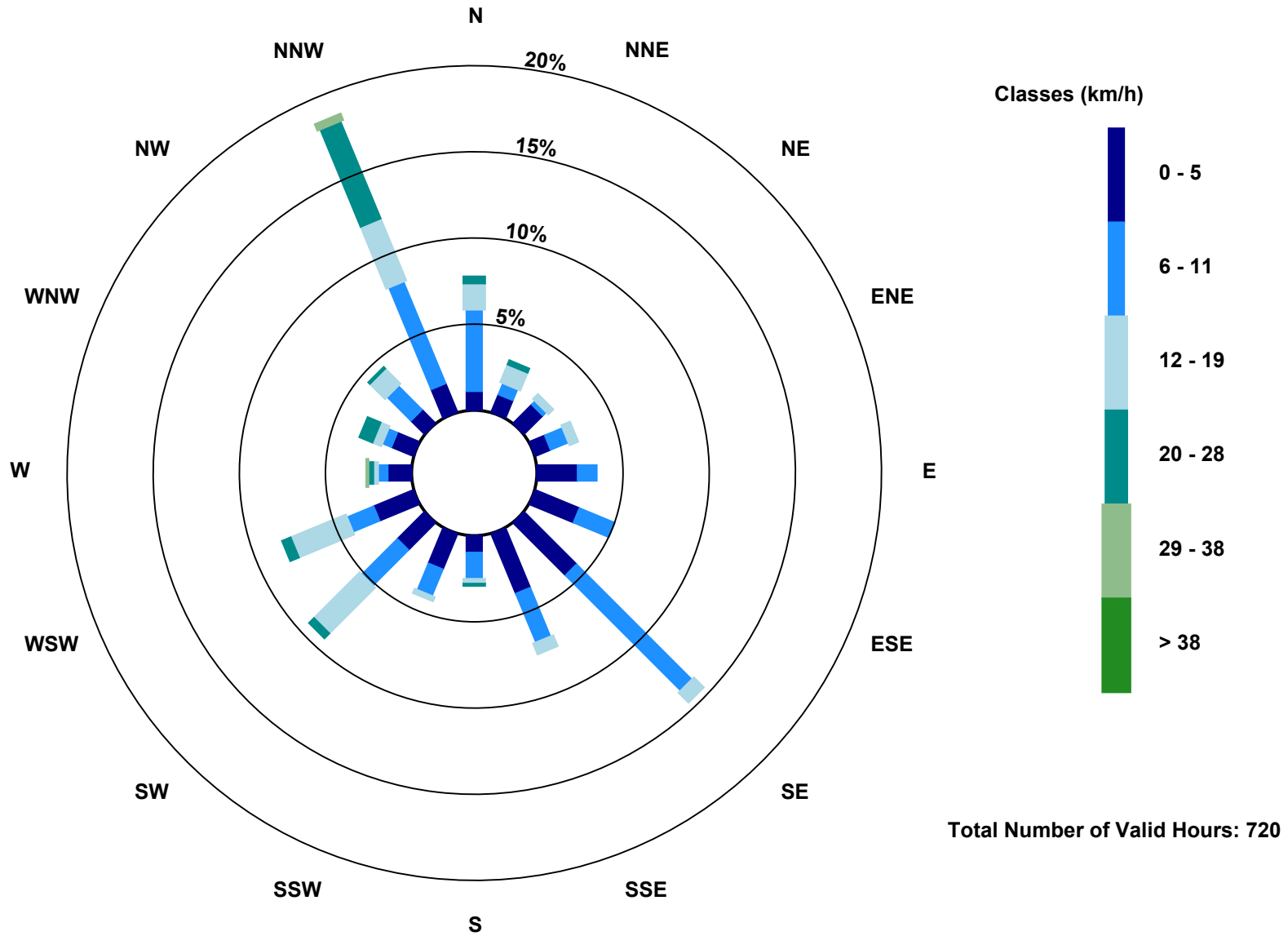
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Athabasca Valley





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 337 deg on Jun 14 16:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 336.8 deg on Jun 14	Hours of Data: 720
Direction of Minimum Speed: 14 deg on Jun 27 01:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.1 deg on Jun 12	Percent Operational Time: 100.0
Monthly Average Direction: 308.4 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-Jun	183	30	321	328	320	198	214	228	272	69	30	342	358	352	341	346	348	348	344	68	90	76	78	87	9.4	
2-Jun	71	343	327	88	330	329	353	342	348	346	323	335	341	339	335	337	344	4	46	83	92	108	163	159	359.4	
3-Jun	156	139	96	48	71	79	53	350	326	339	329	317	152	79	119	124	49	104	98	113	100	88	43	35	75.1	
4-Jun	142	142	132	124	228	90	101	122	144	130	123	112	125	360	330	31	119	119	161	354	113	139	115	117	113.9	
5-Jun	18	320	259	285	328	294	254	328	342	3	8	14	17	338	338	338	327	298	337	323	258	234	261	246	315.4	
6-Jun	245	243	247	241	220	242	237	214	221	241	224	232	232	231	235	240	244	240	236	237	198	204	133	144	234.1	
7-Jun	152	151	144	141	137	138	129	118	213	223	237	224	243	257	255	283	291	299	315	313	278	235	121	81	249.1	
8-Jun	78	39	342	296	117	71	235	276	317	352	345	359	2	359	336	50	237	134	241	227	238	255	231	152	338.0	
9-Jun	156	123	154	142	145	145	137	176	253	254	279	294	27	164	154	187	203	196	182	112	135	94	95	165	170.9	
10-Jun	91	155	151	141	130	124	131	134	136	130	132	134	164	160	154	168	169	174	177	167	145	145	116	126	149.8	
11-Jun	129	139	143	145	146	142	160	203	291	300	335	4	354	341	335	326	342	325	309	290	262	293	341	278	319.6	
12-Jun	302	227	236	80	123	126	188	56	331	321	358	353	326	233	235	227	230	215	23	16	45	123	119	132	232.8	
13-Jun	142	140	137	131	130	137	141	132	130	120	100	114	115	116	81	335	345	11	343	303	345	325	344	343	68.9	
14-Jun	337	344	331	338	334	332	335	338	333	336	335	341	337	338	337	338	341	339	336	341	339	336	338	336	337	336.8
15-Jun	335	337	332	334	335	334	336	336	329	312	330	297	296	304	311	324	329	352	1	335	256	143	163	133	327.0	
16-Jun	195	139	131	139	137	132	124	134	137	121	127	161	217	239	229	221	197	166	217	254	165	213	236	243	189.6	
17-Jun	181	159	212	184	189	216	219	214	213	218	233	241	235	236	246	241	245	238	252	293	333	358	357	291	237.6	
18-Jun	328	344	3	94	121	357	337	344	51	68	32	351	8	28	66	75	65	51	47	40	30	10	353	7	30.3	
19-Jun	13	16	12	27	26	19	7	352	9	14	15	9	359	359	9	8	347	343	344	339	337	336	336	337	358.6	
20-Jun	337	338	338	341	337	338	340	348	347	339	346	345	343	332	326	323	327	333	327	325	313	315	323	321	335.8	
21-Jun	328	331	327	320	320	311	318	329	335	335	347	353	355	10	357	357	3	351	9	29	68	244	123	149	344.7	
22-Jun	120	126	142	144	146	136	139	147	114	96	227	221	228	227	276	266	234	264	236	207	204	183	161	142	214.8	
23-Jun	160	123	133	126	256	122	137	145	61	41	334	234	267	258	245	233	247	230	186	111	158	218	160	173	182.8	
24-Jun	167	160	87	133	133	137	134	128	232	86	213	216	217	214	219	219	359	357	352	343	355	294	325	351	252.0	
25-Jun	359	5	9	350	343	354	1	1	54	64	67	59	195	228	250	278	263	266	243	237	221	216	210	210	342.9	
26-Jun	164	155	147	150	154	148	140	134	132	133	74	135	155	343	213	230	275	130	183	155	180	229	93	108	163.0	
27-Jun	14	303	228	241	230	228	281	345	347	347	343	343	340	337	338	337	338	326	267	204	181	194	211	159	320.9	
28-Jun	212	212	204	158	137	138	138	132	116	118	189	224	248	248	238	202	180	154	144	138	136	131	132	149	160.1	
29-Jun	140	137	143	143	149	136	156	169	285	270	322	253	234	239	258	272	198	166	140	133	134	173	150	191	208.9	
30-Jun	94	145	149	150	149	129	138	180	207	216	208	216	218	222	281	237	238	242	244	249	248	215	230	238	223.7	

4.3	8.0	322.0	79.1	78.7	54.9	82.2	354.2	335.6	332.9	334.9	304.0	287.2	288.3	289.8	288.8	297.0	305.9	306.0	315.1	347.7	291.9	316.3	296.8
Diurnal Average																							

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



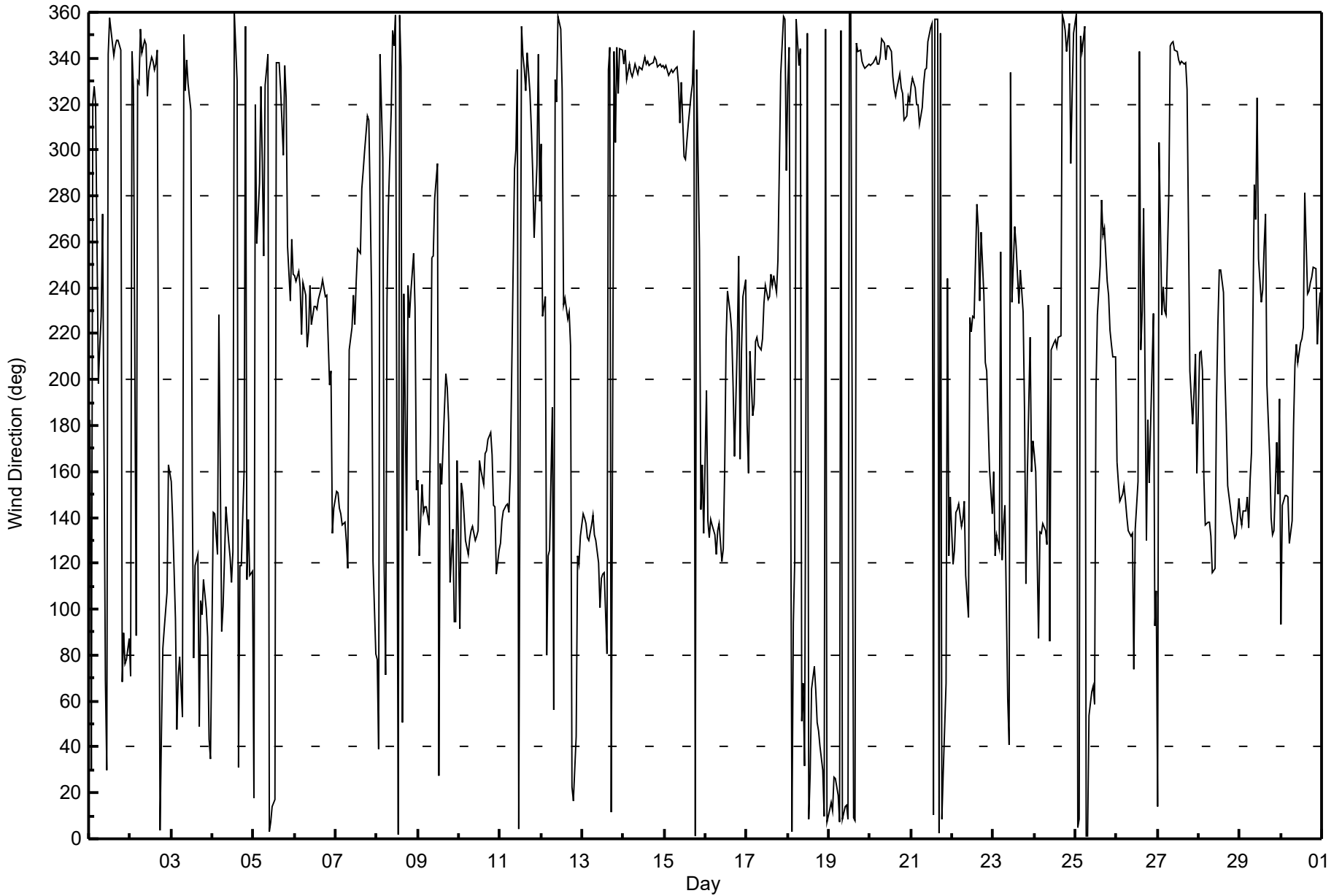
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 105 deg on Jun 9 13:00	Hours of Data: 720
Minimum Value: 8 deg on Jun 7 20:00	Hours of Missing Data: 0
	Hours of Calibration: 0
	Percent Operational Time: 100.0
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 16 Median = 23 Q ₃ = 42 P ₉₀ = 68 P ₉₉ = 93	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	54	86	24	72	68	45	21	23	91	72	78	33	22	24	16	18	20	20	17	54	18	21	16	91	91
2-Jun	35	48	48	97	32	15	29	20	18	19	22	19	20	16	15	17	23	29	39	24	13	40	75	38	97
3-Jun	42	59	91	34	16	16	35	32	13	17	12	74	47	73	50	72	78	23	19	21	20	44	68	81	91
4-Jun	57	39	41	43	82	49	25	24	87	31	19	23	25	76	53	59	29	34	40	97	28	58	80	47	97
5-Jun	65	64	46	56	62	70	52	42	17	23	23	33	41	14	15	14	11	41	32	35	49	11	25	27	70
6-Jun	13	14	15	18	29	14	13	16	22	25	15	18	18	18	17	18	17	15	16	19	80	72	55	59	80
7-Jun	15	10	15	28	21	11	21	32	44	15	17	15	21	19	16	17	15	13	14	8	22	63	58	60	63
8-Jun	52	47	23	58	60	54	21	52	35	31	25	27	31	28	33	84	80	76	53	9	77	90	75	58	90
9-Jun	48	32	26	31	21	18	18	43	20	19	30	38	105	64	45	41	25	19	26	38	18	96	83	58	105
10-Jun	77	48	34	13	15	18	15	15	15	15	16	17	24	18	19	16	14	14	15	13	15	39	55	17	77
11-Jun	14	13	79	35	42	21	55	69	38	19	32	23	45	31	22	35	25	13	14	46	40	36	46	55	79
12-Jun	49	54	40	22	68	78	66	55	53	30	44	23	36	16	12	15	18	73	58	75	74	46	18	14	78
13-Jun	16	21	20	18	19	18	12	15	16	28	33	35	41	77	41	27	21	22	27	55	45	27	26	29	77
14-Jun	18	34	34	33	11	10	14	14	9	11	12	13	17	17	16	12	13	16	19	16	12	14	12	13	34
15-Jun	12	13	10	12	12	12	12	15	14	14	24	17	9	11	10	13	11	26	32	44	86	80	68	42	86
16-Jun	40	23	19	12	16	14	17	13	14	28	22	20	33	14	20	20	22	19	41	66	55	32	15	11	66
17-Jun	59	73	22	49	45	27	23	14	13	14	15	14	15	17	17	17	18	14	18	31	17	31	66	42	73
18-Jun	12	17	37	37	37	31	16	28	46	23	40	32	27	36	21	17	17	20	20	20	17	20	25	22	46
19-Jun	19	22	22	19	22	17	22	23	19	18	18	20	23	22	21	21	21	20	19	15	13	12	12	13	23
20-Jun	13	13	14	17	13	14	18	23	22	16	21	20	20	9	10	10	11	11	11	13	10	14	13	10	23
21-Jun	12	13	12	10	12	10	13	20	16	13	21	25	26	27	24	26	23	23	31	20	53	61	80	85	85
22-Jun	38	26	39	24	18	20	15	20	94	88	91	15	15	19	12	15	16	15	22	14	13	22	39	56	94
23-Jun	31	34	27	51	87	66	15	27	72	89	53	86	18	37	47	43	38	17	43	35	61	59	57	22	89
24-Jun	12	43	89	23	13	13	13	30	94	76	13	12	13	16	13	14	62	26	26	23	32	42	19	23	94
25-Jun	21	21	18	24	21	21	23	34	27	38	26	41	80	31	27	27	27	34	17	13	11	82	40	44	82
26-Jun	49	22	15	14	17	17	16	19	21	35	97	70	29	92	82	14	53	81	45	51	47	38	80	89	97
27-Jun	96	77	88	23	16	14	78	24	18	19	16	16	13	12	12	13	17	11	37	13	37	76	75	63	96
28-Jun	50	42	47	48	26	17	17	23	30	28	55	45	47	61	65	20	24	36	15	16	13	20	14	34	65
29-Jun	34	31	20	28	21	56	50	62	53	35	29	18	26	18	13	22	57	29	72	38	23	40	65	64	72
30-Jun	68	47	20	10	23	23	15	42	37	14	21	13	12	17	20	16	14	15	16	11	10	13	28	11	68

	96	86	91	97	87	78	78	69	94	89	97	86	105	92	82	84	80	81	72	97	86	96	83	91	
	Diurnal Maximum																								





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS08 FORT CHIPEWYAN JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)

JUNE 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	2.7	0	1.4	0
TRS (ppb) Average	685	35	35	100	1.5	0	0.7	0
O3(ppb) Average	687	33	33	100	83.4	4	57.6	-
NO2(ppb) Average	685	35	35	100	12.6	0	2.4	-
NO(ppb) Average	685	35	35	100	4.6	-	0.5	-
NOX(ppb) Average	685	35	35	100	15.8	-	2.9	-
PM2.5(ug/m3) Average	718	1	2	99.86	503.1	64	197.7	7
CO(ppm) Average	686	34	34	100	2.7	0	0.8	-
CO2(ppm) Average	687	33	33	100	425.2	-	404.5	-
Temperature 2 m (C) Average	720	0	0	100	29.4	-	23.3	-
Relative Humidity (%) Average	656	0	64	91.11	100	-	75.8	-
Wind Speed 10 m (km/h) Average	720	0	0	100	43	-	29	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-
PC(mm) Total	720	0	0	100	5.7	-	34	-
Leaf Wetness (% of range) Average	720	0	0	100	41.8	-	24.5	-
Global Solar Radiation (W/m2) Average	720	0	0	100	884.5	-	371.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)

JUNE 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	0.23	0.4	-	0	0	0	0.1	0.2	0.7	2.7
TRS (ppb) Average	685	0.24	0.2	-	0.1	0.1	0.1	0.2	0.3	0.4	1.5
O3(ppb) Average	687	30.65	11	-	6.6	17.7	24.4	29.8	36.2	42.1	83.4
NO2(ppb) Average	685	0.95	1.3	-	0	0.2	0.4	0.5	1	2	12.6
NO(ppb) Average	685	0.1	0.3	-	0	0	0	0	0.1	0.1	4.6
NOX(ppb) Average	685	1.04	1.5	-	0	0.3	0.4	0.6	1.1	2	15.8
PM2.5(ug/m3) Average	718	30.7	61.6	-	0.1	0.5	2.3	8.3	33.7	72.1	503.1
CO(ppm) Average	686	0.16	0.3	-	0	0	0	0.1	0.1	0.4	2.7
CO2(ppm) Average	687	389.81	7.7	-	376.7	381.9	384.4	388.3	393.4	400.1	425.2
Temperature 2 m (C) Average	720	16.49	4.3	-	8	11.3	13.4	16.1	18.9	22.3	29.4
Relative Humidity (%) Average	656	64.19	15.7	-	29.2	42.9	52.8	65.2	75.1	86.3	100
Wind Speed 10 m (km/h) Average	720	14.9	7	-	2	6	10	14	19	25	43
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	51.67	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	1.61	6.1	-	0	0	0	0	0	1.6	41.8
Global Solar Radiation (W/m2) Average	720	232.88	261.4	-	0	0	5.5	121.6	422.6	683.3	884.5

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	26 Jun 2023 13:00	26 Jun 2023 13:00	1	Maintenance - sample filter was replaced
Relative Humidity	04 Jun 2023 12:00	04 Jun 2023 17:00	6	Sensor operated out of range
Relative Humidity	04 Jun 2023 21:00	05 Jun 2023 11:00	15	Sensor operated out of range
Relative Humidity	05 Jun 2023 17:00	05 Jun 2023 19:00	3	Sensor operated out of range
Relative Humidity	06 Jun 2023 00:00	06 Jun 2023 03:00	4	Sensor operated out of range
Relative Humidity	13 Jun 2023 23:00	15 Jun 2023 09:00	35	Sensor operated out of range
Relative Humidity	27 Jun 2023 04:00	27 Jun 2023 04:00	1	Sensor operated out of range



Wood Buffalo Environmental Association
Summary of Hour Averages

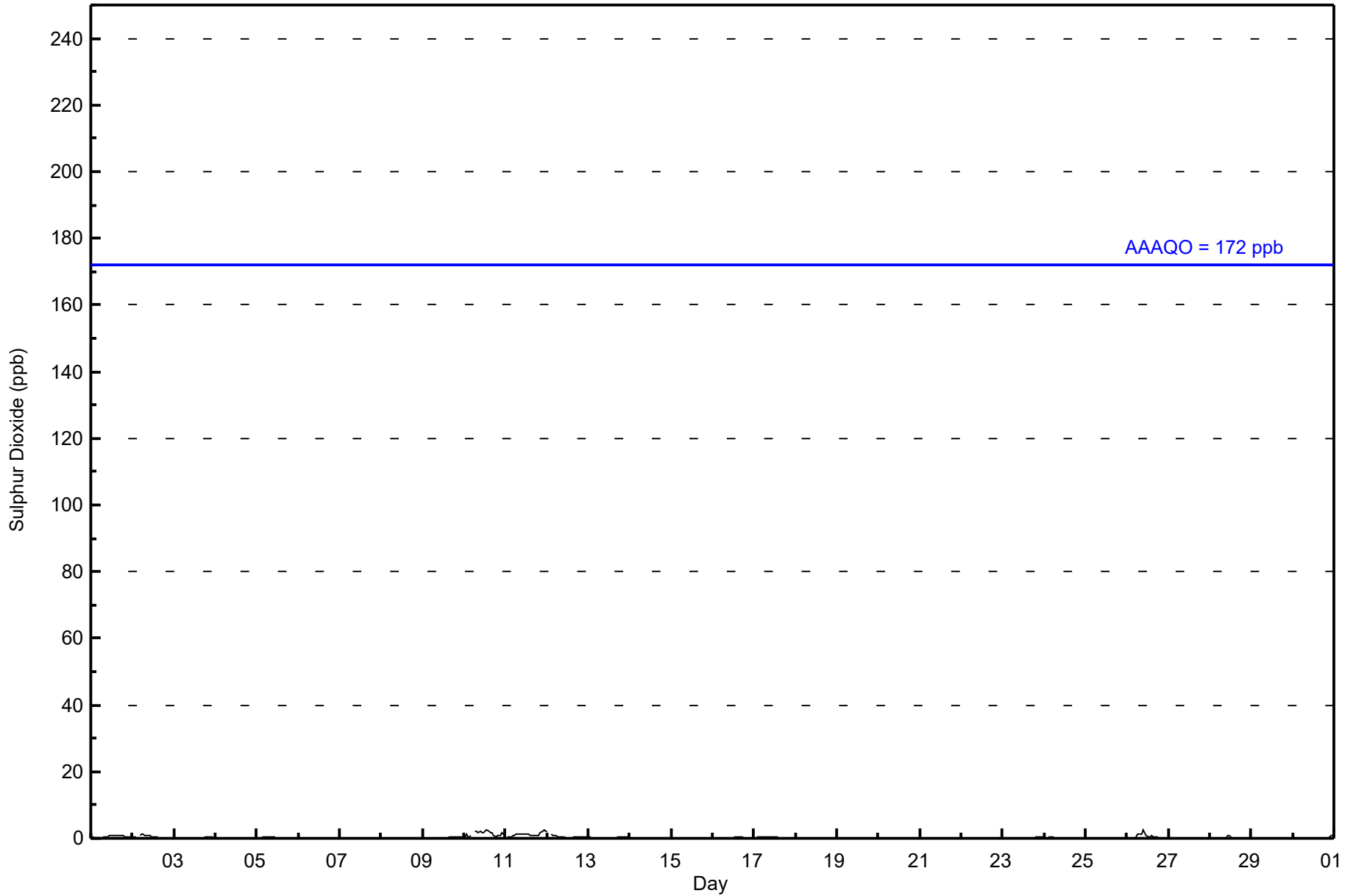
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 2.7 ppb on Jun 10 14:00		Maximum Daily Average: 1.4 ppb on Jun 10																			Hours of Data:	687																											
Minimum Value: 0.0 ppb on Jun 6 14:00		Minimum Daily Average: 0.0 ppb on Jun 22																			Hours of Missing Data:	33																											
Maximum Diurnal Average: 0.3 ppb at hour 10		Minimum Diurnal Average: 0.2 ppb at hour 4																			Hours of Calibration:	33																											
Monthly Average: 0.23 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.7 P ₉₉ = 2.1																			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-Jun	0.4	0.4	Z	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.7	0.7	0.7	0.9	1.0	0.7	0.7	0.7	0.7	0.4	0.2	0.2	0.3	0.5	0.5	1.0																							
2-Jun	0.4	0.5	0.6	Z	0.9	1.1	1.1	1.1	0.9	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	1.1																							
3-Jun	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	0.5	0.4	0.3	0.2	0.2	0.2	0.5																							
4-Jun	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2																							
5-Jun	Z	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4																							
6-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1																							
7-Jun	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
8-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1																							
9-Jun	0.1	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.2	0.5																							
10-Jun	0.6	1.1	0.5	0.4	0.7	Z	2.3	2.1	1.9	2.1	1.7	1.9	1.9	2.7	2.1	1.5	1.5	1.0	0.6	0.8	0.8	0.9	1.8	0.9	1.4	2.7																							
11-Jun	Z	0.5	0.5	0.6	0.8	0.9	1.1	1.4	1.4	1.5	1.3	1.2	1.2	1.1	1.0	0.9	1.0	0.8	0.6	1.0	1.6	2.0	2.3	2.3	1.2	2.3																							
12-Jun	1.9	Z	1.2	1.0	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.5	0.6	0.4	0.5	0.6	0.6	1.9																							
13-Jun	0.5	0.3	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.5																							
14-Jun	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
15-Jun	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	0.1																						
16-Jun	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.6																							
17-Jun	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.4																							
18-Jun	0.0	Z	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	0.1																							
19-Jun	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																							
20-Jun	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	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1																							
21-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
22-Jun	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																							
23-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.1	0.3																							
24-Jun	0.5	Z	0.5	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.5																							
25-Jun	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	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1																							
26-Jun	0.1	0.0	0.0	Z	0.1	0.4	1.4	1.3	1.1	2.6	1.7	0.8	0.6	0.4	0.7	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.6	2.6																							
27-Jun	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1																							
28-Jun	0.1	0.1	0.1	0.1	0.0	C	C	C	C	0.3	1.0	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	1.0																							
29-Jun	Z	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																							
30-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.5	0.7	0.7	0.2	0.7																							
																								0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	Diurnal Average		
																								1.9	1.1	1.2	1.0	0.9	1.1	2.3	2.1	1.9	2.6	1.7	1.9	1.9	2.7	2.1	1.5	1.5	1.0	0.7	1.0	1.6	2.0	2.3	2.3	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	31	28	50	84	130	34	8	17	39	28	20	49	57	27	47	38	687
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	31	28	50	84	130	34	8	17	39	28	20	49	57	27	47	38	687

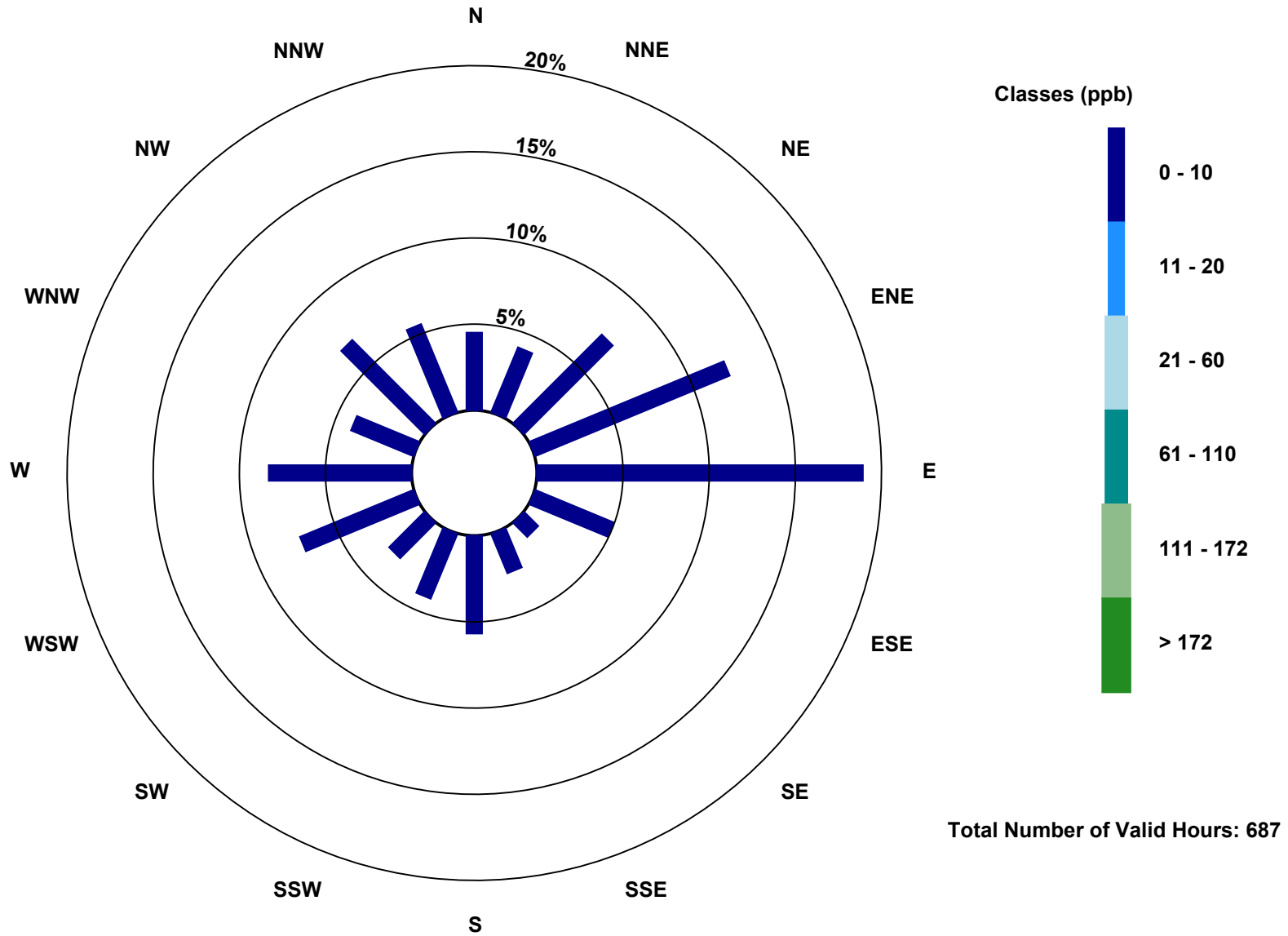
Total Number of Valid Hours: 687

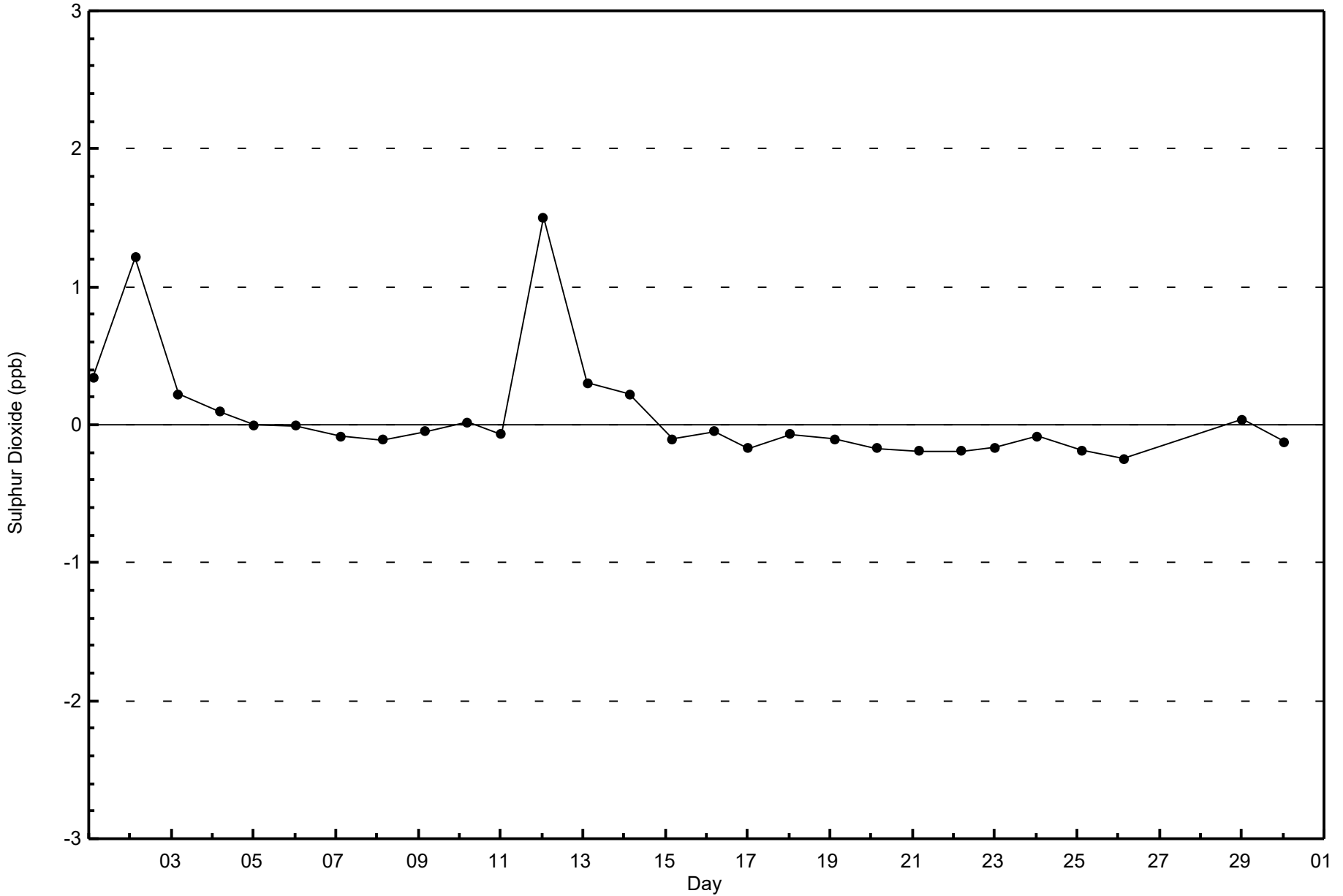
Total Number of Hours: 720

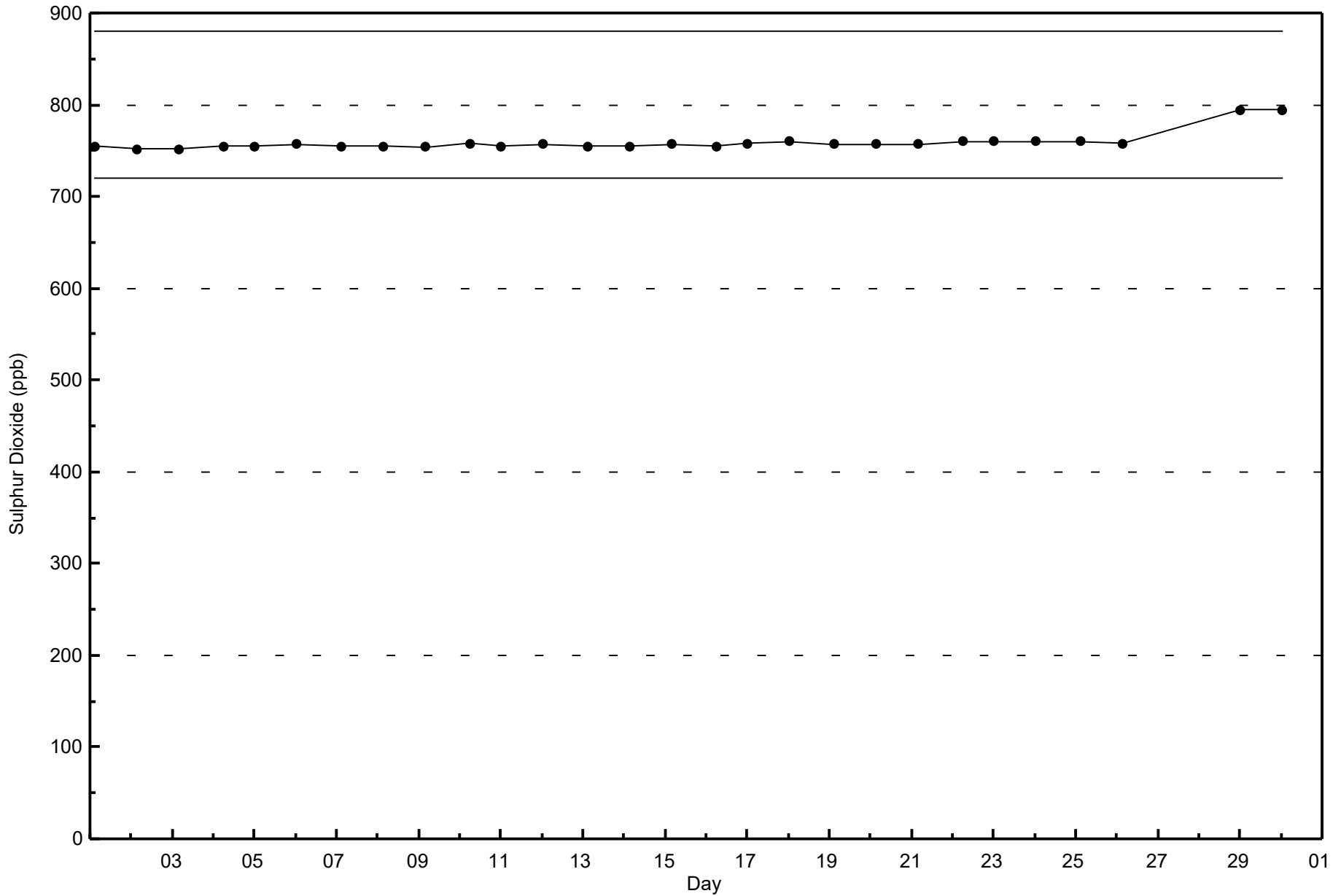


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan



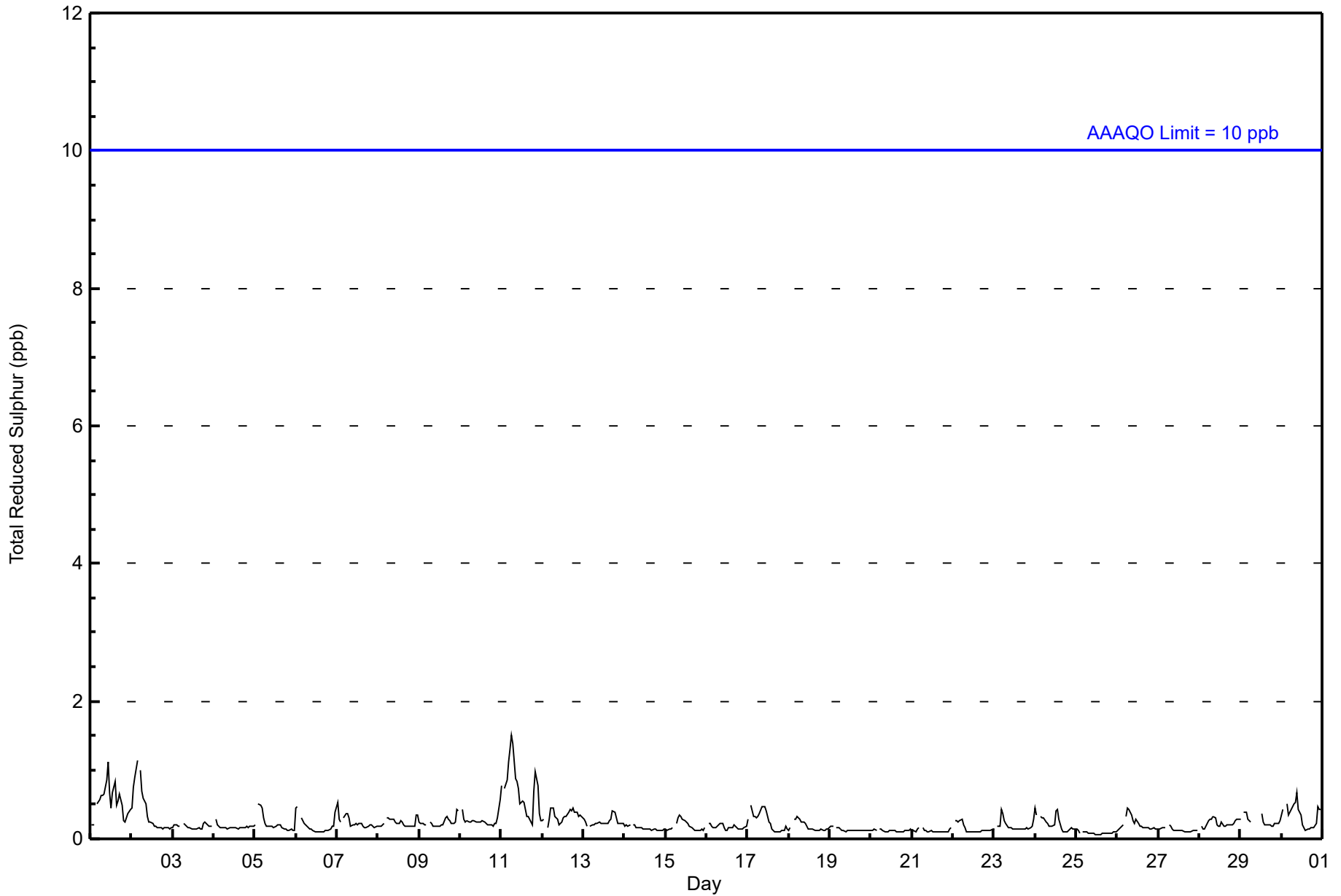






Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan - June 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**

**Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan - June 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	30	30	49	83	132	35	9	19	38	25	18	51	54	26	48	38	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	30	30	49	83	132	35	9	19	38	25	18	51	54	26	48	38	685

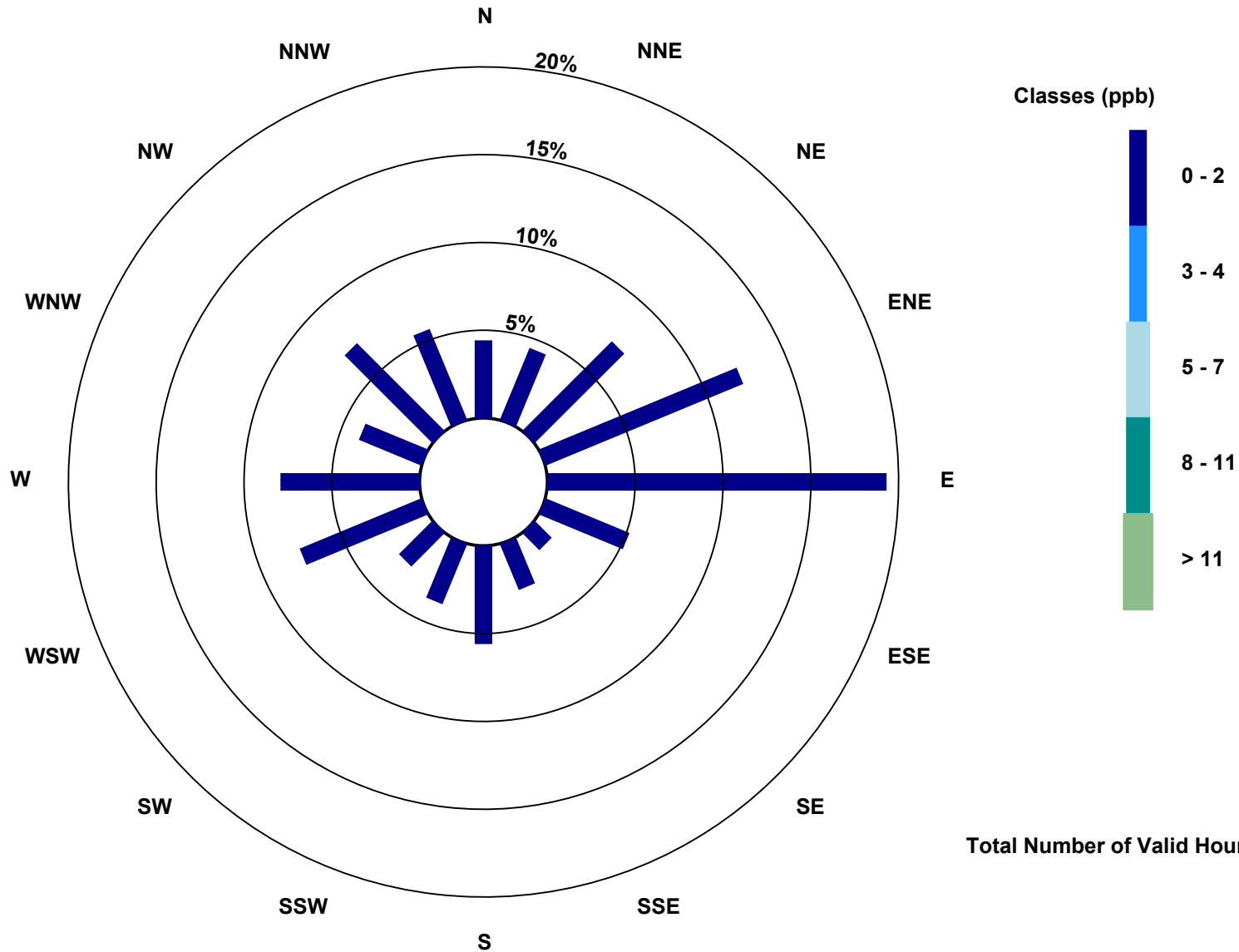
Total Number of Valid Hours: 685

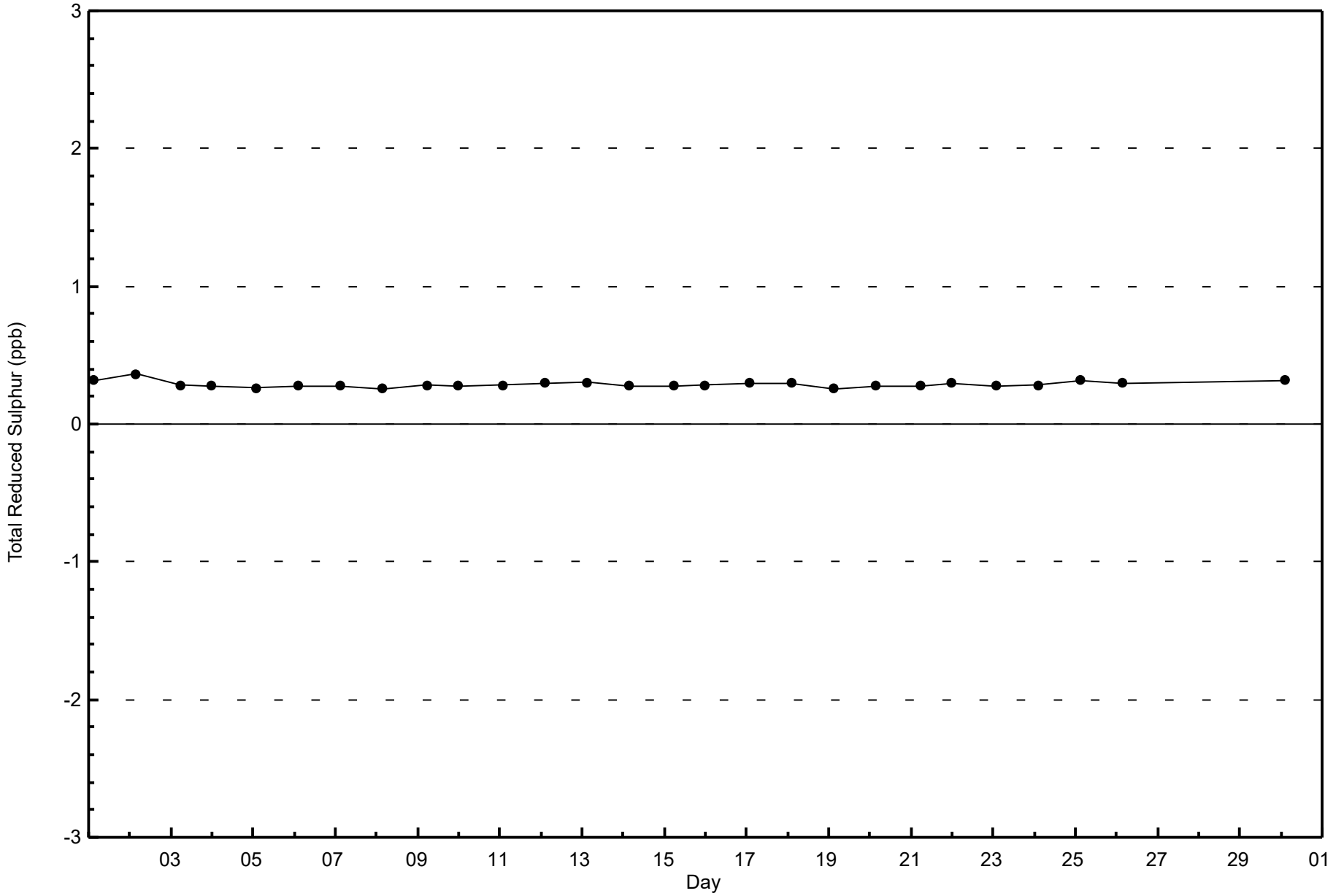
Total Number of Hours: 720

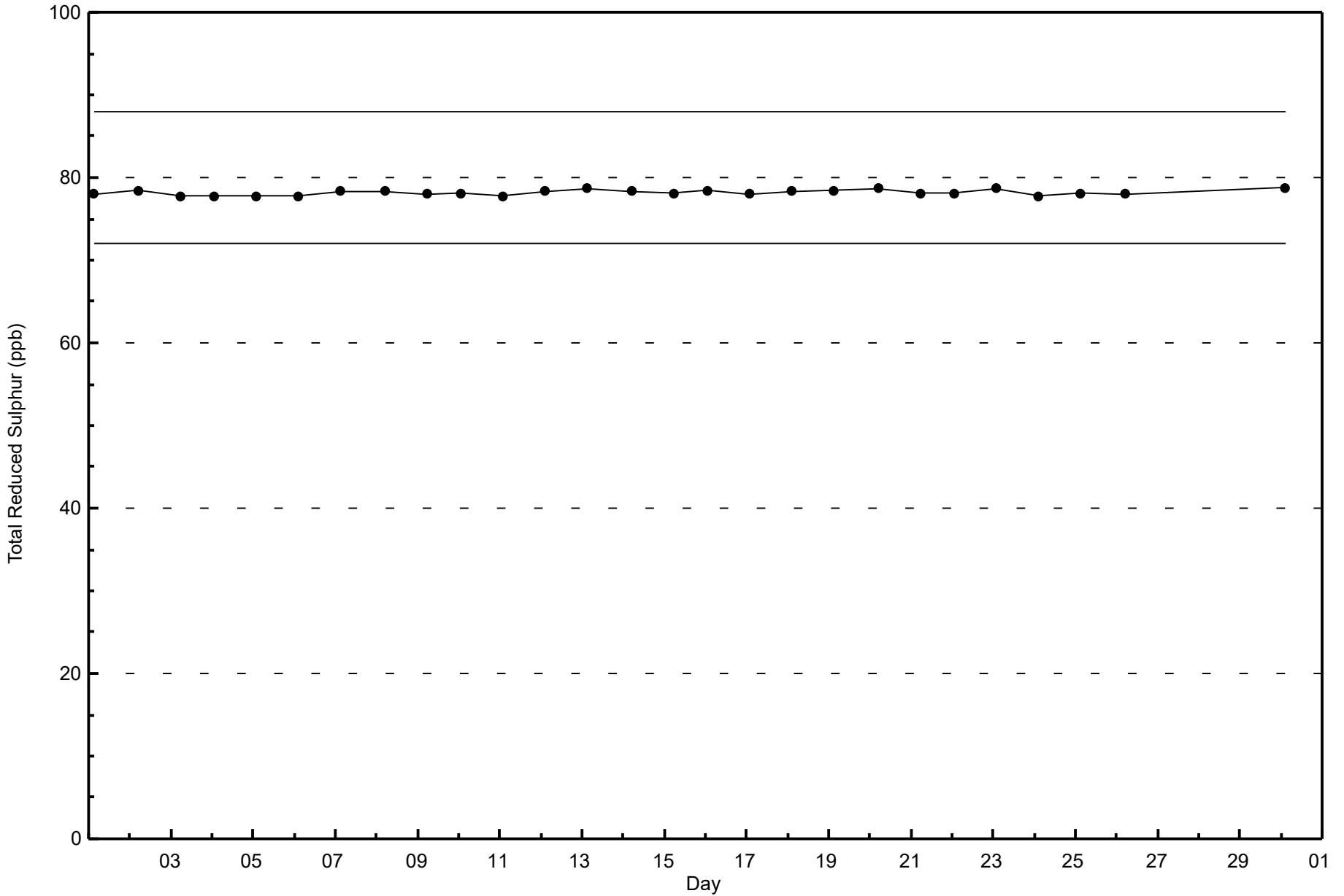


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan



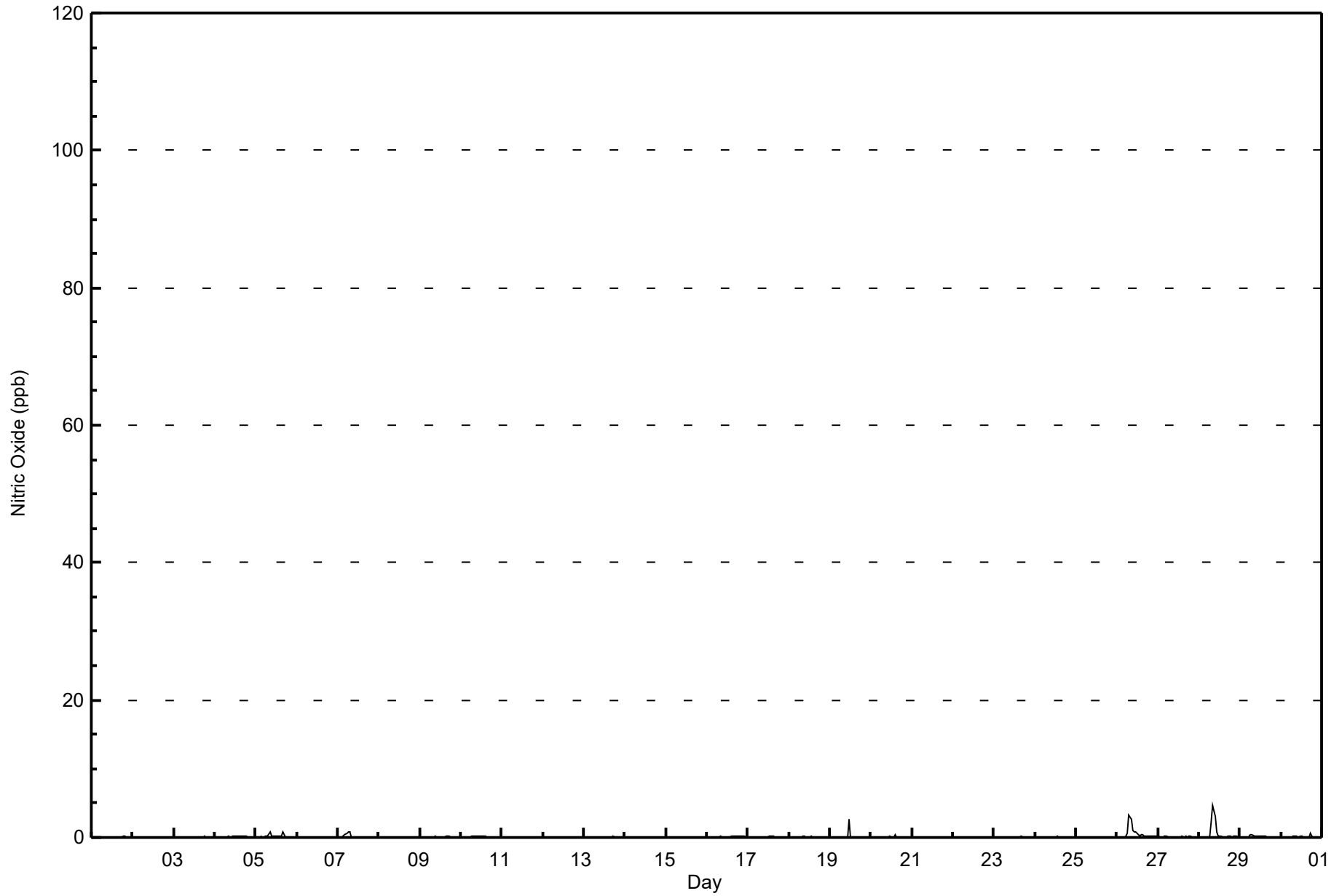






Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	29	31	50	86	128	33	9	16	40	27	19	51	55	27	46	38	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	29	31	50	86	128	33	9	16	40	27	19	51	55	27	46	38	685

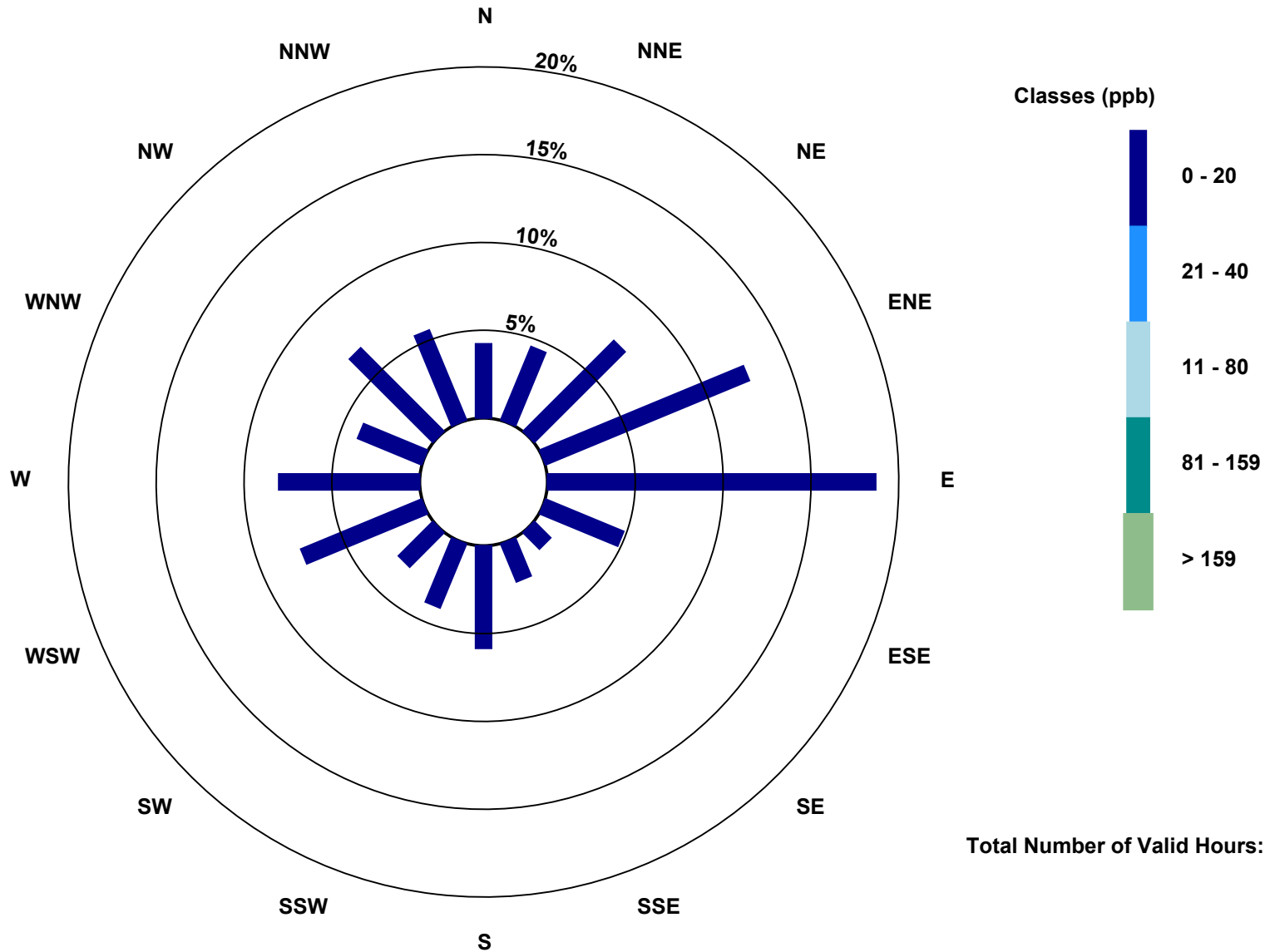
Total Number of Valid Hours: 685

Total Number of Hours: 720

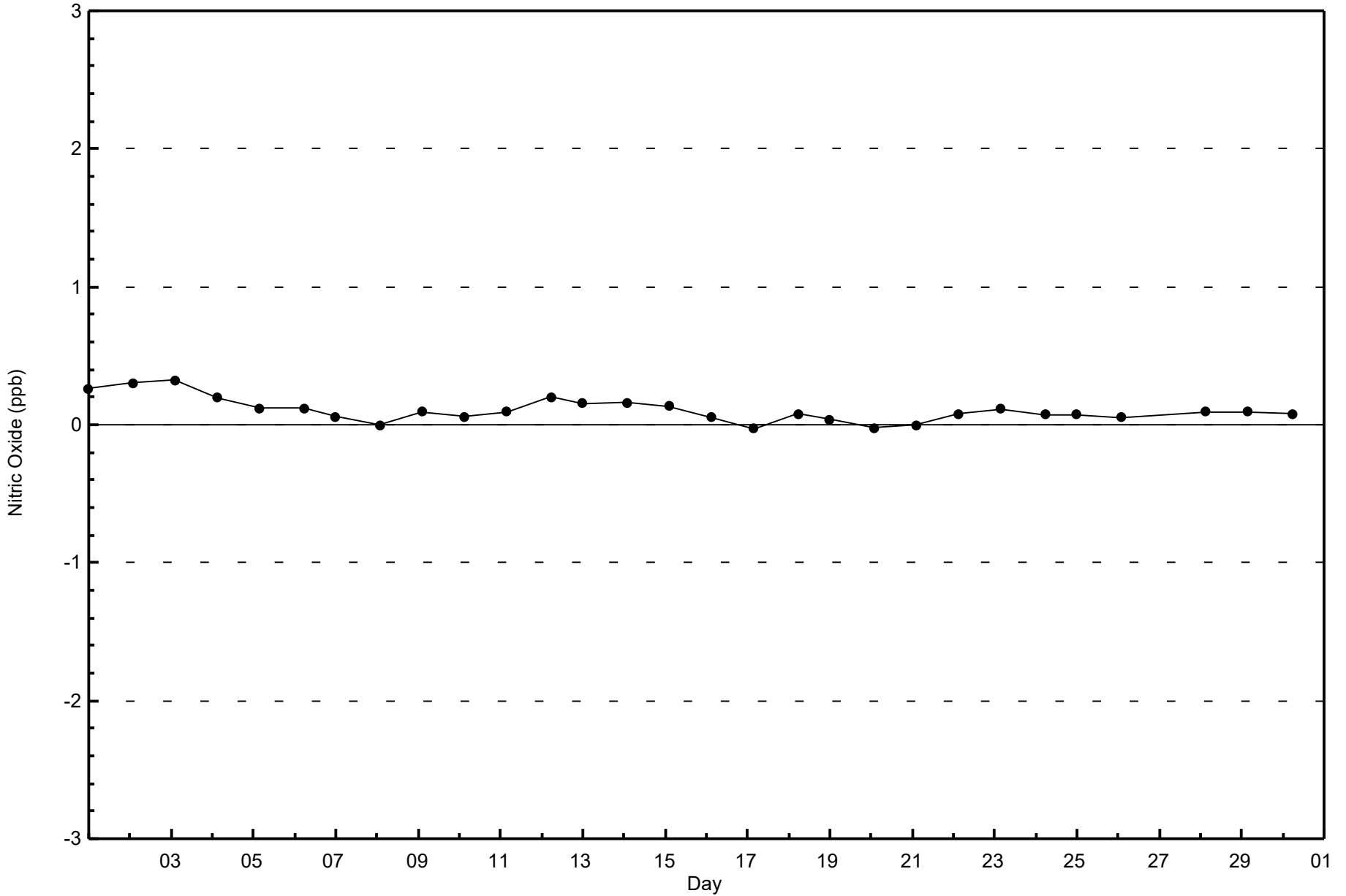


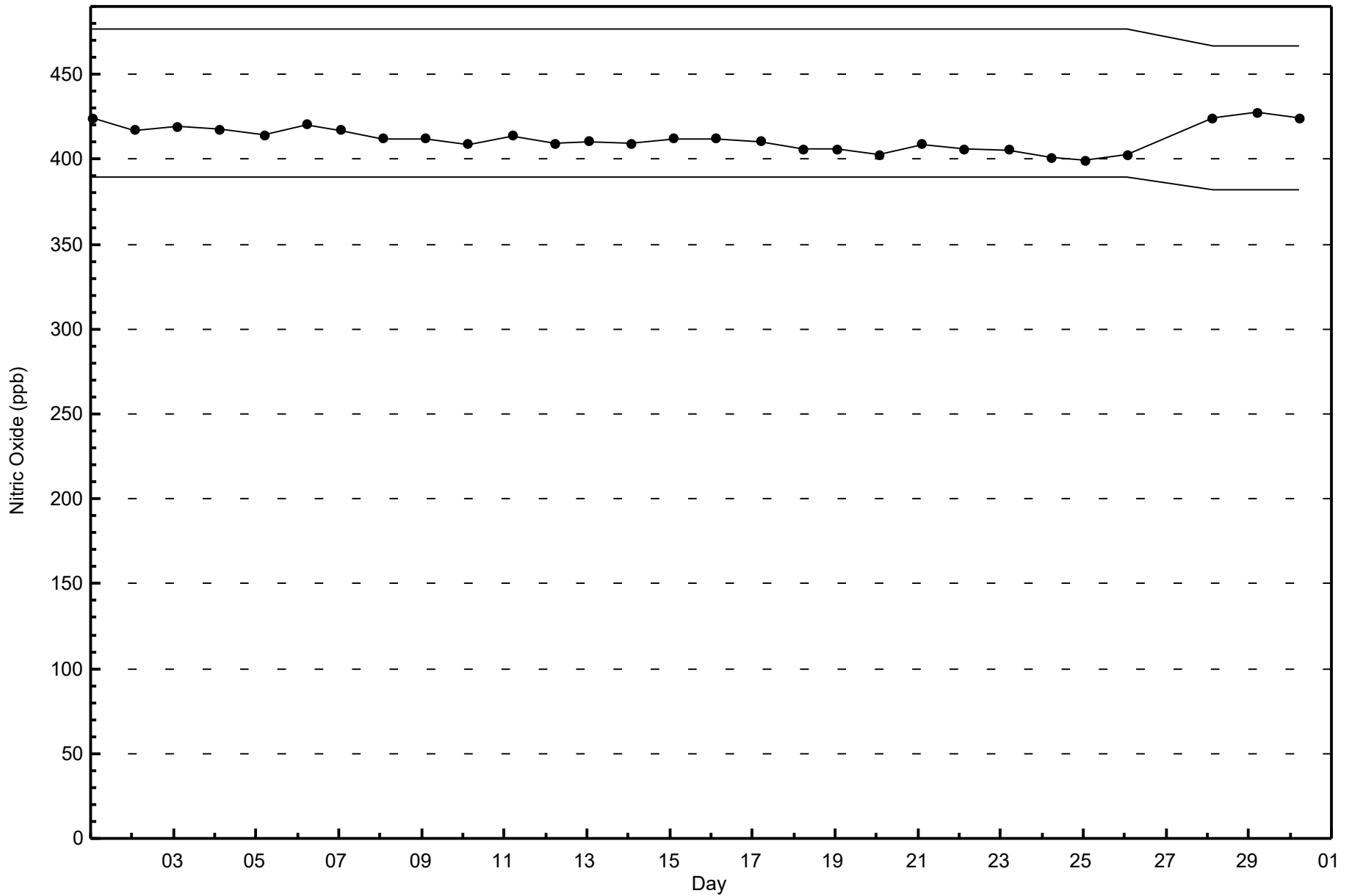
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Fort Chipewyan



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 12.6 ppb on Jun 26 08:00	Maximum Daily Average: 2.4 ppb on Jun 11
Minimum Value: 0.0 ppb on Jun 12 03:00	Hours of Data: 685
Maximum Diurnal Average: 1.4 ppb at hour 8	Hours of Missing Data: 35
Monthly Average: 0.95 ppb	Hours of Calibration: 35
Minimum Daily Average: 0.1 ppb on Jun 14	Percent Operational Time: 100.0
Minimum Diurnal Average: 0.6 ppb at hour 13	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.4 Median = 0.5 Q ₃ = 1.0 P ₉₀ = 2.0 P ₉₉ = 7.4	

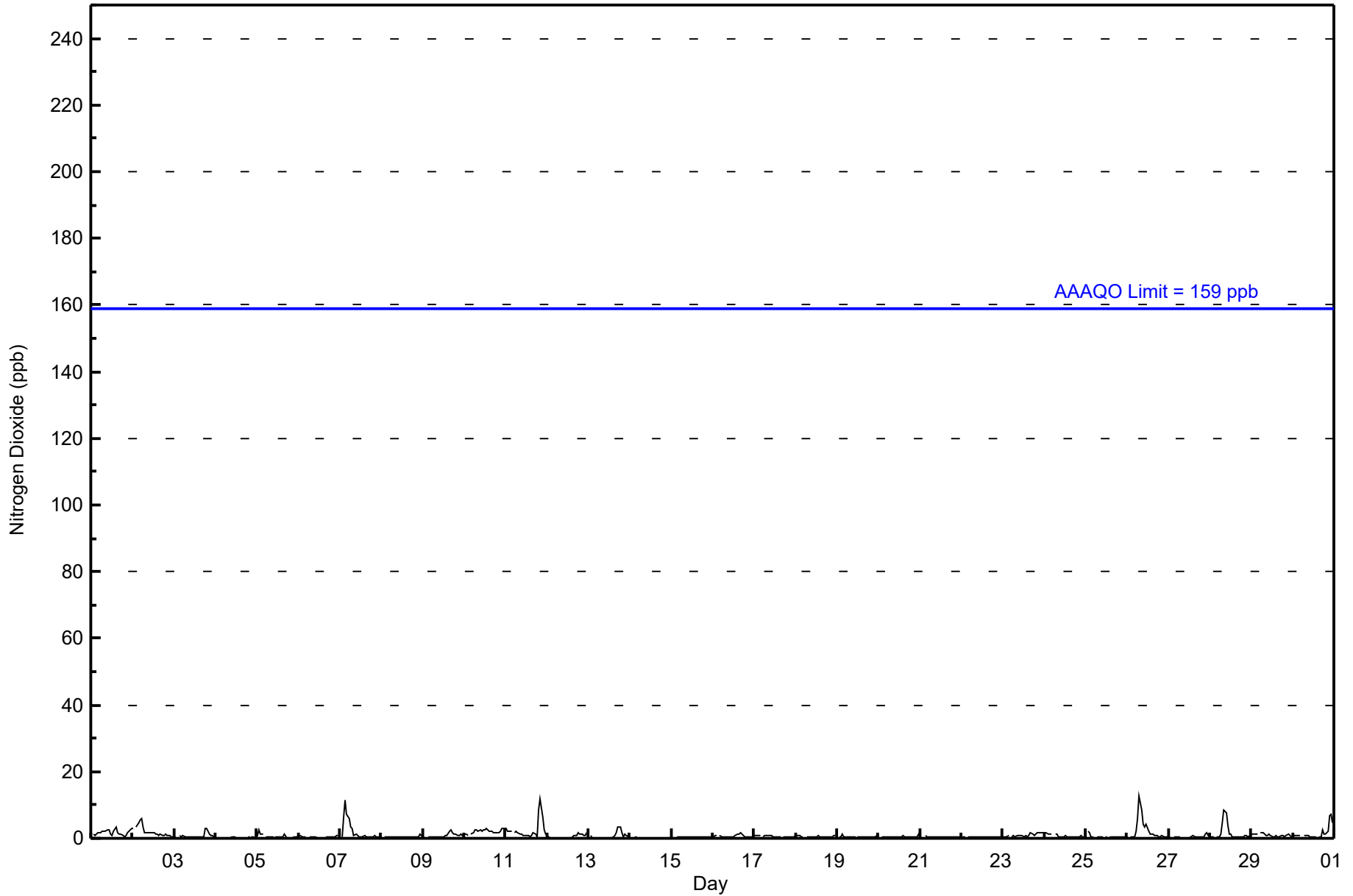
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	1.1	0.7	1.2	1.5	1.6	2.0	2.1	2.0	2.5	2.6	1.4	0.9	2.1	3.2	1.5	1.2	1.3	1.0	0.6	0.9	1.6	2.2	3.0	1.7	3.2	
2-Jun	3.1	Z	3.6	4.6	5.3	5.9	3.6	1.7	1.6	1.5	1.8	1.8	1.8	1.4	1.2	1.0	1.1	1.0	0.9	1.4	0.9	0.7	0.5	0.4	2.0	5.9	
3-Jun	0.4	0.5	Z	0.8	0.5	0.9	0.5	0.6	0.6	0.6	0.4	0.5	0.5	0.4	0.3	0.4	0.4	0.3	2.9	2.9	1.3	0.8	0.7	0.5	0.8	2.9	
4-Jun	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.2
5-Jun	0.8	2.7	1.2	1.2	Z	0.6	0.4	0.3	0.6	0.3	0.2	0.3	0.3	0.3	0.3	0.3	1.2	0.2	0.1	0.2	0.2	0.4	0.5	0.3	0.6	2.7	
6-Jun	0.7	0.7	0.6	0.5	0.5	Z	0.5	0.6	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.9	0.5	0.9	
7-Jun	Z	0.5	6.4	11.4	7.4	5.9	3.6	2.9	1.0	1.3	0.9	0.5	0.6	0.6	0.7	0.5	0.4	0.4	0.5	0.6	0.9	0.6	0.4	0.3	2.1	11.4	
8-Jun	0.4	Z	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	1.1	0.8	0.5	1.1	
9-Jun	0.4	0.3	Z	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.8	0.9	2.1	2.5	1.7	1.3	1.1	0.9	0.8	1.1	1.0	0.8	2.5	
10-Jun	1.2	1.4	1.0	Z	1.3	1.9	2.6	2.5	2.3	2.5	2.3	2.6	2.6	2.8	2.3	2.2	2.1	1.8	1.6	1.8	1.9	2.3	2.8	3.0	2.1	3.0	
11-Jun	2.9	2.3	2.1	2.1	Z	1.9	2.0	1.8	1.2	1.2	1.0	0.7	0.7	0.8	0.6	0.8	1.9	1.2	0.6	8.4	11.8	6.2	2.7	1.4	2.4	11.8	
12-Jun	0.8	0.6	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	0.8	1.0	1.9	1.1	1.4	0.7	1.0	1.7	0.5	1.9	
13-Jun	Z	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.9	1.6	3.4	3.3	1.8	0.5	1.3	0.7	0.4	0.7	3.4	
14-Jun	0.2	Z	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	
15-Jun	0.2	0.7	Z	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.5	
16-Jun	0.5	0.7	0.7	Z	0.7	0.6	0.6	0.5	0.6	0.4	0.3	0.3	0.5	1.0	1.3	1.4	1.7	1.3	0.6	0.4	0.4	0.4	0.4	0.4	0.7	1.7	
17-Jun	0.7	0.9	1.0	0.7	Z	0.6	0.7	0.9	0.8	0.8	0.7	0.4	0.5	0.6	0.5	0.4	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.6	1.0	
18-Jun	0.8	0.8	0.7	0.6	0.6	Z	0.5	0.5	0.5	0.4	0.3	0.3	0.4	0.9	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.9	0.5	0.9	
19-Jun	Z	0.4	0.4	1.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	1.4	
20-Jun	0.7	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	1.0	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	1.1	0.5	1.1	
21-Jun	0.5	0.5	Z	0.7	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.7	
22-Jun	0.5	0.6	0.6	Z	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	
23-Jun	0.5	0.6	0.6	0.7	Z	0.5	0.7	0.6	0.7	0.7	0.8	0.7	0.6	0.7	0.6	0.9	1.5	1.2	1.0	1.3	1.6	1.7	1.6	1.5	0.9	1.7	
24-Jun	1.5	1.5	1.3	1.2	1.2	Z	1.2	1.1	0.6	0.6	0.6	1.0	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.6	0.7	0.6	0.5	0.5	0.8	1.5	
25-Jun	Z	2.3	1.5	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.3	0.4	2.3	
26-Jun	0.3	Z	0.4	0.4	0.6	2.2	5.8	12.6	8.4	4.1	3.2	4.1	2.1	1.1	1.3	1.2	0.9	0.7	0.6	0.5	0.7	0.6	0.6	0.6	2.3	12.6	
27-Jun	0.5	0.6	Z	0.6	0.5	0.4	0.4	C	C	C	C	C	0.5	0.6	0.8	0.5	0.6	0.4	0.5	0.4	0.6	1.2	1.7	0.9	0.7	1.7	
28-Jun	0.6	0.6	0.5	Z	0.4	0.4	1.2	4.8	8.3	7.5	3.8	1.2	1.1	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.8	0.8	0.6	0.9	1.6	8.3	
29-Jun	1.3	1.4	1.4	1.3	Z	1.5	1.6	1.5	1.0	1.0	1.1	0.8	0.6	0.6	0.7	0.6	0.4	0.7	0.7	0.6	0.8	1.2	0.8	0.6	1.0	1.6	
30-Jun	0.8	0.8	0.8	0.8	0.7	Z	0.7	0.8	0.7	0.7	0.5	0.4	0.5	0.3	0.2	0.6	0.6	2.4	1.1	1.3	2.2	6.8	7.4	4.7	1.6	7.4	
																								Diurnal Average			
																								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 Chipewyan - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	29	31	50	86	128	33	9	16	40	27	19	51	55	27	46	38	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	29	31	50	86	128	33	9	16	40	27	19	51	55	27	46	38	685

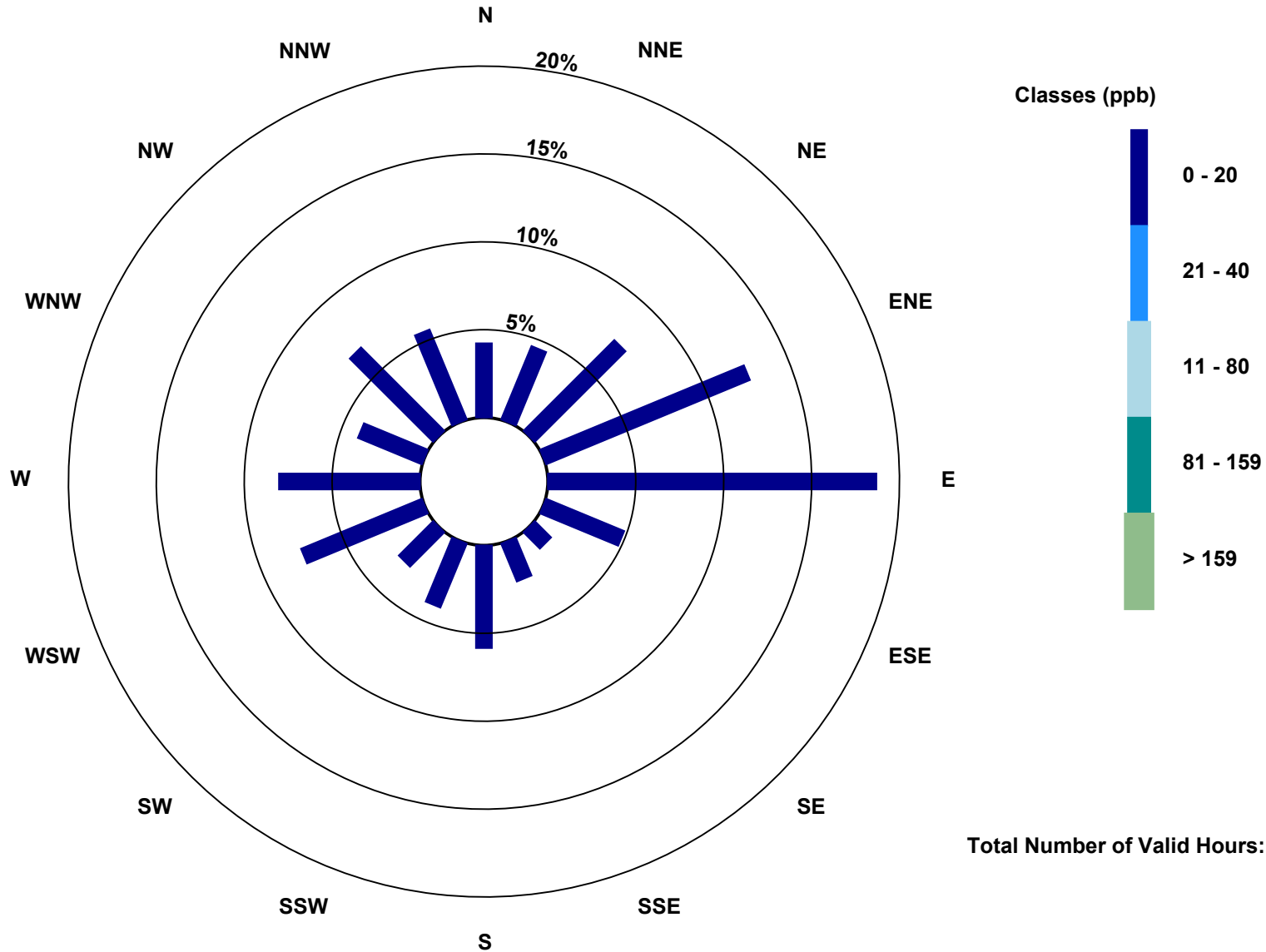
Total Number of Valid Hours: 685

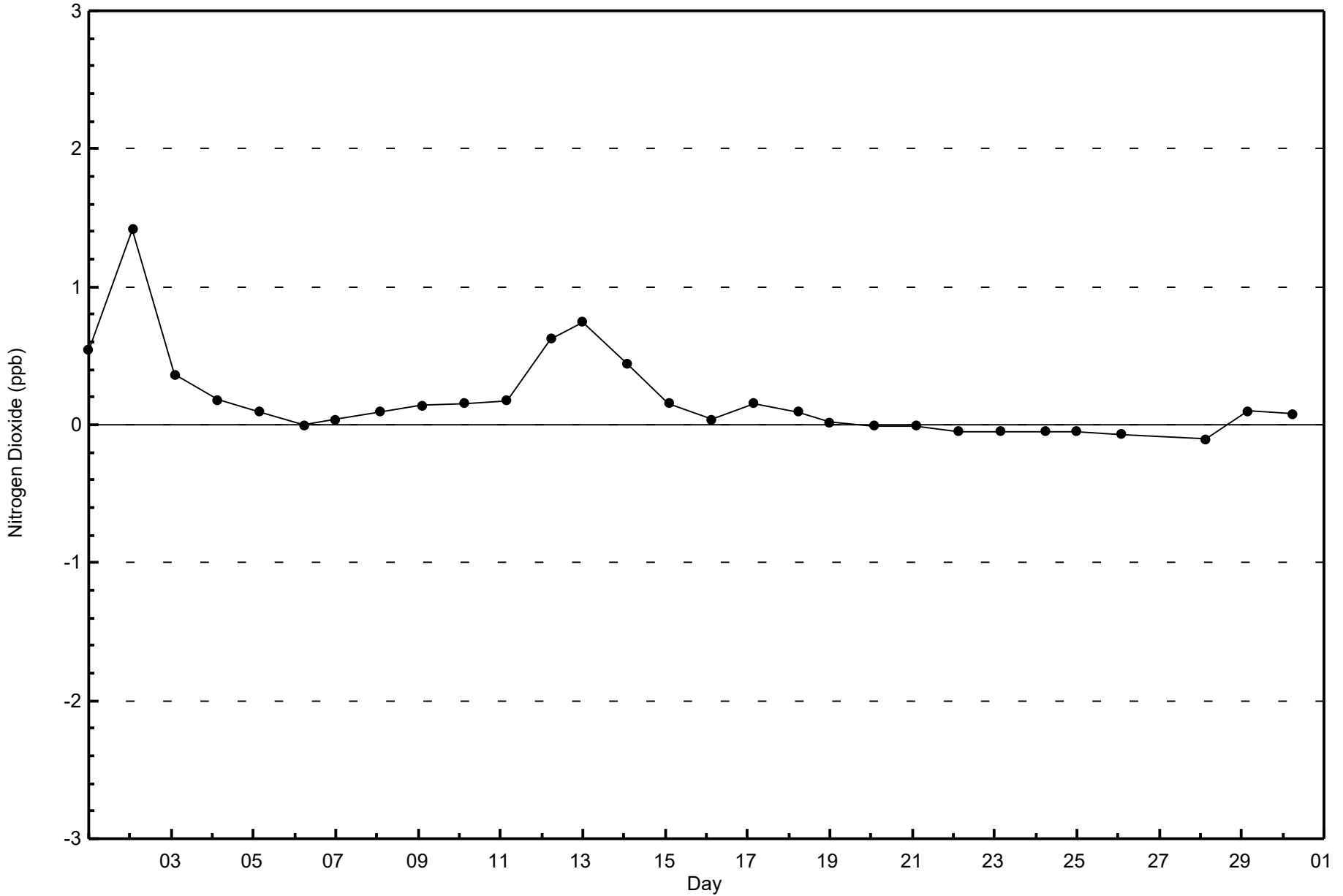
Total Number of Hours: 720

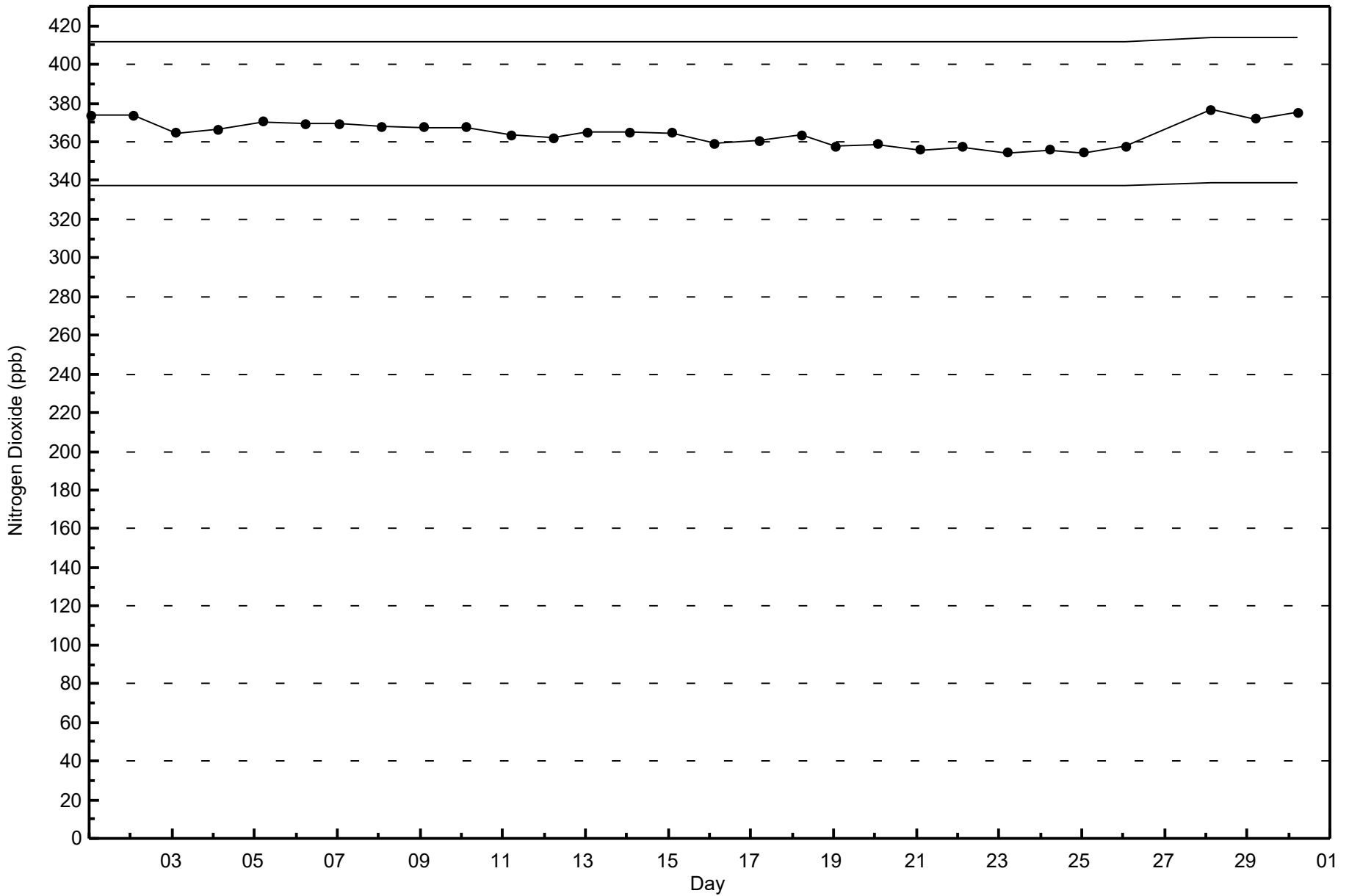


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association
Summary of Hour Averages

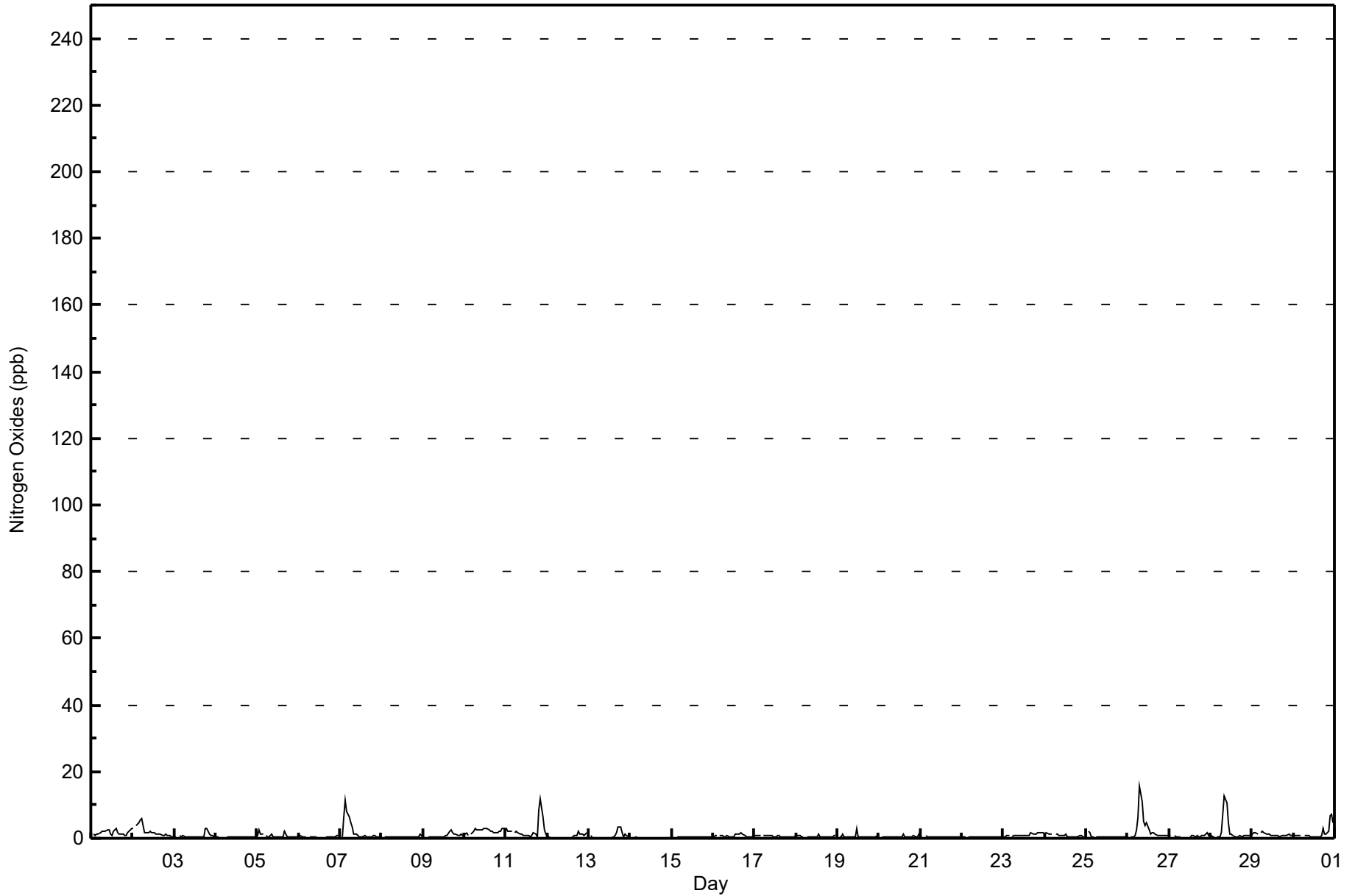
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - June 2023

Maximum Value: 15.8 ppb on Jun 26 08:00																				Maximum Daily Average: 2.9 ppb on Jun 26					Hours in Service: 720		
Minimum Value: 0.0 ppb on Jun 12 10:00																				Minimum Daily Average: 0.1 ppb on Jun 14					Hours of Data: 685		
Maximum Diurnal Average: 1.6 ppb at hour 8																				Minimum Diurnal Average: 0.7 ppb at hour 13					Hours of Missing Data: 35		
Monthly Average: 1.04 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.6 Q ₃ = 1.1 P ₉₀ = 2.0 P ₉₉ = 7.9					Hours of Calibration: 35		
																									Percent Operational Time: 100.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	1.1	0.7	1.2	1.5	1.6	2.0	2.1	2.1	2.5	2.6	1.4	0.9	2.1	3.2	1.5	1.2	1.4	1.1	0.7	1.0	1.6	2.2	3.0	1.7	3.2	
2-Jun	3.1	Z	3.6	4.6	5.3	6.0	3.7	1.8	1.7	1.6	1.9	1.9	1.9	1.4	1.3	1.1	1.2	1.0	0.9	1.4	0.9	0.7	0.5	0.4	2.1	6.0	
3-Jun	0.4	0.5	Z	0.8	0.5	0.9	0.5	0.6	0.6	0.6	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.3	3.0	3.0	1.3	0.8	0.7	0.5	0.8	3.0	
4-Jun	0.3	0.3	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.4	
5-Jun	0.9	2.7	1.2	1.3	Z	0.7	0.6	0.6	1.4	0.6	0.4	0.5	0.4	0.5	0.3	0.4	2.0	0.3	0.2	0.3	0.3	0.5	0.6	0.4	0.8	2.7	
6-Jun	0.7	0.7	0.6	0.5	0.5	Z	0.5	0.6	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.9	0.5	0.9	
7-Jun	Z	0.6	6.5	11.6	7.8	6.5	4.5	3.6	1.1	1.3	0.9	0.5	0.6	0.6	0.7	0.5	0.4	0.4	0.5	0.7	0.9	0.6	0.4	0.4	2.2	11.6	
8-Jun	0.4	Z	0.5	0.4	0.5	0.5	0.6	0.6	0.5	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	1.1	0.8	0.6	1.1	
9-Jun	0.5	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.9	1.0	2.2	2.6	1.8	1.4	1.1	0.9	0.8	1.1	1.0	0.9	2.6	
10-Jun	1.2	1.5	1.0	Z	1.4	2.0	2.8	2.7	2.5	2.7	2.5	2.8	2.8	3.0	2.4	2.3	2.2	1.9	1.6	1.8	1.9	2.3	2.8	3.0	2.2	3.0	
11-Jun	2.9	2.3	2.1	2.1	Z	1.9	2.0	1.8	1.2	1.2	1.0	0.7	0.8	0.8	0.6	0.8	1.9	1.2	0.6	8.5	11.9	6.2	2.7	1.4	2.5	11.9	
12-Jun	0.8	0.6	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	0.8	1.0	1.9	1.1	1.4	0.7	1.1	1.7	0.5	1.9	
13-Jun	Z	0.9	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.9	1.6	3.5	3.3	1.8	0.5	1.3	0.7	0.4	0.7	3.5	
14-Jun	0.2	Z	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	
15-Jun	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.6	
16-Jun	0.5	0.7	0.7	Z	0.8	0.6	0.6	0.6	0.7	0.5	0.4	0.4	0.6	1.1	1.4	1.5	1.9	1.5	0.7	0.5	0.5	0.5	0.5	0.5	0.8	1.9	
17-Jun	0.8	0.9	1.0	0.7	Z	0.7	0.8	1.0	0.9	0.9	0.8	0.5	0.6	0.8	0.7	0.5	0.3	0.4	0.3	0.3	0.4	0.3	0.4	0.5	0.6	1.0	
18-Jun	0.8	0.8	0.7	0.6	0.6	Z	0.6	0.6	0.6	0.5	0.4	0.4	0.5	1.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.9	0.6	1.1	
19-Jun	Z	0.5	0.4	1.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	2.9	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.6	2.9	
20-Jun	0.7	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	1.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	1.1	0.6	1.4	
21-Jun	0.5	0.5	Z	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8
22-Jun	0.5	0.6	0.6	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
23-Jun	0.5	0.6	0.6	0.7	Z	0.5	0.8	0.7	0.8	0.8	0.9	0.8	0.7	0.7	0.7	1.0	1.6	1.3	1.1	1.4	1.7	1.8	1.7	1.5	1.0	1.8	
24-Jun	1.5	1.5	1.3	1.2	1.2	Z	1.3	1.2	0.7	0.7	0.7	1.1	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.7	0.6	0.5	0.5	0.8	1.5	
25-Jun	Z	2.3	1.5	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.3	0.5	2.3	
26-Jun	0.3	Z	0.4	0.4	0.7	2.4	6.5	15.8	11.1	5.1	3.9	4.9	2.6	1.4	1.7	1.6	1.2	0.9	0.8	0.7	0.9	0.8	0.7	0.7	2.9	15.8	
27-Jun	0.6	0.7	Z	0.7	0.6	0.5	0.5	C	C	C	C	C	0.6	0.7	0.9	0.6	0.7	0.5	0.6	0.6	0.7	1.3	1.7	1.0	0.7	1.7	
28-Jun	0.7	0.6	0.5	Z	0.4	0.4	1.5	7.1	12.9	10.5	4.6	1.4	1.2	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.9	0.9	0.7	1.0	2.2	12.9	
29-Jun	1.4	1.5	1.5	1.4	Z	1.7	1.9	1.9	1.2	1.2	1.3	1.0	0.8	0.8	0.8	0.7	0.5	0.7	0.8	0.7	0.9	1.3	0.9	0.7	1.1	1.9	
30-Jun	0.9	0.9	0.9	0.9	0.8	Z	0.8	0.9	0.8	0.8	0.6	0.5	0.6	0.4	0.3	0.6	0.7	3.1	1.2	1.4	2.2	6.8	7.4	4.7	1.7	7.4	
																								Diurnal Average			
																								Diurnal Maximum			
0.9 0.9 1.1 1.3 1.0 1.2 1.2 1.6 1.5 1.2 1.0 0.9 0.7 0.7 0.8 0.8 0.9 0.9 0.9 1.1 1.2 1.2 1.1 1.0																											
3.1 2.7 6.5 11.6 7.8 6.5 6.5 15.8 12.9 10.5 4.6 4.9 2.8 3.0 3.2 2.3 2.6 3.5 3.3 8.5 11.9 6.8 7.4 4.7																											
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	29	31	50	86	128	33	9	16	40	27	19	51	55	27	46	38	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	29	31	50	86	128	33	9	16	40	27	19	51	55	27	46	38	685

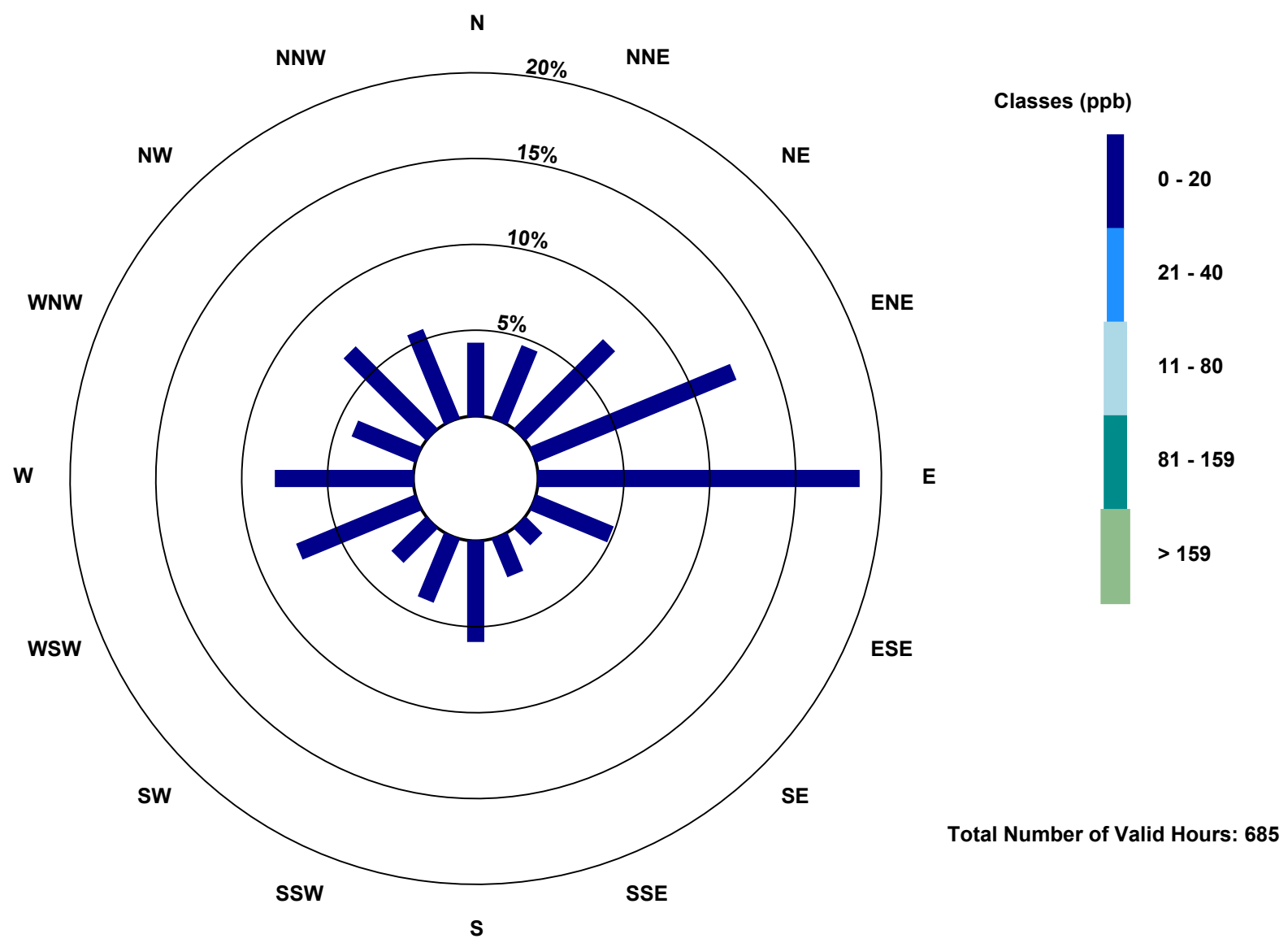
Total Number of Valid Hours: 685

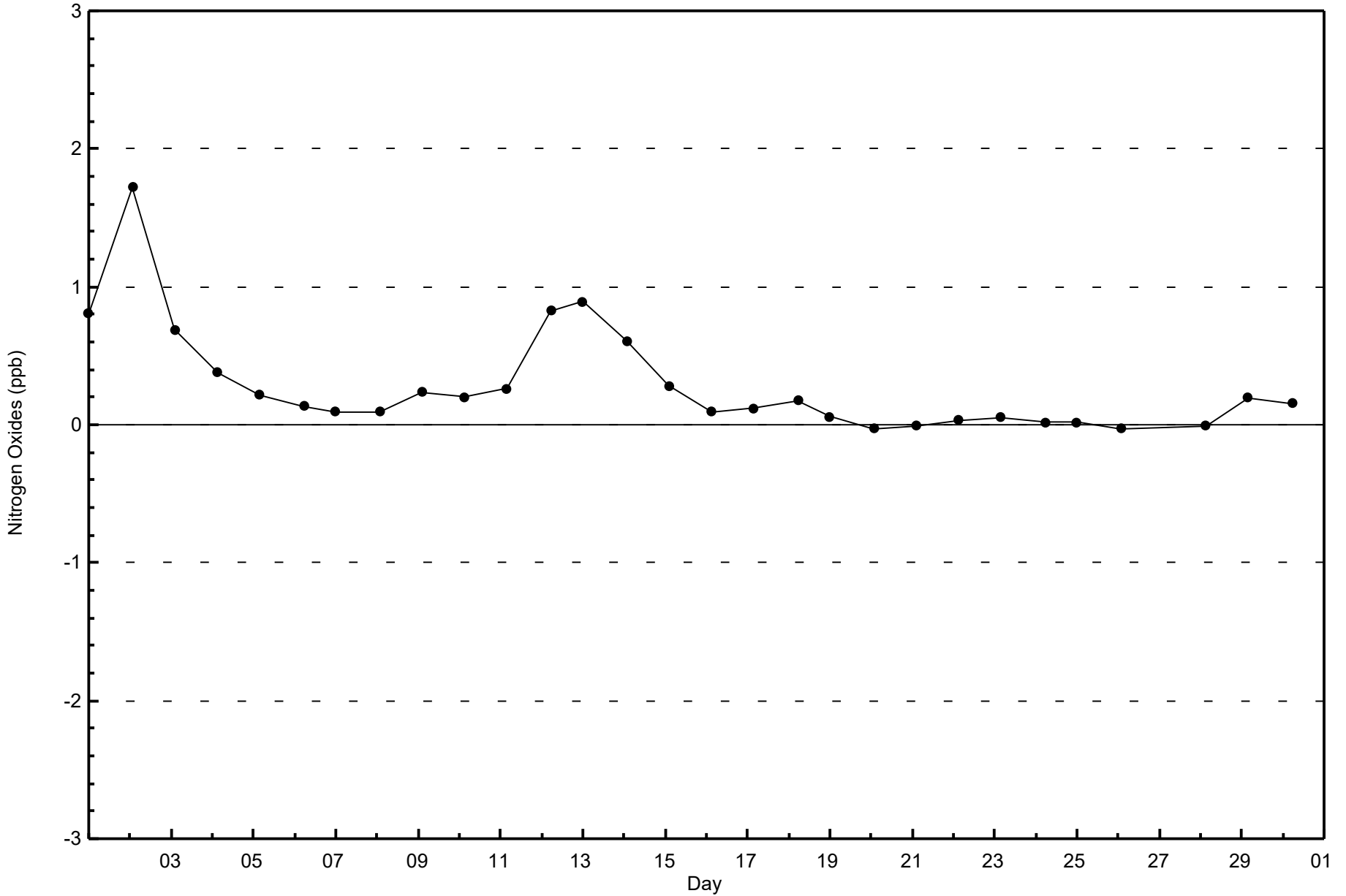
Total Number of Hours: 720

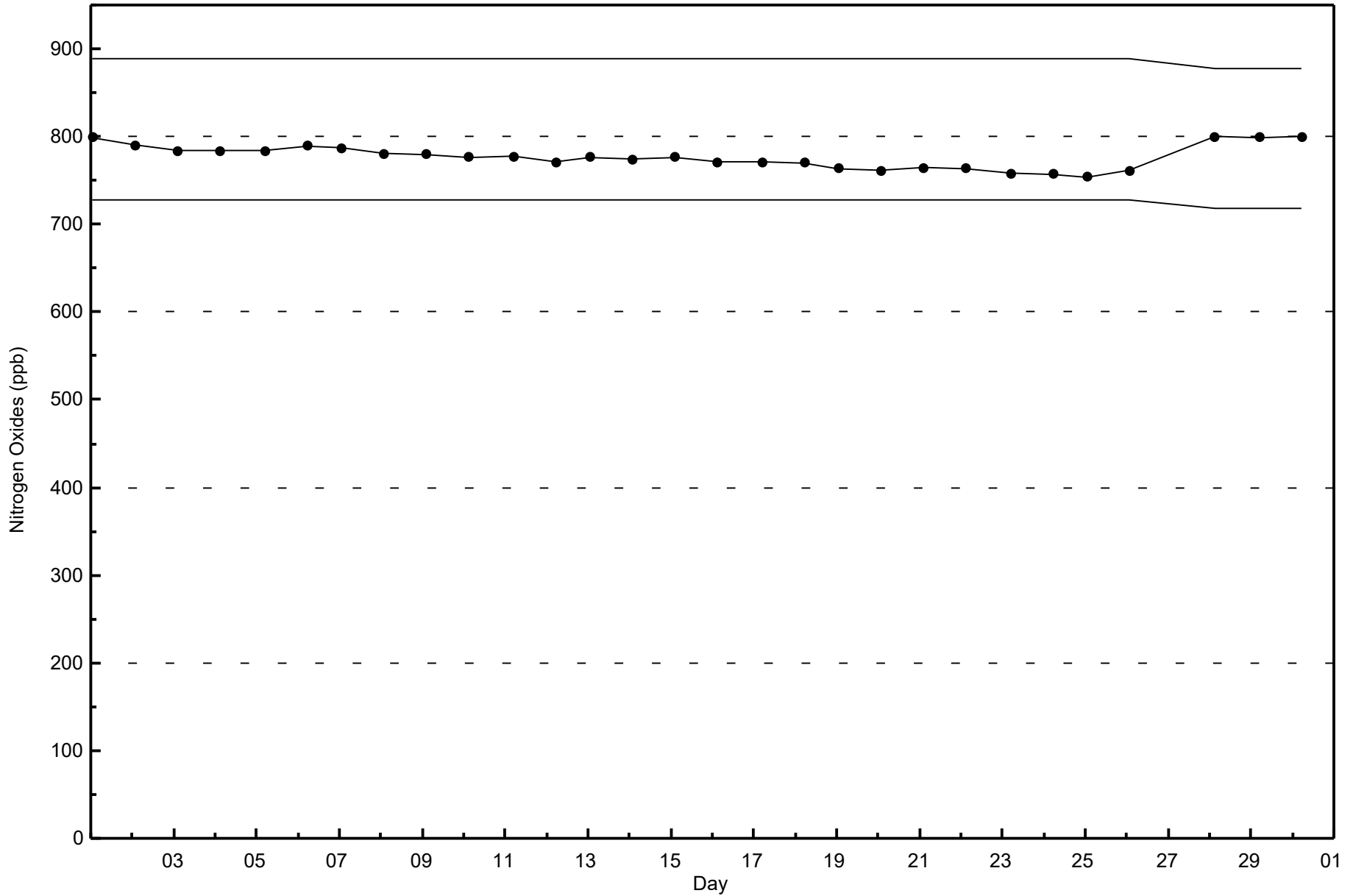


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

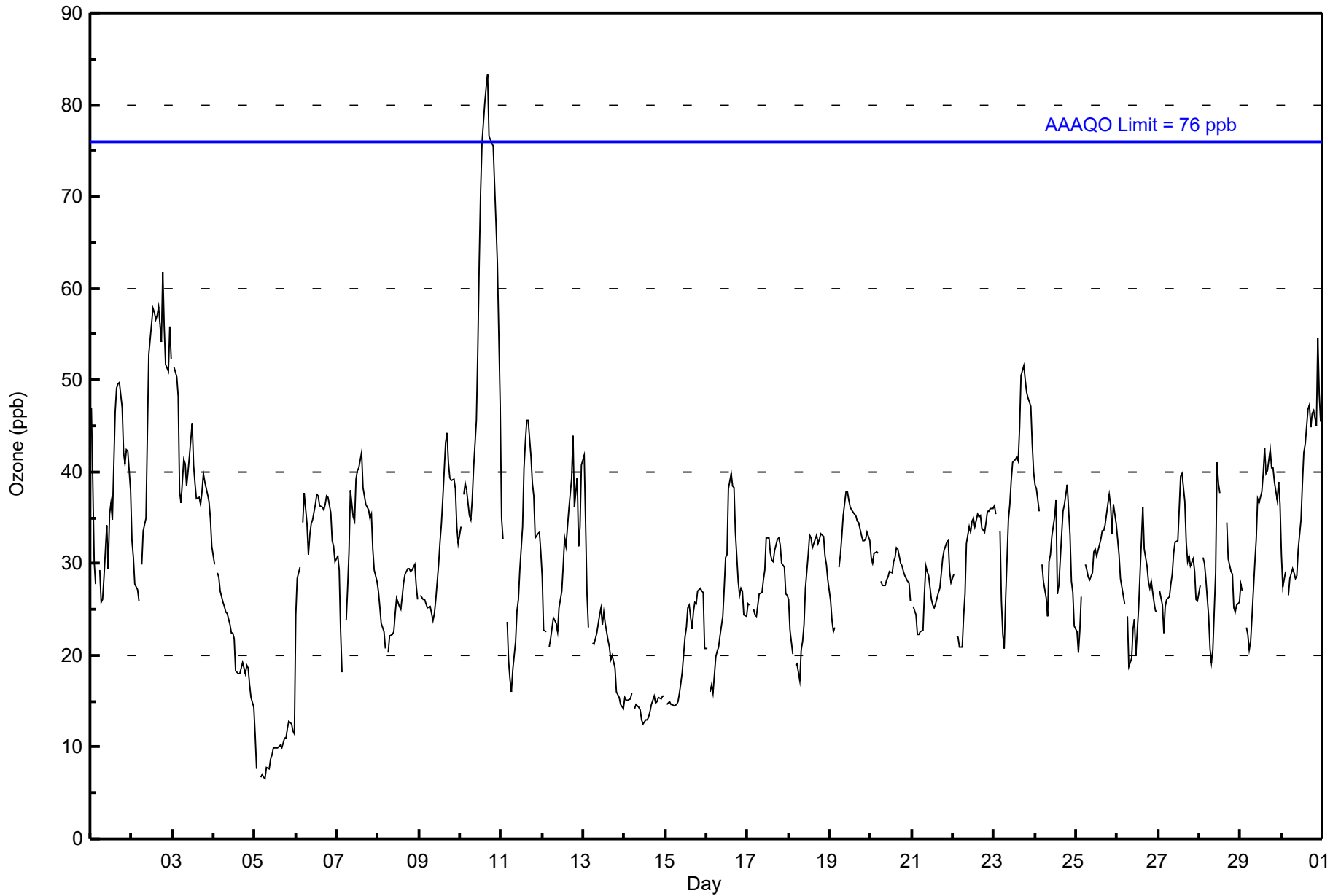
Ozone (O₃) - ppb

Fort Chipewyan - June 2023

Number of Exceedences (AAAQO):	1-hr: 4	24-hr: 0	Hours in Service:	720
Maximum Value: 83.4 ppb on Jun 10 17:00	Maximum Daily Average: 57.6 ppb on Jun 10		Hours of Data:	687
Minimum Value: 6.6 ppb on Jun 5 07:00	Minimum Daily Average: 9.7 ppb on Jun 5		Hours of Missing Data:	33
Maximum Diurnal Average: 36.1 ppb at hour 17	Minimum Diurnal Average: 24.2 ppb at hour 5		Hours of Calibration:	33
Monthly Average: 30.65 ppb	Percentiles: P ₁ = 8.6 P ₁₀ = 17.7 Q ₁ = 24.4 Median = 29.8 Q ₃ = 36.2 P ₉₀ = 42.1 P ₉₉ = 71.9		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-Jun	47.0	39.0	30.2	27.7	Z	29.2	25.7	26.1	28.5	34.1	29.4	35.3	36.7	34.8	46.6	49.1	49.6	49.7	47.0	42.1	40.9	42.4	42.2	38.0	37.9	49.7																						
2-Jun	32.5	30.7	27.8	27.2	25.9	Z	29.9	33.6	34.9	44.2	52.8	54.4	57.8	57.4	56.6	57.1	58.0	54.1	61.8	55.9	51.7	50.9	55.8	52.3	46.2	61.8																						
3-Jun	Z	51.5	50.3	48.3	37.9	36.6	41.3	40.8	38.5	39.9	41.7	45.4	40.8	38.7	37.0	37.2	36.5	37.9	39.7	38.9	37.5	36.8	34.9	31.8	40.0	51.5																						
4-Jun	29.8	Z	29.0	28.5	27.1	25.8	25.3	24.7	24.6	23.4	22.4	22.5	21.7	18.4	17.9	18.0	18.6	19.2	18.0	18.9	18.6	16.8	15.5	14.3	21.7	29.8																						
5-Jun	11.3	7.7	Z	6.7	7.0	6.7	6.6	7.8	7.7	8.8	9.1	10.0	10.0	10.0	10.1	10.3	10.0	11.0	11.0	12.0	12.8	12.6	11.8	11.4	9.7	12.8																						
6-Jun	24.4	28.3	29.5	Z	34.5	37.6	34.3	31.0	33.2	34.3	34.7	36.5	37.6	37.4	36.3	36.2	35.8	36.5	37.3	37.2	35.6	32.4	31.9	30.3	34.0	37.6																						
7-Jun	30.8	29.3	22.7	18.2	Z	23.8	27.3	31.3	38.0	35.1	34.6	39.2	40.2	40.4	42.1	38.3	37.4	36.4	35.8	34.9	35.4	31.6	29.2	28.0	33.0	42.1																						
8-Jun	26.9	25.3	23.4	22.5	20.8	Z	20.3	22.1	22.3	22.6	24.5	26.3	25.4	25.0	26.4	27.9	28.8	29.4	29.5	29.1	29.3	29.8	27.6	26.0	25.7	29.8																						
9-Jun	Z	26.5	26.1	26.0	25.6	25.1	25.3	24.6	23.8	24.5	26.1	29.9	32.4	34.4	37.0	43.2	44.2	41.0	39.3	39.0	39.2	38.1	34.0	32.2	32.1	44.2																						
10-Jun	34.0	Z	37.6	38.7	37.9	35.3	34.8	36.8	40.4	45.7	53.2	62.8	70.5	75.7	80.2	82.0	83.4	76.6	75.7	75.5	71.3	67.1	62.6	47.3	57.6	83.4																						
11-Jun	34.9	32.7	Z	23.7	19.4	17.3	16.0	18.4	21.5	24.8	26.1	29.3	34.1	40.4	43.3	45.6	45.6	41.6	38.8	37.4	32.8	33.2	33.5	31.2	31.4	45.6																						
12-Jun	28.5	22.8	22.6	Z	21.0	21.8	24.2	23.9	23.5	22.6	25.1	27.1	29.8	32.8	32.0	35.9	37.5	39.3	44.0	36.1	39.3	31.9	34.0	40.7	30.3	44.0																						
13-Jun	41.8	34.3	26.6	23.1	Z	21.4	21.2	21.7	22.4	24.4	25.1	23.3	24.7	23.5	21.7	20.9	19.5	20.0	18.6	16.0	15.7	15.4	14.6	14.2	22.2	41.8																						
14-Jun	15.4	15.1	15.1	15.2	15.9	Z	14.2	14.6	14.3	14.1	13.0	12.5	13.0	13.0	13.3	13.9	14.7	15.5	14.8	15.0	15.3	15.2	15.6	15.5	14.5	15.9																						
15-Jun	Z	14.6	14.9	14.7	14.6	14.5	14.7	14.9	15.9	17.0	18.1	22.0	23.1	25.1	25.5	22.9	24.8	25.8	25.6	26.9	27.3	27.0	26.9	20.8	20.8	27.3																						
16-Jun	20.8	Z	16.1	16.8	15.8	19.8	20.4	20.9	22.1	24.3	27.3	30.7	31.0	38.1	39.9	38.4	38.2	33.5	28.1	26.6	27.3	27.1	24.4	24.2	26.6	39.9																						
17-Jun	25.6	25.4	Z	25.0	24.4	24.2	25.5	26.7	26.9	28.1	29.3	32.8	32.8	31.1	30.3	30.2	31.5	32.6	32.8	32.1	30.0	29.6	26.7	26.5	28.7	32.8																						
18-Jun	26.1	22.8	20.2	Z	18.9	19.0	17.3	20.7	21.4	23.4	27.4	30.9	33.1	32.8	31.7	32.6	33.2	32.2	32.7	33.3	32.9	30.9	30.0	28.2	27.5	33.3																						
19-Jun	25.9	23.8	22.6	23.0	Z	29.6	31.0	32.9	35.3	37.9	37.8	37.0	36.2	35.9	35.4	35.2	34.7	34.5	33.1	32.5	32.6	32.6	33.5	32.5	32.4	37.9																						
20-Jun	30.6	30.0	31.2	31.2	31.1	Z	28.1	27.6	27.6	28.2	28.5	29.2	29.0	30.3	30.7	31.7	31.6	30.1	29.8	29.1	28.7	28.0	27.9	25.9	29.4	31.7																						
21-Jun	Z	25.3	24.4	22.3	22.3	22.6	22.7	26.7	29.7	29.1	28.8	26.1	25.5	25.2	25.6	26.9	27.3	28.8	30.5	31.5	32.4	32.4	29.2	27.9	27.1	32.4																						
22-Jun	28.8	Z	22.2	22.0	21.0	21.0	24.3	26.6	32.2	34.0	33.3	34.6	34.9	34.0	35.4	35.1	35.3	33.8	33.4	34.5	35.7	35.7	36.0	36.0	31.3	36.0																						
23-Jun	36.3	35.4	Z	33.6	26.0	22.2	20.7	26.1	34.7	36.4	39.1	41.1	41.4	41.7	41.2	44.9	50.4	51.5	50.0	48.7	48.0	47.2	43.0	40.0	39.1	51.5																						
24-Jun	38.6	38.1	35.7	Z	30.0	28.1	26.2	24.3	30.3	31.0	32.9	35.1	37.0	26.7	27.7	33.1	35.8	36.5	37.5	38.6	33.1	28.0	26.8	23.1	31.9	38.6																						
25-Jun	22.6	20.3	22.7	26.3	Z	29.9	29.3	28.6	28.2	29.0	31.2	31.6	30.8	31.5	32.6	33.6	33.5	34.2	36.5	37.6	36.3	33.2	36.5	34.3	30.9	37.6																						
26-Jun	32.7	31.0	28.3	26.5	25.7	Z	24.3	18.7	19.7	22.9	24.0	19.9	25.2	28.9	32.5	36.2	31.5	29.8	28.1	27.3	28.1	25.8	24.8	24.7	26.8	36.2																						
27-Jun	Z	26.9	25.5	22.5	25.4	26.1	26.4	27.8	28.9	31.1	32.4	32.5	36.1	39.5	39.9	36.7	32.3	30.2	30.8	29.7	30.5	29.1	26.1	25.9	30.1	39.9																						
28-Jun	27.6	Z	30.6	30.0	28.3	24.2	20.7	19.2	20.6	28.9	41.1	38.7	37.7	Z	C	C	C	34.5	30.4	29.1	28.8	25.1	24.6	25.4	25.8	28.6	41.1																					
29-Jun	27.8	27.1	Z	23.1	22.2	20.6	21.5	24.2	30.1	32.7	37.1	36.6	37.8	39.7	42.6	39.8	40.2	42.4	40.4	40.5	38.9	37.0	38.9	36.5	33.8	42.6																						
30-Jun	30.9	27.4	29.1	Z	26.6	28.4	29.5	29.0	28.3	28.7	31.6	34.8	38.8	42.0	43.0	46.8	47.4	44.8	46.3	46.7	45.1	54.6	48.6	45.4	38.0	54.6																						
																								29.3	27.6	26.6	24.9	24.2	24.4	24.3	25.1	26.8	28.7	30.6	32.3	33.5	33.9	35.0	35.9	36.1	35.3	35.2	34.4	33.6	32.6	31.6	29.7	Diurnal Average
																								47.0	51.5	50.3	48.3	37.9	37.6	41.3	40.8	40.4	45.7	53.2	62.8	70.5	75.7	80.2	82.0	83.4	76.6	75.7	75.5	71.3	67.1	62.6	52.3	Diurnal Maximum

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Fort Chipewyan - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	95	13.83	13.83
21 - 50	562	81.80	95.63
51 - 82	29	4.22	99.85
> 83	1	0.15	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Fort Chipewyan - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	12	9	8	6	3	1	0	4	0	0	1	3	6	16	17	95
21 - 50	20	19	42	63	125	30	8	15	25	26	17	49	52	18	34	19	562
51 - 82	0	0	0	10	4	2	0	0	11	0	1	0	0	0	0	1	29
> 83	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Totals	29	31	51	81	135	35	9	15	41	26	18	50	55	24	50	37	687

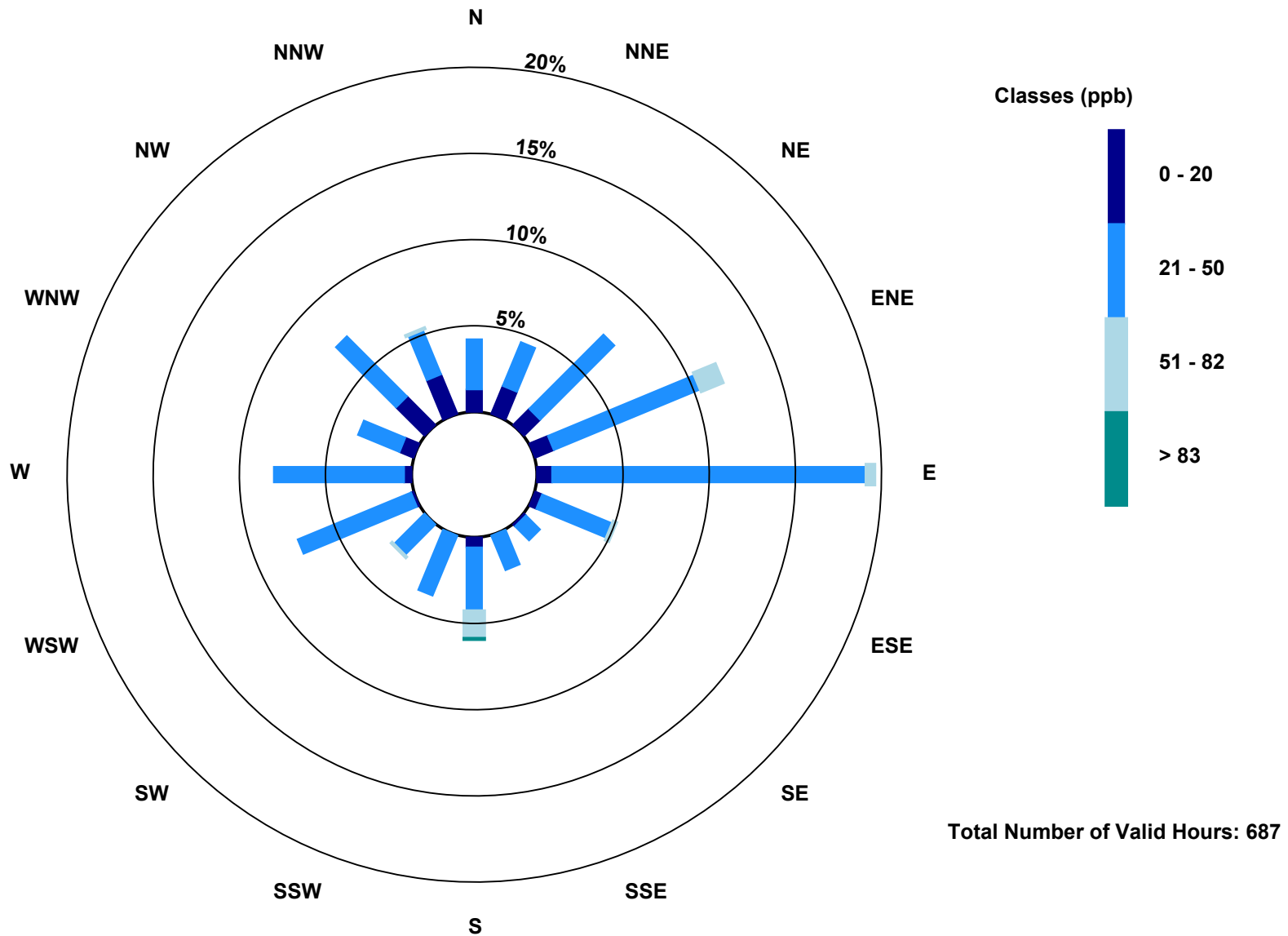
Total Number of Valid Hours: 687

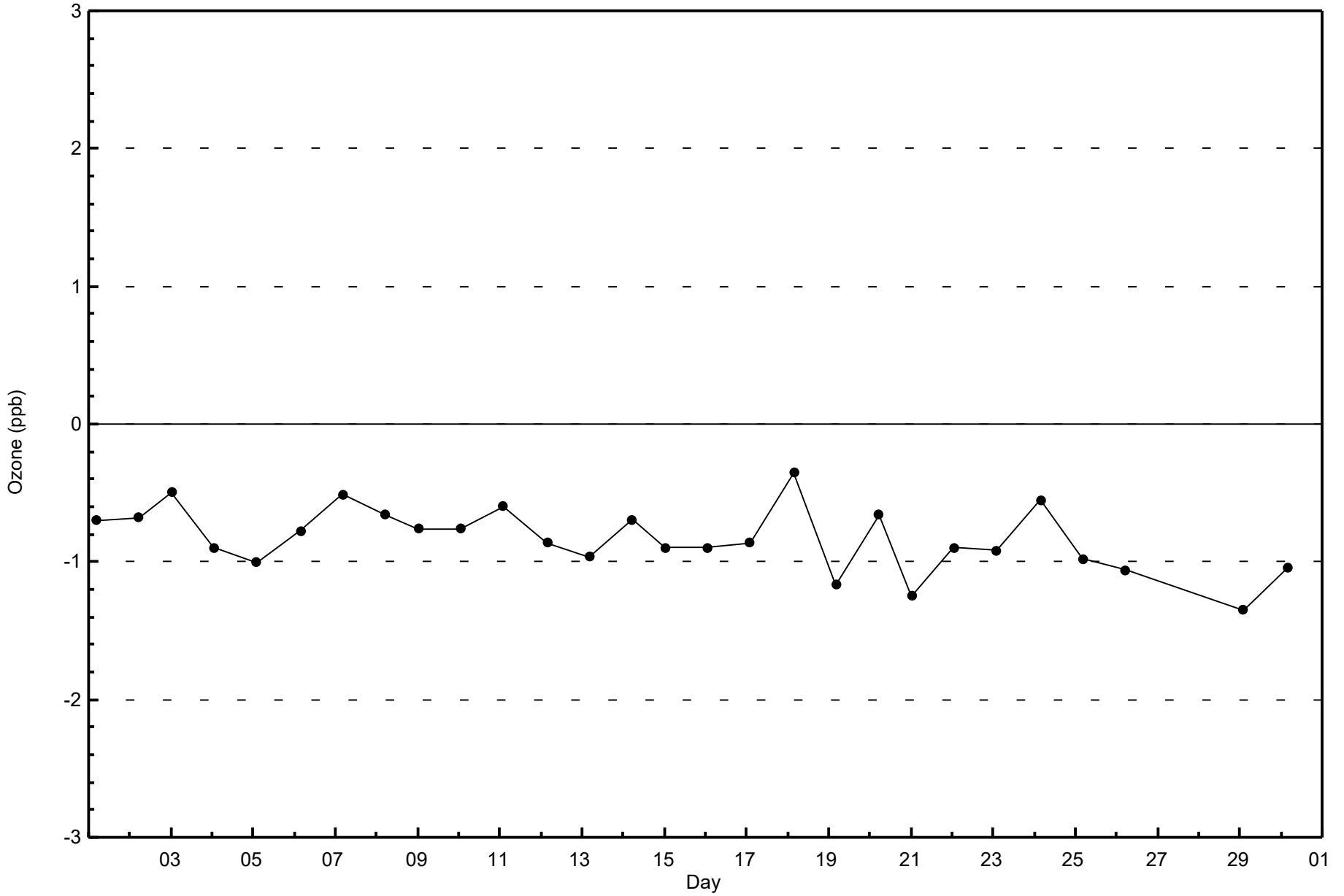
Total Number of Hours: 720

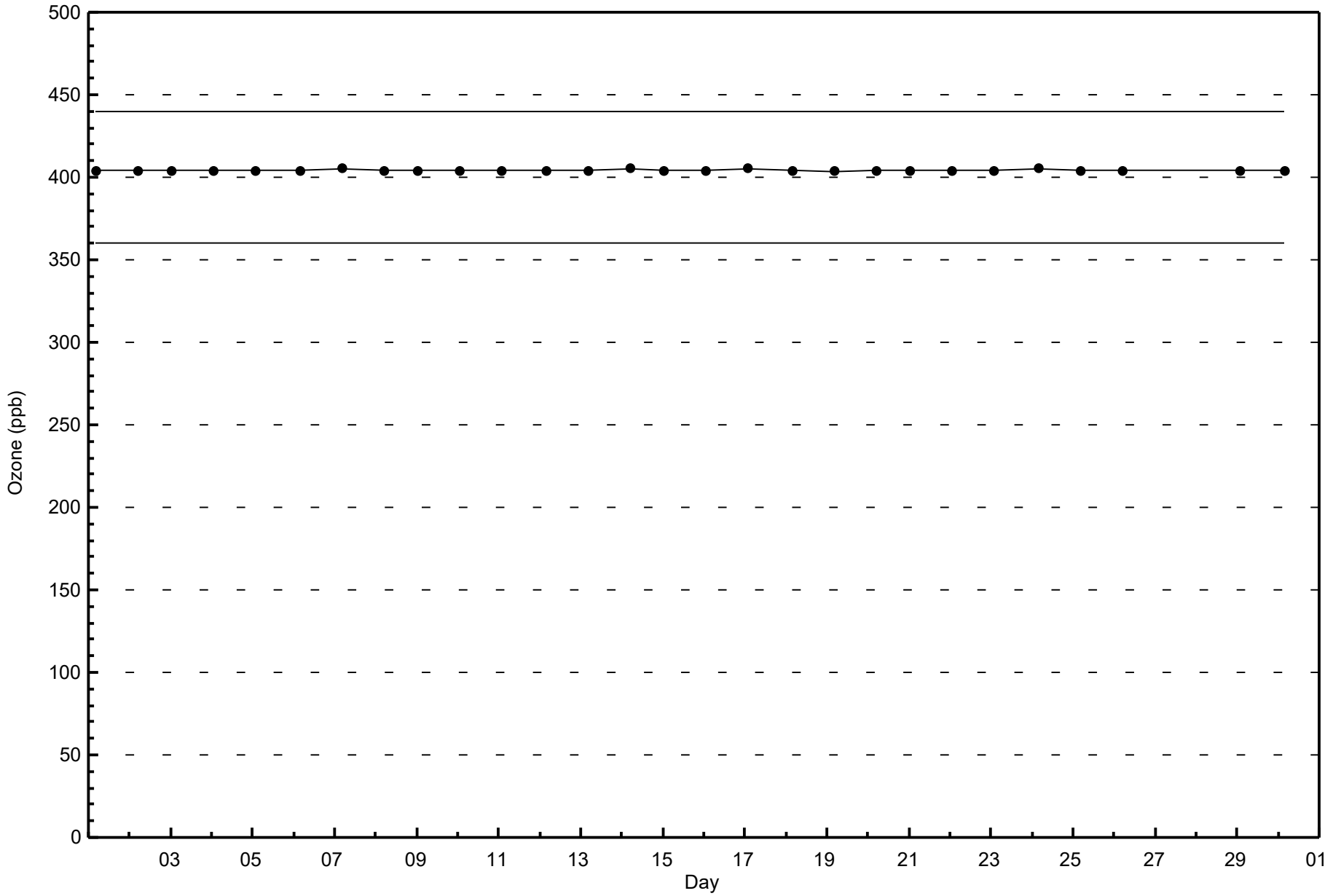


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

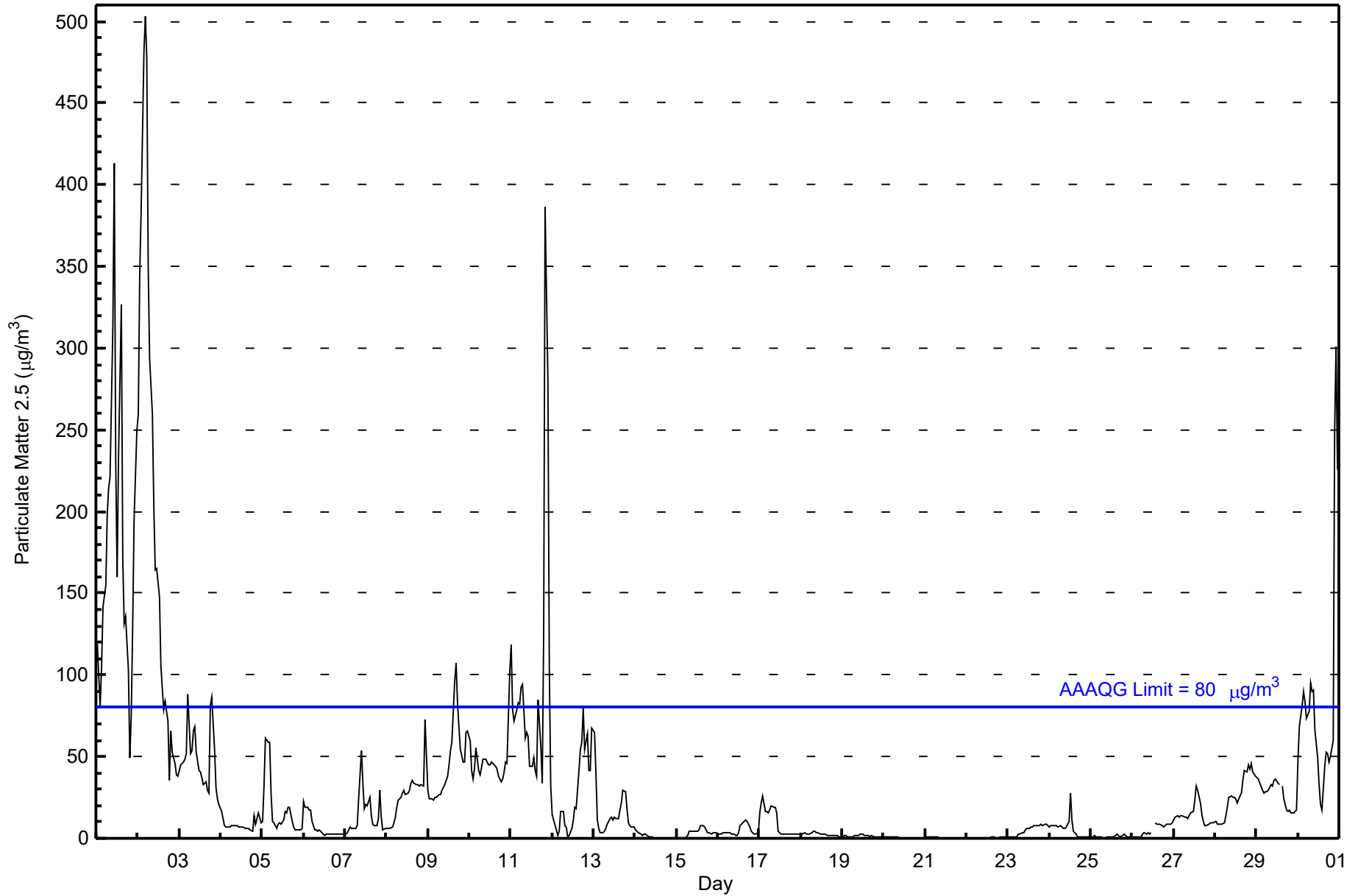
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Fort Chipewyan - June 2023

Number of Exceedences (AAAQO):	1-hr: 64	24-hr: 7	Hours in Service:	720
Maximum Value: 503.1 µg/m ³ on Jun 2 05:00	Maximum Daily Average: 197.7 µg/m ³ on Jun 2		Hours of Data:	718
Minimum Value: 0.1 µg/m ³ on Jun 21 14:00	Minimum Daily Average: 0.3 µg/m ³ on Jun 21		Hours of Missing Data:	2
Maximum Diurnal Average: 38.0 µg/m ³ at hour 5	Minimum Diurnal Average: 22.3 µg/m ³ at hour 19		Hours of Calibration:	1
Monthly Average: 30.70 µg/m ³	Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 2.3 Median = 8.3 Q ₃ = 33.7 P ₉₀ = 72.1 P ₉₉ = 341.8		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-Jun	119.6	99.8	80.8	104.4	141.8	154.5	198.4	214.5	220.9	313.8	412.9	232.5	159.8	233.0	326.9	171.2	131.1	136.1	102.7	49.0	75.4	128.6	194.3	249.9	177.2	412.9
2-Jun	259.6	344.9	383.5	481.5	503.1	477.7	352.0	293.5	259.2	202.1	164.1	165.0	147.9	105.5	91.7	78.8	84.1	71.9	35.8	65.8	53.0	46.1	39.3	38.2	197.7	503.1
3-Jun	41.9	45.0	46.6	48.2	52.1	88.3	52.2	53.8	65.7	68.2	52.8	41.3	40.9	36.9	33.2	34.5	29.3	27.6	81.3	86.7	54.3	31.4	23.9	20.5	48.2	88.3
4-Jun	16.3	12.3	8.0	7.2	7.1	7.3	7.4	7.6	7.4	7.5	7.0	7.0	6.8	5.8	6.0	5.7	4.8	4.7	13.8	8.6	12.3	15.4	15.4	9.8	8.5	16.3
5-Jun	10.4	32.0	61.4	58.6	59.2	28.0	10.3	9.6	5.8	8.9	9.2	8.5	11.1	16.2	15.6	19.2	19.1	10.0	7.1	5.6	5.1	5.2	5.3	6.1	17.8	61.4
6-Jun	22.9	19.3	18.8	16.9	17.6	10.2	5.1	4.9	4.6	5.4	4.0	2.3	1.9	2.4	2.3	2.2	2.2	2.5	2.9	2.8	2.4	2.5	2.7	2.8	6.7	22.9
7-Jun	3.0	3.5	5.3	7.3	6.4	6.4	6.3	7.8	24.0	54.0	33.7	17.8	21.2	19.6	24.8	13.9	8.3	7.9	8.2	11.7	29.7	12.7	4.8	5.9	14.3	54.0
8-Jun	6.3	6.2	6.3	6.7	9.5	12.7	18.7	23.7	25.4	27.5	29.2	26.6	27.8	29.0	33.5	35.2	33.7	33.2	33.0	32.2	32.6	32.3	72.7	51.2	26.9	72.7
9-Jun	29.2	24.3	24.3	23.6	25.0	24.9	26.4	26.6	29.8	31.0	32.8	38.4	44.6	53.9	59.0	96.0	107.5	83.1	68.4	54.4	47.0	46.7	64.8	65.3	47.0	107.5
10-Jun	60.0	41.4	36.4	42.6	55.6	41.2	39.0	43.4	48.7	48.2	47.1	45.3	45.2	46.9	45.2	44.3	41.9	37.8	34.7	36.0	40.4	46.4	46.1	102.1	46.5	102.1
11-Jun	118.8	78.5	71.6	78.5	83.2	82.5	92.1	94.4	61.3	64.8	62.1	44.0	43.9	49.3	41.8	38.3	84.5	56.0	33.9	125.6	386.4	280.8	104.3	32.2	92.0	386.4
12-Jun	14.9	11.6	4.9	1.5	4.6	16.6	16.4	8.0	7.1	1.1	1.4	6.4	11.5	18.8	18.1	41.6	54.2	59.0	79.6	54.4	64.1	41.2	41.2	67.7	26.9	79.6
13-Jun	64.9	39.7	11.6	5.8	3.3	3.6	4.7	6.4	8.3	11.7	13.1	10.8	13.1	12.3	12.2	17.1	21.4	29.1	28.6	18.5	9.6	8.1	7.2	6.8	15.3	64.9
14-Jun	5.2	4.3	3.4	2.7	2.2	2.7	2.3	1.9	1.3	0.7	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	1.3	5.2
15-Jun	0.3	0.3	0.3	0.3	0.3	0.4	1.7	4.0	4.7	4.2	3.9	4.0	4.0	5.0	7.9	7.4	7.1	4.8	3.8	3.1	2.9	3.4	3.4	3.1	3.3	7.9
16-Jun	2.8	2.6	2.9	3.8	3.4	3.8	3.3	3.1	3.0	2.6	2.1	1.7	3.1	8.1	9.8	10.7	11.3	10.4	6.9	4.2	3.2	2.4	2.2	3.8	4.6	11.3
17-Jun	15.2	21.6	25.9	16.4	16.8	15.2	17.4	19.7	19.2	19.1	15.5	4.1	2.8	3.0	2.8	2.9	2.6	2.7	2.8	2.8	2.9	2.8	2.7	2.7	10.0	25.9
18-Jun	3.0	3.0	3.1	2.8	2.8	3.0	3.6	4.7	4.0	3.7	3.6	2.9	2.9	2.7	2.3	1.9	1.7	1.8	2.0	1.8	1.6	1.3	1.1	1.2	2.6	4.7
19-Jun	1.3	1.4	1.4	1.3	1.2	1.1	1.0	1.5	1.7	1.9	2.4	2.4	2.3	2.1	1.9	1.5	1.2	1.8	1.3	1.1	1.1	1.2	1.1	1.1	1.5	2.4
20-Jun	0.7	0.7	0.9	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	1.0
21-Jun	0.4	0.5	0.8	0.7	0.7	0.7	0.7	0.6	0.3	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	0.3	0.8
22-Jun	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.8	0.7	0.6	0.6	0.4	0.8
23-Jun	0.5	0.6	0.6	0.6	0.7	0.6	2.8	2.4	3.5	3.6	5.0	5.8	6.3	6.6	7.0	7.8	7.9	7.6	8.0	8.4	8.2	8.3	8.2	7.4	4.9	8.4
24-Jun	7.0	7.6	7.6	7.7	7.6	7.3	7.4	7.1	6.0	6.1	6.7	10.3	27.6	11.3	4.7	2.6	0.6	0.4	0.6	0.7	0.7	0.6	0.6	0.6	5.8	27.6
25-Jun	0.8	1.0	1.4	0.8	0.5	0.6	0.5	0.4	0.4	0.4	0.6	0.6	0.5	0.6	1.4	2.4	1.4	1.2	1.9	2.5	1.9	1.3	1.0	0.6	1.0	2.5
26-Jun	0.6	0.6	0.6	0.5	0.6	1.2	2.9	3.5	2.6	3.2	2.9	3.1	M	9.7	8.9	8.3	8.4	7.6	7.0	7.4	9.0	8.9	8.8	9.8	5.0	9.8
27-Jun	11.4	12.8	13.6	13.1	13.8	13.5	13.0	12.7	11.8	13.8	15.3	16.8	23.1	31.8	29.7	21.7	14.4	10.2	8.0	7.4	9.0	9.7	9.9	9.3	14.4	31.8
28-Jun	9.9	8.4	8.6	8.7	8.6	9.7	13.7	18.8	24.9	25.7	25.3	24.7	24.5	21.9	25.9	27.6	35.7	41.3	40.8	44.7	42.6	45.6	40.8	38.4	25.7	45.6
29-Jun	37.5	36.0	34.1	29.0	28.0	28.7	28.2	29.1	32.5	31.9	35.4	36.0	33.8	32.8	C	31.9	24.4	17.5	16.8	17.0	15.9	15.9	16.1	17.1	27.2	37.5
30-Jun	46.5	67.9	81.5	89.8	84.1	73.9	78.0	95.2	89.9	90.5	66.3	48.9	32.8	20.6	17.1	44.4	52.6	51.5	47.0	49.9	60.0	249.8	300.5	226.0	86.0	300.5
30.4 30.9 31.6 35.4 38.0 37.2 33.5 33.3 32.5 35.1 35.2 26.9 25.5 26.3 28.7 25.7 26.5 24.0 22.3 23.6 32.3 34.9 34.0 32.7																								Diurnal Average		
259.6 344.9 383.5 481.5 503.1 477.7 352.0 293.5 259.2 313.8 412.9 232.5 159.8 233.0 326.9 171.2 131.1 136.1 102.7 125.6 386.4 280.8 300.5 249.9																								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 Chipewyan - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	288	40.11	40.11
6 - 15	147	20.47	60.58
16 - 25	58	8.08	68.66
26 - 80	161	22.42	91.09
> 81.0	64	8.91	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 Chipewyan - June 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	28	22	29	29	49	13	6	9	11	8	4	8	11	9	26	26	288
6 - 15	0	6	13	22	42	6	2	2	6	9	2	6	6	10	10	5	147
16 - 25	1	3	0	3	12	4	0	1	3	2	3	8	12	1	4	1	58
26 - 80	3	1	5	23	26	11	1	7	19	9	10	17	17	5	7	0	161
> 81.0	1	0	5	9	8	2	0	0	1	0	1	13	12	3	3	6	64
Totals	33	32	52	86	137	36	9	19	40	28	20	52	58	28	50	38	718

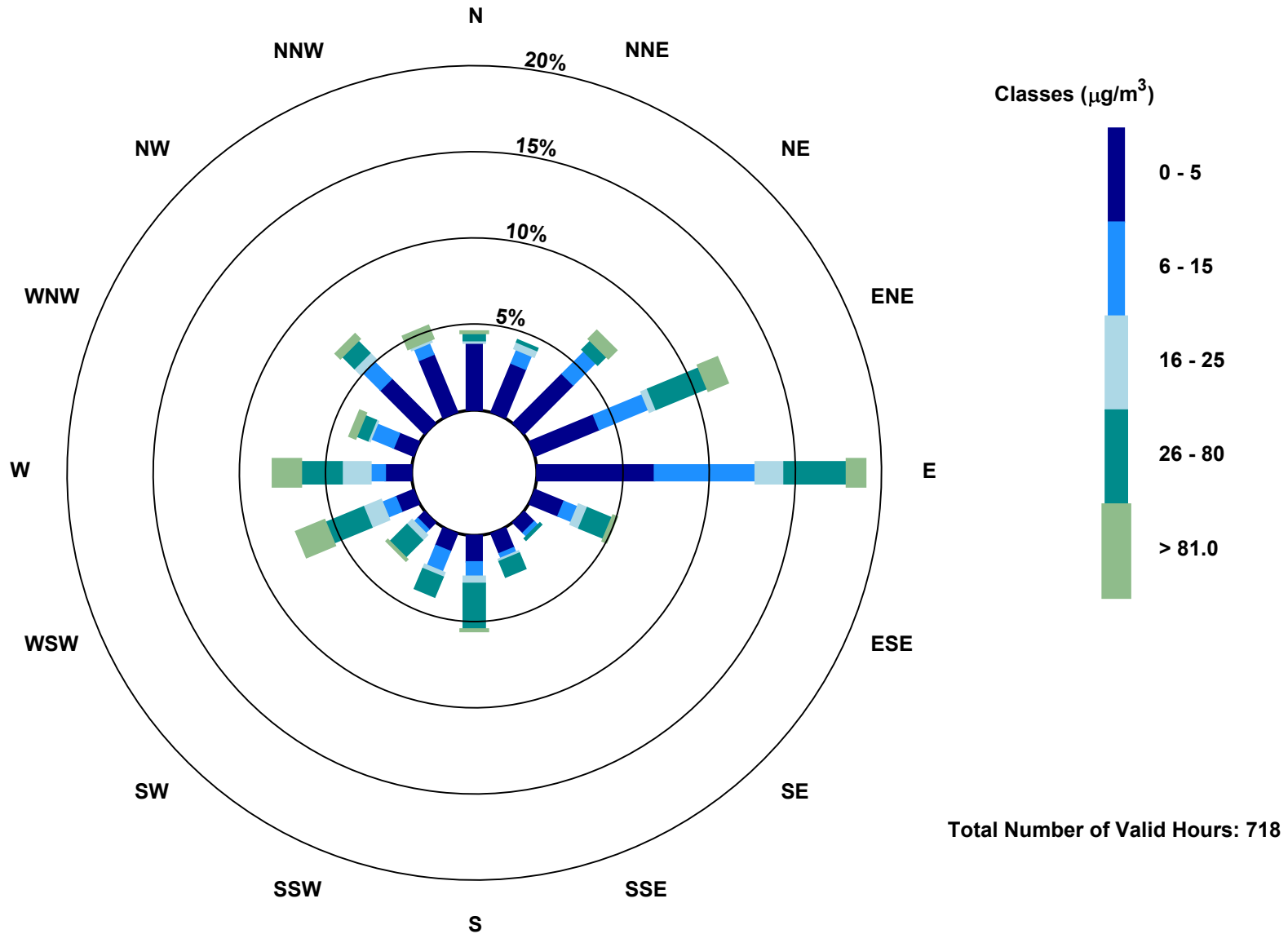
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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

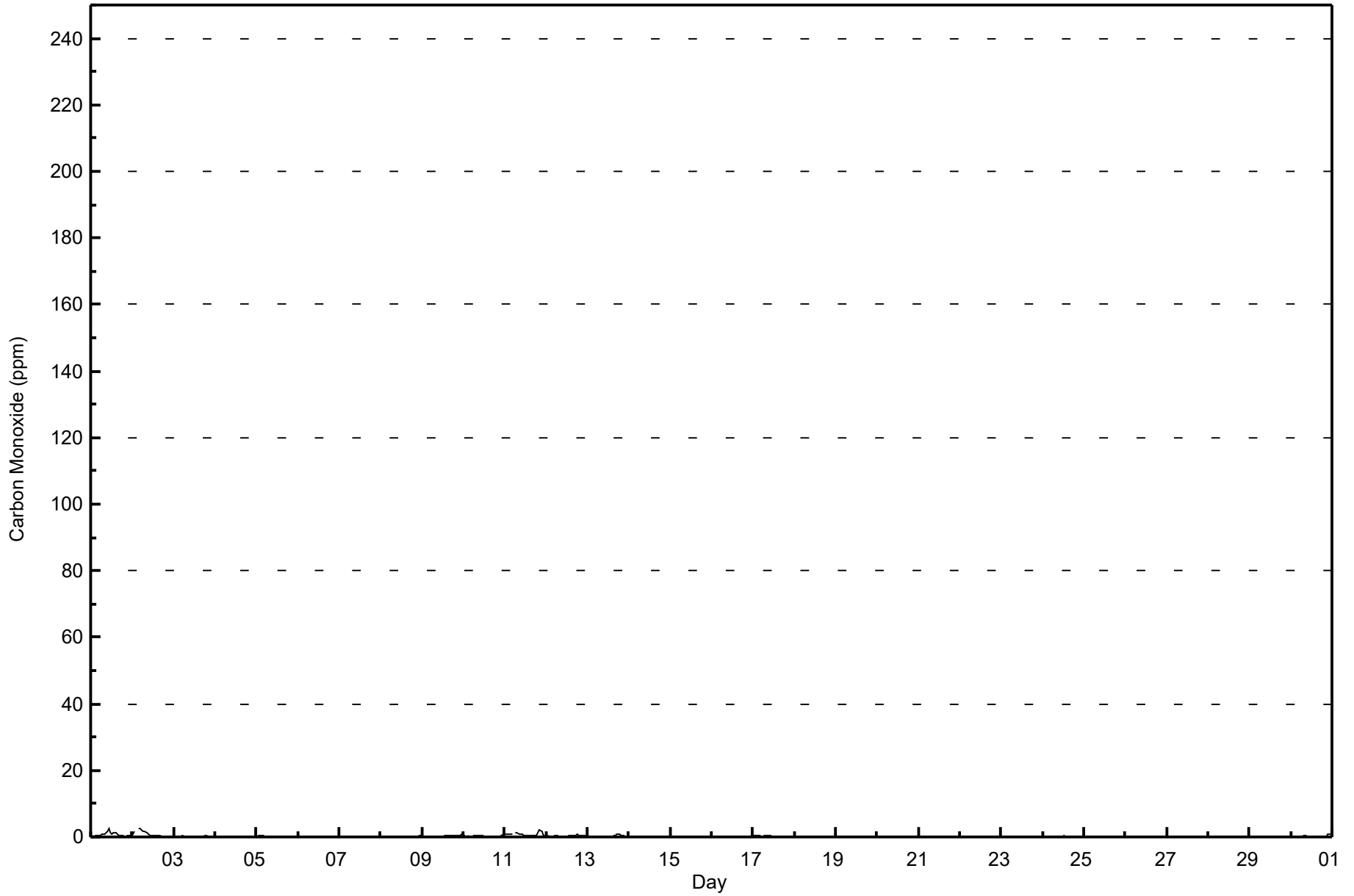
Fort Chipewyan - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720																													
Maximum Value: 2.7 ppm on Jun 1 11:00		Maximum Daily Average: 0.8 ppm on Jun 11														Hours of Data:		686																															
Minimum Value: 0.0 ppm on Jun 4 02:00		Minimum Daily Average: 0.0 ppm on Jun 22														Hours of Missing Data:		34																															
Maximum Diurnal Average: 0.2 ppm at hour 5		Minimum Diurnal Average: 0.1 ppm at hour 3														Hours of Calibration:		34																															
Monthly Average: 0.16 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.4 P ₉₉ = 1.5														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-Jun	0.4	Z	0.2	0.4	0.4	0.4	0.7	0.8	0.8	1.6	2.7	1.5	1.0	1.1	1.3	0.7	0.6	0.6	0.4	0.1	0.2	0.3	0.5	0.6	0.7	2.7																							
2-Jun	0.7	1.5	Z	2.5	2.5	2.3	1.6	1.5	1.3	0.8	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.8	2.5																							
3-Jun	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.3																							
4-Jun	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																							
5-Jun	0.0	0.3	0.5	0.5	0.5	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	0.5																							
6-Jun	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																							
7-Jun	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	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2																							
8-Jun	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	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.5	0.3	0.1	0.5																							
9-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.6	0.6	0.2	0.6																							
10-Jun	0.5	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	0.1	0.2	0.2	0.2	0.2	0.7	0.2	0.7																							
11-Jun	1.0	0.7	0.7	0.8	1.0	Z	1.2	1.1	0.7	0.9	0.9	0.5	0.4	0.5	0.4	0.4	0.6	0.4	0.3	1.2	2.1	1.5	0.5	0.3	0.8	2.1																							
12-Jun	Z	0.3	0.1	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.5	0.5	0.7	0.4	0.5	0.3	0.3	0.4	0.3	0.7																							
13-Jun	0.4	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.5	0.8	0.8	0.6	0.3	0.2	0.2	0.2	0.3	0.8																							
14-Jun	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																							
15-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
16-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2																							
17-Jun	0.2	0.4	0.4	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4																							
18-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
19-Jun	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	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																							
20-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
21-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
22-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
23-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
24-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4																							
25-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
26-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
27-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
28-Jun	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
29-Jun	0.1	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																							
30-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	C	C	C	C	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.7	0.8	0.7	0.2	0.8																							
																								Diurnal Average		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 Maximum		1.0		1.5		0.7		2.5		2.5		2.3		1.6		1.5		1.3		1.6		2.7		1.5	
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 Chipewyan - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	601	87.61	87.61
0.4 - 0.5	39	5.69	93.29
0.6 - 0.7	17	2.48	95.77
0.8 - 1.4	18	2.62	98.40
1.5 - 10	9	1.31	99.71
> 10	0	0.00	99.71

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort Chipewyan - June 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	28	25	49	76	119	28	9	17	39	27	16	36	35	24	41	32	601
0.4 - 0.5	1	2	2	4	9	2	0	0	1	0	0	1	11	2	4	0	39
0.6 - 0.7	0	1	0	1	3	0	0	0	0	0	0	4	4	0	1	3	17
0.8 - 1.4	1	1	0	0	2	0	0	0	0	0	0	7	5	0	1	1	18
1.5 - 10	1	0	1	2	1	1	0	0	0	0	0	1	1	0	0	1	9
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	29	52	83	134	31	9	17	40	27	16	49	56	26	47	37	684

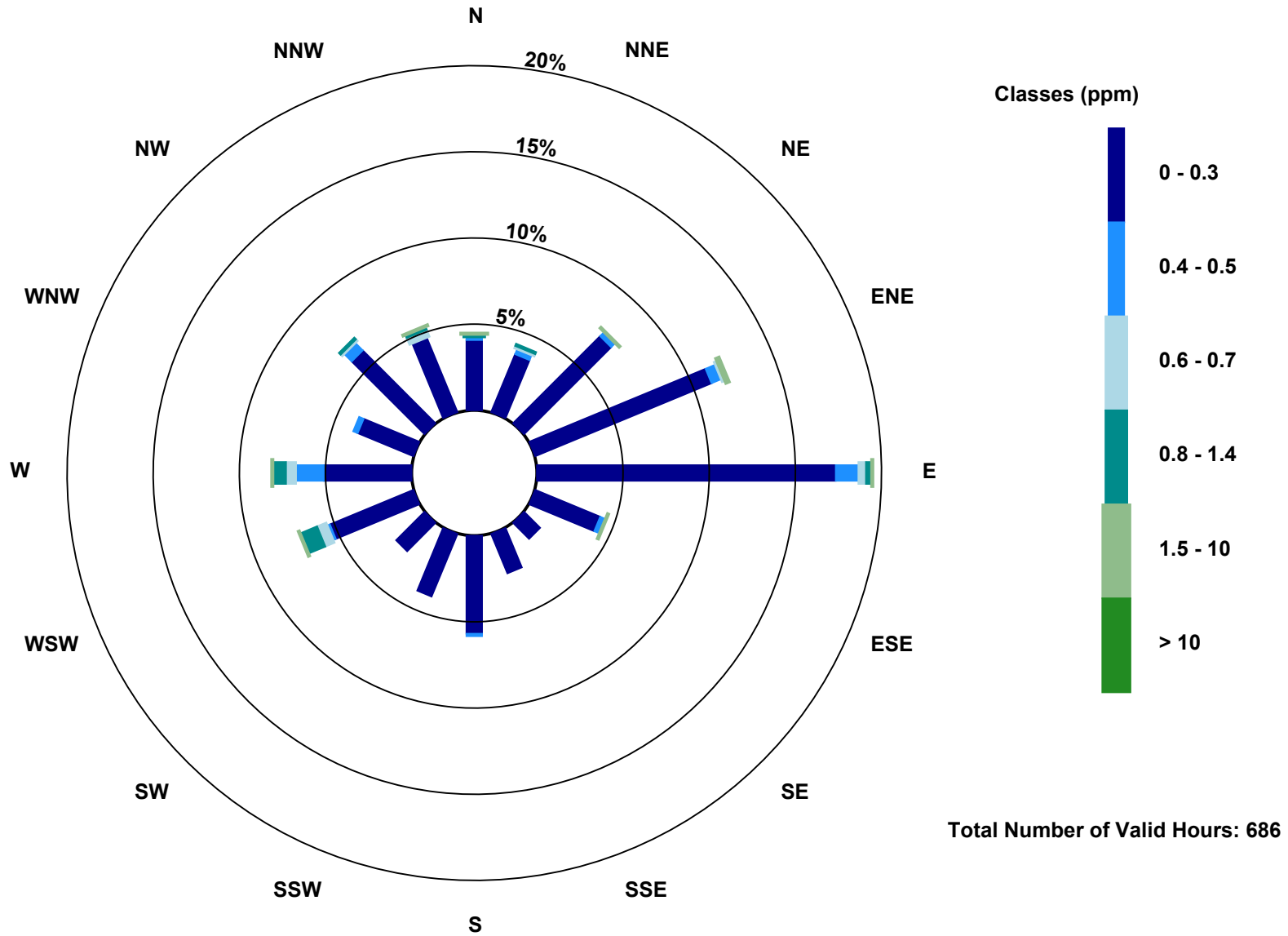
Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Carbon Monoxide (CO) - ppm
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 425.2 ppm on Jun 30 05:00	Maximum Daily Average: 404.5 ppm on Jun 30		Hours of Data:	687
Minimum Value: 376.7 ppm on Jun 16 19:00	Minimum Daily Average: 383.6 ppm on Jun 8		Hours of Missing Data:	33
Maximum Diurnal Average: 398.4 ppm at hour 4	Minimum Diurnal Average: 384.8 ppm at hour 18		Hours of Calibration:	33
Monthly Average: 389.81 ppm	Percentiles: P ₁ = 378.9 P ₁₀ = 381.9 Q ₁ = 384.4 Median = 388.3 Q ₃ = 393.4 P ₉₀ = 400.1 P ₉₉ = 414.8		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-Jun	391.6	Z	388.9	396.3	399.7	404.9	406.5	405.5	400.8	397.3	403.1	395.7	392.3	393.0	392.3	387.2	387.0	387.2	385.0	384.3	386.7	389.4	393.0	394.1	394.0	406.5
2-Jun	400.6	400.2	Z	406.8	411.1	411.0	403.1	399.8	400.4	397.2	393.0	390.8	387.7	385.6	384.9	383.9	384.3	384.5	384.9	384.5	384.1	384.0	384.2	384.8	392.7	411.1
3-Jun	385.4	386.6	387.0	Z	388.8	387.8	384.1	383.3	384.9	384.9	384.6	384.0	383.0	382.1	382.2	381.7	381.7	381.5	383.1	383.9	383.1	383.4	384.1	384.4	384.2	388.8
4-Jun	385.8	386.5	386.6	388.3	Z	386.8	385.7	385.5	385.4	385.1	384.4	383.2	383.5	383.8	384.0	383.9	383.5	383.1	384.7	385.9	386.5	389.5	393.8	386.0	393.8	
5-Jun	398.8	403.3	402.9	408.2	406.4	Z	405.3	403.3	400.7	397.5	394.2	390.8	390.9	393.9	394.7	395.8	394.8	392.1	390.9	389.4	390.6	392.2	395.0	393.9	396.8	408.2
6-Jun	Z	388.8	389.0	389.6	389.3	388.2	387.0	386.5	385.6	384.5	384.6	385.1	385.0	384.9	384.3	384.2	383.7	383.3	383.2	383.5	383.7	385.5	387.8	391.6	386.0	391.6
7-Jun	391.2	Z	393.9	394.9	395.3	395.7	394.4	393.6	389.1	388.0	386.6	386.4	385.9	385.4	386.6	385.6	385.3	385.5	385.3	385.9	388.4	389.5	389.2	390.3	389.2	395.7
8-Jun	391.1	391.9	Z	392.2	391.3	389.3	386.7	384.3	383.1	381.8	380.9	380.3	379.6	379.7	379.3	379.3	379.3	379.3	379.2	379.5	380.8	382.0	387.7	385.1	383.6	392.2
9-Jun	383.5	383.4	384.3	Z	386.4	386.9	387.1	386.7	386.5	385.6	383.6	382.4	381.7	382.2	381.8	383.3	383.6	383.2	383.2	383.5	384.3	384.5	385.9	387.5	384.4	387.5
10-Jun	390.7	400.8	396.5	395.4	Z	394.5	392.6	390.4	386.6	383.7	381.4	381.5	381.8	382.7	382.0	380.1	380.4	379.8	380.3	380.3	381.5	382.8	387.4	395.2	386.5	400.8
11-Jun	399.5	397.8	400.1	404.3	406.5	Z	409.1	406.4	402.8	399.5	396.4	391.9	390.7	389.1	387.7	386.4	388.5	387.1	386.6	397.4	404.9	400.9	395.7	393.5	396.6	409.1
12-Jun	Z	393.4	391.5	392.1	393.4	394.1	392.6	390.3	389.3	388.4	388.2	388.9	389.3	389.2	389.8	391.4	391.7	391.8	393.0	391.0	391.1	389.9	391.2	392.0	391.0	394.1
13-Jun	392.0	Z	392.2	394.4	395.6	396.7	397.1	396.5	394.7	392.3	392.0	390.6	388.8	387.7	388.3	389.3	391.6	394.4	393.8	392.5	390.4	390.6	390.9	391.1	392.3	397.1
14-Jun	390.4	391.8	Z	393.0	392.6	392.8	393.1	391.7	391.1	390.6	392.5	392.8	391.0	390.0	389.3	388.4	388.3	389.1	389.6	389.8	390.5	391.2	392.1	390.9	390.9	393.1
15-Jun	392.5	393.4	393.9	Z	394.7	394.1	393.9	393.0	390.7	388.7	386.9	385.2	383.2	381.3	381.3	379.5	380.6	380.9	381.1	383.9	384.8	385.7	386.1	394.4	387.4	394.7
16-Jun	393.2	400.0	407.3	410.1	Z	399.6	397.1	395.9	392.7	390.3	388.3	387.2	386.0	381.5	380.1	381.2	380.2	377.1	376.7	381.2	384.7	388.2	391.7	394.2	389.8	410.1
17-Jun	392.8	393.0	393.9	394.6	394.4	Z	394.9	394.7	394.0	392.5	389.9	386.8	386.5	386.7	386.3	384.4	383.6	384.2	384.5	383.9	384.5	386.4	389.6	393.1	389.4	394.9
18-Jun	Z	397.6	402.0	412.7	409.6	406.2	405.0	398.4	398.7	395.9	390.3	385.3	384.2	384.1	384.7	385.7	385.4	385.0	384.6	385.3	387.1	387.9	388.5	391.7	392.9	412.7
19-Jun	392.3	Z	394.4	393.4	391.4	389.7	389.4	389.6	388.8	388.6	388.7	393.4	389.0	388.4	387.9	387.1	386.4	386.4	386.4	386.4	386.7	387.1	387.4	387.6	389.0	394.4
20-Jun	388.0	388.5	Z	390.4	390.3	389.5	389.9	388.3	387.5	386.6	386.7	386.5	385.9	385.2	384.3	384.1	384.3	384.5	384.5	384.7	385.3	387.1	388.2	389.3	386.9	390.4
21-Jun	390.4	391.8	392.7	Z	394.5	391.4	389.0	387.4	386.2	385.4	385.2	386.5	386.1	385.8	385.4	385.0	384.3	383.6	383.0	382.6	382.6	383.1	385.9	388.6	386.8	394.5
22-Jun	388.8	393.8	397.8	395.7	Z	391.7	386.7	383.8	382.2	382.6	383.2	383.1	382.9	382.5	382.5	382.0	381.9	381.7	381.8	382.8	384.2	384.9	385.4	386.5	385.6	397.8
23-Jun	387.5	389.3	390.2	389.8	400.8	Z	396.0	386.7	381.2	380.7	380.5	380.1	380.3	380.2	380.1	379.7	379.9	379.7	379.8	380.8	384.4	385.8	390.0	392.6	385.1	400.8
24-Jun	Z	402.2	404.0	404.7	408.3	410.6	407.8	404.6	388.5	385.3	384.1	383.5	384.8	383.3	382.5	381.1	379.8	381.7	382.7	384.6	389.4	393.8	396.0	395.0	392.1	410.6
25-Jun	394.9	Z	391.4	389.3	386.4	385.6	386.2	386.3	386.1	385.3	384.6	384.5	384.7	384.3	384.3	384.4	384.4	384.4	384.5	384.9	385.7	385.8	385.0	386.0	386.0	394.9
26-Jun	387.2	389.0	Z	394.8	397.8	397.8	396.2	394.4	393.0	388.8	383.3	386.2	388.3	379.2	378.9	378.3	377.2	376.7	378.1	378.5	379.2	382.0	385.1	385.3	385.9	397.8
27-Jun	383.8	385.1	385.4	Z	387.8	385.6	385.1	383.6	383.3	382.6	382.8	382.1	382.4	382.1	381.9	380.9	380.5	380.1	380.3	380.7	382.2	386.5	393.3	391.7	383.9	393.3
28-Jun	394.5	390.2	390.1	391.5	Z	406.2	407.8	403.4	401.5	399.4	394.4	C	C	C	392.8	391.7	391.2	389.3	388.6	389.3	392.0	394.3	397.2	401.8	395.4	407.8
29-Jun	404.0	409.5	412.3	415.7	416.7	Z	413.4	405.9	398.0	397.0	393.5	389.9	388.9	388.3	389.6	389.2	393.7	394.9	397.3	396.0	397.0	401.2	408.4	409.1	400.4	416.7
30-Jun	Z	416.4	414.6	421.0	425.2	421.1	412.2	415.7	412.2	407.3	399.3	398.5	395.6	394.1	392.9	393.4	393.7	393.7	393.0	394.4	397.3	401.7	404.7	406.9	404.5	425.2

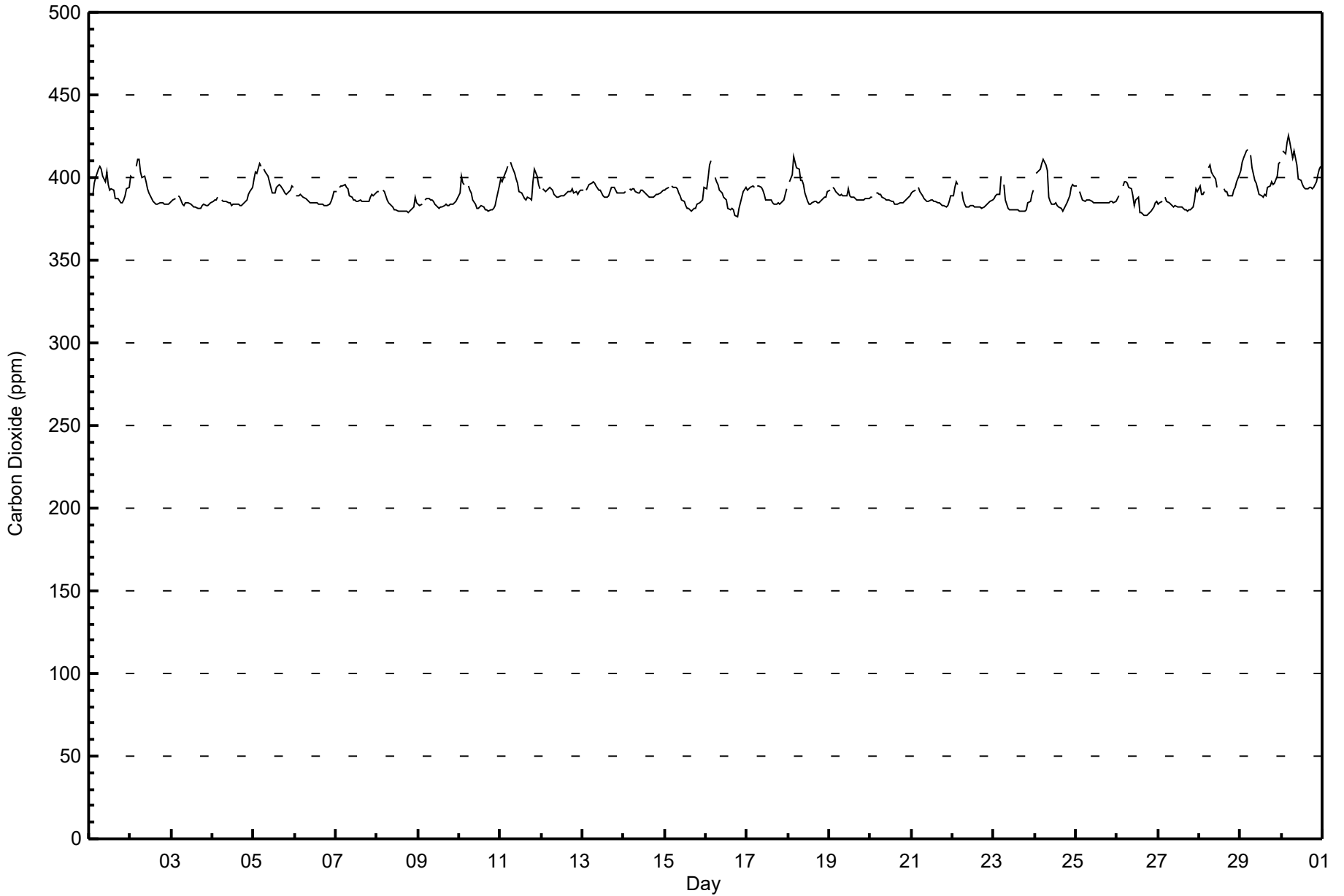
391.6	394.6	395.3	398.4	398.2	395.9	395.8	393.9	391.5	389.8	388.2	387.0	386.2	385.4	385.4	384.9	385.0	384.8	385.0	385.7	387.1	388.5	390.6	392.1	Diurnal Average	
404.0	416.4	414.6	421.0	425.2	421.1	413.4	415.7	412.2	407.3	403.1	398.5	395.6	394.1	394.7	395.8	394.8	394.9	397.3	397.4	404.9	401.7	408.4	409.1	Diurnal Maximum	

Z - zerspan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	68	9.90	9.90
420 - 440	3	0.44	10.33
440 - 460	0	0.00	10.33
460 - 480	0	0.00	10.33
480 - 500	0	0.00	10.33
> 500	0	0.00	10.33

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - June 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	3	0	1	4	5	1	2	4	5	9	2	6	11	5	6	4	68
420 - 440	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3
440 - 460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	3	0	1	4	5	1	2	4	5	9	2	7	13	5	6	4	71

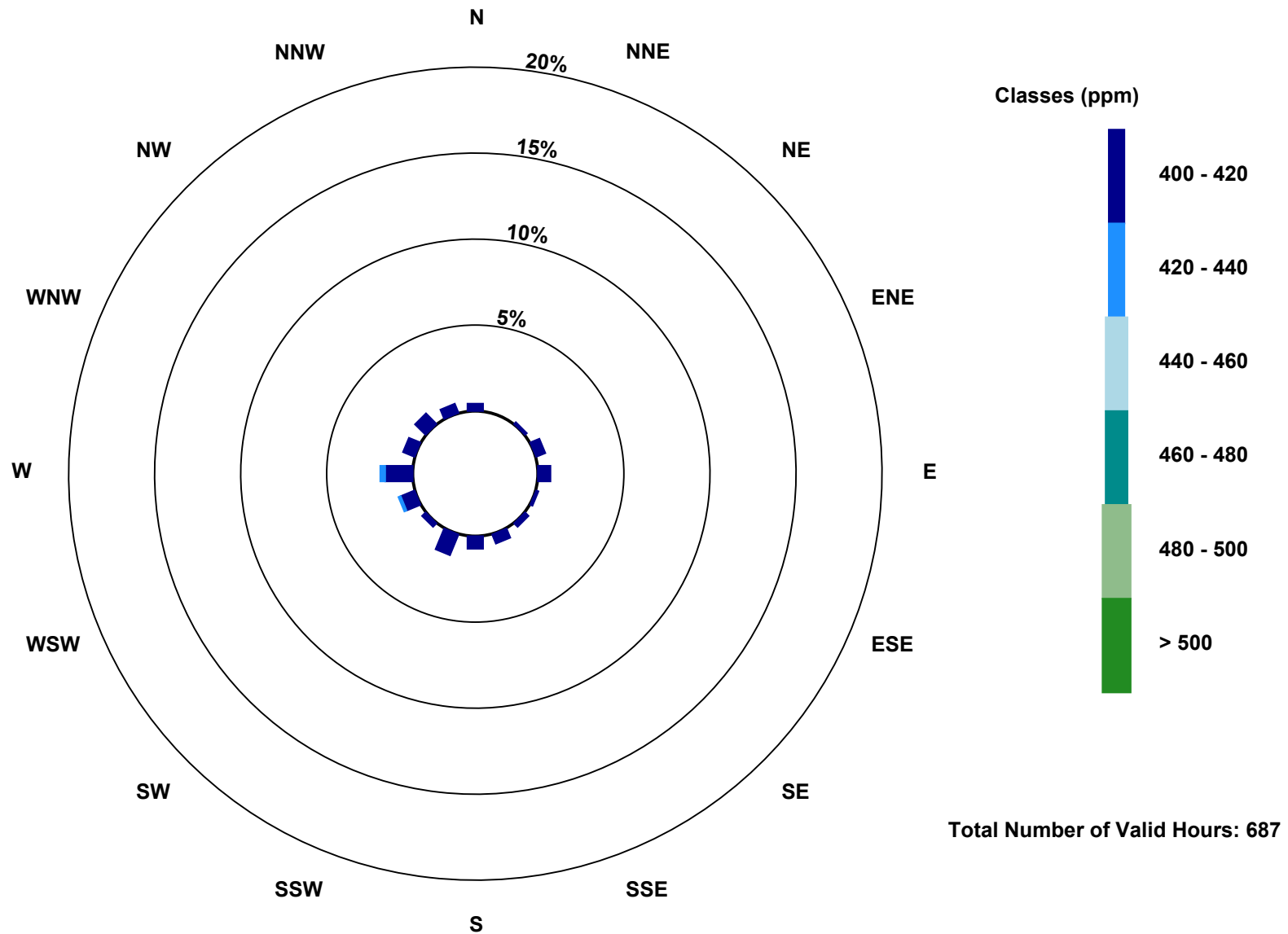
Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan





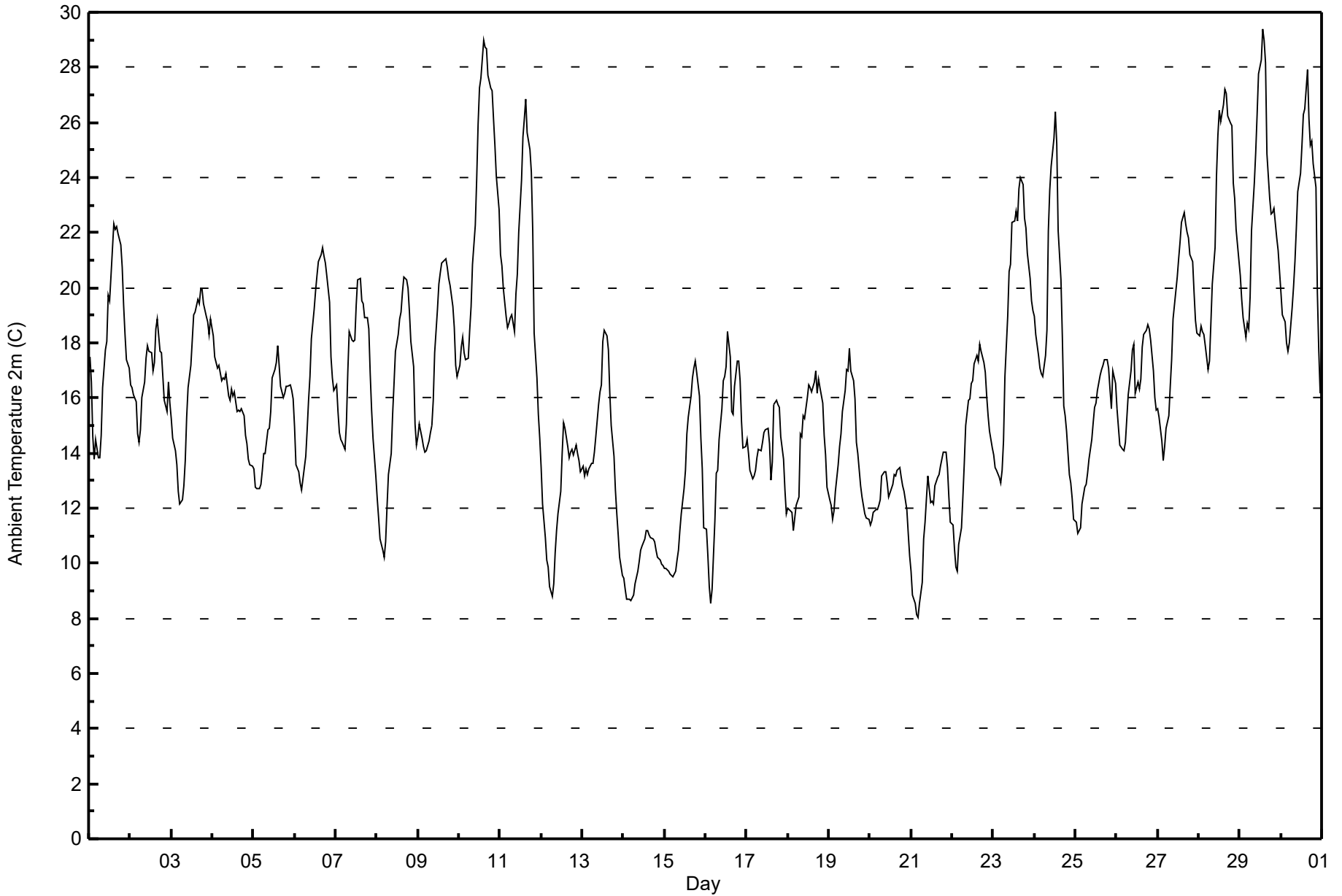
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C

Fort Chipewyan - June 2023

Maximum Value: 29.4 C on Jun 29 14:00		Maximum Daily Average: 23.3 C on Jun 10		Hours in Service: 720																																												
Minimum Value: 8.0 C on Jun 21 05:00		Minimum Daily Average: 10.0 C on Jun 14		Hours of Data: 720																																												
Maximum Diurnal Average: 19.3 C at hour 16		Minimum Diurnal Average: 13.4 C at hour 4		Hours of Missing Data: 0																																												
Monthly Average: 16.49 C		Percentiles: P ₁ = 8.7 P ₁₀ = 11.3 Q ₁ = 13.4 Median = 16.1 Q ₃ = 18.9 P ₉₀ = 22.3 P ₉₉ = 27.9		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	17.5	16.6	14.6	13.8	14.5	13.8	13.8	14.6	16.4	17.8	18.1	19.7	19.5	20.5	22.3	22.1	22.2	21.9	21.6	20.7	19.4	18.3	17.4	17.1	18.1	22.3																						
2-Jun	16.5	16.4	16.1	15.9	14.7	14.4	14.9	16.0	16.6	17.5	17.9	17.7	17.6	17.0	17.3	18.5	18.9	17.7	17.6	16.8	15.9	15.5	16.6	15.8	16.7	18.9																						
3-Jun	15.2	14.6	14.1	13.6	12.6	12.1	12.3	12.8	13.7	15.3	16.4	17.2	18.1	19.0	19.1	19.6	19.4	19.9	19.9	19.4	19.0	18.8	18.3	18.9	16.6	19.9																						
4-Jun	18.3	17.5	17.3	17.1	17.2	16.6	16.7	16.7	16.9	16.0	15.9	16.3	16.1	16.2	15.5	15.6	15.5	15.6	15.4	14.6	14.3	13.8	13.6	13.5	15.9	18.3																						
5-Jun	13.4	12.8	12.7	12.7	12.9	13.4	14.0	14.0	14.8	14.9	15.5	16.7	17.1	17.3	17.9	17.2	16.4	16.0	16.1	16.4	16.4	16.5	16.3	16.0	15.3	17.9																						
6-Jun	15.0	13.6	13.3	12.9	12.7	13.1	13.9	14.9	15.9	16.8	18.2	19.2	19.9	20.4	20.9	21.2	21.4	21.2	20.9	20.4	19.5	17.5	16.7	16.3	17.3	21.4																						
7-Jun	16.5	15.5	14.8	14.5	14.4	14.1	15.1	16.9	18.4	18.1	18.1	18.1	19.4	20.3	20.3	19.5	19.4	18.9	18.9	18.5	16.9	15.5	14.5	13.2	17.1	20.3																						
8-Jun	12.4	11.6	10.9	10.5	10.2	10.8	12.1	13.2	14.0	15.4	16.5	17.7	18.3	18.9	19.1	19.8	20.4	20.3	20.0	19.1	18.0	17.1	15.0	14.3	15.7	20.4																						
9-Jun	14.6	15.0	14.5	14.2	14.1	14.1	14.4	14.7	15.0	15.9	17.6	19.2	20.1	20.5	20.9	21.0	21.0	20.8	20.3	20.1	19.3	18.6	17.2	16.8	17.5	21.0																						
10-Jun	17.2	17.9	18.2	17.6	17.4	17.5	18.5	19.3	20.9	22.3	23.9	26.0	27.3	27.6	29.0	28.7	28.7	27.7	27.3	27.1	26.1	25.2	24.1	22.8	23.3	29.0																						
11-Jun	21.2	20.8	20.0	19.0	18.6	18.7	18.9	19.0	18.4	19.8	20.5	22.0	23.9	25.5	26.1	26.8	25.6	25.0	24.2	22.1	18.4	16.7	15.4	14.5	20.9	26.8																						
12-Jun	13.5	12.1	10.9	10.1	9.9	9.2	8.8	9.3	10.4	11.2	11.8	12.6	14.0	15.1	14.9	14.3	13.8	14.0	14.1	13.9	14.3	14.0	13.7	13.3	12.5	15.1																						
13-Jun	13.5	13.2	13.4	13.2	13.4	13.6	13.6	14.0	14.6	15.8	16.2	16.5	18.1	18.5	18.3	17.8	16.2	15.0	13.9	12.7	11.8	11.0	10.2	9.5	14.3	18.5																						
14-Jun	9.5	9.1	8.7	8.7	8.6	8.8	8.8	9.3	9.7	10.1	10.5	10.6	10.9	11.2	11.2	11.0	10.9	10.9	10.8	10.5	10.2	10.1	10.0	9.9	10.0	11.2																						
15-Jun	9.8	9.8	9.7	9.6	9.5	9.5	9.7	10.1	10.5	11.2	11.8	12.7	13.4	14.7	15.3	16.1	16.7	17.1	17.3	16.9	16.1	14.6	13.4	11.3	12.8	17.3																						
16-Jun	11.2	10.3	9.1	8.6	9.1	11.5	13.3	13.3	14.5	15.6	16.6	16.8	17.1	18.4	17.5	15.5	15.4	16.4	17.3	17.3	16.6	15.1	14.2	14.2	14.4	18.4																						
17-Jun	14.5	14.0	13.4	13.1	13.2	13.4	13.8	14.1	14.1	14.4	14.8	14.8	14.9	14.3	13.0	13.7	15.8	15.9	15.8	15.7	14.6	13.8	12.7	11.8	14.1	15.9																						
18-Jun	12.0	11.9	11.9	11.2	11.7	12.1	12.4	14.7	14.6	15.3	15.2	16.0	16.4	16.4	16.2	16.6	17.0	16.1	16.7	16.4	15.8	14.6	14.0	12.7	14.5	17.0																						
19-Jun	12.3	12.1	11.6	11.9	12.6	13.6	14.2	14.7	15.5	16.3	17.0	17.0	17.8	17.0	16.6	16.0	14.4	14.0	12.8	12.4	12.1	11.8	11.7	11.6	14.0	17.8																						
20-Jun	11.4	11.6	11.9	12.0	11.9	12.1	12.3	13.2	13.3	13.3	12.9	12.4	12.7	12.9	13.2	13.2	13.4	13.5	13.1	12.8	12.6	11.9	11.1	10.3	12.5	13.5																						
21-Jun	9.7	8.9	8.5	8.2	8.0	8.6	9.3	10.9	11.5	12.3	13.1	12.2	12.2	12.1	12.8	13.1	13.2	13.5	13.8	14.0	14.0	13.5	12.4	11.5	11.6	14.0																						
22-Jun	11.4	10.5	9.9	9.7	10.7	11.3	12.4	13.6	15.0	15.9	16.0	16.5	16.6	17.2	17.6	17.4	17.9	17.7	17.3	16.9	16.1	15.4	14.8	14.2	14.7	17.9																						
23-Jun	14.0	13.5	13.4	13.1	12.9	13.4	14.5	16.8	19.0	20.6	20.8	22.4	22.4	22.8	22.4	23.6	24.0	23.7	22.5	22.2	21.2	20.4	19.5	19.2	19.1	24.0																						
24-Jun	19.0	18.3	17.6	17.1	16.9	16.8	17.6	18.5	22.1	23.6	24.4	25.4	26.4	25.2	22.0	20.3	18.2	15.7	15.4	14.8	13.2	12.9	12.4	11.6	18.5	26.4																						
25-Jun	11.5	11.1	11.2	11.3	12.1	12.7	12.9	13.2	13.8	14.5	15.1	15.6	15.8	16.3	16.8	17.0	17.2	17.4	17.4	17.1	16.3	15.6	17.0	16.5	14.8	17.4																						
26-Jun	15.6	15.0	14.3	14.1	14.1	14.4	15.2	16.1	17.0	17.7	18.0	16.2	16.6	16.3	16.7	17.9	18.3	18.4	18.7	18.5	18.1	17.0	16.0	15.6	16.5	18.7																						
27-Jun	15.6	15.3	14.5	13.7	14.2	14.9	15.4	16.4	17.4	18.9	19.4	20.4	21.1	21.7	22.4	22.7	22.3	22.0	21.8	21.2	21.0	19.8	18.8	18.3	18.7	22.7																						
28-Jun	18.2	18.6	18.4	18.3	17.9	17.0	17.3	18.7	20.1	21.5	24.0	25.5	26.4	26.0	26.6	27.2	27.1	26.2	26.0	25.9	23.8	23.2	22.1	21.0	22.4	27.2																						
29-Jun	20.4	19.6	18.9	18.2	18.7	18.5	19.7	22.1	23.8	24.9	26.3	27.8	28.3	29.4	29.0	28.2	24.8	23.2	22.7	22.7	22.9	21.8	21.3	20.6	23.1	29.4																						
30-Jun	19.8	19.0	18.8	18.0	17.7	18.0	19.3	20.0	21.0	22.2	23.5	24.2	25.2	26.3	26.5	27.9	26.1	25.2	25.3	24.5	23.6	19.8	17.7	16.2	21.9	27.9																						
																								14.7	14.2	13.7	13.4	13.4	13.6	14.2	15.0	16.0	16.8	17.5	18.2	18.8	19.2	19.3	19.3	19.1	18.7	18.5	18.1	17.3	16.3	15.6	14.9	Diurnal Average
																								21.2	20.8	20.0	19.0	18.7	18.7	19.7	22.1	23.8	24.9	26.3	27.8	28.3	29.4	29.0	28.7	28.7	27.7	27.3	27.1	26.1	25.2	24.1	22.8	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	35	4.86	4.86
10 - 20	552	76.67	81.53
> 20	133	18.47	100.00

Total Number of Valid Hours: 720

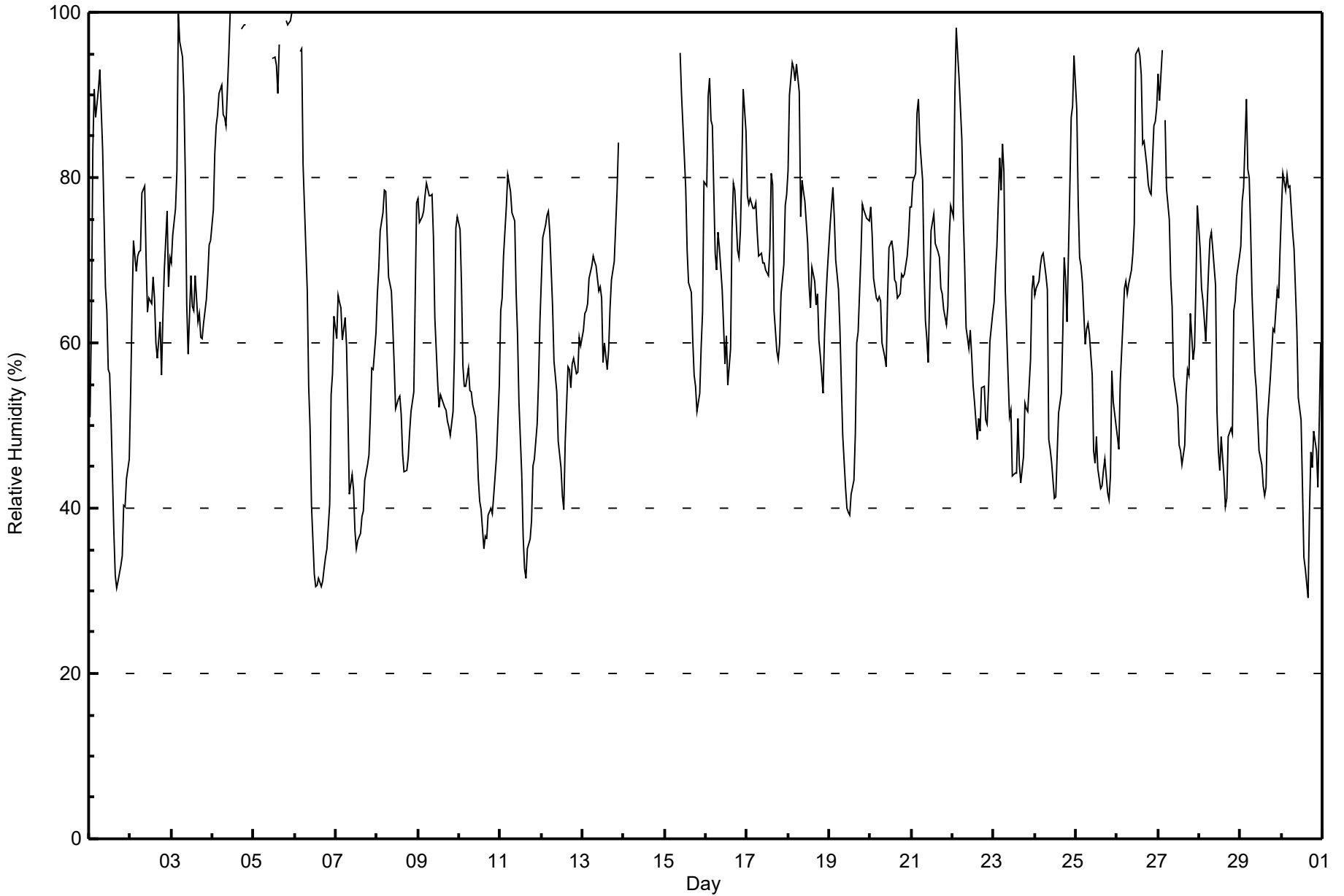
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 100.0 % on Jun 4 11:00																						Maximum Daily Average: 75.8 % on Jun 26																						Hours in Service: 720			
Minimum Value: 29.2 % on Jun 30 16:00																						Minimum Daily Average: 48.4 % on Jun 10																						Hours of Data: 656			
Maximum Diurnal Average: 77.8 % at hour 5																						Minimum Diurnal Average: 53.5 % at hour 17																						Hours of Missing Data: 64			
Monthly Average: 64.19 %																						Percentiles: P ₁ = 31.4 P ₁₀ = 42.9 Q ₁ = 52.8 Median = 65.2 Q ₃ = 75.1 P ₉₀ = 86.3 P ₉₉ = 98.5																						Hours of Calibration: 0			
																																												Percent Operational Time: 91.1			
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-Jun	51.0	62.7	83.4	90.7	87.3	90.6	93.1	88.1	83.4	66.8	63.9	56.8	56.2	50.8	37.1	31.9	30.3	31.3	33.0	34.3	40.3	40.2	43.6	45.9	58.0	93.1																					
2-Jun	54.1	64.3	72.4	68.6	70.5	71.0	71.2	78.2	78.9	70.2	63.8	65.4	64.7	68.0	65.5	60.0	58.2	62.5	56.1	63.1	68.7	76.0	66.8	70.4	67.0	78.9																					
3-Jun	69.7	73.1	76.2	80.8	99.9	96.5	94.6	89.8	80.0	64.6	58.7	68.1	64.4	63.9	68.1	62.5	63.5	60.6	60.6	62.3	65.3	68.1	71.8	72.3	72.3	99.9																					
4-Jun	76.2	82.8	86.3	87.6	90.2	91.2	87.6	87.3	86.3	94.9	100.0	OR	OR	OR	OR	OR	OR	98.0	98.6	98.5	OR	OR	OR	OR	--	100.0																					
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	94.4	94.6	93.5	90.2	96.1	OR	OR	OR	99.1	98.5	99.0	100.0	OR	--	100.0																				
6-Jun	OR	OR	OR	95.2	95.6	81.4	71.3	66.2	54.8	49.6	40.4	32.0	30.4	30.7	31.6	30.5	31.3	32.7	34.0	35.1	40.5	53.8	56.2	63.2	50.3	95.6																					
7-Jun	60.5	65.8	64.9	64.2	60.4	63.0	59.6	51.6	41.8	44.1	42.2	37.3	35.0	36.1	37.0	39.0	39.7	43.3	45.2	46.4	51.3	56.9	56.8	61.2	50.1	65.8																					
8-Jun	65.9	69.1	73.6	75.8	78.5	78.4	72.8	68.0	66.3	62.0	57.2	52.0	53.3	53.6	51.3	46.6	44.4	44.6	46.2	49.1	51.7	54.0	65.6	76.9	60.7	78.5																					
9-Jun	77.5	74.5	75.2	76.0	77.8	79.4	77.7	77.7	78.0	72.9	63.1	55.2	52.1	53.7	53.1	52.1	51.9	50.4	49.9	48.9	51.7	58.8	73.9	75.2	64.9	79.4																					
10-Jun	73.6	67.1	57.3	54.7	54.8	56.9	54.3	54.0	52.5	51.0	48.4	43.5	40.8	39.8	35.1	36.6	36.2	39.2	40.0	39.4	41.5	43.8	46.3	54.9	48.4	73.6																					
11-Jun	63.8	65.4	70.4	76.5	80.3	79.3	78.3	75.8	74.8	66.1	60.9	52.9	44.1	36.7	32.8	31.5	35.0	36.3	38.4	45.0	45.9	50.1	55.4	62.8	56.6	80.3																					
12-Jun	67.6	72.7	74.2	75.5	75.9	73.5	64.4	57.8	55.9	54.0	48.1	44.9	41.6	39.9	48.0	57.1	56.7	54.6	57.5	58.2	56.3	56.4	60.7	59.6	58.8	75.9																					
13-Jun	61.5	63.6	64.0	64.8	67.8	69.3	70.5	69.8	69.3	66.3	66.8	65.5	57.6	59.9	56.8	59.2	64.3	67.6	69.8	74.1	78.2	84.2	OR	OR	66.9	84.2																					
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	--																				
15-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	95.2	90.0	82.6	78.7	71.1	67.2	66.1	60.4	56.1	54.7	51.8	53.9	59.6	63.7	79.5	--	95.2																				
16-Jun	79.0	89.8	92.1	86.9	86.2	70.8	68.8	73.4	71.5	66.5	62.0	57.4	60.8	54.9	59.4	73.6	79.4	78.5	71.3	70.3	73.6	81.1	90.7	85.6	74.3	92.1																					
17-Jun	77.8	76.8	77.4	76.3	76.3	76.9	73.3	70.5	70.8	69.7	69.6	68.9	68.2	71.3	80.6	79.2	64.0	59.0	58.0	60.1	65.9	69.5	76.6	78.0	71.4	80.6																					
18-Jun	80.8	89.9	93.8	93.2	91.7	93.7	90.3	75.3	79.6	78.4	77.1	72.1	66.9	64.2	69.1	67.4	64.5	65.9	60.4	58.4	53.9	61.0	65.3	68.7	74.2	93.8																					
19-Jun	74.2	76.6	78.8	75.1	70.0	66.5	61.7	55.1	48.8	42.6	40.0	39.5	39.2	41.7	43.3	48.9	59.9	61.3	70.7	76.8	76.2	75.6	75.0	74.7	61.3	78.8																					
20-Jun	76.4	73.1	67.7	65.4	65.1	65.7	65.2	60.0	58.3	57.1	65.4	71.5	72.4	71.1	67.7	67.3	65.5	66.0	68.2	68.0	68.3	70.5	72.9	76.4	67.7	76.4																					
21-Jun	76.4	79.5	80.5	87.8	89.6	84.4	79.6	69.0	62.7	60.6	57.6	73.5	74.5	75.6	72.1	71.0	70.4	66.6	65.9	64.0	62.2	64.4	72.8	76.6	72.4	89.6																					
22-Jun	75.2	90.1	98.1	95.0	92.0	84.6	75.4	69.2	61.9	59.3	61.5	58.4	54.9	52.9	48.2	50.9	49.4	54.6	54.8	50.7	50.2	54.4	60.2	63.5	65.2	98.1																					
23-Jun	64.9	68.6	71.8	82.4	78.4	84.1	80.7	66.3	55.9	51.0	51.9	44.0	44.3	44.2	50.8	45.2	43.1	46.3	52.8	52.0	51.7	58.0	66.5	68.2	59.3	84.1																					
24-Jun	65.8	66.6	67.5	69.3	70.5	70.9	68.1	66.4	48.4	47.0	45.5	41.1	41.3	46.6	51.6	53.9	61.2	70.3	67.9	62.5	78.5	87.2	88.6	94.7	63.8	94.7																					
25-Jun	88.1	77.0	70.3	69.3	67.3	59.9	61.7	62.4	61.0	56.2	46.9	45.5	48.7	44.8	42.4	42.8	44.7	45.9	41.9	41.0	44.0	56.7	52.8	50.1	55.0	88.1																					
26-Jun	48.7	47.1	55.3	62.6	66.5	67.5	65.9	67.1	68.8	70.9	74.4	94.8	95.5	94.8	92.4	84.0	84.4	81.4	79.1	78.4	77.9	86.3	86.8	88.5	75.8	95.5																					
27-Jun	92.5	89.3	95.5	OR	86.9	78.7	74.8	67.7	64.4	55.8	54.7	52.3	47.6	47.0	45.2	47.5	54.0	56.8	56.1	63.5	57.9	59.6	67.1	76.6	64.8	95.5																					
28-Jun	71.4	66.5	65.2	62.8	60.2	68.8	72.5	73.4	71.3	67.0	51.8	46.9	44.6	48.7	43.7	40.2	41.2	48.7	49.7	48.9	63.8	65.1	68.1	70.3	58.8	73.4																					
29-Jun	71.6	77.2	78.8	89.5	80.9	79.9	73.8	65.9	56.6	54.6	51.0	47.0	45.2	42.6	41.5	42.6	50.7	55.5	58.4	61.7	61.4	66.5	65.5	71.2	62.1	89.5																					
30-Jun	76.1	80.5	78.6	80.3	78.7	79.0	73.4	71.4	66.4	61.6	53.4	50.6	42.5	34.1	32.8	29.2	39.5	46.8	44.9	49.3	47.0	42.5	50.7	60.0	57.0	80.5																					
																						70.8	73.5	75.7	77.2	77.8	76.4	73.4	69.5	65.5	62.7	59.5	57.6	55.7	54.7	54.1	54.0	53.5	56.5	56.6	59.0	59.9	64.3	67.4	70.2	Diurnal Average	
																						92.5	90.1	98.1	95.2	99.9	96.5	94.6	89.8	86.3	95.2	100.0	94.8	95.5	94.8	92.4	96.1	84.4	98.0	98.6	99.1	98.5	99.0	100.0	94.7	Diurnal Maximum	
OR - Out of Range																																															





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

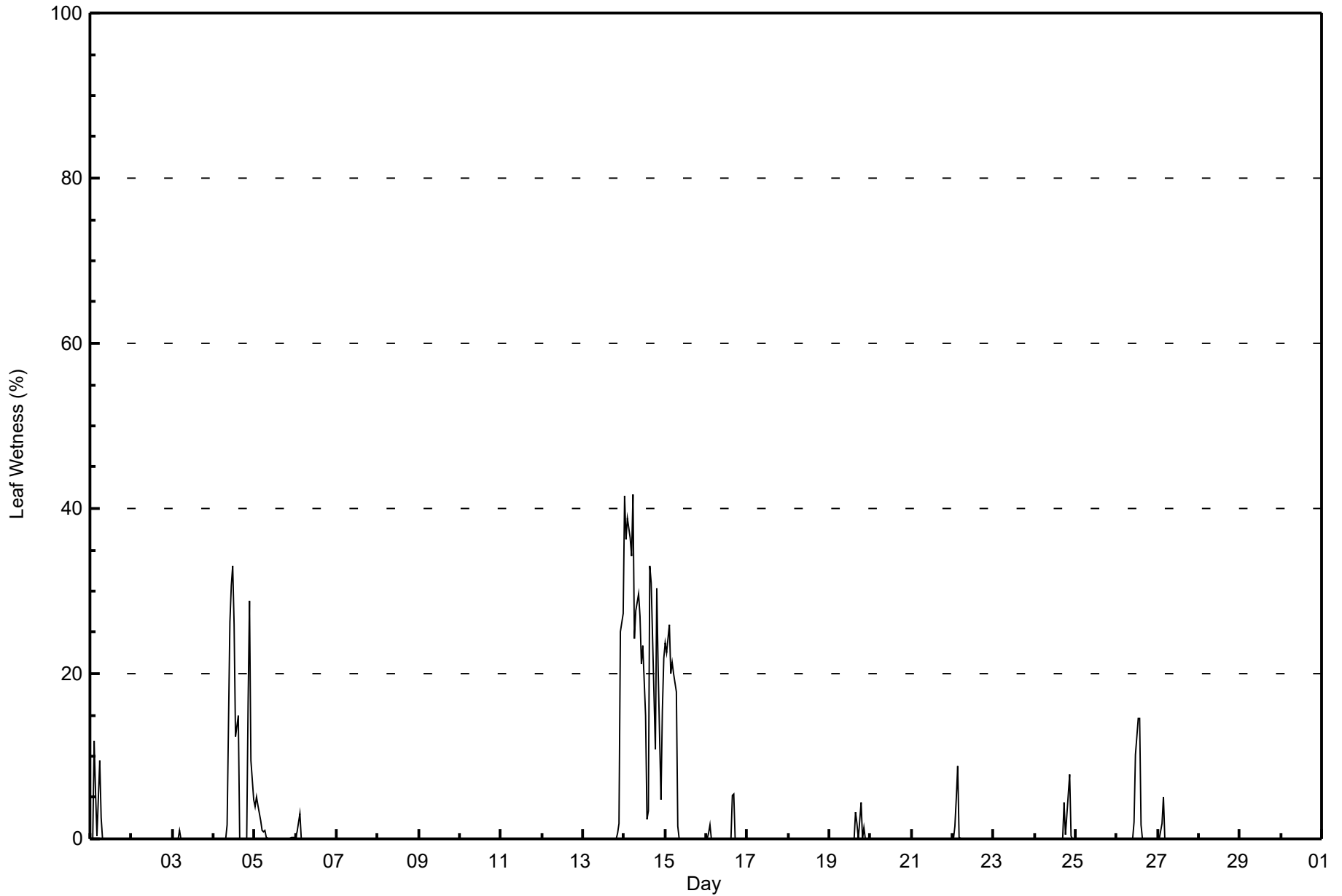
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	40	6.10	6.10
40 - 60	212	32.32	38.41
60 - 80	312	47.56	85.98
80 - 100	90	13.72	99.70

Total Number of Valid Hours: 656

Total Number of Hours: 720



Maximum Value: 41.8 % on Jun 14 06:00		Maximum Daily Average: 24.5 % on Jun 14		Hours in Service: 720																							
Minimum Value: 0.0 % on Jun 1 01:00		Minimum Daily Average: 0.0 % on Jun 2		Hours of Data: 720																							
Maximum Diurnal Average: 3.1 % at hour 3		Minimum Diurnal Average: 0.5 % at hour 19		Hours of Missing Data: 0																							
Monthly Average: 1.61 %		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 1.6 P ₉₉ = 32.7		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-Jun	0.0	0.0	11.9	5.6	0.4	9.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	11.9	
2-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
4-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	26.3	30.7	33.1	25.9	12.4	14.9	0.1	0.0	0.0	0.0	0.0	16.5	28.9	9.5	4.8	8.5	33.1	
5-Jun	3.8	5.1	4.1	2.2	0.9	0.8	1.1	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	0.2	0.1	0.2	0.8	5.1	
6-Jun	0.1	0.8	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.0	
7-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.9	25.1	27.3	2.3	27.3	
14-Jun	41.6	36.2	38.9	36.4	34.3	41.8	24.2	27.6	29.6	26.9	21.1	23.4	15.0	2.3	3.4	33.1	31.1	17.5	10.9	30.3	20.3	4.8	15.6	21.8	24.5	41.8	
15-Jun	23.8	22.6	26.0	19.9	21.4	20.1	17.8	1.6	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	6.4	26.0	
16-Jun	0.0	0.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	5.5	
17-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.8	0.0	4.5	0.0	1.4	0.0	0.0	0.0	0.5	4.5	
20-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	1.4	5.0	8.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	8.8	
23-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	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	0.5	2.8	7.7	0.4	0.0	0.0	0.7	7.7	
25-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	10.1	14.6	14.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	14.6	
27-Jun	0.0	0.0	1.9	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	5.0	5.0	
28-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	2.2	3.1	2.6	1.9	2.4	1.5	1.0	1.0	1.8	1.8	2.2	1.9	1.0	0.7	1.4	1.3	0.7	0.5	1.1	1.6	1.2	1.7	1.8	Diurnal Average	
		41.6	36.2	38.9	36.4	34.3	41.8	24.2	27.6	29.6	26.9	30.7	33.1	25.9	14.6	14.9	33.1	31.1	17.5	10.9	30.3	20.3	28.9	25.1	27.3	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	635	88.19	88.19
0.4 - 0.5	3	0.42	88.61
0.6 - 0.7	2	0.28	88.89
0.8 - 1.4	7	0.97	89.86
1.5 - 10	31	4.31	94.17
> 10	42	5.83	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

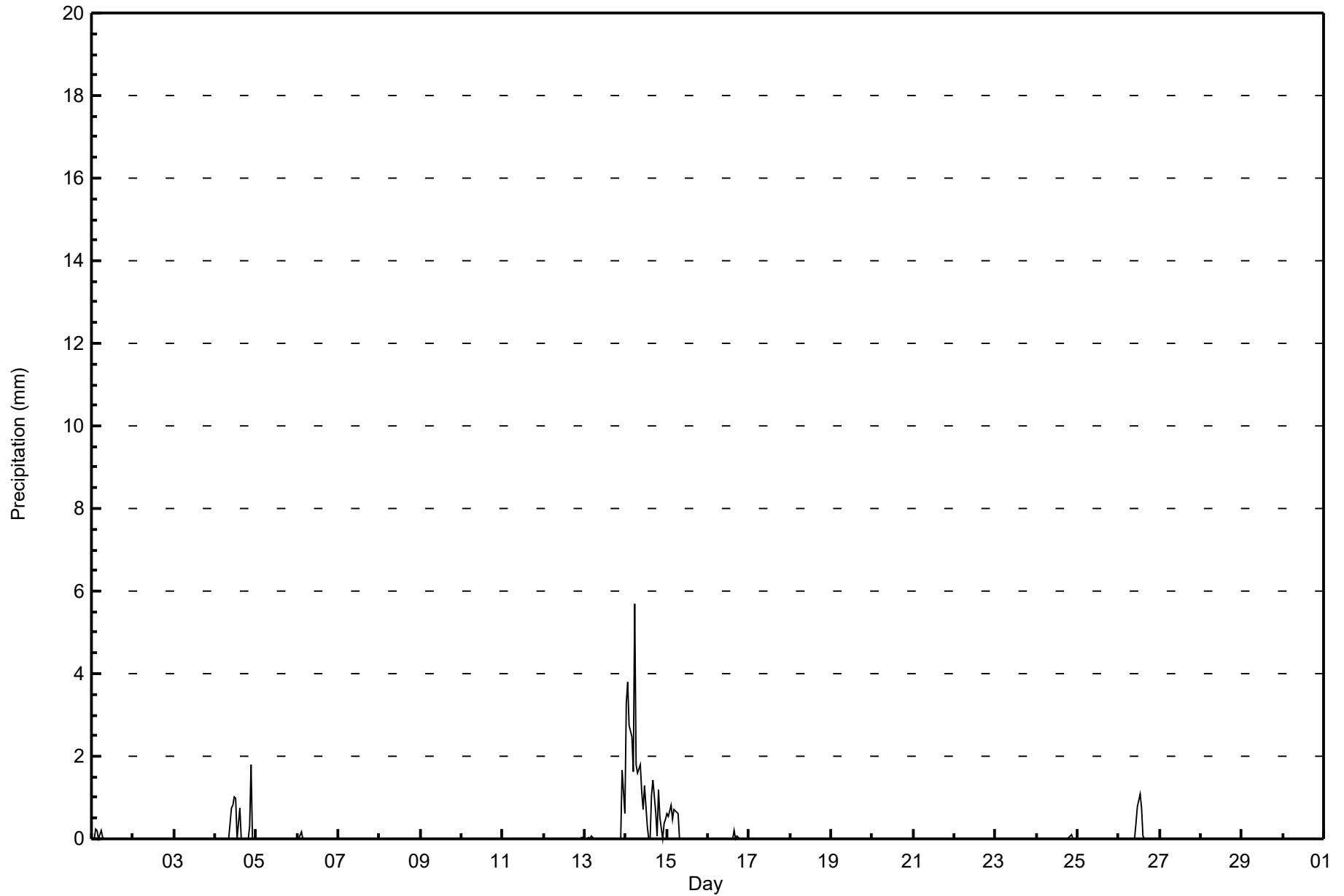
Fort Chipewyan - June 2023

Maximum Value: 5.7 mm on Jun 14 06:00 Maximum Daily Total: 34.0 mm on Jun 14																				Hours in Service: 720 Hours of Data: 720								
Minimum Value: 0.0 mm on Jun 1 01:00 Minimum Daily Total: 0.0 mm on Jun 2 Maximum Diurnal Total: 6.6 mm at hour 6 Minimum Diurnal Total: 0.1 mm at hour 19 Monthly Total: 51.67 mm Percentiles: $P_1 = 0.0$ $P_{10} = 0.0$ $Q_1 = 0.0$ Median = 0.0 $Q_3 = 0.0$ $P_{90} = 0.0$ $P_{99} = 1.8$																				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-Jun	0.0	0.0	0.2	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	
2-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	1.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.3	1.8	0.0	0.0	6.4	1.8	
5-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	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	0.2	0.2	
7-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
13-Jun	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.6	2.4	1.7	
14-Jun	3.3	3.8	2.7	2.5	1.6	5.7	1.8	1.6	1.8	1.2	0.7	1.3	0.3	0.0	0.0	1.1	1.4	0.7	0.1	1.2	0.5	0.0	0.4	0.5	34.0	5.7		
15-Jun	0.6	0.5	0.8	0.5	0.7	0.7	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	4.4	0.8	
16-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	
17-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	
25-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	1.1	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.1	
27-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Fort Chipewyan - June 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	682	94.72	94.72
0.4 - 0.5	6	0.83	95.56
0.6 - 0.7	8	1.11	96.67
0.8 - 1.4	13	1.81	98.47
1.5 - 10	11	1.53	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 720

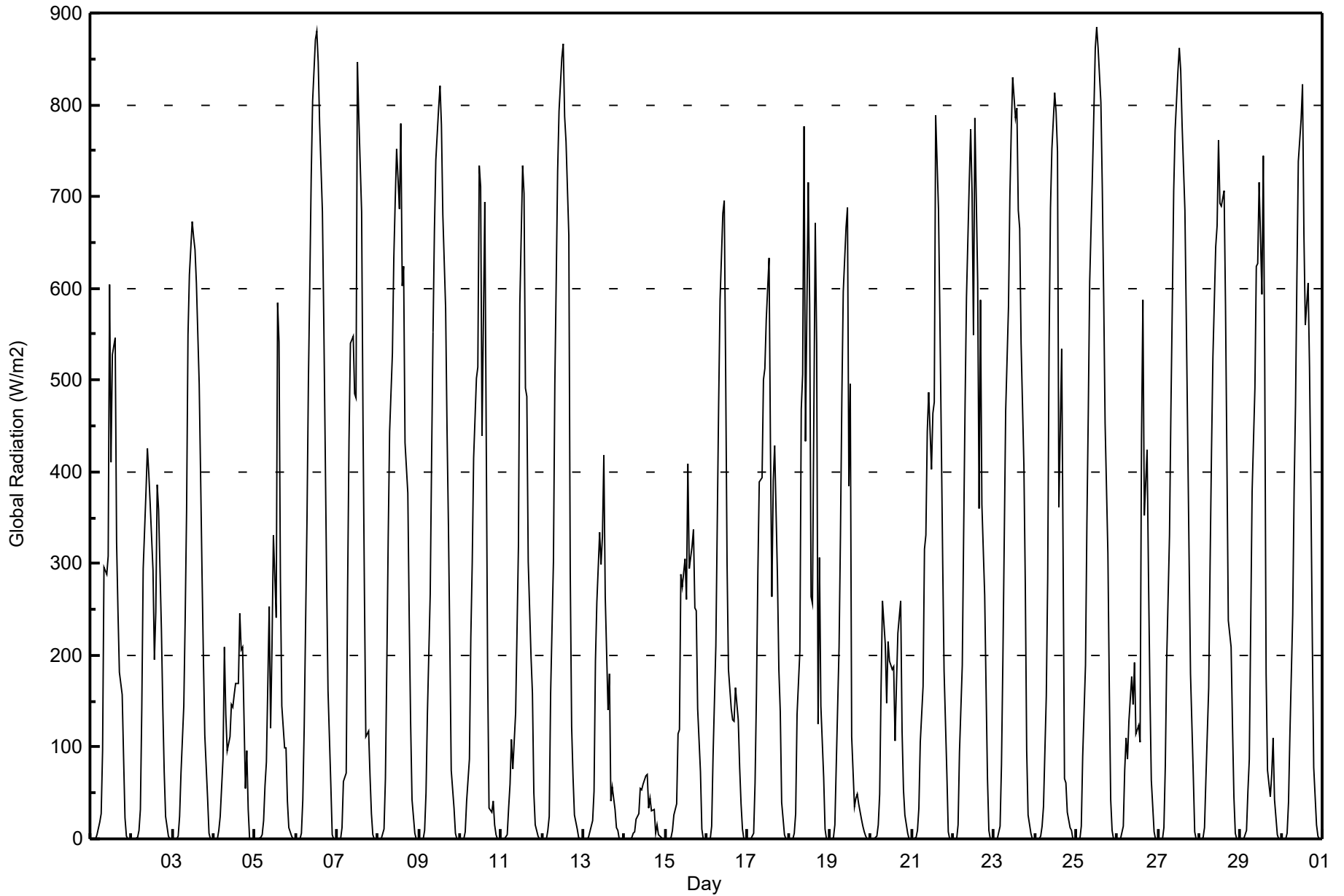
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 884.5 W/m2 on Jun 25 13:00		Maximum Daily Average: 371.8 W/m2 on Jun 25																				Hours in Service: 720					
Minimum Value: 0.0 W/m2 on Jun 1 02:00		Minimum Daily Average: 22.5 W/m2 on Jun 14																				Hours of Data: 720					
Maximum Diurnal Average: 569.0 W/m2 at hour 12		Minimum Diurnal Average: 0.0 W/m2 at hour 2																				Hours of Missing Data: 0					
Monthly Average: 232.88 W/m2		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 5.5 Median = 121.6 Q ₃ = 422.6 P ₉₀ = 683.3 P ₉₉ = 850.6																				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-Jun	0.0	0.0	0.0	0.5	5.1	18.4	27.0	96.4	296.4	288.2	308.4	604.4	411.1	527.2	546.8	323.3	246.5	181.3	157.4	87.8	22.6	3.2	0.0	0.0	173.0	604.4	
2-Jun	0.0	0.0	0.0	1.1	9.3	31.7	141.7	294.3	378.0	425.4	398.1	365.0	293.0	194.9	246.6	385.4	358.1	229.3	143.5	73.1	24.4	2.9	0.0	0.0	166.5	425.4	
3-Jun	0.0	0.0	0.0	3.7	24.5	72.4	145.6	241.3	358.7	548.9	614.2	672.1	656.0	642.8	605.0	496.4	396.5	292.0	197.3	113.6	44.6	6.5	0.0	0.0	255.5	672.1	
4-Jun	0.0	0.0	0.2	9.5	24.5	87.6	209.0	136.3	95.5	111.6	146.8	142.8	157.4	168.9	169.1	244.9	206.7	209.3	55.0	95.7	31.8	0.7	0.0	0.0	96.0	244.9	
5-Jun	0.0	0.0	0.1	2.1	5.0	19.4	58.4	84.4	253.0	119.9	211.1	331.1	240.9	583.8	541.7	283.8	145.3	99.8	98.5	41.3	12.7	2.7	0.0	0.0	130.6	583.8	
6-Jun	0.0	0.0	0.0	6.0	42.5	122.5	348.9	498.1	606.6	722.1	804.5	871.2	880.8	846.8	779.7	683.3	561.1	424.1	284.2	161.3	59.1	5.1	0.1	0.0	362.8	880.8	
7-Jun	0.0	0.0	0.4	12.1	63.1	72.2	273.1	435.0	539.5	547.3	485.5	480.9	847.0	785.8	683.7	453.0	270.6	111.2	117.0	68.1	27.5	3.9	0.1	0.0	261.5	847.0	
8-Jun	0.0	0.0	0.4	10.0	64.8	188.7	329.5	444.6	528.8	633.6	696.1	752.5	686.9	780.1	602.8	623.5	431.8	377.3	240.7	126.6	42.8	5.6	0.2	0.0	315.3	780.1	
9-Jun	0.0	0.0	0.4	8.8	50.9	138.0	267.5	416.5	552.2	663.1	739.3	796.9	821.1	777.7	680.4	577.7	447.4	341.6	213.5	74.5	32.9	5.9	0.1	0.0	316.9	821.1	
10-Jun	0.0	0.0	0.1	8.1	40.6	87.1	219.0	300.1	415.5	501.2	514.4	734.0	710.5	439.7	694.2	437.9	182.5	33.6	28.8	40.7	14.5	4.0	0.0	0.0	225.3	734.0	
11-Jun	0.0	0.0	0.2	5.1	32.9	59.8	108.8	75.6	137.6	227.4	319.1	583.3	733.1	702.8	491.3	482.0	302.0	198.4	158.7	50.8	15.1	2.6	0.1	0.0	195.3	733.1	
12-Jun	0.0	0.0	0.5	9.7	24.7	158.3	301.4	496.4	610.4	727.8	793.4	851.4	867.0	787.7	760.0	656.7	292.0	121.5	67.3	25.2	11.0	1.4	0.0	0.0	315.2	867.0	
13-Jun	0.0	0.0	0.0	1.2	8.2	20.3	51.4	193.0	258.3	334.8	299.6	329.4	418.5	264.2	141.1	180.2	41.2	55.7	31.3	12.6	8.4	0.6	0.0	0.0	110.4	418.5	
14-Jun	0.0	0.0	0.0	0.4	1.7	6.3	7.0	21.3	28.0	54.2	54.1	59.2	68.0	70.8	33.1	44.0	30.7	32.6	6.8	15.9	5.1	1.0	0.0	0.0	22.5	70.8	
15-Jun	0.0	0.0	0.0	0.9	8.6	26.2	38.4	114.5	118.9	288.0	274.2	304.7	260.4	408.5	294.3	319.5	336.6	251.5	248.1	142.5	72.7	9.9	0.6	0.0	146.6	408.5	
16-Jun	0.0	0.0	0.7	14.1	89.8	210.2	343.8	474.8	587.2	681.4	695.9	510.0	300.8	184.2	142.1	130.0	127.7	164.1	129.6	77.4	38.5	10.1	0.1	0.0	204.7	695.9	
17-Jun	0.0	0.0	0.2	5.9	60.3	158.9	289.5	389.3	393.7	500.4	511.8	565.9	633.6	426.5	264.4	391.2	428.7	285.2	184.9	139.2	39.9	4.8	0.2	0.0	236.4	633.6	
18-Jun	0.0	0.0	0.1	5.7	28.1	135.7	204.1	468.3	506.1	776.6	433.7	716.0	582.3	264.5	256.4	671.1	538.2	125.2	306.6	144.3	67.2	10.7	0.4	0.0	260.1	776.6	
19-Jun	0.0	0.0	1.1	15.1	80.7	208.7	330.3	481.8	596.0	666.4	687.6	384.1	496.2	110.6	34.4	44.9	48.1	37.7	21.1	14.0	8.2	2.3	0.0	0.0	177.9	687.6	
20-Jun	0.0	0.0	0.0	2.9	15.7	48.9	165.2	259.8	212.6	147.9	215.6	193.8	185.0	188.2	107.3	169.9	223.8	258.6	117.7	53.5	25.6	6.2	0.3	0.0	108.3	259.8	
21-Jun	0.0	0.0	0.9	9.6	33.7	105.5	165.8	316.4	331.3	444.0	486.7	402.8	463.5	475.8	788.5	686.4	569.5	438.3	303.4	182.5	69.9	8.3	0.3	0.0	261.8	788.5	
22-Jun	0.0	0.0	0.7	15.3	94.0	188.7	336.0	474.6	590.2	716.5	772.8	703.2	548.6	786.3	606.9	359.6	587.6	364.7	264.7	162.9	65.6	9.6	0.2	0.0	318.7	786.3	
23-Jun	0.0	0.0	0.6	13.5	80.3	194.6	329.4	466.7	579.5	700.6	773.2	830.1	785.5	795.8	684.8	665.8	539.9	406.9	277.6	96.4	26.0	6.3	0.3	0.0	343.9	830.1	
24-Jun	0.0	0.0	0.0	2.7	14.2	35.5	155.6	283.4	537.0	687.5	752.0	813.7	791.6	748.4	361.0	534.0	311.9	66.0	60.7	29.2	11.5	9.3	0.7	0.0	258.6	813.7	
25-Jun	0.0	0.0	0.6	13.9	89.4	188.8	343.6	464.5	606.9	727.7	793.9	862.2	884.5	861.9	802.1	709.9	591.0	453.7	311.5	165.3	42.5	8.4	0.3	0.0	371.8	884.5	
26-Jun	0.0	0.0	0.6	14.0	74.4	109.8	86.6	128.2	176.9	146.3	191.9	114.3	123.5	105.4	434.8	587.1	351.8	423.6	285.5	162.8	63.6	7.1	0.3	0.0	149.5	587.1	
27-Jun	0.0	0.0	0.5	12.8	79.5	195.8	330.6	467.4	583.3	705.7	772.0	836.2	861.5	837.2	778.6	684.3	565.5	436.7	306.4	180.1	68.8	8.0	0.3	0.0	363.0	861.5	
28-Jun	0.0	0.0	0.8	12.6	65.1	165.0	299.8	422.3	525.1	645.3	668.2	761.0	692.5	690.2	707.0	581.9	413.6	237.5	208.8	121.8	45.9	6.3	0.2	0.0	302.9	761.0	
29-Jun	0.0	0.0	0.2	9.8	51.7	86.7	232.7	378.3	491.8	623.4	627.5	715.4	594.1	744.5	522.3	179.8	74.8	45.4	69.6	110.3	43.5	3.9	0.0	0.0	233.6	744.5	
30-Jun	0.0	0.0	0.1	5.5	39.9	115.0	243.7	380.3	473.0	612.5	738.6	783.4	822.1	658.3	559.3	606.3	514.5	376.6	216.4	77.6	15.7	2.8	0.0	0.0	301.7	822.1	
		0.0	0.0	0.3	7.8	43.4	108.6	212.8	323.5	412.3	499.2	526.0	569.0	560.6	528.6	477.3	439.8	337.8	236.0	170.4	94.9	35.3	5.3	0.2	0.0	Diurnal Average	
		0.0	0.0	1.1	15.3	94.0	210.2	348.9	498.1	610.4	776.6	804.5	871.2	884.5	861.9	802.1	709.9	591.0	453.7	311.5	182.5	72.7	10.7	0.7	0.0	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	236	32.78	32.78
21 - 100	106	14.72	47.50
101 - 300	142	19.72	67.22
301 - 600	135	18.75	85.97
601 - 900	101	14.03	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 43 km/h on Jun 19 11:00	Maximum Daily Speed Average: 28.3 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 2 km/h on Jun 18 02:00	Minimum Daily Speed Average: 3.4 km/h on Jun 5	Hours of Data: 720
Maximum Diurnal Speed Average: 7.0 km/h at hour 18	Minimum Diurnal Speed Average: 1.4 km/h at hour 7	Hours of Missing Data: 0
Monthly Average Velocity: 3.9 km/h 67.2 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 10 Median = 14 Q ₃ = 19 P ₉₀ = 25 P ₉₉ = 36	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	NE11	ENE7	ESE12	WNW8	S12	W5	NNW2	WSW6	W8	W8WSW10	SW10	W11	WSW8	WSW8	W12	WSW8	WSW8	WSW7	WNW8	WSW5	WNW8	WNW8	NNW3	WSW4.7	S12	
2-Jun	ENE5	ESE3	E3	ENE4	NE5	N4	ENE9	E15	E17	E15	E16	E18	ENE17	ENE20	ENE21	ENE21	ENE22	ENE24	ENE23	ENE20	ENE19	ENE19	E25	ESE19	ENE14.6	E25
3-Jun	ESE20	ESE18	ESE16	ESE9	NE8	NE8	ENE12	ENE17	ENE15	ENE21	ENE26	ENE26	ENE20	ENE18	E20	ENE23	ENE24	NE20	NE18	NE17	NE18	NE21	ENE22	ENE25	ENE17.3	ENE26
4-Jun	ENE24	ENE20	E22	E24	E26	ENE25	ENE23	ENE21	ENE20	ENE19	NE19	NE18	ENE23	ENE28	ENE27	ENE26	NE25	NE22	NE16	NE16	NE13	NE11	NE9	NE6	ENE19.7	ENE28
5-Jun	NNE5	N6	N4	NW5	NW7	WNW7	WNW9	WNW13	NW11	WNW12	WNW10	NNW8	NE6	ESE8	ESE9	E9	E10	E12	E14	ENE14	ENE13	ENE7	ENE7	E2	NNE3.4	E14
6-Jun	W20	W16	W19	W21	W20	W20	W21	WSW18	WSW20	WSW21	WSW23	WSW26	WSW21	WSW18	W18	W19	W17	W17	W13	W7	SSW4	SE3	SSE15	WSW16.0	WSW26	
7-Jun	SSE20	S22	S24	S23	SSW19	SSW13	SSW14	SSW17	WSW21	WSW22	W24	WSW25	WSW30	W29	W31	W27	W21	W13	W12	NW11	NW11	NW10	NW13	NW12	WSW13.8	W31
8-Jun	WNW11	WNW11	WNW11	WNW13	WNW13	WNW11	NW13	NW11	WNW14	NW10	WNW10	WNW12	W11	WSW15	WSW15	WSW13	WSW8	W8	WSW9	WSW9	WSW8	W7	NE8	ENE18	WNW8.5	ENE18
9-Jun	ENE21	E24	E26	E23	E23	E25	E25	E24	E24	E24	E23	E25	E26	E24	E22	E23	E21	E22	ENE21	ENE18	ENE16	E16	E12	E10	E21.4	E26
10-Jun	E9	SSE16	SSE20	SSE20	SSE21	S22	S23	S22	S20	S20	S19	S22	S27	S26	S35	S37	S32	S28	S29	S32	S29	S28	SW18	WSW13	S22.5	S37
11-Jun	WSW13	W15	W14	W12	W14	W13	W10	WSW14	W13	WSW17	WSW16	W19	W20	W19	W19	W15	NW14	NW12	NW10	NNW12	NNW14	NNW11	NW12	NW11	W12.4	W20
12-Jun	NW11	NW13	NW12	WNW12	NW11	NW15	NW15	NW16	NW16	NW18	NW16	NNW12	NNW10	N8	E13	E21	E20	E17	E19	ENE20	E25	ENE20	ESE21	ESE27	NNE6.8	ESE27
13-Jun	ESE32	ESE31	E36	E34	E35	E35	E32	E28	E26	E22	ENE23	ENE17	ENE14	ENE11	NNE10	NNE9	NNE9	N10	N10	NNE13	NNE11	NNE12	N11	NNE17	ENE17.3	E36
14-Jun	NE13	N12	NNE15	NNE13	N14	N18	N19	N18	N17	N17	N14	NNW14	NNW16	NNW14	NNW14	NNW14	NNW15	NNW15	NNW11	NNW13	NNW14	NNW13	NNW14	NNW12	N14.2	N19
15-Jun	NNW12	NNW11	NW10	NW10	NW12	NW15	NW13	NW13	NNW13	NNW15	NW13	NNW15	NW13	NW13	NW12	NW9	NNW11	NW11	NNW10	NNW9	N6	NNW5	NW6	W6	NW10.7	NNW15
16-Jun	W6	WNW7	NW9	NW9	NW6	NW3	SE4	ESE9	E11	E18	E20	E23	E20	S16	SSW30	S17	SE17	S13	SSW20	SSW19	SSW25	SSW21	SW16	SW15	S6.9	SSW30
17-Jun	WSW19	W18	W17	WSW19	WSW19	WSW20	WSW22	W24	W26	W25	W26	W26	WNW24	NW19	NW17	NW14	NNW12	NNW11	NNW8	NNW6	WNW5	WNW4	WNW7	NNE3	W14.3	W26
18-Jun	ENE5	SE2	ENE5	WNW3	SE3	S5	WNW5	SSE3	ESE8	E14	E14	E15	E16	E13	E12	E21	E23	E23	ENE18	ENE16	NE17	NE16	NNE14	N12	ENE9.9	E23
19-Jun	N13	N14	N15	NNE17	NE20	NE22	NE25	NE31	NE38	NE42	NE43	NE43	NE42	NE40	NE36	NE34	ENE29	NE26	ENE28	ENE31	NE29	NE26	NE26	NE22	NE28.3	NE43
20-Jun	NE17	NNE16	NNE13	NNE12	NNE10	NNE10	N9	NNE11	N11	N11	ENE19	E17	E20	E19	E17	E18	E16	E19	E20	ENE14	ENE13	NE9	NNE10	N10	ENE11.9	E20
21-Jun	N12	N10	N12	N12	N11	N8	NNE7	NNE11	NNE11	N10	NNE10	ESE16	ESE21	E21	E22	E24	E25	E20	ESE16	ESE16	SE15	SE9	S8	SSW7	ENE9.1	E25
22-Jun	S5	SSE6	SSW9	S8	SSE13	SSE16	SSE13	ESE14	ESE19	E22	E26	E28	E25	E27	ENE26	ENE21	ENE21	ENE20	ENE19	NE17	NE15	NE15	NE17	ENE13	E13.8	E28
23-Jun	NE10	ENE11	ENE9	E10	SSE9	S6	SSW9	WSW8	SW10	SSW9	SE8	S7	SE9	E12	E15	E11	ESE8	E9	E15	ENE8	ENE6	ENE6	E5	E5	ESE5.7	E15
24-Jun	ESE6	S5	S6	SSW5	SSW8	SW10	SSW9	SW10	WSW18	WSW16	WSW17	WSW15	W16	NNW22	N20	N21	NNE19	N11	NNE10	NNE8	NW6	WNW6	NW7	NNW9	WNW5.1	NNW22
25-Jun	N11	NNE13	NNE15	NE14	ENE19	ENE24	E22	E19	E17	E14	E16	E17	E18	E16	E14	E16	E17	E18	ENE19	ENE18	ENE17	ENE18	E27	ESE26	E16.5	E27
26-Jun	E25	E20	ESE17	ESE11	ESE12	SSE7	S8	S11	S18	S18	SW9	NW3	S10	SSE8	ESE12	ESE14	ESE18	E18	E15	ENE16	ENE13	NE11	NE11	NE13	ESE9.6	E25
27-Jun	ENE10	E6	NE5	ENE9	E7	E5	E7	E7	E7	E7	E10	E10	ESE11	E14	E14	E15	E17	E16	E13	E13	E9	E5	E6	E8	E9.5	E17
28-Jun	E10	E10	E10	E10	ESE12	E13	E12	E12	E11	E9	S4	S8	SW6	WSW13	SW16	SW15	WSW14	WSW9	SW8	SW3	E4	SSE7	S10	SSW5	SSE4.0	SW16
29-Jun	SSE5	S6	SSE6	SE5	SSW7	SSW9	SSW10	SSW8	SW11	SW12	SSW11	SSW13	SSW13	S9	S4	WSW16	WSW19	W11	NNW5	SSE5	ESE2	SSW4	S3	SSW5	SSW6.7	WSW19
30-Jun	SW10	WSW10	WSW8	WSW8	W11	W10	W12	W15	W12	W10	WSW13	WSW14	SW14	SW11	SW9	SW5	ESE8	ESE9	E6	E4	WNW11	NNW17	NW9	WSW5	WSW6.7	NNW17

ENE4.5	ENE2.7	E3.1	ENE2.2	E2.4	ENE1.5	ENE1.4	ENE2.0	ENE1.4	NE2.1	NE2.9	ENE3.2	ENE3.6	ENE3.9	E4.1	ENE5.4	ENE7.0	ENE7.0	ENE6.9	ENE6.8	ENE6.0	NE5.2	NE4.7	ENE4.7	Diurnal Average	
ESE32	ESE31	E36	E34	E35	E35	E32	NE31	NE38	NE42	NE43	NE43	NE42	NE40	NE36	S37	S32	S28	S29	S32	S29	S28	E27	ESE27	Diurnal Maximum	

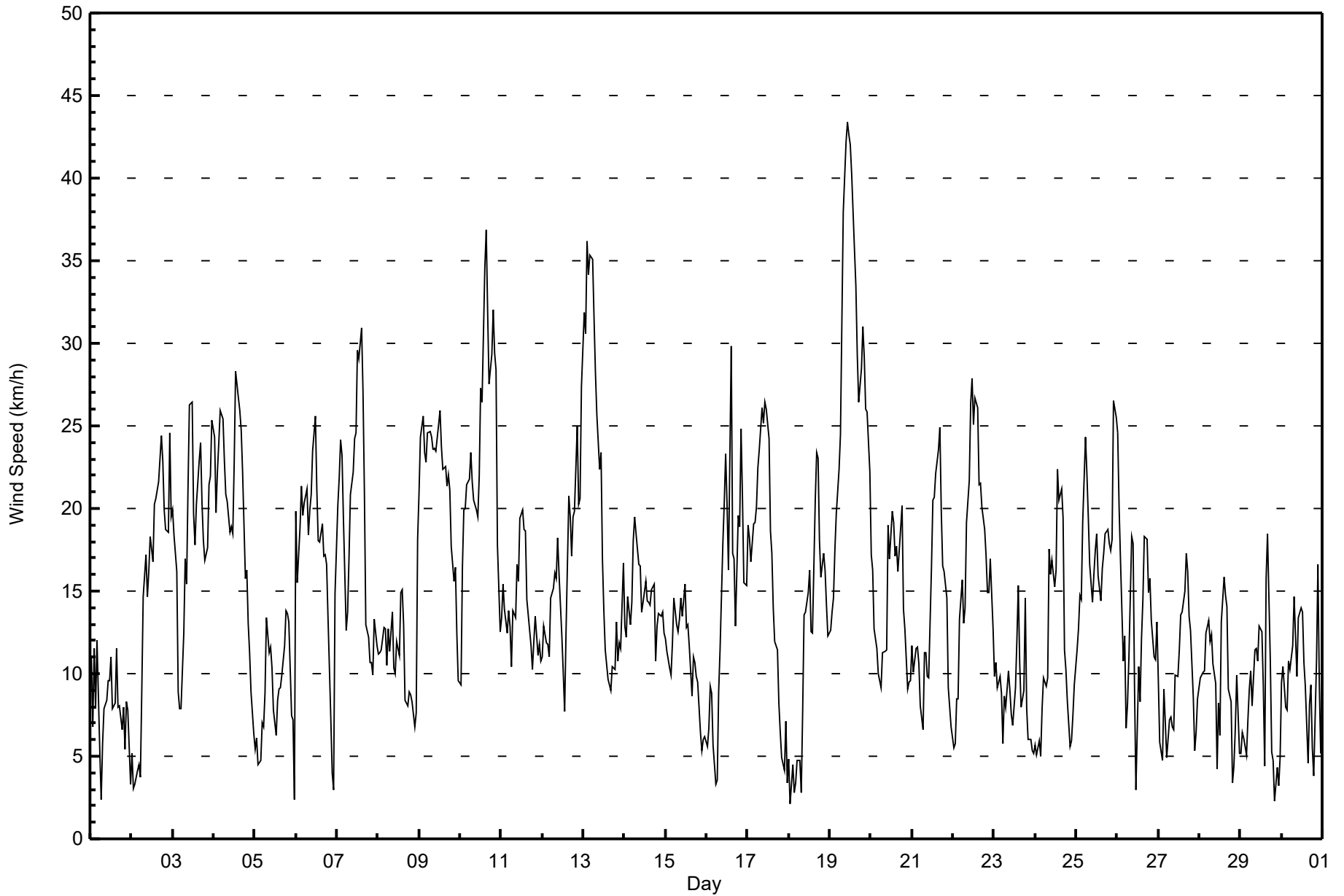
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	55	7.64	7.64
6 - 11	214	29.72	37.36
12 - 19	272	37.78	75.14
20 - 28	150	20.83	95.97
29 - 38	24	3.33	99.31
> 38	5	0.69	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 - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	2	2	4	8	3	4	3	6	5	2	2	1	4	3	4	55
6 - 11	14	16	12	12	26	11	3	7	10	12	11	16	14	16	22	12	214
12 - 19	15	14	17	29	51	15	2	5	7	7	7	23	27	7	25	21	272
20 - 28	2	0	11	39	47	5	0	4	13	3	0	10	14	1	0	1	150
29 - 38	0	0	5	2	5	2	0	0	6	1	0	1	2	0	0	0	24
> 38	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Totals	33	32	52	86	137	36	9	19	42	28	20	52	58	28	50	38	720

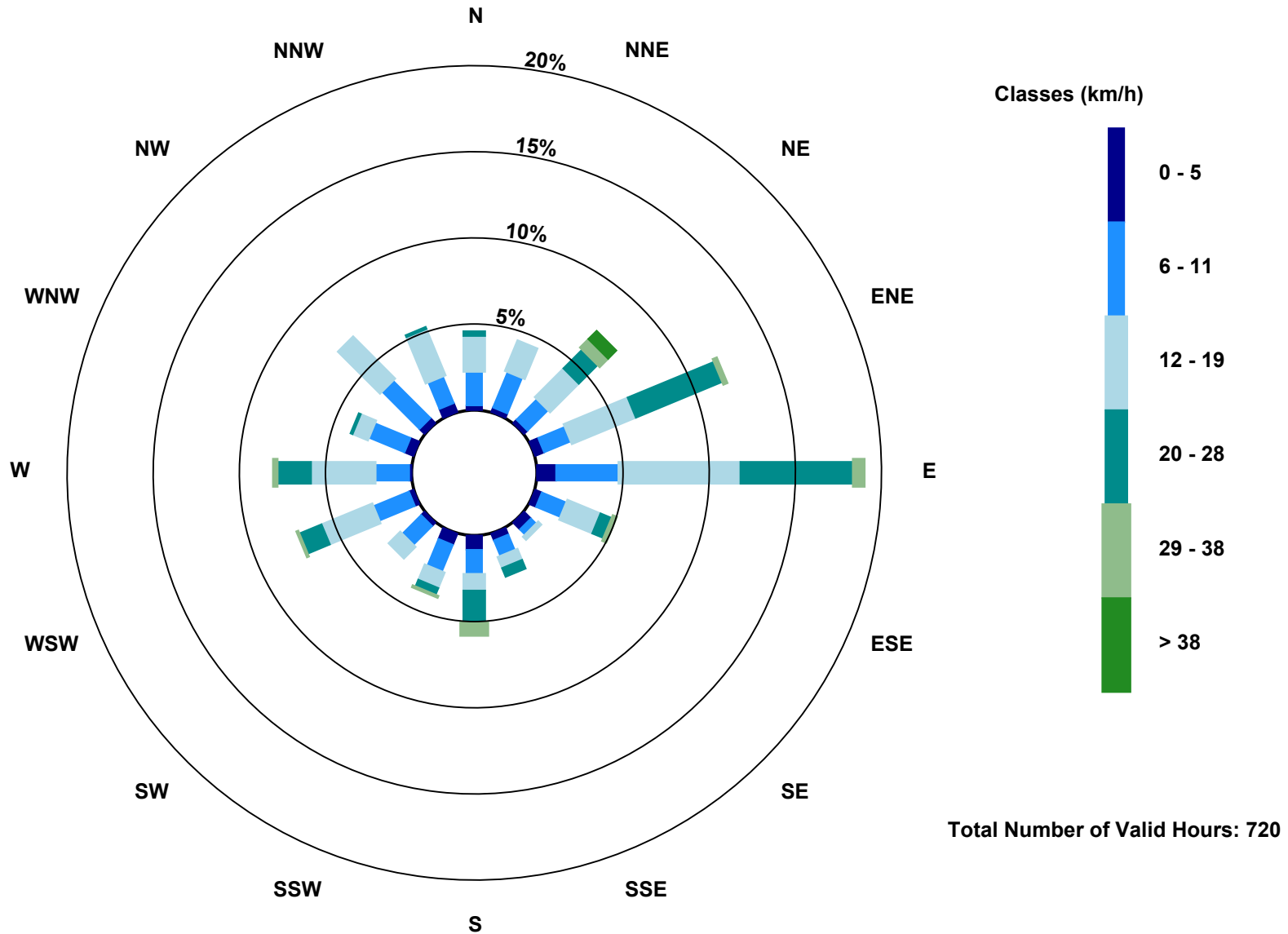
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 52 deg on Jun 19 11:00 Direction of Maximum Daily Speed Average: 47.0 deg on Jun 19	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 133 deg on Jun 18 02:00 Direction of Minimum Daily Speed Average: 3.4 deg on Jun 5	Percent Operational Time: 100.0
Monthly Average Direction: 67.2 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-Jun	47	70	120	299	172	277	331	252	265	268	245	221	268	240	251	263	247	243	256	285	254	287	295	345	258.4
2-Jun	78	104	94	72	53	9	68	79	82	85	84	81	69	70	69	65	65	68	61	59	62	73	99	109	74.4
3-Jun	111	118	119	111	56	49	61	67	69	72	62	69	65	74	81	64	60	48	42	36	47	56	60	75	68.8
4-Jun	76	76	80	80	83	77	77	68	69	58	55	55	58	59	63	59	56	51	42	41	45	39	44	41	63.2
5-Jun	28	353	3	323	304	300	300	294	308	295	296	337	50	120	113	95	99	91	81	75	73	60	71	95	31.3
6-Jun	266	273	264	265	262	263	264	257	252	253	248	247	256	255	262	268	266	270	266	266	263	204	141	147	257.6
7-Jun	153	171	174	185	204	209	210	213	246	252	264	253	248	259	273	279	276	278	281	311	321	322	315	313	246.6
8-Jun	299	300	299	303	299	301	313	311	290	312	299	288	264	247	254	258	255	266	248	241	247	264	47	60	286.3
9-Jun	73	93	95	93	88	86	86	83	81	81	82	83	82	83	84	83	82	79	75	72	77	85	95	92	83.8
10-Jun	88	159	165	153	163	171	178	184	179	183	184	173	172	172	177	177	190	180	176	177	175	186	223	251	177.5
11-Jun	256	260	264	261	263	269	271	257	259	250	256	263	270	265	260	279	323	310	307	334	346	333	314	313	278.2
12-Jun	317	314	308	302	319	318	316	318	309	317	317	331	335	351	81	86	80	82	79	76	82	76	109	109	27.6
13-Jun	104	108	99	98	92	95	91	85	88	81	77	60	58	68	29	12	16	6	11	13	19	29	11	25	75.1
14-Jun	34	354	15	18	8	354	351	355	357	355	353	344	346	345	346	345	346	346	340	337	344	340	344	337	352.1
15-Jun	329	328	322	319	310	314	317	326	329	331	324	327	324	322	319	317	327	325	331	347	358	328	306	269	323.5
16-Jun	269	290	316	317	323	315	124	102	88	86	86	85	86	185	206	170	135	171	194	194	200	200	214	234	169.2
17-Jun	251	260	262	255	253	252	254	261	263	260	267	277	287	307	311	324	344	334	347	341	290	294	288	27	276.9
18-Jun	67	133	77	297	125	176	291	149	117	96	92	93	92	87	89	89	88	80	66	71	53	51	30	8	77.2
19-Jun	9	5	5	28	42	49	48	50	49	50	52	46	48	51	52	56	57	46	58	62	51	46	43	39	47.0
20-Jun	39	32	23	22	21	17	3	13	359	8	71	85	85	93	86	86	88	90	85	70	68	42	24	1	56.3
21-Jun	6	356	10	8	2	1	14	31	14	5	20	102	102	97	98	93	88	100	105	113	126	141	182	204	76.3
22-Jun	189	168	199	181	150	151	152	120	111	97	81	82	79	79	77	69	64	67	65	52	39	39	54	59	85.7
23-Jun	52	60	72	80	155	187	208	243	214	194	141	169	126	88	88	87	105	101	81	70	69	71	90	91	105.9
24-Jun	102	172	184	201	209	221	196	215	239	243	253	257	276	342	350	2	18	8	18	14	307	299	324	333	299.5
25-Jun	6	21	32	46	66	76	79	84	84	89	97	94	87	96	98	100	96	87	74	71	66	70	93	104	79.2
26-Jun	99	100	102	113	108	148	185	178	171	178	232	311	173	158	114	116	108	82	80	74	71	55	53	55	111.3
27-Jun	78	83	53	77	92	98	100	96	94	95	96	98	106	98	90	89	88	88	88	84	84	82	84	80	89.3
28-Jun	81	80	83	96	107	95	97	95	98	97	169	191	229	248	232	236	240	249	222	223	91	152	181	210	153.4
29-Jun	163	173	151	144	192	204	207	203	216	214	202	205	199	191	175	238	256	279	332	150	112	197	170	203	207.9
30-Jun	235	238	245	250	259	277	267	272	275	263	255	243	234	235	220	221	108	102	87	91	288	337	313	246	258.0

65.7 76.2 82.9 70.9 97.1 71.5 70.6 62.0 60.6 55.1 55.4 70.0 74.0 77.7 84.4 74.3 70.5 64.9 65.5 60.9 59.3 51.7 54.0 62.1

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

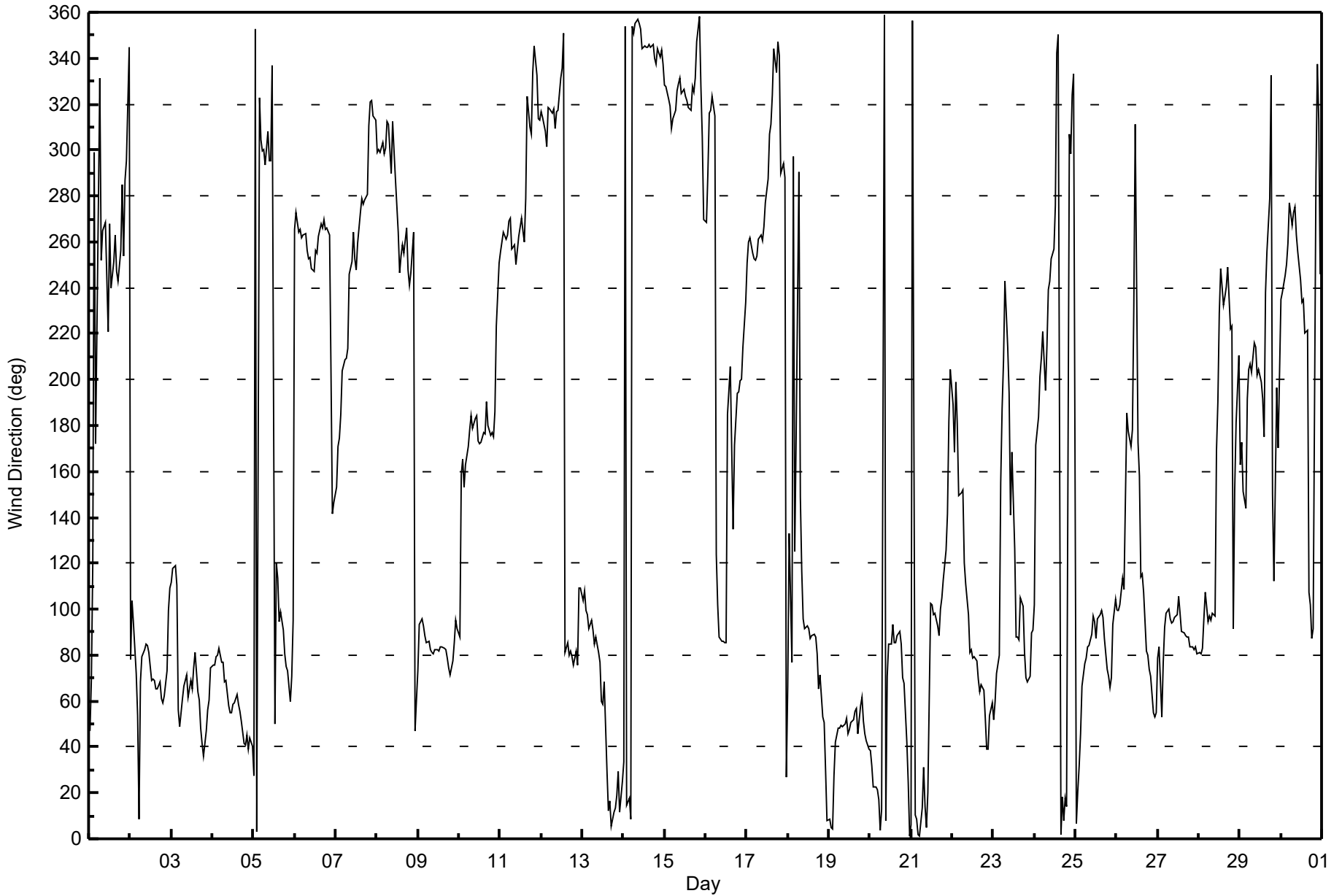
Wind Direction (WD) - deg
Fort Chipewyan - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 93 deg on Jun 18 04:00 Minimum Value: 4 deg on Jun 28 01:00 Percentiles: P ₁ = 4 P ₁₀ = 7 Q ₁ = 10 Median = 15 Q ₃ = 22 P ₉₀ = 29 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-Jun	14	25	40	37	45	32	73	17	21	22	20	23	18	33	37	17	20	15	16	17	22	8	10	31	73
2-Jun	41	29	18	13	35	39	21	8	5	5	7	9	15	12	13	13	15	15	13	12	13	14	10	4	41
3-Jun	5	4	5	26	12	10	14	16	15	16	15	15	16	16	11	15	15	10	13	13	12	11	13	16	26
4-Jun	14	13	8	8	5	13	12	14	14	11	9	10	11	12	13	12	11	11	15	13	13	13	16	22	22
5-Jun	18	18	23	17	15	18	19	18	18	17	18	32	47	12	18	9	8	10	7	9	12	18	10	74	74
6-Jun	16	16	16	16	16	17	17	18	19	19	18	18	21	22	20	18	19	18	17	16	15	9	43	21	43
7-Jun	9	6	6	9	11	11	10	10	18	16	17	18	18	21	17	16	16	16	16	26	25	22	20	19	26
8-Jun	18	18	15	16	17	20	21	26	19	27	30	33	31	24	21	30	44	33	20	13	12	9	60	10	60
9-Jun	8	9	4	4	5	5	4	5	5	5	5	4	5	4	5	5	6	8	10	11	9	7	6	8	11
10-Jun	10	19	9	9	10	9	8	9	8	9	11	11	8	10	8	9	9	8	7	7	6	8	19	15	19
11-Jun	14	15	15	14	15	14	18	15	17	16	17	18	18	17	18	34	23	20	20	24	24	23	18	17	34
12-Jun	21	20	23	18	30	23	21	23	24	23	26	39	44	54	65	7	7	8	9	12	8	13	25	7	65
13-Jun	8	8	5	6	5	5	5	5	4	7	10	15	17	18	19	27	22	30	26	25	32	19	24	24	32
14-Jun	38	31	22	20	25	21	19	20	22	21	23	22	21	22	22	24	24	23	26	24	23	22	22	22	38
15-Jun	23	25	25	22	18	19	22	23	25	25	25	23	24	26	23	26	26	26	28	26	18	20	14	19	28
16-Jun	18	22	12	15	18	50	52	7	7	4	5	5	6	44	13	14	9	22	8	10	10	9	12	15	52
17-Jun	15	17	17	15	16	16	16	17	17	18	18	16	17	20	21	27	34	29	27	28	17	40	14	56	56
18-Jun	45	45	24	93	33	34	35	86	15	7	7	8	6	14	13	11	5	9	14	16	14	10	15	17	93
19-Jun	16	19	20	14	12	11	12	11	13	15	15	13	14	13	13	14	17	14	15	16	14	12	13	13	20
20-Jun	13	16	17	17	19	20	27	23	26	26	25	11	8	7	10	6	7	7	6	16	16	9	11	16	27
21-Jun	10	15	18	15	16	19	22	22	26	33	39	24	7	6	6	6	6	5	9	7	10	8	19	14	39
22-Jun	19	22	11	14	10	7	14	15	5	14	8	6	10	9	12	16	15	16	16	12	13	13	11	13	22
23-Jun	13	9	15	19	15	17	16	25	16	17	32	46	31	11	6	12	29	27	7	15	8	9	8	20	46
24-Jun	21	27	16	27	10	10	12	11	16	20	20	20	22	28	25	27	25	25	24	21	25	15	14	14	28
25-Jun	18	13	13	8	15	9	10	7	8	8	7	8	7	8	9	6	6	6	10	11	12	13	9	4	18
26-Jun	5	6	8	10	10	32	16	11	8	8	38	68	22	22	19	22	14	6	7	11	11	11	7	9	68
27-Jun	17	19	13	14	27	27	16	10	10	12	7	8	6	8	5	5	4	5	5	7	10	12	7	4	27
28-Jun	4	4	5	10	7	7	7	6	8	11	64	36	61	24	16	15	15	17	10	43	18	37	22	29	64
29-Jun	23	28	30	30	19	13	11	12	13	12	14	13	13	25	60	16	16	33	40	44	58	38	54	26	60
30-Jun	11	14	14	18	19	14	16	15	18	22	21	24	24	27	25	55	13	10	9	40	46	23	21	35	55
	45	45	40	93	45	50	73	86	26	33	64	68	61	54	65	55	44	33	40	44	58	40	60	74	
	Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS09 BARGE LANDING JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
 JUNE 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	34	40	99.17	25.4	0	5.5	0
TRS(ppb) Average	680	34	40	99.17	1.9	0	0.8	0
THC(ppm) Average	680	34	40	99.17	3	-	2.3	-
NMHC(ppm) Average	680	34	40	99.17	0.543	-	0.144	-
CH4(ppm) Average	680	34	40	99.17	2.8	-	2.1	-
NO2 (ppb) Average	679	35	41	99.17	29.3	0	11.2	-
NO (ppb) Average	679	35	41	99.17	45.3	-	7.9	-
NOX (ppb) Average	679	35	41	99.17	58.9	-	13.5	-
PM2.5(ug/m3) Average	714	1	6	99.31	297.1	80	178.6	11
Temperature (C) Average	720	0	0	100	31.3	-	23.3	-
Relative Humidity (%) Average	671	0	49	93.19	99.5	-	91.7	-
Barometric Pressure (inHg) Average	720	0	0	100	29.2	-	29.1	-
Wind Speed 20 m (km/h) Average	720	0	0	100	37	-	29	-
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)

JUNE 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	1.1	3.3	-	0	0	0	0.1	0.3	2.7	25.4
TRS(ppb) Average	680	0.41	0.3	-	0	0.1	0.2	0.3	0.5	0.8	1.9
THC(ppm) Average	680	2.08	0.2	-	1.9	1.9	2	2	2.2	2.3	3
NMHC(ppm) Average	680	0.058	0.066	-	0	0	0	0	0.1	0.1	0.543
CH4(ppm) Average	680	2.02	0.1	-	1.9	1.9	1.9	2	2.1	2.2	2.8
NO2 (ppb) Average	679	5.69	4.7	-	0.1	0.9	2.2	4.3	8	11.7	29.3
NO (ppb) Average	679	1.71	3.8	-	0	0	0	0.4	1.6	4.7	45.3
NOX (ppb) Average	679	7.4	7.3	-	0.1	0.9	2.4	4.9	10	16.6	58.9
PM2.5(ug/m3) Average	714	35.15	47.7	-	1.4	3.7	8.5	19.6	39.6	94.5	297.1
Temperature (C) Average	720	17.69	5.6	-	5.3	10.6	12.8	17.6	21.9	25.5	31.3
Relative Humidity (%) Average	671	64.91	21.5	-	23.3	36	46.3	64.9	84	94.1	99.5
Barometric Pressure (inHg) Average	720	28.84	0.1	-	28.5	28.6	28.7	28.8	28.9	29	29.2
Wind Speed 20 m (km/h) Average	720	11.2	6	-	0	5	7	10	14	20	37
Wind Direction 20 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	16 Jun 2023 19:00	17 Jun 2023 00:00	6	Station power failure
Relative Humidity	01 Jun 2023 04:00	01 Jun 2023 07:00	4	Sensor operated out of range
Relative Humidity	03 Jun 2023 06:00	03 Jun 2023 06:00	1	Sensor operated out of range
Relative Humidity	04 Jun 2023 05:00	04 Jun 2023 13:00	9	Sensor operated out of range
Relative Humidity	04 Jun 2023 23:00	05 Jun 2023 08:00	10	Sensor operated out of range
Relative Humidity	06 Jun 2023 00:00	06 Jun 2023 00:00	1	Sensor operated out of range
Relative Humidity	13 Jun 2023 23:00	14 Jun 2023 11:00	13	Sensor operated out of range
Relative Humidity	14 Jun 2023 20:00	15 Jun 2023 03:00	8	Sensor operated out of range
Relative Humidity	15 Jun 2023 05:00	15 Jun 2023 07:00	3	Sensor operated out of range



Wood Buffalo Environmental Association

Summary of Hour Averages

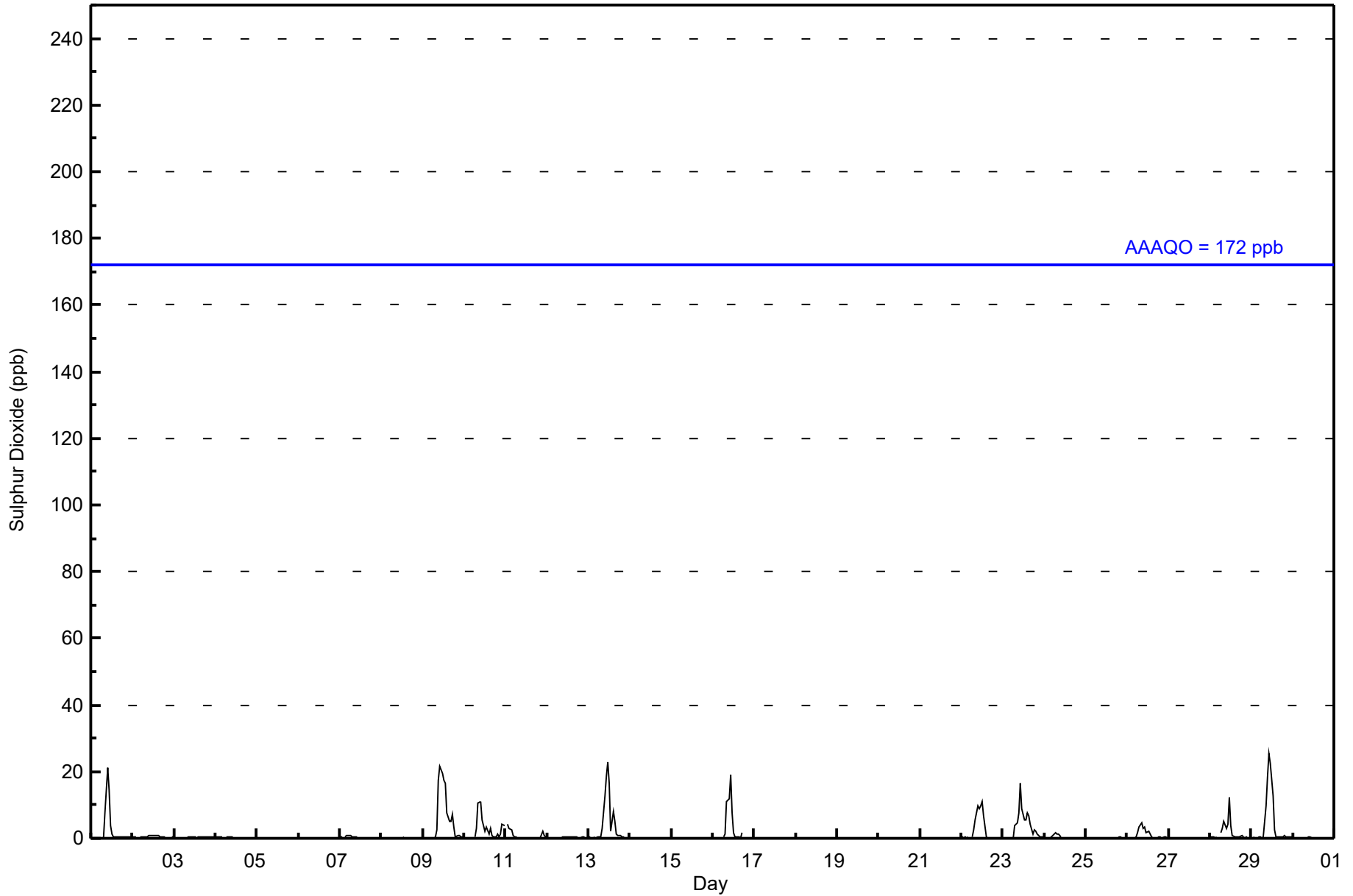
Sulphur Dioxide (SO₂) - ppb

Barge Landing - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 25.4 ppb on Jun 29 11:00	Maximum Daily Average: 5.5 ppb on Jun 9		Hours of Data:	680
Minimum Value: 0.0 ppb on Jun 4 20:00	Minimum Daily Average: 0.0 ppb on Jun 5		Hours of Missing Data:	40
Maximum Diurnal Average: 4.8 ppb at hour 11	Minimum Diurnal Average: 0.2 ppb at hour 1		Hours of Calibration:	34
Monthly Average: 1.10 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 2.7 P ₉₉ = 18.7		Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	0.2	0.0	Z	0.1	0.1	0.1	0.1	0.2	7.6	21.0	14.5	3.9	1.1	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	2.3	21.0																						
2-Jun	0.4	0.4	0.5	Z	0.4	0.4	0.3	0.3	0.5	0.6	0.7	0.8	0.8	0.8	1.0	0.8	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.5	1.0																						
3-Jun	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.4																						
4-Jun	0.4	0.3	0.3	0.3	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4																						
5-Jun	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																						
6-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1																						
7-Jun	0.3	0.3	Z	0.6	0.7	1.0	0.7	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.0																						
8-Jun	0.2	0.1	0.1	Z	0.1	0.0	0.1	0.1	C	C	C	C	0.3	0.2	0.1	0.2	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.3																						
9-Jun	0.0	0.0	0.0	0.1	Z	0.2	0.1	0.4	2.5	17.2	21.6	19.7	17.2	16.7	7.5	4.9	5.2	7.4	3.2	0.6	0.7	0.7	0.5	0.2	5.5	21.6																						
10-Jun	0.2	0.2	0.1	0.1	0.2	Z	0.6	3.0	10.8	10.9	5.4	3.7	2.3	3.4	1.2	3.1	0.6	0.4	0.4	1.2	0.4	1.1	4.4	3.6	2.5	10.9																						
11-Jun	Z	4.3	2.8	2.5	0.8	0.5	0.4	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	0.2	2.2	0.7	0.2	0.7	4.3																						
12-Jun	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.6	0.5	0.5	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.6																						
13-Jun	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.6	3.1	12.6	18.6	23.1	16.6	2.0	8.3	5.1	1.5	0.7	0.6	0.5	0.3	0.2	0.1	0.1	4.1	23.1																						
14-Jun	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
15-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.2																						
16-Jun	0.1	0.0	0.1	0.1	0.1	Z	0.4	1.3	10.9	12.0	19.0	7.6	1.5	0.4	0.4	0.2	0.1	1.9	PF	PF	PF	PF	PF	PF	--	19.0																						
17-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1																						
18-Jun	0.0	Z	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
19-Jun	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																						
20-Jun	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																						
21-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1																						
22-Jun	0.3	0.2	0.3	0.2	0.2	Z	0.6	2.7	5.5	9.7	8.8	9.6	10.9	6.9	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	2.5	10.9																						
23-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	3.8	4.7	7.6	16.4	9.0	5.7	5.5	7.6	7.0	4.2	1.5	2.6	2.3	1.2	0.6	0.5	0.5	3.5	16.4																						
24-Jun	0.5	Z	0.2	0.1	0.3	1.0	1.9	1.5	1.4	0.9	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9																						
25-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.2	0.0	0.0	0.1	0.0	0.3																						
26-Jun	0.0	0.0	0.0	Z	0.1	0.5	1.5	3.2	4.5	2.8	3.4	1.9	2.0	1.1	0.4	0.1	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.1	1.0	4.5																						
27-Jun	0.1	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.2																						
28-Jun	0.2	0.3	0.2	0.2	0.3	Z	1.7	2.8	5.2	3.1	4.3	12.4	3.7	0.9	0.6	0.4	0.4	0.2	0.6	0.4	0.2	0.2	0.2	0.1	1.7	12.4																						
29-Jun	Z	0.2	0.1	0.1	0.2	0.3	0.2	0.5	9.8	18.2	25.4	22.6	12.6	2.4	0.4	0.3	0.3	0.3	0.3	0.8	0.4	0.4	0.3	0.2	4.2	25.4																						
30-Jun	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.4	0.4	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4																						
																								0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.7	2.3	4.1	4.8	4.0	2.5	1.4	1.0	0.8	0.5	0.5	0.3	0.3	0.2	0.3	0.3	0.2	Diurnal Average
																								0.5	4.3	2.8	2.5	0.8	1.0	1.9	3.8	10.9	21.0	25.4	23.1	17.2	16.7	8.3	7.0	5.2	7.4	3.2	2.3	1.2	2.2	4.4	3.6	Diurnal Maximum

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Barge Landing - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	657	96.62	96.62
11 - 20	18	2.65	99.26
21 - 60	5	0.74	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
Barge Landing - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	75	87	47	18	18	14	24	57	40	52	45	39	18	23	38	62	657
11 - 20	0	0	0	0	0	0	0	5	6	3	0	1	0	2	1	0	18
21 - 60	0	0	0	0	0	0	0	0	2	1	1	1	0	0	0	0	5
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	87	47	18	18	14	24	62	48	56	46	41	18	25	39	62	680

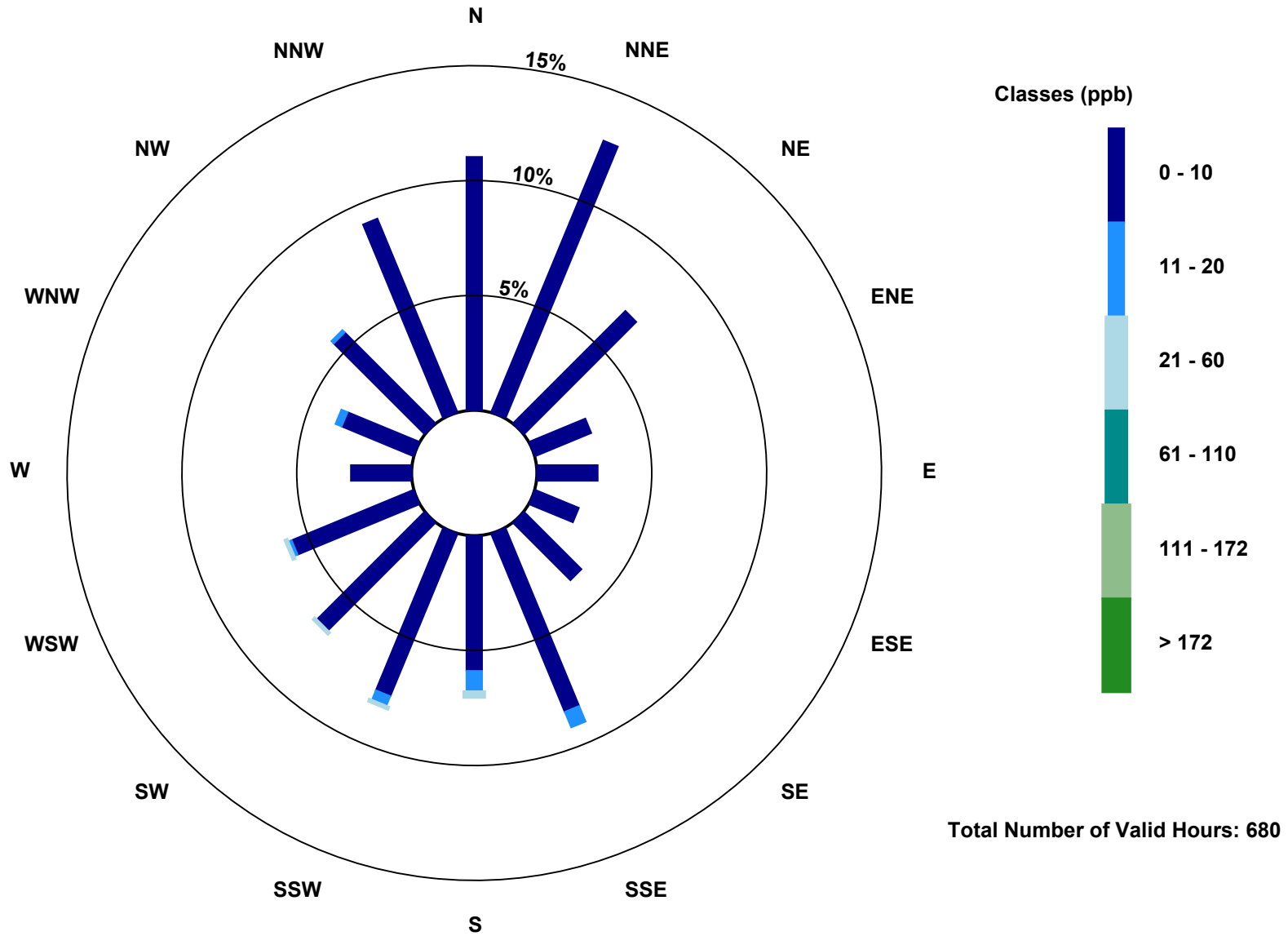
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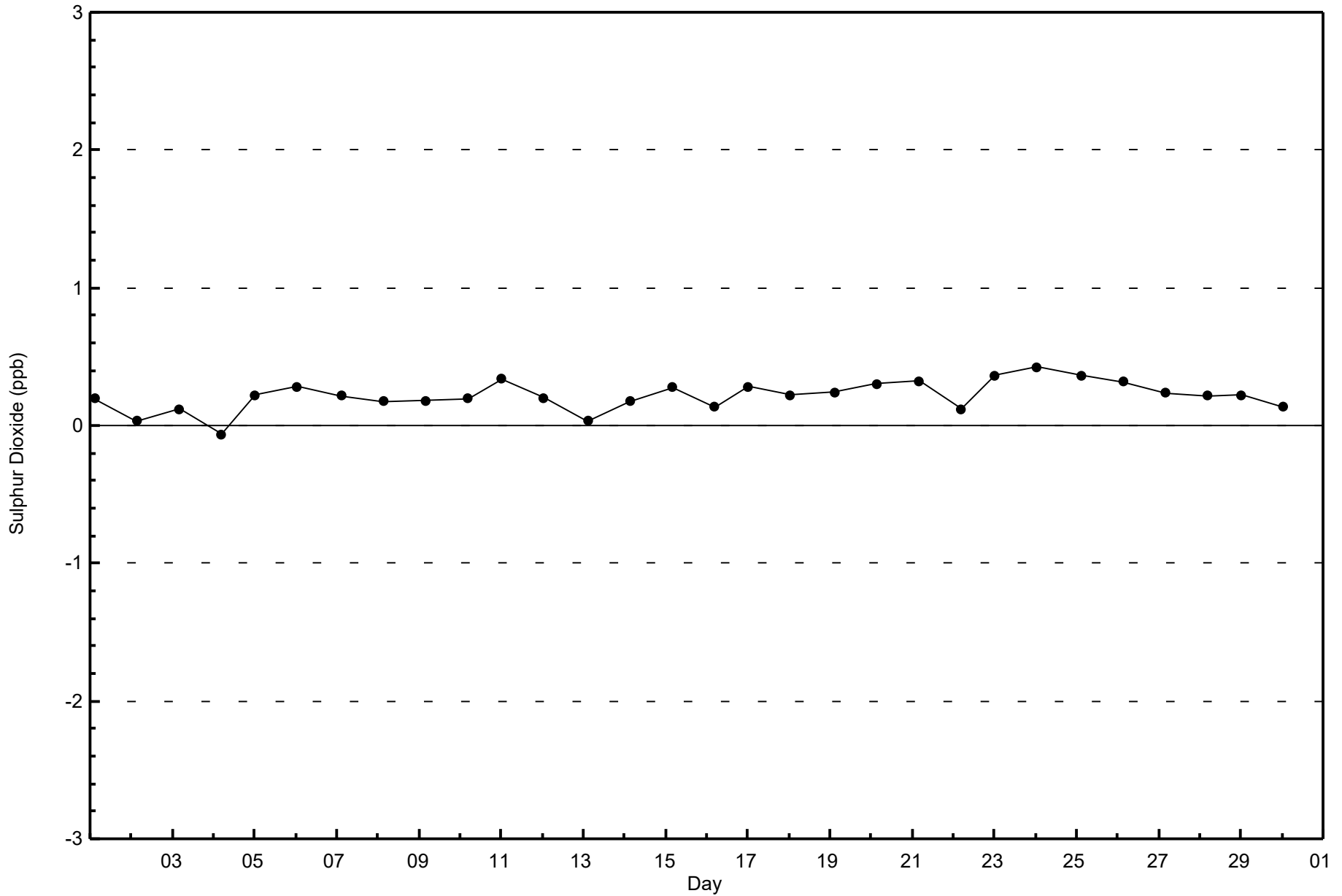
Total Number of Hours: 720

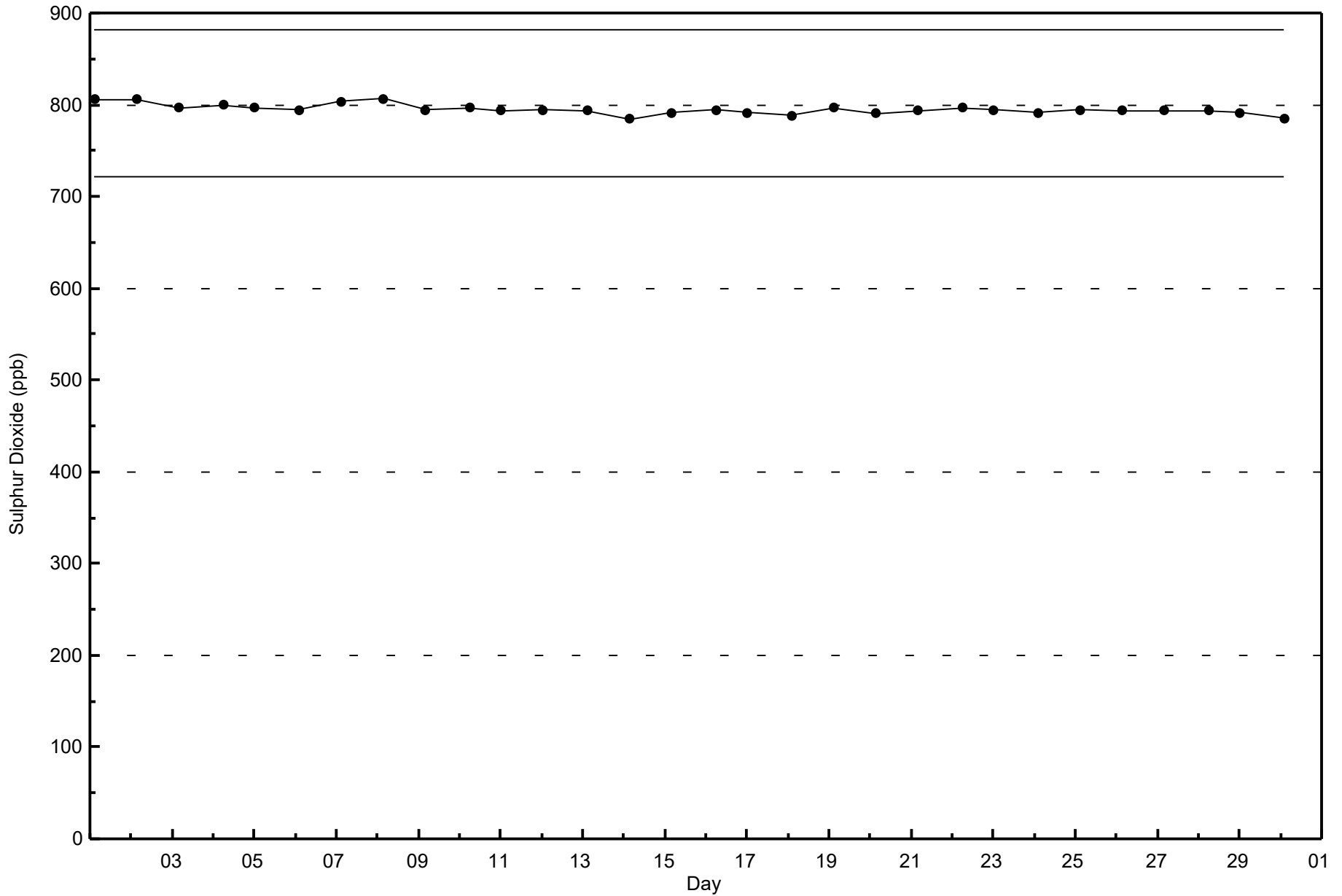


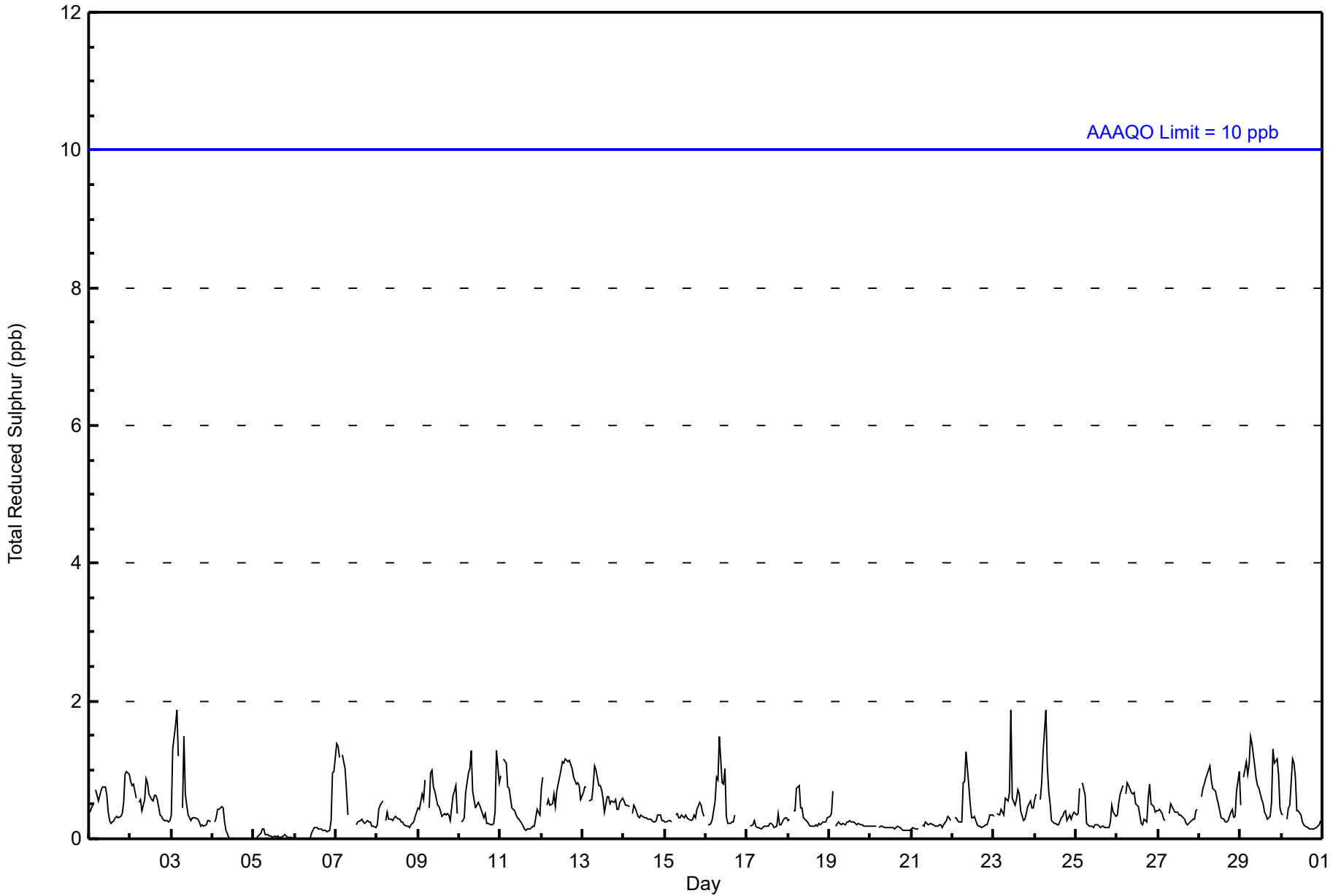
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Barge Landing











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Barge Landing - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	680	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: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	76	88	48	19	14	14	23	67	47	52	44	40	18	26	36	68	680
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	76	88	48	19	14	14	23	67	47	52	44	40	18	26	36	68	680

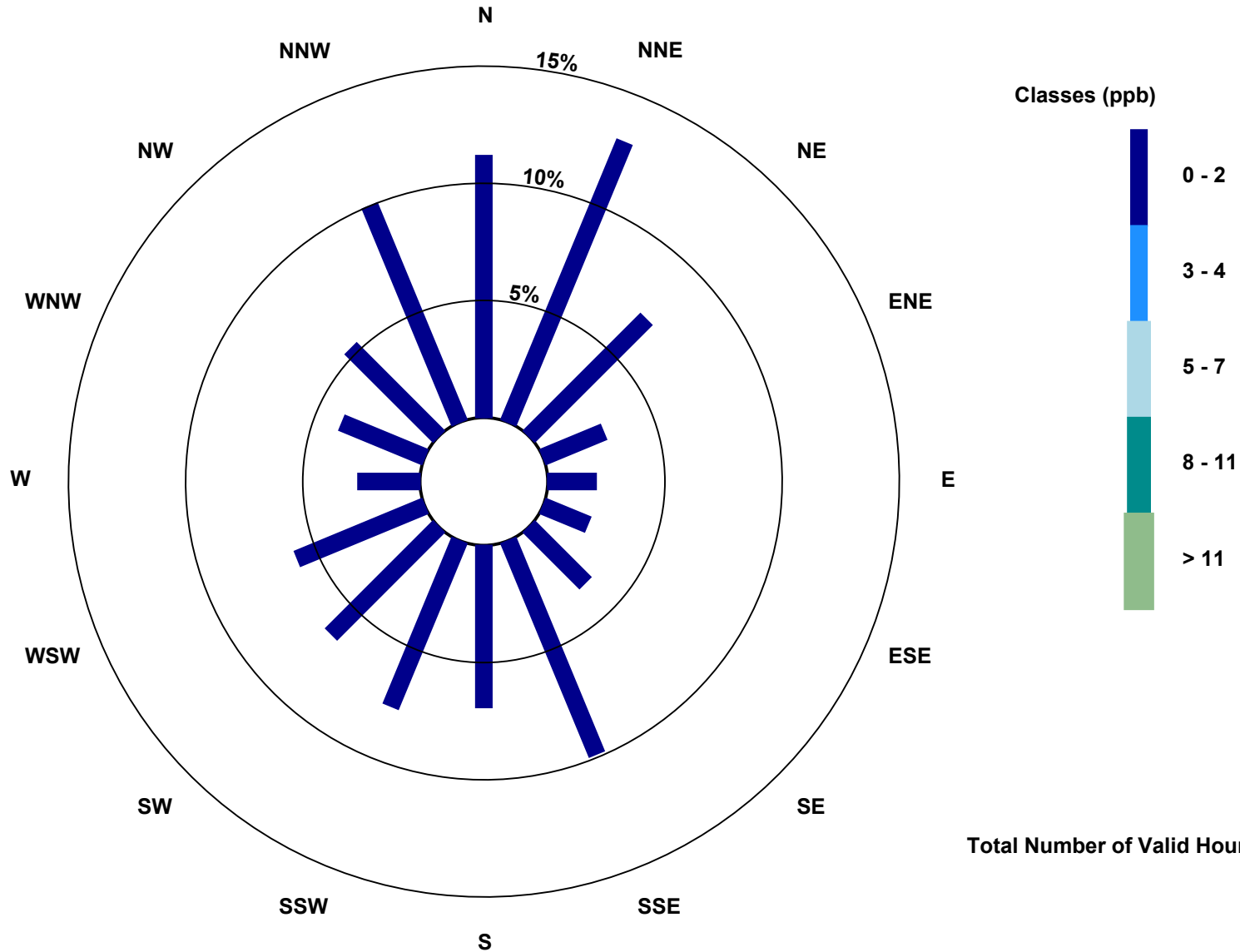
Total Number of Valid Hours: 680

Total Number of Hours: 720

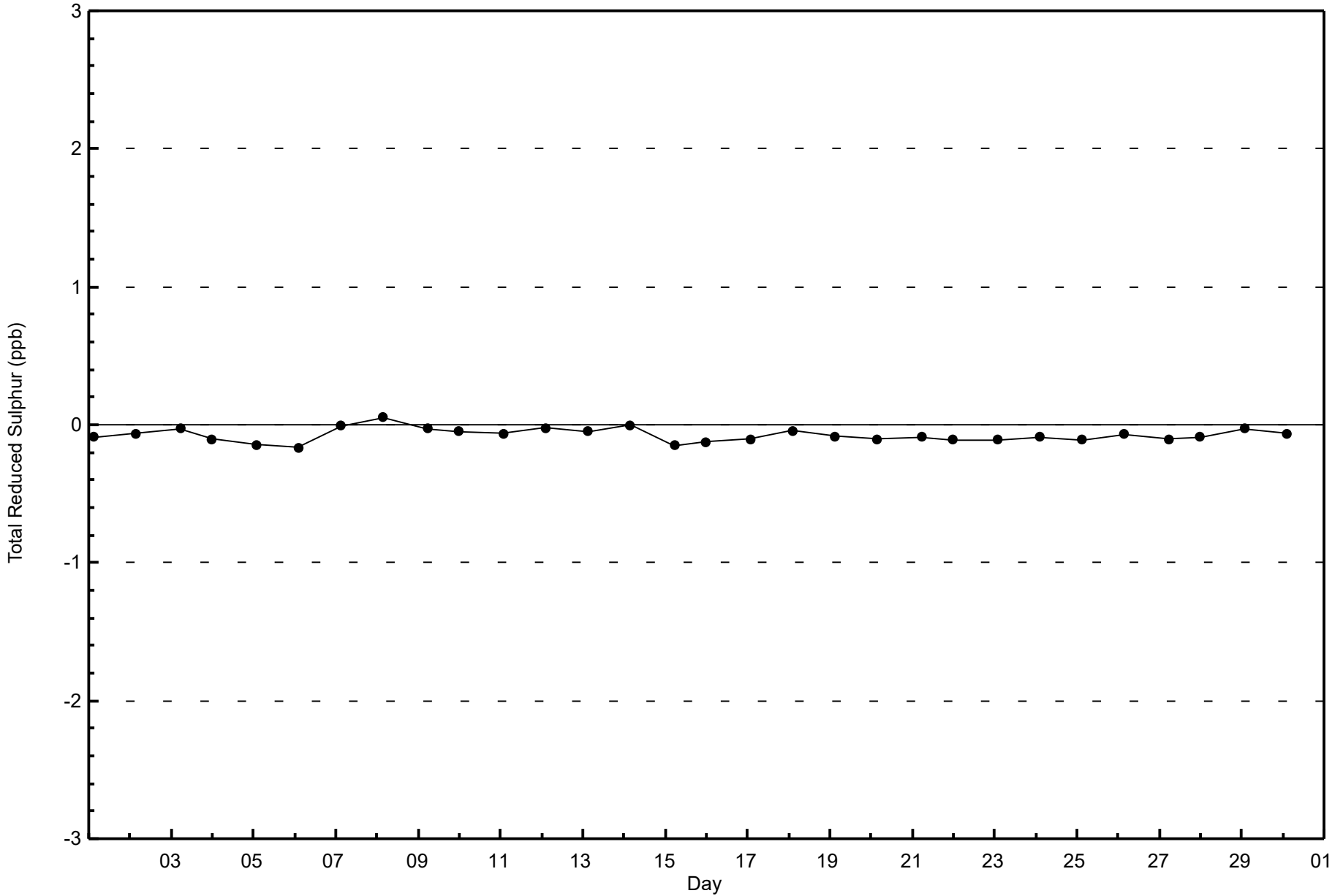


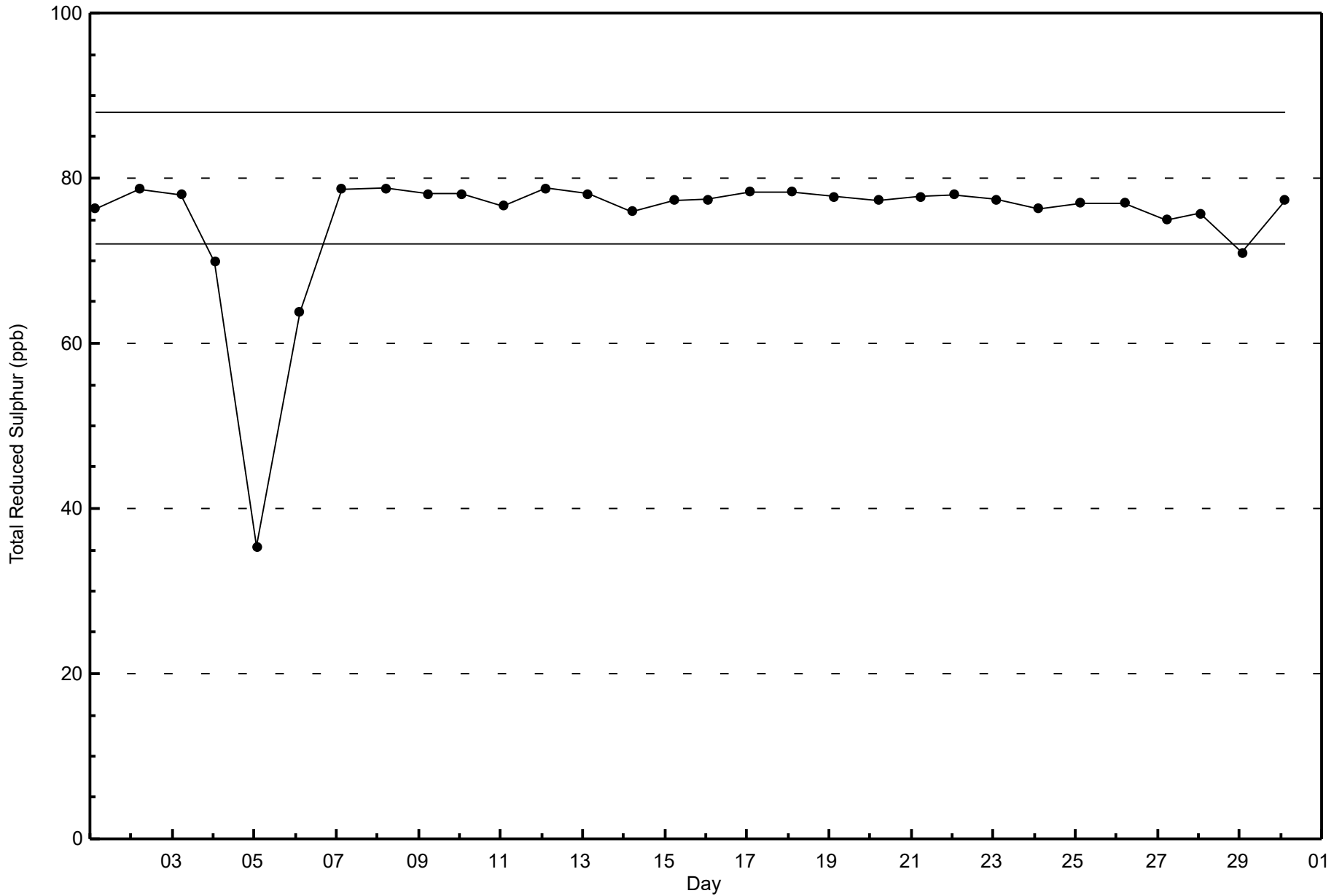
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Barge Landing



Total Number of Valid Hours: 680







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

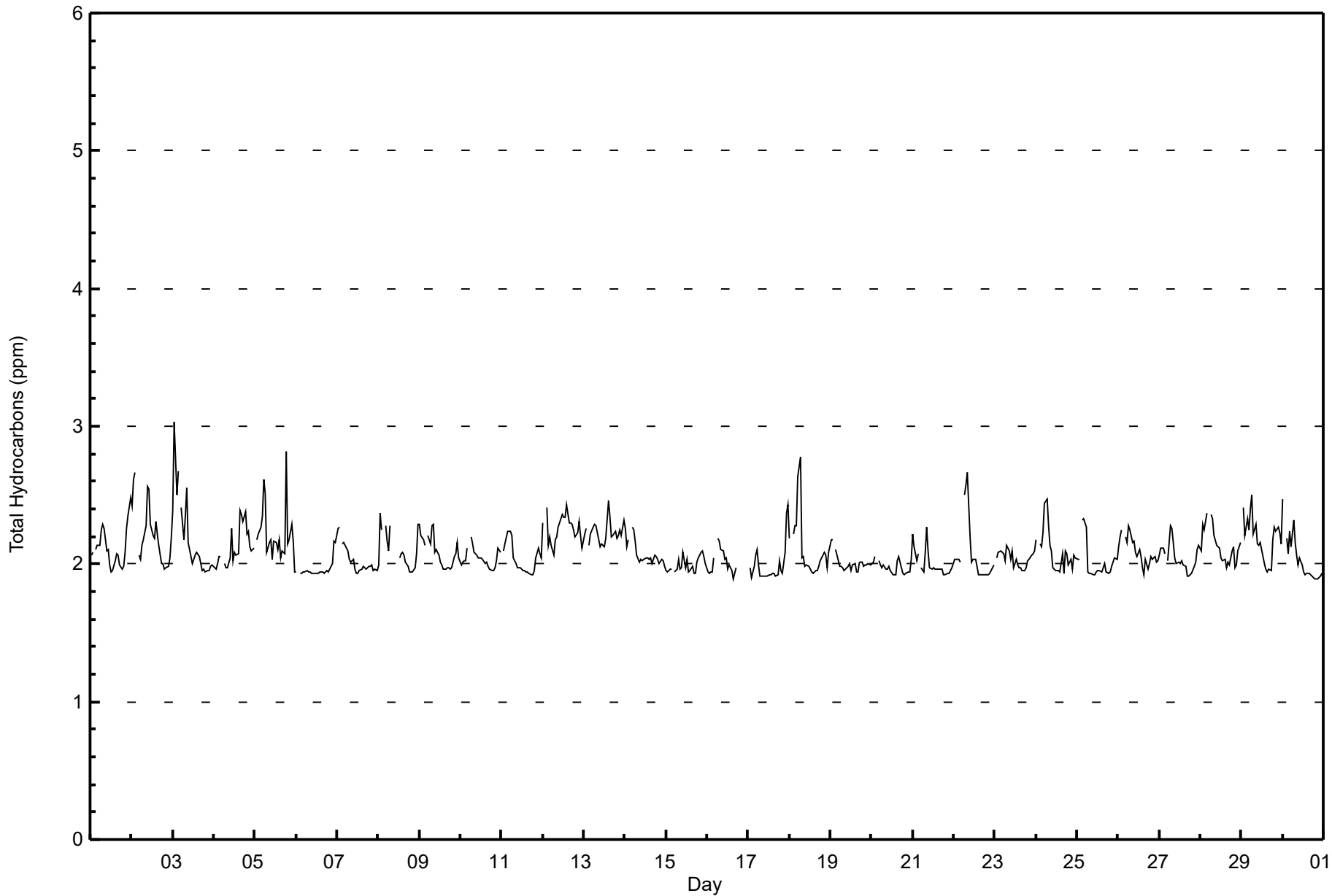
Barge Landing - June 2023

Maximum Value: 3.0 ppm on Jun 3 02:00		Maximum Daily Average: 2.3 ppm on Jun 12		Hours in Service: 720																							
Minimum Value: 1.9 ppm on Jun 30 21:00		Minimum Daily Average: 2.0 ppm on Jun 6		Hours of Data: 680																							
Maximum Diurnal Average: 2.2 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Missing Data: 40																							
Monthly Average: 2.08 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.6		Hours of Calibration: 34																							
				Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.3	2.1	2.1	2.0	1.9	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.3	2.3	2.5	2.1	2.5	
2-Jun	2.4	2.6	2.7	Z	2.1	2.0	2.1	2.2	2.3	2.6	2.5	2.3	2.2	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.7	
3-Jun	2.4	3.0	2.5	2.7	Z	2.4	2.2	2.4	2.6	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.2	3.0	
4-Jun	2.0	2.0	2.0	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.3	2.0	2.1	2.1	2.1	2.4	2.4	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.4	
5-Jun	Z	2.2	2.2	2.3	2.4	2.6	2.5	2.1	2.2	2.2	2.0	2.2	2.2	2.1	2.2	2.0	2.1	2.1	2.8	2.1	2.2	2.3	2.2	1.9	2.2	2.8	
6-Jun	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.2	2.0	2.2	
7-Jun	2.3	2.3	Z	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.3	
8-Jun	2.0	2.4	2.3	Z	2.3	2.2	2.1	2.3	C	C	C	C	2.0	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.1	2.3	2.1	2.4	
9-Jun	2.3	2.2	2.2	2.1	Z	2.2	2.1	2.3	2.3	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	2.2	2.0	2.1	2.3	
10-Jun	2.0	2.0	2.0	2.0	2.1	Z	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	
11-Jun	Z	2.1	2.1	2.2	2.2	2.2	2.2	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	2.1	2.1	2.0	2.0	2.2	
12-Jun	2.3	Z	2.4	2.1	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.1	2.3	2.4	
13-Jun	2.2	2.3	Z	2.1	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.5	
14-Jun	2.3	2.1	2.2	Z	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3	
15-Jun	1.9	1.9	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.0	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	
16-Jun	1.9	1.9	1.9	1.9	2.0	Z	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	PF	PF	PF	PF	PF	PF	--	2.2	
17-Jun	Z	2.0	1.9	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.1	2.4	2.4	2.0	2.4
18-Jun	2.2	Z	2.2	2.3	2.3	2.6	2.8	2.0	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.8
19-Jun	2.2	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	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
20-Jun	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	
21-Jun	2.2	2.1	2.0	2.1	Z	2.0	1.9	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.3	
22-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.5	2.6	2.7	2.2	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.7	
23-Jun	Z	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	
24-Jun	2.2	Z	2.1	2.1	2.2	2.4	2.5	2.3	2.1	2.1	2.0	2.0	2.0	1.9	2.1	1.9	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.5	
25-Jun	2.0	2.0	Z	2.3	2.3	2.3	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.3	
26-Jun	2.1	2.2	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.3	
27-Jun	2.1	2.1	2.1	2.1	Z	2.0	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.3	
28-Jun	2.1	2.3	2.2	2.3	2.4	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	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.4	
29-Jun	Z	2.4	2.2	2.3	2.2	2.4	2.5	2.2	2.3	2.1	2.1	2.2	2.1	2.0	2.0	1.9	2.0	2.0	2.2	2.3	2.2	2.3	2.2	2.1	2.2	2.5	
30-Jun	2.5	Z	2.2	2.1	2.2	2.1	2.3	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.5	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerspan C - Calibration PF - Power Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Barge Landing - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Barge Landing - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	368	54.12	54.12
2.1 - 3.0	312	45.88	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



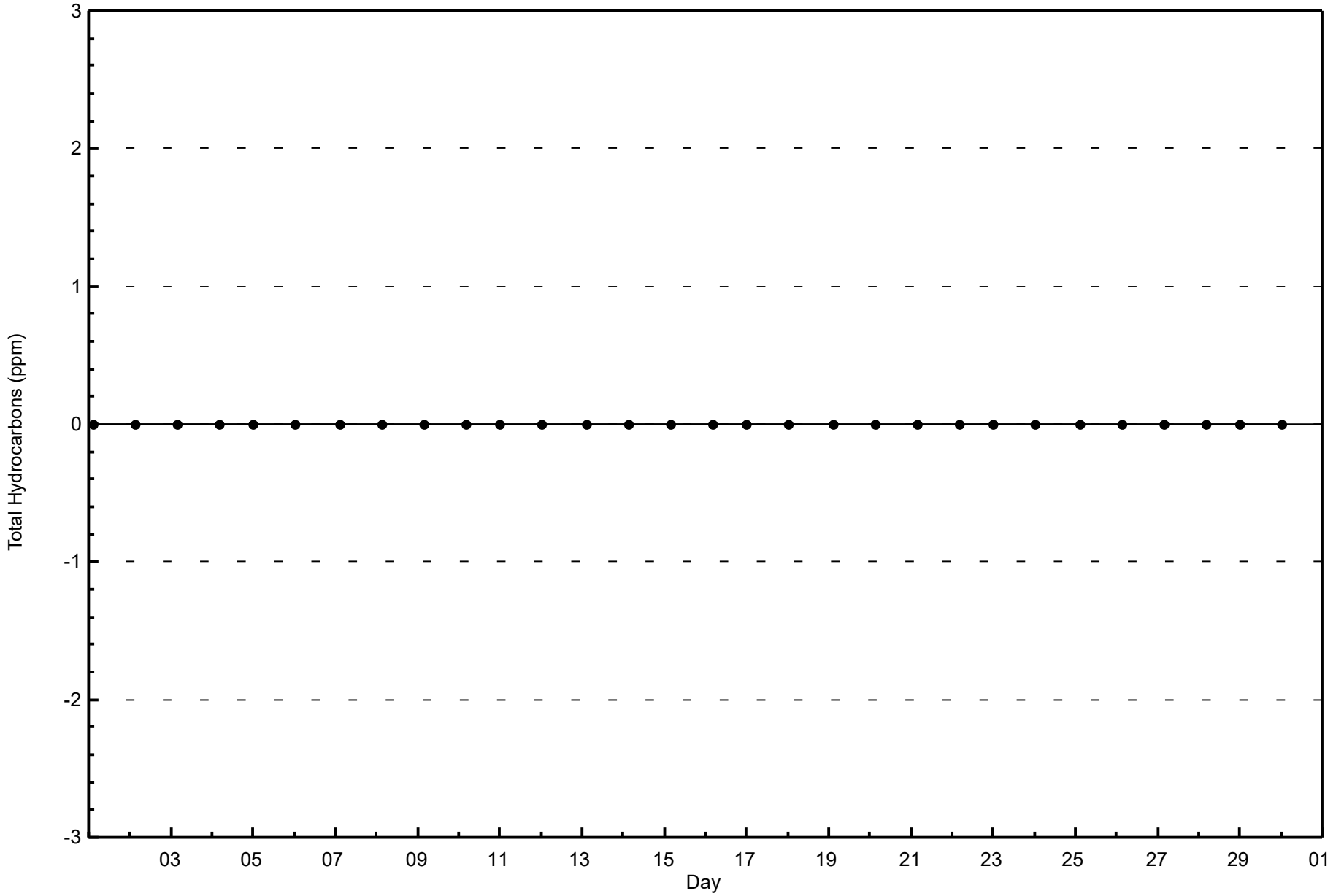
**Wood Buffalo Environmental Association
Frequency Distribution**

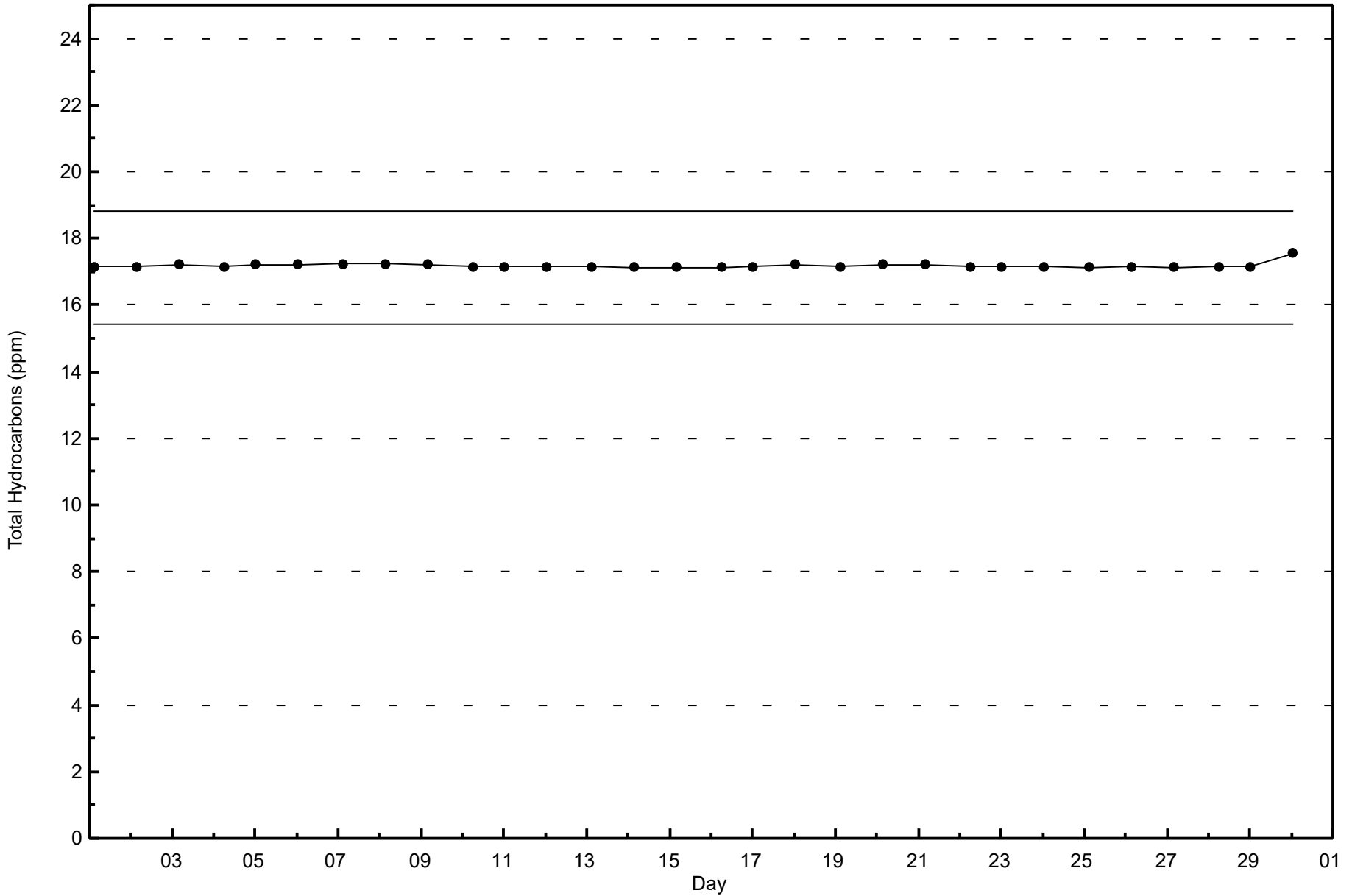
**Total Hydrocarbons (THC) - ppm
Barge Landing - June 2023**

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	42	41	27	13	10	7	10	22	15	28	39	33	16	14	20	31	368
2.1 - 3.0	33	46	20	5	8	7	14	40	33	28	7	8	2	11	19	31	312
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	75	87	47	18	18	14	24	62	48	56	46	41	18	25	39	62	680

Total Number of Valid Hours: 680

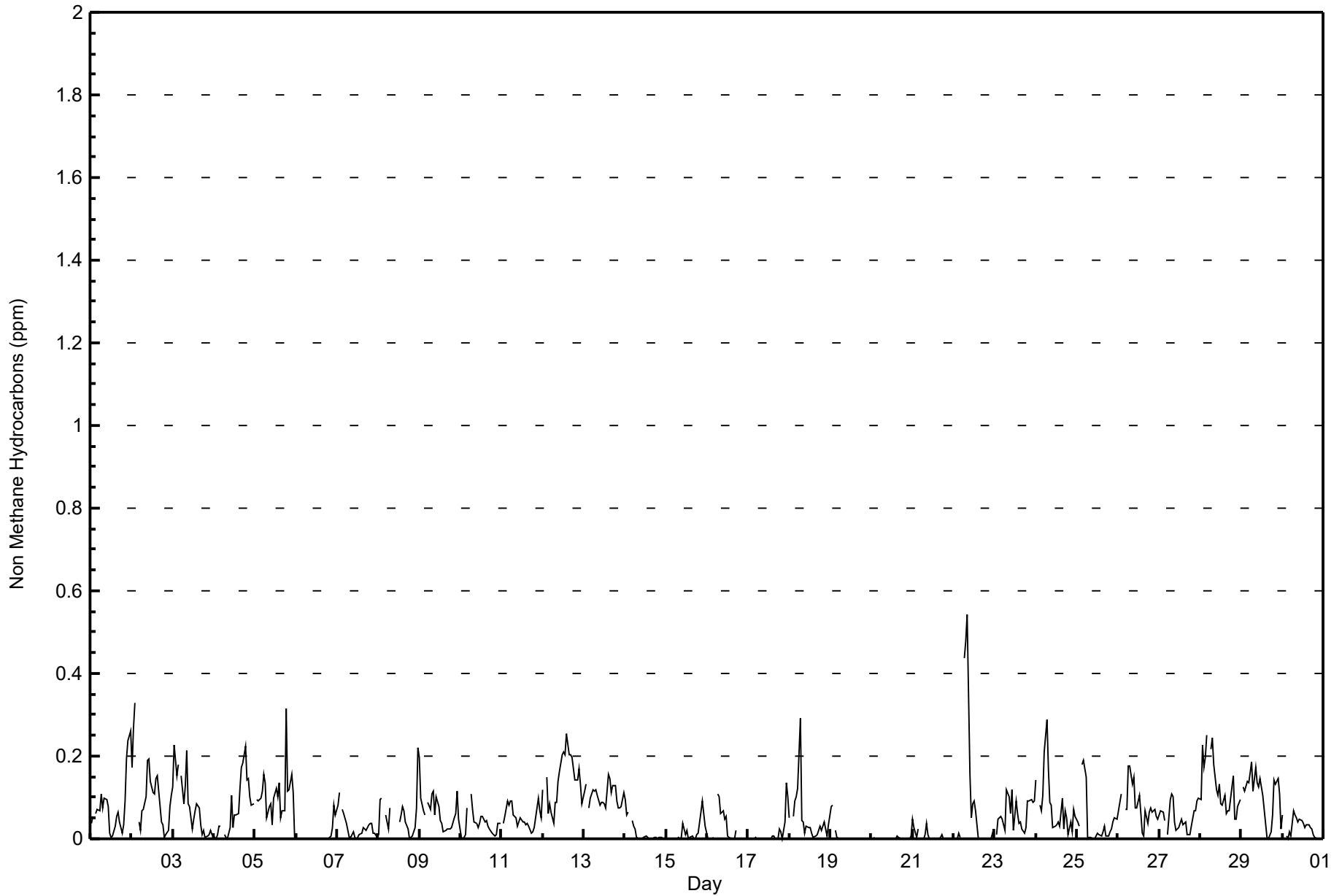
Total Number of Hours: 720







Maximum Value: 0.543 ppm on Jun 22 09:00		Maximum Daily Average: 0.144 ppm on Jun 12		Hours in Service:	720																					
Minimum Value: 0.000 ppm on Jun 6 03:00		Minimum Daily Average: 0.001 ppm on Jun 20		Hours of Data:	680																					
Maximum Diurnal Average: 0.093 ppm at hour 7		Minimum Diurnal Average: 0.036 ppm at hour 18		Hours of Missing Data:	40																					
Monthly Average: 0.058 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 = 0.3		Hours of Calibration:	34																					
				Percent Operational Time:	99.2																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.036	0.055	Z	0.060	0.071	0.069	0.107	0.074	0.099	0.095	0.078	0.014	0.003	0.008	0.030	0.055	0.066	0.040	0.014	0.034	0.092	0.193	0.236	0.261	0.078	0.261
2-Jun	0.172	0.267	0.329	Z	0.039	0.022	0.067	0.071	0.100	0.189	0.194	0.139	0.112	0.108	0.145	0.151	0.115	0.040	0.035	0.004	0.010	0.022	0.079	0.104	0.109	0.329
3-Jun	0.127	0.227	0.154	0.181	Z	0.154	0.084	0.129	0.215	0.085	0.078	0.024	0.048	0.069	0.083	0.073	0.035	0.010	0.019	0.005	0.006	0.009	0.020	0.011	0.080	0.227
4-Jun	0.005	0.001	0.010	0.032	0.030	Z	0.009	0.002	0.001	0.028	0.104	0.027	0.057	0.059	0.061	0.123	0.174	0.182	0.224	0.142	0.147	0.102	0.082	0.084	0.073	0.224
5-Jun	Z	0.096	0.093	0.098	0.114	0.155	0.134	0.051	0.080	0.084	0.033	0.099	0.121	0.101	0.137	0.050	0.067	0.066	0.314	0.114	0.119	0.156	0.112	0.003	0.104	0.314
6-Jun	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.028	0.081	0.059	0.008	0.081
7-Jun	0.082	0.110	Z	0.073	0.060	0.039	0.022	0.004	0.003	0.015	0.004	0.000	0.002	0.009	0.014	0.029	0.023	0.021	0.034	0.036	0.038	0.012	0.014	0.005	0.028	0.110
8-Jun	0.009	0.094	0.097	Z	0.056	0.040	0.025	0.073	C	C	C	C	0.041	0.058	0.077	0.067	0.040	0.025	0.001	0.004	0.005	0.028	0.074	0.221	0.054	0.221
9-Jun	0.197	0.100	0.069	0.059	Z	0.089	0.072	0.108	0.114	0.059	0.102	0.079	0.045	0.038	0.017	0.019	0.023	0.023	0.024	0.027	0.051	0.062	0.116	0.047	0.067	0.197
10-Jun	0.004	0.000	0.003	0.011	0.073	Z	0.107	0.072	0.040	0.039	0.028	0.037	0.055	0.053	0.041	0.045	0.031	0.024	0.014	0.009	0.005	0.009	0.037	0.038	0.034	0.107
11-Jun	Z	0.037	0.053	0.093	0.082	0.091	0.092	0.058	0.051	0.032	0.042	0.051	0.039	0.040	0.036	0.037	0.030	0.015	0.016	0.026	0.052	0.100	0.067	0.050	0.052	0.100
12-Jun	0.119	Z	0.150	0.061	0.085	0.064	0.039	0.087	0.089	0.140	0.162	0.203	0.210	0.204	0.253	0.203	0.204	0.196	0.171	0.143	0.144	0.171	0.132	0.085	0.144	0.253
13-Jun	0.115	0.134	Z	0.076	0.098	0.117	0.114	0.118	0.106	0.081	0.089	0.090	0.085	0.073	0.157	0.145	0.113	0.130	0.129	0.090	0.076	0.073	0.079	0.113	0.104	0.157
14-Jun	0.095	0.057	0.063	Z	0.043	0.031	0.025	0.005	0.001	0.001	0.001	0.004	0.008	0.003	0.000	0.001	0.001	0.003	0.004	0.001	0.003	0.004	0.000	0.000	0.015	0.095
15-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.002	0.001	0.004	0.038	0.011	0.019	0.001	0.002	0.007	0.000	0.000	0.009	0.014	0.063	0.092	0.061	0.032	0.015	0.092
16-Jun	0.000	0.000	0.000	0.000	0.004	Z	0.107	0.101	0.062	0.069	0.049	0.055	0.008	0.002	0.000	0.000	0.000	0.020	PF	PF	PF	PF	PF	PF	--	0.107
17-Jun	Z	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.007	0.006	0.000	0.000	0.001	0.024	0.018	0.001	0.041	0.135	0.103	0.015	0.135
18-Jun	0.049	Z	0.056	0.093	0.100	0.122	0.293	0.044	0.039	0.014	0.032	0.028	0.027	0.013	0.002	0.008	0.009	0.021	0.032	0.022	0.042	0.022	0.005	0.035	0.048	0.293
19-Jun	0.076	0.080	Z	0.021	0.002	0.001	0.000	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.008	0.080
20-Jun	0.000	0.001	0.004	Z	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.006	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.008	0.001	0.008
21-Jun	0.048	0.029	0.003	0.022	Z	0.001	0.000	0.011	0.037	0.010	0.001	0.000	0.000	0.000	0.001	0.003	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.048
22-Jun	0.001	0.001	0.000	0.014	0.003	Z	0.439	0.477	0.543	0.157	0.052	0.086	0.092	0.069	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.024	0.085	0.543
23-Jun	Z	0.010	0.047	0.055	0.049	0.033	0.021	0.118	0.103	0.062	0.118	0.021	0.093	0.061	0.037	0.041	0.023	0.012	0.028	0.091	0.091	0.096	0.090	0.091	0.060	0.118
24-Jun	0.142	Z	0.082	0.068	0.105	0.210	0.289	0.169	0.088	0.080	0.027	0.029	0.033	0.039	0.030	0.099	0.024	0.066	0.051	0.010	0.039	0.018	0.071	0.054	0.079	0.289
25-Jun	0.042	0.030	Z	0.181	0.189	0.149	0.001	0.004	0.002	0.000	0.000	0.008	0.015	0.009	0.007	0.017	0.030	0.005	0.007	0.017	0.024	0.040	0.049	0.048	0.038	0.189
26-Jun	0.069	0.088	0.108	Z	0.070	0.070	0.175	0.176	0.134	0.150	0.076	0.073	0.104	0.060	0.015	0.005	0.068	0.038	0.066	0.075	0.066	0.071	0.055	0.047	0.081	0.176
27-Jun	0.056	0.067	0.063	0.046	Z	0.009	0.094	0.110	0.103	0.039	0.021	0.027	0.039	0.049	0.033	0.039	0.011	0.010	0.011	0.029	0.068	0.069	0.091	0.097	0.051	0.110
28-Jun	0.096	0.228	0.172	0.196	0.250	Z	0.218	0.244	0.178	0.118	0.104	0.132	0.086	0.083	0.106	0.061	0.069	0.066	0.127	0.151	0.049	0.047	0.076	0.094	0.128	0.250
29-Jun	Z	0.127	0.116	0.138	0.135	0.161	0.188	0.115	0.171	0.137	0.126	0.146	0.103	0.073	0.038	0.005	0.000	0.017	0.056	0.141	0.133	0.147	0.110	0.024	0.105	0.188
30-Jun	0.057	Z	0.005	0.001	0.016	0.006	0.068	0.056	0.050	0.040	0.046	0.043	0.039	0.029	0.033	0.033	0.027	0.023	0.010	0.005	0.001	0.001	0.000	0.002	0.026	0.068
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerspan		C - Calibration				PF - Power Failure																				





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	183	26.91	26.91
0.006 - 0.05	216	31.76	58.68
0.06 - 0.1	224	32.94	91.62
> 0.1	57	8.38	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - June 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	39	16	7	5	8	1	5	3	2	15	29	19	2	3	10	19	183
0.006 - 0.05	14	30	19	8	3	7	5	22	12	21	8	11	13	13	11	19	216
0.06 - 0.1	17	31	11	4	6	6	14	30	26	18	7	8	3	8	15	20	224
> 0.1	5	10	10	1	1	0	0	7	8	2	2	3	0	1	3	4	57
Totals	75	87	47	18	18	14	24	62	48	56	46	41	18	25	39	62	680

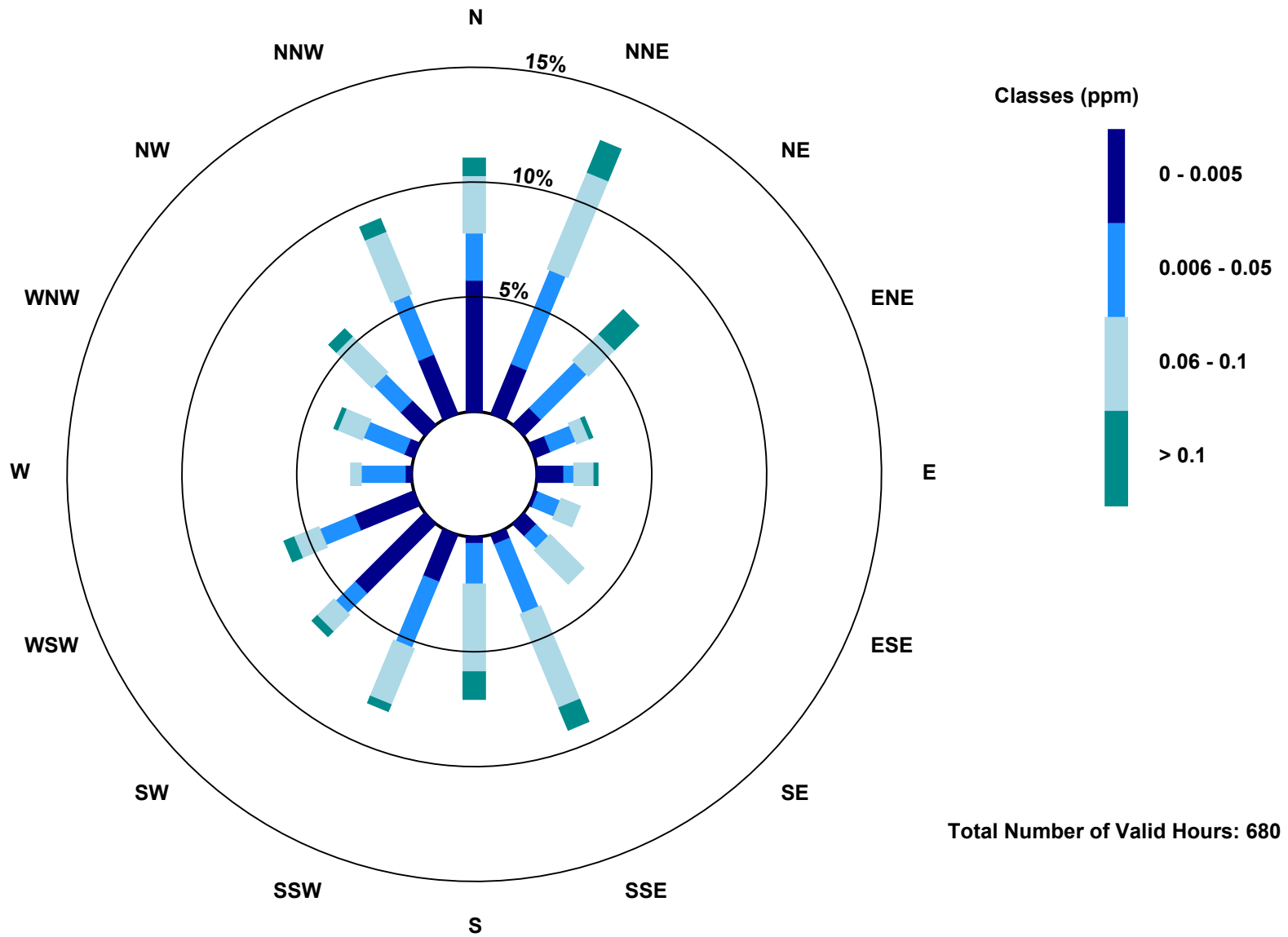
Total Number of Valid Hours: 680

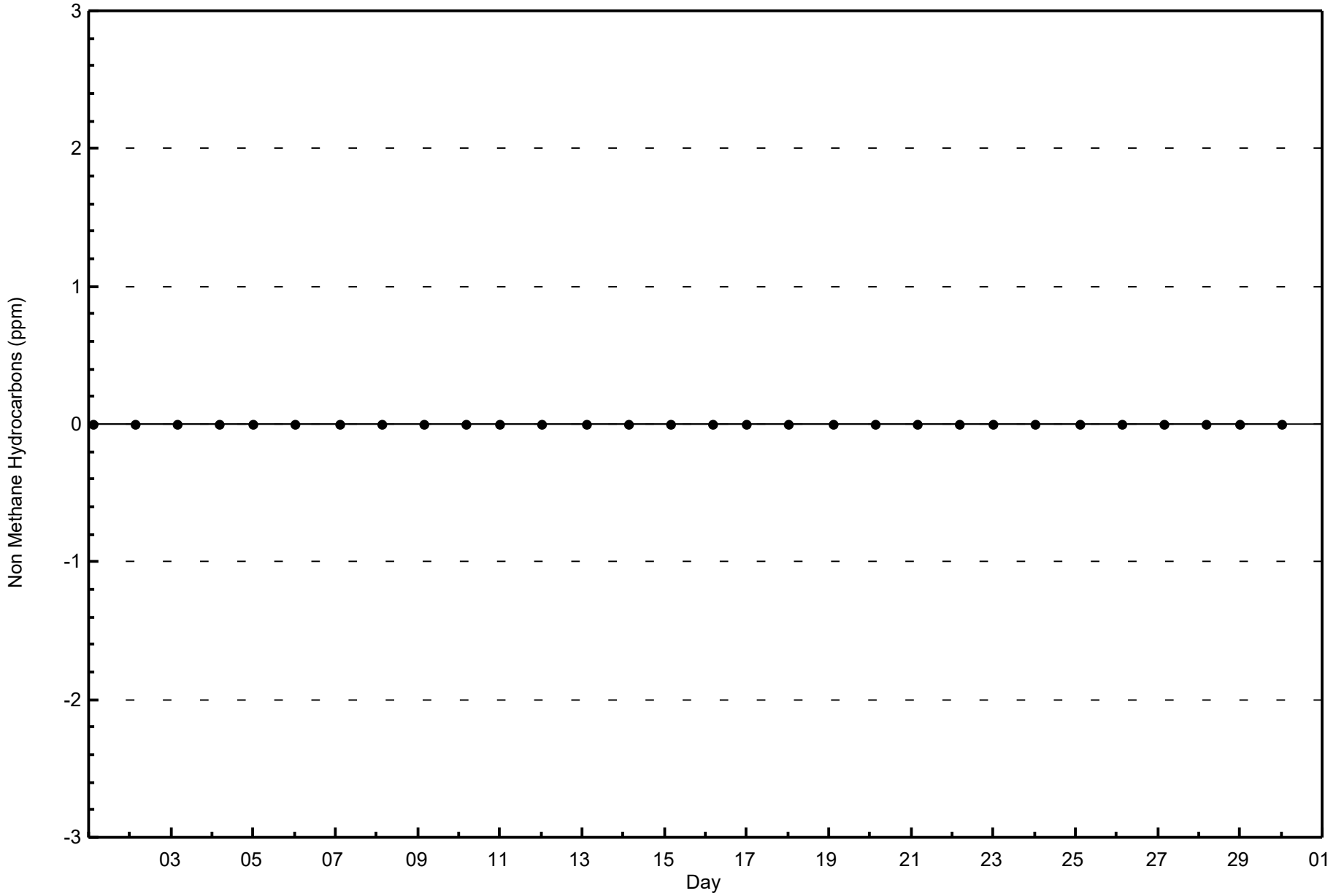
Total Number of Hours: 720

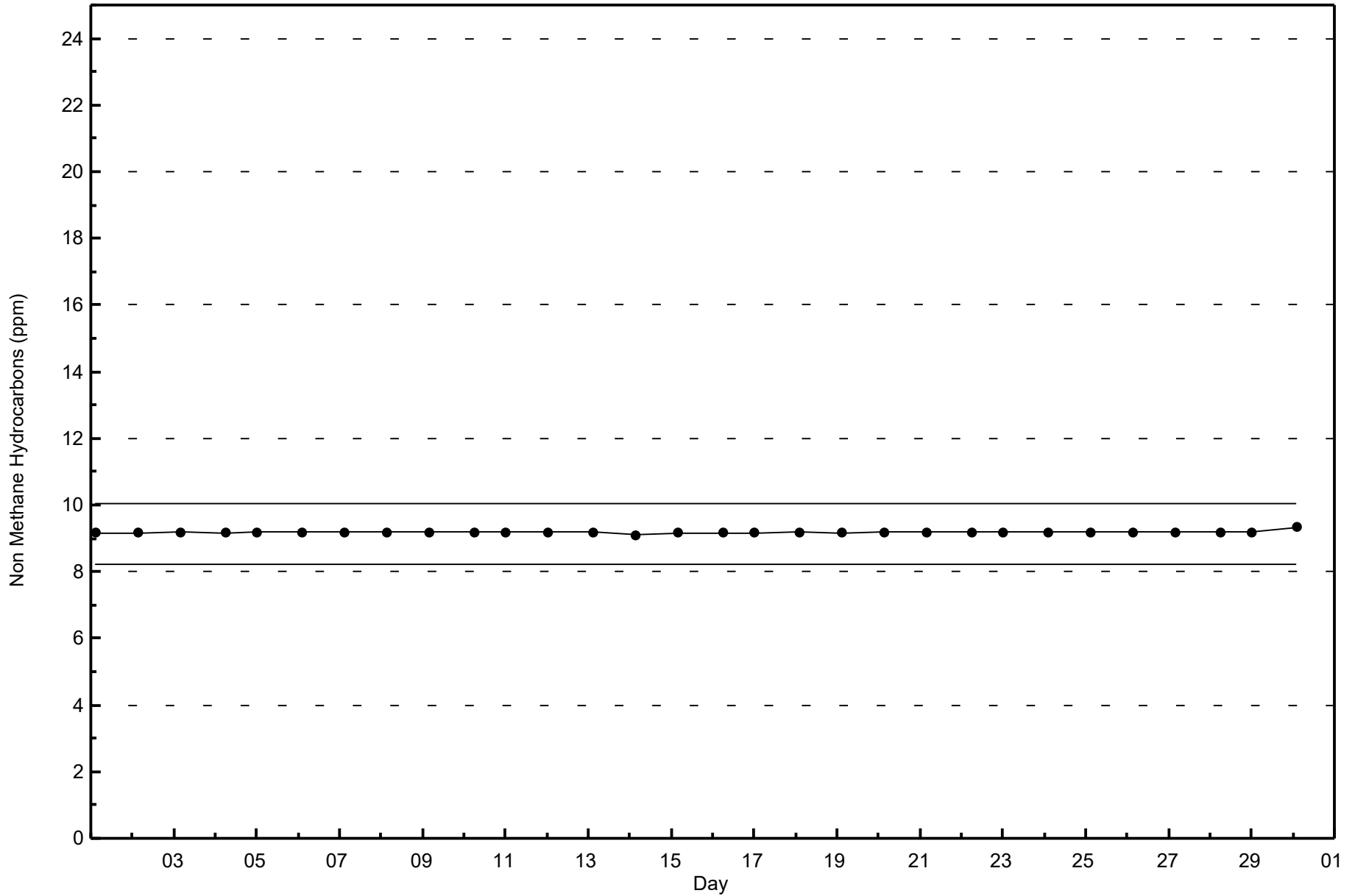


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing









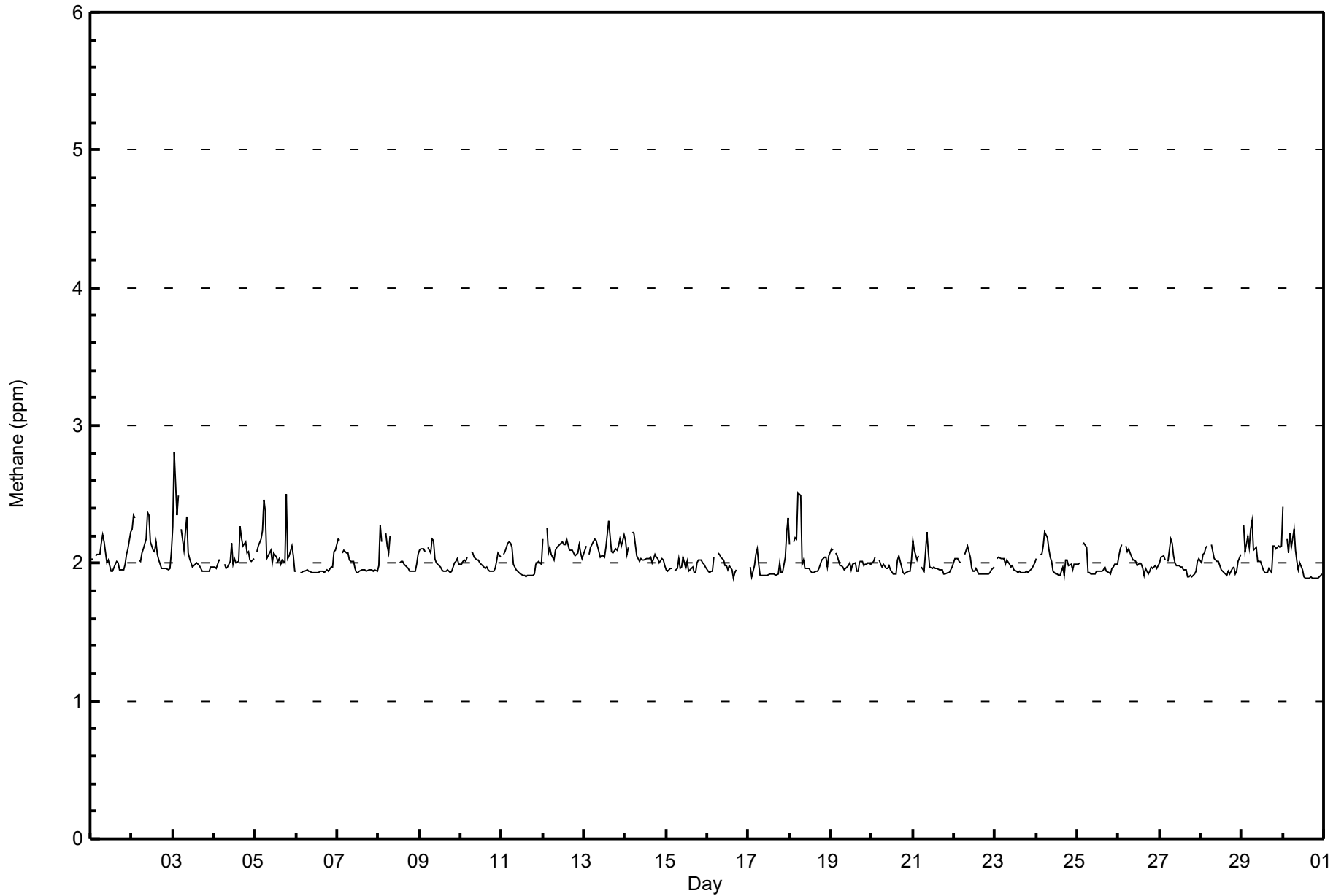
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Barge Landing - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.8 ppm on Jun 3 02:00 Maximum Daily Average: 2.1 ppm on Jun 13																			Hours in Service: 720 Hours of Data: 680 Hours of Missing Data: 40 Hours of Calibration: 34 Percent Operational Time: 99.2							
Minimum Value: 1.9 ppm on Jun 30 19:00 Minimum Daily Average: 2.0 ppm on Jun 6 Maximum Diurnal Average: 2.1 ppm at hour 6 Minimum Diurnal Average: 2.0 ppm at hour 18 Monthly Average: 2.02 ppm Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 1.9 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.4																										
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-Jun	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.2	
2-Jun	2.2	2.4	Z	Z	2.0	2.0	2.1	2.1	2.2	2.4	2.3	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4
3-Jun	2.3	2.8	2.3	2.5	Z	Z	2.1	2.2	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.8	
4-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.3	
5-Jun	Z	2.1	2.1	2.2	2.2	2.5	2.4	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.0	2.1	2.1	2.1	1.9	2.5	
6-Jun	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	
7-Jun	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.2	
8-Jun	2.0	2.3	2.2	Z	2.2	2.1	2.1	2.2	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.3	
9-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	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	2.2	
10-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.1	2.1	
11-Jun	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	
12-Jun	2.2	Z	2.3	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.3	
13-Jun	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.0	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.3	
14-Jun	2.2	2.1	2.1	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
15-Jun	1.9	1.9	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
16-Jun	1.9	1.9	1.9	1.9	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	PF	PF	PF	PF	PF	PF	2.1	
17-Jun	Z	2.0	1.9	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.2	2.3	2.3	
18-Jun	2.1	Z	2.2	2.2	2.2	2.5	2.5	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	2.1	2.1	2.5	
19-Jun	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	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
20-Jun	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	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	
21-Jun	2.2	2.1	2.0	2.1	Z	2.0	1.9	2.1	2.2	2.1	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	2.2	
22-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	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	2.0	2.0	2.1	
23-Jun	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	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	
24-Jun	2.0	Z	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.2	
25-Jun	2.0	2.0	Z	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	
26-Jun	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	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
27-Jun	2.0	2.0	2.1	2.0	Z	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2	
28-Jun	2.0	2.1	2.1	2.1	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	2.0	2.0	1.9	1.9	2.0	2.1	2.1	
29-Jun	Z	2.3	2.1	2.2	2.1	2.2	2.3	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
30-Jun	2.4	Z	2.2	2.1	2.2	2.1	2.3	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	1.9	1.9	2.4	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerspan C - Calibration PF - Power Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Barge Landing - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	473	69.56	69.56
2.1 - 3.0	207	30.44	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



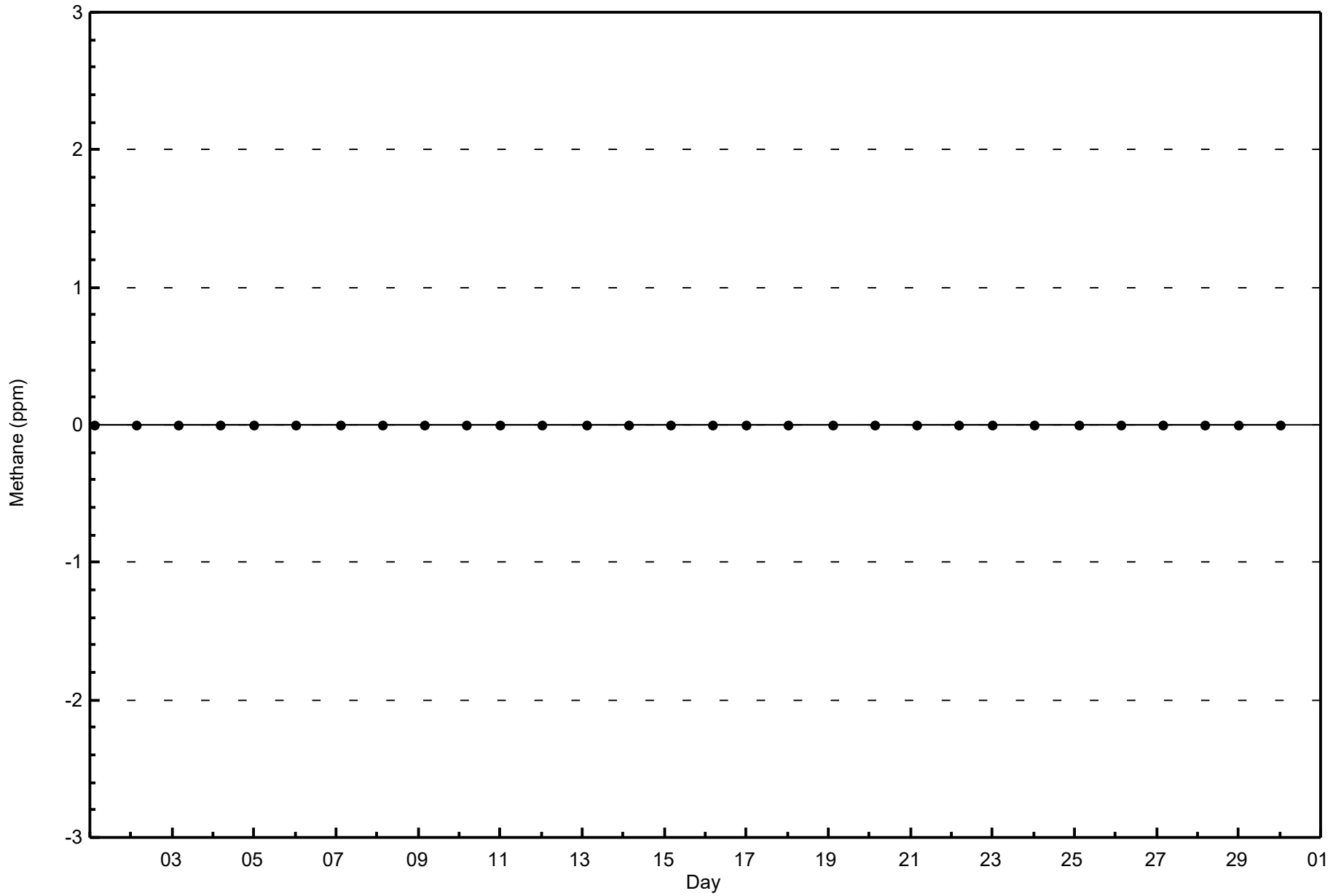
**Wood Buffalo Environmental Association
Frequency Distribution**

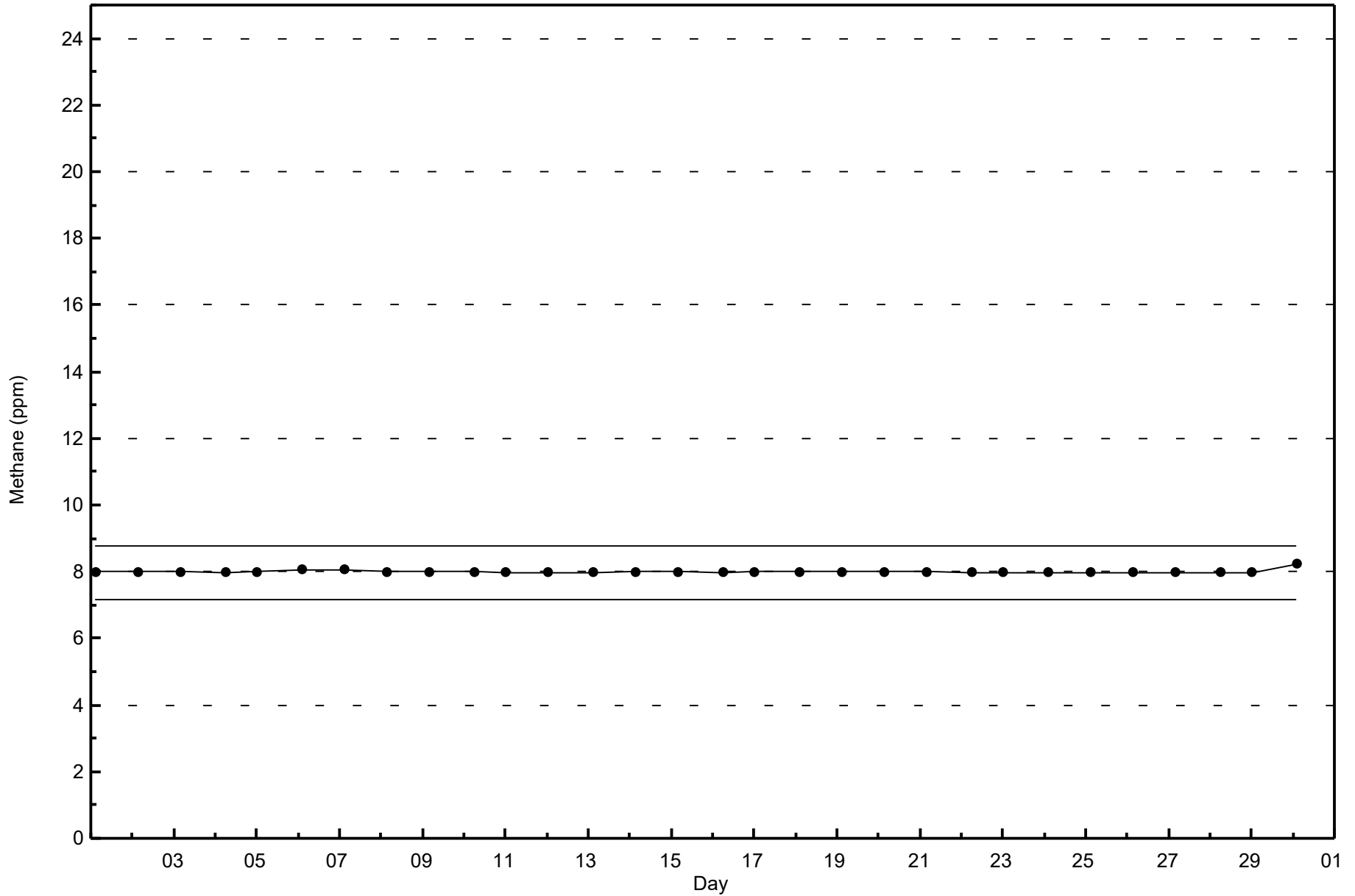
**Methane (CH₄) - ppm
Barge Landing - June 2023**

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	50	53	31	15	15	12	17	40	32	34	41	35	17	19	25	37	473
2.1 - 3.0	25	34	16	3	3	2	7	22	16	22	5	6	1	6	14	25	207
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	75	87	47	18	18	14	24	62	48	56	46	41	18	25	39	62	680

Total Number of Valid Hours: 680

Total Number of Hours: 720







Wood Buffalo Environmental Association
Summary of Hour Averages

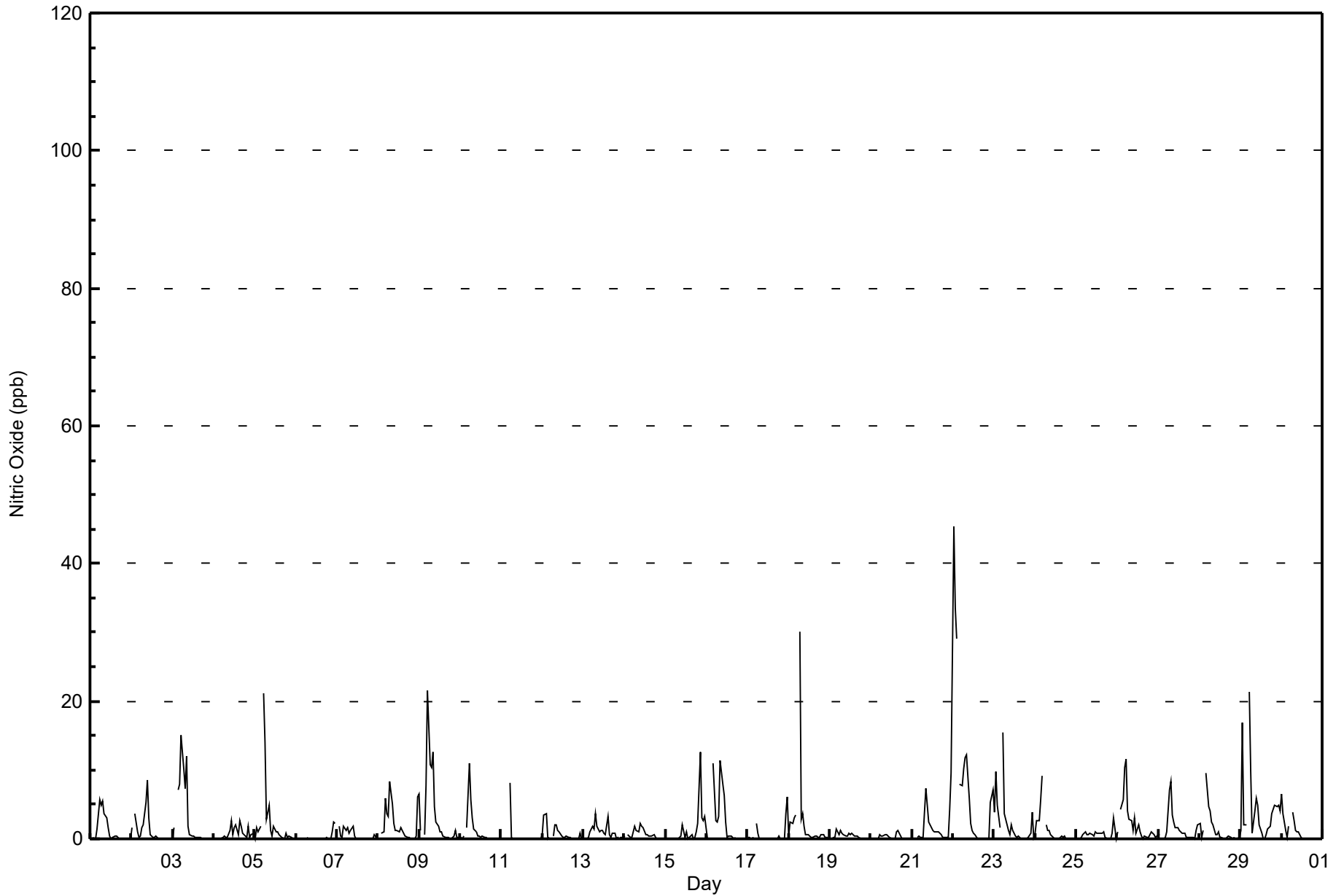
Nitric Oxide (NO) - ppb
Barge Landing - June 2023

Maximum Value: 45.3 ppb on Jun 22 01:00		Maximum Daily Average: 7.9 ppb on Jun 22		Hours in Service: 720																																												
Minimum Value: 0.0 ppb on Jun 1 22:00		Minimum Daily Average: 0.3 ppb on Jun 20		Hours of Data: 679																																												
Maximum Diurnal Average: 6.4 ppb at hour 6		Minimum Diurnal Average: 0.3 ppb at hour 18		Hours of Missing Data: 41																																												
Monthly Average: 1.71 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.4 Q ₃ = 1.6 P ₉₀ = 4.7 P ₉₉ = 17.9		Hours of Calibration: 35																																												
				Percent Operational Time: 99.2																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	Z	0.3	0.0	0.1	1.5	5.6	4.9	5.5	3.6	3.0	1.7	0.4	0.1	0.1	0.4	0.4	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.1	1.2	5.6																						
2-Jun	1.6	Z	3.7	1.1	0.2	0.4	1.6	2.0	5.2	8.5	3.0	0.5	0.2	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	8.5																						
3-Jun	0.0	1.6	Z	7.1	8.0	15.1	10.2	7.3	12.1	1.8	0.7	0.5	0.5	0.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.9	15.1																							
4-Jun	0.0	0.0	0.0	Z	0.1	0.2	0.4	0.1	0.3	1.3	2.7	0.7	1.6	2.0	0.5	2.6	1.8	0.8	0.4	0.2	1.8	0.1	0.6	0.8	0.8	2.7																						
5-Jun	0.1	1.7	1.1	1.7	Z	21.1	14.1	2.8	4.8	1.2	0.3	1.9	1.1	1.1	0.6	0.5	0.2	0.1	0.9	0.3	0.5	0.1	0.0	0.0	2.4	21.1																						
6-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	C	C	C	C	C	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.9	2.5	2.3	0.3	2.5																						
7-Jun	Z	1.7	0.5	0.2	1.8	1.2	1.6	0.9	1.2	1.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	1.8																						
8-Jun	0.1	Z	0.7	1.0	5.8	3.7	3.3	8.4	5.1	2.2	1.2	1.2	1.1	1.6	1.3	0.7	0.4	0.3	0.1	0.1	0.0	0.0	0.4	6.1	2.0	8.4																						
9-Jun	6.5	1.2	Z	0.6	7.8	21.6	10.8	10.5	12.5	4.7	2.5	1.9	1.0	0.9	0.3	0.2	0.2	0.2	0.1	0.0	0.3	1.3	0.1	0.3	3.7	21.6																						
10-Jun	0.2	0.1	0.4	Z	1.6	10.9	5.7	3.0	1.4	1.1	0.4	0.4	0.2	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	10.9																						
11-Jun	0.0	0.0	0.0	0.0	Z	8.2	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	0.4	8.2																						
12-Jun	0.5	3.4	3.7	0.0	0.1	Z	0.3	2.0	2.1	1.3	1.0	0.4	0.3	0.2	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.7	0.0	0.7	3.7																						
13-Jun	Z	0.0	0.0	0.2	1.0	1.9	1.5	3.6	1.9	1.1	1.3	1.2	0.8	0.6	3.3	0.6	0.2	0.9	0.8	0.1	0.1	0.0	0.1	0.2	0.9	3.6																						
14-Jun	0.5	Z	0.6	0.3	0.1	1.0	1.8	1.3	1.1	2.2	1.8	1.6	0.6	0.7	0.5	0.3	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.7	2.2																						
15-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.3	2.0	0.2	1.1	0.0	0.1	0.6	0.0	0.2	1.0	2.3	12.6	3.0	2.7	3.2	1.3	12.6																						
16-Jun	0.0	0.0	0.1	Z	11.0	2.6	2.3	3.3	11.3	7.8	6.4	2.5	0.3	0.5	0.4	0.1	0.1	0.3	PF	PF	PF	PF	PF	PF	--	11.3																						
17-Jun	0.1	0.1	0.0	0.1	Z	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.0	3.7	6.1	0.6	6.1																						
18-Jun	0.4	2.5	2.3	3.0	3.5	Z	30.2	2.8	3.8	1.9	0.7	0.6	0.3	0.3	0.4	0.3	0.3	0.2	0.6	0.5	0.1	0.1	0.2	2.4	30.2	2.4	30.2																					
19-Jun	Z	0.1	0.2	0.2	1.3	0.7	1.2	0.8	0.7	0.3	0.5	0.8	0.7	0.8	0.5	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.3																						
20-Jun	0.0	Z	0.0	0.0	0.1	0.5	0.4	0.5	0.5	0.6	0.4	0.2	0.0	0.0	0.0	1.1	1.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.2																						
21-Jun	0.2	0.0	Z	0.1	0.4	0.2	0.2	3.9	7.3	4.9	2.4	1.7	1.2	1.0	1.0	1.0	0.8	0.5	0.3	0.3	0.1	0.2	4.3	9.6	1.8	9.6																						
22-Jun	45.3	33.6	29.1	Z	7.9	7.7	10.2	11.7	12.1	5.9	2.3	1.1	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	7.1	7.9	45.3																						
23-Jun	3.8	9.7	4.9	1.6	Z	15.5	3.7	2.8	1.3	0.5	2.1	1.2	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.9	3.9	0.2	2.3	15.5																						
24-Jun	0.8	2.6	2.7	5.7	9.1	Z	2.0	1.2	1.2	0.6	0.3	0.0	0.0	0.0	0.5	0.2	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.2	9.1																						
25-Jun	Z	0.0	0.0	0.3	0.5	1.0	0.6	0.5	0.9	0.6	0.5	1.0	0.9	0.8	0.8	0.8	1.0	0.3	0.0	0.0	0.1	0.9	3.1	0.0	0.6	3.1																						
26-Jun	1.0	Z	4.3	5.8	10.3	11.6	4.0	2.9	2.6	1.3	3.0	0.8	2.0	1.1	0.4	0.0	0.4	0.3	0.3	0.5	1.0	0.6	0.1	0.4	2.4	11.6																						
27-Jun	0.6	0.6	Z	0.0	0.1	0.9	7.1	8.2	3.4	2.5	1.6	1.6	1.2	1.1	0.7	0.8	0.2	0.1	0.1	0.2	0.1	0.0	1.2	2.1	1.5	8.2																						
28-Jun	2.2	0.3	1.2	Z	9.5	4.6	4.2	2.5	2.0	0.7	0.7	1.0	0.2	0.1	0.0	0.0	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.3	1.3	9.5																						
29-Jun	1.3	17.0	2.0	2.0	Z	21.3	9.7	0.8	4.2	6.0	4.9	2.1	0.9	0.1	0.0	0.6	1.4	1.9	3.6	4.3	5.0	4.8	5.0	4.1	4.5	21.3																						
30-Jun	6.4	3.7	1.1	0.2	1.9	Z	3.9	2.6	1.2	1.0	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	1.0	6.4																						
																								2.9	3.2	2.4	1.2	3.3	6.4	4.6	3.1	3.6	2.2	1.6	0.9	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.8	0.5	1.2	1.5	Diurnal Average
																								45.3	33.6	29.1	7.1	11.0	21.6	30.2	11.7	12.5	8.5	6.4	2.5	2.0	2.0	3.3	2.6	1.8	1.9	3.6	4.3	12.6	4.8	5.3	9.6	Diurnal Maximum
Z - zerspan																								C - Calibration			PF - Power Failure																					



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Barge Landing - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Barge Landing - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	672	98.97	98.97
21 - 40	6	0.88	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Barge Landing - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	73	86	47	19	15	13	24	66	46	55	42	41	18	24	35	68	672
21 - 40	0	1	0	0	2	1	0	0	1	0	0	0	0	0	1	0	6
41 - 80	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	87	47	19	18	14	24	66	47	55	42	41	18	24	36	68	679

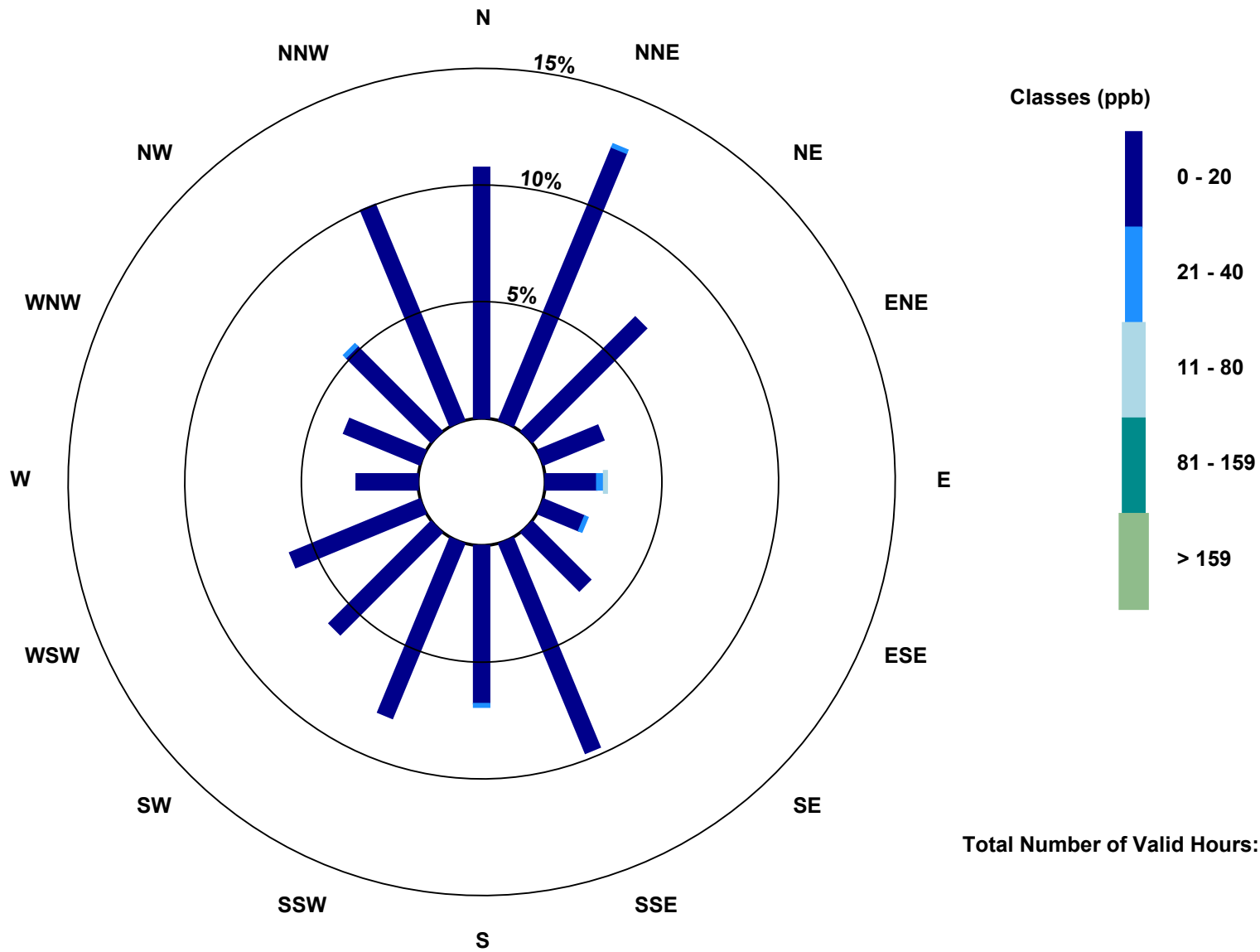
Total Number of Valid Hours: 679

Total Number of Hours: 720

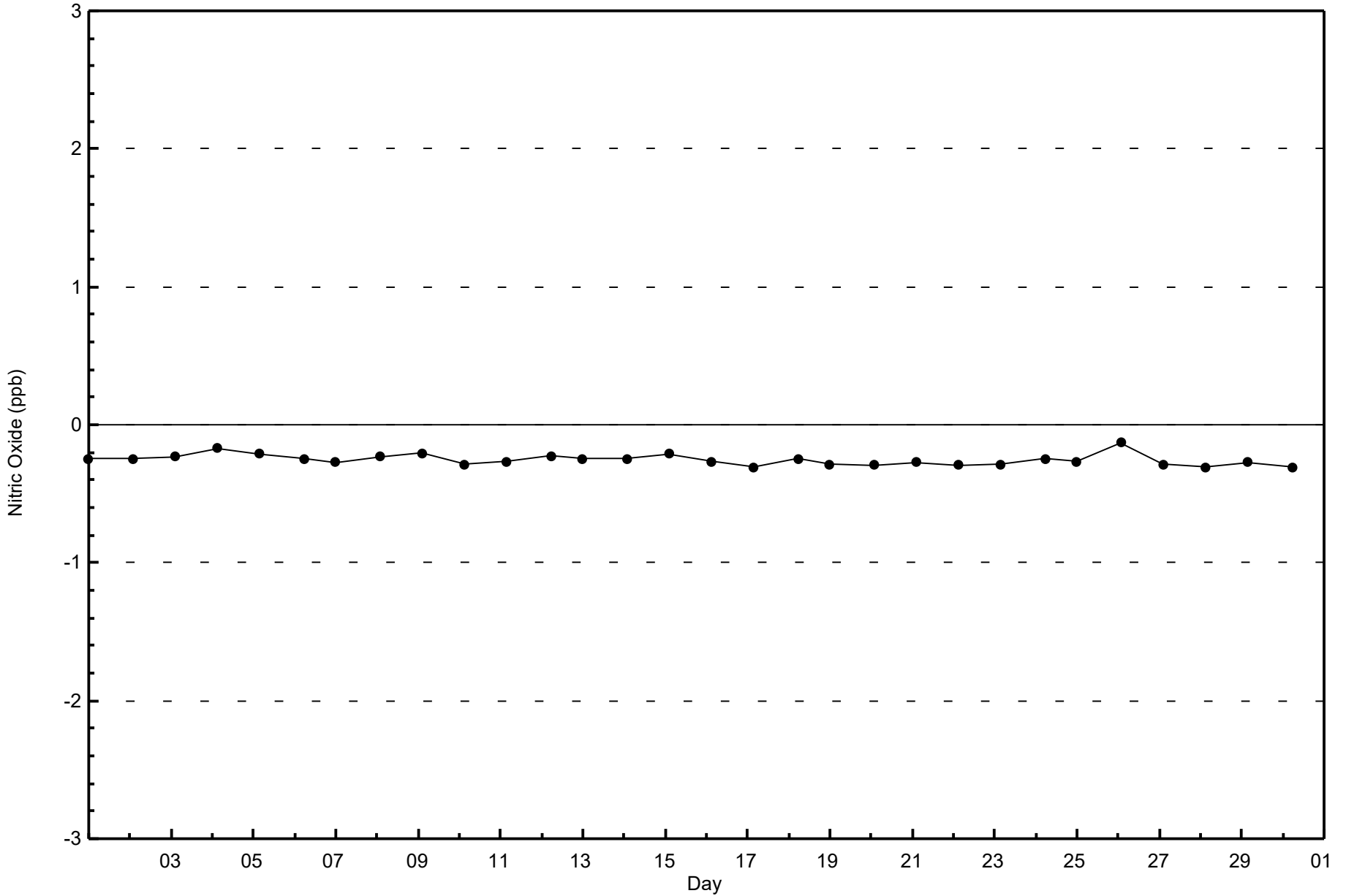


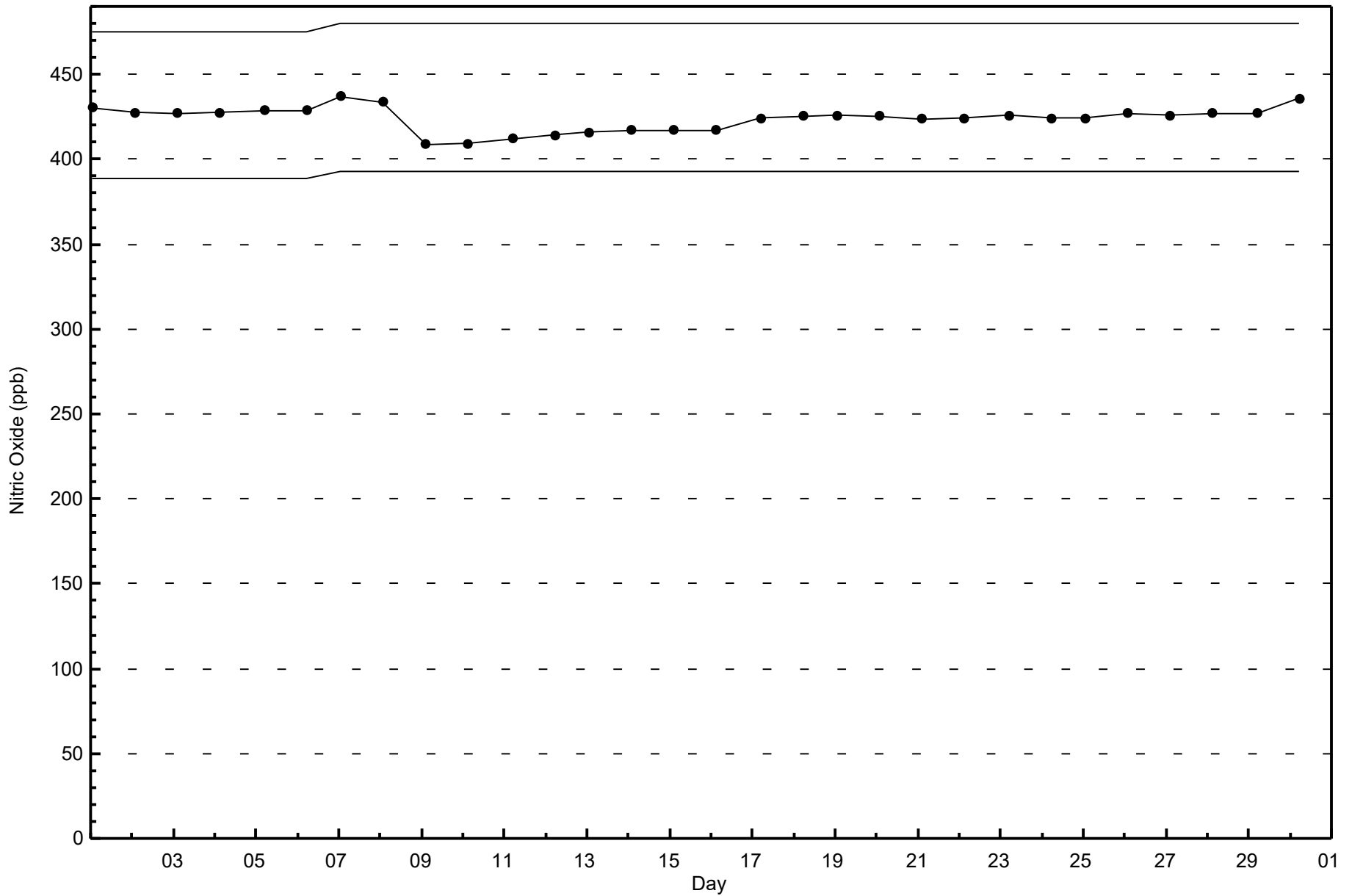
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Barge Landing



Total Number of Valid Hours: 679







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Barge Landing - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 29.3 ppb on Jun 2 10:00	Maximum Daily Average: 11.2 ppb on Jun 2		Hours of Data:	679
Minimum Value: 0.1 ppb on Jun 6 03:00	Minimum Daily Average: 2.6 ppb on Jun 20		Hours of Missing Data:	41
Maximum Diurnal Average: 9.1 ppb at hour 3	Minimum Diurnal Average: 2.7 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 5.69 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 0.9 Q ₁ = 2.2 Median = 4.3 Q ₃ = 8.0 P ₉₀ = 11.7 P ₉₉ = 21.5		Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	Z	8.3	6.5	7.2	9.0	10.9	8.6	10.5	11.6	14.0	11.4	4.3	1.2	1.3	4.2	6.2	4.6	2.0	1.4	3.1	4.0	4.3	10.2	19.9	7.2	19.9
2-Jun	20.6	Z	22.3	19.2	10.1	7.1	12.8	11.4	14.9	29.3	23.8	11.1	8.4	7.9	14.5	7.0	4.3	3.1	3.3	3.3	4.0	4.1	5.1	9.4	11.2	29.3
3-Jun	8.8	20.6	Z	18.5	12.9	14.1	16.3	14.0	21.8	8.8	4.0	2.5	2.7	2.6	2.5	2.8	2.5	1.1	1.0	1.9	3.5	2.5	2.0	1.9	7.4	21.8
4-Jun	1.4	2.4	2.2	Z	4.0	4.1	3.6	1.8	2.0	4.3	6.2	2.3	3.0	4.4	1.8	8.4	7.7	4.7	4.3	3.9	5.3	5.5	5.1	4.6	4.0	8.4
5-Jun	2.5	3.1	3.8	4.5	Z	6.8	5.9	4.1	6.4	4.2	1.5	4.7	2.4	2.9	2.2	2.7	4.0	3.3	10.0	3.1	7.2	7.0	3.1	0.3	4.2	10.0
6-Jun	0.2	0.2	0.1	0.1	0.6	Z	0.7	0.3	C	C	C	C	C	0.3	0.7	0.7	0.6	0.7	1.4	1.1	4.9	14.8	9.4	12.6	2.7	14.8
7-Jun	Z	15.3	13.9	10.1	9.2	7.5	7.4	6.1	5.2	5.7	1.8	0.5	0.7	1.3	1.3	1.4	1.2	1.1	1.2	0.9	0.8	0.6	6.3	2.0	4.4	15.3
8-Jun	3.2	Z	21.4	21.2	16.9	11.0	8.9	13.7	10.0	5.9	4.1	4.7	5.1	6.7	6.2	5.0	4.0	3.8	2.9	2.7	1.7	3.3	10.4	21.7	8.5	21.7
9-Jun	17.5	11.9	Z	8.3	7.4	8.0	8.3	10.2	12.8	9.4	8.4	8.4	5.6	5.6	3.5	3.2	3.6	4.3	2.5	2.1	7.5	10.6	14.4	7.0	7.8	17.5
10-Jun	4.1	4.3	6.4	Z	15.1	18.7	15.1	13.3	8.5	7.2	4.2	3.9	3.1	3.9	2.2	3.1	2.2	2.0	2.0	3.0	2.4	3.0	4.1	6.8	6.0	18.7
11-Jun	6.3	5.6	7.4	7.3	Z	22.1	4.7	1.5	1.4	1.1	0.9	0.7	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.7	5.5	12.7	7.5	4.2	4.0	22.1
12-Jun	15.7	27.0	14.9	5.7	4.9	Z	4.3	9.0	7.2	7.3	7.6	7.2	7.5	7.6	8.6	5.8	3.9	3.5	2.4	2.5	5.0	6.4	13.3	3.0	7.8	27.0
13-Jun	Z	5.3	5.5	10.6	10.8	7.5	5.0	6.9	7.7	6.9	8.3	10.9	9.2	7.0	21.1	15.8	7.6	7.6	8.3	4.6	8.8	6.7	6.8	6.5	8.5	21.1
14-Jun	6.3	Z	5.3	4.3	3.8	5.8	5.5	4.4	3.1	4.5	3.9	3.5	2.7	2.9	2.2	3.1	2.5	4.3	2.7	2.5	3.0	1.5	1.4	2.3	3.5	6.3
15-Jun	1.8	0.5	Z	2.2	0.7	0.8	1.4	1.9	2.0	1.6	5.1	1.3	3.7	0.7	1.0	2.3	0.6	1.0	4.2	9.6	12.4	9.9	7.6	6.0	3.4	12.4
16-Jun	0.9	0.4	1.4	Z	6.3	4.1	4.6	5.0	9.0	7.8	10.0	7.6	2.1	3.0	2.0	1.1	1.1	2.1	PF	PF	PF	PF	PF	PF	--	10.0
17-Jun	0.5	3.3	0.4	3.1	Z	7.8	3.1	0.5	0.6	0.6	0.7	0.6	1.0	1.5	1.9	1.6	0.7	1.3	5.1	1.8	3.2	7.5	16.4	16.0	3.4	16.4
18-Jun	9.2	10.8	10.9	9.7	5.8	Z	11.6	5.8	7.4	4.5	2.0	1.6	1.2	1.1	1.3	1.8	1.8	2.2	3.1	7.3	10.1	11.4	12.4	10.8	6.3	12.4
19-Jun	Z	6.8	9.7	8.5	13.4	8.0	8.3	6.5	4.8	3.5	5.3	7.0	5.7	5.5	4.1	3.9	4.2	2.8	1.2	1.1	1.1	1.2	1.8	2.0	5.1	13.4
20-Jun	1.7	Z	4.3	2.9	3.9	4.6	3.2	3.2	2.8	2.9	3.4	2.1	0.5	0.4	0.4	3.8	5.3	3.1	0.8	0.5	1.5	2.1	1.4	4.9	2.6	5.3
21-Jun	8.7	5.5	Z	5.1	3.7	1.5	1.1	7.2	11.5	8.0	4.2	3.2	3.0	2.7	3.1	3.2	2.9	2.4	1.6	2.3	3.3	4.6	10.7	14.1	4.9	14.1
22-Jun	13.6	11.9	8.9	Z	6.7	5.5	6.5	8.1	11.2	10.5	6.4	4.7	4.9	4.0	0.8	0.7	0.7	0.6	0.6	0.6	0.6	3.3	8.8	10.7	5.7	13.6
23-Jun	10.4	13.2	13.6	11.4	Z	9.4	6.3	6.5	4.5	3.0	7.4	5.4	3.4	2.7	2.9	2.6	1.9	1.8	1.6	2.8	7.4	10.8	10.1	8.1	6.4	13.6
24-Jun	8.5	10.6	12.3	12.2	12.8	Z	7.9	4.8	4.3	3.4	2.4	1.0	0.5	0.6	0.9	7.4	2.9	9.5	5.8	3.0	4.4	3.6	4.1	4.8	5.6	12.8
25-Jun	Z	6.4	8.9	12.3	12.0	9.2	2.8	1.9	2.3	1.6	1.4	2.6	2.8	2.9	3.2	3.9	4.8	2.8	2.5	2.6	5.6	10.5	15.7	10.8	5.6	15.7
26-Jun	9.3	Z	16.5	14.6	14.2	11.0	7.6	7.1	7.2	6.6	8.2	4.9	5.2	2.8	1.6	1.3	4.6	1.9	3.8	6.4	6.8	7.8	5.8	6.9	7.0	16.5
27-Jun	7.6	2.8	Z	2.0	1.2	2.6	8.9	10.8	6.3	5.2	4.4	4.6	3.6	3.6	3.1	3.7	1.4	1.4	2.0	3.4	4.6	4.4	9.5	11.4	4.7	11.4
28-Jun	7.7	8.7	9.4	Z	11.7	9.8	9.4	7.3	6.2	3.3	3.7	5.7	3.2	2.1	1.2	0.7	2.2	4.1	2.6	2.1	2.7	4.5	8.5	13.3	5.7	13.3
29-Jun	13.1	19.6	9.5	7.7	Z	10.2	9.9	3.3	8.3	11.4	11.7	8.5	4.6	1.7	1.2	1.8	3.3	2.5	7.0	6.0	6.7	6.9	10.4	11.9	7.7	19.6
30-Jun	18.7	14.6	10.9	4.2	10.8	Z	11.0	7.5	4.3	4.0	4.3	2.1	0.6	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.6	1.0	1.5	4.3	18.7

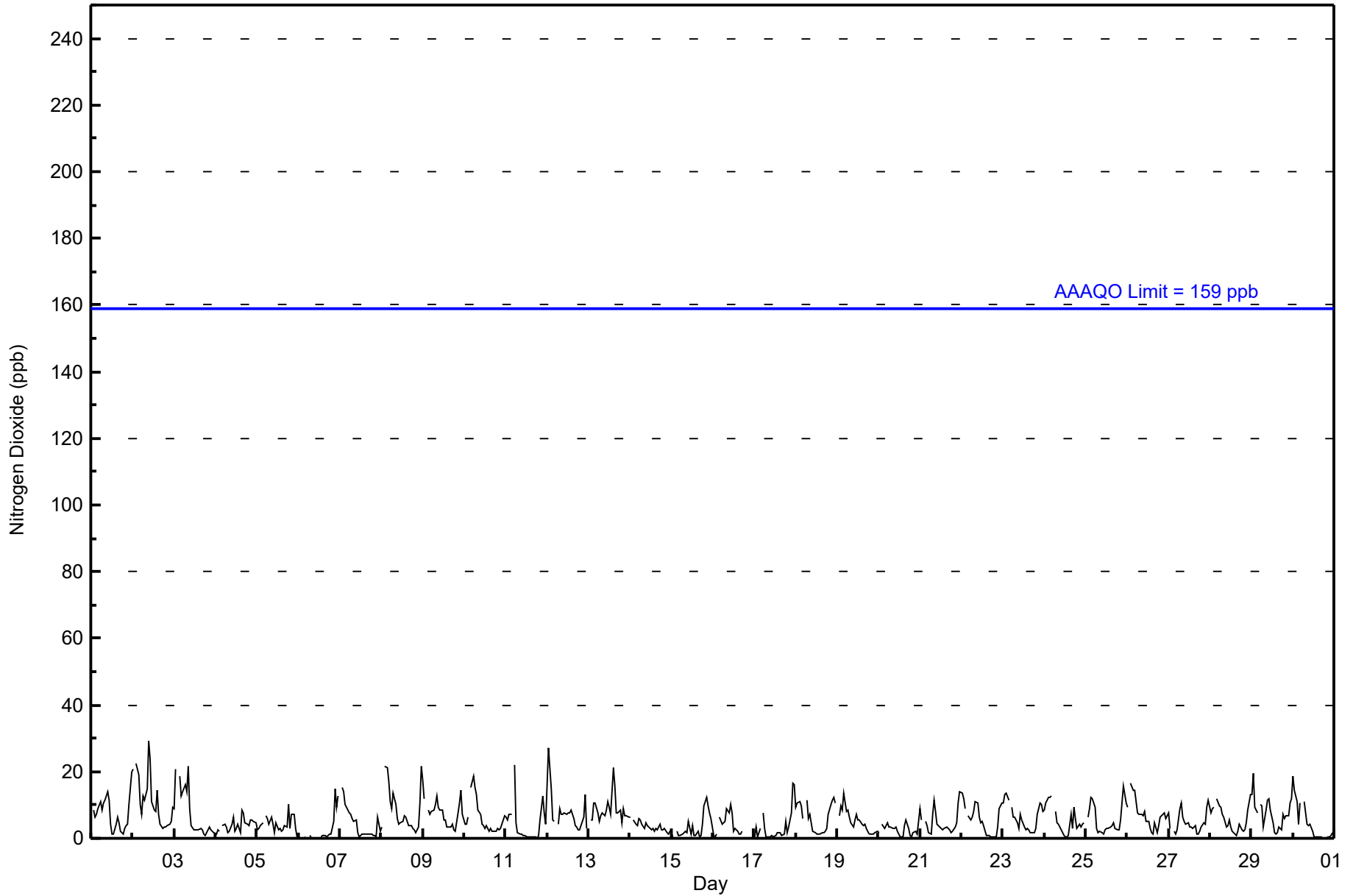
7.9	8.8	9.1	8.5	8.3	8.3	7.0	6.5	7.1	6.4	5.7	4.4	3.4	3.0	3.3	3.5	2.9	2.7	3.0	2.9	4.6	5.9	7.7	8.1	Diurnal Average	
20.6	27.0	22.3	21.2	16.9	22.1	16.3	14.0	21.8	29.3	23.8	11.1	9.2	7.9	21.1	15.8	7.7	9.5	10.0	9.6	12.4	14.8	16.4	21.7	Diurnal Maximum	

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
Barge Landing - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Barge Landing - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	667	98.23	98.23
21 - 40	12	1.77	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: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	70	85	46	19	18	14	24	66	47	54	42	40	18	24	36	64	667
21 - 40	3	2	1	0	0	0	0	0	0	1	0	1	0	0	0	4	12
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	87	47	19	18	14	24	66	47	55	42	41	18	24	36	68	679

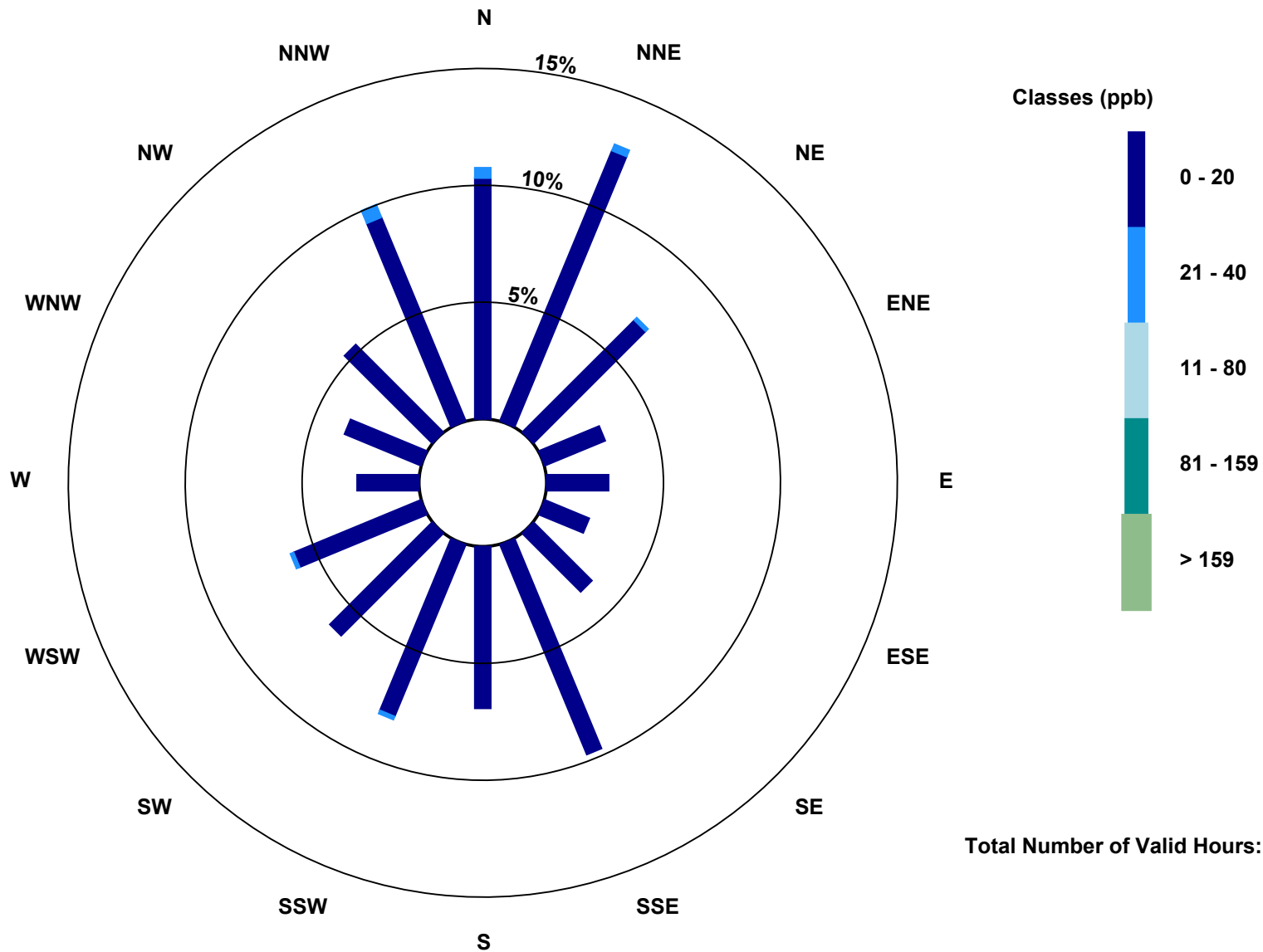
Total Number of Valid Hours: 679

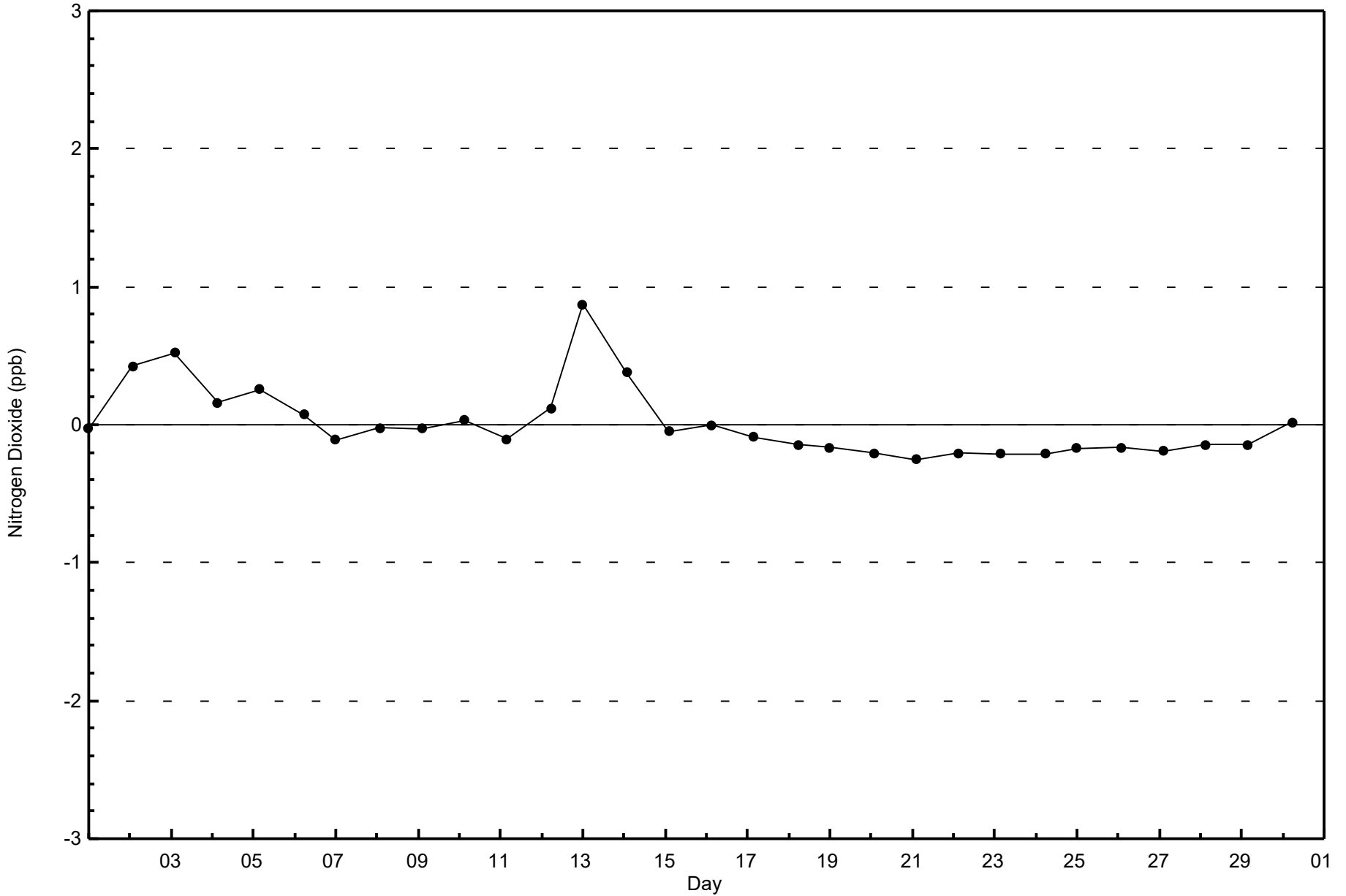
Total Number of Hours: 720

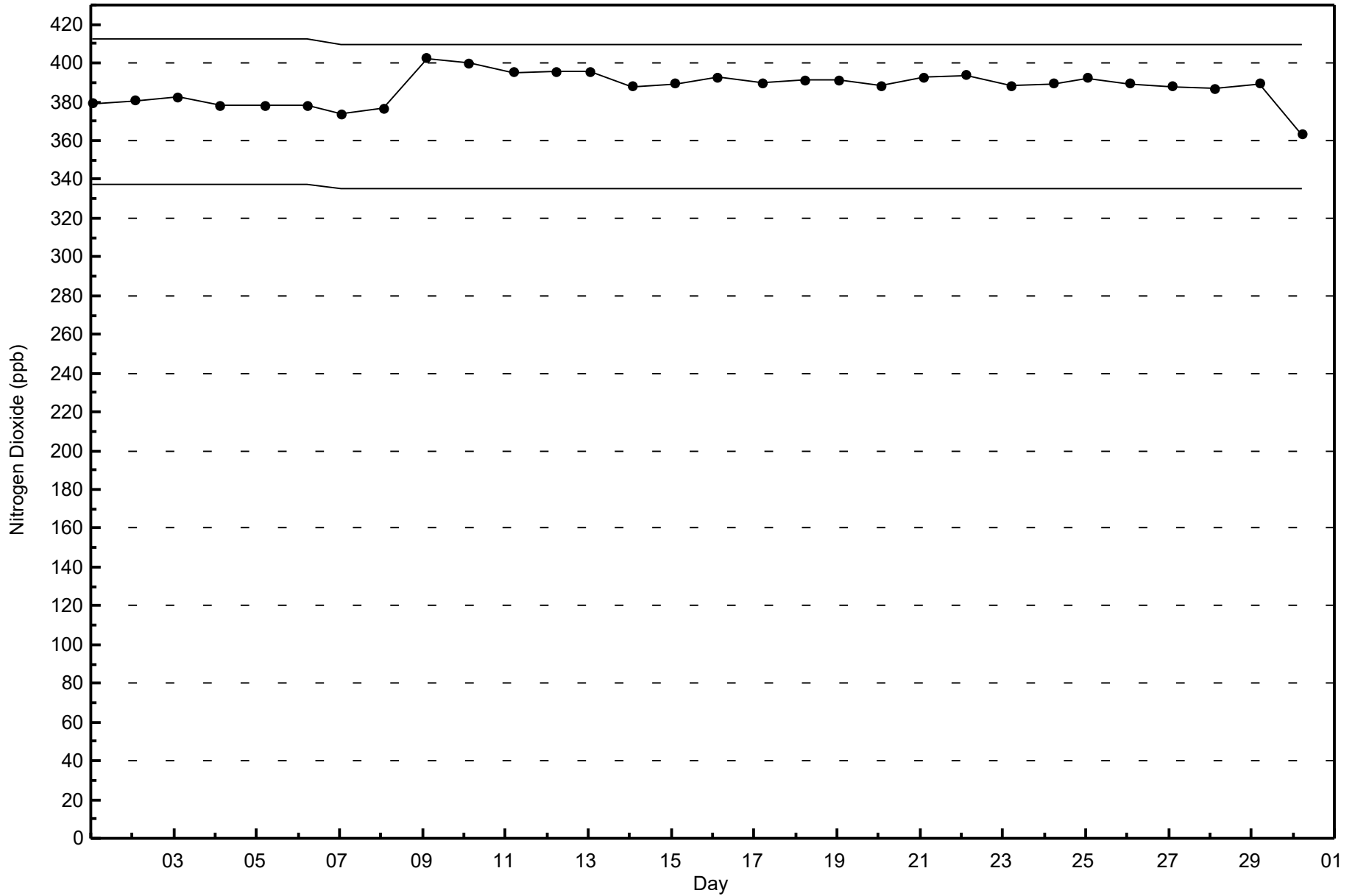


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Barge Landing









Wood Buffalo Environmental Association
Summary of Hour Averages

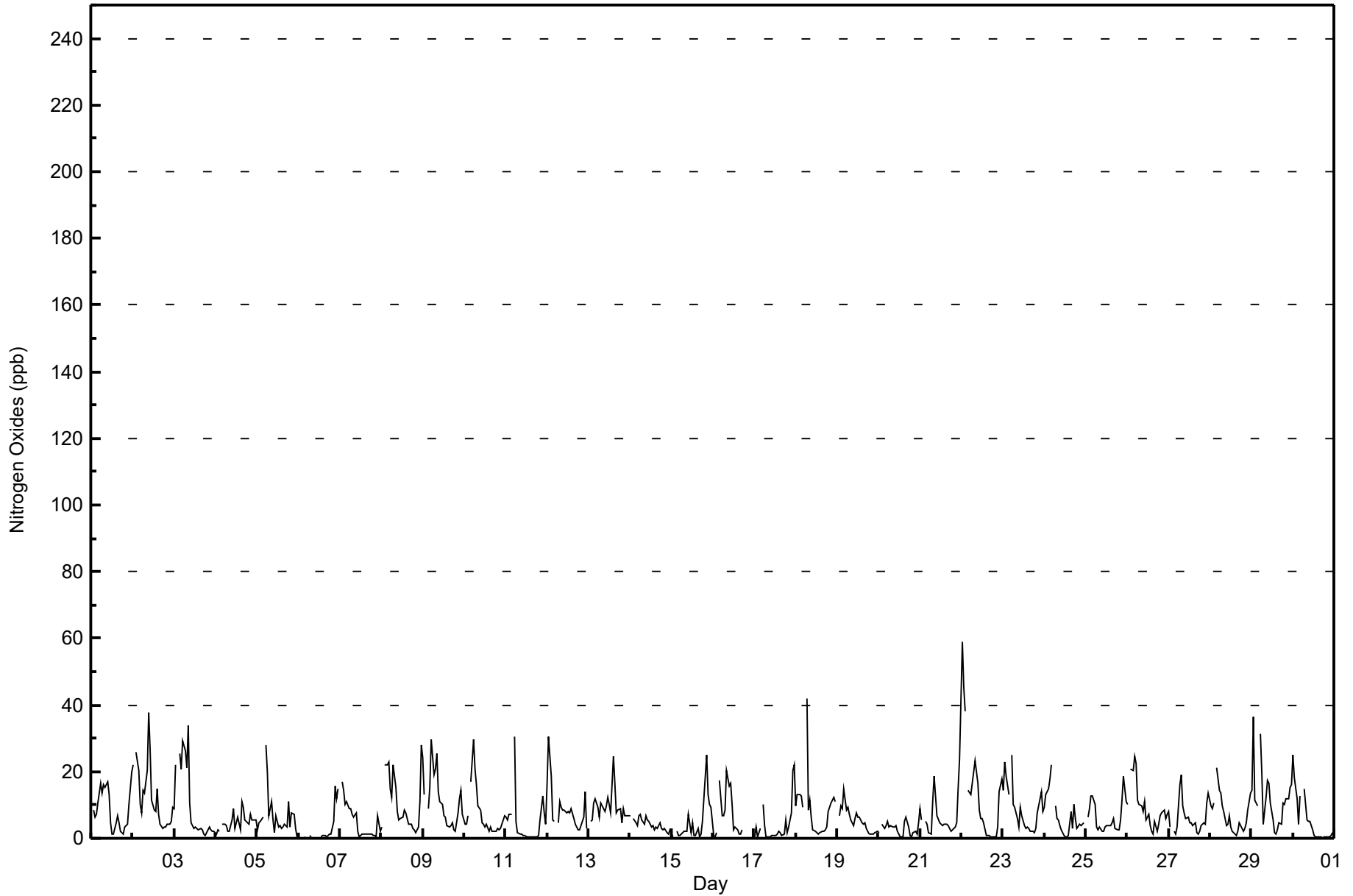
Nitrogen Oxides (NO_x) - ppb
Barge Landing - June 2023

Maximum Value: 58.9 ppb on Jun 22 01:00		Maximum Daily Average: 13.5 ppb on Jun 22		Hours in Service: 720																																													
Minimum Value: 0.1 ppb on Jun 6 03:00		Minimum Daily Average: 2.9 ppb on Jun 20		Hours of Data: 679																																													
Maximum Diurnal Average: 14.7 ppb at hour 6		Minimum Diurnal Average: 3.0 ppb at hour 18		Hours of Missing Data: 41																																													
Monthly Average: 7.40 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.9 Q ₁ = 2.4 Median = 4.9 Q ₃ = 10.0 P ₉₀ = 16.6 P ₉₉ = 32.0		Hours of Calibration: 35																																													
				Percent Operational Time: 99.2																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	Z	8.6	6.5	7.3	10.5	16.5	13.5	16.0	15.2	17.0	13.1	4.7	1.3	1.4	4.6	6.6	4.8	2.1	1.4	3.2	4.0	4.3	10.2	20.0	8.4	20.0																							
2-Jun	22.2	Z	26.0	20.3	10.3	7.5	14.4	13.4	20.1	37.8	26.8	11.6	8.6	8.1	14.9	7.2	4.4	3.1	3.3	3.3	4.0	4.1	5.1	9.4	12.4	37.8																							
3-Jun	8.8	22.2	Z	25.6	20.9	29.2	26.5	21.3	33.9	10.6	4.7	3.0	3.2	2.9	2.7	3.1	2.6	1.1	1.0	1.9	3.5	2.5	2.0	1.9	10.2	33.9																							
4-Jun	1.4	2.4	2.2	Z	4.1	4.3	4.0	1.9	2.3	5.6	8.9	3.0	4.6	6.4	2.3	11.0	9.5	5.5	4.7	4.1	7.1	5.6	5.7	5.4	4.9	11.0																							
5-Jun	2.6	4.8	4.9	6.2	Z	27.9	20.0	6.9	11.2	5.4	1.8	6.6	3.5	4.0	2.8	3.2	4.2	3.4	10.9	3.4	7.7	7.1	3.1	0.3	6.6	27.9																							
6-Jun	0.2	0.2	0.1	0.1	0.6	Z	0.8	0.3	C	C	C	C	C	0.3	0.8	0.7	0.6	0.7	1.5	1.1	5.0	15.7	11.9	14.9	3.1	15.7																							
7-Jun	Z	17.0	14.4	10.3	11.0	8.7	9.0	7.0	6.4	7.5	2.1	0.5	0.7	1.3	1.3	1.4	1.2	1.1	1.2	0.9	0.8	0.6	6.8	2.0	4.9	17.0																							
8-Jun	3.3	Z	22.1	22.2	22.7	14.7	12.2	22.1	15.1	8.1	5.3	5.9	6.2	8.3	7.5	5.7	4.4	4.1	3.0	2.8	1.7	3.3	10.8	27.8	10.4	27.8																							
9-Jun	24.0	13.1	Z	8.9	15.2	29.6	19.1	20.7	25.3	14.1	10.9	10.3	6.6	6.5	3.8	3.4	3.8	4.5	2.6	2.1	7.8	11.9	14.5	7.3	11.6	29.6																							
10-Jun	4.3	4.4	6.8	Z	16.7	29.6	20.8	16.3	9.9	8.3	4.6	4.3	3.3	4.2	2.3	3.3	2.3	2.0	2.0	3.0	2.4	3.0	4.1	6.8	7.2	29.6																							
11-Jun	6.3	5.6	7.4	7.3	Z	30.3	4.9	1.5	1.4	1.1	0.9	0.7	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.7	5.5	12.7	7.5	4.2	4.4	30.3																							
12-Jun	16.2	30.4	18.6	5.7	5.0	Z	4.6	11.0	9.3	8.6	8.6	7.6	7.8	7.8	9.0	6.0	4.0	3.6	2.4	2.5	5.0	6.4	14.0	3.0	8.6	30.4																							
13-Jun	Z	5.3	5.5	10.8	11.8	9.4	6.5	10.5	9.6	8.0	9.6	12.1	10.0	7.6	24.4	16.4	7.8	8.5	9.1	4.7	8.9	6.7	6.9	6.7	9.4	24.4																							
14-Jun	6.8	Z	5.9	4.6	3.9	6.8	7.3	5.7	4.2	6.7	5.7	5.1	3.3	3.6	2.7	3.4	2.9	4.8	2.9	2.5	3.0	1.5	1.4	2.3	4.2	7.3																							
15-Jun	1.8	0.5	Z	2.2	0.7	0.8	1.5	2.0	2.2	1.9	7.1	1.5	4.8	0.7	1.1	2.9	0.6	1.2	5.2	11.9	25.0	12.9	10.3	9.2	4.7	25.0																							
16-Jun	0.9	0.4	1.5	Z	17.3	6.7	6.9	8.3	20.3	15.6	16.4	10.1	2.4	3.5	2.4	1.2	1.2	2.4	PF	PF	PF	PF	PF	PF	--	20.3																							
17-Jun	0.6	3.4	0.4	3.2	Z	10.0	3.8	0.5	0.6	0.6	0.7	0.6	1.0	1.5	1.9	1.6	0.7	1.3	5.5	1.9	3.3	7.5	20.1	22.1	4.0	22.1																							
18-Jun	9.6	13.3	13.2	12.7	9.3	Z	41.8	8.6	11.2	6.4	2.7	2.2	1.5	1.4	1.6	2.2	2.1	2.5	3.3	7.9	10.6	11.5	12.5	11.0	8.7	41.8																							
19-Jun	Z	6.9	9.9	8.7	14.7	8.7	9.5	7.3	5.5	3.8	5.8	7.8	6.4	6.3	4.6	4.2	4.5	3.0	1.2	1.1	1.1	1.2	1.8	2.0	5.5	14.7																							
20-Jun	1.7	Z	4.3	2.9	4.0	5.1	3.6	3.7	3.3	3.5	3.8	2.3	0.5	0.4	0.4	4.9	6.5	3.5	0.9	0.5	1.5	2.1	1.4	4.9	2.9	6.5																							
21-Jun	8.9	5.5	Z	5.2	4.1	1.7	1.3	11.1	18.8	12.9	6.6	4.9	4.2	3.7	4.1	4.2	3.7	2.9	1.9	2.6	3.4	4.8	15.0	23.7	6.7	23.7																							
22-Jun	58.9	45.5	38.0	Z	14.6	13.2	16.7	19.8	23.3	16.4	8.7	5.8	5.7	4.6	0.8	0.7	0.7	0.6	0.6	0.6	0.6	3.3	14.1	17.8	13.5	58.9																							
23-Jun	14.2	22.9	18.5	13.0	Z	24.9	10.0	9.3	5.8	3.5	9.5	6.6	3.8	3.0	3.2	2.8	2.0	1.9	1.6	2.9	7.6	11.7	14.0	8.3	8.7	24.9																							
24-Jun	9.3	13.2	15.0	17.9	21.9	Z	9.9	6.0	5.5	4.0	2.7	1.0	0.5	0.6	0.9	7.9	3.1	10.0	5.9	3.1	4.4	3.6	4.1	4.8	6.8	21.9																							
25-Jun	Z	6.4	8.9	12.6	12.5	10.2	3.4	2.4	3.2	2.2	1.9	3.6	3.7	3.7	4.0	4.7	5.8	3.1	2.5	2.6	5.7	11.4	18.8	10.8	6.3	18.8																							
26-Jun	10.3	Z	20.8	20.4	24.5	22.6	11.6	10.0	9.8	7.9	11.2	5.7	7.2	3.9	2.0	1.3	5.0	2.2	4.1	6.9	7.8	8.4	5.9	7.3	9.4	24.5																							
27-Jun	8.2	3.4	Z	2.0	1.3	3.5	16.0	19.0	9.7	7.7	6.0	6.2	4.8	4.7	3.8	4.5	1.6	1.5	2.1	3.6	4.7	4.4	10.7	13.5	6.2	19.0																							
28-Jun	9.9	9.0	10.6	Z	21.2	14.4	13.6	9.8	8.2	4.0	4.4	6.7	3.4	2.2	1.2	0.7	2.3	4.5	2.8	2.2	2.8	4.5	8.5	13.6	7.0	21.2																							
29-Jun	14.4	36.6	11.5	9.7	Z	31.5	19.6	4.1	12.5	17.4	16.6	10.6	5.5	1.8	1.2	2.4	4.7	4.4	10.6	10.3	11.7	11.7	15.4	16.0	12.2	36.6																							
30-Jun	25.1	18.3	12.0	4.4	12.7	Z	14.9	10.1	5.5	5.0	5.2	2.4	0.6	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.6	1.0	1.5	5.3	25.1																							
																								10.8	12.0	11.4	9.8	11.7	14.7	11.6	9.5	10.7	8.7	7.3	5.3	4.0	3.5	3.8	3.9	3.2	3.0	3.3	3.3	5.4	6.4	8.9	9.6	Diurnal Average	
																								58.9	45.5	38.0	25.6	24.5	31.5	41.8	22.1	33.9	37.8	26.8	12.1	10.0	8.3	24.4	16.4	9.5	10.0	10.9	11.9	25.0	15.7	20.1	27.8	Diurnal Maximum	
Z - zerspan		C - Calibration				PF - Power Failure																																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Barge Landing - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	635	93.52	93.52
21 - 40	41	6.04	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: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	69	82	46	19	13	12	21	60	45	53	41	38	18	24	34	60	635
21 - 40	4	4	1	0	3	2	3	6	2	2	1	3	0	0	2	8	41
11 - 80	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	87	47	19	18	14	24	66	47	55	42	41	18	24	36	68	679

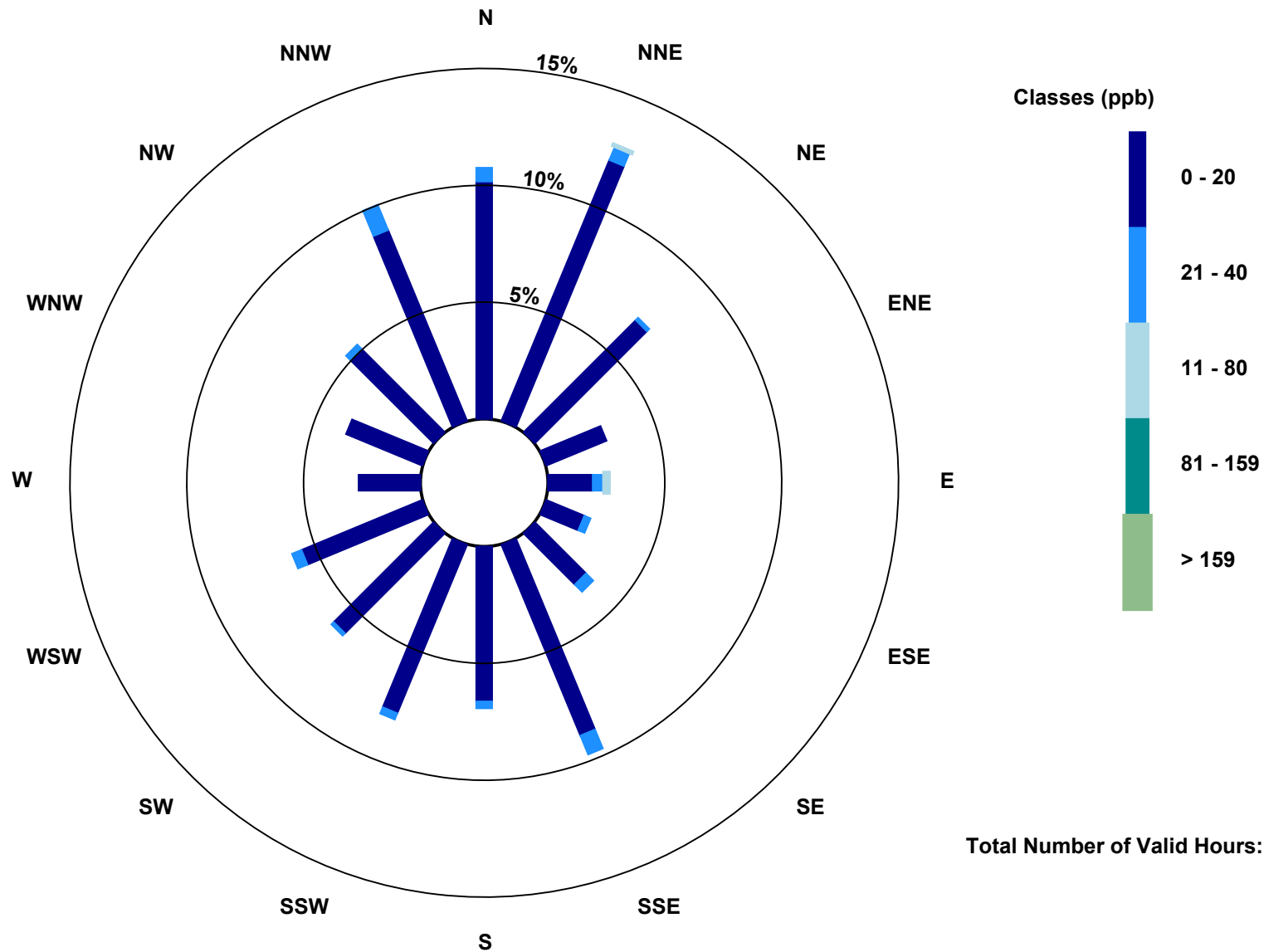
Total Number of Valid Hours: 679

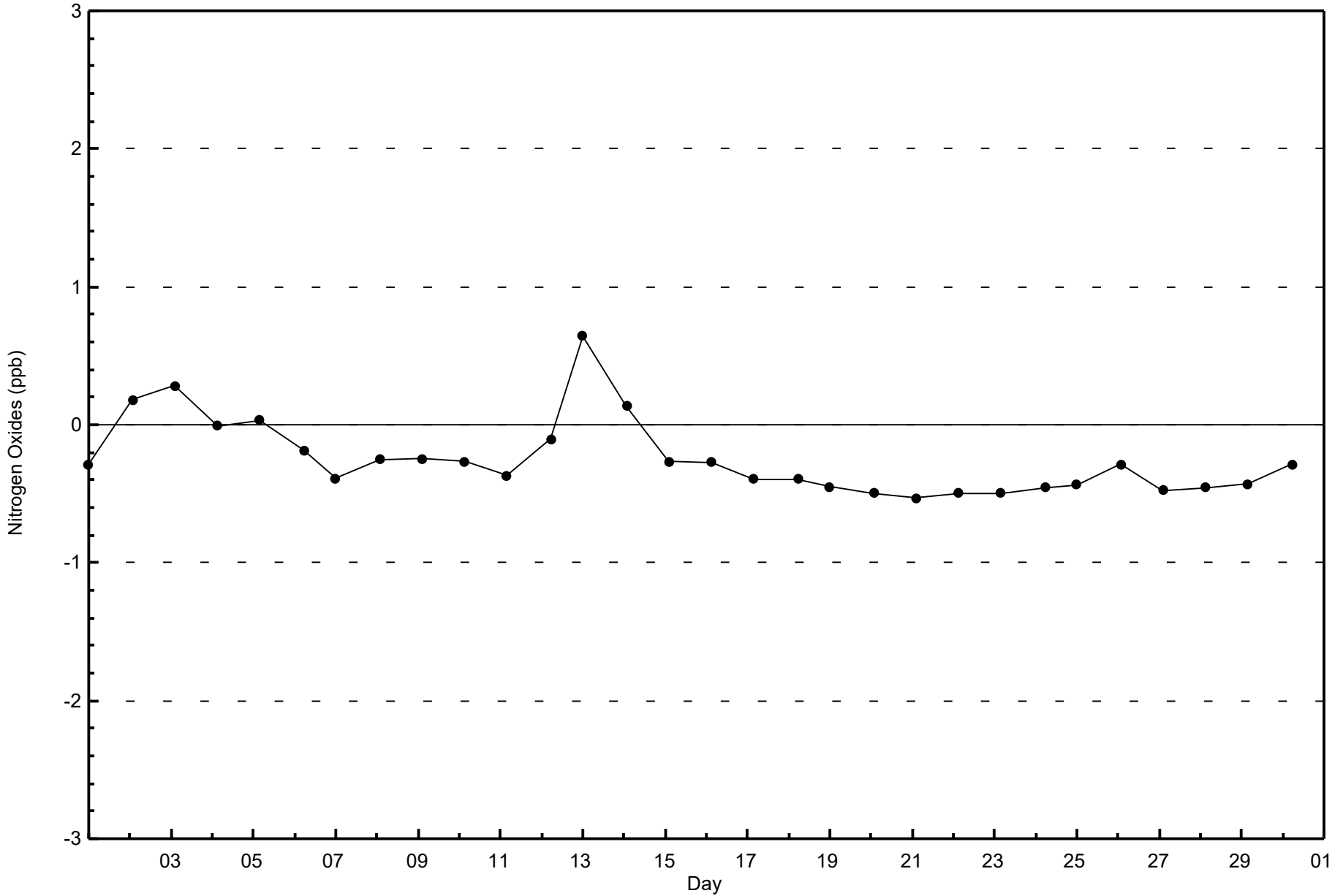
Total Number of Hours: 720

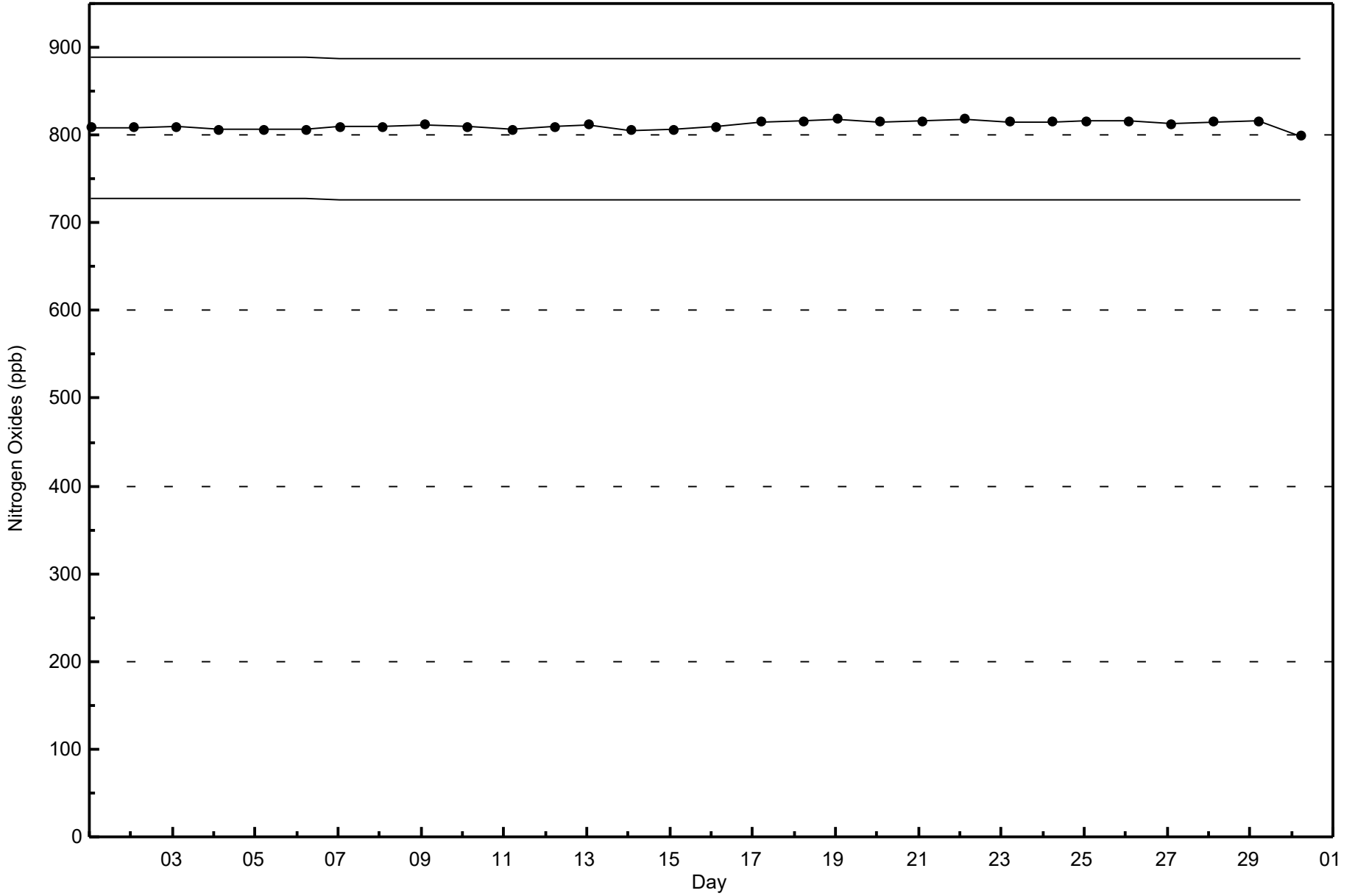


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

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

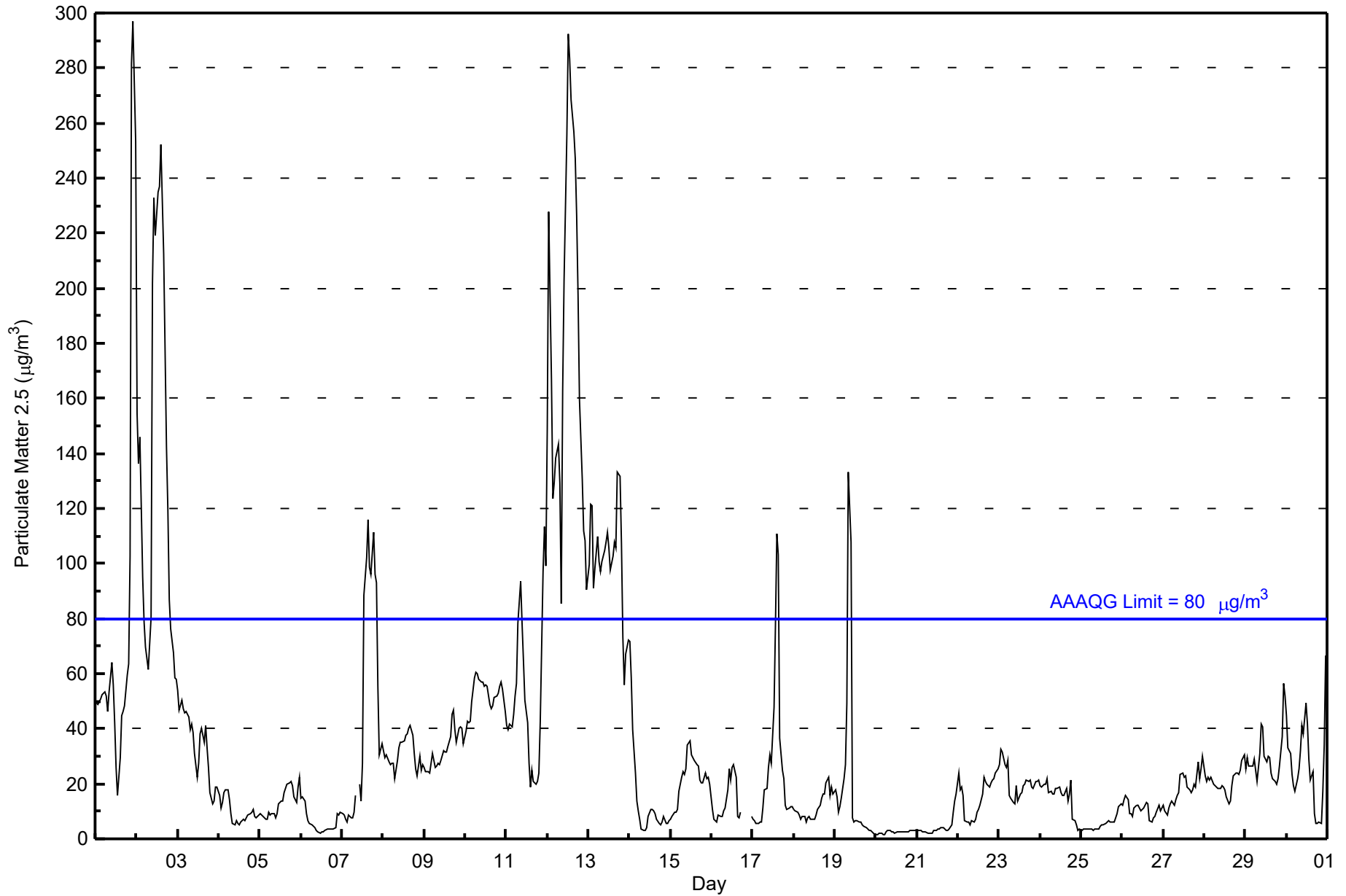
Barge Landing - June 2023

Number of Exceedences (AAAQO):	1-hr: 80	24-hr: 11	Hours in Service:	720
Maximum Value: 297.1 µg/m ³ on Jun 1 23:00	Maximum Daily Average: 178.6 µg/m ³ on Jun 12		Hours of Data:	714
Minimum Value: 1.4 µg/m ³ on Jun 20 01:00	Minimum Daily Average: 2.4 µg/m ³ on Jun 20		Hours of Missing Data:	6
Maximum Diurnal Average: 43.6 µg/m ³ at hour 15	Minimum Diurnal Average: 26.9 µg/m ³ at hour 5		Hours of Calibration:	1
Monthly Average: 35.15 µg/m ³	Percentiles: P ₁ = 2.1 P ₁₀ = 3.7 Q ₁ = 8.5 Median = 19.6 Q ₃ = 39.6 P ₉₀ = 94.5 P ₉₉ = 252.9		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	49.5	48.9	49.8	50.9	52.6	53.2	52.0	46.1	53.6	64.1	56.2	42.3	26.0	15.8	29.4	44.7	46.4	48.5	59.6	63.4	102.8	281.6	297.1	253.1	78.6	297.1
2-Jun	154.5	136.3	146.0	94.8	78.8	69.8	65.8	61.4	80.2	202.0	233.1	219.0	234.7	237.1	252.1	232.4	212.7	142.3	119.4	87.1	76.1	67.9	58.3	57.9	138.3	252.1
3-Jun	53.8	46.9	50.3	47.1	45.5	46.2	44.4	39.6	41.4	38.8	31.0	22.4	27.4	38.0	40.4	35.2	41.4	33.0	25.8	17.0	12.7	13.7	18.7	18.6	34.6	53.8
4-Jun	15.8	11.0	13.4	16.7	17.5	17.6	14.3	9.1	5.6	5.2	6.5	5.5	5.3	6.0	7.0	6.8	7.6	8.5	9.2	9.7	10.5	8.4	7.7	8.6	9.7	17.6
5-Jun	9.3	8.5	7.9	6.9	7.4	9.6	8.6	8.9	9.4	7.5	9.4	12.9	13.7	13.6	16.6	18.4	19.7	20.5	20.7	19.1	15.2	13.2	19.0	22.2	13.3	22.2
6-Jun	14.7	15.1	13.6	9.3	6.6	5.7	4.9	4.5	3.9	3.3	2.5	2.2	2.5	2.3	3.0	3.7	3.7	3.5	3.6	3.5	4.2	9.0	8.5	9.4	6.0	15.1
7-Jun	9.3	8.7	7.3	6.2	8.4	7.5	7.5	9.9	15.6	C	19.6	13.7	27.7	88.3	102.3	115.9	98.8	96.3	111.3	95.9	93.3	55.6	30.4	34.6	46.3	115.9
8-Jun	32.2	29.5	30.4	28.2	27.1	27.4	27.6	21.8	28.4	33.0	35.3	35.2	35.6	37.5	38.2	40.1	41.3	37.6	31.0	25.5	23.1	30.0	24.9	26.8	31.2	41.3
9-Jun	26.1	24.2	24.3	24.0	27.3	30.8	26.0	26.6	27.3	26.7	28.5	31.8	31.6	31.4	33.5	37.3	45.1	46.9	39.8	35.1	40.4	40.7	40.0	34.7	32.5	46.9
10-Jun	39.4	42.6	42.0	42.5	49.9	58.3	60.7	59.9	57.9	57.0	56.8	55.3	55.7	55.7	48.6	47.2	48.1	51.6	51.9	52.7	55.6	56.9	54.3	46.4	52.0	60.7
11-Jun	41.1	39.8	41.6	40.8	45.1	51.8	56.6	78.2	93.8	78.3	64.8	50.6	42.3	27.2	18.8	25.0	21.1	19.9	21.0	23.7	42.6	97.3	113.4	98.9	51.4	113.4
12-Jun	148.9	228.0	166.9	123.6	129.5	138.3	143.5	129.1	85.6	162.5	203.1	256.0	292.6	283.1	268.5	257.0	247.1	226.2	197.3	159.5	130.7	111.9	108.3	90.6	178.6	292.6
13-Jun	99.7	121.5	121.2	91.3	98.0	110.0	100.8	97.1	100.7	104.8	107.9	111.3	105.8	97.9	102.5	108.0	105.6	133.0	131.9	107.3	73.1	55.8	67.1	72.2	101.0	133.0
14-Jun	71.8	58.4	39.4	24.0	13.5	10.0	6.9	3.5	2.9	2.8	4.3	8.2	10.7	10.5	10.0	9.3	7.1	5.4	5.0	6.3	7.9	5.4	5.7	6.4	14.0	71.8
15-Jun	7.0	8.0	9.4	9.6	10.8	17.3	22.6	24.3	23.5	25.4	33.9	35.4	30.7	29.7	28.5	26.8	26.4	21.5	20.1	20.5	23.9	21.9	22.4	19.6	21.6	35.4
16-Jun	10.8	6.9	6.4	6.0	8.6	8.0	8.3	10.0	11.1	17.9	25.3	21.3	25.7	27.2	22.3	8.1	7.8	9.8	PF	PF	PF	PF	PF	8.1	13.1	27.2
17-Jun	7.1	6.4	5.6	5.7	5.9	6.3	11.2	17.9	18.4	25.7	30.3	27.7	47.8	77.9	110.6	103.3	36.8	24.7	21.8	12.1	10.9	11.0	11.8	11.7	27.0	110.6
18-Jun	10.5	10.3	9.9	8.7	7.2	8.1	8.1	6.1	7.4	8.0	7.2	7.1	7.1	8.9	10.8	12.2	14.7	16.3	16.5	20.5	22.2	16.0	19.0	16.2	11.6	22.2
19-Jun	18.0	15.1	9.8	11.5	14.6	22.1	27.1	49.4	133.5	107.7	7.8	6.3	6.8	6.4	6.3	6.2	5.2	4.5	4.1	3.4	3.1	2.9	2.4	1.7	19.8	133.5
20-Jun	1.4	1.7	2.0	2.1	1.6	1.5	2.6	2.8	2.9	2.7	2.4	2.1	2.5	2.5	2.6	2.7	2.3	2.4	2.4	2.4	2.8	2.9	2.9	2.9	2.4	2.9
21-Jun	3.1	2.8	2.8	2.7	2.8	2.5	2.2	2.0	2.2	2.1	2.8	3.3	3.6	3.6	4.0	3.9	3.7	2.8	3.3	3.4	5.3	9.9	13.6	16.5	4.4	16.5
22-Jun	24.1	17.9	19.0	15.9	6.7	6.3	5.9	5.3	6.4	6.0	6.9	9.5	10.8	12.3	16.0	22.4	21.0	19.8	18.7	20.3	21.6	21.8	23.8	25.5	15.2	25.5
23-Jun	27.0	32.7	31.3	26.8	25.9	28.4	16.0	14.8	13.1	12.8	19.5	13.5	16.3	16.7	19.3	20.0	21.1	20.8	21.4	18.9	18.3	21.0	20.8	21.2	20.7	32.7
24-Jun	19.4	18.8	19.7	19.8	21.7	16.6	17.4	16.0	16.5	18.2	18.2	18.9	16.6	15.8	15.9	18.5	13.6	16.2	21.4	7.3	6.8	5.2	3.3	3.3	15.2	21.7
25-Jun	3.3	3.3	3.4	3.6	3.8	3.6	3.6	3.0	3.4	3.5	3.6	4.4	4.9	5.3	5.3	6.0	6.5	6.1	6.1	6.2	7.4	9.1	11.5	13.0	5.4	13.0
26-Jun	12.3	14.4	15.9	14.2	8.9	9.1	8.3	11.2	12.1	12.2	11.2	9.9	11.2	12.1	13.3	12.8	6.7	6.2	7.4	8.1	9.8	12.0	10.3	11.2	10.9	15.9
27-Jun	12.1	10.0	8.8	11.0	12.9	13.7	12.4	14.5	15.7	16.7	23.6	23.8	22.6	22.9	18.9	17.7	16.6	17.9	19.7	18.8	28.2	22.0	25.3	29.8	18.1	29.8
28-Jun	22.9	20.9	22.3	21.5	22.3	19.8	19.5	18.8	18.2	18.5	19.3	18.7	17.5	15.3	12.9	13.6	19.4	22.6	23.7	23.9	23.3	24.7	28.6	30.7	20.8	30.7
29-Jun	25.6	29.6	26.6	26.4	26.5	29.0	25.2	21.0	31.1	41.8	40.9	30.1	28.1	29.9	29.5	23.9	21.9	20.7	19.9	21.9	26.2	37.2	56.7	51.6	30.0	56.7
30-Jun	44.5	33.2	30.8	23.4	19.5	17.5	22.0	25.3	31.8	41.1	38.4	49.3	41.9	29.0	21.3	24.3	9.1	5.6	5.3	5.9	5.6	17.2	34.1	66.7	26.8	66.7

33.8	35.0	32.6	27.2	26.9	28.2	27.7	27.9	31.8	39.5	38.3	38.3	40.2	42.0	43.6	43.4	39.3	36.4	35.8	31.0	31.2	37.3	39.3	37.0	Diurnal Average
154.5	228.0	166.9	123.6	129.5	138.3	143.5	129.1	133.5	202.0	233.1	256.0	292.6	283.1	268.5	257.0	247.1	226.2	197.3	159.5	130.7	281.6	297.1	253.1	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}) - $\mu\text{g}/\text{m}^3$
Barge Landing - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	98	13.73	13.73
6 - 15	188	26.33	40.06
16 - 25	156	21.85	61.90
26 - 80	193	27.03	88.94
> 81.0	79	11.06	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Barge Landing - June 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	30	17	5	4	3	0	0	0	0	2	12	3	0	0	11	11	98
6 - 15	21	25	4	4	4	7	8	25	8	13	9	15	1	3	14	27	188
16 - 25	9	19	9	4	3	4	6	18	18	22	9	13	2	8	3	9	156
26 - 80	12	16	12	4	8	2	12	25	22	18	16	6	6	11	6	17	193
> 81.0	7	13	18	3	1	1	1	0	1	2	1	6	9	4	5	7	79
Totals	79	90	48	19	19	14	27	68	49	57	47	43	18	26	39	71	714

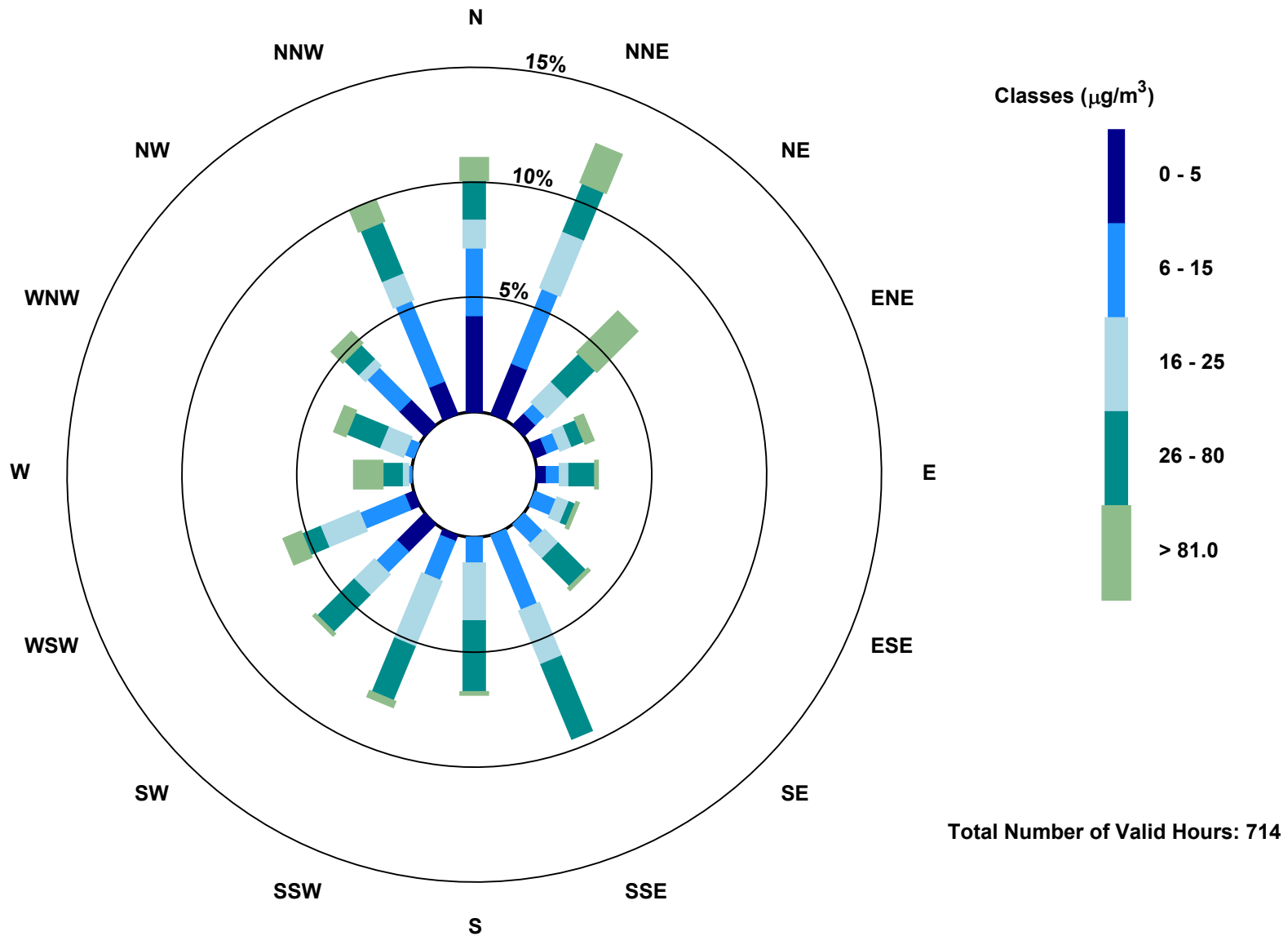
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

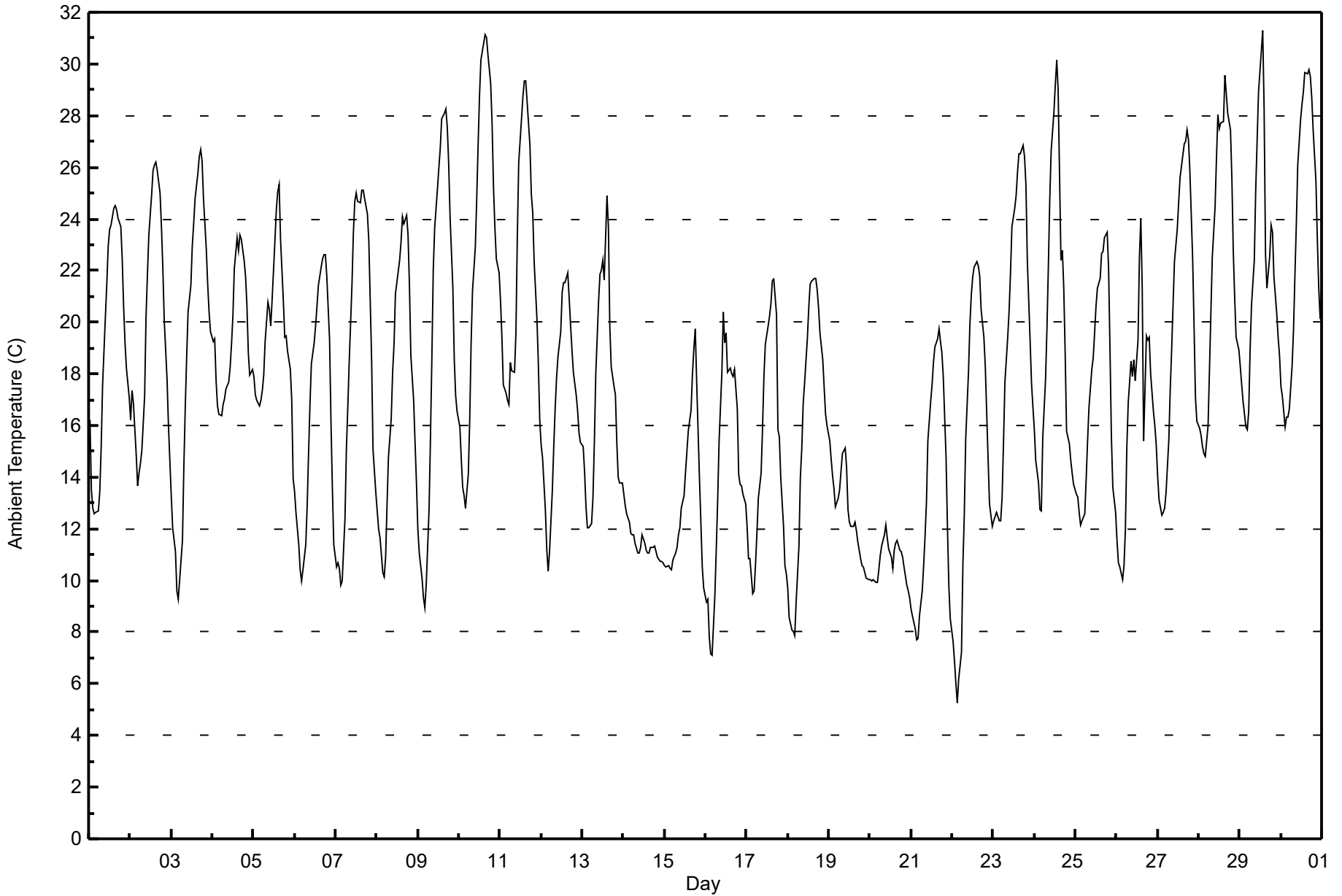
Ambient Temperature (AT) - C
Barge Landing - June 2023

Maximum Value: 31.3 C on Jun 29 14:00 Maximum Daily Average: 23.3 C on Jun 30																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 5.3 C on Jun 22 04:00 Minimum Daily Average: 10.7 C on Jun 20 Maximum Diurnal Average: 23.0 C at hour 15 Minimum Diurnal Average: 11.7 C at hour 5 Monthly Average: 17.69 C Percentiles: $P_1 = 7.7$ $P_{10} = 10.6$ $Q_1 = 12.8$ Median = 17.6 $Q_3 = 21.9$ $P_{90} = 25.5$ $P_{99} = 30.1$																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	16.2	13.5	12.8	12.6	12.6	12.7	13.4	15.2	17.6	20.2	21.5	23.0	23.6	23.8	24.4	24.5	24.4	24.0	23.7	22.4	20.6	19.2	18.2	17.1	19.1	24.5
2-Jun	16.2	17.4	16.9	14.9	13.6	14.2	14.6	15.0	17.2	20.2	21.8	23.4	24.9	25.9	26.1	26.2	25.9	25.0	23.7	22.1	20.1	17.8	16.0	14.6	19.7	26.2
3-Jun	13.3	12.0	11.1	9.6	9.3	10.0	11.5	14.4	16.7	18.7	20.4	21.4	22.9	23.8	24.8	25.8	26.4	26.7	26.2	24.8	22.8	21.5	20.4	19.6	18.9	26.7
4-Jun	19.3	19.3	17.8	16.7	16.4	16.4	16.8	17.0	17.4	17.7	18.2	19.1	20.2	22.1	23.3	22.8	23.4	23.2	22.4	21.8	20.7	18.8	18.0	18.2	19.5	23.4
5-Jun	17.9	17.2	17.0	16.8	17.0	17.4	18.0	19.2	20.8	20.5	19.8	20.9	23.1	24.3	25.0	25.3	23.2	20.8	19.4	19.5	18.8	18.2	17.0	13.9	19.6	25.3
6-Jun	13.4	12.7	11.4	10.4	10.0	10.4	11.4	12.8	14.9	16.8	18.4	19.2	19.9	20.6	21.4	22.1	22.5	22.6	22.6	21.8	19.3	16.1	13.6	11.4	16.5	22.6
7-Jun	10.5	10.7	10.4	9.8	10.0	12.4	15.1	16.7	18.4	21.5	23.5	24.7	25.0	24.7	24.6	25.1	25.1	24.8	24.2	23.1	20.9	18.5	15.1	13.4	18.7	25.1
8-Jun	12.7	12.0	11.7	10.3	10.1	10.9	12.9	14.8	16.3	18.1	19.2	21.1	22.0	22.4	23.1	24.1	23.8	24.1	23.4	21.4	18.7	17.0	15.3	13.8	17.5	24.1
9-Jun	12.0	11.1	10.1	9.3	8.9	9.9	12.7	15.5	18.6	22.0	23.7	25.1	26.0	26.8	27.9	28.1	28.3	27.6	26.1	24.1	21.3	18.6	17.2	16.5	19.5	28.3
10-Jun	15.9	14.7	13.6	13.3	12.8	14.1	16.2	19.2	21.2	22.9	24.8	26.8	28.7	30.1	30.8	31.1	31.0	30.4	29.2	27.7	25.2	23.6	22.5	21.9	22.8	31.1
11-Jun	20.8	19.4	17.6	17.3	17.0	16.8	18.4	18.1	18.1	19.6	23.3	26.2	27.9	28.8	29.3	29.4	28.5	26.8	25.0	24.2	22.4	20.1	18.4	16.2	22.1	29.4
12-Jun	15.2	14.8	12.7	11.2	10.4	11.1	13.5	15.2	16.7	17.8	18.6	19.6	21.1	21.5	21.5	21.9	20.9	19.9	18.9	18.1	17.2	16.6	15.7	15.3	16.9	21.9
13-Jun	15.2	14.2	12.9	12.1	12.0	12.2	13.2	15.4	18.0	20.8	21.9	22.0	22.4	21.6	24.9	23.7	19.9	18.3	17.5	17.2	15.3	14.0	13.8	13.8	17.2	24.9
14-Jun	13.4	12.9	12.6	12.3	11.8	11.7	11.8	11.4	11.0	11.1	11.3	11.8	11.4	11.2	11.1	11.0	11.3	11.3	11.3	11.1	10.9	10.7	10.7	10.7	11.5	13.4
15-Jun	10.6	10.5	10.6	10.5	10.4	10.8	11.1	11.3	11.7	12.1	12.8	13.3	14.2	15.0	15.8	16.6	18.0	19.0	19.7	17.7	13.9	12.3	10.5	9.7	13.2	19.7
16-Jun	9.2	9.3	7.8	7.2	7.1	9.5	11.2	13.1	15.4	18.1	20.4	19.2	19.6	18.0	18.2	18.0	17.9	18.2	16.7	14.1	13.7	13.7	13.3	13.0	14.2	20.4
17-Jun	12.1	10.9	10.8	9.5	9.6	10.6	11.8	13.2	14.2	15.9	17.9	19.1	19.8	20.2	20.7	21.6	21.7	20.3	15.8	15.5	14.0	12.1	10.6	10.3	14.9	21.7
18-Jun	9.7	8.6	8.1	8.0	7.9	9.1	11.3	14.0	15.1	16.8	17.6	19.4	20.6	21.5	21.6	21.7	21.7	21.3	20.6	19.6	18.5	17.5	16.5	16.0	15.9	21.7
19-Jun	15.4	14.7	14.0	13.6	12.9	13.2	13.5	14.2	14.9	15.1	14.3	12.8	12.3	12.1	12.1	12.3	11.9	11.5	10.8	10.6	10.5	10.3	10.1	10.0	12.6	15.4
20-Jun	10.0	10.0	10.1	9.9	9.9	10.4	11.0	11.3	11.8	12.1	11.7	11.2	10.9	10.4	11.2	11.5	11.6	11.2	11.1	10.9	10.5	9.8	9.6	9.3	10.7	12.1
21-Jun	8.9	8.6	8.1	7.7	7.8	8.6	9.6	10.6	11.7	13.0	15.4	16.9	17.6	18.4	19.0	19.4	19.8	19.2	18.8	17.9	14.8	12.1	9.8	8.5	13.4	19.8
22-Jun	7.7	6.9	6.0	5.3	6.2	7.2	10.6	12.5	15.4	18.0	19.9	21.1	21.7	22.1	22.3	22.2	21.8	20.5	19.4	18.3	16.5	14.7	13.0	12.1	15.1	22.3
23-Jun	12.3	12.5	12.7	12.3	12.3	13.2	15.3	17.7	19.4	20.4	21.9	23.7	24.4	24.9	25.8	26.5	26.5	26.8	26.4	25.3	22.4	19.3	17.6	16.7	19.9	26.8
24-Jun	15.9	14.7	13.8	12.7	12.7	15.5	17.8	19.8	22.1	24.7	26.6	28.1	29.2	30.2	28.9	22.4	22.8	21.3	18.8	15.8	15.3	14.7	14.1	13.7	19.6	30.2
25-Jun	13.4	13.2	12.6	12.1	12.3	12.6	14.0	15.4	16.7	18.2	18.6	19.6	20.6	21.3	21.7	22.7	22.7	23.3	23.5	22.1	18.9	15.6	13.6	12.6	17.4	23.5
26-Jun	11.6	10.7	10.5	10.0	10.6	12.0	15.1	16.9	18.5	17.9	18.5	17.7	19.3	22.5	24.0	21.3	15.4	19.4	19.3	19.4	18.0	16.5	16.0	15.2	16.5	24.0
27-Jun	14.0	13.1	12.5	12.7	12.8	13.4	15.5	17.4	18.9	20.7	22.4	23.6	24.6	25.6	26.1	26.9	27.0	27.5	27.1	25.9	22.5	19.8	17.1	16.2	20.1	27.5
28-Jun	15.9	15.6	15.2	14.9	14.8	16.0	18.2	20.3	22.5	24.4	26.4	28.0	27.5	27.7	27.7	29.5	28.9	28.1	27.4	25.5	22.7	20.9	19.4	18.9	22.4	29.5
29-Jun	18.3	17.6	16.9	16.0	15.8	16.5	18.9	20.7	22.4	25.1	27.0	28.9	30.5	31.3	28.2	22.6	21.3	22.6	23.8	23.5	21.8	20.3	19.4	18.7	22.0	31.3
30-Jun	17.5	17.1	16.0	16.3	16.3	16.7	18.3	19.8	21.9	23.8	26.1	27.8	28.4	28.9	29.7	29.6	29.8	29.5	28.7	27.4	25.4	23.2	21.3	20.1	23.3	29.8
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Barge Landing - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Barge Landing - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	43	5.97	5.97
10 - 20	430	59.72	65.69
> 20	247	34.31	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

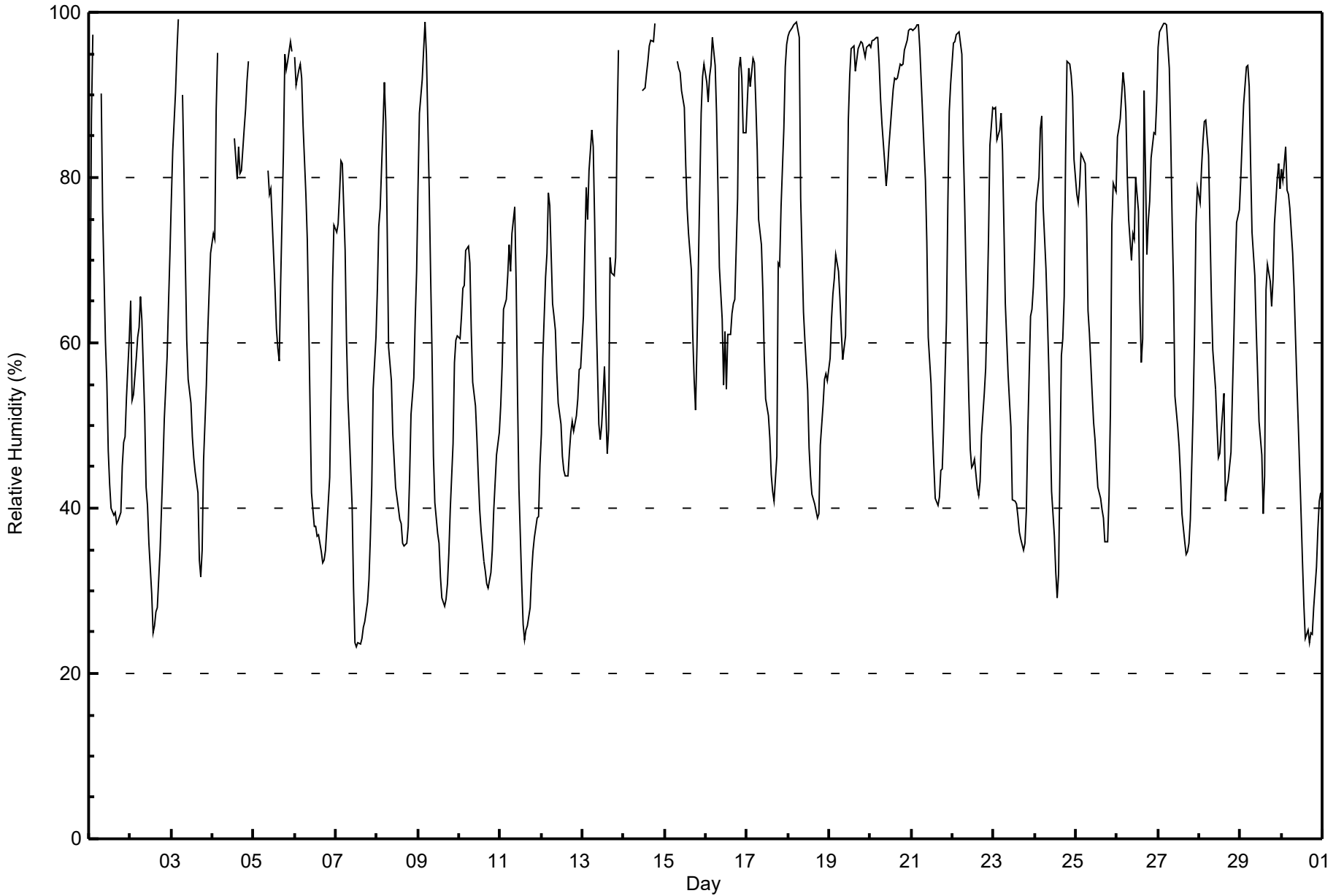
Relative Humidity (RH) - %
Barge Landing - June 2023

Maximum Value: 99.5 % on Jun 15 04:00		Maximum Daily Average: 91.7 % on Jun 20		Hours in Service: 720																																													
Minimum Value: 23.3 % on Jun 7 13:00		Minimum Daily Average: 46.6 % on Jun 7		Hours of Data: 671																																													
Maximum Diurnal Average: 87.3 % at hour 5		Minimum Diurnal Average: 48.0 % at hour 15		Hours of Missing Data: 49																																													
Monthly Average: 64.91 %		Percentiles: P ₁ = 24.2 P ₁₀ = 36.0 Q ₁ = 46.3 Median = 64.9 Q ₃ = 84.0 P ₉₀ = 94.1 P ₉₉ = 98.6		Hours of Calibration: 0																																													
				Percent Operational Time: 93.2																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	59.8	87.0	97.3	OR	OR	OR	OR	90.2	76.0	60.2	55.3	47.0	42.8	40.0	39.2	39.4	38.2	38.4	39.6	45.1	48.0	48.6	53.4	60.5	55.3	97.3																							
2-Jun	65.1	53.1	53.7	58.2	60.7	61.8	65.6	62.7	51.3	42.5	40.4	35.8	29.6	25.0	25.8	27.4	28.0	34.9	40.0	45.0	50.8	58.4	64.7	70.8	48.0	70.8																							
3-Jun	77.3	83.2	90.3	95.2	99.1	OR	90.1	80.9	69.9	60.3	55.5	52.6	48.6	46.1	44.5	41.9	33.7	31.7	34.9	45.8	54.9	61.3	66.3	70.8	62.4	99.1																							
4-Jun	73.2	72.6	88.2	95.0	OR	OR	OR	OR	OR	OR	OR	OR	OR	84.7	79.8	83.8	80.5	80.8	85.9	88.3	91.7	94.1	OR	OR	--	95.0																							
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	80.8	77.9	78.6	74.5	66.5	61.6	59.3	57.8	67.3	83.3	94.9	93.0	94.1	96.4	95.2	OR	OR	--	96.4																	
6-Jun	94.5	91.2	93.1	93.8	92.1	86.3	78.0	72.5	62.8	52.1	41.9	37.7	37.8	36.6	36.8	34.7	33.3	33.7	34.9	37.7	43.8	54.8	67.1	74.2	59.2	94.5																							
7-Jun	73.4	74.5	77.9	82.1	81.7	71.2	60.2	53.2	49.1	40.1	30.3	23.8	23.3	23.7	23.5	24.2	25.5	26.3	28.6	31.3	36.4	42.7	54.5	60.8	46.6	82.1																							
8-Jun	66.4	74.0	76.3	86.1	91.6	86.8	73.8	59.6	55.4	49.1	45.8	42.5	40.0	38.7	38.1	35.8	35.4	35.8	37.9	43.7	51.3	55.8	62.9	68.7	56.3	91.6																							
9-Jun	78.9	87.8	91.9	95.4	98.8	95.0	78.5	68.1	58.7	46.3	40.6	37.0	35.7	31.7	29.2	28.2	29.0	30.8	34.6	39.9	47.8	57.6	60.3	60.9	56.8	98.8																							
10-Jun	60.5	63.3	66.6	67.0	71.3	71.7	69.7	61.4	55.2	52.3	48.5	43.9	39.8	37.3	33.6	32.4	30.8	30.3	32.2	34.9	39.7	43.0	46.4	49.1	49.2	71.7																							
11-Jun	52.4	57.2	64.1	65.3	68.2	71.9	68.7	73.2	76.5	67.2	53.6	42.4	30.8	26.0	24.0	25.3	25.7	27.9	32.1	34.8	36.4	38.8	39.0	45.3	47.8	76.5																							
12-Jun	49.1	58.2	68.0	70.8	78.1	76.6	64.8	63.2	61.5	56.4	52.7	50.3	46.3	44.6	43.8	43.9	46.8	49.2	50.5	49.3	51.3	53.2	56.7	56.9	55.9	78.1																							
13-Jun	63.2	71.5	78.9	74.9	80.9	85.7	83.7	74.9	64.0	50.1	48.4	49.9	53.3	57.2	46.6	49.5	70.3	68.4	68.1	70.3	85.9	95.5	OR	OR	67.8	95.5																							
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	90.4	90.8	92.5	94.1	95.9	96.7	96.4	98.6	OR	OR	OR	OR	--	98.6																						
15-Jun	OR	OR	OR	99.5	OR	OR	OR	OR	94.1	93.3	92.7	90.6	88.5	81.5	76.4	73.2	68.8	61.0	55.6	51.8	59.5	78.5	87.8	92.3	93.7	79.9	99.5																						
16-Jun	91.6	89.1	92.2	93.6	96.9	93.6	87.6	86.6	69.1	62.8	54.9	61.3	54.4	61.0	61.0	63.5	64.7	65.2	77.4	93.2	94.7	92.0	85.4	85.5	77.9	96.9																							
17-Jun	89.5	93.2	90.9	94.4	93.9	89.0	83.3	75.0	71.9	66.4	58.5	53.3	51.1	48.5	44.0	42.1	40.9	46.3	69.7	69.4	76.4	85.9	93.4	96.2	71.8	96.2																							
18-Jun	97.2	97.6	98.2	98.5	98.6	98.8	97.0	77.4	70.6	63.7	60.4	54.2	47.4	44.0	41.7	40.4	39.6	38.7	39.3	47.7	52.6	55.7	56.3	55.4	65.5	98.8																							
19-Jun	58.2	62.8	66.0	67.8	70.7	68.7	65.5	61.3	58.0	60.9	71.7	87.0	92.3	95.6	95.9	92.9	94.3	95.6	96.4	96.2	95.4	94.6	95.7	96.1	80.8	96.4																							
20-Jun	95.8	96.6	96.6	97.0	96.9	93.7	89.5	86.5	81.7	79.0	80.9	83.8	88.5	90.7	92.0	91.9	92.0	93.8	93.6	93.7	95.4	96.7	97.9	98.0	91.7	98.0																							
21-Jun	98.0	97.8	98.2	98.4	98.5	95.7	87.6	83.6	79.6	72.2	60.7	55.1	49.6	45.2	41.2	40.3	41.3	44.6	44.7	49.7	62.7	76.8	88.0	91.3	70.9	98.5																							
22-Jun	96.2	96.4	97.2	97.4	97.6	95.0	84.2	76.7	68.0	53.1	47.1	44.9	45.3	46.0	42.3	41.5	43.3	48.9	54.0	56.9	64.0	72.5	83.9	88.5	68.4	97.6																							
23-Jun	88.3	88.4	84.5	85.8	87.8	83.3	74.1	64.8	56.2	52.8	49.9	41.0	40.9	40.4	39.0	37.1	36.2	34.9	35.8	39.7	49.1	63.2	64.1	66.9	58.5	88.4																							
24-Jun	71.4	76.9	80.0	85.9	87.5	76.5	69.0	63.4	57.2	50.1	42.1	36.6	32.1	29.2	32.1	29.2	29.2	58.5	60.5	65.5	82.6	94.0	93.7	92.5	89.8	82.3	67.1	94.0																					
25-Jun	78.0	76.9	79.0	82.8	82.5	81.7	75.0	63.9	61.1	53.7	50.4	48.2	45.2	42.6	41.1	39.7	38.8	35.9	36.0	41.5	51.9	74.2	79.3	78.3	59.9	82.8																							
26-Jun	84.8	85.9	87.1	92.8	91.1	87.9	80.2	74.8	70.0	73.1	72.6	80.0	75.9	64.9	57.7	60.5	90.5	70.6	74.7	77.1	82.4	85.5	85.3	89.2	78.9	92.8																							
27-Jun	95.8	97.7	98.2	98.6	98.7	98.4	93.2	85.0	74.9	66.9	53.6	49.9	47.5	44.0	39.4	36.0	34.4	34.7	35.8	38.6	51.9	61.3	74.5	78.8	66.1	98.7																							
28-Jun	77.0	81.2	84.4	86.8	86.9	82.7	74.0	65.6	59.1	54.4	50.0	46.0	46.6	49.4	53.9	40.8	42.6	43.4	46.8	53.7	60.5	68.3	74.6	76.1	62.7	86.9																							
29-Jun	79.9	84.6	88.8	93.4	93.6	91.1	81.8	73.4	68.1	61.7	56.3	50.4	46.4	39.4	43.9	66.4	69.5	67.4	64.3	67.7	74.4	79.8	81.8	78.6	70.9	93.6																							
30-Jun	81.0	79.6	83.8	78.4	78.0	76.3	70.8	66.6	60.9	55.3	50.2	39.4	33.6	28.2	24.2	25.3	23.7	24.9	24.8	28.0	32.8	37.5	40.9	41.9	49.4	83.8																							
																								77.6	80.7	84.1	86.5	87.3	84.1	77.8	72.2	66.5	59.8	55.0	53.4	50.5	49.7	48.0	48.9	50.5	51.1	54.7	57.4	63.7	69.8	72.2	73.6	Diurnal Average	
																								98.0	97.8	98.2	99.5	99.1	98.8	97.0	94.1	93.3	92.7	90.6	90.4	92.3	95.6	95.9	95.9	96.7	96.4	98.6	96.2	95.4	96.7	97.9	98.0	Diurnal Maximum	
OR - Out of Range																																																	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Barge Landing - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

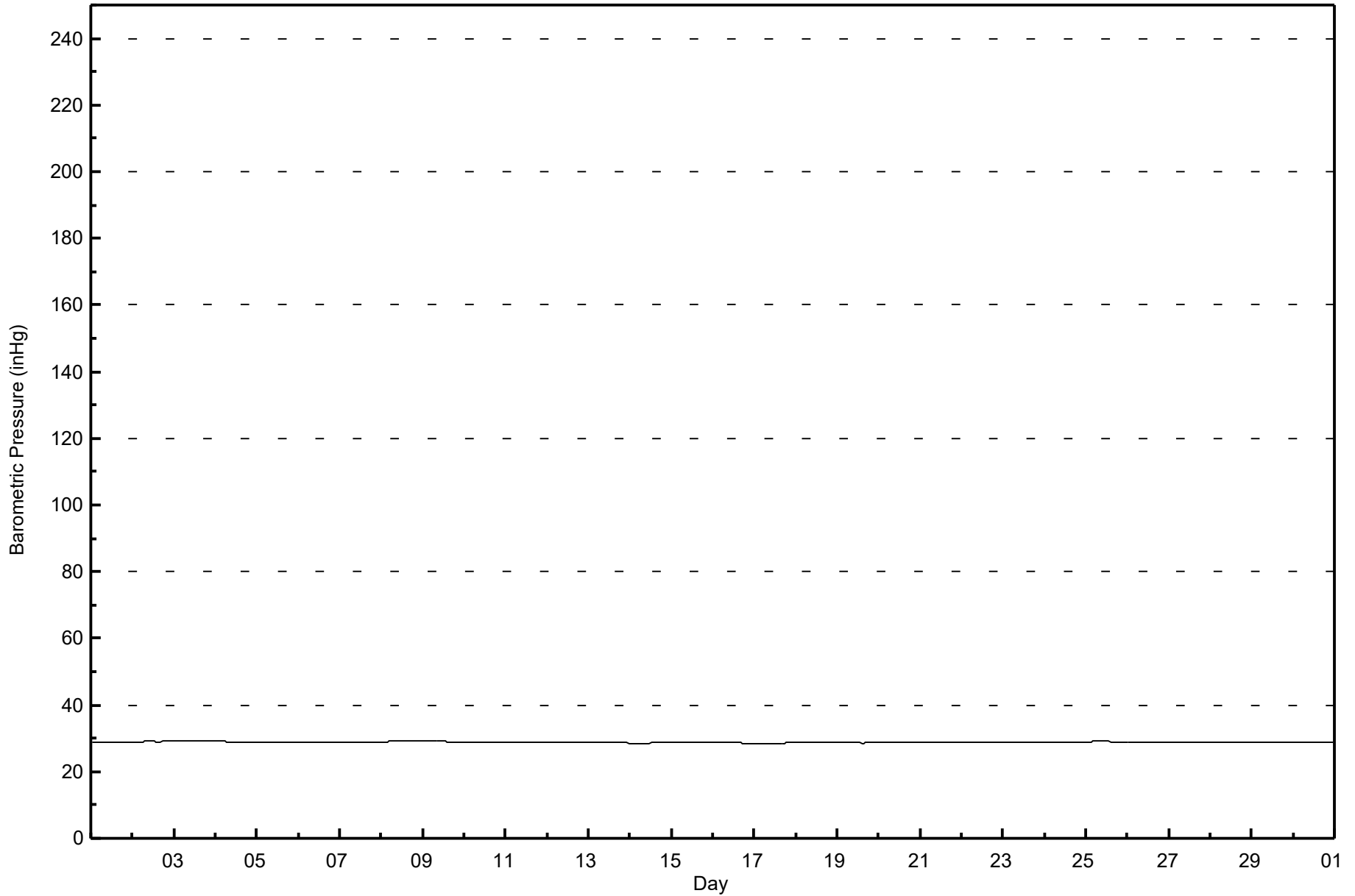
Barge Landing - June 2023

Maximum Value: 29.2 inHg on Jun 3 07:00		Maximum Daily Average: 29.1 inHg on Jun 3		Hours in Service: 720																						
Minimum Value: 28.5 inHg on Jun 14 05:00		Minimum Daily Average: 28.6 inHg on Jun 14		Hours of Data: 720																						
Maximum Diurnal Average: 28.9 inHg at hour 7		Minimum Diurnal Average: 28.8 inHg at hour 18		Hours of Missing Data: 0																						
Monthly Average: 28.84 inHg		Percentiles: P ₁ = 28.6 P ₁₀ = 28.6 Q ₁ = 28.7 Median = 28.8 Q ₃ = 28.9 P ₉₀ = 29.0 P ₉₉ = 29.2		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	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	29.0	29.0	29.0	29.0	28.9	29.0	
2-Jun	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	29.1	29.1	29.1	29.1	29.0	29.1	
3-Jun	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	
4-Jun	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1	
5-Jun	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0	
6-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	
7-Jun	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	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.8	28.9	
8-Jun	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	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	
9-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	
10-Jun	29.0	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	29.0	
11-Jun	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	28.9	28.9	28.9	28.9	28.8	28.9	
12-Jun	28.9	28.9	28.9	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	28.8	28.8	29.0	
13-Jun	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.8	
14-Jun	28.6	28.6	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	28.6	28.6	28.6	28.6	28.6	28.6	
15-Jun	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	
16-Jun	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.8	
17-Jun	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	
18-Jun	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.7	28.8	
19-Jun	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	
20-Jun	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	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0	
21-Jun	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	
22-Jun	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	
23-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	
24-Jun	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	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	28.8	29.0	
25-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	
26-Jun	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9	
27-Jun	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-Jun	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	
29-Jun	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	
30-Jun	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	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Barge Landing - June 2023





Maximum Speed: 37 km/h on Jun 19 16:00	Maximum Daily Speed Average: 28.0 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 11 05:00	Minimum Daily Speed Average: 0.4 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 4.3 km/h at hour 14	Minimum Diurnal Speed Average: 0.6 km/h at hour 6	Hours of Missing Data: 0
Monthly Average Velocity: 1.9 km/h 344.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 14 P ₉₀ = 20 P ₉₉ = 29	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	WNW3	S4	NNW5	E6	SE1	SE6	S6	SW6	SSW6	SW4	WNW3	NNW5	WNW7	NW8	N5	NE6	NNE6	NE8	NE9	NE9	NE12	NE14	ENE7	NW8	NNE2.2	NE14	
2-Jun	N8	NE14	NNE11	NNW13	N10	NNW3	NW5	NW5	WNW5	NNW4	WSW3	NW6	NNW5	NNE5	ENE6	NE9	NE11	NE16	NE17	NE17	NE16	NE13	NE11	N6	NNE7.2	NE17	
3-Jun	NNE7	NNE8	N8	NNW4	NNW6	E3	NNE3	NNW6	NNW8	NNE11	NNE11	NNE14	NNE13	NNE11	NNE12	NNE14	NE8	S6	WSW8	SE8	ESE6	E6	NE5	ENE4	NNE5.6	NNE14	
4-Jun	SE2	SSE7	NNW5	NNW8	NNW8	N5	ENE8	ENE11	E8	NNE7	N4	ENE4	E1	NNW3	NW8	NNW8	N4	NNW6	NW4	NNW4	SE5	SSE5	WSW2	NW3	NNE2.7	ENE11	
5-Jun	WNW4	NW3	NNW4	ESE3	NW6	NW7	NNW6	NNW11	NNE12	NNE14	N11	NNE12	NNE12	NNE11	NNE10	NNE11	N7	N7	NNE11	NE11	NE11	WNW4	WSW16	NNW11	N6.5	WSW16	
6-Jun	WSW14	WSW13	SW12	SW12	SW13	SW16	SW15	SW13	SW13	SW15	WSW19	SW20	SW19	SW19	SSW19	SW20	SW19	SW20	SW16	SW11	SSW9	S11	SSE9	SE11	SW13.8	SW20	
7-Jun	SSE10	SSE12	SSE12	SSW6	SSE12	SSE9	SSW11	SSW13	SSW11	SSW14	SW20	WSW25	WSW25	WSW25	WSW28	W20	W16	W16	W12	W9	W8	WNW8	WNW4	WNW5	SW10.5	WSW28	
8-Jun	NNW10	N8	NNW7	NNW7	NW6	WNW6	NNW6	NNE11	N8	NNW5	NNE7	ENE9	NE8	ENE8	E8	E7	E6	ENE8	ENE9	NE11	NE11	NE12	NNE6	NE4	NNE6.0	NE12	
9-Jun	N6	NNW7	N5	NNW4	E6	E2	SW2	WSW4	SW4	S10	SSW6	S10	SSW11	SSW9	SSE6	SW9	S10	SSW10	SSW10	SSW9	SSE9	SE9	SE11	SE12	S4.7	SE12	
10-Jun	SE11	SE10	SE12	SE10	SSE6	SSE5	SSE10	S13	S15	S15	SSE19	SSE19	SSE22	SSE23	SSE25	SSE26	SSE25	SSE26	SSE23	S18	SSE17	SSE17	SSE16	SSE16	SSE16.4	SSE26	
11-Jun	S11	SSW9	SSE10	S11	N0	SSW5	WSW7	W9	W8	W7	W8	W12	WNW13	NW13	WNW14	WNW15	WNW15	WNW12	W9	WNW8	NW11	NW9	WNW8	NW8	W6.7	WNW15	
12-Jun	N8	N2	SW6	W6	WNW8	WNW4	W3	N5	NNE10	NE10	NNE9	NNE8	NE9	NNE9	NNE8	NE8	NE10	NE10	NE10	NE10	NNE8	NE8	ESE9	SE6	NNE5.2	NE10	
13-Jun	NW6	N6	NE4	E8	ENE5	NE2	NNW4	WNW2	SSW4	S9	SSW5	WSW7	NW9	NNW13	N11	NNE14	NNW18	N22	NNE14	NNE21	N17	N15	NNE17	NNE18	N7.5	N22	
14-Jun	NNE17	NNE16	N14	NNW13	N14	N11	N12	N15	N21	N18	N19	N21	N19	N20	N22	N15	N18	N18	N19	N22	N21	N22	N21	NNW21	N17.6	N22	
15-Jun	NNW22	NNW19	NNW19	NNW18	NNW13	NNW12	N11	NNW15	NNW12	WSW4	WNW3	WNW7	NW11	NNW12	NNW8	NNW11	NNW9	N6	NE5	ESE5	ESE7	SE6	SE6	WNW5	NNW7.8	NNW22	
16-Jun	WSW7	WSW10	SW8	SSW6	S8	SSE7	SSE8	SSE11	SSE11	SSE11	SSE12	SSE14	SSW15	SW16	SSW15	SSW18	S15	S13	SSW14	SSW13	SSW8	SW11	WSW17	WSW16	SSW10.4	SSW18	
17-Jun	SW10	SSW10	SSW11	SSW9	SSW12	SSW13	SW13	WSW16	WSW12	SW10	SW15	SW17	SW18	WSW18	WSW18	WSW15	W13	NW9	NNE21	ENE14	NE9	N7	N9	NNW8	WSW7.3	NNE21	
18-Jun	NNW8	SE3	NW5	NNW9	NNW2	N5	NNE8	NE10	NNE14	NNE13	NNE17	NNE17	NNE19	NNE20	NNE21	NNE24	NNE24	NNE24	NNE24	NNE23	N23	N22	N23	NNE24	NNE28	NNE15.5	NNE28
19-Jun	NNE30	NNE26	NNE26	NNE28	NNE26	NNE27	N30	NNE32	NNE36	NNE36	NNE29	N28	NNE28	N27	N32	NNE37	N31	N26	N27	N27	N26	N23	N23	N22	N28.0	NNE37	
20-Jun	N21	N20	N17	N18	N20	N21	N21	N18	N18	N18	N17	NNW16	NNW14	NNW16	NNW9	NNW12	NNW10	NW10	NW8	NW8	NW10	NW10	NW10	NW9	NNW14.1	N21	
21-Jun	NW9	NW10	NW9	NW8	NNW8	NNW9	NNW12	NNW12	N11	NNE12	NNE18	NNE14	N12	N13	N13	NNE15	NNE15	NE13	ENE12	E9	E8	E9	E10	E8	NNE8.7	NNE18	
22-Jun	E5	E4	ESE5	SE6	SSE4	SE5	SW4	WSW5	WSW5	SSW9	SSE10	S7	WSW4	WSW9	WSW16	WSW18	WSW15	WSW12	W8	WSW11	SW7	SW5	SSW3	S5	SW5.4	WSW18	
23-Jun	SSE4	SE5	ESE8	ESE4	E4	SE6	SSE6	SSW6	S5	W6	WNW5	S11	S10	SW9	SSW8	SSW6	SSW6	SSW5	SSW7	SSE8	SE8	SE10	SSE10	SSE12	S5.4	SSE12	
24-Jun	SSE9	SSE8	S5	SSW2	SSE10	S11	S10	SSW11	S13	SSW14	SSW15	SW14	SW16	SSW17	W9	ENE12	ENE8	NNE13	NNW15	N22	NNE20	NNE22	NNE25	NNE22	SE0.4	NNE25	
25-Jun	NNE19	NNE17	NNE14	NNE10	NNE13	NE12	NE14	NE15	ENE14	ENE14	NE16	NNE15	NNE12	N10	NNW9	NNW11	NW9	NNW5	NNW6	NNW4	ESE3	ESE7	ESE7	SSE6	NNE8.5	NNE19	
26-Jun	SE7	SE7	SSE8	SE9	SE9	SSE7	SSE7	SSE9	SSE8	SSE9	SSE12	SSE12	S8	SSW11	SW12	NW12	NE12	NW3	NNW3	ESE3	SSE5	SSE8	SSE6	ESE4	SSE5.1	SW12	
27-Jun	N4	NW4	NNW7	NNW10	NNW10	NNW10	NNW7	NNE8	NE12	NNE10	NNE12	NNE11	NNE11	NNE8	NE7	NE6	NE5	ENE6	ENE5	NE6	NNW2	NW4	ESE5	SE8	NNE5.8	NNE12	
28-Jun	SSE8	SSE9	SSE9	SSE9	SSE10	SSE9	S8	S10	S11	S11	S11	S10	SSW6	WNW4	NW6	WSW3	SSW6	S6	S10	SW9	S5	S3	S7	SSW7	S6.7	S11	
29-Jun	SSW7	S7	S9	SSE8	S7	S6	S7	S11	S13	SSE11	S12	S14	S13	SW13	SW20	SW14	SW9	S8	SSW10	S9	SSE10	S11	S9	SSW8	S9.6	SW20	
30-Jun	SSW7	SSW6	SSW7	SSW9	SSW9	SSW10	SSW8	SSW9	SSW12	SW13	SSW12	SW13	SW17	WSW17	WSW17	WSW17	WSW17	WSW19	WSW19	WSW21	WSW17	WSW14	WSW12	SW11	W10	SW12.1	WSW21

N2.6	NNE1.7	N1.8	N1.7	N1.6	NNW0.6	NW1.1	NNW1.5	N1.1	NE0.6	NW0.8	NNW1.3	NNW2.7	NNW4.3	NNW4.2	NNW3.6	NNW3.1	NNW2.7	N2.4	NNE3.1	NNE3.0	NNE2.7	NNE1.9	N2.2	Diurnal Average	
NNE30	NNE26	NNE26	NNE28	NNE26	NNE27	N30	NNE32	NNE36	NNE36	NNE29	NNE28	NNE28	N27	N32	NNE37	N31	SSE26	N27	N27	N26	N23	NNE25	NNE28	Diurnal Maximum	

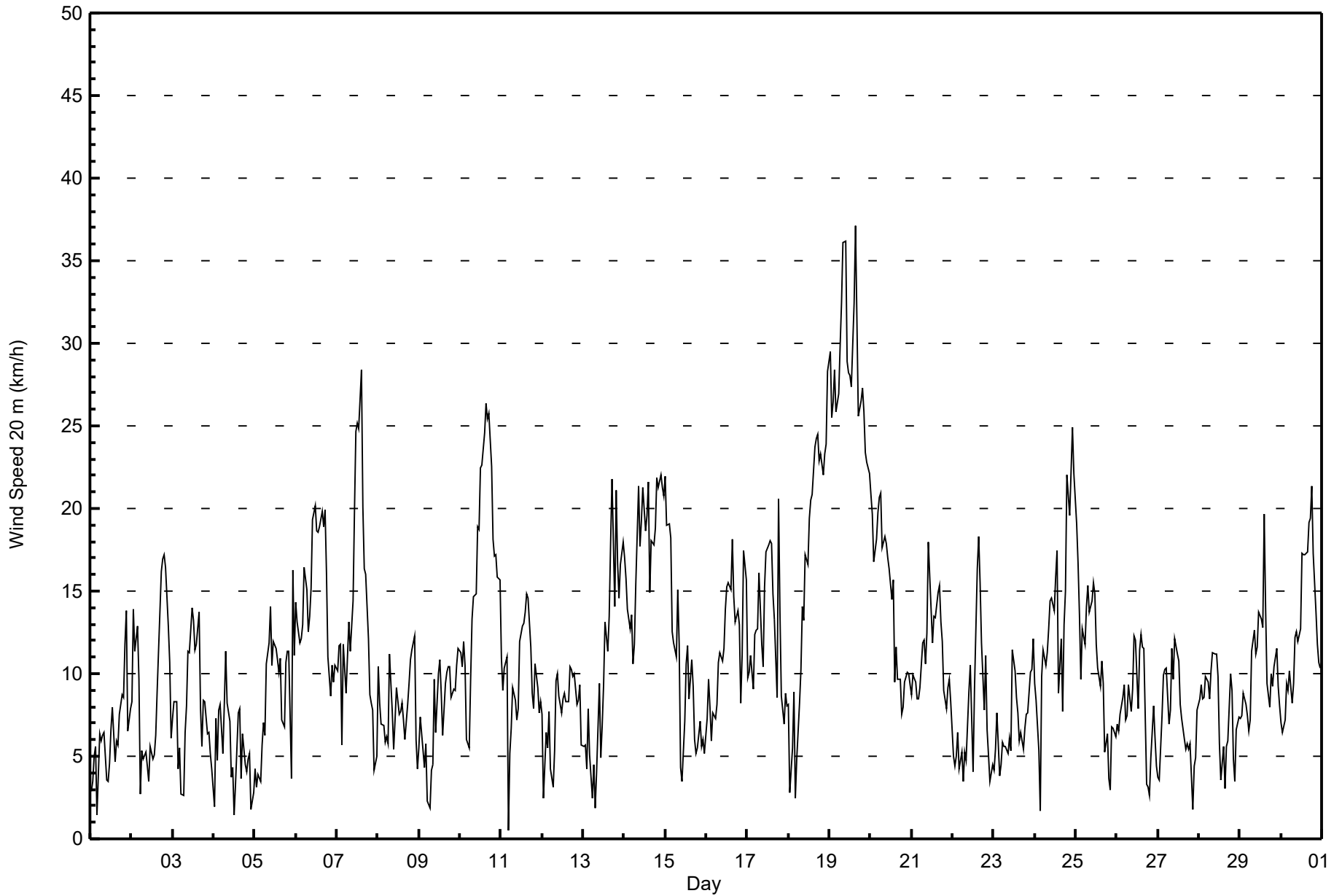
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Barge Landing - June 2023

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Barge Landing - June 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	113	15.69	15.69
6 - 11	335	46.53	62.22
12 - 19	196	27.22	89.44
20 - 28	67	9.31	98.75
29 - 38	9	1.25	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 - June 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	2	6	4	6	8	6	5	6	6	5	8	1	13	10	17	113
6 - 11	20	28	26	10	13	6	19	40	34	40	13	8	11	8	27	32	335
12 - 19	20	33	16	5	0	0	2	16	9	15	25	23	5	5	2	20	196
20 - 28	26	21	0	0	0	0	0	7	0	0	5	5	1	0	0	2	67
29 - 38	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	79	90	48	19	19	14	27	68	49	61	48	44	18	26	39	71	720

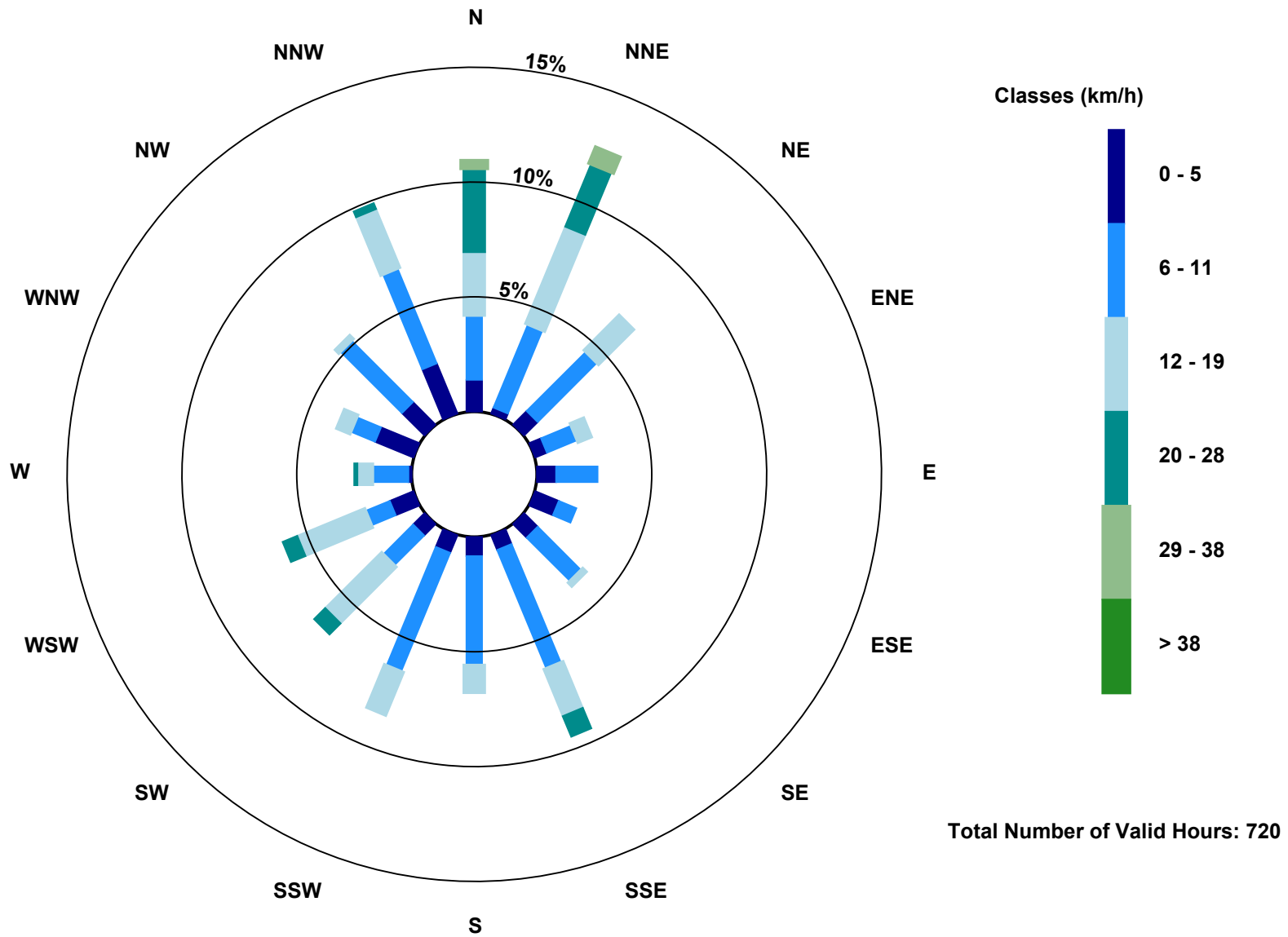
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed 20 m (WS20m) - km/h
Barge Landing





Direction of Maximum Speed: 16 deg on Jun 19 16:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 10.4 deg on Jun 19	Hours of Data: 720
Direction of Minimum Speed: 356 deg on Jun 11 05:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.4 deg on Jun 24	Percent Operational Time: 100.0
Monthly Average Direction: 344.9 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-Jun	292	178	329	99	140	137	191	214	204	228	282	348	297	324	1	39	14	55	54	51	49	51	64	323	30.2
2-Jun	11	36	12	327	349	327	306	323	289	346	255	309	348	27	59	47	38	47	48	55	55	54	52	359	24.4
3-Jun	14	23	354	348	338	91	23	333	340	22	23	16	25	20	14	20	51	179	246	140	108	84	34	62	22.8
4-Jun	141	147	343	338	335	354	61	68	80	33	360	73	81	328	324	331	6	341	320	327	141	152	256	323	15.2
5-Jun	297	319	343	118	313	323	330	343	17	28	349	18	31	31	23	24	10	356	32	44	39	289	258	283	1.7
6-Jun	245	242	227	217	221	232	229	226	231	230	241	233	231	235	212	222	218	221	214	223	192	176	151	137	221.8
7-Jun	148	166	157	198	165	167	197	209	200	192	224	249	251	257	255	265	273	266	262	270	271	300	296	294	235.5
8-Jun	336	354	344	329	315	301	348	17	5	339	25	66	37	71	94	79	86	63	69	48	49	54	31	46	30.8
9-Jun	353	340	6	346	86	98	222	241	218	173	199	182	202	205	166	215	181	200	199	195	166	141	140	137	181.6
10-Jun	129	136	139	137	150	165	153	169	172	169	163	164	161	166	163	159	165	166	167	169	164	163	157	157	160.6
11-Jun	169	193	156	184	356	199	245	264	266	265	264	281	303	307	292	284	300	295	261	288	321	323	299	326	275.4
12-Jun	9	352	228	277	298	283	276	356	28	41	30	29	42	20	16	54	55	47	47	46	20	47	108	141	31.3
13-Jun	326	350	45	91	63	50	339	291	211	188	210	256	323	331	357	27	344	8	23	32	354	352	18	21	4.1
14-Jun	18	20	10	348	351	355	357	4	9	8	9	11	2	2	4	355	349	356	356	357	351	353	352	344	0.1
15-Jun	342	347	346	344	336	341	357	345	336	241	290	291	316	341	329	328	335	358	41	105	122	136	160	283	340.4
16-Jun	245	241	226	207	183	164	161	167	167	159	158	160	209	219	204	195	188	175	197	193	195	229	241	239	197.7
17-Jun	217	210	213	198	205	211	221	237	239	225	227	236	234	237	246	252	264	308	28	62	46	349	353	340	241.5
18-Jun	333	131	322	337	339	0	18	47	29	27	22	22	29	20	23	26	30	28	30	10	4	6	12	22	18.8
19-Jun	27	27	24	22	15	16	10	13	18	21	18	11	15	4	6	16	11	359	353	352	353	353	355	351	10.4
20-Jun	350	352	355	352	360	4	1	358	359	356	360	345	346	343	332	347	339	325	322	323	312	316	326	320	347.2
21-Jun	322	323	321	313	329	334	337	344	354	17	13	26	11	360	5	14	30	39	58	82	92	95	88	83	13.7
22-Jun	98	81	113	130	157	139	217	254	241	200	161	175	248	240	238	239	245	240	259	252	229	229	195	173	217.6
23-Jun	164	131	104	118	100	130	164	196	171	280	295	189	191	214	202	205	207	203	194	161	143	141	152	165	173.1
24-Jun	168	166	183	194	157	170	175	198	191	198	211	225	217	202	266	60	77	13	332	353	30	20	27	26	141.3
25-Jun	26	27	30	24	27	37	42	46	63	66	34	25	18	2	338	318	324	322	329	342	105	114	120	166	28.3
26-Jun	134	136	159	145	135	150	160	159	163	160	155	160	187	206	227	324	46	324	331	122	151	157	167	116	159.0
27-Jun	10	326	337	329	339	332	335	24	34	32	28	24	22	23	34	52	49	58	68	36	332	326	104	142	18.6
28-Jun	166	161	165	156	163	164	176	172	171	190	181	176	202	303	320	256	208	181	175	226	189	188	186	209	182.4
29-Jun	211	190	179	159	182	177	178	191	179	163	173	172	179	221	228	226	232	190	194	170	168	175	185	204	190.1
30-Jun	195	210	206	209	213	203	192	192	197	217	196	216	229	244	252	238	239	239	240	247	243	243	232	270	228.1

360.0 19.1 5.1 350.7 348.9 341.6 325.9 327.4 4.1 50.8 326.0 298.3 297.0 300.8 299.7 327.7 335.7 342.4 355.0 16.3 31.4 29.1 31.5 0.5

Diurnal Average

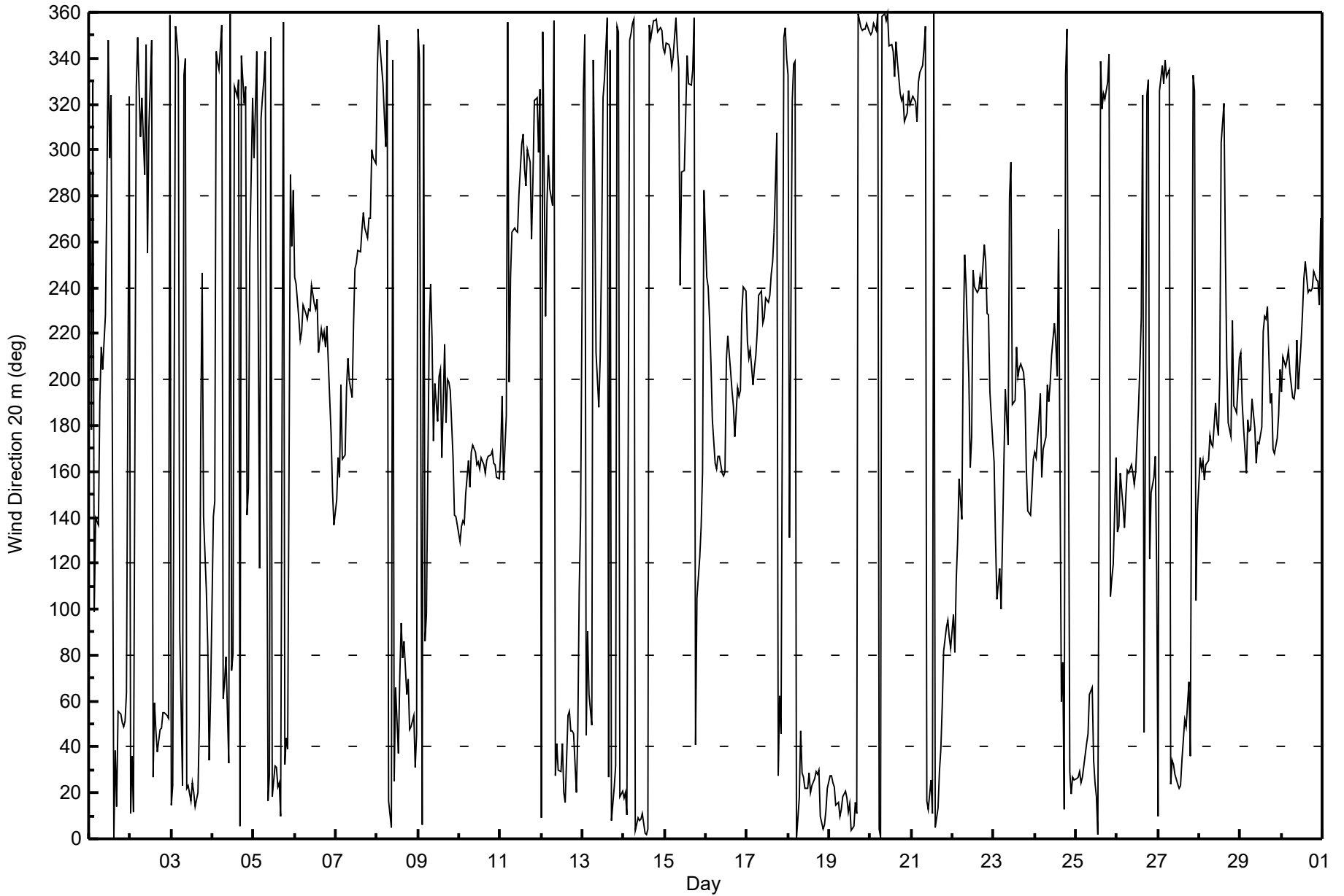
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Barge Landing - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																			Hours in Service: 720						
Maximum Value: 100 deg on Jun 11 05:00																			Hours of Data: 720						
Minimum Value: 3 deg on Jun 7 00:00																			Hours of Missing Data: 0						
Percentiles: P ₁ = 6 P ₁₀ = 12 Q ₁ = 16 Median = 21 Q ₃ = 28 P ₉₀ = 47 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-Jun	84	74	44	16	77	12	24	28	33	77	60	62	39	33	66	53	39	23	14	9	10	10	52	12	84
2-Jun	34	13	24	13	18	71	16	18	23	50	69	56	55	49	54	31	23	15	16	14	13	14	21	20	71
3-Jun	12	21	12	19	13	59	52	19	31	21	24	25	25	27	29	24	59	51	20	38	20	12	25	33	59
4-Jun	74	14	58	12	11	21	22	14	17	31	35	38	71	65	16	15	36	20	53	28	65	43	78	46	78
5-Jun	26	15	26	36	30	16	17	21	22	18	19	20	24	25	25	22	32	25	16	24	16	58	31	45	58
6-Jun	16	21	16	18	17	15	16	19	20	19	19	22	22	24	21	23	23	20	18	17	15	8	13	3	24
7-Jun	11	7	7	29	7	16	20	17	21	24	24	20	22	18	18	21	24	18	18	15	12	15	21	22	29
8-Jun	11	19	19	8	28	12	33	21	35	51	56	36	43	46	43	48	55	27	20	14	9	10	32	33	56
9-Jun	22	8	37	50	21	57	54	37	53	25	48	36	34	41	65	50	28	25	19	16	8	8	6	8	65
10-Jun	5	9	7	7	9	14	12	15	19	21	16	19	18	18	17	16	17	16	16	14	10	10	9	10	21
11-Jun	13	23	20	23	100	28	17	27	16	19	26	26	24	24	29	24	19	20	11	23	15	13	16	20	100
12-Jun	12	66	21	20	13	33	28	42	27	27	29	37	31	24	28	23	17	16	17	21	31	24	28	60	66
13-Jun	21	15	54	10	22	57	34	84	54	32	53	26	23	18	29	17	21	22	33	18	21	23	19	20	84
14-Jun	25	20	22	17	21	20	19	22	19	20	21	20	22	22	23	22	21	22	22	22	21	20	21	17	25
15-Jun	16	19	19	17	17	16	21	18	17	42	28	19	20	19	23	22	25	35	32	25	8	8	28	49	49
16-Jun	17	8	13	19	17	14	17	17	19	25	21	17	29	17	23	19	18	18	24	18	30	16	16	17	30
17-Jun	19	22	22	17	18	18	18	18	19	27	20	20	18	20	19	23	23	53	17	16	24	19	16	18	53
18-Jun	15	73	25	10	74	17	30	19	18	22	17	20	17	21	20	18	17	15	15	21	22	21	19	16	74
19-Jun	14	15	15	15	17	18	19	19	18	17	18	20	17	22	22	19	20	22	21	21	20	20	20	20	22
20-Jun	20	21	21	20	21	21	21	21	22	21	22	18	17	17	13	18	18	16	14	12	13	11	9	9	22
21-Jun	9	10	9	7	9	14	13	18	22	20	22	23	29	30	27	23	22	21	16	23	9	4	4	7	30
22-Jun	34	25	10	11	40	27	52	25	42	41	26	33	56	31	21	20	21	18	23	16	16	18	31	31	56
23-Jun	24	14	8	23	10	16	25	44	54	40	40	52	32	45	48	61	50	48	31	19	6	6	8	6	61
24-Jun	7	8	25	46	9	13	18	22	22	23	21	23	25	22	65	41	31	22	38	21	22	19	14	16	65
25-Jun	15	15	14	16	14	18	16	18	21	19	25	23	28	29	38	21	22	32	17	27	49	8	13	14	49
26-Jun	9	10	13	27	6	12	20	16	26	15	14	12	31	29	25	63	56	51	43	66	16	14	18	28	66
27-Jun	56	15	7	9	15	13	26	36	20	28	21	24	29	41	43	53	47	43	36	17	51	25	44	17	56
28-Jun	9	12	10	11	7	16	20	17	21	26	27	35	38	45	28	60	49	36	19	20	42	50	31	24	60
29-Jun	20	16	17	9	11	11	20	19	21	22	26	24	26	30	18	30	50	22	17	14	13	10	15	15	50
30-Jun	16	17	18	19	19	17	20	22	24	22	27	27	22	21	25	26	20	20	17	15	14	12	11	31	31
	84	74	58	50	100	71	54	84	54	77	69	62	71	65	66	63	59	53	53	66	65	58	78	60	
Diurnal Maximum																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS11 LOWER CAMP JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
JUNE 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	90.2	0	7.9	0
H2S (ppb) Average	686	34	34	100	12.7	1	1.6	0
THC (ppm) Average	686	33	34	99.86	3.3	-	2.3	-
CH4(ppm) Average	686	33	34	99.86	2.9	-	2.2	-
NMHC(ppm) Average	686	33	34	99.86	0.523	-	0.145	-
Temperature (C) Average	720	0	0	100	30.8	-	24	-
Relative Humidity (%) Average	711	0	9	98.75	100	-	98.1	-
Barometric Pressure (inHg) Average	720	0	0	100	29.4	-	29.3	-
Wind Speed 10 m (km/h) Average	718	0	2	99.72	31	-	21	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
 JUNE 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	2.26	7.1	-	0	0	0.1	0.3	0.9	4.7	90.2
H2S (ppb) Average	686	0.57	1.1	-	0	0	0.1	0.3	0.7	1.2	12.7
THC (ppm) Average	686	2.11	0.2	-	1.9	2	2	2.1	2.2	2.3	3.3
CH4(ppm) Average	686	2.07	0.1	-	1.9	2	2	2	2.1	2.2	2.9
NMHC(ppm) Average	686	0.039	0.057	-	0	0	0	0	0.1	0.1	0.523
Temperature 2 m (C) Average	720	18.08	5.1	-	6.9	11.6	13.7	17.9	21.7	25	30.8
Relative Humidity (%) Average	711	68.42	21.5	-	22.5	38.3	50.7	68.4	88.5	96.5	100
Barometric Pressure (inHg) Average	720	29.01	0.1	-	28.7	28.8	28.9	29	29.1	29.2	29.4
Wind Speed 10 m (km/h) Average	718	8.8	6	-	0	2	5	8	12	17	31
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO ₂ , THC/NMHC/CH ₄	28 Jun 2023 13:00	28 Jun 2023 13:00	1	Maintenance - sample manifold cleaned
Relative Humidity	05 Jun 2023 01:00	05 Jun 2023 09:00	9	Sensor operated out of range
Wind Speed, Wind Direction	21 Jun 2023 22:00	21 Jun 2023 23:00	2	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

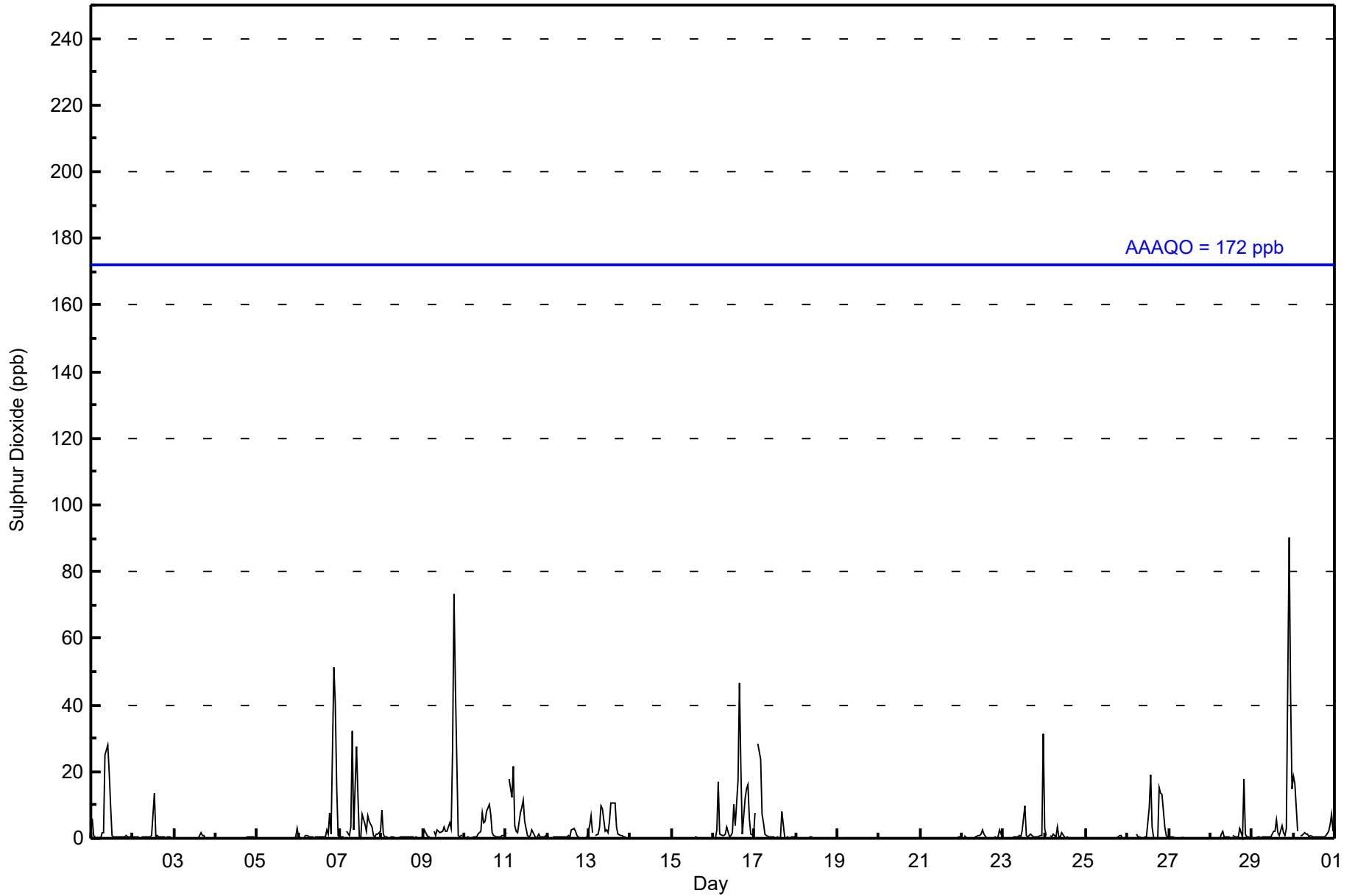
Sulphur Dioxide (SO₂) - ppb

Lower Camp - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 90.2 ppb on Jun 29 22:00	Maximum Daily Average: 7.9 ppb on Jun 16		Hours of Data:	686
Minimum Value: 0.0 ppb on Jun 4 07:00	Minimum Daily Average: 0.0 ppb on Jun 20		Hours of Missing Data:	34
Maximum Diurnal Average: 5.0 ppb at hour 22	Minimum Diurnal Average: 0.7 ppb at hour 7		Hours of Calibration:	33
Monthly Average: 2.26 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.9 P ₉₀ = 4.7 P ₉₉ = 33.2		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-Jun	5.9	0.7	0.3	Z	0.2	0.1	1.6	1.6	24.8	27.8	19.9	9.6	1.0	0.3	0.2	0.3	0.4	0.3	0.3	0.5	0.6	0.6	0.4	0.5	4.3	27.8																							
2-Jun	0.5	0.4	0.5	0.5	Z	0.5	0.5	0.4	0.5	0.6	0.5	0.7	13.7	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.3	0.2	0.1	0.2	1.0	13.7																							
3-Jun	0.1	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.7	1.0	0.7	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.7																							
4-Jun	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.2	0.2	0.4	0.2	0.2	0.1	0.4																							
5-Jun	0.2	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	0.0	0.1	0.0	0.1	0.3	2.8	0.2	2.8																							
6-Jun	0.5	0.2	Z	0.5	0.9	0.8	0.6	0.5	0.3	0.2	0.2	0.5	0.3	0.4	0.4	0.3	2.3	1.1	7.6	1.1	51.2	40.2	15.4	0.8	5.5	51.2																							
7-Jun	0.4	0.3	0.3	Z	2.2	0.7	3.3	32.0	2.7	27.6	13.1	0.4	0.2	7.1	4.1	2.1	6.9	5.1	3.3	1.0	0.6	1.4	1.3	2.2	5.1	32.0																							
8-Jun	8.5	1.1	0.5	0.4	Z	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.7	8.5																							
9-Jun	1.0	2.6	0.7	0.3	0.4	Z	2.0	1.0	2.4	2.3	1.8	2.1	3.6	2.2	2.2	4.8	3.0	26.4	73.4	45.2	1.0	0.6	0.9	1.0	7.9	73.4																							
10-Jun	Z	0.3	0.2	0.2	0.2	0.3	0.4	0.6	1.1	2.3	7.8	4.5	5.2	8.1	10.2	7.4	1.6	0.8	0.5	0.4	0.3	0.5	0.7	1.1	2.4	10.2																							
11-Jun	1.9	Z	17.6	12.2	21.8	3.9	2.0	1.9	7.7	9.3	11.6	4.9	0.9	0.2	0.8	2.7	1.8	0.1	0.3	1.3	0.3	0.3	0.3	0.7	4.6	21.8																							
12-Jun	0.5	1.0	Z	0.6	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.7	0.5	2.5	3.0	2.1	0.9	0.4	0.1	0.1	0.2	0.2	0.3	0.7	3.0																							
13-Jun	4.0	6.6	1.8	Z	0.9	1.3	3.5	9.9	8.7	2.0	2.4	1.7	5.1	10.4	10.6	10.8	3.4	1.2	0.8	0.7	0.3	0.2	0.1	0.1	3.8	10.8																							
14-Jun	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1																						
15-Jun	0.0	0.1	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.2	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.3																							
16-Jun	Z	0.1	2.7	16.9	1.2	0.9	0.8	1.5	3.5	0.5	0.7	1.5	10.1	3.9	17.2	46.4	21.2	1.4	12.0	14.8	16.0	6.0	1.3	0.8	7.9	46.4																							
17-Jun	7.6	Z	28.3	23.7	7.0	4.6	1.2	0.7	0.6	0.4	0.4	0.2	0.1	0.2	0.2	0.1	7.9	0.3	0.2	0.2	0.2	0.2	0.6	0.3	3.7	28.3																							
18-Jun	0.2	0.1	Z	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1																						
19-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1																						
20-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0																						
21-Jun	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.1	0.5																							
22-Jun	Z	0.9	0.3	0.1	0.2	0.1	0.1	0.2	0.2	0.8	0.7	1.4	2.6	1.1	0.2	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.2	2.7	0.5	0.6	2.7																						
23-Jun	0.4	Z	0.1	0.1	0.0	0.1	0.2	0.3	0.4	1.0	0.2	2.0	9.8	0.8	0.6	0.6	1.4	0.6	0.3	0.3	0.3	1.0	0.8	31.3	2.3	31.3																							
24-Jun	2.8	0.8	Z	0.7	0.5	1.5	0.6	3.5	0.5	0.4	1.6	0.3	0.1	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.6	3.5																							
25-Jun	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.8	0.7	0.1	0.0	0.0	0.1	0.8																							
26-Jun	0.0	0.0	0.0	0.1	Z	1.4	0.4	0.2	0.2	0.2	0.3	0.3	9.5	19.1	3.6	0.4	0.1	0.1	15.1	13.5	13.3	3.3	0.9	0.5	3.6	19.1																							
27-Jun	0.4	0.2	0.2	0.2	0.1	Z	0.2	0.2	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	0.1	0.1	0.4																							
28-Jun	Z	0.1	0.0	0.0	0.0	0.2	1.4	2.1	0.6	0.4	0.3	0.4	M	0.7	0.4	0.4	0.6	2.8	0.5	17.8	1.5	0.4	0.2	0.2	1.4	17.8																							
29-Jun	0.1	Z	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.4	2.1	2.3	5.6	1.7	1.0	3.9	1.5	0.8	3.1	90.2	43.0	14.9	7.5	90.2																							
30-Jun	18.6	16.5	2.3	Z	0.8	0.9	1.6	1.4	1.4	0.6	0.9	0.6	0.5	0.3	0.4	0.3	0.5	0.6	0.6	0.7	2.0	4.1	7.2	2.3	2.8	18.6																							
																								2.2	1.3	2.2	2.4	1.5	0.7	0.7	2.0	1.9	2.7	2.2	1.1	2.3	2.0	2.0	2.8	1.9	1.6	4.0	3.4	3.1	5.0	2.6	2.1	Diurnal Average	
																								18.6	16.5	28.3	23.7	21.8	4.6	3.5	32.0	24.8	27.8	19.9	9.6	13.7	19.1	17.2	46.4	21.2	26.4	73.4	45.2	51.2	90.2	43.0	31.3	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Lower Camp - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	647	94.31	94.31
11 - 20	22	3.21	97.52
21 - 60	15	2.19	99.71
61 - 110	2	0.29	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
Lower Camp - June 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	85	55	23	16	17	37	124	37	7	3	4	31	49	28	52	77	645
11 - 20	1	1	0	0	0	2	1	3	3	1	4	3	0	1	1	1	22
21 - 60	0	0	0	0	1	0	2	2	6	3	1	0	0	0	0	0	15
61 - 110	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	86	56	23	16	18	39	127	42	16	9	9	34	49	29	53	78	684

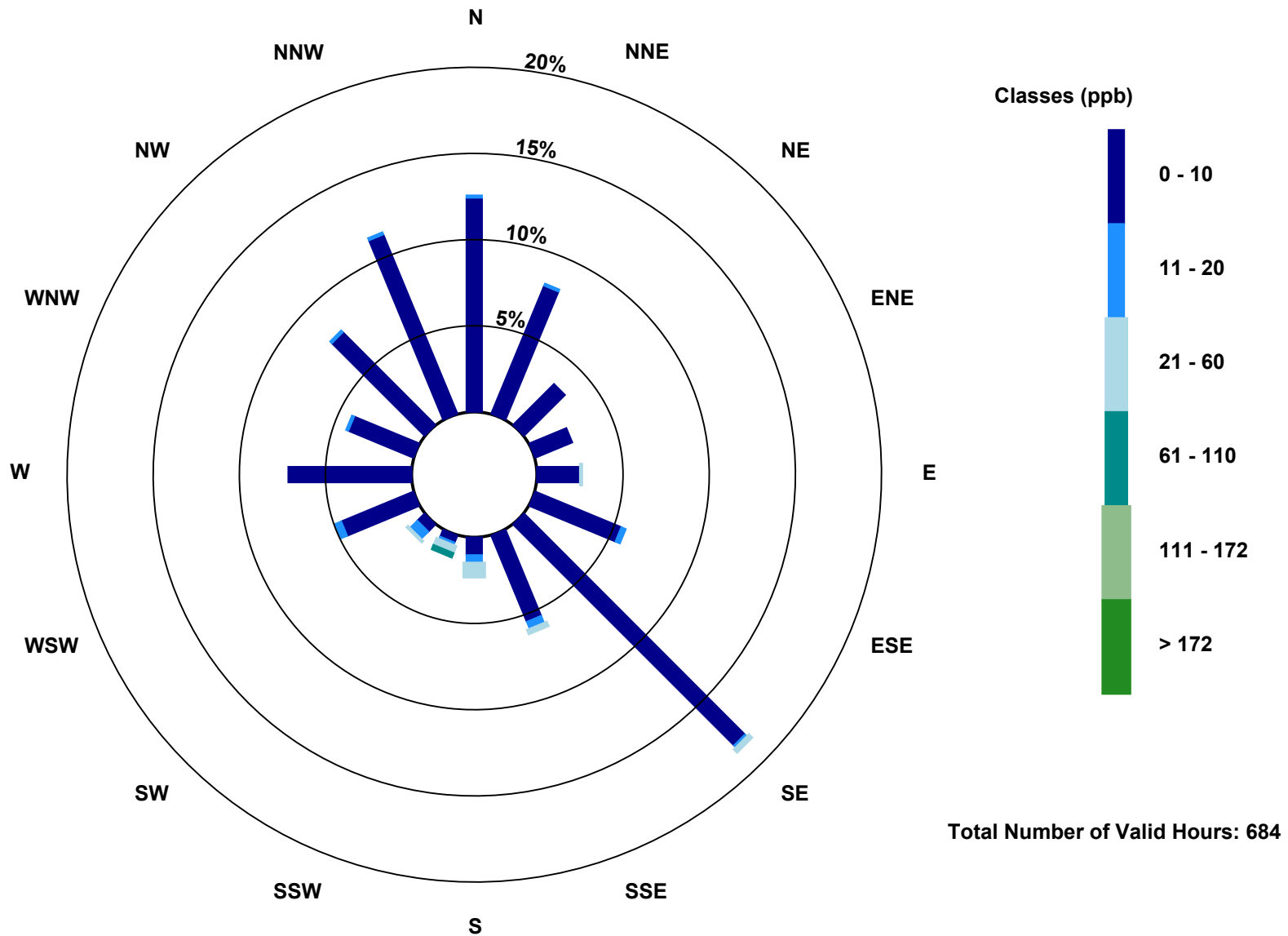
Total Number of Valid Hours: 684

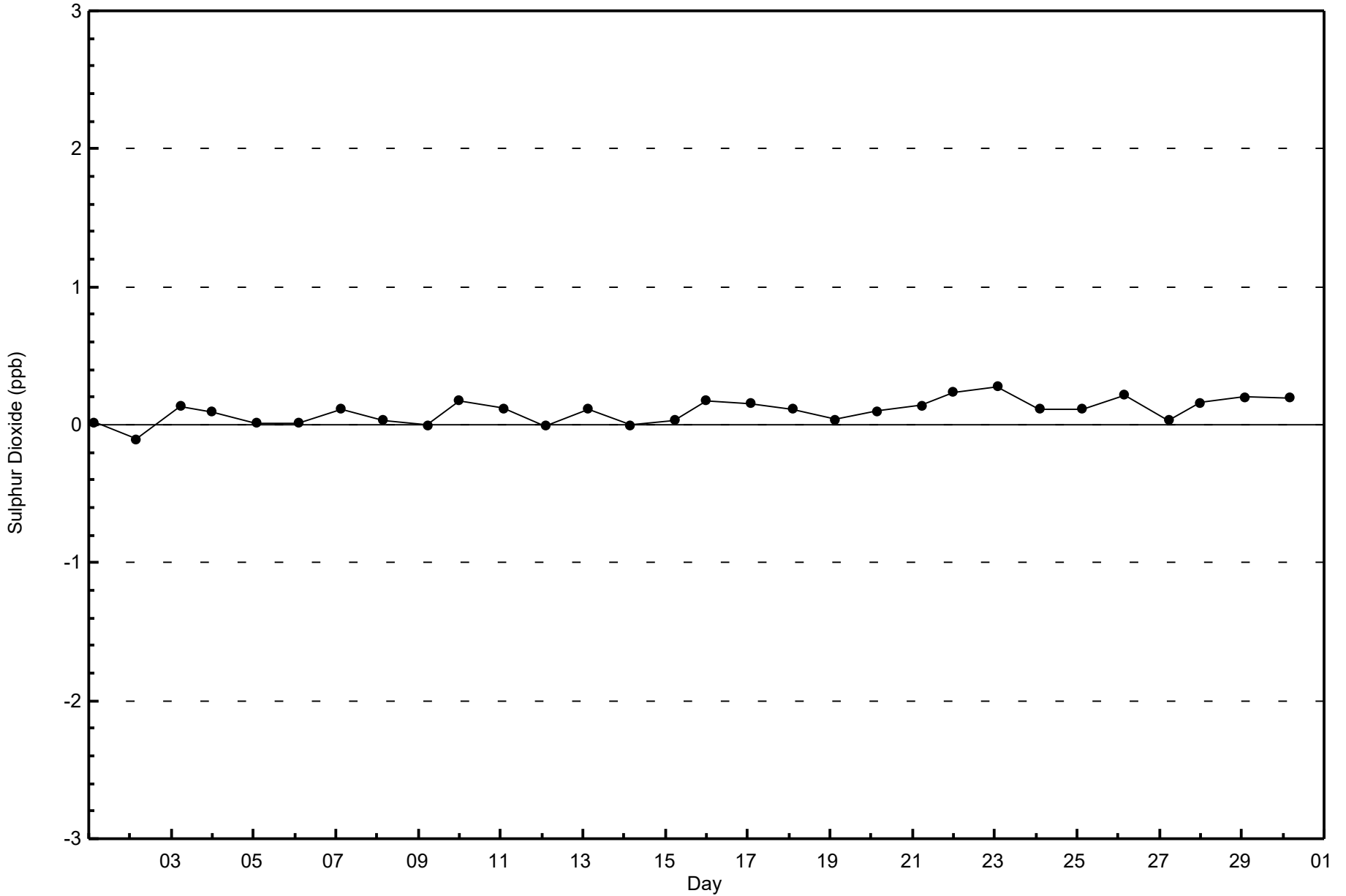
Total Number of Hours: 720

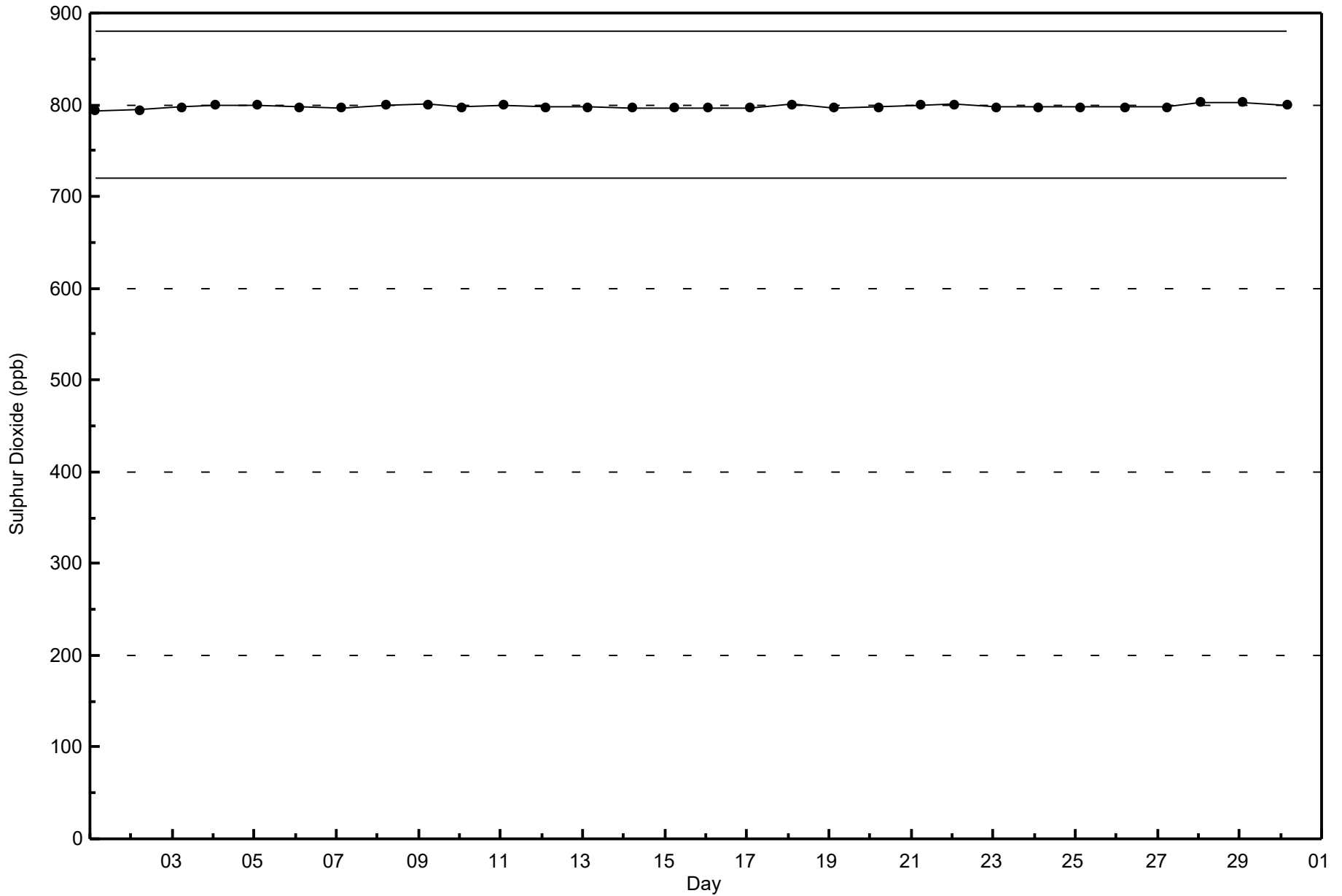


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Lower Camp





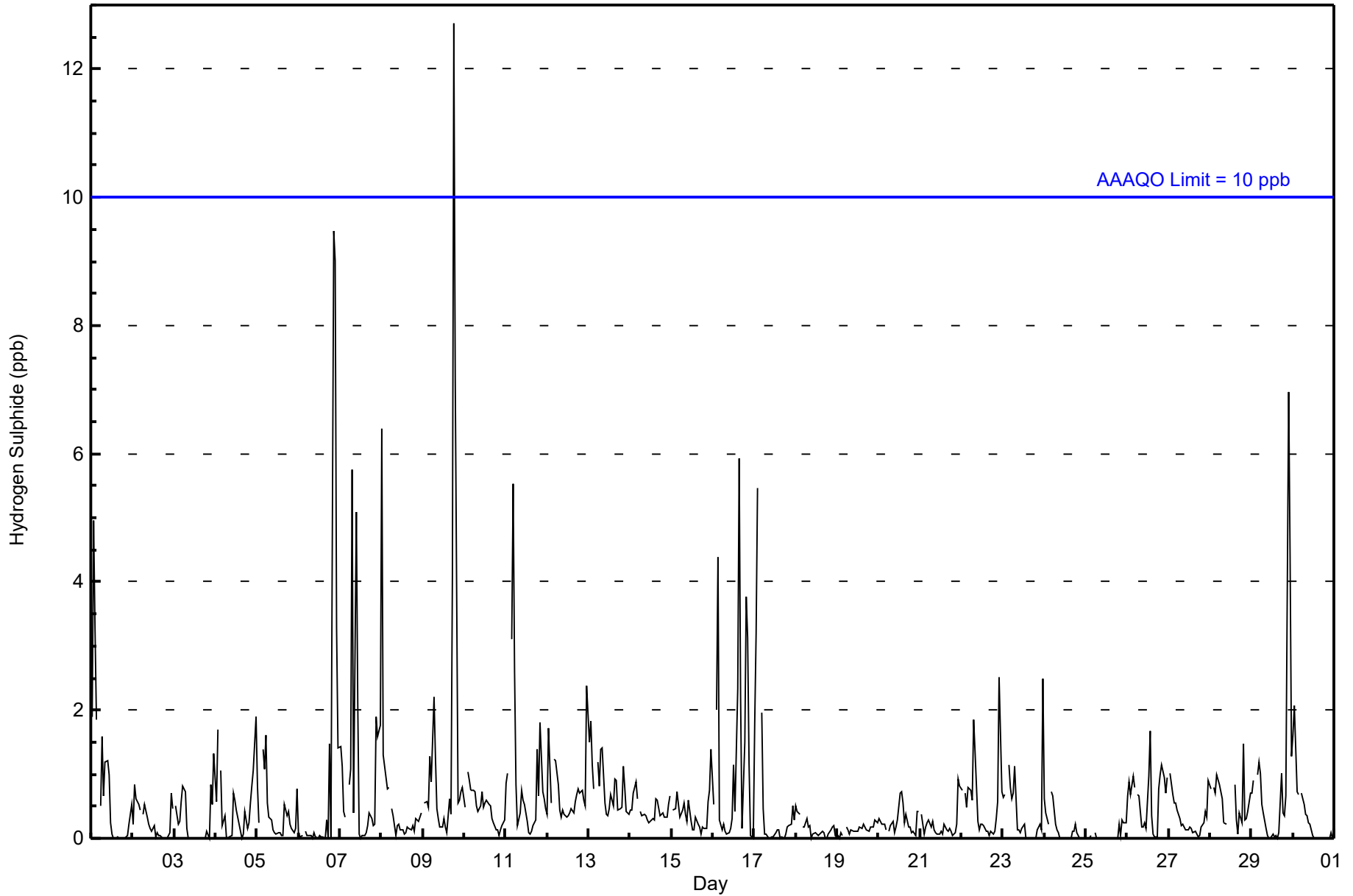




Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 0	Hours in Service:	720
Maximum Value: 12.7 ppb on Jun 9 19:00	Maximum Daily Average: 1.6 ppb on Jun 9		Hours of Data:	686
Minimum Value: 0.0 ppb on Jun 1 15:00	Minimum Daily Average: 0.1 ppb on Jun 25		Hours of Missing Data:	34
Maximum Diurnal Average: 1.0 ppb at hour 2	Minimum Diurnal Average: 0.2 ppb at hour 12		Hours of Calibration:	34
Monthly Average: 0.57 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.7 P ₉₀ = 1.2 P ₉₉ = 5.8		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-Jun	1.9	5.0	3.3	1.8	Z	0.5	1.6	0.7	1.2	1.2	1.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.8	5.0																							
2-Jun	0.2	0.8	0.6	0.5	0.4	Z	0.4	0.5	0.3	0.2	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.5	0.3	0.8																							
3-Jun	Z	0.5	0.2	0.3	0.6	0.8	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.5	1.3	0.3	1.3																							
4-Jun	0.6	1.7	Z	1.1	0.2	0.4	0.0	0.0	0.0	0.0	0.7	0.6	0.4	0.3	0.1	0.0	0.1	0.4	0.2	0.2	0.6	0.8	1.1	1.9	0.5	1.9																							
5-Jun	0.8	0.2	Z	1.4	1.1	1.6	0.6	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.4	0.4	0.2	0.2	0.1	0.2	0.8	0.4	1.6																							
6-Jun	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	1.5	0.0	9.5	9.0	3.3	1.4	1.1	9.5																							
7-Jun	1.4	1.1	0.4	0.3	Z	0.8	1.1	5.8	0.4	5.1	2.1	0.1	0.0	0.0	0.1	0.1	0.2	0.4	0.3	0.2	0.2	1.9	1.6	1.8	1.1	5.8																							
8-Jun	6.4	1.3	1.1	0.8	0.8	Z	0.5	0.4	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.3	0.3	0.3	0.4	0.6	6.4																							
9-Jun	Z	0.5	0.6	0.5	1.3	0.9	2.2	1.3	0.5	0.3	0.2	0.2	0.3	0.2	0.1	0.6	0.4	4.1	12.7	7.2	0.6	0.6	0.7	0.8	1.6	12.7																							
10-Jun	0.5	Z	1.0	0.9	0.7	0.7	0.7	0.5	0.4	0.5	0.7	0.5	0.6	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.5	1.0																							
11-Jun	0.9	1.0	Z	3.1	5.5	2.6	0.8	0.2	0.4	0.7	0.6	0.5	0.3	0.1	0.1	0.1	0.2	0.3	1.4	0.7	1.8	0.7	0.6	0.5	1.0	5.5																							
12-Jun	0.4	1.7	0.5	Z	1.2	1.2	0.8	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.6	0.7	0.8	0.7	0.8	0.6	0.5	2.4	0.7	2.4																							
13-Jun	1.5	1.8	1.1	0.8	Z	1.2	0.8	1.4	1.4	0.6	0.4	0.3	0.5	0.7	0.5	0.9	0.9	0.4	0.5	0.5	1.1	0.8	0.4	0.4	0.8	1.8																							
14-Jun	0.4	0.4	0.7	0.9	0.6	Z	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.6	0.6	0.3	0.4	0.4	0.3	0.3	0.5	0.7	0.4	0.9																							
15-Jun	Z	0.4	0.5	0.7	0.5	0.3	0.4	0.6	0.4	0.3	0.6	0.3	0.1	0.1	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.6	0.7	1.4	0.4	1.4																							
16-Jun	0.5	Z	2.0	4.4	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.3	1.1	0.4	2.3	5.9	2.2	0.2	1.5	3.8	3.1	1.2	0.1	0.0	1.3	5.9																							
17-Jun	1.8	3.2	5.5	Z	2.0	0.5	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	0.2	0.2	0.2	0.5	0.3	0.6	5.5																							
18-Jun	0.5	0.4	0.4	Z	0.2	0.2	0.3	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.0	0.2	0.5																							
19-Jun	0.0	0.0	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.3																						
20-Jun	0.3	0.3	0.2	0.2	0.1	Z	0.1	0.2	0.3	0.1	0.2	0.3	0.7	0.7	0.5	0.2	0.4	0.2	0.2	0.1	0.1	0.0	0.4	0.4	0.3	0.7																							
21-Jun	Z	0.4	0.1	0.2	0.3	0.3	0.2	0.3	0.1	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	0.9	0.8	0.2	0.9																							
22-Jun	0.7	Z	0.7	0.5	0.8	0.8	0.6	1.9	1.3	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.6	2.5	0.7	0.6	2.5																							
23-Jun	0.6	0.7	Z	1.1	0.8	0.6	0.7	1.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	2.5	0.4	2.5																							
24-Jun	0.6	0.4	0.2	Z	0.7	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.7																							
25-Jun	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	0.2	0.1	0.3	0.2	0.2	0.1	0.3																							
26-Jun	0.7	0.9	0.7	1.0	0.8	Z	0.7	0.7	0.2	0.2	0.2	0.1	1.0	1.7	0.4	0.1	0.0	0.0	0.8	1.0	1.1	1.0	0.7	0.9	0.6	1.7																							
27-Jun	Z	1.0	0.7	0.6	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.2	0.4	0.3	0.9	0.3	1.0																							
28-Jun	0.8	Z	0.8	0.7	1.0	0.8	0.7	0.6	0.3	0.2	C	C	C	C	0.8	0.3	0.1	0.4	0.2	1.5	0.3	0.3	0.4	0.7	0.6	1.5																							
29-Jun	0.7	0.9	Z	1.0	1.2	1.0	0.5	0.4	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	1.0	0.4	0.4	0.7	7.0	4.4	1.3	0.9	7.0																							
30-Jun	1.6	2.1	0.7	0.7	Z	0.7	0.5	0.4	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	2.1																							
																								1.0	1.0	0.9	0.9	0.9	0.7	0.5	0.6	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.7	0.6	0.7	1.0	0.8	0.8	Diurnal Average	
																								6.4	5.0	5.5	4.4	5.5	2.6	2.2	5.8	1.4	5.1	2.1	0.6	1.1	1.7	2.3	5.9	2.2	4.1	12.7	7.2	9.5	9.0	4.4	2.5	Diurnal Maximum	

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	663	96.65	96.65
3 - 4	11	1.60	98.25
5 - 7	9	1.31	99.56
8 - 11	2	0.29	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 - June 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	87	57	24	16	19	35	123	39	10	4	8	33	48	28	52	78	661
3 - 4	0	0	0	0	0	2	1	1	4	0	1	1	0	0	0	1	11
5 - 7	0	0	0	0	1	1	1	0	3	3	0	0	0	0	0	0	9
8 - 11	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
> 11	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Totals	87	57	24	16	21	38	125	40	17	9	9	34	48	28	52	79	684

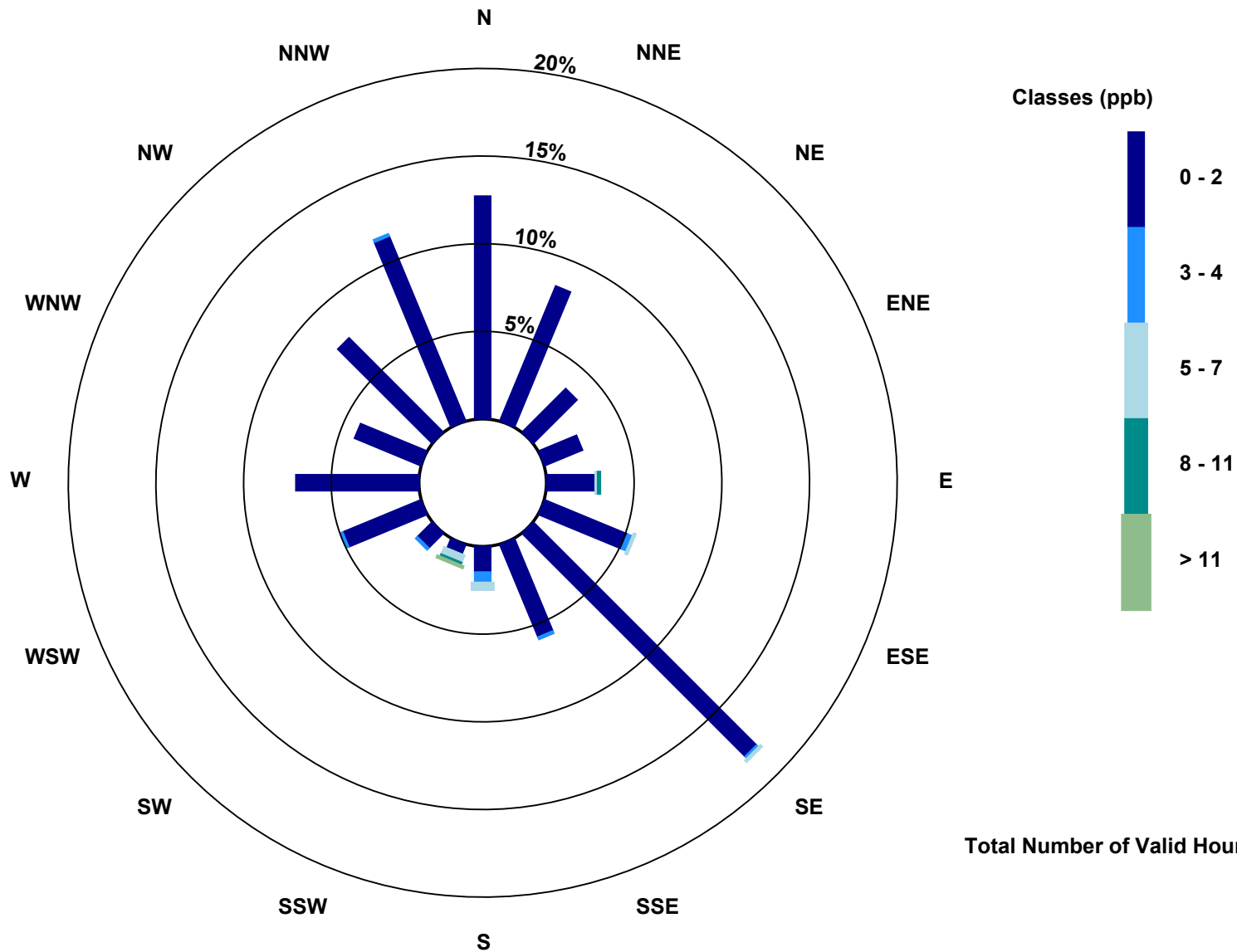
Total Number of Valid Hours: 684

Total Number of Hours: 720

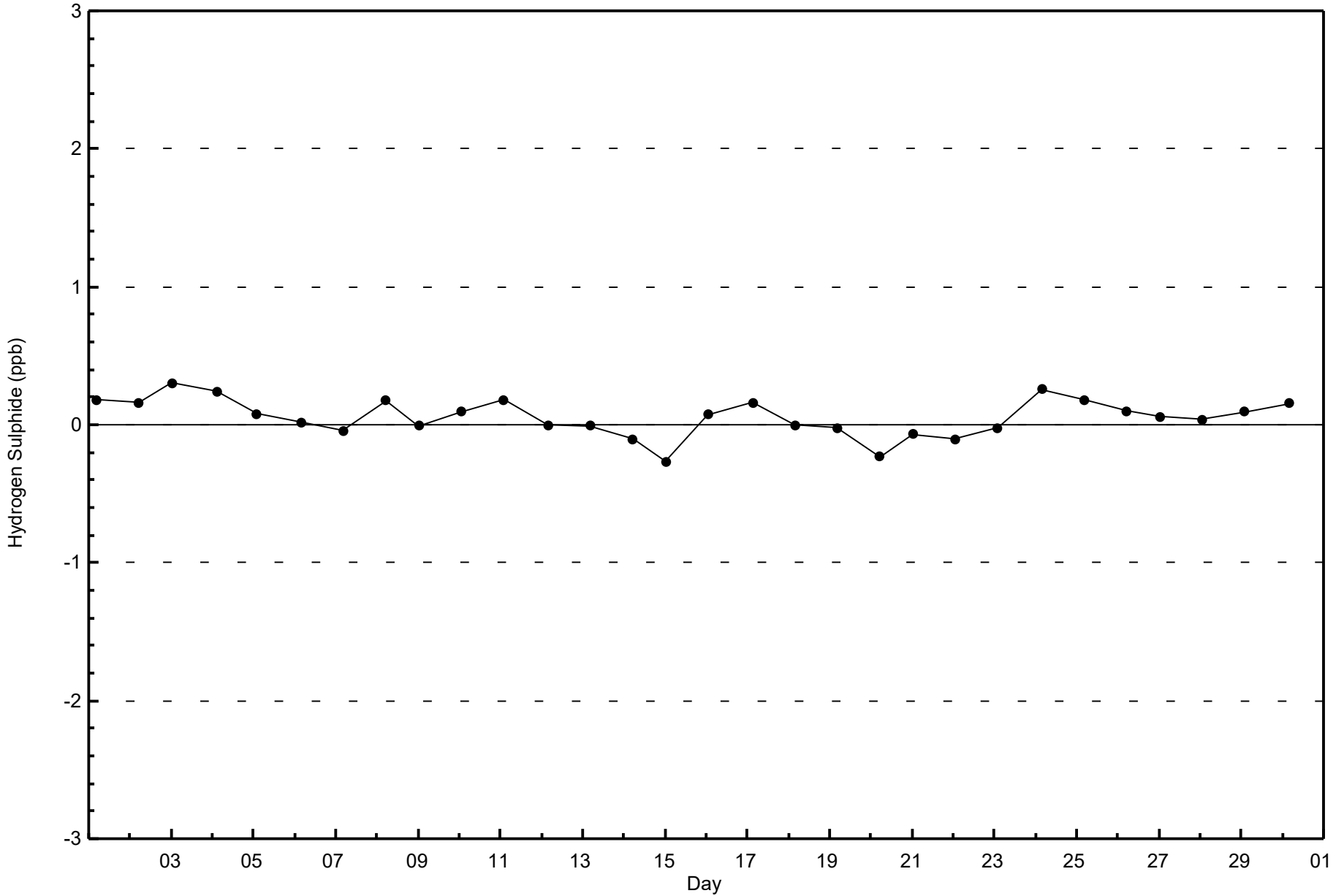


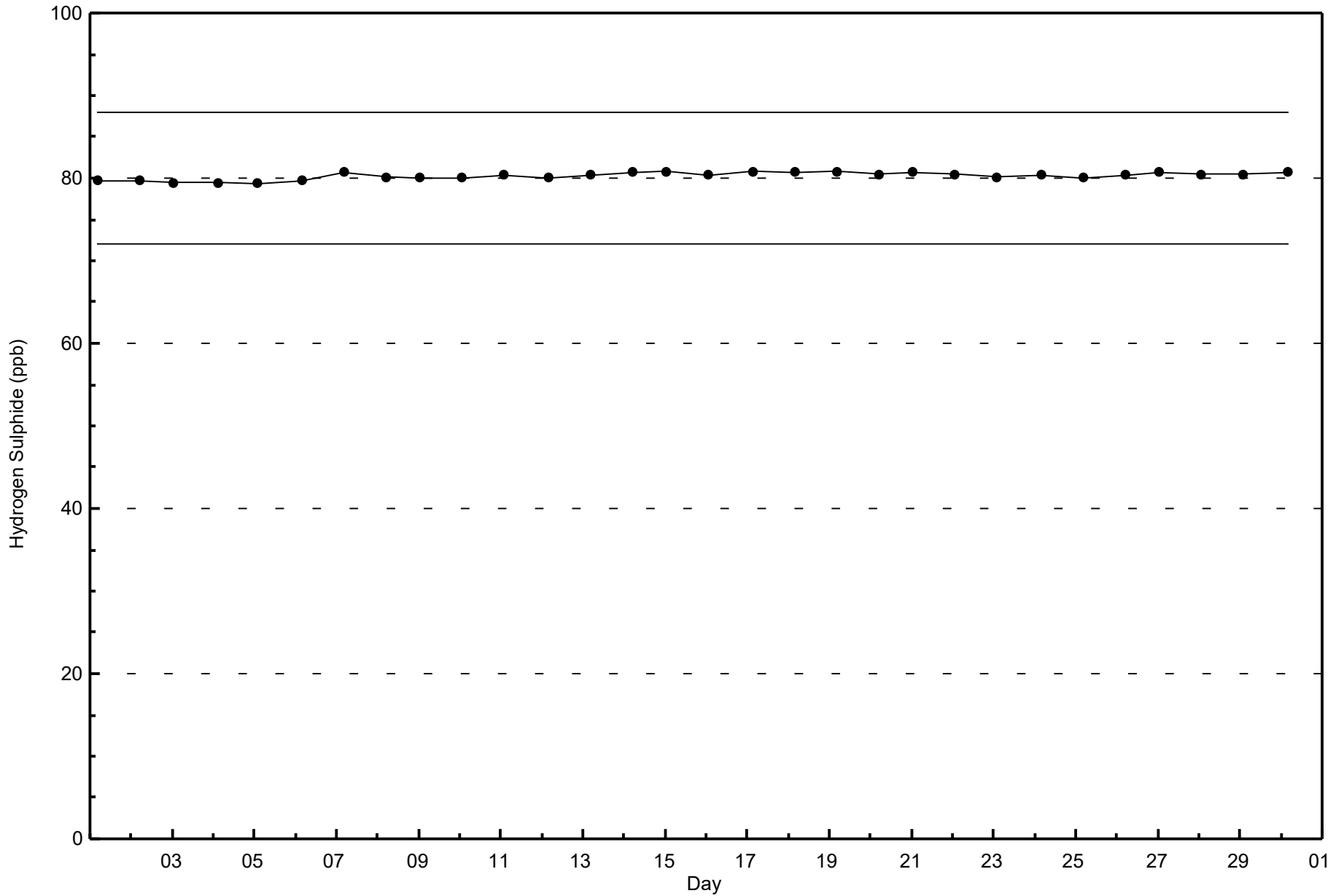
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Lower Camp



Total Number of Valid Hours: 684

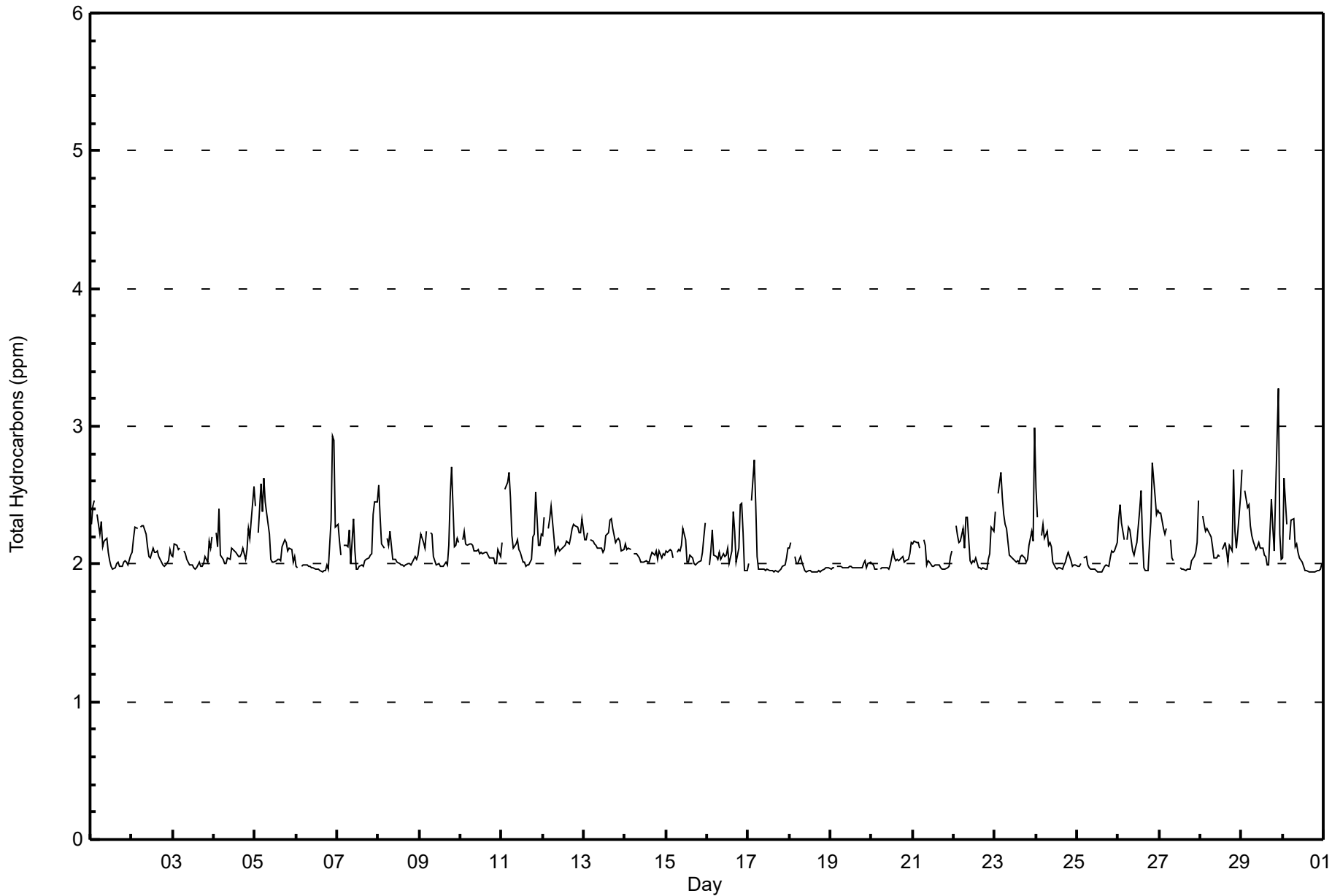






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Lower Camp - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	309	45.04	45.04
2.1 - 3.0	376	54.81	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
Lower Camp - June 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	59	41	16	11	3	10	27	9	2	1	4	26	41	12	20	26	308
2.1 - 3.0	27	15	7	5	15	29	100	33	14	7	5	8	8	17	33	52	375
3.1 - 10.0	0	0	0	0	0	0	0	0	0	1	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	86	56	23	16	18	39	127	42	16	9	9	34	49	29	53	78	684

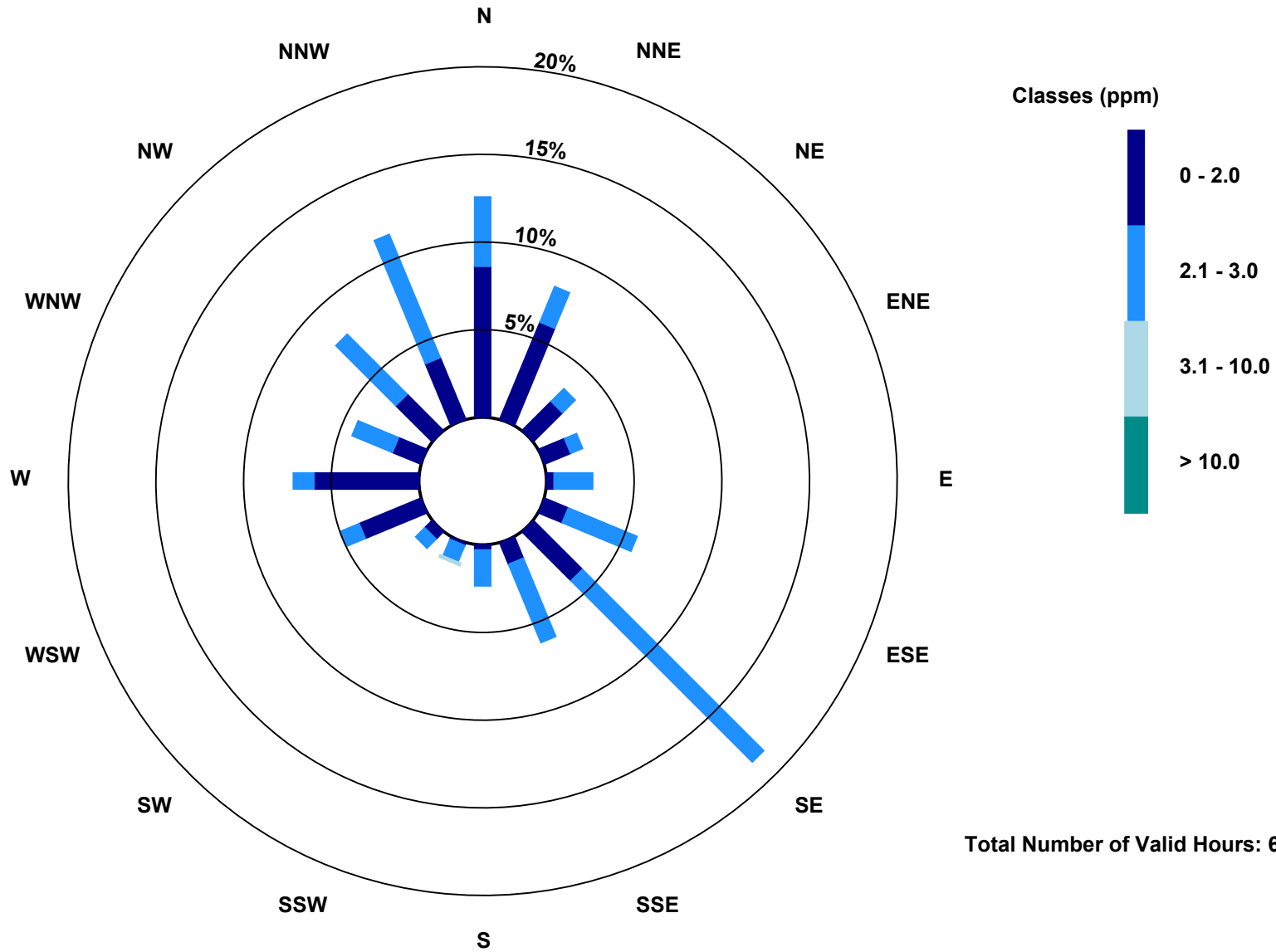
Total Number of Valid Hours: 684

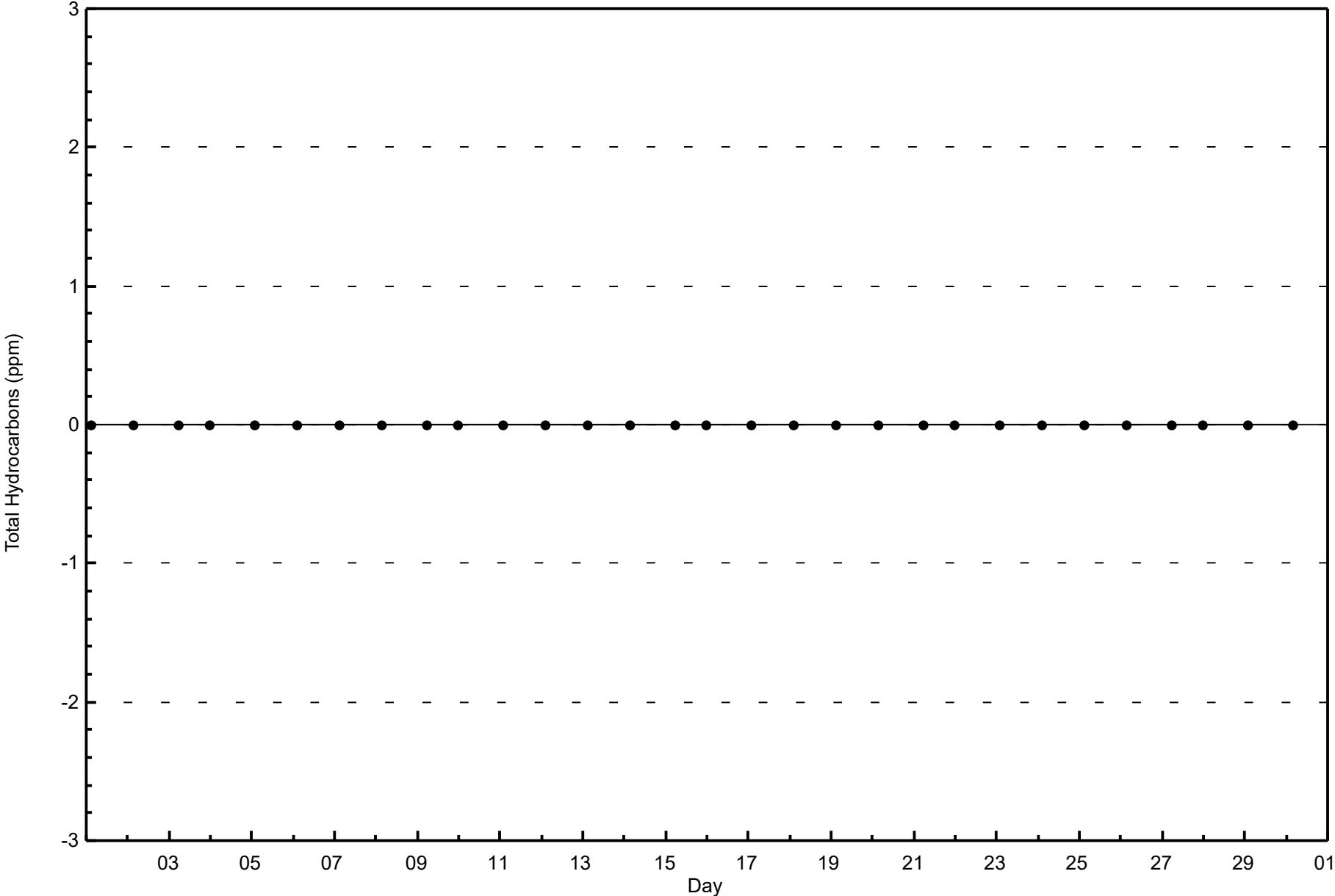
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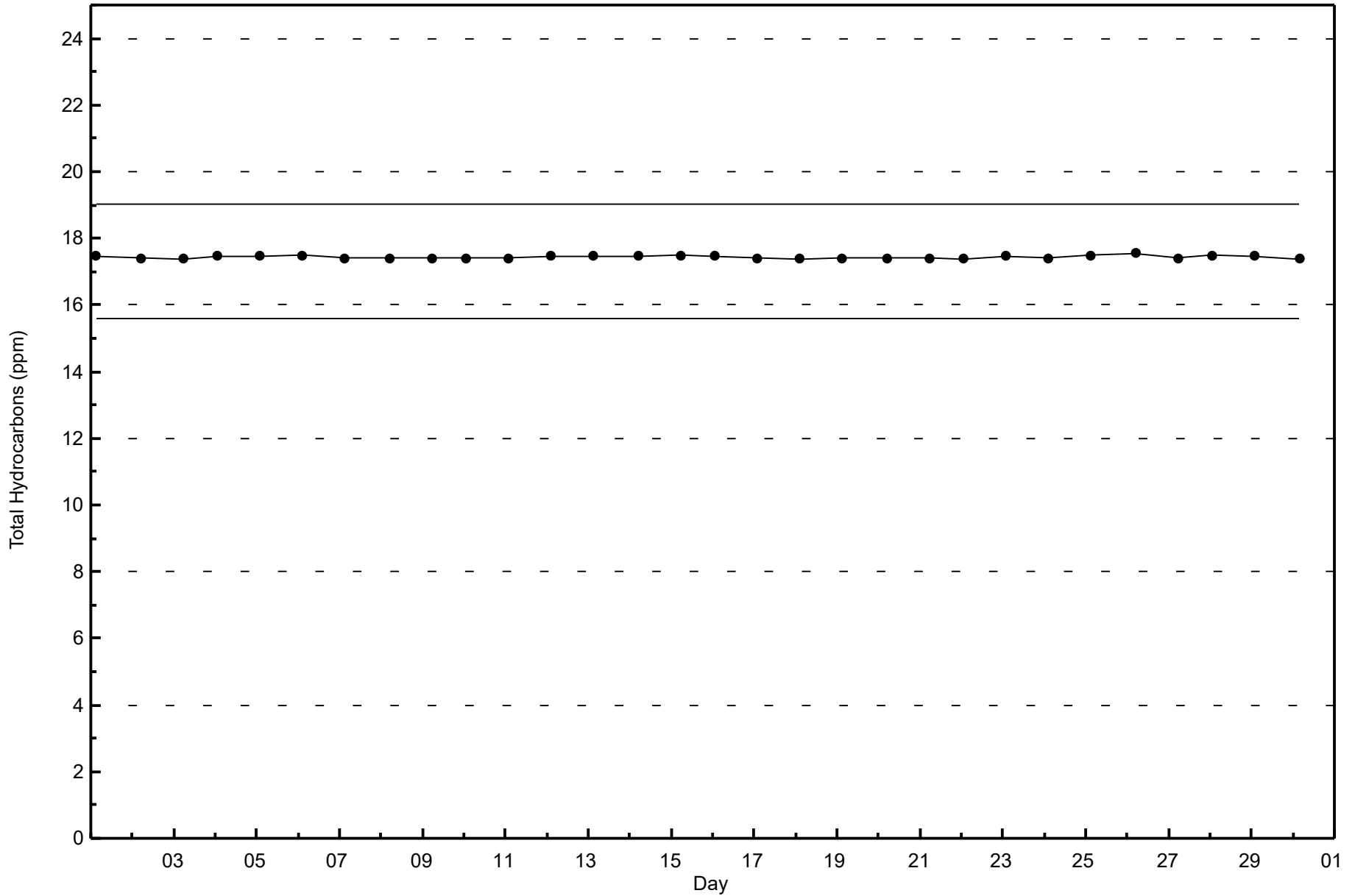


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Lower Camp









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.9 ppm on Jun 6 22:00	Maximum Daily Average: 2.2 ppm on Jun 11		Hours of Data:	686
Minimum Value: 1.9 ppm on Jun 30 18:00	Minimum Daily Average: 2.0 ppm on Jun 19		Hours of Missing Data:	34
Maximum Diurnal Average: 2.2 ppm at hour 4	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 = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.5		Percent Operational Time:	99.9

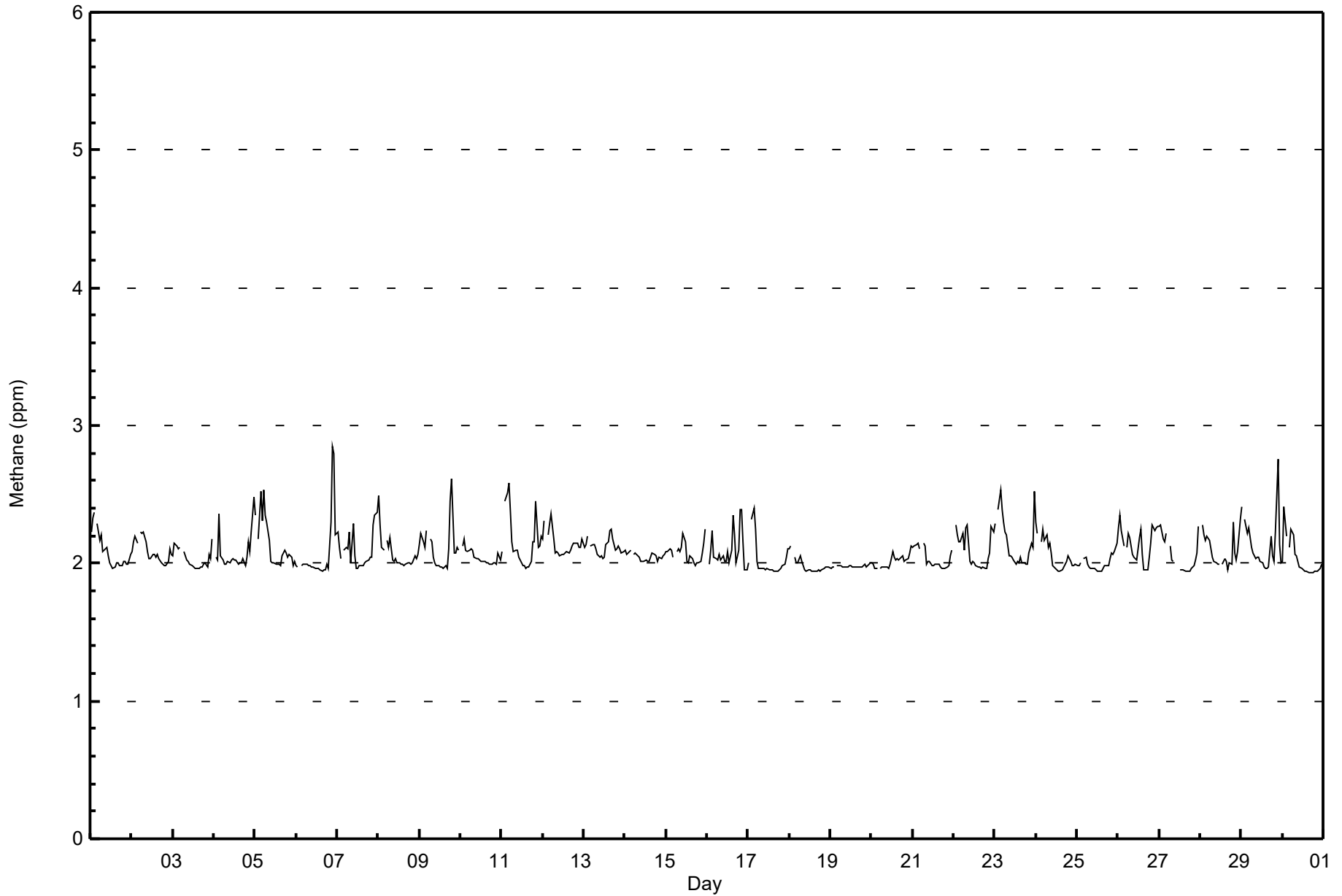
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	2.2	2.3	2.4	Z	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	
2-Jun	2.1	2.2	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	
3-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.2	
4-Jun	Z	2.0	2.0	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.5	2.5	
5-Jun	2.4	Z	2.2	2.5	2.3	2.5	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	
6-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.3	2.9	2.8	2.2	2.1	
7-Jun	2.2	2.1	2.0	Z	2.1	2.1	2.1	2.2	2.0	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.4	2.4	2.1	
8-Jun	2.5	2.3	2.1	2.1	Z	2.2	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	
9-Jun	2.1	2.2	2.2	2.1	2.2	Z	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.6	2.1	2.1	2.1	2.1	2.1	
10-Jun	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	
11-Jun	2.1	Z	2.5	2.5	2.6	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.5	2.1	2.1	2.2	2.2	
12-Jun	2.2	2.3	Z	2.2	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	
13-Jun	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
14-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	
15-Jun	2.1	2.1	2.1	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	
16-Jun	Z	2.0	2.1	2.2	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.3	2.2	2.0	2.1	2.4	2.4	2.2	1.9	1.9	2.1	
17-Jun	2.0	Z	2.3	2.4	2.2	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	2.1	2.0	
18-Jun	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	
19-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
20-Jun	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.0	
21-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	
22-Jun	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	
23-Jun	2.3	Z	2.4	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.5	2.1	2.5	
24-Jun	2.3	2.2	Z	2.2	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
25-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	
26-Jun	2.3	2.3	2.2	2.1	Z	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.2	2.2	2.1	2.0	1.9	2.0	2.0	2.2	2.3	2.2	2.3	2.3	2.1	
27-Jun	2.3	2.3	2.2	2.2	2.2	Z	2.1	2.0	2.0	C	C	C	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.3	2.1	
28-Jun	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	2.0	2.1	2.3	
29-Jun	2.4	Z	2.3	2.2	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.2	2.8	2.1	2.0	2.1	
30-Jun	2.0	2.4	2.2	Z	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	
																								Diurnal Average		
																								Diurnal Maximum		

Z - zerospan	C - Calibration	M - Maintenance
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Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Lower Camp - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Lower Camp - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	384	55.98	55.98
2.1 - 3.0	302	44.02	100.00
3.1 - 10.0	0	0.00	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
Lower Camp - June 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	62	42	17	12	4	17	51	24	4	2	5	29	43	16	21	34	383
2.1 - 3.0	24	14	6	4	14	22	76	18	12	7	4	5	6	13	32	44	301
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	86	56	23	16	18	39	127	42	16	9	9	34	49	29	53	78	684

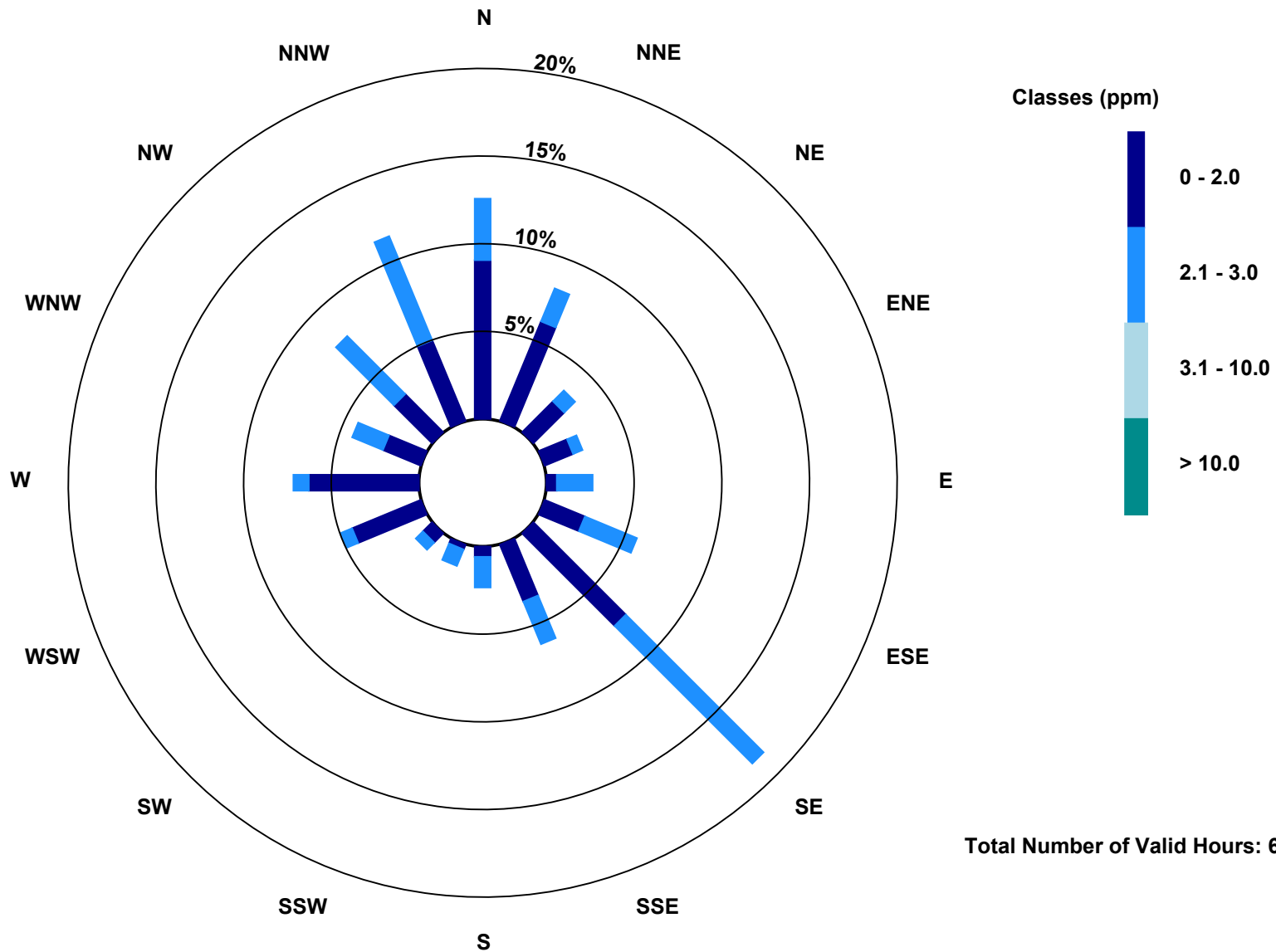
Total Number of Valid Hours: 684

Total Number of Hours: 720

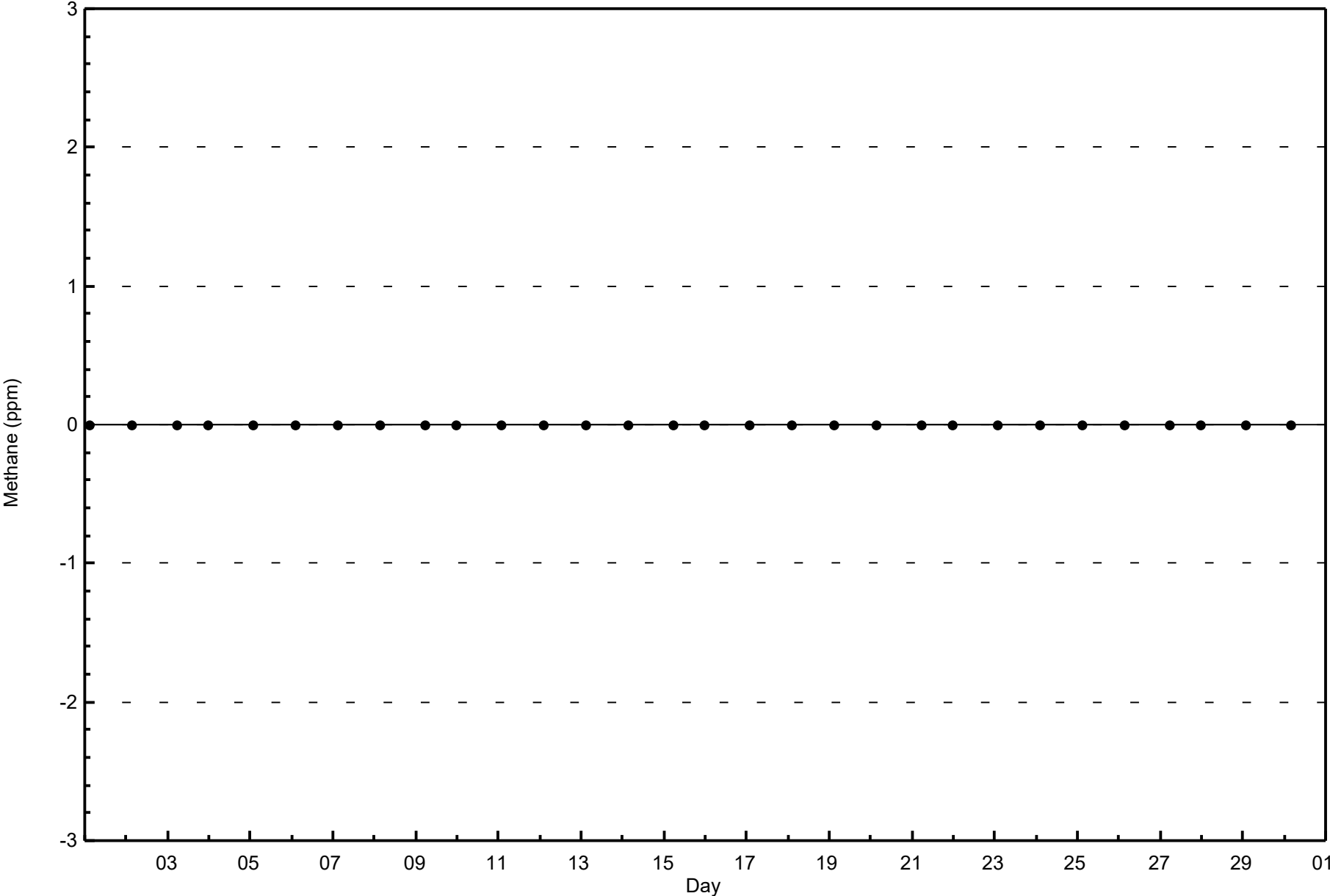


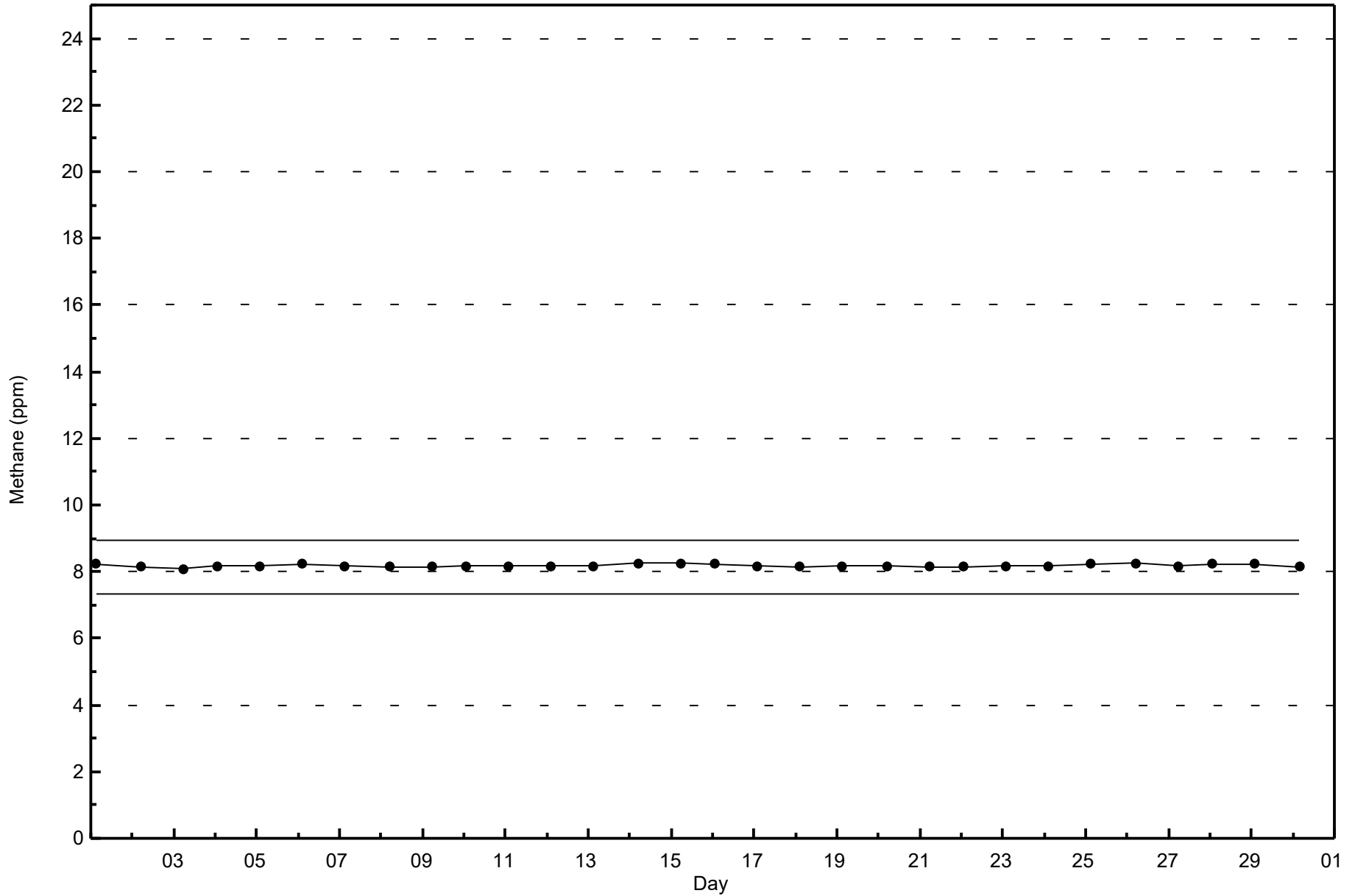
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Lower Camp



Total Number of Valid Hours: 684



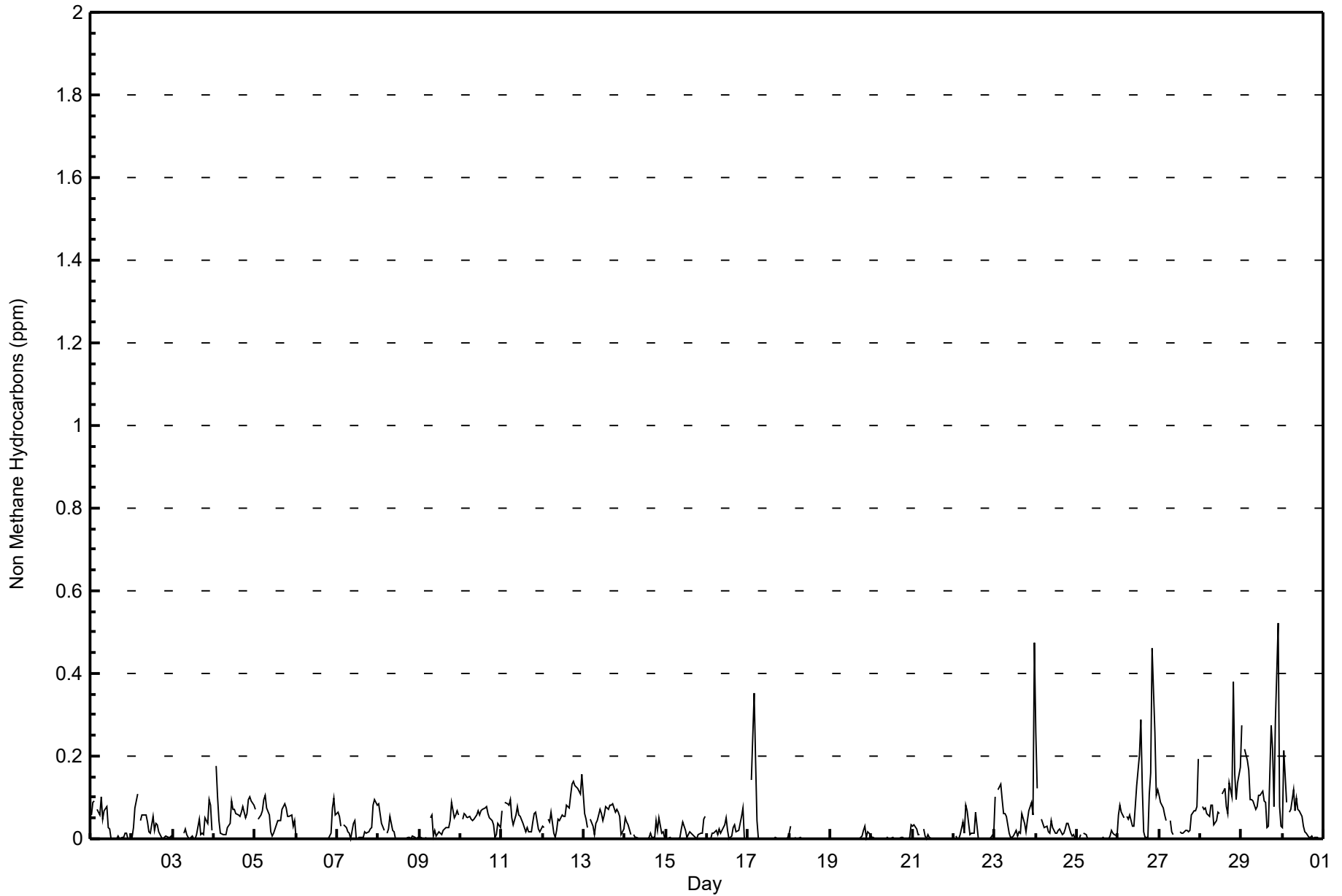




Summary of Hour Averages

Lower Camp - June 2023

Maximum Value: 0.523 ppm on Jun 29 22:00		Maximum Daily Average: 0.145 ppm on Jun 29		Hours in Service: 720																																													
Minimum Value: 0.000 ppm on Jun 1 15:00		Minimum Daily Average: 0.002 ppm on Jun 18		Hours of Data: 686																																													
Maximum Diurnal Average: 0.062 ppm at hour 22		Minimum Diurnal Average: 0.023 ppm at hour 16		Hours of Missing Data: 34																																													
Monthly Average: 0.039 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 = 0.3		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-Jun	0.058	0.089	0.092	Z	0.072	0.056	0.102	0.046	0.067	0.078	0.028	0.024	0.001	0.001	0.000	0.001	0.007	0.001	0.002	0.005	0.015	0.013	0.000	0.001	0.033	0.102																							
2-Jun	0.005	0.028	0.075	0.109	Z	0.043	0.058	0.057	0.058	0.042	0.018	0.014	0.054	0.020	0.038	0.034	0.018	0.005	0.001	0.002	0.006	0.003	0.003	0.006	0.030	0.109																							
3-Jun	0.001	0.000	0.001	0.001	0.001	Z	0.013	0.024	0.009	0.003	0.001	0.008	0.000	0.001	0.010	0.046	0.009	0.015	0.011	0.051	0.037	0.096	0.082	0.019	0.019	0.096																							
4-Jun	Z	0.176	0.101	0.043	0.013	0.009	0.011	0.009	0.027	0.037	0.090	0.071	0.071	0.060	0.058	0.055	0.065	0.078	0.049	0.063	0.095	0.101	0.090	0.081	0.063	0.176																							
5-Jun	0.072	Z	0.049	0.057	0.069	0.095	0.105	0.076	0.057	0.019	0.008	0.012	0.035	0.044	0.043	0.043	0.073	0.085	0.075	0.054	0.054	0.056	0.032	0.045	0.055	0.105																							
6-Jun	0.003	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.075	0.097	0.059	0.011	0.097																							
7-Jun	0.064	0.054	0.032	Z	0.033	0.027	0.016	0.012	0.000	0.038	0.046	0.000	0.000	0.003	0.004	0.005	0.016	0.014	0.016	0.023	0.028	0.081	0.093	0.082	0.030	0.093																							
8-Jun	0.084	0.060	0.036	0.021	Z	0.012	0.022	0.056	0.020	0.018	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.003	0.004	0.000	0.006	0.002	0.001	0.003	0.015	0.084																							
9-Jun	0.005	0.002	0.001	0.001	0.003	Z	0.051	0.058	0.006	0.020	0.006	0.017	0.015	0.012	0.019	0.028	0.026	0.027	0.045	0.089	0.050	0.058	0.068	0.058	0.029	0.089																							
10-Jun	Z	0.047	0.060	0.057	0.051	0.056	0.047	0.044	0.047	0.058	0.068	0.058	0.069	0.070	0.075	0.077	0.060	0.052	0.045	0.033	0.005	0.011	0.036	0.029	0.050	0.077																							
11-Jun	0.067	Z	0.087	0.086	0.083	0.093	0.052	0.036	0.057	0.077	0.059	0.056	0.037	0.028	0.017	0.027	0.018	0.017	0.040	0.060	0.066	0.024	0.018	0.024	0.049	0.093																							
12-Jun	0.029	0.026	Z	0.049	0.041	0.065	0.014	0.005	0.019	0.047	0.043	0.056	0.054	0.053	0.082	0.076	0.104	0.133	0.139	0.129	0.124	0.117	0.110	0.156	0.073	0.156																							
13-Jun	0.062	0.046	0.028	Z	0.047	0.032	0.011	0.038	0.044	0.073	0.062	0.043	0.059	0.078	0.072	0.083	0.082	0.086	0.063	0.070	0.063	0.054	0.010	0.024	0.053	0.086																							
14-Jun	0.052	0.041	0.035	0.011	Z	0.009	0.002	0.002	0.001	0.001	0.000	0.001	0.001	0.002	0.013	0.004	0.003	0.046	0.021	0.052	0.015	0.017	0.004	0.014	0.014	0.052																							
15-Jun	0.001	0.000	0.003	0.001	0.000	Z	0.001	0.001	0.003	0.025	0.041	0.022	0.002	0.010	0.016	0.010	0.008	0.002	0.001	0.011	0.014	0.013	0.048	0.054	0.012	0.054																							
16-Jun	Z	0.000	0.000	0.015	0.014	0.021	0.009	0.024	0.015	0.027	0.035	0.049	0.022	0.001	0.006	0.026	0.032	0.018	0.019	0.039	0.053	0.074	0.000	0.000	0.022	0.074																							
17-Jun	0.000	Z	0.142	0.352	0.189	0.044	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.002	0.001	0.004	0.032	0.352																							
18-Jun	0.013	0.029	Z	0.003	0.000	0.000	0.002	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.029																							
19-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.019	0.029	0.002	0.017	0.010	0.004	0.029																							
20-Jun	0.004	0.002	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.004	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.002	0.002	0.000	0.000	0.001	0.004	0.032	0.002	0.032																							
21-Jun	0.031	0.033	0.025	0.011	0.010	Z	0.023	0.008	0.000	0.009	0.005	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.033																							
22-Jun	Z	0.007	0.000	0.000	0.010	0.042	0.015	0.081	0.066	0.010	0.013	0.012	0.013	0.063	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.003	0.013	0.015	0.081																							
23-Jun	0.100	Z	0.119	0.133	0.097	0.060	0.062	0.056	0.014	0.002	0.003	0.007	0.020	0.008	0.018	0.013	0.060	0.038	0.015	0.046	0.068	0.088	0.058	0.474	0.068	0.474																							
24-Jun	0.258	0.121	Z	0.049	0.039	0.028	0.031	0.018	0.015	0.045	0.028	0.013	0.013	0.021	0.025	0.012	0.015	0.024	0.037	0.039	0.014	0.007	0.009	0.000	0.037	0.258																							
25-Jun	0.000	0.000	0.009	Z	0.013	0.010	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.007	0.021	0.015	0.009	0.008	0.004	0.021																							
26-Jun	0.058	0.082	0.065	0.051	Z	0.056	0.048	0.058	0.030	0.030	0.078	0.129	0.202	0.288	0.127	0.016	0.003	0.003	0.108	0.158	0.459	0.258	0.104	0.118	0.110	0.459																							
27-Jun	0.106	0.089	0.073	0.059	0.045	Z	0.044	0.018	0.009	C	C	C	0.018	0.014	0.014	0.019	0.021	0.018	0.019	0.057	0.067	0.067	0.078	0.193	0.051	0.193																							
28-Jun	Z	0.077	0.073	0.073	0.060	0.053	0.082	0.082	0.034	0.045	0.063	0.063	M	0.109	0.121	0.077	0.061	0.135	0.101	0.378	0.155	0.094	0.135	0.174	0.102	0.378																							
29-Jun	0.275	Z	0.215	0.189	0.166	0.096	0.095	0.091	0.072	0.079	0.106	0.106	0.115	0.091	0.088	0.028	0.029	0.275	0.216	0.079	0.284	0.523	0.078	0.031	0.145	0.523																							
30-Jun	0.028	0.214	0.089	Z	0.065	0.072	0.118	0.068	0.097	0.073	0.067	0.053	0.030	0.017	0.012	0.003	0.005	0.008	0.001	0.004	0.004	0.001	0.001	0.000	0.045	0.214																							
																								0.055	0.049	0.054	0.057	0.045	0.039	0.035	0.032	0.026	0.030	0.030	0.028	0.029	0.033	0.028	0.023	0.024	0.035	0.035	0.048	0.059	0.062	0.040	0.057	Diurnal Average	
																								0.275	0.214	0.215	0.352	0.189	0.096	0.118	0.091	0.097	0.079	0.106	0.129	0.202	0.288	0.127	0.083	0.104	0.275	0.216	0.378	0.459	0.523	0.135	0.474	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	232	33.82	33.82
0.006 - 0.05	259	37.76	71.57
0.06 - 0.1	171	24.93	96.50
> 0.1	24	3.50	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - June 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	46	33	17	10	2	7	2	1	0	1	2	19	34	10	19	27	230
0.006 - 0.05	31	17	2	3	9	14	61	16	9	4	5	7	13	12	26	30	259
0.06 - 0.1	9	6	4	2	6	15	56	18	5	2	2	8	2	7	8	21	171
> 0.1	0	0	0	1	1	3	8	7	2	2	0	0	0	0	0	0	24
Totals	86	56	23	16	18	39	127	42	16	9	9	34	49	29	53	78	684

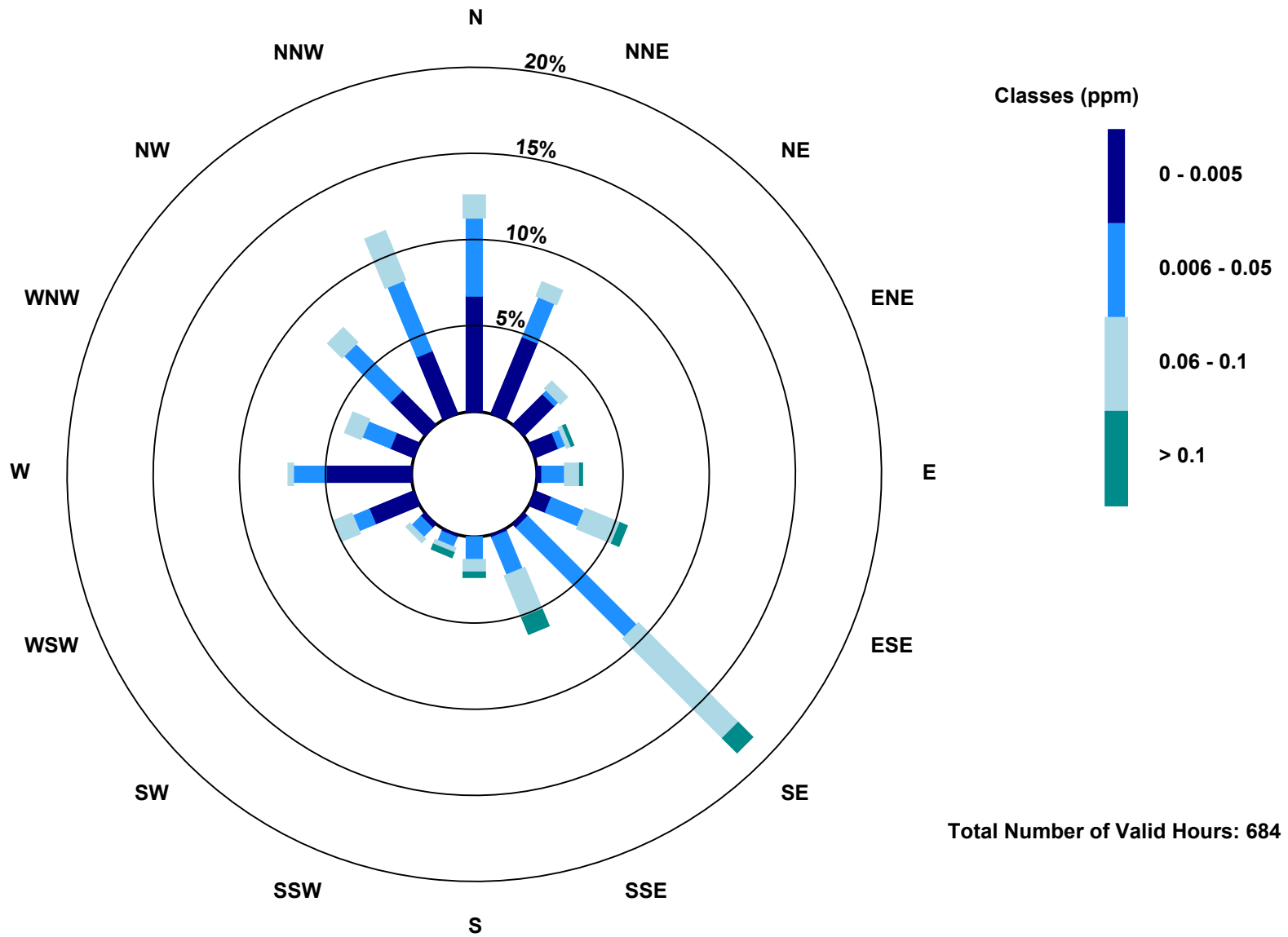
Total Number of Valid Hours: 684

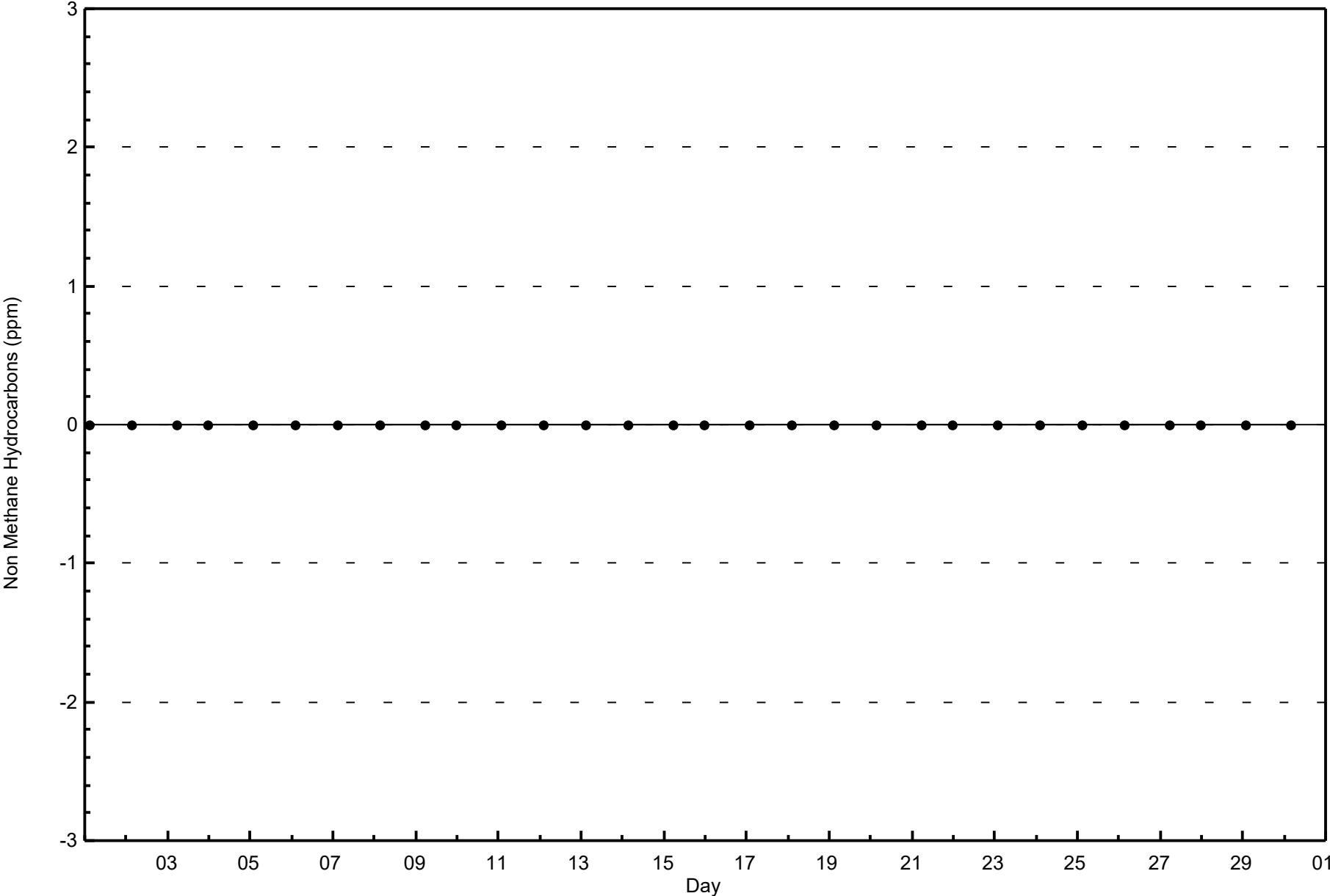
Total Number of Hours: 720

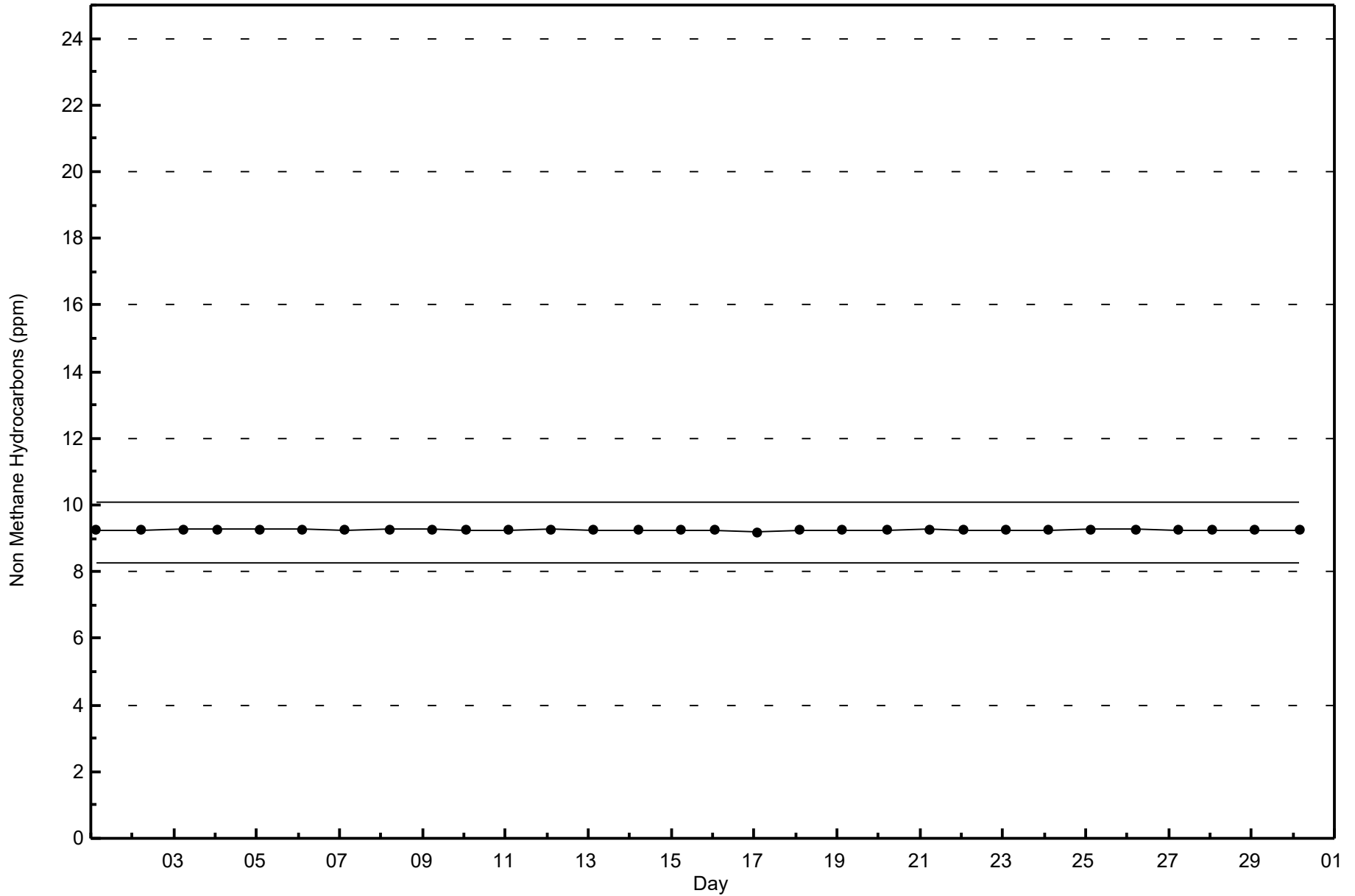


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp





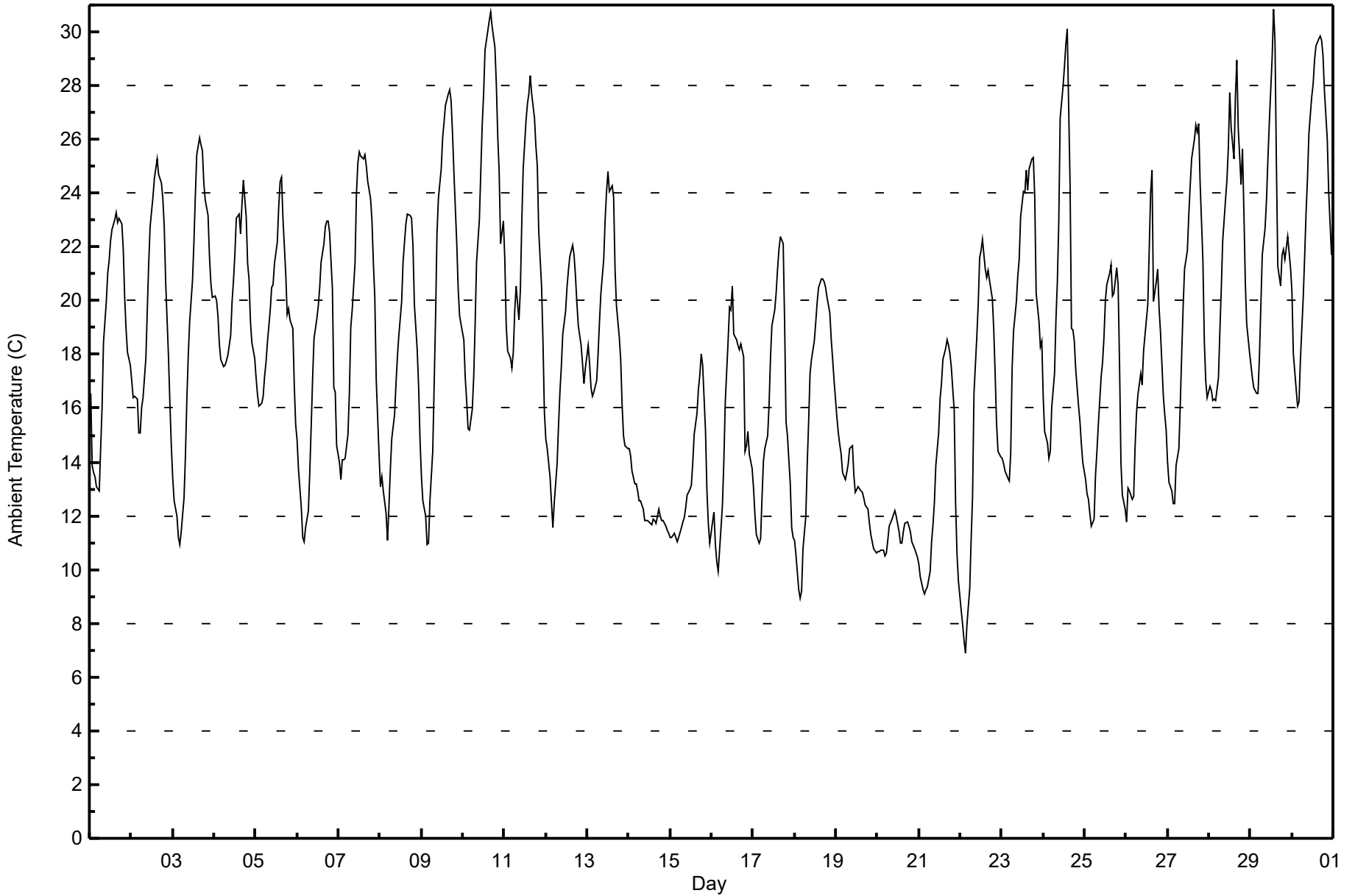




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Lower Camp - June 2023

Maximum Value: 30.8 C on Jun 29 14:00		Maximum Daily Average: 24.0 C on Jun 30		Hours in Service: 720																																												
Minimum Value: 6.9 C on Jun 22 04:00		Minimum Daily Average: 11.2 C on Jun 20		Hours of Data: 720																																												
Maximum Diurnal Average: 22.7 C at hour 15		Minimum Diurnal Average: 13.0 C at hour 5		Hours of Missing Data: 0																																												
Monthly Average: 18.08 C		Percentiles: P ₁ = 9.2 P ₁₀ = 11.6 Q ₁ = 13.7 Median = 17.9 Q ₃ = 21.7 P ₉₀ = 25.0 P ₉₉ = 29.7		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	16.5	13.9	13.6	13.5	13.1	12.9	14.5	16.0	18.5	20.0	21.0	21.5	22.3	22.7	23.0	23.3	22.9	23.1	22.9	21.9	20.1	18.9	18.1	17.6	18.8	23.3																						
2-Jun	17.0	16.4	16.4	16.3	15.1	15.1	16.0	16.4	17.9	19.6	21.4	22.7	23.9	24.6	24.9	25.3	24.7	24.4	23.8	22.7	20.7	17.9	16.2	14.6	19.8	25.3																						
3-Jun	13.4	12.5	12.0	11.2	10.9	11.4	12.6	14.2	16.3	18.0	19.2	20.7	22.2	23.9	25.4	26.1	25.8	25.6	24.4	23.7	23.2	21.6	20.7	20.1	19.0	26.1																						
4-Jun	20.2	20.0	19.4	18.4	17.8	17.6	17.6	17.8	18.0	18.7	20.0	20.8	21.8	23.1	23.2	22.5	23.6	24.5	23.1	21.4	20.8	19.2	18.4	17.9	20.2	24.5																						
5-Jun	17.1	16.5	16.1	16.2	16.4	17.2	17.7	18.5	19.7	20.5	20.6	21.4	22.2	23.5	24.4	24.6	23.1	21.0	19.5	19.7	19.3	19.0	16.9	15.4	19.4	24.6																						
6-Jun	14.8	13.7	12.3	11.2	11.0	11.5	12.2	13.7	15.3	17.1	18.6	19.3	19.8	20.5	21.4	22.1	22.8	23.0	23.0	22.6	20.4	16.8	16.6	14.6	17.3	23.0																						
7-Jun	14.0	13.3	14.1	14.1	14.1	15.0	16.5	19.0	19.7	21.4	24.0	25.1	25.5	25.4	25.3	25.4	25.0	24.4	23.8	23.0	21.4	20.1	17.1	14.3	20.0	25.5																						
8-Jun	13.1	13.4	12.9	12.1	11.1	12.4	13.7	14.9	15.8	16.9	17.9	18.7	20.0	21.4	22.2	22.9	23.2	23.2	23.1	22.1	19.9	18.2	16.8	14.8	17.5	23.2																						
9-Jun	13.5	12.6	12.0	10.9	11.0	12.5	14.4	16.8	19.4	22.5	23.8	24.9	26.0	26.7	27.3	27.7	27.8	27.4	26.2	24.7	22.1	20.4	19.4	19.1	20.4	27.8																						
10-Jun	18.6	17.1	16.3	15.2	15.2	15.9	17.2	19.1	21.4	23.0	24.8	26.5	27.7	29.3	30.1	30.4	30.8	30.2	29.4	28.1	26.1	24.8	22.1	23.0	23.4	30.8																						
11-Jun	21.6	19.1	18.1	17.9	17.5	18.1	19.6	20.6	19.3	20.4	22.9	24.9	26.7	27.3	27.7	28.4	27.7	26.8	25.7	25.0	22.6	20.6	18.5	15.9	22.2	28.4																						
12-Jun	14.9	14.5	13.4	12.5	11.6	12.5	13.9	15.3	16.6	17.5	18.7	19.6	20.5	21.1	21.7	22.1	21.7	20.9	19.9	19.1	18.4	17.6	16.9	17.5	17.4	22.1																						
13-Jun	18.4	17.7	16.8	16.5	16.6	17.0	18.0	19.2	20.3	21.5	23.0	24.0	24.8	24.1	24.3	23.8	21.2	19.8	18.6	17.8	16.1	15.0	14.6	14.5	19.3	24.8																						
14-Jun	14.5	14.2	13.6	13.2	13.2	12.9	12.6	12.6	12.2	11.8	11.8	11.7	11.7	11.9	11.8	11.7	12.2	12.0	11.8	11.8	11.6	11.6	11.5	11.3	12.3	14.5																						
15-Jun	11.2	11.2	11.3	11.2	11.1	11.2	11.6	11.8	11.9	12.3	12.8	13.0	13.1	14.0	15.0	15.8	16.7	17.2	18.0	17.6	15.2	13.0	11.7	11.0	13.3	18.0																						
16-Jun	11.8	12.1	10.9	10.3	9.9	11.6	12.4	14.0	16.2	18.5	19.7	19.7	20.6	18.8	18.6	18.3	18.2	18.4	17.9	14.4	14.6	15.1	14.3	13.8	15.4	20.6																						
17-Jun	13.0	12.0	11.3	11.0	11.1	12.7	14.0	14.5	15.0	16.1	17.9	19.1	19.7	20.3	21.2	21.9	22.4	22.1	19.2	15.5	15.0	13.2	11.6	11.2	15.9	22.4																						
18-Jun	11.1	10.6	9.3	9.0	9.2	10.8	12.0	13.9	15.5	17.3	17.8	18.5	19.2	19.9	20.5	20.8	20.8	20.7	20.5	20.1	19.6	18.5	17.8	17.0	16.3	20.8																						
19-Jun	15.6	15.1	14.7	14.3	13.6	13.4	13.6	13.9	14.5	14.6	13.5	12.9	13.0	13.1	12.9	12.9	12.7	12.4	12.3	11.7	11.3	11.0	10.8	10.6	13.1	15.6																						
20-Jun	10.7	10.7	10.7	10.7	10.5	10.6	11.1	11.6	11.9	12.0	12.2	12.0	11.4	11.0	11.0	11.4	11.7	11.8	11.6	11.4	11.0	10.8	10.6	10.5	11.2	12.2																						
21-Jun	10.2	9.7	9.3	9.1	9.3	9.4	9.9	11.1	11.7	12.5	13.9	15.1	16.3	16.9	17.8	18.2	18.5	18.4	18.0	17.5	15.9	12.4	10.6	9.6	13.4	18.5																						
22-Jun	8.5	7.9	7.4	6.9	7.9	9.3	11.1	12.7	16.6	18.6	19.9	21.6	21.9	22.3	21.2	20.9	21.1	20.7	20.1	18.9	17.2	15.4	14.4	14.2	15.7	22.3																						
23-Jun	14.1	13.9	13.7	13.4	13.3	14.3	17.5	18.8	20.0	20.9	21.5	23.1	24.1	24.0	24.9	24.1	24.9	25.3	25.3	23.8	20.3	19.3	18.3	18.5	19.9	25.3																						
24-Jun	16.4	15.2	14.7	14.1	14.4	16.0	17.3	19.3	20.7	22.9	26.8	28.0	28.7	29.5	30.1	24.3	19.0	18.9	18.5	17.4	16.1	15.5	14.7	14.0	19.7	30.1																						
25-Jun	13.4	12.8	12.6	12.1	11.6	11.9	13.5	14.4	15.4	17.2	17.7	18.6	20.0	20.6	21.0	21.3	20.2	20.3	21.2	20.6	17.7	14.0	12.8	12.3	16.4	21.3																						
26-Jun	11.8	13.1	12.9	12.6	12.7	14.5	15.8	16.5	17.3	16.9	18.2	18.7	19.9	21.9	24.0	24.9	20.0	20.7	21.2	19.7	18.8	16.4	15.8	15.2	17.5	24.9																						
27-Jun	14.0	13.2	12.9	12.4	12.4	13.9	14.5	16.2	18.0	19.8	21.2	21.9	23.2	24.3	25.3	26.0	26.5	26.3	26.6	24.4	21.5	18.5	17.0	16.4	19.4	26.6																						
28-Jun	16.8	16.7	16.3	16.3	16.3	17.1	18.8	20.5	22.2	23.7	24.5	25.7	27.7	26.4	25.3	27.6	28.9	26.4	24.3	25.6	23.3	20.7	19.1	18.1	22.0	28.9																						
29-Jun	17.6	17.1	16.8	16.5	16.6	17.9	19.8	21.7	22.7	23.8	25.3	26.6	29.1	30.8	29.7	25.1	21.3	20.6	21.7	21.9	21.5	22.4	21.8	21.2	22.1	30.8																						
30-Jun	20.4	18.0	16.7	16.1	16.2	17.8	20.1	21.7	23.3	24.5	26.2	27.6	28.1	29.0	29.5	29.7	29.8	29.7	29.1	27.8	26.0	24.1	22.8	21.7	24.0	29.8																						
																								14.8	14.1	13.6	13.2	13.0	13.8	15.0	16.2	17.4	18.7	19.9	20.8	21.7	22.3	22.7	22.7	22.2	21.9	21.4	20.4	18.9	17.4	16.3	15.5	Diurnal Average
																								21.6	20.0	19.4	18.4	17.8	18.1	20.1	21.7	23.3	24.5	26.8	28.0	29.1	30.8	30.1	30.4	30.8	30.2	29.4	28.1	26.1	24.8	22.8	23.0	Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Lower Camp - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	17	2.36	2.36
10 - 20	445	61.81	64.17
> 20	258	35.83	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

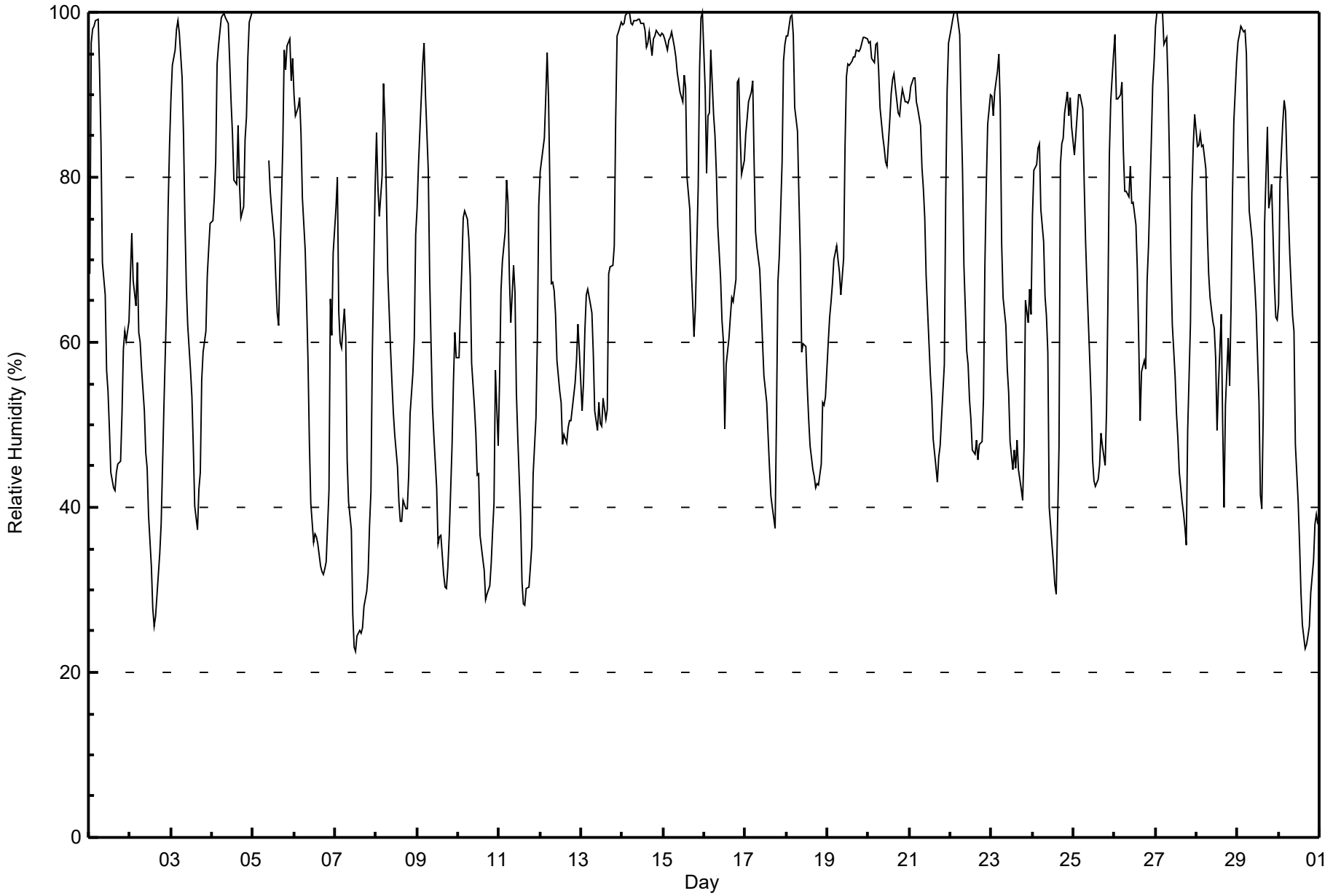
Relative Humidity (RH) - %
Lower Camp - June 2023

Maximum Value: 100.0 % on Jun 5 00:00 Maximum Daily Average: 98.1 % on Jun 14																						Hours in Service:	720																							
Minimum Value: 22.5 % on Jun 7 13:00 Minimum Daily Average: 44.5 % on Jun 7																						Hours of Data:	711																							
Maximum Diurnal Average: 89.0 % at hour 5 Minimum Diurnal Average: 50.0 % at hour 16																						Hours of Missing Data:	9																							
Monthly Average: 68.42 % Percentiles: P ₁ = 25.1 P ₁₀ = 38.3 Q ₁ = 50.7 Median = 68.4 Q ₃ = 88.5 P ₉₀ = 96.5 P ₉₉ = 100.0																						Hours of Calibration:	0																							
																						Percent Operational Time:	98.8																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Jun	68.3	96.3	97.9	98.3	98.9	99.1	92.8	83.9	69.7	65.8	56.6	54.1	49.5	44.3	42.3	42.1	44.3	45.2	45.5	51.3	59.2	61.4	60.2	62.5	66.2	99.1																				
2-Jun	68.1	73.2	67.4	64.5	69.6	61.2	59.9	56.8	51.7	46.6	44.8	38.9	32.9	27.8	25.6	26.8	29.3	34.5	38.0	45.1	52.4	65.4	76.5	83.8	51.7	83.8																				
3-Jun	89.5	93.5	95.5	98.0	99.0	97.5	92.0	85.1	74.7	66.8	62.1	56.6	53.4	47.3	40.2	37.3	42.2	44.3	55.4	58.8	61.3	68.2	71.3	74.5	69.3	99.0																				
4-Jun	74.7	77.5	81.8	93.7	96.0	99.3	99.6	99.8	99.3	98.7	94.1	89.2	85.3	79.7	79.1	86.2	79.4	75.2	76.4	84.6	87.3	94.5	98.8	100.0	88.8	100.0																				
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	82.0	78.2	76.1	72.3	67.6	63.5	62.1	69.8	84.1	95.5	93.1	95.9	96.7	91.7	94.4	--	96.7																				
6-Jun	89.9	87.4	88.5	89.7	85.2	77.5	71.1	65.0	57.8	47.8	40.6	35.7	36.8	36.4	35.6	32.9	32.2	31.9	32.5	33.5	42.1	65.3	60.8	70.8	56.1	89.9																				
7-Jun	76.2	80.0	63.7	59.9	59.3	64.0	60.7	45.7	40.7	37.3	27.2	23.0	22.5	24.4	25.1	24.7	25.4	27.9	29.8	32.0	37.8	41.9	58.7	78.8	44.5	80.0																				
8-Jun	85.4	78.9	75.3	80.2	91.4	87.0	78.3	68.7	59.3	55.2	51.6	48.9	44.9	40.7	38.3	38.3	40.8	39.8	39.8	43.8	51.3	56.3	60.6	73.1	59.5	91.4																				
9-Jun	76.2	81.6	89.7	93.8	96.3	89.9	80.8	67.9	59.6	52.2	48.7	42.3	35.6	36.5	36.7	31.8	30.4	30.2	32.6	36.7	47.5	55.3	61.1	58.2	57.1	96.3																				
10-Jun	58.2	64.1	69.2	75.1	75.9	75.0	72.6	68.0	57.5	52.3	49.0	43.9	44.1	36.6	33.7	32.3	28.8	29.5	30.6	33.2	37.0	40.4	56.6	47.5	50.5	75.9																				
11-Jun	55.6	66.2	69.9	73.4	79.6	76.9	67.9	62.3	69.4	66.1	53.9	48.5	39.0	31.0	28.3	28.1	30.2	30.3	32.7	35.2	44.0	50.9	60.3	76.7	53.2	79.6																				
12-Jun	80.6	82.0	84.8	89.7	95.2	89.6	67.2	67.2	66.3	63.4	57.9	54.1	52.7	47.6	48.8	47.9	49.7	50.4	50.5	52.0	55.1	57.7	62.2	59.0	63.8	95.2																				
13-Jun	51.7	55.1	61.5	65.8	66.4	64.6	63.5	58.6	51.7	49.4	52.6	50.2	49.9	53.3	50.7	51.9	68.3	69.1	69.4	71.6	87.0	97.1	97.6	98.7	64.8	98.7																				
14-Jun	98.5	98.7	99.7	100.0	99.9	98.7	98.5	98.9	99.0	99.1	99.1	98.7	98.6	97.8	95.8	96.2	97.6	94.8	96.7	97.1	97.9	97.3	97.1	97.5	98.1	100.0																				
15-Jun	97.4	96.8	95.4	96.7	96.9	97.6	95.8	94.5	92.6	91.5	90.4	89.2	92.3	90.9	79.9	76.1	69.2	65.1	60.7	64.3	78.8	93.2	99.3	100.0	87.7	100.0																				
16-Jun	90.6	80.6	87.5	87.8	95.5	87.7	85.2	80.6	74.1	67.8	62.8	60.2	49.6	57.3	60.6	63.0	65.4	64.8	67.6	91.5	91.8	85.1	80.3	82.1	75.8	95.5																				
17-Jun	85.3	87.1	89.2	90.3	91.7	81.7	73.4	71.5	68.9	64.8	60.0	55.9	52.7	48.7	44.7	41.4	40.1	37.5	51.1	67.3	70.6	81.8	94.1	96.1	68.6	96.1																				
18-Jun	97.1	97.1	99.5	99.7	97.3	88.5	85.7	77.7	70.6	58.8	59.9	59.5	54.5	50.6	47.4	44.6	43.8	42.4	42.8	42.7	45.3	52.7	52.3	53.4	65.2	99.7																				
19-Jun	60.1	63.1	64.9	67.1	70.0	71.7	70.1	68.4	65.8	70.1	83.8	92.2	93.7	93.6	94.0	94.6	94.5	95.5	95.2	95.7	96.3	96.9	97.0	96.8	83.0	97.0																				
20-Jun	96.4	96.5	94.5	93.9	96.1	96.2	93.1	88.5	84.9	83.5	81.9	81.3	87.0	90.1	91.8	92.5	90.8	87.7	87.4	89.4	90.7	89.2	89.2	88.9	90.1	96.5																				
21-Jun	89.5	91.0	92.1	92.1	89.2	88.3	86.2	81.2	78.6	75.1	68.0	60.0	56.2	53.3	48.3	45.0	43.1	46.1	47.5	50.8	57.3	77.6	90.6	96.2	71.0	96.2																				
22-Jun	98.1	99.2	100.0	100.0	100.0	97.3	88.2	80.9	69.3	59.1	57.3	53.0	50.7	46.9	46.5	48.1	45.8	47.7	47.9	53.2	69.3	78.9	86.5	90.1	71.4	100.0																				
23-Jun	89.9	87.5	90.3	92.8	94.9	88.5	71.8	65.4	62.0	56.8	53.9	47.9	44.5	46.9	44.8	48.2	44.5	42.1	40.9	47.4	65.1	62.3	66.5	63.4	63.3	94.9																				
24-Jun	75.3	80.9	81.5	83.6	84.1	76.2	72.3	65.6	63.2	58.8	40.0	35.4	33.3	30.7	29.5	47.5	81.6	84.0	84.7	87.8	90.3	87.5	89.6	86.2	68.7	90.3																				
25-Jun	82.8	85.1	87.6	90.1	90.0	88.3	79.3	72.2	66.9	57.8	52.9	45.7	43.2	42.6	43.3	45.1	48.9	47.5	45.1	51.8	65.4	82.7	89.4	95.0	66.6	95.0																				
26-Jun	97.2	89.5	89.5	90.0	91.6	83.2	78.3	78.4	77.6	81.3	76.7	77.0	74.3	68.9	60.1	50.5	56.5	57.8	56.8	67.4	71.6	84.5	91.2	94.1	76.8	97.2																				
27-Jun	98.3	100.0	100.0	100.0	100.0	96.1	97.0	90.9	81.8	69.9	62.3	55.9	51.3	48.3	44.2	40.6	39.3	37.6	35.5	49.3	62.3	78.0	83.9	87.7	71.3	100.0																				
28-Jun	83.8	83.9	85.3	83.8	84.0	81.0	73.8	68.4	65.4	62.6	61.7	58.2	49.2	54.8	63.4	50.3	40.0	52.4	60.5	54.8	64.2	77.6	86.8	94.1	68.3	94.1																				
29-Jun	96.4	97.4	98.4	97.7	97.9	95.0	84.1	76.0	72.5	69.7	67.0	63.6	52.7	41.5	39.9	51.2	74.4	86.0	76.4	77.4	79.1	67.1	63.1	62.6	74.5	98.4																				
30-Jun	64.6	79.3	86.7	89.4	88.0	81.3	70.7	66.8	63.3	61.4	47.6	40.7	35.6	29.7	25.8	22.9	23.5	24.3	25.5	29.6	33.5	38.0	39.1	38.0	50.2	89.4																				
																						81.9	84.5	85.8	87.5	89.0	85.5	79.6	74.3	69.5	65.7	61.4	57.9	54.6	52.2	50.3	50.0	52.3	53.5	55.0	59.6	66.2	72.7	77.1	80.0	Diurnal Average
																						98.5	100.0	100.0	100.0	100.0	99.3	99.6	99.8	99.3	99.1	99.1	98.7	98.6	97.8	95.8	96.2	97.6	95.5	96.7	97.1	97.9	97.3	99.3	100.0	Diurnal Maximum
OR - Out of Range																																														



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Lower Camp - June 2023



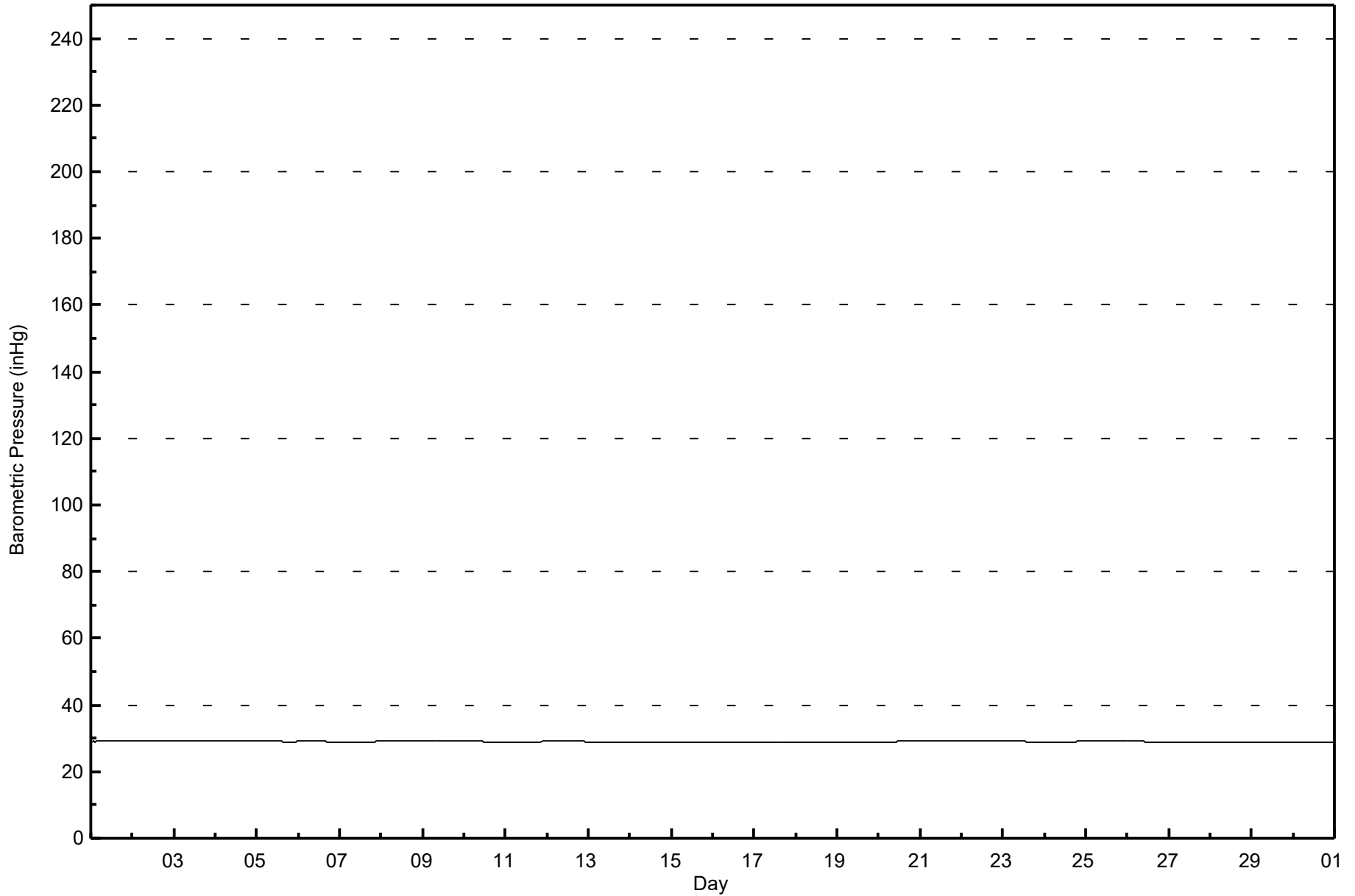


Maximum Value: 29.4 inHg on Jun 3 06:00 Maximum Daily Average: 29.3 inHg on Jun 3																						Hours in Service:	720											
Minimum Value: 28.7 inHg on Jun 14 04:00 Minimum Daily Average: 28.8 inHg on Jun 14																						Hours of Data:	720											
Maximum Diurnal Average: 29.0 inHg at hour 7 Minimum Diurnal Average: 29.0 inHg at hour 18																						Hours of Missing Data:	0											
Monthly Average: 29.01 inHg Percentiles: P ₁ = 28.7 P ₁₀ = 28.8 Q ₁ = 28.9 Median = 29.0 Q ₃ = 29.1 P ₉₀ = 29.2 P ₉₉ = 29.3																						Hours of Calibration:	0											
																						Percent Operational Time:	100.0											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
1-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
2-Jun	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
3-Jun	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
4-Jun	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
5-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
6-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
7-Jun	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	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
8-Jun	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	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
9-Jun	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	29.1	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
10-Jun	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	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
11-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
12-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	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
13-Jun	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	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
14-Jun	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
15-Jun	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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
16-Jun	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	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
17-Jun	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
18-Jun	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
19-Jun	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
20-Jun	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
21-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
22-Jun	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	29.1	29.1	29.1	29.1	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
23-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
24-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
25-Jun	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	29.1	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
26-Jun	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
27-Jun	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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-Jun	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
29-Jun	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
30-Jun	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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
																								Diurnal Average										
																								Diurnal Maximum										



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Lower Camp - June 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Lower Camp - June 2023

Maximum Speed: 31 km/h on Jun 19 09:00	Maximum Daily Speed Average: 20.8 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 27 22:00	Minimum Daily Speed Average: 1.3 km/h on Jun 24	Hours of Data: 718
Maximum Diurnal Speed Average: 5.5 km/h at hour 16	Minimum Diurnal Speed Average: 0.5 km/h at hour 3	Hours of Missing Data: 2
Monthly Average Velocity: 2.0 km/h 343.7 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 5 Median = 8 Q ₃ = 12 P ₉₀ = 17 P ₉₉ = 27	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-Jun	SSW0	ESE4	NNW4	NNE2	ESE3	SE3	SSE1	WSW9	S2	SE5	NNE4	NNE8	N9	N10	NNW8	NW6	N7	NE8	ENE8	E4	ESE3	ESE9	E2	NW5	NNE2.1	N10
2-Jun	NW3	NW5	NW7	NNW4	NW6	NNW7	NNW7	NW6	NW6	NW5	NNW4	WNW8	NW7	NW11	NNW8	NNW9	NNE9	ENE10	NE13	NE11	ENE5	NNW2	N2	N1	NNW4.8	NE13
3-Jun	NE2	W3	WNW3	NNE1	NW2	NNW3	NW4	N6	NW7	NNW8	NE7	NNE6	NNE5	ENE4	SE8	SE8	SE7	SE6	SE10	ESE9	ESE14	ESE7	SW1	N2	E2.0	ESE14
4-Jun	ESE1	SE5	ESE8	NW3	SSE2	SE1	ESE4	ESE4	E9	ESE10	SE14	SE17	SE15	SE9	ESE12	SE8	SE10	SE11	SE6	SE4	NE2	SSE3	NW1	NNW1	SE6.0	SE17
5-Jun	SE1	NE1	N1	NW3	NNW3	N3	NNW6	NNW4	NNE8	NNE12	NE14	NNE12	NNE10	N10	N11	NNW10	NNW10	NW7	NNW3	NNW4	WNW6	WSW10	W27	NNW16	NNW5.5	W27
6-Jun	W21	W22	WSW14	WSW12	WSW11	WSW18	WSW14	WSW13	W14	W17	W18	WSW20	W20	W18	W18	W17	WSW16	WSW17	WSW13	WSW11	SSW3	E2	ESE3	SE7	WSW13.0	W22
7-Jun	SE9	SE7	SSE10	SSE12	SSE6	ESE10	ESE8	SSW7	WSW9	S8	WSW16	W22	W25	WNW20	WNW21	WNW21	WNW19	WNW17	WNW16	WNW13	WNW11	NW8	S1	E3	W7.3	W25
8-Jun	E1	WNW6	NW6	NNW3	N2	NW4	N7	NNW8	N9	NNW8	NNW8	NNE7	NNW6	NW4	N3	ESE1	NE4	N5	N6	NE9	N3	WNW4	ENE1	NNW1	N4.1	NE9
9-Jun	NW3	W4	NW1	NE1	WNW4	NE2	E4	ESE4	SE7	SE9	SE10	SE9	SSE7	SE9	SE9	S6	S7	S8	SSW9	S5	SE5	SE4	SE4	SE6	SSE4.0	SE10
10-Jun	SE6	SE6	SE6	SE8	SE8	SE7	SE8	SE9	SSE8	SSE9	SSE10	SSE12	SSE13	SSE14	SSE14	SSE14	S13	SSE13	SSE12	SSE9	SSE8	SSE9	SE7	SSE10	SSE9.6	SSE14
11-Jun	SE7	ESE2	SSE3	WSW1	SE4	SE5	W4	W14	WNW11	WNW8	WNW10	NW10	NW13	NW10	NW8	NW14	NW15	NW14	WNW10	WNW8	NNW6	NW4	NW1	E2	NW5.6	NW15
12-Jun	NE1	NW2	ENE1	ENE1	E1	NNW3	NW6	NNW7	NNW5	NNE8	NNE7	NNE9	NNE11	N6	NNE7	N4	ENE6	NE6	NNE6	NNW4	N4	NNE4	E4	SE11	NNE4.0	NNE11
13-Jun	SE10	SE9	SE11	SE14	SE17	SE12	SE10	SE8	S7	S7	ESE10	ESE7	E5	N13	N12	NNW9	N12	N19	NE14	N7	NNW9	NNW11	N10	NNE11	ENE4.0	N19
14-Jun	N9	N10	NNW5	NNW9	N9	N12	N13	N15	N19	N18	NNE17	NNE18	N17	N15	N16	N17	NNW15	N15	N15	N16	N17	N14	NNW14	NNW16	N13.8	N19
15-Jun	NNW19	NNW16	NNW16	NNW16	NNW17	NNW14	NNW12	NNW13	NW10	NW10	NNW9	N6	NE4	NNE6	NNW9	NNW8	N9	N9	NW6	ENE1	SE3	SE2	E2	E3	NNW7.9	NNW19
16-Jun	W6	W5	ESE2	S5	SE7	SE7	SE10	SE9	SE9	SE9	SE11	S7	SW13	SW14	SW12	SSW10	S9	SSE7	SW10	S7	SSE6	WSW12	WSW14	WSW18	SSW6.2	WSW18
17-Jun	SW6	S4	S4	SSE5	SE4	WSW9	W11	WSW14	WSW15	W13	W12	W16	W19	W17	W18	W16	WNW15	W14	N12	NNE8	NW3	SSW1	WNW2	W3	W7.9	W19
18-Jun	NNW2	E1	SE3	NNW3	NNE4	NE5	N5	N6	NNW7	NNE10	N12	N15	NNE15	NNE19	NNE19	NE21	NE21	NE20	NE20	NE18	NNE12	N13	NNE15	NNE16	NNE11.1	NE21
19-Jun	N11	N10	N13	NNE16	NNE16	NNE21	NNE27	NNE29	NNE31	NNE27	NNE23	NNE14	NNE23	NNE29	NNE30	NNE27	NNE24	NNE24	N21	N21	N20	N19	N18	NNW15	NNE20.8	NNE31
20-Jun	N14	N16	N14	N17	N17	N16	N16	N18	N17	N19	N18	N15	NNW12	NNW13	NW11	NW10	NNW10	NW11	NW10	NW9	NW7	NW8	NW6	NNW6	NNW12.3	N19
21-Jun	NW7	NW5	WNW5	NW6	NNW7	NW9	NW10	NNW11	N11	N10	N11	N10	N10	N11	NNW12	N11	N11	NNE11	NE9	ENE7	ESE4	UO	UO	ESE2	N7.4	NNW12
22-Jun	NE0	W1	WNW2	ENE1	E1	SE5	SE6	SE4	SE6	SSE6	SE8	SE8	SE7	WSW7	W18	W15	W16	W14	WSW12	W7	WNW2	ESE3	ESE2	SSE1	SW2.9	W18
23-Jun	ESE2	E1	WNW1	WNW2	ESE2	E2	SE5	SE8	SE8	SE8	SE8	SE8	SSE6	SE11	SE9	ESE12	ESE8	SE6	SE5	SE3	SE3	SE6	SE7	SSE4	SE5.2	ESE12
24-Jun	E4	SE4	SE6	SE8	SE8	SE9	SE11	SE9	SE11	SE10	WSW10	W13	W13	WSW12	W14	NNE15	WNW3	N8	NNW9	NNW17	NNE9	N13	NNE15	NNE12	N1.3	NNW17
25-Jun	NNE9	NNE7	N7	N7	N6	NNW4	NE10	ENE9	ENE6	ESE5	ENE7	ENE7	NW2	NNW4	NNW7	NNW8	N9	N9	NNW7	NNW5	NNE1	SE4	ESE2	ESE3	NNE4.4	NE10
26-Jun	SE5	SSE8	SSE8	SE5	SE6	SE6	SE7	SE7	SE9	SE7	SSE9	SSE10	S5	SSW5	WSW8	W12	NNE19	NNW5	WSW6	SSE6	ESE3	SE3	ESE3	NNW2	SSE3.3	NNE19
27-Jun	ESE1	N1	NNW4	N2	E1	E2	NNE4	NNW8	NNW9	NNW10	NNW11	N9	N5	NNW9	NW11	NW10	WNW5	NNW2	N1	NNW2	NNW3	NE0	ESE3	SE2	NNW3.9	NNW11
28-Jun	SE6	SE8	SE8	SE6	SSE7	SE10	SE10	SE9	SE11	SE12	SE12	SE11	SE7	ENE3	NNW4	W9	WSW8	SE7	SSE8	S7	SSE5	SE3	NE1	ENE1	SE5.7	SE12
29-Jun	ESE2	E1	SE3	SSE2	ESE3	SE6	SE7	SE8	SE11	SE11	SE10	SE13	SSE9	SSW8	W16	WSW22	W10	SE4	SE6	SE7	SSE5	SSW8	SW11	SW12	S4.9	WSW22
30-Jun	SW8	SE4	SE7	SE7	SE6	SE6	SE5	SE6	SE7	SE8	WSW7	W12	WSW16	W18	W17	W21	W19	W18	W17	W16	WSW13	WSW10	WSW10	W11	WSW7.9	W21
NNW1.0 NNW0.9 NNE0.5 NNE0.9 ENE1.3 NE1.4 NE2.0 N1.6 NNE1.6 NE2.2 NNE1.9 N1.8 NW3.2 NW4.6 NW5.3 NW5.5 NNW4.7 NNW3.5 NNW2.8 N2.4 N1.6 NNW1.4 NW1.8 NNW1.4																								Diurnal Average		
W21 W22 NNW16 N17 NNW17 NNE21 NNE27 NNE29 NNE31 NNE27 NNE23 W22 W25 NNE29 NNE30 NNE27 NNE24 NNE24 N21 N21 N20 N19 W27 WSW18																								Diurnal Maximum		

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Lower Camp - June 2023

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

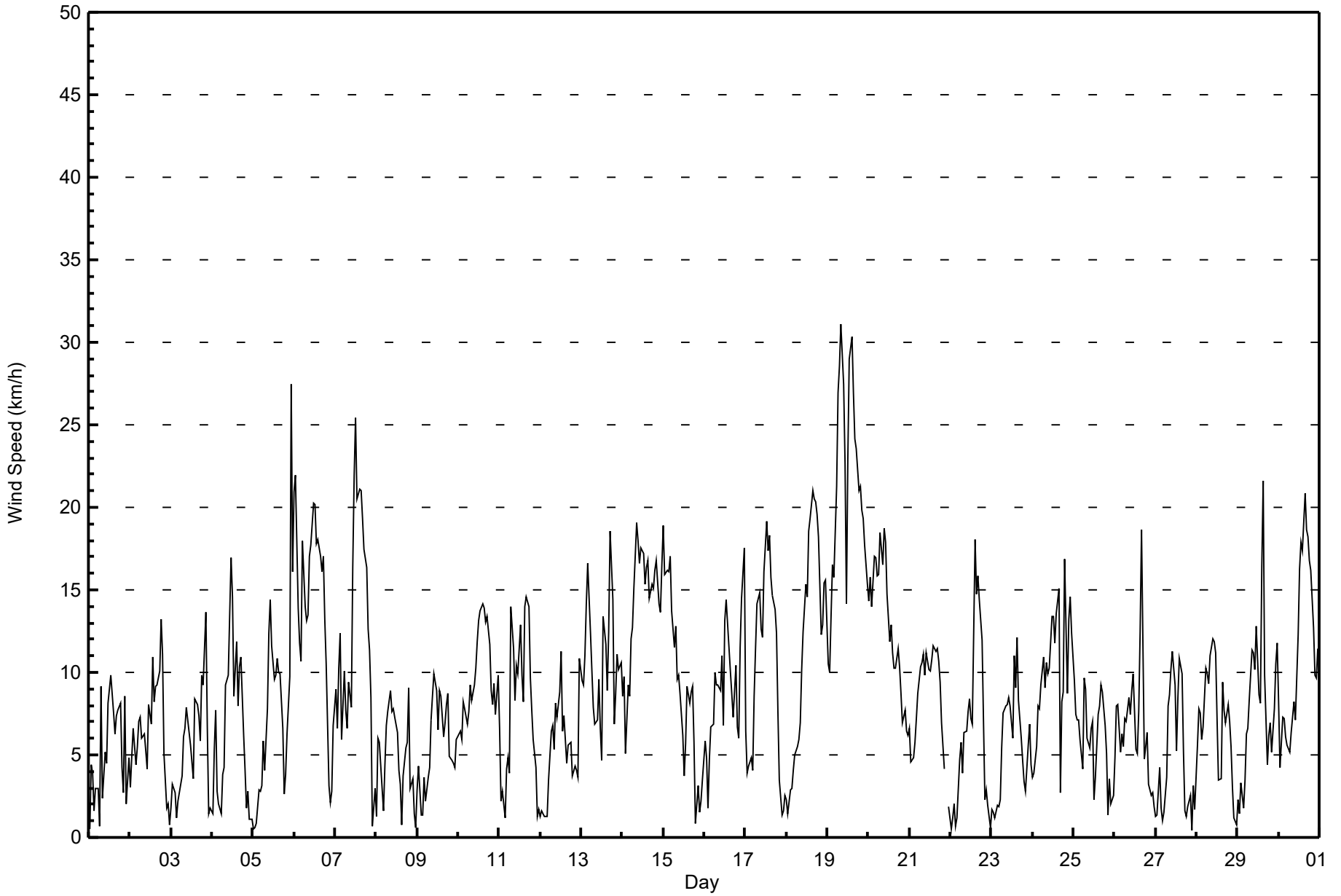
6	6	6	6	5	6	6	7	7	6	7	6	6	7	7	7	7	8	5	8	5	5	6	7	4	
Diurnal Maximum																									

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Lower Camp - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	210	29.25	29.25
6 - 11	318	44.29	73.54
12 - 19	159	22.14	95.68
20 - 28	27	3.76	99.44
29 - 38	4	0.56	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
Lower Camp - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	15	8	11	10	20	28	29	11	7	4	1	1	6	11	19	29	210
6 - 11	35	20	7	8	1	10	97	24	9	5	4	14	6	9	32	37	318
12 - 19	38	18	3	0	0	3	9	8	1	0	4	18	31	6	4	16	159
20 - 28	3	8	4	0	0	0	0	0	0	0	0	2	7	3	0	0	27
29 - 38	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	58	25	18	21	41	135	43	17	9	9	35	50	29	55	82	718

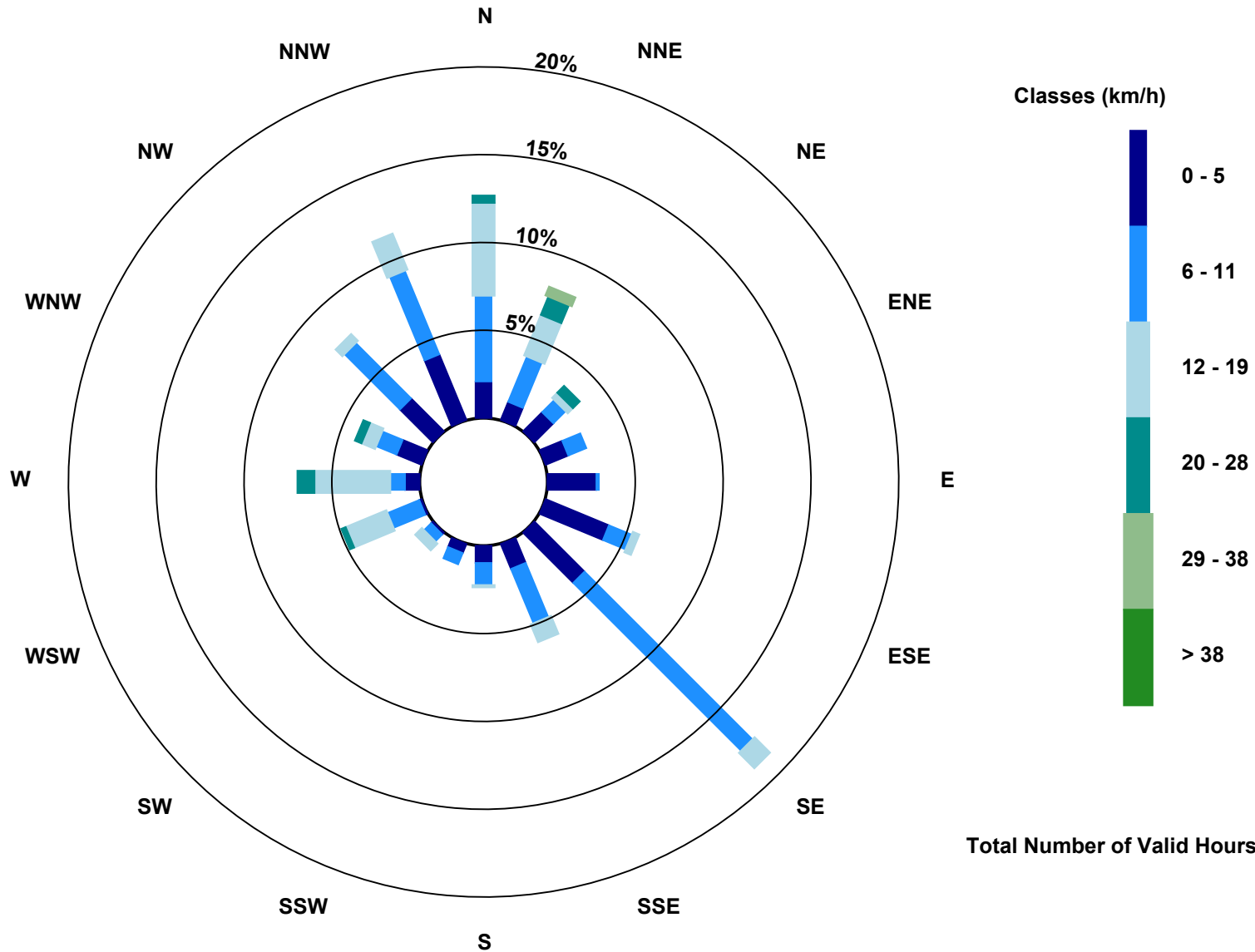
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Lower Camp



Total Number of Valid Hours: 718



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Lower Camp - June 2023

Direction of Maximum Speed: 31 deg on Jun 19 09:00 Direction of Maximum Daily Speed Average: 15.5 deg on Jun 19	Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2
Direction of Minimum Speed: 39 deg on Jun 27 22:00 Direction of Minimum Daily Speed Average: 1.3 deg on Jun 24	Percent Operational Time: 99.7
Monthly Average Direction: 343.7 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-Jun	194	121	341	32	111	128	148	238	182	125	21	20	354	351	330	324	9	53	74	89	113	121	88	309	32.4
2-Jun	307	316	314	340	313	327	338	323	313	315	336	303	304	317	343	332	16	71	54	54	61	331	9	1	346.5
3-Jun	43	281	290	14	319	337	321	349	316	345	35	25	28	63	131	139	136	136	134	123	121	112	236	354	84.7
4-Jun	110	139	121	320	155	124	105	104	96	108	134	126	125	128	123	126	127	138	139	129	40	155	304	342	123.8
5-Jun	124	54	4	323	337	360	338	331	20	26	39	29	18	349	355	346	327	315	335	345	296	254	269	286	335.1
6-Jun	272	271	255	240	241	251	257	257	262	269	266	258	268	266	259	261	250	244	242	254	210	100	115	142	256.4
7-Jun	144	145	154	157	161	117	114	213	248	188	253	261	271	286	286	284	292	300	303	290	284	304	186	98	263.7
8-Jun	89	299	320	338	1	308	4	343	355	340	343	13	342	321	5	108	38	10	352	48	350	295	78	334	351.3
9-Jun	307	280	320	54	299	40	85	119	126	132	129	137	156	132	125	181	178	191	208	169	145	139	125	140	148.5
10-Jun	137	139	144	136	140	140	139	139	162	162	157	158	154	163	159	160	174	166	168	164	159	155	146	156	155.4
11-Jun	131	103	158	251	126	129	267	279	282	293	296	311	319	317	323	309	313	311	302	287	338	319	325	79	303.8
12-Jun	36	326	64	64	91	342	323	340	346	24	15	15	13	353	12	7	72	43	17	342	349	18	91	132	17.2
13-Jun	144	135	127	128	128	132	139	145	169	169	122	115	95	358	352	346	353	2	34	351	338	348	6	20	66.6
14-Jun	358	3	334	330	355	4	7	8	6	9	17	12	8	4	5	355	336	355	354	358	5	353	340	335	358.7
15-Jun	332	336	333	331	329	327	329	329	319	305	328	349	38	32	333	338	353	8	322	63	140	130	98	100	336.9
16-Jun	274	267	116	170	137	140	133	138	137	139	146	177	231	233	221	198	184	166	225	181	157	247	253	255	197.5
17-Jun	227	190	176	147	146	249	259	256	257	260	260	266	279	261	264	272	290	278	2	23	324	205	299	278	267.2
18-Jun	346	88	128	336	14	43	360	357	339	31	358	5	12	14	29	38	37	44	38	36	30	11	12	21	23.5
19-Jun	4	360	6	18	13	21	24	25	31	31	33	23	12	13	22	26	20	12	4	0	359	0	355	347	15.5
20-Jun	350	2	356	1	5	3	2	360	353	6	3	354	333	331	326	321	329	320	321	322	307	310	322	333	346.7
21-Jun	323	319	300	314	334	322	321	335	354	0	355	358	0	0	343	357	355	21	42	59	118	UO	UO	105	352.8
22-Jun	56	278	299	63	86	126	129	144	143	152	139	132	132	251	266	267	266	265	255	268	298	118	113	159	228.1
23-Jun	102	81	301	299	105	89	135	135	136	134	135	142	162	129	129	122	118	130	139	132	143	145	145	165	133.6
24-Jun	97	128	143	144	134	139	139	142	142	144	253	272	271	252	268	16	303	352	334	348	14	3	17	27	352.2
25-Jun	32	14	8	359	4	342	43	73	69	108	74	74	320	331	337	328	2	4	345	338	15	129	120	117	22.2
26-Jun	133	148	148	134	137	143	141	142	140	141	150	161	178	196	245	275	16	334	243	158	110	145	109	338	153.0
27-Jun	113	6	340	356	98	80	18	345	340	338	343	8	10	337	313	305	299	347	4	337	334	39	117	146	342.2
28-Jun	143	146	145	145	147	136	134	134	135	134	133	131	140	72	333	266	240	140	147	175	153	129	37	67	144.3
29-Jun	110	101	137	147	119	139	139	136	132	132	136	130	151	201	259	258	263	139	136	130	149	196	219	222	175.0
30-Jun	234	136	138	139	139	135	137	141	144	141	248	265	255	269	261	264	261	261	263	263	253	255	248	268	244.4
337.1 341.0 21.8 31.5 59.7 52.3 38.6 5.9 23.5 51.7 24.1 356.2 317.5 318.5 312.4 310.3 327.1 342.4 343.7 358.4 5.5 339.0 325.1 327.9																									
Diurnal Average																									

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Lower Camp - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 98 deg on Jun 5 01:00	Hours of Data: 718
Minimum Value: 11 deg on Jun 25 18:00	Hours of Missing Data: 2
Percentiles: P ₁ = 12 P ₁₀ = 16 Q ₁ = 20 Median = 26 Q ₃ = 39 P ₉₀ = 66 P ₉₉ = 94	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-Jun	92	37	28	82	51	45	85	25	84	32	45	26	29	24	26	27	22	18	17	19	25	15	84	39	92
2-Jun	55	23	19	56	71	15	19	20	16	27	57	31	45	26	28	28	26	29	13	16	21	71	80	87	87
3-Jun	47	34	41	66	59	49	29	25	19	29	29	59	49	81	30	22	21	22	19	18	12	19	93	70	93
4-Jun	88	34	24	54	73	94	66	47	13	16	23	15	17	23	15	16	21	20	37	34	73	51	97	63	97
5-Jun	98	62	77	44	35	65	21	35	24	25	26	25	26	27	26	22	18	34	75	48	18	23	18	18	98
6-Jun	15	14	24	19	21	15	18	18	20	15	17	18	19	22	23	21	28	24	31	17	49	46	63	28	63
7-Jun	26	40	22	22	66	41	50	44	32	43	38	20	14	18	15	15	17	14	14	15	11	35	81	24	81
8-Jun	69	27	18	55	72	29	23	25	29	35	38	29	41	58	59	87	38	26	20	16	57	49	95	95	95
9-Jun	32	18	72	50	24	64	25	27	18	22	25	29	57	31	22	54	51	40	31	28	21	23	30	29	72
10-Jun	27	26	39	35	37	30	27	31	42	38	39	39	33	35	35	34	35	32	31	33	27	26	28	30	42
11-Jun	42	75	86	89	31	25	94	17	17	25	29	30	29	29	34	17	17	11	15	28	20	29	74	60	94
12-Jun	51	65	39	38	54	43	17	28	44	23	34	21	12	30	17	26	36	22	30	43	47	33	47	28	65
13-Jun	33	36	34	24	18	27	33	34	45	42	17	33	52	19	21	20	30	21	37	59	28	28	30	25	59
14-Jun	24	26	48	21	28	20	18	18	18	17	16	17	19	26	23	25	17	22	24	24	22	24	20	17	48
15-Jun	14	17	16	16	14	16	17	14	25	18	18	36	32	18	17	23	23	16	23	76	18	85	56	38	85
16-Jun	78	96	82	38	30	37	25	28	26	24	30	41	39	27	33	35	36	34	45	35	30	48	16	15	96
17-Jun	40	42	29	27	28	64	20	20	17	20	24	19	15	20	16	17	17	18	59	38	56	69	65	64	69
18-Jun	68	74	38	56	38	36	37	26	27	31	22	22	24	20	20	17	19	18	15	14	20	14	16	19	74
19-Jun	24	22	19	20	22	16	15	15	16	14	16	39	16	15	14	14	15	15	19	20	22	20	21	21	39
20-Jun	23	21	23	20	19	20	20	21	22	20	21	23	16	16	14	13	19	13	12	12	14	14	15	18	23
21-Jun	18	22	18	16	18	13	12	19	22	23	25	25	31	23	26	25	25	29	27	27	22	UO	UO	44	44
22-Jun	72	84	53	71	74	28	31	38	27	33	28	21	23	68	15	15	14	14	16	21	66	28	74	94	94
23-Jun	75	60	86	56	61	38	21	21	20	18	23	25	69	21	19	13	20	27	42	23	20	17	15	40	86
24-Jun	24	21	22	18	17	20	18	19	15	27	45	22	21	29	25	48	86	45	23	21	34	24	21	19	86
25-Jun	20	21	18	20	23	34	28	22	38	42	38	54	95	78	35	29	17	11	24	27	59	13	63	24	95
26-Jun	19	18	21	40	26	26	20	19	20	23	26	32	40	56	62	31	23	45	56	44	65	58	68	71	71
27-Jun	71	69	19	62	79	64	39	22	22	22	23	22	66	29	21	16	62	83	83	68	47	83	37	78	83
28-Jun	24	20	20	23	23	21	19	20	17	16	16	19	57	58	29	48	32	35	29	33	24	51	76	85	85
29-Jun	47	53	37	72	61	18	25	23	17	16	22	16	42	58	27	18	45	73	36	17	29	31	29	28	73
30-Jun	31	34	18	20	25	28	26	28	37	39	66	30	23	19	21	16	21	18	17	15	14	13	21	21	66
	98	96	86	89	79	94	94	47	84	43	66	59	95	81	62	87	86	83	83	76	73	85	97	95	

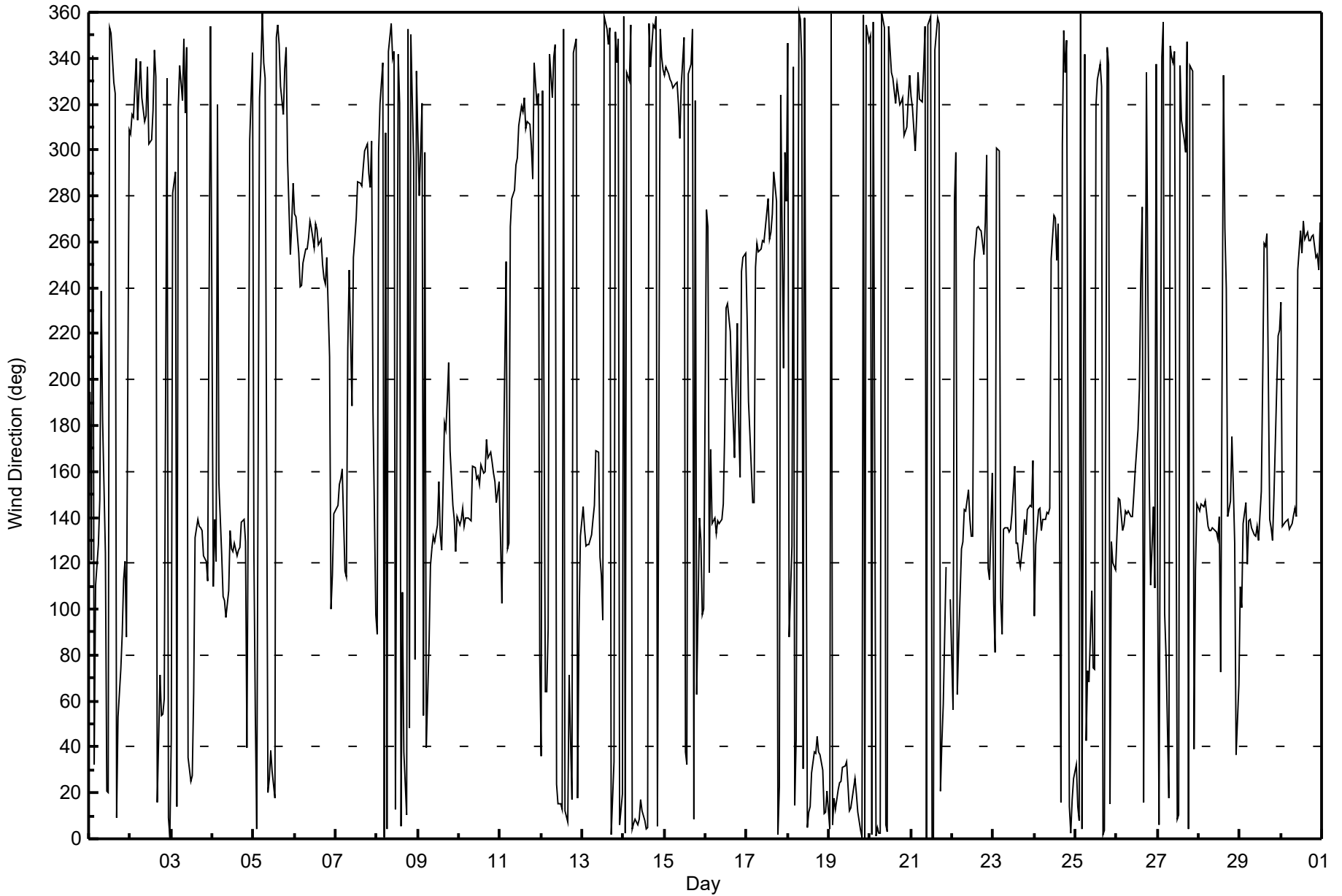
Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Lower Camp - June 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS13 FORT MCKAY SOUTH JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
JUNE 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	679	34	41	99.03	39.6	0	8.4	0
TRS(ppb) Average	624	33	96	91.25	3.7	0	1.3	0
THC(ppm) Average	676	34	44	98.61	3.1	-	2.2	-
NMHC(ppm) Average	676	34	44	98.61	0.606	-	0.066	-
CH4(ppm) Average	676	34	44	98.61	3	-	2.2	-
O3(ppb) Average	679	33	41	98.89	70.9	0	38.4	-
NO2(ppb) Average	677	35	43	98.89	24.5	0	9.5	-
NO(ppb) Average	677	35	43	98.89	54	-	4	-
NOX(ppb) Average	677	35	43	98.89	66.6	-	12.5	-
PM2.5(ug/m3) Average	713	2	7	99.31	322.8	100	207.7	12
ET(C) Average	720	0	0	100	31.5	-	23.3	-
RH(%) Average	720	0	0	100	99	-	96	-
WS(km/h) Average	719	0	1	99.86	30	-	24	-
WD(deg) Average	719	0	1	99.86	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
 JUNE 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	679	1.91	5	-	0	0.3	0.4	0.5	0.8	2.9	39.6
TRS(ppb) Average	624	0.64	0.4	-	0.2	0.4	0.4	0.5	0.7	1.1	3.7
THC(ppm) Average	676	2.09	0.1	-	2	2	2	2	2.1	2.2	3.1
NMHC(ppm) Average	676	0.01	0.046	-	0	0	0	0	0	0	0.606
CH4(ppm) Average	676	2.08	0.1	-	2	2	2	2	2.1	2.2	3
O3(ppb) Average	679	20.92	14.7	-	0	2.6	8.3	19.8	31	40.6	70.9
NO2(ppb) Average	677	4.09	3.9	-	0	0.6	1.3	3	5.6	9.3	24.5
NO(ppb) Average	677	1.23	3.3	-	0	0	0	0.2	1	3.2	54
NOX(ppb) Average	677	5.31	6	-	0	0.6	1.5	3.4	6.8	12.5	66.6
PM2.5(ug/m3) Average	713	42.84	53.9	-	2	5	10.7	24.9	49.4	116.6	322.8
Temperature 2 m (C) Average	720	17.16	5.9	-	2.8	10.1	12.2	17	21.6	25.1	31.5
Relative Humidity (%) Average	720	68.39	22.1	-	23.4	38	49.1	70	89.9	95.9	99
Wind Speed 10 m (km/h) Average	719	8.4	6	-	0	2	4	7	12	17	30
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, PM2.5	16 Jun 2023 19:00	16 Jun 2023 23:00	5	Station power failure
TRS, NMHC, NO2, O3	16 Jun 2023 19:00	17 Jun 2023 00:00	6	Station power failure
ALL GASEOUS ANALYZERS	30 Jun 2023 10:00	30 Jun 2023 11:00	2	Maintenance - sample manifold cleaned
TRS	04 Jun 2023 03:00	06 Jun 2023 01:00	47	Unstable Operation - excessive baseline noise
TRS	29 Jun 2023 16:00	29 Jun 2023 23:00	8	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	23 Jun 2023 09:00	23 Jun 2023 10:00	2	Maintenance - replaced support gas cylinder
Wind Speed, Wind Direction	09 Jun 2023 01:00	09 Jun 2023 01:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 39.6 ppb on Jun 22 09:00	Maximum Daily Average: 8.4 ppb on Jun 10		Hours of Data:	679
Minimum Value: 0.0 ppb on Jun 20 06:00	Minimum Daily Average: 0.1 ppb on Jun 20		Hours of Missing Data:	41
Maximum Diurnal Average: 6.5 ppb at hour 10	Minimum Diurnal Average: 0.4 ppb at hour 2		Hours of Calibration:	34
Monthly Average: 1.91 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.8 P ₉₀ = 2.9 P ₉₉ = 27.8		Percent Operational Time:	99.0

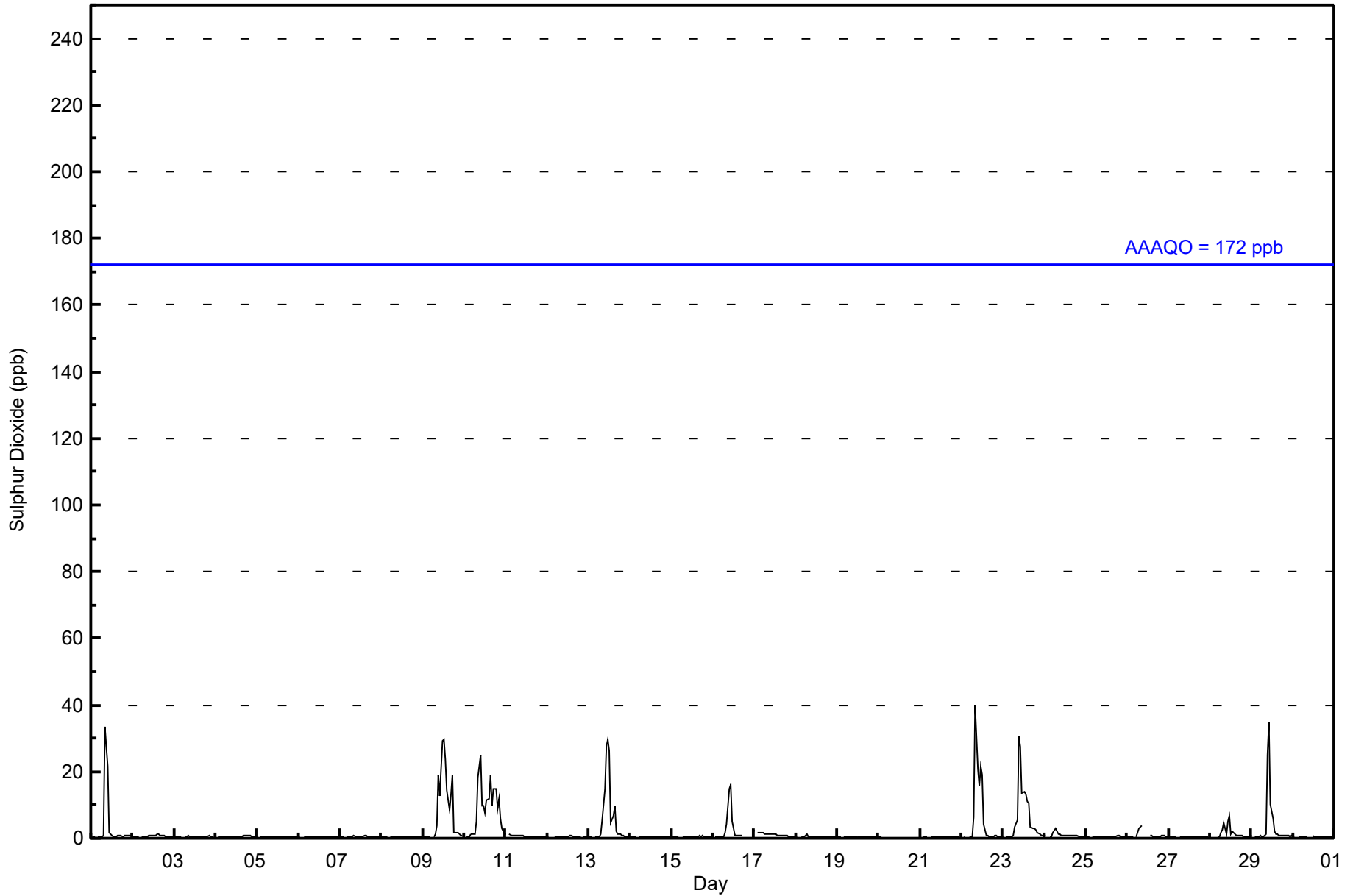
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.6	0.4	0.5	Z	0.5	0.4	0.6	0.8	33.4	21.4	1.9	1.2	0.7	0.6	0.6	0.7	0.7	0.7	0.5	0.6	0.9	0.8	0.7	0.7	3.0	33.4
2-Jun	0.6	0.6	0.6	0.5	Z	0.5	0.4	0.4	0.6	0.9	0.7	0.7	0.8	0.9	1.1	1.2	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.4	0.7	1.2
3-Jun	0.4	0.4	0.3	0.3	0.3	Z	0.4	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.7	0.6	0.6	0.5	0.5	0.7
4-Jun	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	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.6	0.5	0.5	0.6	0.8
5-Jun	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5
6-Jun	0.3	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4
7-Jun	0.3	0.2	0.3	Z	0.3	0.5	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.3	0.5	0.7
8-Jun	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.4	0.6
9-Jun	0.2	0.3	0.2	0.3	0.4	Z	0.5	1.1	3.6	19.1	12.5	29.1	29.8	23.7	14.4	8.3	13.3	19.0	1.8	1.5	1.6	1.1	0.9	0.7	8.0	29.8
10-Jun	Z	0.5	0.5	0.5	1.4	1.2	1.3	5.1	18.2	25.1	9.9	9.7	7.7	11.3	12.0	19.0	9.8	14.8	14.8	8.8	12.0	6.0	2.9	1.3	8.4	25.1
11-Jun	1.2	Z	1.4	1.0	0.8	0.9	1.0	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.7	1.4
12-Jun	0.3	0.3	Z	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.6	0.5	0.5	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.8
13-Jun	0.3	0.3	0.2	Z	0.3	0.3	0.5	1.2	5.5	14.9	27.4	29.8	26.4	4.7	6.8	9.9	2.3	1.4	1.2	1.1	0.8	0.6	0.5	0.6	5.9	29.8
14-Jun	0.6	0.5	0.5	0.5	Z	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6
15-Jun	0.4	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.7	0.6	0.7	0.5	0.4	0.3	0.3	0.3	0.4	0.7
16-Jun	Z	0.3	0.3	0.4	0.5	0.4	0.4	1.6	4.3	14.9	16.0	5.2	2.8	1.0	0.8	0.8	0.7	0.7	PF	PF	PF	PF	PF	2.7	3.0	16.0
17-Jun	2.1	Z	1.8	1.7	1.6	1.6	1.4	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.4	1.1	2.1
18-Jun	0.4	0.4	Z	0.3	0.3	0.5	1.2	0.4	0.3	0.4	0.3	0.3	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	1.2
19-Jun	0.3	0.4	0.4	Z	0.4	0.4	0.4	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	0.3	0.3	0.3	0.2	0.4	0.5
20-Jun	0.2	0.2	0.2	0.2	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2
21-Jun	0.2	0.2	0.2	0.2	0.3	Z	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.4	0.5
22-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.5	6.2	39.6	20.7	15.9	21.8	18.9	4.2	0.9	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.5	0.5	5.9	39.6
23-Jun	0.5	Z	0.5	0.4	0.4	0.5	0.7	3.4	5.5	30.5	27.4	13.7	13.8	13.3	11.0	10.4	3.3	3.1	2.9	2.4	1.8	1.3	0.9	0.8	6.4	30.5
24-Jun	0.7	0.7	Z	0.6	0.6	1.6	2.9	2.2	1.4	1.1	0.8	0.8	0.8	0.8	0.9	1.1	1.0	0.8	0.7	0.6	0.5	0.5	0.4	0.4	1.0	2.9
25-Jun	0.4	0.4	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.6	0.5	0.4	0.3	0.3	0.4	0.7
26-Jun	0.2	0.2	0.3	0.3	Z	0.4	1.6	2.9	3.7	C	C	C	C	1.0	0.8	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.9	3.7
27-Jun	0.4	0.4	0.4	0.3	0.3	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.4	0.3	0.5	0.6
28-Jun	Z	0.2	0.2	0.2	0.1	0.2	1.7	2.7	4.7	1.3	5.1	7.0	1.1	2.1	1.2	1.0	0.7	0.6	0.8	0.6	0.6	0.5	0.5	0.5	1.5	7.0
29-Jun	0.7	Z	0.4	0.5	0.6	0.9	0.6	0.6	1.2	25.1	34.6	10.0	6.0	2.0	1.2	1.2	0.9	0.9	0.8	0.9	0.9	0.7	0.6	0.7	4.0	34.6
30-Jun	0.5	0.5	Z	0.5	0.5	0.6	0.4	0.4	0.5	M	M	0.7	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.7
																								Diurnal Average		
																								Diurnal Maximum		

Z - zerspan 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 McKay South - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	642	94.55	94.55
11 - 20	21	3.09	97.64
21 - 60	16	2.36	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: 679

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - June 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	145	62	12	3	4	1	16	29	49	51	72	44	34	24	42	53	641
11 - 20	0	0	0	0	0	0	8	8	4	1	0	0	0	0	0	0	21
21 - 60	0	0	0	1	0	1	1	7	5	0	0	0	0	1	0	0	16
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	145	62	12	4	4	2	25	44	58	52	72	44	34	25	42	53	678

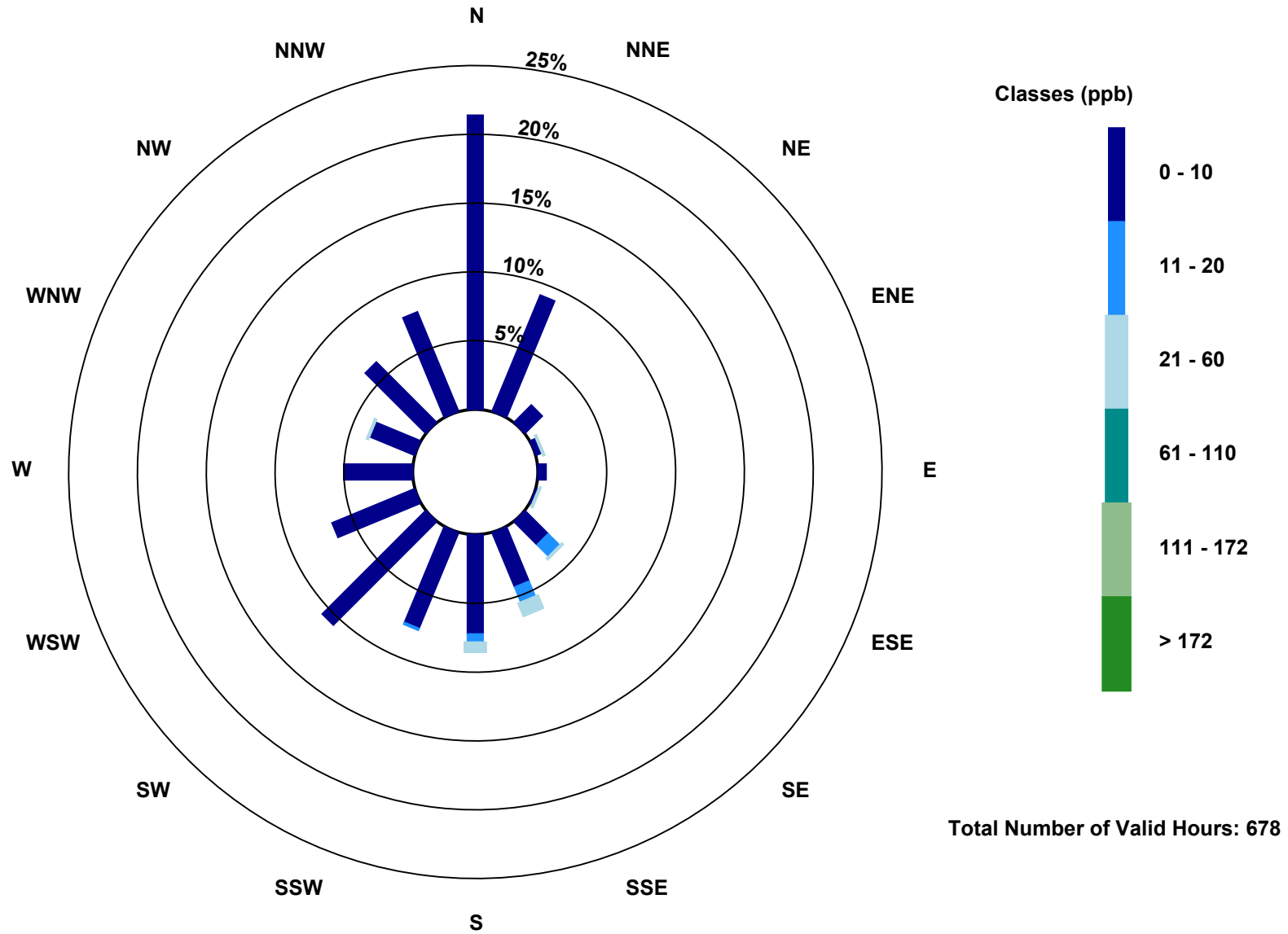
Total Number of Valid Hours: 678

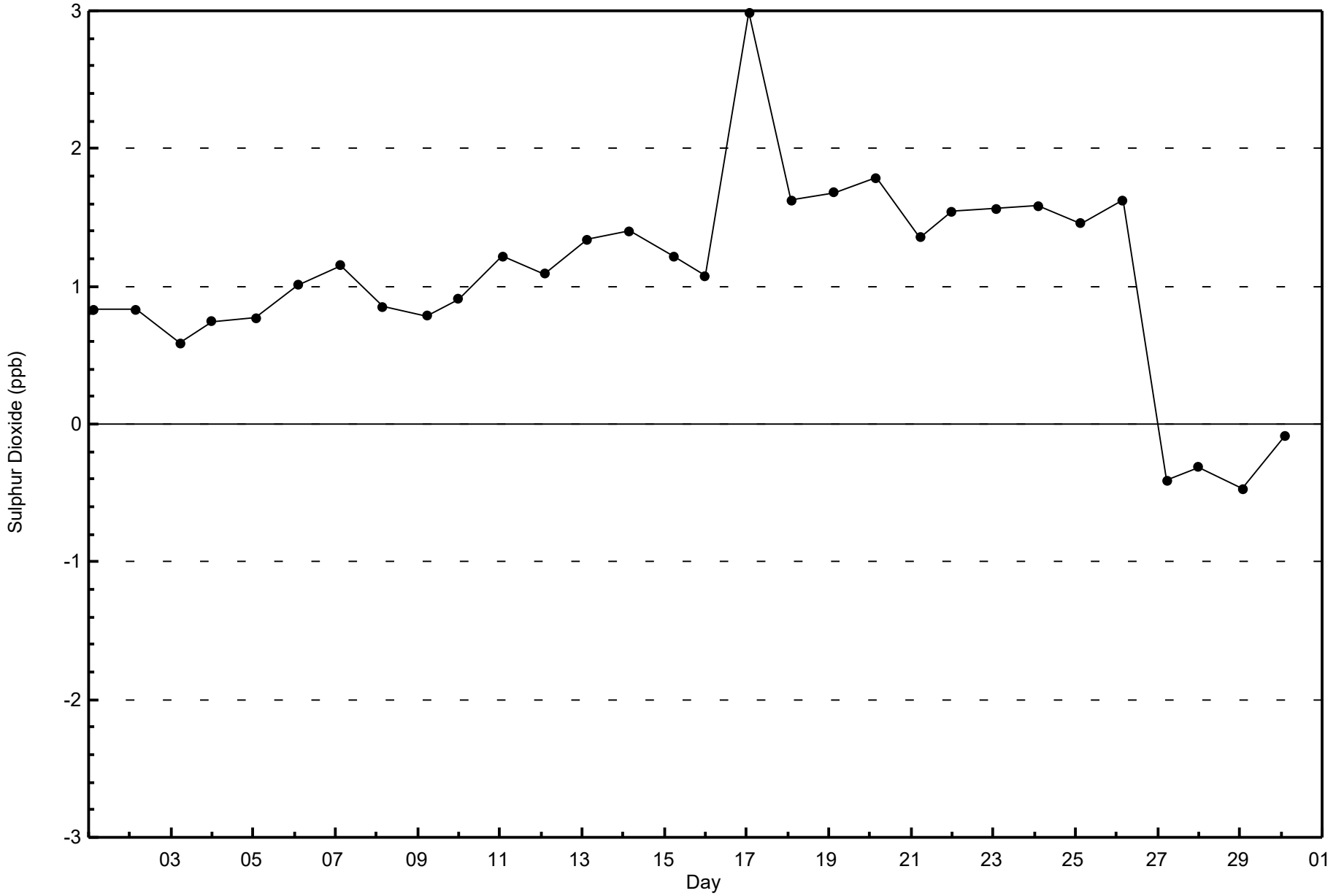
Total Number of Hours: 720

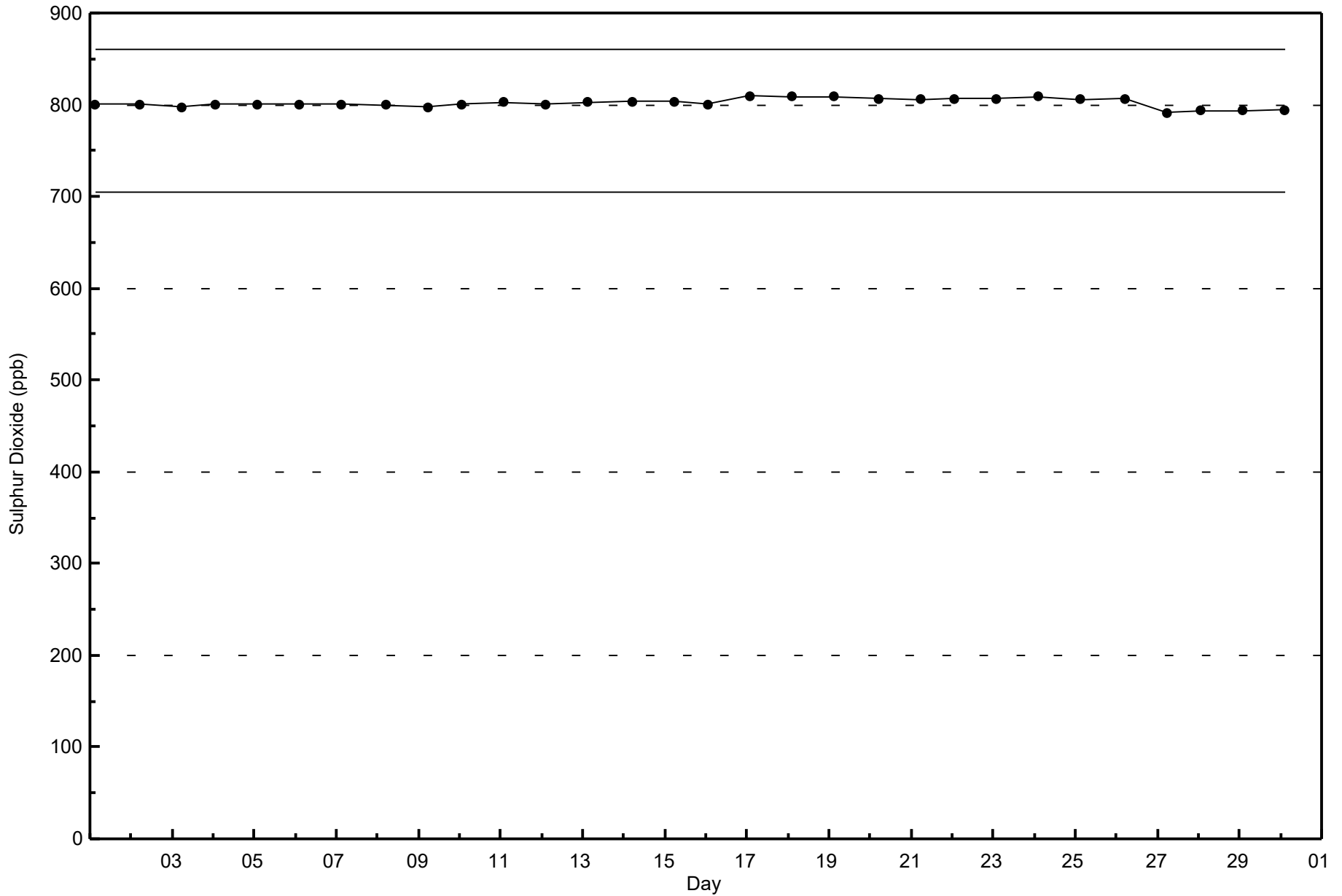


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Fort McKay South









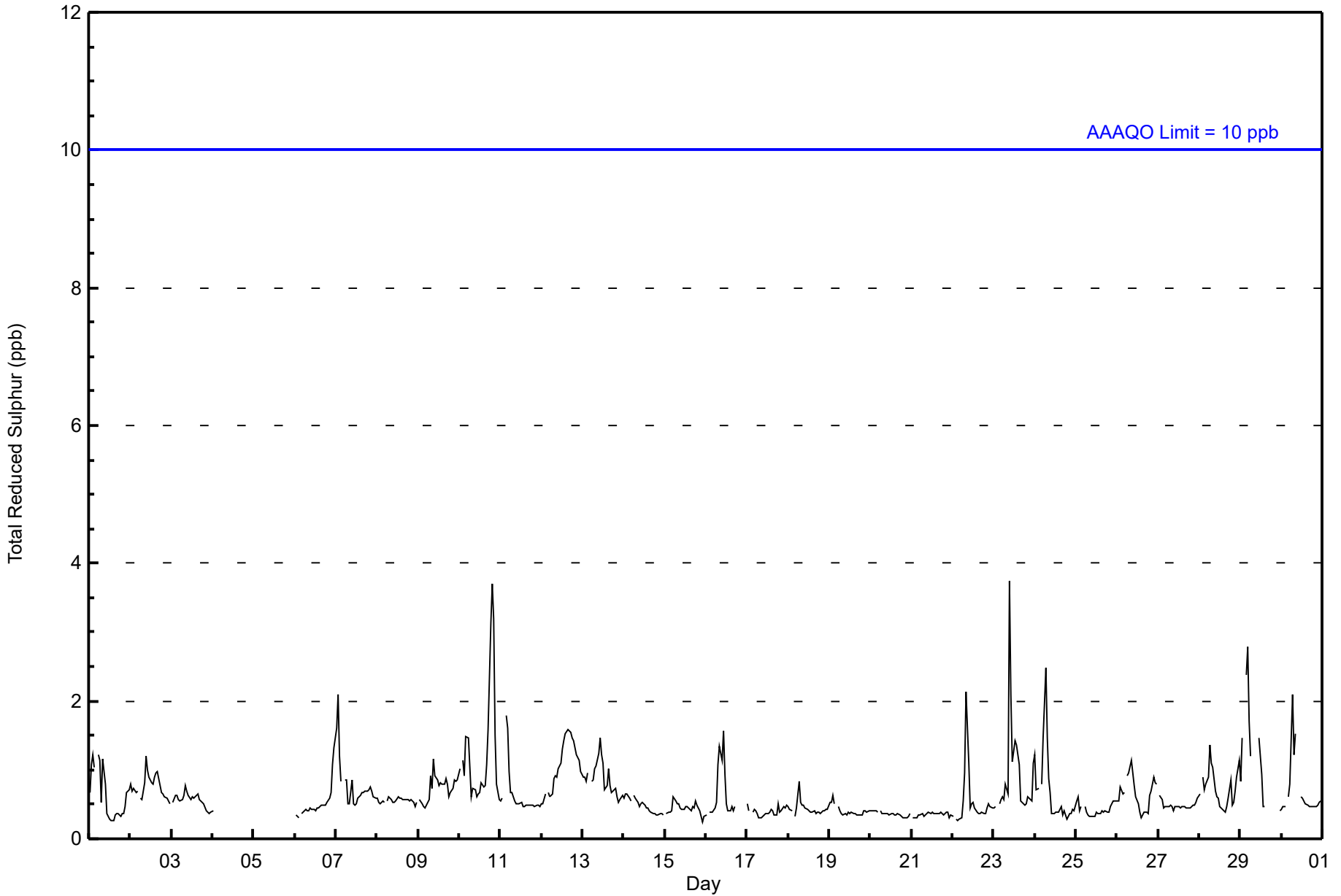
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														720							
Maximum Value: 3.7 ppb on Jun 23 10:00		Maximum Daily Average: 1.3 ppb on Jun 10		Hours of Data: 624														624									
Minimum Value: 0.2 ppb on Jun 15 23:00		Minimum Daily Average: 0.4 ppb on Jun 21		Hours of Missing Data: 96														96									
Maximum Diurnal Average: 0.8 ppb at hour 10		Minimum Diurnal Average: 0.6 ppb at hour 17		Hours of Calibration: 33														33									
Monthly Average: 0.64 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.4 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.7 P ₉₀ = 1.1 P ₉₉ = 2.3		Percent Operational Time: 91.3														91.3									
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-Jun	0.7	1.1	1.2	1.0	Z	1.2	1.1	0.5	1.2	0.8	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.5	0.7	0.7	0.6	1.2		
2-Jun	0.8	0.7	0.7	0.7	0.7	Z	0.6	0.6	0.8	1.2	1.0	0.9	0.8	0.8	0.9	1.0	1.0	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.8	1.2	
3-Jun	Z	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.6	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	0.6	0.8	
4-Jun	0.4	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.4	0.4
5-Jun	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	--	0.4
6-Jun	UO	0.4	0.3	Z	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	0.6	0.7	1.1	1.3	0.5	1.3		
7-Jun	1.6	2.1	1.2	0.8	Z	0.9	0.9	0.5	0.5	0.9	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.8	2.1	
8-Jun	0.6	0.5	0.5	0.6	0.5	Z	0.5	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	0.6	0.5	0.5	0.5	0.6	0.6	
9-Jun	Z	0.6	0.5	0.5	0.5	0.5	0.6	0.9	0.7	1.2	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.6	0.7	0.7	0.9	0.8	0.9	0.7	1.2	
10-Jun	1.0	Z	1.1	0.9	1.5	1.5	1.0	0.6	0.7	0.7	0.6	0.6	0.7	0.8	0.7	0.8	1.1	1.6	3.1	3.7	3.2	1.5	0.8	0.6	1.3	3.7	
11-Jun	0.6	0.6	Z	1.8	1.6	1.0	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.8	
12-Jun	0.5	0.5	0.6	Z	0.7	0.6	0.6	0.9	0.9	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.6	1.5	1.5	1.4	1.2	1.2	1.1	1.0	1.1	1.6	
13-Jun	0.9	0.9	0.8	1.0	Z	0.8	0.8	1.0	1.0	1.3	1.5	1.2	1.1	0.7	0.8	1.0	0.8	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.9	1.5	
14-Jun	0.6	0.7	0.6	0.6	0.5	Z	0.6	0.6	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	0.7	
15-Jun	Z	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.3	0.4	0.6	
16-Jun	0.4	Z	0.4	0.4	0.4	0.4	0.5	1.1	1.3	1.1	1.6	0.9	0.5	0.4	0.4	0.5	0.4	0.5	PF	PF	PF	PF	PF	PF	--	1.6	
17-Jun	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.5	
18-Jun	0.5	0.4	0.4	Z	0.3	0.4	0.8	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8	
19-Jun	0.5	0.5	0.6	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.6	
20-Jun	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	
21-Jun	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	
22-Jun	0.3	Z	0.3	0.3	0.3	0.3	0.5	0.9	2.1	1.1	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	2.1	
23-Jun	0.5	0.5	Z	0.5	0.6	0.6	0.6	0.8	0.7	3.7	2.1	1.1	1.4	1.4	1.2	1.1	0.5	0.5	0.5	0.5	0.6	0.6	0.5	1.1	0.9	3.7	
24-Jun	1.2	0.7	0.7	Z	0.8	1.5	2.5	1.5	0.9	0.7	0.4	0.4	0.4	0.4	0.5	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.7	2.5	
25-Jun	0.6	0.6	0.4	0.5	Z	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.4	0.6	
26-Jun	0.6	0.6	0.8	0.7	0.7	Z	0.9	1.0	1.1	1.0	0.8	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.6	0.7	0.9	0.8	0.8	0.7	1.1	
27-Jun	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.6	
28-Jun	0.6	Z	0.9	0.7	0.8	0.9	1.4	1.1	1.0	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.6	0.8	0.5	0.5	0.7	0.9	1.1	0.7	1.4	
29-Jun	0.8	1.5	Z	2.4	2.8	1.7	1.2	C	C	C	C	1.5	0.9	0.5	0.5	UO	UO	UO	UO	UO	UO	UO	UO	0.4	--	2.8	
30-Jun	0.4	0.5	0.5	Z	0.6	0.8	2.1	1.2	1.5	M	M	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	2.1	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerspan		C - Calibration				M - Maintenance				UO - Unstable Operation				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 McKay South - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	619	99.20	99.20
3 - 4	5	0.80	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: 624

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - June 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	133	60	12	4	4	1	28	45	46	49	71	36	30	20	38	42	619
3 - 4	0	0	0	0	0	1	0	0	3	0	1	0	0	0	0	0	5
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	133	60	12	4	4	2	28	45	49	49	72	36	30	20	38	42	624

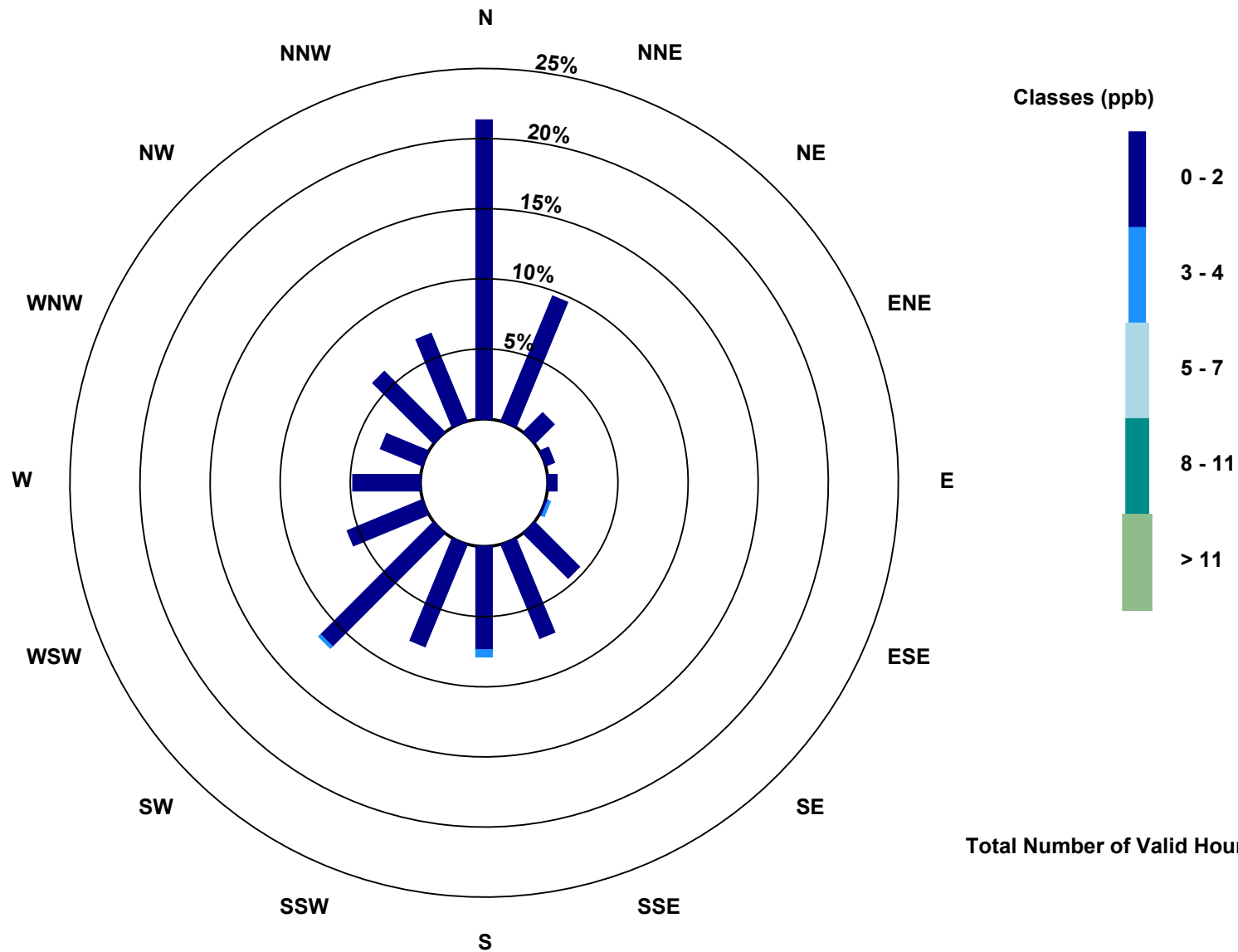
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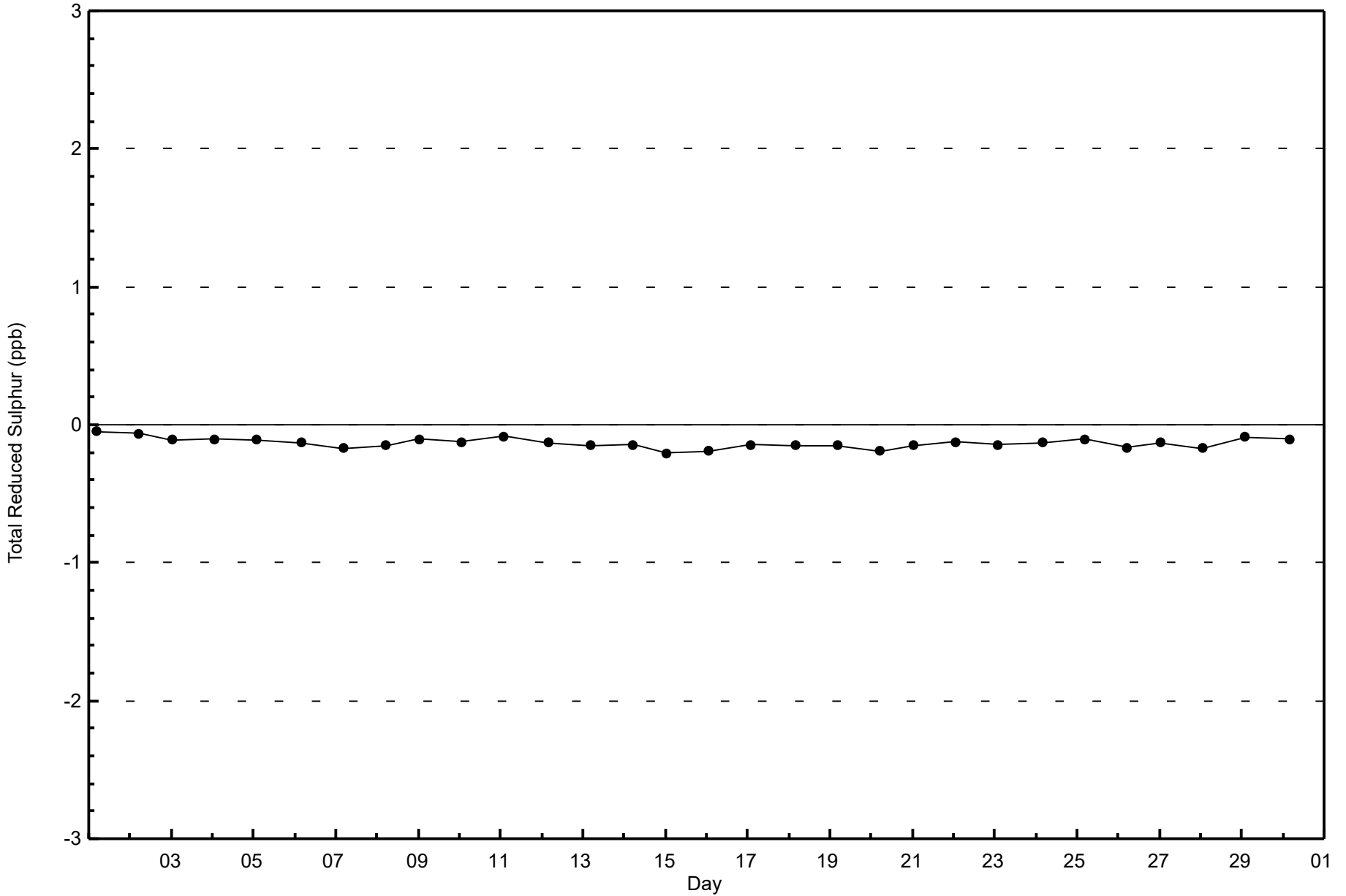
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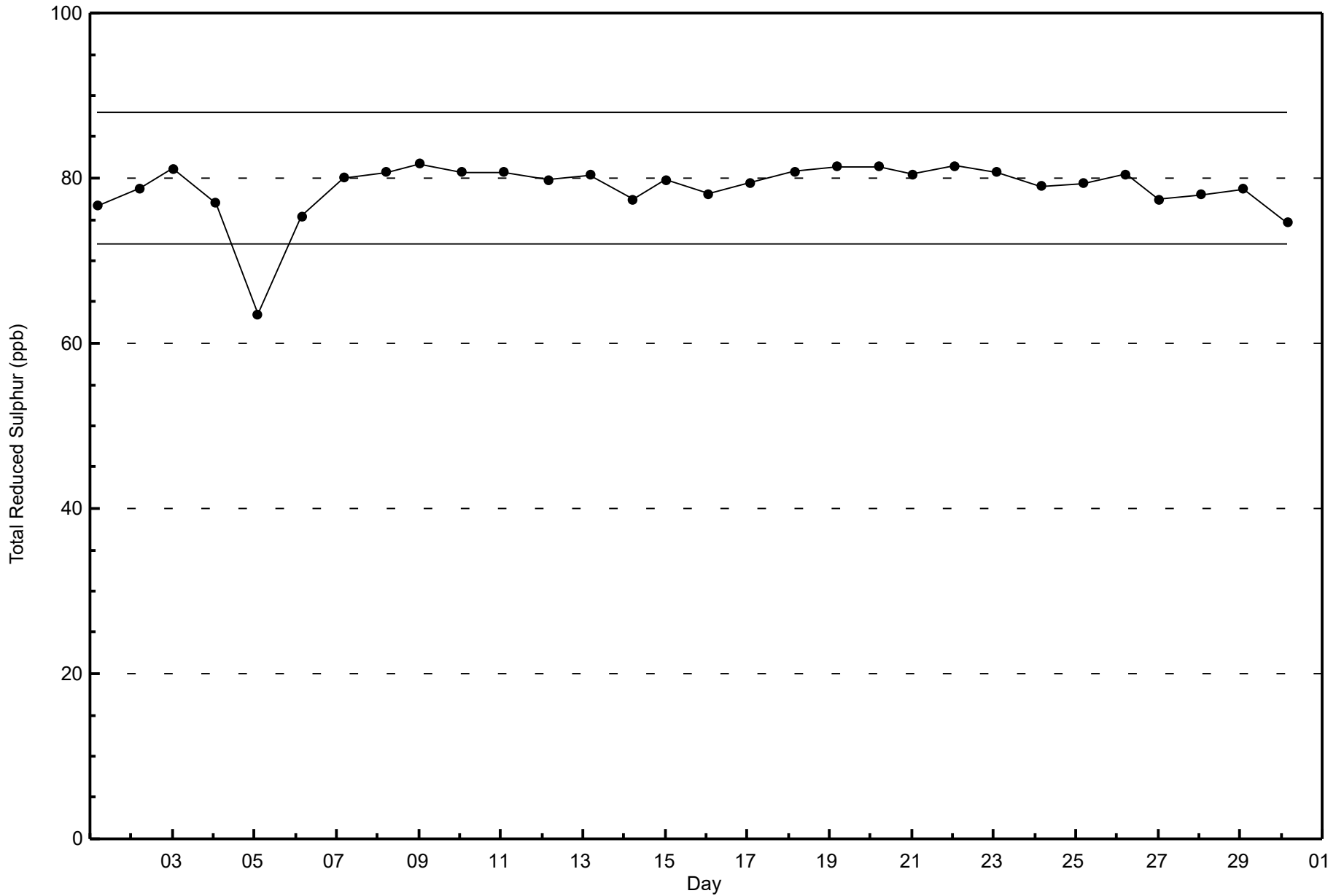


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Fort McKay South



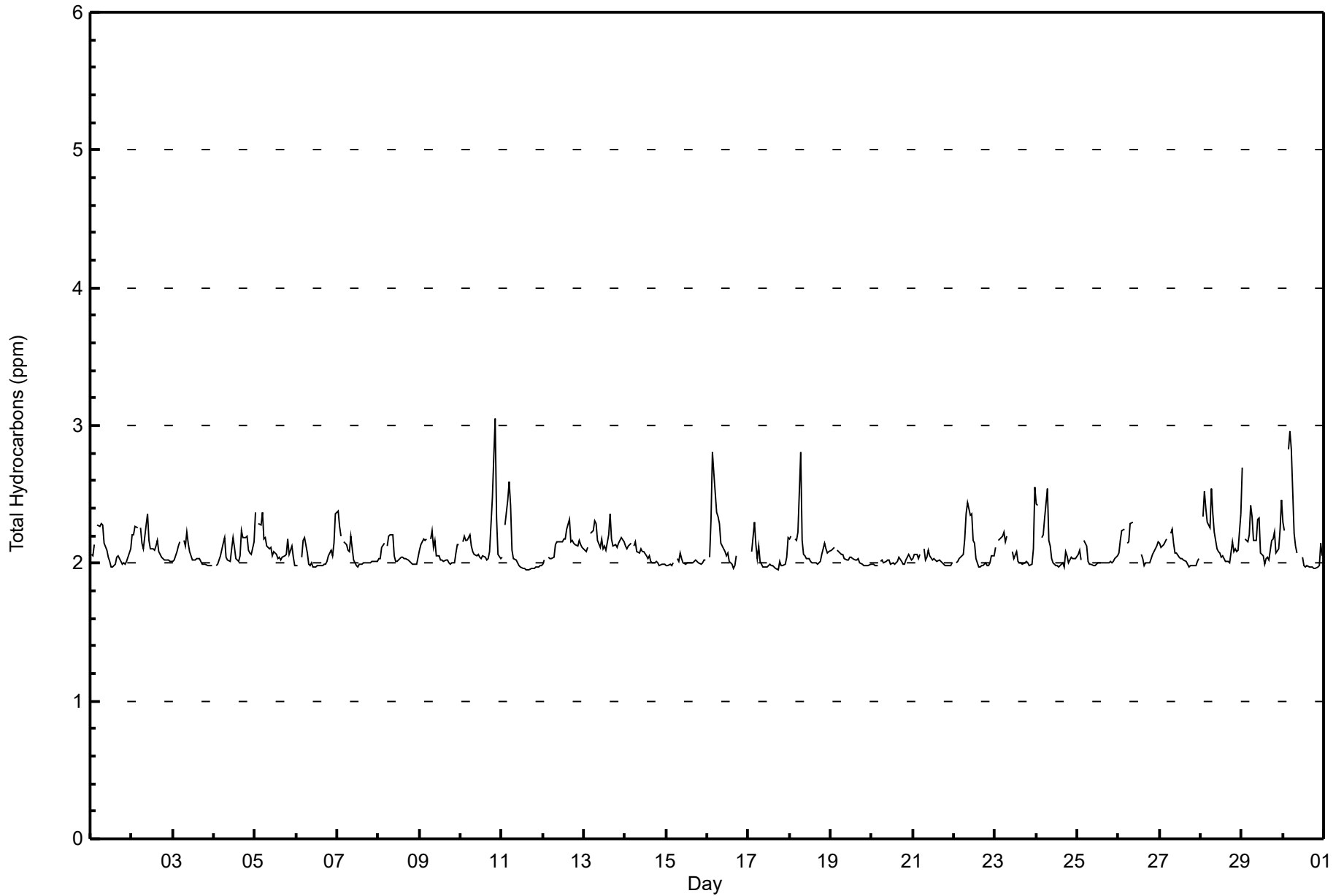






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay South - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay South - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	348	51.48	51.48
2.1 - 3.0	327	48.37	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay South - June 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	76	38	10	3	2	1	6	12	11	19	47	28	24	12	28	31	348
2.1 - 3.0	69	24	2	1	2	0	19	31	46	33	24	16	10	13	14	22	326
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	145	62	12	4	4	1	25	43	58	52	71	44	34	25	42	53	675

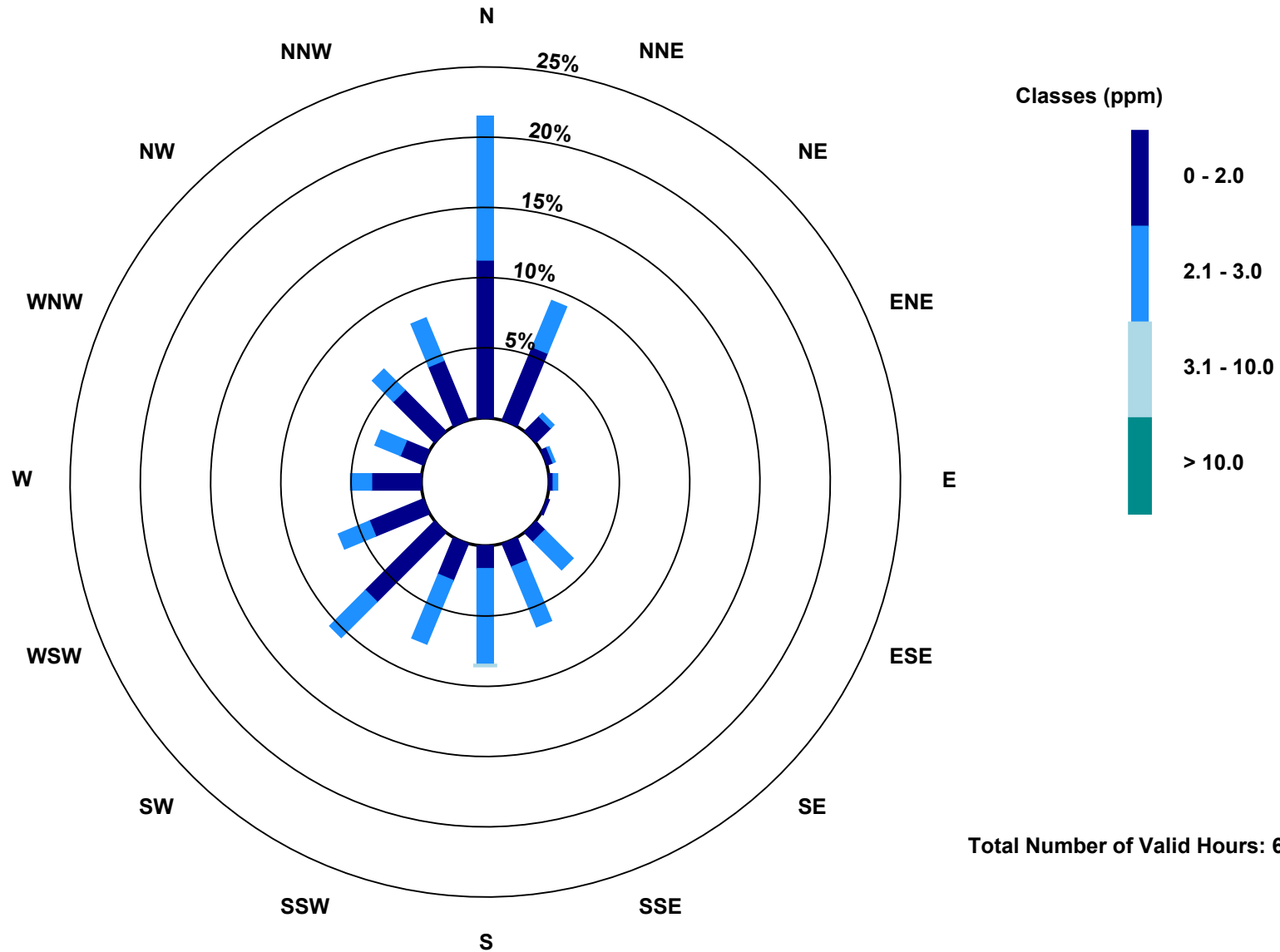
Total Number of Valid Hours: 675

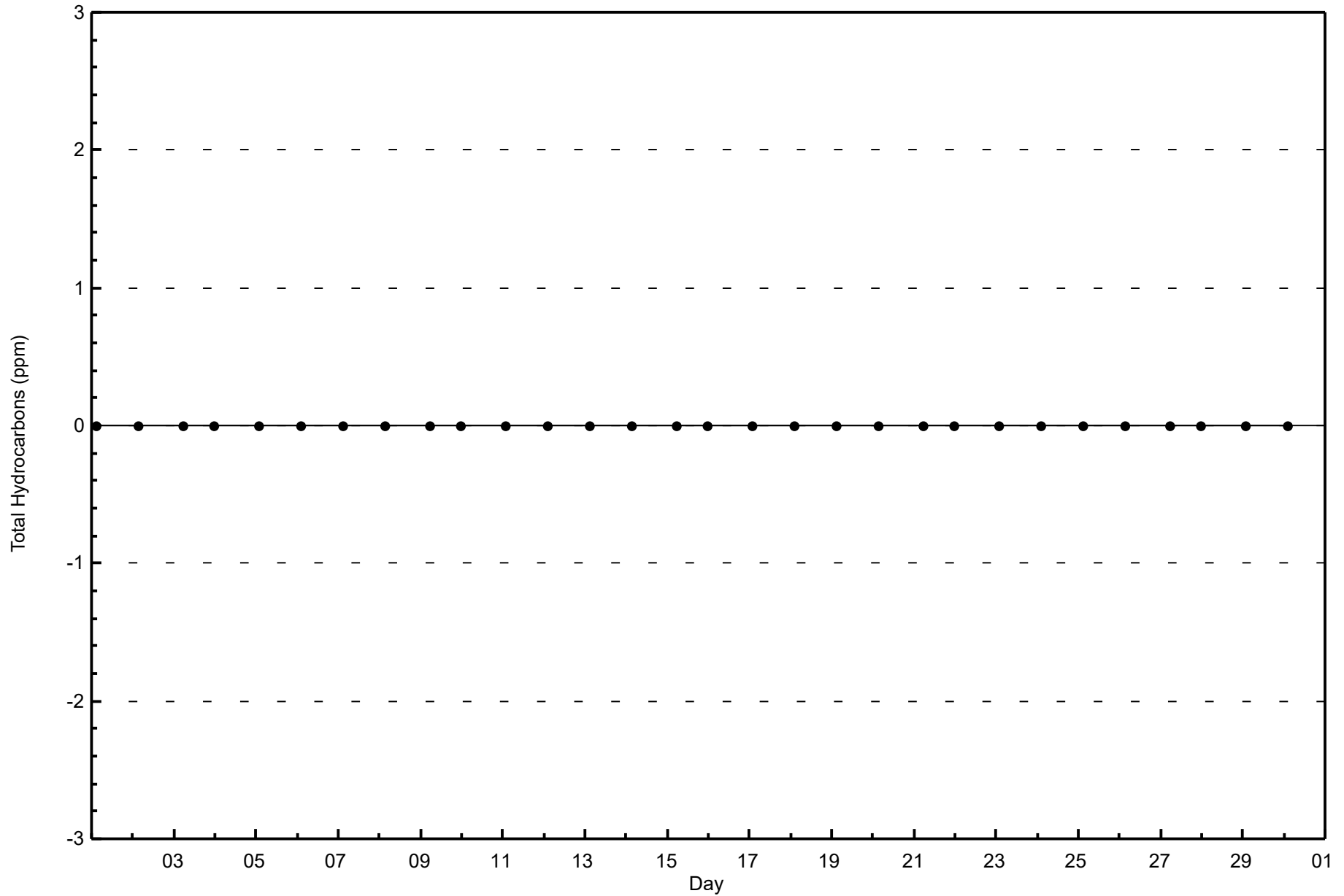
Total Number of Hours: 720

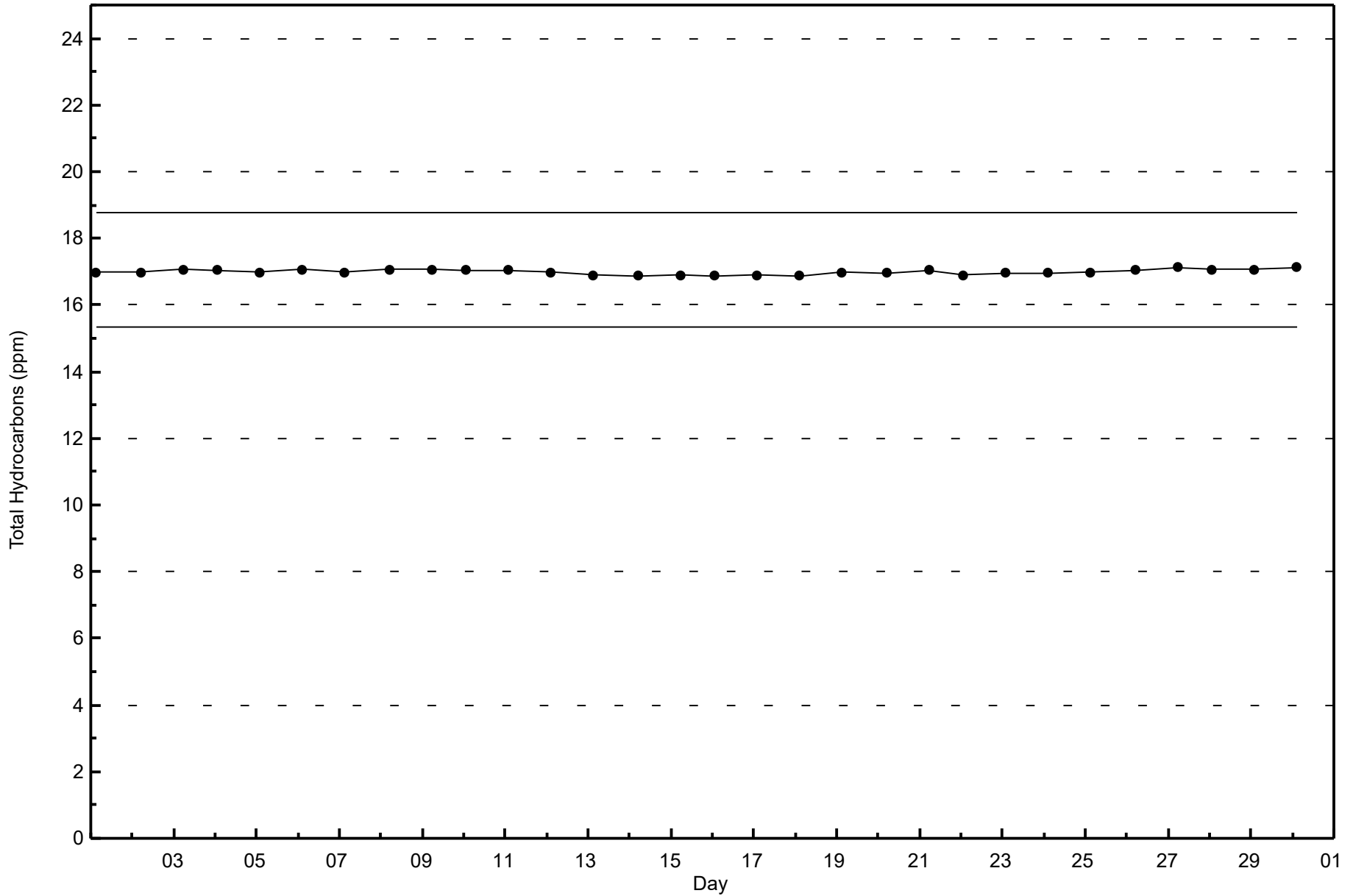


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Fort McKay South

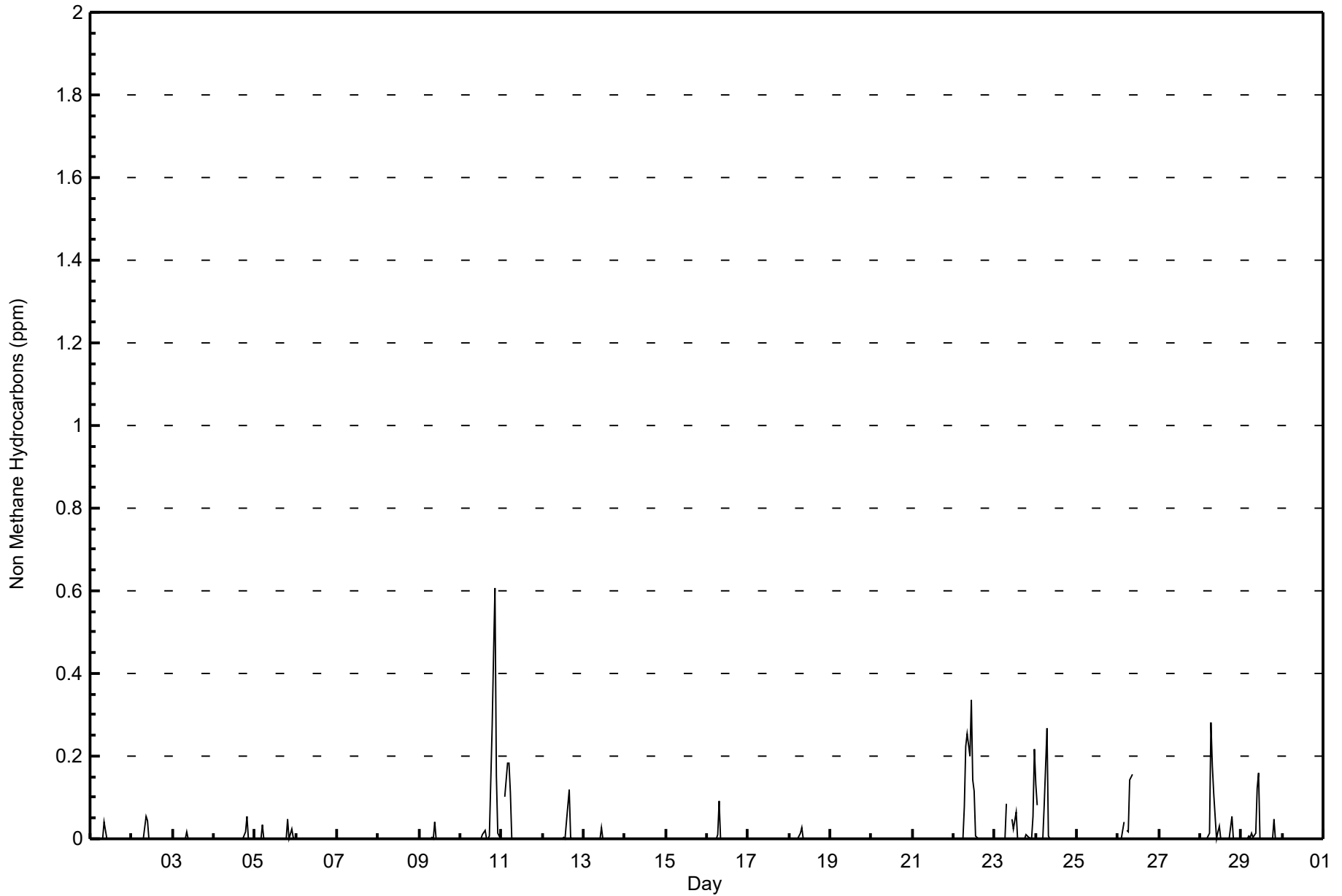








Maximum Value: 0.606 ppm on Jun 10 21:00		Maximum Daily Average: 0.066 ppm on Jun 10		Hours in Service:	720																					
Minimum Value: 0.000 ppm on Jun 1 01:00		Minimum Daily Average: 0.000 ppm on Jun 6		Hours of Data:	676																					
Maximum Diurnal Average: 0.025 ppm at hour 8		Minimum Diurnal Average: 0.000 ppm at hour 17		Hours of Missing Data:	44																					
Monthly Average: 0.010 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:	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-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.041	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	0.002	0.041
2-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.056	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.056
3-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	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	0.000	0.000	0.001	0.018
4-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.053	0.000	0.000	0.000	0.000	0.003	0.053
5-Jun	0.000	Z	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047	0.000	0.024	0.004	0.000	0.005	0.047
6-Jun	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
7-Jun	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
8-Jun	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
9-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.002	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.040
10-Jun	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	0.020	0.000	0.000	0.005	0.273	0.446	0.606	0.153	0.013	0.000	0.066	0.606	
11-Jun	0.000	Z	0.100	0.183	0.182	0.113	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	0.025	0.183
12-Jun	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	0.042	0.120	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.120
13-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.026
14-Jun	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-Jun	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
16-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.009	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	PF	PF	PF	PF	PF	--	0.090
17-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.012	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	0.002	0.029
19-Jun	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-Jun	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
21-Jun	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-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.079	0.225	0.254	0.201	0.335	0.144	0.115	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.059	0.335
23-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.084	M	M	0.047	0.022	0.064	0.000	0.000	0.000	0.000	0.011	0.008	0.005	0.001	0.055	0.218	0.025	0.218	
24-Jun	0.131	0.081	Z	0.000	0.000	0.080	0.267	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.267	
25-Jun	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
26-Jun	0.000	0.000	0.000	0.040	Z	0.020	0.017	0.143	0.154	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.154	
27-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Jun	Z	0.000	0.000	0.000	0.000	0.013	0.280	0.177	0.108	0.001	0.018	0.031	0.000	0.000	0.000	0.001	0.000	0.000	0.054	0.000	0.000	0.000	0.000	0.030	0.280	
29-Jun	0.000	Z	0.000	0.000	0.007	0.005	0.014	0.005	0.015	0.122	0.158	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.047	0.000	0.000	0.000	0.000	0.016	0.158	
30-Jun	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	0.000
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan		C - Calibration				M - Maintenance				PF - Power Failure																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	609	90.09	90.09
0.006 - 0.05	34	5.03	95.12
0.06 - 0.1	17	2.51	97.63
> 0.1	16	2.37	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - June 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	140	60	12	4	4	1	11	25	44	49	66	43	31	24	42	52	608
0.006 - 0.05	3	2	0	0	0	0	3	9	8	1	3	1	2	1	0	1	34
0.06 - 0.1	2	0	0	0	0	0	6	5	1	1	2	0	0	0	0	0	17
> 0.1	0	0	0	0	0	0	5	4	5	1	0	0	1	0	0	0	16
Totals	145	62	12	4	4	1	25	43	58	52	71	44	34	25	42	53	675

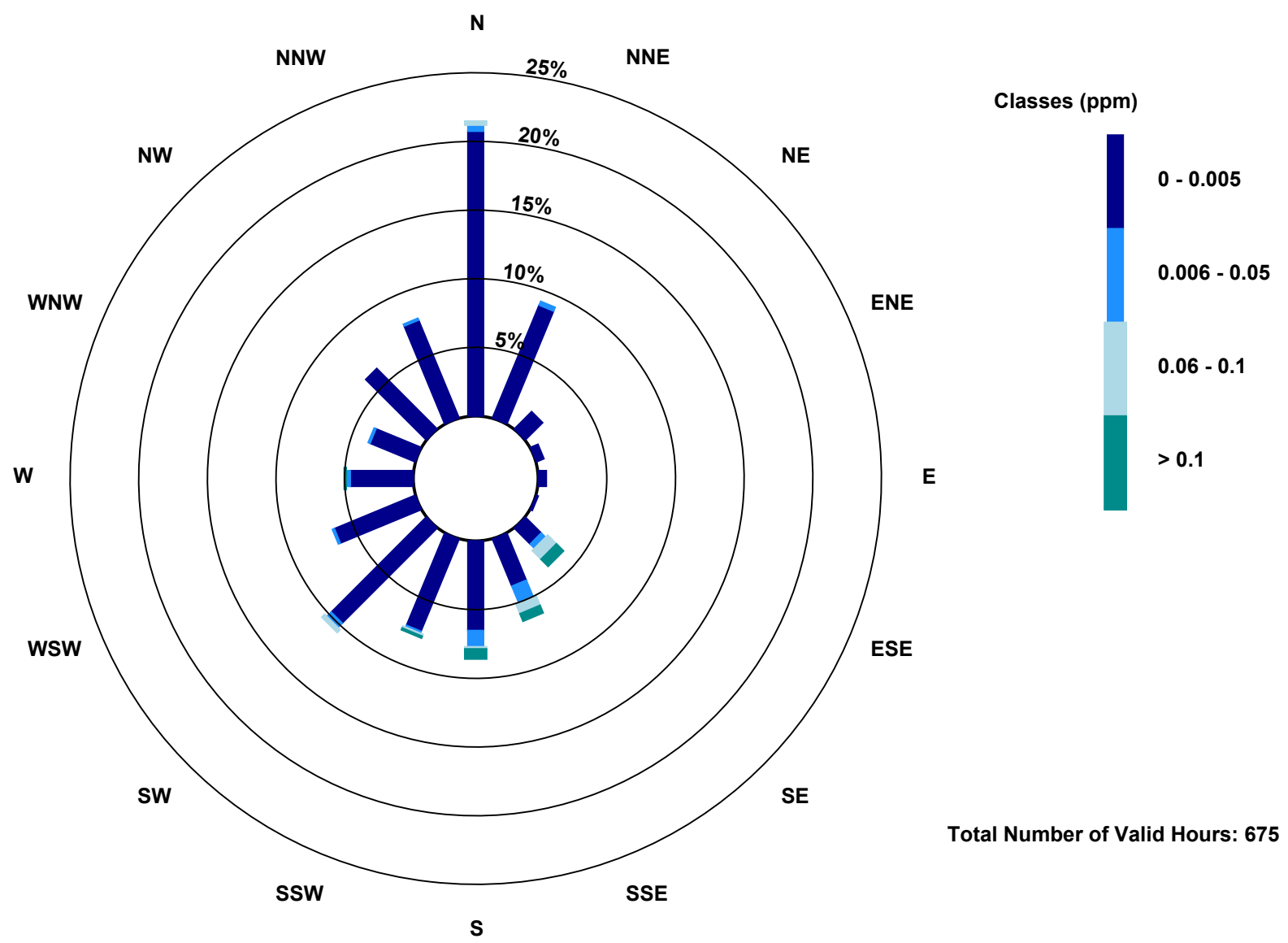
Total Number of Valid Hours: 675

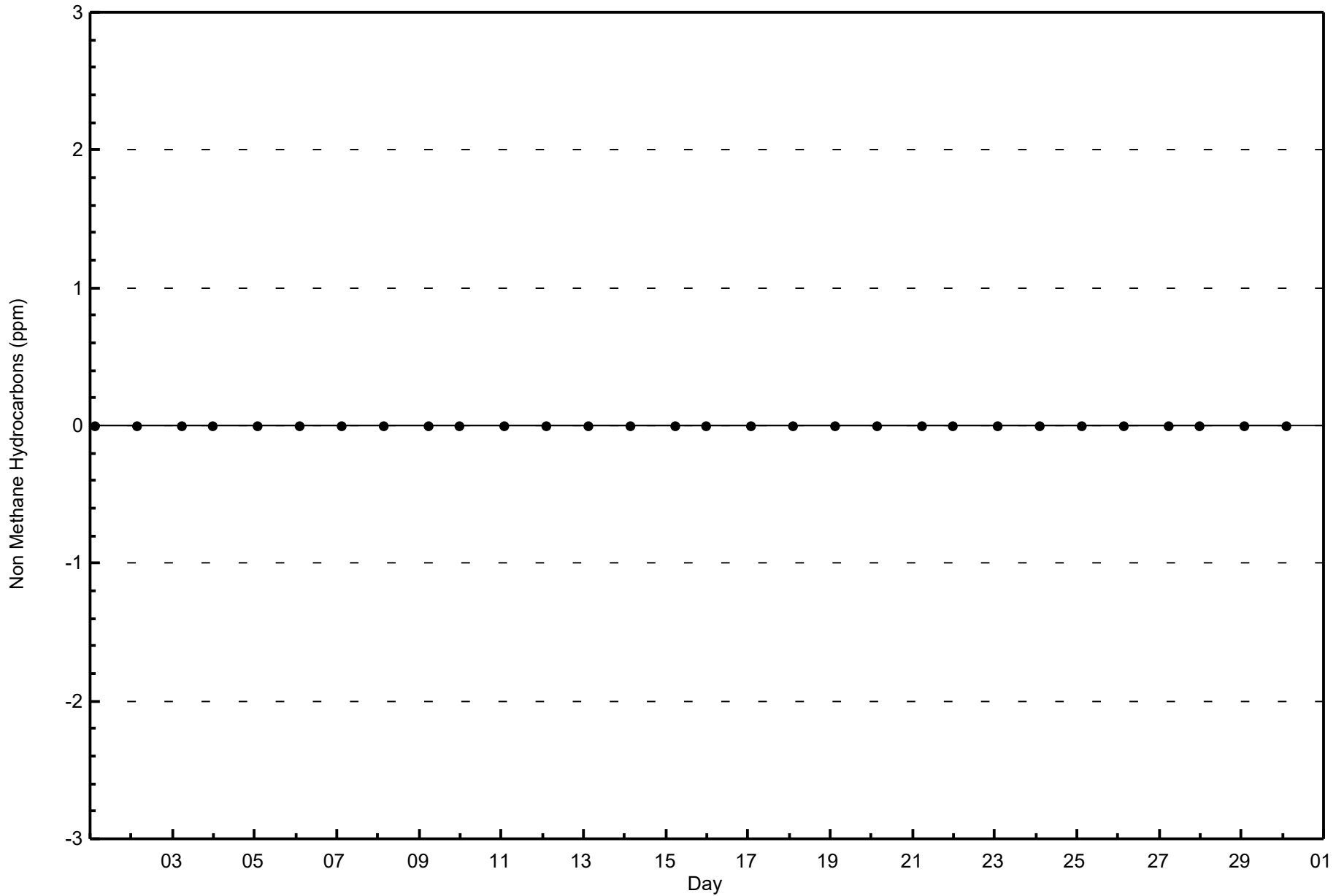
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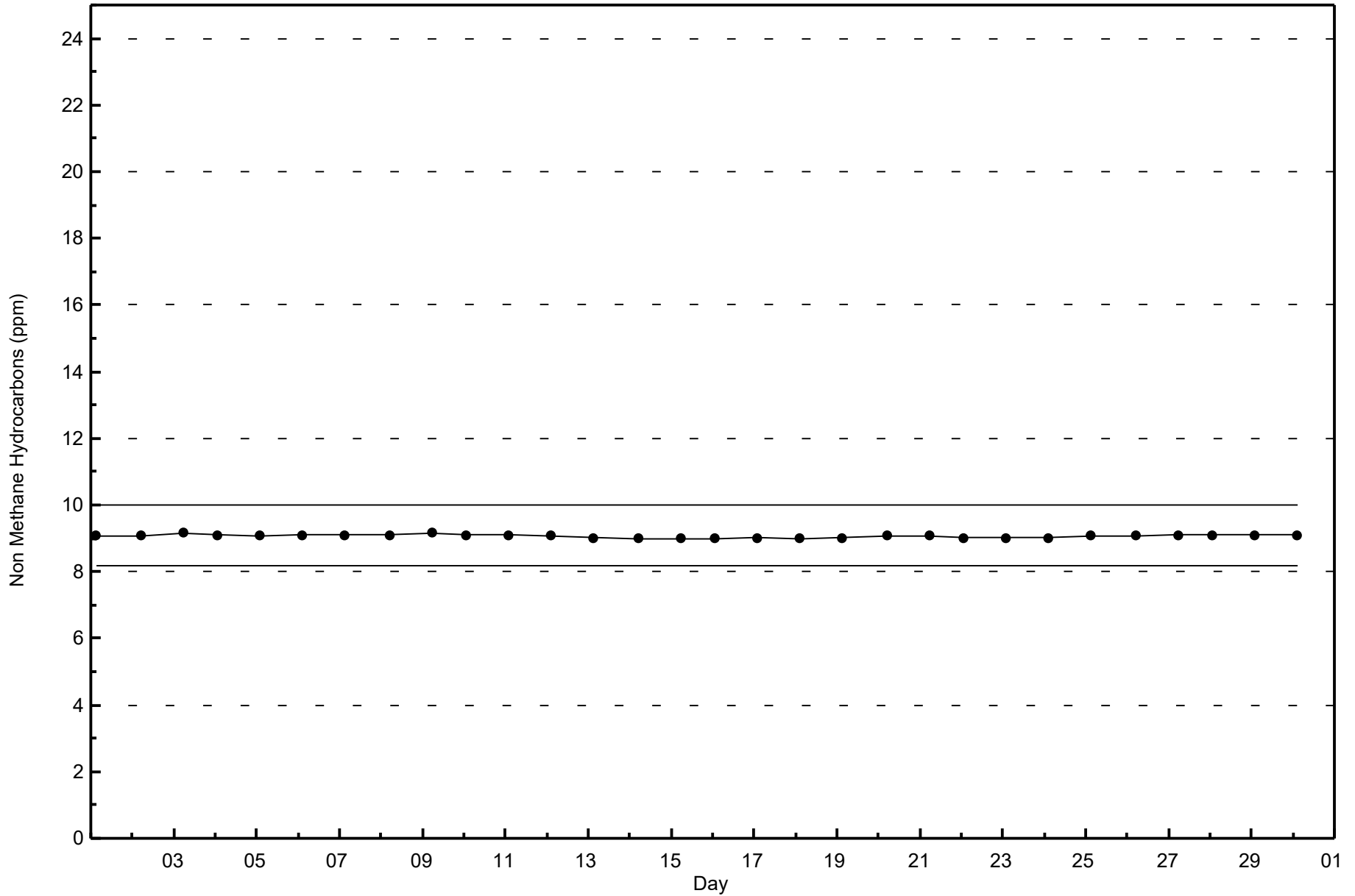


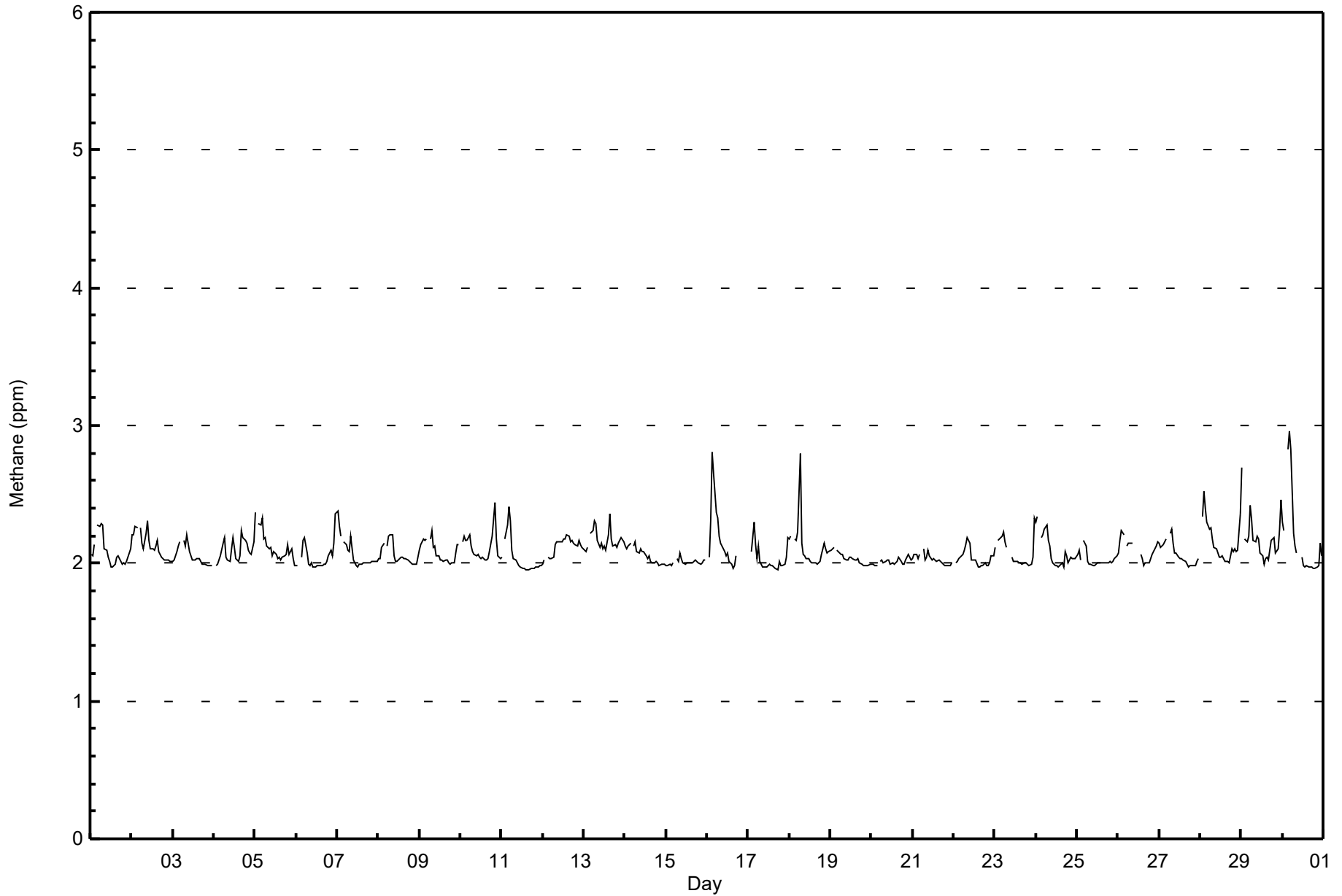
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	356	52.66	52.66
2.1 - 3.0	320	47.34	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - June 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	76	38	10	3	2	1	8	17	11	19	48	28	24	12	28	31	356
2.1 - 3.0	69	24	2	1	2	0	17	26	47	33	23	16	10	13	14	22	319
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	145	62	12	4	4	1	25	43	58	52	71	44	34	25	42	53	675

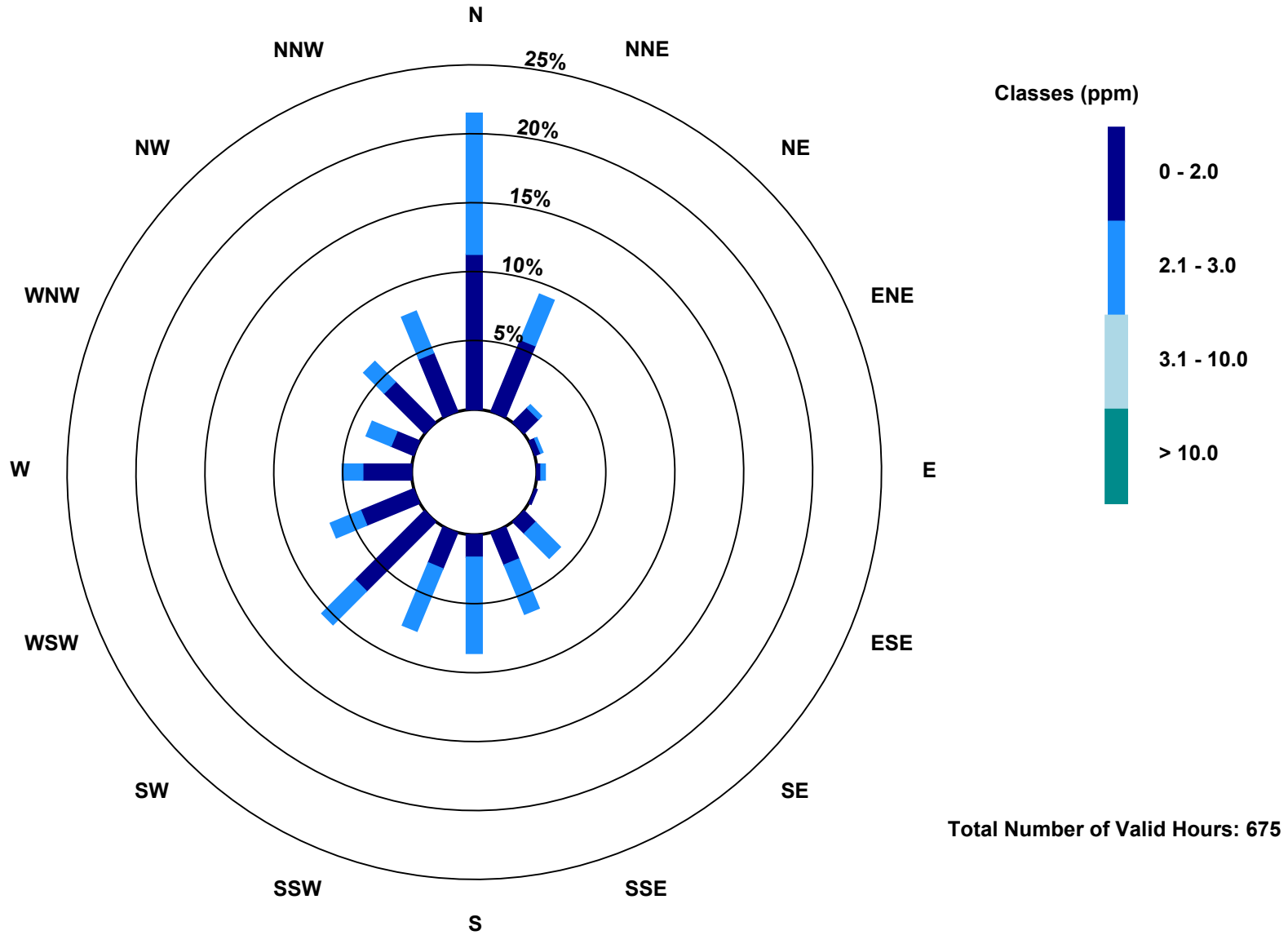
Total Number of Valid Hours: 675

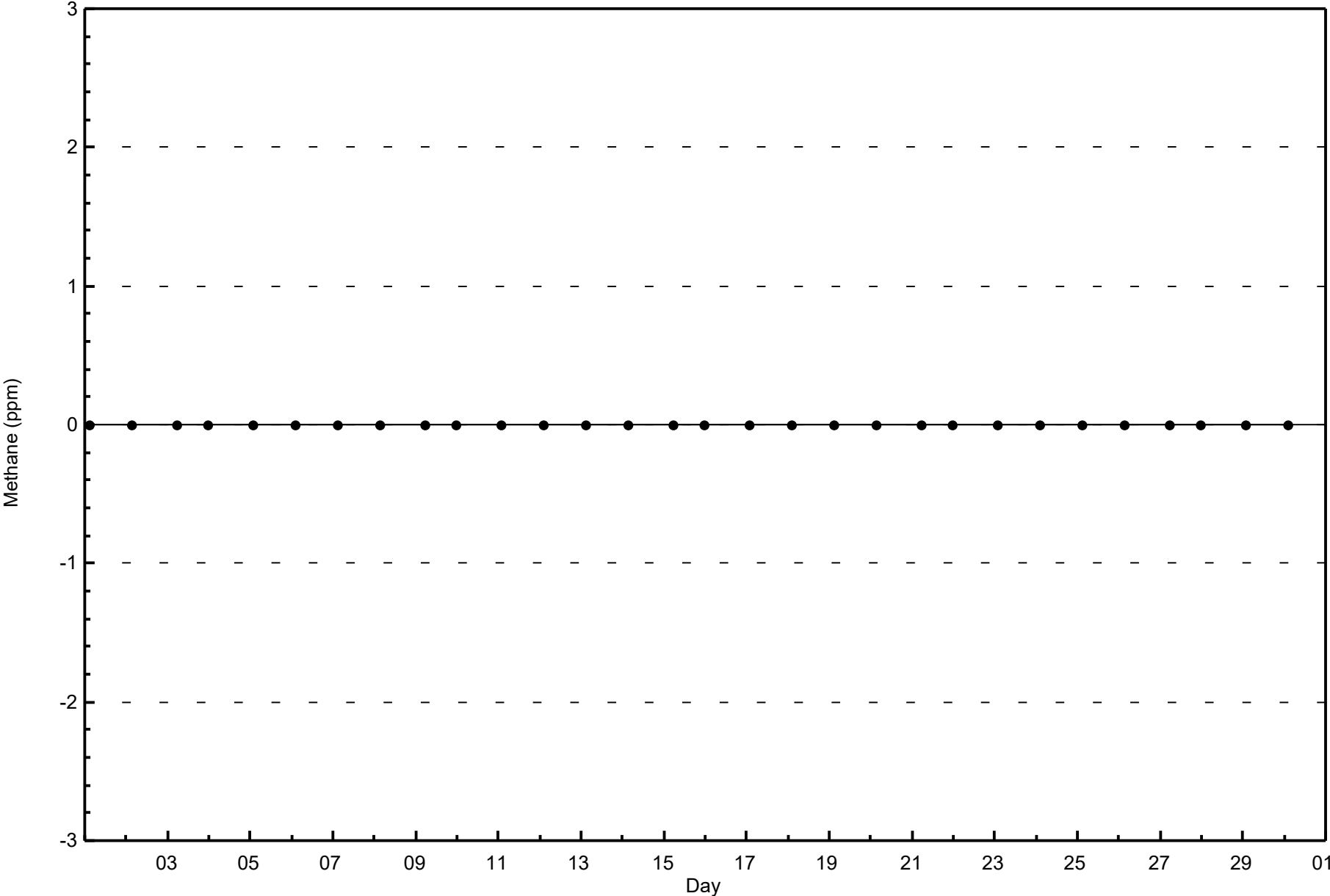
Total Number of Hours: 720

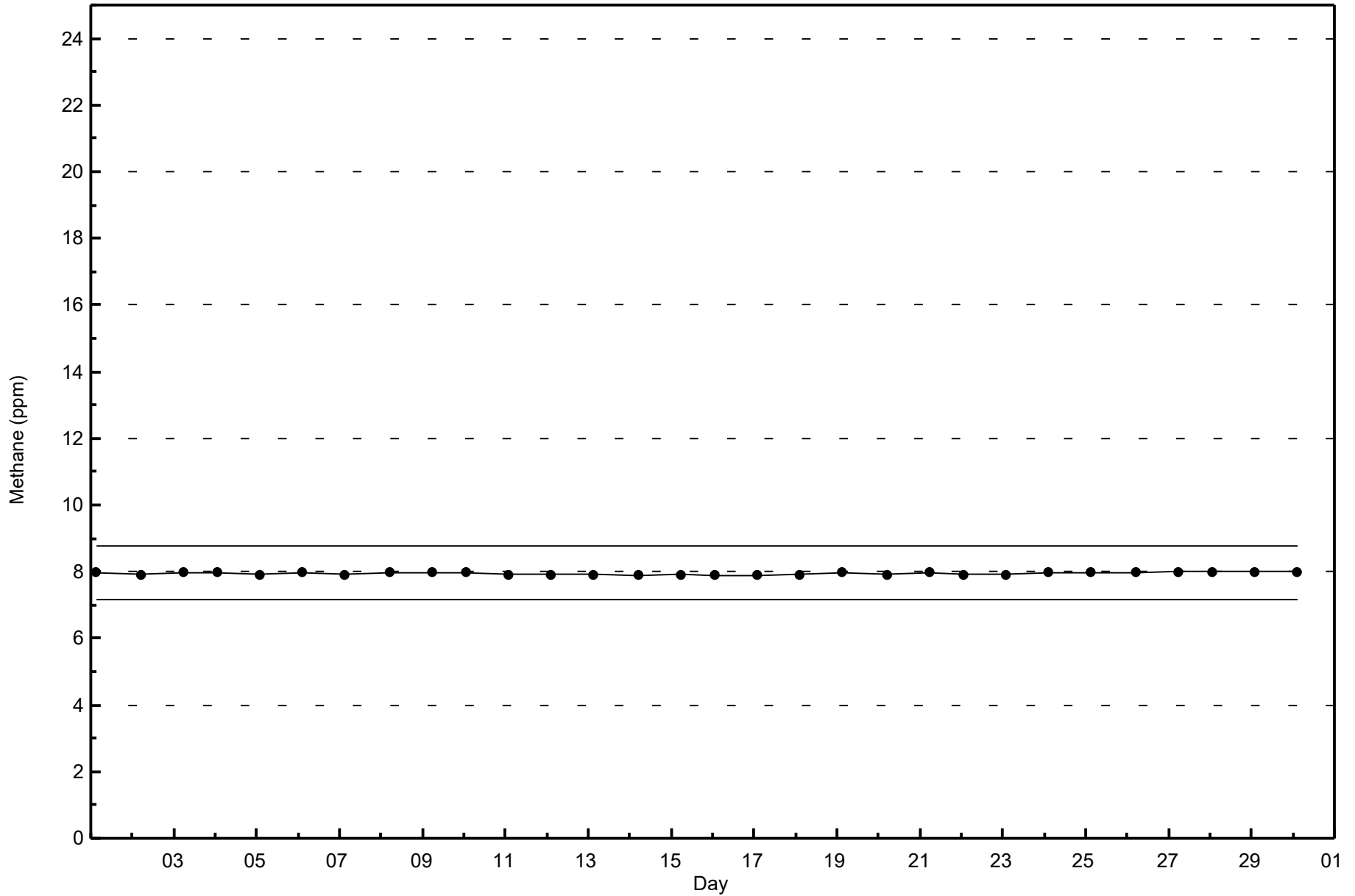


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Fort McKay South









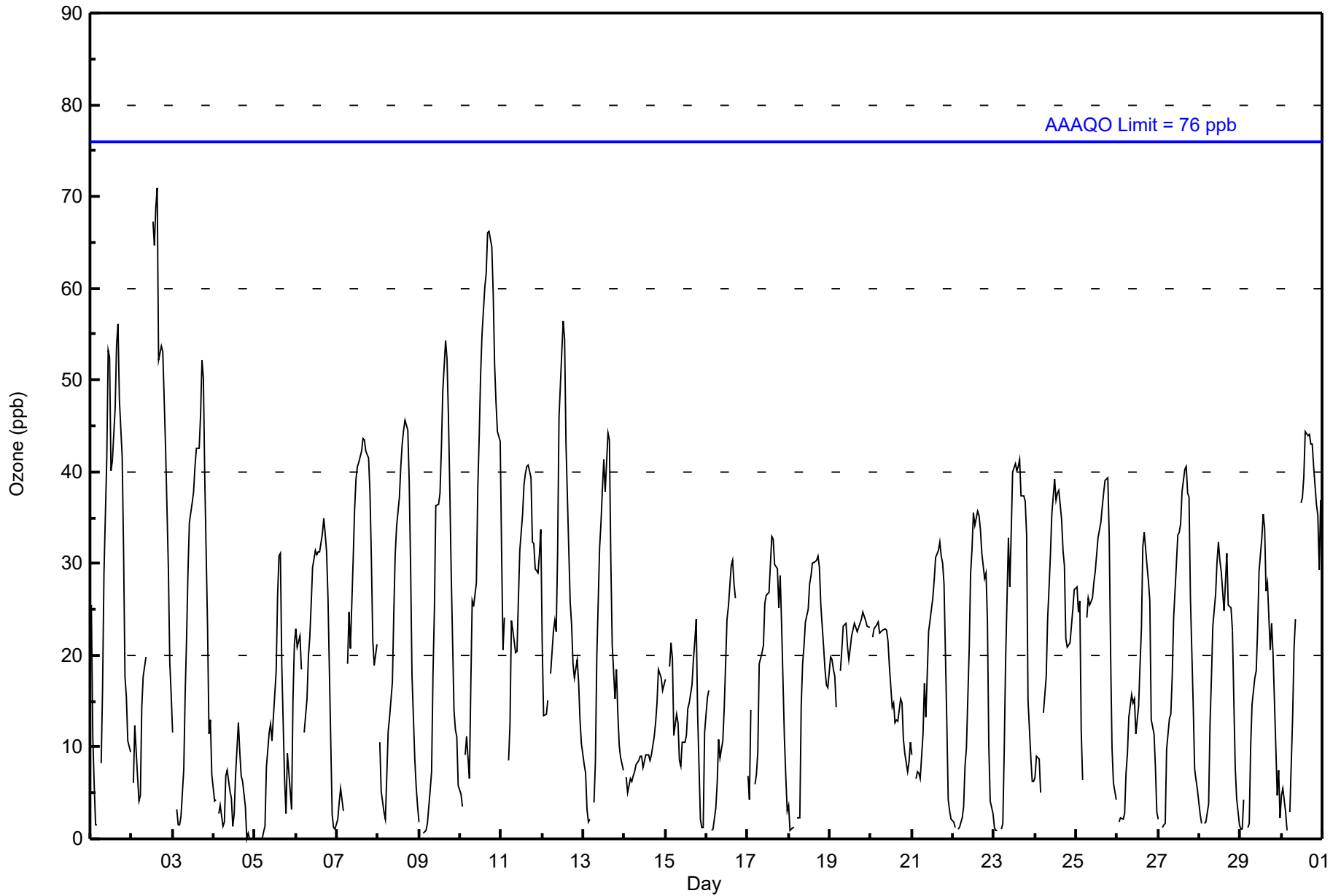
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort McKay South - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																720																											
Maximum Value: 70.9 ppb on Jun 2 16:00		Maximum Daily Average: 38.4 ppb on Jun 10		Hours of Data:																679																													
Minimum Value: 0.0 ppb on Jun 4 20:00		Minimum Daily Average: 4.0 ppb on Jun 4		Hours of Missing Data:																41																													
Maximum Diurnal Average: 35.5 ppb at hour 16		Minimum Diurnal Average: 5.3 ppb at hour 5		Hours of Calibration:																33																													
Monthly Average: 20.92 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 2.6 Q ₁ = 8.3 Median = 19.8 Q ₃ = 31.0 P ₉₀ = 40.6 P ₉₉ = 62.2		Percent Operational Time:																98.9																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	25.5	11.1	5.9	1.6	1.5	Z	8.2	16.5	28.9	41.5	53.3	52.4	40.1	41.2	47.0	53.8	56.2	47.8	41.6	31.3	17.8	15.4	10.6	9.5	28.6	56.2																							
2-Jun	Z	6.2	12.3	6.7	4.1	4.7	14.3	17.6	19.8	C	C	C	67.3	64.6	68.7	70.9	52.1	53.7	53.1	47.9	42.6	29.5	19.2	15.7	33.6	70.9																							
3-Jun	11.6	Z	3.2	1.6	1.5	2.5	7.6	15.9	21.8	29.2	34.5	36.6	37.9	40.6	42.6	42.5	46.3	52.1	50.2	39.2	22.9	11.5	13.0	6.9	24.9	52.1																							
4-Jun	4.1	4.3	Z	2.7	3.6	1.4	1.9	6.9	7.5	5.2	4.5	1.4	2.8	7.0	12.7	9.5	6.9	6.2	3.6	0.0	0.6	0.0	0.0	0.0	4.0	12.7																							
5-Jun	0.0	0.0	0.0	Z	0.0	0.7	1.3	7.8	11.6	12.5	10.6	13.3	18.4	26.6	30.8	31.1	18.8	6.4	2.8	9.4	7.3	3.2	15.2	21.2	10.8	31.1																							
6-Jun	22.8	21.0	22.2	18.5	Z	11.6	15.3	19.8	21.9	25.7	29.6	31.4	31.0	31.3	33.3	34.9	33.3	31.2	26.2	10.3	2.6	1.2	1.1	22.1	34.9																								
7-Jun	2.1	3.9	5.4	4.2	3.0	Z	19.1	24.6	20.8	30.5	35.8	39.2	40.6	41.0	42.2	43.6	43.5	42.3	41.5	37.7	30.3	21.7	18.9	21.2	26.7	43.6																							
8-Jun	Z	10.5	5.2	2.8	2.1	6.8	11.7	13.3	17.1	24.6	30.9	34.0	37.2	40.6	43.0	44.6	45.6	44.6	39.1	29.7	17.9	8.7	5.6	3.5	22.6	45.6																							
9-Jun	1.8	Z	0.7	0.8	0.9	1.7	5.4	7.4	18.0	24.8	36.3	36.4	37.7	42.6	48.8	54.3	52.3	46.2	38.2	29.0	14.0	11.8	11.2	5.8	22.9	54.3																							
10-Jun	4.9	3.5	Z	9.1	11.2	6.6	16.7	25.9	25.3	27.9	38.2	43.7	50.5	54.9	60.1	61.6	66.0	66.1	64.5	59.4	51.7	47.6	44.4	43.3	38.4	66.1																							
11-Jun	31.4	20.6	24.1	Z	8.5	12.4	23.8	22.8	20.3	20.4	26.0	31.4	35.4	38.6	39.9	40.5	40.7	39.4	32.4	32.2	29.4	29.0	31.0	33.7	28.9	40.7																							
12-Jun	21.4	13.5	13.5	15.1	Z	18.0	22.6	23.7	22.5	31.1	45.9	53.1	56.5	54.5	43.0	31.5	25.7	23.4	19.0	17.6	19.6	17.1	13.0	10.3	26.6	56.5																							
13-Jun	8.1	7.1	3.1	1.9	2.2	Z	4.0	8.3	19.8	31.7	34.5	38.1	41.3	37.9	44.3	43.4	30.5	21.2	15.3	18.5	13.7	10.2	8.9	7.5	19.6	44.3																							
14-Jun	Z	6.7	5.0	6.5	6.2	6.9	7.3	8.2	8.5	9.1	9.0	7.8	9.2	9.2	8.5	9.1	11.1	12.6	14.8	18.5	17.5	16.1	16.8	10.2	18.5	16.8																							
15-Jun	17.5	Z	18.8	21.3	19.7	11.3	13.5	12.6	8.5	8.0	10.6	10.5	11.3	14.2	14.8	16.8	19.5	21.5	23.9	13.7	2.2	1.2	1.3	11.6	13.2	23.9																							
16-Jun	15.4	16.1	Z	1.0	1.1	3.3	6.1	10.8	8.8	10.7	14.1	19.0	24.0	25.3	29.7	30.4	27.7	26.2	PF	PF	PF	PF	PF	PF	--	30.4																							
17-Jun	6.9	4.3	14.1	Z	5.9	7.0	9.4	19.1	20.3	21.0	25.6	26.6	26.9	29.8	32.9	32.6	29.9	29.4	25.2	28.7	23.4	10.9	6.6	3.0	19.1	32.9																							
18-Jun	3.6	1.0	1.2	1.2	Z	2.3	2.3	14.5	19.1	21.0	23.6	25.1	27.7	28.7	30.0	30.3	30.3	30.8	29.6	25.5	21.0	18.4	16.8	16.5	18.3	30.8																							
19-Jun	19.8	19.6	18.4	17.8	14.3	Z	18.3	20.6	23.2	23.5	21.0	19.5	20.7	22.1	23.5	23.1	22.6	23.0	24.0	24.7	24.2	23.8	23.3	23.0	21.5	24.7																							
20-Jun	Z	22.0	22.8	23.3	23.6	22.5	22.5	22.8	22.9	22.7	21.6	18.8	14.4	14.8	12.7	12.9	12.8	15.2	14.7	10.8	9.3	7.4	8.4	10.5	16.9	23.6																							
21-Jun	9.2	Z	6.6	7.4	7.1	6.6	11.4	17.0	13.3	17.8	22.5	25.0	26.2	28.2	30.6	31.4	32.4	30.8	30.0	27.8	12.7	4.3	3.1	2.2	17.5	32.4																							
22-Jun	1.8	1.2	Z	1.0	1.2	2.3	3.5	8.0	9.9	20.7	28.9	31.6	35.5	34.1	35.7	35.2	33.7	31.1	28.4	29.0	23.9	10.0	4.1	2.8	18.0	35.7																							
23-Jun	1.2	0.9	0.9	Z	1.1	1.6	9.6	19.6	32.8	27.4	33.5	40.0	40.9	40.1	40.5	41.3	37.4	37.4	36.8	33.1	15.1	8.9	6.3	6.3	22.3	41.3																							
24-Jun	6.7	9.0	8.7	5.0	Z	13.8	17.7	24.0	27.2	31.0	35.3	39.1	36.9	37.7	38.0	34.8	31.4	29.7	21.8	21.0	21.4	23.1	25.1	27.2	24.6	39.1																							
25-Jun	27.5	24.7	26.0	11.8	6.4	Z	24.2	26.2	25.5	26.2	28.0	29.2	31.0	32.8	34.5	36.2	37.6	39.0	39.4	32.9	19.9	9.9	6.1	4.3	25.2	39.4																							
26-Jun	Z	1.8	2.4	2.2	2.7	7.1	9.2	13.2	15.7	14.8	15.3	11.4	14.4	18.9	23.0	31.9	33.3	29.7	28.1	25.9	13.0	11.4	7.8	3.0	14.6	33.3																							
27-Jun	2.1	Z	1.2	1.6	1.7	9.8	13.1	13.6	17.7	24.1	27.0	33.2	33.3	34.3	37.8	40.3	40.6	37.7	37.2	26.3	14.5	7.6	6.4	5.3	20.3	40.6																							
28-Jun	2.6	1.6	Z	1.7	1.9	3.8	12.5	17.6	23.2	26.7	30.2	32.3	30.4	29.2	24.8	28.0	31.1	25.4	25.2	22.7	15.1	7.7	4.4	1.6	17.4	32.3																							
29-Jun	1.0	1.1	4.3	Z	1.2	1.6	9.9	14.6	17.5	18.3	22.9	29.2	32.7	35.4	33.9	27.0	27.9	20.7	23.4	20.2	15.1	4.7	7.4	2.3	16.2	35.4																							
30-Jun	4.8	5.4	3.0	1.0	Z	2.8	13.3	20.7	23.9	M	M	36.5	37.2	39.5	44.3	43.9	44.1	43.1	42.9	40.5	36.5	35.3	29.3	36.9	27.9	44.3																							
																								10.2	8.7	9.2	6.7	5.3	6.8	11.9	16.4	19.1	22.4	26.8	29.2	31.6	33.2	35.0	35.5	34.0	32.1	30.2	26.7	19.4	14.1	12.6	12.2	Diurnal Average	
																								31.4	24.7	26.0	23.3	23.6	22.5	24.2	26.2	32.8	41.5	53.3	53.1	67.3	64.6	68.7	70.9	66.0	66.1	64.5	59.4	51.7	47.6	44.4	43.3	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				PF - Power Failure																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Fort McKay South - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	348	51.25	51.25
21 - 50	306	45.07	96.32
51 - 82	25	3.68	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Fort McKay South - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	63	12	0	0	2	1	18	18	25	28	40	28	18	15	33	46	347
21 - 50	79	41	10	4	2	1	9	23	25	22	34	17	17	7	9	6	306
51 - 82	3	8	2	0	0	0	1	6	4	0	0	0	0	1	0	0	25
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	145	61	12	4	4	2	28	47	54	50	74	45	35	23	42	52	678

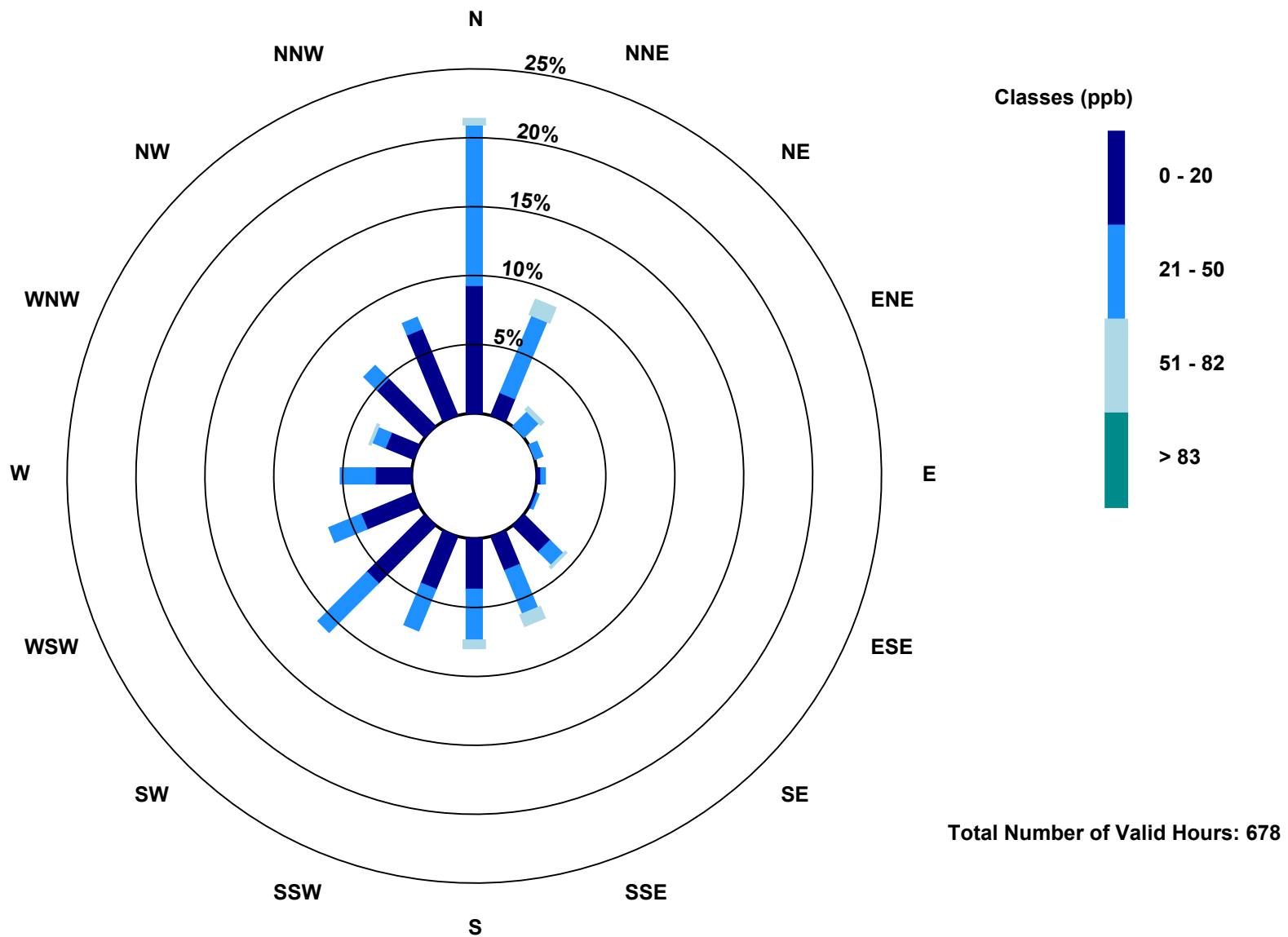
Total Number of Valid Hours: 678

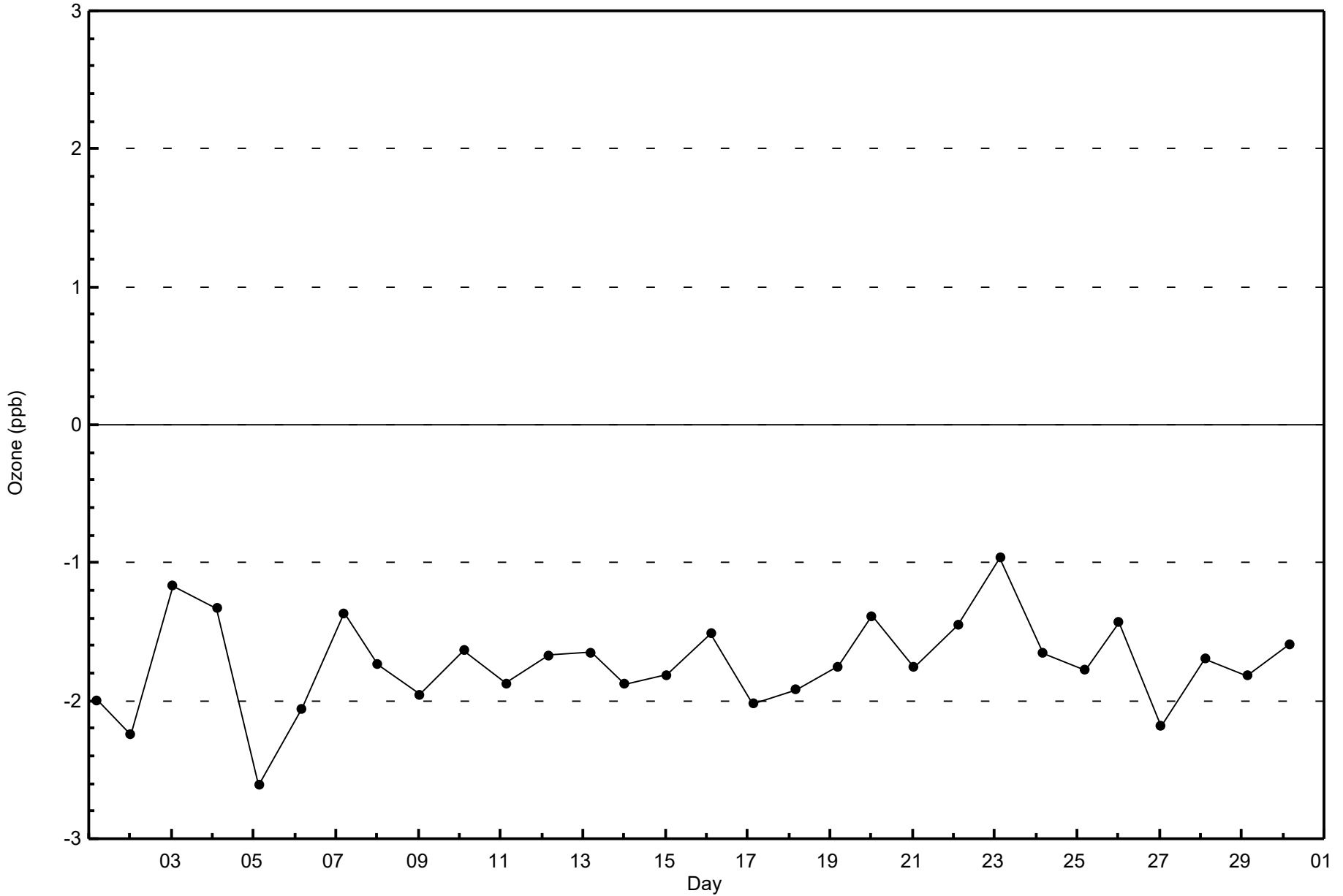
Total Number of Hours: 720

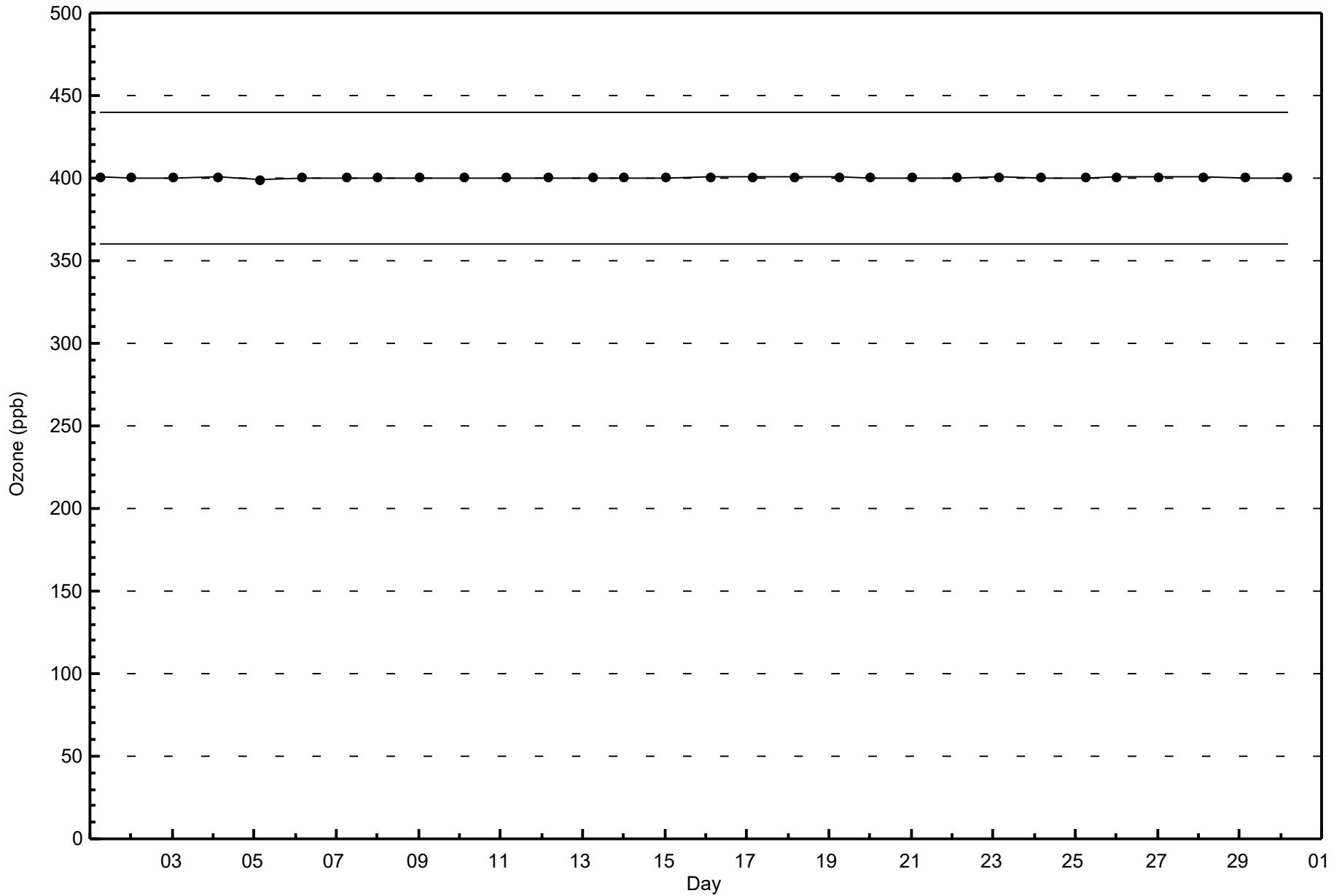


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Fort McKay South







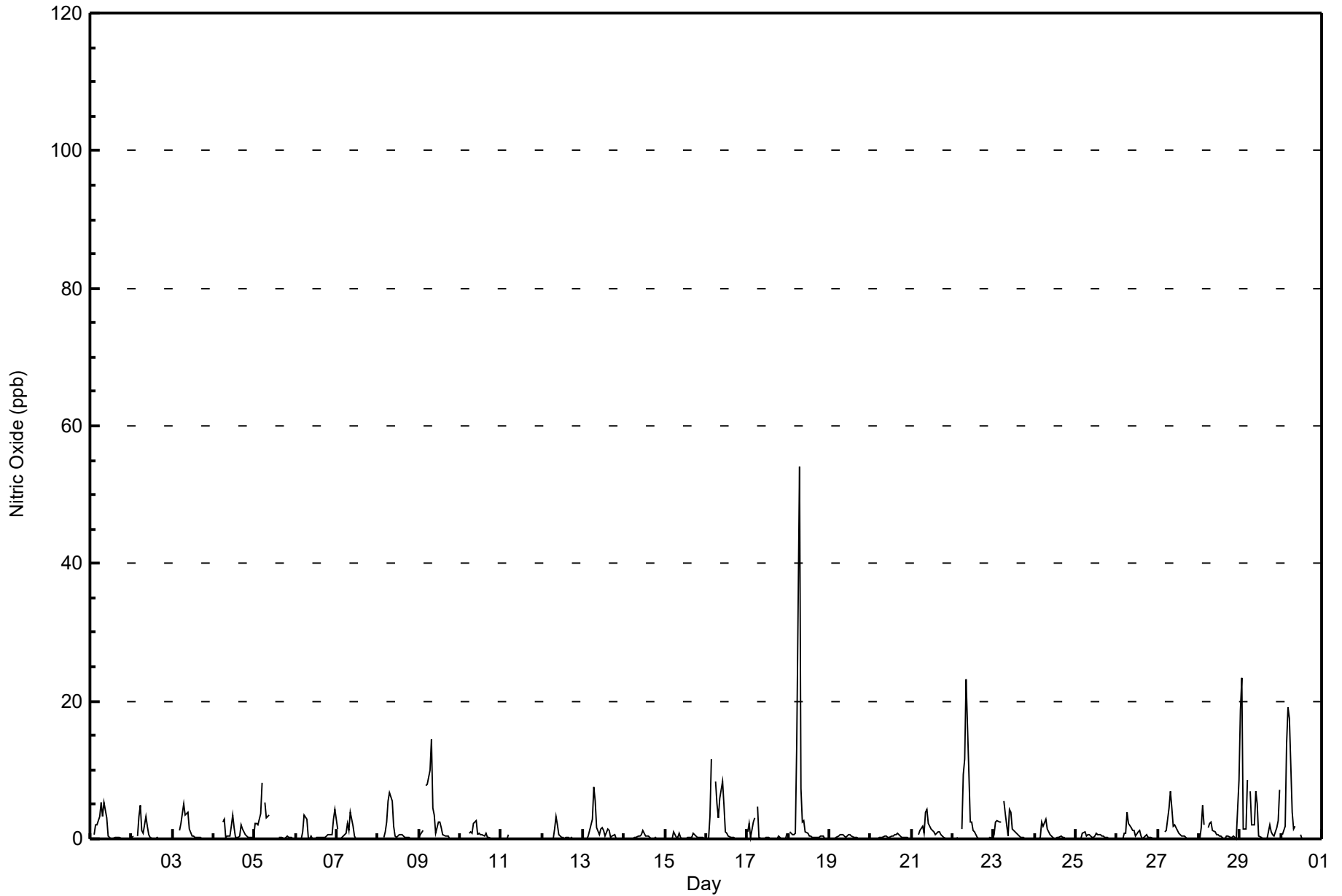


Maximum Value: 54.0 ppb on Jun 18 07:00																	Maximum Daily Average: 4.0 ppb on Jun 29																	Hours in Service: 720	
Minimum Value: 0.0 ppb on Jun 1 21:00																	Minimum Daily Average: 0.0 ppb on Jun 11																	Hours of Data: 677	
Maximum Diurnal Average: 5.2 ppb at hour 7																	Minimum Diurnal Average: 0.1 ppb at hour 22																	Hours of Missing Data: 43	
Monthly Average: 1.23 ppb																	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 1.0 P ₉₀ = 3.2 P ₉₉ = 14.1																	Hours of Calibration: 35	
																																		Percent Operational Time: 98.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Jun	0.0	Z	0.7	1.9	2.1	3.2	5.3	3.3	5.3	3.0	0.4	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.3									
2-Jun	0.1	0.3	Z	0.5	3.3	4.8	1.3	0.7	3.2	1.8	0.7	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	4.8									
3-Jun	0.0	0.1	0.1	Z	1.3	2.2	5.0	3.4	3.7	3.8	1.5	0.4	0.4	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.0										
4-Jun	0.0	0.0	0.0	0.1	Z	2.5	2.9	0.3	0.3	0.3	1.9	3.5	1.7	0.3	0.3	0.4	2.0	1.4	0.7	0.4	0.2	0.1	0.2	0.3	0.9	3.5									
5-Jun	2.2	2.2	2.1	3.7	8.1	Z	5.2	3.0	3.5	C	C	C	C	C	0.3	0.2	0.1	0.1	0.3	0.4	0.2	0.1	0.0	0.0	1.8	8.1									
6-Jun	Z	0.0	0.0	0.1	1.1	3.5	2.8	0.1	0.0	0.3	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.6	0.6	0.6	2.9	4.4	0.8	4.4									
7-Jun	1.4	Z	0.0	0.2	0.4	0.7	2.2	1.2	3.9	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.9										
8-Jun	0.0	0.0	Z	0.3	1.0	2.5	5.6	6.6	5.6	1.9	0.4	0.2	0.6	0.7	0.5	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	1.2	6.6										
9-Jun	0.1	0.5	1.2	Z	7.7	8.0	10.1	14.5	4.4	3.5	0.9	2.4	2.4	1.6	0.6	0.4	0.4	0.5	0.0	0.0	0.0	0.0	0.0	2.6	14.5										
10-Jun	0.0	0.1	0.1	0.0	Z	0.8	0.9	0.9	2.2	2.6	0.7	0.8	0.6	0.5	0.5	0.7	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.5	2.6										
11-Jun	0.0	0.0	0.0	0.0	0.7	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	0.7									
12-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	1.5	3.3	2.1	0.6	0.3	0.1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	3.3										
13-Jun	0.0	Z	0.1	0.5	1.3	2.8	7.6	5.6	1.6	0.7	1.4	1.7	1.1	0.3	1.5	1.2	0.3	0.3	0.6	0.0	0.0	0.0	0.0	1.2	7.6										
14-Jun	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.2	0.5	0.5	0.5	1.3	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.3										
15-Jun	0.0	0.0	0.0	Z	0.0	1.0	0.2	0.1	0.8	0.3	0.0	0.0	0.0	0.1	0.2	0.3	0.9	0.7	0.4	0.1	0.1	0.2	0.1	0.3	1.0										
16-Jun	0.0	0.0	3.3	11.6	Z	8.4	5.2	3.0	6.0	8.4	5.0	1.1	0.9	0.5	0.2	0.1	0.1	0.0	PF	PF	PF	PF	PF	PF	--	11.6									
17-Jun	1.1	2.2	0.3	2.5	3.0	Z	4.8	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.1	0.0	0.0	0.9	0.7	4.8									
18-Jun	Z	1.0	0.6	0.5	0.8	13.8	54.0	7.3	2.4	2.7	1.0	0.9	0.5	0.4	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.1	0.0	0.0	3.8	54.0									
19-Jun	0.0	Z	0.0	0.0	0.3	0.5	0.7	0.6	0.6	0.3	0.5	0.5	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.7										
20-Jun	0.0	0.0	Z	0.0	0.0	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.4	0.3	0.6	0.6	0.8	0.5	0.1	0.1	0.2	0.1	0.0	0.0	0.3	0.8									
21-Jun	0.0	0.0	0.0	Z	0.6	1.3	1.8	0.8	3.9	4.2	2.2	1.5	1.1	0.9	0.7	1.1	1.0	0.6	0.4	0.2	0.0	0.0	0.0	1.0	4.2										
22-Jun	0.0	0.1	0.1	0.1	Z	1.4	9.3	11.6	23.2	9.5	2.4	2.4	1.3	0.9	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	2.7	23.2									
23-Jun	0.6	2.4	2.7	2.5	2.5	Z	5.4	3.7	0.4	4.3	3.9	1.4	1.0	0.8	0.7	0.4	0.1	0.2	0.1	0.0	0.0	0.0	0.0	1.4	5.4										
24-Jun	Z	0.0	0.1	0.2	2.5	1.7	2.8	1.4	1.0	0.6	0.4	0.1	0.1	0.1	0.5	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8										
25-Jun	0.0	Z	0.0	0.1	0.8	1.0	0.4	0.6	0.7	0.2	0.2	0.5	0.7	0.6	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.3	1.0										
26-Jun	0.0	0.1	Z	0.1	0.8	0.8	3.9	2.3	1.7	1.3	1.1	0.4	1.0	1.3	0.4	0.1	0.3	0.6	0.2	0.2	0.1	0.0	0.0	0.7	3.9										
27-Jun	0.1	0.0	0.1	Z	1.1	1.2	4.5	7.0	4.5	1.9	2.1	1.2	0.7	0.6	0.4	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	1.1	7.0										
28-Jun	0.0	1.6	4.9	2.0	Z	1.6	2.3	2.4	1.3	1.0	0.7	0.7	0.4	0.4	0.1	0.1	0.4	0.5	0.2	0.3	0.4	0.1	0.1	1.3	8.6										
29-Jun	18.6	23.5	1.5	1.4	8.5	Z	6.8	2.1	2.0	6.9	5.1	0.5	0.2	0.1	0.0	0.1	0.0	2.1	1.0	0.6	0.5	1.6	2.7	7.1	4.0	23.5									
30-Jun	Z	0.6	1.8	13.9	19.0	17.5	3.9	1.5	1.7	M	M	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	19.0										
																	1.0 1.4 0.8 1.7 2.7 3.3 5.2 2.9 2.9 2.3 1.2 0.8 0.6 0.4 0.3 0.3 0.3 0.3 0.2 0.1 0.1 0.1 0.2 0.7							Diurnal Average											
																	18.6 23.5 4.9 13.9 19.0 17.5 54.0 14.5 23.2 9.5 5.1 3.5 2.4 1.6 1.5 1.2 2.0 2.1 1.0 0.6 0.6 1.6 2.9 8.6							Diurnal Maximum											
Z - zerspan			C - Calibration			M - Maintenance			PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort McKay South - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	674	99.56	99.56
21 - 40	2	0.30	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort McKay South - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	141	61	12	4	4	2	28	44	55	51	73	45	37	25	38	53	673
21 - 40	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
11 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	142	61	12	4	4	2	28	46	55	51	73	45	37	25	38	53	676

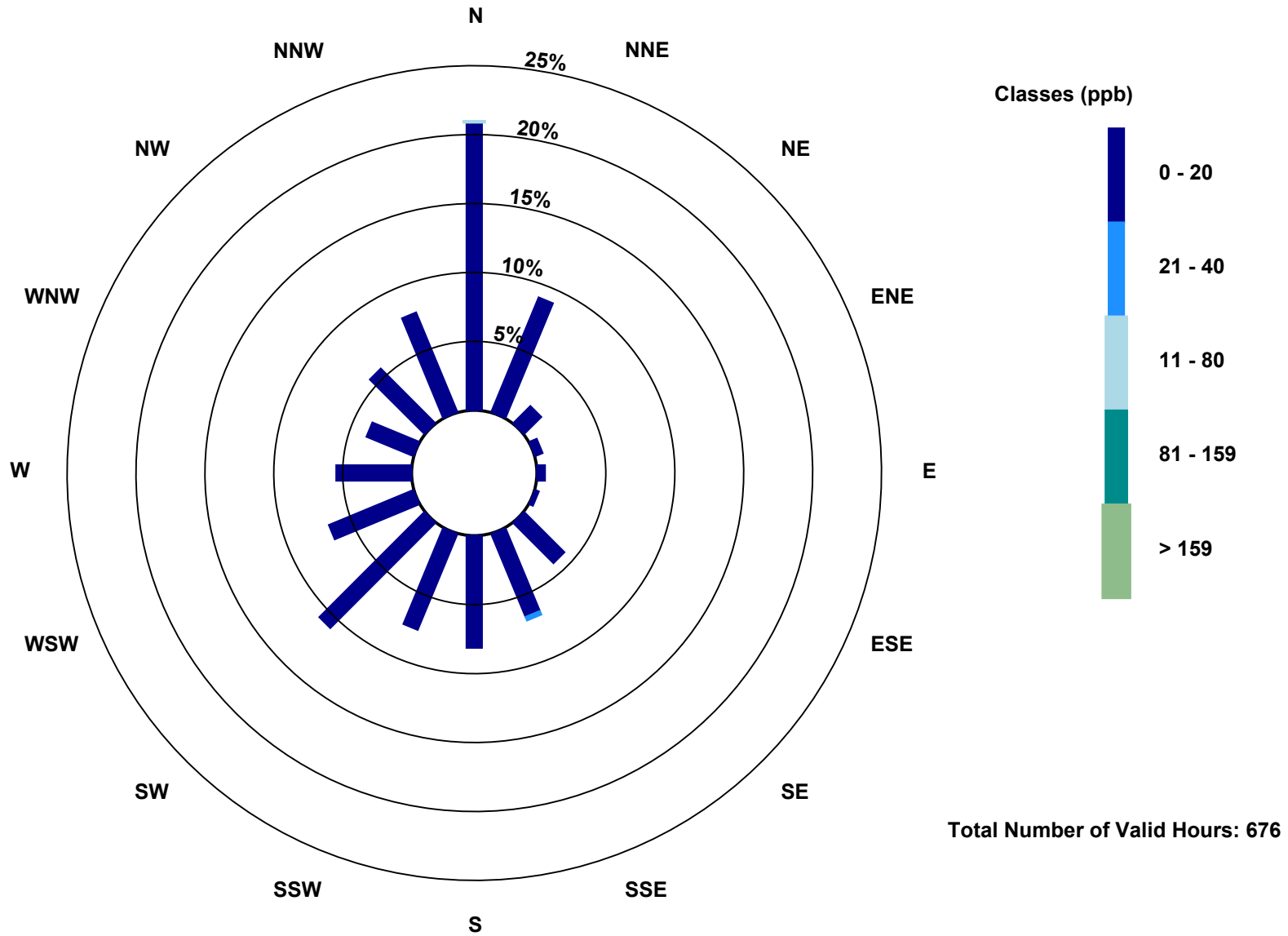
Total Number of Valid Hours: 676

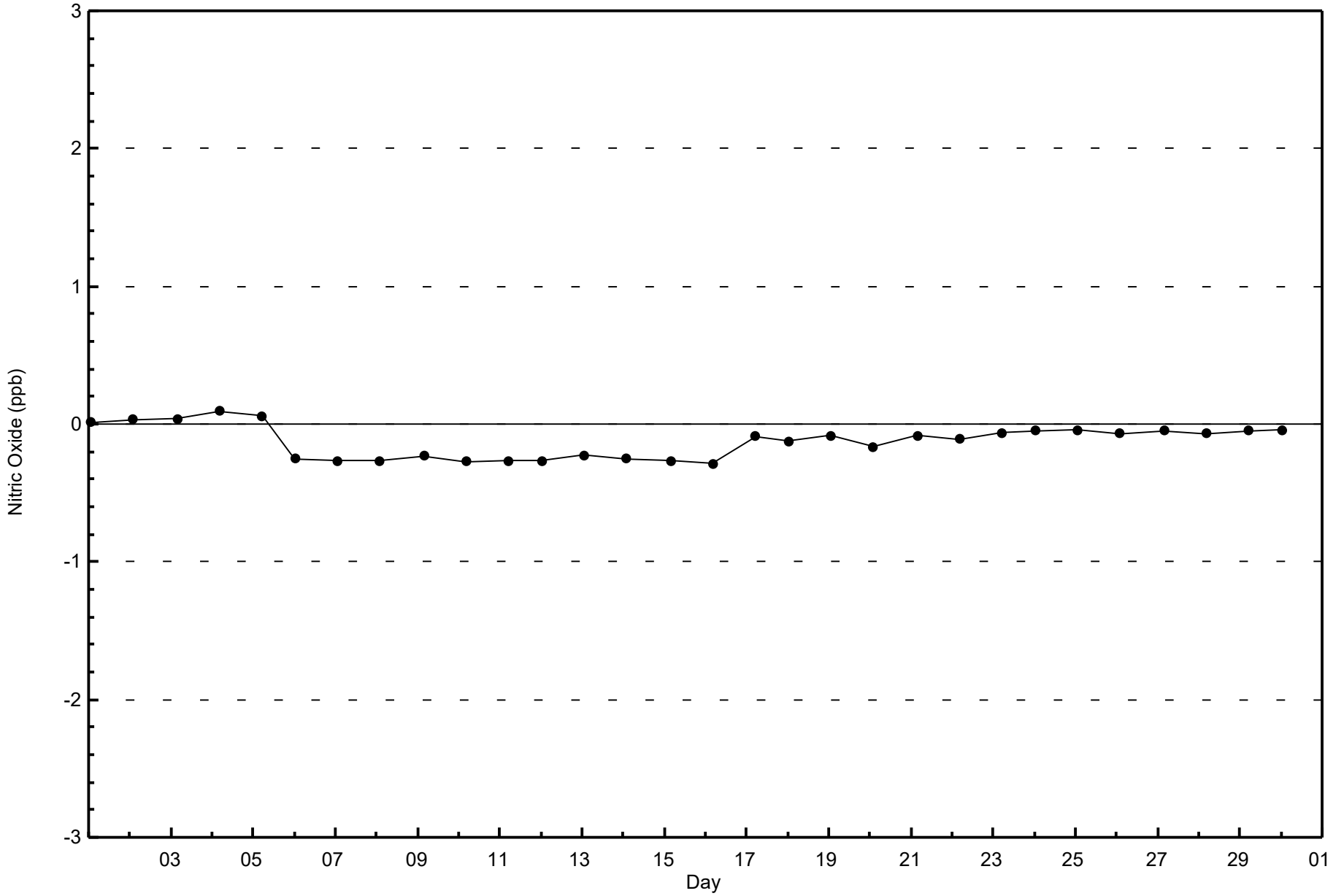
Total Number of Hours: 720

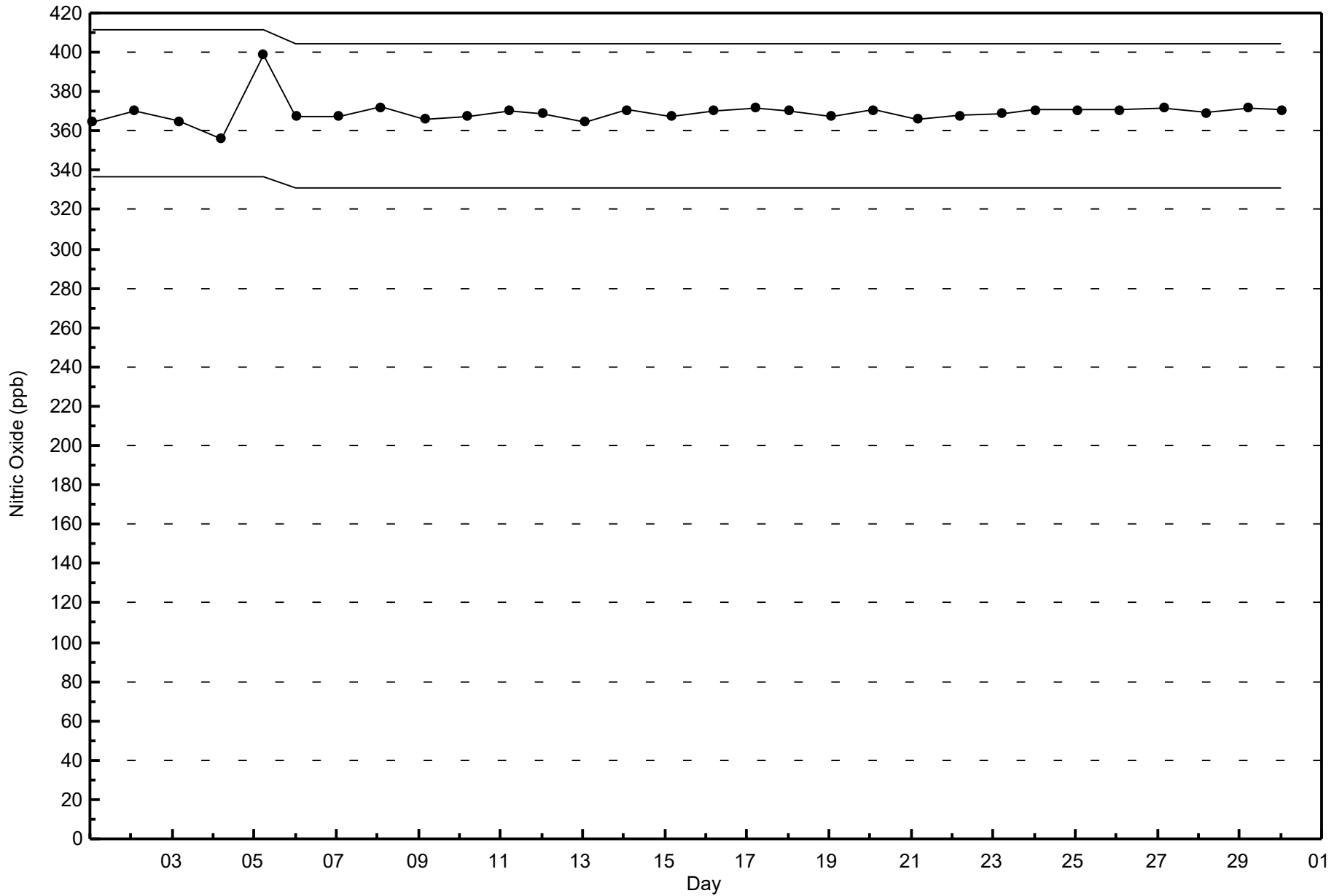


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Fort McKay South









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 24.5 ppb on Jun 30 00:00	Maximum Daily Average: 9.5 ppb on Jun 2		Hours of Data:	677
Minimum Value: 0.0 ppb on Jun 6 00:00	Minimum Daily Average: 1.0 ppb on Jun 15		Hours of Missing Data:	43
Maximum Diurnal Average: 6.4 ppb at hour 7	Minimum Diurnal Average: 2.3 ppb at hour 20		Hours of Calibration:	35
Monthly Average: 4.09 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.6 Q ₁ = 1.3 Median = 3.0 Q ₃ = 5.6 P ₉₀ = 9.3 P ₉₉ = 18.3		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-Jun	6.9	Z	11.7	11.1	7.9	8.0	10.2	9.7	18.1	13.1	3.8	2.4	0.6	0.9	1.9	4.3	5.2	3.8	1.9	2.1	1.8	2.9	3.7	6.1	6.0	18.1
2-Jun	15.4	12.2	Z	21.9	23.8	17.3	9.7	5.2	13.0	15.2	10.2	6.7	5.5	5.0	6.6	9.9	5.2	4.4	5.1	4.4	5.2	5.7	5.1	4.7	9.5	23.8
3-Jun	4.6	4.1	4.9	Z	4.1	2.8	9.8	9.8	11.8	12.9	6.6	1.9	1.9	1.8	1.8	2.2	1.7	0.9	0.6	0.5	0.6	0.9	1.2	1.1	3.8	12.9
4-Jun	0.8	0.8	0.6	0.3	Z	9.8	11.3	3.5	2.0	2.0	4.6	5.8	3.3	0.8	1.1	1.6	6.6	6.2	3.8	1.9	2.2	1.7	1.2	2.4	3.2	11.3
5-Jun	2.0	1.2	1.1	5.9	6.9	Z	4.1	2.3	3.2	C	C	C	C	C	0.5	0.9	3.0	1.7	1.4	2.6	3.3	3.1	0.8	0.0	2.4	6.9
6-Jun	Z	0.0	0.0	3.6	8.3	7.8	4.4	0.0	0.0	0.4	0.0	0.0	0.3	0.3	0.6	0.7	0.9	1.0	2.0	5.4	7.8	8.0	11.4	11.3	3.2	11.4
7-Jun	6.7	Z	3.2	2.4	1.4	2.8	7.2	7.3	11.3	5.1	1.9	0.5	0.4	1.0	1.3	1.3	1.2	1.1	1.1	0.9	0.9	0.8	0.5	0.6	2.6	11.3
8-Jun	0.9	2.9	Z	8.2	5.0	6.5	10.9	12.1	9.5	4.5	2.1	2.0	3.4	4.0	4.1	3.8	3.6	3.3	3.1	3.1	2.0	1.4	1.6	2.3	4.4	12.1
9-Jun	4.1	5.7	5.8	Z	3.3	3.6	8.8	11.1	6.9	7.9	4.2	8.8	8.4	6.9	4.3	4.1	4.3	6.3	1.6	2.2	3.1	4.2	3.4	3.1	5.3	11.1
10-Jun	3.4	3.0	2.1	2.2	Z	3.7	5.0	5.5	9.8	11.0	4.9	5.3	4.3	4.7	4.8	7.4	3.9	4.6	3.4	2.9	3.4	4.0	3.7	2.5	4.6	11.0
11-Jun	2.2	2.4	3.8	5.0	12.4	Z	1.6	1.1	1.0	0.9	0.8	0.6	0.5	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.6	0.9	1.1	1.6	12.4
12-Jun	Z	1.3	1.6	1.2	1.0	1.4	2.4	7.6	10.3	8.6	7.3	6.2	6.5	6.4	7.3	6.4	4.1	6.2	5.3	6.3	5.6	8.0	7.9	3.3	5.3	10.3
13-Jun	1.9	Z	3.4	6.5	5.4	4.2	9.0	10.4	7.0	4.7	8.4	10.8	12.0	5.2	11.0	23.7	8.9	4.7	9.3	3.5	6.2	5.9	6.4	5.7	7.6	23.7
14-Jun	5.0	3.8	Z	2.3	2.8	2.1	1.8	1.1	1.6	1.1	1.2	2.0	1.0	1.0	1.2	0.7	0.0	0.1	1.3	1.6	0.1	0.1	1.2	0.1	1.4	5.0
15-Jun	0.0	0.0	0.0	Z	1.4	6.7	1.2	0.9	3.4	1.4	0.0	0.0	0.0	0.4	0.4	0.6	2.1	2.0	1.9	0.8	0.2	0.1	0.2	0.1	1.0	6.7
16-Jun	0.0	1.4	9.4	8.4	Z	4.9	7.2	4.3	5.2	6.6	7.7	4.1	4.5	2.8	1.5	1.1	1.6	1.1	PF	PF	PF	PF	PF	PF	--	9.4
17-Jun	15.4	17.4	5.3	17.1	12.7	Z	7.6	1.2	0.4	0.5	0.7	0.9	1.9	1.6	1.9	1.3	0.5	0.5	3.9	1.9	3.0	2.2	5.6	14.0	5.1	17.4
18-Jun	Z	6.8	4.9	2.4	0.8	6.5	12.6	6.6	4.5	4.7	2.2	1.7	1.2	1.1	1.0	1.1	1.0	1.1	1.9	4.7	8.7	8.8	9.7	9.6	4.5	12.6
19-Jun	5.2	Z	5.8	6.9	9.4	8.4	6.1	4.9	3.9	3.3	5.3	5.2	4.2	2.9	1.6	2.7	2.4	1.4	1.2	0.7	1.2	1.5	1.4	1.0	3.8	9.4
20-Jun	1.5	1.5	Z	0.2	0.3	1.7	2.0	1.7	1.2	1.9	2.0	1.3	2.3	1.4	2.0	1.9	3.3	2.5	0.7	1.0	3.3	5.5	3.0	1.1	1.9	5.5
21-Jun	1.7	4.2	3.9	Z	4.9	3.1	4.3	2.3	6.8	5.7	3.5	2.5	2.4	2.2	1.9	2.7	3.0	2.1	1.9	1.3	1.0	0.6	0.6	0.5	2.7	6.8
22-Jun	0.4	0.3	0.4	0.8	Z	1.2	5.0	7.2	17.4	10.6	5.7	6.8	6.2	3.7	1.2	0.8	0.7	0.7	1.9	0.7	0.7	2.5	4.8	2.6	3.6	17.4
23-Jun	3.7	4.7	3.9	2.8	2.4	Z	6.2	6.8	2.0	9.8	10.1	5.5	4.6	3.7	3.4	3.0	1.4	2.2	1.5	1.7	1.7	1.5	1.2	1.9	3.7	10.1
24-Jun	Z	4.5	6.2	5.6	8.1	6.7	8.0	4.2	3.5	2.5	2.1	0.9	0.7	1.1	1.2	4.4	2.4	7.4	3.7	0.3	2.6	3.0	3.0	3.3	3.7	8.1
25-Jun	3.9	Z	2.4	4.9	5.8	3.6	1.7	1.6	1.5	0.7	0.6	1.3	2.1	2.1	2.1	2.1	2.3	2.5	2.4	2.3	1.9	1.5	1.3	1.0	2.2	5.8
26-Jun	1.4	3.3	Z	2.0	1.6	2.1	6.4	5.3	5.2	5.8	4.0	3.0	3.0	2.4	1.5	0.9	2.4	2.7	2.6	2.7	2.9	4.7	4.1	3.7	3.2	6.4
27-Jun	3.2	1.8	1.2	Z	1.8	3.0	7.3	9.0	7.3	3.9	4.8	3.9	2.7	2.7	2.3	2.1	2.2	1.2	1.3	1.4	1.4	1.4	1.3	1.8	3.0	9.0
28-Jun	2.7	6.7	7.4	5.2	Z	2.6	5.8	5.9	3.8	3.5	3.0	2.9	3.6	3.6	1.3	1.1	2.8	4.2	3.4	3.7	8.0	10.0	9.7	12.0	4.9	12.0
29-Jun	14.5	10.6	9.8	7.3	7.0	Z	6.8	5.1	4.4	12.3	11.1	2.4	1.8	1.2	1.9	3.7	2.3	6.1	8.0	5.6	10.3	19.0	18.1	24.5	8.4	24.5
30-Jun	Z	20.1	19.6	15.0	9.2	8.6	8.6	4.4	4.9	M	M	3.4	0.8	0.6	0.7	0.6	0.3	0.3	0.2	0.2	0.3	0.6	10.4	4.6	5.4	20.1

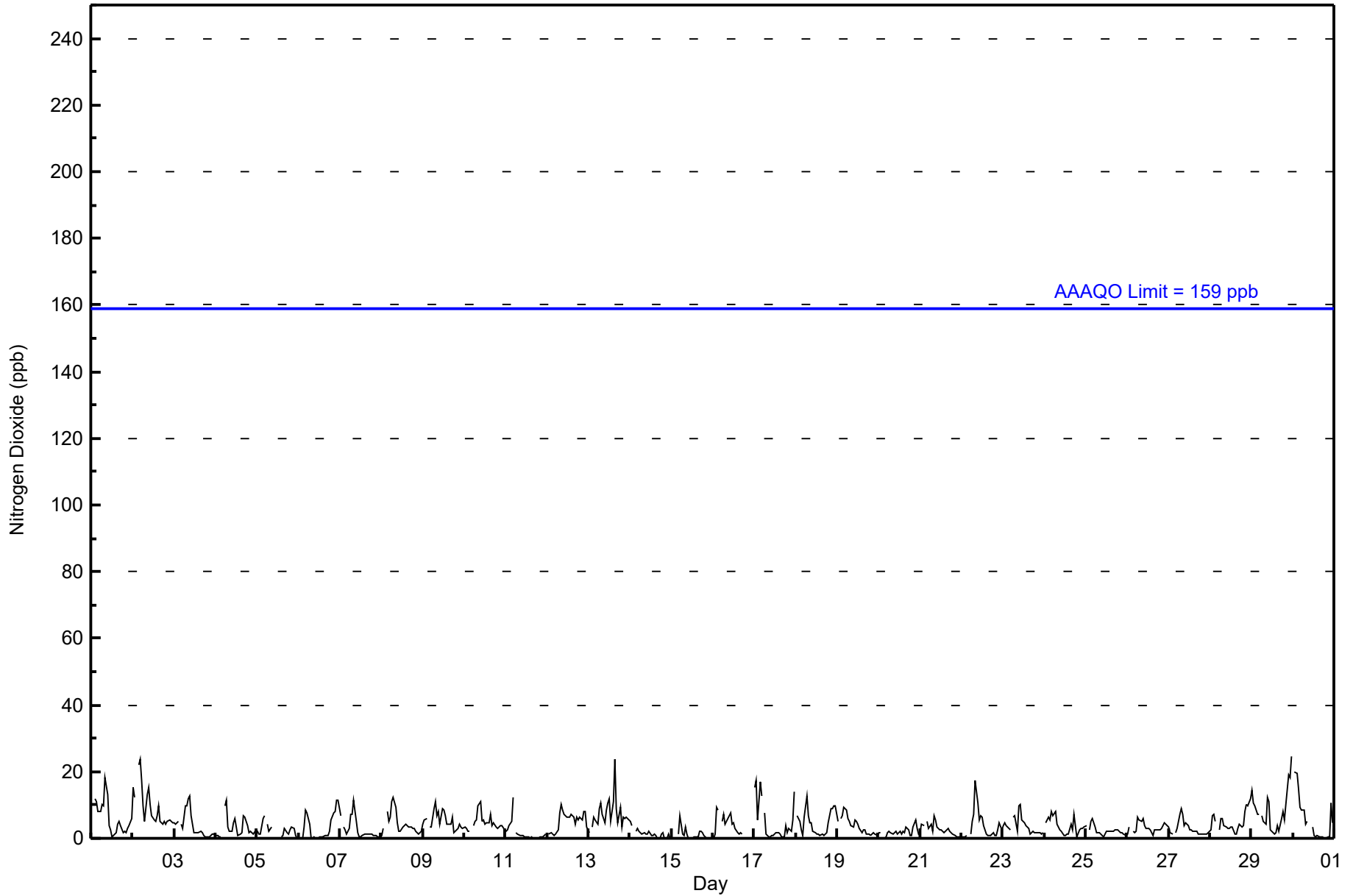
4.3	4.8	4.7	6.0	5.9	5.2	6.4	5.3	6.0	5.7	4.2	3.4	3.1	2.5	2.4	3.2	2.7	2.8	2.6	2.3	3.1	3.8	4.3	4.3	Diurnal Average	
15.4	20.1	19.6	21.9	23.8	17.3	12.6	12.1	18.1	15.2	11.1	10.8	12.0	6.9	11.0	23.7	8.9	7.4	9.3	6.3	10.3	19.0	18.1	24.5	Diurnal Maximum	

Z - zerspan 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 McKay South - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	673	99.41	99.41
21 - 40	4	0.59	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: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	141	61	12	4	4	2	28	46	55	51	72	45	37	25	36	53	672
21 - 40	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	4
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	142	61	12	4	4	2	28	46	55	51	73	45	37	25	38	53	676

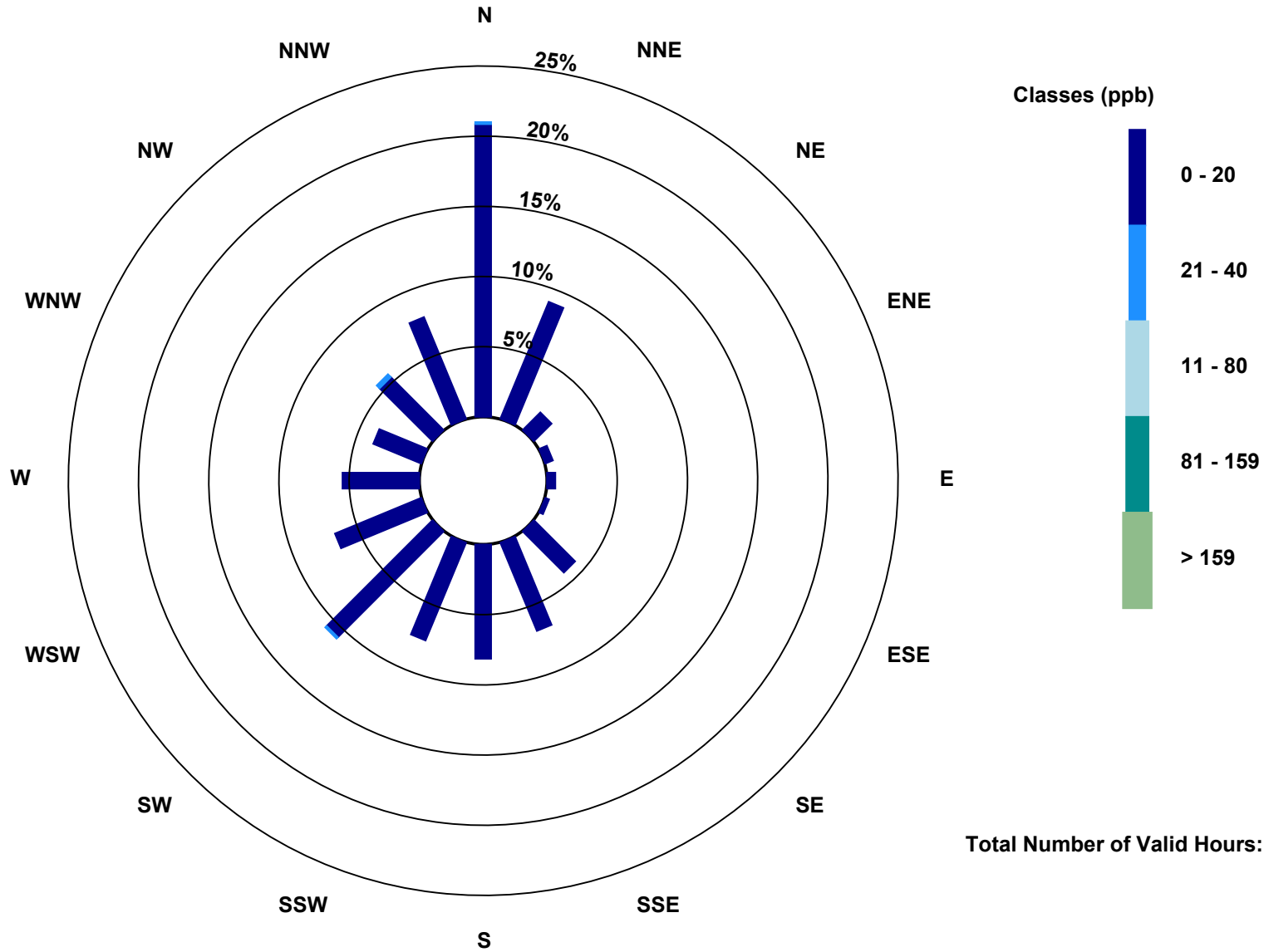
Total Number of Valid Hours: 676

Total Number of Hours: 720

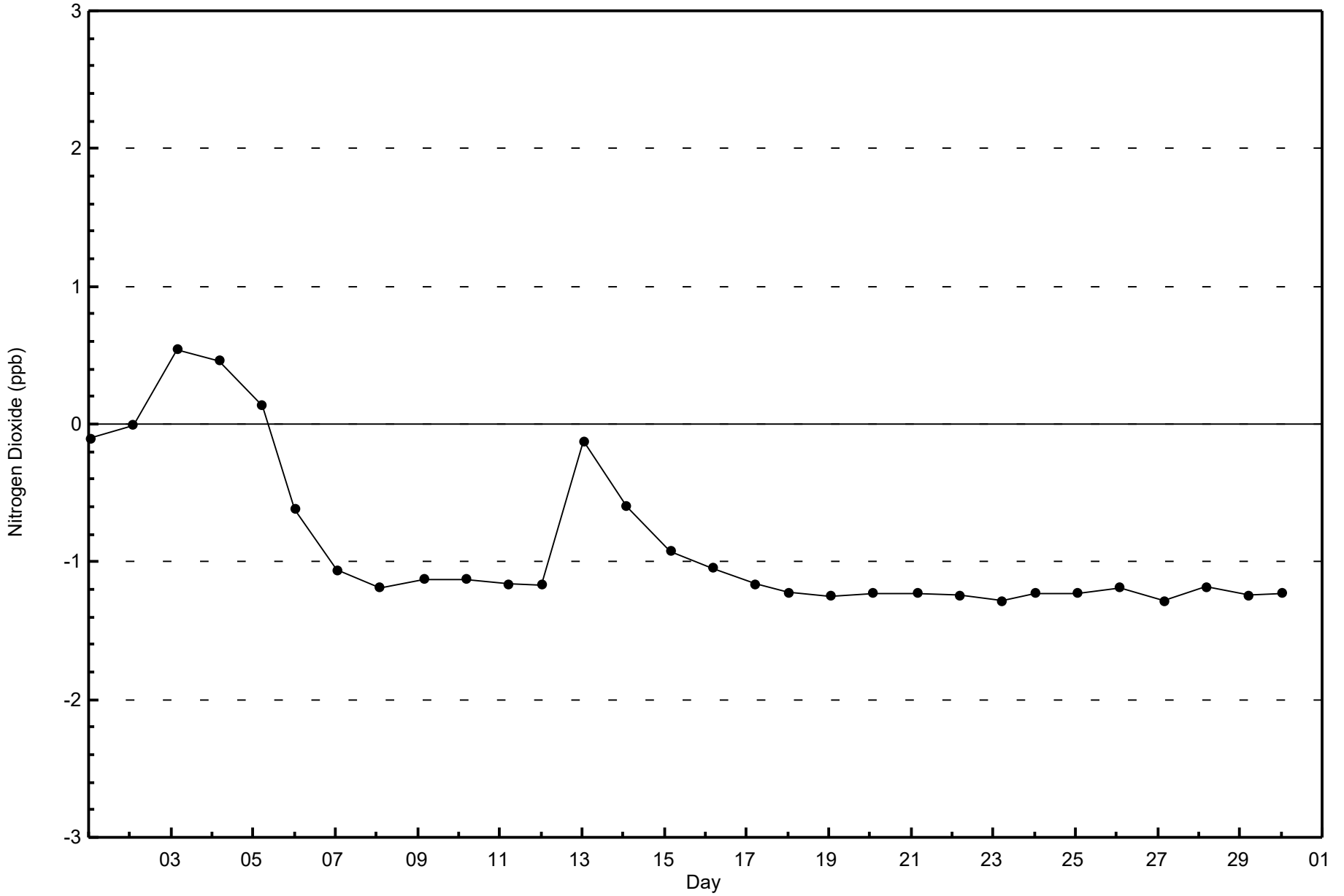


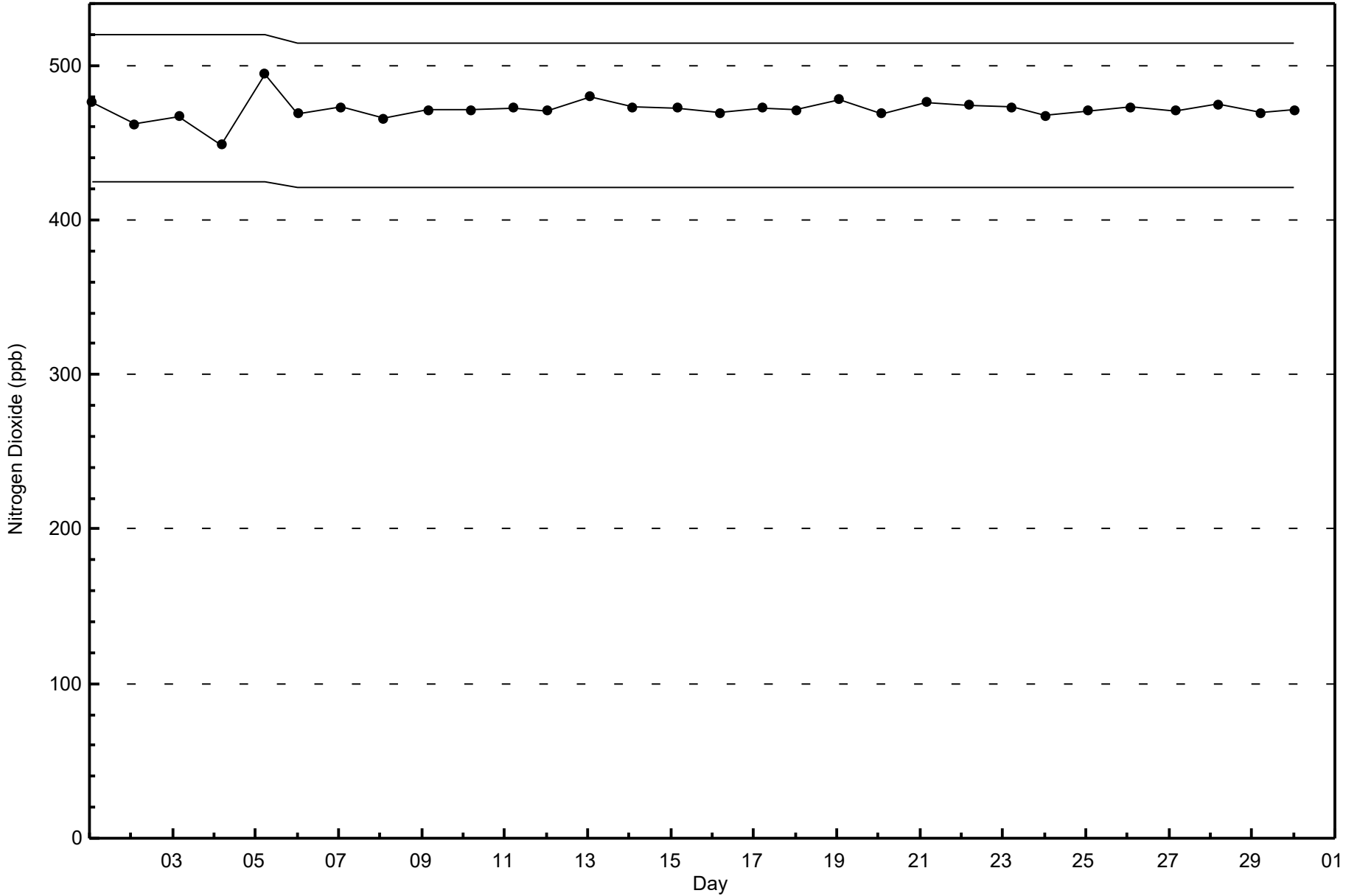
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South



Total Number of Valid Hours: 676







Wood Buffalo Environmental Association
Summary of Hour Averages

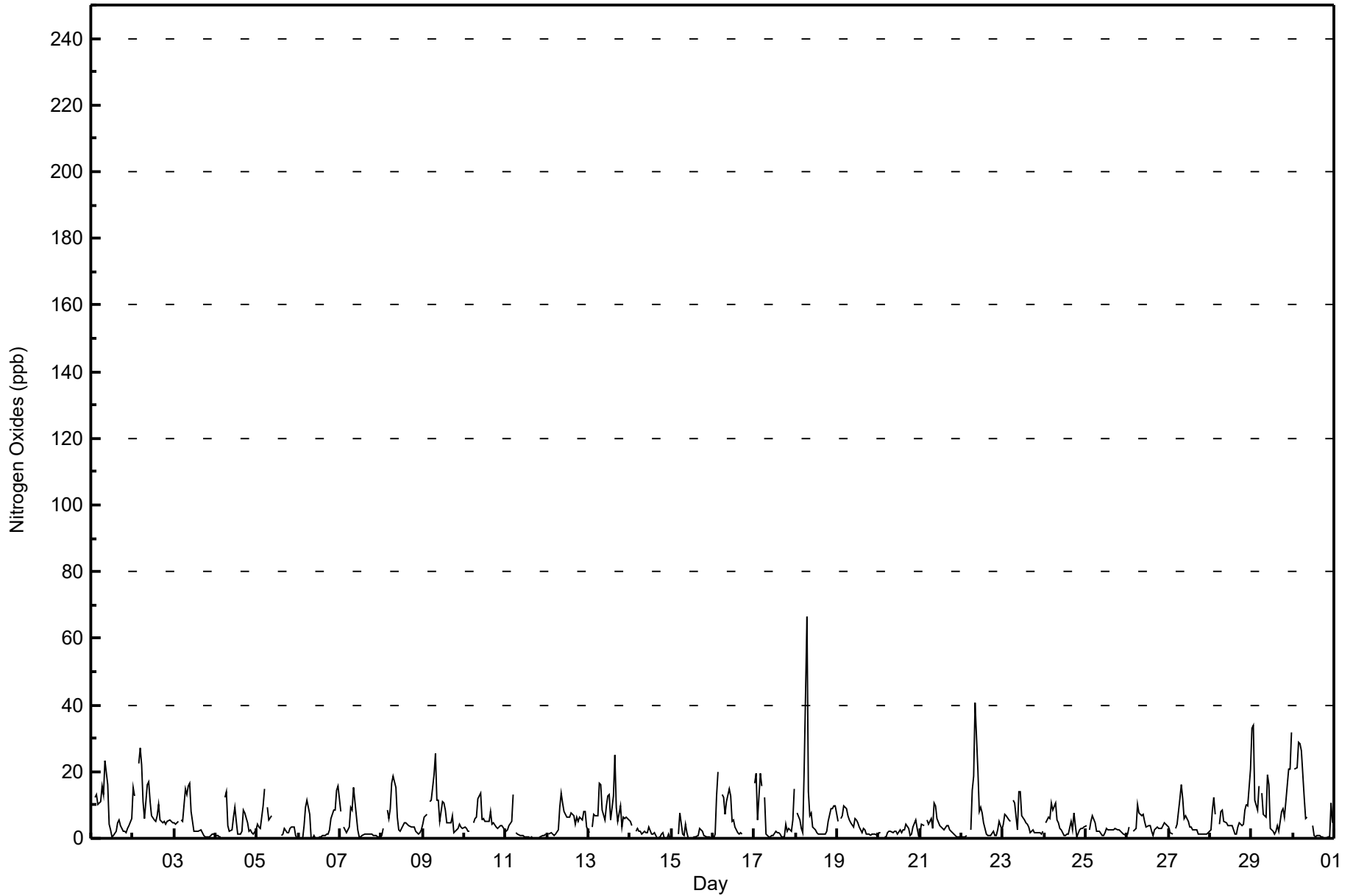
Nitrogen Oxides (NO_x) - ppb
Fort McKay South - June 2023

Maximum Value: 66.6 ppb on Jun 18 07:00																						Maximum Daily Average: 12.5 ppb on Jun 29																						Hours in Service: 720					
Minimum Value: 0.0 ppb on Jun 6 00:00																						Minimum Daily Average: 1.3 ppb on Jun 15																						Hours of Data: 677					
Maximum Diurnal Average: 11.6 ppb at hour 7																						Minimum Diurnal Average: 2.4 ppb at hour 20																						Hours of Missing Data: 43					
Monthly Average: 5.31 ppb																						Percentiles: P ₁ = 0.0 P ₁₀ = 0.6 Q ₁ = 1.5 Median = 3.4 Q ₃ = 6.8 P ₉₀ = 12.5 P ₉₉ = 27.3																						Hours of Calibration: 35					
Percentiles: P ₁ = 0.0 P ₁₀ = 0.6 Q ₁ = 1.5 Median = 3.4 Q ₃ = 6.8 P ₉₀ = 12.5 P ₉₉ = 27.3																						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-Jun	6.9	Z	12.4	13.0	10.0	11.2	15.5	13.0	23.4	16.1	4.2	2.5	0.6	0.9	2.0	4.5	5.4	4.0	1.9	2.1	1.8	2.9	3.7	6.1	7.1	23.4																							
2-Jun	15.5	12.5	Z	22.4	27.1	22.1	11.0	5.9	16.2	17.0	10.9	6.9	5.6	5.0	6.7	10.1	5.3	4.5	5.2	4.4	5.2	5.7	5.1	4.7	10.2	27.1																							
3-Jun	4.6	4.2	5.0	Z	5.4	5.0	14.8	13.2	15.5	16.7	8.1	2.3	2.3	2.0	2.0	2.4	1.8	0.9	0.6	0.5	0.6	0.9	1.2	1.1	4.8	16.7																							
4-Jun	0.8	0.8	0.6	0.4	Z	12.3	14.2	3.8	2.3	2.3	6.5	9.3	5.0	1.1	1.4	2.0	8.6	7.6	4.5	2.3	2.4	1.8	1.4	2.7	4.1	14.2																							
5-Jun	4.2	3.4	3.2	9.6	15.0	Z	9.3	5.3	6.7	C	C	C	C	C	0.8	1.1	3.1	1.8	1.7	3.0	3.5	3.2	0.8	0.0	4.2	15.0																							
6-Jun	Z	0.0	0.0	3.7	9.4	11.3	7.2	0.1	0.0	0.7	0.0	0.0	0.4	0.5	0.9	1.0	1.1	1.3	2.4	6.0	8.4	8.6	14.3	15.7	4.1	15.7																							
7-Jun	8.1	Z	3.2	2.6	1.8	3.5	9.4	8.5	15.2	6.9	2.4	0.5	0.4	1.0	1.3	1.3	1.2	1.1	1.1	0.9	0.9	0.8	0.5	0.6	3.2	15.2																							
8-Jun	0.9	2.9	Z	8.5	6.0	9.0	16.5	18.7	15.1	6.4	2.5	2.2	4.0	4.7	4.6	4.2	3.9	3.4	3.2	3.2	2.0	1.4	1.6	2.3	5.5	18.7																							
9-Jun	4.2	6.2	7.0	Z	11.0	11.6	18.9	25.6	11.3	11.4	5.1	11.2	10.8	8.5	4.9	4.5	4.7	6.8	1.6	2.2	3.1	4.2	3.4	3.1	7.9	25.6																							
10-Jun	3.4	3.1	2.2	2.2	Z	4.5	5.9	6.4	12.0	13.6	5.6	6.1	4.9	5.2	5.3	8.1	4.2	4.8	3.4	2.9	3.4	4.0	3.7	2.5	5.1	13.6																							
11-Jun	2.2	2.4	3.8	5.0	13.1	Z	1.6	1.1	1.0	0.9	0.8	0.6	0.5	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.6	0.9	1.1	1.6	13.1																							
12-Jun	Z	1.3	1.6	1.2	1.0	1.4	2.5	9.1	13.6	10.7	7.9	6.5	6.6	6.4	7.5	6.6	4.2	6.3	5.3	6.3	5.6	8.0	7.9	3.3	5.7	13.6																							
13-Jun	1.9	Z	3.5	7.0	6.7	7.0	16.6	16.0	8.6	5.4	9.8	12.5	13.1	5.5	12.5	24.9	9.2	5.0	9.9	3.5	6.2	5.9	6.4	5.7	8.8	24.9																							
14-Jun	5.0	3.8	Z	2.3	2.9	2.2	2.0	1.3	2.1	1.6	1.7	3.3	1.4	1.4	1.6	0.8	0.1	0.2	1.4	1.6	0.1	0.1	1.2	0.1	1.7	5.0																							
15-Jun	0.0	0.0	0.0	Z	1.4	7.7	1.4	1.0	4.2	1.7	0.0	0.0	0.0	0.5	0.6	0.9	3.0	2.7	2.3	0.9	0.3	0.3	0.4	0.2	1.3	7.7																							
16-Jun	0.0	1.4	12.7	20.0	Z	13.3	12.4	7.3	11.2	15.0	12.7	5.2	5.4	3.3	1.7	1.2	1.7	1.1	PF	PF	PF	PF	PF	PF	--	20.0																							
17-Jun	16.5	19.6	5.6	19.6	15.7	Z	12.4	1.3	0.4	0.5	0.7	1.0	2.2	1.7	1.9	1.3	0.5	0.5	4.3	2.1	3.1	2.2	5.6	14.9	5.8	19.6																							
18-Jun	Z	7.8	5.5	2.9	1.6	20.3	66.6	13.9	6.9	7.4	3.2	2.6	1.7	1.5	1.2	1.4	1.2	1.3	2.1	5.0	9.1	8.9	9.7	9.6	8.3	66.6																							
19-Jun	5.2	Z	5.8	6.9	9.7	8.9	6.8	5.5	4.5	3.6	5.8	5.7	4.7	3.3	1.8	2.9	2.6	1.5	1.3	0.7	1.2	1.5	1.4	1.0	4.0	9.7																							
20-Jun	1.5	1.5	Z	0.2	0.3	1.9	2.3	2.0	1.6	2.3	2.3	1.5	2.7	1.7	2.6	2.5	4.1	3.0	0.8	1.1	3.5	5.6	3.0	1.1	2.1	5.6																							
21-Jun	1.7	4.2	3.9	Z	5.5	4.4	6.1	3.1	10.7	9.9	5.7	4.0	3.5	3.1	2.6	3.8	4.0	2.7	2.3	1.5	1.0	0.6	0.6	0.5	3.7	10.7																							
22-Jun	0.4	0.4	0.5	0.9	Z	2.6	14.3	18.8	40.6	20.1	8.1	9.2	7.5	4.6	1.3	0.8	0.7	0.7	2.0	0.7	0.7	2.5	4.9	2.7	6.3	40.6																							
23-Jun	4.3	7.1	6.6	5.3	4.9	Z	11.6	10.5	2.4	14.1	14.0	6.9	5.6	4.5	4.1	3.4	1.5	2.4	1.6	1.7	1.7	1.5	1.2	1.9	5.2	14.1																							
24-Jun	Z	4.5	6.3	5.8	10.6	8.4	10.8	5.6	4.5	3.1	2.5	1.0	0.8	1.2	1.3	4.9	2.6	7.6	3.7	0.3	2.6	3.0	3.0	3.3	4.2	10.8																							
25-Jun	3.9	Z	2.4	5.0	6.6	4.6	2.1	2.2	2.2	0.9	0.8	1.8	2.8	2.7	2.6	2.6	2.7	2.8	2.6	2.4	1.9	1.5	1.3	1.0	2.6	6.6																							
26-Jun	1.4	3.4	Z	2.1	2.4	2.9	10.3	7.6	6.9	7.1	5.1	3.4	4.0	3.7	1.9	1.0	2.7	3.3	2.8	2.9	3.0	4.7	4.1	3.7	3.9	10.3																							
27-Jun	3.3	1.8	1.3	Z	2.9	4.2	11.8	16.0	11.8	5.8	6.9	5.1	3.4	3.3	2.7	2.4	2.5	1.3	1.3	1.4	1.4	1.4	1.3	1.8	4.2	16.0																							
28-Jun	2.7	8.3	12.3	7.2	Z	4.2	8.1	8.3	5.1	4.5	3.7	3.6	4.0	4.0	1.4	1.2	3.2	4.7	3.6	4.0	8.4	10.1	9.8	20.6	6.2	20.6																							
29-Jun	33.1	34.1	11.3	8.7	15.5	Z	13.6	7.2	6.4	19.2	16.2	2.9	2.0	1.3	1.9	3.8	2.3	8.2	9.0	6.2	10.8	20.6	20.8	31.6	12.5	34.1																							
30-Jun	Z	20.7	21.4	28.9	28.2	26.1	12.5	5.9	6.6	M	M	4.0	0.9	0.6	0.7	0.6	0.3	0.3	0.2	0.2	0.3	0.6	10.4	4.6	8.3	28.9																							
																								5.3	6.2	5.5	7.7	8.6	8.4	11.6	8.1	9.0	8.0	5.5	4.2	3.7	2.9	2.7	3.6	3.0	3.1	2.8	2.4	3.2	3.9	4.5	5.1	Diurnal Average	
																								33.1	34.1	21.4	28.9	28.2	26.1	66.6	25.6	40.6	20.1	16.2	12.5	13.1	8.5	12.5	24.9	9.2	8.2	9.9	6.3	10.8	20.6	20.8	31.6	Diurnal Maximum	
Z - zerospan																								C - Calibration			M - Maintenance			PF - Power Failure																			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay South - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	658	97.19	97.19
21 - 40	17	2.51	99.70
41 - 80	2	0.30	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - June 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	140	61	12	4	3	2	28	43	52	50	68	44	37	24	36	53	657
21 - 40	1	0	0	0	1	0	0	2	3	1	5	1	0	1	2	0	17
11 - 80	1	0	0	0	0	0	0	1	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	142	61	12	4	4	2	28	46	55	51	73	45	37	25	38	53	676

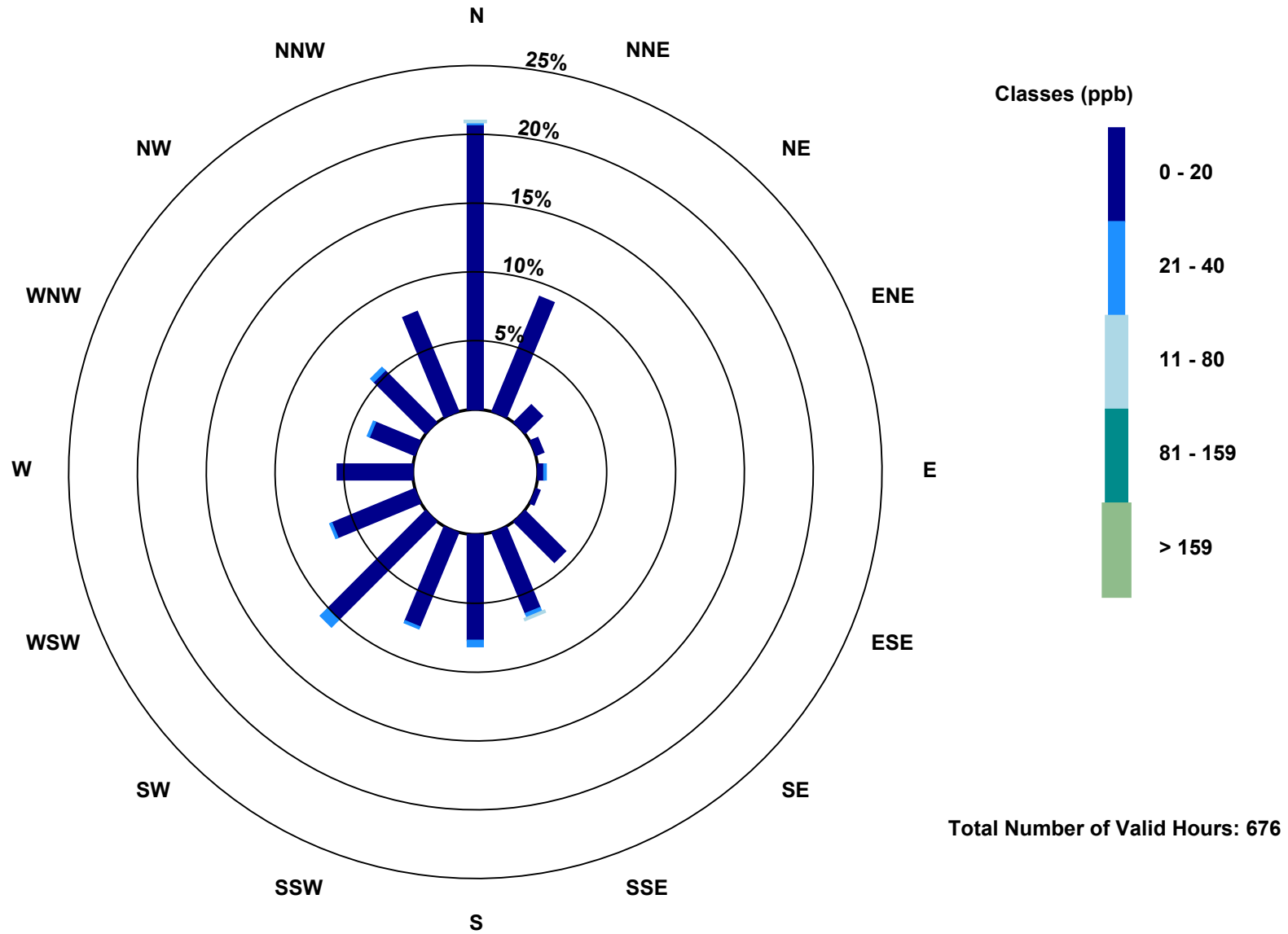
Total Number of Valid Hours: 676

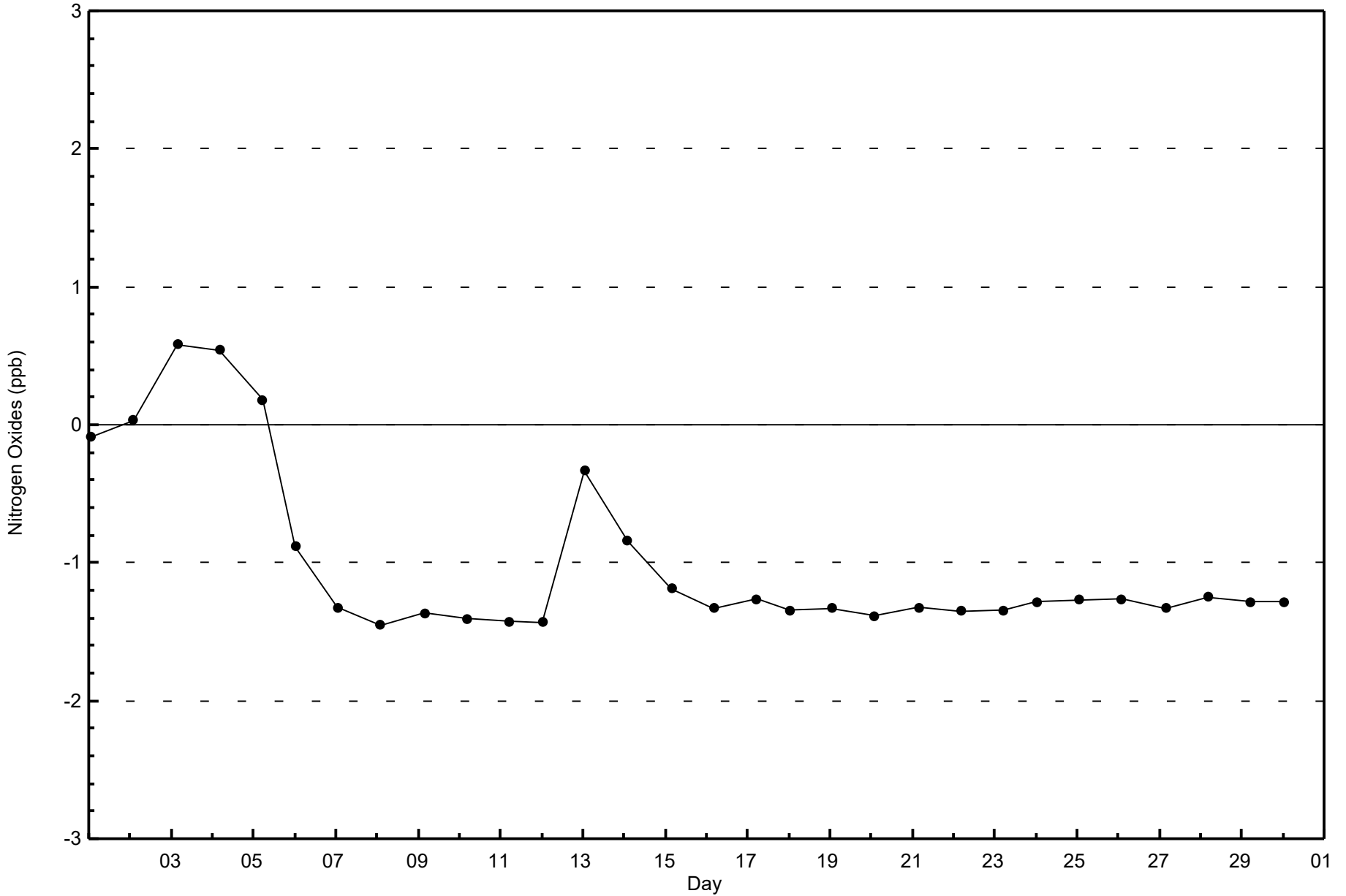
Total Number of Hours: 720

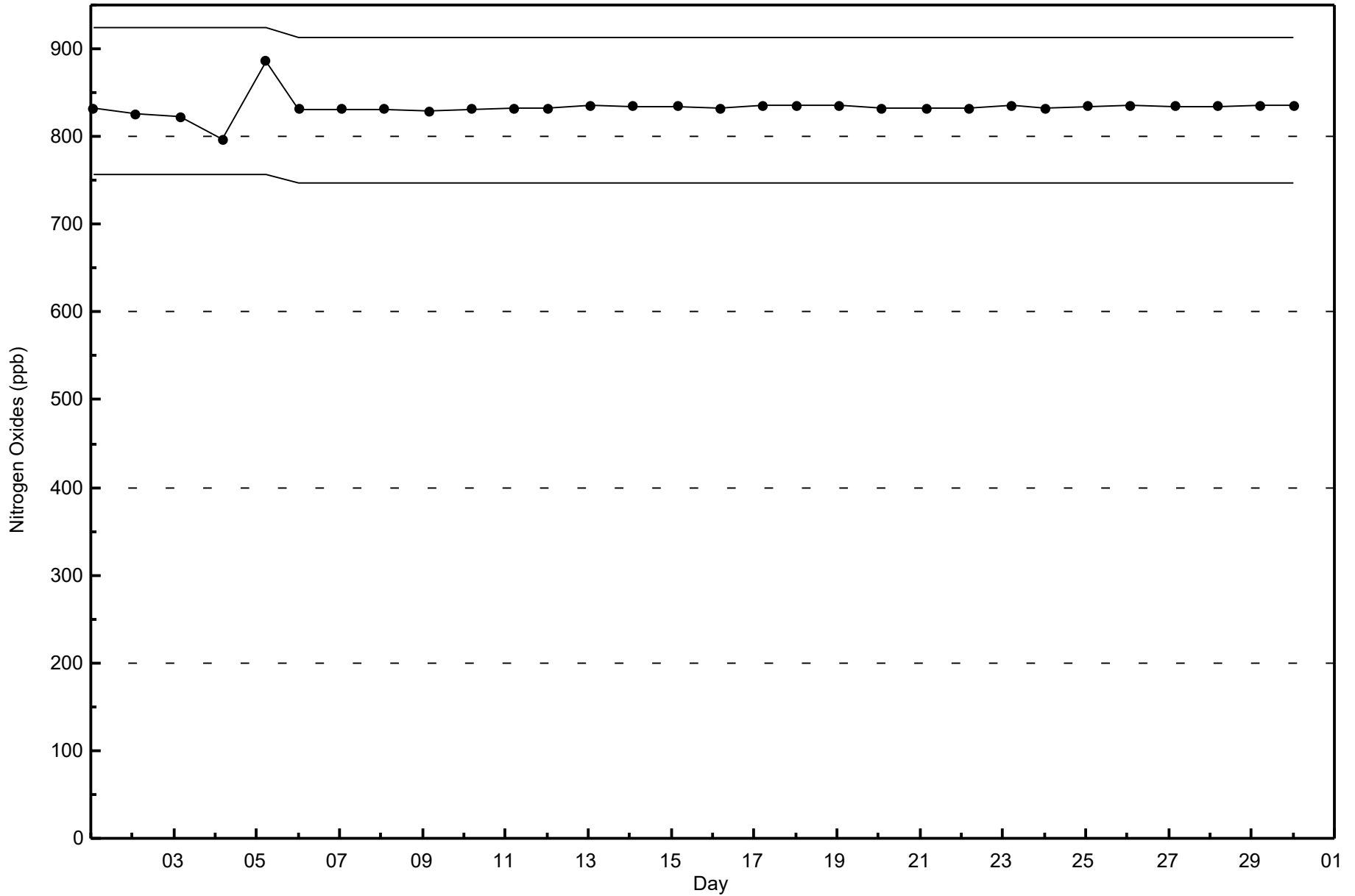


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Fort McKay South





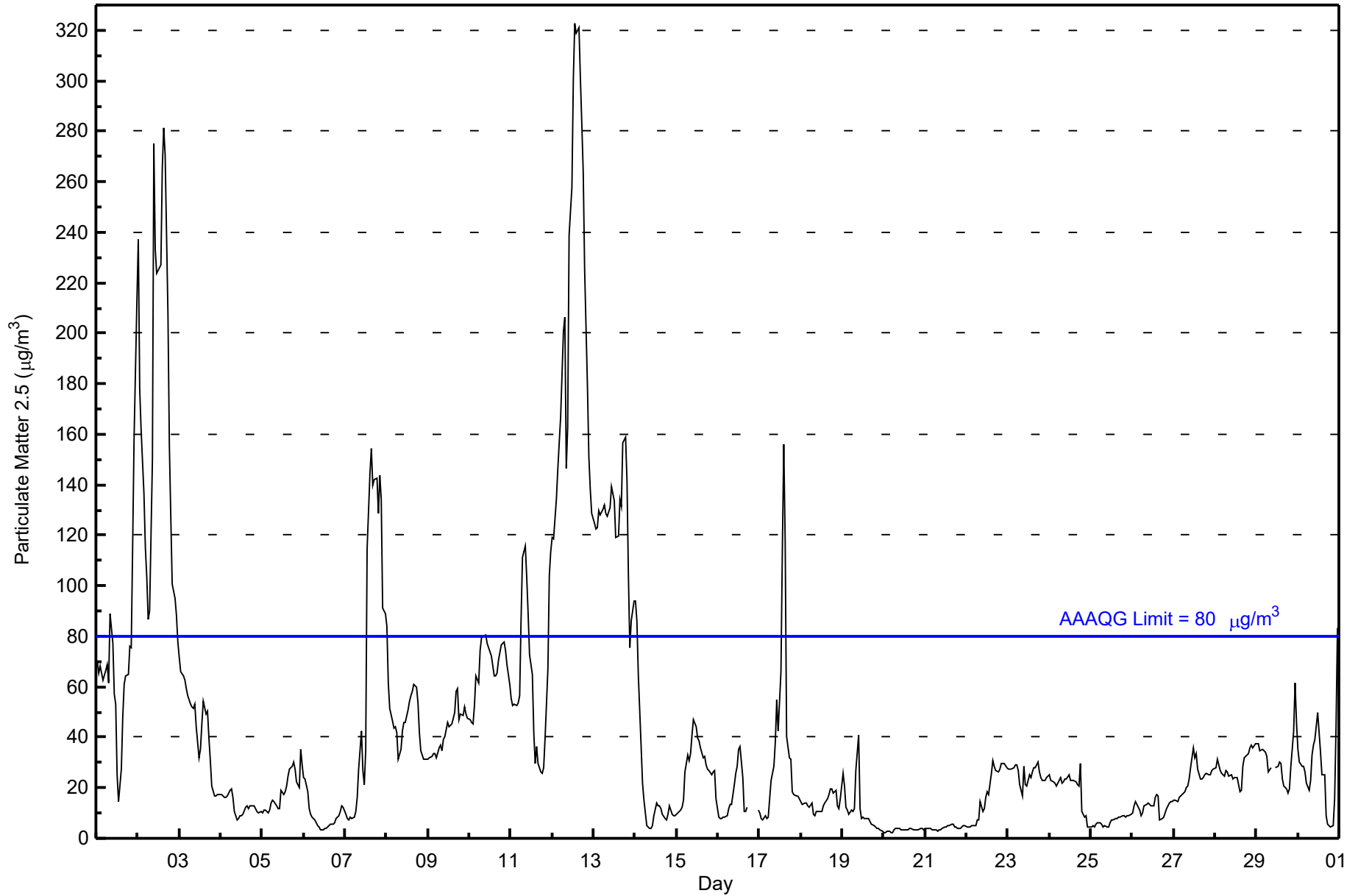




Number of Exceedences (AAAQO):	1-hr: 100	24-hr: 12	Hours in Service:	720
Maximum Value: 322.8 µg/m ³ on Jun 12 14:00	Maximum Daily Average: 207.7 µg/m ³ on Jun 12		Hours of Data:	713
Minimum Value: 2.0 µg/m ³ on Jun 20 06:00	Minimum Daily Average: 3.3 µg/m ³ on Jun 20		Hours of Missing Data:	7
Maximum Diurnal Average: 54.7 µg/m ³ at hour 16	Minimum Diurnal Average: 34.0 µg/m ³ at hour 5		Hours of Calibration:	2
Monthly Average: 42.84 µg/m ³	Percentiles: P ₁ = 3.0 P ₁₀ = 5.0 Q ₁ = 10.7 Median = 24.9 Q ₃ = 49.4 P ₉₀ = 116.6 P ₉₉ = 274.5		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	69.9	65.2	68.0	65.4	62.9	66.6	68.9	61.4	88.9	77.5	56.9	52.9	25.3	14.8	27.4	48.2	61.2	64.4	64.8	76.0	75.6	115.6	158.1	212.8	72.9	212.8
2-Jun	237.3	178.1	161.9	136.4	115.3	103.5	86.8	90.2	150.1	275.0	233.2	223.8	225.8	227.0	265.9	281.2	270.4	207.6	155.6	127.3	100.5	95.1	88.3	77.8	171.4	281.2
3-Jun	71.4	66.3	64.3	62.4	59.5	56.4	53.1	52.3	51.2	52.9	44.3	31.8	35.5	45.3	54.3	49.5	50.1	39.9	30.5	20.5	17.0	16.5	17.4	17.6	44.2	71.4
4-Jun	17.4	16.6	16.3	16.0	16.9	19.1	19.7	16.2	10.7	7.5	7.8	9.1	8.9	9.4	12.5	12.8	11.9	13.0	12.8	13.0	11.7	10.6	10.2	10.6	12.9	19.7
5-Jun	10.1	11.5	11.4	10.3	11.3	14.1	15.3	14.7	12.7	11.6	11.9	18.8	17.3	18.6	20.5	24.7	27.7	28.7	30.0	27.5	22.3	20.1	35.4	29.3	19.0	35.4
6-Jun	23.8	23.8	18.2	11.8	9.4	8.3	7.0	6.0	5.2	4.3	3.4	3.3	3.7	4.1	4.7	5.5	5.7	5.4	6.2	7.7	8.8	10.6	13.1	12.5	8.9	23.8
7-Jun	9.4	7.7	7.5	8.4	8.0	8.6	10.5	16.2	27.4	42.5	26.7	21.5	34.8	114.7	144.5	154.7	140.0	142.2	142.7	128.7	143.5	134.4	91.2	89.1	68.9	154.7
8-Jun	83.9	61.7	51.5	46.6	43.5	44.4	41.8	31.6	35.3	42.3	46.0	46.1	51.0	54.3	56.7	58.1	61.2	60.0	53.9	42.2	34.8	31.2	31.3	31.1	47.5	83.9
9-Jun	31.6	32.1	32.4	33.8	33.6	31.6	35.5	37.2	34.8	39.1	40.5	45.7	44.1	44.8	45.1	49.7	58.2	59.1	46.8	49.0	48.7	52.0	49.4	47.4	42.6	59.1
10-Jun	47.1	45.8	45.6	52.3	64.5	61.5	74.1	79.6	79.9	80.5	77.1	75.6	74.1	72.3	64.4	64.1	65.4	70.3	76.6	77.0	77.6	74.2	68.6	61.1	67.9	80.5
11-Jun	55.5	52.5	53.4	52.4	53.7	56.4	86.6	111.5	115.7	103.4	89.1	72.7	65.0	42.2	29.6	36.5	29.7	26.1	26.0	28.1	40.0	67.4	103.8	113.5	62.9	115.7
12-Jun	119.1	118.6	134.0	145.7	156.4	166.4	200.8	206.2	146.4	162.8	238.8	257.8	300.1	322.8	318.9	321.1	300.8	283.3	263.9	225.2	178.9	151.1	138.3	128.6	207.7	322.8
13-Jun	124.7	122.4	123.2	129.6	128.2	130.5	132.0	128.9	127.6	130.9	139.3	136.3	133.8	119.1	119.5	134.3	131.5	156.8	158.7	141.5	104.2	75.8	85.9	94.1	125.4	158.7
14-Jun	93.9	86.2	65.1	36.4	21.7	14.9	10.3	5.1	3.8	4.0	5.2	9.1	13.9	13.1	12.7	12.0	9.6	7.8	7.5	9.4	13.0	9.5	8.8	9.1	20.1	93.9
15-Jun	9.7	10.2	11.2	12.1	14.8	26.3	32.8	30.6	33.4	40.6	46.8	43.9	39.7	38.3	36.1	32.1	32.6	29.2	27.4	26.6	25.3	26.1	26.9	15.8	27.9	46.8
16-Jun	8.7	7.7	8.1	8.5	8.2	8.8	11.7	13.7	13.7	21.4	25.5	28.4	35.1	36.6	24.3	10.7	10.5	12.2	PF	PF	PF	PF	PF	11.3	16.1	36.6
17-Jun	9.9	8.0	7.4	8.7	7.7	8.5	15.6	22.7	28.8	37.8	55.0	42.7	65.8	114.4	156.2	116.8	40.1	32.0	31.6	18.6	17.1	16.6	16.7	15.6	37.3	156.2
18-Jun	14.3	13.5	14.1	14.2	13.0	12.4	14.2	9.6	9.1	10.6	10.7	10.9	10.7	13.0	14.2	15.7	17.4	19.6	19.8	17.9	18.9	13.0	12.0	15.4	13.9	19.8
19-Jun	25.5	20.8	12.4	11.2	9.8	11.3	10.7	11.8	26.9	40.6	12.0	7.8	8.2	7.7	7.7	7.9	6.5	5.7	5.1	4.2	4.1	3.8	3.4	2.6	11.2	40.6
20-Jun	2.5	2.5	2.9	2.8	2.1	2.0	3.4	3.8	3.8	3.7	3.5	3.3	3.5	3.6	3.6	3.8	3.8	3.4	3.3	3.4	3.6	4.0	4.0	3.6	3.3	4.0
21-Jun	3.6	3.8	3.8	3.7	3.5	3.6	3.5	3.0	3.3	3.5	3.7	4.2	4.7	4.9	5.1	5.4	5.4	4.4	4.5	4.2	4.1	4.6	4.8	4.8	4.2	5.4
22-Jun	4.7	4.5	4.6	5.1	5.0	5.1	7.3	7.4	14.4	10.5	11.7	16.4	18.3	17.3	25.5	30.6	28.6	26.8	26.4	27.4	29.8	29.4	29.5	28.2	17.3	30.6
23-Jun	27.4	27.5	27.4	27.9	28.9	29.2	26.8	21.5	16.9	28.7	21.1	20.8	25.3	24.3	26.0	28.0	28.1	30.2	26.4	23.9	22.8	23.1	24.2	24.9	25.5	30.2
24-Jun	24.9	22.9	22.2	21.7	20.6	22.0	24.1	21.6	22.3	23.5	23.2	24.9	22.9	23.0	22.9	22.2	21.5	20.6	29.8	10.6	8.3	9.0	4.5	4.6	19.7	29.8
25-Jun	4.7	4.9	4.7	5.7	6.4	5.9	5.6	4.6	4.9	4.7	4.7	5.9	7.0	7.5	7.7	7.9	8.2	8.7	9.0	8.9	8.6	8.9	9.2	9.5	6.8	9.5
26-Jun	10.0	12.6	14.6	12.6	11.3	8.9	10.2	12.7	13.2	14.0	13.6	13.0	13.0	16.0	17.5	16.7	7.5	7.6	8.6	10.0	11.6	14.0	14.4	14.3	12.4	17.5
27-Jun	14.9	15.1	14.6	16.1	17.0	17.1	18.6	19.9	20.9	23.3	27.9	35.8	31.7	33.6	27.4	23.5	23.3	24.3	25.3	25.9	24.9	25.3	26.7	27.3	23.3	35.8
28-Jun	28.1	31.5	29.2	26.8	25.5	24.7	26.6	26.1	24.4	25.2	23.7	23.8	23.9	23.9	18.7	19.0	28.5	31.9	33.1	33.7	36.0	36.9	35.9	37.6	28.1	37.6
29-Jun	37.7	37.3	34.6	35.2	34.9	34.0	32.5	26.4	27.8	C	C	27.8	28.3	30.4	29.4	23.4	20.7	19.7	17.7	19.8	28.6	42.7	61.3	46.1	31.6	61.3
30-Jun	35.1	30.0	28.7	28.6	26.1	21.6	18.9	22.9	32.8	37.2	39.0	50.0	41.7	33.9	25.3	25.3	8.7	5.6	5.1	4.7	5.0	15.6	44.4	83.1	27.9	83.1
41.9 38.0 36.4 34.9 34.0 34.1 36.8 37.2 39.5 46.9 46.3 45.5 47.1 51.0 54.1 54.7 50.5 48.2 46.5 41.8 38.8 39.2 42.0 42.6																								Diurnal Average		
237.3 178.1 161.9 145.7 156.4 166.4 200.8 206.2 150.1 275.0 238.8 257.8 300.1 322.8 318.9 321.1 300.8 283.3 263.9 225.2 178.9 151.1 158.1 212.8																								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 McKay South - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	85	11.92	11.92
6 - 15	169	23.70	35.62
16 - 25	115	16.13	51.75
26 - 80	244	34.22	85.97
> 81.0	100	14.03	100.00

Total Number of Valid Hours: 713

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 - June 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	24	16	2	1	0	0	0	1	0	3	10	7	0	1	10	10	85
6 - 15	54	11	0	1	0	0	8	8	17	20	14	7	5	2	4	18	169
16 - 25	25	6	2	0	1	0	10	10	11	10	17	5	4	1	4	9	115
26 - 80	23	15	6	1	3	2	9	24	29	24	32	23	11	13	16	12	243
> 81.0	24	15	2	1	0	0	1	3	1	1	4	6	17	8	9	8	100
Totals	150	63	12	4	4	2	28	46	58	58	77	48	37	25	43	57	712

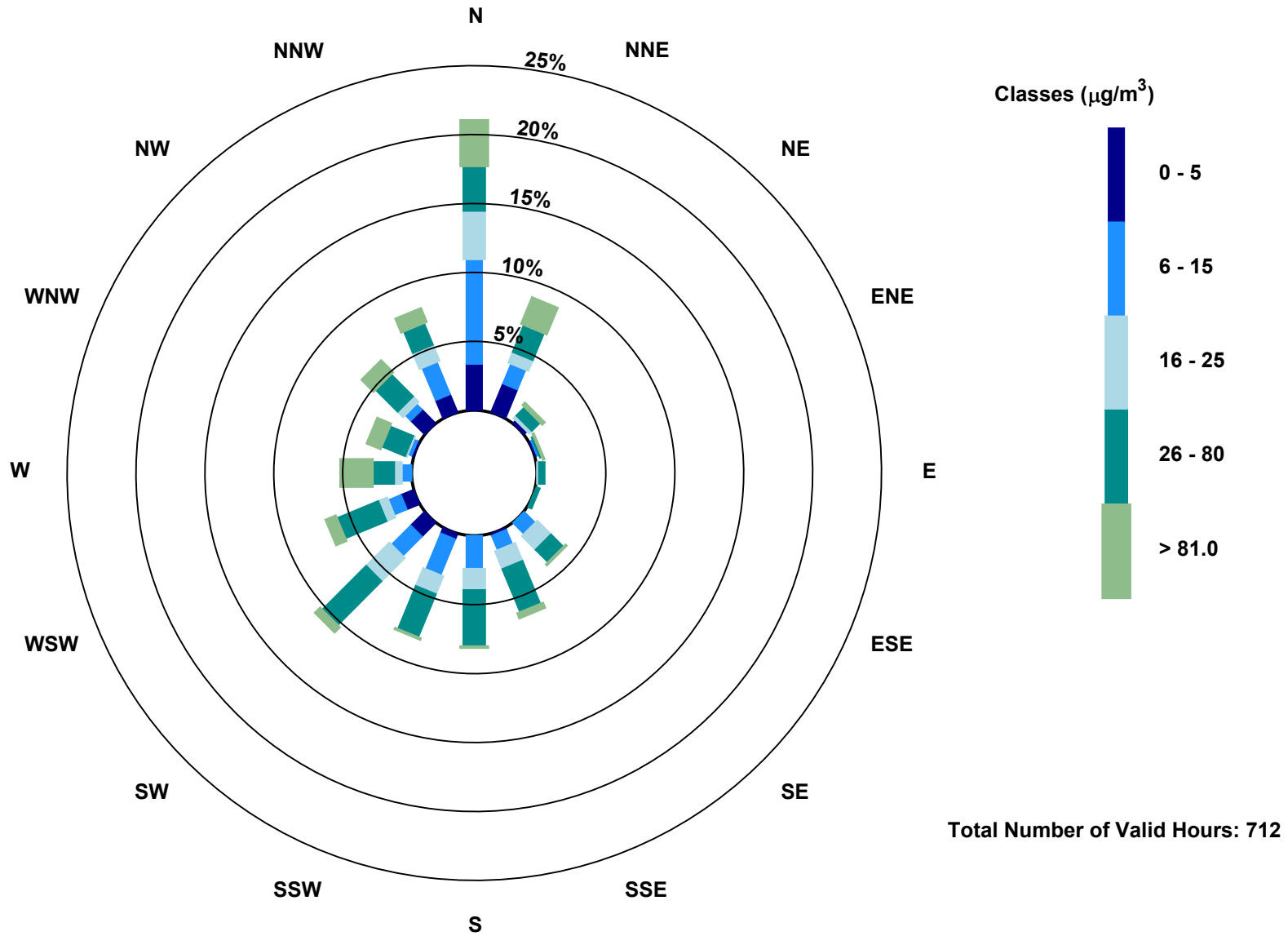
Total Number of Valid Hours: 712

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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

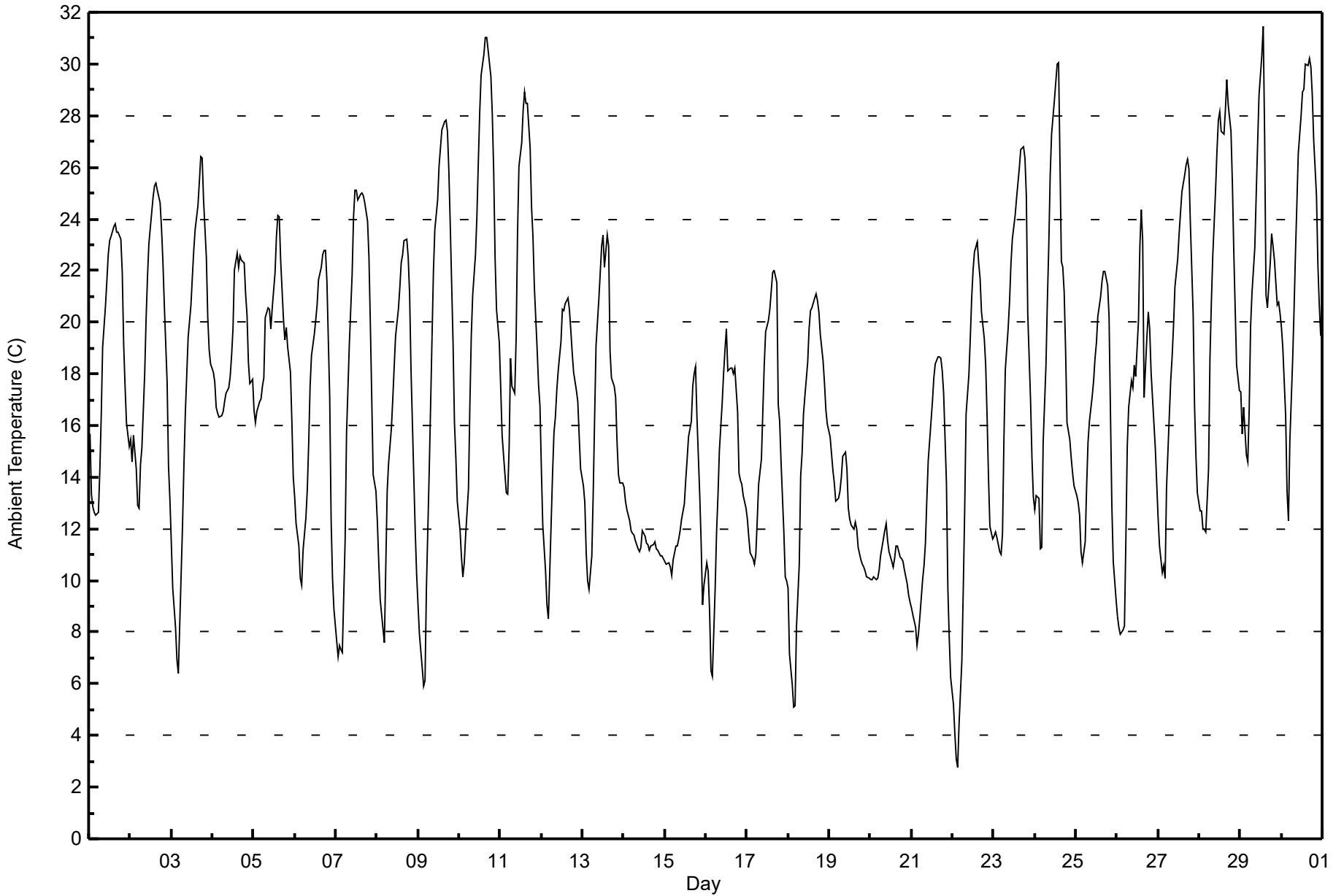
Ambient Temperature (AT) - C
Fort McKay South - June 2023

Maximum Value: 31.5 C on Jun 29 14:00		Maximum Daily Average: 23.3 C on Jun 30		Hours in Service: 720																						
Minimum Value: 2.8 C on Jun 22 04:00		Minimum Daily Average: 10.7 C on Jun 20		Hours of Data: 720																						
Maximum Diurnal Average: 22.7 C at hour 15		Minimum Diurnal Average: 10.3 C at hour 5		Hours of Missing Data: 0																						
Monthly Average: 17.16 C		Percentiles: P ₁ = 5.9 P ₁₀ = 10.1 Q ₁ = 12.2 Median = 17.0 Q ₃ = 21.6 P ₉₀ = 25.1 P ₉₉ = 30.0		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-Jun	15.7	13.3	12.9	12.7	12.6	12.6	14.3	16.4	19.1	20.6	21.6	22.6	23.1	23.3	23.7	23.8	23.5	23.5	23.2	21.9	19.2	17.5	16.1	15.2	18.7	23.8
2-Jun	15.5	14.6	15.6	14.3	12.9	12.8	14.5	15.1	18.0	20.1	21.8	23.0	24.3	24.8	25.3	25.4	25.1	24.6	23.6	22.4	20.7	17.7	14.4	13.1	19.1	25.4
3-Jun	11.4	9.7	8.2	7.0	6.4	8.3	12.1	14.5	16.5	17.9	19.4	20.7	21.8	22.8	23.6	24.5	25.4	26.4	26.3	24.7	22.5	20.2	18.9	18.4	17.8	26.4
4-Jun	18.1	17.7	16.7	16.5	16.3	16.4	16.5	16.9	17.2	17.4	17.9	18.7	19.7	22.0	22.7	22.1	22.5	22.4	22.3	21.1	20.3	18.5	17.6	17.8	19.0	22.7
5-Jun	16.6	16.1	16.5	16.9	17.0	17.5	17.9	20.2	20.6	20.5	19.7	20.5	21.9	23.3	24.1	24.1	22.4	20.1	19.3	19.8	19.0	18.1	16.2	14.0	19.3	24.1
6-Jun	13.2	12.2	11.3	10.1	9.8	11.2	12.4	13.5	15.3	17.5	18.7	19.5	20.1	20.7	21.6	22.1	22.6	22.8	22.8	21.6	17.1	12.4	10.1	8.9	16.1	22.8
7-Jun	7.6	7.0	7.5	7.3	7.2	11.6	15.7	17.4	19.1	21.8	24.1	25.1	25.1	24.8	25.0	25.0	24.9	24.6	23.9	22.5	19.9	17.0	14.1	13.5	18.0	25.1
8-Jun	12.3	10.7	9.3	8.1	7.6	10.5	13.4	14.5	15.9	17.0	18.3	19.5	20.5	21.3	22.3	22.6	23.2	23.2	22.5	21.1	18.2	14.0	11.9	10.2	16.2	23.2
9-Jun	9.1	7.9	6.6	5.9	6.1	9.7	14.3	16.8	19.4	22.0	23.6	24.7	26.1	26.7	27.4	27.8	27.8	27.4	25.8	23.8	19.2	16.1	14.7	13.0	18.4	27.8
10-Jun	11.9	10.9	10.2	10.7	11.8	13.6	16.8	19.5	21.0	22.6	24.1	26.1	28.1	29.5	30.3	31.0	31.0	30.5	29.5	28.0	25.8	22.4	20.5	19.2	21.9	31.0
11-Jun	17.5	15.6	14.9	13.4	13.4	15.1	18.6	17.5	17.2	19.3	23.4	26.0	26.9	28.2	28.9	28.5	28.5	26.7	24.4	23.3	21.4	18.9	17.6	16.8	20.9	28.9
12-Jun	14.3	12.2	10.3	9.1	8.5	10.4	14.2	15.7	16.3	17.4	18.1	19.3	20.5	20.5	20.7	20.9	20.5	19.7	18.8	18.1	17.3	16.9	15.5	14.3	16.2	20.9
13-Jun	13.7	13.0	11.0	10.0	9.6	10.9	13.4	16.3	19.1	20.9	21.9	22.9	23.4	22.1	23.4	22.9	18.9	17.8	17.5	17.1	15.3	14.1	13.8	13.8	16.8	23.4
14-Jun	13.6	13.1	12.7	12.3	11.9	11.8	11.8	11.5	11.2	11.1	11.3	11.9	11.7	11.4	11.4	11.2	11.3	11.4	11.5	11.2	11.2	11.0	11.0	10.8	11.6	13.6
15-Jun	10.7	10.6	10.7	10.5	10.2	10.8	11.3	11.3	11.6	11.9	12.3	13.0	13.9	14.7	15.5	16.2	17.5	18.0	18.3	16.3	13.3	11.4	9.1	9.8	12.9	18.3
16-Jun	10.7	10.4	8.8	6.5	6.3	9.7	11.9	13.3	15.0	16.9	18.0	18.9	19.7	18.1	18.2	18.2	18.0	18.2	16.5	14.2	13.9	13.7	13.3	12.8	14.2	19.7
17-Jun	12.3	11.7	11.1	10.9	10.6	11.0	12.3	13.7	14.7	16.5	18.3	19.6	20.1	20.5	21.2	21.9	22.0	21.5	16.8	16.1	14.6	11.9	10.1	10.0	15.4	22.0
18-Jun	9.7	7.1	6.0	5.1	5.1	8.2	10.6	14.1	14.9	16.4	17.1	18.5	19.8	20.4	20.5	20.9	21.1	20.8	20.4	19.5	18.5	17.6	16.6	16.0	15.2	21.1
19-Jun	15.6	14.9	14.2	13.8	13.1	13.2	13.5	14.0	14.8	14.9	14.3	12.8	12.3	12.1	12.0	12.3	12.0	11.3	10.8	10.6	10.5	10.4	10.1	10.1	12.6	15.6
20-Jun	10.1	10.0	10.1	10.0	10.1	10.4	11.0	11.3	11.9	12.2	11.6	11.1	10.7	10.5	10.8	11.3	11.3	10.9	10.9	10.8	10.4	9.9	9.4	9.2	10.7	12.2
21-Jun	8.9	8.7	8.2	7.5	7.9	8.6	10.0	10.6	11.5	13.1	14.6	16.2	16.9	17.9	18.4	18.7	18.7	18.6	18.1	17.2	13.8	9.7	7.8	6.2	12.8	18.7
22-Jun	5.2	4.1	3.1	2.8	4.5	6.9	9.7	12.7	16.4	18.0	19.4	20.9	22.0	22.7	23.1	22.3	21.7	20.4	19.4	18.3	16.3	14.0	12.1	11.6	14.5	23.1
23-Jun	11.7	11.9	11.6	11.1	11.0	11.8	15.5	18.2	19.8	20.8	22.3	23.2	24.2	24.8	25.4	26.0	26.7	26.8	26.4	24.9	20.3	17.0	14.8	13.2	19.1	26.8
24-Jun	12.8	13.3	13.2	11.2	11.3	15.4	18.3	20.8	23.0	25.6	27.3	28.6	29.3	30.0	30.0	22.4	22.1	21.2	18.9	16.1	15.5	14.7	14.2	13.7	19.5	30.0
25-Jun	13.3	13.0	12.5	11.1	10.7	11.5	13.6	15.3	16.1	17.1	17.8	18.6	19.2	20.2	21.0	21.6	22.0	21.9	21.4	20.2	16.5	12.9	10.7	9.3	16.2	22.0
26-Jun	8.6	8.2	7.9	8.1	8.2	11.6	15.2	16.7	17.7	17.5	18.3	17.9	20.1	23.0	24.3	23.2	17.1	19.4	20.4	19.7	18.0	16.1	15.2	13.8	16.1	24.3
27-Jun	12.4	11.3	10.3	10.6	10.1	13.5	16.4	17.7	18.6	19.9	21.4	22.4	23.4	24.2	25.0	25.7	26.1	26.3	25.9	23.9	20.3	16.8	14.8	13.4	18.8	26.3
28-Jun	12.7	12.7	12.0	12.0	11.9	14.3	18.6	20.8	22.6	25.1	26.6	27.8	28.1	27.4	27.3	28.2	29.4	28.4	27.4	25.4	22.7	20.5	18.4	17.3	21.6	29.4
29-Jun	17.3	15.7	16.7	14.9	14.6	16.7	19.8	21.2	22.9	24.9	26.9	28.8	30.3	31.5	27.2	21.0	20.5	22.3	23.4	22.9	22.4	20.7	20.8	20.3	21.8	31.5
30-Jun	19.8	19.0	16.4	13.5	12.3	15.4	18.6	20.5	22.7	24.6	26.5	28.0	28.9	29.0	30.0	29.9	30.2	29.9	28.8	27.1	24.9	22.2	20.7	19.5	23.3	30.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Fort McKay South - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort McKay South - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	63	8.75	8.75
10 - 20	416	57.78	66.53
> 20	241	33.47	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

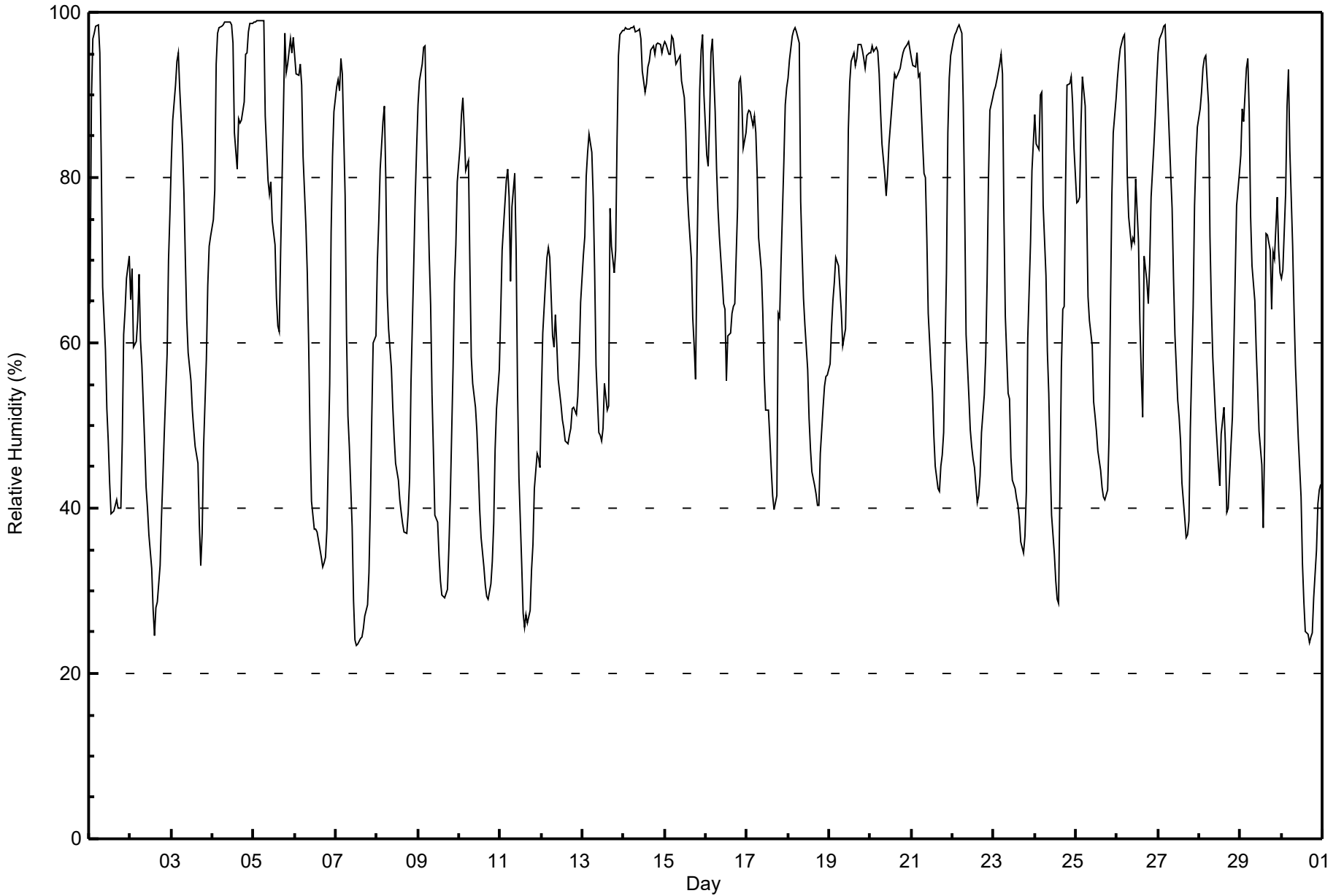
Relative Humidity (RH) - %
Fort McKay South - June 2023

Maximum Value: 99.0 % on Jun 5 05:00 Maximum Daily Average: 96.0 % on Jun 14																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 23.4 % on Jun 7 13:00 Minimum Daily Average: 49.2 % on Jun 2																						Hours of Missing Data: 0 Hours of Calibration: 0																										
Maximum Diurnal Average: 91.0 % at hour 5 Minimum Diurnal Average: 49.1 % at hour 15																						Percent Operational Time: 100.0																										
Monthly Average: 68.39 % Percentiles: P₁ = 24.6 P₁₀ = 38.0 Q₁ = 49.1 Median = 70.0 Q₃ = 89.9 P₉₀ = 95.9 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-Jun	64.7	89.3	96.8	97.5	98.2	98.5	95.1	82.2	66.8	59.2	52.0	48.1	43.0	39.4	39.7	40.3	41.0	40.0	40.0	48.1	61.0	63.8	67.8	70.5	64.3	98.5																						
2-Jun	65.3	69.0	59.5	60.1	62.6	68.3	60.4	57.3	47.8	42.5	40.0	36.8	32.8	27.8	24.6	28.0	28.6	33.1	39.0	43.9	49.1	58.6	70.0	75.5	49.2	75.5																						
3-Jun	82.0	86.9	91.2	94.2	95.2	90.7	83.7	78.2	70.2	62.8	58.7	55.4	51.9	49.5	47.4	45.4	38.0	33.0	37.0	47.4	58.0	67.0	71.8	72.9	65.3	95.2																						
4-Jun	74.9	78.6	93.8	97.4	98.2	98.2	98.6	98.8	98.8	98.8	98.5	96.2	85.4	81.1	87.1	86.7	86.9	89.2	94.9	95.0	97.6	98.6	98.7	92.9	98.8	98.9																						
5-Jun	98.7	98.8	98.9	99.0	99.0	99.0	99.0	99.0	87.4	79.6	78.0	79.4	74.8	71.9	65.5	62.1	61.3	71.2	88.2	97.4	92.7	93.7	96.8	95.2	96.9	86.9	99.0																					
6-Jun	94.7	92.5	92.3	93.7	91.2	82.6	74.3	68.4	59.6	48.7	40.8	37.4	37.4	37.0	36.2	34.0	32.8	33.3	34.0	37.4	55.1	73.4	82.6	88.0	60.7	94.7																						
7-Jun	91.1	91.8	90.4	94.3	92.6	77.8	61.0	51.1	47.4	37.7	28.9	24.1	23.4	23.6	24.2	24.4	25.5	27.0	28.4	32.2	40.3	50.8	60.0	60.9	50.4	94.3																						
8-Jun	69.8	74.8	81.1	86.8	88.7	80.0	66.0	61.7	57.0	52.1	48.5	45.4	43.4	41.1	39.5	38.1	37.1	36.9	39.4	43.6	55.2	69.9	77.6	83.6	59.1	88.7																						
9-Jun	88.7	91.7	93.7	95.7	96.0	86.1	70.5	64.5	53.8	46.8	39.1	38.3	34.3	31.2	29.6	29.1	29.6	30.1	35.0	41.0	57.0	67.4	71.9	79.4	58.3	96.0																						
10-Jun	83.7	87.6	89.7	85.7	80.8	82.1	69.5	58.3	55.2	52.2	49.2	44.9	39.9	36.4	32.9	30.7	29.4	29.0	30.8	33.5	38.1	47.1	52.1	56.9	54.0	89.7																						
11-Jun	63.8	71.1	74.1	79.7	81.0	77.7	67.4	76.4	80.5	71.1	54.3	43.8	33.1	27.3	25.6	27.1	26.1	27.6	32.6	35.6	42.4	46.7	46.1	44.9	52.3	81.0																						
12-Jun	53.6	61.2	67.4	70.3	71.5	70.4	60.9	59.6	63.4	59.8	55.6	52.5	50.7	49.6	48.2	47.8	48.8	49.7	52.1	52.1	51.3	53.5	58.3	65.0	57.2	71.5																						
13-Jun	70.7	72.9	80.1	83.1	85.3	83.1	77.7	68.8	57.3	49.1	48.8	48.1	49.6	55.0	51.9	52.4	76.2	71.8	68.5	71.3	84.6	94.8	97.3	97.9	70.7	97.9																						
14-Jun	97.8	98.1	98.0	98.0	98.1	98.1	98.3	97.7	97.9	97.9	96.8	92.8	90.4	91.4	93.4	94.0	95.5	95.9	94.9	96.0	96.3	96.1	95.1	95.9	96.0	98.3																						
15-Jun	96.4	96.1	95.0	94.9	97.1	96.8	93.7	94.0	94.3	94.8	91.7	89.6	85.6	78.8	75.4	70.2	63.0	59.6	55.6	70.0	90.7	95.4	97.3	89.9	86.1	97.3																						
16-Jun	82.7	81.4	87.0	95.1	96.8	87.9	81.0	76.3	73.0	67.6	64.8	64.0	55.4	60.9	61.2	63.6	64.5	64.8	76.4	91.6	92.1	89.6	83.6	85.5	76.9	96.8																						
17-Jun	87.6	88.2	88.0	86.2	87.4	85.4	80.1	72.6	68.6	63.6	56.1	51.9	51.8	48.5	44.8	41.6	39.9	41.6	63.5	63.1	69.8	81.8	88.9	90.8	68.4	90.8																						
18-Jun	92.1	94.2	97.1	97.8	98.1	97.6	96.2	77.1	71.0	65.3	62.2	56.7	50.9	47.1	44.4	42.6	41.6	40.4	40.4	46.6	52.2	54.8	56.0	56.0	65.8	98.1																						
19-Jun	57.4	61.8	65.1	67.2	70.4	69.4	66.5	63.8	59.7	61.6	70.4	85.7	91.4	94.0	95.1	93.6	94.4	96.2	96.1	95.4	94.4	93.2	94.7	95.1	80.5	96.2																						
20-Jun	95.1	96.0	95.3	95.7	95.3	92.6	88.0	84.1	80.3	77.7	80.3	84.1	88.4	90.7	92.6	92.0	92.4	93.2	94.2	95.1	95.6	96.2	96.4	95.5	91.1	96.4																						
21-Jun	94.5	93.6	93.3	95.1	92.3	92.6	84.3	80.4	80.1	72.6	63.6	56.8	54.0	48.9	45.0	42.3	42.0	45.1	46.4	49.1	68.5	85.5	92.1	94.8	71.4	95.1																						
22-Jun	96.6	97.2	97.7	98.1	98.5	97.4	88.8	76.5	61.0	53.5	49.5	47.4	45.9	44.9	40.7	41.5	43.9	49.2	53.7	58.4	67.5	80.0	88.1	89.6	69.4	98.5																						
23-Jun	90.4	91.0	91.9	93.8	94.9	92.6	75.3	63.2	53.9	53.1	46.2	43.4	42.4	41.1	40.3	38.7	36.0	34.5	36.5	42.1	60.5	72.2	80.8	84.2	62.5	94.9																						
24-Jun	87.6	84.1	83.3	89.9	90.3	76.5	68.2	59.1	53.8	45.7	39.2	34.4	31.3	29.0	28.5	57.1	64.0	64.5	79.1	91.2	91.3	92.3	88.9	83.5	67.2	92.3																						
25-Jun	77.0	77.0	77.7	86.7	92.3	88.6	76.8	65.5	62.8	59.7	52.8	51.2	49.4	47.0	44.5	42.5	41.4	41.0	42.2	48.7	64.2	77.8	85.4	89.4	64.2	92.3																						
26-Jun	92.0	94.0	95.7	97.0	97.3	90.7	80.2	75.2	71.7	72.8	72.2	79.9	72.4	62.5	56.3	51.1	70.5	67.5	64.8	69.4	77.6	83.9	87.5	91.8	78.1	97.3																						
27-Jun	95.2	96.9	97.7	98.4	98.5	93.8	84.8	80.5	76.3	67.9	61.1	53.0	51.1	48.1	43.0	38.7	36.4	36.8	38.5	49.6	64.3	76.5	82.5	86.2	69.0	98.5																						
28-Jun	88.4	90.4	93.3	94.4	94.8	88.8	72.9	64.6	58.3	50.9	48.2	45.3	42.7	49.0	52.1	47.8	39.5	39.9	47.6	51.0	59.2	68.0	76.6	80.5	64.4	94.8																						
29-Jun	82.6	88.3	86.8	93.3	94.4	88.0	75.3	69.3	65.0	59.1	54.5	49.4	45.2	37.6	47.8	73.3	73.0	71.2	64.1	71.0	70.1	77.6	71.3	68.4	69.9	94.4																						
30-Jun	67.8	68.8	78.1	88.6	93.1	83.3	71.6	64.0	57.3	52.9	48.5	41.4	33.3	28.7	25.0	24.8	23.7	24.4	24.9	29.2	35.0	40.5	42.2	42.9	49.6	93.1																						
																								82.8	85.4	87.7	90.3	91.0	87.2	78.9	72.5	67.4	62.5	58.4	55.8	53.0	50.6	49.1	50.0	51.1	51.8	54.7	59.7	67.7	75.0	78.6	80.4	Diurnal Average
																								98.7	98.8	98.9	99.0	99.0	99.0	99.0	98.8	98.8	98.8	98.8	98.5	96.2	94.0	95.1	94.0	95.5	96.2	97.4	96.0	96.3	97.6	98.6	98.7	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort McKay South - June 2023





Maximum Speed: 30 km/h on Jun 19 16:00	Maximum Daily Speed Average: 24.0 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 24 03:00	Minimum Daily Speed Average: 0.7 km/h on Jun 24	Hours of Data: 719
Maximum Diurnal Speed Average: 3.6 km/h at hour 16	Minimum Diurnal Speed Average: 1.1 km/h at hour 11	Hours of Missing Data: 1
Monthly Average Velocity: 2.2 km/h 330.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 12 P ₉₀ = 17 P ₉₉ = 26	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-Jun	WSW2	SSE3	NNW4	SW2	WSW0	S4	SSW3	SSW5	SSE6	S4	WNW1	NNE4	NNW9	NW7	NNE8	N5	NNE7	NNE6	NNE5	N3	NW3	NW4	SW2	WNW3	NNW1.5	NNW9
2-Jun	NNW4	NNW5	NNW7	NW7	NW2	WNW1	WNW3	NW2	N3	N4	NNE4	NNE5	NNE7	NNE9	N8	NNE7	NE8	NNE9	NE10	NNE9	NNE7	N4	NNW5	NNW5	N4.9	NE10
3-Jun	NW2	WNW2	W2	WSW2	WSW2	SSW1	N4	NNE7	NNE8	N12	N12	N13	N14	N11	N13	N13	NE6	SSE5	SSE6	SE7	SW0	NW2	NNW3	W1	N4.2	N14
4-Jun	NNW2	W1	NNW3	NNW4	NNW4	N4	N6	N5	NNE4	NNW6	N7	NNW5	NNW4	NNW4	N6	NNE6	N6	NNW4	W2	WSW2	S3	SSW3	W2	SSW1	NNW3.0	N7
5-Jun	WSW2	SSW1	NW2	W1	WNW4	NNW4	NNW5	N9	N12	NNE10	N10	N11	N11	N11	N12	N11	NW4	NW2	WNW2	NNW5	NNW7	W5WSW14	W7	NNW5.3	WSW14	
6-Jun	WSW11	WSW12	SSW6	SSW7	S7	SSW9	SSW8	SW10	SW11	SW11	SW13	SW15	SW13	SW14	SSW15	SSW15	SSW15	SSW14	SSW11	SSW7	SSW4	SW3	SSE5	S3	SW9.5	SSW15
7-Jun	S4	S5	S4	W2	SSW4	S5	S7	SSW8	SSW10	S15	SSW14	SW16	WSW17	W16	WSW15	W14	W12	W9	W8	WSW5	W6	W6	W7	W6	WSW7.5	WSW17
8-Jun	NNW4	NW5	NW2	W3	SW2	WNW3	NNW6	N8	NNE8	NE7	NE8	NE8	ENE6	E7	NE4	NNE6	NNE5	NNE6	NNE7	N7	NNW5	WNW3	W3	WSW2	NNE3.8	N8
9-Jun	UO	WSW2	WSW3	WSW2	SW2	SSW1	E2	E4	SE7	SE6	SE9	SSE8	S10	S8	SSE8	SE9	SSE10	S11	SSW9	SSW5	SW3	SW3	SSW2	W2	S4.4	S11
10-Jun	W1	WSW2	SSW3	S5	S6	N1	SSE8	SSE12	SSE14	SSE15	SSE18	SSE18	SSE21	SSE22	SSE24	SSE23	SSE24	S25	S22	S16	S12	SSE8	S8	S8	SSE12.8	S25
11-Jun	SSW3	SW4	SSW3	SSW3	W1	SW4	W7	W9	W6	W4	W5	WNW9	NW11	NW10	NW10	WNW11	WNW9	WNW7	W5	W6	NW7	WNW7	WNW7	NW7	WNW5.7	WNW11
12-Jun	NW2	SW4	WSW4	WSW3	N1	NW2	W1	N4	N9	N10	N9	NNE7	NNE9	N10	N10	N10	NNE8	NNE7	N6	N7	N8	NNE6	SSE3	W1	N4.7	N10
13-Jun	WNW3	NW3	NW4	W3	WNW2	W3	NNW4	NNE3	SE7	S8	S5	ENE3	WNW3	NNW11	N12	N9	NNW16	N19	NNE14	N16	N13	NNW13	N12	N16	N6.0	N19
14-Jun	N13	N11	N12	N14	N13	N12	N14	N19	N18	N17	N16	N14	N18	N19	N17	NNW12	NNW13	N16	N18	N19	N21	N20	N19	NNW19	N15.9	N21
15-Jun	NNW17	NNW15	NNW14	NNW13	NNW7	NNW11	N8	NW10	NW5	WSW3	WNW5	WNW7	NW7	NNW9	NW8	NNW10	NNW9	NNE4	NE4	ESE1	WSW3	WSW2	SW4	W6	NNW6.4	NNW17
16-Jun	WSW10	WSW9	SSW4	S3	S3	SSE6	S7	SE8	SE9	SE10	SE11	SSE11	SSW11	SSW12	SSW15	S15	S15	S11	SSW12	S10	SSW5	SW8	SW10	SW9	S8.0	SSW15
17-Jun	SSW9	SW10	SW9	SSW8	SW11	SSW12	SW10	SW11	SW12	SW9	SW12	SW12	SW13	SW13	SW12	WSW11	W8	NW8	N17	NNE10	N5	NW4	NW5	NW4	WSW6.3	N17
18-Jun	NW4	SW3	NNW2	NNW2	SSW2	N6	N6	NNE9	N12	N13	N17	N18	N17	N17	N20	N20	NNE19	NNE18	NNE16	N21	N22	N22	N20	N19	N13.0	N22
19-Jun	N17	N17	N18	N21	N22	N23	N27	N28	N29	N27	N26	N20	N25	N28	N30	N30	N26	N24	N24	N26	N24	N24	N22	N22	N24.0	N30
20-Jun	NNW22	N18	N17	N17	N20	N19	N19	N18	N15	N17	N15	NNW11	NNW10	NNW11	NW7	NNW8	NNW9	NNW9	NW6	NW5	NW6	WNW6	NW6	NW7	NNW11.9	NNW22
21-Jun	NW5	NW5	NW3	NW3	NNW5	N4	NNW8	NNW11	N9	NNE10	NNE13	NNE12	NNE11	NNE12	NNE12	NNE14	N14	NNE10	NE8	ENE5	NNE0	WSW3	WSW2	SW2	N6.5	NNE14
22-Jun	WSW2	WSW2	SW2	WSW2	SW2	SSE0	SSE1	SE2	SSE10	SSE9	SSE11	SE7	SE3	SW9	SW12	WSW14	WSW10	SW9	WSW5	W5	WSW5	WSW4	S2	W2	SSW4.0	WSW14
23-Jun	SW2	NNE0	WSW2	WSW1	NW2	SSW2	SSE6	SE6	SSE7	ESE6	SSE10	SE10	SSE8	SE8	SE4	SE6	SSE4	S6	SSE6	SE6	SW3	SSW3	SW3	S3	SSE4.0	SE10
24-Jun	S1	SSE4	SE0	WSW1	SSW3	SE7	SE6	S10	S13	S14	SSW12	SW12	SW12	SW14	SW7	NE8	E2	N12	NNW14	N19	NNE12	N16	N17	NNE14	WNW0.7	N19
25-Jun	NNE11	NNE9	NNE6	N5	NNW5	N6	NNE10	NNE11	NE11	NNE11	NNE14	N13	N14	N11	N10	NNE9	NNE8	NNE8	NNE8	N3	WSW2	SW2	SW2	SSW2	NNE7.1	N14
26-Jun	SW2	SW2	SSW3	SW2	SSE4	S4	SE5	SE6	SE7	SE8	SE11	SSE5	S9	SSW11	SW11	NW7	N9	WSW1	ENE2	NNE2	S2	SSW2	SSW1	WSW2	S2.7	SSW11
27-Jun	W2	WNW1	NW1	N3	S1	N8	N12	N10	N11	N12	N12	N14	N11	N11	N9	N7	N7	N7	N6	NNW4	W2	SW2	SW3	SW3	N5.7	N14
28-Jun	SW3	SW2	WSW3	SSW3	SSW2	SSW2	SE6	SE8	SSE8	S10	SSE10	SSE10	SW4	NNE5	NNE6	NE4	S7	S6	S8	SW7	SSE3	SW3	SW2	SW3	S3.4	SSE10
29-Jun	SW2	SSE3	S4	S4	SW4	SSW4	S9	S11	S11	SSE11	S12	S12	SSE13	SSW11	SW14	SW13	WSW8	S7	S7	SSE6	S8	S7	SSW8	SW8	S7.4	SW14
30-Jun	SW10	SW8	WSW1	SW3	S2	S4	SSE7	S9	S12	SSW11	SSW9	SSW11	SW12	WSW12	SW12	SW13	SW14	SW13	WSW14	WSW11	SW6	SW5	SW6	WSW6	WSW8.1	SW14

NNW3.1	WNW2.2	NW2.1	NW2.3	NW1.5	NNW1.6	N1.8	N1.9	NE1.2	NE1.1	NNE1.1	N1.2	NW2.5	NW3.2	NW3.4	NNW3.6	NNW3.0	NNW2.5	N2.1	NNW3.0	NNW3.1	NW3.3	NW2.9	NW3.2	Diurnal Average	
NNW22	N18	N18	N21	N22	N23	N27	N28	N29	NNE27	N26	N20	N25	N28	N30	N30	N26	S25	N24	N26	N24	N24	N22	N22	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

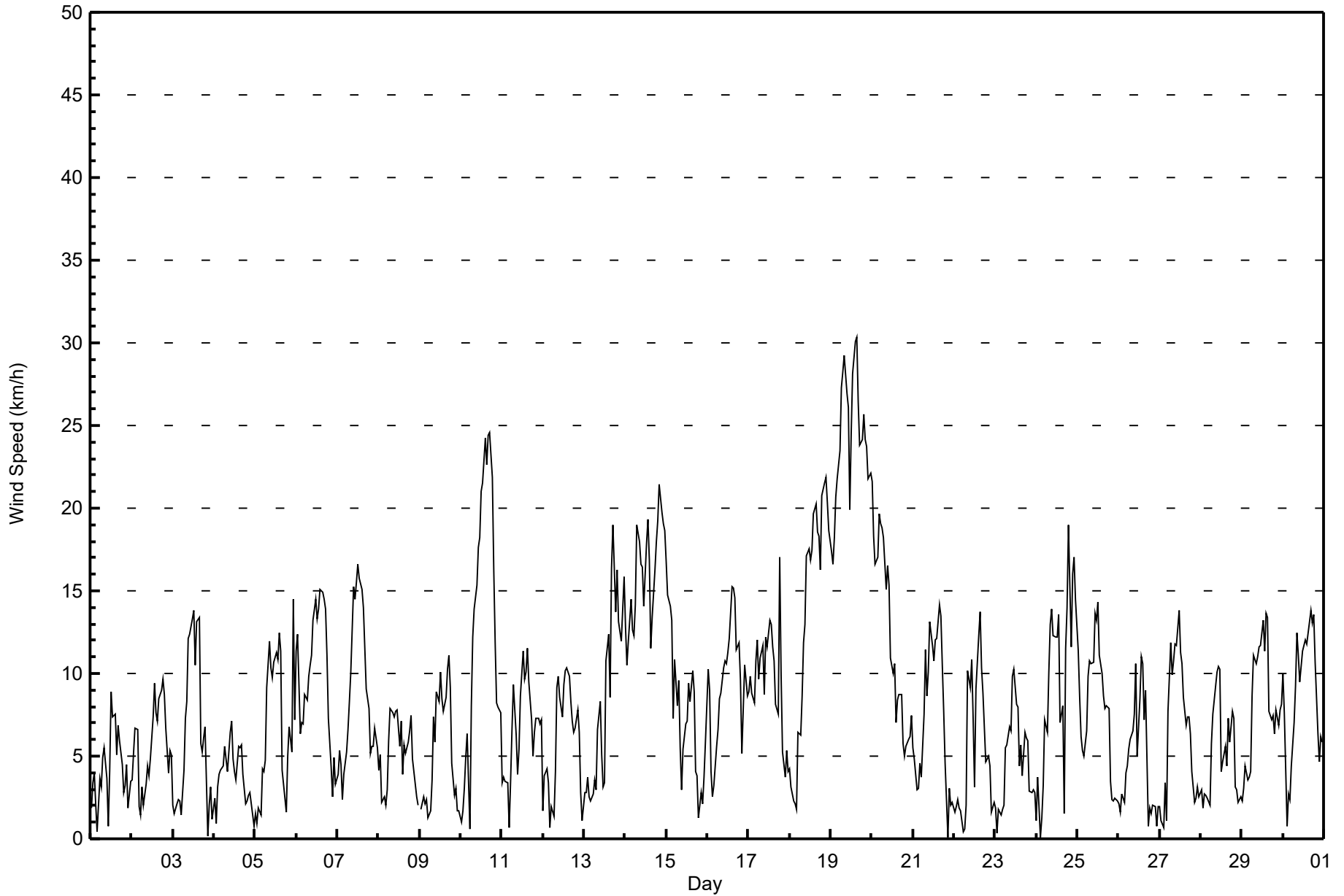
Wind Speed (WS) - km/h
Fort McKay South - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 9 km/h on Jun 26 16:00	Hours of Data: 719
Minimum Value: 0 km/h on Jun 25 23:00	Hours of Missing Data: 1
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 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-Jun	2	2	1	1	1	1	1	1	2	2	2	3	3	3	3	2	2	2	1	1	1	1	2	2	3
2-Jun	1	2	2	2	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	2	1	1	1	3
3-Jun	2	1	1	1	1	2	1	1	2	3	4	4	3	3	4	4	4	3	2	3	1	1	1	4	
4-Jun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	2	
5-Jun	1	1	1	1	3	2	1	3	3	3	2	2	3	3	3	3	2	2	1	2	1	2	8	8	
6-Jun	4	4	2	2	2	3	3	3	4	4	5	5	4	5	5	5	5	4	3	3	1	1	1	5	
7-Jun	1	1	1	2	1	2	3	3	3	4	5	6	7	5	6	5	5	4	3	1	1	1	1	7	
8-Jun	3	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	1	1	3	
9-Jun	UO	1	1	2	1	1	1	1	2	3	3	4	4	4	3	3	3	3	3	3	1	1	1	4	
10-Jun	1	1	1	1	2	2	4	3	3	3	3	4	5	5	5	5	6	5	5	3	2	1	1	6	
11-Jun	1	1	2	2	2	1	2	3	3	2	3	4	4	4	5	4	4	3	1	1	2	1	1	5	
12-Jun	2	1	1	2	1	1	1	3	3	3	3	3	3	3	2	2	2	2	1	1	2	2	1	3	
13-Jun	1	1	1	1	1	1	1	1	4	3	2	2	3	3	3	3	7	5	4	4	4	4	4	7	
14-Jun	4	4	3	3	3	3	3	5	4	4	4	5	5	5	4	4	4	4	5	5	5	5	5	5	
15-Jun	4	4	3	3	3	3	3	3	3	1	1	2	2	3	2	3	3	2	1	2	1	1	1	4	
16-Jun	2	3	2	1	1	1	1	2	2	2	2	3	4	4	4	4	3	3	6	3	2	2	3	6	
17-Jun	2	3	2	2	3	3	3	4	4	3	4	4	4	4	4	4	3	4	5	3	2	1	2	5	
18-Jun	2	1	1	1	1	2	1	3	3	3	4	4	5	5	5	5	5	5	6	5	5	5	5	6	
19-Jun	5	4	4	5	5	6	6	6	7	8	7	7	6	7	7	8	7	6	6	6	6	5	6	8	
20-Jun	5	5	5	5	5	5	5	5	4	4	5	3	3	2	2	2	2	2	2	1	1	1	1	5	
21-Jun	1	1	1	2	2	2	3	3	2	3	4	4	4	3	4	4	4	4	3	2	1	1	1	4	
22-Jun	1	1	1	1	1	1	2	2	2	3	3	2	2	3	5	5	4	3	2	2	1	1	1	5	
23-Jun	1	1	1	1	1	1	2	2	3	2	3	3	4	4	3	3	3	2	2	2	1	1	1	4	
24-Jun	1	2	1	1	1	1	2	3	3	4	4	3	4	4	7	4	3	4	8	5	3	4	5	8	
25-Jun	4	3	2	1	1	3	3	3	3	3	4	4	4	3	3	3	2	2	2	1	1	0	1	4	
26-Jun	1	1	1	1	1	1	1	2	1	2	3	3	3	4	4	9	5	1	1	1	1	3	1	9	
27-Jun	1	1	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	2	3	
28-Jun	1	1	1	1	1	1	1	1	2	3	3	3	3	1	1	2	3	2	2	3	2	2	1	3	
29-Jun	1	1	2	1	1	1	3	3	2	3	3	3	4	4	7	5	6	2	2	2	1	1	2	7	
30-Jun	3	3	2	2	2	1	2	2	3	3	3	4	4	5	5	5	5	5	5	4	2	1	1	5	

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay South - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	266	37.00	37.00
6 - 11	272	37.83	74.83
12 - 19	143	19.89	94.71
20 - 28	35	4.87	99.58
29 - 38	3	0.42	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 McKay South - June 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	12	3	3	3	1	5	12	22	30	36	33	21	17	26	26	266
6 - 11	42	38	9	1	1	1	23	24	25	21	21	8	13	8	17	20	272
12 - 19	63	12	0	0	0	0	0	6	10	10	22	7	3	0	0	10	143
20 - 28	26	1	0	0	0	0	0	5	2	0	0	0	0	0	0	1	35
29 - 38	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	150	63	12	4	4	2	28	47	59	61	79	48	37	25	43	57	719

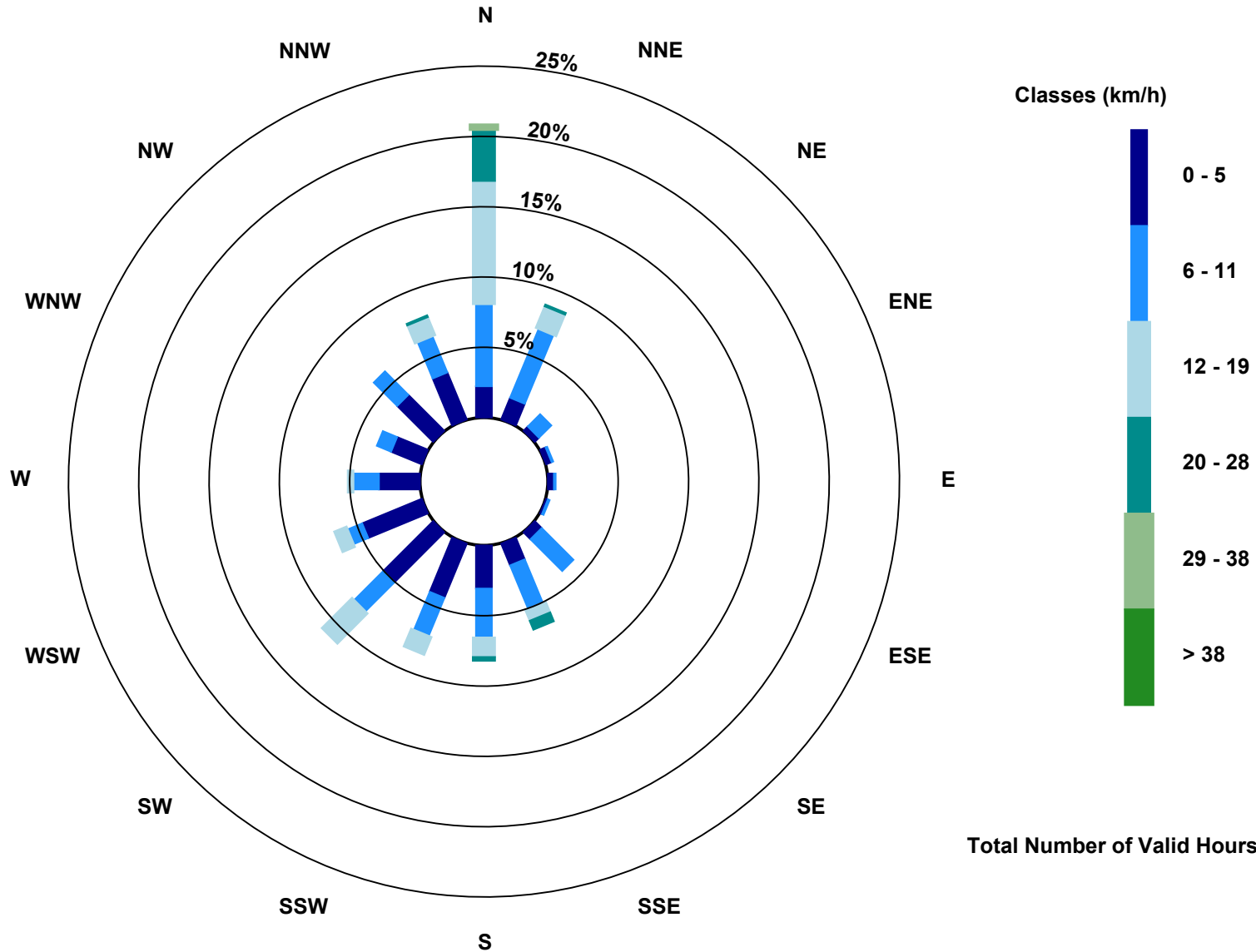
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Fort McKay South





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay South - June 2023

Direction of Maximum Speed: 5 deg on Jun 19 16:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 1.7 deg on Jun 19	Hours of Data: 719
Direction of Minimum Speed: 130 deg on Jun 24 03:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 0.7 deg on Jun 24	Percent Operational Time: 99.9
Monthly Average Direction: 330.2 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-Jun	248	168	348	217	243	188	203	200	166	180	285	21	334	325	24	355	12	19	31	351	315	321	220	301	336.6
2-Jun	332	328	336	315	309	287	291	313	359	1	19	12	26	28	360	31	38	28	36	28	18	1	331	344	5.8
3-Jun	324	290	259	254	243	206	2	18	15	357	1	6	3	8	359	357	36	152	163	140	215	312	348	281	3.3
4-Jun	339	268	345	342	340	354	357	3	12	341	0	337	345	346	357	17	358	342	272	242	186	213	266	205	344.7
5-Jun	257	207	320	270	300	338	329	7	6	13	1	10	3	4	354	359	322	310	291	347	345	262	256	274	341.3
6-Jun	247	242	205	192	186	211	212	229	232	219	234	231	226	223	202	206	211	207	210	204	200	215	158	175	216.0
7-Jun	191	186	186	268	204	175	177	202	202	187	211	235	257	261	255	259	274	274	260	248	262	277	264	265	236.8
8-Jun	340	324	305	281	231	295	347	10	25	36	41	37	58	96	47	26	22	13	21	10	345	301	276	248	12.7
9-Jun	UO	258	241	245	230	208	81	89	133	138	144	165	181	174	156	134	164	180	196	198	236	216	212	270	171.2
10-Jun	264	254	204	188	185	0	159	160	152	150	150	156	154	165	162	168	166	169	172	171	171	156	171	175	164.4
11-Jun	208	225	197	205	265	225	259	261	266	278	272	294	317	312	315	300	297	298	260	268	305	302	300	313	285.8
12-Jun	314	220	240	245	359	308	276	4	359	7	10	27	15	355	356	11	23	17	8	357	0	16	164	281	1.5
13-Jun	297	315	311	264	288	264	336	28	138	191	179	78	289	338	10	2	337	2	13	6	350	347	4	10	353.7
14-Jun	4	5	359	353	350	354	352	357	1	359	357	4	2	5	3	347	348	350	356	354	354	353	350	346	355.8
15-Jun	343	345	345	338	327	336	353	324	318	237	285	292	310	332	319	333	341	16	44	114	239	242	229	265	328.4
16-Jun	251	249	193	186	183	167	173	146	135	142	142	158	200	205	193	187	183	178	192	191	213	221	226	218	188.7
17-Jun	213	220	215	208	214	209	217	234	234	235	232	225	216	230	232	252	262	319	11	24	355	313	326	320	240.6
18-Jun	317	230	340	332	210	353	3	16	7	10	1	4	8	8	4	11	16	16	18	6	2	3	3	8	5.9
19-Jun	11	11	10	8	5	5	2	2	8	11	9	6	2	358	359	5	3	355	356	353	354	351	353	349	1.7
20-Jun	348	352	350	350	359	359	357	356	359	360	360	341	336	337	326	338	336	328	316	313	312	302	305	306	345.6
21-Jun	309	307	315	324	341	350	342	347	359	16	14	20	16	20	21	13	10	15	38	62	26	257	251	234	4.5
22-Jun	248	250	229	239	215	168	149	130	164	154	151	135	134	225	231	241	239	227	238	260	243	248	181	263	210.4
23-Jun	216	20	238	256	304	197	147	145	161	119	148	139	156	142	125	129	159	176	158	146	230	200	236	186	156.7
24-Jun	190	166	130	255	193	145	130	183	185	181	206	216	226	215	223	41	100	4	343	352	14	8	11	15	293.8
25-Jun	18	25	28	353	346	11	17	29	40	23	15	11	3	357	4	12	18	16	14	360	244	229	223	201	12.5
26-Jun	229	234	208	221	162	169	141	128	128	141	145	166	179	199	214	307	359	256	78	23	185	201	196	243	175.1
27-Jun	265	285	319	358	186	349	356	10	0	3	6	4	10	6	357	5	354	360	4	330	269	228	218	221	356.5
28-Jun	226	221	244	212	198	201	141	134	160	185	165	156	229	31	25	36	185	180	172	226	148	228	214	228	176.7
29-Jun	214	164	178	191	214	193	172	180	172	168	174	171	168	207	232	225	242	187	172	150	183	190	213	220	190.8
30-Jun	229	228	252	215	190	182	148	178	187	196	193	196	230	238	236	223	222	234	241	241	226	221	214	251	217.3

311.5 298.9 318.4 311.6 305.2 326.7 354.7 2.3 40.6 50.0 26.2 358.0 323.3 318.6 323.2 335.7 331.4 337.8 350.4 345.7 331.9 320.5 308.1 315.2

Diurnal Average

UO - Unstable Operation

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

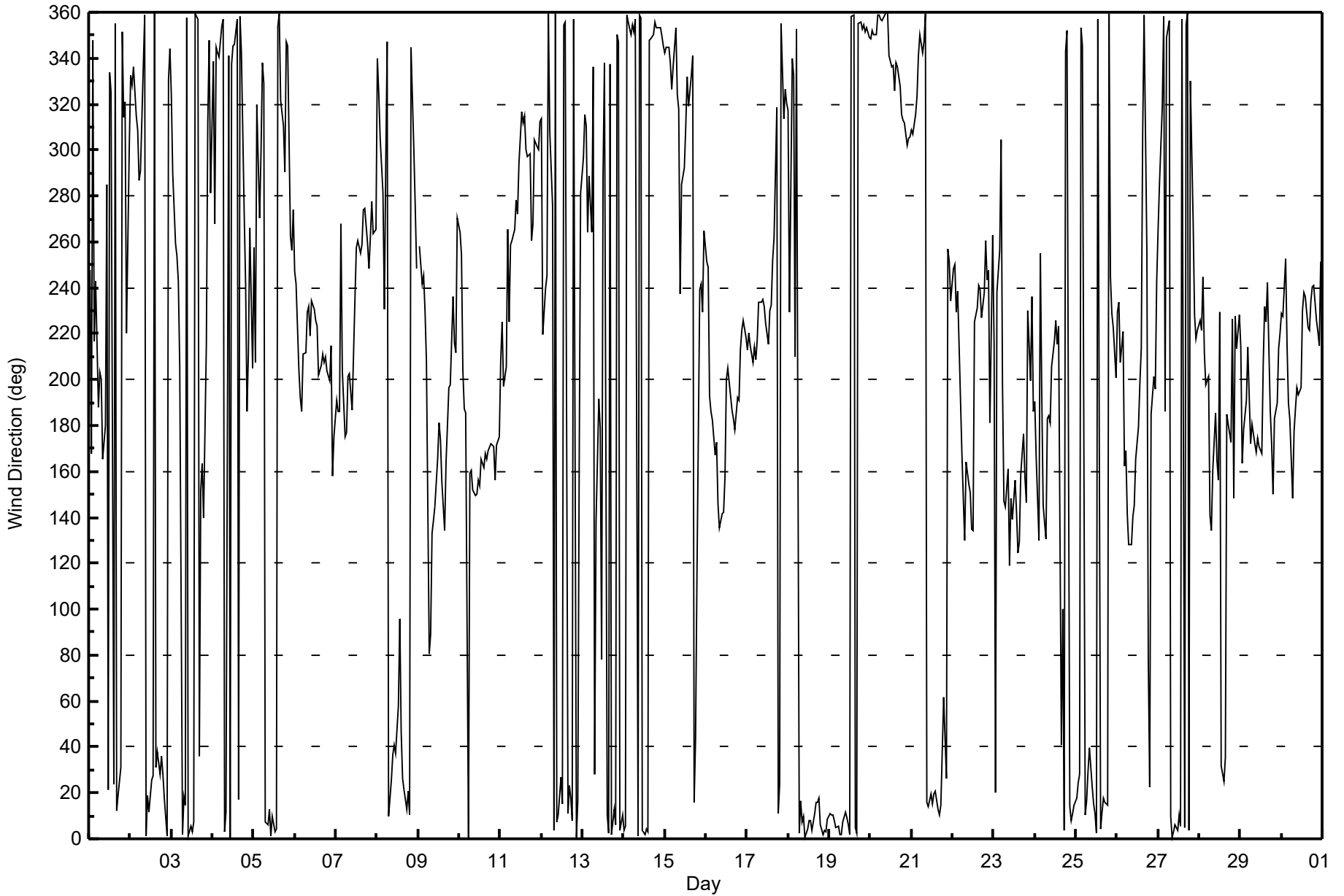
Wind Direction (WD) - deg
Fort McKay South - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 105 deg on Jun 1 11:00	Hours of Data: 719
Minimum Value: 7 deg on Jun 10 22:00	Hours of Missing Data: 1
Percentiles: P ₁ = 11 P ₁₀ = 16 Q ₁ = 19 Median = 25 Q ₃ = 37 P ₉₀ = 58 P ₉₉ = 95	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-Jun	75	59	57	37	92	25	45	28	38	64	105	75	34	43	32	48	26	23	26	33	20	20	50	30	105
2-Jun	23	16	13	19	77	73	35	60	38	53	58	63	36	27	52	35	26	27	25	23	22	21	11	9	77
3-Jun	40	39	30	21	20	60	20	16	21	20	24	22	23	28	23	22	64	47	33	19	97	26	32	49	97
4-Jun	18	73	31	16	17	15	14	20	20	17	14	20	31	48	27	19	23	45	68	49	45	46	61	84	84
5-Jun	39	77	54	66	22	59	23	22	20	21	17	19	23	29	19	19	37	54	81	48	19	28	34	49	81
6-Jun	26	25	34	15	17	22	27	30	30	32	32	30	35	34	30	27	26	26	23	22	23	27	10	19	35
7-Jun	15	11	12	46	24	20	30	29	27	20	31	33	32	34	35	34	35	36	28	19	14	16	13	23	46
8-Jun	42	14	48	19	49	40	29	23	32	36	40	39	64	58	83	57	66	40	23	16	24	21	26	33	83
9-Jun	UO	34	32	22	50	57	70	45	23	50	34	50	40	46	49	37	27	19	18	15	13	26	48	53	70
10-Jun	58	29	22	15	17	93	34	14	13	14	13	16	15	18	16	16	16	14	13	12	9	7	10	11	93
11-Jun	20	35	69	43	103	28	25	23	34	57	57	46	32	40	45	33	33	24	13	17	16	13	14	23	103
12-Jun	78	31	24	62	95	73	80	62	28	30	33	48	26	20	19	23	19	17	16	16	21	15	56	85	95
13-Jun	28	42	18	27	30	31	38	53	47	33	54	76	83	25	23	21	34	19	30	19	19	20	19	17	83
14-Jun	23	29	19	15	17	17	17	19	18	18	17	18	19	21	19	20	19	18	19	19	18	18	18	17	29
15-Jun	16	17	16	15	17	17	24	18	35	51	28	22	21	20	23	22	27	47	33	90	18	66	30	32	90
16-Jun	15	22	42	47	15	16	14	16	17	17	16	16	25	21	19	17	14	13	19	17	33	24	22	22	47
17-Jun	23	23	23	21	21	19	24	27	25	39	32	32	28	32	34	35	37	37	19	24	25	18	19	22	39
18-Jun	27	49	36	44	55	14	19	24	19	20	18	20	23	22	20	21	20	21	19	19	18	17	18	18	55
19-Jun	20	18	18	19	17	19	18	18	18	19	19	19	18	20	19	19	19	18	19	18	18	19	18	18	20
20-Jun	17	17	17	18	19	18	18	18	18	18	18	18	14	15	17	18	17	16	20	16	17	17	17	17	20
21-Jun	19	19	60	54	33	35	17	16	20	23	23	30	28	23	24	21	21	27	30	45	99	20	31	24	99
22-Jun	44	44	45	38	59	95	98	72	18	25	23	34	87	40	38	31	30	28	32	26	18	18	68	59	98
23-Jun	58	91	32	41	50	21	17	34	39	53	26	33	49	49	71	73	74	37	37	10	28	23	18	30	91
24-Jun	90	37	99	62	28	13	18	29	18	23	33	30	36	31	66	56	83	21	25	18	22	19	19	19	99
25-Jun	19	19	21	17	11	21	20	25	28	25	24	24	22	29	29	37	31	24	17	35	34	26	26	27	37
26-Jun	36	54	35	40	24	24	18	25	19	15	15	38	20	27	34	69	27	97	68	82	63	81	89	65	97
27-Jun	47	51	74	53	76	20	18	25	20	21	22	19	25	26	30	37	36	25	18	24	21	30	56	58	76
28-Jun	25	51	24	25	36	26	17	15	30	23	29	29	53	25	19	38	42	20	22	29	47	52	58	79	79
29-Jun	63	30	40	27	27	35	15	15	25	22	24	25	27	27	25	26	61	26	28	21	14	14	19	18	63
30-Jun	19	21	92	40	58	21	13	19	19	26	29	34	32	34	42	33	26	29	25	24	24	21	17	31	92

90	91	99	66	103	95	98	72	47	64	105	76	87	58	83	73	83	97	81	90	99	81	89	85	
Diurnal Maximum																								

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS14
ANZAC
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
 JUNE 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	678	33	42	98.75	12	0	2.7	0
TRS(ppb) Average	654	36	66	95.83	1.1	0	0.5	0
THC(ppm) Average	674	34	46	98.33	2.5	-	2.1	-
NMHC(ppm) Average	674	34	46	98.33	0.267	-	0.047	-
CH4(ppm) Average	674	34	46	98.33	2.2	-	2.1	-
NO2(ppb) Average	676	36	44	98.89	8.7	0	3.1	-
NO(ppb) Average	676	36	44	98.89	5.4	-	0.6	-
NOX(ppb) Average	676	36	44	98.89	12	-	3.6	-
O3(ppb) Average	679	33	41	98.89	70.9	0	46.5	-
PM2.5(ug/m3) Average	698	3	22	97.36	233.5	73	143.8	8
AT 2m(C) Average	720	0	0	100	29.6	-	22	-
RH(%) Average	649	0	71	90.14	100	-	90.7	-
WS(km/h) Average	720	0	0	100	27	-	19	-
WD(deg) Average	720	0	0	100	-	-	-	-
Leaf Wetness (% of range) Average	720	0	0	100	68.2	-	24.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
 JUNE 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	0.45	0.9	-	0	0	0.1	0.2	0.4	1.1	12
TRS(ppb) Average	654	0.26	0.1	-	0	0.1	0.1	0.2	0.4	0.5	1.1
THC(ppm) Average	674	2.03	0	-	2	2	2	2	2	2.1	2.5
NMHC (ppm) Average	674	0.005	0.023	-	0	0	0	0	0	0	0.267
CH4(ppm) Average	674	2.03	0	-	2	2	2	2	2	2.1	2.2
NO2(ppb) Average	676	1.37	1.3	-	0.1	0.4	0.6	0.9	1.7	2.8	8.7
NO(ppb) Average	676	0.21	0.5	-	0	0	0.1	0.1	0.2	0.3	5.4
NOX(ppb) Average	676	1.58	1.6	-	0.1	0.5	0.7	1	2	3.1	12
O3(ppb) Average	679	28.31	12.1	-	1.7	12.9	19.8	27.3	36.3	45.1	70.9
PM2.5(ug/m3) Average	698	28.43	37.8	-	0.7	3.1	5.8	13.2	30.8	82.9	233.5
Temperature 2 m (C) Average	720	16.6	5.4	-	3.2	9.5	12.5	16.6	20.5	23.8	29.6
Relative Humidity (%) Average	649	66.82	21.4	-	20.2	39.5	49.2	64.9	86.3	96.8	100
Wind Speed 20 m (km/h) Average	720	11.4	5	-	0	6	8	11	14	18	27
Wind Direction 20 m (deg) Average	720	237	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	6.89	13.3	-	0	0	0	0	7.5	28.3	68.2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	08 Jun 2023 20:00	08 Jun 2023 21:00	2	Station power failure
ALL PARAMETERS (except NO2)	13 Jun 2023 20:00	14 Jun 2023 01:00	6	Station power failure
NO2	13 Jun 2023 20:00	14 Jun 2023 00:00	5	Station power failure
NO2, O3, SO2, THC/NMHC/CH4	12 Jun 2023 13:00	12 Jun 2023 13:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	19 Jun 2023 12:00	19 Jun 2023 14:00	3	Maintenance - replaced support gas cylinder
TRS	30 Jun 2023 03:00	01 Jul 2023 00:00	22	Analyzer Failure - lamp failure
PM2.5	14 Jun 2023 02:00	14 Jun 2023 12:00	11	Unstable Operation - excessive baseline drift
Relative Humidity	04 Jun 2023 04:00	27 Jun 2023 03:00	71	Sensor operated out of range



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 12.0 ppb on Jun 13 13:00	Maximum Daily Average: 2.7 ppb on Jun 13		Hours of Data:	678
Minimum Value: 0.0 ppb on Jun 2 00:00	Minimum Daily Average: 0.0 ppb on Jun 3		Hours of Missing Data:	42
Maximum Diurnal Average: 0.9 ppb at hour 13	Minimum Diurnal Average: 0.2 ppb at hour 5		Hours of Calibration:	33
Monthly Average: 0.45 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 1.1 P ₉₉ = 4.6		Percent Operational Time:	98.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.2	Z	0.2	0.7	0.2	0.4	1.0	5.1	2.5	2.2	1.4	1.1	1.1	1.5	2.9	7.4	3.7	2.0	1.6	2.5	0.7	0.0	0.0	0.0	1.7	7.4
2-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
3-Jun	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	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2
4-Jun	0.1	0.0	0.2	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.6	0.6	0.4	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.6
5-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.6	0.8	C	C	C	0.3	0.2	0.1	0.2	0.1	0.2	0.4	0.3	0.2	0.1	0.2	0.2	0.8
6-Jun	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.4	0.3	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.4
7-Jun	0.1	Z	0.4	0.4	0.6	0.5	0.8	0.5	0.8	0.5	0.9	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.3	0.9
8-Jun	0.2	0.0	Z	0.4	0.3	0.1	0.1	0.1	0.1	0.4	0.8	2.0	4.8	4.6	1.6	1.6	1.2	1.6	1.7	PF	PF	0.5	0.3	0.2	1.1	4.8
9-Jun	0.2	0.0	0.0	Z	0.1	0.2	0.1	0.0	0.5	0.7	1.0	1.3	2.0	1.8	0.6	1.4	0.4	0.4	0.5	0.3	0.3	2.7	0.3	0.3	0.6	2.7
10-Jun	0.6	1.1	1.6	1.2	Z	1.1	1.0	0.7	0.3	0.3	0.5	0.7	0.7	0.5	0.6	1.3	1.2	1.1	1.1	0.4	0.4	0.6	0.8	0.8	0.8	1.6
11-Jun	0.6	0.4	0.3	0.3	0.2	Z	0.7	0.7	0.7	2.9	1.8	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	1.0	1.1	0.6	2.9
12-Jun	Z	0.8	1.8	1.2	0.4	0.5	0.6	0.5	0.4	0.4	0.3	0.3	M	0.3	0.2	0.3	1.2	1.9	2.9	1.8	2.8	1.8	0.9	0.6	1.0	2.9
13-Jun	0.5	Z	0.4	0.4	0.3	0.7	1.1	0.8	1.1	2.8	7.8	10.1	12.0	4.9	0.8	1.2	0.6	2.1	0.4	PF	PF	PF	PF	PF	2.7	12.0
14-Jun	PF	0.2	Z	0.2	0.2	0.4	0.7	0.6	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7
15-Jun	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.2	0.8	2.6	0.5	0.2	0.1	0.1	0.1	0.3	2.6
16-Jun	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.2	0.3	0.0	0.2	0.4	0.7	0.5	0.3	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.2	0.7
17-Jun	0.3	0.3	0.2	0.1	0.2	Z	0.1	0.2	0.2	0.3	0.2	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.3
18-Jun	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2
19-Jun	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3
20-Jun	0.2	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.7	1.5	0.2	1.5
21-Jun	2.0	1.2	1.0	Z	0.4	0.3	0.3	0.4	0.2	0.1	0.2	0.1	0.3	1.1	1.7	2.6	2.9	2.8	2.9	1.5	0.2	0.1	0.1	0.1	1.0	2.9
22-Jun	0.0	0.1	0.0	0.1	Z	0.2	0.2	0.2	0.6	1.0	1.0	0.3	0.1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.2	1.0
23-Jun	0.1	0.1	0.2	0.3	0.0	Z	0.5	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.2	0.5	
24-Jun	Z	0.1	0.0	0.0	0.0	0.3	0.1	0.4	0.6	0.7	1.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.1
25-Jun	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	0.4	0.4	0.5	0.5	0.1	0.0	0.0	0.0	0.1	0.1	0.5
26-Jun	0.0	0.0	Z	0.1	0.3	0.3	0.3	0.4	0.7	0.1	0.1	0.1	0.3	0.4	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.7
27-Jun	0.0	0.0	0.0	Z	0.1	0.4	0.7	0.6	0.6	0.4	0.3	0.2	0.3	0.3	0.1	0.2	0.1	0.1	2.6	0.5	0.6	0.3	0.2	0.2	0.4	2.6
28-Jun	0.3	0.2	0.2	0.2	Z	0.5	0.5	0.4	0.3	0.4	0.6	0.7	0.7	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.7
29-Jun	0.3	0.2	0.2	0.2	0.2	Z	0.3	0.5	0.6	0.6	0.5	0.4	0.5	0.6	0.4	0.2	0.0	0.0	0.1	0.1	0.0	0.2	0.4	0.2	0.3	0.6
30-Jun	Z	0.3	0.5	0.5	0.6	0.5	0.4	0.3	1.0	1.6	1.6	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.4	1.6

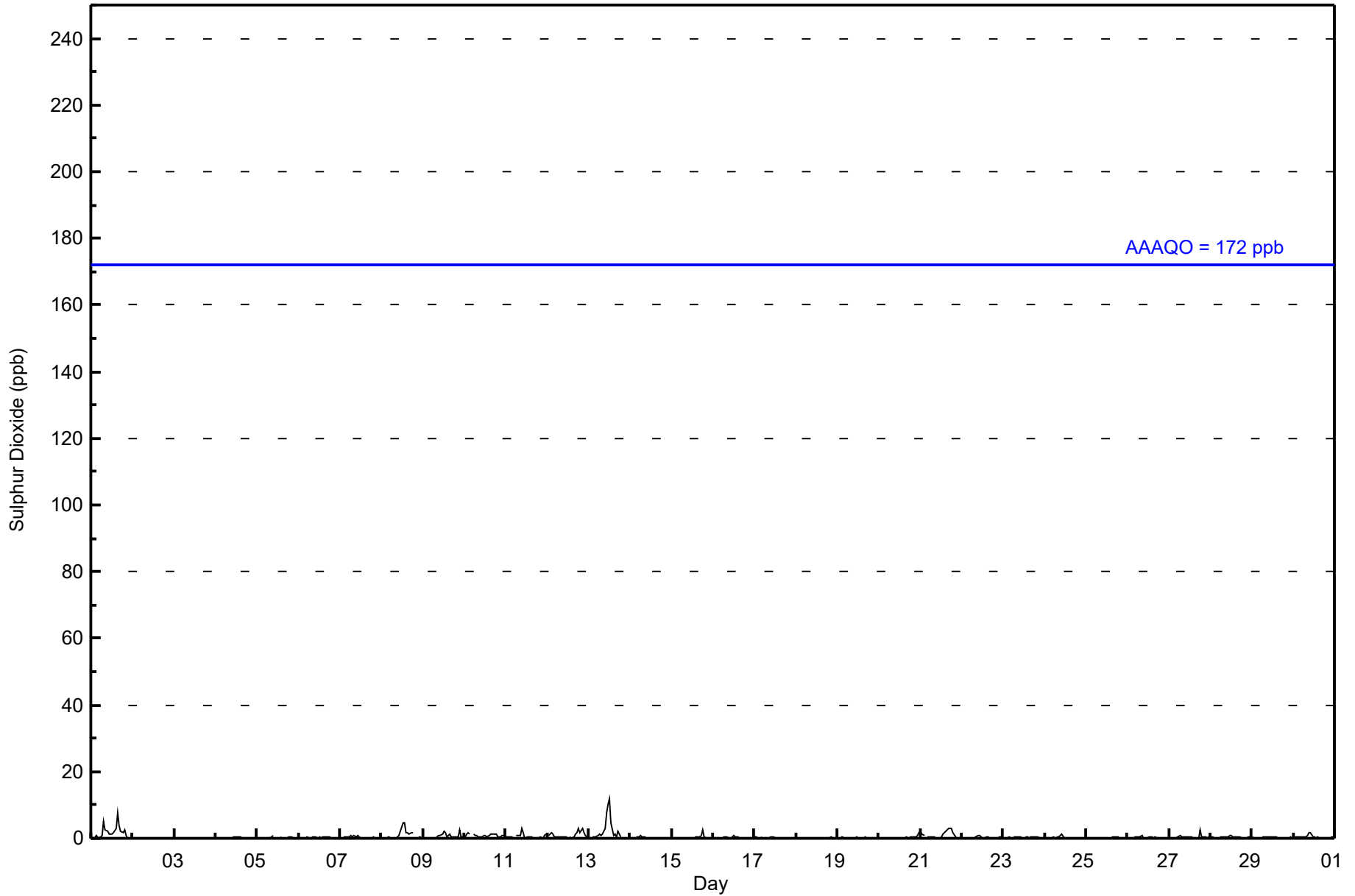
0.3	0.2	0.3	0.3	0.2	0.3	0.4	0.5	0.4	0.6	0.8	0.7	0.9	0.7	0.4	0.7	0.5	0.5	0.7	0.4	0.3	0.3	0.2	0.2	Diurnal Average	
2.0	1.2	1.8	1.2	0.6	1.1	1.1	5.1	2.5	2.9	7.8	10.1	12.0	4.9	2.9	7.4	3.7	2.8	2.9	2.5	2.8	2.7	1.0	1.5	Diurnal Maximum	

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
Anzac - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	677	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: 678

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - June 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	33	20	16	31	14	86	68	43	17	34	63	65	48	75	37	677
11 - 20	0	0	0	0	0	0	1	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	27	33	20	16	31	14	87	68	43	17	34	63	65	48	75	37	678

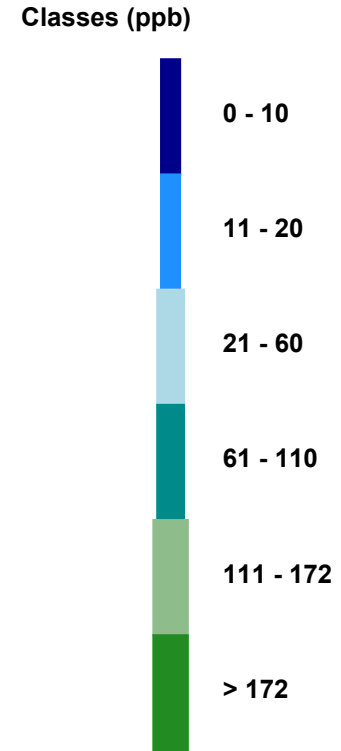
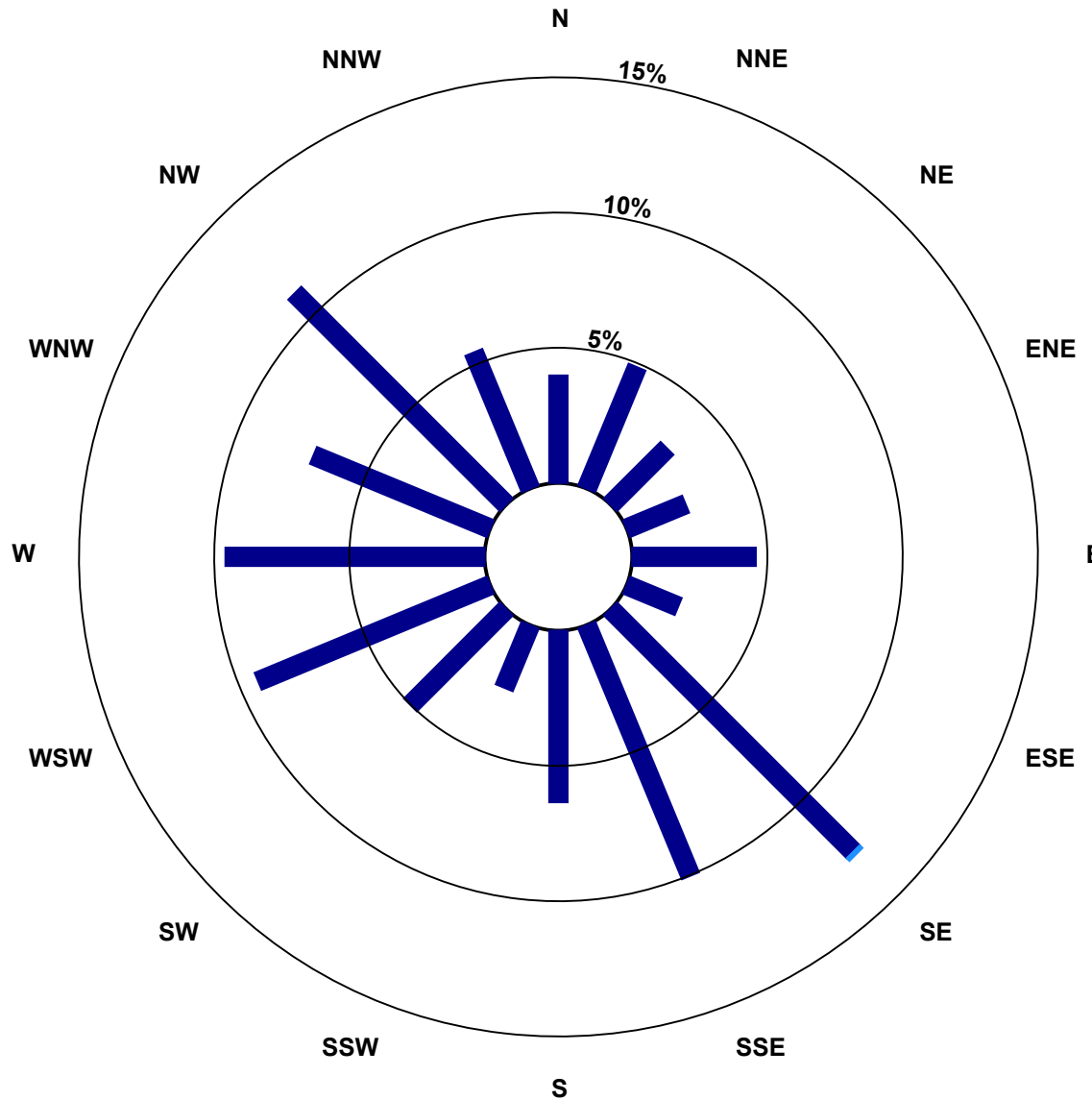
Total Number of Valid Hours: 678

Total Number of Hours: 720

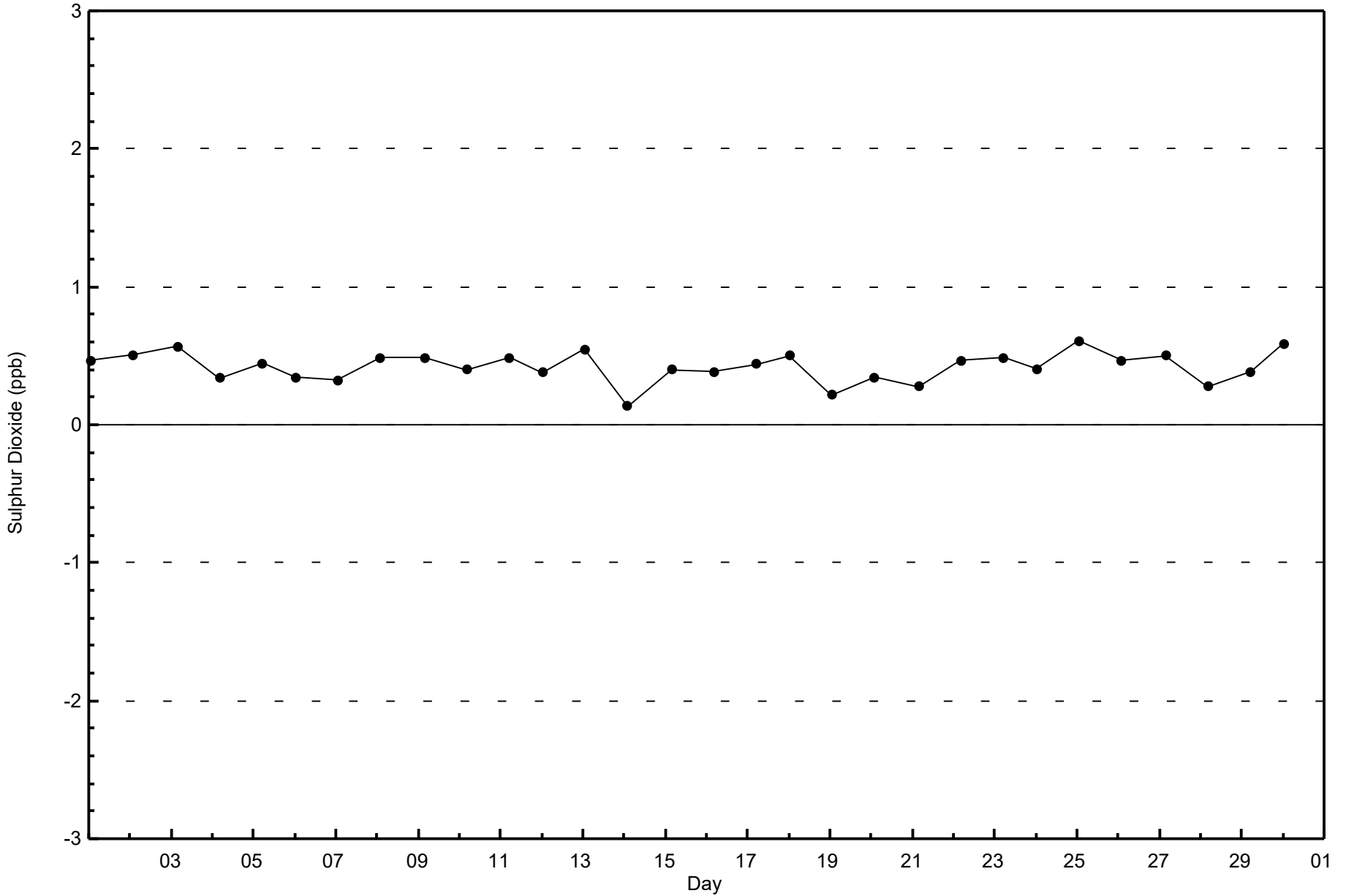


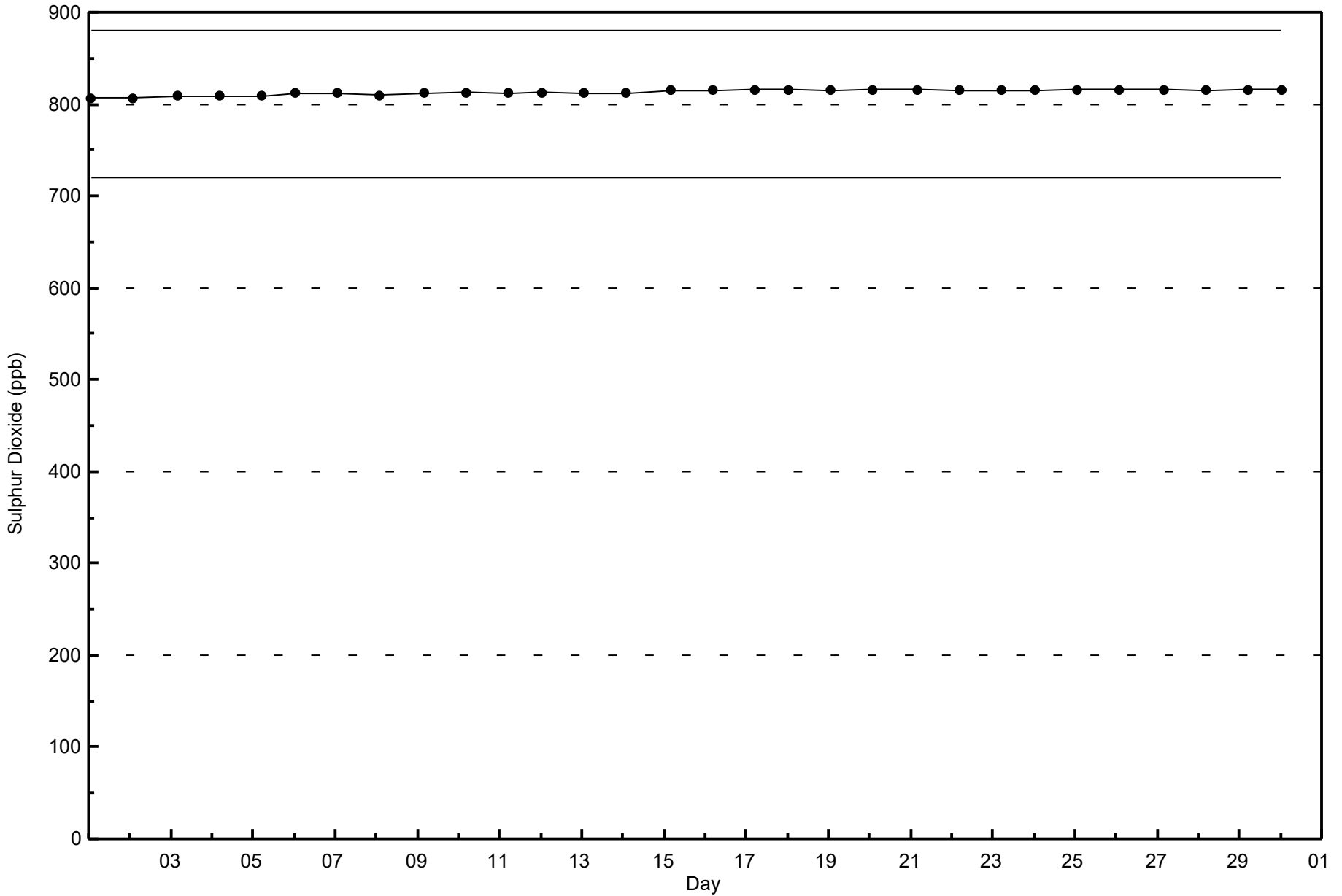
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Anzac



Total Number of Valid Hours: 678



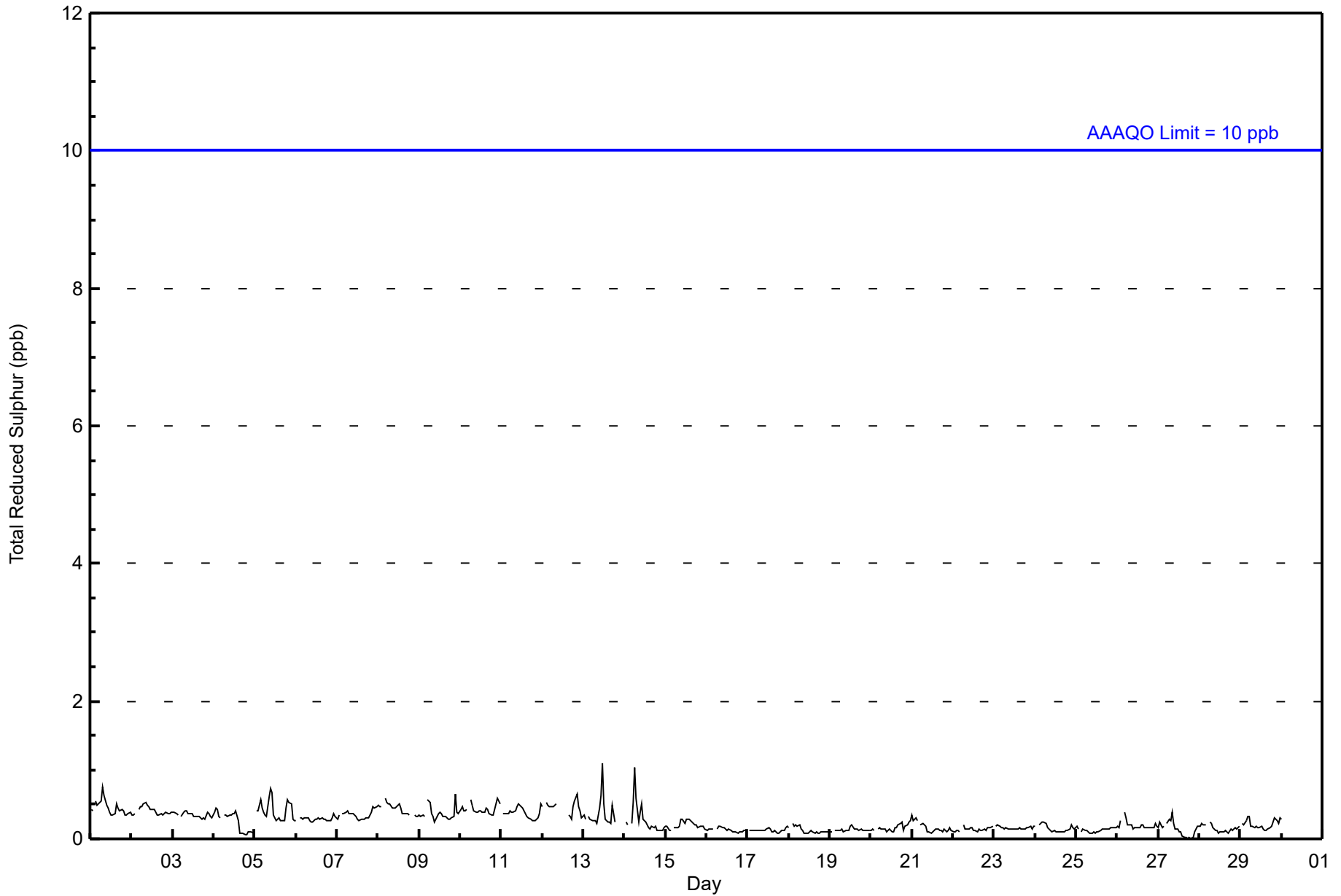




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1.1 ppb on Jun 13 12:00	Maximum Daily Average: 0.5 ppb on Jun 1		Hours of Data:	654
Minimum Value: 0.0 ppb on Jun 27 18:00	Minimum Daily Average: 0.1 ppb on Jun 18		Hours of Missing Data:	66
Maximum Diurnal Average: 0.3 ppb at hour 7	Minimum Diurnal Average: 0.2 ppb at hour 18		Hours of Calibration:	36
Monthly Average: 0.26 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.5 P ₉₉ = 0.6		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-Jun	0.4	0.4	Z	0.5	0.5	0.5	0.6	0.8	0.6	0.5	0.5	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.8
2-Jun	0.3	0.4	0.4	Z	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
3-Jun	0.4	0.4	0.4	0.3	Z	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	0.4	0.4	0.3	0.3	0.4	
4-Jun	0.4	0.4	0.4	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	
5-Jun	Z	0.4	0.4	0.6	0.4	0.4	0.4	0.3	0.6	0.7	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.5	0.5	0.3	0.3	0.7	
6-Jun	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	
7-Jun	0.3	0.3	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	0.4	0.4	0.5	0.4	0.5	0.5	
8-Jun	0.5	0.5	0.5	Z	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	PF	PF	0.3	0.3	0.3	0.6	
9-Jun	0.3	0.3	0.3	0.3	Z	0.6	0.5	0.4	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.4	0.4	0.7	
10-Jun	0.4	0.5	0.4	0.4	0.4	Z	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.6	0.5	0.6	
11-Jun	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	
12-Jun	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	C	C	C	C	C	C	0.3	0.3	0.3	0.5	0.5	0.7	0.5	0.4	0.3	0.7	
13-Jun	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.6	1.1	0.5	0.3	0.2	0.3	0.2	0.5	0.2	PF	PF	PF	PF	PF	1.1	
14-Jun	PF	0.2	0.2	Z	0.2	0.5	1.0	0.6	0.2	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	1.0	
15-Jun	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	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	0.1	0.3	
16-Jun	0.1	0.1	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
17-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	
18-Jun	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
19-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
20-Jun	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	
21-Jun	0.3	0.3	0.3	0.3	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	0.2	0.1	0.3	
22-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	
23-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	
24-Jun	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	
25-Jun	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	
26-Jun	0.2	0.2	0.3	Z	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	
27-Jun	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	
28-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	
29-Jun	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	
30-Jun	0.3	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.3	
																								Diurnal Average	0.26	
																								Diurnal Maximum	0.5	

Z - zerspan C - Calibration AF - Analyzer Failure 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
Anzac - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	654	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: 654

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - June 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	29	33	20	15	32	13	86	68	42	19	31	50	56	48	74	38	654
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	29	33	20	15	32	13	86	68	42	19	31	50	56	48	74	38	654

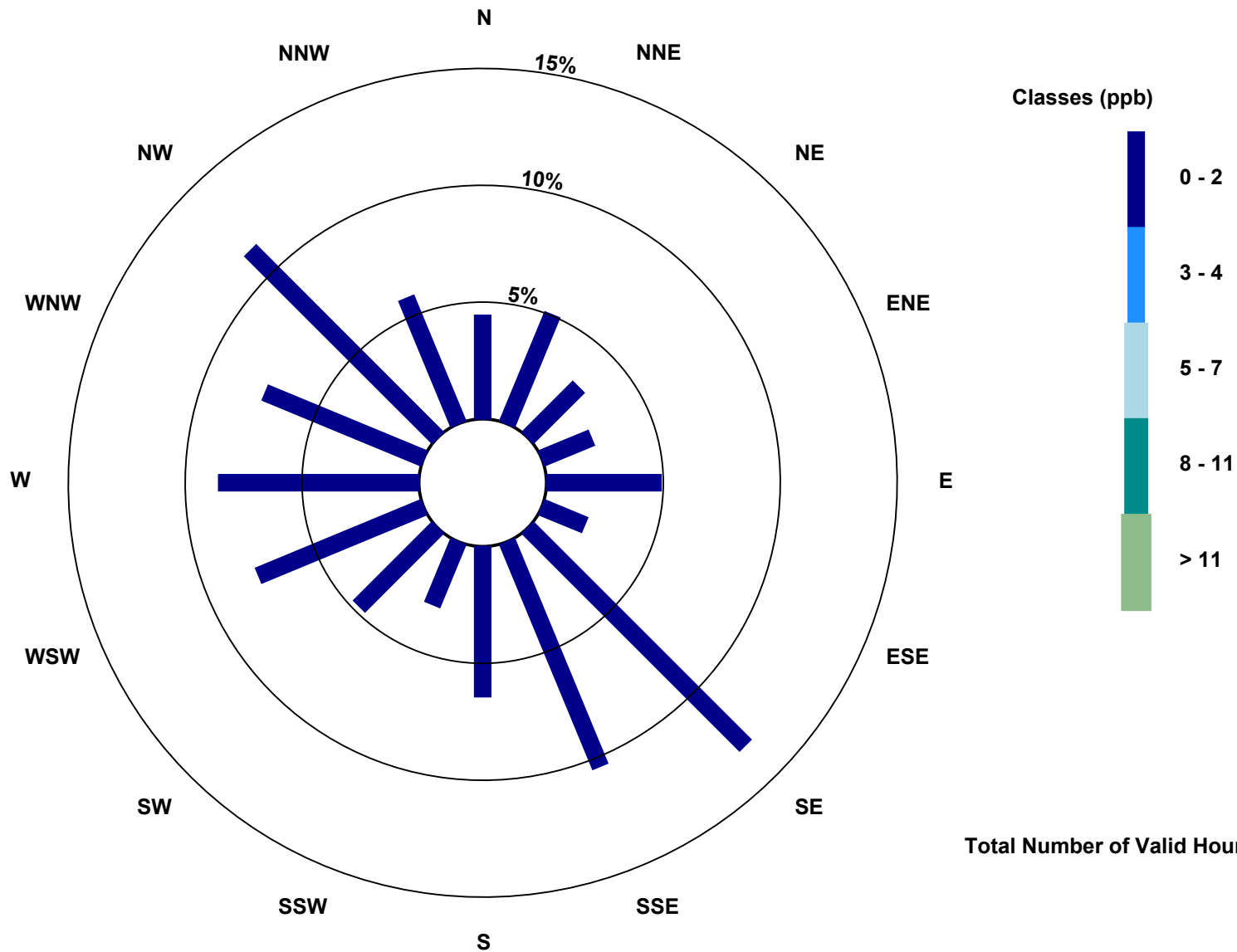
Total Number of Valid Hours: 654

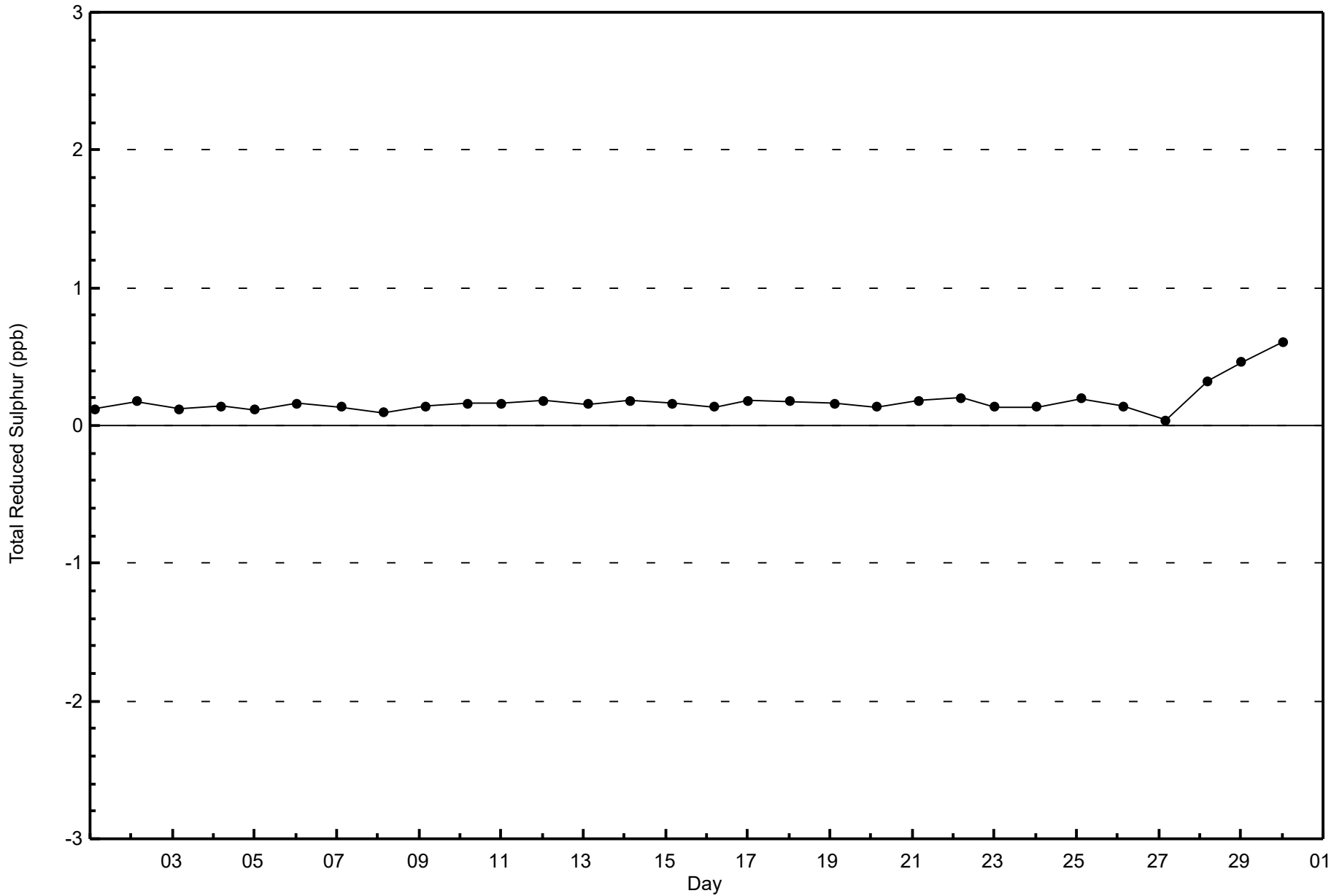
Total Number of Hours: 720

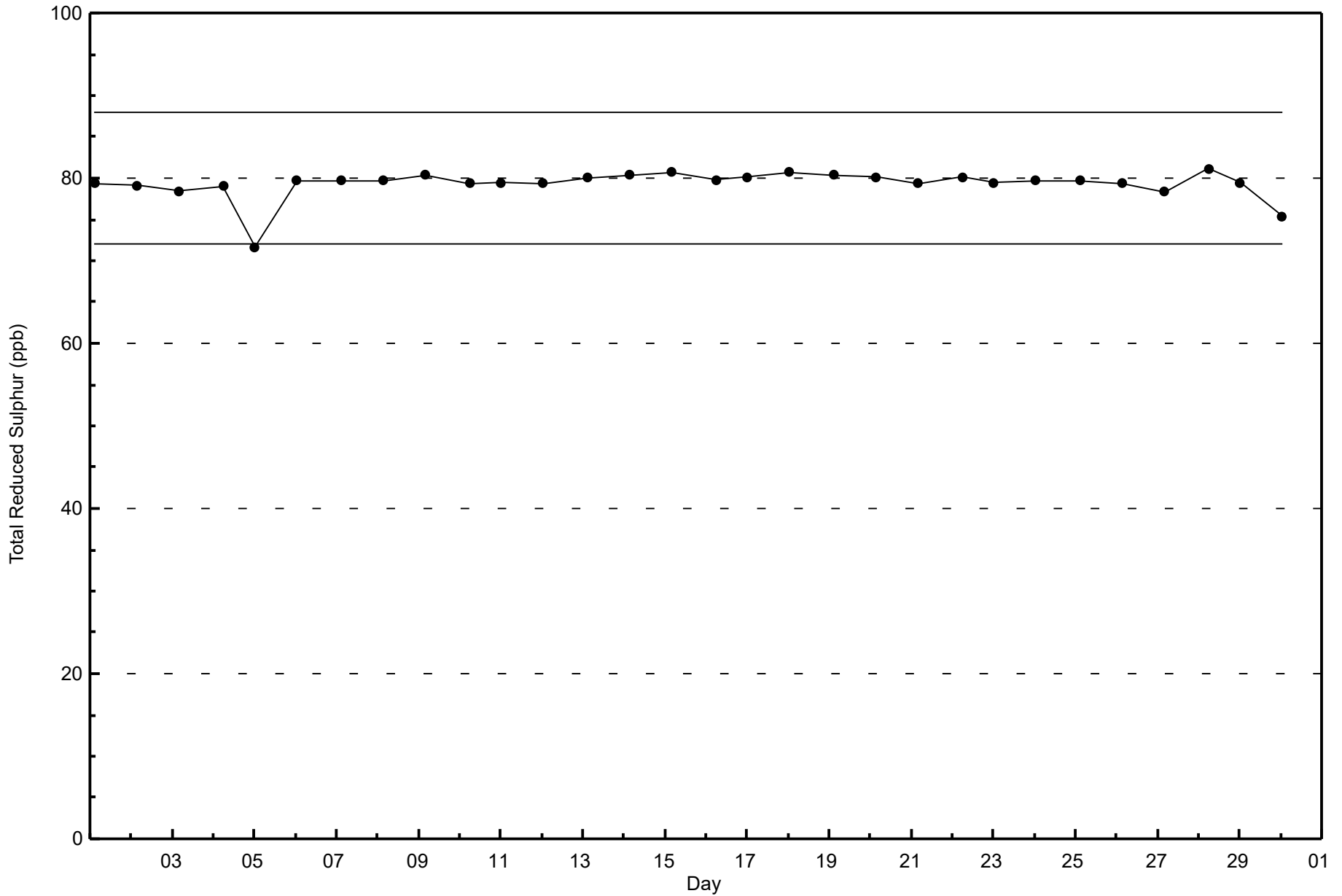


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Anzac

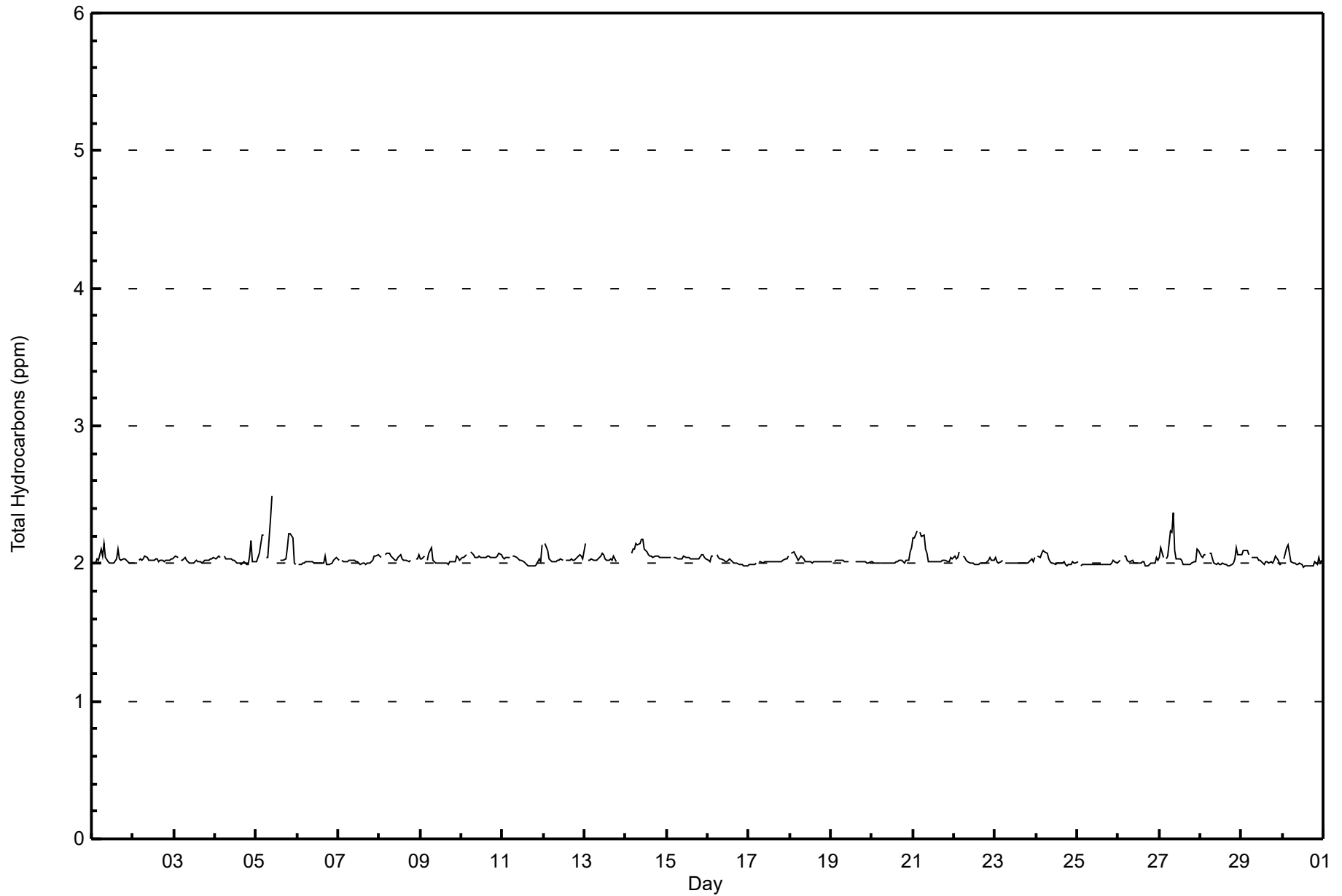








Maximum Value: 2.5 ppm on Jun 5 10:00		Maximum Daily Average: 2.1 ppm on Jun 5		Hours in Service:	720																												
Minimum Value: 2.0 ppm on Jun 30 13:00		Minimum Daily Average: 2.0 ppm on Jun 25		Hours of Data:	674																												
Maximum Diurnal Average: 2.1 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Missing Data:	46																												
Monthly Average: 2.03 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.2		Hours of Calibration:	34																												
				Percent Operational Time:	98.3																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Jun	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	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-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
3-Jun	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
4-Jun	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
5-Jun	2.0	2.0	2.1	2.2	2.2	Z	2.0	2.0	2.3	2.5	C	C	C	C	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	2.1	2.5
6-Jun	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
7-Jun	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
8-Jun	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	PF	PF	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
9-Jun	2.0	2.0	2.1	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
10-Jun	2.0	2.0	2.0	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	
11-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
12-Jun	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
13-Jun	2.1	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	2.1	2.0	2.0	2.0	PF	PF	PF	PF	PF	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
14-Jun	PF	2.0	Z	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	2.1	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	
15-Jun	2.0	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
16-Jun	2.0	2.0	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
17-Jun	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	2.1	
18-Jun	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
19-Jun	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
20-Jun	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	2.1	
21-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
22-Jun	2.0	2.0	2.0	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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-Jun	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	
24-Jun	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
25-Jun	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	2.0	
26-Jun	2.0	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
27-Jun	2.0	2.1	2.0	Z	2.0	2.1	2.2	2.2	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.4	
28-Jun	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	
29-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
30-Jun	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	2.0	2.0	2.0	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									
																								Diurnal Maximum									
Z - zerospan		C - Calibration				M - Maintenance				PF - Power Failure																							





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	548	81.31	81.31
2.1 - 3.0	126	18.69	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - June 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	24	28	19	14	27	8	69	51	34	13	31	57	55	25	60	33	548
2.1 - 3.0	2	2	1	2	4	6	18	17	9	4	3	6	10	23	15	4	126
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	26	30	20	16	31	14	87	68	43	17	34	63	65	48	75	37	674

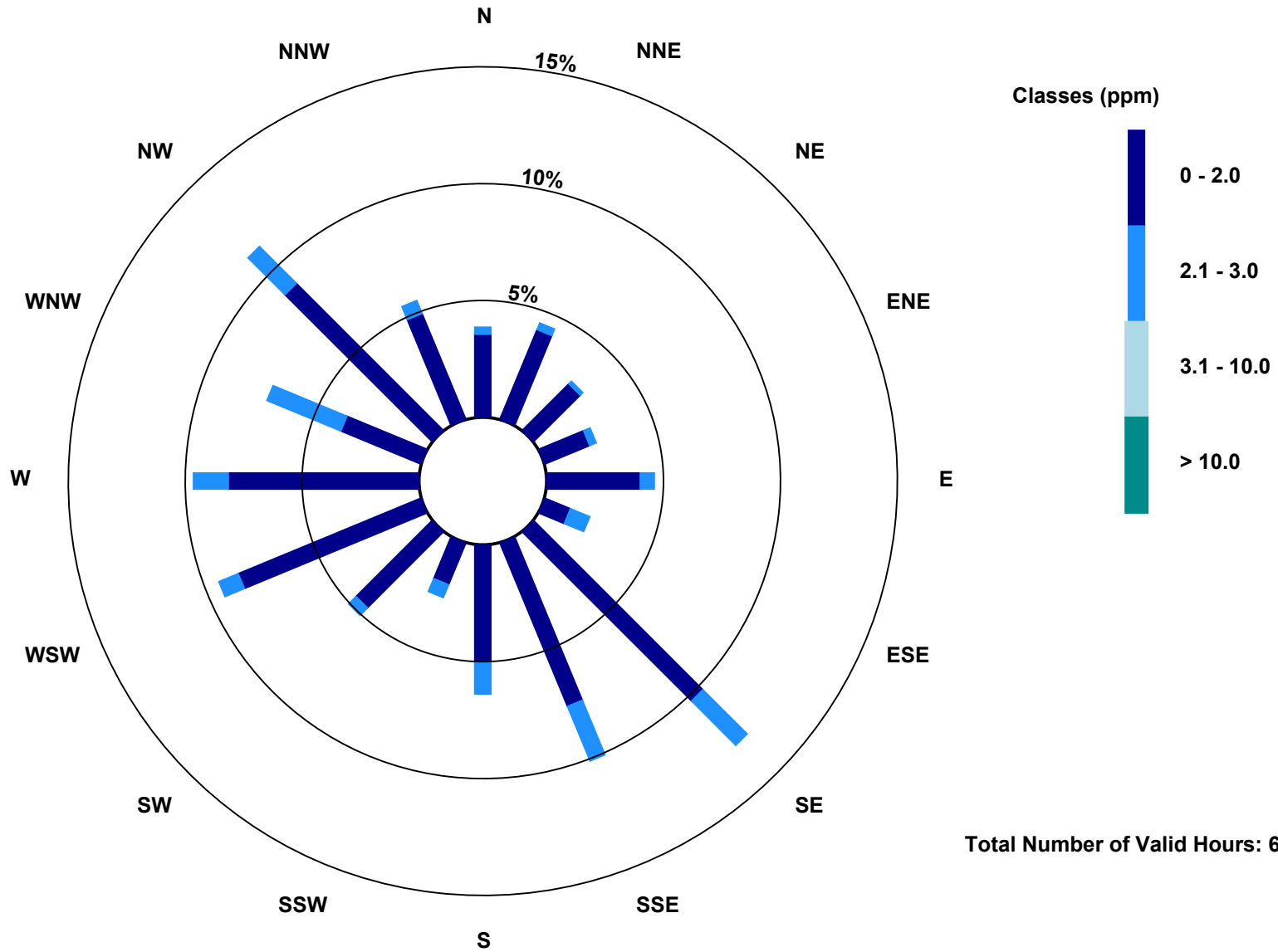
Total Number of Valid Hours: 674

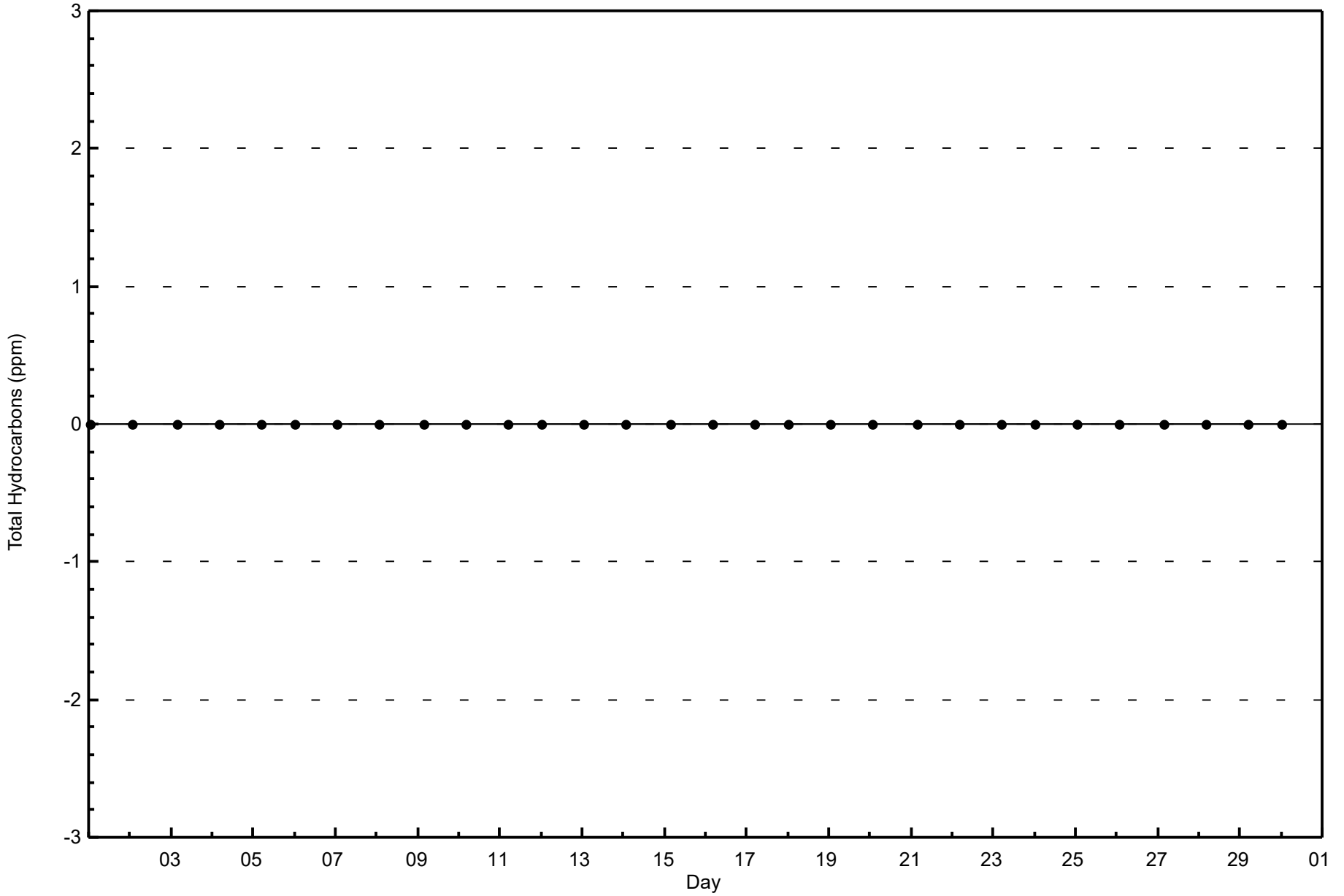
Total Number of Hours: 720

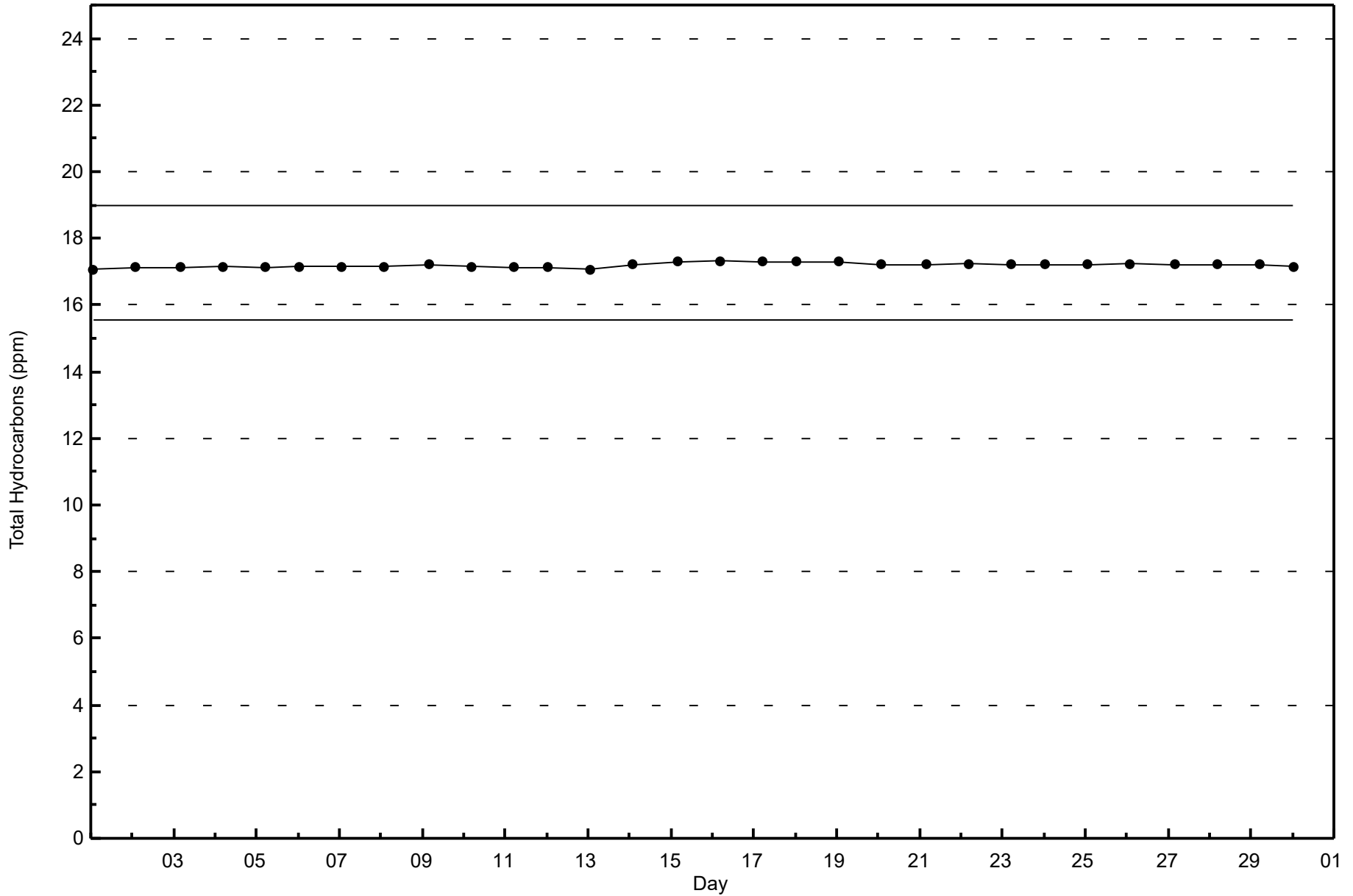


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Anzac





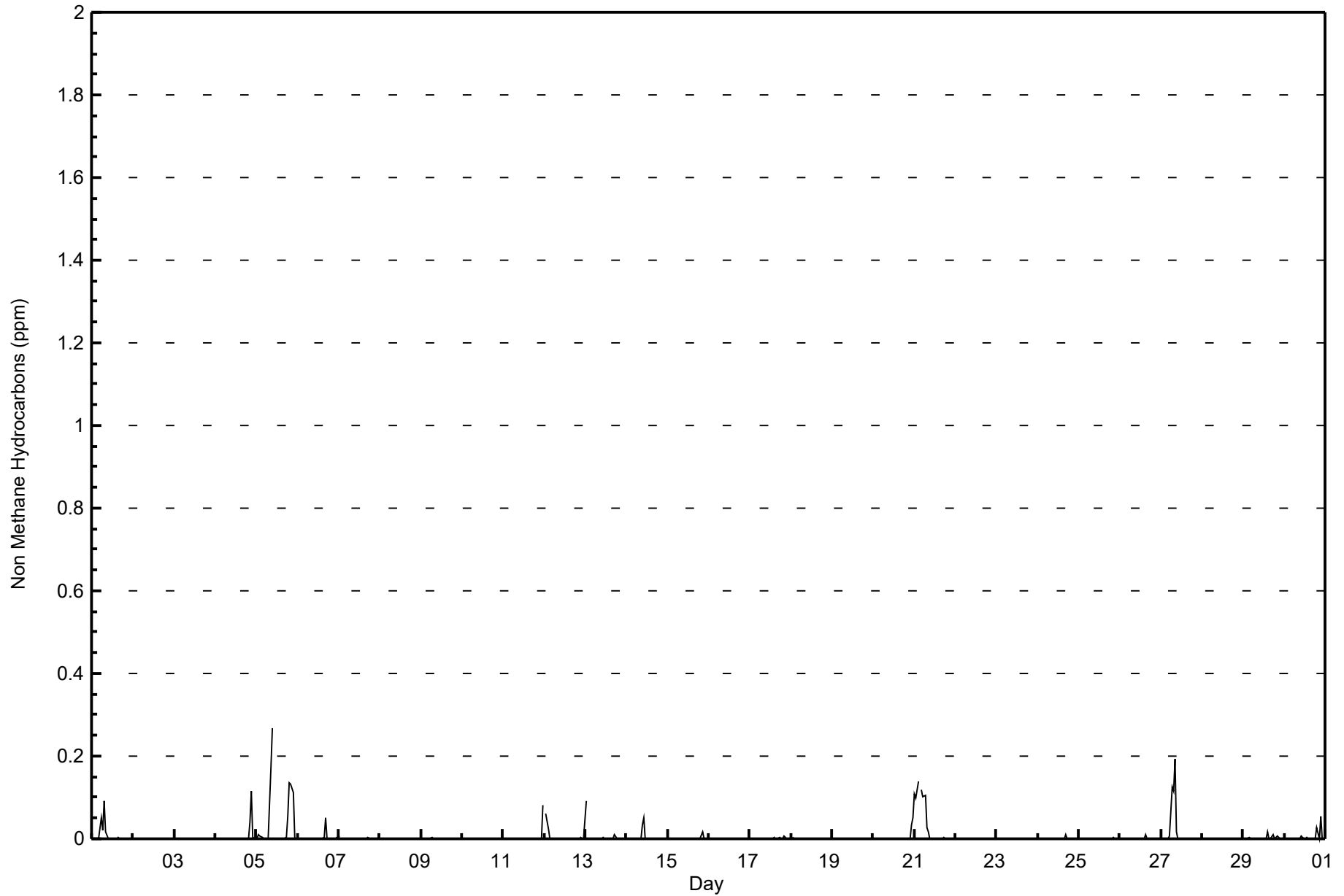




Summary of Hour Averages

Anzac - June 2023

Maximum Value: 0.267 ppm on Jun 5 10:00		Maximum Daily Average: 0.047 ppm on Jun 5		Hours in Service: 720																						
Minimum Value: 0.000 ppm on Jun 1 01:00		Minimum Daily Average: 0.000 ppm on Jun 2		Hours of Data: 674																						
Maximum Diurnal Average: 0.014 ppm at hour 9		Minimum Diurnal Average: 0.000 ppm at hour 12		Hours of Missing Data: 46																						
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: 98.3																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.000	Z	0.000	0.000	0.000	0.051	0.020	0.093	0.018	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	0.008	0.093
2-Jun	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
3-Jun	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
4-Jun	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	0.001	0.000	0.000	0.040	0.114	0.003	0.007	0.114
5-Jun	0.000	0.009	0.006	0.002	0.000	Z	0.000	0.000	0.174	0.267	C	C	C	C	0.000	0.000	0.000	0.005	0.055	0.134	0.132	0.112	0.000	0.000	0.047	0.267
6-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.052
7-Jun	0.007	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.001	0.007
8-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	PF	0.000	0.000	0.000	0.000	0.001
9-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
10-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11-Jun	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	0.001	0.083	0.004	0.083	
12-Jun	Z	0.061	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.004	0.061	
13-Jun	0.091	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	PF	PF	PF	PF	PF	0.006	0.091
14-Jun	PF	0.000	Z	0.000	0.000	0.000	0.002	0.000	0.000	0.035	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.052
15-Jun	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	0.018	0.001	0.000	0.000	0.001	0.018
16-Jun	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	0.000	0.000	0.000	0.000	0.001	0.001
17-Jun	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	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.007
18-Jun	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	0.000	0.002
19-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20-Jun	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	0.034	0.050	0.004	0.050
21-Jun	0.109	0.098	0.137	Z	0.118	0.100	0.105	0.028	0.018	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	0.031	0.137
22-Jun	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
23-Jun	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
24-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
25-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.004
26-Jun	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	0.000	0.000	0.000	0.011
27-Jun	0.000	0.000	0.000	Z	0.000	0.006	0.126	0.114	0.195	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.195
28-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29-Jun	0.000	0.000	0.000	0.003	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.009	0.000	0.004	0.007	0.000	0.000	0.000	0.002	0.016
30-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.055	0.000	0.000	0.004	0.055
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan		C - Calibration				M - Maintenance				PF - Power Failure																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	627	93.03	93.03
0.006 - 0.05	27	4.01	97.03
0.06 - 0.1	17	2.52	99.55
> 0.1	3	0.45	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - June 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	26	30	20	16	31	13	86	64	43	14	31	60	56	35	66	36	627
0.006 - 0.05	0	0	0	0	0	1	1	2	0	3	3	2	6	4	5	0	27
0.06 - 0.1	0	0	0	0	0	0	0	2	0	0	0	1	3	7	3	1	17
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3
Totals	26	30	20	16	31	14	87	68	43	17	34	63	65	48	75	37	674

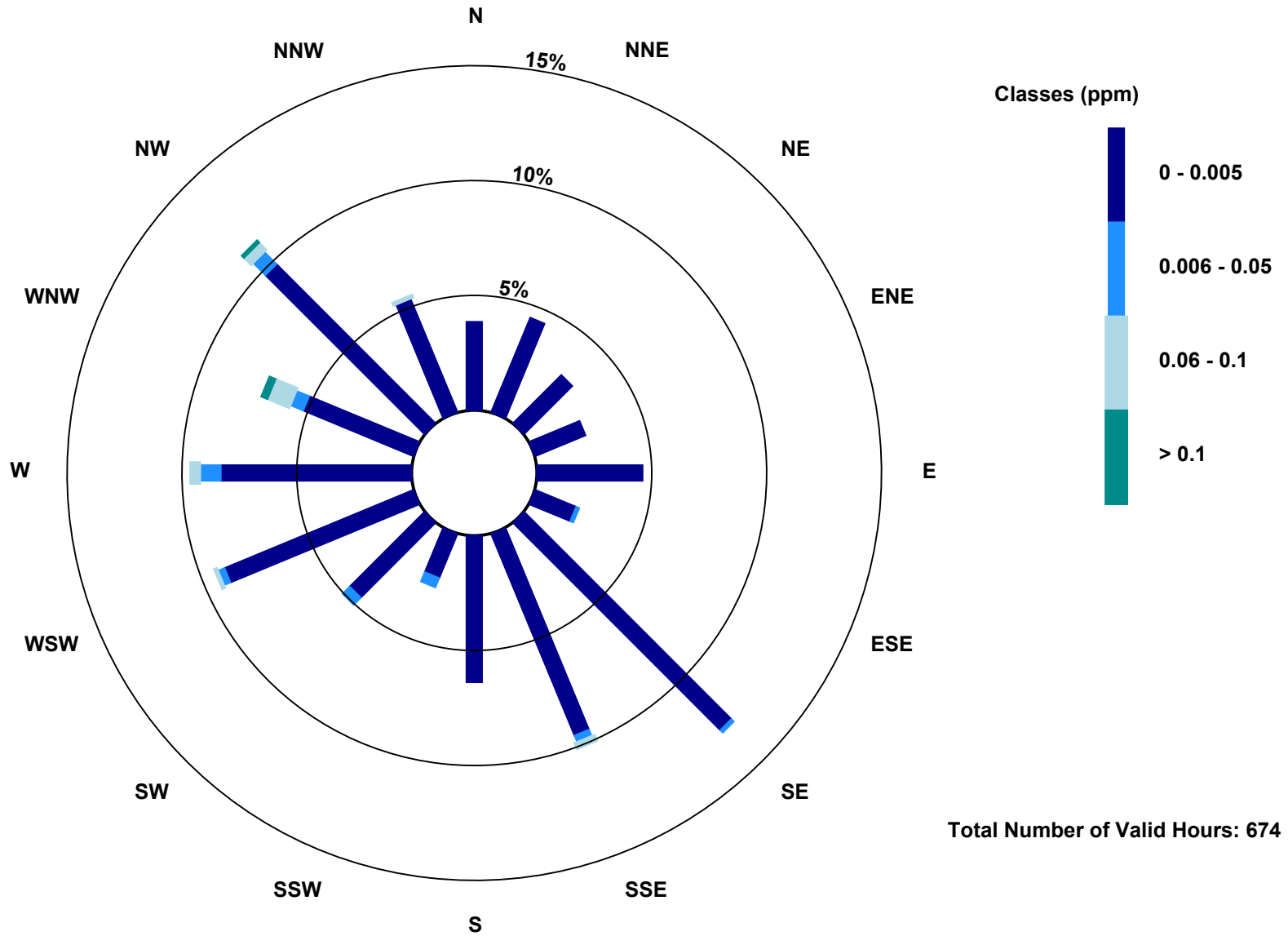
Total Number of Valid Hours: 674

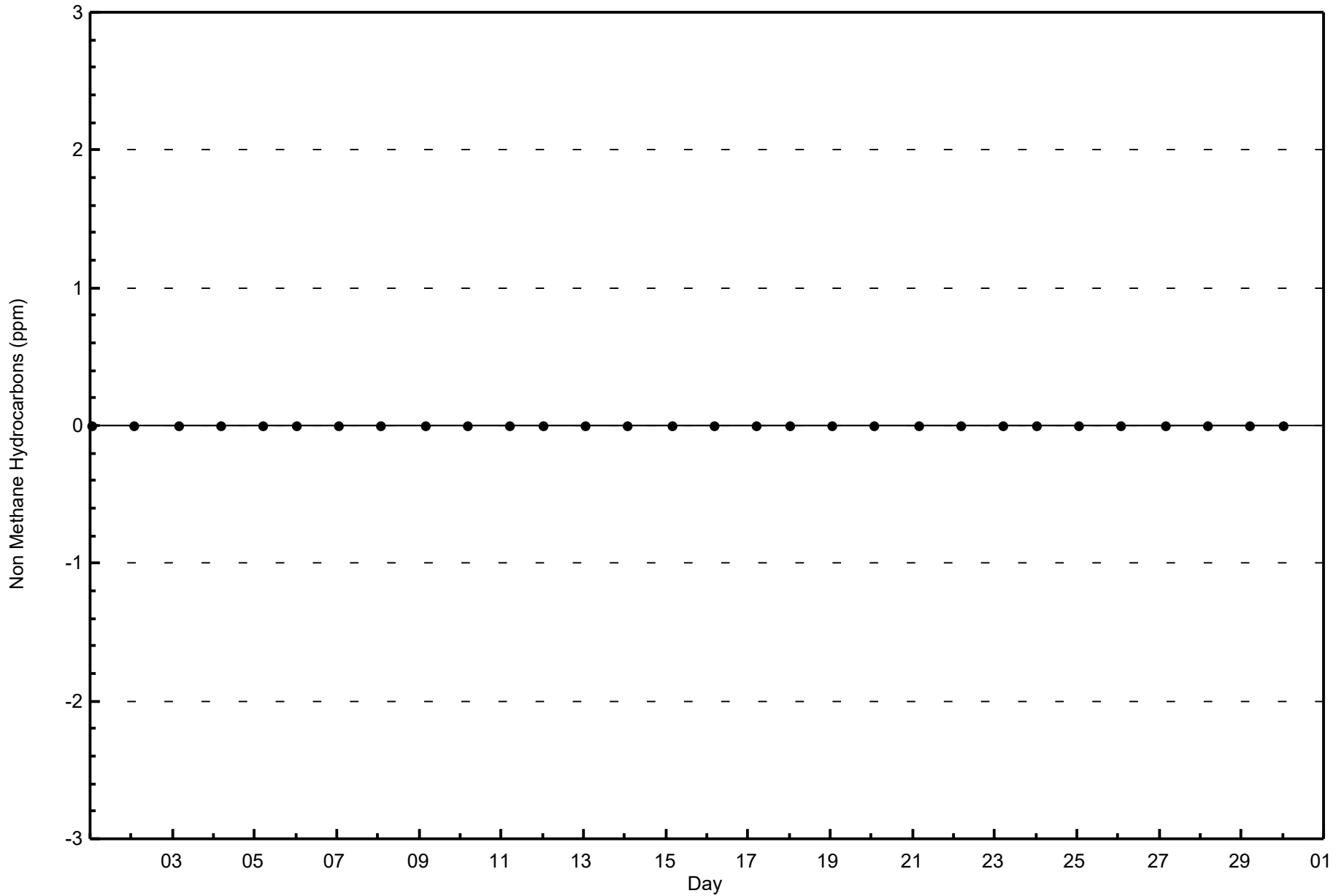
Total Number of Hours: 720

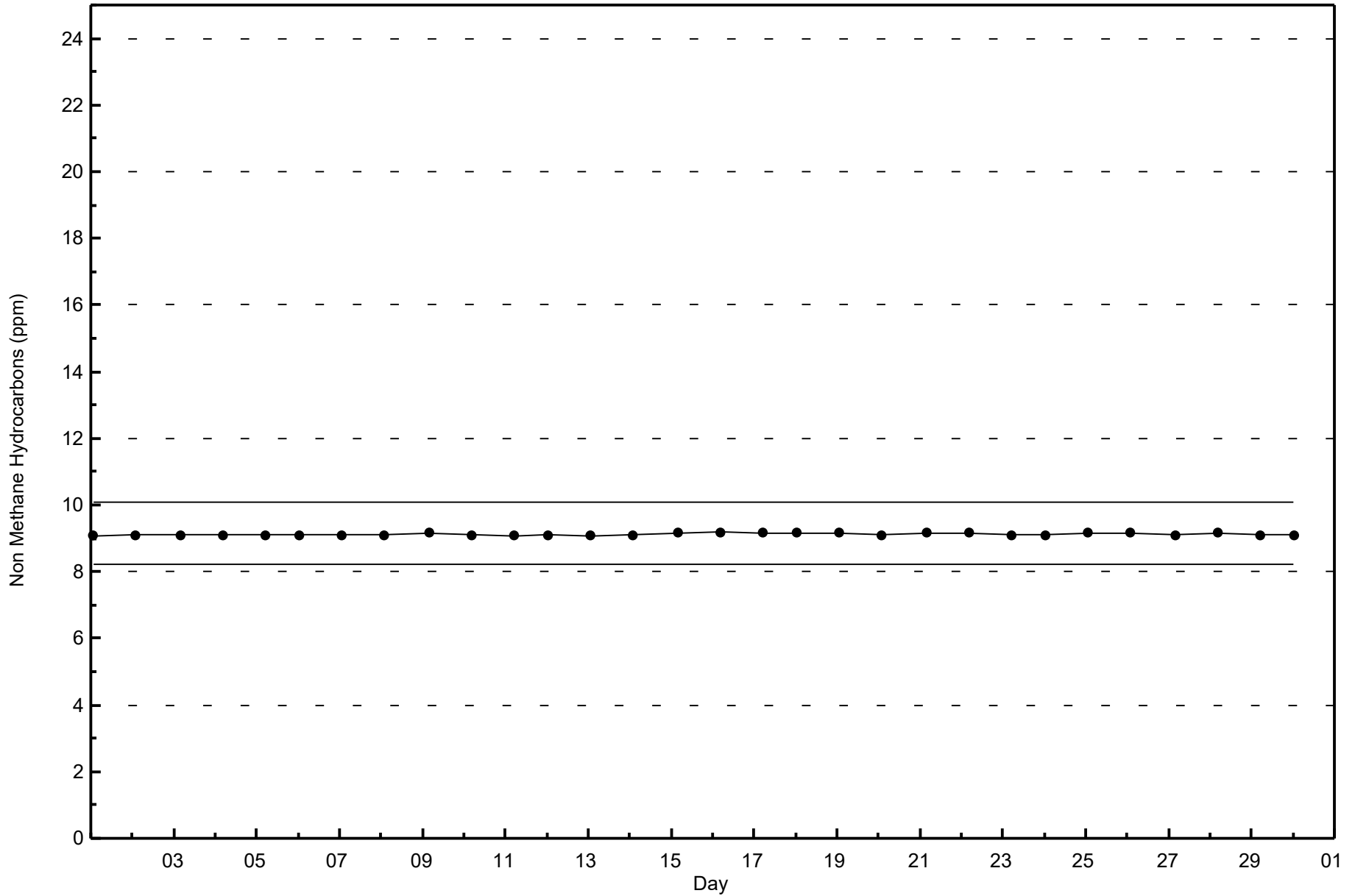


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Anzac



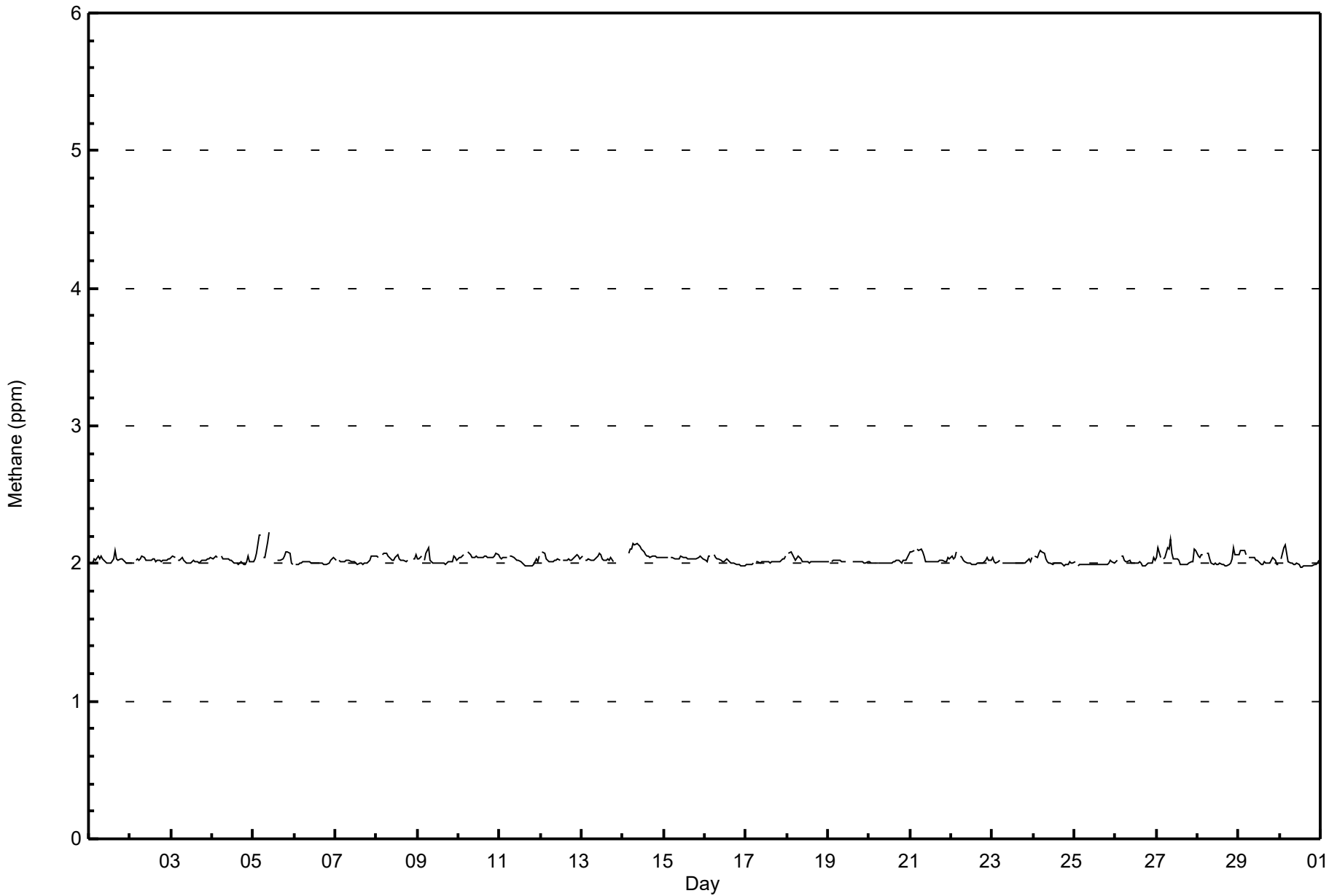






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Anzac - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Anzac - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	556	82.49	82.49
2.1 - 3.0	118	17.51	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



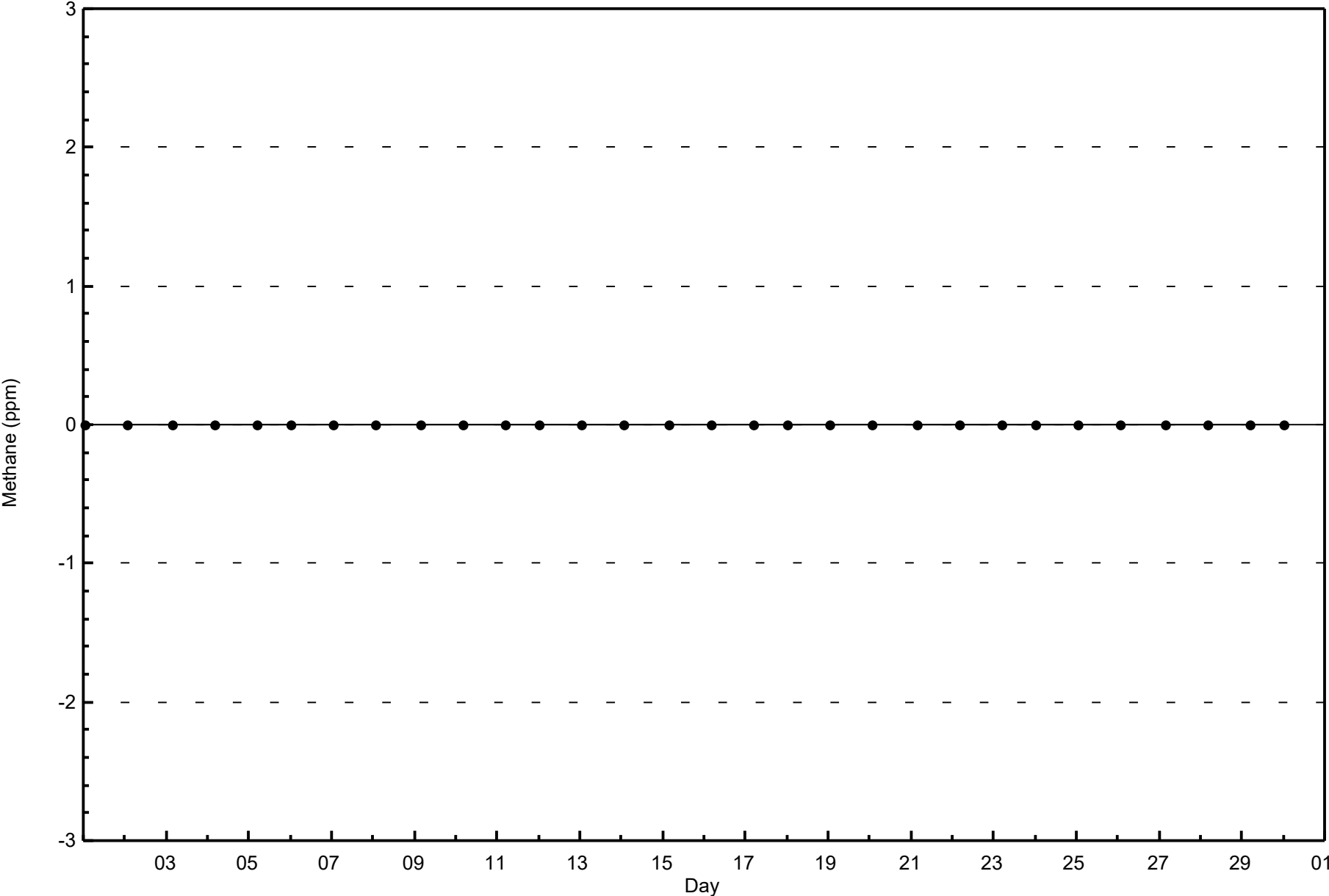
**Wood Buffalo Environmental Association
Frequency Distribution**

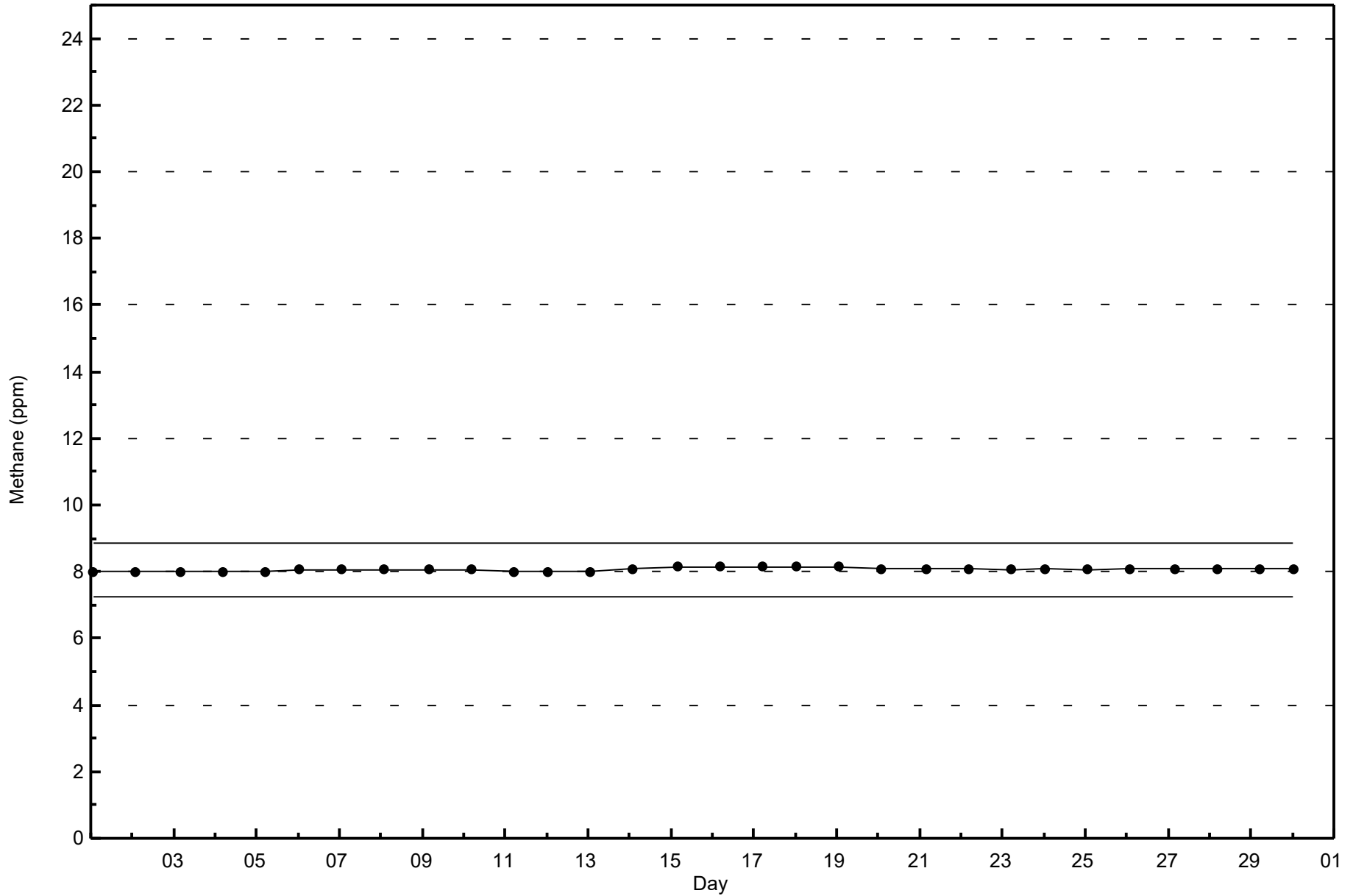
**Methane (CH₄) - ppm
Anzac - June 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	24	28	19	14	27	9	70	51	34	14	32	58	56	27	60	33	556
2.1 - 3.0	2	2	1	2	4	5	17	17	9	3	2	5	9	21	15	4	118
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	26	30	20	16	31	14	87	68	43	17	34	63	65	48	75	37	674

Total Number of Valid Hours: 674

Total Number of Hours: 720







Wood Buffalo Environmental Association
Summary of Hour Averages

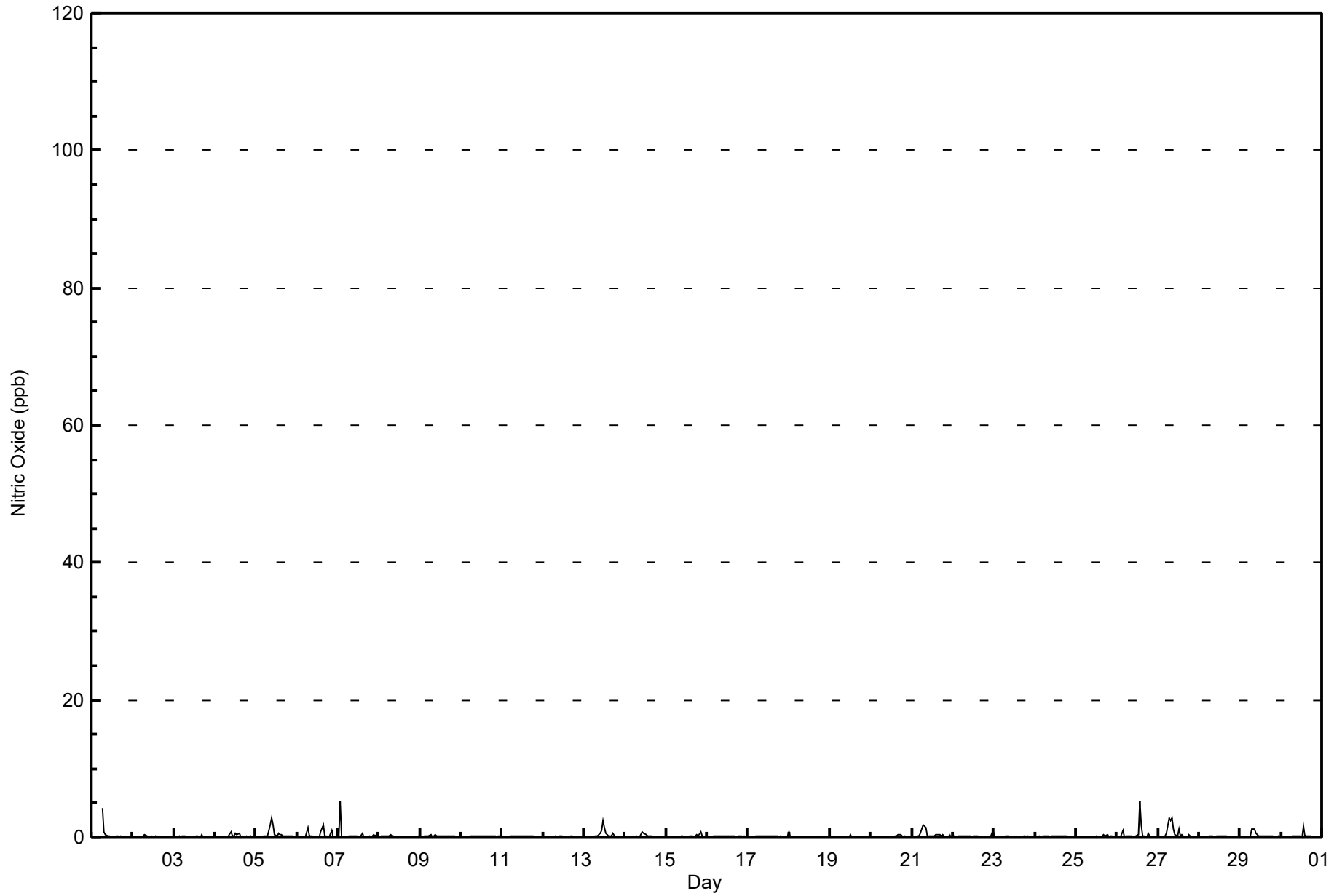
Nitric Oxide (NO) - ppb
Anzac - June 2023

Maximum Value: 5.4 ppb on Jun 26 14:00		Maximum Daily Average: 0.6 ppb on Jun 27		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 19 23:00		Minimum Daily Average: 0.1 ppb on Jun 19		Hours of Data: 676																						
Maximum Diurnal Average: 0.5 ppb at hour 7		Minimum Diurnal Average: 0.1 ppb at hour 3		Hours of Missing Data: 44																						
Monthly Average: 0.21 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 2.4		Hours of Calibration: 36																						
				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-Jun	0.1	0.0	0.0	0.1	0.1	Z	4.2	0.8	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	4.2
2-Jun	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.4
3-Jun	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4
4-Jun	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.3	0.2	0.5	0.3	0.5	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.7
5-Jun	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.3	1.8	2.8	1.8	0.3	0.1	0.5	0.5	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.5	2.8
6-Jun	0.0	0.0	0.0	0.0	Z	0.1	1.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	1.9	0.3	0.1	0.1	0.0	0.9	0.0	0.0	0.1	0.3	1.9
7-Jun	0.1	5.2	0.1	0.0	0.0	Z	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.2	0.6	0.4	5.2
8-Jun	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.2	C	C	C	C	C	C	0.0	0.0	0.0	0.0	PF	PF	0.1	0.1	0.1	--	0.4
9-Jun	0.2	Z	0.2	0.2	0.2	0.3	0.5	0.1	0.2	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
10-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.1	0.2	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	0.3
11-Jun	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
12-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	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	0.2
13-Jun	0.1	0.0	0.0	0.0	0.1	Z	0.1	0.2	0.2	0.6	0.9	2.5	1.4	0.5	0.2	0.3	0.2	0.7	0.1	PF	PF	PF	PF	PF	0.4	2.5
14-Jun	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.4	0.9	0.7	0.5	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
15-Jun	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	0.2	0.5	0.1	0.8	0.1	0.1	0.1	0.8
16-Jun	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
17-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3
18-Jun	0.8	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	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.8
19-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
20-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.5
21-Jun	0.1	Z	0.1	0.1	0.3	0.7	1.9	1.7	1.5	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.4	0.2	0.0	0.0	0.3	0.1	0.4	1.9
22-Jun	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0	0.2	1.0
23-Jun	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
24-Jun	0.1	0.0	0.2	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
25-Jun	0.1	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.3	0.3	0.2	0.3	0.1	0.1	0.2	0.1	0.2	0.1	0.3
26-Jun	Z	0.0	0.1	1.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.3	5.4	1.7	0.2	0.1	0.1	0.6	0.1	0.1	0.1	0.1	0.1	0.5	5.4
27-Jun	0.1	Z	0.1	0.1	0.1	0.7	2.8	2.4	2.9	1.2	0.3	0.2	1.2	0.2	0.4	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.6	2.9
28-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
29-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	1.2	1.1	0.6	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.2	1.2
30-Jun	0.1	0.1	0.0	0.0	Z	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	1.7	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.2	1.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.8 5.2 0.2 1.1 0.3 0.7 4.2 2.4 2.9 2.8 1.8 2.5 1.4 5.4 1.7 1.9 0.5 0.7 0.6 0.2 0.9 0.4 0.3 1.0		
																								Z - zerospan C - Calibration M - Maintenance PF - Power Failure		



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Anzac - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Anzac - June 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
Anzac - June 2023

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	33	19	16	32	14	89	66	43	20	33	62	65	46	71	39	676
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	28	33	19	16	32	14	89	66	43	20	33	62	65	46	71	39	676

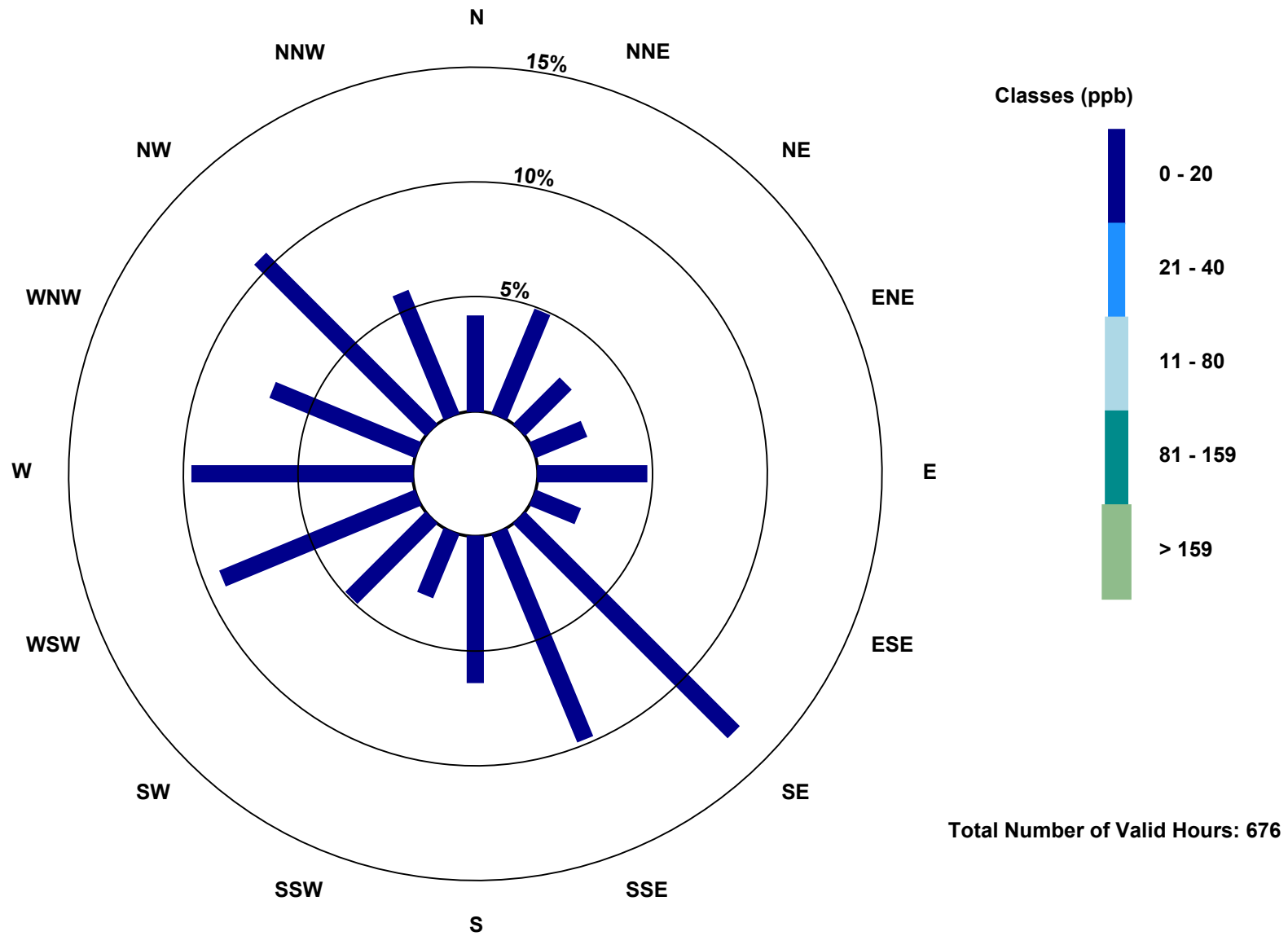
Total Number of Valid Hours: 676

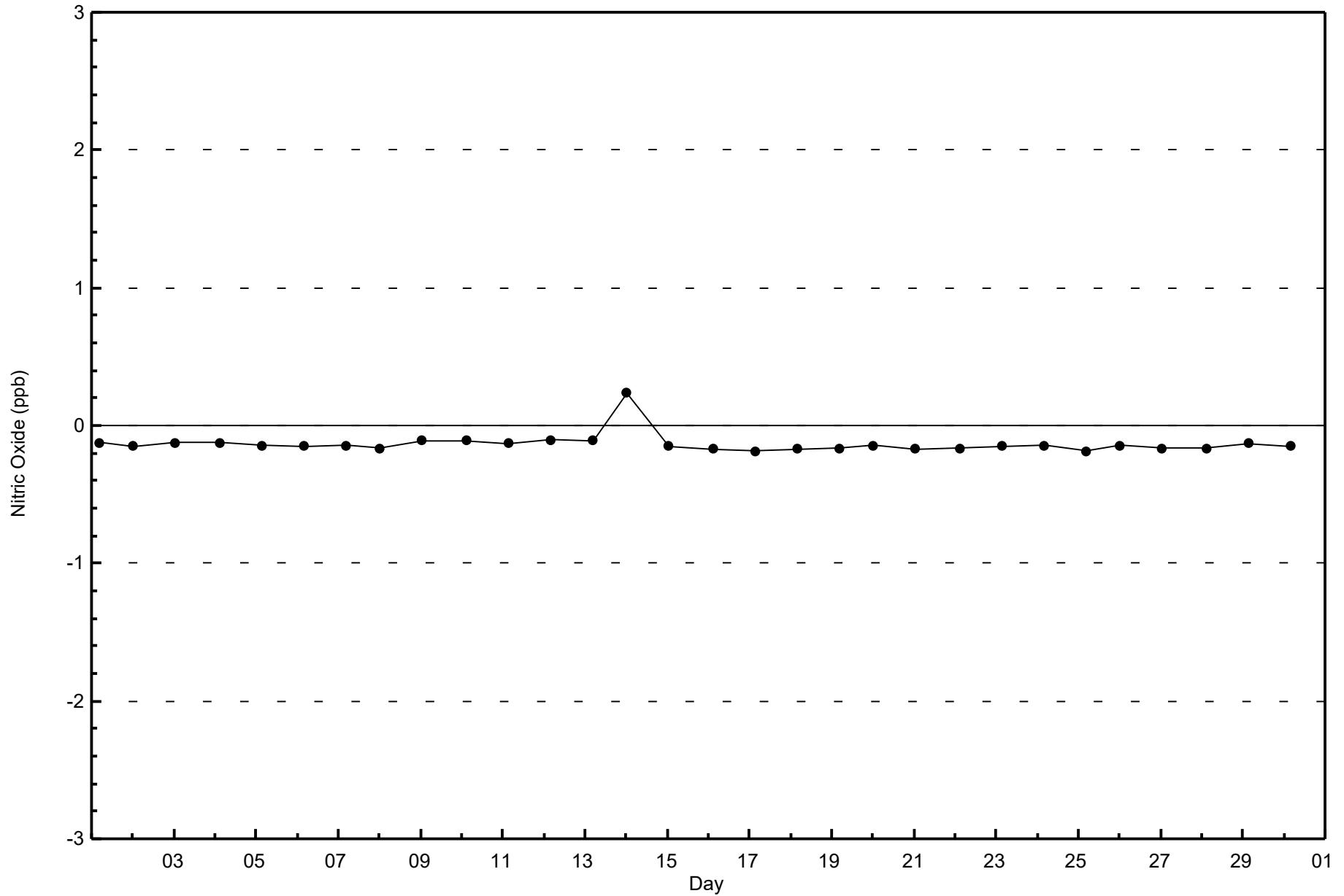
Total Number of Hours: 720

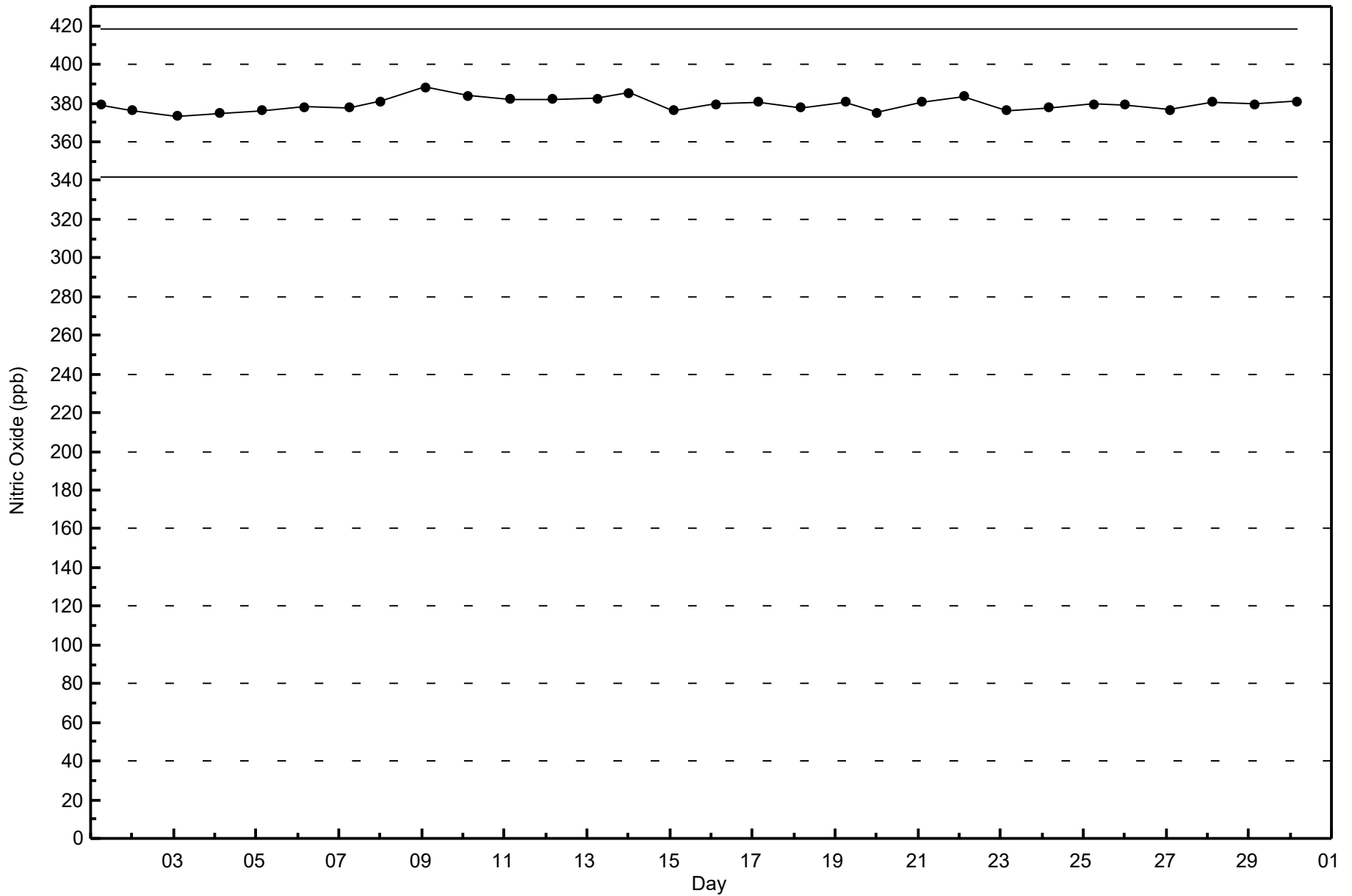


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Anzac









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

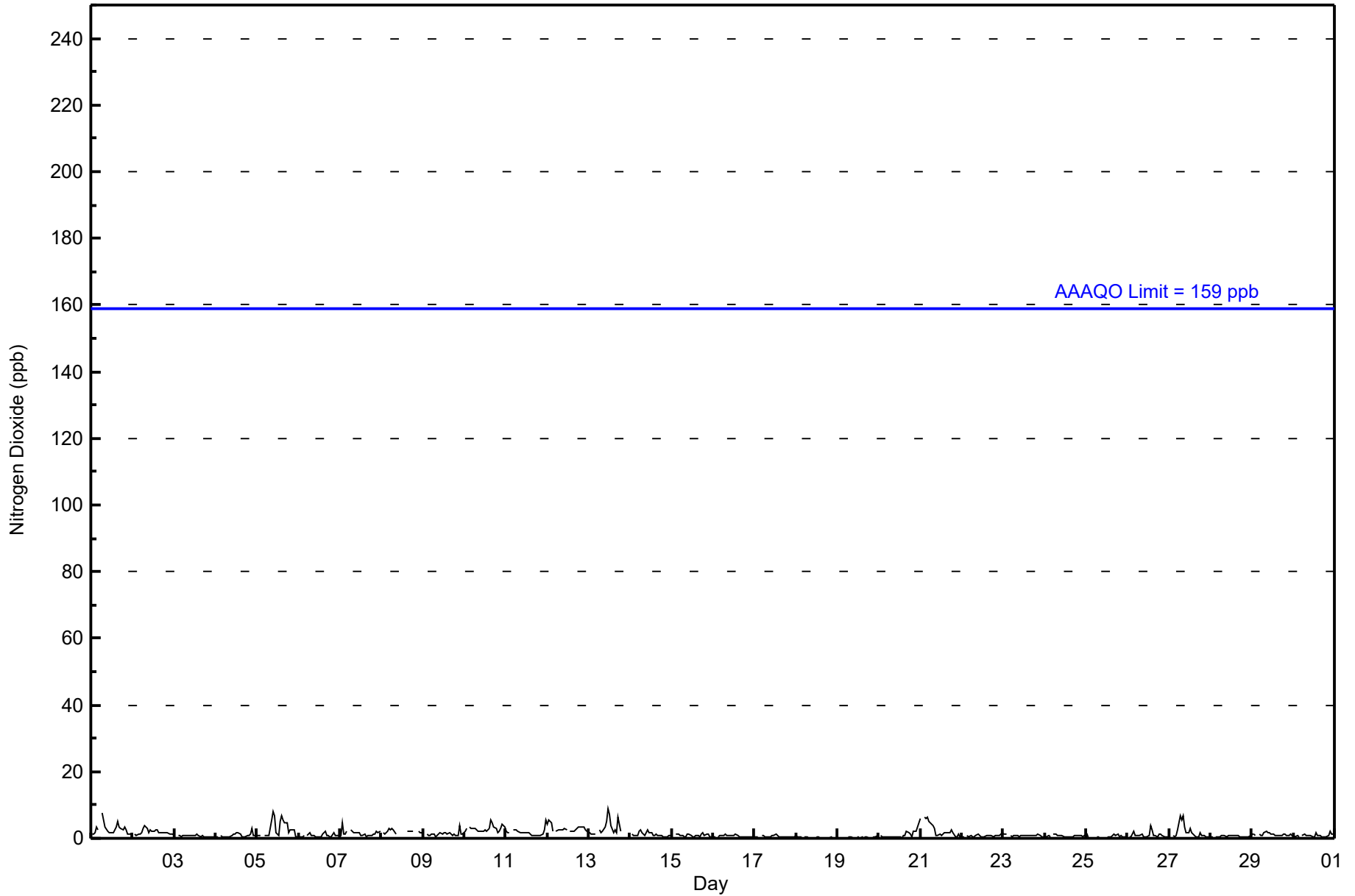
Anzac - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8.7 ppb on Jun 13 12:00 Maximum Daily Average: 3.1 ppb on Jun 13																	Hours in Service: 720 Hours of Data: 676 Hours of Missing Data: 44 Hours of Calibration: 36 Percent Operational Time: 98.9										
Minimum Value: 0.1 ppb on Jun 18 18:00 Minimum Daily Average: 0.3 ppb on Jun 19 Maximum Diurnal Average: 1.8 ppb at hour 7 Minimum Diurnal Average: 1.1 ppb at hour 20 Monthly Average: 1.37 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 0.9 Q ₃ = 1.7 P ₉₀ = 2.8 P ₉₉ = 6.7																											
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-Jun	1.2	1.1	1.6	3.3	2.5	Z	7.8	5.6	3.4	2.3	1.8	1.5	1.5	1.5	3.3	5.2	3.3	2.8	2.5	3.6	2.4	1.4	1.2	1.1	2.7	7.8	
2-Jun	Z	1.2	1.0	1.1	1.1	1.6	2.8	4.0	2.8	1.9	2.5	2.3	2.2	2.6	2.7	1.7	1.6	1.7	1.7	1.6	1.5	1.4	1.2	1.2	1.9	4.0	
3-Jun	1.0	Z	1.0	0.8	0.6	0.7	0.8	0.7	0.7	0.8	0.8	0.7	0.8	1.1	0.9	0.6	0.8	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.7	1.1	
4-Jun	0.5	0.5	Z	0.7	0.5	0.5	0.5	0.5	0.5	0.9	1.2	1.2	1.8	1.5	1.4	0.5	0.6	0.5	0.9	0.7	1.1	2.8	0.9	0.7	0.9	2.8	
5-Jun	0.7	0.7	0.8	Z	1.0	1.0	0.9	0.9	5.3	8.0	6.9	1.8	0.9	5.1	6.9	5.6	4.8	4.6	1.8	2.5	2.7	2.5	0.6	0.5	2.9	8.0	
6-Jun	0.4	0.4	0.5	0.7	Z	1.0	1.8	0.8	0.8	0.7	0.5	0.5	0.4	0.5	1.2	2.3	0.9	0.7	0.6	0.6	1.5	0.7	0.8	0.9	0.8	2.3	
7-Jun	0.7	4.8	1.4	1.4	2.0	Z	2.6	2.0	1.9	1.8	1.9	1.6	0.9	0.7	1.3	0.6	0.7	0.8	1.0	1.2	1.4	2.1	1.9	2.0	1.6	4.8	
8-Jun	Z	1.5	1.2	2.2	3.1	2.7	2.9	2.6	1.4	C	C	C	C	C	C	2.2	2.0	2.0	2.1	PF	PF	2.2	1.7	1.5	--	3.1	
9-Jun	1.3	Z	1.1	1.0	0.9	1.4	1.2	0.6	0.9	1.3	1.5	1.4	1.6	1.7	1.2	1.6	1.1	1.0	1.1	0.9	0.9	3.8	1.3	1.4	1.3	3.8	
10-Jun	2.1	2.8	Z	3.4	3.1	2.8	2.9	2.6	2.2	2.1	2.2	2.3	2.6	2.3	3.0	5.5	4.7	3.3	2.8	1.9	2.3	2.9	4.1	3.2	2.9	5.5	
11-Jun	2.1	1.8	1.8	Z	2.7	2.5	2.5	2.2	1.6	1.7	1.6	1.8	1.9	1.7	1.4	0.9	0.7	0.9	0.8	0.7	0.9	1.3	2.6	5.4	1.8	5.4	
12-Jun	4.1	5.5	4.6	2.3	Z	2.3	2.4	2.5	2.6	2.6	3.0	2.7	M	2.2	2.1	2.3	2.7	3.1	3.4	3.3	3.6	3.2	2.5	2.2	3.0	5.5	
13-Jun	1.9	1.2	1.3	1.2	1.1	Z	2.5	1.8	2.1	3.5	4.9	8.7	7.2	3.9	1.9	2.5	1.6	6.2	2.2	PF	PF	PF	PF	PF	3.1	8.7	
14-Jun	Z	1.2	1.0	1.0	1.0	2.0	2.7	1.9	0.8	1.5	2.4	1.9	1.6	1.0	0.7	1.1	0.9	0.9	1.0	0.5	0.5	0.5	0.7	0.8	1.2	2.7	
15-Jun	0.9	Z	1.2	1.1	1.3	1.0	0.8	0.6	0.6	1.1	1.4	0.7	0.6	0.6	0.8	0.7	0.6	1.3	1.9	0.8	1.3	1.1	0.6	0.4	0.9	1.9	
16-Jun	0.4	0.4	Z	0.6	0.7	0.7	0.8	1.1	0.7	0.7	0.7	0.9	0.9	1.1	0.9	0.6	0.6	0.3	0.5	0.5	0.6	0.4	0.4	0.3	0.6	1.1	
17-Jun	0.4	0.3	0.4	Z	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.8	0.9	1.3	0.9	0.4	0.4	0.5	0.3	0.3	0.6	0.6	0.5	0.4	0.5	0.6	1.3
18-Jun	0.7	0.5	0.4	0.3	Z	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.3	0.7	
19-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.4	0.3	0.3	0.1	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.7	0.3	0.7	
20-Jun	Z	1.0	0.6	0.6	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.8	1.0	2.0	1.6	1.4	0.6	2.2	2.0	3.6	4.8	1.1	4.8	
21-Jun	5.9	Z	6.4	6.0	6.2	5.2	4.1	3.9	3.1	0.8	1.0	1.2	0.8	1.1	1.5	1.7	1.8	1.8	2.4	1.6	0.5	0.4	1.3	0.6	2.6	6.4	
22-Jun	0.5	0.4	Z	0.7	0.5	0.8	0.6	0.6	0.9	1.3	1.0	0.6	0.6	0.6	0.8	0.7	0.8	0.7	0.6	0.8	0.9	0.8	0.7	1.5	0.8	1.5	
23-Jun	1.4	1.3	1.1	Z	0.7	0.6	0.9	1.0	0.9	0.6	0.7	0.7	0.7	0.7	0.7	0.7	1.0	0.9	0.7	1.3	0.7	0.6	0.5	0.8	1.4	1.4	
24-Jun	0.5	0.5	1.0	0.5	Z	1.2	1.1	1.0	0.9	0.8	0.9	0.6	0.6	0.6	0.5	0.6	0.9	0.8	0.7	0.7	1.0	0.6	0.7	0.8	1.2	1.2	
25-Jun	1.3	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.9	1.1	1.0	1.3	0.5	0.8	0.6	0.5	0.5	0.5	1.3	
26-Jun	Z	0.5	0.3	2.0	0.8	0.9	0.8	0.9	1.2	0.5	0.5	0.6	0.8	3.8	2.6	1.0	0.7	0.6	1.3	1.1	0.7	0.6	0.6	0.5	1.0	3.8	
27-Jun	0.4	Z	0.8	0.6	0.7	2.4	6.6	5.4	6.8	3.6	1.9	1.9	3.1	1.5	1.1	0.4	0.4	0.4	1.7	1.0	0.7	0.5	0.4	0.5	1.9	6.8	
28-Jun	0.4	0.4	Z	0.6	0.6	0.6	0.7	0.8	0.8	0.6	0.8	0.8	0.9	0.9	0.7	0.7	0.9	0.6	0.5	0.6	0.5	0.5	0.5	0.7	0.7	0.9	
29-Jun	1.3	1.1	0.7	Z	1.1	0.8	0.7	1.6	2.0	1.9	1.8	1.4	1.4	1.0	1.0	1.0	1.0	1.0	1.3	1.1	0.9	0.9	1.4	0.8	1.2	2.0	
30-Jun	0.8	0.6	0.7	0.6	Z	0.9	1.3	0.8	0.9	0.9	0.9	0.6	0.4	1.8	0.7	0.7	0.5	0.4	0.4	0.5	0.8	2.1	1.3	1.1	0.9	2.1	
																								Diurnal Average			
																								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
Anzac - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Anzac - June 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
Anzac - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	28	33	19	16	32	14	89	66	43	20	33	62	65	46	71	39	676
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	28	33	19	16	32	14	89	66	43	20	33	62	65	46	71	39	676

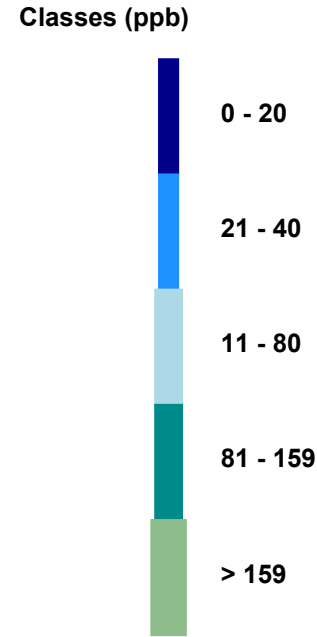
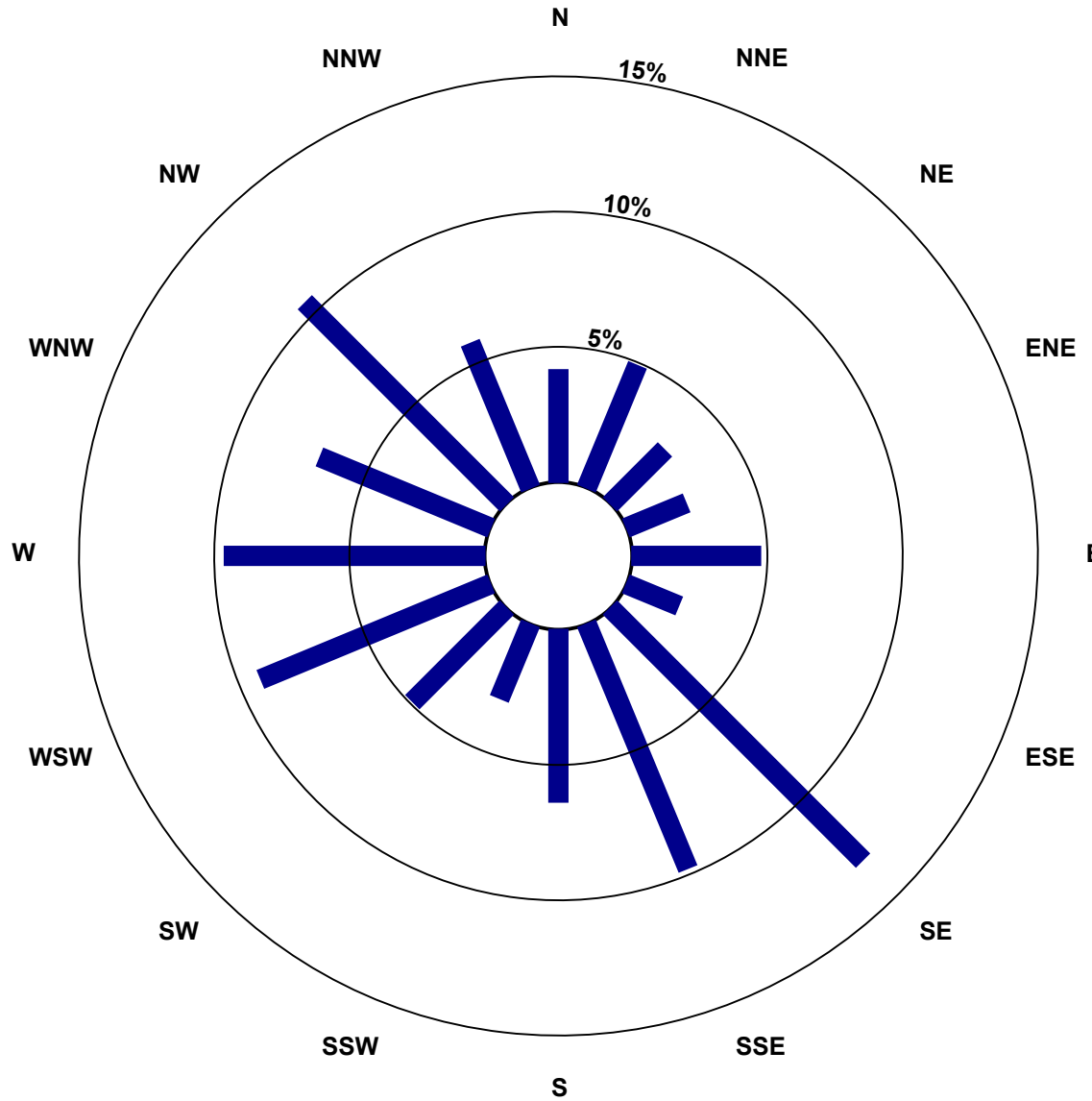
Total Number of Valid Hours: 676

Total Number of Hours: 720

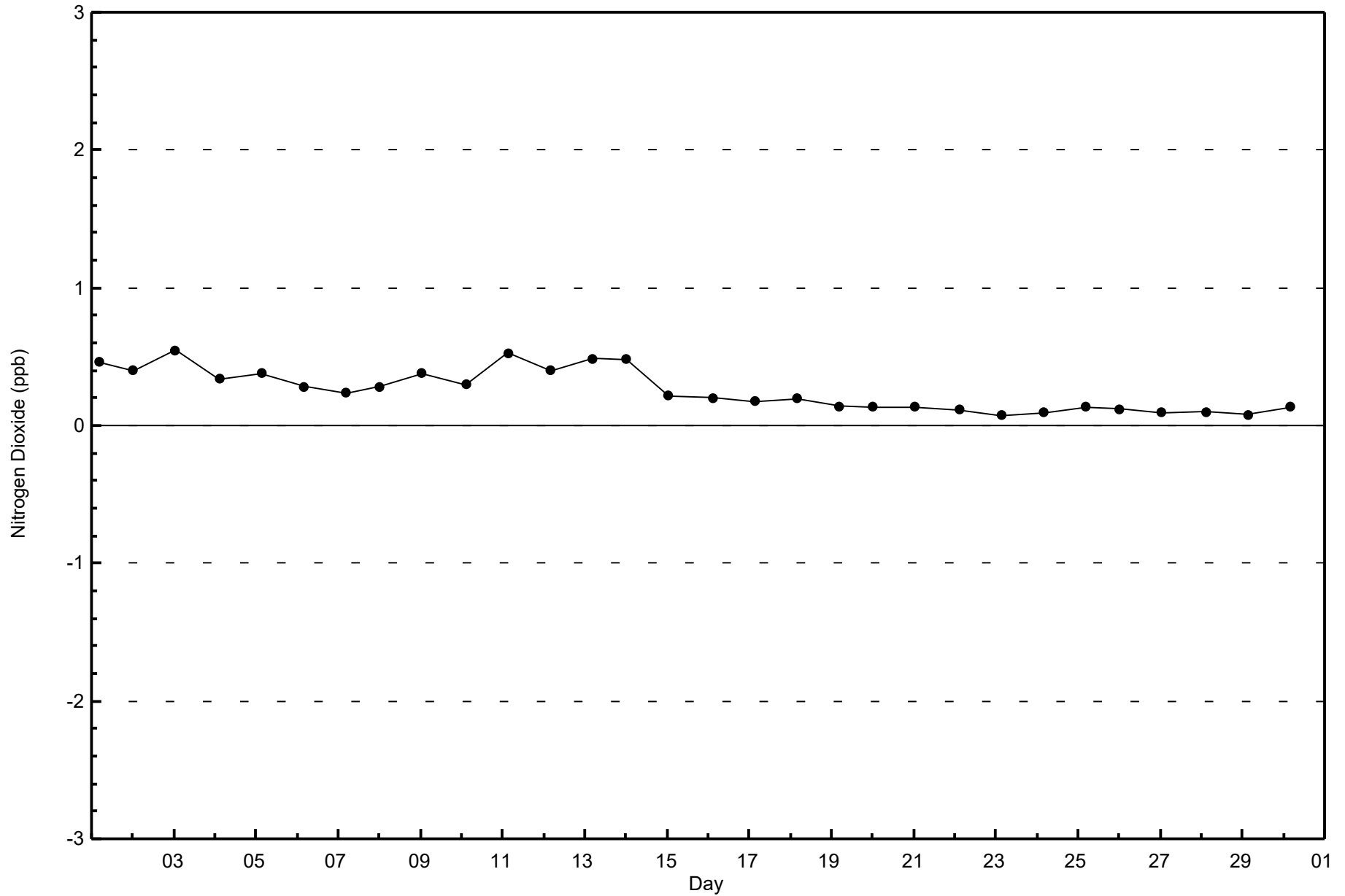


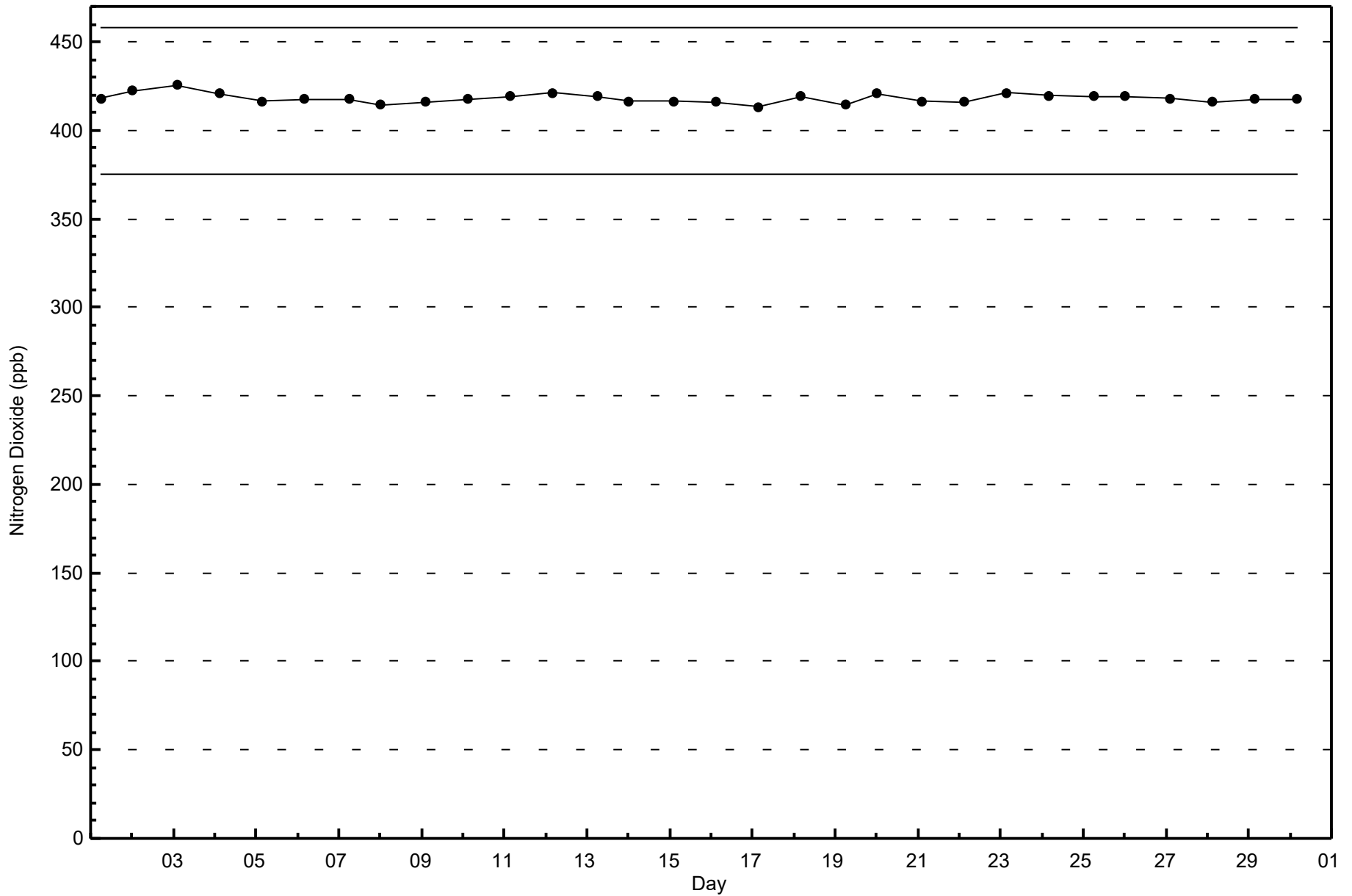
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Anzac



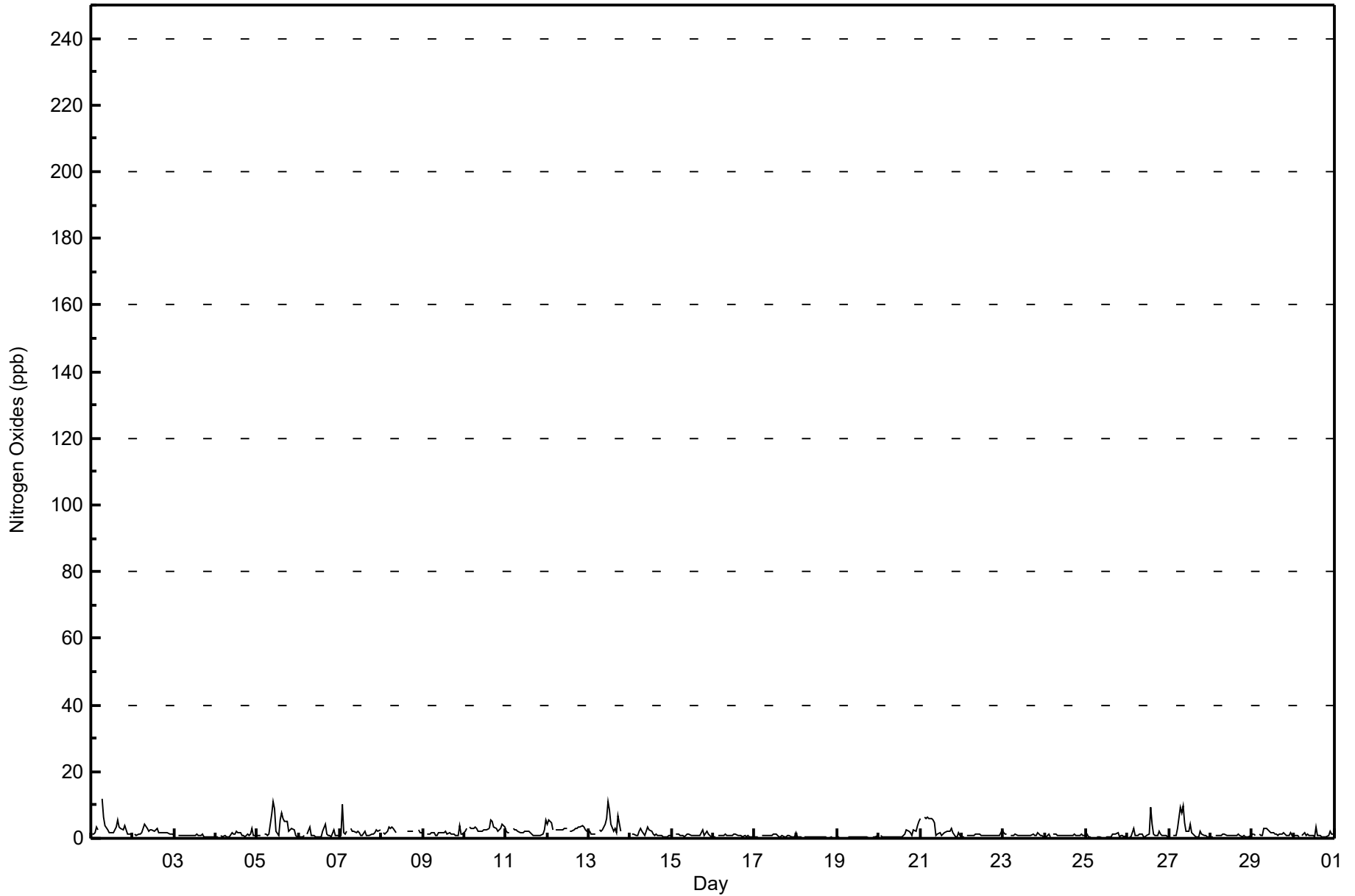
Total Number of Valid Hours: 676







Maximum Value: 12.0 ppb on Jun 1 07:00		Maximum Daily Average: 3.6 ppb on Jun 13		Hours in Service: 720																							
Minimum Value: 0.1 ppb on Jun 19 00:00		Minimum Daily Average: 0.3 ppb on Jun 19		Hours of Data: 676																							
Maximum Diurnal Average: 2.3 ppb at hour 7		Minimum Diurnal Average: 1.1 ppb at hour 20		Hours of Missing Data: 44																							
Monthly Average: 1.58 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.7 Median = 1.0 Q ₃ = 2.0 P ₉₀ = 3.1 P ₉₉ = 8.8		Hours of Calibration: 36																							
				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-Jun	1.3	1.1	1.6	3.4	2.6	Z	12.0	6.4	3.7	2.5	1.9	1.6	1.6	1.6	3.4	5.4	3.4	2.9	2.6	3.7	2.5	1.4	1.3	1.2	3.0	12.0	
2-Jun	Z	1.2	1.0	1.1	1.2	1.7	3.0	4.4	3.1	2.0	2.6	2.4	2.3	2.7	2.8	1.8	1.7	1.8	1.8	1.7	1.5	1.4	1.2	1.2	2.0	4.4	
3-Jun	1.0	Z	1.1	0.9	0.7	0.9	0.9	0.8	0.7	0.8	0.8	0.7	0.9	1.2	1.0	0.7	1.2	0.6	0.5	0.5	0.6	0.5	0.5	0.8	1.2		
4-Jun	0.5	0.5	Z	0.8	0.6	0.6	0.6	0.6	0.6	1.6	1.5	1.4	2.3	1.8	1.9	0.6	0.7	0.6	1.1	0.8	1.2	3.0	1.0	0.8	1.1	3.0	
5-Jun	0.8	0.8	0.9	Z	1.2	1.1	1.0	1.2	7.1	10.8	8.7	2.1	1.0	5.6	7.4	5.9	5.1	4.9	1.9	2.7	2.8	2.6	0.7	0.6	3.4	10.8	
6-Jun	0.4	0.4	0.5	0.7	Z	1.1	3.2	0.9	0.9	0.8	0.6	0.6	0.5	0.6	1.9	4.2	1.2	0.8	0.7	0.6	2.4	0.7	0.8	1.0	1.1	4.2	
7-Jun	0.8	10.0	1.5	1.4	2.0	Z	2.9	2.1	2.0	1.9	2.0	1.7	1.0	0.8	1.9	0.7	0.8	0.9	1.1	1.3	1.5	2.5	2.1	2.6	2.0	10.0	
8-Jun	Z	1.6	1.3	2.3	3.2	2.9	3.2	3.0	1.6	C	C	C	C	C	C	2.2	2.0	2.0	2.1	PF	PF	2.3	1.8	1.6	--	3.2	
9-Jun	1.5	Z	1.3	1.2	1.1	1.7	1.7	0.7	1.1	1.7	1.8	1.7	1.8	2.0	1.4	1.9	1.2	1.1	1.2	1.0	1.0	3.9	1.4	1.5	1.5	3.9	
10-Jun	2.2	2.9	Z	3.5	3.2	2.9	3.2	2.8	2.3	2.3	2.3	2.5	2.7	2.4	3.1	5.7	4.9	3.5	3.0	2.0	2.4	3.0	4.2	3.3	3.0	5.7	
11-Jun	2.2	1.9	1.9	Z	2.8	2.6	2.6	2.3	1.8	1.9	1.8	2.0	2.1	1.9	1.6	1.1	0.9	1.0	0.9	0.8	1.0	1.4	2.7	5.5	1.9	5.5	
12-Jun	4.2	5.6	4.7	2.4	Z	2.4	2.5	2.7	2.7	2.7	3.1	2.8	M	2.3	2.2	2.4	2.8	3.2	3.5	3.4	3.7	3.3	2.6	2.3	3.1	5.6	
13-Jun	2.0	1.2	1.3	1.2	1.2	Z	2.6	2.0	2.3	4.1	5.8	11.2	8.6	4.4	2.1	2.8	1.8	6.9	2.3	PF	PF	PF	PF	PF	3.6	11.2	
14-Jun	Z	1.3	1.1	1.1	1.0	2.1	2.8	2.0	0.9	1.9	3.3	2.6	2.1	1.2	0.8	1.3	1.0	0.9	1.0	0.5	0.5	0.5	0.7	0.8	1.4	3.3	
15-Jun	0.9	Z	1.2	1.1	1.3	1.0	0.8	0.6	0.7	1.2	1.5	0.8	0.7	0.7	0.9	0.8	0.7	1.5	2.4	0.9	2.1	1.2	0.7	0.5	1.0	2.4	
16-Jun	0.5	0.5	Z	0.7	0.8	0.8	1.0	1.3	0.9	0.8	0.8	1.0	1.1	1.3	1.0	0.7	0.7	0.4	0.6	0.6	0.7	0.5	0.5	0.4	0.8	1.3	
17-Jun	0.5	0.4	0.5	Z	1.0	0.8	0.8	0.8	0.8	0.7	1.0	1.1	1.4	1.0	0.6	0.5	0.8	0.5	0.4	0.8	0.7	0.6	0.5	0.6	0.7	1.4	
18-Jun	1.5	0.6	0.5	0.4	Z	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.1	0.1	0.4	1.5	
19-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.5	0.3	0.3	0.2	0.2	0.2	0.6	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.7	0.3	0.7	
20-Jun	Z	1.0	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	1.0	1.3	2.5	1.9	1.6	0.7	2.3	2.0	3.7	4.9	1.3	4.9	
21-Jun	6.0	Z	6.5	6.1	6.5	5.9	6.0	5.6	4.6	1.0	1.2	1.5	1.0	1.3	1.8	2.1	2.1	2.1	2.8	1.8	0.5	0.4	1.6	0.7	3.0	6.5	
22-Jun	0.6	0.5	Z	0.9	0.7	1.0	0.8	0.7	1.2	1.5	1.2	0.7	0.7	0.7	0.9	0.8	0.9	0.8	0.7	0.9	1.0	0.9	0.8	2.5	0.9	2.5	
23-Jun	1.5	1.3	1.1	Z	0.8	0.7	1.0	1.1	1.0	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.1	1.0	0.8	1.5	0.8	0.7	0.6	0.9	1.5	
24-Jun	0.6	0.5	1.2	0.6	Z	1.3	1.3	1.1	1.0	0.9	1.0	0.7	0.7	0.7	0.7	0.8	0.8	1.1	0.9	0.8	0.8	1.1	0.7	0.8	0.9	1.3	
25-Jun	1.4	0.3	0.2	0.2	0.2	Z	0.4	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.4	1.2	1.4	1.2	1.6	0.6	0.9	0.8	0.6	0.7	0.6	1.6	
26-Jun	Z	0.5	0.4	3.1	0.9	1.0	1.0	1.1	1.4	0.6	0.6	0.8	1.1	9.2	4.3	1.2	0.8	0.7	1.9	1.2	0.8	0.7	0.7	0.6	1.5	9.2	
27-Jun	0.5	Z	0.9	0.7	0.8	3.1	9.4	7.8	9.7	4.8	2.2	2.1	4.3	1.7	1.5	0.5	0.5	0.5	2.1	1.2	0.8	0.6	0.5	0.6	2.5	9.7	
28-Jun	0.5	0.5	Z	0.7	0.7	0.7	0.9	1.1	1.1	0.7	0.9	0.9	1.0	1.0	1.0	0.8	1.1	0.7	0.6	0.7	0.6	0.6	0.6	0.8	0.8	1.1	
29-Jun	1.4	1.2	0.8	Z	1.2	0.9	0.8	2.8	3.1	2.5	2.1	1.5	1.6	1.1	1.1	1.1	1.1	1.1	1.6	1.2	1.0	1.0	1.6	0.9	1.4	3.1	
30-Jun	0.9	0.7	0.7	0.6	Z	1.0	1.5	0.9	1.2	1.0	1.0	0.7	0.5	3.5	0.8	0.9	0.6	0.5	0.5	0.6	0.8	2.2	1.4	1.1	1.0	3.5	
		1.4	1.5	1.3	1.4	1.5	1.6	2.3	1.9	2.0	1.8	1.8	1.6	1.6	1.8	1.7	1.7	1.5	1.5	1.4	1.1	1.3	1.4	1.2	1.4	Diurnal Average	
		6.0	10.0	6.5	6.1	6.5	5.9	12.0	7.8	9.7	10.8	8.7	11.2	8.6	9.2	7.4	5.9	5.1	6.9	3.5	3.7	3.7	3.9	4.2	5.5	Diurnal Maximum	
Z - zerspan		C - Calibration				M - Maintenance				PF - Power Failure																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Anzac - June 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
Anzac - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	28	33	19	16	32	14	89	66	43	20	33	62	65	46	71	39	676
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	28	33	19	16	32	14	89	66	43	20	33	62	65	46	71	39	676

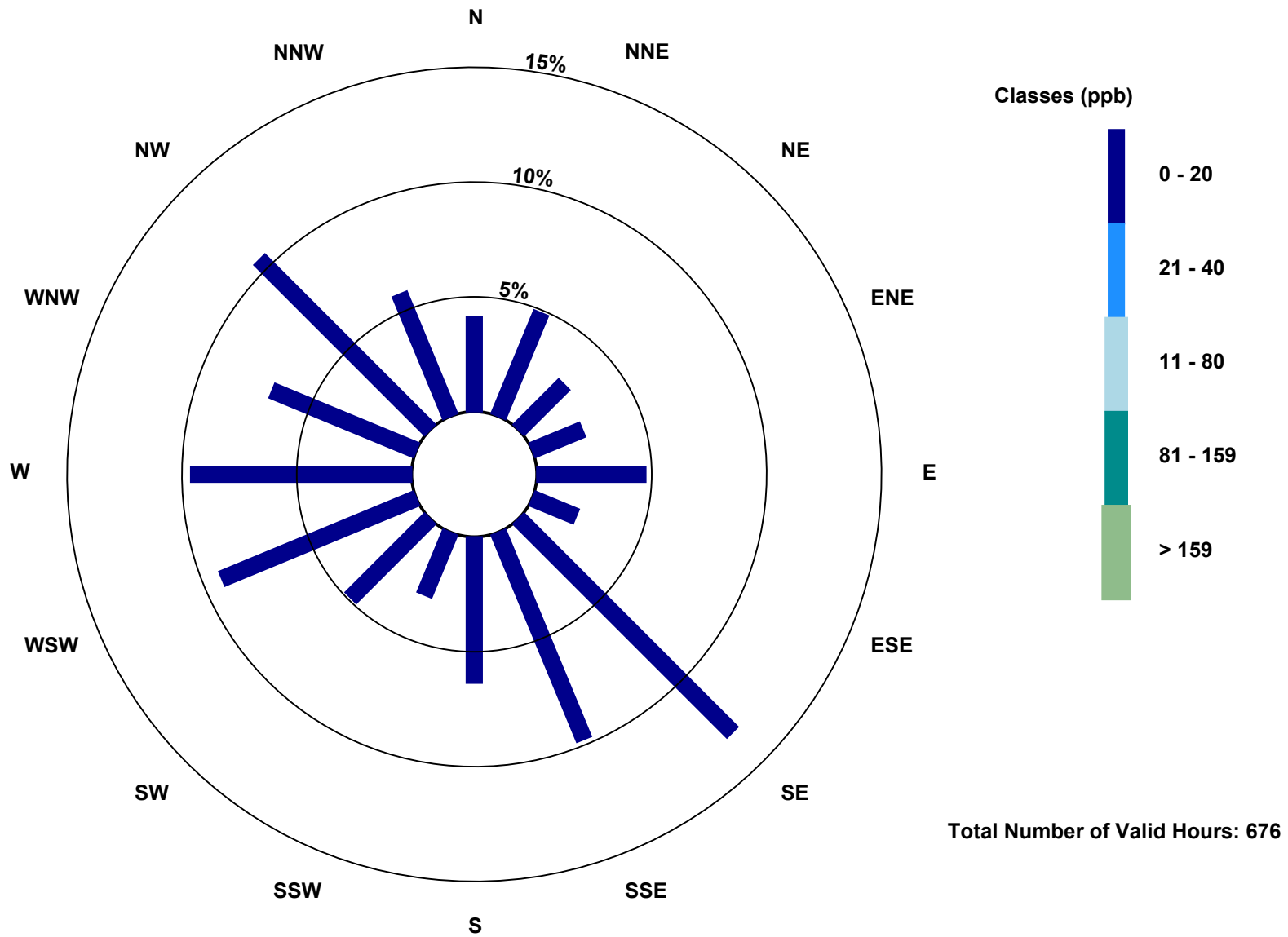
Total Number of Valid Hours: 676

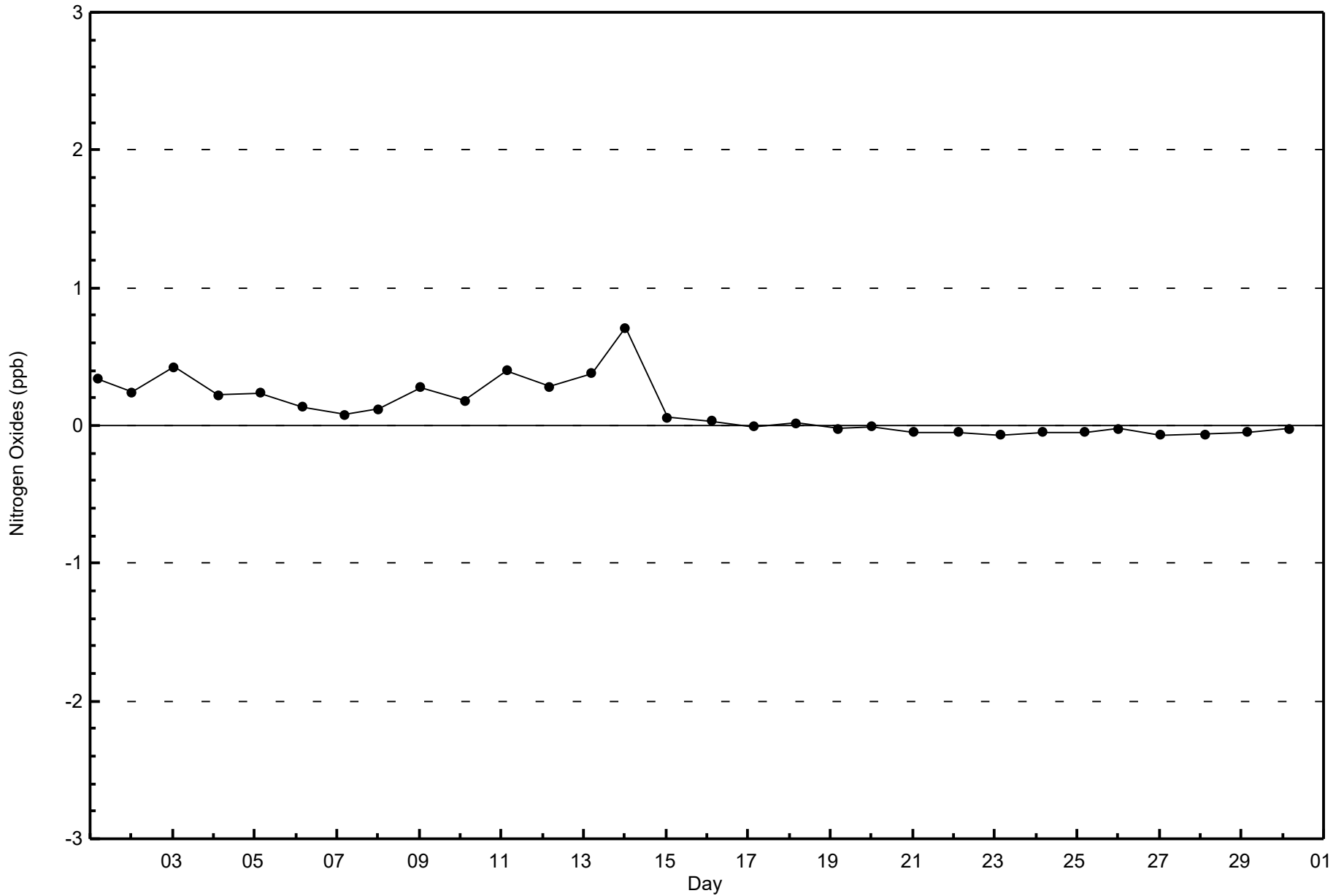
Total Number of Hours: 720

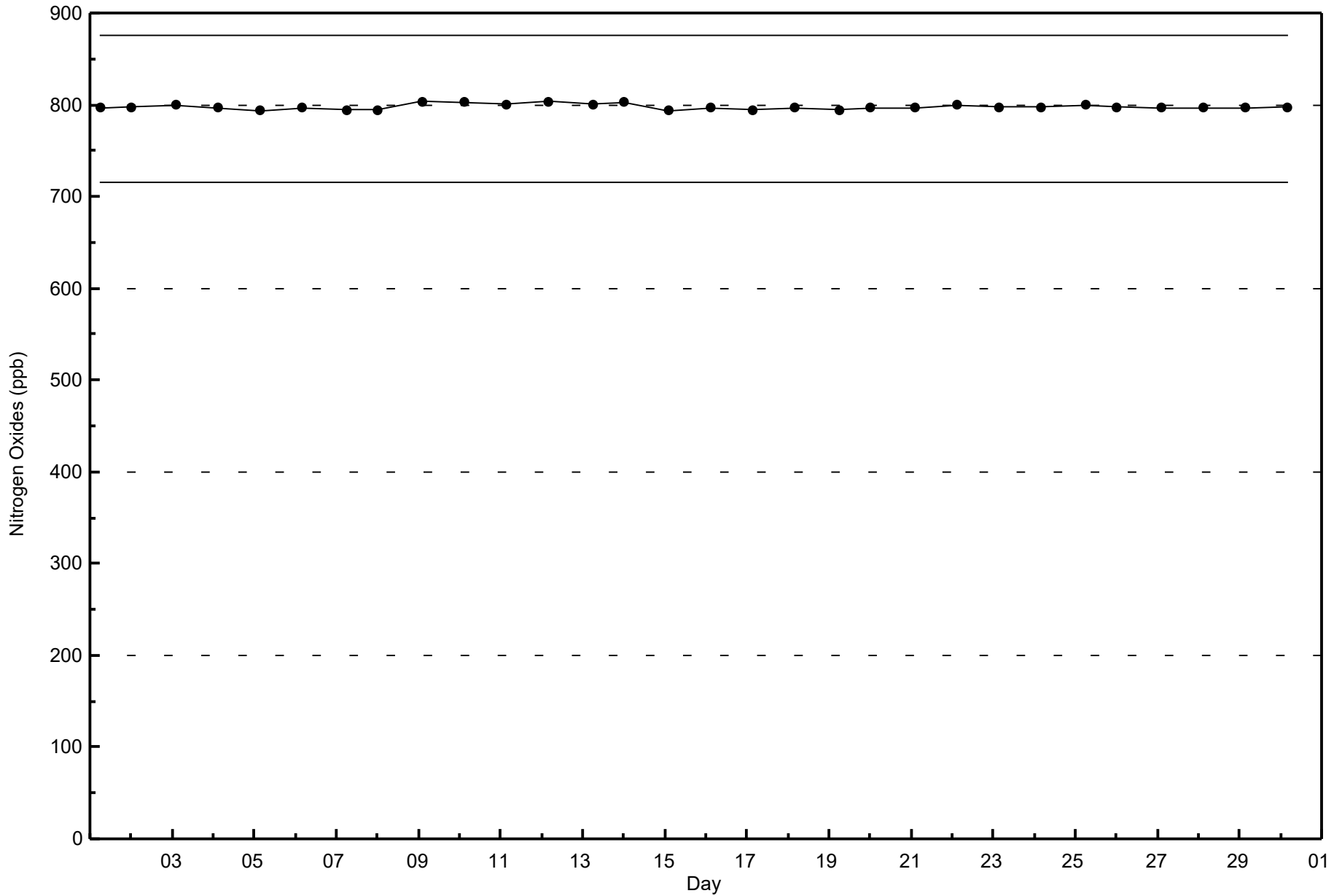


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Anzac









Wood Buffalo Environmental Association
Summary of Hour Averages

Ozone (O₃) - ppb
Anzac - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 70.9 ppb on Jun 1 16:00	Maximum Daily Average: 46.5 ppb on Jun 2		Hours of Data:	679
Minimum Value: 1.7 ppb on Jun 22 04:00	Minimum Daily Average: 15.2 ppb on Jun 14		Hours of Missing Data:	41
Maximum Diurnal Average: 35.6 ppb at hour 16	Minimum Diurnal Average: 19.3 ppb at hour 4		Hours of Calibration:	33
Monthly Average: 28.31 ppb	Percentiles: P ₁ = 6.1 P ₁₀ = 12.9 Q ₁ = 19.8 Median = 27.3 Q ₃ = 36.3 P ₉₀ = 45.1 P ₉₉ = 60.7		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-Jun	41.6	37.7	39.4	Z	32.3	30.8	29.2	38.2	42.6	43.3	46.2	48.7	51.0	53.4	63.9	70.9	65.1	49.9	44.3	41.0	48.3	47.5	43.8	44.7	45.8	70.9
2-Jun	47.1	45.8	46.3	38.7	Z	36.3	33.5	31.0	36.3	44.5	48.0	49.5	50.9	56.7	58.5	52.0	52.9	53.4	54.4	52.8	49.9	44.2	43.0	43.7	46.5	58.5
3-Jun	34.8	25.8	21.9	16.8	11.7	Z	22.9	31.0	32.9	35.9	36.6	32.2	36.6	36.4	35.6	37.7	35.4	33.0	30.1	28.7	26.1	24.8	25.6	25.9	29.5	37.7
4-Jun	Z	23.7	19.0	17.5	17.1	15.1	14.9	14.1	14.1	14.8	17.5	19.3	23.5	28.7	28.0	31.2	28.2	25.2	36.9	35.6	32.1	21.7	25.7	24.9	23.0	36.9
5-Jun	23.3	Z	12.8	8.8	12.2	19.1	18.8	13.2	11.5	13.0	24.5	18.8	25.1	14.5	10.4	12.1	11.5	15.3	30.2	24.4	20.6	18.4	26.0	26.7	17.9	30.2
6-Jun	21.5	25.1	Z	25.4	24.5	24.7	24.7	26.3	27.1	28.1	29.8	31.7	32.7	32.7	32.9	34.8	34.4	33.9	34.1	32.2	25.1	21.0	21.1	14.2	27.7	34.8
7-Jun	8.2	9.5	30.2	Z	46.5	47.4	48.7	47.5	46.2	43.4	C	C	C	49.1	47.8	48.2	49.8	47.5	45.9	46.1	40.4	35.7	25.0	19.4	39.1	49.8
8-Jun	22.9	17.1	21.7	28.5	Z	15.9	19.4	22.1	23.8	26.0	31.1	35.0	42.0	46.7	46.1	47.5	47.7	46.9	46.6	PF	PF	23.4	18.8	15.2	30.7	47.7
9-Jun	13.9	11.8	8.1	7.2	10.2	Z	19.9	21.8	25.2	28.9	34.6	36.6	38.9	38.8	38.1	37.9	37.2	32.8	27.3	21.8	23.5	26.7	23.6	19.3	25.4	38.9
10-Jun	Z	25.0	25.1	25.6	26.3	26.8	28.4	32.0	38.3	40.0	38.0	45.9	52.2	58.0	63.6	66.5	64.8	62.4	59.8	60.2	50.1	49.9	55.4	54.9	45.6	66.5
11-Jun	55.2	Z	52.8	50.9	47.9	48.3	47.7	46.3	36.3	31.6	32.2	38.4	40.6	41.4	42.9	39.8	39.5	40.2	39.1	37.9	35.3	26.1	31.2	25.8	40.3	55.2
12-Jun	20.1	23.6	Z	36.4	36.9	36.3	37.1	35.8	35.2	34.7	38.2	39.0	M	34.3	33.3	36.0	39.6	39.1	33.1	28.1	39.7	31.0	24.4	26.7	33.6	39.7
13-Jun	22.6	27.0	25.0	Z	23.2	24.3	26.3	26.2	29.7	33.0	36.0	40.1	44.6	45.1	48.6	51.2	51.4	50.5	52.8	PF	PF	PF	PF	PF	36.5	52.8
14-Jun	37.9	32.6	31.4	29.2	Z	29.8	26.4	19.6	15.9	11.3	5.5	6.1	6.3	7.4	8.0	7.5	7.7	7.8	8.2	9.4	9.7	10.3	10.6	10.6	15.2	37.9
15-Jun	10.6	11.0	11.8	12.8	13.8	Z	20.3	20.4	21.7	20.9	16.9	15.7	15.2	14.2	13.6	15.1	15.8	20.2	22.8	20.2	8.9	5.8	8.4	15.8	15.3	22.8
16-Jun	Z	18.5	12.6	11.4	9.8	12.9	14.5	19.3	21.9	27.6	33.3	34.0	35.9	33.0	31.6	32.1	30.9	30.9	29.3	29.3	28.5	26.3	23.9	22.3	24.8	35.9
17-Jun	27.0	Z	24.5	18.7	18.8	22.0	24.3	24.7	25.8	25.3	26.8	29.3	31.8	32.2	31.1	32.7	33.1	32.8	33.0	31.7	28.2	21.4	18.0	7.9	26.1	33.1
18-Jun	6.0	8.5	Z	12.3	17.6	20.7	18.1	18.3	20.1	22.0	25.6	28.0	28.2	29.8	30.3	31.4	32.7	32.4	31.2	31.5	30.4	28.6	27.8	27.1	24.3	32.7
19-Jun	26.9	27.3	26.2	Z	24.3	24.1	21.6	21.1	21.3	21.0	20.7	19.7	19.5	19.6	20.2	21.9	30.1	26.4	22.5	21.3	19.3	19.0	19.3	19.6	22.3	30.1
20-Jun	20.8	20.5	20.4	20.2	Z	21.1	21.2	20.9	21.0	21.6	22.3	21.9	21.7	21.9	18.9	17.4	16.4	18.0	20.3	20.4	18.7	19.7	15.9	13.0	19.8	22.3
21-Jun	10.8	10.2	9.8	9.9	10.0	Z	13.3	15.4	18.9	23.5	23.5	24.1	26.1	28.0	29.5	33.1	34.4	34.1	33.2	30.9	25.9	20.5	12.1	9.8	21.2	34.4
22-Jun	Z	2.8	5.4	1.7	3.4	11.1	15.7	20.1	24.6	28.7	30.0	33.1	36.1	37.0	38.3	37.1	37.8	38.0	36.3	34.0	22.2	22.6	19.7	15.8	24.0	38.3
23-Jun	19.8	Z	23.9	23.5	24.3	28.1	31.3	31.3	36.9	40.6	39.6	38.7	40.1	38.7	39.4	39.8	41.4	38.0	37.6	39.3	31.0	25.1	26.2	20.2	32.8	41.4
24-Jun	25.1	21.4	Z	11.5	14.0	24.2	29.3	34.9	41.7	41.0	43.4	42.5	40.6	39.9	40.3	39.4	37.8	39.2	39.4	39.1	33.3	22.3	21.1	21.0	32.3	43.4
25-Jun	16.6	20.5	25.7	Z	26.5	26.6	23.6	24.7	28.1	28.7	29.0	31.6	32.0	31.3	30.5	31.0	30.8	30.1	28.4	27.0	18.7	13.4	10.9	9.4	25.0	32.0
26-Jun	12.6	12.6	11.5	12.9	Z	13.6	16.0	18.6	19.4	23.4	23.6	24.2	25.1	22.5	19.9	23.6	28.6	31.2	28.1	23.0	21.8	17.8	13.3	14.1	19.9	31.2
27-Jun	10.6	10.8	14.1	10.8	10.7	Z	14.6	15.9	20.5	30.3	35.4	37.1	37.4	39.5	31.9	28.1	28.2	29.1	28.4	28.1	21.2	16.4	16.8	17.3	23.2	39.5
28-Jun	Z	13.9	15.8	18.5	14.9	16.2	19.6	23.0	27.2	30.6	30.3	31.4	31.4	33.1	32.7	31.6	28.7	27.9	24.6	22.4	19.1	13.5	15.3	15.5	23.4	33.1
29-Jun	15.5	Z	9.5	10.3	13.6	12.9	16.6	19.9	22.7	27.5	38.6	43.2	43.9	44.4	45.4	38.8	32.9	29.1	30.1	31.0	22.3	31.8	32.4	28.4	27.9	45.4
30-Jun	23.0	22.7	Z	22.1	25.6	29.6	29.4	30.7	32.5	34.5	33.2	32.2	35.4	34.4	38.0	41.6	42.4	44.7	43.5	41.8	39.9	31.9	30.8	39.3	33.9	44.7

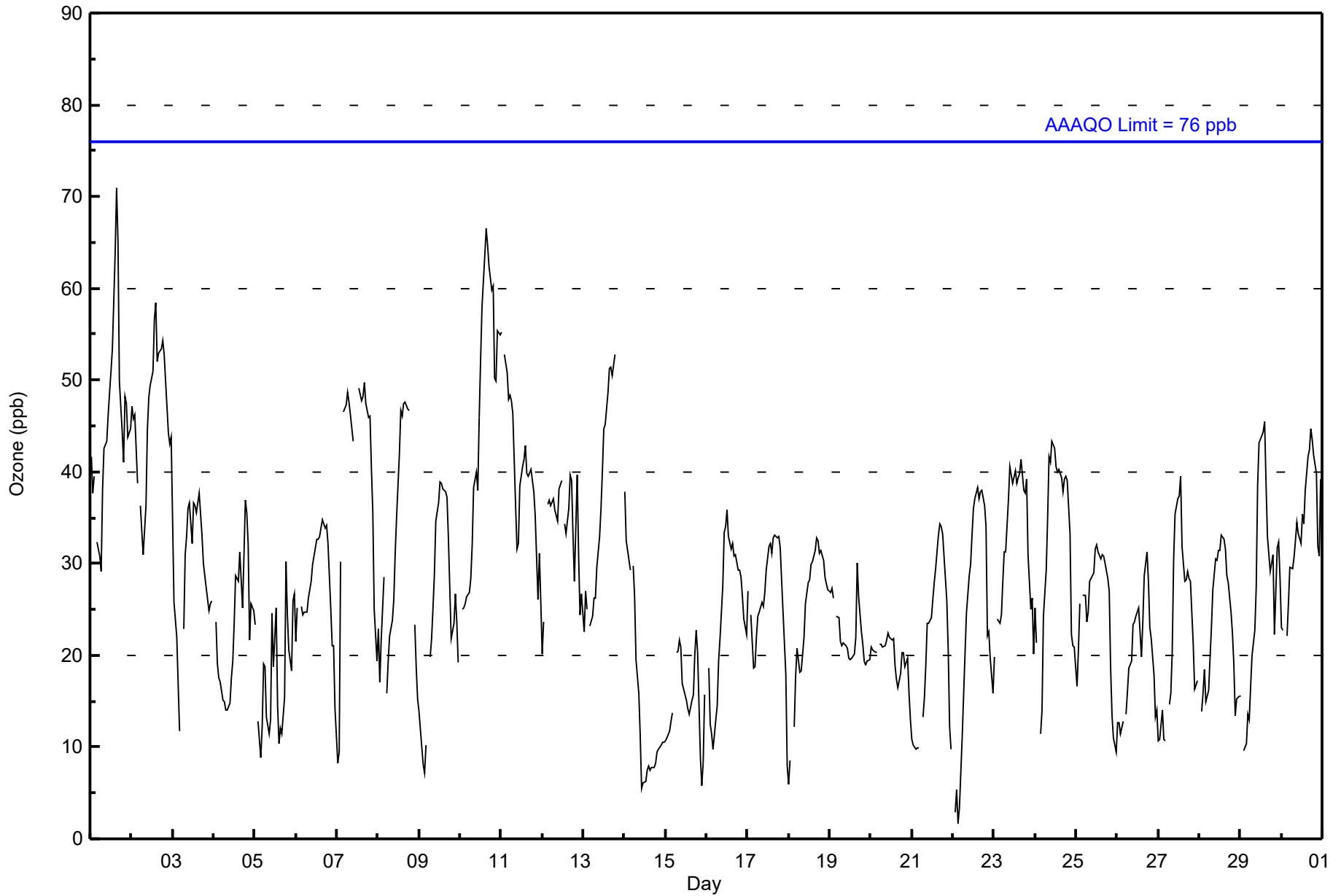
23.0	20.2	21.8	19.3	20.6	24.7	24.2	25.5	27.3	29.2	30.7	32.0	33.7	34.8	35.0	35.6	35.6	34.7	34.4	31.7	28.2	24.7	23.7	22.4	Diurnal Average	
55.2	45.8	52.8	50.9	47.9	48.3	48.7	47.5	46.2	44.5	48.0	49.5	52.2	58.0	63.9	70.9	65.1	62.4	59.8	60.2	50.1	49.9	55.4	54.9	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Anzac - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Anzac - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	187	27.54	27.54
21 - 50	463	68.19	95.73
51 - 82	29	4.27	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Anzac - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	7	4	5	8	2	20	28	15	5	7	7	8	24	35	5	187
21 - 50	21	25	15	11	21	10	60	36	25	15	24	54	60	23	35	28	463
51 - 82	0	1	0	1	3	1	8	4	0	0	1	0	0	0	4	6	29
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	33	19	17	32	13	88	68	40	20	32	61	68	47	74	39	679

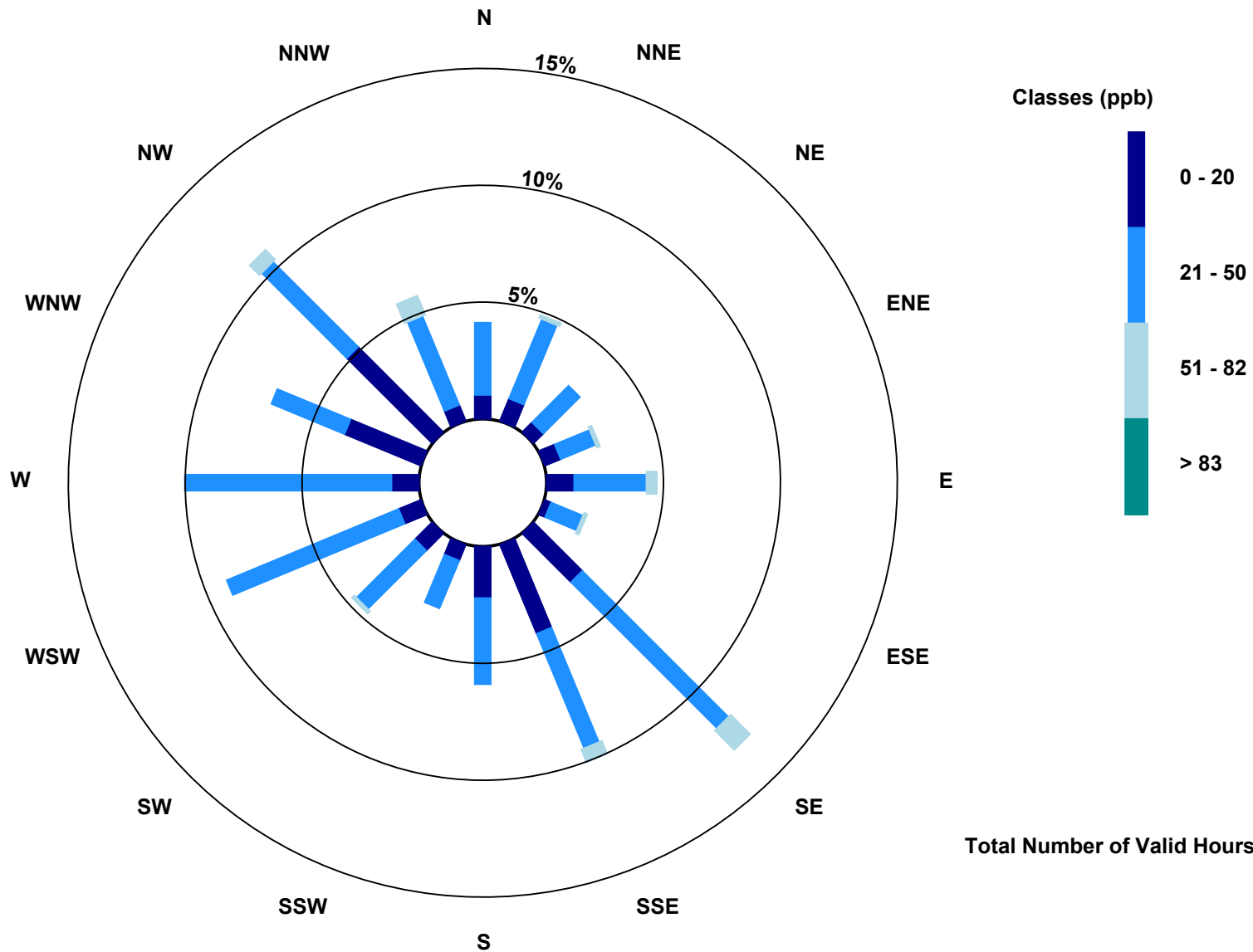
Total Number of Valid Hours: 679

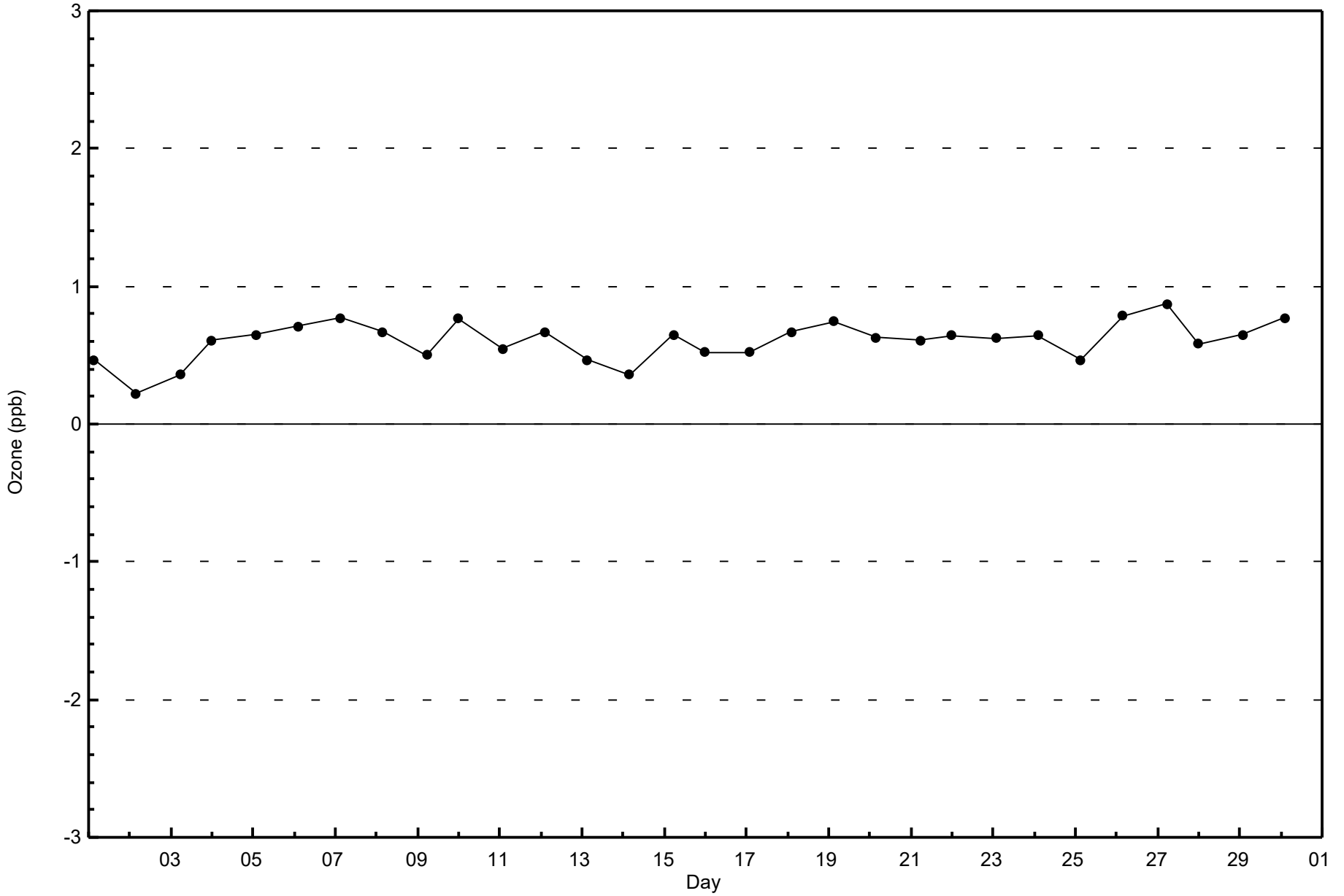
Total Number of Hours: 720

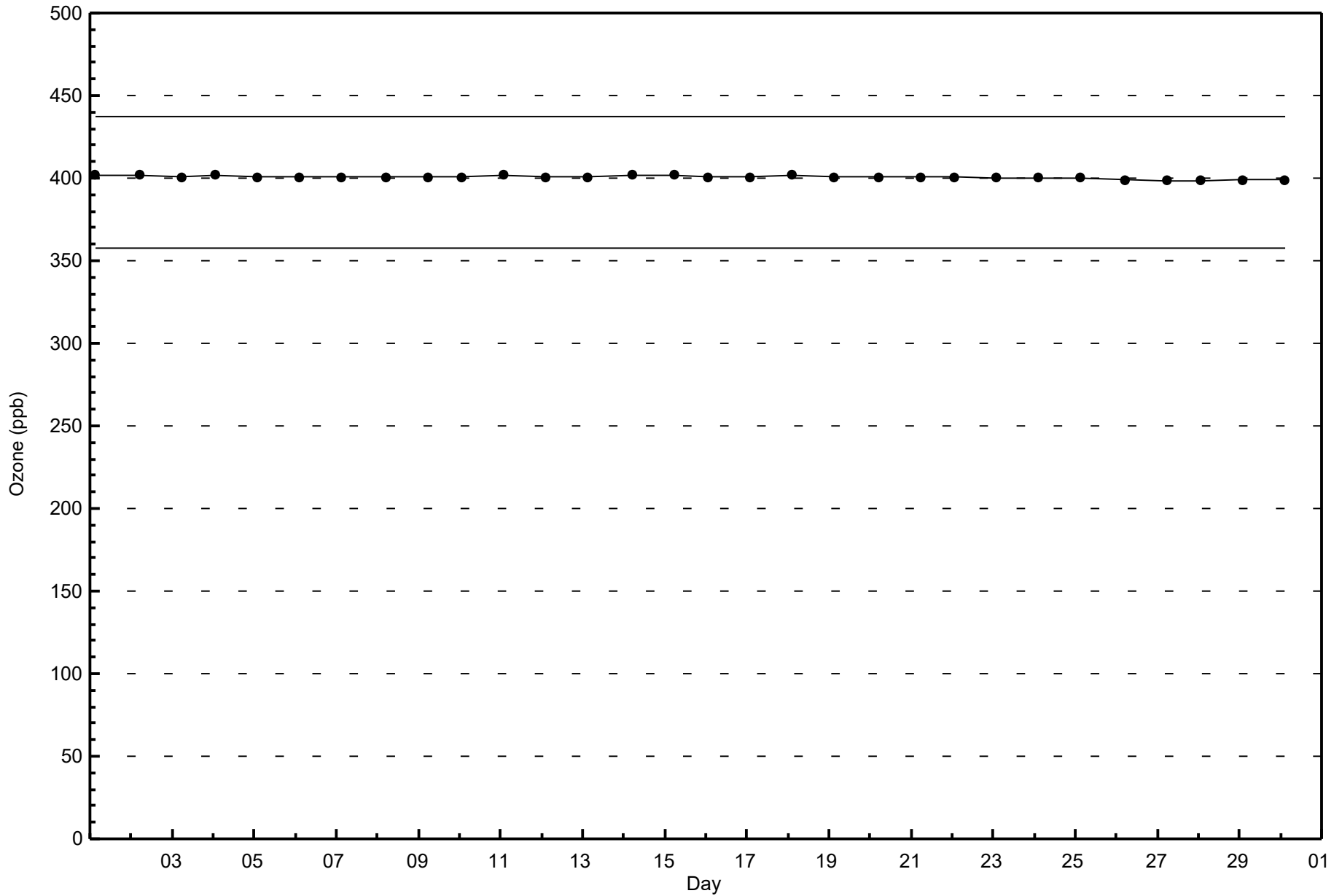


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Anzac









Summary of Hour Averages

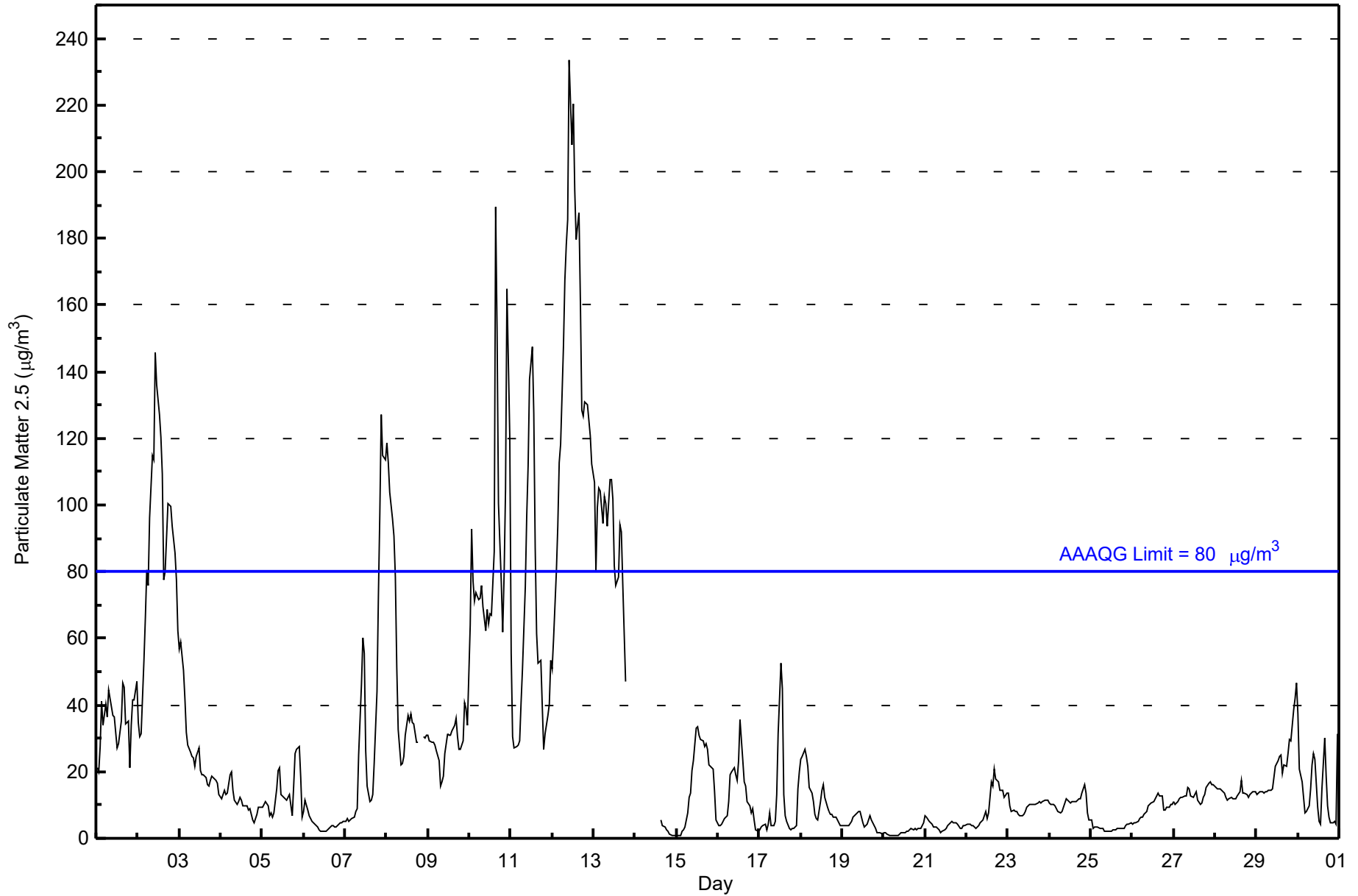
Anzac - June 2023

Number of Exceedences (AAAQO):	1-hr: 73	24-hr: 8	Hours in Service:	720
Maximum Value: 233.5 µg/m ³ on Jun 12 11:00	Maximum Daily Average: 143.8 µg/m ³ on Jun 12		Hours of Data:	698
Minimum Value: 0.7 µg/m ³ on Jun 20 06:00	Minimum Daily Average: 2.0 µg/m ³ on Jun 20		Hours of Missing Data:	22
Maximum Diurnal Average: 36.3 µg/m ³ at hour 11	Minimum Diurnal Average: 23.4 µg/m ³ at hour 20		Hours of Calibration:	3
Monthly Average: 28.43 µg/m ³	Percentiles: P ₁ = 0.9 P ₁₀ = 3.1 Q ₁ = 5.8 Median = 13.2 Q ₃ = 30.8 P ₉₀ = 82.9 P ₉₉ = 179.7		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-Jun	21.3	19.9	27.6	41.0	33.8	40.4	36.6	44.4	42.0	37.1	36.5	31.8	27.1	28.4	35.0	46.5	45.5	34.4	35.1	21.2	33.7	41.5	41.5	47.1	35.4	47.1
2-Jun	34.7	30.5	31.5	53.6	66.3	80.3	75.9	96.3	114.9	113.8	145.7	136.1	127.2	120.2	109.4	77.7	79.9	100.5	100.1	99.7	93.4	85.5	77.4	62.1	88.0	145.7
3-Jun	56.8	59.1	50.3	41.9	31.8	28.0	26.0	24.5	24.0	21.7	24.5	27.1	20.2	18.9	19.0	18.3	16.1	15.8	17.4	18.5	17.8	17.5	16.6	13.2	26.0	59.1
4-Jun	12.0	13.2	14.2	13.1	13.5	19.1	20.1	14.4	11.5	10.2	11.1	12.1	11.5	9.7	9.9	9.5	8.7	8.7	5.4	4.6	5.8	7.4	9.5	9.3	11.0	20.1
5-Jun	9.4	10.4	10.9	9.9	7.0	7.6	6.3	7.5	14.7	20.3	21.3	13.2	12.2	11.7	11.5	12.2	13.3	6.8	15.5	25.5	26.8	27.3	18.3	6.5	13.6	27.3
6-Jun	8.0	11.3	8.3	6.8	6.1	5.1	4.2	3.7	3.3	2.7	2.1	2.0	1.9	2.3	2.5	3.4	4.0	3.6	3.6	3.5	4.1	4.8	4.8	5.0	4.5	11.3
7-Jun	5.3	5.8	5.2	5.3	6.0	6.2	8.1	9.1	24.9	46.0	60.1	55.3	26.3	15.8	11.0	11.3	13.3	22.3	44.1	72.8	97.5	127.1	115.0	113.5	37.8	127.1
8-Jun	118.7	112.7	103.9	95.7	90.6	78.4	51.3	32.6	21.9	22.3	24.8	31.1	36.9	35.3	37.5	34.7	34.1	28.8	28.8	PF	PF	30.4	30.1	31.1	50.5	118.7
9-Jun	30.7	29.2	28.8	28.6	27.9	26.1	23.5	15.7	17.0	18.5	25.3	31.2	31.1	30.8	32.3	33.9	36.0	30.6	26.6	26.8	29.3	40.8	38.8	34.0	28.9	40.8
10-Jun	64.1	92.7	77.0	71.3	73.5	71.7	71.9	75.9	69.4	62.4	68.7	64.5	67.4	66.8	86.0	189.5	152.5	100.4	76.7	61.7	79.3	104.8	164.7	120.9	88.9	189.5
11-Jun	55.4	30.7	27.3	27.7	28.0	29.2	40.8	50.9	75.3	96.5	111.9	137.8	147.5	127.6	87.3	61.3	52.4	53.5	39.9	26.8	31.2	36.9	40.3	53.2	61.2	147.5
12-Jun	50.7	59.6	80.0	93.5	112.5	118.4	147.5	167.6	178.2	185.7	233.5	208.0	220.2	194.4	179.5	187.5	161.2	128.5	126.7	130.8	130.0	125.3	120.8	112.2	143.8	233.5
13-Jun	106.6	80.2	99.3	105.0	104.4	94.5	102.7	100.6	93.6	107.4	107.7	101.7	81.8	76.0	78.5	93.9	91.8	76.1	46.9	PF	PF	PF	PF	PF	92.0	107.7
14-Jun	PF	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	5.6	3.7	3.3	2.7	2.2	1.2	0.8	1.0	0.9	--	5.6
15-Jun	0.9	0.9	1.0	1.9	2.7	3.4	7.7	12.4	13.7	20.2	23.4	33.2	33.5	30.8	29.8	29.3	27.4	28.3	26.6	21.8	21.3	20.7	13.9	5.3	17.1	33.5
16-Jun	3.7	3.8	4.3	5.2	5.8	6.8	11.1	19.1	20.1	21.3	19.1	17.2	23.2	35.5	23.5	17.1	15.5	10.9	9.6	7.8	8.9	5.6	2.4	2.0	12.5	35.5
17-Jun	2.6	3.5	3.9	4.4	2.7	4.2	7.7	4.0	3.7	5.2	13.3	31.3	52.8	45.0	13.3	6.6	5.2	2.8	2.6	3.1	2.8	3.8	15.0	20.1	10.8	52.8
18-Jun	23.9	24.8	26.6	24.8	21.8	15.4	13.4	10.9	7.4	6.0	5.6	11.1	14.3	16.2	12.3	9.4	8.2	7.3	7.0	6.5	6.2	5.3	4.5	4.0	12.2	26.6
19-Jun	3.9	3.7	4.0	3.8	3.9	4.9	6.2	6.9	7.2	8.2	8.1	6.4	4.8	3.6	4.4	5.5	6.8	5.6	3.7	2.9	1.8	1.9	1.8	1.4	4.6	8.2
20-Jun	1.5	1.6	1.2	0.9	0.8	0.7	0.8	0.8	0.9	1.2	1.7	1.6	1.6	1.9	2.3	2.6	3.1	2.7	2.8	2.4	3.0	3.0	4.0	4.8	2.0	4.8
21-Jun	6.6	6.2	5.1	4.6	4.2	3.3	3.2	2.8	2.7	1.9	2.0	2.5	3.1	3.9	4.3	5.2	4.8	4.7	4.6	4.2	3.1	3.1	3.8	4.0	3.9	6.6
22-Jun	4.4	4.4	4.1	3.9	3.7	3.1	3.2	3.9	4.6	5.4	6.8	8.2	5.9	7.7	17.0	15.7	20.8	17.9	16.9	14.6	14.6	14.5	12.4	13.7	9.5	20.8
23-Jun	13.4	9.6	7.9	8.4	8.2	8.1	7.2	6.9	6.9	7.3	8.0	9.1	10.0	10.2	10.3	10.1	10.1	10.6	11.0	10.7	10.9	11.4	11.3	11.2	9.5	13.4
24-Jun	10.7	10.3	10.1	9.6	8.9	8.1	7.7	8.0	9.4	10.6	12.0	10.8	10.6	11.1	11.0	11.0	11.4	11.8	11.8	13.6	15.9	13.6	7.5	5.5	10.5	15.9
25-Jun	5.5	3.1	3.2	3.3	3.2	3.1	3.1	2.8	2.2	2.2	2.1	2.0	2.2	2.4	2.6	2.8	2.8	3.0	3.0	3.1	3.8	4.2	4.2	4.7	3.1	5.5
26-Jun	4.1	4.5	4.9	5.2	5.8	6.1	6.5	7.3	8.1	9.8	10.4	10.7	11.0	12.0	12.5	13.4	12.6	12.8	8.3	8.6	9.3	9.4	10.3	10.4	8.9	13.4
27-Jun	11.1	10.2	10.9	11.8	12.2	12.1	12.6	12.7	15.3	14.7	12.7	12.4	13.0	13.8	11.2	10.0	10.8	12.3	13.1	15.2	16.5	17.0	16.2	16.2	13.1	17.0
28-Jun	15.3	14.7	14.9	14.7	14.6	13.5	12.5	11.3	11.9	12.1	11.8	11.8	11.8	12.9	14.1	17.2	13.4	13.7	13.1	12.5	13.1	13.4	14.1	14.2	13.4	17.2
29-Jun	13.3	13.5	13.8	13.8	13.5	13.9	14.1	14.4	14.4	15.0	18.3	21.7	23.4	24.5	24.8	19.3	21.9	21.6	25.5	29.7	29.1	38.4	41.9	46.7	21.9	46.7
30-Jun	37.3	20.9	16.9	12.3	7.8	8.1	9.9	14.6	22.0	25.2	23.6	9.4	5.0	4.1	14.8	30.3	18.8	9.6	6.4	4.8	4.6	4.9	4.4	31.4	14.5	37.3

25.3	23.8	24.0	24.9	24.9	24.8	25.6	27.0	29.0	31.4	36.3	36.3	35.8	33.6	31.3	33.0	30.2	26.3	24.5	23.4	25.5	28.3	29.2	27.7	Diurnal Average	
118.7	112.7	103.9	105.0	112.5	118.4	147.5	167.6	178.2	185.7	233.5	208.0	220.2	194.4	179.5	189.5	161.2	128.5	126.7	130.8	130.0	127.1	164.7	120.9	Diurnal Maximum	

C - Calibration UO - Unstable Operation 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}) - $\mu\text{g}/\text{m}^3$
Anzac - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	168	24.07	24.07
6 - 15	234	33.52	57.59
16 - 25	81	11.60	69.20
26 - 80	144	20.63	89.83
> 81.0	71	10.17	100.00

Total Number of Valid Hours: 698

Total Number of Hours: 720



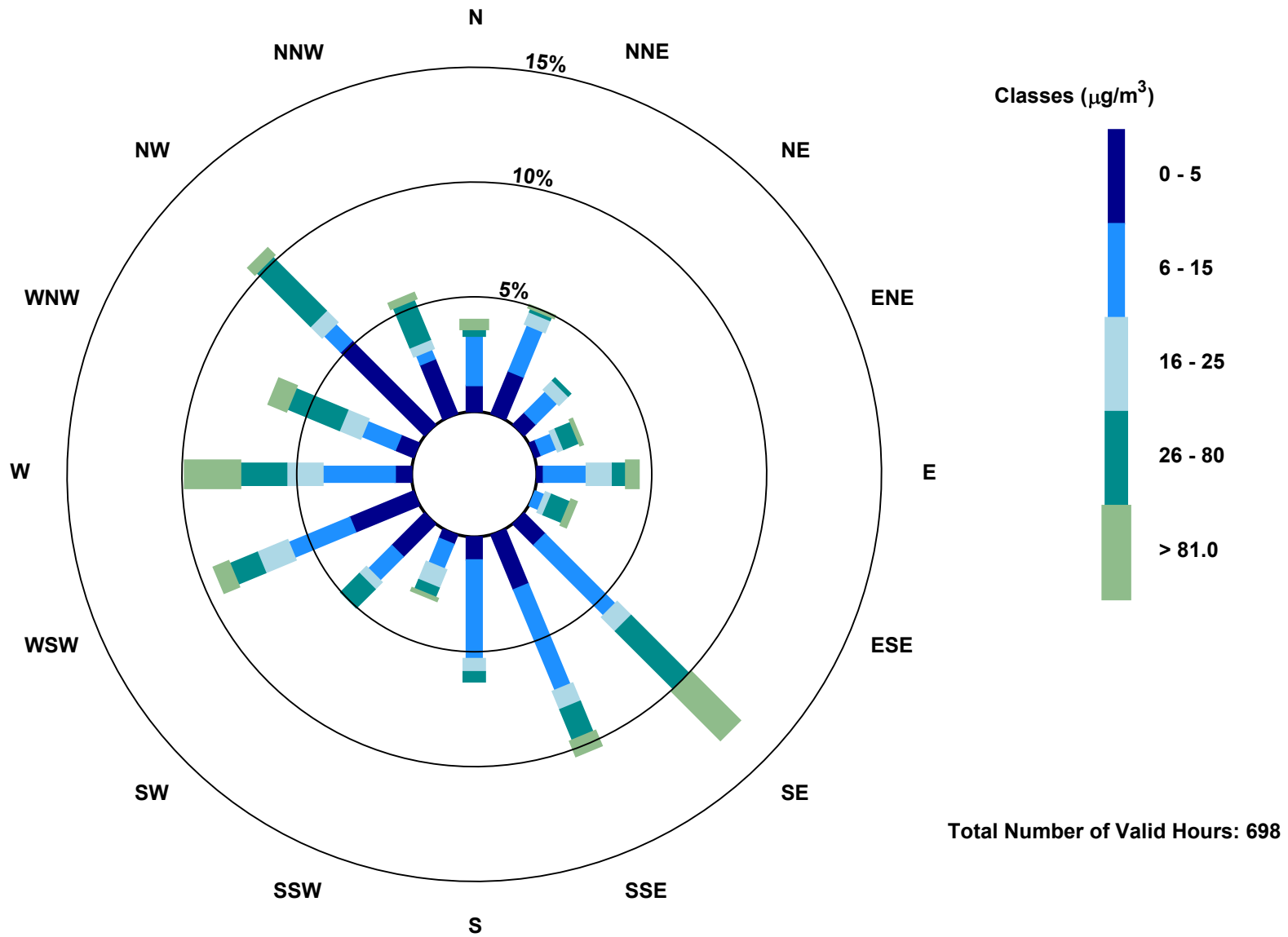
Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Anzac - June 2023

Concentration Ranges (µg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	8	14	5	2	2	0	9	18	7	3	14	21	5	6	36	18	168
6 - 15	15	15	9	5	13	3	30	33	30	8	10	20	22	11	7	3	234
16 - 25	0	4	4	2	8	2	6	6	4	6	3	10	11	7	5	3	81
26 - 80	2	1	1	5	4	6	25	10	3	3	8	9	14	17	23	13	144
> 81.0	3	1	0	1	4	2	21	5	0	1	0	5	17	6	3	2	71
Totals	28	35	19	15	31	13	91	72	44	21	35	65	69	47	74	39	698

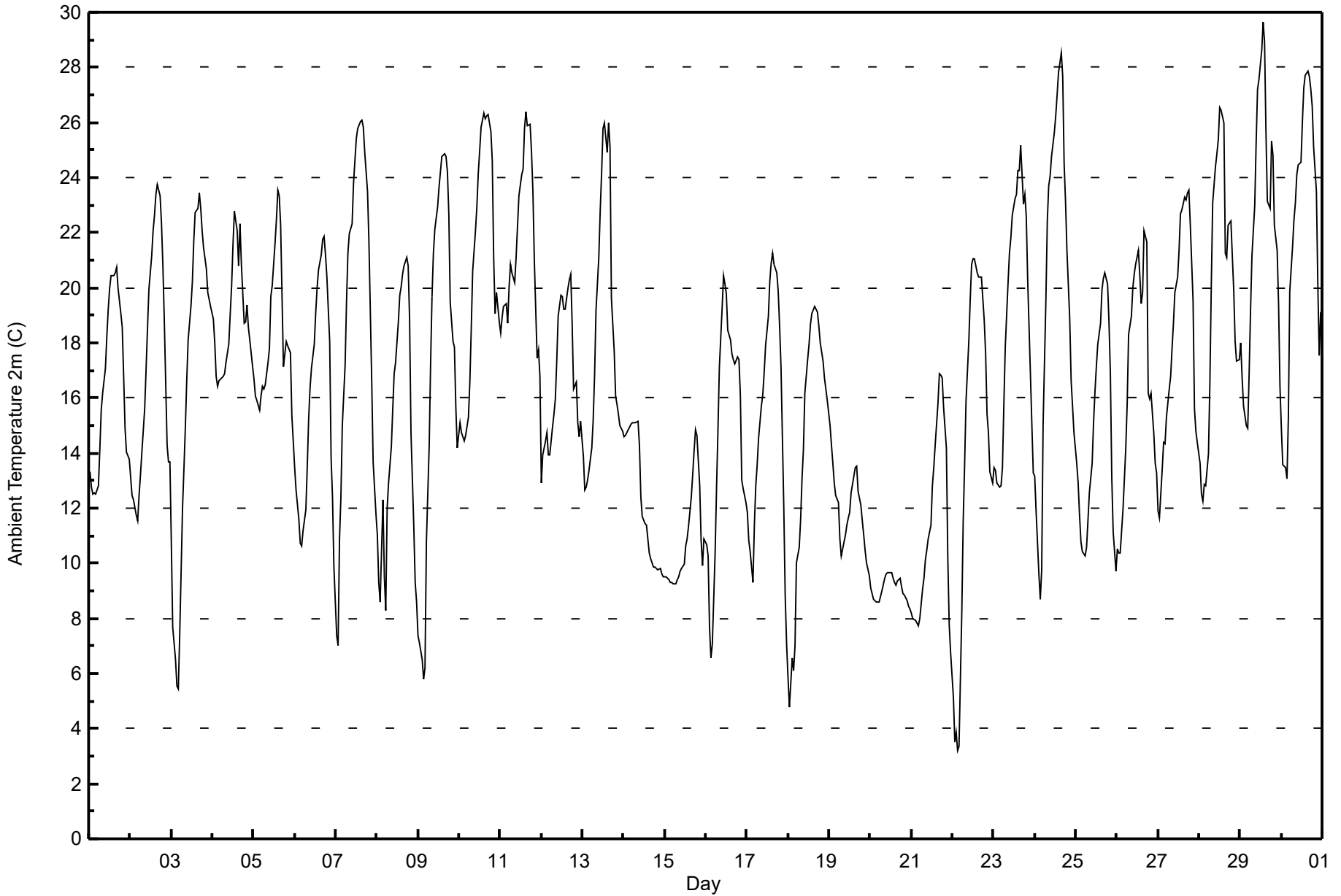
Total Number of Valid Hours: 698

Total Number of Hours: 720





Maximum Value: 29.6 C on Jun 29 14:00 Minimum Value: 3.2 C on Jun 22 04:00 Maximum Diurnal Average: 21.1 C at hour 17 Monthly Average: 16.60 C		Maximum Daily Average: 22.0 C on Jun 29 Minimum Daily Average: 9.1 C on Jun 20 Minimum Diurnal Average: 11.4 C at hour 4 Percentiles: P ₁ = 5.6 P ₁₀ = 9.5 Q ₁ = 12.5 Median = 16.6 Q ₃ = 20.5 P ₉₀ = 23.8 P ₉₉ = 27.7		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 Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	13.3	12.8	12.5	12.5	12.5	12.8	14.1	15.5	16.2	17.1	18.2	19.2	20.0	20.4	20.4	20.5	20.8	20.0	19.1	18.6	16.8	14.9	14.0	13.8	16.5	20.8																						
2-Jun	13.1	12.5	12.3	11.7	11.5	12.4	13.2	14.0	15.6	17.0	18.5	19.9	21.1	22.0	22.6	23.4	23.7	23.3	22.3	20.8	18.8	14.3	13.7	13.7	17.2	23.7																						
3-Jun	10.8	7.7	6.5	5.5	5.4	7.4	12.0	13.4	14.9	16.6	18.1	19.3	20.2	21.7	22.7	22.9	23.4	22.9	22.1	21.4	20.7	19.8	19.6	19.3	16.4	23.4																						
4-Jun	18.9	18.0	16.8	16.4	16.6	16.7	16.8	16.9	17.3	17.9	19.0	20.0	21.5	22.8	22.1	20.8	22.3	20.9	18.7	18.8	19.4	18.6	18.1	17.1	18.8	22.8																						
5-Jun	16.7	16.0	15.9	15.5	16.1	16.4	16.3	16.5	17.3	17.8	19.7	20.1	21.6	22.5	23.5	23.3	22.3	17.1	17.6	18.0	17.9	17.6	15.4	14.5	18.1	23.5																						
6-Jun	13.5	12.7	11.6	10.7	10.6	11.2	11.9	13.5	15.2	16.4	17.1	18.0	19.1	20.0	20.6	21.2	21.8	21.9	21.2	20.4	18.1	13.8	12.4	9.8	15.9	21.9																						
7-Jun	7.4	7.0	10.9	12.4	15.0	17.2	19.5	21.2	22.0	22.3	23.8	24.6	25.4	25.8	26.0	26.1	25.8	24.9	23.5	21.6	19.1	16.6	13.7	11.8	19.3	26.1																						
8-Jun	11.0	9.3	8.6	12.3	9.5	8.3	12.0	12.9	14.2	15.6	16.9	17.3	18.7	19.8	20.1	20.5	20.8	21.1	20.8	18.9	14.7	11.3	9.3	8.6	14.7	21.1																						
9-Jun	7.4	7.1	6.5	5.8	6.2	10.8	14.3	17.2	19.7	21.2	22.1	22.9	23.6	24.2	24.8	24.9	24.8	24.2	22.7	19.5	18.0	17.8	15.7	14.2	17.3	24.9																						
10-Jun	15.1	14.7	14.6	14.4	14.6	15.3	16.6	18.5	20.6	22.1	22.9	24.2	24.9	25.8	26.3	26.1	26.2	26.3	25.7	24.6	21.1	19.1	19.9	18.7	20.8	26.3																						
11-Jun	18.3	18.9	19.3	19.4	18.7	20.0	20.8	20.6	20.2	21.1	22.2	23.3	24.1	24.3	25.8	26.4	25.9	25.9	24.9	23.5	21.0	17.5	17.8	16.8	21.5	26.4																						
12-Jun	12.9	13.9	14.4	14.7	13.9	13.9	15.0	15.4	16.0	17.3	19.0	19.7	19.7	19.2	19.2	20.0	20.3	20.5	18.7	16.3	16.6	15.1	14.6	15.1	16.7	20.5																						
13-Jun	13.9	12.7	12.8	13.0	13.4	14.2	15.2	16.8	19.2	21.1	22.8	24.2	25.8	26.0	24.9	26.0	25.1	19.6	17.7	16.1	15.8	15.4	15.0	14.8	18.4	26.0																						
14-Jun	14.6	14.7	14.7	14.9	15.0	15.1	15.1	15.1	15.2	14.3	12.4	11.7	11.5	11.4	10.9	10.4	10.2	9.9	9.9	9.8	9.8	9.8	9.6	9.5	12.3	15.2																						
15-Jun	9.5	9.5	9.4	9.3	9.3	9.3	9.2	9.4	9.5	9.7	9.8	10.0	10.6	10.9	11.3	12.4	13.2	14.1	14.8	14.7	12.8	10.8	9.9	10.9	10.9	14.8																						
16-Jun	10.7	10.3	7.7	6.6	7.1	10.4	12.7	14.8	17.1	19.3	20.5	20.1	19.8	18.4	18.1	17.6	17.4	17.3	17.5	17.4	16.1	13.0	12.7	12.2	14.8	20.5																						
17-Jun	11.9	10.8	10.4	9.3	11.4	12.8	13.6	14.6	15.7	16.1	16.9	17.9	19.0	20.2	20.9	21.2	20.9	20.6	19.9	18.6	17.1	12.0	8.8	7.0	15.3	21.2																						
18-Jun	5.9	4.8	6.6	6.1	7.0	10.0	10.6	11.6	13.1	14.1	16.1	17.4	18.0	18.7	19.1	19.3	19.2	19.1	18.6	18.0	17.3	16.7	16.3	15.9	14.1	19.3																						
19-Jun	15.0	14.3	13.6	12.9	12.4	12.2	10.9	10.3	10.5	11.0	11.4	11.6	11.9	12.6	13.2	13.5	13.5	12.6	12.1	11.5	11.1	10.5	10.0	9.6	12.0	15.0																						
20-Jun	9.1	8.9	8.7	8.6	8.6	8.6	8.8	9.0	9.4	9.6	9.6	9.7	9.7	9.5	9.3	9.2	9.3	9.5	9.2	8.9	8.9	8.7	8.5	8.3	9.1	9.7																						
21-Jun	8.2	8.0	7.9	7.8	7.7	8.0	9.1	9.5	10.1	10.5	10.9	11.4	12.8	13.5	14.3	15.8	16.9	16.8	16.7	15.7	14.2	10.2	7.8	6.7	11.3	16.9																						
22-Jun	5.1	3.5	3.9	3.2	3.4	8.2	11.5	13.6	15.8	18.1	19.6	20.8	21.1	21.0	20.5	20.4	20.4	20.4	18.8	17.6	15.4	14.8	13.3	12.9	14.3	21.1																						
23-Jun	13.5	13.4	12.9	12.8	12.8	13.5	15.7	17.9	20.2	21.3	21.8	22.6	23.2	23.4	24.2	24.3	25.2	23.1	23.4	22.6	20.3	16.8	15.0	13.2	18.9	25.2																						
24-Jun	13.2	11.9	9.6	8.7	9.8	15.1	19.6	22.4	23.7	24.1	24.8	25.6	26.2	27.0	27.8	28.5	27.6	24.5	23.1	21.3	18.9	16.6	15.7	14.7	20.0	28.5																						
25-Jun	13.6	12.9	11.7	10.8	10.4	10.3	10.6	11.5	12.5	13.6	15.1	16.2	17.1	18.0	18.7	19.9	20.3	20.5	20.1	18.8	16.9	13.1	11.1	9.7	14.7	20.5																						
26-Jun	10.5	10.4	10.4	12.0	13.1	14.2	15.8	18.3	19.0	20.0	20.5	20.9	21.3	20.5	19.4	19.8	22.1	21.7	16.2	16.0	16.2	14.7	13.6	13.2	16.6	22.1																						
27-Jun	11.9	11.6	13.4	14.4	14.3	15.3	16.3	16.8	17.8	18.7	19.9	20.4	21.3	22.7	22.8	23.3	23.2	23.5	23.6	22.3	19.5	15.6	14.8	14.4	18.2	23.6																						
28-Jun	13.7	12.5	12.3	12.9	12.8	14.0	16.6	20.1	23.1	24.4	24.9	25.4	26.6	26.5	26.0	21.2	21.1	22.3	22.4	21.2	19.9	18.0	17.4	17.4	19.7	26.6																						
29-Jun	18.0	16.7	15.7	15.0	14.9	16.9	19.2	21.1	23.0	25.3	27.2	27.6	28.6	29.6	28.9	25.7	23.1	22.9	25.3	24.8	22.3	21.3	19.4	16.4	22.0	29.6																						
30-Jun	14.9	13.6	13.5	13.0	15.3	19.9	21.5	22.5	23.1	24.1	24.5	24.5	26.0	27.3	27.7	27.9	27.7	27.2	26.6	25.1	23.5	20.1	17.6	19.1	21.9	27.9																						
																								12.4	11.7	11.5	11.4	11.6	13.0	14.5	15.7	16.9	17.9	18.9	19.6	20.4	20.8	21.1	21.1	21.1	20.5	19.8	18.8	17.3	15.2	14.0	13.3	Diurnal Average
																								18.9	18.9	19.3	19.4	18.7	20.0	21.5	22.5	23.7	25.3	27.2	27.6	28.6	29.6	28.9	28.5	27.7	27.2	26.6	25.1	23.5	21.3	19.9	19.3	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Anzac - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	95	13.19	13.19
10 - 20	415	57.64	70.83
> 20	210	29.17	100.00

Total Number of Valid Hours: 720

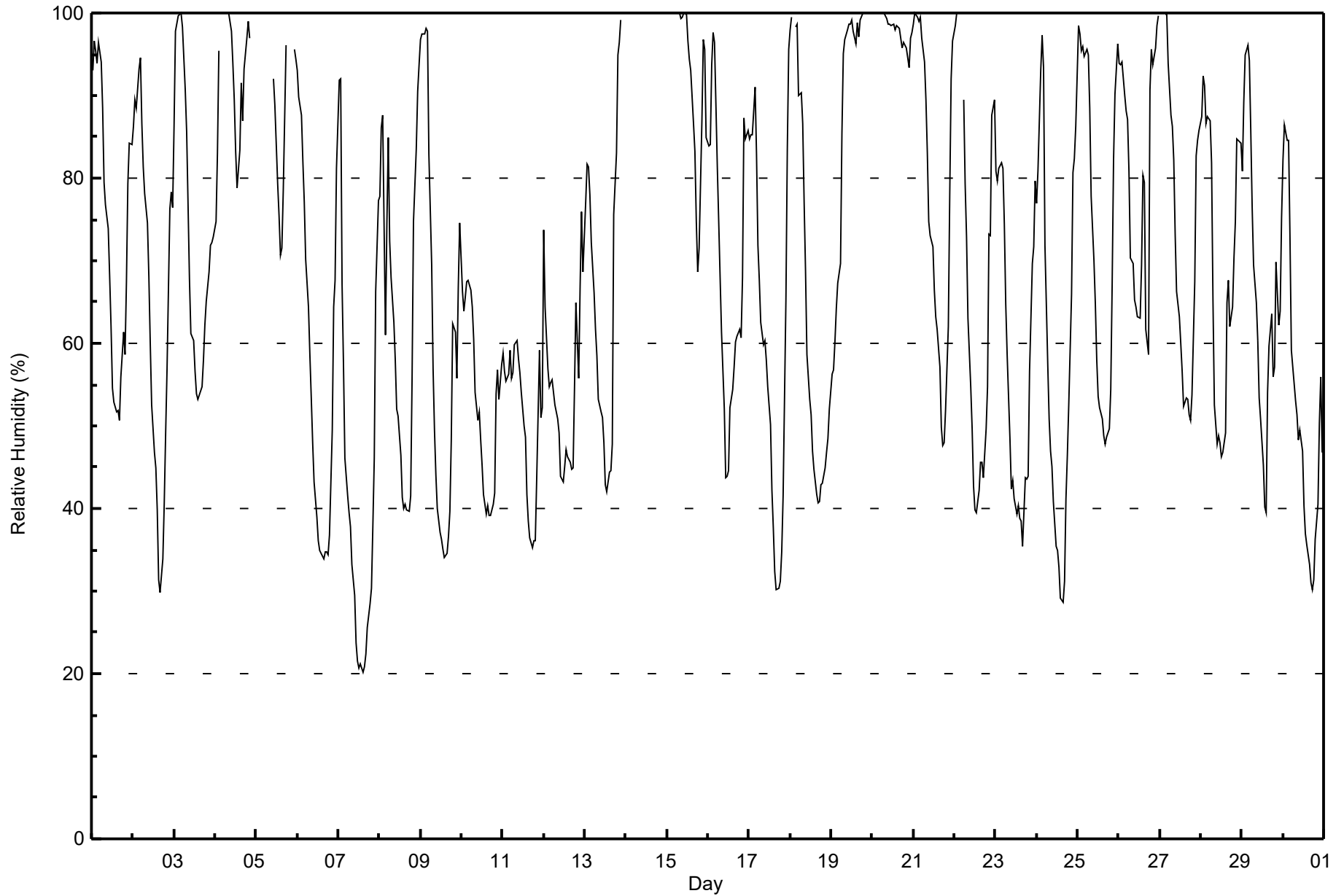
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Anzac - June 2023

Maximum Value: 100.0 % on Jun 3 05:00		Maximum Daily Average: 90.7 % on Jun 15		Hours in Service: 720																																												
Minimum Value: 20.2 % on Jun 7 15:00		Minimum Daily Average: 41.6 % on Jun 7		Hours of Data: 649																																												
Maximum Diurnal Average: 85.8 % at hour 2		Minimum Diurnal Average: 51.5 % at hour 17		Hours of Missing Data: 71																																												
Monthly Average: 66.82 %		Percentiles: P ₁ = 24.6 P ₁₀ = 39.5 Q ₁ = 49.2 Median = 64.9 Q ₃ = 86.3 P ₉₀ = 96.8 P ₉₉ = 100.0		Hours of Calibration: 0																																												
				Percent Operational Time: 90.1																																												
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-Jun	93.1	96.6	95.5	94.0	96.4	94.1	88.5	79.5	76.9	73.8	68.2	62.1	54.6	52.8	51.7	51.9	50.7	56.0	61.4	58.6	67.5	79.4	84.3	84.1	73.8	96.6																						
2-Jun	86.2	89.5	88.5	93.2	94.6	86.6	81.3	78.2	74.7	68.1	59.9	52.6	46.7	44.8	39.9	31.3	29.8	33.9	40.7	49.2	57.0	76.3	78.4	76.4	64.9	94.6																						
3-Jun	86.3	97.8	99.7	99.8	100.0	98.3	90.6	85.5	76.7	67.8	61.3	60.4	56.7	54.0	53.2	54.3	54.7	57.9	62.2	65.1	68.7	71.8	72.1	72.9	73.7	100.0																						
4-Jun	74.8	83.0	95.5	OR	OR	OR	100.0	OR	OR	OR	100.0	97.8	93.9	89.5	83.2	78.9	83.4	91.5	86.9	93.3	97.0	98.9	97.0	OR	OR	OR																						
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	92.0	88.9	79.4	75.4	70.7	71.5	78.5	96.1	OR	OR	OR	OR	OR	95.7	94.4																						
6-Jun	93.0	89.9	87.6	82.0	77.1	70.1	64.5	58.6	53.4	47.9	43.3	39.0	36.1	34.9	34.6	34.0	34.8	34.7	34.5	36.7	49.5	64.4	67.7	81.2	56.2	93.0																						
7-Jun	91.9	92.0	67.1	57.4	46.1	41.5	39.5	37.7	33.3	29.5	23.7	21.5	20.7	21.3	20.2	20.9	22.4	25.6	28.5	30.4	37.9	46.2	66.3	77.3	41.6	92.0																						
8-Jun	77.8	86.1	87.6	61.0	74.3	84.9	72.4	68.0	62.6	58.0	52.1	51.1	46.5	41.4	40.0	40.5	39.8	39.6	41.6	55.8	74.8	83.6	90.5	93.7	63.5	93.7																						
9-Jun	96.7	97.5	97.5	98.1	97.7	82.9	69.5	56.9	49.5	44.1	40.1	37.2	36.2	35.0	34.1	34.6	36.6	39.7	48.2	62.4	61.4	55.8	66.8	74.6	60.5	98.1																						
10-Jun	66.3	63.8	65.6	67.4	67.6	66.5	64.4	60.5	54.1	50.6	51.7	48.3	45.2	41.7	39.3	40.3	39.1	39.1	40.4	41.8	53.8	56.8	53.2	57.4	53.1	67.6																						
11-Jun	58.8	56.6	55.4	56.3	59.2	55.7	56.4	59.8	60.3	58.1	56.4	54.0	50.1	48.6	41.8	38.4	36.5	35.3	36.0	36.2	43.6	59.1	51.0	52.2	50.6	60.3																						
12-Jun	73.7	64.4	57.0	54.8	55.2	55.5	52.5	51.6	50.8	49.1	44.0	43.2	45.0	47.2	46.3	45.6	44.8	45.0	54.5	65.0	55.8	66.8	75.9	68.6	54.7	75.9																						
13-Jun	77.1	81.6	81.4	78.0	72.3	66.1	61.7	58.5	53.2	51.7	51.0	47.9	42.9	42.0	44.4	44.6	47.9	75.6	83.1	95.0	96.5	99.1	OR	OR	66.0	99.1																						
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	--																					
15-Jun	OR	OR	OR	OR	OR	OR	100.0	100.0	99.4	99.5	100.0	99.9	96.6	94.3	93.0	86.7	83.2	74.8	68.7	71.6	87.0	96.8	95.6	84.9	90.7	100.0																						
16-Jun	83.9	84.0	93.8	97.6	96.4	81.4	74.8	67.9	61.3	52.0	43.7	43.9	44.6	52.1	54.4	57.1	60.2	60.9	61.6	60.6	68.0	87.3	84.7	85.7	69.1	97.6																						
17-Jun	84.8	85.2	85.3	91.0	82.9	71.9	67.6	62.6	59.7	60.3	57.9	54.7	50.2	42.2	37.6	32.3	30.1	30.4	31.1	34.8	41.5	65.3	83.6	95.6	60.0	95.6																						
18-Jun	98.0	99.6	OR	98.4	98.6	90.0	90.4	86.6	77.1	68.9	58.7	53.1	51.4	47.0	44.8	41.8	40.7	40.8	42.9	43.1	44.9	46.8	48.4	52.1	63.7	99.6																						
19-Jun	56.3	56.8	60.2	64.2	67.3	69.7	85.5	95.0	96.9	98.0	98.6	98.7	99.1	97.8	96.3	98.8	97.1	99.1	100.0	OR	OR	100.0	OR	OR	86.8	100.0																						
20-Jun	OR	OR	OR	OR	OR	OR	OR	100.0	99.3	98.6	98.6	98.4	98.6	98.0	98.5	98.3	98.1	95.8	96.4	96.2	95.8	93.4	96.9	97.6	--	100.0																						
21-Jun	98.6	100.0	99.5	98.9	99.5	96.9	94.0	89.4	83.1	74.8	73.0	71.6	66.5	63.2	61.6	57.1	49.8	47.7	47.9	51.8	62.0	78.1	92.0	96.6	77.2	100.0																						
22-Jun	98.6	100.0	OR	OR	OR	89.4	79.3	72.9	63.1	54.8	49.7	42.7	39.9	39.5	42.3	45.6	45.7	43.7	49.6	54.8	73.3	73.0	87.7	89.5	63.6	100.0																						
23-Jun	80.9	79.6	81.2	81.9	81.2	74.4	64.7	58.6	48.5	42.4	43.4	41.2	39.3	40.3	38.9	38.5	35.4	43.7	43.5	43.8	56.5	69.7	71.6	79.6	57.5	81.9																						
24-Jun	76.9	80.8	93.0	97.4	93.4	71.9	57.5	50.9	46.9	45.1	40.9	35.5	34.9	32.9	29.2	28.6	31.1	41.1	46.5	52.6	65.9	80.6	82.4	86.3	58.4	97.4																						
25-Jun	98.5	97.5	95.5	96.0	94.7	95.5	95.0	88.5	77.8	69.9	64.7	58.0	53.5	52.3	50.9	48.9	47.8	48.7	49.7	54.5	67.2	82.2	90.1	96.3	73.9	98.5																						
26-Jun	93.9	93.8	94.0	90.1	88.1	87.1	80.8	70.3	69.6	65.2	64.5	63.0	69.5	80.4	79.5	61.7	58.7	90.7	95.6	93.8	95.7	98.5	99.6	81.1	99.6																							
27-Jun	OR	OR	OR	99.8	99.8	93.9	87.6	86.2	82.3	73.3	66.2	63.2	60.0	56.7	52.4	53.3	53.3	51.3	50.7	53.7	67.5	82.7	84.6	85.8	71.6	99.8																						
28-Jun	87.4	92.3	91.2	86.5	87.4	86.9	81.8	65.2	52.5	47.7	48.8	47.9	46.2	46.7	49.1	64.9	67.6	62.0	64.5	70.4	74.8	84.7	84.6	84.2	69.8	92.3																						
29-Jun	80.8	89.2	94.9	96.1	94.2	85.7	76.4	69.5	64.8	60.4	53.4	50.9	45.2	40.2	39.5	54.1	59.7	63.5	55.9	57.2	69.8	62.2	64.0	75.2	66.8	96.1																						
30-Jun	82.3	86.5	84.6	84.6	72.9	59.2	55.1	53.1	51.3	48.3	49.6	46.9	40.4	37.0	35.7	33.2	31.1	30.2	31.3	36.2	40.6	50.4	56.0	46.8	51.8	86.5																						
																								83.9	85.8	84.8	84.3	83.2	78.2	75.3	70.8	67.1	62.7	60.3	57.4	54.2	52.7	51.9	52.3	51.5	53.9	55.7	58.2	65.6	74.4	77.8	80.3	Diurnal Average
																								98.6	100.0	99.7	99.8	100.0	98.3	100.0	100.0	100.0	99.5	100.0	99.9	99.1	98.0	98.5	98.8	98.1	99.1	100.0	98.9	97.0	100.0	98.5	99.6	Diurnal Maximum
OR - Out of Range																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Anzac - June 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	71	10.94	10.94
40 - 60	208	32.05	42.99
60 - 80	151	23.27	66.26
80 - 100	211	32.51	98.77

Total Number of Valid Hours: 649

Total Number of Hours: 720



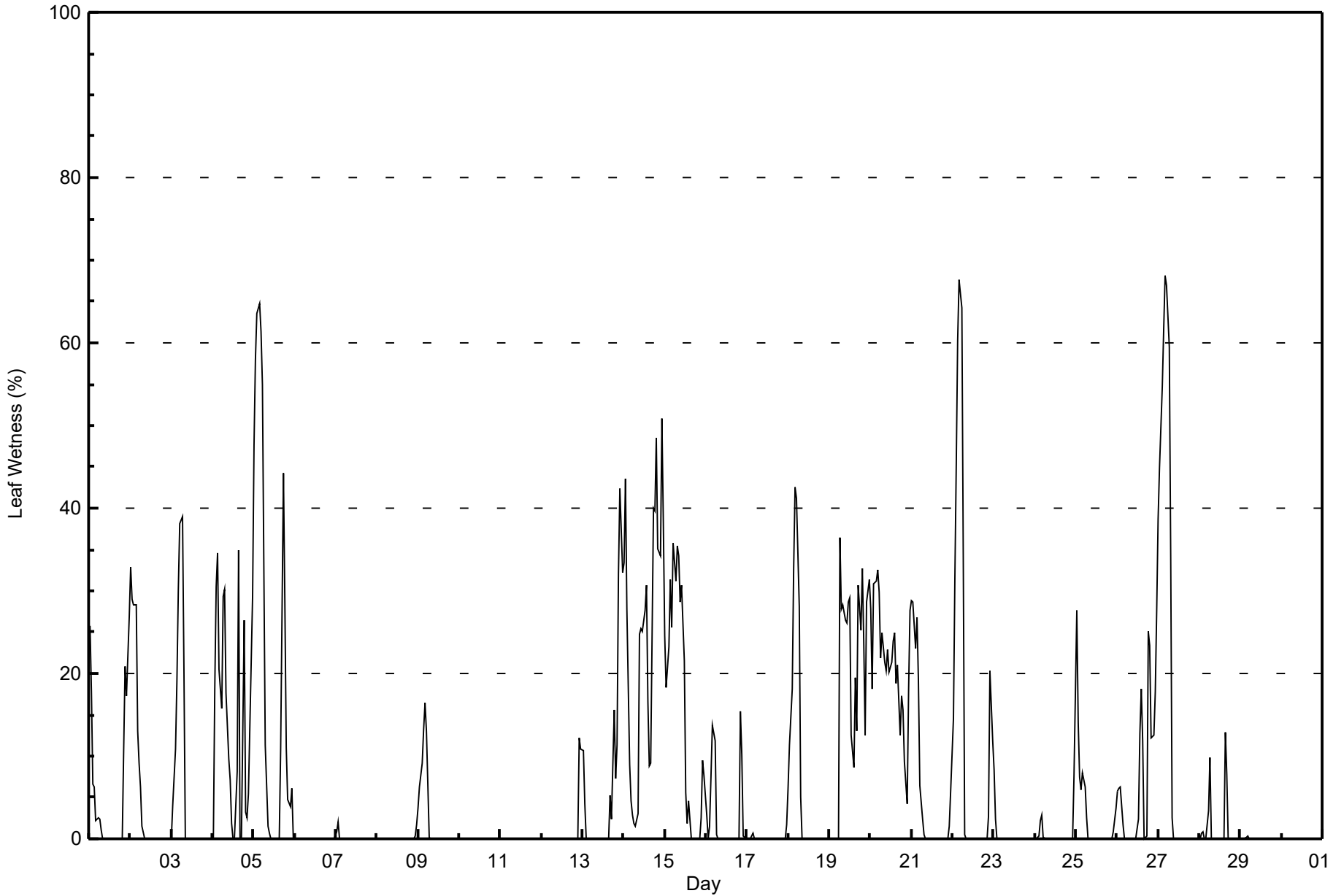
Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Anzac - June 2023

Maximum Value: 68.2 % on Jun 27 05:00																				Maximum Daily Average: 24.3 % on Jun 14					Hours in Service: 720		
Minimum Value: 0.0 % on Jun 1 09:00																				Minimum Daily Average: 0.0 % on Jun 6					Hours of Data: 720		
Maximum Diurnal Average: 14.6 % at hour 4																				Minimum Diurnal Average: 2.2 % at hour 17					Hours of Missing Data: 0		
Monthly Average: 6.89 %																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 7.5 P ₉₀ = 28.3 P ₉₉ = 61.2					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-Jun	25.8	17.9	6.6	6.3	2.2	2.5	2.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	20.9	17.4	27.0	5.9	27.0	
2-Jun	32.8	29.0	28.3	28.2	13.1	9.1	6.3	1.6	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	6.2	32.8	
3-Jun	0.0	4.1	10.9	19.2	30.2	38.1	38.9	20.5	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	6.7	38.9	
4-Jun	0.0	18.2	30.5	34.5	20.6	15.8	29.3	30.1	17.6	9.7	7.2	1.9	0.0	0.0	8.1	34.9	0.0	0.0	26.4	3.3	2.5	5.4	13.3	29.4	14.1	34.9	
5-Jun	47.6	58.0	63.5	64.8	61.4	54.9	33.0	11.4	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	10.9	44.2	28.6	11.0	4.7	3.9	6.1	0.2	21.1	64.8	
6-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.8	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	
8-Jun	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	0.3	1.6	0.1	1.6
9-Jun	3.7	6.2	9.2	13.3	16.5	13.0	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	2.6	16.5	
10-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	10.8	1.0	12.1
13-Jun	10.6	4.2	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	5.3	2.4	15.5	7.3	11.4	32.0	42.4	32.3	6.8	42.4	
14-Jun	33.4	43.5	27.8	9.0	4.5	2.9	1.9	1.5	3.0	24.7	25.4	25.1	27.6	30.7	16.6	8.9	9.1	40.0	39.6	48.5	35.1	34.2	50.9	38.4	24.3	50.9	
15-Jun	24.5	18.2	23.3	31.4	25.6	35.7	31.2	35.4	34.2	28.7	30.7	21.5	5.6	1.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	9.6	7.7	15.5	35.7	
16-Jun	3.0	0.0	1.5	7.5	13.8	11.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	10.2	0.4	0.0	2.7	15.5	
17-Jun	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	0.0	0.0	0.0	0.0	1.7	0.1	1.7	
18-Jun	6.1	11.4	18.1	32.7	42.5	41.2	28.1	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	42.5	
19-Jun	0.0	0.0	0.0	0.0	0.0	0.0	36.5	27.7	28.3	26.4	26.1	28.7	29.2	12.6	8.7	19.4	13.1	30.7	25.3	32.7	24.0	12.6	28.7	31.4	18.4	36.5	
20-Jun	27.9	18.2	30.9	31.2	32.5	29.8	21.8	24.8	21.3	20.4	22.8	20.1	21.3	23.9	24.9	18.9	20.9	12.6	17.3	15.6	9.4	4.3	18.0	27.5	21.5	32.5	
21-Jun	28.8	28.6	23.1	26.7	19.1	6.4	2.3	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	1.6	5.7	6.0	28.8	
22-Jun	14.6	31.3	45.2	60.4	67.6	64.2	34.0	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	2.8	20.3	11.9	14.7	67.6	
23-Jun	8.3	2.3	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	0.4	8.3	
24-Jun	0.0	0.0	0.4	2.2	2.9	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	0.0	0.0	0.0	0.0	7.6	0.6	7.6	
25-Jun	27.6	14.1	7.5	6.0	7.9	6.3	2.5	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	0.9	3.8	3.2	27.6	
26-Jun	5.7	6.2	6.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	12.7	18.2	11.9	0.0	0.3	25.2	23.5	12.2	12.6	17.9	27.6	7.7	27.6	
27-Jun	38.6	44.9	54.8	61.8	68.2	67.0	59.5	34.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	68.2	
28-Jun	0.0	0.8	0.8	0.0	0.0	3.4	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	12.9	
29-Jun	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
30-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11.3 12.0 13.0 14.6 14.3 13.4 11.3 6.5 3.6 3.7 3.7 3.2 2.9 2.7 2.7 3.6 2.2 4.3 5.9 4.7 4.2 4.7 8.0 8.8																								Diurnal Average			
47.6 58.0 63.5 64.8 68.2 67.0 59.5 35.4 34.2 28.7 30.7 28.7 29.2 30.7 24.9 34.9 20.9 44.2 39.6 48.5 35.1 34.2 50.9 38.4																								Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Anzac - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	468	65.00	65.00
0.4 - 0.5	5	0.69	65.69
0.6 - 0.7	2	0.28	65.97
0.8 - 1.4	5	0.69	66.67
1.5 - 10	75	10.42	77.08
> 10	163	22.64	99.72

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 - June 2023

Maximum Speed: 27 km/h on Jun 6 01:00	Maximum Daily Speed Average: 17.8 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 14 02:00	Minimum Daily Speed Average: 1.6 km/h on Jun 27	Hours of Data: 720
Maximum Diurnal Speed Average: 4.5 km/h at hour 14	Minimum Diurnal Speed Average: 1.2 km/h at hour 3	Hours of Missing Data: 0
Monthly Average Velocity: 2.3 km/h 273.0 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 8 Median = 11 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-Jun	W11WNW12	WNW8WNW11	W10	W8	W6	NNW6	NW7	W6	W7	NNW6	NW15	NNW11	NNW10	NW12	NNW12	N6	NW4	W9	NW14	NW13	NW12	NW13	NW8.7	NW15				
2-Jun	NW14	NNW13	NNW12	NNW7	NW8	WNW6	NNW8	N10	N10	N11	NW14	NW13	NNW12	NNW13	NNW10	NNE10	ENE10	E8	E8	E7	ENE9	ENE8	N7.2	NW14				
3-Jun	ENE7	E2	E4	E5	ENE6	E5	NE3	NNE6	NE6	NNE8	NNE8	NNE10	NE11	ENE9	E10	E10	E15	ESE16	ESE12	E10	E8	ENE7	E9	E10	ENE7.1	ESE16		
4-Jun	E10	E9	ENE8	ENE9	ENE12	E12	E13	E12	E12	ESE11	E12	E11	E11	E9	ENE11	E14	ENE12	N9	NNW9	ENE6	SE9	SSE8	SE9	SE8	E8.6	E14		
5-Jun	SSE9	SSE8	SSE4	WNW3	W9WNW15	W12	W10	WNW9	NW11	NNW10	N11	NNE9	NNE6	NNE7	N7	N7WSW15	WNW10	W9	W7WSW15	WSW22	W23	WNW6.6	W23					
6-Jun	W27	W24WSW23	W22	W19	W18	W17	W15WSW15	WSW14	WSW16	WSW18	WSW17	WSW15	SW16	SW16	WSW15	SW15	SW14	SW12	S7	SSE10	SSE10	S6	WSW14.3	W27				
7-Jun	SSE8	SSE8	SSE12	S12	S14	SSW18	SSW15	SW14	WSW16	WSW15	SW16	SW22	WSW21	WSW21	WSW24	WSW21	W18	WNW18	WNW15	NW16	NW11	WNW8	W8	WSW7	WSW11.7	WSW24		
8-Jun	W8	WSW7	W9	WNW9	WNW7	WNW6	WNW6	NNW11	NNW7	WNW10	NW11	NW11	WNW12	NW14	NW13	NW11	NNW8	NNW6	WNW4	WSW3	SW3	SSW3	S3	SSE6	WNW6.4	NW14		
9-Jun	SE5	SSE6	SE6	SSE5	ESE6	ESE7	SE10	SE12	SSE13	SE14	SE12	SE10	SE10	SE8	SE10	SSE8	S10	S9	SSE6	SE6	ESE8	ESE10	SE9	SE10	SE8.4	SE14		
10-Jun	SE14	SE14	SE16	SE17	SE16	SE15	ESE10	SE13	SE16	SE16	SE16	SE18	SE19	SSE20	SSE20	SE18	SE20	SE18	SE16	SSE12	SSE9	SSE13	SE12	SE15	SE15.3	SSE20		
11-Jun	SE14	SSE15	SSE14	SW6	SSW9	SSW10	SW8	W14	W17	W14	W15	W14	WNW14	W12	W11	WNW15	NW12	WNW10	NW14	NW11	WNW9	W7	NW13	NW8	W8.0	W17		
12-Jun	W9	W10	W11	W11	W10	W11	W12	W12	W13	W11	W14	W12	WSW10	WSW9	WSW7	W4	SSW2	SE5	SE6	SE6	SE8	SSE6	SSE8	SE12	WSW5.6	W14		
13-Jun	SSE12	SE13	SE15	SE16	SE14	SE17	SE17	SE13	SE12	ESE11	SE10	SE11	SE12	SE13	SE12	ESE11	E12	ESE17	E8	ENE9	N4	WNW13	NNW11	NNE11	SE9.2	SE17		
14-Jun	ENE9	NW0	E7	ENE10	NE6	E6	ESE6	ENE4	N4	NW9	WNW12	WNW13	WNW12	NW13	NW17	NW19	NNW22	NW21	NNW20	NNW14	NW17	NW18	NW16	WNW20	NW9.2	NNW22		
15-Jun	NW18	NW18	NW19	NW22	NW22	NW22	NNW22	NW13	NW19	NW20	WNW19	WNW20	WNW19	WNW19	WNW19	WNW15	NW14	NW13	WNW7	SSW3	S6	SW8	WSW9	NW15.0	NW22			
16-Jun	WSW9	SW9	SW7	SSW7	SSW7	SSW7	S7	S7	SSE8	SSE12	S14	S12	SSW15	SW14	SW12	SSW11	S13	S12	S10	SSW12	SSW13	SW13	SW19	SW12	SSW9.9	SW19		
17-Jun	WSW12	SW9	SSW9	WSW7	SW9	WSW14	WSW16	WSW14	WSW15	WSW16	WSW16	WSW16	WSW18	WSW19	WSW20	WSW19	WSW20	WSW19	WSW20	WSW17	WSW14	SW9	SSW8	W5	N8	WSW1	WSW12.1	WSW20
18-Jun	SSW4	NW5	N10	NNE6	NE7	E7	E5	NE8	NE10	NE12	NE14	NNE16	NE13	NE15	NE18	NNE19	NNE18	NNE20	NNE22	NNE20	NNE18	NNE20	NNE21	NE23	NNE12.8	NE23		
19-Jun	NE25	NNE25	NNE24	NNE24	NNE24	NNE18	N16	N16	N19	NNE22	NNE23	NNE23	N22	NNE17	NNE15	NNE12	NNE14	N17	N17	N15	NNW17	NW18	NW17	NW17	N17.8	NNE25		
20-Jun	NW20	NW17	NW15	NW16	NW18	NW19	NNW20	NNW19	NNW20	NNW20	NNW20	NNW21	NNW20	NNW22	NW21	NW20	NW17	NW19	NW16	NW13	NW13	WNW13	WNW12	WNW12	NW17.4	NNW22		
21-Jun	WNW13	WNW12	NW14	NW13	NW13	NW13	WNW13	NW17	NW20	NW20	NW18	NW15	NNW14	NNW15	N11	NNW10	NW13	NW13	NNW13	NNW9	NNE6	E6	SSE8	SSE8	NW10.5	NW20		
22-Jun	S6	SSE6	SSE8	SSE7	SE8	SSE9	SE9	SE10	SE11	SE11	SSE4	W13	WSW18	WSW16	WSW17	W15	W15	WSW14	W10	W6	SW3	SW6	S3	SE8	SSW5.7	WSW18		
23-Jun	SE10	SSE13	SE11	SSE9	SSE8	SSE9	SE8	SE10	SSE8	SSE8	SSE9	SSE11	S9	S7	S9	SSE9	S8	SE9	SE8	SE12	SSE7	SSE8	S8	S8	SSE8.7	SSE13		
24-Jun	SSW10	S7	S6	S7	S6	SSE3	S2	S6	WSW7	WNW9	W11	W12	W10	W11	W9	WSW9	W8	N12	N13	N12	NNW17	N13	N6	NW12	WNW4.4	NNW17		
25-Jun	N8	N11	NNE10	NNE9	N9	N9	N8	NNE9	NE11	NE12	NE13	ENE11	E8	SE8	SE8	SSE9	SE6	S9	S8	SSE10	S5	SSE6	SSE5	SSE7	ENE3.7	NE13		
26-Jun	SSE8	SSE8	SSE9	SE9	SE10	SE9	SE8	SE7	SE7	S9	S9	SSE9	SE14	SE9	SSE5	SW6	WSW8	WNW8	NE6	NW5	SSW8	SW8	SW8	SW7	S5.4	SE14		
27-Jun	NE2	NNE5	W10	W11	W10	WNW9	WNW8	W9	WNW9	NW12	NNW10	NNW9	NW7	WNW7	NE6	E8	ESE6	ESE8	SE8	SE8	SE6	SE7	SSE8	SSE10	WNW1.6	NW12		
28-Jun	SSE8	SSE7	SSE7	SSE9	S7	SSE7	SSE9	SSE10	SSE12	SSE12	SE14	SE17	SE15	SSE15	S12	WSW13	S7	S7	SE7	S5	S4	S5	S5	SE8	SSE8.5	SE17		
29-Jun	S8	S6	SSE4	SSE4	SE7	SE11	SE13	SE12	SE10	SE8	SSE8	W7	W12	WSW15	WSW19	W17	WNW10	SSW2	SW6	W6	SW2	WSW8	SW8	SW5	SSW5.1	WSW19		
30-Jun	SW7	SW6	SSW6	SW7	WSW9	WSW9	WSW8	W7	W11	W11	W8	WSW13	WSW13	WSW14	W14	W13	WSW13	WSW14	WSW14	W12	W11	SW7	SW8	WSW8	WSW9.8	WSW14		

SW2.0 SW1.5 SW1.2WSW1.5 W1.6WSW2.1WSW2.0 W1.7WNW2.3WNW2.5WNW2.6WNW3.6 W4.2 W4.5 W3.6 W4.3WNW3.3WNW2.8 NW2.6WNW1.9WNW1.6WSW2.1WSW1.9 SW1.7 W27 NNE25 NNE24 NNE24 NNE24 NW22 NNW22 NNW19 NW20 NNE22 NNE23 NNE23 N22 NNW22 WSW24 WSW21 NNW22 NW21 NNE22 NNE20 NNE18 NNE20 WSW22 W23	Diurnal Average
	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

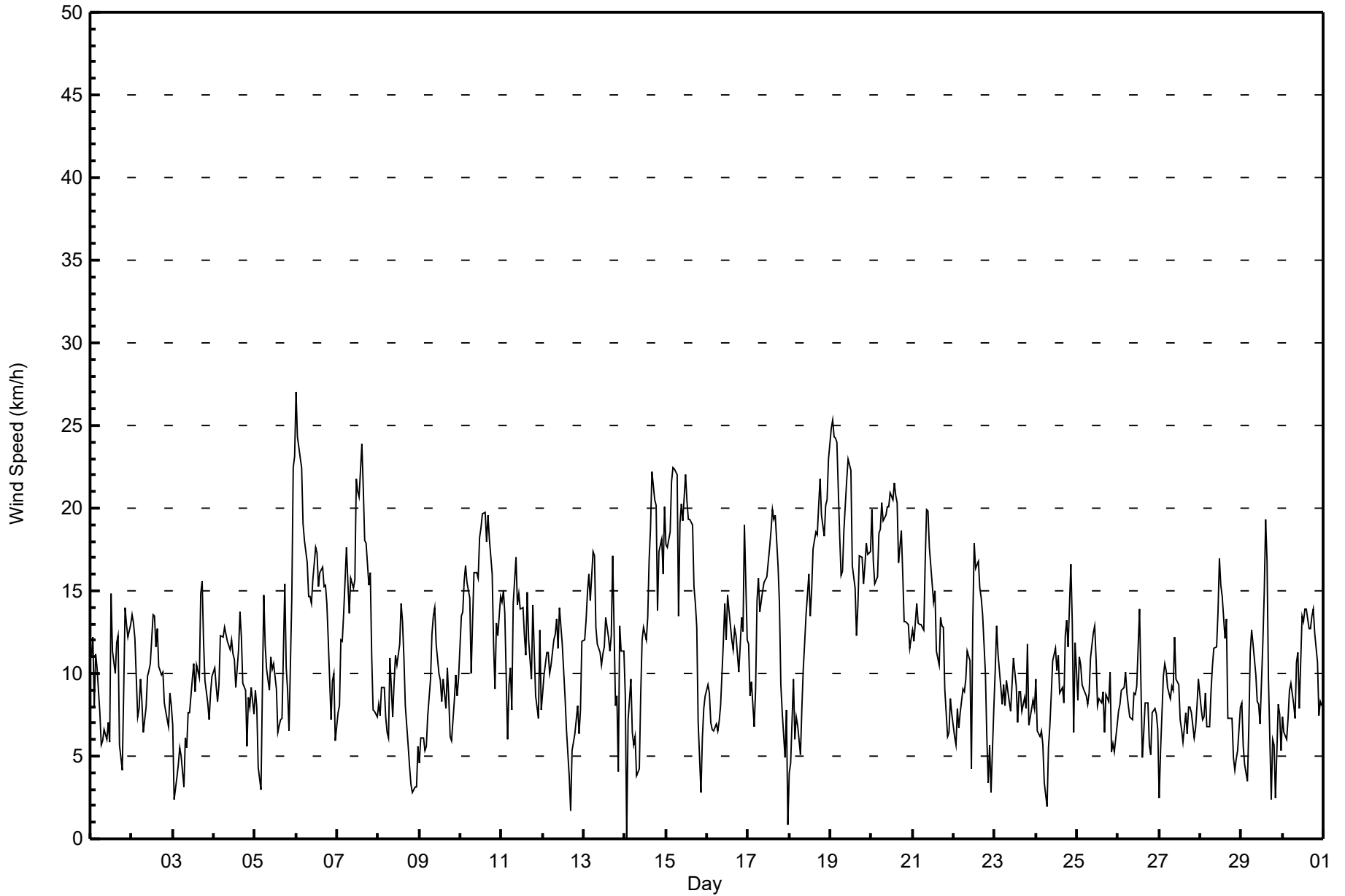
Wind Speed (WS) - km/h
Anzac - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jun 19 01:00 Minimum Value: 0 km/h on Jun 3 03:00 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-Jun	3	3	2	2	3	2	2	2	2	2	3	3	4	3	3	3	3	4	2	2	3	3	2	3	4
2-Jun	3	3	2	2	1	3	2	1	2	2	3	4	4	5	4	6	3	3	3	2	1	1	1	2	6
3-Jun	2	1	0	1	1	1	1	1	2	2	3	3	4	3	3	4	4	4	3	2	2	1	1	2	4
4-Jun	2	2	2	2	3	3	3	3	3	3	3	4	3	3	4	4	3	6	3	2	2	2	2	2	6
5-Jun	2	1	1	2	3	4	3	3	2	2	3	4	3	2	3	3	2	7	4	2	2	8	6	6	8
6-Jun	8	7	6	6	5	5	5	4	5	4	5	6	6	5	5	5	4	5	4	5	1	2	1	2	8
7-Jun	1	2	2	2	3	5	5	4	4	4	5	6	6	7	7	7	5	5	4	4	2	2	1	1	7
8-Jun	1	1	3	2	2	1	1	2	2	2	4	3	4	4	4	4	3	2	3	1	1	1	1	1	4
9-Jun	2	2	1	1	1	1	2	2	3	3	3	4	4	3	3	3	3	3	1	1	1	2	2	2	4
10-Jun	2	2	3	3	3	3	2	3	4	4	4	4	4	5	5	4	4	5	4	3	1	2	2	4	5
11-Jun	3	3	3	6	4	3	3	3	4	4	4	4	4	3	3	4	4	3	5	3	1	1	2	3	6
12-Jun	1	1	2	2	2	2	3	3	3	3	4	3	3	2	2	1	1	2	1	1	2	2	2	3	4
13-Jun	2	2	3	3	3	3	4	3	3	2	2	3	3	4	3	3	5	4	5	2	2	4	4	4	5
14-Jun	3	2	4	2	2	2	2	2	1	3	3	3	4	4	4	6	5	6	4	4	4	4	4	7	7
15-Jun	4	4	5	5	6	5	5	4	6	5	5	5	5	5	5	5	4	4	4	2	1	1	3	2	6
16-Jun	2	2	1	1	1	2	1	3	2	4	4	4	7	5	5	4	4	3	3	4	5	4	6	4	7
17-Jun	4	2	3	3	3	4	4	4	4	4	4	4	5	5	6	6	5	5	4	3	2	2	1	1	6
18-Jun	1	3	2	1	1	2	2	2	3	3	3	4	4	4	5	5	5	5	5	5	5	5	5	6	6
19-Jun	8	7	6	7	6	5	4	4	5	6	6	6	6	4	4	3	4	4	4	4	4	4	3	4	8
20-Jun	5	4	4	4	4	4	4	5	5	5	5	5	5	6	5	5	4	4	4	3	3	3	2	3	6
21-Jun	3	3	3	3	3	3	3	4	5	5	4	4	4	4	3	4	5	3	3	3	2	1	1	1	5
22-Jun	1	1	1	1	1	1	2	2	3	3	3	4	5	5	5	4	4	4	3	2	2	2	1	2	5
23-Jun	2	2	2	2	1	2	2	2	3	3	4	4	3	3	4	3	3	2	3	3	1	1	1	1	4
24-Jun	2	3	1	1	2	2	2	2	2	3	2	3	3	3	3	3	4	6	4	3	4	4	3	3	6
25-Jun	2	3	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	3
26-Jun	1	1	1	1	2	2	2	2	2	3	2	3	3	3	3	4	3	6	5	3	2	2	1	1	6
27-Jun	3	2	3	2	2	2	2	2	2	3	3	3	3	3	3	4	2	2	2	2	1	2	1	1	4
28-Jun	1	1	1	1	2	1	2	2	3	3	3	4	4	5	3	5	2	3	2	1	1	1	1	2	5
29-Jun	2	1	1	1	3	2	2	2	2	2	3	3	4	5	6	5	5	1	2	2	2	2	2	2	6
30-Jun	1	1	1	2	1	3	2	2	2	3	2	5	4	4	4	4	4	4	4	3	4	2	2	2	5
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Anzac - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	48	6.67	6.67
6 - 11	354	49.17	55.83
12 - 19	264	36.67	92.50
20 - 28	54	7.50	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 - June 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	2	4	0	2	8	8	5	4	2	2	2	4	0	48
6 - 11	17	14	9	15	21	11	48	50	29	11	19	19	38	24	11	18	354
12 - 19	10	9	7	2	8	3	40	12	7	5	12	37	25	23	52	12	264
20 - 28	1	12	2	0	0	0	1	2	0	0	1	8	4	2	11	10	54
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	30	36	20	19	33	14	91	72	44	21	36	66	69	51	78	40	720

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Anzac - June 2023

Direction of Maximum Speed: 265 deg on Jun 6 01:00																						Hours in Service: 720			
Direction of Maximum Daily Speed Average: 10.9 deg on Jun 19																						Hours of Data: 720			
Direction of Minimum Speed: 316 deg on Jun 14 02:00											Direction of Minimum Daily Speed Average: 1.6 deg on Jun 27											Hours of Missing Data: 0			
Monthly Average Direction: 273.0 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-Jun	265	299	293	283	280	278	273	336	317	260	269	327	326	343	336	315	332	350	316	280	311	324	319	316	307.9
2-Jun	321	342	345	336	326	298	309	299	332	6	0	349	326	316	341	333	337	20	76	86	82	84	67	76	350.8
3-Jun	59	93	92	80	78	79	46	30	38	33	30	18	35	70	92	82	101	108	106	99	87	69	83	81	74.4
4-Jun	86	87	78	65	75	79	84	86	97	102	99	96	96	87	77	93	64	1	327	60	135	159	142	145	88.1
5-Jun	156	156	148	287	267	285	281	281	297	310	329	350	12	15	30	11	0	258	295	281	266	254	258	263	286.7
6-Jun	265	263	257	259	264	261	259	270	258	253	239	239	240	240	235	234	244	236	223	214	178	161	161	169	244.3
7-Jun	167	165	165	173	183	199	206	225	246	243	233	234	244	249	247	251	260	286	302	304	313	283	259	255	240.9
8-Jun	259	249	279	283	290	286	301	331	333	289	307	304	295	313	322	318	339	337	297	249	218	196	169	150	298.2
9-Jun	140	147	145	147	110	116	132	138	147	145	144	142	126	138	129	150	182	176	163	128	115	115	145	143	140.5
10-Jun	139	142	139	140	135	132	121	127	141	138	134	145	146	155	148	139	144	140	143	157	150	149	139	140	141.4
11-Jun	145	156	162	228	208	213	236	262	274	281	281	272	285	272	264	299	311	289	317	317	302	278	320	304	270.2
12-Jun	271	279	280	279	272	275	270	276	276	262	269	273	258	255	254	269	208	144	132	126	124	153	147	134	254.3
13-Jun	148	142	142	141	136	142	141	130	125	120	127	129	130	132	138	112	101	117	95	67	350	289	338	31	124.6
14-Jun	69	316	82	69	54	96	115	68	1	324	297	295	297	308	319	318	328	314	327	328	313	311	312	303	324.5
15-Jun	309	317	311	316	321	324	327	313	308	310	306	305	299	301	299	301	299	306	306	300	204	179	226	241	306.0
16-Jun	242	232	216	209	201	197	180	187	147	164	173	176	203	231	220	213	183	185	177	209	212	223	236	231	203.8
17-Jun	240	222	212	241	229	248	255	253	258	257	252	248	254	251	244	239	238	238	247	235	210	267	6	251	245.8
18-Jun	202	314	349	32	51	84	87	39	35	51	36	33	37	43	39	33	32	27	27	24	22	24	30	35	32.5
19-Jun	36	29	30	26	26	26	5	9	9	18	15	14	9	17	28	33	25	7	351	349	339	326	326	317	10.9
20-Jun	316	323	322	313	313	320	327	328	329	328	332	331	333	329	325	323	312	319	314	315	304	303	300	296	320.6
21-Jun	298	298	305	306	306	309	300	308	321	323	308	321	328	336	350	342	323	324	339	348	25	98	155	163	319.7
22-Jun	170	158	152	153	143	150	139	139	138	144	148	265	251	243	246	261	267	255	272	272	229	231	185	142	212.6
23-Jun	142	151	142	151	166	157	145	133	164	163	148	162	173	178	171	147	179	144	146	142	156	162	172	189	156.5
24-Jun	202	179	173	174	175	167	170	182	253	286	275	266	270	267	259	257	274	0	9	354	329	358	1	319	287.3
25-Jun	354	11	13	16	358	351	351	24	46	53	51	72	97	145	130	162	141	169	171	157	177	164	154	155	74.1
26-Jun	159	155	148	141	143	145	145	141	131	171	174	165	143	144	168	233	244	294	43	320	205	222	234	234	170.0
27-Jun	41	19	277	263	279	285	287	278	288	311	337	335	317	287	44	97	121	104	129	130	136	140	148	156	289.3
28-Jun	159	162	167	159	179	167	162	158	160	158	136	137	134	163	173	243	172	173	142	180	185	183	172	140	161.7
29-Jun	169	174	157	161	129	139	138	142	141	143	147	265	265	257	245	267	287	202	217	264	223	237	220	214	206.5
30-Jun	227	228	200	216	243	254	251	266	259	272	264	251	256	256	267	265	250	258	257	259	259	230	224	245	251.6
227.8	233.2	223.3	253.0	259.8	243.8	251.7	273.9	286.5	290.4	291.3	285.2	280.6	272.0	270.3	281.0	288.1	291.3	313.4	303.5	285.2	254.4	249.5	231.7		
Diurnal Average																									

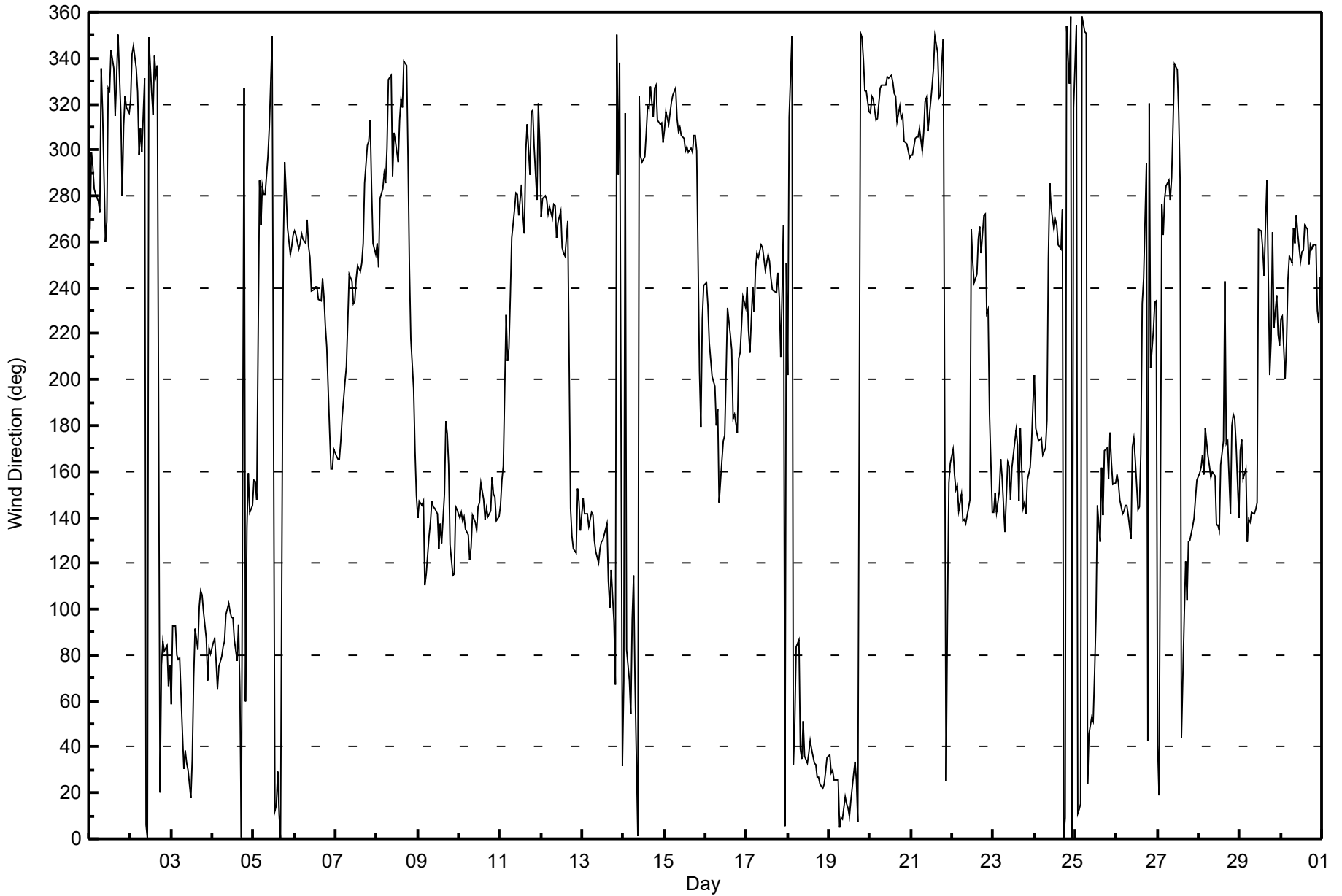
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Anzac - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Jun 14 02:00											Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0														
Minimum Value: 6 deg on Jun 26 00:00																									
Percentiles: P ₁ = 7 P ₁₀ = 11 Q ₁ = 14 Median = 17 Q ₃ = 23 P ₉₀ = 33 P ₉₉ = 69																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	29	20	28	15	16	14	26	31	31	48	41	56	21	24	21	17	19	69	72	22	16	13	16	13	72
2-Jun	17	20	13	16	11	20	17	17	28	24	25	27	25	26	25	28	31	27	21	16	13	11	11	14	31
3-Jun	12	18	11	10	7	10	28	21	37	29	42	26	35	41	33	33	19	18	16	15	11	12	12	14	42
4-Jun	14	14	14	16	15	15	16	17	16	17	17	18	21	25	20	25	17	49	50	44	15	15	11	9	50
5-Jun	9	6	11	57	17	15	15	15	26	15	21	18	21	30	41	26	29	23	22	15	18	17	17	18	57
6-Jun	17	18	17	16	17	16	19	18	20	19	22	26	23	24	27	23	24	25	21	18	17	10	7	34	34
7-Jun	9	10	11	16	15	18	20	21	19	22	23	20	20	23	18	21	18	23	16	11	11	24	14	13	24
8-Jun	12	9	13	14	14	9	13	16	27	25	31	26	33	27	25	30	36	51	37	22	17	50	15	8	51
9-Jun	25	9	8	10	19	15	14	12	13	19	24	35	37	44	29	46	23	21	14	20	14	14	13	9	46
10-Jun	10	10	11	11	11	13	16	14	13	15	14	15	15	15	15	13	13	13	13	15	9	10	14	12	16
11-Jun	13	13	14	67	55	18	22	18	16	19	20	19	23	21	23	25	20	22	15	12	11	20	13	30	67
12-Jun	13	10	11	12	12	15	15	18	17	20	18	23	19	17	23	31	64	16	12	12	18	15	14	12	64
13-Jun	12	12	10	10	12	11	13	13	16	19	19	19	20	16	14	23	28	17	75	36	52	31	30	19	75
14-Jun	28	99	52	19	16	26	28	34	28	22	17	16	16	14	15	15	16	16	20	28	16	14	14	16	99
15-Jun	14	14	14	14	14	14	13	18	14	14	15	13	15	15	14	14	15	15	16	15	46	13	25	12	46
16-Jun	13	13	19	13	9	15	15	23	18	21	24	20	24	21	23	24	20	20	19	18	17	20	17	17	24
17-Jun	18	17	22	22	18	19	19	18	16	17	19	22	19	20	20	20	21	21	19	20	15	49	13	76	76
18-Jun	22	44	13	15	13	21	41	16	17	22	21	17	19	17	15	19	16	15	15	15	14	14	14	14	44
19-Jun	14	14	14	14	14	15	19	17	16	22	16	16	17	18	15	15	15	18	15	16	13	13	13	13	22
20-Jun	13	14	13	13	12	13	13	13	14	13	15	14	14	15	14	13	14	14	13	17	13	14	13	13	17
21-Jun	13	14	14	13	13	13	15	15	17	15	15	19	21	18	20	28	24	21	18	13	20	28	8	8	28
22-Jun	8	11	6	9	8	8	13	13	16	22	74	22	20	23	20	20	16	19	18	20	15	25	39	8	74
23-Jun	13	12	11	11	13	14	19	16	40	38	44	36	35	47	30	30	43	14	17	15	10	7	11	16	47
24-Jun	18	23	13	12	11	53	93	25	39	25	19	20	24	22	40	31	21	50	17	20	15	19	48	14	93
25-Jun	29	16	15	13	14	15	16	22	18	18	19	30	30	29	27	34	61	26	22	13	13	9	7	6	61
26-Jun	6	8	8	8	10	11	13	22	24	26	28	21	20	16	69	48	24	51	58	65	19	14	10	11	69
27-Jun	88	37	35	15	12	14	16	19	25	22	32	29	46	51	40	37	40	31	20	15	11	9	8	7	88
28-Jun	8	7	9	8	16	11	14	17	17	21	16	15	19	24	22	24	21	22	14	29	35	26	21	11	35
29-Jun	14	16	14	24	16	10	12	14	16	19	38	37	19	24	20	26	23	60	26	27	47	16	16	16	60
30-Jun	9	13	18	13	12	18	19	22	16	17	18	21	23	22	21	24	21	19	18	17	17	14	16	19	24
88	99	52	67	55	53	93	34	40	48	74	56	46	51	69	48	64	69	75	65	52	50	48	76		
Diurnal Maximum																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS17
WAPASU
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
 JUNE 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	12.8	0	2.9	0
H2S (ppb) Average	684	36	36	100	1	0	0.5	0
THC (ppm) Average	684	34	36	99.72	2.6	-	2.5	-
O3 (ppb) Average	684	34	36	99.72	75.9	0	54.8	-
NO2 (ppb) Average	660	37	60	96.81	15.2	0	3.5	-
NO (ppb) Average	660	37	60	96.81	12.1	-	1.5	-
NOX (ppb) Average	660	37	60	96.81	25.7	-	4.2	-
PM2.5 (ug/m3) Average	719	1	1	100	365.3	92	220.1	9
Temperature 2 m (C) Average	720	0	0	100	29	-	22.2	-
Relative Humidity (%) Average	718	0	2	99.72	100	-	100	-
Wind Speed 10 m (km/h) Average	720	0	0	100	20	-	15	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-
Precipitation (mm) Total	720	0	0	100	10.1	-	51.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
JUNE 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	0.57	1.5	-	0	0	0	0	0.3	1.9	12.8
H2S (ppb) Average	684	0.13	0.1	-	0	0	0	0.1	0.2	0.3	1
THC (ppm) Average	684	2.13	0.1	-	1.9	2	2	2.1	2.2	2.3	2.6
O3 (ppb) Average	684	30.82	13.4	-	3.3	13	22.6	30	39	48.7	75.9
NO2 (ppb) Average	660	1.76	1.8	-	0.2	0.3	0.6	1.2	2.2	3.7	15.2
NO (ppb) Average	660	0.21	0.8	-	0	0	0	0.1	0.1	0.4	12.1
NOX (ppb) Average	660	1.96	2.4	-	0.2	0.3	0.6	1.3	2.4	4.2	25.7
PM2.5 (ug/m3) Average	719	35.49	51.4	-	0.6	3.1	6.2	16.9	37.8	100.7	365.3
Temperature 2 m (C) Average	720	16.24	5.4	-	3.7	9.3	11.5	16.3	20.2	23.7	29
Relative Humidity (%) Average	718	68.31	22.6	-	23.7	38.6	48.3	69.2	90.8	99	100
Wind Speed 10 m (km/h) Average	720	9.2	4	-	1	4	6	9	12	15	20
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	154.29	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
JUNE 2023

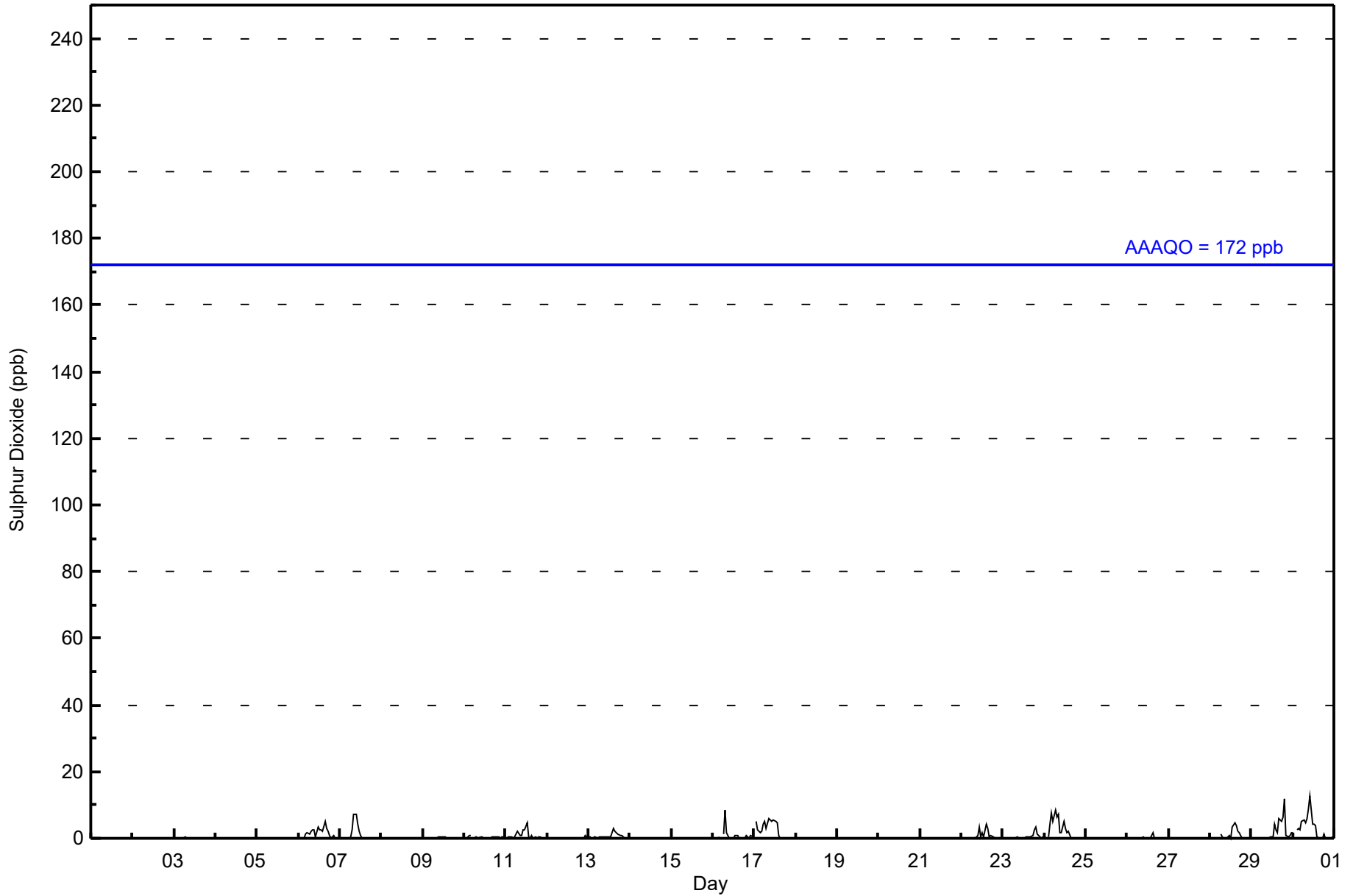
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, THC, O3, NO2	21 Jun 2023 13:00	21 Jun 2023 14:00	2	Maintenance - sample manifold cleaned
NO2	06 Jun 2023 15:00	07 Jun 2023 11:00	21	Maintenance to replaced instrument
Relative Humidity	15 Jun 2023 05:00	15 Jun 2023 06:00	2	Sensor operated out of range



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Wapasu - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	682	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - June 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	84	41	44	23	24	35	61	79	56	40	58	21	11	12	20	73	682
11 - 20	0	0	0	0	0	0	0	0	1	0	1	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	84	41	44	23	24	35	61	79	57	40	59	21	11	12	20	73	684

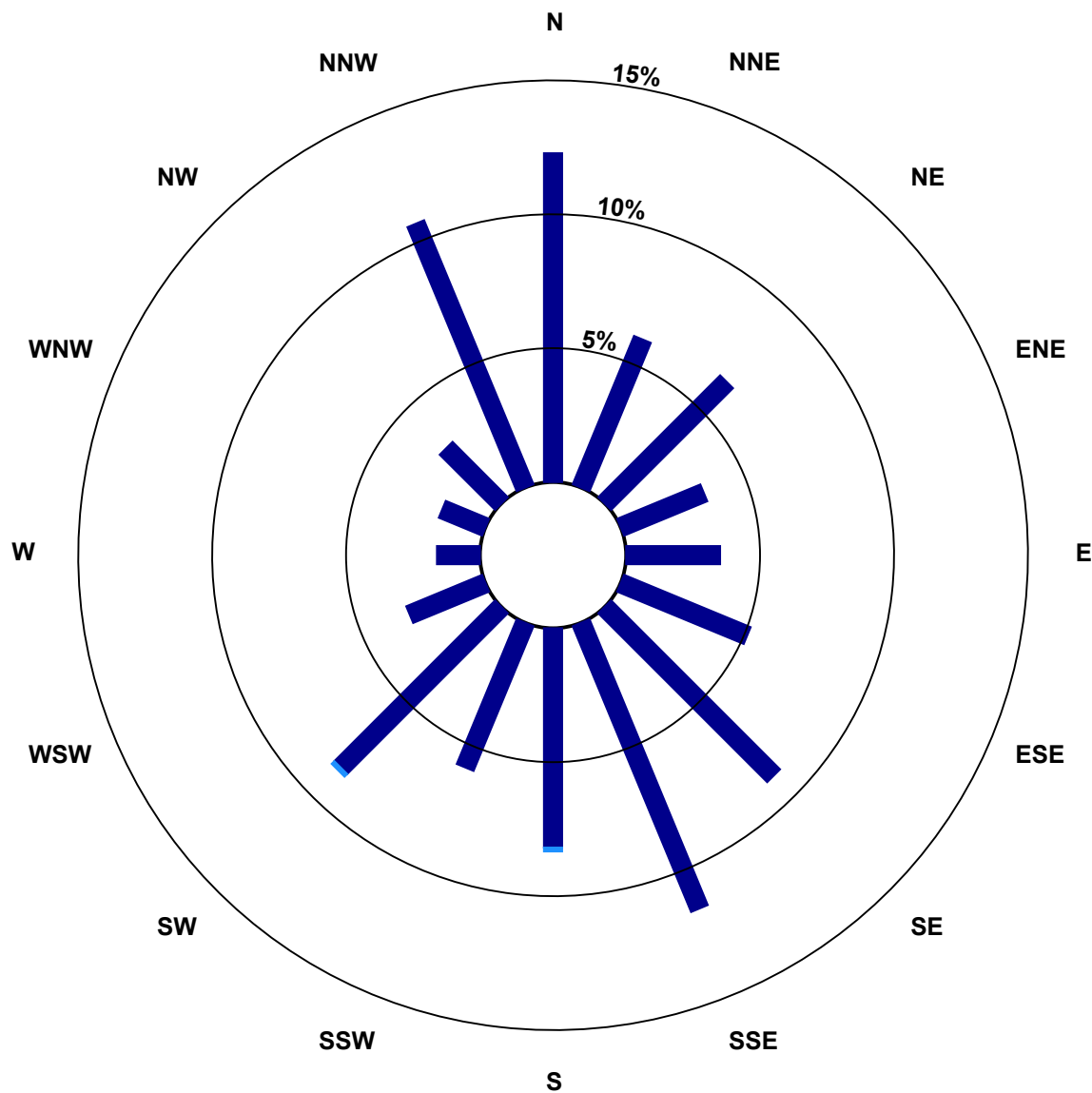
Total Number of Valid Hours: 684

Total Number of Hours: 720

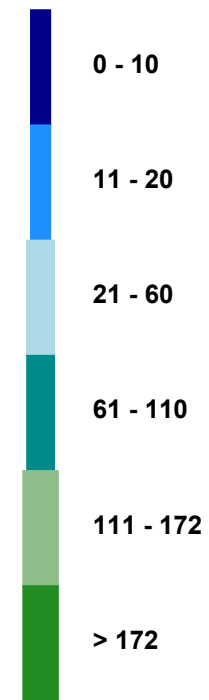


Wood Buffalo Environmental Association
Wind Rose Jun 2023

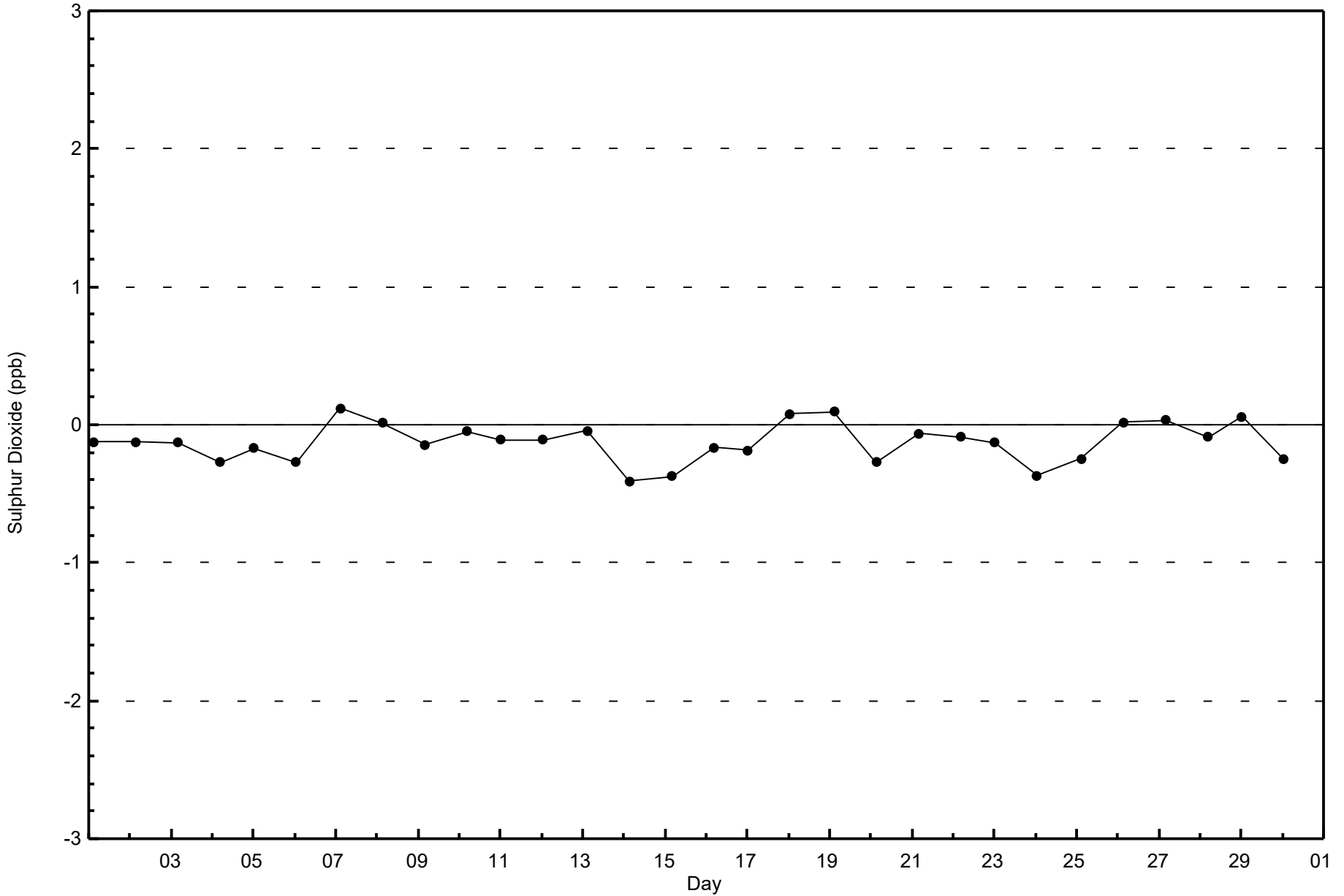
Sulphur Dioxide (SO₂) - ppb
Wapasu

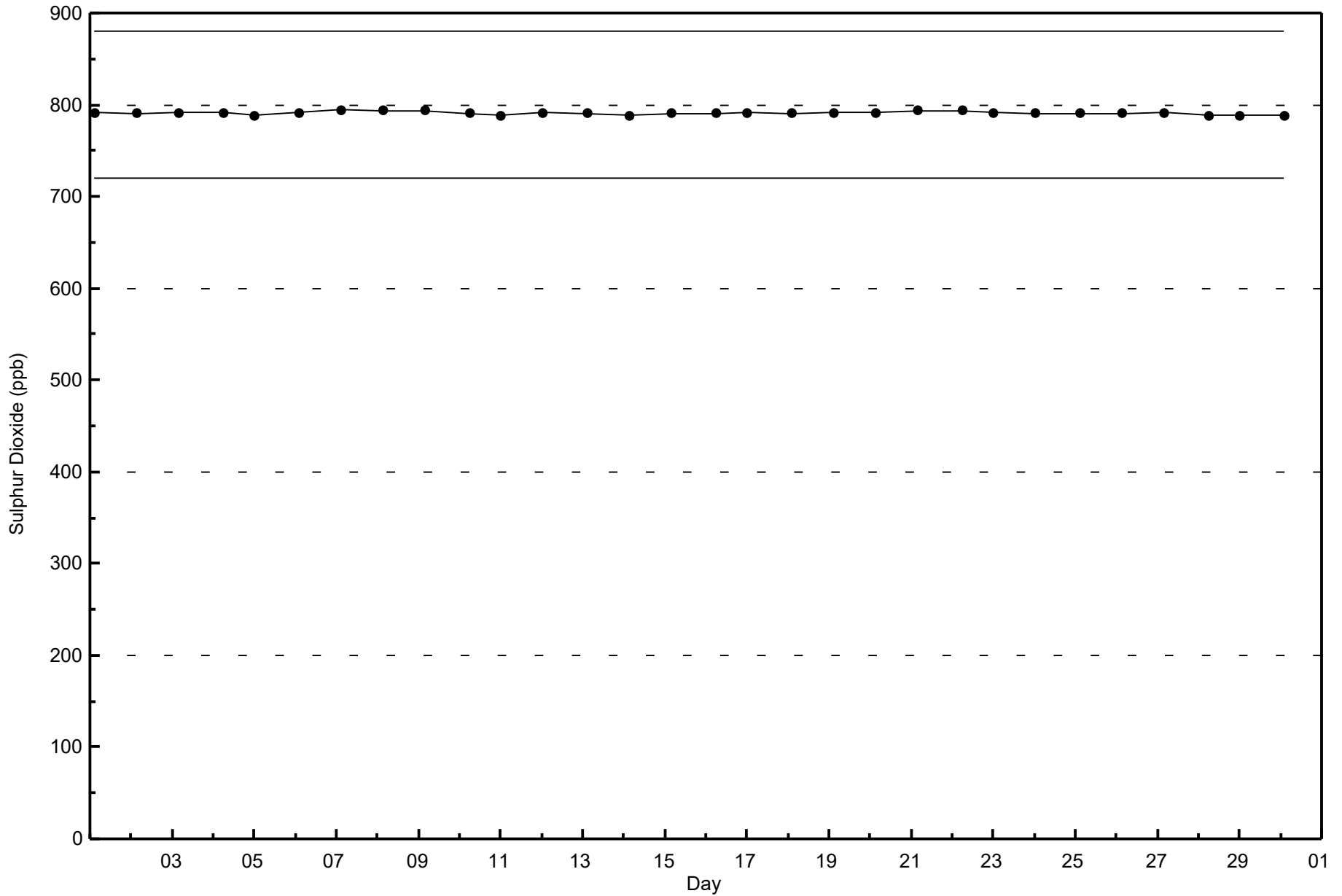


Classes (ppb)



Total Number of Valid Hours: 684







Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 1.0 ppb on Jul 1 00:00	Maximum Daily Average: 0.5 ppb on Jun 12
Minimum Value: 0.0 ppb on Jun 3 11:00	Hours of Data: 684
Maximum Diurnal Average: 0.2 ppb at hour 5	Hours of Missing Data: 36
Monthly Average: 0.13 ppb	Hours of Calibration: 36
Minimum Daily Average: 0.0 ppb on Jun 7	Percent Operational Time: 100.0
Minimum Diurnal Average: 0.1 ppb at hour 14	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.6	

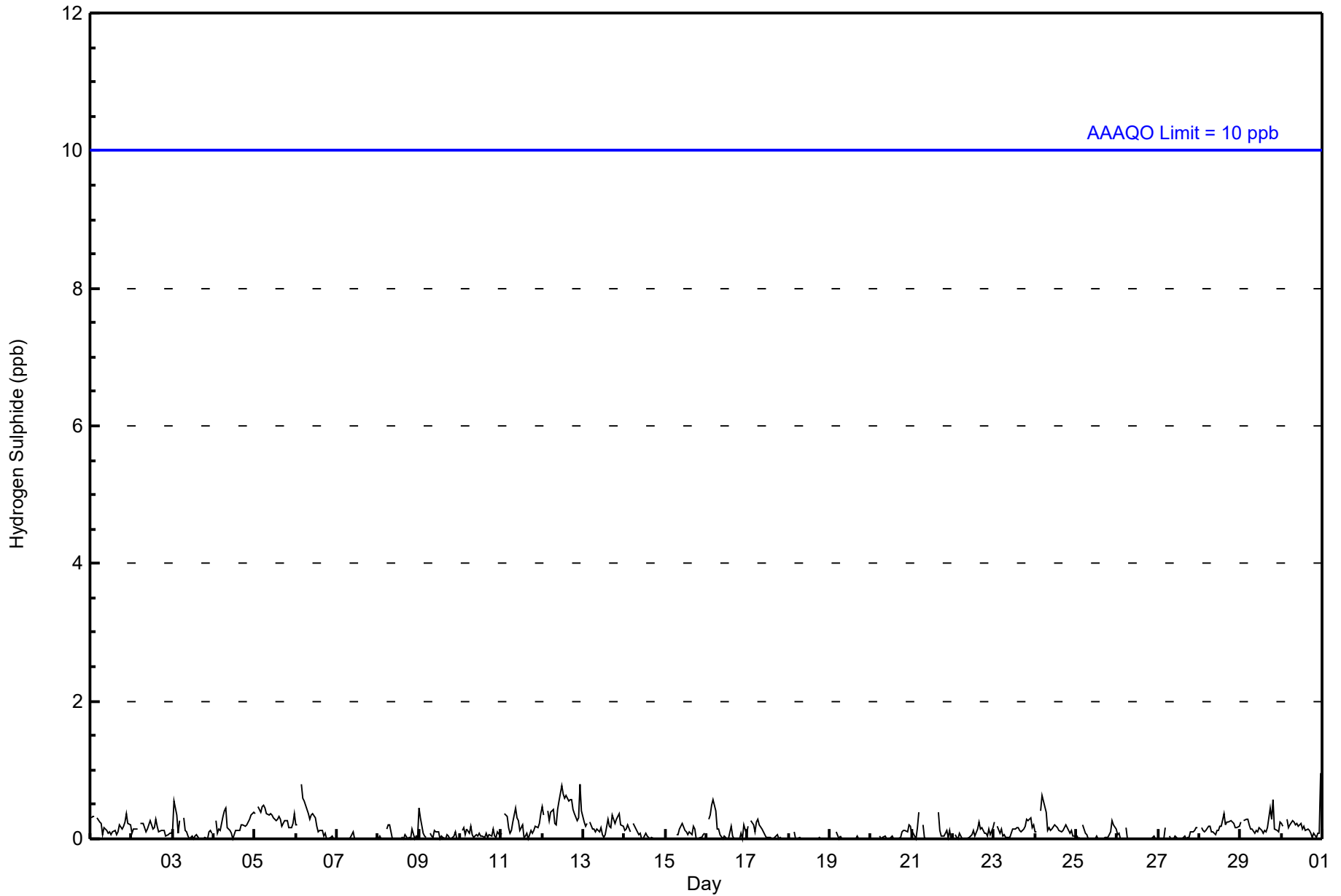
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.3	0.3	0.3	Z	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.4	0.2	0.2	0.2	0.1	0.1
2-Jun	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
3-Jun	0.1	0.6	0.4	0.1	0.3	Z	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
4-Jun	Z	0.3	0.1	0.2	0.1	0.3	0.4	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4
5-Jun	0.4	Z	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.4
6-Jun	0.2	0.2	Z	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.4	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
7-Jun	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	0.0	0.0	0.0
8-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
9-Jun	0.5	0.3	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
10-Jun	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0
11-Jun	0.1	Z	0.4	0.3	0.2	0.1	0.1	0.2	0.4	0.3	0.3	0.1	0.2	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.4
12-Jun	0.5	0.3	Z	0.4	0.3	0.4	0.4	0.2	0.2	0.4	0.5	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.3	0.8	0.4	0.4	0.4
13-Jun	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.3	0.2	0.2	0.4	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2
14-Jun	0.1	0.1	0.2	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
16-Jun	Z	0.3	0.3	0.5	0.6	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.1
17-Jun	0.2	Z	0.3	0.2	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Jun	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
19-Jun	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
20-Jun	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	0.1	0.2	0.2	0.2	0.2
21-Jun	0.1	0.1	0.0	0.2	0.4	Z	0.2	0.0	0.0	C	C	C	C	C	C	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	--
22-Jun	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1
23-Jun	0.2	Z	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1
24-Jun	0.1	0.1	Z	0.4	0.6	0.5	0.4	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
25-Jun	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.1	0.1
26-Jun	0.1	0.1	0.0	0.0	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
27-Jun	0.0	0.0	0.0	0.0	0.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
28-Jun	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
29-Jun	0.2	Z	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.6	0.1	0.1	0.1	0.3	0.2	0.2
30-Jun	0.2	0.2	Z	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	1.0	0.2	0.2
																								Diurnal Average			
																								Diurnal Maximum			

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



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Wapasu - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - June 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
Wapasu - June 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	83	44	43	24	24	36	58	79	60	40	58	22	11	12	20	70	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	83	44	43	24	24	36	58	79	60	40	58	22	11	12	20	70	684

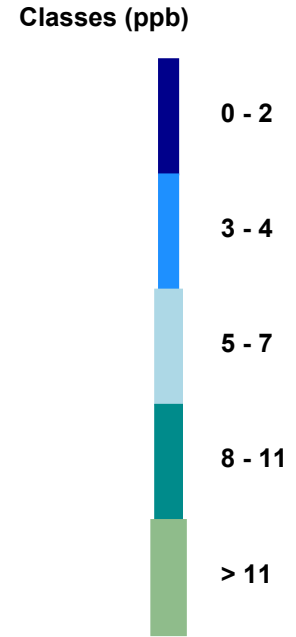
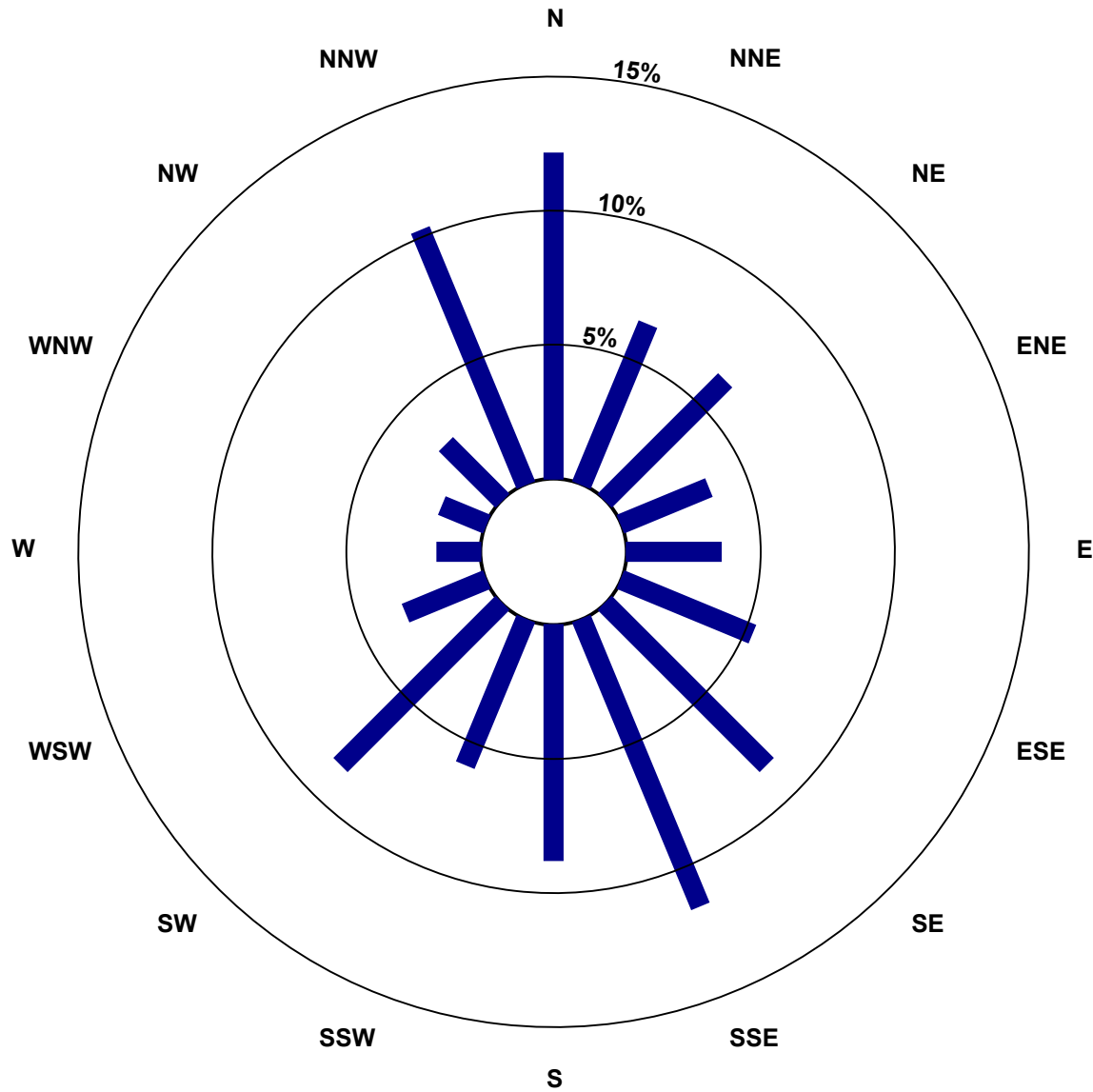
Total Number of Valid Hours: 684

Total Number of Hours: 720

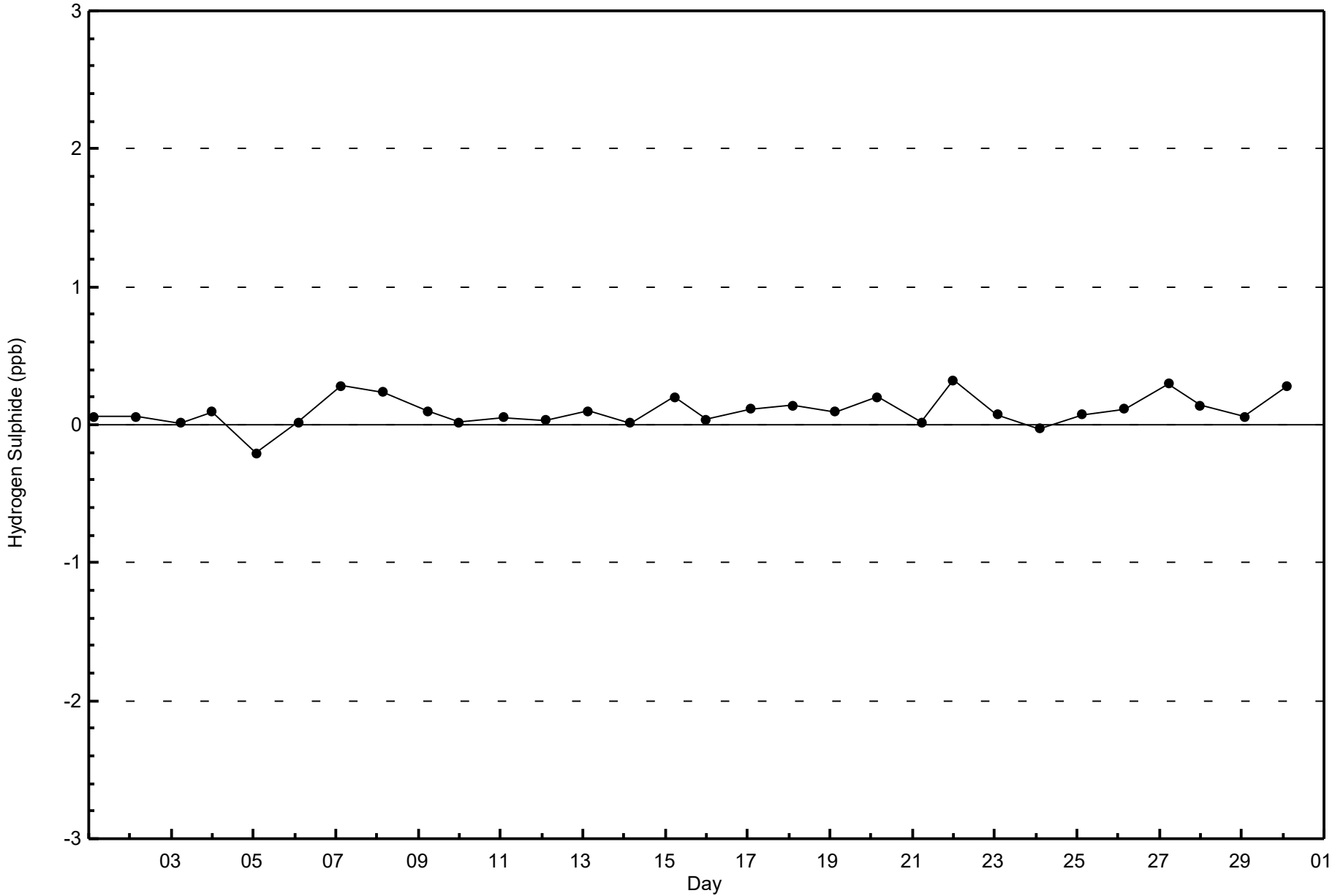


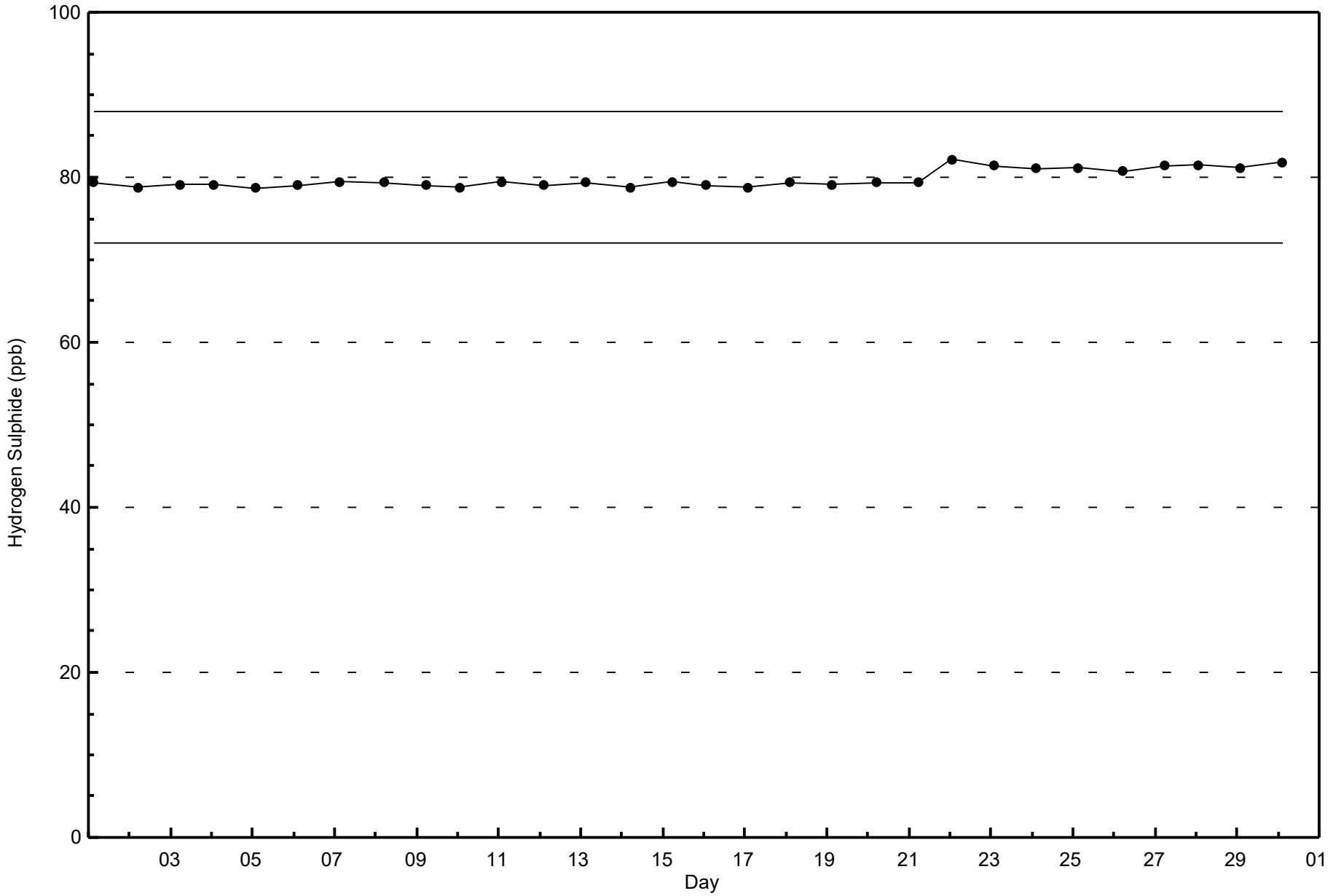
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Wapasu



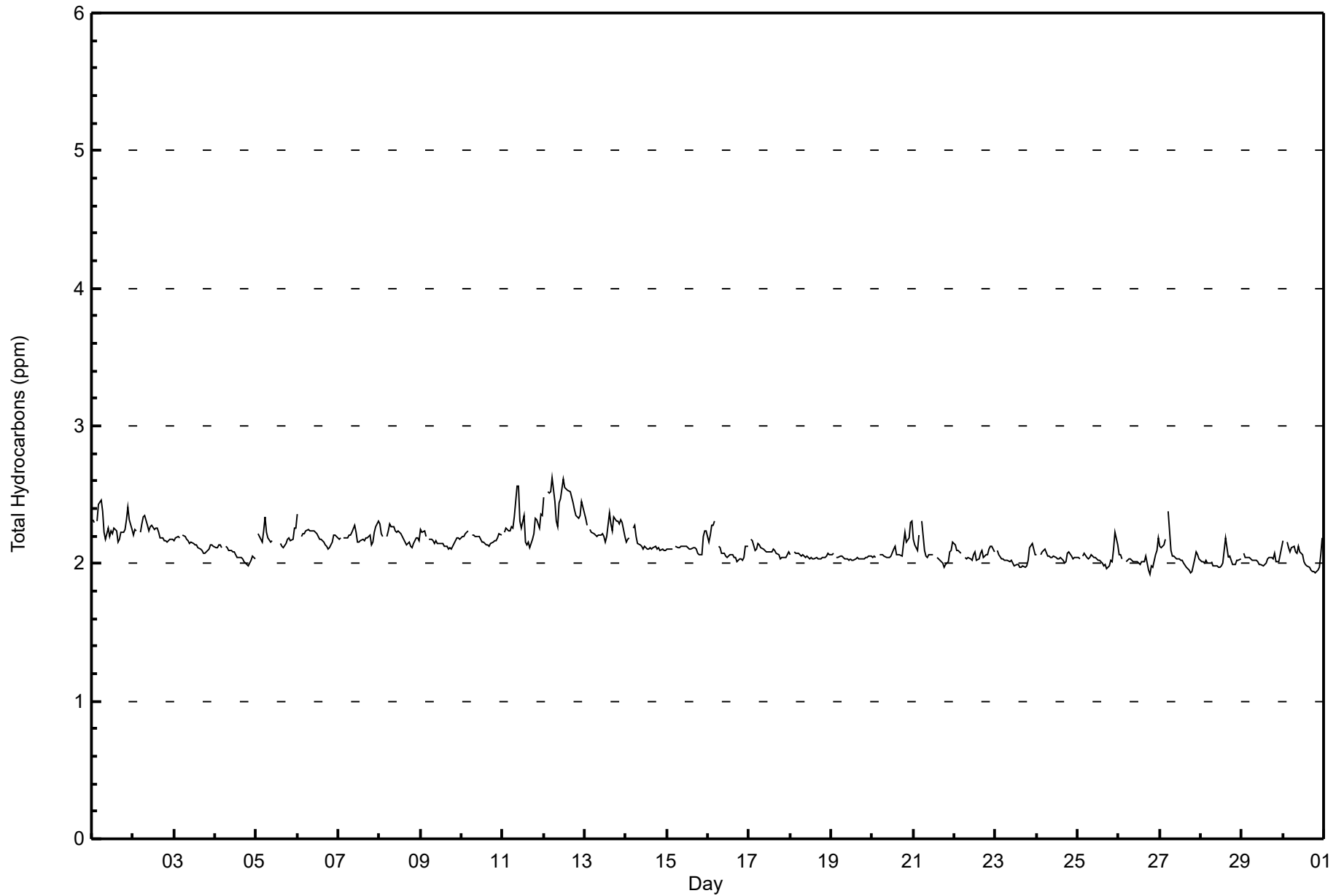
Total Number of Valid Hours: 684







Maximum Value: 2.6 ppm on Jun 12 06:00																				Maximum Daily Average: 2.5 ppm on Jun 12					Hours in Service: 720	
Minimum Value: 1.9 ppm on Jun 26 19:00																				Minimum Daily Average: 2.0 ppm on Jun 28					Hours of Data: 684	
Maximum Diurnal Average: 2.2 ppm at hour 6																				Minimum Diurnal Average: 2.1 ppm at hour 19					Hours of Missing Data: 36	
Monthly Average: 2.13 ppm																				Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.5					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-Jun	2.3	2.3	Z	2.3	2.4	2.5	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.3	2.5
2-Jun	2.2	2.3	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
3-Jun	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
4-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
5-Jun	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	C	C	C	C	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3
6-Jun	2.4	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	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4
7-Jun	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.2	2.3
8-Jun	2.3	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3
9-Jun	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2
10-Jun	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
11-Jun	Z	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.6	2.6	2.3	2.3	2.3	2.2	2.1	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.6
12-Jun	2.5	Z	2.5	2.5	2.5	2.6	2.4	2.3	2.3	2.4	2.5	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.5	2.4	2.5	2.6
13-Jun	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4
14-Jun	2.2	2.2	2.2	Z	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	2.3
15-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2
16-Jun	2.2	2.2	2.3	2.3	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3
17-Jun	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2
18-Jun	2.1	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1
19-Jun	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1
20-Jun	2.0	2.1	2.0	Z	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	2.2	2.2	2.2	2.3	2.3	2.1	2.3
21-Jun	2.2	2.1	2.1	2.2	Z	2.3	2.1	2.0	2.0	2.1	2.1	2.1	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.3
22-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Jun	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1
24-Jun	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	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-Jun	2.0	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.2
26-Jun	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	1.9	2.0	2.0	2.1	2.1	2.2	2.0	2.2
27-Jun	2.1	2.1	2.1	2.2	Z	2.4	2.1	2.1	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	2.1	2.1	2.0	2.1	2.4
28-Jun	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	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
29-Jun	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.1
30-Jun	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.0	2.2
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	199	29.09	29.09
2.1 - 3.0	485	70.91	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
Wapasu - June 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	20	22	17	8	3	1	13	23	28	19	15	11	3	2	4	10	199
2.1 - 3.0	64	19	27	15	21	34	48	56	29	21	44	10	8	10	16	63	485
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	84	41	44	23	24	35	61	79	57	40	59	21	11	12	20	73	684

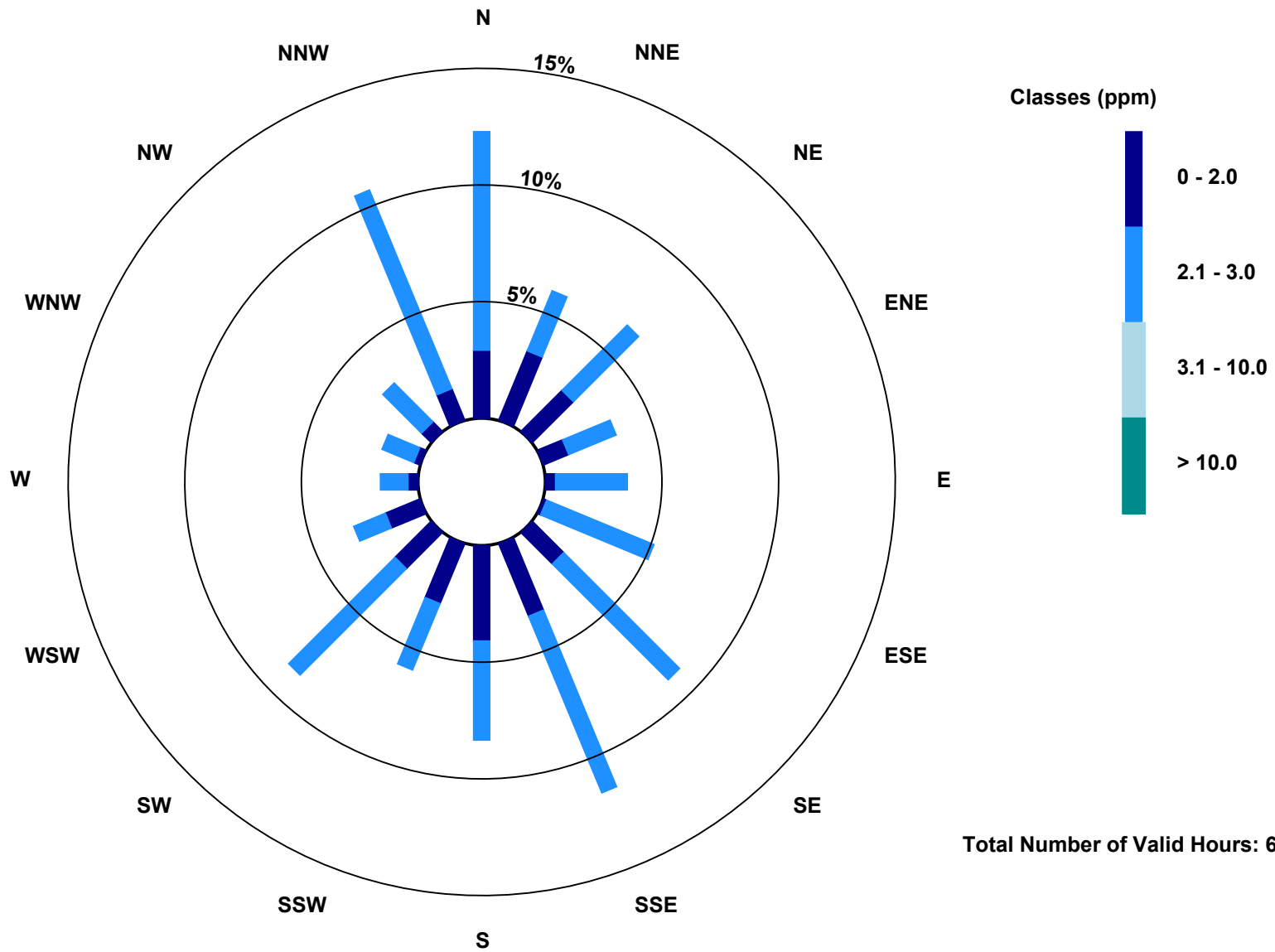
Total Number of Valid Hours: 684

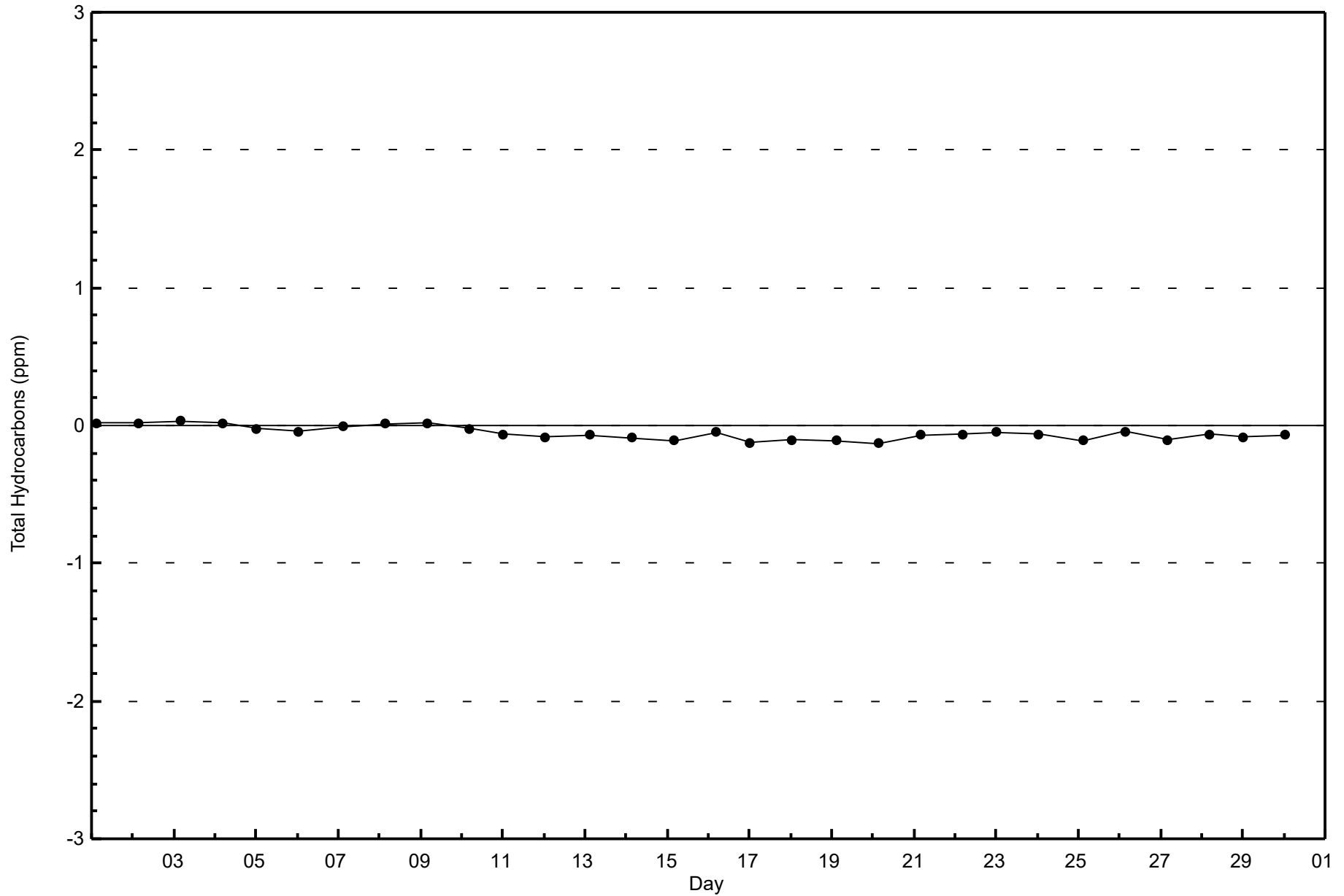
Total Number of Hours: 720

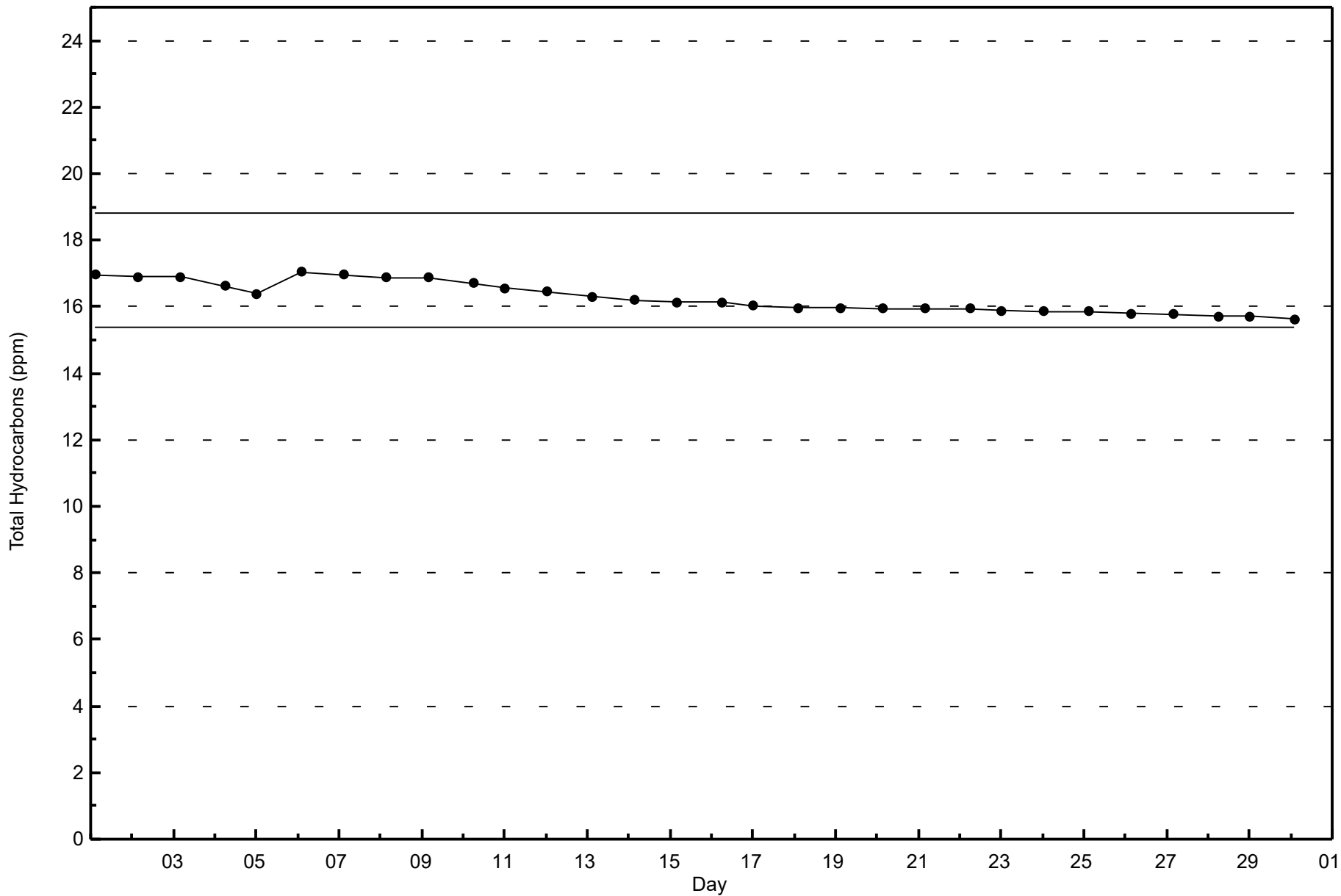


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Wapasu









Wood Buffalo Environmental Association

Summary of Hour Averages

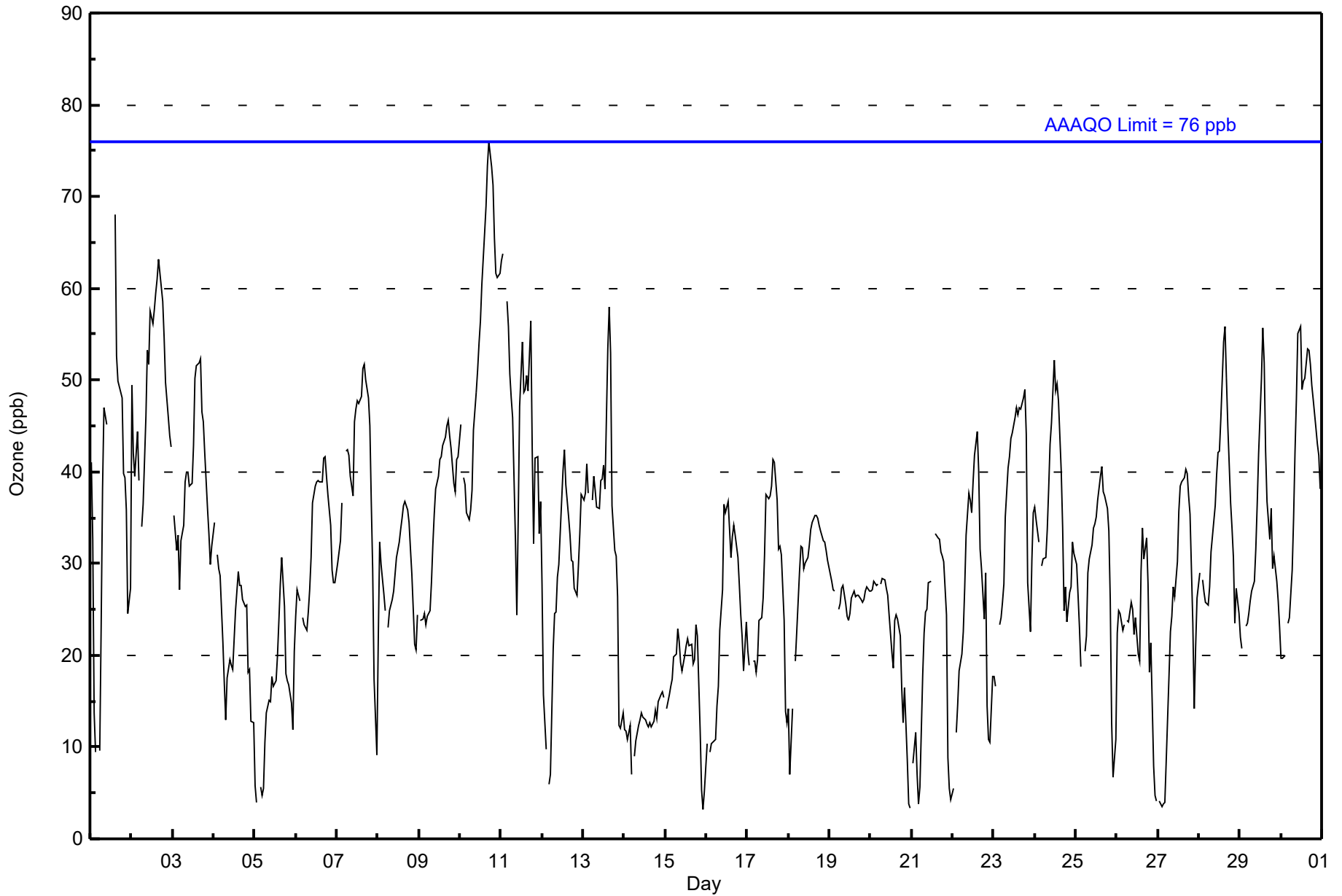
Ozone (O₃) - ppb

Wapasu - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 75.9 ppb on Jun 10 18:00	Maximum Daily Average: 54.8 ppb on Jun 10		Hours of Data:	684
Minimum Value: 3.3 ppb on Jun 15 23:00	Minimum Daily Average: 12.6 ppb on Jun 14		Hours of Missing Data:	36
Maximum Diurnal Average: 40.9 ppb at hour 15	Minimum Diurnal Average: 21.9 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 30.82 ppb	Percentiles: P ₁ = 4.0 P ₁₀ = 13.0 Q ₁ = 22.6 Median = 30.0 Q ₃ = 39.0 P ₉₀ = 48.7 P ₉₉ = 65.6		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-Jun	41.0	32.7	13.7	9.5	Z	9.5	23.0	38.2	46.9	45.2	C	C	C	C	68.0	52.6	49.9	49.3	48.1	39.8	39.3	35.9	24.5	27.3	36.6	68.0																						
2-Jun	49.4	41.9	39.6	44.4	39.0	Z	33.9	36.5	46.0	53.3	51.7	57.5	56.2	57.7	59.4	61.1	63.1	60.1	58.5	54.5	49.8	45.9	44.0	42.8	49.8	63.1																						
3-Jun	Z	35.2	31.4	33.1	27.1	32.5	34.2	38.9	40.0	40.0	38.4	38.8	42.9	50.2	51.5	51.9	52.3	46.6	45.5	42.1	35.9	33.3	30.0	31.9	39.3	52.3																						
4-Jun	34.5	Z	31.0	29.4	28.6	21.4	16.9	13.0	17.6	19.5	18.9	18.5	21.6	24.9	29.2	27.6	27.6	26.1	25.3	25.4	18.1	18.5	12.8	12.7	22.6	34.5																						
5-Jun	5.8	4.0	Z	5.7	4.7	5.5	10.6	13.7	15.1	15.0	17.7	16.6	17.2	20.0	23.8	27.8	30.6	25.3	18.0	17.3	16.8	14.9	11.9	20.5	15.6	30.6																						
6-Jun	24.2	27.2	25.9	Z	24.1	23.3	22.7	24.7	27.1	30.6	36.5	38.5	38.9	39.1	38.9	38.8	41.5	41.6	39.5	37.5	34.2	29.2	27.9	27.9	32.2	41.6																						
7-Jun	30.0	31.3	32.5	36.6	Z	42.2	42.4	41.7	39.5	37.3	45.4	46.8	47.8	47.5	48.2	51.2	51.8	50.0	48.1	44.9	36.7	29.5	17.4	9.2	39.5	51.8																						
8-Jun	21.7	32.3	30.0	26.7	24.8	Z	23.1	24.8	26.1	27.1	28.8	30.6	32.4	33.7	35.0	36.3	36.7	35.8	34.4	31.6	28.8	21.3	20.6	24.5	29.0	36.7																						
9-Jun	Z	23.8	23.9	24.6	23.4	24.2	24.8	27.9	32.0	35.4	38.2	39.4	41.3	41.6	42.8	43.7	44.9	45.5	44.0	42.5	38.8	37.8	41.3	41.6	35.8	45.5																						
10-Jun	45.2	Z	39.3	38.5	35.5	34.8	35.8	37.9	44.6	48.7	51.1	54.1	56.5	60.4	66.1	68.9	73.4	75.9	73.2	71.2	65.5	61.7	61.2	61.6	54.8	75.9																						
11-Jun	62.9	63.7	Z	58.5	55.9	50.6	48.1	46.0	32.7	24.4	35.0	47.2	54.1	48.6	48.9	50.5	48.8	56.5	42.4	32.2	41.5	41.6	33.3	36.7	46.1	63.7																						
12-Jun	27.8	15.7	9.7	Z	5.9	7.0	20.8	24.5	24.8	28.6	29.9	36.7	40.1	42.4	38.6	35.1	33.2	30.4	30.2	27.3	26.6	29.8	33.3	37.5	27.6	42.4																						
13-Jun	37.0	37.7	40.8	37.6	Z	36.9	39.5	38.0	36.2	36.0	39.1	39.2	40.8	38.2	53.4	57.9	52.9	36.3	31.5	30.8	26.3	12.3	12.0	13.7	35.8	57.9																						
14-Jun	11.9	11.7	10.8	12.3	7.1	Z	9.0	10.7	12.3	13.0	13.8	13.3	13.0	12.5	12.3	12.6	12.2	12.8	14.1	13.1	15.0	15.7	16.0	15.4	12.6	16.0																						
15-Jun	Z	14.1	15.7	16.7	17.3	19.8	20.2	22.8	21.5	19.2	18.3	20.0	21.0	21.8	21.1	21.1	19.0	19.6	23.3	22.1	11.7	5.3	3.3	5.2	17.4	23.3																						
16-Jun	10.3	Z	9.5	10.4	10.5	10.9	14.5	16.6	22.7	27.2	36.5	35.5	36.1	36.8	30.7	33.0	34.2	33.1	30.6	27.6	24.3	21.9	18.3	23.7	24.1	36.8																						
17-Jun	20.6	18.9	Z	19.3	19.4	18.2	19.5	23.8	24.1	26.2	30.9	37.6	37.1	37.3	38.5	41.3	41.0	36.9	31.6	31.8	30.9	23.8	13.9	12.6	27.6	41.3																						
18-Jun	14.2	7.0	14.1	Z	19.4	22.6	29.1	31.8	31.7	29.4	30.0	30.6	32.0	33.7	34.5	35.3	35.3	34.9	34.1	33.5	32.4	32.3	31.4	30.4	28.7	35.3																						
19-Jun	28.8	28.1	27.1	27.0	Z	25.0	25.6	27.2	27.6	25.6	24.3	23.9	24.5	26.3	27.0	26.4	26.5	26.5	26.1	25.8	26.0	26.9	27.4	26.9	26.4	28.8																						
20-Jun	27.0	27.1	28.0	27.6	27.8	Z	27.8	28.4	28.3	27.3	26.5	24.3	20.2	18.6	23.7	24.5	23.9	22.2	16.5	12.6	16.5	8.5	3.8	3.3	21.5	28.4																						
21-Jun	Z	8.3	11.5	7.1	3.9	5.7	17.8	22.5	24.7	25.0	27.9	28.1	M	M	33.3	32.8	32.6	31.3	30.8	30.1	24.5	8.9	5.6	4.2	19.8	33.3																						
22-Jun	5.5	Z	11.6	14.6	18.2	20.2	22.6	27.4	33.1	37.6	36.9	35.6	38.9	41.9	44.3	40.1	31.6	29.4	23.9	29.0	14.4	10.8	10.5	17.7	25.9	44.3																						
23-Jun	17.7	16.6	Z	23.3	24.1	25.8	27.7	35.1	40.4	41.6	43.6	44.2	45.9	47.0	46.3	47.0	46.9	48.0	48.9	44.1	27.9	22.6	30.3	35.5	36.1	48.9																						
24-Jun	36.1	34.7	32.4	Z	29.8	30.5	30.7	33.7	38.1	43.0	45.3	52.1	48.7	49.6	47.7	39.9	33.9	24.8	27.5	23.6	26.8	27.4	32.3	31.1	35.6	52.1																						
25-Jun	30.0	26.6	23.1	18.8	Z	20.4	22.2	29.0	30.5	32.0	33.8	34.3	35.2	36.9	39.5	40.5	37.8	37.4	36.0	33.5	26.0	12.7	6.7	10.9	28.4	40.5																						
26-Jun	22.5	24.9	24.6	22.8	23.3	Z	23.8	23.6	25.7	25.0	22.2	24.1	20.2	19.4	29.1	33.9	30.5	32.8	27.7	18.2	21.3	7.9	4.7	4.2	22.3	33.9																						
27-Jun	Z	4.1	3.5	3.8	4.0	8.6	17.8	22.6	24.2	27.5	26.3	30.2	35.7	38.4	38.9	39.4	40.3	39.7	37.4	35.3	23.5	14.2	20.9	26.2	24.5	40.3																						
28-Jun	29.0	Z	28.3	26.9	25.7	25.5	27.4	31.3	33.0	36.4	39.7	42.1	42.3	45.8	54.2	55.8	50.2	45.0	36.6	33.9	30.7	23.5	27.2	24.6	35.4	55.8																						
29-Jun	22.0	20.7	Z	23.2	23.5	24.6	26.0	27.0	28.0	31.5	36.4	42.0	50.0	55.7	51.9	42.3	36.8	32.7	36.0	29.5	30.8	28.1	25.9	23.1	32.5	55.7																						
30-Jun	19.7	19.6	20.0	Z	23.5	24.1	29.3	35.0	42.1	47.9	55.1	55.8	48.9	49.9	50.2	53.4	53.3	51.7	49.4	48.0	44.7	43.0	41.7	38.1	41.1	55.8																						
																								27.0	24.3	23.1	23.9	21.9	22.8	25.6	28.5	30.6	31.9	33.7	35.8	37.1	38.4	40.9	40.8	39.8	37.9	35.6	33.0	29.5	24.8	23.0	24.0	Diurnal Average
																								62.9	63.7	40.8	58.5	55.9	50.6	48.1	46.0	46.9	53.3	55.1	57.5	56.5	60.4	68.0	68.9	73.4	75.9	73.2	71.2	65.5	61.7	61.2	61.6	Diurnal Maximum

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Wapasu - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	147	21.49	21.49
21 - 50	485	70.91	92.40
51 - 82	52	7.60	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
Wapasu - June 2023**

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	8	5	6	6	14	27	10	7	5	3	2	1	1	2	26	147
21 - 50	53	35	36	18	16	19	32	58	44	35	51	15	9	10	17	37	485
51 - 82	7	1	4	0	1	2	0	12	7	0	4	5	1	1	0	7	52
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	84	44	45	24	23	35	59	80	58	40	58	22	11	12	19	70	684

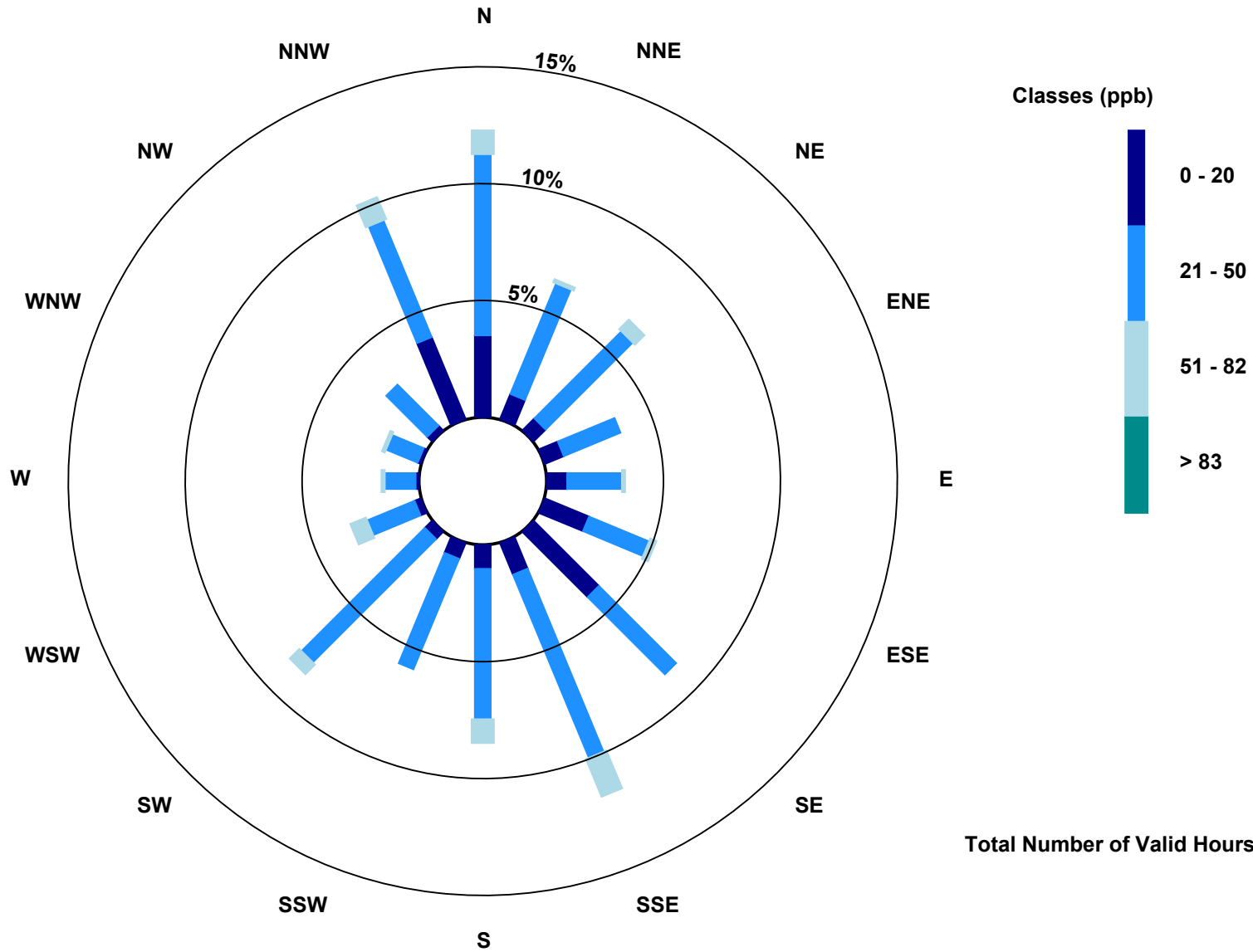
Total Number of Valid Hours: 684

Total Number of Hours: 720

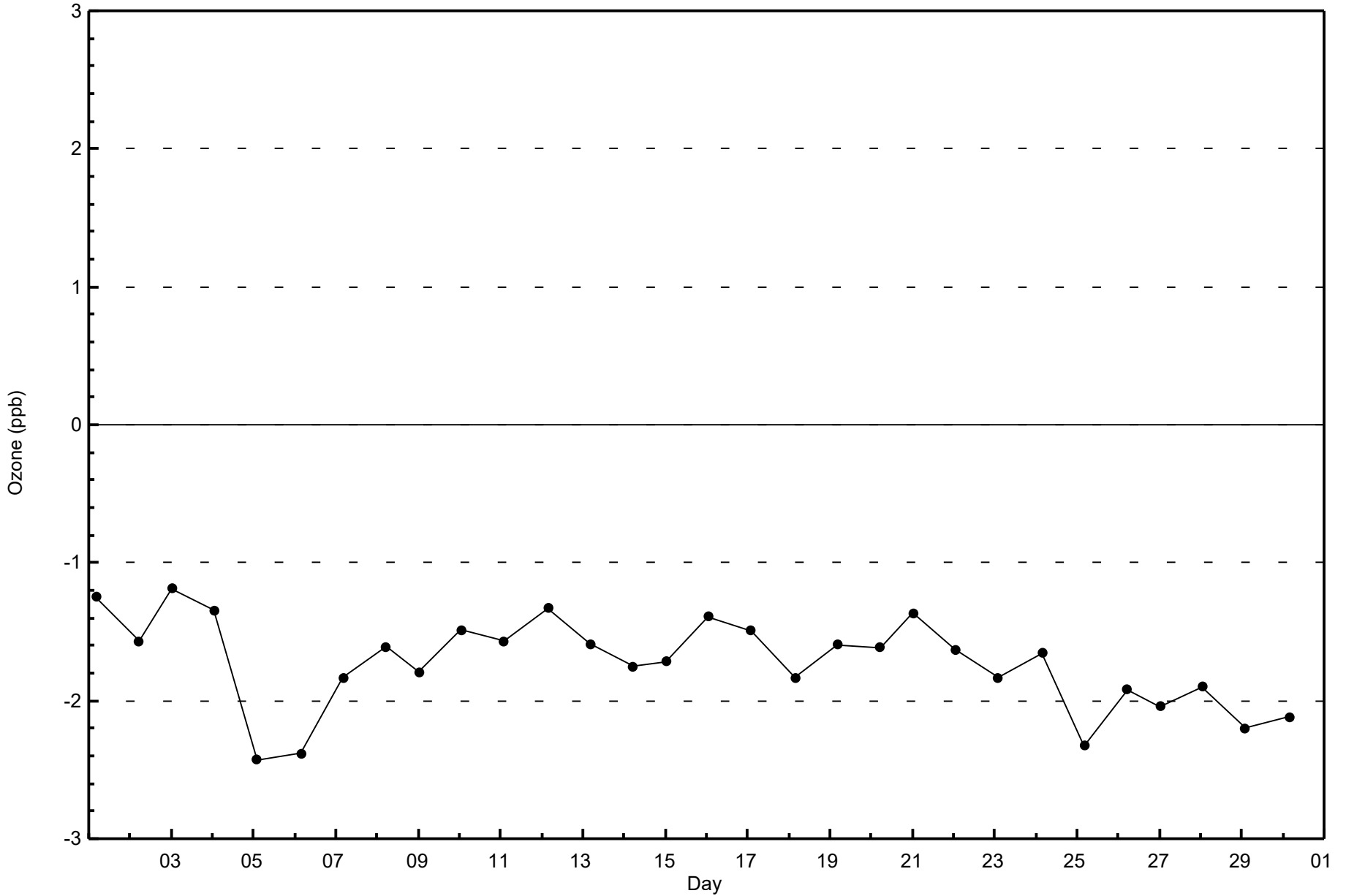


Wood Buffalo Environmental Association
 Wind Rose Jun 2023

Ozone (O₃) - ppb
 Wapasu



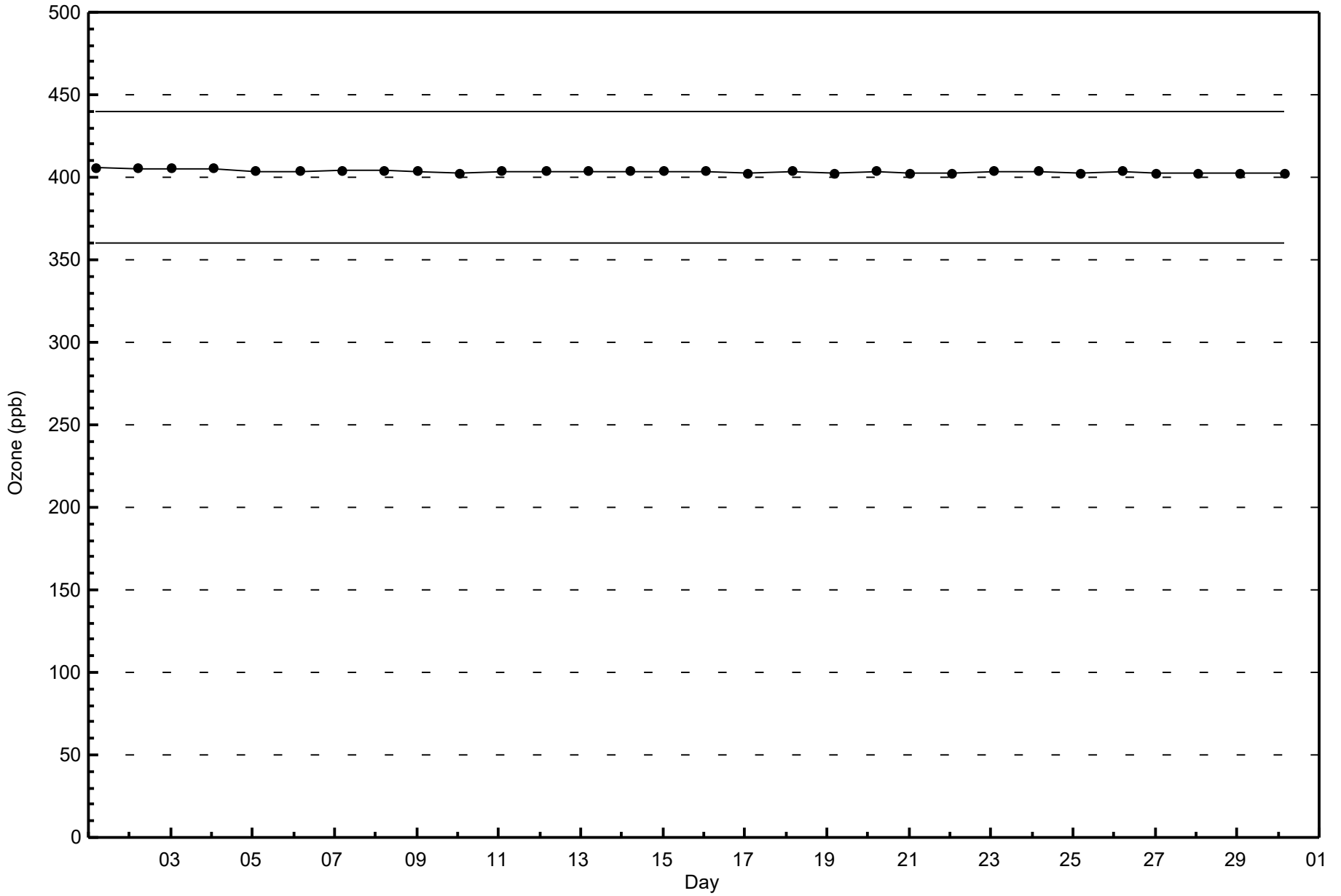
Total Number of Valid Hours: 684





Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Wapasu - June 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

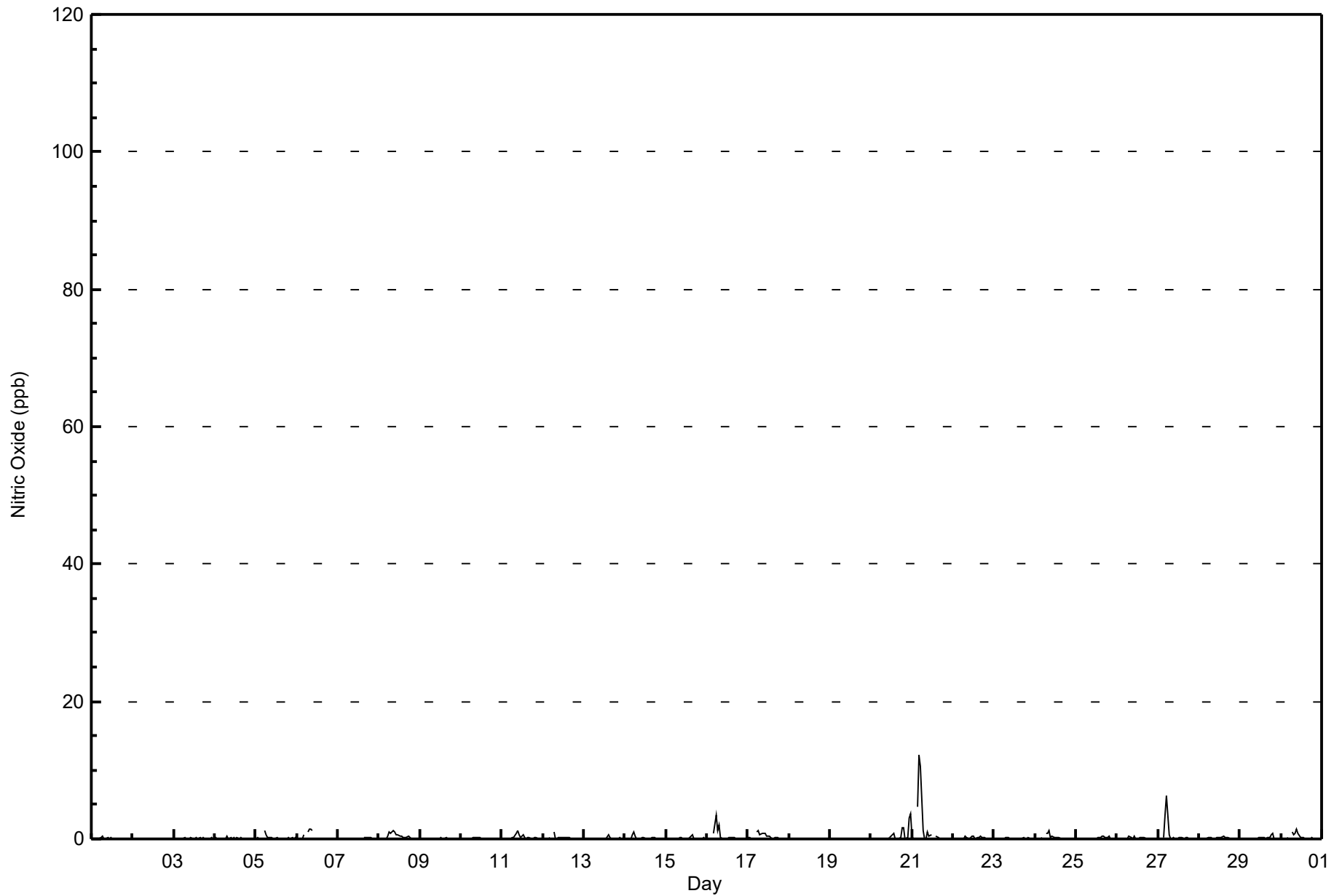
Nitric Oxide (NO) - ppb
Wapasu - June 2023

Maximum Value: 12.1 ppb on Jun 21 05:00		Maximum Daily Average: 1.5 ppb on Jun 21		Hours in Service:	720																					
Minimum Value: 0.0 ppb on Jun 1 02:00		Minimum Daily Average: 0.0 ppb on Jun 19		Hours of Data:	660																					
Maximum Diurnal Average: 1.0 ppb at hour 6		Minimum Diurnal Average: 0.0 ppb at hour 3		Hours of Missing Data:	60																					
Monthly Average: 0.21 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.4 P ₉₉ = 3.2		Hours of Calibration:	37																					
				Percent Operational Time:	96.8																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	Z	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
2-Jun	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	0.0	0.0	0.0	0.0	0.0	0.1
3-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2
4-Jun	0.1	0.1	0.1	Z	0.0	0.0	0.1	0.3	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.3
5-Jun	0.1	0.1	0.1	0.0	Z	1.2	0.7	0.1	0.2	0.2	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.1	1.2
6-Jun	0.0	0.0	0.0	0.1	0.6	Z	1.1	1.4	1.4	1.2	C	C	C	C	M	M	M	M	M	M	M	M	M	M	M	--
7-Jun	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	--
8-Jun	0.1	Z	0.0	0.0	0.0	0.3	1.0	0.8	1.3	1.0	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.4	1.3
9-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
10-Jun	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
11-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.3	0.7	1.3	0.6	0.3	0.7	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2
12-Jun	0.1	0.1	0.1	0.1	0.2	Z	1.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1
13-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.5
14-Jun	0.0	Z	0.0	0.0	0.5	1.1	0.5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1
15-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.5
16-Jun	0.0	0.0	0.0	Z	0.9	3.4	1.2	2.0	0.3	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.4	3.4
17-Jun	0.2	0.2	0.1	0.0	Z	1.1	1.2	0.6	0.8	0.8	0.8	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2
18-Jun	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
19-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.7	0.0	0.1	0.0	0.2	1.6	1.7	0.1	0.2	3.0	3.7	0.5	3.7
21-Jun	0.5	0.1	Z	4.7	12.1	10.5	1.3	0.0	0.0	0.9	0.5	0.6	M	M	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	12.1
22-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	0.1	0.1	0.1	0.3	0.4	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4
23-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
24-Jun	0.0	0.0	0.0	0.0	0.1	Z	0.8	0.8	1.2	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.2
25-Jun	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	0.3	0.3	0.4	0.1	0.2	0.4	0.1	0.0	0.0	0.0	0.1	0.4
26-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.3	0.0	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.3
27-Jun	0.0	0.0	Z	0.2	3.5	6.3	0.6	0.0	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.5	6.3
28-Jun	0.0	0.0	0.0	Z	0.0	0.2	0.3	0.2	0.1	0.0	0.1	0.3	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.4
29-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.6	0.9	0.1	0.0	0.0	0.0	0.1	0.9
30-Jun	0.0	0.0	0.0	0.0	0.2	Z	1.0	0.6	0.9	1.3	0.8	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	0.3	1.3
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.4		
																								0.0 0.1		
																								0.0 0.2		
																								0.1 0.3		
																								0.2 1.2		
																								-- 1.4		
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																								0.4 3.4		
																								0.3 1.2		
																								0.0 0.0		
																								0.0 0.0		
																								0.5 3.7		
																								1.5 12.1		
																								0.1 0.4		
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																								0.1 0.4		
																								0.1 0.9		
																								0.3 1.3		



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Wapasu - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	660	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: 660

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	84	47	42	22	23	37	60	74	56	36	46	19	10	12	19	73	660
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	84	47	42	22	23	37	60	74	56	36	46	19	10	12	19	73	660

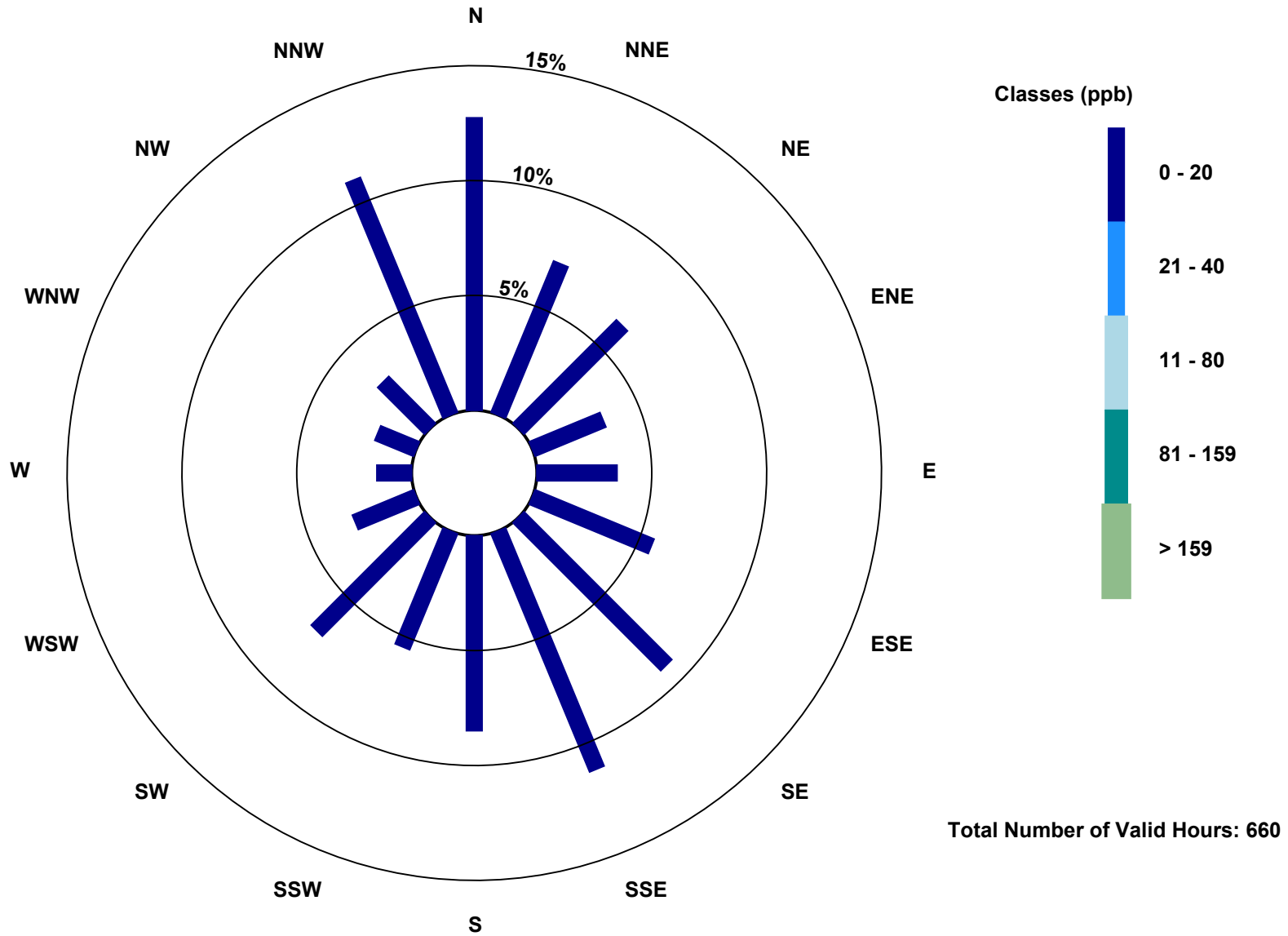
Total Number of Valid Hours: 660

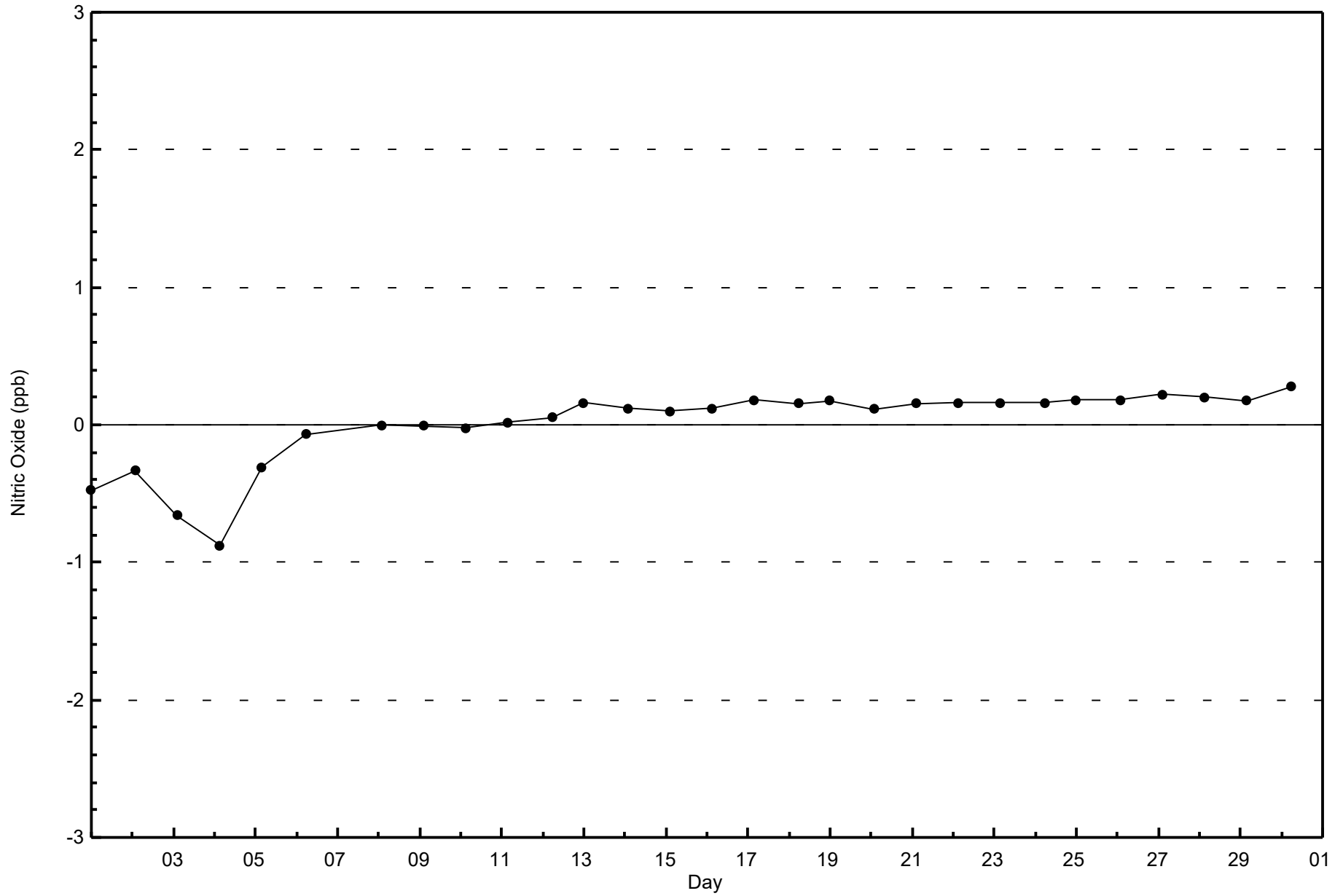
Total Number of Hours: 720

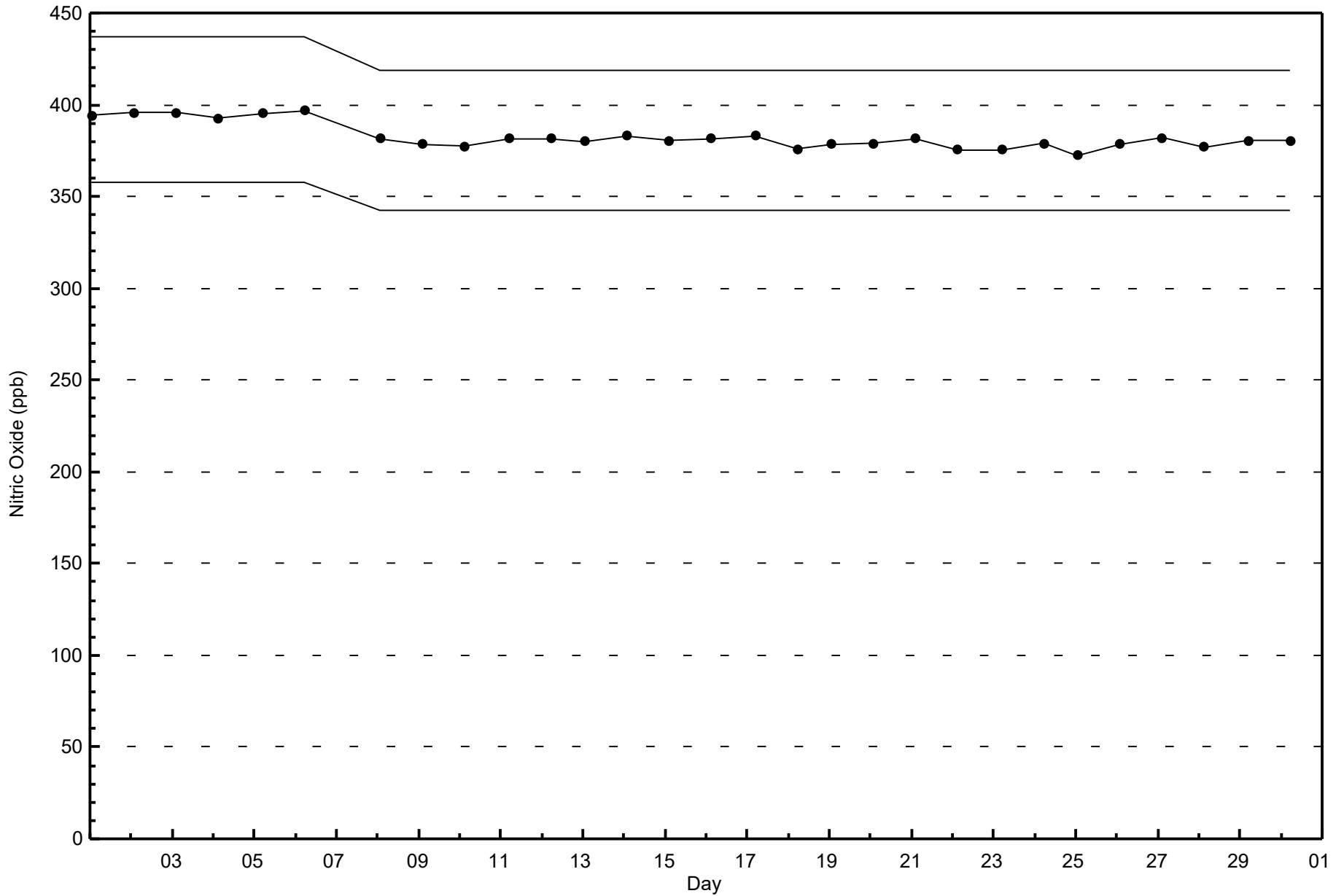


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Wapasu









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Wapasu - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 15.2 ppb on Jun 20 23:00	Maximum Daily Average: 3.5 ppb on Jun 11		Hours of Data:	660
Minimum Value: 0.2 ppb on Jun 18 03:00	Minimum Daily Average: 0.3 ppb on Jun 18		Hours of Missing Data:	60
Maximum Diurnal Average: 2.7 ppb at hour 6	Minimum Diurnal Average: 1.2 ppb at hour 21		Hours of Calibration:	37
Monthly Average: 1.76 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.2 Q ₃ = 2.2 P ₉₀ = 3.7 P ₉₉ = 9.3		Percent Operational Time:	96.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	3.6	5.3	2.6	5.0	4.6	6.2	3.0	2.4	3.2	2.3	4.2	2.6	4.1	3.8	1.7	1.2	1.4	1.2	1.2	1.5	2.0	1.4	1.1	2.9	6.2	
2-Jun	1.2	Z	3.6	1.4	1.6	1.6	1.9	1.9	2.0	2.5	2.8	3.6	2.7	2.7	3.0	2.6	2.4	2.0	1.8	1.6	1.2	1.2	1.0	0.9	2.1	3.6	
3-Jun	0.9	2.5	Z	1.2	1.2	1.5	2.1	1.0	0.7	0.6	0.7	0.8	0.9	1.7	1.1	1.2	1.3	1.0	0.8	1.2	2.5	1.9	3.1	1.3	1.4	3.1	
4-Jun	1.9	0.8	0.6	Z	1.0	0.8	2.2	5.5	0.8	1.0	0.9	0.7	0.6	0.7	0.5	0.6	0.5	0.6	0.6	0.5	0.6	0.6	3.2	0.6	1.1	5.5	
5-Jun	0.7	0.7	0.7	1.0	Z	2.2	3.5	2.4	1.1	1.1	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.5	0.5	1.3	0.9	0.8	1.3	2.0	1.1	3.5	
6-Jun	3.2	0.6	1.3	1.8	5.5	Z	2.9	3.0	2.8	2.6	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	5.5	
7-Jun	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	1.5	1.8	2.1	2.2	1.4	1.2	0.6	1.1	2.0	--	2.2	
8-Jun	3.7	Z	0.6	0.5	0.4	1.9	3.6	2.5	2.9	2.2	1.5	1.6	1.5	1.5	1.3	1.3	1.4	1.7	1.4	0.5	0.4	0.5	0.4	0.4	1.5	3.7	
9-Jun	0.7	2.0	Z	0.8	0.8	0.3	0.4	0.4	0.4	0.8	0.8	0.8	0.9	0.7	0.7	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.7	2.0	
10-Jun	0.6	0.6	1.2	Z	2.0	1.9	1.9	2.2	2.3	1.9	1.9	1.8	1.7	1.7	1.7	1.8	2.0	2.6	2.7	2.5	1.9	1.7	1.9	1.8	1.8	2.7	
11-Jun	2.2	2.1	1.9	2.0	Z	3.2	4.2	6.1	9.5	9.0	4.4	3.5	5.3	1.3	0.7	1.3	1.1	2.9	1.9	3.5	5.3	2.2	1.7	5.8	3.5	9.5	
12-Jun	5.9	3.4	2.5	2.4	1.6	Z	5.2	1.4	1.2	2.5	2.6	3.6	3.4	3.1	2.6	2.3	1.8	1.2	1.1	1.7	1.3	1.5	4.2	3.8	2.6	5.9	
13-Jun	Z	1.8	1.9	1.6	1.3	1.0	1.0	1.1	1.4	1.5	1.6	1.6	1.6	1.9	6.0	4.4	3.1	5.0	2.2	2.1	1.8	6.6	4.1	0.7	2.4	6.6	
14-Jun	0.7	Z	1.0	0.7	3.9	6.2	2.3	0.5	0.5	0.5	0.7	0.6	0.4	0.4	0.5	0.6	2.0	2.2	1.5	2.0	1.0	0.3	0.3	0.8	1.3	6.2	
15-Jun	1.9	2.4	Z	1.4	2.9	2.2	1.4	1.0	1.4	1.8	0.8	0.5	0.5	0.5	0.9	2.3	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.6	1.1	2.9	
16-Jun	1.1	1.7	2.8	Z	4.1	5.5	2.5	4.5	1.2	0.5	0.8	0.7	1.0	2.5	2.2	1.5	1.4	0.7	0.4	2.1	1.3	1.2	4.2	2.0	2.0	5.5	
17-Jun	5.6	6.1	4.6	3.9	Z	5.5	4.8	3.0	3.7	3.2	2.6	2.6	2.6	2.3	2.2	2.4	2.2	1.8	0.5	0.4	0.4	0.4	0.3	0.4	2.7	6.1	
18-Jun	0.4	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	
19-Jun	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
20-Jun	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.2	3.1	3.3	0.3	0.7	0.7	0.9	6.7	9.6	2.3	10.1	15.2	12.7	3.0	15.2	
21-Jun	4.2	2.1	Z	7.5	13.6	12.2	3.0	0.5	0.4	2.2	1.3	2.1	M	M	1.1	0.8	0.4	0.5	0.3	0.4	0.7	0.6	0.6	1.9	2.7	13.6	
22-Jun	1.1	1.5	0.6	Z	0.4	0.4	0.4	1.5	0.7	0.7	0.9	1.7	2.2	0.9	2.1	2.7	2.7	2.6	1.7	1.8	1.3	1.8	1.4	1.3	1.4	2.7	
23-Jun	1.6	1.2	0.6	0.8	Z	0.7	0.7	1.1	1.1	0.7	0.7	0.8	0.8	0.9	0.8	0.9	1.1	1.3	1.5	2.0	1.8	1.4	1.1	0.8	1.1	2.0	
24-Jun	0.9	1.0	1.6	2.6	3.1	Z	3.7	3.3	4.0	1.7	2.1	2.2	1.4	1.3	1.7	2.1	1.1	0.8	2.4	2.5	0.9	0.3	0.3	0.2	1.8	4.0	
25-Jun	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.6	1.2	1.3	1.4	0.6	0.9	2.6	0.9	0.6	0.6	1.4	0.7	2.6	
26-Jun	1.1	Z	0.7	1.0	0.7	0.5	0.5	1.6	1.0	1.1	2.1	0.9	1.2	1.3	1.7	1.6	2.6	0.8	0.6	0.6	0.9	0.6	0.5	0.6	1.1	2.6	
27-Jun	1.3	1.5	Z	1.0	2.6	9.2	1.8	0.5	0.5	0.9	0.4	0.5	0.9	1.0	1.0	0.8	1.1	1.0	0.5	0.4	0.5	0.5	0.6	0.4	1.3	9.2	
28-Jun	0.4	0.5	0.6	Z	1.5	2.3	1.9	1.1	0.7	0.7	1.1	1.6	1.2	2.0	5.2	3.7	2.5	2.2	0.8	0.6	0.7	0.6	0.8	1.3	1.5	5.2	
29-Jun	2.1	2.9	2.6	1.4	Z	0.8	0.8	0.7	0.8	0.7	0.8	1.3	1.7	2.1	1.7	2.5	4.8	4.4	5.0	8.5	2.5	1.8	3.4	6.4	2.6	8.5	
30-Jun	6.9	7.1	6.2	5.1	4.0	Z	4.7	3.9	5.2	7.1	5.6	2.7	2.2	1.9	1.2	0.9	0.8	0.7	1.2	0.6	0.5	0.6	2.3	5.6	3.3	7.1	

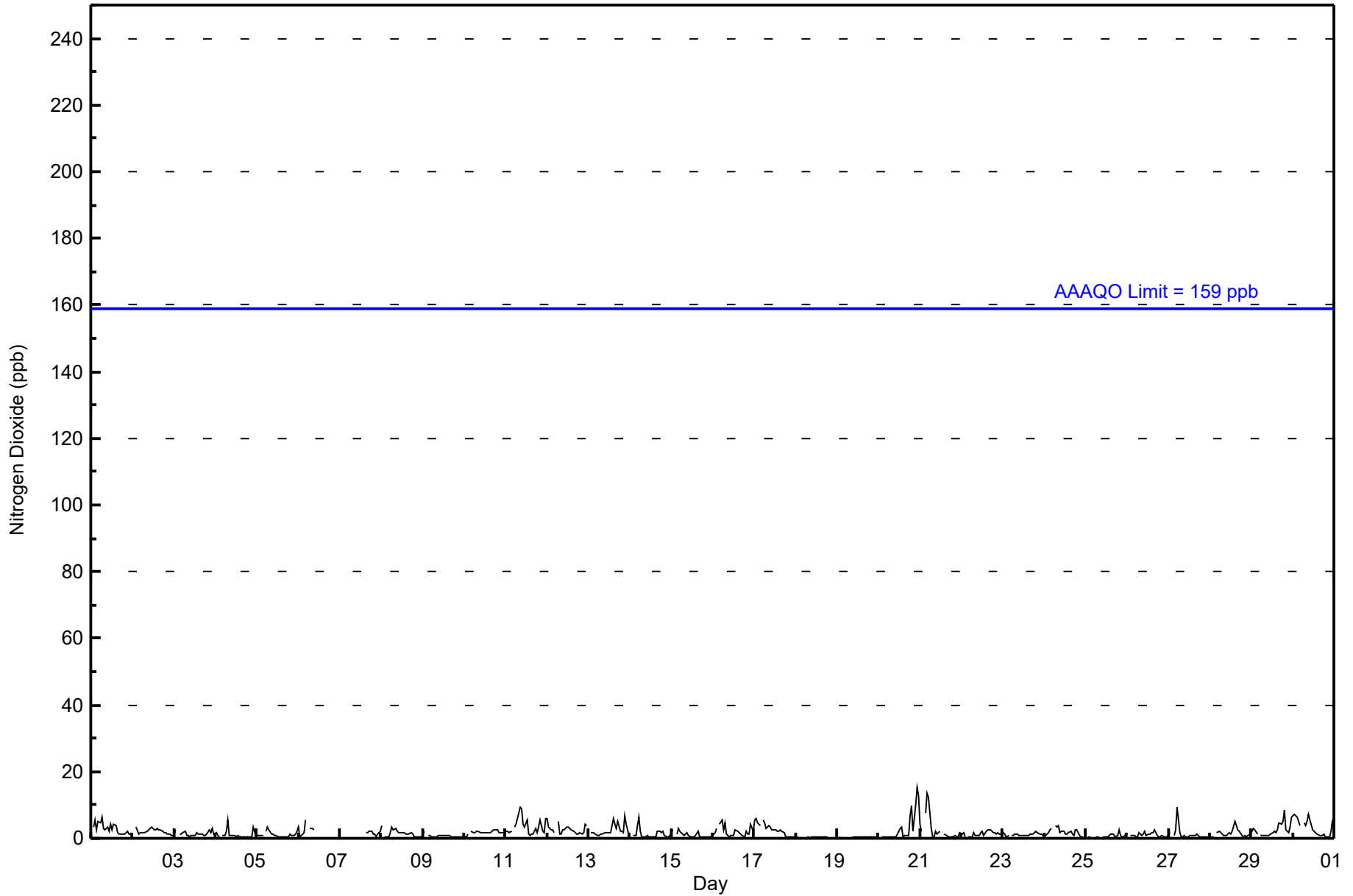
2.0	2.0	1.7	1.7	2.4	2.7	2.2	1.9	1.7	1.8	1.5	1.5	1.5	1.5	1.7	1.6	1.5	1.5	1.4	1.8	1.2	1.4	1.9	2.0	Diurnal Average	
6.9	7.1	6.2	7.5	13.6	12.2	6.2	6.1	9.5	9.0	5.6	4.2	5.3	4.1	6.0	4.4	4.8	5.0	6.7	9.6	5.3	10.1	15.2	12.7	Diurnal Maximum	

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
Wapasu - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	660	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: 660

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	84	47	42	22	23	37	60	74	56	36	46	19	10	12	19	73	660
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	84	47	42	22	23	37	60	74	56	36	46	19	10	12	19	73	660

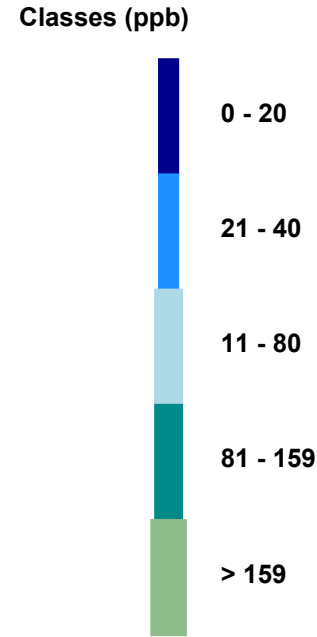
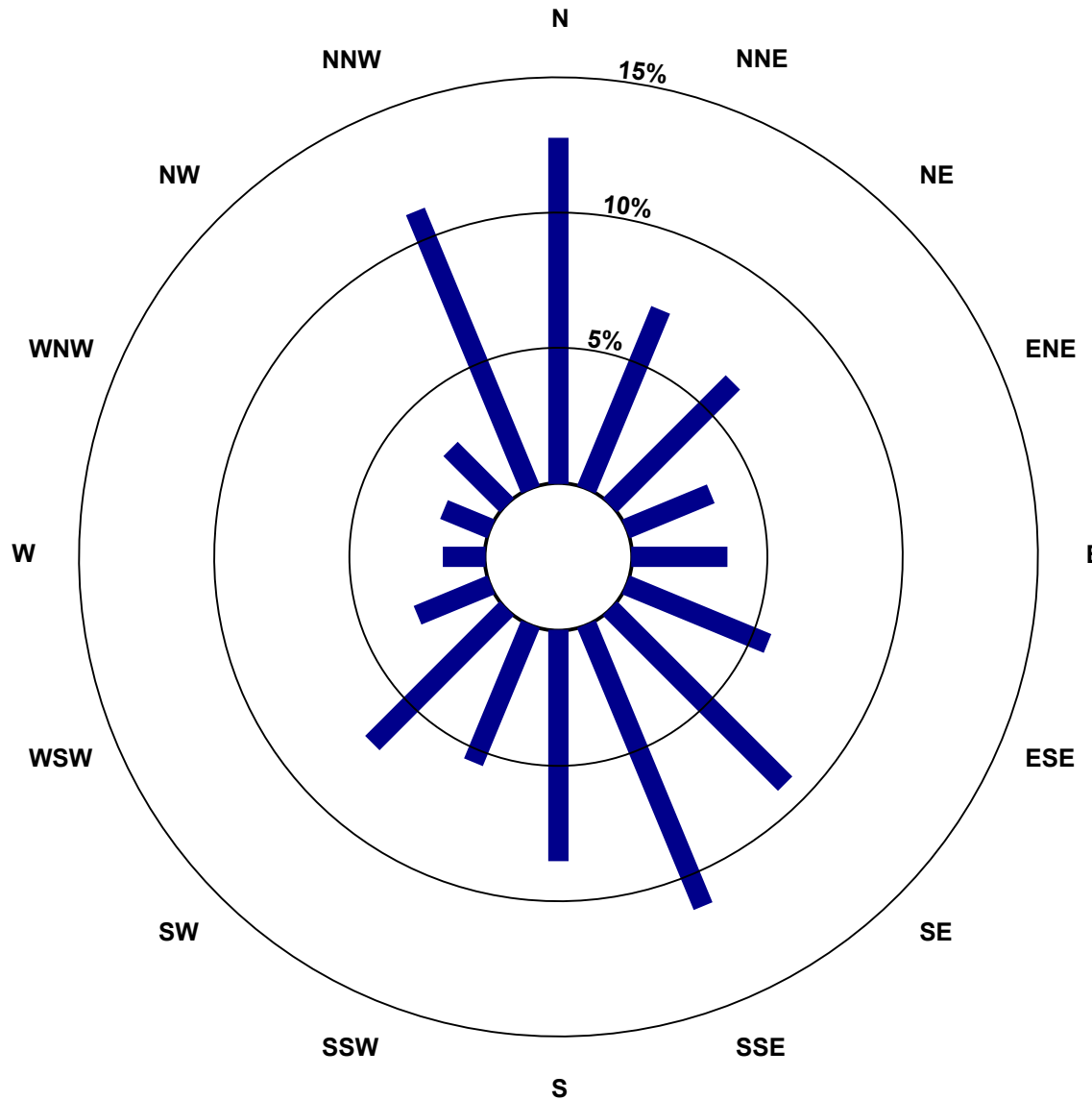
Total Number of Valid Hours: 660

Total Number of Hours: 720

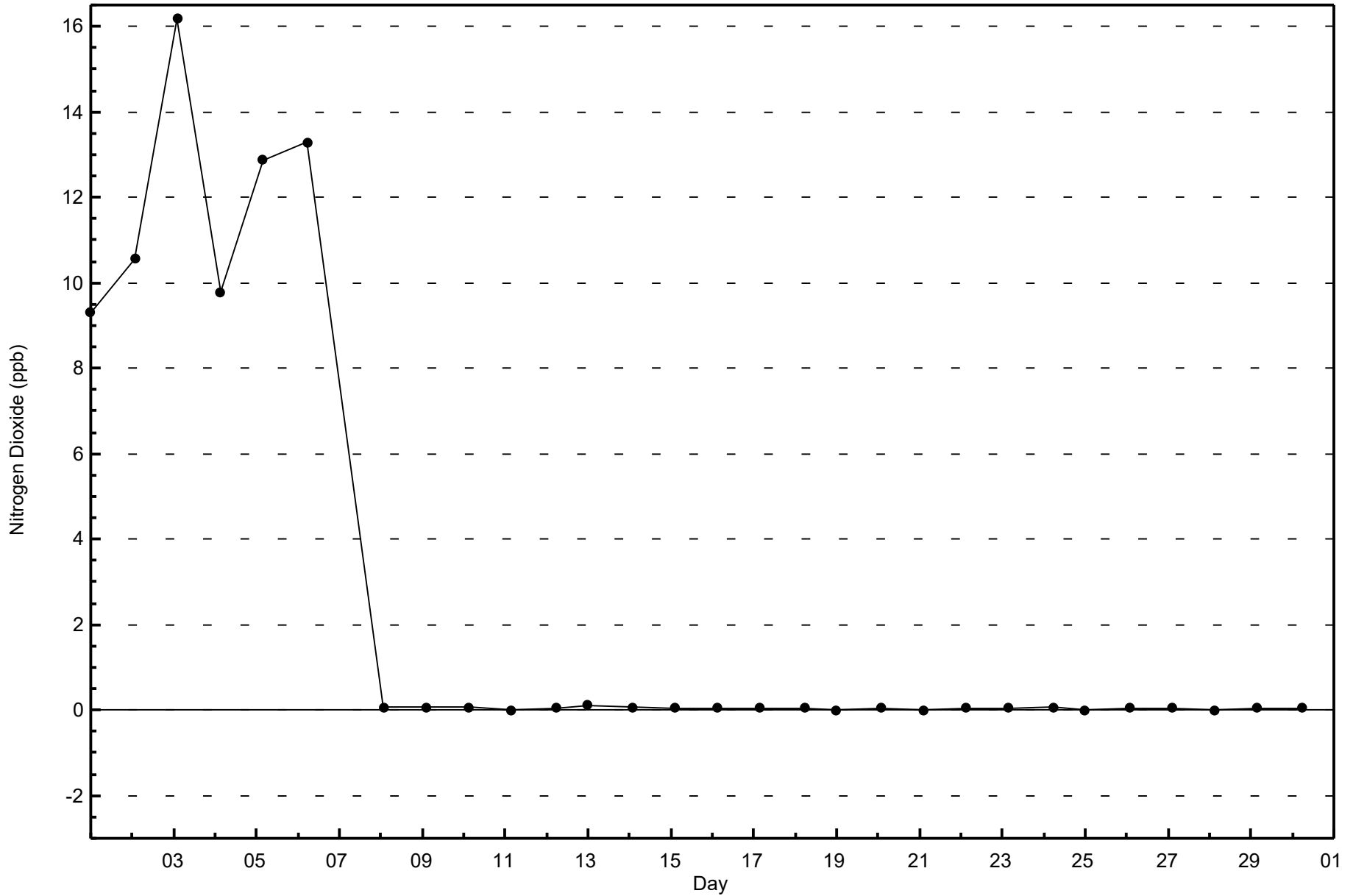


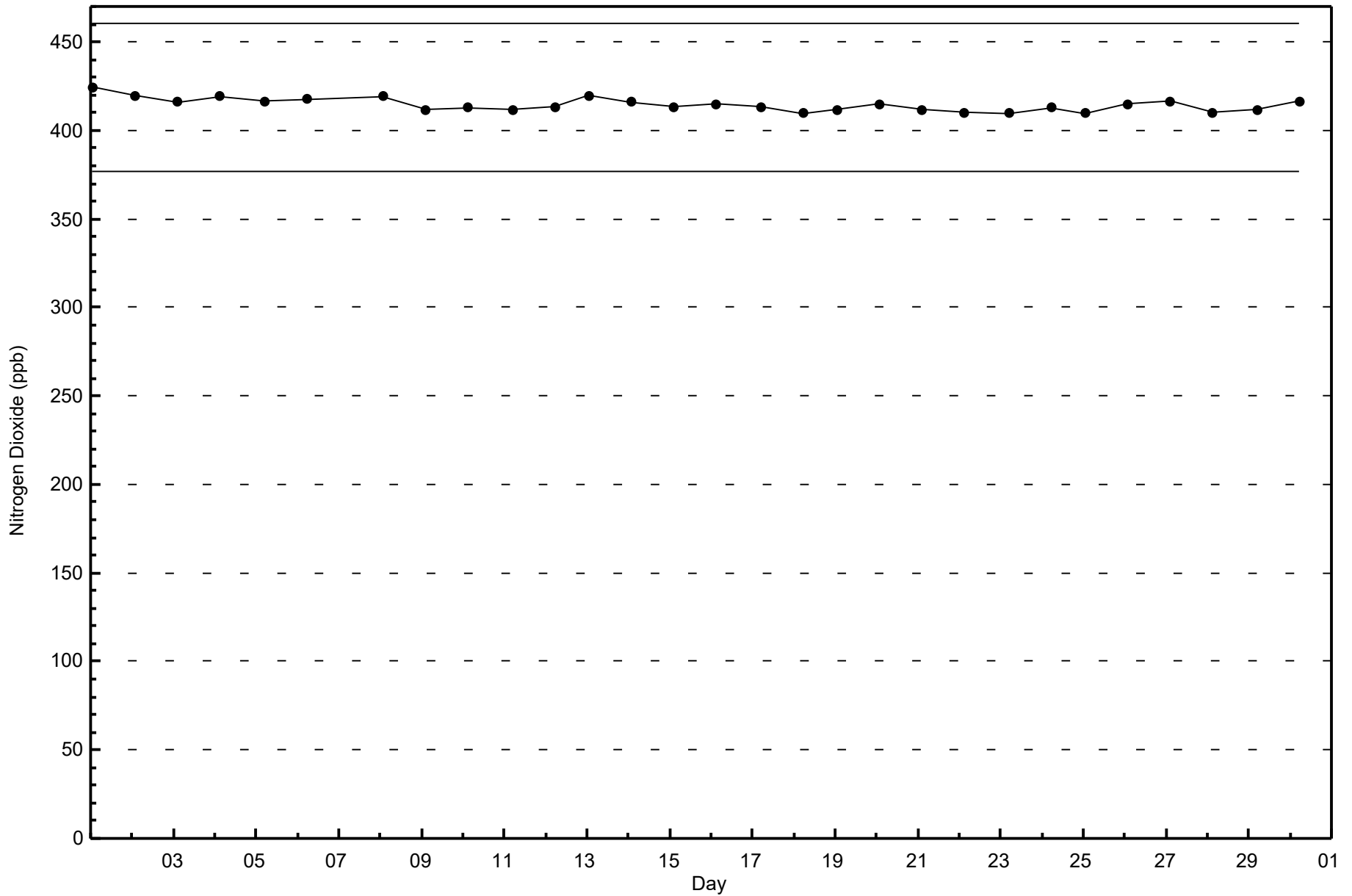
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Wapasu



Total Number of Valid Hours: 660







Wood Buffalo Environmental Association
Summary of Hour Averages

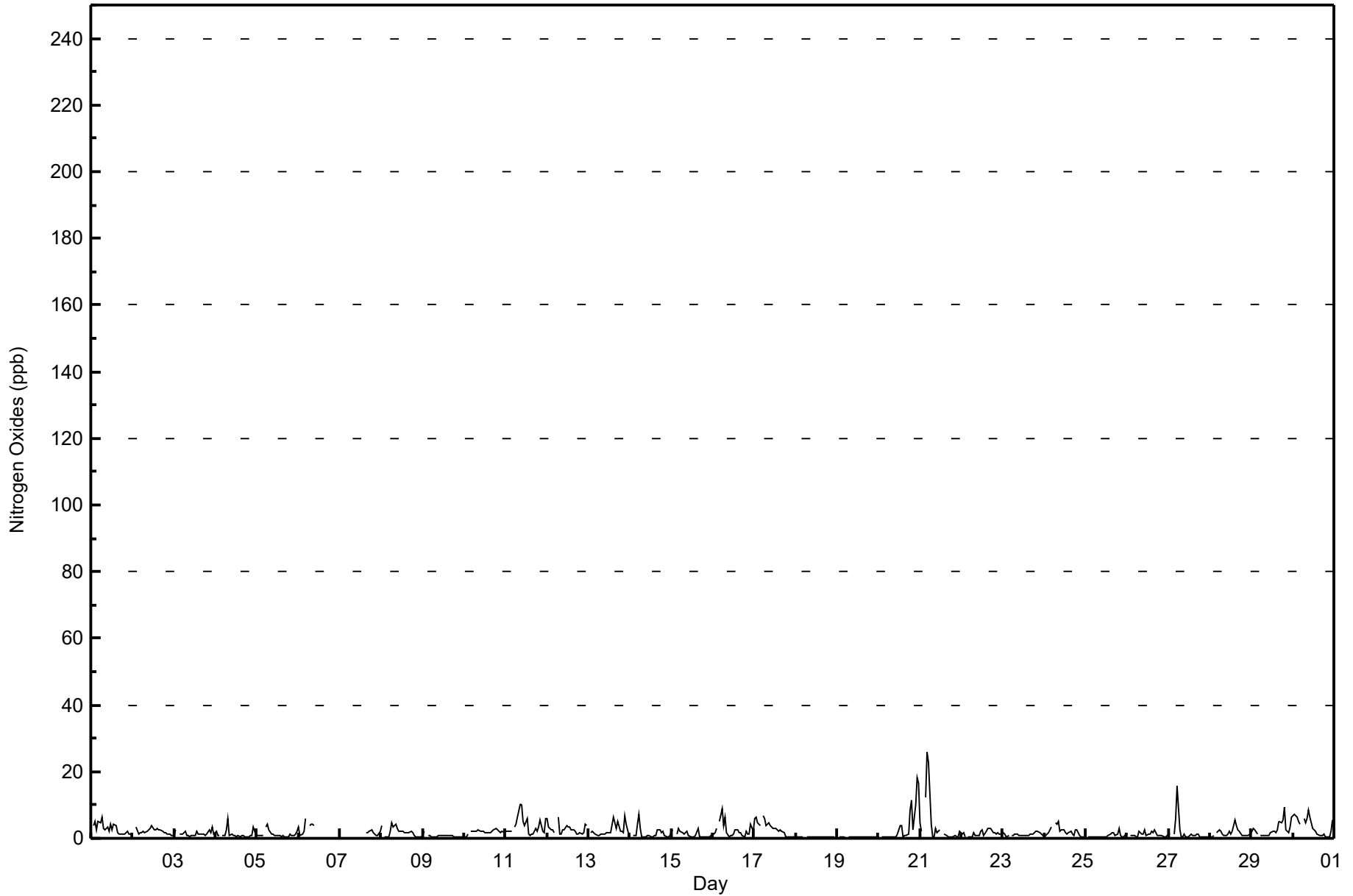
Nitrogen Oxides (NO_x) - ppb
Wapasu - June 2023

Maximum Value: 25.7 ppb on Jun 21 05:00 Maximum Daily Average: 4.2 ppb on Jun 21 Minimum Value: 0.2 ppb on Jun 19 06:00 Minimum Daily Average: 0.3 ppb on Jun 19 Maximum Diurnal Average: 3.8 ppb at hour 6 Minimum Diurnal Average: 1.3 ppb at hour 21 Monthly Average: 1.96 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.3 Q ₃ = 2.4 P ₉₀ = 4.2 P ₉₉ = 10.7																						Hours in Service:	720																								
																						Hours of Data:	660																								
																						Hours of Missing Data:	60																								
																						Hours of Calibration:	37																								
																						Percent Operational Time:	96.8																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jun	Z	3.6	5.3	2.6	5.0	4.9	6.6	3.1	2.4	3.3	2.3	4.4	2.6	4.2	3.8	1.7	1.2	1.4	1.2	1.2	1.5	2.0	1.4	1.1	2.9	6.6																					
2-Jun	1.2	Z	3.6	1.4	1.6	1.6	1.9	1.9	2.0	2.5	2.8	3.6	2.7	2.7	3.0	2.6	2.5	2.0	1.8	1.6	1.2	1.2	1.0	0.9	2.1	3.6																					
3-Jun	0.9	2.5	Z	1.2	1.2	1.5	2.3	1.0	0.7	0.6	0.8	0.9	0.9	1.9	1.1	1.4	1.3	1.1	0.8	1.2	2.5	1.9	3.2	1.3	1.4	3.2																					
4-Jun	2.0	0.9	0.7	Z	1.0	0.8	2.3	5.8	0.8	1.2	0.9	0.8	0.6	0.8	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.6	3.2	0.7	1.2	5.8																					
5-Jun	0.8	0.8	0.8	1.0	Z	3.4	4.2	2.5	1.3	1.3	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.6	1.4	1.0	1.0	1.3	2.1	1.2	4.2																					
6-Jun	3.2	0.6	1.3	1.9	6.1	Z	4.0	4.4	4.2	3.8	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	6.1																					
7-Jun	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	1.7	1.9	2.3	2.4	1.5	1.3	0.7	1.1	2.0	--	2.4																					
8-Jun	3.8	Z	0.6	0.5	0.4	2.2	4.6	3.3	4.2	3.2	2.1	2.2	2.0	1.9	1.6	1.6	1.7	2.0	1.6	0.6	0.5	0.5	0.4	0.4	1.8	4.6																					
9-Jun	0.7	2.0	Z	0.8	0.8	0.3	0.4	0.4	0.5	0.9	0.9	0.9	1.0	0.8	0.8	0.9	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.7	2.0																					
10-Jun	0.6	0.6	1.2	Z	2.1	2.0	2.0	2.3	2.4	2.0	2.0	1.9	1.8	1.8	1.8	1.9	2.1	2.7	2.8	2.6	2.0	1.7	1.9	1.8	1.9	2.8																					
11-Jun	2.2	2.1	1.9	2.0	Z	3.3	4.4	6.4	10.2	10.3	5.0	3.8	6.0	1.4	0.8	1.5	1.2	3.0	2.0	3.6	5.4	2.3	1.8	5.8	3.8	10.3																					
12-Jun	6.0	3.5	2.6	2.5	1.8	Z	6.3	1.4	1.3	2.6	2.7	3.8	3.6	3.3	2.7	2.4	1.9	1.3	1.1	1.7	1.3	1.5	4.2	3.8	2.7	6.3																					
13-Jun	Z	1.8	1.9	1.6	1.3	1.0	1.0	1.1	1.4	1.5	1.6	1.6	1.6	1.9	6.5	4.5	3.1	5.1	2.2	2.1	1.8	6.8	4.1	0.7	2.4	6.8																					
14-Jun	0.7	Z	1.0	0.7	4.4	7.3	2.8	0.6	0.6	0.6	0.8	0.7	0.4	0.4	0.6	0.7	2.3	2.4	1.5	2.0	1.0	0.3	0.3	0.8	1.4	7.3																					
15-Jun	1.9	2.4	Z	1.4	2.9	2.2	1.5	1.1	1.6	2.0	0.8	0.5	0.5	0.5	1.0	2.8	0.6	0.5	0.4	0.4	0.5	0.4	0.5	0.7	1.2	2.9																					
16-Jun	1.1	1.7	2.8	Z	5.0	8.9	3.7	6.5	1.5	0.5	0.8	0.7	1.1	2.7	2.4	1.6	1.5	0.7	0.4	2.2	1.3	1.2	4.3	2.0	2.4	8.9																					
17-Jun	5.8	6.3	4.7	3.9	Z	6.6	6.0	3.6	4.5	4.0	3.4	3.1	3.0	2.5	2.3	2.5	2.3	1.9	0.5	0.4	0.4	0.4	0.3	0.4	3.0	6.6																					
18-Jun	0.4	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4																					
19-Jun	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																					
20-Jun	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.4	3.7	4.0	0.3	0.8	0.7	1.1	8.3	11.3	2.4	10.3	18.2	16.4	3.6	18.2																					
21-Jun	4.7	2.2	Z	12.2	25.7	22.7	4.3	0.5	0.4	3.1	1.8	2.7	M	M	1.4	1.0	0.5	0.5	0.3	0.4	0.7	0.6	0.6	2.0	4.2	25.7																					
22-Jun	1.1	1.5	0.6	Z	0.4	0.4	0.4	1.9	0.8	0.8	1.0	2.0	2.6	1.0	2.3	2.8	3.0	2.9	1.8	1.9	1.4	1.8	1.4	1.3	1.5	3.0																					
23-Jun	1.6	1.2	0.6	0.8	Z	0.7	0.8	1.2	0.8	0.7	0.8	0.8	1.0	0.9	1.0	1.2	1.4	1.6	2.1	1.9	1.5	1.1	0.8	1.1	2.1																						
24-Jun	0.9	1.0	1.6	2.6	3.2	Z	4.5	4.1	5.2	2.0	2.4	2.5	1.5	1.4	1.8	2.2	1.2	0.8	2.5	2.6	0.9	0.3	0.3	0.2	2.0	5.2																					
25-Jun	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.7	1.5	1.6	1.8	0.7	1.1	3.0	1.0	0.6	0.6	1.4	0.7	3.0																					
26-Jun	1.1	Z	0.7	1.0	0.7	0.5	0.5	1.9	1.2	1.2	2.4	0.9	1.3	1.5	2.0	1.7	2.7	0.9	0.7	0.7	0.9	0.6	0.6	0.7	1.1	2.7																					
27-Jun	1.3	1.5	Z	1.2	6.1	15.5	2.4	0.5	0.6	1.1	0.4	0.5	1.0	1.2	1.1	0.9	1.3	1.1	0.6	0.5	0.6	0.6	0.6	0.4	1.8	15.5																					
28-Jun	0.4	0.5	0.6	Z	1.5	2.5	2.2	1.3	0.8	0.7	1.2	1.9	1.3	2.1	5.6	3.9	2.6	2.3	0.9	0.7	0.8	0.7	0.8	1.3	1.6	5.6																					
29-Jun	2.1	2.9	2.6	1.4	Z	0.9	0.9	0.8	0.9	0.8	0.9	1.5	1.9	2.3	1.8	2.6	5.0	4.7	5.6	9.4	2.6	1.8	3.4	6.4	2.7	9.4																					
30-Jun	6.9	7.1	6.2	5.1	4.2	Z	5.7	4.5	6.1	8.4	6.4	2.9	2.4	2.1	1.3	1.0	0.9	0.8	1.3	0.6	0.5	0.6	2.3	5.6	3.6	8.4																					
																						2.1	2.0	1.8	1.9	3.2	3.8	2.7	2.2	2.0	2.1	1.6	1.7	1.7	1.7	1.8	1.7	1.6	1.6	1.6	2.0	1.3	1.5	2.1	2.1	Diurnal Average	
																						6.9	7.1	6.2	12.2	25.7	22.7	6.6	6.5	10.2	10.3	6.4	4.4	6.0	4.2	6.5	4.5	5.0	5.1	8.3	11.3	5.4	10.3	18.2	16.4	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																															



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Wapasu - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Wapasu - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	658	99.70	99.70
21 - 40	2	0.30	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: 660

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	84	47	42	22	23	37	60	74	56	36	46	19	10	12	19	71	658
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	84	47	42	22	23	37	60	74	56	36	46	19	10	12	19	73	660

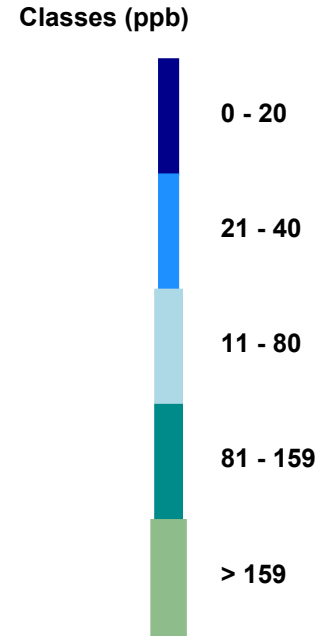
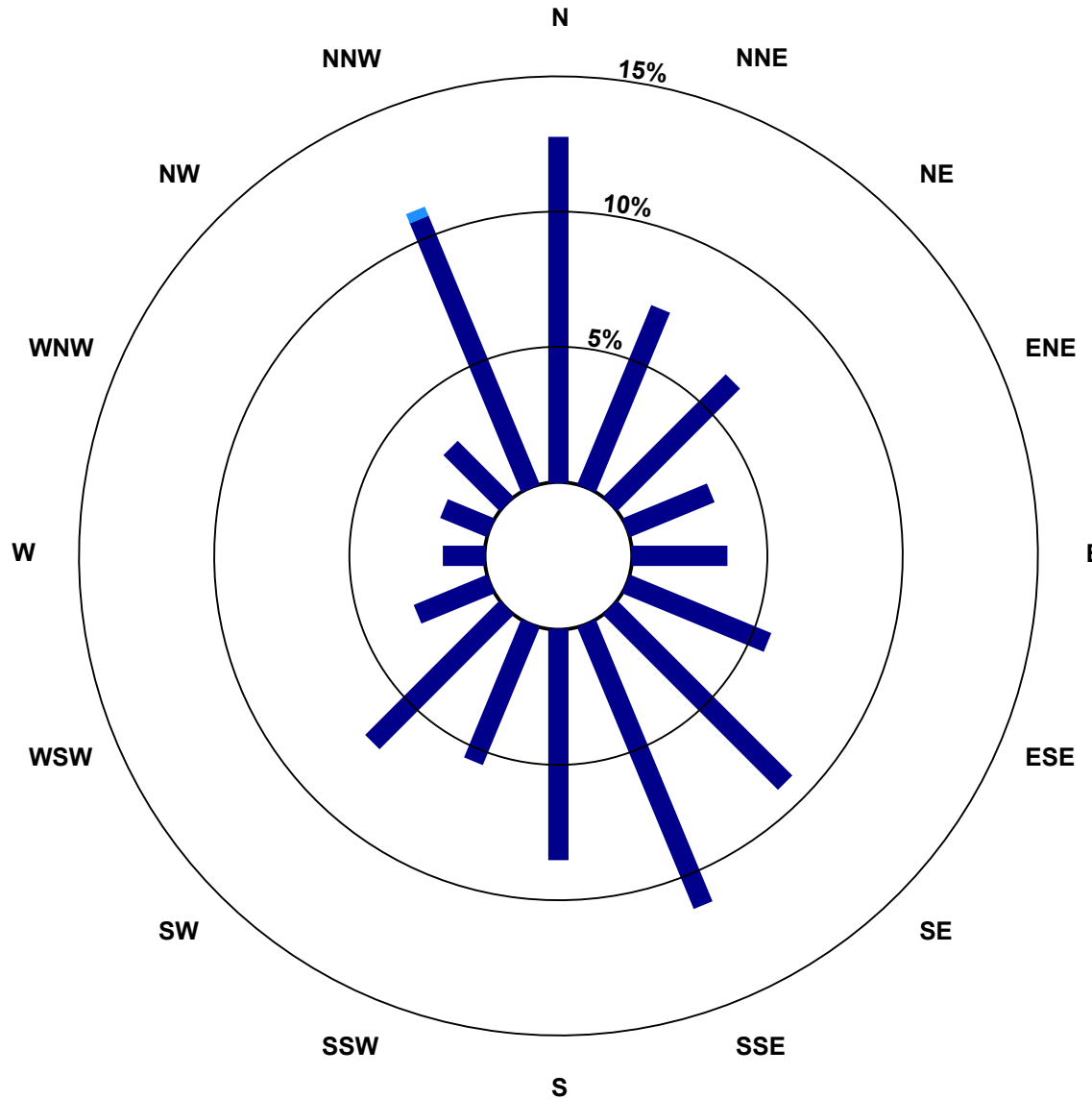
Total Number of Valid Hours: 660

Total Number of Hours: 720

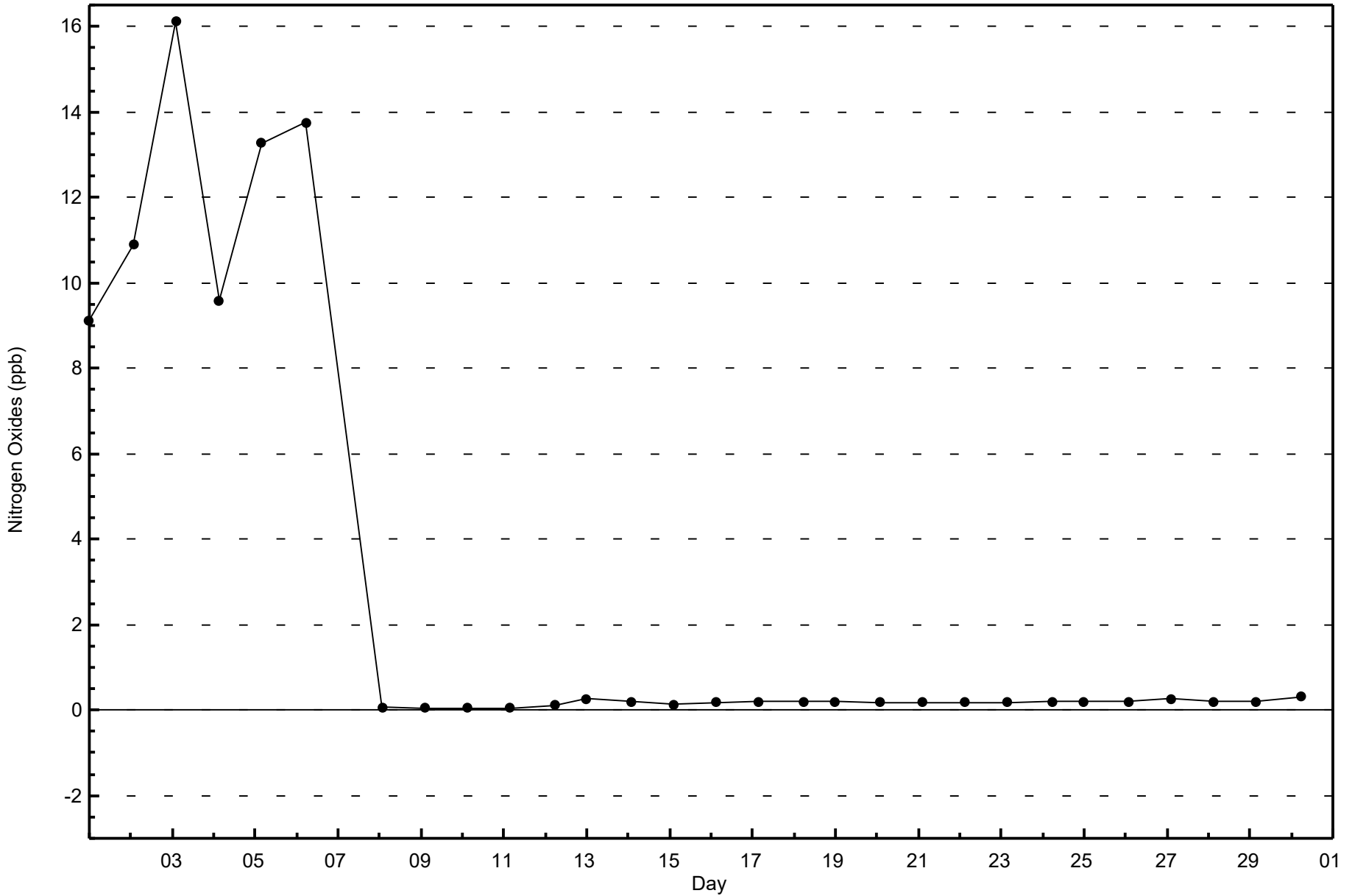


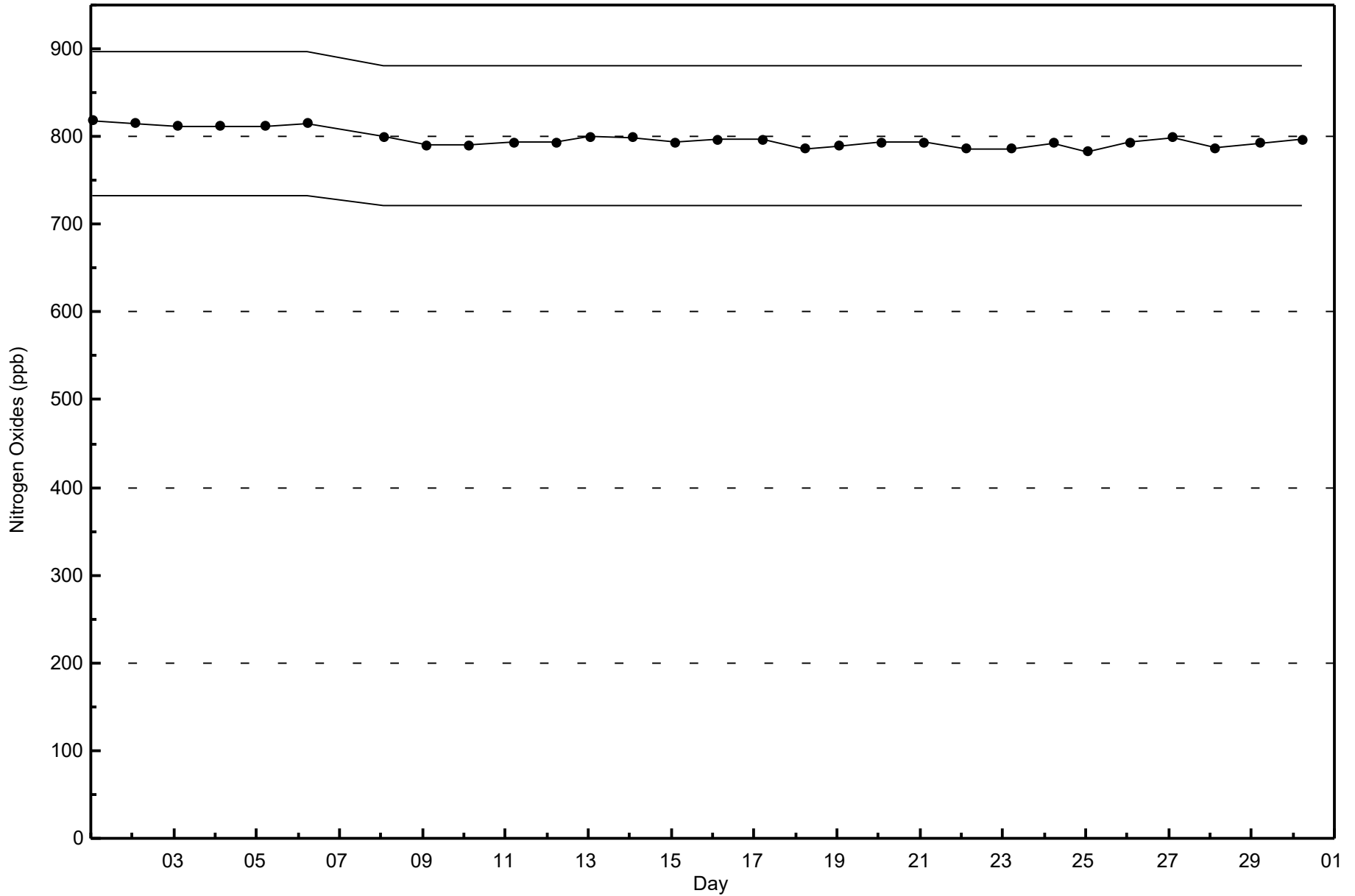
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Wapasu



Total Number of Valid Hours: 660







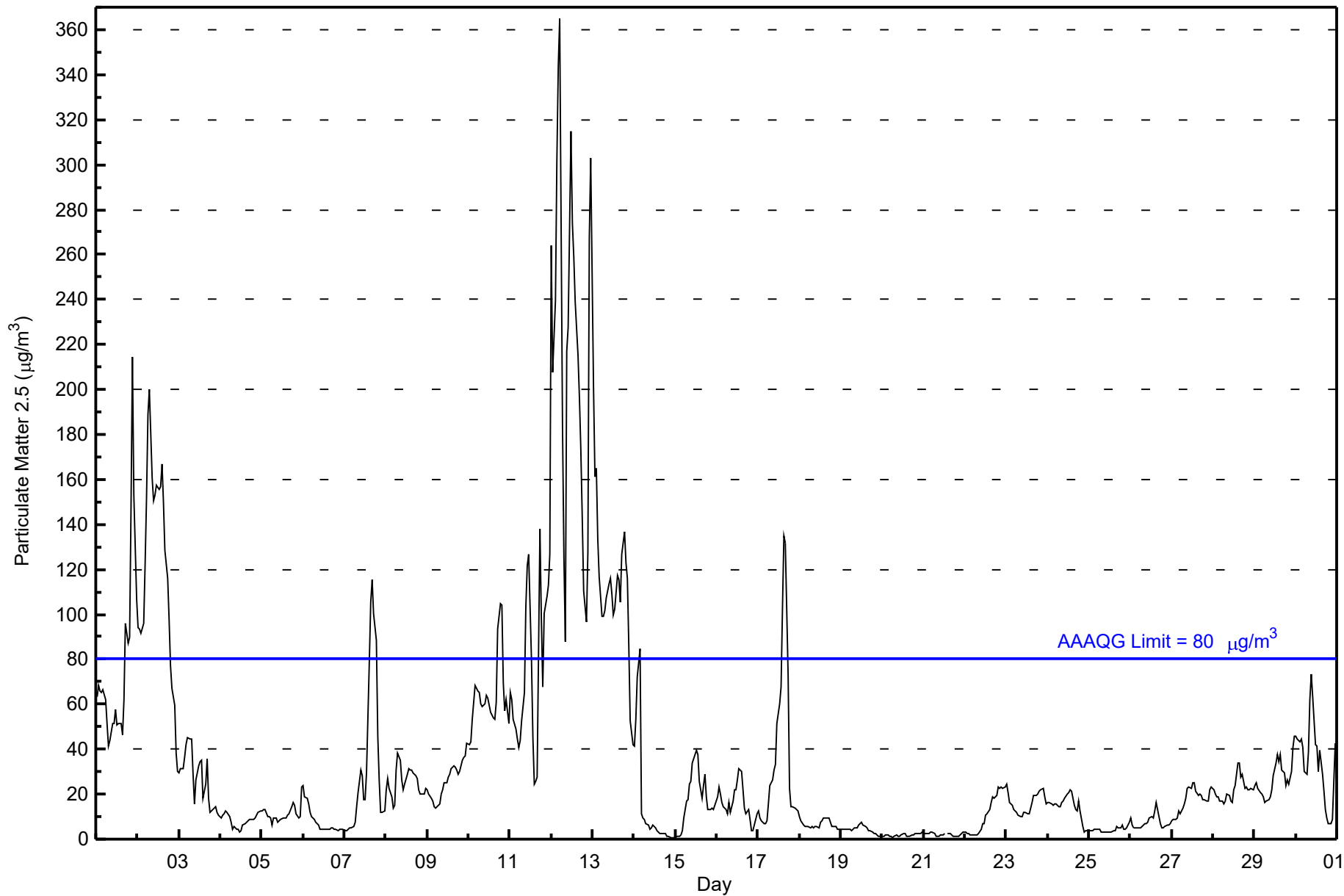
Summary of Hour Averages

Wapasu - June 2023

Number of Exceedences (AAAQO):	1-hr: 92	24-hr: 9	Hours in Service:	720
Maximum Value: 365.3 µg/m ³ on Jun 12 06:00	Maximum Daily Average: 220.1 µg/m ³ on Jun 12		Hours of Data:	719
Minimum Value: 0.6 µg/m ³ on Jun 15 00:00	Minimum Daily Average: 1.7 µg/m ³ on Jun 20		Hours of Missing Data:	1
Maximum Diurnal Average: 41.3 µg/m ³ at hour 12	Minimum Diurnal Average: 29.7 µg/m ³ at hour 9		Hours of Calibration:	1
Monthly Average: 35.49 µg/m ³	Percentiles: P ₁ = 1.0 P ₁₀ = 3.1 Q ₁ = 6.2 Median = 16.9 Q ₃ = 37.8 P ₉₀ = 100.7 P ₉₉ = 263.0		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-Jun	63.1	68.6	65.8	65.3	66.3	62.3	51.2	41.3	43.6	51.7	51.2	57.8	51.0	51.4	51.4	46.5	62.1	95.7	87.2	89.6	146.7	214.7	153.2	106.6	76.8	214.7
2-Jun	94.1	93.1	91.7	96.2	122.2	151.5	188.8	200.3	160.3	150.4	152.9	157.6	155.7	157.0	167.1	149.8	128.8	116.0	98.0	76.9	67.4	59.4	38.0	30.2	121.0	200.3
3-Jun	29.2	31.6	31.5	36.1	41.7	45.3	44.7	44.5	28.9	15.6	26.6	32.7	34.8	35.1	17.9	24.6	35.9	18.5	12.0	12.3	13.9	14.2	11.9	10.6	27.1	45.3
4-Jun	9.7	10.6	11.6	12.8	11.7	10.2	7.7	4.4	5.8	4.4	4.4	3.3	3.8	6.1	7.0	7.5	8.2	8.9	8.7	8.6	9.7	10.6	11.9	12.7	8.4	12.8
5-Jun	12.5	13.0	13.0	9.8	9.8	9.4	6.2	9.6	9.5	7.8	7.8	8.8	9.4	9.7	10.8	11.4	14.2	16.1	15.0	11.5	9.7	10.1	23.2	11.2	23.2	
6-Jun	23.7	19.0	17.9	15.6	12.2	9.7	8.7	7.6	7.2	6.5	4.3	4.5	4.3	4.6	4.4	4.5	5.1	4.9	4.7	4.4	3.6	4.1	4.4	4.3	7.9	23.7
7-Jun	4.0	4.0	4.3	4.8	5.0	5.5	7.4	14.5	20.9	30.5	28.2	17.8	17.8	29.4	79.2	105.3	115.7	100.2	88.5	46.0	26.4	12.0	11.8	12.3	33.0	115.7
8-Jun	22.1	27.2	22.3	19.0	14.0	14.8	30.5	38.3	35.1	26.3	21.9	24.4	28.6	31.5	30.8	30.6	29.5	28.3	27.0	21.9	20.0	20.0	20.3	22.6	25.3	38.3
9-Jun	22.1	20.0	18.4	16.9	14.5	13.7	15.3	16.0	20.1	22.2	24.9	25.4	27.4	29.1	31.5	32.3	32.0	30.6	29.1	30.1	35.1	36.2	36.7	42.8	25.9	42.8
10-Jun	42.0	43.0	53.3	61.0	68.3	65.8	65.4	60.5	58.8	60.3	63.8	62.6	59.5	56.7	53.8	53.0	60.6	93.6	104.9	103.9	69.7	57.4	61.9	51.4	63.8	104.9
11-Jun	65.0	61.9	53.4	48.7	44.5	40.6	43.6	52.7	65.5	103.6	121.7	126.5	79.5	45.1	24.2	25.8	27.3	138.1	97.6	67.6	100.4	107.7	112.8	126.9	74.2	138.1
12-Jun	263.9	207.6	239.4	301.7	343.6	365.3	183.6	125.7	87.9	216.9	227.8	314.7	274.1	259.0	238.8	215.1	196.5	173.3	142.7	110.1	96.8	128.2	267.3	302.9	220.1	365.3
13-Jun	200.8	161.2	165.0	133.8	116.6	98.8	99.1	101.7	107.2	113.4	116.0	108.8	99.9	101.9	117.1	115.6	105.6	126.6	136.4	122.9	116.2	86.8	52.8	41.7	114.4	200.8
14-Jun	41.1	53.5	72.2	85.0	11.4	9.2	8.8	6.6	6.2	4.2	5.0	6.2	5.2	3.5	3.0	2.7	2.5	2.7	2.3	1.4	1.0	0.9	0.8	0.6	14.0	85.0
15-Jun	0.8	1.0	1.3	1.8	3.6	9.1	17.2	17.4	24.7	25.9	33.9	37.8	39.2	37.5	26.0	18.4	23.6	29.1	19.1	13.4	13.1	13.7	13.5	15.1	18.2	39.2
16-Jun	18.7	23.0	20.2	16.6	14.5	13.0	11.4	16.6	12.2	17.2	21.9	22.0	26.3	31.6	29.9	21.9	13.7	11.4	13.4	9.1	3.7	4.1	6.5	11.1	16.2	31.6
17-Jun	12.5	9.5	8.2	6.6	7.0	8.0	15.7	24.0	26.2	30.6	33.5	51.2	60.1	67.6	103.1	134.7	131.9	72.7	22.8	14.6	14.7	13.9	13.0	12.8	37.3	134.7
18-Jun	10.3	8.3	6.3	5.3	5.8	5.8	5.1	5.4	5.1	5.5	5.5	5.3	7.5	7.9	9.4	9.6	9.5	9.5	7.7	5.7	5.8	5.8	4.6	4.1	6.7	10.3
19-Jun	4.3	4.4	4.4	4.3	4.4	4.3	4.1	4.5	4.8	5.2	6.0	6.9	7.8	6.4	5.6	5.0	4.0	3.6	2.9	2.4	2.4	1.8	1.3	1.0	4.2	7.8
20-Jun	1.0	1.3	1.8	1.8	1.1	1.1	0.7	1.3	1.8	1.5	1.4	2.0	2.3	2.5	1.2	1.3	1.4	1.7	2.1	2.3	2.3	2.4	2.6	2.9	1.7	2.9
21-Jun	2.5	2.5	2.3	2.7	3.2	3.1	2.2	1.4	1.3	1.4	1.7	2.1	2.6	C	2.7	2.2	1.7	1.5	1.3	1.2	1.3	1.8	2.3	3.2	2.1	3.2
22-Jun	3.2	2.5	2.5	2.0	1.8	1.9	2.0	2.1	2.6	4.3	6.8	7.2	10.6	11.5	13.0	16.6	18.7	18.3	19.3	23.1	22.4	23.2	22.6	23.2	10.9	23.2
23-Jun	24.6	20.5	16.5	14.8	12.9	12.4	11.8	10.7	9.8	10.2	11.9	11.9	11.5	11.4	13.7	16.5	19.5	19.3	20.2	21.5	22.2	22.6	18.9	15.8	15.9	24.6
24-Jun	16.4	16.5	15.6	15.0	15.6	15.6	14.3	14.7	16.4	17.2	18.3	20.4	20.9	21.8	21.6	15.2	12.9	12.7	17.2	12.7	5.7	3.1	3.6	3.7	14.5	21.8
25-Jun	3.7	3.8	4.0	4.2	4.4	4.1	4.2	3.2	3.1	3.2	3.1	3.2	3.1	3.2	3.3	3.7	4.0	5.7	4.9	5.2	6.2	4.5	4.7	7.6	4.2	7.6
26-Jun	9.4	6.1	4.8	4.9	4.8	4.9	4.9	5.4	6.6	7.0	7.8	9.3	9.8	9.3	12.8	16.3	12.9	6.6	5.2	4.9	5.6	6.0	6.6	7.1	7.5	16.3
27-Jun	7.9	8.6	9.1	9.7	12.6	11.0	13.5	15.5	18.2	22.8	23.2	22.5	25.3	24.8	21.4	19.3	20.0	19.2	17.7	17.3	16.9	17.2	21.9	23.3	17.4	25.3
28-Jun	21.7	20.0	18.8	18.5	17.2	16.8	15.9	17.1	20.4	19.4	16.8	16.4	21.9	24.0	34.1	33.9	27.7	28.9	22.7	23.1	21.7	22.2	22.7	22.0	21.8	34.1
29-Jun	24.1	25.1	22.6	20.5	20.0	18.6	16.2	16.8	17.6	18.9	22.0	28.0	33.8	37.8	34.7	37.8	31.0	29.2	24.1	26.6	24.6	30.3	40.5	46.1	27.0	46.1
30-Jun	45.9	44.8	43.1	44.4	40.5	30.0	29.1	38.9	62.1	73.3	63.4	41.8	41.6	30.1	39.4	28.8	21.5	13.3	9.4	6.6	6.8	8.6	25.9	42.4	34.6	73.3
36.7 33.8 34.7 36.0 35.0 35.4 31.0 30.6 29.7 35.9 37.8 41.3 39.2 39.6 40.3 40.2 39.2 41.1 35.5 30.0 29.7 31.4 33.5 34.3																								Diurnal Average		
263.9 207.6 239.4 301.7 343.6 365.3 188.8 200.3 160.3 216.9 227.8 314.7 274.1 259.0 238.8 215.1 196.5 173.3 142.7 122.9 146.7 214.7 267.3 302.9																								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}) - $\mu\text{g}/\text{m}^3$
Wapasu - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	160	22.25	22.25
6 - 15	174	24.20	46.45
16 - 25	137	19.05	65.51
26 - 80	156	21.70	87.20
> 81.0	92	12.80	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}) - μg/m³
Wapasu - June 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	39	18	12	11	3	5	11	16	3	3	9	1	0	0	1	28	160
6 - 15	14	14	12	7	5	18	28	11	16	16	12	5	5	1	3	7	174
16 - 25	10	4	4	0	4	4	15	24	21	11	18	6	0	2	3	11	137
26 - 80	7	3	5	3	9	10	2	30	17	10	17	7	2	8	10	16	156
> 81.0	17	8	12	3	3	2	9	6	3	1	3	3	4	1	3	14	92
Totals	87	47	45	24	24	39	65	87	60	41	59	22	11	12	20	76	719

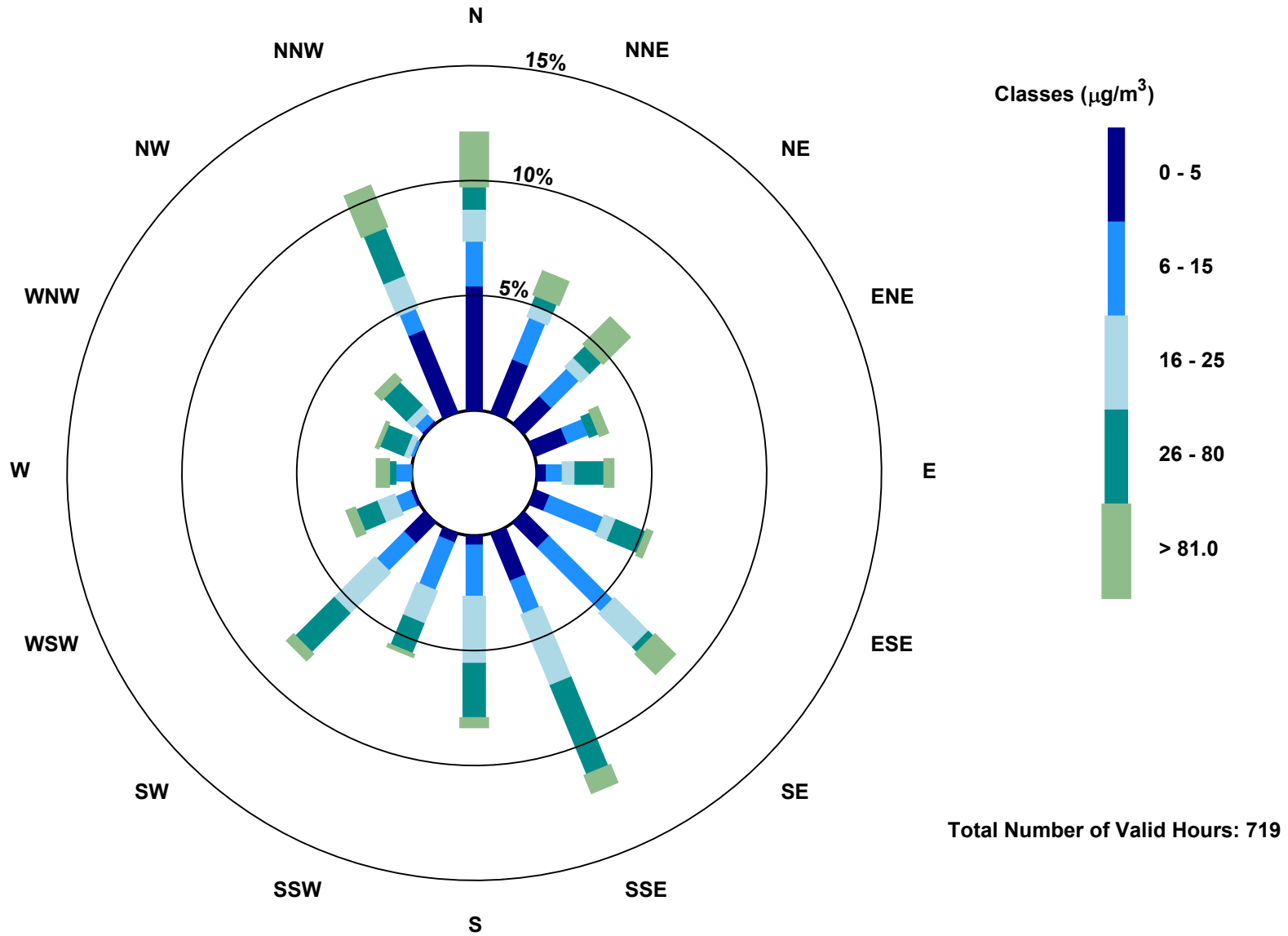
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

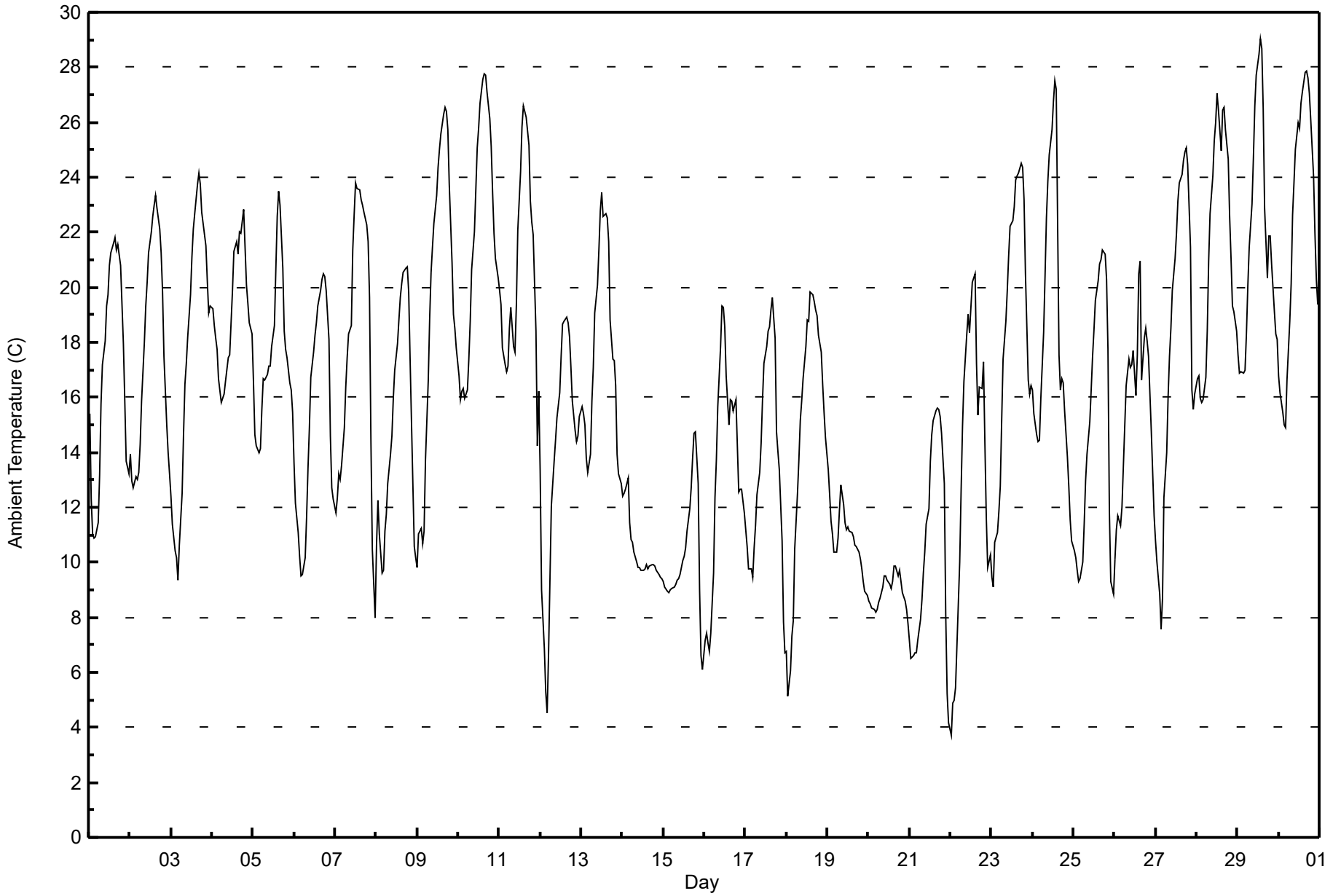




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Wapasu - June 2023

Maximum Value: 29.0 C on Jun 29 14:00 Minimum Value: 3.7 C on Jun 22 01:00 Maximum Diurnal Average: 20.7 C at hour 15 Monthly Average: 16.24 C		Maximum Daily Average: 22.2 C on Jun 30 Minimum Daily Average: 8.9 C on Jun 20 Minimum Diurnal Average: 11.3 C at hour 5 Percentiles: P ₁ = 5.3 P ₁₀ = 9.3 Q ₁ = 11.5 Median = 16.3 Q ₃ = 20.2 P ₉₀ = 23.7 P ₉₉ = 27.7		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 Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	15.4	12.3	11.0	10.9	10.9	11.4	13.2	15.8	17.2	18.1	19.3	19.7	20.8	21.3	21.6	21.8	21.4	21.6	20.8	19.4	18.0	15.9	13.7	13.2	16.9	21.8
2-Jun	13.9	13.0	12.7	13.1	13.0	13.3	14.3	15.9	18.0	19.3	20.2	21.3	22.0	22.6	23.0	23.4	22.9	22.1	21.2	19.8	17.5	15.0	14.0	13.2	17.7	23.4
3-Jun	12.4	11.4	10.4	10.2	9.4	10.6	12.5	14.6	16.5	17.3	18.2	19.7	21.1	22.1	22.7	23.8	24.2	23.7	22.7	22.3	21.5	20.2	19.1	19.3	17.7	24.2
4-Jun	19.2	18.6	18.1	17.8	16.7	15.8	16.0	16.1	16.6	17.5	17.5	18.7	19.9	21.3	21.7	21.2	22.0	22.0	22.8	21.5	20.1	19.4	18.7	18.3	19.1	22.8
5-Jun	16.6	14.6	14.2	14.0	14.2	15.5	16.7	16.6	16.8	17.1	17.1	17.8	18.6	20.6	22.6	23.5	23.0	20.7	18.4	17.8	17.4	16.5	16.3	15.5	17.6	23.5
6-Jun	13.6	12.1	11.1	10.2	9.5	9.6	10.2	11.7	13.4	14.9	16.7	17.7	18.2	18.7	19.3	19.9	20.3	20.5	20.4	19.9	18.1	14.6	12.7	12.3	15.2	20.5
7-Jun	11.8	12.4	13.2	13.0	13.5	14.9	16.4	17.5	18.3	18.6	21.3	22.6	23.8	23.6	23.6	23.2	23.0	22.7	22.3	21.7	19.6	14.4	10.5	8.0	17.9	23.8
8-Jun	10.6	12.3	11.0	9.6	9.7	11.2	11.7	12.8	13.9	14.6	16.0	17.0	18.0	18.8	19.6	20.1	20.6	20.7	20.8	19.8	17.4	12.8	10.6	10.2	15.0	20.8
9-Jun	9.8	11.0	11.3	10.7	11.1	13.7	16.6	18.9	20.5	21.5	22.3	23.3	24.4	25.0	25.6	26.3	26.5	26.4	25.7	23.7	20.9	19.0	18.5	17.8	19.6	26.5
10-Jun	16.8	15.9	16.2	16.3	16.0	16.3	17.4	18.8	20.6	22.0	23.5	25.1	25.8	26.7	27.6	27.8	27.7	27.1	26.2	25.1	23.5	22.0	21.0	20.3	21.9	27.8
11-Jun	19.9	19.4	17.8	17.2	17.0	17.2	18.5	19.3	17.8	17.7	19.4	22.1	24.2	25.8	26.6	26.4	26.2	25.1	23.2	22.4	21.9	18.4	14.3	16.2	20.6	26.6
12-Jun	13.3	9.0	6.8	5.3	4.5	6.7	12.1	12.9	13.7	14.4	15.3	16.2	17.5	18.7	18.8	18.9	18.7	18.2	17.1	15.9	14.8	14.4	14.6	15.3	13.9	18.9
13-Jun	15.7	15.4	15.0	13.8	13.3	13.9	15.8	17.1	19.1	20.1	21.4	22.8	23.4	22.6	22.7	22.5	21.7	18.8	17.4	17.3	16.4	13.9	13.2	12.9	17.8	23.4
14-Jun	12.4	12.5	12.7	13.1	11.4	10.8	10.7	10.4	10.0	9.8	9.8	9.7	9.7	9.7	9.9	9.8	9.9	9.9	9.9	9.9	9.7	9.6	9.5	9.4	10.4	13.1
15-Jun	9.3	9.1	9.0	8.9	9.0	9.0	9.1	9.2	9.4	9.4	9.6	10.1	10.2	10.5	11.1	11.9	12.7	13.8	14.7	14.7	12.9	9.0	6.6	6.1	10.2	14.7
16-Jun	7.2	7.4	7.1	6.8	7.4	9.6	12.4	13.8	15.7	17.8	19.3	19.3	18.6	16.8	15.0	15.9	15.9	15.5	15.9	14.2	12.6	12.7	12.7	11.8	13.4	19.3
17-Jun	11.2	10.6	9.8	9.8	9.4	10.5	11.4	12.4	13.2	14.3	15.9	17.2	17.8	18.4	18.6	19.2	19.6	18.2	14.7	14.0	13.4	10.8	7.8	6.7	13.5	19.6
18-Jun	6.8	5.1	6.0	7.3	7.9	10.5	12.5	13.7	15.1	15.9	16.7	17.9	18.8	18.8	19.8	19.7	19.5	19.2	19.0	18.2	17.6	16.5	15.5	14.5	14.7	19.8
19-Jun	13.4	12.5	11.5	11.0	10.4	10.4	10.9	11.9	12.8	12.1	11.5	11.2	11.3	11.1	11.1	10.9	10.6	10.6	10.4	10.1	9.8	9.3	9.0	8.8	10.9	13.4
20-Jun	8.6	8.5	8.4	8.3	8.2	8.3	8.5	8.7	9.1	9.5	9.5	9.4	9.2	9.1	9.3	9.9	9.9	9.5	9.7	9.3	8.9	8.6	8.3	7.8	8.9	9.9
21-Jun	7.2	6.5	6.6	6.7	6.7	7.2	8.0	8.7	9.6	10.4	11.4	11.9	13.7	14.7	15.2	15.5	15.6	15.6	15.3	14.7	12.9	8.1	5.2	4.2	10.5	15.6
22-Jun	3.7	4.9	5.0	5.5	6.9	10.0	12.6	15.0	16.6	18.3	19.0	18.4	19.2	20.2	20.5	17.3	15.4	16.4	16.3	17.3	14.3	11.6	9.8	10.3	13.5	20.5
23-Jun	9.5	9.1	10.7	11.1	11.9	12.7	15.2	17.4	18.8	19.9	21.2	22.2	22.4	22.9	23.9	24.0	24.2	24.5	24.4	23.2	20.5	16.6	16.1	16.4	18.3	24.5
24-Jun	16.3	15.4	14.6	14.4	14.5	16.0	18.4	20.4	22.5	23.8	24.8	25.7	27.5	27.2	17.5	16.3	16.7	16.5	15.5	13.8	12.7	11.6	10.8	10.8	18.3	27.5
25-Jun	10.4	10.2	9.7	9.3	9.4	10.0	11.4	13.0	13.9	15.1	16.3	17.5	18.4	19.5	20.2	20.9	21.0	21.4	21.2	20.3	17.8	11.9	9.3	8.8	14.9	21.4
26-Jun	10.1	11.2	11.7	11.3	12.0	13.5	15.0	16.4	17.4	17.1	17.2	17.7	16.1	17.6	20.5	21.0	16.6	18.2	18.5	18.0	17.5	14.7	13.2	11.7	15.6	21.0
27-Jun	10.8	10.0	8.9	7.6	8.7	12.4	14.0	16.0	17.5	18.5	19.9	21.1	22.0	23.1	23.8	24.1	24.6	24.9	25.0	24.5	21.5	16.2	15.6	16.1	17.8	25.0
28-Jun	16.7	16.8	16.0	15.8	15.9	16.7	18.4	20.9	22.7	24.1	25.3	26.0	27.0	26.5	25.0	26.4	26.5	25.7	24.7	22.6	21.0	19.3	19.1	18.4	21.6	27.0
29-Jun	17.6	16.9	16.9	16.9	17.0	18.3	20.0	21.5	23.1	24.7	26.6	27.7	28.5	29.0	28.7	26.5	22.9	20.3	21.8	21.9	20.9	19.1	18.3	18.1	21.8	29.0
30-Jun	16.8	16.2	15.4	15.0	14.9	16.6	18.7	20.2	22.6	23.8	25.0	26.0	25.8	26.7	27.1	27.8	27.9	27.6	27.1	26.1	24.0	22.0	20.3	19.4	22.2	27.9
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Wapasu - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	113	15.69	15.69
10 - 20	420	58.33	74.03
> 20	187	25.97	100.00

Total Number of Valid Hours: 720

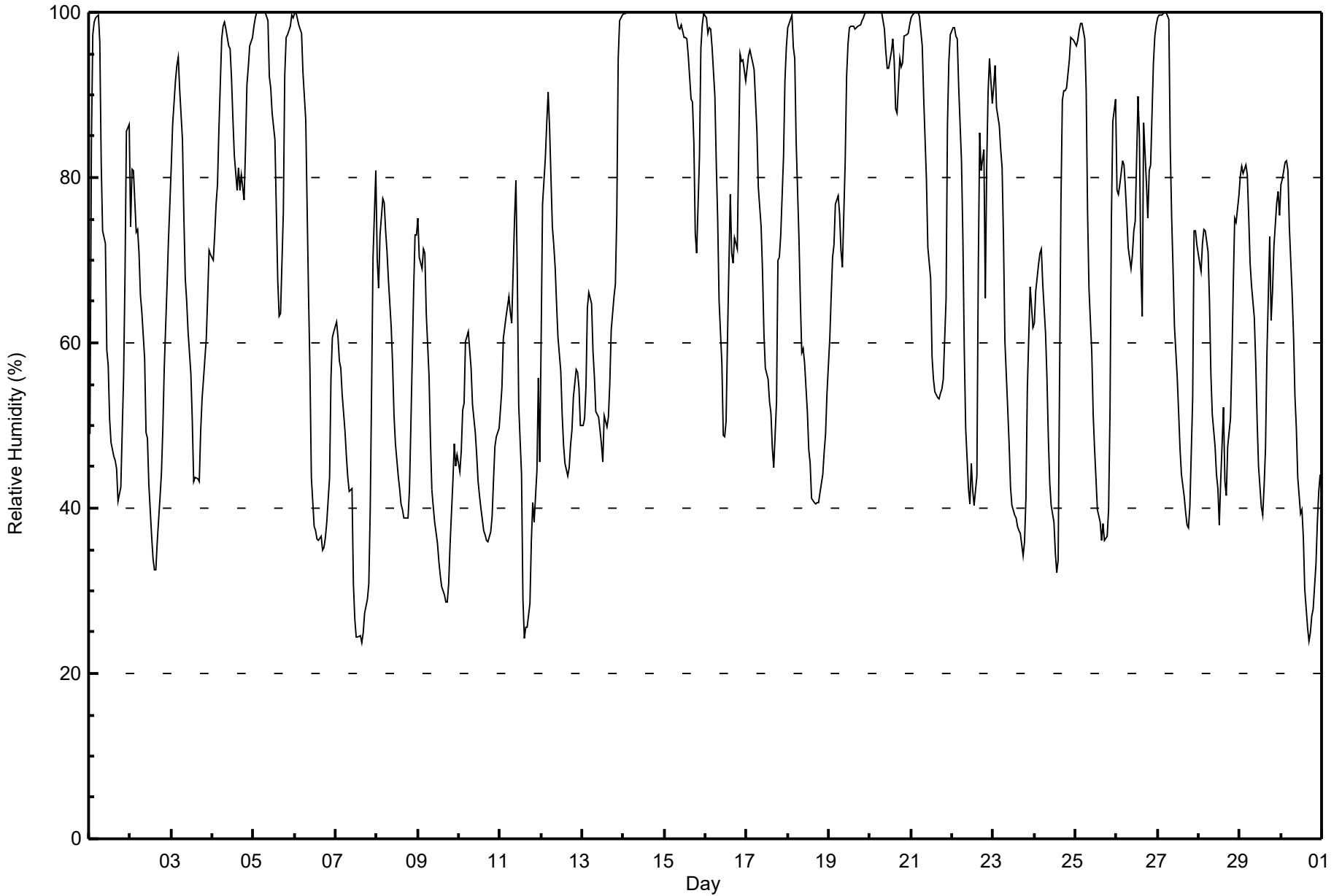
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Wapasu - June 2023

Maximum Value: 100.0 % on Jun 5 04:00 Maximum Daily Average: 100.0 % on Jun 14 Minimum Value: 23.7 % on Jun 7 16:00 Minimum Daily Average: 42.8 % on Jun 7 Maximum Diurnal Average: 84.9 % at hour 4 Minimum Diurnal Average: 52.0 % at hour 15 Monthly Average: 68.31 % Percentiles: P ₁ = 25.1 P ₁₀ = 38.6 Q ₁ = 48.3 Median = 69.2 Q ₃ = 90.8 P ₉₀ = 99.0 P ₉₉ = 100.0																						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 Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	48.9	83.8	97.3	98.8	99.3	99.6	96.5	81.8	73.6	72.0	59.2	57.2	50.8	48.1	46.3	45.8	44.8	40.9	42.6	49.2	56.0	68.2	85.7	86.4	68.0	99.6																							
2-Jun	74.0	81.0	80.9	73.3	73.7	70.9	65.8	63.7	58.1	49.2	48.5	42.9	36.6	33.9	32.6	32.6	35.9	41.3	44.3	49.6	56.9	66.9	72.4	76.7	56.7	81.0																							
3-Jun	81.3	86.4	91.6	93.5	94.6	90.7	84.5	75.3	67.8	65.0	61.3	56.2	50.6	43.2	43.8	43.6	43.3	49.4	53.2	55.6	60.5	65.6	71.2	70.7	66.6	94.6																							
4-Jun	70.0	73.1	76.7	79.2	85.7	96.8	98.3	98.7	97.9	96.0	95.7	92.1	87.2	82.6	78.4	81.2	78.4	80.4	77.3	83.5	91.1	93.3	95.9	96.9	86.9	98.7																							
5-Jun	98.3	99.3	100.0	100.0	100.0	100.0	100.0	100.0	99.0	92.1	90.9	87.9	84.6	75.9	67.6	63.2	63.6	75.8	92.5	97.0	97.4	98.3	99.6	99.3	90.9	100.0																							
6-Jun	99.8	100.0	98.4	98.0	97.5	92.7	87.0	76.0	65.6	56.6	43.7	37.7	37.3	36.2	36.1	36.7	34.9	35.2	36.4	38.3	43.7	55.8	60.7	61.4	61.1	100.0																							
7-Jun	62.5	60.6	57.9	57.0	53.8	49.3	46.3	43.7	42.1	42.4	30.9	26.7	24.4	24.4	24.6	23.7	25.0	27.3	29.0	30.8	39.7	54.4	70.4	80.9	42.8	80.9																							
8-Jun	70.1	66.6	73.1	77.4	77.0	73.5	71.0	67.7	61.9	57.3	51.2	47.8	44.0	42.4	40.4	39.8	38.8	38.7	38.8	42.1	49.9	66.5	73.1	73.1	57.6	77.4																							
9-Jun	75.0	70.3	69.0	71.3	70.8	63.5	55.9	48.2	42.1	40.2	38.3	35.8	33.6	31.9	30.5	29.5	28.7	28.6	30.9	35.6	43.2	47.8	45.1	46.4	46.3	75.0																							
10-Jun	44.4	47.0	51.8	52.7	60.1	61.4	59.2	56.9	52.5	49.2	46.4	43.3	41.5	40.0	37.2	36.7	36.2	35.9	37.2	39.0	43.4	47.4	48.7	49.6	46.6	61.4																							
11-Jun	52.0	54.6	60.5	63.2	64.4	65.7	63.7	62.3	75.0	79.6	67.9	52.3	44.0	29.0	24.3	25.5	25.6	28.5	35.9	40.7	38.3	44.6	55.8	45.5	50.0	79.6																							
12-Jun	60.5	76.8	82.5	86.6	90.3	86.1	74.1	71.8	69.1	64.8	60.6	56.6	51.4	47.7	45.5	43.8	45.0	47.6	49.5	53.4	56.8	56.5	54.6	50.1	61.7	90.3																							
13-Jun	50.0	50.9	54.7	64.2	66.2	64.8	58.9	56.0	51.6	51.0	49.4	47.8	45.7	51.2	49.8	51.0	55.1	61.6	65.6	67.0	75.6	94.5	98.9	99.6	61.7	99.6																							
14-Jun	99.8	99.9	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	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0																						
15-Jun	100.0	100.0	100.0	100.0	OR	OR	100.0	99.0	98.2	97.9	98.5	96.9	96.8	94.7	89.6	89.2	84.3	73.3	70.9	82.6	95.6	98.5	99.8	93.7	93.7	100.0																							
16-Jun	99.4	97.4	98.1	97.9	95.7	89.8	81.7	75.0	65.0	57.5	48.8	48.6	50.5	60.6	77.9	70.8	69.7	72.8	71.3	83.5	95.0	94.1	94.2	91.7	78.6	99.4																							
17-Jun	93.3	94.8	95.5	93.9	93.0	89.3	85.5	78.7	74.1	68.6	61.3	56.9	55.6	52.9	51.5	47.3	45.0	52.8	70.0	70.4	73.0	82.5	91.7	95.8	73.9	95.8																							
18-Jun	98.1	98.7	99.7	95.7	94.4	84.5	72.7	65.1	58.9	59.3	57.6	51.6	47.1	45.4	41.1	40.6	40.5	40.8	40.6	41.9	44.1	46.7	49.1	53.9	61.2	99.7																							
19-Jun	60.5	65.6	70.4	71.8	76.8	77.8	75.6	71.3	69.2	81.9	92.1	96.1	98.1	98.3	98.3	97.9	98.1	98.3	98.6	98.9	99.3	99.8	100.0	100.0	87.3	100.0																							
20-Jun	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	97.9	95.3	93.2	93.3	95.3	96.8	94.0	88.3	87.8	94.3	93.3	93.9	97.1	97.2	97.5	98.5	96.4	100.0																							
21-Jun	99.4	99.7	100.0	100.0	100.0	99.5	96.0	89.9	84.7	79.6	71.6	67.8	58.2	55.6	54.0	53.5	53.2	54.0	54.4	55.5	65.2	86.4	94.0	97.3	77.9	100.0																							
22-Jun	98.2	98.1	97.1	96.8	91.1	82.0	72.7	59.2	49.6	42.3	40.5	45.5	42.2	40.3	43.8	68.9	85.5	80.9	83.3	65.5	81.3	90.3	94.4	88.9	72.4	98.2																							
23-Jun	91.1	93.6	88.6	86.3	83.4	81.2	72.3	60.2	52.0	47.8	42.5	40.4	39.2	38.8	37.8	37.3	37.0	34.2	35.9	41.2	54.4	66.8	64.4	61.8	57.8	93.6																							
24-Jun	62.4	66.3	69.6	70.9	71.4	67.2	61.1	55.7	48.5	43.1	40.3	38.4	34.5	32.3	33.8	77.1	89.4	90.5	90.4	90.9	94.3	96.9	96.8	96.6	67.4	96.9																							
25-Jun	95.9	96.6	97.7	98.6	98.7	96.7	90.5	75.7	66.6	58.9	51.3	47.1	43.6	39.8	38.2	36.2	38.1	36.1	36.6	39.9	51.6	74.9	86.7	89.4	66.1	98.7																							
26-Jun	78.6	78.0	79.1	82.0	81.5	78.7	75.2	71.5	69.1	70.7	73.5	74.7	89.8	84.9	69.5	63.2	86.7	79.4	75.0	80.8	81.5	93.9	97.2	98.5	79.7	98.5																							
27-Jun	99.3	99.6	99.7	99.8	100.0	100.0	99.1	83.8	75.3	69.0	62.1	55.7	51.6	47.1	44.2	41.3	39.5	38.0	37.6	40.2	53.3	73.5	73.6	71.8	69.0	100.0																							
28-Jun	69.7	68.6	72.1	73.8	73.6	71.0	65.1	56.3	51.4	47.4	44.0	42.4	38.0	43.2	52.2	43.2	41.6	47.5	50.9	57.9	67.1	75.1	74.5	77.8	58.5	77.8																							
29-Jun	80.1	81.4	80.6	81.5	80.3	75.2	69.7	66.9	63.0	57.7	50.8	45.1	40.2	39.1	42.7	47.3	58.6	72.8	62.7	66.3	71.7	77.0	78.4	75.5	65.2	81.5																							
30-Jun	79.2	79.8	81.8	82.0	80.9	74.1	65.9	60.8	53.6	49.6	43.7	39.4	39.8	36.4	30.2	25.7	23.8	25.0	26.9	27.7	33.3	38.3	42.1	44.0	49.3	82.0																							
																								79.7	82.3	84.1	84.9	84.6	82.1	78.1	72.4	67.8	64.7	60.5	57.5	55.1	53.1	52.0	52.7	54.6	56.4	57.8	60.2	66.6	75.0	78.8	79.3	Diurnal Average	
																								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	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Diurnal Maximum
OR - Out of Range																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Wapasu - June 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	87	12.12	12.12
40 - 60	197	27.44	39.55
60 - 80	180	25.07	64.62
80 - 100	209	29.11	93.73

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

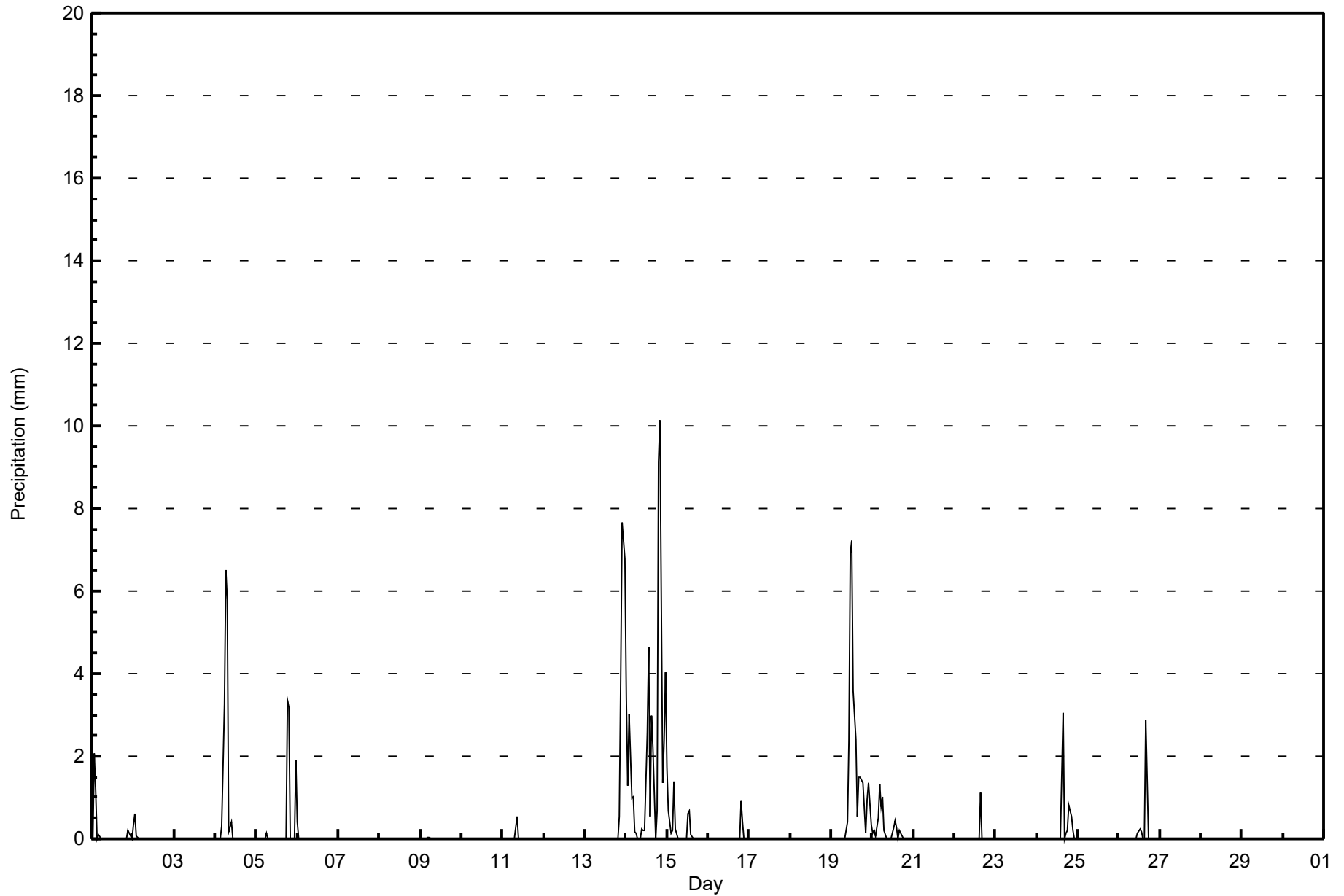
Wapasu - June 2023

Maximum Value: 10.1 mm on Jun 14 21:00																				Maximum Daily Total: 51.3 mm on Jun 14					Hours in Service: 720																							
Minimum Value: 0.0 mm on Jun 1 01:00																				Minimum Daily Total: 0.0 mm on Jun 3					Hours of Data: 720																							
Maximum Diurnal Total: 14.8 mm at hour 20																				Minimum Diurnal Total: 0.7 mm at hour 9					Hours of Missing Data: 0																							
Monthly Total: 154.29 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.2 P ₉₉ = 5.6					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-Jun	0.0	2.1	1.2	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	0.2	0.1	0.0	3.7	2.1																							
2-Jun	0.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.6																							
3-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.3	3.3	6.5	5.8	0.2	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	16.4	6.5																							
5-Jun	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	3.4	3.2	0.0	0.0	1.9	8.6	3.4																							
6-Jun	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4																							
7-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	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	0.1	0.1	0.1																						
10-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	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	0.5	0.5	0.5																						
12-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.9	7.7	6.8	18.8	7.7																						
14-Jun	3.4	1.3	3.0	1.0	1.0	0.2	0.1	0.0	0.0	0.2	0.2	2.6	4.6	0.5	3.0	2.2	0.0	0.7	9.1	10.1	1.4	2.4	4.0	51.3	10.1	10.1																						
15-Jun	1.7	0.7	0.1	0.2	1.4	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	1.7	1.7																						
16-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.4	0.0	0.0	0.0	1.3	0.9	0.9																						
17-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4	6.9	7.2	3.6	2.4	0.5	1.5	1.5	1.4	0.8	0.2	1.0	1.3	0.3	31.4	7.2	7.2																					
20-Jun	0.1	0.2	0.1	0.5	1.3	0.8	1.0	0.2	0.0	0.0	0.0	0.3	0.4	0.3	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.5	1.3	1.3																						
21-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1																						
23-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.1	0.2	0.8	0.5	0.2	0.0	0.0	5.0	3.1	3.1																						
25-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	2.9	2.9																						
27-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
																								6.0	4.9	4.5	1.7	4.2	4.5	7.8	6.0	0.7	1.1	2.6	7.3	11.0	9.5	3.3	7.7	6.8	1.7	5.6	14.8	11.7	6.6	11.5	13.0	Diurnal Average
																								3.4	2.1	3.0	1.0	1.4	3.3	6.5	5.8	0.5	0.4	2.4	6.9	7.2	4.6	2.4	3.1	2.9	1.5	3.4	9.1	10.1	3.9	7.7	6.8	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Wapasu - June 2023





Maximum Speed: 20 km/h on Jun 7 12:00	Maximum Daily Speed Average: 14.7 km/h on Jun 10	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 1 05:00	Minimum Daily Speed Average: 2.6 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 3.7 km/h at hour 3	Minimum Diurnal Speed Average: 0.5 km/h at hour 9	Hours of Missing Data: 0
Monthly Average Velocity: 0.3 km/h 131.0 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 15 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-Jun	NW3	S4	ESE3	NNE1	ESE1	E4	E4	E2	WNW4	WNW6	NW8	NNW6	NNW8	NNW8	NNW9	N9	N9	NE7	NE6	NE4	NNE4	E6	ENE4	NNW4	N3.1	N9
2-Jun	NNW10	NNW8	NE6	NNE5	N4	N5	NE5	NNE6	NE7	NE8	N5	NNW10	N10	N10	NNW10	N8	NNE10	NE11	NE11	NE9	ENE7	E8	E8	E8	NNE6.2	NE11
3-Jun	ESE6	E6	ESE7	ESE8	ESE5	ESE6	E4	NNE5	NE6	NE8	ENE11	NE8	ENE8	ESE9	ESE8	E9	ESE9	SE11	SE10	ESE7	ESE7	ESE7	ESE9	ESE12	E7.0	ESE12
4-Jun	ESE13	SE10	SE9	ESE10	ESE11	ESE8	ESE9	E9	ESE11	ESE12	ESE13	ESE12	SE13	SE12	SE9	SE7	SE10	SE11	SE13	SE12	SE8	SE7	SE7	S4	SE9.8	ESE13
5-Jun	S2	SSE3	SE4	ESE3	SE3	WNW1	NNW9	N9	N11	N12	N9	NNE8	NNE7	NNE7	N8	N10	N7	N7	NE5	ENE11	ENE7	E4	WSW7	WSW13	NNE3.9	WSW13
6-Jun	WSW10	WSW14	SW14	SW15	SW16	SW13	SW14	SW12	SW13	SW16	SW16	SW16	SW17	SW19	SW17	SW18	WSW16	SW15	SW13	SW12	SSW6	SSE6	SSE6	SSE7	SW12.8	SW19
7-Jun	SE8	SSE10	SSE12	SSE12	S11	S11	SSW12	SSW12	SW12	SSW13	SW18	SW20	WSW18	WSW18	W16	WSW18	W14	WNW11	W10	WNW7	NW4	NNW3	SE3	SE4	SW8.4	SW20
8-Jun	N5	N8	NNE6	NNE6	NNE5	NNW7	NNW10	NNW11	NNW11	NW13	NNW14	NW13	NNW12	NW9	NW7	NNW6	N5	N5	N5	NNE5	NE5	E4	E5	E6	N6.5	NNW14
9-Jun	ESE6	ESE6	SE7	SE6	SE7	SE8	SE7	SSE9	SSE8	SSW6	SSW8	SSE4	SW7	SSW7	SW4	S5	SSW5	S6	SSE9	SSE7	SSE8	SSE10	SSE12	SE12	SSE6.4	SSE12
10-Jun	SE12	SE12	SSE14	SSE15	SSE16	SSE15	SSE15	SSE14	SSE14	S15	S14	SSE14	SSE17	SSE17	S17	SSE18	S18	S17	SSE17	S14	S13	SSE12	SSE12	SSE13	SSE14.7	SSE18
11-Jun	SSE13	SSE10	SSE8	SSE8	S6	SSE6	S5	SW8	WSW5	SW5	WSW8	W8	WNW10	WNW12	WNW12	WNW11	WNW11	NNW11	NW3	NW3	NNW8	NNW4	NW4	NNW8	W3.6	SSE13
12-Jun	NNE3	SE2	SE3	ESE3	SE3	ENE2	NNE7	N8	N9	N9	NNW8	N7	NNW8	N8	N8	NNW7	N7	NE5	NE6	ENE5	E5	E6	ESE9	SE13	NNE3.8	SE13
13-Jun	SE13	SSE10	SE12	SE12	SE15	SE15	SSE16	SSE14	SSE13	SSE10	SSW8	S7	SW4	NW10	NNW13	N11	N10	N15	NE9	NNE9	N5	N5	N7	NNE8	ESE3.3	SSE16
14-Jun	NE7	NE5	E6	NNW4	NNW8	NNW8	N9	N10	N10	N11	N14	N13	N12	N12	N13	N13	NNW16	NNW17	N18	N15	N17	N16	N15	N15	N11.4	N18
15-Jun	N15	NNW15	NNW17	NNW17	NNW17	NNW20	N17	N17	NNW15	NNW12	NNW11	NNW11	NW11	NW10	NNW10	NNW10	NW7	NW8	NNW9	NW7	W3	SSW3	SE5	SE7	NNW9.9	NNW20
16-Jun	SE7	SSE6	SSE6	SSE6	S6	SSE6	S6	S8	SSE9	S11	S12	S12	SSW12	SW13	SSW9	SSW12	SSW13	S11	S10	SSW12	S9	SSW9	SW12	SW12	S9.0	SSW13
17-Jun	SSW11	SSW11	SSW9	SSW10	SSW9	SSW12	SW15	SW15	SW16	SW15	SW16	SW18	SW18	SW16	SW17	WSW14	W12	NNW11	NNE10	NNE7	ENE6	E4	E2	NE5	SW7.9	SW18
18-Jun	ENE4	E3	ESE7	E6	E6	ENE6	ENE11	ENE13	ENE11	NE8	NNE10	NNE11	NE12	NE11	NNE14	NE14	NE14	NE15	NE14	NE14	NE12	NE11	NE13	NE16	NE10.2	NE16
19-Jun	NE14	NE14	NE13	NE12	NNE11	NNE13	NNE14	NNE16	NNE17	NNE14	NNE13	NNE13	NNE15	NNE18	NNE20	NNE18	NNE18	NNE15	NNE13	N14	N14	N15	N15	N17	NNE14.4	NNE20
20-Jun	N18	N14	N16	N14	N13	N13	N13	N15	N15	N16	N15	NNW14	NNW14	NNW11	N10	NNW13	N11	N10	NNW11	NNW8	NNW6	NNW7	NNW7	NNW5	N11.9	N18
21-Jun	NNW5	NNW4	NNW5	NW3	NNW5	NNW6	N11	N12	N13	NNW15	N15	NNW15	N13	NNW15	NNW14	N13	NNE12	N11	NNE9	NE8	ENE2	ESE2	SE4	SE5	N7.7	N15
22-Jun	SE5	SE7	SE7	SE7	SE6	SSE6	SSE5	SSE6	SSW6	S5	SW6	W6	SSW4	W5	W4	SSE7	ESE6	SE6	SE5	SW5	SW2	S4	SE6	SE6	SSE4.0	SE7
23-Jun	SE6	SE7	SE7	SE8	SSE6	SSE7	SSE7	SSW7	SW8	S8	S8	S9	S8	SSE8	SSW6	SSW6	SSW5	SW8	SW6	SW4	S2	SE5	SSE7	SSE8	S5.9	S9
24-Jun	SSE8	SSE9	SSE8	SSE8	SSE8	SSE9	S8	S9	SSW12	SW15	SW16	SW15	SW13	SW14	WSW12	N10	ESE8	N3	N7	NNW11	NNE12	NE11	NNE13	NE12	SSW2.6	SW16
25-Jun	NE12	NE7	NNE6	NNE4	NNE5	NNE5	NE7	ENE10	ENE10	ENE8	ENE9	ENE6	ENE7	E5	SE4	NW3	NW9	N10	NNW9	NW9	NW3	E3	SE5	SE7	NE4.5	NE12
26-Jun	SE7	SSE7	SSE8	SSE7	SSE9	SSE10	SSE7	SSE9	S8	S7	SSE9	S11	SSE8	S9	SW10	NW8	W4	E2	ENE4	SE3	SSW4	SE2	ESE2	SE4	SSE5.3	S11
27-Jun	SE3	E2	E3	ENE3	ENE3	NE4	NNE6	N8	NNW8	NNW9	N8	N8	N5	NNW9	NNW7	NNW8	NNW6	N4	N3	NNW5	NE2	SE4	SE7	SSE8	N3.4	NNW9
28-Jun	SSE9	SSE9	SSE7	SSE7	S7	S8	S9	S10	SSW12	SSW13	SSW13	SW13	SW10	WNW9	NNW8	NNW4	WNW3	ESE4	SSE12	SSE9	S5	SE5	S7	S7	S6.1	SW13
29-Jun	S7	SSE7	S8	S8	SSE6	S7	S9	S10	S10	S11	SSW11	SSW13	SSW13	SW13	WSW11	W11	WSW12	S6	SW10	S8	SSE7	S6	S7	S7	SSW8.0	SW13
30-Jun	SSE6	SSE7	SSE8	SSE8	SSE7	S7	S8	S8	SSW9	SSW9	SW13	SW13	WSW13	WSW14	SW15	WSW14	WSW13	WSW15	SW17	WSW11	WSW9	WSW9	SW8	SW7	SW9.0	SW17

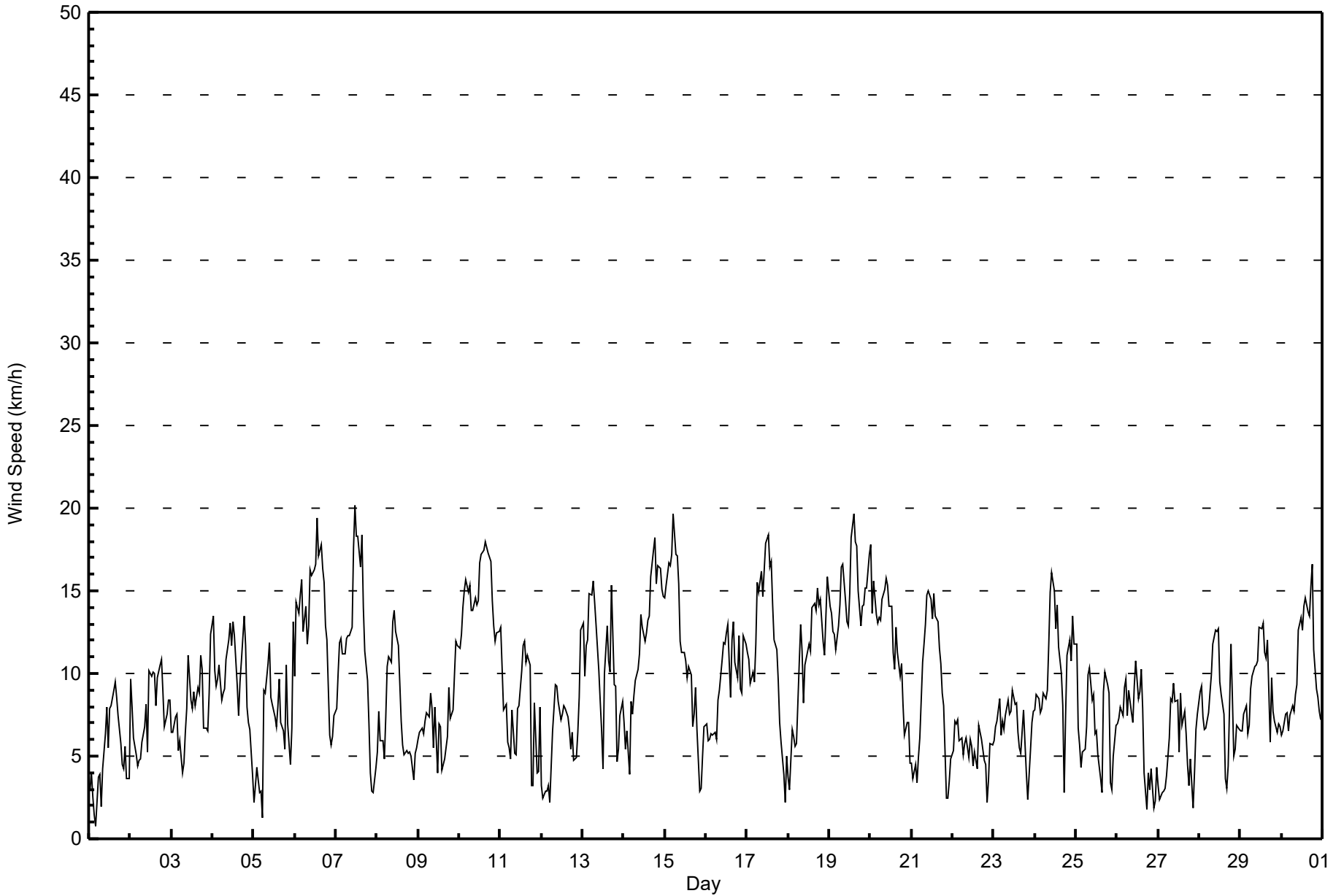
ESE2.7 SE3.0 SE3.7 SE3.3 SE2.8 SE2.3 SE1.5 SE0.9 S0.5WSW1.2WSW2.2 W2.7 W2.6 W3.3NNW3.5 NW3.5 NW2.4 N2.3NNE1.4 NNE1.5 NE1.5 E2.1 ESE2.6 ESE2.7	Diurnal Average
N18 NNW15 NNW17 NNW17 NNW17 NNW20 N17 N17 NNE17 SW16 SW18 SW20 SW18 SW19 NNE20 WSW18 NNE18 NNW17 N18 N15 N17 N16 N15 N17	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Wapasu - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	135	18.75	18.75
6 - 11	366	50.83	69.58
12 - 19	216	30.00	99.58
20 - 28	3	0.42	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
Wapasu - June 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	11	9	8	13	11	20	4	9	5	6	1	4	3	6	13	135
6 - 11	37	18	21	15	11	23	33	59	42	21	11	7	4	7	12	45	366
12 - 19	38	17	15	1	0	5	12	24	9	15	41	14	3	2	2	18	216
20 - 28	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	87	47	45	24	24	39	65	87	60	41	59	22	11	12	20	77	720

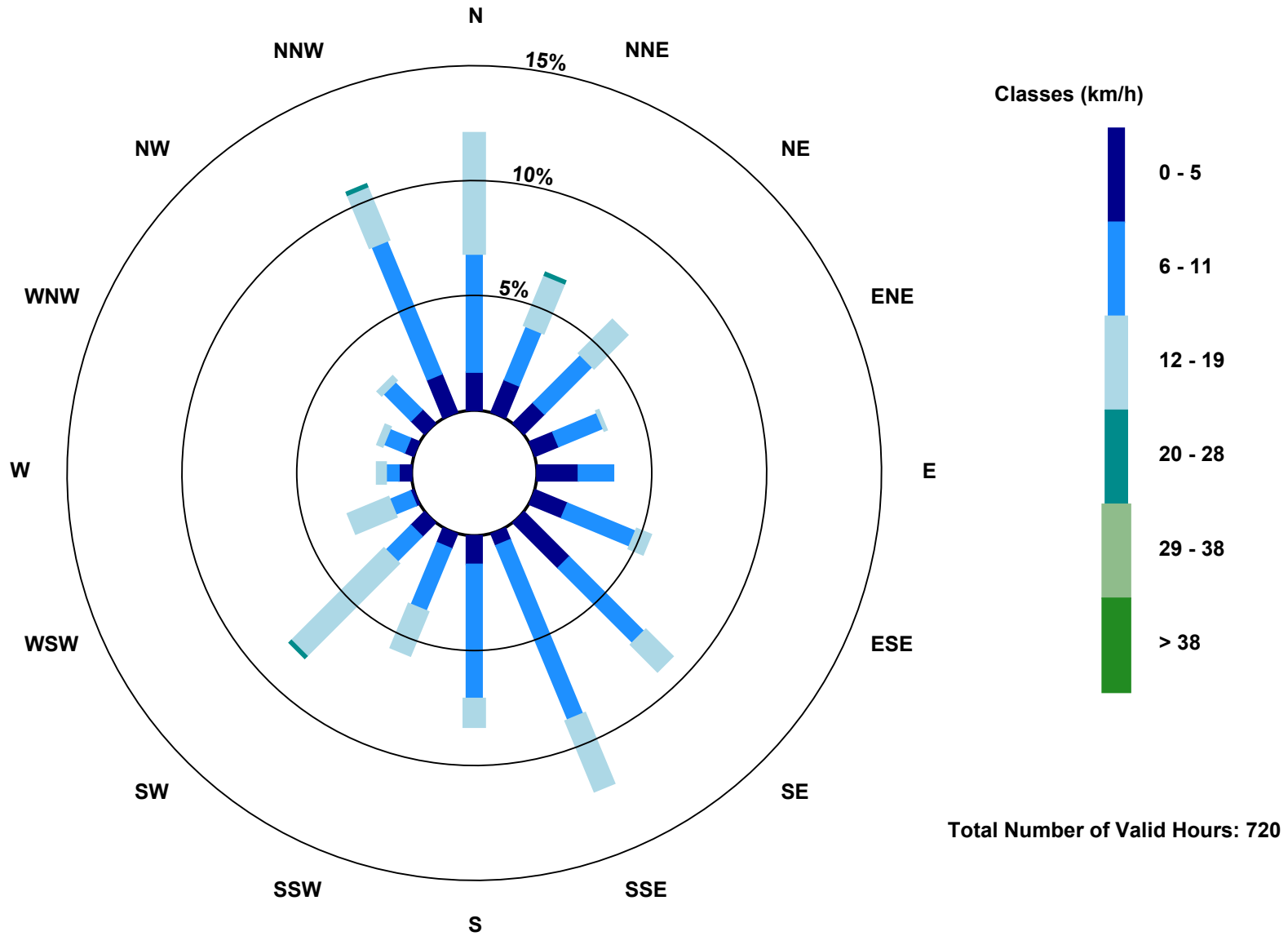
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Wapasu





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Wapasu - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jun 19 15:00 Minimum Value: 0 km/h on Jun 27 03:00 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-Jun	2	3	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	1	1	2	2	2	3
2-Jun	3	3	2	1	1	1	1	2	2	3	3	4	3	4	4	3	3	3	3	3	2	2	2	2	4
3-Jun	2	1	1	2	1	2	2	2	2	3	4	4	3	3	4	4	4	3	3	2	2	2	2	4	
4-Jun	4	3	2	2	3	2	3	3	3	4	4	4	4	4	3	2	3	4	4	4	2	2	1	2	4
5-Jun	1	1	1	1	1	3	3	3	4	4	3	3	3	3	3	3	3	2	2	4	2	1	3	4	4
6-Jun	4	4	3	4	4	3	4	3	4	4	5	5	5	5	6	5	5	5	4	3	2	1	2	1	6
7-Jun	1	3	3	3	4	4	4	4	4	4	5	6	6	6	6	6	5	4	3	3	1	2	1	1	6
8-Jun	4	2	2	2	1	3	3	3	4	4	4	5	4	4	4	3	3	3	2	1	1	1	1	1	5
9-Jun	2	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3
10-Jun	3	3	3	4	4	4	4	4	4	5	5	5	5	6	6	6	6	6	6	5	4	4	3	3	6
11-Jun	4	4	2	2	2	1	2	2	3	2	2	2	4	4	4	4	4	3	2	2	2	2	4	3	4
12-Jun	2	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	2	2	2	1	1	2	3	3	3
13-Jun	3	2	3	3	3	4	4	5	4	3	3	3	2	4	3	3	4	5	4	3	2	4	2	4	5
14-Jun	3	3	2	3	2	2	3	3	3	4	4	4	4	4	4	4	5	5	6	5	6	5	5	4	6
15-Jun	5	4	5	4	5	6	6	5	5	4	3	3	3	3	3	2	2	2	2	3	1	1	2	1	6
16-Jun	1	1	1	1	2	2	2	3	3	4	4	4	5	5	3	4	5	4	3	5	3	4	4	3	5
17-Jun	4	4	3	3	3	4	4	4	4	4	4	5	6	5	5	5	4	4	4	2	2	1	1	1	6
18-Jun	1	2	1	1	1	2	4	4	4	3	4	4	4	4	5	5	5	5	5	5	4	4	5	5	5
19-Jun	4	4	4	4	4	5	5	6	6	5	5	4	5	7	7	7	6	6	5	5	5	5	5	5	7
20-Jun	6	4	5	5	4	5	5	5	5	5	5	4	4	4	3	4	4	3	2	2	1	1	1	1	6
21-Jun	1	1	1	1	1	2	3	4	4	4	5	4	5	4	5	4	4	4	3	3	2	1	1	1	5
22-Jun	1	1	1	1	1	1	2	2	2	3	3	2	2	3	3	5	2	2	1	2	2	1	1	1	5
23-Jun	1	1	1	2	1	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	3
24-Jun	2	2	2	2	2	2	3	3	4	5	5	5	4	4	6	6	2	2	4	3	4	5	5	4	6
25-Jun	4	3	2	1	2	2	2	3	3	3	3	4	3	3	3	2	3	3	3	2	2	1	1	1	4
26-Jun	1	2	2	1	2	3	2	3	3	2	3	4	2	3	3	3	4	2	1	1	2	1	1	1	4
27-Jun	1	0	0	1	1	2	2	2	2	3	3	4	3	4	4	4	4	2	2	2	1	1	1	1	4
28-Jun	2	3	2	2	2	2	3	3	4	4	4	4	4	3	2	2	1	4	3	3	2	1	2	2	4
29-Jun	1	1	2	2	1	2	3	3	3	3	4	4	4	4	4	4	4	2	4	2	2	2	2	2	4
30-Jun	1	1	1	1	1	2	3	2	3	3	3	4	4	4	4	5	4	4	5	4	2	2	1	2	5
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Wapasu - June 2023

Direction of Maximum Speed: 236 deg on Jun 7 12:00 Direction of Maximum Daily Speed Average: 162.8 deg on Jun 10	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 105 deg on Jun 1 05:00 Direction of Minimum Daily Speed Average: 2.6 deg on Jun 24	Percent Operational Time: 100.0
Monthly Average Direction: 131.0 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-Jun	326	177	103	23	105	101	93	98	282	288	308	332	339	328	348	358	354	38	43	39	32	83	69	331	2.7
2-Jun	327	338	54	24	0	11	44	27	36	45	349	335	350	359	345	11	31	52	49	56	72	83	90	97	26.6
3-Jun	104	97	102	113	102	115	96	33	53	47	58	54	73	118	118	82	105	130	127	107	111	113	114	117	97.9
4-Jun	122	124	128	119	116	118	106	101	113	118	121	121	145	131	138	137	132	126	139	144	134	131	131	177	126.8
5-Jun	189	150	130	121	132	296	345	2	0	357	8	18	24	30	4	358	359	358	40	58	61	101	237	238	13.3
6-Jun	253	238	227	224	218	220	226	220	224	229	232	232	226	229	222	231	237	227	235	230	203	163	156	156	224.9
7-Jun	146	152	157	162	177	186	197	207	217	206	219	236	237	254	261	258	268	282	280	290	309	337	124	139	224.1
8-Jun	355	9	19	27	30	344	346	346	343	325	342	326	340	326	322	343	350	349	360	16	39	86	96	90	352.7
9-Jun	117	120	130	125	130	134	144	147	149	194	209	167	216	196	226	183	192	190	163	161	150	150	148	144	158.2
10-Jun	145	146	151	155	155	153	155	161	164	171	171	167	166	167	169	168	173	170	166	170	170	168	159	156	162.8
11-Jun	156	166	167	162	178	156	183	231	242	232	243	265	294	296	298	291	295	329	305	325	336	330	320	344	264.2
12-Jun	24	129	133	116	134	57	12	7	357	352	348	359	335	0	2	348	6	40	49	65	90	97	120	133	31.4
13-Jun	139	147	133	132	132	141	151	155	159	165	198	179	215	326	343	6	3	350	39	30	11	1	10	27	109.2
14-Jun	54	36	86	337	340	345	357	358	5	3	354	2	358	360	352	344	343	353	351	354	360	358	355	355	357.2
15-Jun	351	345	346	345	339	345	350	349	348	336	329	329	320	322	334	335	319	323	327	325	261	209	137	143	338.4
16-Jun	145	163	164	155	170	163	173	170	166	185	189	187	195	214	192	192	198	187	180	203	183	205	218	225	188.3
17-Jun	211	199	199	197	197	205	218	221	218	222	223	233	236	234	232	249	273	346	14	32	60	95	83	45	226.4
18-Jun	68	101	106	93	87	70	65	63	58	54	16	28	42	37	32	36	47	45	40	41	41	38	37	42	47.3
19-Jun	42	49	42	38	31	28	22	24	28	26	19	22	23	23	31	33	33	26	21	8	3	1	359	355	23.5
20-Jun	358	1	357	2	356	358	2	360	2	354	354	347	341	348	359	348	358	349	337	338	327	336	337	340	352.5
21-Jun	336	344	339	326	337	343	354	355	353	344	350	340	349	334	341	351	16	9	21	55	70	105	126	138	355.2
22-Jun	142	143	142	145	145	149	155	164	192	180	225	275	197	268	272	165	113	125	139	230	216	185	138	138	166.4
23-Jun	136	137	139	143	156	163	167	192	225	191	177	185	181	160	201	196	196	233	227	232	175	141	148	156	176.1
24-Jun	160	158	161	168	165	167	178	191	206	214	224	230	232	232	257	5	107	2	355	347	27	35	31	35	203.2
25-Jun	41	39	30	24	25	28	50	69	78	73	65	63	75	84	139	318	324	351	343	323	326	98	141	145	42.6
26-Jun	143	152	150	147	148	156	163	163	181	170	164	175	156	178	217	308	263	99	74	146	208	136	118	140	165.2
27-Jun	132	101	98	58	61	46	19	359	346	347	1	9	3	335	332	334	338	4	11	328	54	125	144	153	8.8
28-Jun	159	167	167	166	174	175	180	185	193	192	203	214	228	292	342	332	294	121	156	164	176	138	174	176	185.6
29-Jun	170	168	175	170	164	178	179	182	178	187	201	208	212	218	239	266	238	174	218	170	166	176	173	180	195.6
30-Jun	164	163	162	161	165	177	188	191	212	209	230	231	244	239	236	243	250	239	228	253	244	240	224	225	221.8

114.5 132.6 129.0 132.6 137.8 137.0 128.2 124.0 188.6 238.8 257.3 264.9 265.0 280.1 296.8 318.9 322.7 357.9 31.0 20.2 56.1 93.5 112.6 120.2

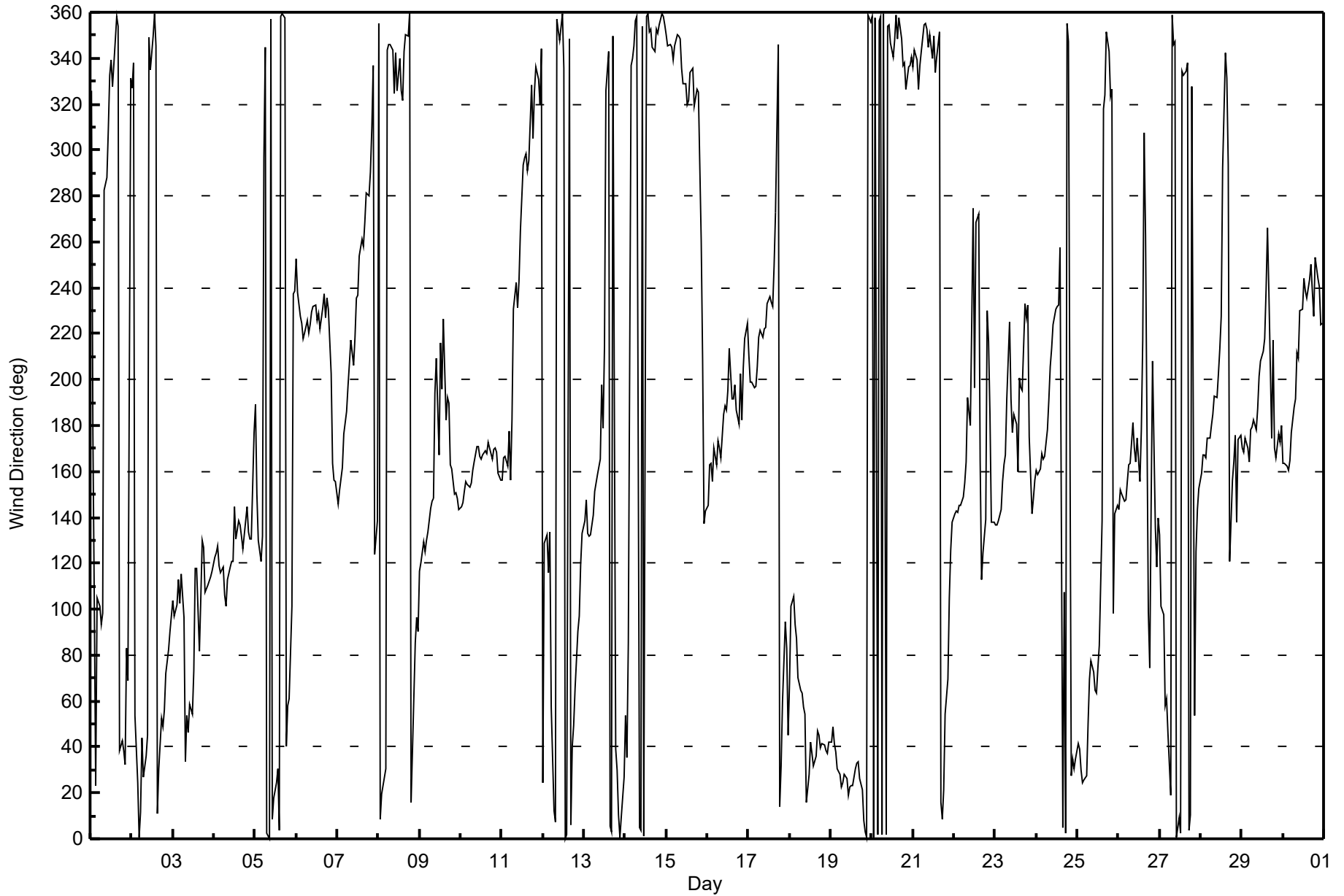
Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Wapasu - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Wapasu - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 94 deg on Jun 5 06:00 Minimum Value: 5 deg on Jun 15 23:00 Percentiles: P ₁ = 8 P ₁₀ = 16 Q ₁ = 21 Median = 26 Q ₃ = 32 P ₉₀ = 45 P ₉₉ = 81																		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-Jun	70	69	45	81	84	23	21	64	45	39	37	63	44	32	32	34	31	31	22	22	25	31	22	55	84
2-Jun	16	23	24	33	26	28	22	32	40	36	62	31	36	39	35	42	32	26	24	23	18	17	21	19	62
3-Jun	18	14	15	15	14	16	32	44	41	40	31	44	47	42	44	46	35	23	21	22	17	16	18	20	47
4-Jun	19	19	17	19	18	19	21	22	22	21	20	24	27	25	22	22	21	22	22	21	19	16	16	56	56
5-Jun	34	26	13	30	24	94	27	26	28	27	31	36	37	53	43	34	33	26	30	29	27	29	32	21	94
6-Jun	35	21	18	18	16	19	17	21	22	21	25	28	24	21	23	22	26	22	22	19	27	11	11	11	35
7-Jun	12	17	22	22	27	31	26	26	23	25	27	23	27	29	31	27	32	30	32	28	21	19	35	11	35
8-Jun	69	28	24	21	22	22	24	25	32	25	32	36	37	42	64	72	69	70	35	33	22	32	17	12	72
9-Jun	14	13	12	13	13	12	21	23	35	62	46	85	53	54	82	65	56	44	30	19	13	15	17	16	85
10-Jun	16	16	17	20	20	19	20	25	26	28	28	26	27	28	30	28	29	29	26	26	26	25	21	20	30
11-Jun	21	26	22	19	23	17	40	19	40	23	32	35	32	32	32	35	30	19	43	42	17	26	41	22	43
12-Jun	47	33	28	31	14	45	30	33	35	38	45	50	53	43	37	39	33	27	20	19	21	16	16	17	53
13-Jun	17	18	16	17	16	17	19	22	25	31	33	41	58	20	24	30	32	26	46	28	34	55	35	40	58
14-Jun	33	57	33	79	23	19	30	28	28	30	25	29	28	28	27	24	23	21	26	26	26	28	28	24	79
15-Jun	24	21	22	21	19	23	25	23	24	20	18	19	20	20	18	17	21	21	21	18	27	26	5	6	27
16-Jun	7	13	13	10	21	20	26	25	27	30	30	29	28	29	28	29	26	28	27	30	28	28	19	19	30
17-Jun	24	24	25	27	25	27	18	19	20	20	21	21	23	24	24	28	33	42	32	28	27	21	49	21	49
18-Jun	27	53	14	17	20	28	24	25	30	39	36	38	36	36	35	32	28	28	27	24	24	26	27	26	53
19-Jun	25	24	25	29	30	30	31	31	30	30	32	30	31	32	29	29	29	31	32	30	29	28	27	25	32
20-Jun	27	28	27	29	26	29	29	28	27	25	25	22	20	28	29	23	29	23	15	17	16	12	14	13	29
21-Jun	12	18	22	22	17	16	25	26	27	24	27	23	30	26	32	30	34	34	34	26	69	30	22	11	69
22-Jun	10	7	6	7	8	15	23	32	45	72	63	45	67	53	68	35	30	20	20	26	61	20	9	10	72
23-Jun	10	9	10	14	18	21	25	30	31	37	42	38	41	41	58	65	54	36	43	39	29	8	12	16	65
24-Jun	16	18	19	19	19	23	28	29	25	23	21	25	30	26	50	48	27	87	33	26	31	33	28	27	87
25-Jun	24	30	27	29	25	28	29	29	28	41	39	60	57	65	79	90	35	30	27	18	31	24	18	7	90
26-Jun	11	14	14	13	15	23	25	26	33	27	26	29	19	29	31	32	70	79	25	25	26	51	30	12	79
27-Jun	10	30	14	41	40	35	32	29	29	36	47	45	82	48	67	56	68	71	70	40	46	16	10	14	82
28-Jun	20	25	20	20	25	25	26	28	28	30	29	25	39	43	29	69	46	78	23	24	34	23	26	21	78
29-Jun	17	16	26	23	16	24	26	29	29	29	29	30	28	27	28	34	26	34	22	25	23	19	20	26	34
30-Jun	18	16	14	15	16	23	29	25	29	30	24	25	25	25	24	28	32	24	20	26	22	21	14	25	32
																		70 69 45 81 84 94 40 64 45 72 63 85 82 65 82 90 70 87 70 42 69 55 49 56							
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS18 STONY MOUNTAIN JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
 JUNE 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	684	34	36	99.72	5.1	0	1.4	0
TRS(ppb) Average	682	36	38	99.72	0.5	0	0.3	0
THC(ppm) Average	684	34	36	99.72	2.1	-	2.1	-
NMHC(ppm) Average	684	34	36	99.72	0.01	-	0.001	-
CH4(ppm) Average	684	34	36	99.72	2.1	-	2.1	-
O3 (ppb) Average	684	36	36	100	67.1	0	50.4	-
NO2 (ppb) Average	684	36	36	100	4.2	0	2.2	-
NO (ppb) Average	684	36	36	100	0.7	-	0.3	-
NOX (ppb) Average	684	36	36	100	4.4	-	2.5	-
PM2.5 (ug/m3) Average	718	2	2	100	162.6	58	88	10
CO(ppm) Average	685	33	35	99.72	1.2	0	0.5	0
CO2(ppm) Average	684	34	36	99.72	461.4	0	434	0
Temperature 2 m (C) Average	720	0	0	100	28.1	-	22.1	-
Relative Humidity (%) Average	720	0	0	100	100	-	97.2	-
Wind Speed 20 m (km/h) Average	720	0	0	100	24	-	16	-
Wind Direction 20 m (deg) Average	720	0	0	100	-	-	-	-
Precipitation (mm) Total	686	0	34	95.28	7.7	-	34.9	-
Leaf Wetness (% of range) Average	720	0	0	100	58.3	-	20.3	-
Global Solar Radiation (W/m2) Average	720	0	0	100	971.3	-	304.9	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
JUNE 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	0.31	0.5	-	0	0	0.1	0.2	0.3	0.8	5.1
TRS (ppb) Average	682	0.2	0.1	-	0	0.1	0.2	0.2	0.2	0.3	0.5
THC (ppm) Average	684	2.04	0	-	2	2	2	2	2.1	2.1	2.1
NMHC(ppm) Average	684	0	0.001	-	0	0	0	0	0	0	0.01
CH4(ppm) Average	684	2.04	0	-	2	2	2	2	2.1	2.1	2.1
O3 (ppb) Average	684	30.52	10.7	-	7.4	17.9	22	30.5	37.6	43.9	67.1
NO2 (ppb) Average	684	0.94	0.7	-	0	0.3	0.4	0.8	1.2	1.9	4.2
NO (ppb) Average	684	0.16	0.1	-	0	0.1	0.1	0.1	0.2	0.2	0.7
NOX (ppb) Average	684	1.1	0.7	-	0.1	0.4	0.6	0.9	1.4	2	4.4
PM2.5 (ug/m3) Average	718	26.09	30.4	-	0.7	3.5	6.4	13.4	31.4	69.8	162.6
CO(ppm) Average	685	0.28	0.1	-	0.1	0.2	0.2	0.2	0.3	0.5	1.2
CO2(ppm) Average	684	422.3	13.1	-	386.6	406.6	413.5	421	430.3	440.9	461.4
Temperature 2 m (C) Average	720	16.21	5.1	-	6.3	9.4	12.3	16.1	19.9	23.2	28.1
Relative Humidity (%) Average	720	69.98	20.7	-	17	41.3	54	69.2	90.1	97.5	100
Wind Speed 10 m (km/h) Average	720	10.5	4	-	0	6	8	10	13	16	24
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	686	-	-	111.61	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	720	5.31	9	-	0	0.5	1	1.4	4.2	18.7	58.3
Global Solar Radiation (W/m2) Average	720	183.92	228.7	-	0	0	1.4	79.3	309.3	540.2	971.3

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
JUNE 2023

MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
CO, CO2, SO2, THC/NMHC/CH4, TRS	28 Jun 2023 15:00	28 Jun 2023 16:00	2	Maintenance - sample manifold cleaned
Precipitation Collector	13 Jun 2023 01:00	14 Jun 2023 10:00	34	DAS Failure - data not recorded



Wood Buffalo Environmental Association
Summary of Hour Averages

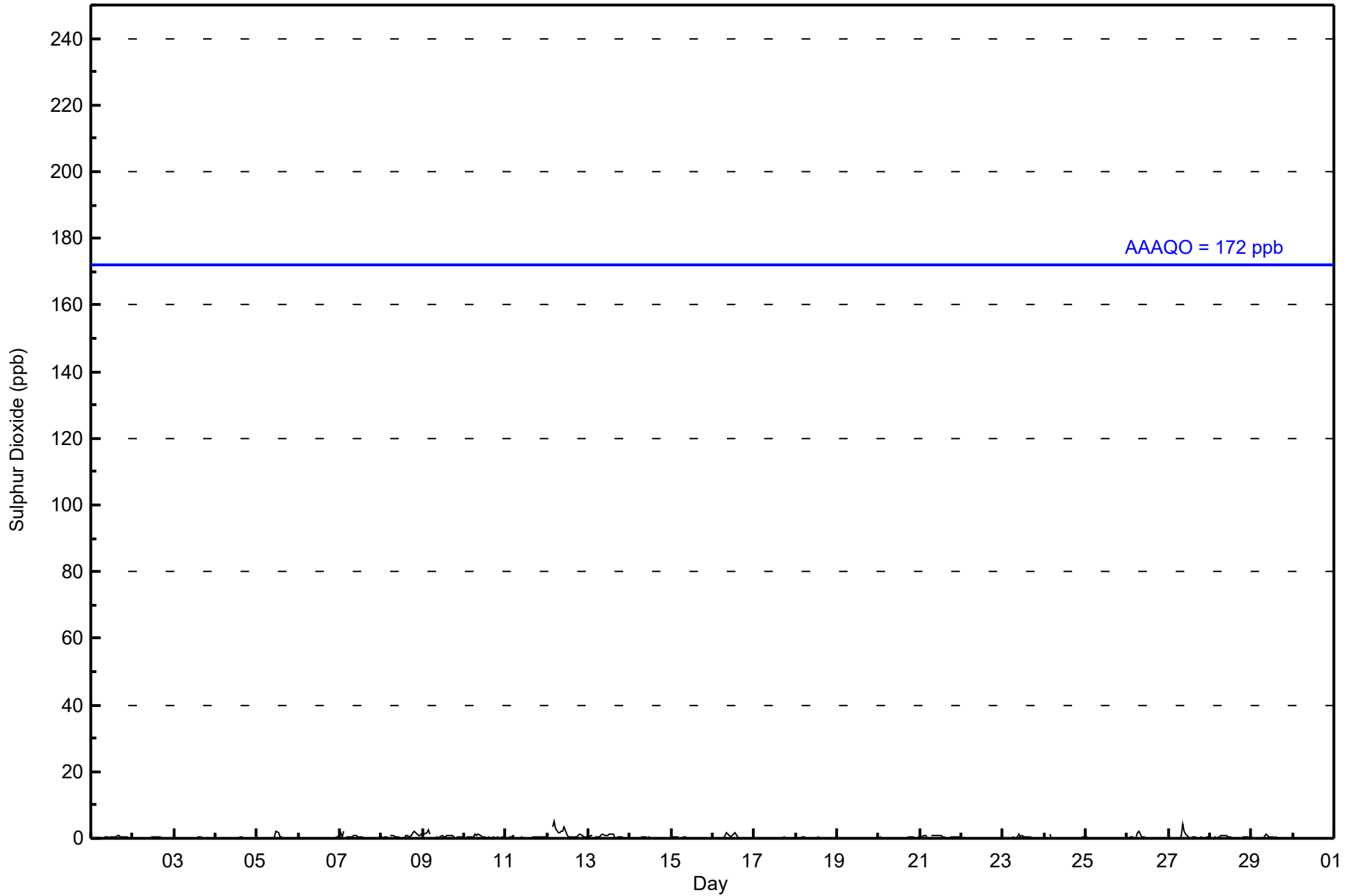
Sulphur Dioxide (SO₂) - ppb
Stony Mountain - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																																														
Maximum Value: 5.1 ppb on Jun 12 05:00		Maximum Daily Average: 1.4 ppb on Jun 12																	Hours of Data: 684		Hours of Missing Data: 36																																																
Minimum Value: 0.0 ppb on Jun 3 04:00		Minimum Daily Average: 0.1 ppb on Jun 3																	Hours of Calibration: 34		Percent Operational Time: 99.7																																																
Maximum Diurnal Average: 0.6 ppb at hour 9		Minimum Diurnal Average: 0.2 ppb at hour 22																																																																			
Monthly Average: 0.31 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.8 P ₉₉ = 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-Jun	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.1	0.3	0.2	0.1	0.3	0.3	0.4	0.6	0.9	0.8	0.4	0.3	0.2	0.6	0.6	0.2	0.1	0.3	0.9																																											
2-Jun	0.1	0.1	0.1	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.3																																										
3-Jun	0.1	0.1	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.3																																										
4-Jun	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3																																										
5-Jun	0.3	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.4	2.1	1.6	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.1																																										
6-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.5	0.1	0.5																																											
7-Jun	1.8	0.6	2.3	Z	0.2	0.4	0.4	0.5	1.0	0.8	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.5	2.3																																										
8-Jun	0.3	0.2	0.3	0.4	Z	0.7	0.6	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.7	0.6	0.6	0.8	1.7	2.1	1.6	0.8	0.9	1.2	0.7	2.1																																											
9-Jun	1.6	1.3	1.6	2.4	1.1	Z	0.2	0.2	0.2	0.2	0.3	0.8	0.4	0.4	0.6	0.8	0.7	0.7	0.2	0.2	0.3	0.2	0.3	0.6	0.7	2.4																																											
10-Jun	Z	0.6	0.6	0.5	0.3	0.5	1.4	0.8	1.4	0.8	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.3	0.6	0.5	1.4																																											
11-Jun	0.5	Z	0.3	0.6	0.8	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.5	0.5	0.4	0.4	0.3	0.8																																											
12-Jun	0.5	1.3	Z	3.4	5.1	2.9	1.7	1.7	1.9	2.2	3.2	1.1	0.4	0.5	0.4	0.4	0.4	0.3	1.0	1.3	0.7	0.4	0.5	0.3	1.4	5.1																																											
13-Jun	0.6	1.0	0.8	Z	0.4	0.4	0.5	0.8	1.3	0.9	1.0	0.9	1.2	1.5	1.2	0.2	0.2	0.2	0.2	0.5	0.1	0.1	0.1	0.1	0.6	1.5																																											
14-Jun	0.0	0.1	0.0	0.1	Z	0.2	0.2	0.2	0.4	0.4	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	0.2	0.1	0.4																																											
15-Jun	0.3	0.3	0.4	0.4	0.5	Z	0.4	0.3	0.2	0.2	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.5																																											
16-Jun	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.7	1.6	0.8	0.3	0.7	1.2	1.5	0.5	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.4	1.6																																											
17-Jun	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2																																											
18-Jun	0.2	0.1	Z	0.2	0.3	0.3	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3																																											
19-Jun	0.1	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2																																											
20-Jun	0.1	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3																																											
21-Jun	0.3	0.5	0.7	0.8	0.5	Z	0.9	0.9	0.8	0.9	1.0	0.9	0.8	0.4	0.2	0.1	0.1	0.1	0.3	0.4	0.5	0.6	0.5	0.4	0.5	1.0																																											
22-Jun	Z	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																																											
23-Jun	0.0	Z	0.0	0.0	0.2	0.1	0.4	0.2	0.5	1.2	0.4	0.8	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	1.2																																											
24-Jun	0.1	0.1	Z	1.1	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.2	1.1																																											
25-Jun	0.3	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3																																											
26-Jun	0.1	0.2	0.3	0.4	Z	0.3	1.5	2.0	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0																																											
27-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.8	4.1	2.1	1.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.5	0.5	4.1																																											
28-Jun	Z	0.2	0.2	0.4	0.2	0.2	1.0	0.7	1.1	1.0	0.3	0.6	0.3	0.1	M	M	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.1	0.4	1.1																																											
29-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	1.4	0.7	0.6	0.5	0.3	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.2	1.4																																											
30-Jun	0.1	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2																																											
																								Diurnal Average		Diurnal Maximum																																											
																								0.3 1.8		0.3 1.3		0.3 2.3		0.4 3.4		0.4 5.1		0.3 2.9		0.4 1.7		0.4 2.0		0.6 4.1		0.5 2.2		0.4 3.2		0.4 2.1		0.3 1.6		0.3 1.5		0.2 1.2		0.2 0.9		0.2 0.8		0.2 1.7		0.2 2.1		0.2 1.6		0.2 0.8		0.2 0.9		0.2 1.2	
Z - zerospan C - Calibration M - Maintenance																																																																					
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																																					



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Stony Mountain - June 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	60	56	51	25	30	24	17	17	49	63	48	35	42	42	50	75	684
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	60	56	51	25	30	24	17	17	49	63	48	35	42	42	50	75	684

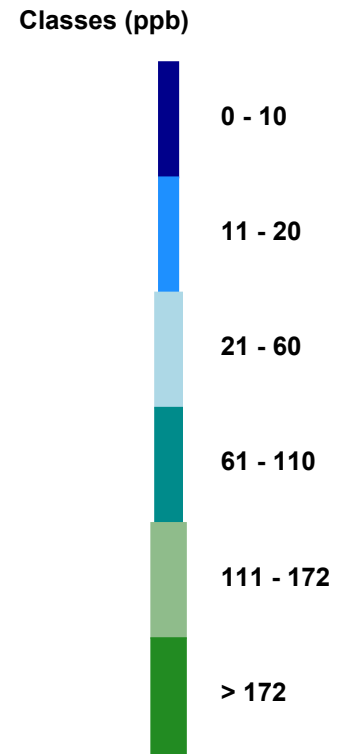
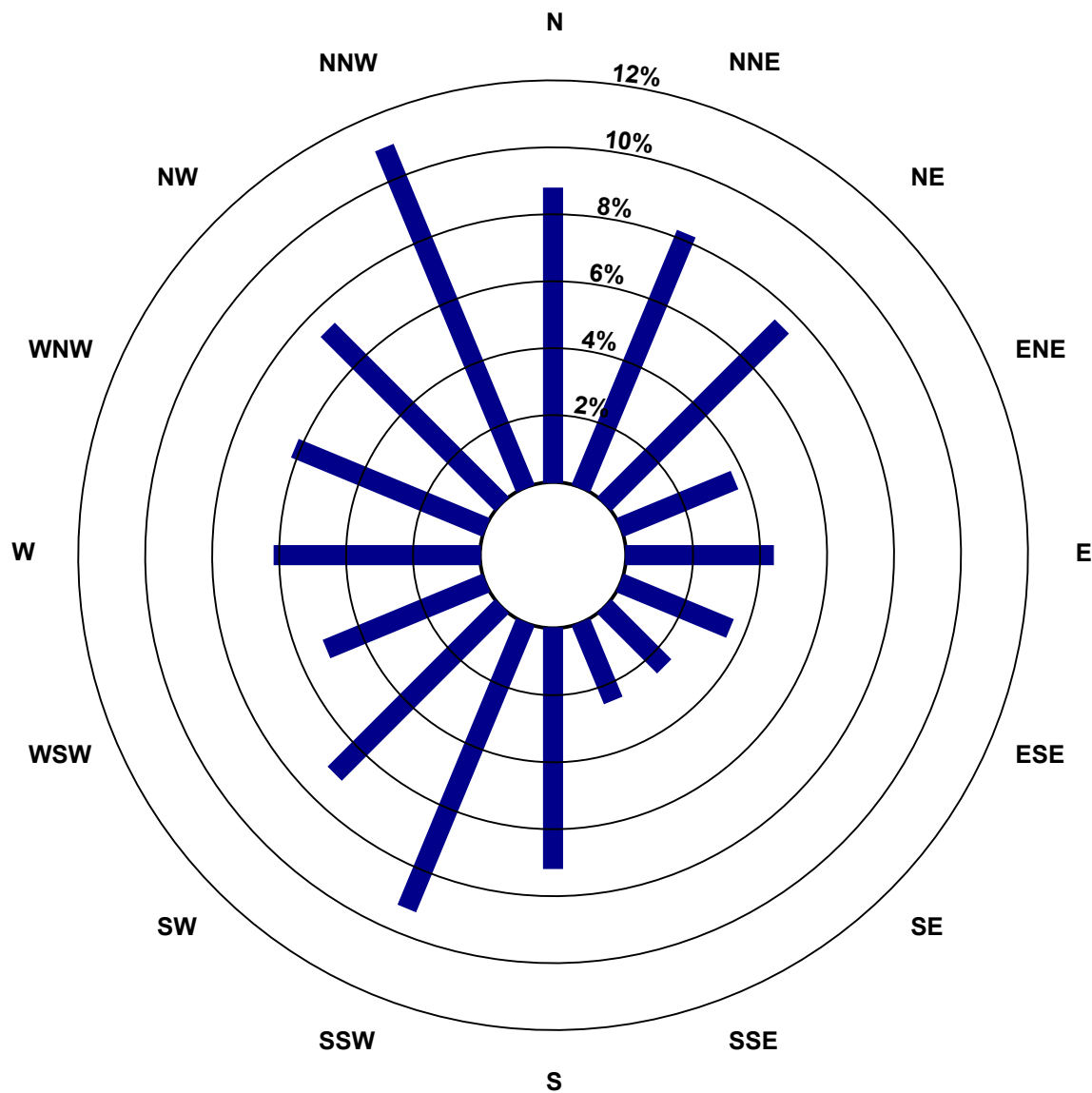
Total Number of Valid Hours: 684

Total Number of Hours: 720

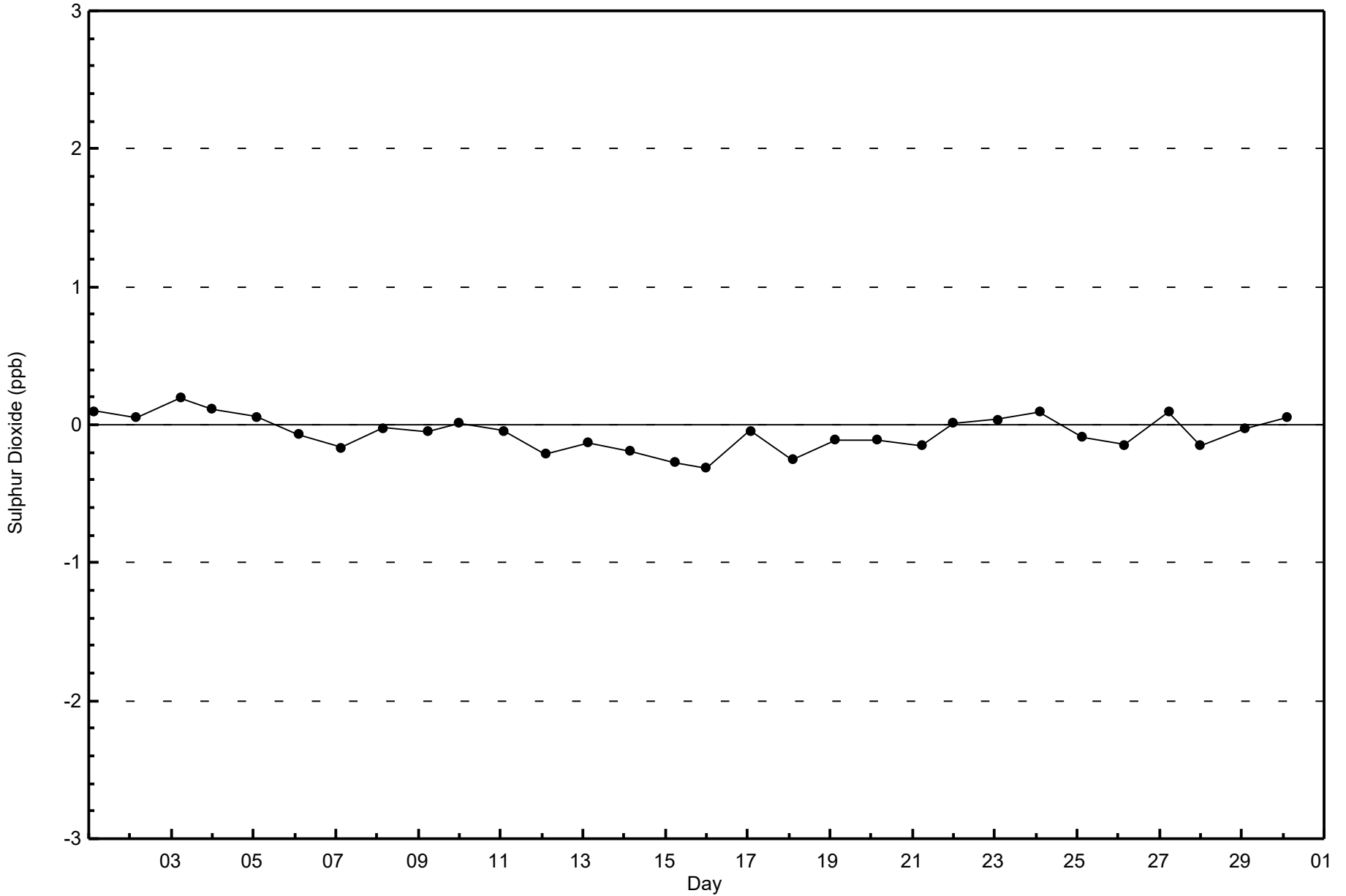


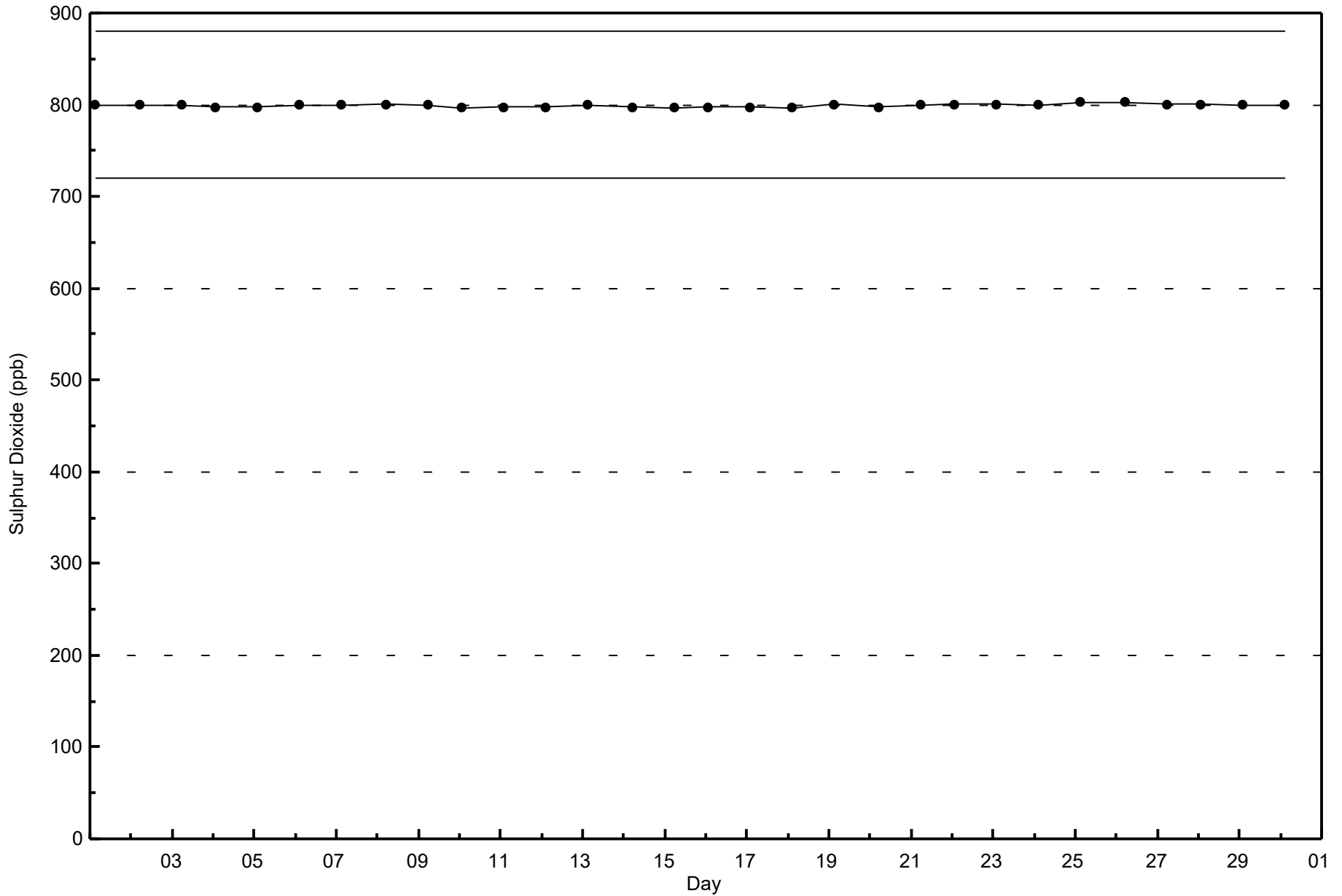
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Stony Mountain



Total Number of Valid Hours: 684

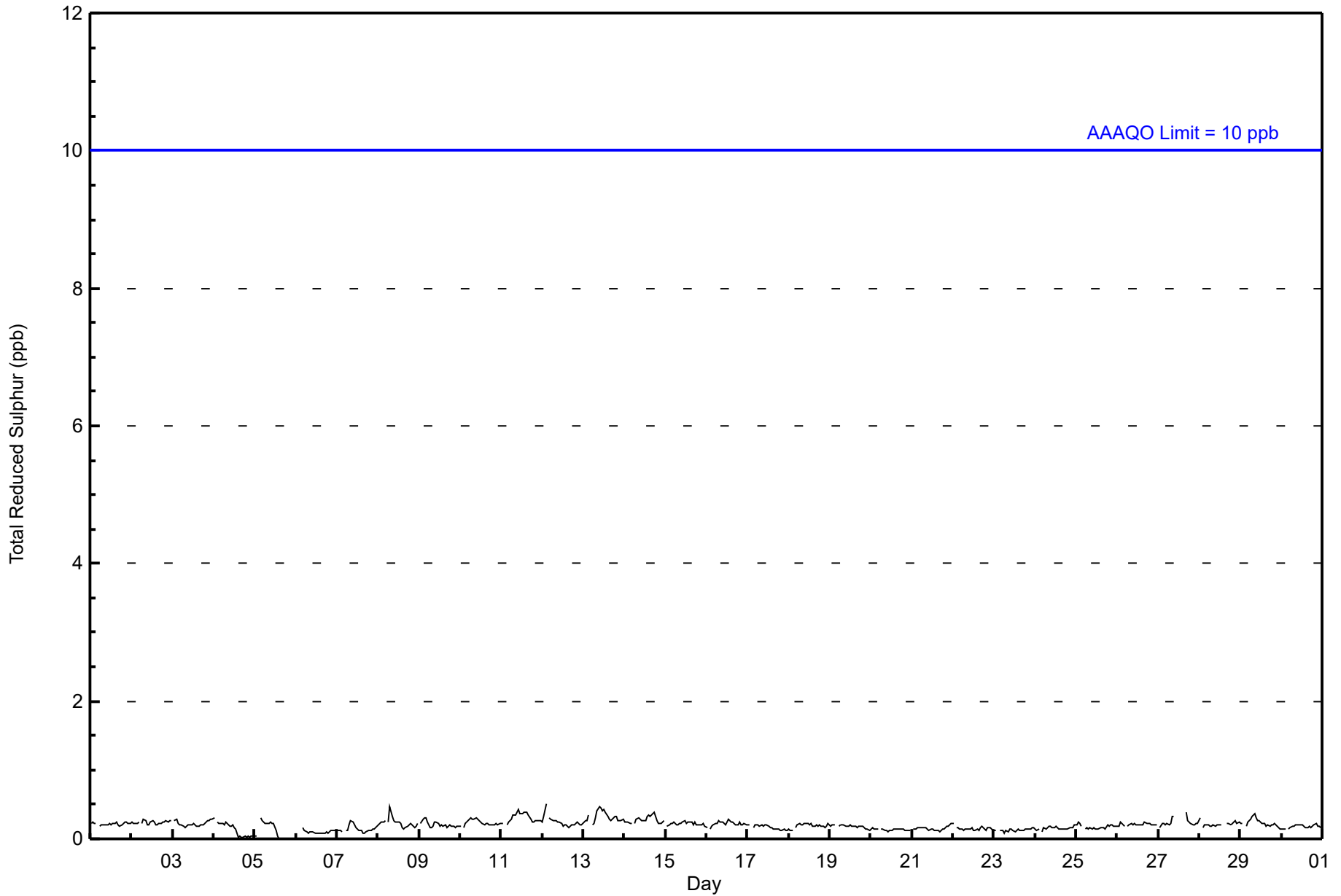






Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Stony Mountain - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	682	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: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - June 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	53	51	25	30	23	17	18	47	65	47	36	41	40	52	77	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	60	53	51	25	30	23	17	18	47	65	47	36	41	40	52	77	682

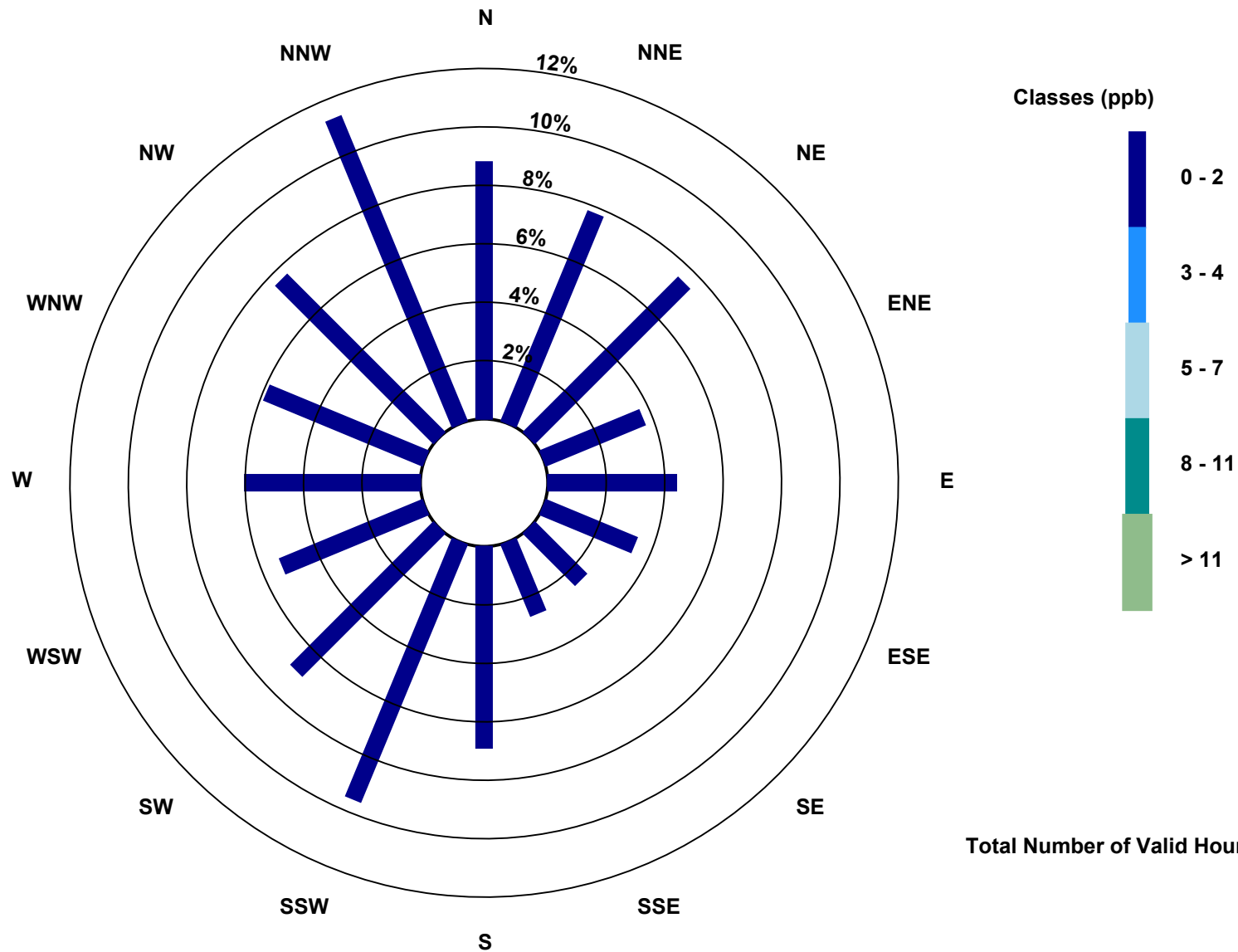
Total Number of Valid Hours: 682

Total Number of Hours: 720

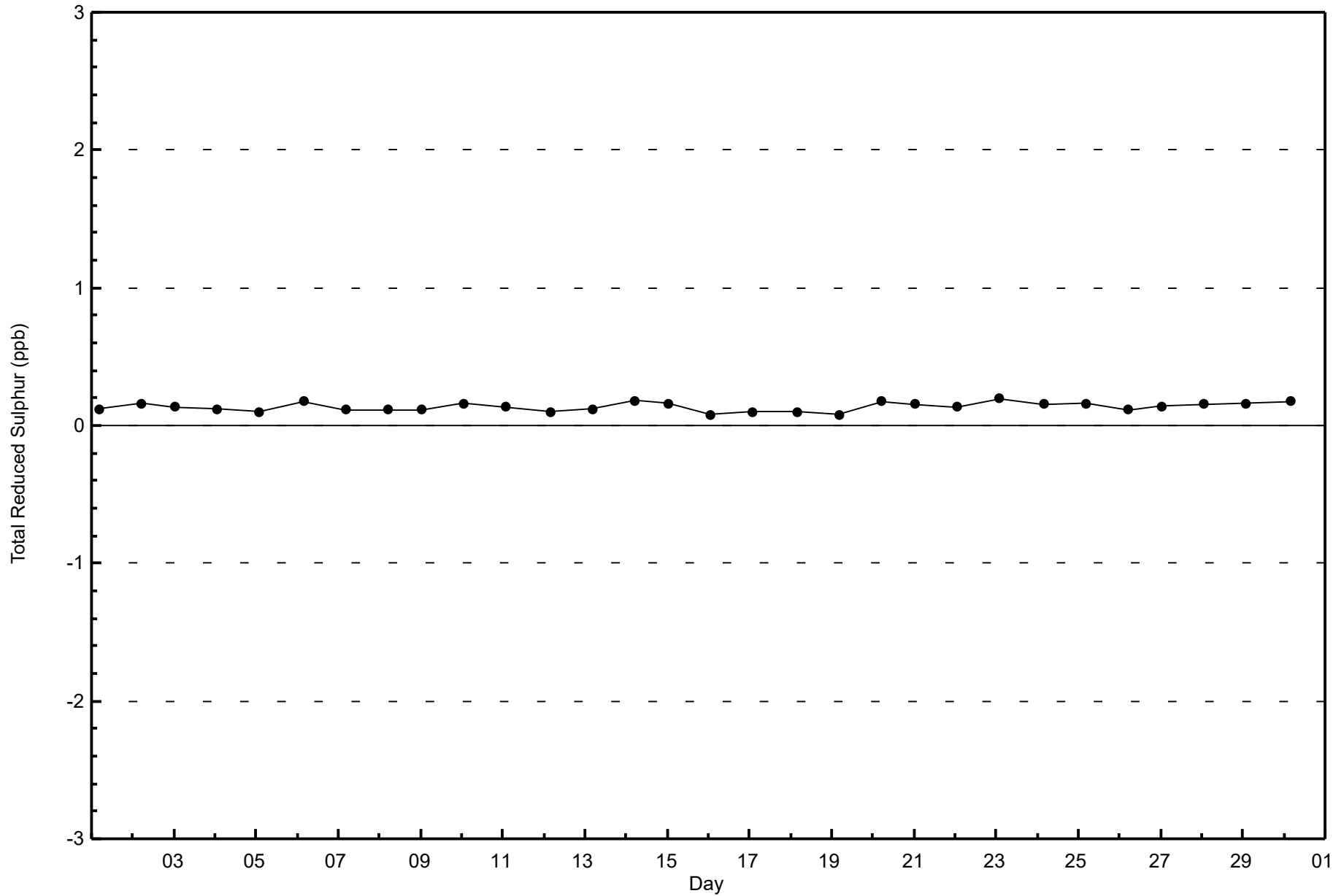


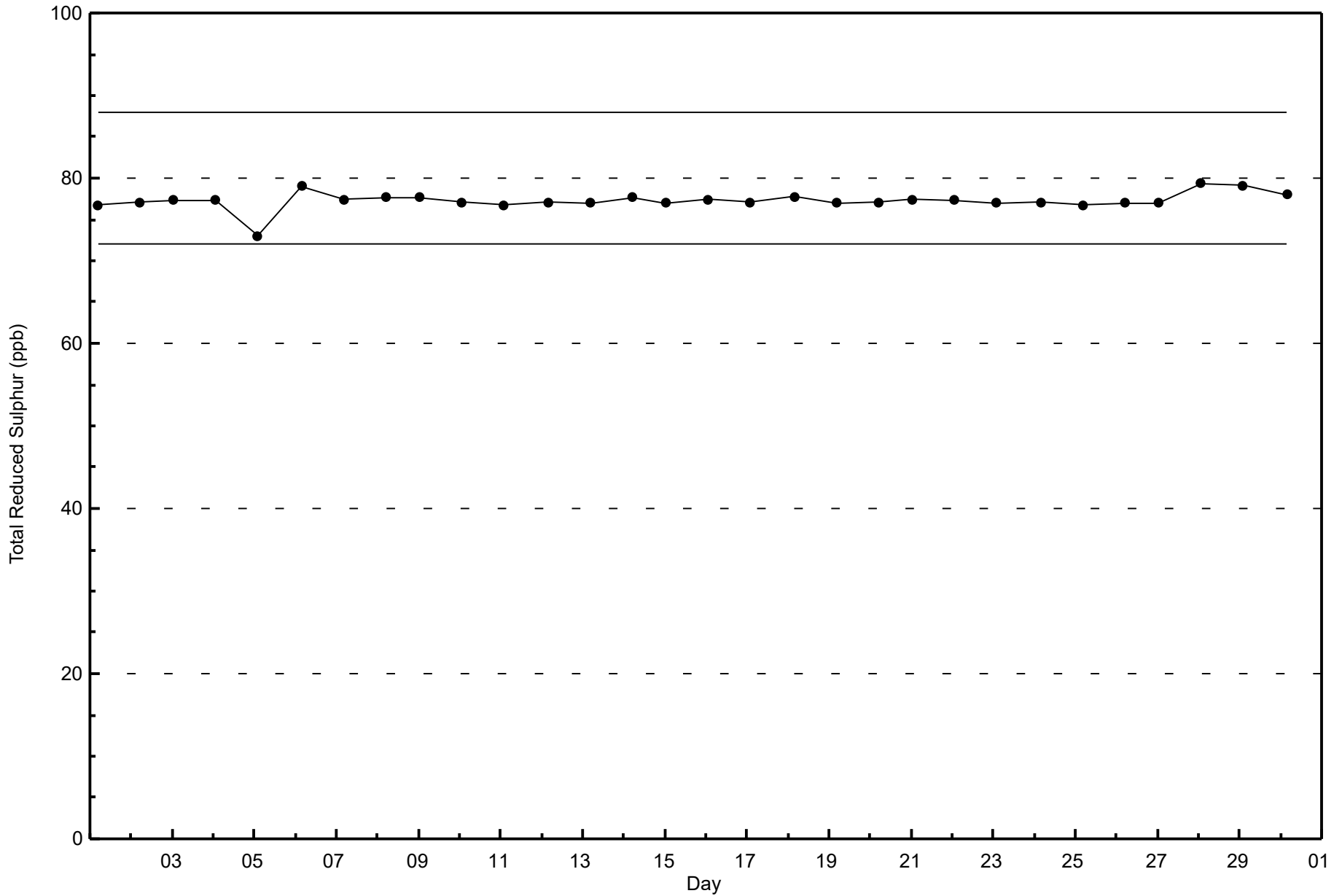
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Stony Mountain



Total Number of Valid Hours: 682





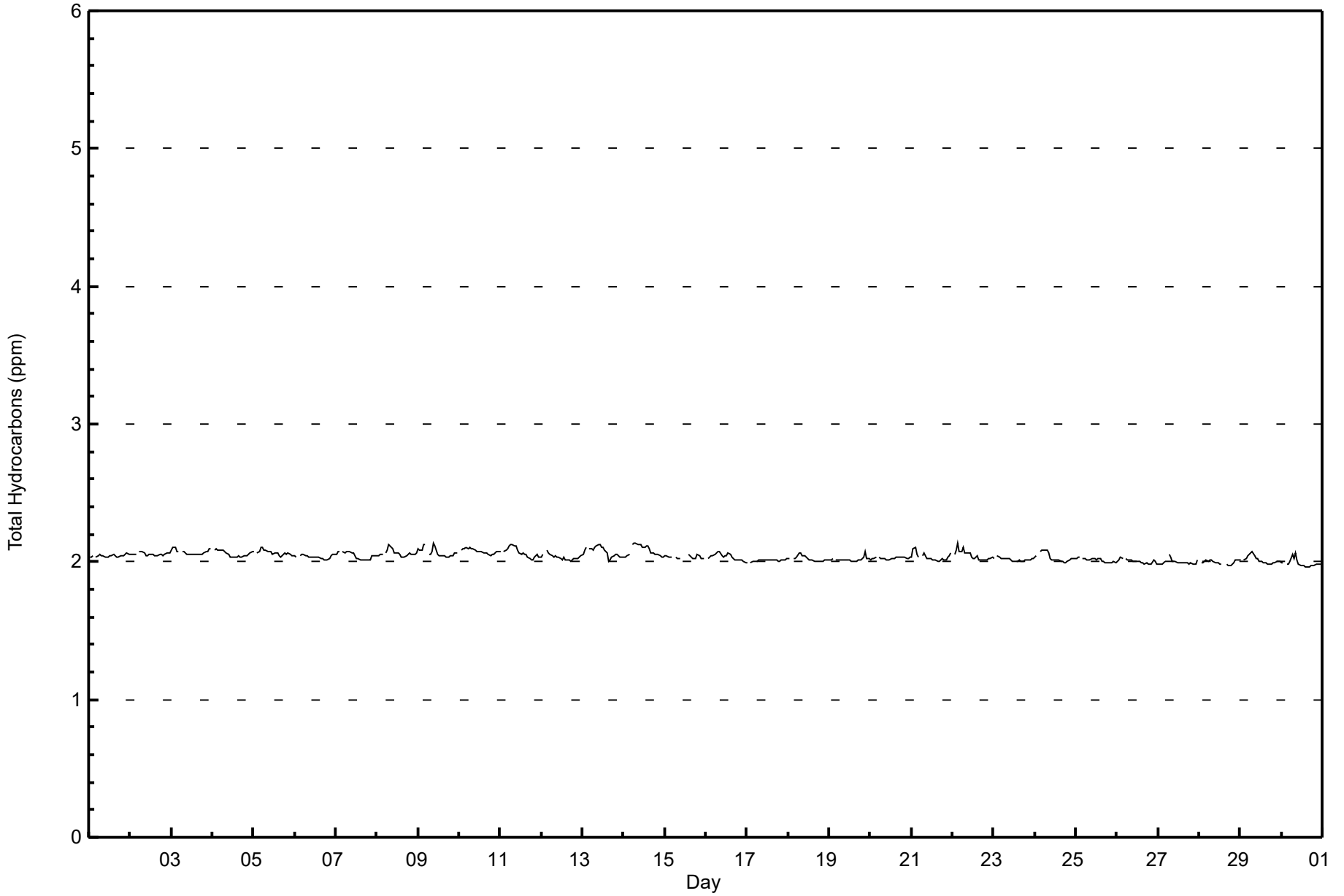


Maximum Value: 2.1 ppm on Jun 14 08:00		Maximum Daily Average: 2.1 ppm on Jun 14		Hours in Service: 720																						
Minimum Value: 2.0 ppm on Jun 30 17:00		Minimum Daily Average: 2.0 ppm on Jun 30		Hours of Data: 684																						
Maximum Diurnal Average: 2.1 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Missing Data: 36																						
Monthly Average: 2.04 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.1 P ₉₉ = 2.1		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-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	
2-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	
3-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
4-Jun	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	2.1	2.1	2.1	2.1	
5-Jun	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	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	
6-Jun	2.0	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	
7-Jun	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	
8-Jun	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
9-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	
10-Jun	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	2.0	2.1	2.1	2.1	2.1	2.1	2.1	
11-Jun	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	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	
12-Jun	2.0	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	
13-Jun	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	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	
14-Jun	2.0	2.0	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	
15-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	C	C	C	C	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
16-Jun	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
17-Jun	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	
18-Jun	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	
19-Jun	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	2.0	2.0	2.0	2.0	
20-Jun	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	
21-Jun	2.0	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	
22-Jun	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
23-Jun	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
24-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
25-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
26-Jun	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	
27-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
28-Jun	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	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
29-Jun	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
30-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	456	66.67	66.67
2.1 - 3.0	228	33.33	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
Stony Mountain - June 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	43	36	45	8	10	14	3	11	20	42	34	30	39	37	36	48	456
2.1 - 3.0	17	20	6	17	20	10	14	6	29	21	14	5	3	5	14	27	228
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	56	51	25	30	24	17	17	49	63	48	35	42	42	50	75	684

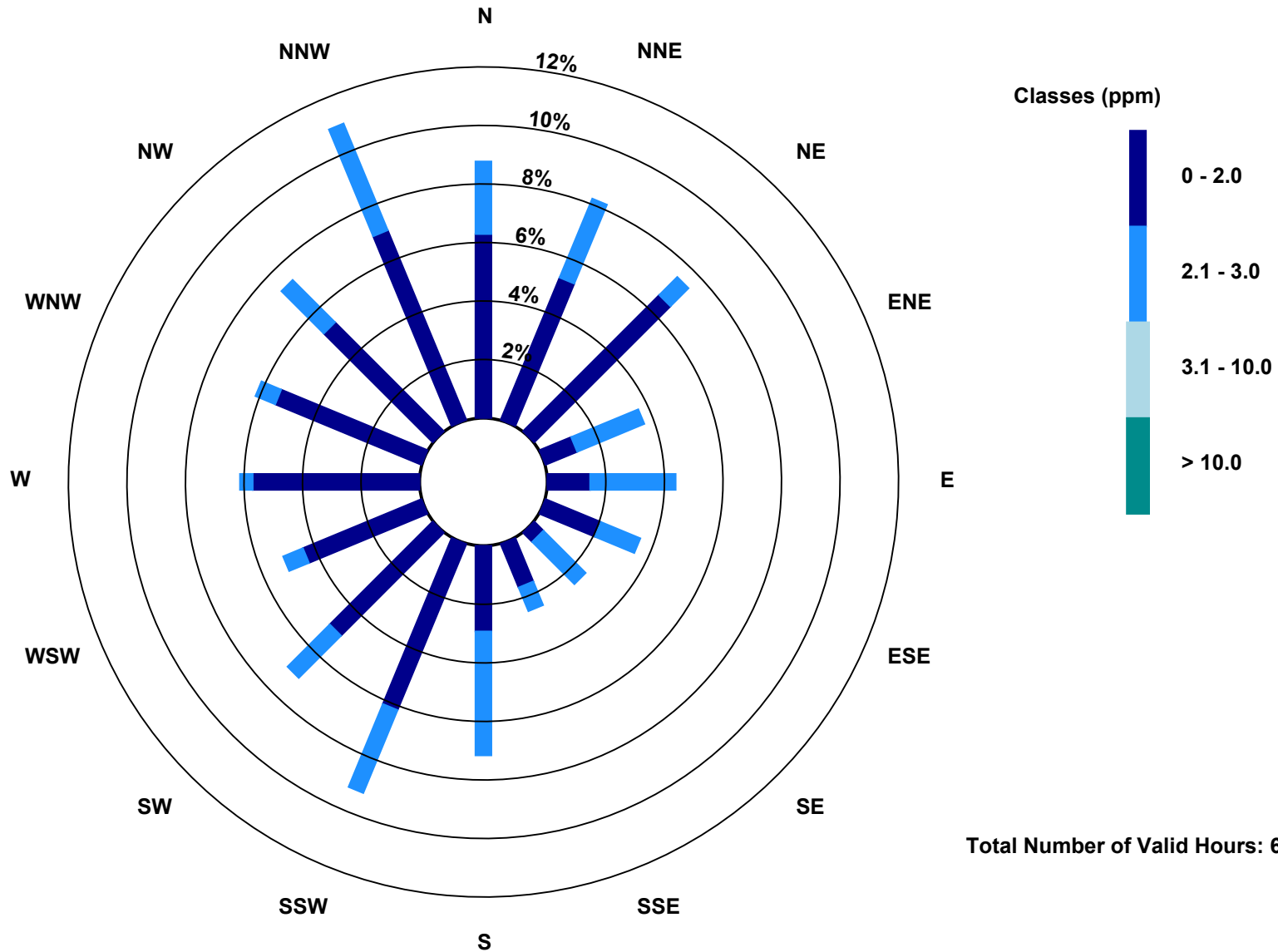
Total Number of Valid Hours: 684

Total Number of Hours: 720

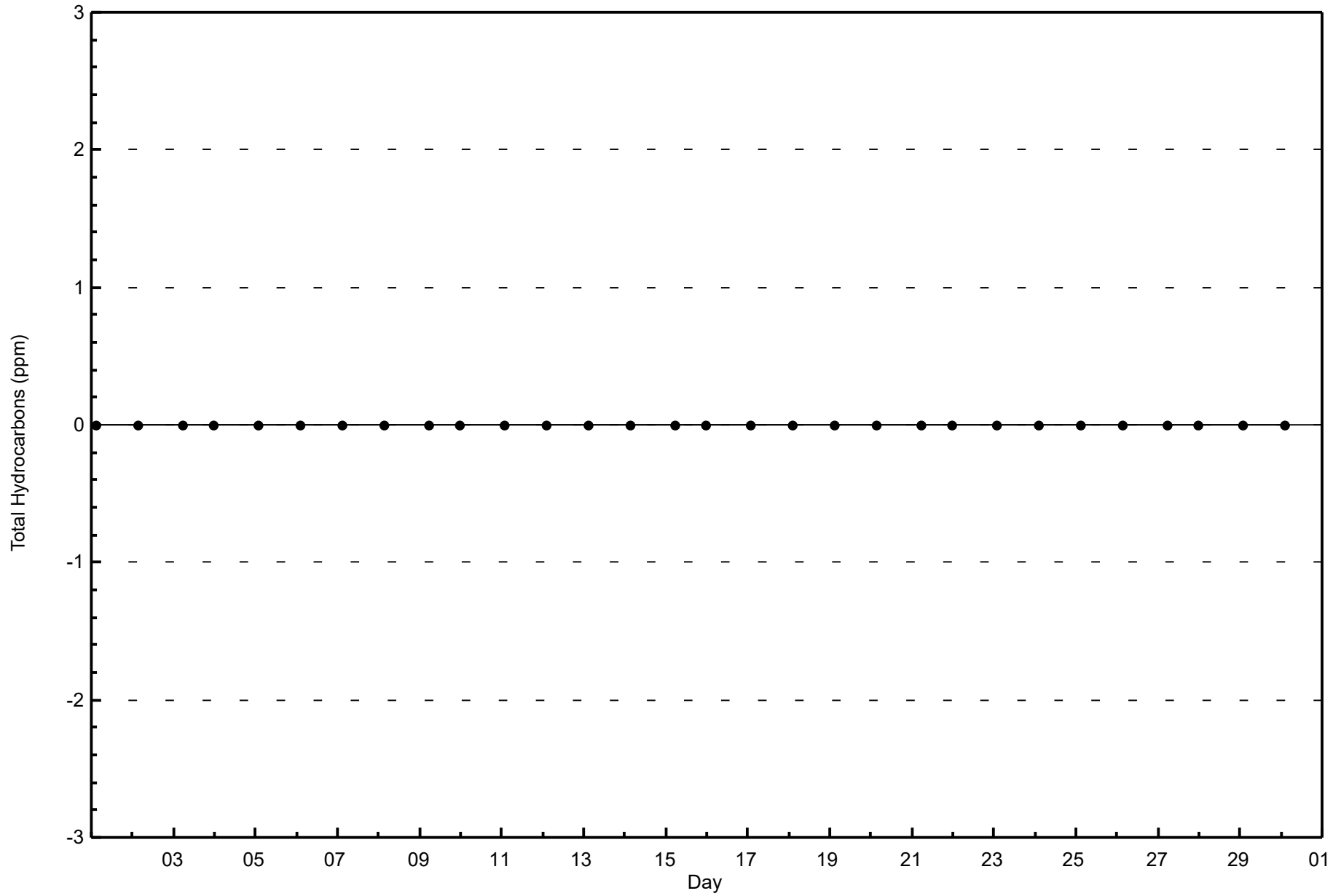


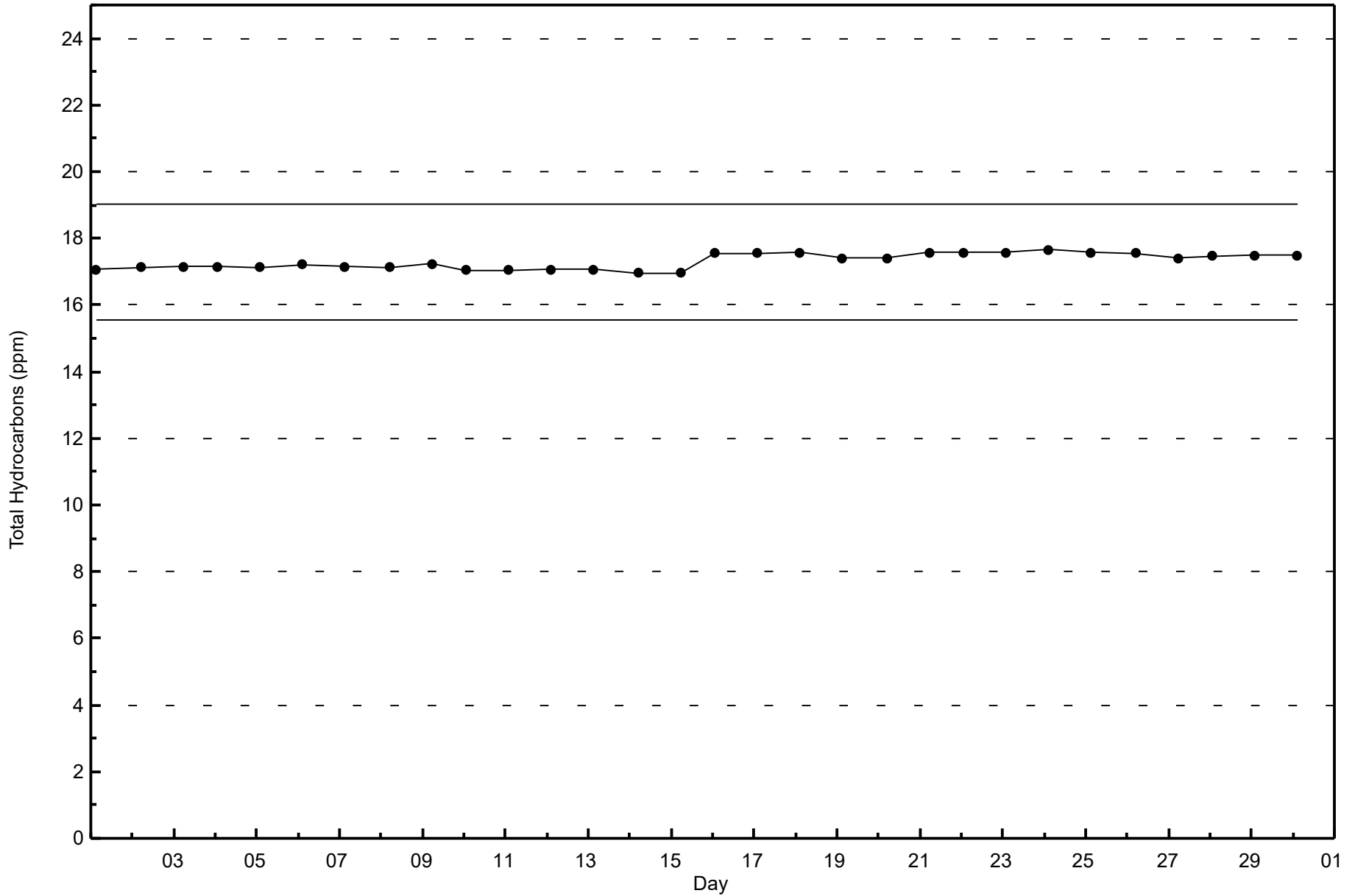
Wood Buffalo Environmental Association
Wind Rose Jun 2023

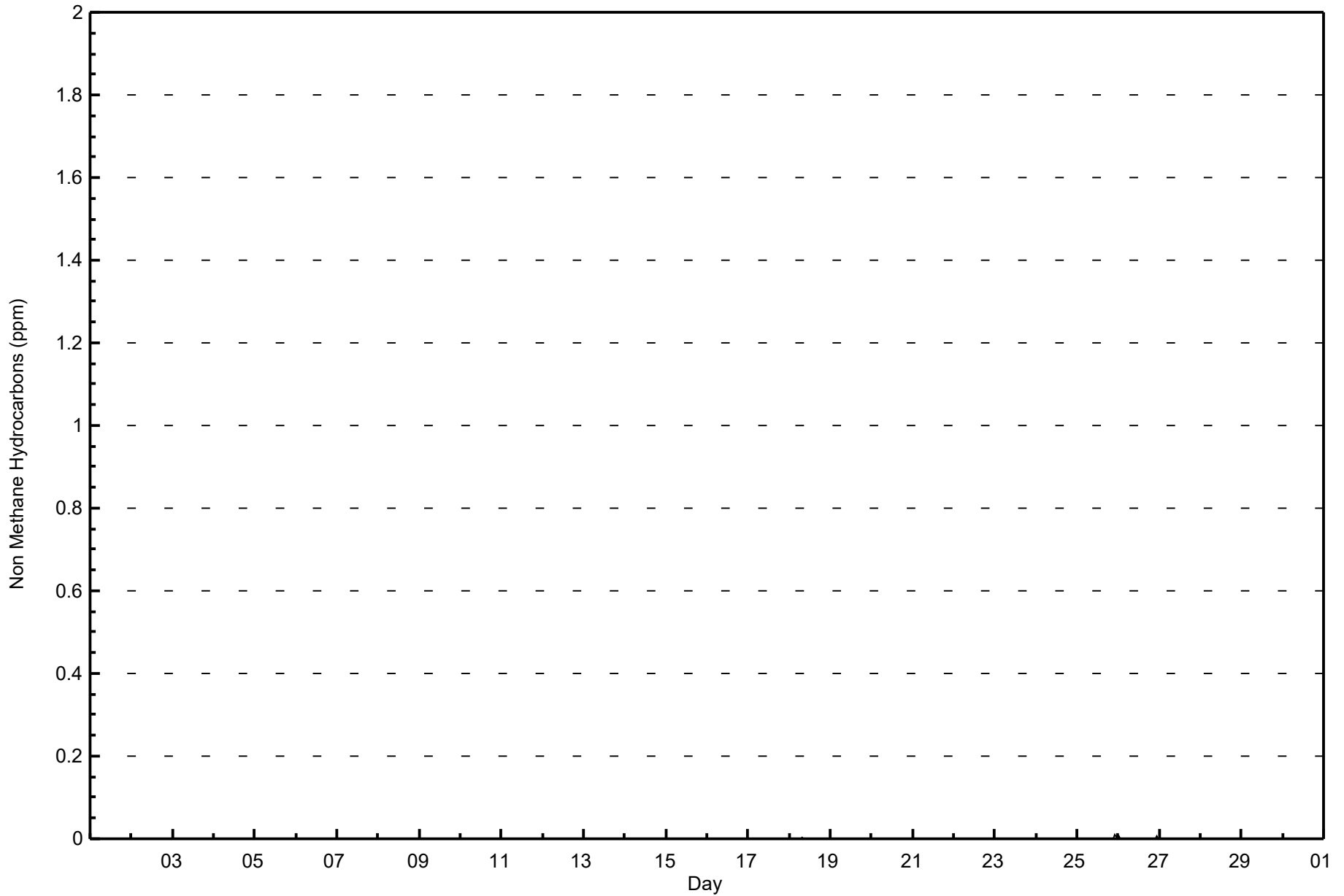
Total Hydrocarbons (THC) - ppm
Stony Mountain



Total Number of Valid Hours: 684









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	681	99.56	99.56
0.006 - 0.05	3	0.44	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



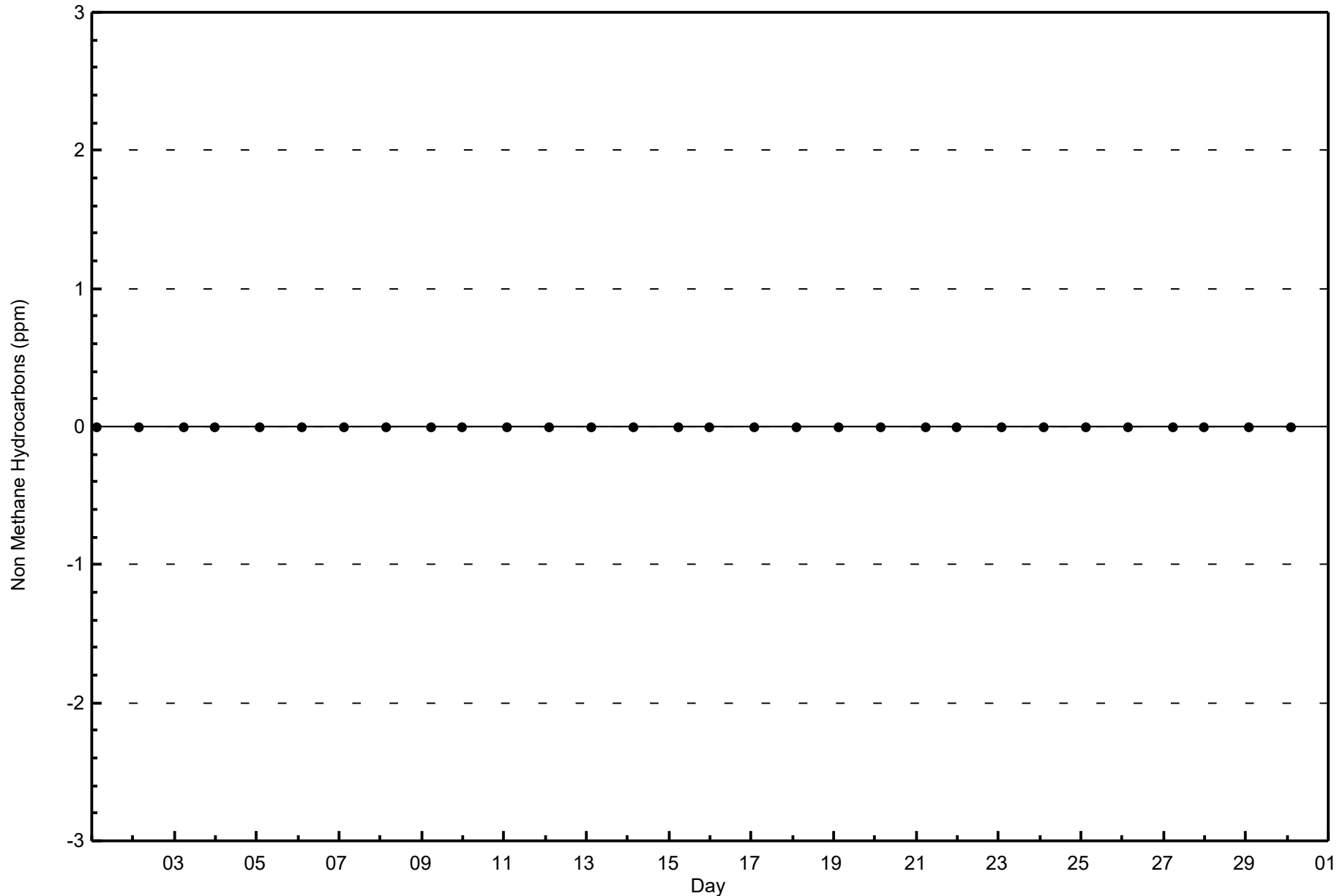
**Wood Buffalo Environmental Association
Frequency Distribution**

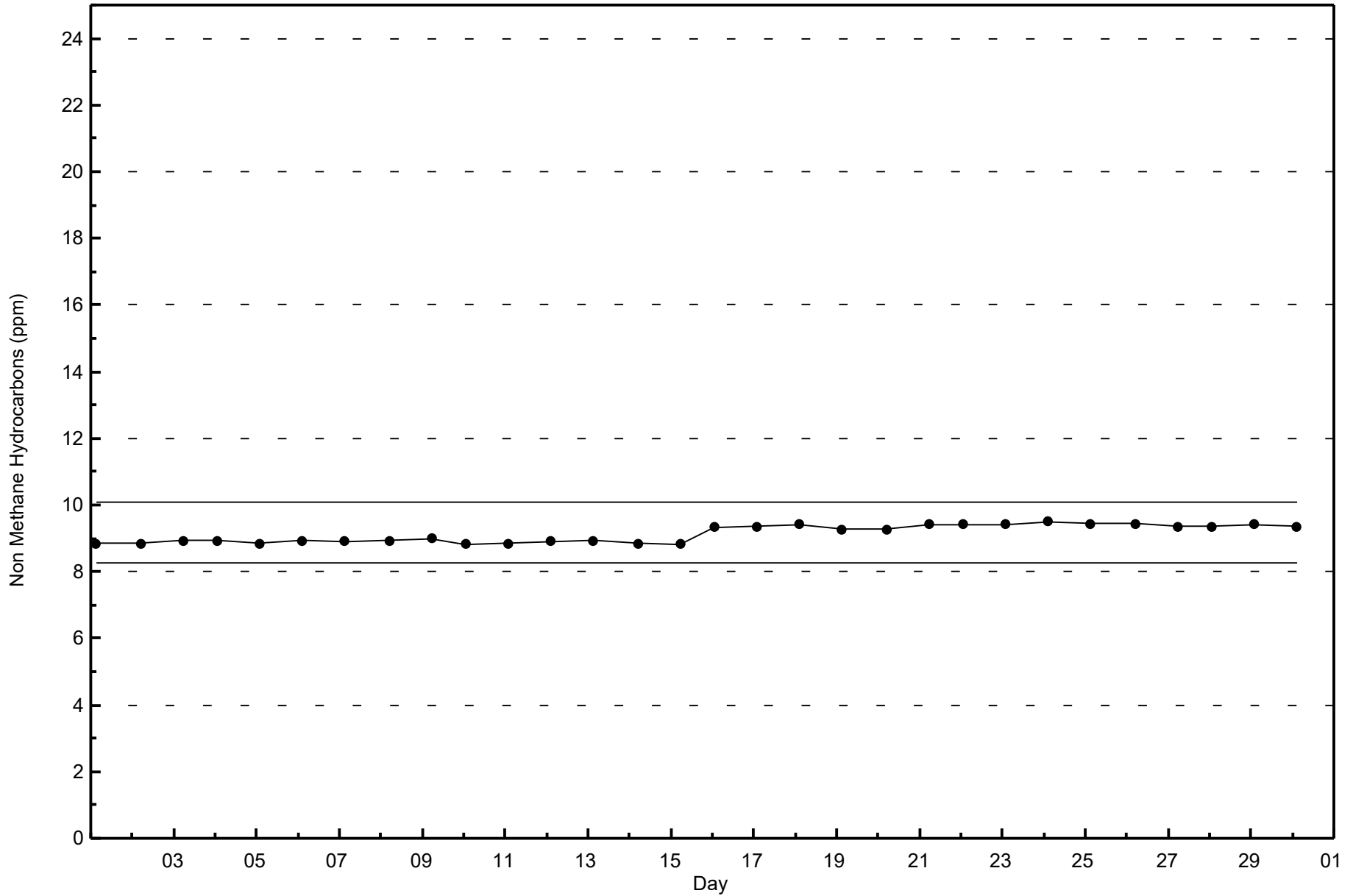
**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - June 2023**

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	60	56	50	24	30	24	17	17	49	63	48	35	42	41	50	75	681
0.006 - 0.05	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	3
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	56	51	25	30	24	17	17	49	63	48	35	42	42	50	75	684

Total Number of Valid Hours: 684

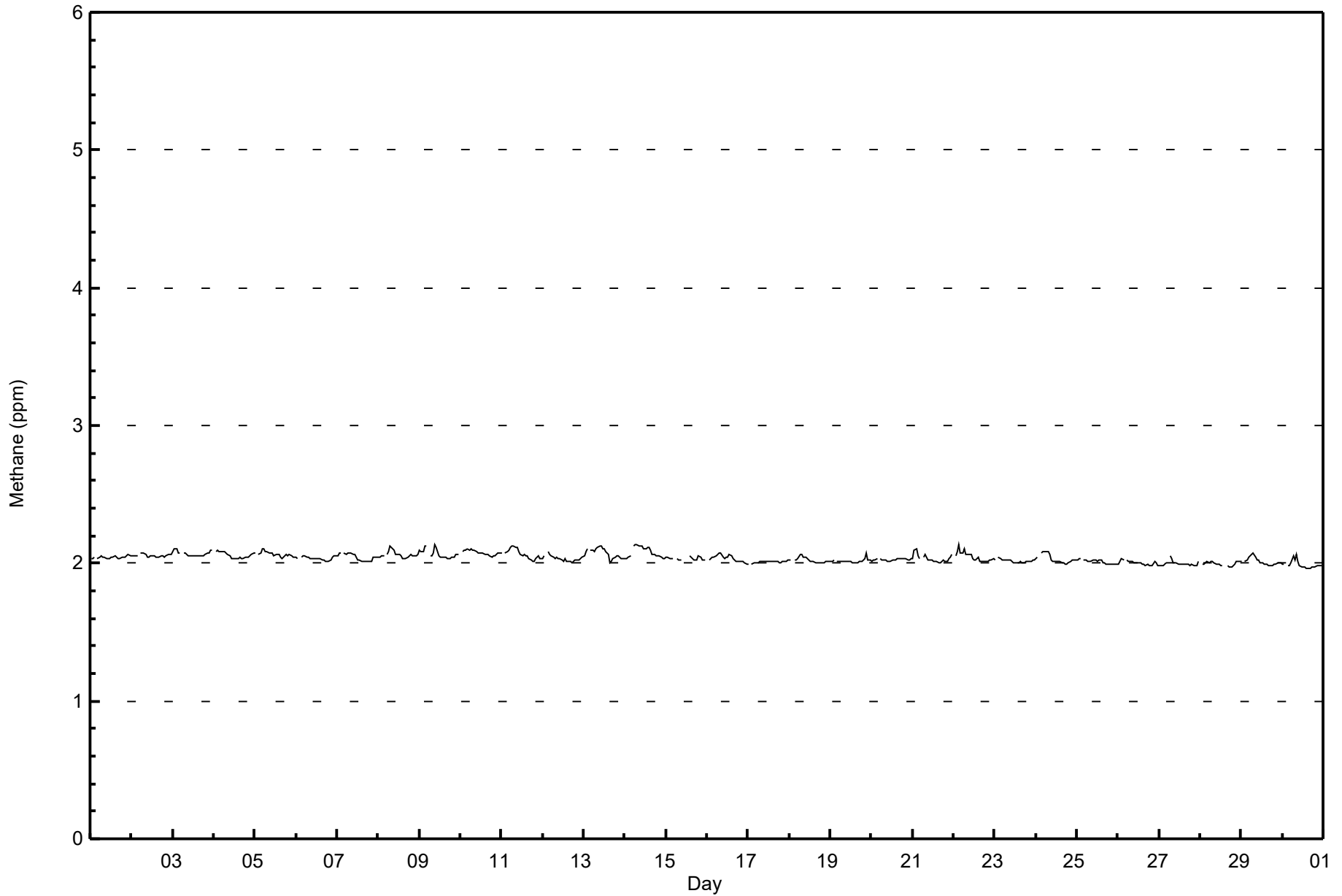
Total Number of Hours: 720







Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum					
Maximum Value: 2.1 ppm on Jun 14 08:00		Maximum Daily Average: 2.1 ppm on Jun 14		Hours of Data: 684																							
Minimum Value: 2.0 ppm on Jun 30 17:00		Minimum Daily Average: 2.0 ppm on Jun 30		Hours of Missing Data: 36																							
Maximum Diurnal Average: 2.1 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Calibration: 34																							
Monthly Average: 2.04 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.1 P ₉₉ = 2.1		Percent Operational Time: 99.7																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	
2-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	
3-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
4-Jun	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	2.1	2.1	2.1	2.1	2.1	
5-Jun	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	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	
6-Jun	2.0	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	
7-Jun	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	2.1	
8-Jun	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
9-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	
10-Jun	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	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
11-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	
12-Jun	2.0	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
13-Jun	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	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	
14-Jun	2.0	2.0	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	
15-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	C	C	C	C	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
16-Jun	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
17-Jun	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	
18-Jun	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	
19-Jun	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	2.0	2.0	2.0	2.1		
20-Jun	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	
21-Jun	2.0	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	
22-Jun	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
23-Jun	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	
24-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
25-Jun	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	
26-Jun	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	
27-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
28-Jun	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	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
29-Jun	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
30-Jun	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	
																								Diurnal Average		Diurnal Maximum	
																								2.0		2.1	
																								2.1		2.1	
Z - zerspan			C - Calibration			M - Maintenance																					





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Stony Mountain - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	456	66.67	66.67
2.1 - 3.0	228	33.33	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
Stony Mountain - June 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	43	36	45	8	10	14	3	11	20	42	34	30	39	37	36	48	456
2.1 - 3.0	17	20	6	17	20	10	14	6	29	21	14	5	3	5	14	27	228
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	56	51	25	30	24	17	17	49	63	48	35	42	42	50	75	684

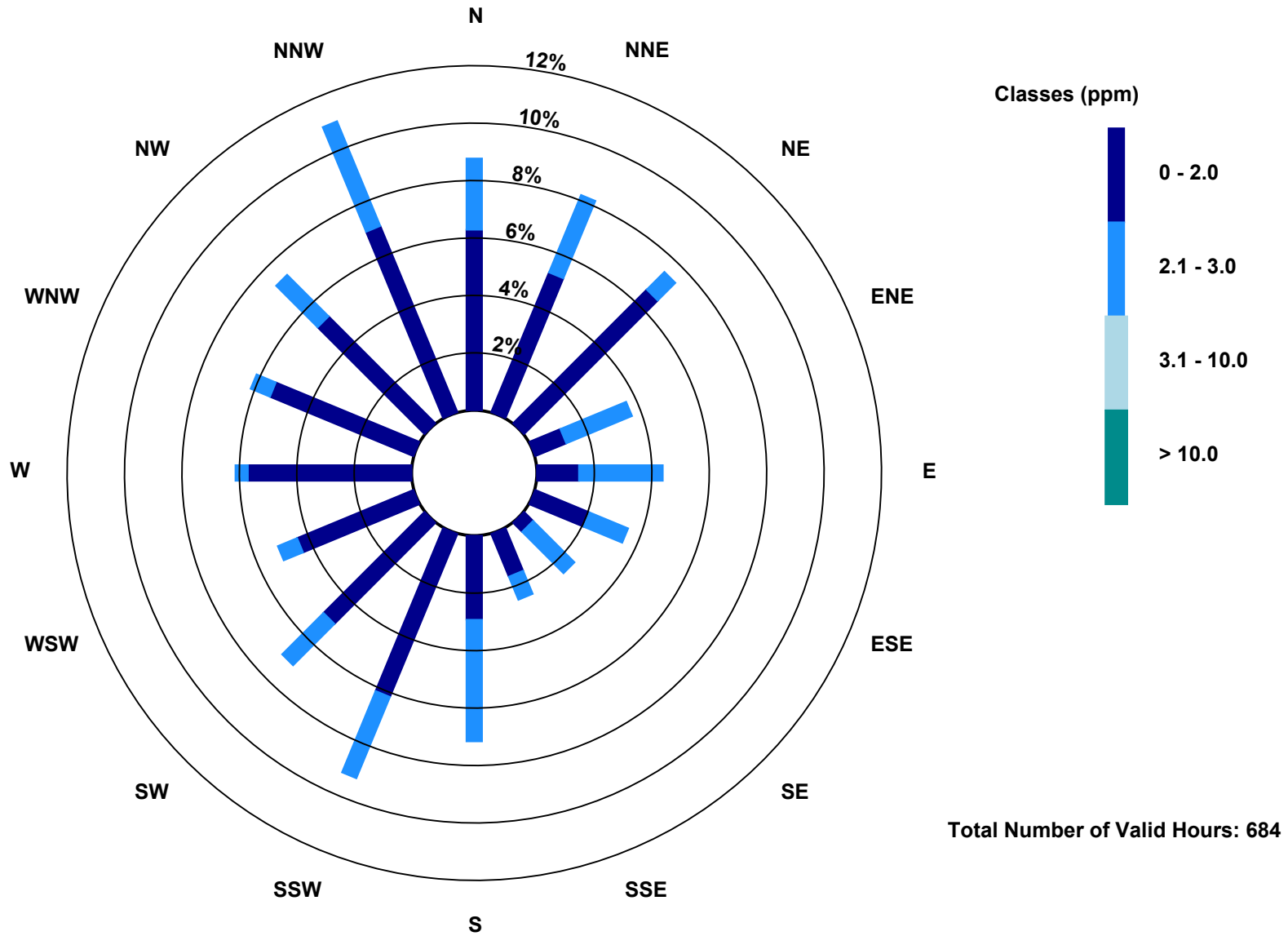
Total Number of Valid Hours: 684

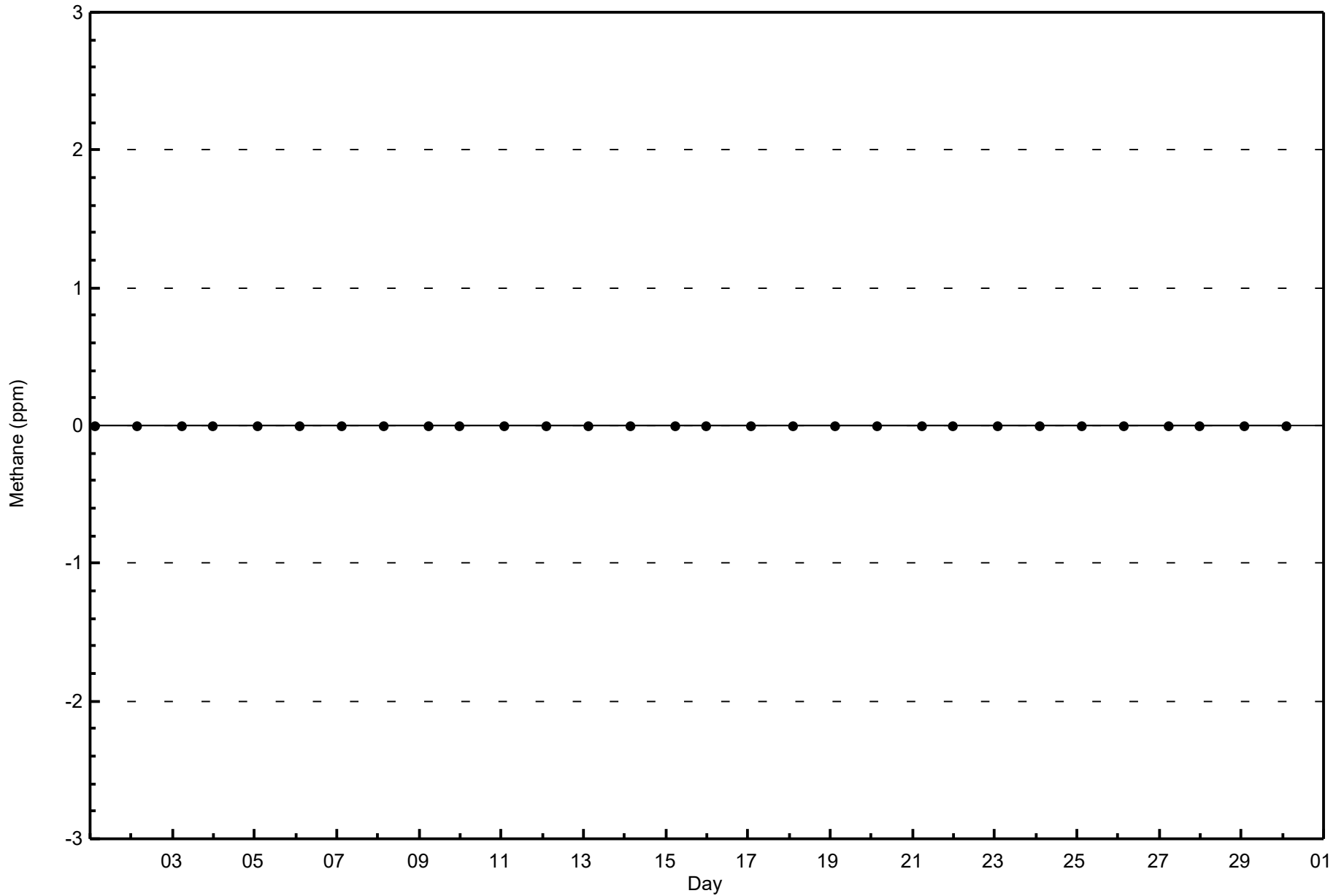
Total Number of Hours: 720

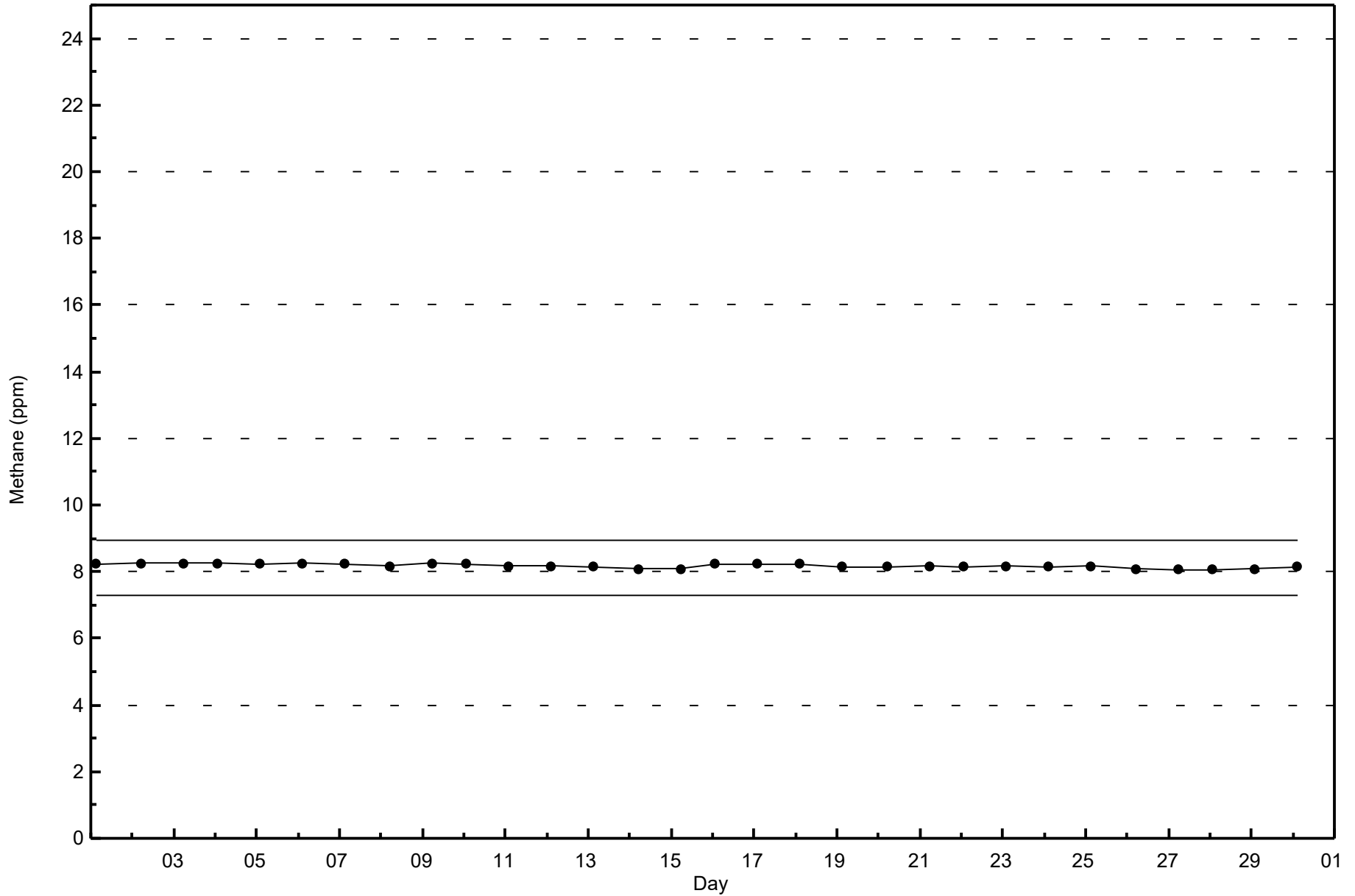


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Stony Mountain



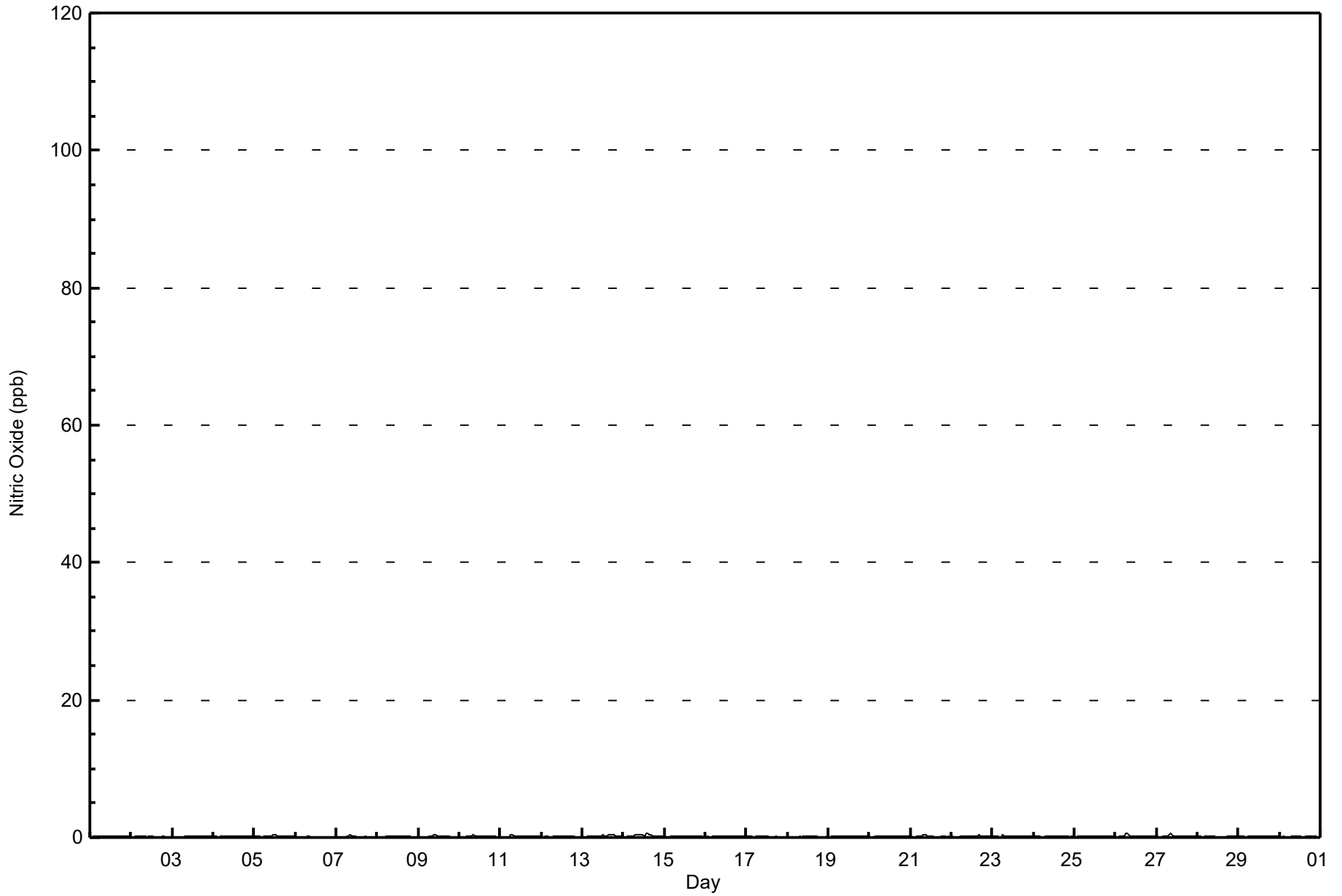






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Stony Mountain - June 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
Stony Mountain - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	60	54	51	25	31	23	17	19	48	64	45	37	40	40	50	80	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	60	54	51	25	31	23	17	19	48	64	45	37	40	40	50	80	684

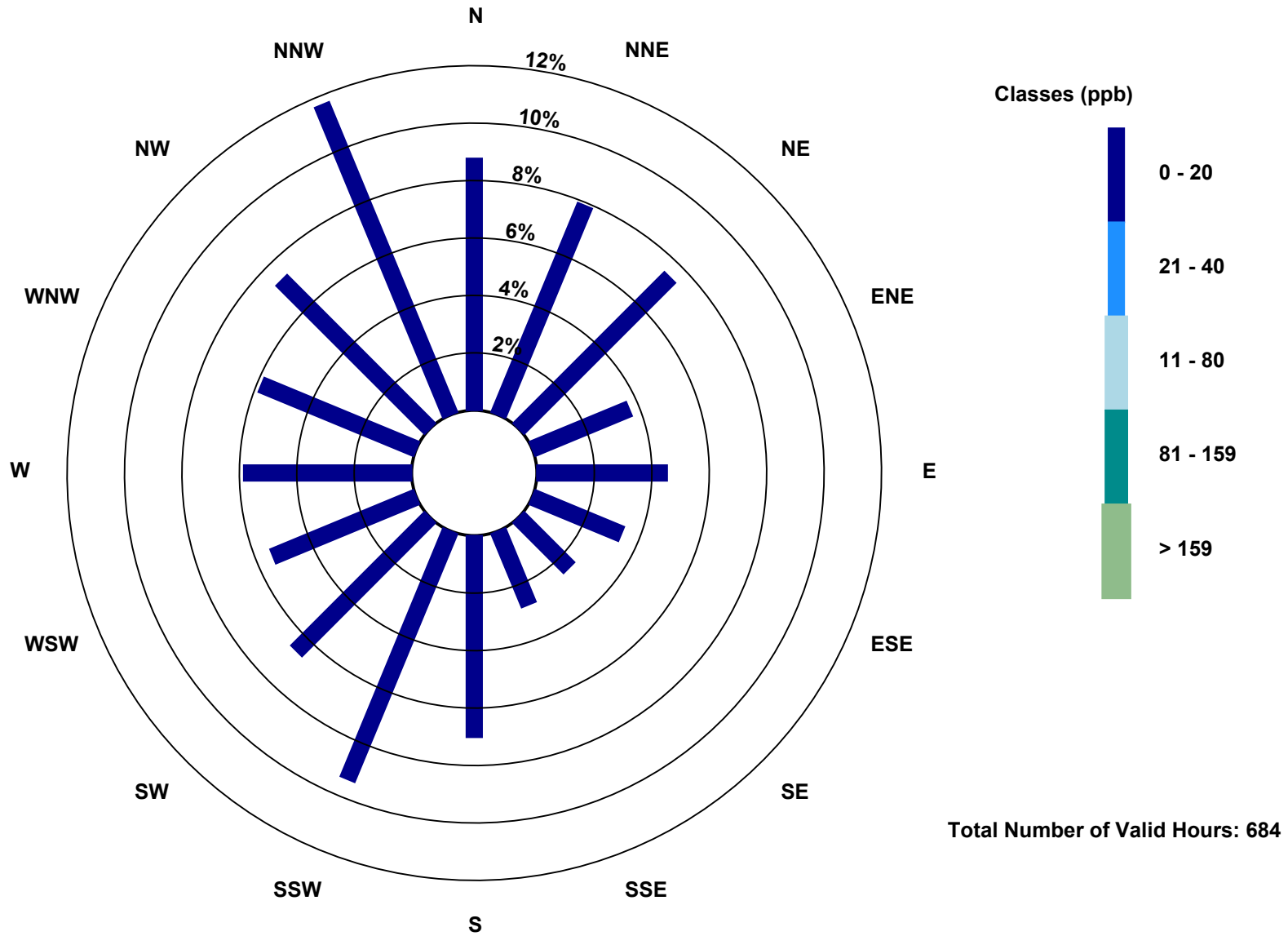
Total Number of Valid Hours: 684

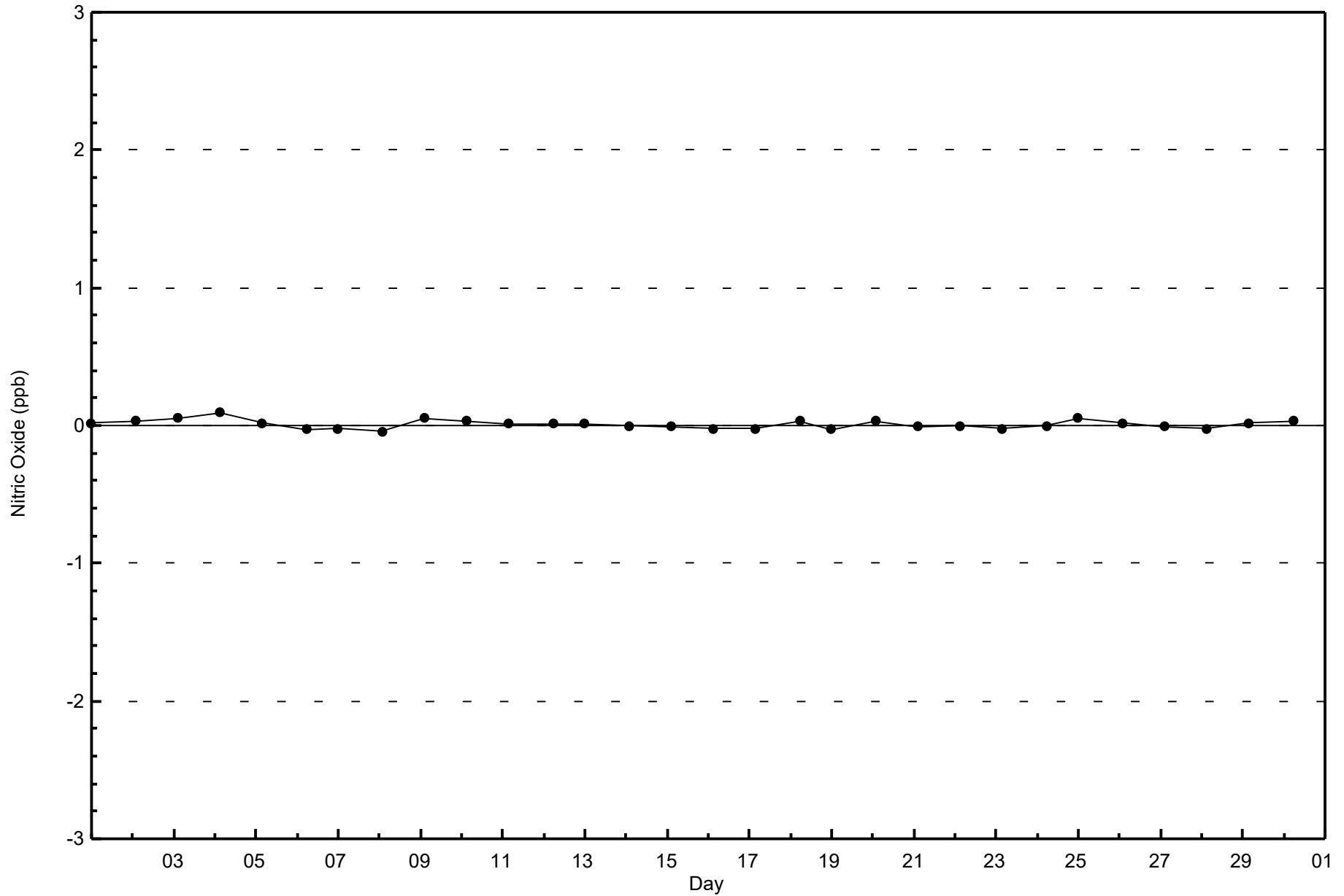
Total Number of Hours: 720

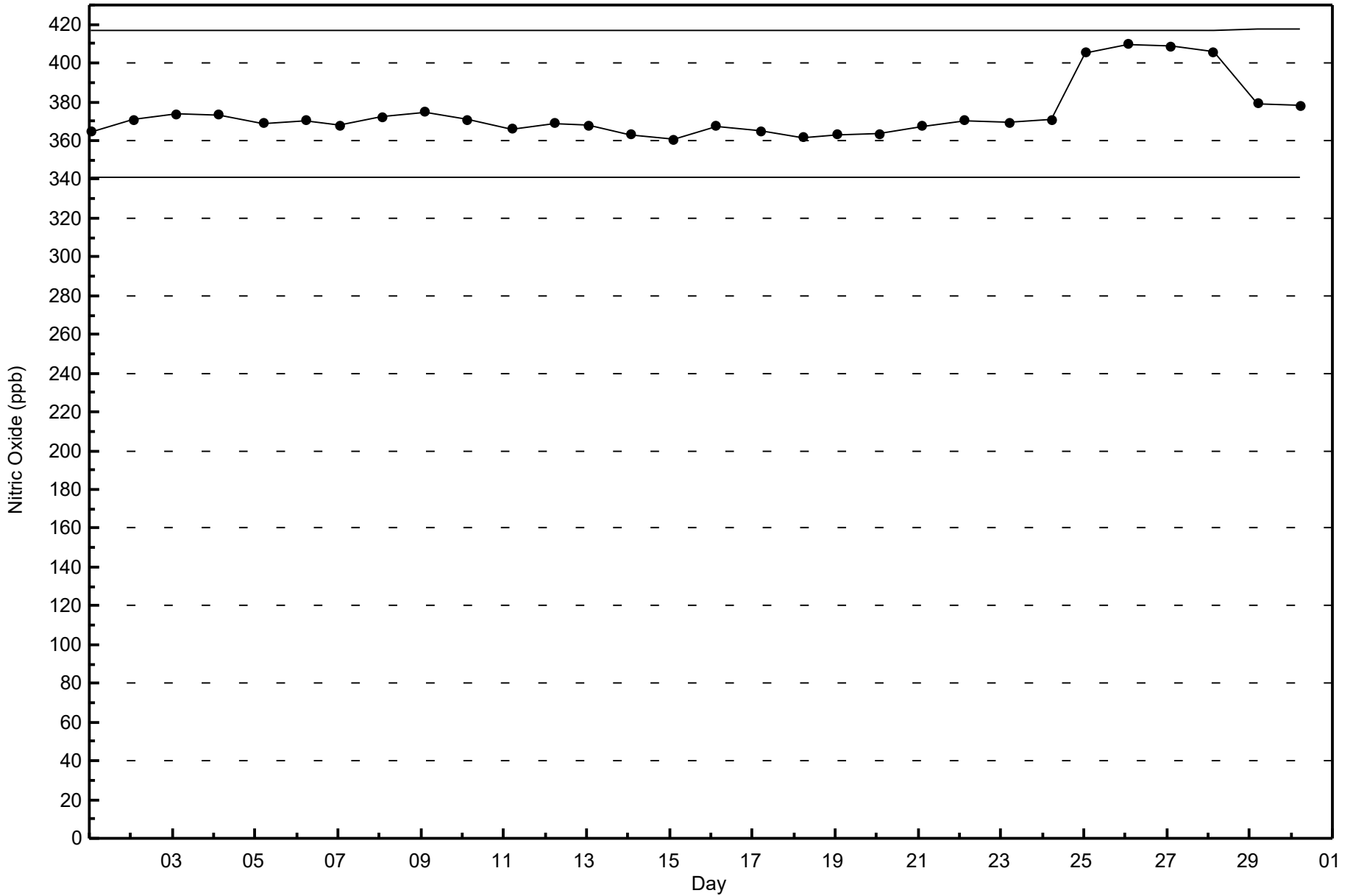


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Stony Mountain









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 4.2 ppb on Jun 12 03:00	Maximum Daily Average: 2.2 ppb on Jun 13		Hours of Data:	684
Minimum Value: 0.0 ppb on Jun 21 17:00	Minimum Daily Average: 0.3 ppb on Jun 25		Hours of Missing Data:	36
Maximum Diurnal Average: 1.2 ppb at hour 4	Minimum Diurnal Average: 0.7 ppb at hour 22		Hours of Calibration:	36
Monthly Average: 0.94 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.8 Q ₃ = 1.2 P ₉₀ = 1.9 P ₉₉ = 3.4		Percent Operational Time:	100.0

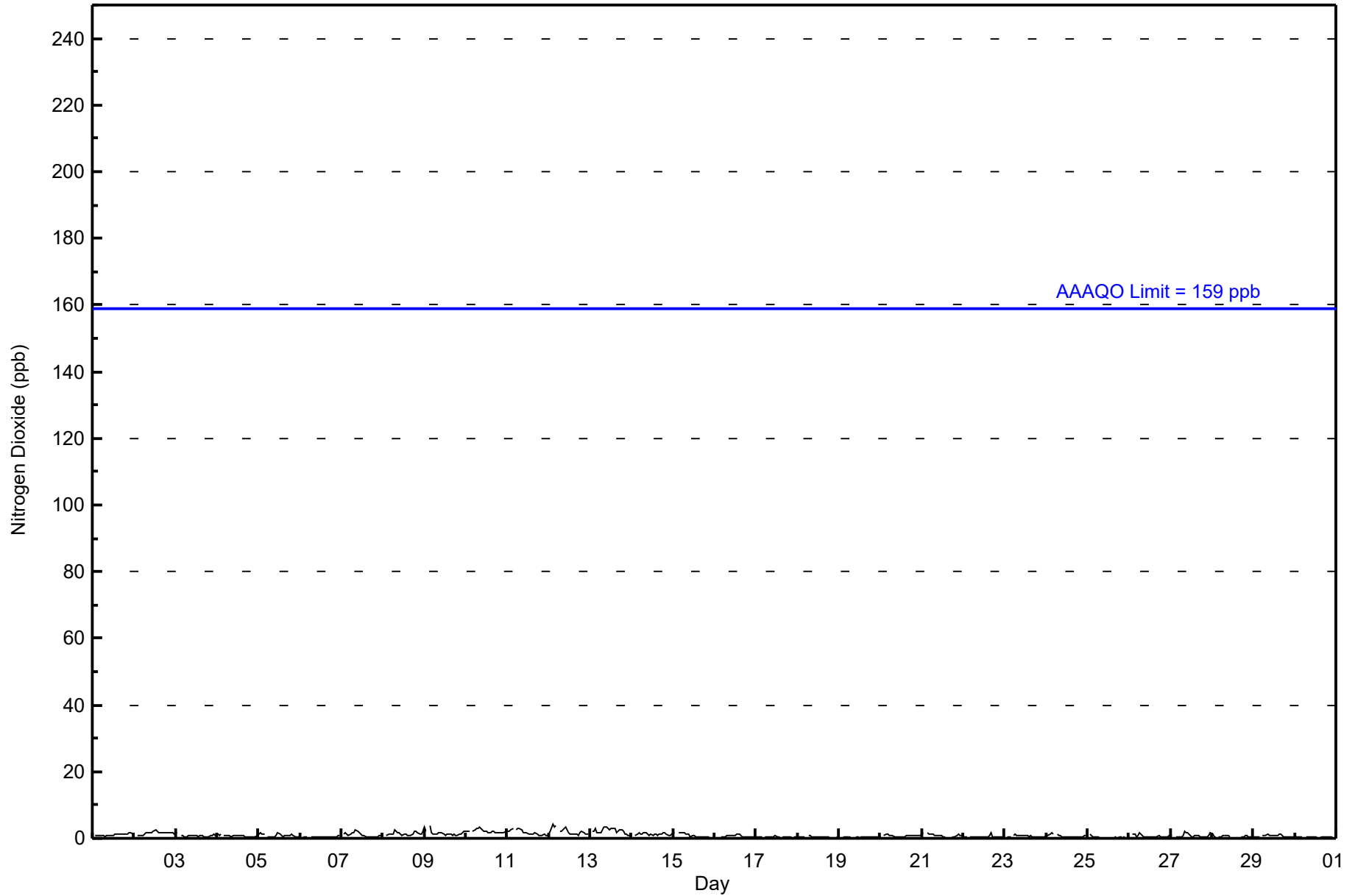
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Jun	Z	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.9	0.9	0.7	0.8	0.8	1.3	1.3	1.4	1.3	1.3	1.1	1.1	1.4	1.6	1.6	1.2	1.1	1.6																								
2-Jun	1.1	Z	1.0	0.9	0.9	1.0	1.1	1.5	1.7	1.5	1.7	2.1	2.5	2.2	1.7	1.7	1.7	1.7	1.9	1.9	1.7	1.7	1.5	1.3	1.6	2.5																								
3-Jun	1.8	1.9	Z	0.9	0.7	0.6	0.6	0.8	0.7	0.8	0.8	0.7	0.9	0.6	0.8	0.7	0.6	0.6	0.5	0.6	0.7	0.8	1.1	1.0	0.8	1.9																								
4-Jun	1.2	1.0	1.3	Z	0.8	0.8	0.8	0.8	0.5	0.7	0.8	0.7	0.7	0.8	0.8	0.6	0.4	0.6	0.4	0.4	0.4	0.6	0.9	0.9	0.7	1.3																								
5-Jun	1.4	1.8	1.3	1.2	Z	0.5	0.4	0.6	0.5	0.5	0.7	1.6	1.4	0.8	0.6	1.0	0.9	0.9	1.0	1.1	0.9	0.5	0.3	0.3	0.9	1.8																								
6-Jun	0.2	0.2	0.3	0.3	0.4	Z	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.6	0.9	1.0	0.4	1.0																								
7-Jun	Z	1.1	1.7	1.4	1.0	1.3	1.5	1.7	2.4	2.1	1.8	1.3	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.9	1.0	1.0	2.4																								
8-Jun	0.9	Z	1.0	1.1	1.1	1.1	1.3	2.7	1.8	1.5	1.1	1.0	1.1	1.1	0.7	0.8	0.8	1.2	2.1	2.2	1.8	1.4	1.4	2.0	1.4	2.7																								
9-Jun	3.6	2.3	Z	3.8	1.9	1.4	1.1	1.2	1.5	1.8	1.5	1.2	1.0	1.1	1.1	1.3	1.0	1.1	0.8	0.8	1.2	1.1	1.5	2.1	1.5	3.8																								
10-Jun	2.3	2.2	2.1	Z	2.1	2.5	3.0	2.8	3.4	2.6	2.2	2.1	2.0	1.9	1.8	2.0	2.0	1.7	1.6	1.7	1.8	1.8	1.8	2.1	2.2	3.4																								
11-Jun	2.3	2.3	2.4	2.8	Z	2.6	2.8	2.8	2.4	1.9	1.6	1.5	1.3	1.2	1.2	1.3	1.7	1.4	1.0	0.9	1.0	1.1	1.0	1.0	1.7	2.8																								
12-Jun	1.2	2.3	4.2	3.4	3.9	Z	2.0	2.2	2.4	2.8	3.4	1.7	1.1	1.2	1.1	1.1	1.1	1.0	1.6	2.1	1.6	1.2	1.3	1.3	2.0	4.2																								
13-Jun	Z	2.3	2.0	2.9	1.6	1.6	1.7	2.4	3.3	3.4	3.1	2.7	3.0	2.8	1.8	2.1	2.7	2.7	2.0	1.2	1.1	1.0	0.9	0.9	2.2	3.4																								
14-Jun	0.8	Z	1.0	1.1	1.5	1.3	1.2	1.5	1.6	1.4	1.0	1.1	0.7	1.3	1.3	1.0	1.1	1.3	1.5	1.7	1.4	1.0	0.8	1.2	1.2	1.7																								
15-Jun	1.6	1.7	Z	1.5	1.7	1.8	1.7	1.4	1.4	1.2	0.6	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.9	1.8																								
16-Jun	0.2	0.2	0.2	Z	0.4	0.5	0.6	0.7	1.0	0.8	0.9	1.0	1.0	1.4	1.2	0.7	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.6	1.4																								
17-Jun	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.5	0.3	0.2	0.2	0.3	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.7																								
18-Jun	0.3	0.3	0.4	0.5	0.5	Z	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.3	0.4	0.7																								
19-Jun	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.5																								
20-Jun	0.5	Z	1.0	1.1	1.1	1.0	1.0	0.7	0.5	0.6	0.5	0.4	0.4	0.5	0.5	0.8	0.8	0.8	1.0	1.0	1.0	0.8	0.8	1.0	0.8	1.1																								
21-Jun	1.3	1.8	Z	1.6	1.2	1.2	1.2	0.9	0.9	0.8	0.8	0.7	0.5	0.3	0.2	0.1	0.0	0.1	0.4	0.6	0.9	1.1	0.9	0.8	0.8	1.8																								
22-Jun	0.6	0.5	0.5	Z	0.4	0.3	0.4	0.5	0.4	0.5	0.6	0.3	0.3	0.4	0.4	0.7	1.9	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.5	1.9																								
23-Jun	0.2	0.2	0.5	0.4	Z	0.8	1.4	0.8	0.8	1.0	0.8	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.6	1.4																								
24-Jun	0.8	1.0	1.4	1.5	1.1	Z	1.2	1.0	0.9	0.6	0.5	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.7	1.0	1.0	0.7	1.5																								
25-Jun	Z	1.3	1.0	0.5	0.3	0.3	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	1.3																								
26-Jun	0.4	Z	1.1	1.4	0.4	0.8	1.7	1.2	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.6	0.6	0.6	0.5	0.5	0.7	0.6	1.7																								
27-Jun	0.7	0.7	Z	0.5	0.5	0.6	0.6	0.9	2.1	1.6	1.6	0.9	0.5	0.5	0.9	0.8	0.8	0.5	0.4	0.4	0.6	0.3	0.7	1.8	0.8	2.1																								
28-Jun	1.1	0.4	0.6	Z	0.6	0.6	0.9	0.8	0.8	0.8	0.6	C	C	C	C	C	C	C	0.5	0.5	0.7	0.7	0.6	0.5	0.4	--	1.1																							
29-Jun	0.3	0.3	0.3	0.5	Z	0.8	0.9	1.0	1.3	0.9	0.8	0.9	0.8	0.9	0.9	1.2	1.2	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.7	1.3																								
30-Jun	0.5	0.4	0.5	0.4	0.4	Z	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.5																								
																								1.0	1.1	1.1	1.2	1.0	1.0	1.1	1.1	1.2	1.1	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.9	Diurnal Average			
																								3.6	2.3	4.2	3.8	3.9	2.6	3.0	2.8	3.4	3.4	3.4	3.4	2.7	3.0	2.8	2.8	2.0	2.1	2.7	2.7	2.2	1.8	1.8	1.8	2.1	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
Stony Mountain - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - June 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
Stony Mountain - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	60	54	51	25	31	23	17	19	48	64	45	37	40	40	50	80	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	60	54	51	25	31	23	17	19	48	64	45	37	40	40	50	80	684

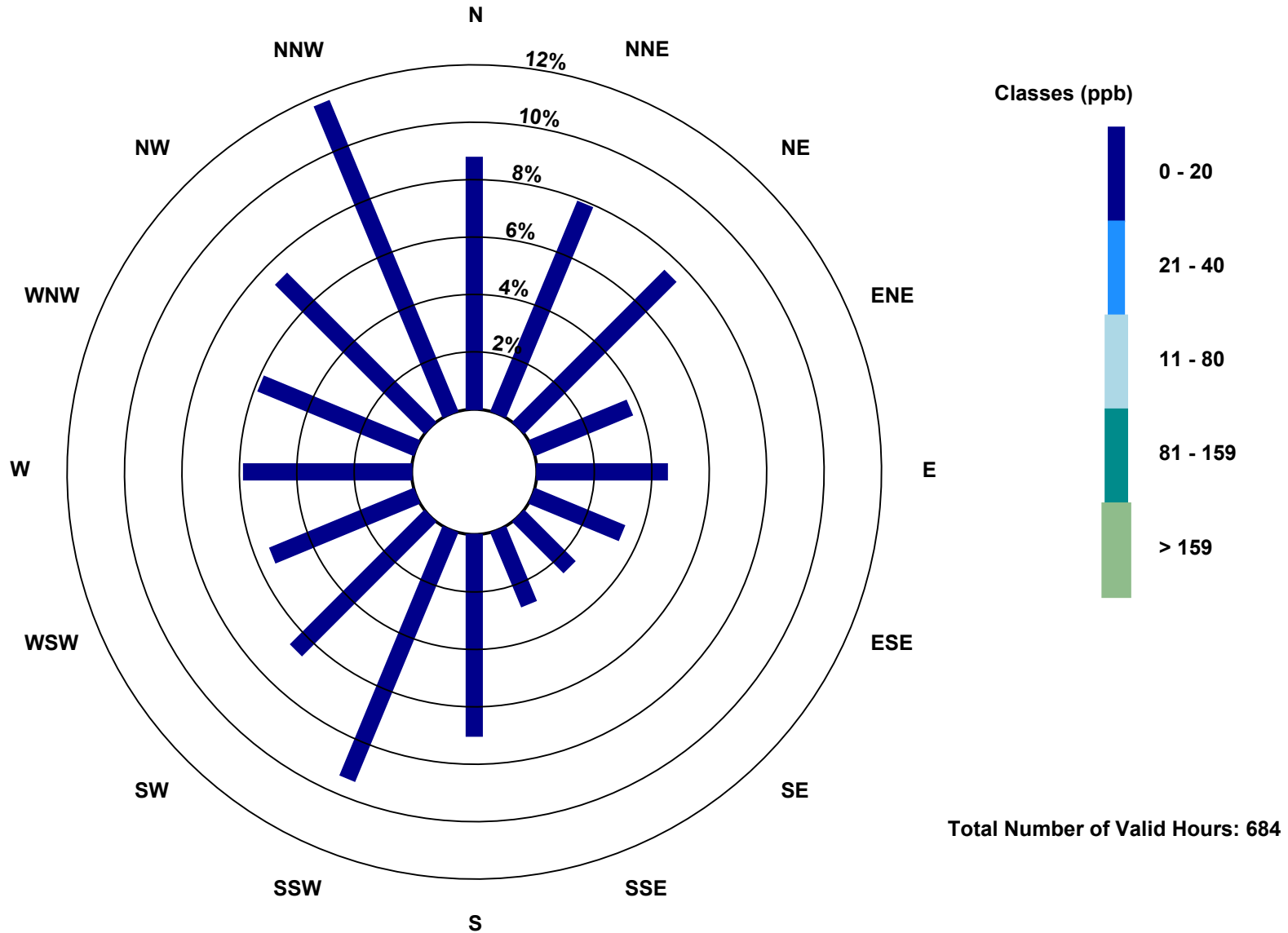
Total Number of Valid Hours: 684

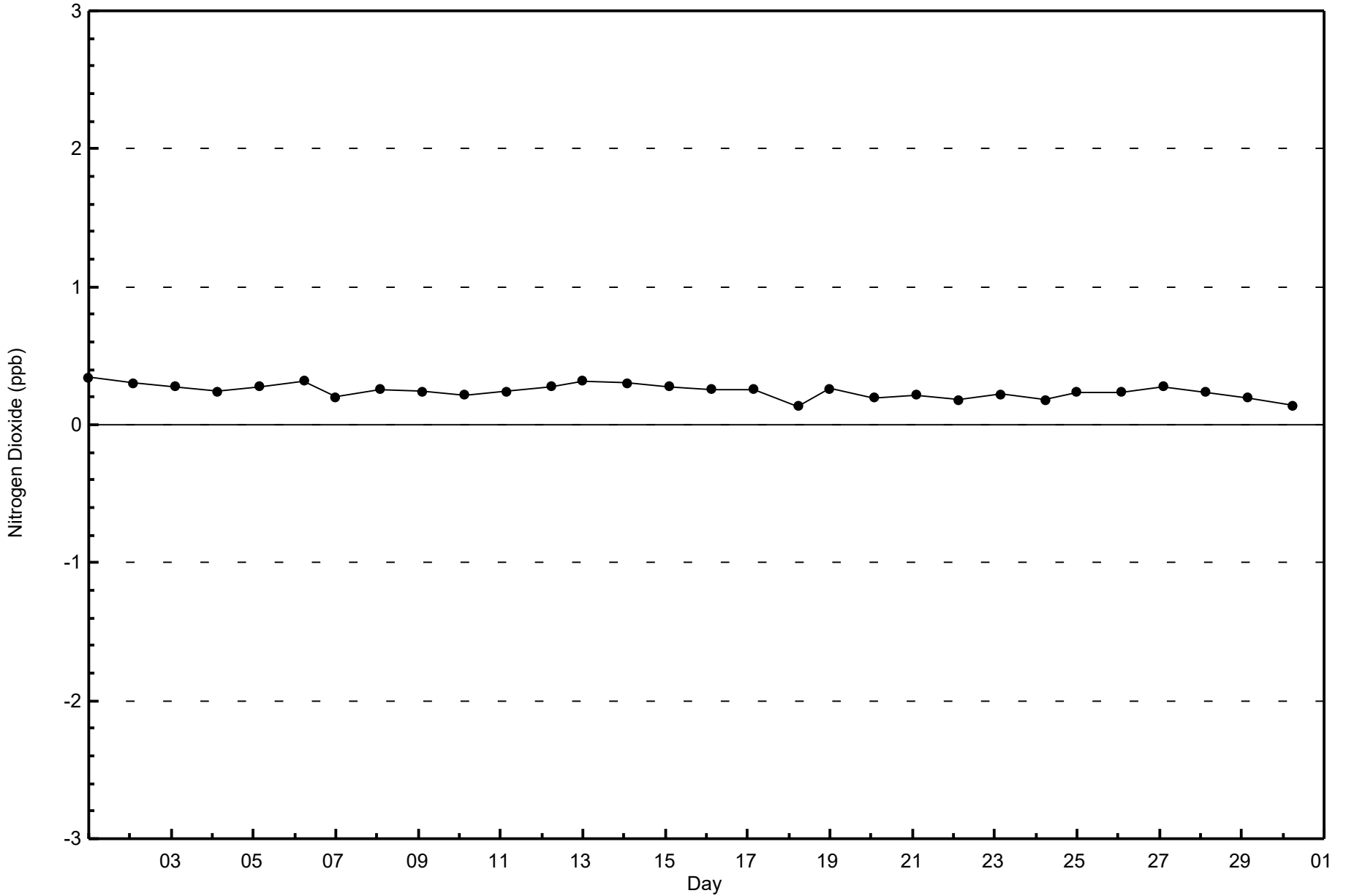
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain

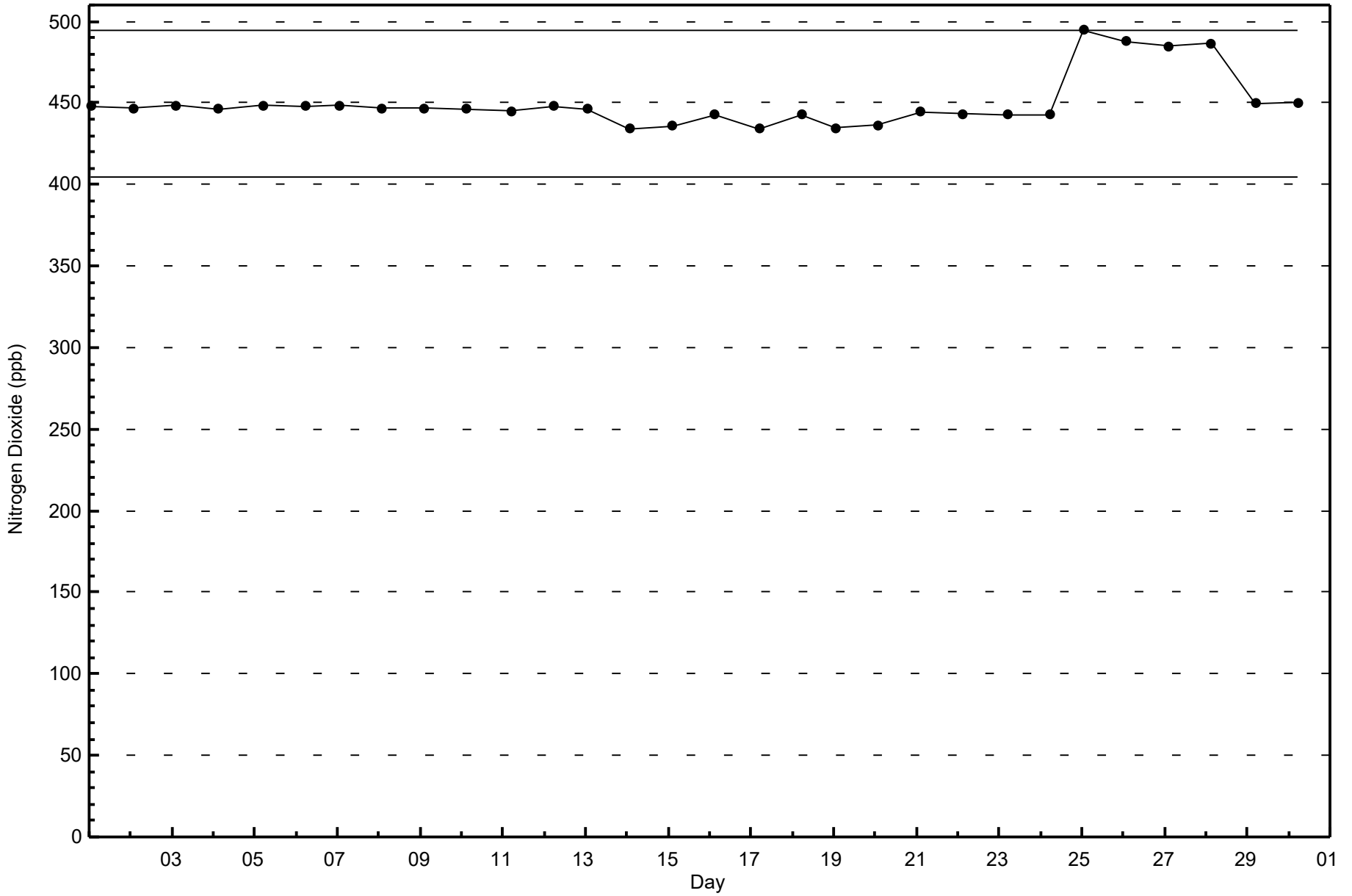






Wood Buffalo Environmental Association
Span Responses

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

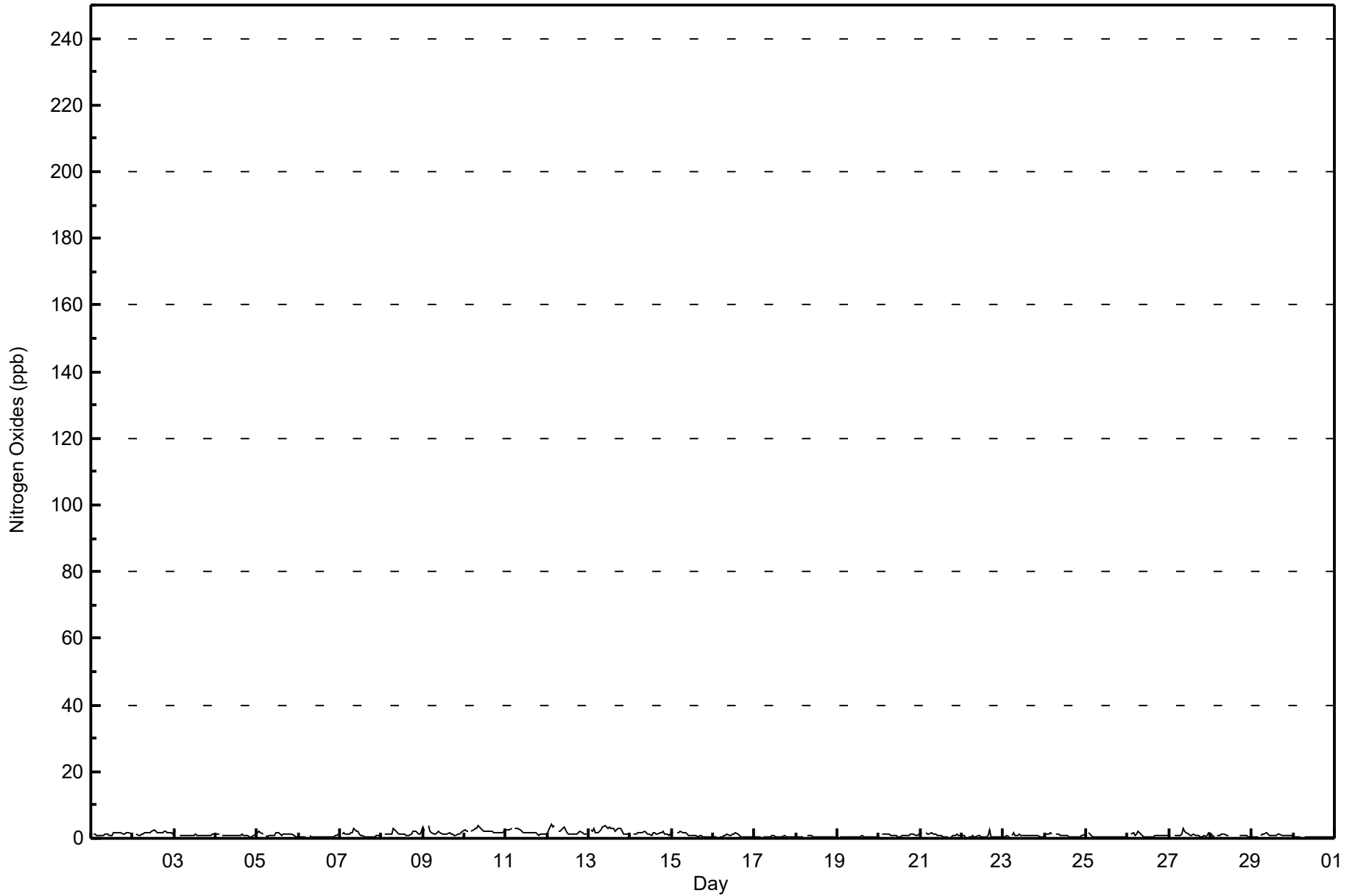
Nitrogen Oxides (NO_x) - ppb
Stony Mountain - June 2023

Maximum Value: 4.4 ppb on Jun 12 03:00		Maximum Daily Average: 2.5 ppb on Jun 13		Hours in Service: 720																							
Minimum Value: 0.1 ppb on Jun 21 17:00		Minimum Daily Average: 0.4 ppb on Jun 17		Hours of Data: 684																							
Maximum Diurnal Average: 1.4 ppb at hour 9		Minimum Diurnal Average: 0.9 ppb at hour 22		Hours of Missing Data: 36																							
Monthly Average: 1.10 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 0.9 Q ₃ = 1.4 P ₉₀ = 2.0 P ₉₉ = 3.6		Hours of Calibration: 36																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	1.2	1.1	1.0	0.9	0.9	0.8	0.8	1.1	1.1	0.9	1.0	1.0	1.5	1.5	1.6	1.5	1.5	1.3	1.3	1.6	1.8	1.8	1.4	1.2	1.8	
2-Jun	1.2	Z	1.1	1.0	1.0	1.1	1.3	1.7	1.8	1.6	1.8	2.2	2.6	2.3	1.8	1.8	1.8	1.8	2.0	2.0	1.8	1.8	1.6	1.4	1.7	2.6	
3-Jun	1.9	2.0	Z	1.0	0.8	0.7	0.7	0.9	0.9	1.0	0.9	0.9	1.1	0.8	1.0	0.9	0.8	0.8	0.7	0.7	0.8	1.0	1.3	1.2	1.0	2.0	
4-Jun	1.3	1.2	1.4	Z	1.0	1.0	1.0	1.0	1.0	0.7	0.9	1.0	0.9	0.9	1.0	1.1	0.8	0.6	0.8	0.6	0.5	0.5	0.8	1.1	0.9	1.4	
5-Jun	1.6	2.0	1.5	1.4	Z	0.7	0.6	0.8	0.8	0.7	1.0	1.9	1.7	1.1	0.8	1.2	1.1	1.1	1.3	1.3	1.1	0.7	0.4	0.4	1.1	2.0	
6-Jun	0.3	0.3	0.4	0.4	0.5	Z	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	1.0	1.1	0.5	1.1	
7-Jun	Z	1.1	1.8	1.4	1.1	1.4	1.7	1.9	2.8	2.3	2.0	1.4	0.9	0.9	0.6	0.5	0.4	0.4	0.4	0.5	0.6	0.7	1.0	1.1	1.2	2.8	
8-Jun	1.0	Z	1.1	1.2	1.2	1.2	1.4	2.9	2.0	1.8	1.3	1.2	1.3	1.3	0.8	0.9	0.9	1.3	2.2	2.3	1.9	1.4	1.4	2.0	1.5	2.9	
9-Jun	3.6	2.3	Z	3.9	2.0	1.5	1.2	1.4	1.7	2.1	1.8	1.4	1.1	1.2	1.3	1.5	1.2	1.2	0.9	0.9	1.3	1.2	1.6	2.2	1.7	3.9	
10-Jun	2.4	2.3	2.2	Z	2.2	2.6	3.2	3.0	3.8	2.8	2.4	2.3	2.2	2.0	2.0	2.1	2.1	1.8	1.7	1.8	1.9	1.9	1.9	2.2	2.3	3.8	
11-Jun	2.4	2.4	2.5	2.9	Z	2.8	3.1	3.2	2.6	2.1	1.8	1.7	1.5	1.5	1.5	1.6	1.9	1.6	1.2	1.1	1.2	1.2	1.1	1.1	1.9	3.2	
12-Jun	1.3	2.4	4.4	3.6	4.0	Z	2.1	2.3	2.5	2.9	3.5	1.8	1.2	1.3	1.2	1.3	1.2	1.1	1.8	2.2	1.7	1.3	1.4	1.4	2.1	4.4	
13-Jun	Z	2.4	2.1	3.0	1.7	1.7	1.9	2.7	3.6	3.7	3.4	3.0	3.3	3.1	3.0	2.1	2.4	3.1	3.0	2.3	1.5	1.3	1.2	1.1	2.5	3.7	
14-Jun	1.0	Z	1.2	1.3	1.7	1.6	1.5	1.9	2.0	1.8	1.3	1.4	1.0	1.9	1.9	1.4	1.5	1.5	1.8	1.9	1.5	1.1	0.9	1.3	1.5	2.0	
15-Jun	1.7	1.8	Z	1.6	1.8	2.0	1.9	1.6	1.6	1.4	0.8	0.9	0.9	0.7	0.7	0.6	0.7	0.7	0.5	0.5	0.5	0.3	0.3	0.3	1.0	2.0	
16-Jun	0.3	0.3	0.3	Z	0.5	0.6	0.8	0.9	1.3	0.9	1.0	1.1	1.1	1.6	1.4	0.9	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.7	1.6	
17-Jun	0.4	0.4	0.4	0.4	Z	0.5	0.6	0.6	0.6	0.6	0.7	0.8	0.6	0.4	0.3	0.3	0.3	0.3	0.7	0.3	0.3	0.3	0.2	0.3	0.4	0.8	
18-Jun	0.3	0.3	0.4	0.5	0.5	Z	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.4	0.5	0.8	
19-Jun	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	
20-Jun	0.6	Z	1.1	1.2	1.2	1.2	1.2	0.9	0.7	0.8	0.7	0.6	0.6	0.7	0.7	1.0	1.0	1.0	1.2	1.1	1.1	0.9	0.9	1.1	0.9	1.2	
21-Jun	1.4	1.9	Z	1.7	1.3	1.3	1.5	1.2	1.3	1.1	1.1	0.9	0.7	0.4	0.3	0.2	0.1	0.2	0.5	0.8	1.0	1.2	1.0	0.9	1.0	1.9	
22-Jun	0.7	0.6	0.6	Z	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.8	0.4	0.4	0.6	0.6	0.9	2.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	2.4
23-Jun	0.4	0.4	0.7	0.6	Z	1.0	1.7	1.0	1.0	1.3	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.8	1.7	
24-Jun	0.9	1.1	1.5	1.6	1.2	Z	1.4	1.2	1.1	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.8	1.1	0.8	1.6	
25-Jun	Z	1.5	1.2	0.7	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.5	1.5	
26-Jun	0.5	Z	1.2	1.6	0.6	1.1	2.3	1.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.8	0.8	0.8	0.7	0.7	0.9	2.3	
27-Jun	0.9	0.9	Z	0.7	0.7	0.8	0.9	1.2	2.8	2.0	1.9	1.1	0.7	0.7	1.1	1.0	1.0	0.7	0.6	0.6	0.7	0.4	0.8	1.9	1.1	2.8	
28-Jun	1.2	0.5	0.7	Z	0.7	0.8	1.2	1.1	1.1	1.0	0.8	C	C	C	C	C	C	C	0.7	0.7	0.9	0.8	0.7	0.6	0.5	--	1.2
29-Jun	0.4	0.4	0.4	0.6	Z	1.0	1.1	1.2	1.5	1.1	1.0	1.0	1.0	1.0	1.0	1.3	1.3	0.8	0.7	0.8	0.8	0.8	0.7	0.6	0.9	1.5	
30-Jun	0.6	0.5	0.6	0.5	0.5	Z	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.5	0.6	
																								Diurnal Average			
																								Diurnal Maximum			
																								Z - zerospan C - Calibration			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - June 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
Stony Mountain - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	60	54	51	25	31	23	17	19	48	64	45	37	40	40	50	80	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	60	54	51	25	31	23	17	19	48	64	45	37	40	40	50	80	684

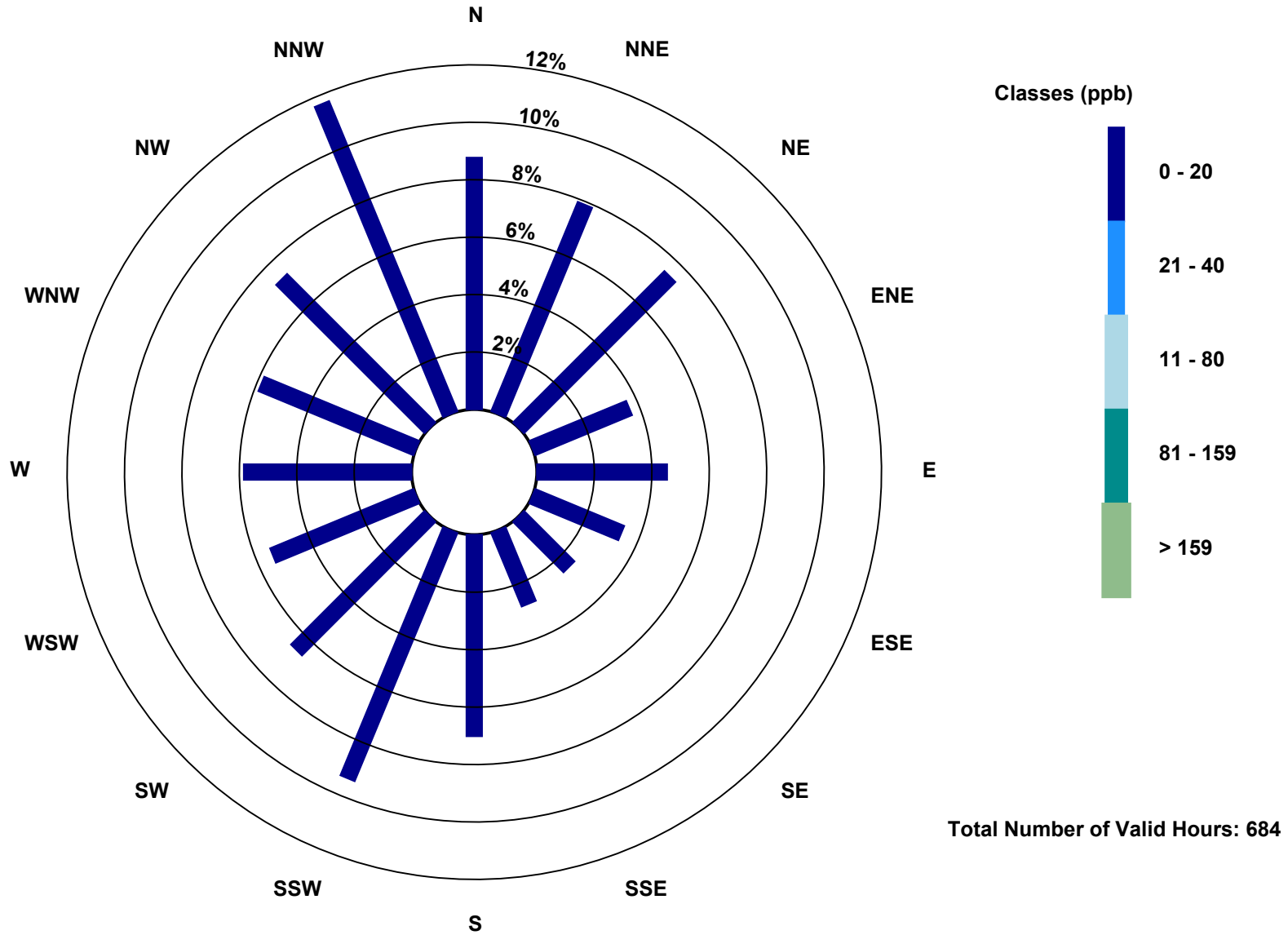
Total Number of Valid Hours: 684

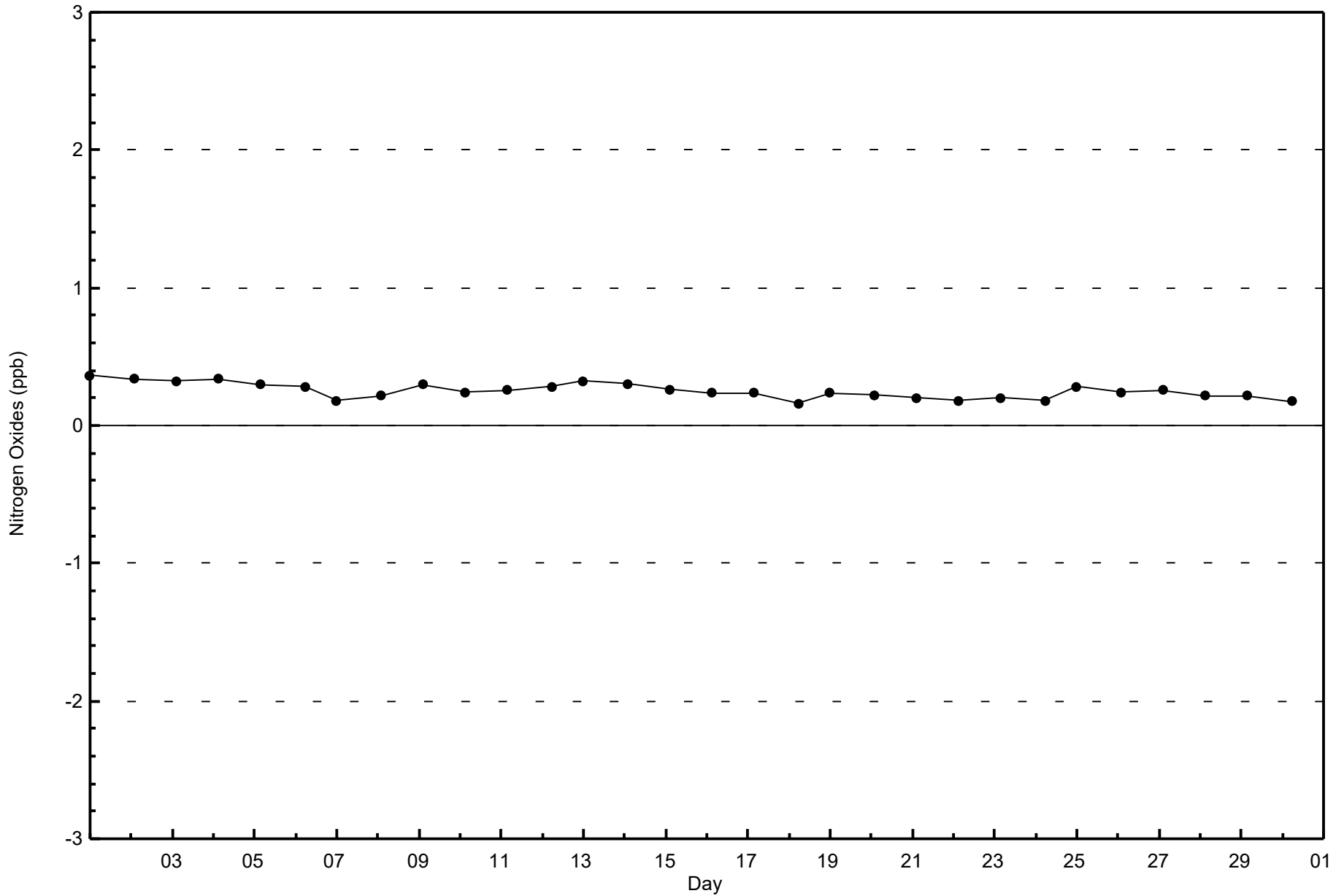
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Stony Mountain

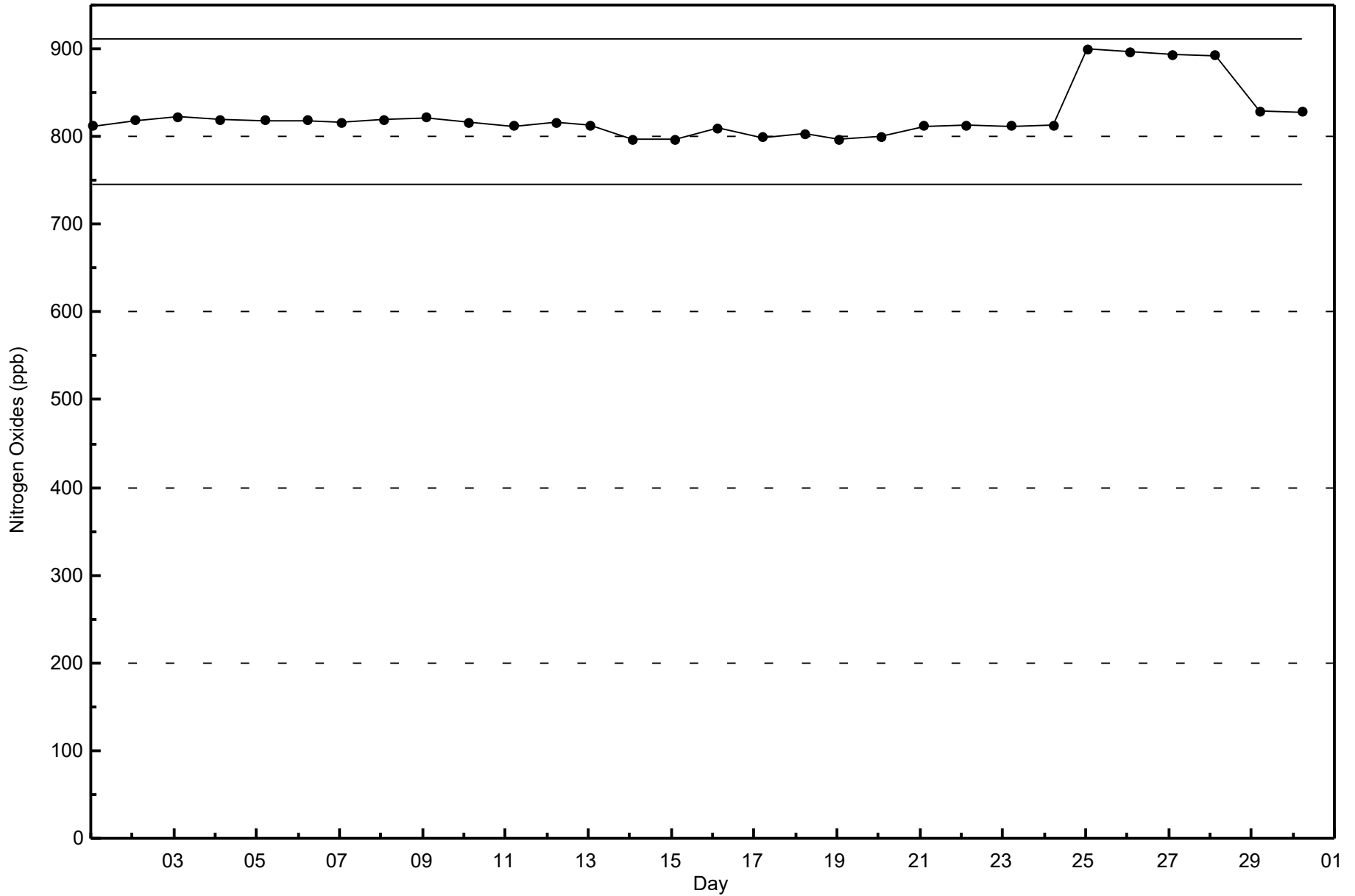






Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Stony Mountain - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 67.1 ppb on Jun 10 20:00	Maximum Daily Average: 50.4 ppb on Jun 10		Hours of Data:	684
Minimum Value: 7.4 ppb on Jun 14 19:00	Minimum Daily Average: 15.5 ppb on Jun 14		Hours of Missing Data:	36
Maximum Diurnal Average: 36.1 ppb at hour 15	Minimum Diurnal Average: 23.6 ppb at hour 7		Hours of Calibration:	36
Monthly Average: 30.52 ppb	Percentiles: P ₁ = 10.3 P ₁₀ = 17.9 Q ₁ = 22.0 Median = 30.5 Q ₃ = 37.6 P ₉₀ = 43.9 P ₉₉ = 62.8		Percent Operational Time:	100.0

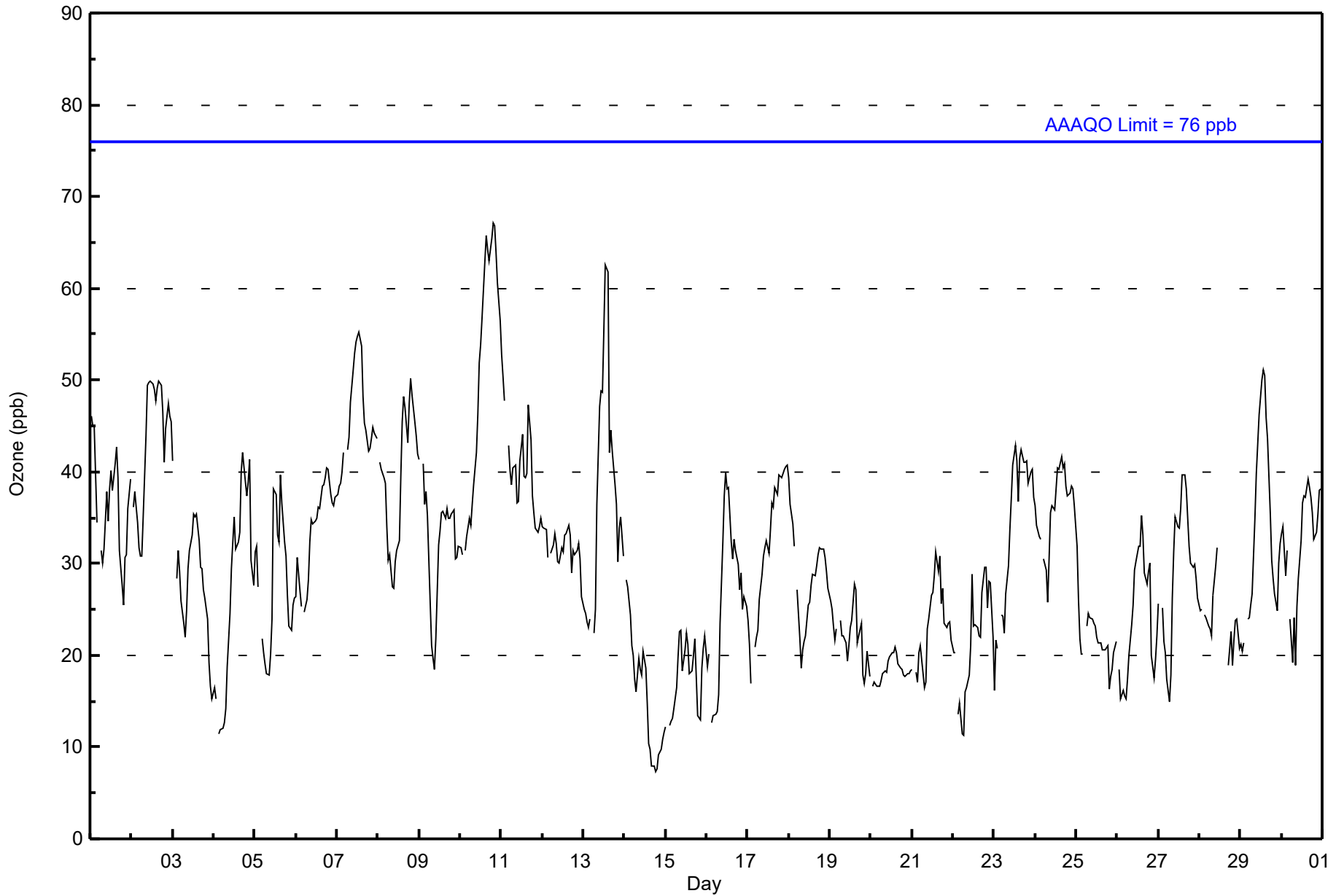
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	46.1	45.0	45.0	39.7	34.4	Z	31.4	30.0	31.6	37.8	34.7	38.1	40.1	38.0	40.9	42.7	39.3	31.4	27.7	25.5	30.6	30.9	35.9	39.2	36.3	46.1																						
2-Jun	Z	36.2	37.8	34.5	31.8	30.8	30.8	35.1	43.9	49.4	49.7	49.9	49.5	49.0	47.7	49.1	49.8	49.4	46.5	41.0	44.7	47.5	46.1	45.5	43.3	49.9																						
3-Jun	41.1	Z	28.4	31.4	29.1	25.9	23.6	22.0	24.9	29.4	31.5	33.1	35.4	35.1	35.3	32.5	29.7	29.5	27.2	26.3	24.0	19.3	16.6	15.2	28.1	41.1																						
4-Jun	16.5	15.3	Z	11.4	11.9	12.0	12.6	14.1	18.8	24.6	29.4	32.3	35.1	31.6	32.4	33.5	39.9	42.2	38.9	37.4	38.9	41.3	30.3	27.7	27.3	42.2																						
5-Jun	31.3	31.9	27.4	Z	21.8	20.2	19.0	18.1	17.9	20.1	24.0	38.1	37.6	33.2	32.3	39.6	36.6	32.3	30.9	26.5	23.2	22.8	25.5	26.2	27.7	39.6																						
6-Jun	26.4	30.7	27.0	25.3	Z	24.8	26.2	28.2	32.3	34.7	34.3	34.6	35.0	36.2	36.1	38.5	38.6	39.4	40.4	40.3	37.6	36.5	36.3	37.2	33.8	40.4																						
7-Jun	37.5	38.5	38.7	39.9	42.1	Z	42.5	43.8	47.6	51.1	52.9	54.2	54.7	55.2	53.7	48.1	45.4	44.6	42.2	42.5	43.7	44.8	44.2	43.6	45.7	55.2																						
8-Jun	Z	41.0	40.3	39.4	38.8	34.0	30.4	30.9	27.5	27.3	30.2	31.4	32.5	39.5	45.4	48.2	47.0	43.2	47.5	50.2	48.4	45.4	43.9	42.0	39.3	50.2																						
9-Jun	41.3	Z	40.9	36.5	37.8	35.3	25.6	21.1	19.7	18.4	21.8	32.0	33.6	35.5	35.7	34.9	36.0	35.0	34.9	35.4	35.8	30.5	30.6	31.8	32.2	41.3																						
10-Jun	31.7	31.0	Z	31.4	33.0	35.0	34.1	36.5	38.6	42.0	46.2	51.9	53.9	56.7	62.8	65.8	64.1	63.0	65.5	67.1	66.7	63.9	60.6	56.4	50.4	67.1																						
11-Jun	52.9	50.4	47.7	Z	42.9	40.2	38.6	40.4	40.7	36.6	36.7	41.1	44.1	39.5	39.4	39.8	47.3	43.5	37.4	35.6	33.9	33.4	34.0	34.9	40.5	52.9																						
12-Jun	34.0	33.8	33.7	30.6	Z	31.2	32.1	33.3	32.2	30.2	30.1	31.8	31.3	33.2	33.3	34.2	33.2	29.0	31.4	31.0	31.4	32.2	30.4	26.4	31.7	34.2																						
13-Jun	25.0	24.6	23.7	23.1	23.9	Z	22.3	25.0	36.4	47.1	48.9	48.6	55.3	62.5	61.7	42.2	44.5	42.2	38.5	36.5	30.1	33.9	35.2	30.7	37.5	62.5																						
14-Jun	Z	28.3	27.5	24.4	21.0	20.0	17.4	16.0	19.7	18.4	17.8	20.4	18.7	14.7	10.4	9.7	7.9	8.0	7.4	7.6	9.1	9.8	10.8	11.6	15.5	28.3																						
15-Jun	12.2	Z	12.3	12.8	13.1	14.2	16.4	19.8	22.5	22.7	18.3	20.6	22.4	21.2	17.9	18.3	19.9	21.8	17.8	13.4	13.0	18.7	20.7	22.2	17.9	22.7																						
16-Jun	18.8	20.1	Z	12.7	13.4	13.6	13.9	15.7	23.4	32.3	37.4	40.0	38.1	38.3	32.3	30.6	32.7	31.4	29.9	27.2	29.0	25.1	26.3	25.3	26.4	40.0																						
17-Jun	23.9	21.2	17.0	Z	20.9	21.9	22.8	26.1	28.9	30.7	31.7	32.4	31.1	33.7	36.6	36.1	38.3	37.5	39.6	39.6	39.4	40.2	40.6	40.8	31.8	40.8																						
18-Jun	39.3	36.5	34.4	31.9	Z	27.1	21.9	18.7	20.6	21.5	22.2	25.5	25.7	27.6	28.8	28.6	29.8	30.9	31.7	31.6	31.6	30.7	29.2	27.4	28.4	39.3																						
19-Jun	26.0	25.0	23.2	21.6	22.8	Z	23.8	22.1	22.2	21.3	19.4	21.1	23.0	23.9	27.7	27.2	21.4	22.2	23.4	17.8	16.9	18.0	20.4	17.7	22.1	27.7																						
20-Jun	Z	16.7	17.1	16.7	16.6	16.7	17.3	17.9	18.3	18.1	19.4	19.9	20.3	20.3	20.8	20.3	19.0	18.5	18.5	17.9	17.7	18.0	18.0	18.3	18.4	20.8																						
21-Jun	18.4	Z	18.1	17.1	20.2	21.0	18.0	16.5	17.0	22.9	24.0	26.6	26.9	28.7	31.2	29.2	30.7	25.7	27.3	23.4	23.0	23.5	23.7	21.7	23.3	31.2																						
22-Jun	20.3	20.3	Z	13.6	14.8	11.4	11.2	15.9	16.5	17.8	21.1	28.9	23.2	23.3	23.0	22.1	22.0	26.9	29.5	29.5	25.2	28.0	27.9	22.0	21.5	29.5																						
23-Jun	16.1	21.6	20.7	Z	24.4	24.3	22.4	26.7	29.8	33.7	37.0	40.8	42.9	41.2	36.8	41.5	42.4	41.1	41.0	41.2	38.7	40.0	40.3	37.1	34.0	42.9																						
24-Jun	36.4	34.2	32.9	32.6	Z	30.6	29.3	25.8	30.5	35.5	36.3	35.8	38.1	40.4	40.3	41.6	40.4	40.9	38.4	37.3	37.6	38.5	38.2	36.3	36.0	41.6																						
25-Jun	31.9	26.1	21.8	20.2	20.2	Z	23.2	24.6	24.1	24.0	23.5	23.1	22.0	21.4	21.4	20.6	20.6	20.5	21.1	16.4	17.7	18.5	20.3	21.5	21.9	31.9																						
26-Jun	Z	18.4	15.2	16.2	15.5	15.2	17.4	20.0	23.3	25.5	29.2	30.3	31.9	31.8	35.3	33.0	29.0	27.8	29.1	30.1	19.9	17.6	19.5	22.2	24.1	35.3																						
27-Jun	25.6	Z	25.2	21.6	20.3	17.4	15.0	17.9	26.2	31.3	35.0	34.1	33.9	36.0	39.7	39.7	38.1	34.9	31.9	30.0	29.6	29.9	28.4	26.3	29.0	39.7																						
28-Jun	24.9	25.0	Z	24.5	24.0	23.2	22.9	22.2	26.5	29.8	31.7	C	C	C	C	C	C	18.9	22.6	19.0	21.6	23.8	24.0	20.8	--	31.7																						
29-Jun	21.2	20.4	21.4	Z	23.9	24.1	25.5	26.6	34.9	39.9	42.9	46.3	50.1	51.1	50.5	45.9	43.7	35.4	30.4	28.3	26.7	24.9	30.0	32.2	33.8	51.1																						
30-Jun	33.3	34.0	28.6	31.4	Z	24.0	19.2	24.1	18.9	25.3	28.4	32.5	36.6	37.4	37.2	39.2	38.3	37.2	35.5	32.7	33.4	35.3	38.0	38.1	32.1	39.2																						
																								29.3	29.0	28.2	25.6	24.8	23.8	23.6	24.5	27.2	30.0	31.5	34.3	35.3	35.7	36.1	35.6	35.4	33.5	32.8	31.3	30.6	30.8	30.9	29.9	Diurnal Average
																								52.9	50.4	47.7	39.9	42.9	40.2	42.5	43.8	47.6	51.1	52.9	54.2	55.3	62.5	62.8	65.8	64.1	63.0	65.5	67.1	66.7	63.9	60.6	56.4	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
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	131	19.15	19.15
21 - 50	528	77.19	96.35
51 - 82	25	3.65	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
Stony Mountain - June 2023**

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	10	2	5	6	3	7	0	5	8	4	4	4	1	8	31	131
21 - 50	28	45	47	18	24	20	12	17	30	55	38	27	36	38	45	48	528
51 - 82	0	1	0	1	0	0	0	0	14	1	3	4	1	0	0	0	25
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	61	56	49	24	30	23	19	17	49	64	45	35	41	39	53	79	684

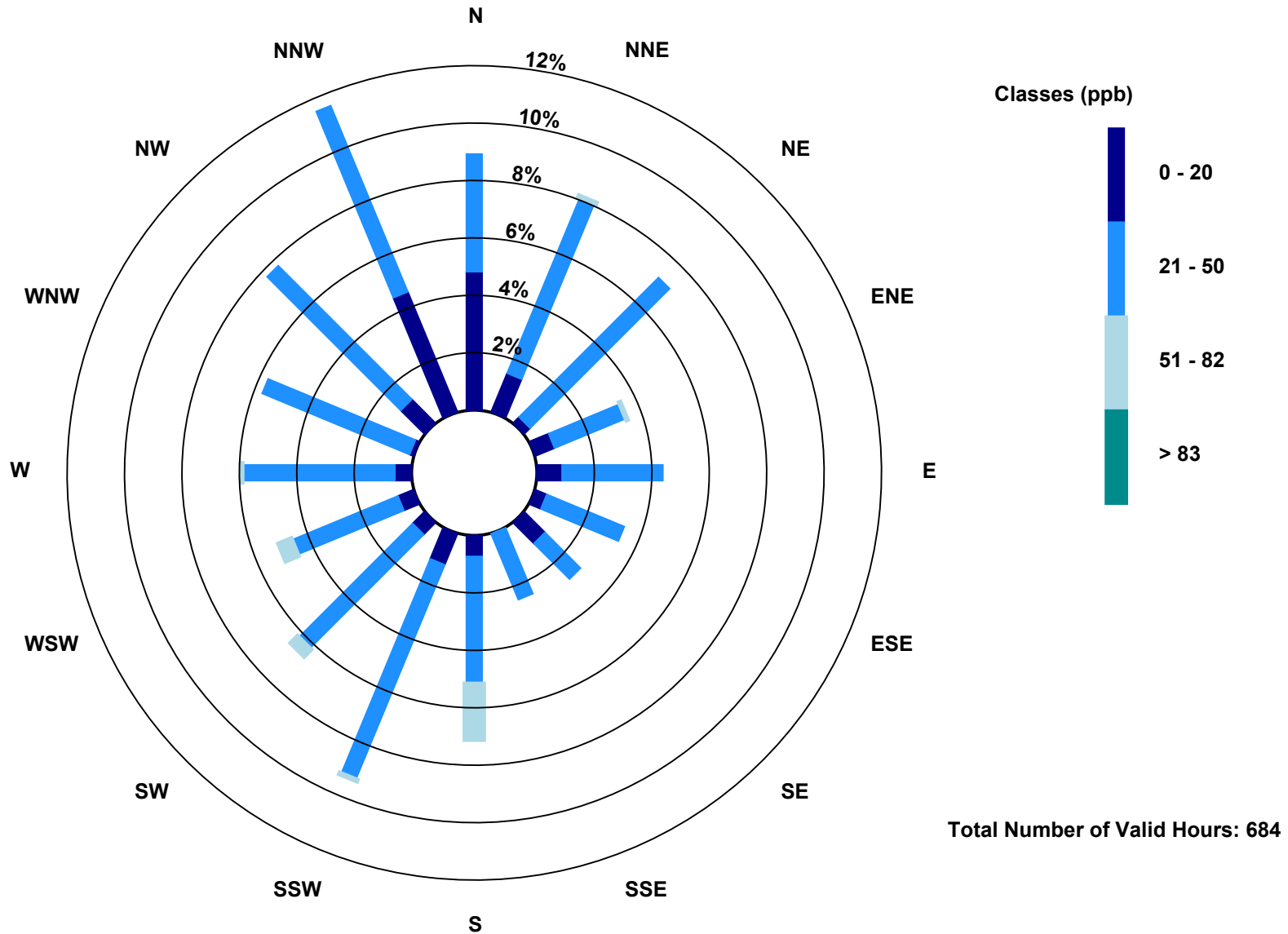
Total Number of Valid Hours: 684

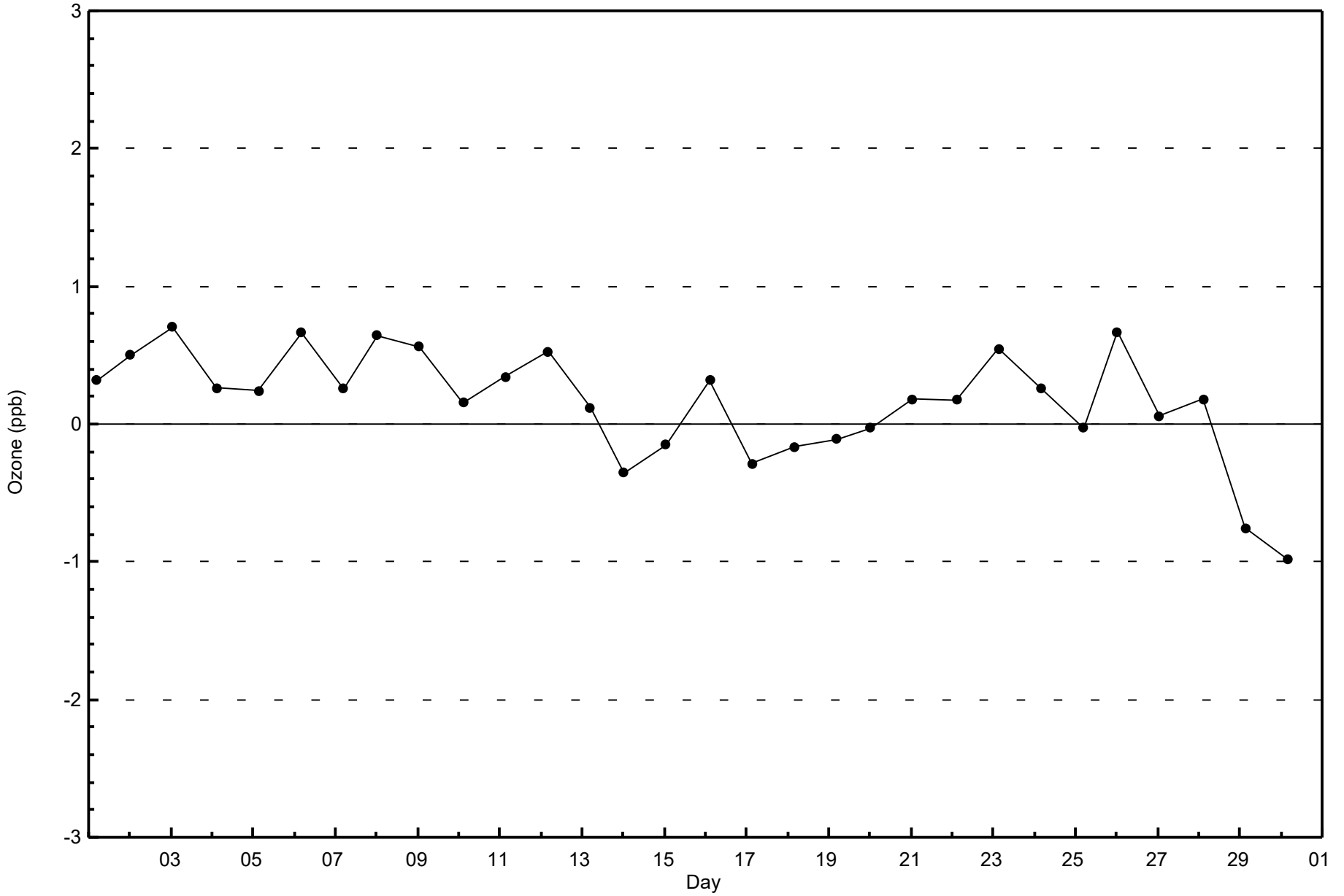
Total Number of Hours: 720

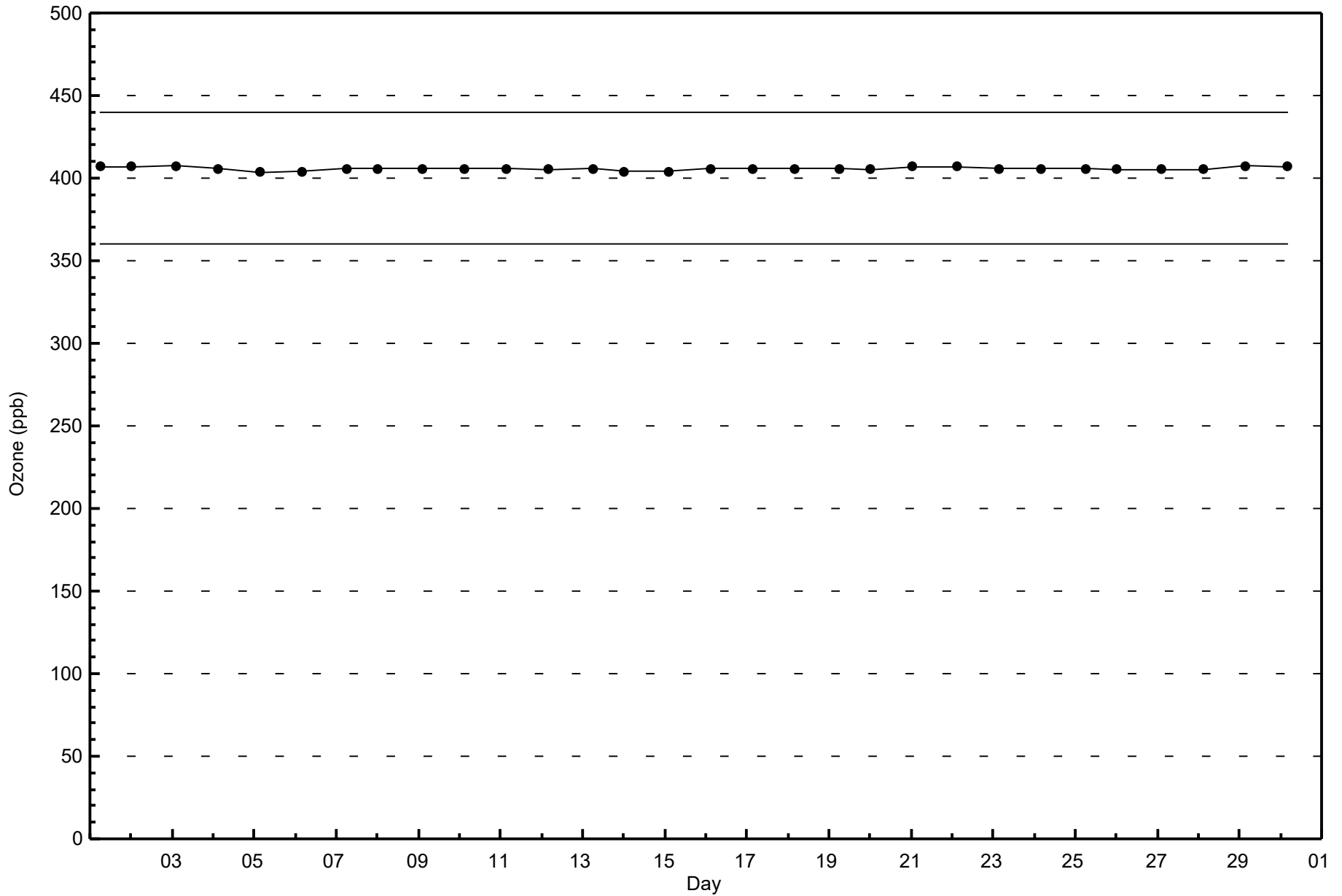


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Stony Mountain









Summary of Hour Averages

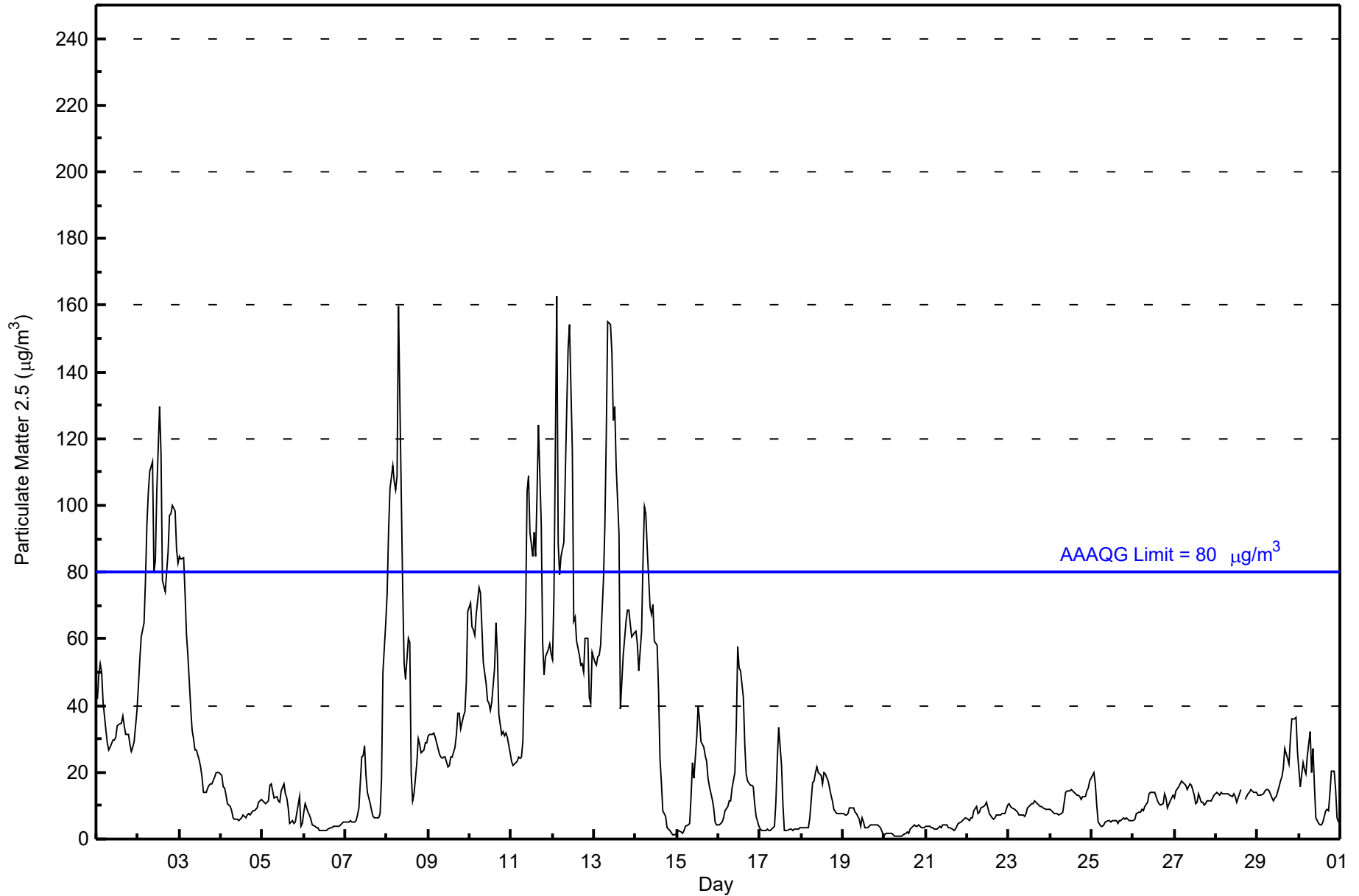
Stony Mountain - June 2023

Number of Exceedences (AAAQO):	1-hr: 58	24-hr: 10	Hours in Service:	720
Maximum Value: 162.6 µg/m ³ on Jun 12 03:00	Maximum Daily Average: 88.0 µg/m ³ on Jun 2		Hours of Data:	718
Minimum Value: 0.7 µg/m ³ on Jun 20 10:00	Minimum Daily Average: 2.2 µg/m ³ on Jun 20		Hours of Missing Data:	2
Maximum Diurnal Average: 33.0 µg/m ³ at hour 10	Minimum Diurnal Average: 20.5 µg/m ³ at hour 19		Hours of Calibration:	2
Monthly Average: 26.09 µg/m ³	Percentiles: P ₁ = 1.2 P ₁₀ = 3.5 Q ₁ = 6.4 Median = 13.4 Q ₃ = 31.4 P ₉₀ = 69.8 P ₉₉ = 129.5		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-Jun	41.9	49.0	52.7	50.0	41.1	32.5	28.8	26.9	27.7	29.5	29.8	30.3	34.1	34.2	34.9	36.7	33.9	31.2	31.3	28.2	26.1	27.5	29.2	38.6	34.4	52.7																							
2-Jun	45.6	53.9	60.5	64.8	77.4	94.1	103.9	110.2	113.3	80.2	83.5	104.1	129.5	115.8	77.4	75.7	74.2	85.9	97.1	97.6	100.2	98.3	87.0	82.4	88.0	129.5																							
3-Jun	85.0	84.1	84.5	73.5	61.4	55.1	39.3	32.7	30.1	26.8	26.9	23.6	21.8	18.7	14.1	13.9	15.4	16.3	16.4	16.4	18.5	20.0	20.1	19.8	34.8	85.0																							
4-Jun	19.1	15.8	15.2	13.2	10.6	9.8	8.7	6.5	5.7	6.1	5.6	5.8	6.5	7.0	6.5	7.4	7.5	7.4	8.4	8.5	9.0	9.4	10.8	11.8	9.3	19.1																							
5-Jun	11.4	11.0	10.7	11.5	16.0	16.5	14.3	12.4	12.5	11.3	11.1	14.2	16.3	13.6	12.2	9.3	4.7	5.6	4.8	5.1	7.7	12.9	4.0	4.6	10.6	16.5																							
6-Jun	8.0	10.5	7.9	7.0	5.8	4.4	3.8	3.5	3.2	2.6	2.6	2.5	2.6	2.7	2.8	3.4	3.5	3.7	3.8	3.8	4.0	4.3	4.8	4.9	4.4	10.5																							
7-Jun	5.0	5.1	5.1	5.4	5.3	5.2	5.4	7.4	9.2	24.4	25.1	28.0	19.1	13.8	10.8	8.4	7.0	6.5	6.4	6.5	7.8	17.7	50.1	64.8	14.6	64.8																							
8-Jun	73.6	92.2	105.1	111.8	107.1	104.7	109.0	159.8	102.4	74.4	52.4	48.0	60.2	59.1	19.6	11.6	13.7	22.9	30.3	28.4	25.9	26.9	28.6	28.8	62.4	159.8																							
9-Jun	30.8	31.5	31.4	31.7	30.4	28.8	25.5	24.7	24.2	24.5	24.4	21.5	22.0	24.7	24.7	27.7	31.4	37.8	37.6	33.2	36.8	38.2	46.9	68.1	31.6	68.1																							
10-Jun	70.9	63.4	62.7	60.9	67.4	75.2	73.9	63.5	53.1	46.8	41.7	40.9	38.6	40.9	51.4	64.8	55.0	37.1	31.3	32.3	30.9	31.7	30.5	25.7	49.6	75.2																							
11-Jun	23.2	21.9	22.3	23.4	24.4	24.1	24.4	29.4	69.5	104.0	109.1	91.9	84.8	91.8	84.9	102.9	124.2	94.5	59.0	49.3	54.7	56.8	58.3	55.5	61.8	124.2																							
12-Jun	53.9	73.2	162.6	88.6	79.3	84.9	89.1	108.6	128.6	147.0	154.4	116.6	65.5	66.6	59.5	55.0	52.2	52.5	49.9	60.3	60.0	42.6	40.8	56.0	81.2	162.6																							
13-Jun	53.1	52.3	54.5	55.2	58.0	77.6	93.5	120.8	155.0	154.2	145.7	125.5	129.5	111.8	91.7	38.8	47.1	55.2	65.2	68.6	68.6	64.4	60.6	61.8	83.7	155.0																							
14-Jun	62.2	58.3	50.6	62.3	83.3	99.4	97.4	87.1	69.6	67.2	70.3	59.5	57.9	44.5	24.0	16.9	8.4	6.9	3.5	2.8	2.4	1.4	1.1	1.4	43.3	99.4																							
15-Jun	2.2	2.3	2.3	1.8	2.4	3.6	4.2	4.7	12.8	22.9	18.2	30.7	39.8	35.5	29.1	27.5	25.2	23.3	18.4	15.6	11.8	9.3	4.9	4.0	14.7	39.8																							
16-Jun	4.4	4.6	4.9	6.4	8.5	9.8	11.5	11.6	15.2	19.7	34.0	57.4	51.3	50.4	42.4	28.5	19.4	17.3	16.2	16.1	15.8	10.4	6.9	3.9	19.4	57.4																							
17-Jun	2.9	2.4	2.5	2.7	2.8	2.7	2.7	2.8	3.8	11.1	23.6	33.5	21.8	10.0	2.5	2.6	2.6	2.8	2.9	2.7	2.9	3.2	3.2	3.3	6.4	33.5																							
18-Jun	3.4	3.3	3.3	3.4	3.4	6.3	17.1	17.3	19.8	21.6	19.9	19.0	16.6	19.8	19.6	17.4	15.1	13.2	11.4	9.1	7.7	7.4	7.5	7.8	12.1	21.6																							
19-Jun	7.5	7.0	7.1	7.7	9.3	9.3	9.4	7.9	7.6	5.8	4.0	6.4	5.2	3.3	3.4	3.7	4.2	4.4	4.4	4.1	4.1	4.0	3.3	1.2	5.6	9.4																							
20-Jun	1.2	1.5	1.6	1.7	1.7	1.4	1.0	0.9	0.7	0.7	1.0	1.1	1.6	2.3	1.8	2.8	3.5	4.0	3.9	3.9	4.2	3.5	3.2	3.4	2.2	4.2																							
21-Jun	3.7	3.7	3.7	3.6	3.2	2.8	3.1	3.2	3.8	3.5	4.1	4.3	4.0	3.6	3.2	2.8	2.7	2.8	3.7	4.8	5.0	5.6	5.8	6.2	3.9	6.2																							
22-Jun	5.9	5.4	6.4	6.4	8.6	9.7	7.7	8.2	9.2	9.6	10.3	11.1	9.5	7.6	6.2	5.7	6.2	7.4	7.2	7.2	7.6	7.5	7.6	10.1	7.9	11.1																							
23-Jun	10.7	9.6	9.5	8.9	8.3	8.0	7.4	7.2	7.0	6.9	7.8	9.3	10.1	10.6	10.5	11.5	11.1	10.3	9.9	9.9	9.3	8.8	8.9	9.0	9.2	11.5																							
24-Jun	8.8	8.4	7.7	7.5	7.5	7.4	7.5	8.2	10.8	13.9	14.3	14.4	14.7	14.4	13.8	13.0	13.0	12.7	11.8	12.5	12.6	14.3	15.3	17.2	11.7	17.2																							
25-Jun	18.9	20.0	16.5	10.0	5.0	3.7	3.8	4.2	5.1	5.6	5.6	5.2	5.6	5.5	5.6	4.6	5.4	5.4	6.2	5.8	6.4	6.1	5.7	5.4	7.1	20.0																							
26-Jun	5.3	6.1	7.6	7.9	8.2	8.8	8.7	9.7	11.2	13.5	14.0	14.1	13.8	12.9	11.6	10.5	10.1	10.4	13.6	12.2	9.4	11.6	12.4	13.3	10.7	14.1																							
27-Jun	12.3	14.3	15.8	16.6	17.6	16.9	16.0	14.8	15.8	16.4	16.0	13.3	10.6	11.1	13.5	10.8	11.0	10.3	10.6	11.3	11.5	11.6	12.3	13.0	13.5	17.6																							
28-Jun	13.9	13.7	13.3	13.9	13.6	13.4	13.5	13.6	13.0	12.8	13.6	12.9	11.0	12.2	14.9	C	C	12.0	13.6	14.0	14.8	14.2	14.1	14.1	13.5	14.9																							
29-Jun	13.1	13.0	13.0	13.6	14.3	15.0	15.0	14.5	12.5	11.7	12.1	12.6	15.7	17.3	18.6	21.3	27.0	24.3	22.3	30.0	36.1	35.8	36.2	26.5	19.7	36.2																							
30-Jun	20.9	15.8	22.7	20.8	19.3	25.2	32.3	20.1	27.2	16.2	6.6	4.5	4.2	4.4	5.2	8.3	8.9	8.5	14.0	20.4	20.5	14.8	6.3	4.9	14.7	32.3																							
																								24.0	25.1	28.8	26.4	26.7	28.6	29.3	31.4	32.7	33.0	32.9	32.1	30.8	28.9	23.9	22.2	22.2	21.1	20.5	20.7	21.1	20.7	20.9	22.3	Diurnal Average	
																								85.0	92.2	162.6	111.8	107.1	104.7	109.0	159.8	155.0	154.2	154.4	125.5	129.5	115.8	91.7	102.9	124.2	94.5	97.1	97.6	100.2	98.3	87.0	82.4	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}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	151	21.03	21.03
6 - 15	256	35.65	56.69
16 - 25	90	12.53	69.22
26 - 80	164	22.84	92.06
> 81.0	57	7.94	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
Stony Mountain - June 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	31	6	9	2	0	3	0	0	0	13	3	11	16	15	13	29	151
6 - 15	7	20	24	10	4	5	7	9	18	43	40	14	11	19	16	9	256
16 - 25	4	9	7	3	6	6	4	1	3	8	5	9	6	4	6	9	90
26 - 80	19	13	11	8	12	9	8	6	29	2	1	4	8	2	1	31	164
> 81.0	3	9	1	3	9	1	0	3	1	2	1	0	0	2	17	5	57
Totals	64	57	52	26	31	24	19	19	51	68	50	38	41	42	53	83	718

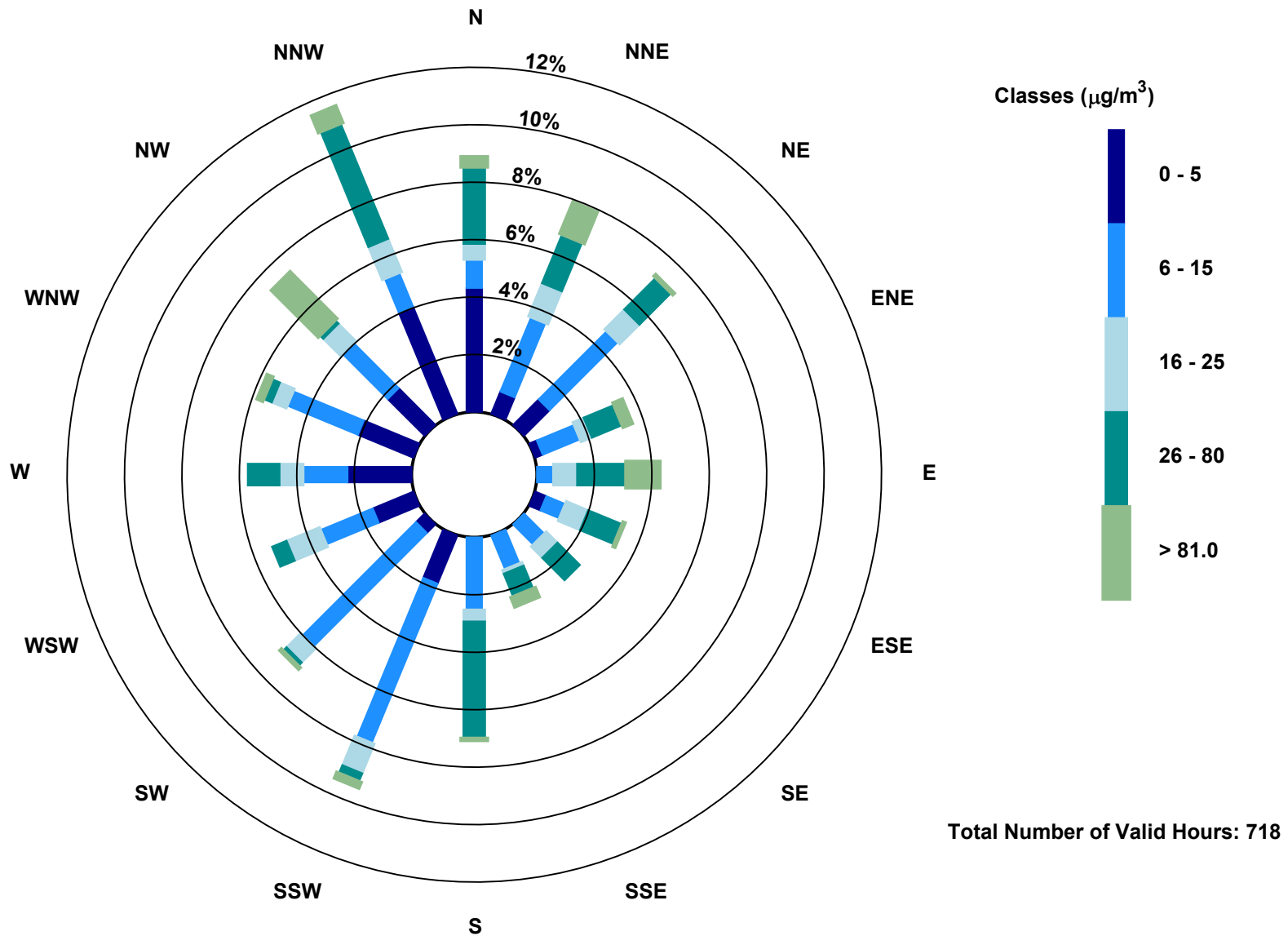
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

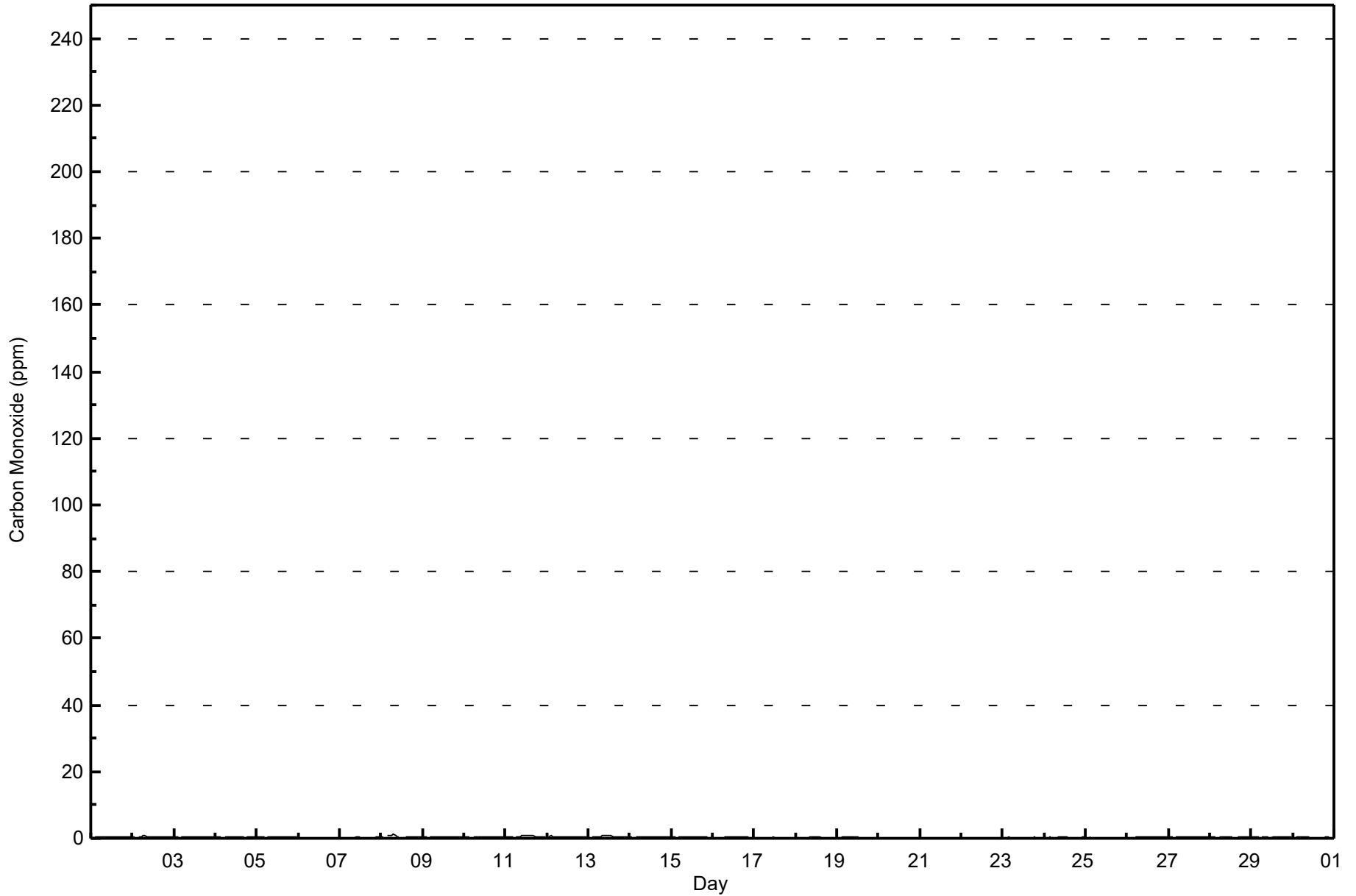
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain





Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm
Stony Mountain - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	553	80.73	80.73
0.4 - 0.5	95	13.87	94.60
0.6 - 0.7	23	3.36	97.96
0.8 - 1.4	14	2.04	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Stony Mountain - June 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	45	36	43	19	15	23	16	15	29	61	45	37	39	37	33	60	553
0.4 - 0.5	13	11	6	6	11	1	1	3	18	0	1	0	2	1	7	14	95
0.6 - 0.7	2	5	1	1	4	0	0	0	1	1	1	0	0	1	4	2	23
0.8 - 1.4	1	2	0	0	0	0	0	1	0	1	0	0	0	1	6	2	14
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	61	54	50	26	30	24	17	19	48	63	47	37	41	40	50	78	685

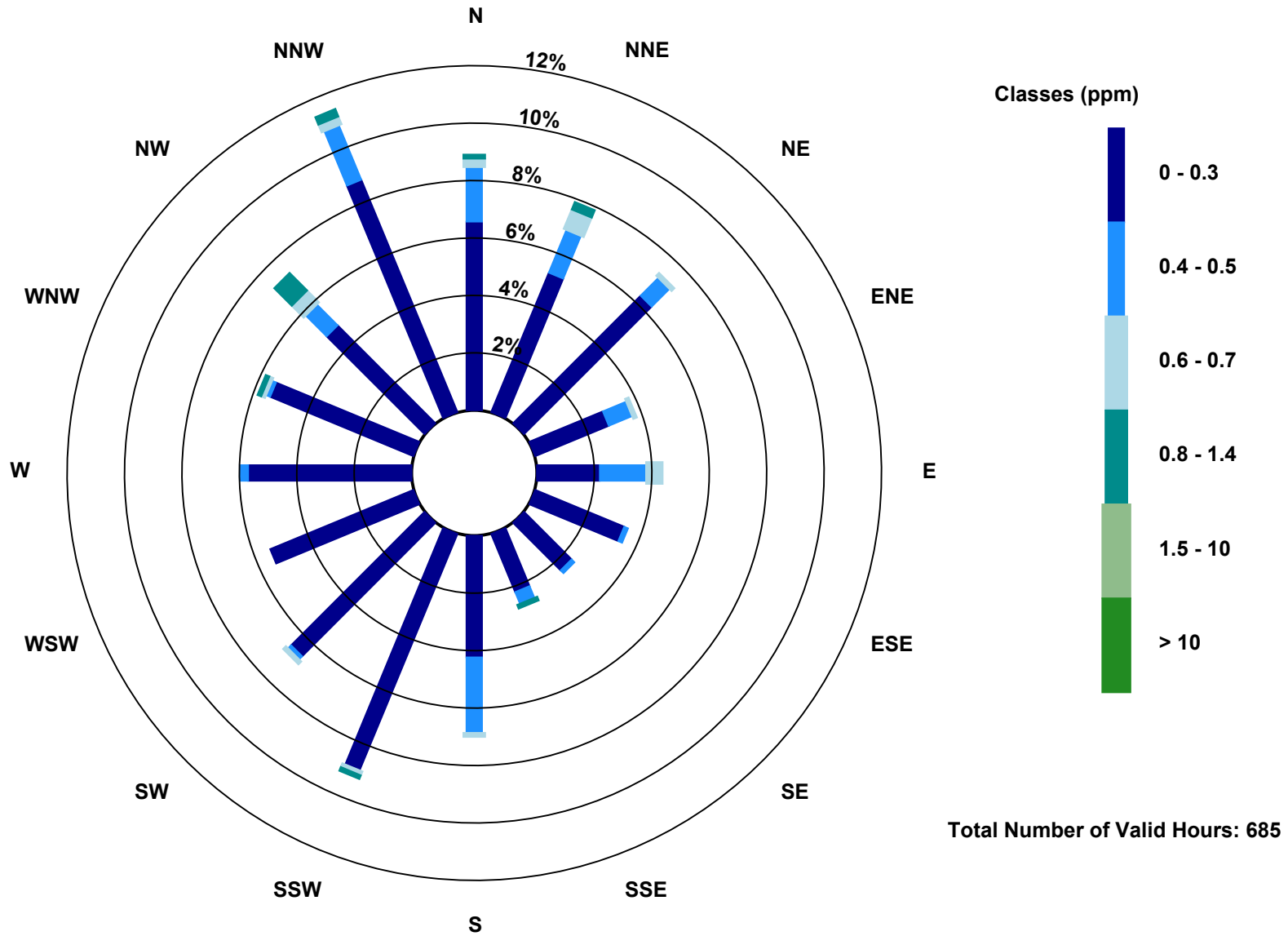
Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Carbon Monoxide (CO) - ppm
Stony Mountain





Wood Buffalo Environmental Association
Summary of Hour Averages

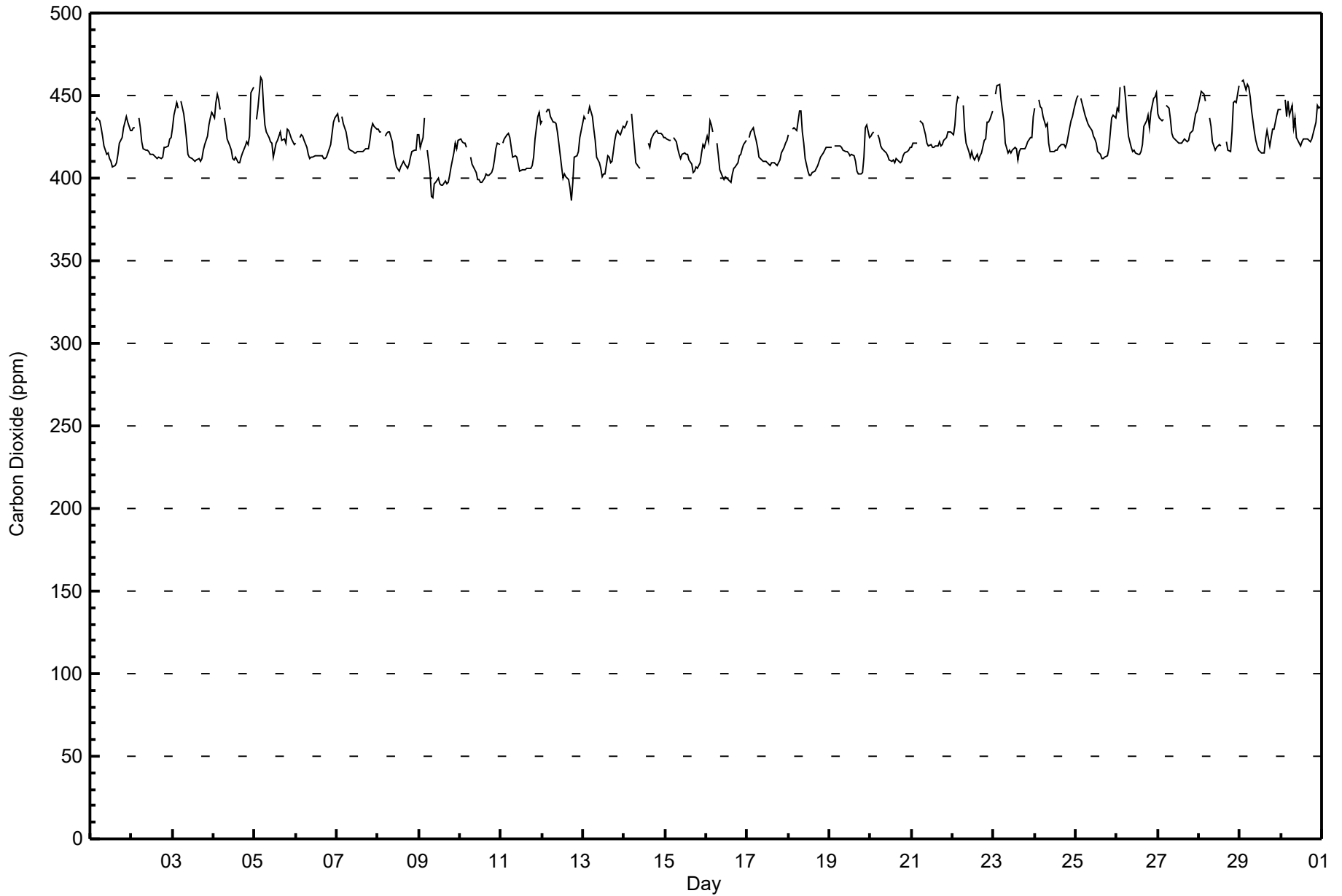
Carbon Dioxide (CO₂) - ppm
Stony Mountain - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																720					
Maximum Value: 461.4 ppm on Jun 5 04:00				Maximum Daily Average: 434.0 ppm on Jun 29		Hours of Data:																684					
Minimum Value: 386.6 ppm on Jun 12 18:00				Minimum Daily Average: 407.0 ppm on Jun 9		Hours of Missing Data:																36					
Maximum Diurnal Average: 437.9 ppm at hour 5				Minimum Diurnal Average: 411.3 ppm at hour 14		Hours of Calibration:																34					
Monthly Average: 422.30 ppm				Percentiles: P ₁ = 396.5 P ₁₀ = 406.6 Q ₁ = 413.5 Median = 421.0 Q ₃ = 430.3 P ₉₀ = 440.9 P ₉₉ = 456.1		Percent Operational Time:																99.7					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	428.6	430.3	Z	434.7	436.8	434.5	430.5	425.6	419.3	414.1	415.1	411.5	410.3	406.7	407.5	409.4	414.4	421.0	424.7	430.1	433.7	436.9	434.0	429.1	423.4	436.9	
2-Jun	429.1	430.5	Z	430.3	Z	436.1	430.2	422.2	417.8	416.9	417.0	415.7	414.8	414.2	413.7	412.3	412.0	412.5	412.0	412.7	418.3	418.5	419.7	424.0	424.3	419.8	436.1
3-Jun	430.6	438.0	445.7	442.7	Z	446.5	439.3	432.6	423.5	414.0	412.4	412.0	411.3	409.8	410.9	412.0	410.0	411.7	417.0	420.6	425.8	432.0	436.7	439.5	425.0	446.5	
4-Jun	436.1	445.7	451.1	447.1	441.4	Z	436.3	431.2	423.9	419.2	416.6	412.0	410.7	412.6	409.7	409.5	413.0	415.2	419.3	421.9	420.3	425.8	451.5	455.2	427.2	455.2	
5-Jun	Z	435.6	442.6	461.4	459.3	444.2	432.5	428.2	424.4	422.2	421.3	412.9	421.2	423.1	425.6	427.9	422.7	424.0	421.6	430.1	428.8	423.8	422.0	420.3	429.4	461.4	
6-Jun	421.2	Z	424.6	426.1	425.4	422.6	418.6	414.2	411.6	412.9	412.9	413.3	413.2	413.9	413.5	413.7	412.0	412.0	413.0	414.9	420.0	426.8	434.0	436.3	418.6	436.3	
7-Jun	439.0	433.6	Z	437.0	433.5	427.9	422.8	417.8	416.9	416.5	415.3	415.6	415.9	415.9	416.0	416.0	417.2	417.7	418.2	423.0	429.7	432.8	431.6	430.0	423.5	439.0	
8-Jun	429.7	427.7	427.6	Z	425.7	427.2	428.1	427.8	422.0	415.6	410.6	407.1	404.4	406.6	408.3	409.7	408.7	405.6	408.3	412.9	415.7	417.2	417.2	425.9	416.9	429.7	
9-Jun	426.0	418.3	424.8	436.1	Z	416.9	403.4	388.9	388.0	396.5	397.4	399.9	396.4	395.5	395.8	397.9	396.7	397.5	401.7	407.0	415.5	421.0	418.0	422.9	407.0	436.1	
10-Jun	423.7	422.0	421.6	420.9	419.1	Z	413.1	408.1	406.5	403.7	399.3	399.0	397.4	397.6	399.9	402.5	401.4	401.8	403.2	405.8	411.0	417.5	421.3	420.2	409.4	423.7	
11-Jun	Z	421.1	423.7	426.1	427.4	424.3	418.7	413.0	413.7	412.8	408.4	404.0	405.2	404.8	404.9	406.1	405.6	406.3	407.6	412.8	423.7	437.3	440.0	433.2	416.6	440.0	
12-Jun	434.5	Z	439.6	441.5	441.9	437.1	433.6	433.8	432.9	427.9	421.0	406.5	400.4	402.9	401.0	399.5	394.0	386.6	397.6	412.5	413.7	415.8	424.9	428.7	418.6	441.9	
13-Jun	436.9	435.5	Z	439.1	443.6	437.4	429.7	422.9	412.5	409.1	405.9	400.7	402.4	402.5	413.9	412.5	409.3	410.1	422.7	427.0	428.6	427.0	425.9	431.0	421.1	443.6	
14-Jun	430.6	432.3	434.6	Z	439.3	428.5	419.7	409.6	406.7	405.9	C	C	C	C	421.5	418.5	423.5	427.4	428.1	428.7	427.5	426.8	426.2	424.6	424.2	439.3	
15-Jun	424.6	423.6	422.9	422.7	Z	424.2	422.1	417.9	414.3	412.1	414.6	414.9	414.6	414.3	411.2	408.1	403.7	404.2	407.2	406.2	409.4	415.0	420.6	418.9	415.1	424.6	
16-Jun	425.0	422.1	434.8	432.3	427.7	Z	420.9	413.4	405.2	400.5	399.2	400.7	400.0	399.3	397.8	402.2	406.0	406.9	409.4	413.9	414.6	418.2	420.6	422.7	412.7	434.8	
17-Jun	Z	424.2	427.7	430.5	425.9	423.0	418.9	412.7	410.8	409.8	409.9	410.1	408.1	407.9	409.5	409.3	409.2	407.9	409.5	411.0	414.9	419.0	421.4	422.9	415.4	430.5	
18-Jun	426.0	Z	429.4	430.8	429.6	428.8	441.1	440.9	427.8	421.1	411.5	404.1	401.7	401.8	403.3	403.9	405.7	407.6	410.4	412.9	415.6	417.4	418.5	418.7	417.8	441.1	
19-Jun	418.9	418.9	Z	419.5	419.7	419.9	419.5	418.6	417.2	416.5	415.9	415.0	413.9	414.5	413.8	409.9	403.9	402.1	402.3	403.4	412.8	430.4	432.6	424.4	415.8	432.6	
20-Jun	425.2	427.0	427.7	Z	426.7	424.1	419.6	417.7	415.9	415.1	413.7	411.3	410.5	410.9	409.1	412.2	411.0	409.7	410.4	413.4	414.9	416.1	417.3	418.5	416.4	427.7	
21-Jun	418.7	421.4	420.9	421.5	Z	434.6	432.9	430.0	425.9	420.9	419.3	420.0	418.3	418.2	419.8	419.6	421.9	419.2	420.5	423.1	424.4	428.1	428.2	428.4	423.3	434.6	
22-Jun	426.6	432.3	443.6	449.0	448.0	Z	444.3	428.5	421.1	415.7	412.9	416.1	412.5	410.7	414.1	411.0	413.5	415.3	422.9	424.0	434.2	433.6	435.4	440.9	426.4	449.0	
23-Jun	Z	450.5	456.1	456.8	447.8	440.7	434.9	421.3	415.1	416.5	415.2	417.0	419.0	417.4	411.0	416.4	417.7	417.8	417.6	419.2	421.9	424.9	425.0	437.0	426.8	456.8	
24-Jun	442.5	Z	447.1	443.4	442.0	436.9	431.1	432.8	421.4	416.4	416.3	416.7	417.2	418.9	420.4	420.6	420.4	418.4	421.2	430.3	434.5	437.6	441.1	428.0	447.1		
25-Jun	447.9	449.8	Z	448.5	444.6	438.5	435.8	432.9	431.3	429.0	425.5	423.6	421.0	416.5	414.4	412.2	412.0	412.9	413.8	417.8	427.0	436.6	437.9	436.8	429.0	449.8	
26-Jun	442.1	440.8	454.9	Z	455.7	447.1	435.9	425.2	418.4	415.9	416.7	415.1	414.2	414.5	416.3	420.3	431.4	435.1	438.2	430.8	439.5	448.0	449.0	451.6	432.9	455.7	
27-Jun	438.6	436.2	434.8	435.7	Z	443.9	442.2	435.3	427.5	425.0	423.5	422.0	420.9	420.9	421.0	423.4	422.8	422.4	422.6	426.7	428.4	434.2	439.0	440.8	429.9	443.9	
28-Jun	448.6	452.3	451.4	450.9	446.7	Z	436.6	431.2	422.1	417.3	418.3	419.9	420.3	419.3	M	M	422.4	416.5	415.9	427.6	446.0	446.3	445.8	456.2	433.9	456.2	
29-Jun	Z	458.2	459.2	453.2	456.7	455.1	449.1	440.8	427.9	423.1	419.8	416.9	415.4	415.5	415.1	423.5	428.7	419.7	424.3	429.5	429.6	438.2	441.2	441.5	434.0	459.2	
30-Jun	441.3	Z	447.2	437.7	446.4	438.4	444.5	430.7	436.0	424.4	422.5	419.2	421.8	423.4	424.0	423.5	422.5	422.3	423.4	427.4	434.0	443.8	442.3	443.0	432.2	447.2	
431.7 433.1 436.9 437.8 437.9 433.3 429.3 423.4 418.6 415.5 414.0 412.1 411.4 411.3 411.7 412.5 413.1 413.0 415.4 419.1 423.7 428.2 430.7 432.2																								Diurnal Average			
448.6 458.2 459.2 461.4 459.3 455.1 449.1 440.9 436.0 429.0 425.5 423.6 421.8 423.4 425.6 427.9 431.4 435.1 438.2 430.8 446.0 448.0 451.5 456.2																								Diurnal Maximum			
Z - zerspan			C - Calibration			M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Stony Mountain - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	306	44.74	44.74
420 - 440	281	41.08	85.82
440 - 460	72	10.53	96.35
460 - 480	1	0.15	96.49
480 - 500	0	0.00	96.49
> 500	0	0.00	96.49

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Stony Mountain - June 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	22	22	33	16	15	4	3	10	24	24	22	17	24	22	15	33	306
420 - 440	34	24	17	6	10	11	11	3	14	23	15	15	12	14	29	43	281
440 - 460	3	8	0	4	1	0	2	4	5	15	9	4	3	5	5	4	72
460 - 480	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
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	59	54	50	26	26	15	16	17	43	62	46	36	39	42	49	80	660

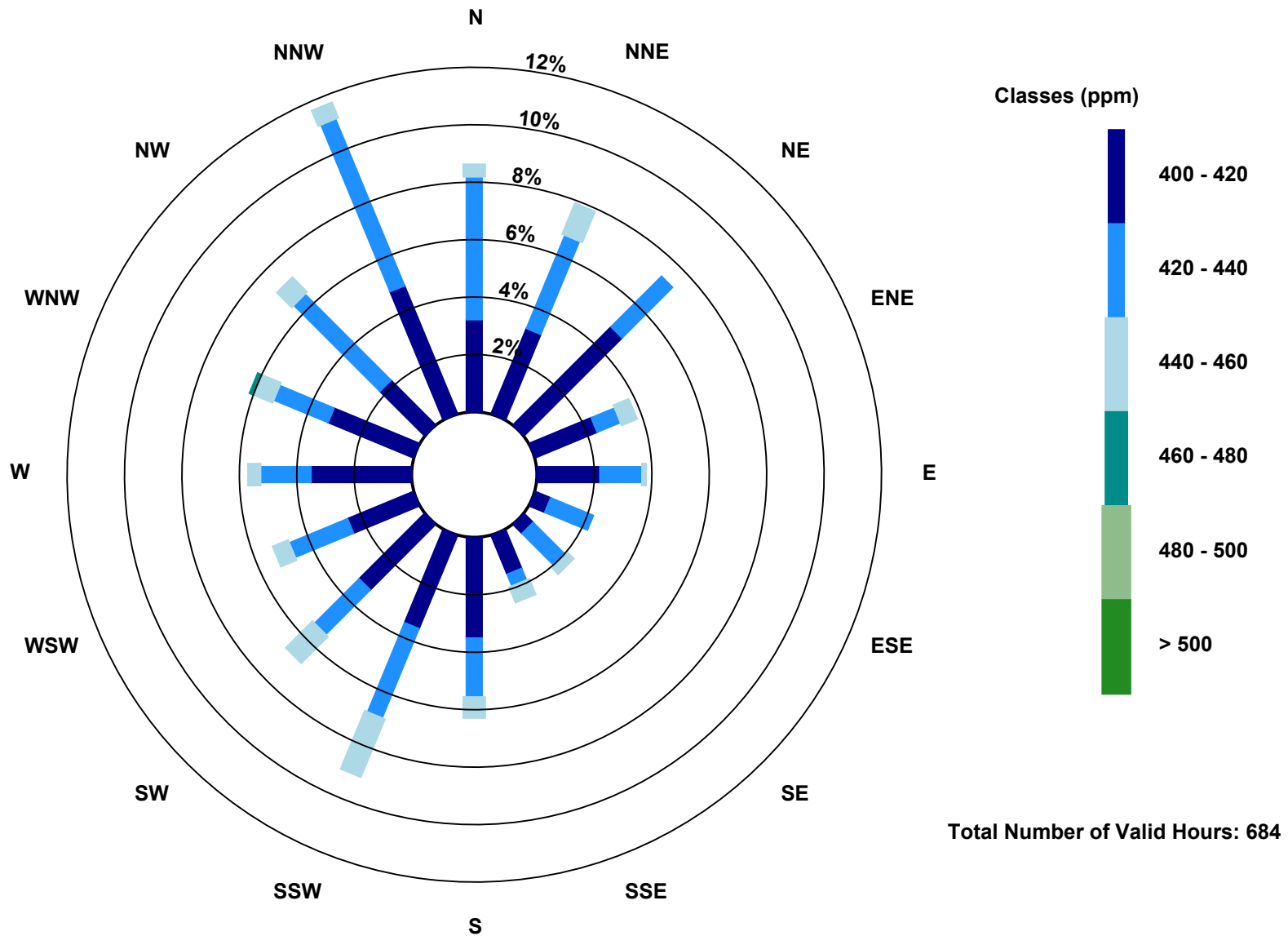
Total Number of Valid Hours: 684

Total Number of Hours: 720



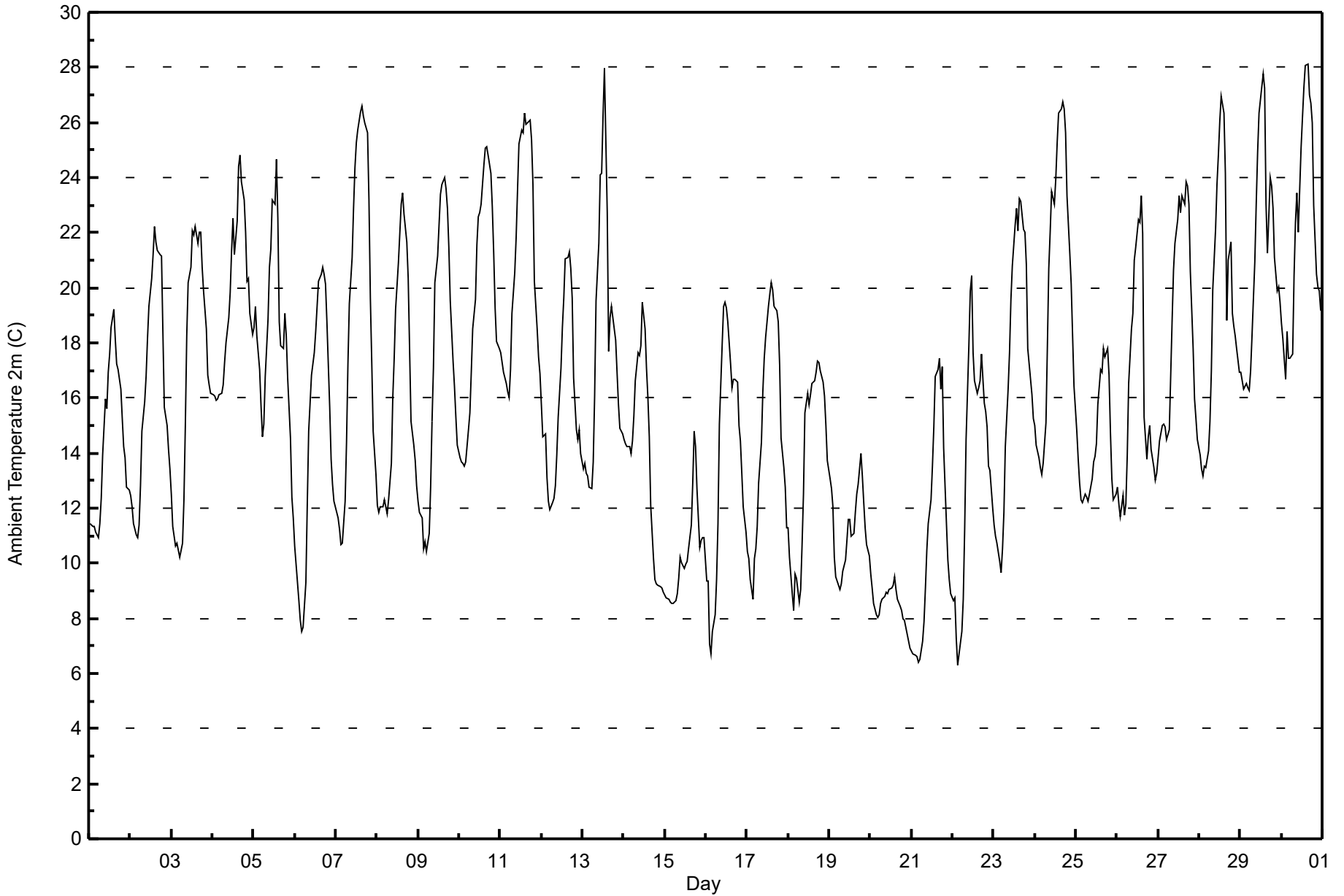
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Carbon Dioxide (CO₂) - ppm
Stony Mountain





Maximum Value: 28.1 C on Jun 30 16:00		Maximum Daily Average: 22.1 C on Jun 30		Hours in Service: 720																																												
Minimum Value: 6.3 C on Jun 22 04:00		Minimum Daily Average: 8.5 C on Jun 20		Hours of Data: 720																																												
Maximum Diurnal Average: 20.8 C at hour 15		Minimum Diurnal Average: 11.7 C at hour 5		Hours of Missing Data: 0																																												
Monthly Average: 16.21 C		Percentiles: P ₁ = 6.8 P ₁₀ = 9.4 Q ₁ = 12.3 Median = 16.1 Q ₃ = 19.9 P ₉₀ = 23.2 P ₉₉ = 27.0		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	11.5	11.4	11.3	11.3	11.1	11.0	11.5	12.4	13.9	16.0	15.6	16.9	17.6	18.5	19.2	18.2	17.2	17.1	16.3	15.3	14.2	13.8	12.8	12.7	14.4	19.2																						
2-Jun	12.5	12.1	11.5	11.0	11.0	11.4	12.8	14.8	15.9	16.8	18.2	19.3	20.4	21.2	22.2	21.7	21.4	21.2	21.1	18.3	15.7	15.0	14.1	13.4	16.4	22.2																						
3-Jun	12.5	11.3	10.6	10.7	10.5	10.2	10.7	12.3	15.0	18.3	20.2	20.7	22.1	21.9	22.2	21.6	22.0	22.0	20.8	19.9	18.5	16.8	16.5	16.2	16.8	22.2																						
4-Jun	16.1	16.0	15.9	15.9	16.1	16.2	16.5	17.3	18.0	18.9	19.8	21.3	22.5	21.2	22.4	24.4	24.8	23.8	23.2	22.0	20.2	20.3	19.1	18.3	19.6	24.8																						
5-Jun	18.6	19.3	18.2	17.1	15.7	14.6	15.1	16.8	18.8	20.7	21.4	23.2	23.0	24.7	22.5	18.8	17.9	17.8	19.1	18.3	16.7	14.5	12.4	11.7	18.2	24.7																						
6-Jun	10.7	10.0	8.7	8.0	7.5	7.7	9.3	12.2	14.8	15.8	16.8	17.7	18.4	19.3	20.2	20.5	20.8	20.5	20.1	18.7	15.7	13.8	12.9	12.3	14.7	20.8																						
7-Jun	11.8	11.6	11.2	10.7	10.8	12.3	14.4	17.2	19.4	21.1	22.9	24.4	25.3	25.7	26.4	26.6	26.3	26.0	25.6	23.2	19.6	17.3	14.8	13.2	19.1	26.6																						
8-Jun	12.1	11.9	12.0	12.0	12.3	12.0	11.8	12.3	13.6	16.0	17.5	19.2	20.9	21.9	23.0	23.5	22.7	21.7	20.3	17.8	15.1	14.3	13.7	12.8	16.3	23.5																						
9-Jun	12.3	11.9	11.6	10.5	10.8	10.4	11.1	12.8	15.2	17.1	20.2	21.2	22.3	23.4	23.7	24.0	23.6	22.9	21.5	19.5	17.3	16.4	15.3	14.3	17.1	24.0																						
10-Jun	13.8	13.7	13.6	13.5	13.7	14.8	15.4	16.9	18.5	19.6	21.6	22.6	22.7	23.0	24.5	25.1	25.1	24.8	24.2	22.9	21.2	19.2	18.1	17.8	19.4	25.1																						
11-Jun	17.6	17.3	16.9	16.5	16.2	16.0	17.0	19.1	20.5	21.8	23.5	25.2	25.7	25.6	26.4	26.0	26.0	26.1	25.4	23.8	20.2	18.5	17.5	16.9	21.1	26.4																						
12-Jun	15.8	14.6	14.7	13.1	12.3	11.9	12.2	12.4	12.8	13.9	15.3	17.1	18.6	19.6	21.1	21.1	21.3	20.7	19.6	16.7	14.9	14.5	14.8	14.0	16.0	21.3																						
13-Jun	13.4	13.6	13.3	13.2	12.7	12.7	13.7	16.1	19.5	21.6	24.1	24.2	26.2	28.0	22.7	17.7	18.9	19.3	18.5	18.1	16.9	15.8	14.9	14.7	17.9	28.0																						
14-Jun	14.5	14.3	14.2	14.3	14.0	14.5	15.3	16.6	17.6	17.9	19.5	18.5	17.1	16.0	14.6	12.1	10.2	9.4	9.2	9.2	9.1	9.1	8.9	8.9	13.9	19.5																						
15-Jun	8.8	8.7	8.7	8.6	8.5	8.5	8.7	8.9	9.5	10.2	10.0	9.8	9.9	10.1	10.5	11.4	12.9	14.8	14.2	12.7	10.6	10.8	10.9	10.9	10.4	14.8																						
16-Jun	9.3	9.4	7.1	6.7	7.5	8.1	9.4	11.5	15.1	17.9	19.3	19.5	19.3	18.8	17.3	16.4	16.7	16.7	16.6	15.0	14.5	13.3	12.0	11.2	13.7	19.5																						
17-Jun	10.4	10.1	9.4	8.7	10.1	10.5	11.4	12.9	14.4	16.2	17.4	18.2	19.3	19.8	20.2	19.9	19.3	19.2	18.8	17.2	14.5	13.5	12.7	11.3	14.8	20.2																						
18-Jun	11.3	10.2	8.9	8.3	9.6	9.4	8.6	9.1	10.7	12.5	15.4	16.2	15.7	16.1	16.5	16.6	16.9	17.4	17.3	17.0	16.6	16.1	15.0	13.7	13.6	17.4																						
19-Jun	13.1	12.7	12.1	10.2	9.5	9.2	9.1	9.2	9.7	10.1	10.8	11.6	11.6	11.0	11.1	11.8	12.5	12.9	14.0	13.2	12.2	11.3	10.7	10.3	11.2	14.0																						
20-Jun	9.6	9.1	8.6	8.2	8.0	8.1	8.5	8.7	8.8	8.9	8.9	9.0	9.1	9.2	9.5	9.0	8.7	8.4	8.3	8.0	7.9	7.4	7.1	6.9	8.5	9.6																						
21-Jun	6.8	6.7	6.7	6.6	6.4	6.5	7.2	7.9	9.1	10.5	11.4	12.3	13.5	15.0	16.8	17.0	17.4	16.3	17.2	14.2	11.4	10.1	9.4	8.9	11.1	17.4																						
22-Jun	8.6	8.7	7.3	6.3	6.7	7.5	8.7	11.3	14.5	17.9	19.9	20.4	17.6	16.6	16.2	16.4	16.6	17.6	15.8	15.5	14.9	13.5	13.4	12.0	13.5	20.4																						
23-Jun	11.4	11.0	10.7	10.1	9.7	10.5	11.8	14.3	16.3	17.6	19.6	20.8	22.3	22.9	22.1	23.2	23.1	22.1	22.0	20.9	17.8	16.7	16.1	15.3	17.0	23.2																						
24-Jun	15.0	14.3	13.8	13.5	13.2	13.7	15.1	17.9	20.7	22.0	23.5	23.1	23.9	25.3	26.3	26.5	26.7	26.5	25.6	23.3	21.3	20.1	18.2	16.4	20.3	26.7																						
25-Jun	14.8	13.8	12.9	12.3	12.2	12.5	12.4	12.2	12.5	13.0	13.7	13.9	14.3	15.8	17.0	16.9	17.8	17.5	17.8	16.8	14.8	13.1	12.3	12.5	14.3	17.8																						
26-Jun	12.8	12.1	11.7	12.4	11.8	12.1	13.9	16.5	18.5	19.1	21.0	21.4	22.5	22.3	23.3	22.0	15.3	13.8	14.6	15.0	14.1	13.5	13.0	13.3	16.1	23.3																						
27-Jun	13.8	14.4	15.0	15.0	14.9	14.5	14.9	16.8	18.8	20.6	21.6	22.5	23.3	22.7	23.3	23.1	23.9	23.7	23.0	20.6	17.8	16.0	15.2	14.5	18.8	23.9																						
28-Jun	13.9	13.4	13.2	13.5	13.5	14.1	15.2	17.0	19.9	22.1	23.8	24.8	26.0	26.9	26.3	24.2	18.8	21.0	21.7	19.1	18.6	18.3	17.8	17.0	19.2	26.9																						
29-Jun	16.9	16.6	16.3	16.5	16.4	16.3	17.0	18.3	20.9	23.0	24.9	26.3	27.3	27.8	27.2	23.0	21.2	24.0	23.7	22.9	21.1	19.9	20.0	19.5	21.1	27.8																						
30-Jun	18.7	18.2	16.7	18.4	17.4	17.4	17.6	20.5	22.4	23.4	22.0	25.1	26.2	27.3	28.1	28.1	27.0	26.7	26.0	23.0	20.5	20.0	19.9	19.2	22.1	28.1																						
																								13.0	12.6	12.1	11.8	11.7	11.8	12.5	14.1	15.9	17.3	18.6	19.6	20.2	20.6	20.8	20.3	19.8	19.8	19.4	17.9	16.1	15.1	14.3	13.7	Diurnal Average
																								18.7	19.3	18.2	18.4	17.4	17.4	17.6	20.5	22.4	23.4	24.9	26.3	27.3	28.0	28.1	28.1	27.0	26.7	26.0	23.8	21.3	20.3	20.0	19.5	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Stony Mountain - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	86	11.94	11.94
10 - 20	455	63.19	75.14
> 20	179	24.86	100.00

Total Number of Valid Hours: 720

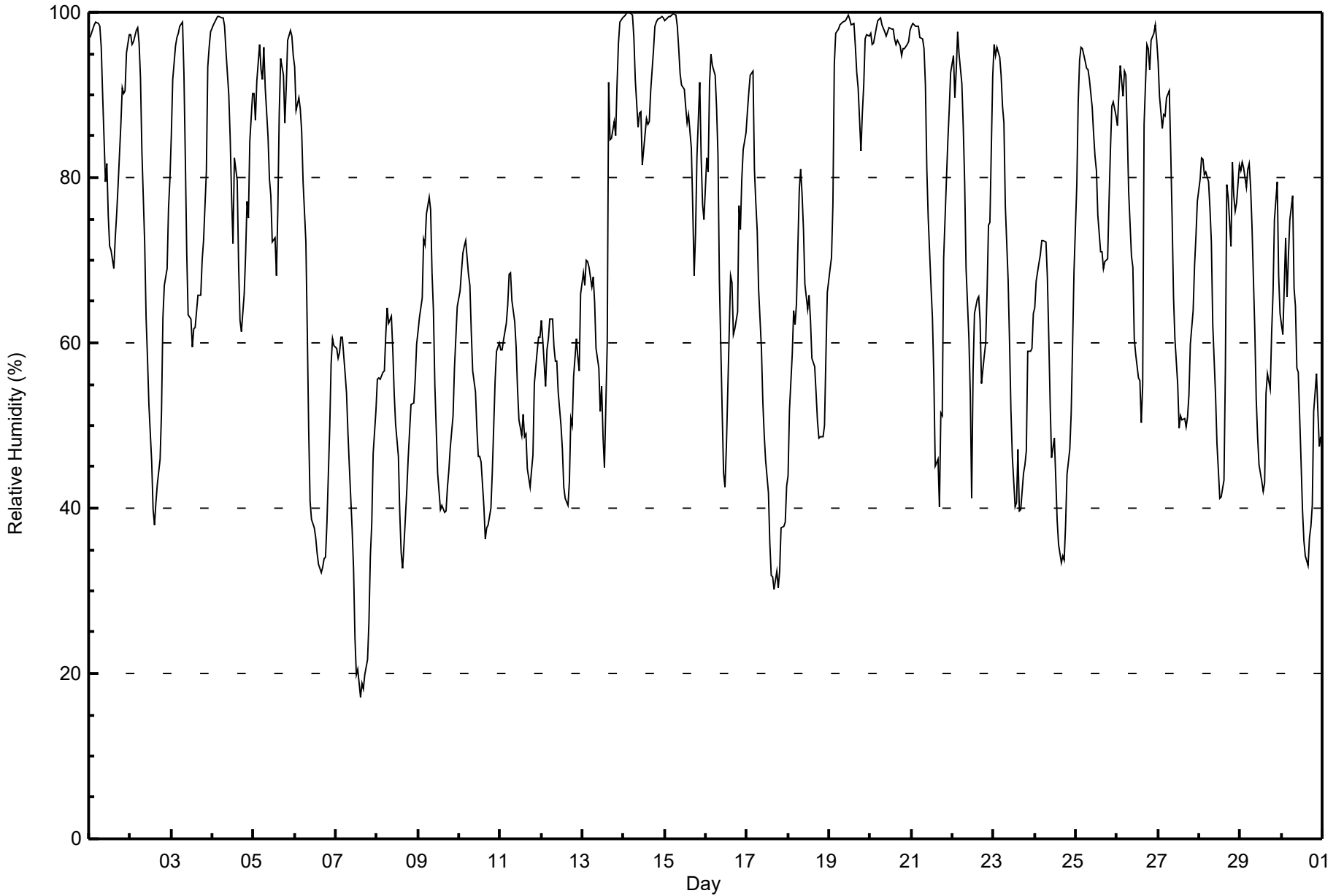
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Stony Mountain - June 2023

Maximum Value: 100.0 % on Jun 14 04:00																								Maximum Daily Average: 97.2 % on Jun 20																								Hours in Service: 720	
Minimum Value: 17.0 % on Jun 7 15:00																								Minimum Daily Average: 38.7 % on Jun 7																								Hours of Data: 720	
Maximum Diurnal Average: 84.4 % at hour 4																								Minimum Diurnal Average: 55.1 % at hour 15																								Hours of Missing Data: 0	
Monthly Average: 69.98 %																								Percentiles: P ₁ = 24.8 P ₁₀ = 41.3 Q ₁ = 54.0 Median = 69.2 Q ₃ = 90.1 P ₉₀ = 97.5 P ₉₉ = 99.6																								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-Jun	96.9	97.5	98.0	98.5	98.8	98.7	98.3	95.8	90.1	79.5	81.7	75.5	71.7	71.2	69.1	72.7	75.6	79.1	86.4	90.8	90.2	90.5	95.2	97.2	87.4	98.8																							
2-Jun	97.3	96.2	96.5	97.8	98.1	96.2	92.0	83.2	72.0	63.1	58.2	52.6	45.6	39.9	37.9	40.7	42.9	45.9	51.7	63.1	66.9	69.0	76.3	79.8	69.3	98.1																							
3-Jun	85.1	91.9	95.9	97.0	97.5	98.3	98.9	92.6	82.1	70.9	63.4	62.9	59.5	61.7	61.8	65.8	65.8	65.7	70.1	72.3	80.7	93.5	95.7	97.7	80.3	98.9																							
4-Jun	98.4	98.8	99.1	99.4	99.5	99.4	99.3	98.3	95.2	90.0	84.7	77.6	72.0	82.3	79.7	69.5	62.6	61.3	66.0	70.7	77.1	75.2	84.5	90.3	84.6	99.5																							
5-Jun	90.2	86.9	91.7	96.1	93.1	91.9	95.7	90.8	85.0	79.8	77.9	72.2	72.7	68.2	76.3	87.9	94.4	92.4	86.6	91.0	96.7	97.8	97.1	94.8	87.8	97.8																							
6-Jun	93.3	88.1	89.6	88.2	85.6	79.5	72.3	61.3	49.5	40.8	38.6	37.6	36.4	34.6	33.2	32.1	32.8	33.9	34.1	38.1	49.6	57.4	60.6	59.6	55.3	93.3																							
7-Jun	59.3	58.2	58.9	60.6	60.7	56.3	53.9	49.2	45.1	37.4	32.6	24.4	19.8	20.5	17.0	18.8	18.1	19.9	21.7	26.2	34.3	38.2	46.7	51.8	38.7	60.7																							
8-Jun	55.6	55.7	55.6	56.4	56.5	61.0	64.3	62.4	63.2	59.1	53.9	50.1	46.2	39.3	34.6	32.8	35.7	42.2	46.2	49.4	52.6	52.7	55.6	59.8	51.7	64.3																							
9-Jun	61.4	63.0	65.5	72.6	71.9	75.6	77.7	76.0	68.5	63.9	54.8	44.3	42.0	39.9	40.4	39.6	39.7	42.5	44.6	47.4	51.2	56.9	60.7	64.5	56.9	77.7																							
10-Jun	66.3	68.7	70.9	71.7	72.3	68.4	67.0	61.3	56.7	54.0	49.6	46.3	46.3	45.6	40.1	36.3	37.5	38.0	40.0	44.5	49.8	55.4	58.9	60.0	54.4	72.3																							
11-Jun	59.2	59.1	60.4	62.3	64.5	68.3	68.5	65.0	62.5	59.4	54.3	50.7	48.8	51.4	48.7	49.1	44.8	42.6	44.6	46.4	55.1	59.0	60.7	60.7	56.1	68.5																							
12-Jun	62.7	60.4	54.8	59.2	60.4	62.9	62.8	59.4	57.8	57.8	54.0	50.0	47.2	42.5	41.2	40.3	43.3	50.8	50.1	55.9	60.5	58.3	56.7	66.0	54.8	66.0																							
13-Jun	68.5	67.0	69.9	69.8	69.2	66.8	68.0	64.9	59.3	57.0	51.7	54.7	48.6	45.0	60.0	91.6	84.6	84.7	86.8	85.0	91.4	96.3	98.8	99.3	72.5	99.3																							
14-Jun	99.5	99.7	99.9	100.0	99.9	99.6	97.0	91.8	86.2	87.8	87.9	81.5	85.3	87.2	86.5	86.8	90.6	95.4	98.3	98.9	99.2	99.3	99.4	99.3	94.0	100.0																							
15-Jun	99.0	99.1	99.4	99.6	99.7	99.8	99.6	98.3	95.5	92.5	91.2	90.6	88.5	86.6	87.7	83.6	76.4	68.1	73.3	82.6	91.5	82.6	76.7	74.9	89.0	99.8																							
16-Jun	82.3	80.6	91.5	94.9	93.6	92.4	88.4	82.7	67.6	51.7	44.3	42.5	47.5	54.3	68.2	67.3	61.0	61.7	63.7	76.6	73.8	79.9	83.4	85.4	72.3	94.9																							
17-Jun	88.0	90.4	92.4	92.8	81.1	76.9	73.5	66.4	59.4	52.9	48.8	45.7	41.9	35.7	31.8	31.7	30.1	32.3	30.4	32.3	37.6	37.8	38.3	42.7	53.8	92.8																							
18-Jun	43.9	51.9	58.6	63.8	62.2	64.8	78.5	81.0	77.9	73.7	67.2	64.0	65.8	62.7	58.1	57.1	54.0	50.6	48.5	48.6	48.6	50.0	58.4	66.1	60.7	81.0																							
19-Jun	69.0	70.3	76.8	93.8	97.5	98.0	98.5	98.7	98.8	99.0	99.2	99.6	99.2	98.4	98.7	96.0	92.7	90.9	83.2	87.8	91.2	96.8	97.4	97.1	92.9	99.6																							
20-Jun	97.4	96.1	96.2	98.1	99.0	99.2	99.3	98.6	97.7	97.2	97.6	98.1	98.0	97.9	96.7	96.1	96.6	95.9	94.7	95.7	95.6	96.2	96.5	97.8	97.2	99.3																							
21-Jun	98.3	98.6	98.3	98.3	98.3	97.0	96.8	95.6	91.3	81.1	75.1	66.9	63.0	56.0	45.1	45.9	40.2	51.5	51.3	70.2	79.9	84.4	88.3	92.7	77.7	98.6																							
22-Jun	94.7	89.7	93.0	97.6	94.9	91.4	86.2	79.3	69.1	60.7	54.0	41.2	56.6	63.6	65.3	65.6	62.7	55.1	58.5	59.9	66.3	74.2	74.6	92.3	72.8	97.6																							
23-Jun	96.0	94.8	95.8	94.6	92.4	88.7	86.5	76.5	67.6	60.2	51.9	46.4	40.1	40.6	47.1	39.7	39.8	44.2	45.2	47.0	59.0	59.0	59.3	63.6	64.0	96.0																							
24-Jun	64.2	67.4	69.7	70.7	72.3	72.4	72.2	68.0	60.7	52.5	46.1	48.5	43.6	38.5	35.6	33.4	34.3	33.7	38.0	44.1	47.1	51.6	59.8	68.6	53.9	72.4																							
25-Jun	79.2	89.1	94.3	95.8	95.6	94.1	93.3	93.1	91.8	88.5	85.2	82.5	80.8	75.4	71.0	71.1	68.9	69.8	70.2	77.2	83.4	88.6	89.2	87.4	84.0	95.8																							
26-Jun	86.3	90.2	93.5	89.8	92.9	92.4	85.7	78.3	70.5	69.1	60.6	58.6	55.8	55.4	50.4	55.0	86.5	96.1	95.6	93.0	96.6	97.5	98.4	96.6	81.0	98.4																							
27-Jun	94.1	89.9	86.0	87.7	87.5	89.7	90.5	83.3	75.0	65.6	60.5	54.9	49.7	51.2	50.7	50.8	49.8	51.0	53.8	59.8	63.8	69.3	72.8	77.0	69.4	94.1																							
28-Jun	79.8	82.3	82.2	80.3	80.7	79.4	76.3	72.3	62.2	53.6	47.9	44.6	41.1	41.3	43.3	56.8	79.2	77.7	71.7	81.9	77.7	75.9	76.9	81.6	68.6	82.3																							
29-Jun	80.9	81.9	81.2	78.8	81.1	81.7	78.8	74.1	61.6	53.3	48.6	45.3	43.2	41.9	43.0	53.9	56.3	54.4	61.3	66.2	75.0	79.4	68.1	63.6	64.7	81.9																							
30-Jun	62.2	61.1	72.8	65.6	70.7	75.0	77.8	66.6	64.4	57.0	56.5	45.7	39.9	36.1	34.3	33.0	36.5	37.8	40.3	51.6	56.3	51.6	47.5	48.7	53.7	77.8																							
80.3 80.8 82.9 84.4 84.2 83.9 83.3 78.8 72.8 67.0 62.6 58.5 56.6 55.5 55.1 56.7 57.8 58.8 60.2 65.1 70.0 72.5 74.4 77.2																								Diurnal Average																									
99.5 99.7 99.9 100.0 99.9 99.8 99.6 98.7 98.8 99.0 99.2 99.6 99.2 98.4 98.7 96.1 96.6 96.1 98.3 98.9 99.2 99.3 99.4 99.3																								Diurnal Maximum																									





Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

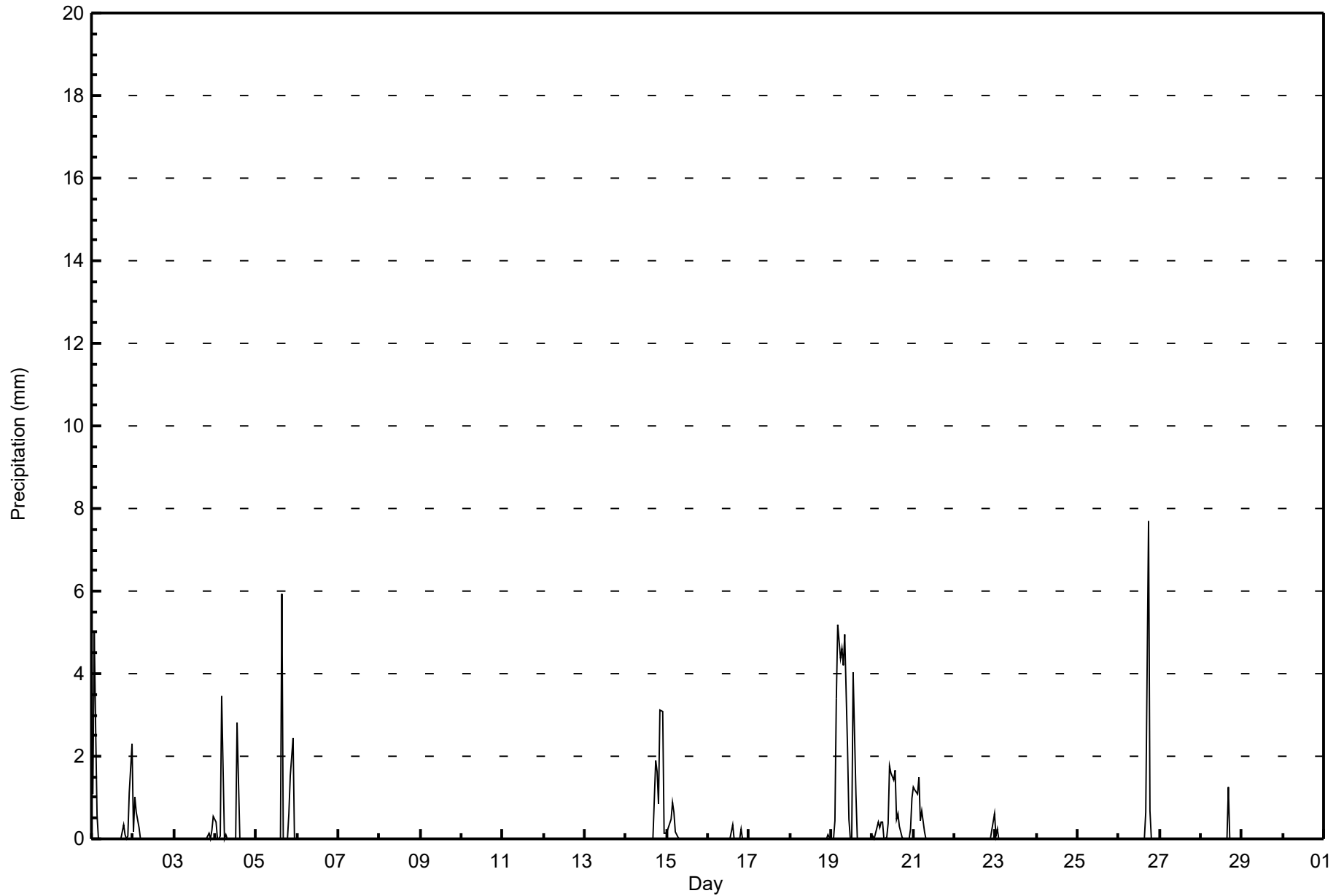
Stony Mountain - June 2023

Maximum Value: 7.7 mm on Jun 26 18:00																				Maximum Daily Total: 34.9 mm on Jun 19					Hours in Service: 720																								
Minimum Value: 0.0 mm on Jun 1 05:00																				Minimum Daily Total: 0.0 mm on Jun 6					Hours of Data: 686																								
Maximum Diurnal Total: 10.0 mm at hour 5																				Minimum Diurnal Total: 1.4 mm at hour 13					Hours of Missing Data: 34																								
Monthly Total: 111.61 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.2 P ₉₉ = 4.2					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-Jun	1.1	5.0	2.7	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	0.3	0.1	0.0	0.1	1.1	2.3	13.3	5.0																							
2-Jun	0.2	1.0	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.0																							
3-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.6	0.9	0.6																							
4-Jun	0.4	0.0	0.0	0.1	3.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	3.5																							
5-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.6	1.5	2.4	0.0	0.0	10.5	5.9																								
6-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--																								
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.6	0.9	3.1	3.1	0.1	0.1	--	3.1																							
15-Jun	0.2	0.3	0.5	0.9	0.6	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	2.6	0.9																								
16-Jun	0.0	0.0	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	0.2	0.0	0.0	0.0	0.0	0.6	0.3																								
17-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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																								
19-Jun	0.0	0.0	0.4	3.4	5.2	4.4	4.6	4.2	5.0	2.2	0.5	0.0	4.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.9	5.2																								
20-Jun	0.1	0.0	0.1	0.4	0.3	0.4	0.4	0.0	0.1	0.4	1.8	1.6	1.4	1.7	0.5	0.6	0.3	0.1	0.0	0.0	0.0	0.2	1.0	11.2	1.8																								
21-Jun	1.3	1.2	1.1	1.5	0.5	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	1.5																								
22-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.8	0.6																								
23-Jun	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	0.3	0.2																								
24-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	7.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	9.0	7.7																								
27-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3																								
29-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	7.7	5.5	7.1	10.0	5.6	5.4	4.2	5.0	2.6	2.2	1.6	1.4	8.5	1.9	6.6	2.2	9.7	2.6	1.8	4.7	5.6	2.0	4.6	Diurnal Average	
																								1.3	5.0	2.7	3.4	5.2	4.4	4.6	4.2	5.0	2.2	1.8	1.6	1.4	4.0	1.1	5.9	1.3	7.7	1.6	0.9	3.1	3.1	1.1	2.3	Diurnal Maximum	
DF - DAS Failure																																																	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Stony Mountain - June 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	629	91.69	91.69
0.4 - 0.5	10	1.46	93.15
0.6 - 0.7	10	1.46	94.61
0.8 - 1.4	12	1.75	96.36
1.5 - 10	25	3.64	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

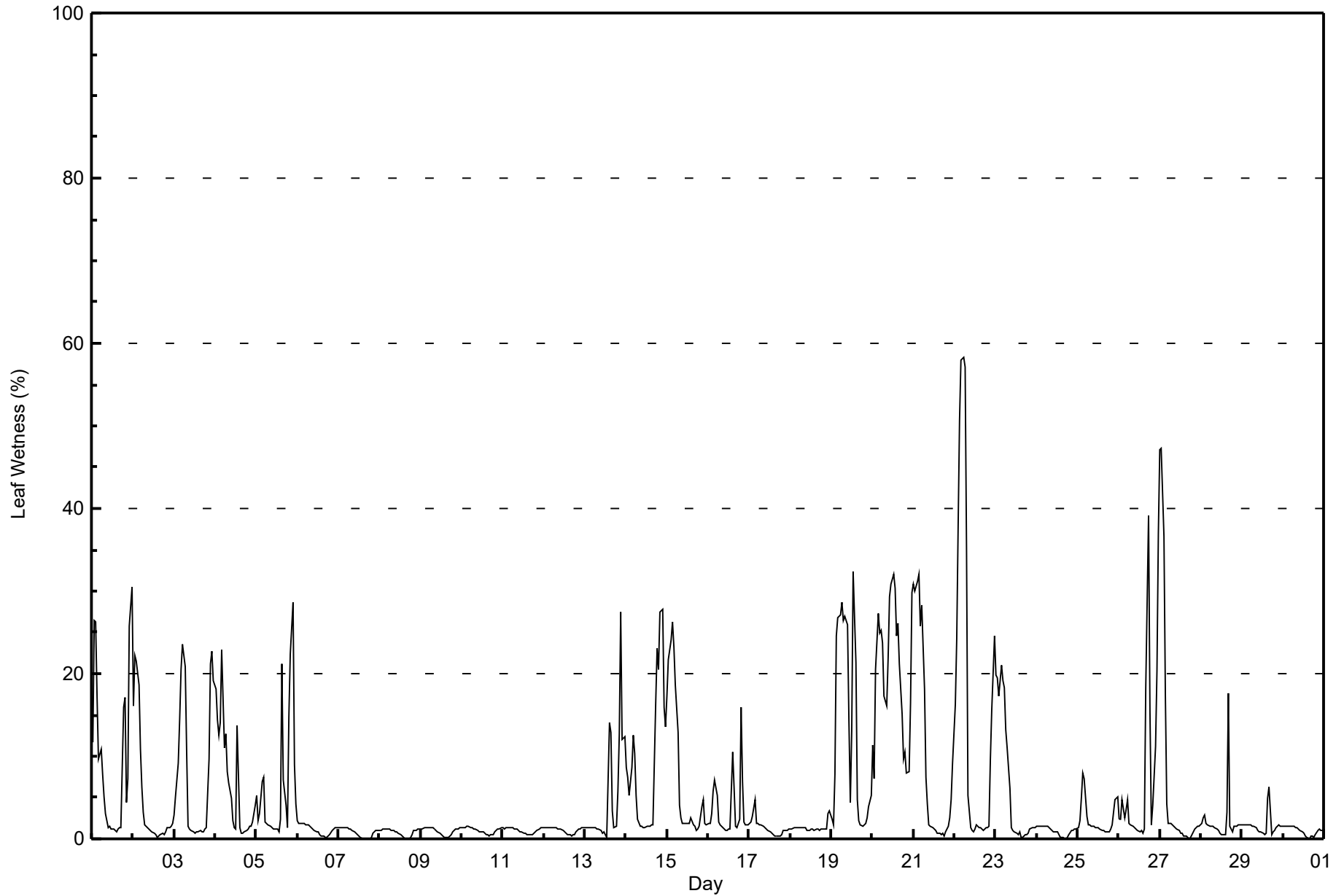
Stony Mountain - June 2023

Maximum Value: 58.3 % on Jun 22 06:00																				Maximum Daily Average: 20.3 % on Jun 20					Hours in Service: 720																								
Minimum Value: 0.0 % on Jun 7 16:00																				Minimum Daily Average: 0.7 % on Jun 7					Hours of Data: 720																								
Maximum Diurnal Average: 10.7 % at hour 4																				Minimum Diurnal Average: 2.1 % at hour 12					Hours of Missing Data: 0																								
Monthly Average: 5.31 %																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.5 Q ₁ = 1.0 Median = 1.4 Q ₃ = 4.2 P ₉₀ = 18.7 P ₉₉ = 37.6					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-Jun	11.7	26.4	26.3	17.3	9.7	10.9	7.8	5.1	3.0	1.3	1.4	1.3	1.2	1.1	0.9	1.1	1.3	1.4	15.9	17.0	4.4	7.3	25.8	30.5	9.6	30.5																							
2-Jun	16.0	22.2	21.6	18.6	10.8	6.3	3.2	1.6	1.3	1.2	1.0	0.9	0.7	0.5	0.2	0.4	0.6	0.7	0.5	0.9	1.3	1.4	1.6	1.9	4.8	22.2																							
3-Jun	3.0	5.1	9.2	14.5	20.6	23.6	20.9	10.6	1.6	1.2	1.0	0.9	0.7	0.8	0.9	1.0	0.8	0.9	1.2	1.3	9.7	21.3	22.8	19.2	8.0	23.6																							
4-Jun	18.1	14.4	12.6	14.1	23.0	11.1	12.7	8.1	6.7	4.9	2.3	1.4	1.2	13.7	1.3	0.7	0.7	0.9	1.0	1.2	1.5	1.5	2.0	4.1	6.6	23.0																							
5-Jun	5.3	2.2	3.0	7.0	7.5	2.0	1.8	1.7	1.5	1.4	1.3	1.1	1.1	0.8	2.3	21.2	7.1	4.1	1.4	14.7	22.4	28.7	8.9	4.3	6.4	28.7																							
6-Jun	2.2	1.9	1.9	1.9	1.8	1.8	1.7	1.5	1.3	1.1	1.0	0.9	0.8	0.6	0.4	0.3	0.2	0.2	0.3	0.5	1.1	1.3	1.3	1.3	1.1	2.2																							
7-Jun	1.4	1.3	1.4	1.4	1.4	1.3	1.3	1.1	1.0	0.8	0.7	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.8	0.9	1.0	0.7	1.4																							
8-Jun	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	0.9	0.8	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.1	0.5	1.0	1.1	1.1	1.2	0.8	1.2																							
9-Jun	1.2	1.2	1.3	1.4	1.4	1.4	1.4	1.3	1.2	1.0	0.8	0.6	0.4	0.3	0.2	0.1	0.1	0.3	0.6	0.9	1.1	1.2	1.3	1.3	0.9	1.4																							
10-Jun	1.4	1.4	1.4	1.5	1.5	1.4	1.3	1.3	1.2	1.1	0.9	0.8	0.8	0.8	0.6	0.4	0.4	0.4	0.5	0.8	1.0	1.1	1.3	1.3	1.0	1.5																							
11-Jun	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.1	1.1	0.9	0.8	0.7	0.7	0.5	0.6	0.5	0.4	0.6	0.8	1.1	1.2	1.3	1.3	1.0	1.3																							
12-Jun	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.0	0.9	0.7	0.5	0.4	0.4	0.5	0.4	0.9	1.2	1.2	1.4	1.4	1.1	1.4																							
13-Jun	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.1	1.0	0.7	0.9	0.4	0.2	14.0	12.9	3.3	1.4	1.5	5.8	12.7	27.5	12.1	12.4	4.9	27.5																							
14-Jun	8.7	7.4	5.2	8.6	12.6	10.3	5.3	2.3	1.5	1.5	1.4	1.3	1.5	1.5	1.5	1.7	1.7	16.4	23.1	20.5	27.4	27.9	16.0	13.6	9.1	27.9																							
15-Jun	17.2	21.6	24.0	26.2	23.1	18.6	12.9	4.1	2.6	1.9	1.8	1.8	1.8	2.5	1.7	1.5	1.0	1.2	1.5	3.9	4.7	1.8	1.8	1.8	7.5	26.2																							
16-Jun	1.9	1.8	3.1	5.8	7.2	5.3	2.0	1.7	1.5	1.2	1.1	1.1	1.3	1.2	10.5	6.0	1.5	1.4	2.4	15.9	6.9	2.1	1.7	1.8	3.6	15.9																							
17-Jun	1.9	2.0	2.7	4.7	1.9	1.8	1.8	1.6	1.5	1.4	1.2	1.1	0.9	0.7	0.5	0.4	0.4	0.3	0.3	0.6	1.0	1.0	1.1	1.1	1.3	4.7																							
18-Jun	1.1	1.2	1.3	1.4	1.4	1.3	1.4	1.4	1.4	1.3	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	3.0	3.4	1.4	3.4																							
19-Jun	2.4	1.6	7.8	24.6	26.8	27.1	28.7	26.4	27.0	25.9	14.2	4.3	13.0	32.4	21.3	4.8	2.3	1.7	1.4	1.7	1.9	2.6	3.9	5.2	12.9	32.4																							
20-Jun	11.3	7.2	20.5	27.3	25.0	25.2	23.8	17.3	16.1	21.9	29.4	30.8	32.0	30.4	24.6	26.1	21.2	15.1	9.7	10.5	8.0	8.2	16.5	29.8	20.3	32.0																							
21-Jun	30.9	30.1	31.2	32.0	25.7	28.3	18.1	7.4	4.2	1.8	1.5	1.4	1.2	0.9	0.7	0.7	0.5	0.7	0.4	0.8	1.5	2.5	4.8	9.1	9.9	32.0																							
22-Jun	16.2	24.2	37.8	50.7	57.9	58.3	57.1	35.0	5.3	1.3	1.0	0.9	1.3	1.7	1.4	1.3	1.3	1.1	1.3	1.3	1.5	9.6	15.6	24.6	17.0	58.3																							
23-Jun	19.8	19.5	17.4	20.9	19.2	18.2	13.3	11.0	6.1	1.3	1.1	0.9	0.6	0.6	0.8	0.2	0.2	0.5	0.5	0.6	1.2	1.3	1.3	1.4	6.6	20.9																							
24-Jun	1.4	1.5	1.5	1.5	1.5	1.4	1.3	1.2	1.1	0.9	0.9	0.8	0.4	0.2	0.1	0.0	0.1	0.1	0.1	0.4	1.0	1.0	1.1	1.3	0.9	1.5																							
25-Jun	1.4	2.2	5.0	8.0	7.3	2.8	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.2	1.0	0.9	0.8	0.8	0.9	1.2	1.8	3.3	4.8	5.1	2.5	8.0																							
26-Jun	2.3	2.4	4.8	2.5	3.6	4.7	1.9	1.6	1.4	1.4	1.1	1.1	0.9	1.0	0.7	1.1	18.2	39.2	15.4	1.7	4.0	11.1	20.3	37.0	7.5	39.2																							
27-Jun	47.1	47.3	36.6	17.5	4.2	1.9	1.9	1.7	1.6	1.4	1.2	1.0	0.7	0.7	0.4	0.4	0.1	0.0	0.1	0.5	1.2	1.4	1.5	1.5	7.2	47.3																							
28-Jun	1.8	2.5	2.8	1.8	1.7	1.6	1.6	1.5	1.3	1.1	0.9	0.7	0.6	0.4	0.5	3.2	17.5	1.5	0.9	1.5	1.6	1.6	1.6	1.7	2.2	17.5																							
29-Jun	1.6	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.3	1.1	0.9	0.8	0.6	0.5	0.6	4.9	6.3	0.5	0.8	1.1	1.4	1.7	1.5	1.5	1.6	6.3																							
30-Jun	1.5	1.4	1.6	1.5	1.6	1.5	1.5	1.4	1.3	1.1	1.1	0.8	0.6	0.4	0.1	0.0	0.3	0.3	0.2	0.6	1.1	1.1	1.1	1.0	1.0	1.6																							
																								7.8	8.6	9.6	10.7	10.2	9.2	7.8	5.2	3.3	2.9	2.5	2.1	2.3	3.2	3.0	3.1	3.0	3.1	2.8	3.6	4.2	5.9	6.0	7.4	Diurnal Average	
																								47.1	47.3	37.8	50.7	57.9	58.3	57.1	35.0	27.0	25.9	29.4	30.8	32.0	32.4	24.6	26.1	21.2	39.2	23.1	20.5	27.4	28.7	25.8	37.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Stony Mountain - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Stony Mountain - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	42	5.83	5.83
0.4 - 0.5	39	5.42	11.25
0.6 - 0.7	36	5.00	16.25
0.8 - 1.4	274	38.06	54.31
1.5 - 10	184	25.56	79.86
> 10	125	17.36	97.22

Total Number of Valid Hours: 720

Total Number of Hours: 720



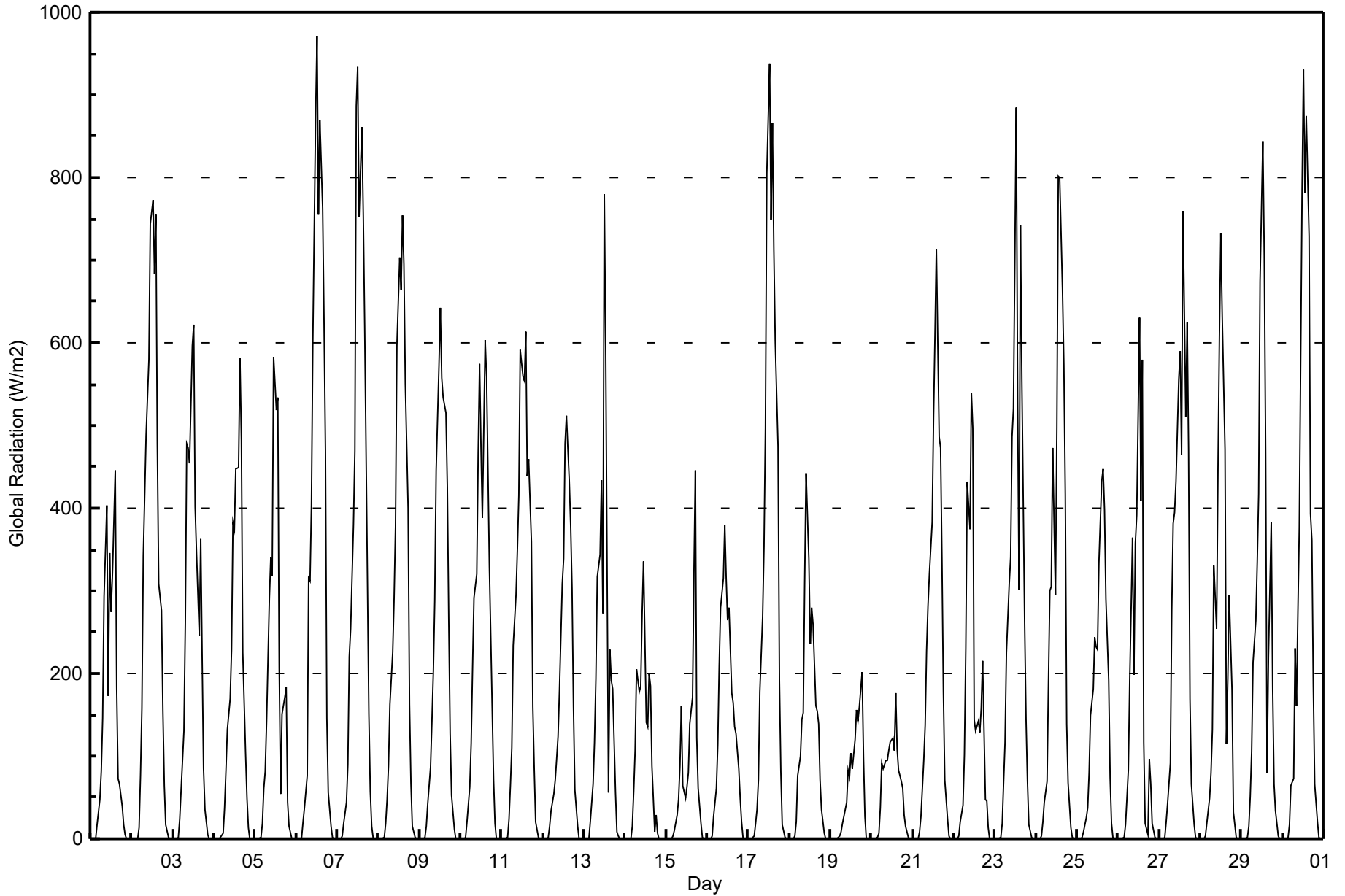
Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Stony Mountain - June 2023

Maximum Value: 971.3 W/m2 on Jun 6 13:00		Maximum Daily Average: 304.9 W/m2 on Jun 6		Hours in Service: 720																							
Minimum Value: 0.0 W/m2 on Jun 1 01:00		Minimum Daily Average: 56.3 W/m2 on Jun 19		Hours of Data: 720																							
Maximum Diurnal Average: 527.6 W/m2 at hour 13		Minimum Diurnal Average: 0.0 W/m2 at hour 2		Hours of Missing Data: 0																							
Monthly Average: 183.92 W/m2		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 1.4 Median = 79.3 Q ₃ = 309.3 P ₉₀ = 540.2 P ₉₉ = 873.4		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-Jun	0.0	0.0	0.0	0.2	16.7	47.1	82.2	146.0	292.5	403.8	173.5	345.7	273.8	319.8	446.3	182.4	72.6	65.7	39.5	17.3	4.7	0.0	0.0	0.0	122.1	446.3	
2-Jun	0.0	0.0	0.0	0.8	13.2	76.8	158.1	342.3	488.2	534.6	580.0	743.4	773.5	683.6	755.5	478.0	307.9	275.6	154.2	64.9	17.6	1.5	0.0	0.1	268.7	773.5	
3-Jun	0.1	0.0	0.0	1.8	23.0	58.7	129.7	261.4	477.5	473.2	454.5	596.4	621.6	402.2	345.2	246.3	362.2	220.9	84.9	34.8	5.4	0.3	0.0	0.0	200.0	621.6	
4-Jun	0.0	0.0	0.0	0.2	1.5	7.5	36.7	83.1	132.0	169.4	228.3	382.8	374.5	447.5	448.6	581.4	483.2	225.2	103.2	48.9	14.2	0.3	0.0	0.1	157.0	581.4	
5-Jun	0.0	0.0	0.0	1.9	18.9	61.4	81.4	142.3	291.4	340.2	318.4	583.2	518.2	534.6	206.8	54.8	151.1	172.0	182.6	43.9	14.5	0.1	0.0	0.0	154.9	583.2	
6-Jun	0.0	0.0	0.0	2.5	20.0	38.1	75.6	315.5	311.5	403.7	602.2	874.2	971.3	756.7	870.3	763.3	624.0	469.6	146.4	56.1	15.3	1.6	0.2	0.1	304.9	971.3	
7-Jun	0.1	0.0	0.0	2.6	19.3	43.8	90.1	220.4	254.8	380.4	468.8	885.9	934.2	752.2	861.0	753.8	620.5	465.6	150.4	57.6	15.6	1.4	0.1	0.0	290.8	934.2	
8-Jun	0.0	0.0	0.0	1.9	18.2	47.6	88.5	162.8	225.7	291.4	378.6	595.9	703.9	663.7	754.0	694.7	550.4	399.3	163.0	67.4	15.7	1.1	0.0	0.0	242.7	754.0	
9-Jun	0.0	0.0	0.0	2.1	15.3	41.6	87.3	141.9	202.5	288.0	445.4	571.7	642.6	557.8	533.7	514.7	426.2	265.3	127.5	53.0	12.2	0.7	0.0	0.0	205.4	642.6	
10-Jun	0.0	0.0	0.0	1.3	20.6	62.4	114.9	207.0	291.5	319.6	466.8	575.2	473.8	388.7	603.4	556.9	443.9	329.6	157.6	70.5	19.0	0.7	0.0	0.0	212.6	603.4	
11-Jun	0.0	0.0	0.0	1.9	23.7	63.6	109.8	234.3	295.4	350.5	415.8	591.5	559.4	554.6	612.8	439.1	459.7	358.5	158.5	84.4	19.5	2.1	0.0	0.0	222.3	612.8	
12-Jun	0.0	0.0	0.0	2.0	15.7	34.4	54.9	70.6	96.1	123.0	180.0	307.8	338.6	478.0	511.6	433.7	380.4	301.9	158.6	60.0	15.1	0.7	0.0	0.0	148.5	511.6	
13-Jun	0.0	0.0	0.0	0.8	19.7	65.4	116.4	192.4	316.3	343.3	433.2	272.6	779.6	595.7	56.6	228.0	191.7	180.8	55.5	9.1	3.9	0.0	0.0	0.0	160.9	779.6	
14-Jun	0.0	0.0	0.0	0.5	15.0	57.6	106.5	204.4	178.6	185.0	272.4	336.3	139.9	135.8	200.2	184.6	87.7	8.1	28.1	7.6	0.8	0.0	0.0	0.0	89.5	336.3	
15-Jun	0.0	0.0	0.0	0.2	2.7	9.7	28.6	47.2	88.0	161.2	64.2	48.8	62.0	79.7	138.1	171.3	321.2	446.2	121.7	61.8	18.3	2.5	0.3	0.2	78.1	446.2	
16-Jun	0.1	0.2	0.3	3.6	28.0	61.6	114.2	208.6	280.5	315.8	380.0	314.9	264.1	279.5	176.5	164.3	134.9	126.5	85.4	49.3	20.3	1.5	0.1	0.0	125.4	380.0	
17-Jun	0.0	0.0	0.0	2.9	19.2	35.7	71.7	177.9	267.3	354.1	495.9	805.5	937.7	748.5	866.2	714.1	601.1	473.7	191.5	80.6	16.4	1.6	0.0	0.1	285.9	937.7	
18-Jun	0.0	0.0	0.0	2.8	19.5	75.7	99.3	143.5	153.2	310.5	442.1	339.2	236.1	279.3	260.1	161.7	154.5	139.6	70.4	36.2	6.8	0.1	0.1	0.0	122.1	442.1	
19-Jun	0.0	0.0	0.0	0.0	0.5	3.2	8.5	19.2	26.5	43.8	83.1	73.8	103.5	84.1	120.6	155.2	142.1	159.9	201.8	98.8	26.7	0.7	0.0	0.0	56.3	201.8	
20-Jun	0.0	0.0	0.0	0.8	6.3	36.7	92.2	84.2	94.3	94.4	106.1	117.2	121.7	106.3	176.9	107.8	83.9	68.9	60.9	29.0	16.0	0.9	0.0	0.0	58.5	176.9	
21-Jun	0.0	0.0	0.0	0.7	8.2	27.5	94.6	137.3	227.8	281.5	320.9	383.5	512.5	610.5	714.1	486.1	472.9	336.4	177.6	71.4	23.7	3.3	0.3	0.6	203.8	714.1	
22-Jun	0.4	0.2	0.1	2.9	19.7	40.8	102.0	231.0	432.7	373.9	539.0	497.1	143.7	130.1	143.2	128.1	157.4	214.9	46.8	45.2	14.2	0.6	0.1	0.0	136.0	539.0	
23-Jun	0.0	0.0	0.0	2.3	19.3	69.2	117.1	225.2	308.9	340.6	486.9	520.4	885.4	528.1	301.1	742.0	556.3	260.4	143.6	68.8	17.2	1.8	0.0	0.0	233.1	885.4	
24-Jun	0.0	0.0	0.0	2.9	21.1	44.5	69.1	189.3	300.7	305.4	473.7	294.1	498.9	801.3	800.4	664.3	573.1	417.5	138.9	67.5	12.9	1.1	0.0	0.0	236.5	801.3	
25-Jun	0.0	0.0	0.0	1.4	7.9	24.7	36.8	79.7	148.7	181.2	244.8	232.3	229.5	333.1	431.8	448.1	399.1	290.0	192.0	73.9	19.2	1.4	0.0	0.0	140.7	448.1	
26-Jun	0.0	0.0	0.0	1.7	17.3	49.0	83.7	192.8	365.1	197.8	357.9	392.0	631.0	408.9	580.3	116.8	19.0	5.4	96.7	66.1	18.0	1.9	0.1	0.0	150.1	631.0	
27-Jun	0.0	0.0	0.0	1.8	21.1	42.4	91.4	278.8	381.1	395.2	432.0	556.4	589.2	464.4	760.2	510.6	624.8	470.4	169.7	65.9	16.7	2.1	0.0	0.0	244.8	760.2	
28-Jun	0.1	0.0	0.1	2.9	19.2	48.9	80.0	131.9	330.2	255.0	448.4	607.9	732.4	632.8	471.1	115.4	193.3	295.2	180.3	31.9	17.1	1.3	0.0	0.0	191.5	732.4	
29-Jun	0.0	0.0	0.0	0.9	15.1	50.9	105.4	214.3	264.7	335.2	417.3	674.0	844.3	704.6	466.7	78.9	221.1	383.1	182.7	65.4	34.7	3.3	0.0	0.0	210.9	844.3	
30-Jun	0.0	0.0	0.0	2.4	17.5	64.2	73.6	230.8	161.0	273.1	375.8	782.7	930.1	781.3	875.1	728.2	393.4	360.6	186.5	66.5	20.0	2.1	0.0	0.0	263.5	930.1	
		0.0	0.0	0.0	1.7	16.1	46.4	86.7	177.2	256.2	294.2	369.5	476.8	527.6	474.8	482.9	386.8	340.3	272.9	131.9	55.1	15.7	1.2	0.1	0.0	Diurnal Average	
		0.4	0.2	0.3	3.6	28.0	76.8	158.1	342.3	488.2	534.6	602.2	885.9	971.3	801.3	875.1	763.3	624.8	473.7	201.8	98.8	34.7	3.3	0.3	0.6	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Stony Mountain - June 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	272	37.78	37.78
21 - 100	117	16.25	54.03
101 - 300	144	20.00	74.03
301 - 600	134	18.61	92.64
601 - 900	49	6.81	99.44
> 900	4	0.56	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 24 km/h on Jun 19 02:00	Maximum Daily Speed Average: 15.9 km/h on Jun 10	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 13 12:00	Minimum Daily Speed Average: 2.9 km/h on Jun 22	Hours of Data: 720
Maximum Diurnal Speed Average: 3.9 km/h at hour 17	Minimum Diurnal Speed Average: 0.8 km/h at hour 20	Hours of Missing Data: 0
Monthly Average Velocity: 2.1 km/h 308.9 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 8 Median = 10 Q ₃ = 13 P ₉₀ = 16 P ₉₉ = 22	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24							
1-Jun	NNW13	NNW11	NE8	N10	NNW10	NNW9	NNW8	N7	N8	N10	N8	N6	NNE5	E4	NE9	NE9	NE6	NNE4	NNW7	NNW9	NNW9	NNW9	NNW8	NNW11	N7.5	NNW13					
2-Jun	N12	N10	N9	NNW10	NNW9	NNW10	N9	N11	NNE15	NNE17	NNE15	NNE15	NNE15	NNE16	NE14	NE13	NNE9	NE9	ENE8	ENE6	E7	E8	E7	E7	NNE9.3	NNE17					
3-Jun	ESE6	E6	NNE5	NNE10	NNE9	N8	NNE8	NE7	NE10	ENE10	E9	E10	E9	ENE9	E9	ENE10	ENE13	E11	E10	ESE10	ESE10	SE6	SE5	E6	ENE7.0	ENE13					
4-Jun	ENE7	ENE6	ENE7	ENE8	E10	ESE10	ESE9	SE8	SE9	SE9	S7	S8	SSE8	S8	SSE8	SSE8	S9	SSW9	S7	SW7	SSW6	S7	SSW10	SSW10	SSE5.5	SSW10					
5-Jun	SW10	SW8	SW6	WNW7	NW13	NW15	NNW13	NNW9	NNW7	NNE7	NNE9	ENE12	NE10	ENE11	NE11	NNW11	NNW9	NNW15	NNW13	NW7	NW13	NW20	NW18	NW18	NNW7.8	NW20					
6-Jun	NW18	NW19	NW16	WNW14	WNW15	WNW14	NW11	WNW8	NW11	NW12	WNW13	W12	W12	W13	WSW12	W12	WSW12	WSW12	WSW11	SW9	SSW9	SSW9	SSW11	SSW12	W10.2	NW19					
7-Jun	SSW13	SSW15	SSW14	SSW15	SSW17	SSW17	SSW17	SW17	SW14	WSW12	WSW11	W12	WSW14	SW16	WSW17	W15	WNW14	WNW11	WNW11	NNW9	NNW8	NNW9	N7	N6	WSW9.7	SSW17					
8-Jun	NNW5	NW6	NW8	NW8	NW8	NW9	NNW8	NNE8	NNE7	NE6	NNE5	NNE5	NNW5	NNW9	NNW10	N9	NNE8	NE9	ENE10	ENE8	ENE9	E9	E10	ESE9	NNE5.2	ENE10					
9-Jun	SE9	ESE10	ESE10	SE9	SSE7	SSE8	SSW5	SSE5	SE4	ESE5	ESE8	SE11	ESE10	ESE8	E10	E9	ESE8	ESE8	SSE8	SSE9	SSE10	S13	S13	S14	SE7.7	S14					
10-Jun	S15	S16	S16	S16	S16	S18	S17	S19	S20	S19	S16	S16	S15	S15	S17	S18	S16	S17	S15	S13	S13	S12	S13	S16	S15.9	S20					
11-Jun	S16	S17	S17	SSW16	SSW15	SSW13	SSW13	WSW11	WNW11	NW10	NW11	NW8	WNW9	NW10	NW11	NW10	NW10	NNW10	NNW8	NNW9	NNW7	NNW8	NNW7	NW7	W5.4	S17					
12-Jun	NNW8	N7	N9	NNW10	NNW8	NW9	NW8	NW8	NW8	NW7	NW6	WNW5	NNW5	NNW3	ENE4	ESE3	ESE4	E5	E8	ESE10	SE10	SE11	NE5	E9	N3.0	SE11					
13-Jun	SE10	SE11	SE11	SE12	SE11	SSE10	SSE9	SSE10	S10	SSW10	SSE3	SW0	NNE6	ENE9	SSW3	ENE8	E12	E12	E10	ENE8	N6	NNW10	NNE9	N9	ESE4.8	SE12					
14-Jun	NE10	NNE9	NE10	E11	E8	E7	E8	E7	ENE5	N7	NNE9	N9	N10	N13	NNW14	NNW17	NNW19	N17	N15	N13	N13	N12	NNW14	N15	N9.3	NNW19					
15-Jun	N14	N14	N15	N12	N3	N13	NNW15	N14	N16	N17	NNW19	NNW18	NNW17	NNW19	NNW19	NNW16	NNW15	NNW14	NNW8	NW6	W7	W10	W11	W11	NNW12.8	NNW19					
16-Jun	WSW11	WSW12	SW12	SW13	SW14	SW15	SW14	SSW13	SSW13	SSW16	SSW15	S17	SW14	W11	W10	WSW10	SW12	SSW10	SSW10	SSW10	SSW10	SSW10	SSW10	SSW10	SW11	WSW12	W13	W13	SW11.3	S17	
17-Jun	WSW13	WSW13	WSW12	WSW15	W15	WSW16	W13	WNW14	WNW13	W12	W16	W16	W14	W15	W15	W10	WSW10	W12	SSW10	SSW10	SSW10	SSW10	SSW10	SSW10	SSW10	SW11	WSW12	W13	W13	SW11.3	S17
18-Jun	WNW9	NW8	NNW7	NNW6	NNE8	NNE10	NNE10	NNE9	NNE7	NNE11	NE14	NE16	NE16	NE17	NNE18	NNE17	NNE19	NNE20	NE19	NE21	NE22	NE23	NE24	NE21	NNE13.6	NE24					
19-Jun	NE22	NE24	NE24	NE21	NE22	NE20	NNE21	NNE23	NE21	NE18	NE11	NE13	NE13	NNE8	ESE6	SSW5	W6	SW4	W6	W5	NW7	N7	N9	N9	NNE11.1	NE24					
20-Jun	N11	N10	N10	NNW11	NNW10	NNW12	N13	N12	N12	N10	N12	N11	N12	NNW12	N14	N13	NNW13	NNW13	N12	N10	NNW10	NNW10	NNW9	NNW9	N11.3	N14					
21-Jun	NNW11	NNW12	NNW13	NNW11	NNW13	NNW12	NNW11	NNW11	NW10	NNW11	NNW10	N11	N8	NNW9	NNW10	NNW10	NW11	NW7	NNE7	ESE8	ESE8	ESE8	ESE7	SE7	NNW7.0	NNW13					
22-Jun	SE7	SSW7	SW3	NNW4	SSW13	W2	N3	NNE4	E4	ENE3	NNE4	NW11	NW7	WNW2	NNW6	SSW6	SSW7	SW8	WSW8	SW8	SW7	SSW7	W9	WNW5	WSW2.9	SSW13					
23-Jun	S8	SSE8	SSE10	SSE12	S12	S11	S10	S9	S7	SSW9	SW7	SW7	WSW7	SW6	WNW6	SSW8	S8	SW7	SSW7	SW8	WSW7	WSW8	SW9	SSW10	SSW7.3	S12					
24-Jun	SSW11	SSW12	SSW11	SW12	SW12	SW12	SW11	SSW7	WSW7	WSW11	WSW11	W10	W10	WSW11	WSW10	WNW9	W9	WNW8	W6	SW8	SW11	NNE9	NNE10	NNE10	WSW6.9	SW12					
25-Jun	N10	NNE9	NE11	NNE10	NNE10	NE12	NNE10	NNE11	NE14	NE13	NE13	NE10	NE9	NE9	NE10	NE9	NE7	NE6	NE5	NNE3	NNE6	NNE8	NE8	NE7	NE8.9	NE14					
26-Jun	ENE5	SE7	S11	SSW11	SSW10	S11	S13	SSW10	SW8	W5	SSW5	SW7	SSW9	SW9	SW11	WSW6	N10	NW8	SSW11	SSW12	NW4	NW6	WNW7	WNW10	SW5.6	S13					
27-Jun	WNW11	WNW12	WNW12	WNW14	NW13	NW11	NNW9	N7	NNE9	N9	N6	N9	N7	NNE10	NNE9	NNE10	NE10	NE10	ENE10	ENE8	ENE8	E7	ESE9	SSE8	N5.3	WNW14					
28-Jun	SSW8	S8	SSW10	SSW11	SSW12	SSW11	SSW11	SSW10	SSW10	SSE8	SSE9	S9	SSW6	SW5	SW5	W9	W11	NNE5	SE6	SSW6	SSW10	SW11	SSW9	SSW10	SSW7.4	SSW12					
29-Jun	SSW12	SSW12	SSW13	SW15	SW15	SW15	SW15	SW14	SW16	SW16	SW15	SSW15	SW16	SW17	SW15	W18	WNW12	WNW7	W8	W7	W6	WSW9	W12	W11	SW11.6	W18					
30-Jun	W11	W11	WSW11	W11	WSW9	WSW9	WSW7	WSW4	S5	WSW7	WNW11	WNW9	W11	WNW11	NW10	NW10	NNW9	NNW9	NNW9	NW7	WNW8	WNW9	NNW11	NNW10	WNW8.0	W11					

WNW2.0	W1.8	W1.4	W2.3	W3.1	W2.9	W2.2	WNW1.3	NW1.5	NNW2.2	NNW2.4	NNW2.4	NW2.7	NW2.6	NNW3.2	NW3.9	NNW3.9	NNW3.0	NNW1.5	NNW0.8	NW1.2	NW1.8	NW2.2	WNW2.1	Diurnal Average
NE22	NE24	NE24	NE21	NE22	NE20	NNE21	NNE23	NE21	S19	NNW19	NNW18	NNW17	NNW19	NNW19	W18	NNE19	NNE20	NE19	NE21	NE22	NE23	NE24	NE21	Diurnal Maximum

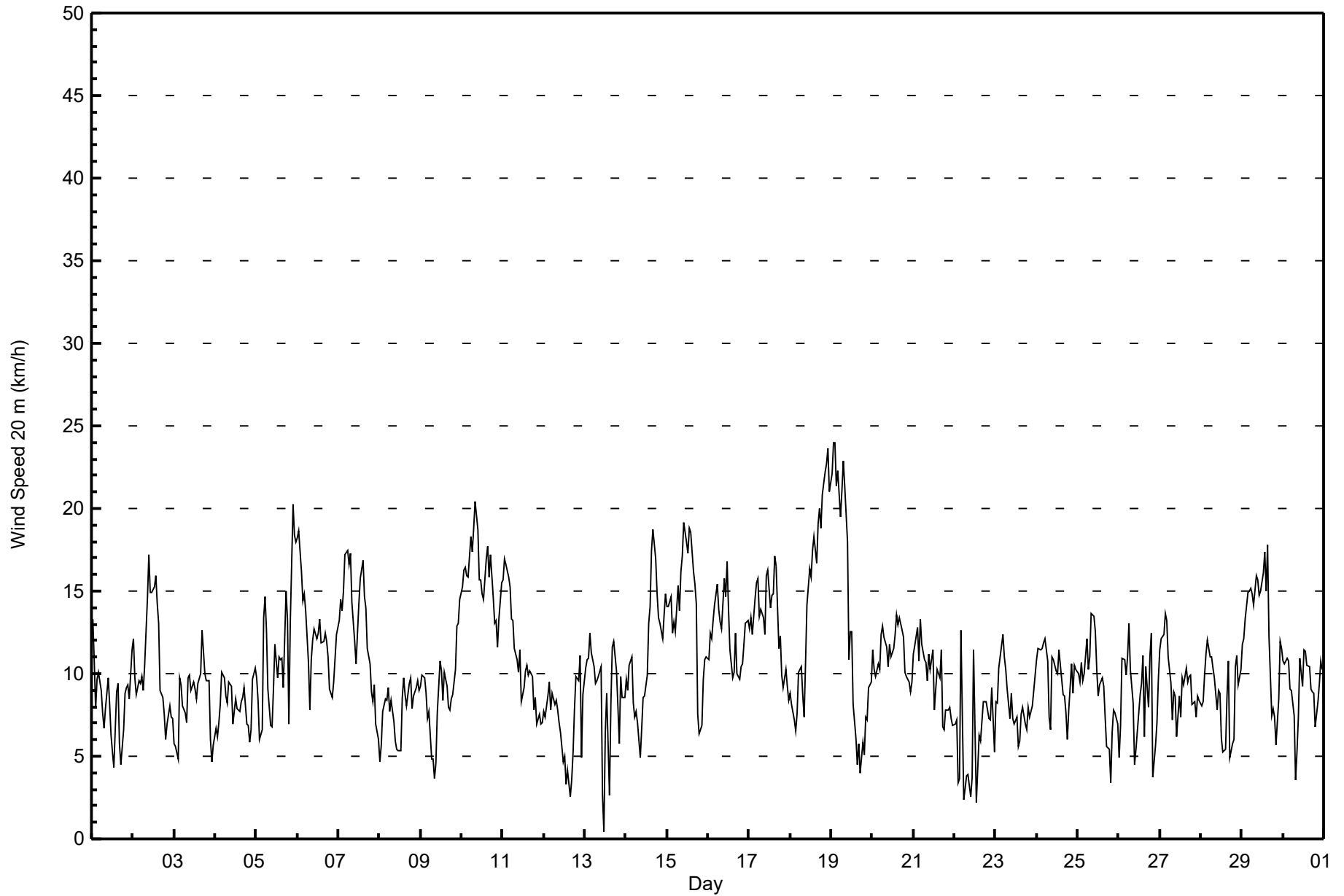
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - June 2023

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - June 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	49	6.81	6.81
6 - 11	439	60.97	67.78
12 - 19	215	29.86	97.64
20 - 28	17	2.36	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
Stony Mountain - June 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	9	2	4	3	3	2	2	1	4	4	2	3	3	1	5	49
6 - 11	39	36	24	20	26	21	16	16	17	40	22	23	21	25	41	52	439
12 - 19	24	9	14	2	2	0	1	1	32	24	24	13	19	14	10	26	215
20 - 28	0	3	12	0	0	0	0	0	1	0	0	0	0	0	1	0	17
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	57	52	26	31	24	19	19	51	68	50	38	43	42	53	83	720

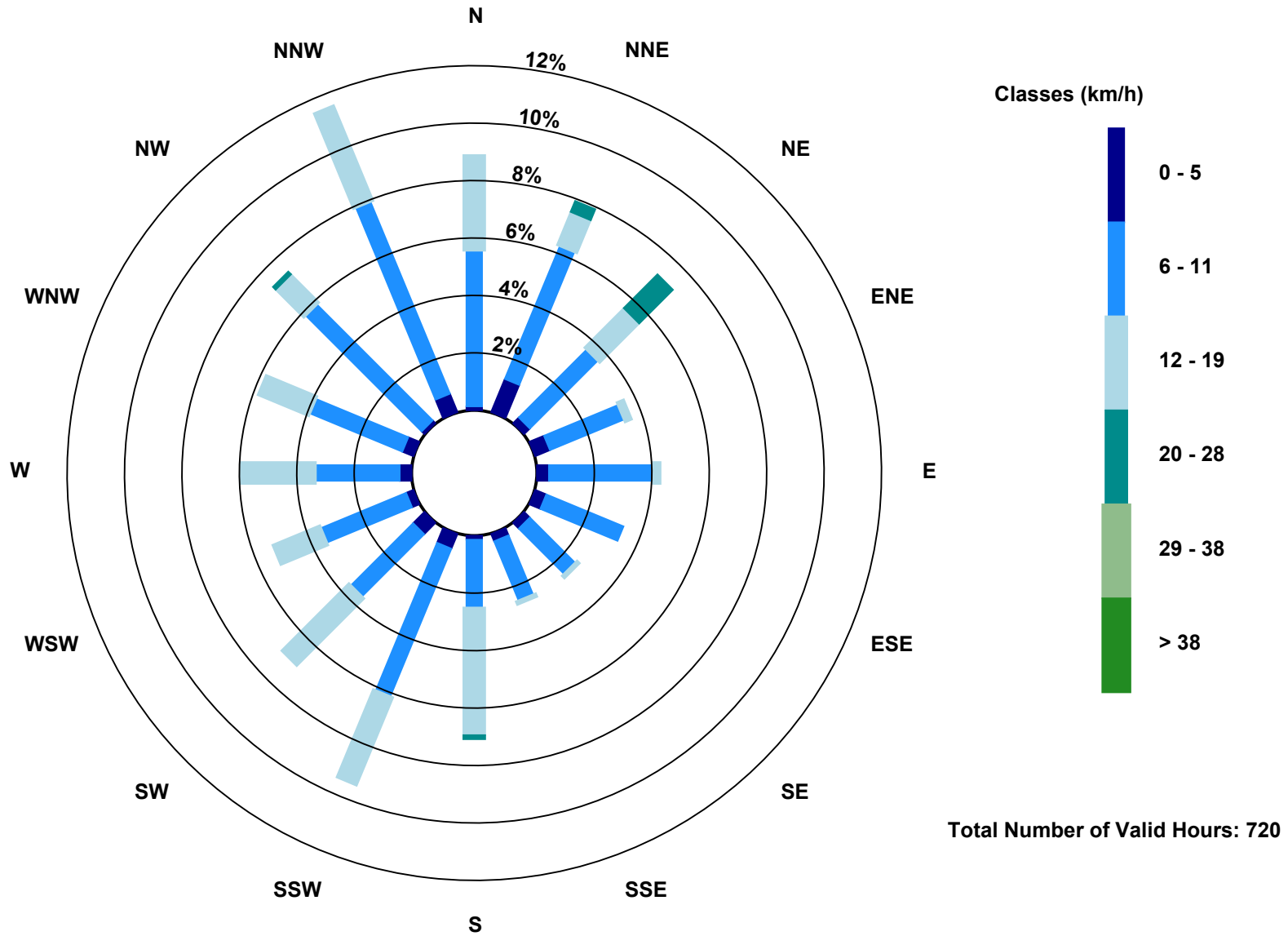
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed 20 m (WS20m) - km/h
Stony Mountain





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Stony Mountain - June 2023

Direction of Maximum Speed: 39 deg on Jun 19 02:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 177.9 deg on Jun 10	Hours of Data: 720
Direction of Minimum Speed: 231 deg on Jun 13 12:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 2.9 deg on Jun 22	Percent Operational Time: 100.0
Monthly Average Direction: 308.9 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-Jun	347	339	34	351	342	345	341	350	358	9	354	8	24	99	46	47	41	21	336	343	343	346	343	339	358.8
2-Jun	349	353	358	346	338	341	349	0	19	22	17	15	21	27	35	41	27	43	70	66	85	87	92	97	22.9
3-Jun	119	80	17	23	18	8	12	50	47	61	93	85	85	78	90	71	67	86	90	113	113	135	143	96	73.4
4-Jun	73	78	65	64	80	103	112	126	131	144	172	173	150	190	152	156	185	213	189	232	202	182	193	202	150.8
5-Jun	222	222	224	299	313	321	330	345	346	21	20	58	56	65	41	322	348	329	339	319	312	309	314	307	331.4
6-Jun	304	309	306	296	288	294	310	289	311	308	296	281	261	262	247	265	247	238	243	231	213	202	205	211	272.7
7-Jun	207	209	207	207	211	208	202	219	221	245	238	265	258	234	252	280	288	283	296	320	317	341	350	353	244.3
8-Jun	338	322	315	317	309	326	347	16	25	39	22	25	335	340	333	359	18	40	62	68	78	81	98	117	15.5
9-Jun	131	108	108	144	150	160	200	157	135	122	111	126	117	114	92	97	123	122	149	161	163	182	173	170	138.5
10-Jun	180	180	179	175	178	184	182	181	184	181	174	183	185	170	176	178	171	171	173	170	171	172	180	182	177.9
11-Jun	187	186	186	195	206	209	212	237	288	311	320	321	303	318	326	324	309	336	335	333	335	334	333	320	271.0
12-Jun	337	351	355	341	332	321	323	324	320	324	317	292	334	331	78	116	110	84	92	103	124	139	41	88	8.6
13-Jun	131	132	126	136	145	159	159	161	171	211	151	231	23	65	200	75	94	97	100	66	356	337	18	0	114.7
14-Jun	41	27	51	83	88	84	81	92	77	4	14	2	6	355	344	340	346	355	352	351	356	351	348	351	10.2
15-Jun	352	350	350	355	350	351	346	351	349	349	345	346	345	339	333	336	339	342	337	318	277	270	274	271	337.9
16-Jun	248	252	226	227	226	224	216	201	198	199	192	190	222	269	280	244	225	208	193	204	228	252	266	268	225.5
17-Jun	254	250	238	244	262	258	267	284	287	273	280	278	275	263	266	268	288	284	297	290	289	281	283	278	271.7
18-Jun	301	313	331	339	13	18	19	29	14	20	42	47	41	36	30	28	28	33	36	39	42	44	41	39	29.5
19-Jun	36	39	42	36	34	34	30	30	35	40	53	45	43	28	109	196	277	229	275	261	319	350	355	357	30.1
20-Jun	351	352	350	347	342	346	349	352	357	354	357	356	352	348	353	353	348	347	349	351	348	345	339	339	349.6
21-Jun	338	337	337	339	340	330	332	327	323	342	346	350	355	342	344	341	323	322	22	104	114	121	118	126	347.3
22-Jun	144	193	236	348	212	268	6	32	85	64	27	322	314	282	327	198	206	216	242	228	216	213	259	288	243.4
23-Jun	187	156	164	167	180	186	179	170	185	204	233	220	242	216	290	213	191	229	193	223	251	246	232	208	202.0
24-Jun	208	208	212	217	219	217	220	210	238	246	241	267	267	243	258	285	281	282	266	226	223	31	18	16	243.3
25-Jun	7	31	40	14	20	42	32	33	49	50	44	54	55	56	49	47	50	35	51	24	13	25	42	44	38.7
26-Jun	75	143	180	197	193	188	191	200	223	267	206	223	207	215	214	248	353	320	198	210	318	304	288	287	217.8
27-Jun	291	293	290	299	307	313	333	354	14	9	357	355	353	20	25	33	42	56	57	72	73	95	121	150	1.2
28-Jun	193	190	204	210	210	205	201	198	205	168	166	185	206	222	230	280	277	25	141	192	211	220	210	210	206.3
29-Jun	213	210	211	218	221	219	217	214	216	216	218	211	225	216	228	280	294	290	275	272	266	250	261	277	232.8
30-Jun	271	259	251	273	256	249	239	254	178	254	289	298	277	283	306	310	334	326	326	313	299	299	304	309	285.4

284.6 274.3 262.9 274.3 267.3 270.0 280.7 294.6 323.3 328.5 330.6 327.7 318.8 318.8 326.6 323.5 330.1 340.9 348.4 303.4 306.1 311.4 311.4 303.0
 Diurnal Average

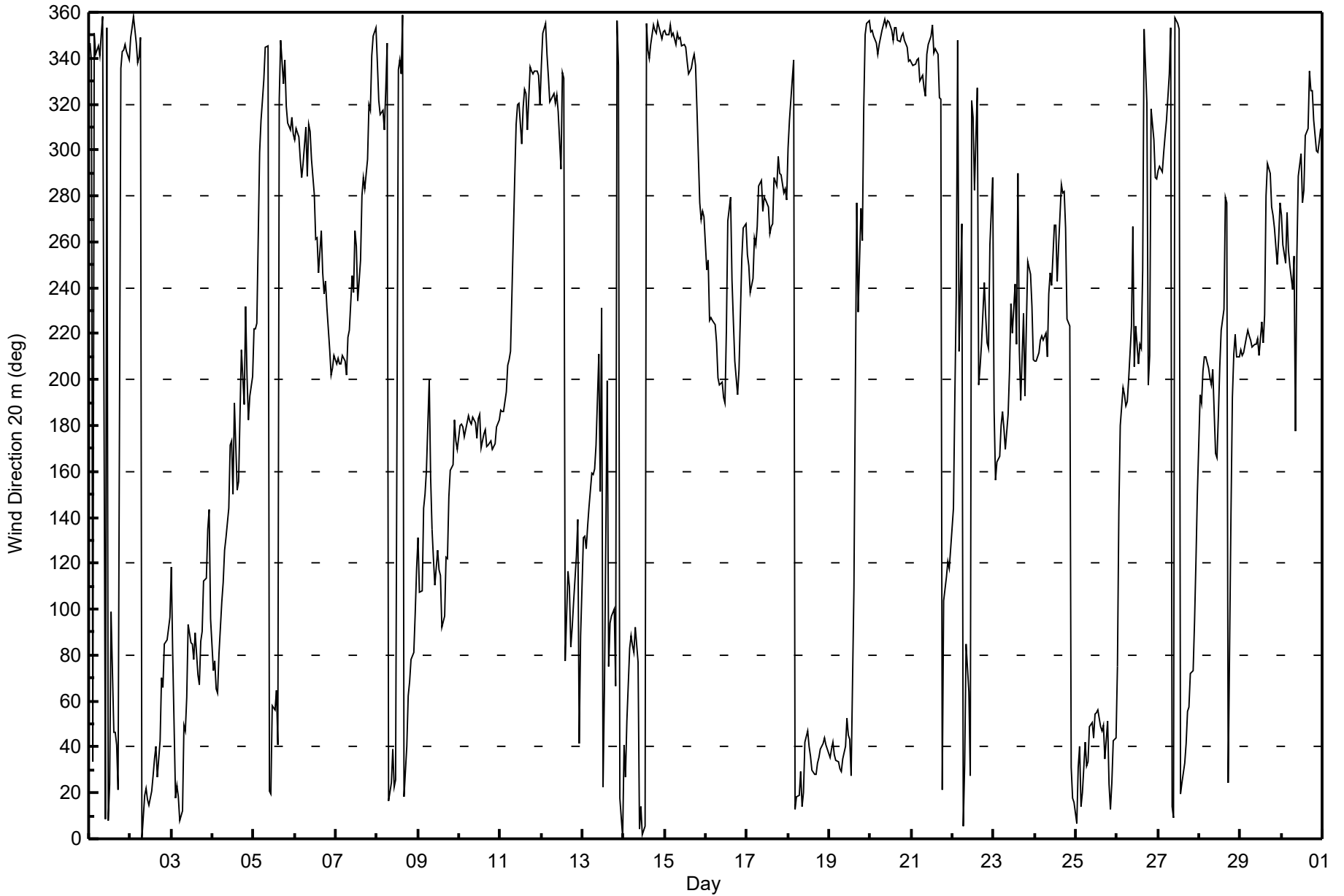
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Stony Mountain - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 93 deg on Jun 13 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: 7 deg on Jun 21 23:00																									
Percentiles: P ₁ = 10 P ₁₀ = 15 Q ₁ = 19 Median = 23 Q ₃ = 30 P ₉₀ = 39 P ₉₉ = 66																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	25	33	54	34	19	18	17	24	23	24	29	30	49	39	25	22	22	17	19	18	18	18	22	20	54
2-Jun	21	22	23	20	18	21	23	25	22	22	24	25	26	26	26	24	26	27	21	12	10	10	9	9	27
3-Jun	23	13	37	13	16	15	19	23	21	30	31	32	34	37	23	23	22	24	17	18	15	13	10	21	37
4-Jun	16	19	17	16	20	19	18	22	22	22	27	32	30	31	34	40	39	33	28	16	12	23	17	16	40
5-Jun	16	15	40	30	21	20	20	24	23	32	25	24	27	27	21	65	31	21	18	31	23	26	24	26	65
6-Jun	24	23	23	24	26	26	25	33	30	31	35	41	43	42	43	42	35	34	29	21	15	13	16	16	43
7-Jun	17	18	17	17	19	19	22	25	30	33	38	38	38	34	35	39	35	39	30	23	17	19	15	11	39
8-Jun	16	16	14	14	13	16	19	20	22	27	36	47	60	39	37	38	36	26	20	15	11	11	12	10	60
9-Jun	11	16	20	13	23	16	22	18	28	23	25	25	28	29	23	22	25	19	21	18	18	18	20	20	29
10-Jun	18	20	20	21	21	22	22	25	26	26	31	30	32	32	29	30	31	29	29	25	23	21	19	19	32
11-Jun	21	20	19	19	21	23	22	30	31	32	29	40	35	31	29	31	31	27	23	21	17	17	15	18	40
12-Jun	19	16	19	15	15	14	15	17	15	14	15	27	25	63	39	40	25	14	12	10	15	13	55	35	63
13-Jun	13	15	14	15	16	19	19	22	29	36	80	92	34	30	93	63	19	19	15	39	61	40	19	33	93
14-Jun	23	20	19	19	16	15	16	21	39	19	21	21	23	25	21	21	21	21	22	22	23	21	21	22	39
15-Jun	23	23	22	26	23	22	22	22	22	25	23	24	22	23	22	26	25	28	24	19	20	21	24	23	28
16-Jun	22	23	15	14	18	18	20	21	24	27	28	27	36	38	31	31	27	24	21	24	22	26	28	31	38
17-Jun	25	25	24	27	29	29	32	31	32	37	33	34	39	41	37	33	31	38	32	27	20	23	19	18	41
18-Jun	18	14	13	14	17	20	18	18	17	21	23	20	20	20	20	19	21	19	19	19	19	19	19	19	23
19-Jun	19	19	19	19	20	20	21	20	20	23	25	20	41	24	46	41	33	40	34	25	27	17	25	23	46
20-Jun	23	25	23	22	25	22	23	24	26	25	26	25	28	24	28	27	24	25	23	24	22	20	22	22	28
21-Jun	22	23	22	23	22	23	24	24	30	27	28	26	34	41	36	34	26	26	55	14	13	9	7	8	55
22-Jun	11	16	49	70	18	67	33	33	43	75	71	28	24	72	28	15	17	31	15	14	13	13	32	48	75
23-Jun	12	22	17	17	18	17	18	24	28	29	37	42	53	60	29	64	41	24	38	21	14	14	13	15	64
24-Jun	15	17	16	16	16	18	17	21	38	33	35	35	34	43	47	35	29	27	15	16	63	20	16	63	
25-Jun	17	22	25	16	19	18	20	20	19	21	21	26	22	23	25	30	29	28	20	30	13	12	12	12	30
26-Jun	35	30	18	17	17	19	21	28	38	55	57	47	43	35	33	52	23	43	43	20	46	20	22	18	57
27-Jun	18	21	25	25	23	24	21	26	27	32	45	42	43	24	34	29	28	29	17	19	11	25	14	14	45
28-Jun	14	15	15	15	17	17	19	19	24	32	40	39	65	59	59	32	49	45	36	19	16	17	18	17	65
29-Jun	17	18	18	20	19	19	21	21	24	26	29	31	32	31	32	35	22	27	28	23	23	16	26	26	35
30-Jun	23	23	27	24	32	26	35	61	34	48	28	34	38	39	37	36	29	25	27	15	14	19	20	19	61
	35	33	54	70	32	67	35	61	43	75	80	92	65	72	93	65	49	45	55	39	61	63	55	48	
	Diurnal Maximum																								





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS19 FIREBAG JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
 JUNE 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	11.1	0	2.3	0
H2S (ppb) Average	620	43	100	92.08	3.6	0	0.4	0
THC (ppm) Average	685	33	35	99.72	2.7	-	2.5	-
NO2 (ppb) Average	685	35	35	100	12.2	0	4.3	-
NO (ppb) Average	685	35	35	100	6.3	-	0.4	-
NOX (ppb) Average	685	35	35	100	13.3	-	4.5	-
Temperature 2 m (C) Average	720	0	0	100	27.9	-	21.6	-
Relative Humidity (%) Average	626	0	94	86.94	100	-	78.1	-
Wind Speed 10 m (km/h) Average	720	0	0	100	33	-	25	-
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)
 JUNE 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	0.55	1.2	-	0	0	0	0.1	0.4	1.5	11.1
H2S (ppb) Average	620	0.17	0.3	-	0	0	0	0.1	0.2	0.3	3.6
THC (ppm) Average	685	2.22	0.1	-	2	2.1	2.2	2.2	2.3	2.3	2.7
NO2 (ppb) Average	685	1.58	1.6	-	0.1	0.3	0.5	1.1	2.1	3.4	12.2
NO (ppb) Average	685	0.16	0.4	-	0	0	0	0.1	0.1	0.3	6.3
NOX (ppb) Average	685	1.74	1.8	-	0.1	0.3	0.6	1.2	2.2	3.8	13.3
Temperature 2 m (C) Average	720	15.87	5	-	5.4	9.1	11.9	16.1	19.3	22.6	27.9
Relative Humidity (%) Average	626	63.63	20.2	-	25.1	38.4	47.2	61.9	78.6	95	100
Wind Speed 10 m (km/h) Average	720	13.5	6	-	1	6	9	12	18	22	33
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2, THC	22 Jun 2023 13:00	22 Jun 2023 13:00	1	Maintenance - sample manifold cleaned
SO2, THC	30 Jun 2023 13:00	30 Jun 2023 13:00	1	Maintenance - station operator activities
H2S	12 Jun 2023 15:00	13 Jun 2023 14:00	24	Maintenacne - repalced instrument lamp
H2S	29 Jun 2023 04:00	30 Jun 2023 10:00	31	Unstable Operation - excessive baseline drift
H2S	30 Jun 2023 11:00	30 Jun 2023 11:00	1	Maintenance - to repalced the analyzer
Relative Humidity	04 Jun 2023 07:00	27 Jun 2023 05:00	94	Sensor operated out of range



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 11.1 ppb on Jun 16 08:00	Maximum Daily Average: 2.3 ppb on Jun 30		Hours of Data:	685
Minimum Value: 0.0 ppb on Jun 3 20:00	Minimum Daily Average: 0.0 ppb on Jun 21		Hours of Missing Data:	35
Maximum Diurnal Average: 1.0 ppb at hour 8	Minimum Diurnal Average: 0.1 ppb at hour 23		Hours of Calibration:	33
Monthly Average: 0.55 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 1.5 P ₉₉ = 5.4		Percent Operational Time:	99.7

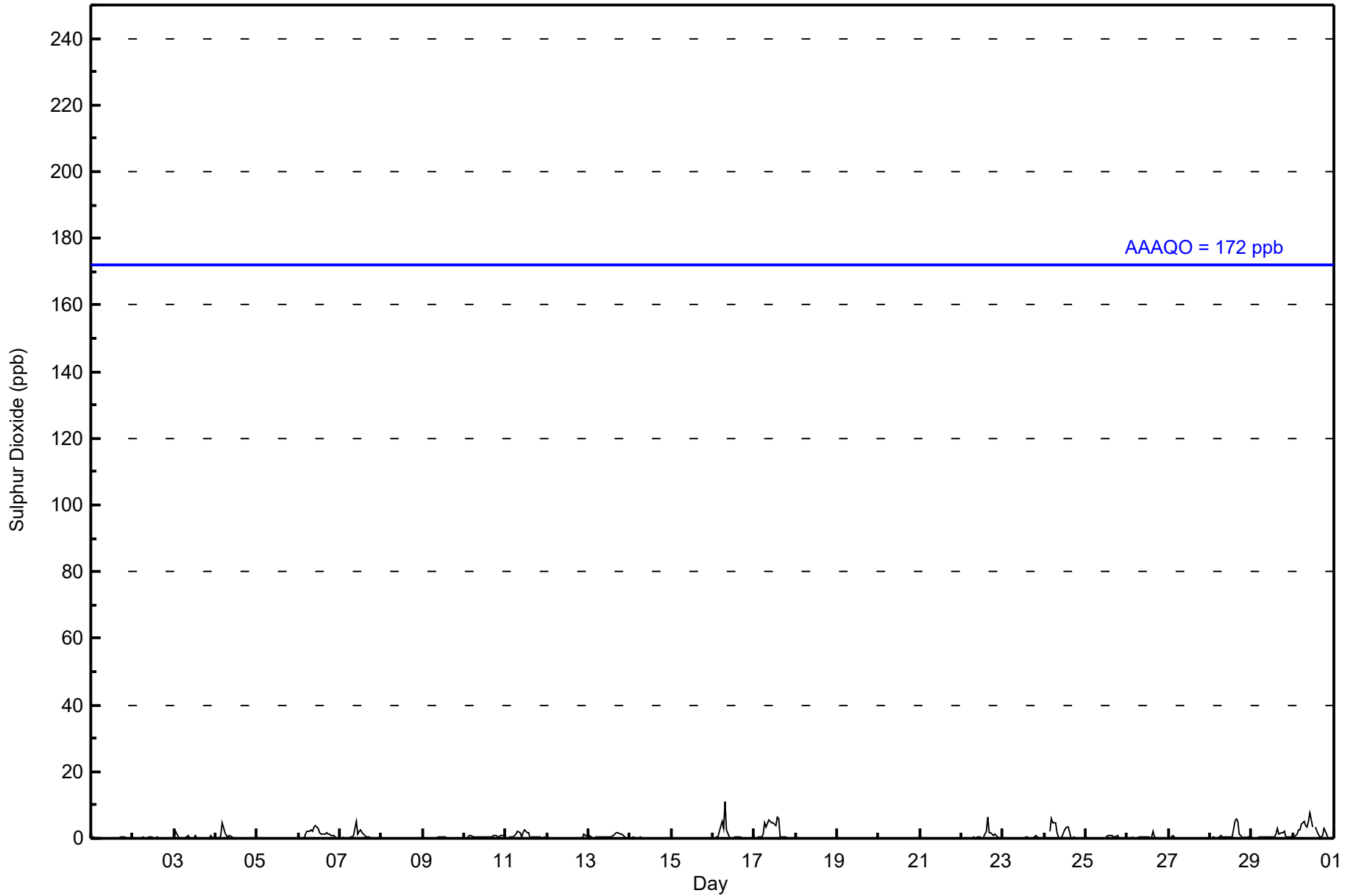
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.4	0.3	0.1	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.2	0.4		
2-Jun	0.1	0.2	0.1	0.1	Z	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.3	
3-Jun	0.6	2.1	0.4	0.2	0.1	Z	0.6	0.3	0.8	0.2	0.1	0.1	0.8	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.9	0.0	0.5	0.4	2.1	
4-Jun	Z	0.0	0.0	0.8	4.7	1.6	0.9	0.6	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	4.7	
5-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	
6-Jun	0.0	0.0	Z	0.0	1.1	2.2	2.2	2.7	2.3	3.5	3.9	3.1	1.9	1.1	1.4	1.3	1.6	1.3	1.1	0.9	0.8	0.3	0.1	0.0	1.4	3.9	
7-Jun	0.1	0.1	0.2	Z	0.1	0.2	0.4	0.3	0.7	5.2	1.2	1.9	2.7	1.5	0.8	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.7	5.2	
8-Jun	0.1	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.2	
9-Jun	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.5	
10-Jun	Z	0.1	0.5	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.7	0.6	0.5	0.5	0.6	0.6	0.7	0.5	0.7	
11-Jun	0.7	Z	0.6	0.5	0.5	0.8	1.4	2.1	1.6	0.6	1.8	2.7	1.8	1.9	0.0	0.4	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.9	2.7	
12-Jun	0.3	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.2	1.0	0.8	0.2	1.2	
13-Jun	0.7	0.6	0.6	Z	0.3	0.4	0.4	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.8	1.1	1.5	1.6	1.4	1.1	0.7	0.3	0.2	0.1	0.7	1.6	
14-Jun	0.2	0.1	0.3	0.1	Z	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
15-Jun	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	0.1	0.0	0.0	0.0	0.1	
16-Jun	Z	0.1	0.2	0.3	2.2	5.0	3.0	11.1	2.5	0.3	0.2	0.1	0.1	0.3	0.5	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.4	1.2	11.1	
17-Jun	1.0	Z	0.4	0.2	0.4	1.2	4.7	3.5	5.3	4.9	4.8	4.6	3.9	6.4	5.8	0.4	0.2	0.2	0.3	0.2	0.1	0.2	0.0	0.0	2.1	6.4	
18-Jun	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
19-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
20-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Jun	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
22-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.3	0.3	0.2	M	0.3	2.1	6.2	1.6	1.6	0.8	1.2	0.7	0.3	0.1	0.1	0.8	6.2	
23-Jun	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.6	1.0	0.5	0.1	0.2	0.1	0.2	1.0	
24-Jun	0.2	0.2	Z	1.9	6.1	4.8	4.7	1.5	0.2	0.1	0.1	2.0	3.0	3.5	3.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.4	6.1	
25-Jun	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.8	0.7	0.9	0.6	0.4	0.7	0.2	0.1	0.1	0.0	0.0	0.2	0.9	
26-Jun	0.1	0.1	0.1	0.3	Z	0.2	0.1	0.6	0.5	0.6	0.4	0.4	0.2	0.2	0.3	2.0	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.3	2.0	
27-Jun	0.0	0.0	0.9	0.5	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.9	
28-Jun	Z	0.3	0.3	0.1	0.2	0.4	0.8	0.3	0.2	0.3	0.4	0.4	0.2	0.6	5.3	6.1	5.1	1.1	0.3	0.2	0.2	0.2	0.2	0.4	1.0	6.1	
29-Jun	0.2	Z	0.1	0.2	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	1.3	3.2	1.3	1.5	1.9	2.0	0.3	0.2	0.4	0.3	0.7	3.2	
30-Jun	0.5	0.4	1.5	2.6	2.5	4.0	5.2	3.8	3.3	5.0	7.7	3.4	M	3.5	2.3	0.2	0.2	0.8	2.9	1.9	0.1	0.1	0.2	0.5	2.3	7.7	
																								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
Firebag - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Firebag - June 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	85	55	52	27	19	27	28	26	80	66	57	55	17	10	22	58	684
11 - 20	0	0	0	0	0	0	0	0	0	1	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	85	55	52	27	19	27	28	26	80	67	57	55	17	10	22	58	685

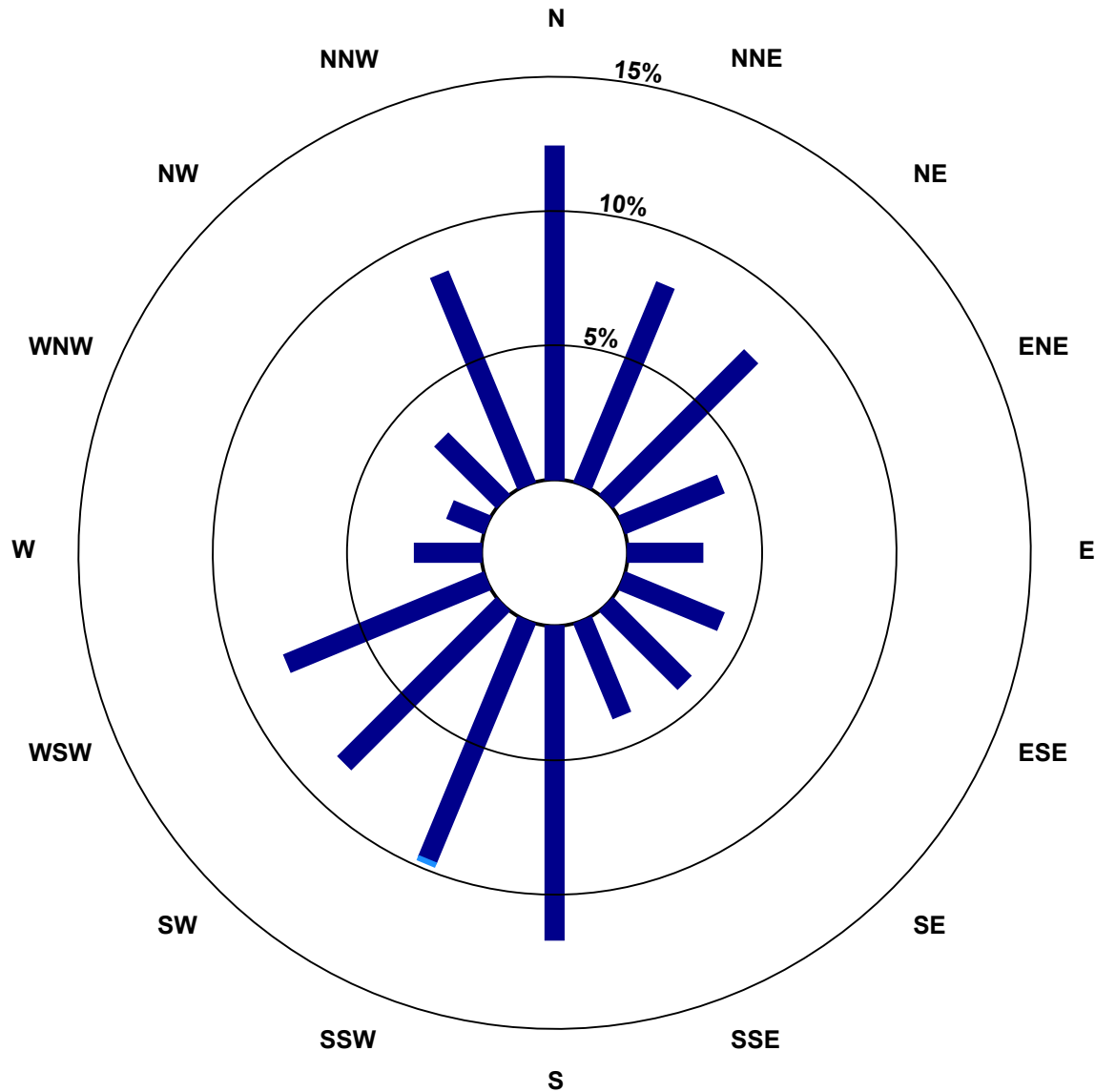
Total Number of Valid Hours: 685

Total Number of Hours: 720

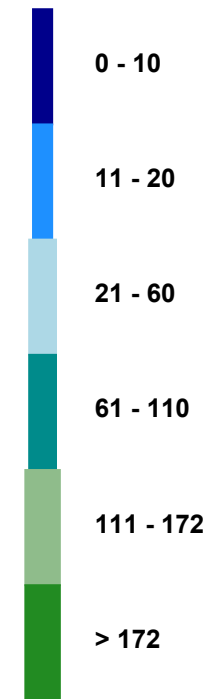


Wood Buffalo Environmental Association
Wind Rose Jun 2023

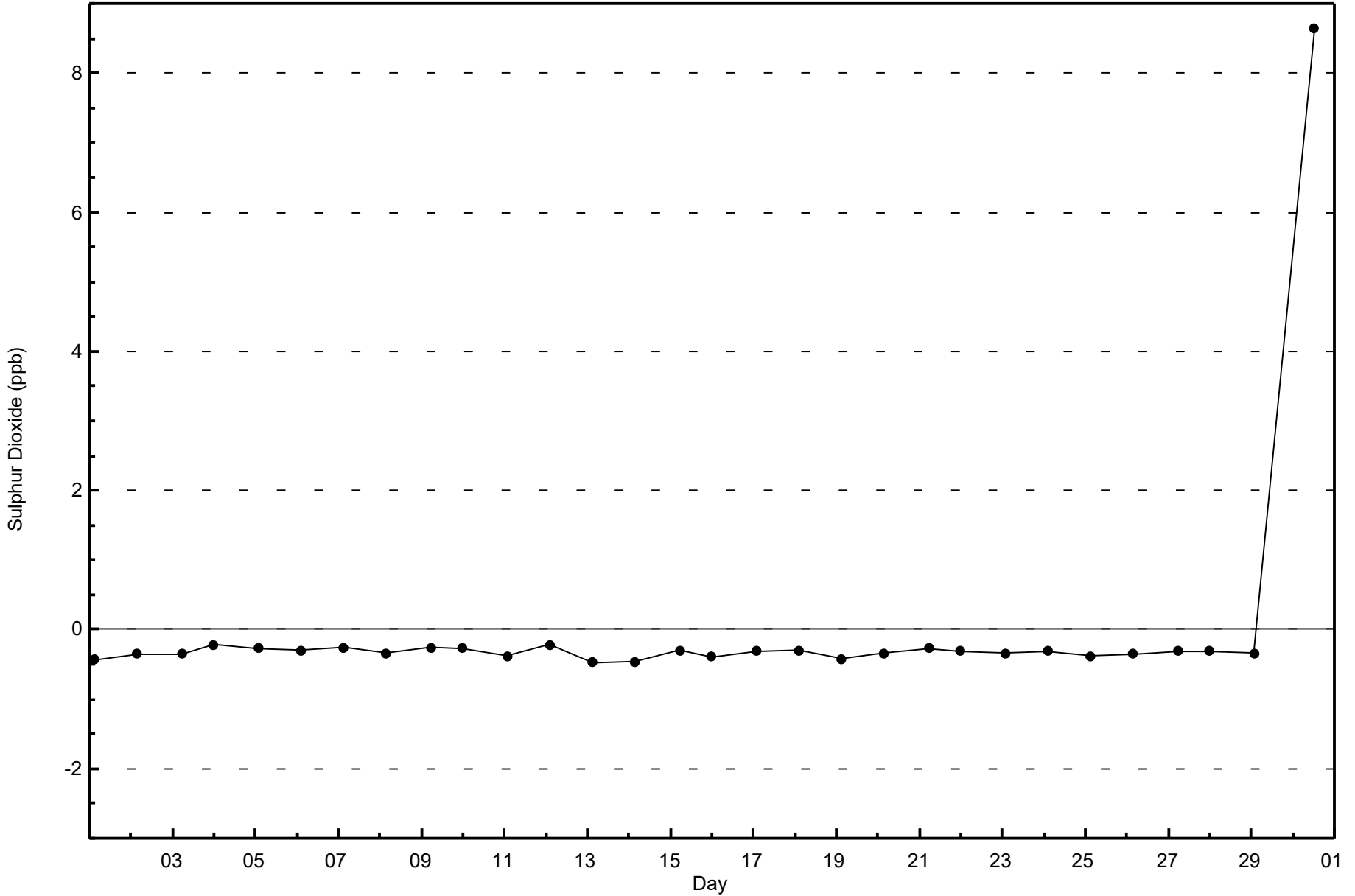
Sulphur Dioxide (SO₂) - ppb
Firebag

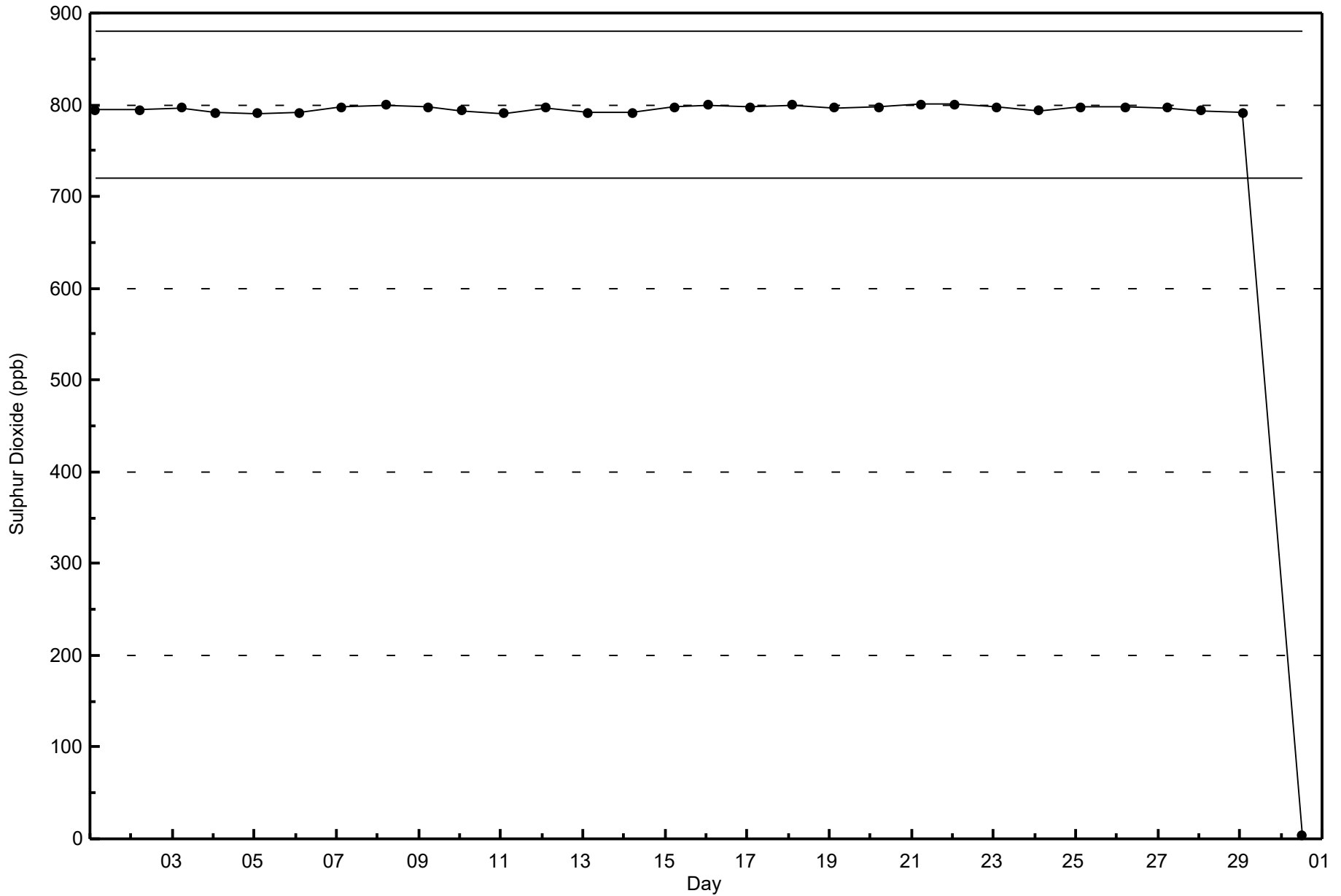


Classes (ppb)



Total Number of Valid Hours: 685



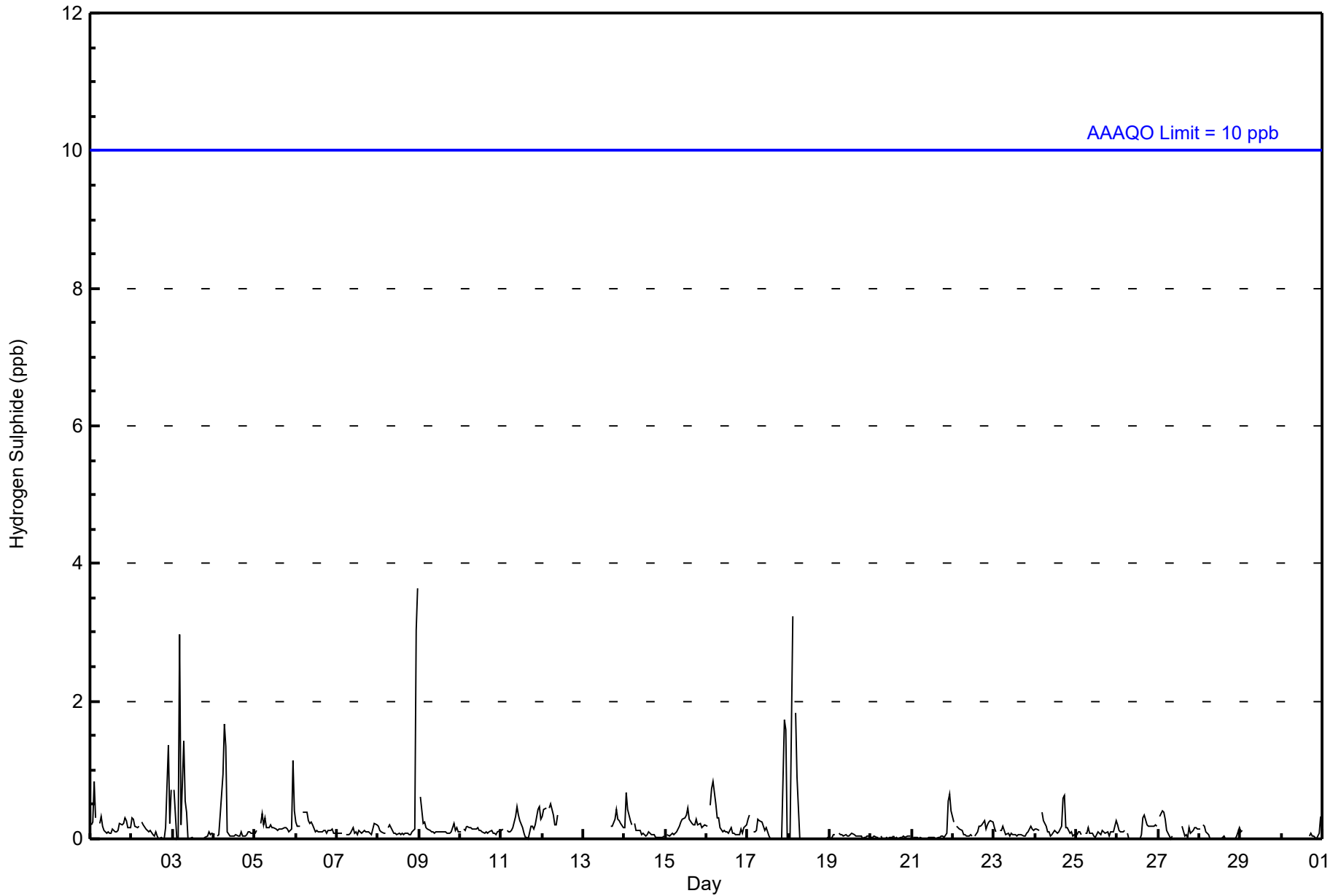




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.6 ppb on Jun 9 00:00	Maximum Daily Average: 0.4 ppb on Jun 8		Hours of Data:	620
Minimum Value: 0.0 ppb on Jun 2 20:00	Minimum Daily Average: 0.0 ppb on Jun 20		Hours of Missing Data:	100
Maximum Diurnal Average: 0.4 ppb at hour 5	Minimum Diurnal Average: 0.1 ppb at hour 13		Hours of Calibration:	43
Monthly Average: 0.17 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 1.7		Percent Operational Time:	92.1

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-Jun	0.2	0.2	0.8	0.3	Z	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.8	
2-Jun	0.3	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.4	0.2	0.7	0.2	1.4	
3-Jun	Z	0.7	0.0	0.0	3.0	0.2	1.4	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	3.0	
4-Jun	0.1	Z	0.0	0.1	0.4	0.9	1.7	1.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	1.7	
5-Jun	0.1	0.1	Z	0.2	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	1.1	0.4	0.2	1.1	
6-Jun	0.2	0.2	0.2	Z	0.4	0.4	0.4	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	0.1	0.1	0.1	0.2	0.4	
7-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	
8-Jun	0.2	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3.0	3.6	0.4	3.6	
9-Jun	Z	0.6	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	0.1	0.2	0.1	0.1	0.6	
10-Jun	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
11-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.1	0.2	0.4	0.5	0.3	0.2	0.5	
12-Jun	0.3	0.4	0.5	Z	0.4	0.5	0.4	0.2	0.2	0.3	C	C	C	C	M	M	M	M	M	M	M	M	M	M	---	0.5	
13-Jun	M	M	M	M	M	M	M	M	M	M	M	M	M	M	C	C	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	---	0.4	
14-Jun	0.2	0.7	0.4	0.3	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	
15-Jun	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.5	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5	
16-Jun	0.2	Z	0.5	0.7	0.8	0.5	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.8	
17-Jun	0.3	0.4	Z	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.6	0.0	0.2	1.7	
18-Jun	0.0	0.0	3.2	Z	1.8	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	0.3	3.2	
19-Jun	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
20-Jun	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
21-Jun	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	0.5	0.7	0.4	0.1	0.7	
22-Jun	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	M	0.0	0.1	0.2	0.2	0.2	0.3	0.1	0.2	0.3	0.3	0.3	0.1	0.3	
23-Jun	0.2	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2
24-Jun	0.1	0.1	0.1	Z	0.4	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.6	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.6	
25-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.3	
26-Jun	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	
27-Jun	Z	0.3	0.4	0.4	0.3	0.1	0.0	0.0	0.0	C	C	C	C	C	0.2	0.0	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.4	
28-Jun	0.1	Z	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	
29-Jun	0.1	0.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	0.1
30-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	C	C	C	0.2	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.3	---	0.3	
																								Diurnal Average			
																								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
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	616	99.35	99.35
3 - 4	4	0.65	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: 620

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - June 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	83	54	50	26	12	26	21	28	73	53	43	49	15	10	18	55	616
3 - 4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	83	54	50	26	16	26	21	28	73	53	43	49	15	10	18	55	620

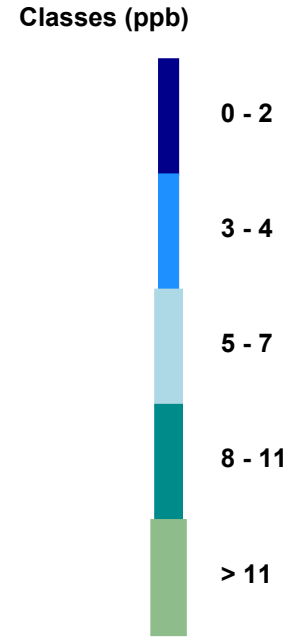
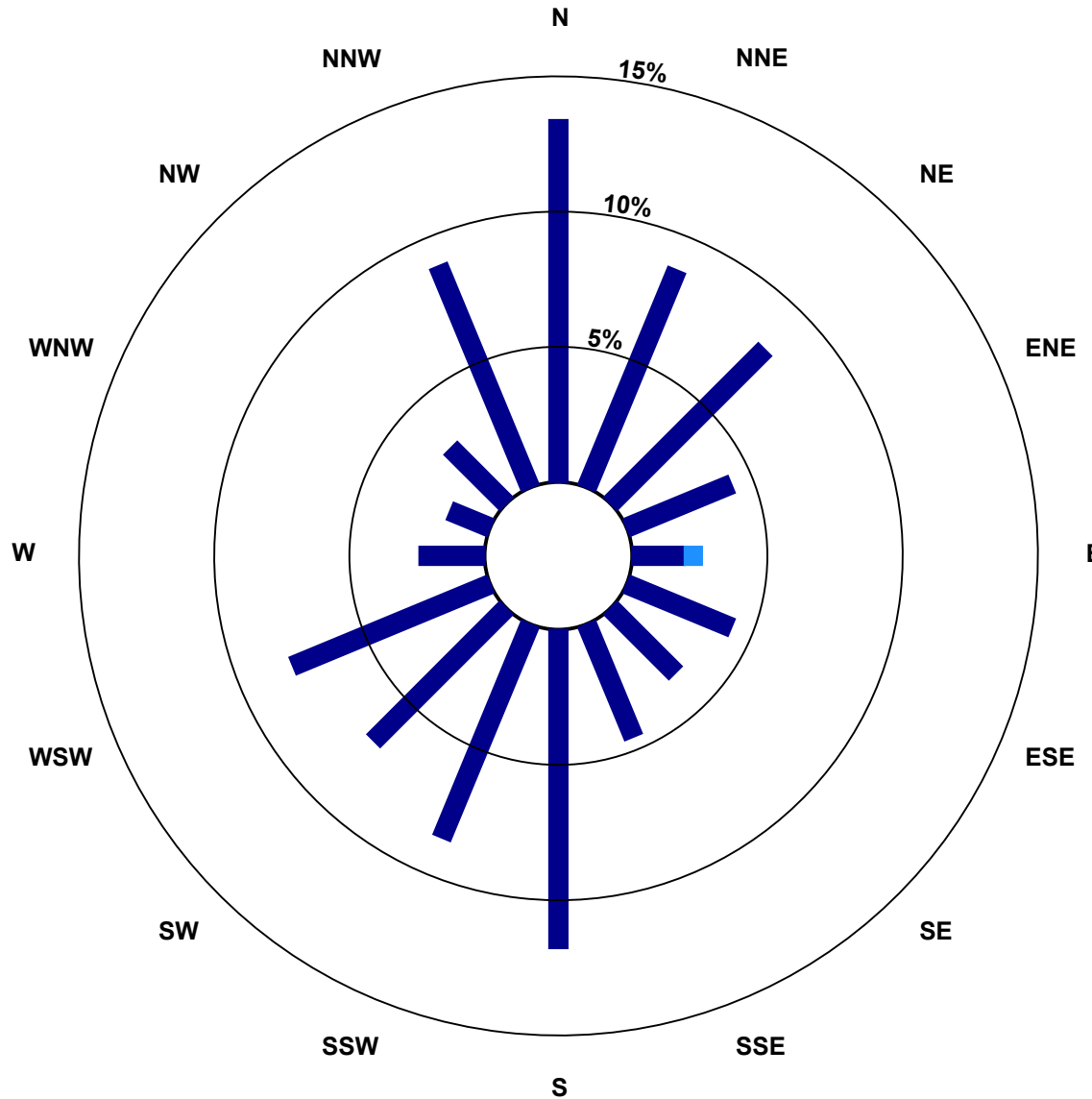
Total Number of Valid Hours: 620

Total Number of Hours: 720

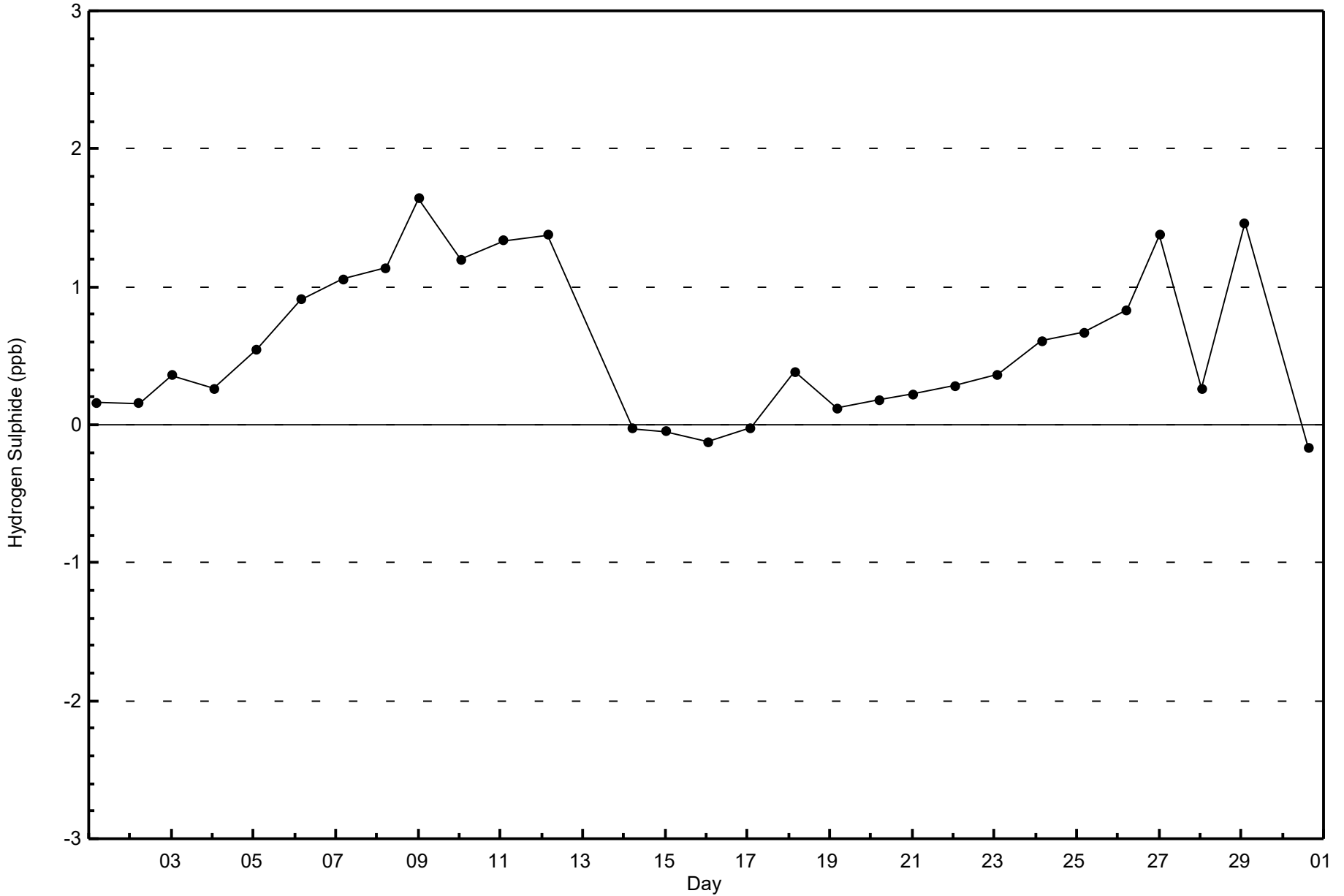


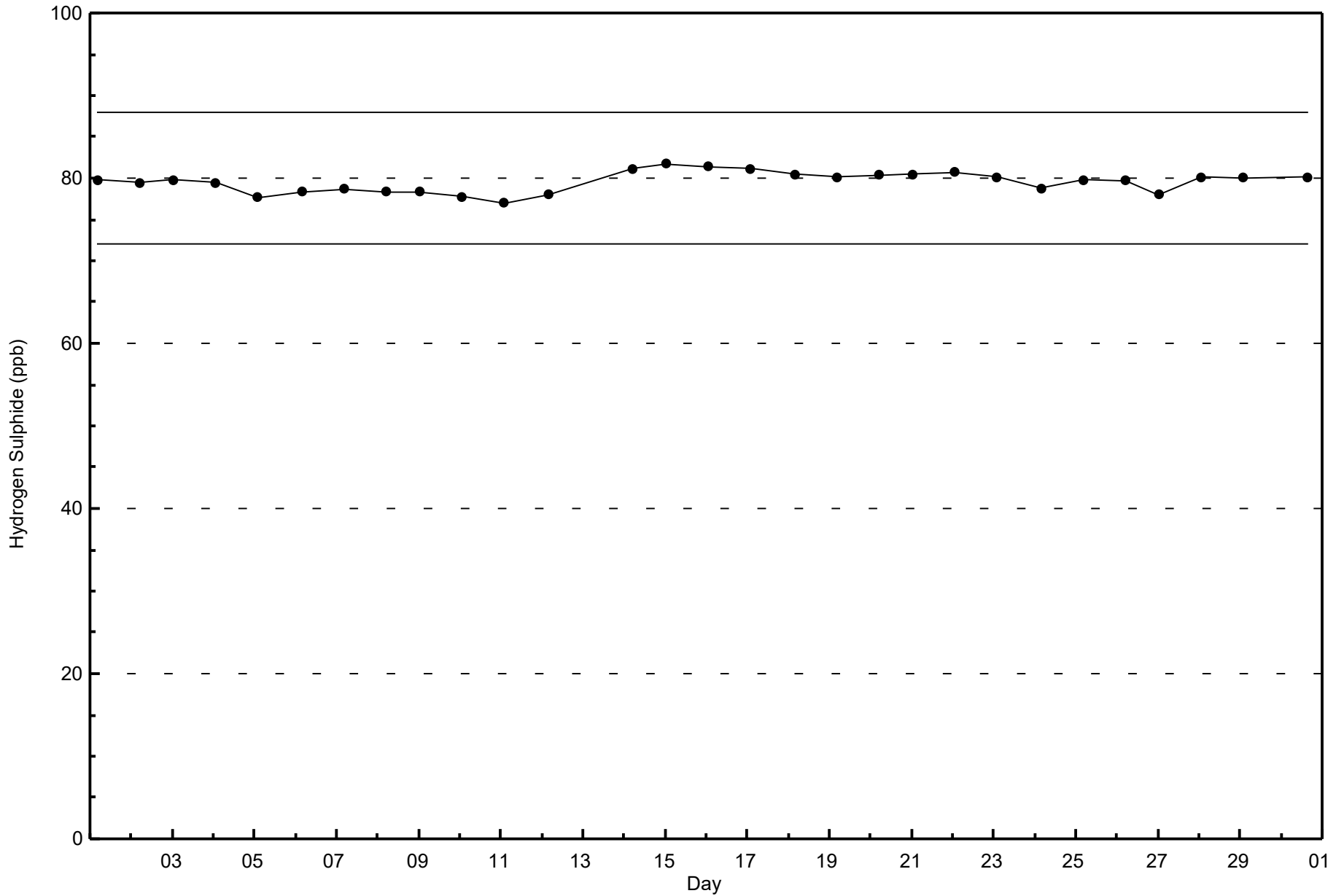
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Firebag



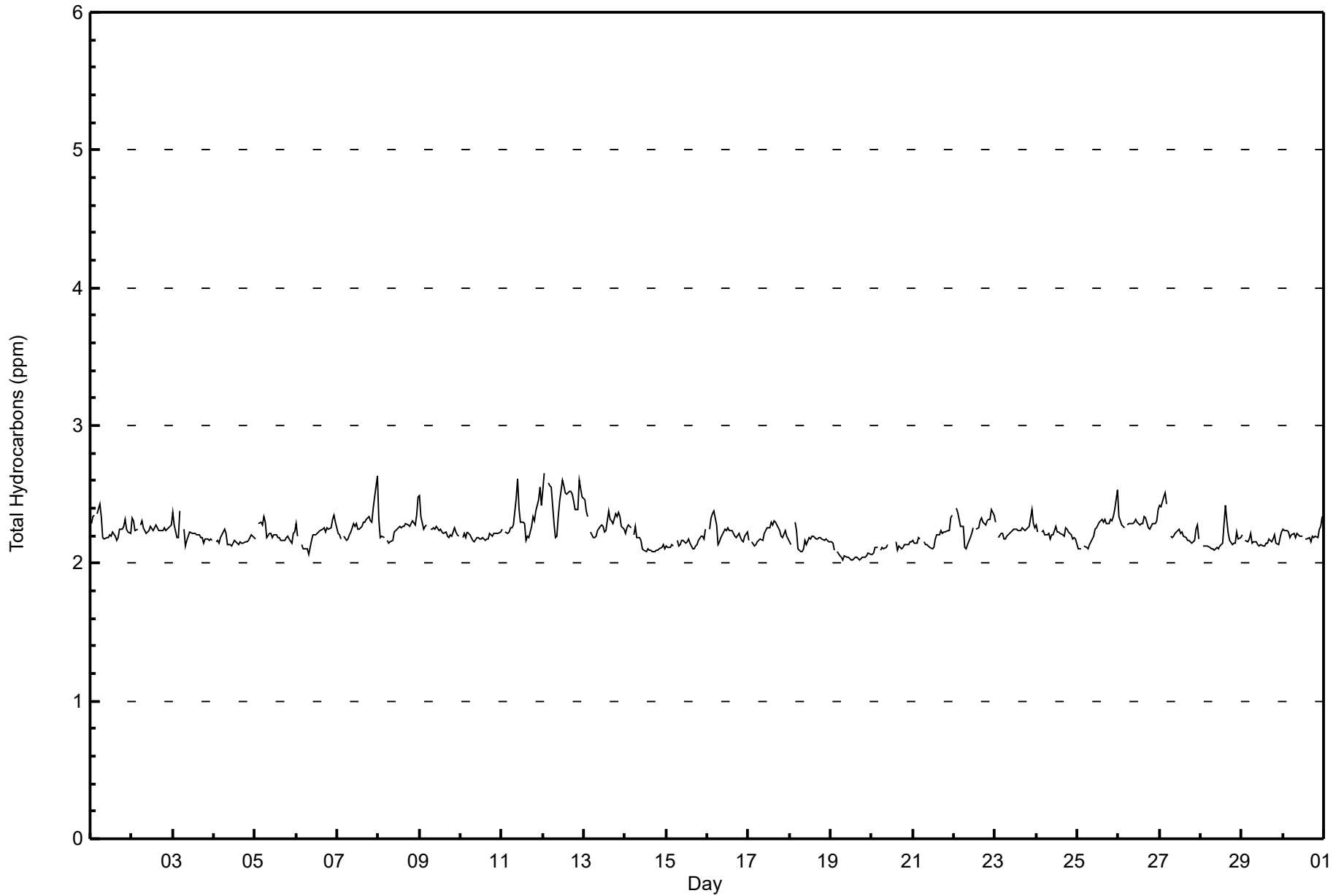
Total Number of Valid Hours: 620







Maximum Value: 2.7 ppm on Jun 12 02:00																				Maximum Daily Average: 2.5 ppm on Jun 12					Hours in Service: 720		
Minimum Value: 2.0 ppm on Jun 19 08:00																				Minimum Daily Average: 2.1 ppm on Jun 19					Hours of Data: 685		
Maximum Diurnal Average: 2.3 ppm at hour 24																				Minimum Diurnal Average: 2.2 ppm at hour 8					Hours of Missing Data: 35		
Monthly Average: 2.22 ppm																				Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.3 P ₉₉ = 2.6					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-Jun	2.3	2.3	2.4	Z	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4	
2-Jun	2.3	2.3	2.2	2.2	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3
3-Jun	2.4	2.3	2.2	2.2	2.4	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
4-Jun	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
5-Jun	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3
6-Jun	2.3	2.2	Z	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	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
7-Jun	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.6	2.3	2.6	2.6
8-Jun	2.3	2.2	2.2	2.2	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.3	2.5
9-Jun	2.5	2.3	2.3	2.3	2.3	Z	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	2.3	2.2	2.2	2.2	2.2	2.2	2.5
10-Jun	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
11-Jun	2.3	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.5	2.6	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.5	2.6	2.4	2.3	2.6	2.6
12-Jun	2.5	2.7	Z	2.6	2.6	2.6	2.3	2.2	2.2	2.3	2.5	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.6	2.5	2.5	2.5	2.7
13-Jun	2.5	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.4	2.3	2.3	2.3	2.4	2.3	2.4	2.3	2.3	2.2	2.3	2.5	2.5
14-Jun	2.2	2.3	2.3	2.3	Z	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
15-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.2	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2
16-Jun	Z	2.2	2.3	2.4	2.4	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
17-Jun	2.2	Z	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
18-Jun	2.2	2.1	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
19-Jun	2.2	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2
20-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	C	C	C	C	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
21-Jun	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	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3
22-Jun	Z	2.4	2.4	2.3	2.3	2.3	2.1	2.1	2.1	2.2	2.2	2.3	M	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4
23-Jun	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.2	2.4	2.4
24-Jun	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
25-Jun	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.2	2.2	2.5
26-Jun	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4
27-Jun	2.4	2.4	2.5	2.5	2.4	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.3	2.5
28-Jun	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	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4
29-Jun	2.2	Z	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	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2
30-Jun	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	M	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
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	15	2.19	2.19
2.1 - 3.0	670	97.81	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
Firebag - June 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	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0	15
2.1 - 3.0	85	43	49	27	19	27	28	26	80	67	57	55	17	10	22	58	670
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	85	55	52	27	19	27	28	26	80	67	57	55	17	10	22	58	685

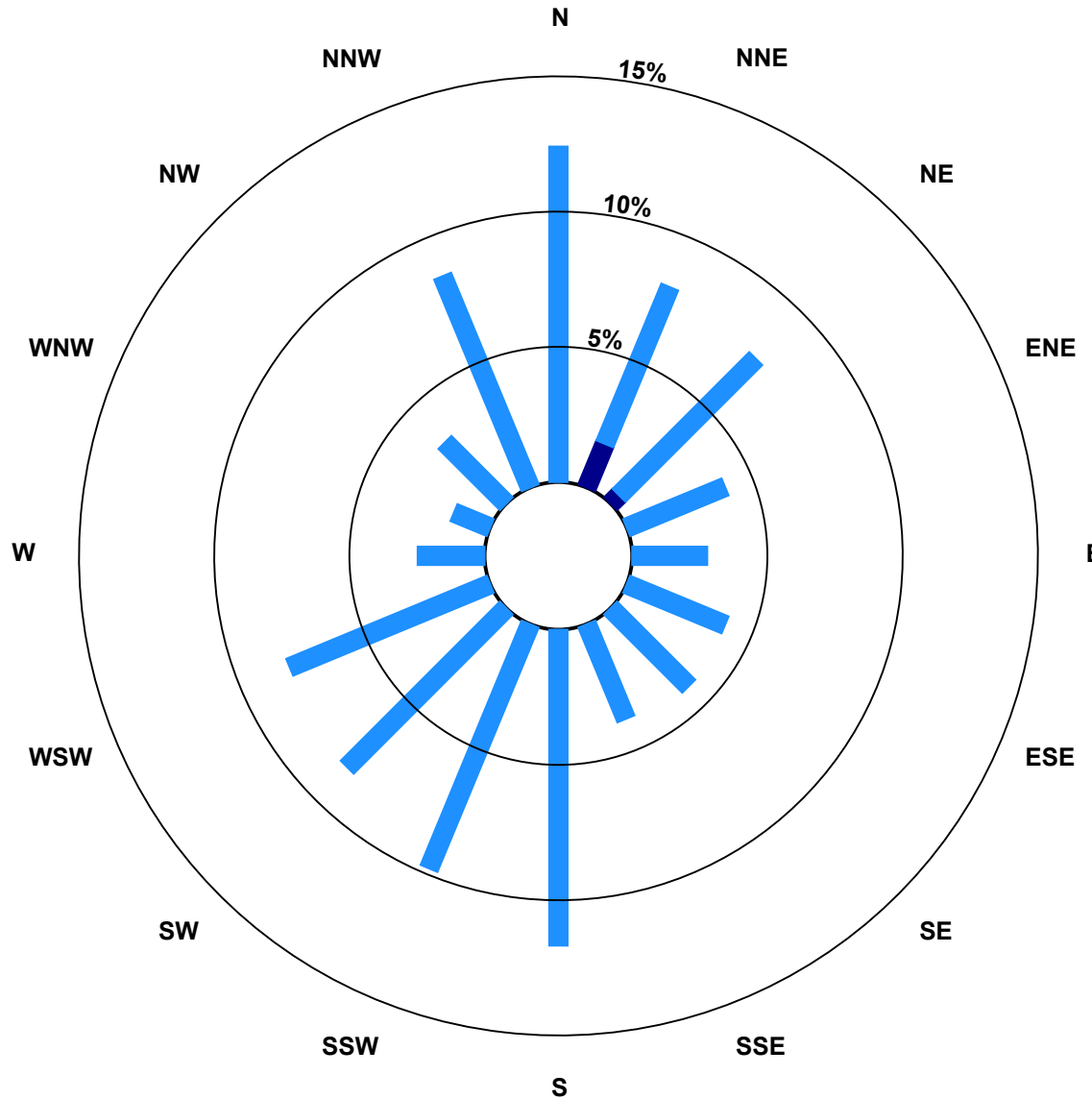
Total Number of Valid Hours: 685

Total Number of Hours: 720

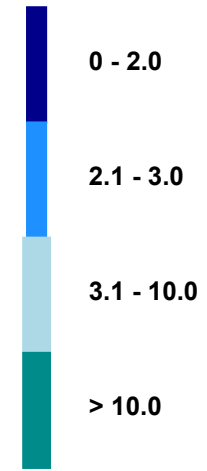


Wood Buffalo Environmental Association
Wind Rose Jun 2023

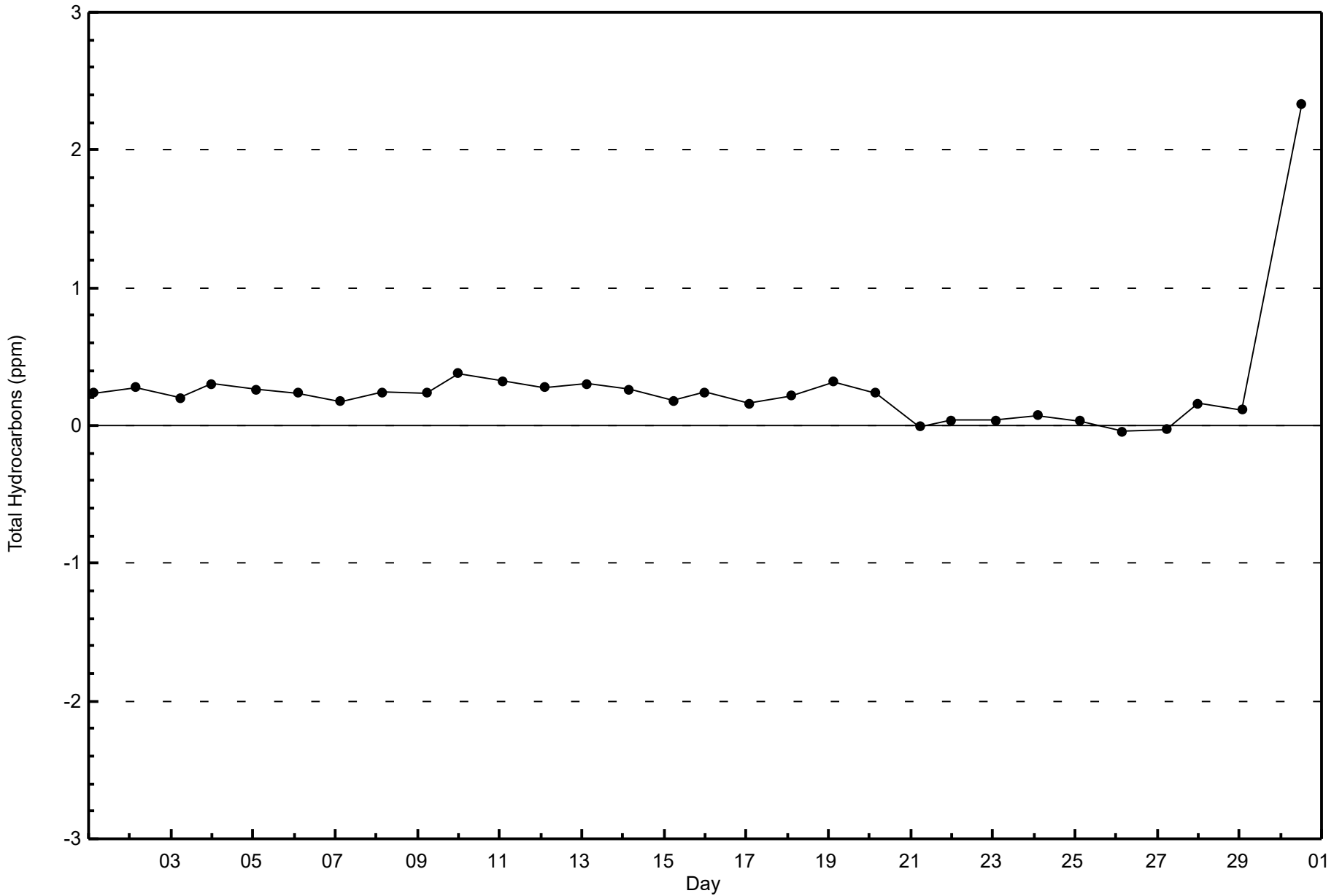
Total Hydrocarbons (THC) - ppm
Firebag

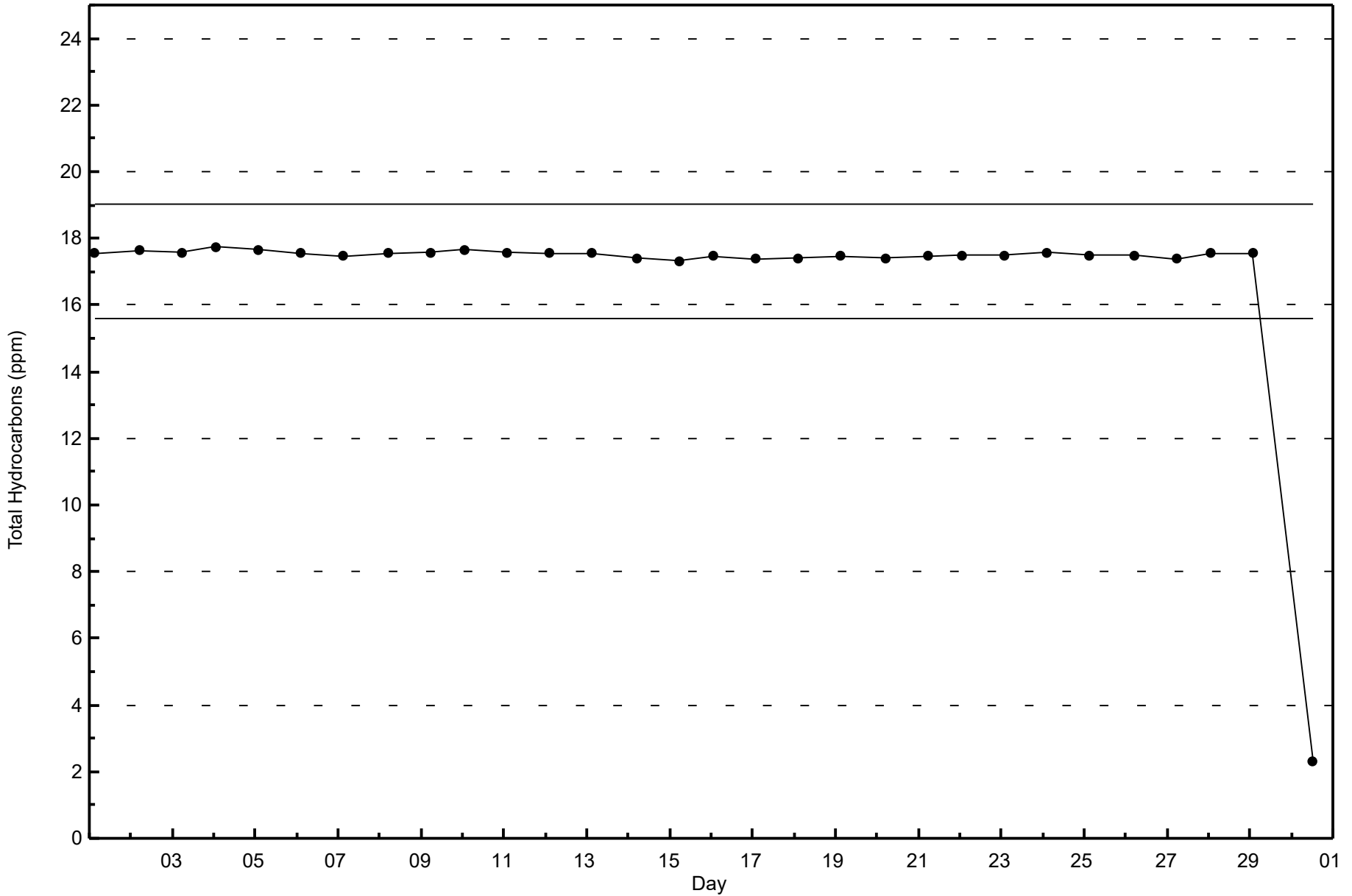


Classes (ppm)



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association
Summary of Hour Averages

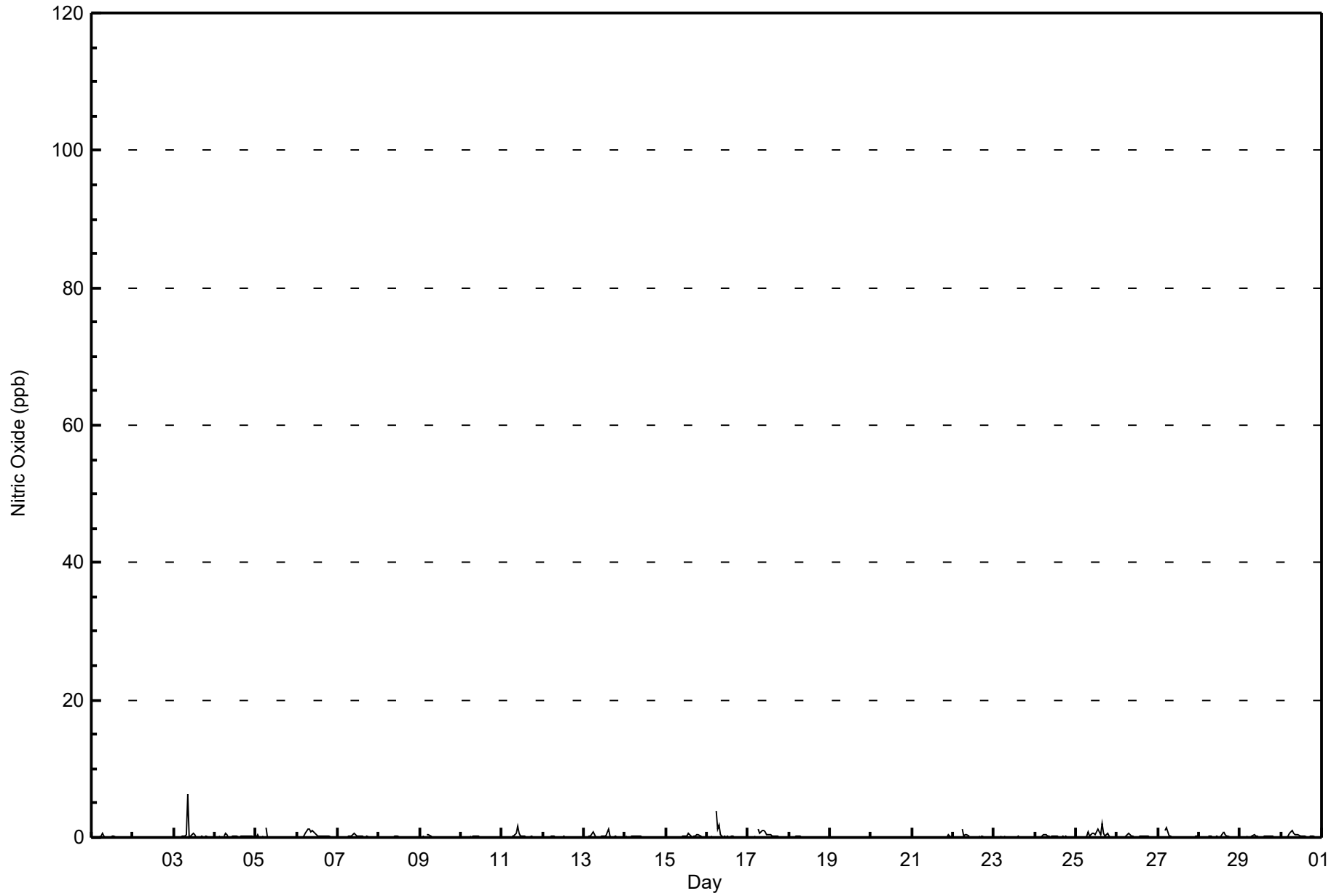
Nitric Oxide (NO) - ppb
Firebag - June 2023

Maximum Value: 6.3 ppb on Jun 3 09:00		Maximum Daily Average: 0.4 ppb on Jun 3		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Jun 8 02:00		Minimum Daily Average: 0.0 ppb on Jun 19		Hours of Data: 685																							
Maximum Diurnal Average: 0.5 ppb at hour 6		Minimum Diurnal Average: 0.0 ppb at hour 3		Hours of Missing Data: 35																							
Monthly Average: 0.16 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.3 P ₉₉ = 1.3		Hours of Calibration: 35																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.1	Z	0.1	0.1	0.1	0.2	0.7	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.7	
2-Jun	0.1	0.0	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
3-Jun	0.1	0.1	0.0	Z	0.0	0.1	0.2	0.4	6.3	0.1	0.2	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	0.4	6.3
4-Jun	0.1	0.1	0.1	0.2	Z	0.2	0.5	0.4	0.1	0.1	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	0.0	0.1	0.5
5-Jun	0.0	0.3	0.1	0.1	0.2	Z	1.4	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	0.0	0.0	0.0	0.0	0.1	1.4
6-Jun	Z	0.0	0.0	0.0	0.2	0.7	1.2	1.2	0.9	1.0	0.7	0.5	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.2
7-Jun	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.5
8-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
9-Jun	0.1	0.1	0.1	Z	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4
10-Jun	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
11-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.2	0.5	1.6	0.6	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	1.6
12-Jun	Z	0.1	0.1	0.1	0.1	0.2	0.2	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	0.1	0.1	0.1	0.2
13-Jun	0.1	Z	0.0	0.2	0.3	0.9	0.4	0.0	0.1	0.1	0.1	0.1	0.1	0.1	1.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.1
14-Jun	0.1	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
15-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.6	0.4	0.1	0.1	0.1	0.3	0.4	0.5	0.2	0.1	0.0	0.0	0.2	0.6
16-Jun	0.0	0.0	0.0	0.1	Z	3.9	1.2	1.9	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	0.4	3.9
17-Jun	0.1	0.0	0.1	0.1	0.2	Z	1.2	0.7	1.0	1.0	0.8	0.5	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	1.2
18-Jun	Z	0.0	0.1	0.1	0.2	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
19-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Jun	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
21-Jun	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	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.1	0.4
22-Jun	0.0	0.0	0.0	0.0	Z	1.2	0.1	0.4	0.3	0.1	C	C	C	C	C	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.2
23-Jun	0.0	0.0	0.0	0.0	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2
24-Jun	Z	0.0	0.0	0.0	0.1	0.4	0.5	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
25-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.9	0.2	0.6	0.5	0.5	0.9	1.2	0.4	2.0	0.6	0.3	0.5	0.1	0.0	0.1	0.0	0.1	0.0	0.4	2.0
26-Jun	0.0	0.0	Z	0.0	0.1	0.3	0.4	0.6	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
27-Jun	0.1	0.1	0.1	Z	0.9	1.3	0.3	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	0.2	1.3
28-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.8	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.8
29-Jun	0.1	0.0	0.1	0.1	0.2	Z	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.1	0.1	0.5
30-Jun	Z	0.0	0.1	0.1	0.2	0.7	0.9	0.5	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.9
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Firebag - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - June 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 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	88	57	53	25	20	27	27	30	76	68	53	55	17	10	21	58	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	88	57	53	25	20	27	27	30	76	68	53	55	17	10	21	58	685

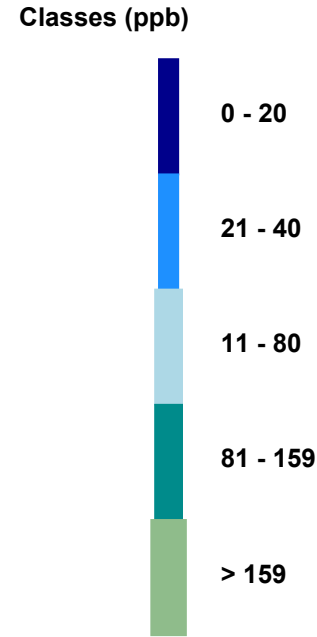
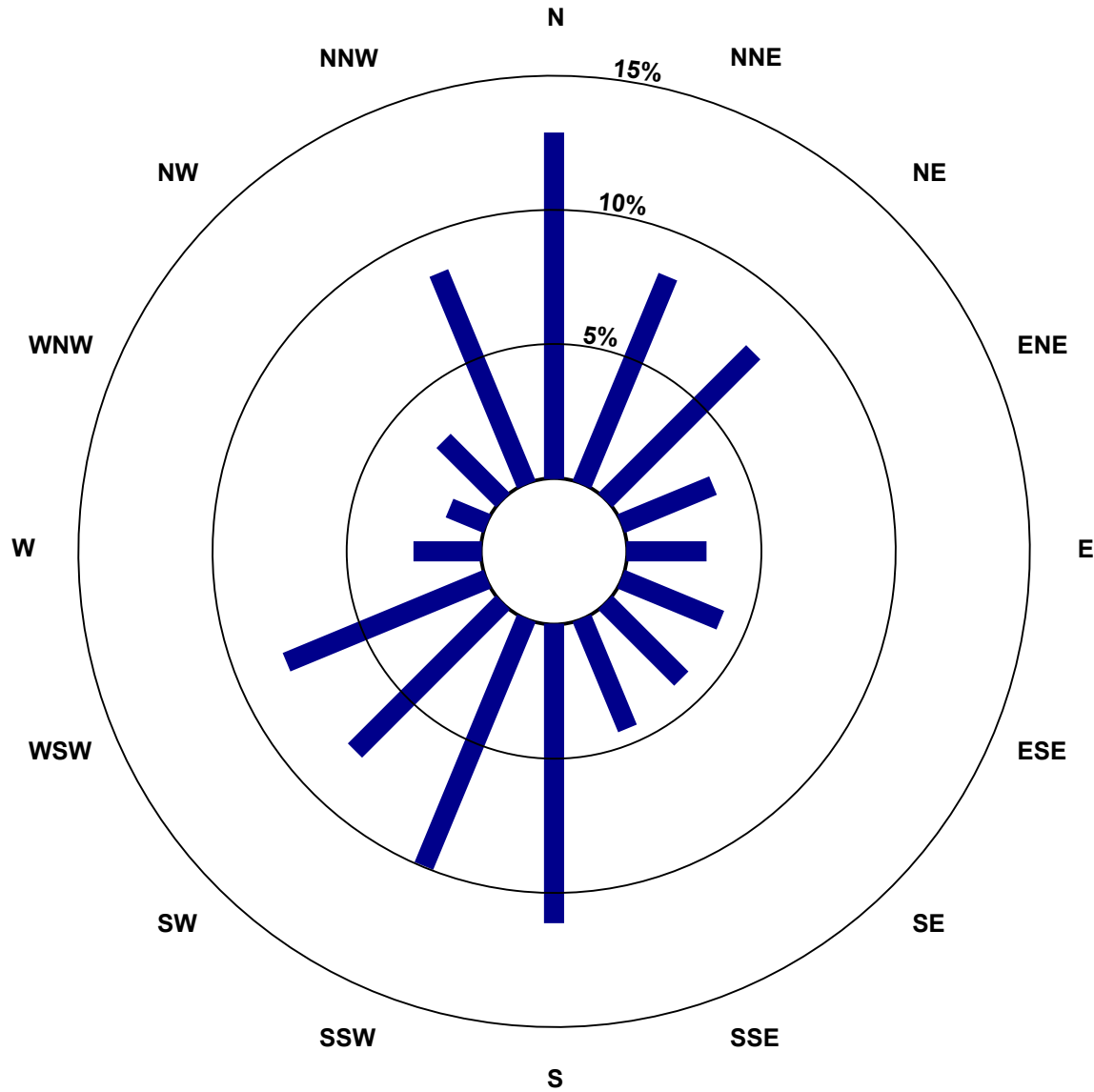
Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Firebag

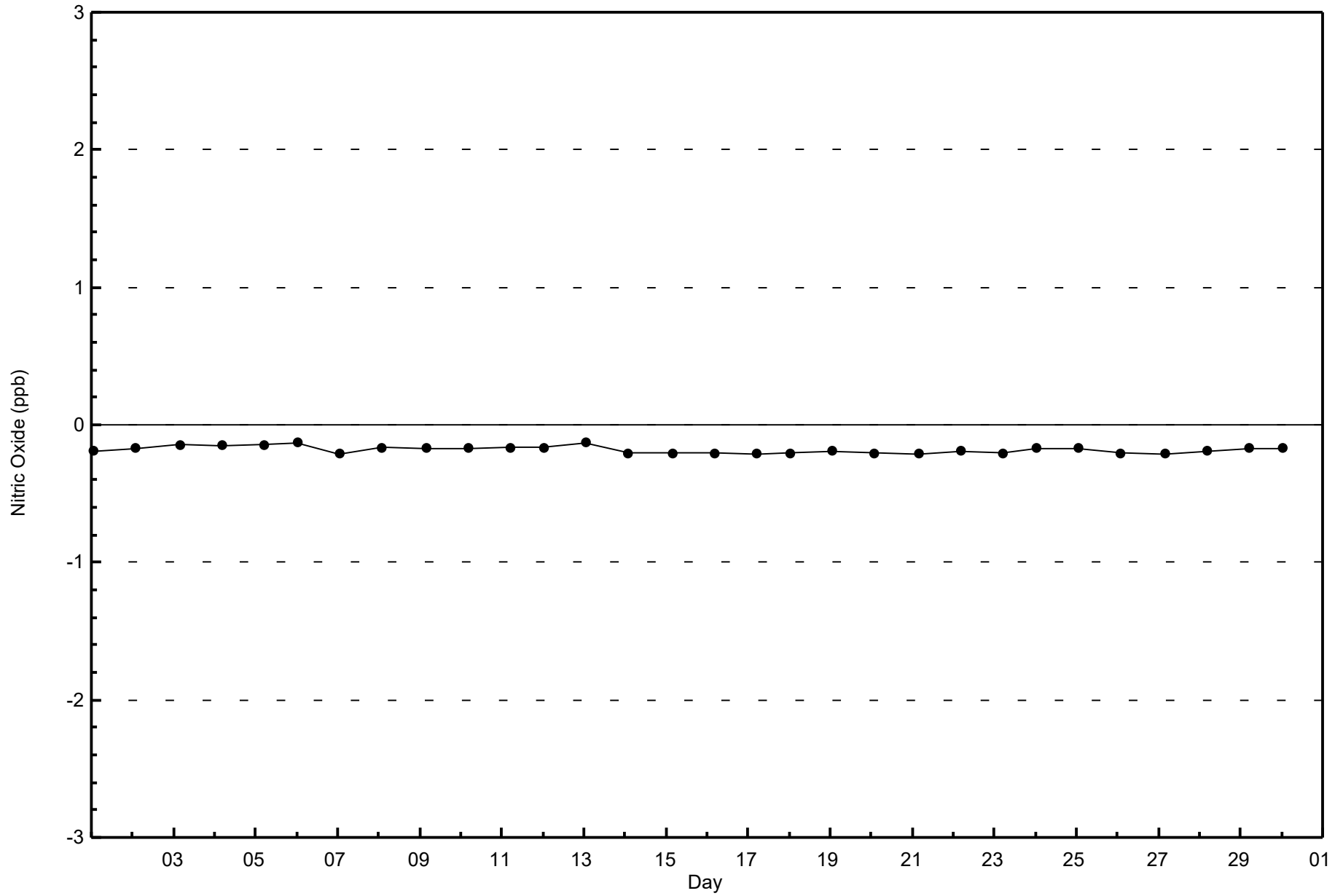


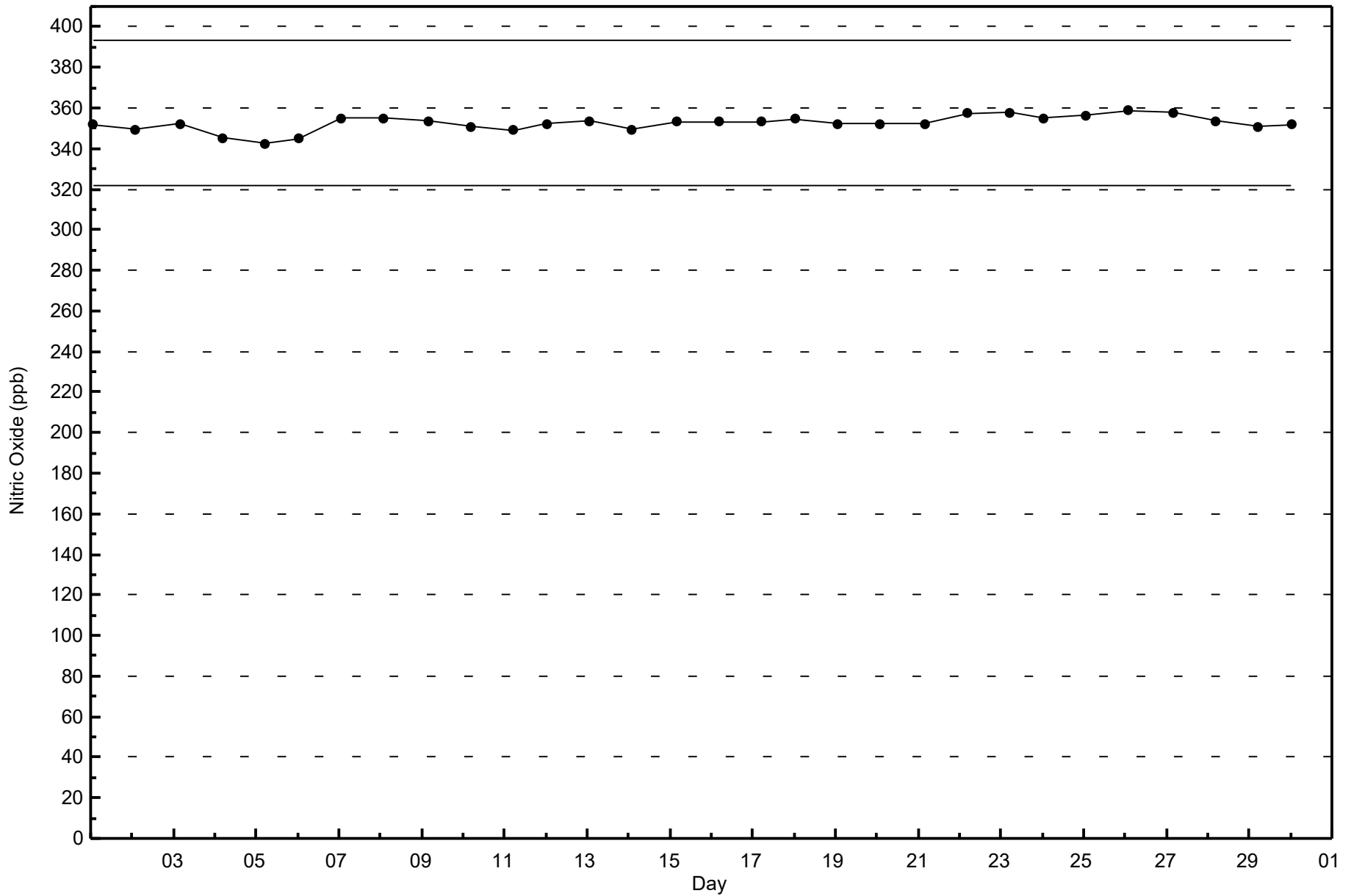
Total Number of Valid Hours: 685



Wood Buffalo Environmental Association
Zero Responses

Nitric Oxide (NO) - ppb
Firebag - June 2023





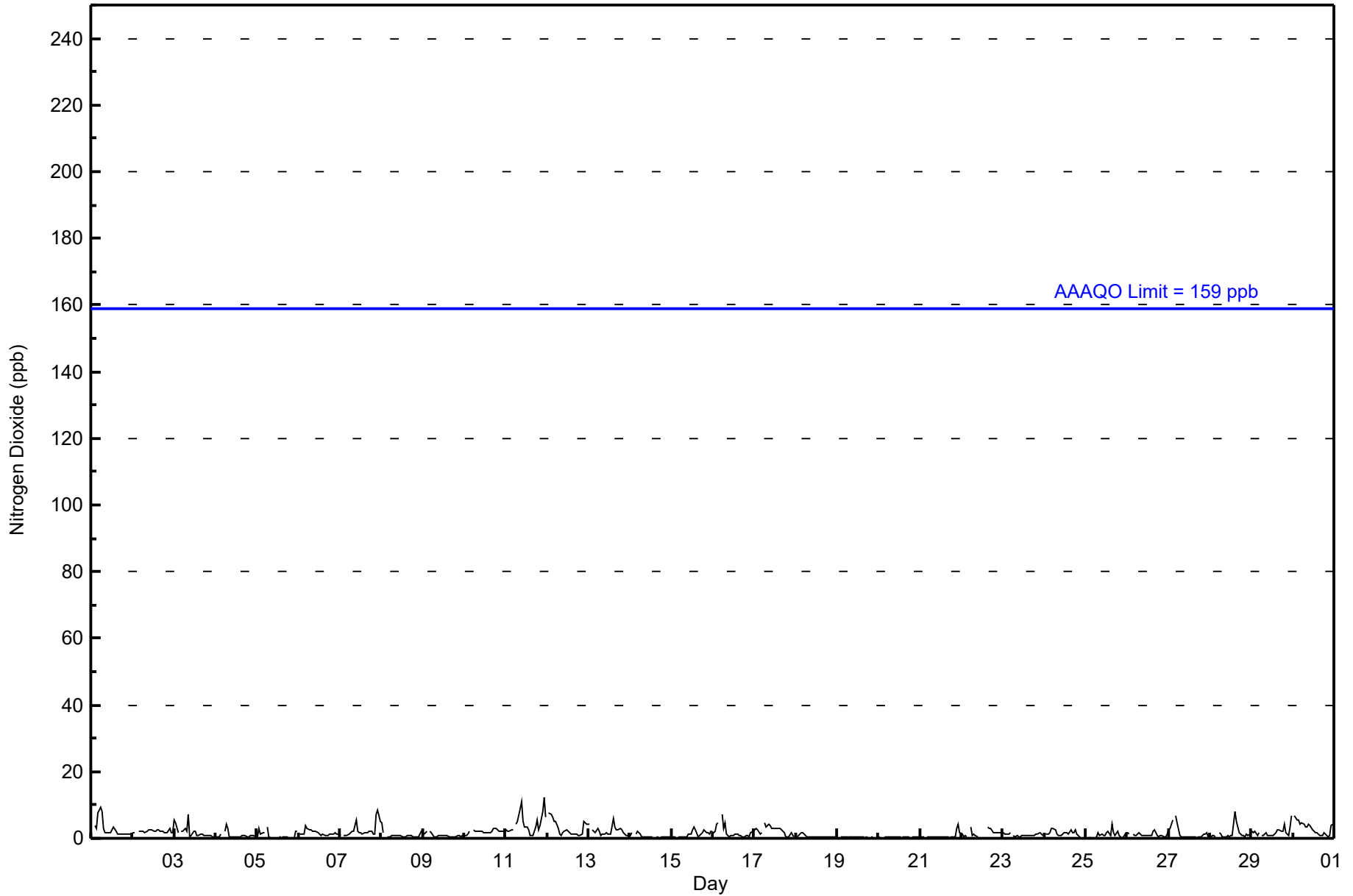


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 12.2 ppb on Jun 11 23:00		Maximum Daily Average: 4.3 ppb on Jun 11																	Hours of Data: 685		Hours of Missing Data: 35						
Minimum Value: 0.1 ppb on Jun 5 21:00		Minimum Daily Average: 0.3 ppb on Jun 19																	Hours of Calibration: 35		Percent Operational Time: 100.0						
Maximum Diurnal Average: 2.5 ppb at hour 6		Minimum Diurnal Average: 1.0 ppb at hour 21																									
Monthly Average: 1.58 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 1.1 Q ₃ = 2.1 P ₉₀ = 3.4 P ₉₉ = 8.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	4.5	Z	3.9	3.1	7.6	9.2	8.1	2.9	1.7	1.6	1.8	1.8	2.6	3.2	2.0	1.2	1.1	1.2	1.1	1.1	1.3	1.2	1.3	1.1	2.8	9.2	
2-Jun	1.6	1.8	Z	2.1	2.2	2.1	2.1	1.8	2.1	2.4	2.6	2.7	2.1	2.1	2.6	2.4	2.3	2.0	1.8	1.6	1.7	3.0	1.6	1.5	2.1	3.0	
3-Jun	5.6	4.6	1.5	Z	2.3	2.0	3.1	2.2	7.0	0.5	0.9	2.1	2.1	0.8	0.9	1.2	1.3	0.7	0.9	0.9	0.8	0.9	0.5	0.4	1.9	7.0	
4-Jun	0.4	0.5	0.5	1.2	Z	2.3	4.2	2.8	0.5	0.3	0.3	0.4	0.4	0.4	0.4	0.8	0.7	1.0	0.5	0.6	0.7	0.7	0.7	0.3	0.9	4.2	
5-Jun	0.3	2.9	1.3	1.5	1.8	Z	3.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.1	0.2	2.0	2.1	0.8	3.3	
6-Jun	Z	1.1	1.1	1.1	3.7	3.0	2.5	2.5	2.0	2.2	2.0	1.5	1.2	1.0	1.1	0.8	1.0	0.9	1.1	1.2	1.1	1.7	1.1	1.2	1.6	3.7	
7-Jun	0.7	Z	0.7	0.8	1.0	1.2	1.5	2.2	2.3	5.3	2.3	1.7	1.6	1.3	1.5	1.6	1.7	2.1	2.3	1.4	1.2	7.3	8.3	5.1	2.4	8.3	
8-Jun	4.8	1.6	Z	0.6	0.4	0.4	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.8	0.9	0.8	0.5	0.5	0.4	0.5	1.2	2.0	0.9	4.8	
9-Jun	1.6	1.3	2.0	Z	2.1	1.6	0.6	0.5	0.5	0.8	0.9	0.7	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.9	0.7	0.6	0.7	0.9	2.1	
10-Jun	0.7	0.7	1.3	2.0	Z	2.6	2.1	2.0	2.1	2.0	2.0	1.9	1.8	1.8	1.7	1.8	2.1	2.8	2.9	2.4	2.0	2.0	2.1	2.2	2.0	2.9	
11-Jun	2.5	2.1	2.1	2.5	2.5	Z	4.4	4.9	8.7	10.9	4.9	3.5	3.4	2.7	0.7	0.8	0.8	3.4	5.5	2.5	3.8	8.0	12.2	6.5	4.3	12.2	
12-Jun	Z	7.5	7.0	6.4	5.0	5.2	2.8	1.2	0.9	1.6	2.0	2.5	2.2	1.7	1.4	1.4	1.3	1.1	0.9	0.7	1.1	5.0	4.7	4.2	2.9	7.5	
13-Jun	4.3	Z	2.7	2.2	1.6	2.9	2.0	1.0	1.1	1.3	1.5	1.4	1.3	1.3	5.8	3.2	2.6	2.4	2.9	2.4	1.9	1.4	0.8	0.8	2.1	5.8	
14-Jun	0.7	1.8	Z	1.3	2.3	1.6	1.2	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.6	2.3	
15-Jun	0.3	0.3	0.3	Z	0.4	0.5	0.5	0.4	0.4	0.5	1.2	1.3	2.7	3.6	2.4	0.5	1.0	1.4	1.6	2.4	1.5	1.6	1.1	2.1	1.2	3.6	
16-Jun	1.7	2.2	4.4	4.6	Z	7.3	2.9	4.5	1.4	0.6	1.0	0.9	0.9	1.1	1.3	0.9	0.7	0.5	0.5	0.7	0.9	0.6	1.9	2.3	1.9	7.3	
17-Jun	2.6	3.0	2.7	1.4	1.8	Z	4.6	3.2	4.2	3.8	2.8	2.8	3.0	3.1	3.1	2.8	2.6	1.6	0.6	0.4	0.4	1.5	0.9	0.4	2.3	4.6	
18-Jun	Z	0.5	1.2	1.6	1.8	1.1	0.5	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.5	1.8	
19-Jun	0.3	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.5	
20-Jun	0.3	0.2	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.4	0.5	0.3	0.3	0.3	0.5
21-Jun	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.2	0.3	0.3	0.3	2.9	4.3	1.9	0.7	4.3	
22-Jun	1.4	0.6	0.8	0.6	Z	3.4	0.9	1.1	0.9	0.6	C	C	C	C	C	3.4	3.1	2.8	1.9	1.7	1.5	1.8	1.9	1.7	1.7	3.4	
23-Jun	1.5	1.1	1.1	1.3	1.9	Z	1.0	0.6	0.7	0.6	0.6	0.7	0.7	0.8	1.0	0.8	0.7	0.8	1.0	1.4	1.4	1.8	1.2	0.8	1.0	1.9	
24-Jun	Z	1.2	1.3	1.9	2.9	2.9	2.5	1.3	0.8	0.7	0.9	1.7	1.5	1.6	1.4	2.6	1.8	1.9	2.7	1.1	0.3	0.2	0.2	0.2	1.5	2.9	
25-Jun	0.2	Z	0.3	0.2	0.2	0.2	0.5	1.7	0.7	1.2	1.0	0.9	1.7	2.3	1.0	4.1	1.8	1.0	2.2	0.7	0.3	0.2	0.5	1.8	1.1	4.1	
26-Jun	1.6	1.2	Z	1.2	1.0	1.0	1.1	1.6	0.9	1.0	0.7	0.7	0.8	0.9	0.9	2.0	2.4	0.7	0.5	0.8	0.9	0.5	0.6	1.2	1.1	2.4	
27-Jun	2.5	2.9	5.6	Z	6.7	4.7	1.0	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.2	0.3	0.3	0.4	1.1	1.3	1.5	0.6	1.4	6.7	
28-Jun	0.5	0.7	1.0	0.5	Z	1.7	1.1	0.6	0.5	0.5	0.8	0.6	0.7	0.9	8.1	4.9	3.3	1.7	0.8	0.9	0.6	1.1	0.8	1.1	1.5	8.1	
29-Jun	2.1	1.9	2.0	0.9	1.7	Z	0.9	0.9	1.5	0.9	0.8	0.7	0.9	1.3	1.7	2.4	2.6	2.2	2.2	4.2	1.8	1.0	3.4	6.7	1.9	6.7	
30-Jun	Z	6.7	5.7	5.3	4.2	4.5	4.4	3.4	3.3	4.1	3.8	2.5	2.1	1.8	1.7	1.0	0.9	1.0	1.5	1.3	0.6	0.9	3.7	4.1	3.0	6.7	
																								Diurnal Average		Diurnal Maximum	
																								1.7 1.9 2.1 1.8 2.2 2.5 2.0 1.6 1.6 1.5 1.3 1.2 1.3 1.3 1.5 1.5 1.3 1.2 1.3 1.1 1.0 1.6 2.0 1.8			
																								5.6 7.5 7.0 6.4 7.6 9.2 8.1 4.9 8.7 10.9 4.9 3.5 3.4 3.6 8.1 4.9 3.3 3.4 5.5 4.2 3.8 8.0 12.2 6.7			
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Firebag - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Firebag - June 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



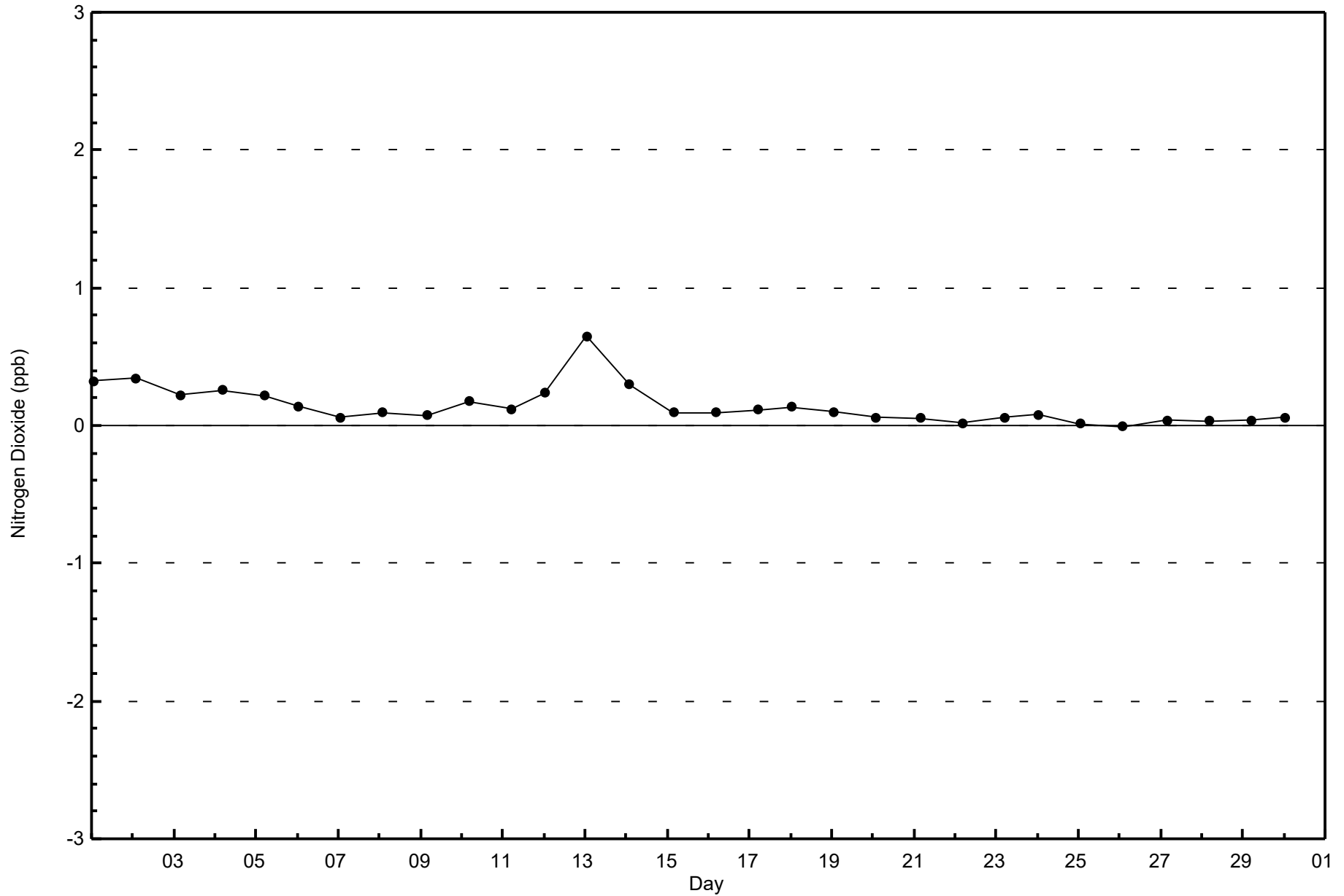
**Wood Buffalo Environmental Association
Frequency Distribution**

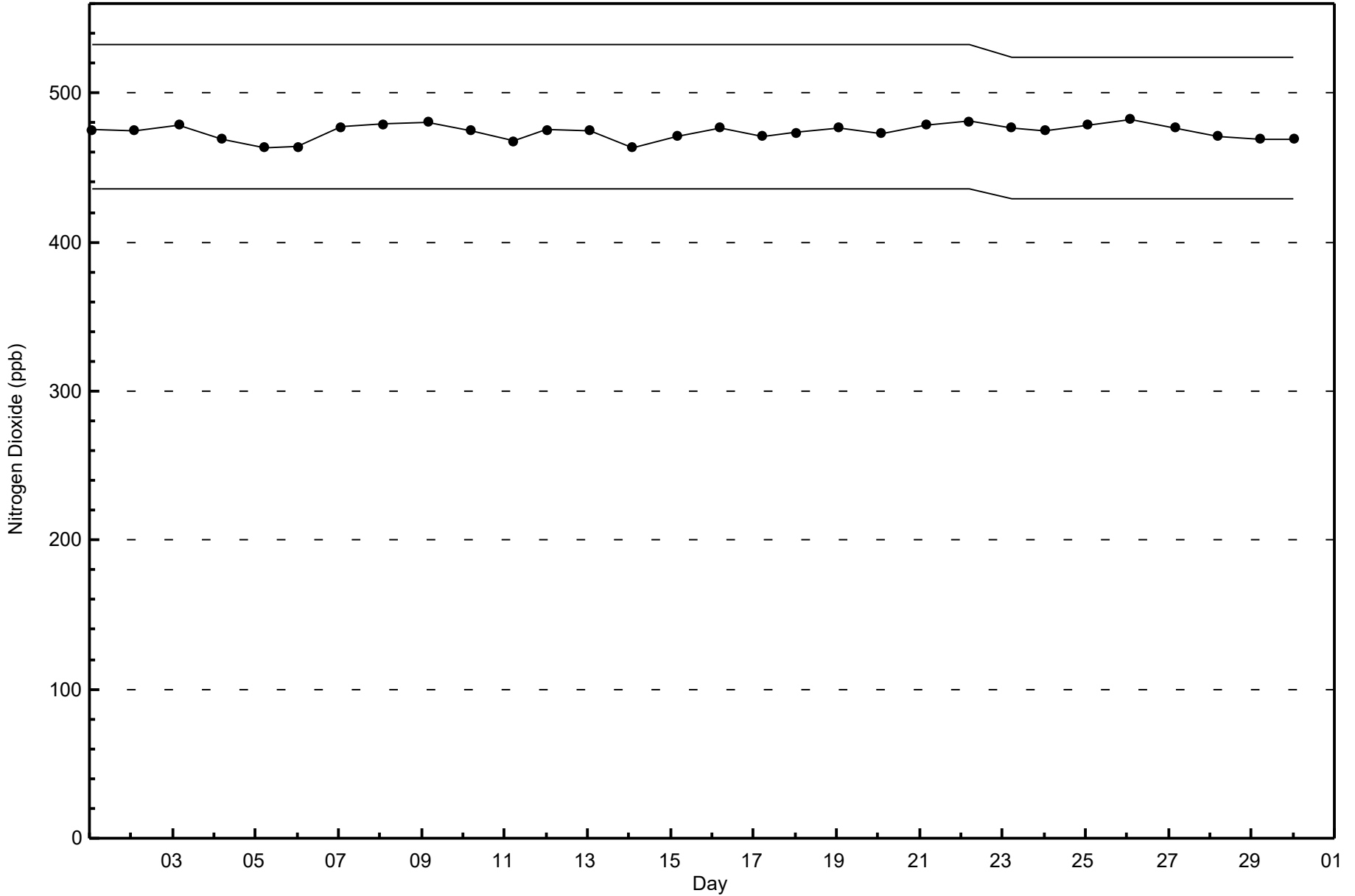
**Nitrogen Dioxide (NO₂) - ppb
Firebag - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	88	57	53	25	20	27	27	30	76	68	53	55	17	10	21	58	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	88	57	53	25	20	27	27	30	76	68	53	55	17	10	21	58	685

Total Number of Valid Hours: 685

Total Number of Hours: 720



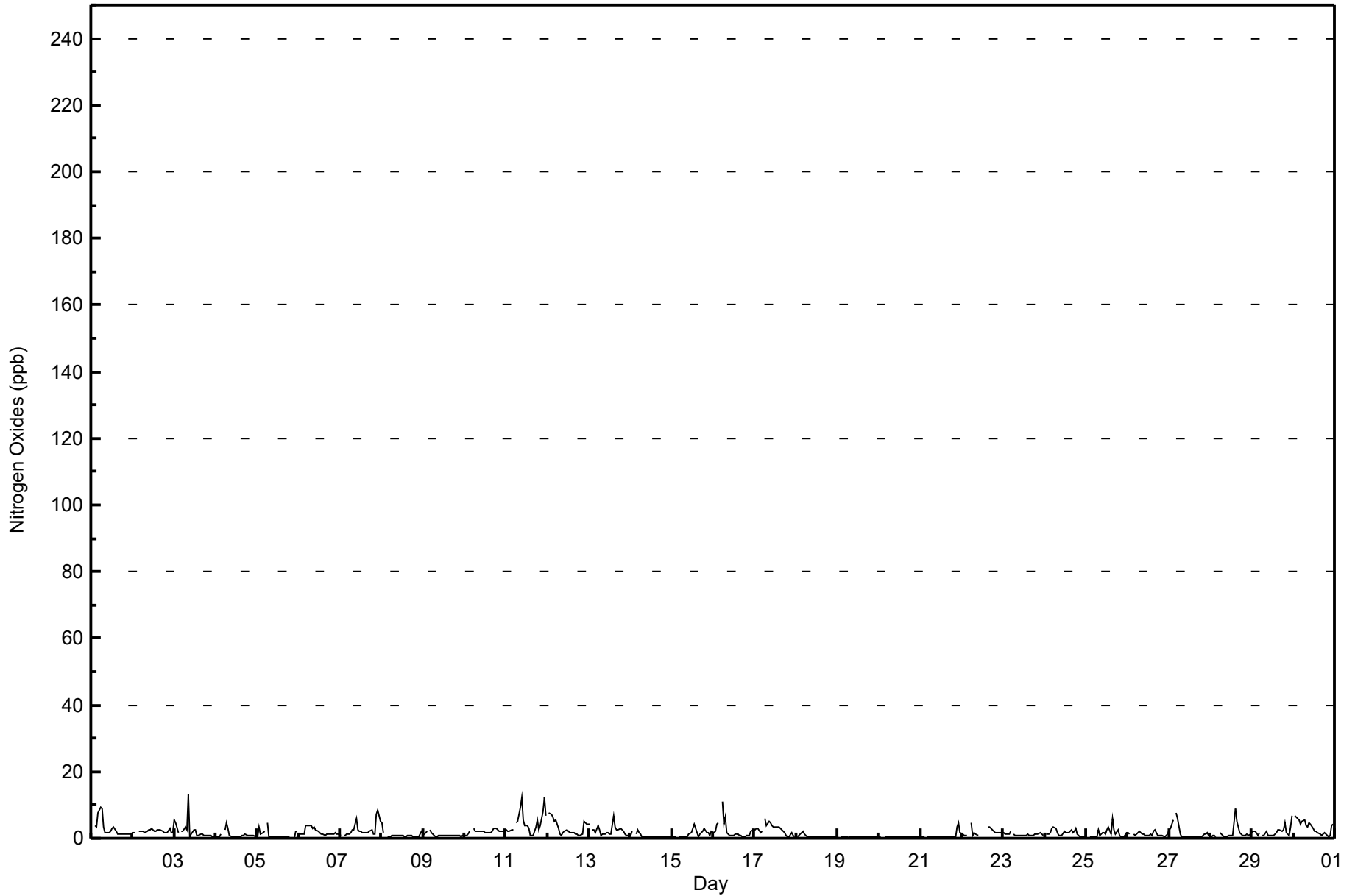




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Firebag - June 2023

Maximum Value: 13.3 ppb on Jun 3 09:00		Maximum Daily Average: 4.5 ppb on Jun 11		Hours in Service: 720																							
Minimum Value: 0.1 ppb on Jun 5 21:00		Minimum Daily Average: 0.3 ppb on Jun 19		Hours of Data: 685																							
Maximum Diurnal Average: 2.9 ppb at hour 6		Minimum Diurnal Average: 1.0 ppb at hour 21		Hours of Missing Data: 35																							
Monthly Average: 1.74 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.2 Q ₃ = 2.2 P ₉₀ = 3.8 P ₉₉ = 8.9		Hours of Calibration: 35																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	4.6	Z	4.0	3.2	7.7	9.4	8.8	3.2	1.8	1.7	1.9	1.9	2.8	3.4	2.1	1.3	1.2	1.3	1.2	1.1	1.3	1.3	1.3	1.1	3.0	9.4	
2-Jun	1.7	1.8	Z	2.1	2.2	2.1	2.2	1.9	2.2	2.5	2.7	2.8	2.2	2.2	2.7	2.5	2.4	2.1	1.8	1.6	1.7	3.0	1.6	1.5	2.1	3.0	
3-Jun	5.7	4.7	1.5	Z	2.3	2.1	3.3	2.6	13.3	0.6	1.1	2.6	2.5	0.9	1.0	1.3	1.4	0.8	1.0	1.0	0.9	1.0	0.6	0.5	2.3	13.3	
4-Jun	0.5	0.6	0.6	1.4	Z	2.5	4.7	3.2	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.9	0.8	1.2	0.7	0.7	0.8	0.8	0.8	0.3	1.0	4.7	
5-Jun	0.3	3.2	1.4	1.6	2.0	Z	4.7	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.2	2.0	2.1	0.9	4.7	
6-Jun	Z	1.1	1.1	1.1	3.9	3.7	3.7	2.9	3.2	2.7	2.0	1.5	1.2	1.3	0.9	1.2	1.1	1.2	1.3	1.2	1.8	1.2	1.3	1.9	3.9		
7-Jun	0.8	Z	0.7	0.8	1.1	1.3	1.6	2.5	2.5	5.8	2.7	2.0	1.9	1.5	1.6	1.7	1.8	2.2	2.4	1.5	1.2	7.4	8.3	5.1	2.5	8.3	
8-Jun	4.8	1.6	Z	0.6	0.4	0.4	0.7	0.8	0.9	1.0	0.8	0.8	0.7	0.6	0.6	0.9	1.0	0.9	0.6	0.5	0.4	0.5	1.2	2.0	1.0	4.8	
9-Jun	1.7	1.4	2.1	Z	2.5	1.9	0.8	0.6	0.6	0.9	1.0	0.8	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	1.0	0.8	0.6	0.7	1.0	2.5	
10-Jun	0.7	0.7	1.3	2.0	Z	2.8	2.2	2.1	2.2	2.1	2.1	2.0	1.9	1.9	1.8	1.9	2.2	2.9	3.0	2.4	2.0	2.0	2.1	2.2	2.0	3.0	
11-Jun	2.5	2.1	2.1	2.5	2.5	Z	4.6	5.1	9.2	12.5	5.5	3.8	3.7	2.9	0.8	0.9	0.9	3.5	5.6	2.5	3.9	8.1	12.3	6.6	4.5	12.5	
12-Jun	Z	7.6	7.1	6.5	5.1	5.4	3.0	1.2	1.0	1.7	2.1	2.6	2.3	1.8	1.5	1.5	1.4	1.2	1.0	0.8	1.1	5.1	4.8	4.3	3.1	7.6	
13-Jun	4.4	Z	2.7	2.4	1.9	3.8	2.4	1.0	1.2	1.4	1.6	1.5	1.4	1.4	6.9	3.4	2.7	2.5	3.0	2.5	2.0	1.5	0.9	0.9	2.3	6.9	
14-Jun	0.8	2.0	Z	1.4	2.5	1.7	1.3	0.5	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	2.5
15-Jun	0.3	0.3	0.3	Z	0.4	0.5	0.5	0.4	0.4	0.5	1.4	1.5	3.0	4.2	2.8	0.6	1.1	1.7	2.0	2.9	1.7	1.7	1.1	2.1	1.4	4.2	
16-Jun	1.7	2.2	4.4	4.7	Z	11.2	4.1	6.4	1.7	0.7	1.1	1.0	1.0	1.2	1.4	1.0	0.8	0.6	0.6	0.8	1.0	0.7	2.0	2.4	2.3	11.2	
17-Jun	2.7	3.0	2.8	1.5	2.0	Z	5.8	3.9	5.2	4.8	3.6	3.3	3.3	3.5	3.3	2.9	2.7	1.7	0.7	0.5	0.5	1.6	0.9	0.4	2.6	5.8	
18-Jun	Z	0.5	1.3	1.7	2.0	1.4	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.6	2.0
19-Jun	0.3	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.5
20-Jun	0.3	0.2	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.3	0.3	0.3	0.5
21-Jun	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	3.3	4.5	1.9	0.7	4.5	
22-Jun	1.4	0.6	0.8	0.6	Z	4.6	1.0	1.5	1.2	0.7	C	C	C	C	C	3.5	3.2	3.0	2.0	1.8	1.5	1.8	1.9	1.7	1.8	4.6	
23-Jun	1.5	1.1	1.1	1.3	2.1	Z	1.1	0.7	0.8	0.7	0.7	0.8	0.8	0.9	1.1	0.9	0.8	0.9	1.1	1.5	1.5	1.8	1.2	0.8	1.1	2.1	
24-Jun	Z	1.2	1.3	1.9	3.0	3.3	3.0	1.5	1.0	0.8	1.0	1.9	1.6	1.7	1.5	2.7	1.9	2.0	2.8	1.2	0.3	0.2	0.2	0.2	1.6	3.3	
25-Jun	0.2	Z	0.3	0.2	0.2	0.2	0.6	2.6	0.9	1.8	1.5	1.4	2.6	3.5	1.4	6.1	2.4	1.3	2.7	0.8	0.3	0.3	0.5	1.9	1.5	6.1	
26-Jun	1.6	1.2	Z	1.2	1.1	1.3	1.5	2.2	1.1	1.2	0.8	0.8	0.9	1.1	1.0	2.3	2.6	0.9	0.6	0.9	1.0	0.6	0.7	1.3	1.2	2.6	
27-Jun	2.6	3.0	5.7	Z	7.6	6.0	1.3	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	1.2	1.4	1.6	0.7	1.6	7.6	
28-Jun	0.5	0.7	1.0	0.5	Z	1.8	1.3	0.7	0.6	0.6	1.0	0.7	0.8	1.0	8.9	5.2	3.5	1.8	0.9	1.0	0.7	1.2	0.8	1.1	1.6	8.9	
29-Jun	2.2	1.9	2.1	1.0	1.9	Z	1.0	1.0	2.0	1.0	0.9	0.8	1.0	1.4	1.8	2.5	2.7	2.3	2.4	4.5	1.9	1.0	3.4	6.8	2.1	6.8	
30-Jun	Z	6.7	5.8	5.4	4.4	5.2	5.3	3.9	3.6	4.5	4.2	2.8	2.3	2.0	1.8	1.1	1.0	1.1	1.7	1.4	0.6	0.9	3.8	4.2	3.2	6.7	
																								Diurnal Average			
																								Diurnal Maximum			
																								1.8 2.0 2.1 1.9 2.4 2.9 2.4 1.8 2.0 1.8 1.5 1.4 1.4 1.5 1.7 1.6 1.4 1.3 1.4 1.2 1.0 1.7 2.1 1.8			
																								5.7 7.6 7.1 6.5 7.7 11.2 8.8 6.4 13.3 12.5 5.5 3.8 3.7 4.2 8.9 6.1 3.5 3.5 5.6 4.5 3.9 8.1 12.3 6.8			
Z - zerospan																								C - Calibration			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Firebag - June 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



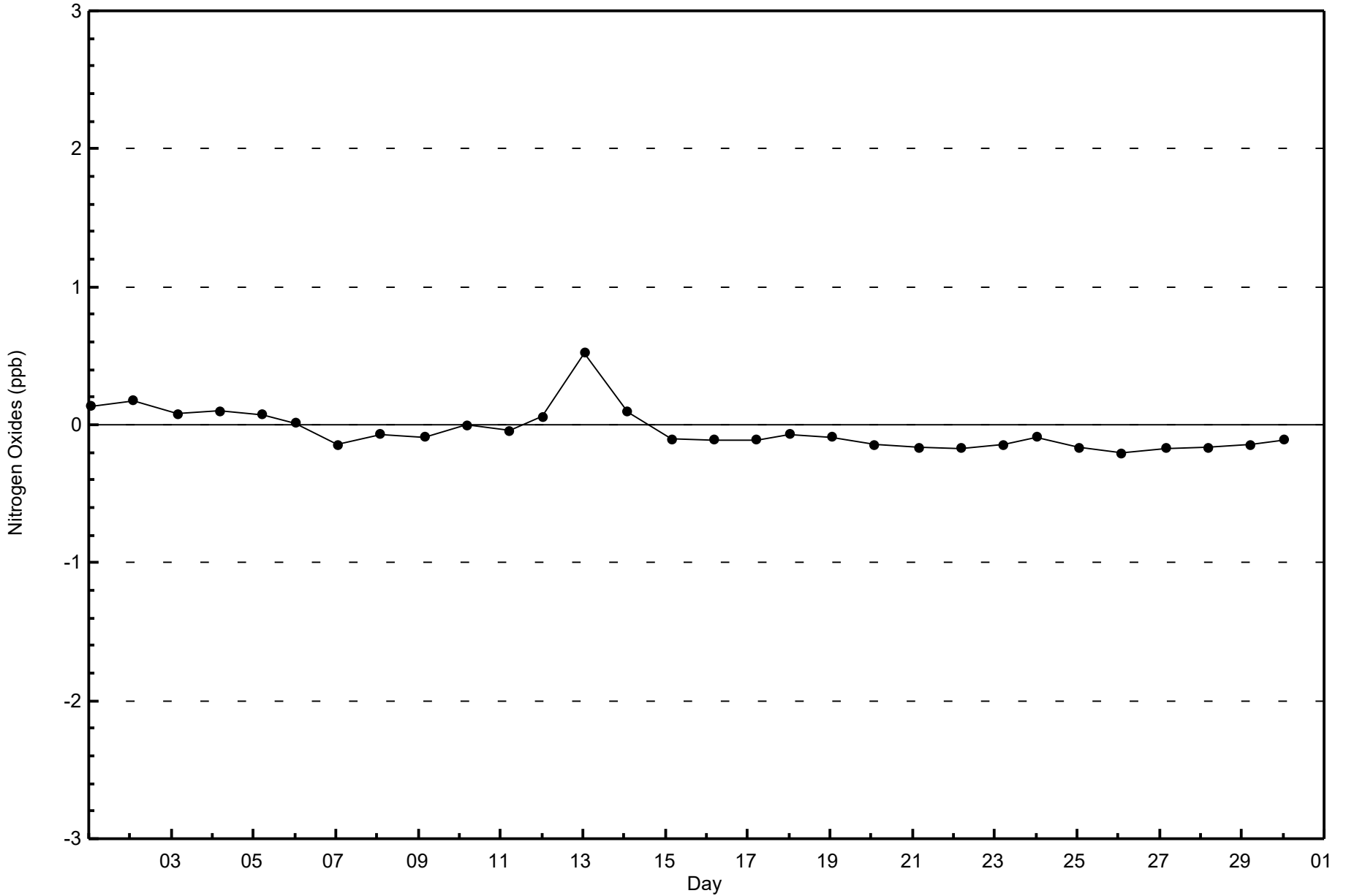
**Wood Buffalo Environmental Association
Frequency Distribution**

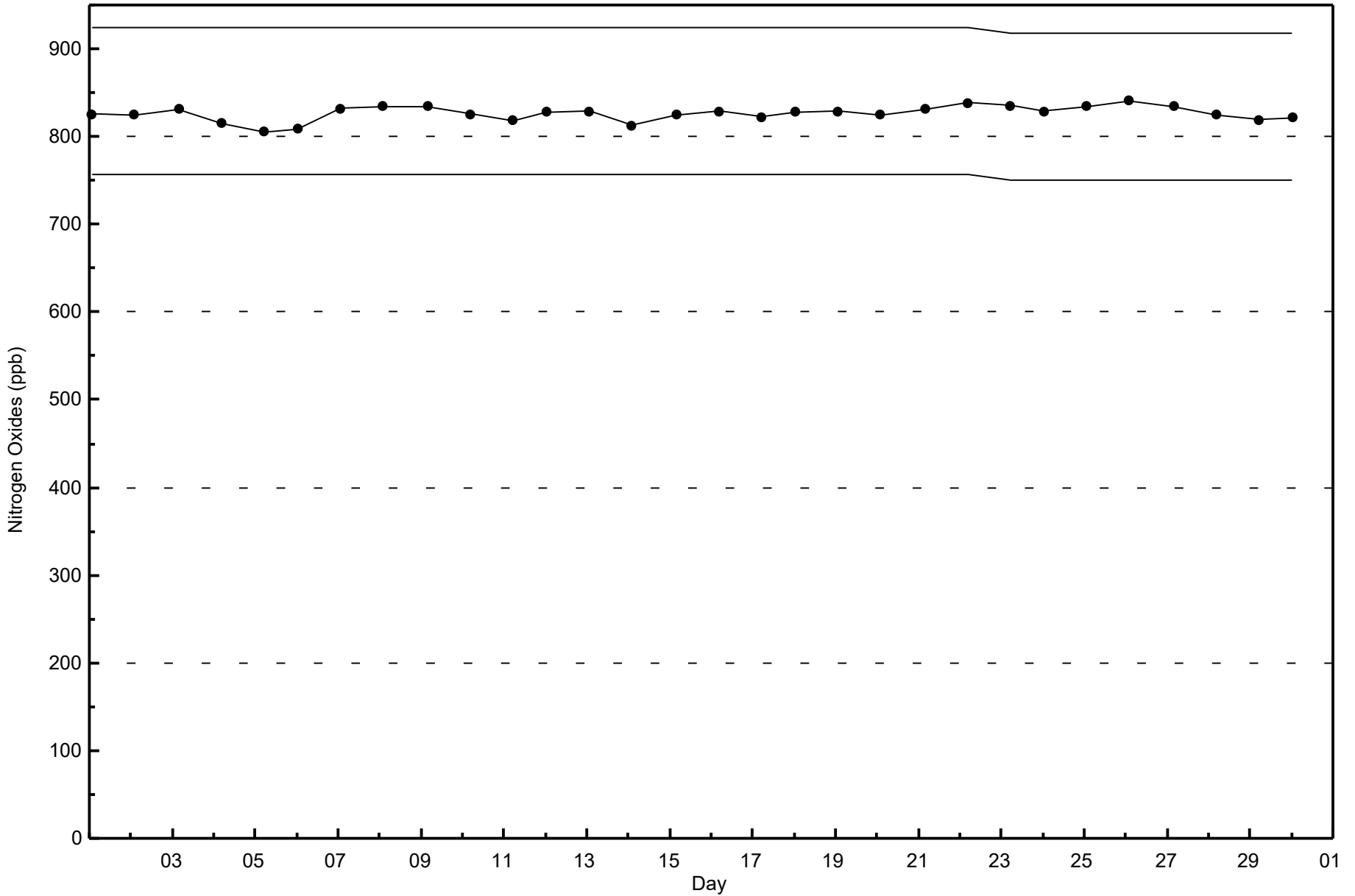
**Nitrogen Oxides (NO_x) - ppb
Firebag - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	88	57	53	25	20	27	27	30	76	68	53	55	17	10	21	58	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	88	57	53	25	20	27	27	30	76	68	53	55	17	10	21	58	685

Total Number of Valid Hours: 685

Total Number of Hours: 720



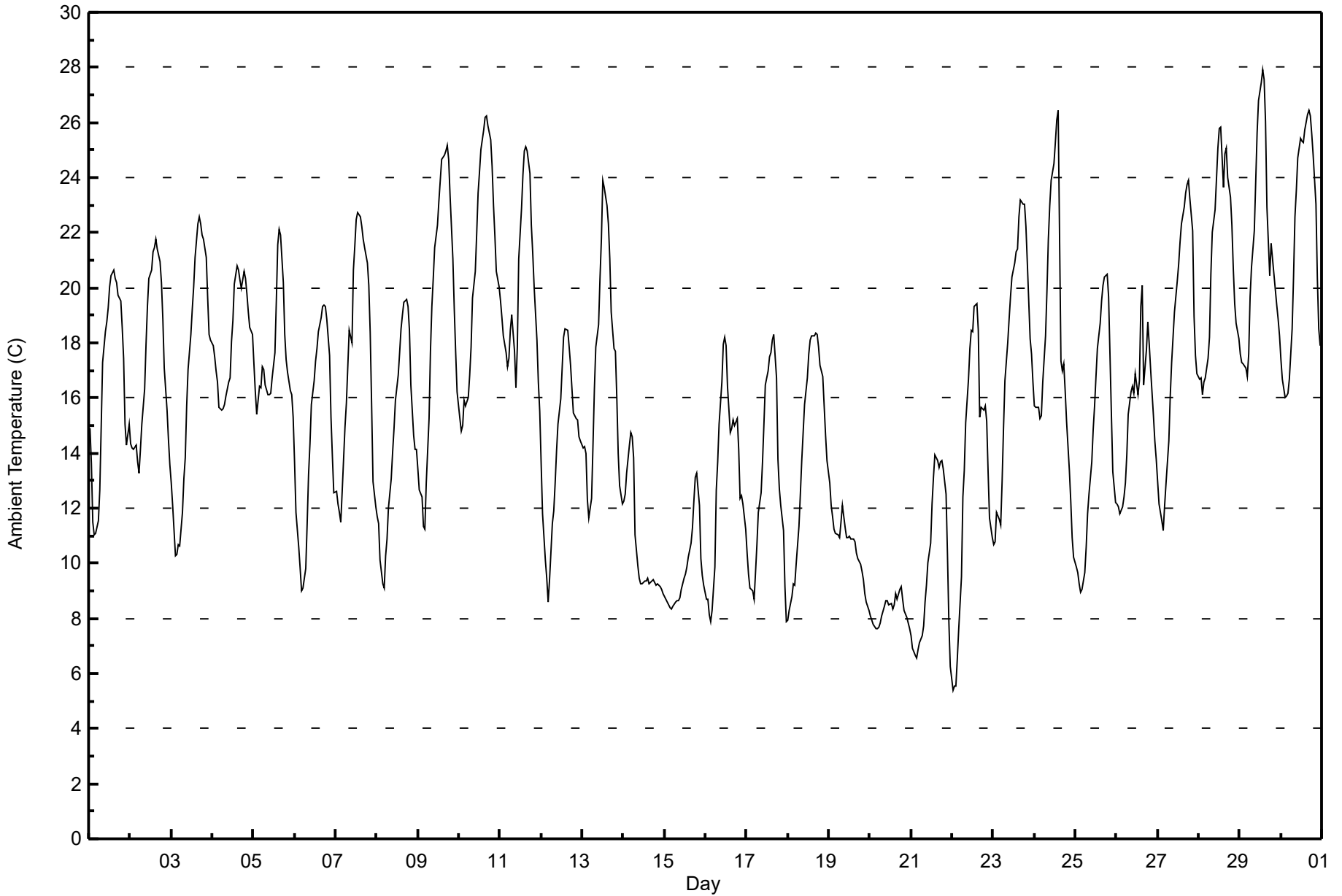




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Firebag - June 2023

Maximum Value: 27.9 C on Jun 29 14:00 Maximum Daily Average: 21.6 C on Jun 30																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 5.4 C on Jun 22 01:00 Minimum Daily Average: 8.3 C on Jun 20 Maximum Diurnal Average: 19.7 C at hour 15 Minimum Diurnal Average: 11.8 C at hour 5 Monthly Average: 15.87 C Percentiles: P ₁ = 6.9 P ₁₀ = 9.1 Q ₁ = 11.9 Median = 16.1 Q ₃ = 19.3 P ₉₀ = 22.6 P ₉₉ = 26.3																						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-Jun	14.9	13.7	11.5	11.0	11.1	11.6	12.7	15.0	17.3	18.4	18.8	19.3	20.0	20.4	20.7	20.3	20.2	19.7	19.5	18.5	17.5	15.1	14.3	15.0	16.5	20.7
2-Jun	14.3	14.2	14.1	14.3	13.7	13.3	14.2	15.1	16.3	17.9	19.3	20.4	20.7	21.3	21.5	21.8	21.4	21.0	20.2	18.9	17.1	15.6	14.5	13.6	17.3	21.8
3-Jun	12.9	12.1	10.3	10.3	10.7	10.6	11.8	13.1	13.8	15.7	17.0	18.3	19.2	20.0	21.1	22.3	22.6	22.3	21.9	21.8	21.1	19.6	18.3	18.1	16.9	22.6
4-Jun	17.9	17.5	17.0	16.6	15.7	15.5	15.6	15.8	16.1	16.6	16.8	18.0	18.8	20.1	20.8	20.6	20.3	20.0	20.6	20.3	19.8	19.1	18.5	18.3	18.2	20.8
5-Jun	17.2	16.2	15.4	16.4	16.4	17.2	17.0	16.5	16.1	16.1	16.1	16.7	17.7	19.6	21.5	22.1	21.9	20.2	18.3	17.4	16.9	16.3	16.1	15.3	17.5	22.1
6-Jun	13.7	11.9	10.6	9.8	9.0	9.1	9.8	11.4	13.2	14.3	15.7	16.6	17.3	17.8	18.4	18.9	19.3	19.4	19.3	18.9	17.6	15.3	13.9	12.5	14.7	19.4
7-Jun	12.6	12.2	11.9	11.5	12.6	15.0	15.8	17.1	18.5	18.0	20.6	21.5	22.5	22.7	22.6	22.2	21.8	21.5	20.9	20.1	18.4	15.8	13.0	12.1	17.5	22.7
8-Jun	11.7	11.4	10.1	9.3	9.1	10.3	10.9	12.0	13.1	14.1	14.9	15.9	16.8	17.6	18.5	19.0	19.5	19.6	19.3	18.4	16.5	14.6	14.1	14.2	14.6	19.6
9-Jun	13.4	12.7	12.4	11.4	11.3	12.9	15.3	17.7	19.3	20.3	21.5	22.3	23.1	23.9	24.7	24.8	25.0	25.2	24.7	23.3	21.0	19.2	17.6	16.2	19.1	25.2
10-Jun	15.3	14.8	15.0	15.9	15.7	16.0	16.8	17.8	19.6	20.6	22.0	23.4	24.2	25.0	25.7	26.2	26.3	25.9	25.3	24.4	23.0	21.8	20.6	20.0	20.9	26.3
11-Jun	19.5	18.9	18.2	17.6	17.1	17.4	18.4	19.0	17.7	16.4	17.8	21.1	22.9	24.1	25.0	25.1	25.0	24.2	22.3	21.3	20.0	18.1	16.6	15.5	20.0	25.1
12-Jun	13.6	11.8	10.1	9.5	8.6	9.4	11.5	11.9	12.9	14.1	15.1	15.9	17.1	18.2	18.5	18.5	17.8	17.2	16.3	15.5	15.3	15.2	14.6	14.4	14.3	18.5
13-Jun	14.2	14.2	14.0	12.3	11.6	12.3	14.3	16.3	17.9	18.7	20.3	21.8	23.9	23.7	23.0	22.3	21.1	19.1	17.8	17.7	16.0	14.0	12.8	12.2	17.1	23.9
14-Jun	12.2	12.5	13.3	14.3	14.7	14.6	13.9	11.0	9.9	9.5	9.3	9.4	9.4	9.5	9.3	9.3	9.4	9.3	9.2	9.2	9.1	9.0	8.9	8.9	10.6	14.7
15-Jun	8.8	8.7	8.5	8.4	8.3	8.4	8.6	8.6	8.6	8.7	9.0	9.5	9.6	9.9	10.2	10.7	11.3	12.3	13.1	13.3	12.1	10.2	9.6	9.2	9.8	13.3
16-Jun	8.7	8.7	8.1	7.9	8.3	9.9	12.7	13.7	15.1	16.6	18.0	18.2	17.9	16.4	14.7	14.9	15.2	15.0	15.3	14.1	12.4	12.4	12.2	11.3	13.2	18.2
17-Jun	10.4	9.6	9.1	9.0	8.7	9.7	10.7	11.8	12.6	13.7	15.1	16.5	17.0	17.5	17.6	18.1	18.3	16.7	13.8	12.7	12.1	11.2	9.2	7.9	12.9	18.3
18-Jun	7.9	8.3	8.8	9.2	9.2	10.0	11.4	12.5	13.7	14.8	15.8	16.8	17.6	18.1	18.2	18.3	18.4	18.3	17.9	17.2	16.8	15.7	14.6	13.7	14.3	18.4
19-Jun	12.9	12.1	11.7	11.3	11.1	11.0	10.9	11.5	12.1	11.3	10.9	10.9	11.0	10.9	10.9	10.8	10.4	10.2	9.9	9.7	9.4	8.9	8.6	8.3	10.7	12.9
20-Jun	8.1	8.0	7.8	7.6	7.7	7.7	7.8	8.1	8.4	8.6	8.6	8.5	8.5	8.3	8.5	8.9	8.7	9.0	9.1	8.7	8.3	8.0	7.8	7.6	8.3	9.1
21-Jun	7.4	6.9	6.7	6.6	6.9	7.1	7.4	7.7	8.6	9.2	10.0	10.7	12.1	13.1	13.9	13.7	13.5	13.7	13.7	13.4	12.5	10.3	7.9	6.2	10.0	13.9
22-Jun	5.4	5.6	5.5	6.5	7.6	9.5	12.4	13.4	15.1	16.7	17.8	18.5	18.4	19.3	19.4	18.4	15.3	15.7	15.6	15.7	15.2	13.3	11.7	10.9	13.4	19.4
23-Jun	10.7	10.8	11.8	11.6	11.4	12.9	14.9	16.6	18.0	18.8	19.7	20.4	20.9	21.3	21.4	22.6	23.2	23.0	23.0	22.2	20.9	18.1	17.6	16.6	17.9	23.2
24-Jun	15.7	15.7	15.7	15.3	15.4	16.6	18.2	19.9	21.8	23.0	23.9	24.5	25.3	26.1	26.4	17.3	17.0	17.3	16.3	15.2	13.4	12.3	10.9	10.2	18.0	26.4
25-Jun	9.8	9.7	9.2	8.9	9.0	9.6	10.6	11.8	12.5	13.7	14.8	15.7	16.8	17.8	18.7	19.5	20.1	20.4	20.5	19.7	17.5	15.4	13.3	12.2	14.5	20.5
26-Jun	12.1	12.1	11.8	12.1	12.4	12.9	13.9	15.4	16.2	16.4	16.1	16.9	16.1	16.6	19.3	20.1	16.5	17.8	18.8	18.0	17.1	15.4	14.4	13.8	15.5	20.1
27-Jun	13.0	12.2	11.6	11.2	12.1	12.9	14.4	16.1	17.3	18.2	19.1	20.3	20.9	21.7	22.3	22.9	23.4	23.7	23.9	23.2	22.1	19.0	17.5	16.9	18.2	23.9
28-Jun	16.7	16.7	16.1	16.6	16.7	17.4	18.2	20.5	22.0	22.8	23.9	25.1	25.8	25.8	23.7	24.9	25.1	24.0	23.3	22.3	20.7	19.4	18.7	18.2	21.0	25.8
29-Jun	17.6	17.3	17.2	17.1	16.8	17.6	19.7	20.8	22.1	23.9	25.7	26.8	27.5	27.9	27.5	26.0	22.9	20.4	21.6	21.0	20.5	19.4	18.9	18.3	21.4	27.9
30-Jun	17.4	16.7	16.0	16.1	16.1	16.7	18.5	20.4	22.6	23.5	24.7	25.4	25.3	25.3	25.7	26.3	26.4	26.2	25.6	24.8	23.0	20.3	18.5	17.9	21.6	26.4
																						Diurnal Average				
																						Diurnal Maximum				





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Firebag - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	114	15.83	15.83
10 - 20	447	62.08	77.92
> 20	159	22.08	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



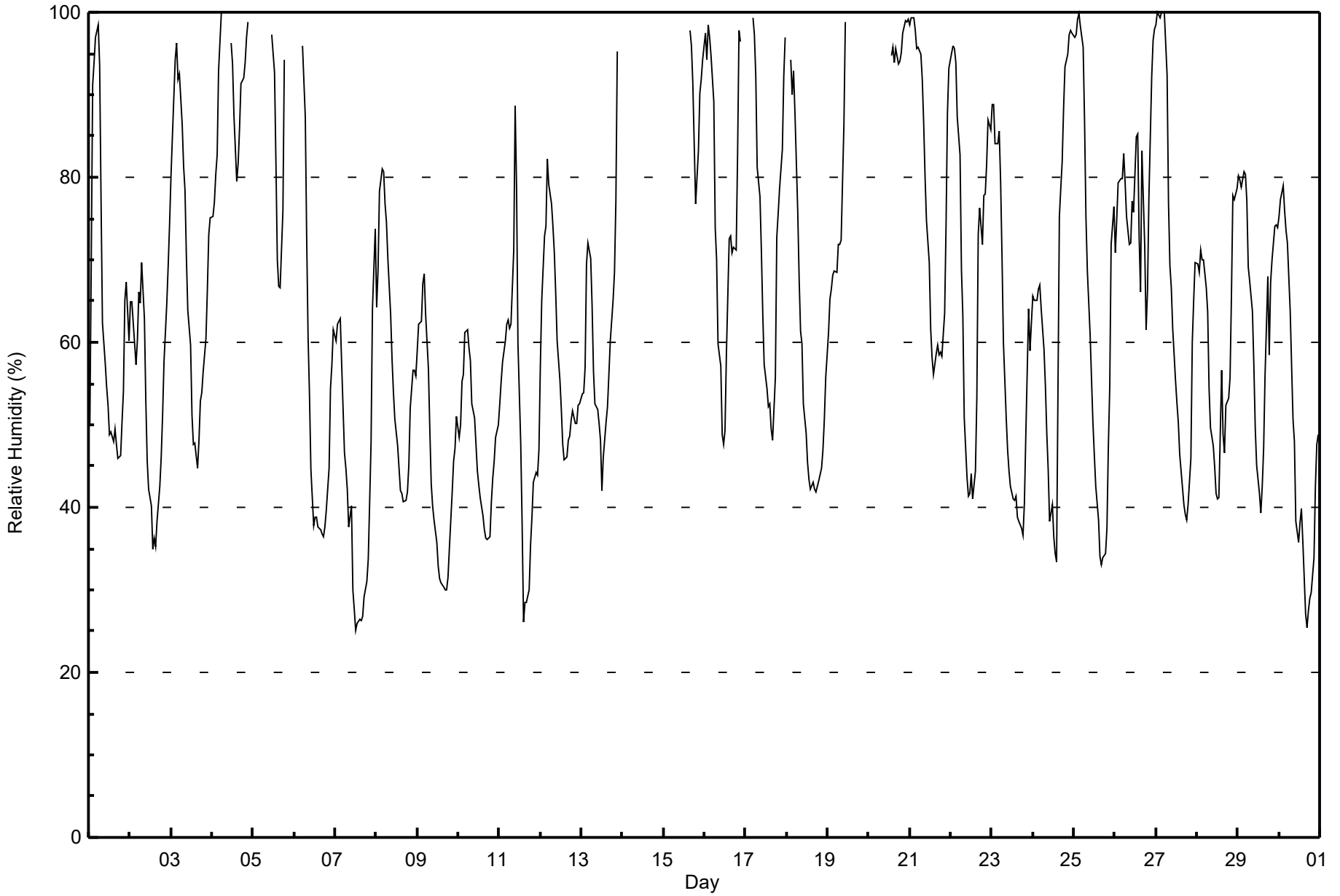
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Firebag - June 2023

Maximum Value: 100.0 % on Jun 4 06:00		Maximum Daily Average: 78.1 % on Jun 26		Hours in Service: 720																																												
Minimum Value: 25.1 % on Jun 7 13:00		Minimum Daily Average: 42.7 % on Jun 7		Hours of Data: 626																																												
Maximum Diurnal Average: 81.5 % at hour 5		Minimum Diurnal Average: 48.6 % at hour 15		Hours of Missing Data: 94																																												
Monthly Average: 63.63 %		Percentiles: P ₁ = 26.9 P ₁₀ = 38.4 Q ₁ = 47.2 Median = 61.9 Q ₃ = 78.6 P ₉₀ = 95.0 P ₉₉ = 100.0		Hours of Calibration: 0																																												
				Percent Operational Time: 86.9																																												
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-Jun	49.8	69.9	91.2	93.9	97.0	98.5	93.5	77.3	62.4	57.5	54.6	52.4	48.7	49.2	47.9	49.5	47.7	46.0	46.3	50.4	54.0	65.0	67.2	60.1	63.8	98.5																						
2-Jun	64.9	64.9	62.3	57.3	60.3	66.1	64.8	69.7	62.9	52.9	45.7	42.2	40.2	34.8	36.3	35.3	38.4	42.6	46.1	51.2	57.6	64.8	69.4	74.4	54.4	74.4																						
3-Jun	80.2	84.9	94.3	96.2	91.8	92.6	86.5	81.4	78.5	70.3	63.9	59.7	51.2	47.7	47.8	44.8	48.2	53.0	53.8	56.4	60.5	66.4	73.0	75.1	69.1	96.2																						
4-Jun	75.2	76.9	80.3	82.7	92.9	100.0	OR	OR	OR	OR	OR	96.2	93.7	87.5	79.5	81.7	85.9	91.4	92.1	93.9	96.9	98.8	OR	OR	--	100.0																						
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	97.4	92.7	81.9	69.9	66.8	66.7	76.0	94.2	OR	OR	OR	OR	OR	--	97.4																						
6-Jun	OR	OR	OR	OR	OR	95.9	87.3	72.3	60.5	53.6	44.6	37.9	38.9	38.9	37.5	37.3	36.8	36.5	37.7	39.6	44.8	54.5	57.2	61.5	51.2	95.9																						
7-Jun	60.1	62.3	62.5	62.9	57.3	46.5	44.7	42.3	37.7	40.1	30.0	27.7	25.1	25.9	26.5	26.3	26.9	29.1	30.9	33.7	40.6	47.8	64.1	73.7	42.7	73.7																						
8-Jun	64.2	68.7	78.3	81.0	80.7	76.8	74.6	70.2	63.3	57.9	53.8	50.7	47.5	44.7	42.0	41.7	40.6	40.9	41.8	45.0	52.1	56.6	56.7	56.0	57.7	81.0																						
9-Jun	59.0	62.2	62.5	67.1	68.3	63.4	56.8	49.5	42.8	40.2	38.5	35.8	32.8	31.3	30.9	30.4	29.9	29.9	31.5	35.0	41.9	45.6	47.2	50.9	45.1	68.3																						
10-Jun	48.4	50.0	55.3	56.1	61.2	61.5	59.3	57.8	52.6	50.8	47.6	44.4	42.6	41.2	38.9	37.3	36.3	36.1	36.4	40.6	43.6	45.7	48.4	49.9	47.6	61.5																						
11-Jun	52.6	55.2	57.6	60.2	62.1	62.7	61.7	62.1	71.2	88.7	78.9	59.9	47.6	37.8	26.1	28.5	28.4	30.1	35.4	38.9	43.0	44.3	43.8	46.9	51.0	88.7																						
12-Jun	57.2	65.1	72.9	74.0	82.2	79.1	76.7	74.0	70.8	66.0	60.1	55.5	51.9	47.6	45.8	46.0	48.1	48.7	50.5	51.7	50.2	50.2	52.4	52.5	59.6	82.2																						
13-Jun	53.7	53.9	57.0	69.4	72.0	70.2	64.4	56.4	52.5	51.8	50.1	48.2	42.0	46.1	50.4	52.1	56.2	60.1	65.1	68.4	77.0	95.2	OR	OR	59.7	95.2																						
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	100.0																						
15-Jun	OR	OR	OR	100.0	100.0	100.0	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	97.8	95.9	91.4	83.9	76.7	83.3	90.2	91.9	94.3	--	100.0																					
16-Jun	97.5	94.3	98.5	96.9	94.7	89.1	73.9	70.0	59.8	57.1	48.8	47.6	49.3	58.7	72.6	72.9	70.8	71.5	71.1	82.9	97.8	96.4	OR	97.0	76.9	98.5																						
17-Jun	OR	OR	OR	OR	99.3	97.3	92.3	81.1	77.7	71.0	63.4	57.2	54.4	52.3	52.5	49.5	48.1	55.7	72.8	75.6	78.6	83.3	92.2	97.0	72.6	99.3																						
18-Jun	OR	OR	94.2	90.0	92.8	87.8	75.8	67.7	61.4	59.8	52.5	49.0	45.4	43.3	42.2	43.0	42.1	41.9	42.5	43.3	44.7	46.9	50.6	55.7	57.9	94.2																						
19-Jun	61.1	65.2	66.4	68.1	68.6	68.5	71.8	71.9	72.4	86.4	98.9	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	98.9																					
20-Jun	OR	OR	OR	100.0	100.0	100.0	OR	OR	OR	OR	OR	OR	OR	94.8	95.8	94.0	95.6	93.7	94.1	95.2	97.4	99.1	98.8	99.2	--	100.0																						
21-Jun	98.5	99.3	99.3	97.8	95.6	95.8	95.0	91.8	86.6	80.0	74.8	69.7	61.7	58.2	56.2	58.7	59.7	58.6	58.8	58.3	63.5	74.2	87.8	93.3	78.0	99.3																						
22-Jun	95.1	96.0	95.6	93.9	87.3	82.7	68.9	63.2	50.8	43.6	41.3	41.8	44.1	40.9	44.4	53.2	73.1	76.2	71.9	77.7	78.0	81.5	87.0	85.7	69.7	96.0																						
23-Jun	88.8	88.8	84.1	84.0	85.6	79.5	70.3	60.0	50.9	47.0	44.4	42.6	41.1	40.8	41.4	38.7	38.4	37.5	36.7	40.5	48.6	64.0	59.0	62.4	57.3	88.8																						
24-Jun	65.6	65.2	65.2	66.4	66.9	64.0	59.1	54.8	49.0	44.6	38.3	40.3	36.4	34.3	33.4	33.4	75.3	78.6	81.9	88.4	93.4	94.8	97.3	97.7	97.4	66.2	97.7																					
25-Jun	96.9	97.4	99.2	99.8	98.3	95.7	86.8	75.1	68.6	60.8	55.4	50.2	46.3	42.6	38.5	34.0	33.1	33.8	34.5	37.5	47.4	54.5	71.9	76.5	63.9	99.8																						
26-Jun	70.9	74.8	79.3	79.8	79.9	82.9	79.3	75.2	71.8	72.0	77.1	75.7	84.8	85.2	72.9	66.1	83.3	71.8	61.5	66.2	77.6	92.2	96.6	98.0	78.1	98.0																						
27-Jun	98.5	100.0	99.4	100.0	OR	100.0	92.3	77.0	69.4	66.6	61.7	55.4	52.7	50.4	46.4	42.4	40.3	39.2	38.4	40.3	46.0	60.1	65.0	69.7	65.7	100.0																						
28-Jun	69.6	68.5	71.2	70.0	70.0	66.7	63.7	54.5	49.6	47.5	44.9	41.8	40.9	41.2	56.6	48.8	46.6	52.4	53.3	55.7	65.7	77.8	77.3	78.6	58.9	78.6																						
29-Jun	80.2	79.6	78.8	80.6	80.3	77.1	69.2	67.5	63.8	57.3	49.7	45.1	41.8	39.3	42.5	47.1	55.9	68.0	58.4	67.3	70.0	74.1	74.3	73.9	64.2	80.6																						
30-Jun	75.3	77.3	78.9	75.9	73.6	72.1	63.8	57.2	50.6	48.0	38.3	35.8	38.2	39.8	35.9	27.1	25.4	27.5	29.0	29.6	33.9	42.6	47.6	48.8	48.8	78.9																						
																								72.3	74.8	78.5	80.9	81.5	81.2	73.3	67.2	61.5	58.9	56.1	52.3	49.7	49.5	48.6	50.9	52.7	54.3	57.1	58.8	62.6	69.2	69.9	73.1	Diurnal Average
																								98.5	100.0	99.4	100.0	100.0	100.0	95.0	91.8	86.6	88.7	100.0	97.4	93.7	94.8	95.8	97.8	95.9	93.7	100.0	100.0	97.8	99.1	98.8	99.2	Diurnal Maximum
OR - Out of Range																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Firebag - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	74	11.82	11.82
40 - 60	220	35.14	46.96
60 - 80	187	29.87	76.84
80 - 100	133	21.25	98.08

Total Number of Valid Hours: 626

Total Number of Hours: 720

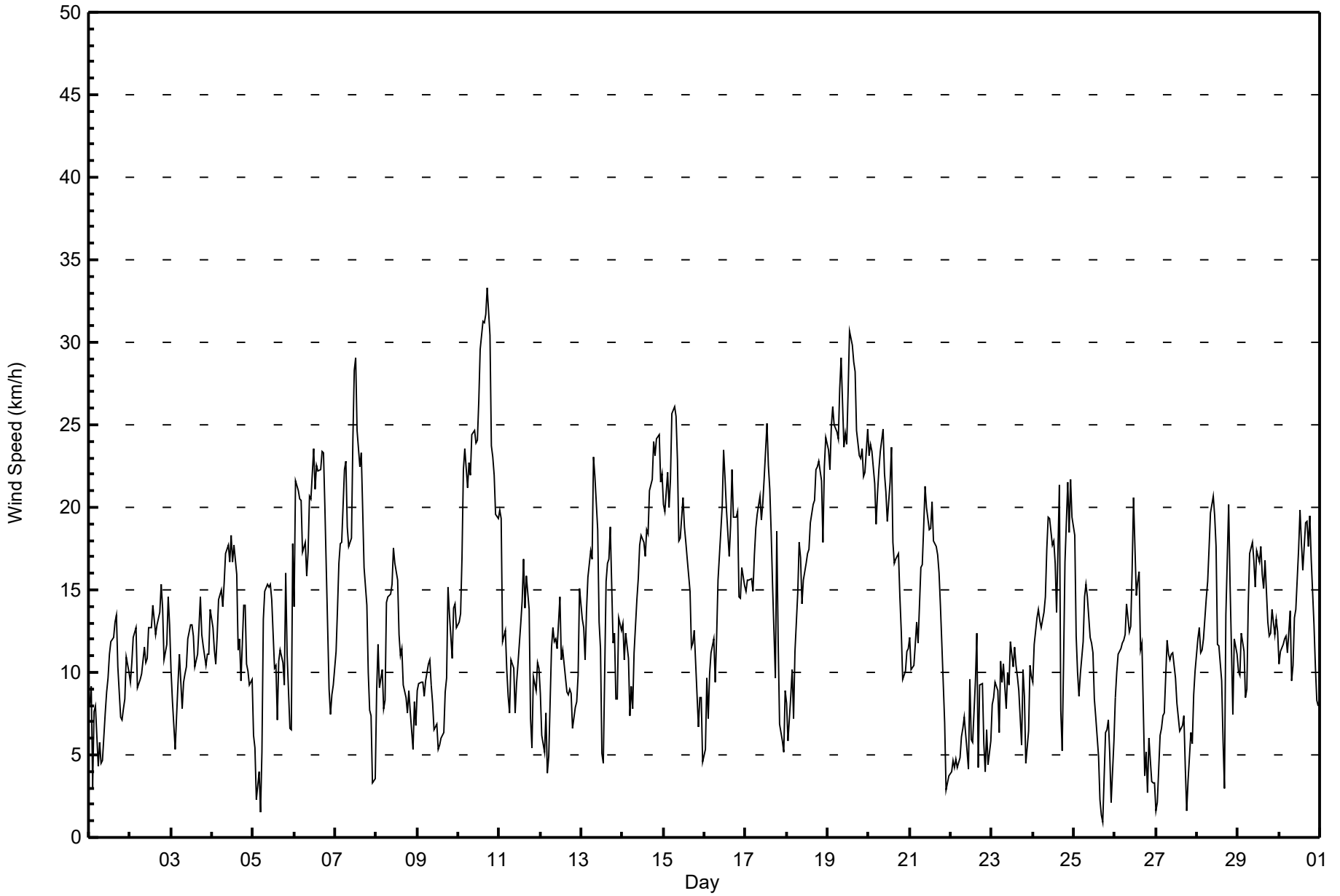


Maximum Speed: 33 km/h on Jun 10 18:00	Maximum Daily Speed Average: 24.5 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 25 18:00	Minimum Daily Speed Average: 4.4 km/h on Jun 27	Hours of Data: 720
Maximum Diurnal Speed Average: 5.1 km/h at hour 16	Minimum Diurnal Speed Average: 0.3 km/h at hour 8	Hours of Missing Data: 0
Monthly Average Velocity: 0.7 km/h 292.1 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 9 Median = 12 Q ₃ = 18 P ₉₀ = 22 P ₉₉ = 29	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	NW8	S9	N3	NNW8	NW8	N4	ENE6	NE4	NNE5	WNW8	NNW9	NNW10	NNW11	NNW12	NNW12	N13	NNE13	NNE10	NNE7	NNE7	NNE8	N8	NNW11	N10	N6.8	NNE13
2-Jun	NNW9	N11	N12	NE13	NNE9	N9	NNE10	NE10	NE12	NNE11	NNE11	N13	N13	N14	N13	NNE12	NE13	NE14	NE15	ENE14	ENE11	E12	E15	E13	NNE10.3	NE15
3-Jun	E10	ESE8	SE5	ESE7	E9	ESE11	E8	ENE9	E10	ENE10	ENE12	ENE13	ESE13	SE12	ESE10	ESE11	SE13	SE15	SE12	ESE12	ESE10	ESE11	ESE11	ESE14	ESE10.0	SE15
4-Jun	ESE13	SE11	ESE11	ESE12	ESE14	ESE15	ESE14	ESE15	ESE17	ESE18	ESE17	ESE18	SE17	SE18	SSE16	SE11	SE12	SE9	SE14	SE14	SE10	SE10	SE9	S10	SE13.1	ESE18
5-Jun	WSW6	W5	SE2	SSW4	S2	NW5	NNW13	N15	N15	N15	N15	NNW14	NNE10	NE10	NE7	NNE11	NNE11	NNE11	NNE9	ENE16	NE11	ENE7	WSW7	WSW18	N6.2	WSW18
6-Jun	W14	WSW22	WSW21	WSW21	WSW20	WSW17	WSW18	WSW16	WSW17	WSW21	WSW21	WSW24	WSW21	SW23	SW22	SW22	WSW23	SW23	SW20	SW16	SW9	S7	S9	S9	WSW17.3	WSW24
7-Jun	S11	S14	S17	S18	S18	SSW22	SW23	SW19	SW18	SW18	SW24	WSW28	WSW29	W25	W22	W23	NNW20	NNW16	NNW14	NNW10	NW8	NNW7	NW3	SW4	WSW12.9	WSW29
8-Jun	NNW9	NNE12	NNE9	NNE10	NNE8	N8	N14	NNW15	NNW15	NNW15	NNW18	NNW17	NNW16	N12	NNW11	NNW11	NNW9	NNW8	NNE8	NNE9	NE8	ENE5	E8	E7	N9.6	NNW18
9-Jun	ESE9	SE9	SE9	SE9	SSE9	SSE9	SSE10	S11	SSE9	SSW8	SW7	SW7	SSW5	SSW6	SW6	SE6	SSE9	SSE10	S15	S14	SSE11	SSE14	SSE14	SSE13	SSE8.7	S15
10-Jun	SSE13	SSE14	S17	S22	S24	S21	S23	S22	S24	S25	S24	S24	S26	S30	S31	S31	S32	S33	S30	S24	S23	SSW22	S20	S19	S23.7	S33
11-Jun	S20	S19	SSW12	SSW13	SW10	SW9	SSW8	WSW11	W10	W8	W9	NNW11	NW13	NW14	NNW17	NW14	NW16	NNW14	NW7	NW5	NNW10	NNW9	NW11	NNW10	W6.6	S20
12-Jun	N9	NNW6	NNW5	NNW8	NNW4	NNW5	N12	N13	N12	N12	NNW11	NNW15	NW11	NNW11	N11	NW9	NNE9	NE9	NE9	ENE7	E8	E8	ESE10	SE15	N6.2	SE15
13-Jun	SE13	SSE13	SE11	ESE14	SE16	SE17	SSE17	S23	S22	S19	S13	S11	S5	NW5	NNW16	N17	NNE17	N19	NE12	NE12	NE8	N8	NNE13	NE13	ESE4.8	S23
14-Jun	NE13	ENE11	ESE12	SE11	SSE7	ESE9	E8	N11	N14	N16	N18	N18	N18	N17	N19	N18	N21	N22	N24	N23	N24	N24	N22	N22	N13.3	N24
15-Jun	N20	N20	N22	N20	NNW22	N26	N26	N25	N23	NNW18	NNW18	NNW21	NNW19	NNW18	NNW17	NNW15	NW12	NW12	NW13	NW11	WNW7	WSW9	WSW8	SSW5	NNW15.3	N26
16-Jun	SSW5	SW10	SW7	SW10	SW11	SW12	SW9	SSW12	SSW16	SSW19	SSW20	SSW23	SSW22	SW20	SSW17	SSW19	SSW22	SSW19	SSW19	SW20	SSW15	SSW14	SW16	WSW15	SSW15.2	SSW23
17-Jun	SW15	SW16	SW16	SSW16	SW15	SW17	WSW19	WSW20	WSW21	SW19	SW20	WSW22	WSW25	WSW23	WSW21	W18	W15	N10	NNE19	NNE12	NE7	E6	ENE5	NE9	WSW10.6	WSW25
18-Jun	ENE8	ENE6	E9	E10	E7	ENE11	ENE15	ENE18	ENE17	NE14	NE16	NE17	NE17	NE17	NE19	NE20	NE20	NE22	NE22	NE23	NE22	NE18	NE22	NE24	NE16.0	NE24
19-Jun	NE23	ENE22	NE25	NE26	NE25	NE25	NNE24	NNE27	NNE29	NNE24	NNE24	NNE24	NNE27	NNE31	NE30	NE29	NNE28	NNE25	NNE23	NNE23	NNE24	N22	N22	N25	NNE24.5	NNE31
20-Jun	N23	N24	N23	N21	N19	N21	N22	N23	N25	N22	N21	N19	N21	N24	N18	N17	N17	N17	NNW15	NNW12	NNW10	NNW10	NNW11	N11	N18.4	N25
21-Jun	N12	N10	N10	NNW12	N13	N12	N16	N17	N19	N21	NNW20	NNW19	NNW19	NNW20	NNW18	N18	N17	N16	NNE14	NE12	ENE7	E3	S3	S4	N12.6	N21
22-Jun	S4	SSW5	S4	SSW5	S4	S5	S6	SSE7	S7	SSE5	SW4	WSW10	W6	WSW6	SW9	WSW12	SSW4	SE9	SE9	S6	W4	SW7	S4	SSE6	SSW4.7	WSW12
23-Jun	SSE8	SSE9	S9	SSE9	S6	S11	S9	SSW10	SSW8	SSW10	SSE9	S12	S10	S11	S10	SSW10	WSW9	WSW6	WSW10	WSW9	WSW4	S6	S10	S10	SSW8.0	S12
24-Jun	S9	SSW12	SSW13	SSW14	SSW13	SSW13	SSW14	SW15	SW17	SW19	WSW19	WSW18	WSW18	WSW17	WSW14	NNW21	E8	NW5	N11	N17	NNE22	NE18	NNE22	NE19	WSW4.8	NNE22
25-Jun	NE18	NE12	NE10	NE9	NE10	NE12	ENE15	ENE15	ENE15	E12	ENE12	ENE11	ESE8	SE7	SSE5	SE2	NW1	SSE1	NNE6	NNE7	NNW7	NE5	SSW2	S6	ENE6.8	NE18
26-Jun	S8	S10	S11	S11	S12	S12	S12	S14	SSW12	S13	S16	S21	S15	S16	SW16	W11	W12	W4	NNE5	NE3	SW6	SW3	SW3	SW3	SSW8.2	S21
27-Jun	SW2	WNW2	NNW6	NNW7	NNE7	NNE8	NE12	NNE11	NE11	NNE11	NNE11	NNE10	N8	N7	NNE6	N7	NNE7	NNE4	N2	E3	SSE6	SSE6	SSE9	S10	NNE4.4	NE12
28-Jun	S12	SSW13	SSW11	SSW11	SSW12	SSW15	SSW16	SSW18	SSW20	SSW21	SSW20	SSW18	WSW12	NNW12	NNW9	NW6	E3	SSE14	S20	SSW15	SSW11	S7	SSW12	SSW11	SSW11.1	SSW21
29-Jun	SSW10	SSW10	SSW12	SSW11	S8	S9	SSW14	SSW17	SSW18	SSW17	SSW15	SW17	SW17	WSW18	WSW16	W15	W17	SW13	SW12	SSW12	SSW14	SW12	SW13	SSW12	SW12.8	SSW18
30-Jun	SW10	SW11	SW12	SSW12	SW12	SW11	SW14	SW10	SW10	WSW13	WSW14	SW17	WSW20	WSW18	WSW16	W19	W19	WSW18	WSW20	WSW17	W13	WSW10	WSW8	SW8	WSW13.2	WSW20

ESE1.5	SSE2.2	SSE1.9	SSE2.2	S2.2	S1.8	SSE0.7	SSW0.3	WSW0.6	WSW1.9	W2.4	W3.5	W4.2	NNW4.1	NNW4.6	NW5.1	NNW3.9	N2.5	NNE1.7	NNE2.0	NNE2.0	ENE1.5	E1.0	ESE1.4	Diurnal Average	
NE23	N24	NE25	NE26	NE25	N26	N26	NNE27	NNE29	S25	NNE24	WSW28	WSW29	NNE31	S31	S31	S31	S32	S33	S30	S24	N24	N24	NE22	N25	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
Firebag - June 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	57	7.92	7.92
6 - 11	253	35.14	43.06
12 - 19	276	38.33	81.39
20 - 28	123	17.08	98.47
29 - 38	11	1.53	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 - June 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	3	2	3	1	2	3	9	8	6	1	3	1	6	3	57
6 - 11	17	29	14	13	13	14	14	17	31	15	17	15	5	4	9	26	253
12 - 19	41	11	22	11	4	15	12	11	20	38	25	22	8	4	7	25	276
20 - 28	31	13	13	1	0	0	0	0	18	9	10	18	3	1	0	6	123
29 - 38	0	2	2	0	0	0	0	0	6	0	0	1	0	0	0	0	11
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	92	58	54	27	20	30	28	31	84	70	58	57	19	10	22	60	720

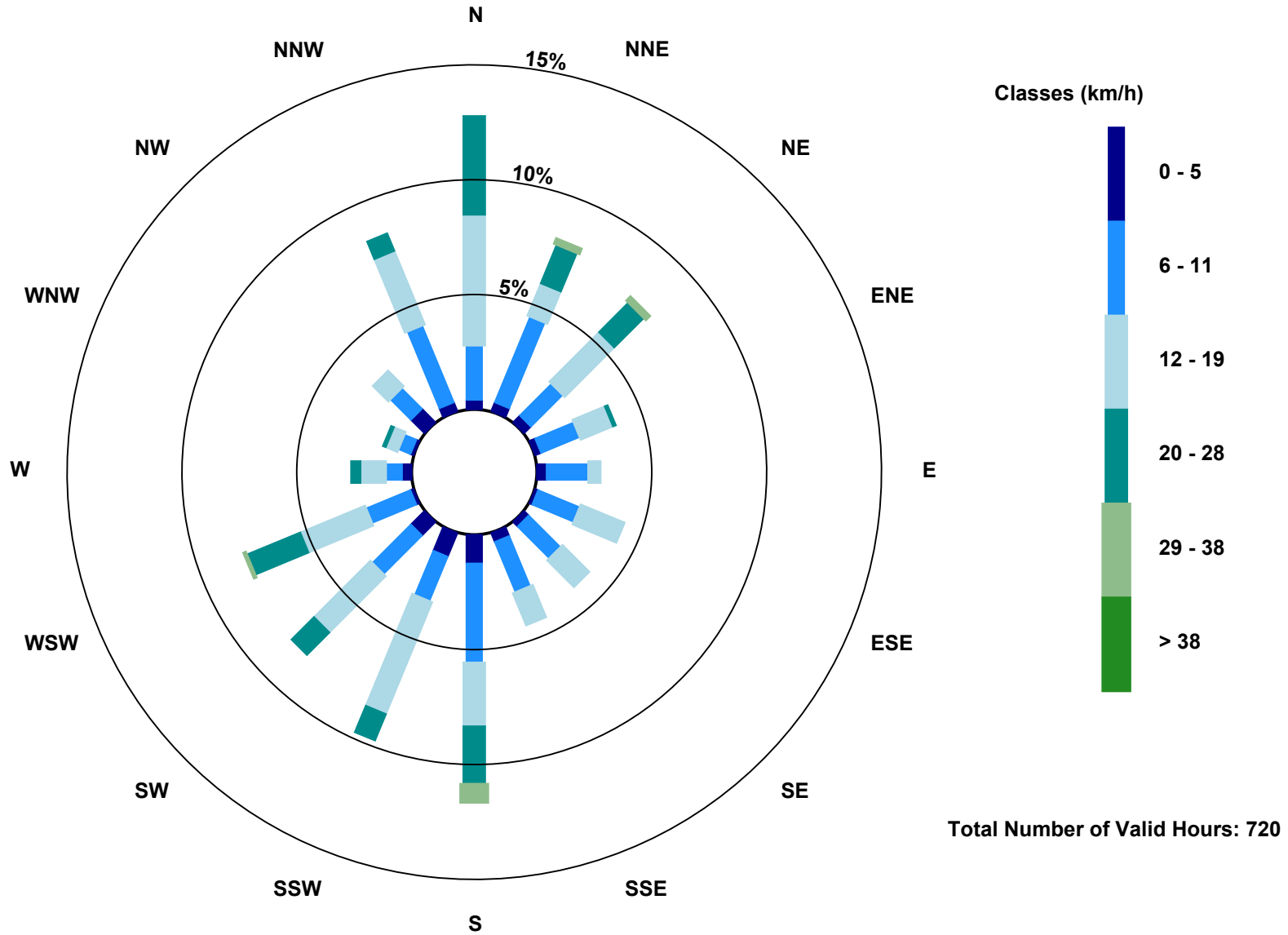
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Firebag





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Firebag - June 2023

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



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Firebag - June 2023

Direction of Maximum Speed: 184 deg on Jun 10 18:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 30.4 deg on Jun 19	Hours of Data: 720
Direction of Minimum Speed: 155 deg on Jun 25 18:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 4.4 deg on Jun 27	Percent Operational Time: 100.0
Monthly Average Direction: 292.1 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-Jun	316	171	357	331	324	1	66	43	14	303	334	330	336	338	339	5	21	26	33	22	29	6	345	1	355.6
2-Jun	336	354	2	34	21	2	23	40	47	29	17	355	0	3	3	25	41	38	54	59	69	83	88	87	31.5
3-Jun	98	115	124	104	91	105	80	65	87	64	63	78	113	131	119	123	130	133	126	121	121	122	119	118	107.6
4-Jun	120	125	123	116	112	108	103	105	112	118	122	122	146	139	154	138	133	128	135	144	134	130	134	173	127.1
5-Jun	241	262	139	194	177	307	333	2	357	359	3	16	28	41	42	31	20	13	31	60	47	67	238	253	8.7
6-Jun	269	258	252	251	244	245	244	243	245	251	249	247	242	227	233	230	237	231	229	233	217	178	171	178	238.7
7-Jun	174	175	174	175	186	207	214	221	224	224	230	243	245	261	272	280	289	288	289	300	313	343	321	225	238.5
8-Jun	336	12	15	15	14	350	353	346	340	345	342	344	338	355	342	335	330	337	27	20	34	69	85	95	356.9
9-Jun	123	134	137	135	154	156	159	169	165	193	224	219	205	204	221	124	153	153	173	170	166	168	160	156	164.1
10-Jun	150	163	173	181	183	180	178	179	179	182	180	173	180	179	185	181	185	184	184	185	189	192	186	179	180.7
11-Jun	180	186	206	200	214	216	209	254	269	265	264	288	305	314	328	309	313	330	319	316	336	331	324	347	278.4
12-Jun	10	345	334	337	328	337	5	11	355	354	338	340	314	341	353	324	18	35	48	67	85	101	122	136	7.4
13-Jun	137	154	125	122	130	143	159	171	176	174	180	177	185	309	347	8	15	4	51	49	39	6	16	34	112.5
14-Jun	54	72	120	144	155	120	84	6	5	1	1	3	4	358	358	357	350	349	355	354	3	4	4	2	9.6
15-Jun	356	353	354	351	347	349	355	354	355	341	336	336	328	328	336	339	323	325	320	318	286	255	246	205	338.9
16-Jun	199	216	215	216	214	225	218	211	194	201	199	193	209	216	211	205	210	202	196	217	208	208	233	247	209.8
17-Jun	230	222	218	213	221	228	237	241	240	234	235	243	250	249	246	261	281	349	18	20	45	90	71	38	245.5
18-Jun	60	73	93	95	90	70	67	71	62	51	53	47	52	51	34	42	47	46	44	43	48	49	42	47	52.9
19-Jun	50	57	54	48	49	40	27	29	31	27	22	26	33	27	35	36	33	26	24	18	15	9	3	4	30.4
20-Jun	10	3	7	10	3	1	4	9	6	4	2	352	355	3	359	355	358	355	343	346	339	340	345	358	359.8
21-Jun	359	357	353	347	352	355	360	2	0	352	348	342	342	344	345	359	7	11	17	37	58	98	174	181	358.0
22-Jun	180	207	189	195	177	170	169	161	170	166	219	241	266	249	232	252	206	136	139	188	267	228	184	150	198.0
23-Jun	156	160	169	166	174	188	187	212	209	196	165	182	180	189	176	195	255	239	245	250	254	172	177	182	191.9
24-Jun	187	199	207	212	209	204	211	216	220	234	240	248	246	242	245	346	79	323	352	350	23	40	30	40	254.3
25-Jun	44	51	40	37	40	46	60	74	69	80	70	66	102	143	150	129	320	155	24	17	334	38	197	189	60.5
26-Jun	183	178	172	172	169	170	171	183	195	182	172	184	174	187	231	279	276	276	32	46	228	236	229	224	192.1
27-Jun	217	289	339	343	13	29	37	30	34	18	33	32	5	10	13	349	31	14	360	87	148	157	163	182	28.2
28-Jun	191	193	194	208	207	210	200	207	206	202	199	212	243	289	334	325	95	148	178	198	213	181	196	202	203.9
29-Jun	199	210	205	196	179	187	194	203	199	197	205	219	232	237	247	265	267	214	232	202	210	215	216	213	215.9
30-Jun	214	214	218	212	214	219	220	221	236	240	251	235	243	255	258	267	263	255	246	257	261	253	247	236	241.6

112.4 167.0 160.3 163.8 170.9 177.8 157.6 198.3 249.2 258.7 275.8 271.4 274.9 287.6 299.0 320.6 328.6 348.9 17.2 18.7 27.8 74.5 98.3 117.5

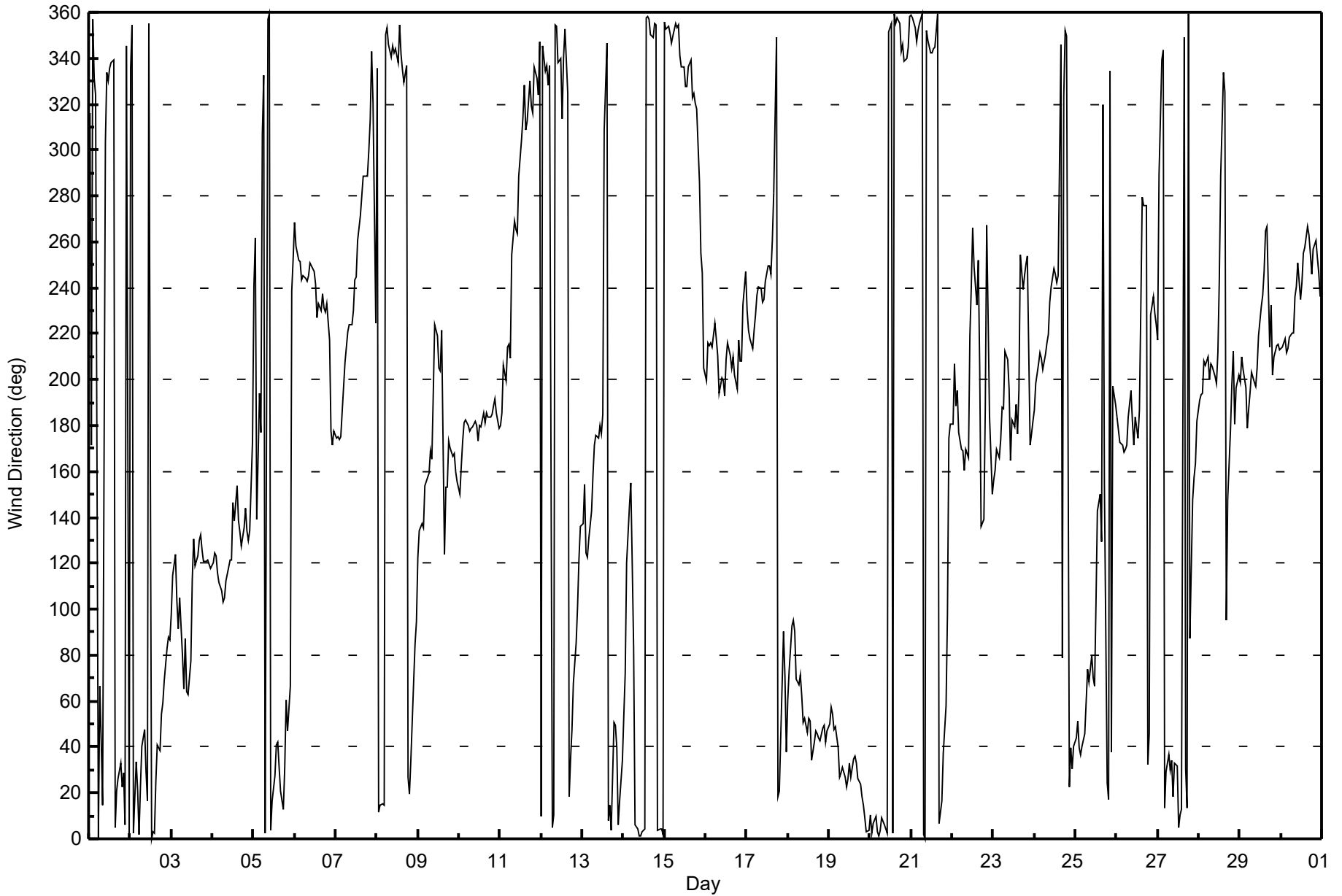
Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Firebag - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Firebag - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Jun 25 17:00											Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0														
Minimum Value: 7 deg on Jun 28 23:00																									
Percentiles: P ₁ = 7 P ₁₀ = 9 Q ₁ = 11 Median = 15 Q ₃ = 20 P ₉₀ = 34 P ₉₉ = 74																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	38	39	63	12	14	35	16	33	50	38	40	32	30	25	26	21	20	15	12	9	23	41	11	18	63
2-Jun	22	20	16	18	25	18	13	16	16	25	29	30	28	26	22	27	18	20	14	11	13	10	10	10	30
3-Jun	14	14	16	14	12	11	16	13	26	22	23	30	27	34	32	27	20	17	15	13	12	12	12	34	
4-Jun	12	12	12	11	10	11	11	13	11	13	12	16	16	18	14	16	14	15	14	13	14	13	16	18	18
5-Jun	35	21	32	38	48	39	15	15	16	17	15	17	23	23	47	24	19	14	20	12	17	18	56	14	56
6-Jun	20	13	12	13	11	11	13	13	16	15	17	19	19	20	16	18	17	15	15	12	11	13	9	7	20
7-Jun	8	8	7	7	8	10	12	12	15	16	17	15	14	21	21	22	21	20	19	16	12	11	51	21	51
8-Jun	36	10	8	9	10	14	17	18	23	21	19	24	29	32	38	34	32	33	26	12	9	25	13	13	38
9-Jun	17	12	11	15	11	10	11	15	25	36	69	55	69	66	64	71	40	36	14	9	8	8	10	11	71
10-Jun	10	11	8	9	8	8	8	9	9	10	12	14	12	12	11	11	11	10	9	10	8	7	8	7	14
11-Jun	8	8	13	9	11	13	33	13	23	16	18	23	23	24	21	26	22	21	13	30	10	8	11	15	33
12-Jun	17	11	10	9	10	13	18	15	20	22	28	23	34	32	26	28	18	12	10	16	15	14	16	13	34
13-Jun	12	12	14	12	14	12	11	10	10	11	18	18	72	64	18	16	14	17	47	23	15	49	17	17	72
14-Jun	11	17	17	15	30	18	38	15	16	16	16	17	17	17	19	18	17	15	17	17	17	17	16	17	38
15-Jun	17	16	15	16	13	16	17	17	18	15	15	14	12	12	12	14	13	12	13	14	19	11	8	16	19
16-Jun	9	9	14	9	9	9	11	11	9	12	11	9	14	14	15	11	10	10	8	16	11	13	11	13	16
17-Jun	11	11	9	11	11	11	10	12	11	14	16	16	15	18	14	18	24	53	15	13	24	19	11	11	53
18-Jun	9	14	12	11	20	12	13	14	15	23	19	22	21	19	19	17	17	14	14	11	11	11	10	11	23
19-Jun	10	11	11	11	11	13	13	13	12	12	12	13	13	13	12	12	11	13	13	14	15	16	17	19	19
20-Jun	17	18	16	17	17	17	17	16	18	17	18	16	17	17	17	16	17	16	14	13	13	13	12	14	18
21-Jun	14	14	13	12	14	16	16	16	17	17	16	16	17	18	22	21	18	18	19	17	26	55	26	17	55
22-Jun	11	12	8	9	17	14	15	26	26	54	80	32	45	58	36	28	78	16	13	25	20	11	12	12	80
23-Jun	12	9	8	9	15	7	11	16	28	24	41	25	32	27	23	38	35	61	20	12	19	10	7	8	61
24-Jun	7	10	10	8	9	9	10	12	13	16	18	17	19	23	47	18	42	64	24	19	16	19	13	11	64
25-Jun	10	13	13	12	11	12	14	16	17	28	32	33	46	54	66	88	103	98	33	49	19	45	69	11	103
26-Jun	10	9	7	7	8	9	10	10	14	10	12	10	10	12	20	34	43	66	26	66	16	26	66	21	66
27-Jun	19	25	13	15	12	12	12	19	22	30	31	30	49	42	53	49	42	74	80	55	13	9	14	8	80
28-Jun	9	7	7	10	9	10	9	11	12	11	16	18	35	32	19	30	74	19	11	9	13	11	7	7	74
29-Jun	8	8	11	7	12	8	9	8	10	12	15	16	19	20	20	24	29	16	14	18	11	8	8	9	29
30-Jun	9	8	9	9	9	10	9	14	18	18	20	21	18	22	23	22	21	18	12	18	14	10	9	12	23
	38	39	63	38	48	39	38	33	50	54	80	55	72	66	66	88	103	98	80	66	26	55	69	21	
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS20 MACKAY RIVER JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)

JUNE 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	19.9	0	2.6	0
H2S (ppb) Average	685	35	35	100	2.7	0	0.6	0
THC (ppm) Average	687	33	33	100	2.8	-	2.4	-
NO2 (ppb) Average	685	35	35	100	12.5	0	3.4	-
NO (ppb) Average	685	35	35	100	7.6	-	1.1	-
NOX (ppb) Average	685	35	35	100	17.3	-	4.3	-
Temperature 2 m (C) Average	720	0	0	100	29.1	-	21.7	-
Relative Humidity (%) Average	720	0	0	100	100	-	99	-
Wind Speed 10 m (km/h) Average	717	0	3	99.58	24	-	19	-
Wind Direction 10 m (deg) Average	717	0	3	99.58	-	-	-	-
Precipitation (mm) Total	720	0	0	100	17.8	-	42.2	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
 JUNE 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	0.63	1.7	-	0	0	0	0.1	0.4	1.6	19.9
H2S (ppb) Average	685	0.19	0.3	-	0	0	0.1	0.1	0.2	0.3	2.7
THC (ppm) Average	687	2.26	0.1	-	2.1	2.2	2.2	2.2	2.3	2.4	2.8
NO2 (ppb) Average	685	1.26	1.4	-	0	0.3	0.4	0.7	1.6	2.8	12.5
NO (ppb) Average	685	0.13	0.5	-	0	0	0	0	0.1	0.2	7.6
NOX (ppb) Average	685	1.38	1.8	-	0.1	0.3	0.5	0.8	1.7	2.9	17.3
Temperature 2 m (C) Average	720	16.09	5.6	-	2.9	9.1	11.6	16.1	20.3	23.8	29.1
Relative Humidity (%) Average	720	67.71	23.3	-	23.6	35.4	47.4	69	90.7	97.6	100
Wind Speed 10 m (km/h) Average	717	7.3	4	-	0	3	4	7	9	12	24
Wind Direction 10 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	182	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	01 Jun 2023 21:00	01 Jun 2023 21:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	02 Jun 2023 00:00	02 Jun 2023 00:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	05 Jun 2023 02:00	05 Jun 2023 02:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

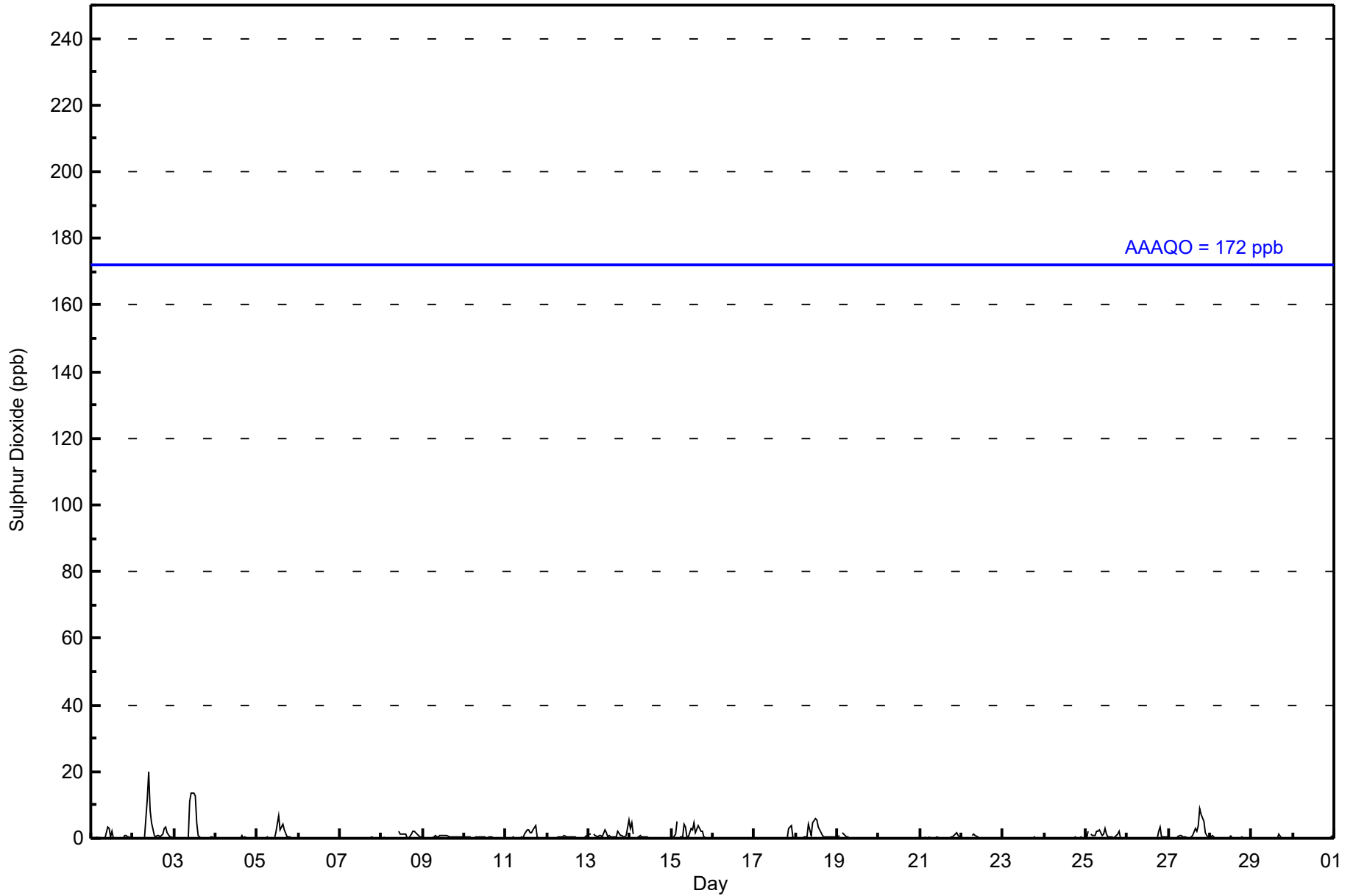
Mackay River - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																										
Maximum Value: 19.9 ppb on Jun 2 10:00		Maximum Daily Average: 2.6 ppb on Jun 2																	Hours of Data: 687		Hours of Missing Data: 33																												
Minimum Value: 0.0 ppb on Jun 1 01:00		Minimum Daily Average: 0.0 ppb on Jun 6																	Hours of Calibration: 33		Percent Operational Time: 100.0																												
Maximum Diurnal Average: 1.5 ppb at hour 10		Minimum Diurnal Average: 0.2 ppb at hour 6																																															
Monthly Average: 0.63 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 1.6 P ₉₉ = 8.7																																															
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-Jun	0.0	0.0	Z	0.5	0.0	0.1	0.2	0.0	0.0	3.4	3.0	0.5	2.1	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.4	0.3	0.1	0.5	3.4																								
2-Jun	0.1	0.1	0.0	Z	0.2	0.1	0.2	0.1	11.7	19.9	8.7	4.7	0.7	0.5	1.0	0.7	0.6	1.2	2.9	3.4	1.5	0.6	0.3	0.1	2.6	19.9																							
3-Jun	0.0	0.1	0.0	0.0	Z	0.0	0.1	0.0	0.1	10.9	13.7	13.6	12.5	4.5	0.9	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.2	2.5	13.7																							
4-Jun	0.1	0.1	0.1	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	0.8																							
5-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	1.7	6.7	2.6	3.5	4.4	2.4	0.4	0.6	0.3	0.0	0.0	0.0	0.0	1.0	6.7																							
6-Jun	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																							
7-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.3																							
8-Jun	0.1	0.0	0.3	Z	0.1	0.1	0.1	C	C	C	2.2	1.4	1.4	1.1	1.1	0.2	0.1	1.2	2.1	2.1	1.9	0.8	0.4	0.2	0.8	2.2																							
9-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.4	0.6	0.5	0.5	0.7	1.0	1.0	1.0	0.7	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.4	0.5	0.4	1.0																							
10-Jun	0.3	0.3	0.4	0.4	0.4	Z	0.3	0.3	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.3	0.5																							
11-Jun	Z	0.2	0.2	0.2	0.6	0.2	0.1	0.1	0.1	0.4	0.1	1.4	2.5	2.3	1.6	1.9	2.6	3.6	0.5	0.1	0.1	0.1	0.0	0.1	0.8	3.6																							
12-Jun	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.7	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.4	0.8	0.3	0.8																							
13-Jun	1.4	1.1	Z	1.2	0.8	0.6	0.8	0.7	0.5	2.6	1.5	0.3	1.0	0.5	0.3	0.3	0.4	2.1	1.0	0.8	0.3	0.3	1.0	5.6	1.1	5.6																							
14-Jun	2.9	4.6	1.2	Z	0.4	0.3	0.8	0.5	0.3	0.3	0.3	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6	4.6																							
15-Jun	0.1	0.1	1.1	5.2	Z	0.3	0.3	4.4	3.3	0.4	0.3	3.1	2.6	4.5	1.9	3.7	2.8	2.2	2.0	0.2	0.2	0.1	0.1	0.1	1.7	5.2																							
16-Jun	0.1	0.1	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	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	0.1	0.1																						
17-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	2.9	3.9	0.5	0.2	0.4	3.9																							
18-Jun	0.1	Z	0.1	0.1	0.1	0.2	0.5	4.2	2.7	1.0	4.8	6.0	5.6	3.5	2.4	1.0	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.2	1.5	6.0																							
19-Jun	0.3	0.9	Z	1.5	1.1	0.3	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	0.0	0.0	0.0	0.0	0.2	1.5																							
20-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1																							
21-Jun	0.1	0.1	0.1	0.2	Z	0.3	0.2	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.2	0.1	0.1	0.2	0.3	0.3	1.2	1.5	0.7	0.2	0.3	1.5																							
22-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.8	1.2	0.7	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2																							
23-Jun	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	0.3	0.1	0.0	0.1	0.0	0.1	0.0	0.3																							
24-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.3	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.3																							
25-Jun	0.0	2.1	Z	1.2	0.8	1.0	2.0	2.0	2.5	0.7	1.5	2.9	1.2	0.3	0.5	0.3	0.2	0.5	1.1	2.1	0.2	0.1	0.1	0.1	1.0	2.9																							
26-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	2.2	3.6	0.6	0.3	0.2	0.2	0.4	3.6																							
27-Jun	0.1	0.2	0.2	0.2	Z	0.3	0.9	0.7	0.4	0.4	0.5	0.2	0.2	0.2	0.6	3.0	2.3	3.8	8.7	7.2	5.0	1.9	1.0	0.5	1.7	8.7																							
28-Jun	0.5	0.7	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.0	0.1	0.1	0.1	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.2	0.7																							
29-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	1.2																							
30-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.3	0.6	0.1	0.6																							
																								0.3	0.4	0.2	0.5	0.2	0.2	0.3	0.6	0.8	1.5	1.3	1.3	1.3	0.7	0.5	0.6	0.5	0.6	0.8	0.8	0.5	0.4	0.2	0.3	Diurnal Average	
																								2.9	4.6	1.2	5.2	1.1	1.0	2.0	4.4	11.7	19.9	13.7	13.6	12.5	4.5	3.5	4.4	2.8	3.8	8.7	7.2	5.0	3.9	1.0	5.6	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 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mackay River - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	681	99.13	99.13
11 - 20	6	0.87	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
Mackay River - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	52	60	25	18	26	36	55	42	81	38	61	42	33	26	36	47	678
11 - 20	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	6
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	61	30	18	26	36	55	42	81	38	61	42	33	26	36	47	684

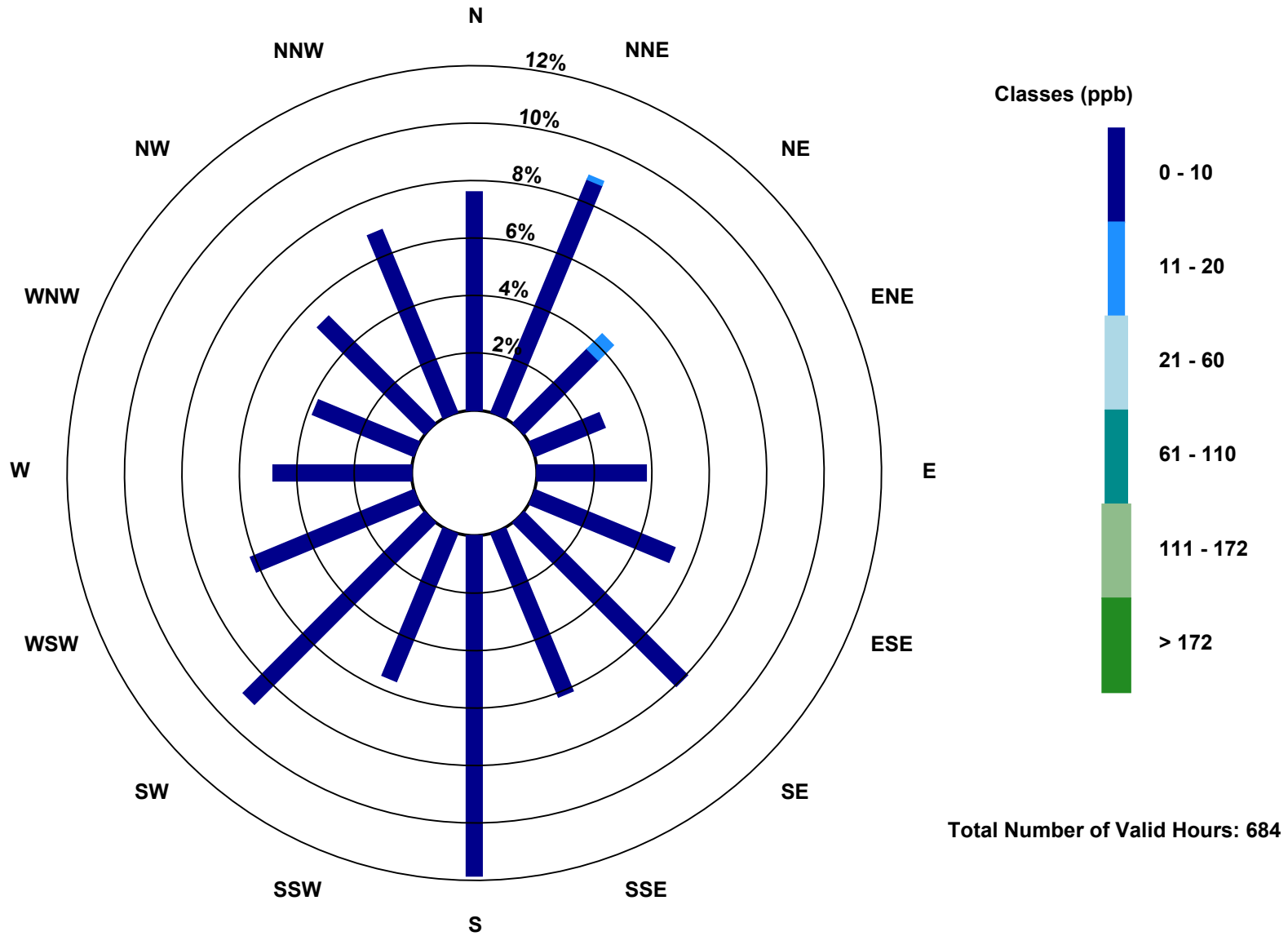
Total Number of Valid Hours: 684

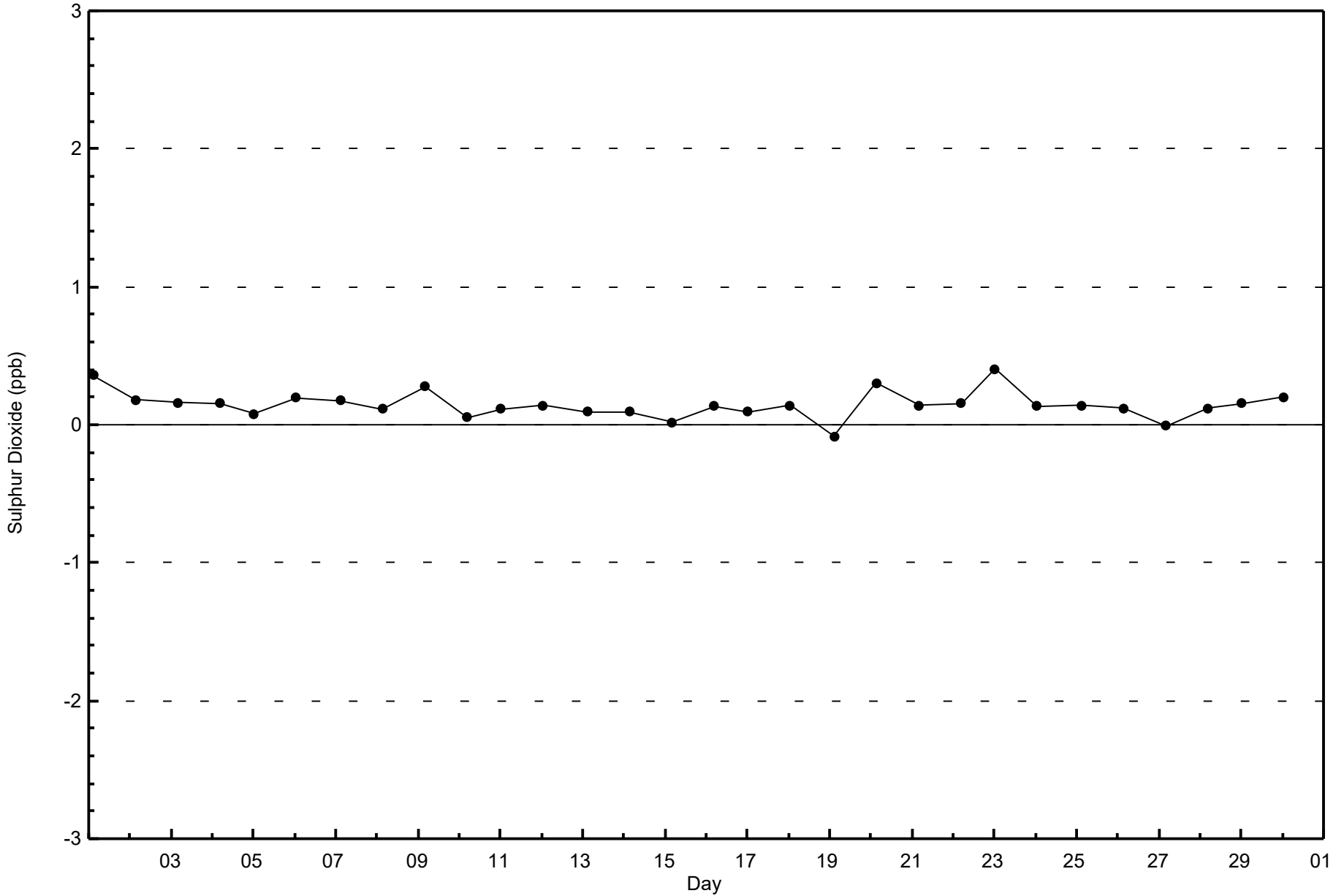
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Mackay River

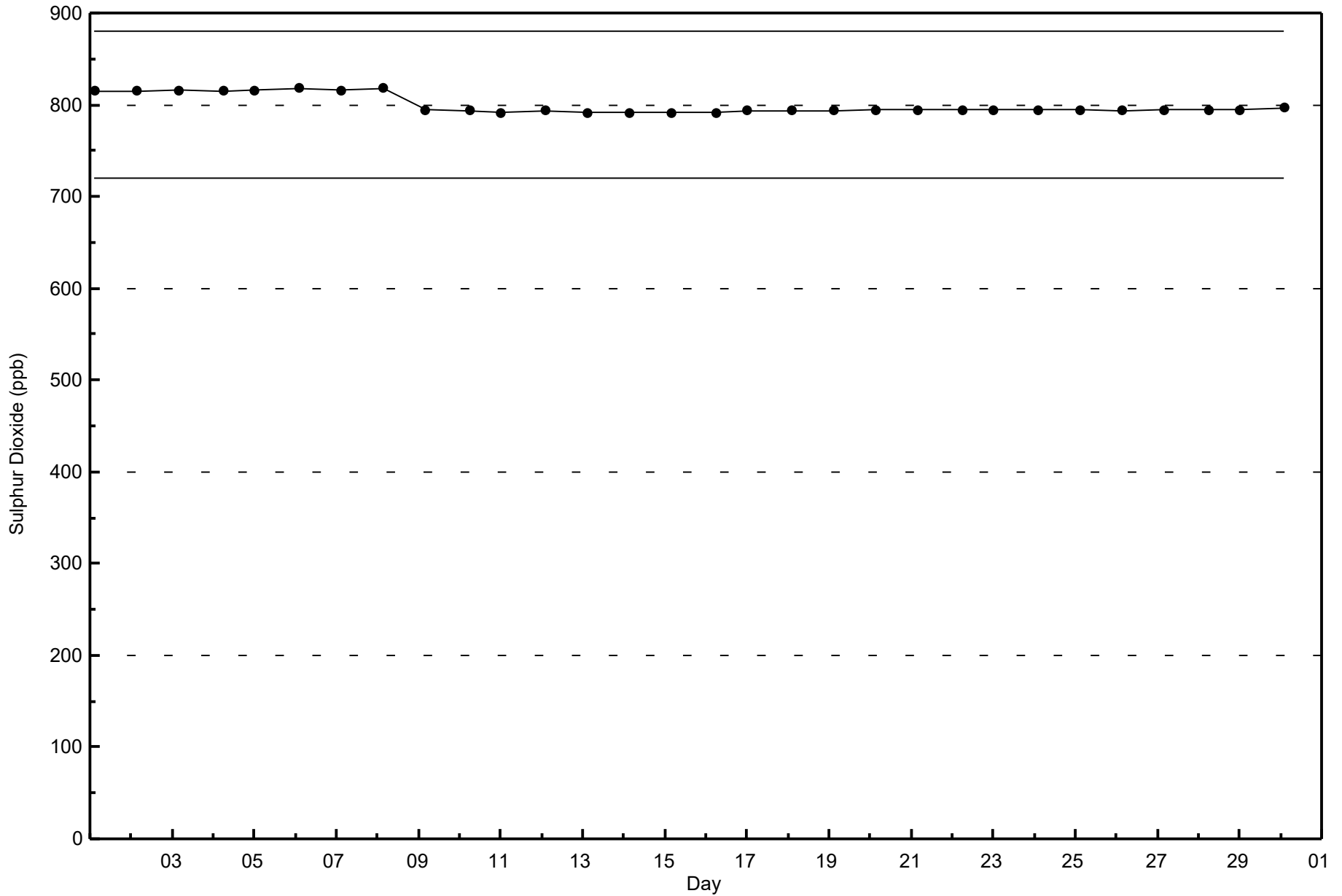






Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Mackay River - June 2023



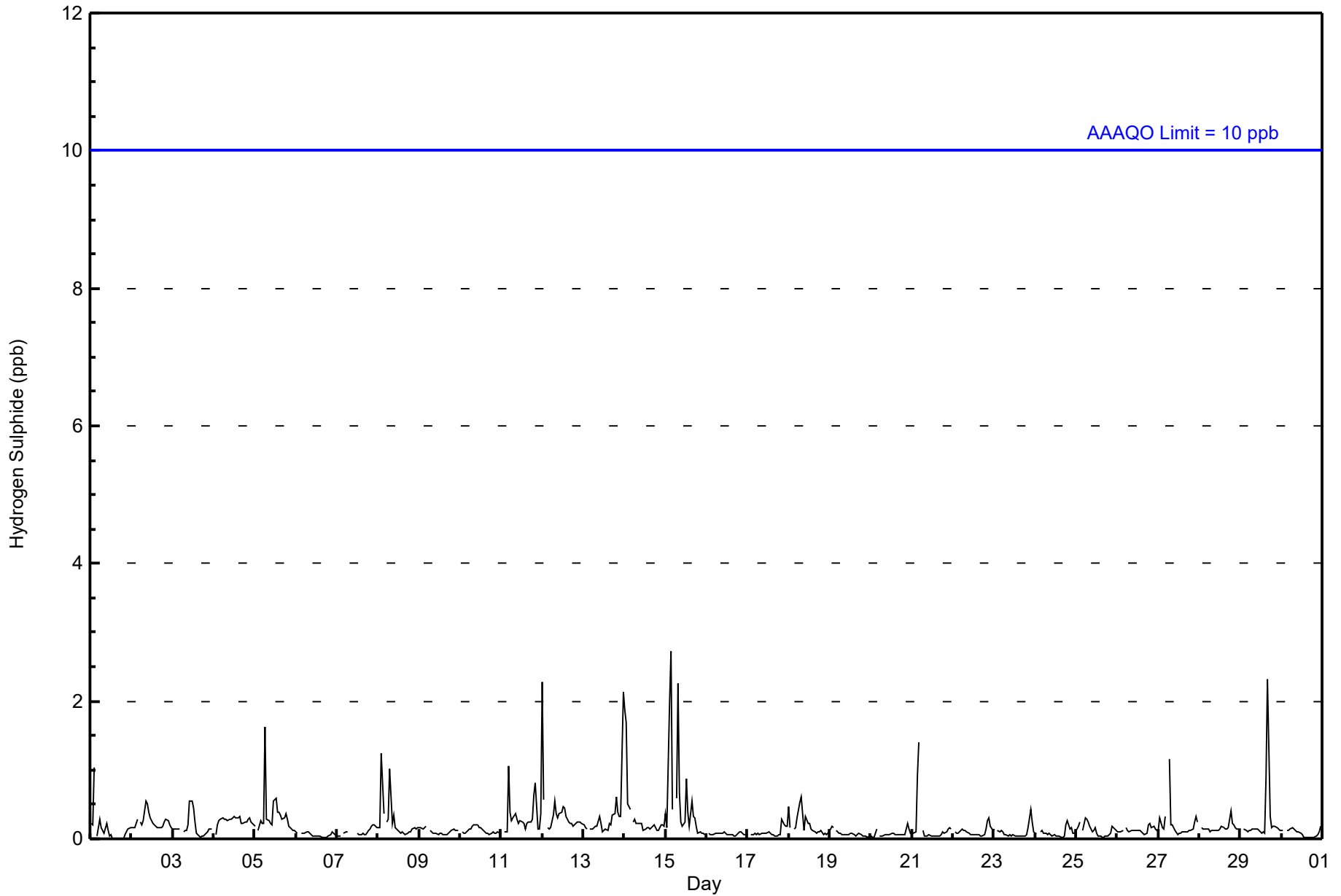


Wood Buffalo Environmental Association
Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb
Mackay River - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum					
Maximum Value: 2.7 ppb on Jun 15 04:00		Maximum Daily Average: 0.6 ppb on Jun 15		Hours of Data: 685														Hours of Missing Data: 35		Hours of Calibration: 35							
Minimum Value: 0.0 ppb on Jun 1 14:00		Minimum Daily Average: 0.1 ppb on Jun 6		Hours of Calibration: 35														Percent Operational Time: 100.0									
Maximum Diurnal Average: 0.3 ppb at hour 1		Minimum Diurnal Average: 0.1 ppb at hour 15		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 1.7																							
Monthly Average: 0.19 ppb																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.2	0.2	1.0	Z	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	1.0	
2-Jun	0.2	0.2	0.2	0.3	Z	0.2	0.2	0.3	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.6	
3-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.5	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	
4-Jun	Z	0.1	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	0.3	0.3	0.2	0.2	0.3	0.3	
5-Jun	0.2	Z	0.1	0.3	0.2	0.2	1.6	0.3	0.3	0.2	0.2	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.3	1.6	
6-Jun	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
7-Jun	0.1	0.0	0.1	Z	0.1	0.1	0.1	C	C	C	C	C	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	
8-Jun	0.2	0.2	1.2	0.4	Z	0.2	0.3	1.0	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	1.2	
9-Jun	0.2	0.2	0.1	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
10-Jun	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	0.1	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-Jun	0.1	Z	0.1	0.1	1.1	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.6	0.8	0.1	0.1	0.4	0.3	1.1	
12-Jun	2.3	0.6	Z	0.2	0.1	0.2	0.3	0.6	0.4	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	2.3	
13-Jun	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.4	0.3	0.3	2.1	0.3	2.1		
14-Jun	1.9	1.7	0.5	0.4	Z	0.2	0.3	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	0.2	0.2	0.2	0.3	1.9	
15-Jun	0.4	0.2	2.0	2.7	0.4	Z	0.6	2.3	0.7	0.2	0.2	0.2	0.9	0.4	0.2	0.6	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.6	2.7	
16-Jun	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
17-Jun	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	0.0	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.1	0.3	
18-Jun	0.5	0.2	Z	0.1	0.2	0.3	0.5	0.6	0.4	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	
19-Jun	0.1	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	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
20-Jun	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	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	
21-Jun	0.1	0.1	0.1	0.9	1.4	Z	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	1.4	
22-Jun	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	0.0	0.0	0.1	0.1	0.3	0.3	0.2	0.1	0.1	0.3	0.3	
23-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.2	0.1	0.1	0.4	
24-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.2	0.1	0.1	0.1	0.3	
25-Jun	0.1	0.2	0.2	Z	0.1	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.3	
26-Jun	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	
27-Jun	0.1	0.3	0.2	0.2	0.3	Z	1.2	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	0.3	0.2	0.2	1.2	
28-Jun	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.4	
29-Jun	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	0.9	2.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.3	2.3	
30-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	
																								Diurnal Average		Diurnal Maximum	
																								0.3		2.3	
																								0.2		1.7	
																								0.3		2.0	
																								0.3		2.7	
																								0.2		1.4	
																								0.2		0.4	
																								0.3		1.6	
																								0.3		2.3	
																								0.2		0.7	
																								0.2		0.5	
																								0.2		0.5	
																								0.2		0.6	
																								0.2		0.9	
																								0.1		0.4	
																								0.1		0.4	
																								0.1		0.9	
																								0.2		2.3	
																								0.1		0.3	
																								0.1		0.4	
																								0.2		0.6	
																								0.2		0.8	
																								0.2		0.4	
																								0.2		0.3	
																								0.2		2.1	
																								0.1		0.2	

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - June 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



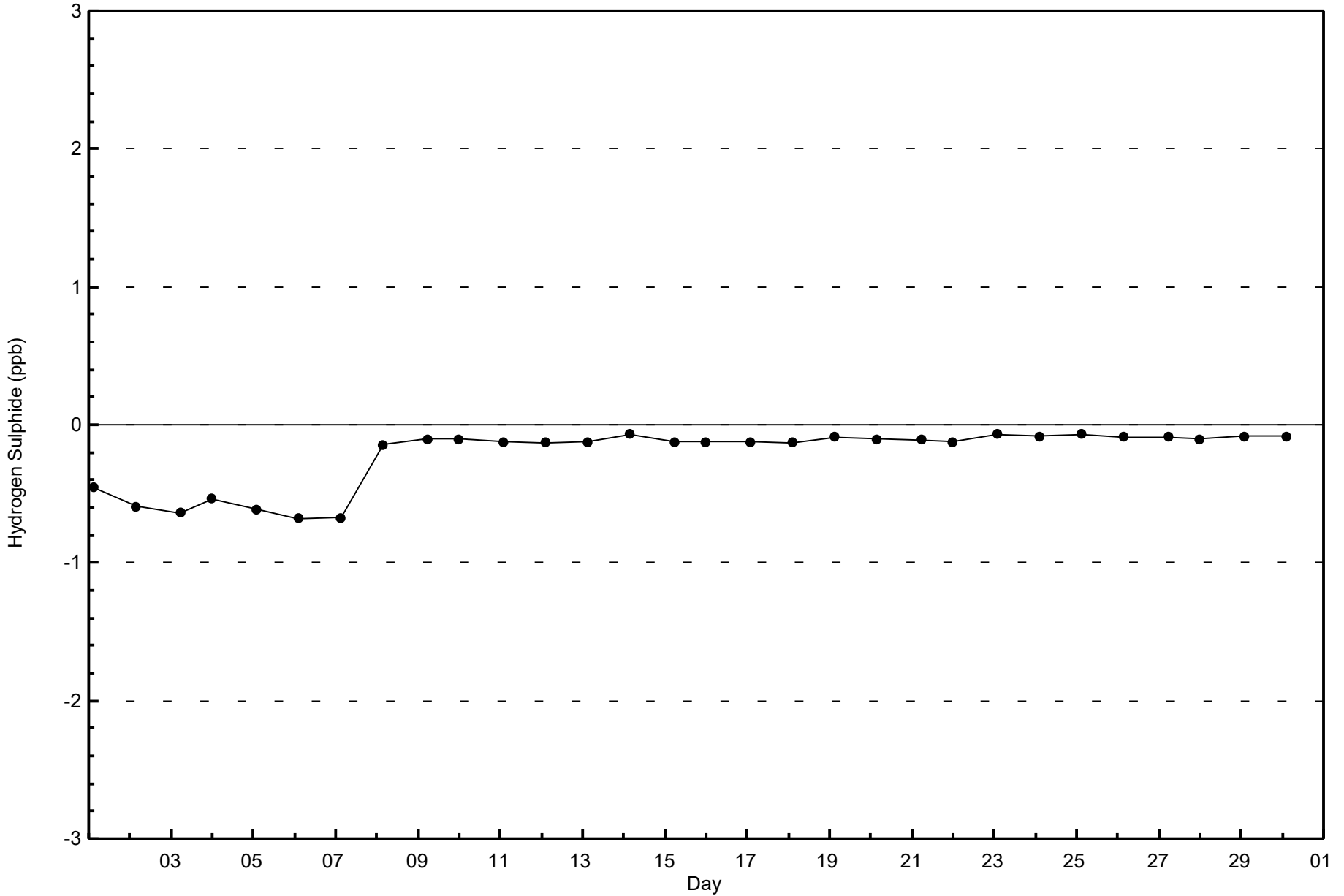
**Wood Buffalo Environmental Association
Frequency Distribution**

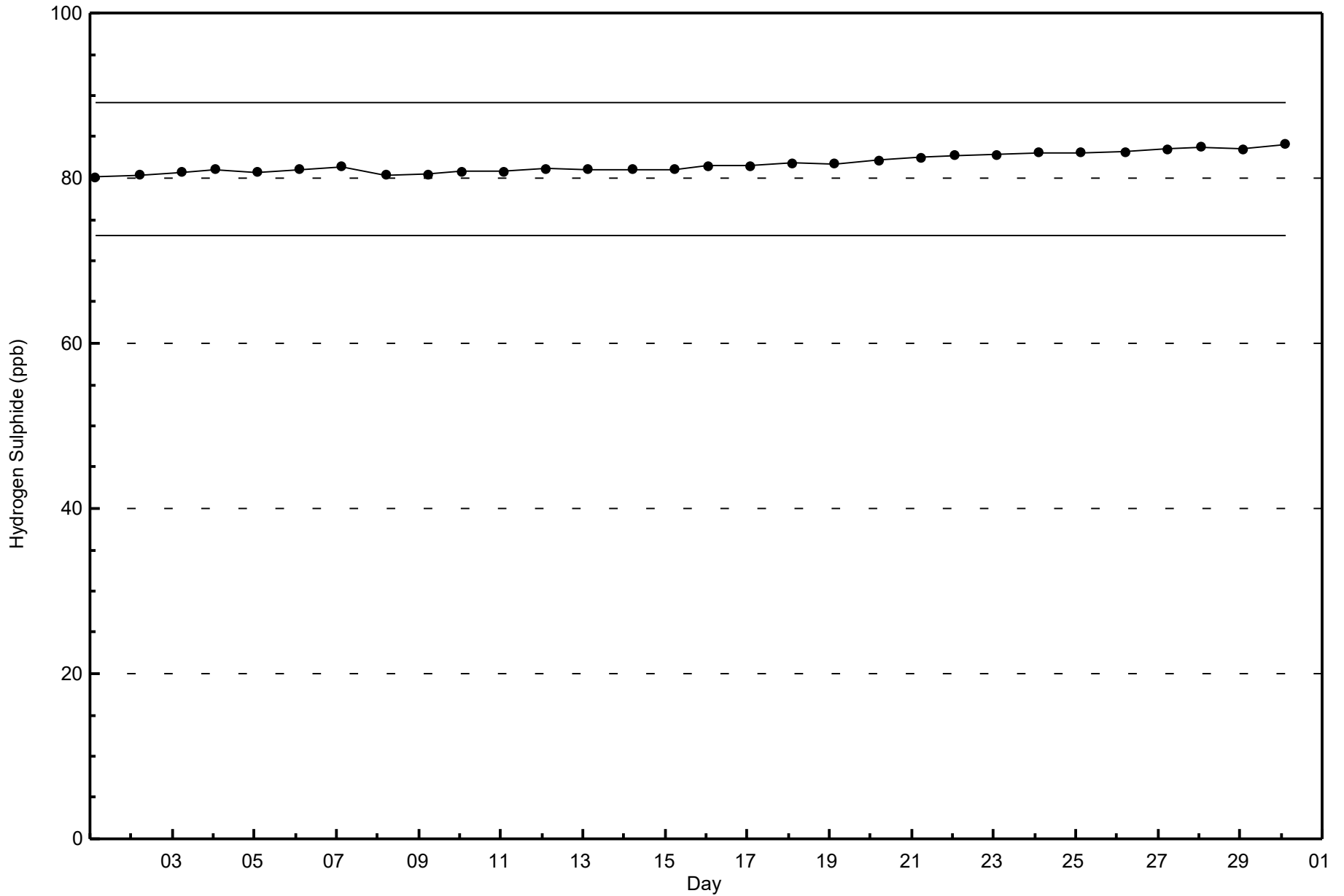
**Hydrogen Sulphide (H₂S) - ppb
Mackay River - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	52	61	31	19	26	33	55	45	84	34	57	42	33	25	40	45	682
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	61	31	19	26	33	55	45	84	34	57	42	33	25	41	45	683

Total Number of Valid Hours: 683

Total Number of Hours: 720







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

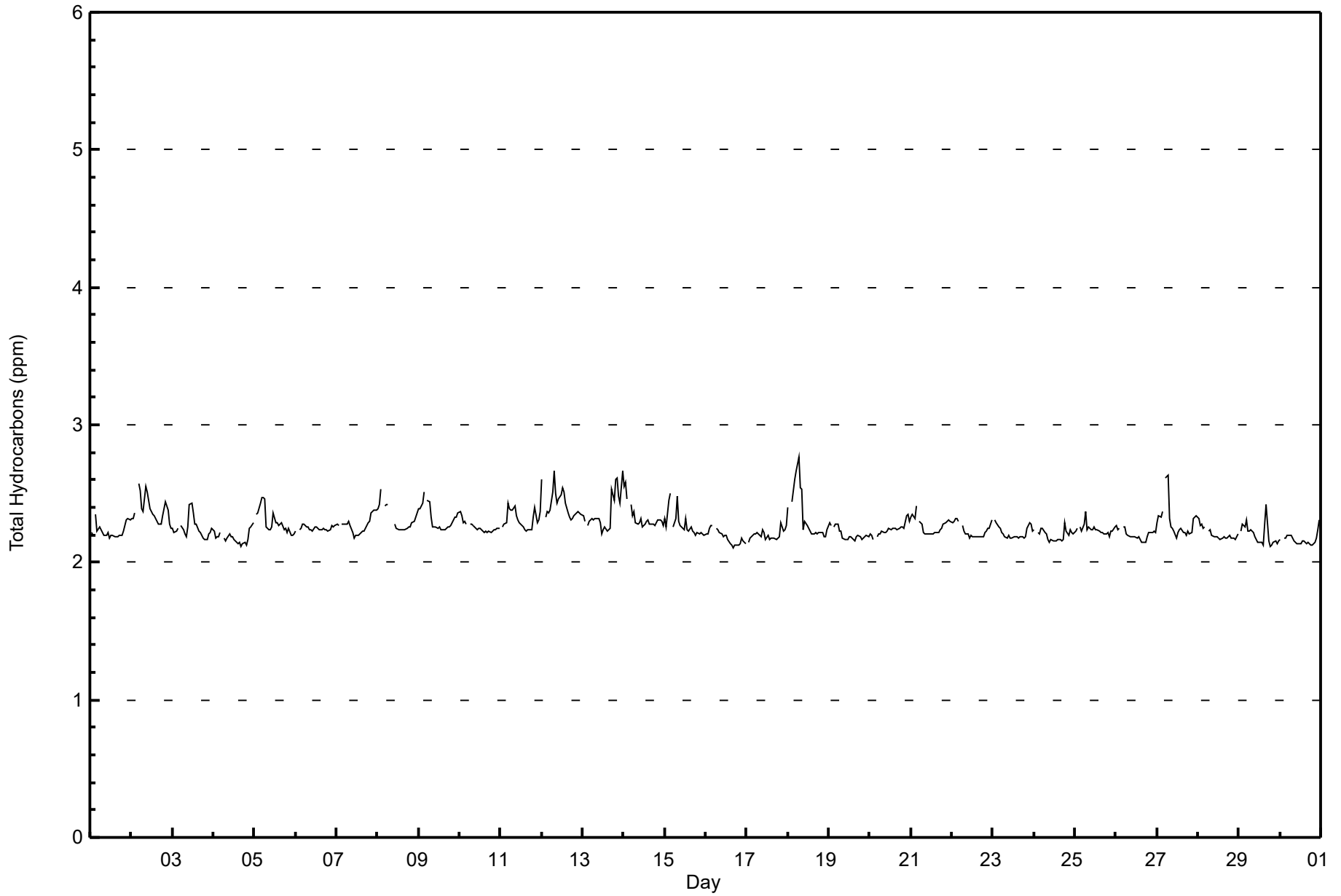
Mackay River - June 2023

Maximum Value: 2.8 ppm on Jun 18 07:00		Maximum Daily Average: 2.4 ppm on Jun 12		Hours in Service: 720																						
Minimum Value: 2.1 ppm on Jun 16 17:00		Minimum Daily Average: 2.2 ppm on Jun 30		Hours of Data: 687																						
Maximum Diurnal Average: 2.3 ppm at hour 6		Minimum Diurnal Average: 2.2 ppm at hour 16		Hours of Missing Data: 33																						
Monthly Average: 2.26 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.6		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-Jun	2.2	2.2	Z	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	2.3	2.3	2.3	2.3	2.2	2.3
2-Jun	2.3	2.3	2.4	Z	2.6	2.5	2.4	2.4	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.4	2.6
3-Jun	2.3	2.2	2.2	2.3	Z	2.3	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
4-Jun	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.3
5-Jun	Z	2.4	2.4	2.4	2.5	2.5	2.5	2.3	2.2	2.2	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5
6-Jun	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3
7-Jun	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.4
8-Jun	2.4	2.4	2.5	Z	2.4	2.4	2.4	C	C	C	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	2.4	2.3	2.5
9-Jun	2.4	2.4	2.4	2.5	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.5
10-Jun	2.4	2.3	2.3	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	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.4
11-Jun	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.4	2.3	2.4
12-Jun	2.6	Z	2.3	2.4	2.4	2.4	2.5	2.7	2.5	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.7
13-Jun	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.5	2.5	2.6	2.6	2.5	2.4	2.7	2.4	2.7	
14-Jun	2.5	2.6	2.5	Z	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6
15-Jun	2.3	2.3	2.4	2.5	Z	2.3	2.3	2.5	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5
16-Jun	2.2	2.2	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.3
17-Jun	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	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.3
18-Jun	2.4	Z	2.4	2.5	2.6	2.7	2.8	2.5	2.5	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.8
19-Jun	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
20-Jun	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	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3
21-Jun	2.3	2.4	2.3	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	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
22-Jun	2.3	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	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3
23-Jun	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3
24-Jun	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3
25-Jun	2.2	2.2	Z	2.3	2.2	2.3	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4
26-Jun	2.3	2.2	2.2	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
27-Jun	2.3	2.3	2.3	2.4	Z	2.6	2.6	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	2.3	2.3	2.6
28-Jun	2.3	2.3	2.3	2.2	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
29-Jun	Z	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.4
30-Jun	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerospan C - Calibration		



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mackay River - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mackay River - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	687	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: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mackay River - June 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	52	61	30	18	26	36	55	42	81	38	61	42	33	26	36	47	684
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	52	61	30	18	26	36	55	42	81	38	61	42	33	26	36	47	684

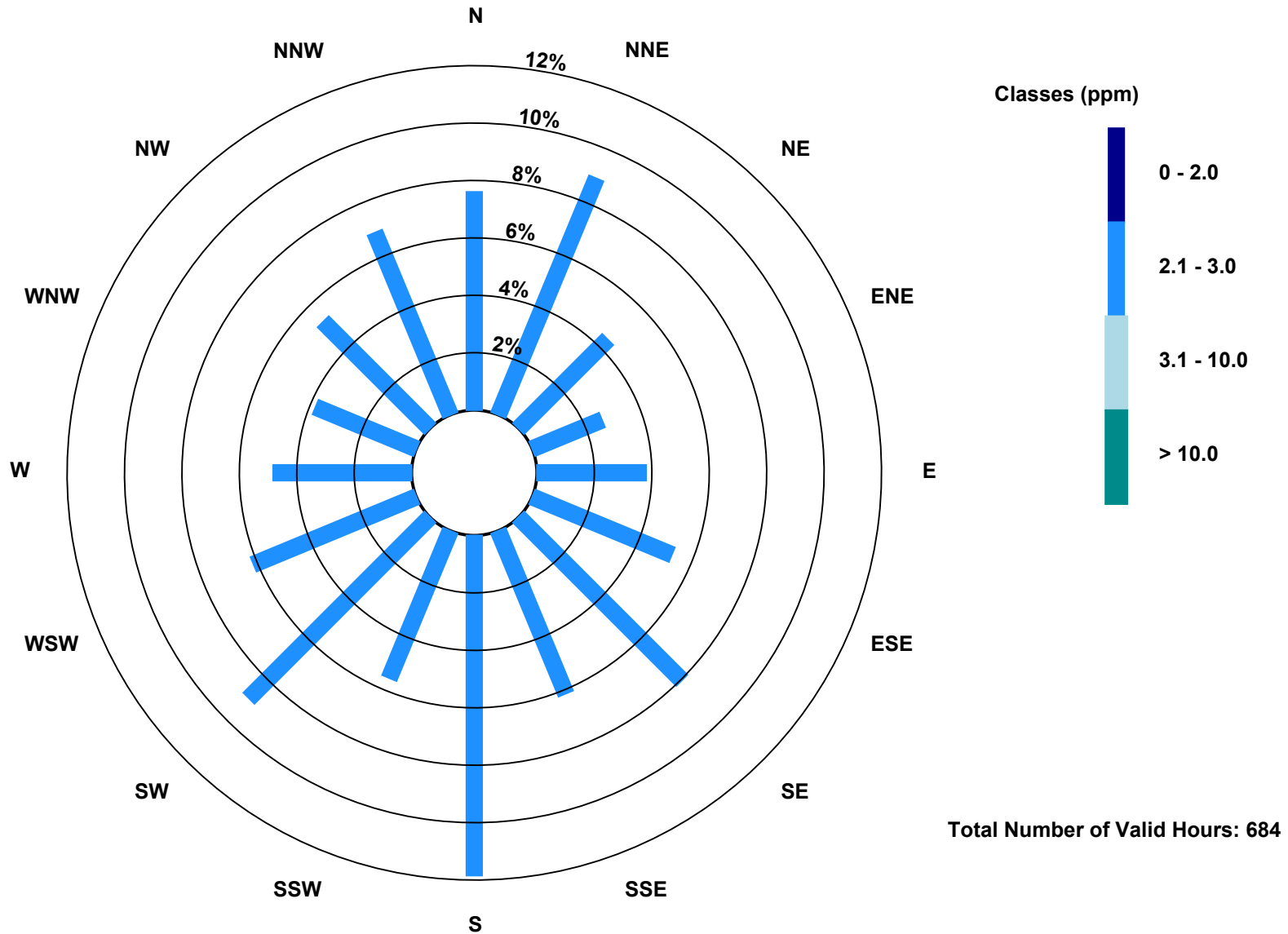
Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

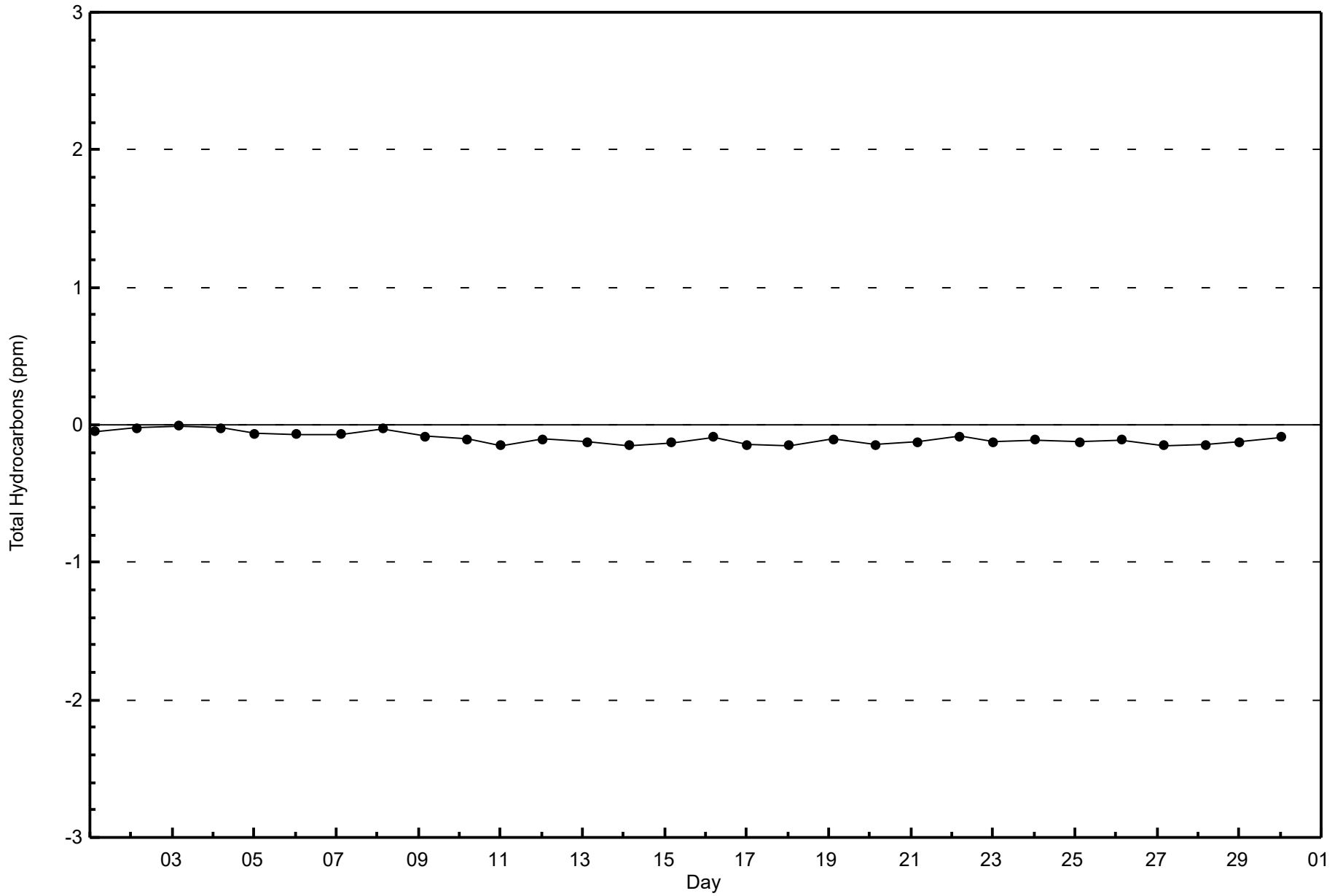
Total Hydrocarbons (THC) - ppm
Mackay River

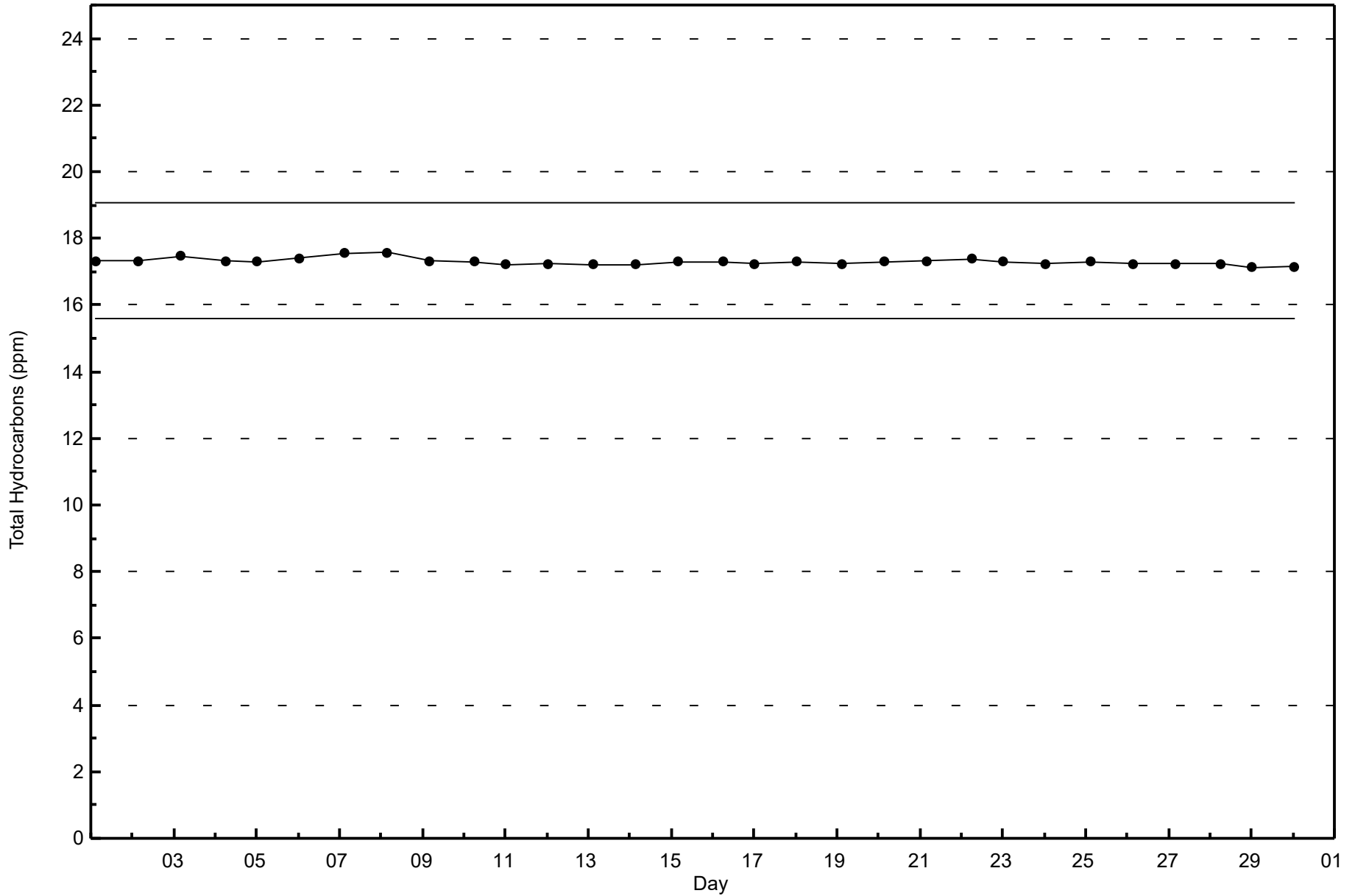




Wood Buffalo Environmental Association
Zero Responses

Total Hydrocarbons (THC) - ppm
Mackay River - June 2023







Wood Buffalo Environmental Association
Summary of Hour Averages

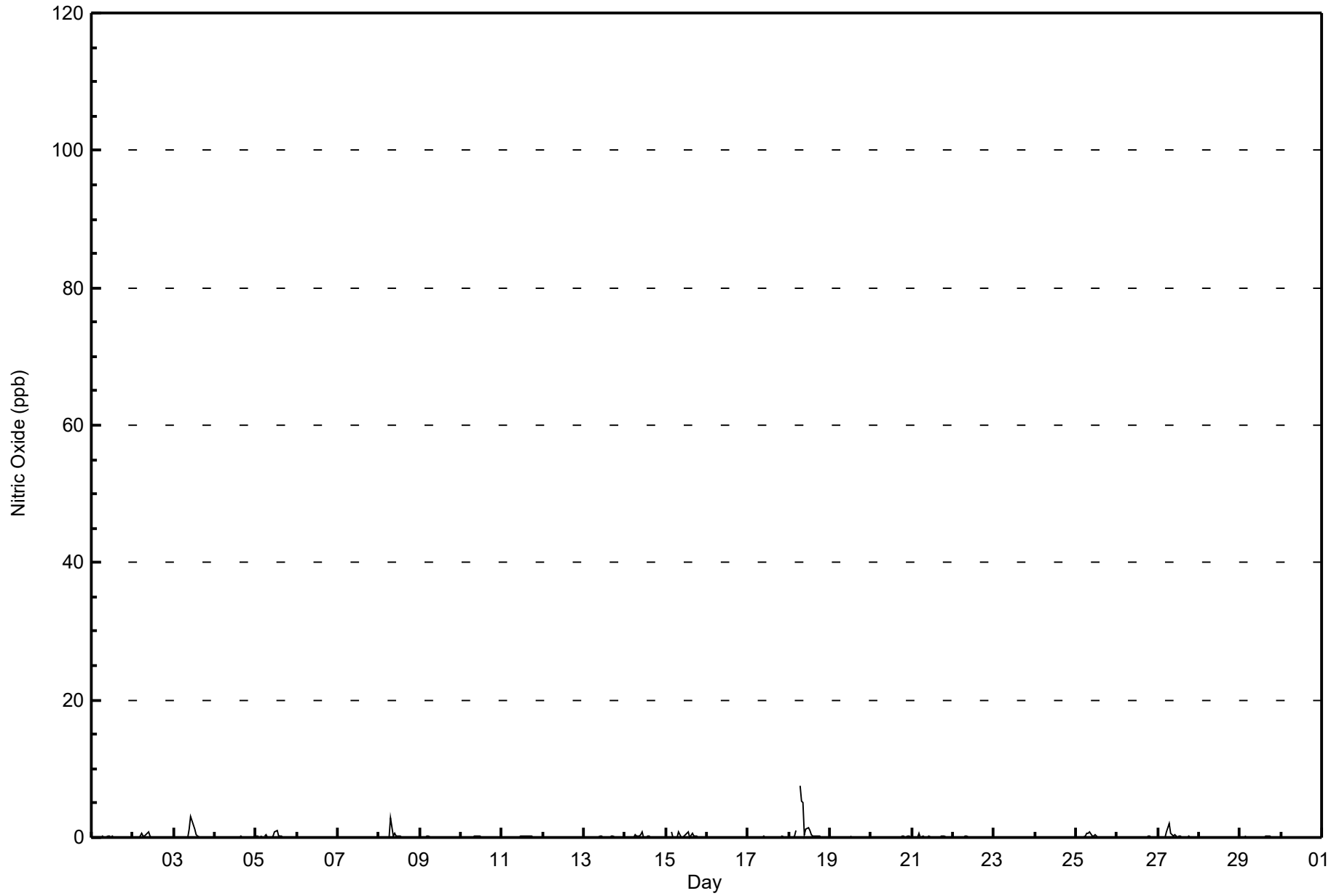
Nitric Oxide (NO) - ppb
Mackay River - June 2023

Maximum Value: 7.6 ppb on Jun 18 07:00		Maximum Daily Average: 1.1 ppb on Jun 18		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 1 18:00		Minimum Daily Average: 0.0 ppb on Jun 6		Hours of Data: 685																						
Maximum Diurnal Average: 0.4 ppb at hour 7		Minimum Diurnal Average: 0.0 ppb at hour 23		Hours of Missing Data: 35																						
Monthly Average: 0.13 ppb		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 = 1.4		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-Jun	Z	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.3	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	0.1	0.3
2-Jun	0.0	Z	0.0	0.0	0.2	0.5	0.2	0.1	0.6	0.7	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
3-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.0	1.9	1.1	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.0
4-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5-Jun	0.2	0.3	0.1	0.1	Z	0.2	0.4	0.1	0.1	0.1	0.1	0.8	1.0	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	1.0
6-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
7-Jun	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
8-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	2.9	0.1	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.9
9-Jun	0.0	0.0	Z	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
10-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
11-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
12-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Jun	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	0.0	0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3
14-Jun	0.0	Z	0.0	0.0	0.1	0.1	0.4	0.1	0.2	0.5	0.7	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
15-Jun	0.0	0.0	Z	0.8	0.0	0.0	0.0	0.8	0.4	0.0	0.0	0.3	0.5	0.8	0.1	0.7	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.8
16-Jun	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
17-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1
18-Jun	0.0	0.0	0.1	0.3	1.1	Z	7.6	5.3	5.2	0.4	1.3	1.3	1.1	0.5	0.3	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	1.1	7.6
19-Jun	Z	0.0	0.0	0.0	0.1	0.1	0.1	C	C	C	C	C	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
20-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21-Jun	0.1	0.1	Z	0.1	0.7	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.7
22-Jun	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
23-Jun	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
24-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
25-Jun	Z	0.0	0.0	0.0	0.1	0.3	0.6	0.5	0.8	0.2	0.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
26-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.1	0.3
27-Jun	0.0	0.0	Z	0.0	0.1	0.9	2.0	0.7	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	2.0
28-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
29-Jun	0.0	0.1	0.1	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2
30-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Mackay River - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Mackay River - June 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 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	55	32	18	25	38	52	44	82	38	60	42	31	26	41	46	682
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	52	55	32	18	25	38	52	44	82	38	60	42	31	26	41	46	682

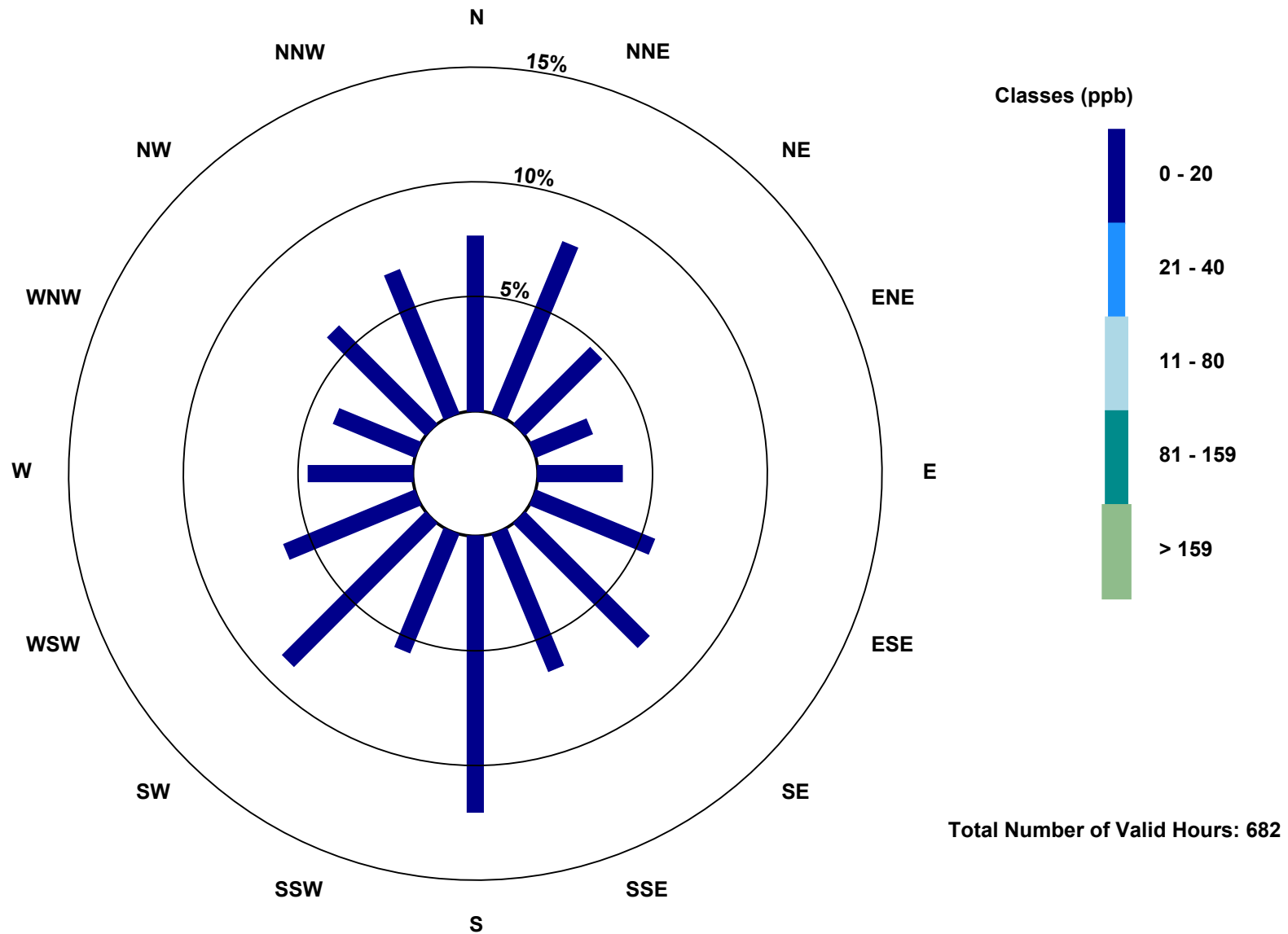
Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

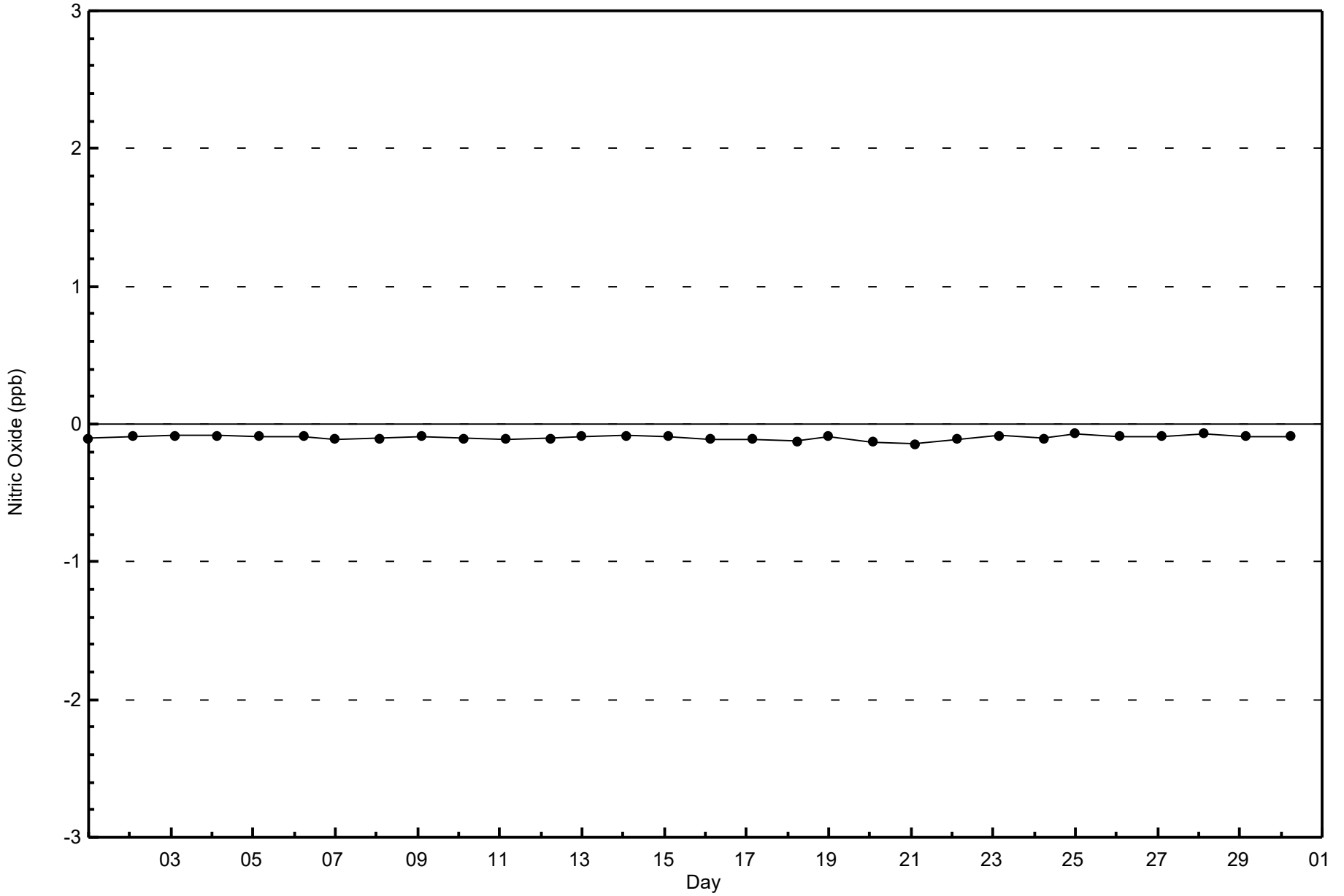
Nitric Oxide (NO) - ppb
Mackay River





Wood Buffalo Environmental Association
Zero Responses

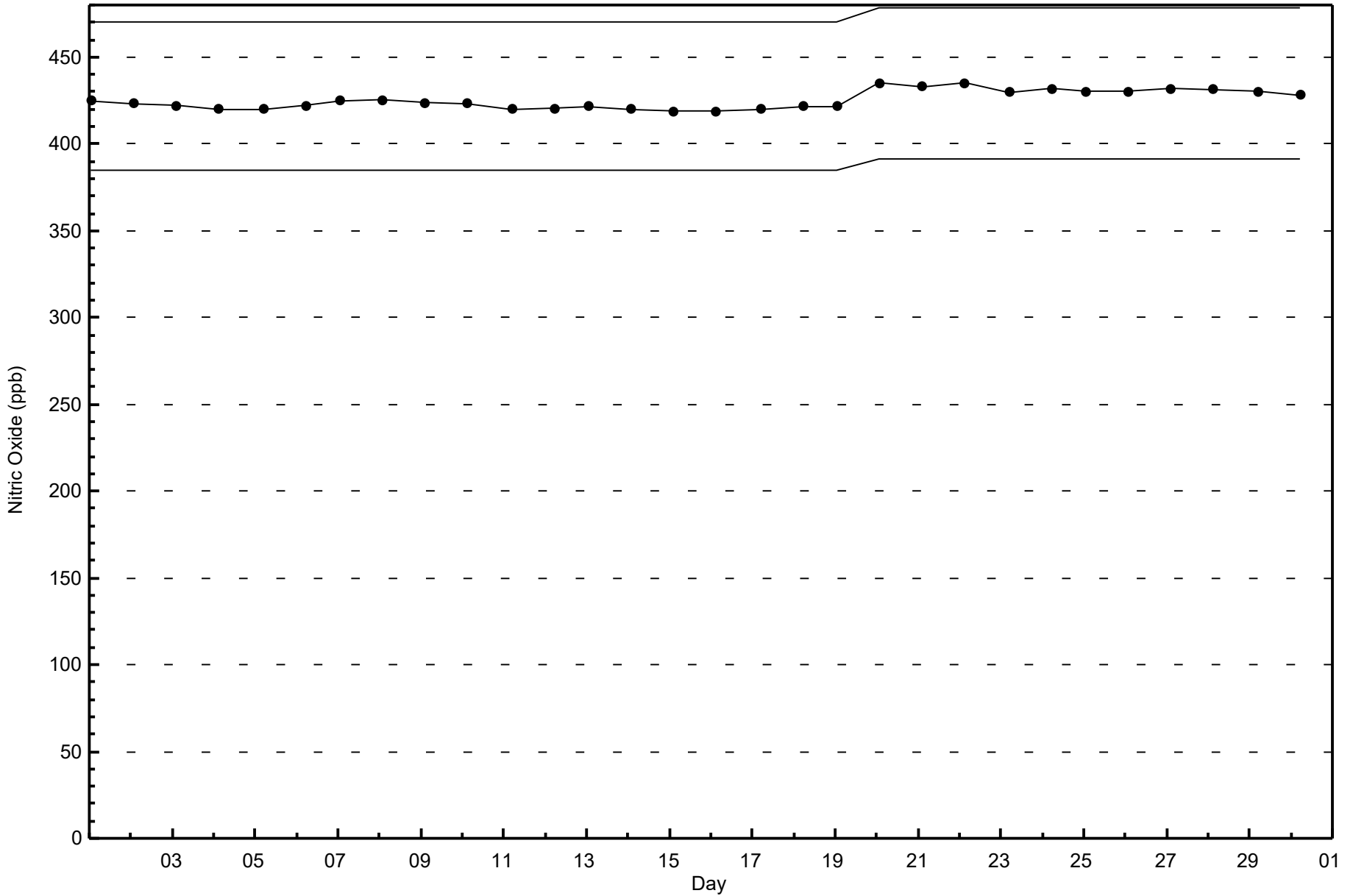
Nitric Oxide (NO) - ppb
Mackay River - June 2023





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Mackay River - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

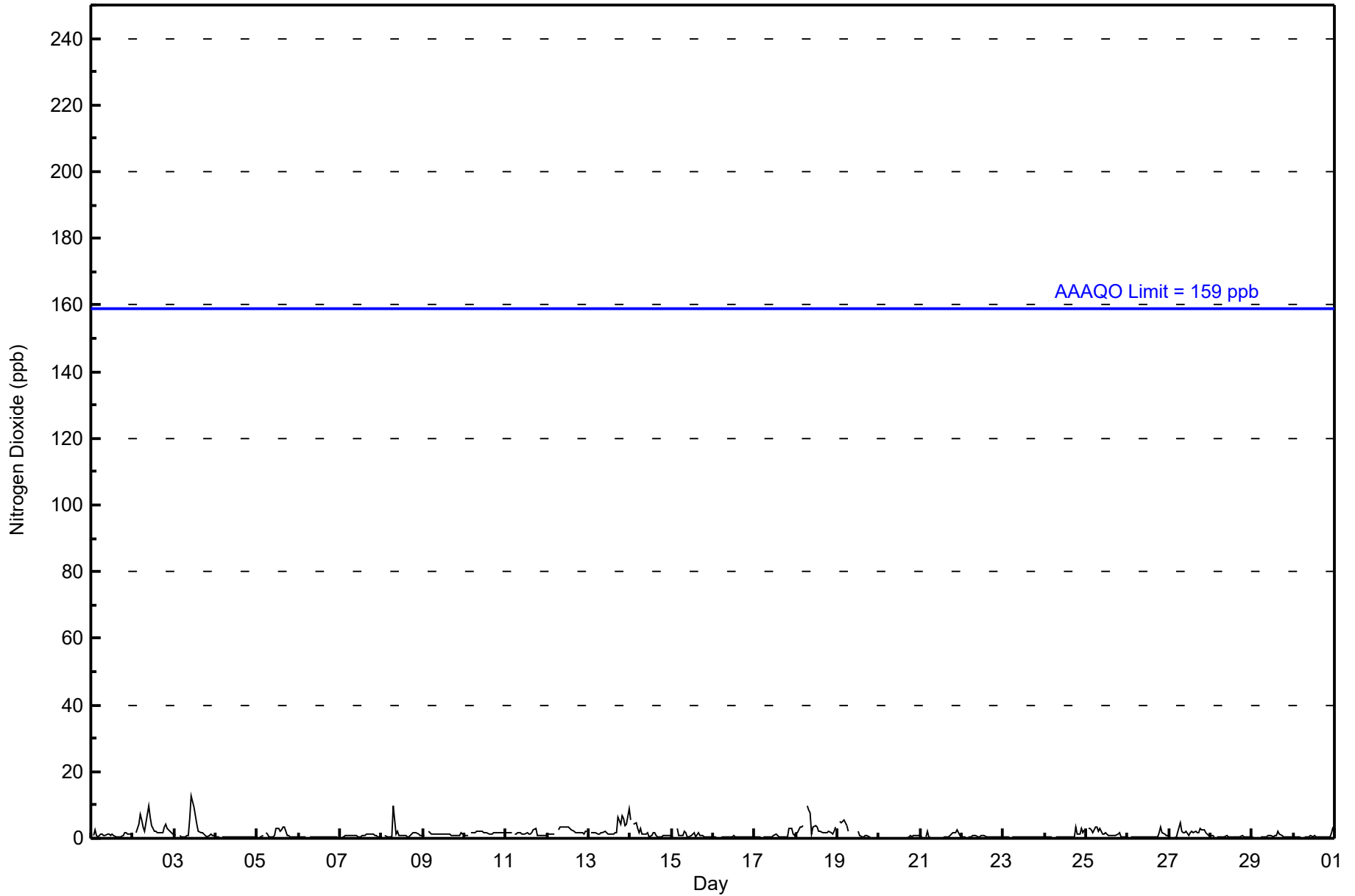
Mackay River - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720				
Maximum Value: 12.5 ppb on Jun 3 11:00		Maximum Daily Average: 3.4 ppb on Jun 2																	Hours of Data:	685						
Minimum Value: 0.0 ppb on Jun 20 10:00		Minimum Daily Average: 0.3 ppb on Jun 20																	Hours of Missing Data:	35						
Maximum Diurnal Average: 1.6 ppb at hour 8		Minimum Diurnal Average: 0.9 ppb at hour 1																	Hours of Calibration:	35						
Monthly Average: 1.26 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.7 Q ₃ = 1.6 P ₉₀ = 2.8 P ₉₉ = 7.8																	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-Jun	Z	0.7	2.5	1.0	0.6	1.1	1.1	0.8	0.7	1.4	1.4	0.8	1.2	0.7	0.6	0.5	0.5	0.5	0.7	1.5	1.5	1.2	1.4	1.4	1.0	2.5
2-Jun	1.1	Z	1.9	4.4	7.0	5.3	3.2	2.0	7.0	9.8	6.2	3.9	2.3	2.0	1.9	1.8	1.6	1.7	3.3	4.1	3.1	2.3	1.8	1.4	3.4	9.8
3-Jun	1.2	1.0	Z	0.7	0.5	0.5	0.6	0.7	1.0	6.1	12.5	9.5	6.8	4.3	2.3	1.8	1.6	1.1	0.8	0.6	0.8	1.2	0.9	0.7	2.5	12.5
4-Jun	0.6	0.5	0.4	Z	0.6	0.5	0.5	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.6	0.4	0.5	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.6
5-Jun	0.2	0.2	0.4	0.7	Z	1.5	1.2	0.4	0.3	0.3	0.8	2.9	3.1	2.1	2.4	3.5	3.2	1.0	0.9	0.6	0.6	0.5	0.5	0.3	1.2	3.5
6-Jun	0.3	0.3	0.3	0.4	0.5	Z	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.6
7-Jun	Z	0.4	0.6	0.7	0.8	0.9	0.9	1.0	1.0	0.7	0.5	0.5	0.5	0.7	0.9	1.3	1.3	1.2	1.4	1.2	1.0	0.8	0.6	0.5	0.8	1.4
8-Jun	0.4	Z	0.8	0.5	0.4	0.3	0.4	9.8	1.1	2.0	1.0	0.7	0.8	0.7	0.7	0.6	0.6	1.1	1.7	1.7	1.7	1.3	1.0	0.9	1.3	9.8
9-Jun	0.9	0.9	Z	2.0	1.7	1.4	1.3	1.2	1.1	1.1	1.2	1.1	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.8	0.7	1.0	1.5	1.3	1.2	2.0
10-Jun	0.9	0.8	1.0	Z	1.5	1.7	1.8	2.1	2.3	2.3	2.1	1.9	1.7	1.6	1.4	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.6	1.7	1.6	2.3
11-Jun	1.8	1.8	1.9	1.8	Z	1.4	1.2	1.5	1.5	1.4	1.2	1.3	1.5	1.4	1.2	1.9	2.5	3.0	1.0	0.9	0.9	0.8	0.8	0.9	1.5	3.0
12-Jun	1.2	1.1	1.2	1.4	1.4	Z	2.4	3.4	3.2	3.5	3.6	3.3	3.5	3.1	2.5	2.1	1.9	1.8	1.5	1.5	1.5	1.4	2.0	2.3	2.2	3.6
13-Jun	Z	1.8	1.9	1.7	1.6	1.4	1.4	1.7	1.7	2.2	1.8	1.2	1.4	1.3	1.4	1.8	1.8	6.4	4.1	6.6	6.1	3.8	4.2	9.0	2.9	9.0
14-Jun	5.6	Z	4.4	4.6	2.9	1.9	2.9	1.3	1.3	1.4	1.8	0.5	0.9	1.7	1.8	0.8	0.5	0.5	0.4	0.7	0.7	0.8	0.8	0.7	1.7	5.6
15-Jun	0.6	0.6	Z	2.8	0.7	0.8	0.7	2.2	1.6	0.4	0.4	1.0	1.4	1.6	0.5	1.6	1.0	0.8	0.9	0.3	0.3	0.3	0.3	0.3	0.9	2.8
16-Jun	0.3	0.3	0.2	Z	0.2	0.3	0.3	0.4	0.5	0.6	0.5	0.6	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7
17-Jun	0.3	0.3	0.3	0.3	Z	0.5	0.4	0.5	0.6	0.6	0.6	0.8	1.1	0.7	0.5	0.4	0.4	0.4	0.4	0.4	2.8	3.0	1.2	0.8	0.8	3.0
18-Jun	1.5	1.5	3.2	3.5	4.0	Z	9.7	8.6	7.6	1.4	3.2	4.0	3.3	2.3	2.0	1.7	1.5	1.5	1.9	2.0	1.9	1.4	2.0	3.2	3.2	9.7
19-Jun	Z	5.0	4.6	5.0	5.3	4.0	2.2	Z	Z	Z	Z	Z	2.0	1.0	0.5	0.5	0.8	0.9	0.3	0.2	0.1	0.1	0.1	0.1	1.8	5.3
20-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.4	0.8	0.6	0.7	0.8	0.7	0.8	0.3	0.8
21-Jun	0.7	0.6	Z	0.6	2.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.5	0.4	0.4	1.0	1.4	1.8	1.9	2.4	1.9	1.0	0.8	2.4
22-Jun	0.6	0.3	0.3	Z	0.4	0.4	0.7	0.9	0.7	0.4	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.5	0.9
23-Jun	0.3	0.3	0.3	0.4	Z	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.6
24-Jun	0.4	0.4	0.4	0.4	0.4	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	3.2	1.3	1.2	3.0	1.6	2.4	0.9	3.2
25-Jun	Z	2.9	2.9	2.4	1.8	3.2	3.3	2.2	2.9	1.2	1.1	1.9	1.3	1.0	0.9	0.9	0.8	1.0	1.2	1.5	0.5	0.4	0.3	1.6	3.3	
26-Jun	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.4	0.5	0.5	0.5	0.5	1.9	3.2	1.6	1.1	0.9	0.7	0.7	3.2
27-Jun	0.4	0.5	Z	0.4	0.2	1.9	4.6	2.1	1.6	1.6	2.0	1.0	1.8	2.0	1.9	2.0	1.5	1.6	2.8	2.6	2.4	1.6	1.2	0.9	1.7	4.6
28-Jun	0.8	0.9	0.6	Z	0.6	0.5	0.4	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.4	0.4	0.6	0.9
29-Jun	0.4	0.2	0.2	0.2	Z	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.6	0.7	0.7	2.0	1.2	0.7	0.6	0.6	0.6	0.4	0.4	0.4	0.6	2.0
30-Jun	0.4	0.3	0.3	0.3	0.3	Z	0.5	0.6	0.5	0.6	0.7	0.5	0.7	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	1.7	3.2	0.6	3.2
																								Diurnal Average		
																								Diurnal Maximum		
																								0.9 0.9 1.2 1.5 1.4 1.2 1.5 1.6 1.4 1.5 1.6 1.5 1.4 1.2 1.0 1.1 1.0 1.1 1.2 1.3 1.2 1.1 1.0 1.2		
																								5.6 5.0 4.6 5.0 7.0 5.3 9.7 9.8 7.6 9.8 12.5 9.5 6.8 4.3 2.5 3.5 3.2 6.4 4.1 6.6 6.1 3.8 4.2 9.0		
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 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - June 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 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	55	32	18	25	38	52	44	82	38	60	42	31	26	41	46	682
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	52	55	32	18	25	38	52	44	82	38	60	42	31	26	41	46	682

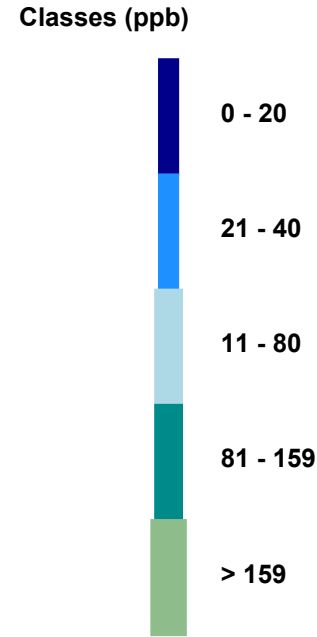
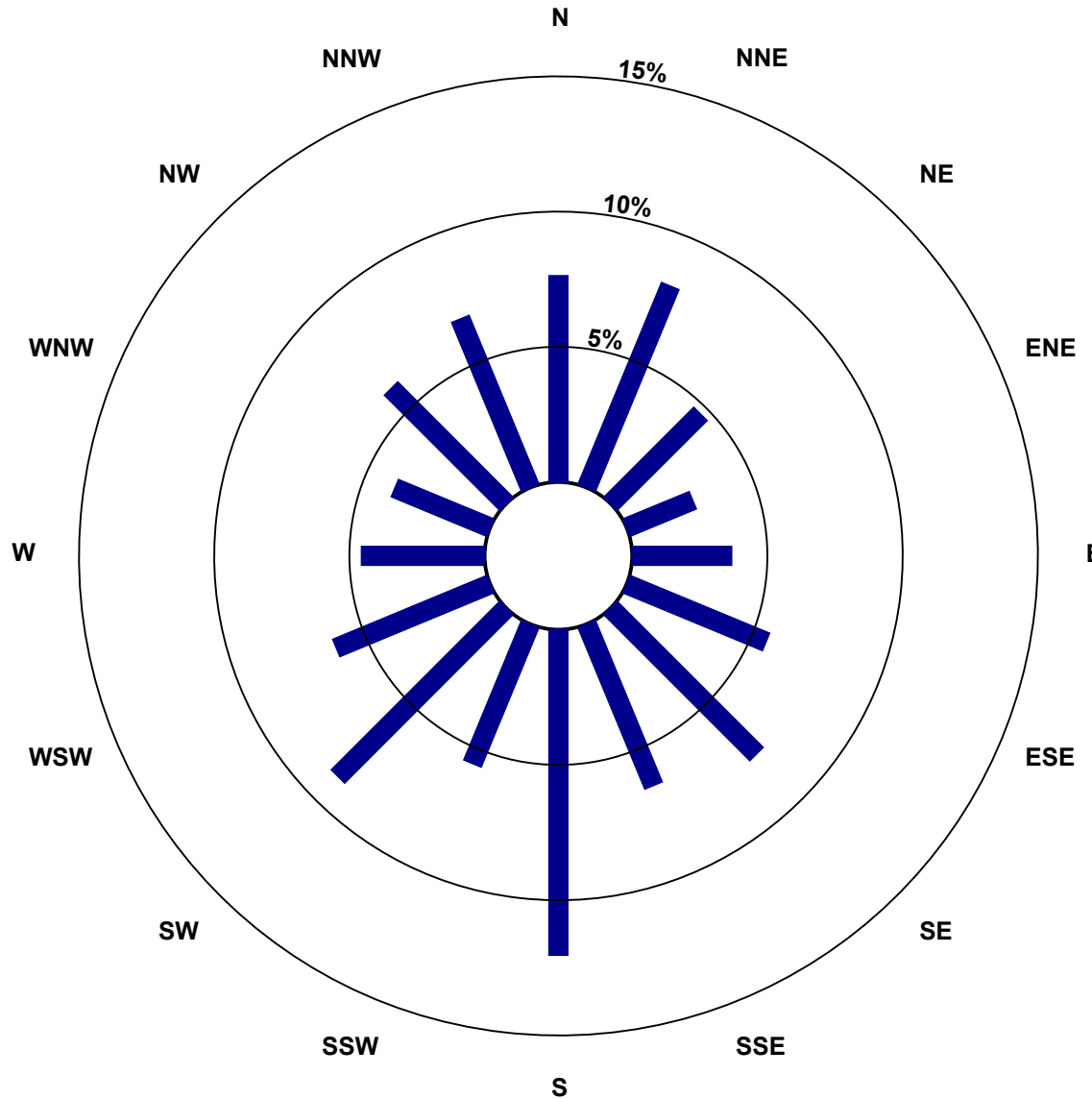
Total Number of Valid Hours: 682

Total Number of Hours: 720

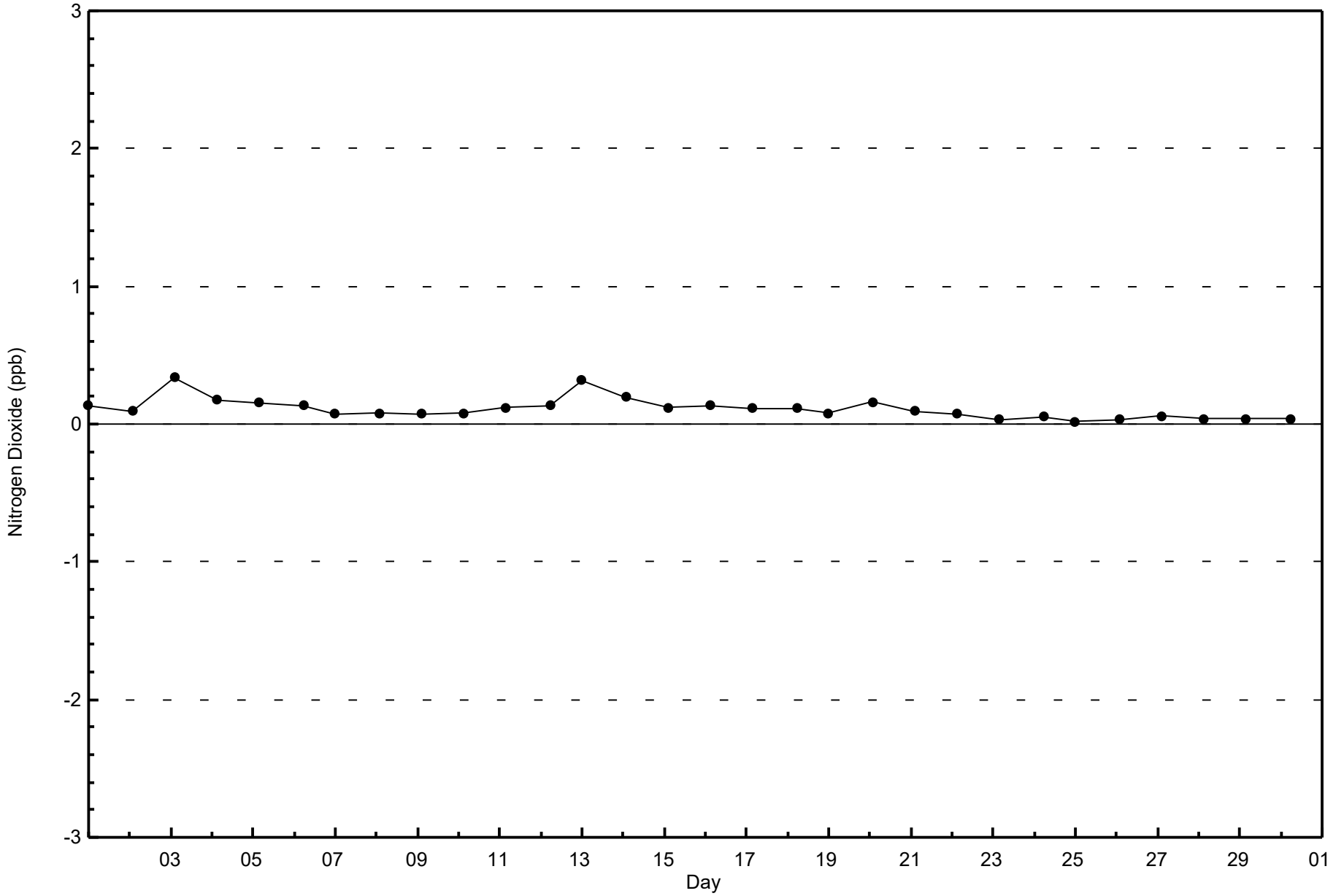


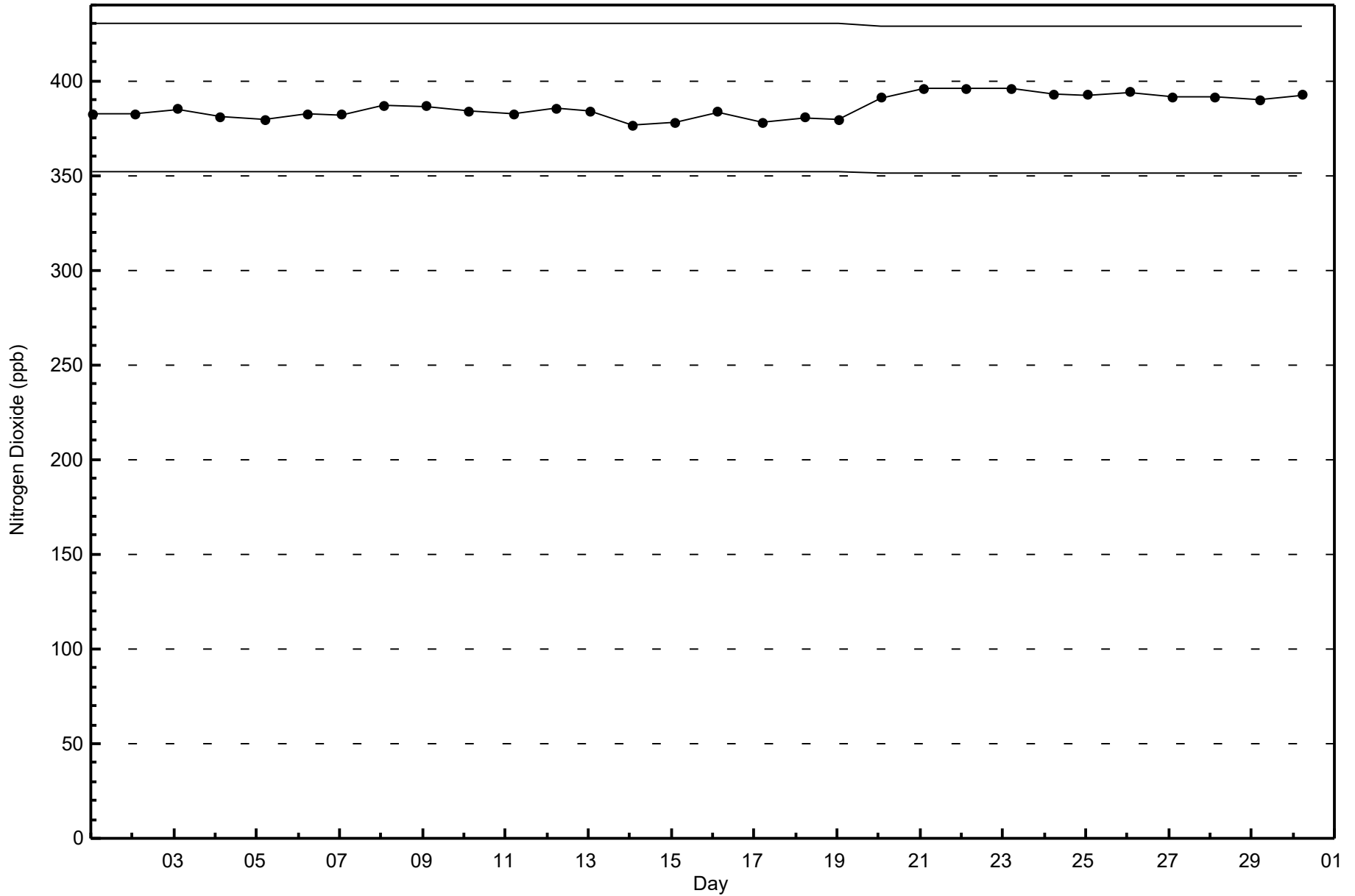
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Mackay River



Total Number of Valid Hours: 682







Wood Buffalo Environmental Association
Summary of Hour Averages

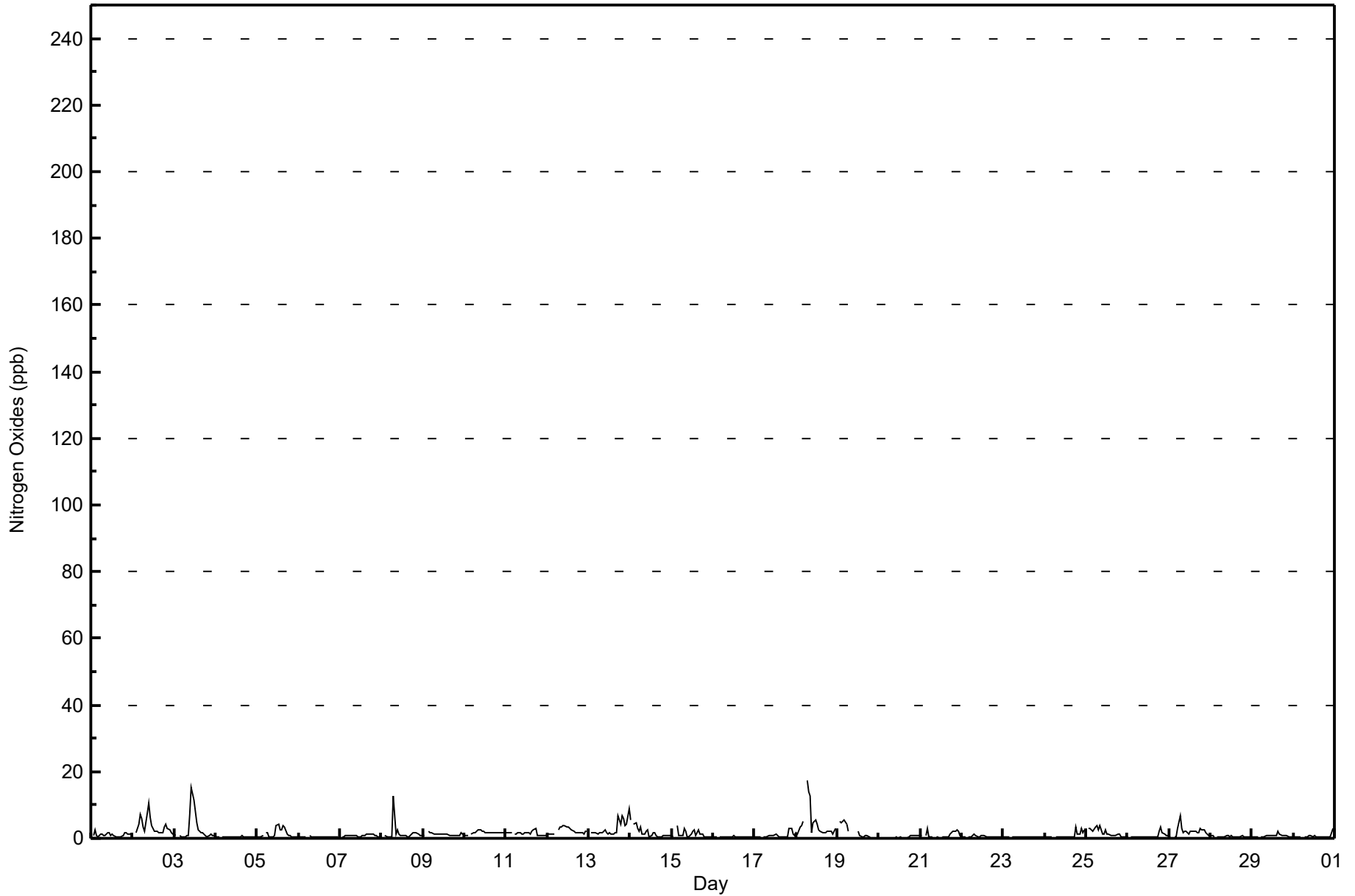
Nitrogen Oxides (NO_x) - ppb
Mackay River - June 2023

Maximum Value: 17.3 ppb on Jun 18 07:00		Maximum Daily Average: 4.3 ppb on Jun 18		Hours in Service: 720																						
Minimum Value: 0.1 ppb on Jun 20 01:00		Minimum Daily Average: 0.3 ppb on Jun 20		Hours of Data: 685																						
Maximum Diurnal Average: 2.0 ppb at hour 8		Minimum Diurnal Average: 0.9 ppb at hour 1		Hours of Missing Data: 35																						
Monthly Average: 1.38 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 0.8 Q ₃ = 1.7 P ₉₀ = 2.9 P ₉₉ = 9.2		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-Jun	Z	0.7	2.6	1.0	0.6	1.2	1.2	0.8	0.8	1.7	1.7	0.9	1.4	0.7	0.6	0.5	0.5	0.5	0.7	1.5	1.5	1.2	1.4	1.4	1.1	2.6
2-Jun	1.1	Z	1.9	4.4	7.2	5.8	3.4	2.1	7.6	10.5	6.4	4.0	2.3	2.0	2.0	1.8	1.6	1.7	3.3	4.1	3.1	2.3	1.8	1.4	3.6	10.5
3-Jun	1.2	1.0	Z	0.7	0.5	0.5	0.6	0.7	1.0	7.3	15.5	11.4	7.9	4.8	2.4	1.9	1.6	1.1	0.8	0.6	0.8	1.2	0.9	0.7	2.8	15.5
4-Jun	0.6	0.5	0.5	Z	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.7
5-Jun	0.4	0.5	0.5	0.8	Z	1.7	1.6	0.5	0.4	0.4	0.9	3.7	4.1	2.4	2.7	3.7	3.3	1.1	1.0	0.7	0.6	0.5	0.5	0.3	1.4	4.1
6-Jun	0.3	0.3	0.3	0.4	0.5	Z	0.7	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.7
7-Jun	Z	0.4	0.6	0.7	0.8	0.9	0.9	1.0	1.0	0.7	0.5	0.5	0.5	0.7	0.9	1.3	1.3	1.2	1.4	1.2	1.0	0.8	0.6	0.5	0.8	1.4
8-Jun	0.4	Z	0.8	0.5	0.4	0.3	0.4	12.7	1.2	2.5	1.2	0.8	0.9	0.8	0.8	0.6	0.6	1.1	1.7	1.7	1.7	1.3	1.0	0.9	1.5	12.7
9-Jun	0.9	0.9	Z	2.1	1.9	1.6	1.4	1.2	1.1	1.2	1.3	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.8	0.7	1.0	1.5	1.3	1.2	2.1
10-Jun	0.9	0.8	1.0	Z	1.5	1.7	1.9	2.2	2.4	2.4	2.2	2.0	1.8	1.7	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.7	2.4
11-Jun	1.8	1.8	1.9	1.8	Z	1.4	1.3	1.5	1.6	1.5	1.3	1.5	1.7	1.6	1.4	2.2	2.7	3.1	1.0	0.9	0.9	0.8	0.8	0.9	1.5	3.1
12-Jun	1.2	1.1	1.2	1.4	1.4	Z	2.4	3.5	3.3	3.6	3.7	3.4	3.5	3.2	2.6	2.1	1.9	1.8	1.5	1.5	1.5	1.4	2.0	2.3	2.2	3.7
13-Jun	Z	1.8	1.9	1.7	1.6	1.4	1.5	1.8	1.8	2.4	1.9	1.3	1.5	1.4	1.4	1.9	1.9	6.7	4.2	6.7	6.1	3.8	4.2	9.0	2.9	9.0
14-Jun	5.6	Z	4.4	4.6	3.0	2.0	3.3	1.4	1.5	1.9	2.5	0.6	1.0	1.9	1.9	0.9	0.5	0.5	0.4	0.7	0.7	0.8	0.8	0.7	1.8	5.6
15-Jun	0.6	0.6	Z	3.6	0.7	0.8	0.7	3.0	2.0	0.4	0.4	1.3	1.9	2.4	0.6	2.3	1.3	1.1	1.1	0.3	0.3	0.3	0.3	0.3	1.1	3.6
16-Jun	0.3	0.3	0.2	Z	0.3	0.3	0.4	0.5	0.6	0.6	0.5	0.6	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7
17-Jun	0.3	0.3	0.3	0.3	Z	0.5	0.5	0.6	0.7	0.7	0.7	0.9	1.2	0.7	0.5	0.4	0.4	0.4	0.4	0.4	2.9	3.1	1.2	0.8	0.8	3.1
18-Jun	1.5	1.5	3.3	3.8	5.1	Z	17.3	13.9	12.8	1.8	4.5	5.3	4.4	2.8	2.3	1.9	1.8	1.7	2.0	2.1	1.9	1.4	2.0	3.2	4.3	17.3
19-Jun	Z	5.0	4.6	5.0	5.4	4.1	2.3	Z	Z	Z	Z	Z	2.2	1.1	0.5	0.5	0.8	0.9	0.3	0.2	0.1	0.1	0.1	0.1	1.8	5.4
20-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.5	1.0	0.7	0.8	0.9	0.8	0.9	0.3	1.0
21-Jun	0.8	0.7	Z	0.7	2.9	0.4	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.3	0.6	0.5	0.5	1.1	1.6	2.0	2.0	2.5	1.9	1.0	0.9	2.9
22-Jun	0.6	0.4	0.3	Z	0.5	0.5	0.8	1.1	0.8	0.5	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.6	1.1
23-Jun	0.3	0.3	0.3	0.4	Z	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.6
24-Jun	0.4	0.4	0.4	0.4	0.4	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	3.3	1.3	1.2	3.0	1.6	2.4	0.9	3.3	
25-Jun	Z	2.9	2.9	2.4	1.9	3.5	3.9	2.7	3.7	1.4	1.4	2.4	1.5	1.1	1.0	0.9	0.8	1.0	1.2	1.5	0.5	0.4	0.3	1.7	3.9	
26-Jun	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	2.2	3.5	1.6	1.1	0.9	0.7	0.8	3.5
27-Jun	0.4	0.5	Z	0.4	0.3	2.8	6.6	2.8	1.9	1.9	2.3	1.1	1.9	2.1	2.0	2.1	1.6	1.7	2.9	2.7	2.4	1.6	1.2	0.9	1.9	6.6
28-Jun	0.8	0.9	0.6	Z	0.6	0.5	0.4	0.5	0.6	0.7	0.6	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.4	0.4	0.6	0.9
29-Jun	0.4	0.3	0.3	0.3	Z	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.7	2.1	1.4	0.8	0.7	0.6	0.7	0.4	0.4	0.4	0.7	2.1
30-Jun	0.4	0.3	0.3	0.3	0.3	Z	0.5	0.6	0.6	0.7	0.8	0.5	0.7	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	1.7	3.2	0.6	3.2
																								Diurnal Average		
																								Diurnal Maximum		
																								0.9 1.0 1.3 1.5 1.6 1.4 1.9 2.0 1.8 1.7 1.9 1.7 1.6 1.3 1.1 1.1 1.0 1.2 1.3 1.3 1.2 1.1 1.1 1.2		
																								5.6 5.0 4.6 5.0 7.2 5.8 17.3 13.9 12.8 10.5 15.5 11.4 7.9 4.8 2.7 3.7 3.3 6.7 4.2 6.7 6.1 3.8 4.2 9.0		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Mackay River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - June 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
Mackay River - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	55	32	18	25	38	52	44	82	38	60	42	31	26	41	46	682
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	52	55	32	18	25	38	52	44	82	38	60	42	31	26	41	46	682

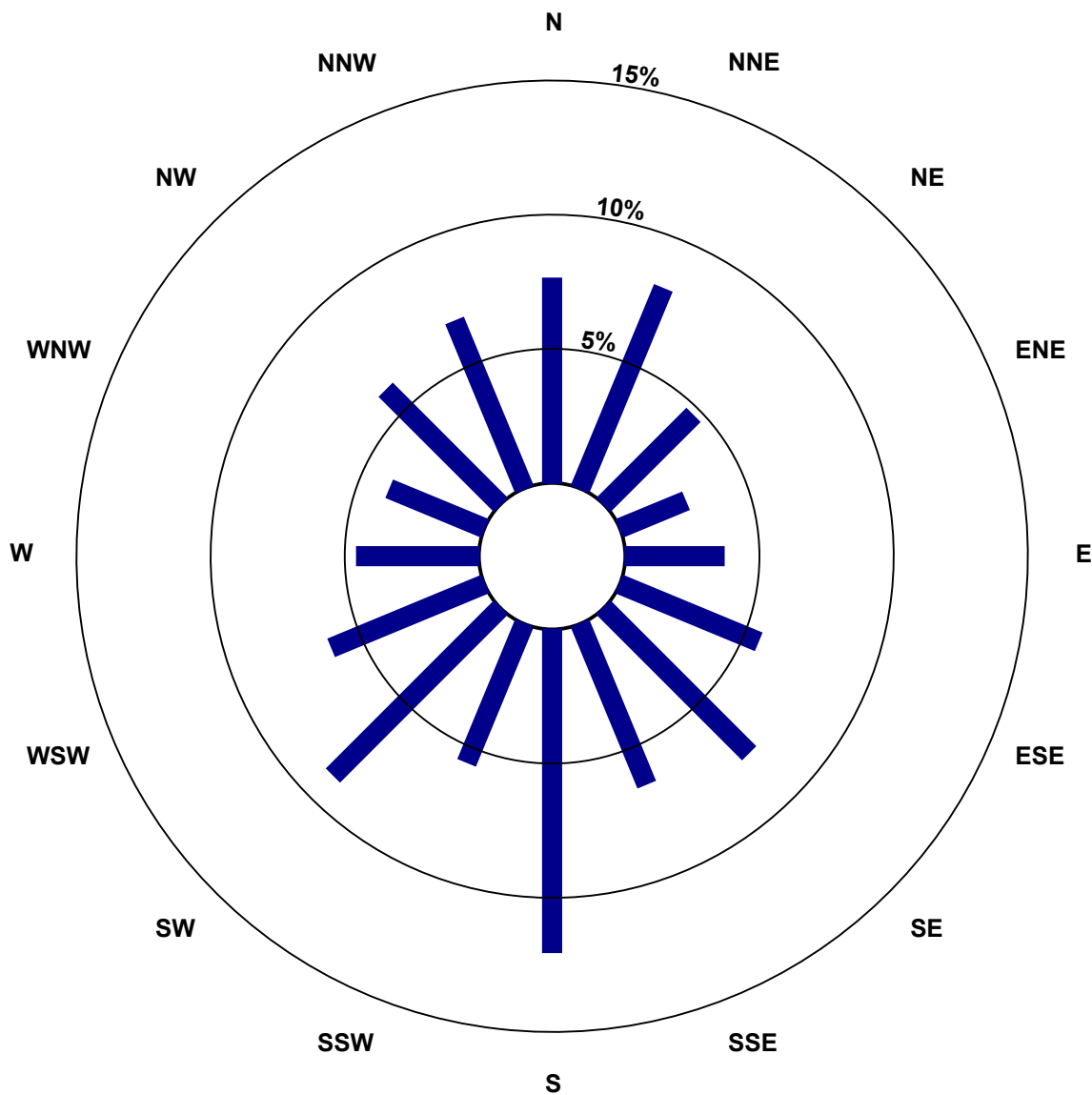
Total Number of Valid Hours: 682

Total Number of Hours: 720

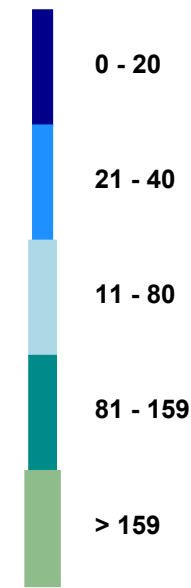


Wood Buffalo Environmental Association
Wind Rose Jun 2023

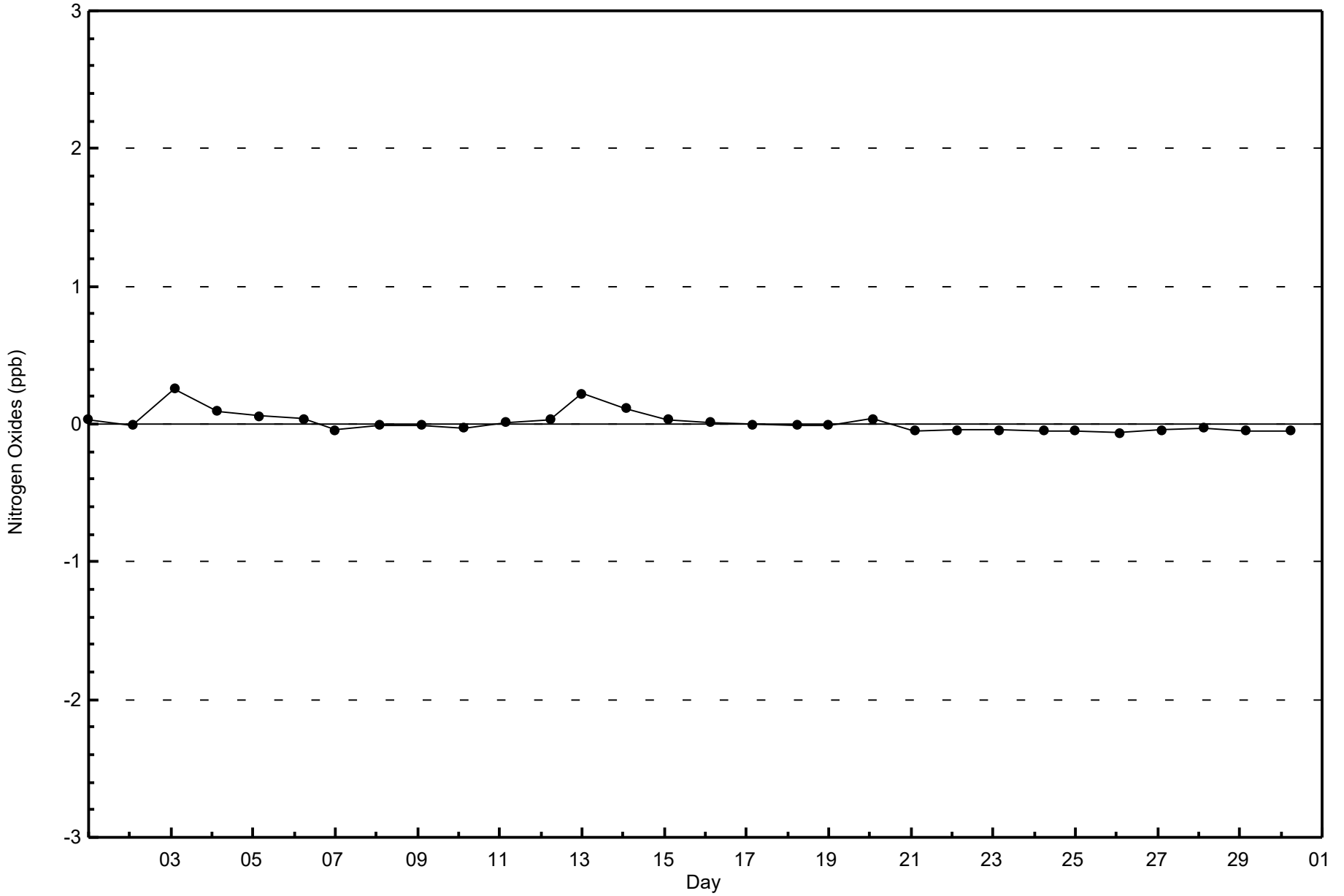
Nitrogen Oxides (NO_x) - ppb
Mackay River

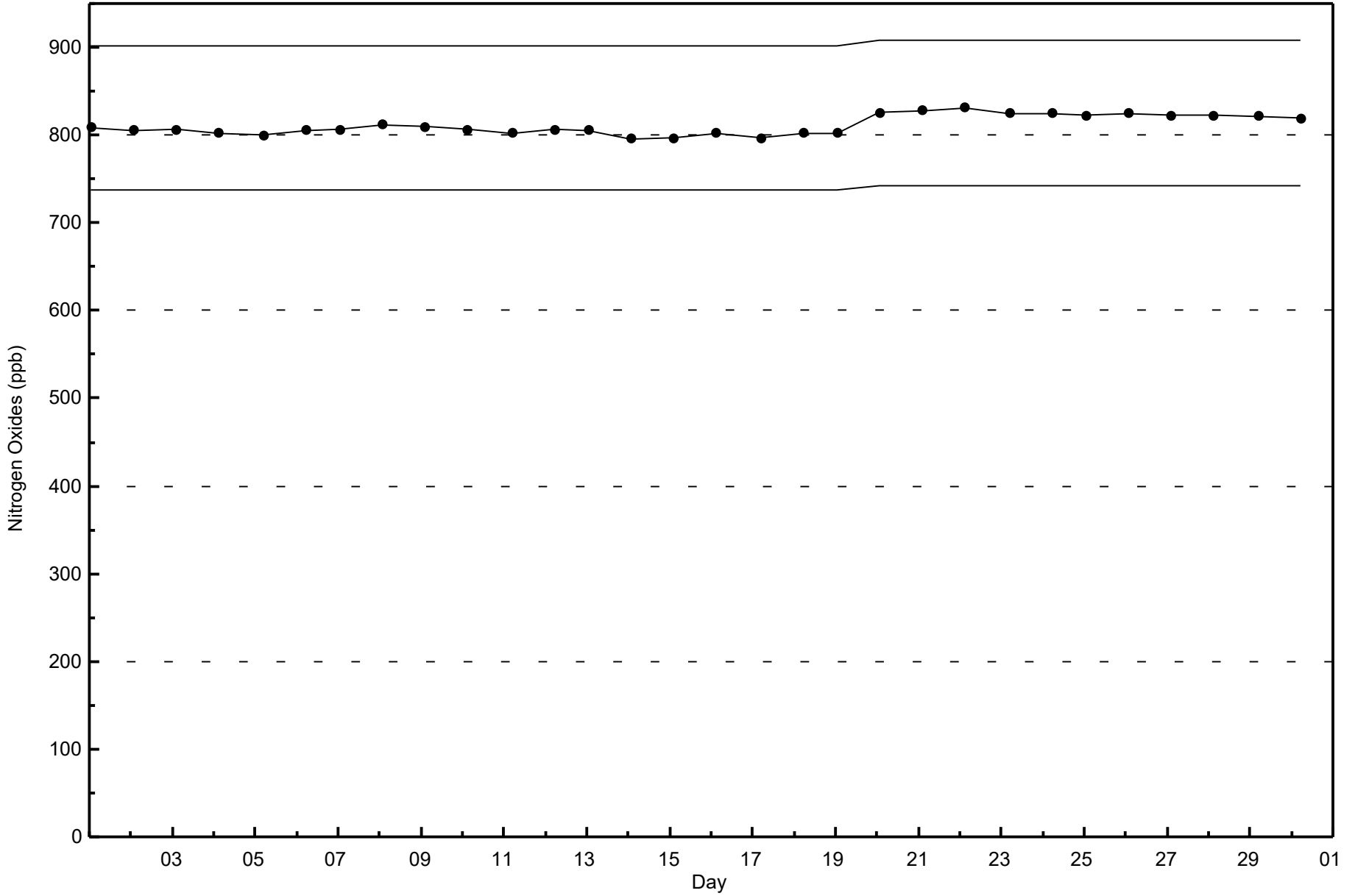


Classes (ppb)



Total Number of Valid Hours: 682



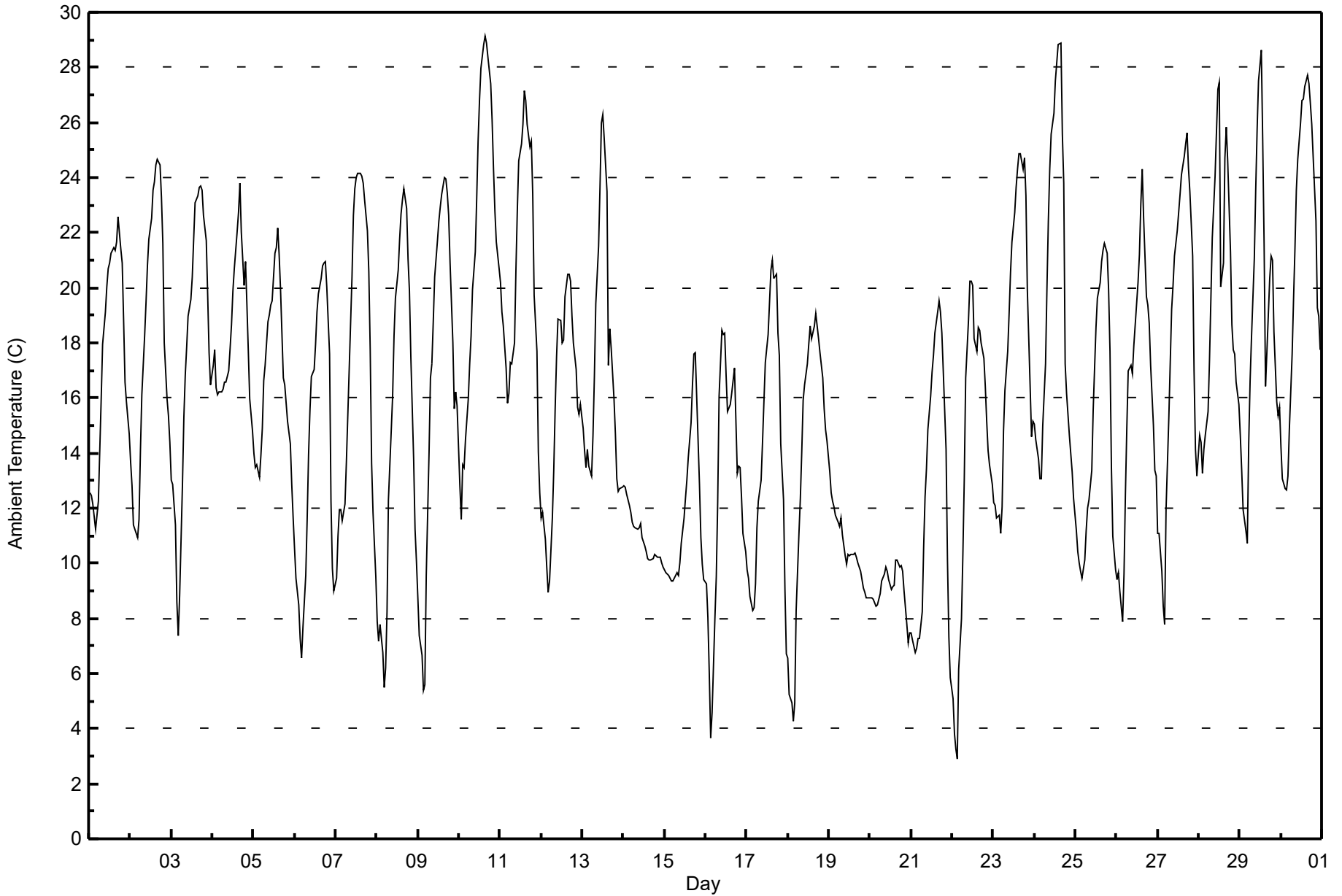




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Mackay River - June 2023

Maximum Value: 29.1 C on Jun 10 16:00 Minimum Value: 2.9 C on Jun 22 04:00 Maximum Diurnal Average: 21.0 C at hour 17 Monthly Average: 16.09 C		Maximum Daily Average: 21.7 C on Jun 10 Minimum Daily Average: 9.0 C on Jun 20 Minimum Diurnal Average: 10.1 C at hour 4 Percentiles: $P_1 = 5.0$ $P_{10} = 9.1$ $Q_1 = 11.6$ Median = 16.1 $Q_3 = 20.3$ $P_{90} = 23.8$ $P_{99} = 28.1$		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-Jun	12.5	12.4	12.2	11.7	11.2	12.3	14.1	16.0	17.9	19.1	20.0	20.7	20.9	21.2	21.4	21.4	21.7	22.6	21.4	20.9	18.8	16.6	15.9	14.7	17.4	22.6																						
2-Jun	13.7	12.8	11.4	11.1	11.0	11.6	14.1	16.1	18.2	19.5	20.8	21.8	22.5	23.5	23.9	24.5	24.6	24.4	23.3	21.6	18.0	15.9	15.4	14.4	18.1	24.6																						
3-Jun	13.0	12.8	11.4	8.6	7.3	8.9	12.9	15.3	16.9	17.9	19.0	19.6	20.4	21.8	23.1	23.3	23.6	23.7	23.5	22.7	21.7	19.7	17.6	16.5	17.6	23.7																						
4-Jun	17.2	17.8	16.4	16.1	16.2	16.2	16.3	16.6	16.6	17.0	17.8	18.7	19.9	20.7	22.0	22.8	23.8	22.0	20.1	21.0	19.4	17.7	16.0	14.8	18.4	23.8																						
5-Jun	14.0	13.5	13.6	13.1	13.9	14.9	16.6	17.2	18.8	19.0	19.4	19.5	21.3	21.5	22.2	21.2	19.9	16.7	16.5	15.8	15.2	14.3	12.9	11.7	16.8	22.2																						
6-Jun	10.5	9.5	8.5	7.3	6.6	7.7	9.6	11.6	13.9	15.6	16.8	17.0	18.0	19.1	19.8	20.4	20.8	20.9	20.9	20.0	17.6	12.3	9.8	9.0	14.3	20.9																						
7-Jun	9.5	11.0	11.9	11.9	11.5	12.1	13.7	15.3	17.0	20.4	22.6	23.6	24.0	24.2	24.1	24.0	23.8	23.2	22.1	20.6	17.7	13.6	11.9	9.5	17.5	24.2																						
8-Jun	7.9	7.1	7.8	6.7	5.5	6.2	8.2	12.3	14.8	16.1	18.2	19.6	20.7	21.8	22.7	23.2	23.6	22.9	21.1	19.9	17.5	13.8	11.3	10.1	15.0	23.6																						
9-Jun	8.8	7.4	6.6	5.4	5.6	9.6	14.1	16.7	17.3	18.7	20.4	21.7	22.4	22.9	23.4	24.0	24.0	23.5	22.7	20.9	18.0	15.6	16.2	15.7	16.7	24.0																						
10-Jun	12.8	11.6	13.6	13.5	14.5	15.9	17.2	18.3	19.9	21.3	23.2	25.3	26.8	28.0	28.8	29.1	28.9	28.4	27.4	26.1	24.3	22.8	21.7	20.7	21.7	29.1																						
11-Jun	20.2	19.1	18.6	17.1	15.8	16.2	17.3	17.2	18.0	20.7	22.8	24.6	25.2	26.0	27.2	26.8	25.9	25.1	25.3	23.4	19.7	17.7	14.0	12.5	20.7	27.2																						
12-Jun	11.7	11.8	10.9	9.9	9.0	9.4	11.7	13.4	15.6	17.5	18.9	18.8	18.0	18.1	19.7	20.5	20.5	20.2	19.0	18.0	17.0	15.7	15.4	15.8	15.7	20.5																						
13-Jun	14.9	14.1	13.5	14.1	13.5	13.2	14.7	16.8	19.4	21.5	23.6	26.0	26.3	25.4	23.5	17.2	18.5	17.8	16.0	14.7	13.1	12.6	12.7	12.8	17.3	26.3																						
14-Jun	12.8	12.8	12.5	12.1	11.8	11.5	11.3	11.3	11.3	11.4	10.9	10.7	10.4	10.2	10.1	10.1	10.2	10.3	10.2	10.3	10.2	10.2	10.0	9.9	11.0	12.8																						
15-Jun	9.7	9.7	9.6	9.5	9.4	9.3	9.6	9.7	9.6	10.0	10.7	11.6	12.3	13.0	13.8	15.1	16.5	17.6	17.6	16.1	12.9	10.9	10.0	9.4	11.8	17.6																						
16-Jun	9.2	8.0	6.0	3.7	4.6	8.0	9.5	12.2	16.1	18.5	18.3	18.3	16.8	15.5	15.8	16.1	16.6	17.1	13.3	13.5	13.5	12.4	11.1	10.4	12.7	18.5																						
17-Jun	9.8	9.5	8.8	8.3	8.4	9.3	11.3	12.3	13.0	14.4	15.9	17.3	18.3	19.5	20.7	21.0	20.3	20.5	18.4	17.5	14.4	12.3	9.1	6.7	14.0	21.0																						
18-Jun	6.5	5.2	4.9	4.3	4.9	8.3	11.1	12.4	14.0	15.9	16.5	17.2	17.9	18.6	18.2	18.6	19.1	18.6	18.1	17.6	16.7	15.6	14.8	14.4	13.7	19.1																						
19-Jun	13.3	12.6	12.2	12.0	11.8	11.5	11.3	11.6	11.1	10.2	10.0	10.3	10.3	10.3	10.3	10.4	10.2	10.0	9.7	9.4	9.1	9.0	8.8	8.8	10.6	13.3																						
20-Jun	8.7	8.7	8.7	8.5	8.5	8.7	8.9	9.4	9.6	9.9	9.7	9.4	9.1	9.1	9.2	10.1	10.1	9.9	9.9	9.7	9.0	7.8	7.1	7.5	9.0	10.1																						
21-Jun	7.5	7.2	6.8	6.9	7.3	7.3	8.2	10.6	12.4	13.4	14.8	16.1	17.0	17.6	18.3	19.1	19.5	19.1	18.3	17.0	14.1	10.1	7.3	5.8	12.6	19.5																						
22-Jun	5.1	3.8	3.3	2.9	6.2	8.0	10.3	13.1	16.7	18.8	20.2	20.2	20.1	18.1	17.7	18.5	18.4	18.0	17.4	16.4	15.1	14.1	13.6	12.8	13.7	20.2																						
23-Jun	12.2	12.1	11.7	11.7	11.1	12.0	14.8	16.3	17.7	19.1	20.6	21.7	22.7	23.6	24.3	24.8	24.8	24.3	24.7	23.3	19.9	16.4	14.6	15.2	18.3	24.8																						
24-Jun	15.1	14.5	13.8	13.1	13.1	15.0	17.2	20.0	22.4	24.3	25.6	26.4	27.5	28.1	28.8	28.9	25.6	23.8	17.2	16.2	14.7	14.0	13.3	12.3	19.6	28.9																						
25-Jun	11.2	10.4	10.0	9.7	9.4	10.1	11.2	12.0	12.3	13.4	15.6	17.1	18.5	19.6	20.2	20.9	21.3	21.6	21.2	20.0	17.7	13.5	11.0	9.8	14.9	21.6																						
26-Jun	9.4	9.7	9.0	7.9	9.6	12.5	14.9	17.0	17.2	16.9	17.9	18.6	20.2	21.2	23.0	24.3	22.5	19.7	19.4	18.7	17.2	15.0	13.4	13.2	16.2	24.3																						
27-Jun	11.1	11.1	9.7	8.4	7.8	12.0	15.3	17.3	19.2	20.1	21.1	22.1	22.7	23.4	24.1	24.8	25.2	25.6	24.3	23.5	21.1	17.0	14.1	13.2	18.1	25.6																						
28-Jun	14.6	14.4	13.3	14.1	14.6	15.5	17.3	19.6	21.8	24.1	25.7	27.2	27.4	20.0	20.9	24.7	25.9	24.6	21.3	18.6	17.7	17.6	16.6	15.7	19.7	27.4																						
29-Jun	14.6	13.4	12.0	11.2	10.7	14.3	16.6	18.2	21.0	23.6	25.7	27.5	28.6	25.3	21.6	16.4	17.7	20.4	21.1	21.0	18.4	15.9	15.4	15.7	18.6	28.6																						
30-Jun	14.2	13.1	12.7	12.7	13.2	14.8	17.6	19.6	21.4	23.5	24.7	26.0	26.8	26.8	27.3	27.7	27.4	26.7	26.0	24.8	22.4	19.3	19.0	17.7	21.1	27.7																						
																								11.7	11.2	10.7	10.1	10.1	11.4	13.2	14.8	16.4	17.7	18.9	19.8	20.4	20.5	20.9	21.0	21.0	20.6	19.6	18.6	16.7	14.6	13.3	12.6	Diurnal Average
																								20.2	19.1	18.6	17.1	16.2	16.2	17.6	20.0	22.4	24.3	25.7	27.5	28.6	28.1	28.8	29.1	28.9	28.4	27.4	26.1	24.3	22.8	21.7	20.7	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mackay River - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	117	16.25	16.25
10 - 20	411	57.08	73.33
> 20	192	26.67	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

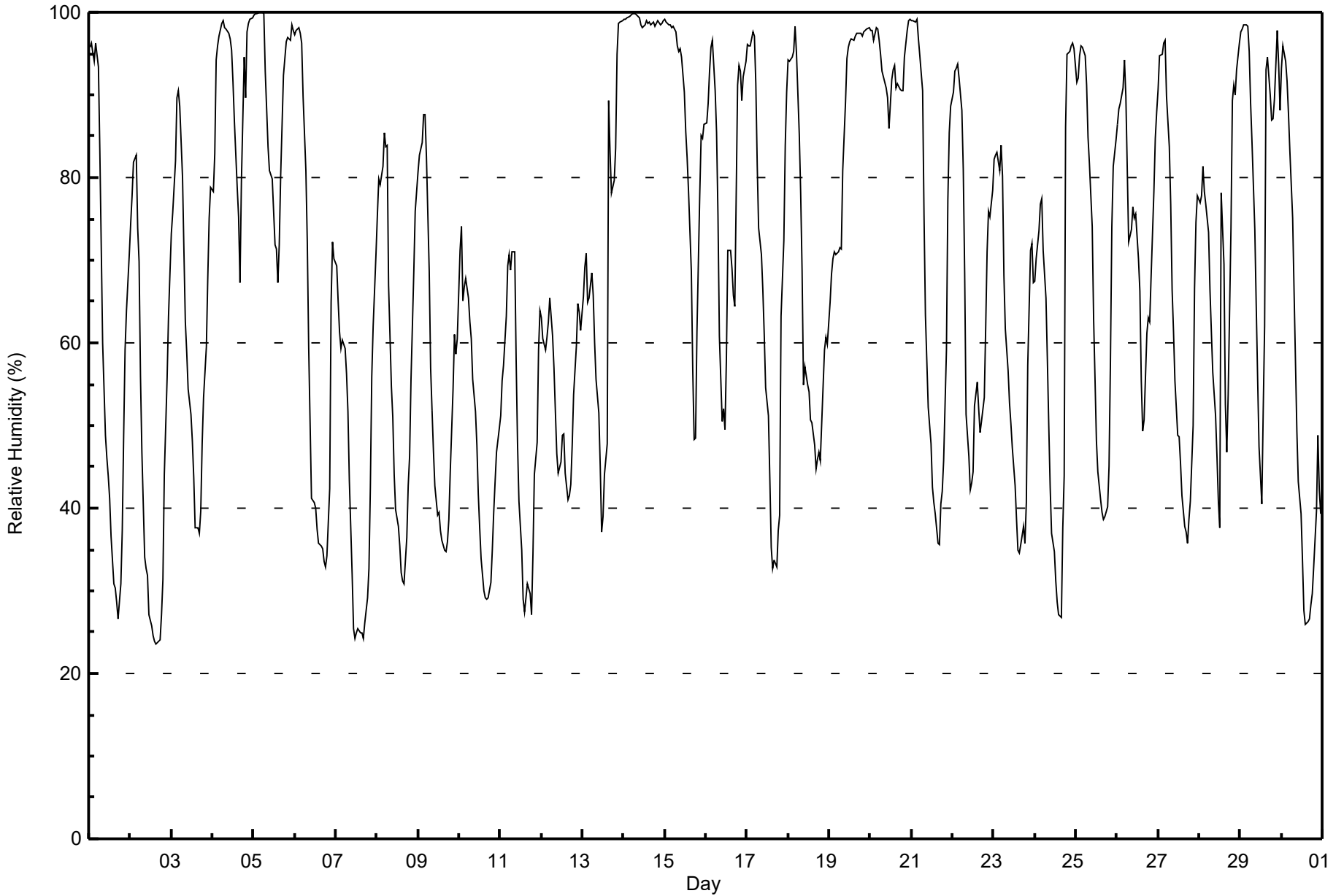
Relative Humidity (RH) - %
Mackay River - June 2023

Maximum Value: 100.0 % on Jun 5 05:00 Maximum Daily Average: 99.0 % on Jun 14 Minimum Value: 23.6 % on Jun 2 16:00 Minimum Daily Average: 43.8 % on Jun 7 Maximum Diurnal Average: 87.0 % at hour 5 Minimum Diurnal Average: 49.6 % at hour 17 Monthly Average: 67.71 % Percentiles: P ₁ = 24.9 P ₁₀ = 35.4 Q ₁ = 47.4 Median = 69.0 Q ₃ = 90.7 P ₉₀ = 97.6 P ₉₉ = 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 Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	95.8	96.3	95.1	94.2	96.2	93.4	83.3	71.7	60.0	48.8	46.1	43.9	41.1	36.5	30.9	30.4	28.6	26.6	30.8	37.3	48.8	59.2	63.8	70.7	59.6	96.3																						
2-Jun	74.4	77.8	81.9	82.6	74.0	69.9	55.9	46.8	34.1	32.7	31.8	27.1	25.7	24.6	23.9	23.6	23.8	24.1	27.1	31.3	44.0	55.8	63.2	68.3	46.9	82.6																						
3-Jun	73.2	75.7	82.1	89.7	90.6	88.6	79.9	71.0	62.6	58.8	54.4	51.3	48.2	43.7	37.6	37.7	37.0	39.7	47.8	53.3	59.5	67.9	75.1	78.9	62.7	90.6																						
4-Jun	78.4	82.9	94.2	95.9	97.1	98.7	99.0	98.1	98.0	97.4	96.7	95.4	91.5	86.7	78.8	75.3	67.4	79.5	94.5	89.6	97.6	98.7	99.1	99.4	91.2	99.4																						
5-Jun	99.6	99.8	99.9	100.0	100.0	100.0	99.8	92.8	83.8	80.9	80.4	79.9	71.8	71.4	67.2	71.9	80.1	92.4	94.5	96.5	96.9	96.6	98.6	97.8	89.7	100.0																						
6-Jun	97.3	97.7	98.1	97.4	96.4	89.9	80.9	72.3	59.4	50.3	41.3	40.6	40.1	37.5	35.7	35.4	35.1	33.6	32.9	34.2	42.3	64.9	72.2	70.1	60.6	98.1																						
7-Jun	69.4	65.0	61.4	59.4	60.3	59.3	56.2	51.7	43.3	32.0	25.4	24.2	24.9	25.5	24.9	24.9	24.2	26.1	29.2	32.7	42.5	55.9	62.0	70.6	43.8	70.6																						
8-Jun	75.4	79.9	79.2	81.4	85.4	83.7	84.0	67.0	54.7	50.9	44.0	39.9	37.8	35.4	32.3	31.2	30.8	36.5	42.7	46.2	55.6	68.6	76.0	78.3	58.2	85.4																						
9-Jun	80.7	82.8	84.2	87.7	87.6	82.6	68.7	57.0	51.9	47.0	42.6	39.2	39.6	37.4	36.2	34.9	34.8	35.9	38.6	44.4	54.5	61.1	58.6	60.5	56.2	87.7																						
10-Jun	71.2	74.1	65.0	66.8	67.7	65.5	62.6	60.6	55.6	51.6	47.6	41.7	37.7	34.0	30.1	29.1	28.9	29.1	31.0	35.0	39.6	43.3	46.8	49.6	48.5	74.1																						
11-Jun	51.1	55.4	57.2	63.2	69.2	70.6	68.9	71.0	71.1	58.0	47.8	40.9	35.0	29.0	27.4	29.1	30.9	29.7	27.1	34.4	44.1	48.0	59.2	63.9	49.3	71.1																						
12-Jun	63.0	60.5	59.1	60.6	62.5	65.4	60.9	56.9	51.7	46.6	44.2	45.5	48.8	48.9	44.3	41.0	41.5	42.9	47.6	53.7	59.7	64.8	63.8	61.5	54.0	65.4																						
13-Jun	65.6	69.2	70.8	64.9	65.4	68.5	65.8	60.0	55.6	51.5	45.0	37.2	39.0	44.1	47.8	89.3	83.0	78.2	79.7	83.5	94.9	98.6	98.8	98.9	69.0	98.9																						
14-Jun	99.1	99.2	99.3	99.4	99.6	99.8	99.9	99.8	99.5	99.3	98.5	98.1	98.4	98.9	98.6	98.9	98.4	98.8	98.3	98.7	99.1	98.4	98.6	99.0	99.0	99.0	99.9																					
15-Jun	99.2	98.8	98.5	98.4	98.2	98.3	97.6	95.9	95.2	95.6	94.6	90.3	85.7	82.4	78.3	68.6	56.7	48.3	48.5	61.4	77.9	85.0	84.8	86.4	84.4	99.2																						
16-Jun	86.7	89.0	92.9	95.8	96.7	90.6	85.4	75.4	60.8	50.6	52.1	49.6	58.0	71.2	71.1	69.0	65.8	64.4	91.3	93.5	92.8	89.3	92.1	94.0	78.2	96.7																						
17-Jun	96.1	95.9	95.9	97.7	97.2	91.4	81.6	74.0	70.6	66.4	61.0	54.6	51.2	43.6	35.3	32.7	33.8	32.9	37.3	39.1	63.2	72.4	83.8	90.4	66.6	97.7																						
18-Jun	94.2	94.1	94.5	95.3	98.4	95.1	85.2	78.1	68.9	55.0	57.1	54.9	54.1	50.7	50.3	47.7	44.8	45.9	46.8	45.8	54.7	59.2	60.7	59.9	66.3	98.4																						
19-Jun	64.9	68.2	70.2	71.0	70.6	71.0	71.6	71.4	80.8	89.2	94.4	95.8	96.5	96.8	96.5	97.1	97.4	97.5	97.4	97.2	97.6	97.8	97.9	98.2	87.0	98.2																						
20-Jun	97.9	97.8	96.7	98.1	97.9	96.7	95.0	92.9	91.6	90.8	89.7	86.0	91.9	93.0	93.6	90.9	91.3	90.7	90.6	90.5	94.6	97.8	98.9	99.2	93.9	99.2																						
21-Jun	99.0	99.0	98.9	99.1	96.8	94.8	90.5	75.5	63.4	57.9	52.1	47.8	42.5	40.7	39.3	35.7	35.6	40.5	42.0	45.7	59.2	77.3	85.4	88.7	67.0	99.1																						
22-Jun	90.3	92.9	93.2	93.7	92.1	88.1	81.0	68.4	51.3	46.3	42.2	43.1	44.4	52.4	55.2	52.1	49.1	50.5	53.3	61.8	71.1	75.9	75.3	78.4	66.8	93.7																						
23-Jun	82.2	82.6	83.0	80.9	83.9	80.2	68.1	61.8	56.7	52.7	50.2	47.2	42.8	38.7	34.9	34.5	35.6	37.9	35.8	40.7	57.2	71.1	72.0	67.3	58.3	83.9																						
24-Jun	67.4	70.1	73.5	76.7	77.5	71.3	65.4	57.9	50.0	42.6	36.9	34.7	31.1	28.7	27.2	26.8	37.6	44.0	86.1	94.9	95.3	96.0	96.3	95.6	61.8	96.3																						
25-Jun	91.5	92.1	94.7	96.0	95.8	94.7	91.1	85.0	81.7	74.1	63.0	55.5	48.1	44.4	41.1	39.5	38.6	39.1	40.1	45.1	57.9	74.1	81.3	84.6	68.7	96.0																						
26-Jun	86.4	88.3	88.9	90.8	94.3	89.8	81.0	72.1	73.8	76.5	75.1	75.7	70.1	66.3	55.5	49.3	50.7	61.2	63.0	62.6	68.0	78.3	84.7	87.9	74.6	94.3																						
27-Jun	90.7	94.8	94.9	96.3	96.6	89.8	83.8	76.8	66.4	61.4	55.4	48.9	48.7	45.4	41.5	37.7	37.1	35.7	38.7	40.9	50.0	66.7	74.5	77.8	64.6	96.6																						
28-Jun	76.9	77.8	81.3	78.3	76.8	73.4	66.5	61.3	56.4	51.2	46.3	40.8	37.6	78.1	69.6	52.6	46.8	53.8	73.9	89.3	91.2	90.0	93.1	96.3	69.1	96.3																						
29-Jun	97.6	98.0	98.5	98.5	98.3	95.3	89.0	84.2	73.8	64.5	55.7	47.5	40.5	51.8	62.1	93.1	94.6	90.1	87.0	87.1	89.5	97.7	93.7	88.2	82.3	98.5																						
30-Jun	93.3	96.0	94.0	91.7	87.8	83.2	75.1	66.2	57.8	49.4	43.3	39.3	33.7	27.5	26.0	26.2	26.7	28.2	29.6	33.0	39.6	48.8	42.3	39.2	53.2	96.0																						
																								83.6	85.1	85.9	86.7	87.0	84.6	79.1	72.4	66.0	61.0	57.2	53.9	51.9	52.2	49.8	50.2	49.6	51.1	56.1	60.0	68.0	75.3	78.4	80.0	Diurnal Average
																								99.6	99.8	99.9	100.0	100.0	100.0	99.9	99.8	99.5	99.3	98.5	98.1	98.4	98.9	98.6	98.9	98.4	98.8	98.3	98.7	99.1	98.7	99.1	99.4	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mackay River - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Mackay River - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	116	16.11	16.11
40 - 60	169	23.47	39.58
60 - 80	166	23.06	62.64
80 - 100	267	37.08	99.72

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

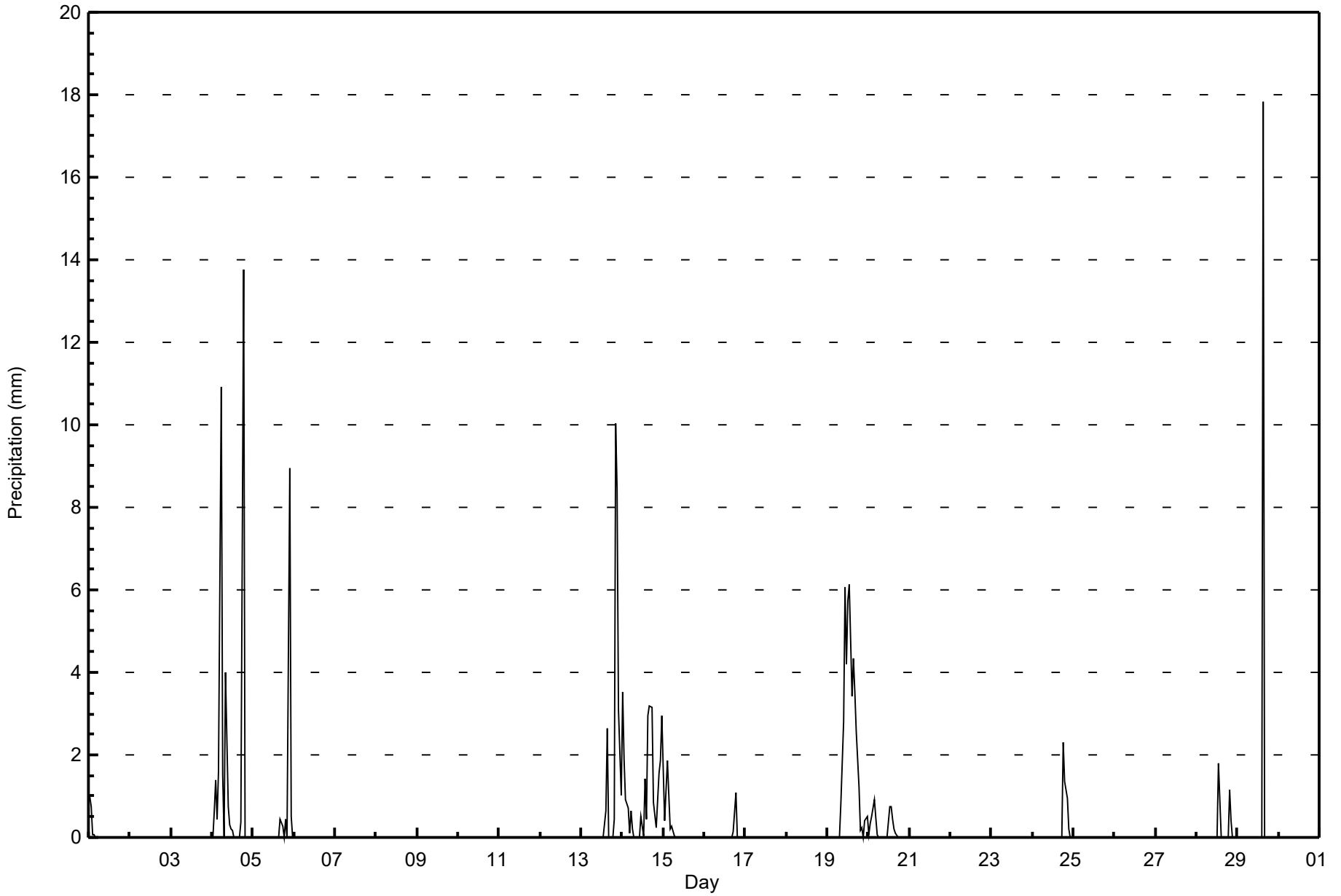
Mackay River - June 2023

Maximum Value: 17.8 mm on Jun 29 16:00																				Maximum Daily Total: 42.2 mm on Jun 19					Hours in Service: 720		
Minimum Value: 0.0 mm on Jun 1 05:00																				Minimum Daily Total: 0.0 mm on Jun 2					Hours of Data: 720		
Maximum Diurnal Total: 28.0 mm at hour 16																				Minimum Diurnal Total: 0.0 mm at hour 8					Hours of Missing Data: 0		
Monthly Total: 182.00 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.3 P ₉₉ = 6.0					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-Jun	1.0	0.8	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	1.9	1.0	
2-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.7	1.4	0.4	1.6	10.9	1.5	0.0	4.0	0.8	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.4	13.8	0.0	0.0	0.0	0.0	0.0	36.1	13.8	
5-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.4	0.0	9.0	0.5	0.0	10.6	9.0	
6-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	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	0.0	0.0	0.4	10.0	8.5	3.1	1.0	26.3	10.0	
14-Jun	3.5	1.9	0.9	0.7	0.1	0.7	0.2	0.0	0.0	0.0	0.0	0.5	0.1	1.4	0.4	3.0	3.2	3.1	0.8	0.5	0.3	1.6	1.9	2.9	27.7	3.5	
15-Jun	1.7	0.4	1.9	1.0	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	1.9	
16-Jun	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	1.2	1.1	
17-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.8	6.1	4.2	5.7	6.1	3.4	4.3	3.5	2.6	1.2	0.2	0.2	0.0	0.4	0.5	42.2	6.1	
20-Jun	0.1	0.3	0.5	0.9	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.9	
21-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	1.3	0.9	0.2	0.0	0.0	4.8	2.3
25-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.4	0.0	0.0	0.0	3.4	1.8	
29-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	17.8	
30-Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
Mackay River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Precipitation (PC) - mm
Mackay River - June 2023**

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	650	90.28	90.28
0.4 - 0.5	16	2.22	92.50
0.6 - 0.7	5	0.69	93.19
0.8 - 1.4	17	2.36	95.56
1.5 - 10	28	3.89	99.44
> 10	4	0.56	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
Mackay River - June 2023

Maximum Speed: 24 km/h on Jun 19 15:00	Maximum Daily Speed Average: 18.4 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 18 00:00	Minimum Daily Speed Average: 1.2 km/h on Jun 8	Hours of Data: 717
Maximum Diurnal Speed Average: 3.0 km/h at hour 14	Minimum Diurnal Speed Average: 0.4 km/h at hour 22	Hours of Missing Data: 3
Monthly Average Velocity: 0.6 km/h 302.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 4 Median = 7 Q ₃ = 9 P ₉₀ = 12 P ₉₉ = 20	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	SSE3	WSW2	NW6	NW4	N2	W4	W4	WSW4	WNW6	NW11	NW11	NW10	NNW10	NNW7	NNW6	NNW6	NE6	ENE4	ENE3	UO	ESE2	ESE3	UO	NW3.8	WNW11	
2-Jun	E1	WNW1	NNW2	NW4	NNW3	N3	NNW4	NNW5	NE7	NE5	NW3	NW7	N8	NNW6	ENE2	NNE4	NNW3	E2	E8	E4	ENE2	ENE3	ENE4	E4	NNE2.6	E8
3-Jun	E4	ESE6	ENE3	NE2	ENE2	NE2	NE4	NE6	ENE7	NNE8	NE9	NE9	NE9	ENE8	ENE8	E10	ENE9	E8	E9	E9	ESE8	ESE4	ESE3	ESE2	ENE5.7	E10
4-Jun	ESE4	ESE6	ESE5	E4	E5	NE4	E7	ESE10	ESE9	ESE10	ESE7	E6	E6	ESE6	SE4	SE5	SE3	N5	E6	E3	ESE1	ESE2	S0	SE1	E4.5	ESE10
5-Jun	SSE1	UO	NNW1	W3	W3	W3	NNW8	NNW10	NNW10	N8	NNE8	NNE10	NNE8	NNE9	NNE8	N8	NW4	WNW5	WNW5	W4	WSW5	WSW11	W10	W9	NNW4.1	WSW11
6-Jun	WSW10	WSW8	SW7	SSW7	SSW7	SW7	WSW8	WSW8	WSW8	SW9	WSW12	SW13	SW12	SW12	SW13	SW12	SW12	SW11	SW10	SW8	SSW5	SSE4	SSE5	SSE6	SW8.3	SW13
7-Jun	SSE4	SSE6	S9	S11	S10	S11	SSW10	SSW8	SW9	SW12	SW13	WSW14	WSW13	W12	WSW12	W13	W13	W11	WNW12	WNW8	W3	WSW3	SW2	SSE3	SW7.2	WSW14
8-Jun	SSE2	W3	NNW5	NW1	SSW1	SSE1	SSW1	NE0	NW2	NW5	NNW6	NNW9	NW6	WNW4	NNW6	N7	NE3	E8	ESE10	ESE7	ESE4	ESE2	E2	SE3	NNE1.2	ESE10
9-Jun	SE3	SE4	SE3	ESE2	SE3	SE3	SE5	S6	S7	S8	SSE7	SSE9	SE8	SE9	SE9	SE8	SE8	SE8	SE5	ESE4	ESE4	SE5	SE6	SE6	SE5.5	SE9
10-Jun	ESE4	SE4	SE6	SE7	SSE9	SSE11	SSE13	SSE11	SSE10	SSE11	SSE11	SSE13	SSE14	S16	S16	S16	S17	S15	S16	S12	S11	S8	S8	S8	SSE10.9	S17
11-Jun	S11	SSW7	S8	SW4	NW3	SSW2	WSW5	W7	W7	WNW8	W8	WNW10	NW10	NW10	WNW10	NW11	WNW11	WNW9	NW8	NW2	NW3	NNW4	SE0	NW3	WNW5.0	S11
12-Jun	NW5	WNW5	WNW3	WNW4	W2	WSW3	WSW3	W4	W6	W5	W5	SW5	SW6	SSW7	S6	SSE5	SE5	SE6	ESE4	E4	E3	E3	ESE6	SE7	SSW1.8	SSW7
13-Jun	SE7	SE7	SE7	SE7	SE5	SE2	SSE2	S5	SW3	SW1	NE2	S2	NNW5	N14	N9	N6	N10	NNE14	NNE13	NNE11	NNW7	NNE10	NE13	NE11	NE3.9	NNE14
14-Jun	NE8	NNE8	NNE5	N7	N7	NNW8	N9	N11	N11	N11	N12	N11	N10	N9	NNW12	NNW11	NNW11	NNW12	NNW10	NNW9	NW12	NW11	NW12	NW12	N9.4	N12
15-Jun	NW13	NW13	NW12	NW13	NW12	NW11	NW9	NW12	WNW7	WNW8	WNW8	WNW10	NW11	WNW11	WNW9	NW9	NW11	WNW8	W3	WSW3	SW4	WSW4	SW5	SW5	WNW8.3	NW13
16-Jun	SW5	SW4	SSW3	SE4	SSE6	S8	S8	S8	S9	SSE11	S8	SSW9	SW10	SW8	S10	SSW12	S12	SSW11	SSW6	SSW5	SSW8	W6	SW6	SSW7	SSW7.1	S12
17-Jun	SSW8	SSW8	S7	S7	SSW8	SW8	SW8	SW9	WSW9	SW10	SW12	SW12	WSW10	WSW10	WSW11	WSW11	SW11	WSW9	WSW7	SW6	NNE6	ENE4	ESE2	ENE0	SW6.6	SW12
18-Jun	NNE3	ESE2	ESE2	E1	N2	NNE5	NNE7	NE8	NE8	NE10	NNE12	NE11	NE13	NNE14	NNE14	NNE15	NNE18	NNE16	NNE14	NNE14	NNE15	NNE15	NNE15	NNE17	NNE10.2	NNE18
19-Jun	NNE16	NNE15	NNE16	NNE18	NNE19	NNE21	NNE21	NNE21	NNE20	NNE19	NNE18	N19	N20	N22	N24	N23	N21	N20	N19	N19	N16	N15	N15	N13	N18.4	N24
20-Jun	N13	NNW13	NNW13	NW8	NNW8	NNW11	NNW13	NNW11	NNW9	NW9	NNW11	NNW12	NNW9	NNW8	NNW7	NNW6	N5	NNE5	NNE5	NNE4	NW3	WSW1	W3	W3	NNW7.5	N13
21-Jun	WNW3	W3	NW2	WNW4	NW6	NW4	NW5	N8	N8	N8	NNW5	NNW8	N7	NNW8	N8	N8	NNE8	NE10	NE9	ENE6	E3	SE3	SE3	ESE4	N4.3	NE10
22-Jun	ESE4	ESE2	SE3	SE3	SE4	SE4	SE6	S5	S6	SW6	SW11	SSW10	W8	W7	WSW8	SW9	WSW8	WSW5	SSW4	SSW2	S3	SE2	SE3	ESE1	SSW3.6	SW11
23-Jun	ESE3	ESE3	SSE3	SE4	SE4	SSE4	S8	S7	SSE7	S7	SSE6	S7	S9	SW5	W3	WSW4	SSW5	S3	S1	SW3	SSE3	SSE3	S5	S6	S4.1	S9
24-Jun	S6	S7	S7	S7	S8	S8	S7	SSW8	SSW7	SW8	SW8	W8	WSW8	SW7	WSW7	W8	N10	NNE7	N11	N18	NNE16	NNE9	N10	NNE11	W1.3	N18
25-Jun	NNE13	NNE7	NNE6	NNE5	NNE5	NNE6	NNE7	NE10	NE10	NE8	NE8	NE7	NE7	ENE6	ENE6	NNE3	NE4	NNE3	N7	NE4	SE2	SE3	SE2	SSE3	NE5.1	NNE13
26-Jun	SSE4	S5	SSE4	SSE3	SE5	SSE4	S6	S7	S8	S8	S9	SSE6	SSW6	SW7	WSW9	SW7	NNW8	NE8	E9	ESE8	SSE5	S4	S5	S5	S4.0	E9
27-Jun	SW1	NNW3	S1	SSE1	SW1	WNW3	NNW5	NNE7	NNE8	NNE9	N9	N10	NNE7	N8	N7	NNE8	ENE7	NE7	E5	ESE4	SE3	SE2	SE3	SE4	NNE3.4	N10
28-Jun	SSE5	S5	SSE4	S7	S7	SSE7	S9	S9	S9	S6	S5	SSW4	WSW3	SE1	S8	S7	S6	S4	WSW2	SW3	SSW7	SSW7	SE4	SSE2	S5.2	S9
29-Jun	SSE3	SSE3	SE2	SE3	SSE3	S6	S7	S6	S6	S7	S8	SSW9	SW8	SW8	SW9	W6	SSW1	SSW5	S6	SSW6	S6	S6	S7	S7	S5.1	SW9
30-Jun	S6	S5	SSW6	SSW6	SSW6	SW4	SW5	SW8	WSW8	SW8	WSW9	WSW10	W11	WSW11	WSW11	WSW11	SW11	SW11	SW10	WSW8	SW5	SSW5	SW7	SW6	SW7.2	WSW11

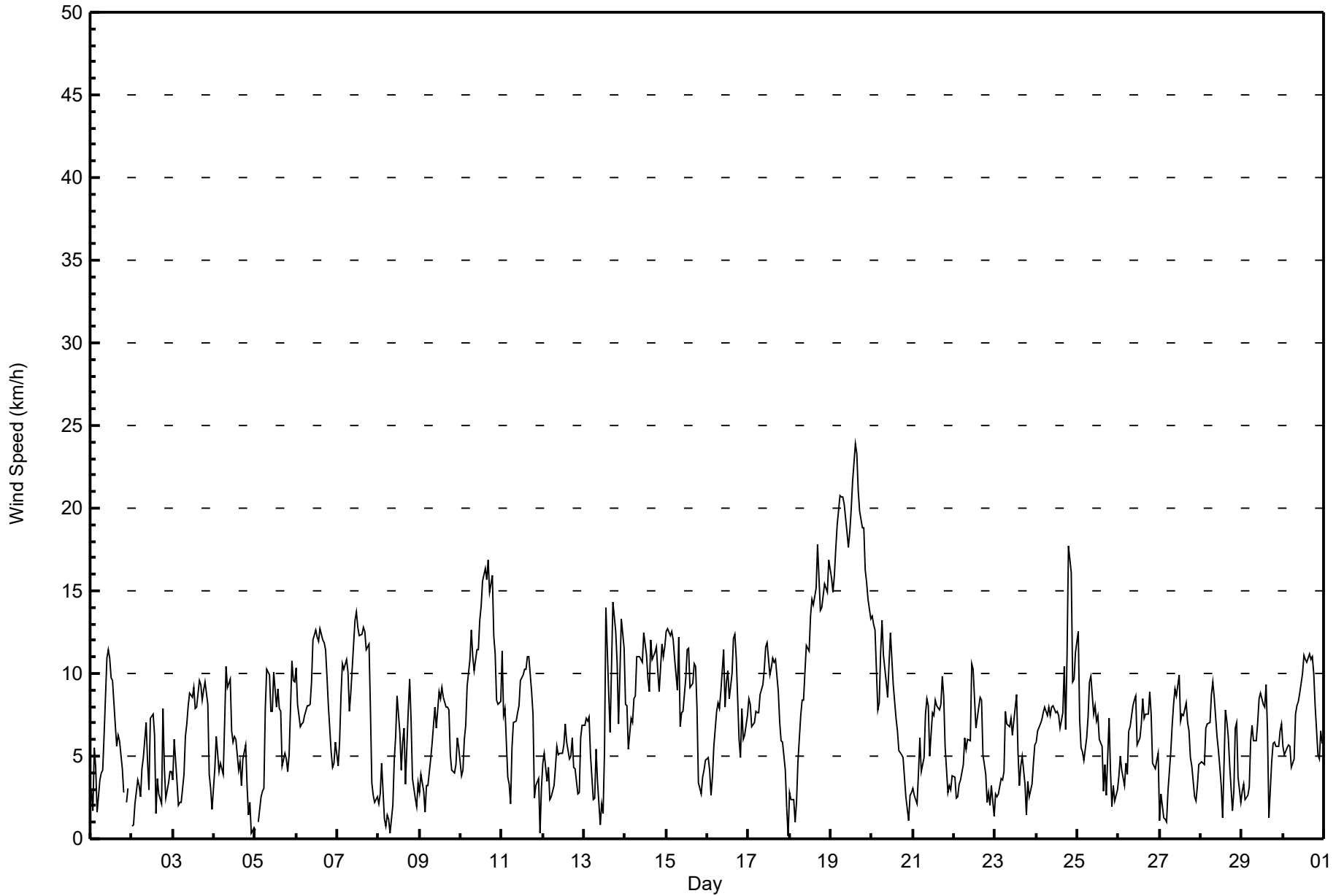
ESE0.6 SSE0.5 SSE0.5 S0.6 S0.6SSW0.5 SW0.5 W0.6 W0.7WSW1.0 W1.5WNW2.1WNW2.6 NW3.0WNW2.2WNW2.4 NW1.8 N1.5NNE1.6 NE1.1 NE0.6 ENE0.4 ESE0.8 ESE0.7	Diurnal Average
NNE16 NNE15 NNE16 NNE18 NNE19 NNE21 NNE21 NNE21 NNE20 NNE19 NNE18 N19 N20 N22 N24 N23 N21 N20 N19 N19 N16 N15 NNE15 NNE17	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Mackay River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	261	36.40	36.40
6 - 11	366	51.05	87.45
12 - 19	80	11.16	98.61
20 - 28	10	1.39	100.00
29 - 38	0	0.00	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
Mackay River - June 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	11	9	11	15	26	41	27	17	13	17	14	17	10	16	12	261
6 - 11	31	25	21	8	11	12	17	16	62	25	35	25	13	16	20	29	366
12 - 19	11	23	2	0	0	0	0	4	7	1	10	4	3	1	8	6	80
20 - 28	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
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	53	63	32	19	26	38	58	47	86	39	62	43	33	27	44	47	717

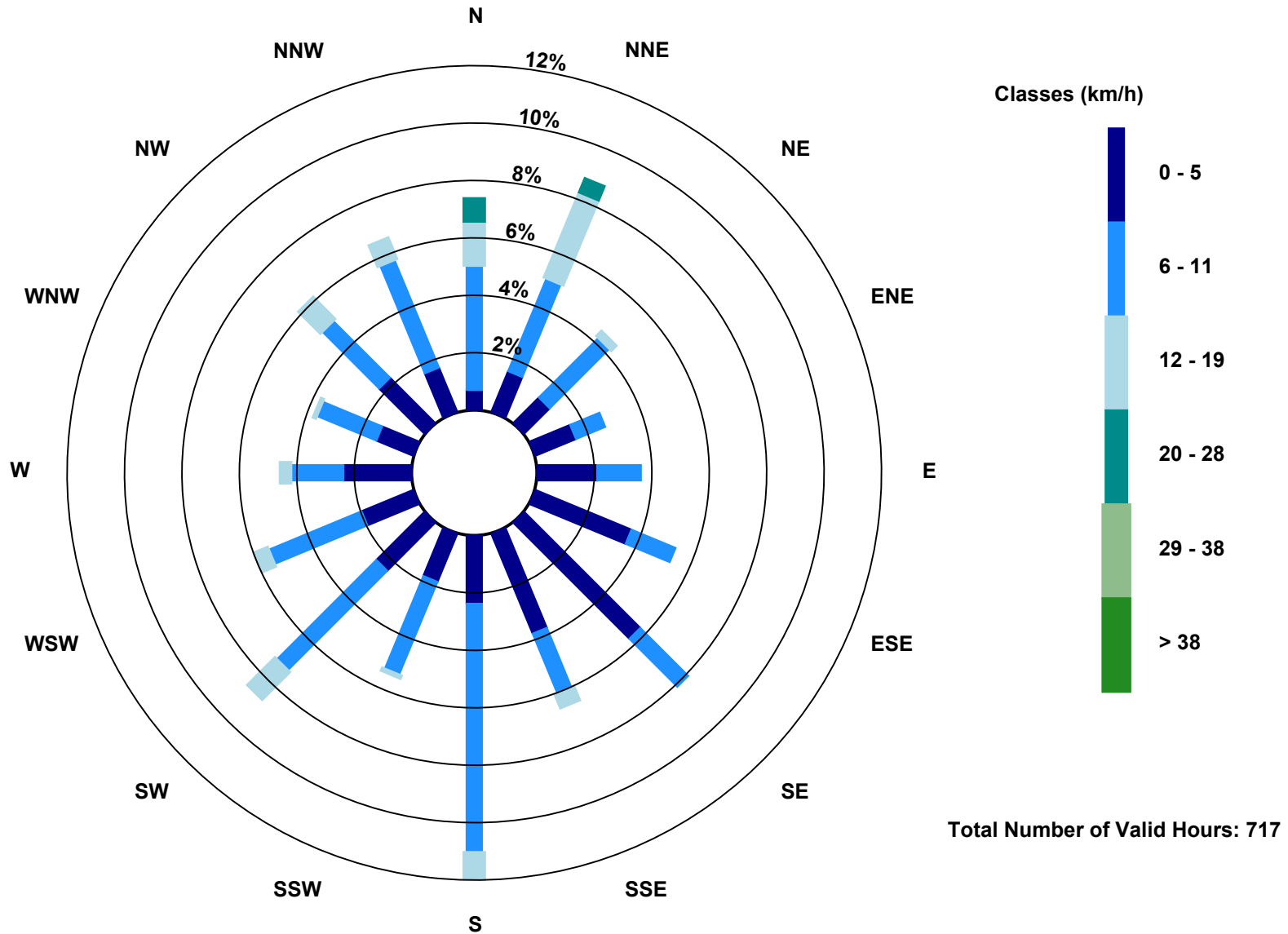
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Mackay River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Mackay River - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jun 19 15:00	Hours in Service: 720 Hours of Data: 717 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6
Minimum Value: 0 km/h on Jun 27 22:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 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-Jun	1	2	2	1	1	1	1	2	3	4	4	4	3	3	2	2	2	2	2	1	UO	1	1	UO	4
2-Jun	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	2	3	2	1	1	1	1	3
3-Jun	1	2	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	3
4-Jun	2	2	1	1	2	2	3	3	2	3	2	3	2	2	2	3	2	3	4	1	1	1	1	1	4
5-Jun	1	UO	1	2	1	2	3	3	3	3	3	3	3	3	3	3	2	4	3	2	3	5	4	4	5
6-Jun	4	4	2	2	2	3	3	3	4	4	5	5	5	5	5	5	5	5	4	3	2	1	1	1	5
7-Jun	1	2	3	3	3	3	3	3	3	5	6	6	5	5	5	6	5	5	4	3	2	1	1	1	6
8-Jun	1	1	1	2	1	1	1	1	2	2	3	3	4	3	3	3	2	4	3	2	1	0	1	1	4
9-Jun	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	2	2	1	1	1	2	2	3
10-Jun	1	1	1	2	3	3	4	4	4	4	3	4	5	5	5	6	5	5	5	4	3	3	3	3	6
11-Jun	3	4	3	3	2	1	2	3	3	3	3	4	4	3	4	5	4	3	2	2	2	1	1	2	5
12-Jun	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	2	2	2	1	2	1	1	2	2	3
13-Jun	2	2	2	2	2	1	2	2	1	1	2	2	4	4	5	2	4	5	4	4	2	4	4	4	5
14-Jun	3	3	2	2	2	2	3	4	4	3	3	4	4	3	3	4	4	3	3	3	3	4	3	3	4
15-Jun	3	4	3	4	3	3	3	4	3	3	3	3	4	4	3	3	3	4	3	2	1	1	1	1	4
16-Jun	2	1	1	1	2	2	2	2	3	4	3	4	4	4	4	4	4	4	3	1	3	3	2	2	4
17-Jun	2	2	2	2	2	3	3	3	4	4	4	5	4	5	5	4	4	4	3	2	3	2	1	2	5
18-Jun	2	1	1	2	1	2	2	2	3	4	4	4	4	5	5	5	6	5	4	5	5	5	5	6	6
19-Jun	5	5	5	6	6	7	7	7	7	6	6	6	6	7	8	7	7	6	6	6	6	5	5	4	8
20-Jun	4	4	4	2	2	4	4	3	3	3	3	4	3	2	2	2	2	2	1	1	1	1	1	1	4
21-Jun	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	3	3	2	1	1	1	1	4
22-Jun	1	1	0	1	1	1	2	2	2	3	5	4	4	3	3	3	4	2	1	1	1	1	1	1	5
23-Jun	1	1	1	1	1	1	3	2	3	3	3	4	3	3	3	2	3	2	2	2	1	1	1	1	4
24-Jun	1	1	1	1	1	2	2	3	2	3	3	3	4	3	4	5	5	4	5	6	6	4	4	4	6
25-Jun	5	2	2	1	1	2	2	3	3	3	3	3	3	3	3	2	2	3	2	2	1	1	1	1	5
26-Jun	1	1	1	1	1	2	2	2	2	2	3	2	2	3	3	3	6	3	3	2	1	1	1	2	6
27-Jun	2	2	1	1	1	1	2	2	3	3	3	4	3	4	3	3	3	3	2	1	1	0	1	1	4
28-Jun	1	1	1	2	2	2	3	3	3	3	2	2	4	4	3	2	2	2	1	2	2	2	1	1	4
29-Jun	1	1	1	1	1	1	2	2	2	2	3	3	3	4	4	4	1	2	1	1	1	1	1	1	4
30-Jun	1	1	1	1	1	1	2	3	3	3	3	4	5	5	4	5	4	5	4	4	2	2	2	2	5
	5	5	5	6	6	7	7	7	7	6	6	6	6	7	8	7	7	6	6	6	6	5	5	6	
Diurnal Maximum																									

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mackay River - June 2023

Direction of Maximum Speed: 3 deg on Jun 19 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 10.3 deg on Jun 19	Hours of Data: 717
Direction of Minimum Speed: 62 deg on Jun 18 00:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 1.2 deg on Jun 8	Percent Operational Time: 99.6
Monthly Average Direction: 302.9 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-Jun	149	247	306	323	360	270	277	256	282	309	300	322	316	334	338	343	348	35	66	72	UO	118	118	UO	321.6
2-Jun	85	284	329	323	332	8	342	347	43	48	326	324	358	338	63	24	340	89	96	80	70	70	72	79	20.4
3-Jun	100	102	74	48	64	42	47	45	67	21	42	52	55	59	69	91	78	98	90	101	103	105	111	108	73.5
4-Jun	104	112	107	96	96	35	82	105	102	106	105	100	96	116	126	132	139	4	91	89	122	110	175	137	100.8
5-Jun	149	UO	336	274	269	270	327	338	340	1	27	32	33	19	22	0	324	293	300	279	248	253	266	260	328.2
6-Jun	256	245	221	206	211	227	239	243	249	225	241	235	231	234	228	219	221	222	229	215	197	157	152	147	225.4
7-Jun	158	163	174	184	188	183	196	209	222	216	232	250	240	263	258	260	259	275	293	291	280	255	221	151	232.2
8-Jun	154	263	330	318	209	167	205	47	323	314	334	340	308	297	342	357	56	101	105	105	115	121	99	127	20.8
9-Jun	130	132	136	119	145	129	140	169	171	181	161	161	142	129	127	132	135	139	128	121	123	125	130	136	141.6
10-Jun	120	142	138	142	154	157	153	159	168	165	157	154	167	169	175	176	177	181	185	179	177	174	176	179	167.3
11-Jun	180	203	187	230	324	211	255	271	277	285	277	293	312	311	290	306	294	301	320	310	317	339	146	324	282.8
12-Jun	309	283	284	282	264	249	242	265	268	259	265	215	220	208	185	162	138	132	108	98	86	92	106	128	206.7
13-Jun	131	132	137	143	135	126	156	174	235	219	48	183	334	2	8	5	352	14	28	20	340	22	43	40	35.0
14-Jun	39	31	18	6	358	348	1	5	10	5	2	349	356	5	354	346	335	341	345	336	342	320	322	320	351.9
15-Jun	316	320	312	311	316	317	315	310	290	282	283	296	316	298	290	307	314	319	295	267	245	233	237	230	302.6
16-Jun	234	227	195	133	157	175	177	176	183	168	173	208	223	218	190	192	185	195	207	196	198	265	218	202	194.4
17-Jun	195	202	188	188	194	221	224	229	243	224	224	225	246	258	248	246	231	253	246	220	32	72	122	62	226.8
18-Jun	17	106	111	98	357	31	31	48	49	38	29	46	34	20	19	17	20	20	19	22	18	21	22	21	26.6
19-Jun	27	25	21	27	22	14	14	14	17	15	14	10	6	1	3	8	11	8	4	1	359	358	354	352	10.3
20-Jun	352	344	344	322	332	341	347	341	330	324	334	344	338	343	346	342	356	22	25	15	316	241	266	269	341.1
21-Jun	287	279	310	297	314	323	325	351	358	359	348	348	3	348	360	2	13	35	44	65	89	127	131	119	2.1
22-Jun	123	110	132	124	132	133	145	169	183	218	217	203	267	261	239	229	245	237	213	197	169	136	130	109	201.2
23-Jun	114	119	166	139	129	148	175	174	160	169	168	173	178	219	281	242	202	179	172	215	148	164	176	176	174.5
24-Jun	179	180	180	181	176	180	186	202	206	219	227	261	240	234	239	281	359	22	3	1	23	13	11	27	274.3
25-Jun	29	24	22	22	25	27	28	35	38	56	56	34	49	77	76	32	35	25	5	39	132	145	135	163	41.3
26-Jun	165	170	159	148	146	157	171	176	183	179	170	164	207	231	238	230	331	34	97	123	160	172	169	184	173.4
27-Jun	226	343	171	153	233	294	348	19	22	14	5	358	26	354	360	12	62	45	100	115	125	133	136	129	26.1
28-Jun	165	172	165	180	175	166	177	191	180	190	181	204	242	141	182	179	184	178	241	223	203	193	132	156	182.5
29-Jun	166	161	128	132	149	172	176	170	173	173	186	199	216	224	219	263	207	198	175	197	191	173	182	186	189.1
30-Jun	187	187	192	202	209	222	234	231	238	231	241	240	270	257	245	251	223	234	236	242	223	212	216	223	231.8

120.5 162.7 161.0 182.4 174.4 213.1 234.2 269.9 274.3 258.6 271.3 290.3 302.6 307.0 289.8 300.6 318.1 353.8 24.0 34.3 52.3 63.3 105.2 120.8

Diurnal Average

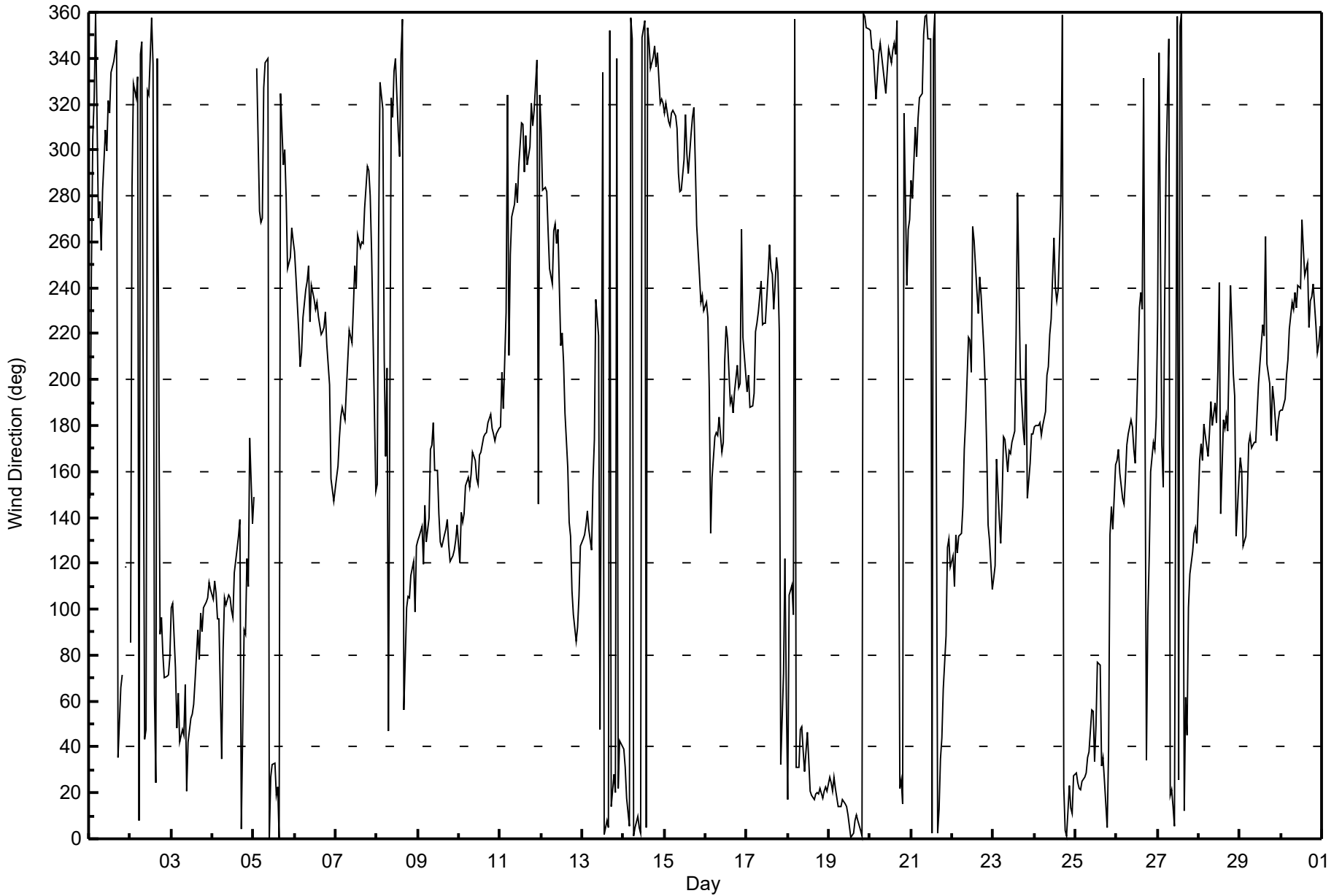
UO - Unstable Operation

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Mackay River - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Mackay River - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 103 deg on Jun 8 08:00	Hours of Data: 717
Minimum Value: 9 deg on Jun 23 22:00	Hours of Missing Data: 3
Percentiles: P ₁ = 12 P ₁₀ = 19 Q ₁ = 25 Median = 30 Q ₃ = 43 P ₉₀ = 55 P ₉₉ = 91	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	34	79	24	22	38	38	50	53	42	28	30	34	34	28	44	38	37	42	29	30	UO	18	15	UO	79
2-Jun	86	71	37	14	19	37	27	28	33	55	86	50	53	55	102	89	83	86	28	29	35	32	31	35	102
3-Jun	30	24	29	29	28	25	28	26	34	37	34	40	38	49	47	35	33	33	34	25	20	18	14	12	49
4-Jun	18	17	18	25	33	34	37	21	19	21	21	28	31	30	43	67	72	62	58	35	34	31	77	81	81
5-Jun	77	UO	70	62	53	46	24	24	24	31	29	28	36	34	43	30	39	69	47	37	45	47	42	51	77
6-Jun	47	49	30	24	23	36	44	45	50	46	45	43	46	47	43	43	41	38	42	31	22	10	11	14	50
7-Jun	24	24	26	23	24	21	25	31	35	38	46	46	46	49	48	46	46	39	26	28	31	26	45	18	49
8-Jun	18	34	18	80	58	19	31	103	92	57	67	43	71	80	57	51	77	44	20	17	16	17	36	20	103
9-Jun	19	14	14	17	17	22	21	32	27	28	36	35	35	35	31	37	31	27	22	19	16	17	19	21	37
10-Jun	18	21	20	23	27	26	26	28	31	28	32	30	32	30	29	31	28	27	25	25	25	25	26	25	32
11-Jun	23	48	29	53	29	65	44	39	41	45	45	41	36	30	38	35	32	26	21	50	64	17	85	32	85
12-Jun	19	19	25	24	39	46	48	56	46	60	57	46	34	37	43	51	31	28	16	33	30	27	24	22	60
13-Jun	21	22	22	25	29	30	50	35	67	101	87	100	75	32	74	30	27	28	29	30	33	29	25	29	101
14-Jun	28	29	31	27	26	25	28	27	27	26	27	25	26	28	29	28	26	23	24	24	25	20	20	19	31
15-Jun	19	21	20	21	20	19	22	20	34	33	31	25	22	25	29	27	27	24	28	38	38	31	37	31	38
16-Jun	34	27	35	13	28	19	21	24	27	28	28	33	37	40	28	26	27	35	34	24	24	47	30	27	47
17-Jun	21	25	24	24	23	29	34	39	47	41	38	41	52	48	48	44	42	51	50	33	49	31	37	76	76
18-Jun	45	31	38	84	73	23	26	30	36	34	33	31	31	29	27	28	26	26	27	27	26	26	26	27	84
19-Jun	26	26	26	26	27	26	26	26	27	28	26	28	28	29	27	28	27	27	28	28	27	29	28	27	29
20-Jun	27	25	25	20	21	25	25	25	22	21	24	25	24	24	24	25	31	28	23	29	22	44	26	30	44
21-Jun	29	55	26	18	22	23	23	27	29	33	77	45	49	40	48	57	43	29	30	33	33	14	16	21	77
22-Jun	18	25	26	15	18	19	27	30	40	52	49	39	49	50	41	43	46	55	31	14	22	52	34	89	89
23-Jun	28	36	34	25	26	23	27	30	43	46	60	54	45	69	87	66	60	64	98	26	13	9	13	15	98
24-Jun	16	15	16	15	15	20	22	31	38	45	46	50	48	52	63	55	37	33	39	30	29	35	33	28	63
25-Jun	28	27	25	24	24	24	24	27	28	36	40	49	51	54	55	92	63	92	36	60	31	10	10	19	92
26-Jun	12	12	14	20	16	24	29	32	24	27	28	35	38	47	49	53	62	33	33	23	27	16	14	18	62
27-Jun	82	62	44	43	62	31	33	29	34	37	39	39	50	51	44	43	47	38	41	16	27	13	13	17	82
28-Jun	24	20	23	20	22	25	25	27	29	48	54	77	75	81	35	24	28	27	70	47	25	20	25	69	81
29-Jun	27	25	21	11	22	18	20	24	33	31	31	38	43	36	41	63	77	31	19	21	17	11	14	16	77
30-Jun	18	16	20	18	21	33	46	31	37	39	43	49	45	44	48	47	40	43	44	48	36	23	29	31	49

86	79	70	84	73	65	50	103	92	101	87	100	75	81	102	92	83	92	98	60	64	52	85	89	
Diurnal Maximum																								

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS21
CONKLIN
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
 JUNE 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	3.1	0	0.6	0
TRS(ppb) Average	683	35	37	99.72	0.8	0	0.6	0
THC(ppm) Average	681	34	39	99.31	4.1	-	2.4	-
NMHC(ppm) Average	681	34	39	99.31	0.028	-	0.002	-
CH4(ppm) Average	681	34	39	99.31	4.1	-	2.4	-
O3 (ppb) Average	686	34	34	100	73.9	0	50.5	-
NO2 (ppb) Average	683	35	37	99.72	9.7	0	3.4	-
NO (ppb) Average	683	35	37	99.72	20.8	-	1.6	-
NOX (ppb) Average	683	35	37	99.72	21.6	-	4.9	-
PM2.5 (ug/m3) Average	718	2	2	100	189.9	66	100.6	10
Temperature 2 m (C) Average	720	0	0	100	28.8	-	21.5	-
Relative Humidity (%) Average	720	0	0	100	98.9	-	95.7	-
Wind Speed 10 m (km/h) Average	718	0	2	99.72	18	-	10	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
 JUNE 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	0.23	0.4	-	0	0	0	0.1	0.3	0.5	3.1
TRS (ppb) Average	683	0.45	0.1	-	0.2	0.4	0.4	0.4	0.5	0.5	0.8
THC (ppm) Average	681	2.1	0.2	-	1.9	2	2	2	2.1	2.3	4.1
NMHC(ppm) Average	681	0	0.002	-	0	0	0	0	0	0	0.028
CH4(ppm) Average	681	2.1	0.2	-	1.9	2	2	2	2.1	2.3	4.1
O3 (ppb) Average	686	27.63	14.7	-	1.8	8.1	16.9	27.3	38.2	46	73.9
NO2 (ppb) Average	683	1.41	1.2	-	0.2	0.4	0.7	1.1	1.7	2.7	9.7
NO (ppb) Average	683	0.42	1.4	-	0	0	0	0.1	0.2	0.6	20.8
NOX (ppb) Average	683	1.82	2.2	-	0.2	0.5	0.8	1.2	2	3.3	21.6
PM2.5 (ug/m3) Average	718	29.95	32.8	-	1.1	4.2	8	16.1	39.1	74.8	189.9
Temperature 2 m (C) Average	720	15.91	6	-	0.9	8.3	10.9	15.9	20.7	24.2	28.8
Relative Humidity (%) Average	720	71.55	22.8	-	16.3	38.1	51.8	76.4	93.8	97	98.9
Wind Speed 10 m (km/h) Average	718	6.2	4	-	0	2	3	6	9	12	18
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2, TRS, THC/NMHC/CH4	07 Jun 2023 10:00	07 Jun 2023 11:00	2	Maintenance - sample manifold cleaned
THC/NMHC/CH4	21 Jun 2023 11:00	21 Jun 2023 13:00	3	Maintenance - retention time adjustment
Wind Speed, Wind Direction	02 Jun 2023 22:00	02 Jun 2023 22:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	08 Jun 2023 00:00	08 Jun 2023 00:00	1	Flat line in sensor output signal



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.1 ppb on Jun 16 09:00	Maximum Daily Average: 0.6 ppb on Jun 9		Hours of Data:	684
Minimum Value: 0.0 ppb on Jun 2 02:00	Minimum Daily Average: 0.0 ppb on Jun 19		Hours of Missing Data:	36
Maximum Diurnal Average: 0.5 ppb at hour 11	Minimum Diurnal Average: 0.1 ppb at hour 2		Hours of Calibration:	34
Monthly Average: 0.23 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 2.0		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-Jun	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.4	0.6	0.8	0.6	0.8	1.1	0.9	0.7	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.4	1.1
2-Jun	0.0	0.0	0.0	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	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2
3-Jun	0.1	0.1	0.0	0.3	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	0.3
4-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
5-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
6-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2
7-Jun	0.0	0.0	0.0	Z	0.1	0.7	0.3	0.8	0.7	M	M	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	0.2	0.8
8-Jun	0.1	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.5	0.6	0.5	1.2	2.2	2.1	0.9	0.3	0.2	0.2	0.4	2.2
9-Jun	0.2	0.2	0.1	0.2	0.2	Z	0.2	0.3	0.5	0.9	1.2	0.9	1.0	1.3	1.5	1.3	0.7	0.8	0.7	0.5	0.4	0.3	0.4	0.3	0.6	1.5
10-Jun	Z	0.2	0.3	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.6	1.2	0.4	1.2
11-Jun	0.8	Z	0.5	0.5	0.4	1.8	2.0	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.5	2.0
12-Jun	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.5	2.2	0.8	0.7	0.4	0.4	0.4	0.2	1.2	0.5	0.3	0.1	0.1	0.1	0.5	2.2
13-Jun	0.1	0.1	0.0	Z	0.6	0.4	0.7	1.0	1.0	1.1	1.1	1.1	1.4	2.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0
14-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3
15-Jun	0.2	0.2	0.3	0.3	0.4	Z	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.4
16-Jun	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.7	3.1	0.9	0.6	0.7	1.4	1.7	0.9	0.5	0.3	0.2	0.4	0.5	0.2	0.2	0.2	0.2	0.6	3.1
17-Jun	0.2	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2
18-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
19-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
20-Jun	0.0	0.0	0.0	0.1	Z	0.1	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	0.1	0.1	0.1	0.1	0.1	0.2
21-Jun	0.1	0.2	0.3	0.4	0.4	Z	0.4	0.5	0.8	1.1	1.0	0.8	0.8	0.5	0.3	0.1	0.1	0.1	0.4	0.5	0.3	0.0	0.0	0.0	0.4	1.1
22-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
23-Jun	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.6	0.5	0.6	0.6	0.4	0.4	0.5	0.3	0.3	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.6
24-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.3
25-Jun	0.2	0.3	0.1	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	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.3
26-Jun	0.1	0.0	0.0	0.0	Z	0.1	0.3	0.2	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
27-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.4	1.8	2.6	3.0	0.8	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.0
28-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.4	0.3	0.1	0.0	0.1	0.0	0.0	0.2	1.1	0.5	0.3	0.2	0.2	0.2	1.1
29-Jun	0.2	Z	0.1	0.2	0.0	0.1	0.1	0.2	1.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	1.5
30-Jun	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2

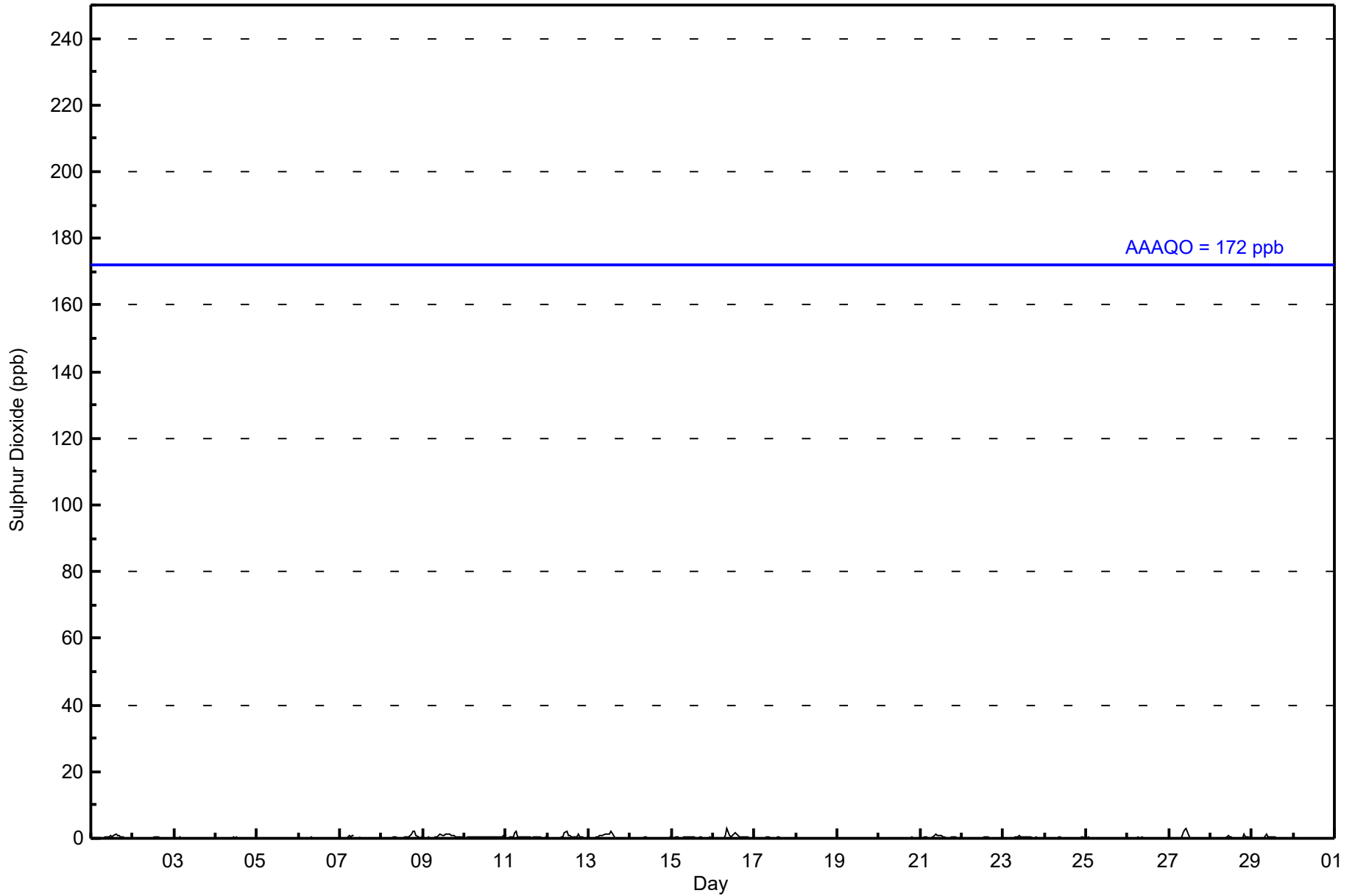
0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	Diurnal Average	
0.8	0.3	0.5	0.5	0.6	1.8	2.0	1.0	3.1	2.6	3.0	2.2	1.4	2.0	1.5	1.3	0.7	1.2	2.2	2.1	0.9	0.4	0.6	1.2	Diurnal Maximum	

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
Conklin - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	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: 684

Total Number of Hours: 720



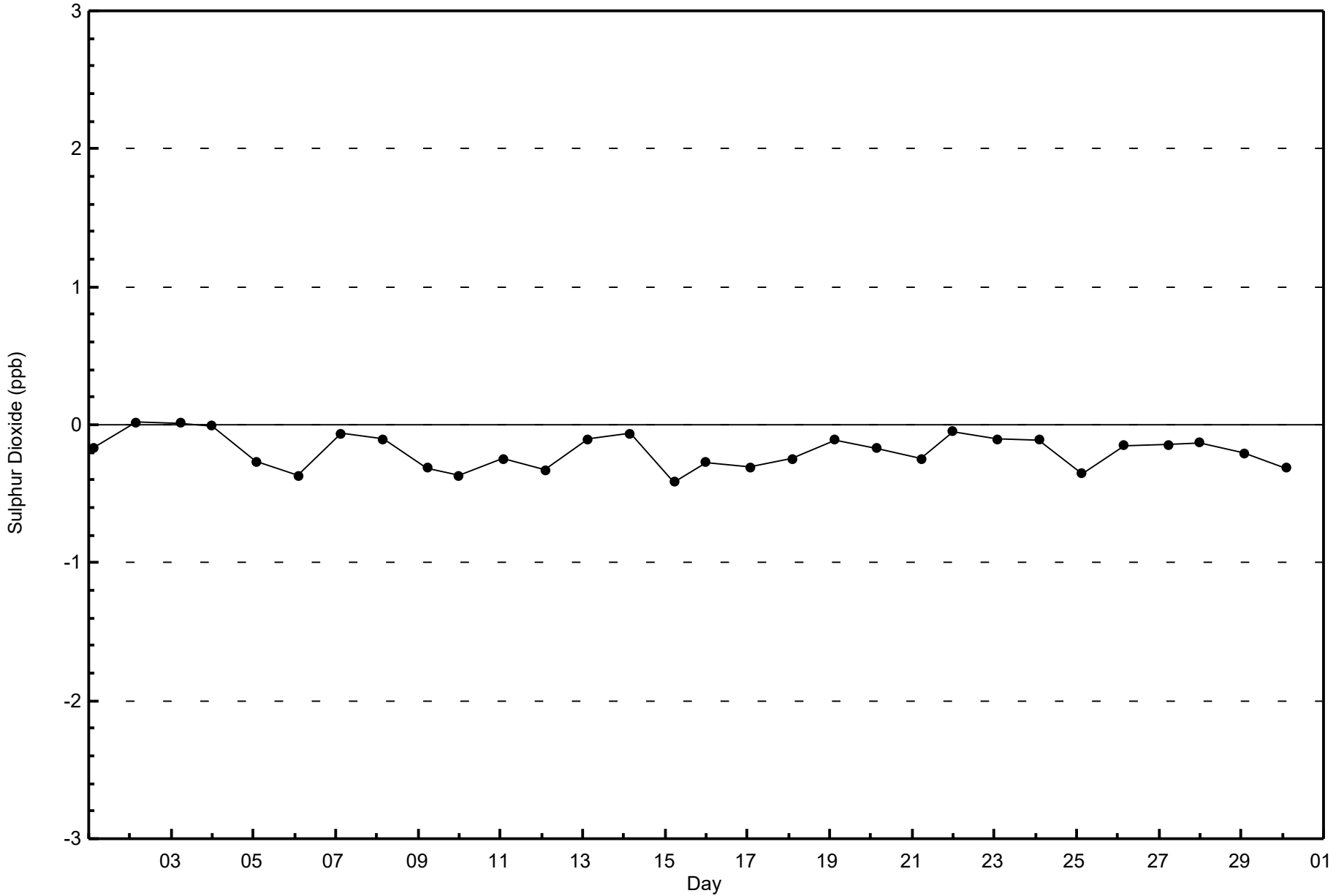
Wood Buffalo Environmental Association
Frequency Distribution

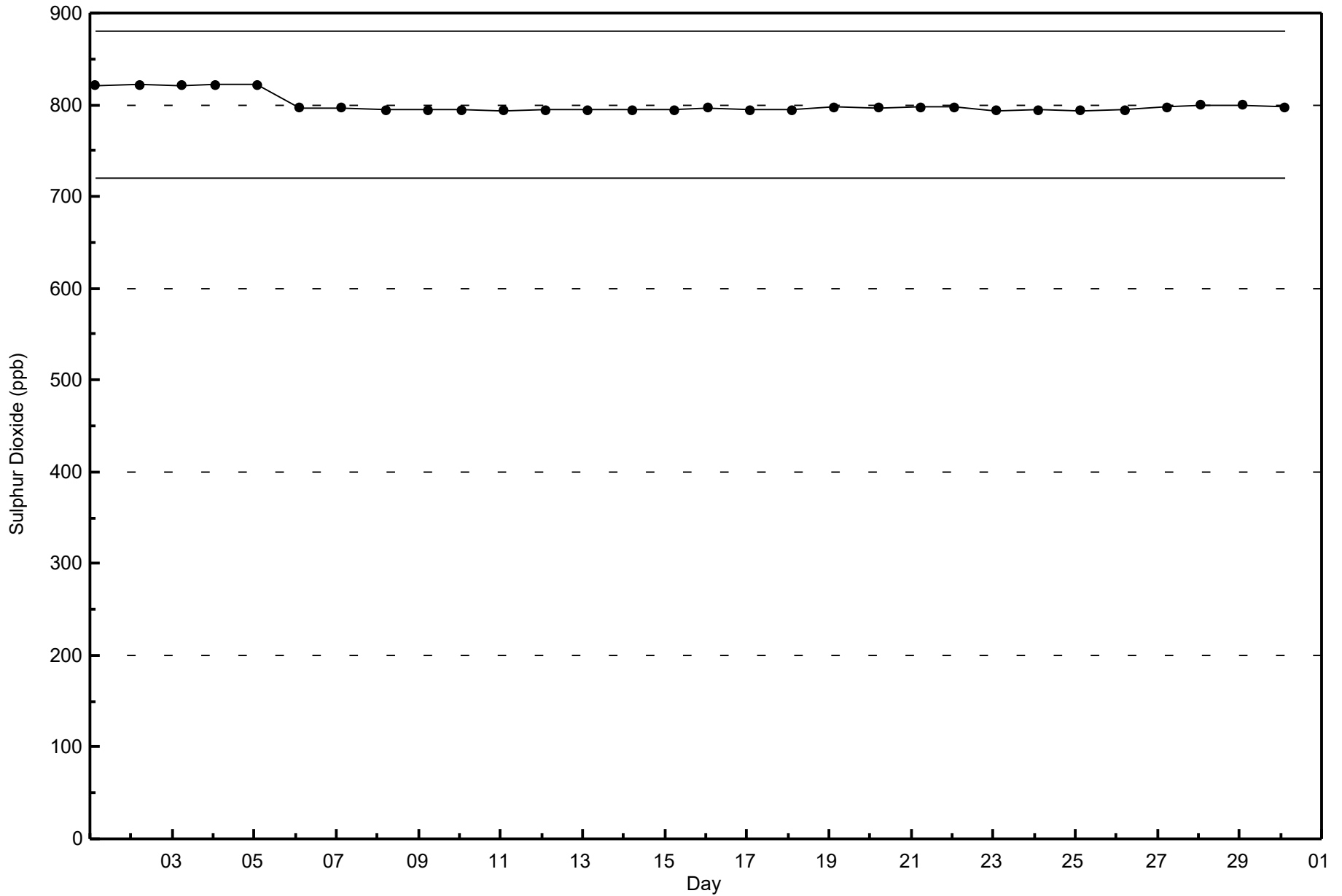
Sulphur Dioxide (SO₂) - ppb
Conklin - June 2023

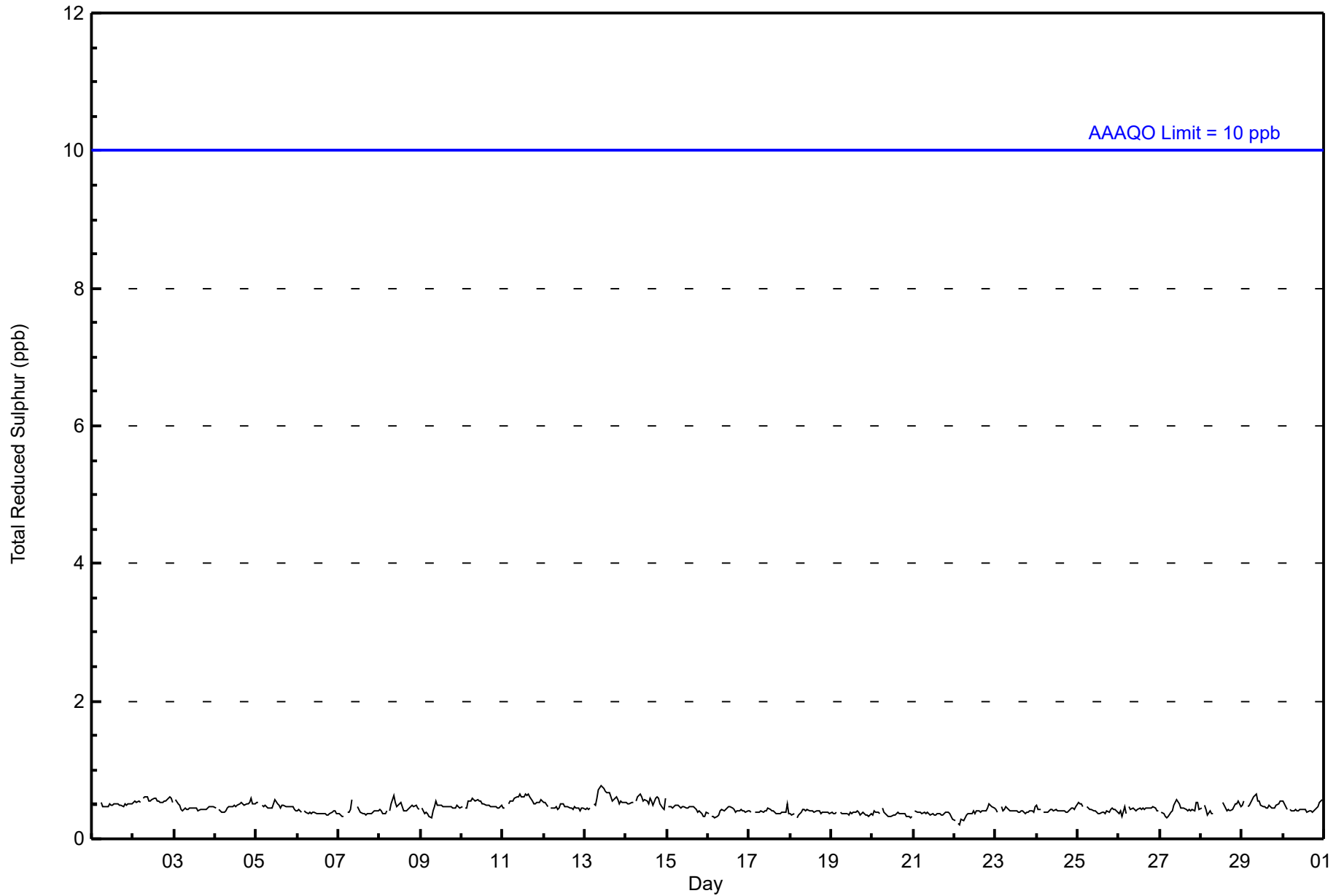
Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	49	56	20	10	12	31	36	59	66	61	40	29	23	31	62	97	682
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	49	56	20	10	12	31	36	59	66	61	40	29	23	31	62	97	682

Total Number of Valid Hours: 682

Total Number of Hours: 720









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Conklin - June 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
Conklin - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	47	59	18	12	12	31	35	61	63	58	40	29	22	33	61	100	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	47	59	18	12	12	31	35	61	63	58	40	29	22	33	61	100	681

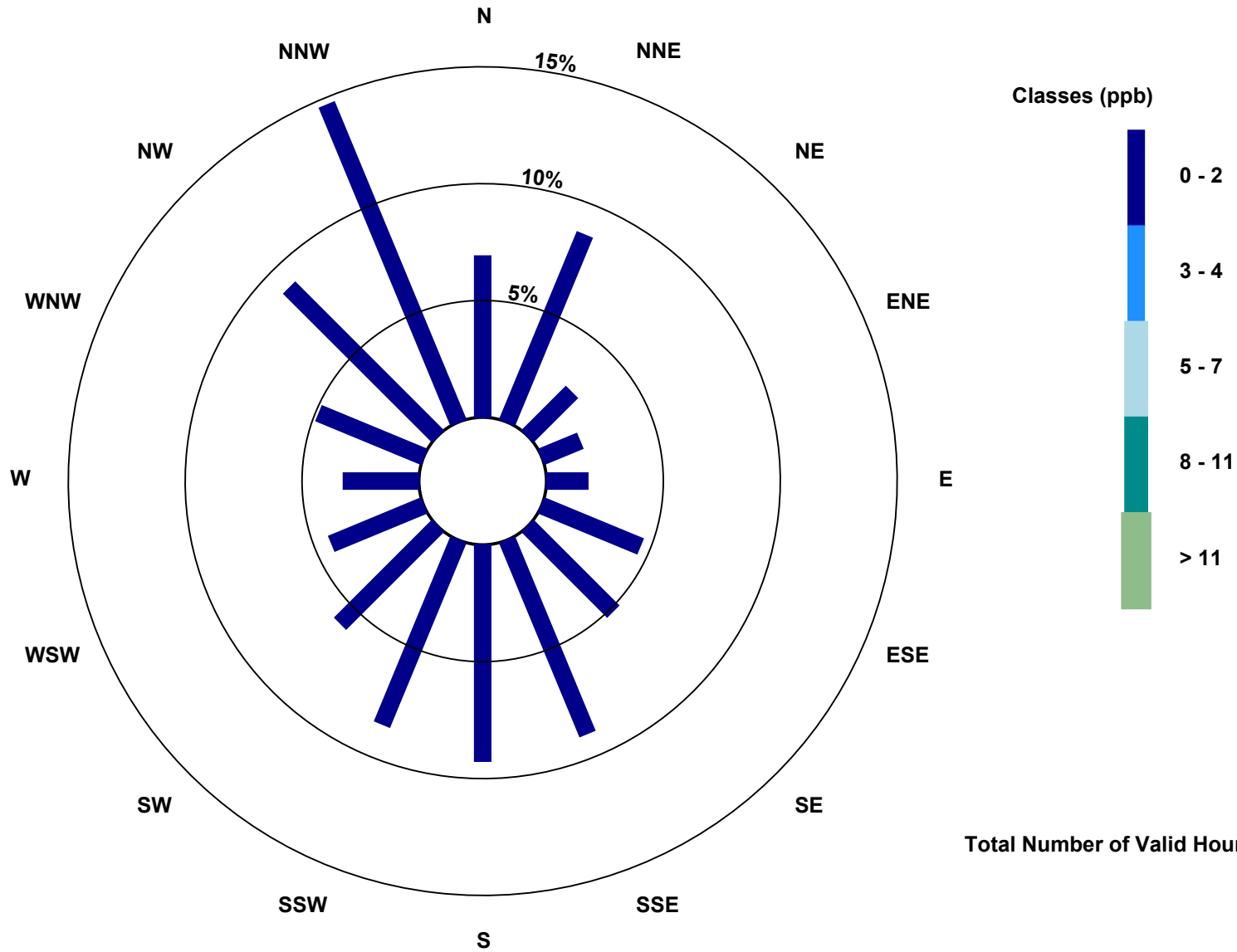
Total Number of Valid Hours: 681

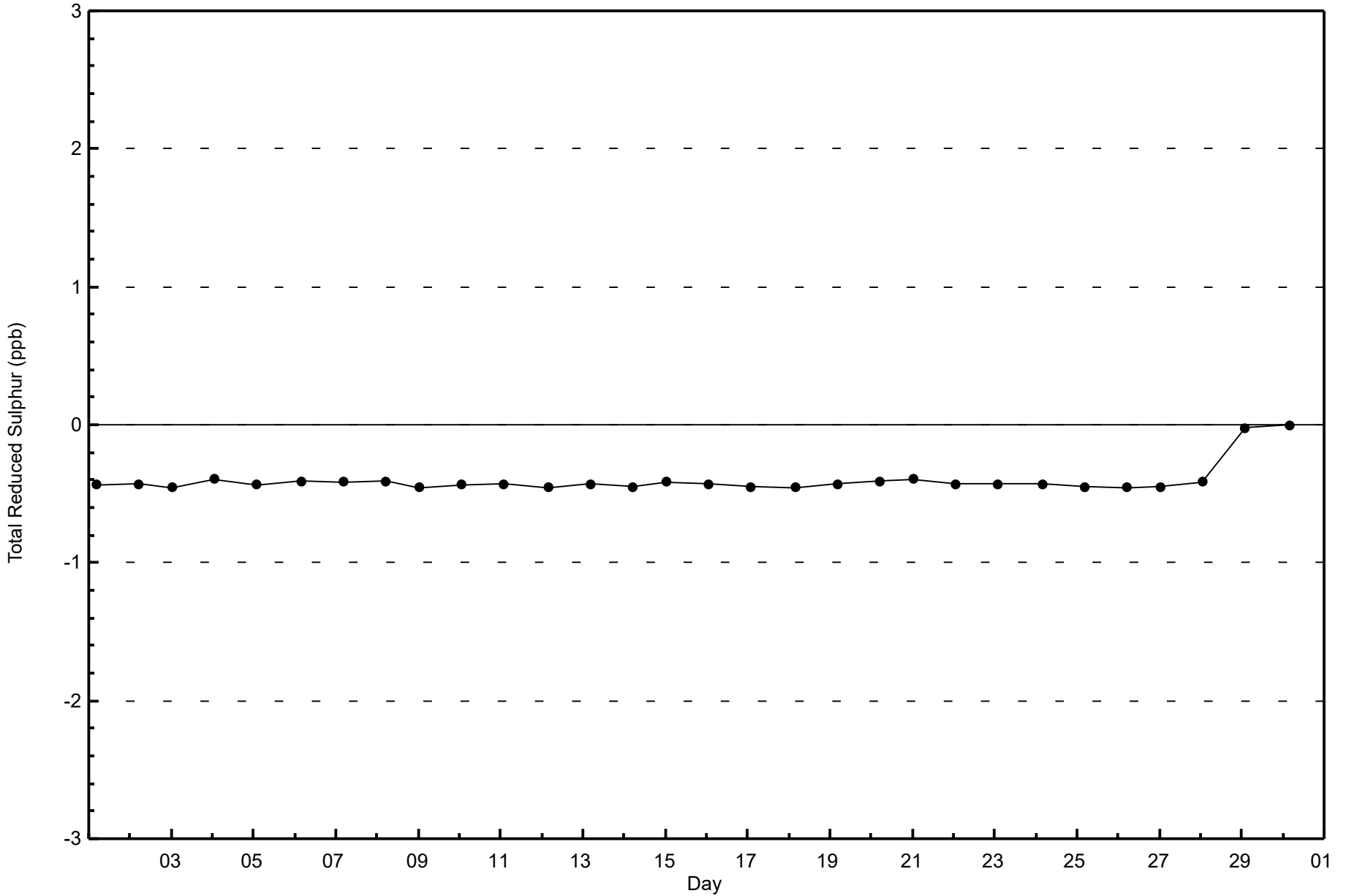
Total Number of Hours: 720

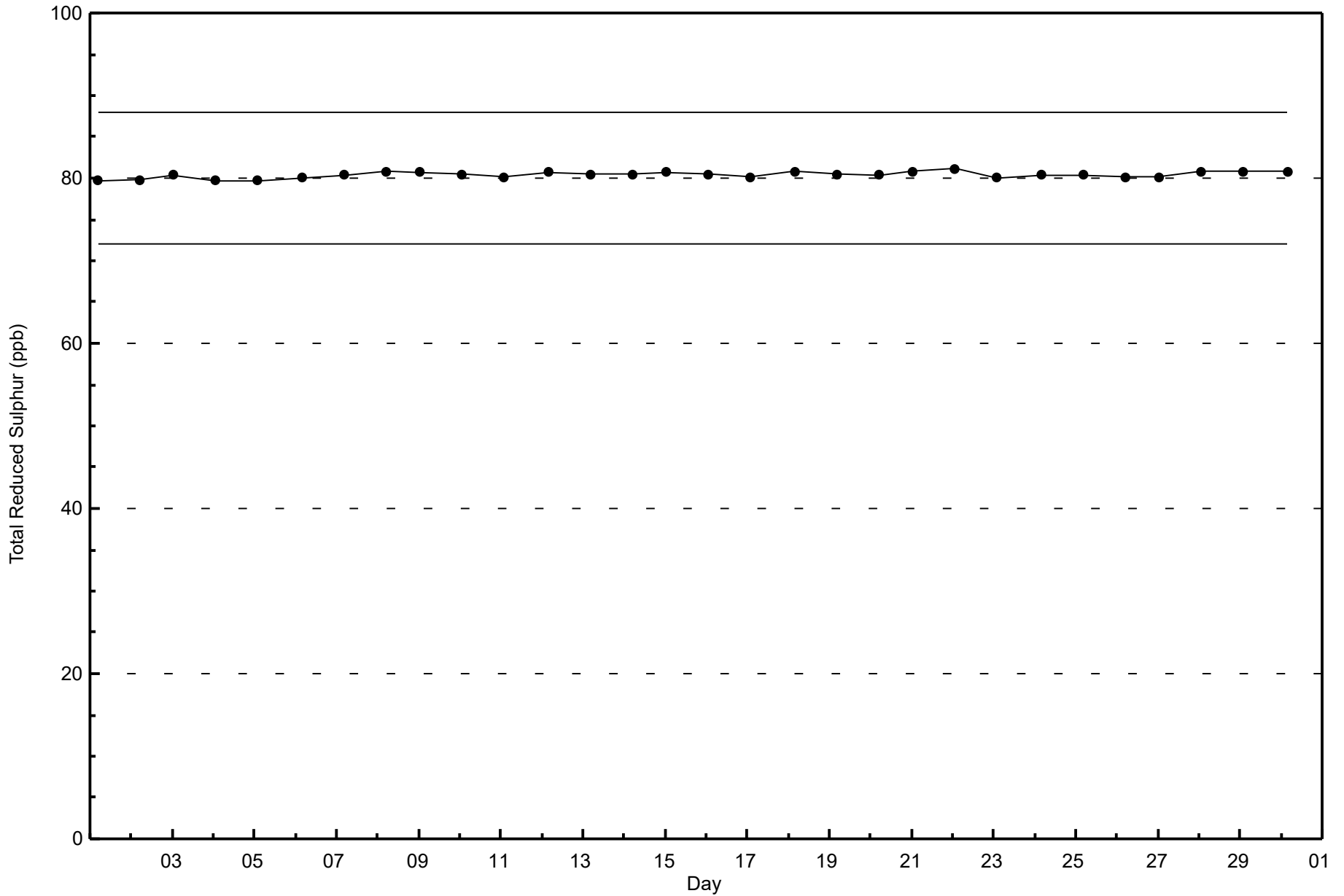


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Conklin





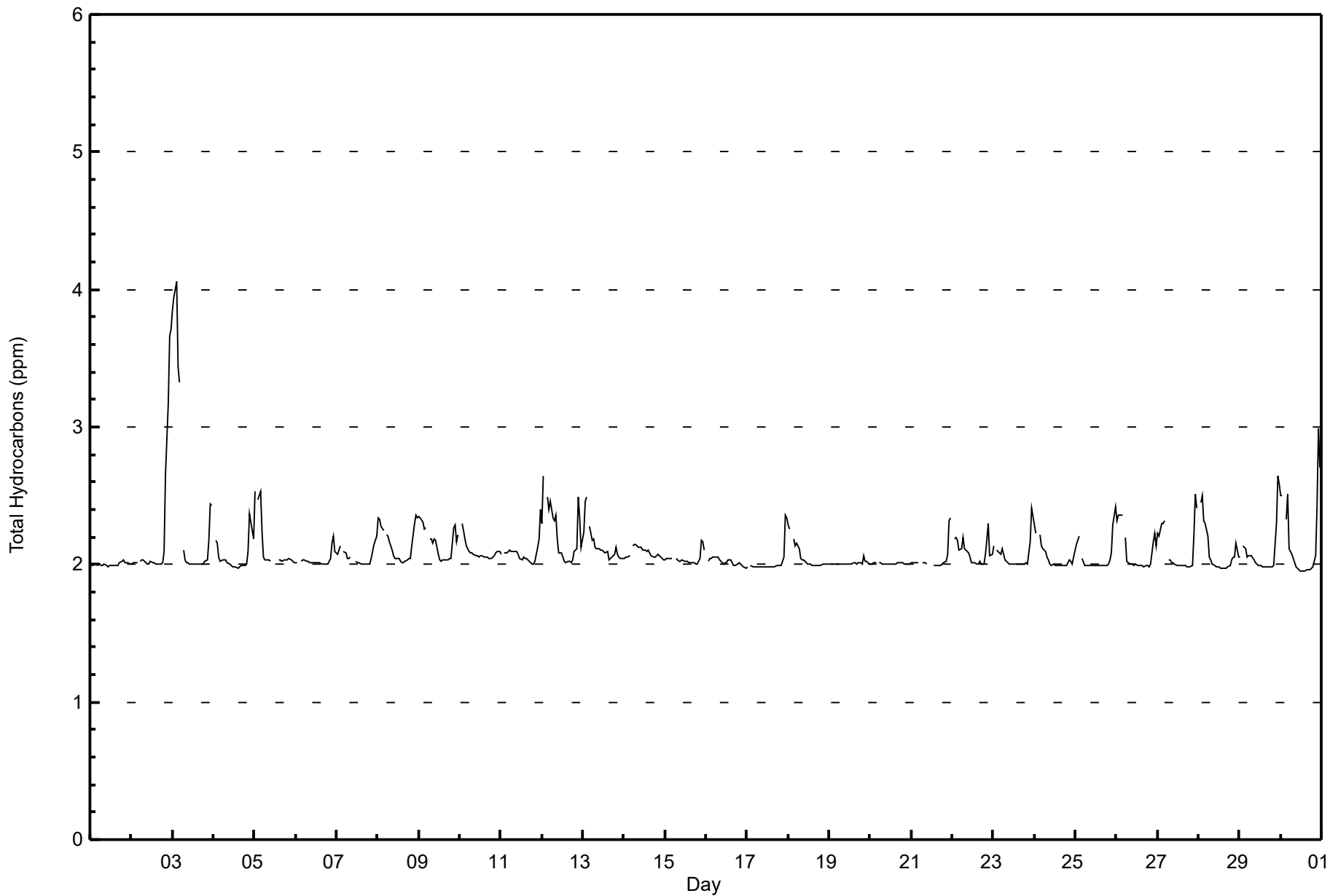




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Conklin - June 2023

Maximum Value: 4.1 ppm on Jun 3 03:00		Maximum Daily Average: 2.4 ppm on Jun 3		Hours in Service: 720																																												
Minimum Value: 1.9 ppm on Jun 30 14:00		Minimum Daily Average: 2.0 ppm on Jun 1		Hours of Data: 681																																												
Maximum Diurnal Average: 2.3 ppm at hour 2		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Missing Data: 39																																												
Monthly Average: 2.10 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.3 P ₉₉ = 3.2		Hours of Calibration: 34																																												
				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-Jun	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-Jun	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	2.7	3.2	3.7	3.7	2.2	3.7																						
3-Jun	3.9	3.9	4.1	3.4	3.3	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.4	2.4	4.1																						
4-Jun	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.3	2.2	2.1	2.4																						
5-Jun	2.5	Z	2.5	2.5	2.2	2.1	2.0	2.0	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5																							
6-Jun	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	2.2	2.2	2.1	2.0	2.2																							
7-Jun	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.1	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.2																							
8-Jun	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.4	2.3	2.1	2.4																						
9-Jun	2.3	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.2	2.2	2.2	2.3																						
10-Jun	Z	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	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3																						
11-Jun	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.1	2.4																							
12-Jun	2.3	2.6	Z	2.5	2.4	2.5	2.3	2.3	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.3	2.1	2.2	2.6																						
13-Jun	2.2	2.5	2.5	Z	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.5																							
14-Jun	2.0	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	2.0	2.0	2.1	2.1																						
15-Jun	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	2.2	2.2	2.1	2.0	2.2																							
16-Jun	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																						
17-Jun	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.3	2.0	2.4																						
18-Jun	2.3	2.3	Z	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3																						
19-Jun	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	2.0	2.0	2.0	2.0	2.1																						
20-Jun	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																						
21-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.0	2.3																							
22-Jun	Z	2.2	2.2	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	2.1	2.2	2.3	2.1	2.1	2.1	2.3																						
23-Jun	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	2.2	2.4	2.3	2.1	2.4																							
24-Jun	2.3	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3																						
25-Jun	2.2	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.4	2.1	2.4																							
26-Jun	2.3	2.4	2.4	2.4	Z	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.1	2.1	2.4																							
27-Jun	2.2	2.2	2.3	2.3	2.3	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.4	2.1	2.5																							
28-Jun	Z	2.5	2.5	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	2.1	2.1	2.2	2.1	2.1	2.5																							
29-Jun	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.6	2.6	2.1	2.6																							
30-Jun	2.5	2.5	Z	2.3	2.5	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	3.0	2.7	2.2	3.0																							
																								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	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	Diurnal Average	
																								3.9	3.9	4.1	3.4	3.3	2.5	2.3	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.7	3.2	3.7	3.7	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance																				





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	423	62.11	62.11
2.1 - 3.0	250	36.71	98.83
3.1 - 10.0	8	1.17	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Conklin - June 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	32	44	17	7	6	21	12	7	21	27	36	26	21	27	51	68	423
2.1 - 3.0	17	12	2	3	6	10	22	52	45	33	4	3	1	4	11	24	249
3.1 - 10.0	0	0	1	0	0	0	2	0	0	1	0	0	1	0	0	2	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	56	20	10	12	31	36	59	66	61	40	29	23	31	62	94	679

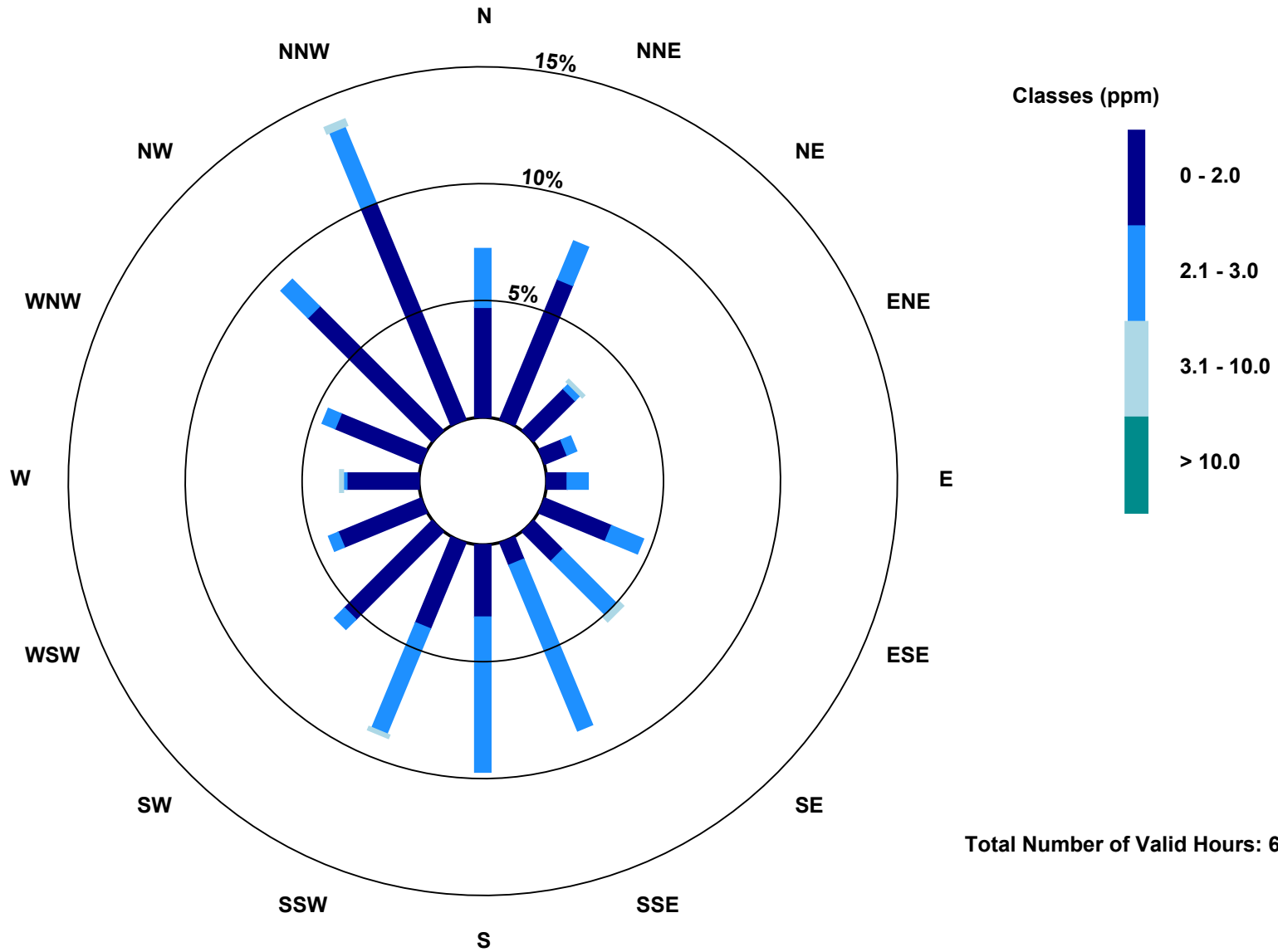
Total Number of Valid Hours: 679

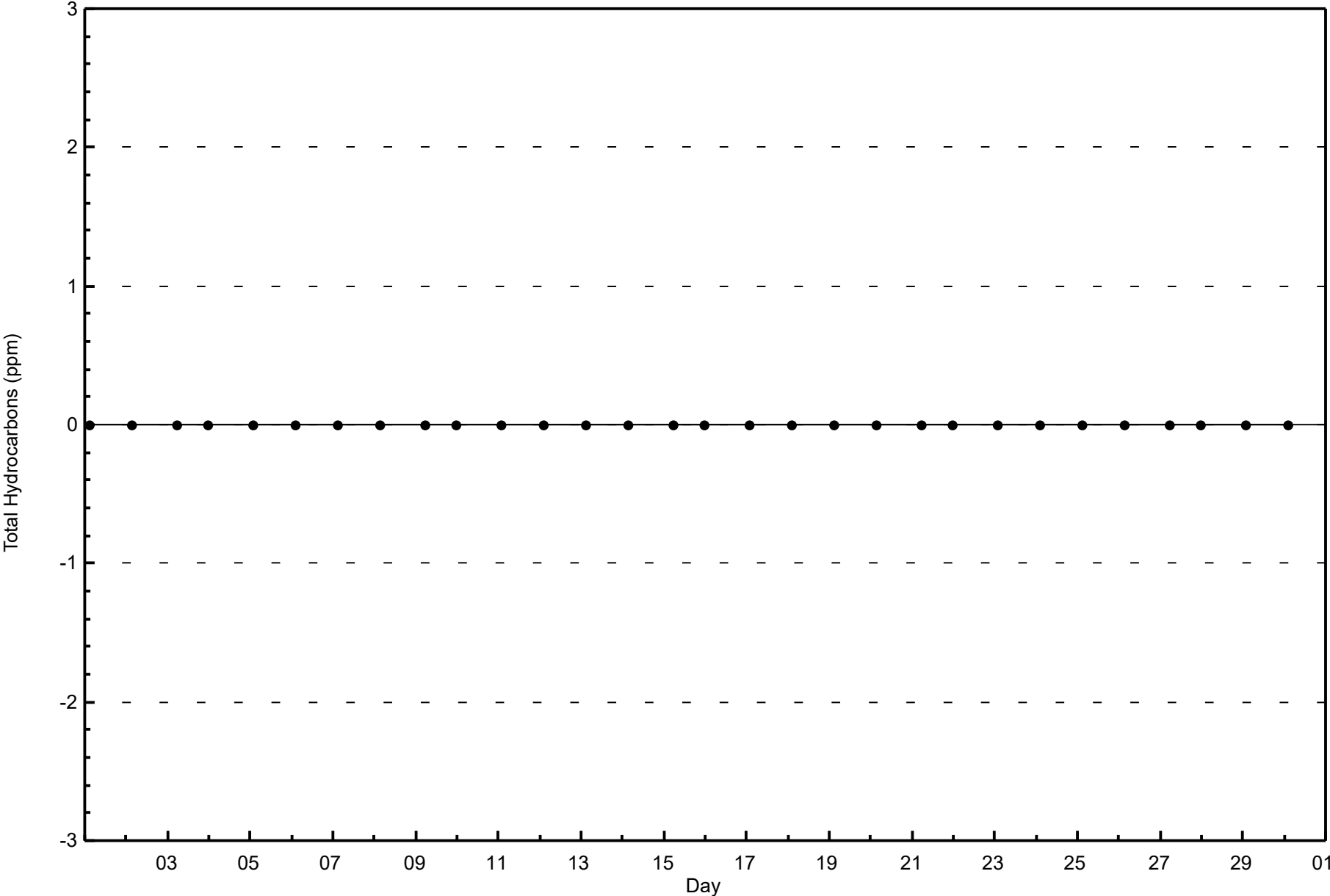
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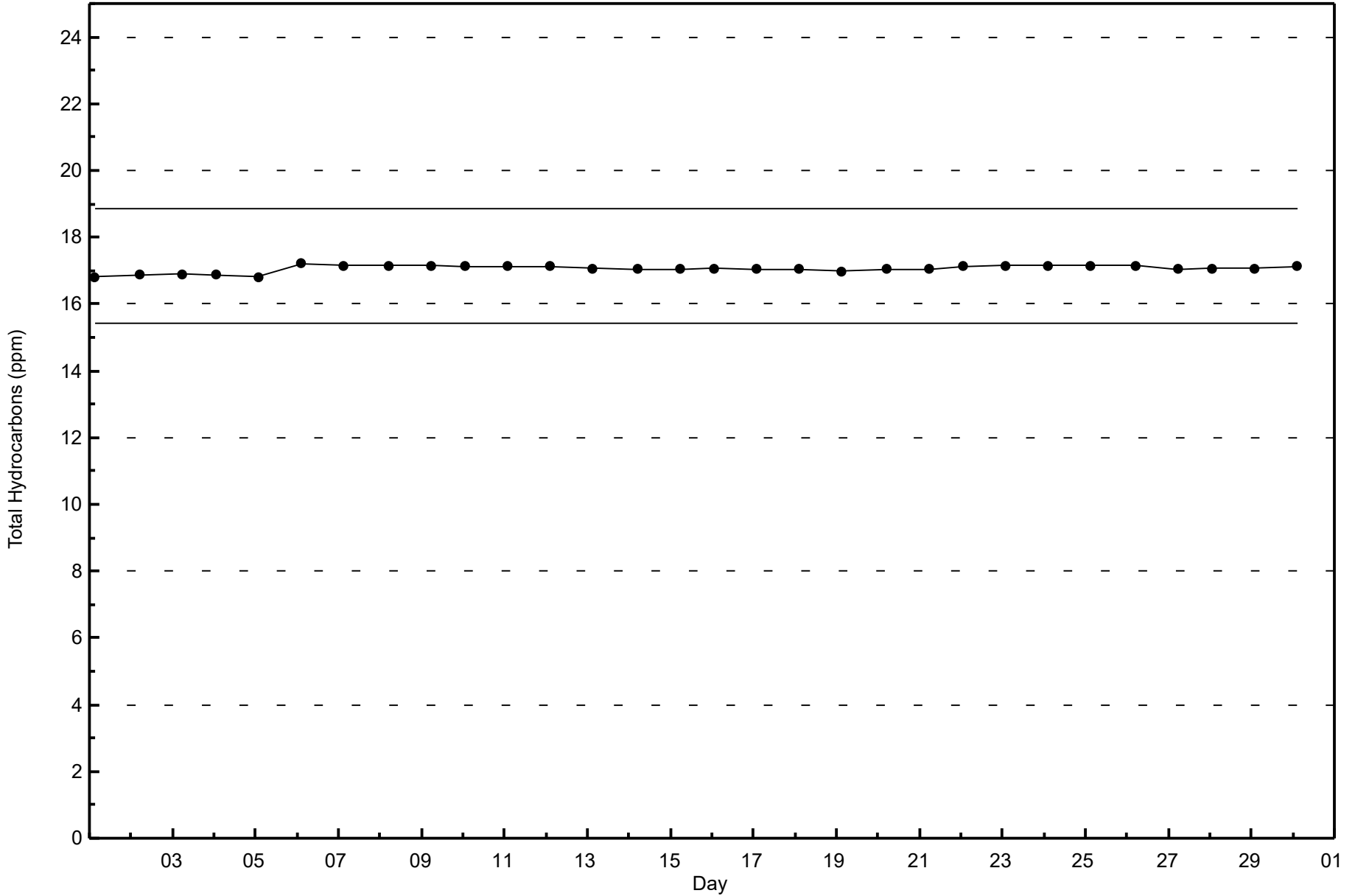


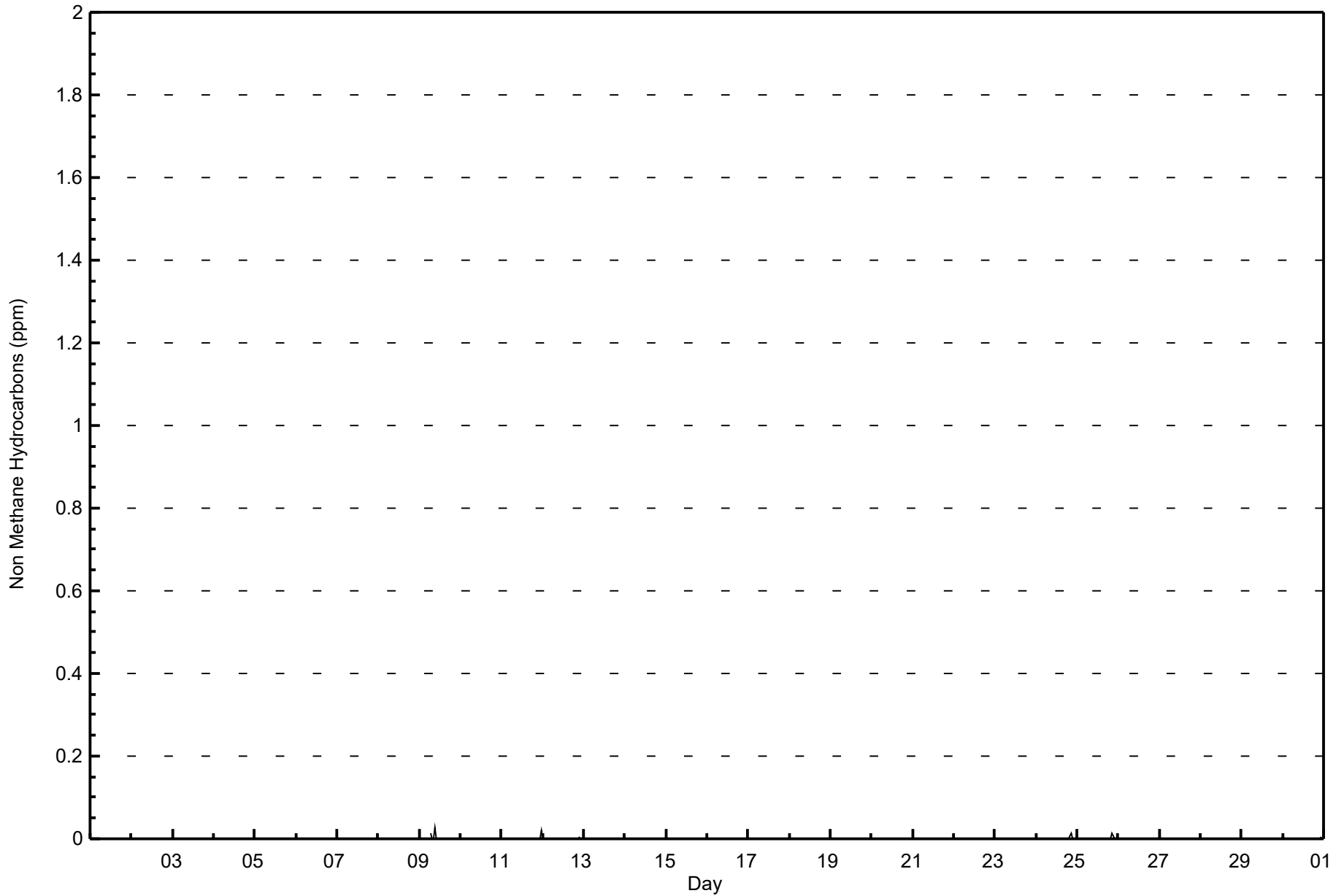
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Conklin











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Conklin - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	674	98.97	98.97
0.006 - 0.05	7	1.03	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



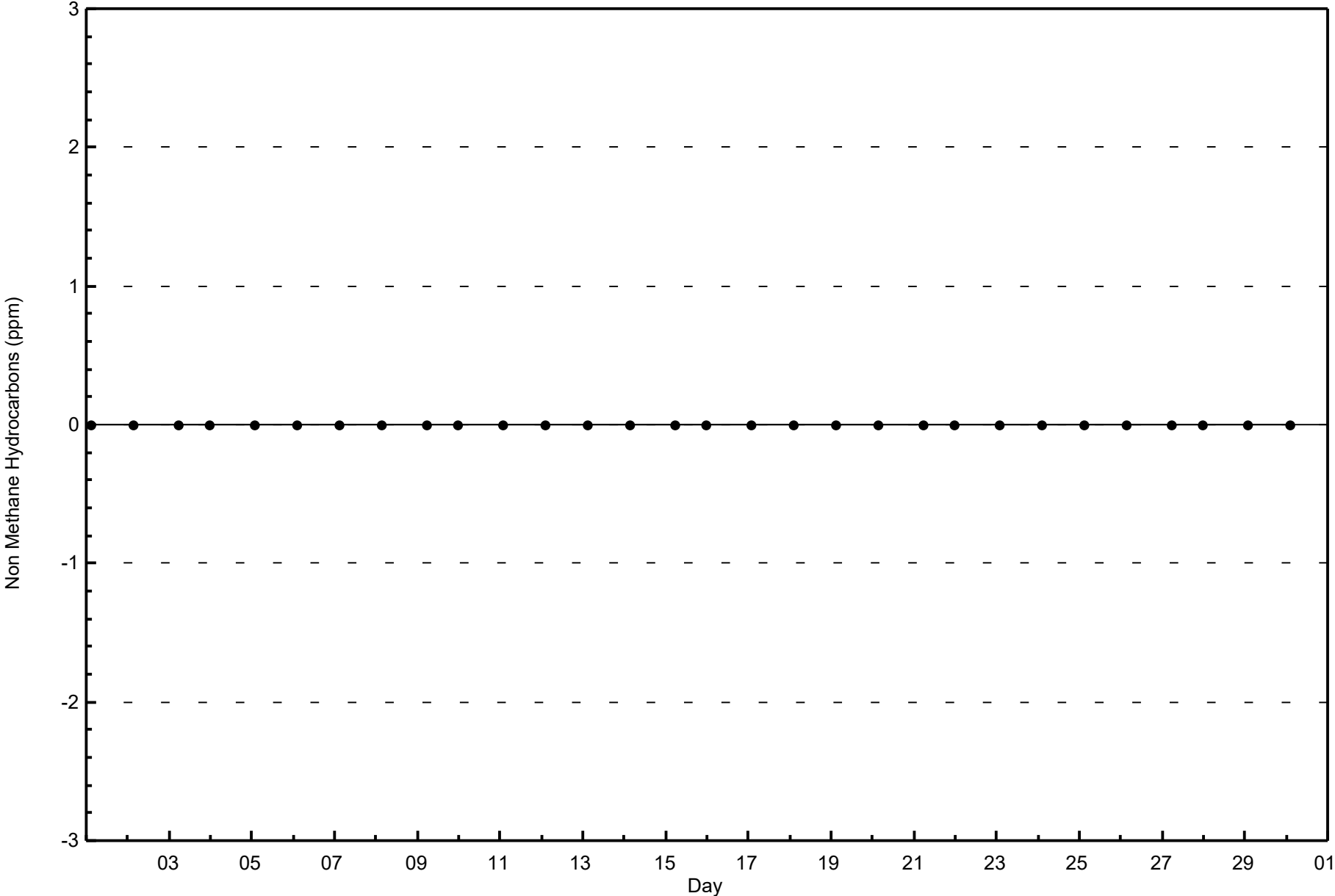
Wood Buffalo Environmental Association
Frequency Distribution

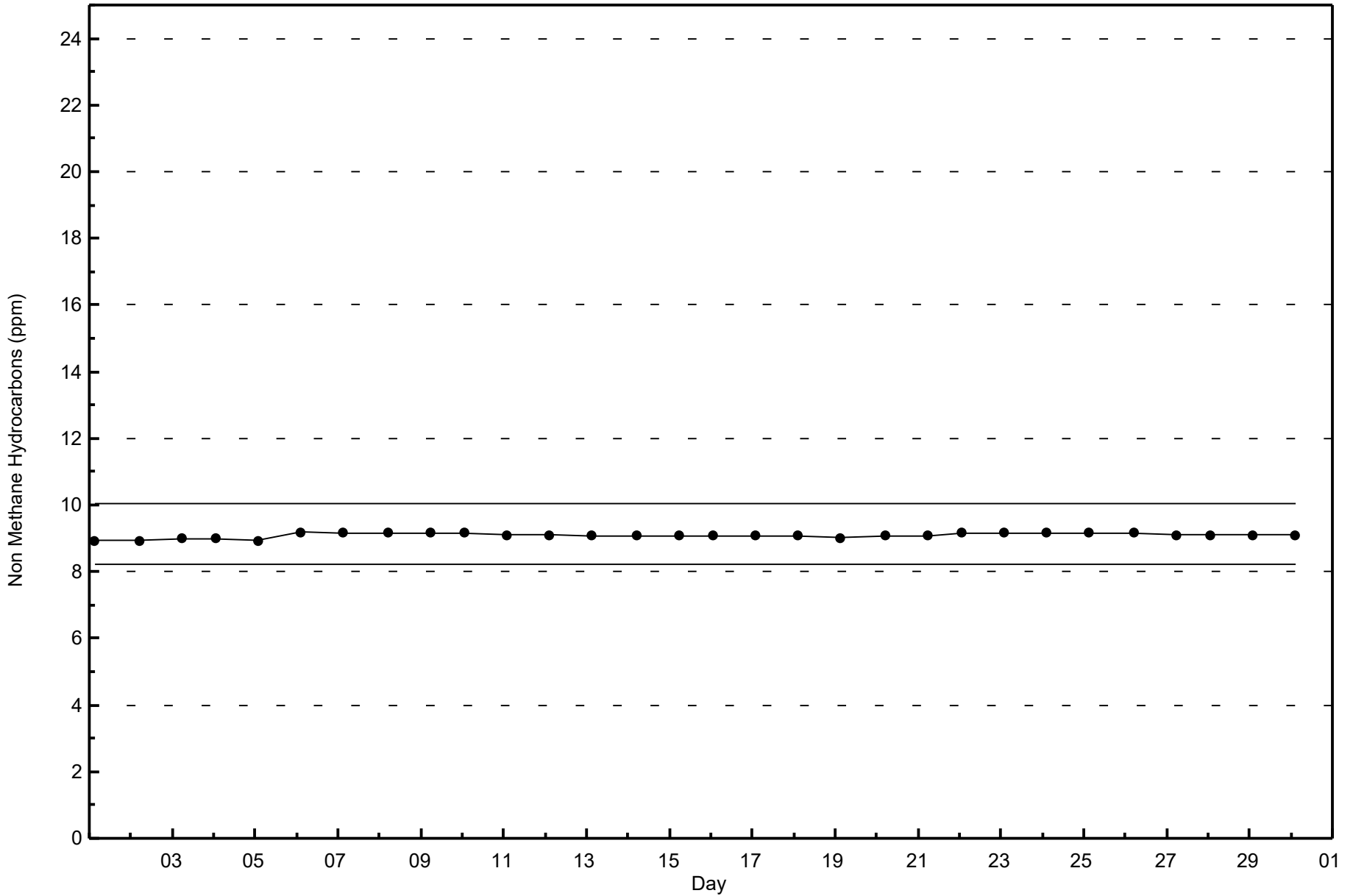
Non Methane Hydrocarbons (NMHC) - ppm
Conklin - June 2023

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	49	56	20	10	12	31	34	58	65	60	40	29	23	31	62	92	672
0.006 - 0.05	0	0	0	0	0	0	2	1	1	1	0	0	0	0	0	2	7
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	56	20	10	12	31	36	59	66	61	40	29	23	31	62	94	679

Total Number of Valid Hours: 679

Total Number of Hours: 720

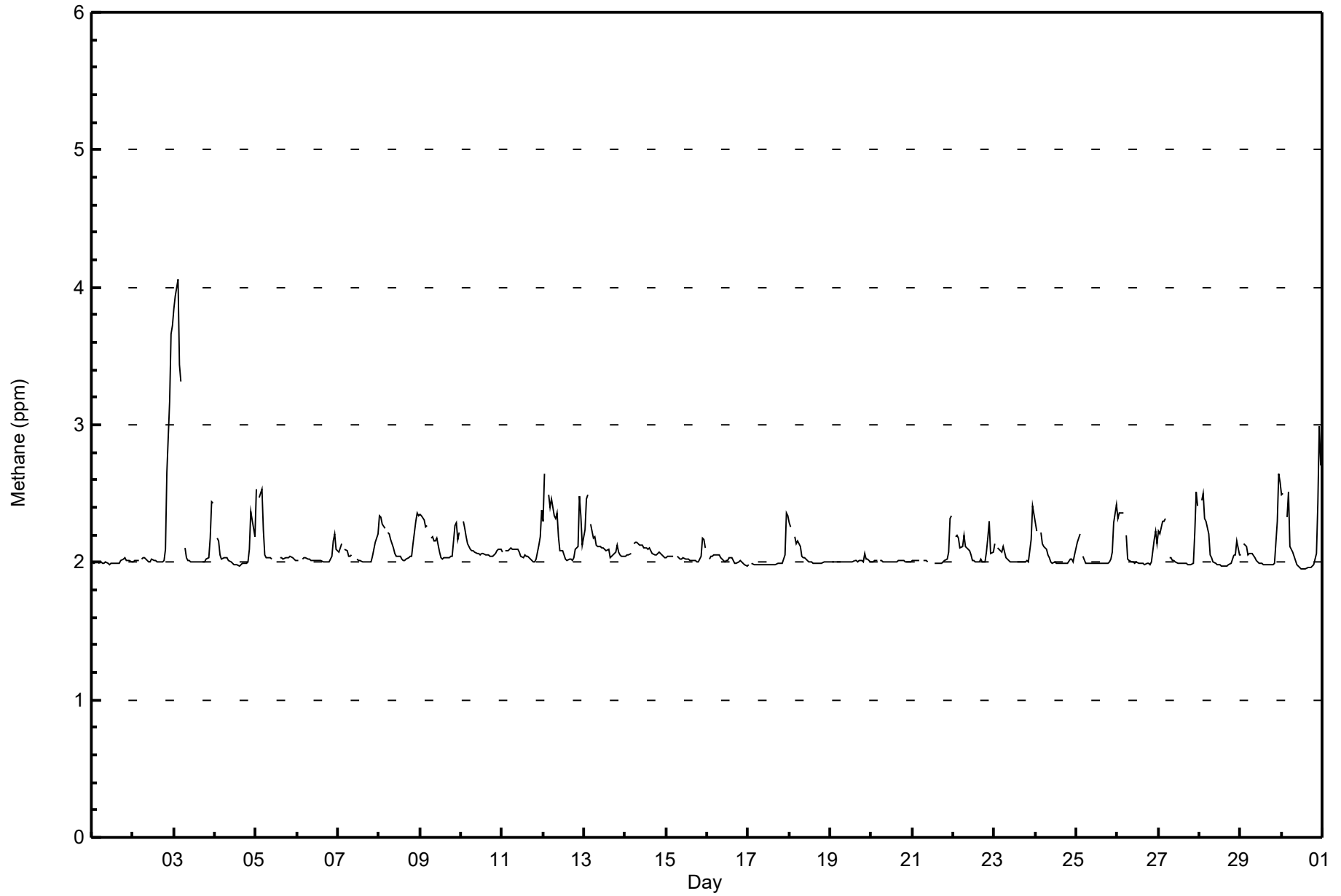






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Conklin - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	424	62.26	62.26
2.1 - 3.0	249	36.56	98.83
3.1 - 10.0	8	1.17	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - June 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	32	44	17	7	6	21	12	7	21	28	36	26	21	27	51	68	424
2.1 - 3.0	17	12	2	3	6	10	22	52	45	32	4	3	1	4	11	24	248
3.1 - 10.0	0	0	1	0	0	0	2	0	0	1	0	0	1	0	0	2	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	56	20	10	12	31	36	59	66	61	40	29	23	31	62	94	679

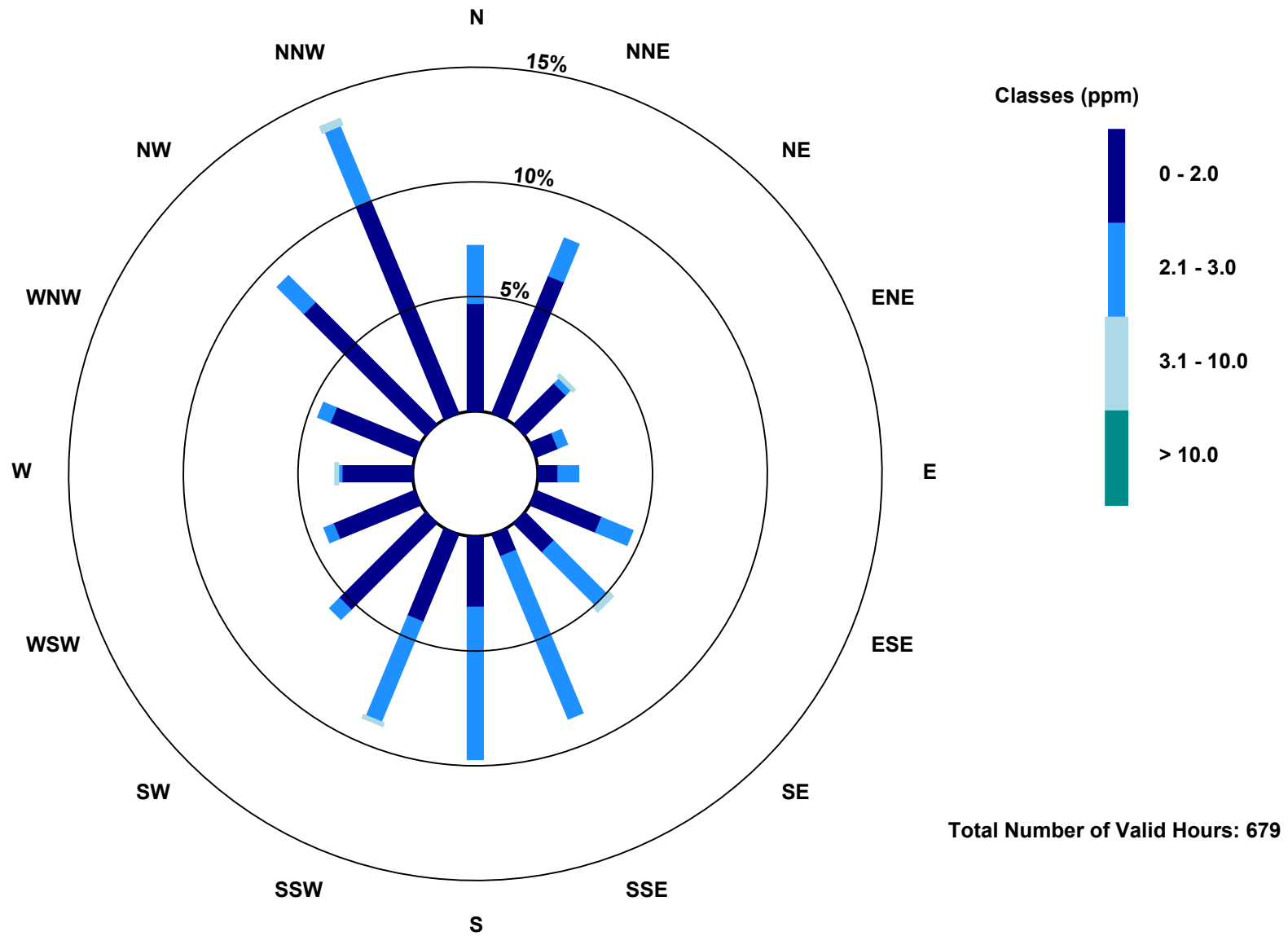
Total Number of Valid Hours: 679

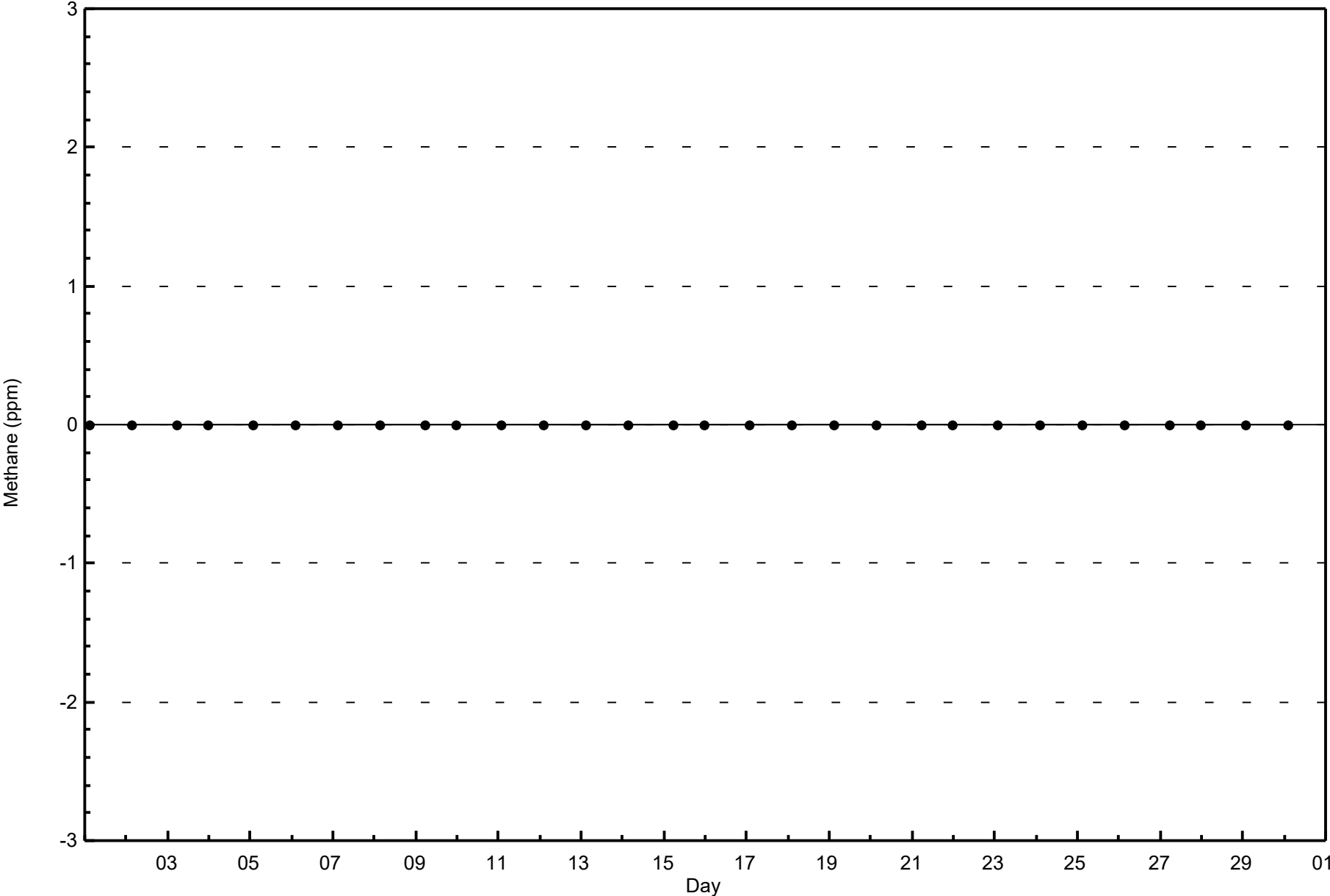
Total Number of Hours: 720

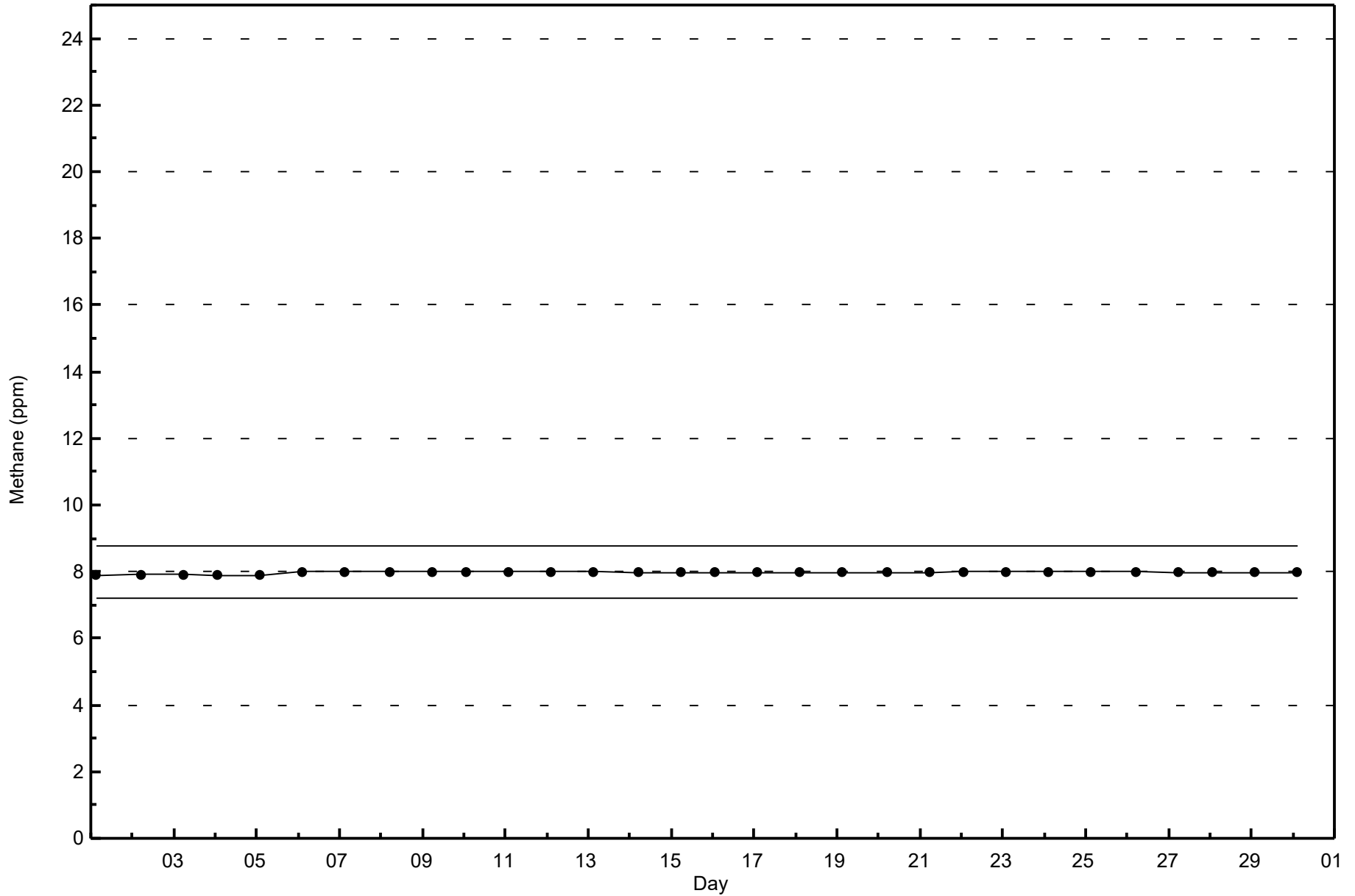


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Conklin









Wood Buffalo Environmental Association
Summary of Hour Averages

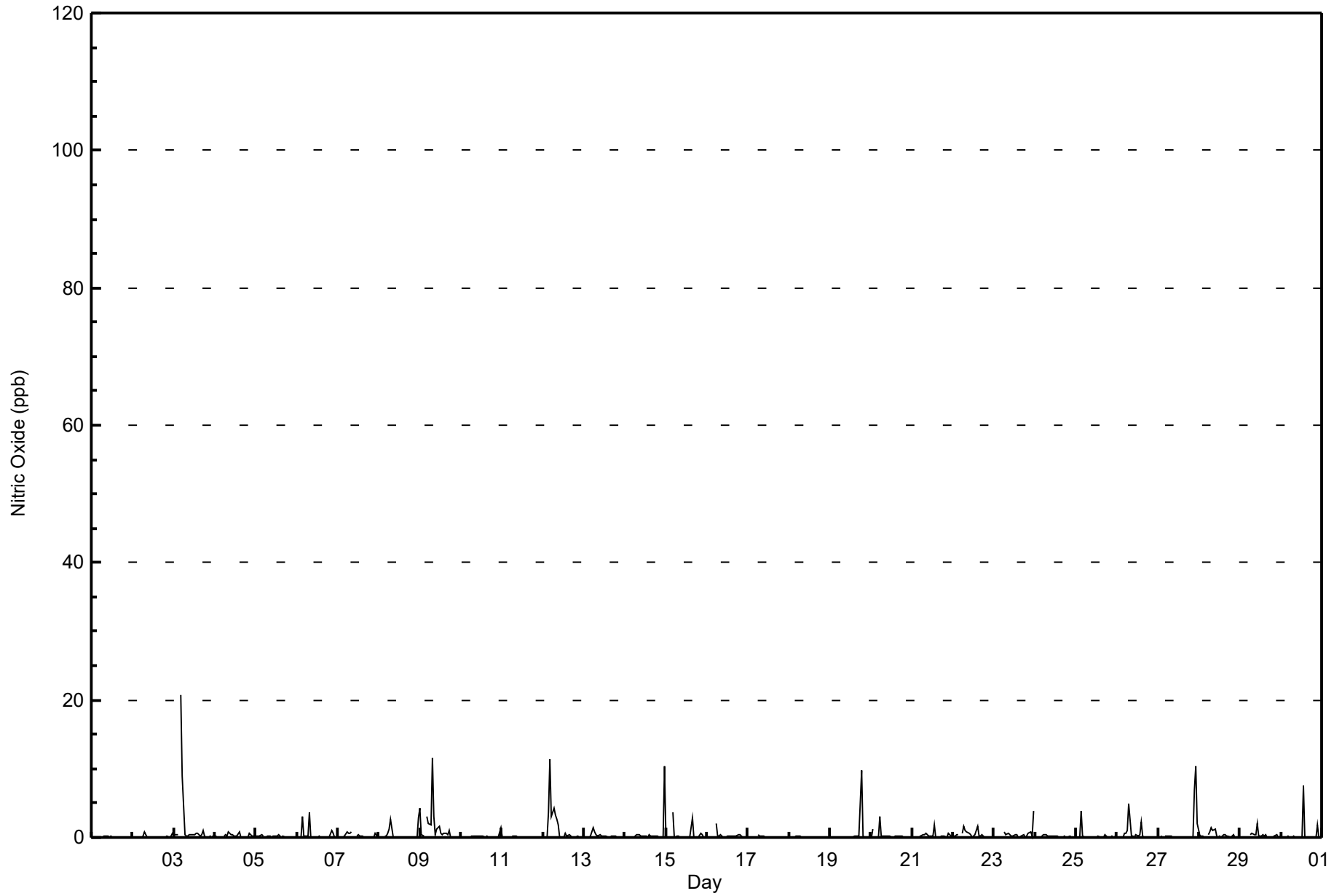
Nitric Oxide (NO) - ppb
Conklin - June 2023

Maximum Value: 20.8 ppb on Jun 3 05:00		Maximum Daily Average: 1.6 ppb on Jun 3		Hours in Service: 720																																													
Minimum Value: 0.0 ppb on Jun 4 19:00		Minimum Daily Average: 0.0 ppb on Jun 11		Hours of Data: 683																																													
Maximum Diurnal Average: 1.7 ppb at hour 5		Minimum Diurnal Average: 0.1 ppb at hour 3		Hours of Missing Data: 37																																													
Monthly Average: 0.42 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.6 P ₉₉ = 7.8		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-Jun	0.0	Z	0.0	0.0	0.0	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	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2																					
2-Jun	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.8	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.5	0.1	0.8	0.1	0.8																					
3-Jun	0.5	0.3	0.3	Z	20.8	8.9	0.3	0.2	0.2	0.4	0.4	0.3	0.4	0.7	0.6	0.2	0.4	1.1	0.1	0.1	0.0	0.1	0.1	0.2	1.6	20.8	0.2	0.9																					
4-Jun	0.1	0.1	0.1	0.0	Z	0.3	0.4	0.2	0.8	0.4	0.4	0.1	0.2	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.2	0.1	0.2	0.1	0.2	0.1																					
5-Jun	0.2	0.2	0.2	0.4	0.1	Z	0.1	0.1	0.2	0.1	0.3	0.3	0.1	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.4	0.1	0.4																					
6-Jun	Z	0.0	0.0	3.1	0.3	0.1	0.1	3.6	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.0	0.1	0.0	1.1	0.6	0.1	0.0	0.4	3.6	0.4	3.6																					
7-Jun	0.0	Z	0.0	0.0	0.2	0.8	0.7	0.6	0.8	M	M	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.2	0.8	0.2	0.8																					
8-Jun	0.1	0.1	Z	0.1	0.3	0.6	1.3	2.6	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.9	0.4	2.9	0.4	2.9																					
9-Jun	4.2	0.3	0.1	Z	3.0	2.0	1.9	11.5	3.0	0.4	1.3	1.6	0.6	0.4	0.6	0.7	0.5	1.0	0.1	0.0	0.1	0.0	0.0	0.0	1.4	11.5	0.4	11.5																					
10-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.2	1.5	0.2	1.5																					
11-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.3	0.3	0.3	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	0.3	0.0	0.3																				
12-Jun	Z	0.0	0.0	3.7	11.4	3.1	4.4	3.2	2.7	1.9	0.1	0.1	0.0	0.6	0.1	0.4	0.2	0.0	0.1	0.0	0.1	0.1	0.0	0.0	1.4	11.4	0.2	11.4																					
13-Jun	0.0	Z	0.0	0.0	0.1	1.5	0.8	0.4	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.2	1.5	0.2	1.5	0.2	1.5																				
14-Jun	0.0	0.1	Z	0.0	0.0	0.1	0.1	0.5	0.5	0.2	0.1	0.1	0.2	0.1	0.3	0.2	0.3	0.1	0.2	0.2	0.1	0.0	0.0	10.4	0.6	10.4	0.6	10.4																					
15-Jun	0.0	0.0	0.0	Z	3.7	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.6	0.5	0.1	0.0	0.4	3.7	0.4	3.7																					
16-Jun	0.0	0.0	0.0	0.0	Z	2.1	0.2	0.2	0.4	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.1	0.3	0.4	0.3	0.2	0.0	0.0	0.0	0.2	2.1	0.2	2.1	0.2	2.1																			
17-Jun	0.0	0.0	0.0	0.0	0.1	Z	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.1	0.3	0.1	0.3																			
18-Jun	Z	0.0	0.1	0.0	0.1	0.1	0.2	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	0.2	0.1	0.2	0.1	0.2																			
19-Jun	0.1	Z	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	9.7	0.2	0.1	0.0	0.0	0.0	0.5	9.7	0.5	9.7	0.5	9.7																			
20-Jun	0.0	1.2	Z	0.0	0.0	3.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.3	0.3	3.1	0.3	3.1	0.3	3.1																			
21-Jun	0.0	0.0	0.0	Z	0.1	0.1	0.3	0.5	0.6	0.4	0.2	0.2	0.2	1.8	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.7	0.4	0.2	0.3	1.8	0.3	1.8	0.3	1.8																			
22-Jun	0.2	0.2	0.3	0.4	Z	0.6	1.6	1.0	0.9	0.5	0.5	0.1	0.1	0.4	1.6	0.2	0.2	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.4	1.6	0.4	1.6	0.4	1.6																			
23-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.9	0.5	0.5	0.3	0.2	0.1	0.4	0.4	0.0	0.1	0.2	0.3	0.0	0.1	0.7	0.8	0.3	3.8	0.4	3.8	0.4	3.8	0.4	3.8																			
24-Jun	Z	0.1	0.0	0.0	0.2	0.4	0.5	0.3	0.2	0.1	0.3	0.1	0.2	0.3	0.1	0.1	0.0	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.5	0.1	0.5	0.1	0.5																			
25-Jun	0.0	Z	0.0	3.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.3	0.1	0.0	0.0	0.2	0.1	0.1	0.2	3.9	0.2	3.9	0.2	3.9																			
26-Jun	0.0	0.0	Z	0.0	0.6	0.6	1.0	4.8	0.3	0.2	0.1	0.3	0.2	0.4	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	4.8	0.5	4.8	0.5	4.8																			
27-Jun	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.3	0.2	C	C	C	C	C	0.0	0.0	0.0	0.1	0.0	0.0	0.0	6.8	10.3	2.0	1.1	10.3	1.1	10.3	1.1	10.3																			
28-Jun	0.1	0.1	0.1	0.1	Z	0.4	0.7	1.4	1.1	1.3	0.2	0.1	0.2	0.1	0.3	0.3	0.1	0.2	0.1	0.2	0.5	0.0	0.0	0.0	0.3	1.4	0.3	1.4	0.3	1.4																			
29-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.4	0.7	0.3	0.4	2.0	0.2	0.1	0.4	0.3	0.4	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.2	0.3	2.0	0.3	2.0	0.3	2.0																			
30-Jun	Z	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.4	7.6	0.4	7.6	0.4	7.6																		
																								0.2	0.1	0.1	0.5	1.7	1.0	0.6	1.2	0.5	0.3	0.3	0.2	0.1	0.5	0.3	0.2	0.1	0.2	0.4	0.1	0.2	0.4	0.4	0.7	Diurnal Average	
																								4.2	1.2	0.3	3.9	20.8	8.9	4.4	11.5	3.0	1.9	2.0	1.6	0.6	7.6	2.2	2.9	0.5	1.1	9.7	0.3	1.1	6.8	10.3	10.4	Diurnal Maximum	
Z - zerospan																								C - Calibration			M - Maintenance																						



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Conklin - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	682	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	46	55	20	11	12	31	36	60	64	62	40	29	23	31	63	97	680
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	55	20	11	12	31	36	60	64	62	40	29	23	31	63	98	681

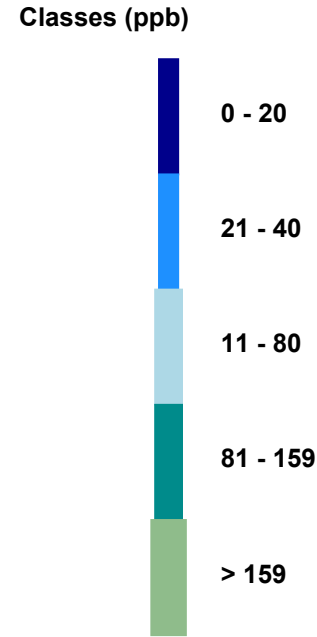
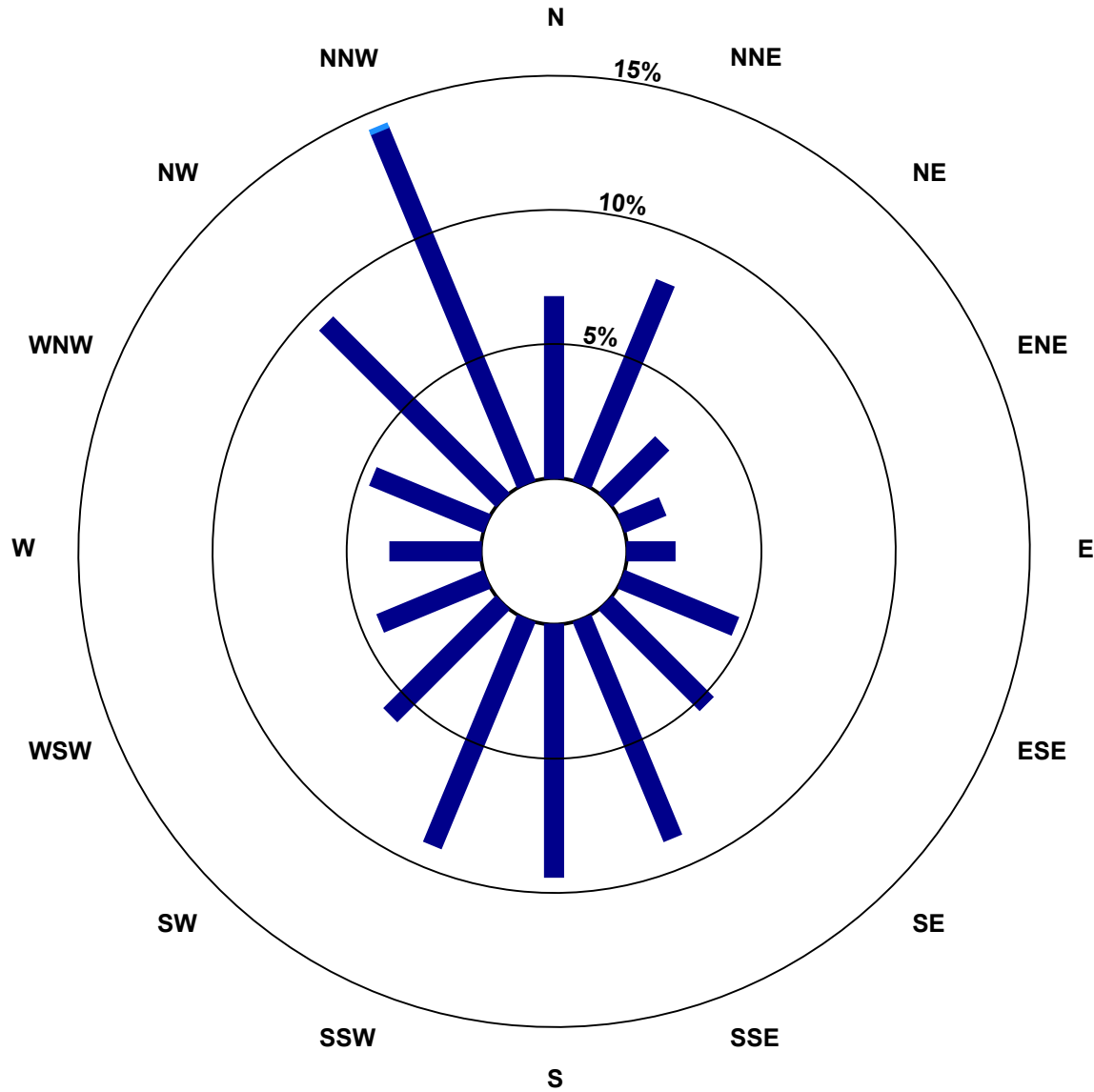
Total Number of Valid Hours: 681

Total Number of Hours: 720

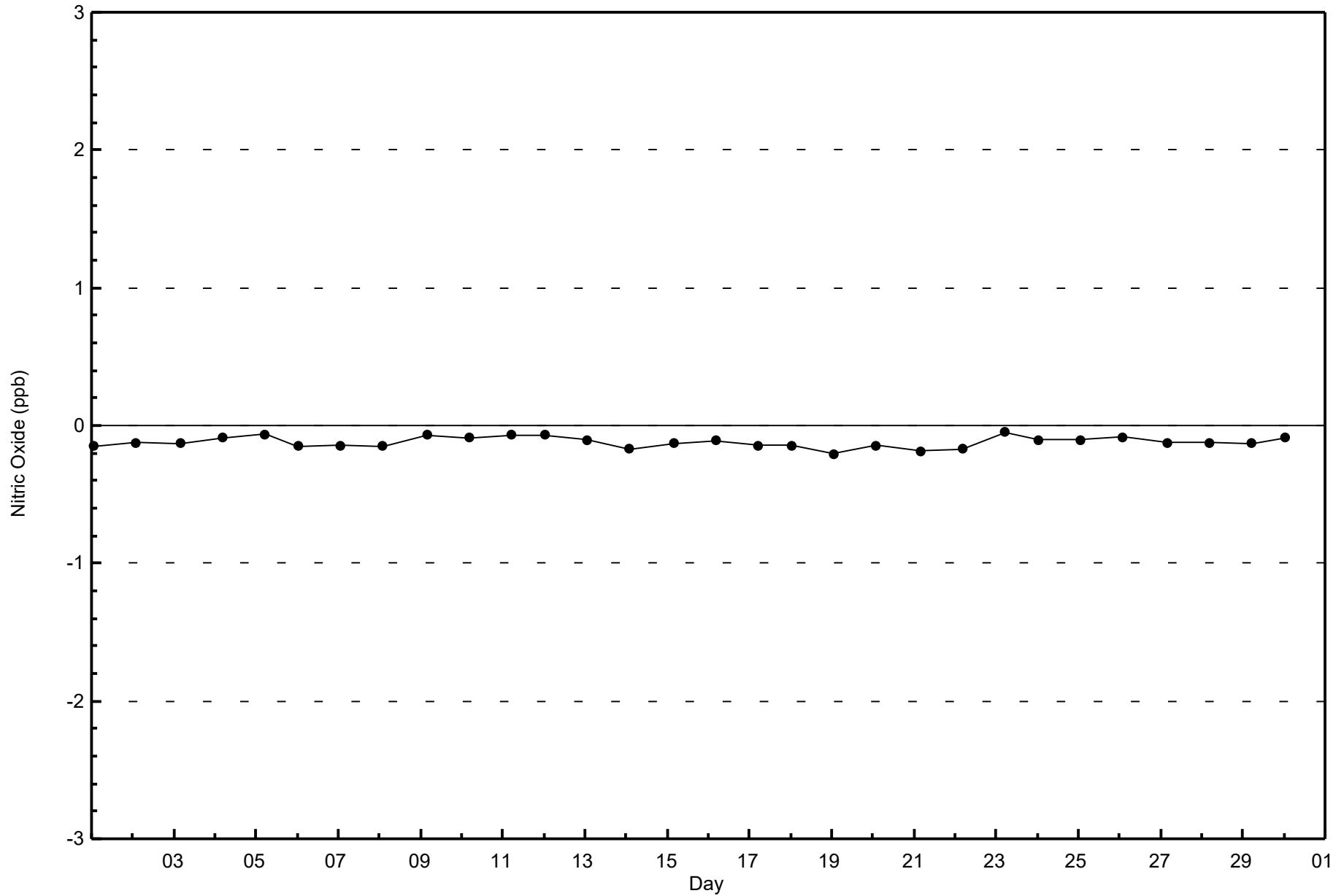


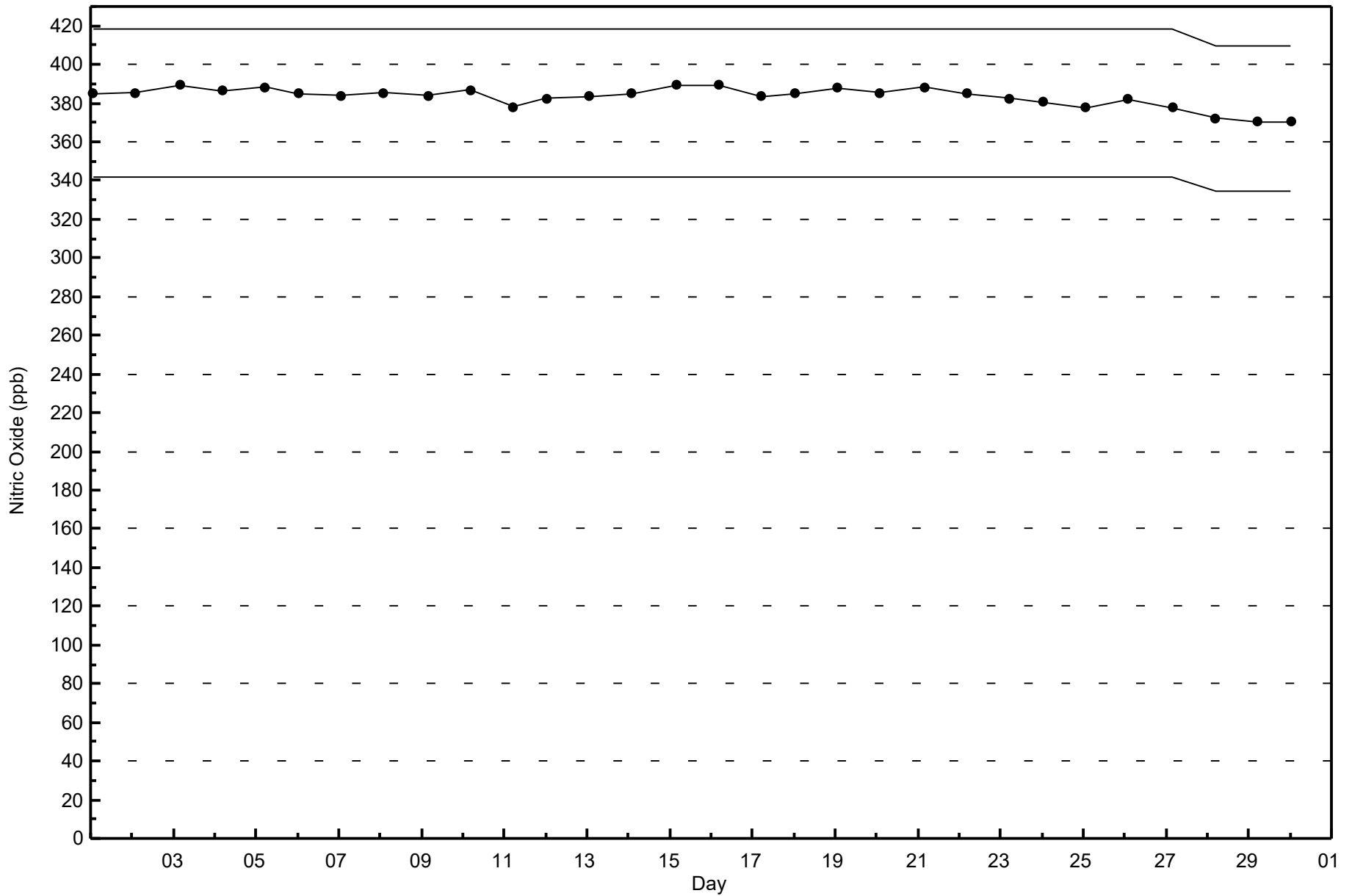
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Conklin



Total Number of Valid Hours: 681







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

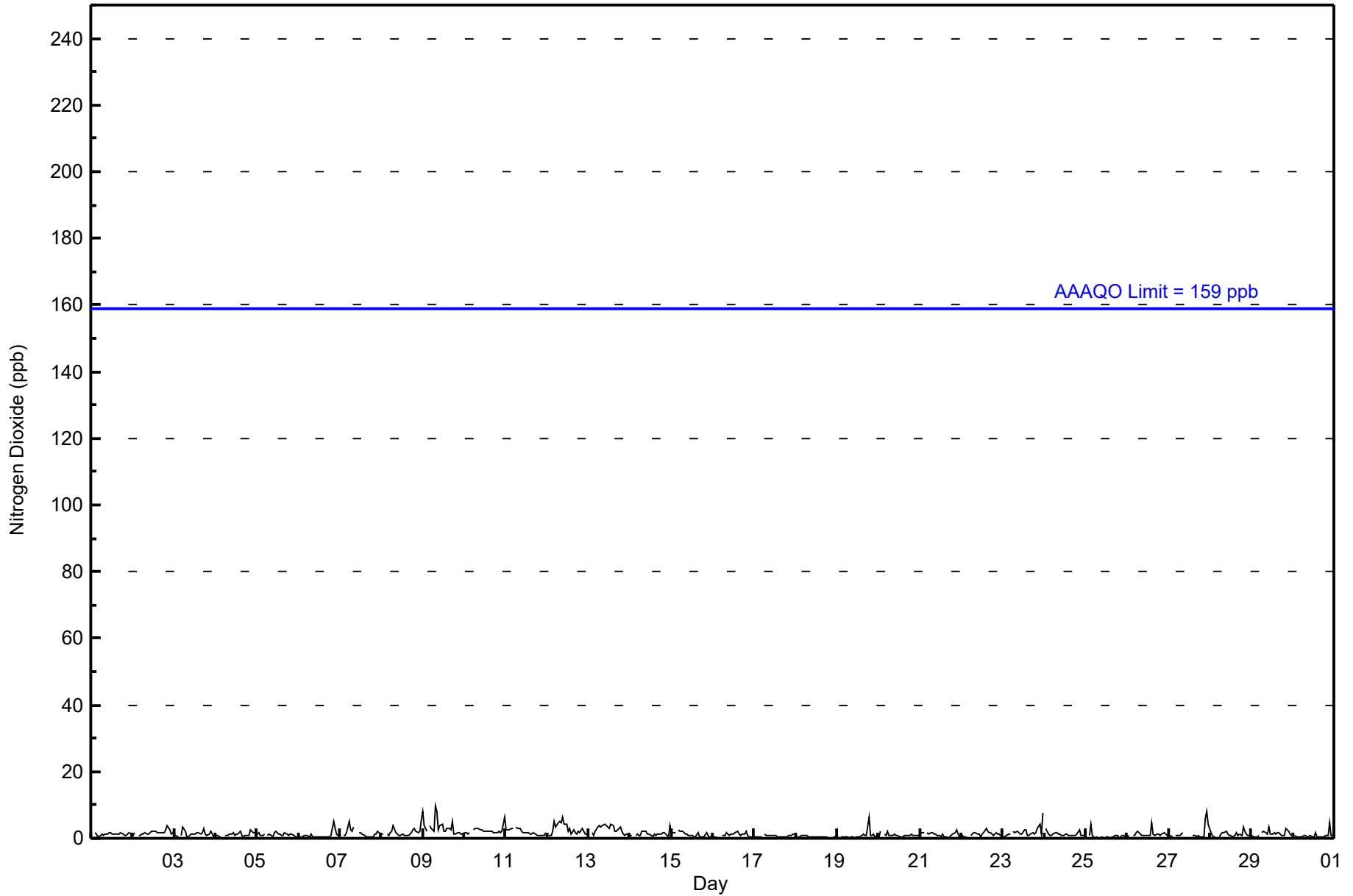
Conklin - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720						
Maximum Value: 9.7 ppb on Jun 9 08:00		Maximum Daily Average: 3.4 ppb on Jun 9														Hours of Data:		683								
Minimum Value: 0.2 ppb on Jun 19 08:00		Minimum Daily Average: 0.5 ppb on Jun 18														Hours of Missing Data:		37								
Maximum Diurnal Average: 1.9 ppb at hour 8		Minimum Diurnal Average: 0.9 ppb at hour 3														Hours of Calibration:		35								
Monthly Average: 1.41 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.1 Q ₃ = 1.7 P ₉₀ = 2.7 P ₉₉ = 6.2														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-Jun	1.1	Z	1.6	1.2	0.6	0.7	1.2	0.9	1.3	1.3	1.5	1.5	1.2	1.3	1.3	1.4	1.3	1.5	1.2	0.9	1.0	1.3	1.5	1.2	1.2	1.6
2-Jun	0.8	1.6	Z	1.0	1.0	1.3	1.2	1.8	1.4	1.3	1.6	2.1	2.1	2.0	1.6	1.8	1.7	1.7	1.8	2.6	4.0	2.6	1.4	1.9	1.8	4.0
3-Jun	1.1	0.9	0.5	Z	0.8	3.5	2.1	0.6	0.6	0.8	1.1	1.2	1.3	1.9	1.7	1.1	1.5	2.8	1.1	1.0	1.1	2.1	1.2	0.5	1.3	3.5
4-Jun	0.7	0.7	0.5	0.4	Z	0.8	1.0	0.9	1.2	1.3	1.5	1.0	1.1	1.2	2.1	0.8	0.6	0.7	0.7	0.9	2.6	2.0	1.8	1.5	1.1	2.6
5-Jun	1.2	1.7	0.8	0.8	1.1	Z	1.0	1.2	0.7	0.6	1.6	2.0	1.3	1.4	0.9	1.0	1.6	1.1	0.9	1.2	1.2	0.7	0.5	0.5	1.1	2.0
6-Jun	Z	0.5	0.6	0.7	0.8	0.8	0.6	1.4	0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.6	0.7	5.1	2.9	1.2	0.7	0.9	5.1
7-Jun	0.8	Z	0.8	0.7	1.7	5.0	2.6	2.3	3.2	M	M	1.9	1.6	1.4	0.9	0.6	0.5	0.4	0.6	0.6	1.4	1.1	2.2	1.1	1.5	5.0
8-Jun	1.2	1.1	Z	1.1	1.0	1.5	2.3	4.0	1.6	1.2	0.8	1.0	1.2	1.0	0.8	0.8	1.0	1.6	2.6	3.1	2.1	1.8	2.0	5.4	1.7	5.4
9-Jun	8.0	4.0	2.3	Z	3.7	3.0	2.3	9.7	8.2	2.7	4.0	4.1	2.3	2.0	2.8	3.0	2.7	5.2	1.4	1.2	1.9	1.9	1.4	1.3	3.4	9.7
10-Jun	1.6	1.5	1.4	1.8	Z	2.5	2.9	3.0	2.8	2.5	2.4	2.2	2.3	2.3	2.0	2.2	2.1	1.9	1.8	1.9	2.1	1.8	2.0	6.3	2.3	6.3
11-Jun	2.6	2.4	2.6	2.8	2.9	Z	3.6	2.9	2.8	2.2	1.9	1.5	1.5	1.5	1.4	1.3	1.7	1.4	0.8	0.8	0.8	0.7	0.7	1.8	1.9	3.6
12-Jun	Z	1.0	0.8	2.0	5.2	3.5	4.6	5.0	4.6	6.2	4.2	4.3	2.0	2.9	1.4	2.4	1.7	1.2	2.0	1.7	3.1	2.0	1.3	1.2	2.8	6.2
13-Jun	1.1	Z	1.5	1.0	2.1	3.3	3.9	3.3	3.7	4.1	3.9	3.5	3.1	4.2	3.7	2.2	2.2	2.5	3.6	2.0	1.2	1.0	1.1	0.9	2.6	4.2
14-Jun	0.8	0.8	Z	1.0	1.1	0.8	0.8	2.0	2.3	2.2	1.3	1.2	1.0	0.6	1.1	0.9	1.1	1.2	1.3	1.7	1.6	0.8	0.6	3.8	1.3	3.8
15-Jun	1.3	1.5	1.5	Z	2.6	2.0	2.1	1.6	1.1	1.2	0.9	0.8	0.8	0.5	0.4	1.6	0.4	0.4	0.3	0.3	1.7	1.0	0.4	0.3	1.1	2.6
16-Jun	0.4	0.3	0.2	0.6	Z	1.0	1.0	1.0	1.6	0.8	1.1	1.2	1.4	1.8	2.1	1.4	1.0	1.3	1.4	2.0	0.8	0.5	0.4	0.4	1.0	2.1
17-Jun	0.4	0.4	0.3	0.3	0.3	Z	1.1	0.8	0.8	0.8	0.8	0.8	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.7	1.4	1.1	0.6	1.4
18-Jun	Z	0.6	0.6	0.8	0.7	0.7	0.9	0.6	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.9
19-Jun	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.5	1.0	1.4	0.9	0.8	6.2	0.9	0.8	1.1	0.5	0.8	0.8	6.2
20-Jun	0.4	2.3	Z	1.1	1.0	2.3	0.9	0.8	0.7	1.1	0.8	0.7	0.4	0.6	0.5	0.8	1.0	1.0	1.0	1.3	1.0	0.9	0.7	0.9	1.0	2.3
21-Jun	1.1	1.6	1.8	Z	1.5	1.4	1.8	1.5	1.3	1.3	1.0	0.8	0.6	1.3	0.4	0.3	0.2	0.4	1.0	1.2	1.6	2.4	1.3	0.6	1.1	2.4
22-Jun	0.7	0.4	0.4	0.3	Z	0.8	1.3	1.6	1.7	1.4	1.2	0.6	1.1	1.7	2.8	2.0	1.7	1.5	0.7	1.1	1.9	1.2	1.1	0.6	1.2	2.8
23-Jun	0.6	0.4	0.7	1.1	1.3	Z	2.0	1.9	2.1	1.7	1.2	1.3	2.5	2.5	0.9	1.0	1.3	1.5	1.1	1.9	3.1	4.1	1.3	7.7	1.9	7.7
24-Jun	Z	2.9	1.2	0.8	0.7	1.2	1.6	1.6	1.3	1.1	0.9	0.9	1.1	1.2	0.8	0.7	0.7	0.9	0.7	1.2	2.6	0.8	0.8	0.9	1.2	2.9
25-Jun	1.7	Z	0.9	4.1	0.9	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.9	0.7	0.2	0.4	1.0	0.8	0.6	0.7	4.1
26-Jun	0.7	0.6	Z	0.8	0.8	1.6	2.0	1.5	0.9	0.8	0.7	0.9	0.8	1.0	4.6	1.2	0.8	1.3	1.1	1.0	1.2	1.5	1.1	0.8	1.2	4.6
27-Jun	0.7	0.7	0.6	Z	0.7	0.8	0.8	1.2	1.6	C	C	C	C	C	0.9	0.9	0.6	0.9	0.6	0.4	0.6	6.1	8.0	4.3	1.7	8.0
28-Jun	1.6	0.9	0.6	0.5	Z	0.6	1.3	1.9	1.9	2.1	1.1	0.7	0.9	0.5	0.8	1.5	0.8	1.2	0.8	3.3	2.2	1.1	1.0	0.7	1.2	3.3
29-Jun	0.7	0.6	0.6	0.6	0.9	Z	1.6	2.0	1.9	1.4	3.5	1.4	1.3	1.8	1.4	1.7	1.7	1.0	0.9	1.0	2.9	2.3	1.1	0.9	1.4	3.5
30-Jun	Z	0.7	0.5	0.6	0.5	0.6	0.7	0.8	0.5	0.6	0.7	0.5	0.4	1.6	0.3	0.4	0.4	0.4	0.5	0.7	1.0	4.7	1.0	0.9	0.8	4.7
																								Diurnal Average		
																								Diurnal Maximum		
																								8.0 4.0 2.6 4.1 5.2 5.0 4.6 9.7 8.2 6.2 4.2 4.3 3.1 4.2 4.6 3.0 2.7 5.2 6.2 3.3 5.1 6.1 8.0 7.7		
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 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - June 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 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	46	55	20	11	12	31	36	60	64	62	40	29	23	31	63	98	681
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	46	55	20	11	12	31	36	60	64	62	40	29	23	31	63	98	681

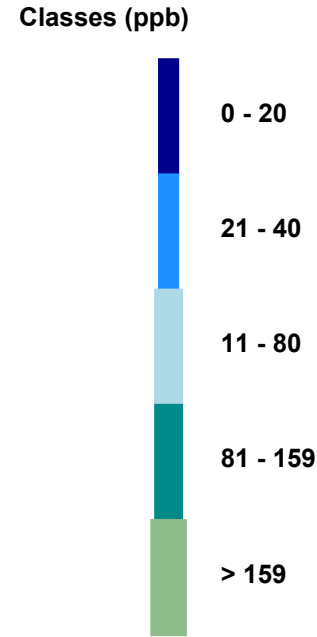
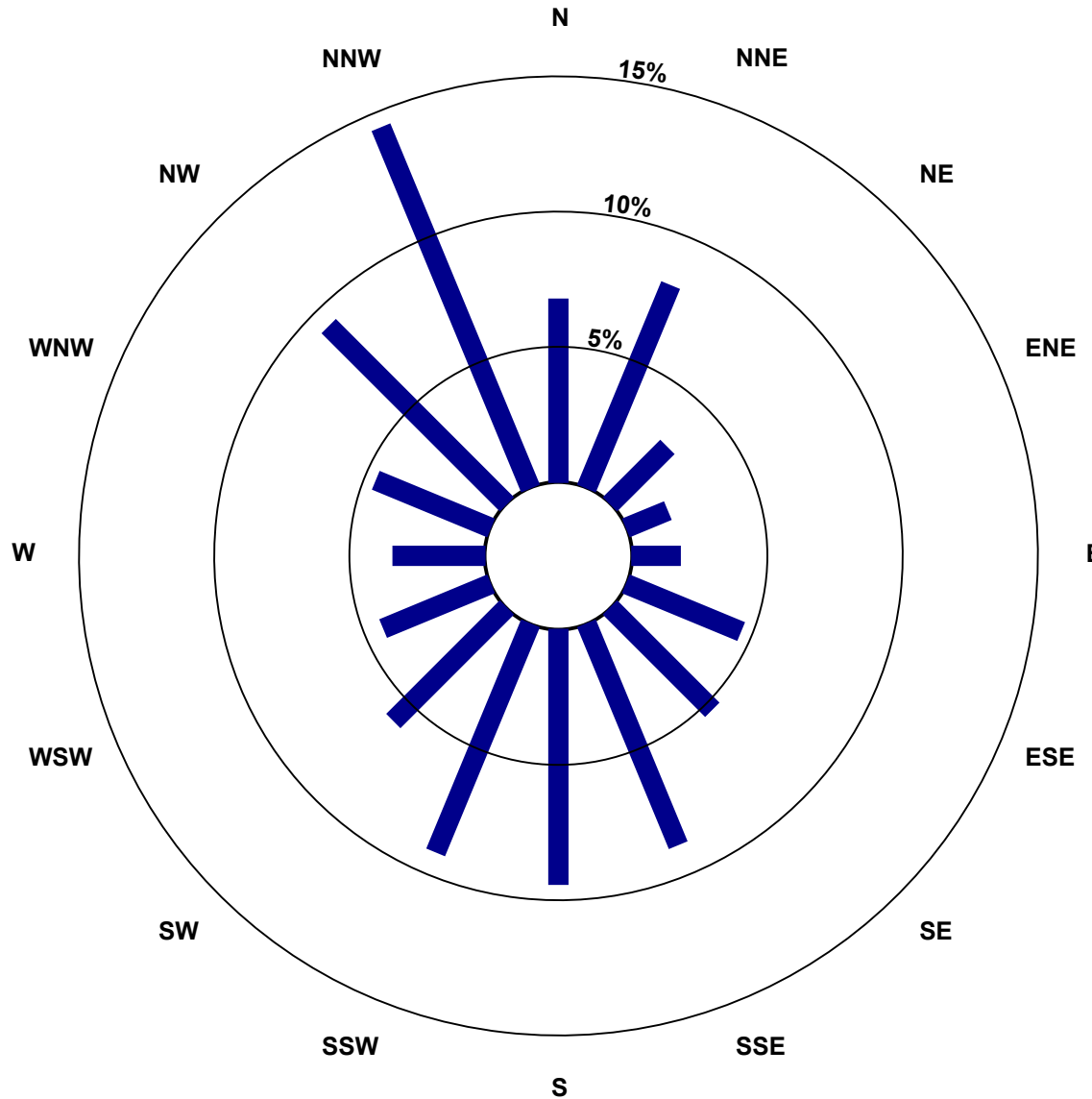
Total Number of Valid Hours: 681

Total Number of Hours: 720

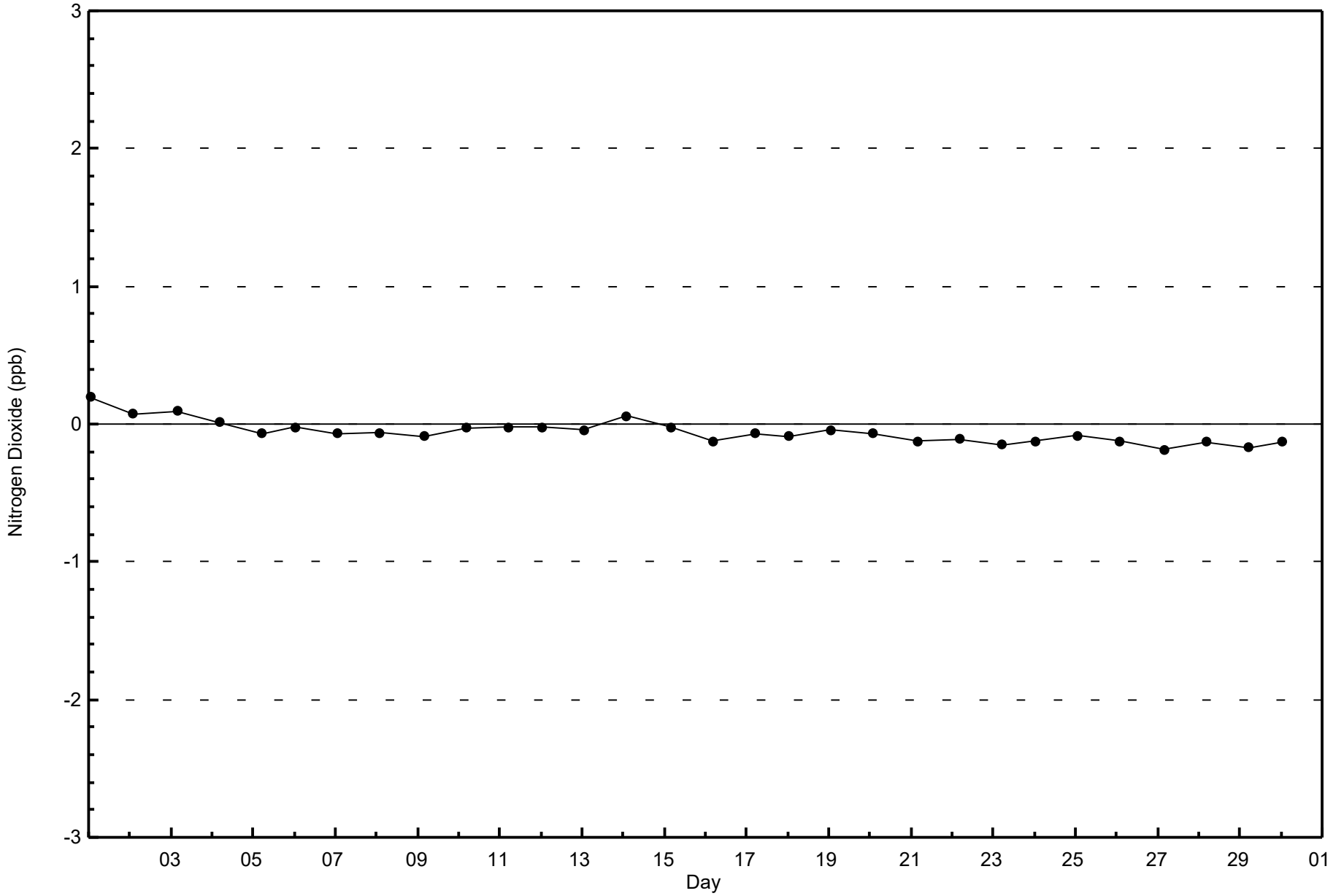


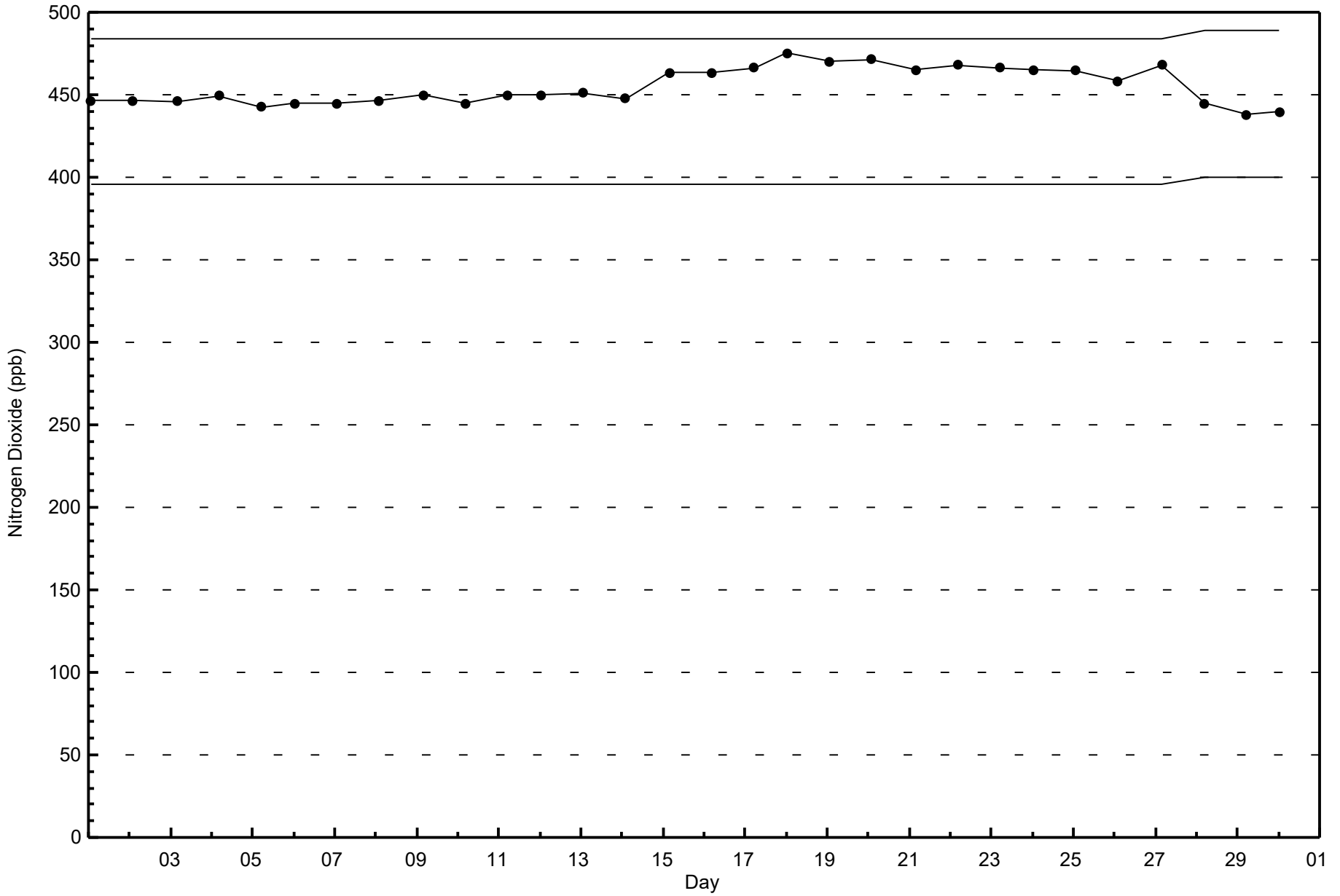
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Conklin



Total Number of Valid Hours: 681



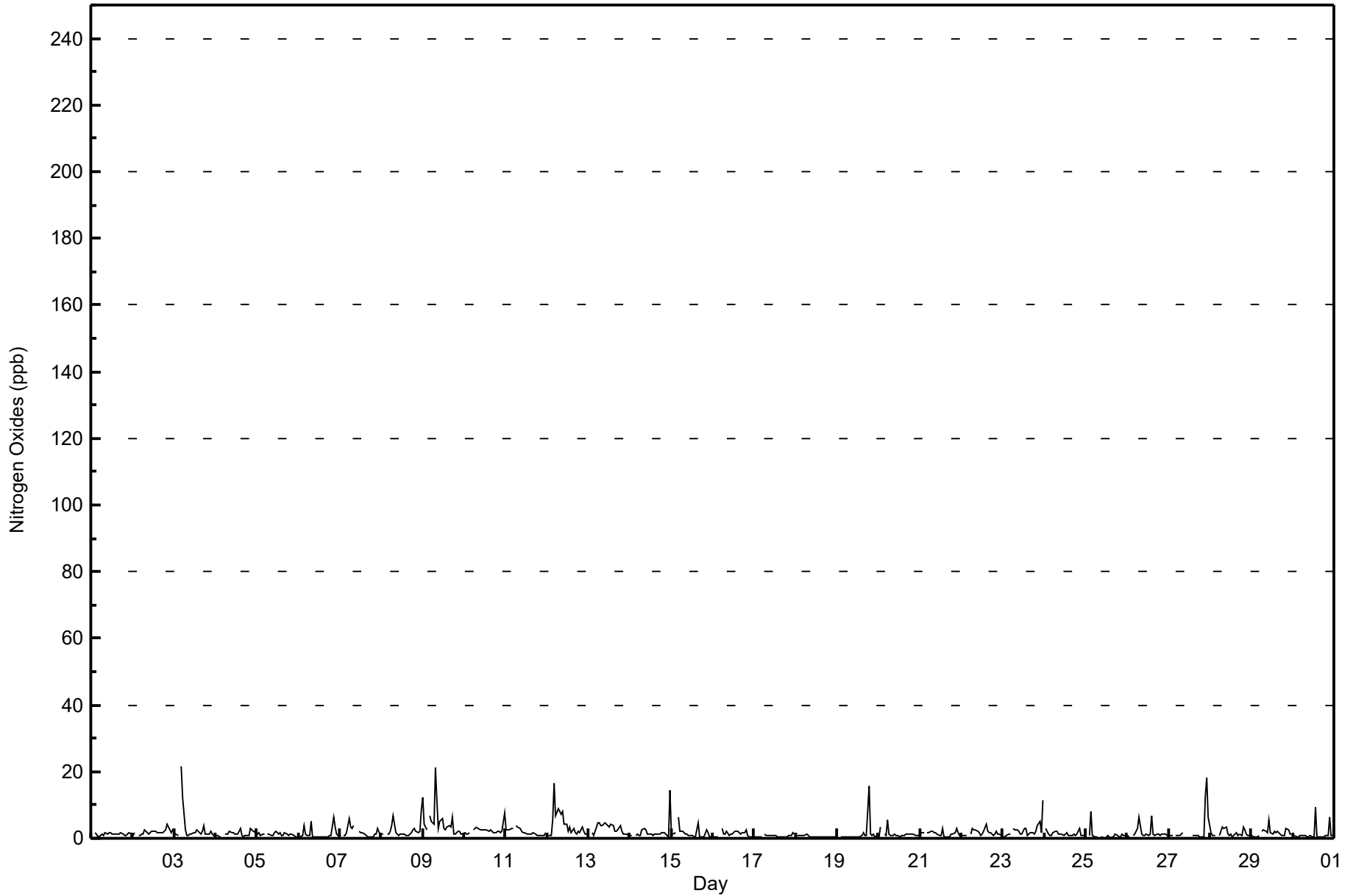




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Conklin - June 2023

Maximum Value: 21.6 ppb on Jun 3 05:00 Maximum Daily Average: 4.9 ppb on Jun 9																				Hours in Service: 720 Hours of Data: 683 Hours of Missing Data: 37 Hours of Calibration: 35 Percent Operational Time: 99.7						
Minimum Value: 0.2 ppb on Jun 25 12:00 Minimum Daily Average: 0.5 ppb on Jun 18 Maximum Diurnal Average: 3.1 ppb at hour 8 Minimum Diurnal Average: 1.0 ppb at hour 3 Monthly Average: 1.82 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.2 Q ₃ = 2.0 P ₉₀ = 3.3 P ₉₉ = 12.5																										
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-Jun	1.1	Z	1.6	1.2	0.6	0.8	1.3	1.0	1.5	1.5	1.6	1.6	1.3	1.4	1.4	1.4	1.3	1.5	1.3	1.0	1.0	1.3	1.5	1.2	1.3	1.6
2-Jun	0.8	1.6	Z	1.0	1.0	1.4	1.3	2.6	1.5	1.3	1.7	2.2	2.2	2.1	1.7	1.9	1.7	1.8	1.9	2.7	4.2	2.6	1.5	2.4	1.9	4.2
3-Jun	1.6	1.2	0.8	Z	21.6	12.4	2.4	0.8	0.8	1.2	1.5	1.5	1.7	2.6	2.3	1.3	1.9	3.9	1.2	1.1	1.1	2.2	1.3	0.7	2.9	21.6
4-Jun	0.8	0.8	0.6	0.4	Z	1.1	1.4	1.1	2.0	1.7	1.9	1.1	1.3	1.4	3.0	0.8	0.6	0.7	0.7	0.9	3.1	2.4	2.0	1.6	1.4	3.1
5-Jun	1.4	1.9	1.0	1.2	1.2	Z	1.1	1.3	0.9	0.7	1.9	2.3	1.4	1.8	1.0	1.0	1.7	1.2	1.0	1.3	1.3	0.8	0.5	0.5	1.2	2.3
6-Jun	Z	0.5	0.6	3.8	1.1	0.9	0.7	5.0	0.6	0.5	0.4	0.5	0.4	0.6	0.4	0.5	0.5	0.5	0.7	0.7	6.2	3.5	1.3	0.7	1.3	6.2
7-Jun	0.8	Z	0.8	0.7	1.9	5.8	3.3	2.9	4.0	M	M	2.1	1.9	1.6	1.1	0.7	0.6	0.5	0.6	0.6	1.4	1.1	2.8	1.1	1.7	5.8
8-Jun	1.3	1.2	Z	1.2	1.3	2.1	3.6	6.6	1.7	1.3	0.9	1.1	1.3	1.1	0.8	0.8	1.0	1.7	2.6	3.1	2.1	1.8	2.0	8.3	2.1	8.3
9-Jun	12.2	4.3	2.4	Z	6.7	5.0	4.2	21.2	11.2	3.1	5.3	5.7	2.9	2.4	3.4	3.7	3.2	6.2	1.5	1.2	2.0	1.9	1.4	1.3	4.9	21.2
10-Jun	1.6	1.5	1.4	1.8	Z	2.6	3.1	3.3	3.0	2.7	2.6	2.4	2.5	2.4	2.0	2.4	2.2	1.9	1.8	1.9	2.1	1.8	2.0	7.8	2.5	7.8
11-Jun	2.6	2.4	2.6	2.8	2.9	Z	3.9	3.2	3.1	2.2	1.9	1.5	1.5	1.5	1.4	1.4	1.7	1.4	0.8	0.8	0.8	0.7	0.7	1.8	1.9	3.9
12-Jun	Z	1.0	0.8	5.7	16.6	6.6	9.0	8.2	7.3	8.1	4.3	4.4	2.0	3.5	1.5	2.8	1.9	1.2	2.1	1.7	3.2	2.1	1.3	1.2	4.2	16.6
13-Jun	1.1	Z	1.5	1.0	2.2	4.8	4.7	3.7	4.0	4.5	4.1	3.6	3.2	4.3	3.8	2.3	2.3	2.7	3.7	2.0	1.2	1.1	1.1	0.9	2.8	4.8
14-Jun	0.8	0.9	Z	1.0	1.1	0.9	0.9	2.5	2.8	2.4	1.4	1.3	1.2	0.7	1.4	1.1	1.4	1.3	1.5	1.9	1.7	0.8	0.6	14.2	1.9	14.2
15-Jun	1.3	1.5	1.5	Z	6.3	2.1	2.3	1.7	1.2	1.3	0.9	0.8	0.9	0.5	0.4	4.5	0.4	0.4	0.3	0.3	2.3	1.5	0.5	0.3	1.5	6.3
16-Jun	0.4	0.3	0.2	0.6	Z	3.1	1.2	1.2	2.0	0.9	1.1	1.2	1.5	1.9	2.3	1.7	1.1	1.6	1.8	2.3	1.0	0.5	0.4	0.4	1.3	3.1
17-Jun	0.4	0.4	0.3	0.3	0.4	Z	1.4	1.0	0.9	0.9	0.9	0.9	0.7	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.7	0.7	1.5	1.1	0.7	1.5
18-Jun	Z	0.6	0.7	0.8	0.8	0.8	1.1	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.5	1.1
19-Jun	0.4	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	1.1	1.6	1.0	0.9	15.9	1.1	0.9	1.1	0.5	0.8	1.3	15.9
20-Jun	0.4	3.5	Z	1.1	1.0	5.4	1.1	0.9	0.8	1.3	1.0	0.8	0.5	0.7	0.6	0.9	1.2	1.2	1.2	1.4	1.1	0.9	0.7	0.9	1.2	5.4
21-Jun	1.1	1.6	1.8	Z	1.6	1.5	2.1	2.0	1.9	1.7	1.2	1.0	0.8	3.1	0.5	0.4	0.3	0.5	1.2	1.3	1.7	3.1	1.7	0.8	1.4	3.1
22-Jun	0.9	0.6	0.7	0.7	Z	1.4	2.9	2.6	2.6	1.9	1.7	0.7	1.2	2.1	4.4	2.2	1.9	1.8	0.7	1.2	2.0	1.2	1.1	0.6	1.6	4.4
23-Jun	0.6	0.4	0.7	1.1	1.3	Z	2.9	2.4	2.6	2.0	1.4	1.4	2.9	2.9	0.9	1.1	1.5	1.8	1.1	2.0	3.8	4.9	1.6	11.5	2.3	11.5
24-Jun	Z	3.0	1.2	0.8	0.9	1.6	2.1	1.9	1.5	1.2	1.2	1.0	1.3	1.5	0.9	0.8	0.7	1.1	0.7	1.3	2.8	0.8	0.8	0.9	1.3	3.0
25-Jun	1.7	Z	0.9	8.0	1.0	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.6	0.2	0.4	0.3	1.2	0.8	0.2	0.4	1.2	0.9	0.7	0.9	8.0
26-Jun	0.7	0.6	Z	0.8	1.4	2.2	3.0	6.3	1.2	1.0	0.8	1.2	1.0	1.4	6.8	1.3	0.8	1.3	1.1	1.0	1.2	1.5	1.2	0.8	1.7	6.8
27-Jun	0.8	0.8	0.7	Z	1.0	1.0	1.0	1.5	1.8	C	C	C	C	C	0.9	0.9	0.6	1.0	0.6	0.4	0.6	12.9	18.3	6.3	2.8	18.3
28-Jun	1.7	1.0	0.7	0.6	Z	1.0	2.0	3.3	3.0	3.4	1.3	0.8	1.1	0.6	1.1	1.8	0.9	1.4	0.9	3.5	2.7	1.1	1.0	0.7	1.5	3.5
29-Jun	0.7	0.6	0.6	0.6	0.9	Z	2.0	2.7	2.2	1.8	5.5	1.6	1.4	2.2	1.7	2.1	1.7	1.0	0.9	1.0	3.1	2.6	1.2	1.1	1.7	5.5
30-Jun	Z	0.7	0.5	0.6	0.7	0.7	0.7	0.9	0.5	0.6	0.7	0.5	0.4	9.2	0.3	0.4	0.4	0.4	0.5	0.7	1.0	6.6	1.0	1.0	1.3	9.2
																								Diurnal Average		
																								Diurnal Maximum		
1.5 1.3 1.0 1.5 3.0 2.6 2.2 3.1 2.3 1.8 1.7 1.5 1.4 1.9 1.6 1.4 1.2 1.4 1.7 1.3 1.9 2.2 1.8 2.4 12.2 4.3 2.6 8.0 21.6 12.4 9.0 21.2 11.2 8.1 5.5 5.7 3.2 9.2 6.8 4.5 3.2 6.2 15.9 3.5 6.2 12.9 18.3 14.2																										
Z - zerspan C - Calibration M - Maintenance																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - June 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 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	46	55	20	11	12	31	36	59	64	62	40	29	23	31	63	97	679
21 - 40	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	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	46	55	20	11	12	31	36	60	64	62	40	29	23	31	63	98	681

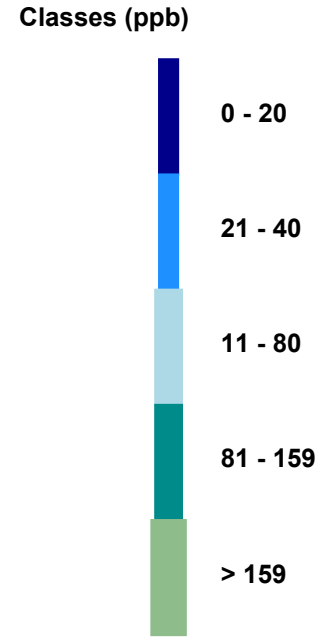
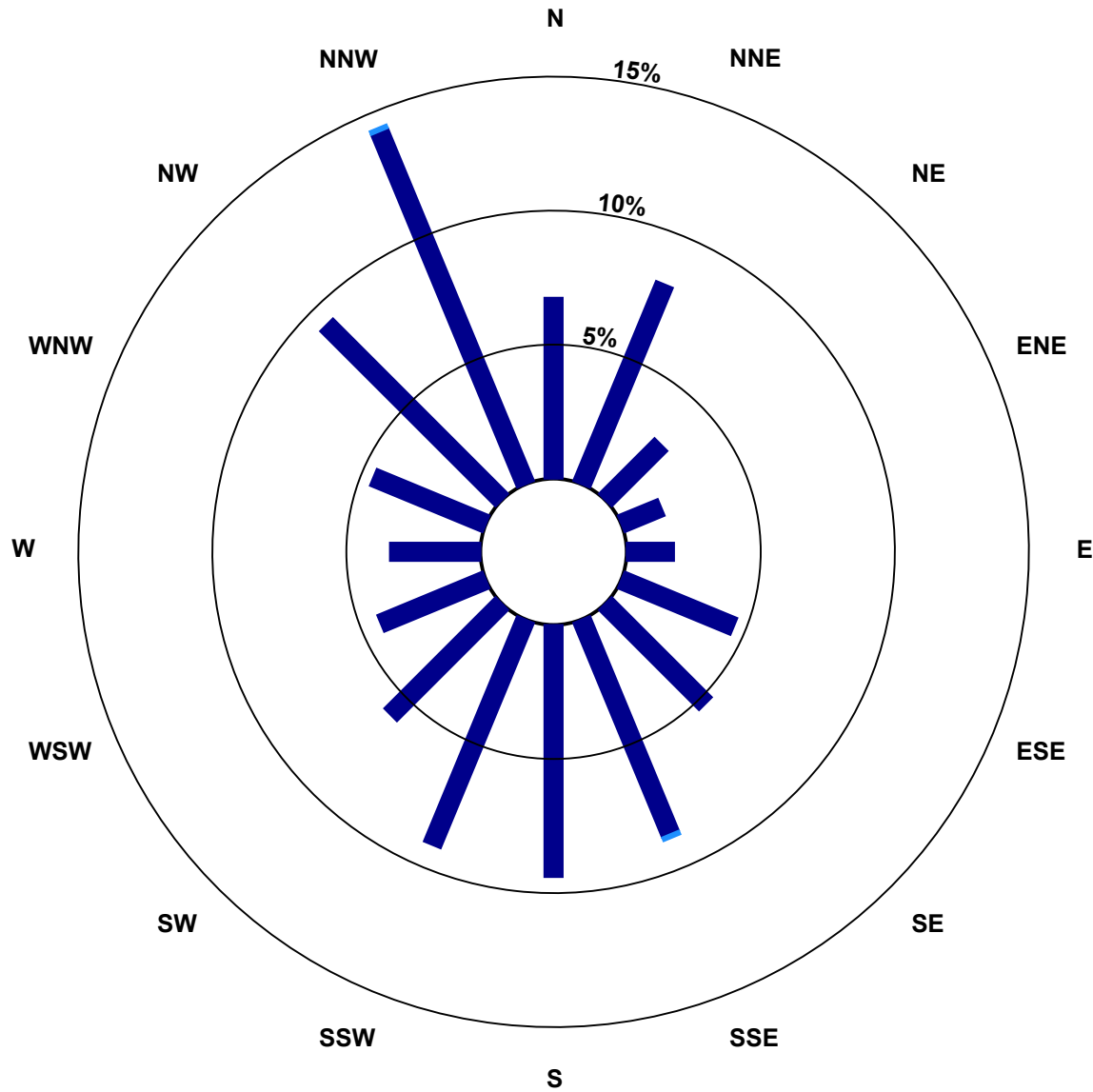
Total Number of Valid Hours: 681

Total Number of Hours: 720

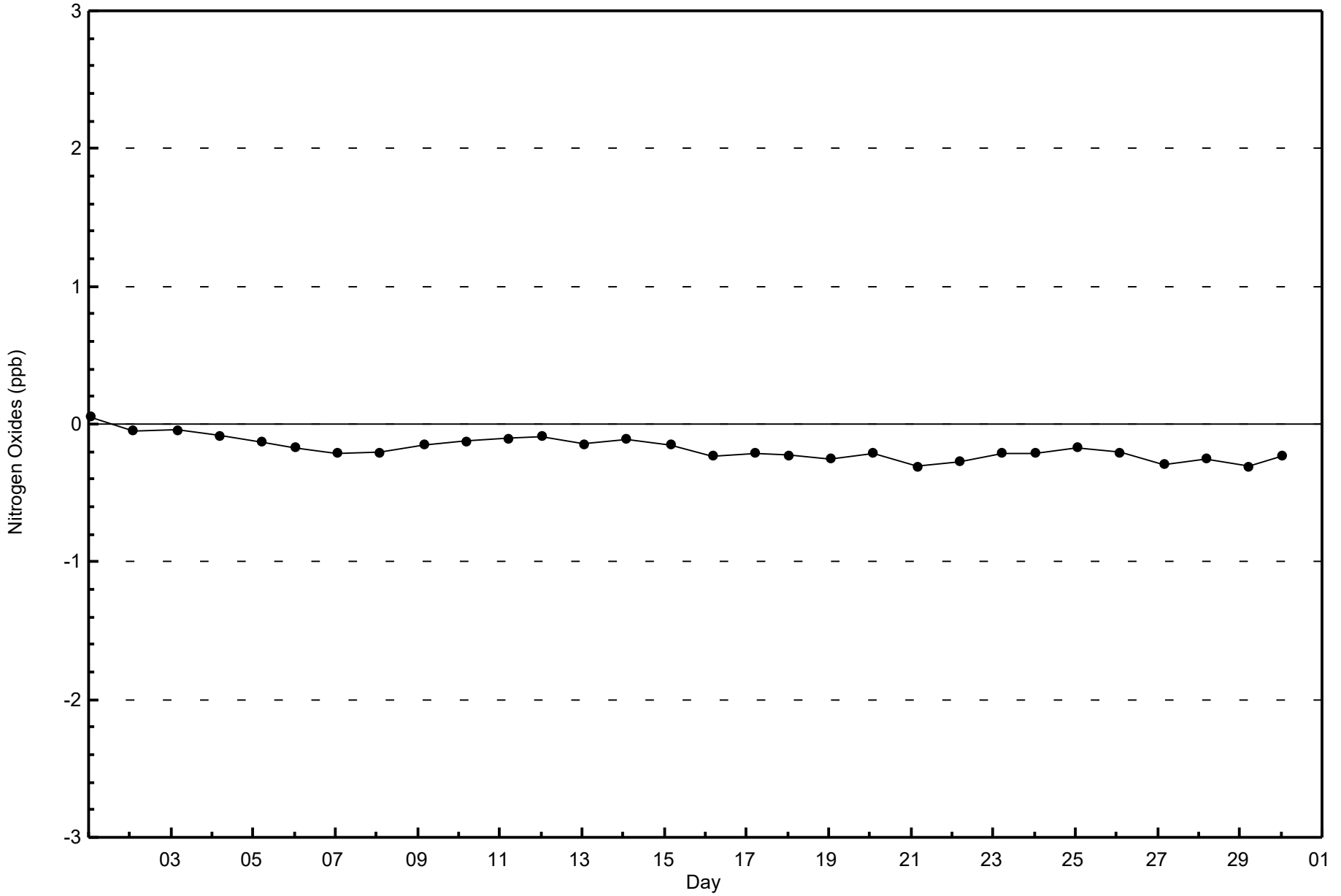


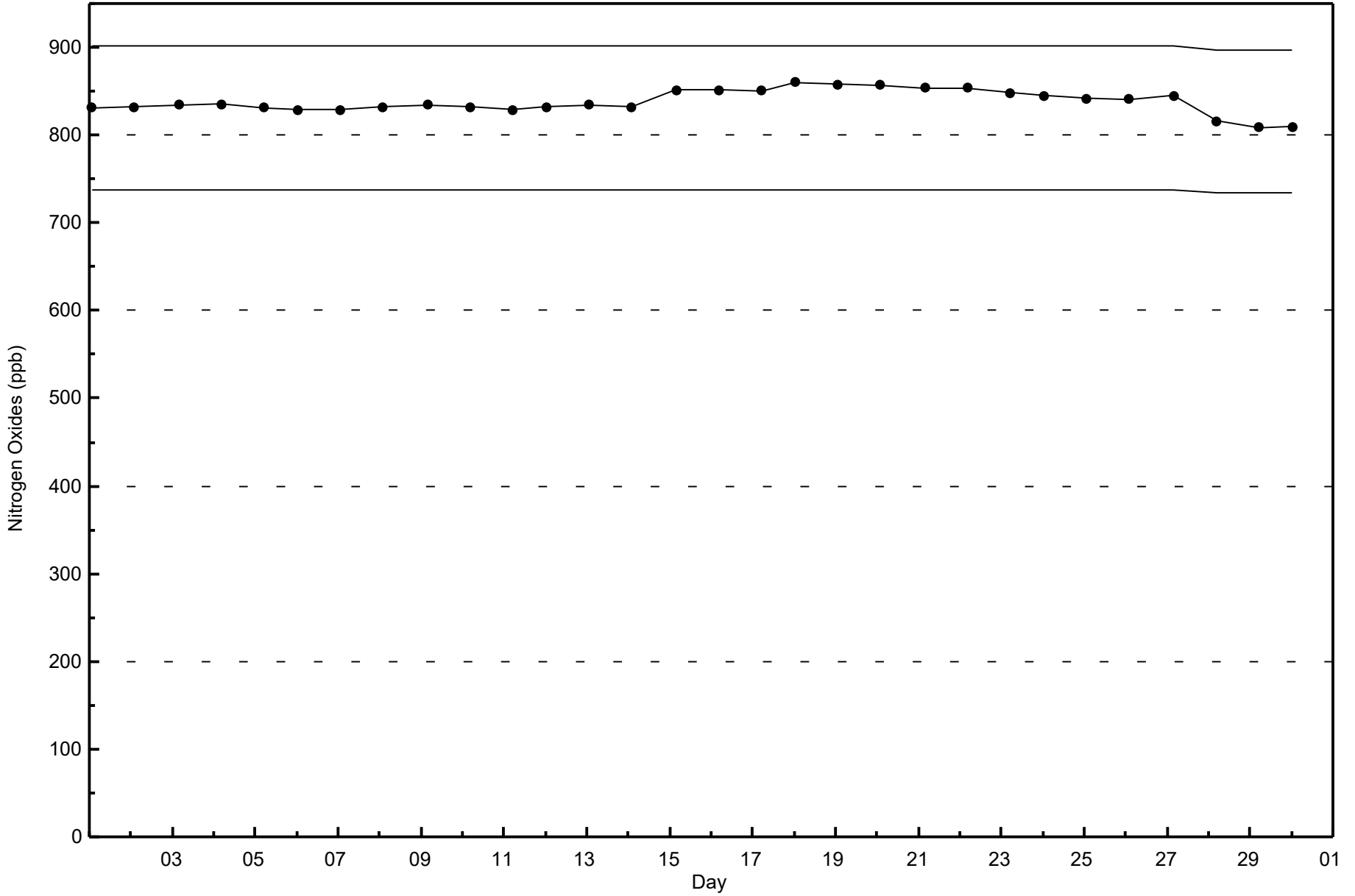
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Conklin



Total Number of Valid Hours: 681







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb Conklin - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 73.9 ppb on Jun 13 14:00	Maximum Daily Average: 50.5 ppb on Jun 10		Hours of Data:	686
Minimum Value: 1.8 ppb on Jun 22 04:00	Minimum Daily Average: 17.1 ppb on Jun 15		Hours of Missing Data:	34
Maximum Diurnal Average: 39.6 ppb at hour 15	Minimum Diurnal Average: 13.2 ppb at hour 4		Hours of Calibration:	34
Monthly Average: 27.63 ppb	Percentiles: P ₁ = 2.6 P ₁₀ = 8.1 Q ₁ = 16.9 Median = 27.3 Q ₃ = 38.2 P ₉₀ = 46.0 P ₉₉ = 66.0		Percent Operational Time:	100.0

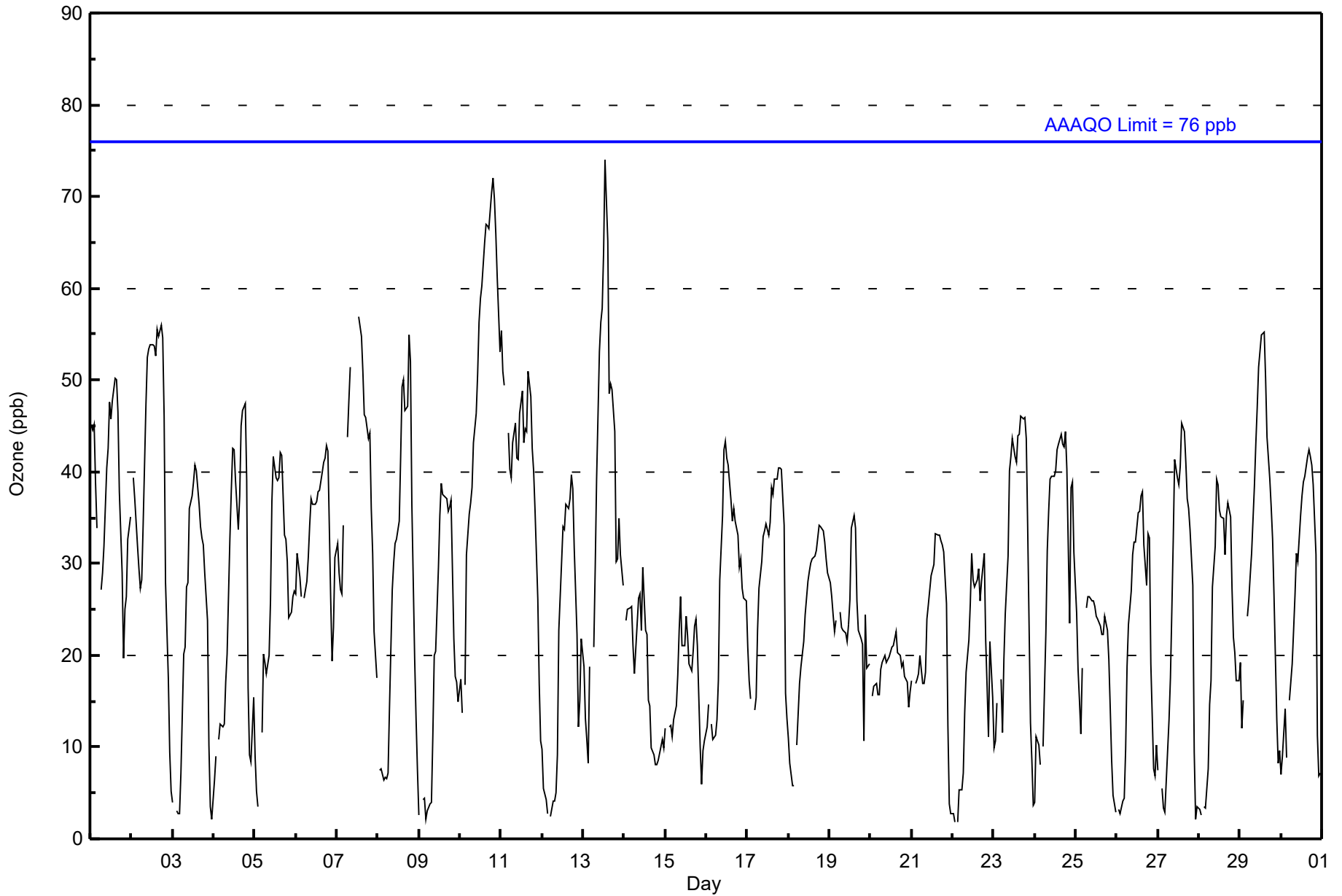
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	45.0	44.6	45.1	38.8	33.9	Z	27.1	29.0	31.9	40.5	42.5	47.6	45.7	47.8	50.2	50.0	46.5	37.8	28.9	19.7	25.1	26.4	32.6	35.2	37.9	50.2																							
2-Jun	Z	39.3	37.1	31.9	29.5	27.3	28.3	34.2	47.3	52.4	53.3	53.8	53.9	53.6	52.7	55.5	54.8	55.9	54.6	46.0	27.9	17.5	9.5	5.2	40.1	55.9																							
3-Jun	4.0	Z	3.0	2.8	2.8	7.1	20.2	20.9	27.5	27.9	36.0	37.4	39.0	40.7	40.2	36.5	34.0	32.9	32.0	28.9	23.7	10.2	3.5	2.2	22.3	40.7																							
4-Jun	6.4	9.0	Z	10.9	12.5	12.3	12.5	17.1	20.2	32.8	38.0	42.5	42.4	39.0	33.8	37.4	45.1	46.7	47.4	39.1	16.5	9.2	8.4	15.4	25.8	47.4																							
5-Jun	9.1	5.3	3.5	Z	11.7	20.1	19.2	18.0	20.0	25.9	36.8	41.6	39.4	39.1	39.4	42.1	41.8	33.1	32.6	30.2	24.1	24.8	26.4	27.0	26.6	42.1																							
6-Jun	26.6	31.1	28.5	26.3	Z	26.3	28.1	30.6	34.2	37.0	36.4	36.4	36.7	37.8	38.0	40.0	41.0	41.5	42.9	42.2	26.2	19.3	23.0	30.7	33.1	42.9																							
7-Jun	32.2	29.0	27.2	26.7	34.2	Z	43.9	47.7	51.4	C	C	C	C	56.9	54.7	51.0	46.2	45.9	43.6	44.2	36.0	31.2	22.5	17.6	39.1	56.9																							
8-Jun	Z	7.5	7.6	6.4	6.7	6.6	7.1	14.2	27.2	30.1	32.2	32.7	34.6	41.6	49.2	50.0	46.6	47.2	55.0	52.1	36.4	19.7	13.2	7.4	27.4	55.0																							
9-Jun	2.5	Z	4.2	4.4	2.2	3.0	3.9	3.9	11.3	19.9	20.4	29.6	35.2	38.8	37.5	37.2	37.1	35.6	36.2	37.0	21.8	17.7	17.0	15.0	20.5	38.8																							
10-Jun	17.4	13.7	Z	16.7	31.0	35.4	36.6	38.3	43.1	46.4	50.6	56.2	58.9	60.3	65.0	67.0	66.9	66.5	70.5	72.0	69.7	66.0	61.2	53.1	50.5	72.0																							
11-Jun	55.4	50.9	49.5	Z	44.2	40.3	39.3	43.1	45.3	41.4	41.3	46.4	48.8	43.2	44.7	44.4	50.9	48.1	42.6	40.1	35.9	26.1	16.9	10.6	41.3	55.4																							
12-Jun	9.7	5.4	4.2	2.8	Z	2.4	4.1	4.1	5.0	9.2	22.7	30.2	34.0	33.7	36.5	36.0	37.1	39.7	38.2	31.7	22.3	12.2	15.1	21.9	19.9	39.7																							
13-Jun	18.8	13.1	10.8	8.3	18.8	Z	20.9	29.4	39.1	53.0	56.3	57.9	63.9	73.9	65.1	48.5	49.6	49.0	44.3	30.3	30.4	35.0	31.0	27.6	38.0	73.9																							
14-Jun	Z	23.7	25.0	25.2	25.3	21.1	18.1	20.8	26.2	26.7	22.7	29.5	22.7	22.3	15.1	14.5	9.9	9.1	8.1	8.1	8.5	10.0	10.9	9.9	18.0	29.5																							
15-Jun	12.0	Z	12.3	12.4	11.1	12.9	14.5	17.8	22.7	26.4	21.0	21.0	24.2	22.2	19.1	18.3	20.4	23.2	24.0	21.0	10.1	5.9	9.6	10.6	17.1	26.4																							
16-Jun	12.2	14.6	Z	12.5	10.8	11.2	13.0	17.3	28.2	35.3	42.4	43.4	41.4	40.7	36.8	34.6	36.0	34.6	33.0	29.6	30.6	27.4	26.3	26.0	27.7	43.4																							
17-Jun	20.8	17.2	15.2	Z	14.0	15.4	22.7	27.3	30.3	32.9	33.5	34.4	33.2	34.4	38.2	37.5	39.3	39.2	40.5	40.4	40.2	34.2	15.9	13.0	29.1	40.5																							
18-Jun	11.0	8.2	5.8	5.9	Z	10.2	16.9	18.7	20.2	21.5	24.4	28.1	29.1	30.0	30.5	30.8	31.4	32.9	34.1	34.1	33.5	32.4	30.5	29.0	23.9	34.1																							
19-Jun	27.9	26.3	24.5	22.6	23.8	Z	24.7	23.1	22.8	22.3	21.6	23.3	26.0	33.9	35.2	33.8	25.9	22.7	21.8	21.2	10.7	24.4	18.7	19.1	24.2	35.2																							
20-Jun	Z	15.6	16.6	16.9	15.7	15.6	18.5	19.2	20.0	19.2	19.5	19.8	20.9	21.1	21.8	22.6	20.3	19.9	18.8	19.3	17.7	17.1	14.4	16.1	18.5	22.6																							
21-Jun	17.2	Z	17.0	17.4	18.0	19.9	16.9	16.9	18.2	24.0	25.5	28.6	29.3	29.9	33.3	33.1	33.1	32.5	32.0	31.2	25.6	12.4	3.8	2.8	22.5	33.3																							
22-Jun	2.7	1.9	Z	1.8	5.3	5.4	7.2	13.7	18.1	21.6	25.6	31.2	28.2	27.5	28.3	29.4	26.0	28.1	31.2	21.7	16.6	11.1	21.4	15.4	18.2	31.2																							
23-Jun	9.9	10.7	14.7	Z	17.3	11.6	19.5	24.5	30.8	40.1	41.6	43.7	41.6	41.1	44.0	44.0	46.0	45.7	45.9	43.6	34.0	12.6	8.6	3.6	29.4	46.0																							
24-Jun	4.0	11.1	10.2	8.1	Z	10.1	22.4	31.4	35.7	39.2	39.5	39.5	40.1	42.4	43.1	44.1	42.9	42.6	44.3	40.3	23.5	38.3	38.8	31.3	31.4	44.3																							
25-Jun	24.6	18.5	15.1	11.5	18.7	Z	25.2	26.4	26.4	25.9	26.0	25.3	24.3	23.9	23.2	22.3	22.2	24.2	22.8	19.5	14.1	8.5	4.7	2.9	19.8	26.4																							
26-Jun	Z	3.2	2.7	4.2	4.4	9.8	18.8	23.3	27.0	30.9	32.4	32.4	35.5	35.7	37.3	37.8	32.1	27.6	33.3	32.8	19.1	7.6	6.9	10.2	22.0	37.8																							
27-Jun	7.4	Z	5.5	3.4	2.9	6.3	13.0	17.5	24.9	32.5	41.3	39.4	38.5	40.6	45.3	44.4	41.0	37.1	36.0	33.8	27.7	9.4	2.1	3.5	24.1	45.3																							
28-Jun	3.2	2.6	Z	3.5	3.3	7.7	14.7	17.2	27.5	31.8	39.3	38.6	35.8	35.0	35.0	31.0	35.3	36.5	35.1	27.3	22.0	20.3	17.3	17.2	23.4	39.3																							
29-Jun	19.2	12.1	15.2	Z	24.3	26.1	28.7	31.2	38.5	43.0	47.1	51.5	54.8	55.1	55.2	50.2	43.8	39.1	36.2	32.7	26.5	13.0	8.2	9.7	33.1	55.2																							
30-Jun	7.0	9.1	14.2	8.9	Z	15.1	19.0	22.7	26.6	31.1	30.2	35.3	37.4	38.9	39.5	41.7	42.4	41.6	40.8	38.6	31.0	11.3	6.9	7.2	25.9	42.4																							
																								16.3	16.9	16.6	13.2	16.9	15.2	20.2	23.3	28.2	31.8	34.5	37.1	37.8	39.4	39.6	38.9	38.2	37.2	36.9	33.6	26.3	20.4	17.5	16.5	Diurnal Average	
																								55.4	50.9	49.5	38.8	44.2	40.3	43.9	47.7	51.4	53.0	56.3	57.9	63.9	73.9	65.1	67.0	66.9	66.5	70.5	72.0	69.7	66.0	61.2	53.1	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Conklin - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Conklin - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	237	34.55	34.55
21 - 50	406	59.18	93.73
51 - 82	43	6.27	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
Conklin - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	5	2	1	2	7	21	46	31	24	3	0	1	4	24	49	235
21 - 50	29	49	14	8	8	24	15	11	22	36	29	27	21	28	37	48	406
51 - 82	5	3	4	2	1	0	0	3	11	3	7	0	1	1	1	1	43
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	57	20	11	11	31	36	60	64	63	39	27	23	33	62	98	684

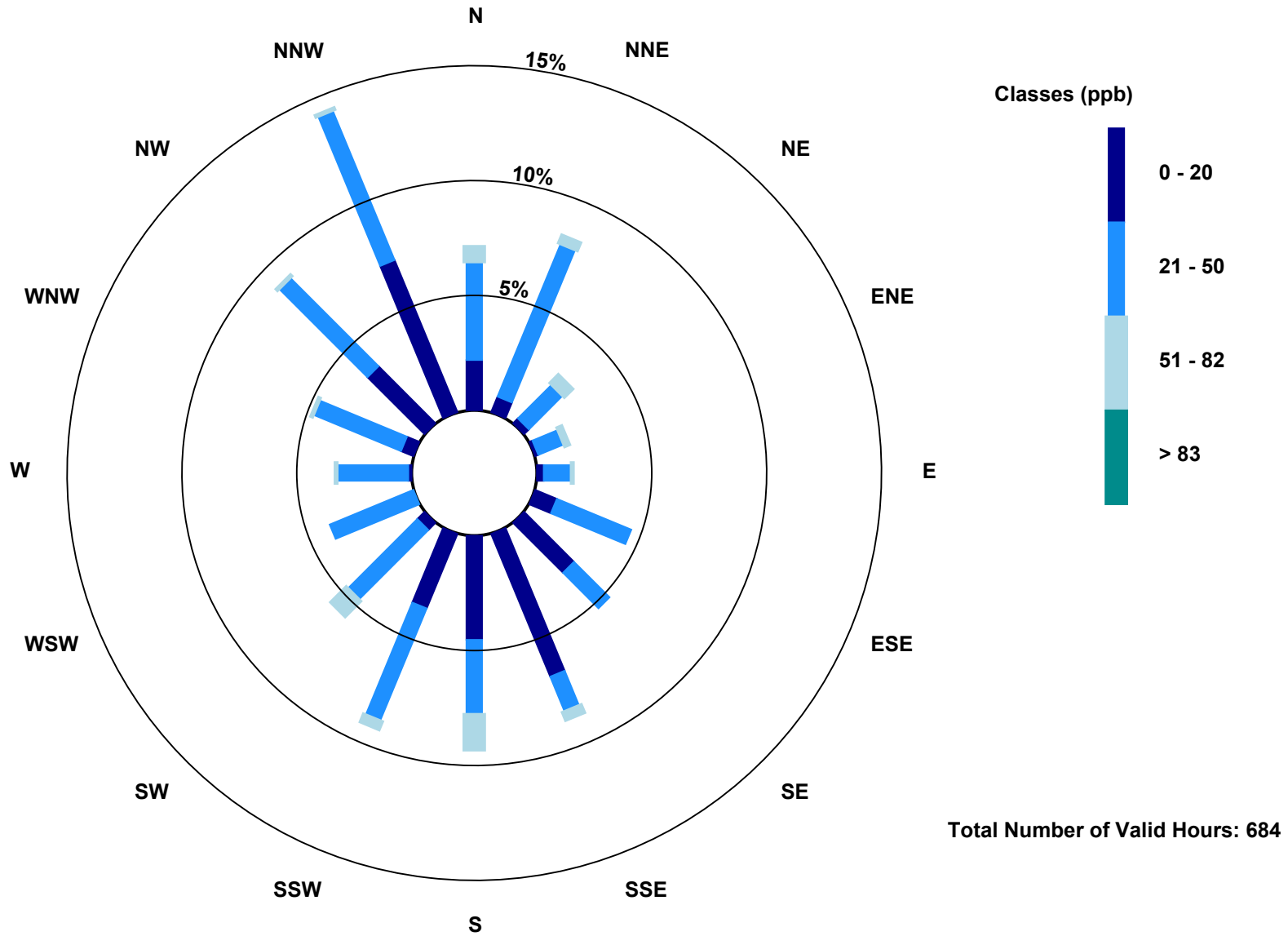
Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

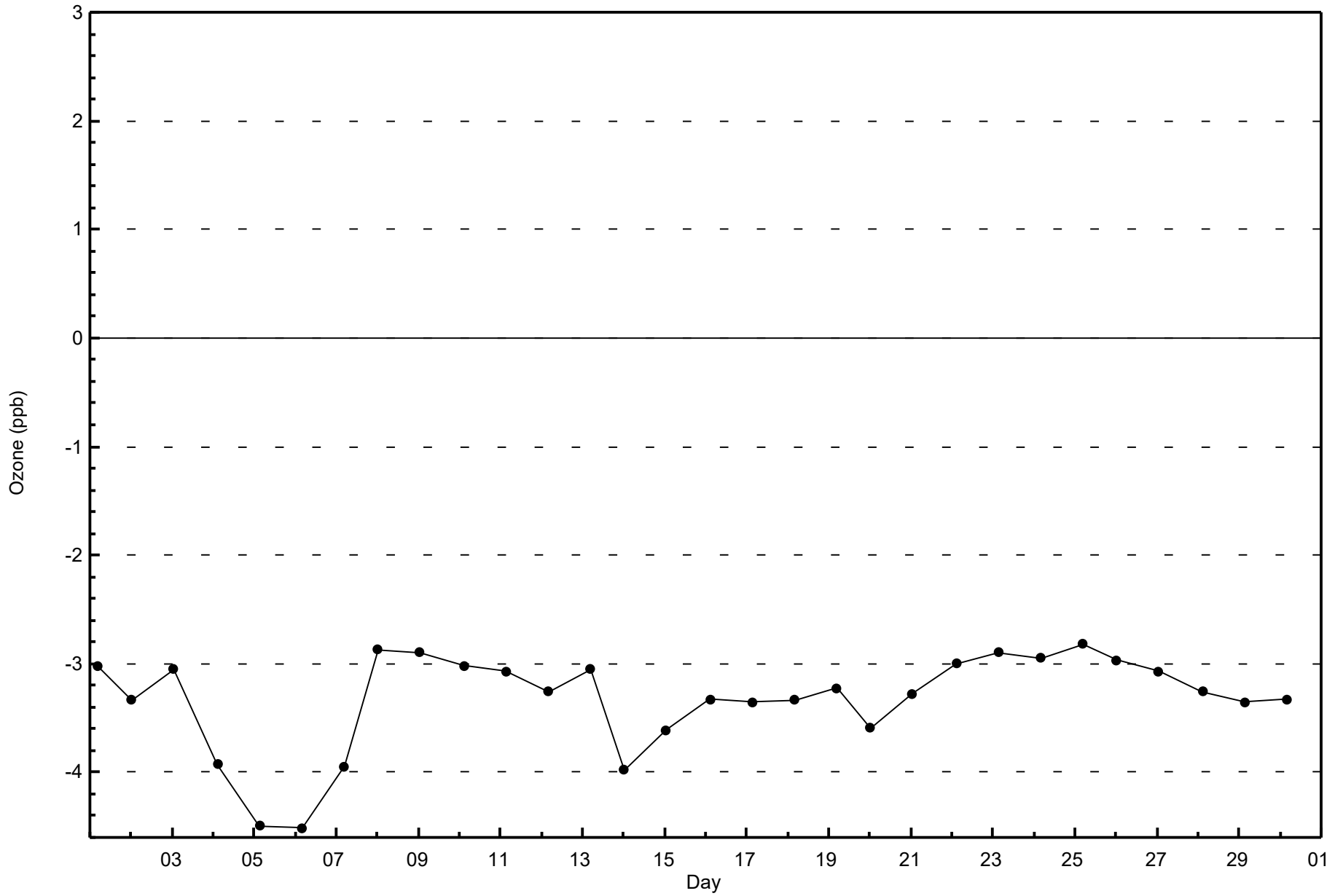
Ozone (O₃) - ppb
Conklin





Wood Buffalo Environmental Association
Zero Responses

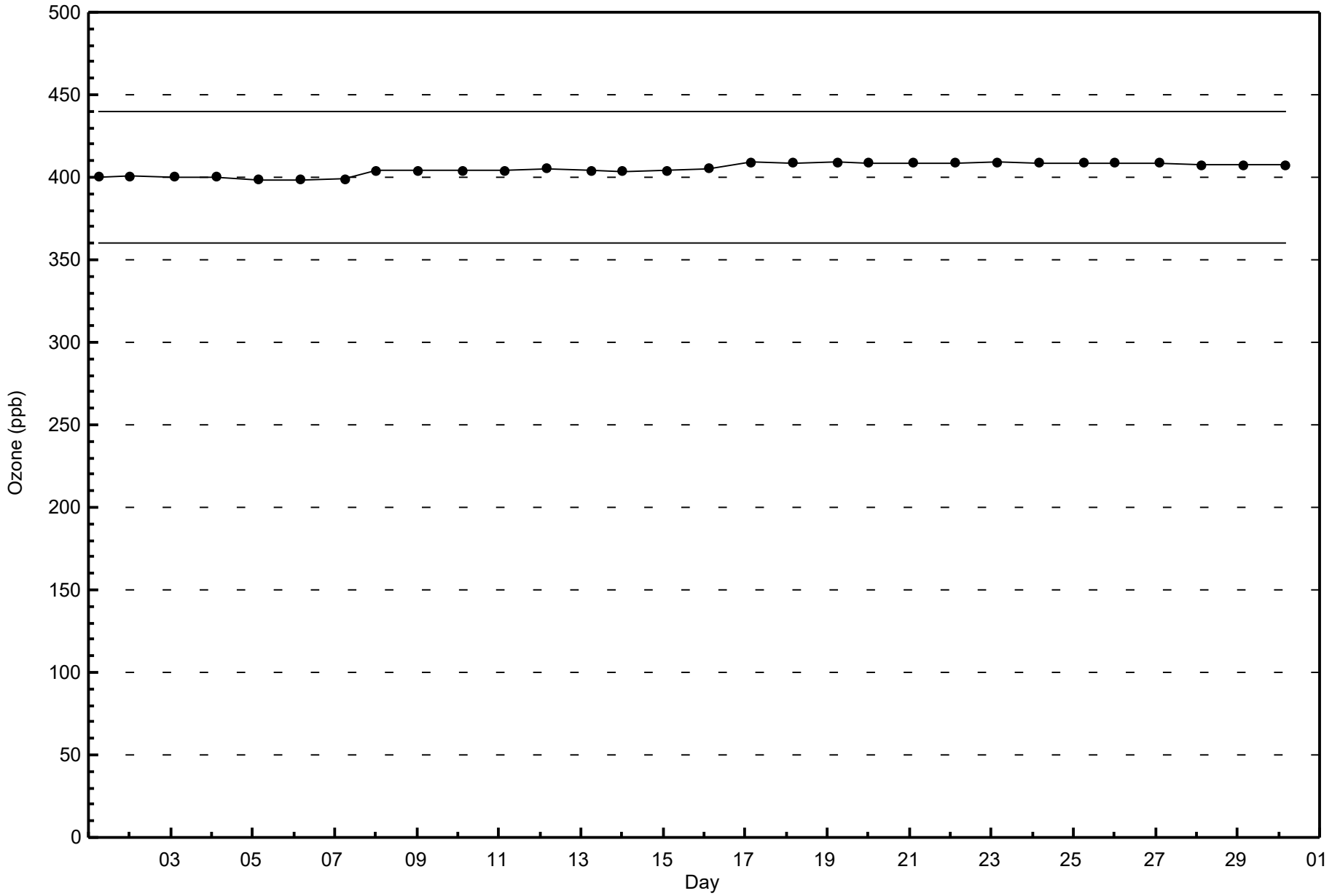
Ozone (O₃) - ppb
Conklin - June 2023





Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Conklin - June 2023





Summary of Hour Averages

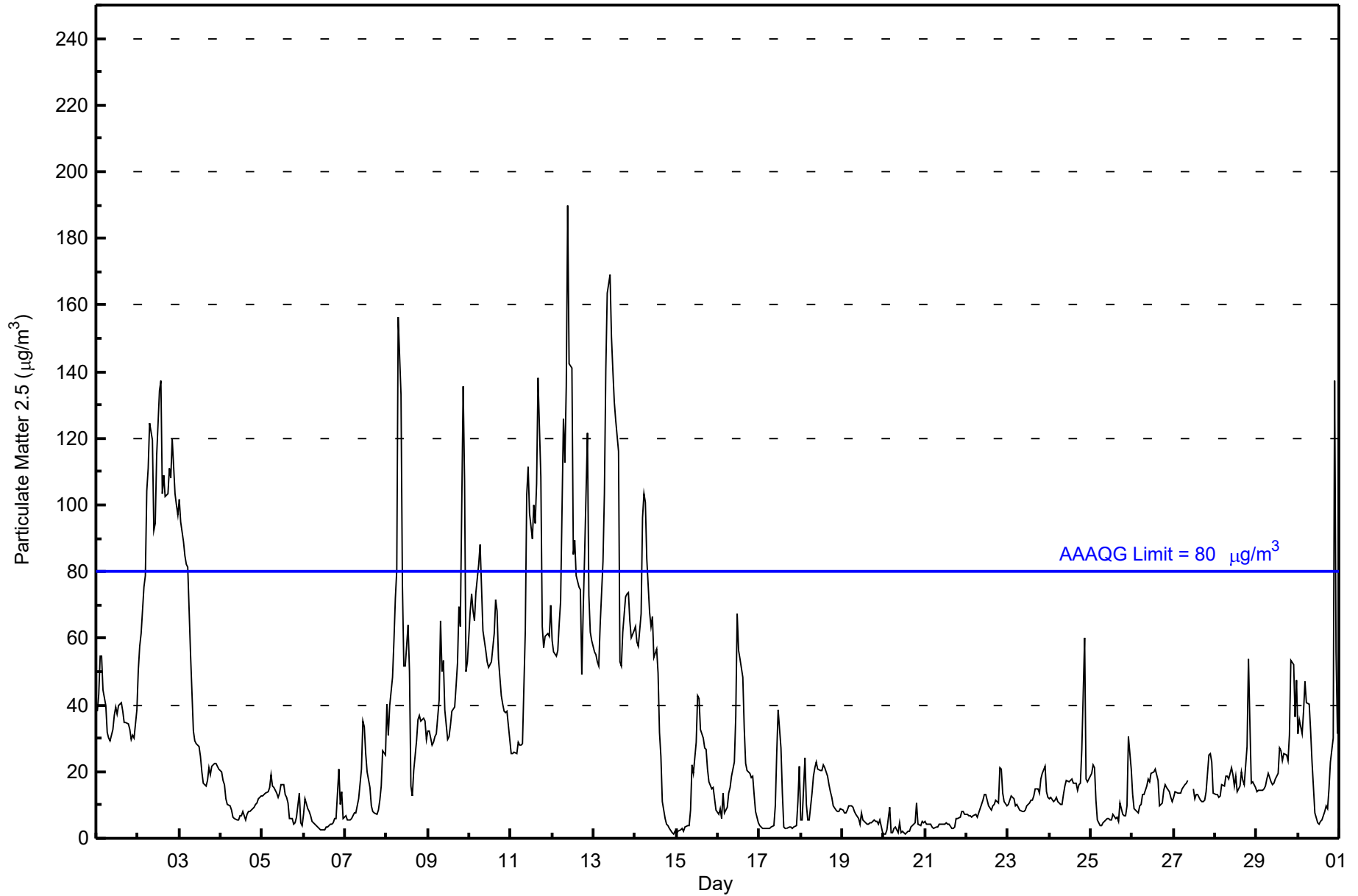
Conklin - June 2023

Number of Exceedences (AAAQO):	1-hr: 66	24-hr: 10	Hours in Service:	720
Maximum Value: 189.9 µg/m ³ on Jun 12 10:00	Maximum Daily Average: 100.6 µg/m ³ on Jun 2		Hours of Data:	718
Minimum Value: 1.1 µg/m ³ on Jun 20 01:00	Minimum Daily Average: 3.4 µg/m ³ on Jun 20		Hours of Missing Data:	2
Maximum Diurnal Average: 38.3 µg/m ³ at hour 10	Minimum Diurnal Average: 24.9 µg/m ³ at hour 24		Hours of Calibration:	2
Monthly Average: 29.95 µg/m ³	Percentiles: P ₁ = 1.7 P ₁₀ = 4.2 Q ₁ = 8.0 Median = 16.1 Q ₃ = 39.1 P ₉₀ = 74.8 P ₉₉ = 140.5		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-Jun	38.1	43.1	54.8	54.8	44.3	39.6	31.7	30.1	29.4	32.6	37.0	39.3	37.3	39.9	40.5	38.3	34.5	34.6	34.3	32.5	29.7	30.7	30.0	38.7	37.3	54.8																						
2-Jun	50.3	57.7	61.5	75.6	78.9	104.1	111.0	124.5	119.6	92.3	94.5	114.9	134.5	137.3	103.3	108.7	102.5	103.3	110.9	108.0	120.0	103.4	100.0	97.2	100.6	137.3																						
3-Jun	101.9	94.9	89.2	84.7	82.0	81.5	55.1	43.7	32.3	29.1	28.4	27.6	24.6	19.8	16.6	15.6	17.3	21.2	19.1	21.7	22.4	22.4	21.5	20.7	41.4	101.9																						
4-Jun	20.0	17.5	16.1	12.0	10.3	9.5	8.4	6.3	5.8	5.6	5.6	6.7	7.9	5.7	7.2	8.0	8.2	8.9	9.3	10.1	10.8	11.8	12.8	9.6	20.0																							
5-Jun	12.8	13.1	13.7	14.0	15.1	19.2	15.8	15.1	13.6	12.3	13.6	16.0	15.9	13.3	12.4	10.6	5.9	6.0	4.3	4.7	6.6	13.4	4.7	4.0	11.5	19.2																						
6-Jun	7.1	11.7	8.7	8.0	6.8	5.0	4.2	3.8	3.5	2.8	2.4	2.6	2.7	3.2	3.3	4.2	4.4	4.6	5.8	5.9	20.7	10.0	14.0	5.7	6.3	20.7																						
7-Jun	6.8	5.7	5.7	5.7	6.0	7.4	7.8	9.9	12.1	20.8	35.1	33.3	25.4	19.9	15.2	9.9	7.9	7.6	7.4	8.4	11.6	15.7	26.1	25.1	14.0	35.1																						
8-Jun	40.1	31.1	40.0	48.1	59.3	71.9	80.4	156.4	133.0	75.9	51.6	51.8	64.0	49.8	15.7	12.7	20.5	29.3	35.6	36.7	35.2	35.9	35.0	29.7	51.6	156.4																						
9-Jun	32.2	32.3	28.0	28.7	30.3	31.5	41.4	65.4	50.0	53.4	38.4	29.6	30.5	33.8	38.0	39.3	45.9	52.6	69.5	63.6	135.5	107.3	50.2	53.2	49.2	135.5																						
10-Jun	68.1	73.2	68.3	65.3	73.9	82.2	87.9	75.3	62.3	56.5	52.8	51.1	52.2	53.0	61.6	71.7	68.3	53.9	42.8	40.4	38.2	37.6	38.0	29.6	58.5	87.9																						
11-Jun	25.4	25.3	25.7	25.4	28.9	27.9	27.9	28.3	62.1	103.1	111.4	97.5	89.9	100.2	94.5	106.3	138.0	108.6	63.4	57.4	60.7	61.4	60.7	69.8	66.7	138.0																						
12-Jun	59.5	55.8	54.7	56.2	64.4	71.0	125.9	112.5	135.6	189.9	142.6	141.0	85.0	89.2	78.6	75.5	74.6	49.2	68.5	85.2	121.4	73.0	61.8	59.2	88.8	189.9																						
13-Jun	55.7	55.2	53.0	51.5	64.2	83.2	103.4	140.5	163.7	169.2	150.5	140.2	131.1	125.4	116.0	53.1	51.6	61.7	72.6	73.5	73.9	65.2	60.4	62.3	90.7	169.2																						
14-Jun	63.8	59.0	57.6	67.6	96.4	103.5	100.8	83.9	67.8	63.5	66.7	54.0	56.6	49.6	31.8	24.7	11.2	6.1	4.3	3.8	3.0	1.9	1.1	2.0	45.0	103.5																						
15-Jun	1.3	2.0	2.6	2.9	2.2	3.2	3.9	3.7	8.3	22.2	19.5	28.8	43.0	41.9	32.7	29.9	27.3	26.7	20.9	17.0	14.9	15.2	12.0	8.3	16.3	43.0																						
16-Jun	7.0	8.9	6.1	13.6	7.8	9.4	13.5	15.2	18.7	23.0	36.4	67.4	56.5	54.0	48.3	33.2	22.5	20.5	19.6	18.1	18.5	13.1	8.0	4.8	22.7	67.4																						
17-Jun	3.9	3.4	3.0	3.1	2.9	3.1	3.0	3.2	3.8	9.8	25.5	38.7	27.3	13.4	3.2	3.1	3.0	3.4	3.4	3.0	3.2	3.7	11.2	21.5	8.5	38.7																						
18-Jun	5.5	5.3	24.1	10.2	5.3	5.7	13.5	18.6	21.1	22.8	20.7	20.2	20.4	21.9	21.2	18.6	16.0	14.0	12.1	9.7	8.4	8.0	8.0	8.7	14.2	24.1																						
19-Jun	8.5	7.7	7.8	8.3	9.9	9.8	9.4	8.1	7.3	5.8	4.4	7.6	5.4	5.0	4.2	4.4	4.5	4.6	5.6	4.9	5.2	4.2	5.6	1.9	6.3	9.9																						
20-Jun	1.1	1.3	2.4	9.4	1.8	1.7	2.8	3.6	1.7	4.8	1.7	2.2	1.2	1.6	1.9	2.2	3.5	4.4	4.5	10.4	4.1	3.8	5.3	4.5	3.4	10.4																						
21-Jun	5.1	4.4	4.1	4.1	3.6	3.1	3.3	3.5	4.3	4.3	4.3	4.2	4.5	4.3	4.3	3.1	2.9	3.3	5.8	5.7	6.5	8.1	8.0	7.3	4.7	8.1																						
22-Jun	7.1	6.8	6.8	6.5	6.7	7.3	6.4	7.7	8.7	11.3	13.3	13.0	11.2	9.6	8.3	9.6	10.2	11.3	10.5	21.2	20.7	13.6	11.1	9.6	10.4	21.2																						
23-Jun	10.2	11.6	12.8	12.0	9.6	10.0	9.2	8.7	7.9	8.0	8.5	9.8	10.8	11.3	11.3	12.5	14.7	14.8	13.6	17.8	19.5	21.6	14.0	12.3	12.2	21.6																						
24-Jun	12.1	12.1	11.1	11.3	12.5	10.9	10.2	10.2	12.9	15.8	17.4	17.0	17.4	17.9	16.5	16.5	14.5	16.2	16.4	26.5	60.2	17.9	16.7	17.6	17.0	60.2																						
25-Jun	19.6	22.0	21.3	11.5	5.4	3.8	4.0	4.5	5.1	6.0	6.0	5.5	5.6	7.4	6.0	6.2	5.1	10.4	7.4	6.6	6.6	9.9	30.3	20.7	9.9	30.3																						
26-Jun	13.1	8.8	8.3	7.6	9.8	10.0	13.1	13.2	15.9	17.8	17.0	19.7	19.7	20.6	19.1	17.3	9.7	10.7	14.6	16.2	15.4	13.9	12.1	11.1	13.9	20.6																						
27-Jun	12.4	13.8	13.6	13.6	13.4	14.7	16.2	16.4	17.4	C	C	15.0	12.0	13.1	13.1	11.3	10.9	11.1	11.3	13.8	25.0	25.6	23.0	13.6	15.0	25.6																						
28-Jun	13.3	13.2	12.2	12.7	16.1	15.8	18.4	18.7	17.6	21.2	19.1	15.5	18.5	13.9	15.8	19.8	17.3	15.9	27.6	54.0	34.7	16.4	16.8	15.4	19.2	54.0																						
29-Jun	13.9	14.5	14.3	14.2	14.7	15.8	17.7	19.6	16.9	16.0	16.4	17.7	19.5	27.0	26.2	23.4	25.3	24.8	23.3	31.0	53.4	52.1	36.4	47.6	24.2	53.4																						
30-Jun	31.5	35.5	31.2	38.3	47.1	40.5	40.1	32.3	22.7	15.3	7.5	4.7	4.2	5.2	5.5	8.2	9.6	8.9	14.9	23.0	30.1	137.3	56.0	31.3	28.4	137.3																						
																								24.9	24.9	25.3	25.9	27.7	30.1	32.9	36.1	36.0	38.3	36.2	36.4	34.4	33.7	29.0	26.6	26.2	24.9	25.3	27.7	33.8	31.8	26.3	24.9	Diurnal Average
																								101.9	94.9	89.2	84.7	96.4	104.1	125.9	156.4	163.7	189.9	150.5	141.0	134.5	137.3	116.0	108.7	138.0	108.6	110.9	108.0	135.5	137.3	100.0	97.2	Diurnal Maximum

C - Calibration

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	113	15.74	15.74
6 - 15	230	32.03	47.77
16 - 25	118	16.43	64.21
26 - 80	192	26.74	90.95
> 81.0	65	9.05	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
Conklin - June 2023

Concentration Ranges (μg/m³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	6	4	0	0	0	0	0	3	3	5	5	9	8	13	17	40	113
6 - 15	6	31	7	3	3	10	16	26	28	31	13	7	5	10	18	16	230
16 - 25	14	10	1	3	2	2	5	4	12	13	18	8	6	1	8	10	117
26 - 80	15	11	6	2	6	18	10	29	24	13	6	6	3	3	15	25	192
> 81.0	8	3	6	4	1	1	7	5	2	2	0	0	1	6	7	11	64
Totals	49	59	20	12	12	31	38	67	69	64	42	30	23	33	65	102	716

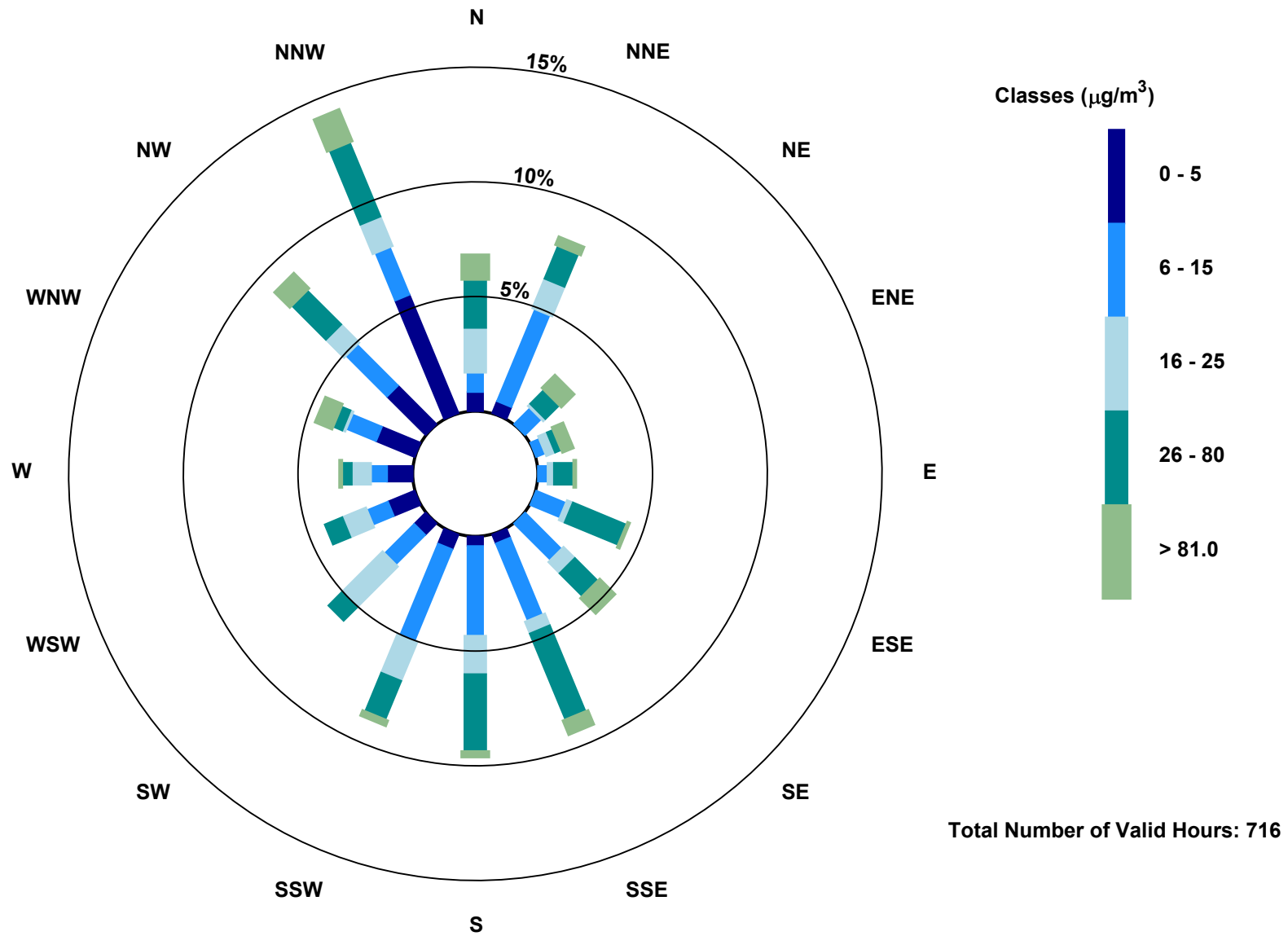
Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

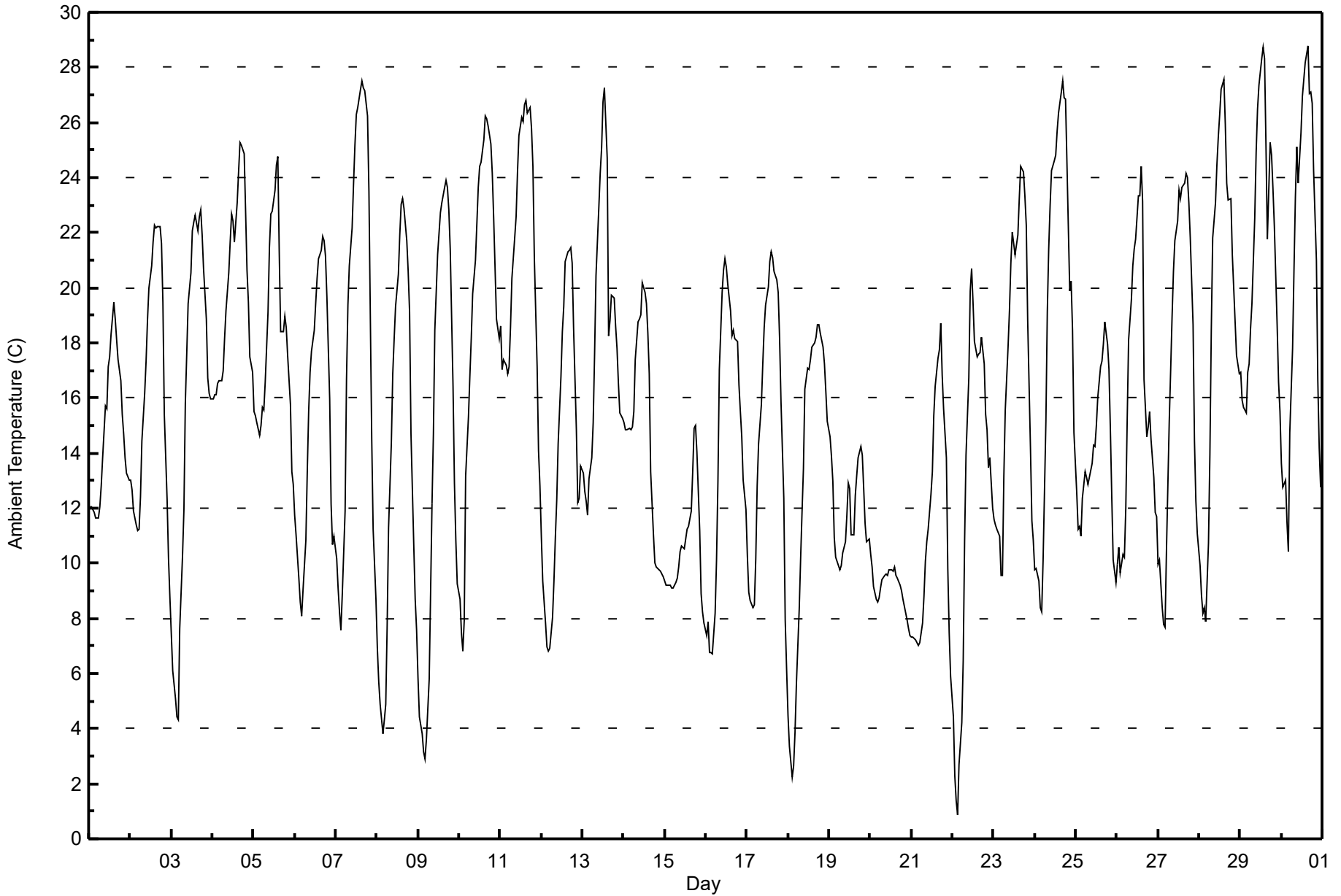




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Conklin - June 2023

Maximum Value: 28.8 C on Jun 30 16:00 Minimum Value: 0.9 C on Jun 22 04:00 Maximum Diurnal Average: 21.5 C at hour 15 Monthly Average: 15.91 C		Maximum Daily Average: 21.5 C on Jun 29 Minimum Daily Average: 9.1 C on Jun 20 Minimum Diurnal Average: 9.3 C at hour 4 Percentiles: P ₁ = 3.2 P ₁₀ = 8.3 Q ₁ = 10.9 Median = 15.9 Q ₃ = 20.7 P ₉₀ = 24.2 P ₉₉ = 27.5		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 Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	12.1	12.1	11.9	11.9	11.7	11.7	12.0	12.8	13.8	15.7	15.6	17.1	17.5	18.3	19.5	18.9	18.1	17.4	16.6	15.4	14.7	13.8	13.3	13.0	14.8	19.5																						
2-Jun	13.0	12.7	11.9	11.4	11.2	11.2	12.4	14.4	16.1	17.3	18.8	20.0	20.8	21.6	22.3	22.2	22.2	22.2	21.6	19.5	15.4	12.3	10.2	8.7	16.2	22.3																						
3-Jun	7.4	6.1	5.1	4.4	4.3	7.6	10.3	12.0	15.8	17.6	19.4	20.5	22.1	22.4	22.6	22.1	22.6	22.8	21.9	20.7	18.9	16.7	16.2	15.9	15.6	22.8																						
4-Jun	16.0	16.1	16.1	16.5	16.6	16.6	17.0	18.2	19.1	20.5	21.7	22.7	22.4	21.7	23.1	24.2	25.3	25.2	24.9	22.8	20.7	19.5	17.5	16.9	20.1	25.3																						
5-Jun	15.5	15.4	15.1	14.6	15.0	15.7	15.6	16.6	19.1	21.5	22.7	22.8	23.6	24.5	24.7	21.3	18.4	18.4	19.0	18.6	17.5	15.8	13.3	12.9	18.2	24.7																						
6-Jun	11.8	11.0	9.5	8.6	8.1	9.1	10.8	13.3	15.5	16.9	17.7	18.4	19.4	20.3	21.1	21.3	21.9	21.7	21.1	19.7	16.0	12.2	10.7	11.0	15.3	21.9																						
7-Jun	10.2	9.1	8.2	7.6	8.9	11.9	16.7	19.4	20.8	22.2	23.8	25.2	26.3	26.5	27.2	27.5	27.3	27.1	26.3	23.5	18.9	14.5	11.2	8.7	18.7	27.5																						
8-Jun	6.9	5.7	4.9	3.8	4.3	4.9	7.7	11.3	14.4	16.9	18.1	19.3	20.5	21.9	23.0	23.2	22.9	21.7	20.6	19.1	14.7	10.6	8.7	7.6	13.9	23.2																						
9-Jun	5.8	4.4	3.8	3.2	2.9	3.6	5.8	8.9	12.1	14.7	18.4	21.2	22.0	22.8	23.1	23.6	23.9	23.7	22.8	21.4	16.4	12.9	10.8	9.2	14.1	23.9																						
10-Jun	8.7	7.5	6.8	8.0	13.2	15.3	16.8	18.2	19.8	21.0	22.3	23.7	24.4	24.5	25.4	26.3	26.1	25.9	25.2	24.2	22.5	20.7	18.9	18.2	19.3	26.3																						
11-Jun	18.6	17.0	17.4	17.2	16.9	17.1	18.6	20.4	21.8	22.6	24.2	25.5	26.2	26.0	26.7	26.8	26.3	26.5	25.8	24.4	21.1	17.2	14.1	12.8	21.3	26.8																						
12-Jun	11.0	9.4	7.8	7.0	6.8	6.9	8.0	9.4	10.9	12.3	14.3	16.8	18.4	19.3	20.9	21.3	21.3	21.4	20.9	18.6	14.8	12.2	12.3	13.5	14.0	21.4																						
13-Jun	13.3	12.6	12.2	11.8	13.0	13.8	15.1	17.6	20.4	22.9	24.1	25.1	26.8	27.2	24.7	18.3	18.8	19.7	19.6	18.6	17.8	16.5	15.5	15.3	18.4	27.2																						
14-Jun	15.1	14.9	14.9	14.9	14.8	14.9	15.5	17.4	18.7	18.9	19.0	20.2	19.8	19.4	18.4	16.9	13.3	11.0	10.0	9.8	9.8	9.7	9.6	9.5	14.9	20.2																						
15-Jun	9.4	9.2	9.2	9.2	9.1	9.1	9.3	9.5	9.9	10.4	10.6	10.5	10.9	11.3	11.4	11.9	13.3	14.9	15.0	14.0	11.2	8.9	8.2	7.8	10.6	15.0																						
16-Jun	7.4	7.9	6.7	6.7	6.7	8.2	10.1	12.9	17.0	19.8	20.7	21.1	20.8	20.1	19.2	18.3	18.4	18.2	18.1	16.5	15.5	14.6	13.0	12.0	14.6	21.1																						
17-Jun	10.3	8.9	8.6	8.4	8.5	10.2	12.8	14.3	15.8	17.3	18.6	19.4	20.0	20.9	21.3	21.1	20.6	20.3	19.8	18.2	15.9	12.3	7.9	6.1	14.9	21.3																						
18-Jun	4.5	3.4	2.2	2.6	3.9	5.7	8.4	10.2	11.9	13.4	16.3	17.1	17.0	17.4	17.9	18.0	18.2	18.7	18.7	18.4	17.8	17.2	16.2	15.1	12.9	18.7																						
19-Jun	14.6	13.9	13.0	10.9	10.2	9.9	9.8	9.9	10.4	10.8	11.8	12.9	12.7	11.0	11.1	12.5	13.2	13.8	14.3	13.9	12.7	11.5	10.8	10.9	11.9	14.6																						
20-Jun	10.3	9.9	9.2	8.7	8.6	8.7	9.1	9.4	9.6	9.6	9.6	9.8	9.8	9.7	9.9	9.6	9.5	9.2	9.0	8.7	8.4	8.0	7.6	7.4	9.1	10.3																						
21-Jun	7.3	7.3	7.2	7.1	7.0	7.1	7.8	8.8	10.0	10.8	11.2	12.5	13.3	15.4	16.4	17.5	17.8	18.7	16.8	15.6	13.8	9.8	7.5	5.9	11.4	18.7																						
22-Jun	4.4	2.3	1.4	0.9	2.7	4.2	6.5	10.8	13.9	16.7	19.9	20.7	19.5	18.1	17.5	17.6	17.7	18.2	17.2	15.4	14.9	13.5	13.8	12.0	12.5	20.7																						
23-Jun	11.6	11.4	11.3	11.0	9.6	9.6	13.2	15.5	17.9	19.2	20.9	22.0	21.2	21.6	21.9	23.2	24.4	24.2	23.3	22.3	18.8	14.1	11.6	10.8	17.1	24.4																						
24-Jun	9.7	9.8	9.4	8.4	8.2	10.1	15.1	19.1	21.4	23.0	24.3	24.6	24.8	25.7	26.3	27.1	27.5	26.9	26.9	24.5	19.9	20.2	18.5	14.7	19.4	27.5																						
25-Jun	12.6	11.3	11.3	11.0	12.4	13.3	13.1	12.8	13.1	13.6	14.3	14.2	15.0	16.0	17.1	17.3	18.0	18.7	18.0	17.0	14.8	12.4	10.1	9.3	14.0	18.7																						
26-Jun	10.0	10.6	9.6	10.3	10.2	12.0	15.2	18.1	19.6	20.8	21.4	21.8	23.4	23.4	24.4	23.1	16.7	14.6	15.0	15.5	14.5	13.1	11.8	11.7	16.1	24.4																						
27-Jun	10.0	10.1	8.4	7.8	7.7	10.4	15.2	17.0	18.9	20.6	21.7	22.4	23.5	23.3	23.7	23.8	24.2	24.0	23.1	21.8	18.7	14.4	12.3	11.1	17.2	24.2																						
28-Jun	9.9	8.9	8.2	8.4	7.9	10.7	14.0	18.5	21.8	23.1	24.5	25.5	26.3	27.2	27.6	25.9	23.8	23.2	23.3	21.2	20.0	18.8	17.5	16.9	18.9	27.6																						
29-Jun	16.9	15.9	15.7	15.5	16.9	17.2	18.5	19.4	22.5	24.9	26.5	27.4	28.3	28.7	28.3	25.2	21.8	25.3	24.8	23.6	22.2	18.6	16.6	15.5	21.5	28.7																						
30-Jun	13.6	12.7	13.0	11.5	10.4	14.8	17.8	20.6	23.3	25.1	23.8	25.6	26.9	27.6	28.2	28.8	27.0	27.1	26.7	24.2	21.0	16.6	14.2	12.8	20.6	28.8																						
																								10.9	10.2	9.7	9.3	9.6	10.7	12.6	14.6	16.5	18.0	19.2	20.2	20.8	21.1	21.5	21.2	20.7	20.7	20.2	18.9	16.6	14.3	12.7	11.8	Diurnal Average
																								18.6	17.0	17.4	17.2	16.9	17.2	18.6	20.6	23.3	25.1	26.5	27.4	28.3	28.7	28.3	28.8	27.5	27.1	26.9	24.5	22.5	20.7	18.9	18.2	Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Conklin - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	144	20.00	20.00
10 - 20	376	52.22	72.22
> 20	200	27.78	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

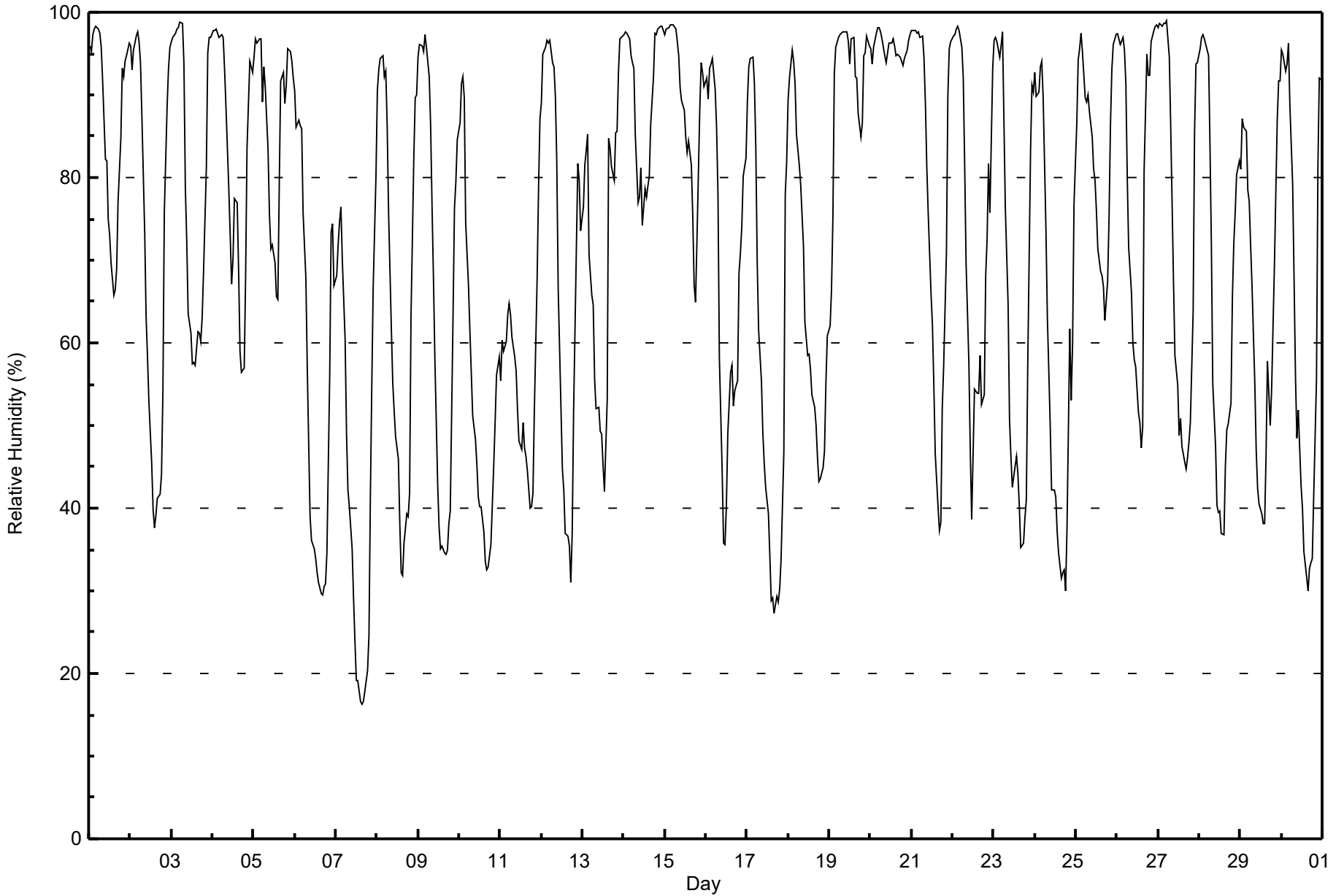
Relative Humidity (RH) - %
Conklin - June 2023

Maximum Value: 98.9 % on Jun 27 06:00 Maximum Daily Average: 95.7 % on Jun 20 Minimum Value: 16.3 % on Jun 7 16:00 Minimum Daily Average: 43.1 % on Jun 7 Maximum Diurnal Average: 93.1 % at hour 4 Minimum Diurnal Average: 51.3 % at hour 15 Monthly Average: 71.55 % Percentiles: P ₁ = 24.1 P ₁₀ = 38.1 Q ₁ = 51.8 Median = 76.4 Q ₃ = 93.8 P ₉₀ = 97.0 P ₉₉ = 98.5																						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 Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jun	95.9	95.2	97.3	98.0	98.3	97.9	97.5	95.8	91.7	82.2	82.0	74.9	73.0	69.7	65.8	66.5	69.0	77.2	84.7	93.2	92.2	94.0	94.8	96.2	86.8	98.3																					
2-Jun	96.0	93.0	95.5	97.2	97.6	96.5	93.9	87.5	73.4	63.3	58.2	52.9	45.4	39.9	37.6	39.1	41.2	41.8	44.1	54.3	75.7	88.6	93.2	95.7	70.9	97.6																					
3-Jun	96.4	96.9	97.5	97.9	98.1	98.8	98.7	93.7	78.8	72.3	63.6	61.2	57.5	57.6	57.2	61.3	61.2	60.2	63.0	68.7	81.1	95.1	97.0	96.9	79.6	98.8																					
4-Jun	97.8	97.8	98.0	97.4	97.0	97.3	96.9	93.1	88.5	78.7	73.1	67.1	70.2	77.4	77.0	68.9	59.0	56.4	56.9	67.9	83.6	88.8	94.0	92.7	82.3	98.0																					
5-Jun	94.6	96.8	96.3	96.8	96.7	89.2	93.4	91.0	83.4	75.5	71.4	71.9	69.7	65.7	65.3	79.0	91.6	92.7	89.0	91.1	95.6	95.3	94.1	92.1	86.6	96.8																					
6-Jun	90.5	86.1	86.9	86.4	85.9	75.8	67.8	57.0	47.9	39.0	36.0	35.1	33.9	32.3	31.0	29.7	29.6	30.5	30.9	34.6	56.1	73.4	74.4	66.9	54.9	90.5																					
7-Jun	68.1	71.9	74.6	76.5	69.9	60.3	48.9	42.3	40.1	35.1	29.1	24.0	19.2	19.1	16.6	16.3	16.7	17.8	20.3	24.6	41.2	54.6	66.6	80.2	43.1	80.2																					
8-Jun	90.5	93.0	94.5	94.7	92.1	92.8	86.3	75.7	61.5	55.2	51.6	48.6	46.0	38.1	32.2	31.9	35.7	39.4	39.0	41.8	63.2	82.3	89.6	90.0	65.2	94.7																					
9-Jun	94.6	96.0	96.0	95.3	97.4	95.8	92.2	86.2	76.6	68.0	58.3	43.1	37.9	35.1	35.5	34.6	34.4	35.0	38.1	39.7	63.4	76.3	79.5	84.7	66.4	97.4																					
10-Jun	86.5	91.3	92.2	89.7	74.6	67.0	61.5	56.5	51.2	48.3	45.3	41.4	40.2	40.2	37.1	33.6	32.6	32.9	35.5	40.3	45.1	50.3	56.0	58.4	54.5	92.2																					
11-Jun	55.4	60.4	58.9	60.2	63.4	64.7	63.3	60.8	58.3	56.7	51.9	48.1	47.1	50.4	47.2	46.2	44.6	40.0	40.3	41.9	51.9	68.0	78.8	87.1	56.1	87.1																					
12-Jun	88.9	94.9	95.8	96.6	96.2	96.6	93.9	93.4	89.8	81.8	66.6	52.0	44.7	42.3	36.9	36.6	35.5	31.0	37.0	51.7	71.7	81.7	79.7	73.5	69.5	96.6																					
13-Jun	76.4	81.5	83.3	85.3	70.7	65.8	64.5	55.6	52.1	52.2	49.3	48.9	45.3	42.0	53.2	84.8	83.5	81.4	79.7	85.5	85.6	92.7	96.8	97.1	71.4	97.1																					
14-Jun	97.3	97.6	97.5	96.7	94.7	93.8	93.2	85.3	77.0	77.6	81.2	74.3	78.7	77.7	79.0	80.1	86.5	92.2	97.5	97.4	98.0	98.2	98.3	97.9	89.5	98.3																					
15-Jun	97.3	97.9	98.2	98.4	98.5	98.5	98.0	96.5	94.7	90.8	89.3	88.2	85.0	83.1	84.4	81.6	75.5	67.0	64.9	72.4	88.2	93.9	92.7	91.1	88.6	98.5																					
16-Jun	92.0	89.5	93.2	93.8	94.4	90.7	86.1	77.9	58.2	44.4	35.7	35.7	40.3	48.9	56.5	57.4	52.4	54.2	55.5	68.4	70.9	74.1	80.1	82.4	68.0	94.4																					
17-Jun	89.3	93.4	94.5	94.5	91.3	83.5	69.7	61.6	55.4	49.2	45.4	42.5	39.3	34.3	28.7	29.1	27.3	29.3	28.6	30.2	33.7	46.8	78.0	81.9	56.6	94.5																					
18-Jun	89.4	92.0	95.5	94.0	91.3	85.2	81.5	79.1	75.4	71.7	62.5	58.4	58.6	56.8	53.8	52.2	50.0	46.0	43.2	43.6	44.8	46.9	55.0	60.8	66.2	95.5																					
19-Jun	62.0	66.5	75.2	92.5	95.8	97.0	97.3	97.5	97.7	97.7	97.7	96.5	93.8	96.8	96.9	92.2	92.0	87.8	84.9	86.6	94.7	95.1	97.1	95.9	91.1	97.7																					
20-Jun	95.6	93.7	95.7	97.4	98.1	98.2	97.6	96.7	94.7	93.9	95.0	96.3	96.3	96.8	96.0	94.8	94.8	94.6	94.0	93.5	94.4	95.4	96.6	97.4	95.7	98.2																					
21-Jun	97.7	97.8	97.7	97.5	97.6	97.0	97.1	94.5	88.9	81.1	75.5	65.9	62.3	55.0	46.6	40.2	37.2	38.3	52.0	57.1	70.9	89.8	95.6	96.5	76.2	97.8																					
22-Jun	97.1	97.3	98.0	98.3	97.8	95.7	92.0	81.5	69.7	57.7	47.0	38.7	46.5	54.4	53.9	54.0	58.5	52.5	53.7	68.1	72.6	81.7	75.8	93.3	72.3	98.3																					
23-Jun	96.6	96.9	96.5	94.6	95.9	97.6	86.9	76.5	64.5	50.6	46.3	42.6	45.0	46.3	44.0	40.1	35.2	35.8	38.8	41.0	57.3	83.2	91.2	90.3	66.4	97.6																					
24-Jun	92.7	89.9	90.4	93.5	94.1	89.7	73.6	63.1	56.8	50.1	42.2	42.2	41.3	37.0	34.6	31.5	32.3	32.6	30.0	37.4	61.7	53.0	60.1	76.8	58.6	94.1																					
25-Jun	86.6	94.2	95.6	97.4	95.2	89.7	89.2	90.0	88.0	85.0	80.9	79.6	76.0	71.3	68.7	68.1	66.7	62.7	67.4	75.1	86.2	93.0	96.1	97.3	83.3	97.4																					
26-Jun	97.5	96.7	96.1	97.0	95.5	91.4	80.0	71.5	66.1	60.0	57.9	57.2	51.5	50.3	47.3	49.8	80.7	94.9	92.4	92.5	96.4	97.8	98.3	98.6	79.9	98.6																					
27-Jun	98.1	98.7	98.3	98.7	98.6	98.9	94.6	86.2	76.9	67.3	58.5	55.0	48.8	50.9	47.5	45.6	44.7	46.2	48.0	50.4	63.8	85.4	93.7	93.9	72.8	98.9																					
28-Jun	95.7	96.9	97.2	96.7	96.2	94.8	84.1	72.0	55.2	47.4	40.4	39.6	37.0	36.8	45.2	49.4	50.1	52.7	65.4	72.1	75.7	80.3	82.1	66.8	97.2																						
29-Jun	81.0	87.1	86.1	85.7	78.6	77.2	71.9	67.0	55.1	47.0	42.4	40.4	39.3	38.1	38.1	46.3	57.8	50.0	54.4	62.1	69.4	87.0	91.7	91.6	64.4	91.7																					
30-Jun	95.4	94.9	92.9	93.7	96.3	88.9	79.2	67.7	56.2	48.5	51.9	42.6	40.0	34.8	33.2	30.0	32.7	33.4	33.9	41.3	55.7	81.0	92.0	91.8	62.8	96.3																					
																						89.8	91.2	92.2	93.1	91.6	88.9	84.4	78.4	70.8	64.3	59.5	55.5	53.7	52.6	51.3	52.2	53.6	53.5	55.0	60.6	71.2	80.6	85.6	87.7	Diurnal Average	
																						98.1	98.7	98.3	98.7	98.6	98.9	98.7	97.5	97.7	97.7	97.7	96.5	96.3	96.8	96.9	94.8	94.8	94.9	97.5	97.4	98.0	98.2	98.3	98.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Conklin - June 2023



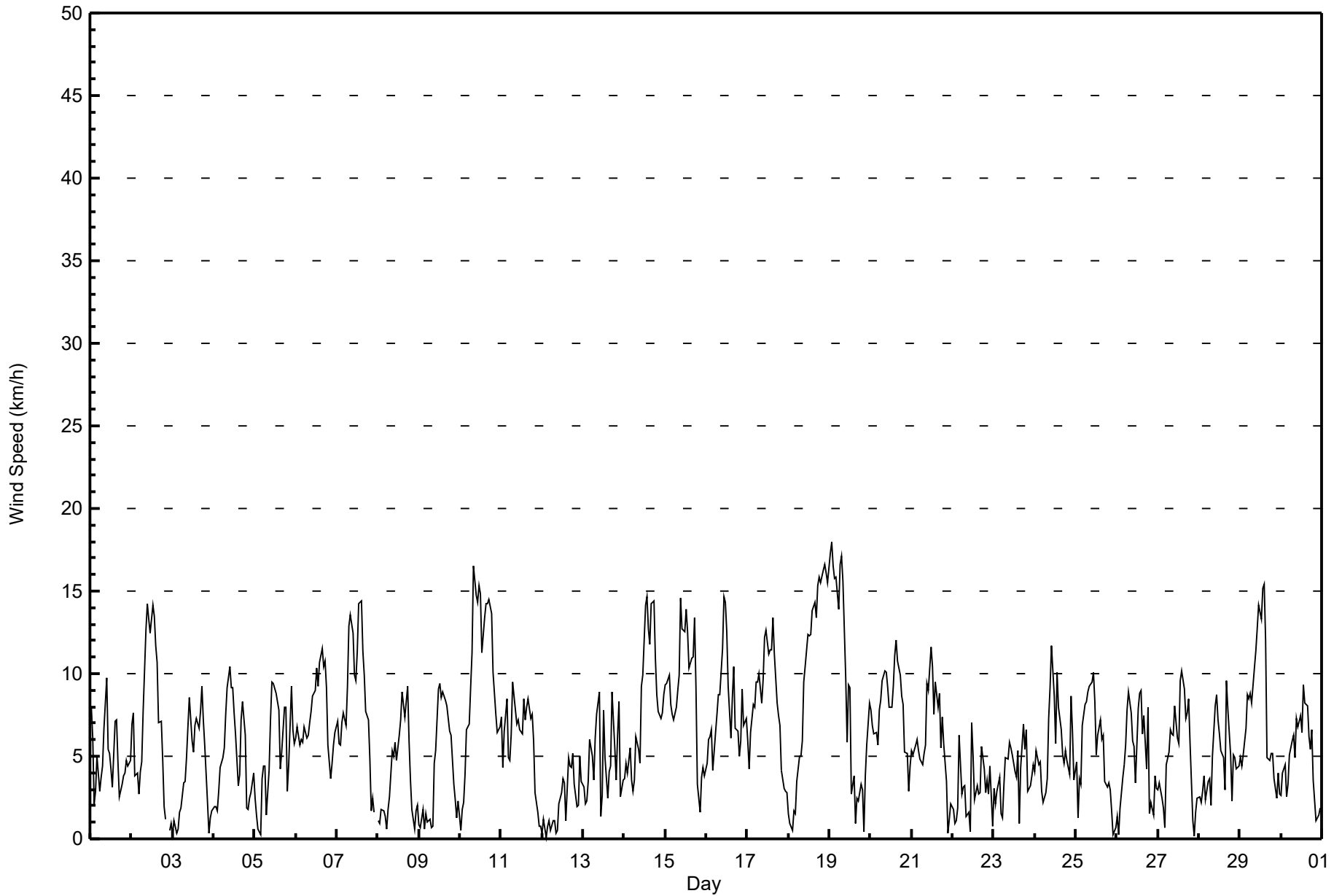


Maximum Speed: 18 km/h on Jun 19 02:00	Maximum Daily Speed Average: 9.5 km/h on Jun 10	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 12 03:00	Minimum Daily Speed Average: 0.7 km/h on Jun 12	Hours of Data: 718
Maximum Diurnal Speed Average: 3.0 km/h at hour 17	Minimum Diurnal Speed Average: 0.2 km/h at hour 3	Hours of Missing Data: 2
Monthly Average Velocity: 1.3 km/h 298.1 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 3 Median = 6 Q ₃ = 9 P ₉₀ = 12 P ₉₉ = 16	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	NNW8	NNW6	N2	NNW3	NW5	NNW3	NW4	NNW4	N7	N10	NNE5	N5	NE4	E3	NE7	NNE7	N5	NNW3	NW3	NNW4	NNW4	NW5	NW4	NW5	N4.2	N10
2-Jun	NW7	NNW8	NNW4	NNW4	NW3	NNW4	NNW5	NNW8	N13	N14	N13	N12	N14	N13	NNE12	NE11	NE7	NE7	ENE5	ENE2	NNW1	UO	SE1	SE1	N6.4	N14
3-Jun	NE0	NNW1	W0	SSW1	NNW2	NNW2	N3	NNE3	NE5	ESE7	SE9	ESE6	ENE5	ESE7	E7	NE7	ENE8	E9	ESE7	SE6	SE2	NW0	N1	N2	E3.1	E9
4-Jun	N2	N2	NNE2	NNE3	ENE4	ESE5	ESE6	SE8	SE9	SSE10	SSE9	SSE9	SSE8	SSW6	S3	S4	SSW7	S8	SSW6	SW2	SSE2	SSE2	SSW3	SSW4	SSE3.7	SSE10
5-Jun	S2	SSE1	SW1	NW0	NW4	NW4	NW4	NNW1	NNW4	NNE7	NNE9	NNE9	NNE9	ENE8	NE8	NW4	NNW5	NW8	NNW8	VNW3	W5	NW9	NW7	VNW6	NNW3.7	NNE9
6-Jun	VNW6	VNW7	VNW6	W6	WSW6	W7	VNW6	VNW6	VNW7	VNW8	VNW9	W9	WSW10	WSW9	SW11	SW12	WSW10	WSW11	SW9	SW6	S4	SSW5	SSW6	SSW6	WSW6.4	SW12
7-Jun	SSW7	S6	SSW6	SSW7	SSW8	S7	SSW9	SW13	SW14	SW12	WSW10	SW10	WSW11	SW14	SW14	W11	W10	VNW8	VNW7	NW5	NW2	NW2	NNW2	UO	SW7.0	SW14
8-Jun	SSE1	SSE1	SSE2	S2	SSE1	S1	SSE2	NNW3	N5	NNE5	N6	NNE5	NNW6	NW7	NNW9	NNW8	NNE7	NE9	NE6	E4	NNE2	NNW1	SSE2	SSE2	N2.3	NE9
9-Jun	SSE1	ENE1	SSE2	VNW1	SSE2	SSE1	SSE1	SSE1	SSW1	SE5	ESE5	ESE9	ESE9	ESE9	ESE9	ESE8	ESE8	ESE7	SE6	SSE6	SE3	SSE2	NNE1	SSE2	SE3.8	ESE9
10-Jun	VNW0	N2	E2	SE4	SSE7	SSE7	S9	S11	S17	S15	SSW14	S15	SSW15	S11	S13	SSE14	S14	S14	S14	SSE10	SSE9	S8	S6	S7	S9.5	S17
11-Jun	S7	S4	SSW7	SSW8	S5	S5	SSW6	SW10	W8	VNW7	NW7	VNW7	VNW6	NW8	VNW7	VNW8	NW8	NW7	NW8	NW6	NW3	N2	N1	SSW1	W3.7	SW10
12-Jun	NNE0	SSE1	SW0	SSE1	SSE1	ESE0	SSE1	NNW1	SE0	N0	NW2	NW3	NW4	NNW3	ENE1	ESE5	ESE4	ESE4	ESE5	ESE3	S2	SSE2	NNW5	SE3	ESE0.7	ESE5
13-Jun	S3	SSE2	SSE2	SSE4	S6	SSE5	SE4	SE6	SSE8	SSW9	VNW1	N3	NNE8	ENE5	NNW2	NE4	ESE4	ESE9	ESE5	NNW4	NNW6	NNW8	NNE3	NNW4	ESE1.2	SSW9
14-Jun	N4	N5	NNE4	E5	ENE4	NE3	NE4	E6	E5	NNE5	N9	N10	N14	N15	NNW13	NNW12	NW14	NNW14	NNW11	NNW9	NNW8	NNW7	NW8	NNW9	N6.7	N15
15-Jun	NNW9	NNW9	NNW10	NNW8	NNW8	NW7	NW8	NNW9	NNW10	NNW15	NNW13	NNW13	NNW14	NW13	NW10	NW11	NNW11	NNW13	NNW9	NW3	S2	SSW4	SSW4	SSE4	NNW8.0	NNW15
16-Jun	S5	SSW6	S6	S7	SSE4	SSW6	SSW8	SSW9	SSW9	SSW11	SSW15	S14	SSW13	WSW9	W6	WSW9	SW10	SSW7	S7	S5	SW6	SW9	WSW7	SW7	SSW7.4	SSW15
17-Jun	SSW6	SSW4	SSW6	SW8	SSW8	SW9	WSW10	W10	W8	WSW10	W12	W13	WSW11	WSW11	WSW11	WSW13	W11	VNW8	VNW7	W7	W4	WSW3	SE3	S3	WSW7.3	WSW13
18-Jun	S2	SSE1	SSW1	SSE2	SSE1	NW3	NNW5	N5	NNW6	N10	NNE10	NNE12	NNE12	NNE12	N14	N14	N13	NNE15	NNE16	NNE16	NNE16	NNE17	NNE16	NNE16	NNE9.1	NNE17
19-Jun	NNE17	NNE18	NNE17	NNE16	NNE16	NNE14	NNE17	N17	NNE16	NNE10	NNE6	N9	NNE9	NNW3	SSE4	SSW1	VNW2	S2	SSW3	WSW3	S0	NNW4	NNW6	NNW8	NNE7.6	NNE18
20-Jun	NNW8	NNW7	NNW6	NW6	NW6	NW8	NNW8	NNW10	NNW10	NNW10	N9	NNW8	NNW8	NNW9	NNW11	NNW12	NNW11	NNW10	NNW9	NNW8	NNW5	NW5	NW3	NW4	NNW7.9	NNW12
21-Jun	NW5	NW5	NW6	NW6	NW5	NW5	NW4	NW5	NW6	NNW9	NNW9	NNW12	NNW10	NNW8	NNW10	NW8	NNW9	N6	ESE7	ESE6	ESE3	NNE0	SSE1	S2	NNW4.6	NNW12
22-Jun	SSE2	NW1	SSE1	SSE2	S6	NNW3	NNE3	N3	SE1	ESE2	VNW0	NW7	NW5	VNW2	NW3	S3	SSW3	SSW6	SW4	SSE3	S4	SSE3	SW4	ESE1	SW1.1	NW7
23-Jun	SSW3	SE2	SSE3	SSE4	SSW1	S1	ESE3	ESE5	SE5	SSW6	SE6	SE5	ENE4	NE4	NE5	E1	S4	SW7	SW5	SSW7	SW3	SSW3	S4	SSE4	SSE2.5	SW7
24-Jun	SSE4	SSW5	S5	S5	SE3	SE2	SE3	WSW4	WSW7	SW9	SW12	WSW9	W6	SW10	WSW8	WSW7	VNW5	W5	WSW5	SW5	S4	N9	N7	NNW4	WSW3.6	SW12
25-Jun	NNW5	N1	NNW4	NNW3	N7	NNE8	N8	N9	NNE9	NNE9	NNE10	NNE8	NNE5	NE6	NNE7	NNE6	N6	NE3	NNE3	NNW3	NNW3	NNW2	VNW0	N1	NNE5.0	NNE10
26-Jun	SSE1	ESE0	SSE2	SSE4	SSE5	S6	S8	SSW9	SSW8	SSW6	SW6	SW3	SW8	SW9	SW9	WSW6	NNW7	W4	S8	WSW2	NW2	S1	SSW4	S3	SSW3.7	SW9
27-Jun	SSW3	S3	SE2	SSE2	E1	NNW4	NNW5	N7	NNE6	N6	NNE8	N6	N6	NNE10	N10	NNE9	NNE7	NE8	NE8	E6	ENE1	E0	SSE2	SSE2	NNE3.6	N10
28-Jun	SSE3	SE2	SE3	SE4	SE2	SSE3	S4	S2	SE5	SE8	SSE9	SSW7	S6	SW5	WSW5	W3	VNW10	N8	SE5	SSW2	SSW5	SSW5	S4	S4	S2.9	VNW10
29-Jun	S5	SE4	S5	S7	SSW9	SSW8	SSW9	SSW8	SW10	SW11	SW13	SW14	SW13	SW15	SW15	W12	NW5	NW5	W5	WSW5	SSW4	S2	S4	S3	SW6.9	SW15
30-Jun	SE3	SE4	SSE4	SSE3	S3	SSE5	SSW6	SSW6	S5	WSW7	VNW7	VNW7	VNW6	W9	VNW8	NW8	NW6	NW5	NW7	NW4	W1	SE1	SE1	SE2	WSW2.6	W9

VNW0.7 N0.8WSW0.2SSW0.8SSW0.7WSW0.7 W1.0 W1.4/VNW1.2/VNW1.7 NW1.7 NW2.4 NW2.9/VNW2.5 NW2.7 NW2.9 NW3.0/VNW2.0 NW0.7/VNW0.7 W0.8/VNW1.1/VNW0.8/WSW0.6 NNE17 NNE18 NNE17 NNE16 NNE16 NNE14 NNE17 N17 S17 S15 SSW15 S15 SSW15 SW15 SW15 N14 NW14 NNE15 NNE16 NNE16 NNE16 NNE17 NNE16 NNE16	Diurnal Average	Diurnal Maximum
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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
Conklin - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	341	47.49	47.49
6 - 11	305	42.48	89.97
12 - 19	72	10.03	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: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	19	17	9	10	8	16	30	55	41	23	10	7	8	10	38	40	341
6 - 11	19	24	11	2	4	15	8	11	20	37	20	22	12	23	25	52	305
12 - 19	12	19	0	0	0	0	0	1	8	4	12	1	3	0	2	10	72
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	50	60	20	12	12	31	38	67	69	64	42	30	23	33	65	102	718

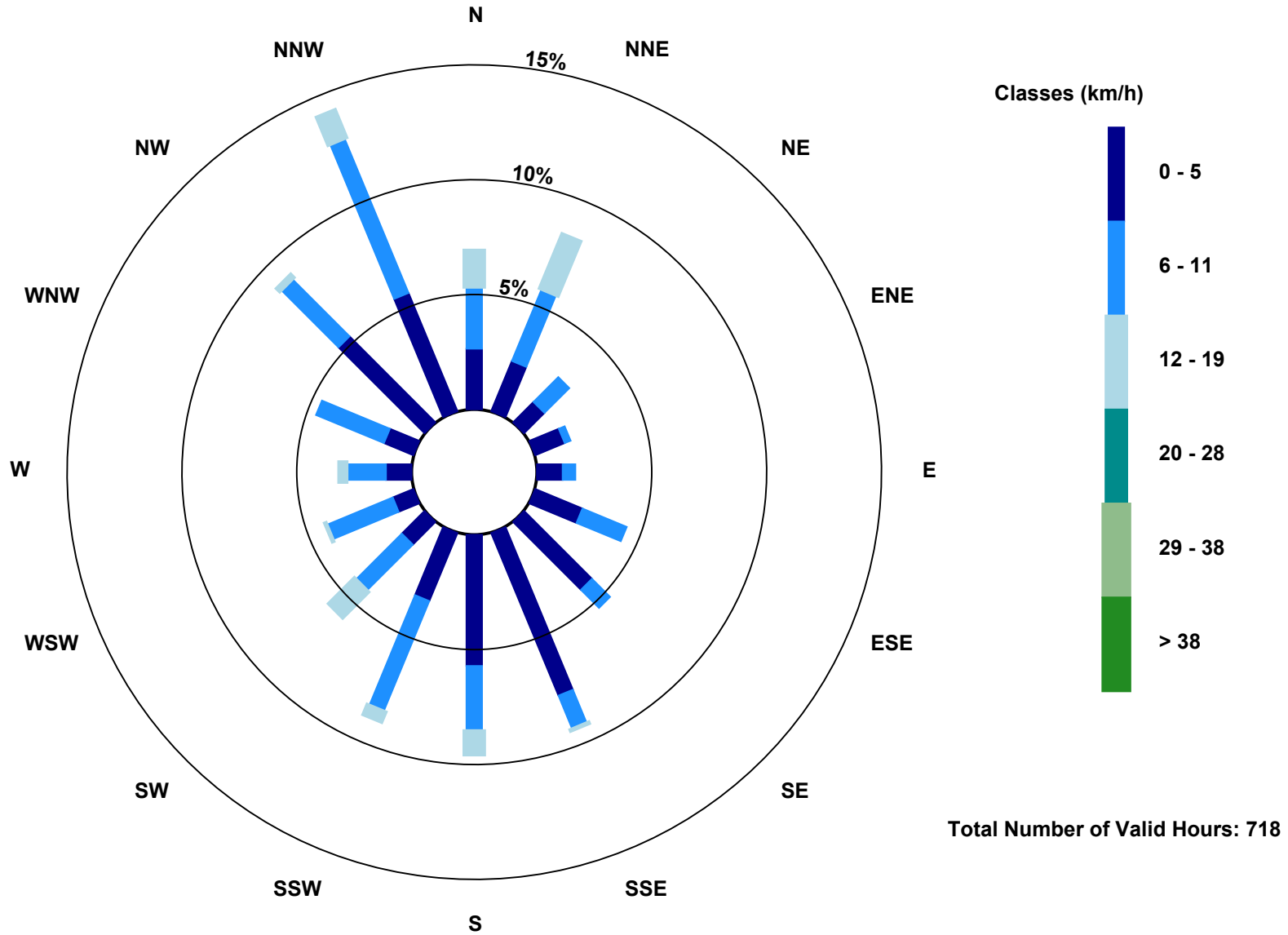
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Conklin





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Conklin - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Jun 19 03:00	Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7
Minimum Value: 1 km/h on Jun 4 21:00	
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-Jun	4	3	3	2	2	2	2	1	2	4	2	2	2	2	3	3	2	1	1	1	1	1	1	2	4
2-Jun	3	2	1	1	1	1	2	3	4	4	5	4	5	4	5	4	3	3	2	1	1	UO	1	1	5
3-Jun	1	1	1	1	2	1	1	2	3	3	3	3	3	3	3	3	3	3	2	2	2	1	1	1	3
4-Jun	1	1	1	1	2	2	2	2	2	3	3	3	3	4	2	2	3	3	3	2	1	1	1	1	4
5-Jun	1	1	1	1	2	2	2	1	2	3	4	3	3	3	3	5	3	3	3	1	3	4	3	3	5
6-Jun	3	3	3	2	2	3	3	2	3	3	4	4	4	4	5	5	4	4	3	2	1	1	1	1	5
7-Jun	2	1	1	2	2	2	3	5	4	4	4	4	5	5	5	5	5	4	3	2	1	2	2	UO	5
8-Jun	1	1	1	1	1	1	1	2	2	2	2	2	3	3	4	4	3	3	3	2	1	1	1	1	4
9-Jun	1	1	1	1	1	1	1	1	1	1	2	3	3	2	3	3	2	2	1	2	1	1	1	1	3
10-Jun	1	1	1	2	2	2	3	4	5	4	4	5	5	4	5	5	5	5	4	3	2	2	2	2	5
11-Jun	2	1	2	2	3	2	2	3	3	3	3	3	3	4	3	3	3	3	3	2	1	1	1	1	4
12-Jun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2
13-Jun	1	1	1	1	1	1	1	2	2	3	2	2	3	3	3	2	2	3	2	2	3	3	2	2	3
14-Jun	2	1	2	2	1	1	1	2	2	3	3	3	4	5	4	4	5	5	4	3	4	3	2	3	5
15-Jun	3	3	3	3	3	2	3	3	4	6	5	5	5	5	4	4	4	5	3	2	1	2	1	1	6
16-Jun	2	2	1	2	2	2	2	3	3	4	5	4	4	4	3	4	4	2	2	2	2	3	3	2	5
17-Jun	2	2	2	3	2	3	3	4	4	4	5	5	6	5	6	6	5	4	4	3	2	2	1	1	6
18-Jun	1	1	1	1	1	1	2	1	2	3	3	4	4	4	5	4	5	6	5	5	6	6	6	5	6
19-Jun	6	6	6	5	5	5	5	5	5	5	3	4	5	2	2	1	1	1	1	1	1	2	3	3	6
20-Jun	3	2	2	2	2	3	3	3	4	3	3	3	3	3	4	5	4	3	3	3	2	2	1	2	5
21-Jun	2	2	2	3	2	2	2	2	2	4	3	4	4	3	4	4	3	3	3	2	1	1	1	1	4
22-Jun	1	1	1	2	2	2	1	1	1	1	2	4	3	2	3	1	2	2	2	1	1	2	1	1	4
23-Jun	1	1	2	2	1	1	1	1	2	3	2	2	2	2	2	3	3	3	2	2	1	1	1	1	3
24-Jun	1	1	1	1	2	1	1	1	3	3	4	4	3	4	4	3	3	3	2	1	1	3	2	1	4
25-Jun	2	1	2	1	2	3	3	3	3	3	3	3	2	2	3	3	2	2	2	1	1	1	1	1	3
26-Jun	1	1	1	1	1	2	2	2	3	2	2	2	3	3	3	5	5	4	3	4	1	2	2	1	5
27-Jun	2	1	1	1	1	1	2	2	2	3	3	3	3	4	4	4	4	3	3	2	1	1	1	1	4
28-Jun	1	1	1	1	1	1	1	1	2	3	3	3	2	3	3	2	5	5	1	2	2	1	1	1	5
29-Jun	1	1	1	2	2	2	2	3	3	4	4	5	5	6	5	6	2	2	2	2	1	2	1	1	6
30-Jun	1	1	1	1	2	1	2	2	2	3	3	3	3	4	4	3	3	2	3	2	1	1	1	1	4

6	6	6	5	5	5	5	5	5	5	6	5	5	6	6	6	6	5	6	5	5	6	6	6	5	
Diurnal Maximum																									

UO - Unstable Operation



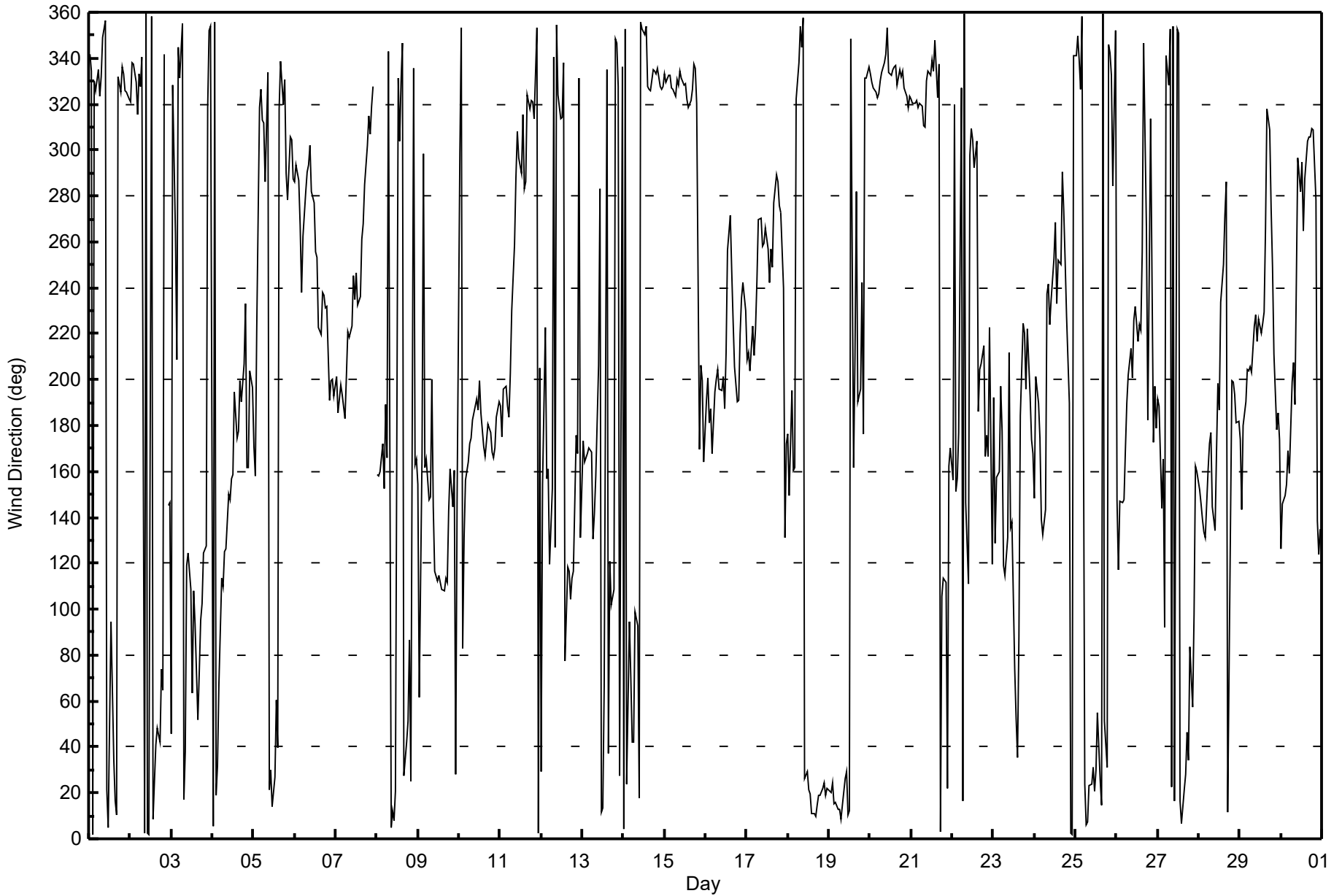
Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Conklin - June 2023

Direction of Maximum Speed: 20 deg on Jun 19 02:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 177.7 deg on Jun 10	Hours of Data: 718
Direction of Minimum Speed: 223 deg on Jun 12 03:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 0.7 deg on Jun 12	Percent Operational Time: 99.7
Monthly Average Direction: 298.1 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-Jun	342	334	2	330	326	335	323	332	349	356	21	5	51	95	34	17	10	332	325	336	333	326	325	322	351.2
2-Jun	321	338	338	329	316	333	328	340	3	360	2	2	358	8	25	41	48	42	74	65	342	UO	145	146	4.7
3-Jun	46	328	263	209	345	331	355	17	38	119	124	109	63	108	93	52	72	95	103	125	127	318	352	354	84.7
4-Jun	6	356	19	32	67	114	110	125	126	150	148	157	158	194	174	177	199	191	207	233	162	162	204	197	156.5
5-Jun	171	158	221	318	326	313	312	286	334	22	30	14	27	60	40	318	338	320	331	290	278	306	305	287	343.7
6-Jun	286	294	287	267	238	263	282	291	293	302	282	277	255	253	223	220	238	237	231	232	191	199	200	193	252.0
7-Jun	202	186	192	198	194	183	201	221	218	224	245	235	246	233	236	261	268	285	302	315	307	319	328	UO	233.4
8-Jun	159	158	160	172	153	189	166	343	5	12	8	21	332	304	330	347	28	42	51	87	25	336	163	165	10.2
9-Jun	154	62	168	298	162	166	148	149	200	144	117	112	114	111	109	108	113	112	143	161	145	160	28	147	124.3
10-Jun	299	353	83	131	156	164	172	175	183	189	192	187	200	186	171	166	173	180	177	168	166	170	184	191	177.7
11-Jun	189	175	196	197	189	184	203	230	259	288	308	297	290	315	283	286	324	318	321	321	313	353	2	205	269.3
12-Jun	29	154	223	157	161	120	152	341	127	355	324	313	314	338	77	118	116	104	113	117	175	168	331	131	102.1
13-Jun	173	164	166	168	170	168	131	141	158	206	283	11	13	66	335	37	121	102	109	348	346	328	27	336	109.2
14-Jun	4	353	24	95	70	42	42	99	93	18	355	353	350	354	328	327	326	335	335	333	336	328	326	327	349.1
15-Jun	333	329	332	332	327	326	323	331	328	335	332	328	329	322	319	321	327	337	336	320	170	207	200	164	326.5
16-Jun	191	201	181	188	168	195	200	204	196	195	201	188	212	256	271	248	226	206	190	191	220	236	242	230	210.0
17-Jun	209	212	204	224	211	222	243	270	271	258	260	266	257	242	257	249	277	289	286	276	273	239	131	172	250.6
18-Jun	176	149	195	160	162	322	338	354	345	357	26	29	21	19	11	11	10	15	19	19	22	24	19	22	15.9
19-Jun	21	20	24	16	16	13	13	8	15	26	29	10	12	348	162	211	282	191	196	242	177	331	331	336	11.8
20-Jun	333	329	327	325	323	325	330	334	338	342	353	334	333	335	336	337	328	335	332	334	327	323	319	323	332.9
21-Jun	322	320	320	321	319	320	319	310	310	330	334	333	339	335	348	323	337	3	106	113	111	22	163	171	335.1
22-Jun	156	320	151	157	177	327	16	359	146	111	297	309	305	293	304	186	204	207	215	167	176	167	222	120	224.5
23-Jun	192	129	158	160	197	177	119	115	131	212	136	138	74	52	36	88	184	225	220	196	222	193	174	168	163.6
24-Jun	148	201	190	175	139	132	144	238	242	224	235	253	269	233	252	250	290	273	251	228	190	2	2	341	239.8
25-Jun	341	350	339	327	358	24	6	8	23	24	31	20	30	55	26	15	359	51	31	346	342	332	284	352	14.3
26-Jun	148	117	147	147	148	170	190	202	213	201	226	232	217	224	222	256	347	266	182	246	313	173	197	179	208.8
27-Jun	192	188	144	165	92	341	329	353	23	354	17	353	351	16	7	21	28	47	34	84	57	98	163	160	19.1
28-Jun	152	146	139	133	131	160	172	177	145	134	168	199	187	234	250	272	286	11	137	200	199	193	181	182	181.6
29-Jun	174	143	180	190	205	204	206	203	223	228	217	227	220	224	229	266	318	309	275	249	211	178	186	174	220.7
30-Jun	126	146	150	154	169	160	199	208	189	242	296	282	295	265	287	304	306	306	310	309	278	138	124	135	256.2
	292.9	319.1	242.0	207.7	202.9	254.2	268.6	280.4	287.1	287.8	306.8	306.7	311.2	296.8	306.7	308.8	318.8	333.9	308.4	285.1	278.6	298.9	284.1	239.8	
	Diurnal Average																								

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Conklin - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 109 deg on Jun 22 11:00	Hours of Data: 718
Minimum Value: 9 deg on Jun 28 04:00	Hours of Missing Data: 2
Percentiles: P ₁ = 13 P ₁₀ = 20 Q ₁ = 24 Median = 33 Q ₃ = 48 P ₉₀ = 65 P ₉₉ = 92	Hours of Calibration: 0
	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	36	49	92	82	32	46	29	29	19	25	37	43	44	63	41	28	29	30	24	23	14	20	25	30	92
2-Jun	29	22	30	31	39	24	32	27	25	25	27	27	28	29	36	31	39	38	42	44	10	UO	77	56	77
3-Jun	82	57	76	73	77	68	42	54	65	42	28	50	64	41	38	39	45	32	27	19	33	74	57	39	82
4-Jun	57	34	36	41	42	23	24	20	21	23	31	30	32	43	79	59	31	25	24	49	32	31	28	21	79
5-Jun	61	85	77	93	45	51	50	88	51	33	40	34	43	47	39	80	37	38	22	59	52	51	56	56	93
6-Jun	62	52	55	44	32	37	55	54	47	48	50	48	40	47	44	34	33	34	25	26	13	13	12	15	62
7-Jun	16	12	14	15	17	18	22	25	25	26	36	40	44	35	31	44	44	50	45	35	46	50	77	UO	77
8-Jun	26	76	50	54	92	87	47	76	34	47	37	58	51	50	45	45	43	34	44	45	33	89	21	23	92
9-Jun	73	60	60	82	49	63	63	83	85	18	30	26	27	29	28	26	22	19	19	16	14	37	65	49	85
10-Jun	87	57	59	35	17	24	23	24	22	21	24	24	24	27	24	24	22	23	20	20	16	17	17	18	87
11-Jun	19	22	21	18	36	38	24	25	44	55	48	53	56	44	46	46	39	34	30	28	24	17	68	71	71
12-Jun	81	70	84	67	17	70	66	39	75	84	30	43	38	52	98	33	31	24	19	22	29	32	33	64	98
13-Jun	36	43	24	18	13	18	24	26	28	30	96	68	48	52	81	63	44	25	26	61	46	41	59	55	96
14-Jun	46	24	34	34	37	44	36	31	37	52	23	23	21	25	26	27	28	23	22	22	27	31	24	26	52
15-Jun	21	25	23	23	26	25	29	23	24	22	26	24	26	32	35	33	29	27	25	44	53	32	24	36	53
16-Jun	39	23	21	24	40	27	21	18	28	25	24	23	27	38	47	37	25	22	21	28	28	26	31	25	47
17-Jun	21	32	23	26	24	23	29	40	56	43	41	45	50	44	47	39	47	55	47	45	49	58	35	17	58
18-Jun	28	13	88	58	52	39	22	27	25	25	35	32	27	26	25	26	26	26	27	25	28	26	28	28	88
19-Jun	27	25	26	25	26	27	25	25	26	42	49	26	64	71	48	93	60	78	42	31	88	32	20	23	93
20-Jun	20	25	21	25	30	25	29	25	25	22	21	25	25	23	23	23	24	24	22	23	24	24	31	30	31
21-Jun	32	39	35	33	39	38	41	49	47	31	25	28	30	42	38	47	29	53	30	24	32	65	38	20	65
22-Jun	26	84	64	63	29	85	38	46	89	79	109	43	51	67	67	60	23	24	28	20	17	29	36	85	109
23-Jun	26	68	49	45	58	37	45	24	45	54	48	56	57	42	29	97	66	39	33	26	20	14	20	26	97
24-Jun	14	15	13	13	45	61	34	48	38	27	29	46	55	34	46	54	55	53	45	18	18	26	24	23	61
25-Jun	21	69	54	18	22	27	23	24	29	27	35	33	53	44	46	61	42	69	47	15	22	53	67	78	78
26-Jun	69	90	22	16	13	20	21	24	39	46	49	64	33	29	33	46	34	68	51	92	50	71	19	27	92
27-Jun	24	30	24	29	67	21	30	25	41	45	36	54	67	35	38	38	54	45	32	36	81	90	17	22	90
28-Jun	14	22	16	9	47	23	24	63	46	35	32	54	48	58	70	57	46	60	28	35	23	18	18	23	70
29-Jun	24	19	17	17	18	20	20	21	25	25	26	26	28	30	26	44	51	44	45	29	17	37	16	50	51
30-Jun	22	22	33	59	18	24	24	25	41	45	53	48	51	47	49	47	50	45	44	39	77	52	28	32	77

87	90	92	93	92	87	66	88	89	84	109	68	67	71	98	97	66	78	51	92	88	90	77	85	
Diurnal Maximum																								

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS22
JANVIER
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 JUNE 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	681	34	39	99.31	2.6	0	0.4	0
TRS(ppb) Average	645	43	75	95.56	1.4	0	0.6	0
THC(ppm) Average	681	34	39	99.31	2.6	-	2.1	-
NMHC(ppm) Average	681	34	39	99.31	0.296	-	0.043	-
CH4(ppm) Average	681	34	39	99.31	2.3	-	2.1	-
O3 (ppb) Average	630	31	90	91.81	64.5	0	44.7	-
NO2 (ppb) Average	676	38	44	99.17	5.4	0	2	-
NO (ppb) Average	676	38	44	99.17	3.6	-	0.5	-
NOX (ppb) Average	676	38	44	99.17	8	-	2.2	-
PM2.5 (ug/m3) Average	714	1	6	99.31	572.4	78	130.1	10
Temperature 2 m (C) Average	720	0	0	100	29.2	-	21.9	-
Relative Humidity (%) Average	720	0	0	100	98.6	-	93.3	-
Wind Speed 20 m (km/h) Average	715	0	5	99.31	25	-	13	-
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)
 JUNE 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	681	0.17	0.3	-	0	0	0	0.1	0.2	0.5	2.6
TRS (ppb) Average	645	0.19	0.2	-	0	0	0.1	0.1	0.2	0.3	1.4
THC (ppm) Average	681	2.01	0.1	-	1.9	2	2	2	2	2.1	2.6
NMHC(ppm) Average	681	0.003	0.026	-	0	0	0	0	0	0	0.296
CH4(ppm) Average	681	2	0.1	-	1.9	2	2	2	2	2.1	2.3
O3 (ppb) Average	630	28.63	12.6	-	3.7	13	19.2	26.9	36.8	46.2	64.5
NO2 (ppb) Average	676	1.02	0.7	-	0	0.3	0.5	0.8	1.4	2	5.4
NO (ppb) Average	676	0.19	0.3	-	0	0	0.1	0.1	0.2	0.4	3.6
NOX (ppb) Average	676	1.21	0.9	-	0	0.3	0.6	1	1.6	2.2	8
PM2.5 (ug/m3) Average	714	31.79	56.1	-	0.5	3.4	6.4	13.7	36.4	84.3	572.4
Temperature 2 m (C) Average	720	16.64	5.5	-	3.8	9.9	12.3	16.2	20.6	24.6	29.2
Relative Humidity (%) Average	720	73.38	21	-	16.2	42.1	57.8	77.3	93.3	97.1	98.6
Wind Speed 20 m (km/h) Average	715	7.7	4	-	0	3	5	7	10	13	25
Wind Direction 20 m (deg) Average	715	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	21 Jun 2023 08:00	21 Jun 2023 12:00	5	Station power failure
NO2	16 Jun 2023 08:00	16 Jun 2023 08:00	1	Maintenance - remote troubleshooting
O3	18 Jun 2023 13:00	22 Jun 2023 10:00	53	Unstable Operation - excessive baseline noise
TRS	17 Jun 2023 04:00	17 Jun 2023 07:00	4	Unstable Operation - excessive baseline drift
TRS	19 Jun 2023 15:00	20 Jun 2023 11:00	21	Maintenance - replaced analyzer
TRS	30 Jun 2023 09:00	30 Jun 2023 10:00	2	Maintenance - verify daily QA response
Wind Speed, Wind Direction	09 Jun 2023 01:00	09 Jun 2023 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Jun 2023 01:00	22 Jun 2023 02:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Jun 2023 04:00	22 Jun 2023 04:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	25 Jun 2023 20:00	25 Jun 2023 20:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

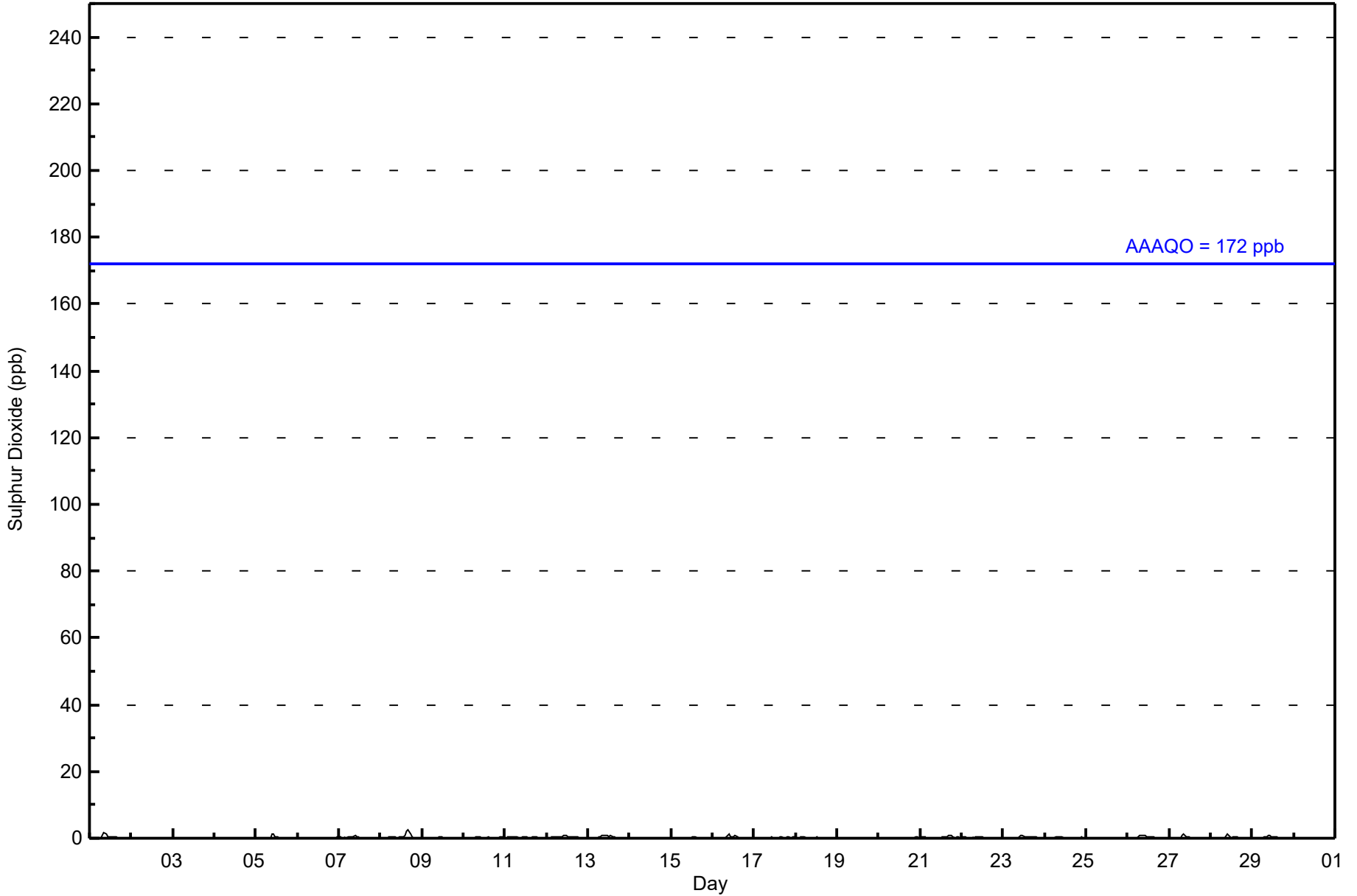
Janvier - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																720				
Maximum Value: 2.6 ppb on Jun 8 17:00		Maximum Daily Average: 0.4 ppb on Jun 8																Hours of Data:		681						
Minimum Value: 0.0 ppb on Jun 2 06:00		Minimum Daily Average: 0.0 ppb on Jun 14																Hours of Missing Data:		39						
Maximum Diurnal Average: 0.4 ppb at hour 10		Minimum Diurnal Average: 0.1 ppb at hour 21																Hours of Calibration:		34						
Monthly Average: 0.17 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 1.2																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-Jun	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.8	1.8	1.1	0.5	0.6	0.6	0.6	0.4	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.4	1.8
2-Jun	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
3-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
4-Jun	0.0	0.0	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2
5-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.2	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
6-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.3	
7-Jun	0.3	0.2	Z	0.3	0.2	0.3	0.6	0.5	0.5	0.7	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.3	0.7
8-Jun	0.0	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.4	0.3	0.5	0.9	1.9	2.6	1.3	0.4	0.2	0.0	0.0	0.1	0.0	0.4	2.6
9-Jun	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.2	0.1	0.2	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	0.1	0.3
10-Jun	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.3	0.5	0.5	0.2	0.5
11-Jun	Z	0.4	0.2	0.3	0.4	0.5	0.6	0.5	0.1	0.2	0.2	0.4	0.3	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.6
12-Jun	0.1	Z	0.4	0.3	0.3	0.3	0.4	0.6	0.4	0.5	0.7	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.1	0.1	0.0	0.0	0.2	0.3	0.9
13-Jun	0.2	0.1	Z	0.2	0.2	0.2	0.3	0.2	0.7	0.8	1.0	0.8	0.5	0.7	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0
14-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.4	0.4	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4
16-Jun	0.0	0.1	0.0	0.0	0.0	Z	0.1	0.1	0.3	1.2	0.6	0.3	0.2	0.7	0.4	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.2
17-Jun	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3
18-Jun	0.3	Z	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3
19-Jun	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	0.1	0.0	0.0	0.1
20-Jun	0.0	0.1	0.1	Z	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	0.2	0.2	0.3	0.3	0.2	0.1	0.3
21-Jun	0.3	0.2	0.3	0.3	Z	0.2	0.2	PF	PF	PF	PF	PF	0.2	0.5	0.6	0.5	0.6	0.9	0.9	0.5	0.2	0.2	0.2	0.1	0.4	0.9
22-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.5	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.5
23-Jun	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.9	0.8	0.6	0.5	0.5	0.6	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.9
24-Jun	0.1	Z	0.2	0.1	0.2	0.2	0.6	0.6	0.5	0.6	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.6
25-Jun	0.2	0.2	Z	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
26-Jun	0.0	0.0	0.0	Z	0.0	0.2	0.3	1.0	0.8	0.7	0.7	0.6	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	1.0
27-Jun	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.7	1.1	0.7	0.4	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	0.2	1.1
28-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	1.4	0.7	0.4	0.1	0.5	0.5	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.4
29-Jun	Z	0.1	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.9	0.8	0.5	0.4	0.4	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.9
30-Jun	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.3 0.4 0.4 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		
																								0.3 0.4 0.4 0.3 0.4 0.5 0.6 1.0 1.8 1.4 1.2 0.9 0.6 0.7 0.9 1.9 2.6 1.3 0.9 0.5 0.2 0.3 0.5 0.5		
Z - zeronspan C - Calibration PF - Power Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Janvier - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Janvier - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	681	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: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Janvier - June 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	96	48	26	16	11	21	25	59	88	67	50	36	19	21	32	676
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	61	96	48	26	16	11	21	25	59	88	67	50	36	19	21	32	676

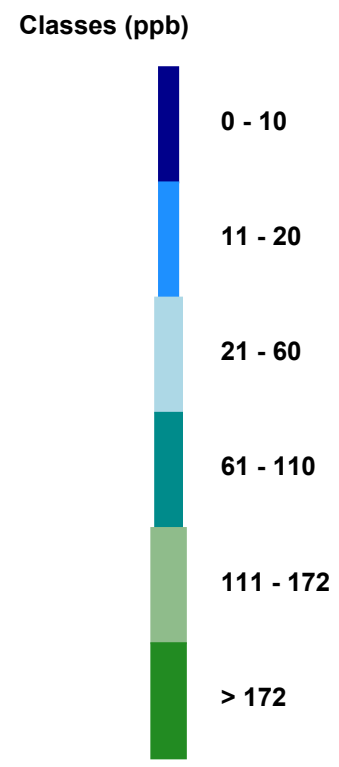
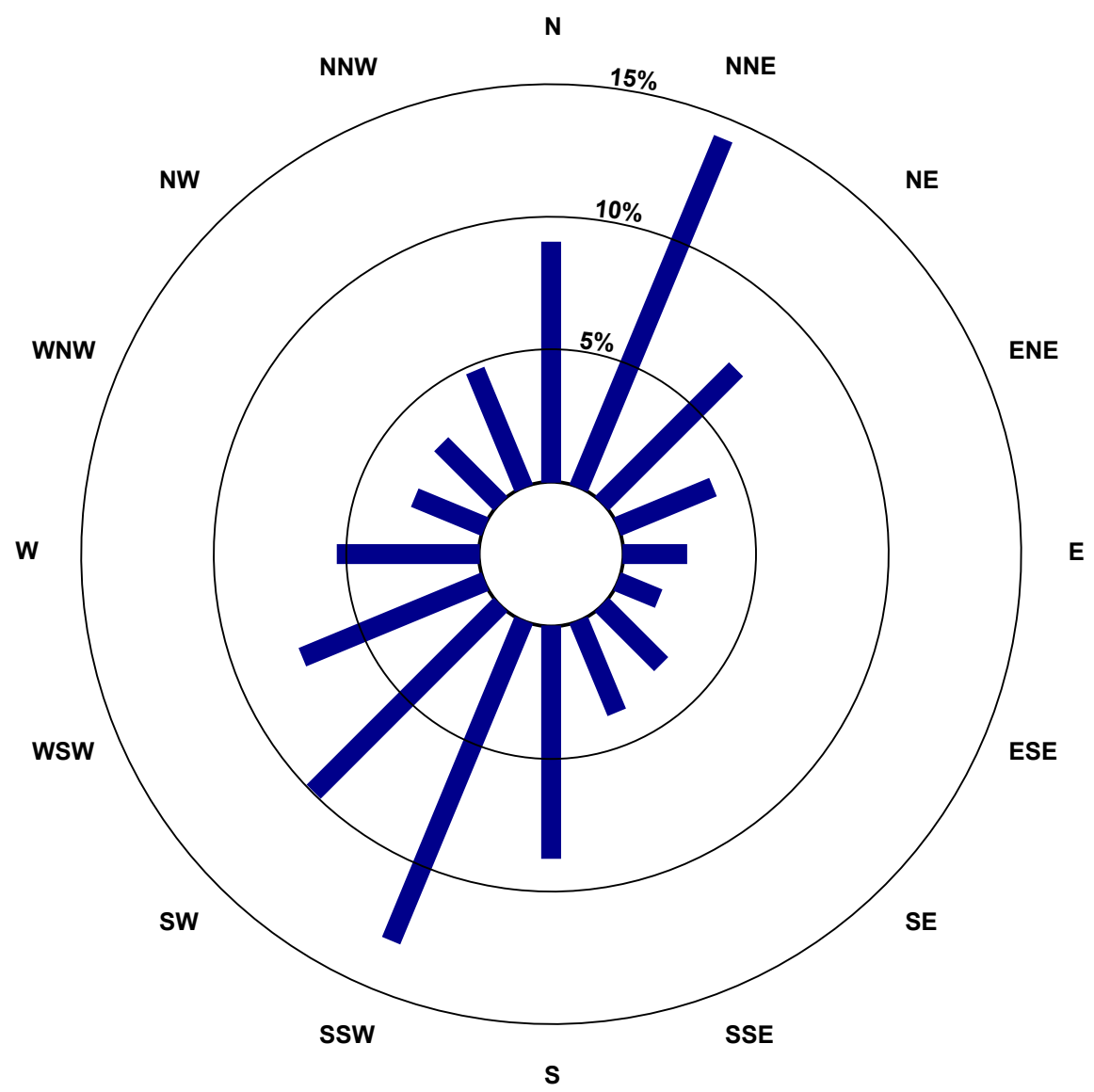
Total Number of Valid Hours: 676

Total Number of Hours: 720

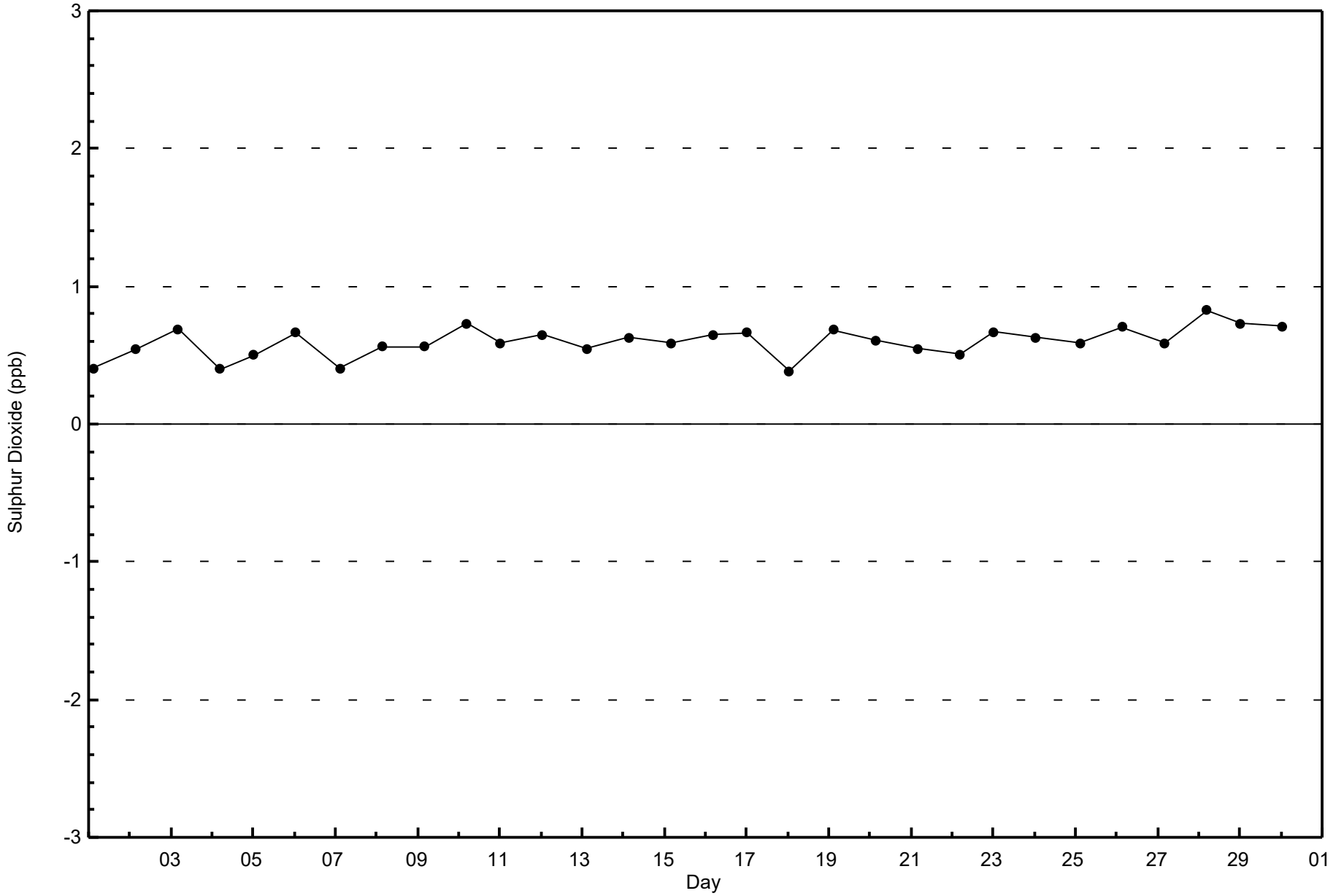


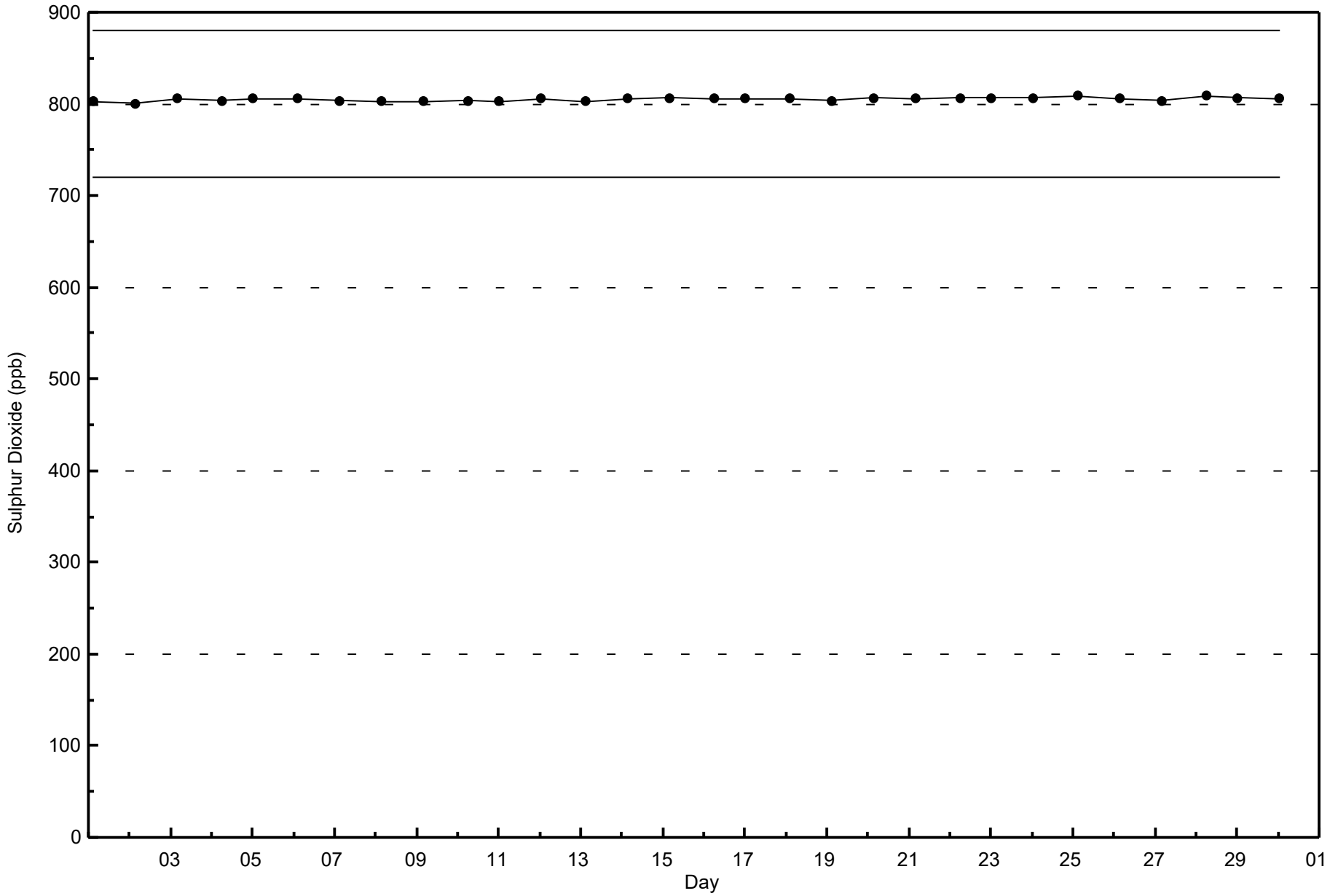
Wood Buffalo Environmental Association
Wind Rose Jun 2023

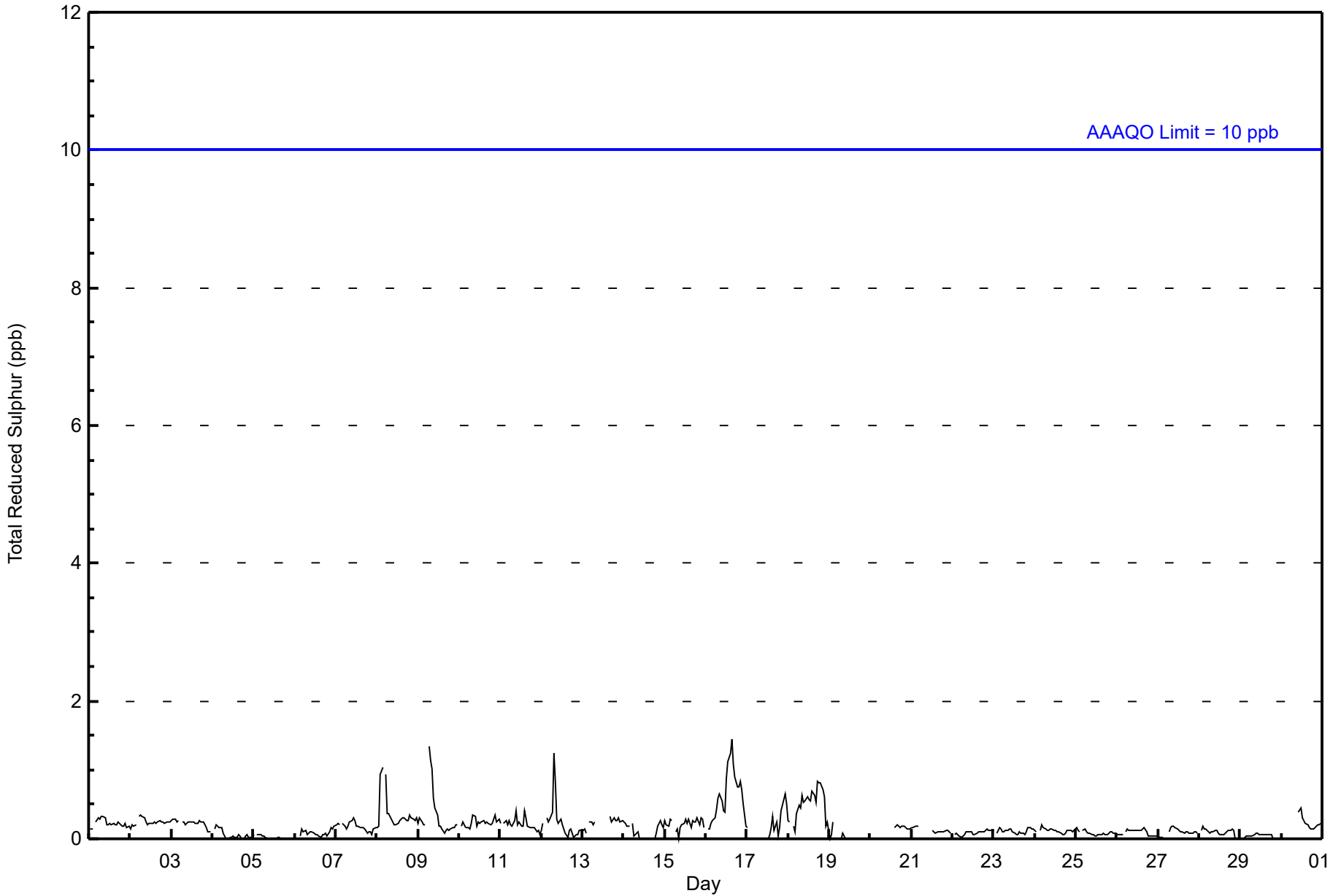
Sulphur Dioxide (SO₂) - ppb
Janvier



Total Number of Valid Hours: 676









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	645	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: 645

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - June 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	54	98	44	25	16	12	20	23	54	89	62	47	36	19	21	21	641
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	54	98	44	25	16	12	20	23	54	89	62	47	36	19	21	21	641

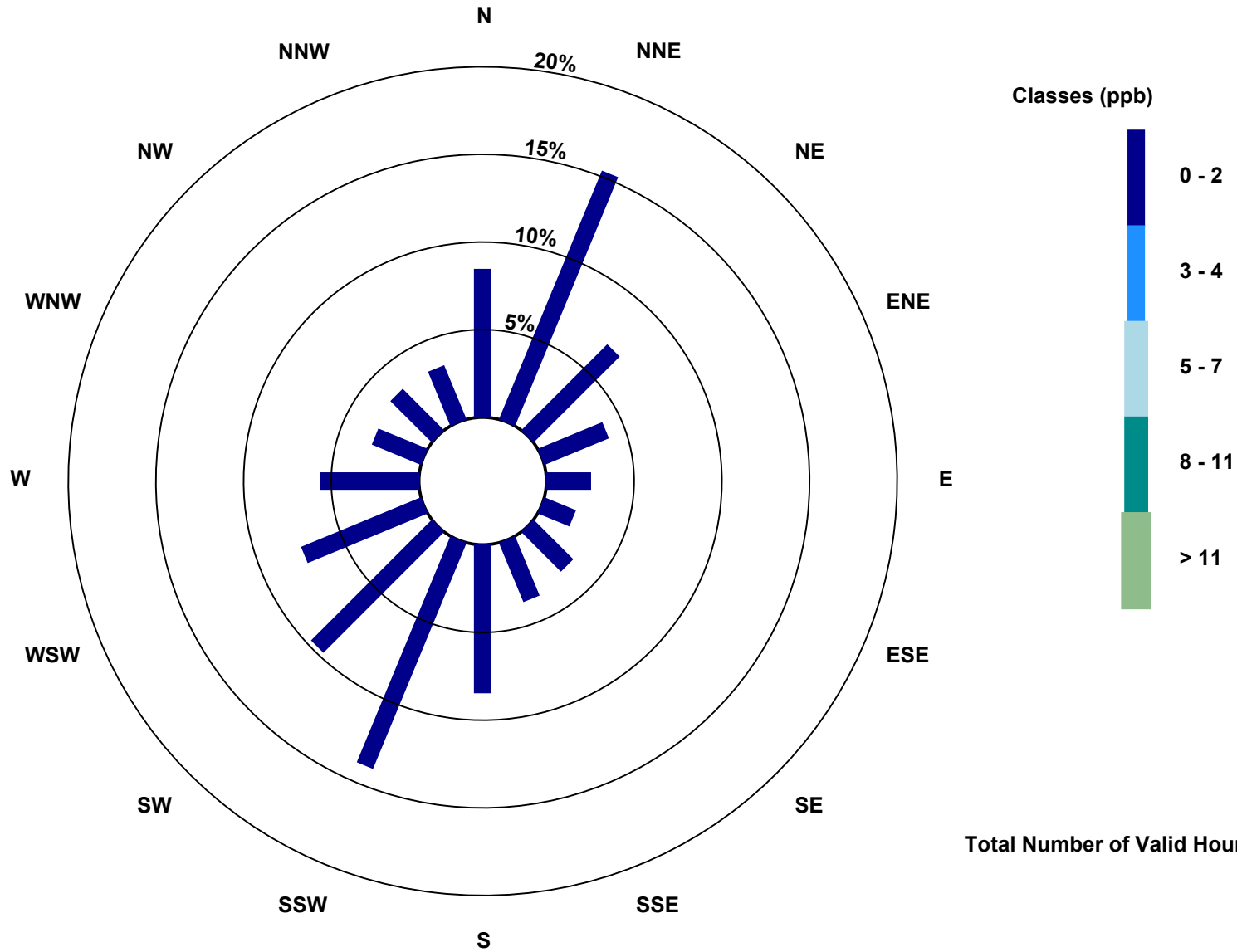
Total Number of Valid Hours: 641

Total Number of Hours: 720

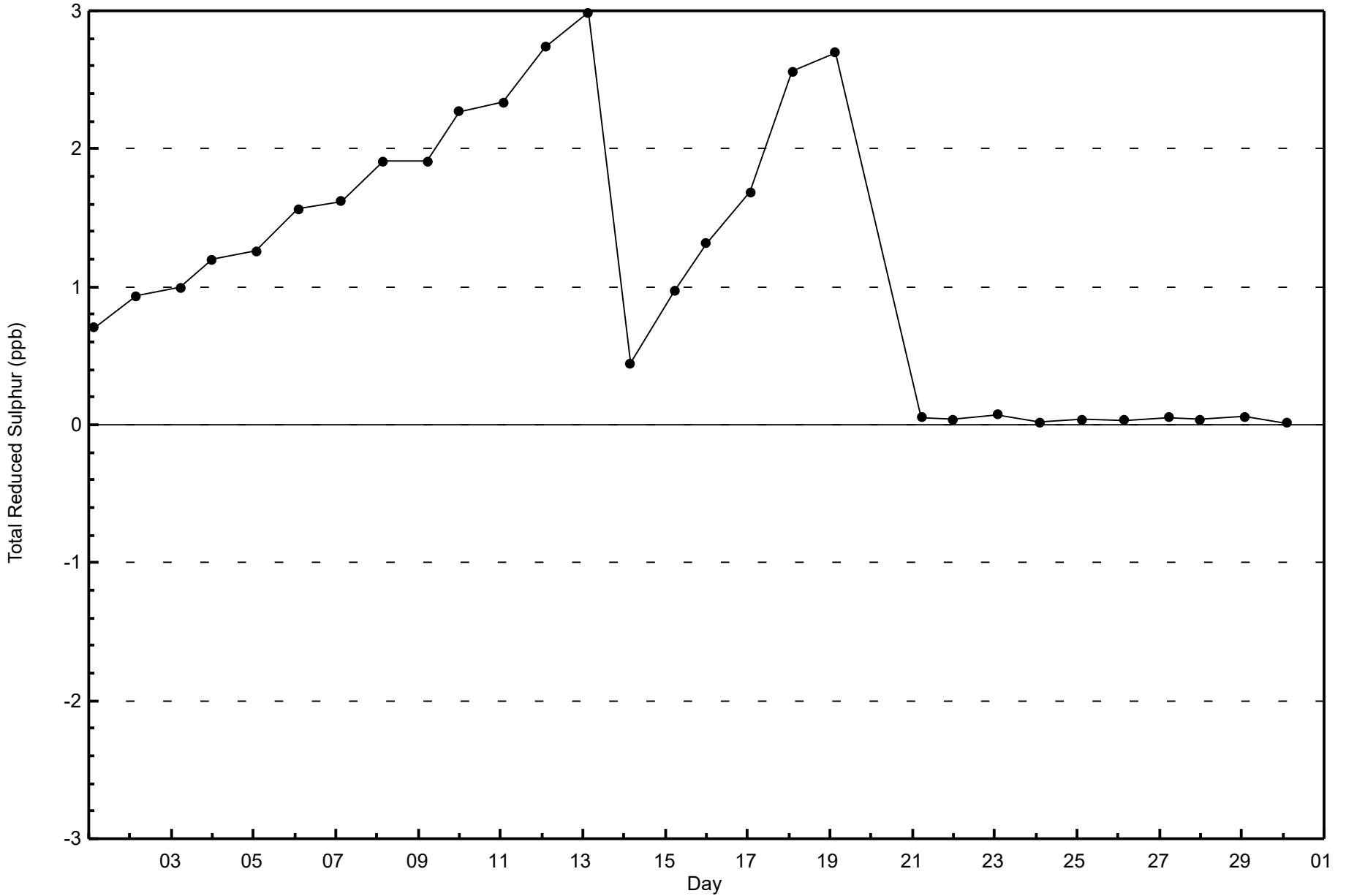


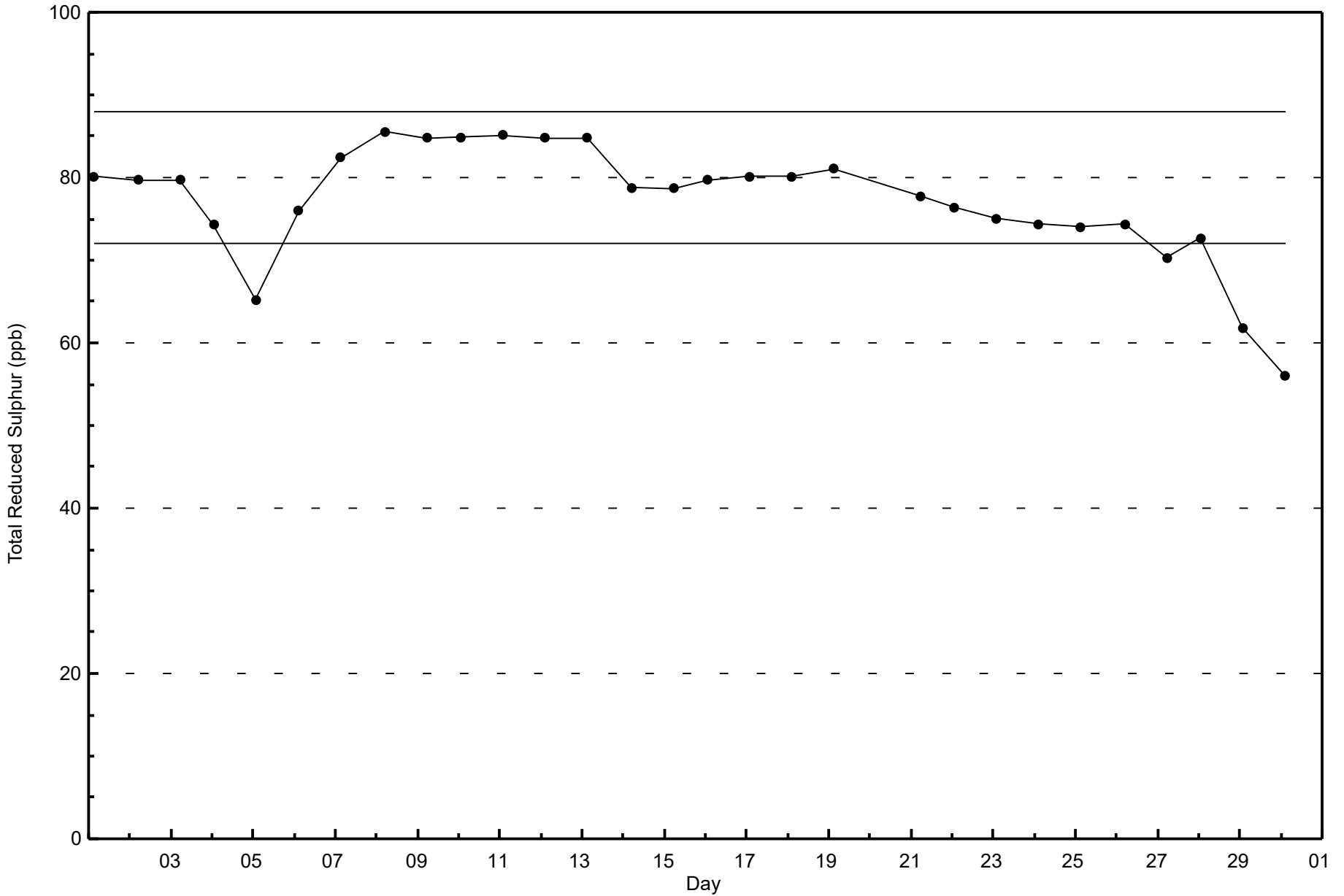
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Janvier



Total Number of Valid Hours: 641







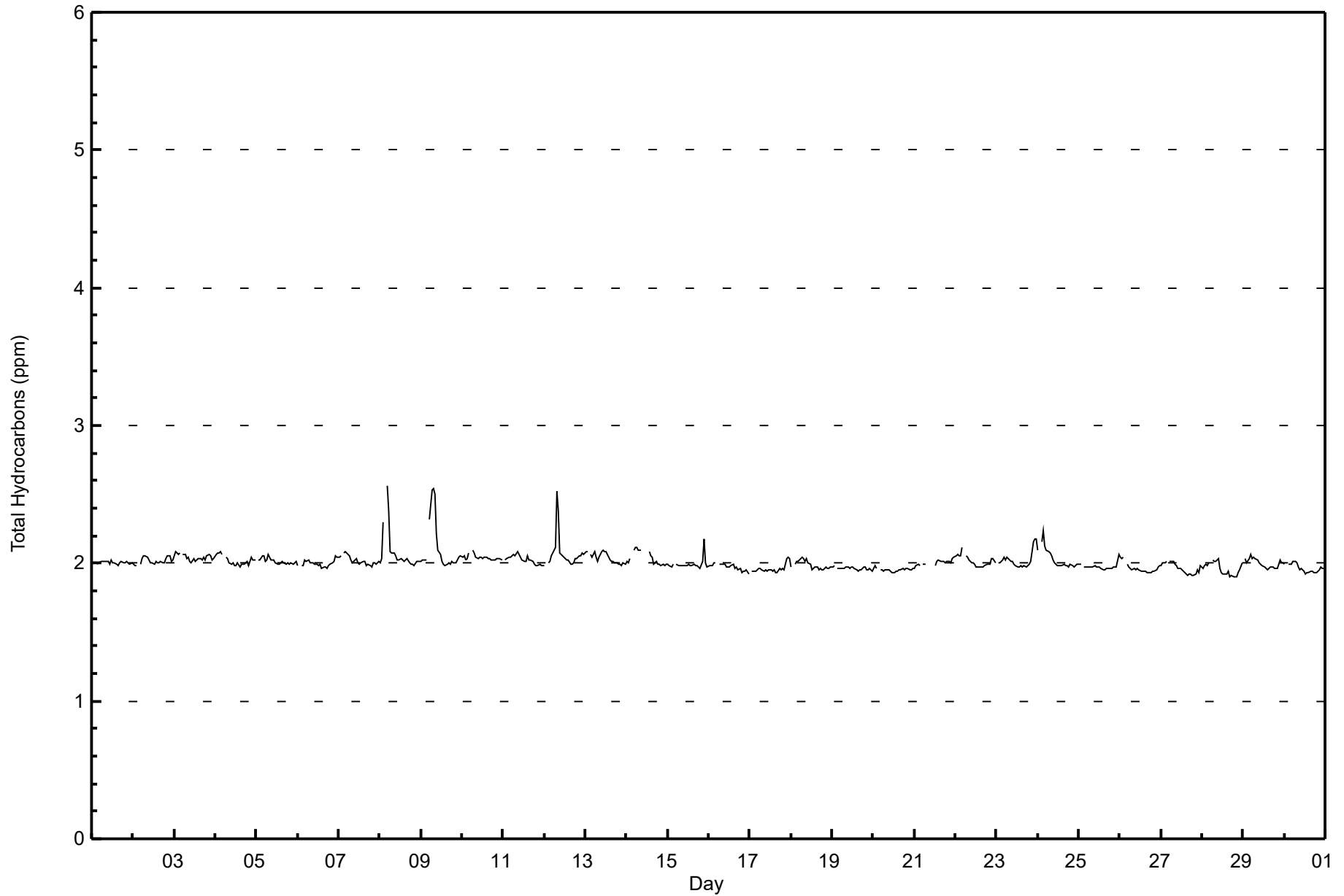
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Janvier - June 2023

Maximum Value: 2.6 ppm on Jun 8 05:00		Maximum Daily Average: 2.1 ppm on Jun 9		Hours in Service: 720																							
Minimum Value: 1.9 ppm on Jun 28 19:00		Minimum Daily Average: 2.0 ppm on Jun 20		Hours of Data: 681																							
Maximum Diurnal Average: 2.1 ppm at hour 8		Minimum Diurnal Average: 2.0 ppm at hour 19		Hours of Missing Data: 39																							
Monthly Average: 2.01 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.3		Hours of Calibration: 34																							
				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-Jun	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-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0
3-Jun	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0
4-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Jun	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
6-Jun	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0
7-Jun	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-Jun	2.0	2.0	2.3	Z	2.6	2.4	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
9-Jun	2.0	2.0	2.0	2.0	Z	2.3	2.5	2.5	2.5	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0
10-Jun	2.0	2.1	2.0	2.0	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
11-Jun	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
12-Jun	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.5	2.4	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
13-Jun	2.1	2.1	Z	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
14-Jun	2.0	2.0	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0
15-Jun	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	2.2	2.0	2.0	2.0	2.0	2.0
16-Jun	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	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0
17-Jun	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
18-Jun	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
19-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0
20-Jun	2.0	2.0	2.0	Z	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
21-Jun	2.0	2.0	2.0	2.0	Z	2.0	2.0	PF	PF	PF	PF	PF	2.0	2.0	2.0	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-Jun	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Jun	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	2.2	2.2	2.2	2.2	2.0	2.2
24-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
25-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1
26-Jun	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	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0
27-Jun	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0
28-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0
29-Jun	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	2.0	2.0	2.0	2.0
30-Jun	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	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration PF - Power Failure																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	583	85.61	85.61
2.1 - 3.0	98	14.39	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - June 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	58	84	39	21	11	10	20	21	49	59	60	48	34	17	21	29	581
2.1 - 3.0	3	12	9	5	5	1	1	4	10	29	7	2	2	2	0	3	95
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	61	96	48	26	16	11	21	25	59	88	67	50	36	19	21	32	676

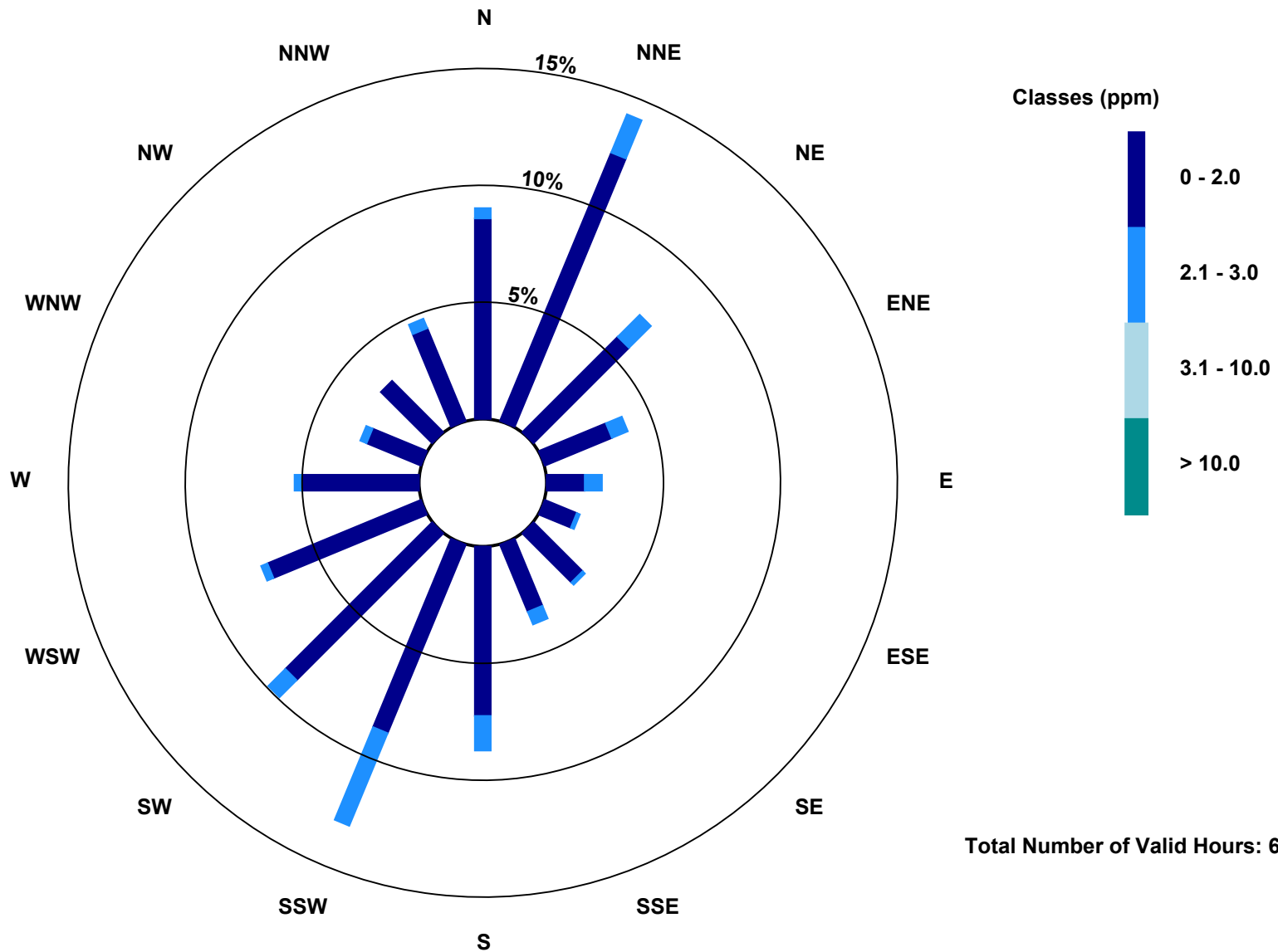
Total Number of Valid Hours: 676

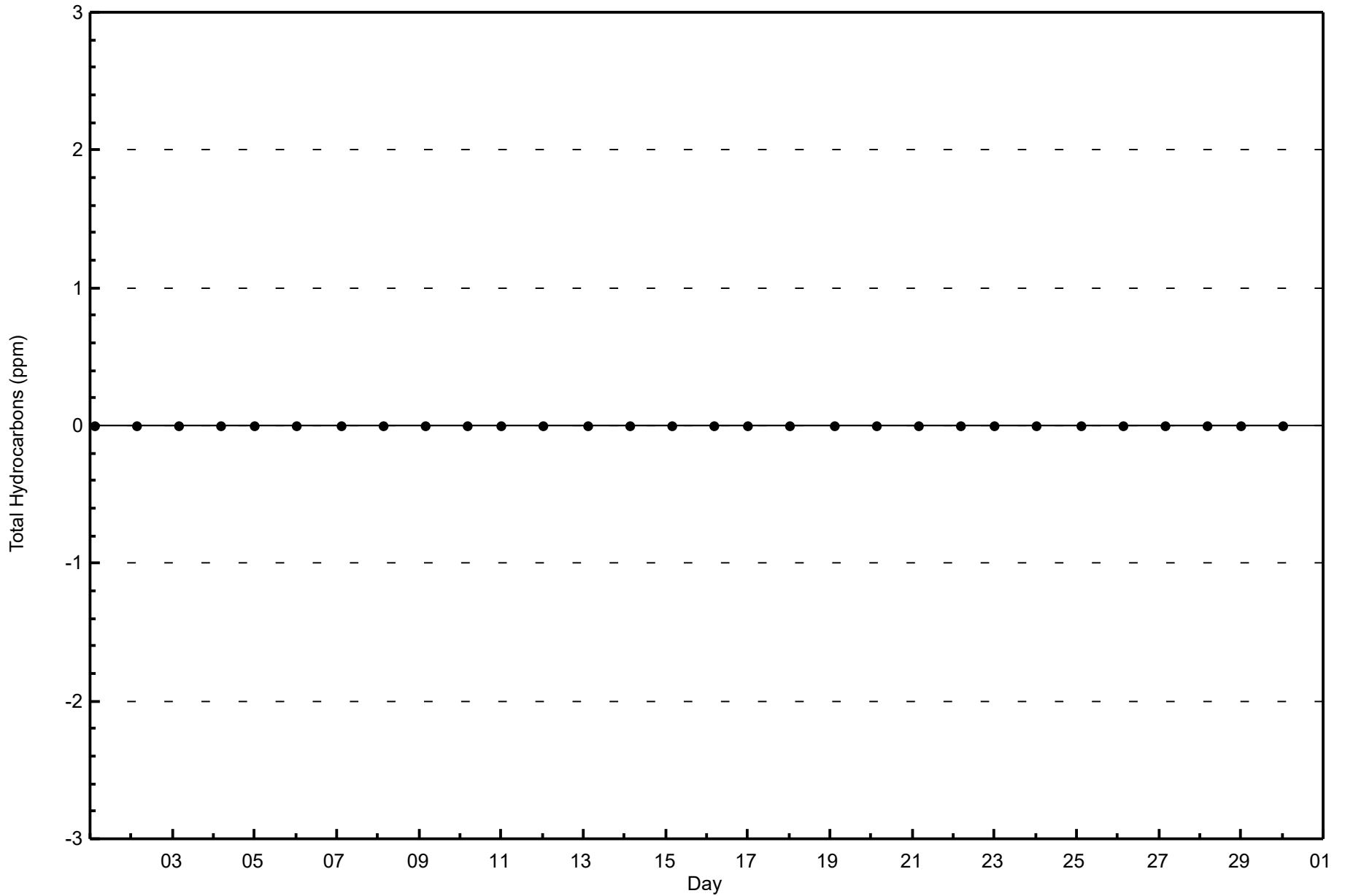
Total Number of Hours: 720

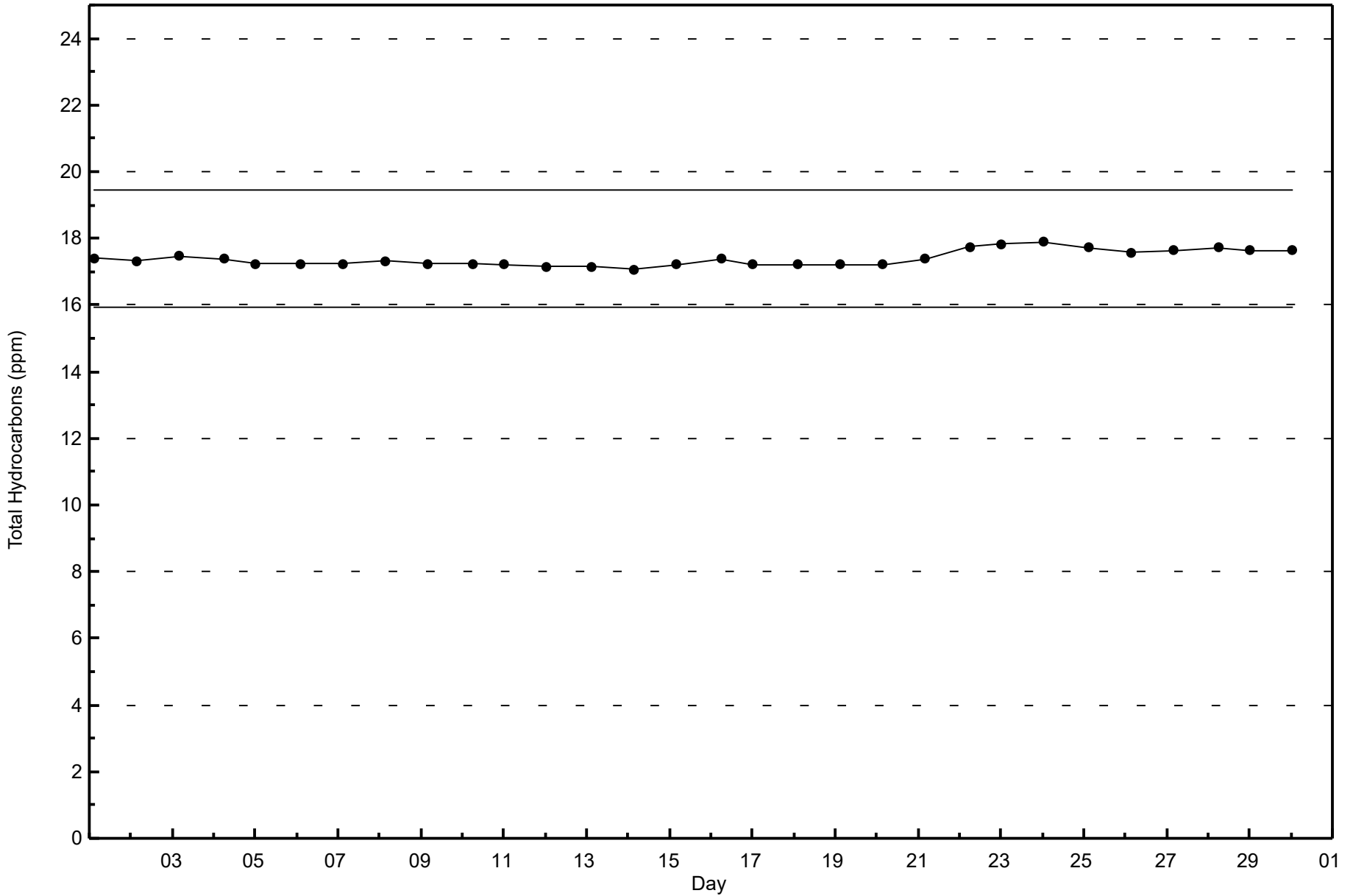


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Janvier









Summary of Hour Averages

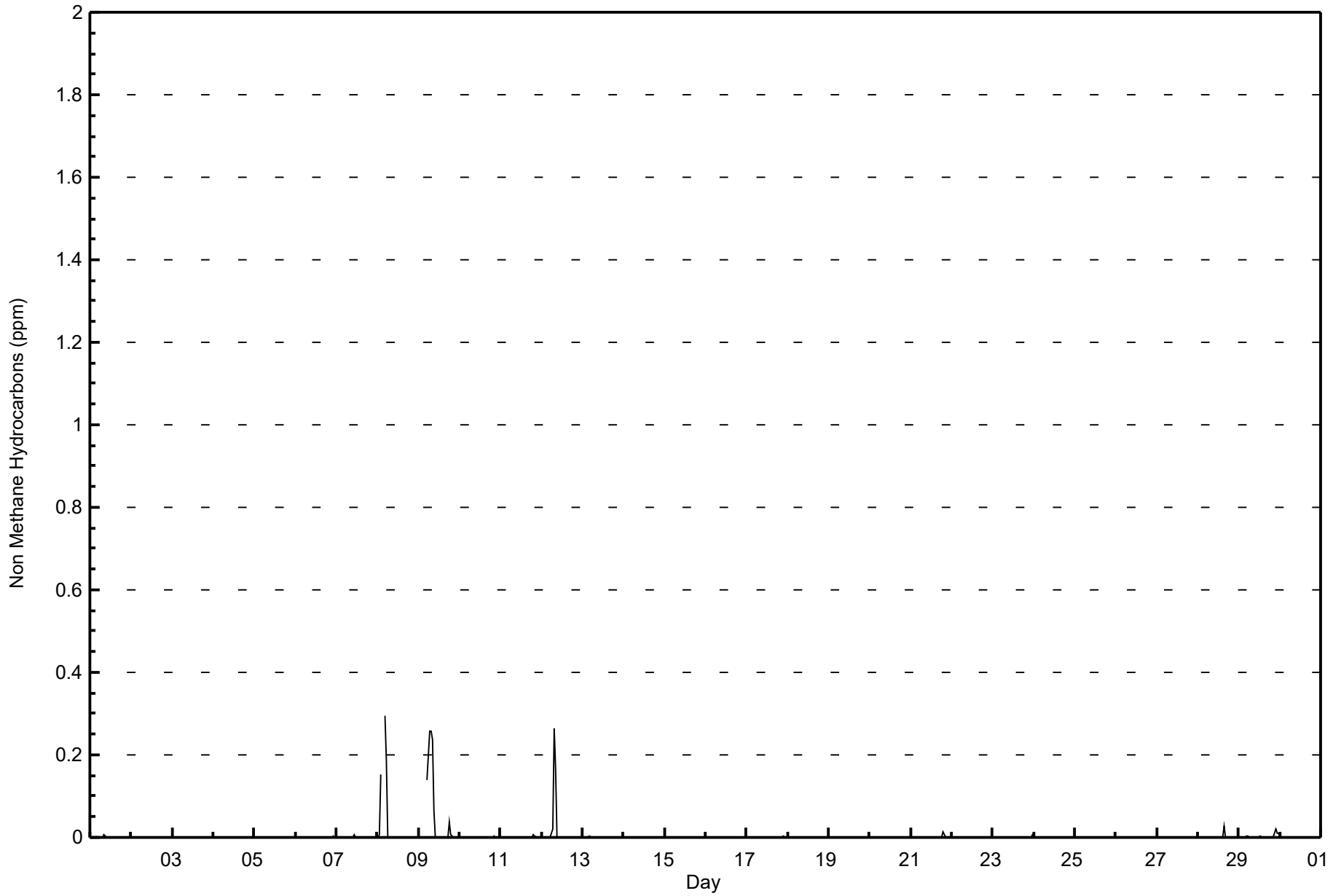
Janvier - June 2023

Maximum Value: 0.296 ppm on Jun 8 05:00	Maximum Daily Average: 0.043 ppm on Jun 9	Hours in Service: 720
Minimum Value: 0.000 ppm on Jun 1 01:00	Minimum Daily Average: 0.000 ppm on Jun 2	Hours of Data: 681
Maximum Diurnal Average: 0.018 ppm at hour 8	Minimum Diurnal Average: 0.000 ppm at hour 4	Hours of Missing Data: 39
Monthly Average: 0.003 ppm	Percentiles: $P_1 = 0.0$ $P_{10} = 0.0$ $Q_1 = 0.0$ Median = 0.0 $Q_3 = 0.0$ $P_{90} = 0.0$ $P_{99} = 0.2$	Hours of Calibration: 34
		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-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
2-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
3-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
4-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
5-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.004	0.000		
7-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	
8-Jun	0.000	0.007	0.154	Z	0.296	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.296	
9-Jun	0.000	0.000	0.000	0.000	Z	0.138	0.258	0.257	0.237	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.258	
10-Jun	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	0.002	0.000	0.000	0.000	0.000	0.000		
11-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005		
12-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.020	0.263	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.263	
13-Jun	0.000	0.000	Z	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
14-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
15-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
16-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
17-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.004		
18-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
21-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	PF	PF	PF	PF	PF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	
22-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
23-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
25-Jun	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
26-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
27-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Jun	Z	0.000	0.000	0.000	0.004	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	0.000	0.000	0.000	0.000	
30-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

0.000	0.000	0.006	0.000	0.012	0.013	0.009	0.018	0.014	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.001	Diurnal Average
0.001	0.007	0.154	0.000	0.296	0.187	0.258	0.263	0.237	0.065	0.008	0.001	0.002	0.000	0.000	0.026	0.000	0.000	0.038	0.013	0.002	0.020	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Diurnal Maximum

Z - zerspan C - Calibration PF - Power Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Janvier - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	660	96.92	96.92
0.006 - 0.05	11	1.62	98.53
0.06 - 0.1	2	0.29	98.83
> 0.1	8	1.17	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Janvier - June 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	60	96	47	26	16	11	20	25	57	80	61	50	35	19	20	32	655
0.006 - 0.05	1	0	0	0	0	0	1	0	1	3	4	0	0	0	1	0	11
0.06 - 0.1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
> 0.1	0	0	1	0	0	0	0	0	0	4	2	0	1	0	0	0	8
Totals	61	96	48	26	16	11	21	25	59	88	67	50	36	19	21	32	676

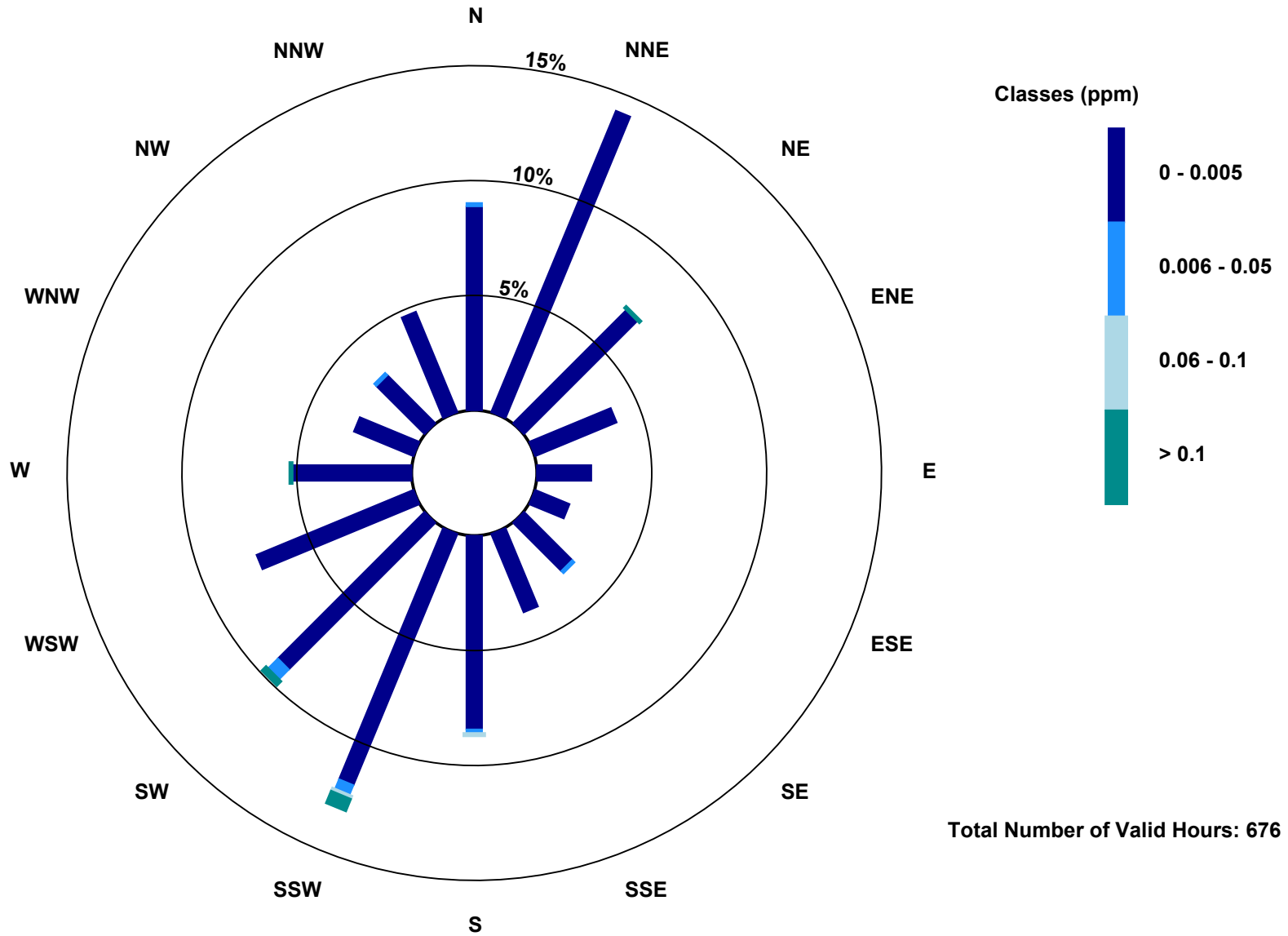
Total Number of Valid Hours: 676

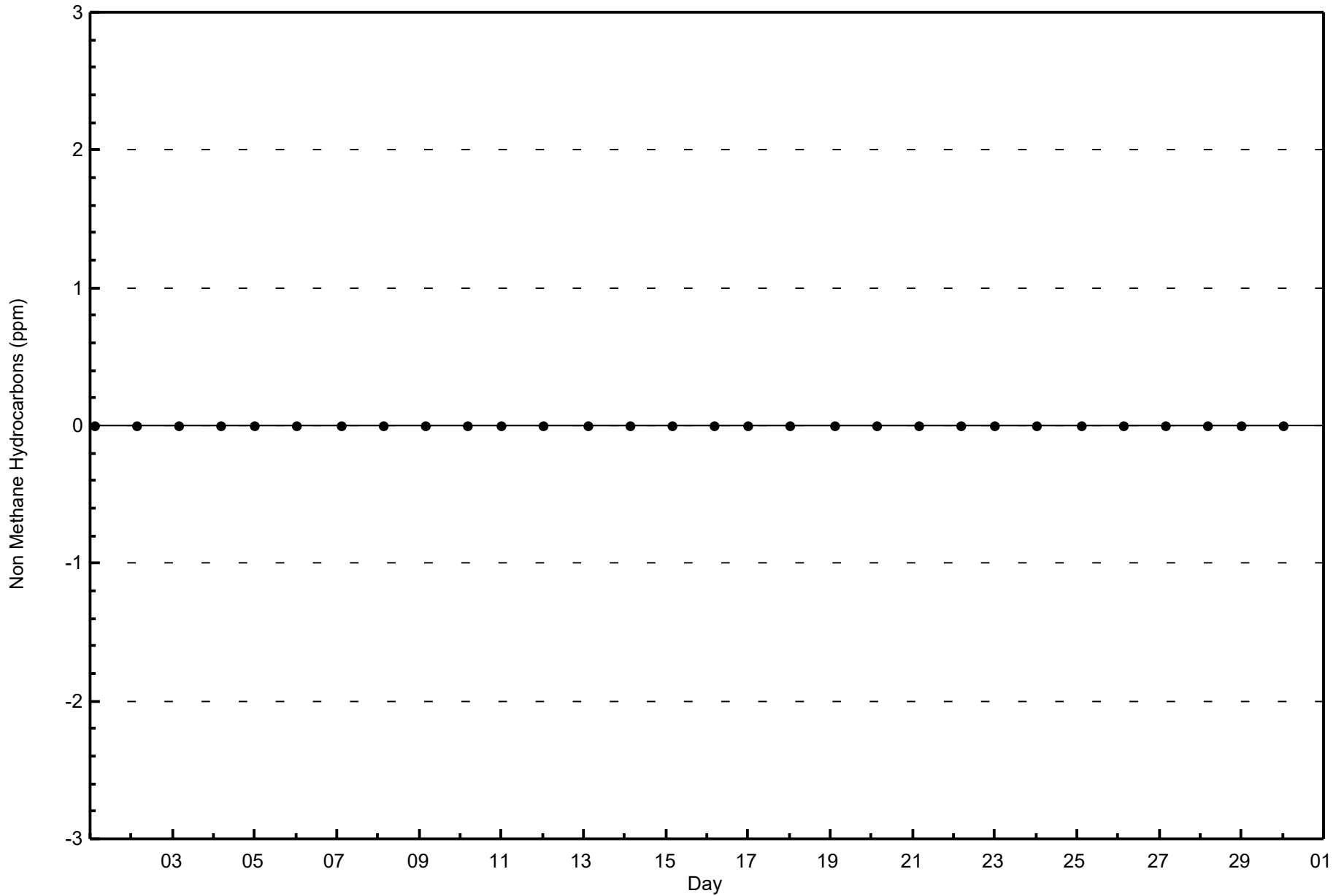
Total Number of Hours: 720

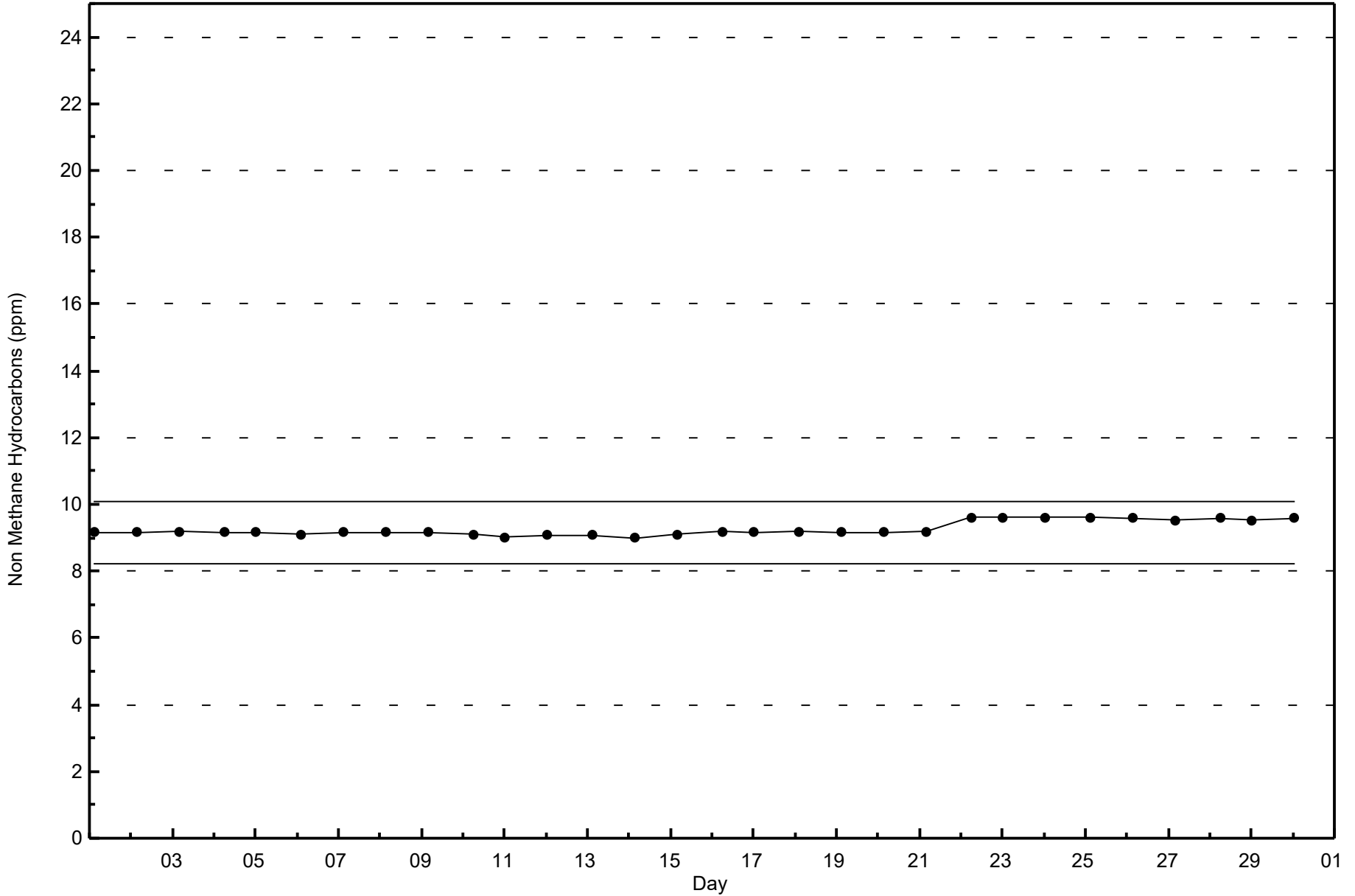


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Janvier



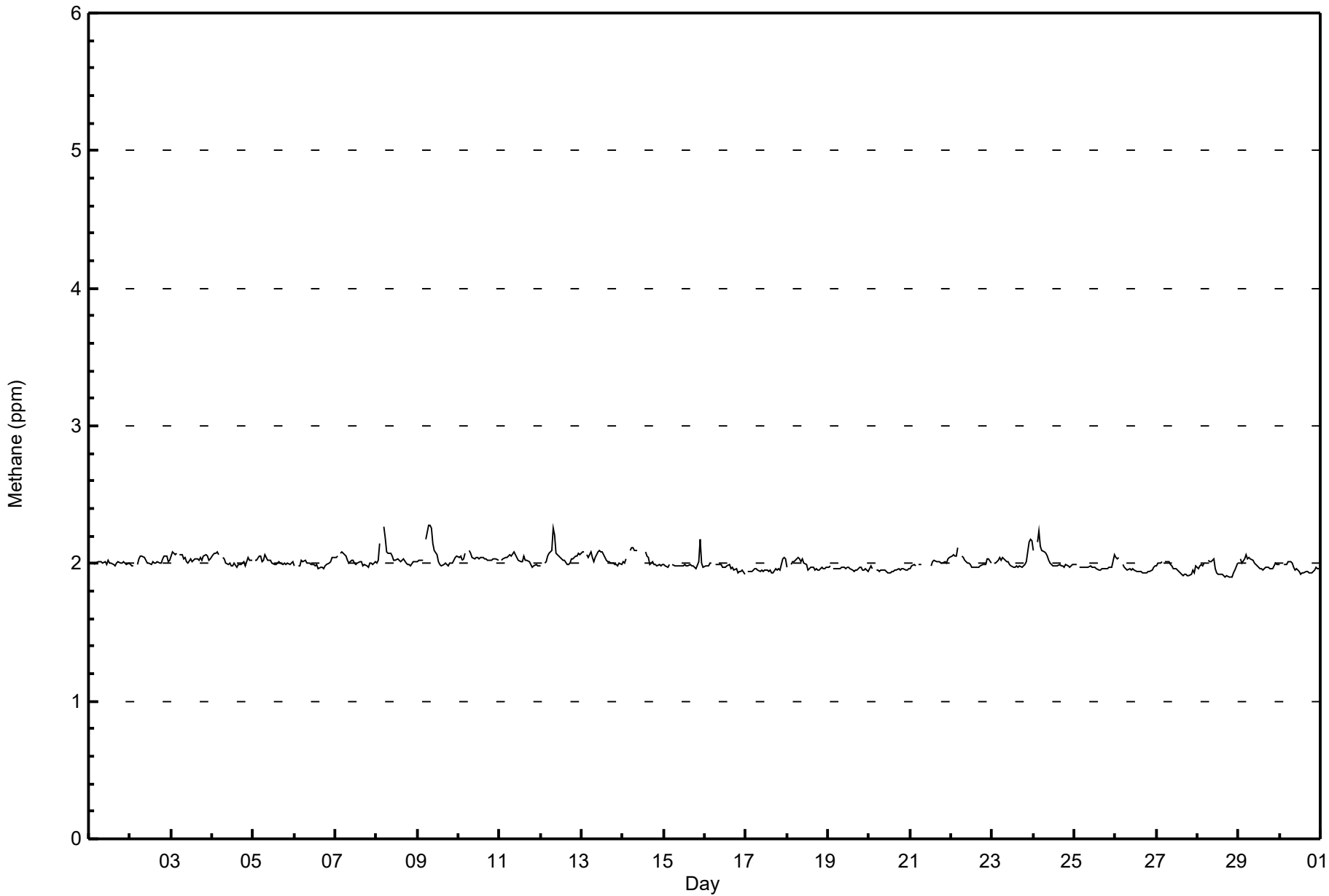






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Janvier - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Janvier - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	584	85.76	85.76
2.1 - 3.0	97	14.24	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Janvier - June 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	58	84	39	21	11	10	20	21	50	59	60	48	34	17	21	29	582
2.1 - 3.0	3	12	9	5	5	1	1	4	9	29	7	2	2	2	0	3	94
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	61	96	48	26	16	11	21	25	59	88	67	50	36	19	21	32	676

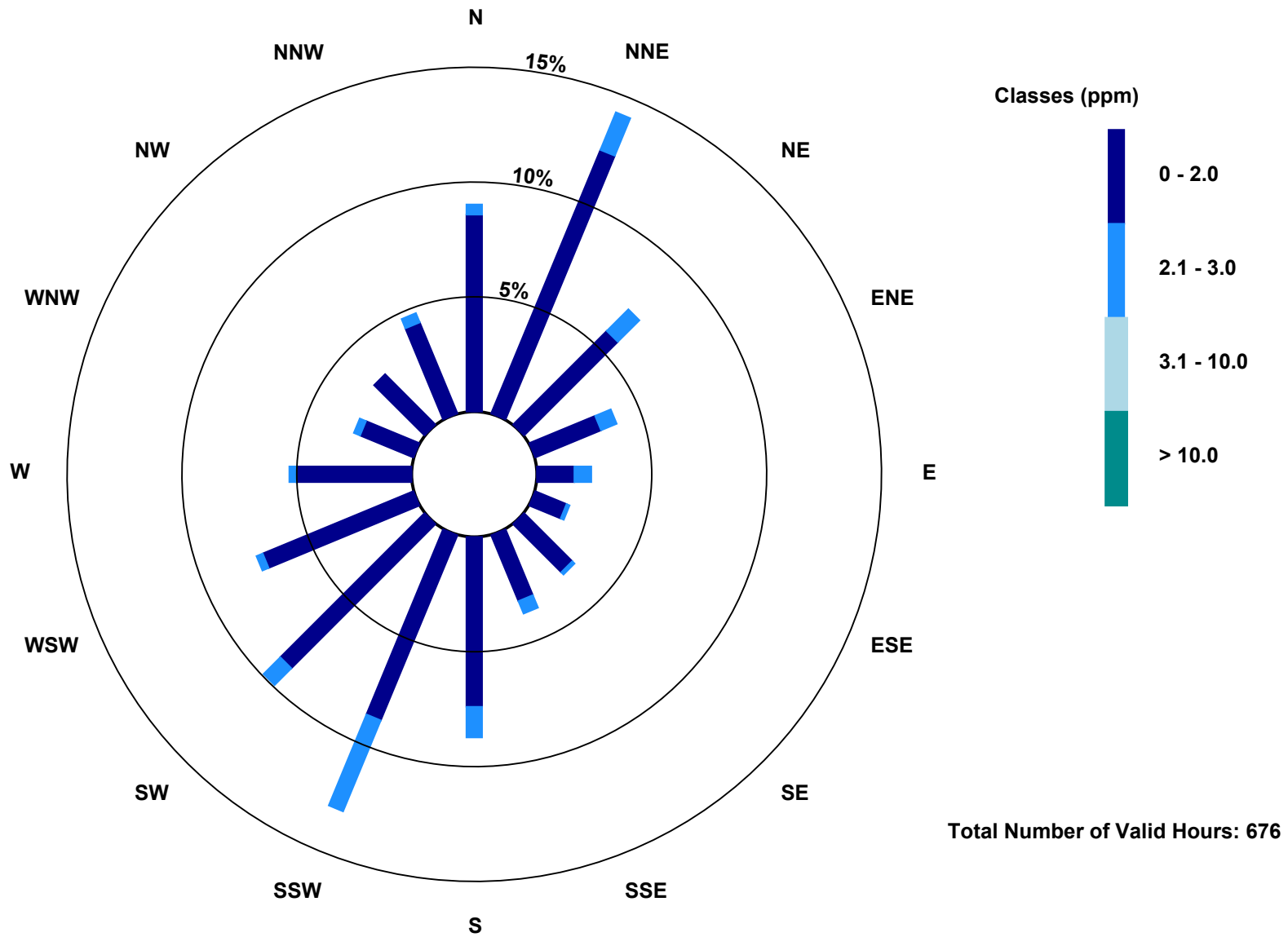
Total Number of Valid Hours: 676

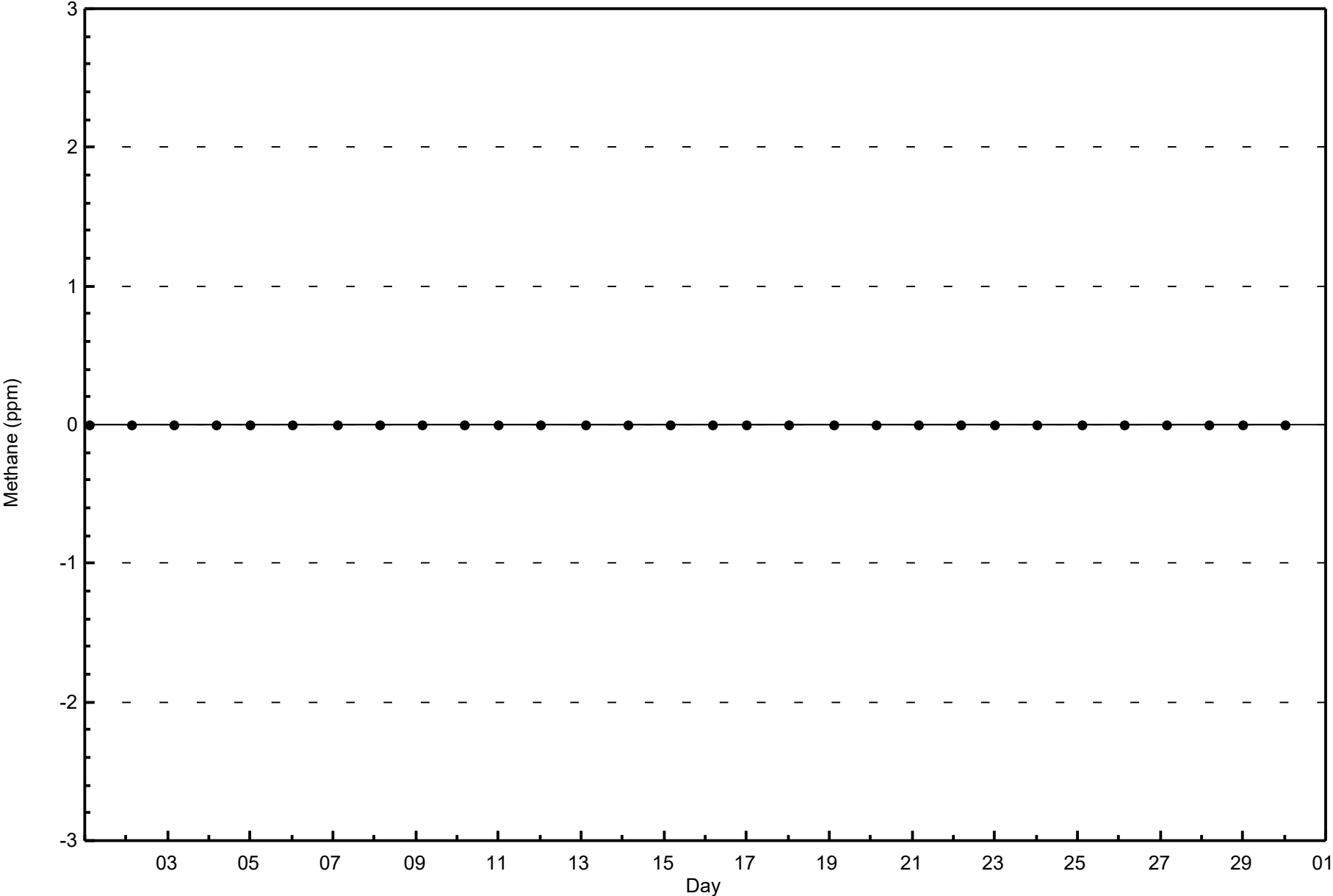
Total Number of Hours: 720

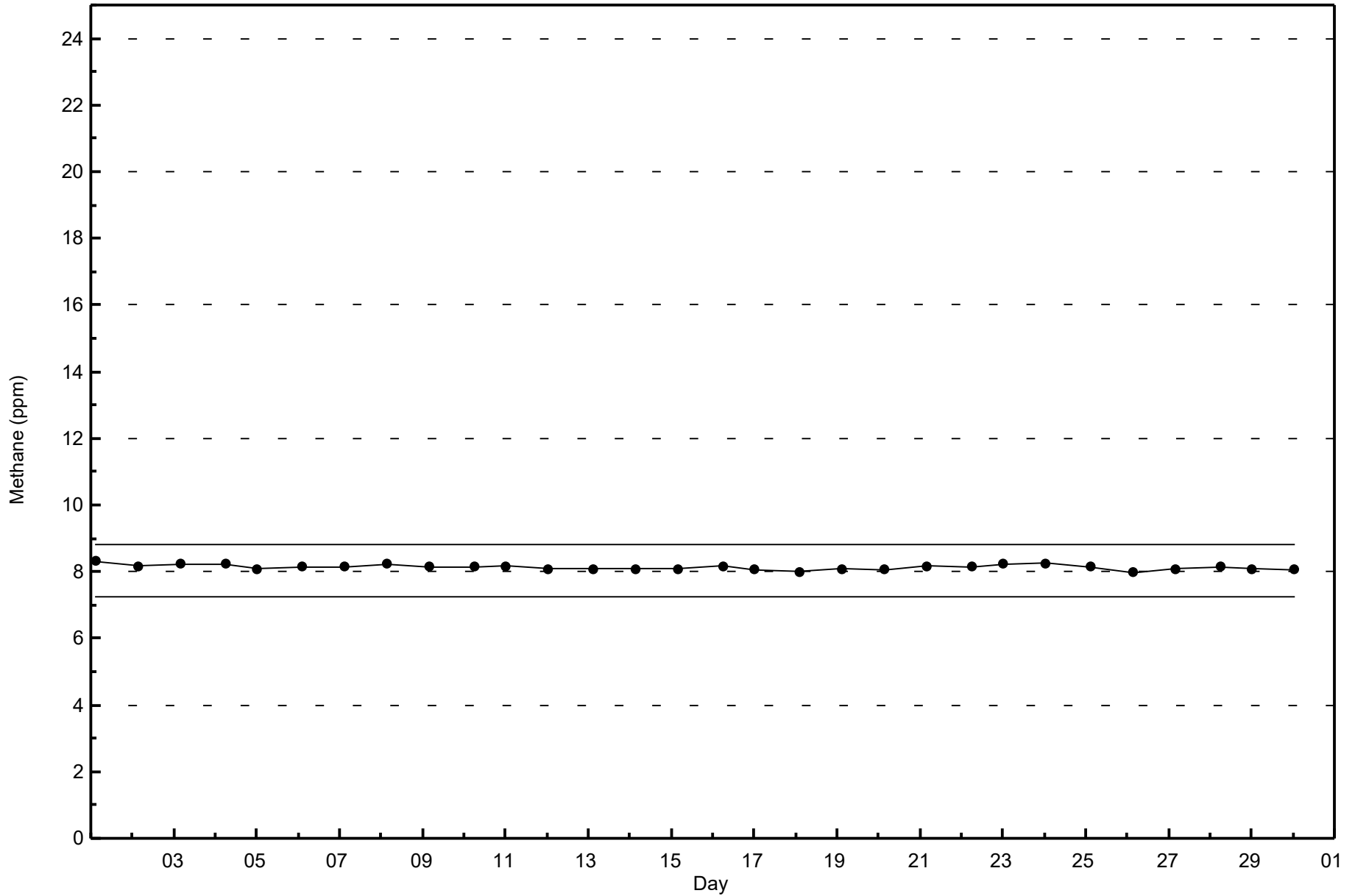


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

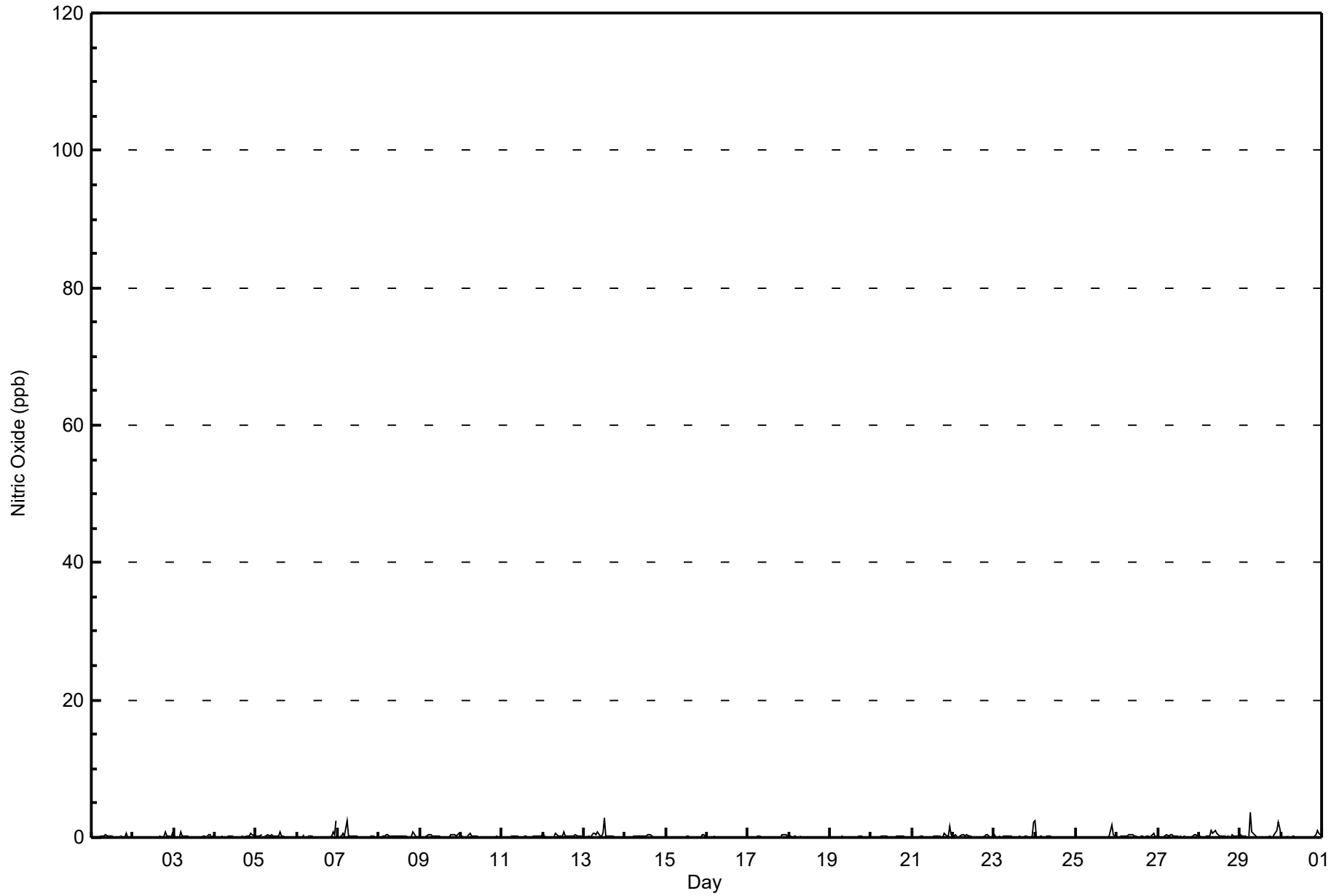
Nitric Oxide (NO) - ppb
Janvier - June 2023

Maximum Value: 3.6 ppb on Jun 29 07:00		Maximum Daily Average: 0.5 ppb on Jun 29		Hours in Service: 720																									
Minimum Value: 0.0 ppb on Jun 15 18:00		Minimum Daily Average: 0.1 ppb on Jun 19		Hours of Data: 676																									
Maximum Diurnal Average: 0.4 ppb at hour 24		Minimum Diurnal Average: 0.1 ppb at hour 17		Hours of Missing Data: 44																									
Monthly Average: 0.19 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.4 P ₉₉ = 1.9		Hours of Calibration: 38																									
				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-Jun	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.1	0.6	0.0	0.0	0.0	0.1	0.6			
2-Jun	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.2	0.1	0.1	0.7	0.1	0.8			
3-Jun	0.1	0.2	Z	0.1	0.8	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.2	0.2	0.8			
4-Jun	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	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	0.7	0.4	0.1	0.1	0.7			
5-Jun	0.2	0.2	0.2	0.4	Z	0.2	0.2	0.5	0.2	0.5	0.2	0.2	0.2	0.2	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.9			
6-Jun	0.0	0.0	0.0	0.1	0.4	Z	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	0.4	2.5	0.2	2.5			
7-Jun	Z	0.3	0.1	0.7	0.2	2.5	0.2	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.2	2.5			
8-Jun	0.1	Z	0.1	0.2	0.3	0.5	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.2	0.1	0.1	0.2	0.7			
9-Jun	0.1	0.1	Z	0.2	0.2	0.4	0.4	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.4	0.3	0.4	0.7	0.2	0.7			
10-Jun	0.2	0.1	0.1	Z	0.1	0.7	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.7			
11-Jun	0.0	0.1	0.0	0.1	Z	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	0.2	0.1	0.3	0.1	0.2	0.2	0.1	0.3			
12-Jun	0.5	0.2	0.1	0.1	0.1	Z	0.1	0.6	0.4	0.2	0.1	0.1	0.7	0.1	0.1	0.3	0.1	0.2	0.3	0.4	0.1	0.2	0.1	0.2	0.2	0.7			
13-Jun	Z	0.1	0.1	0.1	0.1	0.7	0.6	0.3	0.8	0.2	0.1	0.7	2.9	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	2.9			
14-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.5			
15-Jun	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.1	0.1	0.5			
16-Jun	0.0	0.0	0.0	Z	0.1	0.0	0.0	M	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.1			
17-Jun	0.0	0.0	0.0	0.0	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.4	0.4	0.3	0.2	0.1	0.4			
18-Jun	0.1	0.3	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3			
19-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.1	0.3			
20-Jun	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2			
21-Jun	0.0	0.0	Z	0.1	0.1	0.2	0.2	PF	PF	PF	PF	PF	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.5	0.2	0.2	1.6	0.5	0.3	1.6			
22-Jun	0.2	0.4	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.4	0.3	0.2	0.1	0.2	0.2	0.4			
23-Jun	0.3	0.1	0.0	0.3	Z	0.3	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.3	0.0	0.0	0.2	0.1	0.1	0.1	0.2	2.2	0.2	2.2			
24-Jun	2.4	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.3	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	2.4			
25-Jun	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.2	0.9	1.7	0.4	0.1	0.2	1.7			
26-Jun	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.5	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.1	0.2	0.6			
27-Jun	0.1	0.1	Z	0.2	0.2	0.5	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.1	0.2	0.5			
28-Jun	0.2	0.1	0.1	Z	0.1	0.1	0.1	1.0	0.6	0.9	0.6	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.1	0.2	0.1	0.3	0.3	1.0			
29-Jun	0.5	0.2	0.1	0.2	Z	0.1	3.6	0.8	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.1	0.1	0.4	1.1	2.3	1.4	0.5	3.6			
30-Jun	0.2	0.1	0.1	0.1	0.2	Z	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	0.4	1.1	0.7	0.5	0.2	1.1			
																								Diurnal Average					
																								Diurnal Maximum					
																								0.2 0.1 0.1 0.1 0.2 0.3 0.3 0.3 0.2 0.2 0.1 0.1 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.3 0.3 0.4					
																								2.4 0.4 0.3 0.7 0.8 2.5 3.6 1.0 0.8 0.9 0.6 0.7 2.9 0.4 0.9 0.3 0.2 0.3 0.5 0.8 0.9 1.7 2.3 2.5					
Z - zerospan																								C - Calibration		M - Maintenance		PF - Power Failure	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Janvier - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - June 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
Janvier - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	62	98	47	27	17	12	22	23	60	87	62	49	35	19	20	32	672
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	98	47	27	17	12	22	23	60	87	62	49	35	19	20	32	672

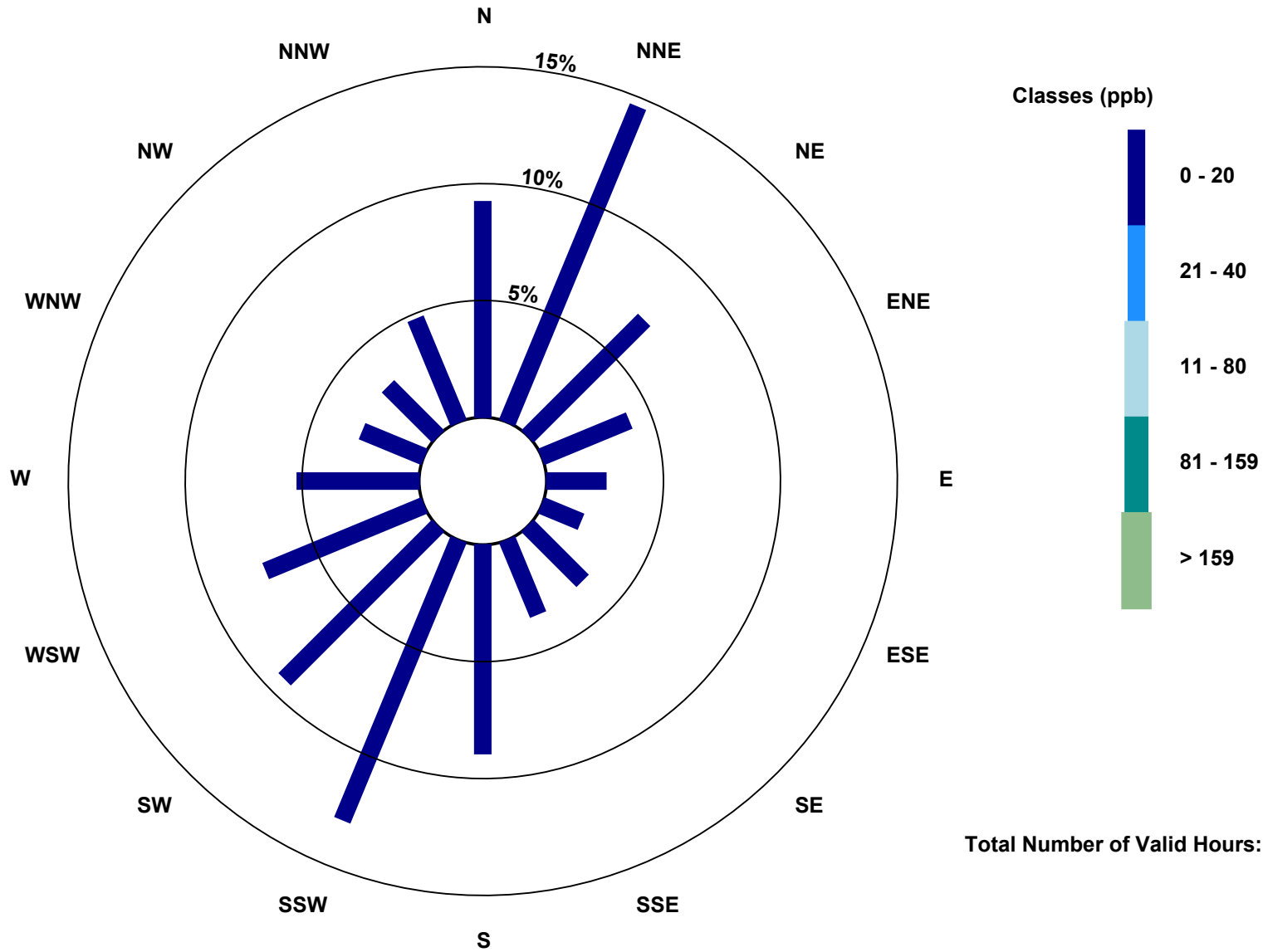
Total Number of Valid Hours: 672

Total Number of Hours: 720

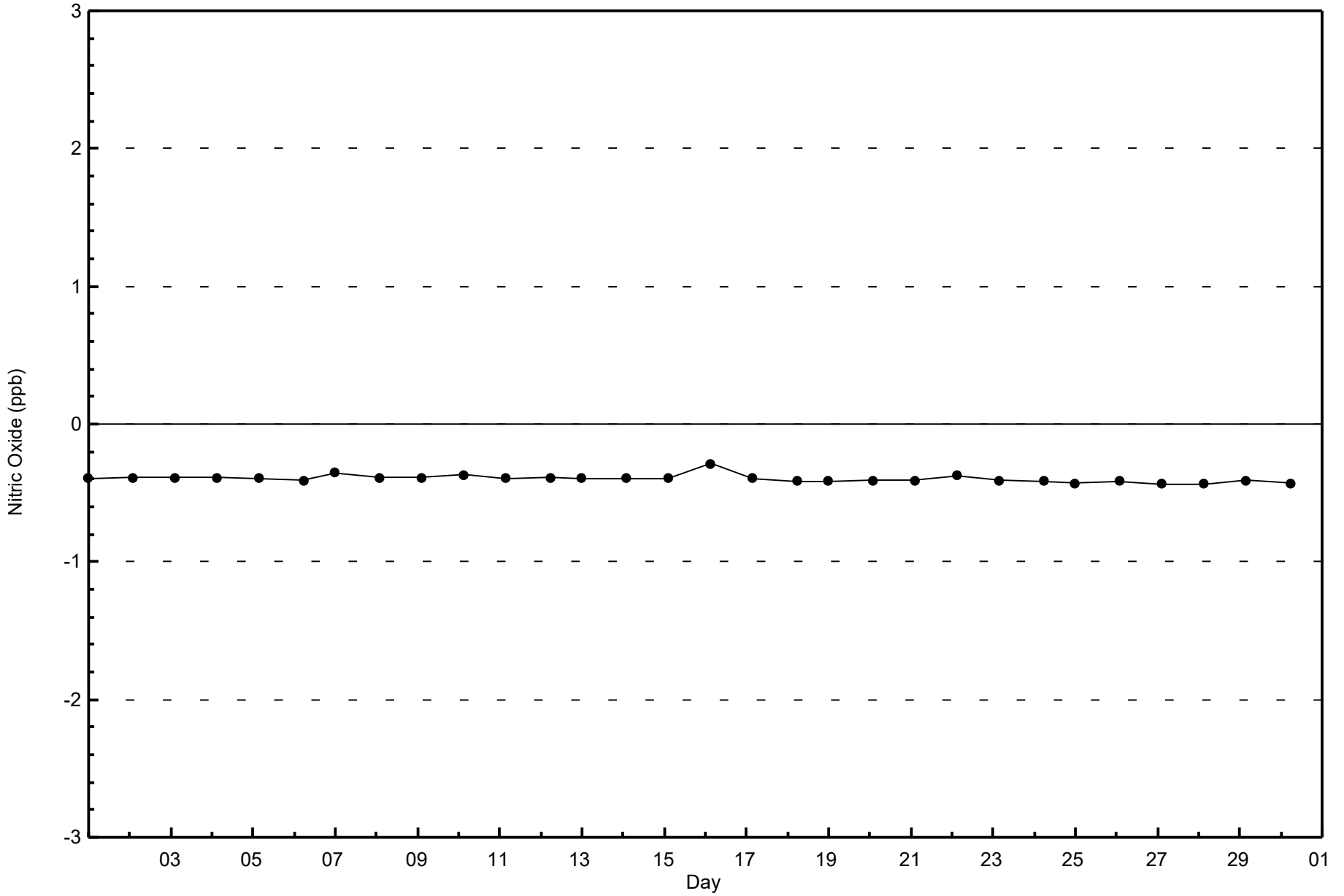


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Janvier



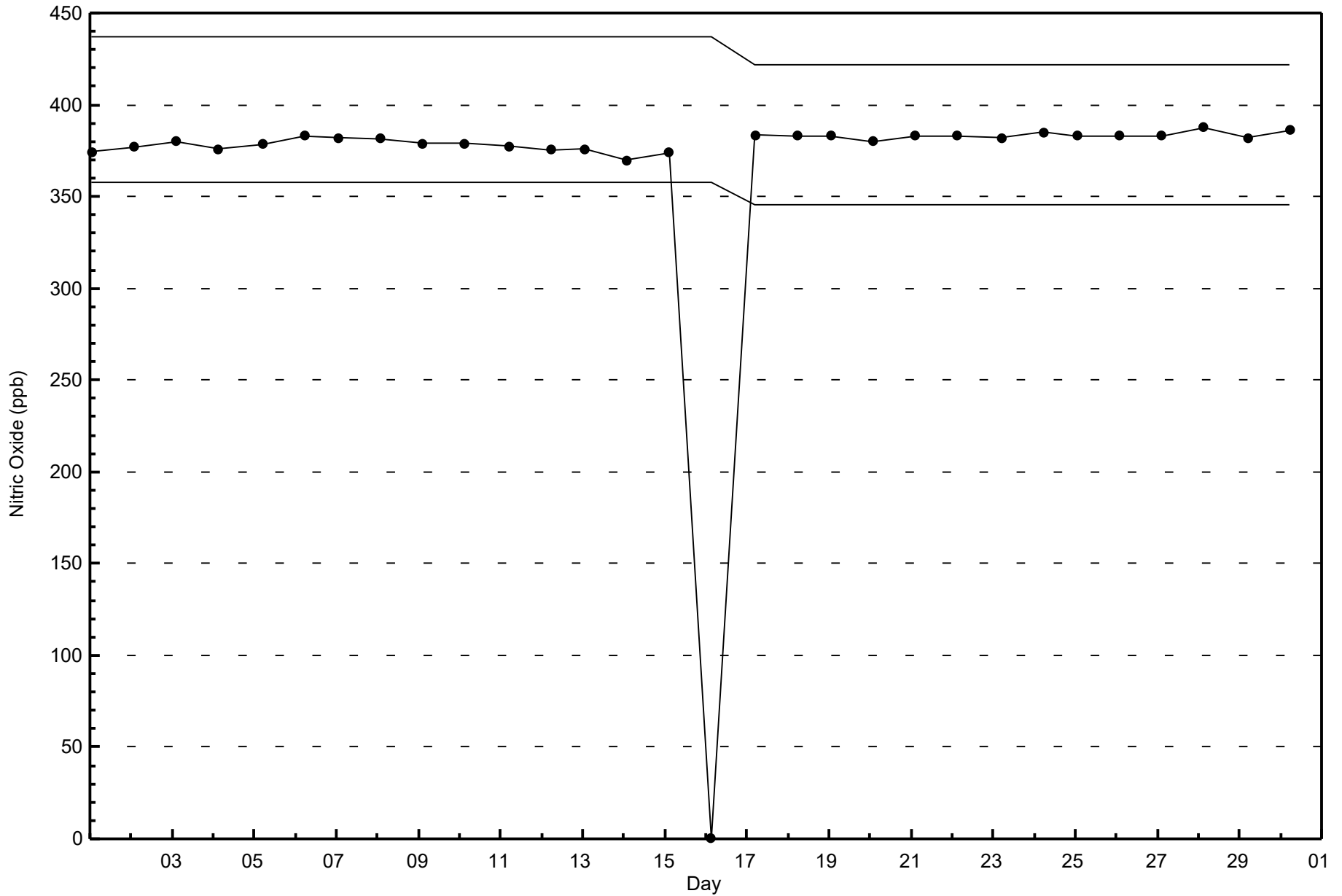
Total Number of Valid Hours: 672





Wood Buffalo Environmental Association
Span Responses

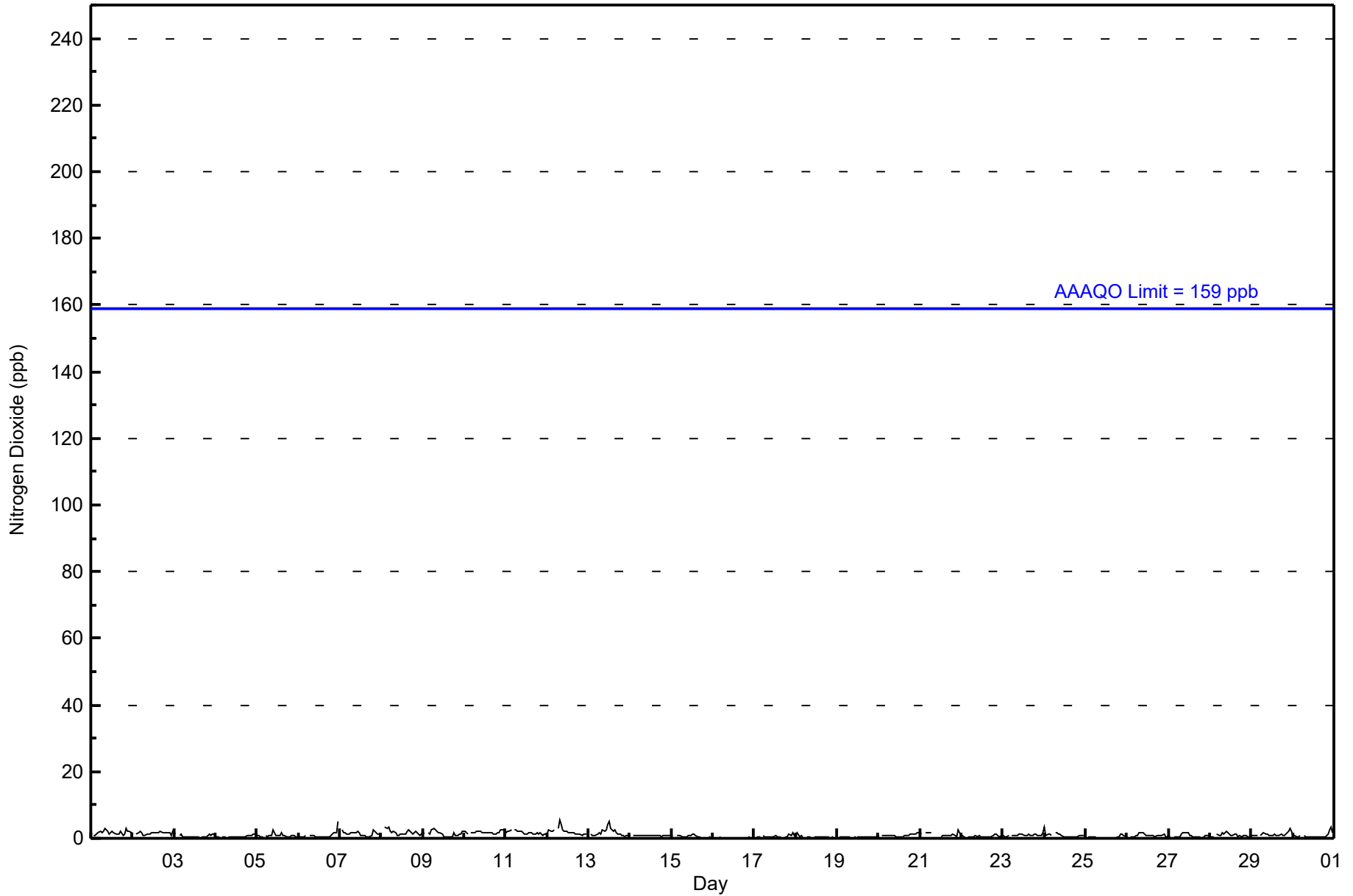
Nitric Oxide (NO) - ppb
Janvier - June 2023





Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Janvier - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - June 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
Janvier - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	62	98	47	27	17	12	22	23	60	87	62	49	35	19	20	32	672
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	98	47	27	17	12	22	23	60	87	62	49	35	19	20	32	672

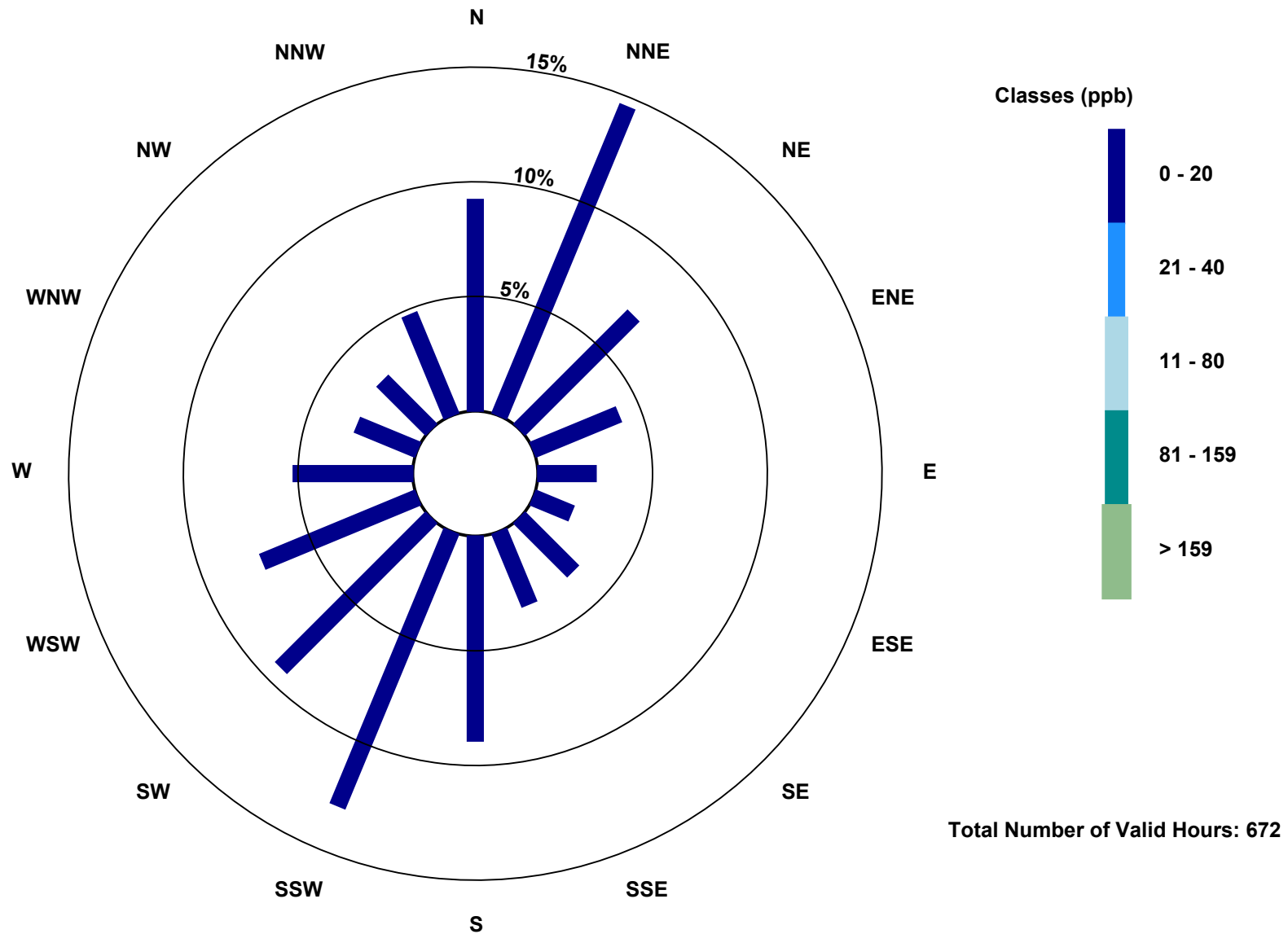
Total Number of Valid Hours: 672

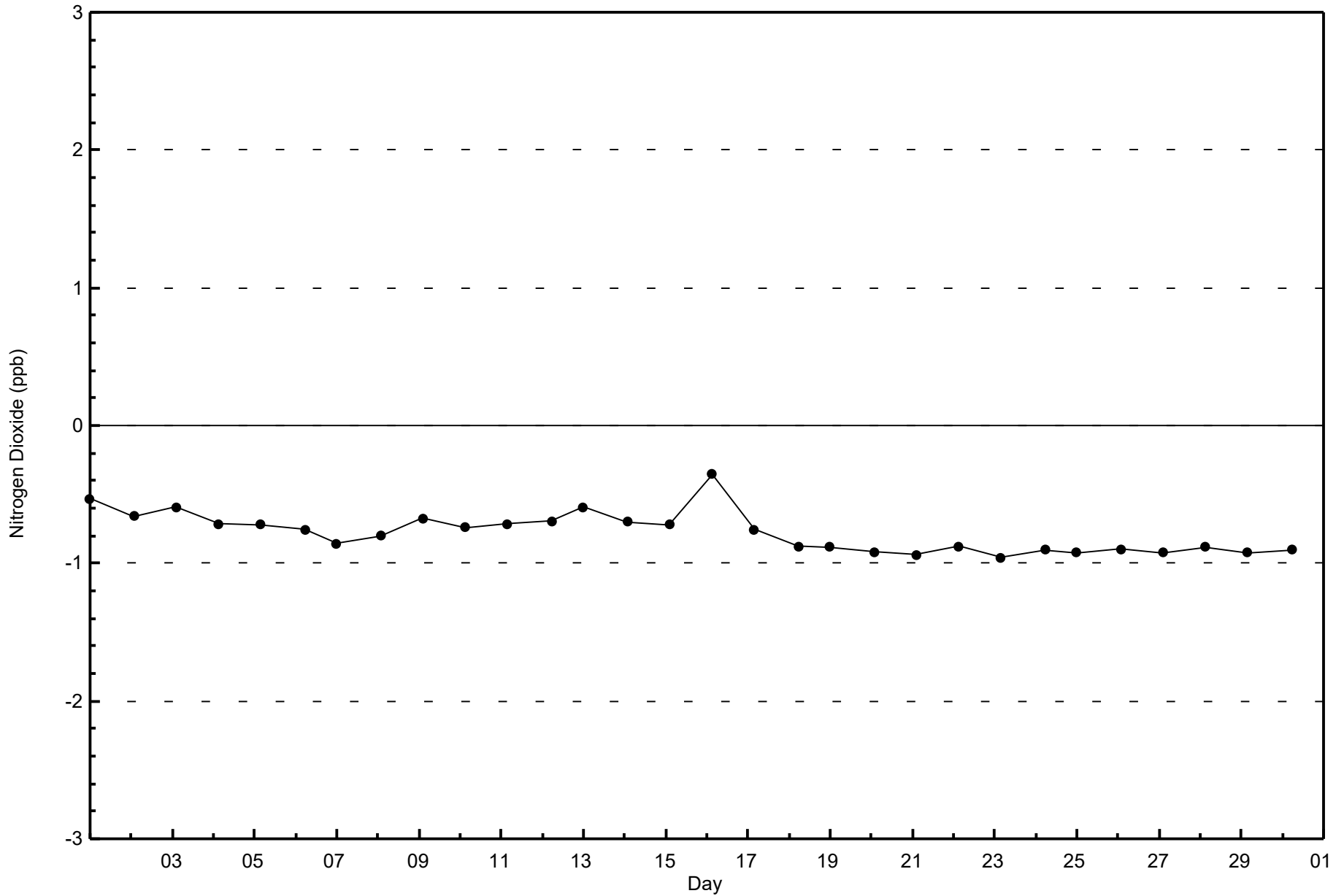
Total Number of Hours: 720

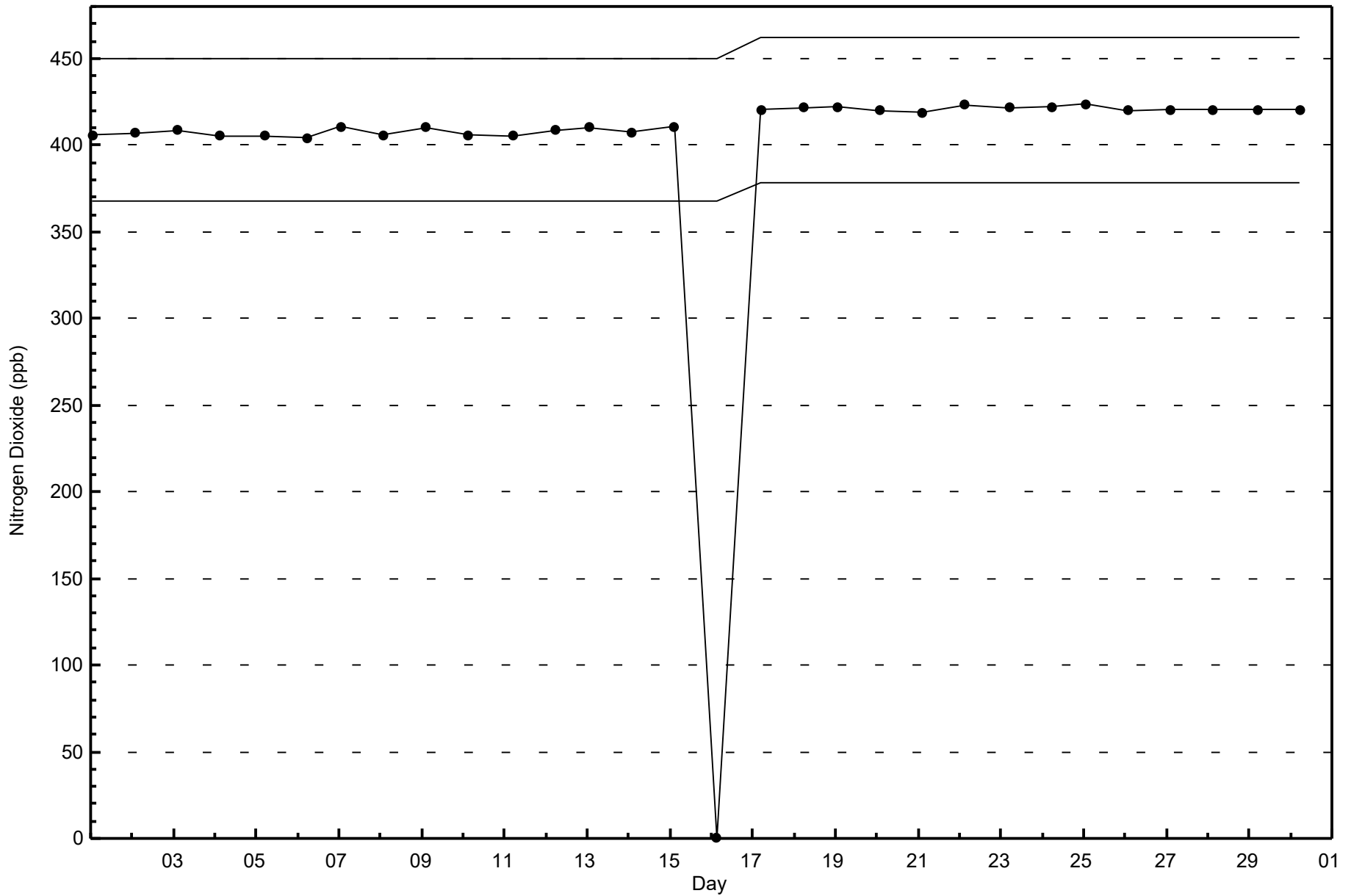


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

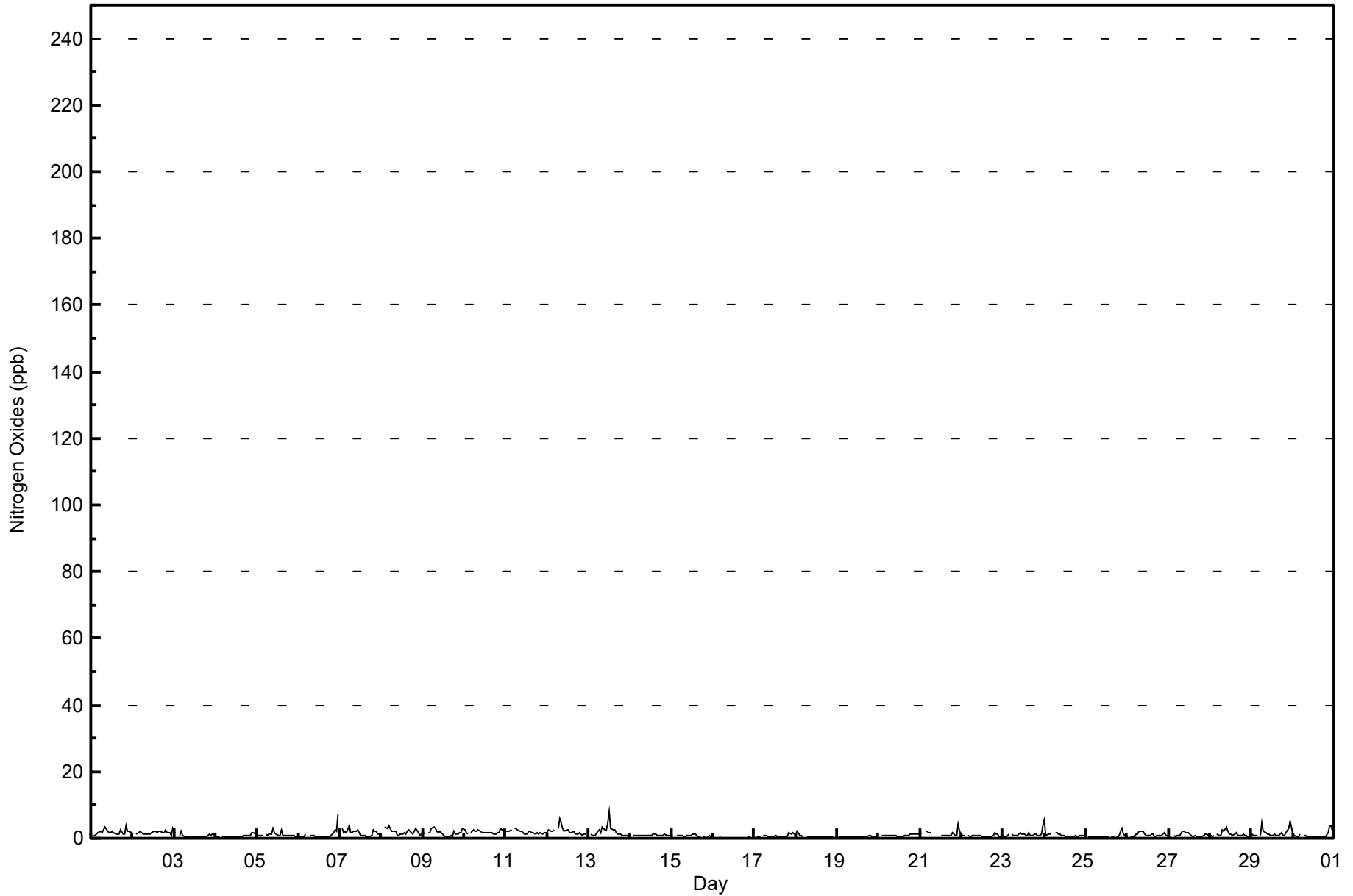
Nitrogen Oxides (NO_x) - ppb
Janvier - June 2023

Maximum Value: 8.0 ppb on Jun 13 13:00		Maximum Daily Average: 2.2 ppb on Jun 12		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 16 03:00		Minimum Daily Average: 0.4 ppb on Jun 19		Hours of Data: 676																						
Maximum Diurnal Average: 1.6 ppb at hour 24		Minimum Diurnal Average: 0.8 ppb at hour 18		Hours of Missing Data: 44																						
Monthly Average: 1.21 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.0 Q ₃ = 1.6 P ₉₀ = 2.2 P ₉₉ = 4.7		Hours of Calibration: 38																						
				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-Jun	Z	0.9	1.0	1.2	1.6	2.3	1.7	2.3	3.3	2.3	1.5	1.7	2.1	1.7	1.4	1.2	1.4	2.5	1.1	1.4	3.6	2.0	2.1	1.6	1.8	3.6
2-Jun	1.4	Z	1.4	1.5	2.1	1.6	1.1	1.1	1.4	1.2	1.4	1.7	2.0	2.0	1.9	1.9	2.1	1.8	1.8	2.5	1.7	1.7	1.0	2.9	1.7	2.9
3-Jun	1.6	1.6	Z	0.8	2.2	0.8	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.4	0.3	0.4	0.5	0.6	0.6	1.4	1.0	1.4	1.3	0.8	2.2
4-Jun	0.6	0.4	0.4	Z	0.6	0.3	0.2	0.2	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.6	0.7	0.7	0.8	1.0	1.0	1.7	1.7	1.2	0.6	1.7
5-Jun	1.0	0.9	0.7	0.9	Z	1.1	0.8	1.3	1.1	3.1	1.8	1.1	0.9	0.9	2.4	0.8	1.0	0.6	0.7	0.7	0.9	1.0	0.6	0.4	1.1	3.1
6-Jun	0.3	0.3	0.4	0.6	1.3	Z	0.8	0.9	0.9	0.9	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.7	1.8	2.7	2.2	7.4	1.1	7.4
7-Jun	Z	2.9	1.8	2.3	1.6	3.6	1.9	1.9	1.9	2.0	2.3	1.8	1.0	1.0	0.8	0.6	0.4	0.4	0.8	2.5	2.2	2.0	1.4	1.5	1.7	3.6
8-Jun	0.9	Z	3.3	3.1	3.9	2.8	2.1	2.2	2.0	1.0	0.9	1.5	1.4	1.5	1.5	2.2	2.6	1.8	1.4	2.1	2.8	1.5	1.0	1.4	2.0	3.9
9-Jun	2.1	1.2	Z	1.8	1.6	2.8	3.4	2.8	2.2	1.8	2.0	1.2	0.6	0.6	0.5	0.5	0.6	0.5	2.0	1.3	1.3	1.6	1.7	2.9	1.6	3.4
10-Jun	2.4	1.8	1.4	Z	1.6	2.4	2.2	2.2	2.5	2.1	1.9	1.6	1.6	1.6	1.5	1.6	1.3	1.3	1.6	1.5	2.9	2.6	2.6	1.9	2.9	2.9
11-Jun	1.9	2.2	2.1	2.7	Z	2.8	2.9	2.5	2.2	2.2	1.6	1.5	1.4	2.0	2.0	1.6	1.5	1.4	1.7	1.3	1.8	1.1	1.5	1.6	1.9	2.9
12-Jun	1.8	2.7	2.2	2.1	2.6	Z	2.9	6.0	4.7	2.9	2.2	2.4	2.5	1.7	1.6	2.0	1.4	1.4	1.4	1.5	0.9	1.5	1.3	1.6	2.2	6.0
13-Jun	Z	1.2	0.9	1.0	0.8	2.1	2.4	1.6	3.3	2.5	2.7	4.8	8.0	3.1	2.4	2.7	1.8	1.5	1.2	1.0	0.9	0.7	0.9	0.9	2.1	8.0
14-Jun	1.0	Z	1.0	0.9	1.0	1.0	1.0	0.8	1.0	1.0	1.0	0.8	0.8	1.4	1.4	1.1	1.0	1.1	0.7	0.9	1.1	1.0	1.1	0.9	1.0	1.4
15-Jun	0.8	0.9	Z	0.9	0.8	0.8	0.7	0.6	0.6	0.7	1.0	0.9	1.5	1.3	1.1	0.5	0.4	0.2	0.1	0.2	0.1	0.6	1.0	0.3	0.7	1.5
16-Jun	0.1	0.0	0.0	Z	0.4	0.1	0.2	M	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	--	0.4
17-Jun	0.1	0.2	0.3	0.3	Z	0.9	0.8	0.7	0.5	0.5	0.6	0.6	0.9	0.5	0.4	0.3	0.2	0.3	0.4	0.5	1.6	1.4	1.9	1.1	0.6	1.9
18-Jun	0.9	2.0	0.7	1.0	0.6	Z	0.6	0.5	0.4	0.3	0.3	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.2	0.3	0.2	0.2	0.5	2.0
19-Jun	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.6	0.3	0.5	0.4	0.7
20-Jun	0.9	Z	1.0	1.0	1.0	0.9	0.8	0.9	0.9	0.8	0.6	0.4	0.5	0.5	0.5	0.8	1.0	0.9	1.5	1.5	1.4	1.4	1.5	1.5	1.0	1.5
21-Jun	1.7	1.4	Z	1.9	1.9	1.9	1.7	PF	PF	PF	PF	PF	0.8	1.0	1.0	1.0	0.8	0.9	0.9	1.6	0.9	0.8	4.1	2.0	1.5	4.1
22-Jun	1.0	1.0	0.9	Z	0.7	0.6	0.7	0.7	1.0	0.7	0.9	0.7	0.4	0.4	0.6	0.6	0.4	0.4	0.8	1.5	1.4	1.1	0.5	0.9	0.8	1.5
23-Jun	1.0	0.6	0.5	1.1	Z	1.2	1.0	1.0	0.9	1.3	1.7	1.2	1.1	0.9	1.0	1.5	0.9	0.8	1.4	1.2	0.8	0.9	1.2	3.7	1.2	3.7
24-Jun	5.6	0.9	1.2	1.4	1.1	Z	1.8	1.8	1.4	1.5	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.6	0.9	0.9	0.7	0.9	0.9	1.1	5.6
25-Jun	Z	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.8	2.0	2.8	1.1	0.5	0.5	2.8
26-Jun	0.5	Z	0.5	0.4	0.6	1.2	1.1	2.0	2.0	2.1	1.5	1.0	0.8	0.8	1.1	1.1	0.6	0.8	1.0	0.9	0.9	1.8	0.7	0.6	1.0	2.1
27-Jun	0.8	0.6	Z	0.7	0.6	1.0	0.8	1.5	2.2	1.9	1.8	1.7	1.1	0.9	0.5	0.6	0.4	0.4	0.3	0.3	0.6	1.1	1.2	0.8	0.9	2.2
28-Jun	0.8	0.6	0.7	Z	1.3	1.0	0.8	2.7	2.0	3.2	2.3	1.5	1.1	1.0	1.2	1.5	0.7	0.9	0.7	1.2	0.9	1.1	0.6	0.9	1.2	3.2
29-Jun	1.2	1.0	0.8	0.9	Z	1.0	4.8	2.3	1.7	1.4	1.1	0.9	1.0	1.2	0.9	0.9	1.0	1.6	0.8	0.9	1.5	3.1	5.1	3.6	1.7	5.1
30-Jun	1.0	0.8	0.5	0.5	1.1	Z	0.8	0.7	0.6	0.6	0.5	0.4	0.5	0.4	0.3	0.5	0.5	0.4	0.5	0.5	1.6	3.8	4.0	2.1	1.0	4.0
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerspan C - Calibration M - Maintenance PF - Power Failure		



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Janvier - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Janvier - June 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
Janvier - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	62	98	47	27	17	12	22	23	60	87	62	49	35	19	20	32	672
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	98	47	27	17	12	22	23	60	87	62	49	35	19	20	32	672

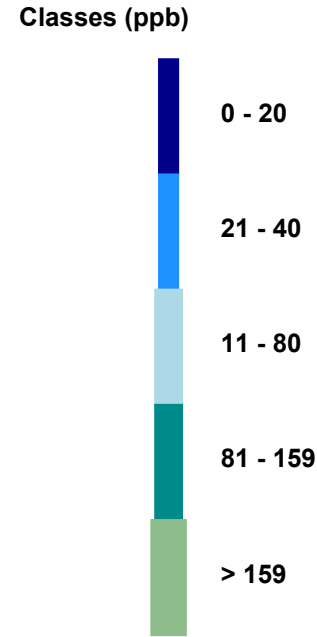
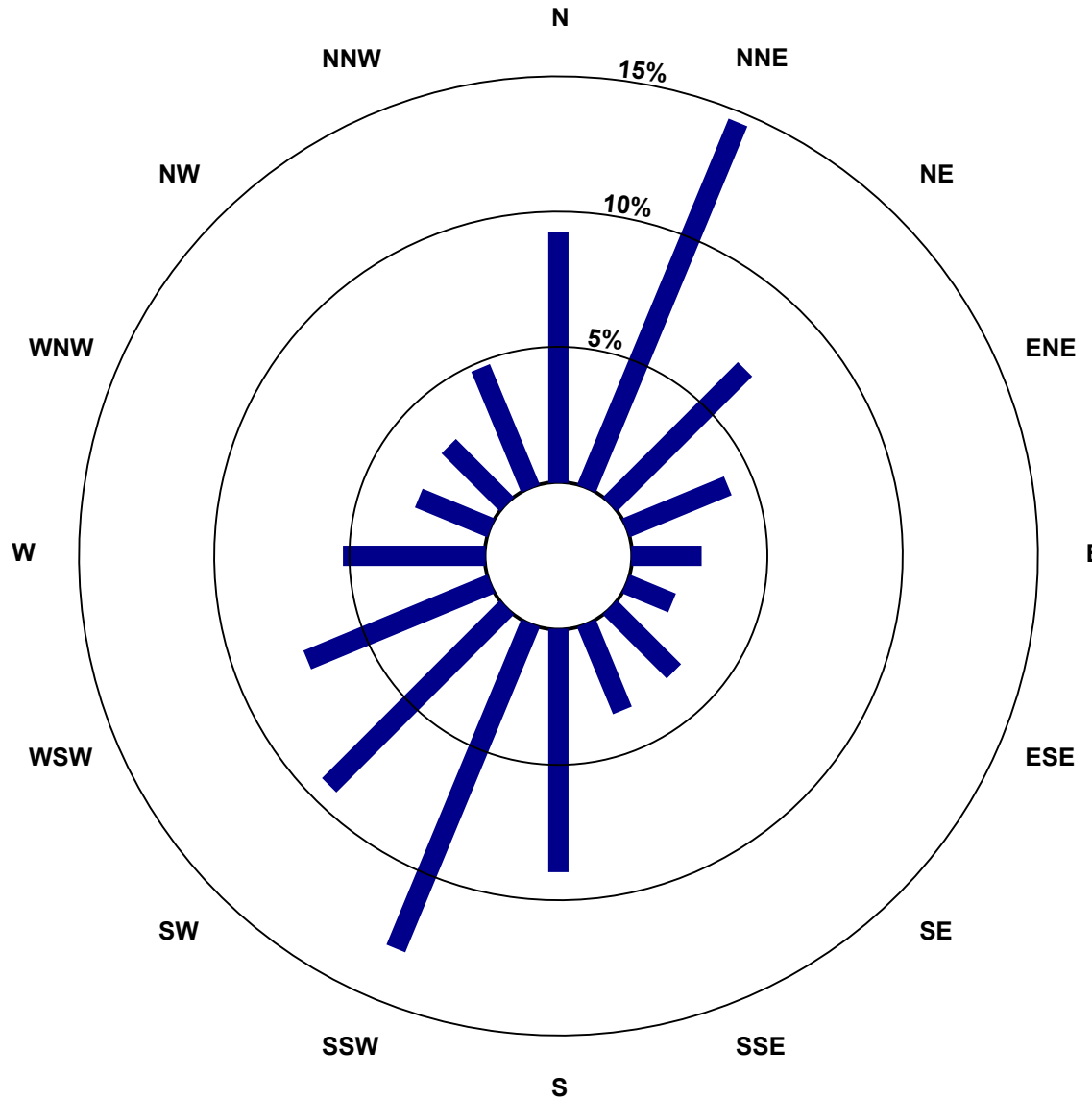
Total Number of Valid Hours: 672

Total Number of Hours: 720

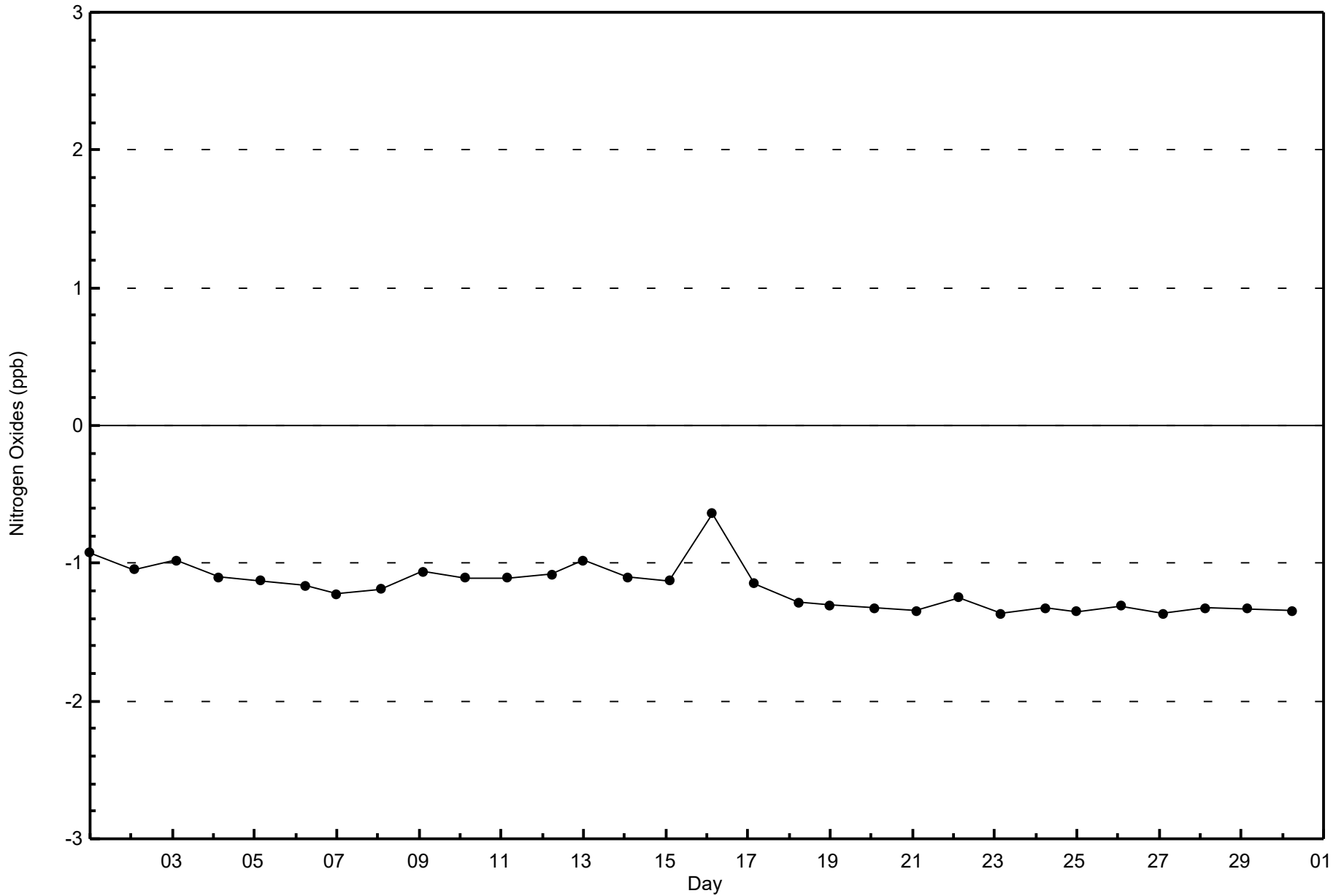


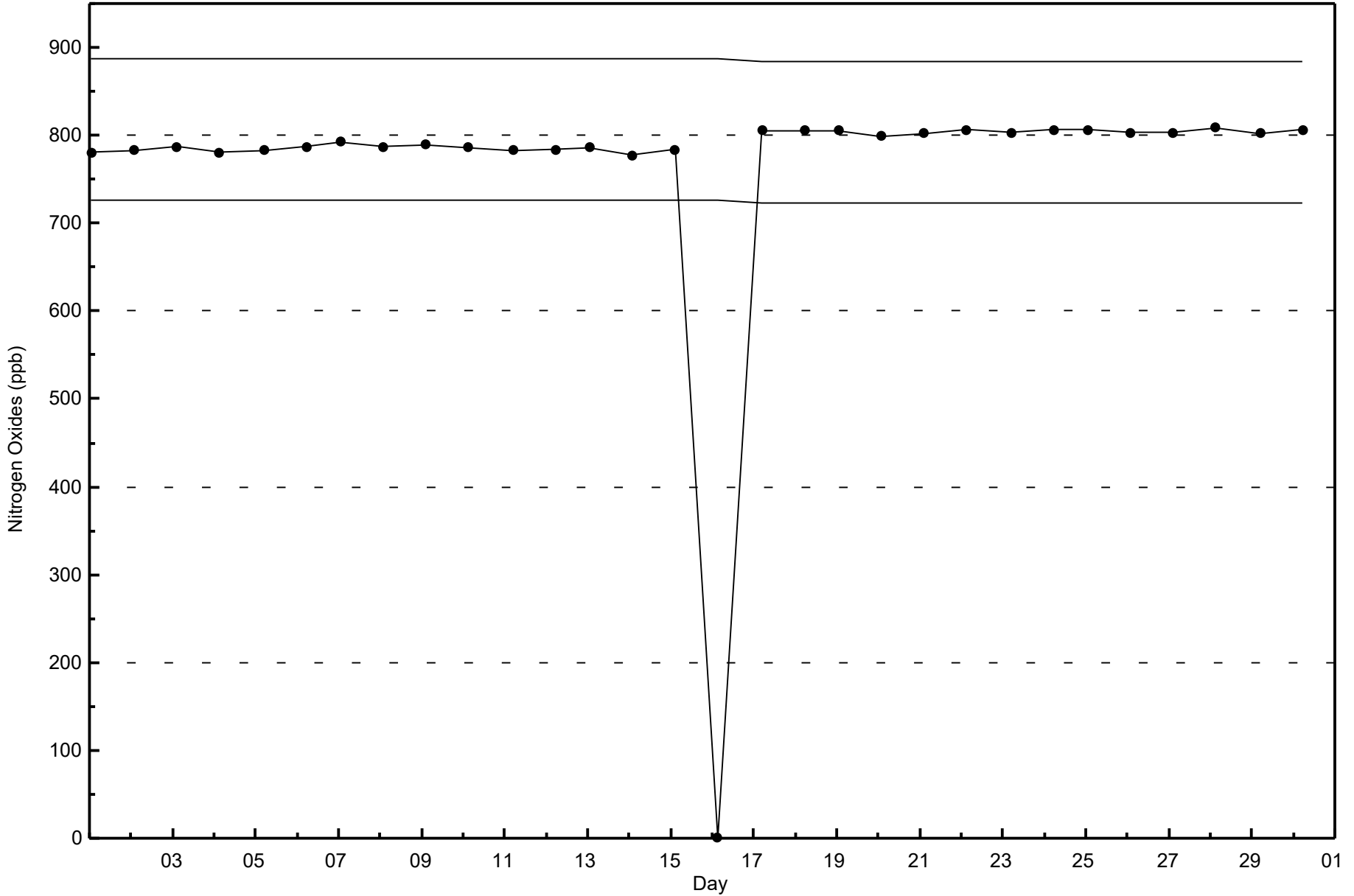
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Janvier



Total Number of Valid Hours: 672







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

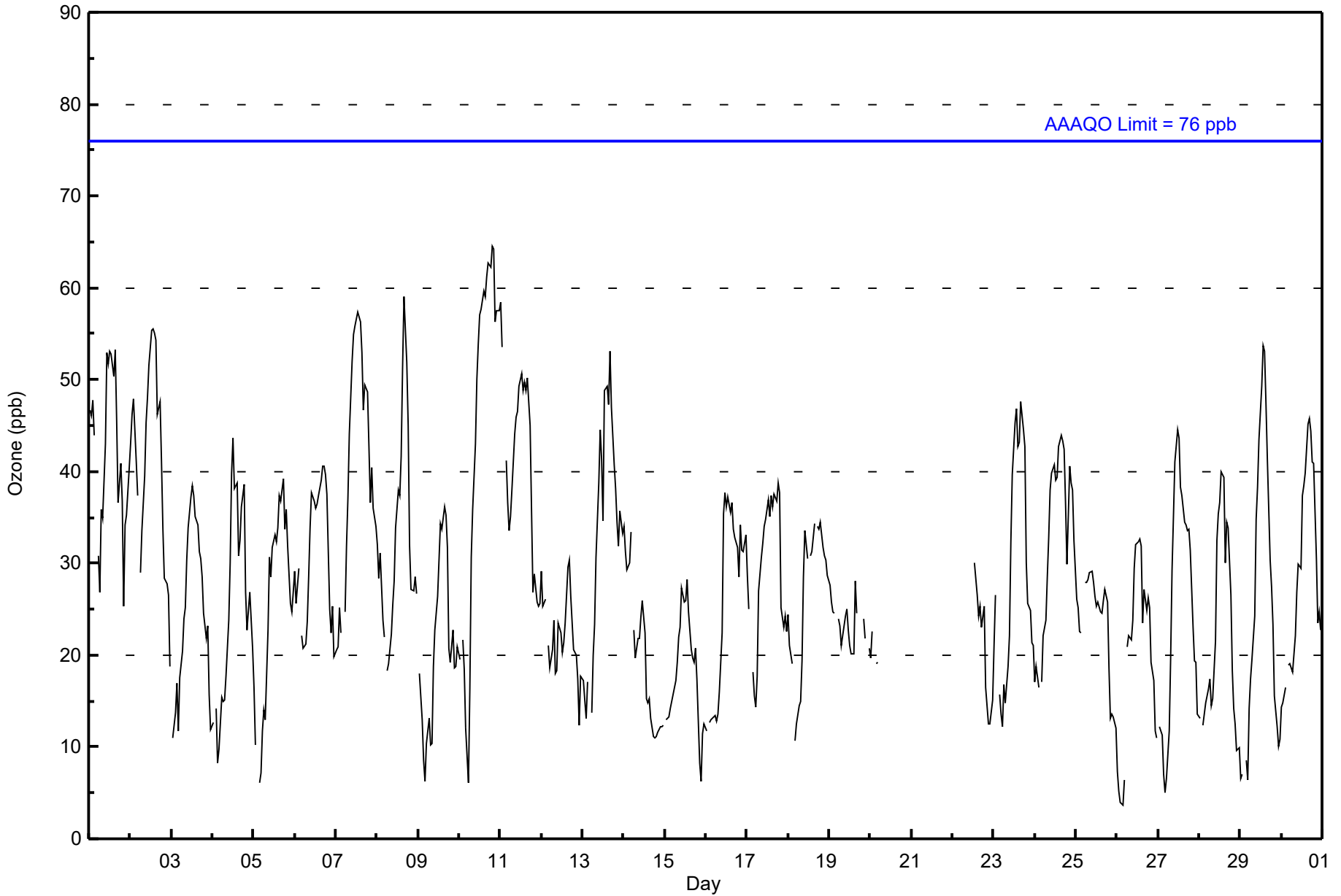
Janvier - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 64.5 ppb on Jun 10 20:00		Maximum Daily Average: 44.7 ppb on Jun 10				Hours of Data:		630																		
Minimum Value: 3.7 ppb on Jun 26 04:00		Minimum Daily Average: 18.3 ppb on Jun 15				Hours of Missing Data:		90																		
Maximum Diurnal Average: 38.4 ppb at hour 13		Minimum Diurnal Average: 16.3 ppb at hour 5				Hours of Calibration:		31																		
Monthly Average: 28.63 ppb		Percentiles: P ₁ = 6.3 P ₁₀ = 13.0 Q ₁ = 19.2 Median = 26.9 Q ₃ = 36.8 P ₉₀ = 46.2 P ₉₉ = 59.0				Percent Operational Time:		91.8																		
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-Jun	46.6	46.0	47.7	43.9	Z	30.8	26.9	35.9	34.9	43.1	52.9	51.7	53.1	52.9	50.4	53.2	45.6	36.6	40.9	36.7	25.3	34.1	35.2	40.4	41.9	53.2
2-Jun	43.2	46.2	47.9	41.0	37.3	Z	29.0	33.6	39.5	45.3	48.1	51.6	55.4	55.6	55.1	54.3	46.2	47.6	41.0	33.6	28.4	27.8	26.5	18.8	41.4	55.6
3-Jun	Z	11.0	13.7	16.9	11.7	17.5	20.5	24.0	25.2	30.4	33.9	37.2	38.5	37.4	35.1	34.1	31.3	30.5	28.6	24.6	21.8	23.1	15.7	12.0	25.0	38.5
4-Jun	12.7	Z	14.2	8.2	9.8	15.4	15.0	15.1	17.7	23.8	30.0	39.9	43.6	38.2	38.8	30.8	32.5	36.2	38.6	26.8	22.7	24.9	26.8	20.7	25.3	43.6
5-Jun	16.5	10.2	Z	6.1	7.2	11.7	14.1	13.0	22.8	30.7	28.6	31.8	33.2	32.4	33.9	37.4	36.8	39.1	33.8	35.8	31.9	25.6	24.8	26.9	25.4	39.1
6-Jun	29.2	25.7	29.5	Z	22.0	20.7	21.2	23.7	28.5	33.8	37.7	36.8	36.0	36.4	37.4	39.1	40.6	40.6	39.7	37.5	25.0	22.5	25.3	19.9	30.8	40.6
7-Jun	20.6	20.9	25.2	22.4	Z	24.7	31.9	37.0	44.1	52.0	55.0	55.8	56.7	57.3	56.3	52.9	46.7	49.5	48.7	42.7	36.7	40.5	36.0	34.0	41.2	57.3
8-Jun	32.1	28.4	31.1	23.8	21.9	Z	18.2	19.1	22.3	25.5	28.0	33.9	37.9	37.4	41.7	51.3	59.0	51.8	45.1	31.9	27.2	27.0	28.6	26.6	32.6	59.0
9-Jun	Z	18.0	13.0	8.5	6.3	10.4	13.1	10.1	10.4	18.8	22.7	26.3	30.3	34.3	33.7	36.2	35.2	31.7	20.7	19.3	22.8	18.7	18.7	20.9	20.9	36.2
10-Jun	19.5	Z	21.7	18.5	12.0	6.1	16.3	30.7	35.9	43.1	50.0	53.8	57.1	57.6	59.6	59.0	61.2	62.7	62.2	64.5	64.2	56.2	57.6	57.5	44.7	64.5
11-Jun	58.4	53.5	Z	41.1	36.6	33.5	35.1	38.0	44.0	46.0	46.5	49.2	50.7	48.8	49.8	48.8	50.1	45.0	35.9	26.8	28.8	25.8	25.3	25.7	41.0	58.4
12-Jun	29.2	25.3	26.1	Z	21.1	18.7	20.6	23.8	18.0	18.3	23.5	22.4	20.4	21.3	23.4	29.6	30.4	26.4	23.4	20.6	20.0	17.3	12.4	17.7	22.2	30.4
13-Jun	17.2	15.0	13.2	17.1	Z	13.7	19.9	23.3	30.7	38.7	44.5	41.3	34.6	48.8	49.3	47.3	53.1	47.0	40.8	38.2	34.4	31.9	35.7	33.2	33.4	53.1
14-Jun	34.0	31.3	29.2	30.0	33.5	Z	22.7	19.6	21.8	21.8	24.2	25.9	22.4	15.3	14.7	15.3	13.2	11.1	10.9	11.1	11.6	12.2	12.2	12.4	19.9	34.0
15-Jun	Z	12.9	13.3	14.1	14.9	15.7	17.2	19.2	22.0	23.0	27.3	25.8	26.0	28.2	24.7	20.7	19.7	19.3	20.7	17.3	8.2	6.3	11.4	12.5	18.3	28.2
16-Jun	11.7	Z	12.6	13.0	13.1	13.4	12.8	13.6	16.0	22.3	35.3	37.6	36.1	37.2	35.5	36.6	33.8	32.8	31.8	28.5	34.2	31.5	31.2	33.1	26.3	37.6
17-Jun	28.6	24.9	Z	18.2	15.5	14.4	17.7	27.0	30.6	32.2	34.0	34.8	37.0	35.0	37.4	36.1	37.6	36.7	38.7	37.7	25.1	23.0	24.2	22.5	29.1	38.7
18-Jun	24.4	21.1	19.0	Z	10.7	12.6	14.5	15.0	19.3	28.5	33.6	30.6	UO	30.8	31.2	34.3	UO	34.0	33.7	34.5	31.7	30.9	30.4	28.6	26.2	34.5
19-Jun	27.6	25.8	24.7	24.5	Z	23.9	23.1	21.0	22.1	24.3	25.0	22.8	21.1	20.2	20.1	28.0	24.6	UO	UO	UO	24.0	21.9	UO	20.7	23.4	28.0
20-Jun	19.6	22.6	UO	19.0	19.3	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	22.6
21-Jun	UO	UO	UO	UO	UO	UO	UO	UO	PF	PF	PF	PF	PF	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
22-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	30.0	26.5	24.3	25.3	23.0	25.4	16.5	14.5	12.5	12.5	15.0	--	30.0
23-Jun	21.0	26.5	Z	15.7	13.5	12.3	16.8	14.7	18.8	22.1	32.3	39.7	45.3	46.9	42.7	43.2	47.6	44.6	42.7	30.0	25.7	24.8	21.4	21.0	29.1	47.6
24-Jun	17.1	18.7	16.5	Z	17.1	22.2	23.7	28.5	32.9	38.0	39.8	40.7	39.0	39.4	42.7	44.0	43.3	42.4	36.6	29.9	40.6	38.7	38.0	32.4	33.1	44.0
25-Jun	26.2	25.2	22.5	22.4	Z	27.9	28.0	28.2	28.9	29.1	27.9	26.4	25.3	25.8	24.8	24.6	25.9	27.2	25.8	18.6	13.2	13.5	13.2	12.0	23.6	29.1
26-Jun	7.4	5.3	4.0	3.7	6.5	Z	20.9	22.1	21.7	23.8	29.4	32.1	32.4	32.6	31.9	23.5	27.2	24.9	26.3	25.1	19.2	17.3	11.7	11.0	20.0	32.6
27-Jun	Z	12.2	11.3	7.0	5.1	6.6	11.8	19.6	29.3	35.1	41.0	44.6	43.7	38.3	37.4	34.5	34.2	33.5	33.7	31.4	23.0	19.4	19.2	13.5	25.5	44.6
28-Jun	13.1	Z	12.3	13.6	14.9	16.3	17.4	14.5	15.2	21.4	32.5	35.4	36.6	40.0	39.4	30.1	34.5	33.9	26.5	18.4	14.2	12.6	9.7	9.9	22.3	40.0
29-Jun	6.6	7.0	Z	8.5	6.4	14.2	17.4	19.6	24.3	34.8	38.3	43.5	49.3	53.7	53.1	47.5	41.3	30.4	27.4	23.3	15.6	12.1	10.1	10.8	25.9	53.7
30-Jun	14.3	14.8	16.5	Z	18.9	19.1	18.1	20.2	22.1	26.8	29.8	29.4	37.4	38.4	39.7	45.2	45.8	44.4	41.1	40.9	30.5	23.5	24.7	22.7	28.9	45.8
																								Diurnal Average		
																								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
Janvier - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Janvier - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	177	28.10	28.10
21 - 50	414	65.71	93.81
51 - 82	39	6.19	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 630

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Janvier - June 2023**

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	20	5	6	6	4	8	10	16	45	23	1	4	2	2	4	176
21 - 50	24	72	36	19	8	8	10	9	28	41	38	42	32	15	13	19	414
51 - 82	3	7	3	0	1	0	0	0	12	3	4	5	0	1	0	0	39
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	99	44	25	15	12	18	19	56	89	65	48	36	18	15	23	629

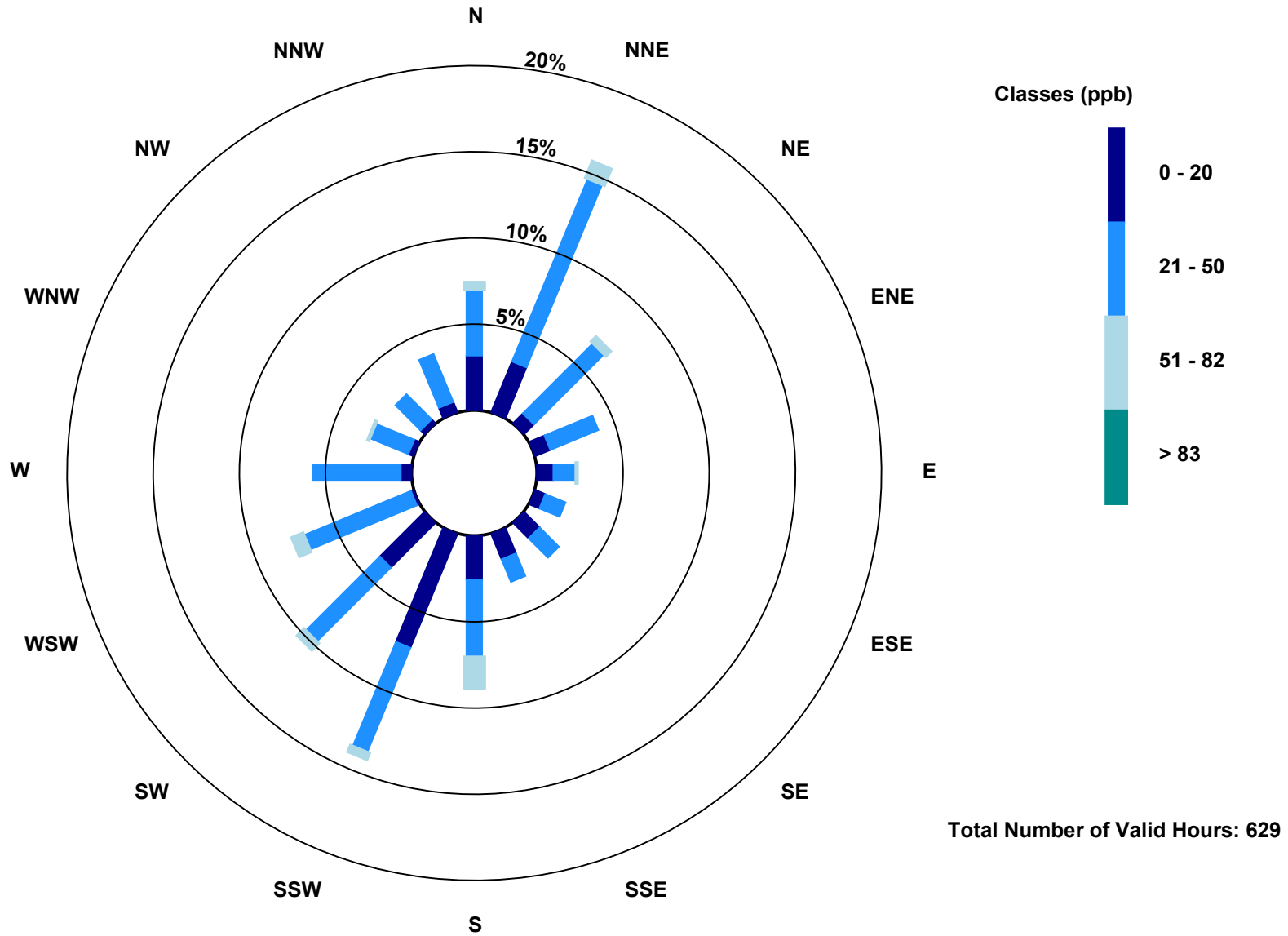
Total Number of Valid Hours: 629

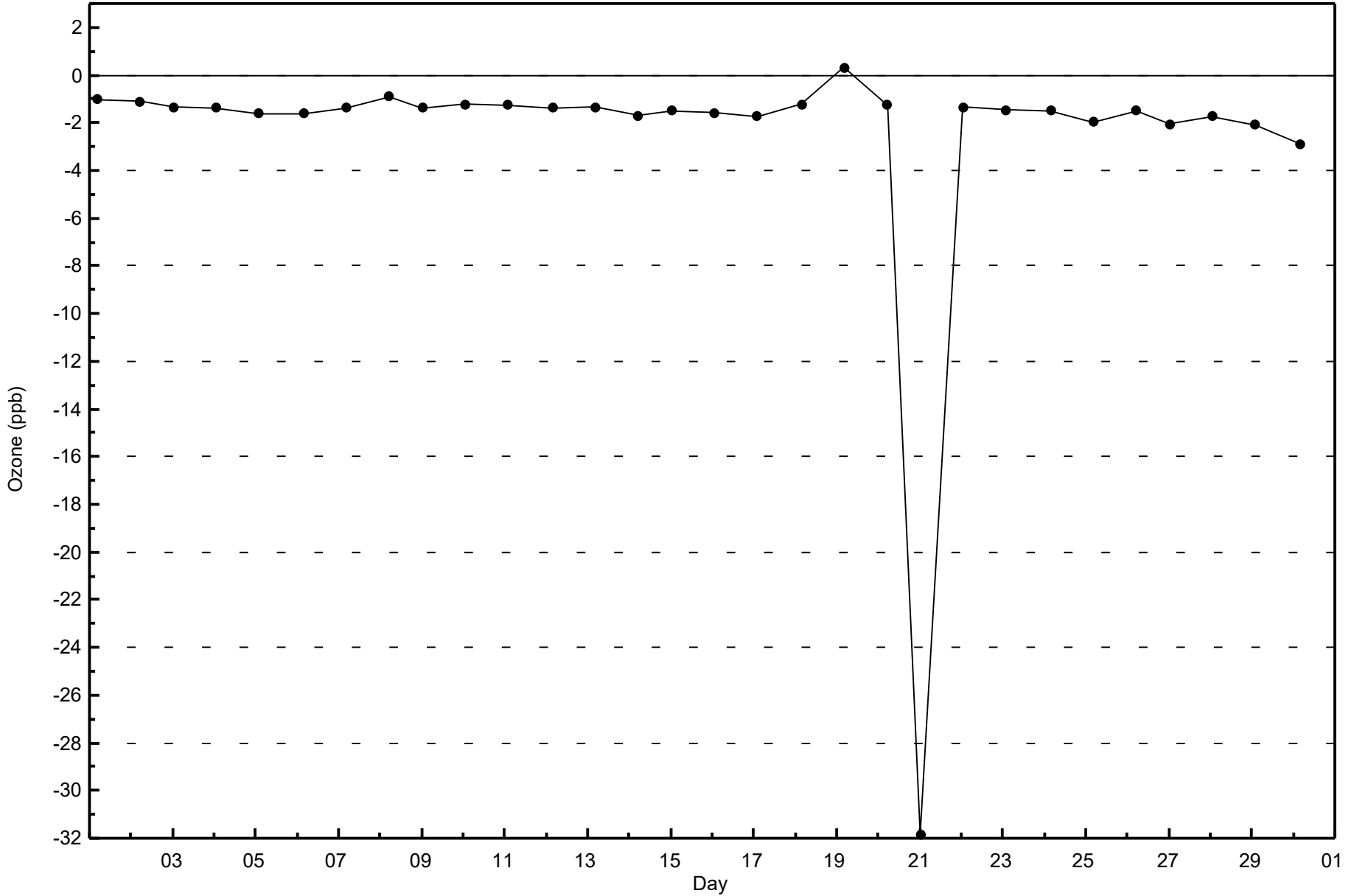
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Ozone (O₃) - ppb
Janvier

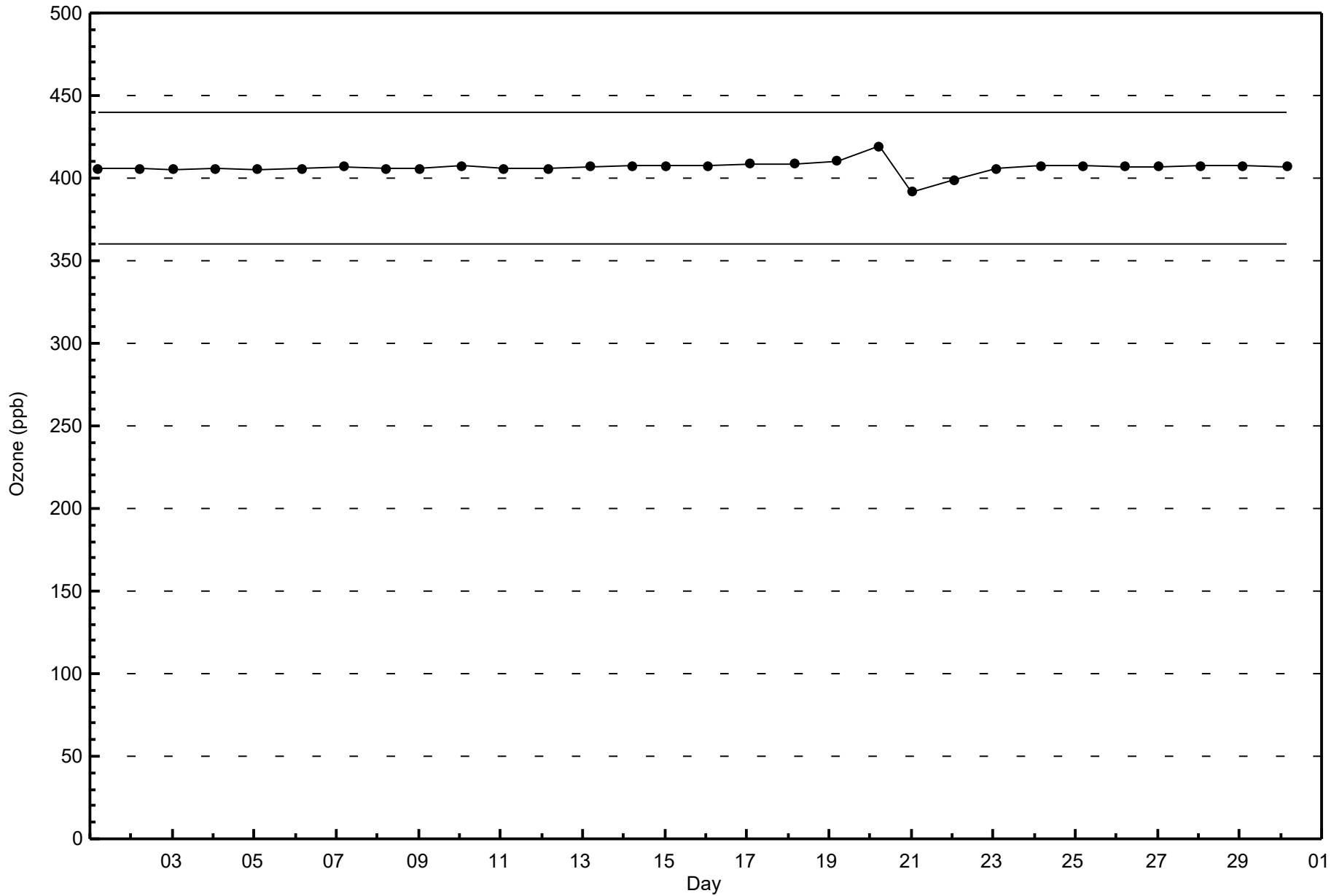






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Janvier - June 2023





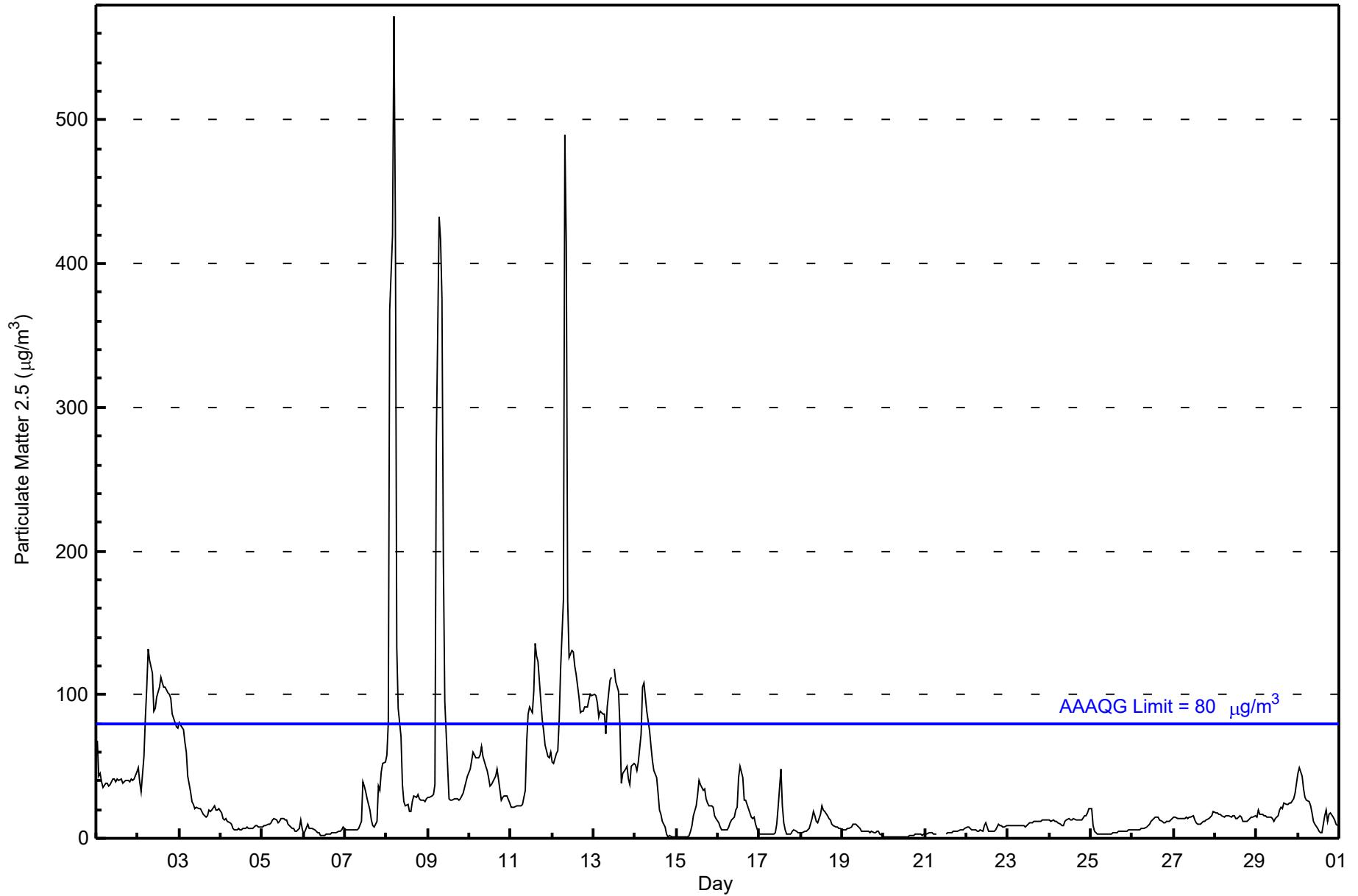
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Janvier - June 2023

Number of Exceedences (AAAQO):		1-hr: 78	24-hr: 10	Hours in Service: 720																	720																											
Maximum Value: 572.4 µg/m ³ on Jun 8 05:00		Maximum Daily Average: 130.1 µg/m ³ on Jun 12																	714																													
Minimum Value: 0.5 µg/m ³ on Jun 20 09:00		Minimum Daily Average: 1.5 µg/m ³ on Jun 20																	6																													
Maximum Diurnal Average: 55.4 µg/m ³ at hour 8		Minimum Diurnal Average: 22.5 µg/m ³ at hour 21																	1																													
Monthly Average: 31.79 µg/m ³		Percentiles: P ₁ = 0.8 P ₁₀ = 3.4 Q ₁ = 6.4 Median = 13.7 Q ₃ = 36.4 P ₉₀ = 84.3 P ₉₉ = 374.3																	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-Jun	67.9	43.5	45.1	38.9	35.7	38.4	38.7	36.4	37.8	41.1	41.6	39.1	41.1	40.2	40.9	38.2	39.4	40.4	40.3	39.5	40.9	39.8	40.9	46.4	41.3	67.9																						
2-Jun	49.1	39.3	32.3	57.3	83.1	105.7	131.4	123.9	115.3	88.7	90.8	98.3	105.5	112.4	108.6	104.9	105.4	100.9	100.4	97.8	86.5	81.0	78.0	76.8	90.6	131.4																						
3-Jun	80.5	79.1	75.6	66.7	59.8	43.6	32.2	25.8	23.5	20.8	21.8	20.9	20.2	18.9	16.4	14.6	15.8	19.3	19.0	19.5	22.6	19.9	20.0	20.4	32.4	80.5																						
4-Jun	17.7	13.9	12.7	13.9	11.9	11.1	10.1	7.2	5.8	6.3	6.4	5.9	5.8	7.0	7.0	7.5	7.2	7.1	6.9	7.8	8.7	9.1	7.8	8.1	8.9	17.7																						
5-Jun	8.2	8.8	9.1	10.0	9.9	11.0	12.5	13.4	12.3	10.9	12.2	13.4	13.7	12.6	13.0	10.2	8.4	7.0	6.7	5.2	5.3	7.1	13.3	6.7	10.0	13.7																						
6-Jun	3.2	4.8	9.7	6.9	6.4	6.4	5.5	4.8	3.9	3.4	2.4	2.1	2.3	2.5	2.8	3.1	3.6	3.9	3.8	3.8	5.3	5.3	5.5	7.8	4.5	9.7																						
7-Jun	6.0	6.1	5.9	6.0	5.8	6.1	5.5	5.5	7.0	11.6	39.6	36.4	32.0	27.6	19.9	13.2	9.3	7.5	11.9	35.9	33.8	46.4	52.1	53.5	20.2	53.5																						
8-Jun	57.9	80.6	367.6	419.9	572.4	430.9	132.6	90.7	70.6	37.1	25.1	22.9	23.8	18.6	18.4	25.1	29.3	28.4	30.0	27.1	26.7	26.3	25.2	27.9	109.0	572.4																						
9-Jun	28.8	29.0	29.4	30.8	37.2	275.5	432.1	416.6	375.3	192.6	95.8	49.9	27.7	26.3	27.0	27.4	27.6	27.7	26.9	27.9	31.5	35.5	38.9	43.5	98.4	432.1																						
10-Jun	48.1	53.7	59.7	58.5	55.8	55.7	58.4	64.0	57.2	49.7	46.7	42.2	36.5	37.6	41.0	43.4	48.2	41.6	26.3	28.6	30.0	29.9	29.3	24.9	44.5	64.0																						
11-Jun	21.5	21.3	21.5	22.2	22.2	22.4	22.5	23.8	33.5	68.1	86.9	91.7	87.5	102.1	135.4	127.2	122.4	95.2	82.6	74.9	65.2	57.4	56.2	59.7	63.5	135.4																						
12-Jun	53.1	52.2	59.2	61.3	82.8	117.6	166.4	489.8	413.5	165.1	125.8	130.3	130.2	119.9	114.4	98.2	87.6	88.0	89.0	91.1	91.2	96.5	100.3	99.2	130.1	489.8																						
13-Jun	100.7	99.3	93.9	84.8	88.4	86.8	86.4	72.6	91.6	110.1	112.3	C	118.4	109.5	102.3	78.5	38.2	45.4	47.9	50.2	41.6	37.2	49.7	51.9	78.2	118.4																						
14-Jun	51.1	46.9	53.2	72.7	105.6	108.0	98.4	88.5	74.5	63.5	53.8	47.2	42.3	31.7	19.7	16.5	11.7	7.9	3.4	1.4	1.5	1.5	0.8	0.6	41.8	108.0																						
15-Jun	0.7	0.9	1.2	1.4	1.0	0.9	1.0	1.8	4.6	8.8	15.3	27.2	30.6	40.4	37.4	33.8	34.1	27.3	24.6	22.8	22.3	21.5	15.8	13.3	16.0	40.4																						
16-Jun	10.6	7.6	5.9	5.5	5.6	6.2	7.8	10.4	12.3	15.2	19.3	21.8	42.6	50.1	41.9	26.3	26.2	23.3	17.5	15.0	13.4	15.1	10.2	3.5	17.2	50.1																						
17-Jun	3.1	3.4	3.1	3.0	2.6	2.5	2.6	3.0	3.1	3.7	9.8	21.6	48.3	22.9	10.5	5.9	3.1	3.3	3.3	4.7	5.6	4.8	4.4	4.1	7.6	48.3																						
18-Jun	4.2	4.2	4.5	5.3	5.4	6.9	14.0	18.6	15.5	11.8	10.8	16.7	22.4	19.4	18.4	15.5	14.0	12.7	10.2	8.4	8.0	7.6	7.3	6.5	11.2	22.4																						
19-Jun	5.9	6.0	6.3	6.8	7.2	7.6	9.4	10.0	10.2	8.3	6.6	4.8	4.7	4.9	5.3	4.5	3.7	4.5	4.3	4.4	5.0	4.9	3.1	1.5	5.8	10.2																						
20-Jun	1.3	1.1	1.3	1.1	0.9	0.7	0.6	0.6	0.5	0.6	0.8	1.0	1.0	1.0	1.3	1.5	1.9	2.0	2.7	2.8	2.9	2.6	2.5	2.5	1.5	2.9																						
21-Jun	2.8	2.9	3.5	3.7	3.8	3.3	2.6	PF	PF	PF	PF	PF	3.1	4.1	4.3	4.3	4.5	4.8	4.9	5.2	5.9	6.1	6.4	6.8	4.4	6.8																						
22-Jun	7.8	7.5	6.5	6.2	5.9	5.5	5.1	5.2	5.5	5.4	8.6	10.9	8.1	5.1	4.9	5.2	5.4	5.6	9.4	9.3	8.4	8.0	8.1	8.5	6.9	10.9																						
23-Jun	8.9	8.5	8.6	8.8	9.1	9.0	8.8	8.9	8.8	8.6	8.0	8.9	10.3	10.8	11.1	11.6	11.6	11.7	12.2	12.1	12.9	12.9	12.6	12.6	10.3	12.9																						
24-Jun	12.3	12.2	12.5	11.8	11.7	10.6	9.7	8.6	9.1	11.8	13.2	13.4	13.1	13.2	13.4	13.0	13.0	12.9	12.7	13.2	15.6	15.9	18.2	20.4	13.0	20.4																						
25-Jun	20.6	8.6	4.4	3.5	3.3	3.2	3.2	3.3	3.4	3.1	3.1	3.2	3.3	3.4	3.7	4.1	4.6	4.8	4.6	4.6	4.8	5.2	6.0	5.9	4.9	20.6																						
26-Jun	5.8	6.0	5.9	5.8	6.1	6.6	6.6	7.1	8.0	8.9	10.2	11.9	13.4	14.5	15.2	14.5	12.4	11.4	10.6	11.2	11.5	12.2	13.3	14.0	10.1	15.2																						
27-Jun	14.8	14.3	13.7	14.2	13.9	13.4	13.3	14.3	14.2	14.8	15.2	15.4	13.1	10.9	9.5	9.4	10.8	12.2	11.5	12.3	13.4	14.9	16.0	18.7	13.5	18.7																						
28-Jun	18.1	17.8	16.8	16.7	15.8	15.1	15.3	15.4	15.4	15.0	15.6	15.4	14.1	13.5	15.3	15.1	12.0	12.1	12.1	12.8	13.8	14.9	14.9	15.3	14.9	18.1																						
29-Jun	15.2	19.4	16.9	16.4	15.8	15.4	14.5	14.7	15.0	13.6	12.3	13.3	15.9	19.8	21.2	21.0	24.4	23.5	23.3	24.2	24.4	27.4	31.0	38.6	19.9	38.6																						
30-Jun	44.9	49.6	43.2	34.1	28.5	26.7	25.3	22.7	17.6	12.2	9.5	6.6	4.8	4.2	3.9	16.1	20.0	11.9	17.1	17.9	15.0	13.0	10.1	8.9	19.3	49.6																						
																								25.7	24.9	34.3	36.5	43.8	48.4	45.8	55.4	50.5	34.9	31.7	28.1	31.2	30.2	29.5	27.0	25.2	23.5	22.5	23.1	22.5	22.7	23.3	23.6	Diurnal Average
																								100.7	99.3	367.6	419.9	572.4	430.9	432.1	489.8	413.5	192.6	125.8	130.3	130.2	119.9	135.4	127.2	122.4	100.9	100.4	97.8	91.2	96.5	100.3	99.2	Diurnal Maximum
C - Calibration																																																
PF - Power Failure																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	142	19.89	19.89
6 - 15	259	36.27	56.16
16 - 25	86	12.04	68.21
26 - 80	150	21.01	89.22
> 81.0	77	10.78	100.00

Total Number of Valid Hours: 714

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 - June 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	30	13	8	3	3	1	2	3	4	8	11	18	11	1	7	18	141
6 - 15	5	35	16	10	6	6	13	13	23	43	34	22	15	9	2	4	256
16 - 25	3	16	8	9	0	0	1	1	4	24	5	5	5	3	2	0	86
26 - 80	20	31	11	1	2	0	3	6	24	13	12	6	4	4	7	5	149
> 81.0	6	9	5	4	6	5	3	2	5	11	7	0	2	2	4	6	77
Totals	64	104	48	27	17	12	22	25	60	99	69	51	37	19	22	33	709

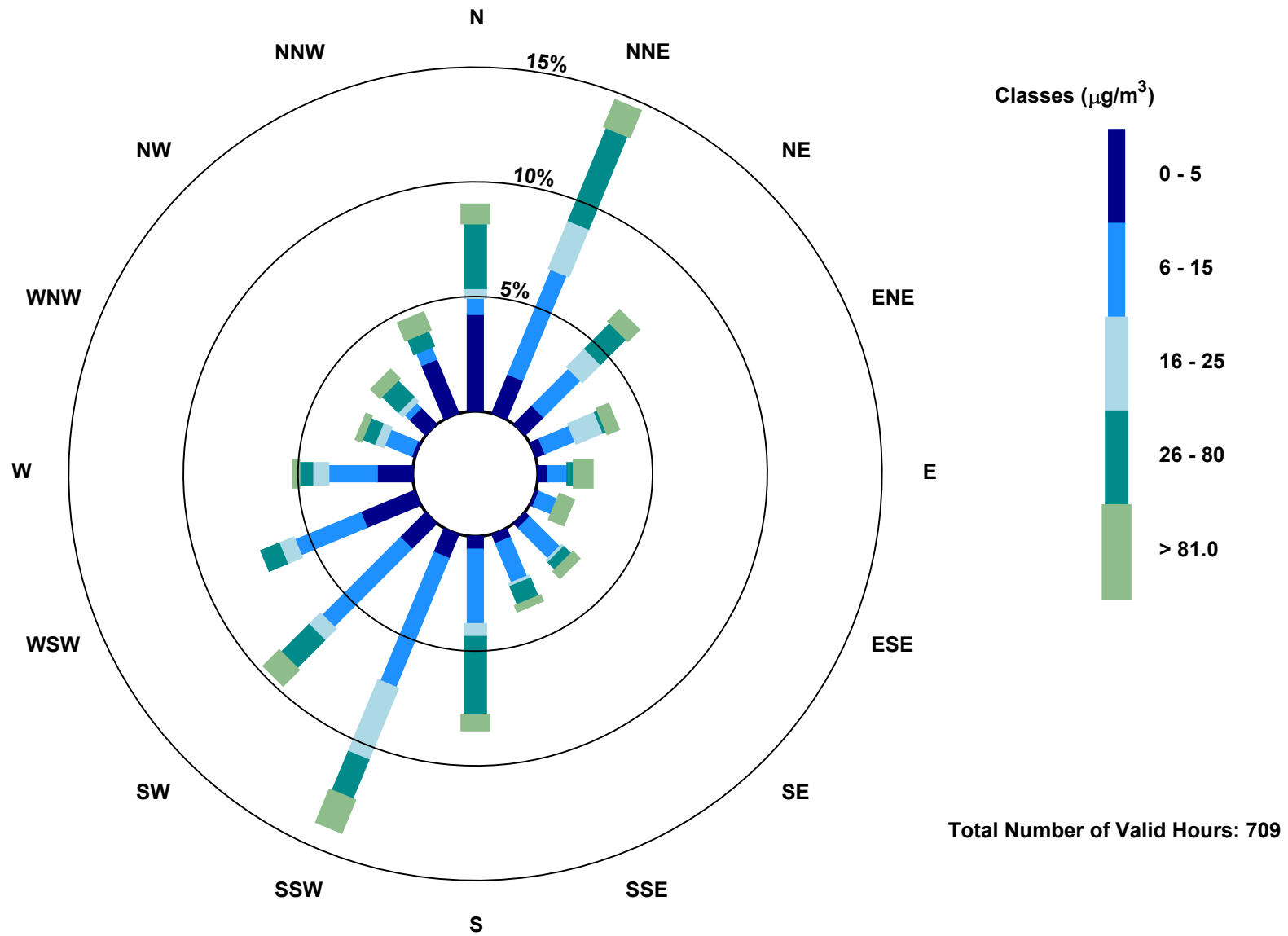
Total Number of Valid Hours: 709

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

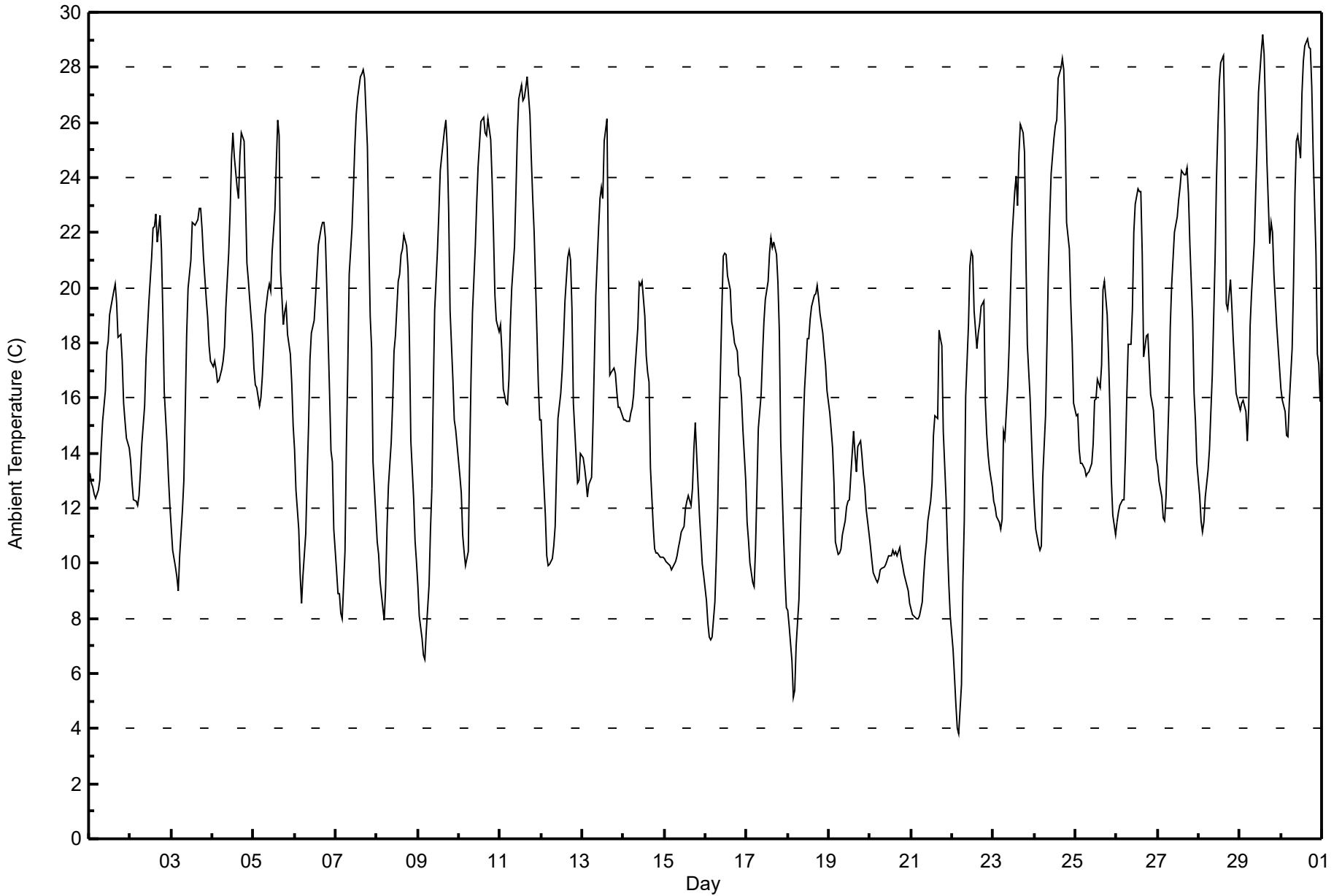




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Janvier - June 2023

Maximum Value: 29.2 C on Jun 29 14:00 Minimum Value: 3.8 C on Jun 22 05:00 Maximum Diurnal Average: 21.9 C at hour 15 Monthly Average: 16.64 C		Maximum Daily Average: 21.9 C on Jun 30 Minimum Daily Average: 9.9 C on Jun 20 Minimum Diurnal Average: 10.8 C at hour 5 Percentiles: P ₁ = 6.5 P ₁₀ = 9.9 Q ₁ = 12.3 Median = 16.2 Q ₃ = 20.6 P ₉₀ = 24.6 P ₉₉ = 28.4		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-Jun	13.3	12.9	12.8	12.5	12.4	12.6	13.0	14.2	15.1	16.3	17.7	18.0	19.0	19.3	19.9	20.2	19.5	18.2	18.3	17.3	15.8	15.2	14.5	14.2	15.9	20.2																						
2-Jun	13.7	12.9	12.3	12.3	12.1	12.5	13.3	14.3	15.7	17.4	18.5	19.5	21.1	22.2	22.2	22.7	21.7	22.6	21.4	19.1	16.2	14.3	13.1	12.1	16.8	22.7																						
3-Jun	11.3	10.5	9.9	9.5	9.0	10.3	12.0	13.0	15.6	18.3	20.0	21.0	22.4	22.3	22.5	22.9	22.9	22.1	21.1	19.6	18.9	17.9	17.3	17.2	22.9	22.9																						
4-Jun	17.1	17.3	17.1	16.6	16.6	17.1	17.3	17.8	19.3	21.2	22.7	24.7	25.6	24.8	23.6	23.3	24.8	25.6	25.3	23.2	20.9	20.3	19.6	18.2	20.8	25.6																						
5-Jun	17.1	16.5	16.4	15.7	16.0	16.8	17.9	19.0	19.9	20.1	19.9	21.3	22.8	24.6	26.1	25.5	20.6	18.7	19.1	19.4	18.3	17.6	16.5	15.0	19.2	26.1																						
6-Jun	14.1	12.7	11.2	9.6	8.6	9.5	11.1	13.2	15.0	17.4	18.3	18.8	19.7	20.7	21.5	22.2	22.4	22.4	21.8	20.0	16.1	14.1	13.7	11.2	16.1	22.4																						
7-Jun	9.7	8.9	8.9	8.2	8.0	10.4	14.3	17.2	20.5	22.2	23.6	25.1	26.3	26.9	27.6	27.8	27.9	27.6	25.1	21.8	19.0	17.8	13.7	11.7	18.8	27.9																						
8-Jun	10.8	10.3	9.3	8.4	7.9	9.1	11.3	12.8	14.4	15.8	17.7	18.3	20.2	20.5	21.2	21.4	21.9	21.5	20.7	18.0	14.5	12.3	10.8	10.1	15.0	21.9																						
9-Jun	9.2	8.1	7.3	6.7	6.5	7.5	9.2	11.2	12.7	16.2	19.2	21.4	22.7	24.2	24.8	25.7	26.1	25.1	22.8	19.2	16.7	15.2	14.8	14.3	16.1	26.1																						
10-Jun	13.2	12.6	11.0	10.4	9.9	10.4	13.9	16.8	19.1	21.5	23.1	24.4	25.2	26.1	26.2	25.6	25.5	26.2	25.4	23.9	22.0	19.8	18.8	18.4	19.6	26.2																						
11-Jun	18.7	17.7	16.3	15.8	15.7	16.7	18.6	20.0	21.5	23.4	25.5	26.8	27.4	26.8	26.9	27.2	27.7	26.3	24.7	23.2	22.0	18.4	16.5	15.2	21.6	27.7																						
12-Jun	15.2	13.9	11.7	10.3	9.9	10.0	10.2	10.6	11.3	13.4	15.2	16.2	17.0	18.1	19.5	21.1	21.4	21.0	19.2	15.8	13.8	12.9	13.0	14.0	14.8	21.4																						
13-Jun	13.8	13.5	13.0	12.4	12.9	13.1	15.0	17.4	19.7	22.2	23.2	23.6	23.2	25.3	26.1	20.6	16.8	17.0	17.1	16.9	16.2	15.7	15.7	15.4	17.7	26.1																						
14-Jun	15.2	15.2	15.1	15.2	15.4	15.7	16.1	17.1	18.6	20.2	20.1	20.2	18.9	17.6	16.9	16.6	13.5	11.4	10.5	10.4	10.4	10.2	10.2	10.2	15.0	20.2																						
15-Jun	10.2	10.0	10.0	9.9	9.8	9.9	10.0	10.3	10.6	10.8	11.1	11.3	12.0	12.3	12.5	12.1	12.7	14.2	15.1	13.9	11.7	10.9	10.0	9.6	11.3	15.1																						
16-Jun	8.7	7.8	7.3	7.2	7.3	8.6	10.2	12.0	14.8	19.3	21.2	21.3	21.2	20.5	19.9	18.8	18.5	18.0	17.7	16.8	16.7	16.0	14.9	13.0	14.9	21.3																						
17-Jun	11.5	10.9	10.0	9.3	9.2	10.5	12.7	14.9	16.1	17.5	18.8	19.6	20.3	21.2	21.8	21.5	21.7	21.2	20.2	18.4	14.4	11.0	9.5	8.4	15.4	21.8																						
18-Jun	8.3	7.7	6.5	5.1	5.4	7.0	8.7	11.0	13.0	14.9	16.3	18.2	18.2	18.9	19.3	19.7	19.8	20.1	19.6	19.1	18.4	17.8	17.2	16.3	14.4	20.1																						
19-Jun	15.5	14.9	14.2	12.9	10.8	10.3	10.4	10.6	11.0	11.6	12.1	12.2	12.3	13.2	14.8	14.0	13.3	14.2	14.4	13.9	13.2	12.8	11.9	11.1	12.7	15.5																						
20-Jun	10.6	10.1	9.6	9.4	9.3	9.4	9.7	9.8	9.9	10.0	10.1	10.3	10.2	10.5	10.3	10.4	10.3	10.6	10.2	9.9	9.6	9.2	9.0	8.6	9.9	10.6																						
21-Jun	8.3	8.1	8.0	8.0	8.0	8.1	8.6	9.5	10.3	10.8	11.5	12.3	12.9	14.7	15.4	15.2	18.4	18.1	17.9	14.8	12.3	10.6	9.2	8.1	11.6	18.4																						
22-Jun	6.9	5.9	4.9	4.0	3.8	5.6	9.3	11.5	16.1	18.6	20.8	21.3	21.2	19.2	17.8	18.4	18.7	19.3	19.5	15.9	14.7	13.9	13.4	12.8	13.9	21.3																						
23-Jun	12.3	12.1	11.7	11.5	11.2	11.6	14.8	14.6	16.4	17.8	19.9	21.8	23.5	24.1	23.0	24.9	25.9	25.6	24.9	21.1	18.0	16.0	14.5	13.1	17.9	25.9																						
24-Jun	12.0	11.2	10.7	10.5	10.6	13.1	15.3	17.9	20.6	22.6	24.1	25.4	25.9	26.1	27.6	28.0	28.3	27.9	25.9	22.4	21.4	19.5	17.9	15.8	20.0	28.3																						
25-Jun	15.4	15.4	14.1	13.6	13.6	13.4	13.2	13.3	13.3	13.6	14.4	15.9	16.0	16.7	16.4	17.2	20.0	20.2	19.0	17.4	15.5	13.0	11.8	11.0	15.1	20.2																						
26-Jun	11.5	11.9	12.1	12.3	12.3	14.0	16.0	18.0	17.9	19.2	22.0	23.0	23.6	23.5	23.5	21.3	17.5	18.3	18.3	17.2	16.1	15.6	14.6	13.8	17.2	23.6																						
27-Jun	13.5	12.9	12.4	11.6	11.5	12.4	15.8	18.6	20.1	21.0	22.0	22.6	23.2	23.6	24.3	24.1	24.1	24.3	23.4	21.6	18.8	16.2	15.2	13.6	18.6	24.3																						
28-Jun	12.5	11.6	11.1	11.5	12.4	13.4	14.2	15.5	16.8	21.0	24.0	25.8	27.5	28.2	28.4	25.7	19.4	19.2	20.3	19.3	18.1	17.1	16.2	15.8	18.5	28.4																						
29-Jun	15.6	15.8	15.9	15.5	14.4	15.6	18.6	19.8	21.7	23.5	25.2	27.1	28.6	29.2	28.5	26.5	24.6	21.6	22.3	22.0	20.5	18.6	17.8	17.1	21.1	29.2																						
30-Jun	16.3	15.9	15.5	14.7	14.6	15.9	17.8	20.2	23.4	25.3	25.5	24.7	27.0	28.2	28.8	29.1	28.8	28.7	27.3	24.9	21.2	17.6	17.3	15.9	21.9	29.1																						
																								12.7	12.2	11.6	11.0	10.8	11.7	13.3	14.7	16.3	18.1	19.5	20.4	21.2	21.6	21.9	21.6	21.1	20.9	20.3	18.6	16.7	15.3	14.3	13.4	Diurnal Average
																								18.7	17.7	17.1	16.6	16.6	17.1	18.6	20.2	23.4	25.3	25.5	27.1	28.6	29.2	28.8	29.1	28.8	28.7	27.3	24.9	22.0	20.3	19.6	18.4	Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Janvier - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	78	10.83	10.83
10 - 20	442	61.39	72.22
> 20	200	27.78	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



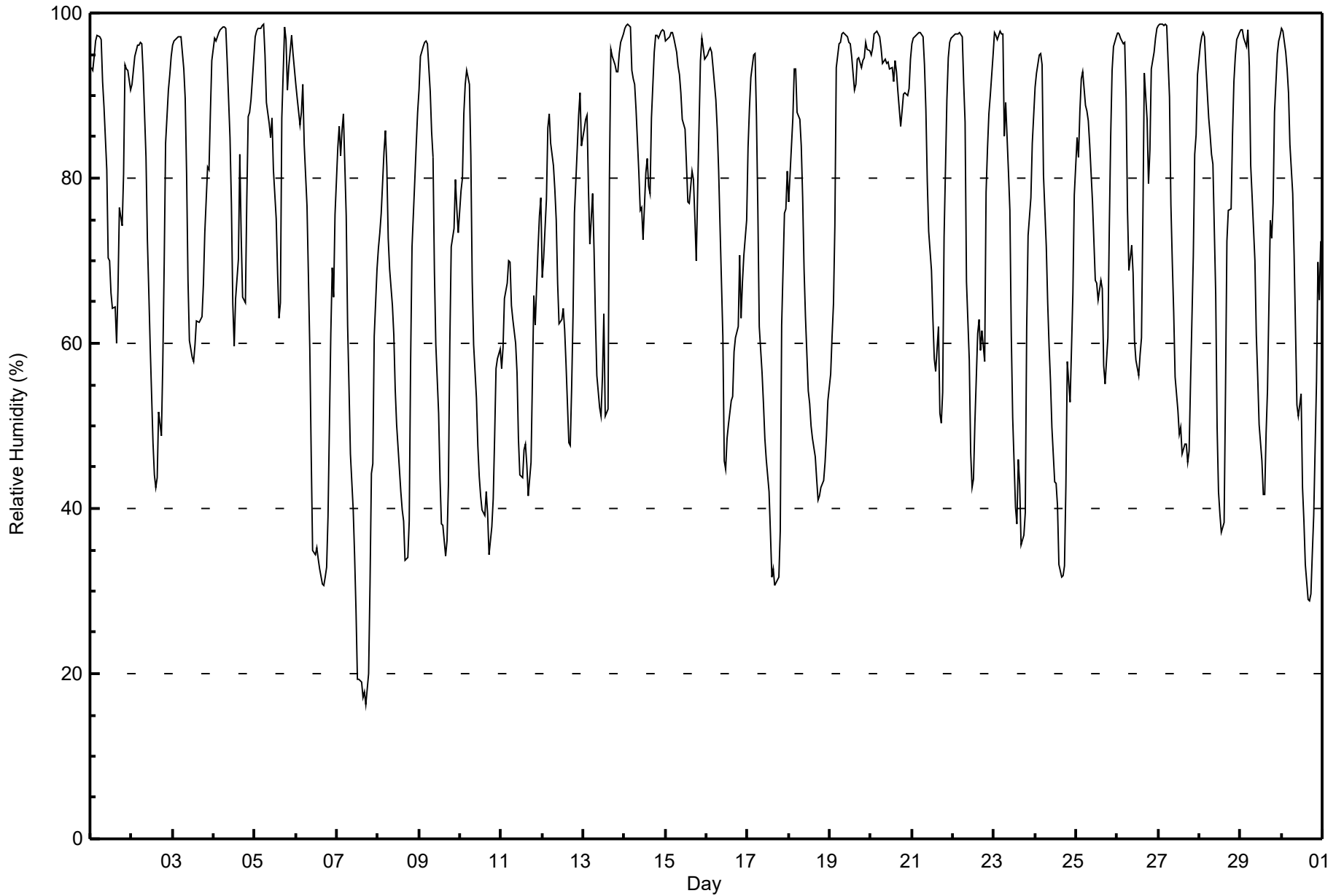
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Janvier - June 2023

Maximum Value: 98.6 % on Jun 27 05:00 Maximum Daily Average: 93.3 % on Jun 20																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 16.2 % on Jun 7 18:00 Minimum Daily Average: 47.8 % on Jun 7																						Hours of Missing Data: 0 Hours of Calibration: 0																										
Maximum Diurnal Average: 93.0 % at hour 5 Minimum Diurnal Average: 52.9 % at hour 15																						Percent Operational Time: 100.0																										
Monthly Average: 73.38 % Percentiles: P ₁ = 27.8 P ₁₀ = 42.1 Q ₁ = 57.8 Median = 77.3 Q ₃ = 93.3 P ₉₀ = 97.1 P ₉₉ = 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-Jun	93.4	93.0	94.7	96.6	97.3	97.1	96.8	91.8	88.7	81.1	70.4	70.1	66.1	64.2	64.4	60.0	66.6	76.4	74.2	80.6	93.7	93.3	93.0	90.8	83.1	97.3																						
2-Jun	91.4	93.1	94.8	96.0	96.1	96.4	96.3	92.8	82.5	72.5	66.3	59.6	47.9	44.1	42.6	43.7	51.7	48.9	57.6	69.6	84.2	90.6	92.6	94.7	75.3	96.4																						
3-Jun	96.1	96.6	96.9	97.2	97.2	97.1	93.2	89.6	80.5	67.7	60.3	58.4	57.9	59.8	62.7	62.5	62.8	63.2	67.1	73.4	81.4	81.1	88.0	94.2	78.5	97.2																						
4-Jun	96.9	96.6	97.1	97.6	98.0	98.3	98.3	98.2	94.0	84.9	76.9	64.7	59.6	65.5	70.2	82.9	72.9	65.6	64.9	77.4	87.5	87.9	89.6	94.7	84.2	98.3																						
5-Jun	97.1	97.7	98.1	98.1	98.4	98.6	94.8	89.2	86.6	85.0	87.3	81.0	75.1	68.5	63.1	64.9	87.4	98.3	96.8	90.7	93.6	97.2	95.1	93.3	89.0	98.6																						
6-Jun	91.4	89.7	86.4	88.0	91.4	84.1	76.5	68.2	59.3	46.5	34.8	34.4	35.3	33.8	32.7	30.9	30.7	31.7	32.8	39.0	61.3	69.2	65.6	75.6	57.9	91.4																						
7-Jun	83.8	86.3	82.7	85.8	87.9	75.4	62.3	54.6	46.6	39.9	34.3	27.6	19.4	19.4	18.9	17.2	17.8	16.2	20.1	30.8	44.3	45.3	60.8	69.0	47.8	87.9																						
8-Jun	71.6	73.4	75.8	83.2	85.8	81.4	72.6	68.9	64.5	60.9	54.5	50.2	44.7	42.1	39.8	38.4	33.7	34.1	38.4	57.9	71.7	79.8	84.0	88.0	62.3	88.0																						
9-Jun	90.7	94.8	96.0	96.5	96.6	96.2	90.5	85.6	82.5	68.6	59.8	51.5	43.5	38.1	37.9	34.2	36.1	42.8	60.0	71.6	73.9	79.8	76.3	73.3	69.9	96.6																						
10-Jun	78.4	80.0	87.9	91.4	93.1	91.4	82.7	67.4	59.8	53.3	47.6	43.9	41.6	39.8	39.2	42.1	39.2	34.4	37.9	41.3	48.7	56.9	58.1	59.3	59.0	93.1																						
11-Jun	56.9	59.5	65.5	67.2	70.0	69.9	64.6	62.8	60.1	56.4	48.6	44.0	43.8	47.2	47.7	45.2	41.6	45.6	55.8	65.7	62.1	71.5	75.3	77.7	58.5	77.7																						
12-Jun	68.0	70.4	77.4	86.2	87.7	84.2	81.6	78.6	74.9	67.3	62.3	62.8	64.3	61.6	57.4	47.9	47.5	54.5	63.3	75.8	83.6	87.7	90.4	84.0	71.6	90.4																						
13-Jun	86.0	87.1	87.7	78.9	72.0	78.1	71.4	62.8	56.1	52.3	51.2	55.9	63.6	51.2	52.1	80.2	95.6	94.7	93.8	92.9	92.9	95.2	96.5	97.4	76.9	97.4																						
14-Jun	98.2	98.4	98.6	98.3	93.1	92.0	91.4	88.3	80.6	76.0	76.4	72.6	80.7	82.4	79.1	78.1	87.3	95.2	97.3	97.2	96.9	97.8	98.0	97.7	89.7	98.6																						
15-Jun	96.7	96.8	97.2	97.6	97.6	97.0	95.2	93.5	92.5	90.3	87.1	86.0	81.7	77.1	77.0	80.8	79.9	75.3	70.1	78.5	94.2	97.0	95.7	94.4	88.7	97.6																						
16-Jun	95.0	95.4	95.8	95.3	93.4	89.4	85.9	80.9	74.0	60.9	45.8	44.7	48.5	50.1	53.1	53.5	59.0	60.7	62.0	70.7	63.0	67.4	70.7	74.9	70.4	95.8																						
17-Jun	83.7	88.4	92.1	95.0	95.1	87.5	76.1	62.0	56.4	52.8	48.5	45.9	42.1	37.0	31.8	32.7	30.7	31.3	31.7	37.2	62.3	75.7	76.3	80.8	60.5	95.1																						
18-Jun	77.1	80.6	87.3	93.2	93.2	88.0	87.1	83.9	77.6	68.9	63.2	54.2	52.8	50.1	48.5	46.2	43.6	41.0	41.6	42.6	43.5	45.7	48.8	53.0	63.0	93.2																						
19-Jun	56.3	60.8	64.8	74.3	93.3	96.2	96.5	97.5	97.7	97.3	97.2	96.4	96.3	94.8	90.7	91.4	94.5	94.5	93.3	94.3	94.5	96.5	95.6	95.4	90.0	97.7																						
20-Jun	95.0	95.7	97.4	97.8	97.4	97.1	95.8	93.9	94.4	93.9	94.0	93.2	93.3	91.6	94.3	92.9	90.6	86.2	88.1	90.1	90.4	90.0	90.9	94.4	93.3	97.8																						
21-Jun	96.3	96.9	97.3	97.5	97.7	97.6	97.1	93.7	88.4	79.6	73.5	68.8	63.1	58.2	56.7	62.1	51.5	50.3	54.1	72.8	89.5	94.5	96.4	96.9	80.4	97.7																						
22-Jun	97.3	97.4	97.4	97.5	97.6	97.1	91.6	86.7	67.5	58.0	46.8	42.6	43.5	50.3	61.2	62.9	59.1	61.5	57.9	78.4	83.5	87.8	90.0	94.9	75.3	97.6																						
23-Jun	97.7	97.3	96.7	97.8	97.5	97.4	85.1	89.2	80.7	76.1	61.1	51.1	40.2	38.2	45.9	42.8	35.6	36.8	39.4	61.8	73.0	77.6	84.3	87.6	70.5	97.8																						
24-Jun	91.1	92.7	95.0	95.1	93.8	80.3	71.6	65.0	59.7	55.5	49.9	43.2	43.0	40.3	33.3	31.7	31.9	33.1	42.7	57.9	52.8	59.3	66.0	77.9	60.9	95.1																						
25-Jun	84.8	82.5	88.1	92.1	92.9	88.8	88.2	86.9	84.1	77.1	72.4	67.6	63.0	65.2	67.6	66.7	57.3	55.1	60.7	73.9	85.1	93.1	95.9	97.1	78.8	97.1																						
26-Jun	97.7	97.4	97.0	96.2	96.4	89.7	76.1	68.8	71.9	68.5	60.3	57.9	56.1	58.7	60.6	75.4	92.7	87.1	79.4	83.4	93.2	95.3	97.0	98.2	81.5	98.2																						
27-Jun	98.5	98.6	98.6	98.5	98.6	98.5	89.8	76.7	69.8	63.7	56.0	51.8	48.9	49.8	46.6	47.7	47.8	45.6	47.0	55.1	70.5	83.0	85.2	92.6	71.6	98.6																						
28-Jun	96.1	97.2	97.7	97.1	93.4	87.3	85.3	82.8	81.7	66.0	49.8	42.1	39.2	37.2	38.4	54.2	72.3	76.2	76.3	85.2	91.7	94.7	96.8	97.6	76.5	97.7																						
29-Jun	97.9	97.9	97.0	96.0	98.0	93.5	81.5	77.7	69.9	61.0	55.9	50.1	45.7	41.7	41.7	49.2	54.4	75.0	72.6	77.0	87.9	95.1	96.6	97.2	75.4	98.0																						
30-Jun	98.2	97.8	95.3	93.3	90.3	84.0	78.2	70.8	61.7	52.6	51.2	53.8	42.5	38.5	33.2	28.9	28.7	29.7	34.5	39.2	55.4	69.8	65.3	72.3	61.1	98.2																						
																								88.6	89.7	91.1	92.5	93.0	90.3	85.1	80.3	74.8	67.8	61.4	57.5	54.9	53.2	52.9	54.9	56.7	58.0	60.4	68.7	76.9	81.9	83.8	86.5	Diurnal Average
																								98.5	98.6	98.6	98.5	98.6	98.6	98.3	98.2	97.7	97.3	97.2	96.4	96.3	94.8	94.3	92.9	95.6	98.3	97.3	97.2	96.9	97.8	98.0	98.2	Diurnal Maximum





Maximum Speed: 25 km/h on Jun 19 02:00	Maximum Daily Speed Average: 11.7 km/h on Jun 18	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 9 17:00	Minimum Daily Speed Average: 2.0 km/h on Jun 9	Hours of Data: 715
Maximum Diurnal Speed Average: 2.8 km/h at hour 15	Minimum Diurnal Speed Average: 0.1 km/h at hour 22	Hours of Missing Data: 5
Monthly Average Velocity: 1.1 km/h 308.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 7 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 20	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-Jun	NW9	N8	N7	NNE7	N6	N3	NW4	N5	N5	N7	N8	N8	NE8	NE8	NE6	NNE9	NNE5	NNW4	NW4	N3	NNE5	NNE6	N6	N8	N5.6	NNE9
2-Jun	N10	N9	N7	N6	NNW4	N5	NNW4	NNW7	N8	N11	N10	N9	NNE13	NNE12	NNE13	NE8	ENE5	NNE4	ENE5	E5	E4	NNE2	NE2	ENE2	NNE6.2	NNE13
3-Jun	NNE2	NNE4	NNE4	NNE5	NNE4	NNE5	NNE5	NNE6	NNE6	NNE6	NE5	NE5	ENE8	ENE7	ENE6	ENE9	NE9	ENE8	ENE6	ENE4	ENE5	ENE4	NNE4	NE2	NE5.2	NE9
4-Jun	ENE5	NE6	NE6	NNE5	NNE6	E8	E7	E5	ESE5	SE7	SSE8	SE10	SE10	SE9	S10	SSW8	SSW6	S5	SSE5	SE5	SE6	NE4	N5	SSW0	ESE4.0	SE10
5-Jun	NNE2	ENE3	W1	S2	SSW4	SW6	SW6	SSW3	NNE8	NNE9	NNE10	NNE10	NE11	NE10	ENE9	ENE7	NNW3	N4	NNW6	NNE8	NNW5	W8WNW12	W10	N3.0	WNW12	
6-Jun	W14	W12	W9	SW8	SW7	SW8	WSW8	SW7	SW8	WSW8	W14	W14	WSW13	WSW13	WSW11	WSW13	WSW13	WSW11	WSW9	SW8	S6	S8	S8	SSW7	WSW8.6	W14
7-Jun	SSW6	SSW7	SSW9	SSW7	SSW6	SSW8	SW5	SW7	WSW10	WSW12	SW13	SW13	SW16	WSW16	WSW15	WSW17	W15	WNW16	WNW10	WNW7	N5	NNE6	WSW1	SW5	WSW7.9	WSW17
8-Jun	SSW7	SSW7	SSW7	SSW7	SW2	NE5	NNE5	NNE2	NNE4	NE8	NE7	NNE9	NE9	NNE12	NE13	NNE14	NNE11	NNE11	NNE8	NE2	S1	SSW3	SSW6	S4	NE3.3	NNE14
9-Jun	UO	S1	NE1	SSW2	SSW4	SSW4	SSW3	W2	SW2	S2	S3	WNW2	WSW3	SSE2	WNW2	N3	SE0	WNW4	SW1	SE3	SE7	SSE6	S7	SSE7	S2.0	S7
10-Jun	S7	SSE6	SSE3	SSE5	S5	SSW5	S6	S10	S11	S11	S15	S14	S14	SSW13	S14	S11	S12	S14	S11	S11	S9	S9	S10	SSW11	S9.7	S15
11-Jun	SSW12	S10	SSW7	SSW8	SW7	SSW5	SSW5	WSW9	SW11	WSW7	NW8	NW7	WNW7	NW11	WNW11	NNW8	NW7	NNW4	NNE4	NNE2	NNW3	NNW1	W1	W2	W3.8	SSW12
12-Jun	NNE5	NNE4	S1	SSW4	SSW7	SSW6	SSW6	SW7	SSW7	SW7	SW7	SW7	SW6	SW5	SSW5	SSE4	ESE3	ESE4	ESE5	ESE6	ESE7	E4	N5	E6	S2.5	SW7
13-Jun	W0	E4	SE4	SE6	SE7	SSE3	S4	S3	S9	S6	NNW3	NE4	NE4	NE7	NNE8	SW10	E11	NE5	NE9	NE8	NNE8	NW7	NNE10	NNE7	ENE2.2	E11
14-Jun	NNE9	NNE5	NNE7	E8	E10	ENE7	ENE7	NE7	NE9	NNE8	NNE11	NNE15	NNE13	N12	N14	N14	N15	N10	N14	N14	N14	N13	N9	N10	NNE9.6	NNE15
15-Jun	N11	N11	N10	N11	N11	N11	N13	N12	N11	NNW14	N14	N13	N14	NNW12	NNW13	NW9	NW9	NW9	NW10	W3	SSW4	SSW7	SSW9	SSW10	NNW7.8	N14
16-Jun	SSW9	SSW9	SSW10	SSW12	SSW11	SSW10	SW10	SW9	SW6	SW3	SSW11	SSW9	SW5	WSW11	W8	WSW12	SW8	SW9	SSW8	S8	SSW11	SW8	W11	WSW11	SW8.5	SSW12
17-Jun	SW12	WSW12	SW11	SSW11	SW10	SW11	WSW10	W13	W14	WSW12	SW15	W15	W16	WSW14	WSW15	W11	W13	W14	W13	W7	W5	SSW6	SSW7	SSW8	WSW10.5	W16
18-Jun	SSW7	SSW5	SSW3	SW3	NNE3	NNE4	N6	NNE7	NNE8	NNE12	NNE13	NNE17	NE16	NNE17	NNE17	NNE20	NNE19	NNE19	NNE19	NE19	NNE19	NE21	NE24	NE20	NNE11.7	NE24
19-Jun	NE23	NE25	NE22	NE19	NNE19	NNE16	NNE17	NNE19	NNE18	NNE23	NE16	NE14	NNE14	NNE7	NNW2	SSE7	SW3	WSW2	S4	SW3	NNW3	NNW4	N10	N11	NNE10.6	NE25
20-Jun	NNW9	NNW8	NNW6	NNW6	NNW7	NNW8	NNW9	N10	N12	N13	N11	N12	N12	N11	N11	NNW12	NNW13	N12	N10	N9	NNW8	N6	NNW4	NNW5	N9.2	NNW13
21-Jun	NNW5	NW6	NW6	NW7	NW7	NW7	NW7	NW7	NNW7	NNW11	NNW9	NNW10	NNW10	N7	NE8	E6	E6	ENE3	SE5	SE5	SSE5	SE2	NE1	NNE2	NNW3.6	NNW11
22-Jun	UO	UO	S2	UO	SSW1	WSW1	SSE3	NW2	SSE4	SSE2	S2	WSW6	WNW8	WNW7	WSW5	WSW1	SW5	SSW4	S3	SE5	SSE6	S3	SW4	SSW5	SW2.1	WNW8
23-Jun	ESE7	SE7	SSE5	SE6	SSE4	ENE0	S2	W2	WNW4	WSW4	WSW6	SW5	SSW5	W2	ENE1	ENE6	S2	SW7	SSW5	S3	SSW6	SSW7	SSW7	S6	S2.9	SE7
24-Jun	SSW5	SSW6	SSW6	SSW6	SSW8	SSW6	SSW6	SW7	SSW8	WSW8	WSW11	SW12	WSW10	W9	W10	WSW12	SW9	SW8	SW7	NW1	NNE9	NNE10	NNE9	N6	WSW4.8	SW12
25-Jun	NNE8	NNE11	NNE7	NNE10	NNE9	NNE10	NNE9	NNE11	NNE12	NE14	NE13	NE10	NE10	NNE9	NE6	NNE4	E7	ENE6	ESE3	UO	ENE1	NE2	E2	SSW2	NE7.0	NE14
26-Jun	NNE1	NNE0	S2	SW1	SSE3	S4	S7	W4	W3	W2	SSE4	ESE4	SE5	E3	E1	NNW5	SW8	SW7	SW8	WSW5	SW6	SW8	SSW5	SSW8	SSW3.0	SW8
27-Jun	SSW9	SSW9	SSW8	SE2	SSW4	SW5	WNW1	NNE7	NE9	NNE9	NNE10	NNE11	NNE10	NNE12	NNE10	NE12	NE11	ENE8	ENE8	E6	ESE5	ESE6	SE6	SSW4	ENE3.4	NNE12
28-Jun	SSW4	S6	SSW6	SSW9	SSW8	SSW9	SW7	S3	SSE5	S6	S10	SSE10	S8	S6	S3	NW2	WNW9	SW9	SW6	SW4	S5	S4	SE5	SSE6	SSW5.2	S10
29-Jun	S4	SSW5	SSW8	S5	SSW7	SW6	ESE5	SSE4	WSW7	WSW10	WSW8	WSW10	WSW11	SW16	WSW16	W10	W10	W4	SSW6	S4	SSE5	SSW6	SW6	SW7	SW6.3	SW16
30-Jun	SW8	SSW10	SSW10	SSW10	SSW11	SSW11	SW9	SW9	SSW8	WSW8	WSW12	WSW9	SW11	WSW11	W12	WNW13	WNW12	WNW9	NW9	WNW8	WNW5	WSW5	WSW7	SW7	WSW7.9	WNW13

W1.1WNW0.6	SW0.9SSW1.2	SW1.4	SW1.1	W1.1	NW1.8	NW1.4	NNW2.2	NW2.2	NNW2.4	NNW2.2	NNW2.5	NW2.8	NW2.2	NW2.2	NW2.0	NW1.1	NE0.7	ENE0.9	SE0.1	WNW0.7	SW1.2						Diurnal Average	
NE23	NE25	NE22	NE19	NNE19	NNE16	NNE17	NNE19	NNE18	NNE23	NE16	NNE17	SW16	NNE17	NNE17	NNE20	NNE19	NNE19	NE19	NNE19	NNE21	NE24	NE20						Diurnal Maximum

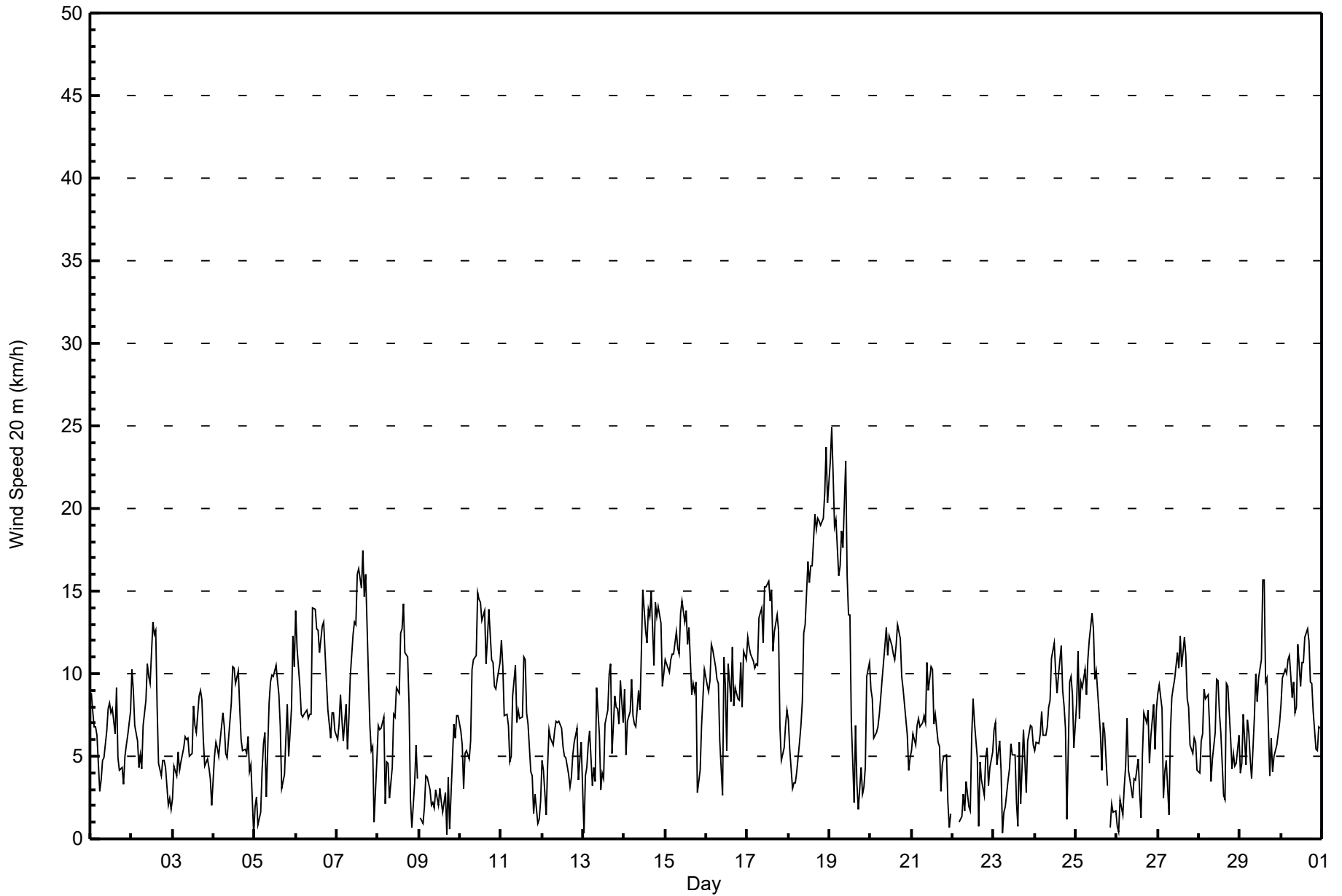
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Janvier - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Jun 13 16:00 Minimum Value: 0 km/h on Jun 22 00:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 715 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	5	4	5	3	2	1	1	2	2	3	3	3	2	3	3	3	2	1	2	1	2	2	2	2	5	
2-Jun	4	4	3	2	2	2	1	3	4	4	3	3	5	4	4	2	1	2	2	1	1	1	1	2	5	
3-Jun	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	2	2	2	1	1	1	1	1	3	
4-Jun	1	1	2	1	1	3	2	2	2	3	3	4	4	4	3	3	3	2	3	1	1	2	2	1	4	
5-Jun	1	1	1	2	2	2	2	2	4	3	3	3	3	3	3	2	8	5	3	3	2	2	5	3	8	
6-Jun	4	4	3	2	1	2	3	2	2	4	5	5	6	5	5	5	5	4	3	3	1	2	2	1	6	
7-Jun	1	1	1	1	1	2	2	3	4	4	4	5	5	6	5	6	5	6	4	2	3	3	1	1	6	
8-Jun	1	1	1	1	2	2	2	1	2	2	2	3	4	3	3	3	3	3	2	2	1	1	1	1	4	
9-Jun	UO	1	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	2	2	2	
10-Jun	1	2	1	1	2	1	2	3	3	4	4	4	5	4	4	3	4	4	3	3	3	2	2	3	5	
11-Jun	3	2	2	2	2	1	2	3	3	3	3	3	3	4	4	3	3	2	1	1	2	1	1	1	4	
12-Jun	1	1	1	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1	2	2	4	4	
13-Jun	2	2	2	2	2	2	2	2	3	3	1	1	2	2	2	10	4	3	2	4	2	5	3	3	10	
14-Jun	4	1	2	3	3	2	2	2	2	3	3	4	3	5	5	5	6	4	5	5	5	4	4	3	6	
15-Jun	4	4	4	4	4	4	4	4	4	5	6	5	5	5	6	4	4	3	4	2	0	1	2	2	6	
16-Jun	2	1	2	2	2	2	3	3	2	2	4	4	3	4	3	4	3	3	2	2	3	2	4	3	4	
17-Jun	3	4	3	2	3	3	3	4	5	4	5	5	5	5	5	5	5	4	4	2	1	1	1	1	5	
18-Jun	2	2	1	1	1	2	2	2	2	3	4	5	4	5	5	6	6	6	5	5	6	6	7	6	7	
19-Jun	7	7	6	6	6	5	5	6	5	6	4	4	4	3	1	2	2	2	2	2	1	2	3	4	7	
20-Jun	4	3	3	2	3	3	3	4	4	5	4	4	4	4	4	5	6	5	4	3	3	3	2	2	6	
21-Jun	2	2	2	2	2	2	2	2	3	5	4	4	5	3	2	2	2	2	2	1	1	2	2	0	5	
22-Jun	UO	UO	2	UO	1	1	1	1	2	2	3	2	5	3	1	1	1	1	1	1	2	1	2	1	5	
23-Jun	1	2	2	1	1	1	1	1	2	1	2	2	2	2	2	2	3	2	2	1	1	1	1	1	3	
24-Jun	1	1	1	1	1	1	2	2	2	3	4	4	4	3	3	4	3	3	2	4	3	3	2	2	4	
25-Jun	3	4	2	3	2	3	2	3	4	4	3	3	3	2	2	2	3	2	2	UO	1	1	1	1	4	
26-Jun	1	2	1	1	1	1	2	2	1	1	2	3	3	2	1	5	3	2	3	2	2	2	1	2	5	
27-Jun	1	1	2	2	1	1	1	2	2	4	4	3	4	4	4	4	3	2	2	1	1	1	1	1	4	
28-Jun	1	1	1	1	1	2	2	2	2	3	3	3	3	3	2	4	5	4	2	1	1	2	3	2	5	
29-Jun	1	1	1	2	1	2	2	1	3	3	3	3	4	5	6	3	4	2	2	2	1	1	1	1	6	
30-Jun	1	2	2	2	2	3	3	3	3	3	4	3	3	4	4	4	4	3	4	2	2	1	1	1	4	
																	Diurnal Maximum									
UO - Unstable Operation																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Janvier - June 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	229	32.03	32.03
6 - 11	373	52.17	84.20
12 - 19	105	14.69	98.88
20 - 28	8	1.12	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 - June 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	9	29	13	12	8	8	11	17	28	28	17	9	13	6	5	16	229
6 - 11	37	48	22	15	9	4	11	8	26	68	45	26	11	9	18	16	373
12 - 19	18	24	9	0	0	0	0	0	6	3	7	16	13	4	0	5	105
20 - 28	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	8
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	104	49	27	17	12	22	25	60	99	69	51	37	19	23	37	715

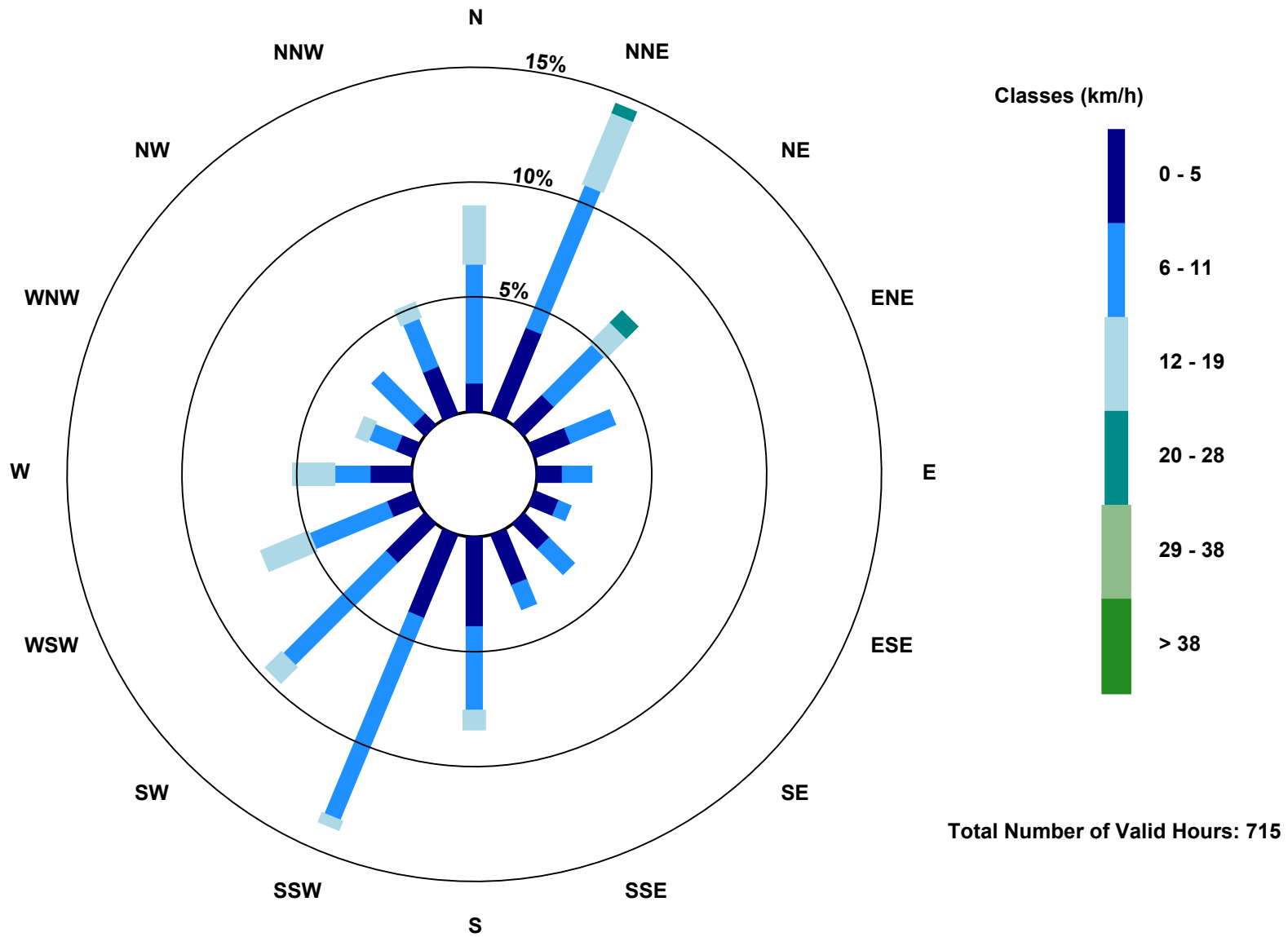
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Janvier - June 2023

Direction of Maximum Speed: 37 deg on Jun 19 02:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 31.5 deg on Jun 18	Hours of Data: 715
Direction of Minimum Speed: 127 deg on Jun 9 17:00	Hours of Missing Data: 5
Direction of Minimum Daily Speed Average: 2.0 deg on Jun 9	Percent Operational Time: 99.3
Monthly Average Direction: 308.8 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-Jun	306	6	1	20	2	351	317	4	360	358	356	11	34	38	42	27	14	339	320	355	21	15	9	0	5.4
2-Jun	354	349	352	360	345	6	340	347	4	10	8	359	19	18	22	48	62	26	57	88	83	28	42	63	14.7
3-Jun	26	13	21	17	13	22	19	27	23	33	44	37	62	57	70	65	50	59	68	59	60	63	22	44	43.6
4-Jun	78	49	41	23	30	79	81	81	113	131	147	142	143	141	171	196	196	174	160	134	137	35	9	206	121.3
5-Jun	19	66	265	172	208	223	231	213	30	29	20	22	34	50	62	61	340	11	336	23	332	273	289	272	0.4
6-Jun	274	281	271	227	215	231	255	236	225	252	281	275	256	241	250	245	241	251	239	217	177	173	186	206	244.4
7-Jun	199	203	201	197	196	201	215	234	239	241	228	232	236	245	250	249	261	285	298	300	356	25	243	219	242.3
8-Jun	200	208	194	205	217	35	17	22	32	35	36	14	41	32	36	31	23	31	31	48	172	199	204	190	35.8
9-Jun	UO	188	50	209	205	196	208	261	233	172	180	297	249	151	284	6	127	291	220	146	145	161	177	161	187.8
10-Jun	171	167	155	162	178	194	178	181	188	190	190	181	180	192	186	185	176	181	183	180	171	172	182	197	181.9
11-Jun	204	190	192	205	214	210	210	239	234	257	307	312	301	305	303	342	326	336	13	25	338	332	278	278	263.6
12-Jun	15	18	180	198	202	199	211	214	213	225	226	228	227	223	212	164	122	102	110	104	112	99	1	93	185.3
13-Jun	269	92	142	145	145	152	173	177	184	179	341	42	36	49	22	230	90	54	51	49	15	307	24	24	72.9
14-Jun	27	12	30	84	89	69	61	51	45	31	21	30	28	2	3	4	358	350	0	4	8	8	356	356	19.2
15-Jun	358	351	353	354	350	359	357	350	357	348	356	355	351	347	330	323	319	322	322	280	192	196	209	203	340.7
16-Jun	212	212	208	206	207	211	220	226	226	230	202	196	221	244	269	238	235	219	203	189	211	236	281	253	222.5
17-Jun	216	241	224	213	219	222	239	265	266	242	235	262	260	254	253	274	272	271	278	271	271	208	198	196	246.7
18-Jun	208	194	193	219	20	25	11	19	23	31	23	29	36	28	26	30	30	32	32	34	32	34	38	41	31.5
19-Jun	37	37	38	41	25	26	22	20	26	33	41	36	26	33	332	168	234	242	173	214	337	333	4	355	28.6
20-Jun	346	341	341	334	337	340	347	355	359	359	359	6	358	359	355	348	348	354	350	350	343	349	339	346	350.9
21-Jun	332	325	325	312	310	316	318	315	340	339	336	327	342	359	47	88	98	71	125	139	157	144	46	23	345.0
22-Jun	UO	UO	172	UO	204	247	154	324	148	153	180	237	298	303	248	257	222	194	170	136	152	179	219	209	214.1
23-Jun	118	133	168	139	160	59	169	271	303	249	250	230	205	262	69	78	186	234	199	188	193	199	197	182	189.5
24-Jun	212	200	192	206	198	204	211	228	205	245	245	229	238	273	260	238	232	234	230	323	16	23	25	11	237.3
25-Jun	13	26	20	21	23	28	18	22	28	44	35	48	36	33	39	32	91	75	103	UO	66	46	93	199	35.5
26-Jun	12	19	174	217	168	181	191	265	267	278	151	113	143	99	83	337	225	214	232	245	215	215	211	203	208.7
27-Jun	204	202	194	130	212	214	296	26	39	18	16	16	20	29	28	45	55	75	78	90	106	121	136	213	56.7
28-Jun	193	191	200	204	205	209	218	183	164	169	172	167	180	176	186	309	297	227	232	222	186	169	146	152	195.0
29-Jun	188	206	204	188	201	218	112	155	240	238	243	252	245	228	243	261	270	259	198	178	159	203	218	214	224.9
30-Jun	214	203	208	207	204	213	225	226	213	239	246	239	231	238	273	283	288	292	307	296	282	238	250	217	242.4
	272.9	287.2	224.3	199.0	214.2	231.6	272.9	305.9	321.4	338.5	317.0	329.1	332.5	328.8	321.1	324.3	313.7	306.7	324.5	46.4	77.3	129.3	302.3	226.1	

Diurnal Average

UO - Unstable Operation

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

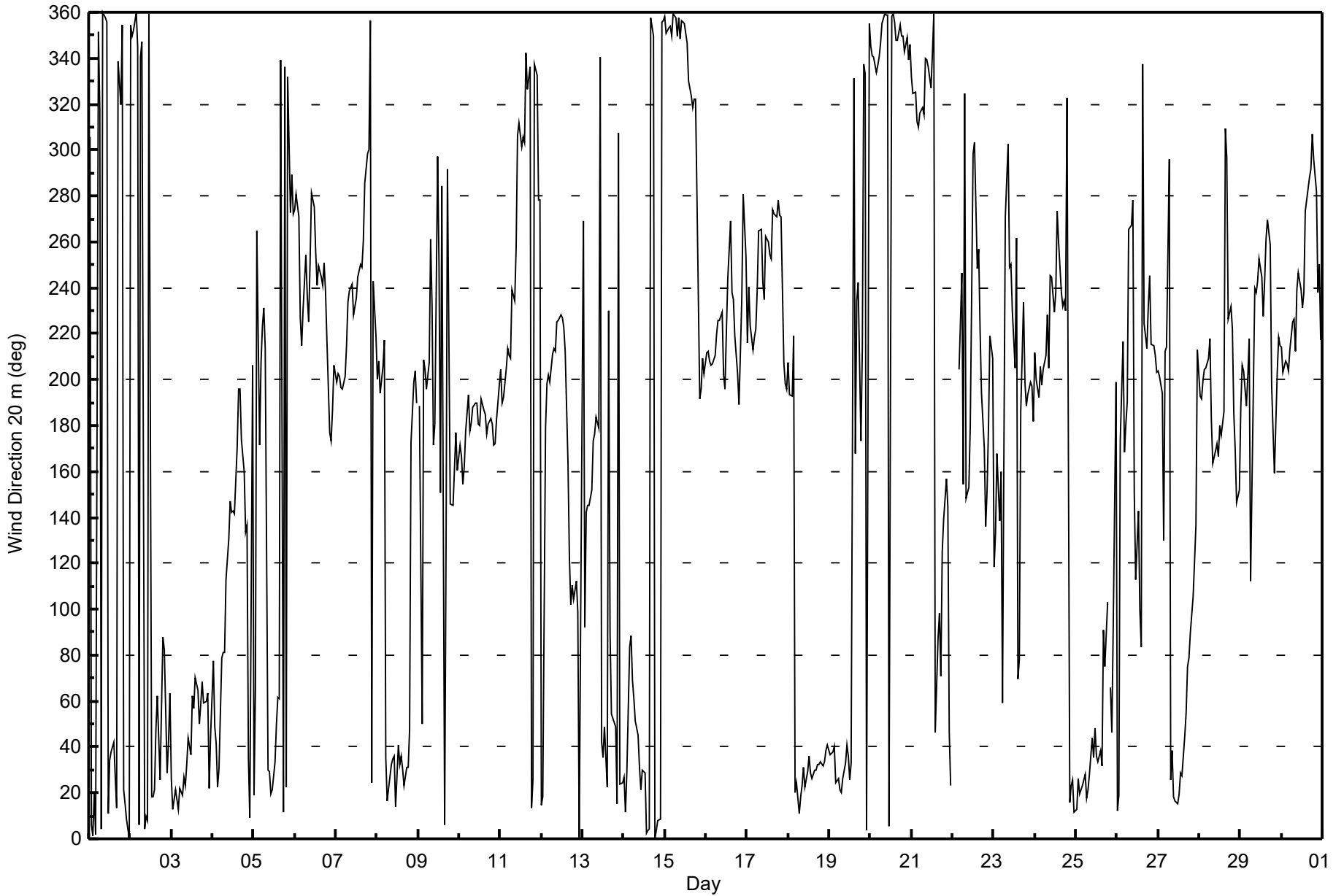
Wind Direction 20 m (WD20m) - deg
Janvier - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 103 deg on Jun 9 17:00	Hours of Data: 715
Minimum Value: 8 deg on Jun 12 05:00	Hours of Missing Data: 5
Percentiles: P ₁ = 9 P ₁₀ = 14 Q ₁ = 20 Median = 27 Q ₃ = 35 P ₉₀ = 56 P ₉₉ = 89	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-Jun	42	50	57	36	29	63	32	43	30	41	37	29	23	26	34	19	23	31	36	41	20	27	22	30	63
2-Jun	34	38	34	31	43	28	32	33	30	31	33	33	28	29	26	23	18	37	21	13	9	40	32	48	48
3-Jun	17	14	17	12	16	21	24	27	35	44	49	58	30	28	25	24	19	20	23	13	9	20	20	51	58
4-Jun	14	18	21	10	14	25	25	27	35	25	30	31	30	33	32	36	28	41	35	11	12	56	23	86	86
5-Jun	63	33	83	84	29	23	24	65	20	21	22	22	23	25	29	33	85	79	40	19	37	21	25	20	85
6-Jun	21	20	23	26	17	26	27	29	32	51	29	26	38	39	36	34	29	33	28	25	16	16	16	18	51
7-Jun	8	8	9	10	13	15	32	36	35	29	30	31	31	30	34	30	29	23	23	16	44	18	77	16	77
8-Jun	10	14	8	9	93	24	22	33	33	23	23	28	34	19	20	18	21	18	15	62	70	20	8	29	93
9-Jun	UO	67	80	59	25	24	39	54	62	48	52	72	69	77	101	74	103	41	66	18	14	15	17	16	103
10-Jun	19	20	23	15	18	19	22	21	20	23	22	25	24	28	25	20	22	21	20	18	19	17	18	16	28
11-Jun	18	14	12	17	21	29	28	28	27	43	41	41	49	32	30	39	38	50	28	78	48	72	47	42	78
12-Jun	17	16	42	9	8	8	14	12	13	23	19	20	25	29	20	22	34	19	14	10	10	61	27	46	61
13-Jun	95	60	26	21	25	74	34	37	22	31	57	21	37	23	28	86	30	47	21	16	33	45	23	40	95
14-Jun	38	24	14	33	23	20	20	22	20	38	20	17	31	27	30	32	37	29	27	27	24	32	30	30	38
15-Jun	31	33	34	32	32	28	30	33	31	33	31	34	32	34	37	34	30	29	40	55	16	10	14	13	55
16-Jun	14	14	13	13	15	18	23	23	34	77	33	26	38	32	26	27	27	24	17	16	23	25	22	28	77
17-Jun	20	26	21	18	20	22	27	23	28	31	29	30	30	33	32	35	31	28	24	21	16	17	9	8	35
18-Jun	17	29	39	50	23	27	22	19	20	16	21	20	18	18	20	18	16	16	15	15	17	16	18	16	50
19-Jun	17	16	16	17	19	21	20	19	18	16	17	18	18	24	74	24	60	71	30	68	41	35	28	29	74
20-Jun	37	34	38	36	37	33	35	34	27	28	32	25	28	30	34	36	36	32	38	32	35	38	36	40	40
21-Jun	36	33	28	27	22	28	26	27	36	34	36	32	42	42	27	32	35	80	38	17	10	50	81	27	81
22-Jun	UO	UO	59	UO	76	56	45	76	62	86	88	40	53	25	39	89	26	23	49	14	23	48	20	30	89
23-Jun	26	19	40	14	27	92	76	46	59	34	45	47	61	89	96	33	86	29	31	50	17	10	9	13	96
24-Jun	17	15	12	13	10	15	22	29	27	29	31	34	32	25	40	32	30	29	21	78	21	18	15	15	78
25-Jun	20	20	20	18	18	19	21	19	19	19	17	25	21	21	23	41	39	32	35	UO	64	18	43	38	64
26-Jun	82	94	72	64	35	24	19	43	51	58	62	78	51	59	86	39	37	33	30	43	26	21	21	12	94
27-Jun	13	10	17	50	12	15	73	24	18	30	41	27	33	24	38	25	30	27	23	18	12	12	13	33	73
28-Jun	23	11	12	11	14	20	21	63	35	27	29	30	39	45	74	84	63	40	31	34	39	28	22	29	84
29-Jun	24	23	11	17	10	25	19	39	28	27	27	27	33	30	28	30	24	64	20	40	22	15	14	11	64
30-Jun	13	11	13	13	13	20	25	23	28	27	29	28	30	31	35	29	26	25	26	19	23	13	20	19	35

95	94	83	84	93	92	76	76	62	86	88	78	69	89	101	89	103	80	66	78	70	72	81	86	
Diurnal Maximum																								

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS23
FORT HILLS
JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
 JUNE 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	16.3	0	5.7	0
TRS(ppb) Average	686	34	34	100	1.3	0	0.8	0
THC(ppm) Average	687	33	33	100	3.7	-	2.6	-
NMHC(ppm) Average	687	33	33	100	1.165	-	0.428	-
CH4(ppm) Average	687	33	33	100	3	-	2.2	-
NO2 (ppb) Average	680	35	40	99.31	42.9	0	17.3	-
NO (ppb) Average	680	35	40	99.31	72.6	-	11.5	-
NOX (ppb) Average	680	35	40	99.31	98.5	-	28.8	-
PM2.5 (ug/m3) Average	719	1	1	100	369.8	81	211.2	11
Temperature 2 m (C) Average	720	0	0	100	29.5	-	22.9	-
Relative Humidity (%) Average	720	0	0	100	99.4	-	92.9	-
Wind Speed 10 m (km/h) Average	720	0	0	100	44	-	31	-
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 - FORT HILLS (AMS23)
JUNE 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	0.79	2.1	-	0	0	0	0.1	0.3	1.8	16.3
TRS (ppb) Average	686	0.24	0.2	-	0	0.1	0.1	0.2	0.3	0.6	1.3
THC (ppm) Average	687	2.18	0.3	-	1.9	1.9	2	2.1	2.3	2.5	3.7
NMHC(ppm) Average	687	0.148	0.163	-	0	0	0	0.1	0.2	0.3	1.165
CH4(ppm) Average	687	2.04	0.1	-	1.9	1.9	1.9	2	2.1	2.2	3
NO2 (ppb) Average	680	7.08	7	-	0.2	0.8	2.2	4.7	9.7	16.8	42.9
NO (ppb) Average	680	3.04	7.2	-	0	0	0.1	0.6	2.5	7.4	72.6
NOX (ppb) Average	680	10.12	12.8	-	0.2	0.9	2.6	5.7	12.4	23.7	98.5
PM2.5 (ug/m3) Average	719	38.01	54.1	-	1	4.4	8.8	21.6	40.8	89.3	369.8
Temperature 2 m (C) Average	720	17.6	5	-	7.6	11.3	13.6	17.4	21.1	24.4	29.5
Relative Humidity (%) Average	720	65.55	20.7	-	22.3	36.5	48.7	66.9	84.9	92	99.4
Wind Speed 10 m (km/h) Average	720	12.3	8	-	0	4	7	10	17	23	44
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO/NO2/NOX	25 Jun 2023 10:00	25 Jun 2023 14:00	5	Unstable Operation - excessive baseline drift



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

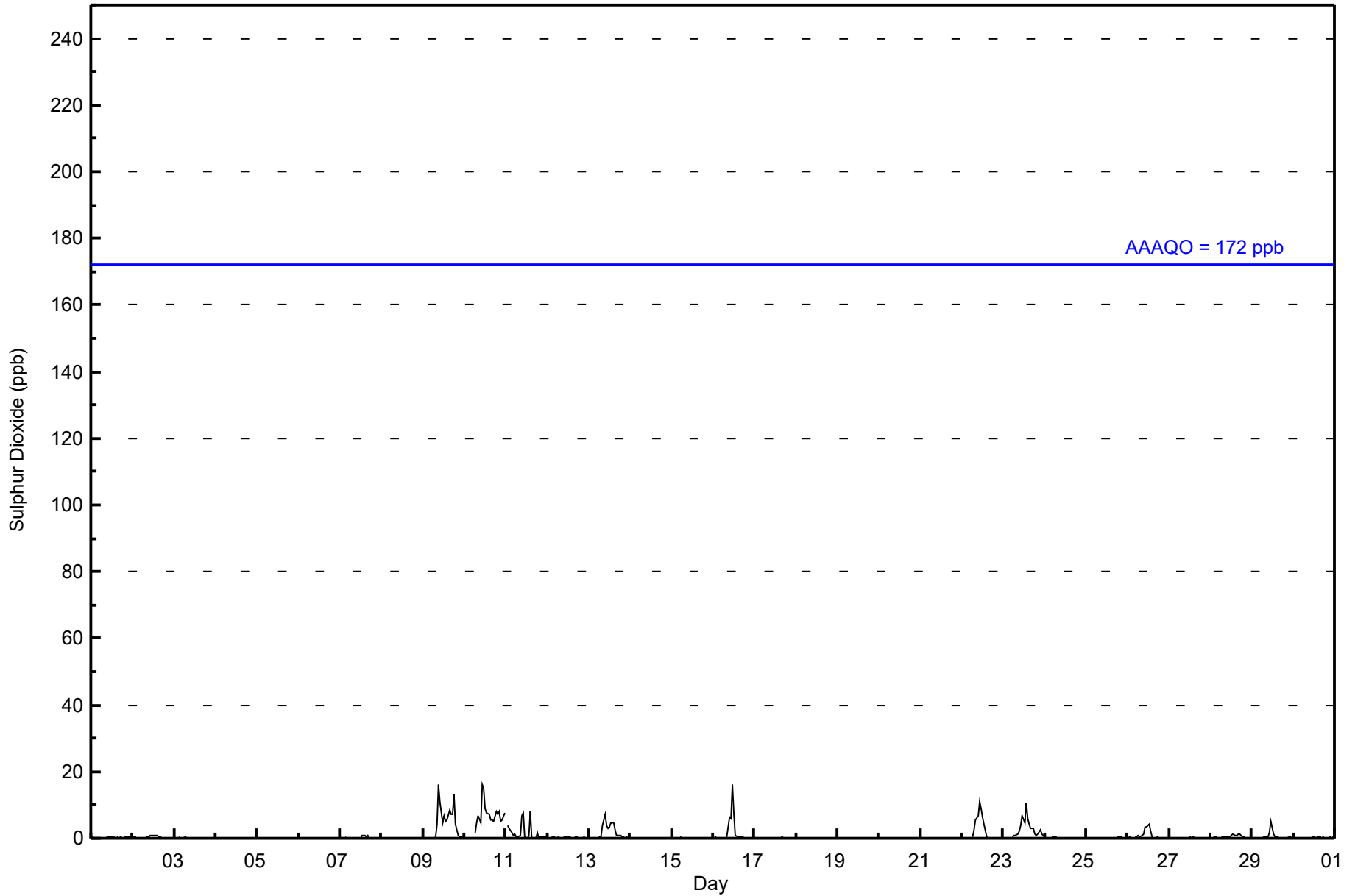
Fort Hills - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 16.3 ppb on Jun 16 12:00	Maximum Daily Average: 5.7 ppb on Jun 10		Hours of Data:	687
Minimum Value: 0.0 ppb on Jun 3 01:00	Minimum Daily Average: 0.0 ppb on Jun 19		Hours of Missing Data:	33
Maximum Diurnal Average: 2.3 ppb at hour 11	Minimum Diurnal Average: 0.1 ppb at hour 1		Hours of Calibration:	33
Monthly Average: 0.79 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 1.8 P ₉₉ = 10.7		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-Jun	0.4	0.3	Z	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.4	0.3	0.3	0.2	0.6	
2-Jun	0.3	0.4	0.3	Z	0.1	0.1	0.1	0.1	0.2	0.6	0.6	0.7	0.7	0.9	0.9	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.4	0.9
3-Jun	0.0	0.0	0.0	0.2	Z	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
4-Jun	0.2	0.2	0.1	0.1	0.1	Z	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2
5-Jun	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	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-Jun	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	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
7-Jun	0.0	0.3	Z	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.8	0.4	0.8	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.8	
8-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	
9-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.6	4.3	16.2	11.0	4.5	6.9	4.9	5.4	8.5	7.4	7.0	12.9	4.2	0.8	0.4	0.6	0.3	4.2	16.2	
10-Jun	0.1	0.1	0.0	0.1	0.2	Z	1.8	4.8	7.0	4.6	16.2	14.8	8.9	7.6	7.2	5.4	5.6	5.0	7.9	7.2	8.1	5.0	5.7	7.8	5.7	16.2	
11-Jun	Z	3.8	2.9	1.8	0.8	1.1	0.5	0.4	0.7	7.0	7.5	0.4	0.1	0.9	8.0	0.0	0.0	0.1	1.6	0.0	0.3	0.5	0.4	0.5	1.7	8.0	
12-Jun	0.3	Z	0.3	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.3	0.0	0.1	0.2	0.5
13-Jun	0.0	0.1	Z	0.1	0.0	0.1	0.3	0.5	3.7	7.3	3.6	2.9	3.2	4.5	4.5	2.4	0.8	0.7	0.9	0.6	0.3	0.2	0.3	0.2	1.6	7.3	
14-Jun	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2
15-Jun	0.1	0.2	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2
16-Jun	0.1	0.2	0.0	0.1	0.1	Z	0.1	0.1	0.3	6.5	6.1	16.3	7.8	0.8	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.1	1.8	16.3	
17-Jun	Z	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	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
18-Jun	0.0	Z	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	0.1	0.1
19-Jun	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
20-Jun	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Jun	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	0.2	0.0	0.0	0.2	0.2
22-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.6	2.4	5.5	6.7	11.2	8.9	6.2	4.3	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	2.0	11.2	
23-Jun	Z	0.0	0.0	0.0	0.0	0.1	0.7	1.0	1.3	2.1	3.9	6.9	4.8	10.7	6.1	4.3	3.0	2.9	1.3	0.8	1.4	2.4	1.3	0.8	2.4	10.7	
24-Jun	0.4	Z	0.2	0.1	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.4	0.4
25-Jun	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.5	0.4	0.2	0.1	0.0	0.5
26-Jun	0.1	0.4	0.6	Z	0.5	0.4	0.6	0.5	1.0	1.4	3.6	3.2	4.0	1.9	0.5	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.9	4.0	
27-Jun	0.0	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.3
28-Jun	0.1	0.2	0.2	0.3	0.4	Z	0.5	0.5	0.5	0.6	0.5	0.5	1.0	1.2	0.8	0.9	1.4	1.2	0.4	0.3	0.2	0.1	0.0	0.1	0.5	1.4	
29-Jun	Z	0.0	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	1.7	5.0	1.2	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.5	5.0
30-Jun	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5

0.1	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.9	1.9	2.3	2.3	1.6	1.4	1.2	0.8	0.7	0.7	0.9	0.5	0.5	0.4	0.4	0.4	Diurnal Average	
0.4	3.8	2.9	1.8	0.8	1.1	1.8	4.8	7.0	16.2	16.2	16.3	8.9	10.7	8.0	8.5	7.4	7.0	12.9	7.2	8.1	5.0	5.7	7.8	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	679	98.84	98.84
11 - 20	8	1.16	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
Fort Hills - June 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	134	97	43	24	10	7	10	39	65	68	68	29	10	12	23	40	679
11 - 20	0	0	0	0	0	0	0	2	2	3	1	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	134	97	43	24	10	7	10	41	67	71	69	29	10	12	23	40	687

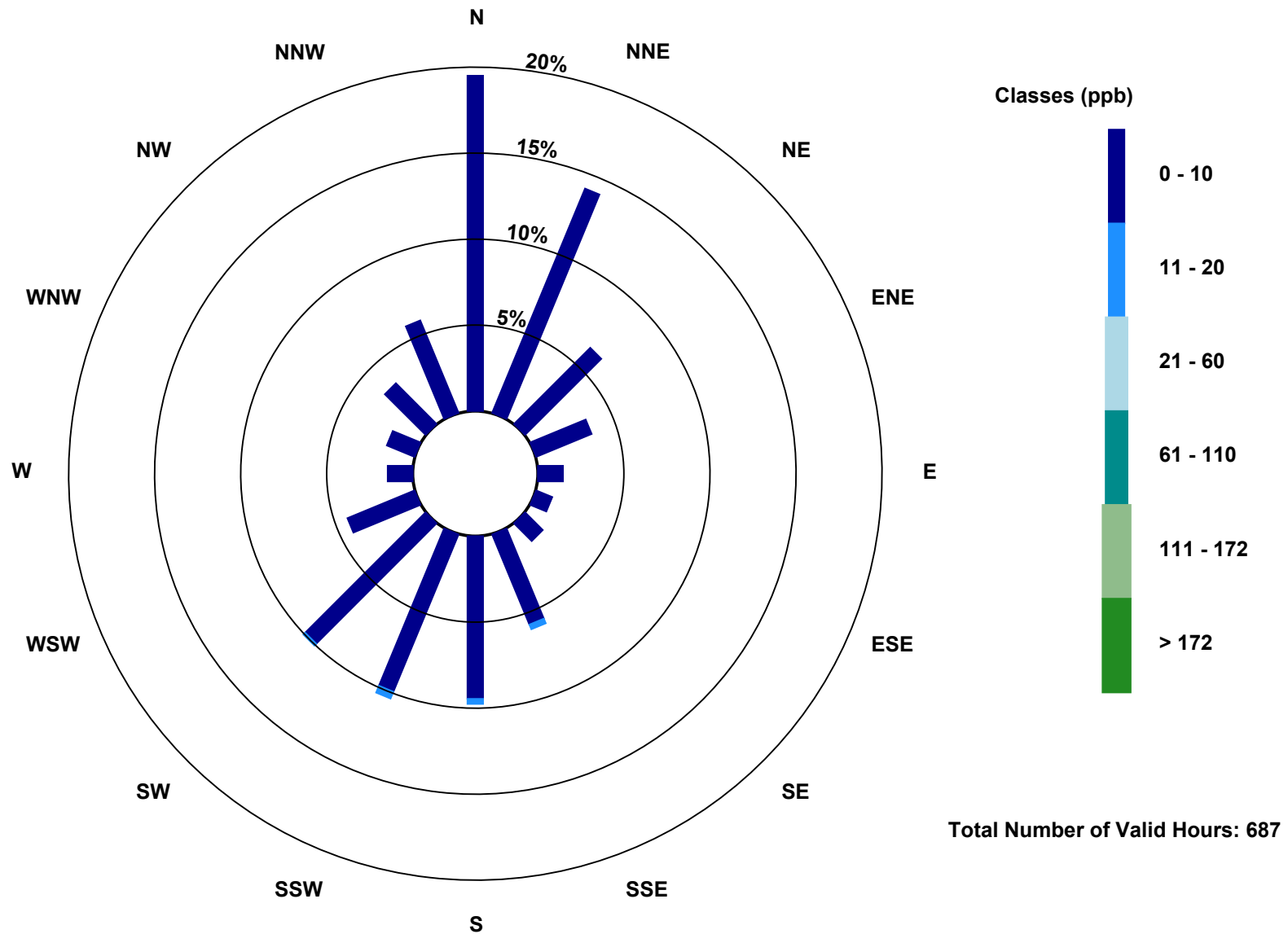
Total Number of Valid Hours: 687

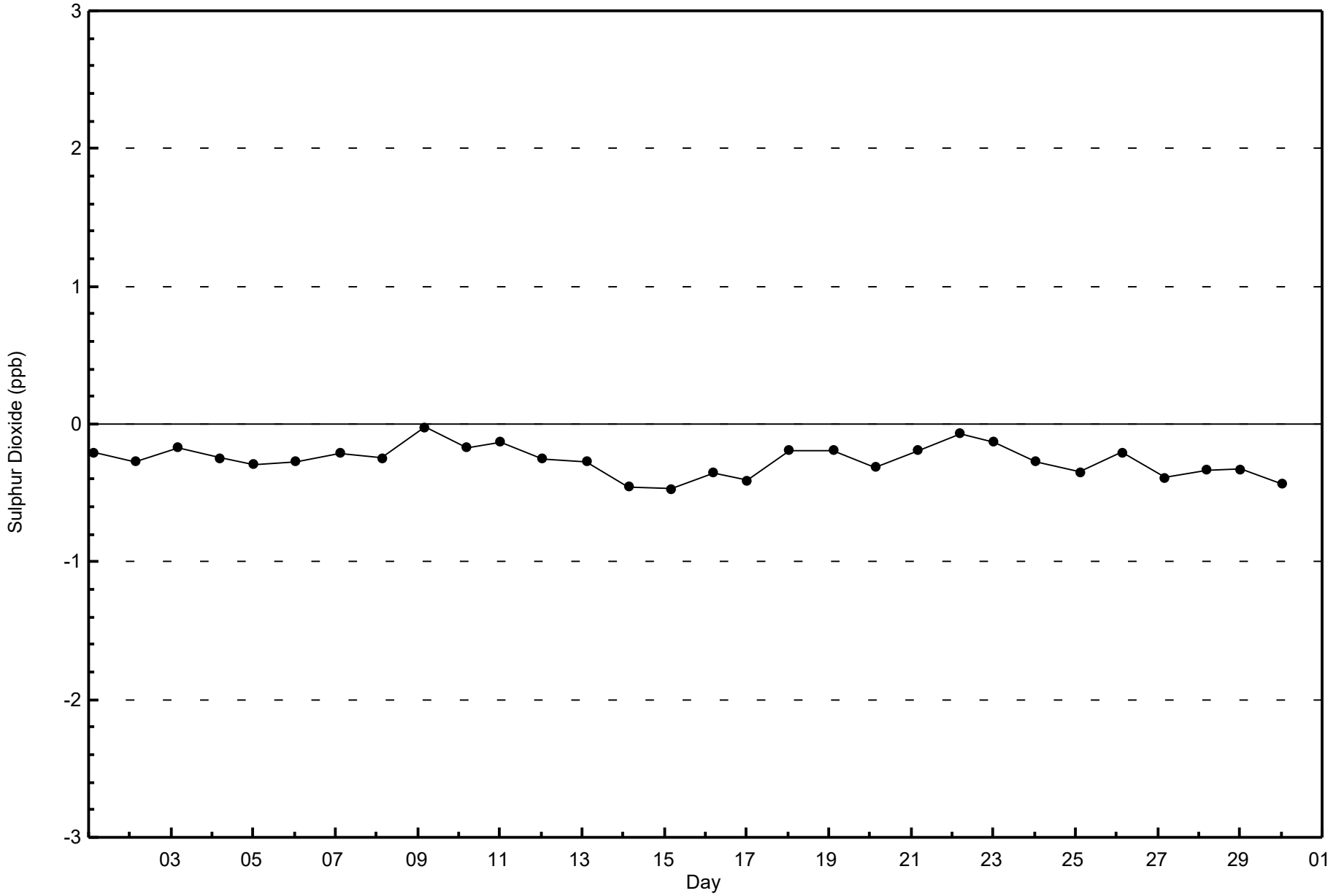
Total Number of Hours: 720

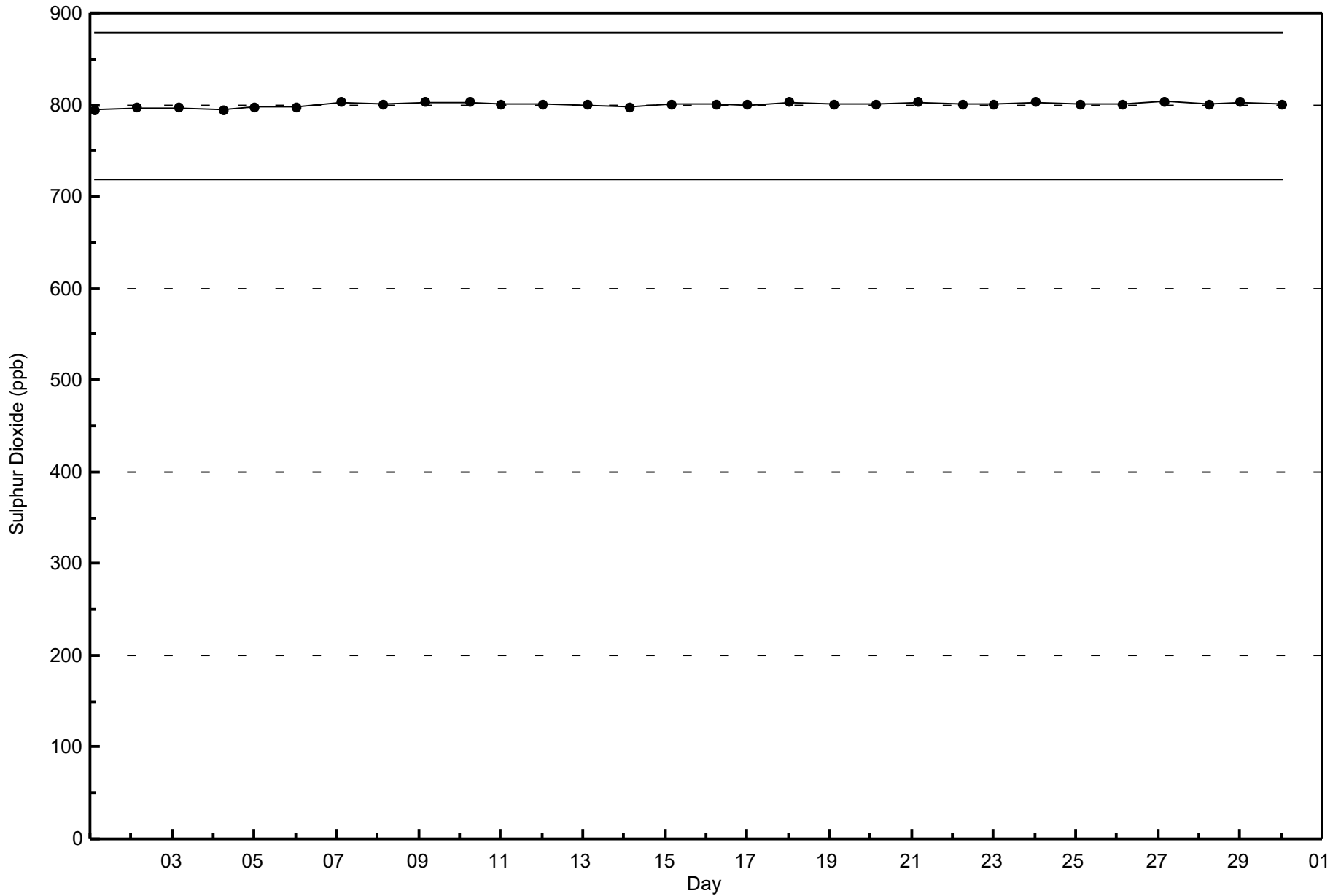


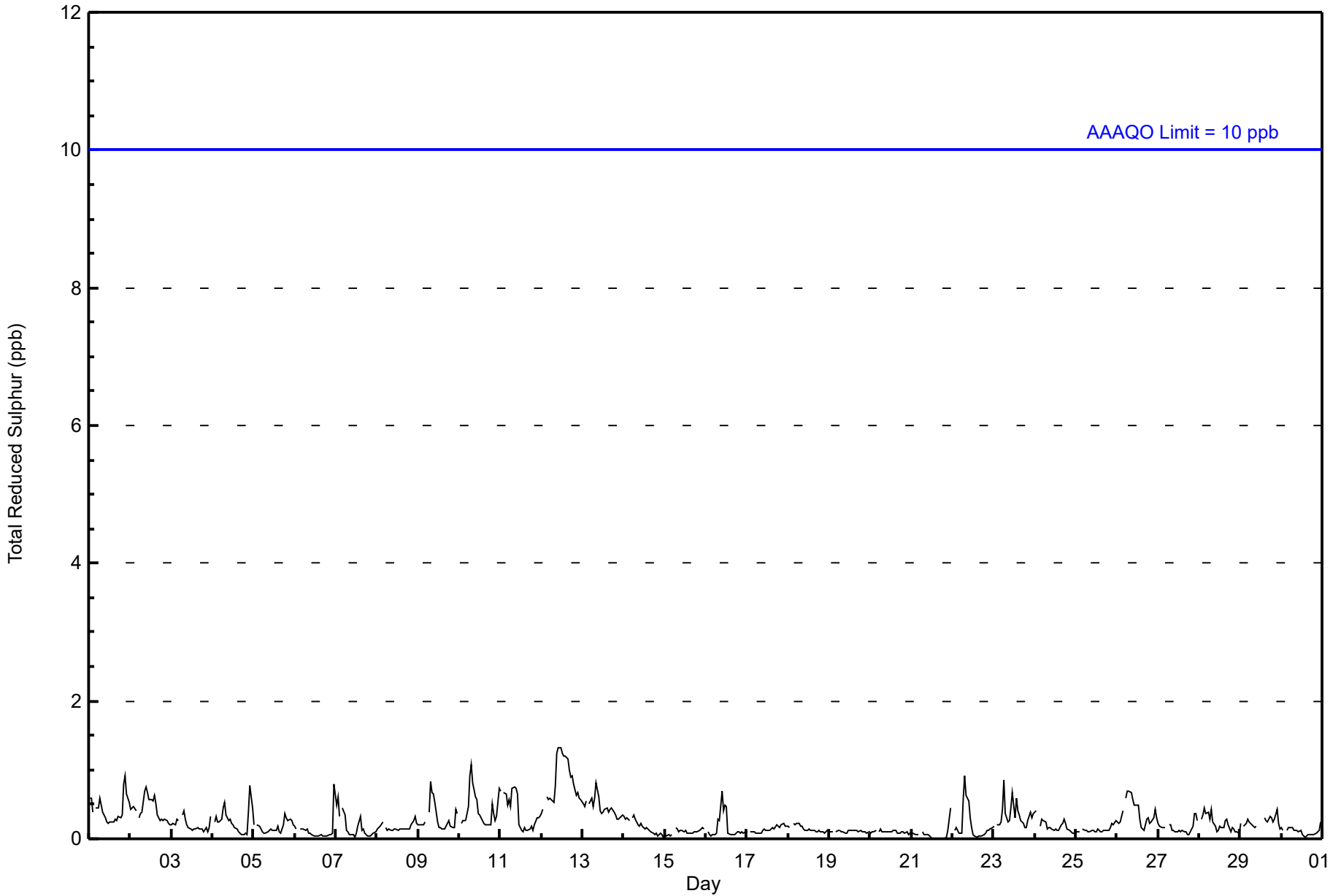
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Fort Hills











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort Hills - June 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

Total Reduced Sulphur (TRS) - ppb
Fort Hills - June 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	131	100	44	24	10	6	10	43	65	67	72	30	10	12	25	37	686
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	131	100	44	24	10	6	10	43	65	67	72	30	10	12	25	37	686

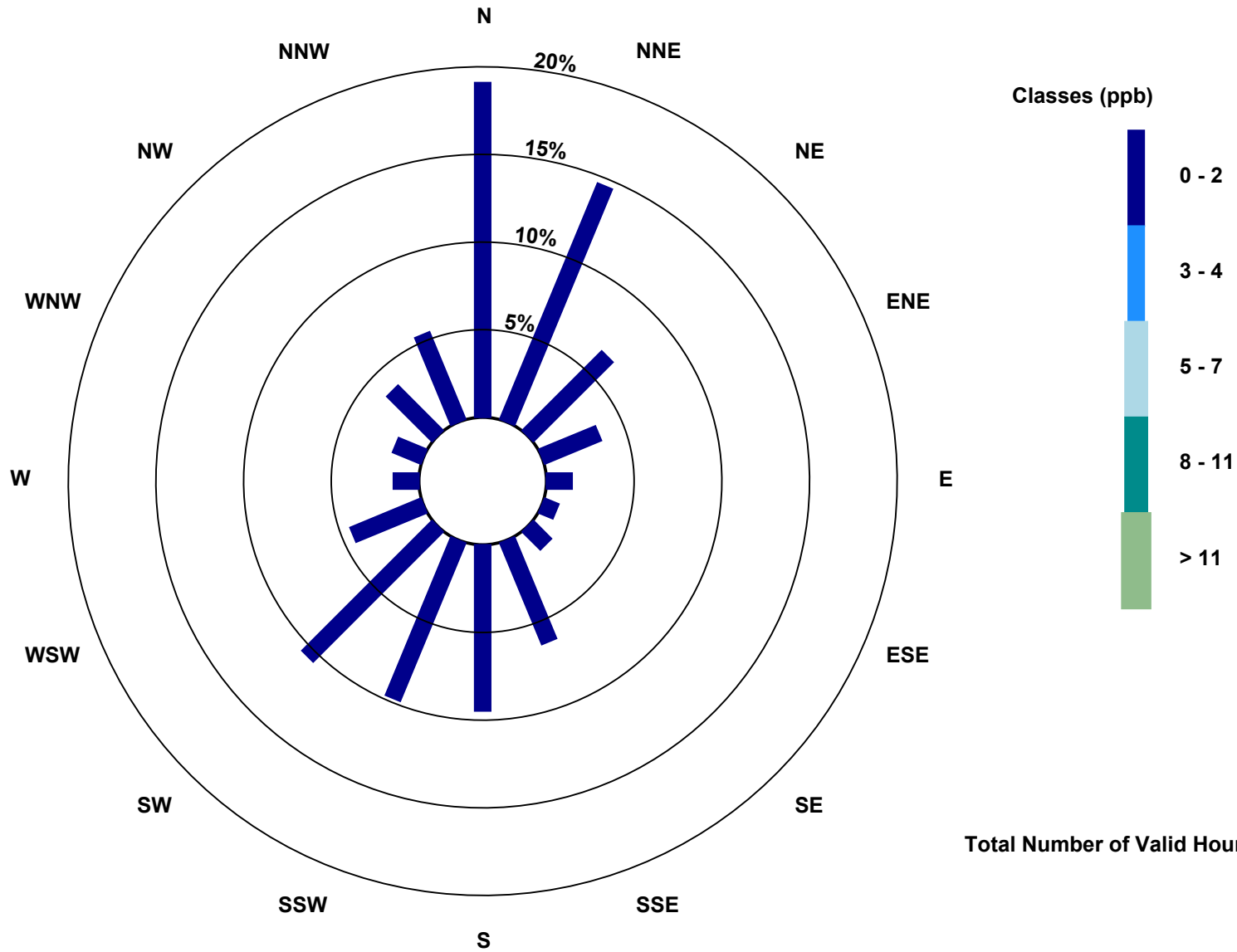
Total Number of Valid Hours: 686

Total Number of Hours: 720

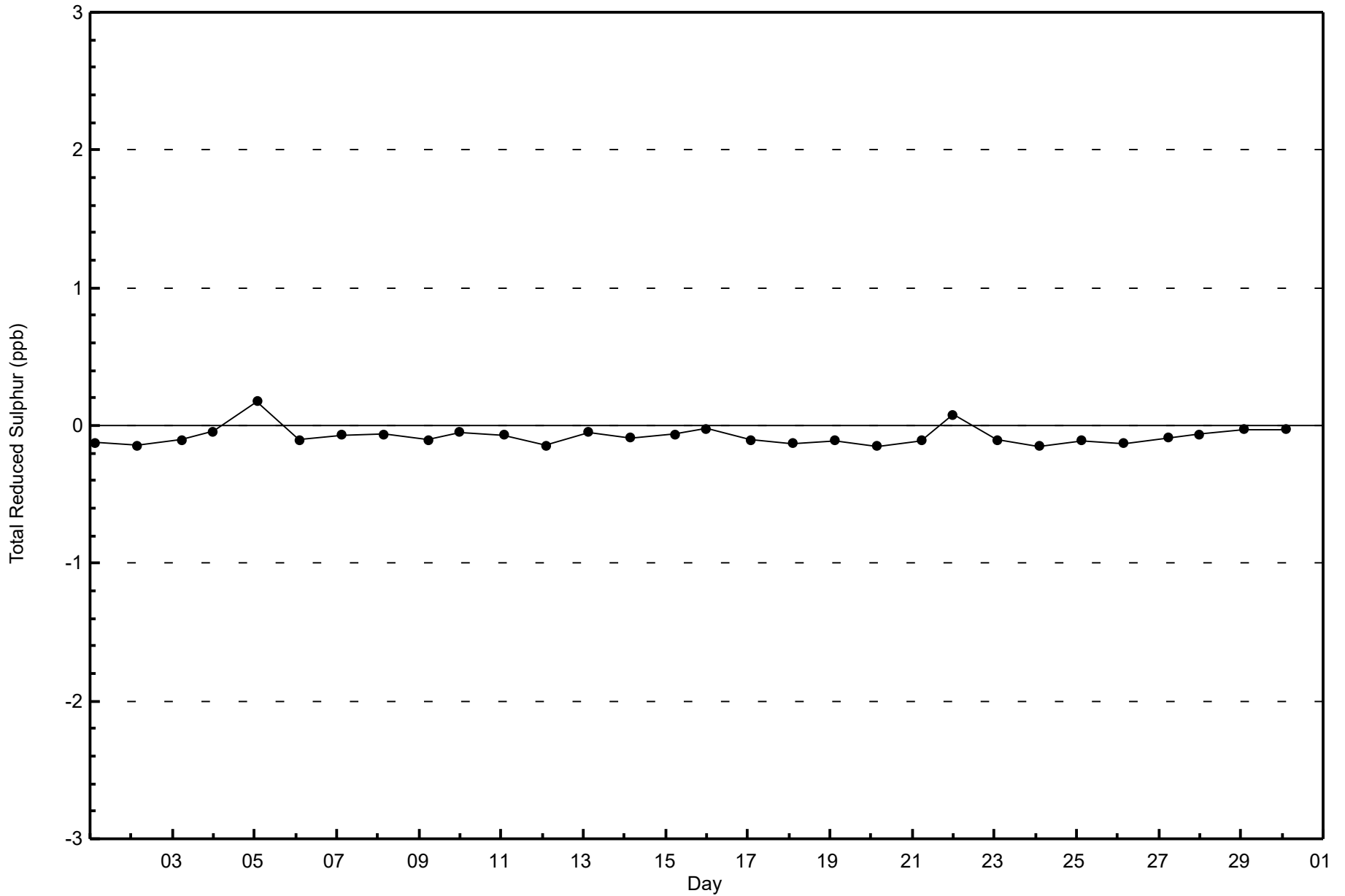


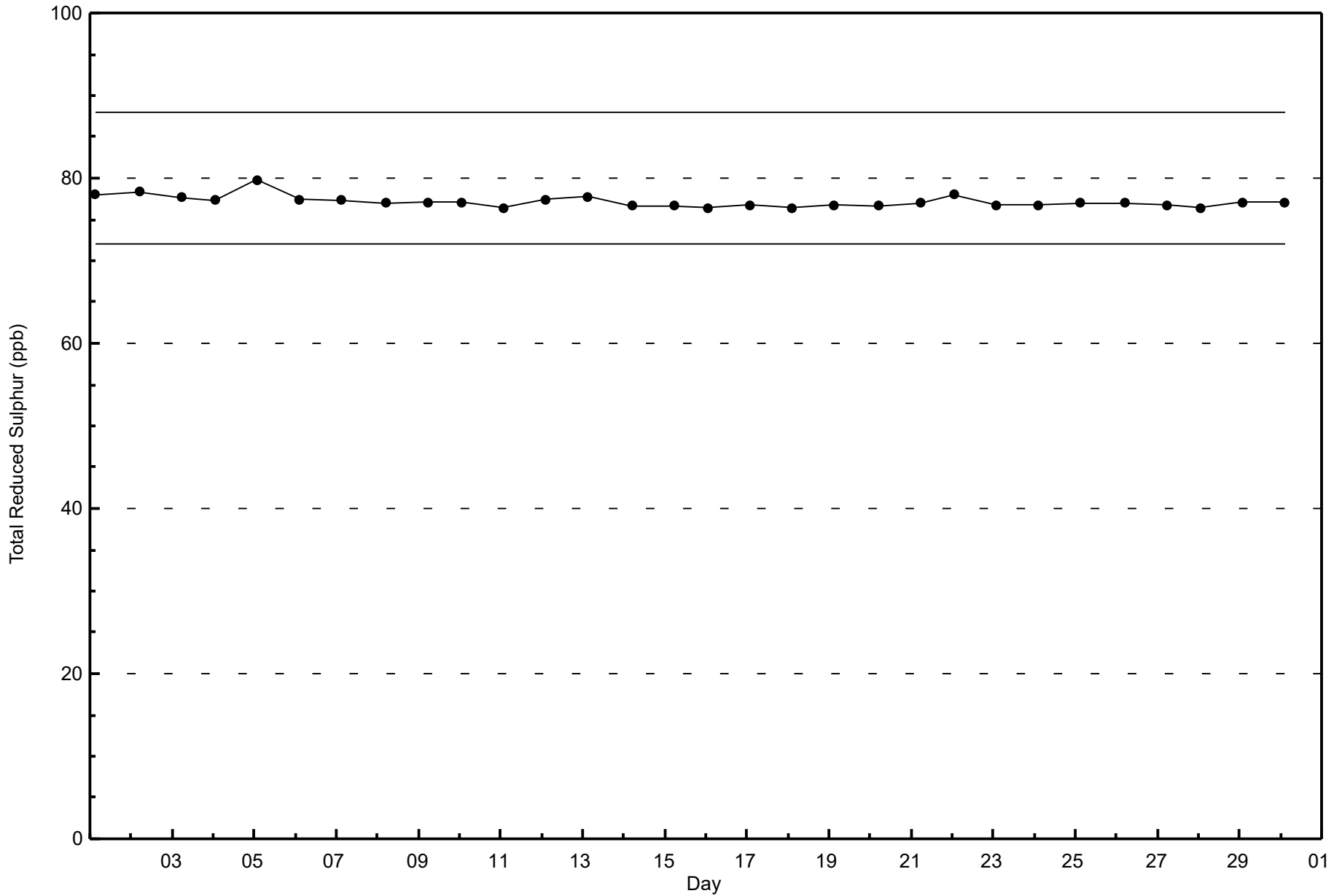
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Fort Hills



Total Number of Valid Hours: 686







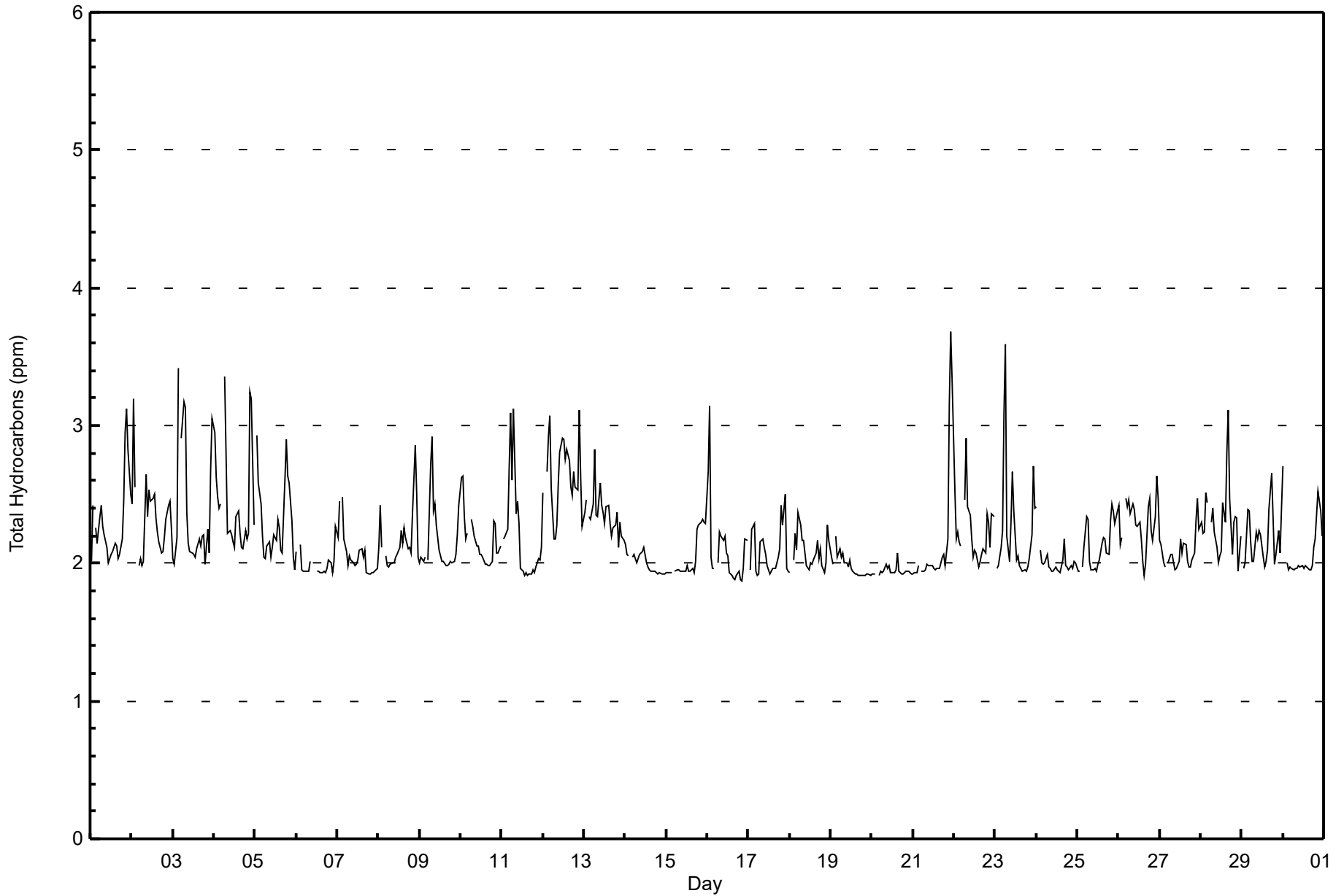
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort Hills - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum																											
Maximum Value: 3.7 ppm on Jun 21 23:00		Maximum Daily Average: 2.6 ppm on Jun 12		Hours of Data: 687														2.3		3.1																													
Minimum Value: 1.9 ppm on Jun 16 21:00		Minimum Daily Average: 1.9 ppm on Jun 20		Hours of Missing Data: 33														2.3		3.2																													
Maximum Diurnal Average: 2.3 ppm at hour 23		Minimum Diurnal Average: 2.1 ppm at hour 13		Hours of Calibration: 33														2.4		3.4																													
Monthly Average: 2.18 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.5 P ₉₉ = 3.2		Percent Operational Time: 100.0														2.5		3.4																													
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-Jun	2.0	2.4	Z	2.3	2.1	2.3	2.4	2.3	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.5	2.9	3.1	2.8	2.5	2.3	3.1																							
2-Jun	2.4	3.2	Z	2.6	Z	2.0	2.0	2.0	2.6	2.3	2.5	2.4	2.5	2.5	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.4	2.4	2.3	2.3	3.2																							
3-Jun	2.0	2.0	2.2	3.4	Z	2.9	3.2	3.1	2.4	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.2	2.2	2.0	2.2	2.1	2.7	3.0	2.4	3.4																							
4-Jun	3.0	2.6	2.5	2.4	2.4	Z	3.4	2.8	2.2	2.2	2.2	2.2	2.1	2.3	2.4	2.2	2.1	2.1	2.2	2.2	2.2	3.2	3.2	2.3	2.5	3.4																							
5-Jun	Z	2.9	2.6	2.4	2.2	2.0	2.0	2.1	2.2	2.0	2.1	2.2	2.2	2.3	2.3	2.1	2.1	2.6	2.9	2.6	2.6	2.3	2.0	1.9	2.3	2.9																							
6-Jun	2.1	Z	2.1	1.9	1.9	1.9	1.9	1.9	2.0	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.3	2.0	2.3																							
7-Jun	2.2	2.5	Z	2.5	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.5																							
8-Jun	2.1	2.4	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.3	2.2	2.1	2.1	2.1	2.4	2.9	2.5	2.0	2.2	2.9																							
9-Jun	2.0	2.0	2.0	2.0	Z	2.0	2.7	2.9	2.4	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.2	2.9																							
10-Jun	2.6	2.6	2.3	2.2	2.2	Z	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	2.3	2.3	2.1	2.1	2.1	2.2	2.6																							
11-Jun	Z	2.2	2.2	2.2	2.7	3.1	2.6	3.1	2.4	2.4	2.3	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.2	3.1																							
12-Jun	2.5	Z	2.7	2.9	3.1	2.5	2.2	2.2	2.3	2.6	2.8	2.9	2.9	2.8	2.8	2.7	2.5	2.5	2.7	2.5	2.5	3.1	2.6	2.3	2.6	3.1																							
13-Jun	2.4	2.5	Z	2.3	2.3	2.4	2.8	2.3	2.3	2.6	2.4	2.4	2.3	2.4	2.4	2.3	2.2	2.3	2.3	2.4	2.1	2.3	2.2	2.2	2.4	2.8																							
14-Jun	2.1	2.1	2.1	Z	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1																							
15-Jun	1.9	1.9	1.9	1.9	Z	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.0	2.3																							
16-Jun	2.7	3.1	2.0	2.0	2.0	Z	2.0	2.2	2.2	2.2	2.2	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.2	2.1	3.1																							
17-Jun	Z	1.9	2.2	2.3	1.9	1.9	1.9	2.2	2.2	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.4	2.3	2.5	2.0	1.9	2.1	2.5																							
18-Jun	1.9	Z	2.0	2.2	2.1	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.1	2.0	1.9	2.0	2.3	2.2	2.1	2.1	2.4																							
19-Jun	2.0	2.0	Z	2.2	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2																							
20-Jun	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	2.0	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1																							
21-Jun	1.9	1.9	1.9	2.0	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	3.2	3.7	3.3	2.2	3.7																							
22-Jun	2.5	2.2	2.2	2.2	2.1	Z	2.5	2.9	2.4	2.3	2.2	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.4	2.3	2.1	2.4	2.3	2.2	2.9																							
23-Jun	Z	2.0	2.0	2.1	2.2	3.1	3.6	2.2	2.0	2.3	2.7	2.4	2.0	2.1	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.2	2.7	2.4	2.2	3.6																							
24-Jun	2.4	Z	2.1	2.0	2.0	2.0	2.1	2.0	2.0	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4																						
25-Jun	1.9	1.9	Z	2.0	2.1	2.3	2.3	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.3	2.4	2.4	2.3	2.4	2.1	2.4																							
26-Jun	2.4	2.1	2.2	Z	2.5	2.4	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.0	1.9	2.0	2.4	2.5	2.2	2.2	2.3	2.6	2.5	2.3	2.6																							
27-Jun	2.2	2.1	2.0	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3	2.5	2.3	2.1	2.5																							
28-Jun	2.3	2.2	2.2	2.5	2.4	Z	2.3	2.4	2.2	2.1	2.0	2.1	2.1	2.4	2.3	2.8	3.1	2.5	2.1	2.3	2.3	2.3	1.9	2.2	2.3	3.1																							
29-Jun	Z	2.0	2.0	2.4	2.4	2.2	2.0	2.0	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.1	2.4	2.7	2.3	2.0	2.1	2.2	2.1	2.4	2.2	2.7																							
30-Jun	2.7	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	1.9	2.0	2.0	2.1	2.2	2.5	2.4	2.4	2.2	2.1	2.7																							
																								2.3	2.3	2.2	2.3	2.2	2.2	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	2.3	2.3	2.3	Diurnal Average		
																								3.0	3.2	2.7	3.4	3.1	3.1	3.6	3.1	2.6	2.6	2.8	2.9	2.9	2.8	2.8	2.8	3.1	2.7	2.9	2.6	2.9	3.2	3.7	3.3	Diurnal Maximum	
Z - zerospan																								C - Calibration																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	299	43.52	43.52
2.1 - 3.0	369	53.71	97.23
3.1 - 10.0	19	2.77	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
Fort Hills - June 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	79	33	5	8	5	0	3	9	24	38	33	10	6	9	12	25	299
2.1 - 3.0	51	61	35	16	4	5	6	31	42	32	36	18	4	3	11	14	369
3.1 - 10.0	4	3	3	0	1	2	1	1	1	1	0	1	0	0	0	1	19
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	134	97	43	24	10	7	10	41	67	71	69	29	10	12	23	40	687

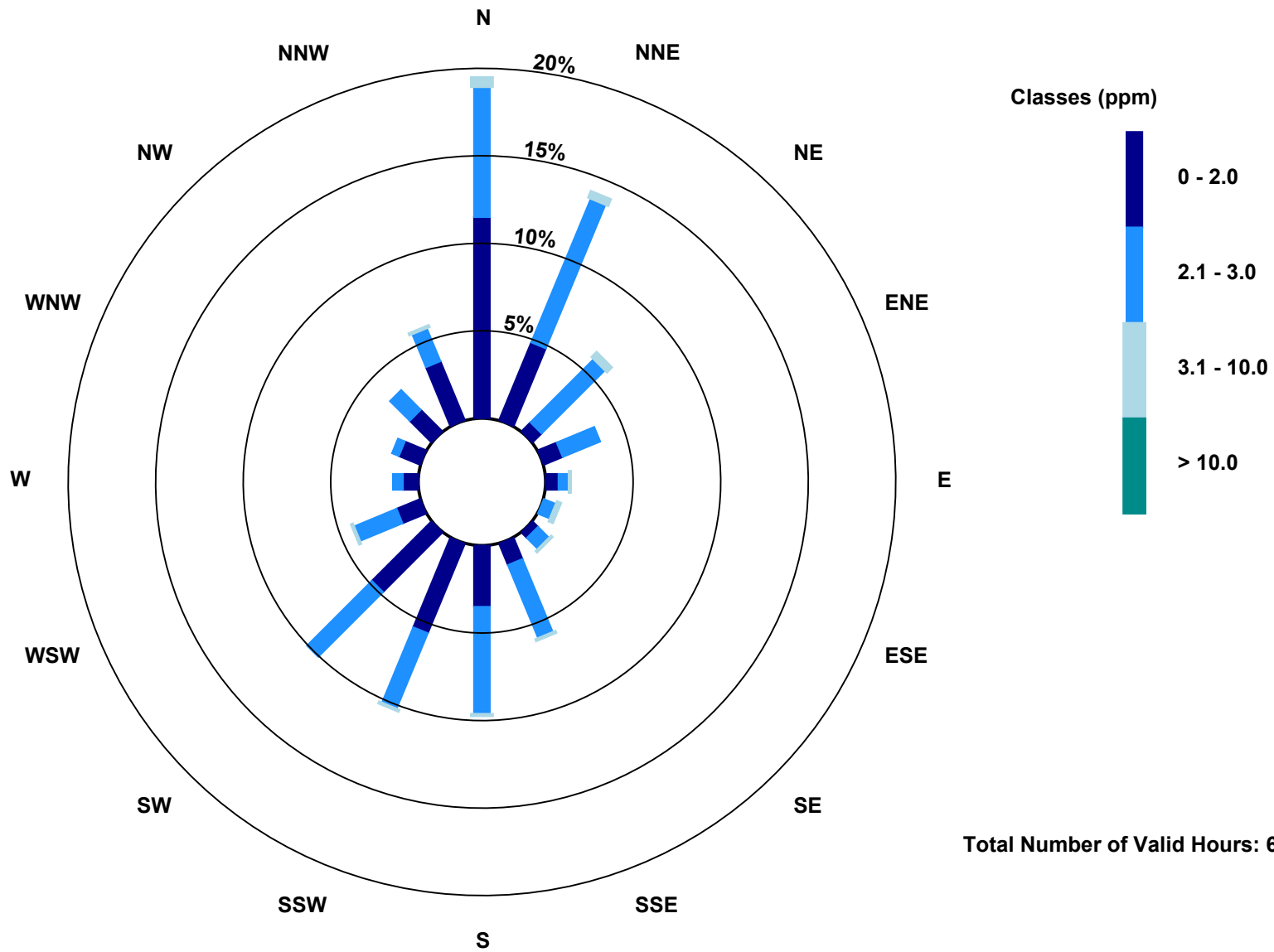
Total Number of Valid Hours: 687

Total Number of Hours: 720

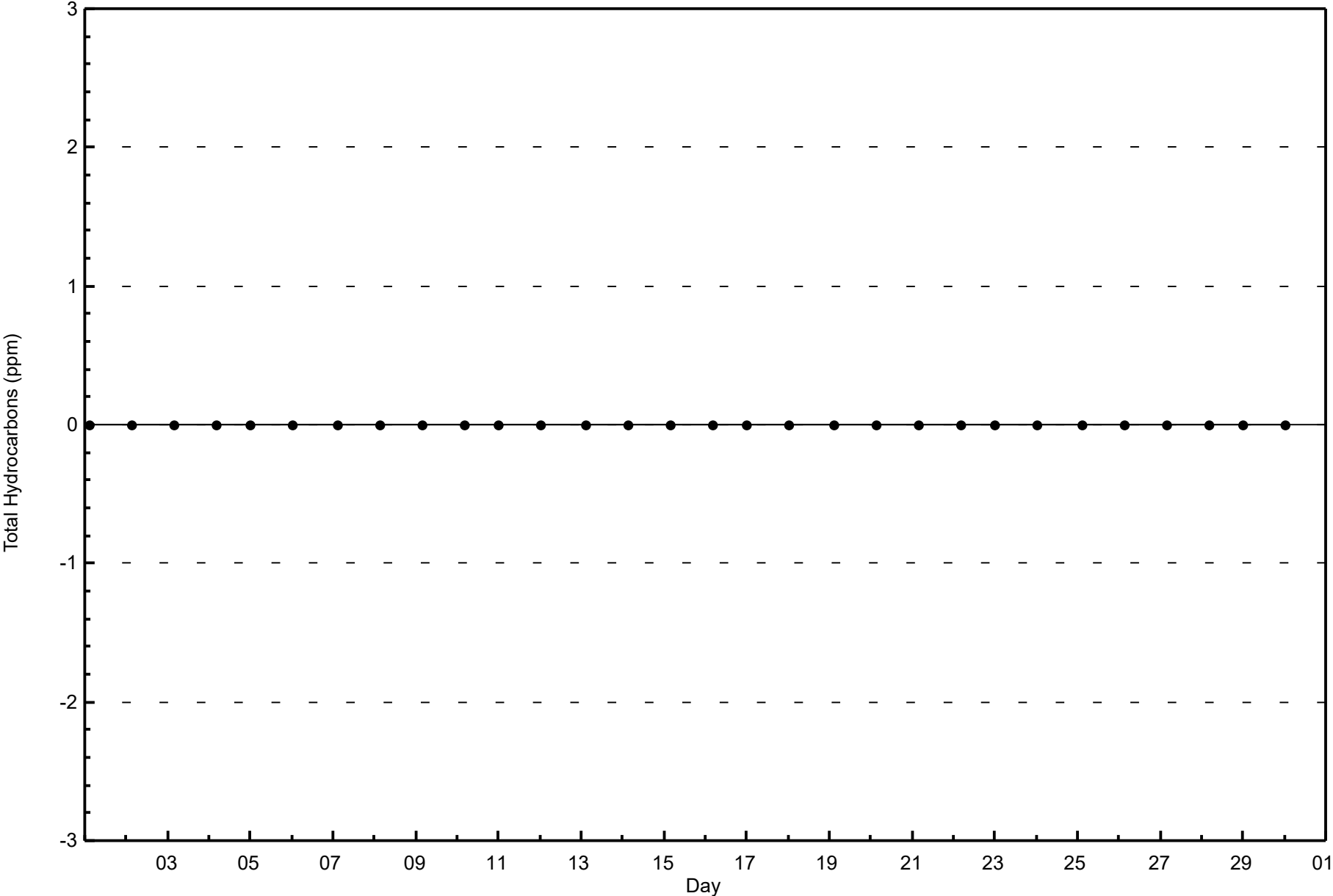


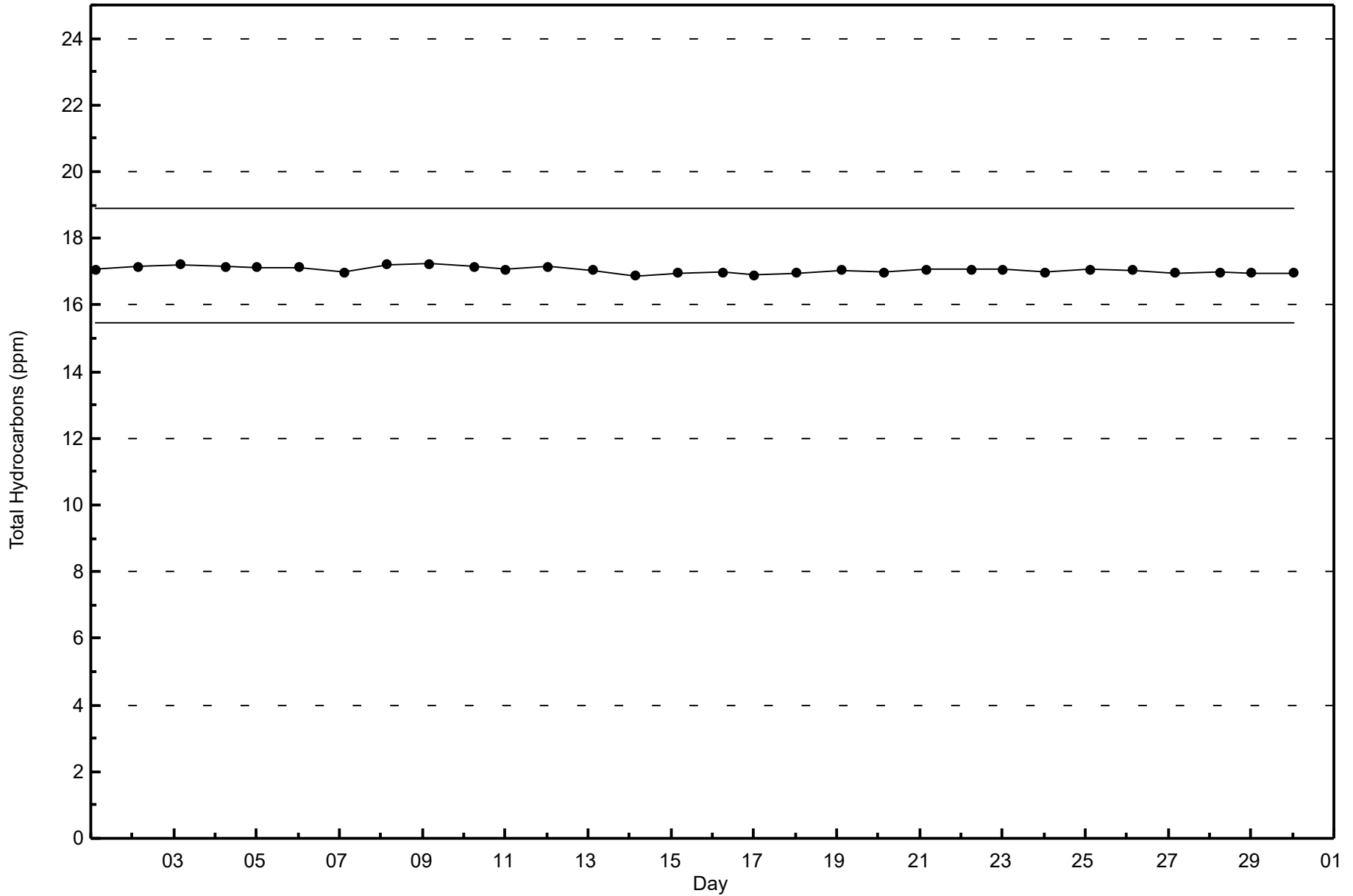
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Fort Hills



Total Number of Valid Hours: 687







Summary of Hour Averages

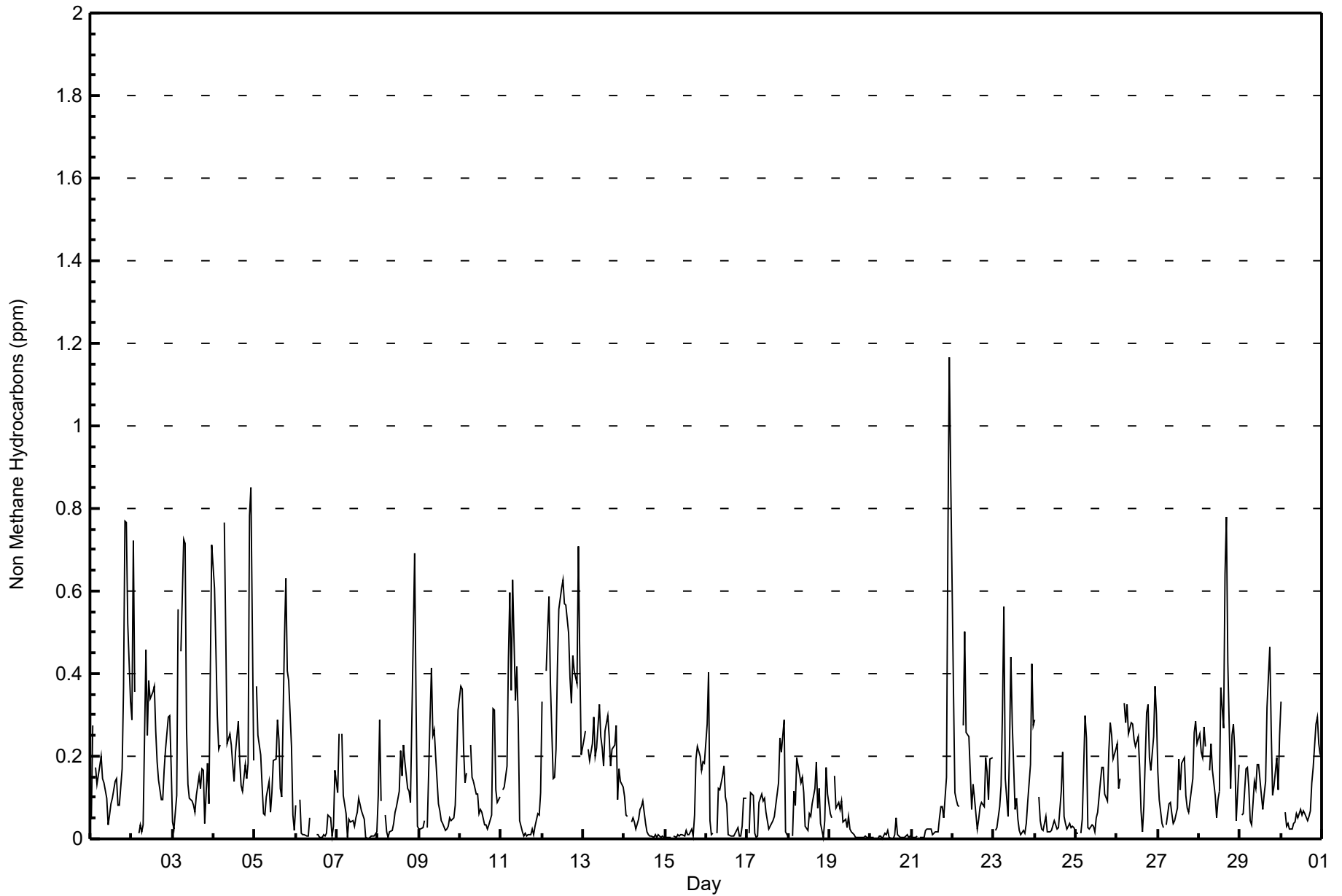
Fort Hills - June 2023

Maximum Value: 1.165 ppm on Jun 21 23:00	Maximum Daily Average: 0.428 ppm on Jun 12	Hours in Service: 720
Minimum Value: 0.000 ppm on Jun 7 19:00	Minimum Daily Average: 0.008 ppm on Jun 20	Hours of Data: 687
Maximum Diurnal Average: 0.234 ppm at hour 22	Minimum Diurnal Average: 0.109 ppm at hour 13	Hours of Missing Data: 33
Monthly Average: 0.148 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.8	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-Jun	0.046	0.275	Z	0.172	0.131	0.177	0.200	0.146	0.135	0.099	0.035	0.059	0.086	0.097	0.140	0.146	0.083	0.083	0.170	0.366	0.769	0.766	0.523	0.332	0.219	0.769
2-Jun	0.287	0.722	0.356	Z	0.014	0.035	0.018	0.034	0.458	0.251	0.384	0.339	0.355	0.371	0.261	0.187	0.143	0.095	0.095	0.165	0.217	0.294	0.298	0.176	0.242	0.722
3-Jun	0.042	0.023	0.106	0.557	Z	0.454	0.724	0.716	0.269	0.131	0.100	0.090	0.081	0.066	0.105	0.152	0.123	0.170	0.167	0.036	0.183	0.085	0.405	0.714	0.239	0.724
4-Jun	0.606	0.457	0.298	0.216	0.228	Z	0.766	0.507	0.232	0.256	0.227	0.180	0.138	0.209	0.285	0.191	0.128	0.116	0.179	0.144	0.183	0.784	0.851	0.190	0.320	0.851
5-Jun	Z	0.369	0.252	0.204	0.128	0.063	0.059	0.103	0.139	0.064	0.112	0.189	0.193	0.288	0.239	0.123	0.102	0.487	0.629	0.407	0.384	0.224	0.057	0.021	0.210	0.629
6-Jun	0.083	Z	0.097	0.014	0.011	0.009	0.006	0.008	0.050	C	C	C	0.009	0.010	0.003	0.004	0.012	0.005	0.015	0.059	0.050	0.007	0.032	0.165	0.032	0.165
7-Jun	0.112	0.253	Z	0.256	0.103	0.061	0.004	0.048	0.039	0.043	0.029	0.050	0.066	0.097	0.069	0.058	0.046	0.004	0.000	0.003	0.006	0.008	0.007	0.016	0.060	0.256
8-Jun	0.104	0.287	0.093	Z	0.057	0.017	0.004	0.018	0.020	0.037	0.064	0.076	0.115	0.214	0.154	0.227	0.185	0.123	0.117	0.087	0.289	0.690	0.328	0.029	0.145	0.690
9-Jun	0.023	0.024	0.027	0.043	Z	0.026	0.292	0.413	0.251	0.265	0.199	0.084	0.069	0.044	0.038	0.022	0.023	0.030	0.051	0.045	0.050	0.083	0.190	0.311	0.113	0.413
10-Jun	0.369	0.362	0.215	0.134	0.159	Z	0.228	0.151	0.138	0.108	0.107	0.061	0.070	0.064	0.032	0.034	0.024	0.034	0.058	0.315	0.311	0.117	0.089	0.101	0.143	0.369
11-Jun	Z	0.120	0.127	0.177	0.438	0.596	0.359	0.627	0.335	0.417	0.289	0.046	0.018	0.006	0.013	0.008	0.009	0.009	0.025	0.011	0.030	0.060	0.058	0.112	0.169	0.627
12-Jun	0.333	Z	0.406	0.506	0.587	0.375	0.146	0.149	0.219	0.414	0.556	0.608	0.627	0.570	0.566	0.497	0.389	0.329	0.445	0.405	0.377	0.708	0.431	0.202	0.428	0.708
13-Jun	0.242	0.261	Z	0.217	0.191	0.229	0.295	0.200	0.220	0.326	0.248	0.219	0.178	0.261	0.299	0.246	0.176	0.218	0.226	0.274	0.095	0.168	0.141	0.124	0.220	0.326
14-Jun	0.103	0.058	0.053	Z	0.041	0.051	0.040	0.023	0.048	0.072	0.076	0.092	0.037	0.018	0.011	0.007	0.006	0.002	0.011	0.005	0.010	0.005	0.005	0.003	0.034	0.103
15-Jun	0.005	0.005	0.005	0.003	Z	0.007	0.005	0.011	0.008	0.009	0.011	0.007	0.022	0.009	0.011	0.025	0.006	0.056	0.192	0.224	0.200	0.166	0.185	0.184	0.059	0.224
16-Jun	0.278	0.404	0.043	0.009	0.015	Z	0.015	0.121	0.120	0.153	0.176	0.101	0.085	0.009	0.006	0.007	0.006	0.014	0.028	0.007	0.007	0.032	0.099	0.098	0.080	0.404
17-Jun	Z	0.014	0.113	0.105	0.013	0.003	0.006	0.088	0.108	0.092	0.098	0.063	0.024	0.031	0.038	0.043	0.053	0.107	0.134	0.244	0.211	0.289	0.018	0.009	0.083	0.289
18-Jun	0.008	Z	0.008	0.117	0.082	0.197	0.157	0.135	0.150	0.112	0.030	0.020	0.063	0.055	0.086	0.123	0.185	0.074	0.123	0.037	0.005	0.045	0.174	0.109	0.091	0.197
19-Jun	0.060	0.051	Z	0.152	0.076	0.087	0.072	0.091	0.042	0.048	0.028	0.054	0.023	0.016	0.010	0.005	0.004	0.003	0.003	0.004	0.002	0.006	0.003	0.004	0.037	0.152
20-Jun	0.004	0.002	0.004	Z	0.001	0.008	0.006	0.001	0.014	0.011	0.022	0.004	0.001	0.002	0.012	0.050	0.009	0.003	0.003	0.005	0.004	0.009	0.003	0.005	0.008	0.050
21-Jun	0.004	0.003	0.003	0.006	Z	0.002	0.005	0.002	0.020	0.024	0.022	0.023	0.011	0.014	0.016	0.016	0.052	0.077	0.080	0.050	0.148	0.723	1.165	0.877	0.145	1.165
22-Jun	0.356	0.112	0.096	0.080	0.077	Z	0.273	0.503	0.257	0.249	0.161	0.070	0.133	0.098	0.025	0.048	0.079	0.088	0.077	0.195	0.162	0.094	0.194	0.198	0.157	0.503
23-Jun	Z	0.020	0.026	0.076	0.130	0.313	0.564	0.146	0.054	0.213	0.440	0.279	0.071	0.099	0.048	0.021	0.011	0.019	0.013	0.039	0.088	0.178	0.424	0.274	0.154	0.564
24-Jun	0.289	Z	0.101	0.043	0.025	0.021	0.054	0.018	0.018	0.017	0.021	0.046	0.036	0.025	0.026	0.116	0.209	0.053	0.038	0.023	0.038	0.028	0.032	0.026	0.056	0.289
25-Jun	0.014	0.014	Z	0.015	0.047	0.298	0.244	0.028	0.023	0.035	0.031	0.017	0.051	0.064	0.140	0.173	0.174	0.109	0.091	0.213	0.081	0.250	0.193	0.218	0.118	0.298
26-Jun	0.231	0.121	0.145	Z	0.329	0.283	0.326	0.253	0.281	0.280	0.241	0.223	0.246	0.171	0.069	0.016	0.078	0.304	0.327	0.197	0.166	0.246	0.369	0.301	0.226	0.369
27-Jun	0.164	0.097	0.038	0.027	Z	0.033	0.084	0.087	0.062	0.037	0.043	0.075	0.192	0.120	0.183	0.196	0.104	0.073	0.064	0.093	0.145	0.258	0.285	0.230	0.117	0.285
28-Jun	0.255	0.210	0.198	0.271	0.224	Z	0.167	0.230	0.167	0.105	0.051	0.093	0.114	0.367	0.267	0.642	0.779	0.427	0.120	0.251	0.280	0.213	0.046	0.180	0.246	0.779
29-Jun	Z	0.058	0.060	0.170	0.172	0.126	0.043	0.034	0.138	0.122	0.179	0.181	0.106	0.072	0.108	0.139	0.318	0.466	0.265	0.104	0.128	0.195	0.119	0.249	0.154	0.466
30-Jun	0.333	Z	0.064	0.031	0.037	0.025	0.023	0.038	0.039	0.061	0.053	0.071	0.059	0.067	0.060	0.044	0.056	0.068	0.135	0.174	0.279	0.294	0.231	0.204	0.106	0.333

0.174	0.173	0.117	0.144	0.133	0.140	0.173	0.164	0.135	0.140	0.139	0.118	0.109	0.118	0.111	0.119	0.119	0.122	0.129	0.139	0.170	0.234	0.232	0.189			Diurnal Average
0.606	0.722	0.406	0.557	0.587	0.596	0.766	0.716	0.458	0.417	0.556	0.608	0.627	0.570	0.566	0.642	0.779	0.487	0.629	0.407	0.769	0.784	1.165	0.877			Diurnal Maximum

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	48	6.99	6.99
0.006 - 0.05	206	29.99	36.97
0.06 - 0.1	183	26.64	63.61
> 0.1	250	36.39	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - June 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	30	0	0	0	0	0	0	0	0	1	4	0	1	1	2	9	48
0.006 - 0.05	44	30	3	5	1	0	2	6	20	32	23	4	4	8	9	15	206
0.06 - 0.1	26	27	12	8	5	3	1	15	19	16	25	10	3	2	5	6	183
> 0.1	34	40	28	11	4	4	7	20	28	22	17	15	2	1	7	10	250
Totals	134	97	43	24	10	7	10	41	67	71	69	29	10	12	23	40	687

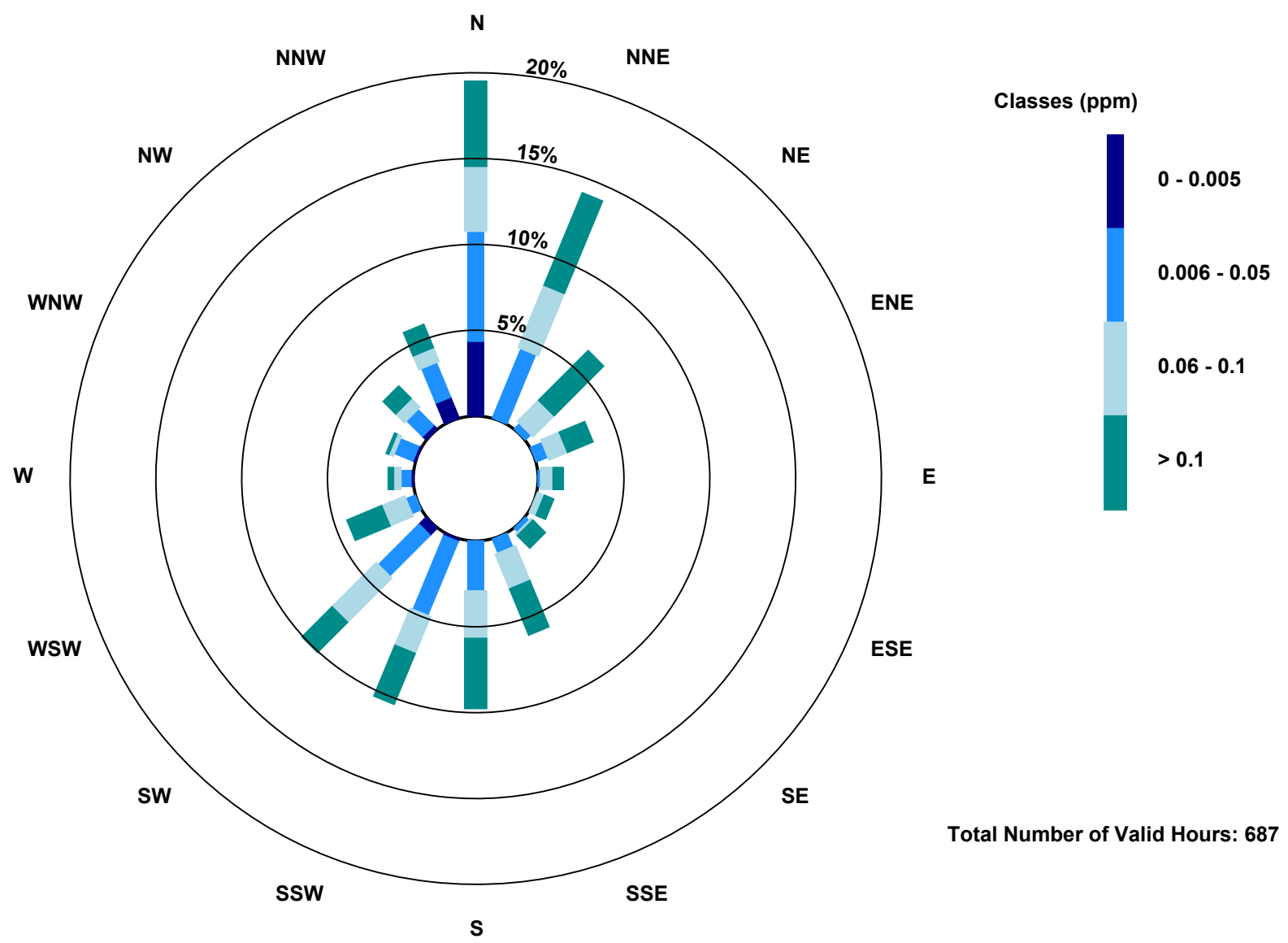
Total Number of Valid Hours: 687

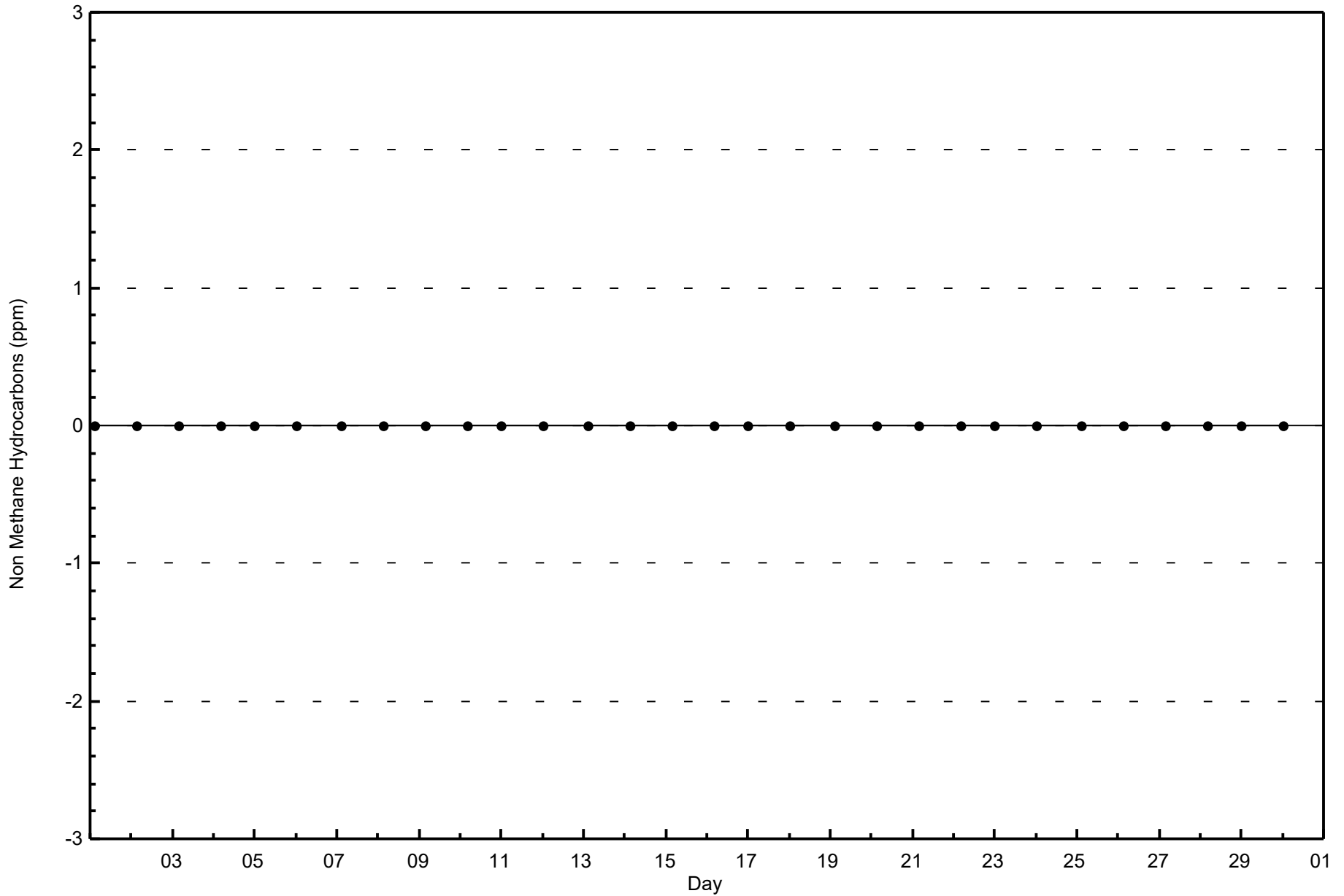
Total Number of Hours: 720

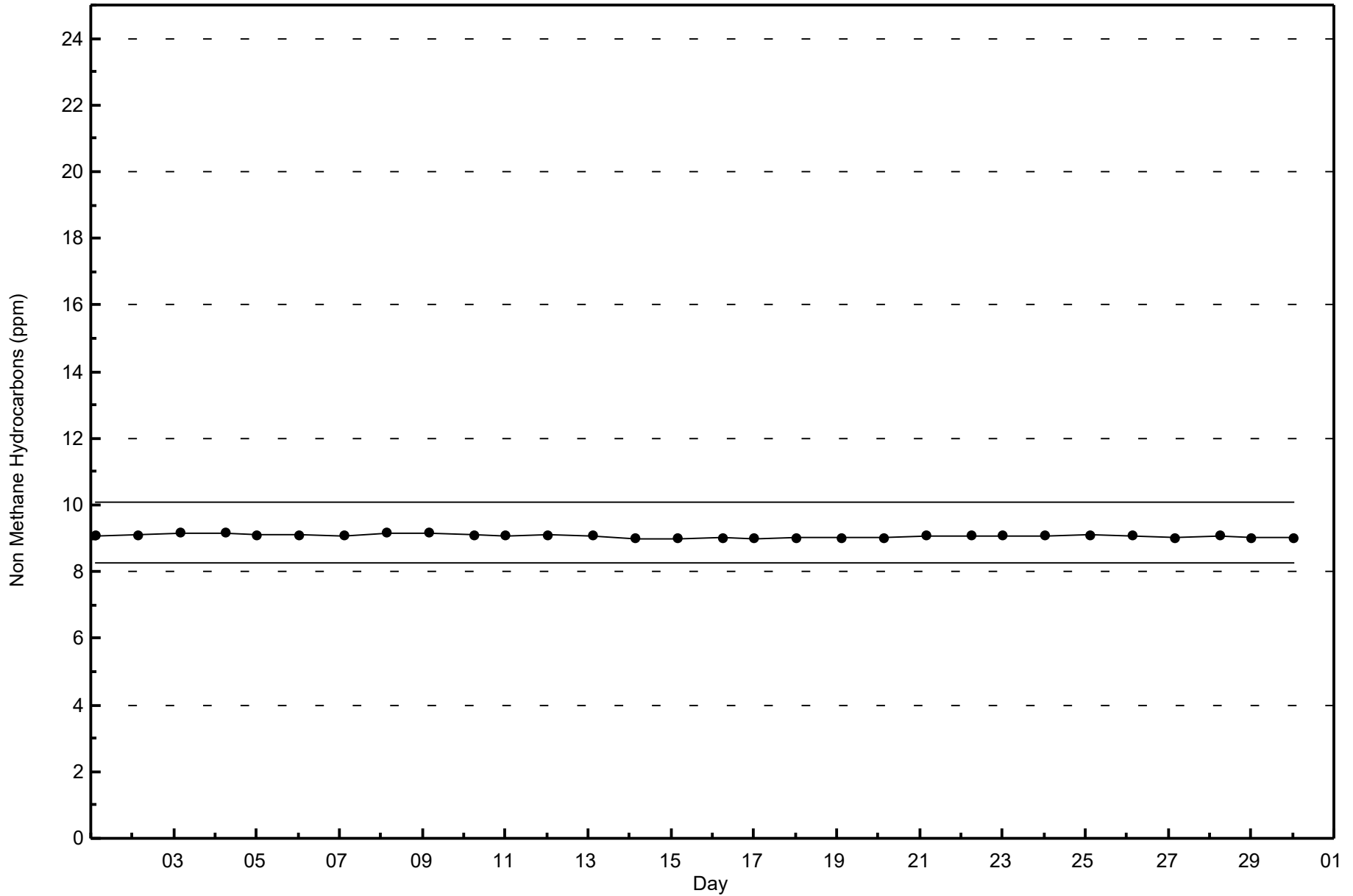


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Fort Hills - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.0 ppm on Jun 23 07:00	Maximum Daily Average: 2.2 ppm on Jun 12		Hours of Data:	687
Minimum Value: 1.9 ppm on Jun 16 21:00	Minimum Daily Average: 1.9 ppm on Jun 20		Hours of Missing Data:	33
Maximum Diurnal Average: 2.1 ppm at hour 7	Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration:	33
Monthly Average: 2.04 ppm	Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 1.9 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.5		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-Jun	2.0	2.1	Z	2.1	2.0	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	2.4	2.3	2.2	2.1	2.4
2-Jun	2.1	2.5	Z	Z	2.0	2.0	2.0	2.0	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	2.1	2.5
3-Jun	2.0	2.0	2.1	2.9	Z	2.5	2.4	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.3	2.3	2.1	2.9
4-Jun	2.3	2.2	2.2	2.2	2.2	Z	2.6	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.5	2.3	2.1	2.1	2.6
5-Jun	Z	2.6	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	2.1	2.3	2.2	2.2	2.1	2.0	1.9	2.1	2.6
6-Jun	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	2.0	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.1	2.0	2.1
7-Jun	2.1	2.2	Z	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
8-Jun	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.2
9-Jun	2.0	2.0	2.0	2.0	Z	2.0	2.4	2.5	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.5
10-Jun	2.2	2.3	2.1	2.0	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	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
11-Jun	Z	2.1	2.1	2.1	2.3	2.5	2.2	2.5	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	2.5
12-Jun	2.2	Z	2.3	2.4	2.5	2.2	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.4	2.2	2.1	2.2	2.5
13-Jun	2.1	2.2	Z	2.1	2.1	2.2	2.5	2.1	2.1	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.5
14-Jun	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	1.9	1.9	1.9	1.9	2.0
15-Jun	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.2	2.1	2.1	2.0	2.2
16-Jun	2.4	2.7	2.0	1.9	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.0	2.7
17-Jun	Z	1.9	2.1	2.2	1.9	1.9	1.9	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.1	2.2	1.9	1.9	2.0	2.2
18-Jun	1.9	Z	2.0	2.1	2.0	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.1	2.0	2.2
19-Jun	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
20-Jun	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
21-Jun	1.9	1.9	1.9	2.0	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.4	2.5	2.4	2.0	2.5
22-Jun	2.2	2.1	2.1	2.1	2.1	Z	2.2	2.4	2.2	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.2	2.1	2.1	2.4
23-Jun	Z	1.9	2.0	2.0	2.1	2.8	3.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3	2.1	2.1	3.0
24-Jun	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	2.0	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1
25-Jun	1.9	1.9	Z	2.0	2.1	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.2
26-Jun	2.2	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	1.9	1.9	1.9	2.1	2.1	2.0	2.0	2.1	2.3	2.2	2.1	2.3
27-Jun	2.0	2.0	2.0	1.9	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2	2.0	2.0	2.2
28-Jun	2.0	2.0	2.0	2.2	2.2	Z	2.1	2.2	2.1	2.0	1.9	2.0	2.0	2.1	2.0	2.2	2.3	2.0	1.9	2.0	2.1	2.1	1.9	2.0	2.1	2.3
29-Jun	Z	1.9	1.9	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.1	2.2	2.1	1.9	1.9	2.0	2.0	2.1	2.0	2.2
30-Jun	2.4	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.2	2.1	2.0	2.0	2.4

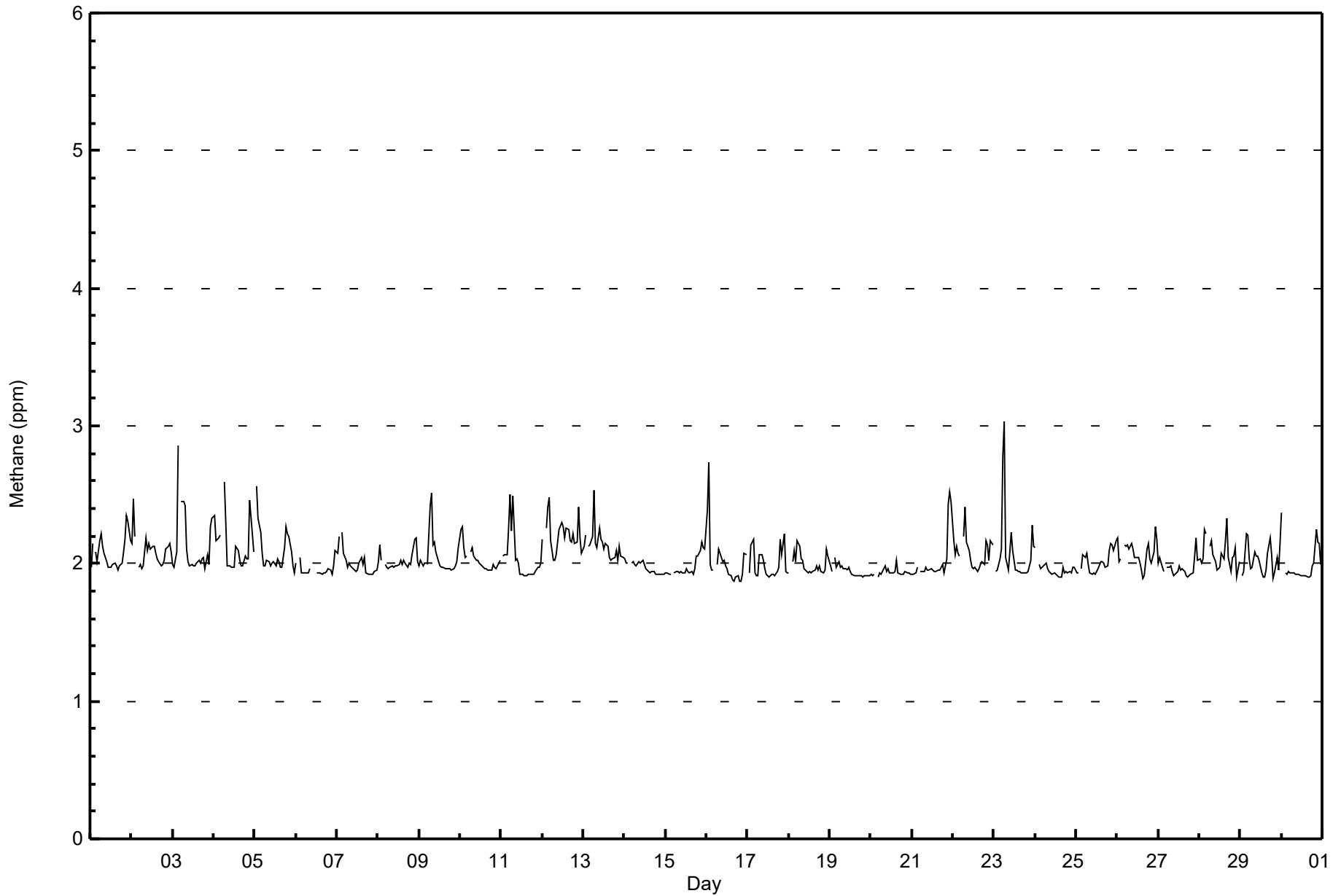
2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	Diurnal Average	
2.4	2.7	2.3	2.9	2.5	2.8	3.0	2.5	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.2	2.5	2.5	2.4	Diurnal Maximum	

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort Hills - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	472	68.70	68.70
2.1 - 3.0	215	31.30	100.00
3.1 - 10.0	0	0.00	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
Fort Hills - June 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	102	65	22	20	7	3	5	25	40	51	47	18	9	11	16	31	472
2.1 - 3.0	32	32	21	4	3	4	5	16	27	20	22	11	1	1	7	9	215
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	134	97	43	24	10	7	10	41	67	71	69	29	10	12	23	40	687

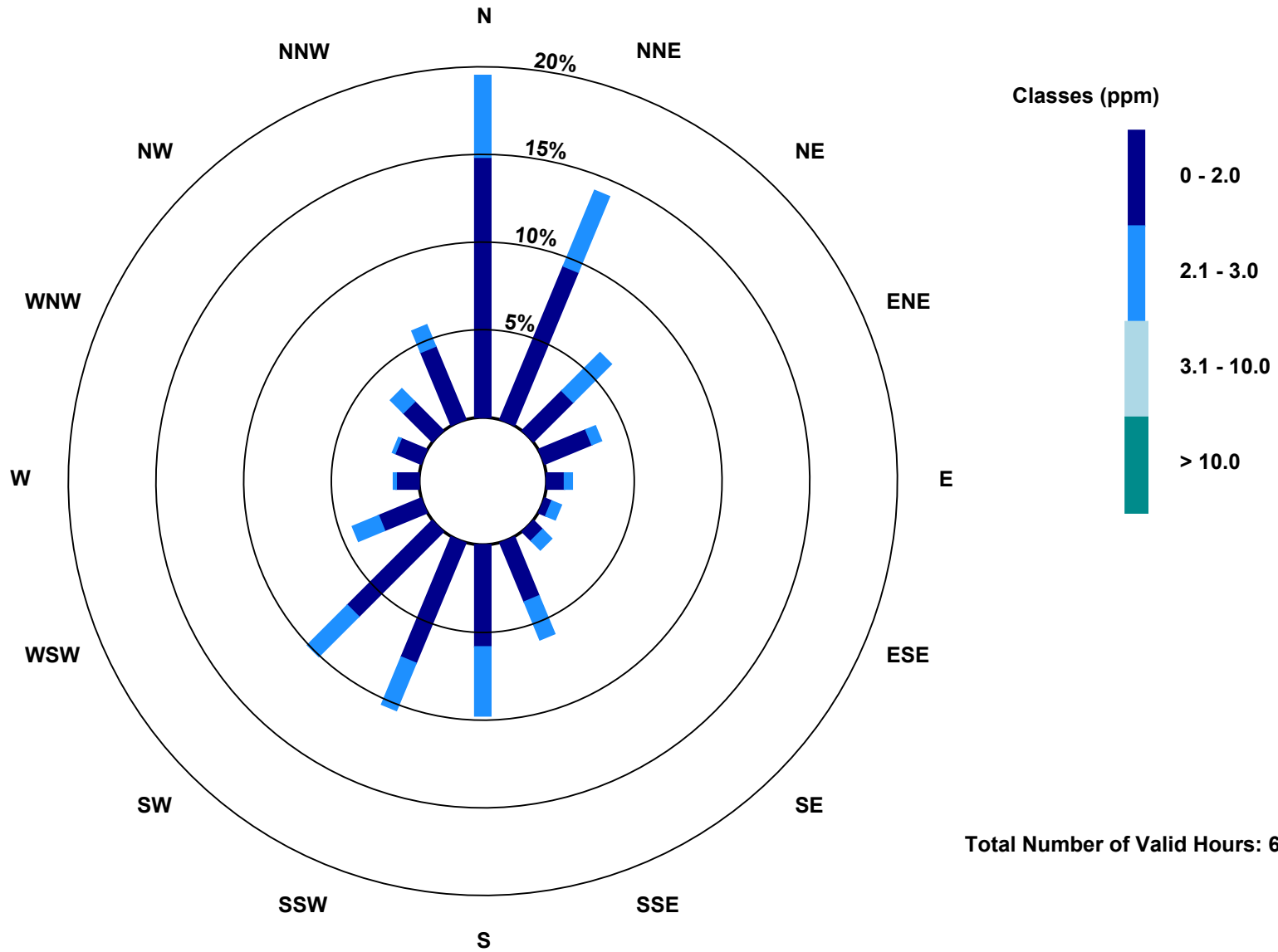
Total Number of Valid Hours: 687

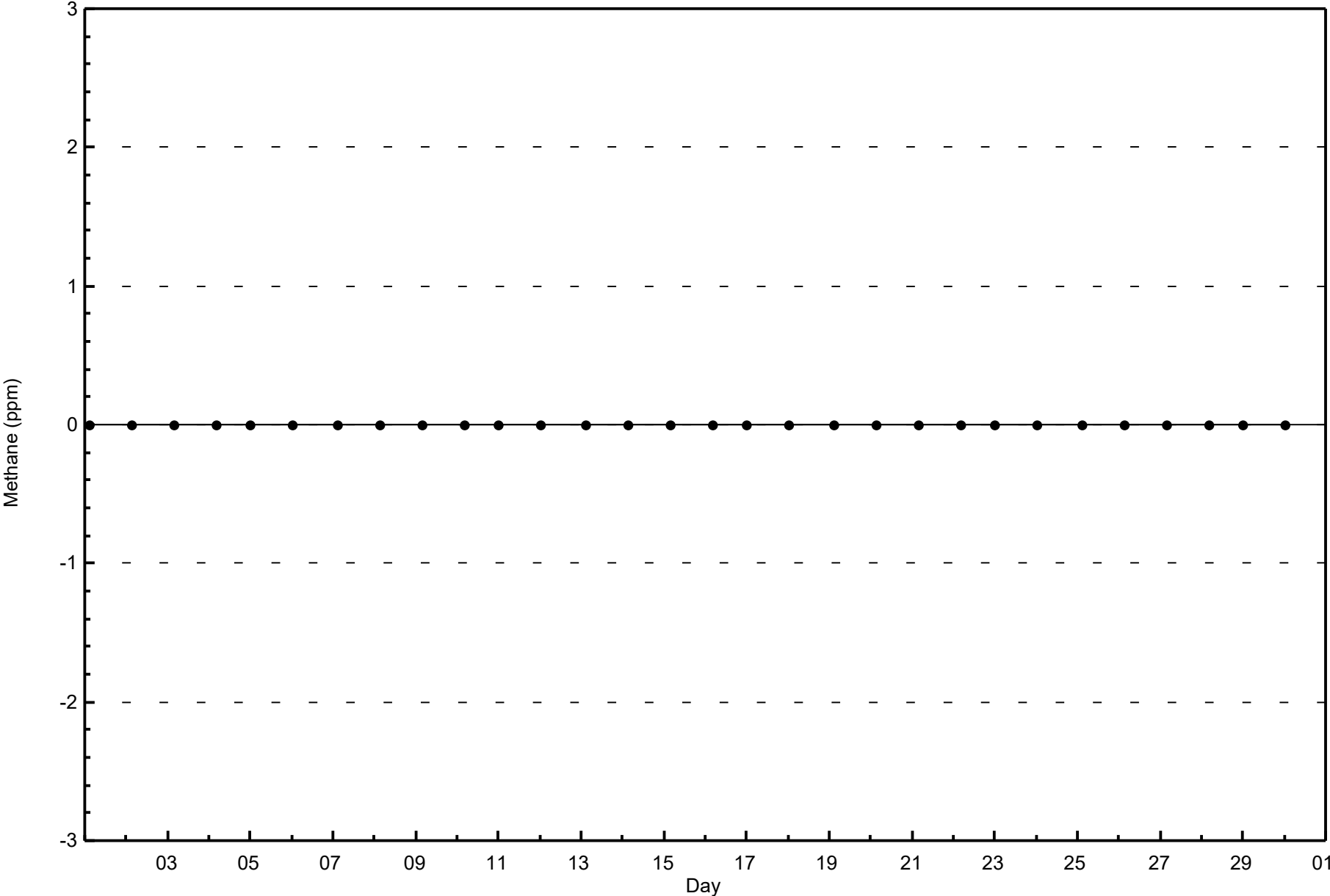
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Fort Hills

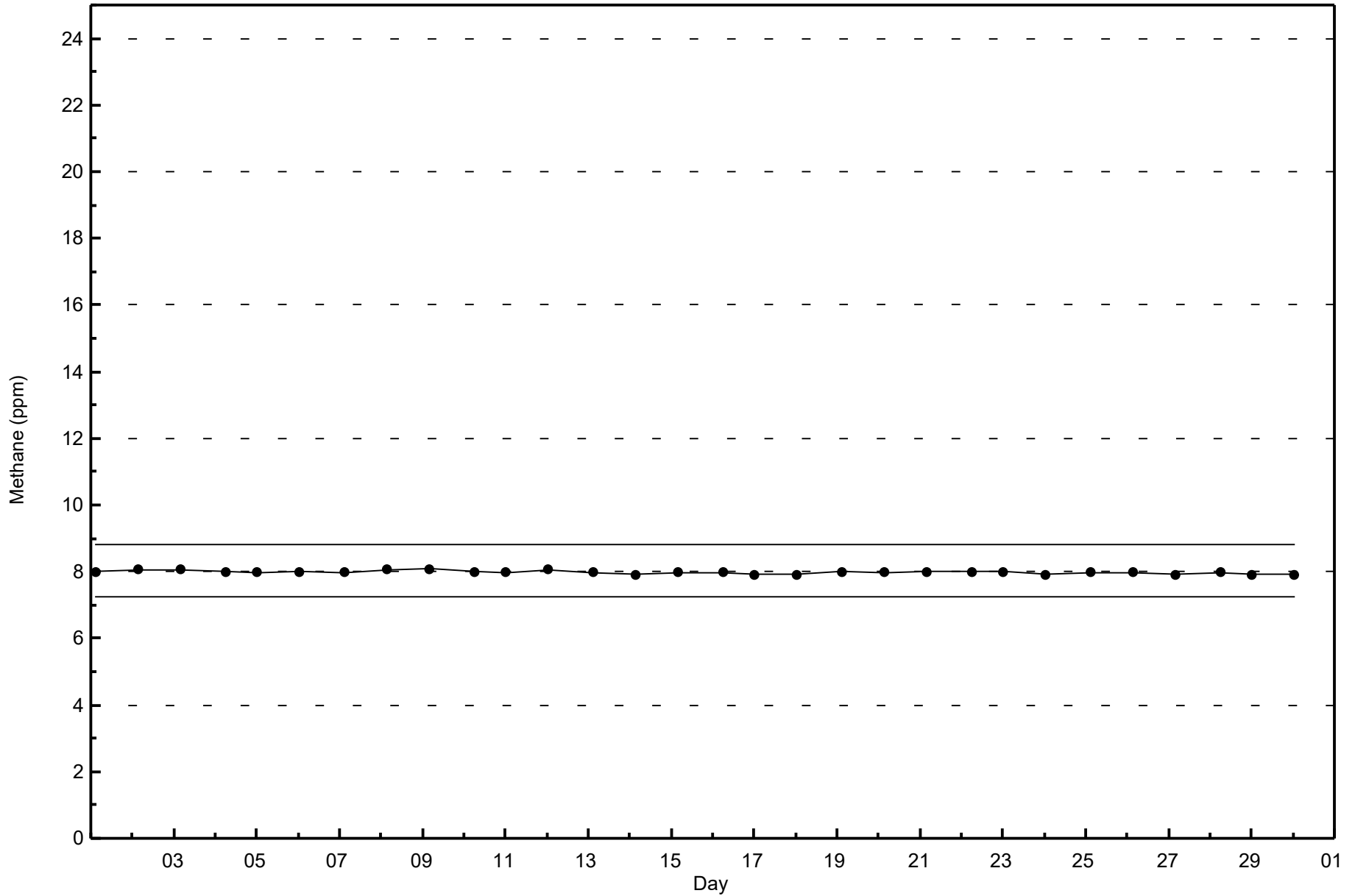






Wood Buffalo Environmental Association
Span Responses

Methane (CH₄) - ppm
Fort Hills - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 72.6 ppb on Jun 21 23:00	Maximum Daily Average: 11.5 ppb on Jun 12		Hours of Data:	680
Minimum Value: 0.0 ppb on Jun 1 17:00	Minimum Daily Average: 0.2 ppb on Jun 30		Hours of Missing Data:	40
Maximum Diurnal Average: 8.2 ppb at hour 7	Minimum Diurnal Average: 0.9 ppb at hour 17		Hours of Calibration:	35
Monthly Average: 3.04 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.6 Q ₃ = 2.5 P ₉₀ = 7.4 P ₉₉ = 36.7		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-Jun	Z	0.1	0.0	0.1	0.0	1.1	4.1	2.7	1.9	C	C	C	C	C	0.6	0.2	0.0	0.2	1.0	3.6	31.2	10.7	9.2	4.6	4.0	31.2
2-Jun	6.0	Z	6.3	0.0	0.0	0.0	0.5	0.6	17.1	1.1	1.1	0.5	0.5	0.6	0.4	0.2	0.1	0.1	0.2	0.3	0.5	0.3	1.2	0.1	1.7	17.1
3-Jun	0.0	0.0	Z	50.5	1.5	19.9	49.2	27.7	5.7	1.7	1.1	0.7	0.6	0.3	0.7	0.8	0.4	0.6	0.7	0.0	1.3	0.1	7.9	16.8	8.2	50.5
4-Jun	2.9	7.4	6.6	Z	10.9	18.6	22.5	17.8	0.3	0.8	0.9	0.8	0.5	3.6	3.7	1.1	0.3	0.3	2.3	3.7	5.0	8.3	5.2	0.5	5.4	22.5
5-Jun	7.0	7.5	15.0	11.3	Z	0.2	2.2	3.7	7.6	0.4	2.1	7.0	1.4	2.5	3.7	1.4	0.4	6.0	8.9	5.4	3.3	2.1	0.0	0.0	4.3	15.0
6-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.4	0.2	1.9	2.3	0.4	0.3	0.2	0.1	0.0	0.0	0.2	0.0	0.3	0.8	0.2	0.0	0.0	0.0	0.3	2.3
7-Jun	Z	9.9	5.8	23.1	1.0	0.6	0.1	1.1	1.3	1.0	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	2.0	23.1
8-Jun	0.8	Z	0.1	0.3	0.3	0.4	0.2	0.5	1.6	0.7	1.4	1.5	1.8	3.3	2.2	3.0	1.6	0.6	1.0	1.0	21.8	34.9	18.6	0.4	4.3	34.9
9-Jun	1.0	0.2	Z	4.2	13.0	3.0	36.1	26.8	9.8	10.2	3.4	0.6	0.6	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	4.8	36.1
10-Jun	1.2	0.4	0.0	Z	0.1	1.3	1.8	1.0	1.1	0.4	1.1	0.8	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.8
11-Jun	0.0	0.0	0.0	0.0	Z	16.0	8.9	15.5	1.0	4.9	3.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	2.2	16.0
12-Jun	15.0	20.4	11.3	32.7	22.1	Z	9.8	7.3	7.1	3.2	6.8	6.1	4.1	5.0	14.5	5.3	12.2	22.1	12.5	5.6	3.3	34.3	3.8	0.3	11.5	34.3
13-Jun	Z	13.3	51.0	5.6	5.1	7.4	9.3	4.0	2.5	6.9	3.7	1.5	0.6	1.0	2.5	0.9	0.3	1.9	1.5	4.4	0.4	1.3	3.3	0.5	5.6	51.0
14-Jun	0.3	Z	1.0	1.0	0.7	0.5	0.7	3.0	2.5	3.2	2.8	2.4	1.1	0.6	0.4	0.2	0.2	0.2	0.1	0.0	0.4	0.1	0.1	0.1	0.9	3.2
15-Jun	0.1	0.0	Z	0.1	0.2	0.1	0.2	0.5	0.3	0.1	0.3	0.5	0.6	0.1	0.1	0.3	0.0	1.2	3.2	1.4	0.7	2.8	1.9	3.1	0.8	3.2
16-Jun	11.0	21.0	0.2	Z	0.2	0.6	0.9	3.8	2.9	6.0	2.8	3.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	21.0
17-Jun	0.1	0.0	1.2	2.2	Z	0.0	0.0	2.9	3.0	2.9	1.6	0.7	0.1	0.2	0.3	0.2	0.2	1.0	2.3	3.0	1.5	9.7	0.2	0.0	1.5	9.7
18-Jun	0.0	0.2	0.4	38.9	15.8	Z	14.9	9.3	5.0	2.3	1.4	1.2	1.7	1.1	2.0	2.1	1.3	0.7	2.0	0.3	0.0	0.3	1.6	0.9	4.5	38.9
19-Jun	Z	1.1	1.8	2.6	0.3	1.7	1.4	1.6	1.0	1.0	0.7	1.1	0.6	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.6
20-Jun	0.0	Z	0.0	0.1	0.0	0.4	0.1	0.4	1.0	0.6	0.4	0.0	0.0	0.0	1.1	2.5	0.3	0.2	0.0	0.0	0.2	0.0	0.1	0.1	0.3	2.5
21-Jun	0.9	0.0	Z	0.2	0.1	0.3	0.7	0.7	3.3	3.8	2.6	1.7	1.1	0.4	1.3	1.5	0.8	1.5	1.8	0.9	4.4	19.4	72.6	54.4	7.6	72.6
22-Jun	16.5	1.2	2.8	Z	6.8	3.7	14.7	17.4	9.0	6.8	4.4	1.7	0.3	0.3	0.1	0.3	0.6	0.4	0.1	2.4	1.8	0.2	1.4	0.8	4.1	17.4
23-Jun	2.5	0.0	0.1	1.0	Z	21.8	51.5	3.6	0.6	3.6	7.9	3.3	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.2	0.5	4.3	51.5
24-Jun	1.0	0.3	0.0	0.0	0.0	Z	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	12.2	0.6	0.0	0.0	0.3	0.1	0.0	0.1	0.1	0.7	12.2
25-Jun	Z	0.0	0.2	0.0	0.9	6.0	3.2	1.7	1.6	UO	UO	UO	UO	UO	3.0	2.9	2.5	1.3	0.5	0.8	0.6	0.1	0.2	2.6	1.6	6.0
26-Jun	0.4	Z	0.0	0.4	1.5	4.1	3.0	2.7	2.8	2.0	1.3	2.3	3.4	1.1	0.6	0.0	0.1	2.0	4.2	1.7	0.1	0.2	3.1	1.3	1.7	4.2
27-Jun	0.2	0.2	Z	0.1	0.2	2.6	5.6	4.0	1.9	1.2	1.2	1.0	2.4	0.9	1.3	0.9	0.2	0.0	0.1	0.4	1.2	2.5	0.9	0.0	1.3	5.6
28-Jun	1.2	0.1	0.0	Z	2.7	1.8	4.0	5.3	2.1	1.2	0.3	0.2	0.5	7.1	2.1	8.7	3.2	0.5	0.0	0.6	0.4	0.4	0.0	3.1	2.0	8.7
29-Jun	20.4	0.0	0.5	9.9	Z	1.5	0.5	1.2	3.7	1.7	1.8	0.7	0.1	0.0	0.0	0.4	0.3	4.0	2.0	0.0	0.0	0.0	0.0	0.2	2.1	20.4
30-Jun	2.2	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	0.2	0.1	0.1	0.2	0.7	0.7	0.6	0.0	0.0	0.0	0.2	2.2

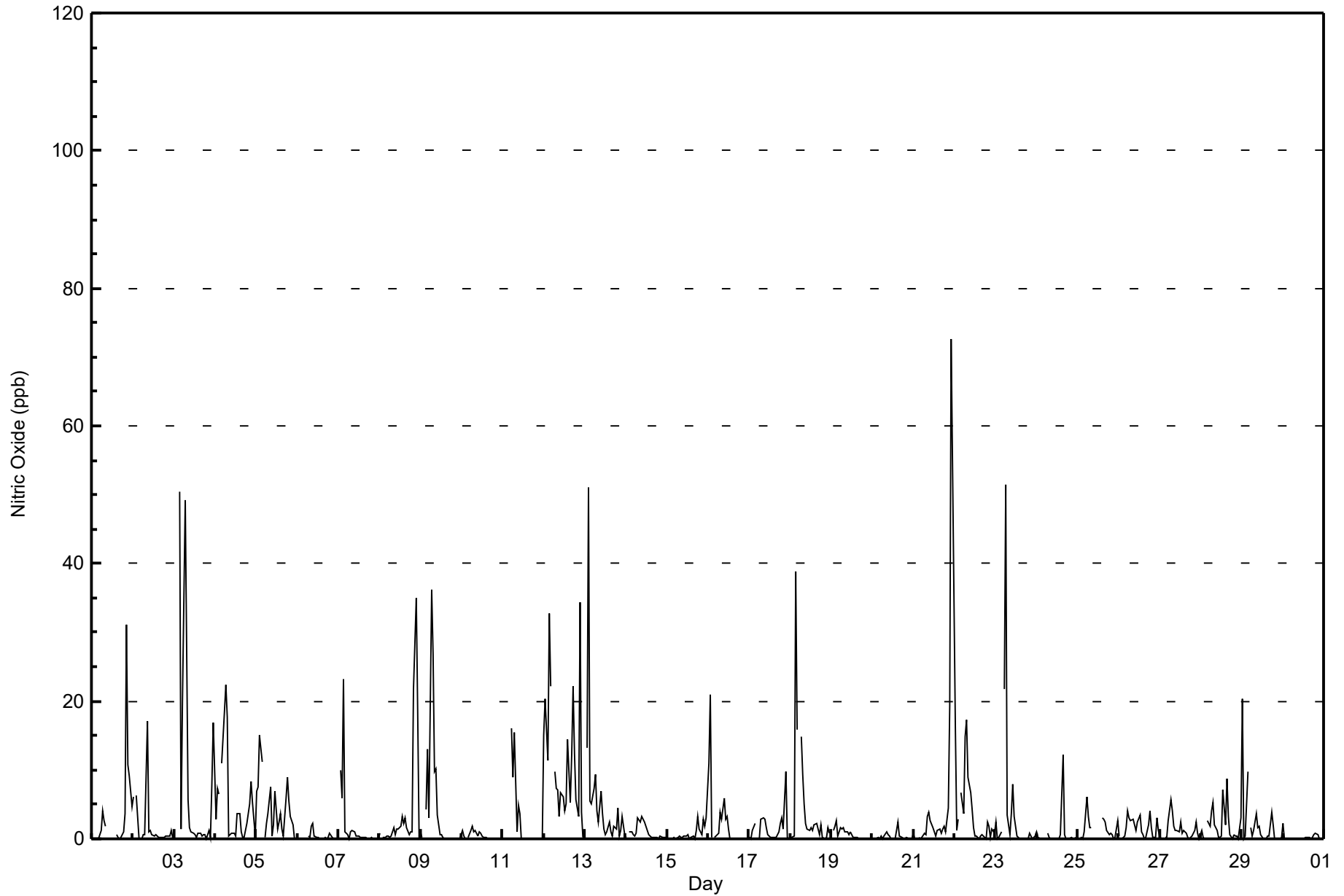
3.6	3.3	4.2	7.4	3.4	4.5	8.2	5.6	3.3	2.5	2.0	1.4	0.9	1.1	1.4	1.5	0.9	1.5	1.5	1.2	2.7	4.3	4.4	3.0	Diurnal Average	
20.4	21.0	51.0	50.5	22.1	21.8	51.5	27.7	17.1	10.2	7.9	7.0	4.1	7.1	14.5	12.2	12.2	22.1	12.5	5.6	31.2	34.9	72.6	54.4	Diurnal Maximum	

Z - zerospan C - Calibration UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	659	96.91	96.91
21 - 40	15	2.21	99.12
41 - 80	6	0.88	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	127	91	38	21	8	6	9	45	62	67	73	29	9	11	23	40	659
21 - 40	2	4	4	0	0	0	1	1	1	1	0	1	0	0	0	0	15
11 - 80	3	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	6
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	95	42	21	8	7	10	47	63	68	73	30	9	11	23	41	680

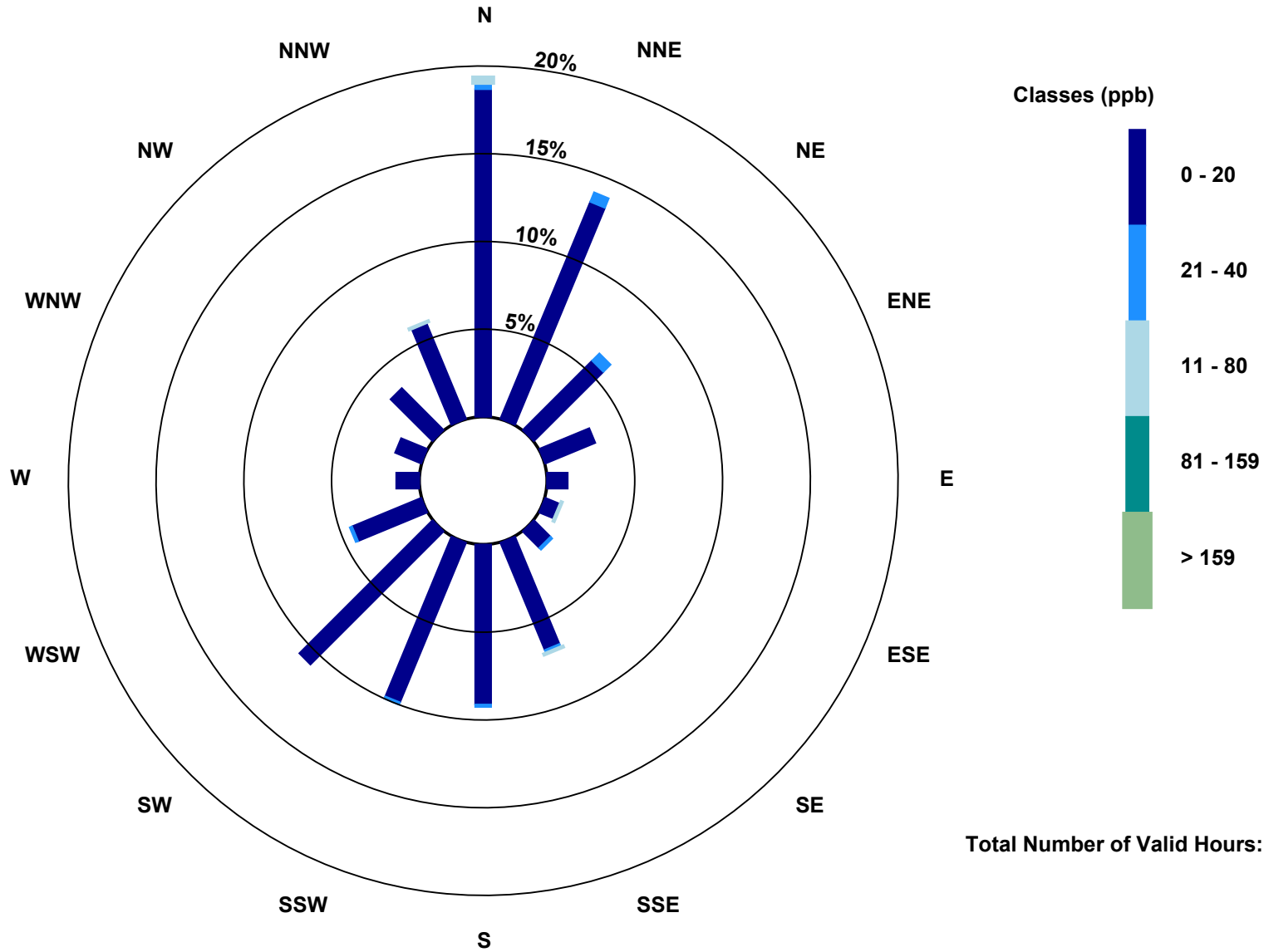
Total Number of Valid Hours: 680

Total Number of Hours: 720

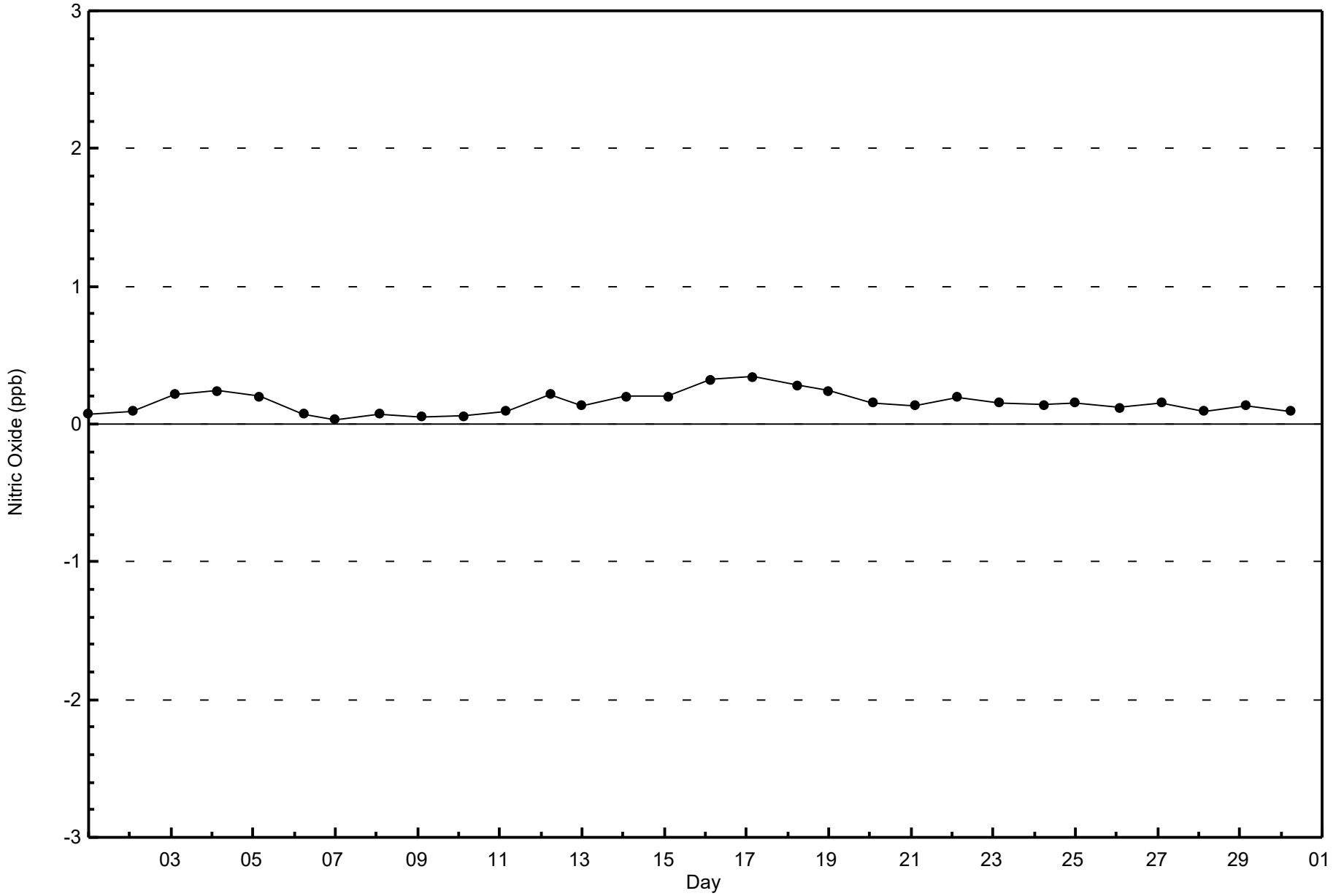


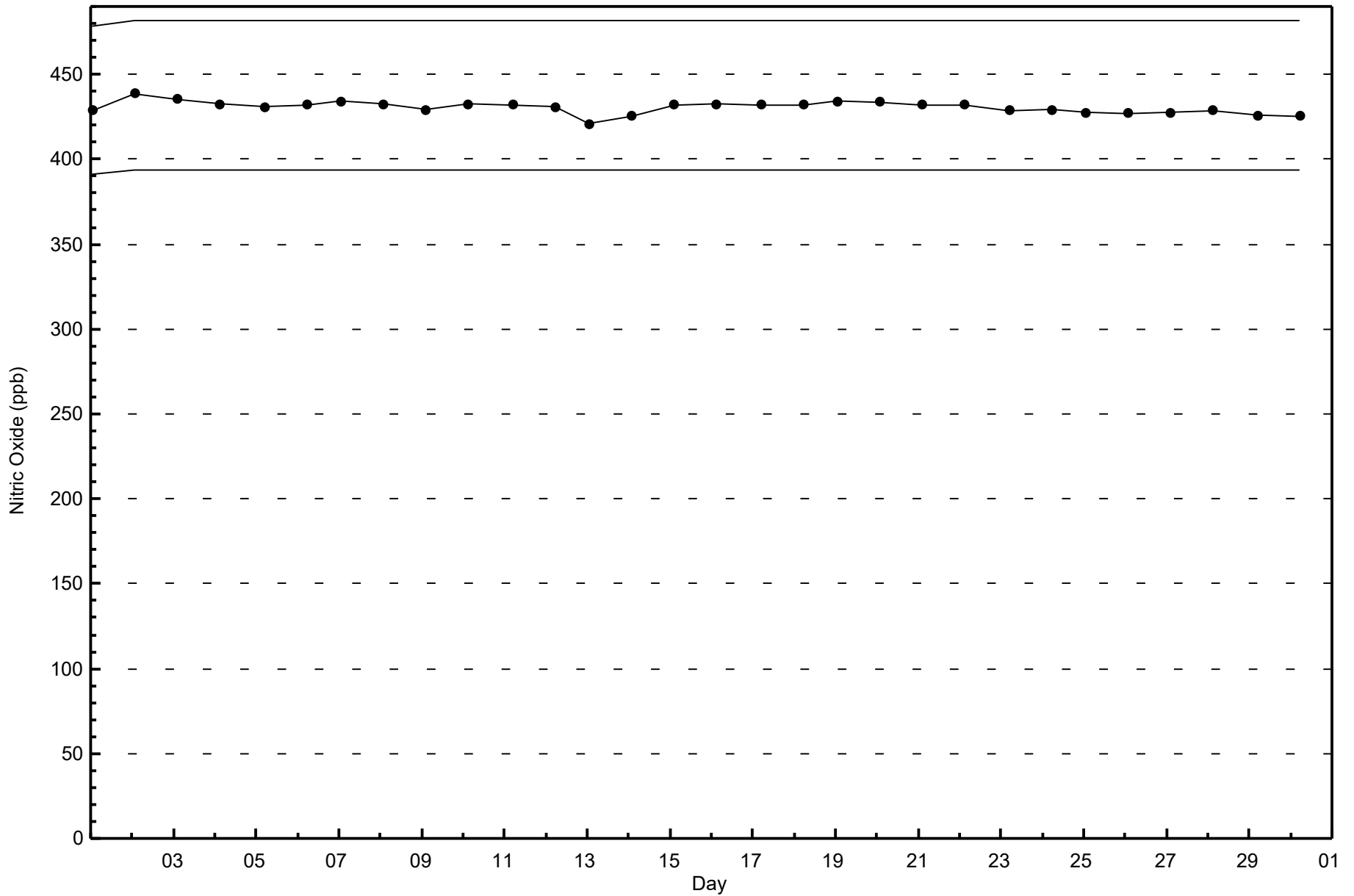
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Fort Hills



Total Number of Valid Hours: 680



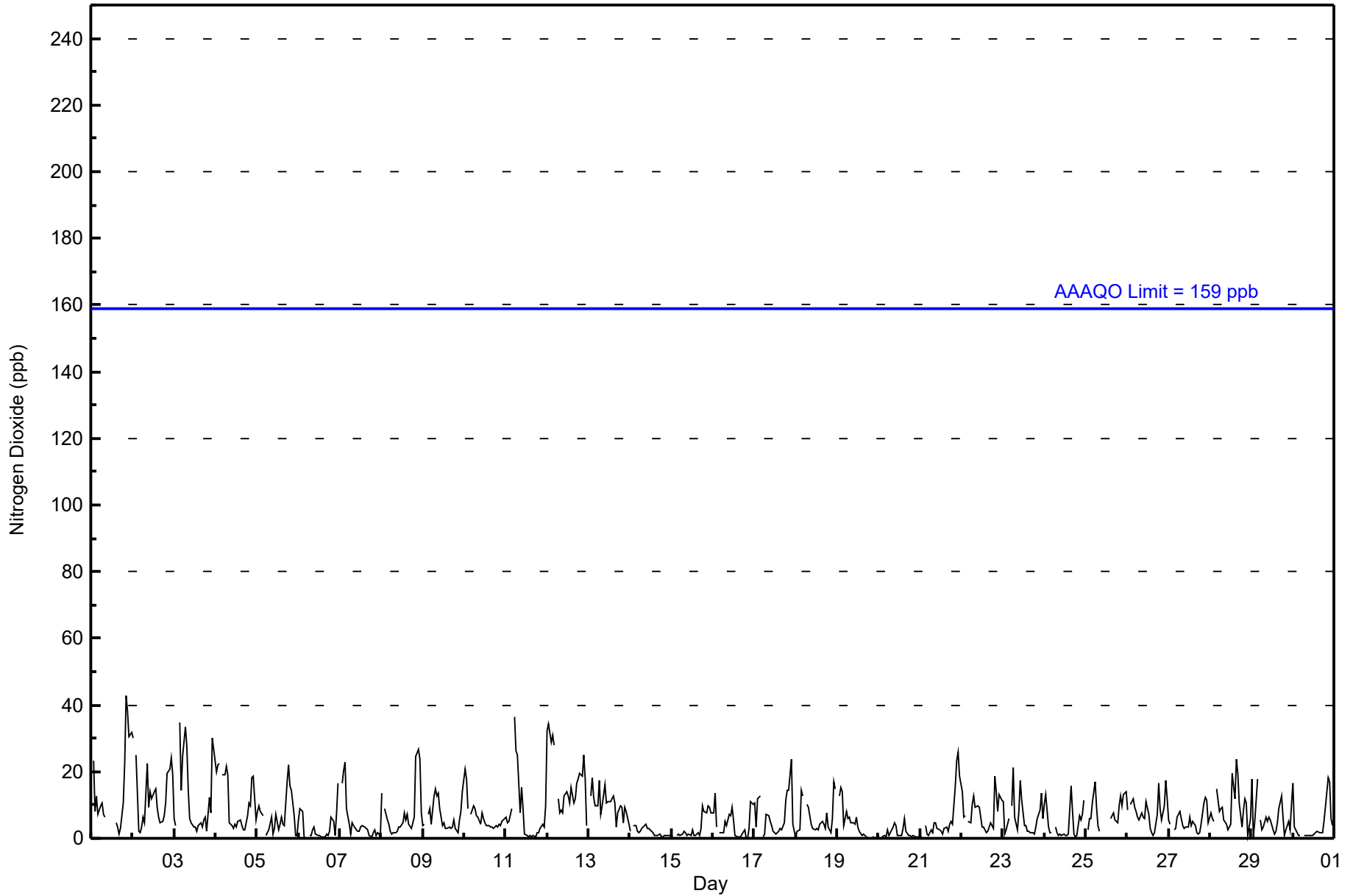




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 42.9 ppb on Jun 1 21:00		Maximum Daily Average: 17.3 ppb on Jun 12																	Hours of Data:	680																													
Minimum Value: 0.2 ppb on Jun 6 05:00		Minimum Daily Average: 1.6 ppb on Jun 20																	Hours of Missing Data:	40																													
Maximum Diurnal Average: 11.1 ppb at hour 23		Minimum Diurnal Average: 3.8 ppb at hour 17																	Hours of Calibration:	35																													
Monthly Average: 7.08 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.8 Q ₁ = 2.2 Median = 4.7 Q ₃ = 9.7 P ₉₀ = 16.8 P ₉₉ = 31.7																	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-Jun	Z	23.5	7.9	12.9	7.1	9.7	10.6	7.0	6.3	C	C	C	C	C	4.7	3.4	1.2	3.1	10.5	22.4	42.9	38.1	30.6	31.6	15.2	42.9																							
2-Jun	30.1	Z	25.0	2.3	1.8	3.6	6.4	4.6	22.6	9.2	13.8	12.0	14.0	14.7	9.2	6.3	4.8	4.9	6.9	10.7	19.5	20.9	24.0	19.0	12.4	30.1																							
3-Jun	6.1	4.0	Z	34.8	14.3	24.6	33.6	27.5	14.2	6.0	4.7	3.6	3.3	2.0	3.9	4.7	3.5	5.4	6.5	2.0	12.1	7.6	30.2	26.9	12.2	34.8																							
4-Jun	20.1	22.0	22.5	Z	19.0	19.1	21.6	19.1	4.5	4.0	3.1	4.3	3.6	4.9	5.6	3.8	2.4	2.7	6.9	10.8	9.6	18.2	18.5	5.7	11.0	22.5																							
5-Jun	8.1	9.9	7.9	6.9	Z	0.9	1.7	2.7	6.5	1.2	3.1	7.0	2.7	4.3	6.5	4.2	3.7	17.1	22.1	15.6	14.5	6.8	0.8	0.7	6.7	22.1																							
6-Jun	5.4	8.8	7.9	0.6	0.2	Z	1.0	0.7	2.7	3.5	1.2	0.9	0.7	0.6	0.4	0.5	1.3	0.9	2.0	6.5	4.9	0.7	7.7	16.5	3.3	16.5																							
7-Jun	Z	16.4	20.2	22.9	8.8	4.4	1.2	4.5	3.7	2.6	2.2	2.3	3.2	3.9	3.3	3.0	2.5	0.8	0.3	1.5	2.7	0.8	1.9	0.9	5.0	22.9																							
8-Jun	13.5	Z	9.1	5.3	4.2	2.2	1.2	1.5	1.9	2.0	3.3	3.6	4.6	7.5	5.6	7.1	4.4	3.0	4.7	6.5	24.4	26.7	23.9	7.5	7.6	26.7																							
9-Jun	4.0	4.2	Z	7.4	8.8	4.3	12.6	14.8	12.9	13.7	9.0	4.0	4.5	2.9	2.8	3.3	3.1	3.4	5.5	3.1	1.7	5.5	7.9	13.8	6.7	14.8																							
10-Jun	20.7	17.9	8.9	Z	7.0	9.8	9.1	6.7	6.2	4.2	7.6	6.1	4.8	4.0	3.9	3.2	3.3	2.9	3.7	3.3	4.3	4.0	5.2	5.9	6.6	20.7																							
11-Jun	6.5	4.6	5.1	8.9	Z	36.4	26.2	24.9	7.8	15.3	8.7	1.1	0.7	0.6	0.7	0.6	0.8	0.6	1.8	1.5	2.9	4.1	3.2	9.8	7.5	36.4																							
12-Jun	32.0	34.5	28.7	31.1	28.1	Z	11.7	7.7	8.4	7.8	12.8	14.1	12.6	10.5	15.3	10.8	11.8	16.6	17.6	19.7	18.7	25.2	18.0	4.0	17.3	34.5																							
13-Jun	Z	12.6	18.4	12.2	9.6	9.8	17.3	7.3	9.7	16.3	10.8	10.9	11.0	11.0	12.8	10.7	3.6	7.8	9.9	9.5	4.7	9.3	8.0	4.1	10.3	18.4																							
14-Jun	2.3	Z	4.0	3.7	2.0	1.8	2.2	3.0	3.8	4.1	3.0	2.9	2.0	1.6	0.9	1.0	0.7	1.4	0.6	0.6	0.8	0.7	0.7	0.8	1.9	4.1																							
15-Jun	0.8	0.5	Z	0.8	1.3	0.8	1.3	2.1	1.8	1.0	1.4	0.8	2.4	0.8	1.0	1.5	0.8	3.1	9.6	8.2	7.8	9.9	9.5	7.8	3.3	9.9																							
16-Jun	7.8	13.4	3.2	Z	1.5	1.5	1.7	5.0	4.0	7.3	6.9	9.4	5.3	0.8	0.5	0.4	0.5	1.2	2.6	0.2	0.2	3.1	11.0	10.3	4.3	13.4																							
17-Jun	10.6	3.4	11.9	12.8	Z	0.5	1.4	7.2	6.6	4.9	3.7	2.3	1.1	1.8	2.2	2.9	2.6	4.5	11.3	14.2	14.3	23.7	4.3	2.1	6.5	23.7																							
18-Jun	0.9	2.2	2.4	14.3	12.5	Z	10.0	9.5	6.6	4.2	2.9	2.4	2.9	2.6	4.1	5.2	4.4	3.1	7.6	3.3	1.9	6.0	16.8	14.9	6.1	16.8																							
19-Jun	Z	12.8	15.2	14.0	3.9	8.1	5.8	6.2	4.5	4.8	4.4	6.2	3.4	2.3	0.9	1.1	1.0	0.6	0.2	0.2	0.2	0.4	0.2	0.3	4.2	15.2																							
20-Jun	0.9	Z	0.3	0.8	0.6	2.4	0.8	1.6	3.2	4.6	3.9	1.0	0.7	0.7	3.1	6.1	2.0	0.7	0.7	0.6	0.9	0.3	0.5	0.6	1.6	6.1																							
21-Jun	0.8	0.4	Z	3.8	1.2	0.9	2.4	1.7	4.7	4.5	3.1	2.5	2.0	1.3	2.8	3.2	2.3	4.1	5.2	4.2	15.7	23.3	25.9	18.7	5.9	25.9																							
22-Jun	13.8	6.4	6.6	Z	5.2	4.8	10.3	12.5	9.4	9.8	9.3	6.5	3.5	3.5	1.7	2.2	3.5	4.5	3.1	18.6	14.1	8.0	13.0	11.6	7.9	18.6																							
23-Jun	11.0	1.1	2.7	5.8	Z	9.9	21.0	6.2	2.6	8.1	17.2	11.3	4.0	3.9	2.3	2.0	1.7	1.7	1.2	3.3	5.8	8.3	13.4	5.8	6.5	21.0																							
24-Jun	10.3	13.1	3.3	1.6	1.7	Z	3.4	1.5	0.7	1.1	0.7	1.1	1.0	0.7	1.4	15.6	7.9	1.1	0.6	1.0	6.7	5.6	7.1	11.4	4.3	15.6																							
25-Jun	Z	2.6	6.0	5.8	10.6	17.0	9.4	4.0	2.1	UO	UO	UO	UO	UO	5.8	6.9	7.7	5.6	4.8	9.7	12.5	9.7	13.1	14.1	8.2	17.0																							
26-Jun	8.5	Z	10.2	11.9	9.2	8.2	6.4	5.4	7.8	6.4	6.1	11.1	7.0	3.0	1.9	1.0	1.6	7.2	16.7	9.1	5.5	9.7	17.2	11.7	7.9	17.2																							
27-Jun	5.5	4.2	Z	2.7	2.9	6.4	8.2	5.8	3.9	2.9	3.4	3.2	6.2	3.7	5.2	3.9	1.8	1.3	1.9	4.1	10.8	12.2	11.5	4.8	5.1	12.2																							
28-Jun	7.5	6.1	5.1	Z	14.9	7.9	8.9	9.5	5.3	4.2	2.6	3.4	4.3	19.6	11.9	23.7	19.3	10.7	3.2	8.5	11.8	10.8	1.0	6.1	9.0	23.7																							
29-Jun	17.7	0.6	4.9	17.6	Z	5.6	2.4	3.3	6.4	5.0	6.5	5.5	2.5	1.1	2.3	4.5	8.9	12.5	6.4	0.8	2.4	4.9	2.4	10.2	5.8	17.7																							
30-Jun	16.4	3.2	1.5	0.8	0.9	Z	0.8	0.7	0.8	0.8	0.8	0.9	1.4	1.7	2.1	1.6	1.5	1.8	5.2	9.5	18.2	16.9	6.0	3.7	4.2	18.2																							
																								Diurnal Average																									
																								Diurnal Maximum																									
																								10.5	9.1	9.6	9.7	7.1	8.0	8.4	7.1	6.1	5.7	5.6	5.0	4.1	4.1	4.2	4.8	3.8	4.5	6.0	7.0	9.8	10.7	11.1	9.4		
																								32.0	34.5	28.7	34.8	28.1	36.4	33.6	27.5	22.6	16.3	17.2	14.1	14.0	19.6	15.3	23.7	19.3	17.1	22.1	22.4	42.9	38.1	30.6	31.6		
Z - zerospan																								C - Calibration		UO - Unstable Operation																							
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	640	94.12	94.12
21 - 40	39	5.74	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	123	83	34	21	8	5	10	44	63	67	70	29	9	11	23	40	640
21 - 40	9	11	8	0	0	2	0	3	0	1	3	1	0	0	0	1	39
11 - 80	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	95	42	21	8	7	10	47	63	68	73	30	9	11	23	41	680

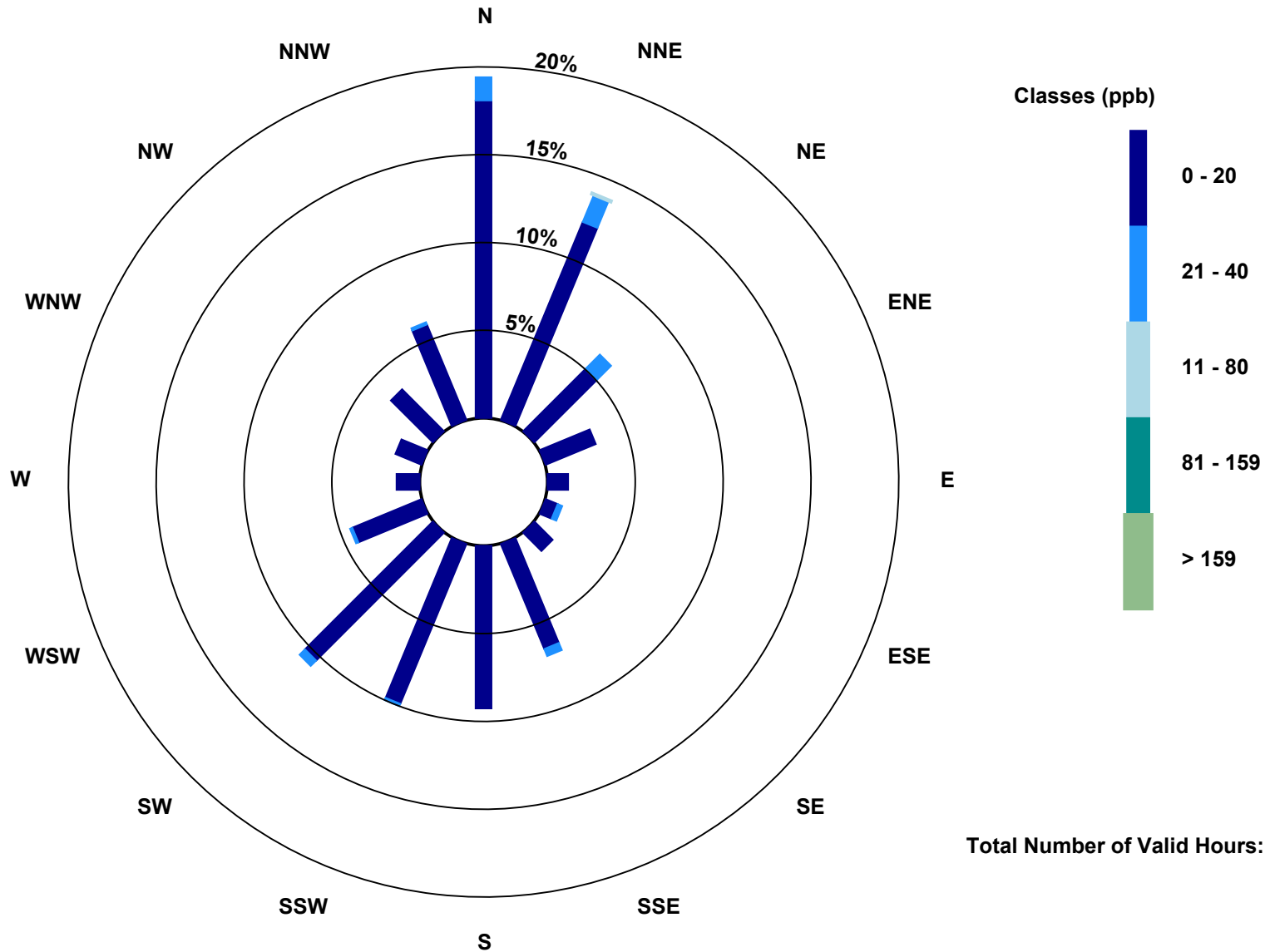
Total Number of Valid Hours: 680

Total Number of Hours: 720

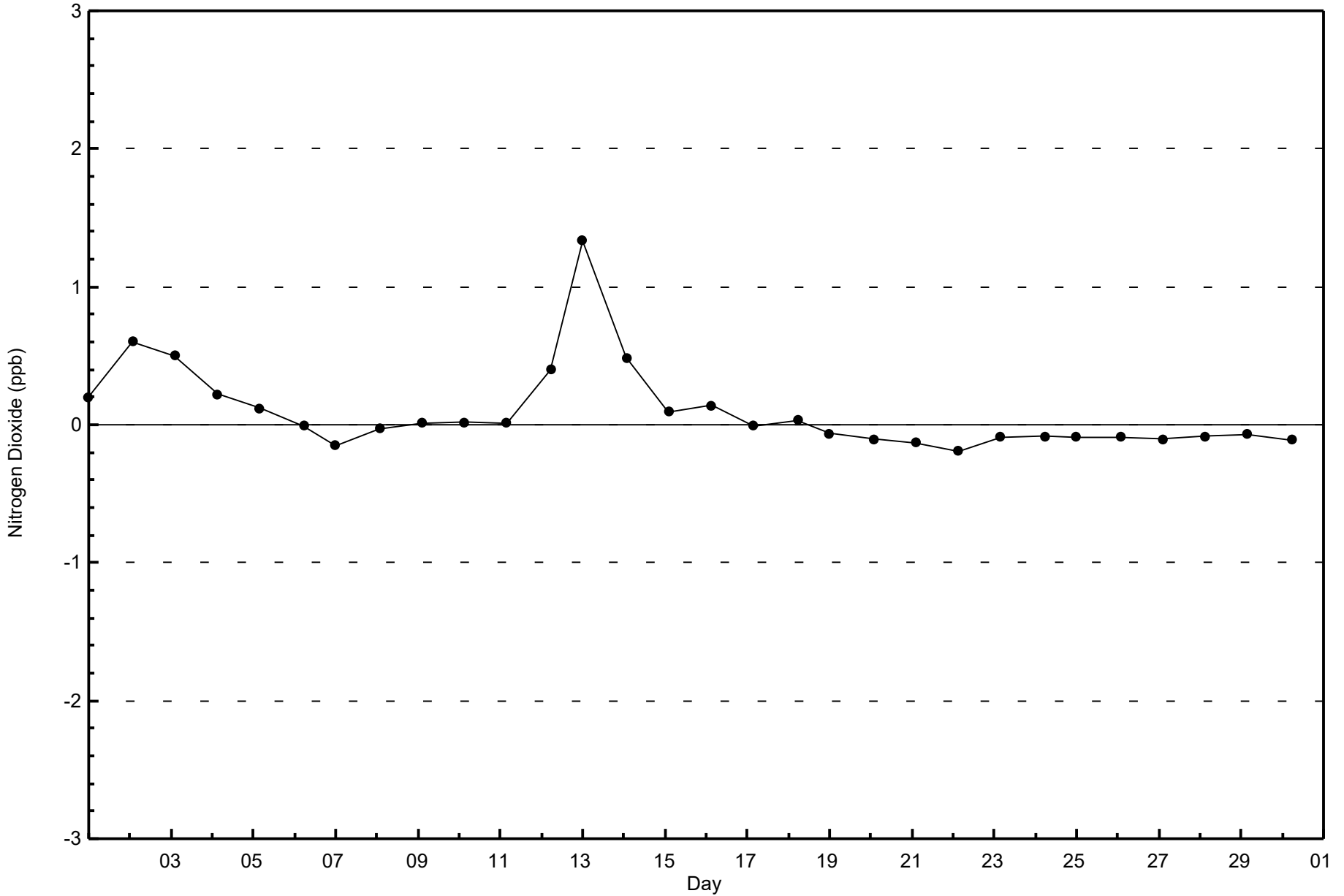


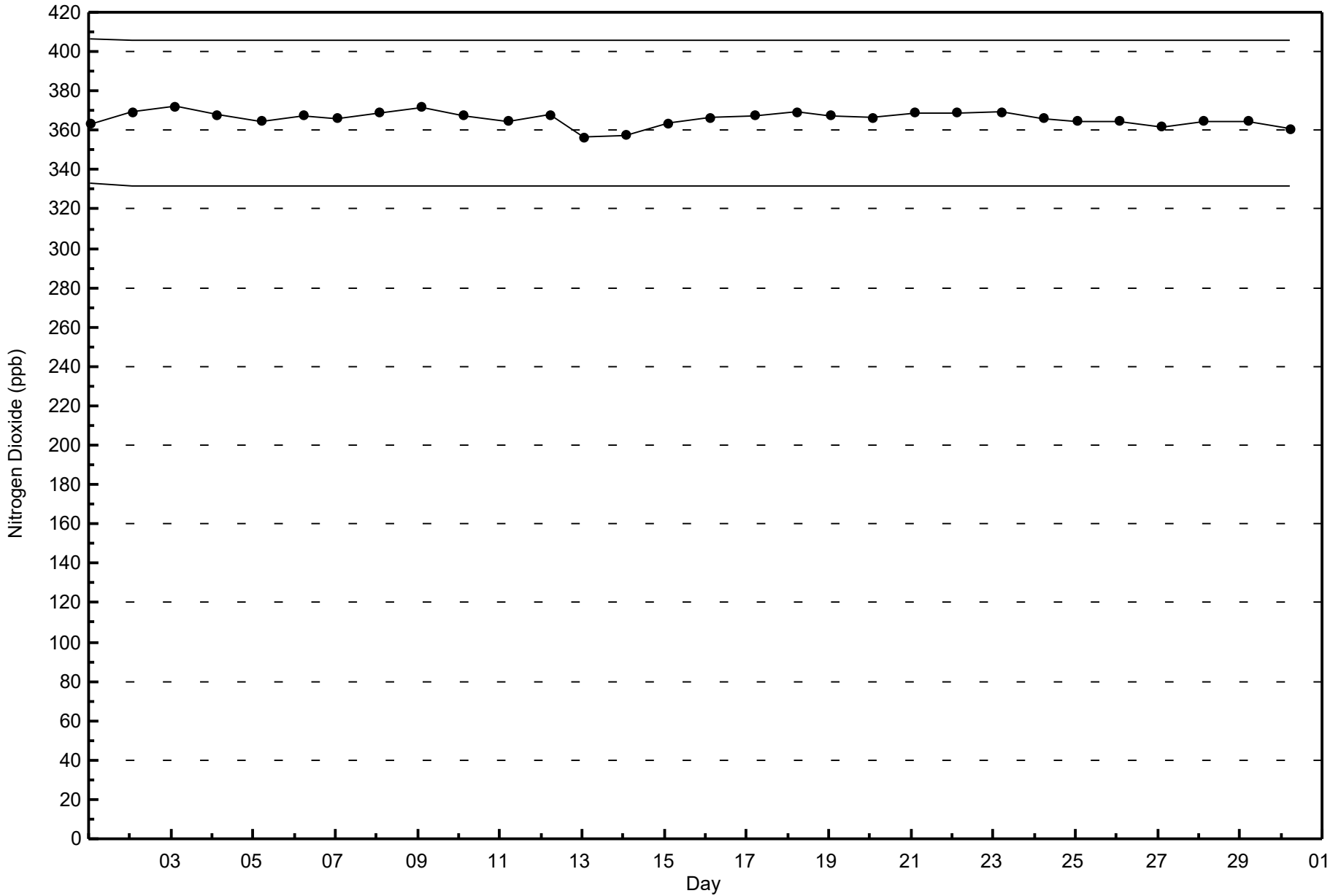
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Hills



Total Number of Valid Hours: 680



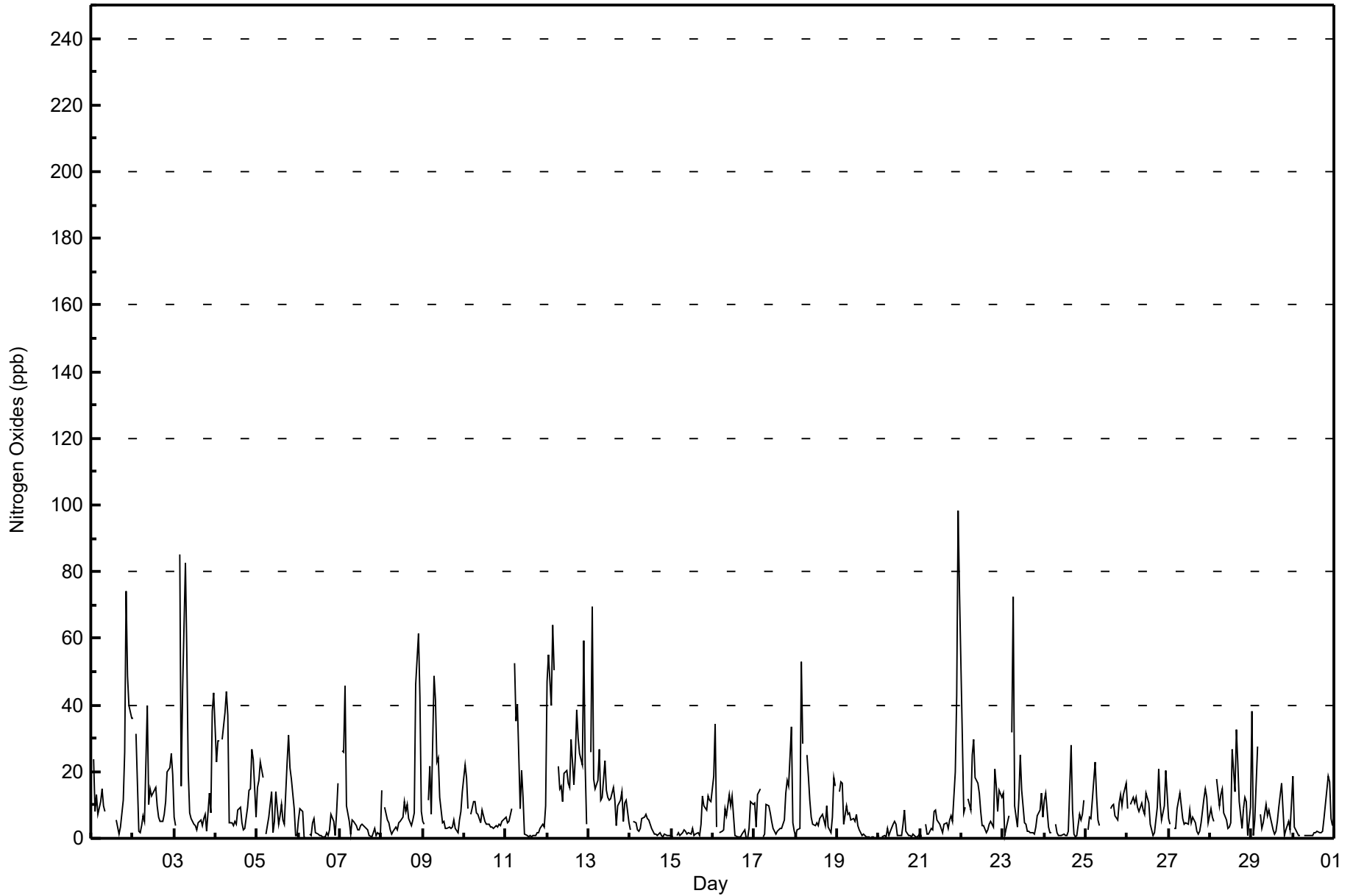




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																																									
Maximum Value: 98.5 ppb on Jun 21 23:00		Maximum Daily Average: 28.8 ppb on Jun 12				Hours of Data:		680																																									
Minimum Value: 0.2 ppb on Jun 19 20:00		Minimum Daily Average: 1.9 ppb on Jun 20				Hours of Missing Data:		40																																									
Maximum Diurnal Average: 17.0 ppb at hour 4		Minimum Diurnal Average: 4.7 ppb at hour 17				Hours of Calibration:		35																																									
Monthly Average: 10.12 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.9 Q ₁ = 2.6 Median = 5.7 Q ₃ = 12.4 P ₉₀ = 23.7 P ₉₉ = 65.0				Percent Operational Time:		99.3																																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	Z	23.6	7.9	13.0	7.1	10.8	14.7	9.7	8.2	C	C	C	C	C	5.3	3.6	1.2	3.3	11.5	26.0	74.1	48.8	39.8	36.2	19.2	74.1																							
2-Jun	36.1	Z	31.3	2.3	1.8	3.6	6.9	5.2	39.7	10.3	14.9	12.5	14.5	15.3	9.6	6.5	4.9	5.0	7.1	11.0	20.0	21.2	25.2	19.1	14.1	39.7																							
3-Jun	6.1	4.0	Z	85.3	15.8	44.5	82.8	55.2	19.9	7.7	5.8	4.3	3.9	2.3	4.6	5.5	3.9	6.0	7.2	2.0	13.4	7.7	38.1	43.7	20.4	85.3																							
4-Jun	23.0	29.4	29.1	Z	29.9	37.7	44.1	36.9	4.8	4.8	4.0	5.1	4.1	8.5	9.3	4.9	2.7	3.0	9.2	14.5	14.6	26.5	23.7	6.2	16.3	44.1																							
5-Jun	15.1	17.4	22.9	18.2	Z	1.1	3.9	6.4	14.1	1.6	5.2	14.0	4.1	6.8	10.2	5.6	4.1	23.1	31.0	21.0	17.8	8.9	0.8	0.7	11.0	31.0																							
6-Jun	5.4	8.8	7.9	0.6	0.2	Z	1.4	0.9	4.6	5.8	1.6	1.2	0.9	0.7	0.4	0.5	1.5	0.9	2.3	7.3	5.1	0.7	7.7	16.5	3.6	16.5																							
7-Jun	Z	26.3	26.0	46.0	9.8	5.0	1.3	5.6	5.0	3.6	2.6	2.7	3.6	4.1	3.5	3.2	2.7	0.8	0.3	1.6	2.8	0.8	1.9	0.9	7.0	46.0																							
8-Jun	14.3	Z	9.2	5.6	4.5	2.6	1.4	2.0	3.5	2.7	4.7	5.1	6.4	10.8	7.8	10.1	6.0	3.6	5.7	7.5	46.2	61.6	42.5	7.9	11.8	61.6																							
9-Jun	5.0	4.4	Z	11.6	21.8	7.3	48.7	41.6	22.7	23.9	12.4	4.6	5.1	3.1	2.9	3.4	3.1	3.4	5.6	3.1	1.7	5.5	7.9	13.9	11.4	48.7																							
10-Jun	21.9	18.3	8.9	Z	7.1	11.1	10.9	7.7	7.3	4.6	8.7	6.9	5.2	4.2	4.1	3.3	3.4	2.9	3.7	3.3	4.3	4.0	5.2	5.9	7.1	21.9																							
11-Jun	6.5	4.6	5.1	8.9	Z	52.4	35.1	40.4	8.8	20.2	12.4	1.1	0.7	0.6	0.7	0.6	0.9	0.6	1.8	1.6	3.0	4.1	3.2	9.8	9.7	52.4																							
12-Jun	47.0	54.9	40.0	63.8	50.2	Z	21.5	15.0	15.5	11.0	19.6	20.2	16.7	15.5	29.8	16.1	24.0	38.7	30.1	25.3	22.0	59.5	21.8	4.3	28.8	63.8																							
13-Jun	Z	25.9	69.4	17.8	14.7	17.2	26.6	11.3	12.2	23.2	14.5	12.4	11.6	12.0	15.3	11.6	3.9	9.7	11.4	13.9	5.1	10.6	11.3	4.6	15.9	69.4																							
14-Jun	2.6	Z	5.0	4.7	2.7	2.3	2.9	6.0	6.3	7.3	5.8	5.3	3.1	2.2	1.3	1.2	0.9	1.6	0.7	0.6	1.2	0.8	0.8	0.9	2.9	7.3																							
15-Jun	0.9	0.5	Z	0.9	1.5	0.9	1.5	2.6	2.1	1.1	1.7	1.3	3.0	0.9	1.1	1.8	0.8	4.3	12.8	9.6	8.5	12.7	11.4	10.9	4.0	12.8																							
16-Jun	18.8	34.4	3.4	Z	1.7	2.1	2.6	8.8	6.9	13.3	9.7	12.7	6.7	0.8	0.5	0.4	0.5	1.2	2.6	0.2	0.2	3.1	11.0	10.3	6.6	34.4																							
17-Jun	10.7	3.4	13.1	15.0	Z	0.5	1.4	10.1	9.6	7.8	5.3	3.0	1.2	2.0	2.5	3.1	2.8	5.5	13.6	17.2	15.8	33.4	4.5	2.1	8.0	33.4																							
18-Jun	0.9	2.4	2.8	53.2	28.3	Z	24.9	18.8	11.6	6.5	4.3	3.6	4.6	3.7	6.1	7.3	5.7	3.8	9.6	3.6	1.9	6.3	18.4	15.8	10.6	53.2																							
19-Jun	Z	13.9	17.0	16.6	4.2	9.8	7.2	7.8	5.5	5.8	5.1	7.3	4.0	2.6	1.0	1.4	1.0	0.6	0.2	0.2	0.2	0.4	0.2	0.3	4.9	17.0																							
20-Jun	0.9	Z	0.3	0.9	0.6	2.8	0.9	2.0	4.2	5.2	4.3	1.0	0.7	0.7	4.2	8.6	2.3	0.9	0.7	0.6	1.1	0.3	0.6	0.7	1.9	8.6																							
21-Jun	1.7	0.4	Z	4.0	1.3	1.2	3.1	2.4	8.0	8.3	5.7	4.2	3.1	1.7	4.1	4.7	3.1	5.6	7.0	5.1	20.1	42.7	98.5	73.1	13.4	98.5																							
22-Jun	30.3	7.6	9.4	Z	12.0	8.5	25.0	29.9	18.4	16.6	13.7	8.2	3.8	3.8	1.8	2.5	4.1	4.9	3.2	21.0	15.9	8.2	14.4	12.4	12.0	30.3																							
23-Jun	13.5	1.1	2.8	6.8	Z	31.7	72.5	9.8	3.2	11.7	25.1	14.6	4.5	4.2	2.3	2.0	1.7	1.7	1.2	3.4	6.7	8.3	13.6	6.3	10.8	72.5																							
24-Jun	11.3	13.4	3.3	1.6	1.7	Z	4.3	1.7	0.7	1.1	0.7	1.1	1.0	0.7	2.1	27.8	8.5	1.1	0.6	1.0	7.0	5.7	7.1	11.5	5.0	27.8																							
25-Jun	Z	2.6	6.2	5.8	11.5	23.0	12.6	5.7	3.7	UO	UO	UO	UO	UO	8.8	9.8	10.2	6.9	5.3	10.5	13.1	9.8	13.3	16.7	9.8	23.0																							
26-Jun	8.9	Z	10.2	12.3	10.7	12.3	9.4	8.1	10.6	8.4	7.4	13.4	10.4	4.1	2.5	1.0	1.7	9.2	20.9	10.8	5.6	9.9	20.3	13.0	9.6	20.9																							
27-Jun	5.7	4.4	Z	2.8	3.1	9.0	13.8	9.8	5.8	4.1	4.6	4.2	8.6	4.6	6.5	4.8	2.0	1.3	2.0	4.5	12.0	14.7	12.4	4.8	6.3	14.7																							
28-Jun	8.7	6.2	5.1	Z	17.6	9.7	12.9	14.8	7.4	5.4	2.9	3.6	4.8	26.7	14.0	32.4	22.5	11.2	3.2	9.1	12.2	11.2	1.0	9.2	10.9	32.4																							
29-Jun	38.1	0.6	5.4	27.5	Z	7.1	2.9	4.5	10.1	6.7	8.3	6.2	2.6	1.1	2.3	4.9	9.2	16.5	8.4	0.8	2.4	4.9	2.4	10.4	8.0	38.1																							
30-Jun	18.6	3.2	1.5	0.8	0.9	Z	0.8	0.7	0.8	0.8	0.8	0.9	1.5	1.8	2.3	1.7	1.6	2.0	5.9	10.2	18.8	16.9	6.0	3.7	4.4	18.8																							
																								14.1	12.5	13.7	17.0	10.4	12.6	16.6	12.7	9.4	8.2	7.6	6.4	5.0	5.2	5.6	6.3	4.7	6.0	7.5	8.2	12.4	15.0	15.5	12.4	Diurnal Average	
																								47.0	54.9	69.4	85.3	50.2	52.4	82.8	55.2	39.7	23.9	25.1	20.2	16.7	26.7	29.8	32.4	24.0	38.7	31.0	26.0	74.1	61.6	98.5	73.1	Diurnal Maximum	
Z - zerspan																								C - Calibration				UO - Unstable Operation																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	594	87.35	87.35
21 - 40	60	8.82	96.18
41 - 80	23	3.38	99.56
81 - 159	3	0.44	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	113	76	28	21	6	4	8	41	59	63	68	27	9	11	22	38	594
21 - 40	12	13	9	0	2	1	2	4	4	3	5	2	0	0	1	2	60
41 - 80	5	6	5	0	0	1	0	2	0	2	0	1	0	0	0	1	23
81 - 159	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	95	42	21	8	7	10	47	63	68	73	30	9	11	23	41	680

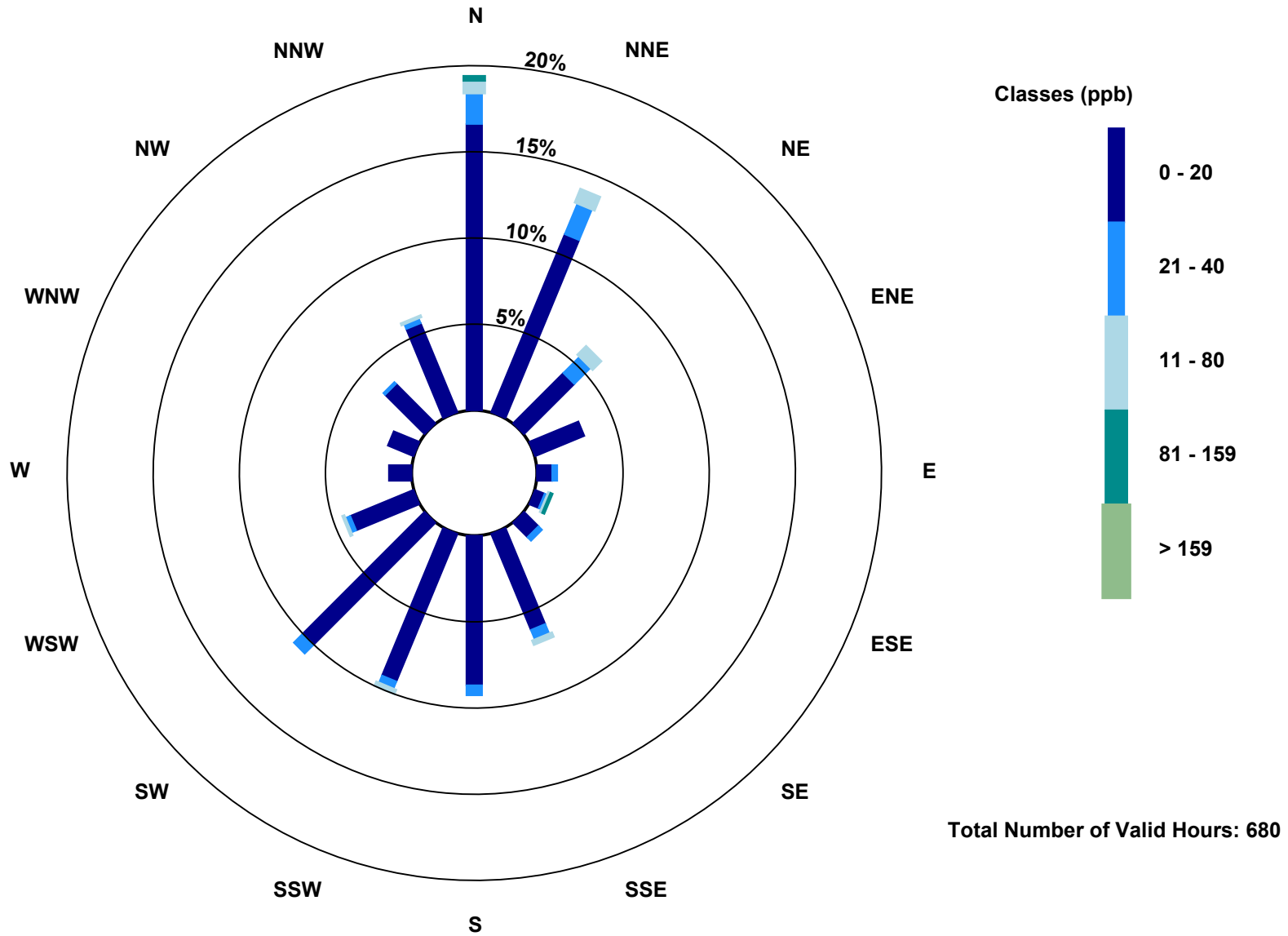
Total Number of Valid Hours: 680

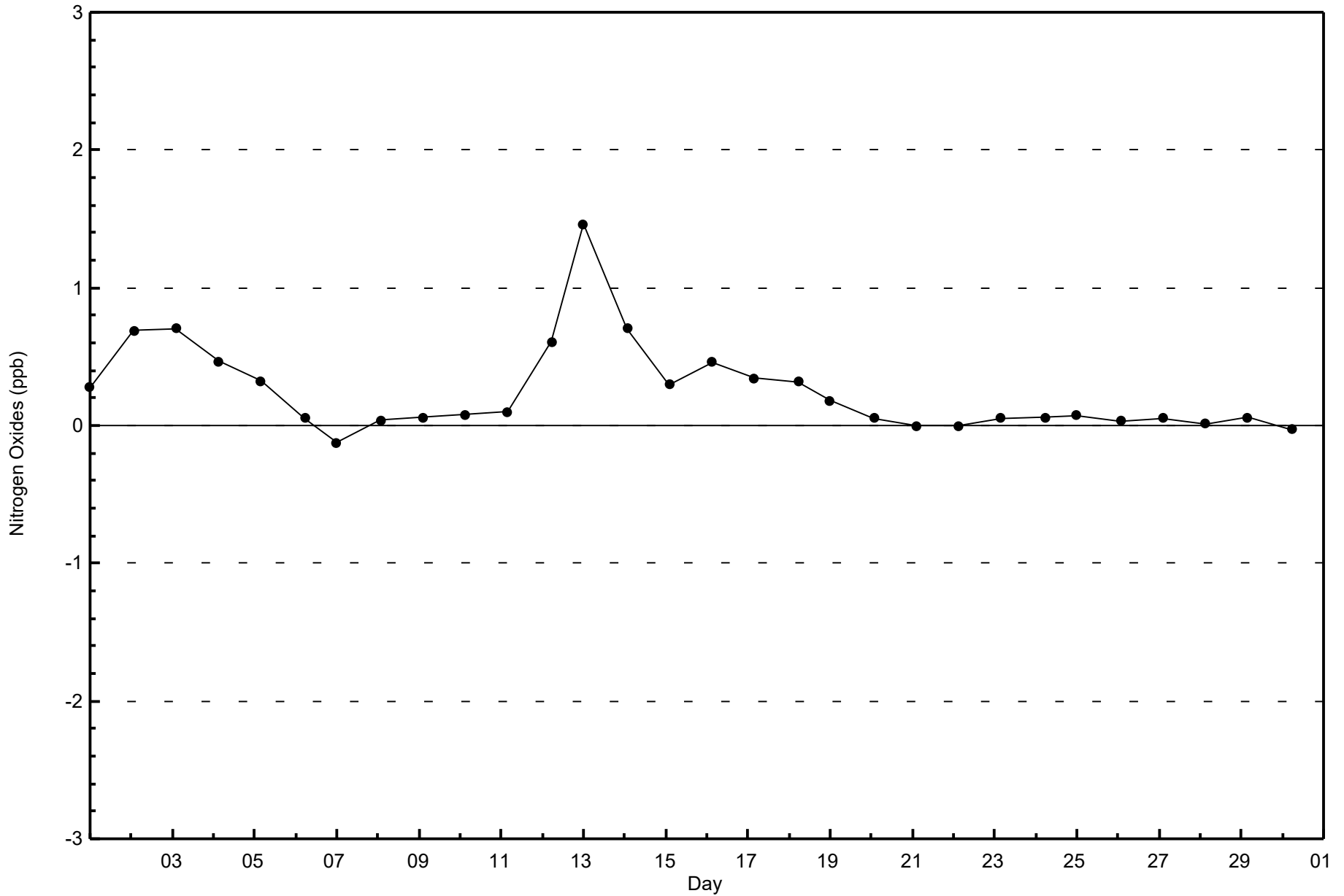
Total Number of Hours: 720

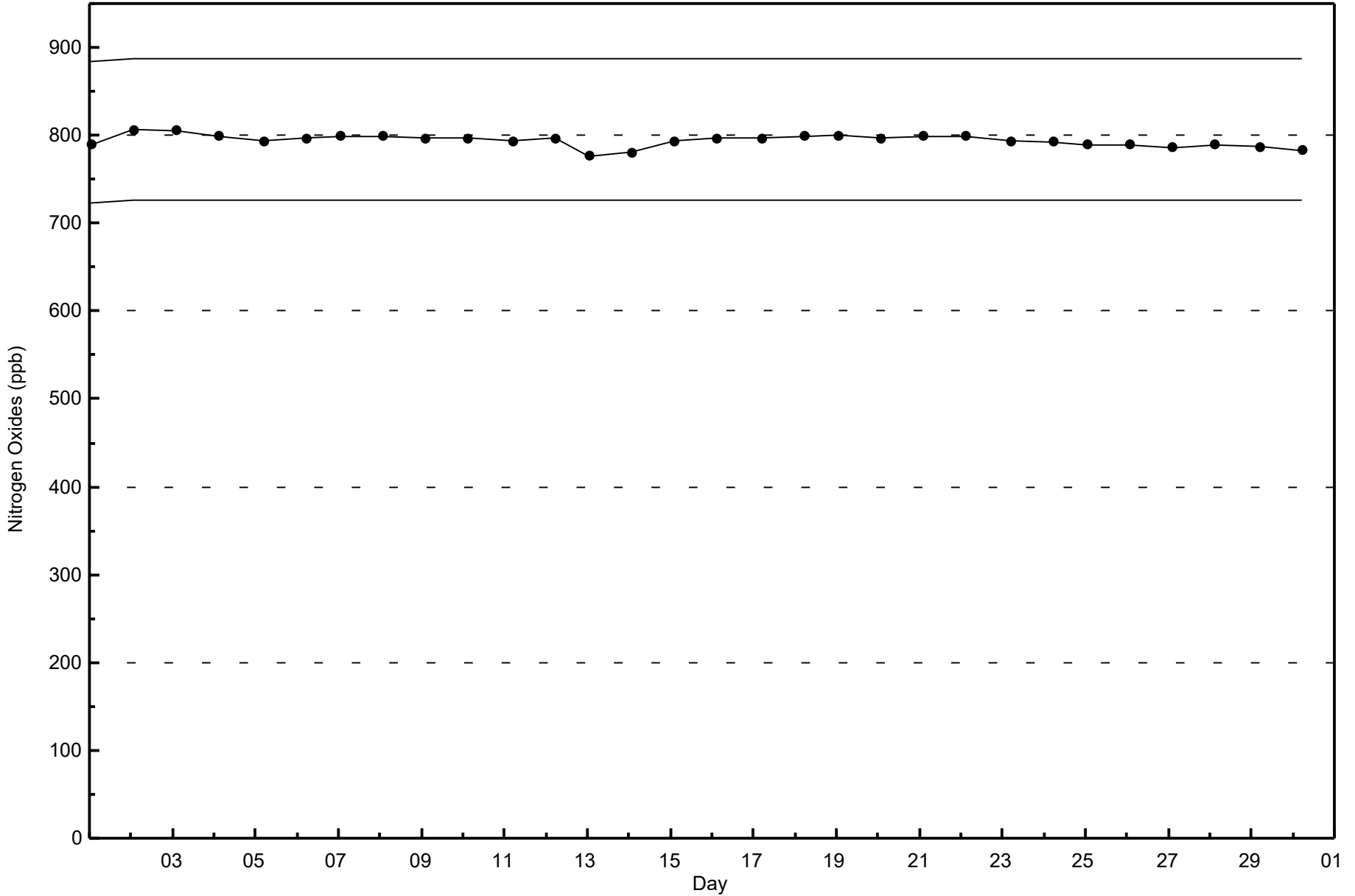


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Fort Hills









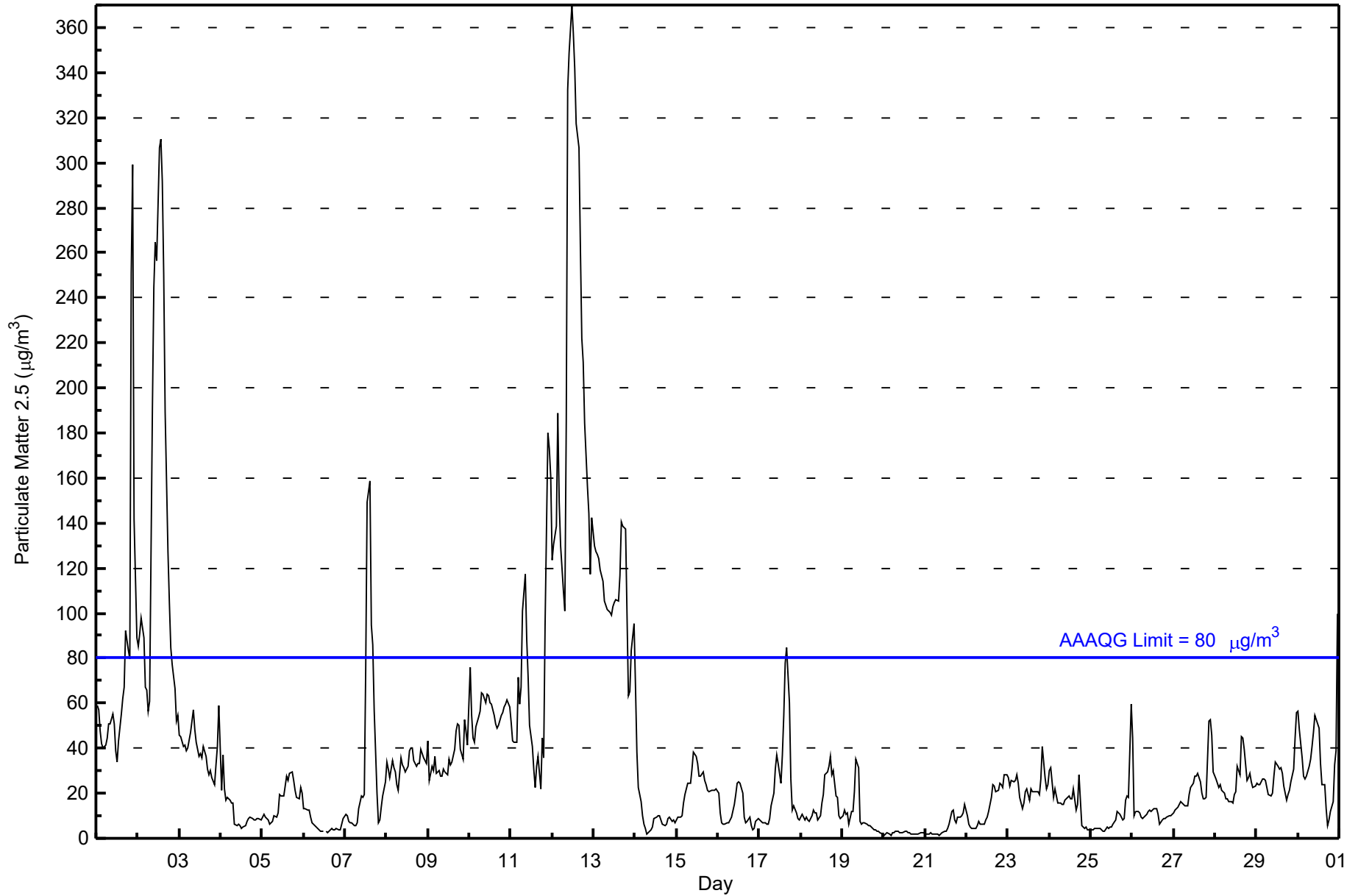
Summary of Hour Averages

Fort Hills - June 2023

Number of Exceedences (AAAQO):	1-hr: 81	24-hr: 11	Hours in Service:	720
Maximum Value: 369.8 µg/m ³ on Jun 12 12:00	Maximum Daily Average: 211.2 µg/m ³ on Jun 12		Hours of Data:	719
Minimum Value: 1.0 µg/m ³ on Jun 20 05:00	Minimum Daily Average: 2.3 µg/m ³ on Jun 20		Hours of Missing Data:	1
Maximum Diurnal Average: 50.2 µg/m ³ at hour 14	Minimum Diurnal Average: 26.4 µg/m ³ at hour 7		Hours of Calibration:	1
Monthly Average: 38.01 µg/m ³	Percentiles: P ₁ = 1.9 P ₁₀ = 4.4 Q ₁ = 8.8 Median = 21.6 Q ₃ = 40.8 P ₉₀ = 89.3 P ₉₉ = 306.5		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-Jun	59.0	57.1	47.7	41.8	39.9	41.1	44.4	50.9	50.9	55.4	50.7	38.7	33.7	43.6	55.1	62.2	66.9	92.0	83.3	79.8	251.0	299.3	141.7	89.0	78.1	299.3	
2-Jun	85.3	90.9	97.8	89.0	67.1	65.6	56.7	60.6	191.5	244.4	264.4	256.6	306.5	310.2	291.8	250.5	189.5	127.6	104.5	85.0	77.3	66.4	52.3	54.4	145.2	310.2	
3-Jun	45.6	45.4	40.8	41.3	38.6	40.3	46.7	52.1	56.9	48.0	42.9	36.5	37.9	35.7	40.7	36.1	30.9	28.3	29.9	26.7	23.9	32.8	40.5	58.7	39.9	58.7	
4-Jun	21.1	37.0	21.7	16.9	18.1	16.9	15.9	15.4	6.0	5.9	6.2	5.5	4.7	4.9	5.7	7.4	8.7	9.1	8.6	8.4	8.1	8.6	8.7	8.1	11.6	37.0	
5-Jun	9.3	10.8	9.5	7.8	6.1	6.9	7.6	9.9	9.5	11.2	19.6	18.7	19.0	23.1	27.5	25.9	29.1	29.4	25.6	21.3	18.0	17.5	22.4	20.0	16.9	29.4	
6-Jun	13.0	13.0	12.7	12.5	9.3	6.8	5.7	5.0	4.2	3.7	2.9	3.0	C	3.0	2.8	3.5	4.2	3.6	3.7	4.2	4.0	3.8	6.1	9.0	6.1	13.0	
7-Jun	10.5	9.9	7.6	6.8	6.7	5.5	5.3	7.1	13.3	18.5	18.3	19.3	74.8	149.5	158.9	94.7	86.0	57.1	20.4	6.6	8.2	13.5	18.6	25.1	35.1	158.9	
8-Jun	33.6	31.0	26.8	34.6	31.6	29.7	24.1	21.4	36.0	32.7	31.3	29.2	32.1	39.1	40.4	40.2	34.3	32.3	33.4	33.1	39.7	35.7	34.7	33.5	32.9	40.4	
9-Jun	43.1	25.7	31.8	30.0	36.3	29.1	30.1	27.4	27.4	30.7	29.2	28.4	35.0	32.3	34.0	39.2	47.9	51.1	50.2	39.4	34.9	52.8	47.5	41.7	36.5	52.8	
10-Jun	75.7	54.6	44.3	42.7	49.5	53.7	56.4	64.7	64.2	60.4	64.1	63.2	60.2	59.6	54.5	50.6	48.9	50.3	54.8	55.5	58.2	59.8	61.7	58.5	56.9	75.7	
11-Jun	51.3	43.5	42.5	42.4	71.3	59.5	67.1	100.7	117.0	88.2	71.6	50.2	40.5	30.9	22.9	31.8	36.4	22.1	44.7	35.8	94.8	179.7	173.0	160.5	69.9	179.7	
12-Jun	123.7	130.3	138.7	188.6	149.4	130.1	109.6	101.2	184.7	332.3	348.9	369.8	357.2	341.7	317.6	306.5	262.3	221.7	211.1	184.2	156.3	144.4	117.5	142.2	211.2	369.8	
13-Jun	129.9	127.1	126.2	124.2	119.0	114.2	105.4	103.2	101.7	100.3	98.9	103.1	104.6	105.9	105.3	116.7	140.6	138.5	137.5	99.9	63.4	65.0	83.3	95.5	108.7	140.6	
14-Jun	67.9	38.0	22.4	16.1	10.2	6.5	4.4	2.1	2.9	3.5	4.8	9.0	9.7	9.8	10.2	8.3	6.4	5.8	6.1	8.6	9.2	7.4	7.9	7.2	11.8	67.9	
15-Jun	7.9	9.5	9.3	9.8	15.4	19.7	24.7	24.7	24.3	30.7	38.5	36.4	33.2	27.9	27.7	29.4	25.7	23.9	21.6	20.9	21.3	21.4	21.6	22.1	22.8	38.5	
16-Jun	20.3	11.3	7.0	6.2	6.1	7.0	6.6	8.0	9.3	15.2	19.5	24.7	25.0	24.2	20.0	9.5	6.7	7.3	9.3	5.6	3.6	4.4	7.6	8.8	11.4	25.0	
17-Jun	8.1	7.4	6.9	6.8	6.3	6.4	8.6	14.3	20.2	30.7	37.2	33.1	24.5	37.2	54.8	77.7	84.4	60.3	26.1	12.7	14.2	11.3	8.5	8.0	25.2	84.4	
18-Jun	9.2	10.4	8.0	9.2	8.0	7.8	10.1	12.8	11.3	11.2	8.4	10.0	15.5	19.5	28.0	29.6	32.2	36.4	28.4	30.0	19.0	18.4	10.3	8.5	16.3	36.4	
19-Jun	10.0	12.3	10.9	11.2	6.4	12.0	12.0	20.5	34.8	31.3	7.7	6.1	6.7	6.7	6.1	5.9	5.6	4.8	4.0	3.6	3.2	2.9	2.3	1.7	9.5	34.8	
20-Jun	1.6	1.8	2.2	1.8	1.0	2.3	2.8	3.0	2.9	2.7	2.2	2.5	3.0	2.8	2.6	2.3	1.6	1.9	2.0	2.2	2.2	2.3	2.3	2.3	2.3	2.3	3.0
21-Jun	2.1	2.0	2.0	2.5	2.1	1.9	2.1	1.9	1.6	2.1	2.7	3.2	3.4	4.7	6.0	11.9	12.3	8.2	6.9	9.4	9.5	9.9	11.0	15.3	5.6	15.3	
22-Jun	10.2	6.4	5.0	4.4	4.4	4.5	5.8	7.8	6.1	6.2	6.0	8.1	9.4	11.6	17.9	23.6	23.2	20.8	21.1	24.7	23.9	22.4	28.3	28.3	13.8	28.3	
23-Jun	26.7	23.1	25.5	24.9	26.0	28.0	24.5	17.9	13.3	15.6	20.6	21.8	16.7	21.8	20.7	20.9	20.6	20.8	19.7	26.4	40.9	27.1	21.6	24.0	22.9	40.9	
24-Jun	30.3	31.5	18.5	22.2	18.8	15.5	15.9	15.2	15.3	16.8	17.5	19.0	17.7	17.7	22.0	12.5	15.4	28.2	17.2	5.8	4.7	5.2	3.9	3.7	16.3	31.5	
25-Jun	3.9	4.0	4.6	4.5	4.2	4.2	3.7	3.0	3.0	4.7	4.5	5.2	5.0	6.2	7.9	11.8	11.4	10.6	8.4	8.6	16.8	18.7	18.1	59.4	9.7	59.4	
26-Jun	44.2	10.3	11.9	12.2	11.2	9.5	8.9	9.3	11.0	11.8	12.4	11.7	13.3	13.4	12.9	10.4	6.5	8.1	8.8	8.9	9.2	9.8	10.2	10.7	11.9	44.2	
27-Jun	11.1	12.8	14.0	15.3	16.4	15.5	14.2	14.2	14.1	19.2	22.3	24.5	27.3	27.5	28.6	24.8	20.0	17.8	17.4	18.1	52.3	52.9	45.7	29.2	23.1	52.9	
28-Jun	26.3	24.7	22.7	23.8	21.6	20.0	17.5	17.9	16.4	16.1	15.6	19.4	21.0	31.8	28.1	45.3	44.5	39.5	25.8	26.8	28.6	25.0	22.8	23.0	25.2	45.3	
29-Jun	24.7	23.6	23.8	26.1	26.1	25.5	22.3	19.3	18.9	20.3	27.5	33.9	31.9	31.0	31.4	28.7	23.2	16.9	19.7	21.1	25.1	30.8	44.4	55.9	27.2	55.9	
30-Jun	56.7	48.0	35.6	27.7	26.2	27.4	31.7	35.2	40.8	47.3	54.7	50.7	49.0	33.5	23.6	23.8	13.4	5.6	8.4	11.7	16.1	32.8	39.1	99.5	34.9	99.5	
35.4 31.8 29.3 30.1 28.4 27.1 26.4 28.2 37.0 43.9 45.0 44.7 48.9 50.2 50.2 48.1 44.6 39.3 35.3 30.8 37.9 42.7 37.1 40.1																								Diurnal Average			
129.9 130.3 138.7 188.6 149.4 130.1 109.6 103.2 191.5 332.3 348.9 369.8 357.2 341.7 317.6 306.5 262.3 221.7 211.1 184.2 251.0 299.3 173.0 160.5																								Diurnal Maximum			

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	91	12.66	12.66
6 - 15	189	26.29	38.94
16 - 25	131	18.22	57.16
26 - 80	227	31.57	88.73
> 81.0	81	11.27	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}) - $\mu\text{g}/\text{m}^3$
Fort Hills - June 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	32	17	4	5	0	0	0	1	1	4	13	0	0	0	3	11	91
6 - 15	49	29	4	5	5	3	1	15	19	14	22	4	0	1	9	9	189
16 - 25	15	7	5	4	3	1	4	11	23	22	15	8	3	3	2	5	131
26 - 80	31	23	19	6	2	3	4	22	25	31	19	9	4	8	9	12	227
> 81.0	13	24	12	4	0	0	1	0	0	2	4	9	3	0	3	6	81
Totals	140	100	44	24	10	7	10	49	68	73	73	30	10	12	26	43	719

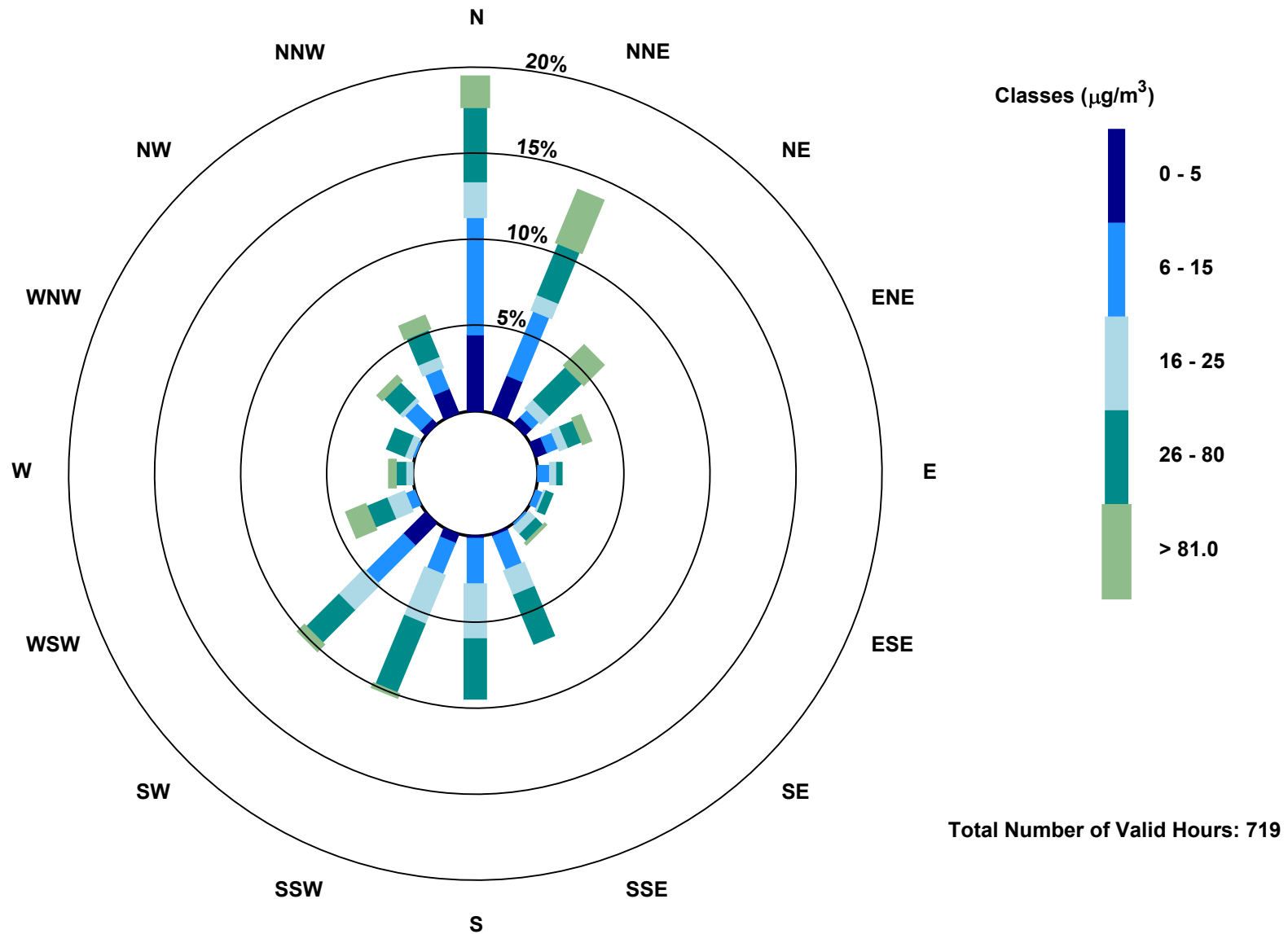
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

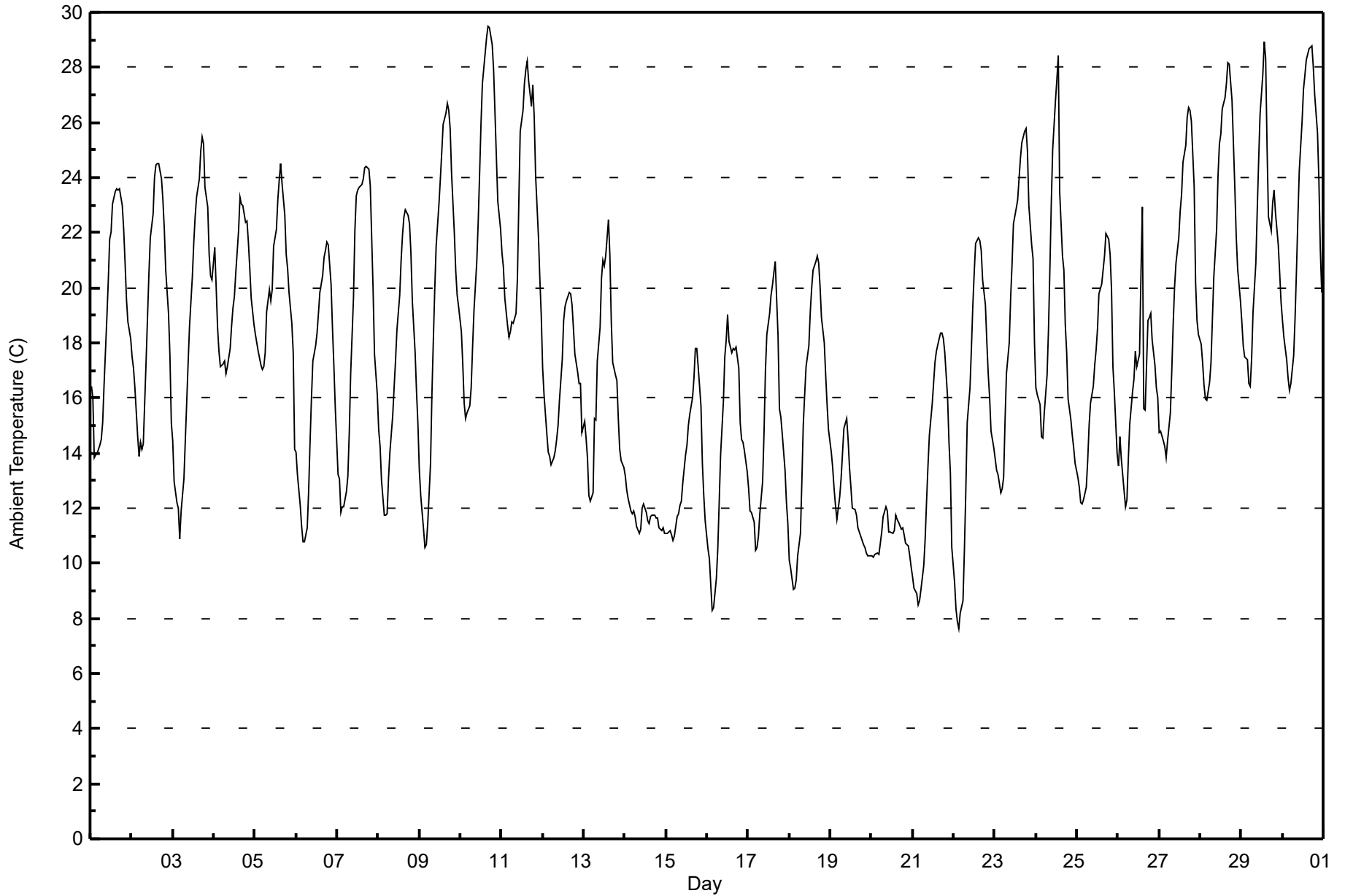
Ambient Temperature (AT) - C
Fort Hills - June 2023

Maximum Value: 29.5 C on Jun 10 17:00		Maximum Daily Average: 22.9 C on Jun 30		Hours in Service: 720																																												
Minimum Value: 7.6 C on Jun 22 04:00		Minimum Daily Average: 11.0 C on Jun 20		Hours of Data: 720																																												
Maximum Diurnal Average: 21.8 C at hour 15		Minimum Diurnal Average: 12.7 C at hour 5		Hours of Missing Data: 0																																												
Monthly Average: 17.60 C		Percentiles: P ₁ = 8.6 P ₁₀ = 11.3 Q ₁ = 13.6 Median = 17.4 Q ₃ = 21.1 P ₉₀ = 24.4 P ₉₉ = 28.6		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	16.4	16.0	13.8	13.9	14.0	14.3	14.5	15.1	16.5	18.9	20.2	21.8	22.0	23.0	23.5	23.6	23.5	23.6	23.0	22.1	20.9	19.6	18.8	18.1	19.0	23.6																						
2-Jun	17.5	17.1	16.4	14.6	13.9	14.4	14.2	14.3	17.3	18.9	20.5	21.8	22.7	24.0	24.5	24.5	24.5	23.9	23.2	22.1	20.6	19.1	17.5	15.1	19.3	24.5																						
3-Jun	14.4	12.9	12.2	12.0	10.9	11.9	13.0	14.5	15.9	17.3	18.6	20.4	21.6	22.6	23.3	23.9	25.0	25.5	25.2	23.7	22.9	21.2	20.5	20.3	18.7	25.5																						
4-Jun	21.4	20.0	18.5	17.7	17.1	17.2	17.3	16.9	17.2	17.8	18.6	19.3	19.7	20.6	22.1	23.3	23.0	23.0	22.4	22.4	21.7	20.7	19.6	18.7	19.8	23.3																						
5-Jun	18.3	18.0	17.7	17.2	17.1	17.1	17.7	19.1	19.9	19.5	19.9	21.5	22.1	23.2	23.9	24.5	23.8	22.6	21.2	20.7	19.8	18.7	17.7	14.2	19.8	24.5																						
6-Jun	14.1	13.2	12.1	11.3	10.8	10.8	11.3	12.6	14.4	16.0	17.3	17.9	18.4	19.1	19.8	20.4	21.1	21.4	21.6	20.2	18.6	17.2	15.7	16.5	21.6																							
7-Jun	13.2	13.1	11.9	12.0	12.0	12.6	13.2	14.7	16.9	19.6	22.1	23.3	23.5	23.6	23.8	23.9	24.4	24.4	24.3	23.7	21.8	19.9	17.6	16.1	18.8	24.4																						
8-Jun	14.9	14.3	13.0	11.8	11.7	11.8	13.1	14.0	15.3	16.4	17.3	18.5	19.8	21.0	21.9	22.6	22.8	22.6	22.3	21.3	19.5	17.7	16.2	15.0	17.3	22.8																						
9-Jun	13.4	12.5	11.3	10.6	10.7	11.4	13.6	16.2	18.1	19.9	21.5	23.0	23.9	24.9	25.9	26.4	26.7	26.5	25.8	24.1	22.0	20.6	19.7	19.3	19.5	26.7																						
10-Jun	18.4	17.2	15.8	15.2	15.5	15.7	16.4	17.8	19.2	21.0	22.4	24.1	25.9	27.4	28.5	29.1	29.5	29.4	28.8	27.9	26.4	24.7	23.1	22.1	22.6	29.5																						
11-Jun	21.3	20.8	19.6	18.6	18.2	18.4	18.8	18.7	19.1	20.3	23.1	25.7	26.4	27.4	27.9	28.2	27.5	26.6	27.4	26.2	24.0	21.9	20.3	19.0	22.7	28.2																						
12-Jun	17.1	16.1	14.7	14.0	13.9	13.6	13.8	14.1	14.5	15.0	15.9	17.4	18.8	19.3	19.5	19.9	19.8	19.4	18.5	17.6	16.9	16.5	16.5	14.7	16.6	19.9																						
13-Jun	15.1	14.5	13.8	12.5	12.2	12.5	15.3	15.2	17.3	18.6	20.3	21.0	20.8	21.1	22.5	21.2	18.7	17.3	16.8	16.6	15.3	14.1	13.7	13.5	16.7	22.5																						
14-Jun	13.2	12.7	12.4	11.9	11.8	11.9	11.7	11.4	11.1	11.2	12.0	12.1	11.8	11.6	11.4	11.7	11.7	11.8	11.6	11.6	11.3	11.2	11.3	11.1	11.7	13.2																						
15-Jun	11.1	11.1	11.2	11.0	10.8	11.0	11.7	11.8	12.1	12.3	12.9	14.0	14.3	15.0	15.4	16.0	16.7	17.8	17.8	17.1	15.7	13.6	12.5	11.5	13.5	17.8																						
16-Jun	10.5	10.2	9.2	8.3	8.4	9.5	10.5	12.2	13.9	15.9	17.5	18.1	19.0	18.1	17.6	17.8	17.7	17.8	17.1	15.1	14.5	14.4	14.1	13.3	14.2	19.0																						
17-Jun	12.7	11.9	11.8	11.5	10.5	10.6	11.0	11.8	13.0	14.7	17.0	18.3	19.0	19.7	20.1	20.6	20.9	18.3	15.6	15.3	14.7	13.4	12.2	11.4	14.8	20.9																						
18-Jun	10.1	9.8	9.0	9.1	9.4	10.3	11.1	12.9	15.0	16.1	17.1	17.9	19.1	20.0	20.6	20.9	21.2	20.9	20.0	18.9	18.0	16.8	15.8	14.9	15.6	21.2																						
19-Jun	14.0	13.5	12.7	12.1	11.6	12.4	13.0	14.0	14.9	15.2	14.5	13.5	12.8	12.0	12.0	11.7	11.3	11.1	10.8	10.7	10.6	10.4	10.3	10.3	12.3	15.2																						
20-Jun	10.3	10.2	10.3	10.4	10.3	10.7	11.1	11.7	12.1	11.9	11.1	11.1	11.1	11.2	11.8	11.6	11.5	11.2	11.3	11.0	10.7	10.6	10.3	9.9	11.0	12.1																						
21-Jun	9.5	9.1	8.9	8.5	8.7	9.1	9.9	10.9	12.3	13.5	14.6	15.8	16.5	17.3	17.7	18.2	18.4	18.4	18.2	17.6	16.0	14.4	13.3	10.6	13.6	18.4																						
22-Jun	9.3	8.3	7.9	7.6	8.2	8.6	10.5	12.6	15.1	16.4	17.8	19.3	20.5	21.6	21.8	21.7	21.3	20.3	19.4	18.1	16.9	16.0	14.8	14.2	15.3	21.8																						
23-Jun	13.8	13.4	13.2	12.5	12.7	13.1	15.2	16.9	18.0	19.6	20.8	22.3	22.9	23.2	23.9	24.7	25.3	25.7	25.8	25.0	23.0	21.5	21.1	18.1	19.6	25.8																						
24-Jun	16.4	16.1	15.7	14.6	14.5	15.5	16.8	18.5	20.7	23.0	25.0	26.8	27.6	28.4	23.5	21.1	20.6	18.7	17.7	16.0	15.2	14.6	14.2	13.6	19.0	28.4																						
25-Jun	13.1	12.7	12.2	12.1	12.3	12.8	13.8	15.0	15.8	16.4	17.2	17.8	18.5	19.8	20.1	20.7	21.1	22.0	21.7	21.2	19.9	17.2	16.2	14.0	16.8	22.0																						
26-Jun	13.5	14.6	13.8	12.6	12.1	12.3	13.8	15.0	16.2	16.7	17.7	17.1	17.6	20.4	22.9	15.6	15.6	18.8	18.9	19.1	18.1	17.2	16.4	16.0	16.3	22.9																						
27-Jun	14.7	14.8	14.4	14.2	13.8	14.5	15.5	17.0	18.7	20.0	20.9	21.8	22.8	23.4	24.5	25.2	26.2	26.5	26.4	26.1	23.7	20.2	18.8	18.3	20.1	26.5																						
28-Jun	18.0	17.3	16.5	16.0	15.9	16.6	17.3	18.9	20.4	22.1	24.1	25.2	25.6	26.5	26.9	27.4	28.2	28.1	26.8	25.2	23.6	21.9	20.7	19.5	22.0	28.2																						
29-Jun	18.8	17.9	17.5	17.4	16.5	16.4	17.5	19.1	20.9	22.8	24.6	26.3	27.8	29.0	28.3	25.1	22.6	22.1	23.1	23.5	22.7	21.6	20.5	19.5	21.7	29.0																						
30-Jun	18.8	18.2	17.4	16.7	16.3	16.5	17.5	18.9	20.6	22.5	24.2	26.0	27.2	27.7	28.3	28.7	28.7	28.8	28.0	27.0	25.6	23.9	21.4	19.8	22.9	28.8																						
																								14.8	14.3	13.5	12.9	12.7	13.1	14.0	15.1	16.4	17.7	18.9	20.0	20.7	21.4	21.8	21.7	21.6	21.5	21.0	20.3	19.1	17.7	16.7	15.6	Diurnal Average
																								21.4	20.8	19.6	18.6	18.2	18.4	18.8	19.1	20.9	23.0	25.0	26.8	27.8	29.0	28.5	29.1	29.5	29.4	28.8	27.9	26.4	24.7	23.1	22.1	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	22	3.06	3.06
10 - 20	468	65.00	68.06
> 20	230	31.94	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

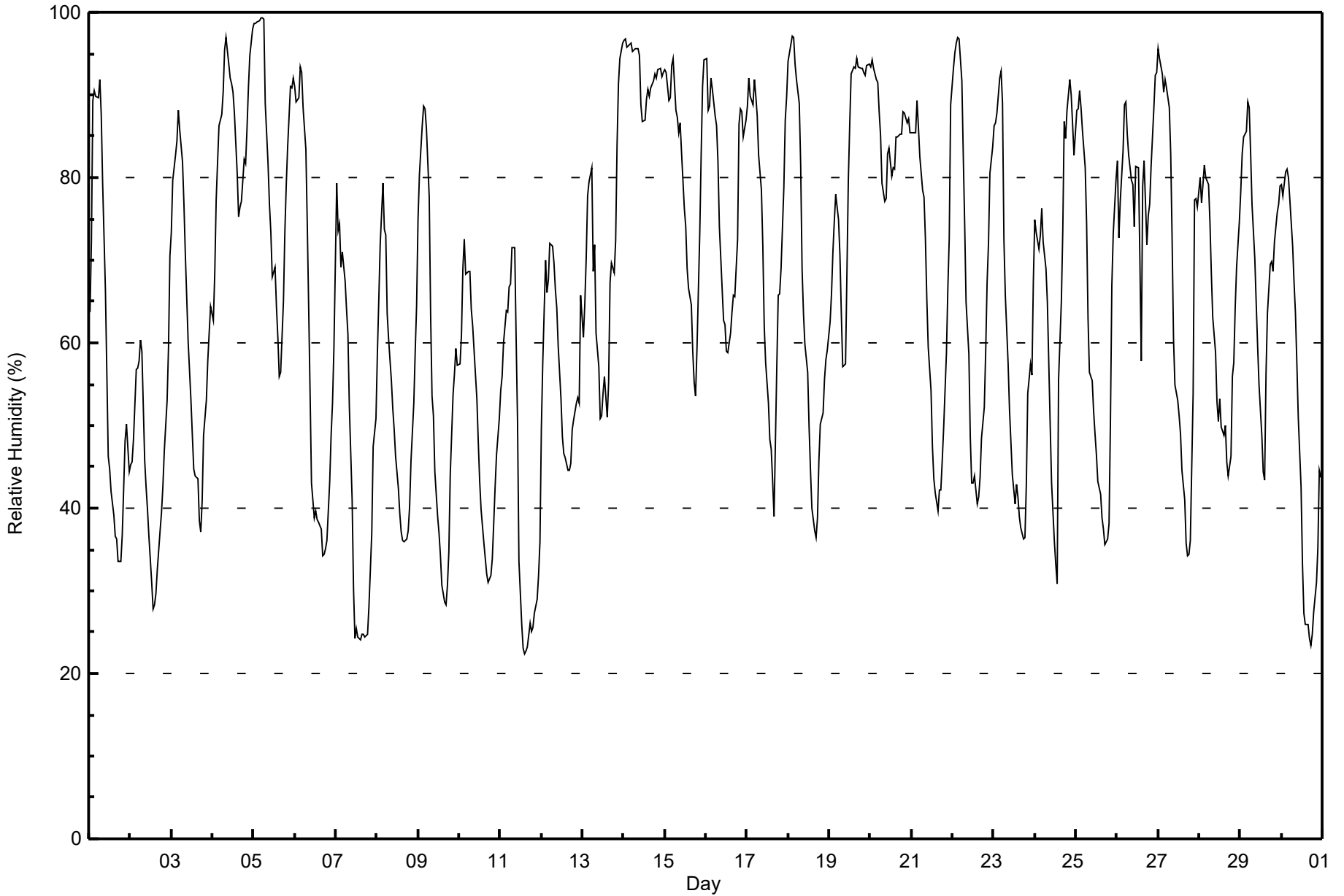
Relative Humidity (RH) - %
Fort Hills - June 2023

Maximum Value: 99.4 % on Jun 5 06:00 Maximum Daily Average: 92.9 % on Jun 14																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 22.3 % on Jun 11 15:00 Minimum Daily Average: 43.2 % on Jun 11																						Hours of Missing Data: 0 Hours of Calibration: 0																										
Maximum Diurnal Average: 84.3 % at hour 5 Minimum Diurnal Average: 48.6 % at hour 15																						Percent Operational Time: 100.0																										
Monthly Average: 65.55 % Percentiles: P₁ = 24.3 P₁₀ = 36.5 Q₁ = 48.7 Median = 66.9 Q₃ = 84.9 P₉₀ = 92.0 P₉₉ = 97.8																																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	63.7	72.4	89.4	90.6	89.9	89.6	91.8	87.6	79.4	66.2	56.3	46.3	44.8	42.0	39.2	36.7	36.3	33.6	33.5	36.8	42.3	48.1	50.2	44.4	58.8	91.8																						
2-Jun	45.3	45.6	48.3	56.7	57.0	57.8	60.4	59.0	45.7	42.6	39.9	36.5	31.1	27.8	28.3	29.7	32.6	37.3	39.5	42.8	46.9	53.0	59.4	70.5	45.6	70.5																						
3-Jun	73.3	79.7	82.7	84.5	88.1	85.8	81.8	76.9	70.6	65.4	60.2	53.1	48.8	44.8	43.9	43.5	38.5	37.1	40.8	48.9	53.0	57.7	61.1	64.5	61.9	88.1																						
4-Jun	62.7	68.4	77.3	81.8	86.3	87.7	90.4	95.5	96.9	93.7	92.0	91.4	90.3	87.8	80.6	75.2	76.4	77.1	82.3	81.7	85.9	90.9	94.8	98.0	85.2	98.0																						
5-Jun	98.7	98.6	98.9	99.1	99.3	99.4	99.2	89.1	81.8	76.7	73.3	67.9	69.1	64.5	60.7	56.0	56.4	65.0	73.4	79.1	83.8	91.0	90.9	92.1	81.8	99.4																						
6-Jun	90.9	89.1	89.7	93.3	92.7	88.5	83.4	74.2	64.3	53.9	43.1	38.9	39.6	38.7	38.2	37.4	34.2	34.4	35.0	36.1	43.2	48.8	52.8	59.4	58.3	93.3																						
7-Jun	79.3	73.6	74.3	69.2	71.0	67.4	64.0	61.0	52.4	40.9	30.1	24.3	25.4	24.4	24.0	24.7	24.8	24.4	24.8	28.1	32.5	36.9	47.5	50.9	44.8	79.3																						
8-Jun	58.6	65.1	71.9	79.3	73.8	73.1	63.6	60.5	55.5	52.1	49.5	46.4	42.4	39.2	37.0	36.0	36.0	36.2	37.2	40.1	45.7	52.6	59.1	64.7	53.2	79.3																						
9-Jun	75.0	80.4	86.4	88.7	88.3	85.9	77.6	63.5	53.6	51.1	44.4	39.0	36.9	34.2	30.7	28.6	28.3	30.6	34.7	44.1	53.7	56.2	59.4	57.3	55.4	88.7																						
10-Jun	57.5	61.0	68.9	72.6	68.2	68.7	68.6	64.1	62.0	56.1	53.2	48.0	43.3	39.8	35.7	34.0	32.1	31.0	31.9	33.9	38.1	42.5	46.4	50.8	50.3	72.6																						
11-Jun	54.3	56.0	60.1	64.0	63.7	66.9	67.0	71.5	71.5	60.5	50.6	33.5	25.9	23.1	22.3	22.7	23.3	26.1	25.1	25.6	27.2	29.0	31.9	36.0	43.2	71.5																						
12-Jun	49.7	57.6	69.9	66.1	67.6	72.1	71.7	69.6	66.4	64.3	59.7	53.2	48.6	46.7	46.1	44.7	44.5	45.5	49.4	50.7	52.8	53.4	52.8	65.7	57.0	72.1																						
13-Jun	60.6	64.8	70.4	77.7	79.6	81.2	68.7	71.9	61.2	57.1	50.8	51.2	53.9	55.9	51.0	55.2	67.2	69.6	68.4	72.4	83.8	91.3	94.4	96.3	68.9	96.3																						
14-Jun	96.7	96.7	95.8	96.1	96.2	95.2	95.5	95.6	95.6	94.7	88.8	86.7	87.0	89.5	90.7	89.8	90.9	91.7	92.5	92.0	93.1	93.3	92.1	92.7	92.9	96.7																						
15-Jun	93.1	92.7	89.4	89.6	93.5	94.5	88.2	87.3	85.5	86.6	83.0	76.2	74.0	69.0	66.5	64.5	59.0	55.3	53.5	59.2	73.2	82.7	91.0	94.2	79.2	94.5																						
16-Jun	94.5	88.1	88.6	92.0	90.7	87.4	86.3	81.9	74.0	66.4	62.7	62.2	58.9	58.9	61.3	63.7	65.8	65.7	72.5	86.4	88.3	87.9	84.9	86.9	77.3	94.5																						
17-Jun	88.6	92.1	89.8	88.9	91.8	89.8	87.5	82.7	78.4	71.7	62.0	57.7	52.7	48.4	47.1	43.2	39.0	57.4	65.7	65.9	69.0	78.8	86.9	89.8	71.9	92.1																						
18-Jun	94.1	95.0	97.1	97.0	93.7	91.8	89.0	81.6	69.0	63.5	59.8	56.5	49.9	44.6	40.0	37.3	36.4	38.9	45.8	50.2	51.6	55.6	57.9	59.1	64.8	97.1																						
19-Jun	62.5	66.0	71.1	74.8	78.0	74.9	70.7	63.5	57.2	57.4	68.4	79.7	86.4	92.6	93.4	93.2	94.4	93.3	93.3	93.2	92.7	92.3	93.6	93.8	80.7	94.4																						
20-Jun	93.5	94.3	93.2	91.9	91.5	88.0	85.0	79.3	77.2	77.4	82.9	83.6	80.2	81.2	81.1	84.9	84.9	85.3	85.3	87.9	87.8	86.6	87.1	85.5	85.6	94.3																						
21-Jun	85.4	85.5	85.4	89.3	86.1	82.5	78.4	77.6	72.5	65.2	59.5	54.3	47.4	43.5	41.9	39.6	42.2	42.2	45.8	49.6	58.9	66.6	72.6	88.9	65.0	89.3																						
22-Jun	93.2	95.1	96.4	97.0	96.7	91.7	82.7	74.4	65.0	58.7	48.7	43.0	43.1	44.0	40.5	41.3	43.7	48.5	52.3	59.0	67.3	72.0	80.5	83.7	67.4	97.0																						
23-Jun	86.3	86.6	87.7	92.1	92.9	88.9	72.5	65.8	57.5	51.9	48.0	44.0	40.6	42.9	41.4	39.0	37.6	36.2	36.5	42.9	53.9	57.4	56.1	67.5	59.4	92.9																						
24-Jun	74.9	73.4	71.4	73.1	76.2	72.1	69.1	64.9	57.6	50.1	43.1	36.0	33.1	30.9	55.5	65.0	73.6	86.7	84.8	88.1	91.9	90.0	86.5	82.6	67.9	91.9																						
25-Jun	88.1	88.4	90.4	88.4	85.8	81.3	74.4	63.1	56.4	55.5	51.7	49.0	46.5	43.2	41.7	38.8	37.5	35.6	36.4	38.2	50.5	67.0	73.2	79.8	60.9	90.4																						
26-Jun	82.0	72.7	77.0	83.2	88.9	89.1	85.2	82.7	79.6	79.2	74.1	81.4	81.3	70.2	57.9	79.1	82.1	71.9	75.4	76.7	81.4	88.4	92.4	92.7	80.2	92.7																						
27-Jun	95.6	94.4	92.6	90.3	91.8	90.8	88.4	82.8	72.6	60.6	54.9	53.1	51.2	49.0	44.6	41.1	35.8	34.2	34.3	36.1	53.9	77.3	77.4	76.5	65.8	95.6																						
28-Jun	80.1	77.0	79.2	81.6	80.0	79.2	74.5	68.3	63.1	58.9	52.9	50.5	53.2	49.8	48.7	50.0	45.5	43.8	46.3	55.9	57.6	64.2	69.2	74.7	62.7	81.6																						
29-Jun	78.5	82.9	85.0	85.6	89.2	88.4	83.1	76.8	70.2	64.7	59.7	55.0	48.8	44.4	43.4	56.3	63.5	69.5	69.7	68.7	72.1	75.8	76.8	79.0	70.3	89.2																						
30-Jun	79.1	77.9	80.6	80.9	80.0	77.3	71.7	67.3	63.6	57.5	51.1	42.6	33.2	27.3	26.0	25.9	24.3	23.4	24.8	27.5	31.0	35.2	44.6	43.7	49.8	80.9																						
																								77.9	79.0	81.9	83.8	84.3	82.9	79.0	74.7	68.5	63.4	58.5	54.7	52.2	49.9	48.6	49.2	49.6	50.9	53.0	56.6	62.1	67.4	70.8	74.0	Diurnal Average
																								98.7	98.6	98.9	99.1	99.3	99.4	99.2	95.6	96.9	94.7	92.0	91.4	90.3	92.6	93.4	93.2	94.4	93.3	93.3	93.2	93.1	93.3	94.8	98.0	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Fort Hills - June 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	105	14.58	14.58
40 - 60	192	26.67	41.25
60 - 80	196	27.22	68.47
80 - 100	227	31.53	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



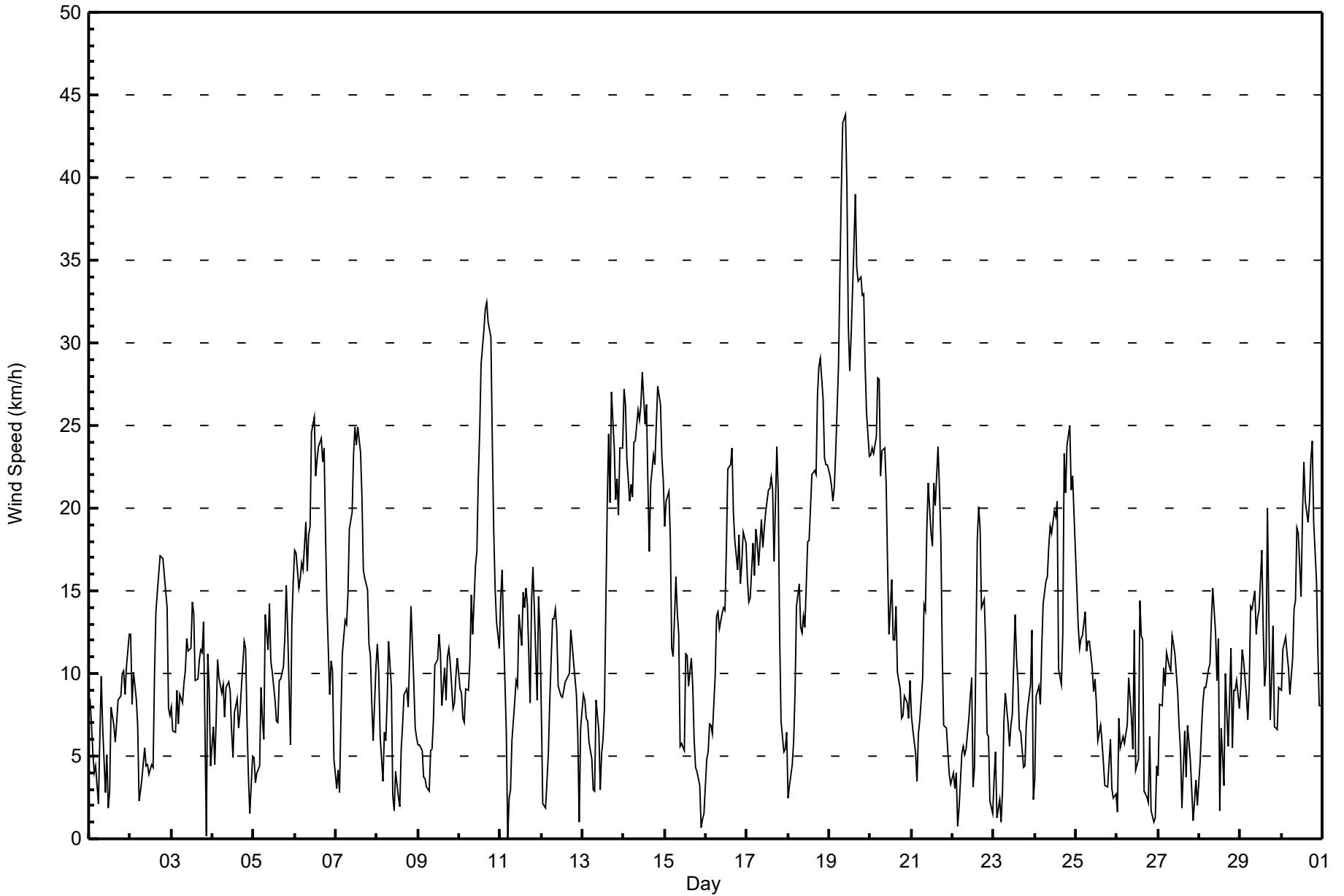
Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Speed: 44 km/h on Jun 19 10:00	Maximum Daily Speed Average: 31.0 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 11 05:00	Minimum Daily Speed Average: 0.6 km/h on Jun 24	Hours of Data: 720
Maximum Diurnal Speed Average: 5.1 km/h at hour 24	Minimum Diurnal Speed Average: 1.0 km/h at hour 7	Hours of Missing Data: 0
Monthly Average Velocity: 2.4 km/h 344.6 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 10 Q ₃ = 17 P ₉₀ = 23 P ₉₉ = 34	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	WNW8	SW7	WSW5	NW4	NW4	ESE2	SSW6	SSW10	SW7	SSE3	SSW5	SSW2	W3	NE8	ENE7	E6	ENE7	ENE8	NNE9	NNE10	NNE10	N9	N10	NNE12	NNE2.0	NNE12
2-Jun	NNE12	NNE8	N10	NNW8	NNW7	NNW2	SSW3	W4	NNW6	NW4	SW4	WSW4	WSW4	NNE4	NNE10	NNE14	NNE15	ENE17	NE17	NE17	NE16	NE14	NE8	N7	NNE6.6	ENE17
3-Jun	N8	N6	N6	N9	NNW7	N9	N8	N9	N10	N12	N11	NE11	NE14	NE14	NNE10	NE10	NE11	NNE11	NNE11	N13	NNE0	N11	N9	NE4	NNE8.8	NE14
4-Jun	ESE7	NNE5	N7	N11	N10	NNE9	NE9	NNE7	ENE9	ENE9	ENE9	ENE6	NE5	N8	NNE8	N7	NNW8	NNE9	NNE12	NNE12	NNE7	E4	N1	NNW5	NNE6.6	NNE12
5-Jun	N5	N3	N4	NW4	NW9	N7	N6	N14	NNE11	N14	N11	NE10	E8	NE7	NE7	NNE10	N10	NNE10	NE12	NE15	NE13	NW6	W13	NW16	N7.4	NW16
6-Jun	SW17	SW17	SW15	SSW16	SW17	SSW16	SW19	SSW16	SW18	SW19	SW25	SW26	SW22	SW23	SW24	SW24	SW23	SW24	SW18	SW14	SSW9	S11	S10	S5	SW17.3	SW26
7-Jun	SW3	SSE4	SSE3	SSE7	SSE11	SSW13	SSW13	SW15	SW19	SSW20	SW23	WSW25	WSW24	WSW25	WSW23	WSW21	W16	NNW16	W15	NW12	NW11	NW8	NNW6	NNW10	WSW11.1	WSW25
8-Jun	N12	NNE10	N6	N3	NNW6	NW6	N8	N12	NNE9	ENE3	WSW2	SW4	ESE3	NE2	NNE5	NE7	ENE9	ENE9	NE8	NE11	NNE14	NNE9	N7	N6	NNE5.9	NNE14
9-Jun	NNW6	N6	NNW5	N4	NW4	NNW3	WSW3	SSW5	SSW5	SSW7	SW11	SSW11	SSW12	SW11	S8	SSE10	SSW8	SSW11	SSW12	SW11	S8	S8	SSE10	SSE11	SSW5.5	SSW12
10-Jun	SSE9	S9	S7	S7	S9	SSE9	S11	SSW15	SW12	SSW17	S17	S22	S25	S29	S31	S32	SSE32	S31	S30	S24	S19	SSE15	SSE13	SSE12	S17.8	SSE32
11-Jun	SSE15	SSE16	SSE13	SSW6	E0	SSW2	SW3	WSW6	W8	WSW10	WSW9	NNW14	NNW12	NNW15	NNW14	NW15	NW14	W8	NW14	NW16	NNW14	NW8	NNW15	N13	WNW6.4	NW16
12-Jun	NNE8	NE2	SW2	NE4	NNE5	NNE8	NNE13	NNE13	NNE14	N13	NNE9	NE9	NE9	ENE9	NE10	NE10	NE10	NE13	NNE12	NNE11	N9	NE6	NE1	NNW7	NNE7.9	NNE14
13-Jun	N9	N8	N7	N7	N6	N5	SE3	SSW3	SSW8	SW7	SW3	WSW5	W6	NNW8	N20	NNE25	N20	NNE27	NNE24	NE21	N22	NNE20	NNE24	NNE24	N10.1	NNE27
14-Jun	NNE27	NNE26	NNE23	NNE20	N21	NNE21	NNE24	NNE24	NNE26	N25	N26	NNE28	NNE25	N26	N22	N17	N21	N23	N23	N25	N27	N26	N23	N22	N23.8	NNE28
15-Jun	N19	N20	N21	N18	NNW12	NNW11	N16	N14	N12	WNW6	W6	NNW5	NNW11	N11	N9	N11	N9	NE6	ENE4	SE4	SSE3	S1	WSW1	WSW2	N8.3	N21
16-Jun	SSW5	S5	SSE7	S7	S6	SSE10	S13	SSE14	S13	SSE14	SSE14	S14	SSW18	SW22	SSW23	SSW24	SSW20	SSW18	S16	SSW18	SSW15	SW17	SW19	SW18	SSW13.5	SSW24
17-Jun	SW16	SSW14	SW15	SW18	SSW16	SW19	SW18	SW17	SW19	SW18	SW19	SW20	SW21	SW21	SW22	WSW21	WSW17	NNE24	NNE21	NE12	NE7	N5	N5	NNW6	SSW9.8	NNE24
18-Jun	NW2	NW3	N5	N6	N9	N14	N15	N13	NE12	NNE13	NE13	NNE18	NNE18	NNE20	NNE22	NE22	NE22	NNE27	NNE29	N29	N27	N23	NNE23	NNE23	NNE16.5	N29
19-Jun	NNE22	NNE21	NNE20	N21	N23	NNE29	N34	NNE39	NNE43	NNE44	NNE39	N31	N28	N30	N36	N39	N35	N34	N34	N33	N33	N29	N26	N23	N31.0	NNE44
20-Jun	N23	N24	N23	N24	N28	N28	N22	N23	NNE24	NNE21	N17	N12	N16	N12	N12	N14	N10	NNW9	NNW7	NW7	NNW9	NNW8	NNW7	NNW10	N15.9	N28
21-Jun	NNW7	NNW7	NNW5	NNW3	NW6	NNW7	N10	N14	NNE14	NNE19	NNE22	NNE19	NNE18	NNE22	NNE20	NNE24	NNE21	NNE18	ENE11	E7	ESE7	ESE5	ESE4	NNW3	NNE10.5	NNE24
22-Jun	NNW4	NNW3	N4	NW1	SW2	SSE5	S6	SW5	SSE5	WSW7	SSE9	SE10	SSE3	S4	SW18	SW20	SW19	SW14	SW14	WSW12	SSW6	WSW6	SSW2	S2	SW5.8	SW20
23-Jun	SSE4	S5	SE1	NNW2	NW1	SE3	SSE7	S9	SSW7	SE6	SSE7	SSE8	SSE14	SSW11	SSW10	SSW7	S6	S4	S4	SSE7	SSE8	SSE9	SSE13	SSW2	S5.8	SSE14
24-Jun	S4	SSE9	SSE9	SE8	SSE12	S14	S16	SSW16	SSW18	SSW19	SSW18	SW20	SW20	SW20	NNW10	E9	N12	N23	NNW21	N24	NNE25	NNE21	NNE22	NNE20	WSW0.6	NNE25
25-Jun	N15	N13	N12	N12	NNE12	NNE14	NE11	NE12	ENE12	ENE10	ENE9	ENE20	NE8	E6	N7	NW6	NW5	WNW3	S3	S5	SSE6	S3	S2	NNW3	NE5.6	N15
26-Jun	SE2	SSE7	S6	SSE6	SSE6	S6	S7	S10	SW7	S5	S13	SSW4	SW5	SW14	SW12	N12	SSE3	NNE3	S2	SSW6	NNE2	E1	ENE1	N4	S3.7	SW14
27-Jun	NNW4	N8	N8	N10	N9	N11	NNE10	N10	NNE12	NNE12	N11	N9	N7	WNW5	ENE2	SE7	E4	E7	ENE6	ENE5	E1	WNW2	NNW4	SW2	NNE5.4	NNE12
28-Jun	SSE5	SSE7	S8	S9	S9	S10	S11	S13	SSW15	SSW12	SSW10	SSW12	NNW2	N7	NNW3	NNE10	NE8	SE6	S12	WSW6	WSW9	S9	SSW10	SW8	S5.7	SSW15
29-Jun	SSW9	S11	S11	S9	SSW7	SSW9	SSW14	SSW14	S15	S12	SSW13	SSW14	SSW17	SSW13	W9	SW11	SW20	SW7	SSW10	SSW13	S7	SSE7	SSW9	SSW9	SSW10.5	SW20
30-Jun	SSW9	SSW11	S12	S11	SSE10	S9	S11	SSW14	SSW14	SSW19	SSW19	SW15	WSW20	SW23	WSW20	WSW19	SW20	WSW23	WSW24	WSW19	WSW16	SW11	SW8	NW8	SW13.4	WSW24
N3.3 N1.9 N2.2NNW2.5NNW2.6 N1.9 N1.0NNW1.3NNW1.6 NN1.0WSW1.2 W1.7 W1.9 W2.9 NW3.3NNW3.2NNW3.4 N4.7 N3.8 N4.3 N4.4 N3.5 N3.2NNW5.1																								Diurnal Average		
NNE27 NNE26 N23 N24 N28 NNE29 N34 NNE39 NNE43 NNE44 NNE39 N31 N28 N30 N36 N39 N35 N34 N34 N33 N33 N29 N26 NNE24																								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
Fort Hills - June 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	129	17.92	17.92
6 - 11	272	37.78	55.69
12 - 19	181	25.14	80.83
20 - 28	114	15.83	96.67
29 - 38	19	2.64	99.31
> 38	5	0.69	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 Hills - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	11	8	6	5	4	5	5	10	15	11	10	8	2	3	10	16	129
6 - 11	53	26	21	17	6	2	5	25	32	25	12	7	5	4	10	22	272
12 - 19	29	23	14	2	0	0	0	12	14	33	31	5	3	5	6	4	181
20 - 28	35	37	3	0	0	0	0	1	2	4	21	10	0	0	0	1	114
29 - 38	11	2	0	0	0	0	0	1	5	0	0	0	0	0	0	0	19
> 38	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Totals	140	100	44	24	10	7	10	49	68	73	74	30	10	12	26	43	720

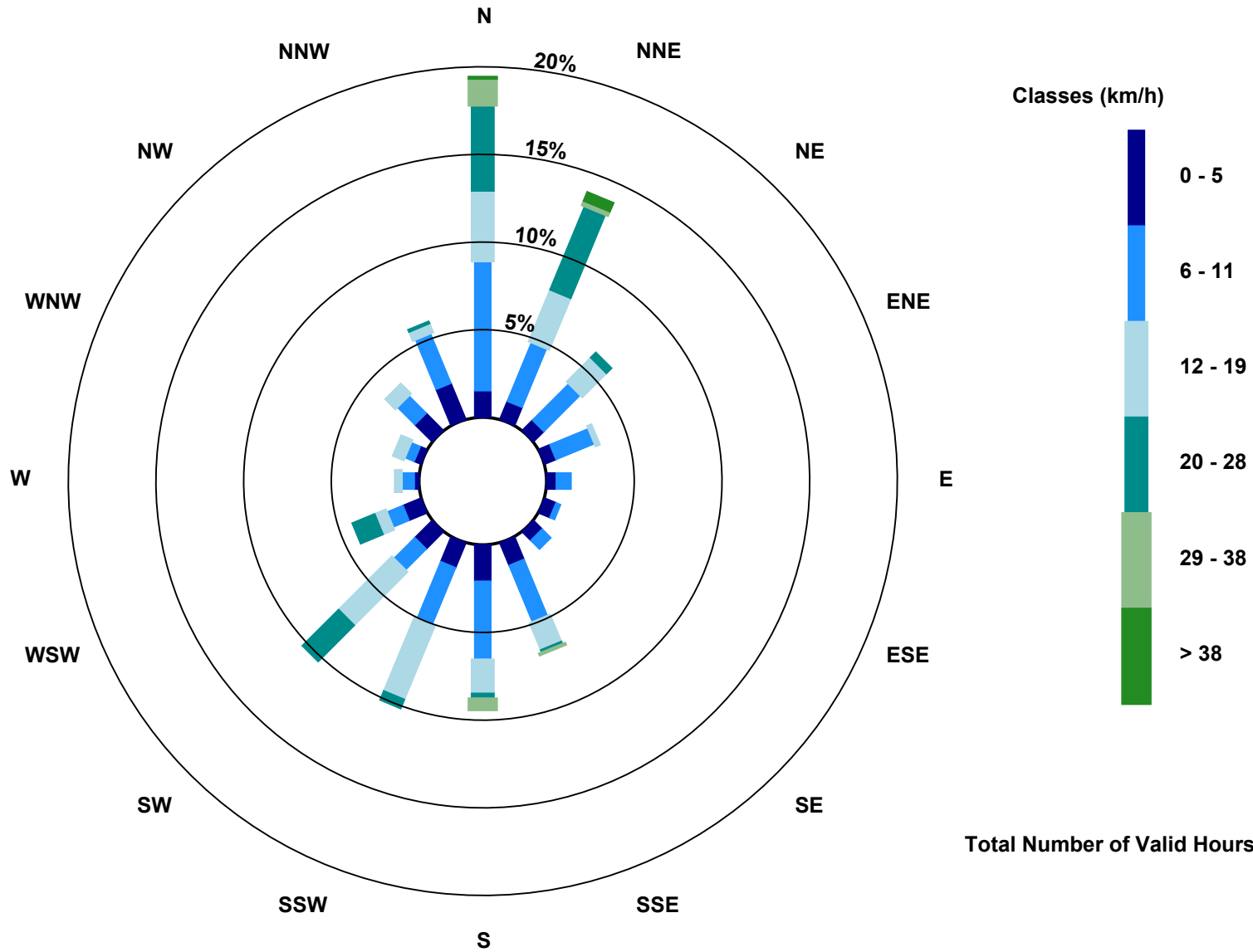
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Fort Hills



Total Number of Valid Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

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



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort Hills - June 2023

Direction of Maximum Speed: 16 deg on Jun 19 10:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 9.4 deg on Jun 19		Hours of Data:	720
Direction of Minimum Speed: 90 deg on Jun 11 05:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 0.6 deg on Jun 24		Percent Operational Time:	100.0
Monthly Average Direction: 344.6 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-Jun	292	214	243	326	325	122	204	195	225	166	206	213	264	36	64	89	70	58	33	16	22	11	9	13	16.1
2-Jun	14	17	0	337	338	342	212	268	344	305	223	257	245	22	23	14	29	61	55	55	50	54	36	354	23.8
3-Jun	358	359	359	2	329	4	1	4	3	1	357	43	56	51	30	38	37	32	20	1	23	359	358	44	16.1
4-Jun	106	22	353	3	355	20	41	24	70	73	59	61	55	1	16	7	339	15	15	13	18	84	1	340	25.1
5-Jun	351	355	3	323	322	349	351	8	15	351	5	56	86	47	40	15	8	32	45	46	44	317	277	322	9.6
6-Jun	234	234	222	210	216	213	216	210	219	229	228	231	230	223	215	222	232	228	225	232	197	173	177	187	220.7
7-Jun	226	167	153	165	151	198	194	216	218	210	236	245	243	254	258	249	265	289	279	315	317	312	301	298	245.1
8-Jun	8	15	350	5	339	319	359	6	14	72	248	215	105	52	28	41	66	59	51	40	25	18	357	353	19.3
9-Jun	348	352	338	358	321	329	237	208	196	209	217	209	197	215	178	160	196	198	196	214	190	175	168	159	200.2
10-Jun	154	174	191	184	174	162	177	194	218	199	171	169	178	170	172	170	168	174	175	175	171	165	154	167	174.1
11-Jun	165	166	150	213	90	198	219	250	273	251	247	291	298	295	289	304	307	267	310	323	330	326	330	358	287.3
12-Jun	33	50	234	37	32	18	18	18	17	11	25	37	52	60	46	56	50	47	23	14	5	37	49	339	28.8
13-Jun	357	3	357	354	353	354	144	208	211	225	230	253	277	327	10	13	353	17	23	42	10	15	22	15	7.8
14-Jun	13	15	14	14	9	16	14	16	12	10	10	14	14	9	6	6	1	6	1	0	2	3	3	2	8.9
15-Jun	359	354	2	352	333	334	358	359	351	284	279	336	347	353	358	351	349	48	65	139	162	188	250	243	351.9
16-Jun	209	174	165	186	170	155	175	165	176	153	159	189	196	215	209	204	196	192	191	205	205	219	229	227	194.9
17-Jun	219	212	226	223	208	218	218	227	233	218	223	225	219	228	222	247	251	15	27	46	52	11	353	346	232.1
18-Jun	321	317	351	3	359	11	11	9	38	32	40	18	29	32	29	36	37	20	18	9	8	9	16	17	19.2
19-Jun	13	14	15	9	8	15	9	14	15	16	18	11	8	7	7	8	7	6	5	4	5	3	1	3	9.4
20-Jun	4	360	359	358	3	10	6	9	17	17	6	354	354	351	5	11	355	344	335	325	329	332	340	332	0.0
21-Jun	339	330	338	328	320	333	360	7	19	23	20	17	17	13	16	19	24	33	64	98	122	105	116	346	19.0
22-Jun	333	332	9	316	232	168	175	214	152	240	158	143	159	191	229	228	235	234	227	238	199	241	197	177	217.6
23-Jun	156	175	131	337	306	145	162	170	208	146	154	147	157	205	193	197	189	191	179	160	163	161	160	210	172.1
24-Jun	173	151	165	142	154	171	185	195	200	209	212	226	220	216	332	84	4	9	344	4	23	20	17	21	253.6
25-Jun	7	11	10	8	23	25	43	52	59	66	66	77	35	94	6	324	319	293	183	178	163	183	180	336	33.8
26-Jun	128	161	170	154	160	175	187	169	225	190	170	208	228	215	229	349	155	16	175	193	22	85	58	349	190.5
27-Jun	340	10	357	0	359	6	15	6	15	13	5	360	10	303	64	135	101	85	68	63	101	297	343	223	13.8
28-Jun	161	160	175	178	182	183	181	179	193	202	203	203	345	9	339	20	41	126	190	240	246	174	198	226	189.6
29-Jun	212	174	176	182	211	197	197	203	190	184	199	201	205	212	281	221	234	217	192	204	183	152	197	202	201.7
30-Jun	198	196	177	171	164	176	187	205	206	206	203	216	237	234	244	244	236	249	247	248	242	232	223	325	223.2

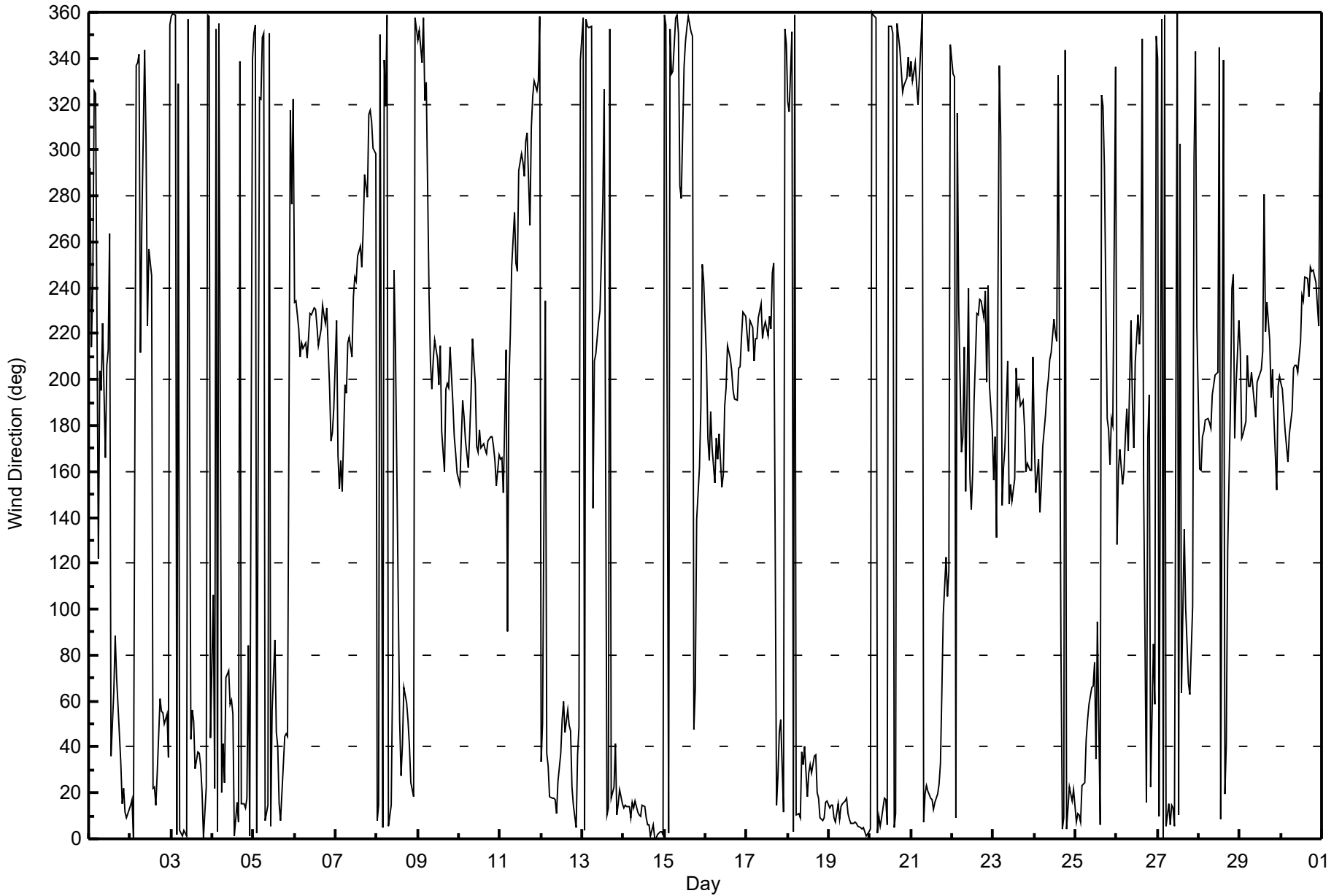
353.1	2.5	354.7	348.4	344.1	3.6	0.4	338.4	328.3	307.3	244.7	259.0	261.8	280.7	315.9	340.7	331.7	10.0	3.4	1.5	9.5	9.2	354.1	348.5
Diurnal Average																							

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Jun 3 21:00 Minimum Value: 3 deg on Jun 23 21:00 Percentiles: P ₁ = 6 P ₁₀ = 10 Q ₁ = 12 Median = 16 Q ₃ = 26 P ₉₀ = 51 P ₉₉ = 87																	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-Jun	60	46	50	58	26	65	28	13	22	50	52	75	73	53	46	48	27	19	18	15	8	16	10	10	75
2-Jun	16	25	13	12	11	64	40	41	29	54	21	64	42	70	29	15	23	13	11	10	10	11	27	17	70
3-Jun	11	17	27	13	23	12	13	16	18	17	18	34	20	21	31	30	28	18	23	33	99	14	14	48	99
4-Jun	24	43	10	12	11	18	14	21	15	15	16	18	17	20	24	33	29	16	10	12	31	42	88	17	88
5-Jun	15	13	44	27	22	16	19	18	19	15	19	28	27	42	51	25	17	12	10	10	10	43	17	24	51
6-Jun	12	8	12	8	8	8	8	11	13	14	14	15	16	18	18	15	16	13	11	12	22	6	9	60	60
7-Jun	50	41	48	14	14	10	12	16	11	12	15	13	16	16	15	15	22	17	17	13	10	8	13	9	50
8-Jun	20	12	12	36	17	10	25	16	32	76	90	75	78	98	78	39	35	24	31	15	8	9	12	23	98
9-Jun	12	13	12	15	34	25	41	23	29	24	20	26	27	28	42	24	34	13	10	7	7	10	6	11	42
10-Jun	10	21	19	12	9	6	15	12	11	12	15	14	15	13	12	11	10	10	9	8	7	7	8	8	21
11-Jun	4	6	9	34	93	61	63	30	15	12	19	25	24	32	26	27	17	24	23	12	13	22	17	17	93
12-Jun	17	70	58	64	47	17	14	15	16	18	30	34	32	26	22	15	13	10	17	13	15	20	86	15	86
13-Jun	15	11	11	11	21	16	86	62	31	33	74	25	14	23	14	12	17	12	10	28	15	13	10	11	86
14-Jun	11	10	11	12	13	12	11	11	12	12	13	12	14	16	15	16	16	16	16	17	17	17	15	16	17
15-Jun	16	17	15	18	13	13	17	16	16	30	25	28	15	17	18	17	18	33	30	20	23	76	76	64	76
16-Jun	48	25	15	17	26	16	10	11	15	14	13	15	19	12	10	10	11	10	9	9	9	9	9	9	48
17-Jun	10	10	13	10	10	9	10	14	11	13	16	14	14	13	14	15	16	40	14	11	14	30	13	14	40
18-Jun	70	57	23	10	13	12	11	13	18	23	26	16	17	16	14	15	14	14	13	13	12	12	10	9	70
19-Jun	11	11	11	13	15	11	14	12	12	11	10	11	13	16	15	15	15	16	15	15	16	17	16	16	17
20-Jun	16	16	16	16	16	13	15	13	11	11	16	15	15	15	18	13	17	13	17	9	8	11	9	10	18
21-Jun	7	10	7	19	11	9	14	13	14	13	13	16	16	14	18	13	14	17	25	23	19	18	51	43	51
22-Jun	19	33	21	71	72	20	23	35	68	48	22	21	78	64	16	17	11	10	10	9	21	12	75	75	78
23-Jun	30	18	82	25	84	57	12	16	34	45	33	33	30	26	30	50	40	54	31	12	3	4	6	89	89
24-Jun	32	10	14	12	9	9	11	10	9	9	11	16	16	15	76	25	31	17	19	16	11	12	10	10	76
25-Jun	13	11	11	11	10	10	14	14	19	24	33	34	35	56	50	62	67	64	61	13	18	34	41	21	67
26-Jun	72	16	11	17	18	23	28	19	19	25	12	54	36	15	24	92	81	44	61	24	80	83	74	21	92
27-Jun	29	7	12	14	13	12	13	15	15	17	21	28	61	58	93	40	66	30	27	20	76	35	28	73	93
28-Jun	24	23	15	10	9	9	9	15	12	13	24	14	81	52	70	17	26	40	10	73	19	23	23	17	81
29-Jun	24	7	9	15	20	11	9	10	12	13	14	20	15	18	47	16	17	34	21	10	42	30	10	8	47
30-Jun	9	11	11	19	13	15	10	10	10	9	10	21	16	13	16	17	13	13	11	11	10	11	32	15	32
																	72 70 82 71 93 65 86 62 68 76 90 75 81 98 93 92 81 64 61 73 99 83 88 89								
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS25 WASKŌW OHCI PIMÂTISIWIN JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)
 JUNE 2 023

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	666	32	54	96.94	33.4	0	6.4	0
H2S(ppb) Average	647	35	73	94.72	2.1	0	0.7	0
Temperature 2 m (C) Average	715	0	5	99.31	30.8	0	23	0
Relative Humidity (%) Average	715	0	5	99.31	100	-	96.4	-
Wind Speed 10 m (km/h) Average	711	0	9	98.75	20	0	17	0
Wind Direction 10 m (deg) Average	711	0	9	98.75	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
 JUNE 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	666	1.29	3.9	-	0	0	0	0.1	0.3	2.6	33.4
H2S (ppb) Average	647	0.29	0.3	-	0	0.1	0.1	0.2	0.4	0.7	2.1
Temperature 2 m (C) Average	715	17.27	5.5	-	4.8	10.6	12.5	17.2	21.4	24.9	30.8
Relative Humidity (%) Average	715	68.7	22.2	-	23.1	38.8	50	69.9	90.3	96.6	100
Wind Speed 10 m (km/h) Average	711	5.7	4	-	0	1	3	5	8	11	20
Wind Direction 10 m (deg) Average	711	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)

JUNE 2023

OPERATIONAL NOTES

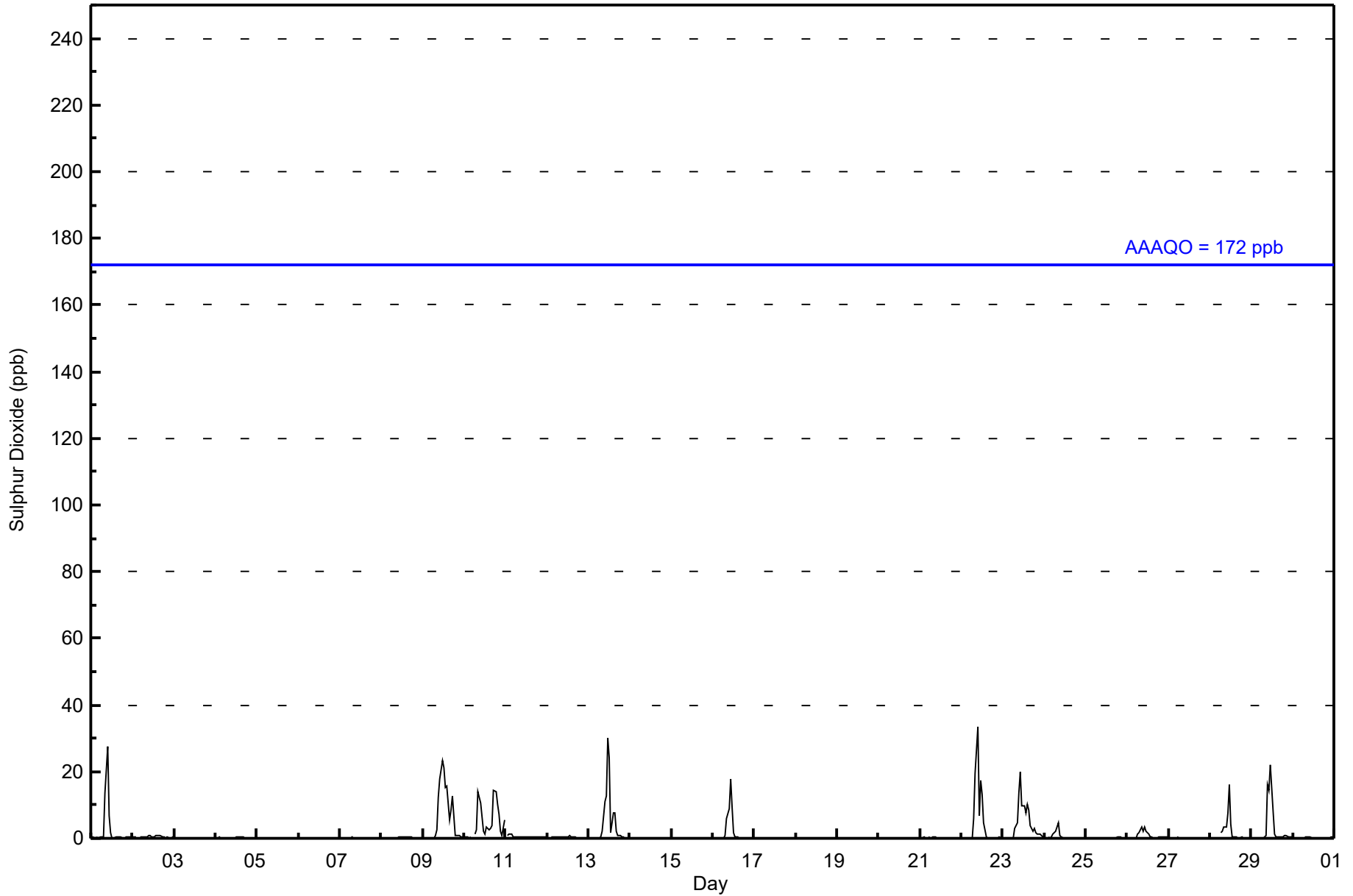
Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	16 Jun 2023 19:00	16 Jun 2023 23:00	5	DAS Failure - data not recorded
H2S	20 Jun 2023 13:00	21 Jun 2023 05:00	17	Stabilization period after converter replacement
H2S	27 Jun 2023 07:00	27 Jun 2023 12:00	6	Maintenance - sulphur study
H2S	29 Jun 2023 07:00	29 Jun 2023 11:00	5	Maintenance - sulphur study
H2S	30 Jun 2023 06:00	30 Jun 2023 10:00	5	Maintenance - multi-point verification check
SO2	14 Jun 2023 18:00	15 Jun 2023 10:00	17	Analyzer Failure - inconsistent response
Wind Speed, Wind Direction	09 Jun 2023 21:00	09 Jun 2023 23:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Jun 2023 20:00	15 Jun 2023 20:00	1	Flat line in sensor output signal



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 33.4 ppb on Jun 22 10:00	Maximum Daily Average: 6.4 ppb on Jun 9		Hours of Data:	666
Minimum Value: 0.0 ppb on Jun 5 04:00	Minimum Daily Average: 0.0 ppb on Jun 17		Hours of Missing Data:	54
Maximum Diurnal Average: 4.9 ppb at hour 10	Minimum Diurnal Average: 0.1 ppb at hour 5		Hours of Calibration:	32
Monthly Average: 1.29 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 2.6 P ₉₉ = 20.3		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-Jun	0.4	0.3	Z	0.2	0.2	0.2	0.2	0.3	13.7	27.6	6.7	1.6	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.3	2.4	27.6																						
2-Jun	0.3	0.3	0.4	Z	0.3	0.3	0.3	0.3	0.5	0.8	0.7	0.6	0.6	0.7	0.8	0.9	0.7	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.9																						
3-Jun	0.2	0.2	0.2	0.1	Z	0.1	0.1	0.2	0.2	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	0.1	0.2																						
4-Jun	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3																						
5-Jun	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1																						
6-Jun	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
7-Jun	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.3	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3																						
8-Jun	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
9-Jun	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.9	2.6	12.1	17.9	23.4	21.0	15.3	15.9	5.4	8.5	12.9	6.6	0.8	0.7	0.7	0.6	0.4	6.4	23.4																						
10-Jun	0.3	0.3	0.2	0.2	0.4	Z	1.3	2.7	14.0	10.6	6.6	2.1	1.3	3.2	2.7	3.1	3.8	14.5	14.0	10.0	7.3	1.9	0.8	5.6	4.6	14.5																						
11-Jun	Z	1.0	1.2	1.1	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.4	1.2																						
12-Jun	0.6	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.7																						
13-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.6	2.1	11.2	12.6	30.1	24.1	1.6	7.8	7.8	1.9	0.7	0.7	0.6	0.3	0.1	0.1	0.1	4.5	30.1																						
14-Jun	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	AF	AF	AF	AF	AF	0.1																						
15-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	--	0.2																						
16-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.9	5.9	8.8	17.8	9.2	1.7	0.3	0.2	0.2	0.1	0.1	0.1	DF	DF	DF	DF	DF	1.8	17.8																						
17-Jun	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																						
18-Jun	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																						
19-Jun	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																						
20-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.2																						
21-Jun	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3																						
22-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.2	6.0	19.6	33.4	6.8	17.3	13.3	4.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	33.4																						
23-Jun	Z	0.2	0.1	0.1	0.1	0.1	0.1	3.1	4.5	13.5	19.9	9.8	9.6	7.5	10.2	8.5	4.0	2.2	2.9	1.9	1.5	1.1	0.7	0.6	4.4	19.9																						
24-Jun	0.4	Z	0.3	0.2	0.4	1.2	2.1	3.5	4.7	0.7	0.2	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.6	4.7																						
25-Jun	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	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.3																						
26-Jun	0.1	0.1	0.0	Z	0.1	0.2	1.3	1.8	3.3	2.3	3.5	2.1	1.3	0.5	0.3	0.1	0.1	0.2	0.2	0.4	0.3	0.4	0.3	0.2	0.8	3.5																						
27-Jun	0.1	0.1	0.2	0.1	Z	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2																						
28-Jun	0.0	0.0	0.0	0.1	0.1	Z	1.7	2.1	3.5	3.5	7.6	16.2	4.1	0.4	0.6	0.4	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.0	1.8	16.2																						
29-Jun	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.8	16.1	14.2	22.0	8.2	1.3	0.3	0.3	0.2	0.2	0.5	1.0	0.8	0.6	0.4	0.2	2.9	22.0																						
30-Jun	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.2	0.4																						
																								0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.8	2.7	4.9	4.0	4.7	3.0	1.3	1.4	1.0	0.7	1.1	1.0	0.6	0.5	0.2	0.2	0.4	Diurnal Average
																								0.6	1.0	1.2	1.1	0.6	1.2	2.1	6.0	19.6	33.4	19.9	30.1	24.1	15.3	15.9	8.5	8.5	14.5	14.0	10.0	7.3	1.9	0.8	5.6	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	638	95.80	95.80
11 - 20	21	3.15	98.95
21 - 60	7	1.05	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: 666

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - June 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	111	51	31	10	3	8	51	60	32	45	37	27	37	32	38	61	634
11 - 20	0	0	0	1	0	1	11	8	0	0	0	0	0	0	0	0	21
21 - 60	0	0	0	0	1	0	2	3	0	0	0	0	0	0	1	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	111	51	31	11	4	9	64	71	32	45	37	27	37	32	39	61	662

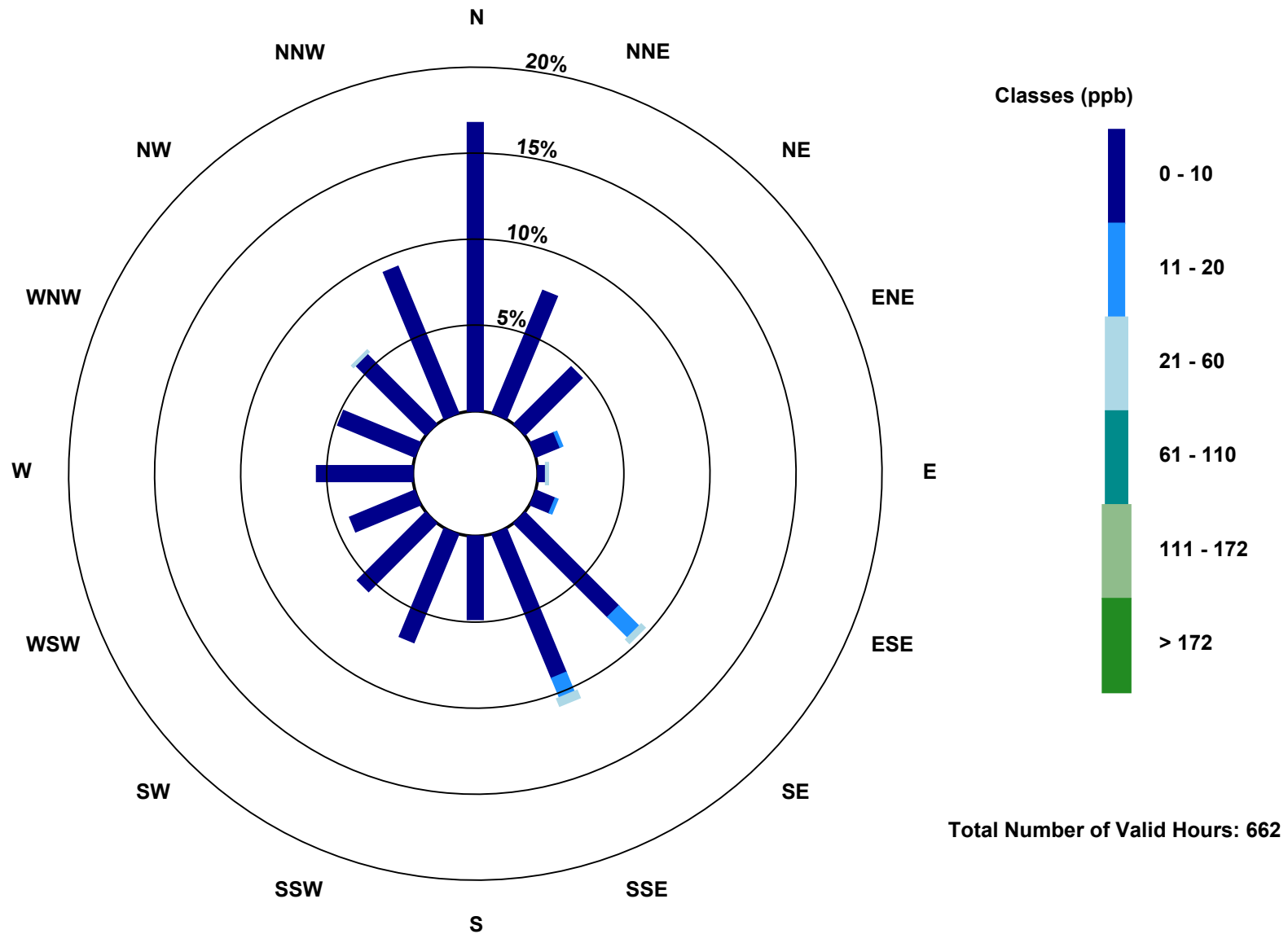
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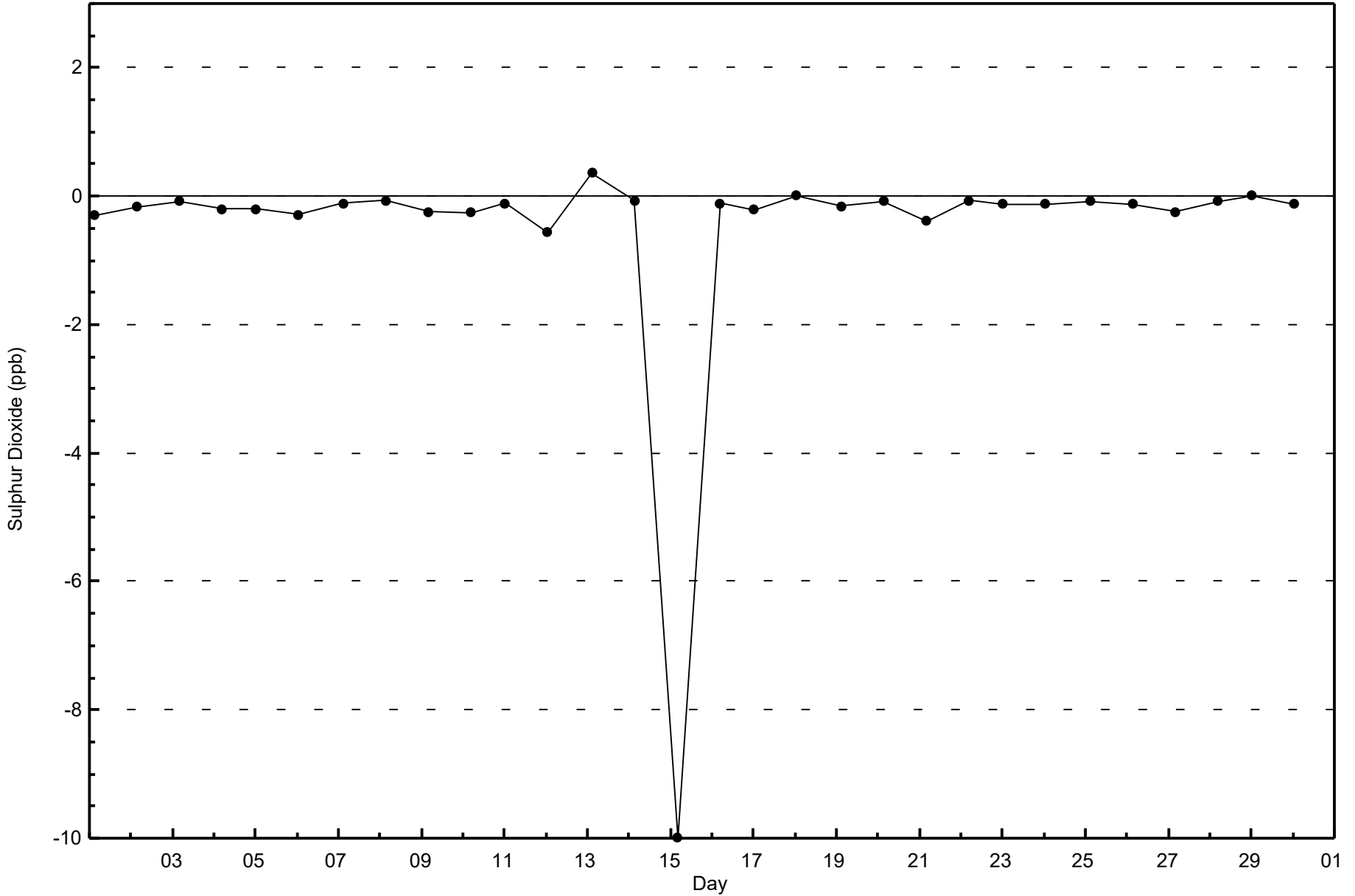
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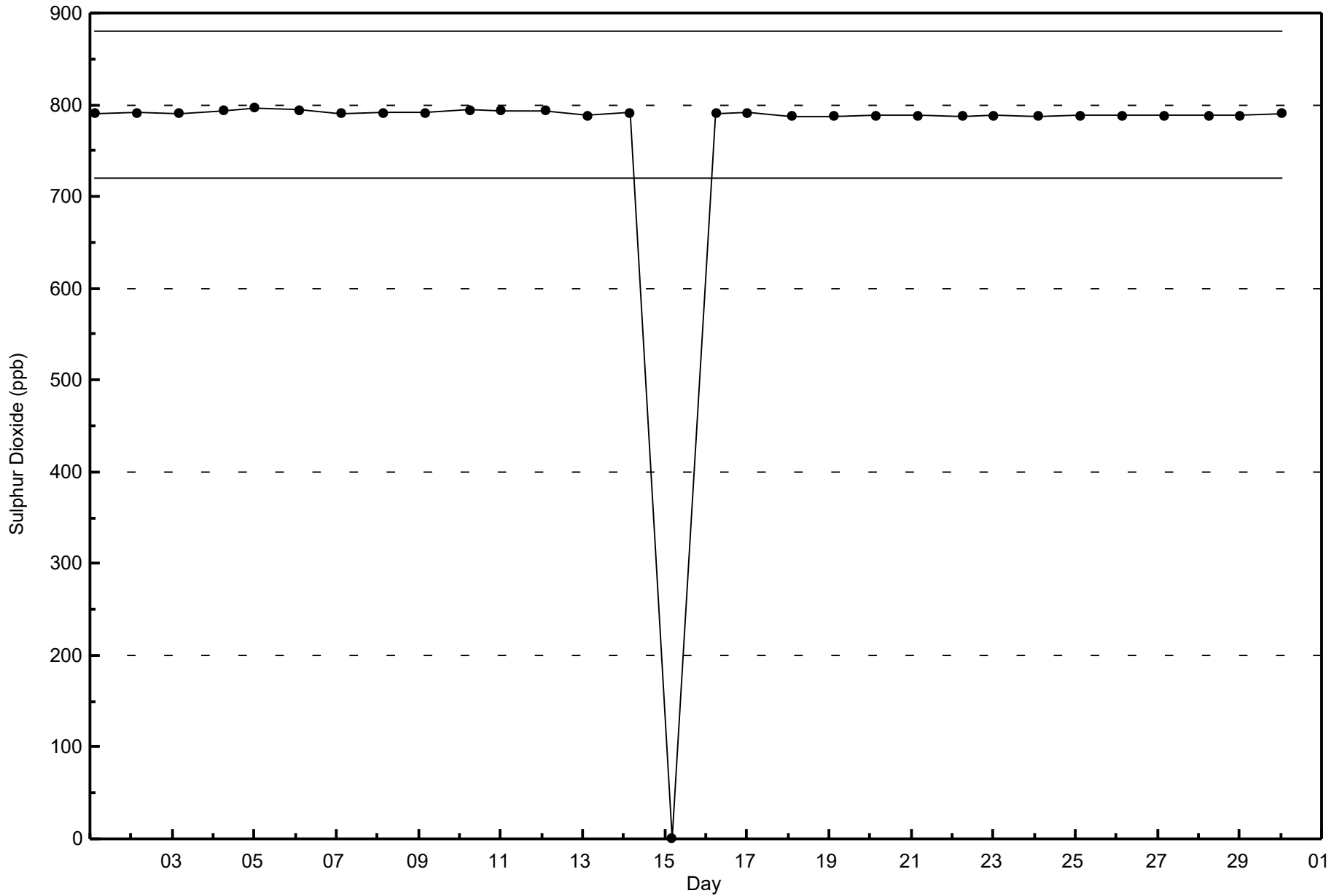


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin

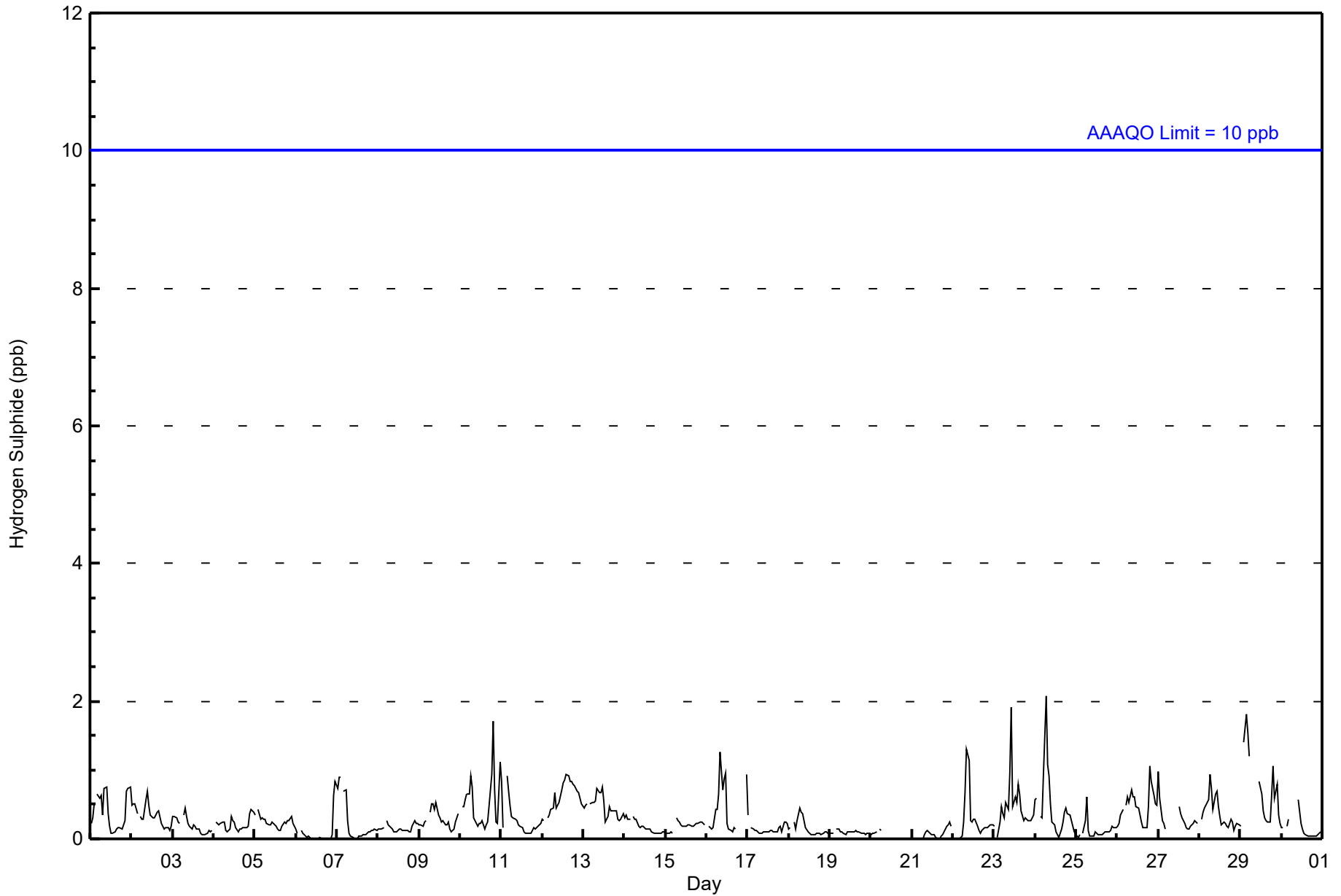








Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.1 ppb on Jun 24 07:00 Maximum Daily Average: 0.7 ppb on Jun 29																	Hours in Service: 720 Hours of Data: 647 Hours of Missing Data: 73 Hours of Calibration: 35 Percent Operational Time: 94.7										
Minimum Value: 0.0 ppb on Jun 6 11:00 Minimum Daily Average: 0.1 ppb on Jun 21 Maximum Diurnal Average: 0.4 ppb at hour 7 Minimum Diurnal Average: 0.2 ppb at hour 17 Monthly Average: 0.29 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 = 1.3																											
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-Jun	0.2	0.3	0.5	Z	0.7	0.6	0.6	0.3	0.7	0.8	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.7	0.7	0.7	0.4	0.8	
2-Jun	0.5	0.5	0.5	0.4	Z	0.3	0.3	0.3	0.6	0.7	0.5	0.3	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.7	
3-Jun	0.3	0.3	0.3	0.3	0.2	Z	0.3	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
4-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.2	0.4	
5-Jun	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.4	
6-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.8	0.1	0.8	
7-Jun	0.7	0.9	0.9	Z	0.7	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9	
8-Jun	0.1	0.1	0.2	0.2	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	
9-Jun	0.2	0.2	0.2	0.2	0.3	Z	0.4	0.5	0.5	0.4	0.5	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.4	0.3	0.5
10-Jun	Z	0.5	0.5	0.6	0.6	0.7	0.9	0.7	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.5	0.9	1.7	0.7	0.2	0.2	1.1	0.5	1.7	
11-Jun	0.8	0.2	Z	0.9	0.7	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.9	
12-Jun	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.7	0.5	0.5	0.5	0.7	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.6	0.9	
13-Jun	0.4	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.7	0.7	0.7	0.8	0.6	0.2	0.3	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.8	
14-Jun	0.3	0.3	0.3	0.3	Z	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	0.1	0.1	0.1	0.2	0.3	
15-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
16-Jun	Z	0.2	0.2	0.1	0.2	0.4	0.4	0.7	1.3	0.7	0.9	1.0	0.2	0.1	0.1	0.1	0.2	0.1	DF	DF	DF	DF	DF	0.9	0.4	1.3	
17-Jun	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.3	
18-Jun	0.1	0.2	Z	0.3	0.1	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
19-Jun	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	
20-Jun	0.1	0.1	0.1	0.1	Z	0.1	0.1	C	C	C	C	C	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	--	0.1	
21-Jun	RE	RE	RE	RE	RE	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	
22-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.3	1.1	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.3	
23-Jun	0.2	Z	0.0	0.2	0.5	0.4	0.3	0.5	0.4	1.0	1.9	0.5	0.6	0.5	0.8	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	1.9	
24-Jun	0.6	0.6	Z	0.3	0.3	0.9	2.1	1.1	0.9	0.5	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.5	2.1	
25-Jun	0.0	0.0	0.1	Z	0.1	0.3	0.6	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.6	
26-Jun	0.2	0.2	0.4	0.4	Z	0.5	0.6	0.5	0.7	0.6	0.6	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.5	1.1	0.8	0.6	0.5	0.5	1.1	
27-Jun	1.0	0.6	0.3	0.2	0.2	Z	M	M	M	M	M	M	M	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	--	1.0	
28-Jun	Z	0.3	0.4	0.5	0.5	0.6	0.9	0.7	0.4	0.7	0.7	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.4	0.9	
29-Jun	0.2	Z	1.4	1.8	1.5	1.2	M	M	M	M	M	M	M	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.6	1.1	0.6	0.8	0.4	1.8	
30-Jun	0.2	0.2	Z	0.2	0.3	M	M	M	M	M	M	0.6	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.6	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerspan C - Calibration M - Maintenance DF - DAS Failure RE - Recovery Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	647	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: 647

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin - June 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	105	48	32	11	4	9	60	69	28	44	40	27	34	29	37	66	643
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	105	48	32	11	4	9	60	69	28	44	40	27	34	29	37	66	643

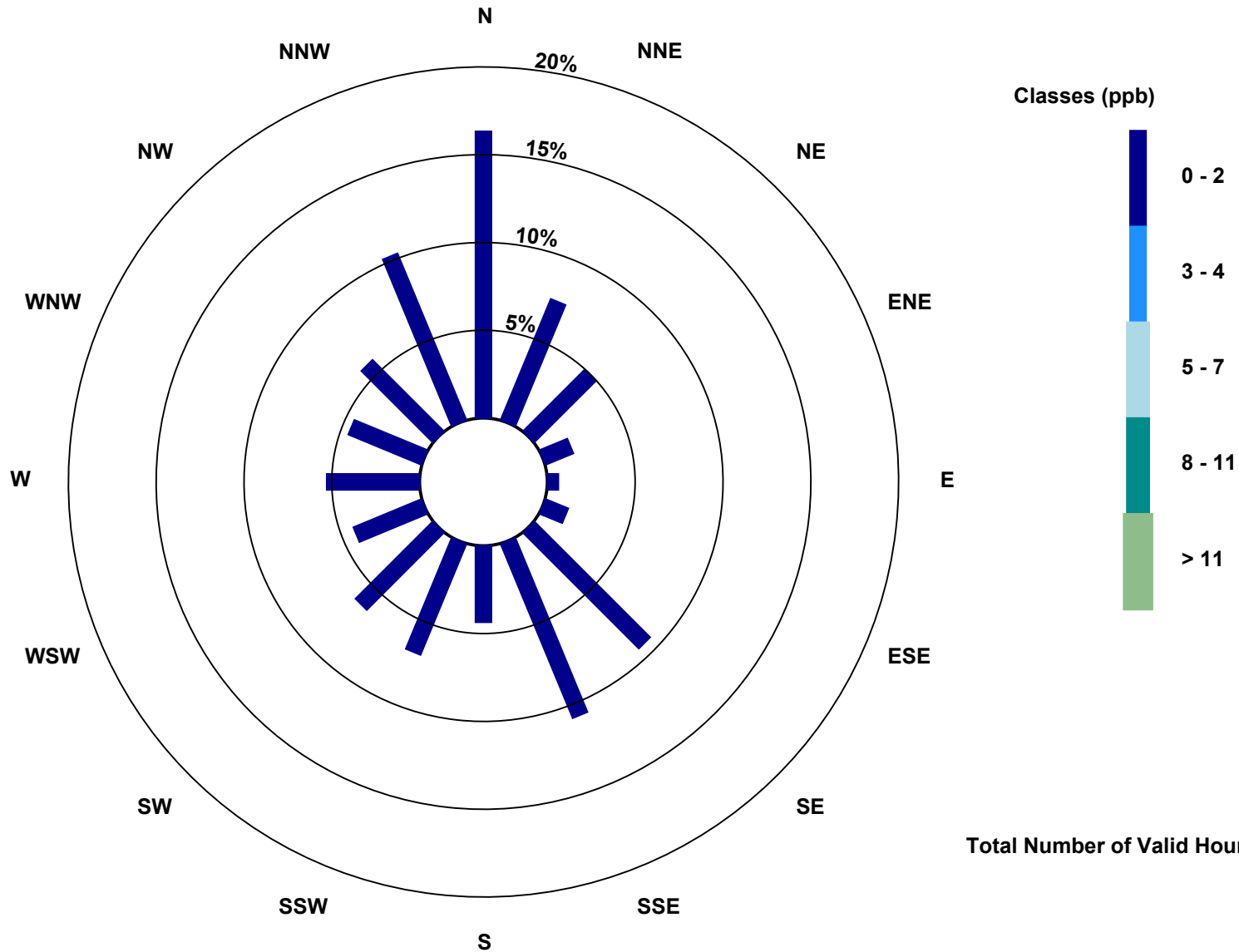
Total Number of Valid Hours: 643

Total Number of Hours: 720

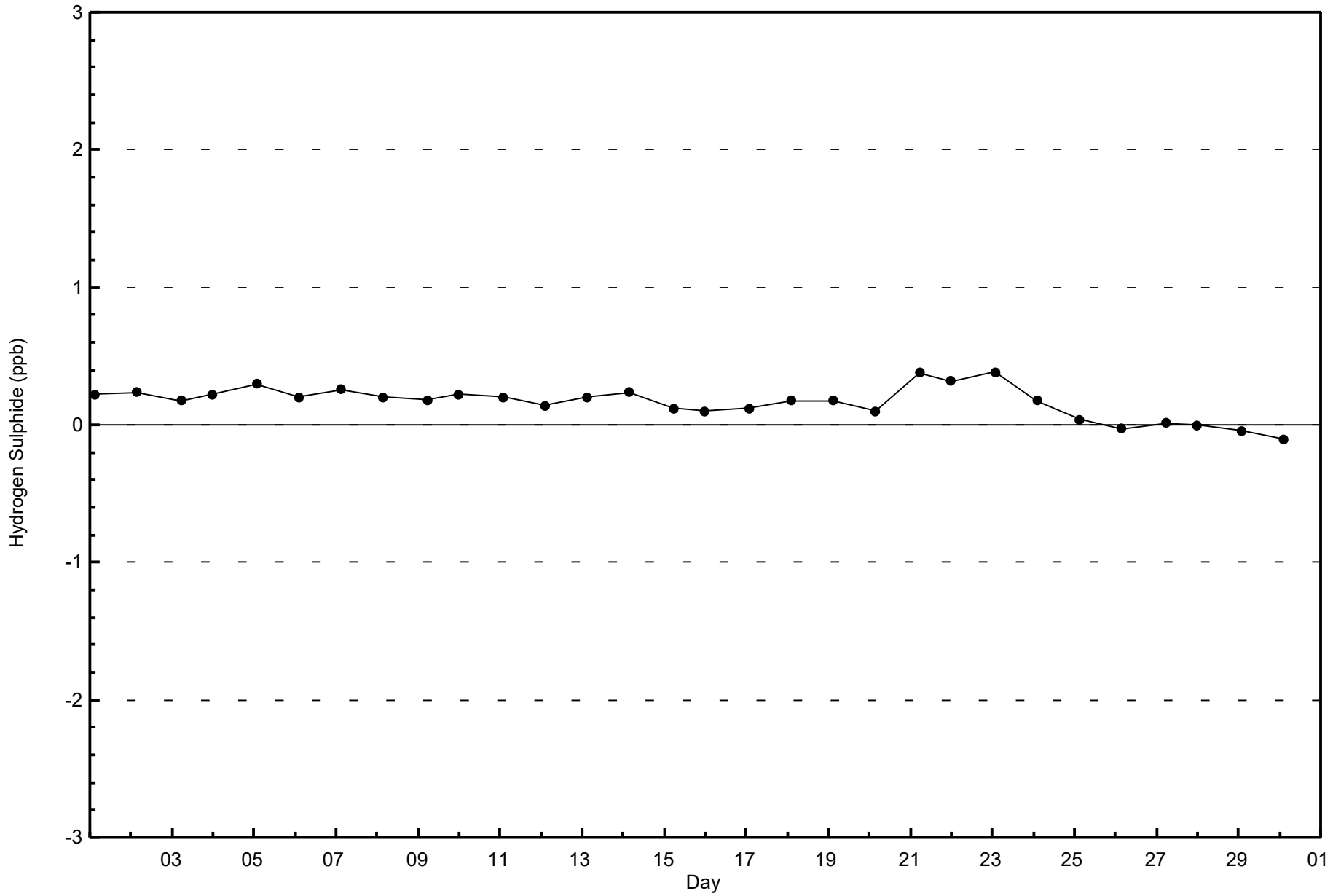


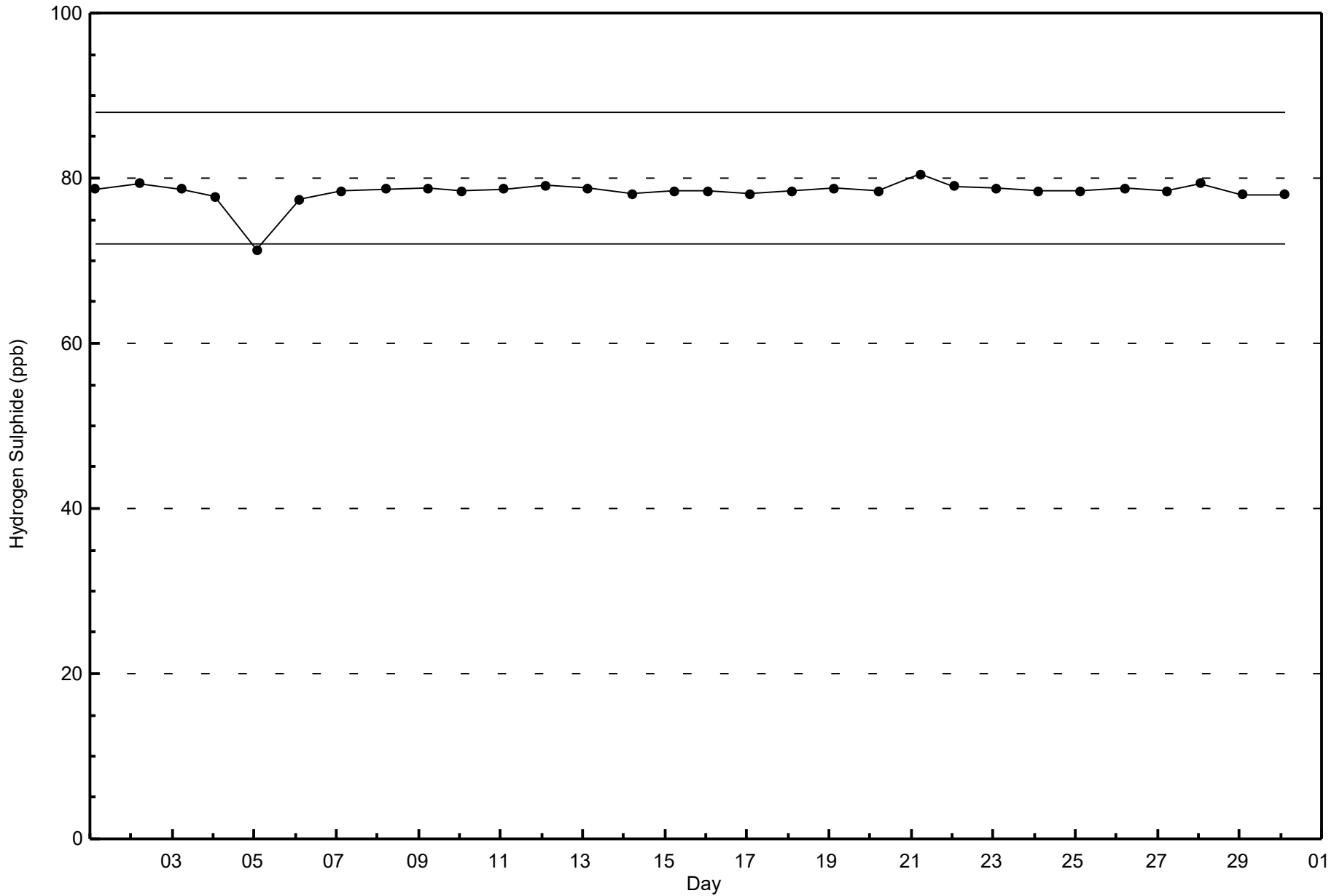
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin



Total Number of Valid Hours: 643



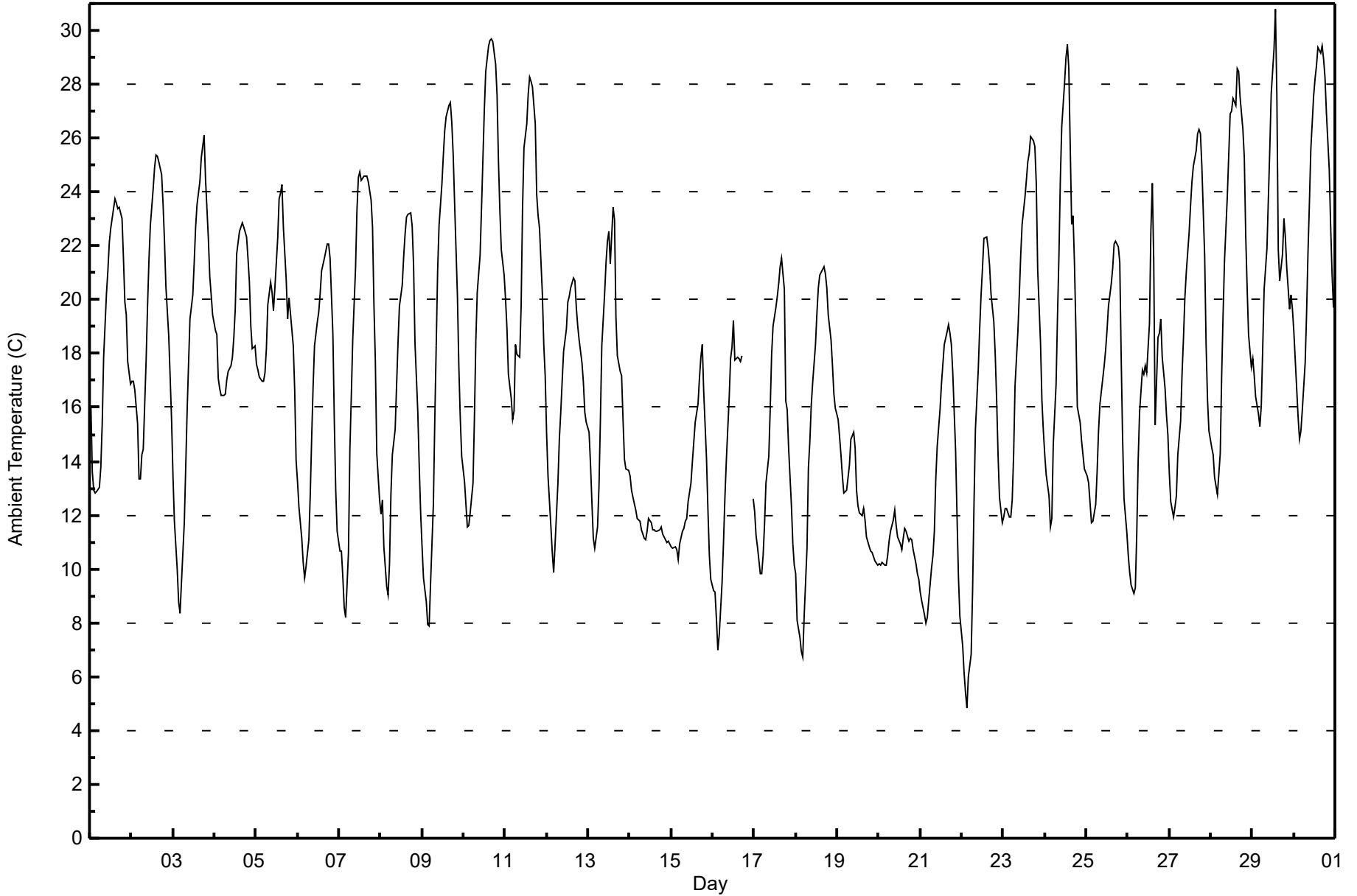




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - June 2023

Maximum Value: 30.8 C on Jun 29 14:00		Maximum Daily Average: 23.0 C on Jun 30		Hours in Service: 720																																												
Minimum Value: 4.8 C on Jun 22 04:00		Minimum Daily Average: 10.8 C on Jun 20		Hours of Data: 715																																												
Maximum Diurnal Average: 22.4 C at hour 15		Minimum Diurnal Average: 11.2 C at hour 5		Hours of Missing Data: 5																																												
Monthly Average: 17.27 C		Percentiles: P ₁ = 7.0 P ₁₀ = 10.6 Q ₁ = 12.5 Median = 17.2 Q ₃ = 21.4 P ₉₀ = 24.9 P ₉₉ = 29.4		Hours of Calibration: 0																																												
				Percent Operational Time: 99.3																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	16.1	13.6	12.9	12.8	12.9	13.0	13.8	15.4	17.9	20.2	21.1	22.1	22.6	23.0	23.7	23.6	23.4	23.4	23.0	21.6	19.9	19.5	17.7	16.9	18.8	23.7																						
2-Jun	17.0	17.0	16.6	15.4	13.4	13.4	14.2	14.5	17.7	19.7	21.4	22.7	24.1	24.9	25.4	25.3	25.1	24.6	23.5	22.1	20.5	18.6	17.1	15.6	19.6	25.4																						
3-Jun	13.4	11.8	10.0	8.8	8.4	9.5	11.7	13.7	15.9	17.6	19.3	20.2	21.4	22.7	23.6	24.4	25.3	25.7	26.1	24.5	22.3	20.8	20.2	19.4	18.2	26.1																						
4-Jun	18.8	18.7	17.1	16.7	16.4	16.5	16.5	17.0	17.3	17.5	17.8	18.6	19.6	21.7	22.6	22.7	22.9	22.7	22.3	21.5	20.7	19.0	18.2	18.3	19.2	22.9																						
5-Jun	17.6	17.4	17.1	17.0	17.0	17.3	18.2	19.8	20.7	20.3	19.6	20.4	22.3	23.8	23.9	24.3	22.7	20.7	19.3	20.1	19.5	18.3	16.7	14.0	19.5	24.3																						
6-Jun	13.2	12.3	11.2	10.3	9.7	10.1	11.1	12.8	14.9	16.8	18.3	19.2	19.6	20.3	21.1	21.6	21.8	22.1	22.1	21.5	18.7	15.5	12.9	11.4	16.2	22.1																						
7-Jun	10.7	10.7	9.7	8.6	8.2	10.6	14.4	16.4	18.5	21.2	23.3	24.5	24.8	24.5	24.6	24.6	24.6	24.4	23.7	22.7	19.8	17.7	14.3	12.6	18.1	24.8																						
8-Jun	12.1	12.5	10.8	9.4	9.1	10.2	12.8	14.2	15.2	16.8	18.4	19.7	20.6	21.6	22.4	23.1	23.2	23.2	22.7	21.3	18.4	15.8	13.8	12.1	16.6	23.2																						
9-Jun	10.8	9.7	8.8	7.9	7.9	9.5	12.4	15.5	18.3	21.0	22.7	24.2	25.3	26.3	26.8	27.2	27.3	26.6	25.4	23.6	20.1	17.5	15.6	14.2	18.5	27.3																						
10-Jun	13.3	12.4	11.5	11.6	12.1	13.2	15.6	18.5	20.3	21.7	23.4	25.2	27.1	28.5	29.4	29.6	29.7	29.6	28.7	27.6	25.1	23.3	21.9	20.9	21.7	29.7																						
11-Jun	20.0	18.9	17.2	16.3	15.5	15.9	18.3	18.0	17.9	19.7	23.4	25.7	26.6	27.7	28.3	28.1	27.9	26.5	23.9	23.1	22.6	20.2	18.3	17.2	21.6	28.3																						
12-Jun	15.0	13.4	11.6	10.6	9.9	10.9	13.2	14.8	15.8	17.0	18.1	18.9	19.9	20.1	20.5	20.8	20.7	19.7	19.0	18.5	17.7	16.9	15.8	15.4	16.4	20.8																						
13-Jun	15.1	13.9	12.5	11.1	10.8	11.5	13.0	15.5	18.3	20.2	21.4	22.2	22.6	21.3	23.4	23.0	19.3	17.9	17.3	17.2	15.5	14.1	13.7	13.7	16.9	23.4																						
14-Jun	13.4	12.9	12.7	12.2	11.9	11.8	11.7	11.5	11.1	11.1	11.4	11.9	11.7	11.5	11.4	11.4	11.5	11.6	11.3	11.2	11.0	11.0	11.0	10.9	11.7	13.4																						
15-Jun	10.8	10.8	10.8	10.7	10.4	10.9	11.4	11.5	11.8	11.9	12.5	13.2	14.0	14.7	15.4	16.2	17.1	17.9	18.3	16.6	14.1	12.2	10.5	9.6	13.1	18.3																						
16-Jun	9.2	9.2	8.2	7.0	7.6	9.5	11.0	12.6	14.0	16.4	17.8	18.2	19.2	17.8	17.9	17.8	17.7	17.9	DF	DF	DF	DF	DF	12.6	13.8	19.2																						
17-Jun	12.1	11.2	10.8	9.8	9.8	10.5	11.7	13.2	14.2	15.9	18.0	19.0	19.7	20.1	20.6	21.2	21.6	20.4	16.2	15.9	14.5	12.3	10.9	10.1	15.0	21.6																						
18-Jun	9.8	8.1	7.4	6.9	6.7	8.2	10.8	13.8	14.7	16.1	16.9	18.3	19.5	20.4	20.9	21.1	21.2	21.0	20.4	19.5	18.5	17.5	16.5	16.0	15.4	21.2																						
19-Jun	15.5	14.9	14.3	13.4	12.8	12.9	13.4	13.9	14.8	15.1	14.5	12.9	12.4	12.1	12.0	12.2	11.8	11.2	10.8	10.7	10.6	10.4	10.3	10.2	12.6	15.5																						
20-Jun	10.2	10.2	10.2	10.2	10.1	10.5	11.0	11.4	11.8	12.2	11.6	11.2	10.9	10.7	11.1	11.5	11.4	11.0	11.1	11.1	10.7	10.2	9.8	9.6	10.8	12.2																						
21-Jun	9.1	8.8	8.3	8.0	8.2	8.8	10.0	10.5	11.4	13.4	14.5	15.9	16.8	17.6	18.3	18.8	19.0	18.8	18.3	17.3	14.4	12.0	9.7	8.3	13.2	19.0																						
22-Jun	7.1	6.2	5.4	4.8	6.0	6.9	9.2	12.4	15.2	17.4	18.9	20.2	21.2	22.3	22.4	21.9	21.3	20.2	19.2	18.0	16.3	14.2	12.6	11.7	14.6	22.4																						
23-Jun	11.9	12.2	12.2	11.9	11.9	12.6	14.3	16.8	18.8	20.2	21.6	22.8	23.8	24.5	25.1	25.4	26.1	25.9	25.7	24.3	21.1	18.4	16.3	15.1	19.1	26.1																						
24-Jun	14.2	13.5	12.7	11.6	11.9	14.6	16.8	19.4	21.6	24.4	26.4	28.0	29.0	29.5	28.6	22.8	23.1	21.3	18.9	16.0	15.5	14.8	14.2	13.7	19.3	29.5																						
25-Jun	13.5	13.2	12.5	11.7	11.7	12.4	13.6	15.1	16.1	17.1	17.5	18.1	18.9	19.8	20.6	21.2	22.1	22.2	21.9	21.4	17.9	14.9	12.6	11.3	16.6	22.2																						
26-Jun	10.5	9.9	9.4	9.1	9.3	11.3	14.0	15.8	17.4	17.2	17.5	17.3	19.1	22.6	24.3	21.5	15.3	18.6	18.7	19.3	17.8	16.7	15.7	15.0	16.0	24.3																						
27-Jun	13.6	12.5	11.9	12.3	12.7	14.3	15.5	17.2	18.5	20.1	21.0	22.5	23.5	24.4	24.9	25.5	26.1	26.3	26.2	25.0	21.6	18.3	16.3	15.1	19.4	26.3																						
28-Jun	14.5	14.2	13.4	13.1	12.8	14.3	17.2	19.4	21.4	23.8	25.4	26.9	27.0	27.5	27.2	28.6	28.5	27.5	26.3	25.3	22.4	20.5	18.7	17.5	21.4	28.6																						
29-Jun	17.8	17.2	16.4	15.8	15.3	16.1	18.2	20.4	21.9	23.7	25.6	27.7	29.3	30.8	27.6	21.9	20.7	21.7	23.0	22.3	21.2	19.6	20.2	19.7	21.4	30.8																						
30-Jun	18.8	17.8	15.7	14.8	15.1	15.9	17.7	19.5	21.7	23.6	25.6	27.6	28.2	28.7	29.4	29.2	29.4	29.0	28.3	27.0	24.9	22.8	21.0	19.7	23.0	29.4																						
																								13.5	12.8	12.0	11.3	11.2	12.1	13.8	15.4	16.8	18.3	19.5	20.5	21.4	22.0	22.4	22.2	21.9	21.7	21.1	20.2	18.4	16.7	15.3	14.3	Diurnal Average
																								20.0	18.9	17.2	17.0	17.0	17.3	18.3	20.4	21.9	24.4	26.4	28.0	29.3	30.8	29.4	29.6	29.7	29.6	28.7	27.6	25.1	23.3	21.9	20.9	Diurnal Maximum
DF - DAS Failure																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	52	7.27	7.27
10 - 20	428	59.86	67.13
> 20	235	32.87	100.00

Total Number of Valid Hours: 715

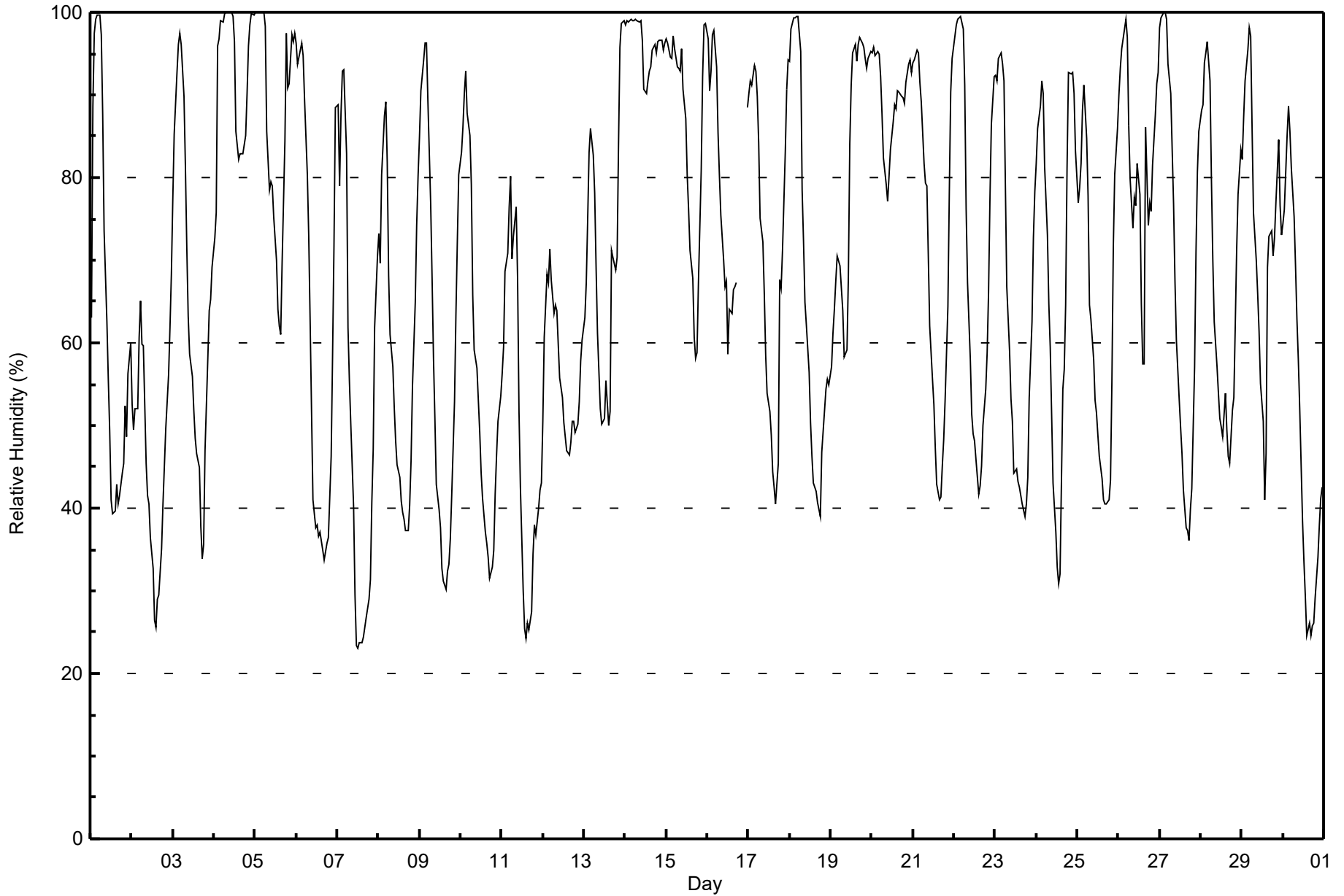
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - June 2023

Maximum Value: 100.0 % on Jun 4 08:00		Maximum Daily Average: 96.4 % on Jun 14		Hours in Service: 720																							
Minimum Value: 23.1 % on Jun 7 13:00		Minimum Daily Average: 46.5 % on Jun 2		Hours of Data: 715																							
Maximum Diurnal Average: 91.6 % at hour 5		Minimum Diurnal Average: 49.1 % at hour 15		Hours of Missing Data: 5																							
Monthly Average: 68.70 %		Percentiles: P ₁ = 24.8 P ₁₀ = 38.8 Q ₁ = 50.0 Median = 69.9 Q ₃ = 90.3 P ₉₀ = 96.6 P ₉₉ = 100.0		Hours of Calibration: 0																							
				Percent Operational Time: 99.3																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	63.0	88.6	97.4	99.2	99.7	99.7	97.4	87.6	73.5	62.5	55.5	49.4	41.0	39.3	39.6	42.9	40.6	41.5	44.2	45.4	52.4	48.7	56.3	60.0	63.6	99.7	
2-Jun	52.6	49.6	52.0	52.0	60.6	65.1	59.8	59.7	45.4	41.5	40.4	36.4	32.8	26.5	25.6	29.0	29.5	35.1	40.5	45.1	49.7	56.1	61.9	68.3	46.5	68.3	
3-Jun	77.3	85.2	92.7	96.0	97.5	96.1	89.8	81.3	71.6	63.2	58.7	56.0	51.9	48.5	46.6	45.0	37.8	33.8	35.5	47.0	58.2	63.8	65.3	69.2	65.3	97.5	
4-Jun	72.7	75.8	95.9	96.7	99.0	98.8	99.8	100.0	100.0	99.9	99.9	99.5	96.4	85.6	82.2	82.8	82.8	82.8	85.1	90.2	95.9	98.4	99.9	99.7	92.5	100.0	
5-Jun	100.0	100.0	100.0	100.0	100.0	100.0	98.3	85.6	78.5	79.5	79.0	75.2	70.1	64.0	62.1	61.1	69.6	84.4	97.4	90.9	91.4	97.2	96.5	97.5	86.6	100.0	
6-Jun	96.3	93.7	95.4	96.3	94.8	89.4	80.4	73.0	62.6	51.6	41.1	37.7	38.0	36.6	37.1	35.0	33.8	34.7	35.8	36.5	46.3	58.4	71.6	88.4	61.0	96.3	
7-Jun	88.8	78.9	87.6	92.8	93.1	83.0	61.9	55.4	50.1	40.2	29.5	23.5	23.1	23.8	23.7	24.4	25.5	26.7	29.0	31.4	40.8	47.1	61.8	70.3	50.5	93.1	
8-Jun	73.3	69.6	80.3	87.5	89.1	81.9	68.1	61.1	57.1	52.2	48.1	45.3	43.7	40.9	39.5	38.7	37.3	37.4	40.3	45.7	54.8	64.9	74.2	80.2	58.8	89.1	
9-Jun	85.0	90.5	94.3	96.3	96.3	89.4	76.8	67.9	58.2	50.9	42.9	39.8	37.6	32.7	31.2	30.2	32.3	33.2	36.2	41.5	52.8	63.4	72.3	80.4	59.7	96.3	
10-Jun	83.1	86.1	90.2	92.9	87.8	85.1	79.2	65.8	59.1	57.0	53.1	49.1	44.3	41.2	37.1	35.7	34.0	31.5	32.9	34.9	41.7	46.4	50.4	53.6	57.2	92.9	
11-Jun	56.3	59.4	68.6	70.9	76.5	80.2	70.1	72.9	76.4	67.8	51.6	42.5	30.0	25.4	24.2	26.1	25.3	27.4	34.4	38.0	36.8	39.9	42.2	43.0	49.4	80.2	
12-Jun	50.5	60.6	68.3	67.3	71.3	67.6	63.6	64.6	63.9	59.9	55.8	53.4	50.3	48.6	46.9	46.4	48.0	50.5	50.5	49.2	50.2	52.9	57.8	60.3	56.6	71.3	
13-Jun	63.0	67.3	74.9	83.0	85.9	82.7	78.2	69.1	61.2	52.0	50.2	50.5	50.8	55.4	50.0	51.6	71.2	70.4	68.7	70.4	84.0	95.7	98.7	98.9	70.2	98.9	
14-Jun	98.5	99.1	98.9	99.1	99.0	99.0	99.1	99.0	98.8	99.0	96.6	90.7	90.1	91.7	92.8	93.3	95.4	96.1	95.1	96.5	96.7	96.7	95.5	96.2	96.4	99.1	
15-Jun	96.8	96.3	94.5	94.4	97.1	95.5	93.3	93.2	92.8	95.6	90.6	87.1	80.3	76.1	71.2	67.9	60.7	58.1	58.7	67.2	80.9	92.1	98.5	98.7	84.9	98.7	
16-Jun	96.8	90.6	92.9	97.2	97.8	93.3	85.5	80.2	75.4	70.0	66.8	67.4	58.6	64.1	63.6	66.4	66.8	67.3	DF	DF	DF	DF	DF	88.5	78.4	97.8	
17-Jun	90.1	91.7	91.2	93.5	92.8	89.8	84.3	75.1	72.2	65.9	58.5	53.8	51.7	48.8	44.4	42.5	40.5	45.4	67.7	66.7	71.2	83.2	90.7	94.2	71.1	94.2	
18-Jun	94.0	98.0	99.3	99.3	99.6	99.4	95.3	78.6	72.2	65.0	62.2	56.5	50.3	46.3	43.0	42.1	40.6	39.9	38.9	46.9	51.9	54.4	55.6	54.9	66.0	99.6	
19-Jun	57.2	61.2	64.1	67.5	70.6	69.4	66.6	63.8	58.4	59.2	68.2	84.1	91.1	95.0	96.1	94.1	96.1	96.9	96.2	95.7	94.4	93.2	94.3	95.3	80.4	96.9	
20-Jun	95.1	95.8	94.8	95.3	94.9	92.3	87.7	82.5	79.1	77.2	80.1	83.4	86.7	88.8	88.3	90.6	90.3	89.8	89.7	89.0	91.5	93.8	94.3	92.8	89.3	95.8	
21-Jun	93.8	94.2	95.4	95.2	91.6	89.2	81.7	79.4	79.0	70.7	62.0	55.6	52.6	47.2	42.9	41.0	41.3	45.0	48.3	53.1	64.4	78.1	90.3	94.5	70.3	95.4	
22-Jun	97.1	98.5	99.1	99.4	99.5	98.0	91.2	76.3	67.3	57.9	51.4	49.0	48.1	45.9	41.7	42.7	45.1	50.0	54.4	58.9	66.2	77.5	86.5	92.2	70.6	99.5	
23-Jun	92.4	91.7	94.4	95.0	93.7	91.6	79.1	66.7	58.9	53.3	50.4	44.3	44.7	43.2	42.6	41.5	40.5	39.0	40.5	43.7	53.3	62.6	72.7	78.2	63.1	95.0	
24-Jun	81.8	85.9	88.6	91.7	90.2	81.4	73.0	64.7	59.4	51.4	43.0	37.1	32.8	30.8	32.1	54.3	56.8	64.6	81.2	92.6	92.5	92.7	90.1	83.2	68.8	92.7	
25-Jun	77.0	78.8	81.7	88.2	91.2	84.8	77.8	64.5	62.9	58.0	53.1	51.5	48.8	46.2	43.5	41.0	40.5	40.5	41.0	43.4	55.3	71.6	80.3	85.9	62.8	91.2	
26-Jun	90.1	93.3	95.5	97.9	99.2	97.0	86.2	79.9	73.9	77.7	76.6	81.7	77.9	64.8	57.4	57.4	86.2	74.2	77.0	75.9	81.5	87.7	91.4	92.8	82.2	99.2	
27-Jun	98.2	99.3	99.9	100.0	99.1	93.8	90.1	83.4	76.8	67.5	60.3	53.3	49.9	46.7	42.2	37.6	37.3	36.1	39.8	42.4	57.1	70.9	80.7	85.6	68.7	100.0	
28-Jun	88.2	88.9	93.9	95.1	96.5	91.7	79.9	70.0	62.6	57.2	54.0	50.9	49.9	48.6	54.0	49.5	46.2	45.4	51.8	53.4	62.0	71.1	77.9	83.4	67.6	96.5	
29-Jun	82.3	87.3	91.7	95.4	98.2	97.1	86.0	75.8	69.9	66.0	61.4	55.2	50.6	40.9	46.7	69.2	73.0	73.6	70.5	72.6	76.9	84.5	76.7	73.1	73.9	98.2	
30-Jun	74.4	76.1	85.1	88.6	85.7	81.3	75.2	69.4	63.0	57.9	52.1	38.5	33.6	29.3	24.7	26.1	24.7	25.7	26.1	29.2	34.1	38.0	41.2	42.5	50.9	88.6	
		82.2	84.4	88.6	90.8	91.6	88.8	81.8	74.9	69.3	64.3	59.8	56.6	53.6	50.8	49.1	50.2	51.7	52.6	55.4	58.4	65.0	71.8	76.7	80.1	Diurnal Average	
		100.0	100.0	100.0	100.0	100.0	99.8	100.0	100.0	99.9	99.9	99.5	96.4	95.0	96.1	94.1	96.1	96.9	97.4	96.5	96.7	98.4	99.9	99.7	Diurnal Maximum		
DF - DAS Failure																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	81	11.33	11.33
40 - 60	194	27.13	38.46
60 - 80	164	22.94	61.40
80 - 100	267	37.34	98.74

Total Number of Valid Hours: 715

Total Number of Hours: 720

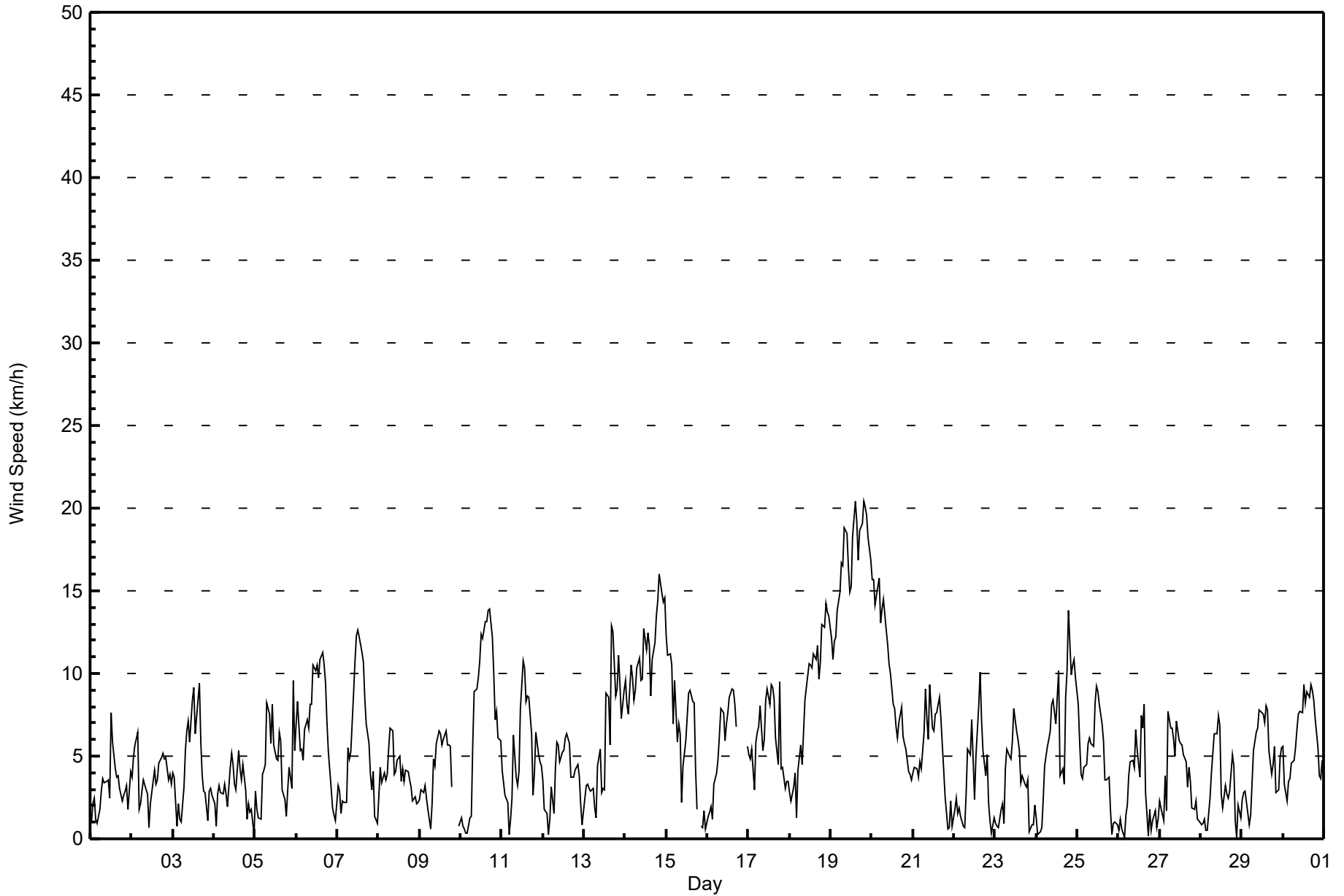


Maximum Speed: 20 km/h on Jun 19 15:00	Maximum Daily Speed Average: 16.5 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 28 22:00	Minimum Daily Speed Average: 0.7 km/h on Jun 24	Hours of Data: 711
Maximum Diurnal Speed Average: 2.9 km/h at hour 21	Minimum Diurnal Speed Average: 0.8 km/h at hour 12	Hours of Missing Data: 9
Monthly Average Velocity: 1.6 km/h 339.2 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 5 Q ₃ = 8 P ₉₀ = 11 P ₉₉ = 19	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	W1	SW2	NNW2	S1	WSW1	SE2	S3	SSE4	SSE3	E4	SSE4	NE2	NW8	NW6	NNE4	NNE4	N4	NNE3	NE2	N3	N3	N3	NNW2	NW4	N1.0	NW8
2-Jun	NNW4	NNW5	NW6	NW6	N2	WSW2	NW3	WNW4	NNW3	N3	SSW1	NE2	ENE3	ENE4	NE3	ENE4	NE5	NE5	NE5	NE5	NE5	NNE4	N4	N3	N2.7	NW6
3-Jun	NNW4	NNW4	WSW1	WSW2	WSW1	SSE1	NNW3	N5	NNW7	N7	NNE6	N8	N9	NNE6	N7	N9	NNE6	SSE4	WSW3	ESE3	NNE1	NNW3	NNW3	NW3	N3.4	N9
4-Jun	WNW2	N1	NW3	NW3	NW3	NNW3	N3	NNE3	NE2	N4	NNW5	NNW4	NW3	N3	N5	N4	N4	NNW4	NW3	NNW1	SE2	S2	WNW2	NW0	NNW2.4	NNW5
5-Jun	W3	W2	NW1	SW1	NW4	NNW4	N5	N8	N8	N6	NNW8	NNE6	NE5	NE5	NNE6	NNE6	NNW3	NNW2	N1	N3	NNW4	WSW3	WSW10	W5	NNW3.3	WSW10
6-Jun	SW7	SW8	SSW5	S5	S5	SSW7	SSW7	SSW7	SSW8	SSW8	SW11	SSW10	SW11	SSW10	S11	SSW11	SSW10	SSW9	SSW7	SSW5	SSE3	SE2	SE1	SSE1	SSW6.8	SSW11
7-Jun	SE3	SSE3	SSE1	WSW2	SSW2	S2	SSE6	S5	S5	SSE9	SSW11	SW12	WSW13	WSW12	WSW11	W11	WSW8	W7	WSW6	W4	WNW3	WNW4	WNW1	E1	SW4.5	WSW13
8-Jun	NNW3	NNW4	WNW3	W4	W4	WNW4	NNW5	N7	N7	NE4	ENE4	NE5	NE5	ENE3	ENE4	ENE3	NNE4	NE4	NE4	NE3	N2	NW3	W2	WSW2	N2.5	N7
9-Jun	W2	W3	W3	W3	W2	W2	SSE1	SE2	SE5	SE4	SE6	SE7	SSE6	SSE6	SE6	SE7	SE6	SSE6	S6	S3	UO	UO	UO	WSW1	SSE2.8	SE7
10-Jun	W1	SW1	SSW1	SE0	SSE0	NW1	ESE1	SSE6	SSE9	SE9	SE10	SE11	SE12	SE12	SE13	SE13	SSE14	SSE14	SSE12	SSE10	SSE7	SSE8	SSE6	SSE6	SSE7.1	SSE14
11-Jun	SSE4	S3	SSE3	S2	SSW0	SSW1	W2	W6	W4	W3	W4	WNW8	NNW11	NW10	WNW8	WNW9	WNW9	NW6	W3	W4	WNW6	WNW5	WNW5	WNW4	WNW4.1	WNW11
12-Jun	WNW4	SW2	WSW2	N0	WNW1	WNW3	W2	N4	N6	NNE6	NE5	NE5	NNE5	N6	N6	N6	NE4	NNE4	NNE4	NNE4	N4	N4	SE2	ENE1	N2.9	N6
13-Jun	NW2	NNW3	NW3	W3	W3	W3	WNW2	N1	SE4	SSE5	SSE3	SSE3	NW3	NNW9	N9	N6	NW13	N13	NNE9	N9	NNW11	NNW9	N7	N9	NNW4.1	NW13
14-Jun	N10	N8	N8	NNW10	NNW10	N8	N9	N10	N11	N10	N10	N13	N11	N12	N12	NNW9	NNW11	NNW12	NNW13	NNW14	NNW16	NNW15	NNW14	NNW15	N11.2	NNW16
15-Jun	NNW12	NNW11	NNW11	NNW11	NW7	NW10	NNW6	NW7	NW6	SW2	WNW4	WNW6	NW7	NW9	NNW8	NNW8	N4	NE2	UO	SE1	WSW1	SW2	NE1	NW5.7	NNW12	
16-Jun	SSW1	SSW2	SE2	SSE1	SSE3	SSE4	SSE5	SSE6	SE8	SE8	SE6	SSE7	SSW8	SSW9	S9	S9	SSE8	SSE7	DF	DF	DF	DF	DF	SW6	SSE5.2	S9
17-Jun	SSW5	SSW5	SSW5	S3	SSW6	SSW6	SSW7	SW8	SW5	SSW6	SSW8	SW9	SW8	SW9	WSW9	W8	W6	WNW4	N9	NE4	N4	NW3	NW3	WNW4	WSW4.1	N9
18-Jun	WNW3	SW2	WNW3	WNW4	W1	N4	N6	NNE5	NNE6	N8	N9	N11	N10	NNE10	N11	NNE11	NNE12	NNE10	NNE11	N13	N13	N14	N14	N13	N7.9	N14
19-Jun	N12	N11	N12	N12	N14	N15	N17	N17	N19	N18	N16	N15	N15	N18	N20	N19	N17	NNW19	NNW19	NNW20	NNW20	NNW20	NNW18	NNW17	N16.5	N20
20-Jun	NNW16	NNW16	NNW14	NNW15	N16	N13	NNW14	NNW14	NNW13	N12	N11	NNW10	NNW8	NNW8	NW7	NNW6	NNW7	NW8	NW6	NW6	NW5	NW4	NW4	NW4	NNW9.6	NNW16
21-Jun	WNW4	WNW4	WNW4	NW4	NW5	NNW4	NNW6	NNW9	N7	NNE6	N9	NNE7	NNE6	NNE8	N8	NNE9	NNE7	NE6	NE4	ENE3	NE1	NW1	W2	WSW1	N4.3	N9
22-Jun	W2	W2	WSW2	SW2	WSW1	S1	S1	S3	SE5	SSE5	SE7	SE5	ENE2	SSW5	SW8	SW10	WSW7	SW5	W4	WSW5	SW2	SE1	SW0	SW1	SSW2.5	SW10
23-Jun	WSW1	N1	WNW1	W2	WNW2	SE1	SSE4	SE5	SE5	SE5	SE6	SSE8	SE6	SE6	SE5	ESE3	ESE4	ESE3	SE3	SSE4	SSE0	SSE1	SE1	SSE2	SE2.8	SSE8
24-Jun	SSE1	NE0	SW0	SW1	SSE2	SSE4	SSE6	SSE6	SE7	SSE8	S8	SSW7	SSW9	S10	W4	NE4	NE3	N9	NNW10	NNW14	NNE10	N10	N11	N10	NE0.7	NNW14
25-Jun	N8	N6	N4	NNW4	NNW4	NNE4	NNE6	NE6	NE6	NE6	NNE8	N9	N9	N8	N7	N6	NNE4	NNE4	NNE4	NNE2	SE0	WSW1	SSW1	SW1	N4.4	N9
26-Jun	SSW1	SW1	S1	SW0	SSE1	SE2	SE4	SE5	SE5	SSE4	SE7	SSE5	SSE4	S7	SSW7	NW8	NNW3	NNE0	NNE2	SE0	SE1	ESE2	ESE1	S1	SSE1.8	NW8
27-Jun	NW2	W2	NW1	NW4	NNW2	NNW8	N7	N7	NNE6	NE5	N7	NNE6	NNE6	NNE6	N5	N5	NNE3	N4	NNE3	NNE2	NNW2	W2	SW1	SSW1	N3.4	NNW8
28-Jun	SSW1	SE1	SSW1	SE1	S0	SSE2	SE4	SE5	SE6	SE6	SE7	SE7	S3	NW2	N3	E3	SSE2	SE3	SSE5	SW4	S1	SSE0	WSW2	SE1	SSE2.2	SE7
29-Jun	SSE2	S3	S3	SE2	E1	SE1	SE3	S5	SE6	SE7	SE8	SE8	SSE8	S7	SSW8	SW8	WSW5	SSE4	SSE4	SSE6	SE3	SSE3	SSW5	SW6	SSE3.9	SSW8
30-Jun	SW6	SSW3	SSE2	SSE4	SSE4	SSE5	SSE5	SSE5	S7	S8	SSE8	SSW8	SW9	SW8	WSW9	SSW9	SW9	SW9	SW8	SW7	SW6	SSW4	SSW4	W5	SSW5.4	SW9

NNW2.1	NW1.9	NW1.8	NW2.1	NW1.7	NW1.5	NNW1.3	N1.3	NE1.3	E1.6	ENE0.9	NNE0.8	NNW1.2	NW1.6	NNW2.2	NNW2.1	NNW2.0	N1.8	N2.0	NNW2.2	NNW2.9	NNW2.6	NW2.4	NW2.2	Diurnal Average
NNW16	NNW16	NNW14	NNW15	NNW16	N15	N17	N17	N19	N18	N16	N15	N15	N18	N20	N19	N17	NNW19	NNW19	NNW20	NNW20	NNW20	NNW18	NNW17	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - June 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	398	55.98	55.98
6 - 11	250	35.16	91.14
12 - 19	59	8.30	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: 711

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - June 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	32	23	28	11	4	9	36	49	23	23	19	20	35	27	29	30	398
6 - 11	54	27	4	0	0	0	24	24	10	25	21	7	5	7	18	24	250
12 - 19	26	1	0	0	0	0	4	3	0	0	1	2	0	0	1	21	59
20 - 28	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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	113	51	32	11	4	9	64	76	33	48	41	29	40	34	48	78	711

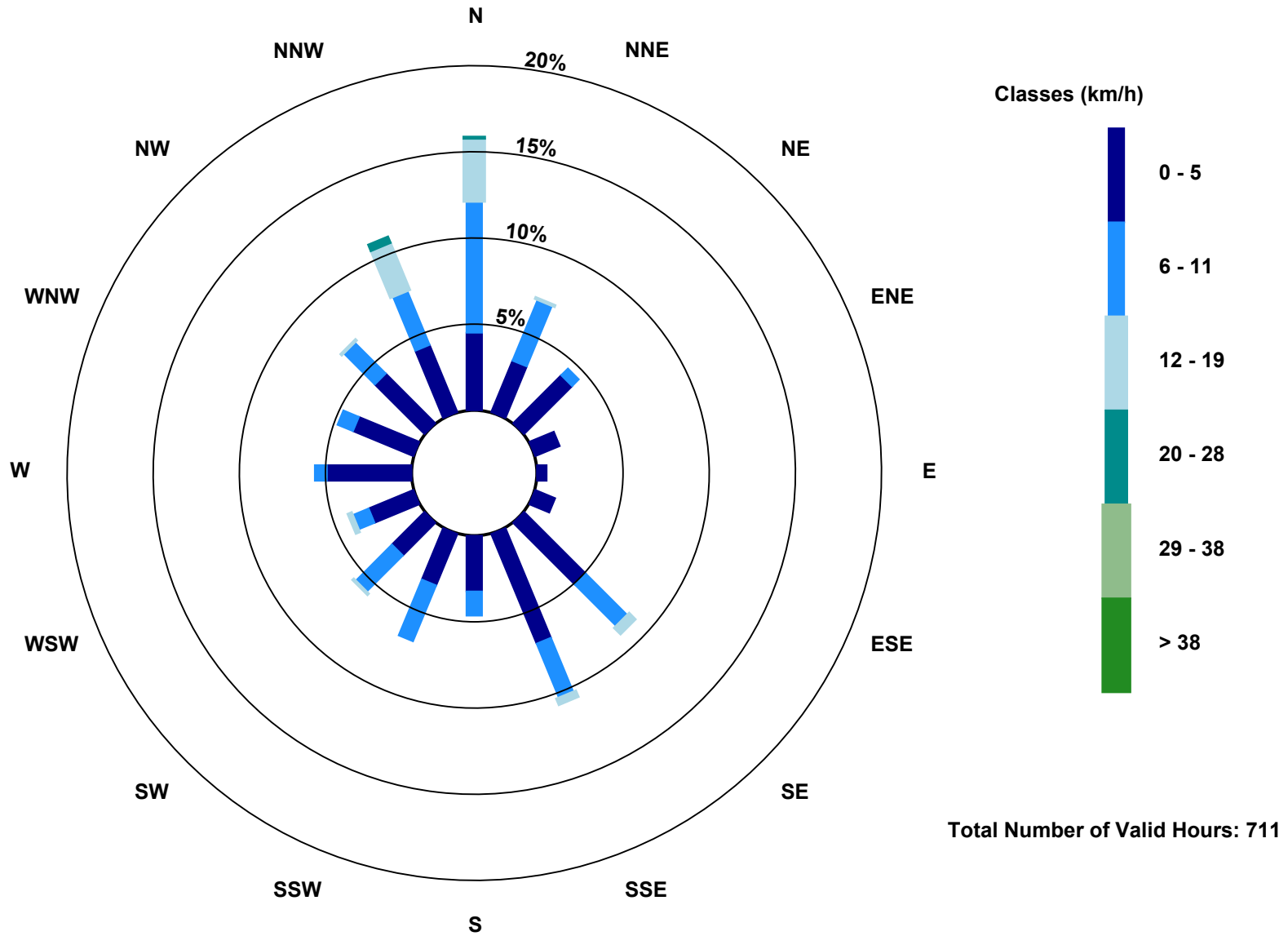
Total Number of Valid Hours: 711

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Jun 26 16:00 Minimum Value: 0 km/h on Jun 8 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																		Hours in Service: 720 Hours of Data: 711 Hours of Missing Data: 9 Hours of Calibration: 0 Percent Operational Time: 98.8							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	2	1	2	1	1	2	1	1	2	1	2	3	3	2	2	2	2	1	1	1	1	1	1	1	3
2-Jun	1	1	1	2	2	1	1	1	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	1	2
3-Jun	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	2	1	2	1	1	1	3	
4-Jun	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	2	
5-Jun	1	1	1	1	2	2	2	3	3	2	2	2	2	2	3	2	1	2	1	2	2	1	7	7	
6-Jun	3	4	2	2	2	3	3	3	3	3	5	5	4	5	5	5	4	4	3	2	1	1	1	5	
7-Jun	1	2	1	1	1	1	2	2	2	3	5	5	6	5	5	5	4	3	3	2	1	1	1	6	
8-Jun	3	2	1	0	1	1	3	3	2	2	1	2	2	2	1	1	1	1	1	1	1	1	1	3	
9-Jun	1	1	1	1	1	1	1	1	2	2	2	2	3	3	2	2	2	2	2	2	UO	UO	UO	3	
10-Jun	1	1	1	1	1	1	1	2	3	3	4	4	4	4	5	5	5	5	4	4	3	2	2	5	
11-Jun	1	1	1	1	1	1	1	3	2	2	2	3	4	4	4	3	3	4	1	1	2	1	1	4	
12-Jun	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	1	2	
13-Jun	1	1	1	1	1	1	1	1	2	2	2	1	4	3	3	3	6	4	3	3	3	4	3	6	
14-Jun	4	3	3	3	3	3	3	4	4	3	4	4	4	5	4	3	4	4	5	5	5	5	5	5	
15-Jun	4	3	3	3	2	3	3	2	3	1	1	2	2	3	3	3	3	2	1	UO	1	1	1	4	
16-Jun	1	2	1	1	1	1	1	2	2	2	2	3	3	4	3	3	3	3	DF	DF	DF	DF	DF	4	
17-Jun	2	2	3	1	2	3	3	4	3	3	4	4	4	4	4	4	3	5	4	2	2	1	1	5	
18-Jun	1	1	1	1	1	2	2	2	3	3	3	4	4	4	4	5	5	4	4	5	4	5	5	5	
19-Jun	5	4	5	4	5	5	6	6	7	7	6	5	6	6	7	7	6	5	6	6	6	5	6	7	
20-Jun	4	5	5	5	5	4	5	5	4	4	4	3	2	2	2	2	2	2	2	1	1	1	1	5	
21-Jun	1	1	1	1	1	2	2	3	2	2	4	4	3	3	3	3	3	2	2	1	1	1	1	4	
22-Jun	1	1	1	1	1	1	1	2	2	2	2	2	1	3	4	4	4	2	2	2	1	1	1	4	
23-Jun	1	1	1	1	1	1	1	2	2	2	2	3	2	2	2	2	2	2	1	1	1	1	1	3	
24-Jun	1	1	1	1	2	1	2	2	2	3	3	3	4	4	7	3	2	4	6	4	4	4	4	7	
25-Jun	3	2	2	1	1	2	2	3	2	2	4	4	3	3	3	2	2	2	2	1	1	1	1	4	
26-Jun	1	1	1	1	1	1	2	2	2	1	2	2	2	3	4	10	3	1	1	1	1	2	1	10	
27-Jun	1	1	1	1	1	3	3	2	2	2	3	2	2	2	3	2	2	2	2	1	1	1	2	3	
28-Jun	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	2	2	1	1	1	2	
29-Jun	1	1	1	1	1	1	1	2	3	2	2	3	3	4	4	5	5	2	2	2	1	1	2	5	
30-Jun	2	2	1	1	1	1	1	2	3	3	3	4	4	4	5	4	4	4	4	3	3	2	1	5	
																		5 5 5 5 5 5 6 6 7 7 6 5 6 6 7 10 6 5 6 6 6 5 7 5							
Diurnal Maximum																									
DF - DAS Failure												UO - Unstable Operation													



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - June 2023

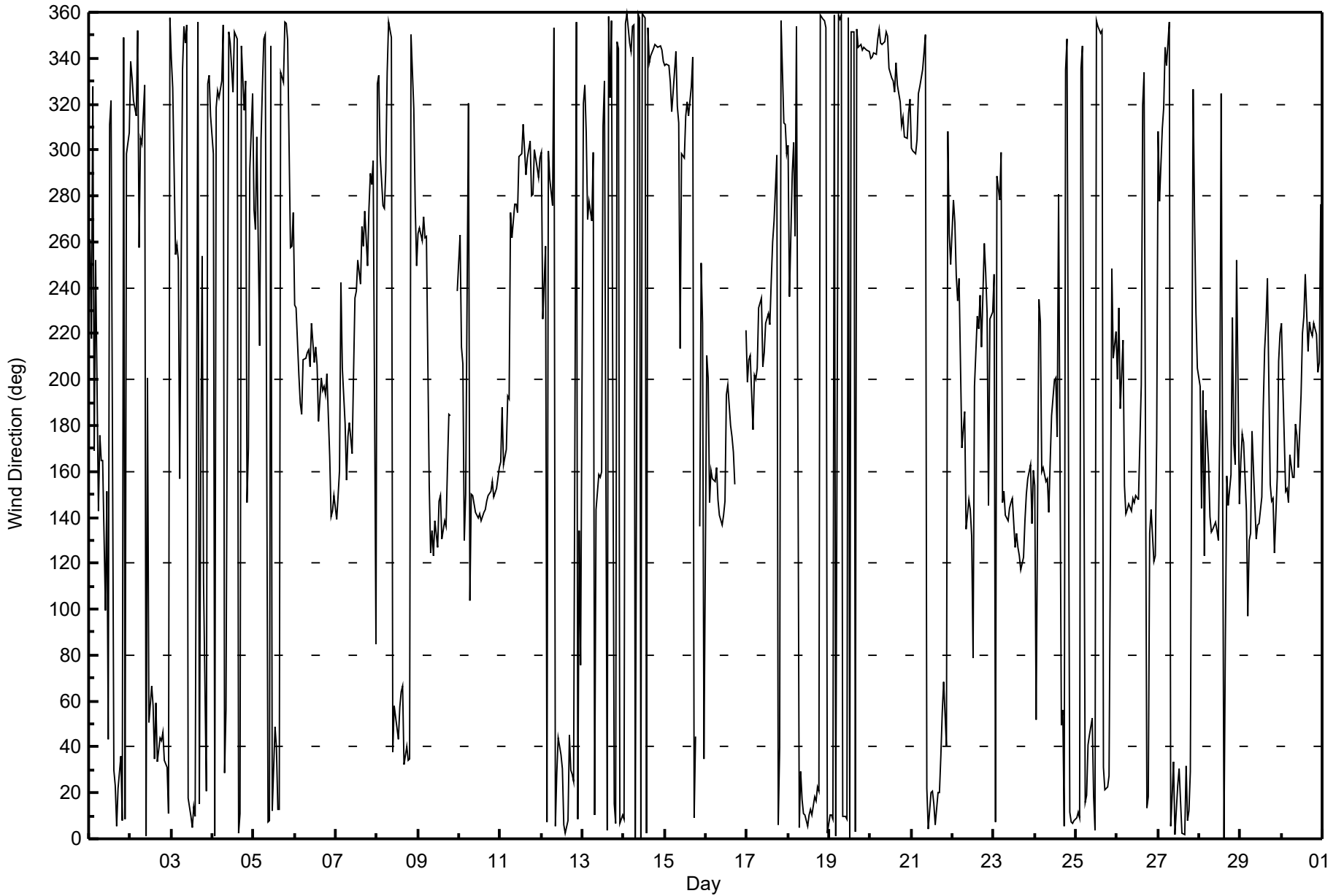
Direction of Maximum Speed: 351 deg on Jun 19 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 355.6 deg on Jun 19	Hours of Data: 711
Direction of Minimum Speed: 163 deg on Jun 28 22:00	Hours of Missing Data: 9
Direction of Minimum Daily Speed Average: 0.7 deg on Jun 24	Percent Operational Time: 98.8
Monthly Average Direction: 339.2 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-Jun	261	218	328	169	252	143	176	165	164	100	151	43	311	322	30	23	5	22	36	8	349	8	298	308	355.7
2-Jun	339	331	322	315	352	258	305	303	328	1	201	51	67	58	35	59	34	44	43	46	34	31	11	357	9.0
3-Jun	340	327	255	258	252	157	335	354	347	355	18	10	5	14	10	356	15	162	254	112	21	329	332	315	355.3
4-Jun	298	1	318	326	323	330	355	29	56	351	346	336	325	352	349	3	11	346	318	330	146	171	292	325	343.7
5-Jun	274	266	306	215	304	328	349	350	7	8	345	12	49	39	13	13	334	330	356	355	348	257	258	273	341.3
6-Jun	232	231	202	190	185	209	209	211	213	206	225	207	214	206	182	201	195	197	194	203	167	140	143	150	203.9
7-Jun	139	150	160	242	205	181	156	175	181	168	202	236	238	252	242	267	258	274	249	275	290	285	295	85	230.4
8-Jun	329	333	298	276	274	291	334	356	349	38	58	53	43	57	64	67	32	40	34	34	350	318	276	249	3.6
9-Jun	264	266	261	271	262	262	154	124	134	124	139	127	147	150	131	138	136	162	185	184	UO	UO	UO	239	157.9
10-Jun	263	214	207	130	150	321	104	150	150	142	141	140	142	139	142	143	147	150	151	155	149	151	152	162	147.0
11-Jun	164	188	163	169	193	192	273	261	276	276	273	297	298	311	300	289	296	304	280	281	300	292	288	297	285.4
12-Jun	299	226	258	7	300	287	276	354	5	29	44	36	30	6	3	8	45	30	28	25	356	9	134	76	10.8
13-Jun	320	328	308	270	278	269	299	10	144	159	157	160	311	330	4	358	323	357	15	7	347	344	7	11	346.1
14-Jun	9	355	360	346	343	354	355	1	360	357	0	360	358	3	353	338	341	344	346	345	345	346	343	338	350.9
15-Jun	337	337	337	330	316	325	343	319	312	214	298	297	315	321	315	328	341	9	45	UO	136	251	225	35	325.9
16-Jun	211	201	146	160	157	156	161	148	141	137	141	147	193	198	180	175	168	155	DF	DF	DF	DF	DF	221	166.5
17-Jun	199	209	210	178	202	200	205	231	236	206	212	225	229	224	243	260	269	297	6	39	357	312	311	298	236.3
18-Jun	302	236	290	303	262	354	5	30	17	11	10	6	11	13	10	18	16	22	21	359	357	356	353	2	4.3
19-Jun	11	11	8	358	1	359	357	358	10	10	8	358	0	352	351	3	353	345	346	344	345	344	343	343	355.6
20-Jun	340	341	342	342	349	353	347	346	347	351	349	336	331	330	325	338	328	321	310	314	306	305	316	322	338.1
21-Jun	301	300	298	305	325	328	335	342	350	22	4	20	21	15	6	20	20	36	55	68	40	308	264	250	357.9
22-Jun	278	269	245	234	244	170	178	186	135	148	143	132	78	197	228	222	237	214	259	246	229	145	227	229	205.0
23-Jun	246	8	288	278	299	146	152	141	139	144	146	148	127	133	127	123	117	123	139	150	157	163	137	160	140.3
24-Jun	154	52	235	225	160	161	155	157	142	164	184	200	201	175	281	49	56	6	335	348	12	8	6	8	38.3
25-Jun	9	11	9	335	346	16	19	41	45	52	19	4	356	354	351	352	31	21	22	28	130	248	209	221	10.7
26-Jun	200	231	187	218	154	141	143	146	143	148	146	149	147	172	198	320	334	13	18	133	144	121	123	174	158.7
27-Jun	308	278	309	319	344	337	356	6	19	34	2	23	30	16	2	2	32	8	12	29	327	271	229	205	0.9
28-Jun	197	144	196	124	187	163	140	134	135	138	134	130	178	324	0	88	158	145	159	227	172	163	252	146	147.1
29-Jun	164	176	172	143	97	130	133	177	146	131	137	137	149	188	213	225	244	154	147	148	124	157	208	220	168.3
30-Jun	224	198	151	153	147	167	158	158	181	176	162	194	220	228	246	213	225	221	219	225	219	203	207	276	204.5

319.5 312.3 317.8 313.6 317.4 322.5 348.7 358.3 45.0 79.7 78.2 32.0 331.2 323.3 327.3 336.5 335.7 354.1 354.4 347.5 346.7 339.8 324.4 325.1

Diurnal Average

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 110 deg on Jun 2 11:00	Hours of Data: 711
Minimum Value: 11 deg on Jun 8 04:00	Hours of Missing Data: 9
Percentiles: P ₁ = 16 P ₁₀ = 22 Q ₁ = 28 Median = 38 Q ₃ = 53 P ₉₀ = 73 P ₉₉ = 93	Hours of Calibration: 0
	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	92	65	66	61	75	43	51	38	59	50	70	86	38	51	53	60	31	47	45	18	28	34	83	20	92
2-Jun	33	20	17	23	50	39	30	33	46	69	110	72	65	43	56	44	38	36	36	38	36	38	27	28	110
3-Jun	16	18	87	36	72	79	26	24	29	32	49	38	34	48	42	34	63	53	59	61	48	15	26	28	87
4-Jun	39	56	33	25	27	40	30	53	45	26	22	19	42	68	38	35	36	22	29	88	32	57	76	87	88
5-Jun	22	32	77	64	35	29	30	27	36	35	21	38	46	56	48	44	44	41	84	62	31	32	51	66	84
6-Jun	56	52	44	30	39	44	39	49	46	48	54	51	49	55	42	46	42	41	45	44	19	30	27	29	56
7-Jun	31	36	73	56	64	43	28	45	49	37	50	52	53	52	55	53	53	50	54	50	35	17	53	61	73
8-Jun	43	22	26	11	16	24	34	31	33	54	57	59	48	63	46	54	48	39	33	35	27	24	54	45	63
9-Jun	50	17	20	20	31	38	99	60	35	46	38	38	49	54	41	34	41	37	32	40	UO	UO	UO	84	99
10-Jun	68	79	73	70	71	86	70	30	27	28	31	30	29	33	29	29	28	29	28	27	26	21	23	25	86
11-Jun	22	40	44	76	91	67	81	52	71	81	79	42	34	43	45	42	41	34	29	26	21	18	19	28	91
12-Jun	19	70	78	98	78	43	71	53	39	44	51	46	43	36	35	34	38	32	30	37	40	37	54	82	98
13-Jun	63	21	20	13	18	34	65	71	34	46	79	55	97	30	31	31	29	27	36	30	22	30	33	33	97
14-Jun	33	33	29	21	23	24	24	29	27	25	28	27	26	32	28	26	25	24	24	22	22	21	22	22	33
15-Jun	21	21	20	22	19	20	32	23	24	58	39	31	25	20	22	28	29	39	49	UO	52	84	81	80	84
16-Jun	81	75	54	53	29	30	25	30	25	29	30	35	46	37	38	36	34	30	DF	DF	DF	DF	DF	47	81
17-Jun	40	51	53	61	40	40	45	50	78	68	55	53	58	51	57	55	54	66	31	41	26	34	21	24	78
18-Jun	50	48	31	17	57	41	24	42	39	33	34	33	33	35	31	36	34	33	31	27	28	25	25	28	57
19-Jun	31	31	29	27	27	26	27	27	29	29	29	26	26	24	24	28	26	20	22	21	20	20	21	20	31
20-Jun	19	20	22	20	22	25	22	22	23	25	25	22	22	21	19	24	20	19	20	18	21	26	21	24	26
21-Jun	15	14	14	22	23	23	18	20	26	38	34	48	44	37	37	37	42	44	43	44	58	82	34	58	82
22-Jun	52	23	67	48	75	75	97	77	38	38	33	44	78	73	57	52	59	51	54	47	41	83	94	65	97
23-Jun	73	47	82	36	37	83	26	24	40	44	38	36	39	41	43	72	51	51	47	23	69	49	32	29	83
24-Jun	73	76	95	90	50	23	24	30	30	37	44	53	53	40	79	48	49	30	31	22	33	28	29	31	95
25-Jun	28	32	29	19	17	28	36	39	38	45	41	33	35	38	42	42	64	50	38	33	83	79	56	92	92
26-Jun	90	58	61	84	40	43	30	32	34	27	25	28	42	48	67	78	90	101	55	86	66	65	82	83	101
27-Jun	23	59	84	21	70	22	30	35	42	49	35	46	44	51	67	56	60	47	31	47	63	51	89	84	89
28-Jun	78	64	77	65	84	25	27	30	29	36	28	34	63	69	52	58	62	46	25	50	74	89	71	76	89
29-Jun	35	25	35	42	55	45	26	40	40	32	27	33	36	59	46	47	74	55	39	28	37	33	39	38	74
30-Jun	46	42	46	32	25	28	26	29	39	37	39	61	50	55	58	55	52	52	54	43	45	46	39	45	61

92	79	95	98	91	86	99	77	78	81	110	86	97	73	79	78	90	101	84	88	83	89	94	92	
Diurnal Maximum																								

DF - DAS Failure UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS26 CHRISTINA LAKE JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
 JUNE 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	661	36	59	96.81	19	0	3	0
H2S (ppb) Average	665	33	55	96.94	3.5	0	0.6	0
NO2 (ppb) Average	663	34	57	96.81	15.2	0	4.9	-
NO (ppb) Average	663	34	57	96.81	12.2	-	3.6	-
NOX (ppb) Average	663	34	57	96.81	22.6	-	8.2	-
Temperature 2 m (C) Average	673	0	47	93.47	28.4	-	22.5	-
Relative Humidity (%) Average	673	0	47	93.47	98.8	-	92.1	-
Wind Speed 10 m (km/h) Average	331	1	389	46.11	22	-	16	-
Wind Direction 10 m (deg) Average	331	1	389	46.11	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
 JUNE 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	661	1	2	-	0	0	0.1	0.3	0.9	2.5	19
H2S (ppb) Average	665	0.3	0.3	-	0	0	0.1	0.2	0.4	0.6	3.5
NO2 (ppb) Average	663	2.49	2.1	-	0.3	0.7	1.1	1.9	3.1	5.2	15.2
NO (ppb) Average	663	0.79	1.5	-	0	0.1	0.1	0.3	0.8	2	12.2
NOX (ppb) Average	663	3.28	3.1	-	0.4	0.9	1.4	2.2	3.8	7.1	22.6
Temperature 2 m (C) Average	673	16.96	5.4	-	3.6	10	12.9	17	21	24.5	28.4
Relative Humidity (%) Average	673	65.32	20.6	-	15.4	38.1	48.3	65.1	85.2	92.9	98.8
Wind Speed 10 m (km/h) Average	331	10.9	5	-	1	4	7	11	14	17	22
Wind Direction 10 m (deg) Average	331	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, NO2, SO2, WS.WD	13 Jun 2023 16:00	14 Jun 2023 12:00	21	DAS Failure - power distribution card failure
ALL PARAMETERS	15 Jun 2023 14:00	15 Jun 2023 14:00	1	Maintenance - power distribution card replaced
Relative Humidity, Temperature	13 Jun 2023 16:00	15 Jun 2023 13:00	46	DAS Failure - power distribution card failure
NO2, SO2	14 Jun 2023 14:00	14 Jun 2023 14:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	14 Jun 2023 13:00	15 Jun 2023 15:00	27	Sensor Failure - WD sensor water damage
Wind Speed, Wind Direction	15 Jun 2023 16:00	15 Jun 2023 17:00	2	Maintenance - WD sensor replaced
Wind Speed, Wind Direction	16 Jun 2023 13:00	30 Jun 2023 12:00	336	Unstable Operations - WD sensor mis-aligned
Wind Speed, Wind Direction	30 Jun 2023 13:00	30 Jun 2023 14:00	2	Maintenance - WD sensor re-aligned



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Christina Lake - June 2023

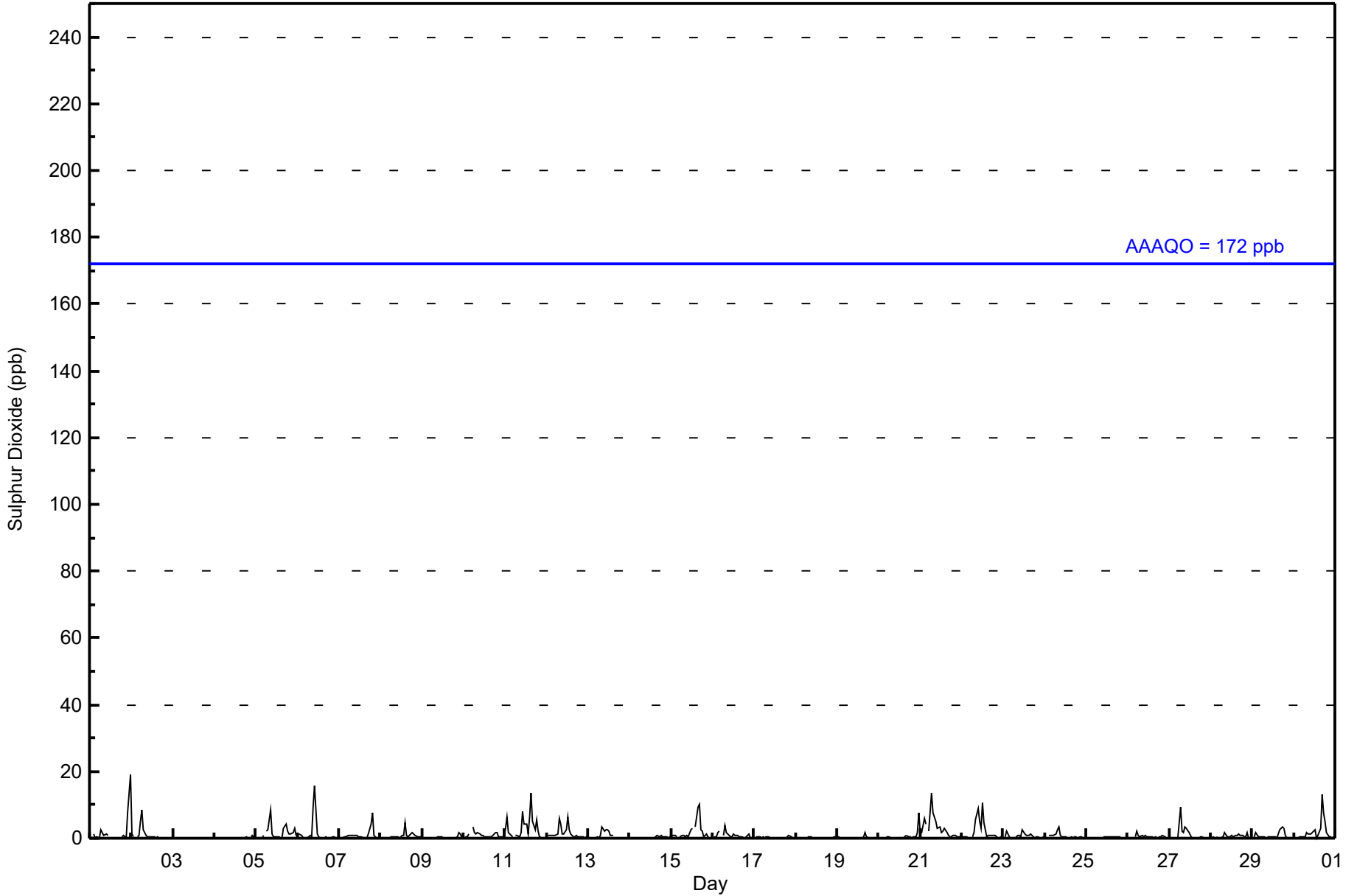
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																																																
Maximum Value: 19.0 ppb on Jun 2 00:00		Maximum Daily Average: 3.0 ppb on Jun 11		Hours of Data: 661																																																																			
Minimum Value: 0.0 ppb on Jun 2 21:00		Minimum Daily Average: 0.0 ppb on Jun 3		Hours of Missing Data: 59																																																																			
Maximum Diurnal Average: 1.6 ppb at hour 7		Minimum Diurnal Average: 0.4 ppb at hour 5		Hours of Calibration: 36																																																																			
Monthly Average: 1.00 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.9 P ₉₀ = 2.5 P ₉₉ = 9.8		Percent Operational Time: 96.8																																																																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																															
1-Jun	3.1	Z	1.3	0.0	0.3	0.1	2.5	1.9	1.0	1.5	1.1	C	C	C	C	C	C	C	0.3	0.8	0.4	0.6	8.2	19.0	--	19.0																																													
2-Jun	1.3	0.5	Z	0.2	0.7	4.9	8.5	2.7	0.9	0.6	0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	1.0	8.5																																													
3-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																																													
4-Jun	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	0.2	0.0	0.0	1.0	0.2	0.1	1.0																																														
5-Jun	0.1	0.0	0.0	0.0	1.0	Z	2.0	2.6	8.3	1.3	0.4	0.6	0.5	0.3	0.1	0.1	3.1	4.3	2.0	1.4	1.3	1.6	3.0	0.7	1.5	8.3																																													
6-Jun	Z	1.3	0.7	0.2	0.1	0.1	0.5	0.9	0.4	9.3	15.8	1.1	0.2	0.1	0.2	0.1	0.3	0.2	0.1	0.2	0.4	0.4	0.1	0.1	1.4	15.8																																													
7-Jun	0.0	Z	0.1	0.3	0.3	0.8	0.8	0.9	0.7	0.9	0.7	0.4	0.3	0.3	0.2	0.1	0.2	1.3	4.1	7.6	0.8	0.4	0.2	0.2	0.9	7.6																																													
8-Jun	0.2	0.2	Z	0.2	0.2	0.2	0.4	0.4	0.4	0.3	0.3	0.2	0.7	1.0	4.7	0.7	0.5	1.1	1.9	1.3	0.7	0.4	0.3	0.3	0.7	4.7																																													
9-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	1.9	1.2	0.3	0.3	1.9																																													
10-Jun	0.2	0.2	0.5	1.2	Z	3.6	1.8	1.3	1.5	1.3	0.6	0.8	0.6	0.2	0.4	0.3	0.3	0.7	1.5	1.6	0.4	0.3	0.2	0.3	0.9	3.6																																													
11-Jun	2.8	6.5	1.8	0.7	0.3	Z	0.7	1.0	0.6	1.6	8.0	4.4	4.3	1.2	6.3	13.4	5.0	2.6	5.5	1.9	0.4	0.2	0.1	0.1	3.0	13.4																																													
12-Jun	Z	0.9	0.8	0.7	0.8	1.0	1.4	5.8	4.1	1.3	1.4	2.5	6.2	2.4	1.3	0.6	0.5	0.7	0.5	0.4	0.3	0.2	0.2	0.3	1.5	6.2																																													
13-Jun	0.1	Z	0.2	0.2	0.2	0.2	0.9	3.2	2.2	2.5	2.5	2.1	0.9	0.7	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	3.2																																													
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	M	0.2	0.3	0.9	0.6	0.9	0.3	0.4	0.2	0.1	0.4	--	0.9																																													
15-Jun	0.5	0.7	0.7	0.4	Z	0.5	0.7	0.7	0.4	1.0	0.2	2.4	3.1	M	3.5	9.5	10.3	2.4	2.1	0.6	1.1	0.3	0.2	0.1	1.9	10.3																																													
16-Jun	0.1	0.2	0.5	1.7	2.3	Z	1.0	4.0	1.9	0.7	0.3	0.6	1.2	0.7	1.0	0.4	0.6	0.5	0.2	0.4	0.7	1.1	0.1	0.0	0.9	4.0																																													
17-Jun	Z	0.4	0.2	0.3	0.1	0.2	0.1	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	0.4	0.0	0.0	0.2	0.7																																													
18-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.5	0.1	0.6																																													
19-Jun	0.5	0.4	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.6	0.3	0.2	0.0	0.0	0.0	0.1	0.0	0.2	1.6																																													
20-Jun	0.0	0.0	0.0	Z	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.7	0.4	0.3	0.2	0.5	0.3	1.5	7.8	0.6	7.8																																													
21-Jun	1.6	1.7	5.8	4.3	Z	2.2	13.4	7.7	6.3	4.9	2.9	3.2	1.8	2.0	3.0	1.5	0.7	0.5	0.6	0.7	0.6	0.4	0.3	0.2	2.9	13.4																																													
22-Jun	0.2	0.3	0.2	0.2	0.1	Z	0.5	1.8	5.6	9.0	5.0	3.0	10.6	4.6	0.6	0.9	0.8	0.7	1.0	0.7	0.3	0.2	0.2	0.9	2.0	10.6																																													
23-Jun	Z	0.3	1.9	0.2	0.1	0.1	0.1	0.1	0.9	0.7	0.6	2.5	1.1	0.8	0.8	1.0	1.2	0.6	0.2	0.3	0.3	0.1	0.1	0.4	0.6	2.5																																													
24-Jun	0.4	Z	0.7	0.7	0.8	0.7	1.2	2.7	3.3	1.0	0.4	0.3	0.2	0.2	0.2	0.4	0.1	0.2	0.4	0.0	0.2	0.3	0.1	0.0	0.6	3.3																																													
25-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.2	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.1	0.2	0.4																																													
26-Jun	0.1	0.1	0.1	Z	0.5	2.0	0.8	0.4	0.8	0.6	0.7	0.4	0.4	0.6	0.4	0.2	0.3	0.1	0.4	0.3	1.0	0.5	0.2	0.0	0.5	2.0																																													
27-Jun	0.1	0.0	0.0	0.0	Z	0.2	9.2	2.0	1.6	3.3	2.8	1.8	0.9	0.2	0.2	0.1	0.1	0.1	0.3	0.4	0.1	0.2	0.1	0.2	1.0	9.2																																													
28-Jun	0.1	0.2	0.2	0.1	0.2	Z	0.4	0.5	1.9	0.2	0.6	0.6	0.9	0.6	0.8	0.7	1.3	0.7	0.9	0.3	0.5	1.7	0.1	0.1	0.6	1.9																																													
29-Jun	Z	0.5	1.6	0.3	0.5	0.3	0.4	0.3	0.1	0.3	0.4	0.5	0.3	0.2	0.1	1.4	2.4	3.5	2.8	0.6	0.1	0.1	0.1	0.0	0.7	3.5																																													
30-Jun	0.0	Z	0.0	0.4	0.3	0.4	0.6	1.5	1.2	1.3	1.1	2.0	2.4	0.2	1.0	2.8	13.2	7.7	4.9	1.8	0.5	0.5	0.2	0.3	1.9	13.2																																													
																								Diurnal Average		Diurnal Maximum																																													
																								0.5 3.1		0.6 6.5		0.7 5.8		0.5 4.3		0.4 2.3		0.8 4.9		1.6 13.4		1.4 7.7		1.6 8.3		1.5 9.3		1.6 15.8		1.1 4.4		1.3 10.6		0.6 4.6		0.9 6.3		1.3 13.4		1.6 13.2		1.1 7.7		1.1 5.5		0.8 7.6		0.4 1.3		0.4 1.9		0.6 8.2		1.1 19.0	

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Christina Lake - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Christina Lake - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	655	99.09	99.09
11 - 20	6	0.91	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: 661

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Christina Lake - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 10	11	24	19	10	11	13	20	26	42	20	21	28	16	13	24	8	306
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	24	19	10	11	13	20	26	42	20	21	28	16	15	26	8	310

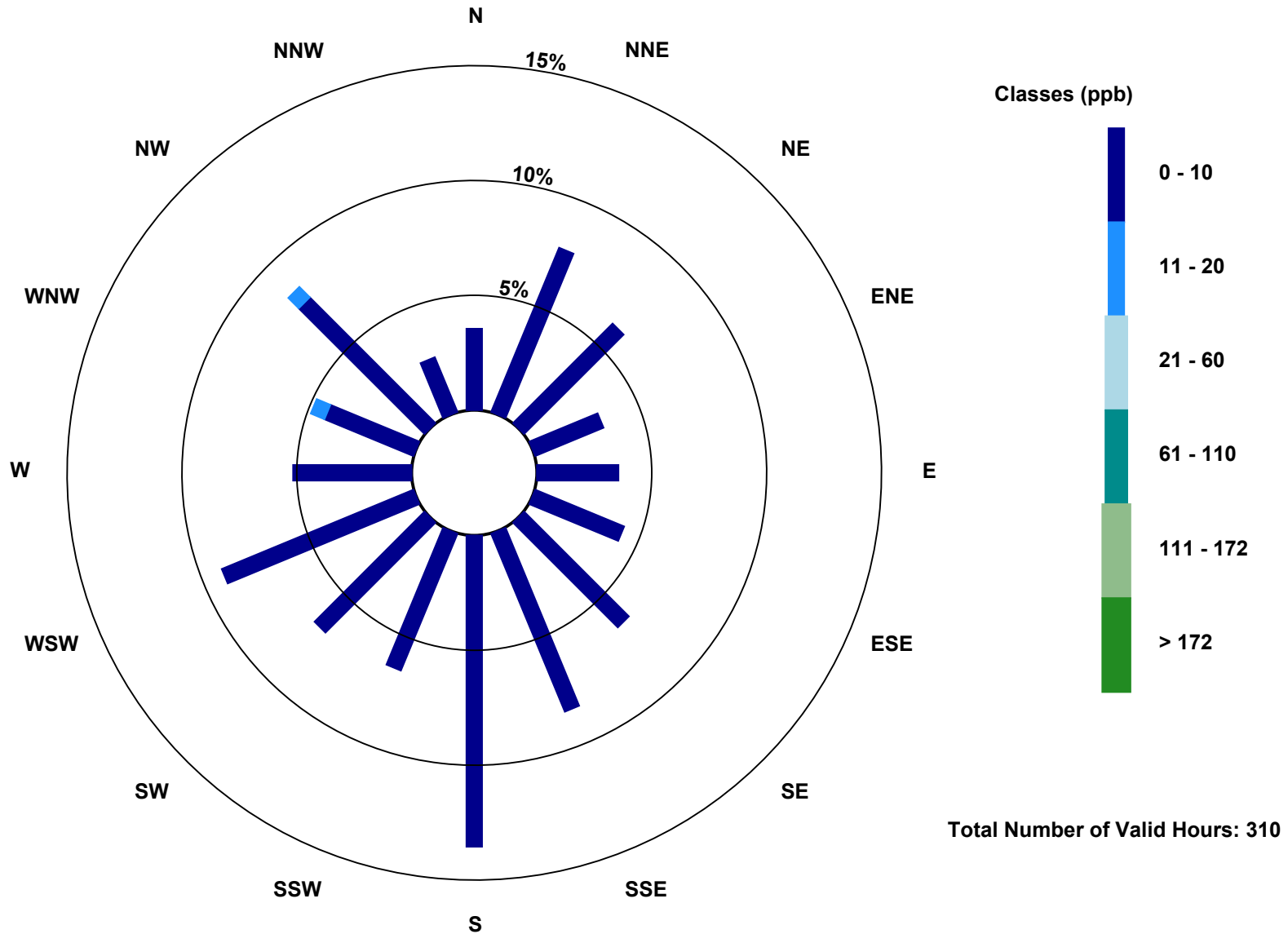
Total Number of Valid Hours: 310

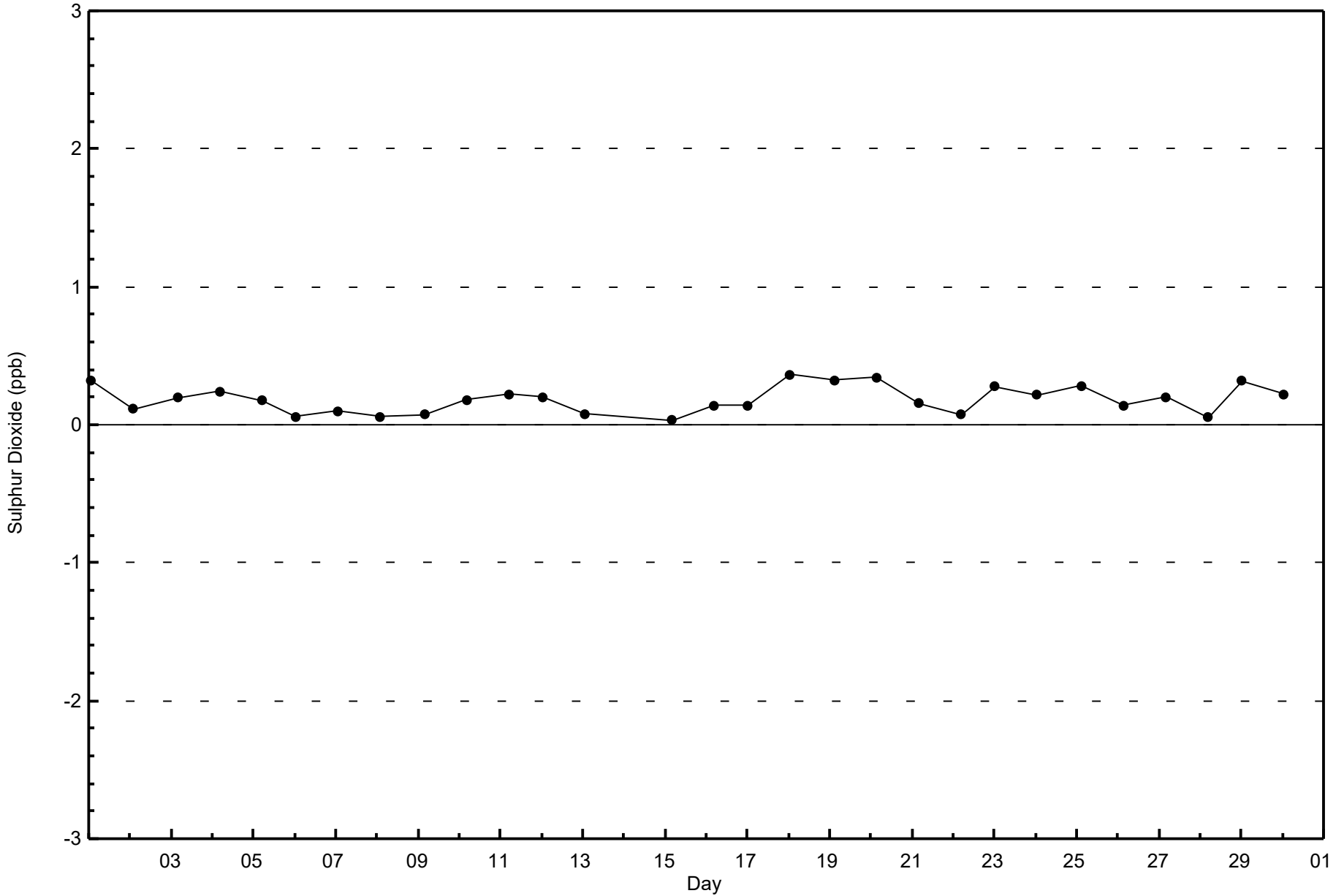
Total Number of Hours: 720

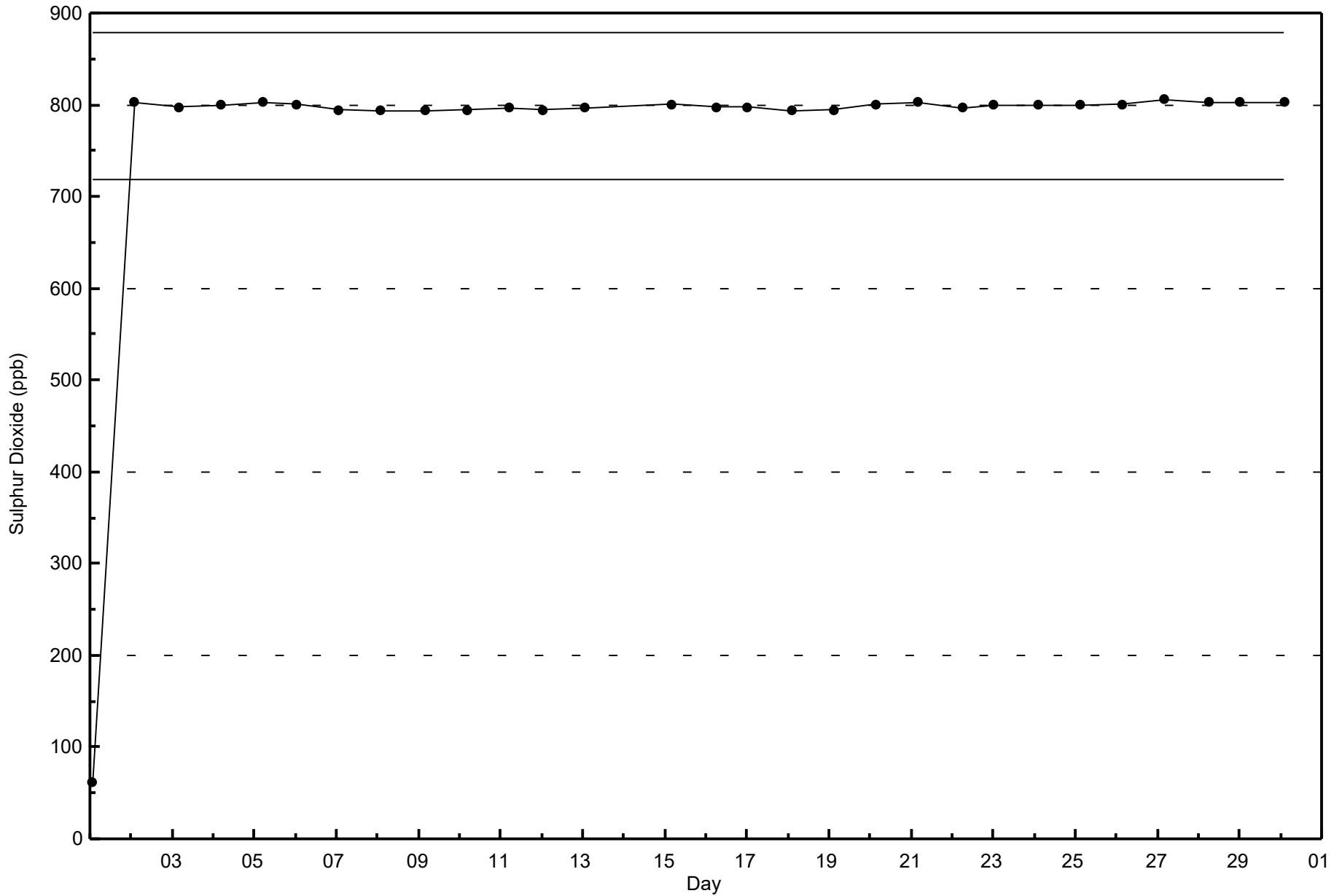


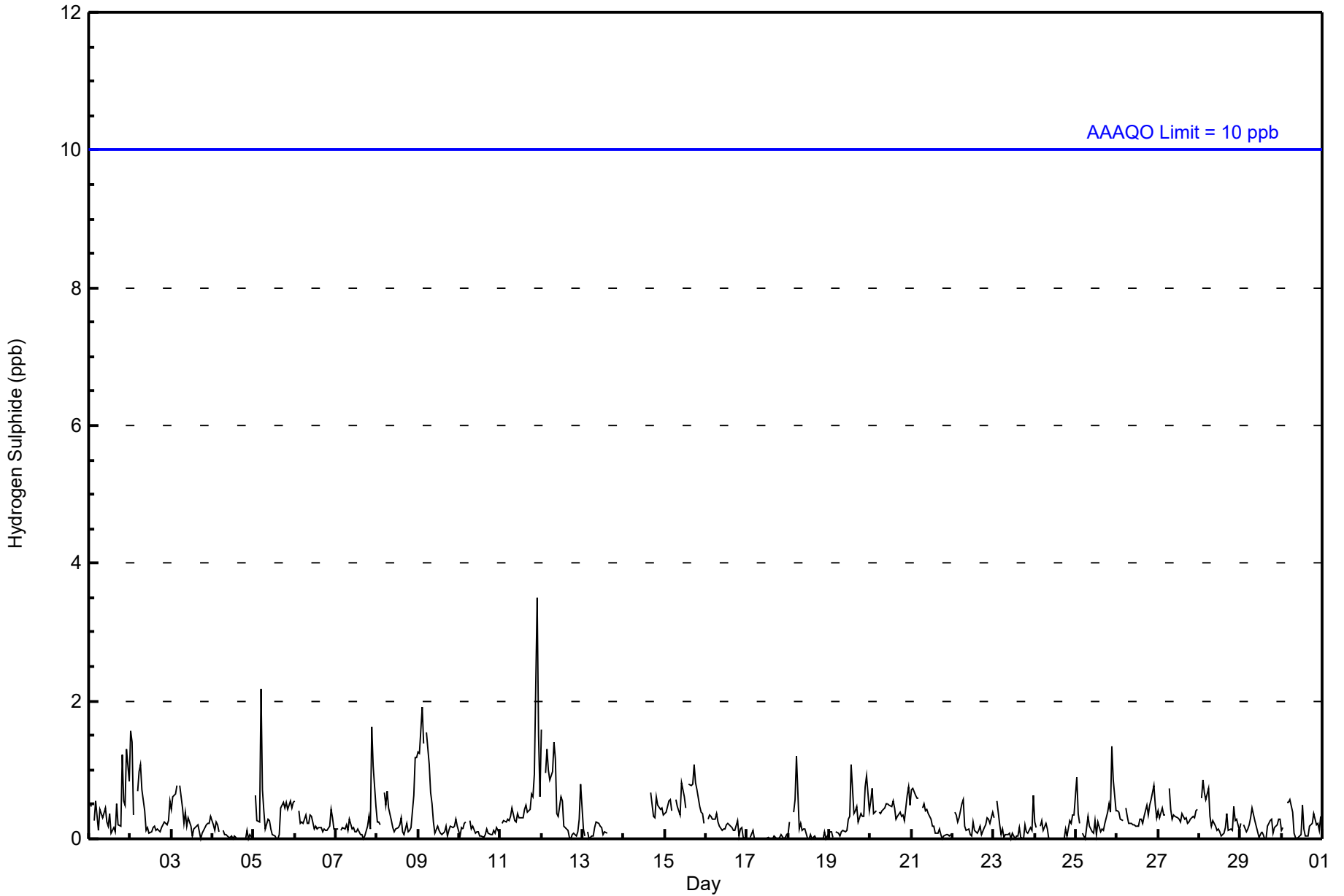
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Christina Lake











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	664	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: 665

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - June 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	27	20	11	10	13	20	25	43	18	22	28	15	17	25	11	316
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	27	20	11	10	13	20	25	43	18	22	28	15	17	26	11	317

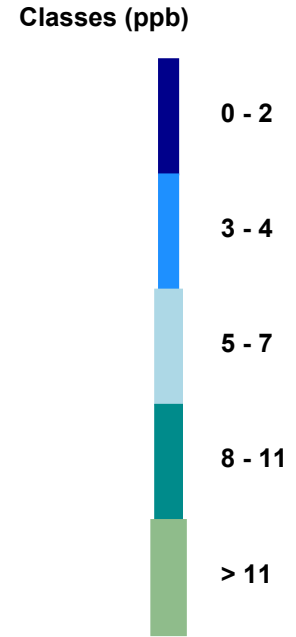
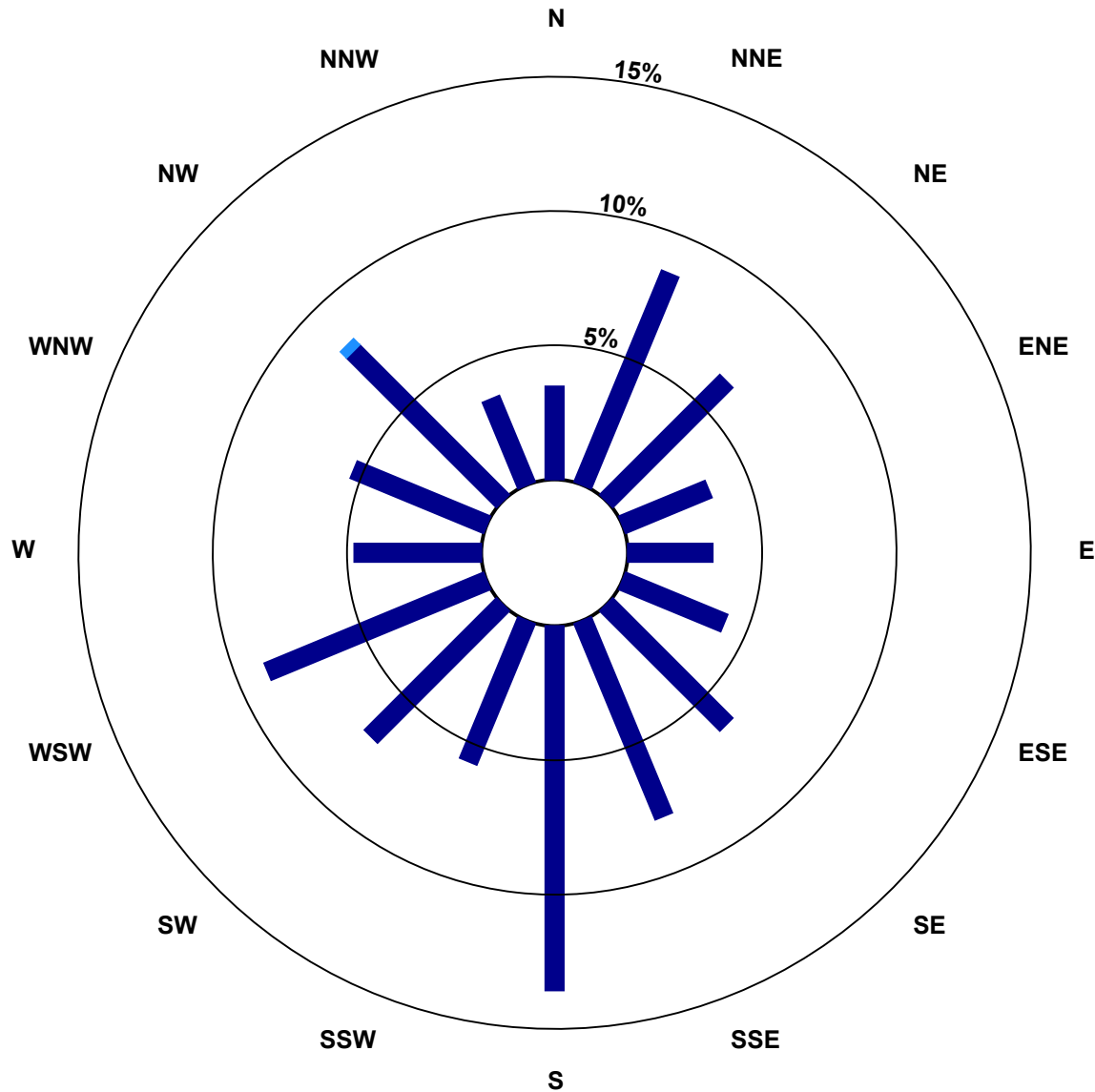
Total Number of Valid Hours: 317

Total Number of Hours: 720

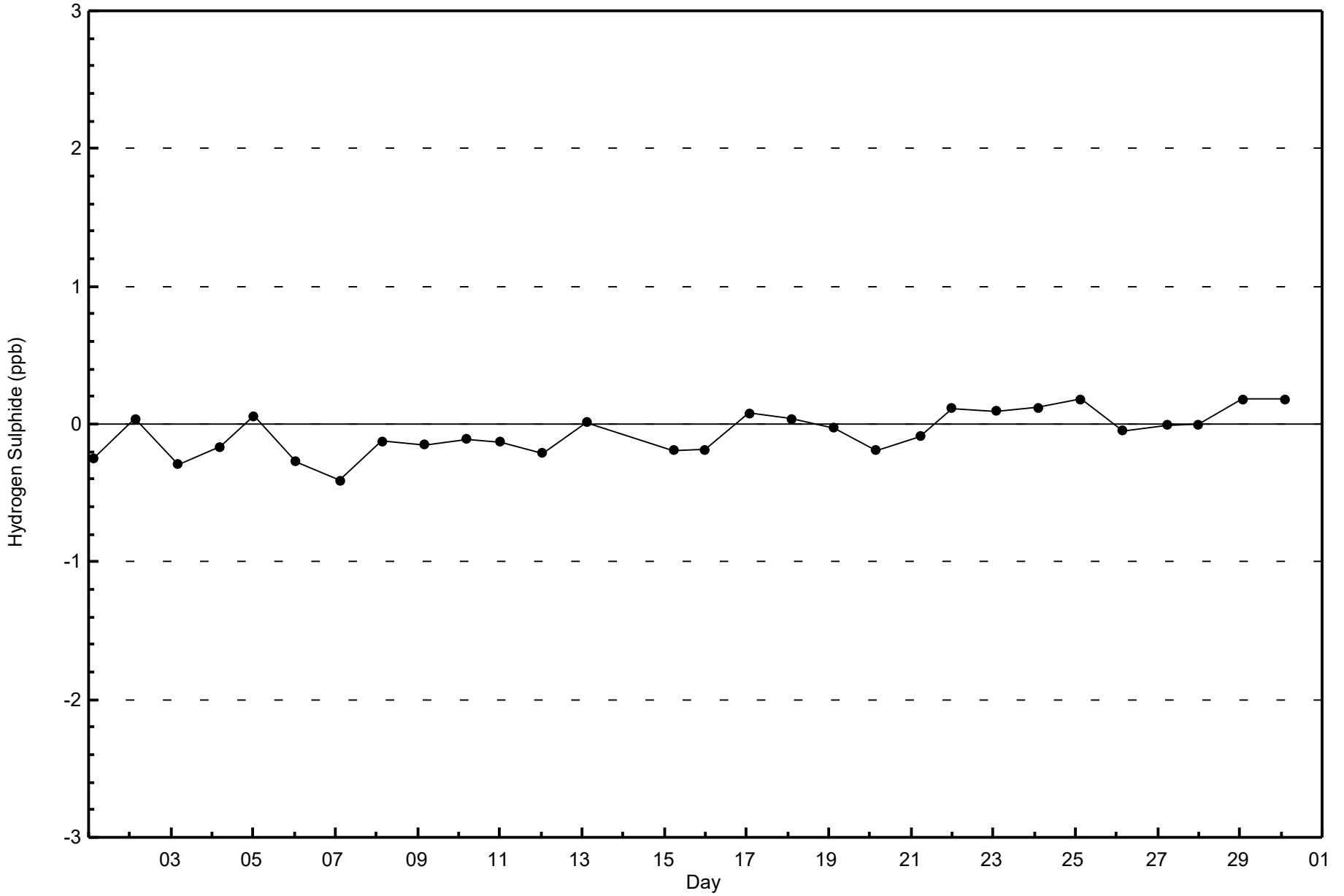


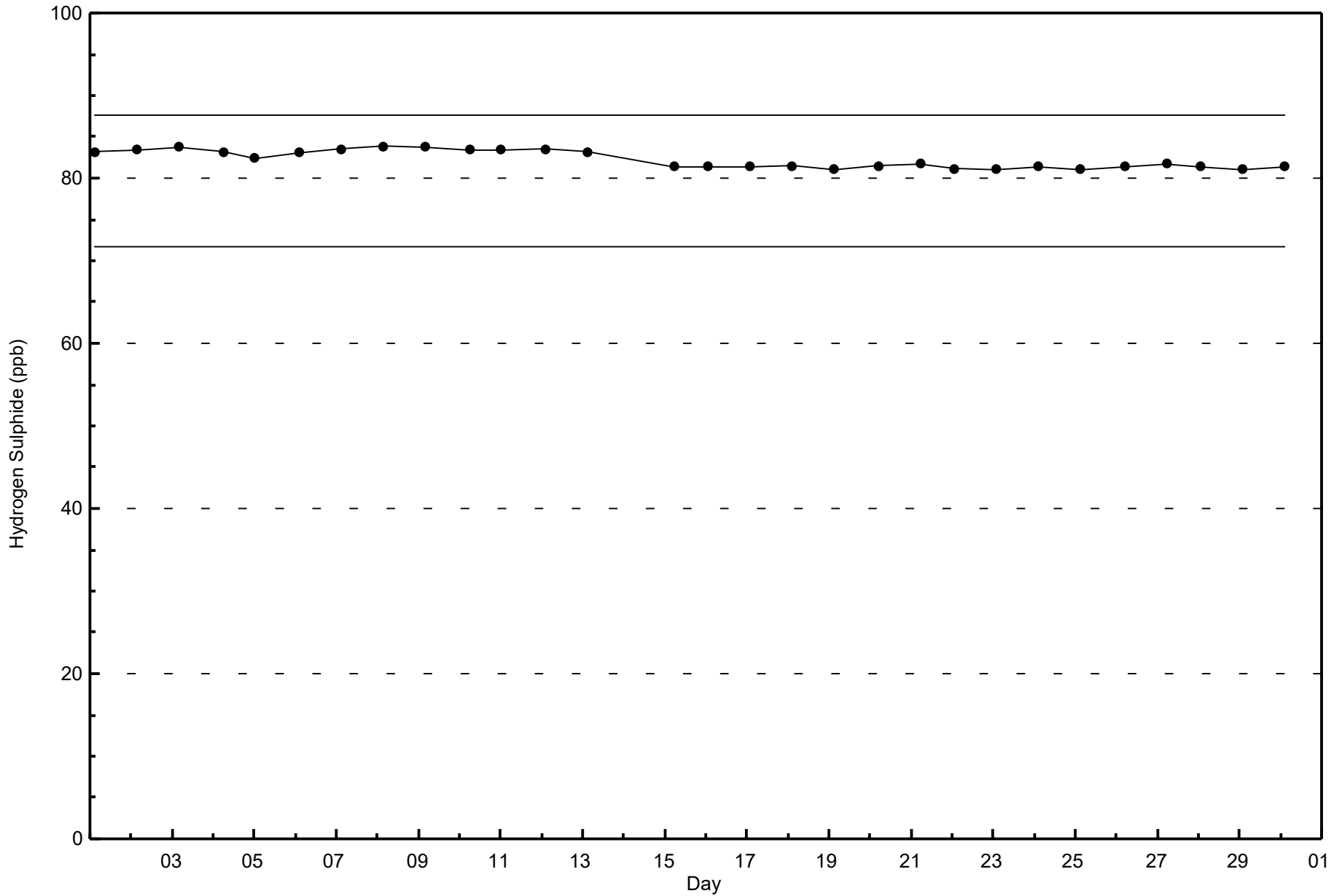
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Christina Lake



Total Number of Valid Hours: 317







Wood Buffalo Environmental Association
Summary of Hour Averages

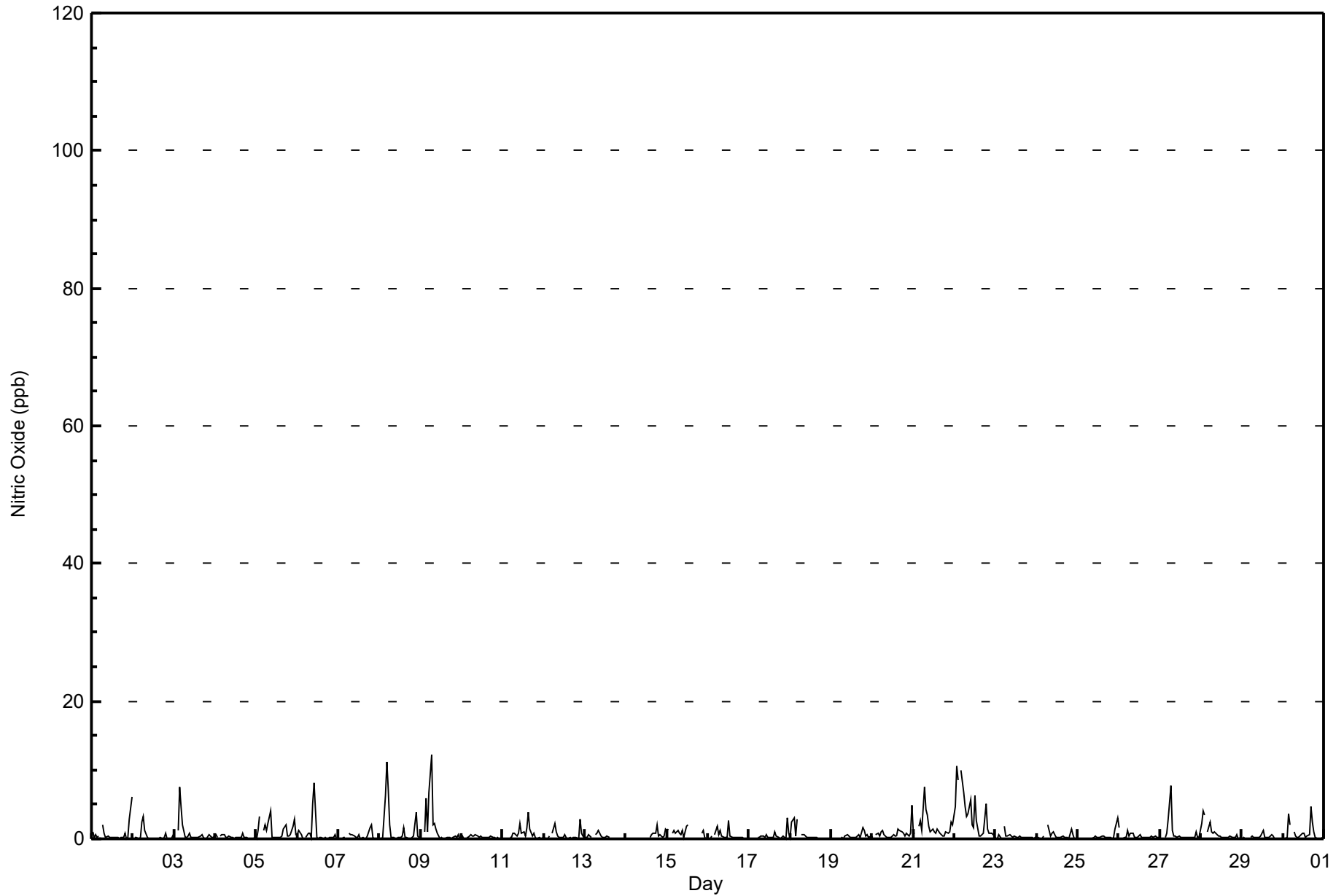
Nitric Oxide (NO) - ppb
Christina Lake - June 2023

Maximum Value: 12.2 ppb on Jun 9 07:00		Maximum Daily Average: 3.6 ppb on Jun 22		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 7 23:00		Minimum Daily Average: 0.2 ppb on Jun 29		Hours of Data: 663																						
Maximum Diurnal Average: 1.9 ppb at hour 7		Minimum Diurnal Average: 0.3 ppb at hour 14		Hours of Missing Data: 57																						
Monthly Average: 0.79 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.8 P ₉₀ = 2.0 P ₉₉ = 7.6		Hours of Calibration: 34																						
				Percent Operational Time: 96.8																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	1.1	0.3	0.6	0.2	0.3	Z	1.9	0.7	0.3	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.8	0.1	0.1	2.9	6.0	0.7	6.0
2-Jun	Z	0.1	0.2	0.1	0.3	2.5	3.3	1.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8	0.1	0.0	0.1	0.4	0.4	3.3
3-Jun	0.7	Z	1.3	7.5	4.7	2.1	0.1	0.2	0.3	0.7	0.2	0.1	0.1	0.3	0.2	0.4	0.6	0.2	0.1	0.0	0.6	0.3	0.3	0.2	0.9	7.5
4-Jun	0.7	0.1	Z	0.4	0.6	0.6	0.3	0.2	0.4	0.1	0.3	0.1	0.2	0.1	0.2	0.2	0.8	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8
5-Jun	0.1	1.2	3.3	Z	1.3	2.1	1.1	2.2	4.1	0.3	0.1	0.2	0.3	0.2	0.2	0.5	1.4	2.0	0.4	0.3	0.6	1.9	2.9	0.6	1.2	4.1
6-Jun	0.7	1.3	0.5	0.0	Z	0.2	0.7	0.8	0.3	5.0	8.1	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.6	0.1	0.9	8.1
7-Jun	0.0	0.1	0.0	0.1	0.2	Z	0.8	0.6	0.6	0.4	0.2	0.1	0.7	0.1	0.1	0.1	0.1	0.1	0.5	1.5	2.1	0.1	0.1	0.0	0.4	2.1
8-Jun	Z	0.1	0.1	6.2	11.1	7.1	2.0	0.2	0.2	0.1	0.0	0.1	0.3	0.5	1.5	0.1	0.1	0.1	0.1	0.1	0.5	3.9	0.4	0.1	1.5	11.1
9-Jun	0.0	Z	1.0	5.9	0.9	6.7	12.2	2.1	2.3	1.5	0.7	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.3	0.2	0.6	0.1	1.6	12.2
10-Jun	0.4	0.1	Z	0.3	0.2	0.6	0.4	0.4	0.5	0.4	0.3	0.4	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.3	0.6
11-Jun	0.1	0.1	0.1	Z	0.2	0.3	0.7	0.8	0.3	0.7	2.3	0.9	1.0	0.5	1.7	3.8	1.4	0.4	0.9	0.3	0.1	0.1	0.1	0.1	0.7	3.8
12-Jun	0.4	0.1	0.1	0.4	Z	0.8	2.3	1.0	0.4	0.1	0.2	0.1	0.5	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	2.8	0.8	0.5	0.5	2.8
13-Jun	0.1	0.3	0.7	0.5	0.2	Z	0.6	0.8	1.1	0.5	0.2	0.3	0.2	0.4	0.3	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	1.1
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	M	0.6	0.8	0.8	0.8	2.1	0.4	0.6	0.1	0.4	1.4	--	2.1
15-Jun	1.2	1.3	Z	0.7	1.2	0.8	1.3	0.9	0.6	1.3	0.3	1.8	2.0	M	1.6	C	C	C	C	C	0.8	1.1	0.2	0.0	--	2.0
16-Jun	0.1	0.0	0.4	Z	0.7	1.9	0.6	1.1	0.4	0.3	0.1	0.3	2.6	0.4	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.5	2.6
17-Jun	0.0	0.0	0.1	0.1	Z	0.2	0.3	0.4	0.4	0.2	0.5	0.2	0.2	0.2	0.1	1.1	0.3	0.1	0.1	0.2	0.4	0.0	3.0	0.9	0.4	3.0
18-Jun	0.2	2.5	3.0	0.4	2.8	Z	0.6	0.5	0.6	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.5	3.0
19-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.5	0.4	0.3	0.1	0.2	0.2	0.5	0.7	0.2	1.7	1.2	0.3	0.7	0.3	0.4	0.4	1.7
20-Jun	0.2	Z	0.6	0.7	0.3	1.1	1.2	0.6	0.2	0.2	0.2	0.2	0.5	0.3	0.4	1.3	1.1	0.9	0.7	0.5	0.8	0.3	0.9	4.8	0.8	4.8
21-Jun	0.8	0.8	Z	1.9	2.6	1.3	7.5	4.3	3.5	1.8	1.1	1.4	1.0	0.7	1.3	0.9	0.6	0.5	0.4	1.0	0.8	1.1	2.4	2.1	1.7	7.5
22-Jun	4.6	10.6	8.6	Z	10.0	6.7	4.7	3.3	3.6	5.7	2.0	1.5	6.2	2.6	0.4	0.5	0.7	0.8	5.0	1.4	0.8	0.8	0.8	0.5	3.6	10.6
23-Jun	0.1	0.1	0.6	0.1	Z	1.9	0.4	0.5	0.5	0.4	0.2	0.5	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	1.9
24-Jun	0.1	0.2	0.1	0.1	0.3	Z	2.0	1.1	0.5	0.9	1.0	0.2	0.1	0.2	0.2	0.3	0.1	0.2	0.2	0.1	1.5	0.5	0.1	0.1	0.4	2.0
25-Jun	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.2	0.4	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.2	1.5	3.1	0.4	3.1
26-Jun	1.6	Z	0.1	0.1	0.2	1.2	0.5	0.8	0.8	0.3	0.3	0.3	0.5	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.4	0.1	0.2	0.4	1.6
27-Jun	0.1	0.1	Z	0.2	0.7	2.9	7.6	1.3	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	1.0	0.2	0.2	0.8	7.6
28-Jun	2.2	4.0	3.5	Z	1.0	2.5	1.1	0.8	1.0	0.7	0.4	0.4	0.3	0.1	0.1	0.3	0.3	0.4	0.3	0.1	0.1	0.5	0.0	0.1	0.9	4.0
29-Jun	0.0	0.3	0.1	0.1	Z	0.3	0.4	0.2	0.2	0.1	0.1	0.5	1.3	0.1	0.1	0.2	0.3	0.5	0.3	0.1	0.1	0.1	0.0	0.1	0.2	1.3
30-Jun	0.1	0.0	0.2	3.7	2.1	Z	1.0	0.4	0.3	0.3	0.3	0.3	0.8	0.9	0.2	0.5	0.7	4.7	2.4	1.0	0.3	0.1	0.1	0.1	0.9	4.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.6 1.0 1.0 1.2 1.7 1.9 1.9 1.0 0.8 0.8 0.7 0.4 0.7 0.3 0.4 0.5 0.6 0.4 0.6 0.4 0.3 0.6 0.7 0.8		
																								4.6 10.6 8.6 7.5 11.1 7.1 12.2 4.3 4.1 5.7 8.1 1.8 6.2 2.6 1.7 3.8 4.7 2.4 5.0 2.1 1.5 3.9 3.0 6.0		
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure																



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Christina Lake - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Christina Lake - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	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: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Christina Lake - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	12	27	19	11	10	14	19	25	44	18	20	28	17	17	25	9	315
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	27	19	11	10	14	19	25	44	18	20	28	17	17	25	9	315

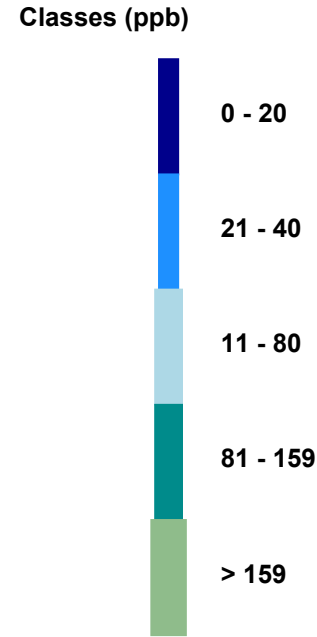
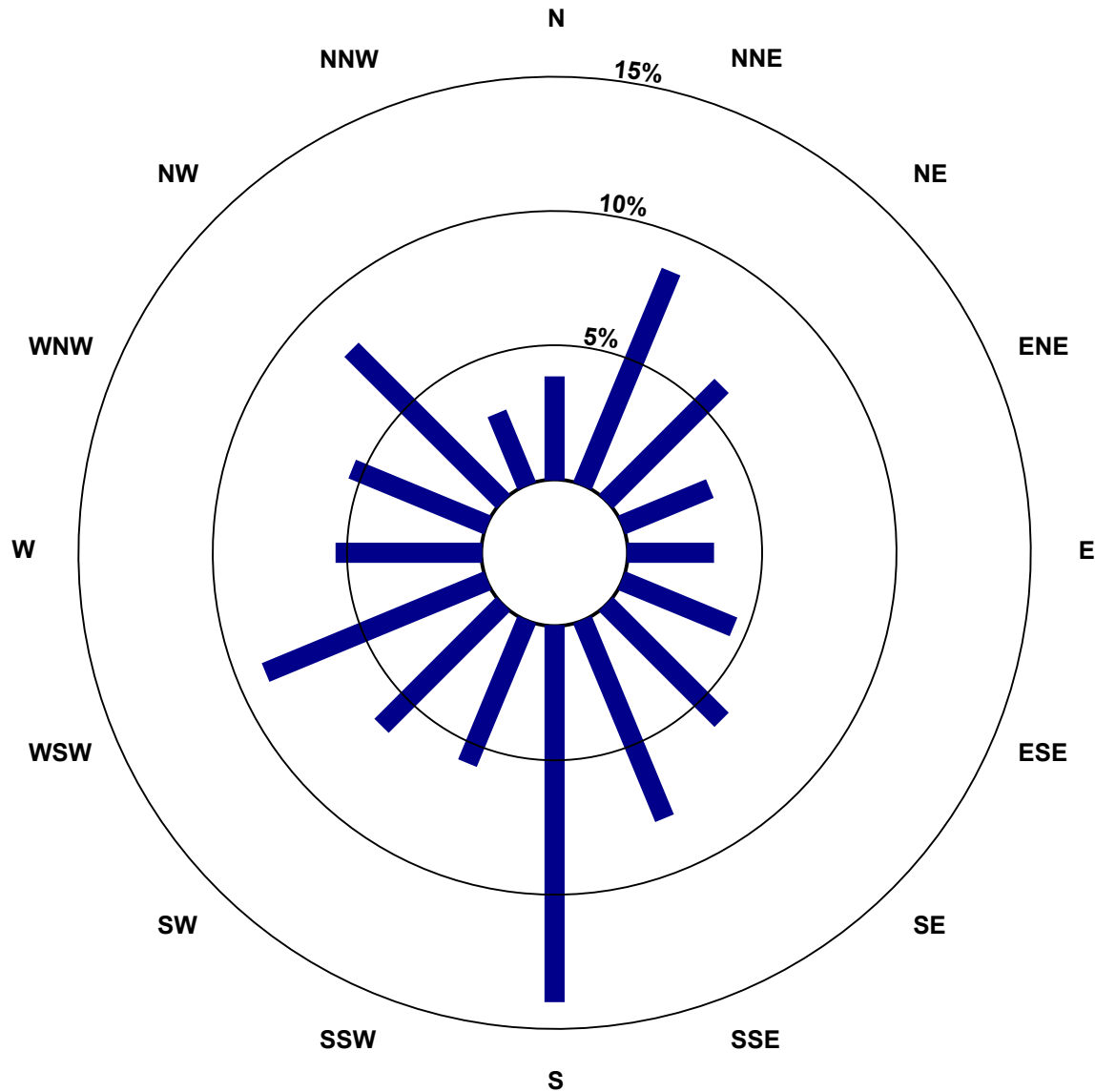
Total Number of Valid Hours: 315

Total Number of Hours: 720

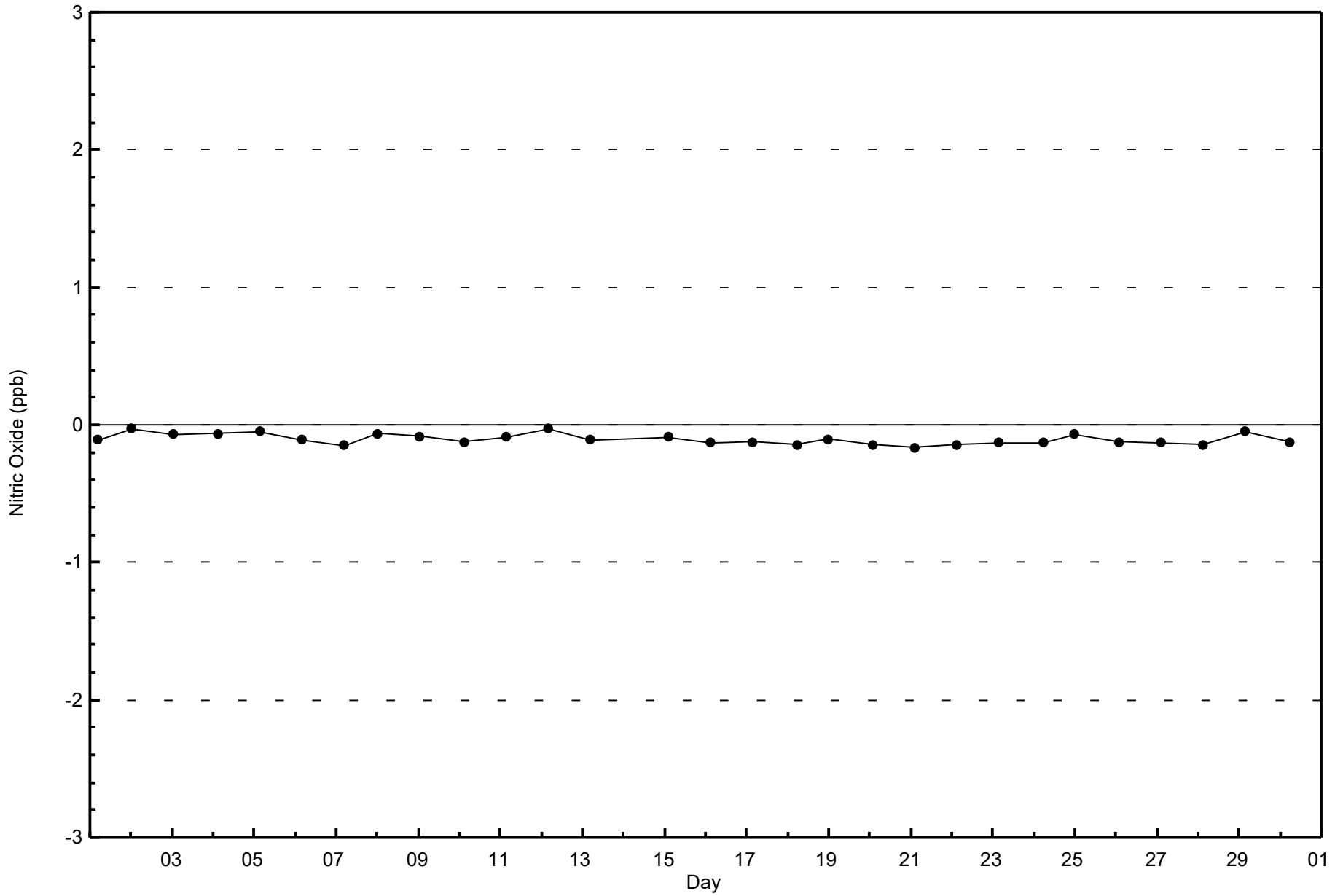


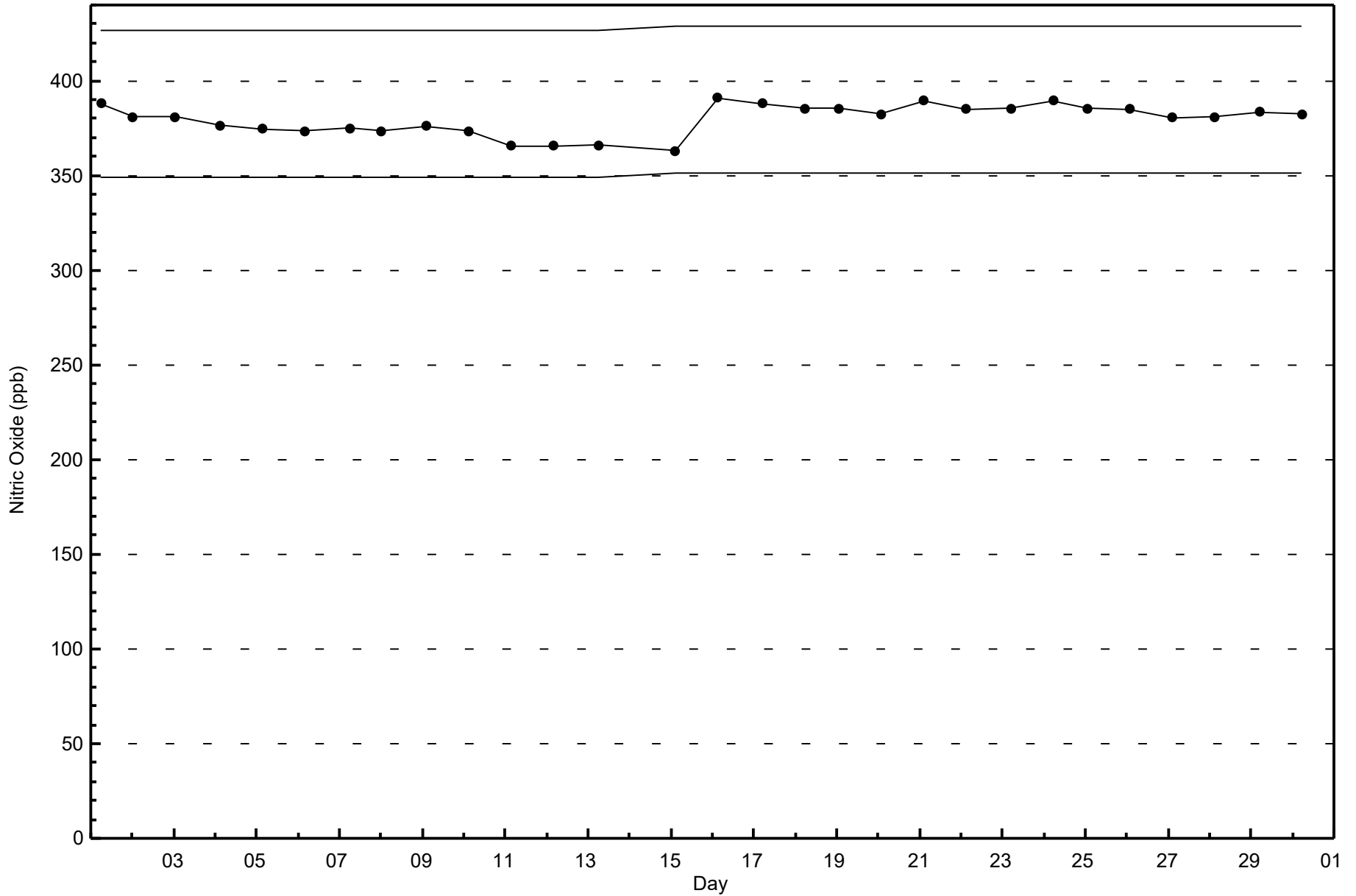
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Christina Lake



Total Number of Valid Hours: 315







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Christina Lake - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 15.2 ppb on Jun 8 04:00	Maximum Daily Average: 4.9 ppb on Jun 12		Hours of Data:	663
Minimum Value: 0.3 ppb on Jun 3 19:00	Minimum Daily Average: 1.0 ppb on Jun 25		Hours of Missing Data:	57
Maximum Diurnal Average: 3.7 ppb at hour 7	Minimum Diurnal Average: 1.5 ppb at hour 14		Hours of Calibration:	34
Monthly Average: 2.49 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 0.7 Q ₁ = 1.1 Median = 1.9 Q ₃ = 3.1 P ₉₀ = 5.2 P ₉₉ = 9.8		Percent Operational Time:	96.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	4.1	2.1	3.4	2.1	2.1	Z	5.9	2.8	2.1	3.2	2.3	2.1	2.1	2.0	1.8	1.8	1.6	2.2	1.8	4.0	1.9	3.2	9.3	14.3	3.4	14.3
2-Jun	Z	1.6	1.8	1.6	3.2	6.5	8.3	4.6	1.8	1.4	1.6	1.9	2.0	2.3	2.4	2.2	2.3	2.0	2.5	3.6	3.0	2.0	1.0	1.7	2.7	8.3
3-Jun	2.5	Z	6.3	5.7	5.7	3.7	0.8	0.8	1.2	1.9	0.9	0.8	0.7	0.7	0.5	0.7	1.0	0.4	0.3	0.4	2.6	1.1	0.7	1.9	1.8	6.3
4-Jun	1.7	2.7	Z	1.9	1.4	1.0	0.6	0.4	0.5	0.5	0.6	0.4	0.7	0.5	1.0	0.9	1.6	0.9	1.3	1.0	0.9	1.0	4.7	1.4	1.2	4.7
5-Jun	1.8	7.7	8.2	Z	5.3	4.1	2.8	3.3	4.7	0.8	0.6	1.3	1.2	1.1	0.8	1.0	3.9	5.7	1.8	3.0	3.2	4.5	4.5	1.6	3.2	8.2
6-Jun	1.5	3.8	2.1	0.9	Z	1.0	1.8	1.8	0.8	5.5	7.8	0.8	0.5	0.6	0.6	0.4	0.6	0.7	0.8	1.3	4.5	2.0	2.2	1.0	1.9	7.8
7-Jun	0.7	0.9	0.9	2.2	2.1	Z	3.3	3.1	2.8	2.8	2.3	1.7	2.6	1.4	1.3	0.8	0.8	1.6	4.4	7.0	1.6	1.8	2.1	2.1	2.2	7.0
8-Jun	Z	5.4	9.8	15.2	11.3	9.3	7.6	3.1	2.2	1.4	1.2	1.3	1.9	2.2	4.4	1.2	1.1	1.7	2.2	2.9	5.5	3.9	2.9	2.1	4.3	15.2
9-Jun	1.6	Z	2.3	4.2	2.3	5.3	10.4	7.5	8.1	6.0	1.8	0.6	0.6	0.5	0.6	0.7	0.8	1.0	0.6	0.9	2.2	5.2	3.3	1.7	3.0	10.4
10-Jun	2.0	1.7	Z	4.1	4.1	7.8	3.8	3.4	3.9	3.1	2.3	2.6	2.1	1.8	2.2	1.7	1.9	2.4	3.5	3.5	1.7	2.4	1.9	2.1	2.9	7.8
11-Jun	6.3	10.5	3.8	Z	3.5	4.3	5.0	4.8	3.2	3.9	6.9	3.9	4.5	3.0	5.1	7.8	4.4	3.1	4.7	1.6	1.2	1.4	1.6	1.3	4.2	10.5
12-Jun	4.0	4.0	4.5	5.0	Z	7.8	11.6	8.5	6.4	5.4	6.0	5.0	6.0	4.1	1.8	2.7	1.4	2.0	2.7	2.1	2.0	9.9	4.5	4.3	4.9	11.6
13-Jun	4.0	2.6	5.8	6.4	2.9	Z	1.9	2.9	5.8	4.5	3.9	4.0	3.3	3.1	3.0	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	6.4
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	M	M	0.6	1.6	1.6	1.6	2.0	1.1	1.3	1.2	1.1	1.5	--	2.0
15-Jun	1.6	1.8	Z	1.6	2.0	2.1	2.1	1.8	1.3	2.2	1.3	3.0	3.4	M	M	1.7	C	C	C	C	2.0	2.2	2.0	0.9	--	3.4
16-Jun	1.0	0.7	2.4	Z	3.1	4.4	2.2	3.5	1.2	1.2	1.0	1.4	4.0	2.0	1.8	1.3	1.6	1.2	1.3	1.7	1.5	1.4	0.4	0.5	1.8	4.4
17-Jun	0.6	0.9	1.1	0.7	Z	0.8	0.8	1.0	1.0	0.7	0.9	0.9	0.9	0.6	0.6	1.4	0.6	0.6	0.6	1.6	3.0	1.9	6.0	7.4	1.5	7.4
18-Jun	4.5	7.5	7.9	5.1	5.4	Z	2.0	2.7	2.3	1.6	0.7	0.8	0.9	0.7	0.5	0.5	0.4	0.3	0.4	0.3	0.4	1.2	1.6	2.3	2.2	7.9
19-Jun	Z	2.0	1.1	0.4	0.4	0.7	0.6	0.4	1.7	1.6	1.1	0.8	1.0	1.9	2.1	2.6	3.0	1.2	2.4	2.5	1.7	2.1	1.2	1.0	1.5	3.0
20-Jun	0.9	Z	1.6	1.9	1.4	1.8	1.9	1.2	0.7	0.8	0.6	0.7	1.1	0.9	0.8	1.8	1.9	1.6	1.5	1.5	2.0	1.4	1.5	4.3	1.5	4.3
21-Jun	1.8	2.1	Z	3.3	3.6	2.0	7.8	4.9	4.9	3.0	2.1	2.0	1.8	1.6	2.7	1.8	1.2	1.1	1.0	3.7	3.2	7.2	1.5	1.2	2.8	7.8
22-Jun	6.8	3.2	2.9	Z	4.0	4.2	2.8	2.9	5.1	7.5	5.2	3.2	7.0	3.6	1.3	2.1	3.7	2.9	6.8	7.7	6.1	4.3	8.7	4.1	4.6	8.7
23-Jun	1.5	2.1	5.7	0.9	Z	3.0	1.1	0.9	1.8	1.6	1.3	2.2	1.7	1.5	1.9	1.9	1.8	1.7	2.2	1.4	2.6	6.3	1.4	1.3	2.1	6.3
24-Jun	1.3	2.3	2.7	3.3	4.3	Z	6.1	4.3	2.8	1.9	2.1	1.3	0.9	1.1	0.9	1.4	0.8	1.0	1.5	0.7	4.4	2.6	0.8	0.7	2.1	6.1
25-Jun	Z	1.2	1.2	0.4	0.4	0.5	0.6	0.4	0.4	1.1	1.0	0.8	0.7	0.9	0.9	0.9	0.6	0.9	0.8	0.9	0.9	2.1	3.3	2.6	1.0	3.3
26-Jun	2.8	Z	0.4	0.8	1.6	3.5	1.2	1.1	1.7	1.1	1.1	1.1	1.4	1.1	0.9	1.1	1.7	2.0	2.6	2.5	2.8	2.4	1.7	1.8	1.7	3.5
27-Jun	2.6	2.6	Z	3.0	2.6	3.6	5.3	1.7	1.5	1.9	1.9	2.2	1.6	1.1	1.1	0.8	0.5	0.5	0.7	1.1	1.2	1.9	5.2	5.4	2.2	5.4
28-Jun	3.1	3.6	3.6	Z	3.1	4.1	2.3	2.0	2.3	1.3	0.9	1.0	1.0	0.8	0.9	1.4	2.0	1.3	2.3	1.8	3.1	5.8	1.1	1.4	2.2	5.8
29-Jun	1.6	1.9	3.6	1.5	Z	2.8	2.9	2.2	1.8	1.4	1.4	1.7	3.5	1.4	1.4	2.0	3.4	3.6	2.8	1.2	1.6	2.8	2.6	1.2	2.2	3.6
30-Jun	1.7	0.9	2.3	8.6	5.9	Z	2.8	1.7	1.5	1.3	1.3	1.6	1.9	0.7	1.2	2.0	8.4	4.7	3.7	1.6	1.0	2.1	1.4	1.9	2.6	8.6

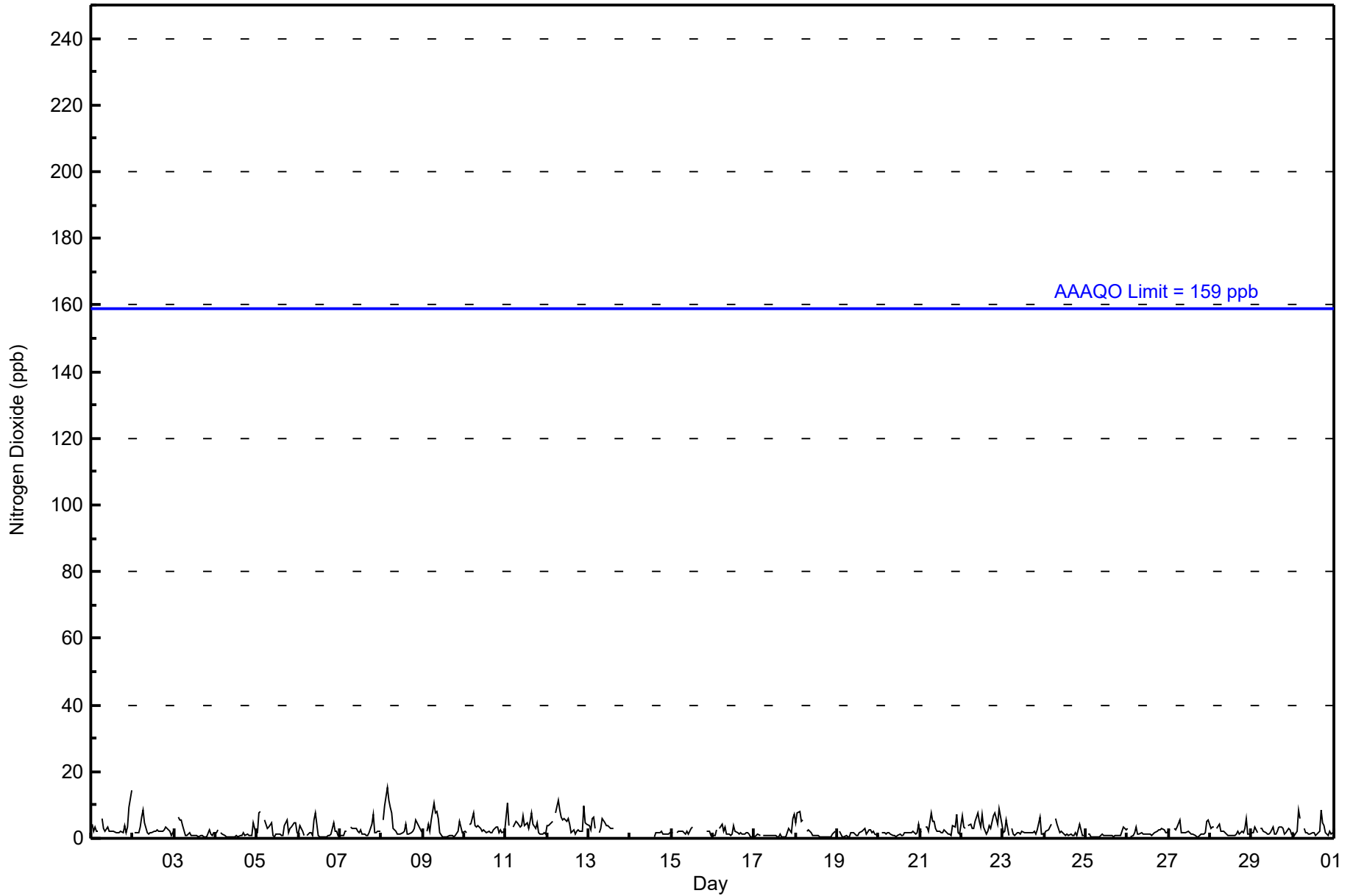
2.5	3.0	3.6	3.4	3.4	3.7	3.7	2.7	2.6	2.4	2.1	1.8	2.1	1.5	1.6	1.7	2.0	1.8	2.1	2.2	2.4	3.0	2.8	2.6	Diurnal Average	
6.8	10.5	9.8	15.2	11.3	9.3	11.6	8.5	8.1	7.5	7.8	5.0	7.0	4.1	5.1	7.8	8.4	5.7	6.8	7.7	6.1	9.9	9.3	14.3	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	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: 663

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - June 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	12	27	19	11	10	14	19	25	44	18	20	28	17	17	25	9	315
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	27	19	11	10	14	19	25	44	18	20	28	17	17	25	9	315

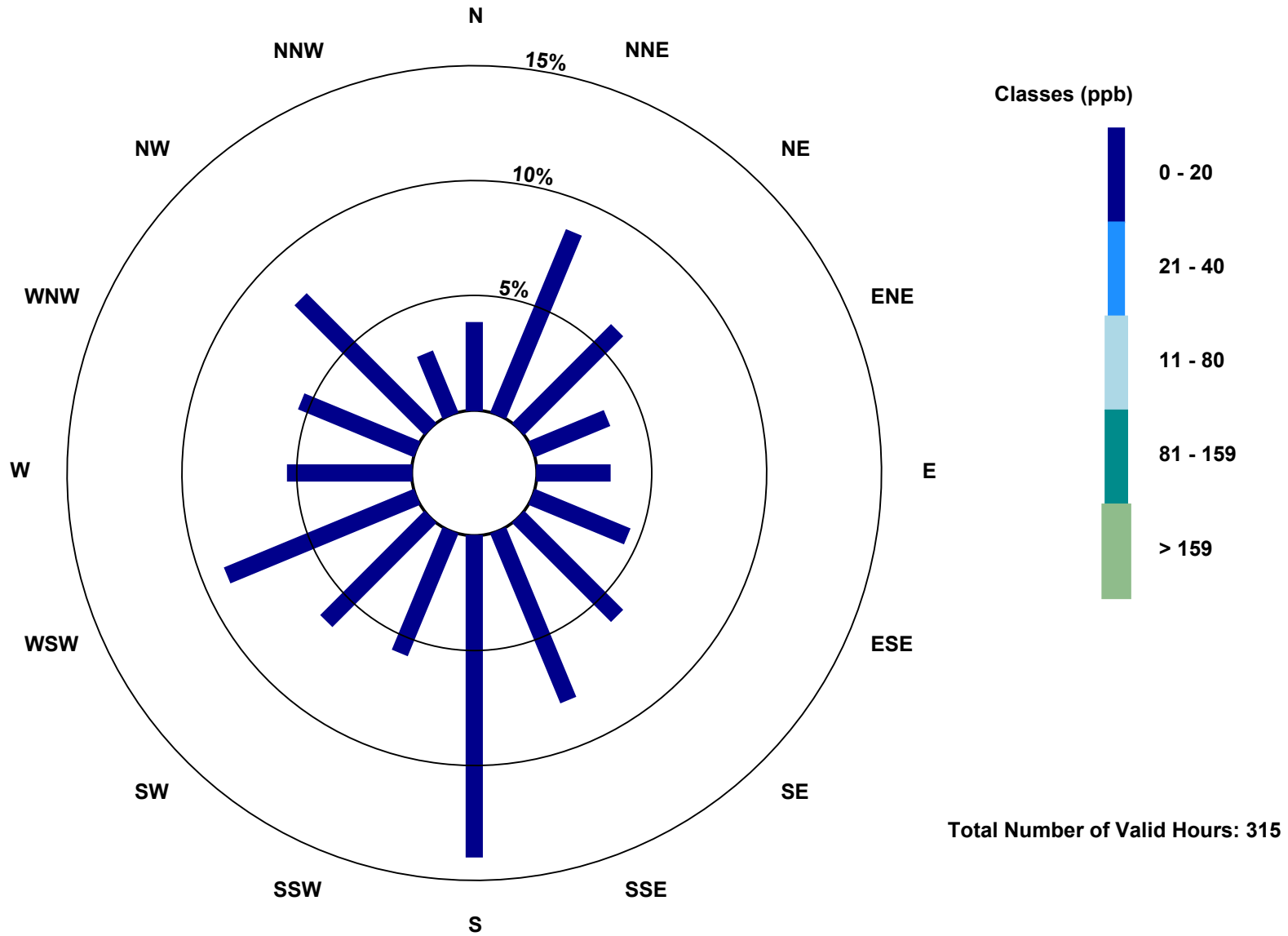
Total Number of Valid Hours: 315

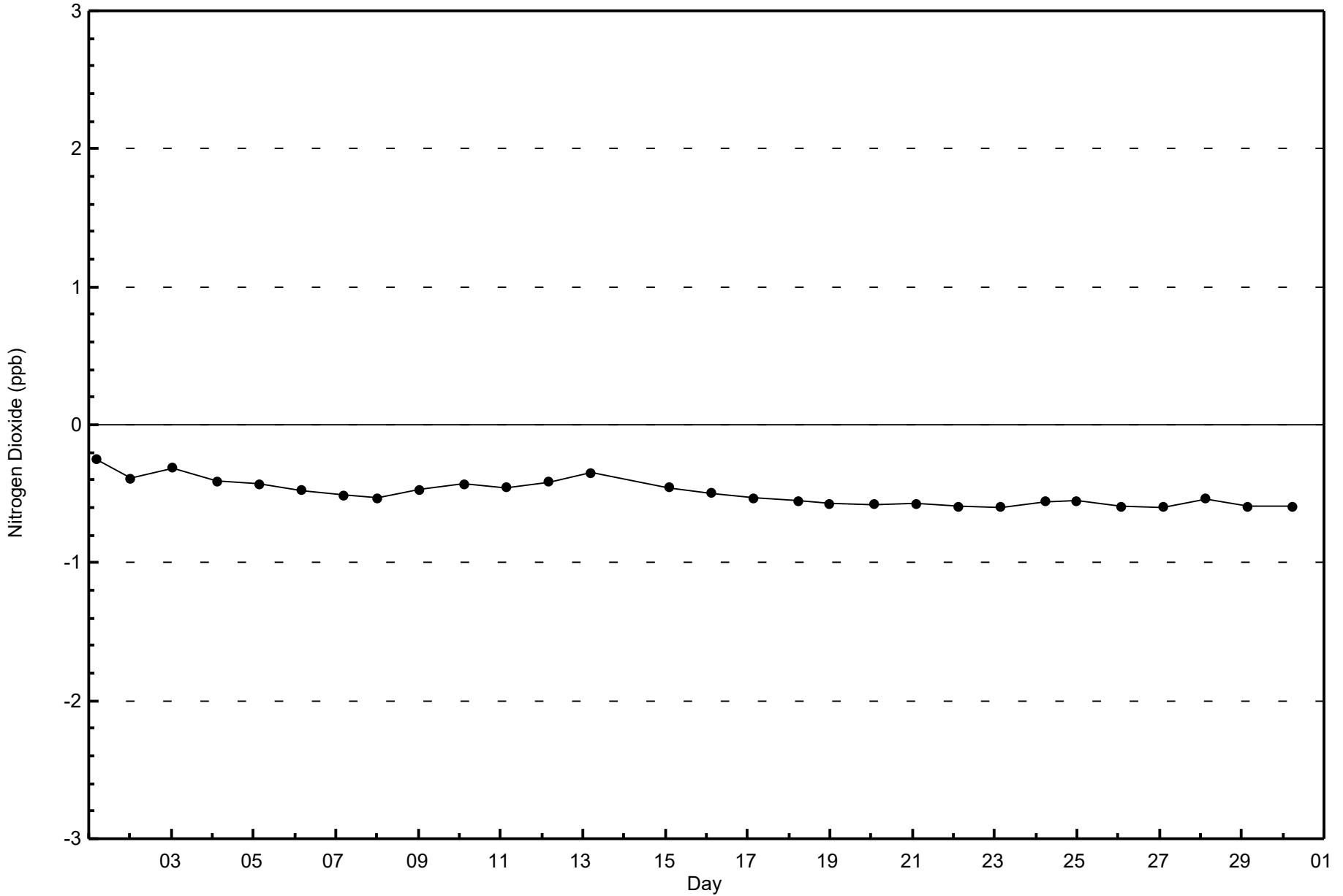
Total Number of Hours: 720

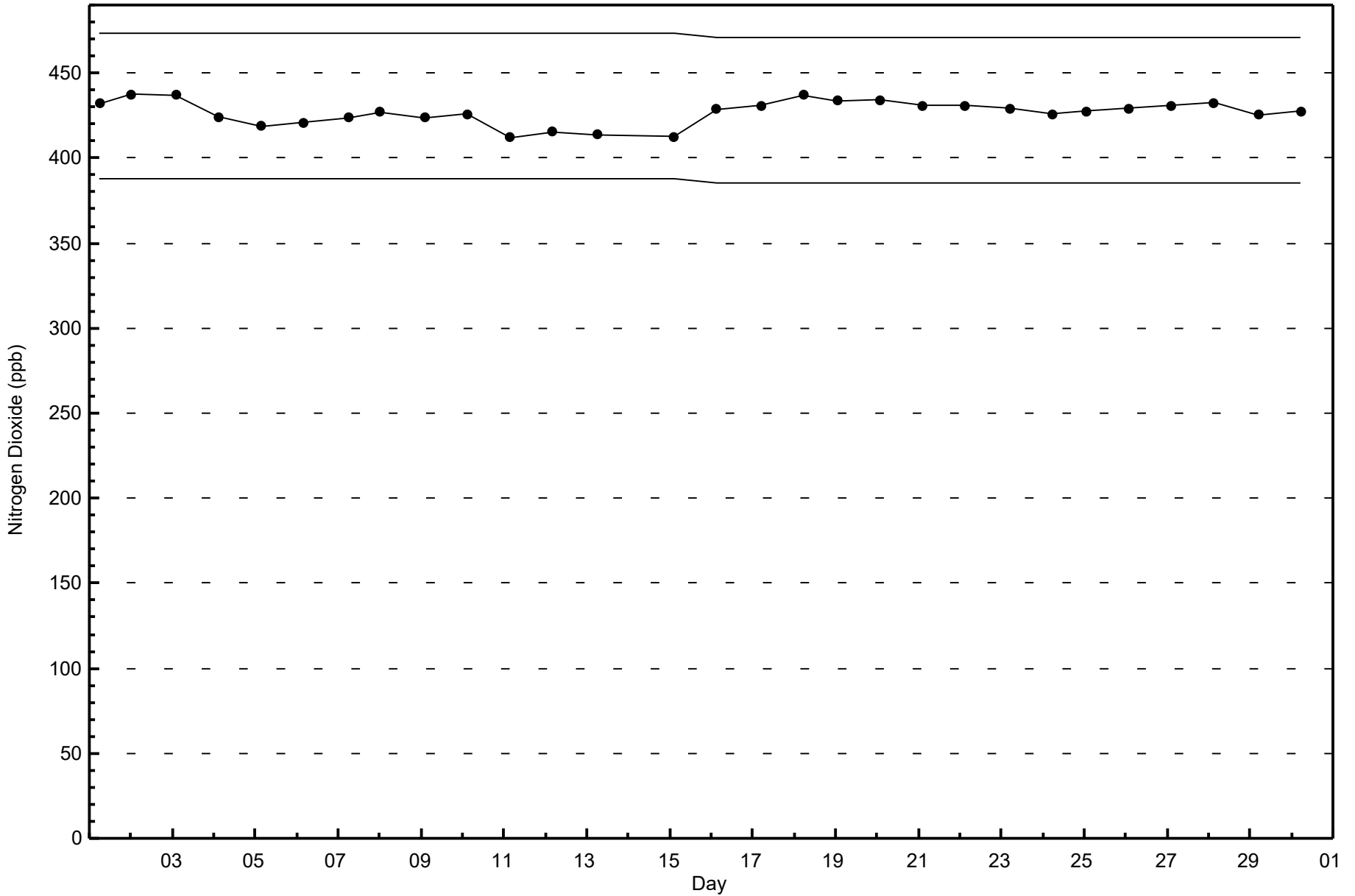


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

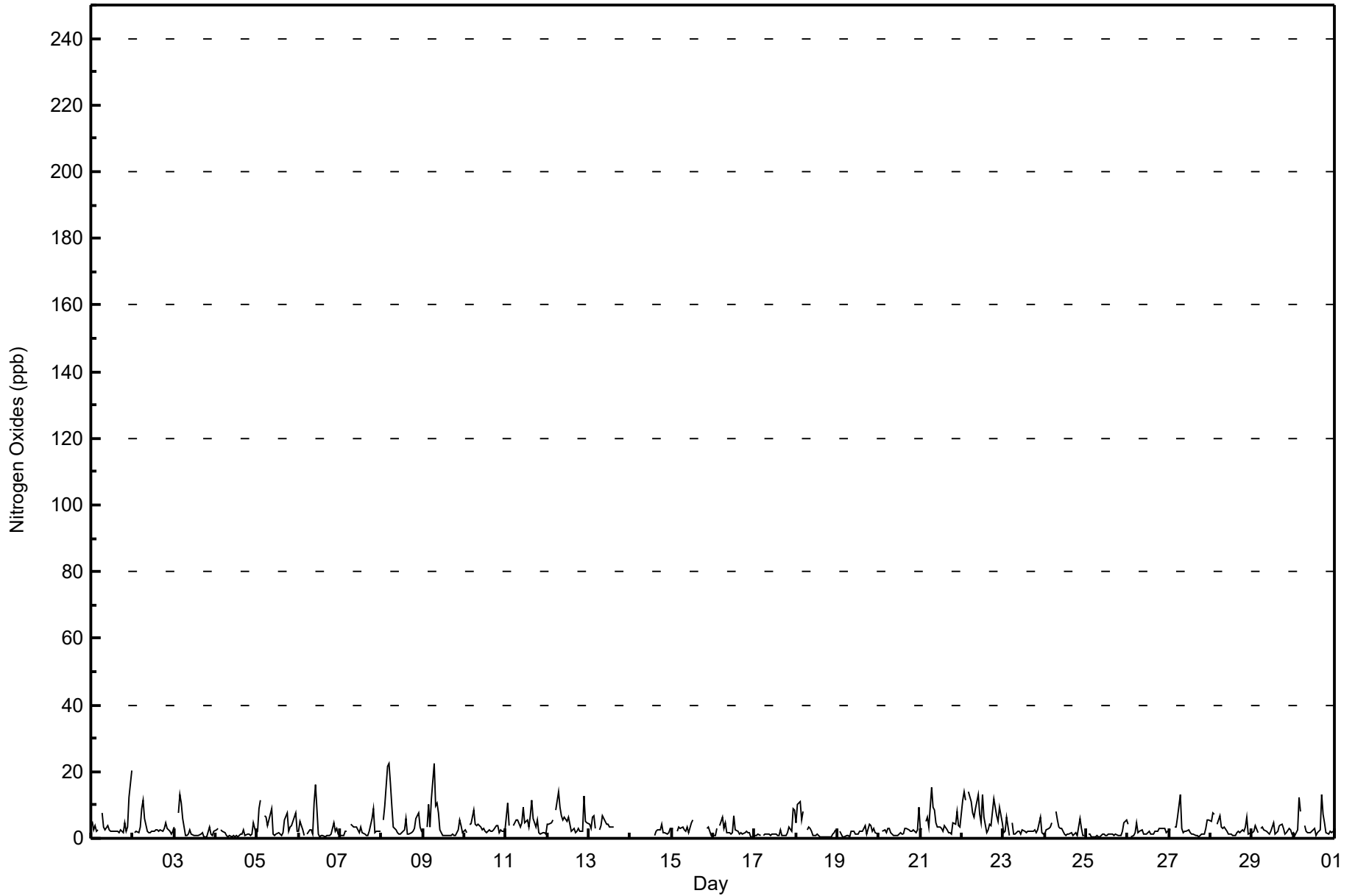
Nitrogen Oxides (NO_x) - ppb
Christina Lake - June 2023

Maximum Value: 22.6 ppb on Jun 9 07:00		Maximum Daily Average: 8.2 ppb on Jun 22		Hours in Service: 720																																													
Minimum Value: 0.4 ppb on Jun 25 05:00		Minimum Daily Average: 1.4 ppb on Jun 25		Hours of Data: 663																																													
Maximum Diurnal Average: 5.6 ppb at hour 7		Minimum Diurnal Average: 1.9 ppb at hour 14		Hours of Missing Data: 57																																													
Monthly Average: 3.28 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 0.9 Q ₁ = 1.4 Median = 2.2 Q ₃ = 3.8 P ₉₀ = 7.1 P ₉₉ = 14.5		Hours of Calibration: 34																																													
				Percent Operational Time: 96.8																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	5.2	2.4	4.0	2.3	2.4	Z	7.8	3.5	2.4	3.7	2.5	2.2	2.2	2.1	1.9	1.9	1.7	2.4	1.9	4.8	2.0	3.3	12.2	20.3	4.1	20.3																							
2-Jun	Z	1.7	2.0	1.7	3.5	9.0	11.6	5.9	2.0	1.5	1.6	2.0	2.1	2.4	2.5	2.3	2.4	2.1	2.8	4.4	3.1	2.0	1.1	2.1	3.1	11.6																							
3-Jun	3.2	Z	7.6	13.2	10.4	5.8	0.9	1.0	1.5	2.6	1.1	0.9	0.8	1.0	0.7	1.1	1.6	0.6	0.4	0.4	3.2	1.4	1.0	2.1	2.7	13.2																							
4-Jun	2.4	2.8	Z	2.3	2.0	1.6	0.9	0.6	0.9	0.6	0.9	0.5	0.9	0.6	1.2	1.1	2.4	1.1	1.4	1.1	1.0	1.1	4.8	1.5	1.5	4.8																							
5-Jun	1.9	8.9	11.5	Z	6.6	6.2	3.9	5.5	8.8	1.1	0.7	1.5	1.5	1.3	1.0	1.5	5.3	7.7	2.2	3.3	3.8	6.4	7.4	2.2	4.4	11.5																							
6-Jun	2.2	5.1	2.6	0.9	Z	1.2	2.5	2.6	1.1	10.5	15.9	1.1	0.6	0.7	0.8	0.5	0.7	0.8	0.9	1.4	4.7	2.1	2.8	1.1	2.7	15.9																							
7-Jun	0.7	1.0	0.9	2.3	2.3	Z	4.1	3.7	3.4	3.2	2.5	1.8	3.3	1.5	1.4	0.9	0.9	2.1	5.9	9.1	1.7	1.9	2.1	2.1	2.5	9.1																							
8-Jun	Z	5.5	9.9	21.4	22.4	16.4	9.6	3.3	2.4	1.5	1.2	1.4	2.2	2.7	5.9	1.3	1.2	1.8	2.3	3.0	6.0	7.8	3.3	2.2	5.9	22.4																							
9-Jun	1.6	Z	3.3	10.1	3.2	12.0	22.6	9.6	10.4	7.5	2.5	0.7	0.7	0.6	0.7	0.8	1.0	1.3	0.7	1.0	2.5	5.4	3.9	1.8	4.5	22.6																							
10-Jun	2.4	1.8	Z	4.4	4.3	8.4	4.2	3.8	4.4	3.5	2.6	3.0	2.3	1.9	2.4	1.9	2.1	2.7	3.7	3.6	1.8	2.6	2.0	2.2	3.1	8.4																							
11-Jun	6.4	10.6	3.9	Z	3.7	4.6	5.7	5.6	3.5	4.6	9.2	4.8	5.5	3.5	6.8	11.6	5.8	3.5	5.6	1.9	1.3	1.5	1.7	1.4	4.9	11.6																							
12-Jun	4.4	4.1	4.6	5.4	Z	8.6	13.9	9.5	6.8	5.5	6.2	5.1	6.5	4.3	1.9	2.9	1.5	2.1	2.9	2.3	2.1	12.7	5.3	4.8	5.4	13.9																							
13-Jun	4.1	2.9	6.5	6.9	3.1	Z	2.5	3.7	6.9	5.0	4.1	4.3	3.5	3.3	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	6.9																							
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	M	0.8	2.2	2.4	2.4	4.1	1.5	1.9	1.3	1.5	2.9	--	4.1																							
15-Jun	2.8	3.1	Z	2.3	3.2	2.9	3.4	2.7	1.9	3.5	1.6	4.8	5.4	M	3.3	C	C	C	C	C	2.8	3.3	2.2	0.9	--	5.4																							
16-Jun	1.1	0.7	2.8	Z	3.8	6.3	2.8	4.6	1.6	1.5	1.1	1.7	6.6	2.4	2.0	1.5	1.8	1.4	1.5	2.0	1.6	1.5	0.5	0.6	2.2	6.6																							
17-Jun	0.6	0.9	1.2	0.8	Z	1.0	1.1	1.4	1.4	0.9	1.4	1.1	1.1	0.8	0.7	2.5	0.9	0.7	0.7	1.8	3.4	1.9	9.0	8.3	1.9	9.0																							
18-Jun	4.7	10.0	10.9	5.5	8.2	Z	2.6	3.2	2.9	2.1	0.9	1.0	1.1	0.8	0.6	0.6	0.5	0.4	0.5	0.4	0.5	1.2	1.6	2.4	2.7	10.9																							
19-Jun	Z	2.1	1.2	0.5	0.5	0.8	0.7	0.5	2.1	2.1	1.5	1.1	1.1	2.1	2.3	3.1	3.7	1.4	4.1	3.7	2.0	2.8	1.5	1.4	1.8	4.1																							
20-Jun	1.1	Z	2.2	2.6	1.7	2.9	3.1	1.8	0.9	1.0	0.8	0.9	1.6	1.2	1.2	3.1	3.0	2.5	2.2	2.0	2.8	1.7	2.4	9.1	2.3	9.1																							
21-Jun	2.6	2.9	Z	5.2	6.2	3.3	15.3	9.2	8.4	4.8	3.2	3.4	2.8	2.3	4.0	2.7	1.8	1.6	1.4	4.7	4.0	8.3	3.9	3.3	4.6	15.3																							
22-Jun	11.4	13.8	11.5	Z	14.0	10.9	7.5	6.2	8.7	13.2	7.2	4.7	13.2	6.2	1.7	2.6	4.4	3.7	11.8	9.1	6.9	5.1	9.5	4.6	8.2	14.0																							
23-Jun	1.6	2.2	6.3	1.0	Z	4.9	1.5	1.4	2.3	2.0	1.5	2.7	2.0	1.7	2.2	2.2	2.0	1.9	2.4	1.6	2.8	6.4	1.5	1.4	2.4	6.4																							
24-Jun	1.4	2.5	2.8	3.4	4.6	Z	8.1	5.4	3.3	2.8	3.1	1.5	1.0	1.3	1.1	1.7	0.9	1.2	1.7	0.8	5.9	3.1	0.9	0.8	2.6	8.1																							
25-Jun	Z	1.3	1.3	0.5	0.4	0.6	0.7	0.5	0.4	1.3	1.4	1.0	0.9	1.2	1.3	1.3	0.8	1.1	1.0	1.0	1.0	2.3	4.8	5.7	1.4	5.7																							
26-Jun	4.4	Z	0.5	0.9	1.8	4.7	1.7	1.9	2.5	1.4	1.4	1.4	1.9	1.3	1.1	1.3	2.0	2.2	2.8	2.8	3.0	2.8	1.8	2.0	2.1	4.7																							
27-Jun	2.7	2.7	Z	3.2	3.3	6.5	12.9	3.0	1.9	2.3	2.2	2.6	1.9	1.3	1.3	0.9	0.7	0.6	0.9	1.3	1.4	2.9	5.4	5.6	2.9	12.9																							
28-Jun	5.3	7.6	7.1	Z	4.1	6.6	3.4	2.8	3.3	2.0	1.3	1.4	1.3	0.9	1.0	1.7	2.3	1.7	2.6	1.9	3.2	6.3	1.1	1.5	3.1	7.6																							
29-Jun	1.6	2.2	3.7	1.6	Z	3.1	3.3	2.4	2.0	1.5	1.5	2.2	4.8	1.5	1.5	2.2	3.7	4.1	3.1	1.3	1.7	2.9	2.6	1.3	2.4	4.8																							
30-Jun	1.8	0.9	2.5	12.3	8.0	Z	3.8	2.1	1.8	1.6	1.6	2.4	2.8	0.9	1.7	2.7	13.1	7.1	4.7	1.9	1.1	2.2	1.5	2.0	3.5	13.1																							
																								3.1	4.0	4.6	4.6	5.1	5.6	5.6	3.7	3.4	3.3	2.9	2.2	2.8	1.9	2.0	2.2	2.5	2.2	2.7	2.7	3.6	3.4	3.4	Diurnal Average		
																								11.4	13.8	11.5	21.4	22.4	16.4	22.6	9.6	10.4	13.2	15.9	5.1	13.2	6.2	6.8	11.6	13.1	7.7	11.8	9.1	6.9	12.7	12.2	20.3	Diurnal Maximum	
Z - zerspan		C - Calibration				M - Maintenance				DF - DAS Failure																																							



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	660	99.55	99.55
21 - 40	3	0.45	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: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	12	27	19	11	10	14	19	24	44	16	20	28	17	17	25	9	312
21 - 40	0	0	0	0	0	0	0	1	0	2	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	12	27	19	11	10	14	19	25	44	18	20	28	17	17	25	9	315

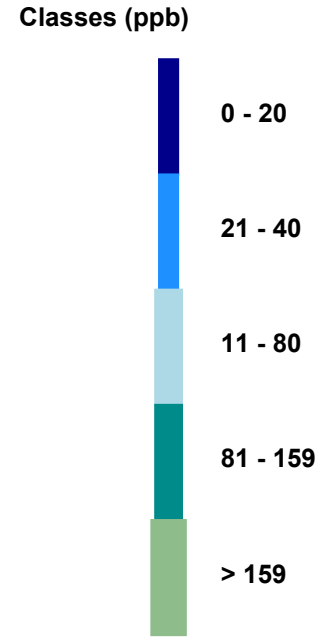
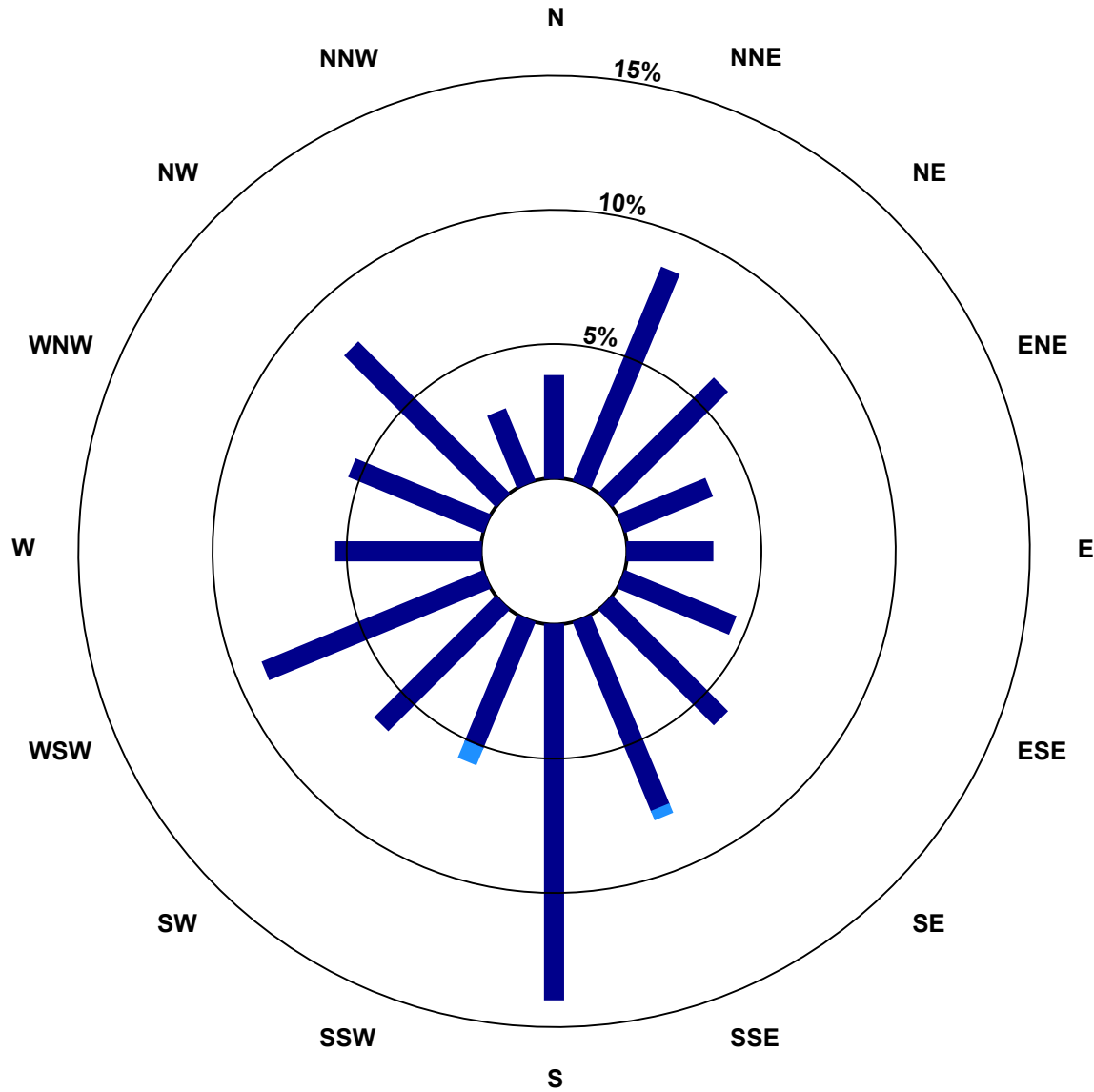
Total Number of Valid Hours: 315

Total Number of Hours: 720

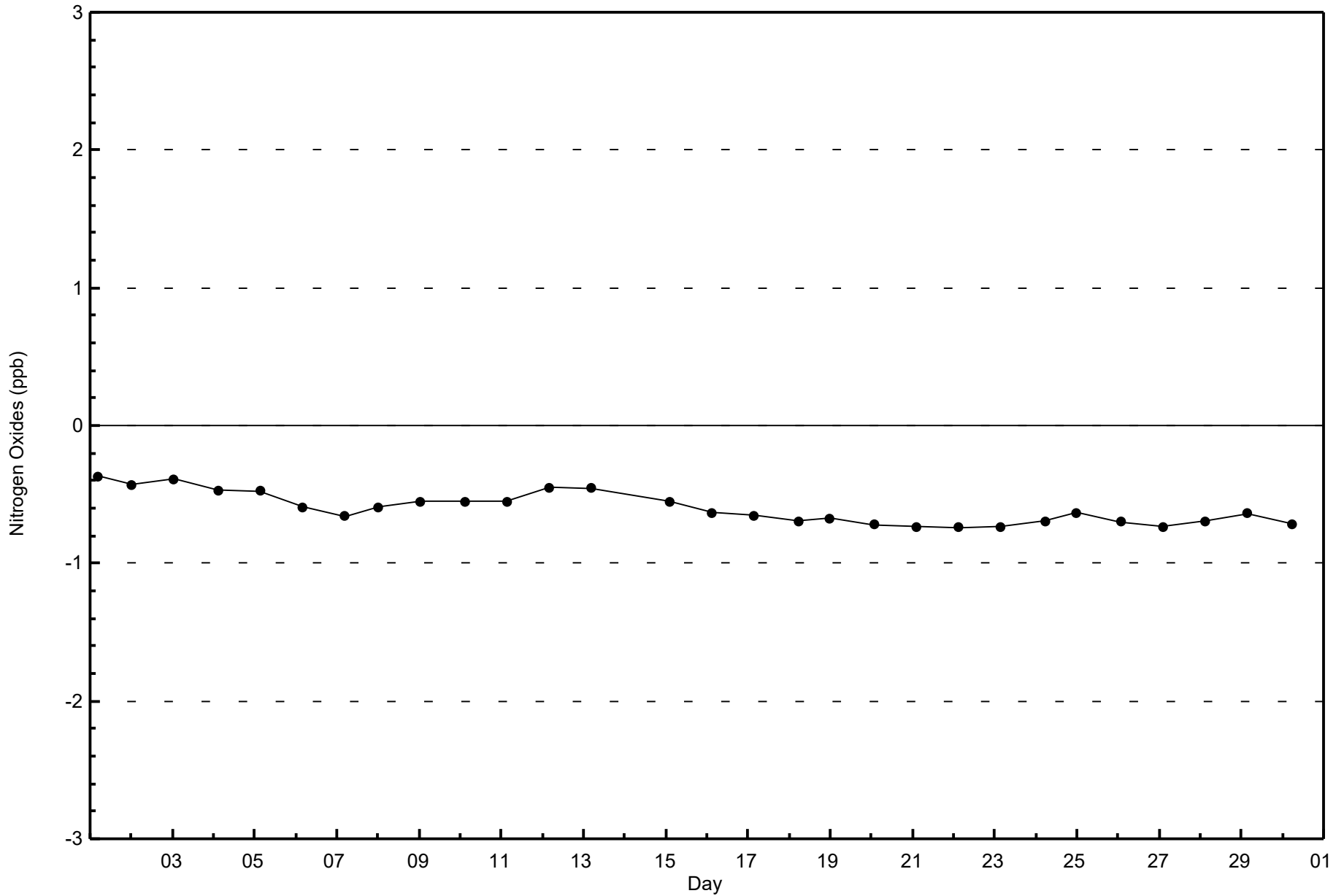


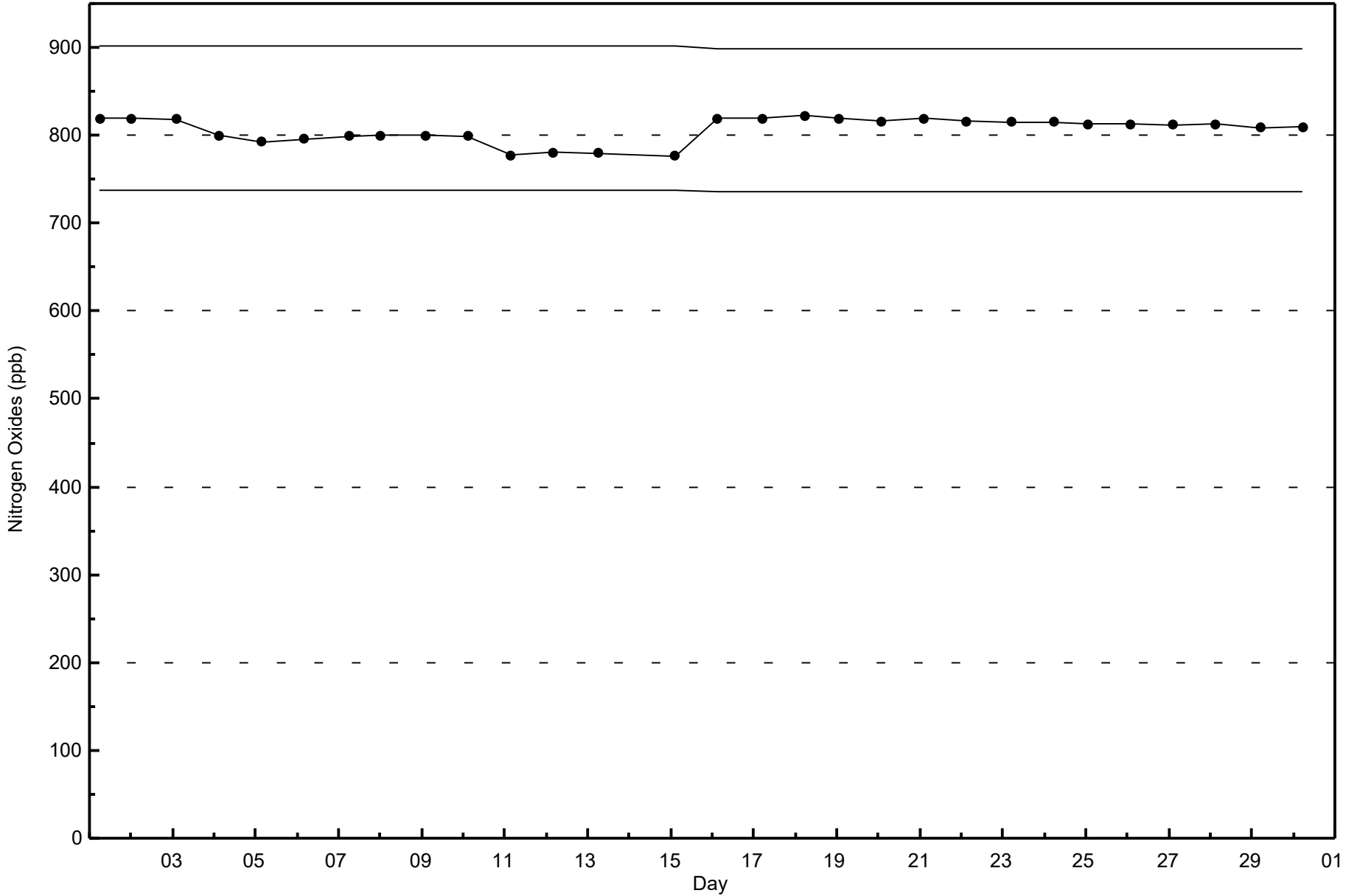
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Christina Lake



Total Number of Valid Hours: 315



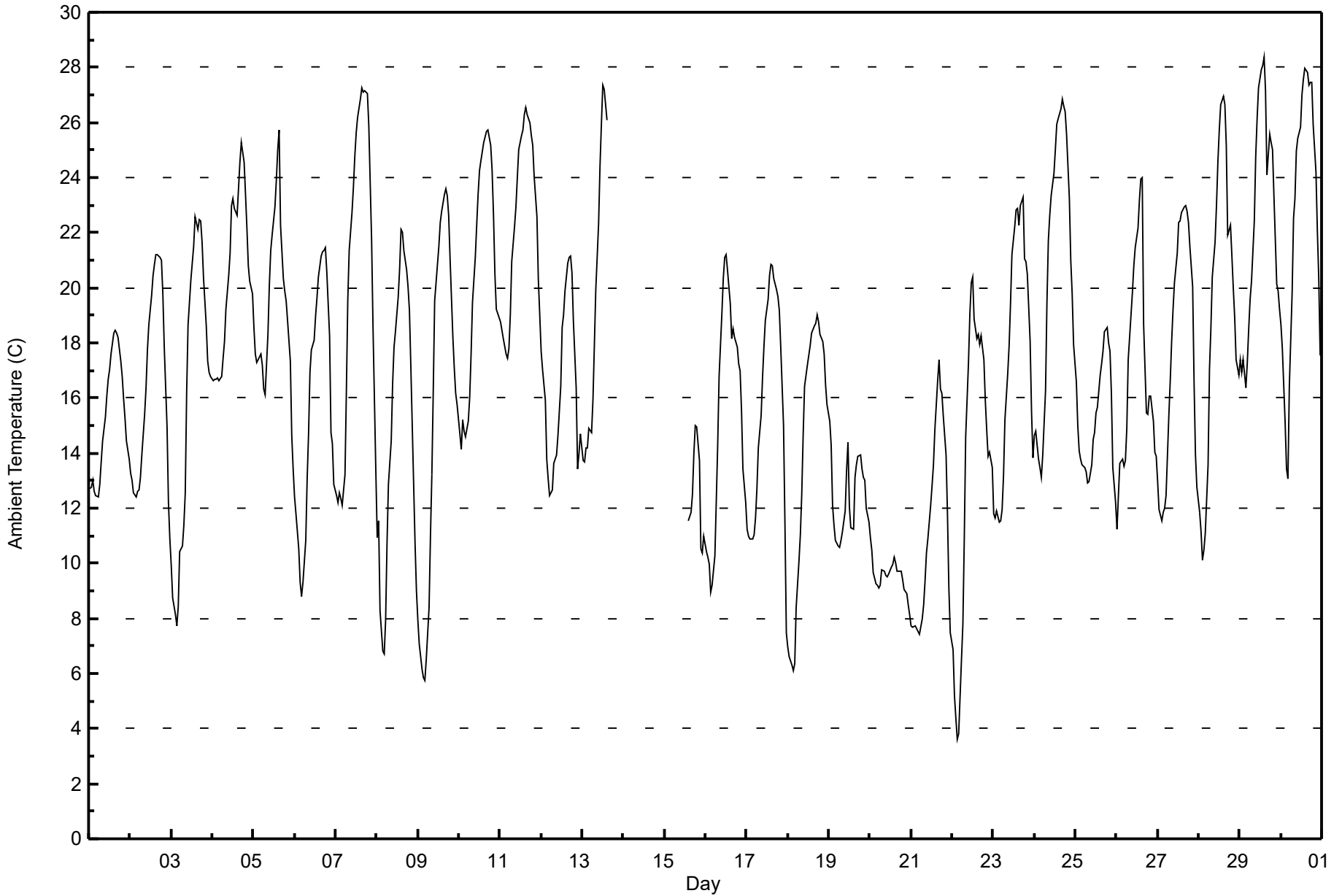




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Christina Lake - June 2023

Maximum Value: 28.4 C on Jun 29 15:00		Maximum Daily Average: 22.5 C on Jun 30		Hours in Service: 720																						
Minimum Value: 3.6 C on Jun 22 04:00		Minimum Daily Average: 9.6 C on Jun 20		Hours of Data: 673																						
Maximum Diurnal Average: 21.4 C at hour 16		Minimum Diurnal Average: 11.6 C at hour 5		Hours of Missing Data: 47																						
Monthly Average: 16.96 C		Percentiles: P ₁ = 6.1 P ₁₀ = 10.0 Q ₁ = 12.9 Median = 17.0 Q ₃ = 21.0 P ₉₀ = 24.5 P ₉₉ = 27.4		Hours of Calibration: 0																						
				Percent Operational Time: 93.5																						
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-Jun	12.7	12.8	13.0	12.6	12.5	12.4	12.9	13.7	14.5	15.3	16.1	16.7	17.0	17.6	18.4	18.5	18.4	18.2	17.3	16.8	16.0	15.2	14.4	13.8	15.3	18.5
2-Jun	13.3	13.0	12.6	12.4	12.6	12.7	13.1	13.9	15.4	16.4	17.7	18.7	19.7	20.4	20.8	21.2	21.2	21.1	21.0	19.8	17.8	15.0	12.2	10.9	16.4	21.2
3-Jun	9.9	8.7	8.1	7.7	8.5	10.4	10.6	11.4	12.6	16.2	18.7	20.3	20.9	21.5	22.6	22.1	22.5	22.4	21.7	20.4	18.6	17.3	16.9	16.8	16.1	22.6
4-Jun	16.6	16.7	16.7	16.7	16.6	16.8	17.4	18.1	19.2	20.5	21.3	23.0	23.3	22.9	22.6	23.6	24.6	25.3	24.6	23.4	22.2	20.8	20.2	19.8	20.5	25.3
5-Jun	18.6	17.6	17.3	17.5	17.6	17.2	16.3	16.1	18.3	20.1	21.4	21.9	22.9	23.9	25.0	25.7	22.3	20.3	19.9	19.5	18.8	17.3	14.6	13.4	19.3	25.7
6-Jun	12.4	11.8	10.5	9.3	8.8	9.3	10.8	13.1	14.7	16.9	17.7	18.1	19.0	19.6	20.4	21.1	21.3	21.4	21.4	20.6	18.3	14.7	14.3	12.9	15.8	21.4
7-Jun	12.5	12.2	12.5	12.4	12.1	13.2	16.3	19.6	21.4	22.7	23.6	24.8	25.6	26.2	26.9	27.2	27.1	27.2	27.0	25.9	23.8	21.7	18.5	13.4	20.6	27.2
8-Jun	10.9	11.5	8.3	6.8	6.7	7.9	10.7	12.9	14.4	16.5	17.9	18.4	19.7	20.7	22.1	22.0	21.4	20.6	20.0	19.2	17.1	12.9	10.7	9.0	14.9	22.1
9-Jun	7.9	7.1	6.1	5.9	5.8	6.5	8.4	11.0	13.2	16.3	19.5	20.9	21.5	22.4	22.8	23.4	23.6	23.3	22.6	21.1	18.2	17.1	16.2	15.7	15.7	23.6
10-Jun	14.7	14.2	15.2	14.8	14.6	15.2	16.0	17.6	19.5	21.1	22.3	23.4	24.3	24.6	25.3	25.5	25.7	25.8	25.2	24.2	22.6	20.5	19.2	18.9	20.4	25.8
11-Jun	18.8	18.5	18.1	17.6	17.4	17.8	19.0	21.0	22.2	22.9	24.0	25.0	25.5	25.7	26.3	26.5	26.3	26.0	25.5	25.1	24.0	22.6	20.3	19.0	22.3	26.5
12-Jun	17.7	17.0	15.9	13.8	13.1	12.5	12.7	13.6	13.8	14.0	14.6	16.4	18.6	19.0	19.9	20.9	21.1	21.1	20.5	18.8	16.4	13.4	14.0	14.7	16.4	21.1
13-Jun	13.7	13.7	14.2	14.2	14.9	14.8	16.0	18.0	19.9	22.3	24.4	25.9	27.3	27.2	26.1	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	27.3
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--
15-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	M	11.6	11.9	12.5	14.0	15.0	15.0	13.7	10.5	10.4	11.0	--	15.0
16-Jun	10.4	10.2	10.0	9.0	9.2	10.3	12.2	14.3	16.8	19.1	20.3	21.1	21.2	20.6	19.4	18.1	18.5	18.2	17.9	17.2	17.0	15.6	13.4	12.2	15.5	21.2
17-Jun	11.2	11.0	10.9	10.9	11.0	11.6	12.7	14.2	15.4	16.7	17.8	18.8	19.6	20.5	20.9	20.8	20.3	19.9	19.7	19.2	17.9	15.0	11.5	7.5	15.6	20.9
18-Jun	7.0	6.6	6.3	6.1	6.3	8.4	10.1	11.1	12.5	14.6	16.4	17.2	17.5	17.9	18.3	18.6	18.7	19.0	18.8	18.3	18.0	17.6	16.5	15.8	14.1	19.0
19-Jun	15.1	14.3	12.1	11.4	10.9	10.6	10.6	10.8	11.1	11.9	13.4	14.4	12.0	11.3	11.3	13.1	13.6	13.9	13.9	13.4	13.1	13.0	12.0	11.5	12.4	15.1
20-Jun	10.9	10.5	9.7	9.3	9.2	9.1	9.2	9.8	9.7	9.6	9.5	9.6	9.9	10.0	10.2	10.0	9.7	9.7	9.7	9.4	9.1	8.9	8.5	8.1	9.6	10.9
21-Jun	7.7	7.7	7.7	7.6	7.5	7.4	8.0	8.5	9.4	10.4	10.9	12.1	12.8	13.6	14.8	16.6	17.4	16.3	16.2	15.4	13.9	11.8	9.1	7.5	11.3	17.4
22-Jun	6.9	5.2	4.4	3.6	3.8	6.5	7.8	10.9	14.6	17.3	19.1	20.2	20.4	18.8	18.2	18.3	17.9	18.2	17.4	15.9	14.9	13.9	14.0	13.5	13.4	20.4
23-Jun	11.8	11.7	11.9	11.5	11.5	12.0	13.2	15.2	16.9	17.9	19.4	21.2	22.2	22.8	22.9	22.3	23.0	23.3	21.1	20.9	20.5	18.0	15.5	13.8	17.5	23.3
24-Jun	14.7	14.8	13.8	13.5	13.1	13.9	16.3	19.5	21.7	22.6	23.3	24.2	25.0	26.0	26.1	26.5	26.8	26.6	26.4	25.6	23.3	21.0	19.8	17.9	20.9	26.8
25-Jun	16.6	15.0	14.1	13.8	13.6	13.5	13.3	12.9	13.0	13.6	14.5	14.7	15.5	15.6	16.8	17.2	17.7	18.4	18.5	18.0	17.7	16.2	13.5	12.2	15.2	18.5
26-Jun	11.2	12.4	13.6	13.8	13.5	13.8	14.9	17.4	19.0	19.8	20.8	21.5	22.2	23.2	23.9	24.0	18.7	15.5	15.4	16.1	16.1	15.1	14.0	13.9	17.1	24.0
27-Jun	13.0	11.9	11.5	11.9	12.0	12.5	15.3	16.6	18.0	19.2	20.2	21.3	22.4	22.4	22.7	22.9	23.0	22.8	22.4	21.5	20.0	16.6	13.9	12.8	17.8	23.0
28-Jun	11.9	11.1	10.1	10.5	11.1	13.6	17.0	18.5	20.4	21.7	23.0	24.5	25.7	26.6	27.0	26.6	25.2	21.9	22.3	21.2	20.0	18.9	17.4	16.8	19.3	27.0
29-Jun	17.4	16.9	17.4	16.4	17.3	18.5	19.6	20.2	22.4	24.8	26.2	27.2	27.9	28.1	28.4	27.1	24.1	25.6	25.3	25.0	23.3	20.2	19.9	19.2	22.4	28.4
30-Jun	18.7	17.8	15.1	13.4	13.1	16.4	19.8	22.5	23.2	25.0	25.4	25.8	27.0	27.6	28.0	27.8	27.4	27.4	27.5	25.9	24.2	22.1	20.3	17.6	22.5	28.0
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
M - Maintenance DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Christina Lake - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	68	10.10	10.10
10 - 20	399	59.29	69.39
> 20	206	30.61	100.00

Total Number of Valid Hours: 673

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

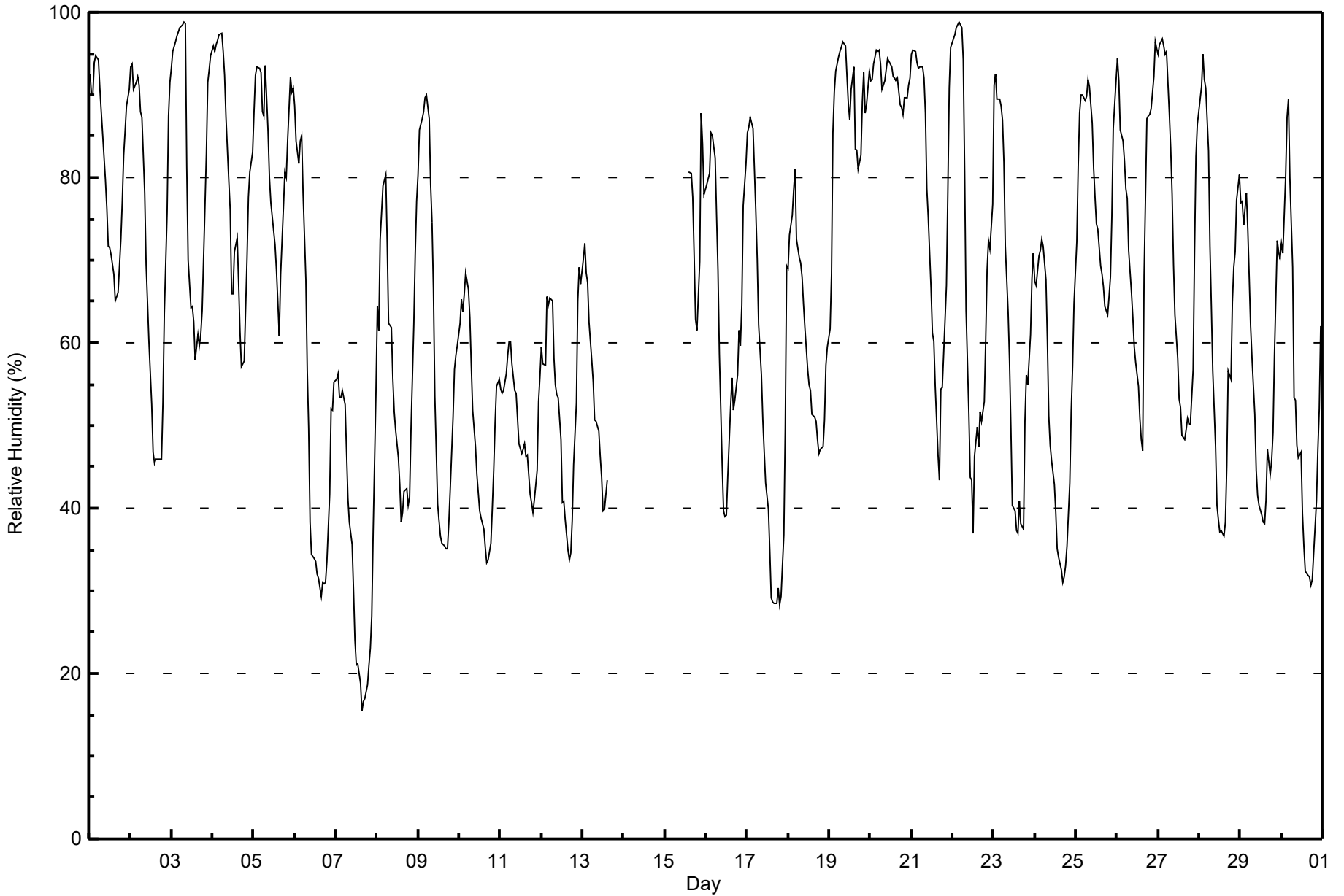
Relative Humidity (RH) - %
Christina Lake - June 2023

Maximum Value: 98.8 % on Jun 3 08:00 Maximum Daily Average: 92.1 % on Jun 20																						Hours in Service: 720 Hours of Data: 673																										
Minimum Value: 15.4 % on Jun 7 16:00 Minimum Daily Average: 34.7 % on Jun 7																						Hours of Missing Data: 47																										
Maximum Diurnal Average: 83.9 % at hour 4 Minimum Diurnal Average: 48.9 % at hour 16																						Hours of Calibration: 0																										
Monthly Average: 65.32 % Percentiles: P ₁ = 21.2 P ₁₀ = 38.1 Q ₁ = 48.3 Median = 65.1 Q ₃ = 85.2 P ₉₀ = 92.9 P ₉₉ = 98.1																						Percent Operational Time: 93.5																										
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-Jun	92.5	90.1	90.0	93.9	94.7	94.2	90.9	88.0	85.2	79.6	76.3	71.7	71.5	70.6	68.3	65.1	65.7	66.1	72.5	77.1	82.6	85.7	88.6	90.6	81.3	94.7																						
2-Jun	93.4	93.8	90.6	91.5	92.2	91.1	88.0	87.2	78.2	69.5	64.9	60.2	52.5	46.7	45.4	46.0	46.0	46.0	46.0	52.6	63.5	75.7	87.4	91.6	70.8	93.8																						
3-Jun	93.2	95.3	96.5	97.1	97.7	98.2	98.6	98.8	98.7	81.4	70.0	64.3	64.3	62.5	58.0	61.0	59.6	61.0	63.9	70.1	83.0	91.6	93.0	94.8	81.4	98.8																						
4-Jun	96.0	95.2	96.2	96.7	97.2	97.4	95.3	92.4	87.3	79.7	76.1	66.0	66.0	70.9	72.8	67.4	61.3	57.1	57.8	64.0	70.1	77.6	80.7	83.0	79.3	97.4																						
5-Jun	88.0	92.4	93.4	93.2	92.8	87.9	87.4	93.6	85.6	80.0	76.9	75.2	71.9	68.7	64.9	60.8	68.2	76.4	80.6	80.1	84.5	92.2	90.3	90.9	82.3	93.6																						
6-Jun	88.6	84.4	81.6	84.4	85.1	78.2	67.6	56.5	49.6	38.3	34.5	33.9	33.6	32.0	31.5	29.3	31.1	30.8	31.0	33.5	41.7	52.0	51.8	55.3	51.5	88.6																						
7-Jun	55.7	56.3	53.4	53.3	54.2	52.5	46.9	41.2	38.3	35.5	30.1	24.1	21.1	21.3	18.9	15.4	16.6	17.0	18.7	21.1	23.0	27.0	37.1	54.1	34.7	56.3																						
8-Jun	64.4	61.5	72.6	78.9	79.7	80.3	72.1	62.4	61.8	55.8	51.7	49.4	46.2	42.9	38.4	39.5	42.1	42.4	40.4	41.4	49.4	62.2	70.7	77.1	57.6	80.3																						
9-Jun	80.4	85.7	87.1	88.1	89.7	90.0	87.1	79.2	74.6	66.4	53.6	40.5	38.5	36.5	35.8	35.3	35.0	35.1	38.3	42.3	51.0	56.9	58.5	59.6	60.2	90.0																						
10-Jun	62.4	65.2	63.7	66.0	68.4	66.5	63.0	57.3	51.9	47.4	44.1	41.9	39.7	38.9	37.4	35.3	33.4	33.7	35.7	40.0	44.6	50.4	54.7	55.6	49.9	68.4																						
11-Jun	54.5	53.9	54.2	56.2	58.4	60.1	60.2	57.5	54.2	54.0	50.9	47.7	46.5	47.1	47.8	46.2	46.4	41.7	40.7	39.4	41.0	44.5	52.9	55.9	50.5	60.2																						
12-Jun	59.4	57.5	57.3	65.7	64.6	65.4	65.1	58.1	54.9	53.8	53.3	48.3	40.6	40.8	38.7	34.9	33.7	34.5	38.4	45.3	52.6	65.1	69.2	67.2	52.7	69.2																						
13-Jun	70.1	72.0	68.4	67.3	62.5	57.9	55.3	50.7	50.6	49.4	46.3	43.7	39.7	39.8	43.4	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	72.0																						
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--																						
15-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	M	80.7	80.6	77.7	70.4	62.9	61.6	69.8	87.8	84.0	78.0	--	87.8																						
16-Jun	79.2	79.9	80.5	85.5	85.1	82.3	75.4	68.8	58.7	45.3	39.7	39.0	39.2	43.9	52.1	55.8	51.9	53.0	56.1	61.6	59.7	64.7	76.6	81.7	63.2	85.5																						
17-Jun	85.4	86.1	87.2	85.9	81.1	76.0	70.1	62.2	56.2	50.6	46.8	43.1	39.7	34.8	29.2	28.6	28.5	28.6	30.3	28.3	29.3	36.9	49.6	69.4	52.6	87.2																						
18-Jun	69.0	73.0	75.4	78.4	81.0	72.6	70.3	69.6	68.0	64.7	61.9	56.7	55.0	54.3	51.3	51.0	50.5	48.3	46.6	47.1	47.5	50.7	57.2	59.4	60.8	81.0																						
19-Jun	61.7	68.2	85.5	90.4	92.9	94.6	95.2	95.8	96.5	95.9	92.3	89.0	86.9	90.7	93.3	83.4	83.4	81.0	82.8	89.1	92.7	87.8	88.9	92.9	88.0	96.5																						
20-Jun	91.7	91.9	93.8	95.5	95.3	95.5	93.8	90.7	91.7	93.0	94.3	94.1	93.5	92.3	92.0	91.8	92.0	88.9	88.6	87.6	89.7	89.7	91.1	92.0	92.1	95.5																						
21-Jun	95.0	95.5	95.3	93.9	93.2	93.4	93.4	92.1	87.9	78.6	75.3	66.6	61.3	60.2	54.8	46.4	43.4	54.3	54.6	58.6	66.9	78.3	90.8	95.8	76.1	95.8																						
22-Jun	96.8	97.3	98.1	98.5	98.8	98.1	94.2	80.6	63.9	51.3	43.7	43.4	37.0	46.2	49.9	47.5	51.6	50.5	52.9	60.4	68.8	72.3	71.4	76.9	68.8	98.8																						
23-Jun	91.2	92.6	89.5	89.4	88.7	87.0	81.9	71.6	63.7	57.8	49.6	40.3	39.7	37.2	36.9	40.9	38.2	37.5	50.5	56.2	55.0	61.1	67.8	70.8	62.3	92.6																						
24-Jun	67.4	67.0	70.6	71.1	72.5	71.8	67.6	60.3	51.2	47.6	45.7	42.9	39.5	35.0	34.1	32.5	31.0	31.7	33.1	35.5	43.0	51.6	57.2	64.7	51.0	72.5																						
25-Jun	72.2	81.4	87.8	90.0	90.0	89.3	89.8	91.8	91.0	86.6	81.2	77.7	74.3	73.7	69.3	68.3	66.8	64.4	63.4	65.6	68.0	75.2	86.0	91.6	79.0	91.8																						
26-Jun	94.5	91.8	85.8	84.3	82.1	78.6	77.5	71.1	66.1	63.1	59.5	57.6	54.7	50.8	48.3	46.9	68.1	87.1	87.5	87.7	88.2	92.3	96.4	95.6	75.7	96.4																						
27-Jun	95.0	96.1	96.7	95.9	95.0	95.2	87.9	83.5	78.0	69.5	63.4	58.1	53.2	52.2	48.8	48.2	49.4	50.8	50.1	50.1	56.8	71.0	82.6	86.5	71.4	96.7																						
28-Jun	89.6	91.0	94.9	91.8	90.8	83.3	71.7	64.5	56.6	47.4	40.4	38.7	37.1	37.3	36.6	38.4	45.1	56.6	55.5	65.0	69.2	71.0	77.3	80.3	63.7	94.9																						
29-Jun	76.9	77.1	74.2	78.2	73.7	67.9	62.0	58.1	51.4	44.5	41.5	40.4	39.1	38.4	38.1	41.1	47.2	44.0	45.7	49.2	58.6	72.4	71.1	70.2	56.7	78.2																						
30-Jun	72.1	70.9	80.1	87.3	89.4	80.0	69.1	53.5	53.1	47.6	46.0	46.8	39.3	35.5	32.3	31.8	31.7	30.7	31.4	34.7	40.9	47.1	52.1	62.0	52.7	89.4																						
																								79.9	80.8	82.2	83.9	83.8	81.6	77.8	72.8	68.0	61.9	57.5	53.6	50.8	50.0	50.0	48.9	49.8	50.7	52.0	55.2	60.4	67.5	72.7	76.5	Diurnal Average
																								96.8	97.3	98.1	98.5	98.8	98.2	98.6	98.8	98.7	95.9	94.3	94.1	93.5	92.3	93.3	91.8	92.0	88.9	88.6	89.1	92.7	92.3	96.4	95.8	Diurnal Maximum
M - Maintenance DF - DAS Failure																																																



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Christina Lake - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Christina Lake - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	5	0.74	0.74
20 - 40	89	13.22	13.97
40 - 60	191	28.38	42.35
60 - 80	180	26.75	69.09
80 - 100	208	30.91	100.00

Total Number of Valid Hours: 673

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Christina Lake - June 2023

Maximum Speed: 22 km/h on Jun 2 00:00	Maximum Daily Speed Average: 15.6 km/h on Jun 10	Hours in Service: 720
Minimum Speed Value: 1 km/h on Jun 9 06:00	Minimum Daily Speed Average: 0.7 km/h on Jun 12	Hours of Data: 331
Maximum Diurnal Speed Average: 4.1 km/h at hour 7	Minimum Diurnal Speed Average: 0.3 km/h at hour 12	Hours of Missing Data: 389
Monthly Average Velocity: 1.9 km/h 240.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 7 Median = 11 Q ₃ = 14 P ₉₀ = 17 P ₉₉ = 21	Percent Operational Time: 46.1

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-Jun	NW19	NNW8	N12	ENE12	NW14	NNW15	NW14	N9	NNE10	NNE14	NNE13	N14	N11	NE8	NNE12	NNE15	NNE12	NNW13	NNW12	NNW17	N12	N12	NW16	NW22	N11.6	NW22
2-Jun	NW16	NW14	NNW17	N14	NW13	NW14	NW15	NW15	N17	NNE22	NNE20	NNE18	NNE20	NNE19	NNE16	NNE15	NE13	NE12	NE11	E7	ENE7	ESE4	SE4	S3	N10.7	NNE22
3-Jun	S4	SSW3	SW4	WSW2	SSW4	NNE4	NNE7	NNE7	NNE6	NE4	NNE6	ENE10	ENE14	E11	ESE12	E13	E13	E14	ESE13	ESE8	SE4	S4	SSE3	ENE4	E5.0	E14
4-Jun	ENE5	NE6	NE7	NE9	ENE10	E7	ESE11	SE12	SE10	SE11	SE13	SSE14	SE13	SE15	SSE8	SSE13	SSE13	SSE14	S9	SSE6	SSE8	S9	S9	S9	SE7.9	SE15
5-Jun	SSE4	NE3	SE2	SSE3	WNW3	WNW12	W9	W7	NW9	NNE10	NNE15	NE14	NE13	NE13	ENE14	ESE14	NW11	NW14	NW16	WNW10	WNW10	W18	W18	W16	NNW5.3	W18
6-Jun	W17	W15	W14	WSW10	WSW11	W12	W12	W10	WSW11	WNW15	WNW16	WSW16	WSW16	WSW15	SW16	WSW15	SW15	SW15	WSW13	SW11	SSW8	S10	S9	S10	WSW11.5	W17
7-Jun	S10	S11	SSW13	SSW14	SSW15	SSW16	SSW16	SSW18	SW20	WSW18	WSW15	WSW15	WSW17	SW17	WSW21	WSW21	WSW18	WSW16	W14	WNW14	NW15	NNW12	NNE9	NE1	WSW11.2	WSW21
8-Jun	SW5	SSW3	S4	SSW4	SSW5	SW2	S2	N8	NE7	NNE8	NNE8	NNE13	N8	NNW13	NNW9	NNE13	NNE14	NNE16	NE14	NE9	NE6	SE4	S5	S4	NNE4.4	NNE16
9-Jun	SSW5	E3	S5	S3	S3	ENE1	SSE2	SSE2	ENE4	E3	SE3	SE12	ESE12	SE10	ESE12	SE10	SSE10	SSE10	SSE9	SSE8	SSE8	S8	SSE9	SSE10	SSE5.9	ESE12
10-Jun	SE7	S10	S15	SSE13	S13	S12	S14	S17	S19	S20	S21	S18	S20	SSW17	S19	SSE20	S18	S18	S18	S16	S14	SSE11	SSE13	S17	S15.6	S21
11-Jun	S17	S17	S19	S18	SSW14	SSW7	SSW10	SW13	WSW13	WSW13	WNW13	WNW13	WNW11	W11	NW16	WNW15	NW17	NW17	NW14	NW18	NW14	NW12	N3	SW6	W7.8	S19
12-Jun	WNW8	W3	N6	SSW4	SSW5	WSW5	SW5	WNW6	WNW6	SW6	SSW6	WSW4	NW5	WSW2	NE4	E3	ESE4	E4	E7	SE8	SE6	SE5	NE5	NE5	SSW0.7	WNW8
13-Jun	ESE5	ESE5	ESE6	ESE8	SE8	SE8	SSE8	SSE11	S12	S12	SW5	ESE4	E5	S9	S15	DF	DF	DF	DF	DF	DF	DF	DF	DF	---	S15
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---
15-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	C	N18	NNW14	WNW4	SW9	WSW9	WSW10	---	N18
16-Jun	WSW11	WSW11	WSW10	SW9	SW9	SW6	WSW11	SW11	SW12	SW18	SW18	SW18	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SSW18
17-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---
30-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	W14	NW11	NW17	WNW14	WNW12	NW15	W9	W8	WSW10	---	NW17

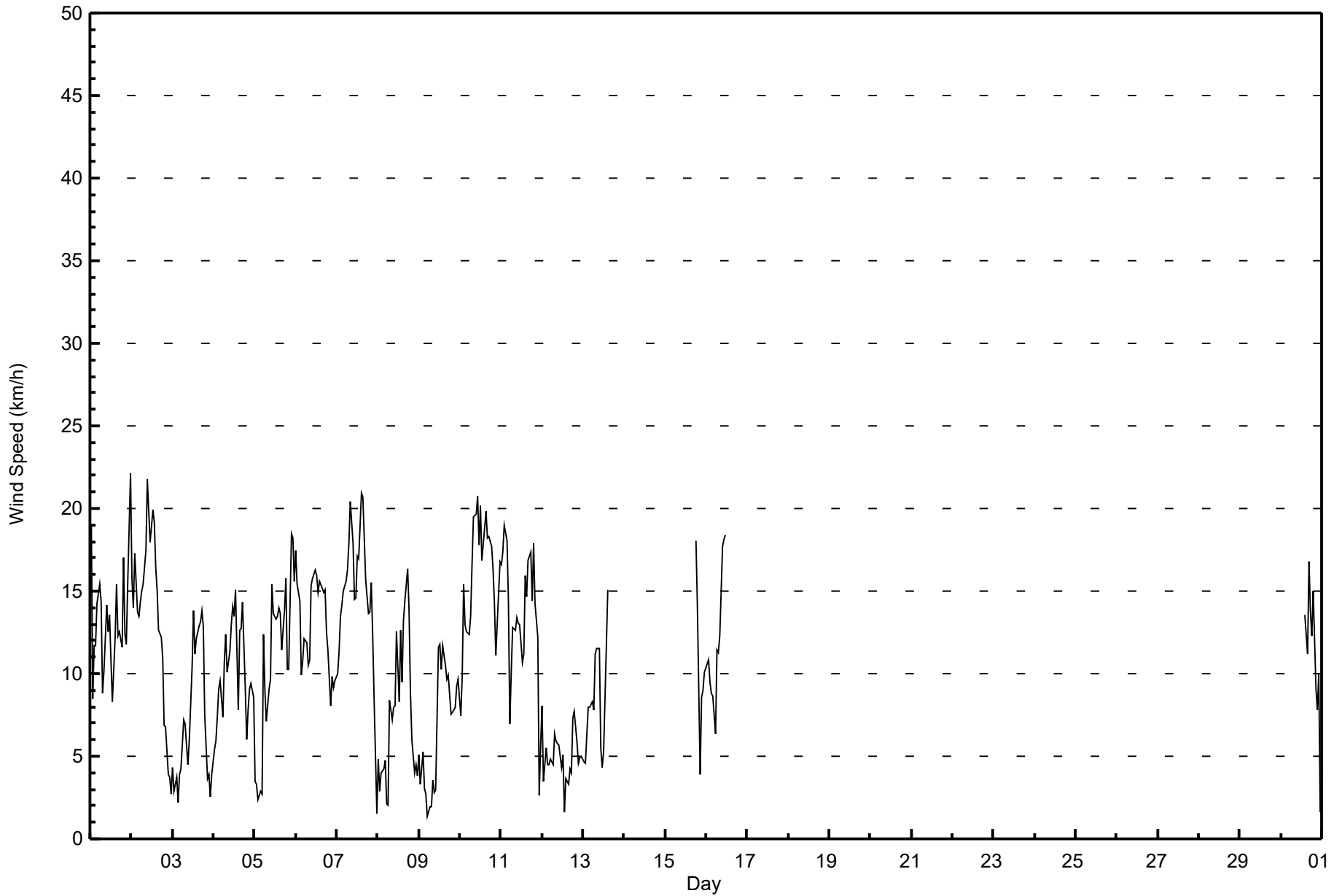
WSW3.8	SW2.8	SW2.5	S3.2	SW3.9	WSW3.2	SW4.1	SW3.8	WSW3.2	WSW2.4	NNW1.9	SSW0.3	NE1.5	SSE1.1	SSW1.4	ESE1.0	NNW1.5	NNW2.3	NW2.8	NNW3.2	W1.4	WSW2.8	SW3.1	SW3.7	Diurnal Average	
NW19	S17	S19	S18	SSW15	SSW16	SSW16	SSW18	SW20	NNE22	S21	SSW18	S20	NNE19	WSW21	WSW21	S18	S18	N18	NW18	NW15	W18	W18	NW22	Diurnal Maximum	

C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Christina Lake - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	65	19.64	19.64
6 - 11	106	32.02	51.66
12 - 19	149	45.02	96.68
20 - 28	11	3.32	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 331

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - June 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	6	4	5	5	6	5	11	8	5	4	1	2	1	0	65
6 - 11	5	9	8	4	3	4	9	14	11	4	8	10	6	6	3	2	106
12 - 19	7	14	6	3	3	5	5	6	21	9	8	13	10	9	21	9	149
20 - 28	0	3	0	0	0	0	0	1	3	0	1	2	0	0	1	0	11
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	13	27	20	11	11	14	20	26	46	21	22	29	17	17	26	11	331

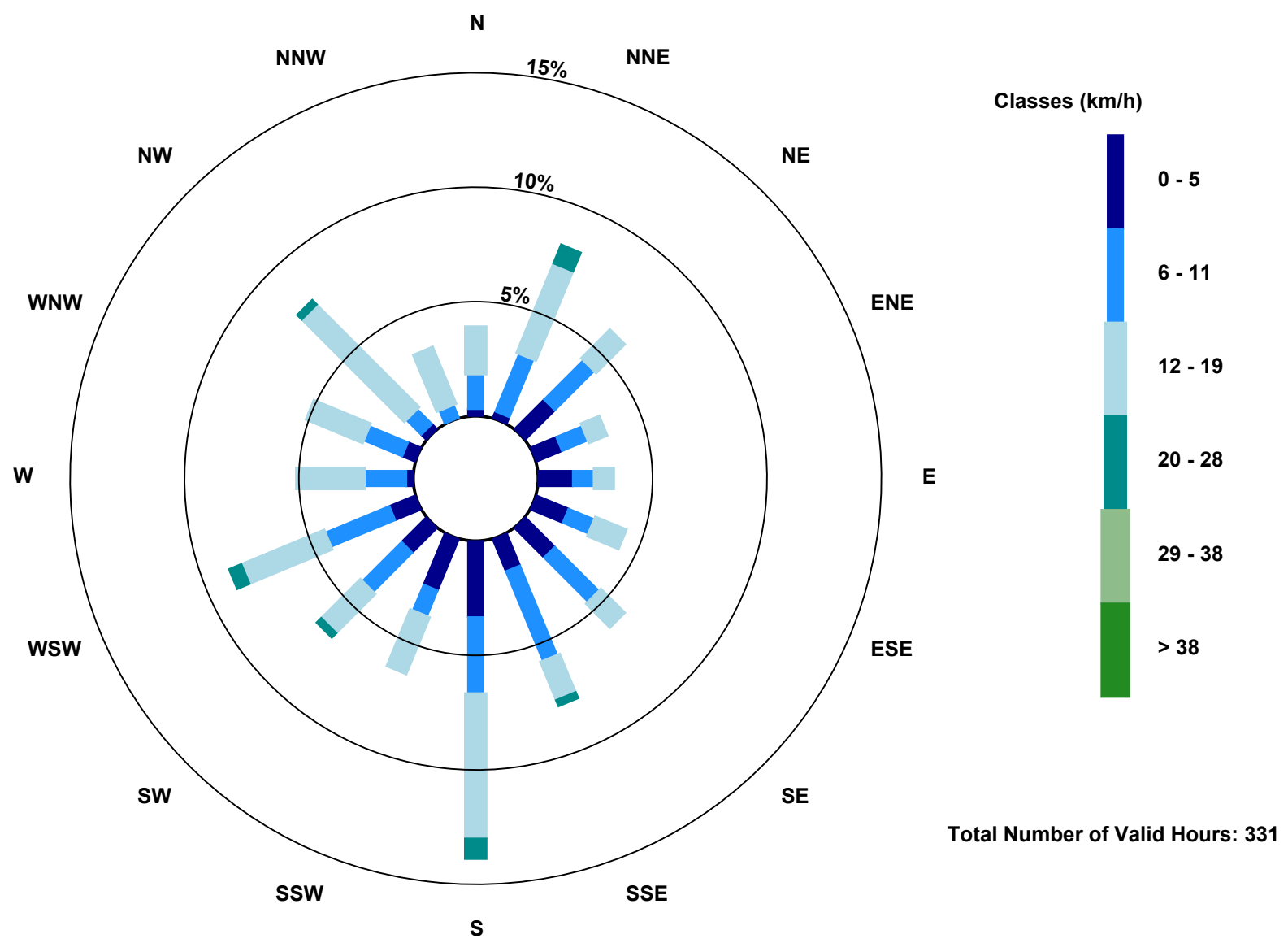
Total Number of Valid Hours: 331

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Christina Lake





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Christina Lake - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 8 km/h on Jun 5 18:00	Hours of Data: 331
Minimum Value: 1 km/h on Jun 9 08:00	Hours of Missing Data: 389
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6	Hours of Calibration: 1
	Percent Operational Time: 46.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	4	4	5	4	4	3	3	4	2	3	2	3	3	2	3	3	3	5	4	4	4	4	5	4	5
2-Jun	4	3	4	4	4	3	4	3	5	5	4	4	4	4	4	3	3	3	2	1	1	1	1	1	1
3-Jun	1	1	1	1	1	2	2	1	2	2	2	3	4	3	3	3	3	3	3	3	1	1	1	1	1
4-Jun	2	2	2	2	2	2	3	3	2	3	3	4	4	4	5	4	4	3	3	1	1	1	2	2	5
5-Jun	1	1	1	3	3	3	3	3	2	4	3	3	3	3	4	4	5	8	4	3	5	6	7	5	8
6-Jun	5	4	4	2	2	3	3	3	3	5	4	5	5	5	4	5	4	4	3	2	2	2	2	1	5
7-Jun	1	2	2	3	3	3	3	4	5	5	4	4	5	5	6	6	5	5	4	4	3	3	4	2	6
8-Jun	1	1	2	1	1	1	1	2	2	2	3	3	4	4	4	4	3	3	3	3	1	1	1	1	4
9-Jun	1	2	2	1	1	1	1	1	1	1	3	3	3	3	3	3	3	2	2	1	3	1	2	2	3
10-Jun	1	3	3	3	3	3	3	4	4	5	5	4	5	4	5	5	5	5	5	4	3	2	2	3	5
11-Jun	3	4	4	4	4	2	2	3	3	4	4	4	4	3	4	4	4	4	4	3	4	2	3	2	4
12-Jun	4	2	3	1	1	1	2	4	4	1	1	1	2	2	2	2	1	1	2	1	1	1	2	2	4
13-Jun	2	2	2	1	2	2	2	3	3	3	2	4	4	5	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	5
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
15-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	C	5	3	3	1	1	2	5	
16-Jun	2	2	2	1	2	3	2	3	3	4	4	4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	
17-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
30-Jun	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

5	4	5	4	4	3	4	4	4	5	5	5	5	5	5	6	6	5	8	5	4	5	6	7	5	
Diurnal Maximum																									

C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Christina Lake - June 2023

Direction of Maximum Speed: 310 deg on Jun 2 00:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 177.1 deg on Jun 10	Hours of Data: 331
Direction of Minimum Speed: 63 deg on Jun 9 06:00	Direction of Minimum Daily Speed Average: 0.7 deg on Jun 12
Direction of Minimum Speed: 63 deg on Jun 9 06:00	Hours of Missing Data: 389
Monthly Average Direction: 240.9 deg	Percent Operational Time: 46.1

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	325	331	10	59	325	334	325	356	25	14	14	359	11	43	25	25	15	346	337	327	357	352	316	310	351.6	
2-Jun	311	321	339	4	326	316	318	324	0	20	18	30	21	14	33	30	44	40	55	80	76	103	140	185	7.4	
3-Jun	176	209	214	242	211	23	13	30	28	51	30	64	70	79	109	97	95	89	110	113	125	179	152	62	86.7	
4-Jun	60	39	51	54	75	96	120	132	142	141	131	155	140	126	162	155	166	168	188	167	158	172	182	190	139.9	
5-Jun	161	52	124	162	296	296	269	267	312	15	26	36	42	43	60	102	317	306	315	294	288	278	281	267	326.3	
6-Jun	271	270	266	250	248	262	263	261	257	298	299	258	255	239	232	246	232	233	239	229	197	178	190	184	248.7	
7-Jun	186	187	192	195	194	196	195	208	220	243	248	247	244	230	239	251	256	258	279	296	318	328	15	53	236.5	
8-Jun	229	211	183	211	195	216	170	6	34	18	28	28	8	340	345	31	32	30	39	47	44	132	183	175	26.2	
9-Jun	194	98	187	173	185	63	168	156	65	84	143	129	122	139	114	135	154	161	167	168	159	173	165	157	147.5	
10-Jun	144	169	170	168	170	182	184	182	185	185	179	176	178	198	179	167	181	185	181	179	169	163	166	174	177.1	
11-Jun	179	184	189	191	199	200	195	222	251	257	289	302	302	261	305	297	326	316	314	319	316	312	352	217	263.9	
12-Jun	299	281	350	209	204	238	234	293	288	218	211	239	325	246	52	97	121	100	100	130	137	127	52	56	203.4	
13-Jun	122	107	102	108	136	140	152	160	180	187	227	112	88	171	177	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	
15-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	C	354	338	300	234	253	258	--	
16-Jun	255	254	246	231	233	224	241	234	221	224	225	214	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
17-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
30-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	263	305	309	294	295	310	261	264	248	175	--

246.9	234.8	214.4	179.4	216.0	246.7	232.0	231.3	238.1	258.0	293.0	212.8	45.6	168.0	193.0	110.8	300.3	285.0	316.0	300.6	273.9	238.6	230.7	220.4
Diurnal Average																							

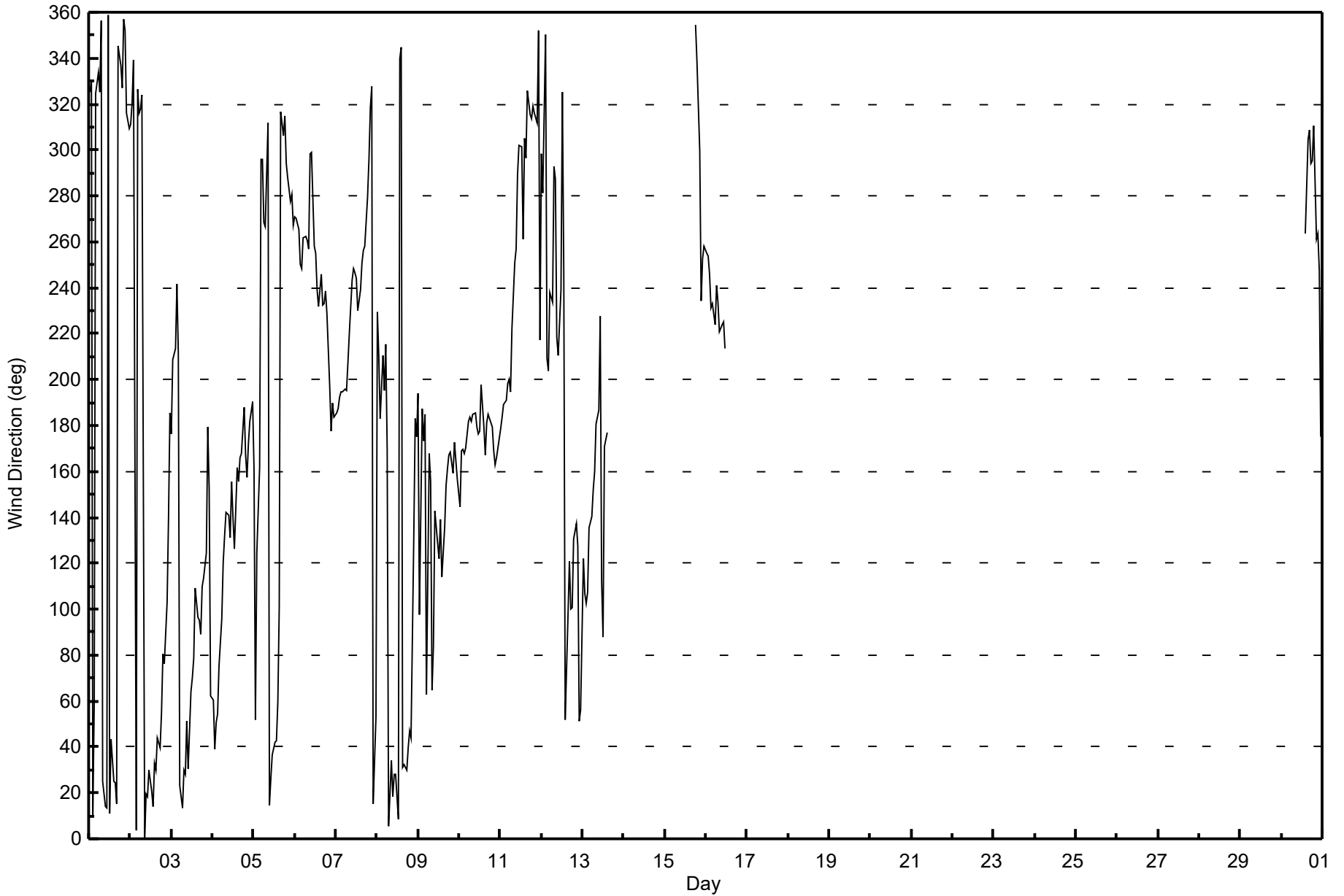
C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure UO - Unstable Operation

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Christina Lake - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Christina Lake - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 93 deg on Jun 8 00:00 Minimum Value: 5 deg on Jun 2 21:00 Percentiles: P ₁ = 7 P ₁₀ = 11 Q ₁ = 14 Median = 20 Q ₃ = 27 P ₉₀ = 48 P ₉₉ = 84											Hours in Service: 720 Hours of Data: 331 Hours of Missing Data: 389 Hours of Calibration: 1 Percent Operational Time: 46.1															
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	24	48	58	38	25	11	16	30	15	15	19	23	27	23	17	14	13	32	23	12	24	27	14	9	58	
2-Jun	12	14	21	20	17	13	15	14	21	15	17	20	19	22	18	16	18	10	16	6	5	16	21	27	27	
3-Jun	16	38	14	63	40	52	21	23	48	58	39	31	21	26	21	16	16	16	13	11	8	28	46	26	63	
4-Jun	28	14	10	10	16	14	15	12	18	19	24	20	20	26	66	17	24	19	22	14	12	11	9	11	66	
5-Jun	49	27	56	85	73	24	28	33	20	30	18	21	24	20	19	23	69	31	14	27	29	19	19	17	85	
6-Jun	16	17	17	16	14	17	18	24	20	28	24	24	27	25	25	23	21	21	21	16	15	6	11	7	28	
7-Jun	8	11	11	12	12	12	13	16	14	19	22	23	23	22	18	21	21	24	25	24	11	25	16	93	93	
8-Jun	30	40	35	22	10	76	69	21	29	21	27	15	47	37	43	32	14	13	13	11	8	27	34	21	76	
9-Jun	11	41	17	36	23	75	39	35	23	53	88	25	24	25	25	29	20	13	12	10	16	8	11	9	88	
10-Jun	8	10	12	12	15	13	14	14	13	16	17	18	15	21	22	14	17	16	14	12	11	9	11	11	22	
11-Jun	11	12	11	12	15	25	17	21	20	27	28	32	38	26	26	27	21	13	16	10	12	10	86	27	86	
12-Jun	43	59	53	34	36	17	33	50	55	18	14	45	54	83	54	46	31	25	19	8	18	14	37	54	83	
13-Jun	35	31	26	10	15	11	14	16	17	20	66	57	68	65	23	DF	DF	DF	DF	DF	DF	DF	DF	DF	68	
14-Jun	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	
15-Jun	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	C	20	15	71	9	13	8	71
16-Jun	11	9	11	10	11	20	12	14	16	16	16	14	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	20	
17-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	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-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
30-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
	49	59	58	85	73	76	69	50	55	58	88	57	68	83	66	53	69	32	25	27	71	35	86	93		
Diurnal Maximum																										
C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure UO - Unstable Operation																										



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS27
JACKFISH 2/3
JUNE 2023

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 JUNE 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	681	34	39	99.31	8.8	0	2.9	0
H2S (ppb) Average	675	35	45	98.61	2	0	0.4	0
NO2 (ppb) Average	656	37	64	96.25	7.2	0	2	-
NO (ppb) Average	656	37	64	96.25	6.2	-	0.7	-
NOX (ppb) Average	656	37	64	96.25	11.6	-	2.3	-
Temperature 2 m (C) Average	715	0	5	99.31	27.9	-	21.8	-
Relative Humidity (%) Average	715	0	5	99.31	100	-	98	-
Wind Speed 10 m (km/h) Average	715	0	5	99.31	19	-	10	-
Wind Direction 10 m (deg) Average	715	0	5	99.31	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 JUNE 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	681	1.28	1.1	-	0	0.2	0.5	1	1.7	2.7	8.8
H2S (ppb) Average	675	0.2	0.1	-	0	0.1	0.1	0.2	0.2	0.3	2
NO2 (ppb) Average	656	1.05	1	-	0	0.2	0.4	0.8	1.3	2.2	7.2
NO (ppb) Average	656	0.22	0.4	-	0	0	0	0.1	0.3	0.5	6.2
NOX (ppb) Average	656	1.27	1.2	-	0	0.3	0.6	1	1.6	2.5	11.6
Temperature 2 m (C) Average	715	16.19	5.1	-	5.6	9.3	12.1	16.1	20.1	23.4	27.9
Relative Humidity (%) Average	715	69.25	21.7	-	17.1	39.5	52	68.6	91.3	97.9	100
Wind Speed 10 m (km/h) Average	715	6.4	3	-	0	3	4	6	8	11	19
Wind Direction 10 m (deg) Average	715	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, NO2	01 Jun 2023 10:00	01 Jun 2023 11:00	2	Maintenance - sample manifold cleaned
ALL PARAMETERS	12 Jun 2023 18:00	12 Jun 2023 20:00	3	DAS Failure - data not recorded
ALL PARAMETERS	13 Jun 2023 08:00	13 Jun 2023 08:00	1	DAS Failure - data not recorded
ALL PARAMETERS	22 Jun 2023 10:00	22 Jun 2023 10:00	1	Maintenance - station logger/modem reset
H2S	05 Jun 2023 16:00	05 Jun 2023 16:00	1	Unstable Operation - excessive baseline drift
H2S	22 Jun 2023 16:00	22 Jun 2023 17:00	2	Unstable Operation - excessive baseline drift
NO2	14 Jun 2023 15:00	15 Jun 2023 10:00	20	Maintenance - stabilization post maintenance



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

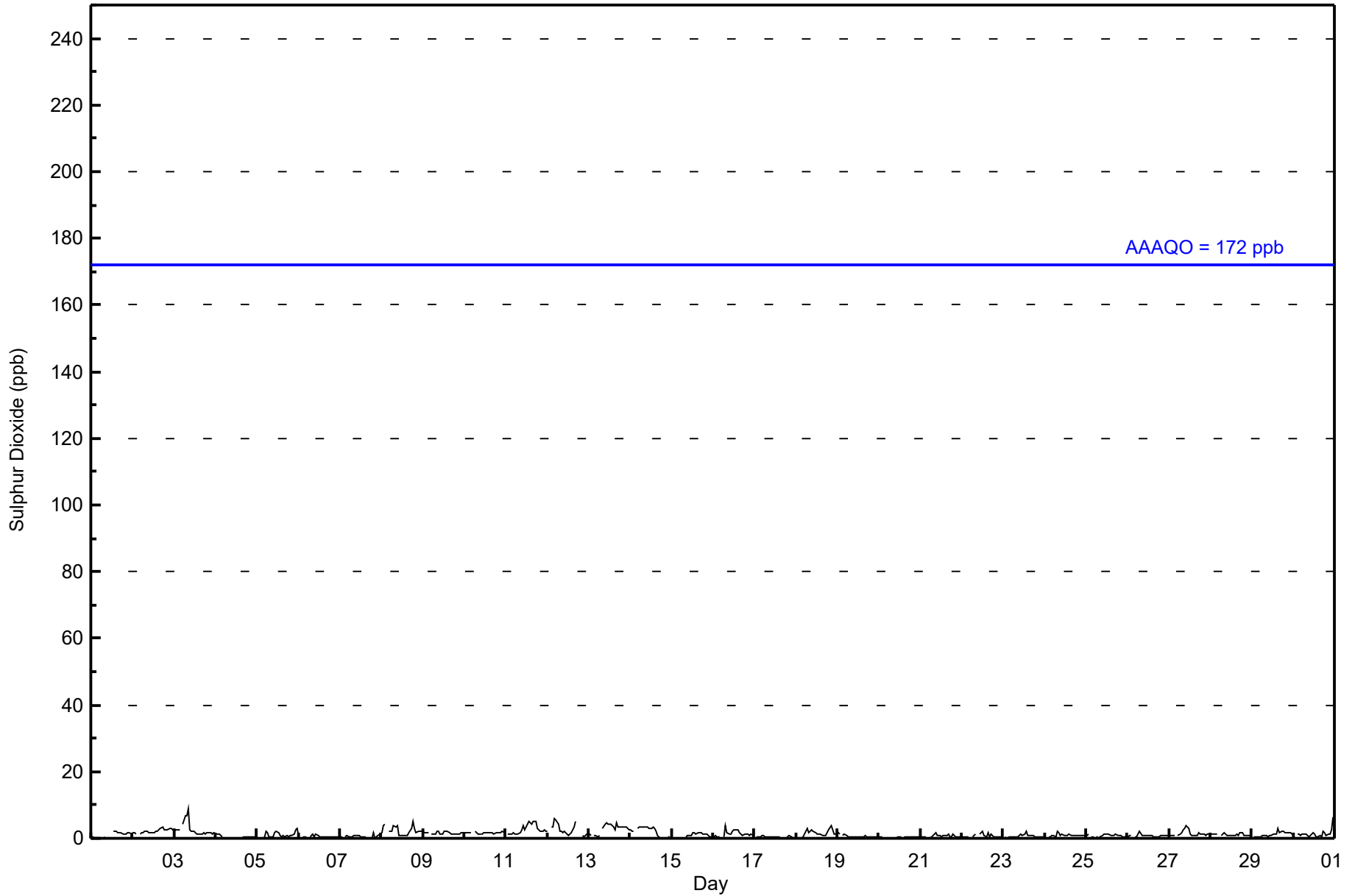
Jackfish 2/3 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 8.8 ppb on Jun 3 09:00		Maximum Daily Average: 2.9 ppb on Jun 13				Hours of Data:		681																		
Minimum Value: 0.0 ppb on Jun 1 04:00		Minimum Daily Average: 0.2 ppb on Jun 20				Hours of Missing Data:		39																		
Maximum Diurnal Average: 1.6 ppb at hour 9		Minimum Diurnal Average: 0.9 ppb at hour 4				Hours of Calibration:		34																		
Monthly Average: 1.28 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.0 Q ₃ = 1.7 P ₉₀ = 2.7 P ₉₉ = 5.2				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-Jun	0.2	0.2	Z	0.0	0.0	0.0	0.0	0.1	0.3	C	C	C	C	2.0	2.0	1.7	1.6	1.7	1.4	1.4	1.4	1.6	1.6	1.4	1.0	2.0
2-Jun	1.9	1.6	1.3	Z	1.2	1.6	1.6	2.1	2.1	1.7	1.7	1.7	1.7	2.0	2.2	2.4	2.8	3.3	2.7	2.5	2.5	2.9	3.0	2.7	2.1	3.3
3-Jun	2.2	2.4	2.5	2.6	Z	4.3	6.7	6.6	8.8	2.7	2.3	2.2	1.8	1.4	1.1	1.2	1.2	1.6	1.4	1.5	1.7	1.7	1.5	1.6	2.7	8.8
4-Jun	1.5	1.3	1.2	0.8	0.5	Z	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	1.5
5-Jun	Z	0.0	0.1	0.2	0.5	2.0	1.6	0.6	0.5	0.6	1.7	1.9	1.7	0.9	0.4	0.7	0.6	1.0	0.4	0.9	0.7	1.1	2.6	3.0	1.0	3.0
6-Jun	0.8	Z	0.3	0.3	0.2	0.2	0.7	1.2	0.5	1.2	0.8	0.3	0.4	0.5	0.3	0.3	0.5	0.3	0.4	0.3	0.3	0.5	0.5	0.5	0.5	1.2
7-Jun	0.5	0.5	Z	0.4	0.8	0.4	0.3	0.4	0.8	0.8	1.0	0.9	0.6	0.4	0.3	0.2	0.1	0.1	0.1	1.5	0.1	0.2	0.8	1.2	0.5	1.5
8-Jun	1.8	3.8	4.4	Z	2.0	2.1	2.2	3.8	3.5	3.7	0.9	0.8	1.0	1.0	0.8	0.7	1.6	3.1	4.9	2.9	1.9	1.9	2.0	2.2	2.3	4.9
9-Jun	2.1	1.9	1.8	1.7	Z	1.4	1.2	1.3	2.0	1.9	1.4	1.3	2.1	2.2	2.0	1.9	1.4	1.5	1.5	1.4	1.4	1.3	1.5	1.5	1.6	2.2
10-Jun	1.5	1.6	1.8	1.9	1.8	Z	1.9	1.9	1.5	1.5	1.4	1.5	1.7	1.8	1.8	1.8	1.6	1.5	1.6	1.7	1.7	1.8	2.0	1.7	1.7	2.0
11-Jun	Z	1.4	1.3	1.3	1.6	1.4	1.3	1.3	1.9	2.5	4.0	2.7	4.0	5.2	4.6	4.4	5.0	5.1	3.2	2.5	2.3	2.2	2.4	2.2	2.8	5.2
12-Jun	2.3	Z	3.6	3.2	5.7	5.4	4.1	2.3	2.1	1.9	1.9	1.3	1.0	1.3	1.8	3.4	5.2	DF	DF	DF	0.7	0.6	0.7	1.1	2.5	5.7
13-Jun	1.4	1.0	Z	0.6	0.7	0.6	0.8	DF	3.0	4.4	4.8	4.3	4.2	4.1	3.4	2.7	4.8	3.5	3.2	3.4	3.3	3.5	3.2	2.7	2.9	4.8
14-Jun	2.4	2.3	2.1	Z	3.1	3.2	3.3	3.5	3.2	3.3	3.6	2.8	3.0	3.3	2.9	2.1	0.8	0.2	0.1	0.1	0.1	0.1	0.2	0.1	2.0	3.6
15-Jun	0.1	0.1	0.2	0.2	Z	0.0	0.0	0.1	0.2	0.7	0.9	0.9	1.5	1.6	1.4	1.6	1.6	1.6	1.3	1.1	1.2	0.9	0.6	0.4	0.8	1.6
16-Jun	0.6	0.9	0.6	0.5	0.6	Z	0.5	3.8	1.6	1.1	1.4	2.2	2.4	2.6	2.6	1.7	1.2	1.0	1.1	1.3	1.1	0.7	1.3	0.7	1.4	3.8
17-Jun	Z	0.3	0.5	0.4	0.8	1.0	0.6	0.2	0.3	0.4	0.5	0.6	0.4	0.4	0.4	0.2	0.1	0.2	0.2	0.5	0.7	0.3	0.2	0.2	0.4	1.0
18-Jun	0.2	Z	0.0	0.0	0.2	1.3	3.0	1.7	2.1	2.7	2.3	1.9	1.4	1.2	1.1	1.0	0.8	1.0	1.6	2.4	3.7	2.4	1.3	1.1	1.5	3.7
19-Jun	1.5	1.1	Z	1.0	1.2	1.0	0.6	0.5	0.6	0.4	0.4	0.5	0.3	0.4	0.4	0.3	0.8	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.6	1.5
20-Jun	0.3	0.3	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.4
21-Jun	0.3	0.3	0.6	0.5	Z	0.0	0.5	0.9	1.3	1.7	1.0	0.6	0.6	0.7	0.7	0.7	1.1	0.5	0.6	1.2	0.6	0.5	0.3	0.3	0.7	1.7
22-Jun	0.3	0.3	0.5	0.5	0.6	Z	0.4	0.7	1.2	M	1.3	1.9	1.9	1.0	0.5	1.5	0.6	1.1	0.5	0.4	0.5	0.5	0.5	0.5	0.8	1.9
23-Jun	Z	0.2	0.1	0.3	0.4	0.4	0.4	0.6	0.6	0.8	1.2	1.0	1.4	2.0	0.8	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	2.0
24-Jun	0.5	Z	0.4	0.6	0.7	0.8	0.5	2.2	1.8	0.9	1.2	0.8	0.9	1.0	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0	0.9	2.2
25-Jun	1.0	1.1	Z	0.5	0.4	0.2	0.4	0.2	0.2	0.9	1.2	1.2	1.2	1.1	0.7	0.8	0.9	1.4	0.9	1.0	0.7	0.5	0.6	0.5	0.8	1.4
26-Jun	0.6	0.7	0.7	Z	0.4	0.5	1.3	2.3	0.8	0.7	0.8	0.8	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.7	0.7	0.8	0.8	0.7	0.8	2.3
27-Jun	0.8	0.8	0.8	0.8	Z	1.0	1.1	1.7	2.7	3.2	4.0	3.0	1.4	0.9	0.8	0.7	0.7	1.5	1.3	1.2	1.1	1.0	1.1	1.1	1.4	4.0
28-Jun	1.1	1.1	1.1	1.2	1.3	Z	1.0	1.3	1.6	0.9	0.8	1.0	0.8	0.8	0.9	1.1	1.1	1.5	1.5	1.0	1.0	1.0	0.9	0.8	1.1	1.6
29-Jun	Z	0.5	0.4	0.6	0.5	0.6	0.7	0.7	0.7	0.6	0.7	0.8	1.1	1.1	1.1	2.9	1.7	2.0	2.1	1.6	1.6	1.7	1.6	1.4	1.2	2.9
30-Jun	1.1	Z	1.3	1.2	1.0	1.1	1.4	1.2	1.0	0.6	1.0	1.6	1.3	0.4	0.4	1.0	0.6	2.1	1.5	0.7	1.1	1.1	2.4	6.3	1.4	6.3
																								Diurnal Average		
																								Diurnal Maximum		
																								1.1 1.0 1.1 0.9 1.0 1.2 1.3 1.5 1.6 1.5 1.5 1.4 1.4 1.4 1.3 1.3 1.4 1.4 1.3 1.2 1.1 1.1 1.2 1.3		
																								2.4 3.8 4.4 3.2 5.7 5.4 6.7 6.6 8.8 4.4 4.8 4.3 4.2 5.2 4.6 4.4 5.2 5.1 4.9 3.4 3.7 3.5 3.2 6.3		
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	681	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: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - June 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	16	9	8	4	5	9	9	7	1	1	1	0	2	10	7	93
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	16	9	8	4	5	9	9	7	1	1	1	0	2	10	7	93

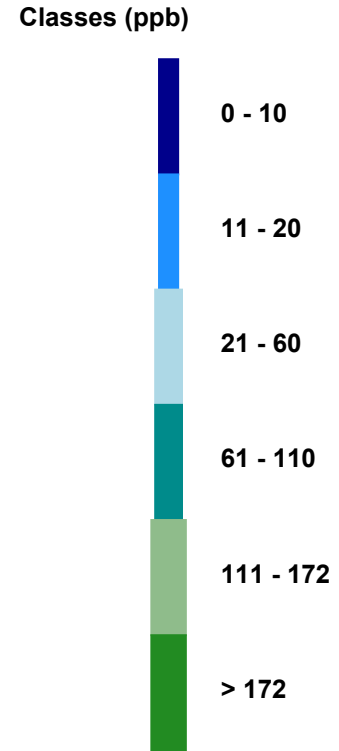
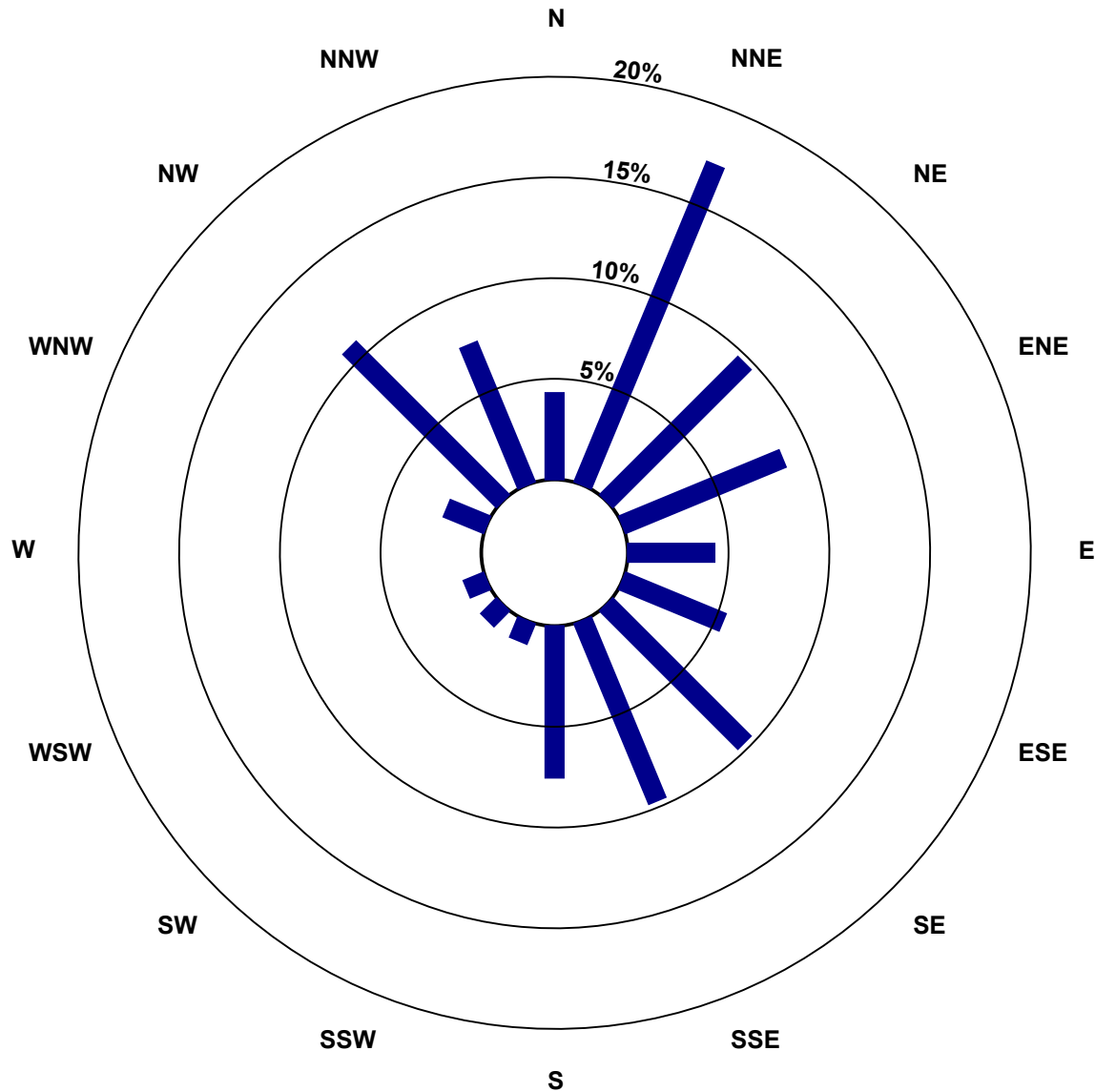
Total Number of Valid Hours: 93

Total Number of Hours: 720

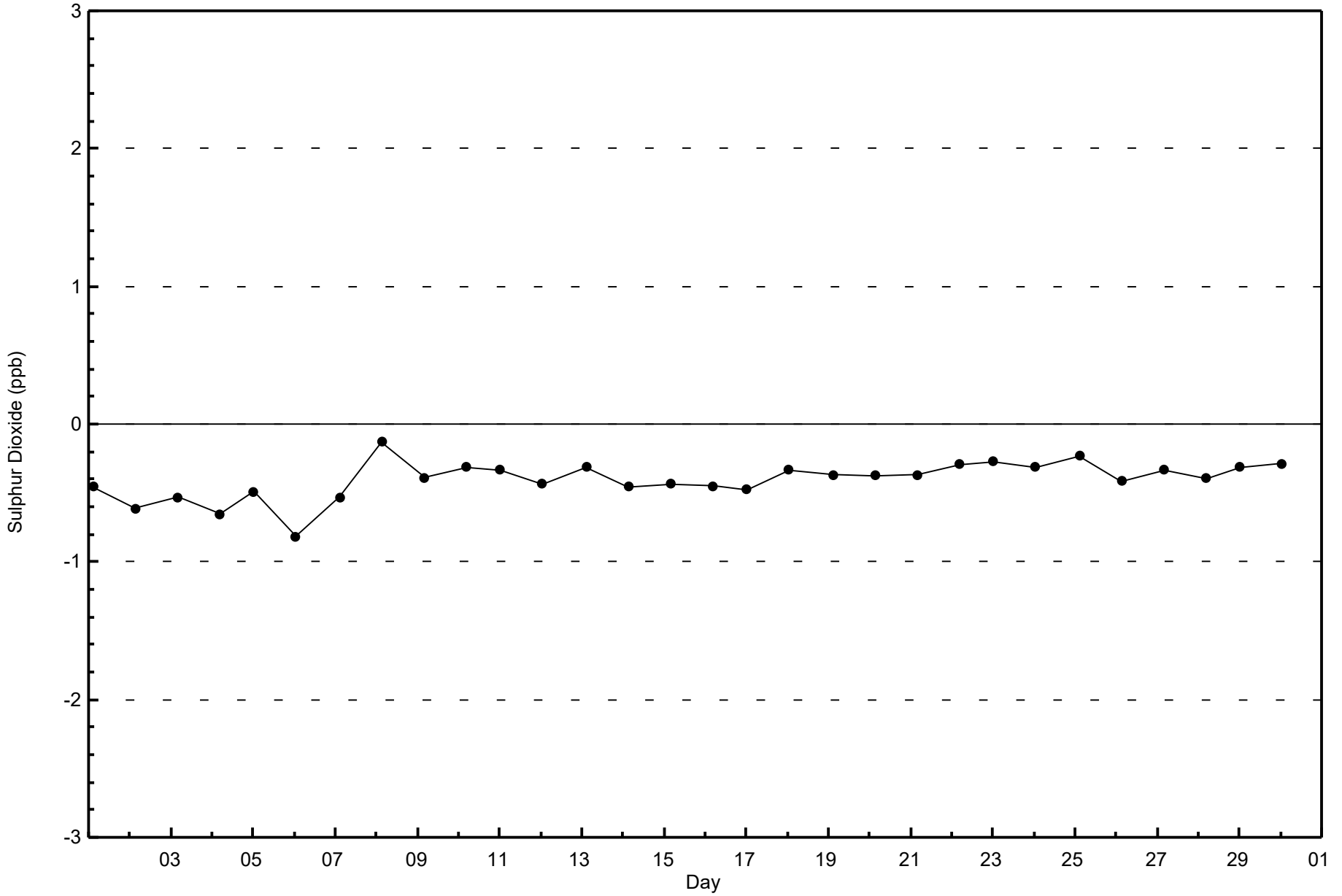


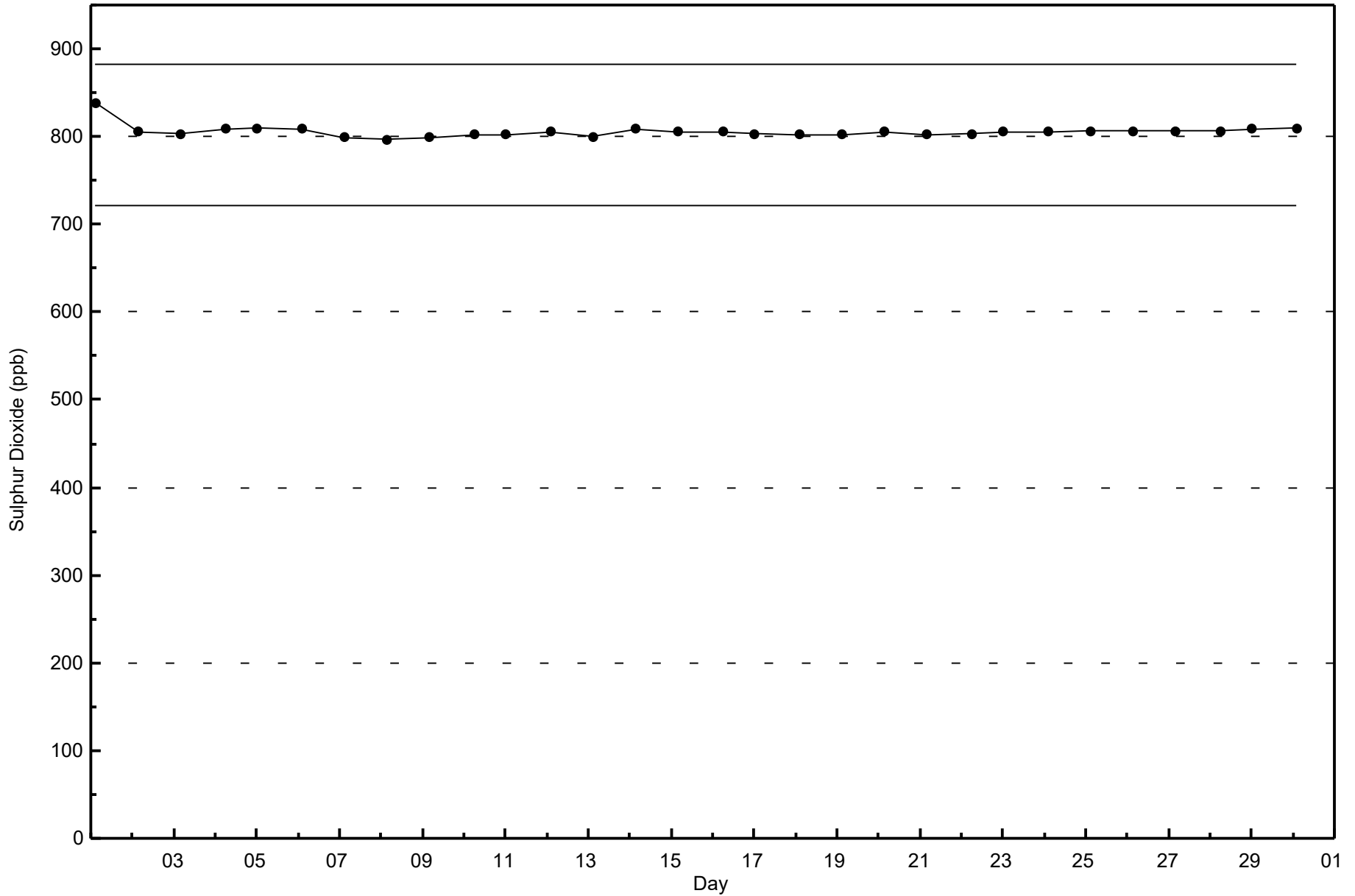
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3



Total Number of Valid Hours: 93







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.0 ppb on Jun 9 00:00	Maximum Daily Average: 0.4 ppb on Jun 8		Hours of Data:	675
Minimum Value: 0.0 ppb on Jun 4 22:00	Minimum Daily Average: 0.1 ppb on Jun 20		Hours of Missing Data:	45
Maximum Diurnal Average: 0.3 ppb at hour 6	Minimum Diurnal Average: 0.2 ppb at hour 17		Hours of Calibration:	35
Monthly Average: 0.20 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.7		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-Jun	0.2	0.1	0.2	Z	0.3	0.2	0.2	0.2	0.2	M	M	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3
2-Jun	0.2	0.2	0.2	0.2	Z	0.3	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	0.3	0.4	0.4	0.3	0.2	0.4
3-Jun	0.1	0.6	0.3	0.3	0.3	Z	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.5	0.1	0.1	0.3	0.2	0.6
4-Jun	Z	0.5	0.2	0.1	0.2	0.4	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	0.0	0.0	0.0	0.1	0.5
5-Jun	0.0	Z	0.4	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	UO	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.4
6-Jun	0.1	0.1	Z	0.1	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2
7-Jun	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.2	0.4
8-Jun	0.4	0.5	0.6	0.9	Z	0.7	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.9	2.0	0.4	2.0
9-Jun	0.5	1.1	1.4	0.2	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.2	1.4
10-Jun	Z	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.1	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	0.3
11-Jun	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.3
12-Jun	0.1	0.3	Z	0.3	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	DF	DF	DF	0.2	0.2	0.2	0.3	0.2	0.5
13-Jun	0.6	0.2	0.2	Z	0.2	0.2	0.2	DF	0.4	C	C	C	C	C	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	--	0.6
14-Jun	0.0	0.1	0.1	0.3	Z	0.7	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.7
15-Jun	0.3	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.2	0.3
16-Jun	Z	0.1	0.3	0.5	0.4	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.5
17-Jun	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.4	0.2	0.4
18-Jun	0.5	0.4	Z	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.2	0.5
19-Jun	0.1	0.1	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.3
20-Jun	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	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2
21-Jun	0.0	0.1	0.1	0.1	0.1	Z	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.2	0.4
22-Jun	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.5	M	0.1	0.2	0.2	0.2	0.2	UO	UO	0.1	0.3	0.3	0.2	0.3	0.4	0.3	0.2	0.5
23-Jun	0.2	Z	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.4
24-Jun	0.2	0.3	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.0	0.1	0.1	0.2	0.4
25-Jun	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2
26-Jun	0.3	0.3	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.4	0.2	0.4
27-Jun	0.3	0.2	0.4	0.2	0.2	Z	0.3	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.9	0.2	0.2	0.9
28-Jun	Z	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.4
29-Jun	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.3	0.5
30-Jun	0.3	0.2	Z	0.2	0.1	0.4	0.2	0.1	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	0.2	0.3	0.3	0.2	0.4

0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	Diurnal Average	
0.6	1.1	1.4	0.9	0.5	0.7	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.9	2.0	Diurnal Maximum	

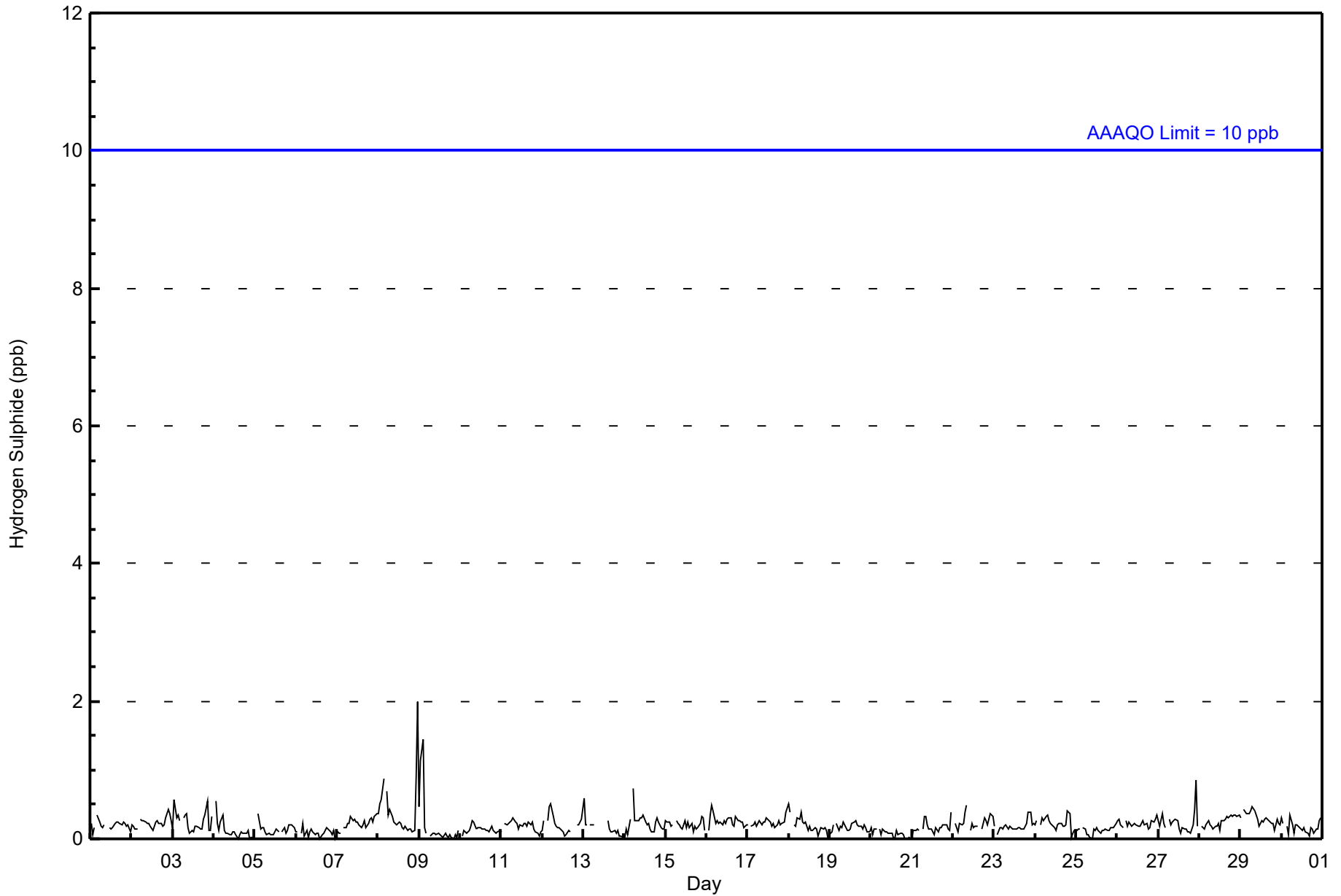
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	675	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: 675

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - June 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	49	70	18	27	24	17	28	68	56	71	76	36	28	43	36	675
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	49	70	18	27	24	17	28	68	56	71	76	36	28	43	36	675

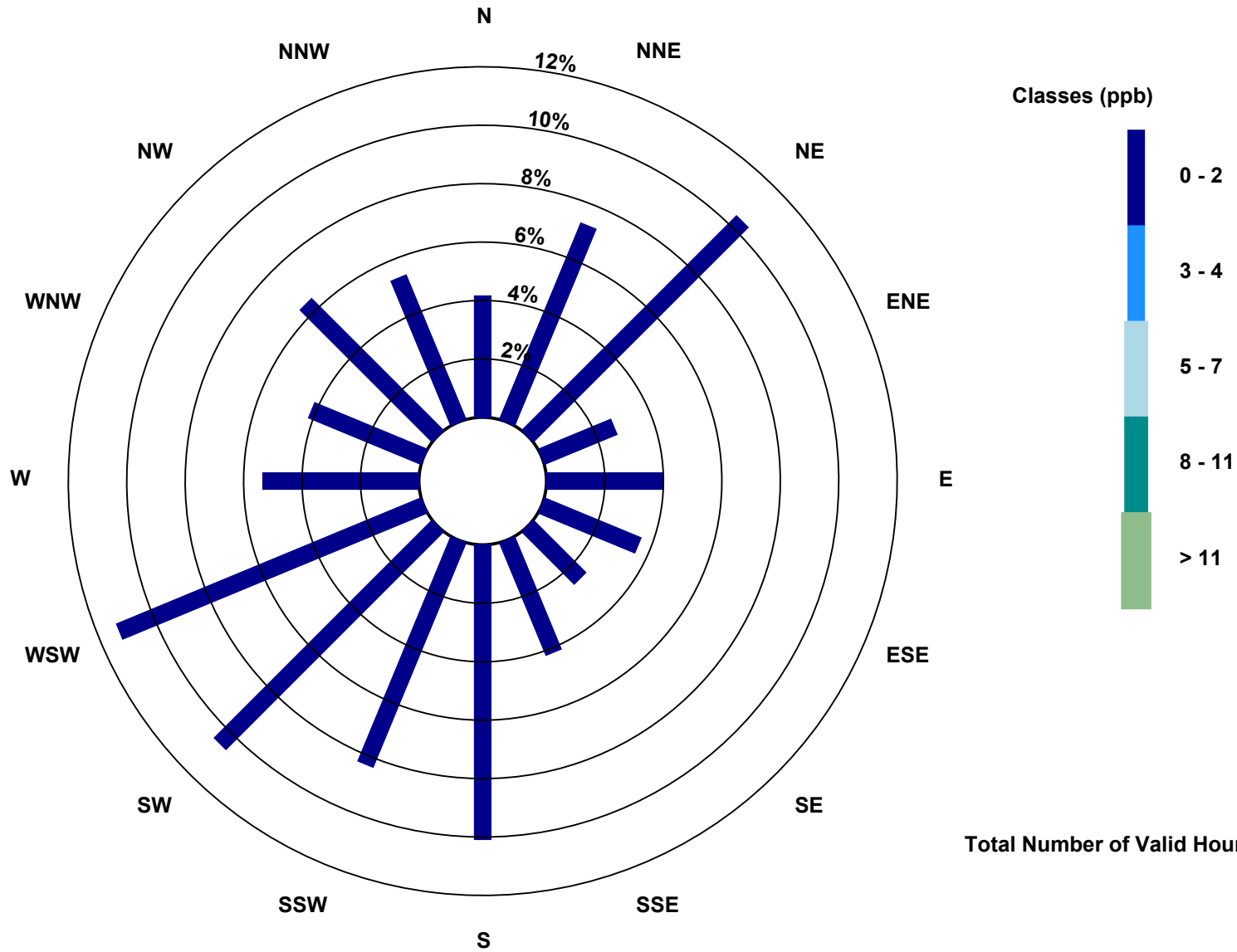
Total Number of Valid Hours: 675

Total Number of Hours: 720

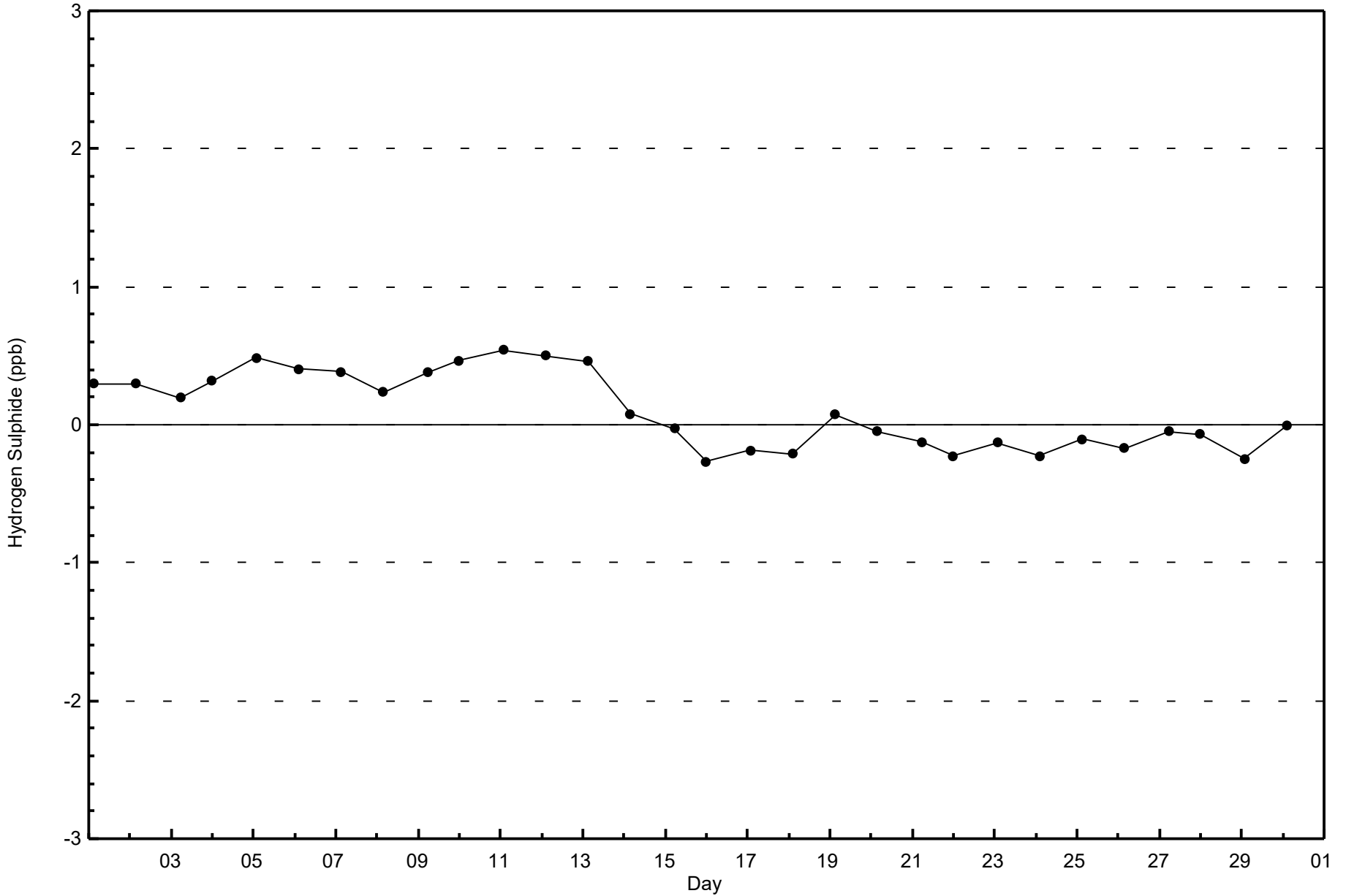


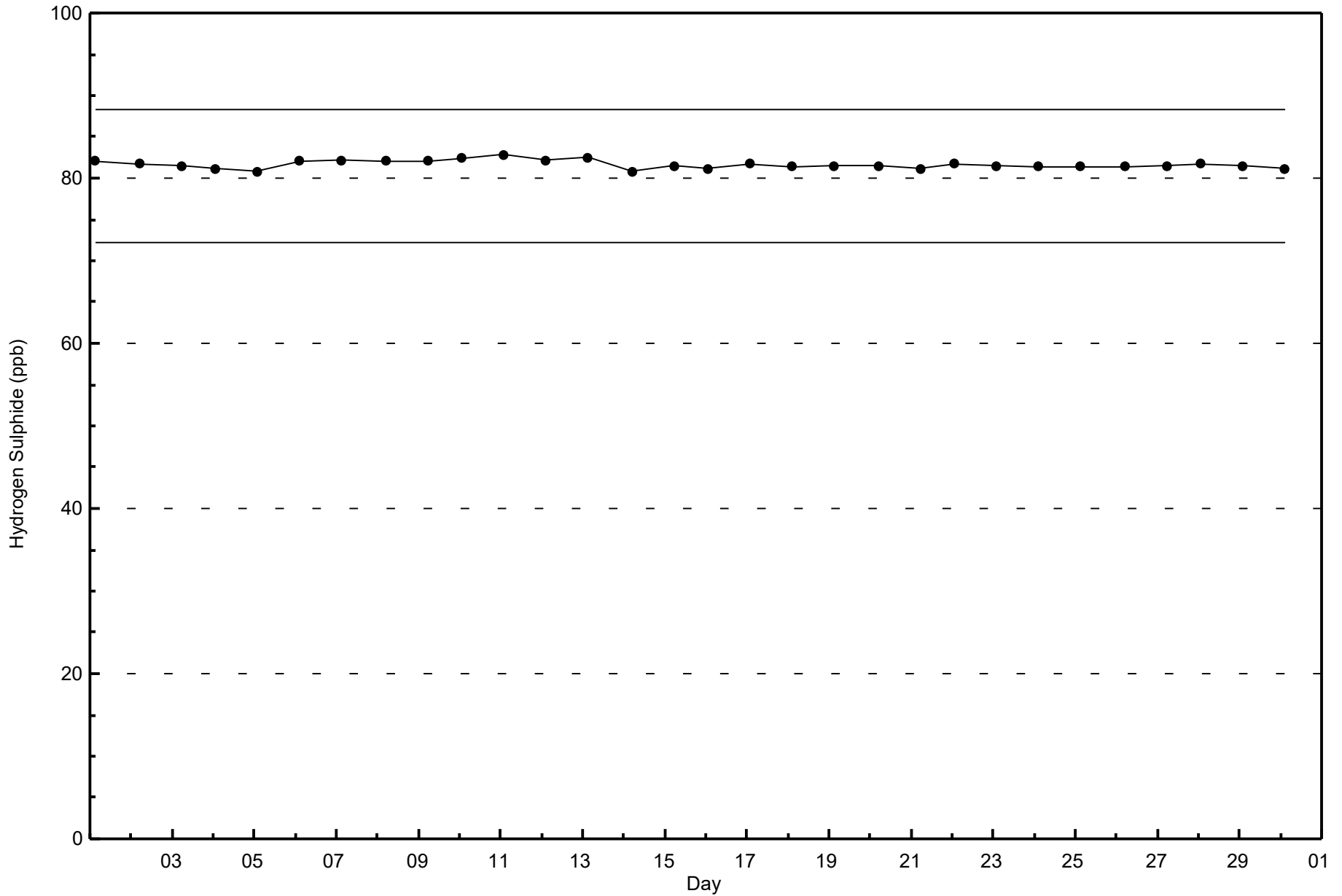
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3



Total Number of Valid Hours: 675







Wood Buffalo Environmental Association
Summary of Hour Averages

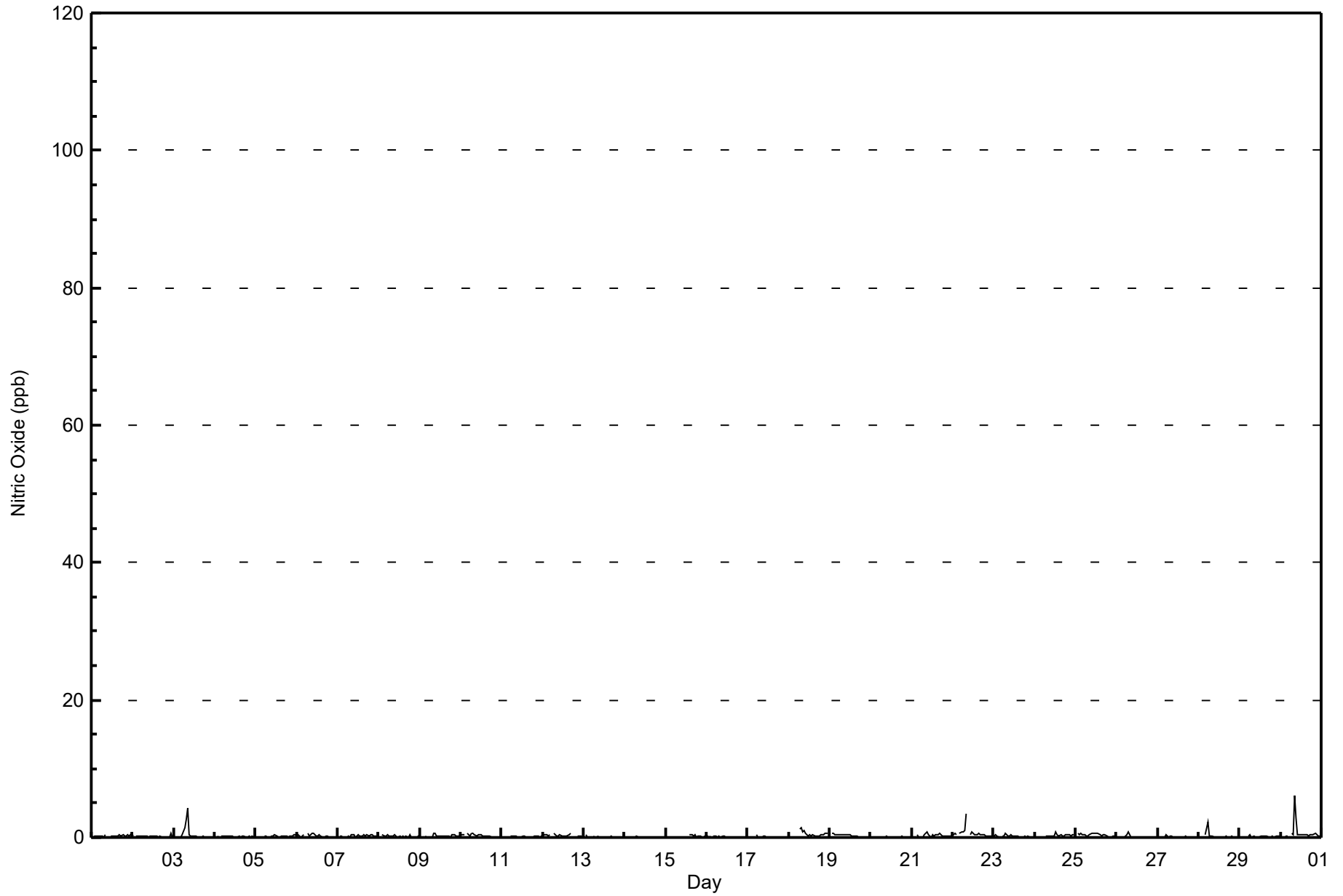
Nitric Oxide (NO) - ppb
Jackfish 2/3 - June 2023

Maximum Value: 6.2 ppb on Jun 30 09:00		Maximum Daily Average: 0.7 ppb on Jun 30		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 1 08:00		Minimum Daily Average: 0.0 ppb on Jun 20		Hours of Data: 656																						
Maximum Diurnal Average: 0.7 ppb at hour 9		Minimum Diurnal Average: 0.1 ppb at hour 1		Hours of Missing Data: 64																						
Monthly Average: 0.22 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 1.4		Hours of Calibration: 37																						
				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-Jun	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.3	M	M	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.1	0.3	0.2	0.5	0.2	0.5
2-Jun	0.3	Z	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.2	0.6
3-Jun	0.0	0.0	Z	0.1	0.1	0.5	1.5	2.6	4.4	0.5	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.5	4.4
4-Jun	0.0	0.0	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3
5-Jun	0.0	0.0	0.0	0.1	Z	0.3	0.3	0.0	0.1	0.2	0.2	0.5	0.1	0.0	0.1	0.2	0.1	0.1	0.3	0.0	0.1	0.2	0.5	0.3	0.2	0.5
6-Jun	0.2	0.5	0.1	0.3	0.3	Z	0.5	0.3	0.4	0.5	0.6	0.3	0.2	0.3	0.3	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.6
7-Jun	Z	0.2	0.1	0.0	0.1	0.0	0.2	0.0	0.3	0.4	0.1	0.3	0.4	0.2	0.2	0.3	0.2	0.4	0.1	0.4	0.4	0.2	0.2	0.3	0.2	0.4
8-Jun	0.2	Z	0.4	0.3	0.3	0.4	0.2	0.2	0.2	0.5	0.2	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.2	0.2	0.5
9-Jun	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.7	0.6	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.0	0.3	0.3	0.2	0.3	0.3	0.2	0.7
10-Jun	0.3	0.4	0.4	Z	0.6	0.3	0.5	0.6	0.5	0.3	0.4	0.4	0.4	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.6
11-Jun	0.1	0.0	0.0	0.0	Z	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.3
12-Jun	0.2	0.3	0.3	0.2	0.5	Z	0.5	0.4	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.4	0.5	DF	DF	DF	0.2	0.2	0.1	0.1	0.3	0.5
13-Jun	Z	0.3	0.0	0.0	0.1	0.1	0.2	DF	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3
14-Jun	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	C	C	C	C	M	M	M	M	M	M	M	M	M	M	M	0.2
15-Jun	M	M	M	M	M	M	M	M	M	M	C	C	C	C	0.3	0.4	0.3	0.3	0.1	0.2	0.1	0.0	0.0	0.1	--	0.4
16-Jun	0.2	0.1	0.1	Z	0.3	0.2	0.1	0.2	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
17-Jun	0.0	0.0	0.0	0.0	Z	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.4
18-Jun	0.0	0.0	0.0	0.0	0.0	Z	1.2	1.3	0.9	1.0	0.7	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.6	0.5	0.6	0.4	1.3
19-Jun	Z	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6
20-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
21-Jun	0.0	0.0	Z	0.3	0.0	0.0	0.1	0.3	0.7	0.7	0.5	0.1	0.4	0.1	0.3	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.7
22-Jun	0.5	0.5	0.4	Z	0.6	0.7	0.8	1.0	3.5	M	0.5	0.8	0.6	0.4	0.4	0.7	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.6	3.5
23-Jun	0.3	0.3	0.2	0.0	Z	0.3	0.2	0.6	0.2	0.3	0.4	0.2	0.2	0.3	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.6
24-Jun	0.0	0.0	0.0	0.0	0.1	Z	0.3	0.1	0.2	0.1	0.2	0.1	0.9	0.4	0.1	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.9
25-Jun	Z	0.5	0.3	0.5	0.4	0.4	0.2	0.2	0.3	0.6	0.6	0.5	0.5	0.6	0.3	0.3	0.3	0.4	0.2	0.0	0.1	0.0	0.1	0.1	0.3	0.6
26-Jun	0.0	Z	0.0	0.0	0.0	0.2	0.4	0.7	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
27-Jun	0.0	0.0	Z	0.1	0.0	0.4	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.4
28-Jun	0.0	0.0	0.0	Z	0.5	2.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	2.3
29-Jun	0.1	0.0	0.0	0.0	Z	0.3	0.3	0.0	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.0	0.1	0.3	0.2	0.1	0.3
30-Jun	0.2	0.0	0.1	0.2	0.2	Z	0.6	0.5	6.2	2.8	0.3	0.5	0.5	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.6	0.4	0.3	0.2	0.7	6.2
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.2 0.1 0.1 0.2 0.3 0.3 0.4 0.7 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 0.2 0.1 0.1 0.6		
																								0.5 0.6 0.5 0.5 0.6 2.3 1.5 2.6 6.2 2.8 0.7 0.8 0.9 0.6 0.4 0.7 0.5 0.4 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6		
																								Z - zerospan C - Calibration M - Maintenance DF - DAS Failure		



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 2/3 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 2/3 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	656	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: 656

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 2/3 - June 2023**

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	49	65	17	29	24	18	27	74	56	73	75	37	28	38	22	656
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	24	49	65	17	29	24	18	27	74	56	73	75	37	28	38	22	656

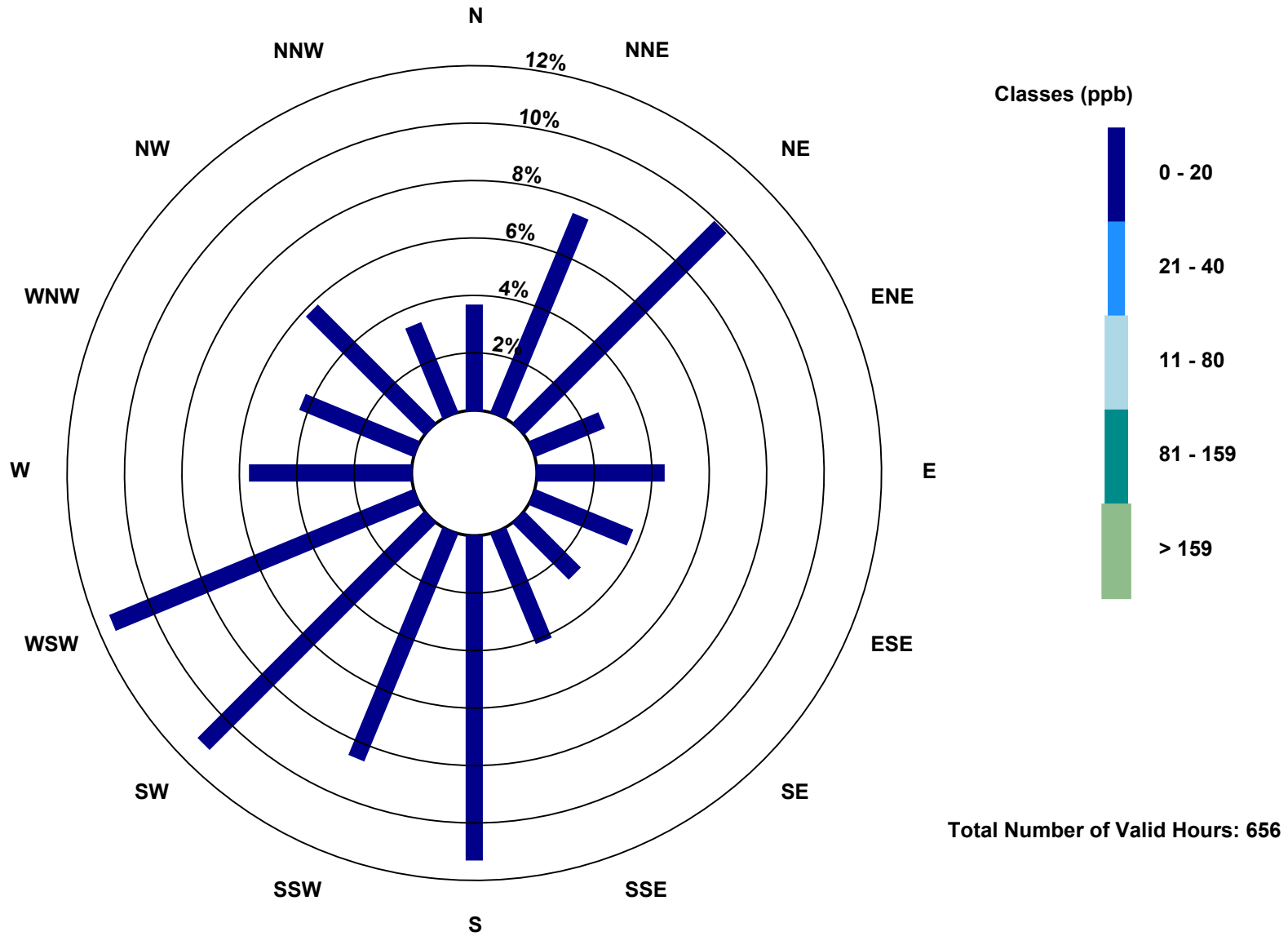
Total Number of Valid Hours: 656

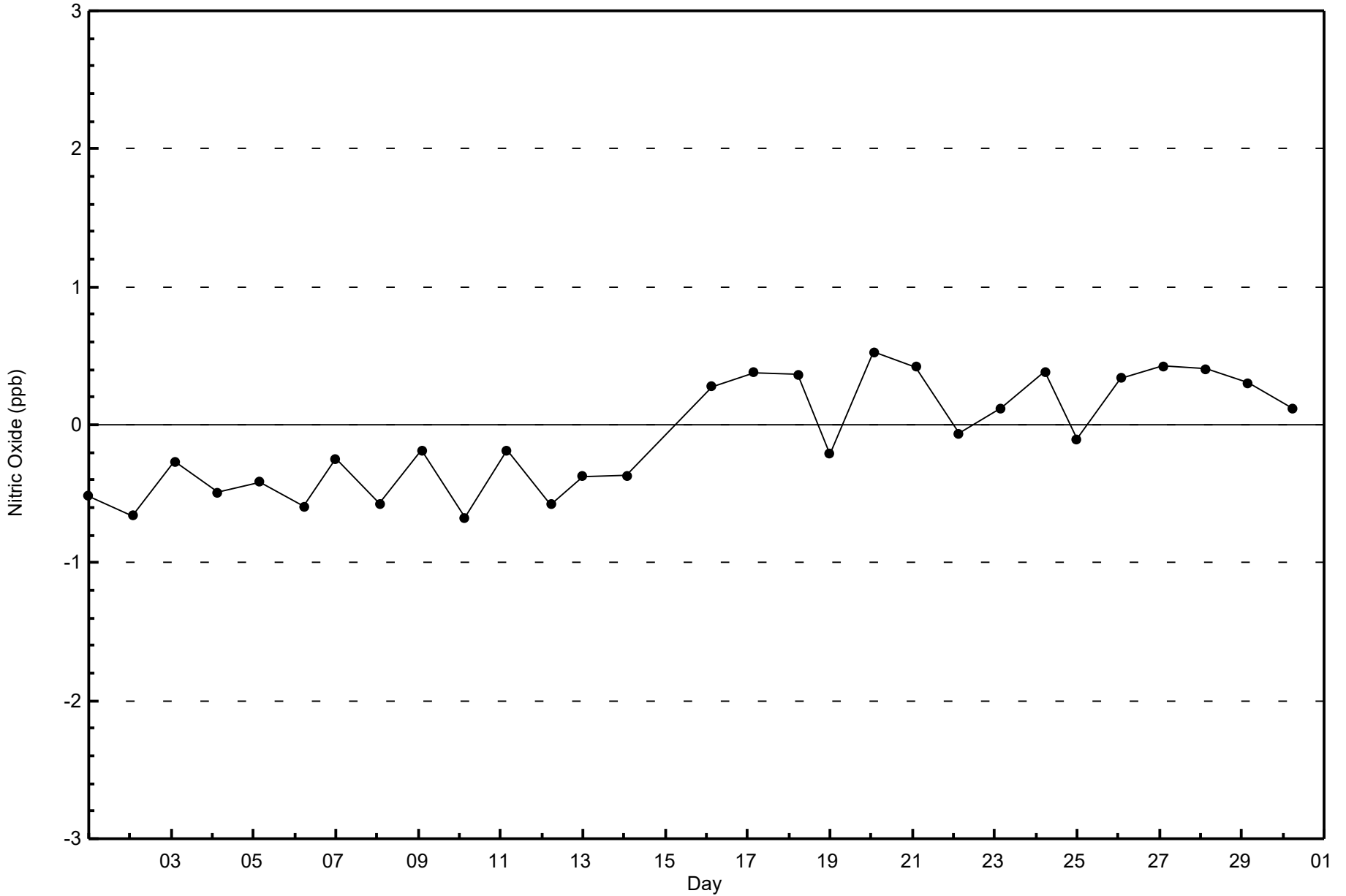
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Jackfish 2/3

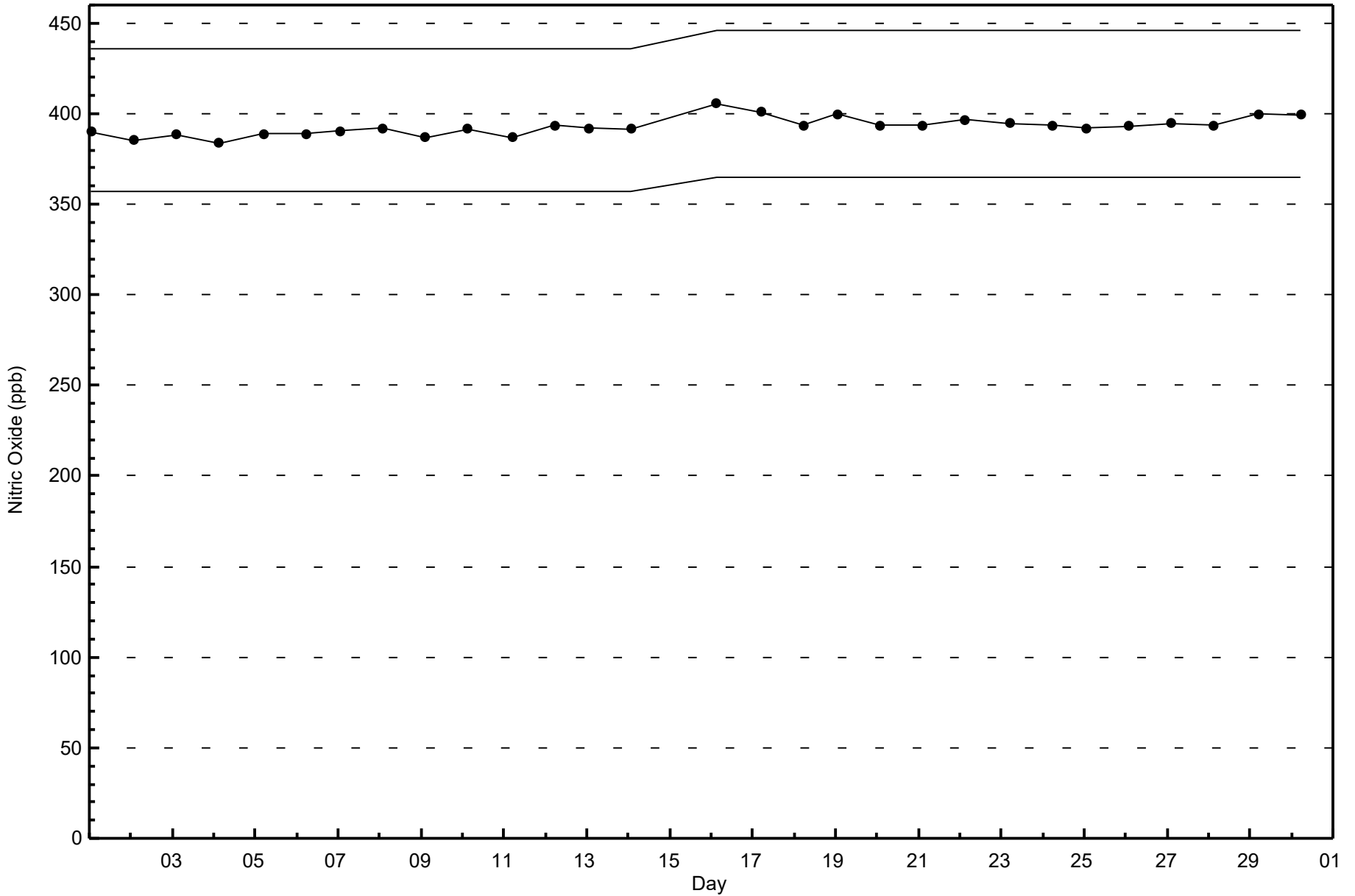






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Jackfish 2/3 - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Jackfish 2/3 - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 7.2 ppb on Jun 3 09:00	Maximum Daily Average: 2.0 ppb on Jun 13		Hours of Data:	656
Minimum Value: 0.0 ppb on Jun 15 19:00	Minimum Daily Average: 0.3 ppb on Jun 17		Hours of Missing Data:	64
Maximum Diurnal Average: 1.8 ppb at hour 9	Minimum Diurnal Average: 0.6 ppb at hour 1		Hours of Calibration:	37
Monthly Average: 1.05 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.4 Median = 0.8 Q ₃ = 1.3 P ₉₀ = 2.2 P ₉₉ = 4.6		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-Jun	Z	1.8	1.4	1.7	1.2	0.8	0.8	0.9	1.1	M	M	1.3	1.1	1.1	1.1	0.9	1.0	1.2	0.8	0.8	0.9	1.0	1.3	0.7	1.1	1.8	
2-Jun	0.4	Z	0.7	0.8	0.7	0.6	0.8	1.1	1.0	1.0	1.0	1.3	1.6	1.9	1.9	1.6	1.8	2.0	1.6	1.4	1.2	0.9	3.6	1.1	1.3	3.6	
3-Jun	0.4	1.1	Z	1.4	1.2	4.5	5.3	4.9	7.2	2.0	1.1	0.9	0.9	0.8	0.7	0.6	0.2	0.6	0.4	0.3	0.4	0.3	0.3	0.4	1.6	7.2	
4-Jun	0.4	1.0	4.6	Z	0.9	0.7	0.2	0.4	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.6	0.7	0.6	0.7	0.4	0.4	0.6	0.7	0.6	0.7	4.6	
5-Jun	0.7	0.7	1.0	1.0	Z	2.2	1.3	0.6	0.4	0.6	1.4	1.7	1.7	1.3	0.7	0.8	0.9	1.4	0.7	1.4	1.1	1.0	1.8	2.2	1.2	2.2	
6-Jun	0.1	1.1	0.3	0.1	0.5	Z	0.5	0.8	0.7	0.6	0.4	0.6	0.2	0.4	0.3	0.4	0.2	0.5	0.5	0.4	0.5	0.3	0.8	0.8	0.5	1.1	
7-Jun	Z	0.9	1.0	1.3	2.5	1.7	1.7	1.6	2.3	2.6	2.1	1.4	1.2	1.2	0.8	0.4	0.2	0.1	0.3	1.1	0.4	0.5	1.0	1.3	1.2	2.6	
8-Jun	1.7	Z	2.1	1.5	0.9	1.9	1.2	2.1	2.6	3.2	1.0	0.9	0.9	1.1	0.7	0.5	1.1	2.4	3.9	2.6	2.1	3.4	2.3	1.3	1.8	3.9	
9-Jun	1.1	1.0	Z	0.9	1.0	1.1	1.0	1.1	4.0	3.5	1.6	0.3	0.9	1.0	0.8	0.9	0.7	0.4	0.6	0.9	0.9	1.1	1.2	1.5	1.2	4.0	
10-Jun	1.4	1.5	1.8	Z	2.0	2.0	3.1	3.1	2.5	2.1	1.9	1.6	1.7	1.8	1.9	1.6	1.6	1.5	1.6	1.6	1.5	1.4	1.9	2.1	1.9	3.1	
11-Jun	2.2	2.4	2.5	2.8	Z	3.9	3.4	3.3	3.1	2.1	2.4	1.4	1.9	2.3	1.9	1.2	1.1	1.5	1.0	0.6	0.4	0.4	0.3	0.4	1.8	3.9	
12-Jun	0.2	2.3	3.0	2.4	3.6	Z	5.8	2.7	1.6	1.9	2.6	1.9	1.2	0.9	1.2	2.1	4.0	DF	DF	DF	0.4	0.3	0.5	1.4	2.0	5.8	
13-Jun	Z	1.1	0.9	1.1	1.1	0.7	1.1	DF	3.4	3.5	3.2	2.7	2.2	2.4	2.0	1.9	5.3	1.5	1.5	1.6	1.4	1.6	1.2	2.7	2.0	5.3	
14-Jun	0.8	Z	3.1	1.3	1.6	1.0	0.9	1.3	1.2	1.3	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	M	3.1
15-Jun	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	0.3	0.4	0.3	0.2	0.0	0.0	0.6	0.2	0.0	0.1	--	0.6
16-Jun	0.0	0.2	0.0	Z	0.0	0.2	0.2	1.0	0.5	0.3	0.5	0.8	0.5	1.0	0.9	0.7	0.4	0.3	0.3	0.3	0.3	0.2	0.4	0.4	0.4	0.4	1.0
17-Jun	0.2	0.4	0.5	0.4	Z	0.6	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.1	0.2	0.0	0.1	0.1	0.0	0.3	0.5	0.4	0.2	0.0	0.3	0.6	0.6
18-Jun	0.1	0.4	0.3	0.0	0.4	Z	4.3	6.1	2.7	2.5	1.7	1.3	0.9	0.4	0.3	0.1	0.1	0.2	1.0	2.0	4.2	2.6	1.6	1.0	1.5	6.1	
19-Jun	Z	1.5	3.5	3.7	4.4	2.4	0.1	0.4	1.6	0.5	0.6	0.5	0.8	1.1	0.6	0.3	0.7	0.4	0.3	0.2	0.2	0.2	0.0	0.0	1.0	4.4	
20-Jun	0.6	Z	0.4	0.6	0.4	0.5	0.6	0.3	0.3	0.6	0.9	0.6	0.4	0.3	0.2	0.3	0.5	0.7	0.6	0.9	0.8	0.7	0.5	0.5	0.5	0.9	0.9
21-Jun	0.6	0.9	Z	1.2	0.9	1.2	1.4	1.5	1.4	1.7	0.8	0.5	0.3	0.4	0.3	0.3	0.9	0.3	0.5	1.0	0.5	0.2	0.2	0.1	0.7	1.7	1.7
22-Jun	0.1	0.2	0.2	Z	0.2	0.6	0.5	0.9	3.7	M	0.6	0.8	1.0	0.9	0.6	1.1	0.4	0.5	0.4	0.2	0.1	0.0	0.2	0.5	0.6	3.7	3.7
23-Jun	0.2	0.6	0.5	0.6	Z	0.6	0.6	1.3	0.8	1.0	1.1	0.8	0.8	1.0	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.2	0.3	0.4	0.6	1.3	1.3
24-Jun	0.3	0.8	1.3	1.8	2.3	Z	1.5	1.7	1.2	0.7	0.6	0.6	0.9	0.4	0.5	0.4	0.2	0.2	0.3	0.3	0.3	0.4	0.7	0.8	0.8	2.3	2.3
25-Jun	Z	0.9	2.2	1.2	0.6	0.8	0.9	0.3	0.4	1.5	1.9	1.3	1.2	0.9	0.6	0.5	0.7	0.9	0.5	0.8	0.5	0.4	0.1	0.7	0.9	2.2	2.2
26-Jun	0.5	Z	0.1	0.5	1.0	0.4	1.1	2.1	0.4	0.3	0.5	0.1	0.5	0.5	0.4	0.3	0.6	1.0	0.9	0.4	0.4	1.2	1.1	0.6	0.6	2.1	
27-Jun	0.7	0.6	Z	0.8	0.8	1.7	0.8	1.1	1.3	1.5	1.6	1.4	1.0	0.7	0.9	0.9	0.6	1.0	1.0	1.0	1.4	0.6	0.2	0.0	0.9	1.7	1.7
28-Jun	0.2	0.4	0.4	Z	1.4	2.2	1.2	1.0	1.3	0.4	0.3	0.5	0.2	0.1	0.1	0.3	1.0	0.7	0.8	0.3	0.0	0.1	0.1	0.0	0.6	2.2	2.2
29-Jun	0.2	0.2	0.0	0.4	Z	0.9	1.0	1.0	0.9	0.6	0.7	0.6	0.6	0.5	0.8	1.3	1.5	1.0	0.8	0.6	0.4	0.5	0.9	0.7	0.7	1.5	1.5
30-Jun	0.8	0.2	0.9	0.8	0.4	Z	0.8	0.6	3.2	2.8	0.8	0.7	0.7	0.4	0.2	0.5	0.5	1.2	0.8	0.3	2.5	1.7	2.7	4.7	1.2	4.7	

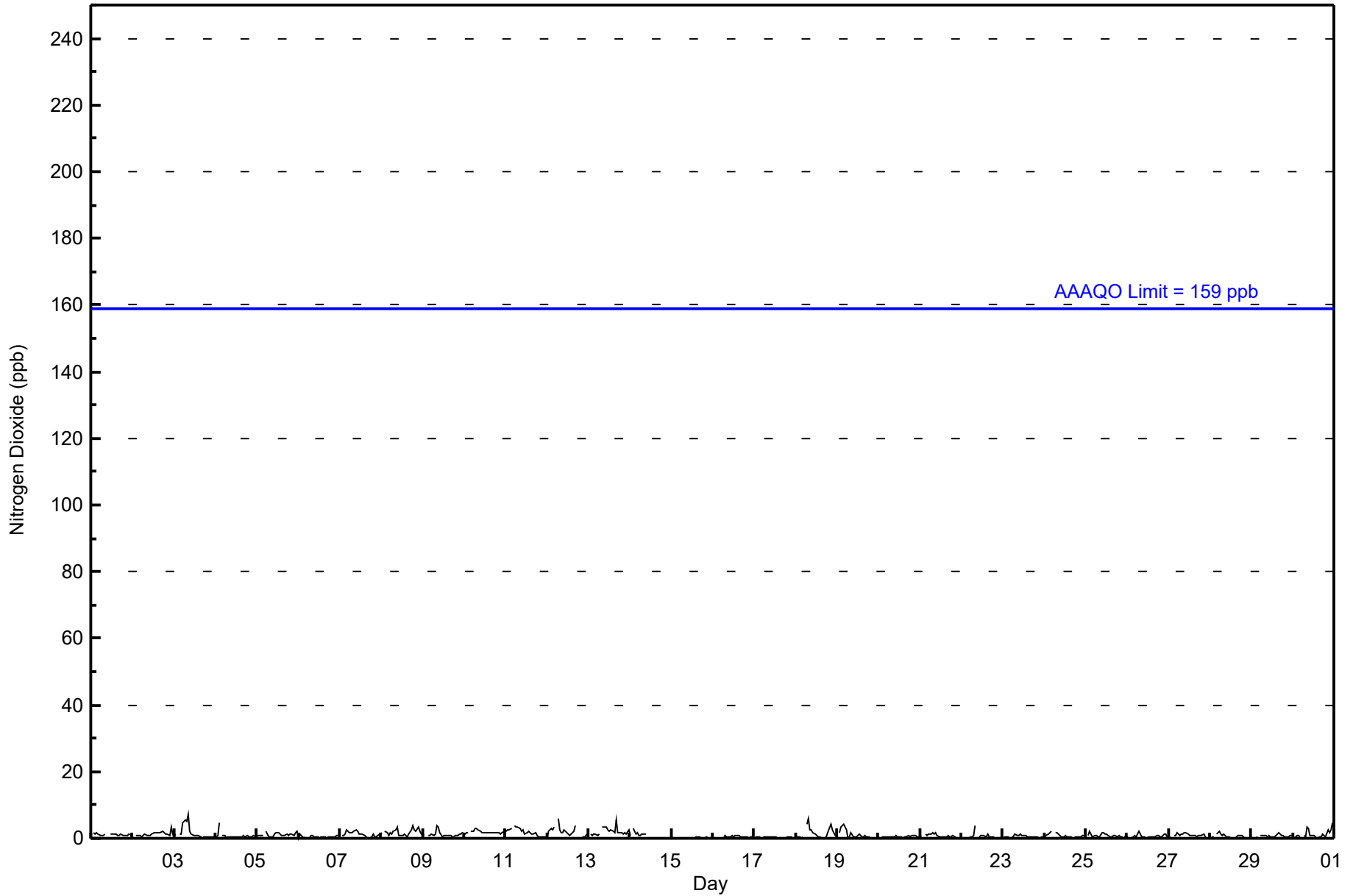
0.6	0.9	1.3	1.2	1.3	1.4	1.5	1.6	1.8	1.5	1.2	1.0	0.9	0.9	0.8	0.7	1.0	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.9	Diurnal Average	
2.2	2.4	4.6	3.7	4.4	4.5	5.8	6.1	7.2	3.5	3.2	2.7	2.2	2.4	2.0	2.1	5.3	2.4	3.9	2.6	4.2	3.4	3.6	4.7	Diurnal Maximum			

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	656	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: 656

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - June 2023**

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	49	65	17	29	24	18	27	74	56	73	75	37	28	38	22	656
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	24	49	65	17	29	24	18	27	74	56	73	75	37	28	38	22	656

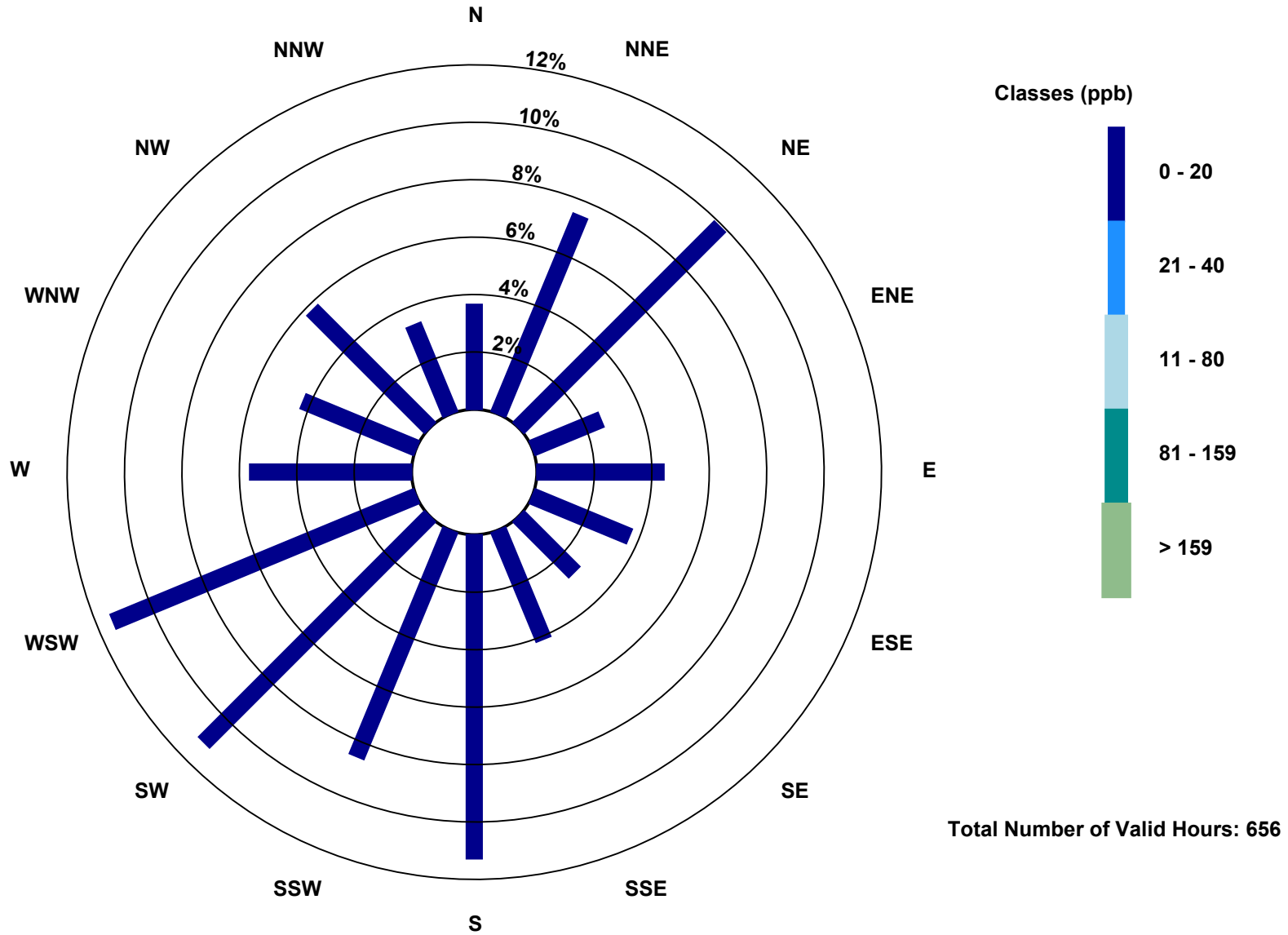
Total Number of Valid Hours: 656

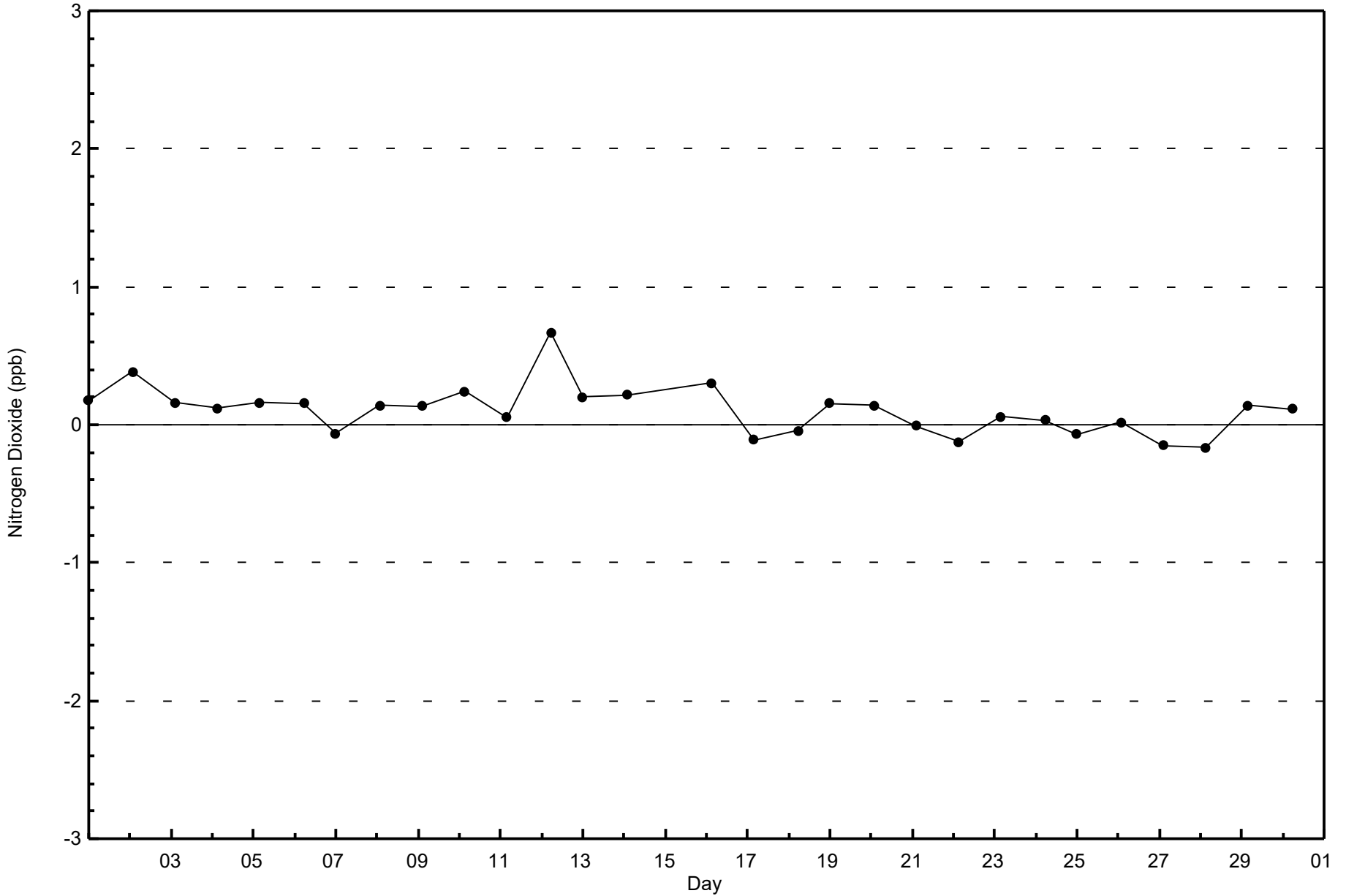
Total Number of Hours: 720

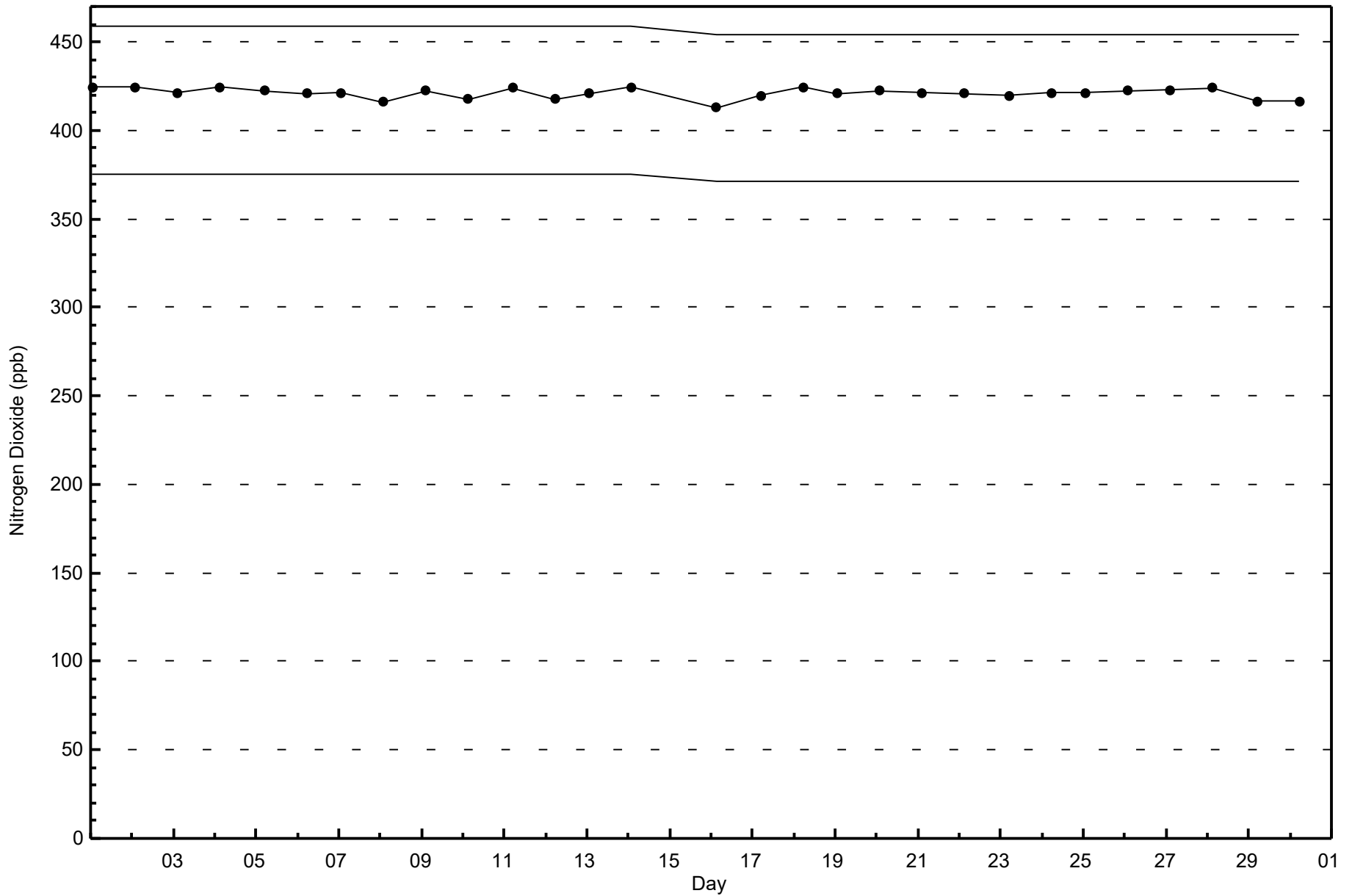


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

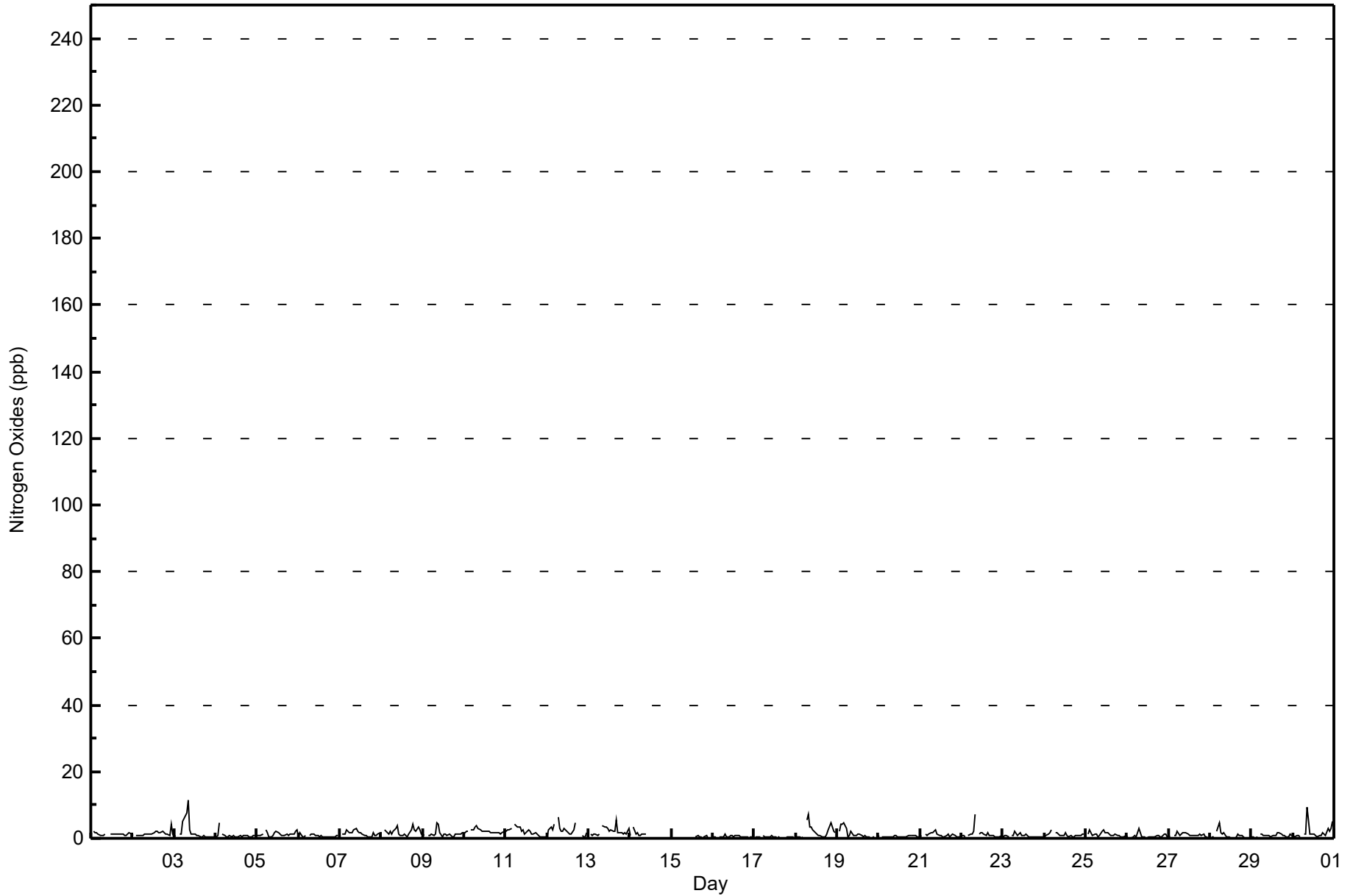
Jackfish 2/3 - June 2023

Maximum Value: 11.6 ppb on Jun 3 09:00		Maximum Daily Average: 2.3 ppb on Jun 12		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Jun 19 23:00		Minimum Daily Average: 0.4 ppb on Jun 17		Hours of Data: 656																							
Maximum Diurnal Average: 2.5 ppb at hour 9		Minimum Diurnal Average: 0.7 ppb at hour 1		Hours of Missing Data: 64																							
Monthly Average: 1.27 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.0 Q ₃ = 1.6 P ₉₀ = 2.5 P ₉₉ = 5.9		Hours of Calibration: 37																							
				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-Jun	Z	2.0	1.6	1.8	1.4	1.0	1.0	0.9	1.4	M	M	1.4	1.3	1.4	1.3	1.1	1.3	1.4	1.1	1.1	1.0	1.3	1.5	1.2	1.3	2.0	
2-Jun	0.7	Z	0.9	1.0	0.8	0.9	1.0	1.3	1.2	1.1	1.3	1.5	1.8	2.1	2.0	1.7	1.9	2.1	1.6	1.4	1.2	0.9	4.2	1.1	1.5	4.2	
3-Jun	0.4	1.1	Z	1.5	1.3	5.0	6.8	7.5	11.6	2.5	1.3	1.1	1.1	0.9	0.7	0.6	0.2	0.7	0.4	0.3	0.5	0.3	0.3	0.4	2.0	11.6	
4-Jun	0.4	1.0	4.7	Z	1.1	0.9	0.4	0.5	0.6	0.6	0.7	0.5	0.6	0.5	0.7	0.6	0.9	0.7	0.8	0.5	0.5	0.6	0.8	0.7	0.9	4.7	
5-Jun	0.7	0.7	1.0	1.1	Z	2.5	1.6	0.6	0.5	0.8	1.6	2.2	1.8	1.3	0.8	1.0	1.0	1.5	1.0	1.4	1.2	1.2	2.3	2.5	1.3	2.5	
6-Jun	0.3	1.6	0.4	0.4	0.8	Z	1.0	1.1	1.1	1.1	1.0	0.9	0.4	0.7	0.6	0.4	0.3	0.6	0.6	0.4	0.5	0.3	0.8	0.9	0.7	1.6	
7-Jun	Z	1.1	1.1	1.3	2.6	1.7	1.9	1.6	2.6	3.0	2.2	1.7	1.6	1.4	1.0	0.7	0.4	0.5	0.4	1.5	0.8	0.7	1.2	1.6	1.4	3.0	
8-Jun	1.9	Z	2.5	1.8	1.2	2.3	1.4	2.3	2.8	3.7	1.2	0.9	1.0	1.2	0.9	0.6	1.3	2.5	4.2	2.6	2.1	3.4	2.3	1.5	2.0	4.2	
9-Jun	1.1	1.0	Z	1.0	1.0	1.1	1.0	1.2	4.7	4.1	1.8	0.5	1.1	1.2	0.9	1.1	0.8	0.6	0.6	1.2	1.2	1.3	1.5	1.8	1.4	4.7	
10-Jun	1.7	1.9	2.2	Z	2.6	2.3	3.6	3.7	3.0	2.4	2.3	2.0	2.1	1.9	2.0	1.8	1.7	1.6	1.7	1.7	1.5	1.4	1.9	2.1	2.1	3.7	
11-Jun	2.3	2.4	2.5	2.8	Z	4.1	3.7	3.5	3.3	2.2	2.5	1.4	2.0	2.5	2.0	1.2	1.1	1.5	1.1	0.8	0.6	0.6	0.4	0.5	2.0	4.1	
12-Jun	0.4	2.6	3.3	2.6	4.1	Z	6.3	3.1	1.9	2.1	2.9	2.1	1.5	1.1	1.4	2.5	4.5	DF	DF	DF	0.6	0.5	0.6	1.5	2.3	6.3	
13-Jun	Z	1.4	0.9	1.1	1.2	0.8	1.3	DF	3.7	3.5	3.2	2.8	2.3	2.4	2.0	2.0	5.5	1.5	1.6	1.6	1.4	1.6	1.2	2.8	2.1	5.5	
14-Jun	0.8	Z	3.2	1.4	1.6	1.0	1.0	1.5	1.3	1.4	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	3.2	
15-Jun	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	0.6	0.8	0.6	0.5	0.1	0.2	0.7	0.2	0.0	0.2	--	0.8
16-Jun	0.2	0.3	0.1	Z	0.3	0.4	0.3	1.2	0.5	0.5	0.7	0.9	0.5	1.0	0.9	0.8	0.4	0.3	0.3	0.3	0.3	0.2	0.4	0.4	0.5	1.2	
17-Jun	0.2	0.4	0.5	0.4	Z	1.0	0.4	0.4	0.4	0.5	0.7	0.6	0.5	0.1	0.3	0.1	0.1	0.1	0.0	0.4	0.5	0.4	0.3	0.0	0.4	1.0	
18-Jun	0.1	0.4	0.3	0.0	0.4	Z	5.5	7.4	3.6	3.5	2.4	1.6	1.3	0.6	0.6	0.4	0.4	0.5	1.3	2.4	4.5	3.2	2.1	1.6	1.9	7.4	
19-Jun	Z	2.1	4.0	4.2	4.9	2.8	0.5	0.8	2.0	0.8	1.0	0.8	1.1	1.3	0.9	0.4	0.9	0.4	0.3	0.2	0.2	0.2	0.0	0.0	1.3	4.9	
20-Jun	0.6	Z	0.4	0.6	0.4	0.5	0.6	0.3	0.3	0.9	0.9	0.6	0.4	0.3	0.3	0.3	0.5	0.7	0.7	0.9	0.8	0.7	0.5	0.5	0.6	0.9	
21-Jun	0.6	0.9	Z	1.5	0.9	1.2	1.5	1.8	2.1	2.4	1.3	0.6	0.7	0.5	0.6	0.7	1.4	0.6	0.8	1.3	0.8	0.5	0.4	0.4	1.0	2.4	
22-Jun	0.6	0.7	0.6	Z	0.8	1.3	1.3	1.9	7.2	M	1.1	1.6	1.6	1.3	1.0	1.8	0.9	0.9	0.8	0.5	0.4	0.2	0.4	0.7	1.3	7.2	
23-Jun	0.5	0.9	0.7	0.6	Z	0.9	0.8	1.9	1.0	1.3	1.5	1.0	1.0	1.3	0.8	0.6	0.5	0.4	0.5	0.4	0.6	0.2	0.3	0.5	0.8	1.9	
24-Jun	0.3	0.8	1.3	1.8	2.4	Z	1.8	1.8	1.4	0.8	0.8	0.7	1.8	0.8	0.6	0.7	0.4	0.5	0.7	0.7	0.7	0.7	1.1	1.2	1.0	2.4	
25-Jun	Z	1.4	2.5	1.7	1.0	1.2	1.1	0.5	0.7	2.1	2.5	1.8	1.7	1.5	0.9	0.8	1.0	1.3	0.7	0.8	0.6	0.4	0.2	0.8	1.2	2.5	
26-Jun	0.5	Z	0.1	0.5	1.0	0.6	1.5	2.8	0.5	0.3	0.6	0.1	0.5	0.5	0.4	0.3	0.6	1.0	0.9	0.4	0.4	1.2	1.1	0.6	0.7	2.8	
27-Jun	0.7	0.6	Z	0.9	0.8	2.1	0.8	1.3	1.6	1.5	1.6	1.4	1.0	0.7	0.9	0.9	0.7	1.0	1.1	1.0	1.4	0.6	0.3	0.0	1.0	2.1	
28-Jun	0.2	0.4	0.4	Z	1.9	4.5	1.5	1.2	1.5	0.4	0.3	0.5	0.2	0.1	0.1	0.3	1.1	0.7	0.8	0.4	0.0	0.1	0.2	0.0	0.7	4.5	
29-Jun	0.3	0.2	0.0	0.4	Z	1.2	1.3	1.0	1.0	0.7	0.8	0.6	0.8	0.7	1.0	1.6	1.7	1.1	0.9	0.8	0.4	0.6	1.2	0.9	0.8	1.7	
30-Jun	1.0	0.2	1.0	1.0	0.6	Z	1.4	1.1	9.4	5.6	1.1	1.2	1.2	0.7	0.6	0.9	0.8	1.6	1.2	0.7	3.1	2.1	3.0	4.9	1.9	9.4	
																								Diurnal Average			
																								Diurnal Maximum			
0.7 1.1 1.5 1.3 1.5 1.7 1.8 1.9 2.5 1.9 1.5 1.2 1.2 1.1 0.9 0.9 1.1 1.0 0.9 0.9 1.0 0.9 1.1 1.1																											
2.3 2.6 4.7 4.2 4.9 5.0 6.8 7.5 11.6 5.6 3.2 2.8 2.3 2.5 2.0 2.5 5.5 2.5 4.2 2.6 4.5 3.4 4.2 4.9																											
Z - zerspan C - Calibration M - Maintenance DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	656	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: 656

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - June 2023**

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	49	65	17	29	24	18	27	74	56	73	75	37	28	38	22	656
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	24	49	65	17	29	24	18	27	74	56	73	75	37	28	38	22	656

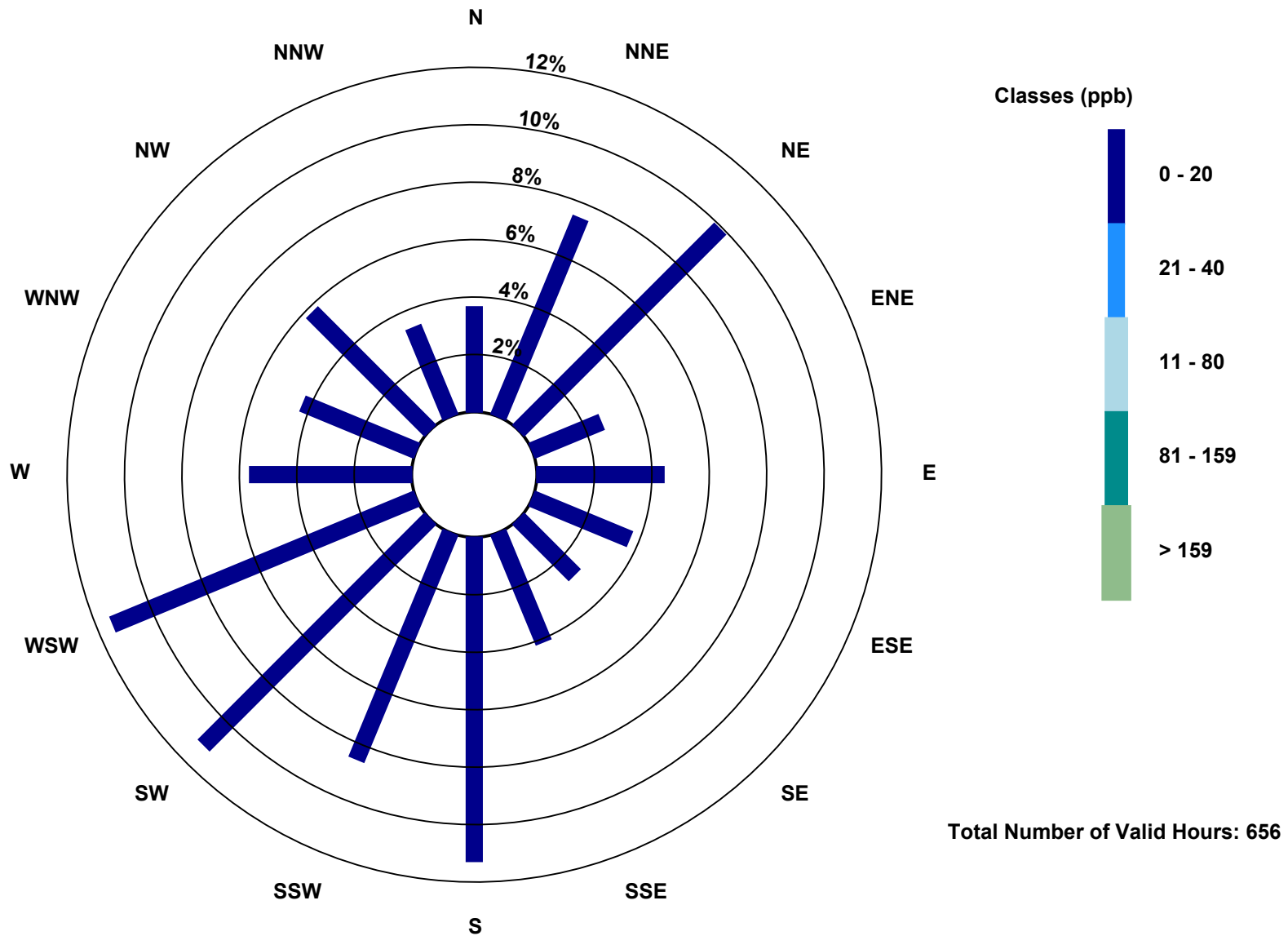
Total Number of Valid Hours: 656

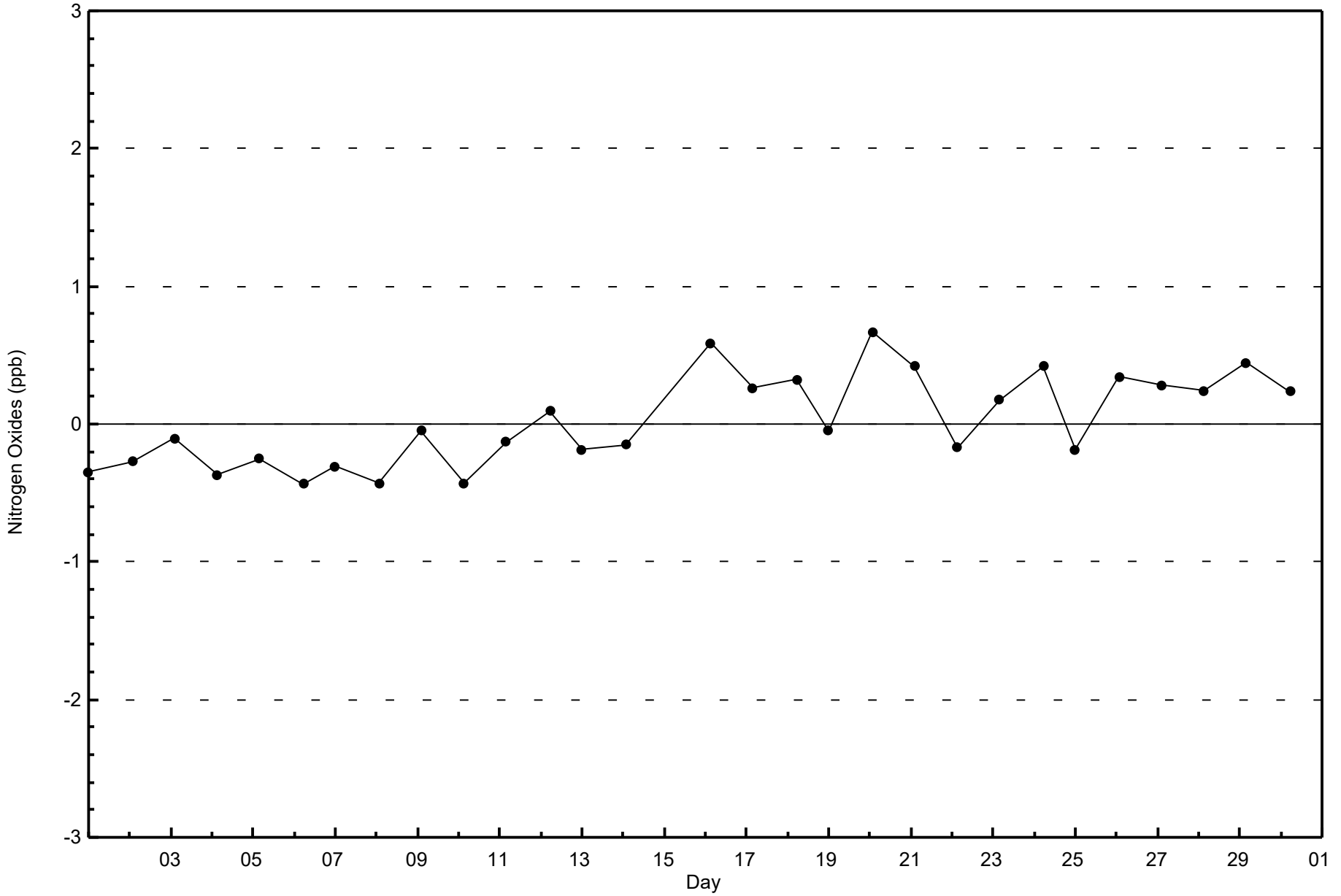
Total Number of Hours: 720

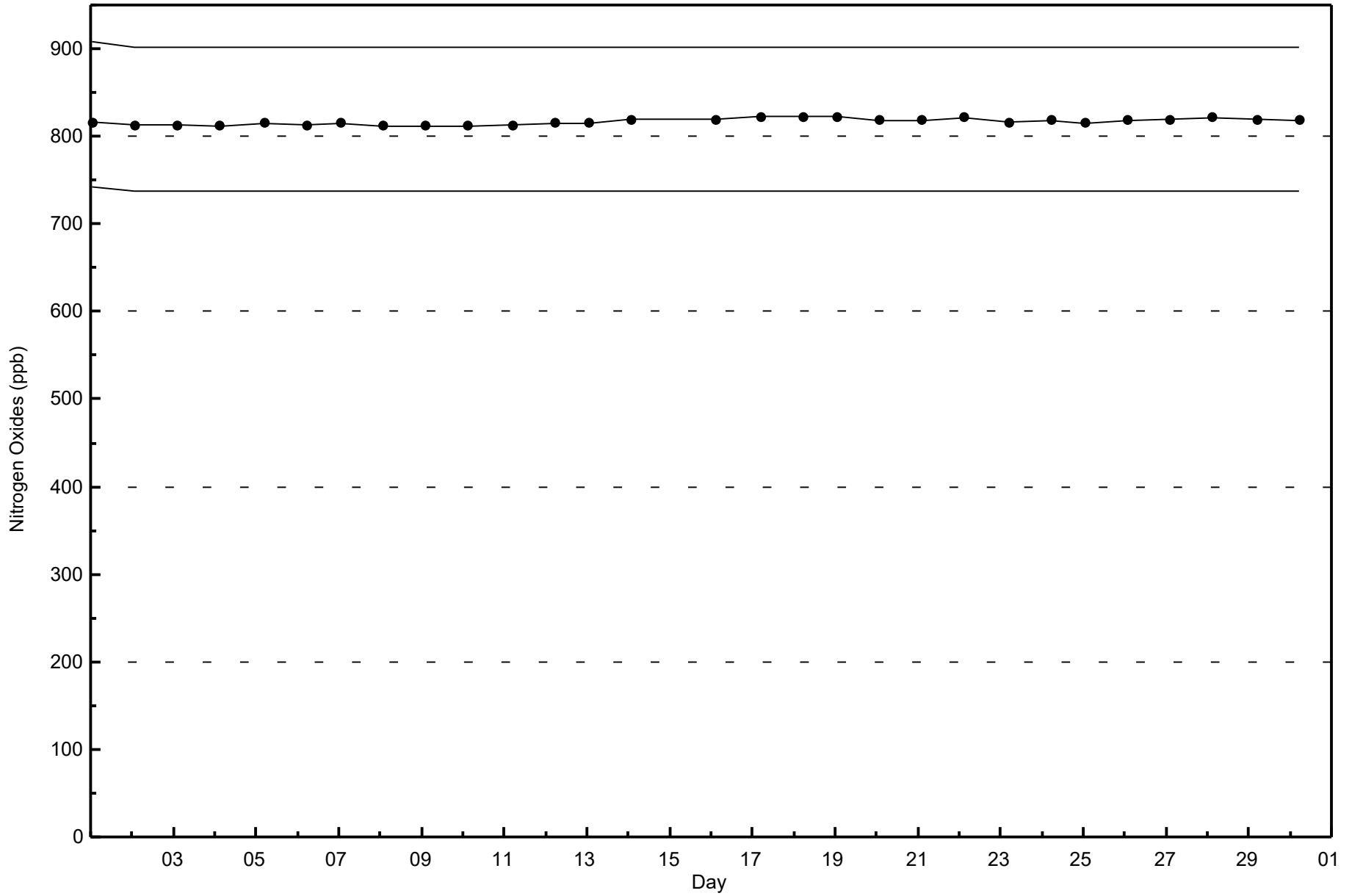


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

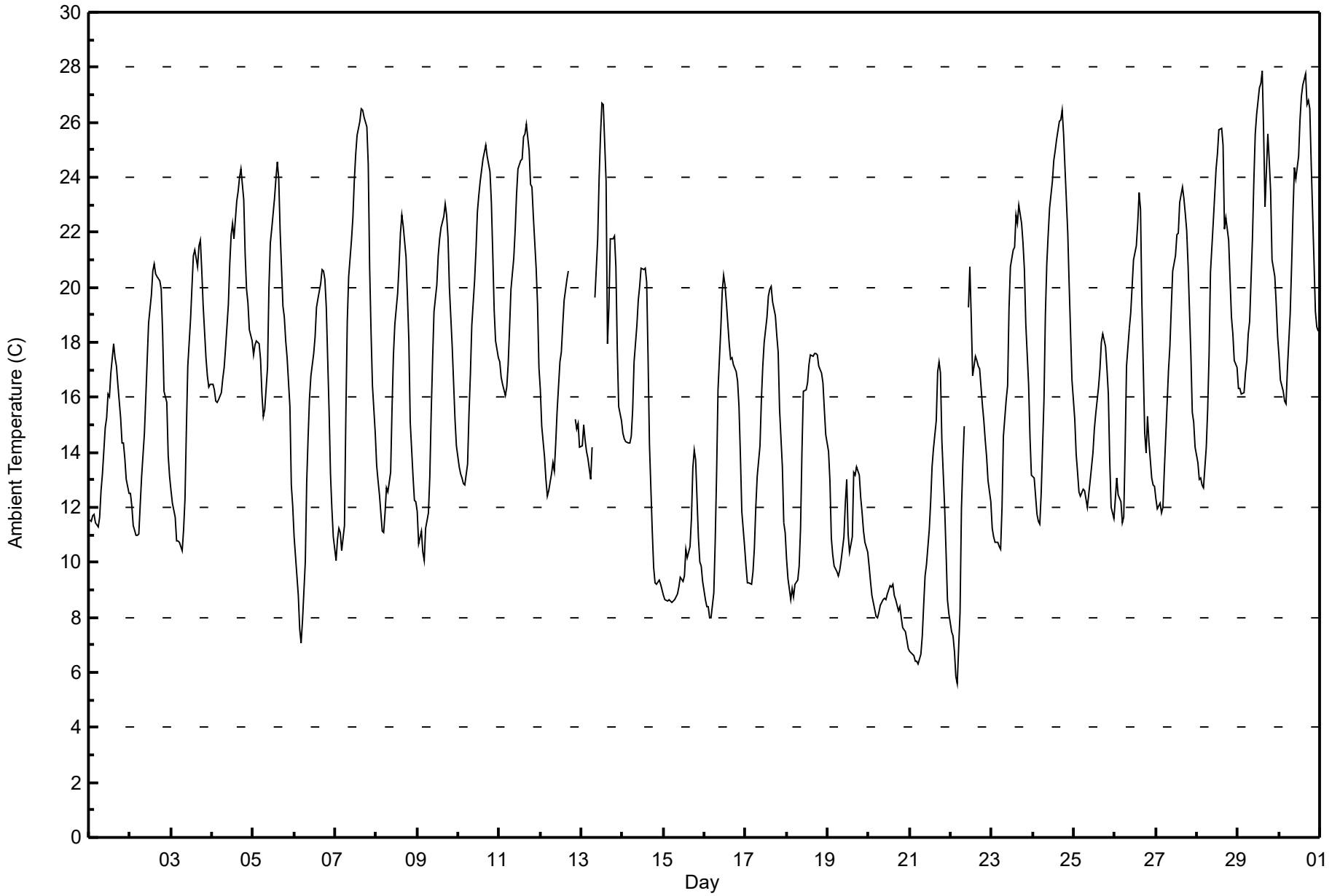
Jackfish 2/3 - June 2023

Maximum Value: 27.9 C on Jun 29 15:00 Minimum Value: 5.6 C on Jun 22 05:00 Maximum Diurnal Average: 20.7 C at hour 15 Monthly Average: 16.19 C		Maximum Daily Average: 21.8 C on Jun 30 Minimum Daily Average: 8.4 C on Jun 20 Minimum Diurnal Average: 11.4 C at hour 5 Percentiles: P ₁ = 6.7 P ₁₀ = 9.3 Q ₁ = 12.1 Median = 16.1 Q ₃ = 20.1 P ₉₀ = 23.4 P ₉₉ = 26.7		Hours in Service: 720 Hours of Data: 715 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	11.6	11.5	11.7	11.8	11.5	11.3	11.6	12.6	13.2	14.9	15.2	16.1	16.0	16.9	17.9	17.4	17.2	16.5	15.2	14.3	14.3	13.8	13.0	12.5	14.1	17.9																						
2-Jun	12.5	12.0	11.3	11.0	11.0	11.0	12.1	13.1	14.7	16.0	17.4	18.7	19.7	20.6	20.9	20.5	20.4	20.2	19.9	18.4	16.2	15.8	13.9	13.1	15.9	20.9																						
3-Jun	12.6	12.1	11.6	10.8	10.8	10.7	10.4	11.2	12.3	14.9	17.1	18.8	20.0	21.2	21.4	20.8	21.5	21.7	20.6	19.3	17.5	16.8	16.4	16.5	16.1	21.7																						
4-Jun	16.5	16.3	15.9	15.8	15.9	16.2	16.7	17.1	17.8	19.3	20.9	21.9	22.3	21.7	23.2	23.5	24.0	24.3	23.2	21.2	19.9	19.4	18.4	18.1	19.6	24.3																						
5-Jun	17.6	17.9	18.1	17.9	17.4	16.1	15.3	15.6	17.1	20.0	21.6	22.1	23.2	24.0	24.6	24.0	22.1	19.3	18.9	18.1	17.5	15.7	12.8	12.1	18.7	24.6																						
6-Jun	10.9	10.2	8.8	7.6	7.1	7.9	10.0	12.9	14.6	16.0	16.8	17.6	18.2	19.3	19.6	20.1	20.6	20.6	20.3	19.3	15.5	13.2	12.0	11.0	14.6	20.6																						
7-Jun	10.1	10.8	11.3	11.1	10.4	11.3	15.4	18.8	20.4	21.7	22.5	23.9	24.8	25.5	26.1	26.5	26.4	26.2	25.8	24.4	20.7	18.3	16.4	14.7	19.3	26.5																						
8-Jun	13.5	13.0	12.5	11.1	11.1	11.8	12.7	12.6	13.2	15.6	17.6	18.7	19.8	20.8	22.0	22.6	22.2	21.1	19.7	18.1	15.1	13.1	12.3	12.2	15.9	22.6																						
9-Jun	11.8	10.7	11.1	10.4	10.1	11.2	11.8	13.1	15.5	17.4	19.1	20.1	21.1	21.8	22.2	22.6	23.0	22.6	21.8	20.0	17.8	16.5	15.2	14.3	16.7	23.0																						
10-Jun	13.5	13.2	13.1	12.9	12.8	13.6	15.4	16.8	18.6	20.2	21.4	22.7	23.4	23.8	24.7	24.9	25.2	24.7	24.2	23.1	21.2	19.2	18.0	17.4	19.3	25.2																						
11-Jun	17.3	16.7	16.5	16.1	16.4	17.2	18.5	19.9	21.0	22.1	23.4	24.3	24.6	24.7	25.5	25.6	25.9	25.0	23.8	23.6	22.6	20.7	19.4	17.1	21.2	25.9																						
12-Jun	16.3	15.0	13.8	13.0	12.4	12.6	13.2	13.6	13.3	14.3	15.5	17.3	17.6	18.6	19.5	20.3	20.6	DF	DF	DF	15.2	14.9	15.0	14.2	15.5	20.6																						
13-Jun	14.3	15.0	14.4	14.0	13.8	13.0	14.2	DF	19.6	21.7	23.9	25.5	26.7	26.6	23.9	17.9	19.3	21.7	21.8	21.9	20.7	17.7	15.7	15.1	19.1	26.7																						
14-Jun	14.7	14.5	14.4	14.3	14.4	14.6	15.6	17.3	18.6	19.5	20.1	20.7	20.6	20.7	20.2	17.5	14.3	11.2	9.8	9.3	9.2	9.3	9.2	9.0	15.0	20.7																						
15-Jun	8.8	8.7	8.6	8.6	8.6	8.6	8.6	8.8	8.9	9.1	9.5	9.3	9.5	10.5	10.1	10.6	11.6	13.4	14.1	13.7	10.9	10.0	9.9	9.3	10.0	14.1																						
16-Jun	8.6	8.4	8.4	8.0	8.0	8.9	10.8	13.2	16.3	18.5	19.8	20.4	20.1	19.4	18.0	17.4	17.4	17.2	16.9	16.6	15.7	13.9	11.8	10.6	14.3	20.4																						
17-Jun	9.9	9.3	9.3	9.2	9.6	10.5	12.0	13.1	14.3	15.9	17.1	18.0	18.9	19.7	19.9	20.1	19.5	18.9	18.3	17.7	15.5	13.5	11.4	11.1	14.7	20.1																						
18-Jun	10.1	9.4	8.6	9.0	8.8	9.2	9.3	9.9	11.2	14.0	16.2	16.3	16.5	17.2	17.6	17.5	17.6	17.6	17.6	17.1	16.9	16.5	15.6	14.6	13.9	17.6																						
19-Jun	14.0	13.0	10.9	10.3	9.9	9.6	9.5	9.7	10.1	11.0	12.2	13.0	11.1	10.4	10.9	13.3	13.2	13.5	13.2	12.3	11.8	11.2	10.7	10.4	11.5	14.0																						
20-Jun	9.9	9.3	8.8	8.3	8.0	8.0	8.2	8.4	8.6	8.7	8.7	8.9	9.2	9.1	9.2	8.8	8.7	8.3	8.4	8.0	7.6	7.5	7.2	6.9	8.4	9.9																						
21-Jun	6.8	6.7	6.6	6.4	6.4	6.3	6.7	7.3	8.4	9.5	9.9	11.2	12.2	13.5	14.1	15.1	16.9	17.3	16.9	14.4	12.0	10.4	8.6	8.1	10.5	17.3																						
22-Jun	7.5	7.3	6.8	5.8	5.6	8.2	12.0	13.6	14.9	M	19.3	20.7	18.9	16.8	17.5	17.3	17.1	17.0	15.7	15.1	14.4	13.8	12.9	12.2	13.5	20.7																						
23-Jun	11.2	10.9	10.7	10.7	10.6	10.5	12.0	14.6	15.9	16.4	19.2	20.8	21.4	21.4	22.6	22.3	23.0	22.3	21.6	20.6	18.7	16.5	14.5	13.2	16.7	23.0																						
24-Jun	13.1	13.1	11.7	11.5	11.4	12.5	15.9	19.0	20.9	21.9	22.9	23.8	24.6	25.0	25.4	26.0	26.1	26.4	25.6	24.4	22.0	20.1	18.3	16.7	19.9	26.4																						
25-Jun	15.2	13.9	13.3	12.6	12.4	12.6	12.6	12.3	12.0	13.0	13.5	14.0	14.9	15.4	16.4	17.1	18.0	18.3	17.9	17.1	16.1	13.7	12.0	11.6	14.4	18.3																						
26-Jun	12.3	13.1	12.5	12.2	11.4	11.7	14.1	17.1	18.5	19.1	20.0	21.0	21.5	22.3	23.4	22.8	19.4	14.7	14.0	15.3	14.4	13.1	12.8	12.7	16.2	23.4																						
27-Jun	12.3	11.9	12.1	11.8	12.0	13.3	15.8	17.0	17.8	19.2	20.6	21.1	21.9	22.0	23.1	23.6	23.2	22.7	22.0	20.8	17.6	15.5	15.1	14.2	17.8	23.6																						
28-Jun	13.6	13.0	13.0	12.8	12.7	14.2	15.6	17.5	20.5	22.4	23.3	24.3	24.8	25.7	25.8	25.2	22.1	22.5	21.7	20.3	18.9	18.3	17.3	17.1	19.3	25.8																						
29-Jun	16.3	16.3	16.1	16.2	16.9	17.3	18.3	18.8	21.8	23.9	25.6	26.3	27.3	27.4	27.9	25.6	22.9	25.6	24.6	23.5	21.0	20.4	19.4	18.2	21.6	27.9																						
30-Jun	17.5	16.6	16.2	15.9	15.7	17.0	19.1	20.8	22.7	24.4	24.0	24.8	26.1	27.0	27.4	27.8	26.6	26.8	26.5	24.5	20.9	19.1	18.6	18.4	21.8	27.8																						
																								12.7	12.3	11.9	11.6	11.4	11.9	13.1	14.3	15.8	17.3	18.5	19.4	19.9	20.3	20.7	20.5	20.2	19.9	19.3	18.4	16.6	15.3	14.1	13.4	Diurnal Average
																								17.6	17.9	18.1	17.9	17.4	17.3	19.1	20.8	22.7	24.4	25.6	26.3	27.3	27.4	27.9	27.8	26.6	26.8	26.5	24.5	22.6	20.7	19.4	18.4	Diurnal Maximum
M - Maintenance DF - DAS Failure																																																



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Jackfish 2/3 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Jackfish 2/3 - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	92	12.87	12.87
10 - 20	438	61.26	74.13
> 20	185	25.87	100.00

Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

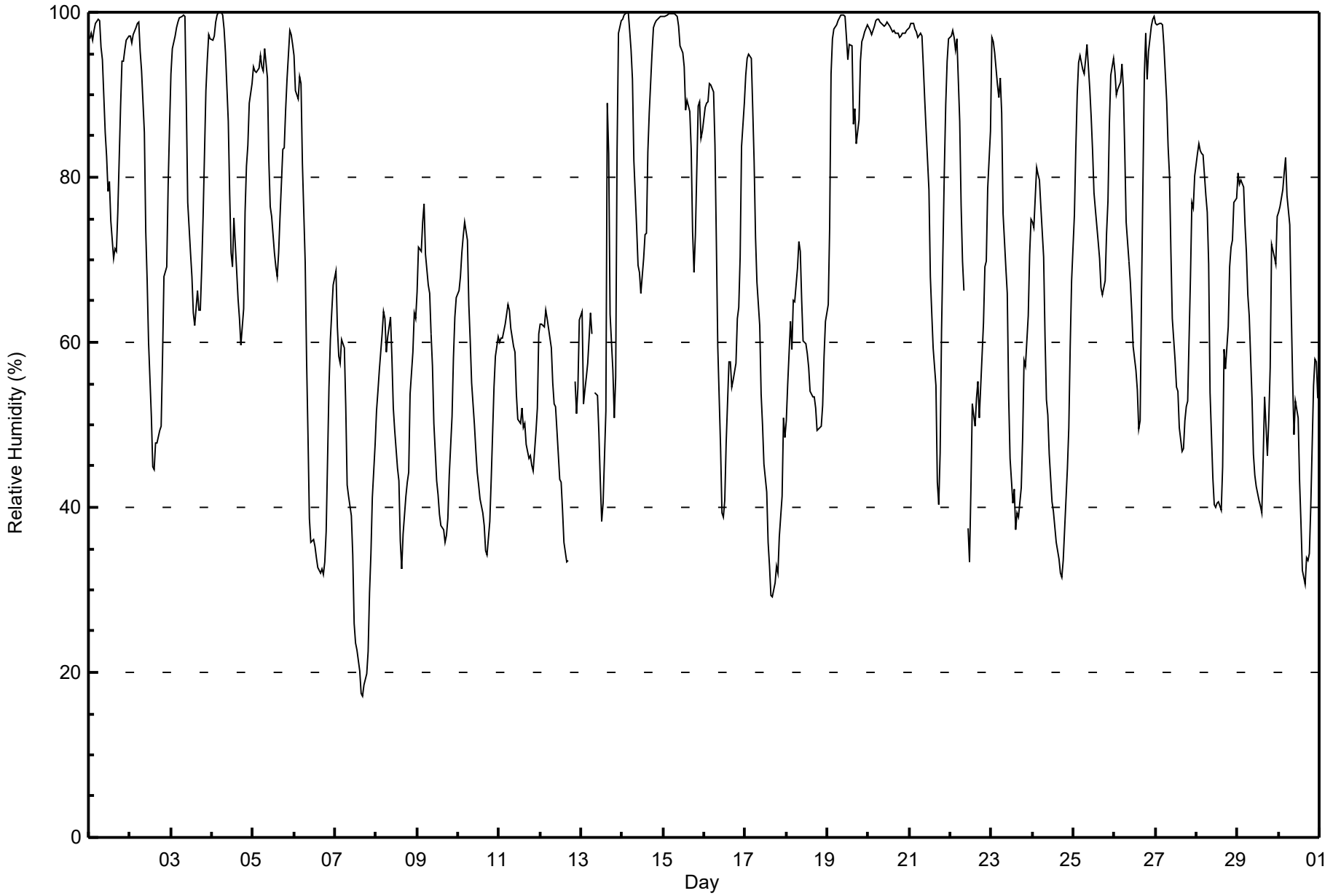
Relative Humidity (RH) - %
Jackfish 2/3 - June 2023

Maximum Value: 100.0 % on Jun 4 06:00 Maximum Daily Average: 98.0 % on Jun 20 Minimum Value: 17.1 % on Jun 7 17:00 Minimum Daily Average: 38.2 % on Jun 7 Maximum Diurnal Average: 85.7 % at hour 5 Minimum Diurnal Average: 52.7 % at hour 15 Monthly Average: 69.25 % Percentiles: P ₁ = 23.8 P ₁₀ = 39.5 Q ₁ = 52.0 Median = 68.6 Q ₃ = 91.3 P ₉₀ = 97.9 P ₉₉ = 99.7																								Hours in Service:	720																								
																								Hours of Data:	715																								
																								Hours of Missing Data:	5																								
																								Hours of Calibration:	0																								
																								Percent Operational Time:	99.3																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	96.8	97.5	96.6	97.9	98.7	99.1	99.0	95.7	94.3	85.5	82.6	78.3	79.5	74.8	70.2	71.3	71.1	75.7	88.7	94.1	94.0	95.5	96.7	97.2	88.8	99.1																							
2-Jun	97.1	96.3	97.3	98.1	98.7	98.9	95.2	92.9	85.5	73.5	67.4	59.9	51.1	44.8	44.6	47.7	47.8	49.3	49.9	58.3	67.9	69.1	79.0	86.1	73.2	98.9																							
3-Jun	92.6	95.7	97.2	98.2	98.8	99.3	99.5	99.7	99.6	89.0	77.0	70.8	67.9	63.6	62.0	66.2	63.8	63.8	68.9	75.3	90.5	94.2	97.2	96.8	84.5	99.7																							
4-Jun	96.6	97.1	98.8	99.6	100.0	100.0	99.7	98.0	95.0	86.8	78.0	70.9	69.1	75.1	68.6	65.3	62.9	59.6	64.1	75.8	81.4	83.9	88.9	91.3	83.6	100.0																							
5-Jun	93.4	92.8	92.8	93.2	94.7	93.4	92.8	95.5	92.1	82.0	76.4	75.2	70.9	69.2	67.9	70.8	75.3	83.5	83.5	88.1	91.9	97.7	97.3	96.2	86.1	97.7																							
6-Jun	94.7	90.5	89.5	92.2	91.4	81.7	69.7	57.7	48.6	38.6	35.7	36.2	35.3	33.9	32.7	32.1	32.5	31.8	33.3	37.1	54.5	60.3	63.7	67.0	55.9	94.7																							
7-Jun	68.6	61.8	58.3	57.5	60.3	59.3	52.1	42.7	41.4	38.9	34.2	26.0	23.5	22.7	20.2	17.4	17.1	18.4	19.9	22.6	29.7	34.3	41.2	47.6	38.2	68.6																							
8-Jun	51.7	54.1	56.6	61.1	63.7	62.8	58.8	60.7	63.1	58.1	52.1	49.3	44.8	43.2	35.9	32.6	36.8	41.4	43.0	44.3	53.7	58.8	63.5	62.9	52.2	63.7																							
9-Jun	66.1	71.5	71.1	74.6	76.9	70.7	66.9	66.0	61.0	57.1	50.2	43.2	41.5	39.2	37.9	37.3	35.8	36.6	38.6	43.9	51.0	58.2	63.0	65.5	55.1	76.9																							
10-Jun	66.3	67.9	70.9	72.9	74.6	72.5	64.7	60.1	55.1	50.0	47.0	44.2	42.7	41.0	39.3	37.9	34.7	34.3	38.3	43.4	48.9	54.6	58.3	60.6	53.3	74.6																							
11-Jun	60.0	60.5	60.5	62.3	63.4	64.6	63.9	61.7	59.5	58.8	53.8	50.6	50.2	52.1	49.7	50.1	47.6	45.9	46.3	45.1	44.4	49.2	52.0	61.1	54.7	64.6																							
12-Jun	62.3	62.2	61.9	63.9	62.9	61.7	59.3	55.1	52.6	52.2	49.3	43.5	43.0	39.6	35.8	33.4	33.6	DF	DF	DF	55.3	51.3	54.6	62.7	52.2	63.9																							
13-Jun	63.7	52.5	54.2	55.7	57.5	63.6	61.1	DF	54.0	53.5	48.9	43.3	38.3	40.5	51.7	88.9	82.9	63.4	56.6	50.9	55.7	83.3	97.4	99.0	61.6	99.0																							
14-Jun	99.2	99.6	99.9	100.0	97.7	95.4	91.8	82.1	73.9	69.3	68.6	65.9	70.1	73.0	73.3	83.0	87.7	95.1	98.2	98.6	99.1	99.4	99.5	99.5	88.3	100.0																							
15-Jun	99.5	99.5	99.6	99.8	99.8	99.8	99.8	99.7	99.4	98.3	95.9	95.1	93.4	88.1	89.4	88.0	83.4	73.5	68.5	73.0	88.7	89.1	84.8	85.6	91.3	99.8																							
16-Jun	88.6	88.9	89.2	91.3	91.2	90.4	84.0	72.1	59.4	47.2	39.4	38.8	40.9	47.7	57.6	57.6	54.5	55.4	57.5	62.9	64.3	70.3	83.7	89.1	67.6	91.3																							
17-Jun	92.3	94.4	95.0	94.4	88.3	81.9	72.6	67.3	62.0	53.8	50.0	45.3	41.8	35.7	32.9	29.3	29.1	30.9	32.9	32.0	36.5	41.4	50.8	48.5	55.8	95.0																							
18-Jun	50.6	55.0	62.5	59.2	65.0	64.9	68.9	72.2	71.1	65.0	60.2	59.8	58.6	56.9	54.0	53.4	53.3	52.0	49.3	49.5	49.8	52.3	58.4	62.6	58.5	72.2																							
19-Jun	64.6	73.8	92.5	96.7	98.0	98.5	99.0	99.3	99.6	99.7	99.4	97.0	94.3	96.2	96.0	86.5	88.2	84.1	87.0	94.0	96.4	97.0	97.6	98.4	93.1	99.7																							
20-Jun	98.2	97.8	97.3	98.3	98.9	99.2	99.2	98.8	98.4	98.3	98.5	98.7	98.3	98.0	97.6	97.7	97.4	97.4	97.0	97.2	97.5	97.5	97.9	98.0	98.0	99.2																							
21-Jun	98.2	98.6	98.7	97.9	97.6	97.0	97.5	97.1	93.4	89.4	85.7	78.4	68.0	63.6	59.3	54.8	43.0	40.3	46.6	61.4	80.9	88.8	94.0	96.8	80.3	98.7																							
22-Jun	97.2	97.8	96.9	95.5	96.8	86.7	76.7	69.9	66.3	M	37.4	33.4	42.1	52.5	49.8	53.3	55.2	50.9	58.5	62.3	69.2	69.9	78.6	85.6	68.8	97.8																							
23-Jun	97.0	96.5	95.0	91.2	89.6	92.1	87.8	75.6	68.9	66.0	53.3	45.9	40.5	42.2	37.3	39.4	38.8	42.4	48.4	57.7	57.1	63.2	70.7	74.9	65.5	97.0																							
24-Jun	74.5	73.8	81.2	80.3	79.7	76.4	70.3	60.6	53.1	51.2	46.4	40.6	39.4	37.6	35.8	33.8	32.1	31.5	33.5	37.2	44.8	49.7	59.5	67.5	53.8	81.2																							
25-Jun	75.4	83.4	89.9	93.9	94.7	93.1	92.6	94.2	96.0	90.7	87.3	83.3	78.2	76.1	72.2	70.1	66.5	65.7	67.4	73.1	77.2	86.4	92.4	94.3	83.1	96.0																							
26-Jun	92.7	90.0	90.8	91.5	93.8	90.9	83.2	74.6	69.8	67.3	63.6	59.5	56.6	54.2	49.5	50.6	66.0	92.4	97.4	91.9	95.3	98.3	99.2	99.4	79.9	99.4																							
27-Jun	98.7	98.6	98.7	98.6	98.5	95.9	89.1	83.7	80.2	71.0	63.0	57.8	54.6	54.1	49.7	46.9	47.2	50.6	52.3	52.9	68.0	76.9	76.3	80.2	72.6	98.7																							
28-Jun	82.9	84.1	83.2	82.9	82.7	77.8	75.8	69.5	54.0	43.5	40.3	39.9	40.5	40.7	39.7	44.9	59.2	56.7	61.8	69.1	71.6	72.4	76.9	77.4	63.7	84.1																							
29-Jun	80.5	79.1	79.7	78.9	74.2	70.9	65.7	63.3	53.2	46.5	43.8	42.5	40.8	40.1	39.4	46.2	53.3	46.3	50.6	57.0	71.9	70.4	69.5	75.3	60.0	80.5																							
30-Jun	75.8	76.4	78.5	80.5	82.4	77.8	74.3	64.3	55.7	48.8	52.8	50.9	43.2	38.1	32.4	30.6	33.9	33.5	34.4	40.1	54.7	58.0	57.6	53.1	55.3	82.4																							
																								82.5	82.9	84.5	85.3	85.7	83.9	80.4	76.9	71.9	66.5	61.3	57.5	55.3	54.5	52.7	53.9	54.4	55.3	57.7	61.7	68.1	72.4	76.7	79.3	Diurnal Average	
																								99.5	99.6	99.9	100.0	100.0	100.0	99.8	99.7	99.6	99.7	99.4	98.7	98.3	98.0	97.6	97.7	97.4	97.4	98.2	98.6	99.1	99.4	99.5	99.5	99.5	Diurnal Maximum
M - Maintenance DF - DAS Failure																																																	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 2/3 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Jackfish 2/3 - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	4	0.56	0.56
20 - 40	71	9.93	10.49
40 - 60	192	26.85	37.34
60 - 80	189	26.43	63.78
80 - 100	258	36.08	99.86

Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Jackfish 2/3 - June 2023

Maximum Speed: 19 km/h on Jun 18 23:00	Maximum Daily Speed Average: 10.3 km/h on Jun 17	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 23 14:00	Minimum Daily Speed Average: 0.4 km/h on Jun 12	Hours of Data: 715
Maximum Diurnal Speed Average: 2.3 km/h at hour 13	Minimum Diurnal Speed Average: 0.5 km/h at hour 20	Hours of Missing Data: 5
Monthly Average Velocity: 1.1 km/h 256.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 4 Median = 6 Q ₃ = 8 P ₉₀ = 11 P ₉₉ = 16	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-Jun	NNW6	NNW4	NNE4	NE7	NW4	NNW4	NNW4	N5	N6	N7	NNE7	NNW5	NNE5	NNE6	NNE7	NNE7	NNE6	NW3	NW1	W3	NW2	NW3	NW5	NW6	N4.2	NNE7	
2-Jun	NW6	NW7	NNW5	NNW5	NNW5	NW4	NW5	NNW6	N7	NNE11	NNE11	NNE10	NNE10	NNE10	NE10	NNE8	NE7	NE7	ENE6	E4	E5	E6	ESE3	SE2	NNE5.1	NNE11	
3-Jun	E3	E3	ENE3	NNE3	NNE4	NNE4	NNE5	NNE5	NE7	NE8	NE6	NE5	ENE8	E9	ESE7	E9	ENE9	E9	E8	E6	E4	SSE2	E1	ENE5	ENE5.1	E9	
4-Jun	E6	ENE5	NE4	NE5	ENE7	E8	ESE6	ESE6	SE6	SE4	ESE7	SE6	SSE7	SSW5	SSE6	SSE7	S7	SSW4	SSW3	SSE2	SSE2	SSW2	S3	SE3.7	E8		
5-Jun	S3	S4	SSE1	S2	W3	WNW4	WNW4	NNW4	NW5	NNE7	NNE9	NE8	NE8	ENE10	NE9	E6	N3	WNW6	NNW5	WNW5	W4	W10	W9	W8	NNW2.2	ENE10	
6-Jun	W10	W9	W8	WSW7	WSW10	WSW10	W7	W6	W7	WSW11	W10	W11	WSW11	WSW11	WSW12	SW11	WSW11	WSW11	SW9	SW7	S3	SSE3	S4	S4	WSW7.8	WSW12	
7-Jun	S4	S5	S6	S6	S6	S5	S6	SW11	SW13	WSW13	WSW11	WSW12	WSW12	WSW14	WSW14	WSW14	WSW14	WSW12	WSW11	WSW9	W6	WSW2	W2	NNE3	NNE3	SW7.2	WSW14
8-Jun	ENE1	S2	SW3	SW3	SW4	WSW2	NNE3	NNE5	NNE6	NNE5	NE5	N5	NW4	N5	NW7	N7	NNE7	NE9	NE8	NE6	ENE3	ENE4	E4	ESE4	NNE2.8	NE9	
9-Jun	SE2	ESE4	ESE4	SE3	SSE3	S4	S5	S4	SSE4	SSE3	SE5	ESE8	E7	E7	E6	E7	SE4	SE5	SSE4	SSE2	S3	S4	SSE4	S5	SE3.7	ESE8	
10-Jun	S6	S6	S6	S6	S6	S6	SSW10	S10	S10	S11	SSW10	S9	S10	S9	S8	S8	S9	SSW10	SSW8	S6	S4	SSE4	S5	S5	S7.4	S11	
11-Jun	S6	S5	S6	S6	SSW7	SSW6	SSW9	SW10	WSW10	W7	WNW6	NW6	WNW5	W5	W7	WNW6	NW6	NW5	WNW4	WNW4	WNW4	W3	SW1	SSW1	WSW3.8	WSW10	
12-Jun	SW3	E1	NNE3	NNE1	E2	SW3	WSW3	WSW2	NW1	W2	WNW2	NW3	NW3	N2	E3	ESE2	ENE3	DF	DF	DF	ESE4	SE4	ESE3	ENE4	ENE0.4	ENE4	
13-Jun	E3	ESE6	ESE5	ESE5	SE5	SE6	S6	DF	S6	SW9	SW5	SSW4	S3	SSE4	SSE4	NNE2	E6	E6	ESE6	ESE9	SE9	W3	NE5	N3	SE3.3	SE9	
14-Jun	NE5	NE5	NE7	ENE7	E6	E5	ESE6	ESE6	ESE5	ENE5	NE7	NE8	NNE8	NNE11	N8	NNW8	NW8	NW8	NNW8	N9	NNE9	N7	NNW7	NNW7	NNE4.9	NNE11	
15-Jun	NNW7	NNW7	NNW7	NNW7	NNW7	NNW8	NNW4	NNW6	NNW6	NNW7	NNW7	NW8	NW8	NW9	WNW9	WNW9	NW7	NW8	NW5	WNW2	SSW3	SW6	SW7	SW8	NW5.8	NW9	
16-Jun	SW9	SW9	SW8	SW8	SSW7	SSW8	SSW8	SSW7	SSW8	SSW10	SW12	SSW9	SW12	WSW12	WSW11	WSW11	SW9	SW6	SSW4	SSW5	SW10	SW12	WSW11	WSW10	SW8.7	SW12	
17-Jun	SW10	SW10	SW9	SW11	SW12	SW12	WSW11	WSW12	WSW11	WSW11	WSW13	WSW14	WSW13	WSW13	WSW14	WSW14	WSW14	WSW14	WSW12	WSW10	W7	W5	WSW4	SW4	WSW4	WSW10.3	WSW14
18-Jun	WSW3	SSW3	S1	ENE2	ENE1	NE4	NE6	NNE6	NNE5	NE9	NE12	NE11	NE11	NE13	NNE14	NE15	NNE14	NE14	NE15	NE15	NE16	NE18	NE19	NE18	NE9.6	NE19	
19-Jun	NE18	NE18	NE15	NE15	NE15	NE15	NE17	NE16	NE14	NE9	NE7	NE5	SW2	N2	WSW3	WSW5	W4	W3	W3	SE1	SSE1	WNW2	NNW3	N6	NNE6.4	NE18	
20-Jun	N7	N6	NW5	NW5	NW6	NNW6	NNW7	NNW7	NNW7	N6	N7	N7	NNW7	N7	NNW7	NW8	NW7	NW7	NW6	NW5	NW3	NW4	NW4	WNW6	NNW5.8	NNW8	
21-Jun	NW6	WNW6	WNW7	NW7	WNW6	NW6	WNW5	WNW6	WNW6	NW5	WNW5	NW5	NW6	NW5	N4	NNE4	WNW6	WNW6	NNE4	E7	SE3	S2	ESE2	SSE3	NW3.5	WNW7	
22-Jun	S4	S3	SSW4	S2	SSW4	SSW8	N2	NE4	NE3	M	SW5	WNW6	WNW7	W3	SW2	WSW4	SW5	SW8	SSW5	SSW4	S4	S4	SSW4	W3	SW2.7	SSW8	
23-Jun	SSE3	SE3	SSE3	SE4	SSE5	SSE5	S5	S6	SSW4	SSE4	S3	SW3	NNE0	SW7	SW5	SW7	S3	SSW3	SSW3	SW5	SSW5	S3	S3	S3	S3.5	SW7	
24-Jun	S2	S4	S4	S5	S6	S6	SSW6	SW7	SSW8	SW10	SW12	WSW11	SW11	SW11	SW11	WSW9	SW8	WSW8	SW7	SW7	SW6	WSW2	NNE6	NNE7	SW5.7	SW12	
25-Jun	NE6	NE6	NE7	NNE6	NNE7	NE9	NNE9	NNE7	NE9	NE9	NE9	NNE6	NE7	NE8	NE8	NE7	NNE6	NE6	NE4	NE2	NE3	NE3	NE1	ESE1	NE6.0	NE9	
26-Jun	SE3	SSE5	SSE5	S6	S6	S6	S5	SSW6	SW8	SW5	WSW6	SSW5	SW7	SW7	SW9	SW8	N4	N4	S5	SSW8	SW5	NW1	SW4	WSW5	SSW4.3	SW9	
27-Jun	WSW7	WSW6	WSW7	WSW5	WSW5	W4	WNW4	N6	NNE6	N5	N6	N6	NNW5	NNE6	N6	NNE7	NE9	NE8	NE9	NE7	ENE3	E4	ESE4	ESE3	N2.5	NE9	
28-Jun	S4	S3	S4	S5	SSW4	SSW5	SSW5	SSW5	SSW5	SE5	SSE5	SW6	WSW4	SW7	S4	WSW3	WSW6	NE3	SSE4	S5	SSW6	SSW6	S5	S6	SSW4.1	SW7	
29-Jun	S6	S5	S5	SSW6	SW9	SSW9	SW11	SW11	SW12	SW14	SW11	SSW12	SW13	SW13	SW13	SW15	WSW13	WSW6	W6	W6	WSW5	SSW3	SW6	WSW7	SW8	SW8.3	SW15
30-Jun	WSW8	SW8	SW7	SW8	SSW8	SW7	SW6	SW6	SSW5	SW7	W8	WSW9	W9	W9	WSW10	W8	WSW7	W6	W6	NW3	WSW3	WSW3	WSW3	WSW4	WSW6.0	WSW10	

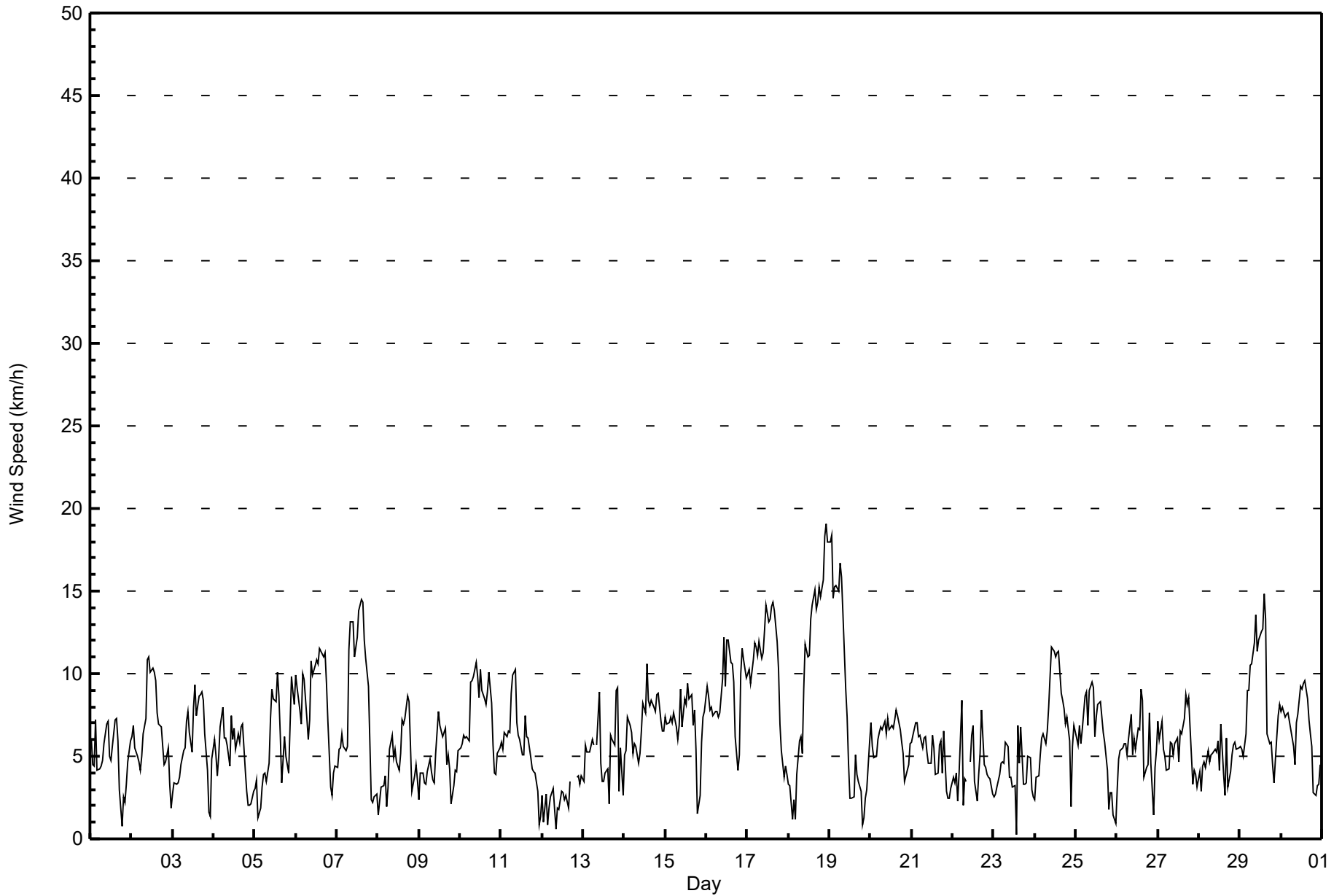
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NE18	NE18	NE15	NE15	NE15	NE15	NE17	NE16	NE14	SW14	WSW13	WSW14	WSW13	WSW14	SW15	NE15	NNE14	NE14	NE15	NE15	NE16	NE18	NE19	NE18	Diurnal Maximum										

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Jackfish 2/3 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	307	42.94	42.94
6 - 11	355	49.65	92.59
12 - 19	53	7.41	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: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - June 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	19	17	12	13	15	14	25	47	30	16	22	15	13	24	13	307
6 - 11	17	31	37	6	17	10	4	4	33	26	51	35	23	16	20	25	355
12 - 19	0	3	18	0	0	0	0	0	0	1	11	20	0	0	0	0	53
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	29	53	72	18	30	25	18	29	80	57	78	77	38	29	44	38	715

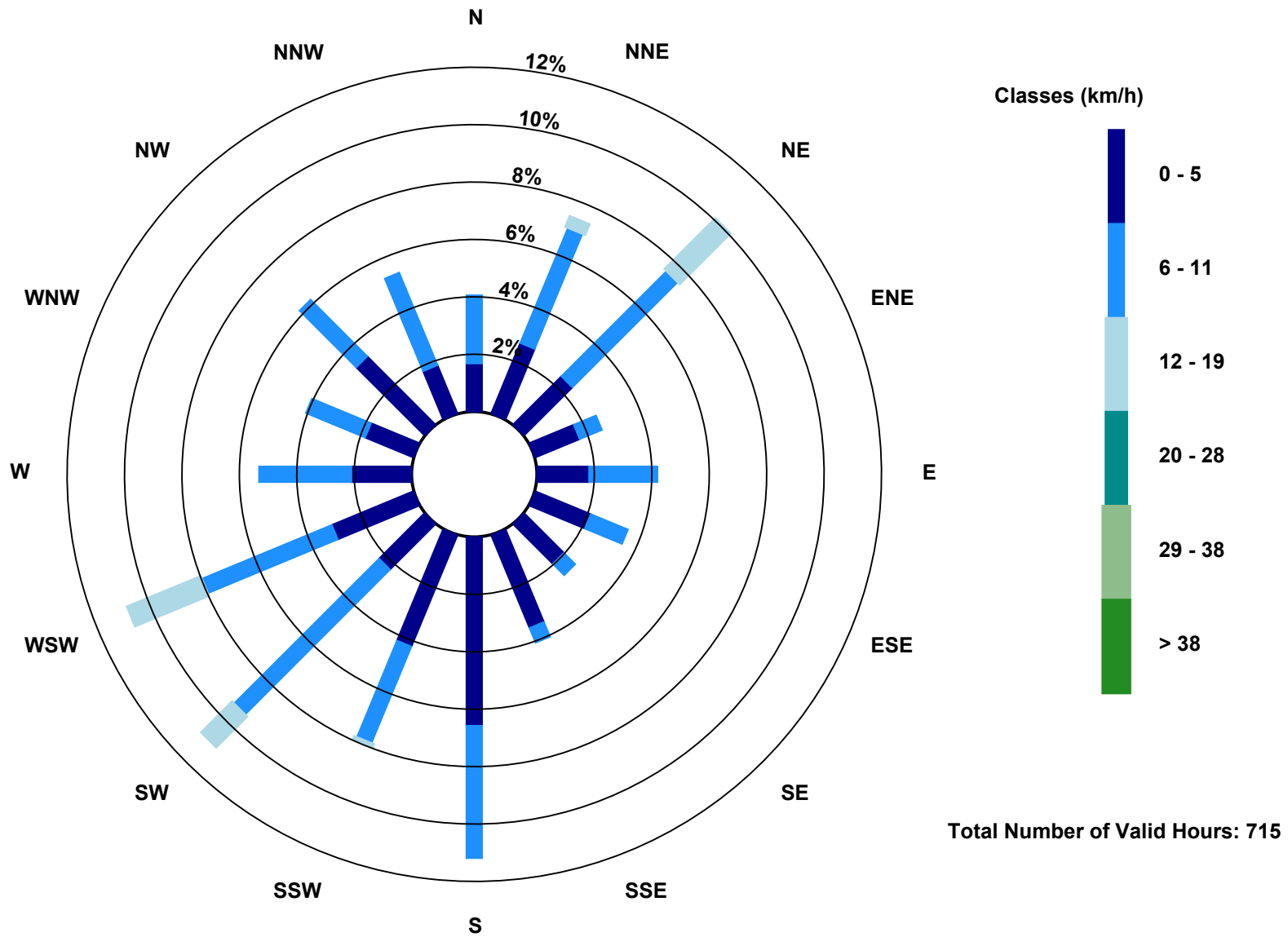
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 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 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Jun 18 23:00	Hours of Data: 715
Minimum Value: 0 km/h on Jun 8 05:00	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-Jun	3	3	3	3	2	2	2	2	2	3	3	2	2	2	3	3	2	1	1	1	1	1	2	3	3
2-Jun	3	3	2	2	2	2	2	3	3	5	5	4	4	4	4	4	3	2	2	1	1	1	1	1	5
3-Jun	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	2	1	1	2	2	3
4-Jun	2	2	1	1	2	3	2	3	2	2	4	3	3	3	3	3	3	3	2	1	1	1	1	1	4
5-Jun	1	1	1	1	2	2	1	2	2	3	4	3	3	4	3	4	2	3	2	2	2	5	4	3	5
6-Jun	4	4	3	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	3	3	1	1	1	1	4
7-Jun	1	1	2	2	1	1	2	4	4	4	4	4	5	5	6	6	5	4	4	3	1	2	1	1	6
8-Jun	1	1	1	0	0	1	1	2	2	2	2	2	3	3	3	3	3	3	3	2	1	1	1	1	3
9-Jun	1	1	1	1	1	1	1	1	1	1	3	3	3	3	2	2	2	2	2	2	2	1	2	2	3
10-Jun	2	2	2	2	2	2	4	4	4	4	4	4	5	4	4	4	4	4	4	3	2	2	2	2	5
11-Jun	2	2	2	2	2	2	3	3	3	3	3	2	2	3	4	3	3	3	2	2	2	1	2	1	4
12-Jun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	DF	DF	DF	1	2	2	1	2
13-Jun	2	2	2	2	2	2	2	DF	2	3	2	2	2	3	5	2	2	2	3	4	5	4	2	2	5
14-Jun	1	1	2	3	2	2	2	2	2	2	3	3	4	3	4	4	4	4	4	3	3	3	3	3	4
15-Jun	3	3	3	3	3	3	3	3	3	3	4	3	4	4	4	4	3	4	3	1	1	1	1	1	4
16-Jun	2	2	2	2	2	2	2	2	3	4	4	3	4	4	4	4	3	2	1	2	4	3	3	3	4
17-Jun	2	3	2	3	3	3	4	4	4	4	5	5	5	5	6	5	5	4	4	3	2	1	1	1	6
18-Jun	1	0	1	1	1	2	2	2	2	3	4	4	4	5	5	6	5	5	6	5	6	6	7	7	7
19-Jun	6	7	5	5	5	5	6	6	5	3	3	3	2	2	1	2	2	1	1	1	1	2	1	3	7
20-Jun	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	4	4	3	3	2	2	2	2	2	4
21-Jun	2	3	3	3	3	3	2	3	3	2	2	2	3	3	3	2	2	3	2	2	1	1	1	1	3
22-Jun	1	2	1	1	2	2	1	1	1	M	2	3	3	2	2	2	2	2	1	1	1	1	1	2	3
23-Jun	1	1	1	2	2	2	2	2	2	2	2	2	2	2	4	2	3	2	4	1	1	1	1	1	4
24-Jun	1	1	1	1	1	1	1	2	2	3	4	4	4	4	3	4	3	3	2	2	1	2	2	2	4
25-Jun	2	2	2	2	2	3	3	3	3	3	4	2	2	3	3	3	3	2	1	1	1	1	1	1	4
26-Jun	2	2	2	2	2	2	2	3	3	2	3	2	3	2	3	3	3	3	4	2	2	1	2	2	4
27-Jun	2	2	2	2	1	1	2	2	2	2	2	3	2	3	3	3	3	3	3	2	1	1	1	1	3
28-Jun	1	1	1	1	1	1	1	2	3	3	3	3	2	2	2	2	4	3	2	1	1	2	1	1	4
29-Jun	1	1	1	2	2	3	3	3	4	4	4	4	5	4	5	5	2	2	2	2	1	2	1	2	5
30-Jun	1	1	1	1	1	1	2	2	2	3	3	4	4	4	4	4	3	3	3	2	1	1	1	1	4

6	7	5	5	5	5	6	6	5	5	5	5	5	5	5	6	6	5	5	6	5	6	6	7	7	
Diurnal Maximum																									

M - Maintenance DF - DAS Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Jackfish 2/3 - June 2023

Direction of Maximum Speed: 47 deg on Jun 18 23:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 244.3 deg on Jun 17	Hours of Data: 715
Direction of Minimum Speed: 32 deg on Jun 23 14:00	Hours of Missing Data: 5
Direction of Minimum Daily Speed Average: 0.4 deg on Jun 12	Percent Operational Time: 99.3
Monthly Average Direction: 256.4 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-Jun	333	330	13	50	318	343	334	3	10	3	19	344	13	29	16	29	22	326	306	268	321	324	313	309	356.2
2-Jun	312	318	345	331	330	309	319	335	353	16	22	24	15	18	38	25	41	52	57	83	82	85	106	144	15.9
3-Jun	97	89	69	21	30	27	29	31	48	52	49	49	70	80	106	81	75	86	94	87	91	166	96	74	69.2
4-Jun	81	63	43	53	72	91	111	122	132	133	116	141	161	202	165	155	162	191	207	195	147	156	195	186	133.3
5-Jun	187	187	149	190	276	296	283	332	313	15	33	46	50	58	56	94	351	299	331	302	276	270	276	268	340.3
6-Jun	272	273	269	248	242	248	262	267	271	249	264	260	246	244	240	233	242	238	229	215	187	163	181	181	245.7
7-Jun	184	188	187	185	185	183	188	215	223	245	237	241	247	242	241	246	253	256	257	273	249	263	18	12	233.7
8-Jun	67	187	215	218	228	238	26	20	32	29	38	360	326	6	306	11	25	42	43	55	63	78	94	112	28.5
9-Jun	137	102	111	146	152	171	178	180	165	154	124	104	92	89	86	95	139	131	157	166	191	191	163	181	135.3
10-Jun	176	180	184	188	182	188	201	191	190	190	192	189	191	178	169	170	186	199	192	187	173	151	172	178	185.1
11-Jun	171	178	176	174	192	197	208	226	244	269	293	311	302	279	265	300	307	309	299	297	291	279	221	192	248.9
12-Jun	221	92	25	32	86	227	248	252	309	271	285	316	308	351	84	113	76	DF	DF	DF	104	124	122	69	76.5
13-Jun	95	114	103	108	133	144	172	DF	188	218	215	202	179	168	158	16	82	98	116	122	125	263	43	6	135.8
14-Jun	42	37	52	71	81	89	107	121	107	66	37	50	28	14	1	329	325	325	332	351	13	350	337	330	21.0
15-Jun	335	332	338	346	339	344	330	332	334	333	329	312	320	315	302	300	307	313	326	295	213	226	236	232	314.9
16-Jun	230	231	222	224	213	209	212	209	199	206	214	208	217	246	244	240	231	217	212	205	224	233	240	243	223.8
17-Jun	229	228	228	230	236	236	248	253	249	244	248	241	251	248	242	252	252	251	248	261	268	258	228	239	244.3
18-Jun	237	212	177	57	70	34	42	33	23	40	40	47	41	34	32	34	32	34	36	38	41	40	47	45	38.7
19-Jun	45	45	42	39	44	40	34	36	45	55	45	38	236	351	250	255	280	260	280	125	166	293	339	349	33.6
20-Jun	358	349	326	326	323	334	330	335	344	358	3	2	343	351	336	326	317	318	318	316	309	308	305	299	333.2
21-Jun	306	297	297	310	302	304	294	296	295	313	299	311	322	322	9	19	300	296	14	81	142	172	103	150	312.2
22-Jun	185	179	201	183	192	195	1	43	48	M	224	296	297	272	214	250	220	235	206	194	188	180	210	267	221.6
23-Jun	158	134	162	140	162	162	172	171	178	198	167	182	218	32	222	230	216	184	212	192	217	211	191	171	188.0
24-Jun	191	183	184	178	175	186	213	222	213	233	234	244	234	224	236	258	229	253	234	222	224	248	29	29	226.1
25-Jun	34	40	50	33	32	42	33	26	34	36	40	19	35	38	52	34	31	39	34	38	37	41	56	117	36.8
26-Jun	145	167	165	176	171	173	191	199	221	218	237	212	226	232	229	224	4	358	186	202	228	304	232	243	210.0
27-Jun	243	242	241	245	248	265	303	4	17	356	7	355	341	18	11	23	38	47	51	55	77	97	107	114	8.4
28-Jun	185	175	186	186	192	204	198	203	195	130	167	217	244	229	179	237	239	47	153	191	210	209	189	190	196.4
29-Jun	188	187	187	197	214	212	219	222	223	226	224	211	223	222	228	249	255	275	273	237	196	225	237	236	224.3
30-Jun	238	233	222	215	201	221	223	223	211	232	271	256	264	264	257	263	241	276	279	309	245	252	258	257	245.1

234.5 213.6 202.5 190.6 208.2 214.6 241.7 256.1 250.9 271.4 289.2 280.7 275.7 288.0 260.7 283.6 286.0 291.5 280.5 207.0 186.2 234.7 229.8 249.5

Diurnal Average

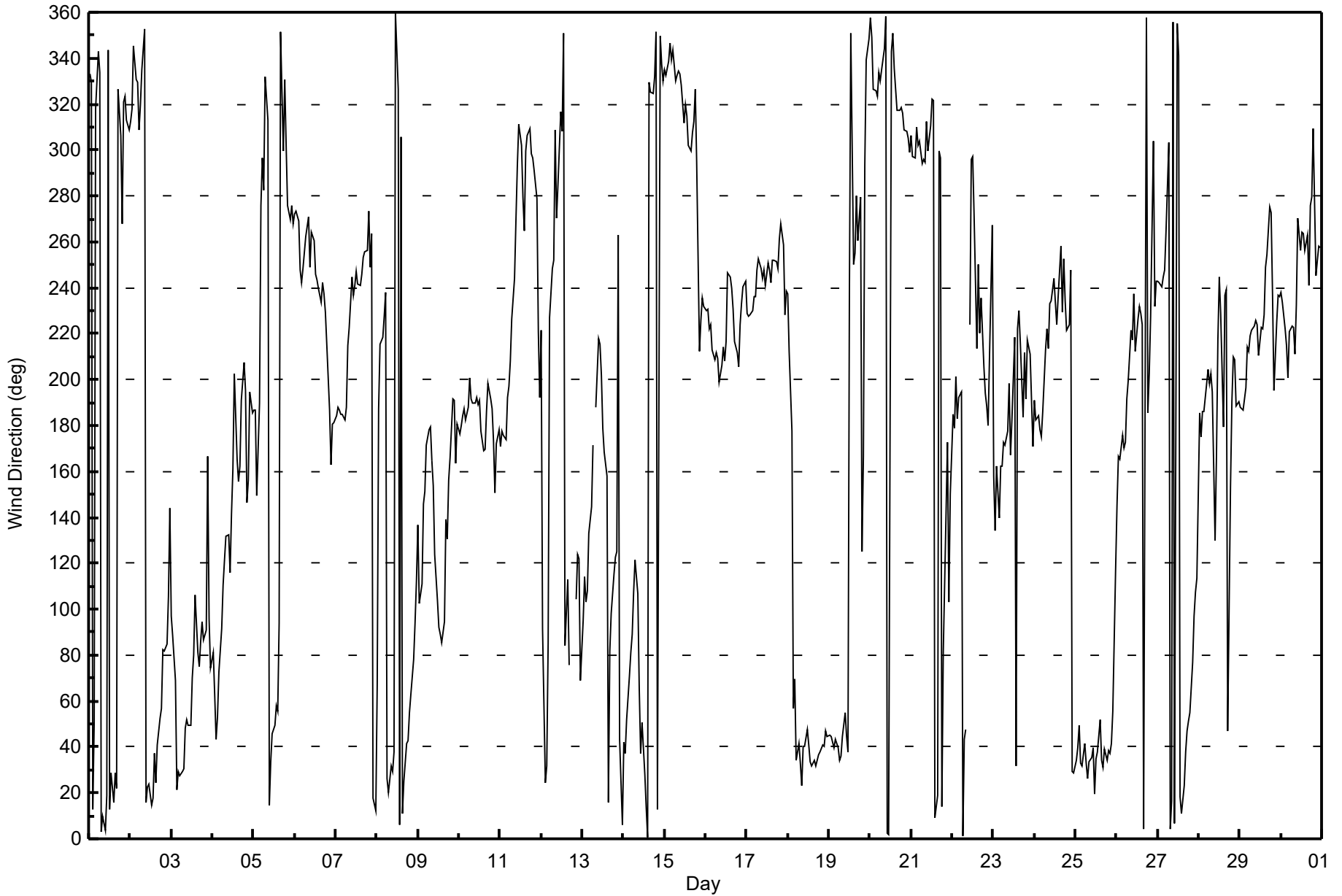
M - Maintenance DF - DAS Failure

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Jackfish 2/3 - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 2/3 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 120 deg on Jun 12 09:00	Hours of Data: 715
Minimum Value: 7 deg on Jun 22 01:00	Hours of Missing Data: 5
Percentiles: P ₁ = 14 P ₁₀ = 20 Q ₁ = 30 Median = 43 Q ₃ = 58 P ₉₀ = 67 P ₉₉ = 96	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-Jun	62	64	65	45	74	60	60	53	48	51	48	63	53	40	49	42	40	65	76	63	85	66	67	67	85
2-Jun	67	56	56	51	55	63	59	52	60	46	46	47	53	50	48	52	42	32	28	17	16	16	33	43	67
3-Jun	30	15	22	24	21	33	33	34	32	35	46	48	39	33	41	30	30	33	30	26	17	58	57	23	58
4-Jun	30	26	22	23	29	30	43	48	47	59	54	53	52	57	65	57	55	46	30	22	35	81	81	60	81
5-Jun	27	20	77	53	54	52	50	67	60	48	42	42	43	38	37	59	79	60	63	61	66	44	49	45	79
6-Jun	41	38	36	23	18	26	47	55	49	33	46	45	38	35	35	36	35	28	27	24	27	32	24	19	55
7-Jun	24	22	25	25	23	24	33	31	27	30	34	36	37	33	34	35	39	41	38	49	84	91	63	52	91
8-Jun	76	46	28	12	13	70	56	38	37	47	45	72	79	74	56	56	54	32	30	23	30	22	15	14	79
9-Jun	38	20	18	26	41	31	22	25	43	50	51	42	47	50	46	42	55	45	63	65	59	36	79	53	79
10-Jun	49	51	40	39	47	43	32	37	37	43	44	52	47	47	58	55	46	42	47	60	77	78	65	55	78
11-Jun	55	54	42	45	26	29	25	26	32	51	62	57	62	59	55	63	56	72	64	65	68	77	101	56	101
12-Jun	68	90	38	101	75	36	47	84	120	56	61	41	50	66	66	81	48	DF	DF	DF	37	54	70	50	120
13-Jun	29	35	31	32	50	57	53	DF	47	32	57	80	63	78	75	83	29	44	53	52	59	97	27	70	97
14-Jun	31	19	23	27	28	30	38	51	67	54	41	31	47	50	54	56	61	61	71	54	46	59	61	61	71
15-Jun	58	61	62	57	60	60	57	62	60	59	65	61	61	67	63	57	65	59	74	100	40	18	13	14	100
16-Jun	15	16	17	17	19	20	23	28	36	35	30	36	30	33	28	26	23	25	28	31	28	20	19	20	36
17-Jun	20	19	19	18	16	21	31	36	35	36	41	32	38	35	35	36	36	37	35	42	37	23	17	17	42
18-Jun	21	17	75	38	65	38	24	30	42	37	34	30	34	35	36	36	35	34	32	30	31	29	29	31	75
19-Jun	31	31	32	32	30	35	34	35	31	32	31	71	63	87	64	37	45	39	47	77	74	61	61	57	87
20-Jun	55	58	70	61	58	62	58	69	63	61	54	55	61	57	62	59	59	63	65	64	86	61	58	54	86
21-Jun	54	51	55	60	61	52	52	55	52	59	66	72	66	67	72	68	61	61	72	22	45	38	33	30	72
22-Jun	7	23	16	58	47	15	60	43	58	M	51	60	54	72	79	61	20	21	18	18	25	23	32	68	79
23-Jun	54	58	40	53	60	62	53	42	43	46	71	83	77	101	56	56	47	43	89	41	16	17	35	46	101
24-Jun	80	37	22	17	14	17	19	28	30	34	31	36	33	35	31	47	44	40	39	22	17	97	29	31	97
25-Jun	28	27	31	35	29	29	31	44	37	37	39	46	38	34	39	41	55	53	41	63	26	22	42	57	63
26-Jun	55	50	43	31	46	36	33	44	42	44	51	51	49	43	40	27	73	60	71	21	39	79	32	15	79
27-Jun	13	14	14	20	19	36	61	47	54	60	61	66	74	56	71	61	44	35	34	29	19	20	21	41	74
28-Jun	18	33	14	16	17	19	22	26	52	58	68	54	67	38	60	67	63	102	44	22	21	24	17	18	102
29-Jun	15	19	18	21	22	23	22	22	24	27	29	32	33	30	28	36	37	49	45	32	16	19	15	14	49
30-Jun	14	14	17	18	19	17	19	24	41	41	49	45	47	50	46	47	44	57	61	90	44	29	27	26	90

80	90	77	101	75	70	61	84	120	61	71	83	79	101	79	83	79	102	89	100	86	97	101	70	
Diurnal Maximum																								

M - Maintenance DF - DAS Failure



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS29
SURMONT 2
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)
JUNE 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	34	40	99.17	5.4	0	1	0
H2S (ppb) Average	681	36	39	99.58	0.6	0	0.2	0
THC(ppm) Average	661	35	59	96.67	2.6	-	2.4	-
NO2 (ppb) Average	681	36	39	99.58	7.4	0	2.6	-
NO (ppb) Average	681	36	39	99.58	2.4	-	0.6	-
NOX (ppb) Average	681	36	39	99.58	8.1	-	2.8	-
PM2.5 (ug/m3) Average	716	2	4	99.72	168.9	65	101.4	8
Temperature 2 m (C) Average	667	0	53	92.64	28.5	-	21.7	-
Relative Humidity (%) Average	564	0	156	78.33	100.5	-	79.6	-
Wind Speed 10 m (km/h) Average	689	1	31	95.83	12	-	9	-
Wind Direction 10 m (deg) Average	689	1	31	95.83	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
 JUNE 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	0.36	0.5	-	0	0	0.1	0.2	0.4	0.9	5.4
H2S (ppb) Average	681	0.13	0.1	-	0	0	0.1	0.1	0.2	0.2	0.6
THC (ppm) Average	661	2.3	0.1	-	1.9	2.2	2.3	2.3	2.3	2.4	2.6
NO2 (ppb) Average	681	1.26	1.1	-	0.2	0.4	0.5	0.9	1.6	2.6	7.4
NO (ppb) Average	681	0.35	0.2	-	0.1	0.2	0.3	0.3	0.4	0.5	2.4
NOX (ppb) Average	681	1.61	1.2	-	0.4	0.6	0.8	1.2	2	3	8.1
PM2.5 (ug/m3) Average	716	24.14	29.5	-	0.3	2.9	5.4	11.8	28.2	74.2	168.9
Temperature 2 m (C) Average	667	16.48	5.2	-	3.6	9.5	12.4	16.5	20.3	23.8	28.5
Relative Humidity (%) Average	564	65.73	20.8	-	17.3	38.5	49.5	65	83.5	95.1	100.5
Wind Speed 10 m (km/h) Average	689	5.1	3	-	0	2	3	5	7	9	12
Wind Direction 10 m (deg) Average	689	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	01 Jun 2023 11:00	01 Jun 2023 13:00	3	Maintenance - multipoint verification check
THC	01 Jun 2023 14:00	02 Jun 2023 10:00	21	Maintenance - stabilization post maintenance
H2S, SO2, THC	21 Jun 2023 12:00	21 Jun 2023 12:00	1	Maintenance - sample manifold cleaned
NO2	19 Jun 2023 09:00	19 Jun 2023 09:00	1	Maintenance - reinitiated daily QA check
ALL PARAMETERS	22 Jun 2023 16:00	22 Jun 2023 17:00	2	DAS Failure - data not recorded
Relative Humidity, Temperature	21 Jun 2023 11:00	21 Jun 2023 11:00	1	Maintenance - sensor replaced
Relative Humidity, Temperature	26 Jun 2023 12:00	26 Jun 2023 13:00	2	Maintenance - sensor replaced
Relative Humidity, Temperature	21 Jun 2023 22:00	22 Jun 2023 08:00	11	Unstable Operation - flatline in sensor output signal
Relative Humidity, Temperature	22 Jun 2023 21:00	23 Jun 2023 07:00	11	Unstable Operation - flatline in sensor output signal
Relative Humidity, Temperature	24 Jun 2023 04:00	24 Jun 2023 07:00	4	Unstable Operation - flatline in sensor output signal
Relative Humidity, Temperature	24 Jun 2023 22:00	25 Jun 2023 10:00	13	Unstable Operation - flatline in sensor output signal
Relative Humidity, Temperature	25 Jun 2023 22:00	26 Jun 2023 06:00	9	Unstable Operation - flatline in sensor output signal
Relative Humidity	01 Jun 2023 01:00	27 Jun 2023 05:00	103	Sensor operated out of range
Wind Speed, Wind Direction	03 Jun 2023 04:00	03 Jun 2023 05:00	2	Unstable Operation - flatline in sensor output signal
Wind Speed, Wind Direction	03 Jun 2023 23:00	03 Jun 2023 23:00	1	Unstable Operation - flatline in sensor output signal
Wind Speed, Wind Direction	05 Jun 2023 02:00	05 Jun 2023 02:00	1	Unstable Operation - flatline in sensor output signal
Wind Speed, Wind Direction	07 Jun 2023 13:00	08 Jun 2023 11:00	23	Maintenance - sensor replacement



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

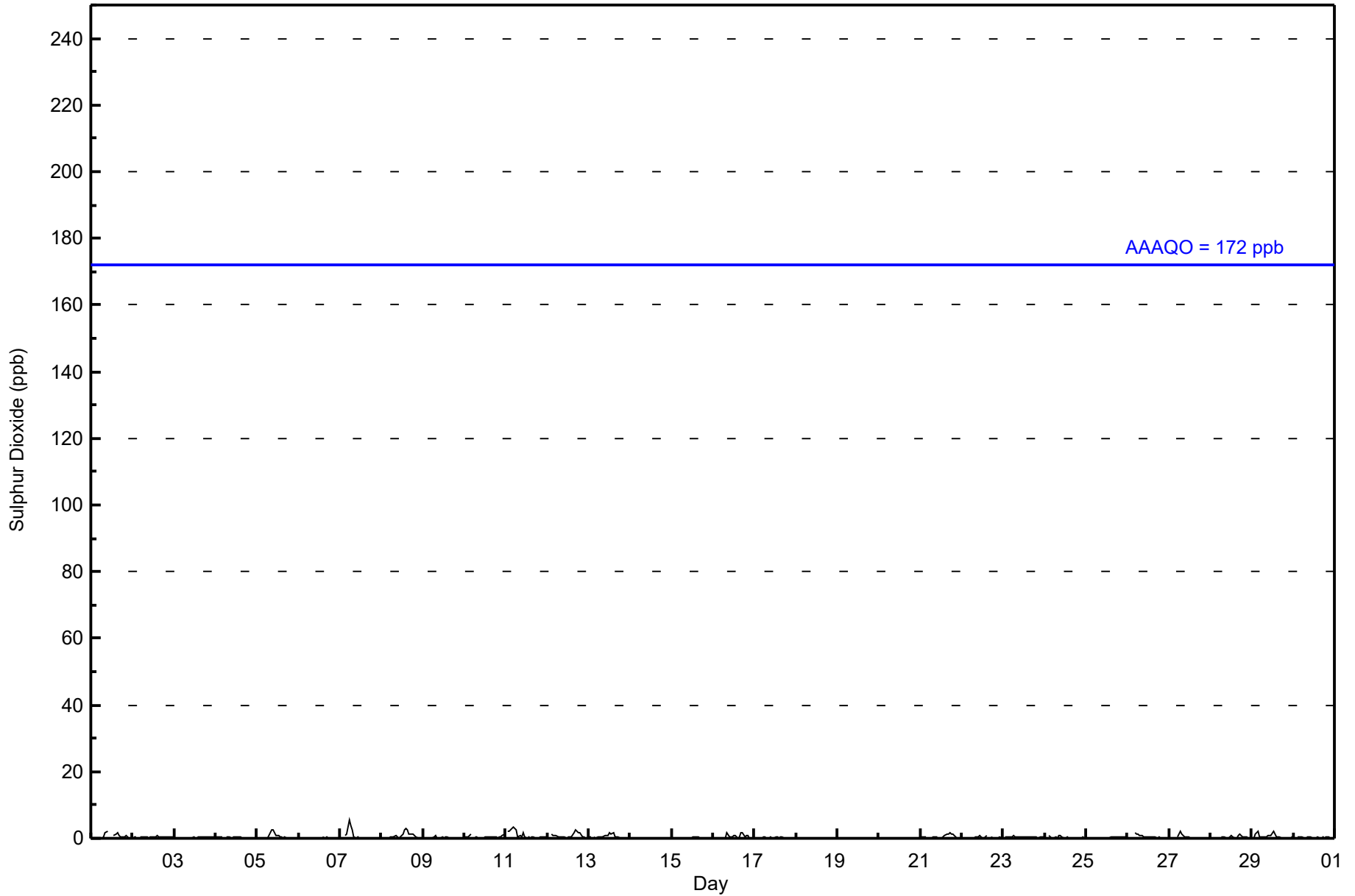
Surmont 2 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720									
Maximum Value: 5.4 ppb on Jun 7 06:00		Maximum Daily Average: 1.0 ppb on Jun 11														Hours of Data:		680											
Minimum Value: 0.0 ppb on Jun 5 03:00		Minimum Daily Average: 0.0 ppb on Jun 20														Hours of Missing Data:		40											
Maximum Diurnal Average: 0.6 ppb at hour 6		Minimum Diurnal Average: 0.1 ppb at hour 22														Hours of Calibration:		34											
Monthly Average: 0.36 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.9 P ₉₉ = 2.7														Percent Operational Time:		99.2											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jun	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.6	1.7	2.0	M	M	M	1.0	1.2	1.6	0.8	0.3	0.2	0.4	0.7	0.3	0.2	0.1	0.6	2.0			
2-Jun	0.1	0.3	0.4	Z	0.6	0.3	0.4	0.4	0.4	0.2	0.3	0.4	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.2	0.4	0.2	0.2	0.2	0.4	0.6			
3-Jun	0.1	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.1	0.4	0.1	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.5	0.2	0.5			
4-Jun	0.5	0.5	0.5	0.4	0.3	Z	0.3	0.4	0.3	0.2	0.2	0.4	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.5			
5-Jun	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.9	2.4	2.6	1.5	1.0	0.6	0.5	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.5	2.6			
6-Jun	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	C	C	C	C	0.3	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3			
7-Jun	0.0	0.2	Z	1.1	1.3	5.4	3.6	2.7	0.3	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.7	5.4			
8-Jun	0.1	0.1	0.1	Z	0.1	0.3	0.4	0.5	0.7	0.4	0.1	0.4	1.4	2.6	3.1	2.4	1.1	1.1	1.1	0.9	0.4	0.1	0.0	0.0	0.8	3.1			
9-Jun	0.0	0.0	0.1	0.0	Z	0.0	0.6	0.7	0.1	0.0	0.0	0.2	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.7			
10-Jun	0.4	0.6	0.5	0.8	1.1	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.6	1.2	0.4	1.2			
11-Jun	Z	2.0	2.0	2.8	3.3	3.1	2.5	0.4	0.7	0.5	1.6	0.5	0.1	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	1.0	3.3		
12-Jun	0.5	Z	1.2	1.0	0.8	0.9	0.4	0.4	0.2	0.4	0.2	0.2	0.2	0.3	0.3	1.5	2.7	2.1	1.8	1.6	0.6	0.3	0.2	0.1	0.8	2.7			
13-Jun	0.2	0.3	Z	0.2	0.2	0.4	0.4	0.4	0.5	0.7	0.9	1.0	1.7	1.2	1.8	0.6	0.4	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.5	1.8			
14-Jun	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	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2		
15-Jun	0.0	0.1	0.1	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.6	0.5	0.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.6		
16-Jun	0.1	0.0	0.0	0.0	0.1	Z	0.1	0.0	1.8	0.2	0.4	0.5	1.0	0.9	0.2	0.2	1.9	1.7	0.4	0.7	0.7	0.1	0.1	0.1	0.5	1.9			
17-Jun	Z	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3			
18-Jun	0.2	Z	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.0	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	0.2	0.2		
19-Jun	0.1	0.1	Z	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2		
20-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1		
21-Jun	0.6	0.6	0.3	0.4	Z	0.1	0.2	0.2	0.3	0.3	0.5	M	0.0	0.6	1.0	1.1	1.4	1.6	1.4	1.2	0.6	0.1	0.1	0.1	0.6	1.6			
22-Jun	0.0	0.0	0.1	0.0	0.0	Z	0.2	0.1	0.2	0.5	0.7	0.4	0.1	0.0	0.7	DF	DF	0.3	0.0	0.0	0.1	0.1	0.3	0.1	0.2	0.7			
23-Jun	Z	0.5	0.3	0.5	0.5	0.3	0.7	0.5	0.5	0.6	0.5	0.5	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.4	0.3	0.4	0.4	0.7			
24-Jun	0.1	Z	1.0	0.3	0.2	0.2	0.2	0.9	1.0	0.6	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.0		
25-Jun	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4		
26-Jun	0.1	0.1	0.1	Z	1.6	1.3	1.3	0.9	0.8	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.4	1.6			
27-Jun	0.0	0.0	0.0	0.0	Z	0.3	2.0	1.3	0.8	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0			
28-Jun	0.0	0.0	0.0	0.0	0.2	Z	0.5	0.4	0.4	0.1	0.2	0.4	0.7	0.5	0.1	0.1	1.0	1.3	0.5	0.3	0.3	0.2	0.2	0.1	0.3	1.3			
29-Jun	Z	0.2	1.2	2.1	0.5	0.3	0.4	0.3	0.4	0.7	0.9	0.8	2.1	1.1	0.4	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.3	0.6	2.1			
30-Jun	0.4	Z	0.2	0.5	0.5	0.3	0.2	0.2	0.5	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	0.3	0.5			
																								Diurnal Average					
																								Diurnal Maximum					
																								0.2 0.2 0.3 0.4 0.5 0.6 0.5 0.4 0.5 0.4 0.4 0.3 0.4 0.4 0.4 0.4 0.5 0.4 0.3 0.3 0.2 0.1 0.1 0.2					
																								0.6 2.0 2.0 2.8 3.3 5.4 3.6 2.7 2.4 2.6 1.6 1.0 2.1 2.6 3.1 2.4 2.7 2.1 1.8 1.6 0.7 0.4 0.6 1.2					
Z - zerospan																								C - Calibration		M - Maintenance		DF - DAS Failure	
Alberta Ambient Air Quality Objectives (AAAQO):																								1-hr 172 ppb		24-hr 48 ppb			



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - June 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
Surmont 2 - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 10	27	21	31	13	20	25	36	41	21	25	53	114	90	48	54	35	654
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	21	31	13	20	25	36	41	21	25	53	114	90	48	54	35	654

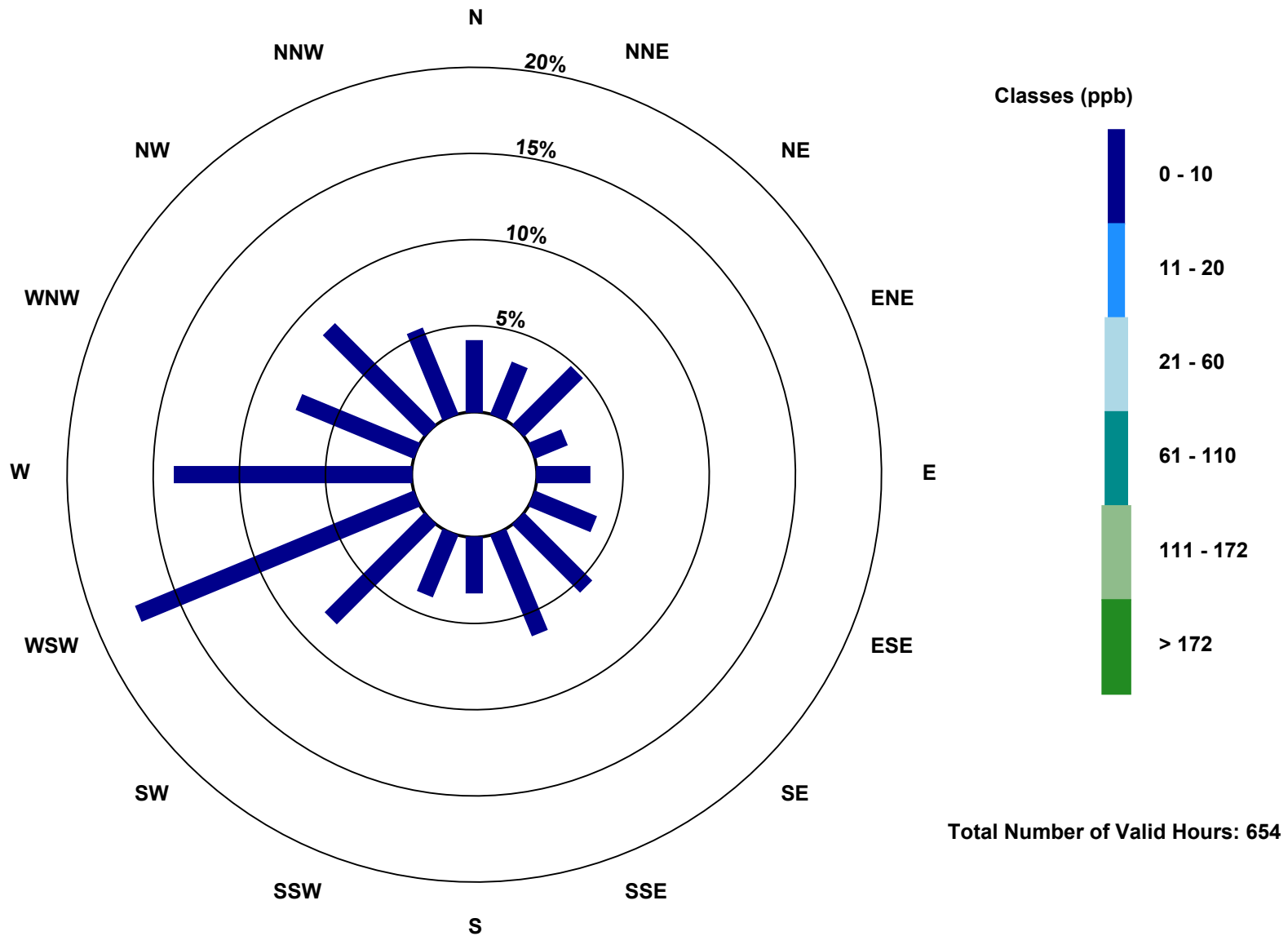
Total Number of Valid Hours: 654

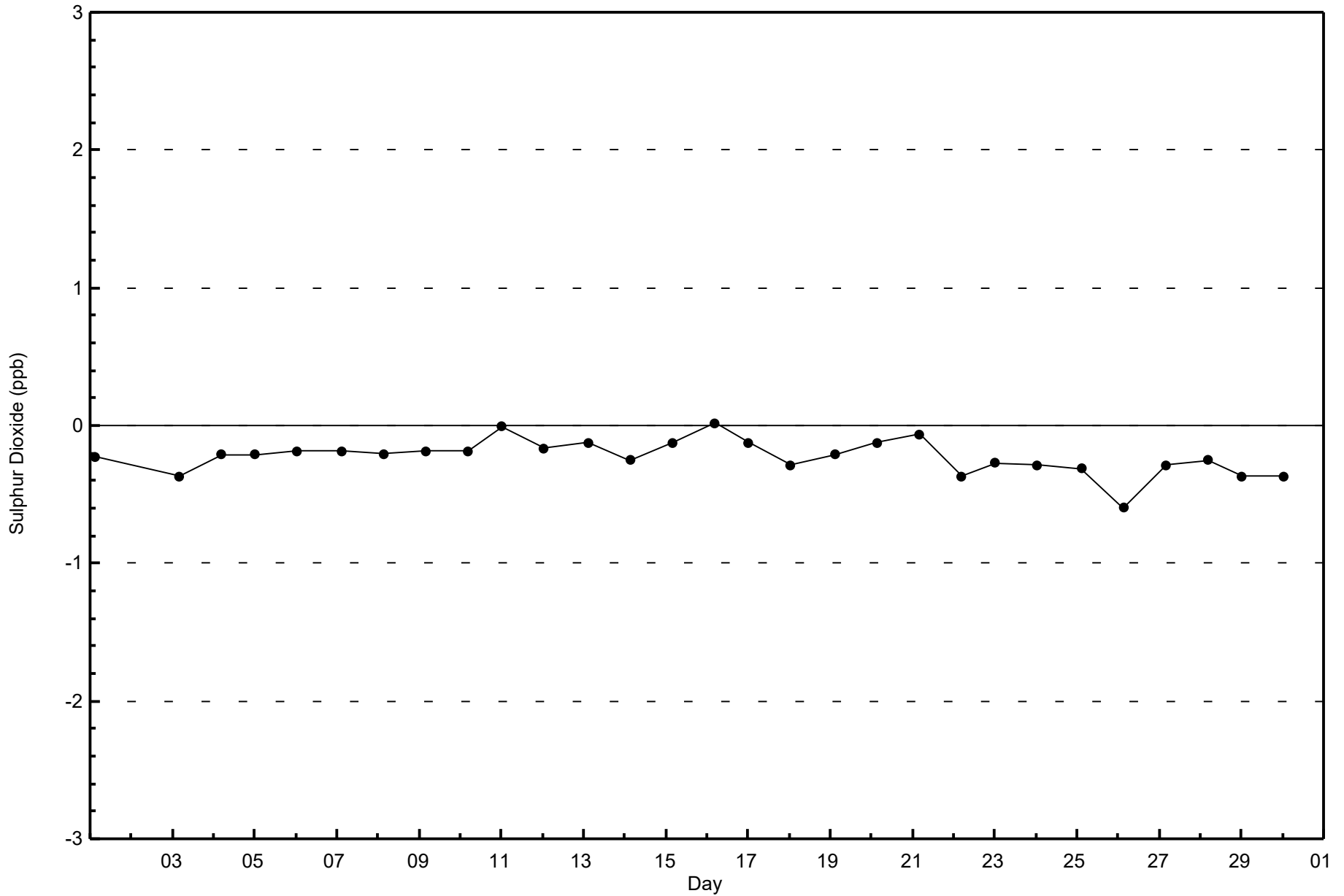
Total Number of Hours: 720

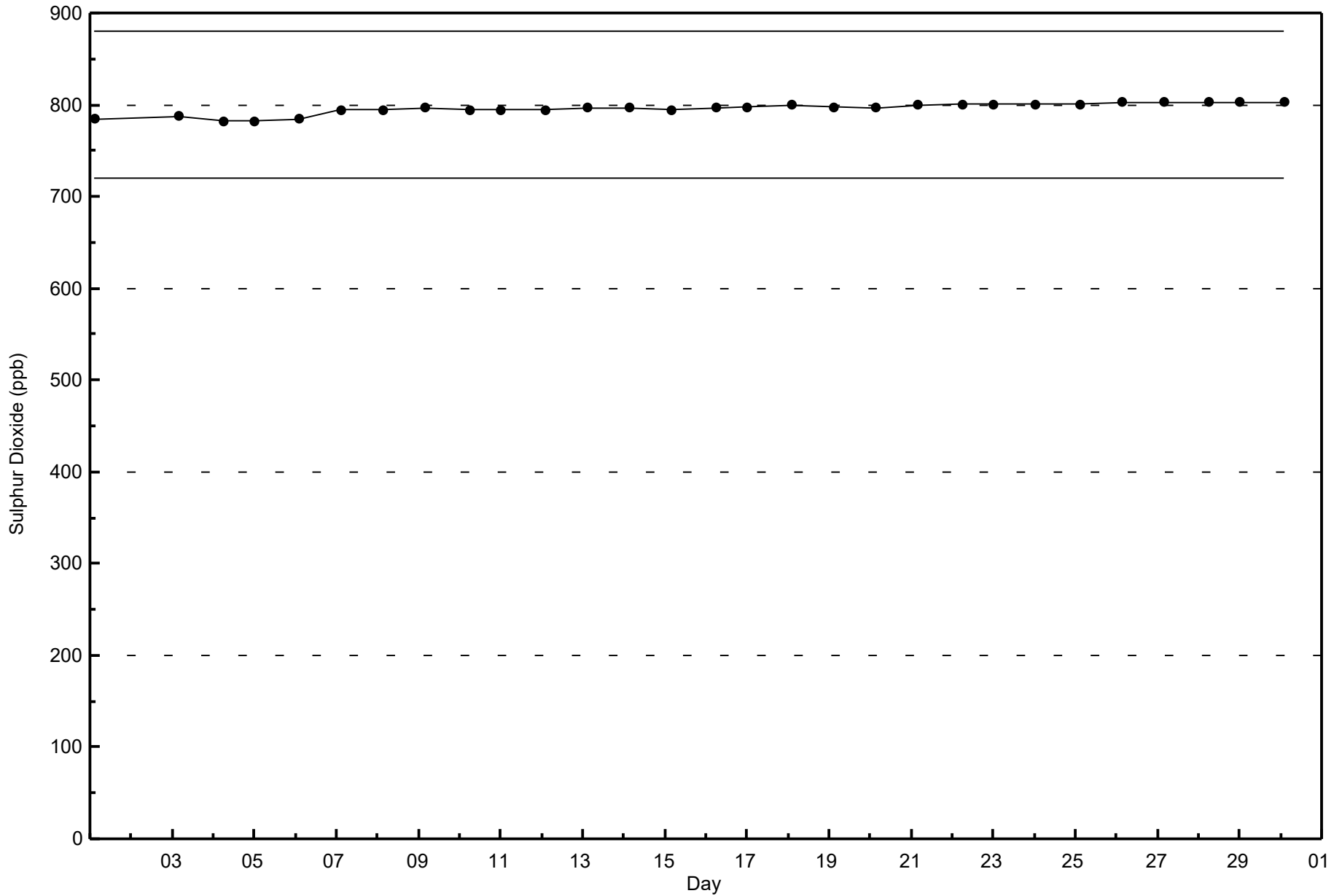


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Surmont 2



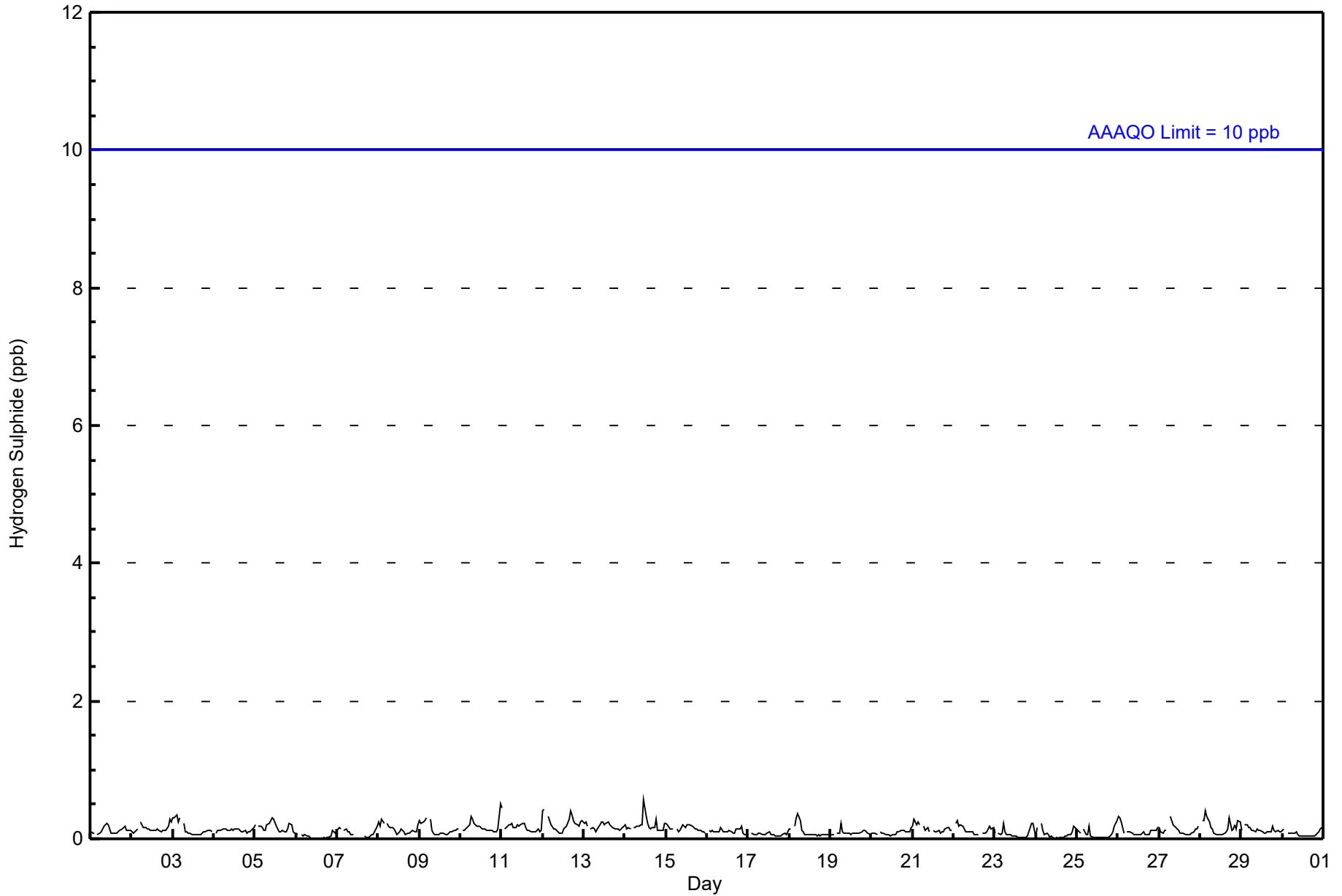






Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	681	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: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - June 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	21	31	13	21	24	38	41	21	24	55	111	93	46	55	36	658
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	21	31	13	21	24	38	41	21	24	55	111	93	46	55	36	658

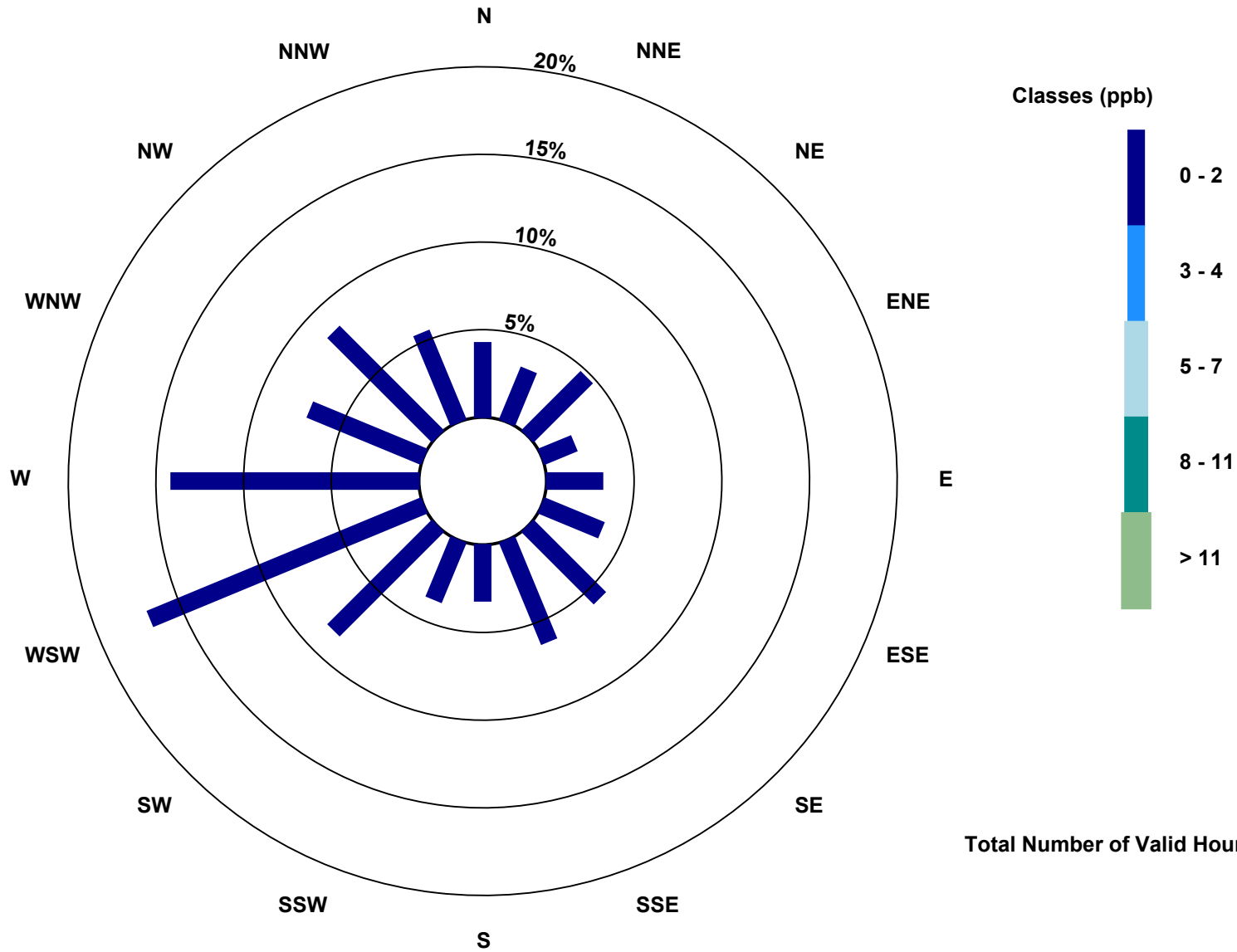
Total Number of Valid Hours: 658

Total Number of Hours: 720

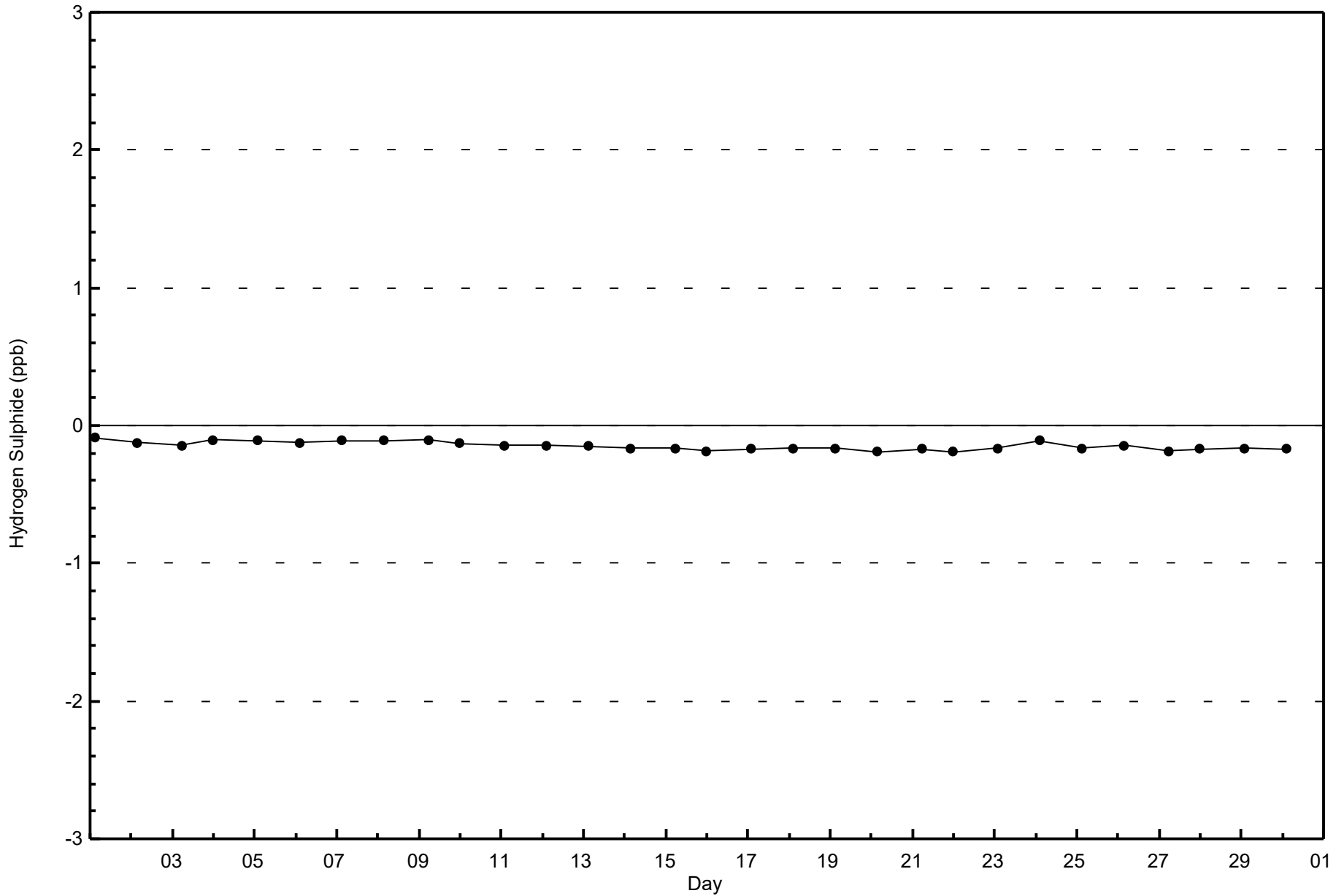


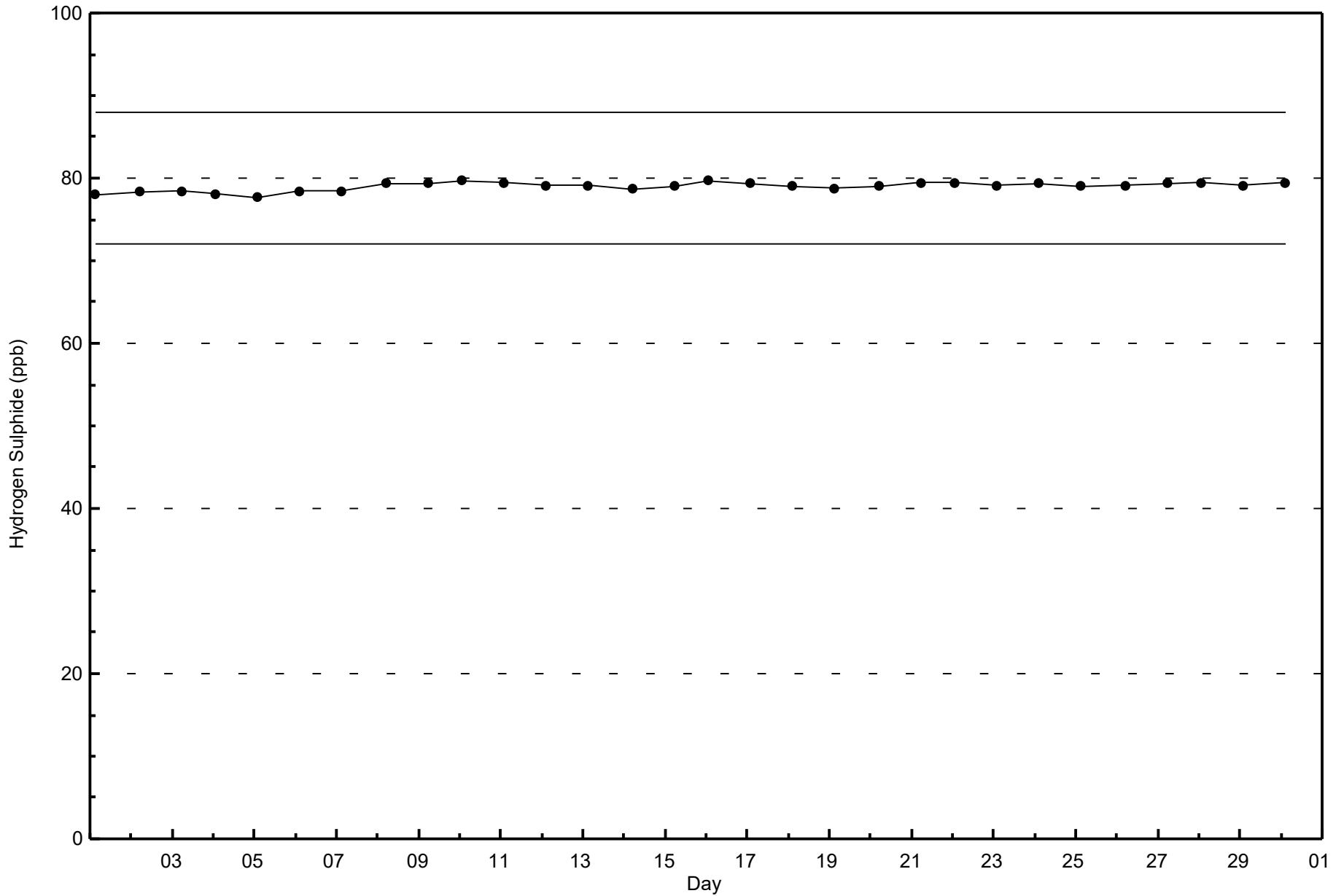
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Surmont 2



Total Number of Valid Hours: 658







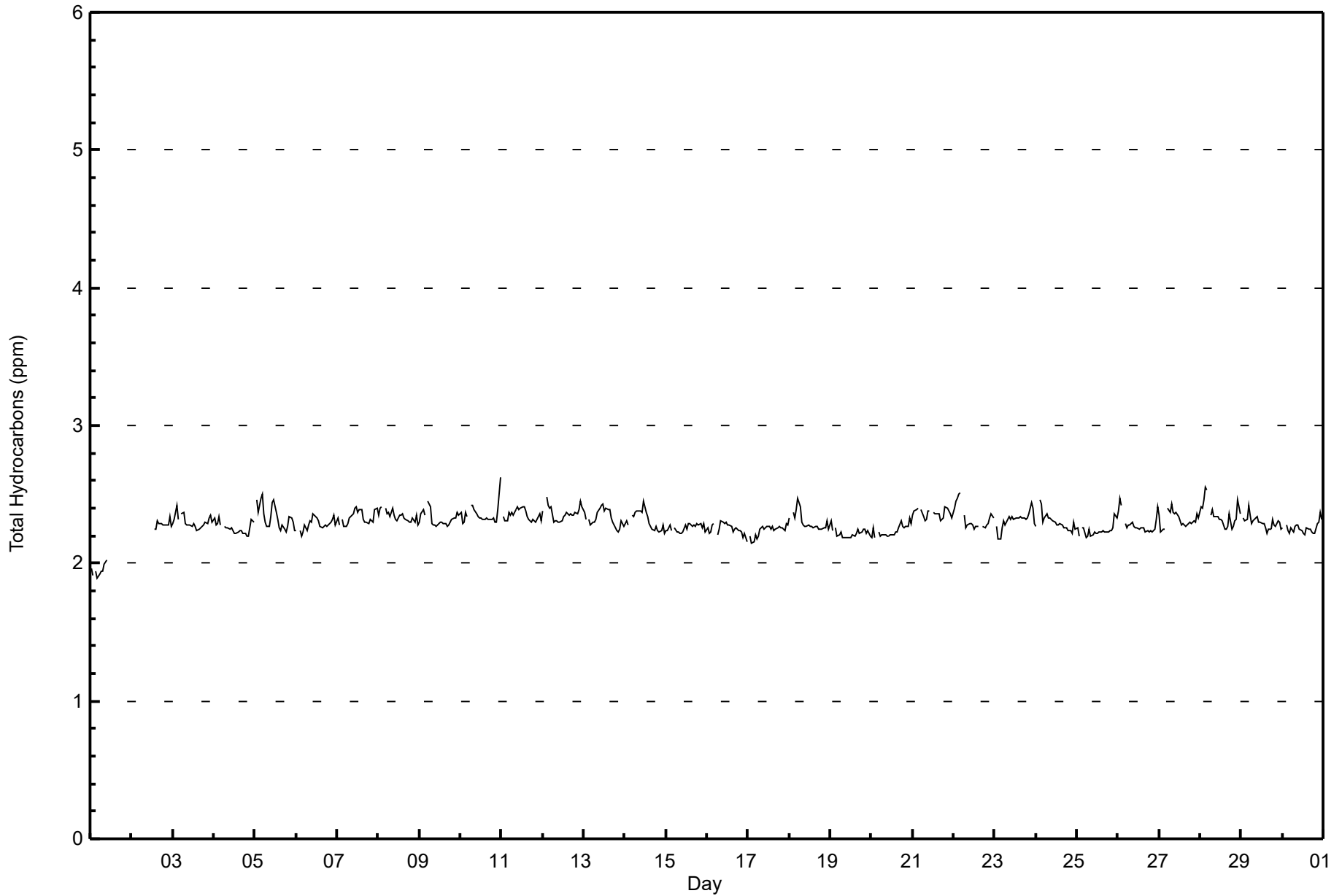
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Surmont 2 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 2.6 ppm on Jun 11 00:00		Maximum Daily Average: 2.4 ppm on Jun 12				Hours of Data:		661																		
Minimum Value: 1.9 ppm on Jun 1 05:00		Minimum Daily Average: 2.2 ppm on Jun 19				Hours of Missing Data:		59																		
Maximum Diurnal Average: 2.3 ppm at hour 23		Minimum Diurnal Average: 2.3 ppm at hour 19				Hours of Calibration:		35																		
Monthly Average: 2.30 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.2 Q ₁ = 2.3 Median = 2.3 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.5				Percent Operational Time:		96.7																		
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-Jun	2.0	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	C	C	C	M	M	M	M	M	M	M	M	M	M	M	--	2.0
2-Jun	M	M	M	M	M	M	M	M	M	M	C	C	C	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	--	2.3
3-Jun	2.3	2.3	2.4	2.3	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
4-Jun	2.3	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	2.2	2.2	2.2	2.3	2.3	2.3	2.3
5-Jun	Z	2.5	2.4	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.5
6-Jun	2.2	Z	2.2	2.2	2.2	2.3	2.2	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
7-Jun	2.3	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	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4
8-Jun	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
9-Jun	2.3	2.4	2.4	2.4	Z	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	2.4	2.3	2.3	2.5
10-Jun	2.4	2.3	2.3	2.4	2.3	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.4	2.6
11-Jun	Z	2.3	2.3	2.3	2.4	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4
12-Jun	2.4	Z	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
13-Jun	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.4
14-Jun	2.3	2.3	2.3	Z	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4
15-Jun	2.2	2.2	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3
16-Jun	2.3	2.2	2.2	2.3	2.3	Z	2.2	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	2.2	2.2	2.2	2.2	2.2	2.3
17-Jun	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3
18-Jun	2.3	Z	2.4	2.3	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	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.5
19-Jun	2.3	2.2	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
20-Jun	2.2	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3
21-Jun	2.4	2.4	2.4	2.4	Z	2.4	2.3	2.3	2.3	2.4	2.4	M	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.4
22-Jun	2.4	2.4	2.5	2.5	2.5	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	DF	DF	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.5
23-Jun	Z	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	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.4
24-Jun	2.3	Z	2.5	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	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5
25-Jun	2.3	2.2	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.4
26-Jun	2.4	2.5	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.5
27-Jun	2.3	2.2	2.3	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4
28-Jun	2.4	2.4	2.5	2.6	2.5	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.5	2.4	2.4	2.6
29-Jun	Z	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4
30-Jun	2.3	Z	2.3	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4
																								Diurnal Average		
																								Diurnal Maximum		
																								2.3		
																								2.4		
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	9	1.36	1.36
2.1 - 3.0	652	98.64	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 661

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - June 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	3	3	1	2	9
2.1 - 3.0	23	20	30	13	20	25	36	41	21	25	53	116	83	39	50	31	626
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	23	20	30	13	20	25	36	41	21	25	53	116	86	42	51	33	635

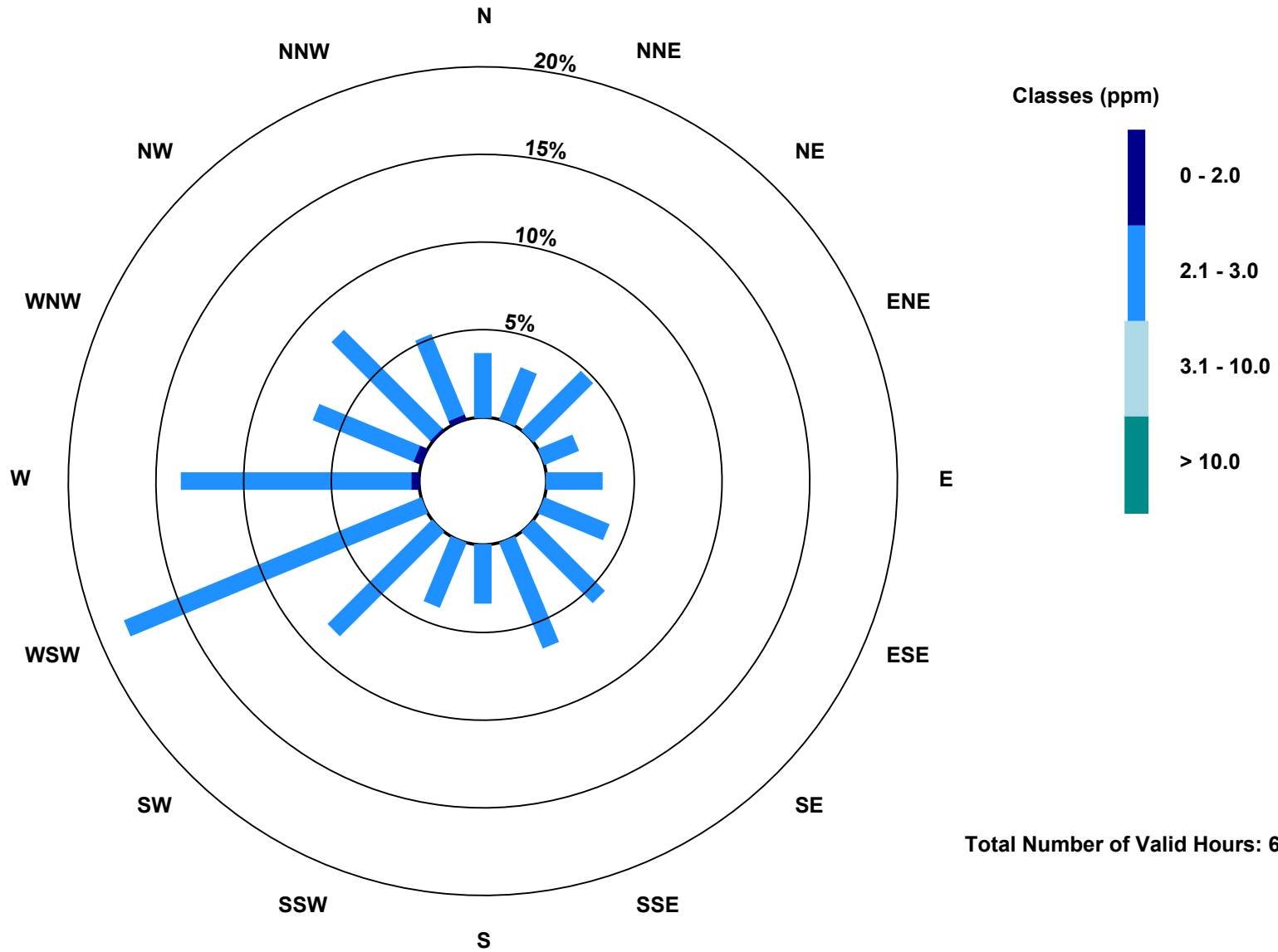
Total Number of Valid Hours: 635

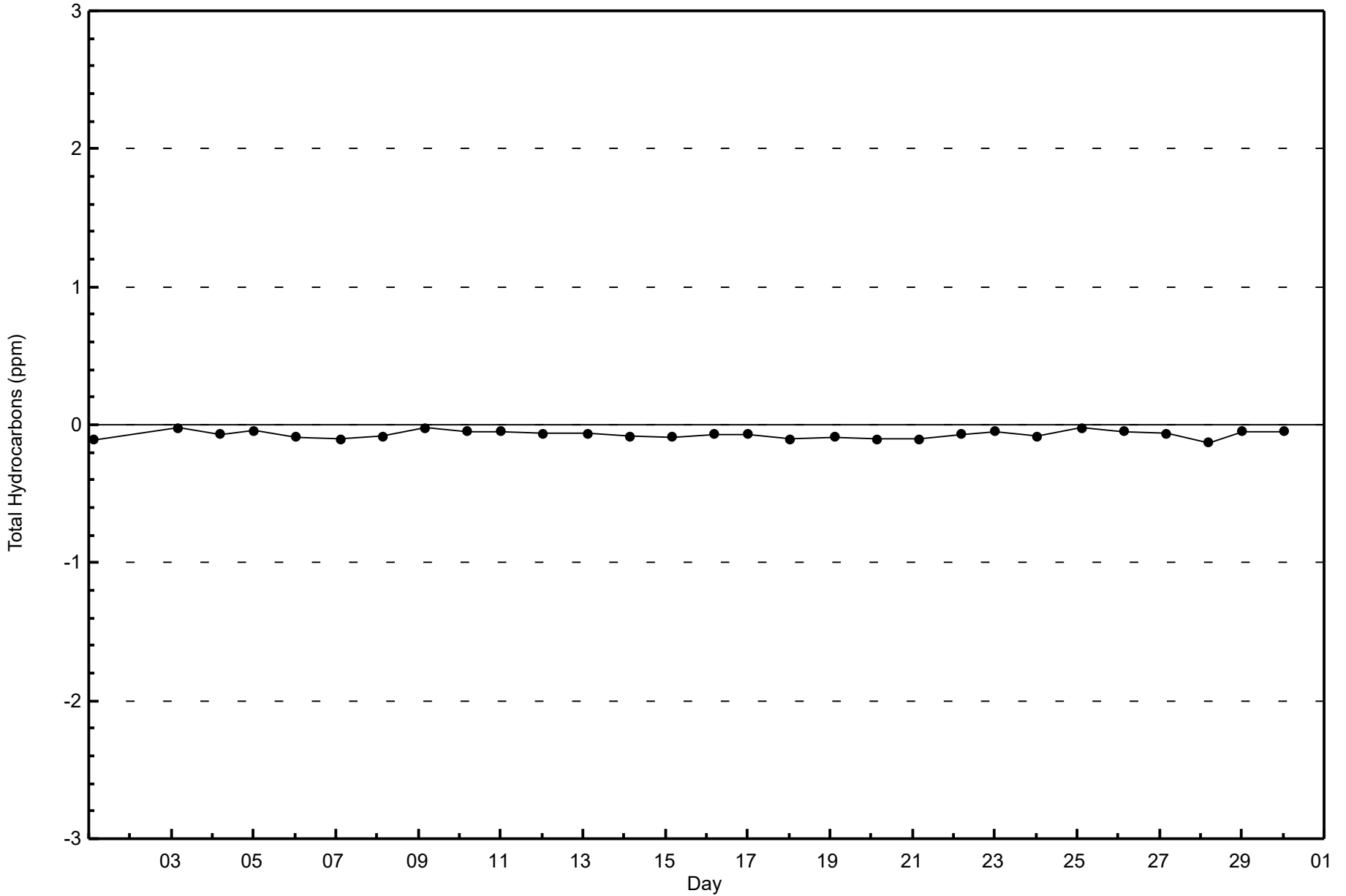
Total Number of Hours: 720

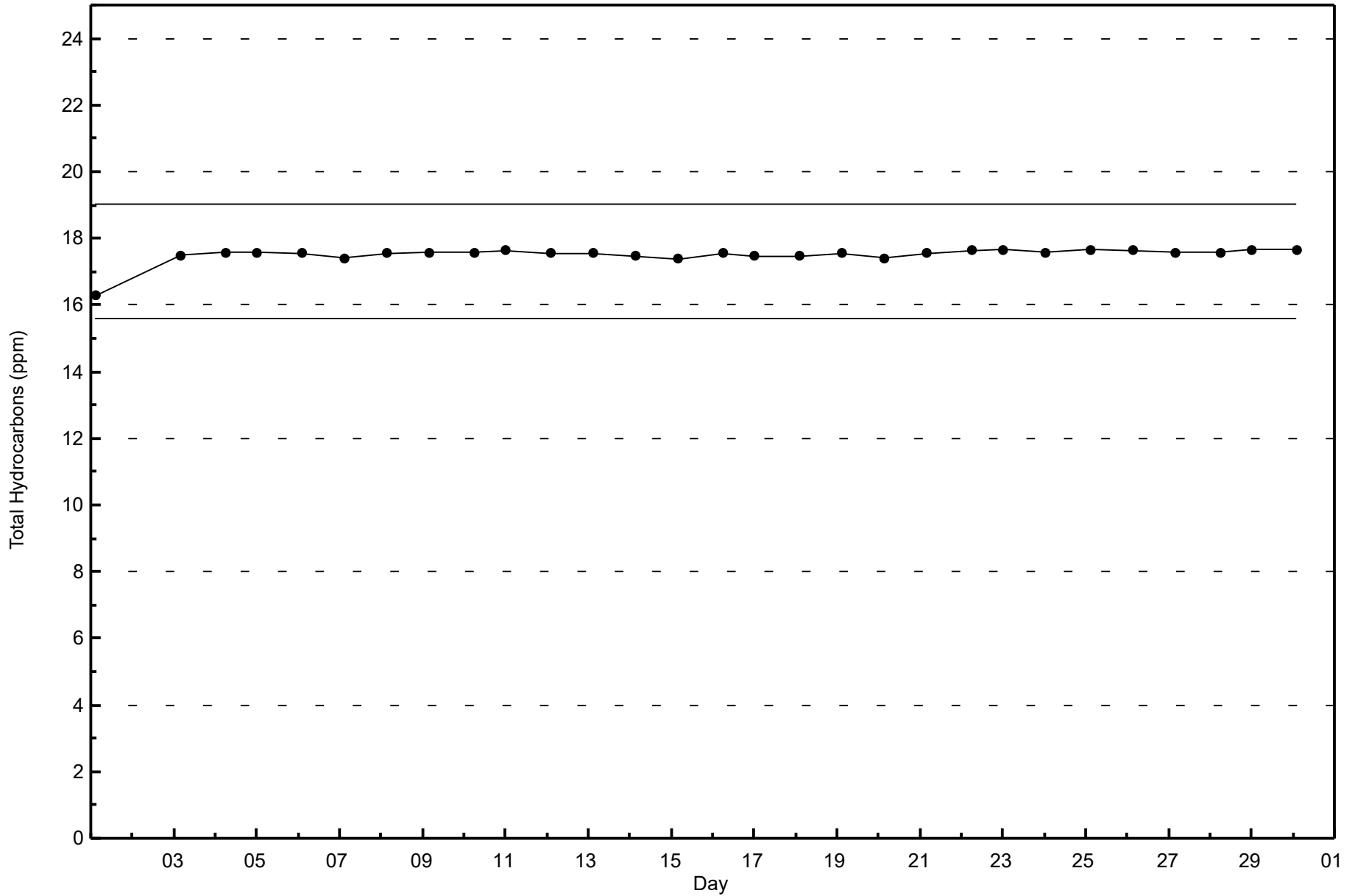


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Surmont 2









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

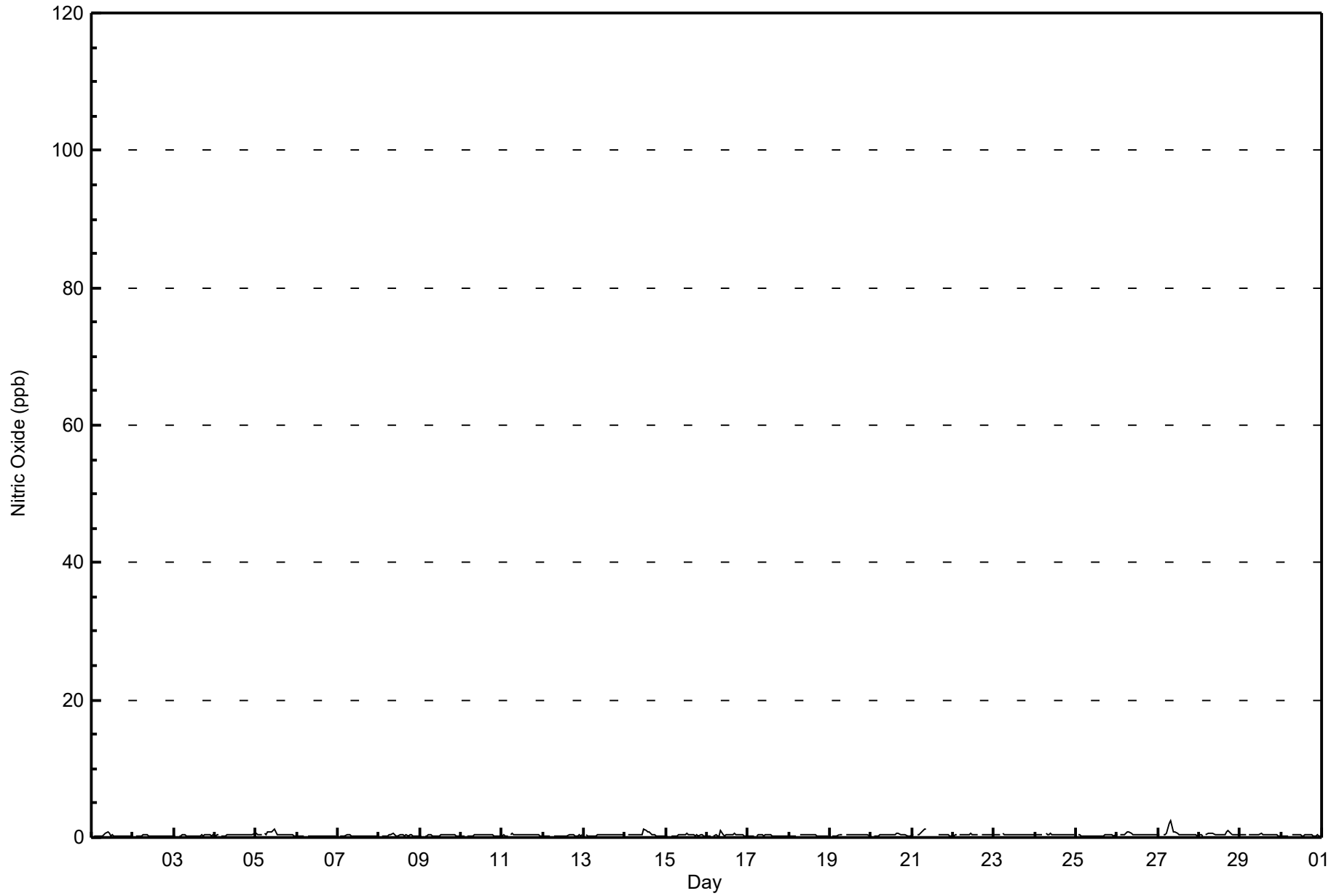
Surmont 2 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Hours of Data: 681						
Maximum Value: 2.4 ppb on Jun 27 08:00		Maximum Daily Average: 0.6 ppb on Jun 27		Hours of Missing Data: 39																	Hours of Calibration: 36						
Minimum Value: 0.1 ppb on Jun 6 11:00		Minimum Daily Average: 0.2 ppb on Jun 6		Hours of Calibration: 36																	Percent Operational Time: 99.6						
Maximum Diurnal Average: 0.5 ppb at hour 9		Minimum Diurnal Average: 0.3 ppb at hour 4		Percentiles: P ₁ = 0.2 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.3 Q ₃ = 0.4 P ₉₀ = 0.5 P ₉₉ = 1.0																							
Monthly Average: 0.35 ppb																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.9	0.6	0.3	0.5	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.9	
2-Jun	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	
3-Jun	0.2	0.2	Z	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
4-Jun	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6		
5-Jun	0.6	0.5	0.4	0.4	Z	0.6	0.4	0.7	0.8	0.8	1.0	1.1	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	1.1		
6-Jun	0.2	0.2	0.2	0.2	0.2	Z	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	0.2	0.2	0.2	0.3		
7-Jun	Z	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5		
8-Jun	0.2	Z	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.4	0.3	0.3	0.3	0.5	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.6		
9-Jun	0.2	0.2	Z	0.2	0.3	0.4	0.5	0.3	0.3	0.3	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	0.5		
10-Jun	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.4		
11-Jun	0.3	0.3	0.3	0.3	Z	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.5		
12-Jun	0.2	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4		
13-Jun	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4		
14-Jun	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	1.2	1.0	0.8	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	1.2		
15-Jun	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.6		
16-Jun	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	1.0	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	1.0		
17-Jun	0.3	0.2	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4		
18-Jun	0.2	0.2	0.2	0.2	0.3	Z	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4		
19-Jun	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.3	M	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4		
20-Jun	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	0.3	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.5		
21-Jun	0.3	0.3	Z	0.3	0.4	0.6	0.9	1.1	1.2	C	C	C	C	C	C	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	1.2		
22-Jun	0.3	0.3	0.4	Z	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.4	DF	DF	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5		
23-Jun	0.4	0.3	0.3	0.3	Z	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.6		
24-Jun	0.3	0.3	0.3	0.3	0.4	Z	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6		
25-Jun	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
26-Jun	0.3	Z	0.4	0.4	0.4	0.5	0.8	0.7	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.8		
27-Jun	0.4	0.4	Z	0.3	0.4	0.7	2.1	2.4	1.6	0.8	0.9	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.4		
28-Jun	0.3	0.3	0.3	Z	0.5	0.7	0.7	0.7	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.8	1.0	0.6	0.4	0.4	0.3	0.3	0.3	1.0		
29-Jun	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.6		
30-Jun	0.3	0.2	0.2	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4		
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Surmont 2 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Surmont 2 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	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: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Surmont 2 - June 2023**

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	21	29	12	22	25	37	43	23	22	54	114	90	48	50	36	653
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	21	29	12	22	25	37	43	23	22	54	114	90	48	50	36	653

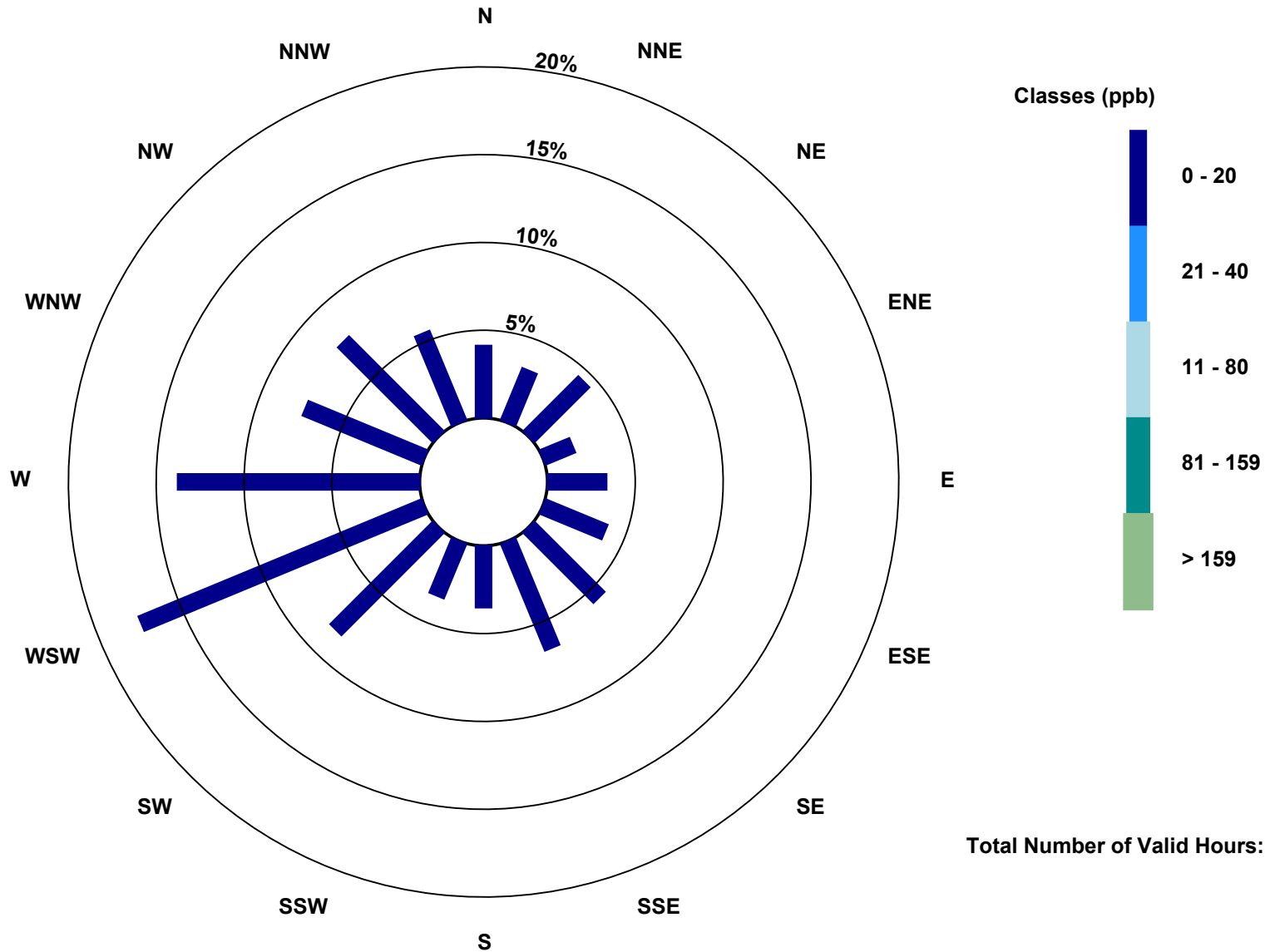
Total Number of Valid Hours: 653

Total Number of Hours: 720

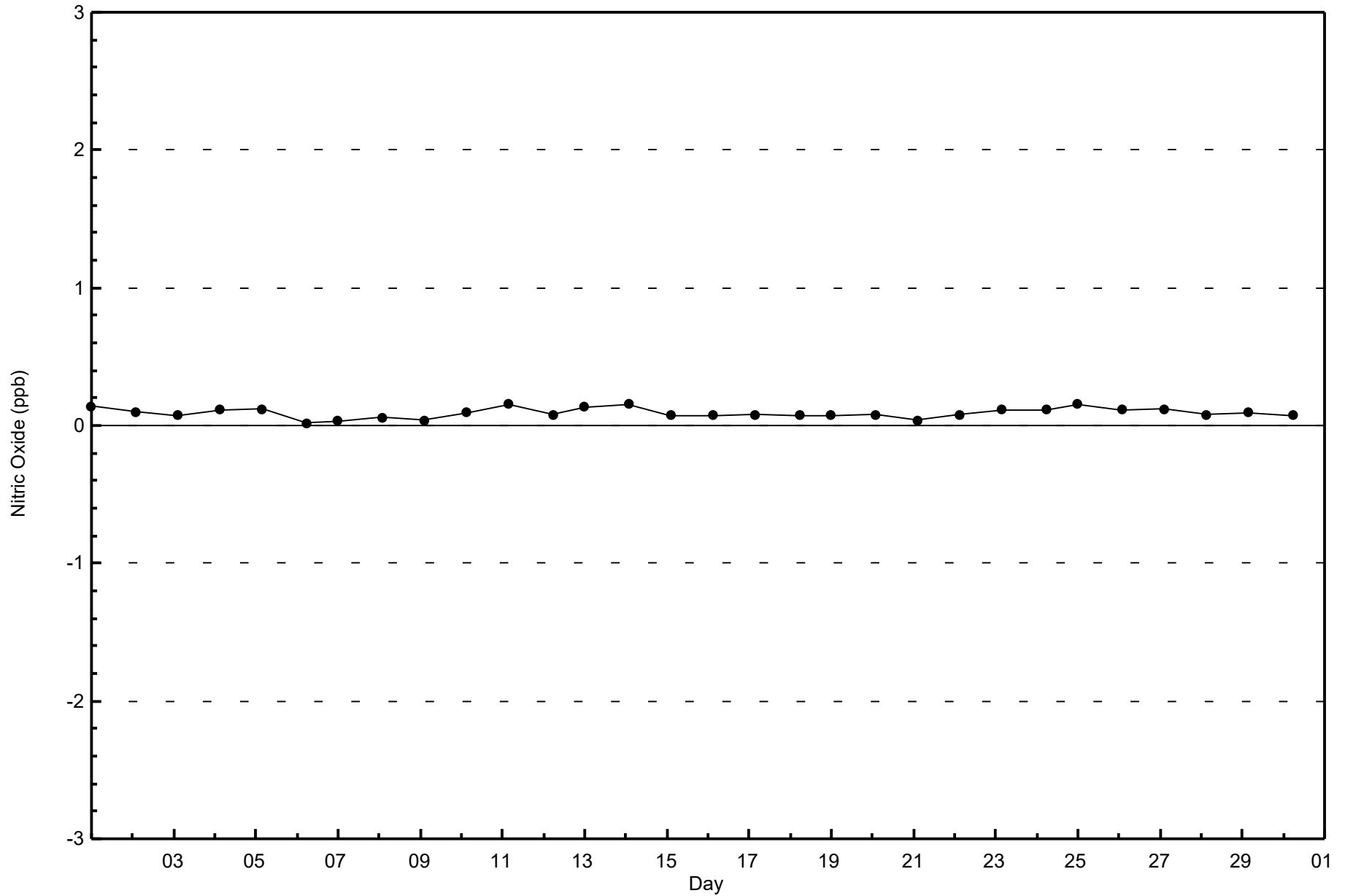


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Surmont 2



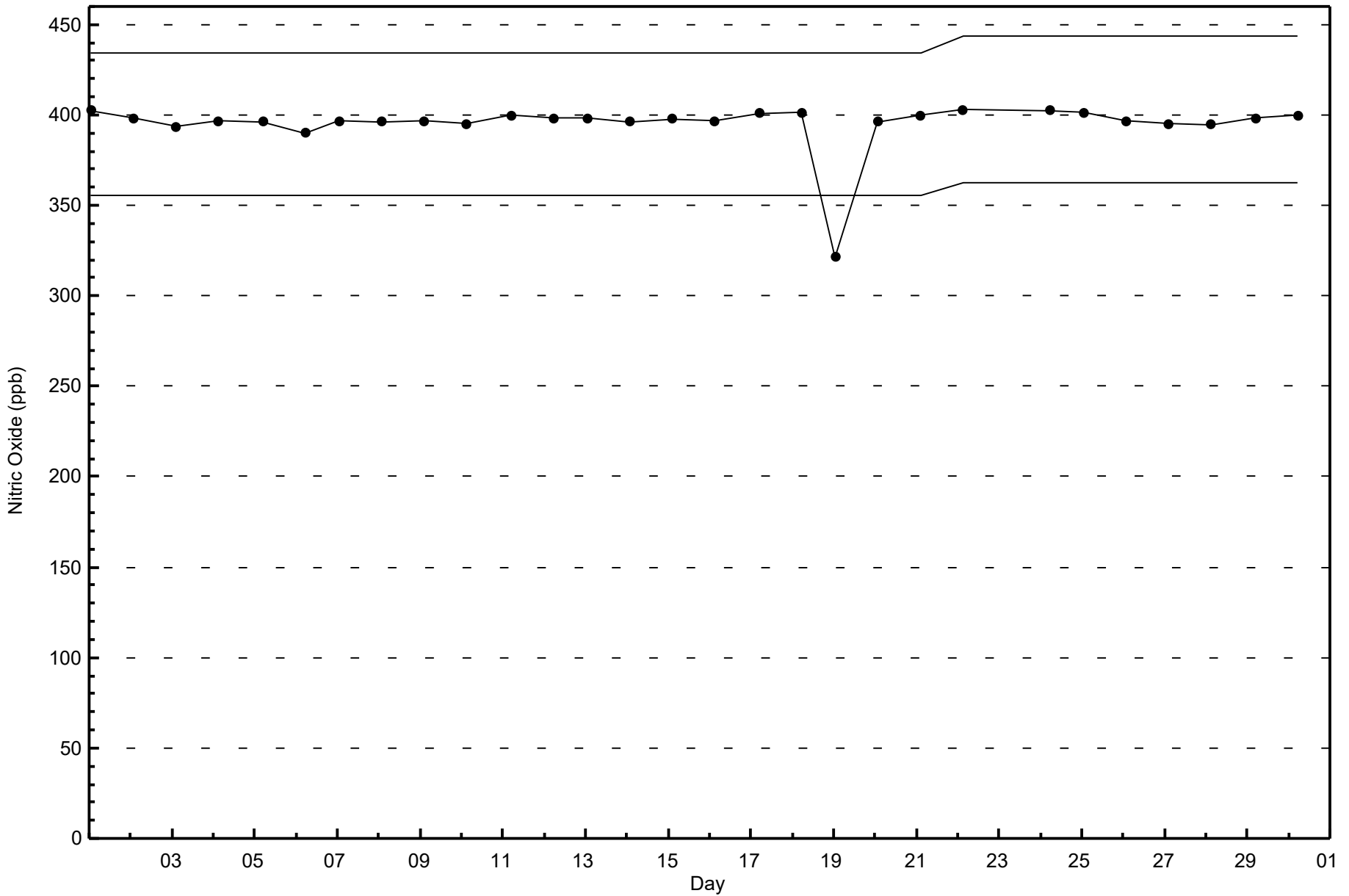
Total Number of Valid Hours: 653





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Surmont 2 - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

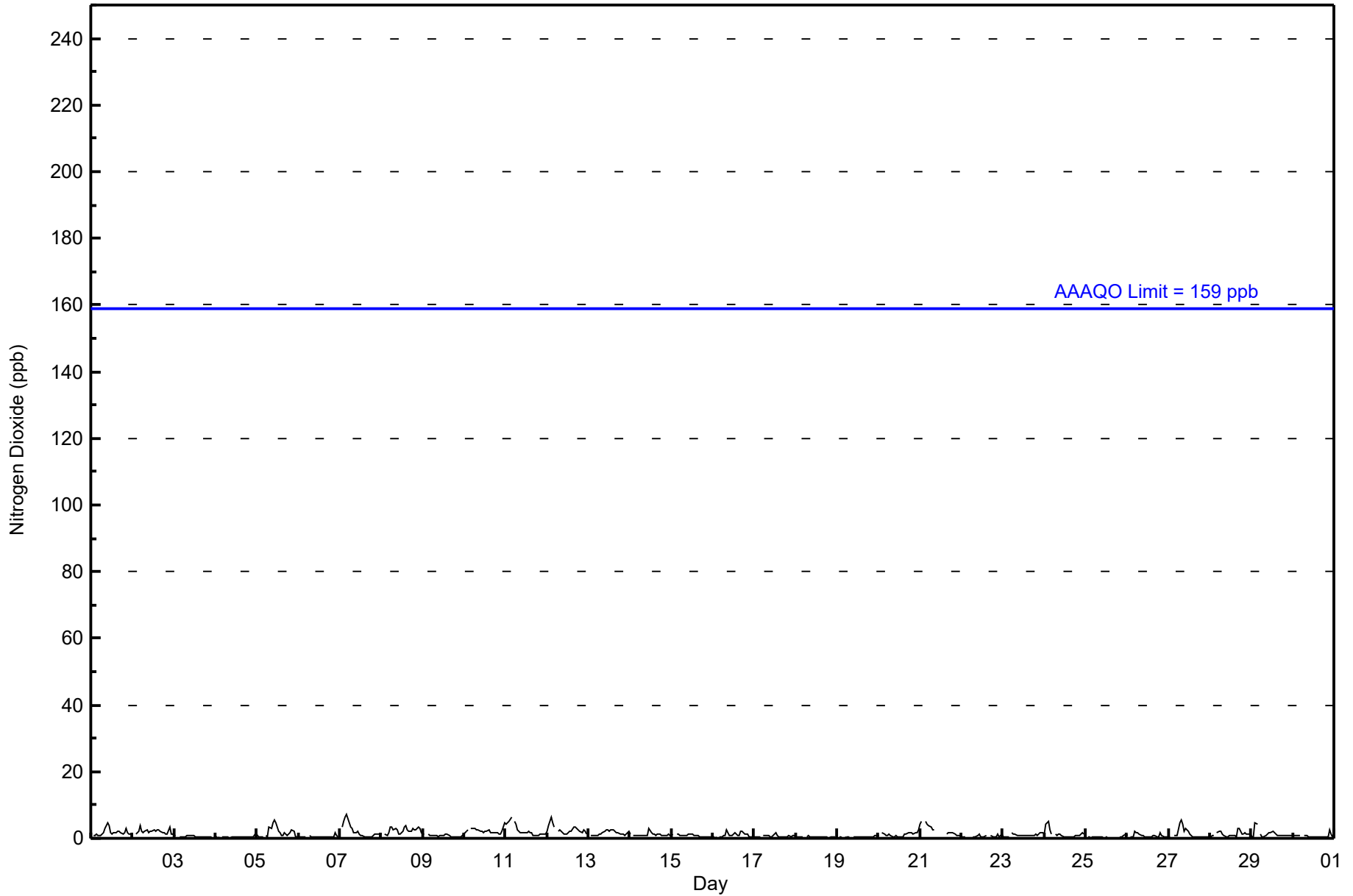
Surmont 2 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0 24-hr: 0		Hours in Service:		720																				
Maximum Value: 7.4 ppb on Jun 7 05:00		Maximum Daily Average: 2.6 ppb on Jun 12		Hours of Data:		681																				
Minimum Value: 0.2 ppb on Jun 22 05:00		Minimum Daily Average: 0.4 ppb on Jun 25		Hours of Missing Data:		39																				
Maximum Diurnal Average: 1.8 ppb at hour 4		Minimum Diurnal Average: 1.0 ppb at hour 20		Hours of Calibration:		36																				
Monthly Average: 1.26 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.9 Q ₃ = 1.6 P ₉₀ = 2.6 P ₉₉ = 5.1		Percent Operational Time:		99.6																				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	Z	0.9	1.0	1.2	0.9	1.0	1.2	1.8	3.1	4.6	3.8	1.9	1.3	1.6	1.6	2.3	2.0	1.7	1.4	1.7	2.9	1.9	1.1	1.2	1.8	4.6
2-Jun	1.4	Z	1.2	2.2	3.8	2.3	1.9	2.1	2.5	1.9	2.1	2.3	2.5	2.3	2.5	2.7	2.0	1.7	1.6	1.3	1.3	3.2	1.4	1.2	2.1	3.8
3-Jun	0.9	0.7	Z	0.6	0.5	0.5	0.5	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.5	0.9
4-Jun	0.4	0.2	0.4	Z	0.3	0.4	0.4	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	1.5	0.4	1.5
5-Jun	0.7	0.5	0.4	0.4	Z	0.7	0.5	3.2	3.1	4.8	5.4	4.8	2.3	1.5	0.7	0.7	1.7	1.0	1.2	1.7	2.4	2.3	0.6	0.4	1.8	5.4
6-Jun	0.4	0.3	0.3	0.6	0.5	Z	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.4	0.6	0.5	0.4	0.4	0.5	1.9	0.7	0.6	0.5	1.9
7-Jun	Z	3.6	5.0	6.2	7.4	4.6	3.2	2.9	1.6	1.9	2.0	1.3	0.8	0.7	0.5	0.6	0.4	0.6	0.6	0.9	1.1	1.2	1.4	1.2	2.2	7.4
8-Jun	1.3	Z	1.3	1.0	1.7	3.3	3.2	2.4	2.9	2.4	1.4	1.3	2.2	3.3	3.8	2.5	2.2	2.2	3.0	2.7	2.7	3.4	3.1	1.6	2.4	3.8
9-Jun	1.3	1.1	Z	1.3	0.9	0.7	0.8	0.7	0.7	0.6	0.7	1.0	0.8	1.1	1.3	0.9	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.8	1.3
10-Jun	1.6	2.2	2.5	Z	3.0	2.8	3.0	2.5	2.5	2.1	2.1	1.9	2.0	2.2	2.4	1.9	1.9	1.9	1.9	1.5	1.4	1.4	2.2	4.8	2.2	4.8
11-Jun	4.1	4.6	5.1	6.3	Z	4.9	4.1	2.5	1.8	1.5	1.7	1.7	1.6	2.3	1.8	1.5	1.0	0.9	1.0	0.8	1.4	1.3	1.1	1.3	2.4	6.3
12-Jun	2.1	3.8	6.2	4.8	3.2	Z	2.1	2.7	2.0	1.7	1.1	1.2	1.8	2.3	2.2	3.2	3.3	2.8	2.6	2.1	1.6	2.5	2.1	1.4	2.6	6.2
13-Jun	Z	1.0	0.8	0.8	0.8	1.0	1.1	1.1	1.7	2.0	2.6	2.7	2.2	2.6	2.5	2.1	1.8	1.6	1.4	1.1	1.1	1.0	1.2	2.1	1.6	2.7
14-Jun	1.4	Z	0.9	0.9	1.0	0.8	0.7	0.7	0.7	0.8	0.8	2.8	1.7	1.4	1.1	1.0	1.1	1.1	0.9	0.8	0.9	1.0	1.3	0.8	1.1	2.8
15-Jun	0.9	1.4	Z	1.1	1.3	1.0	0.9	0.9	0.9	0.8	1.3	1.1	1.3	0.8	0.9	0.8	0.6	0.5	0.6	0.4	0.3	0.4	0.4	0.3	0.8	1.4
16-Jun	0.3	0.2	0.4	Z	0.5	0.4	0.7	0.8	2.7	0.9	0.7	0.7	1.4	1.6	1.0	0.8	2.2	2.1	1.1	1.1	1.3	0.3	0.4	0.3	1.0	2.7
17-Jun	0.4	0.4	0.4	0.4	Z	0.7	0.8	0.7	0.7	0.6	0.6	0.9	1.5	0.7	0.4	0.5	0.5	0.5	0.3	0.4	0.7	0.6	0.8	0.7	0.6	1.5
18-Jun	0.5	0.5	0.4	0.4	0.3	Z	0.6	0.7	0.5	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.7
19-Jun	Z	0.4	0.3	0.2	0.2	0.4	0.3	0.3	M	0.5	0.3	0.3	0.3	0.3	0.5	0.4	0.4	0.6	0.4	0.4	0.4	0.6	0.7	0.7	0.4	0.7
20-Jun	0.8	Z	1.5	1.2	0.8	1.0	1.2	0.9	0.6	0.6	0.7	0.4	0.5	0.5	0.5	1.3	1.4	1.8	1.8	1.5	1.4	1.7	1.7	2.6	1.1	2.6
21-Jun	4.4	4.9	Z	5.2	4.4	3.9	3.6	2.4	2.7	C	C	C	C	C	C	1.3	1.5	1.5	1.5	1.6	1.4	0.9	1.0	0.8	--	5.2
22-Jun	0.5	0.4	0.5	Z	0.2	0.2	0.2	0.4	0.5	0.8	1.2	0.6	0.3	0.4	1.0	DF	DF	0.8	0.6	0.6	0.6	1.3	0.5	1.3	0.6	1.3
23-Jun	0.5	0.4	0.4	0.5	Z	1.5	1.4	1.1	1.0	1.0	1.0	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.7	1.1	0.9	1.9	1.7	1.6	1.0	1.9
24-Jun	1.1	4.2	5.1	2.6	1.3	Z	1.2	1.0	1.2	1.2	1.0	0.6	0.5	0.5	0.4	0.5	0.6	0.8	0.9	0.8	1.1	1.7	1.3	1.3	1.3	5.1
25-Jun	Z	0.6	0.4	0.2	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.8	1.1	0.4	1.1
26-Jun	0.9	Z	0.5	0.6	2.0	1.5	1.6	1.4	1.0	0.7	0.6	0.6	0.5	0.6	0.6	0.7	0.8	0.5	0.5	1.7	0.8	0.6	0.6	0.4	0.9	2.0
27-Jun	0.3	0.4	Z	0.8	0.7	0.9	4.7	5.7	4.2	2.2	2.8	2.3	1.4	0.8	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.4	5.7
28-Jun	0.4	0.8	0.8	Z	1.6	2.1	2.3	1.4	1.0	0.5	0.5	0.7	0.9	0.8	0.7	0.6	3.0	2.9	1.2	1.3	1.7	1.4	1.3	1.3	1.3	3.0
29-Jun	0.6	0.6	4.8	4.4	Z	1.1	0.6	0.6	0.9	1.3	1.6	1.5	2.2	1.5	1.3	1.0	0.8	0.7	1.0	0.7	0.7	0.8	0.7	0.7	1.3	4.8
30-Jun	0.8	0.7	0.7	0.9	0.7	Z	0.7	0.7	0.8	0.6	0.6	0.5	0.3	0.3	0.5	0.6	0.6	0.5	0.4	0.3	0.4	2.6	1.2	0.5	0.7	2.6
																								Diurnal Average		
																								Diurnal Maximum		
																								1.1 1.4 1.7 1.8 1.5 1.5 1.5 1.5 1.5 1.3 1.3 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.3 1.1 1.1		
																								4.4 4.9 6.2 6.3 7.4 4.9 4.7 5.7 4.2 4.8 5.4 4.8 2.5 3.3 3.8 3.2 3.3 2.9 3.0 2.7 2.9 3.4 3.1 4.8		
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
Surmont 2 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	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: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - June 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	27	21	29	12	22	25	37	43	23	22	54	114	90	48	50	36	653
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	21	29	12	22	25	37	43	23	22	54	114	90	48	50	36	653

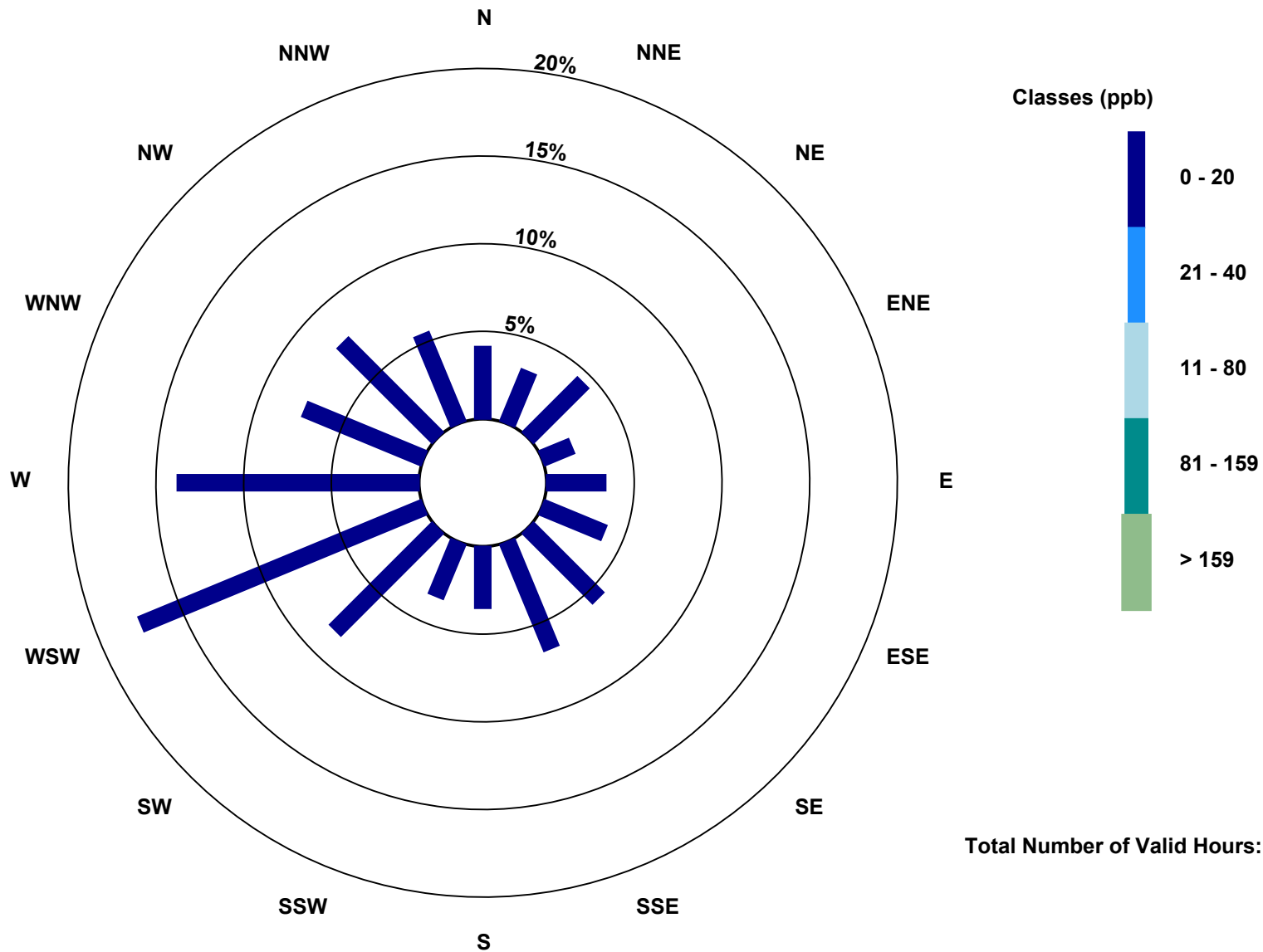
Total Number of Valid Hours: 653

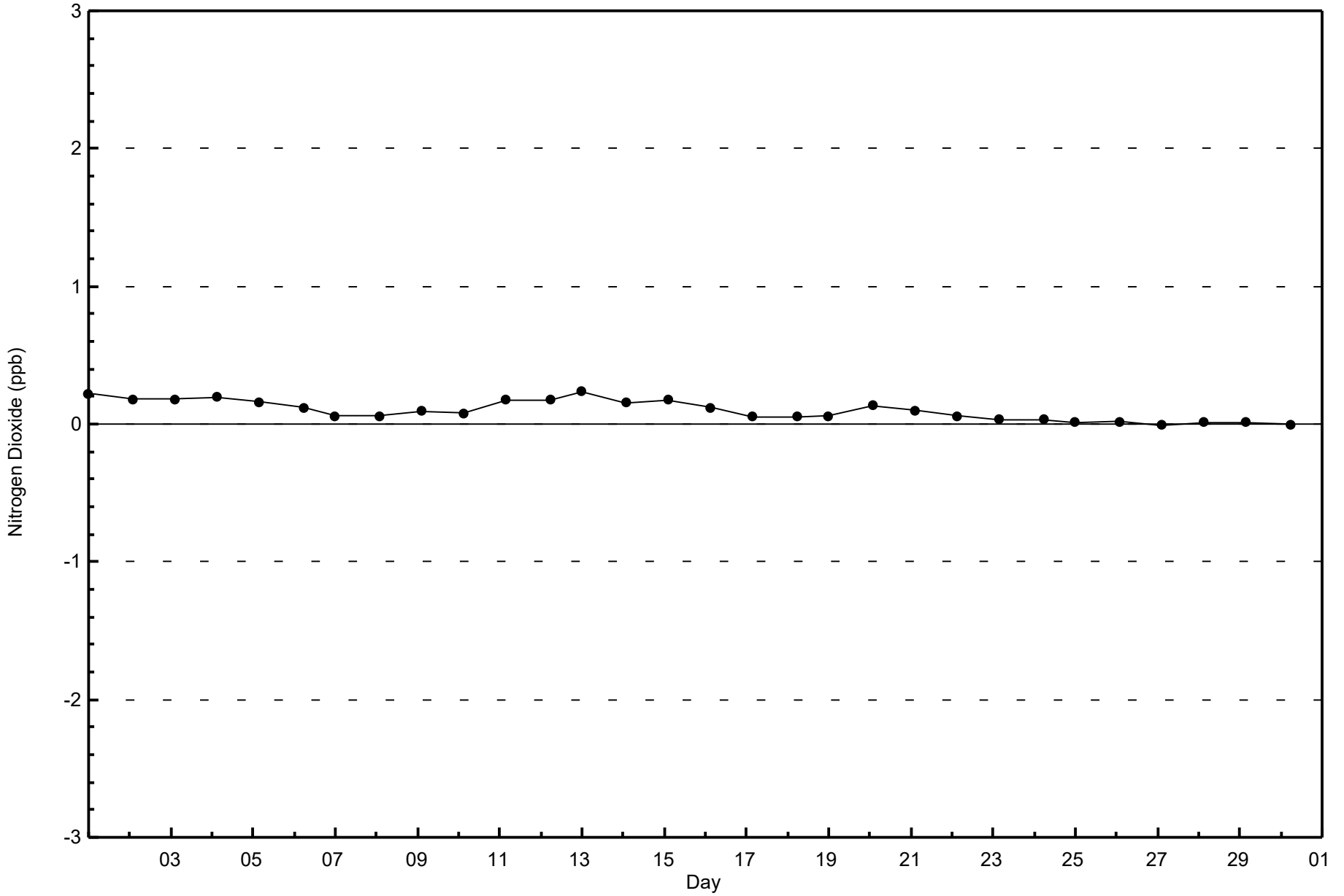
Total Number of Hours: 720

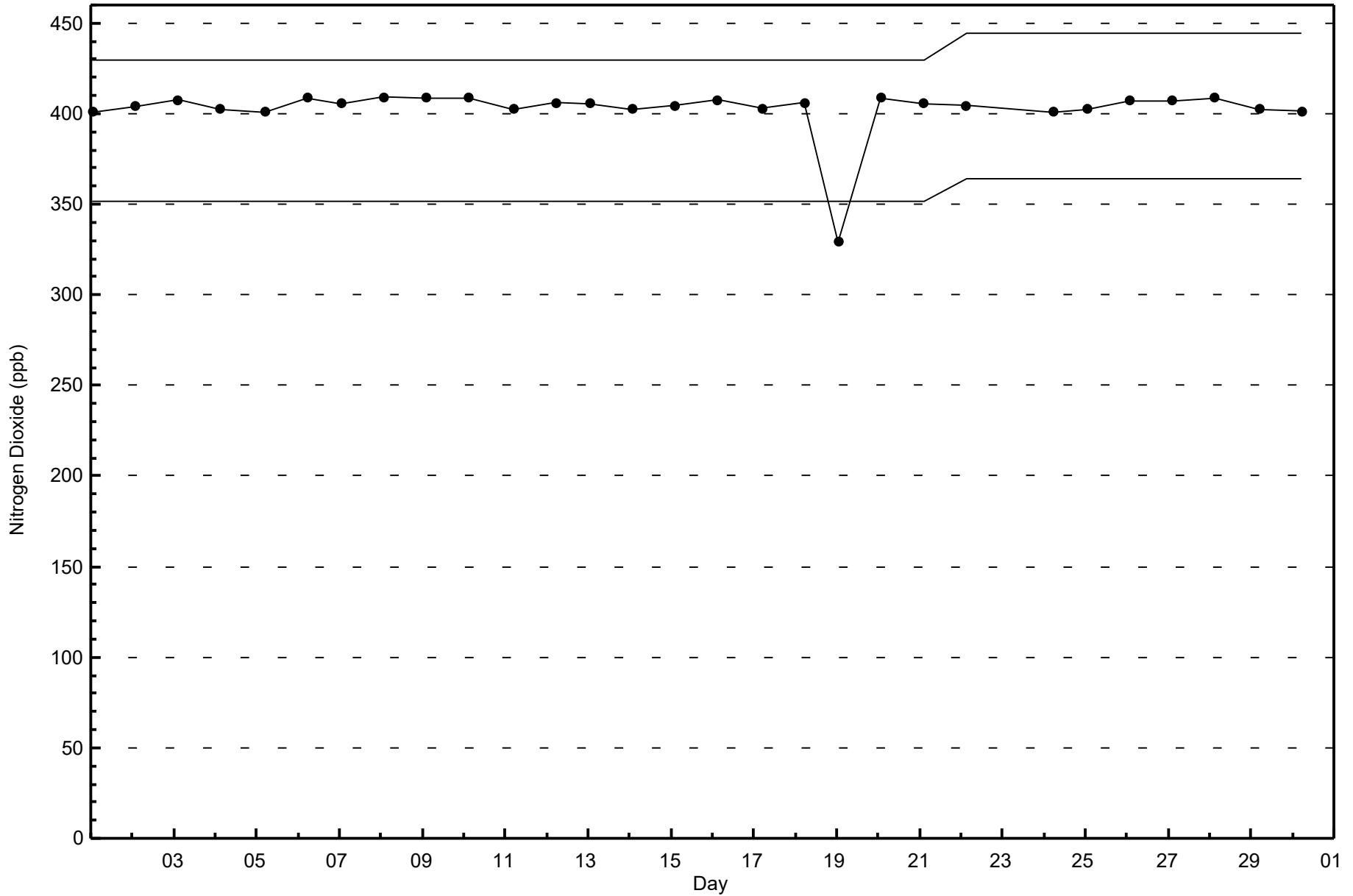


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Surmont 2









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

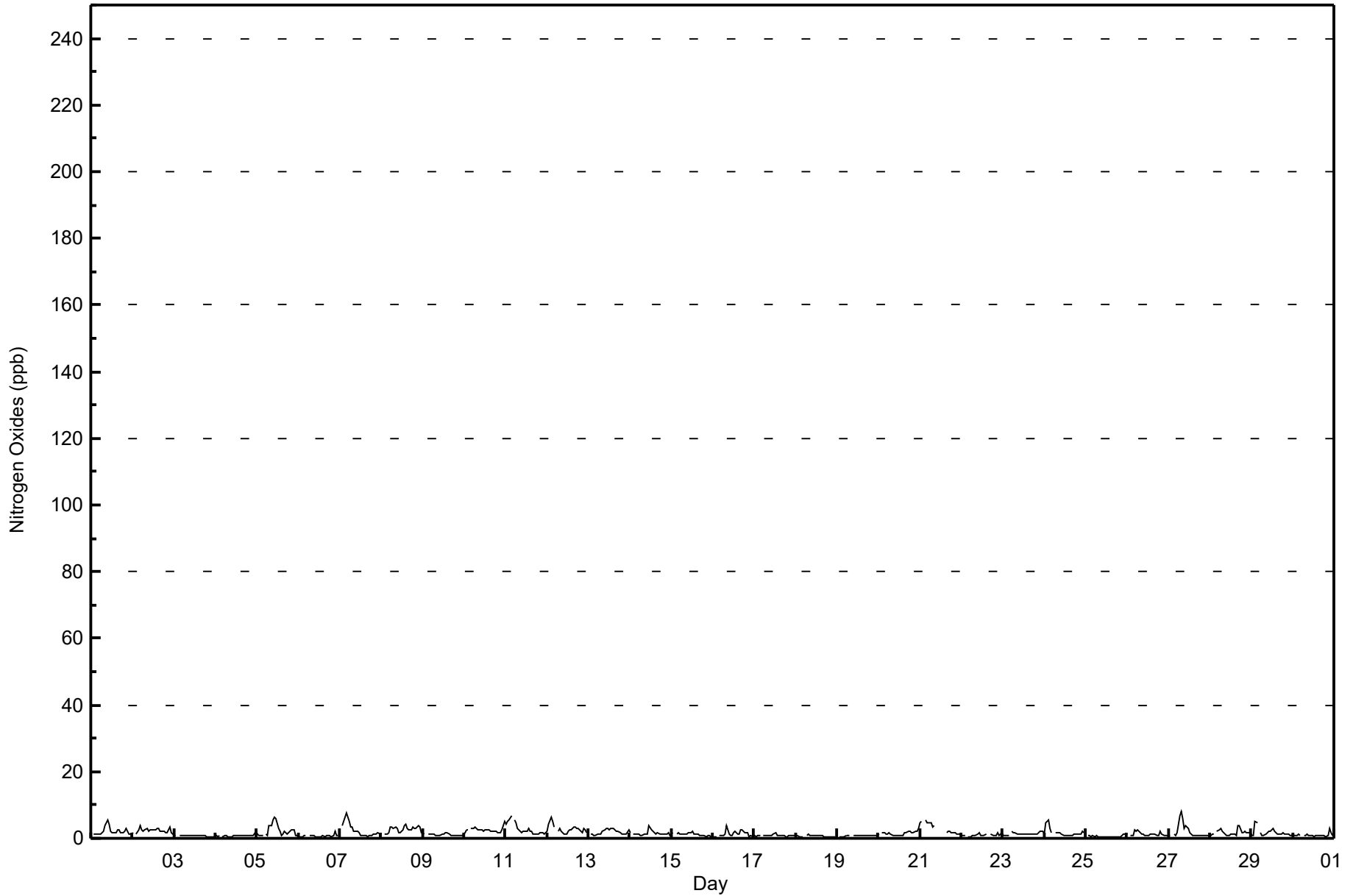
Surmont 2 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum																											
Maximum Value: 8.1 ppb on Jun 27 08:00		Maximum Daily Average: 2.8 ppb on Jun 12		Hours of Data: 681														Daily Average		Daily Maximum																													
Minimum Value: 0.4 ppb on Jun 25 11:00		Minimum Daily Average: 0.6 ppb on Jun 25		Hours of Missing Data: 39														Daily Average		Daily Maximum																													
Maximum Diurnal Average: 2.1 ppb at hour 4		Minimum Diurnal Average: 1.3 ppb at hour 20		Hours of Calibration: 36														Daily Average		Daily Maximum																													
Monthly Average: 1.61 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 0.6 Q ₁ = 0.8 Median = 1.2 Q ₃ = 2.0 P ₉₀ = 3.0 P ₉₉ = 6.0		Percent Operational Time: 99.6														Daily Average		Daily Maximum																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	Z	1.1	1.2	1.4	1.1	1.2	1.5	2.2	3.7	5.5	4.4	2.2	1.8	1.8	1.8	2.5	2.3	1.9	1.7	2.0	3.1	2.1	1.3	1.4	2.1	5.5																							
2-Jun	1.6	Z	1.4	2.4	4.0	2.5	2.2	2.4	2.9	2.2	2.4	2.5	2.7	2.6	2.8	3.0	2.3	2.0	1.9	1.6	1.5	3.4	1.6	1.4	2.3	4.0																							
3-Jun	1.1	0.9	Z	0.8	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.8	1.1																							
4-Jun	0.7	0.5	0.7	Z	0.6	0.7	0.7	0.6	0.5	0.6	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	2.1	0.7	2.1																							
5-Jun	1.3	1.0	0.8	0.8	Z	1.3	0.9	3.9	3.9	5.6	6.4	5.9	2.8	1.9	1.0	1.1	2.1	1.4	1.6	2.0	2.7	2.7	0.9	0.7	2.3	6.4																							
6-Jun	0.6	0.5	0.5	0.8	0.7	Z	0.9	0.9	0.7	0.7	0.5	0.5	0.5	0.5	0.6	0.6	0.8	0.7	0.6	0.6	0.7	2.1	0.9	0.8	0.7	2.1																							
7-Jun	Z	3.8	5.2	6.4	7.7	5.0	3.6	3.4	1.9	2.2	2.2	1.5	1.0	0.9	0.7	0.8	0.6	0.8	0.8	1.1	1.3	1.4	1.6	1.4	2.4	7.7																							
8-Jun	1.5	Z	1.5	1.2	1.9	3.6	3.6	2.9	3.5	2.8	1.7	1.6	2.5	3.8	4.2	2.8	2.5	2.5	3.4	3.0	3.0	3.7	3.4	1.8	2.7	4.2																							
9-Jun	1.5	1.3	Z	1.5	1.2	1.1	1.3	1.0	1.0	0.9	1.0	1.3	1.1	1.5	1.7	1.3	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.7																							
10-Jun	1.9	2.4	2.7	Z	3.2	3.0	3.2	2.8	2.8	2.5	2.5	2.2	2.4	2.5	2.7	2.2	2.2	2.2	2.2	1.8	1.7	1.7	2.4	5.0	2.5	5.0																							
11-Jun	4.4	4.9	5.4	6.6	Z	5.3	4.6	2.9	2.2	1.9	2.1	2.1	2.0	2.8	2.2	1.9	1.4	1.3	1.4	1.2	1.8	1.6	1.4	1.6	2.7	6.6																							
12-Jun	2.3	4.1	6.4	5.0	3.4	Z	2.3	2.9	2.2	1.9	1.3	1.4	2.0	2.5	2.4	3.5	3.6	3.1	2.9	2.4	1.9	2.9	2.4	1.7	2.8	6.4																							
13-Jun	Z	1.3	1.1	1.1	1.0	1.2	1.3	1.4	2.1	2.4	3.0	3.1	2.6	3.0	2.9	2.5	2.2	2.0	1.7	1.4	1.4	1.3	1.5	2.4	1.9	3.1																							
14-Jun	1.7	Z	1.2	1.2	1.3	1.1	1.0	1.0	1.1	1.2	1.2	4.0	2.7	2.2	1.8	1.5	1.5	1.4	1.2	1.1	1.1	1.2	1.5	1.0	1.5	4.0																							
15-Jun	1.1	1.6	Z	1.3	1.5	1.3	1.2	1.2	1.2	1.1	1.7	1.5	1.9	1.2	1.3	1.1	0.9	0.8	0.9	0.7	0.6	0.7	0.7	0.5	1.1	1.9																							
16-Jun	0.5	0.4	0.6	Z	0.7	0.7	1.0	1.1	3.7	1.3	1.0	1.0	1.8	2.0	1.3	1.1	2.7	2.6	1.5	1.5	1.6	0.6	0.7	0.6	1.3	3.7																							
17-Jun	0.7	0.6	0.7	0.7	Z	1.0	1.1	1.0	1.0	0.9	0.9	1.2	1.9	1.0	0.7	0.8	0.8	0.7	0.5	0.6	0.9	0.8	1.0	0.9	0.9	1.9																							
18-Jun	0.7	0.7	0.6	0.6	0.6	Z	1.0	1.1	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.7	1.1																							
19-Jun	Z	0.6	0.6	0.5	0.5	0.7	0.6	0.6	M	0.8	0.7	0.7	0.7	0.7	0.9	0.8	0.8	1.0	0.8	0.8	0.7	0.9	1.0	1.0	0.8	1.0																							
20-Jun	1.1	Z	1.8	1.5	1.1	1.4	1.6	1.3	1.0	1.0	1.1	0.8	0.9	0.9	0.8	1.8	1.9	2.3	2.3	1.9	1.7	2.0	2.0	2.9	1.5	2.9																							
21-Jun	4.7	5.2	Z	5.5	4.8	4.5	4.5	3.5	3.9	C	C	C	C	C	C	1.8	1.9	1.9	1.9	1.9	1.7	1.2	1.3	1.1	--	5.5																							
22-Jun	0.8	0.7	0.9	Z	0.6	0.6	0.6	0.7	0.9	1.2	1.7	1.0	0.6	0.7	1.4	DF	DF	1.2	1.0	1.0	1.0	1.7	0.9	1.7	1.0	1.7																							
23-Jun	0.9	0.7	0.7	0.8	Z	2.1	1.9	1.6	1.5	1.5	1.4	1.2	1.2	1.4	1.2	1.1	1.1	1.1	1.1	1.5	1.3	2.3	2.1	1.9	1.4	2.3																							
24-Jun	1.4	4.5	5.4	2.9	1.7	Z	1.8	1.5	1.7	1.7	1.4	1.0	0.9	0.9	0.8	0.8	0.9	1.1	1.3	1.3	1.2	1.5	2.1	1.7	1.7	5.4																							
25-Jun	Z	0.9	0.7	0.5	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.8	1.1	1.4	0.6	1.4																							
26-Jun	1.2	Z	0.9	1.0	2.4	2.0	2.4	2.1	1.5	1.2	1.0	1.0	0.9	1.1	1.1	1.2	1.2	0.9	0.9	2.1	1.2	0.9	0.9	0.8	1.3	2.4																							
27-Jun	0.7	0.8	Z	1.1	1.1	1.6	6.8	8.1	5.8	3.0	3.7	2.9	1.8	1.2	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	2.0	8.1																							
28-Jun	0.7	1.1	1.1	Z	2.1	2.8	3.0	2.1	1.5	0.9	0.9	1.1	1.4	1.3	1.1	1.0	3.8	3.9	1.8	1.7	2.1	1.7	1.6	1.6	1.7	3.9																							
29-Jun	0.9	0.9	5.1	4.7	Z	1.5	1.0	1.0	1.4	1.8	2.1	2.0	2.8	2.0	1.7	1.4	1.2	1.2	1.5	1.1	1.1	1.1	1.0	1.0	1.7	5.1																							
30-Jun	1.1	0.9	0.9	1.2	1.0	Z	1.0	1.0	1.2	1.0	0.9	0.8	0.6	0.6	0.8	1.0	0.9	0.8	0.7	0.6	0.7	2.9	1.5	0.8	1.0	2.9																							
																								1.4	1.7	1.9	2.1	1.8	1.9	1.9	1.9	2.0	1.7	1.7	1.6	1.5	1.5	1.4	1.4	1.5	1.4	1.3	1.3	1.3	1.6	1.3	1.4	Diurnal Average	
																								4.7	5.2	6.4	6.6	7.7	5.3	6.8	8.1	5.8	5.6	6.4	5.9	2.8	3.8	4.2	3.5	3.8	3.9	3.4	3.0	3.1	3.7	3.4	5.0	Diurnal Maximum	
Z - zerspan																								C - Calibration				M - Maintenance				DF - DAS Failure																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	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: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - June 2023**

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	21	29	12	22	25	37	43	23	22	54	114	90	48	50	36	653
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	21	29	12	22	25	37	43	23	22	54	114	90	48	50	36	653

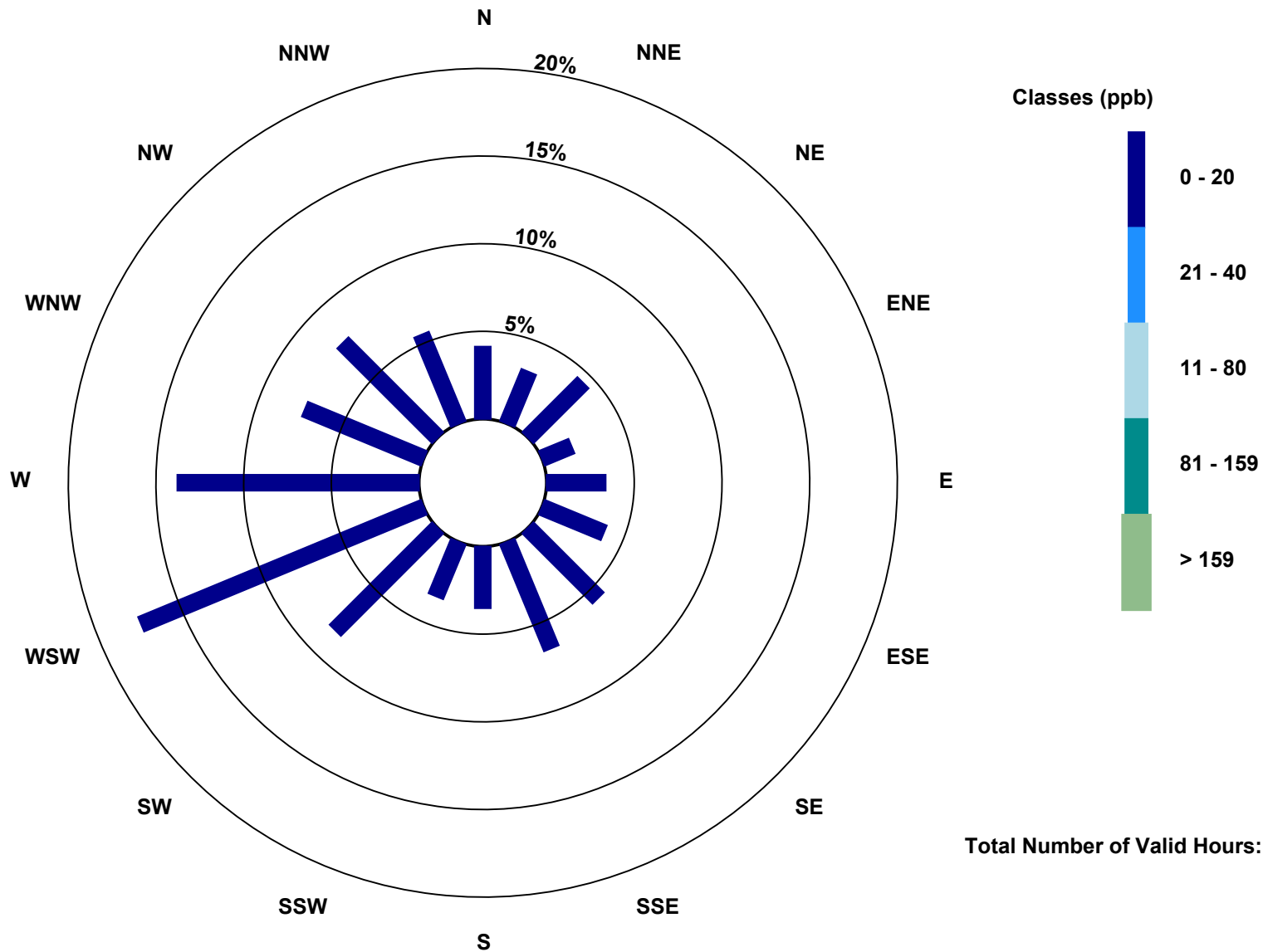
Total Number of Valid Hours: 653

Total Number of Hours: 720

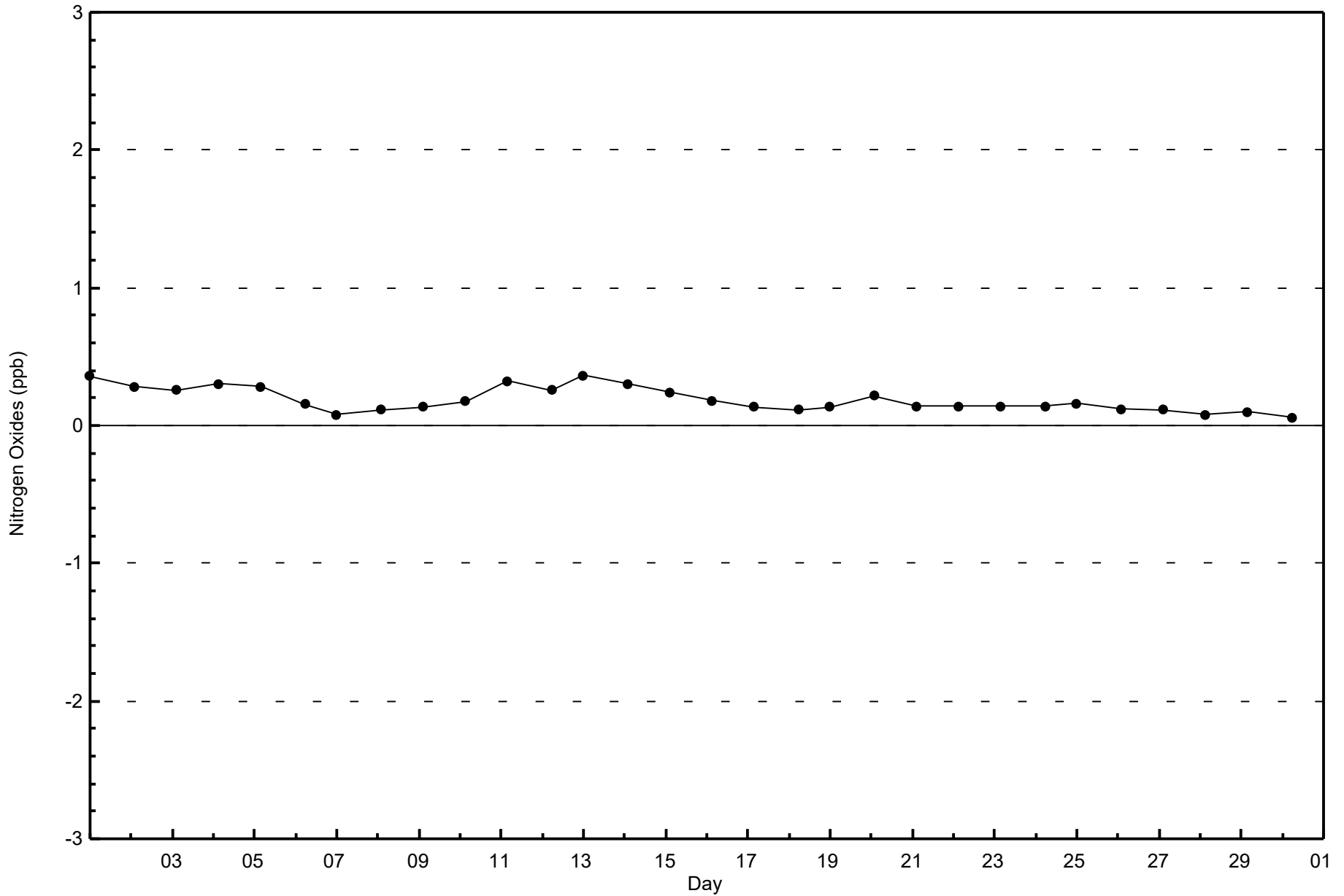


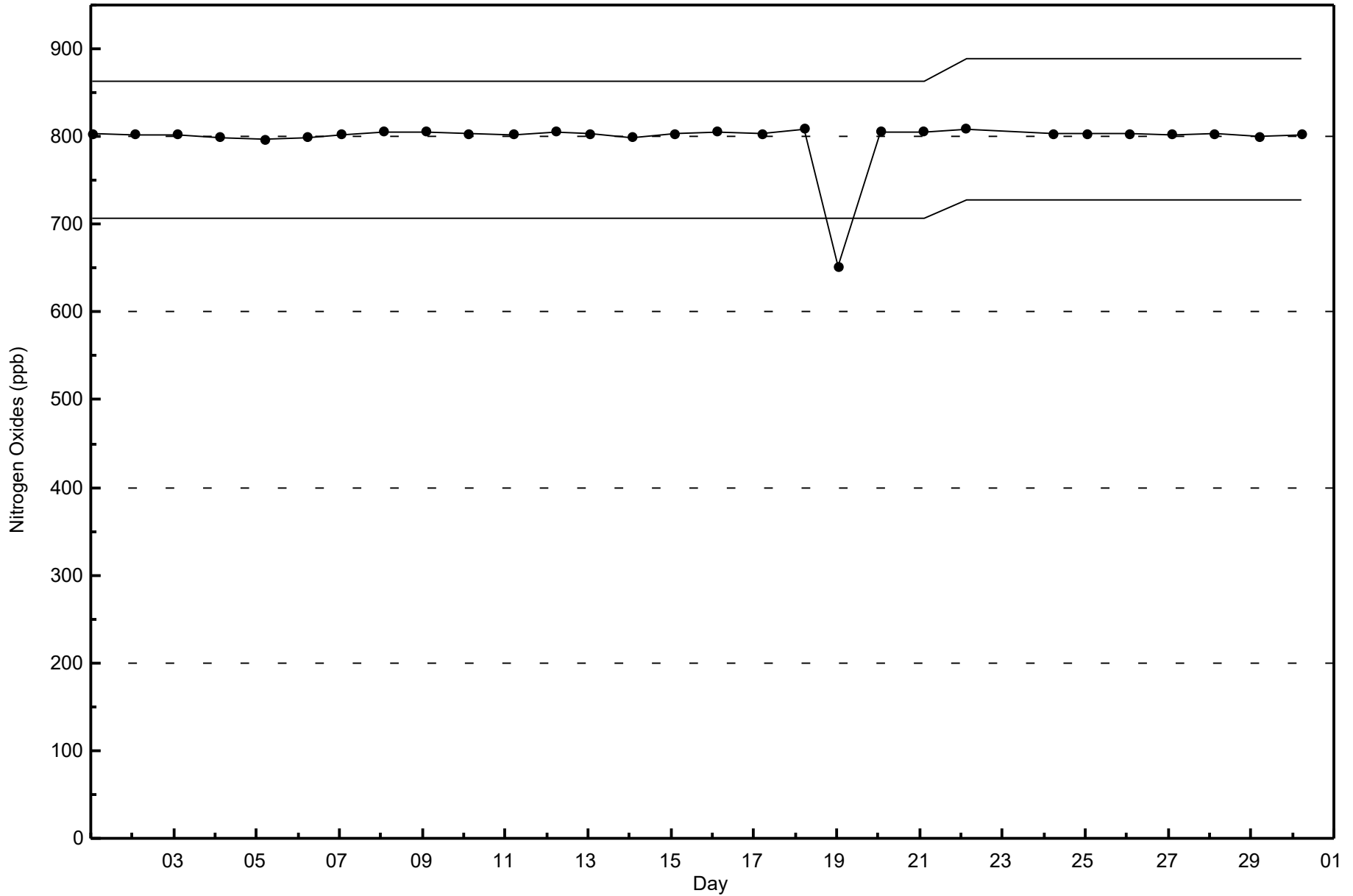
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Surmont 2



Total Number of Valid Hours: 653



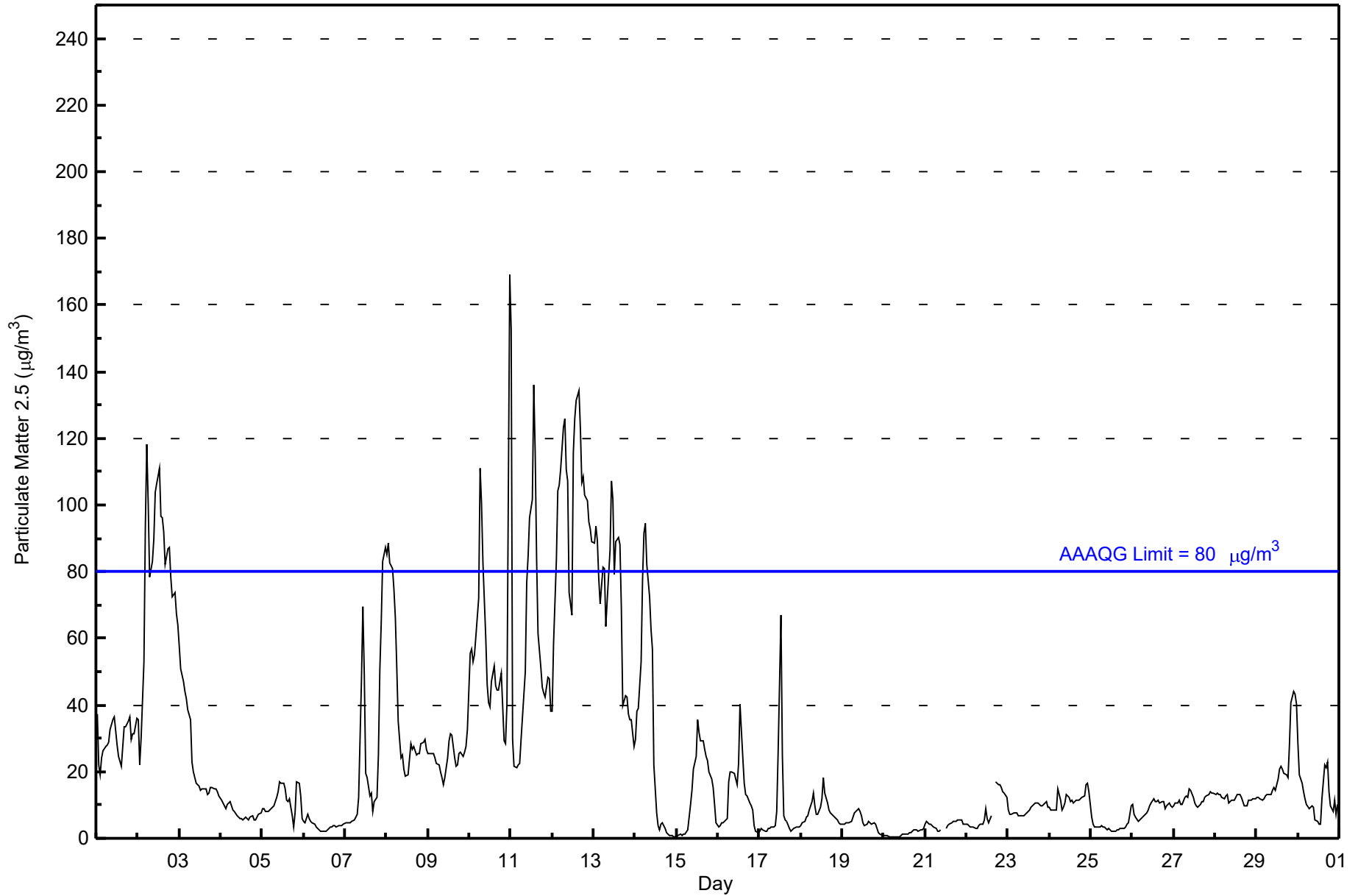




Summary of Hour Averages

Surmont 2 - June 2023

Number of Exceedences (AAAQO):		1-hr: 65		24-hr: 8		Hours in Service:		720																		
Maximum Value: 168.9 µg/m ³ on Jun 11 00:00		Maximum Daily Average: 101.4 µg/m ³ on Jun 12				Hours of Data:		716																		
Minimum Value: 0.3 µg/m ³ on Jun 20 07:00		Minimum Daily Average: 1.4 µg/m ³ on Jun 20				Hours of Missing Data:		4																		
Maximum Diurnal Average: 28.1 µg/m ³ at hour 14		Minimum Diurnal Average: 20.5 µg/m ³ at hour 20				Hours of Calibration:		2																		
Monthly Average: 24.14 µg/m ³		Percentiles: P ₁ = 0.6 P ₁₀ = 2.9 Q ₁ = 5.4 Median = 11.8 Q ₃ = 28.2 P ₉₀ = 74.2 P ₉₉ = 123.1				Percent Operational Time:		99.7																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	37.4	22.2	19.0	24.0	26.1	27.7	28.1	28.8	32.4	35.5	36.3	32.3	28.2	24.5	21.7	27.5	33.3	33.5	35.0	36.4	29.5	31.2	31.4	36.0	29.9	37.4
2-Jun	35.8	22.0	29.9	53.1	93.8	118.1	100.9	78.3	82.9	89.8	103.9	106.6	111.1	96.4	96.2	91.7	82.3	86.7	87.5	78.5	72.3	73.6	67.5	63.8	80.1	118.1
3-Jun	57.6	50.7	47.2	44.0	41.9	38.4	35.8	22.8	19.9	18.1	16.5	15.7	14.5	14.9	15.0	14.8	13.3	13.7	15.4	15.1	14.8	14.9	13.8	12.5	24.2	57.6
4-Jun	11.5	10.6	9.9	8.8	10.1	11.0	9.6	8.5	8.0	6.6	6.2	5.8	5.7	5.6	6.2	6.0	5.6	6.2	6.7	5.4	5.5	6.3	7.0	7.4	7.5	11.5
5-Jun	9.0	9.1	7.9	8.3	8.5	8.7	9.3	9.8	12.3	14.2	17.0	16.6	16.3	14.7	11.3	11.1	12.0	6.7	3.3	7.8	17.0	16.5	12.8	5.7	11.1	17.0
6-Jun	5.0	4.7	7.3	5.8	5.2	4.7	4.1	3.5	2.9	2.7	2.2	2.0	2.2	2.2	2.6	3.2	3.5	3.8	3.6	3.5	3.6	3.7	3.8	4.0	3.7	7.3
7-Jun	4.5	4.8	4.6	4.8	5.2	5.4	6.4	7.2	12.2	47.4	69.6	49.0	19.5	18.2	12.5	13.6	8.2	11.2	12.5	24.8	50.3	65.0	83.0	87.4	26.1	87.4
8-Jun	85.4	88.6	82.5	80.9	74.7	66.0	51.1	35.3	24.0	24.9	21.0	18.5	19.0	23.8	28.3	26.9	27.6	25.2	25.3	25.4	28.3	28.8	29.7	26.6	40.3	88.6
9-Jun	25.6	25.5	25.4	25.4	24.0	22.7	22.0	20.0	18.1	16.1	18.2	24.3	29.2	31.2	30.8	23.9	21.7	21.9	25.4	25.7	24.5	25.9	27.3	32.7	24.5	32.7
10-Jun	55.4	56.7	53.0	54.9	60.4	72.1	111.0	100.3	82.5	60.0	46.3	40.8	39.3	46.9	51.7	45.7	44.3	44.4	49.6	39.4	29.4	28.2	40.3	168.9	59.2	168.9
11-Jun	152.3	29.6	21.5	21.3	22.0	22.5	29.6	36.3	49.9	76.8	84.7	96.0	101.6	136.2	115.6	83.8	61.3	51.2	45.3	43.7	42.5	48.4	47.9	38.3	60.8	152.3
12-Jun	38.0	58.7	83.3	104.1	105.9	110.5	123.2	125.9	110.5	107.0	73.7	66.9	115.8	125.7	131.5	134.2	122.8	106.9	108.4	102.8	101.1	94.7	92.8	89.1	101.4	134.2
13-Jun	88.7	93.7	89.5	77.9	70.3	81.4	81.0	63.4	71.8	86.5	107.1	101.8	79.4	88.9	90.4	88.0	69.0	39.7	42.8	42.4	37.1	35.7	35.8	27.5	70.4	107.1
14-Jun	29.4	38.0	39.0	53.0	77.7	91.4	94.4	82.0	72.4	62.5	56.8	22.0	7.6	3.8	2.7	4.0	4.8	2.8	1.7	1.2	1.0	0.7	0.6	0.5	31.3	94.4
15-Jun	0.8	1.0	1.1	1.0	1.2	1.4	2.5	6.6	10.0	14.2	20.9	24.6	35.7	31.9	29.3	29.4	26.9	24.6	23.2	20.1	17.9	15.1	10.4	4.6	14.8	35.7
16-Jun	3.6	3.9	4.9	4.8	4.9	6.0	16.8	19.9	19.9	19.7	17.6	16.3	22.6	40.5	24.3	16.5	13.0	12.6	10.6	9.9	8.3	3.6	2.0	1.7	12.7	40.5
17-Jun	2.2	2.9	2.7	2.3	2.2	2.9	3.0	3.4	3.5	4.0	7.9	26.0	67.0	24.9	6.7	5.7	5.1	2.8	2.3	2.5	3.0	3.4	3.5	3.5	8.1	67.0
18-Jun	4.0	4.6	5.0	6.4	7.0	8.4	11.2	13.5	9.8	7.1	7.2	9.3	11.8	18.3	13.6	10.5	8.5	7.4	7.1	6.9	6.1	5.6	4.8	4.3	8.3	18.3
19-Jun	4.0	4.2	4.8	4.6	4.6	5.1	6.4	7.6	7.9	8.7	8.0	6.8	4.7	4.0	4.3	5.2	4.8	4.0	4.7	4.3	2.9	1.5	1.1	0.8	4.8	8.7
20-Jun	0.8	0.9	0.7	0.5	0.4	0.3	0.3	0.4	0.4	0.6	0.8	1.2	1.2	1.4	1.3	1.7	1.8	2.5	2.5	2.4	2.2	2.4	2.7	3.2	1.4	3.2
21-Jun	4.2	5.0	4.4	4.1	3.9	3.5	2.9	2.2	2.2	2.4	C	C	2.8	3.8	4.3	4.5	4.9	5.1	4.9	5.4	5.4	5.3	4.2	4.3	4.1	5.4
22-Jun	4.1	3.8	3.6	3.2	3.2	3.1	2.8	3.9	4.0	4.2	5.4	8.9	5.9	4.5	6.6	DF	DF	17.0	16.2	16.3	15.1	14.2	13.6	12.2	7.8	17.0
23-Jun	8.3	7.4	7.4	7.5	7.5	7.5	6.6	6.9	7.0	6.7	7.2	7.6	8.6	9.1	9.9	10.4	10.8	10.4	10.0	9.9	9.9	10.6	10.9	9.3	8.6	10.9
24-Jun	9.2	8.6	8.4	8.3	8.3	14.7	11.3	8.3	9.4	10.7	13.0	12.4	11.0	11.5	10.8	11.3	11.3	11.3	11.8	12.3	12.8	16.0	16.4	13.9	11.4	16.4
25-Jun	6.4	4.4	3.4	3.2	3.3	3.3	3.7	3.2	3.5	2.7	2.9	2.4	2.1	2.3	2.3	2.5	2.7	2.8	2.9	2.9	3.3	4.2	4.7	9.8	3.5	9.8
26-Jun	10.2	7.2	6.3	4.9	5.6	5.9	6.3	7.0	7.8	8.6	9.9	10.5	12.0	11.2	11.2	11.3	10.5	10.8	10.9	8.7	9.8	10.4	9.7	9.5	9.0	12.0
27-Jun	9.6	10.5	10.7	11.3	10.3	10.1	12.4	12.7	12.4	14.6	14.5	12.2	10.4	9.8	9.3	10.0	11.2	10.9	12.1	12.7	13.3	13.8	13.7	13.5	11.8	14.6
28-Jun	13.3	13.4	13.3	13.1	12.3	11.9	12.8	13.3	10.6	11.3	11.2	11.5	12.1	13.0	13.1	12.3	10.8	9.6	9.8	11.3	11.6	11.6	11.8	12.0	12.0	13.4
29-Jun	12.2	12.3	11.8	11.4	11.8	12.6	12.9	13.1	13.2	14.3	15.4	14.3	17.7	20.8	21.8	20.7	19.6	19.0	18.2	27.8	40.5	44.3	43.4	40.1	20.4	44.3
30-Jun	28.5	19.0	16.4	13.8	11.7	10.1	8.8	9.1	9.6	9.2	5.7	5.2	4.3	4.4	11.8	22.1	21.3	22.8	14.0	9.6	8.0	11.4	7.0	10.1	12.3	28.5
																								Diurnal Average		
																								Diurnal Maximum		
25.2 20.8 20.8 22.2 24.1 26.2 27.6 25.1 24.4 26.2 27.8 26.5 27.3 28.1 26.6 25.8 23.2 20.9 20.8 20.5 20.9 21.6 21.8 25.1																										
152.3 93.7 89.5 104.1 105.9 118.1 123.2 125.9 110.5 107.0 107.1 106.6 115.8 136.2 131.5 134.2 122.8 106.9 108.4 102.8 101.1 94.7 92.8 168.9																										
C - Calibration		DF - DAS Failure																								
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Surmont 2 - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	183	25.56	25.56
6 - 15	254	35.47	61.03
16 - 25	82	11.45	72.49
26 - 80	132	18.44	90.92
> 81.0	65	9.08	100.00

Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Surmont 2 - June 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	7	7	10	3	2	4	3	1	3	5	12	36	25	18	31	16	183
6 - 15	9	6	21	6	14	10	16	17	15	11	32	40	28	8	8	6	247
16 - 25	3	4	0	3	0	1	4	6	2	5	7	17	5	8	3	6	74
26 - 80	6	1	0	1	5	5	6	18	2	2	3	17	30	14	7	7	124
> 81.0	3	4	1	0	1	5	9	1	2	2	4	8	7	4	6	2	59
Totals	28	22	32	13	22	25	38	43	24	25	58	118	95	52	55	37	687

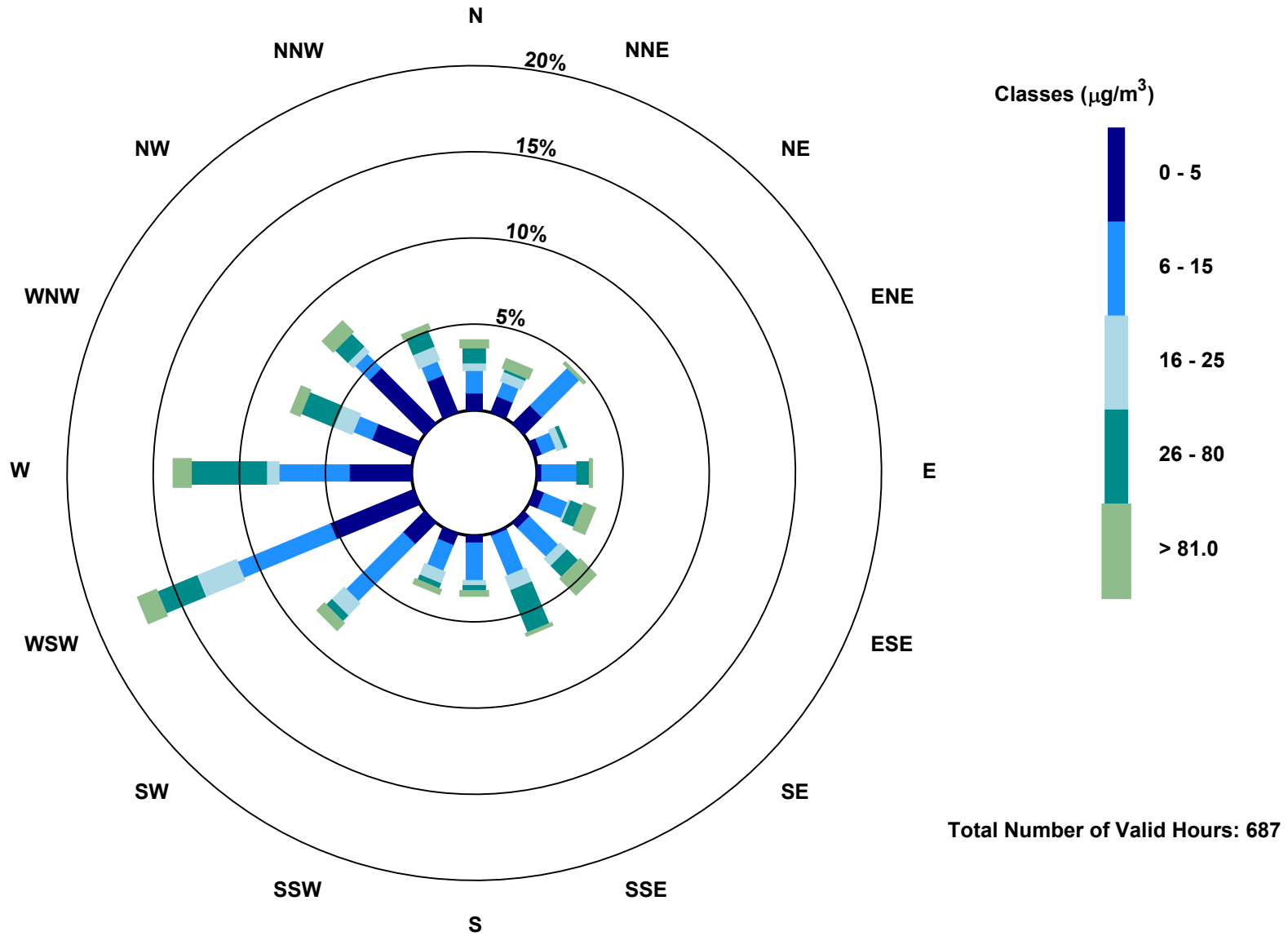
Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

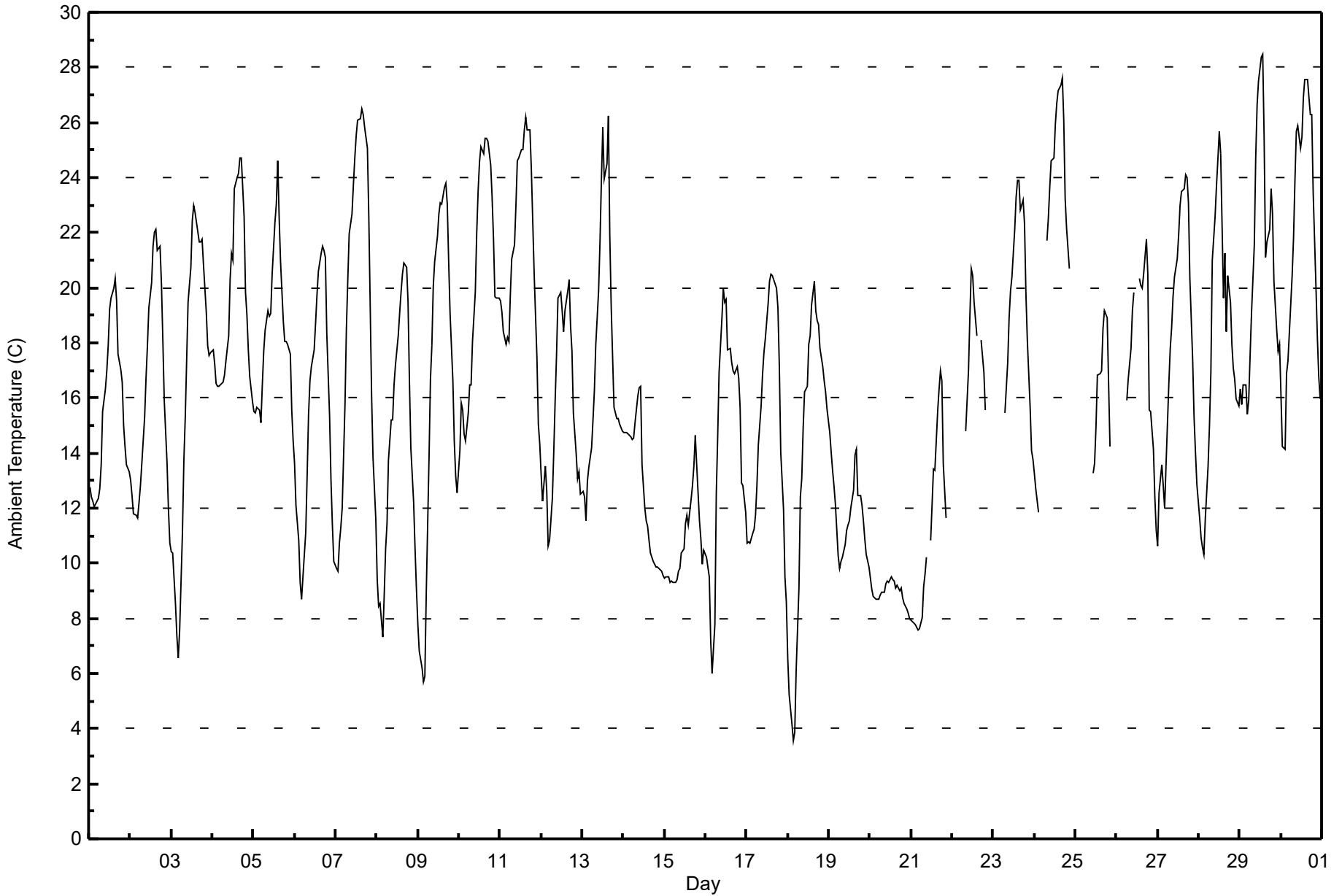




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Surmont 2 - June 2023

Maximum Value: 28.5 C on Jun 29 14:00 Minimum Value: 3.6 C on Jun 18 04:00 Maximum Diurnal Average: 20.8 C at hour 16 Monthly Average: 16.48 C		Maximum Daily Average: 21.7 C on Jun 30 Minimum Daily Average: 8.9 C on Jun 20 Minimum Diurnal Average: 11.4 C at hour 5 Percentiles: P ₁ = 6.1 P ₁₀ = 9.5 Q ₁ = 12.4 Median = 16.5 Q ₃ = 20.3 P ₉₀ = 23.8 P ₉₉ = 27.2		Hours in Service: 720 Hours of Data: 667 Hours of Missing Data: 53 Hours of Calibration: 0 Percent Operational Time: 92.6																						
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-Jun	12.8	12.4	12.3	12.0	12.1	12.3	12.7	13.6	15.5	16.3	17.0	17.9	19.2	19.6	20.0	20.3	19.5	17.6	17.1	16.6	15.0	14.2	13.6	13.3	15.5	20.3
2-Jun	13.0	12.5	11.8	11.8	11.7	12.2	12.8	13.6	15.3	16.8	17.9	19.3	20.2	21.5	22.0	22.1	21.4	21.5	20.2	18.1	15.9	13.6	11.9	10.7	16.2	22.1
3-Jun	10.4	10.4	8.6	7.4	6.5	7.6	11.1	13.7	15.3	17.4	19.5	20.7	22.4	23.0	22.8	22.0	21.7	21.7	21.8	20.8	19.1	17.9	17.5	17.6	16.5	23.0
4-Jun	17.7	17.2	16.5	16.4	16.4	16.5	16.6	16.8	17.3	18.3	20.3	21.3	21.0	23.6	24.0	24.1	24.7	24.7	22.6	19.8	19.0	17.8	16.8	15.9	19.4	24.7
5-Jun	15.5	15.4	15.7	15.6	15.1	16.5	17.7	18.4	19.2	19.0	20.5	22.4	23.0	24.6	22.6	20.9	18.7	18.0	18.1	17.9	17.6	15.6	14.4	18.4	24.6	
6-Jun	13.6	12.1	10.8	9.3	8.7	9.5	11.1	13.2	15.4	16.6	17.2	17.8	18.7	19.7	20.6	21.2	21.5	21.4	21.1	18.3	15.3	13.0	11.4	10.1	15.3	21.5
7-Jun	9.8	9.7	10.7	11.3	12.0	15.7	18.5	20.3	22.0	22.7	23.7	24.7	25.5	26.1	26.1	26.5	26.3	25.8	25.1	22.6	19.3	16.1	13.9	11.6	19.4	26.5
8-Jun	9.4	8.4	8.5	7.3	8.9	10.5	11.4	13.7	15.2	15.2	16.5	17.2	18.2	19.1	19.8	20.5	20.9	20.8	19.5	16.6	14.2	12.2	10.5	9.0	14.3	20.9
9-Jun	7.8	6.8	6.2	5.7	5.9	8.9	13.9	16.7	17.9	20.1	20.9	21.8	22.7	23.1	23.0	23.7	23.8	23.0	21.0	19.1	16.7	14.4	13.2	12.6	16.2	23.8
10-Jun	14.1	15.8	15.6	14.7	14.5	15.4	16.5	16.5	18.1	19.8	21.9	23.5	24.6	25.1	24.9	25.4	25.4	25.3	24.4	23.3	21.7	19.7	19.6	19.6	20.2	25.4
11-Jun	19.5	19.1	18.4	18.0	18.2	18.1	19.7	21.1	21.5	23.0	24.6	24.7	25.0	25.0	25.7	26.2	25.7	25.7	24.3	22.4	20.5	17.5	15.0	14.4	21.4	26.2
12-Jun	13.2	12.3	13.5	12.6	10.6	10.9	12.4	14.0	15.9	17.6	19.6	19.8	19.2	18.4	19.2	19.9	20.3	18.6	17.7	15.5	14.0	13.1	13.3	12.5	15.6	20.3
13-Jun	12.6	12.4	11.6	13.0	13.5	14.2	15.2	16.3	17.9	19.9	21.7	23.9	25.8	23.9	24.5	26.2	21.9	19.3	15.7	15.5	15.3	15.2	15.0	14.8	17.7	26.2
14-Jun	14.7	14.8	14.7	14.6	14.6	14.5	14.6	15.1	16.1	16.4	16.4	13.6	12.0	11.5	11.3	10.8	10.4	10.1	10.0	9.9	9.9	9.8	9.7	9.6	12.7	16.4
15-Jun	9.5	9.5	9.5	9.3	9.3	9.3	9.3	9.4	9.7	9.8	10.4	10.5	11.4	11.8	11.4	12.3	12.8	13.5	14.6	13.6	11.5	10.9	10.0	10.5	10.8	14.6
16-Jun	10.2	9.8	9.5	7.2	6.0	7.8	12.5	14.6	16.9	18.9	20.0	19.5	19.6	17.8	17.8	17.3	17.0	16.9	17.2	16.7	15.6	12.9	12.8	11.8	14.4	20.0
17-Jun	10.7	10.8	10.7	11.1	11.3	11.8	12.8	14.3	15.7	16.8	17.7	18.1	19.4	20.2	20.5	20.4	20.3	20.0	19.3	17.1	14.0	11.9	9.5	8.6	15.1	20.5
18-Jun	6.5	5.2	4.2	3.6	3.9	6.1	9.1	12.4	13.0	14.9	16.2	16.4	17.9	18.3	19.4	20.3	19.2	18.8	18.6	17.8	17.1	16.6	16.2	15.6	13.6	20.3
19-Jun	14.7	14.0	13.4	12.8	12.1	10.3	9.8	10.0	10.2	10.7	11.2	11.4	11.5	12.0	12.6	14.0	14.1	12.5	12.5	12.1	11.5	10.9	10.3	9.9	11.9	14.7
20-Jun	9.4	9.0	8.8	8.7	8.7	8.7	8.9	9.0	9.0	9.2	9.4	9.3	9.5	9.4	9.4	9.1	9.2	9.0	9.1	8.7	8.5	8.3	8.2	8.0	8.9	9.5
21-Jun	7.9	7.9	7.8	7.7	7.6	7.6	8.0	9.2	9.6	10.2	M	10.8	12.1	13.4	13.4	15.5	16.3	17.0	16.6	13.6	11.7	UO	UO	UO	11.2	17.0
22-Jun	UO	UO	UO	UO	UO	UO	UO	UO	14.8	17.0	19.0	20.7	20.4	19.5	18.2	DF	DF	18.1	17.0	15.6	UO	UO	UO	UO	--	20.7
23-Jun	UO	UO	UO	UO	UO	UO	UO	15.4	17.3	18.9	19.9	20.4	22.1	23.3	23.9	23.9	22.8	23.2	23.3	19.8	18.1	15.7	14.1	13.8	--	23.9
24-Jun	13.3	12.7	11.8	UO	UO	UO	UO	21.7	22.5	23.7	24.6	24.7	25.9	26.7	27.1	27.4	27.6	26.1	23.3	22.2	20.7	UO	UO	UO	--	27.6
25-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	13.3	13.6	14.9	16.9	16.9	17.0	18.5	19.2	18.9	16.5	14.2	UO	UO	UO	--	19.2
26-Jun	UO	UO	UO	UO	UO	UO	15.9	16.7	17.8	19.2	19.8	M	M	20.3	20.1	20.0	20.5	21.8	20.5	15.6	15.5	14.1	12.4	11.2	--	21.8
27-Jun	10.6	12.6	13.6	12.8	12.0	13.6	16.5	17.8	18.6	19.7	20.4	21.0	21.9	23.0	23.5	23.6	24.1	24.0	23.1	20.3	17.4	15.3	14.0	12.8	18.0	24.1
28-Jun	11.7	10.9	10.6	10.3	11.6	13.5	15.0	16.9	21.0	22.6	23.7	24.7	25.7	24.8	19.6	21.2	18.4	20.4	19.5	18.0	17.1	16.7	16.0	15.7	17.7	25.7
29-Jun	16.3	15.8	16.5	16.5	15.4	15.9	17.6	19.1	21.5	24.7	26.7	27.5	28.4	28.5	25.5	21.1	21.6	22.1	23.6	22.7	20.2	18.5	17.7	18.0	20.9	28.5
30-Jun	16.2	14.2	14.1	16.9	17.4	18.4	20.5	21.8	23.9	25.7	25.9	25.1	25.5	26.9	27.6	27.6	26.9	26.3	26.3	23.5	20.0	18.2	16.8	16.0	21.7	27.6
																								Diurnal Average		
																								Diurnal Maximum		
M - Maintenance DF - DAS Failure UO - Unstable Operation																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Surmont 2 - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	87	13.04	13.04
10 - 20	402	60.27	73.31
> 20	178	26.69	100.00

Total Number of Valid Hours: 667

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

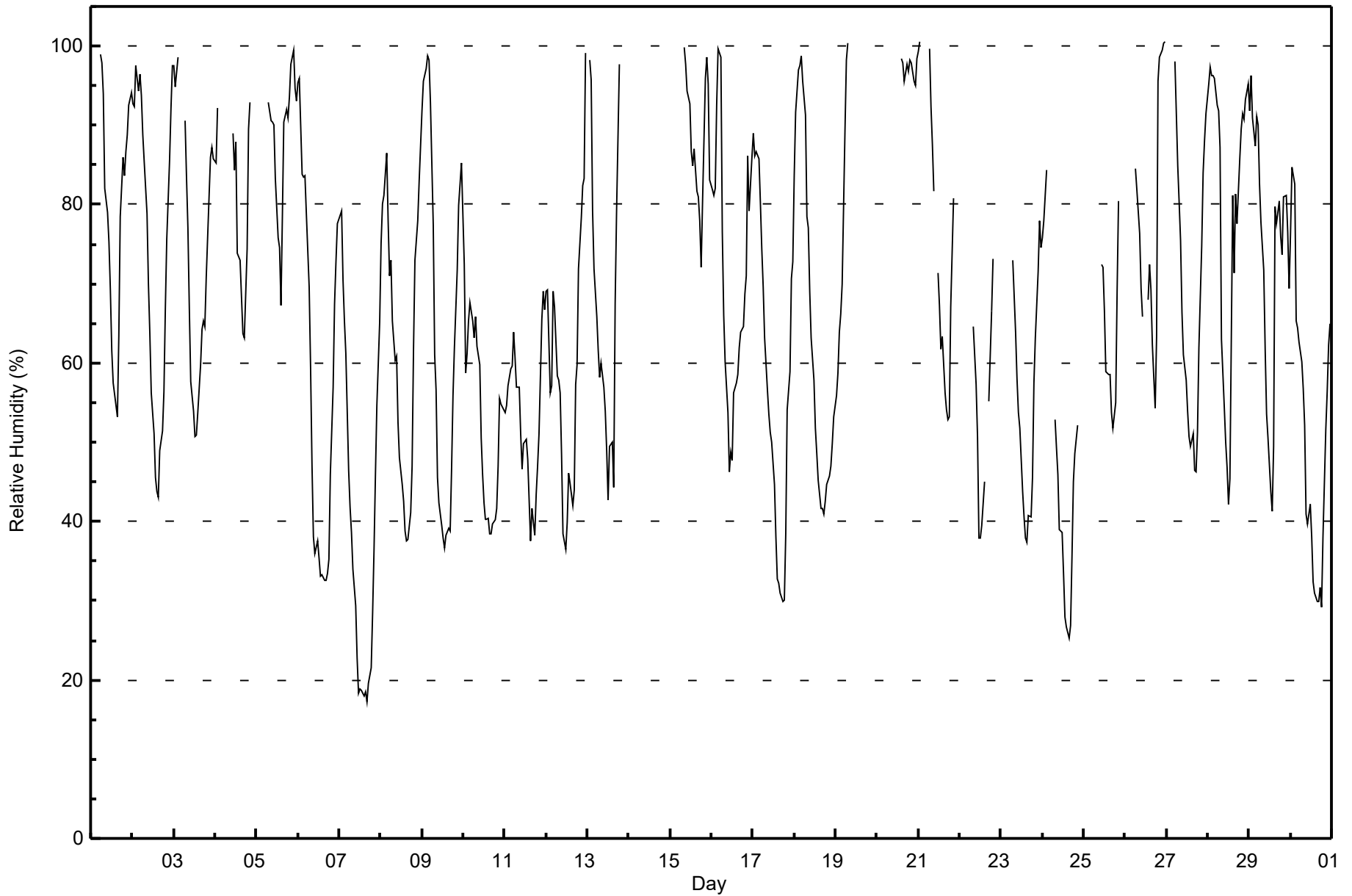
Relative Humidity (RH) - %
Surmont 2 - June 2023

Maximum Value: 100.5 % on Jun 21 02:00		Maximum Daily Average: 79.6 % on Jun 28		Hours in Service:	720																																				
Minimum Value: 17.3 % on Jun 7 17:00		Minimum Daily Average: 39.6 % on Jun 7		Hours of Data:	564																																				
Maximum Diurnal Average: 84.3 % at hour 2		Minimum Diurnal Average: 48.6 % at hour 14		Hours of Missing Data:	156																																				
Monthly Average: 65.73 %		Percentiles: P ₁ = 19.3 P ₁₀ = 38.5 Q ₁ = 49.5 Median = 65.0 Q ₃ = 83.5 P ₉₀ = 95.1 P ₉₉ = 99.7		Hours of Calibration:	0																																				
				Percent Operational Time:	78.3																																				
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-Jun	OR	OR	OR	OR	OR	99.0	97.9	94.0	82.0	79.1	75.3	69.2	61.5	57.4	54.7	53.2	63.3	78.5	86.0	83.6	86.8	88.7	92.5	94.2	78.8	99.0															
2-Jun	92.8	92.4	97.5	94.3	96.4	93.7	88.9	85.4	78.9	70.0	63.7	56.3	51.2	45.6	43.9	43.1	48.9	51.5	56.4	66.9	75.7	85.7	92.1	97.6	73.7	97.6															
3-Jun	97.5	94.9	98.7	OR	OR	OR	90.5	83.5	77.0	66.9	57.7	53.9	50.7	50.9	53.8	59.8	64.2	65.3	64.6	70.8	81.0	86.0	87.2	85.7	73.4	98.7															
4-Jun	85.2	92.2	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	89.0	84.4	87.9	73.9	72.9	68.3	63.7	63.3	74.4	89.5	92.9	OR	OR	OR	92.9														
5-Jun	OR	OR	OR	OR	OR	OR	OR	OR	92.8	90.6	90.3	90.1	83.4	75.8	74.5	67.3	78.5	90.4	91.9	90.9	93.5	97.7	99.5	94.6	93.1	--	99.5														
6-Jun	95.4	95.9	83.7	83.4	83.6	78.9	69.6	59.4	47.1	38.1	36.0	37.6	35.4	33.1	33.2	32.5	32.6	33.5	35.1	45.9	56.9	67.5	72.8	77.5	56.9	95.9															
7-Jun	78.6	79.2	70.5	65.3	61.2	46.5	41.9	38.7	34.0	29.4	22.8	18.4	18.9	18.7	17.9	18.5	17.3	19.6	21.5	28.6	36.5	45.8	54.6	65.2	39.6	79.2															
8-Jun	75.0	80.0	81.2	86.5	78.0	71.0	73.0	65.4	60.3	60.8	52.5	48.0	44.7	42.6	38.8	37.6	37.8	41.1	47.0	61.8	72.9	78.0	83.0	87.4	62.7	87.4															
9-Jun	91.7	95.6	97.2	98.7	98.2	93.0	77.3	61.0	56.7	45.5	42.4	39.4	37.9	36.7	38.3	39.2	38.8	46.6	55.8	61.9	71.8	79.8	82.6	85.3	65.5	98.7															
10-Jun	72.4	58.7	61.2	65.3	67.6	65.3	63.2	65.8	62.0	59.7	50.5	45.9	42.4	40.2	40.4	38.5	38.5	39.7	40.2	41.6	47.0	55.4	54.8	54.1	52.9	72.4															
11-Jun	53.7	54.6	57.1	59.3	59.6	63.9	60.7	56.9	56.9	51.0	46.7	49.9	50.4	47.8	42.7	37.5	41.6	38.3	43.4	47.0	51.1	65.5	69.1	66.8	53.0	69.1															
12-Jun	69.0	69.3	56.3	57.2	69.0	67.1	58.3	57.9	56.1	48.5	38.5	36.5	39.8	46.1	44.9	42.1	43.9	57.4	59.8	71.9	78.2	82.4	83.3	99.2	59.7	99.2															
13-Jun	OR	98.3	95.7	79.2	71.9	65.9	61.7	58.2	60.0	56.9	54.0	48.9	42.7	49.6	50.0	44.4	67.5	79.0	97.7	OR	OR	OR	OR	OR	65.6	98.3															
14-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	--														
15-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	99.8	97.7	94.3	92.7	86.6	84.8	87.1	81.7	81.0	78.0	72.1	80.4	95.9	98.5	95.2	83.1	--	99.8														
16-Jun	81.9	81.1	82.1	92.6	99.7	98.6	76.5	66.0	60.2	53.7	46.3	48.7	47.7	56.3	57.4	58.5	61.9	63.9	64.7	68.7	70.9	86.1	79.2	86.0	70.4	99.7															
17-Jun	89.0	86.1	86.7	85.7	80.3	74.3	69.6	63.2	56.6	53.6	51.2	50.1	44.6	38.0	32.8	32.2	31.0	30.0	30.0	38.4	54.2	59.0	70.7	72.9	57.5	89.0															
18-Jun	83.6	91.6	97.1	97.6	98.9	95.6	91.3	78.5	77.1	69.1	63.1	57.8	51.8	48.6	45.3	41.7	41.6	41.0	42.5	44.7	45.7	47.0	49.8	53.2	64.8	98.9															
19-Jun	55.9	58.7	63.9	66.1	69.9	89.3	98.3	100.4	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	100.4														
20-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	98.5														
21-Jun	99.3	100.5	OR	OR	OR	OR	99.7	92.4	87.6	81.7	M	71.4	67.3	61.8	63.4	56.2	54.1	52.8	53.3	67.1	80.8	OR	OR	OR	--	100.5															
22-Jun	OR	OR	OR	OR	OR	OR	OR	OR	64.7	57.2	50.8	37.9	37.9	39.5	45.0	DF	DF	55.1	66.6	73.2	OR	OR	OR	OR	--	73.2															
23-Jun	OR	OR	OR	OR	OR	OR	OR	73.0	63.8	58.1	53.7	51.8	43.8	40.5	37.9	37.3	40.7	40.6	45.6	57.5	63.3	71.5	77.9	74.6	--	77.9															
24-Jun	75.9	77.9	84.4	OR	OR	OR	OR	OR	52.8	49.3	45.9	39.0	38.6	33.5	28.0	26.7	25.3	26.8	35.7	45.1	48.6	52.1	OR	OR	--	84.4															
25-Jun	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	72.3	71.2	66.6	58.9	58.6	53.8	51.7	55.1	69.0	80.5	OR	OR	OR	--	80.5														
26-Jun	OR	OR	OR	OR	OR	OR	84.5	81.8	76.3	69.5	65.8	M	M	67.9	72.4	69.2	62.2	54.3	63.3	95.6	98.7	99.5	100.3	100.5	--	100.5															
27-Jun	OR	OR	OR	OR	OR	98.1	85.0	80.2	75.4	66.3	61.1	57.9	54.0	50.7	49.4	51.1	46.4	46.3	51.2	62.0	74.8	84.0	88.0	91.5	67.0	98.1															
28-Jun	95.2	97.3	96.3	96.4	95.9	92.5	91.8	87.1	63.1	54.4	50.0	46.8	42.2	45.3	81.1	71.3	81.3	77.6	85.7	89.4	91.5	90.8	93.3	95.2	79.6	97.3															
29-Jun	91.8	96.2	91.0	87.3	91.1	90.1	82.6	77.8	71.6	61.7	53.6	50.5	43.7	41.4	49.5	79.7	77.6	80.5	76.0	73.7	81.0	81.2	76.6	69.5	74.0	96.2															
30-Jun	76.5	84.8	82.5	65.4	64.5	62.7	60.2	56.8	52.1	40.9	39.8	42.2	38.0	32.4	31.0	29.9	30.0	31.7	29.2	38.0	51.5	56.4	62.4	64.9	51.0	84.8															
																								Diurnal Average																	
																								Diurnal Maximum																	
M - Maintenance																								DF - DAS Failure		OR - Out of Range				UO - Unstable Operation											



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Surmont 2 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Surmont 2 - June 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	7	1.24	1.24
20 - 40	63	11.17	12.41
40 - 60	169	29.96	42.38
60 - 80	154	27.30	69.68
80 - 100	167	29.61	99.29

Total Number of Valid Hours: 564

Total Number of Hours: 720



Maximum Speed: 12 km/h on Jun 7 12:00	Maximum Daily Speed Average: 8.6 km/h on Jun 17	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 28 07:00	Minimum Daily Speed Average: 1.1 km/h on Jun 25	Hours of Data: 689
Maximum Diurnal Speed Average: 2.4 km/h at hour 23	Minimum Diurnal Speed Average: 0.3 km/h at hour 10	Hours of Missing Data: 31
Monthly Average Velocity: 1.4 km/h 275.1 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 5 Q ₃ = 7 P ₉₀ = 9 P ₉₉ = 12	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-Jun	W6	NW3	WNW2	WNW5	W3	WNW3	W2	WNW3	NNW4	NNW4	NNW4	N5	NNW5	NNW5	NNW5	N4	N3	W2	W4	W5	W5	W6	W3	NW3	NW3.3	W6
2-Jun	NW5	WNW6	WNW5	WNW6	WNW5	WNW4	WNW6	WNW5	NW5	N7	N6	NNE6	NE6	NNE6	NNW6	NNE5	N3	NNE2	NW2	SW2	W3	W3	W2	W2	NW3.3	N7
3-Jun	W4	W3	W2	UO	UO	WNW1	NNW0	N4	NNE3	NNE5	ENE6	ENE5	E6	ESE6	ESE7	E9	E8	E8	E7	E5	WSW1	W2	UO	ESE3	E2.7	E9
4-Jun	E5	E5	NE2	ENE3	E5	E7	E9	E8	E7	E6	ESE6	ESE4	SSW2	S3	ESE8	SE9	SSE8	SSE6	SW2	NW4	WNW2	WSW2	WSW3	W2	ESE3.3	SE9
5-Jun	WSW1	UO	W2	WSW1	NW1	WNW2	NW2	NNW6	N6	N6	NNW5	NNE5	NNE5	NNE6	ENE3	NNW3	W3	W9	NNE3	NW4	WNW4	W6	W11	W9	NW3.0	W11
6-Jun	W11	WNW10	W10	WNW6	W4	W6	W8	W7	W9	W10	W11	W10	WSW10	WSW9	WSW9	WSW9	WSW9	WSW7	WSW5	W3	WSW2	WSW3	WSW3	WSW2	W7.2	W11
7-Jun	SW2	SW2	SW2	SSW2	S3	SW5	WSW6	WSW7	WSW9	W9	WSW10	W12	M	M	M	M	M	M	M	M	M	M	M	M	---	W12
8-Jun	M	M	M	M	M	M	M	M	M	M	M	M	C	NNW5	N7	NNW6	N5	N4	N2	WNW3	WSW3	WSW3	WSW2	WSW2	---	N7
9-Jun	WSW2	WSW1	WSW1	WSW1	UO	SW1	SE2	SE3	SSE4	SSE6	SE6	SE7	SSE6	SSW6	SW6	SW5	SSW4	SSW2	SW2	SW3	WSW2	WSW4	SW2	SSW2	SSW2.7	SE7
10-Jun	SSE5	SSE5	SSE5	SE6	ESE6	SE7	SE8	ESE7	SE8	SE8	SSE10	SE9	SSE10	SSE9	SSE8	SSE9	SSE8	SSE6	SSE6	SSE6	SSE5	SSE4	SSE5	SE6	SSE6.6	SSE10
11-Jun	SSE7	S6	SSE5	S3	SSW3	ESE2	S2	W6	W7	WNW7	NNW6	WNW7	W7	NW6	NW7	NW4	WNW5	NW4	WNW4	W3	WSW4	WSW3	W2	WSW3	W2.8	W7
12-Jun	WSW2	W3	WSW4	WSW5	W3	WSW5	WSW5	WSW4	W3	W6	NW6	NNW6	NW4	W3	W3	WSW2	SSW2	SW2	SW2	WSW3	WSW3	W2	SW2	SW1	W2.9	NW6
13-Jun	SSW2	S2	S2	SSE5	SSE7	SE7	SE7	SE6	SE6	SE7	ESE7	SE5	ESE8	SE6	SE5	E5	SE4	E6	ESE7	WNW3	W3	W4	N2	WNW4	SE3.6	ESE8
14-Jun	E2	WNW3	E1	E1	ESE4	ESE5	ESE6	ESE6	E5	ENE1	NNE3	NNW6	NW5	NW6	NW9	NW9	NNW9	NNW9	NNW9	NNW9	NNW8	NNW8	NW8	NNW8	NNW3.4	NW9
15-Jun	NW8	NW9	NW9	NW8	NW9	NNW10	NW9	NW8	NW8	NW9	NNW10	NW11	NW11	NW11	NW10	WNW9	WNW9	WNW7	WNW6	W3	SW2	WSW4	W6	W6	NW7.3	NW11
16-Jun	WSW6	WSW7	WSW6	SW2	SSW1	S2	W5	WSW5	SSW4	SSE7	SSE8	SE7	SSW4	W8	WSW6	WSW6	SW5	SSW5	S4	SSW3	WSW4	WSW5	WSW9	WSW8	SW4.0	WSW9
17-Jun	W5	WSW11	WSW9	WSW8	WSW10	WSW11	WSW10	W9	WSW9	WSW10	WSW11	W11	W12	WSW12	W12	W11	W10	W9	W9	WSW5	SW3	SW4	WSW1	WSW4	WSW8.6	W12
18-Jun	SW1	W1	W1	W2	SW1	S1	SW1	NE2	NNE5	NE6	NE6	NE6	ENE8	ENE9	NE9	NE10	NE9	NE9	NE9	NE9	NE9	NE10	NE11	NE12	NE5.4	NE12
19-Jun	NE12	NE12	NE12	NE11	NE10	NNE7	NNE7	NNE7	NE8	NE9	NE11	NE11	NE9	NE7	ENE5	NE4	NNE3	WNW1	NNW5	N5	N6	N7	NW7	NW6	NNE6.6	NE12
20-Jun	NW7	NW8	NW7	NW6	NW6	NW7	NNW8	NW8	NNW8	NNW7	NNW8	NNW9	N9	NNW8	NW9	NW9	NW8	WNW7	WNW6	WNW6	WNW6	WNW5	W5	WNW5	NW6.8	N9
21-Jun	WNW6	WNW5	WNW6	WNW5	WNW6	WNW6	WNW5	WNW7	NW8	NW8	NW8	NW8	NW6	NNW6	N5	N5	NNW5	NW3	NW3	W2	WSW3	WSW3	WSW3	WSW2	WNW4.7	NW8
22-Jun	SW2	SW1	WSW2	W1	SW1	SW1	SE2	ESE6	SE6	ESE7	SSE6	W8	W11	W9	WSW5	DF	DF	WSW4	WSW2	WSW3	SW3	WSW3	SW2	SSW3	SW2.2	W11
23-Jun	SSE3	S3	SSE4	SSW4	SSW2	SW1	SSE2	SE6	S6	SSE6	SSE6	SSE5	SE8	SSE6	S5	SSE6	SSE5	SE5	S4	SW2	SW2	SW2	SSW2	SW2	SSE3.6	SE8
24-Jun	SSW2	SW2	SW2	WSW1	WSW1	SW1	SW1	SW3	SW5	SSW5	WSW6	W5	WSW7	W7	WSW7	W6	W5	W4	N4	NW4	NNW5	NNW5	WNW4	WNW4	W3.1	WSW7
25-Jun	NNE4	NNE3	NNE5	NNE5	NNW4	NW4	NNW5	N5	NNE5	ENE6	ENE6	E6	ESE6	E5	ESE4	S3	SSW3	SSW3	SSW3	SSW3	SSW3	SSW3	SSW2	SSW2	NE1.1	E6
26-Jun	SW1	WSW1	S1	SE5	S5	SE4	SE5	ESE6	SE6	ESE7	SE7	SSE5	SE6	SE4	S3	WSW5	WSW4	W5	NNW3	W3	SW3	SW2	S1	SW2	SSE2.5	ESE7
27-Jun	SW1	W4	WNW3	W3	SW1	WNW2	NW3	NNW5	NNW5	N7	N7	N6	N6	ENE6	NE5	ENE7	ENE6	NE5	NNE2	S1	WSW3	WSW3	WSW4	SW2	N1.7	N7
28-Jun	SW2	WSW1	SW3	SW2	WSW1	SW1	N0	SE2	SSE4	SE8	SE8	SE9	SE9	SSE3	SSW2	W6	SW4	N0	WSW2	WSW2	SSW2	WSW2	SW2	SW2	S2.1	SE9
29-Jun	S3	WSW1	W2	NE2	NE2	ESE4	ESE7	SE5	SSE6	SSE5	S5	SSE5	SW6	WSW7	WSW12	SW4	WSW4	S2	SW2	WSW3	WSW2	W3	WSW5	WSW6	SSW2.5	WSW12
30-Jun	W3	WSW2	WSW4	WSW6	W6	W6	WNW4	W4	WSW3	WSW7	WSW8	W8	W8	W9	W9	W8	WSW7	W7	W7	W5	WSW3	SW4	WSW4	WSW5	W5.6	W9

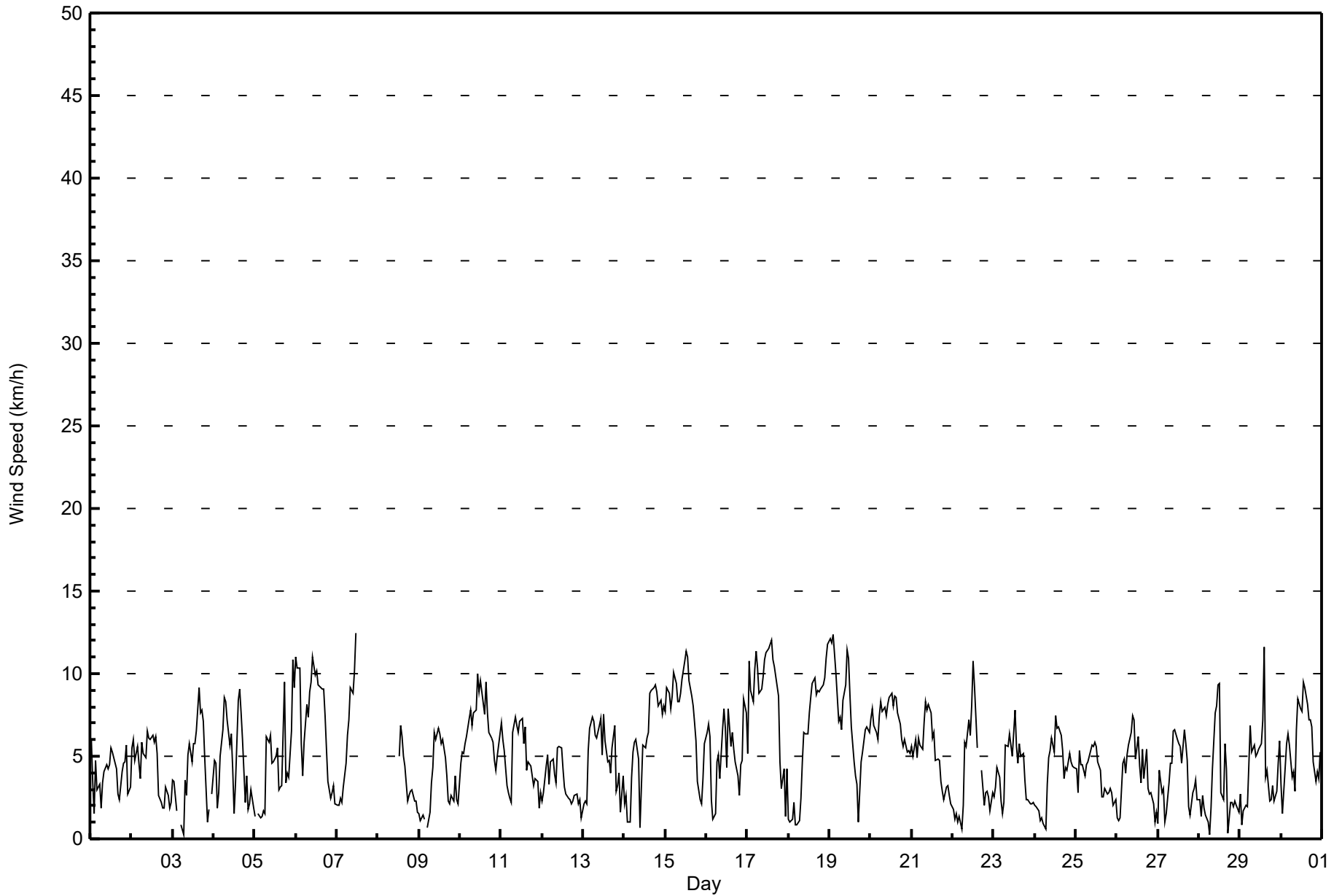
W1.6	W2.0	W1.9	W1.4	W1.1	W0.9	W1.0	NNW0.8	W0.7	NNW0.3	NW0.4	NW0.9	NNW0.9	NNW1.7	NNW1.9	NNW1.4	W1.6	W1.5	NNW1.4	W1.9	W2.1	W2.4	W2.4	W2.4	W2.4	Diurnal Average
NE12	NE12	NE12	NE11	WSW10	WSW11	WSW10	W9	WSW9	WSW10	NE11	W12	W12	WSW12	W12	W11	W10	W9	NW9	NE9	NE9	NE10	NE11	NE12	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Surmont 2 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	392	56.89	56.89
6 - 11	288	41.80	98.69
12 - 19	9	1.31	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 689

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - June 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	16	7	5	10	7	13	19	22	24	56	81	50	29	18	19	392
6 - 11	12	6	21	8	12	18	25	24	2	1	2	35	42	23	39	18	288
12 - 19	0	0	4	0	0	0	0	0	0	0	0	2	3	0	0	0	9
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	22	32	13	22	25	38	43	24	25	58	118	95	52	57	37	689

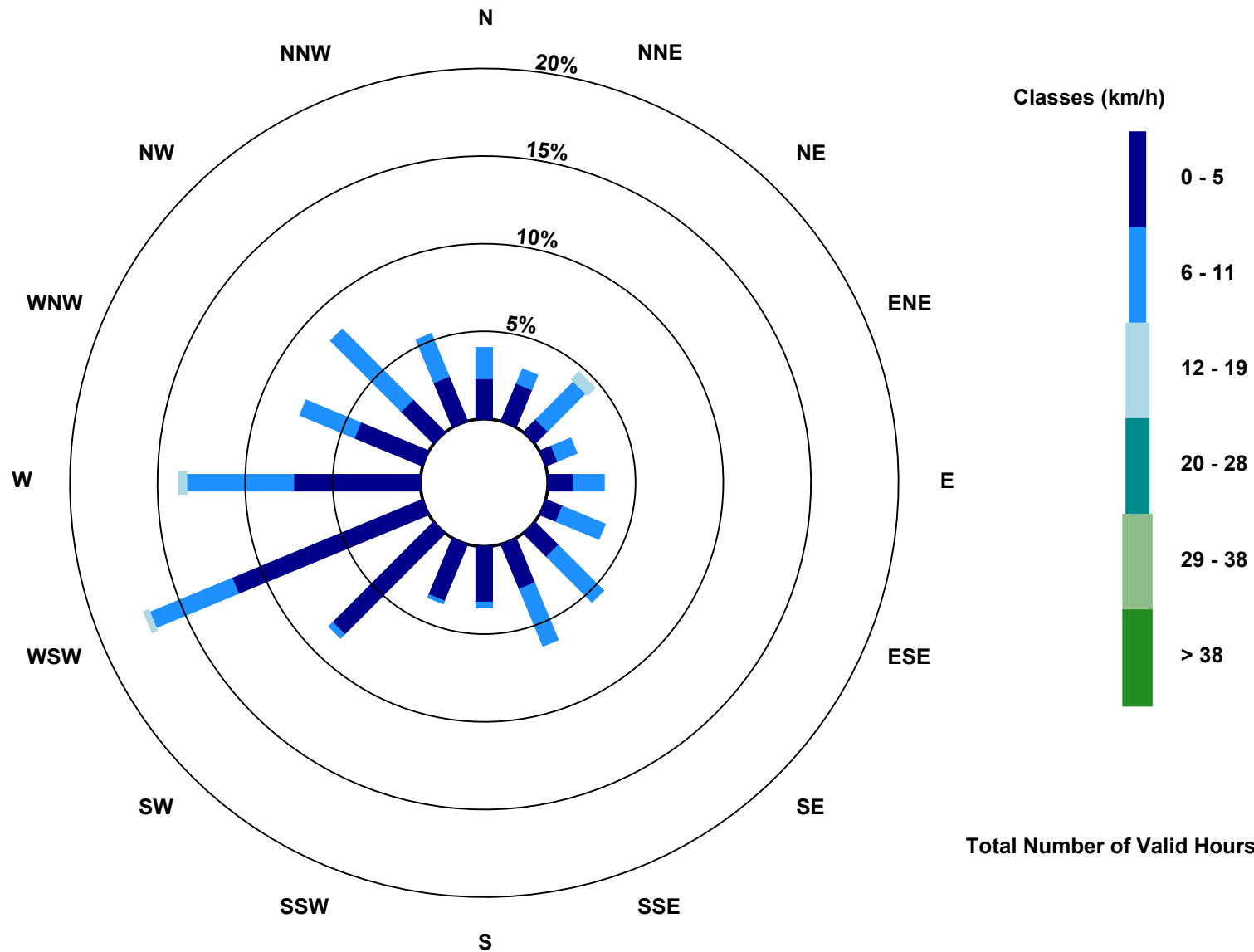
Total Number of Valid Hours: 689

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Surmont 2





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Surmont 2 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Jun 13 19:00	Hours of Data: 689
Minimum Value: 0 km/h on Jun 15 22:00	Hours of Missing Data: 31
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 5	Hours of Calibration: 1
	Percent Operational Time: 95.8

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

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

C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

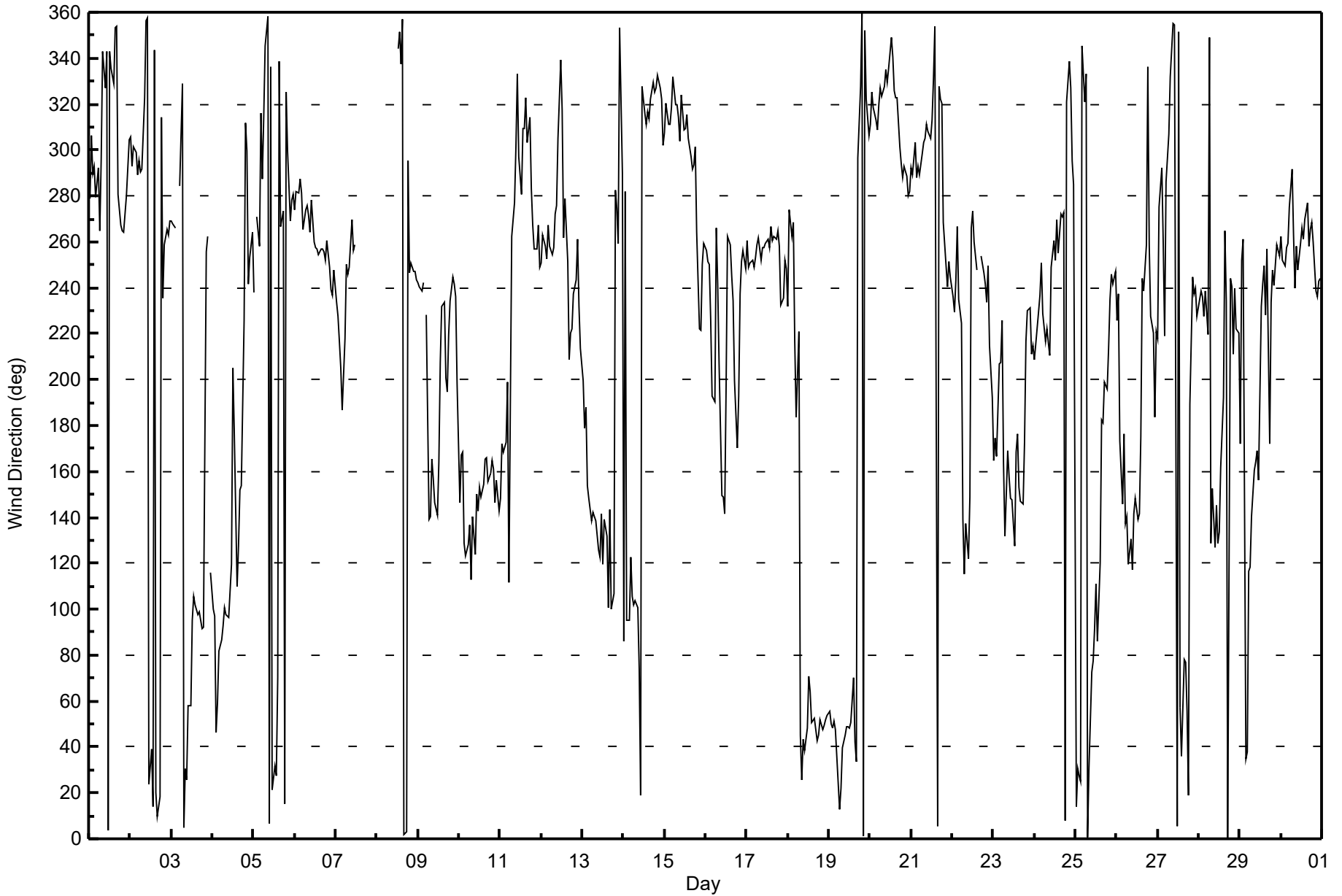
Wind Direction (WD) - deg
Surmont 2 - June 2023

Direction of Maximum Speed: 259 deg on Jun 7 12:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 256.7 deg on Jun 17	Hours of Data: 689
Direction of Minimum Speed: 349 deg on Jun 28 07:00	Direction of Minimum Daily Speed Average: 1.1 deg on Jun 25
Direction of Minimum Daily Speed Average: 1.1 deg on Jun 25	Hours of Missing Data: 31
Monthly Average Direction: 275.1 deg	Percent Operational Time: 95.8

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	279	306	290	293	280	292	265	296	343	327	343	4	343	335	329	353	354	281	267	265	264	272	280	305	306.7
2-Jun	306	293	302	299	289	295	290	292	322	356	358	24	39	14	343	20	10	18	314	236	259	265	263	269	325.7
3-Jun	269	268	266	UO	UO	284	329	5	31	26	58	58	95	105	102	98	99	95	92	92	255	263	UO	116	82.5
4-Jun	100	97	46	59	82	86	93	101	98	108	119	205	177	110	127	152	154	226	312	300	241	253	264	113.0	
5-Jun	238	UO	271	258	316	288	314	345	358	6	336	22	32	27	70	338	267	274	15	325	300	269	278	281	319.5
6-Jun	274	282	281	287	281	266	274	276	272	264	278	260	257	257	255	257	257	256	252	261	249	239	237	248	265.9
7-Jun	234	228	217	205	187	218	250	246	249	269	256	259	M	M	M	M	M	M	M	M	M	M	M	M	--
8-Jun	M	M	M	M	M	M	M	M	M	M	M	C	344	352	337	357	2	3	295	247	251	247	247	244	--
9-Jun	243	240	239	242	UO	228	139	141	165	157	146	141	164	208	232	234	201	195	220	234	244	242	236	198	193.1
10-Jun	147	167	168	129	123	128	136	113	140	124	150	143	153	149	154	165	166	156	160	165	161	147	157	143	147.3
11-Jun	148	172	168	172	199	112	188	263	277	302	333	297	281	310	309	323	303	314	283	267	257	257	267	249	272.4
12-Jun	251	263	258	253	267	258	255	257	272	276	305	339	317	262	279	252	209	220	222	237	244	261	232	214	265.0
13-Jun	199	179	188	154	149	138	142	141	139	126	122	141	120	139	132	101	143	100	107	283	275	259	354	290	138.9
14-Jun	86	282	95	95	123	106	102	104	101	74	19	328	316	311	316	313	322	330	325	327	332	327	322	302	335.2
15-Jun	308	320	311	311	318	332	320	320	314	304	324	309	309	316	305	297	292	293	301	264	222	222	250	259	306.6
16-Jun	256	252	250	226	193	190	266	241	207	149	149	141	196	263	258	246	234	200	170	193	237	252	257	249	226.9
17-Jun	260	249	251	252	249	253	258	262	252	258	257	260	261	257	267	260	262	261	265	258	233	236	252	248	256.7
18-Jun	232	274	262	269	217	184	221	45	26	43	38	48	71	64	51	52	47	43	45	52	48	49	52	54	49.0
19-Jun	55	50	48	51	48	24	13	22	39	45	49	49	48	51	70	42	33	297	328	360	1	352	322	306	33.3
20-Jun	311	325	319	313	308	319	327	324	328	335	330	336	349	341	326	323	323	301	294	288	293	289	280	282	318.1
21-Jun	293	289	303	288	293	289	299	303	305	311	308	305	313	330	354	5	327	322	321	269	250	240	251	245	303.8
22-Jun	236	230	244	267	235	224	139	115	137	122	149	266	273	260	247	DF	DF	254	247	242	234	250	215	192	224.4
23-Jun	165	175	167	207	207	226	164	132	169	158	148	148	127	168	177	153	147	146	173	217	230	231	211	215	165.7
24-Jun	209	215	230	237	251	229	217	222	216	210	249	260	252	270	255	272	271	273	8	321	339	327	295	285	266.3
25-Jun	14	31	28	25	345	321	333	0	31	73	77	92	111	86	120	182	181	199	196	213	335	246	241	247	52.3
26-Jun	226	238	173	146	176	137	140	120	130	117	141	148	139	142	175	244	238	259	336	259	227	220	184	221	164.8
27-Jun	218	275	292	259	219	286	307	332	343	355	354	6	352	57	36	78	77	55	19	189	244	237	240	228	351.6
28-Jun	235	238	236	228	239	220	349	129	153	127	145	129	134	162	192	265	234	0	244	240	211	240	222	220	178.4
29-Jun	172	252	261	35	38	116	119	141	161	164	169	156	232	242	250	228	257	172	233	248	241	259	257	254	207.8
30-Jun	262	252	250	258	259	275	292	263	240	258	248	259	266	261	270	277	258	266	268	260	239	236	243	244	260.1

266.4	272.8	272.9	270.9	262.9	269.0	272.0	291.0	269.1	347.1	312.3	305.0	291.2	288.8	282.8	289.1	267.3	269.1	288.0	273.1	268.9	267.8	268.0	262.0
Diurnal Average																							

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Surmont 2 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 114 deg on Jun 28 18:00	Hours of Data: 689
Minimum Value: 9 deg on Jun 22 20:00	Hours of Missing Data: 31
Percentiles: P ₁ = 12 P ₁₀ = 23 Q ₁ = 36 Median = 52 Q ₃ = 61 P ₉₀ = 72 P ₉₉ = 94	Hours of Calibration: 1
	Percent Operational Time: 95.8

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-Jun	55	71	88	56	30	37	48	30	53	51	59	51	63	59	48	58	58	49	18	17	21	32	63	54	88
2-Jun	52	51	58	55	53	66	41	43	63	56	60	56	58	63	58	55	70	81	70	55	10	14	18	24	81
3-Jun	17	14	28	UO	UO	16	72	55	80	57	61	71	73	71	57	33	35	31	32	45	62	30	UO	80	
4-Jun	46	49	77	71	40	34	31	29	32	44	48	76	82	70	37	53	57	65	78	58	60	37	24	29	82
5-Jun	37	UO	18	27	60	36	69	57	52	51	56	62	59	51	89	47	27	29	72	54	51	29	32	32	89
6-Jun	31	34	34	38	34	30	30	34	36	40	36	48	45	50	48	46	45	50	41	34	16	12	21	16	50
7-Jun	30	47	81	76	75	79	63	54	43	39	43	39	M	M	M	M	M	M	M	M	M	M	M	M	81
8-Jun	M	M	M	M	M	M	M	M	M	M	M	C	73	59	61	74	71	86	48	13	19	32	13	12	86
9-Jun	35	61	36	14	UO	55	58	48	53	51	55	54	64	59	62	63	66	58	24	16	10	16	19	64	66
10-Jun	53	58	64	52	49	59	56	42	53	47	52	56	59	55	60	54	60	54	56	59	57	57	53	56	64
11-Jun	64	64	57	92	100	73	79	42	34	47	65	53	50	55	57	72	57	63	38	27	15	15	13	17	100
12-Jun	15	40	14	10	19	17	19	19	28	31	58	61	63	29	27	36	31	27	29	16	23	34	32	83	83
13-Jun	78	61	77	65	57	50	50	52	56	41	43	55	42	45	54	59	73	43	81	33	41	69	88	57	88
14-Jun	97	87	94	105	62	35	31	32	40	110	52	56	64	59	67	61	65	57	64	61	63	57	67	52	110
15-Jun	63	65	63	67	65	65	64	57	54	61	68	55	57	53	54	57	52	50	53	38	12	18	27	24	68
16-Jun	23	21	22	49	56	66	37	51	74	53	52	55	69	37	39	51	57	80	51	70	47	33	34	33	80
17-Jun	29	27	26	31	26	30	33	39	38	38	41	37	36	34	38	35	35	37	35	27	17	15	31	33	41
18-Jun	63	77	80	39	54	55	69	86	54	48	51	55	45	45	49	52	50	42	43	48	45	44	37	42	86
19-Jun	40	43	39	43	40	61	61	59	55	48	43	45	42	47	54	64	72	94	67	74	67	68	60	62	94
20-Jun	64	61	65	61	62	61	59	60	58	62	63	59	60	63	67	63	68	54	66	64	53	54	51	48	68
21-Jun	55	65	56	63	51	50	53	61	59	63	59	55	60	56	56	66	63	69	71	53	11	38	15	14	71
22-Jun	17	60	34	43	23	70	56	43	56	49	54	50	47	35	45	DF	DF	27	14	9	30	18	29	47	70
23-Jun	56	56	59	58	47	33	78	48	63	55	61	59	46	70	81	65	51	56	58	45	35	23	38	43	81
24-Jun	24	28	23	30	12	42	77	59	47	56	55	51	44	49	50	40	37	37	65	60	71	72	53	52	77
25-Jun	73	78	56	64	62	80	62	60	57	46	48	42	46	65	60	61	81	65	57	39	17	12	14	13	81
26-Jun	25	40	77	47	59	58	57	43	43	44	49	54	53	51	54	41	67	39	83	58	49	49	74	74	83
27-Jun	76	28	49	16	56	76	61	62	70	65	63	64	70	57	80	48	55	59	87	77	16	19	17	35	87
28-Jun	28	39	24	31	49	90	103	73	57	47	55	52	52	85	75	33	55	114	48	30	51	31	24	26	114
29-Jun	49	86	82	95	86	66	39	57	41	61	65	72	61	52	39	51	38	41	39	52	33	15	17	19	95
30-Jun	17	29	41	23	24	32	42	49	65	44	39	36	45	45	39	39	32	32	29	26	11	14	17	12	65

97	87	94	105	100	90	103	86	80	110	68	76	82	85	89	74	81	114	87	77	71	72	88	83	
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Diurnal Maximum

C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS30
ELLS RIVER
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 JUNE 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	666	33	54	97.08	22.6	0	4.7	0
TRS (ppb) Average	661	34	59	96.53	2.5	0	1.1	0
THC (ppm) Average	665	33	55	96.94	3.8	-	2.5	-
NMHC (ppm) Average	665	33	55	96.94	0.647	-	0.083	-
CH4 (ppm) Average	665	33	55	96.94	3.4	-	2.4	-
NO2 (ppb) Average	663	34	57	96.81	29.9	0	13.2	-
NO (ppb) Average	663	34	57	96.81	59.5	-	10.2	-
NOX (ppb) Average	663	34	57	96.81	75.2	-	20.1	-
PM2.5 (ug/m3) Average	698	1	22	97.08	353.2	77	199.3	11
Temperature 2 m (C) Average	720	0	0	100	30.6	-	23.4	-
Relative Humidity (%) Average	720	0	0	100	98.5	-	93.8	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	43	-	33	-
Wind Direction 10 m (deg) Average	719	0	1	99.86	-	-	-	-
Global Solar Radiation (W/m2) Average	720	0	0	100	875.8	-	354.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
JUNE 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	666	0.73	2.5	-	0	0	0	0.1	0.3	0.9	22.6
TRS (ppb) Average	661	0.56	0.3	-	0.1	0.4	0.4	0.5	0.6	0.8	2.5
THC (ppm) Average	665	2.09	0.2	-	1.9	2	2	2	2.1	2.2	3.8
NMHC(ppm) Average	665	0.011	0.049	-	0	0	0	0	0	0	0.647
CH4(ppm) Average	665	2.08	0.1	-	1.9	2	2	2	2.1	2.2	3.4
NO2 (ppb) Average	663	4.62	5	-	0.2	0.5	1.1	3	6.2	10.8	29.9
NO (ppb) Average	663	1.65	4.8	-	0	0	0.1	0.3	1.2	3.1	59.5
NOX (ppb) Average	663	6.27	8.4	-	0.2	0.6	1.2	3.6	7.4	14	75.2
PM2.5 (ug/m3) Average	698	35.98	48.9	-	1.6	4.6	9.4	20.7	38.6	90.1	353.2
Temperature 2 m (C) Average	720	17.3	5.4	-	5.1	10.8	12.7	17.1	21.2	24.4	30.6
Relative Humidity (%) Average	720	65.81	21.3	-	22.6	37	47.9	66.3	86.3	92.9	98.5
Wind Speed 10 m (km/h) Average	719	10.8	7	-	0	3	6	9	14	20	43
Wind Direction 10 m (deg) Average	719	295.5	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	720	228.74	264	-	0	0	3.5	98.2	439.2	660.3	875.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
JUNE 2023

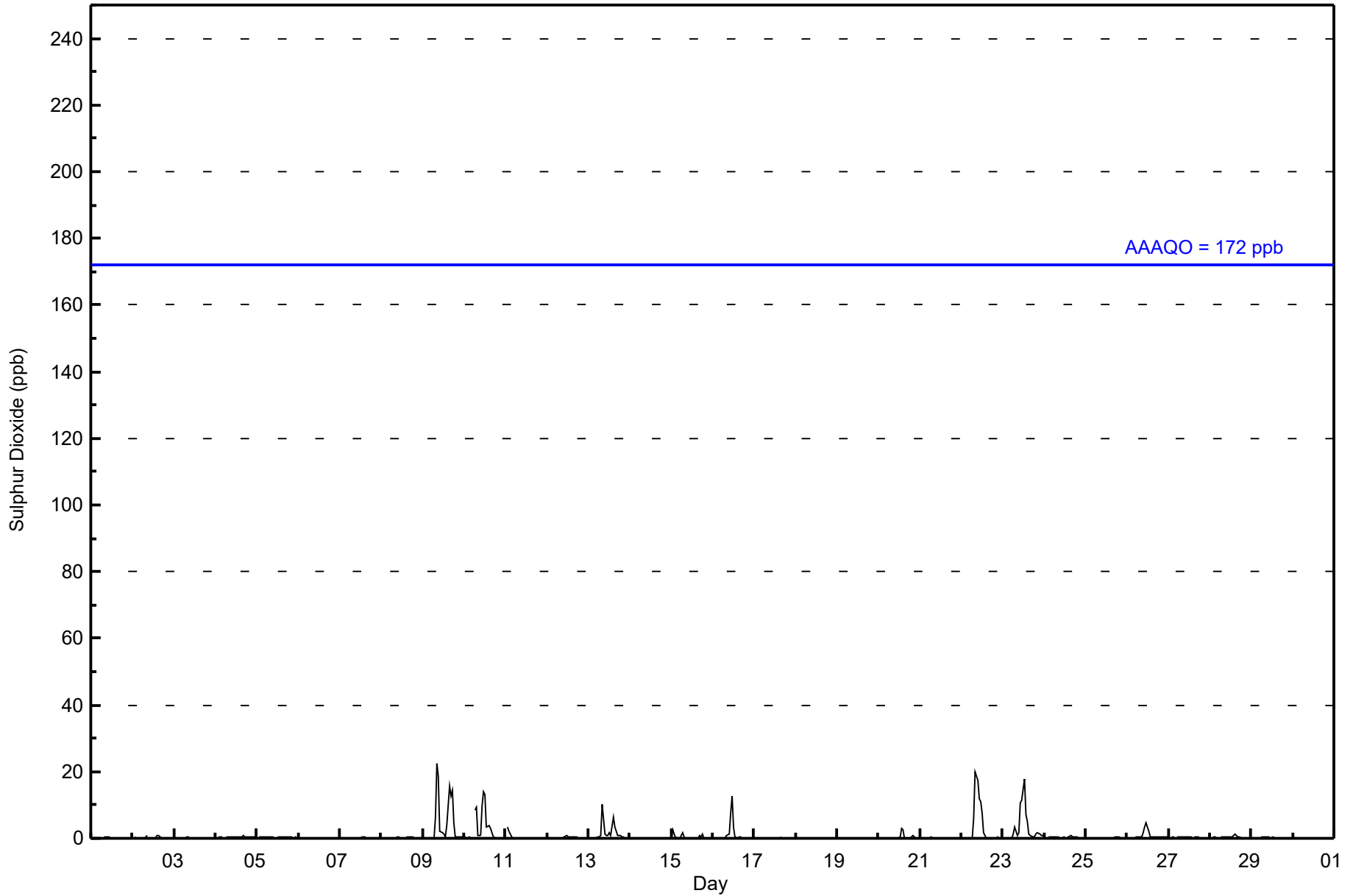
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, NO2, PM2.5	16 Jun 2023 19:00	17 Jun 2023 15:00	21	Station power failure
THC/NMHC/CH4, TRS	16 Jun 2023 19:00	17 Jun 2023 16:00	22	Station power failure
TRS, NO2	02 Jun 2023 10:00	02 Jun 2023 11:00	2	Maintenance - sample manifold cleaned
TRS	30 Jun 2023 09:00	30 Jun 2023 09:00	1	Maintenance - verify daily QA response
Wind Speed, Wind Direction	23 Jun 2023 21:00	23 Jun 2023 21:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Ells River - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Ells River - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	652	97.90	97.90
11 - 20	13	1.95	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: 666

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Ells River - June 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	67	118	50	26	6	5	7	17	63	53	61	38	32	41	32	35	651
11 - 20	0	0	0	0	0	0	0	7	6	0	0	0	0	0	0	0	13
21 - 60	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	118	50	26	6	5	7	25	69	53	61	38	32	41	32	35	665

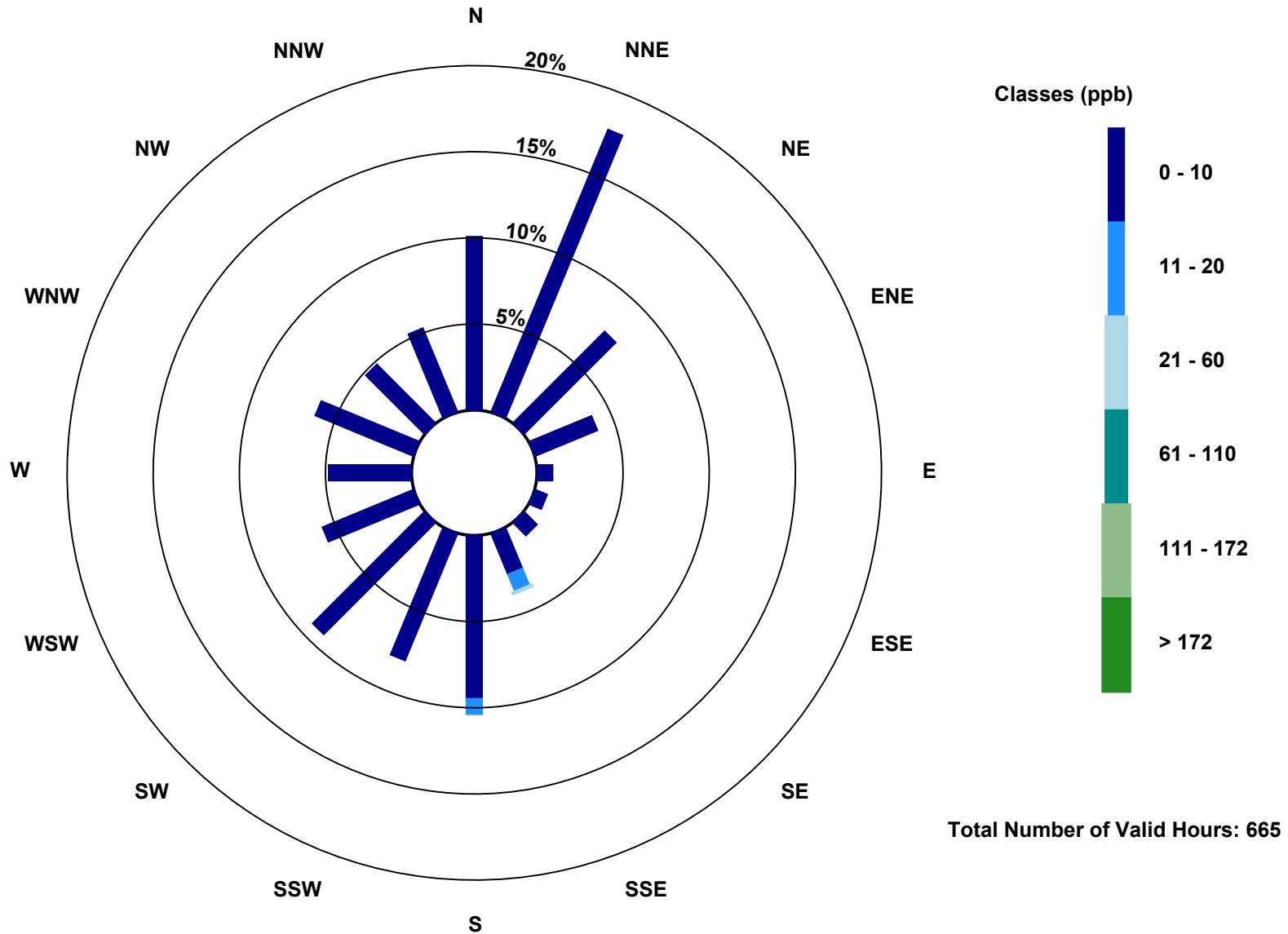
Total Number of Valid Hours: 665

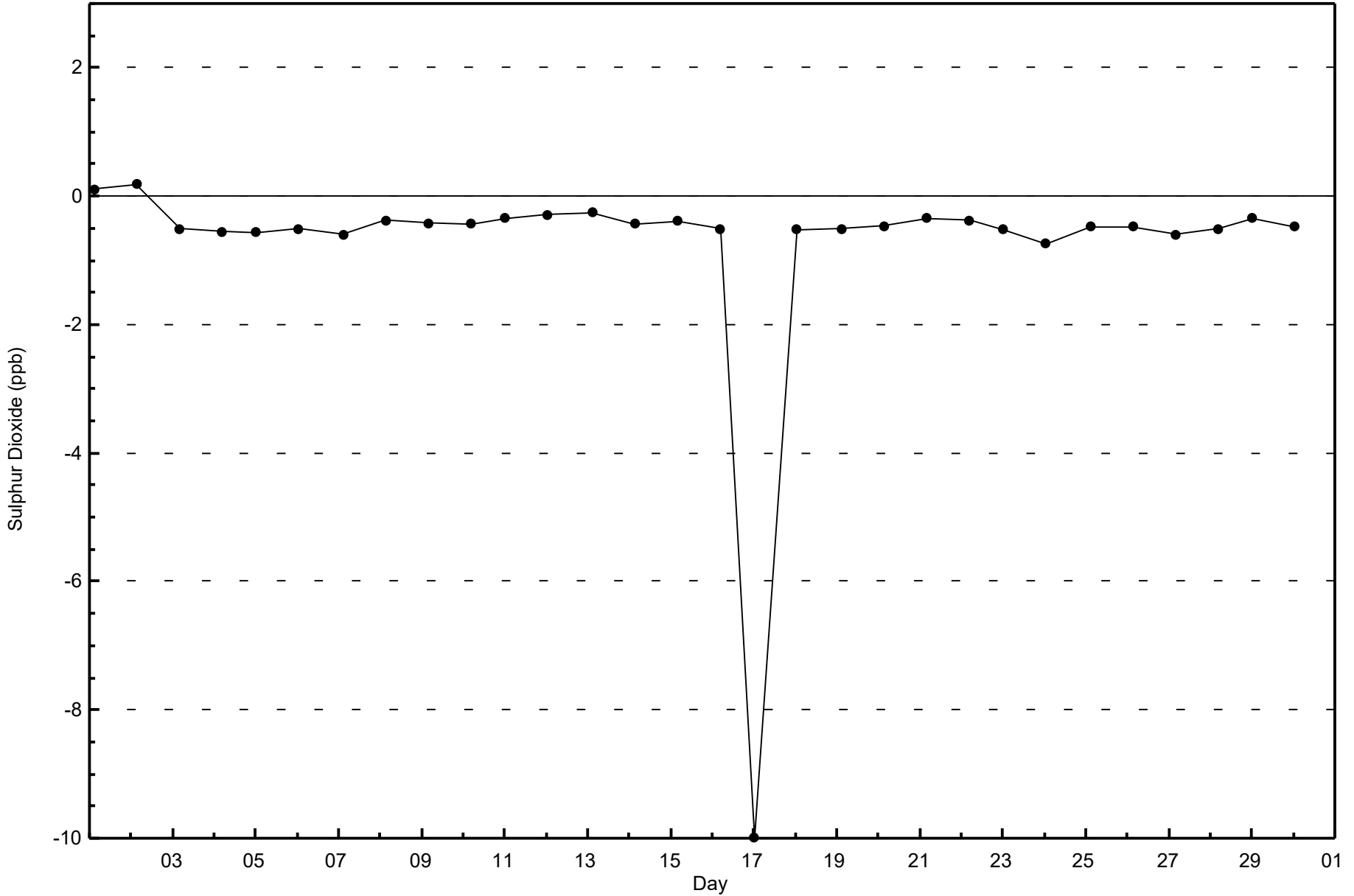
Total Number of Hours: 720

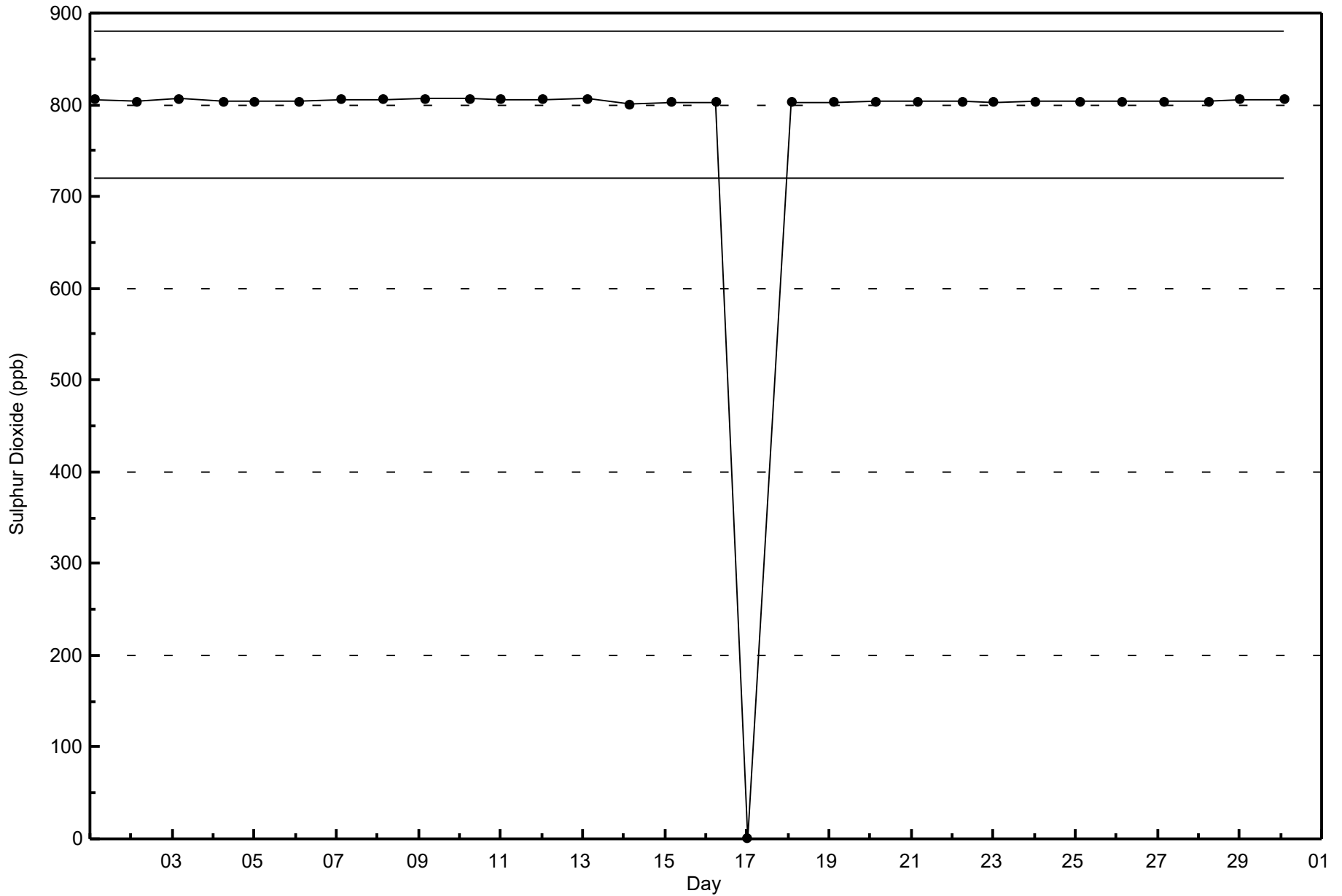


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Ells River









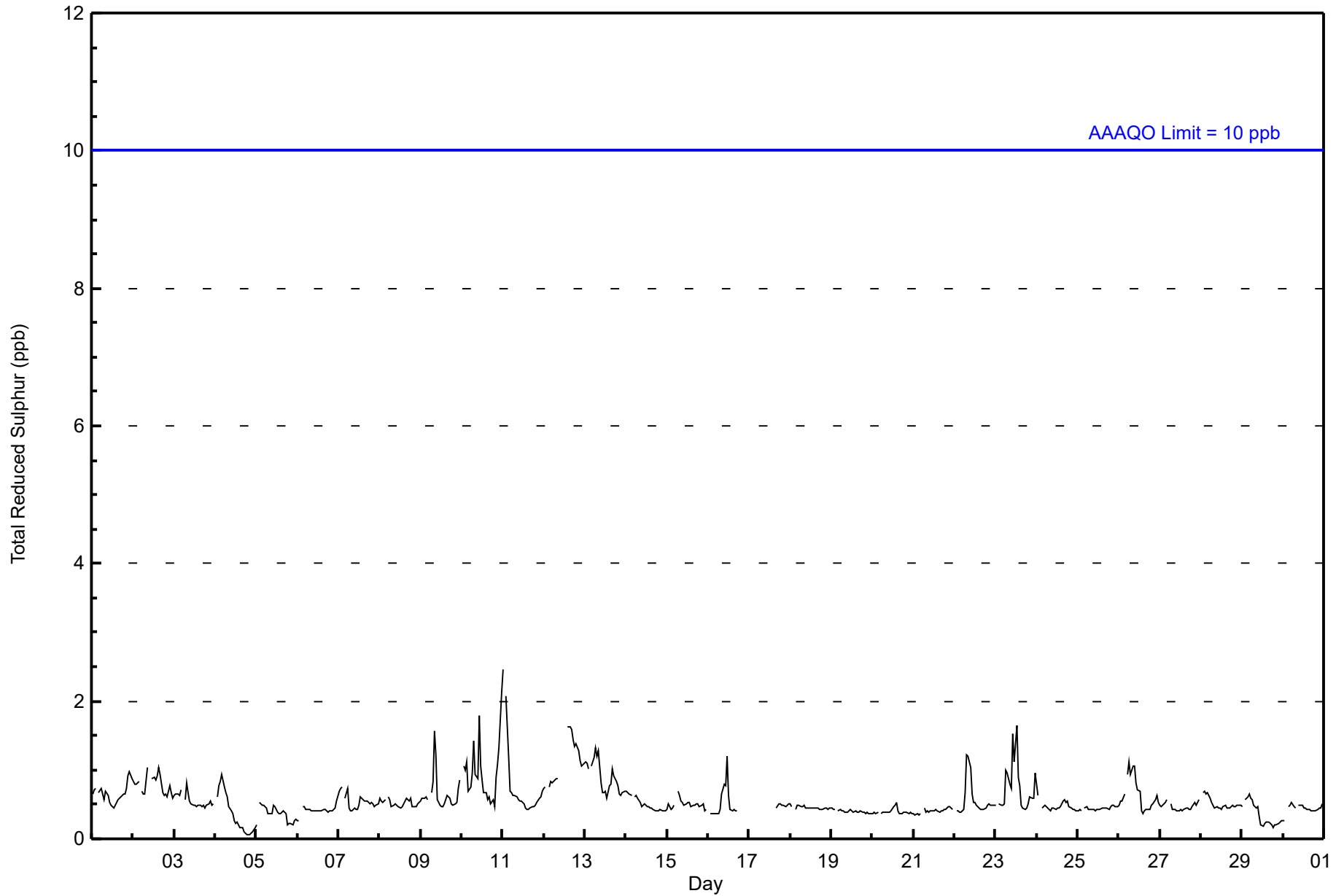
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Ells River - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720					
Maximum Value: 2.5 ppb on Jun 11 01:00		Maximum Daily Average: 1.1 ppb on Jun 12																	Hours of Data:	661							
Minimum Value: 0.1 ppb on Jun 4 19:00		Minimum Daily Average: 0.3 ppb on Jun 29																	Hours of Missing Data:	59							
Maximum Diurnal Average: 0.7 ppb at hour 9		Minimum Diurnal Average: 0.5 ppb at hour 14																	Hours of Calibration:	34							
Monthly Average: 0.56 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.6 P ₉₀ = 0.8 P ₉₉ = 1.6																	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-Jun	0.7	0.7	0.7	Z	0.7	0.7	0.7	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.7	0.9	1.0	0.9	0.7	1.0	
2-Jun	0.8	0.8	0.8	0.8	Z	0.7	0.7	0.6	1.0	M	M	0.9	0.9	0.8	0.9	1.0	0.9	0.7	0.6	0.6	0.6	0.8	0.7	0.6	0.8	1.0	
3-Jun	0.6	0.6	0.7	0.6	0.7	Z	0.6	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.8	0.8	
4-Jun	Z	0.6	0.8	0.8	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9	0.9	
5-Jun	0.2	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	
6-Jun	0.3	0.3	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	
7-Jun	0.7	0.7	0.8	Z	0.6	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8
8-Jun	0.6	0.5	0.5	0.6	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
9-Jun	0.6	0.6	0.6	0.6	0.6	Z	0.7	0.8	1.6	1.2	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.8	0.7	1.6	1.6
10-Jun	Z	1.1	1.0	1.1	0.7	0.8	1.0	1.4	0.9	0.9	1.8	1.0	0.8	0.7	0.7	0.6	0.6	0.5	0.6	0.5	0.9	1.1	1.3	2.1	1.0	2.1	2.1
11-Jun	2.5	Z	2.1	1.2	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	2.5	2.5
12-Jun	0.7	0.8	Z	0.7	0.8	0.8	0.8	0.9	0.9	C	C	C	C	C	1.6	1.6	1.6	1.4	1.3	1.4	1.3	1.1	1.1	1.1	1.1	1.6	1.6
13-Jun	1.1	1.1	1.0	Z	1.0	1.2	1.3	1.2	1.3	0.8	0.7	0.7	0.7	0.6	0.8	0.8	1.0	0.9	0.8	0.8	0.7	0.6	0.7	0.7	0.9	1.3	1.3
14-Jun	0.7	0.7	0.6	0.6	Z	0.6	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	0.5	0.7	0.7
15-Jun	0.4	0.5	0.4	0.5	0.5	Z	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.7
16-Jun	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.8	0.8	1.2	0.6	0.4	0.4	0.4	0.4	0.4	0.4	PF	PF	PF	PF	PF	PF	--	1.2
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	--	0.5
18-Jun	0.5	0.5	Z	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
19-Jun	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
20-Jun	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
21-Jun	0.4	0.3	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5
22-Jun	Z	0.4	0.4	0.4	0.4	0.4	0.7	1.2	1.2	1.0	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	1.2
23-Jun	0.5	Z	0.5	0.5	0.5	0.5	1.0	1.0	0.8	0.7	1.5	1.1	1.6	0.9	0.8	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	1.0	0.7	1.6	
24-Jun	0.8	0.6	Z	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.8	0.8
25-Jun	0.4	0.4	0.4	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5
26-Jun	0.5	0.6	0.5	0.6	Z	0.9	1.1	0.9	1.1	1.1	0.8	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.6	1.1	1.1
27-Jun	0.5	0.5	0.5	0.5	0.6	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.6	0.6
28-Jun	Z	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7
29-Jun	0.5	Z	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.6	0.6
30-Jun	0.3	0.3	Z	0.5	0.5	0.5	0.5	0.5	M	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5
																								Diurnal Average			
																								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

Total Reduced Sulphur (TRS) - ppb
Ells River - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	661	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: 661

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Ells River - June 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	69	116	49	24	6	5	7	25	70	53	61	37	30	44	27	37	660
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	69	116	49	24	6	5	7	25	70	53	61	37	30	44	27	37	660

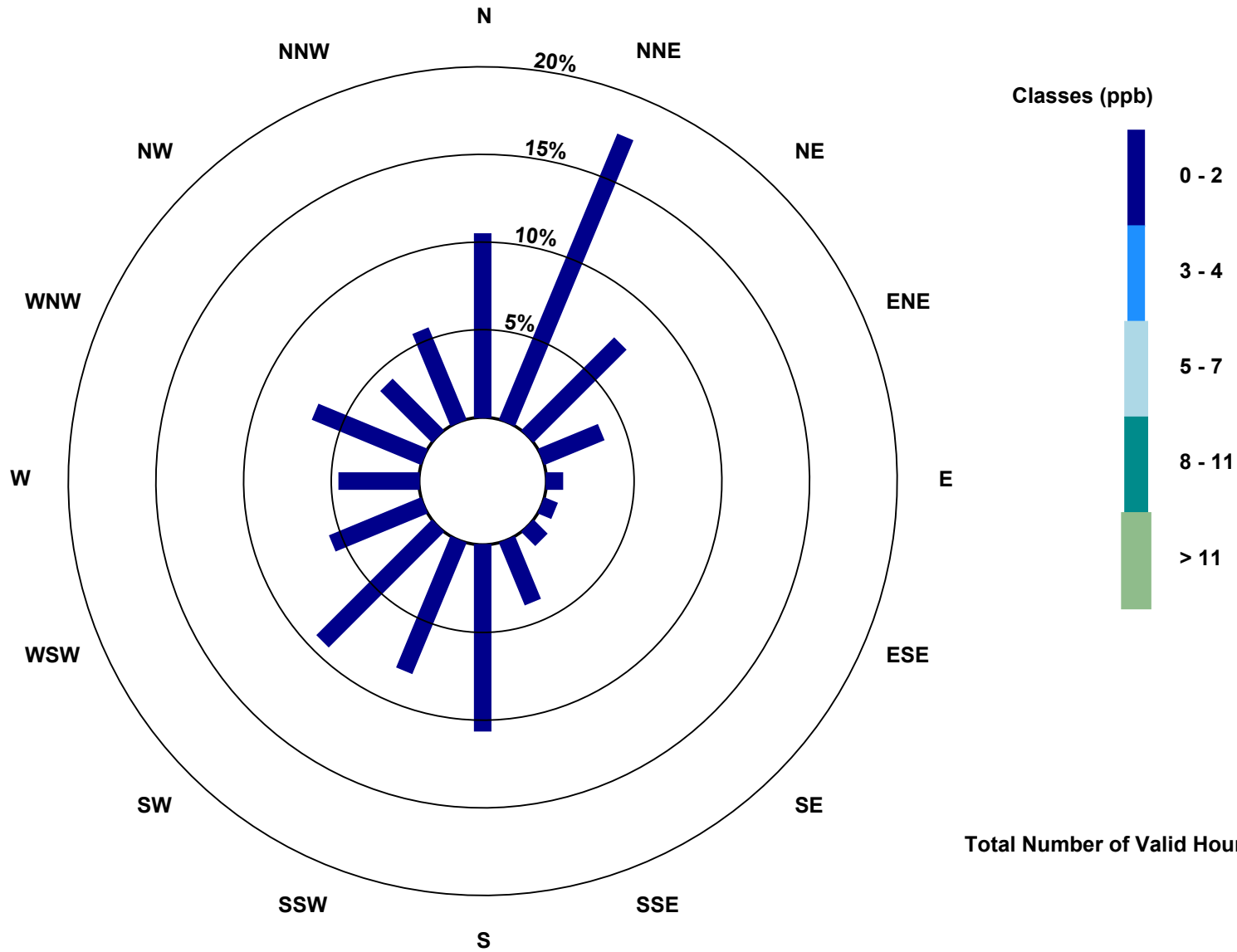
Total Number of Valid Hours: 660

Total Number of Hours: 720

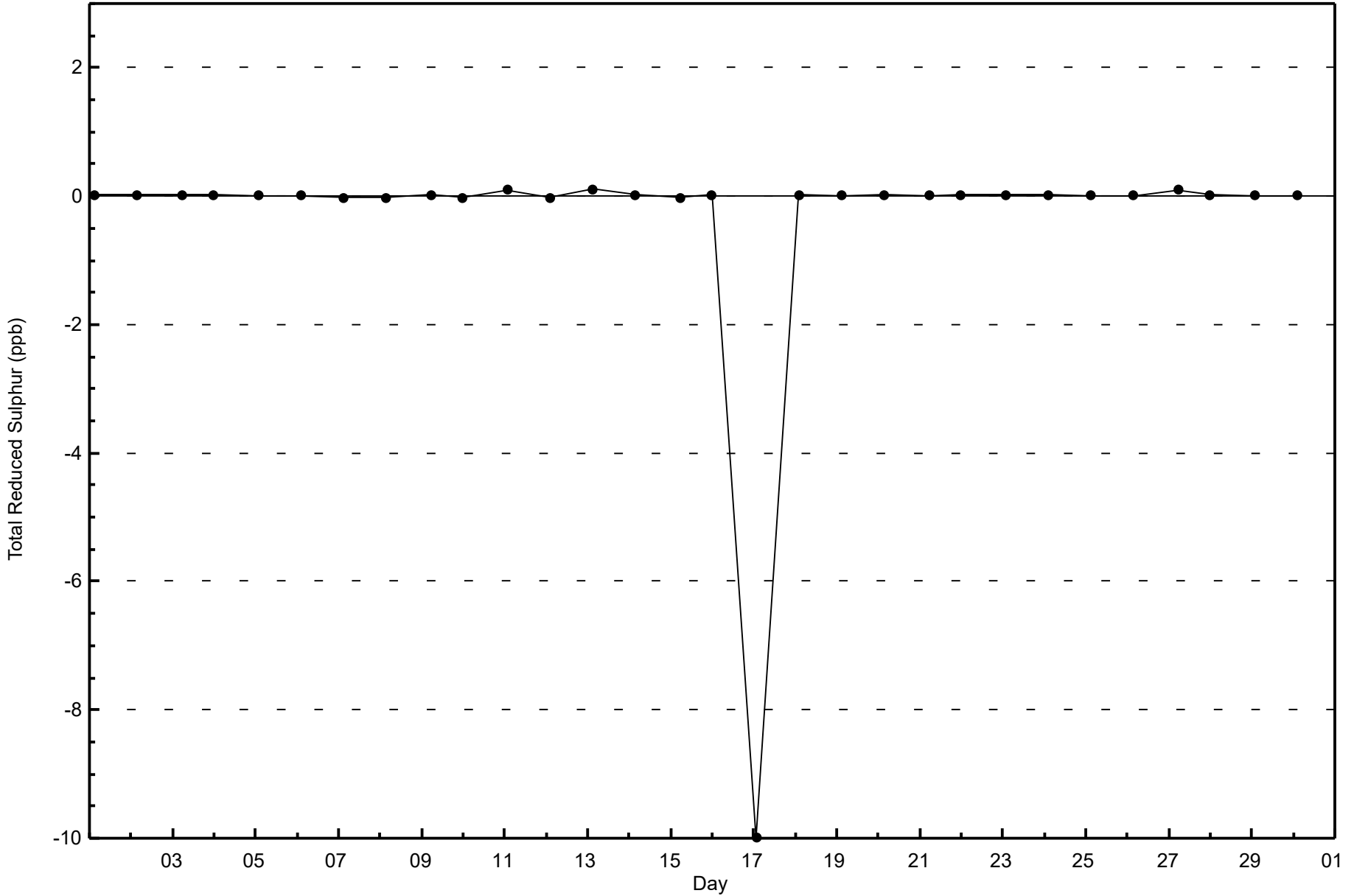


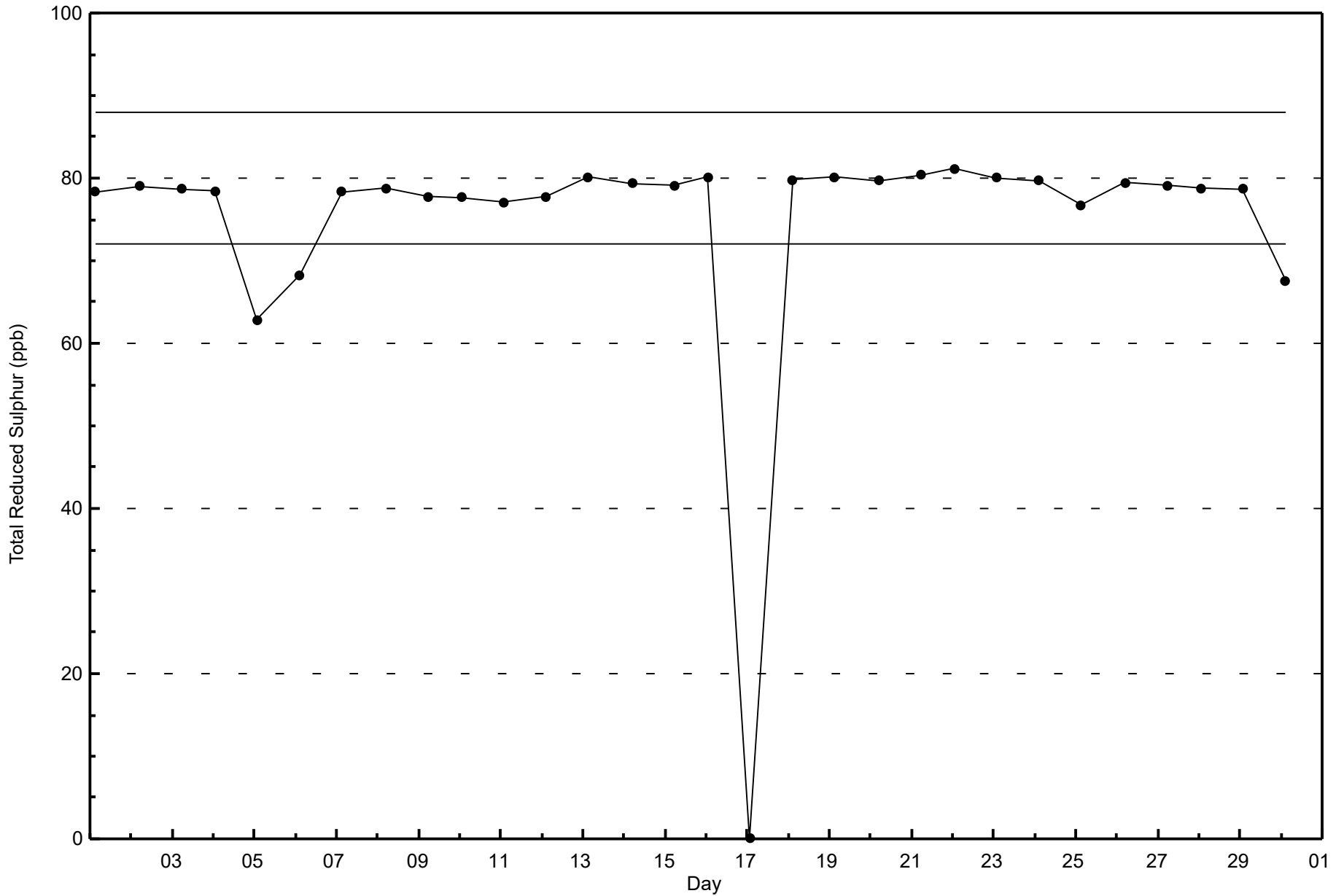
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Reduced Sulphur (TRS) - ppb
Ells River



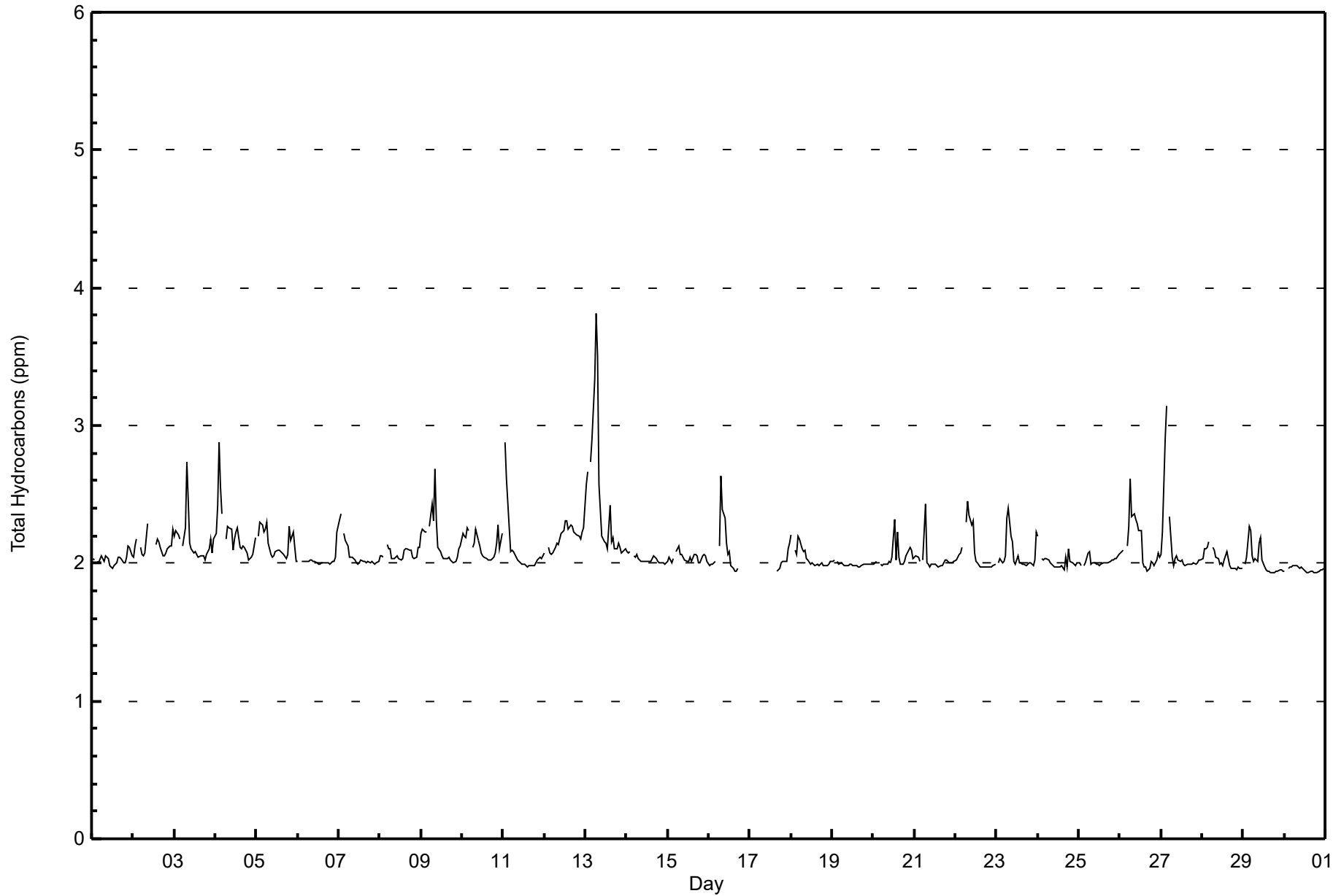
Total Number of Valid Hours: 660







Maximum Value: 3.8 ppm on Jun 13 07:00		Maximum Daily Average: 2.5 ppm on Jun 13		Hours in Service: 720																							
Minimum Value: 1.9 ppm on Jun 30 19:00		Minimum Daily Average: 2.0 ppm on Jun 30		Hours of Data: 665																							
Maximum Diurnal Average: 2.2 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Missing Data: 55																							
Monthly Average: 2.09 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.9		Hours of Calibration: 33																							
				Percent Operational Time: 96.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	
2-Jun	2.0	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.3	C	C	C	C	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.3
3-Jun	2.2	2.2	2.2	2.2	Z	2.1	2.3	2.7	2.5	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.2	2.2	2.7	
4-Jun	2.2	2.4	2.9	2.5	2.4	Z	2.2	2.3	2.3	2.2	2.1	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.9	
5-Jun	Z	2.2	2.3	2.3	2.2	2.2	2.3	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.3	2.2	2.2	2.1	2.0	2.1	2.3	
6-Jun	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	2.2	2.0	2.2	
7-Jun	2.3	2.4	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
8-Jun	2.1	2.1	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	
9-Jun	2.2	2.2	2.2	2.2	Z	2.3	2.4	2.3	2.7	2.3	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	2.2	2.7	
10-Jun	2.2	2.2	2.2	2.3	2.2	Z	2.1	2.1	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	2.3	2.1	2.2	2.1	2.3	
11-Jun	Z	2.9	2.6	2.3	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	2.9	
12-Jun	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	
13-Jun	2.6	2.7	Z	2.7	2.9	3.3	3.8	3.5	2.6	2.2	2.2	2.2	2.2	2.1	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	3.8	
14-Jun	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
15-Jun	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	
16-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.6	2.4	2.3	2.1	2.1	2.1	2.0	2.0	1.9	1.9	2.0	PF	PF	PF	PF	PF	PF	--	2.6	
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	1.9	2.0	2.0	2.0	2.0	2.1	2.1	--	2.1	
18-Jun	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
19-Jun	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	
20-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.0	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.3	
21-Jun	2.0	2.1	2.0	2.0	Z	2.0	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
22-Jun	2.0	2.0	2.1	2.1	2.1	Z	2.3	2.5	2.4	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	
23-Jun	Z	2.0	2.0	2.0	2.0	2.1	2.3	2.4	2.2	2.2	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.4	
24-Jun	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	
25-Jun	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	
26-Jun	2.1	2.1	2.1	Z	2.1	2.3	2.6	2.3	2.4	2.3	2.3	2.2	2.2	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.6	
27-Jun	2.1	2.2	2.9	3.1	Z	2.3	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	2.1	3.1	
28-Jun	2.0	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
29-Jun	Z	2.0	2.0	2.3	2.2	2.1	2.0	2.0	2.0	2.2	2.2	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	2.3	
30-Jun	1.9	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration PF - Power Failure																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	384	57.74	57.74
2.1 - 3.0	277	41.65	99.40
3.1 - 10.0	4	0.60	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 665

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - June 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	37	70	27	15	4	3	5	9	30	34	51	29	21	27	11	10	383
2.1 - 3.0	30	48	23	11	2	2	2	16	39	19	10	9	10	13	19	24	277
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	118	50	26	6	5	7	25	69	53	61	38	31	41	32	35	664

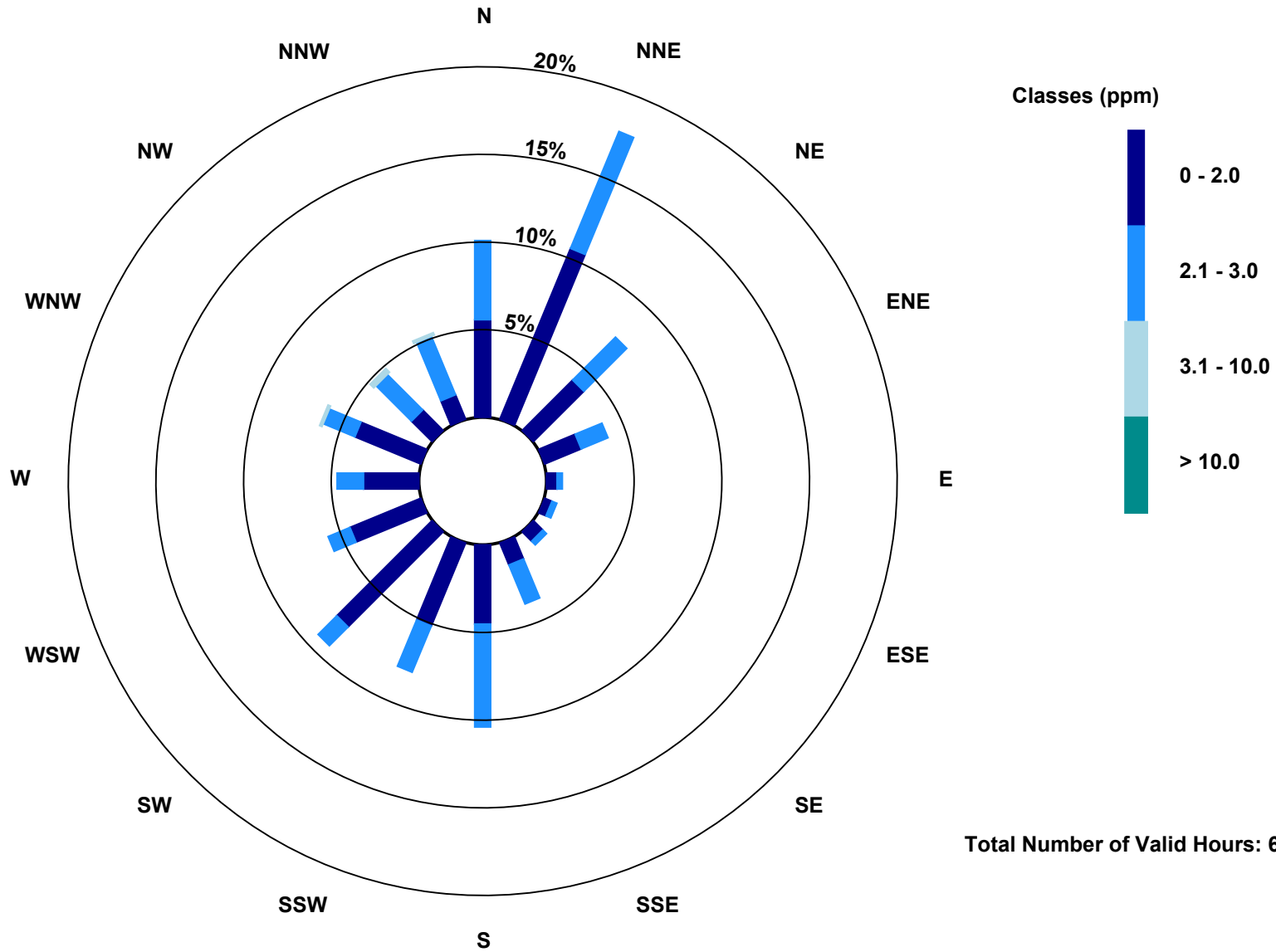
Total Number of Valid Hours: 664

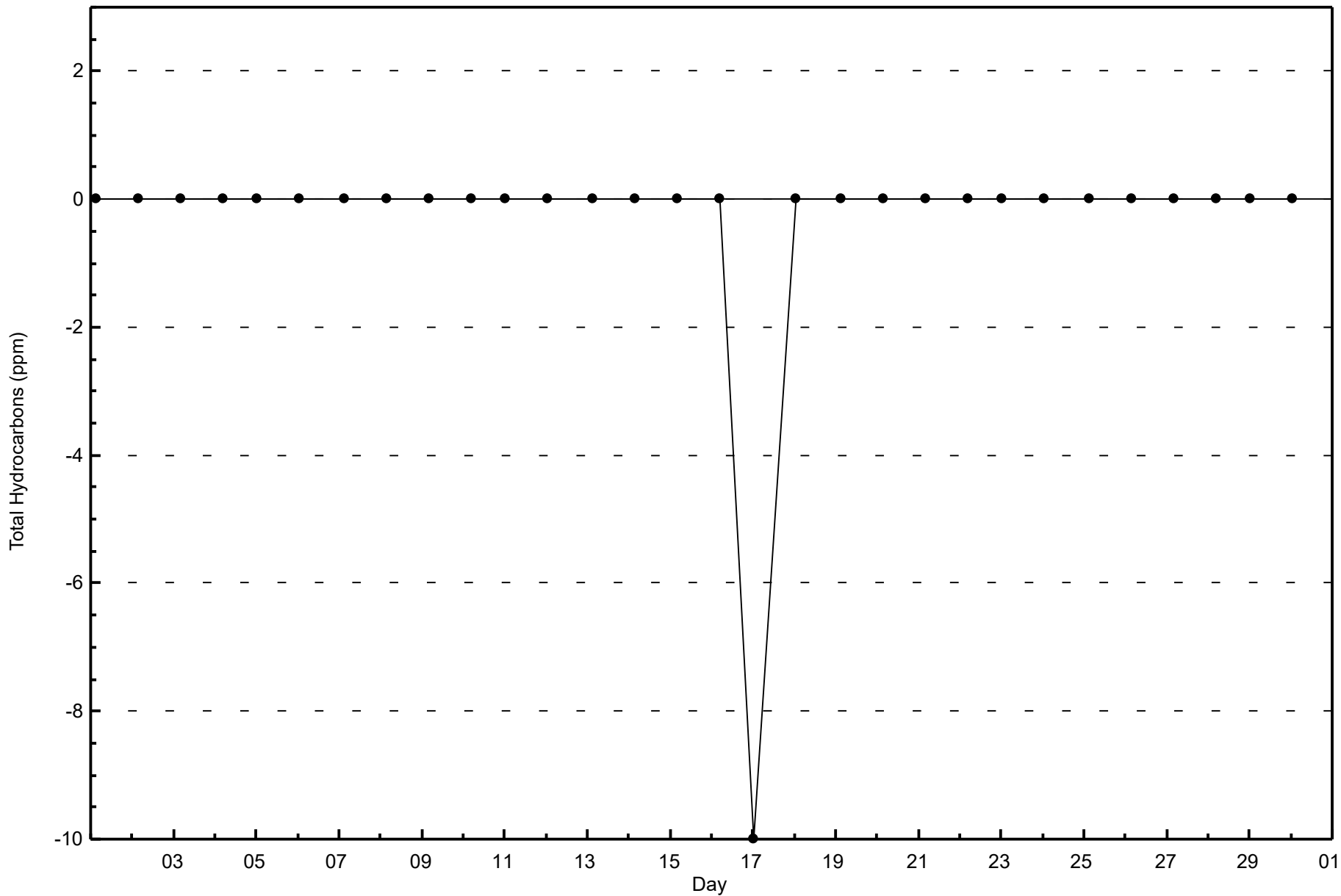
Total Number of Hours: 720

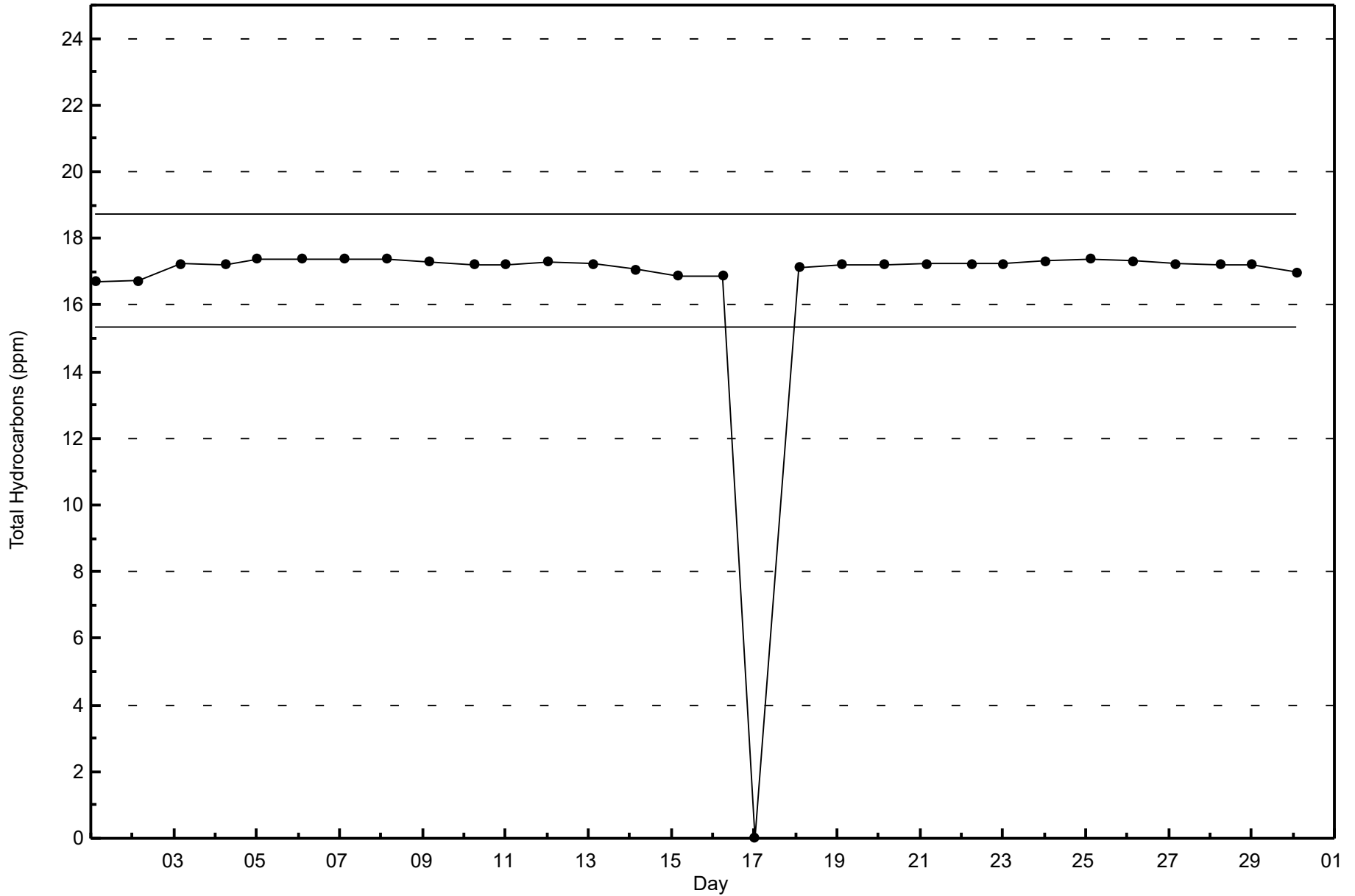


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Ells River





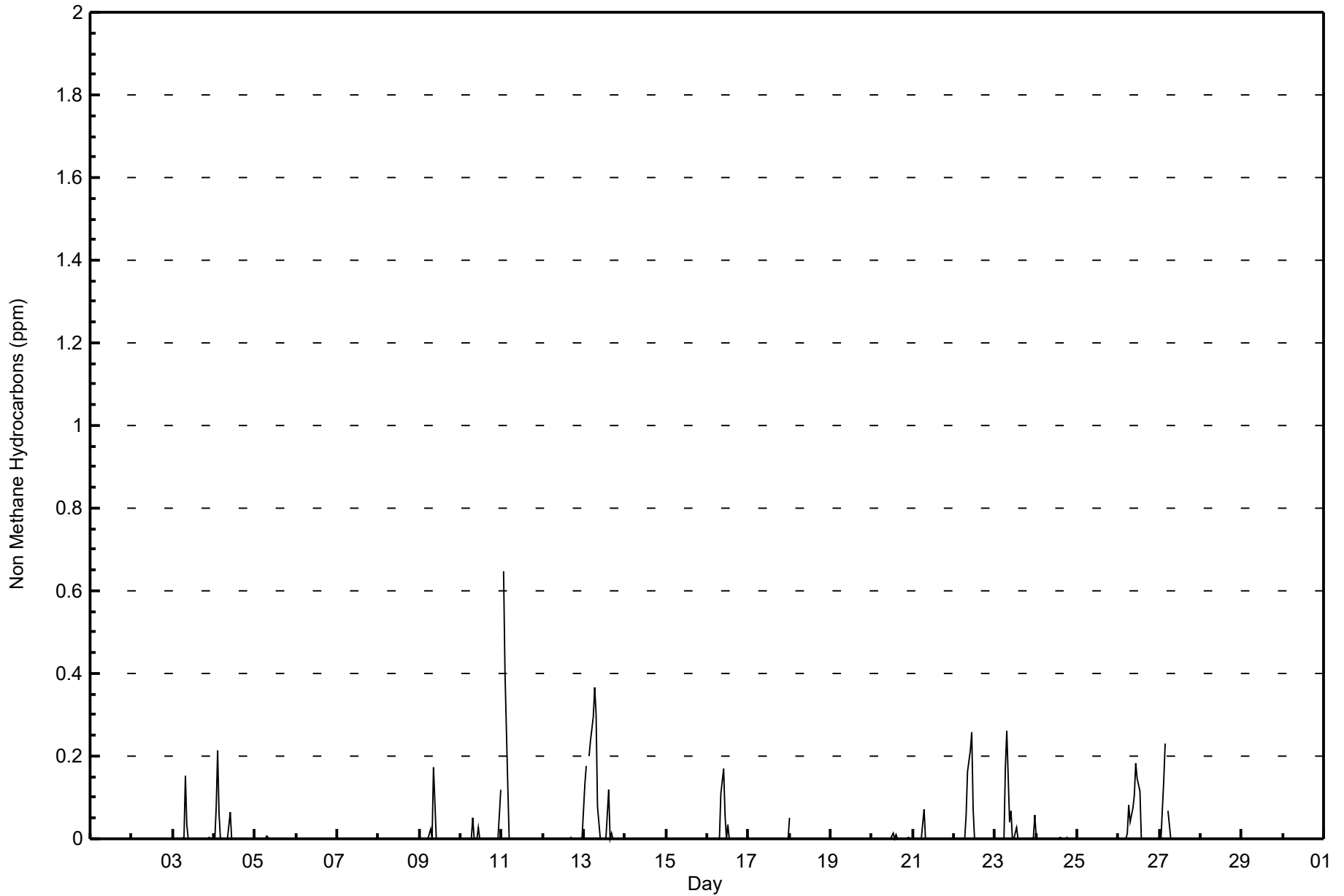




Maximum Value: 0.647 ppm on Jun 11 02:00	Maximum Daily Average: 0.083 ppm on Jun 13	Hours in Service: 720
Minimum Value: 0.000 ppm on Jun 1 01:00	Minimum Daily Average: 0.000 ppm on Jun 1	Hours of Data: 665
Maximum Diurnal Average: 0.038 ppm at hour 2	Minimum Diurnal Average: 0.000 ppm at hour 14	Hours of Missing Data: 55
Monthly Average: 0.011 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2	Hours of Calibration: 33
		Percent Operational Time: 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-Jun	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																						
2-Jun	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	0.000	0.000	0.000	0.000																						
3-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.003	0.153	0.035	0.000	0.000	0.000	0.000	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	0.008	0.153																							
4-Jun	0.000	0.078	0.213	0.059	0.000	Z	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.213																							
5-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																							
6-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	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																							
8-Jun	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																							
9-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.024	0.000	0.173	0.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.173																								
10-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.050	0.000	0.000	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	0.000	0.000	0.008	0.117																								
11-Jun	Z	0.647	0.403	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.647																								
12-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004																							
13-Jun	0.132	0.177	Z	0.199	0.236	0.294	0.366	0.302	0.079	0.000	0.000	0.000	0.000	0.000	0.118	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.366																								
14-Jun	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																							
15-Jun	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																							
16-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.108	0.168	0.058	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	PF	PF	PF	PF	PF	--	0.168																								
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000																								
18-Jun	0.050	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.050																								
19-Jun	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																							
20-Jun	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.001	0.013																								
21-Jun	0.000	0.000	0.000	0.000	Z	0.000	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.070																								
22-Jun	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.057	0.164	0.214	0.258	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.258																								
23-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.174	0.260	0.039	0.068	0.000	0.000	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	0.002	0.027	0.260																								
24-Jun	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	0.002	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003																							
25-Jun	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																							
26-Jun	0.000	0.000	0.000	Z	0.000	0.013	0.083	0.041	0.073	0.106	0.182	0.147	0.115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.182																								
27-Jun	0.000	0.000	0.141	0.231	Z	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.231																									
28-Jun	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																							
29-Jun	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jun	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																							
																								0.007	0.038	0.032	0.026	0.010	0.016	0.025	0.030	0.023	0.025	0.019	0.008	0.007	0.000	0.005	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	Diurnal Average		
																								0.132	0.647	0.403	0.231	0.236	0.294	0.366	0.302	0.173	0.214	0.258	0.147	0.115	0.000	0.118	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.117	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Ells River - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	610	91.73	91.73
0.006 - 0.05	13	1.95	93.68
0.06 - 0.1	23	3.46	97.14
> 0.1	19	2.86	100.00

Total Number of Valid Hours: 665

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - June 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	62	115	49	26	5	5	7	12	60	47	60	36	31	39	26	29	609
0.006 - 0.05	2	1	0	0	0	0	0	2	2	2	0	1	0	1	1	1	13
0.06 - 0.1	2	1	1	0	1	0	0	4	4	4	1	1	0	0	2	2	23
> 0.1	1	1	0	0	0	0	0	7	3	0	0	0	0	1	3	3	19
Totals	67	118	50	26	6	5	7	25	69	53	61	38	31	41	32	35	664

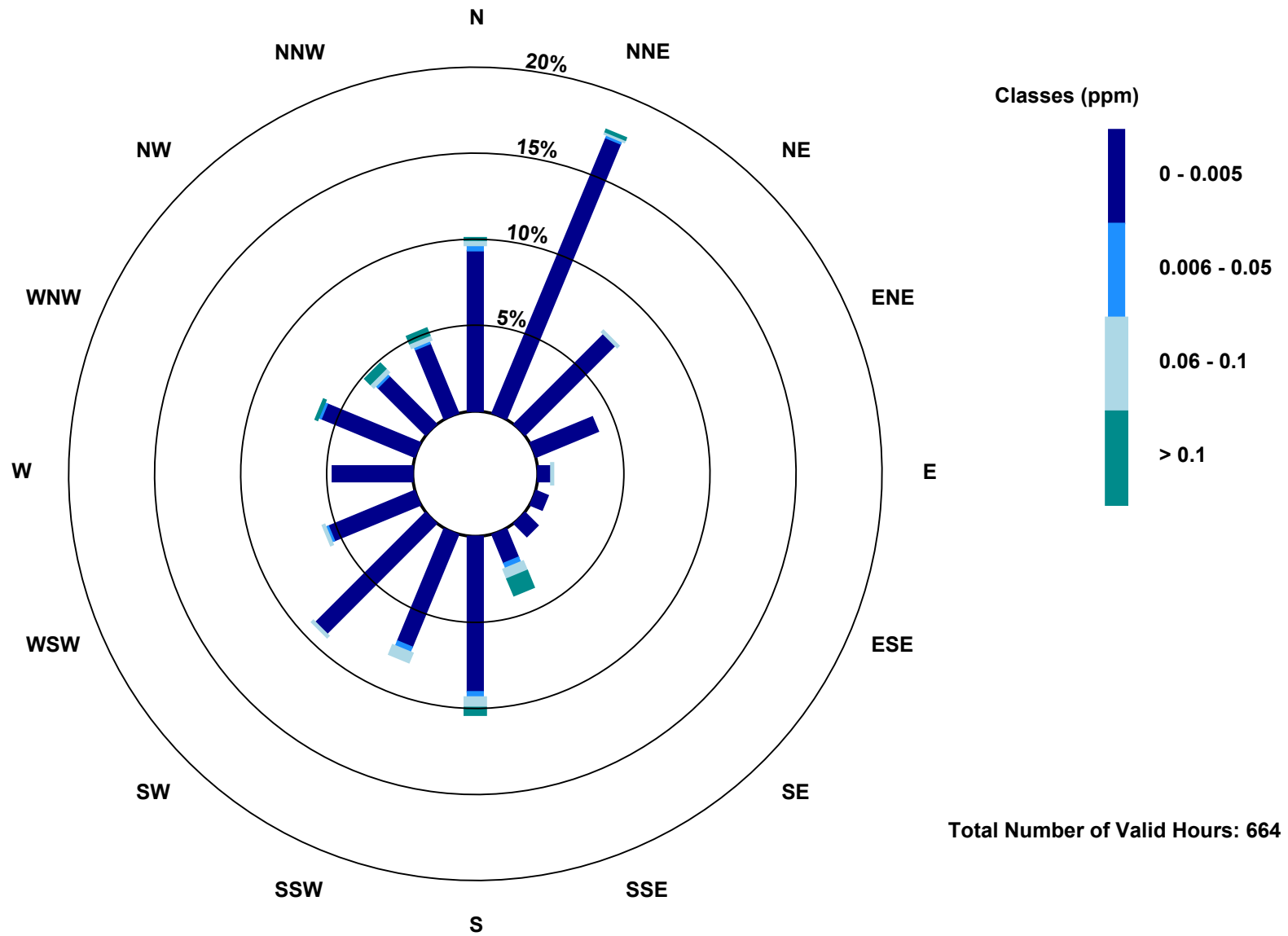
Total Number of Valid Hours: 664

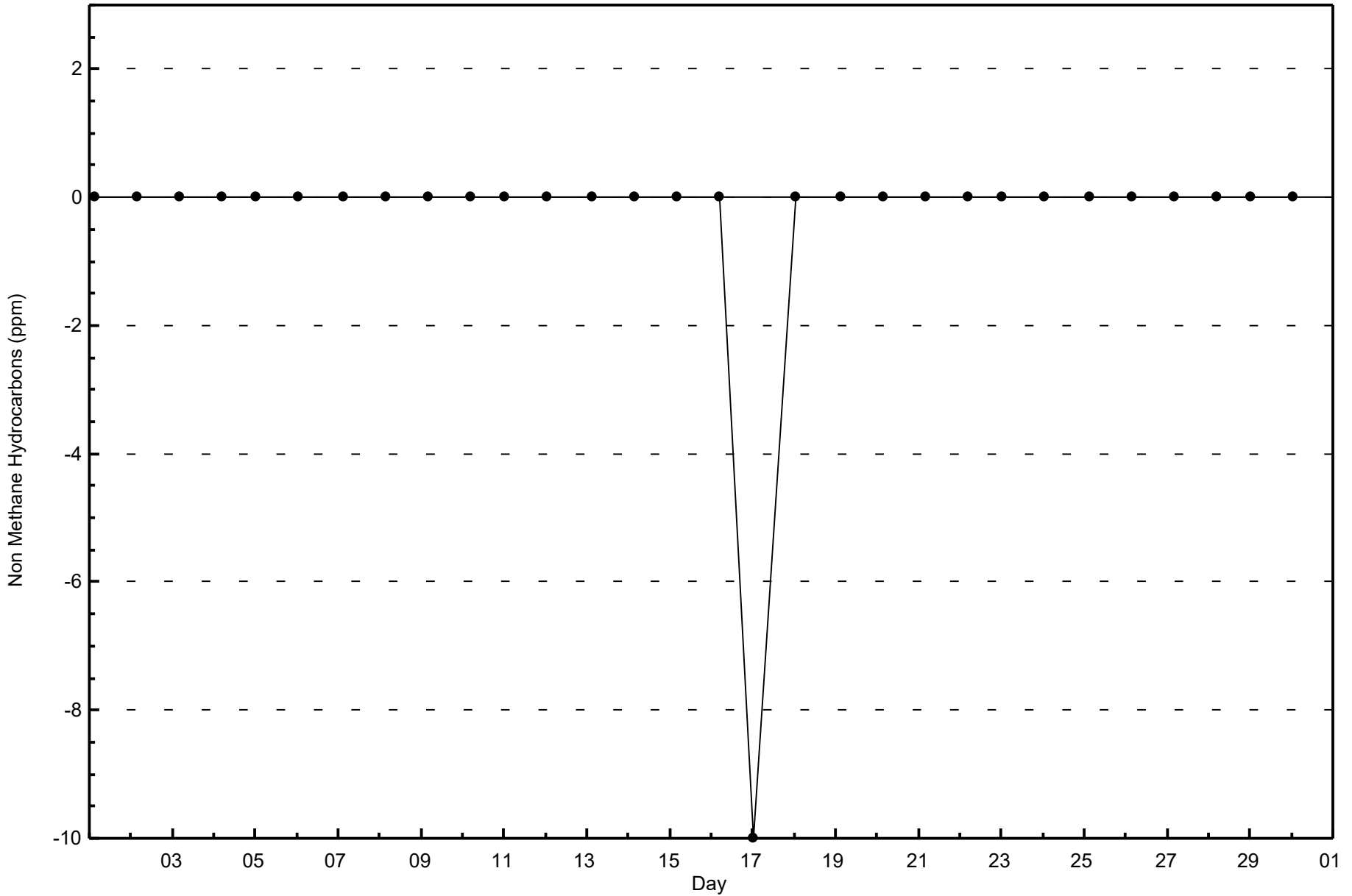
Total Number of Hours: 720

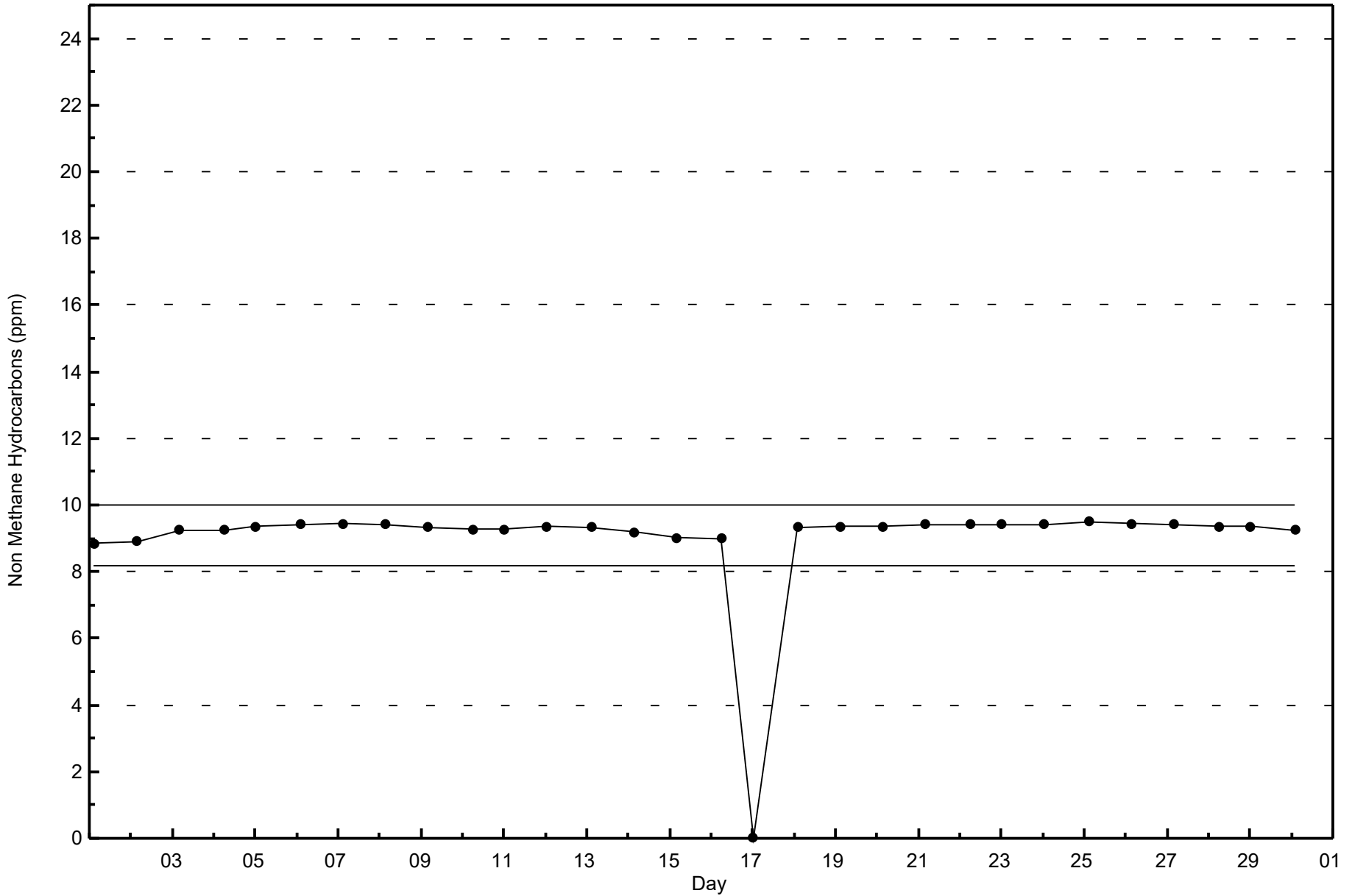


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Non Methane Hydrocarbons (NMHC) - ppm
Ells River









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

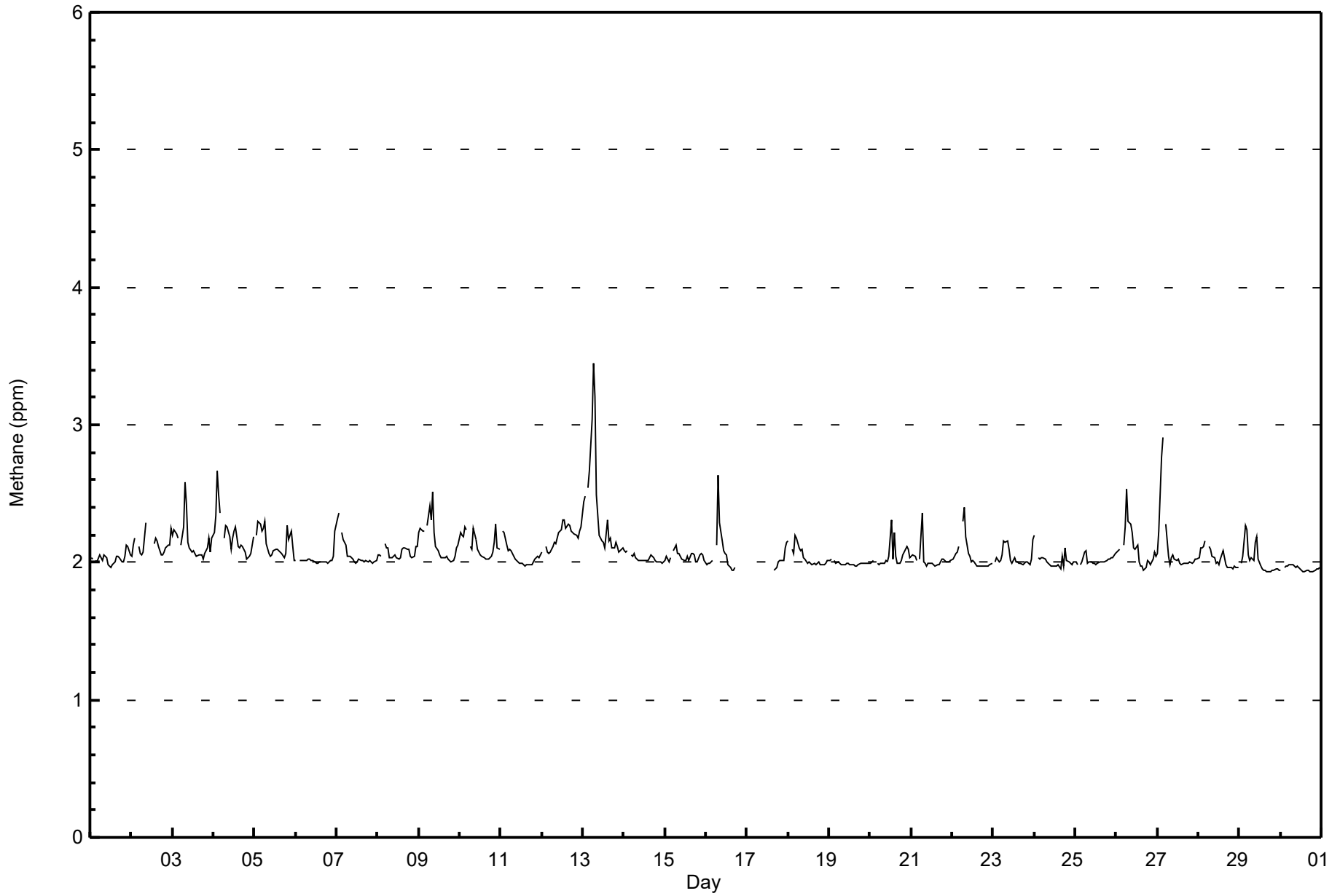
Ells River - June 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum																													
Maximum Value: 3.4 ppm on Jun 13 07:00		Maximum Daily Average: 2.4 ppm on Jun 13		Hours of Data: 665														2.0		2.1																															
Minimum Value: 1.9 ppm on Jun 30 19:00		Minimum Daily Average: 2.0 ppm on Jun 30		Hours of Missing Data: 55														2.1		2.3																															
Maximum Diurnal Average: 2.2 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Calibration: 33														2.2		2.6																															
Monthly Average: 2.08 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.6		Hours of Operational Time: 96.9														2.2		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-Jun	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1																							
2-Jun	2.0	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.3	C	C	C	C	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	2.1	2.2																							
3-Jun	2.2	2.2	2.2	2.2	Z	2.1	2.3	2.6	2.4	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.6																							
4-Jun	2.2	2.3	2.7	2.5	2.4	Z	2.2	2.3	2.3	2.2	2.1	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.7																							
5-Jun	Z	2.2	2.3	2.3	2.2	2.2	2.3	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.3	2.2	2.2	2.1	2.0	2.1	2.3	2.3																							
6-Jun	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	2.2	2.0	2.2	2.2																							
7-Jun	2.3	2.4	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.4																							
8-Jun	2.1	2.1	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1																							
9-Jun	2.2	2.2	2.2	2.2	Z	2.3	2.4	2.3	2.5	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.5	2.5																							
10-Jun	2.2	2.2	2.2	2.3	2.2	Z	2.1	2.1	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	2.3	2.1	2.1	2.1	2.3	2.3																							
11-Jun	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.2																							
12-Jun	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3																							
13-Jun	2.4	2.5	Z	2.5	2.7	3.0	3.4	3.2	2.5	2.2	2.2	2.2	2.2	2.1	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	3.4	3.4																							
14-Jun	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1																							
15-Jun	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1																							
16-Jun	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.6	2.3	2.2	2.1	2.1	2.1	2.0	2.0	1.9	1.9	2.0	PF	PF	PF	PF	PF	PF	PF	--	2.6																								
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	1.9	2.0	2.0	2.0	2.0	2.1	2.1	--	2.1	2.1																								
18-Jun	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2																							
19-Jun	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
20-Jun	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.3	2.3																							
21-Jun	2.0	2.1	2.0	2.0	Z	2.0	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.4																							
22-Jun	2.0	2.0	2.1	2.1	2.1	Z	2.3	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	2.0	2.0	2.4	2.4																							
23-Jun	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.2	2.2																							
24-Jun	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2																							
25-Jun	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1																							
26-Jun	2.1	2.1	2.1	Z	2.1	2.3	2.5	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.5	2.5																							
27-Jun	2.1	2.2	2.8	2.9	Z	2.3	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.9	2.9																							
28-Jun	2.0	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2																							
29-Jun	Z	2.0	2.0	2.3	2.2	2.1	2.0	2.0	2.0	2.2	2.2	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	2.3	2.3																							
30-Jun	1.9	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0																							
																								2.1	2.1	2.1	2.2	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	2.0	2.0	2.0	2.1	Diurnal Average		
																								2.4	2.5	2.8	2.9	2.7	3.0	3.4	3.2	2.5	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.3	Diurnal Maximum	
Z - zerspan			C - Calibration			PF - Power Failure																																													



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Ells River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Ells River - June 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	387	58.20	58.20
2.1 - 3.0	276	41.50	99.70
3.1 - 10.0	2	0.30	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 665

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Ells River - June 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	37	70	27	15	4	3	5	12	30	34	51	29	21	27	11	10	386
2.1 - 3.0	30	48	23	11	2	2	2	13	39	19	10	9	10	14	20	24	276
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	118	50	26	6	5	7	25	69	53	61	38	31	41	32	35	664

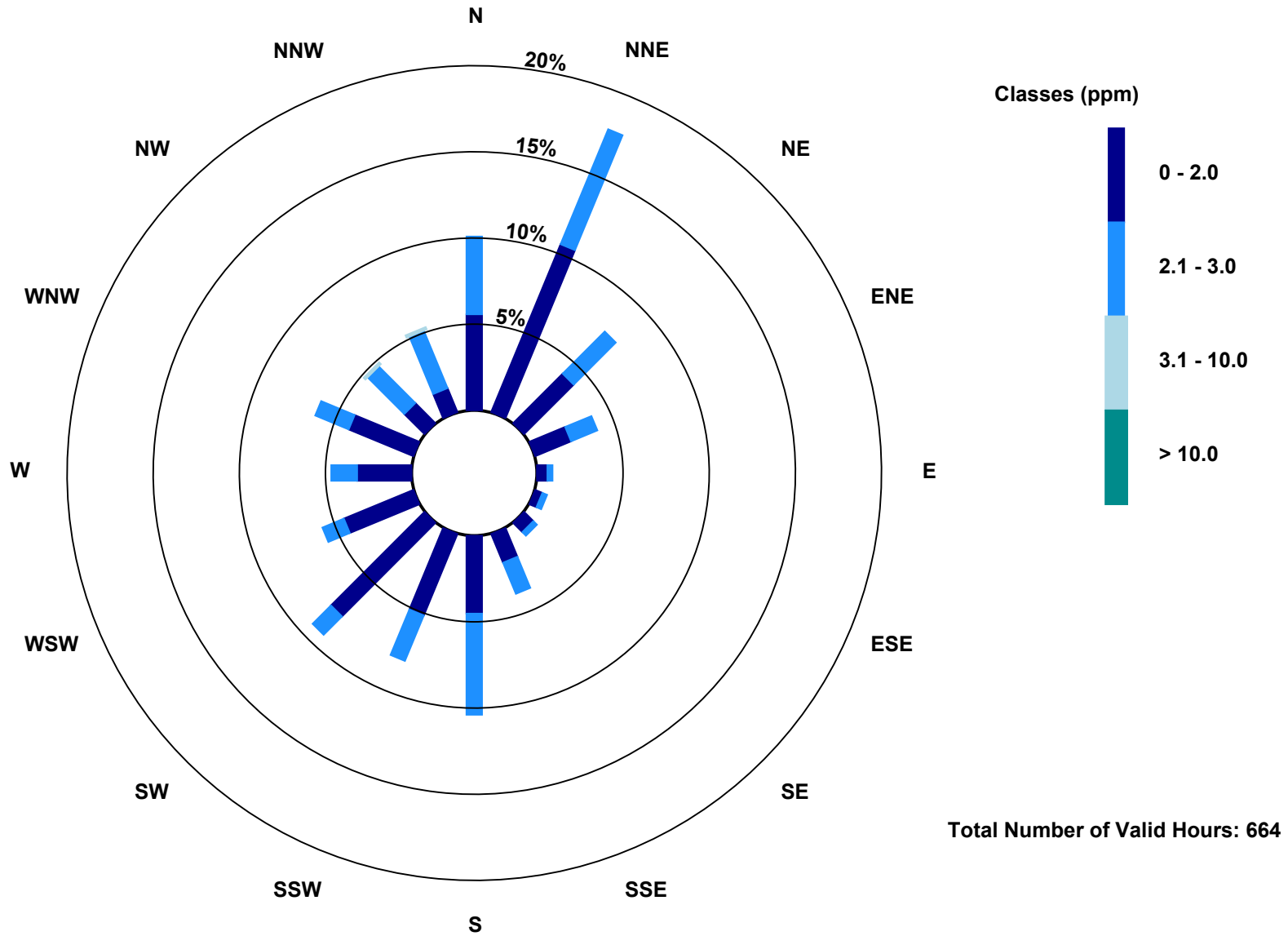
Total Number of Valid Hours: 664

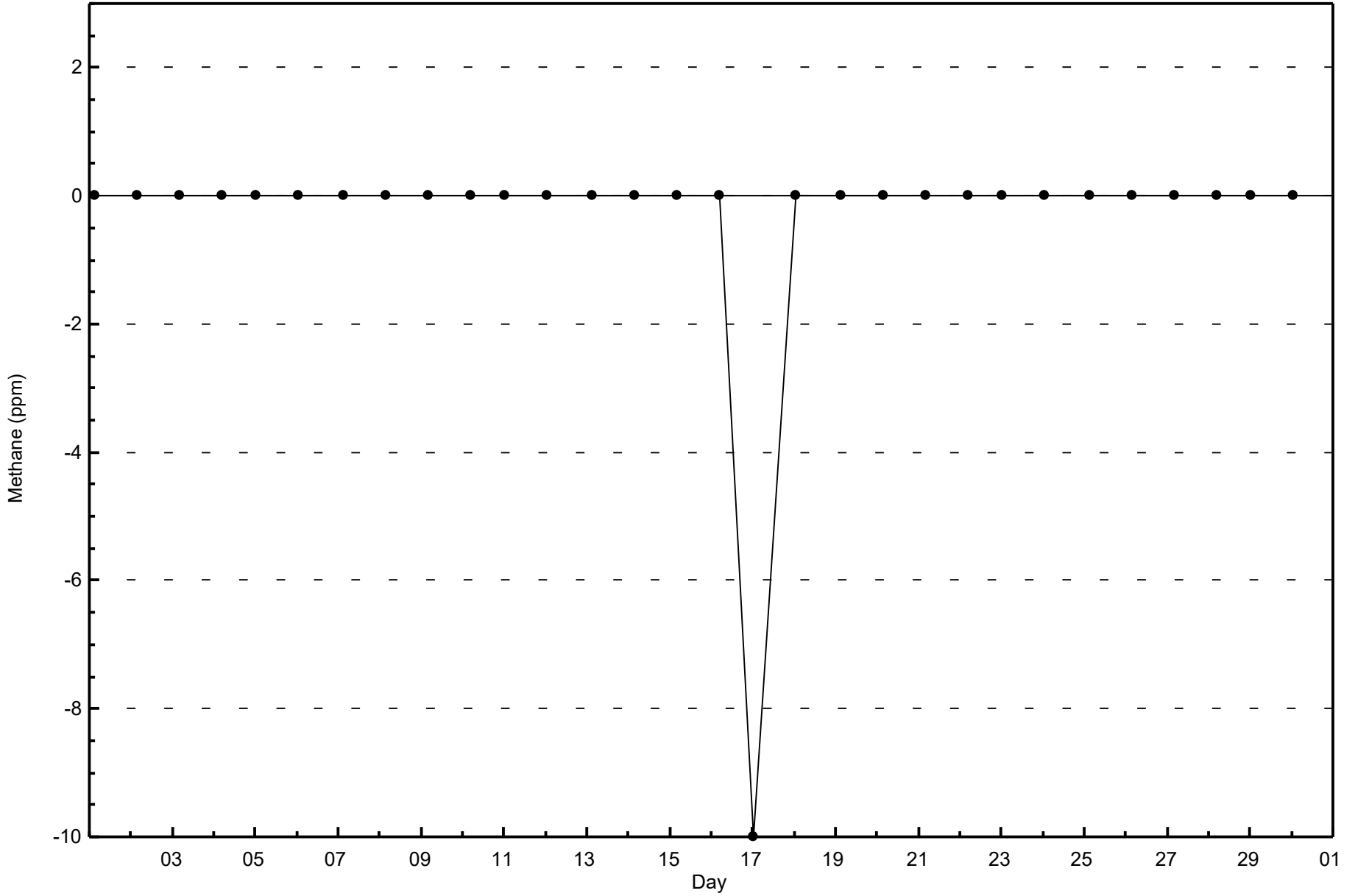
Total Number of Hours: 720

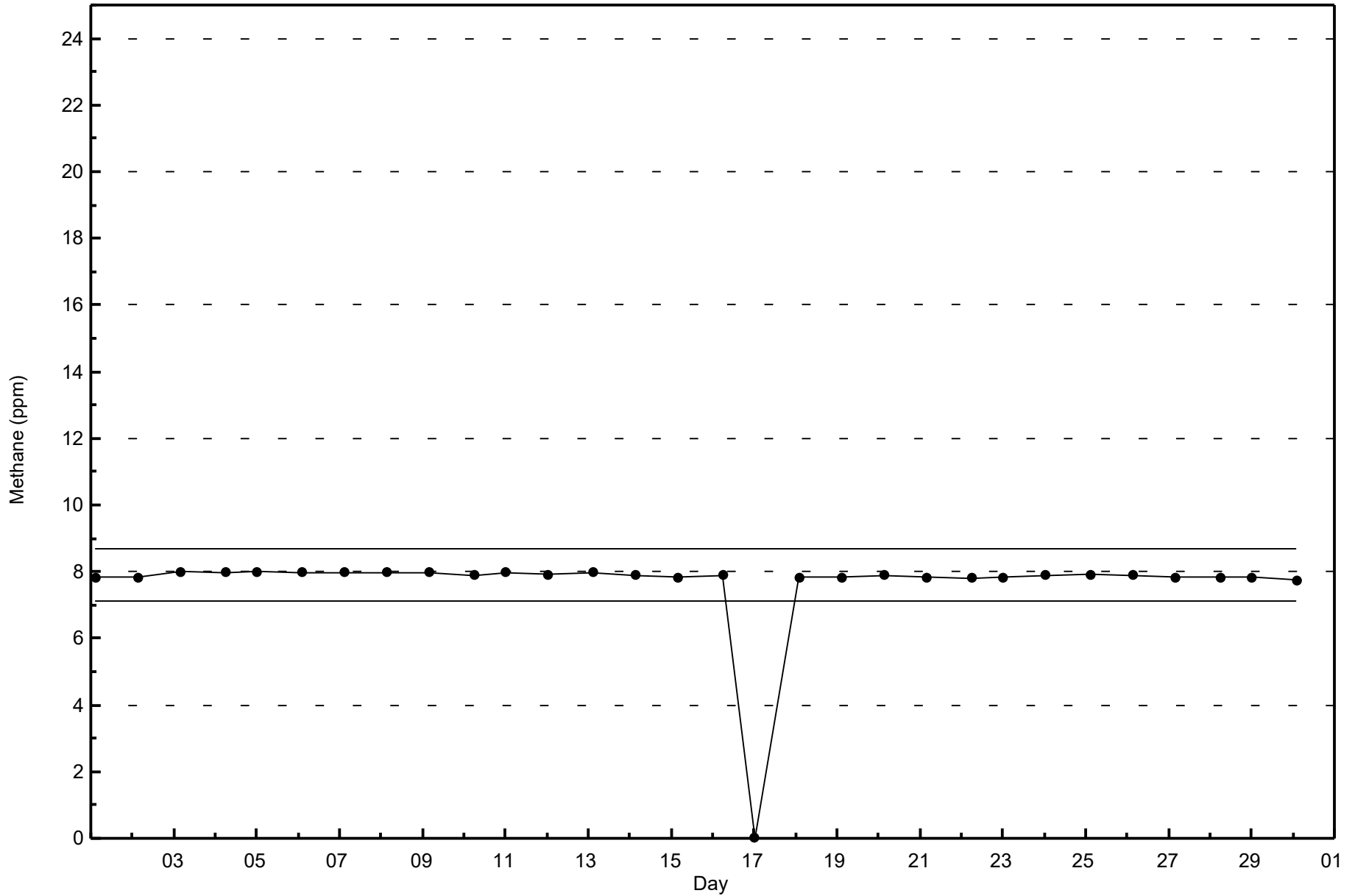


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Methane (CH₄) - ppm
Ells River









Wood Buffalo Environmental Association
Summary of Hour Averages

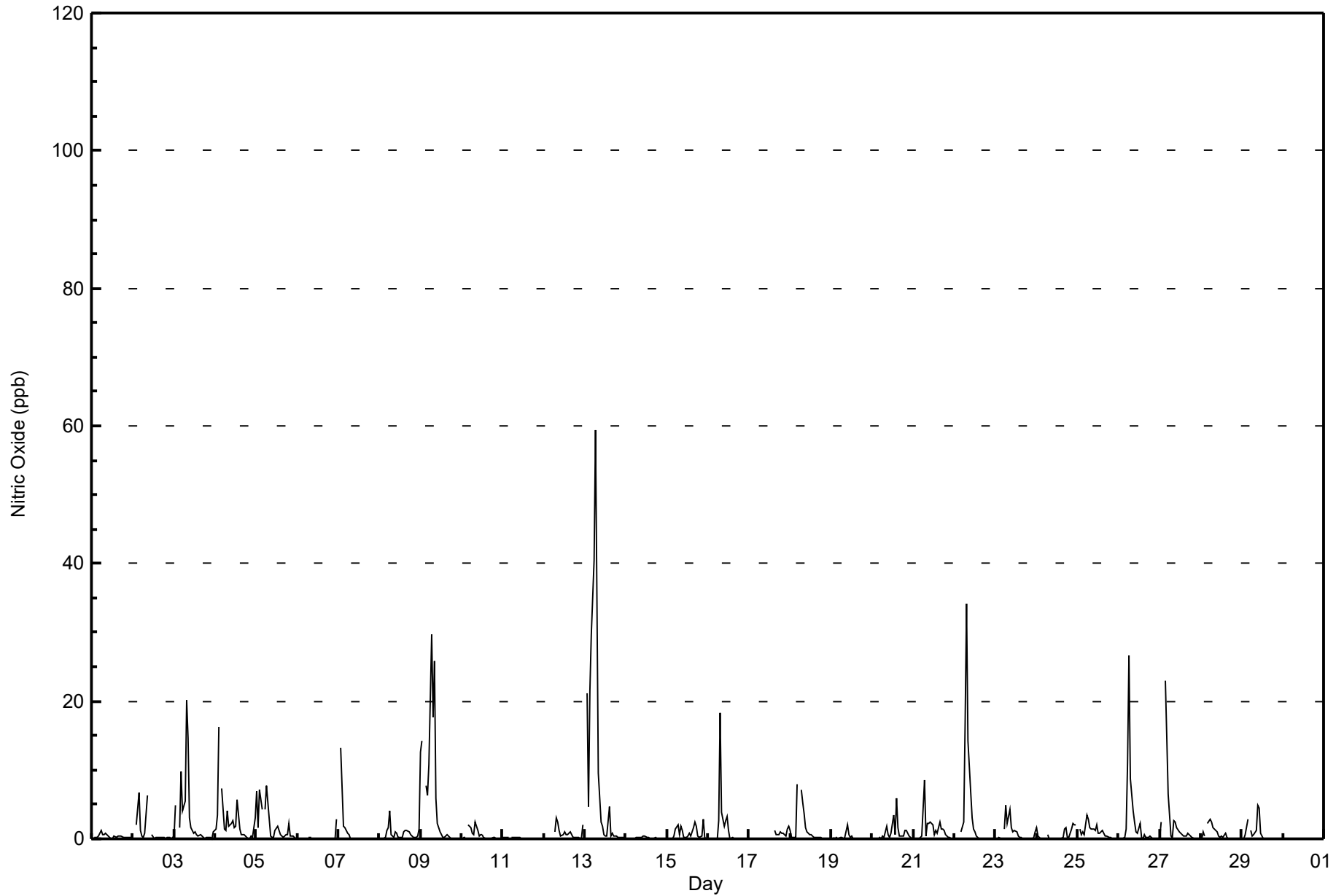
Nitric Oxide (NO) - ppb
Ells River - June 2023

Maximum Value: 59.5 ppb on Jun 13 07:00		Maximum Daily Average: 10.2 ppb on Jun 13		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Jun 3 19:00		Minimum Daily Average: 0.0 ppb on Jun 30		Hours of Data: 663																							
Maximum Diurnal Average: 6.5 ppb at hour 7		Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Missing Data: 57																							
Monthly Average: 1.65 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.2 P ₉₀ = 3.1 P ₉₉ = 26.2		Hours of Calibration: 34																							
				Percent Operational Time: 96.8																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	Z	0.2	0.2	0.2	0.3	1.3	0.6	0.5	0.7	0.4	0.2	0.1	0.1	0.3	0.3	0.4	0.4	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.3	1.3	
2-Jun	0.1	Z	2.0	6.7	1.1	0.4	0.2	0.9	6.3	M	M	0.5	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	1.0	6.7	
3-Jun	0.4	5.0	Z	1.6	9.7	4.1	5.5	20.2	14.6	3.1	1.6	0.9	1.1	0.7	0.4	0.6	0.5	0.3	0.0	0.3	0.2	0.1	0.0	1.1	3.1	20.2	
4-Jun	1.5	3.4	16.2	Z	7.2	1.4	1.3	4.0	1.9	2.3	2.6	1.7	1.9	5.7	1.3	0.6	0.7	0.6	0.2	0.0	0.0	0.4	0.2	3.1	2.5	16.2	
5-Jun	6.9	1.6	7.2	4.3	Z	4.2	7.8	5.2	0.4	0.2	0.1	1.2	1.8	1.2	0.6	0.4	0.2	0.7	0.7	2.3	0.4	0.3	0.2	0.0	2.1	7.8	
6-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.2	0.1	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.9	0.2	2.9	
7-Jun	Z	13.2	7.5	1.9	1.7	0.7	0.5	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	1.1	13.2	
8-Jun	0.0	Z	0.1	0.3	1.3	1.6	4.1	0.7	0.3	0.9	0.7	0.3	0.1	0.2	1.1	1.2	1.2	1.0	0.7	0.3	0.1	0.1	0.4	1.4	0.8	4.1	
9-Jun	12.5	14.1	Z	7.7	6.3	10.7	29.6	17.7	25.9	6.0	2.2	0.9	0.5	0.2	0.2	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.1	5.9	29.6	
10-Jun	0.1	0.1	0.1	Z	2.1	1.6	0.9	0.6	2.4	1.3	0.5	0.5	0.5	0.2	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.5	2.4	
11-Jun	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	
12-Jun	0.1	0.1	0.1	0.1	0.1	Z	1.0	3.0	2.5	1.3	0.5	0.6	1.0	0.7	0.7	1.1	0.6	0.2	0.2	0.1	0.2	0.1	0.1	2.1	0.7	3.0	
13-Jun	Z	21.2	4.6	21.5	29.8	40.5	59.5	35.3	9.5	2.5	1.8	0.6	0.4	0.5	4.6	0.4	0.9	0.4	0.3	0.2	0.1	0.1	0.1	0.1	10.2	59.5	
14-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
15-Jun	0.0	0.0	Z	0.1	0.4	1.4	2.0	0.6	1.8	1.3	0.3	0.2	0.4	0.9	0.4	1.7	2.4	1.7	0.5	0.3	0.4	2.8	0.2	0.1	0.9	2.8	
16-Jun	0.0	0.0	0.0	Z	0.1	0.1	2.7	18.2	3.8	1.8	2.7	3.3	1.3	0.0	0.1	0.0	0.0	0.0	0.0	PF	PF	PF	PF	PF	PF	--	18.2
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	1.1	0.7	0.5	1.0	0.8	0.8	0.4	1.4	1.9	--	1.9	
18-Jun	1.2	0.2	0.1	0.1	7.9	Z	7.2	5.3	3.6	1.7	1.0	0.5	0.5	0.4	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.1	1.3	7.9	
19-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	2.0	0.6	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0	
20-Jun	0.0	Z	0.0	0.0	0.3	0.1	0.4	0.3	1.8	0.7	0.2	0.9	3.5	0.6	5.8	1.6	0.4	0.4	0.5	1.3	1.2	0.4	0.2	0.0	0.9	5.8	
21-Jun	0.0	0.0	Z	0.1	0.3	0.5	8.6	0.5	2.2	2.2	2.4	2.1	0.6	1.3	0.8	2.5	1.5	1.4	1.3	0.7	0.3	0.3	0.0	0.1	1.3	8.6	
22-Jun	0.0	0.0	0.0	Z	1.1	2.4	16.9	34.2	14.1	6.6	3.1	1.4	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.5	34.2	
23-Jun	0.1	0.1	0.1	0.1	Z	1.4	4.9	2.2	4.3	1.6	1.1	1.3	1.1	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.2	1.1	0.9	4.9	
24-Jun	1.7	0.3	0.1	0.0	0.0	Z	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.3	1.7	0.3	0.2	1.4	2.3	2.1	2.0	0.6	2.3	
25-Jun	Z	1.5	0.7	1.0	0.5	3.4	2.8	1.5	1.4	1.4	1.2	2.0	0.9	0.8	1.1	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	1.0	3.4	
26-Jun	0.0	Z	0.1	0.3	1.5	11.1	26.7	8.8	4.0	2.5	1.0	0.7	2.1	0.1	0.0	0.6	0.2	0.2	0.4	0.3	0.1	0.0	0.0	0.0	2.6	26.7	
27-Jun	0.1	2.4	Z	22.9	14.9	6.5	0.5	0.2	2.6	2.5	1.6	1.0	0.9	0.6	0.4	0.5	0.8	0.6	0.4	0.2	0.0	0.0	0.0	0.0	2.6	22.9	
28-Jun	0.0	0.9	0.4	Z	2.2	2.7	2.5	1.7	1.4	1.1	0.3	0.3	0.3	0.3	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.7	2.7	
29-Jun	0.0	0.0	0.7	2.9	Z	1.2	0.3	0.6	1.1	4.9	4.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	4.9	
30-Jun	0.0	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	0.0	0.0	0.1	
		1.0	2.7	1.7	3.0	3.6	4.1	6.5	5.6	3.7	1.8	1.1	0.8	0.7	0.6	0.7	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.6	Diurnal Average	
		12.5	21.2	16.2	22.9	29.8	40.5	59.5	35.3	25.9	6.6	4.5	3.3	3.5	5.7	5.8	2.5	2.4	1.7	1.3	2.3	1.4	2.8	2.1	3.1	Diurnal Maximum	
Z - zerspan		C - Calibration			M - Maintenance			PF - Power Failure																			



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Ells River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	652	98.34	98.34
21 - 40	9	1.36	99.70
41 - 80	2	0.30	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 663

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Ells River - June 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	64	117	50	26	6	5	7	24	73	51	57	34	32	41	30	34	651
21 - 40	1	0	0	0	0	0	0	2	0	1	0	1	0	0	2	2	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	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	65	117	50	26	6	5	7	26	73	52	57	35	32	42	33	36	662

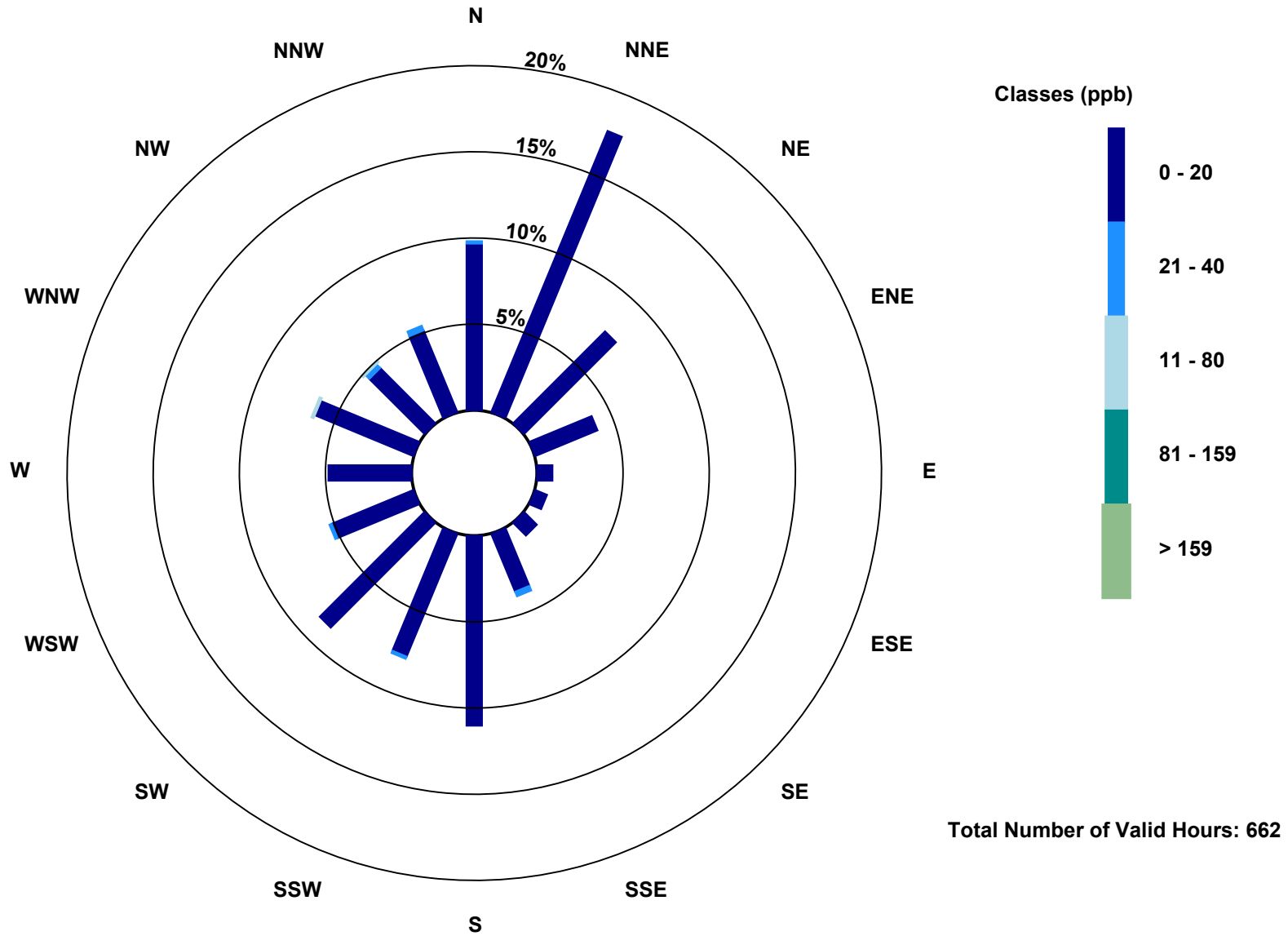
Total Number of Valid Hours: 662

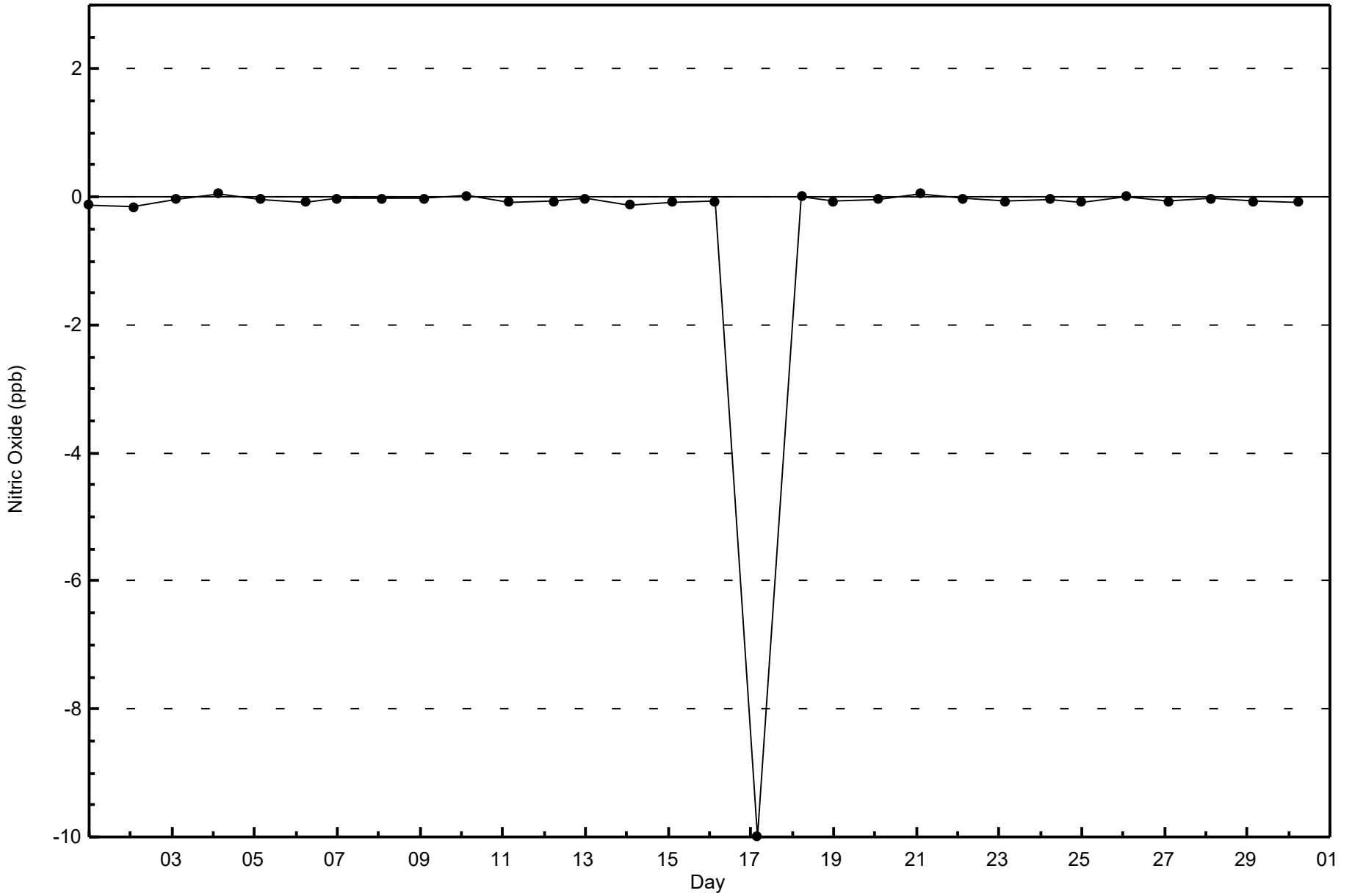
Total Number of Hours: 720

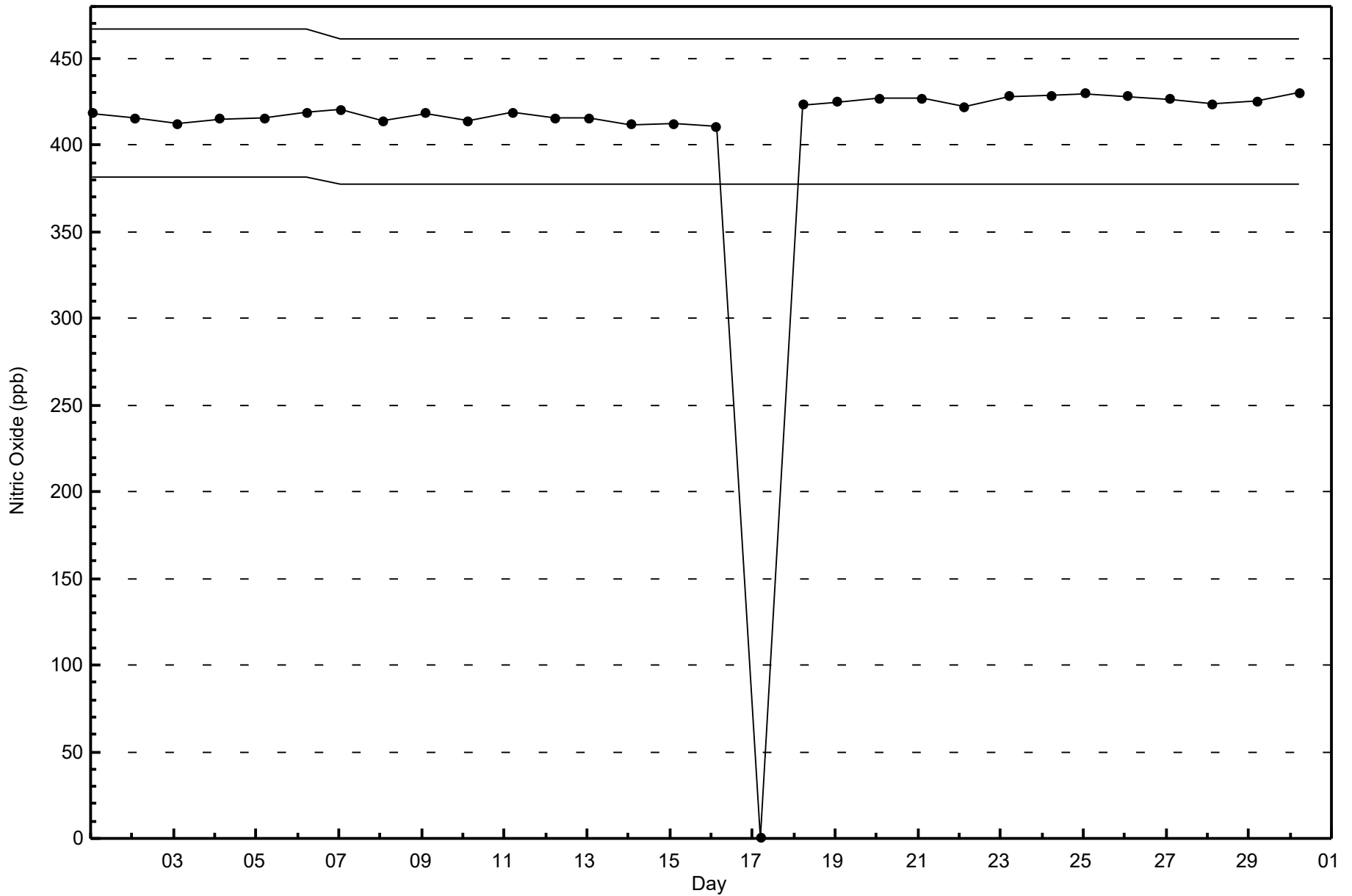


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Ells River









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Ells River - June 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 29.9 ppb on Jun 2 04:00	Maximum Daily Average: 13.2 ppb on Jun 3		Hours of Data:	663
Minimum Value: 0.2 ppb on Jun 6 09:00	Minimum Daily Average: 0.7 ppb on Jun 30		Hours of Missing Data:	57
Maximum Diurnal Average: 6.9 ppb at hour 2	Minimum Diurnal Average: 2.6 ppb at hour 14		Hours of Calibration:	34
Monthly Average: 4.62 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 1.1 Median = 3.0 Q ₃ = 6.2 P ₉₀ = 10.8 P ₉₉ = 24.3		Percent Operational Time:	96.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	Z	4.8	3.1	2.7	2.5	5.7	2.4	2.4	4.5	3.3	2.2	1.1	0.6	2.3	3.1	6.4	6.1	5.3	3.4	3.6	7.6	14.9	13.6	11.8	4.9	14.9
2-Jun	10.5	Z	23.7	29.9	19.0	5.3	2.5	4.4	20.1	M	M	10.2	5.5	7.0	9.9	8.5	5.6	4.2	4.7	4.9	10.7	14.4	13.6	21.5	11.2	29.9
3-Jun	18.8	29.0	Z	20.5	26.9	18.3	14.4	25.0	24.9	10.5	6.4	4.2	4.2	3.3	2.8	3.9	3.9	3.9	1.6	7.4	11.2	20.8	13.0	29.7	13.2	29.7
4-Jun	24.4	24.2	22.3	Z	20.9	14.7	10.2	13.6	10.1	7.2	6.5	5.6	5.4	6.0	3.3	3.3	4.7	4.9	2.8	0.7	0.9	2.6	1.9	7.3	8.8	24.4
5-Jun	9.4	3.5	6.3	2.4	Z	3.8	6.2	4.4	1.0	0.6	0.8	2.8	4.0	3.7	2.9	3.1	4.1	5.0	4.5	11.7	7.7	8.6	5.4	0.6	4.5	11.7
6-Jun	0.5	0.4	0.3	0.3	0.3	Z	0.3	0.2	0.2	C	C	C	C	C	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	6.2	17.7	1.6	17.7
7-Jun	Z	12.4	7.7	4.2	4.9	3.1	0.7	0.5	0.8	0.8	0.6	0.5	1.2	2.0	1.6	1.4	1.3	1.2	0.8	0.8	0.5	0.4	0.4	0.4	2.1	12.4
8-Jun	3.4	Z	3.4	6.0	7.9	6.0	8.2	1.8	1.2	2.9	3.1	2.1	1.7	2.1	5.4	6.4	6.6	7.1	6.8	4.8	2.8	9.5	15.8	13.8	5.6	15.8
9-Jun	15.3	12.4	Z	6.7	4.1	4.7	13.8	12.6	19.3	11.9	6.3	4.9	3.6	2.3	3.2	5.9	5.3	6.6	3.8	1.5	2.0	2.8	6.5	5.6	7.0	19.3
10-Jun	11.4	6.1	4.2	Z	5.2	4.5	5.9	5.0	9.7	7.0	4.6	5.0	5.1	2.7	2.6	2.6	2.2	2.2	3.3	7.8	9.9	11.1	5.8	3.3	5.5	11.4
11-Jun	3.4	4.4	6.2	4.0	Z	2.2	1.7	1.3	1.3	1.0	0.9	0.7	0.6	0.3	0.3	0.4	0.3	0.3	0.3	1.8	1.3	2.8	1.3	4.5	1.8	6.2
12-Jun	5.7	5.0	4.7	2.3	1.8	Z	5.8	9.5	7.8	7.5	6.8	7.1	10.6	10.7	10.8	10.8	9.1	6.8	6.6	4.8	9.7	8.4	13.4	15.7	7.9	15.7
13-Jun	Z	18.8	14.1	14.3	14.0	13.8	15.7	19.3	17.2	9.1	8.8	7.7	6.6	4.3	17.4	9.2	8.9	3.4	6.4	5.6	3.9	1.9	4.0	3.1	9.9	19.3
14-Jun	2.1	Z	3.3	1.3	0.7	0.5	0.8	0.7	0.7	0.3	0.5	0.7	0.6	0.5	0.3	0.5	0.6	0.7	0.3	0.4	0.5	0.3	0.2	0.3	0.7	3.3
15-Jun	0.6	3.7	Z	3.8	9.3	8.7	7.5	3.3	7.8	6.4	1.3	0.8	1.5	2.7	1.4	4.0	4.9	4.6	2.2	1.8	3.8	4.2	1.6	0.6	3.8	9.3
16-Jun	0.3	0.2	0.2	Z	0.4	0.2	2.7	8.9	5.6	4.6	6.4	8.6	4.7	0.7	0.6	0.7	0.6	0.7	PF	PF	PF	PF	PF	PF	--	8.9
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	1.6	0.9	1.4	4.8	5.7	9.2	11.2	14.0	14.8	--	14.8
18-Jun	10.2	3.5	1.6	1.0	4.0	Z	6.9	7.0	6.2	3.9	2.2	1.4	1.5	1.3	1.1	1.1	0.9	1.1	1.5	0.7	0.9	0.7	2.2	5.9	2.9	10.2
19-Jun	Z	6.4	5.3	5.4	1.9	1.9	1.3	0.7	1.2	1.9	3.1	1.9	1.2	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.8	1.7	6.4
20-Jun	0.9	Z	1.0	0.9	1.6	1.0	1.4	1.0	1.8	1.9	1.9	5.8	12.1	2.8	11.3	4.2	1.4	2.7	3.9	9.3	10.2	10.8	6.9	1.8	4.2	12.1
21-Jun	2.8	4.4	Z	1.6	4.2	2.2	10.7	1.8	2.1	2.5	3.0	2.4	1.2	1.4	1.0	2.5	2.8	2.5	4.4	4.2	4.5	5.8	4.0	2.1	3.2	10.7
22-Jun	1.3	1.2	1.5	Z	2.0	1.8	6.7	14.9	15.2	12.8	7.2	5.2	4.5	2.6	1.0	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.7	3.7	15.2
23-Jun	0.6	0.6	1.2	0.8	Z	2.1	7.5	5.8	9.2	5.2	4.7	5.6	5.7	3.0	2.7	2.0	1.8	1.7	2.1	2.2	2.1	1.7	2.1	10.6	3.5	10.6
24-Jun	12.2	7.4	1.5	0.7	0.8	Z	2.5	0.8	0.7	0.8	0.8	0.7	0.6	0.6	1.8	2.0	7.8	2.9	5.9	1.8	3.4	4.9	5.7	6.1	3.1	12.2
25-Jun	Z	3.2	3.2	1.9	4.2	8.9	6.4	3.3	2.9	2.4	2.2	3.6	2.2	2.5	3.2	3.0	2.5	2.8	3.0	3.3	3.3	2.6	2.1	1.6	3.2	8.9
26-Jun	2.0	Z	3.8	6.6	5.3	7.5	12.5	8.4	8.5	7.8	4.9	5.1	4.2	0.9	0.6	2.4	1.5	1.6	3.6	2.6	1.9	3.5	4.6	2.8	4.5	12.5
27-Jun	2.6	4.8	Z	8.2	11.8	8.5	1.4	0.7	5.1	5.8	4.5	4.0	3.6	2.7	2.7	2.9	4.1	3.7	3.4	3.7	2.8	2.5	2.1	1.9	4.1	11.8
28-Jun	1.8	7.3	11.1	Z	6.2	7.2	6.2	4.4	3.9	3.5	2.5	2.6	1.9	2.6	6.2	3.3	1.9	1.2	2.1	0.6	0.6	1.5	0.5	0.5	3.5	11.1
29-Jun	0.5	0.5	7.9	14.6	Z	4.4	1.5	2.1	3.3	8.9	9.8	3.7	1.4	0.8	0.7	0.8	0.7	0.6	0.7	0.7	0.7	0.8	0.8	0.7	2.9	14.6
30-Jun	0.5	0.5	0.5	0.5	0.5	Z	0.6	0.7	0.7	0.9	0.9	0.9	0.7	0.7	0.5	0.5	0.3	0.3	0.3	0.4	0.6	1.1	1.4	1.5	0.7	1.5

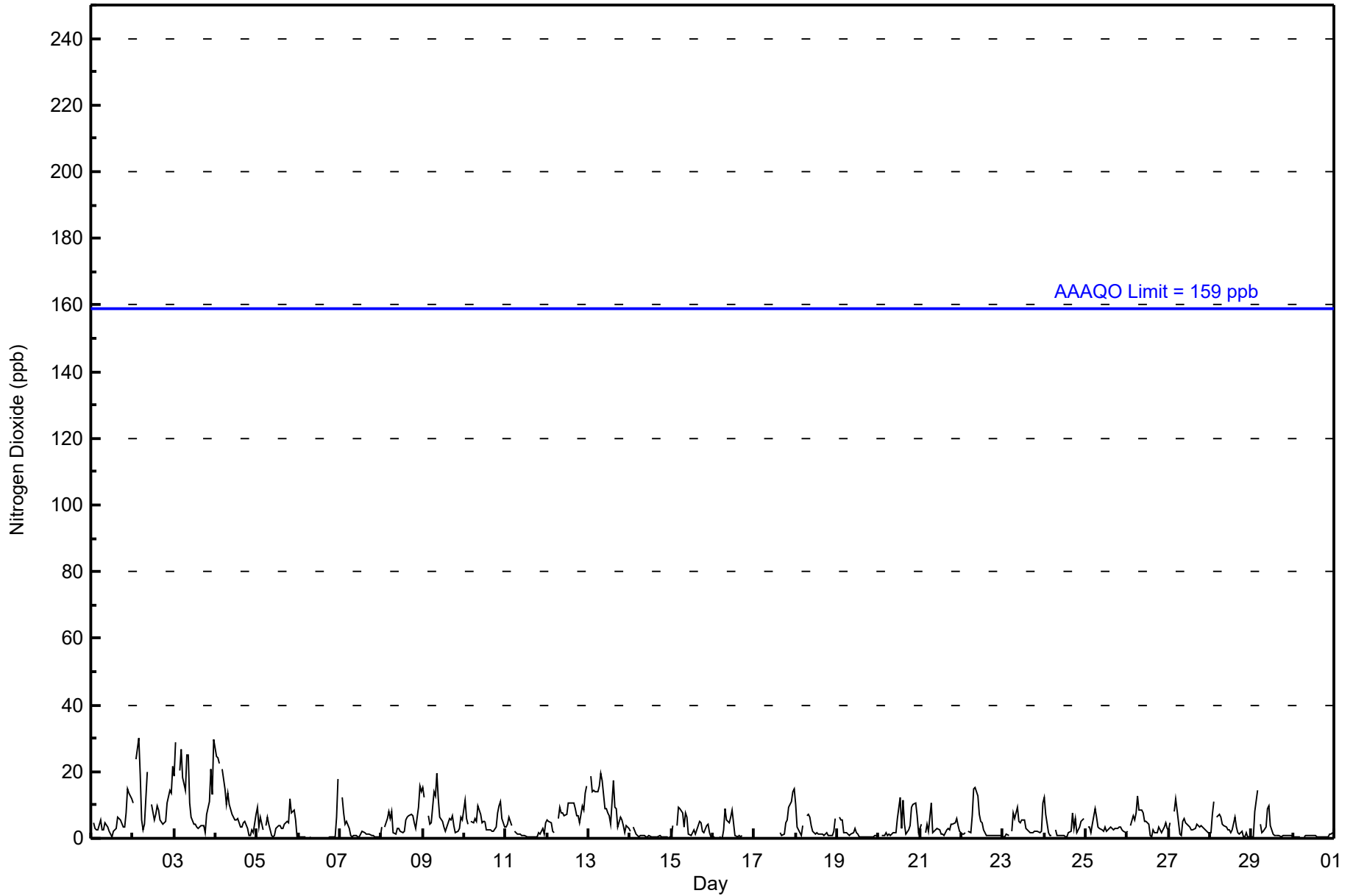
5.9	6.9	5.8	5.9	6.4	5.7	5.7	5.7	6.7	4.9	3.8	3.7	3.5	2.6	3.4	3.2	3.1	2.7	2.9	3.3	3.9	5.2	5.2	6.5	Diurnal Average	
24.4	29.0	23.7	29.9	26.9	18.3	15.7	25.0	24.9	12.8	9.8	10.2	12.1	10.7	17.4	10.8	9.1	7.1	6.8	11.7	11.2	20.8	15.8	29.7	Diurnal Maximum	

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
Ells River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	649	97.89	97.89
21 - 40	14	2.11	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: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	59	114	50	26	6	5	7	26	73	52	57	35	32	42	30	34	648
21 - 40	6	3	0	0	0	0	0	0	0	0	0	0	0	0	3	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	65	117	50	26	6	5	7	26	73	52	57	35	32	42	33	36	662

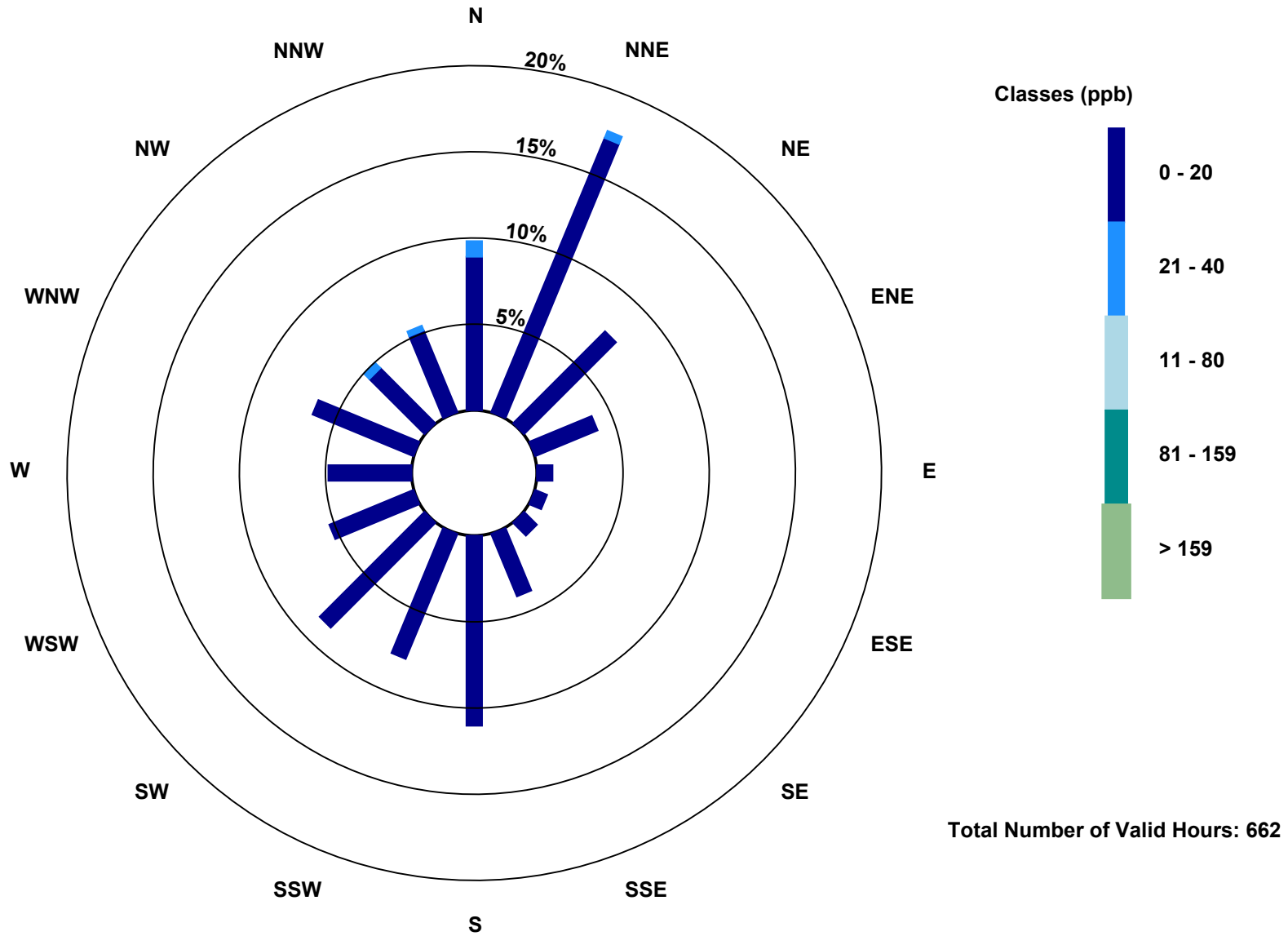
Total Number of Valid Hours: 662

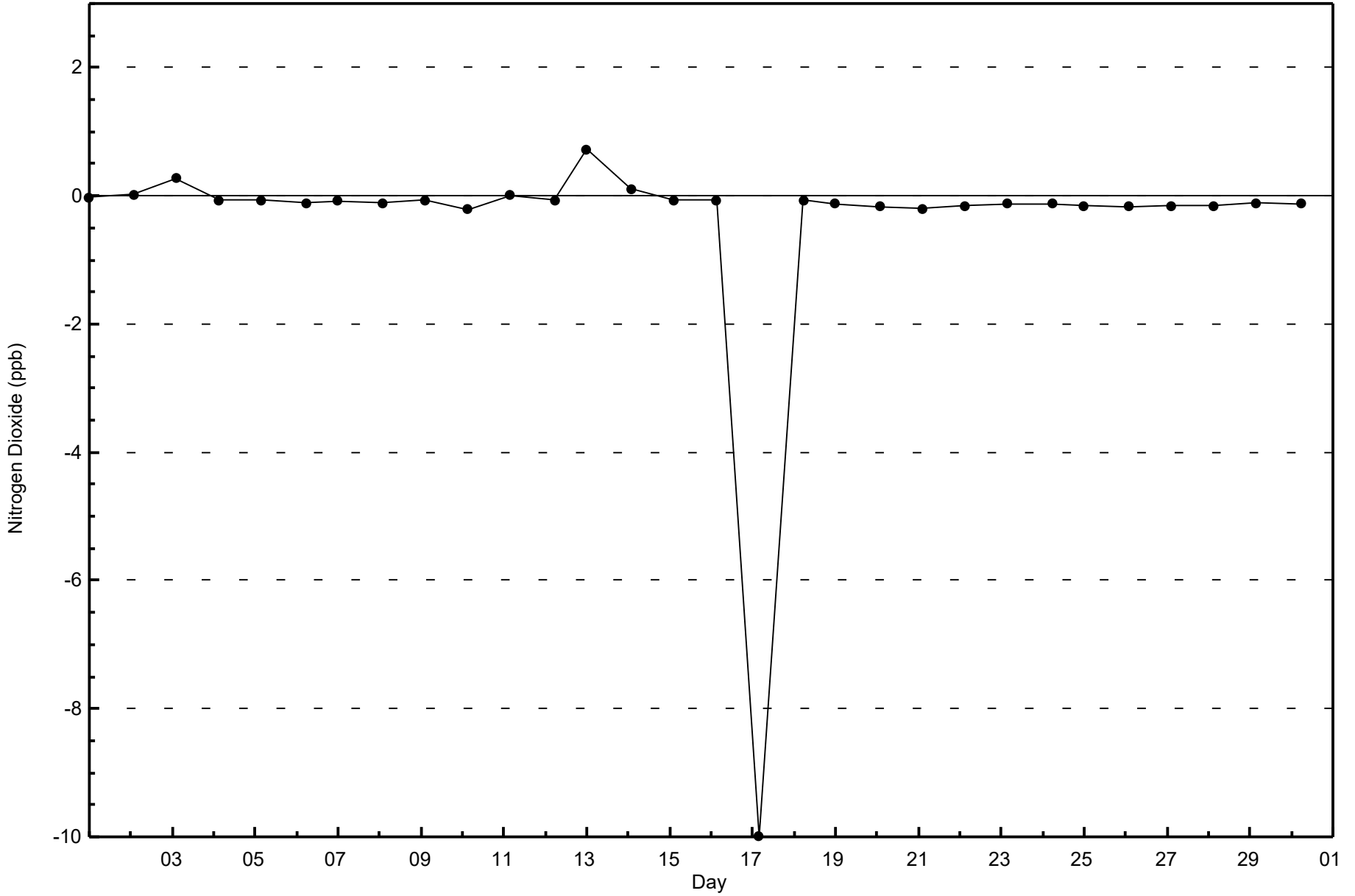
Total Number of Hours: 720

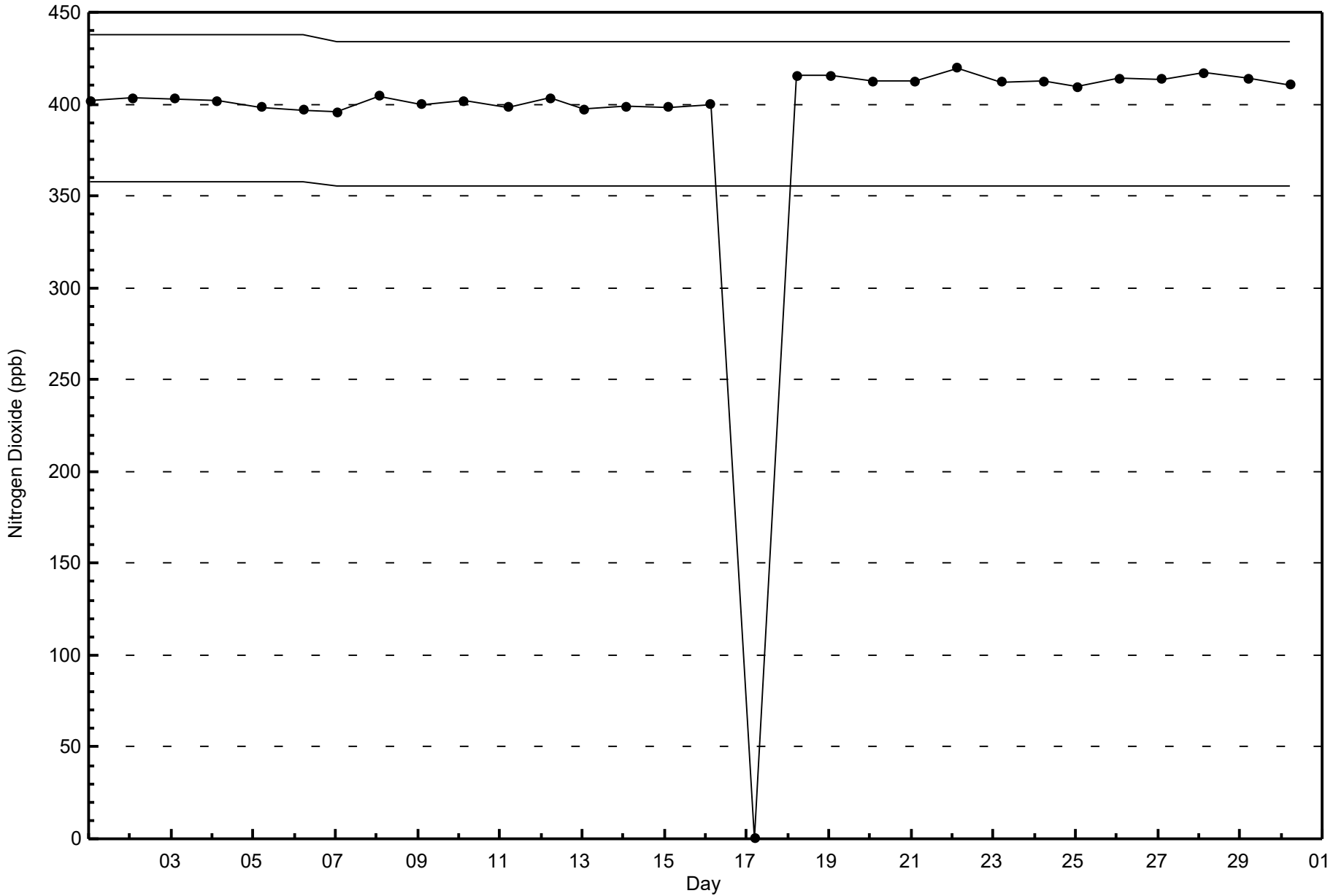


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Ells River









Wood Buffalo Environmental Association
Summary of Hour Averages

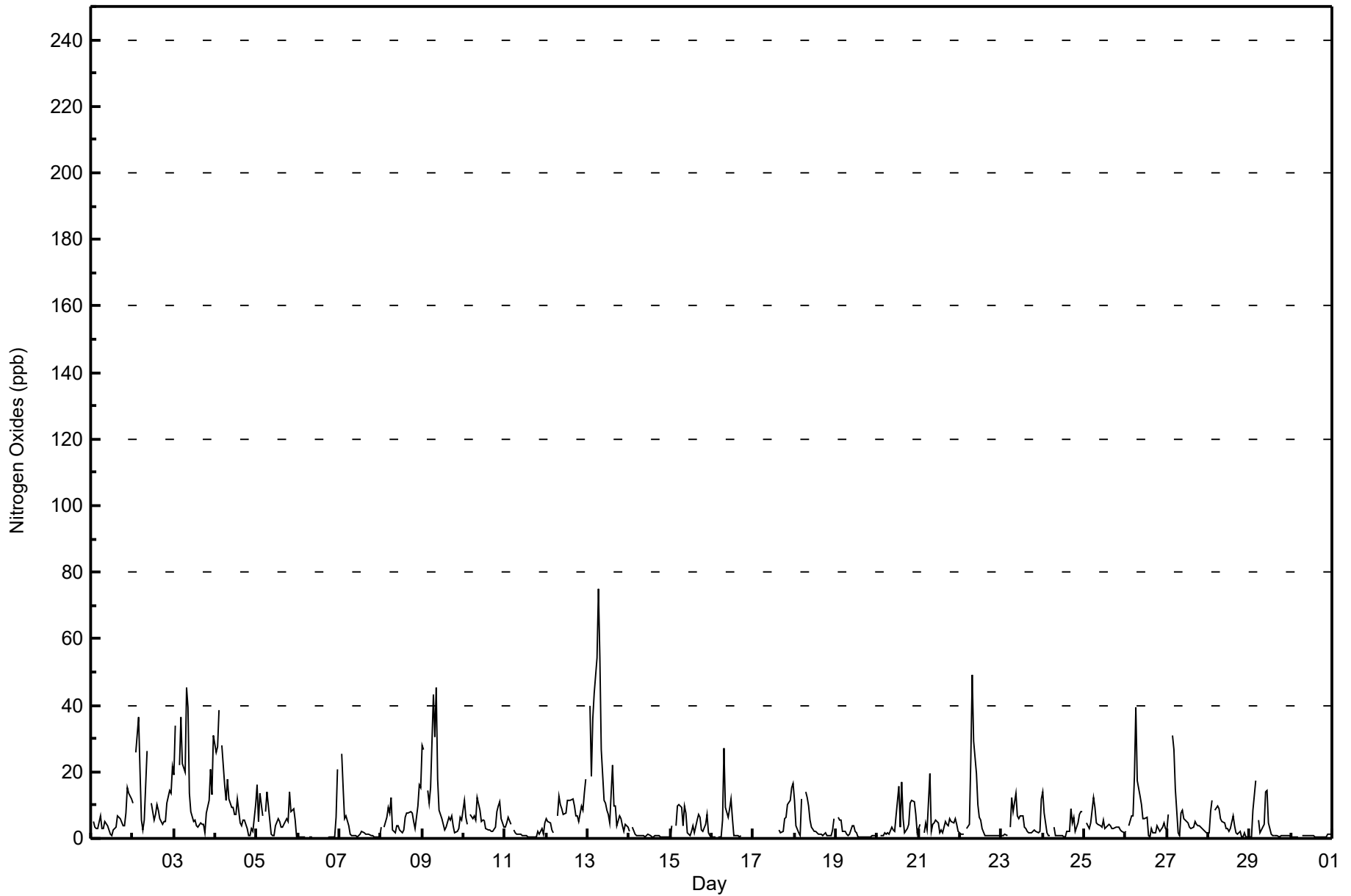
Nitrogen Oxides (NO_x) - ppb
Ells River - June 2023

Maximum Value: 75.2 ppb on Jun 13 07:00																						Maximum Daily Average: 20.1 ppb on Jun 13																						Hours in Service: 720	
Minimum Value: 0.2 ppb on Jun 6 15:00																						Minimum Daily Average: 0.7 ppb on Jun 30																						Hours of Data: 663	
Maximum Diurnal Average: 12.1 ppb at hour 7																						Minimum Diurnal Average: 3.1 ppb at hour 18																						Hours of Missing Data: 57	
Monthly Average: 6.27 ppb																						Percentiles: P ₁ = 0.3 P ₁₀ = 0.6 Q ₁ = 1.2 Median = 3.6 Q ₃ = 7.4 P ₉₀ = 14.0 P ₉₉ = 43.5																						Hours of Calibration: 34	
																						Percent Operational Time: 96.8																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																					
1-Jun	Z	5.0	3.3	2.9	2.8	7.0	3.0	2.9	5.2	3.7	2.4	1.2	0.7	2.6	3.4	6.8	6.5	5.7	3.6	3.7	7.8	15.1	13.8	12.0	5.3	15.1																			
2-Jun	10.6	Z	25.7	36.6	20.1	5.7	2.7	5.3	26.4	M	M	10.7	5.6	7.1	10.1	8.7	5.8	4.3	4.9	5.0	10.8	14.5	13.7	21.6	12.2	36.6																			
3-Jun	19.2	34.0	Z	22.1	36.6	22.4	19.9	45.2	39.5	13.6	8.0	5.1	5.3	4.0	3.2	4.5	4.4	4.2	1.6	7.7	11.4	20.9	13.0	30.8	16.4	45.2																			
4-Jun	25.9	27.6	38.5	Z	28.1	16.1	11.5	17.6	12.0	9.5	9.1	7.3	7.3	11.7	4.6	3.9	5.4	5.5	3.0	0.7	0.9	3.0	2.1	10.4	11.4	38.5																			
5-Jun	16.3	5.1	13.5	6.7	Z	8.0	14.0	9.6	1.4	0.8	0.9	4.0	5.8	4.9	3.5	3.5	4.3	5.7	5.2	14.0	8.1	8.9	5.6	0.6	6.5	16.3																			
6-Jun	0.5	0.4	0.3	0.3	0.3	Z	0.5	0.4	0.3	C	C	C	C	C	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	6.3	20.6	1.8	20.6																			
7-Jun	Z	25.6	15.2	6.1	6.6	3.8	1.2	0.6	0.8	0.8	0.6	0.6	1.2	2.0	1.6	1.4	1.3	1.2	0.8	0.8	0.5	0.4	0.4	0.4	3.2	25.6																			
8-Jun	3.4	Z	3.5	6.3	9.2	7.6	12.3	2.5	1.5	3.8	3.8	2.4	1.8	2.3	6.5	7.6	7.8	8.1	7.5	5.1	2.9	9.6	16.2	15.2	6.4	16.2																			
9-Jun	27.8	26.5	Z	14.4	10.4	15.4	43.4	30.3	45.2	17.9	8.5	5.8	4.1	2.5	3.4	6.4	5.7	6.9	3.9	1.5	2.0	2.8	6.5	5.7	12.9	45.2																			
10-Jun	11.5	6.2	4.3	Z	7.3	6.1	6.8	5.6	12.1	8.3	5.1	5.5	5.6	2.9	2.7	2.7	2.2	2.2	3.5	7.9	10.0	11.1	5.8	3.3	6.0	12.1																			
11-Jun	3.5	4.5	6.3	4.1	Z	2.4	1.8	1.4	1.4	1.1	1.0	0.8	0.7	0.3	0.3	0.4	0.3	0.3	0.3	1.9	1.3	2.8	1.4	4.6	1.9	6.3																			
12-Jun	5.8	5.1	4.8	2.4	1.9	Z	6.8	12.5	10.3	8.8	7.3	7.7	11.6	11.4	11.5	11.9	9.7	7.0	6.8	4.9	9.9	8.5	13.5	17.8	8.6	17.8																			
13-Jun	Z	40.0	18.7	35.8	43.8	54.3	75.2	54.6	26.7	11.6	10.6	8.3	7.0	4.8	22.0	9.6	9.8	3.8	6.7	5.8	4.0	2.0	4.1	3.2	20.1	75.2																			
14-Jun	2.2	Z	3.4	1.4	0.8	0.6	1.0	0.9	1.0	0.4	0.8	1.1	0.9	0.6	0.4	0.6	0.7	0.8	0.4	0.4	0.5	0.3	0.2	0.3	0.9	3.4																			
15-Jun	0.6	3.7	Z	3.9	9.7	10.1	9.5	3.9	9.6	7.7	1.6	1.0	1.9	3.6	1.8	5.7	7.3	6.3	2.7	2.1	4.2	7.0	1.8	0.7	4.6	10.1																			
16-Jun	0.3	0.2	0.2	Z	0.5	0.3	5.4	27.1	9.4	6.4	9.1	11.9	6.0	0.7	0.7	0.7	0.6	0.7	PF	PF	PF	PF	PF	PF	--	27.1																			
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	2.7	1.6	1.9	5.8	6.5	10.0	11.6	15.4	16.7	--	16.7																			
18-Jun	11.4	3.7	1.7	1.1	11.9	Z	14.1	12.3	9.8	5.6	3.2	1.9	2.0	1.7	1.3	1.3	1.0	1.3	1.7	0.7	0.9	0.7	2.3	6.0	4.2	14.1																			
19-Jun	Z	6.5	5.4	5.5	2.0	2.0	1.4	0.7	1.4	3.9	3.7	2.0	1.7	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.8	1.9	6.5																			
20-Jun	0.9	Z	1.0	0.9	1.9	1.1	1.8	1.3	3.6	2.6	2.1	6.7	15.6	3.4	17.1	5.8	1.8	3.1	4.4	10.6	11.4	11.2	7.1	1.8	5.1	17.1																			
21-Jun	2.8	4.4	Z	1.7	4.5	2.7	19.3	2.3	4.3	4.7	5.4	4.5	1.8	2.7	1.8	5.0	4.3	3.9	5.7	4.9	4.8	6.1	4.0	2.2	4.5	19.3																			
22-Jun	1.3	1.2	1.5	Z	3.1	4.2	23.6	49.1	29.3	19.4	10.3	6.6	5.4	3.0	1.0	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	7.2	49.1																			
23-Jun	0.7	0.7	1.3	0.9	Z	3.5	12.4	8.0	13.5	6.8	5.8	6.9	6.8	3.3	2.9	2.1	1.9	1.7	2.2	2.3	2.1	1.7	2.3	11.7	4.4	13.5																			
24-Jun	13.9	7.7	1.6	0.7	0.8	Z	3.2	0.9	0.7	0.8	0.8	0.7	0.6	0.6	1.9	2.2	9.1	4.6	6.2	2.0	4.8	7.2	7.8	8.1	3.8	13.9																			
25-Jun	Z	4.7	3.9	2.9	4.7	12.3	9.2	4.8	4.3	3.8	3.4	5.6	3.1	3.3	4.3	3.7	2.9	3.1	3.2	3.4	3.3	2.6	2.1	1.6	4.2	12.3																			
26-Jun	2.0	Z	3.9	6.9	6.8	18.6	39.2	17.2	12.5	10.3	5.9	5.8	6.3	1.0	0.6	3.0	1.7	1.8	4.0	2.9	2.0	3.5	4.6	2.8	7.1	39.2																			
27-Jun	2.7	7.2	Z	31.1	26.7	15.0	1.9	0.9	7.7	8.3	6.1	5.0	4.5	3.3	3.1	3.4	4.9	4.3	3.8	3.9	2.8	2.5	2.1	1.9	6.7	31.1																			
28-Jun	1.8	8.2	11.5	Z	8.4	9.9	8.7	6.1	5.3	4.6	2.8	2.9	2.2	2.9	6.9	3.6	1.9	1.2	2.1	0.6	0.6	1.6	0.5	0.5	4.1	11.5																			
29-Jun	0.5	0.5	8.6	17.5	Z	5.6	1.8	2.7	4.4	13.8	14.3	4.5	1.4	0.8	0.7	0.8	0.7	0.6	0.7	0.7	0.7	0.8	0.8	0.7	3.6	17.5																			
30-Jun	0.5	0.5	0.5	0.5	0.5	Z	0.7	0.7	0.8	0.9	0.9	0.9	0.7	0.7	0.5	0.5	0.3	0.3	0.3	0.4	0.6	1.1	1.4	1.5	0.7	1.5																			
																								Diurnal Average																					
																								Diurnal Maximum																					
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																																													



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Ells River - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Ells River - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	625	94.27	94.27
21 - 40	30	4.52	98.79
41 - 80	8	1.21	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Ells River - June 2023**

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	112	50	26	6	5	7	23	69	50	57	34	32	39	27	30	624
21 - 40	8	4	0	0	0	0	0	1	4	2	0	0	0	2	5	4	30
11 - 80	0	1	0	0	0	0	0	2	0	0	0	1	0	1	1	2	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	65	117	50	26	6	5	7	26	73	52	57	35	32	42	33	36	662

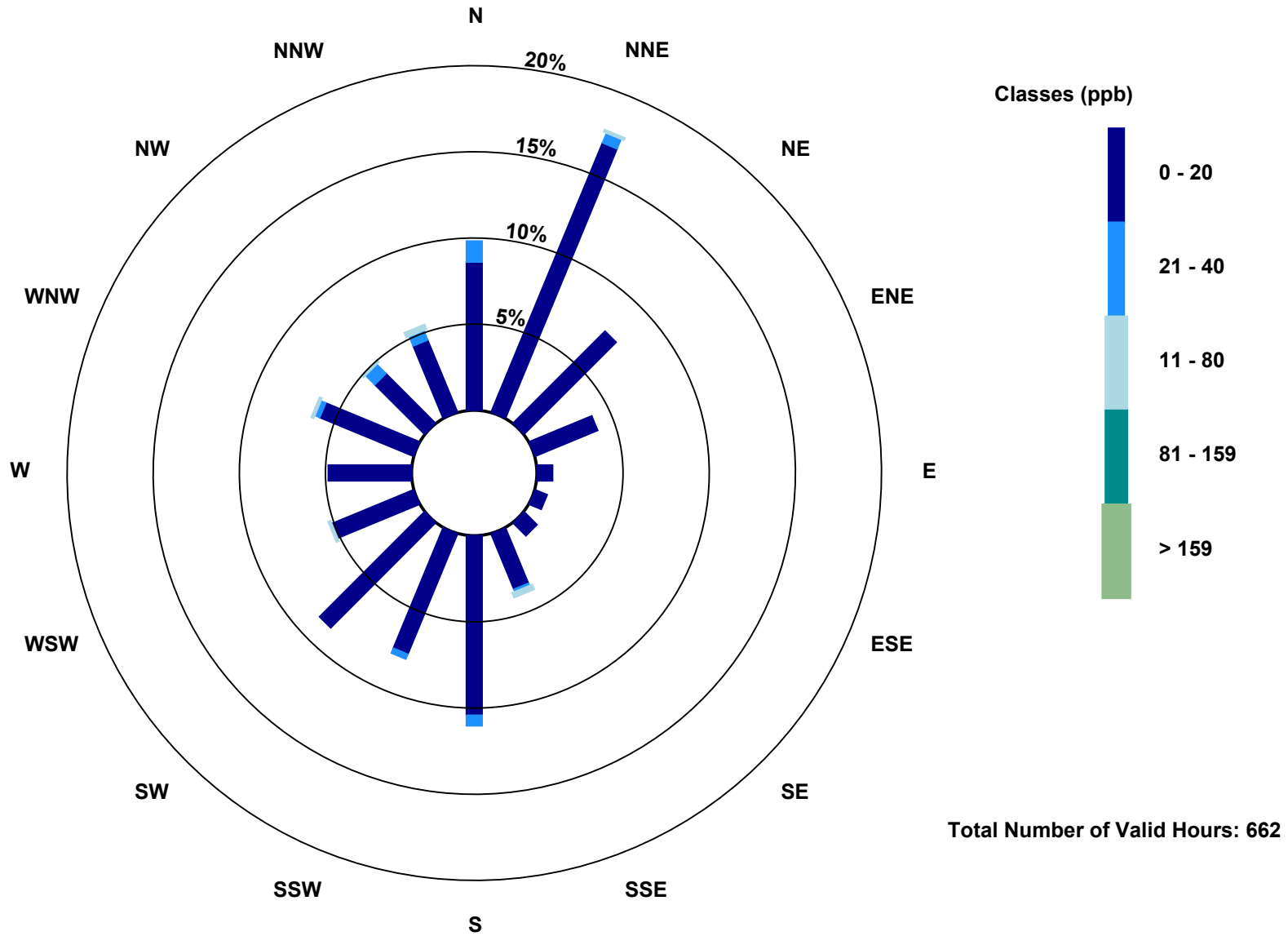
Total Number of Valid Hours: 662

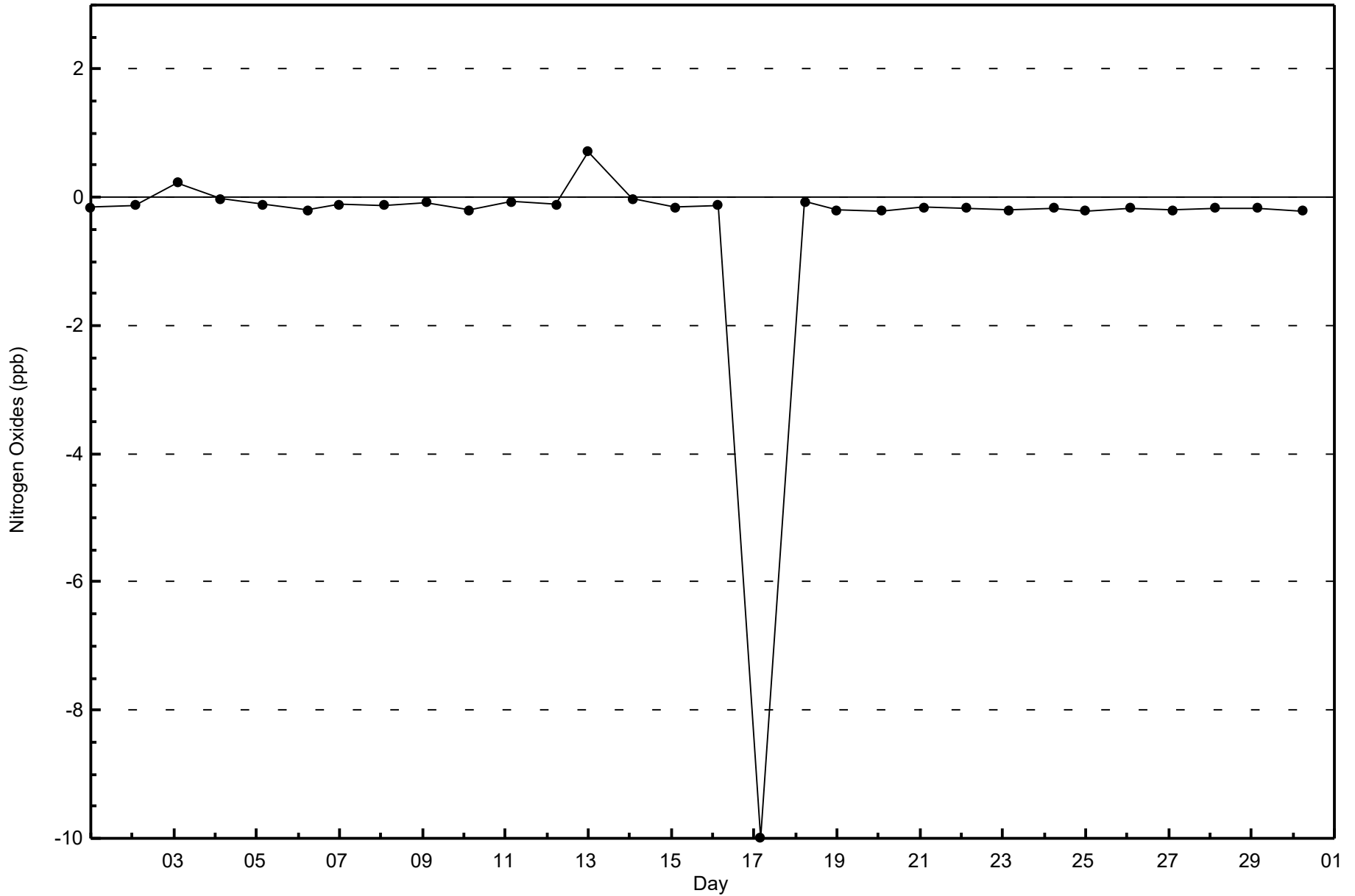
Total Number of Hours: 720

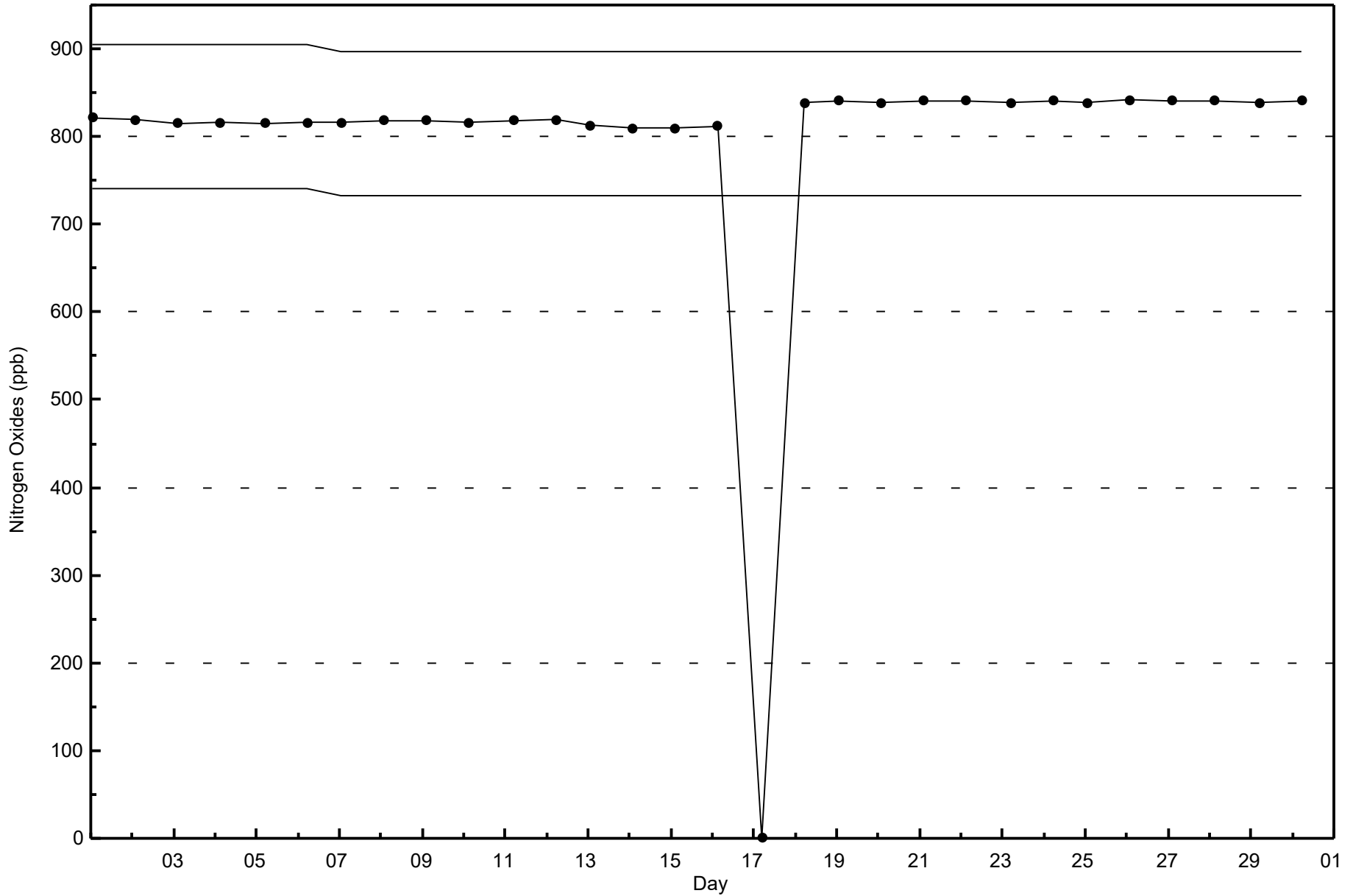


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Ells River









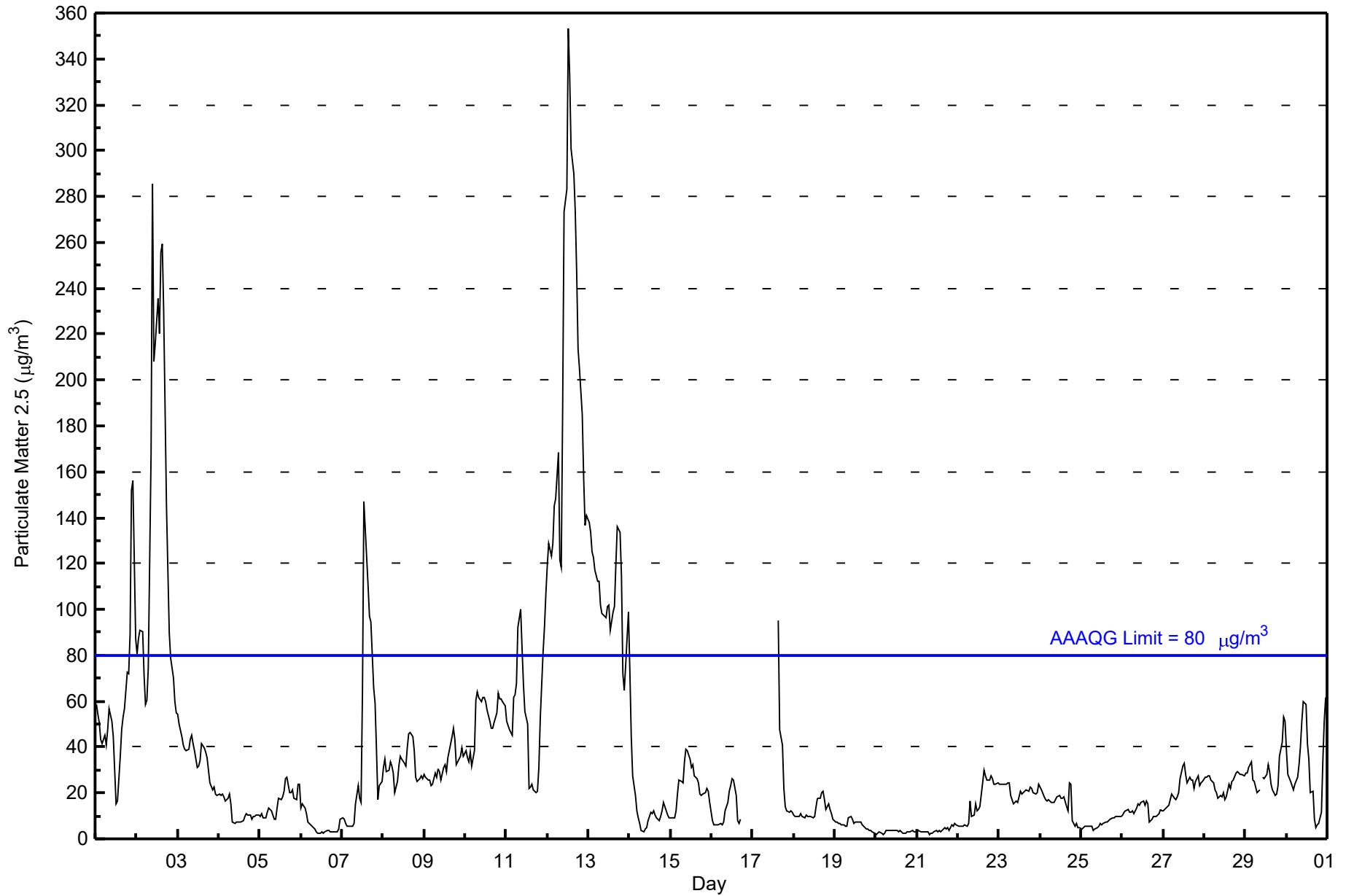
Summary of Hour Averages

Ells River - June 2023

Number of Exceedences (AAAQO):	1-hr: 77	24-hr: 11	Hours in Service:	720
Maximum Value: 353.2 µg/m ³ on Jun 12 13:00	Maximum Daily Average: 199.3 µg/m ³ on Jun 12		Hours of Data:	698
Minimum Value: 1.6 µg/m ³ on Jun 20 05:00	Minimum Daily Average: 3.1 µg/m ³ on Jun 20		Hours of Missing Data:	22
Maximum Diurnal Average: 46.7 µg/m ³ at hour 16	Minimum Diurnal Average: 28.2 µg/m ³ at hour 5		Hours of Calibration:	1
Monthly Average: 35.98 µg/m ³	Percentiles: P ₁ = 2.4 P ₁₀ = 4.6 Q ₁ = 9.4 Median = 20.7 Q ₃ = 38.6 P ₉₀ = 90.1 P ₉₉ = 273.4		Percent Operational Time:	97.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	58.6	54.4	50.6	43.3	41.6	45.0	40.8	47.4	56.5	51.3	44.3	29.9	15.3	16.4	35.9	47.8	53.0	57.0	72.4	72.3	89.3	152.2	156.3	87.1	59.1	156.3
2-Jun	80.6	87.2	91.0	90.3	71.1	58.6	60.4	74.3	167.9	285.4	207.9	216.1	235.7	220.0	255.9	259.5	230.0	145.1	117.3	90.0	78.5	70.0	59.7	55.0	137.8	285.4
3-Jun	54.3	50.2	44.3	41.0	39.2	38.6	39.1	43.1	44.9	41.8	38.5	31.2	32.0	34.0	41.4	39.4	37.6	35.7	29.8	24.2	21.3	22.6	19.3	19.2	35.9	54.3
4-Jun	19.2	19.0	19.2	18.6	16.5	17.5	19.5	15.5	7.1	6.5	7.2	7.3	7.3	7.1	8.1	9.9	10.9	10.5	10.3	8.8	9.5	9.9	10.1	10.4	11.9	19.5
5-Jun	9.9	11.1	8.9	9.1	11.5	13.7	13.1	12.2	8.6	8.6	13.5	17.9	16.8	18.3	21.0	26.2	26.5	20.4	20.2	21.1	17.4	17.0	23.7	23.8	16.3	26.5
6-Jun	13.7	15.0	13.4	10.9	7.5	6.5	5.8	4.6	4.1	3.3	2.7	2.7	2.8	2.6	2.8	3.5	3.7	3.2	3.2	3.2	3.2	3.3	4.4	8.4	5.6	15.0
7-Jun	9.4	8.5	6.7	5.3	5.5	5.3	5.4	6.8	15.2	23.3	17.4	15.9	64.3	147.3	122.5	110.3	97.2	94.8	66.0	59.5	38.9	17.0	23.0	25.1	41.3	147.3
8-Jun	31.3	34.6	29.3	29.7	33.6	31.4	29.0	20.2	25.2	31.6	36.2	34.6	32.7	31.9	39.6	45.7	46.6	44.3	38.3	26.8	24.8	26.4	27.4	26.3	32.4	46.6
9-Jun	28.0	26.8	25.8	25.7	23.2	24.0	28.5	26.8	30.3	29.5	25.5	31.2	32.5	29.4	35.6	41.8	44.7	48.5	43.6	32.5	34.7	36.0	39.8	36.2	32.5	48.5
10-Jun	38.7	35.2	33.4	38.1	31.9	38.6	60.7	64.2	61.7	59.7	61.6	61.6	59.9	56.4	51.4	48.4	48.4	50.8	54.9	63.7	61.1	60.7	59.5	57.8	52.4	64.2
11-Jun	51.4	49.7	47.4	45.4	61.8	63.0	67.8	92.1	100.1	82.8	67.4	55.4	49.8	21.8	22.3	23.8	21.5	20.4	20.7	31.3	52.6	81.0	92.1	106.5	55.3	106.5
12-Jun	118.9	128.9	123.5	128.8	145.3	148.5	168.6	121.6	118.4	188.2	273.4	283.2	353.2	333.4	301.0	290.1	273.4	247.3	213.8	204.9	185.0	157.3	136.7	141.0	199.3	353.2
13-Jun	138.0	133.7	125.0	122.5	117.3	112.5	112.1	102.2	98.5	97.0	96.5	101.1	102.0	91.1	98.7	101.1	119.8	136.2	133.7	114.9	72.0	64.9	75.6	98.6	106.9	138.0
14-Jun	73.0	44.4	27.3	18.6	12.2	9.2	6.5	3.4	2.8	4.4	5.1	8.1	11.7	10.8	12.0	10.7	8.9	7.7	9.7	12.1	15.6	11.9	10.4	9.2	14.4	73.0
15-Jun	9.3	9.1	9.4	12.1	19.4	25.4	24.8	24.5	33.8	39.2	38.6	34.9	30.9	32.4	27.4	26.1	24.2	19.5	18.7	19.6	20.2	22.1	20.7	16.0	23.3	39.2
16-Jun	8.0	6.2	6.3	6.3	6.4	6.5	6.4	7.3	12.1	15.8	20.8	23.3	25.9	25.6	18.8	8.2	6.9	8.4	PF	PF	PF	PF	PF	PF	12.2	25.9
17-Jun	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	95.2	47.4	41.0	22.0	14.0	12.2	11.7	12.3	11.4	--	95.2
18-Jun	10.6	9.8	9.7	9.8	11.0	9.9	9.4	10.3	9.9	9.7	9.7	9.4	10.0	14.2	17.7	17.8	19.9	21.0	16.9	12.7	15.1	12.9	11.0	8.5	12.4	21.0
19-Jun	7.4	7.4	6.7	6.9	6.1	5.9	5.5	5.8	9.0	9.9	8.3	7.0	7.2	7.1	7.2	7.1	6.2	5.3	4.5	4.0	3.8	3.5	3.0	2.2	6.1	9.9
20-Jun	2.0	2.3	3.1	2.4	1.6	2.6	3.4	3.6	3.6	3.6	3.5	3.4	3.8	3.2	3.7	3.3	2.7	2.4	2.9	3.0	3.2	3.5	3.3	3.2	3.1	3.8
21-Jun	3.2	3.4	3.1	3.1	3.1	2.8	3.0	2.1	2.4	2.3	3.1	3.4	3.3	3.5	3.1	4.1	5.1	4.5	4.7	3.8	6.1	5.7	6.8	6.4	3.8	6.8
22-Jun	5.6	5.5	5.7	5.7	5.8	5.7	7.0	16.5	9.5	10.2	15.5	12.2	12.8	14.0	24.4	29.9	27.2	25.7	25.9	27.5	26.0	23.9	24.0	24.4	16.3	29.9
23-Jun	23.9	23.9	23.7	24.0	23.5	24.3	24.2	19.1	15.2	16.0	16.5	15.8	20.8	19.5	20.4	20.9	21.1	20.8	22.5	21.7	19.9	19.7	20.4	23.6	20.9	24.3
24-Jun	22.6	21.1	18.5	17.2	16.5	16.9	15.8	16.1	16.1	17.1	18.5	19.1	17.6	17.5	18.5	14.3	12.4	24.3	23.9	7.7	5.5	6.5	4.9	4.7	15.6	24.3
25-Jun	4.6	5.0	5.3	5.6	5.6	5.5	5.2	3.8	4.1	4.8	5.7	6.5	6.3	6.9	7.2	7.5	8.2	8.5	9.0	9.4	9.5	9.5	9.7	9.9	6.8	9.9
26-Jun	10.3	11.8	12.4	12.8	11.8	11.8	12.0	11.1	13.5	15.4	14.9	15.9	16.3	14.6	16.4	15.3	7.5	8.8	9.8	9.9	9.7	11.0	12.6	12.3	12.4	16.4
27-Jun	12.0	12.7	14.2	14.5	17.3	19.5	18.0	17.3	18.1	20.0	25.9	31.9	32.9	28.3	24.6	27.0	25.9	25.4	22.3	24.9	27.2	23.2	24.1	25.2	22.2	32.9
28-Jun	26.7	26.8	27.5	27.4	25.3	24.4	21.6	19.9	17.8	18.7	18.1	19.9	17.0	18.0	23.6	22.0	24.9	25.8	28.6	29.4	28.4	28.2	27.9	27.7	24.0	29.4
29-Jun	28.5	28.7	31.0	33.3	25.8	25.0	22.3	20.1	21.1	C	26.8	26.5	27.8	32.1	29.3	23.8	21.6	18.7	19.3	23.4	36.0	42.3	52.9	51.4	29.0	52.9
30-Jun	38.5	28.3	25.2	23.0	21.6	24.0	26.7	32.2	40.0	51.0	59.7	58.8	41.7	34.5	20.2	20.9	8.3	4.9	6.1	6.4	11.6	33.8	51.0	61.9	30.4	61.9
32.4 31.1 29.2 28.7 28.2 28.4 29.7 29.1 33.4 41.0 40.8 40.8 44.5 44.6 45.2 46.7 43.1 39.6 36.9 33.9 32.4 34.1 35.3 34.3																								Diurnal Average		
138.0 133.7 125.0 128.8 145.3 148.5 168.6 121.6 167.9 285.4 273.4 283.2 353.2 333.4 301.0 290.1 273.4 247.3 213.8 204.9 185.0 157.3 156.3 141.0																								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}) - $\mu\text{g}/\text{m}^3$
Ells River - June 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	86	12.32	12.32
6 - 15	180	25.79	38.11
16 - 25	157	22.49	60.60
26 - 80	198	28.37	88.97
> 81.0	77	11.03	100.00

Total Number of Valid Hours: 698

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Ells River - June 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	22	21	5	3	1	0	0	0	5	1	10	5	0	6	4	3	86
6 - 15	18	48	13	4	1	1	3	11	8	11	16	10	6	9	10	11	180
16 - 25	16	13	11	4	1	2	2	12	14	23	15	11	8	11	6	7	156
26 - 80	7	21	14	8	3	2	2	3	41	22	22	10	9	18	7	9	198
> 81.0	8	19	7	8	0	0	0	0	4	1	1	3	10	2	6	8	77
Totals	71	122	50	27	6	5	7	26	72	58	64	39	33	46	33	38	697

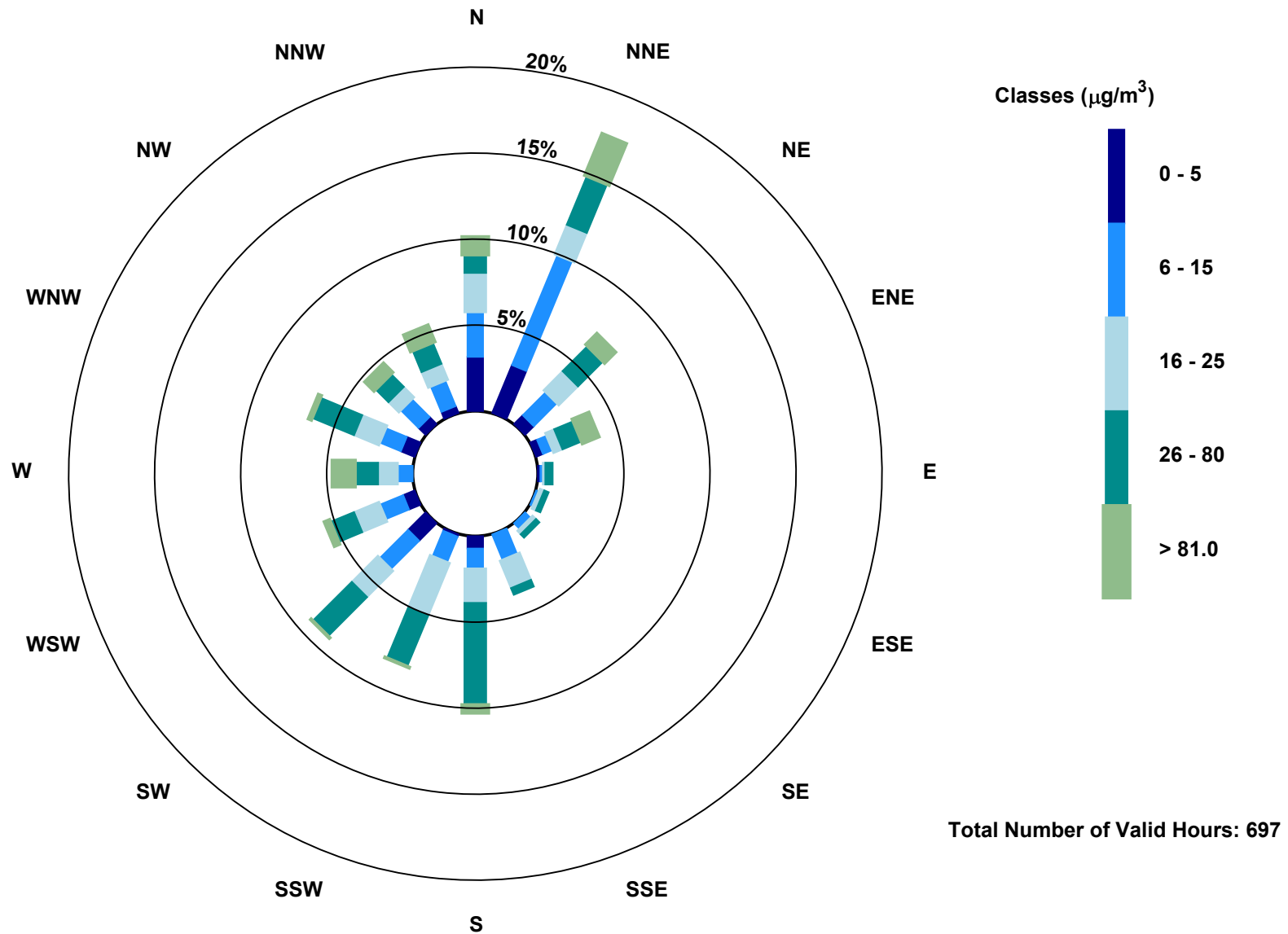
Total Number of Valid Hours: 697

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

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

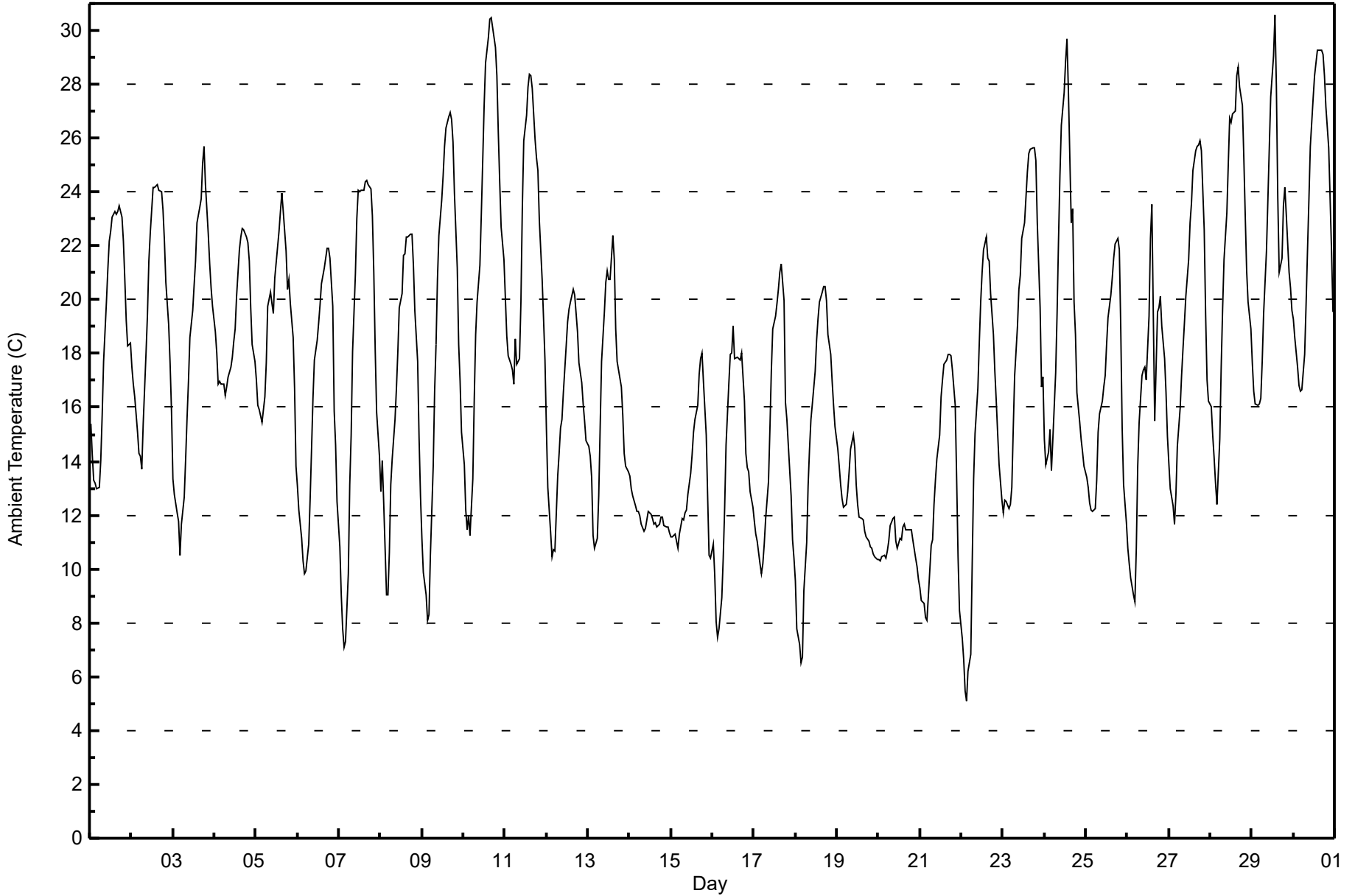




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Ells River - June 2023

Maximum Value: 30.6 C on Jun 29 14:00		Maximum Daily Average: 23.4 C on Jun 30		Hours in Service: 720																						
Minimum Value: 5.1 C on Jun 22 04:00		Minimum Daily Average: 11.0 C on Jun 20		Hours of Data: 720																						
Maximum Diurnal Average: 22.1 C at hour 15		Minimum Diurnal Average: 11.5 C at hour 5		Hours of Missing Data: 0																						
Monthly Average: 17.30 C		Percentiles: P ₁ = 7.1 P ₁₀ = 10.8 Q ₁ = 12.7 Median = 17.1 Q ₃ = 21.2 P ₉₀ = 24.4 P ₉₉ = 29.3		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-Jun	15.4	14.2	13.3	13.2	13.0	13.1	14.0	15.7	17.7	19.9	21.1	22.1	22.5	23.1	23.3	23.2	23.3	23.5	23.0	22.2	20.7	19.2	18.3	18.4	18.9	23.5
2-Jun	17.5	16.9	16.4	15.1	14.3	14.2	13.7	15.4	18.0	19.5	21.4	22.5	24.2	24.2	24.2	24.1	24.0	23.3	22.2	20.7	19.1	17.7	15.9	19.5	24.2	
3-Jun	13.3	12.8	12.1	11.8	10.5	11.7	12.7	14.1	15.6	17.0	18.6	19.6	20.5	21.4	22.9	23.4	23.7	25.1	25.7	24.3	22.4	21.3	20.4	19.7	18.4	25.7
4-Jun	18.8	18.0	16.9	17.0	16.8	16.8	16.5	16.7	17.1	17.5	17.8	18.5	18.9	20.1	21.9	22.3	22.7	22.6	22.3	22.1	21.4	19.7	18.3	17.7	19.1	22.7
5-Jun	17.0	16.1	15.9	15.4	15.9	16.4	17.6	19.8	20.3	19.9	19.5	20.8	22.0	22.5	23.3	23.9	23.3	21.8	20.4	20.7	19.9	18.6	16.7	13.8	19.2	23.9
6-Jun	13.1	12.2	11.1	10.3	9.8	10.0	11.0	12.6	14.4	16.3	17.8	18.5	19.1	19.8	20.6	21.2	21.6	21.9	21.9	21.5	19.7	15.9	14.6	12.5	16.1	21.9
7-Jun	10.8	9.1	7.8	7.1	7.3	9.8	13.1	15.0	18.1	20.9	23.0	24.1	24.0	24.1	24.4	24.4	24.3	24.1	23.1	21.0	18.1	15.8	14.2	17.8	24.4	
8-Jun	12.9	14.1	12.5	9.0	9.0	10.6	13.1	14.1	15.6	16.7	18.1	19.7	20.2	21.7	21.7	22.3	22.3	22.4	22.4	21.3	19.6	17.7	14.9	12.7	16.9	22.4
9-Jun	11.1	9.9	9.1	8.1	8.3	10.5	13.8	16.6	18.3	20.8	22.4	23.7	24.6	25.7	26.4	26.8	26.9	26.7	25.8	24.0	21.2	18.3	17.0	15.1	18.8	26.9
10-Jun	13.9	12.2	11.4	12.0	11.2	13.4	16.3	18.7	19.9	21.3	23.2	25.2	27.2	28.8	29.8	30.4	30.5	30.1	29.4	28.3	26.2	24.4	22.7	21.5	22.0	30.5
11-Jun	20.1	18.6	17.9	17.6	17.4	16.9	18.5	17.6	17.8	19.9	23.4	25.9	26.8	27.9	28.4	28.3	27.8	26.0	25.3	24.8	22.9	20.7	19.3	17.7	22.0	28.4
12-Jun	15.2	13.0	11.3	10.4	10.7	10.7	13.5	14.3	15.2	15.6	16.5	18.3	19.2	19.6	19.9	20.4	20.2	19.5	18.8	17.7	16.9	16.2	15.5	14.8	16.0	20.4
13-Jun	14.6	14.2	13.4	11.2	10.8	11.2	12.7	15.2	17.7	19.6	20.6	21.1	20.7	20.7	22.4	21.5	18.9	17.7	17.1	16.8	15.7	14.3	13.8	13.6	16.5	22.4
14-Jun	13.5	13.0	12.7	12.3	12.1	12.1	12.0	11.7	11.4	11.5	11.8	12.1	12.0	11.9	11.7	11.7	11.5	11.7	11.9	11.9	11.6	11.5	11.6	11.3	11.9	13.5
15-Jun	11.2	11.2	11.3	11.0	10.8	11.3	11.9	11.8	12.1	12.2	12.8	13.5	14.2	15.1	15.6	16.1	17.3	17.8	18.0	17.0	15.0	12.7	10.5	10.4	13.4	18.0
16-Jun	10.9	9.8	8.1	7.4	7.8	9.0	10.4	12.2	14.6	16.9	18.0	18.0	19.0	17.8	17.8	17.8	17.8	18.0	16.3	14.3	13.8	13.6	12.9	12.3	13.9	19.0
17-Jun	11.8	11.3	11.0	10.2	9.8	10.2	10.9	11.9	13.3	15.2	17.4	18.9	19.4	19.9	20.4	21.0	21.3	20.0	16.2	15.5	14.6	12.7	11.1	10.4	14.8	21.3
18-Jun	9.6	7.8	7.2	6.5	6.7	9.2	11.0	13.1	14.4	15.5	16.1	17.3	18.5	19.3	19.9	20.3	20.5	20.5	20.0	18.7	18.0	17.0	16.1	15.3	14.9	20.5
19-Jun	14.5	13.8	13.1	12.6	12.3	12.4	12.9	13.6	14.4	15.0	14.5	13.2	12.4	11.9	11.9	11.8	11.4	11.2	11.0	10.8	10.8	10.6	10.4	10.4	12.4	15.0
20-Jun	10.4	10.3	10.5	10.5	10.4	10.6	11.0	11.6	11.9	11.9	11.0	10.8	11.1	11.1	11.6	11.7	11.5	11.4	11.5	11.4	11.1	10.4	10.1	9.6	11.0	11.9
21-Jun	9.3	8.9	8.7	8.2	8.1	9.0	10.9	11.1	12.4	13.3	14.1	15.0	16.4	17.0	17.6	17.7	18.0	18.0	17.9	17.4	16.1	13.3	10.5	8.5	13.2	18.0
22-Jun	7.4	6.6	5.4	5.1	6.2	6.8	10.2	13.3	15.0	16.7	18.4	19.9	21.0	21.9	22.4	21.5	21.4	20.2	18.7	17.3	16.2	15.1	13.9	12.5	14.7	22.4
23-Jun	12.1	12.5	12.5	12.2	12.4	13.1	15.2	17.2	19.0	20.4	20.9	22.3	22.9	23.8	24.8	25.4	25.6	25.6	25.7	25.1	22.9	19.7	16.7	17.1	19.4	25.7
24-Jun	14.8	13.9	14.3	15.2	13.7	14.8	17.3	19.5	22.2	24.6	26.5	27.7	28.8	29.7	27.7	22.9	23.4	19.9	18.7	16.6	15.5	14.8	14.4	13.8	19.6	29.7
25-Jun	13.4	13.1	12.4	12.2	12.1	12.3	13.3	15.1	15.8	16.3	16.7	17.2	18.3	19.3	20.2	20.8	21.5	22.1	22.3	21.8	19.0	15.2	13.1	11.7	16.5	22.3
26-Jun	10.8	10.2	9.7	9.0	8.8	10.8	13.8	15.4	17.2	17.4	17.5	17.0	19.4	22.3	23.6	19.5	15.5	19.5	19.7	20.1	19.0	17.8	16.6	14.9	16.1	23.6
27-Jun	13.9	13.0	12.4	11.7	12.7	14.6	16.0	17.2	18.2	19.1	20.1	21.5	22.9	23.6	24.8	25.5	25.7	25.8	25.9	25.5	22.6	19.5	17.0	16.2	19.4	25.9
28-Jun	16.0	15.0	14.1	13.2	12.4	14.8	17.5	19.6	21.5	23.2	25.0	26.8	26.6	26.9	27.0	28.3	28.6	27.9	27.2	25.3	23.1	21.1	19.9	18.9	21.7	28.6
29-Jun	17.7	16.6	16.2	16.1	16.1	16.4	17.7	19.5	21.8	23.7	25.6	27.5	29.1	30.6	27.9	23.8	21.0	21.5	23.5	24.2	23.2	21.0	20.5	19.6	21.7	30.6
30-Jun	19.3	18.6	17.5	16.8	16.6	16.7	18.0	19.8	21.8	23.7	25.7	27.5	28.3	28.8	29.3	29.2	29.3	29.1	28.3	27.2	25.6	23.8	21.8	19.5	23.4	29.3
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Ells River - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	42	5.83	5.83
10 - 20	456	63.33	69.17
> 20	222	30.83	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

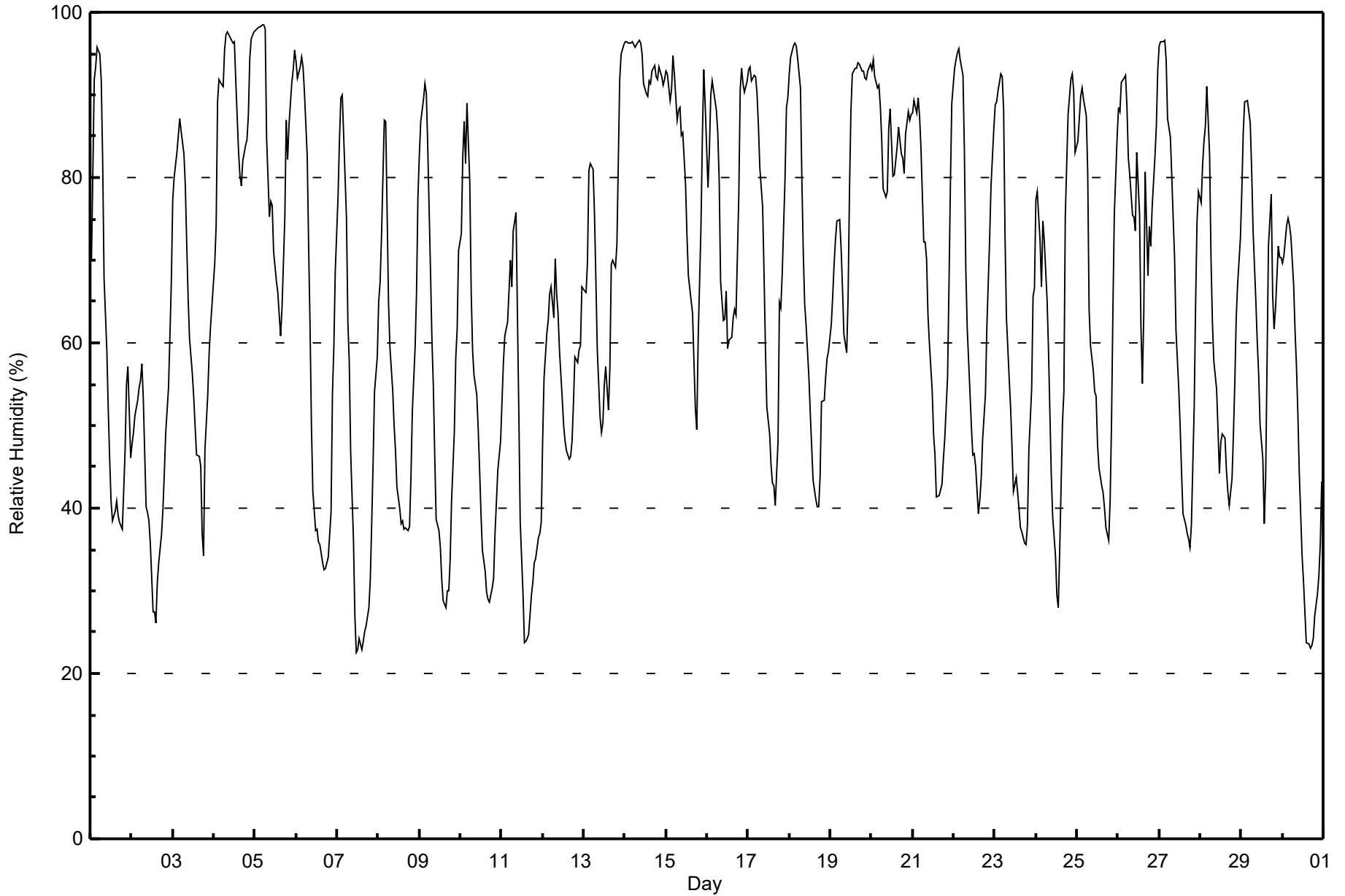
Ells River - June 2023

Maximum Value: 98.5 % on Jun 5 06:00 Maximum Daily Average: 93.8 % on Jun 14																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 22.6 % on Jun 7 12:00 Minimum Daily Average: 44.7 % on Jun 2																						Hours of Missing Data: 0 Hours of Calibration: 0				
Maximum Diurnal Average: 86.6 % at hour 5 Minimum Diurnal Average: 47.6 % at hour 15																						Percent Operational Time: 100.0				
Monthly Average: 65.81 % Percentiles: P₁ = 23.8 P₁₀ = 37.0 Q₁ = 47.9 Median = 66.3 Q₃ = 86.3 P₉₀ = 92.9 P₉₉ = 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-Jun	70.0	80.7	91.9	93.4	95.8	94.9	91.7	82.0	67.8	58.9	51.9	46.0	40.9	38.4	39.6	40.9	39.2	38.2	37.5	42.0	47.0	54.9	57.1	46.2	60.3	95.8
2-Jun	47.8	49.1	51.2	53.0	54.5	55.5	57.4	53.3	40.3	39.5	38.5	35.8	27.4	27.4	26.1	31.0	33.4	36.9	39.8	44.2	49.1	54.6	60.9	67.3	44.7	67.3
3-Jun	77.2	80.0	83.1	85.2	87.1	85.6	82.9	79.0	71.9	65.5	60.5	56.2	53.4	49.8	46.4	46.3	45.1	36.9	34.3	47.1	53.8	58.8	62.0	64.6	63.0	87.1
4-Jun	69.7	74.2	89.2	91.8	91.6	91.1	95.5	97.3	97.6	97.0	96.7	96.3	96.4	91.8	83.1	80.1	79.0	82.1	83.8	84.5	87.7	94.4	96.8	97.6	89.4	97.6
5-Jun	97.9	98.0	98.2	98.3	98.4	98.5	98.0	84.8	75.3	77.2	76.7	71.0	67.4	66.1	63.4	60.8	64.2	75.1	87.0	82.3	86.5	91.5	93.0	95.5	83.5	98.5
6-Jun	94.0	92.0	93.4	94.6	93.3	90.4	82.5	71.7	62.0	50.1	42.0	37.2	37.5	35.9	35.6	33.5	32.5	32.8	33.5	34.1	39.5	53.9	59.5	68.7	58.3	94.6
7-Jun	77.7	84.6	89.7	89.9	85.0	75.0	62.5	57.7	46.7	36.1	26.9	22.6	22.9	24.2	22.9	23.9	25.0	25.8	28.0	31.3	38.2	45.5	54.0	58.2	48.1	89.9
8-Jun	65.0	67.2	72.8	87.0	86.8	75.9	65.0	59.5	54.2	50.0	46.9	42.5	40.0	38.1	38.4	37.5	37.6	37.2	37.9	43.5	51.6	59.4	66.0	77.7	55.7	87.0
9-Jun	82.8	86.8	89.4	91.4	90.1	83.6	68.5	60.3	54.8	46.2	38.6	37.3	35.2	31.3	28.9	28.0	30.0	30.1	33.8	40.8	49.4	58.2	61.7	71.2	55.4	91.4
10-Jun	73.1	82.5	86.8	81.7	89.0	79.5	66.2	59.2	56.0	53.8	49.6	44.7	39.3	34.9	32.4	29.8	29.1	28.7	30.3	31.5	37.0	40.8	44.6	48.2	52.0	89.0
11-Jun	52.8	57.6	60.8	62.6	66.3	70.1	66.9	73.6	75.8	63.6	51.7	38.4	29.6	23.7	23.9	24.3	24.8	29.5	31.0	33.5	33.9	36.4	37.0	38.3	46.1	75.8
12-Jun	48.1	55.7	61.2	62.8	65.9	66.7	63.1	70.2	66.0	63.5	59.2	53.2	50.0	48.2	47.0	46.0	46.3	48.1	52.7	58.3	57.6	59.1	59.7	66.9	57.3	70.2
13-Jun	66.2	66.1	69.8	80.9	81.8	81.0	75.6	67.7	59.2	51.0	49.2	50.3	55.0	57.1	51.8	57.1	69.5	70.1	69.2	71.9	81.9	91.8	94.9	96.1	69.4	96.1
14-Jun	96.4	96.4	96.3	96.3	96.4	96.1	95.8	96.1	96.6	96.2	95.0	91.3	90.2	89.8	91.7	91.3	92.9	93.6	92.2	91.8	93.4	92.2	91.2	91.9	93.8	96.6
15-Jun	92.9	92.6	89.3	90.7	94.8	92.5	86.9	88.1	88.4	85.0	85.4	79.2	73.1	68.2	66.6	63.6	57.6	52.1	49.5	60.5	74.1	84.9	93.1	88.9	79.1	94.8
16-Jun	78.7	83.3	90.0	91.7	90.5	88.2	85.5	79.6	67.4	62.7	62.9	66.2	59.4	60.3	60.6	63.0	64.0	63.3	77.8	90.6	93.2	91.3	90.3	91.7	77.2	93.2
17-Jun	93.1	93.3	91.6	92.3	92.2	90.2	86.4	81.3	76.4	68.5	59.2	52.3	49.0	45.3	43.1	42.7	40.3	48.2	64.9	64.2	68.6	80.0	88.4	89.7	70.9	93.3
18-Jun	92.6	94.6	95.9	96.3	95.9	94.4	90.8	79.8	70.9	64.7	62.3	56.0	51.5	47.5	43.4	41.1	40.2	40.2	43.8	52.9	53.0	55.9	58.2	59.1	65.9	96.3
19-Jun	62.1	65.6	69.5	72.5	74.7	74.8	71.6	66.6	61.1	58.9	65.6	78.5	87.9	92.5	93.2	93.2	94.0	93.8	92.9	92.8	92.1	91.9	92.9	93.7	80.5	94.0
20-Jun	93.1	94.3	92.3	90.9	91.2	88.6	84.6	78.7	77.6	78.3	85.9	88.3	80.1	80.3	82.0	83.7	86.1	82.9	82.4	80.5	85.2	87.9	86.9	87.6	85.4	94.3
21-Jun	87.8	89.3	87.9	89.6	87.5	83.6	72.2	72.2	70.2	63.4	60.1	54.2	49.0	46.4	41.3	41.5	42.2	42.9	46.0	48.5	55.9	67.0	79.0	89.0	65.3	89.6
22-Jun	93.2	94.3	95.1	95.5	94.3	92.3	83.3	69.0	61.9	53.9	49.8	46.4	46.6	45.1	39.3	41.0	43.6	48.3	53.7	61.8	67.1	72.5	79.0	85.9	67.2	95.5
23-Jun	88.7	89.1	90.5	92.6	92.3	88.2	72.9	63.0	55.5	52.1	47.3	42.1	43.7	41.9	39.8	37.6	37.2	35.8	35.5	37.9	47.0	54.3	65.7	66.6	59.1	92.6
24-Jun	77.2	78.2	72.3	66.8	74.7	72.4	65.3	59.3	51.7	44.1	39.0	34.2	29.6	28.0	34.7	50.4	54.0	75.3	81.6	87.6	91.8	92.6	90.4	83.1	63.9	92.6
25-Jun	84.3	87.1	89.8	90.9	89.4	87.4	80.7	64.0	59.6	56.7	54.1	53.6	47.8	44.9	42.7	41.9	39.9	37.7	36.1	40.8	50.3	64.0	75.6	84.9	62.7	90.9
26-Jun	88.5	88.0	91.5	92.0	92.4	88.7	82.4	80.4	75.5	75.3	73.5	83.0	75.5	62.1	55.1	63.2	80.7	68.2	74.0	71.7	76.5	82.6	86.2	93.0	79.2	93.0
27-Jun	96.0	96.4	96.5	96.7	94.3	87.2	84.9	80.1	75.1	70.3	61.5	54.4	49.8	44.2	39.3	37.9	37.0	36.3	35.2	38.0	52.2	64.5	74.6	78.3	65.9	96.7
28-Jun	76.9	81.5	84.3	86.3	90.9	82.7	70.1	62.6	57.8	54.3	49.5	44.3	48.0	49.0	48.4	44.7	42.0	40.3	43.6	49.0	55.3	63.1	67.2	72.7	61.0	90.9
29-Jun	78.5	85.4	89.1	89.4	88.0	86.7	80.9	73.7	65.0	60.2	56.3	50.1	45.9	38.2	43.8	57.6	71.7	77.9	65.8	61.7	64.1	71.6	70.3	70.3	68.4	89.4
30-Jun	69.6	70.5	74.2	75.1	74.2	72.8	67.0	61.4	57.1	51.4	44.2	34.3	31.2	27.4	23.8	23.6	23.0	23.4	24.3	27.0	29.7	31.9	35.8	43.3	45.7	75.1
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Ells River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Ells River - June 2023**

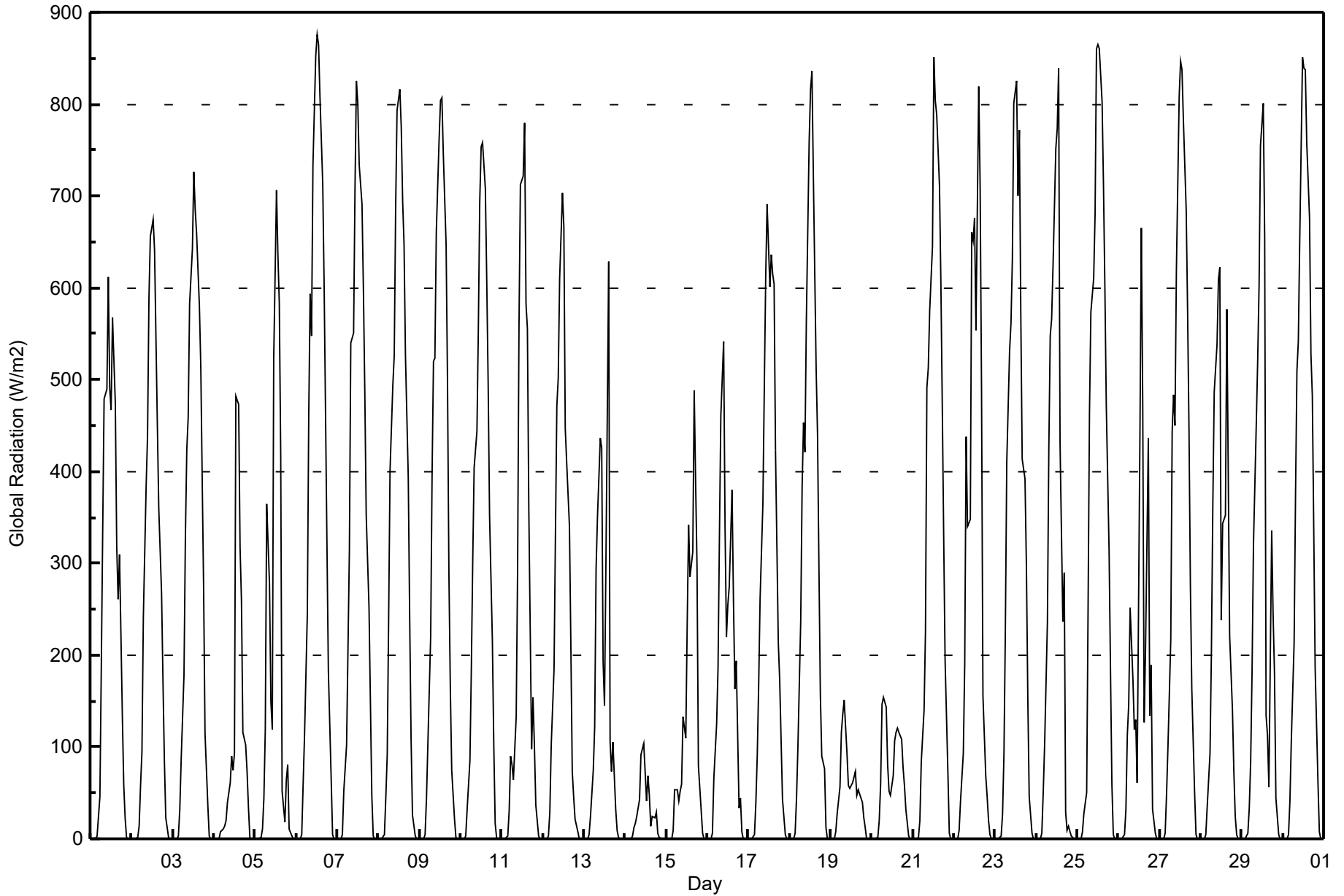
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	110	15.28	15.28
40 - 60	183	25.42	40.69
60 - 80	182	25.28	65.97
80 - 100	245	34.03	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 875.8 W/m2 on Jun 6 13:00 Maximum Daily Average: 354.3 W/m2 on Jun 6																								Hours in Service:	720		
Minimum Value: 0.0 W/m2 on Jun 1 02:00 Minimum Daily Average: 27.1 W/m2 on Jun 14																								Hours of Data:	720		
Maximum Diurnal Average: 596.5 W/m2 at hour 14 Minimum Diurnal Average: 0.0 W/m2 at hour 2																								Hours of Missing Data:	0		
Monthly Average: 228.74 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 3.5 Median = 98.2 Q ₃ = 439.2 P ₉₀ = 660.3 P ₉₉ = 849.8																								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-Jun	0.0	0.0	0.0	0.0	3.1	46.0	186.6	335.2	478.9	489.7	611.3	490.7	466.3	568.1	473.9	319.5	261.5	309.6	136.5	59.1	22.5	1.3	0.0	0.0	219.2	611.3	
2-Jun	0.0	0.0	0.0	1.5	13.9	58.3	94.7	240.7	383.7	439.0	588.3	655.2	674.9	640.6	544.0	450.6	360.1	267.3	172.2	86.1	23.3	1.8	0.0	0.0	237.3	674.9	
3-Jun	0.1	0.0	0.0	3.0	31.4	87.1	177.9	329.3	424.0	459.6	583.1	642.0	726.9	684.4	658.6	580.2	512.6	390.6	273.0	115.0	37.3	3.4	0.0	0.0	280.0	726.9	
4-Jun	0.0	0.0	0.0	0.3	7.8	10.1	14.2	20.4	39.4	60.8	89.6	75.4	92.8	481.7	473.6	317.3	258.8	115.3	101.8	73.8	34.2	2.2	0.0	0.0	94.6	481.7	
5-Jun	0.0	0.0	0.0	2.2	11.2	43.9	118.4	364.3	276.9	149.0	119.1	521.6	706.6	636.1	582.4	417.8	52.4	18.3	63.9	80.3	11.0	3.0	0.0	0.0	174.1	706.6	
6-Jun	0.0	0.0	0.0	4.5	59.0	112.1	245.1	461.1	593.9	547.6	734.5	852.0	875.8	865.5	808.1	712.3	599.9	460.6	318.6	182.7	65.8	4.3	0.3	0.2	354.3	875.8	
7-Jun	0.2	0.2	0.1	5.1	51.3	102.2	207.1	314.3	539.3	550.2	708.0	825.8	801.5	733.4	690.3	597.9	486.0	352.6	252.3	147.6	47.4	3.5	0.1	0.1	309.0	825.8	
8-Jun	0.0	0.0	0.0	4.8	46.3	91.9	240.2	401.5	494.9	526.3	686.4	792.6	815.4	774.7	694.0	647.4	526.6	394.2	242.8	110.0	26.2	2.6	0.2	0.1	313.3	815.4	
9-Jun	0.1	0.1	0.2	4.7	43.9	103.9	221.1	397.7	520.5	523.9	660.4	760.6	804.5	806.4	746.6	647.0	497.7	290.5	164.7	75.3	21.8	1.8	0.2	0.1	303.9	806.4	
10-Jun	0.1	0.1	0.1	2.8	32.0	85.2	184.3	303.3	405.0	444.4	554.7	694.7	753.3	757.7	707.8	607.2	495.1	352.7	216.7	104.4	16.4	2.1	0.1	0.1	280.0	757.7	
11-Jun	0.1	0.1	0.1	3.6	29.9	89.3	81.5	63.7	132.9	291.6	557.9	711.8	721.3	779.1	582.2	554.5	359.8	98.2	153.3	101.3	36.1	3.3	0.1	0.0	223.0	779.1	
12-Jun	0.2	0.2	0.2	3.1	28.3	102.8	184.6	331.6	472.1	501.9	609.6	702.9	666.1	447.1	410.8	340.0	210.3	73.1	45.4	20.7	7.4	0.6	0.0	0.0	214.9	702.9	
13-Jun	0.0	0.0	0.0	4.8	24.0	74.7	122.1	294.7	350.8	436.5	425.3	193.2	145.4	297.3	627.8	105.1	73.5	105.0	31.9	9.0	0.8	0.0	0.0	0.0	138.4	627.8	
14-Jun	0.0	0.0	0.0	0.4	3.8	12.4	16.5	25.0	43.3	91.9	98.2	103.0	40.5	69.2	47.6	13.2	24.0	22.9	29.2	6.2	2.2	0.3	0.0	0.0	27.1	103.0	
15-Jun	0.0	0.0	0.0	0.2	9.0	53.7	54.1	41.5	51.6	60.1	132.2	109.6	233.2	342.2	285.6	312.4	488.0	389.2	297.4	79.0	31.2	5.4	0.2	0.0	124.0	488.0	
16-Jun	0.0	0.1	0.2	6.5	65.9	124.3	185.7	329.6	460.3	542.1	340.6	219.2	255.1	274.9	379.8	261.0	163.2	193.0	33.6	43.8	7.6	0.6	0.0	0.0	162.0	542.1	
17-Jun	0.0	0.0	0.0	5.0	39.7	91.9	167.6	261.5	364.9	490.0	610.4	691.4	601.7	635.9	615.5	604.8	422.8	214.1	172.8	107.0	42.4	5.1	0.1	0.0	256.0	691.4	
18-Jun	0.1	0.1	0.1	5.9	45.0	101.0	238.1	385.2	453.6	420.4	562.8	758.6	815.4	836.6	723.6	511.0	438.8	294.0	156.6	89.9	76.3	12.2	0.0	0.0	288.6	836.6	
19-Jun	0.0	0.0	0.0	7.7	26.7	56.4	115.3	135.6	150.7	93.7	58.4	54.5	57.5	60.7	73.6	47.8	53.7	49.4	39.7	23.3	12.6	0.4	0.0	0.0	46.6	150.7	
20-Jun	0.0	0.0	0.0	2.0	20.5	60.1	147.0	154.2	144.1	80.1	51.3	46.6	68.4	107.1	115.6	120.6	116.6	108.4	77.9	57.8	31.7	3.7	0.0	0.0	63.1	154.2	
21-Jun	0.0	0.0	0.0	2.2	19.8	84.1	139.8	226.4	490.8	512.7	574.7	645.0	850.6	803.9	789.4	710.7	603.4	470.1	327.3	193.0	71.7	6.3	0.3	0.2	313.4	850.6	
22-Jun	0.0	0.0	0.2	8.5	41.1	93.8	190.7	437.1	340.7	347.5	660.3	650.8	676.1	554.4	819.0	708.8	486.3	155.1	68.4	46.2	19.6	4.5	0.2	0.0	262.9	819.0	
23-Jun	0.0	0.0	0.0	3.5	27.2	93.2	229.9	410.5	530.9	561.1	632.1	801.3	825.7	699.6	771.3	571.5	414.2	392.6	297.6	154.0	45.6	6.0	0.2	0.2	311.2	825.7	
24-Jun	0.2	0.0	0.1	6.2	49.9	102.6	236.4	424.5	548.4	566.0	624.4	752.4	773.3	839.5	432.1	236.0	290.2	28.8	9.5	13.1	3.7	1.2	0.0	0.0	247.4	839.5	
25-Jun	0.0	0.0	0.0	7.0	28.2	50.3	249.9	463.9	573.0	610.6	616.6	681.0	860.5	864.9	861.0	802.0	710.8	599.2	470.7	313.2	182.8	59.7	4.5	0.3	0.1	349.7	864.9
26-Jun	0.1	0.0	0.1	4.0	31.7	112.2	146.2	251.2	173.4	118.3	129.7	60.6	439.5	664.9	472.0	126.3	208.1	436.1	134.5	189.0	31.7	5.9	0.2	0.0	155.6	664.9	
27-Jun	0.0	0.0	0.0	5.4	48.4	100.6	217.1	443.9	483.5	450.6	618.0	809.1	846.4	836.8	782.3	684.7	575.7	445.8	276.8	162.7	51.1	4.2	0.2	0.0	326.8	846.4	
28-Jun	0.0	0.0	0.1	4.7	34.7	93.0	204.9	362.4	487.1	537.9	609.1	622.2	237.5	343.8	352.4	576.1	400.8	220.5	140.9	73.0	24.8	5.0	0.2	0.0	222.1	622.2	
29-Jun	0.1	0.0	0.1	6.6	33.0	83.5	182.9	320.2	450.9	519.8	602.9	754.4	801.1	654.8	134.7	113.5	56.8	335.1	244.0	180.2	44.9	4.6	0.2	0.2	230.2	801.1	
30-Jun	0.1	0.1	0.2	4.3	41.7	107.5	214.0	374.2	509.1	541.7	651.3	850.8	838.3	836.9	758.4	675.6	528.1	481.5	337.0	185.4	63.1	7.3	0.3	0.2	333.6	850.8	
																								Diurnal Average			
																								Diurnal Maximum			





Maximum Speed: 43 km/h on Jun 19 09:00	Maximum Daily Speed Average: 32.7 km/h on Jun 19	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 9 08:00	Minimum Daily Speed Average: 1.9 km/h on Jun 1	Hours of Data: 719
Maximum Diurnal Speed Average: 4.8 km/h at hour 20	Minimum Diurnal Speed Average: 1.4 km/h at hour 11	Hours of Missing Data: 1
Monthly Average Velocity: 2.7 km/h 353.0 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 9 Q ₃ = 14 P ₉₀ = 20 P ₉₉ = 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-Jun	W6	SW4	WNW6	SSE3	SW1	S6	SW7	SSW7	S7	WNW5	WNW2	NNW6	NW11	NNW10	ENE8	E6	E6	ENE7	ENE7	NNE8	NNE10	NNE6	N6	N13	N1.9	N13	
2-Jun	NNE8	NNE10	N9	NW10	NW9	WSW4	WSW3	WNW3	N5	N6	ENE2	NNE4	S0	NE9	NNE10	NE14	NNE17	NE16	ENE15	ENE16	ENE13	NE10	NE9	NNE5	NNE6.9	NNE17	
3-Jun	N3	N4	N6	N7	NNW5	NNE7	NNE5	NNE8	NNE9	NE12	NE10	NE15	NE14	NNE17	NE11	NE13	NNE14	NNE8	ENE3	N11	NNW7	N6	N6	N4	NNE8.1	NNE17	
4-Jun	NW4	NW4	NNW4	N5	N6	N8	NNE8	NE8	ENE7	NE9	NE9	NNE8	NNW6	N8	NNE8	N9	NNE8	NNE8	NNE8	NNE11	NNE8	SSE1	W4	WNW6	N5.9	NNE11	
5-Jun	WNW5	W3	NNW3	W4	WNW7	NW5	NNW7	N13	N16	NE17	NNE14	NE11	ENE8	NE9	NNW10	NNE9	NNE6	NE5	NE4	NE10	NE9	WNW6	W14	WNW11	N5.9	NE17	
6-Jun	WSW12	WSW14	SW10	SW11	SW12	SW13	SW12	SW13	WSW13	SW13	SW16	WSW16	SW15	SW17	SW18	WSW18	SW17	SW16	SW13	SW10	S6	S8	S10	S11	SW12.4	SW18	
7-Jun	SSW6	SSW1	W3	SW3	S9	S7	SSW9	SW10	SW13	SSW16	WSW17	W19	W19	W18	W20	W16	W13	W11	WNW8	W6	WNW5	WNW6	WNW7	WNW9	WSW8.9	W20	
8-Jun	NW5	N8	NNE4	WNW3	WNW5	WNW5	NNW4	NNE10	N5	NE2	NE3	NE5	SE1	NE4	ESE10	ESE7	SE11	E9	ENE9	NE10	NNE8	NNE6	NNW3	NW3	NE3.4	SE11	
9-Jun	WNW4	WNW4	WNW3	WNW3	WNW2	W1	WSW1	S0	SSE8	S8	S8	S12	S13	S8	S8	S9	S11	S11	SSW9	SSW5	SSW4	S4	SSW8	S4	S5.2	S13	
10-Jun	S4	SW1	S1	SSW5	WSW2	SSW5	S8	S11	S13	S14	S17	S20	S23	S24	S25	S25	S27	S26	S22	S17	S13	S13	S11	S10	S13.9	S27	
11-Jun	S7	S9	S9	SW7	WNW3	SW4	W6	W10	W8	W7	W8	WNW14	WNW11	NW17	WNW13	WNW14	NW15	W6	W5	NW11	NW11	NW9	WNW7	NW6	WNW6.9	NW17	
12-Jun	W1	SW2	WSW2	W3	NW4	WSW3	NNW5	NNE13	NNE11	NNE12	NNE9	NE8	ENE11	ENE11	NE10	ENE11	ENE13	ENE9	NNE8	NNE10	NNE10	NNE7	NNW2	NNW4	NNE5.8	NNE13	
13-Jun	NNW4	N4	N4	NW4	NNW3	WNW5	NW4	NNW3	S7	SSW7	S5	S2	NNW8	NNW10	NNE16	NNE19	N21	NNE23	NE21	NE19	NNE19	N17	NNE19	NNE24	NNE8.7	NNE24	
14-Jun	NE25	NNE18	NNE17	NNE19	N19	NNE17	NNE20	NNE20	NNE16	NNE19	NNE14	NNE17	NNE16	NNE23	N18	N8	N14	N18	NNE25	NNE28	N27	N30	NNE27	N24	NNE19.7	N30	
15-Jun	N20	N16	N17	N13	NNW10	NNW13	N15	NNW9	NNW9	NW9	WNW7	NW11	NNW14	NNW15	NNW14	N8	N9	NNE5	SE5	SSW1	SSW1	SW1	WSW7	NNW8.6	N20		
16-Jun	WSW10	WSW7	SW5	SW6	S6	S8	S8	S10	S12	S12	SSE12	SSE11	SSW13	SW15	SSW17	SSW18	SSW15	S15	SSW12	SSW13	SW8	SW11	SW14	WSW11	SSW10.3	SSW18	
17-Jun	SW12	SW15	WSW14	SW11	SW14	SW15	SW14	SW16	WSW12	WSW11	WSW13	WSW13	WSW14	WSW15	W15	W14	W12	N15	NE22	NE13	NE8	NNW5	NNW6	NW6	WSW7.4	NE22	
18-Jun	WNW3	SW3	NW3	NW4	NW4	NNE9	NNE15	NNE10	NE16	NE15	NNE19	NE20	NE19	NE21	NE25	NE25	NE27	NE26	NNE26	NNE33	NNE31	NNE29	NNE28	NNE27	NNE17.2	NNE33	
19-Jun	NNE26	NNE23	NNE27	NNE27	NNE32	NNE32	NNE36	NNE39	NNE43	NNE42	NNE38	NNE31	NNE28	NNE31	N39	NNE41	N37	N34	N34	N33	N33	N30	N29	N24	NNE32.7	NNE43	
20-Jun	N23	N23	N24	N26	NNE27	N25	N23	NNE23	NNE20	N17	N17	N12	N15	N15	NNW8	NNE12	N11	N11	NNW7	NNW8	NW8	NW9	NW8	WNW10	N15.1	NNE27	
21-Jun	WNW7	WNW7	WNW8	WNW7	WNW11	NW10	N13	N17	NNE13	NNE16	NE17	NNE14	NNE10	NNE13	NE15	NNE18	NE18	NE15	ENE12	E9	SE7	SE4	SW1	WNW2	NNE7.8	NNE18	
22-Jun	WNW3	WNW2	SW2	SW1	SW2	SSE3	NNW2	SSE4	SSE9	SSE10	SSE11	SSE7	SSW7	WSW5	WSW14	WSW17	W14	WSW10	WSW7	SW7	SSW6	WSW2	WSW4	SSW3	SW4.8	WSW17	
23-Jun	SSW7	SSW5	WNW1	WNW3	WSW2	SE3	SSE6	SSE7	NW1	E2	SSE11	SSE12	S12	SSW8	SSE6	S4	WNW3	S5	S8	SSE8	UO	SSW3	S8	S8	S4.8	SSE12	
24-Jun	WSW2	S6	SSW9	SW9	S9	SSW10	SSW11	SSW14	SW14	SW13	WSW12	SW12	WSW12	NW9	ENE7	NE14	NNE18	N21	NNE28	NNE19	NNE21	NNE20	NNE20	NNW2.0	NNE28		
25-Jun	NNE16	NNE14	NNE9	NNE11	NNE10	NNE8	NNE10	NE15	ENE15	ENE17	ENE14	NE15	NE13	NE8	NNE8	N7	NNW7	NNW5	WNW4	WNW1	SE2	WSW2	SW1	W1	NNE7.6	ENE17	
26-Jun	WSW1	SSW2	SSW2	SSW4	S3	SSW4	SSW5	SSE8	SSW6	SSE8	SSE14	SSW4	WSW4	SW14	SW8	N17	ENE3	NW2	E4	SE5	SSE3	SSE2	SSE3	NNW2	S2.8	N17	
27-Jun	NW4	NNW3	NNW5	NW5	NNW6	NW3	NNE9	NNE14	NNE11	NNE9	N12	NNE11	NE10	NNE9	ENE9	ENE7	ENE7	ENE9	ENE6	ESE4	W2	W1	SSW3	SW3	NNE4.9	NNE14	
28-Jun	SSW5	SSW5	SSW7	SSW5	S7	SSW5	SSW7	S11	S12	S12	S12	S12	S9	SW5	N6	N5	N4	ESE3	SSE9	SSW9	SW10	WSW4	S5	SW6	WSW7	SSW5.2	S12
29-Jun	SSW6	SSW9	S10	SSW7	SW7	SW6	SSW10	SSW11	SSW10	S12	S12	S14	S17	SW12	SW14	SSW14	W11	SW9	SW9	SW10	SSW10	SSW9	SW9	SW7	SSW9.7	S17	
30-Jun	SW9	SW9	SW9	SW9	SW10	SSW7	SSW8	SSW10	SSW13	SW13	SW12	SW14	WSW13	W13	W16	WSW16	WSW15	WSW15	W14	WSW12	WSW10	SW7	SW9	WNW9	WSW10.6	WSW16	

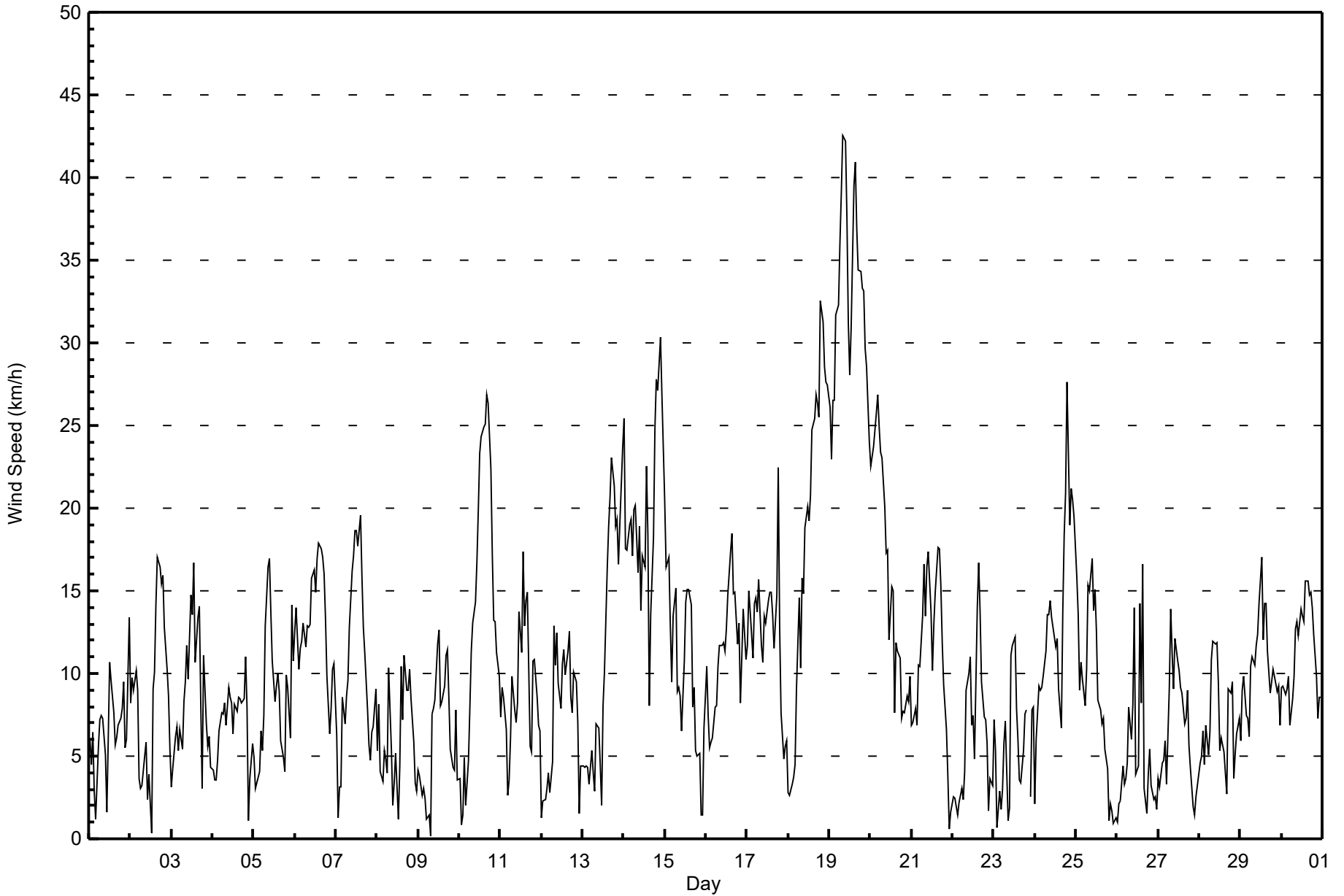
NNW3.1	NW2.4	NW2.9	NW3.2	NW2.9	NW1.9	NNW2.6	N2.5	NNE1.7	NE1.8	ENE1.4	N1.6	NW1.5	NNW3.7	NNW3.4	N3.8	N4.2	NNE4.0	NNE4.1	NNE4.8	NNE4.8	N3.6	NNW3.0	NNW4.2	Diurnal Average	
NNE26	N23	NNE27	NNE27	NNE32	NNE32	NNE36	NNE39	NNE43	NNE42	NNE38	NNE31	NNE28	NNE31	N39	NNE41	NNE37	N34	N34	N33	N33	N30	N29	NNE27	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Ells River - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Ells River - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	173	24.06	24.06
6 - 11	282	39.22	63.28
12 - 19	189	26.29	89.57
20 - 28	53	7.37	96.94
29 - 38	17	2.36	99.30
> 38	5	0.70	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Ells River - June 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	5	6	3	2	2	6	8	12	20	16	15	11	24	16	17	173
6 - 11	20	45	17	16	4	3	1	14	35	29	29	10	9	19	15	16	282
12 - 19	21	34	19	8	0	0	0	4	18	11	29	22	13	3	2	5	189
20 - 28	12	24	8	0	0	0	0	0	8	0	0	0	1	0	0	0	53
29 - 38	7	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
> 38	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Totals	71	122	50	27	6	5	7	26	73	60	74	47	34	46	33	38	719

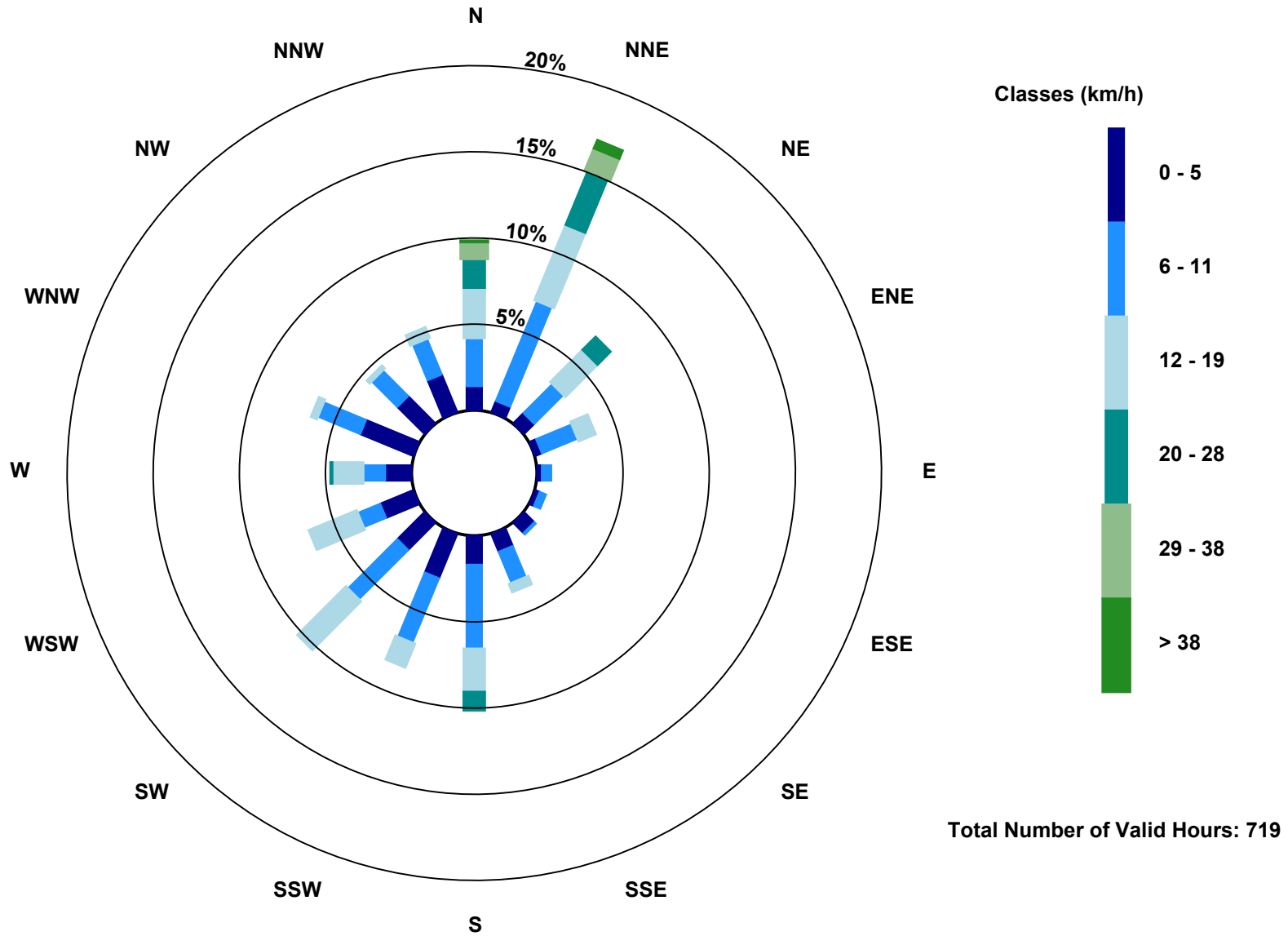
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Ells River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Ells River - June 2023

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

4	5	4	5	5	4	5	6	7	6	7	6	6	6	8	15	7	11	7	5	6	5	10	5	
Diurnal Maximum																								

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Ells River - June 2023

Direction of Maximum Speed: 22 deg on Jun 19 09:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 14.9 deg on Jun 19	Hours of Data: 719
Direction of Minimum Speed: 172 deg on Jun 9 08:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 1.9 deg on Jun 1	Percent Operational Time: 99.9
Monthly Average Direction: 353.0 deg	

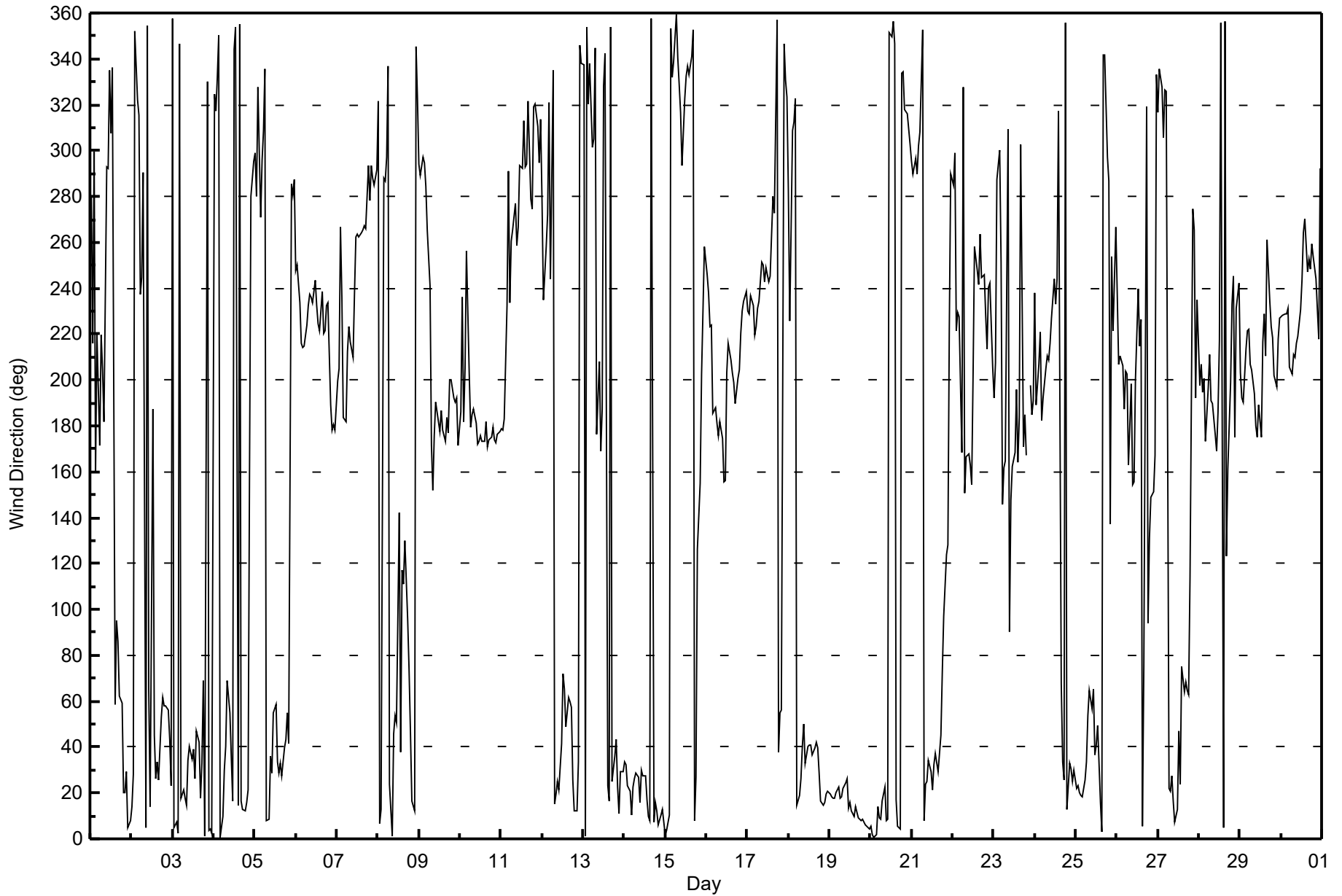
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	280	216	300	160	220	171	220	205	182	293	292	335	308	336	59	95	86	62	59	20	20	29	5	8	359.5
2-Jun	14	28	352	322	315	237	245	291	5	355	65	14	187	45	26	34	25	53	62	58	58	56	43	23	29.1
3-Jun	358	5	7	2	347	18	21	18	15	34	40	35	39	26	47	42	17	33	69	1	330	4	4	3	21.9
4-Jun	325	317	332	350	1	10	30	40	69	55	36	16	344	354	15	355	17	13	12	16	22	159	280	295	11.0
5-Jun	299	280	328	271	296	309	335	8	9	36	29	55	59	34	29	33	27	40	44	55	41	286	280	287	7.3
6-Jun	248	250	234	216	214	215	224	232	237	236	234	244	232	224	222	238	220	222	233	234	189	178	181	178	225.3
7-Jun	199	205	266	236	184	182	212	223	217	210	237	263	264	263	264	265	267	266	293	278	294	288	285	292	250.7
8-Jun	322	7	13	288	287	297	337	24	1	46	54	51	142	38	117	111	130	96	74	46	16	12	345	323	39.0
9-Jun	294	289	297	295	284	265	241	172	152	176	190	182	178	187	178	173	184	177	200	200	192	190	192	171	190.0
10-Jun	186	236	182	205	256	203	179	185	187	181	172	173	176	173	173	182	171	174	175	179	174	173	177	177	177.5
11-Jun	179	178	183	232	291	234	260	265	277	259	267	294	292	313	293	294	321	279	274	319	320	310	295	314	284.5
12-Jun	279	235	258	272	321	244	335	15	20	25	21	42	72	65	49	62	60	57	26	12	12	33	346	338	30.3
13-Jun	337	1	354	320	338	301	305	345	176	208	169	188	328	343	23	17	354	25	36	44	23	11	30	29	14.7
14-Jun	34	32	23	21	10	22	26	29	27	16	30	28	28	17	10	8	357	7	16	12	6	10	13	7	17.5
15-Jun	2	4	10	353	332	339	360	341	329	317	294	323	332	337	333	341	353	8	27	126	155	202	230	258	344.4
16-Jun	246	238	223	224	185	188	181	175	182	174	155	156	203	216	209	203	199	190	201	204	220	230	234	238	202.5
17-Jun	230	229	237	233	219	223	232	234	251	250	243	249	243	245	263	280	273	357	38	55	56	347	330	324	256.1
18-Jun	283	226	309	312	323	14	19	26	40	50	33	40	41	41	37	40	42	40	29	17	15	16	20	21	27.8
19-Jun	20	19	18	18	20	23	18	18	22	25	26	13	16	12	10	14	11	9	8	9	7	6	6	5	14.9
20-Jun	6	2	0	2	14	9	9	16	22	8	8	352	349	356	346	17	5	4	333	335	318	316	309	303	0.4
21-Jun	295	290	296	290	302	308	352	8	24	25	34	29	21	32	37	29	37	45	73	97	124	128	222	290	19.6
22-Jun	285	299	222	230	227	168	327	151	166	168	163	155	203	258	248	242	264	245	246	228	213	241	242	206	221.2
23-Jun	192	208	287	300	252	146	162	165	309	91	148	162	169	196	164	184	303	171	185	167	UO	198	185	191	177.6
24-Jun	238	189	207	221	182	192	205	210	208	216	227	244	233	244	317	68	34	26	355	13	33	30	25	30	330.6
25-Jun	22	23	20	19	18	26	33	53	64	57	65	36	41	49	16	3	342	342	297	287	137	254	221	267	32.3
26-Jun	237	207	210	206	187	204	202	163	198	154	156	200	240	215	226	5	76	319	94	131	149	151	167	333	183.5
27-Jun	317	336	328	306	327	326	22	20	28	16	7	13	47	24	75	64	68	64	63	114	274	265	192	235	24.3
28-Jun	198	207	195	201	173	196	211	191	190	176	169	186	217	356	5	356	123	161	199	233	245	175	231	242	196.8
29-Jun	203	192	190	213	221	222	207	204	194	180	175	189	175	217	229	210	261	234	223	219	202	197	218	227	206.6
30-Jun	228	228	229	229	231	206	203	211	210	216	219	230	244	264	270	247	253	248	259	254	244	231	218	292	237.9

328.1 322.9 325.8 312.4 319.3 321.8 341.7 6.3 26.6 38.6 73.4 353.0 311.2 334.6 344.1 358.5 2.1 26.0 21.4 19.0 12.8 2.6 339.3 338.1

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
Ells River - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Jun 2 13:00	Hours of Data: 719
Minimum Value: 2 deg on Jun 7 00:00	Hours of Missing Data: 1
Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 14 Median = 20 Q ₃ = 31 P ₉₀ = 56 P ₉₉ = 88	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-Jun	61	42	25	79	83	33	17	20	27	47	91	66	66	37	62	53	34	28	25	26	9	11	22	8	91
2-Jun	22	11	14	15	50	53	51	44	26	33	73	59	100	34	24	15	12	19	11	10	9	10	9	18	100
3-Jun	26	16	14	15	14	13	15	11	18	20	27	24	29	19	36	23	17	40	78	17	23	21	12	19	78
4-Jun	24	24	21	20	17	14	11	12	18	12	9	18	23	14	19	15	18	18	19	9	20	86	24	16	86
5-Jun	18	42	64	43	42	29	33	13	17	10	9	25	37	27	20	31	36	48	50	13	12	29	29	37	64
6-Jun	22	22	27	16	14	14	19	21	23	26	27	27	30	30	27	25	24	26	21	21	15	4	4	2	30
7-Jun	25	82	53	47	12	17	20	21	19	21	26	24	23	28	26	28	27	25	22	21	20	14	12	10	82
8-Jun	38	15	35	32	48	18	43	17	42	93	70	72	93	84	32	46	23	35	16	9	12	13	17	28	93
9-Jun	24	16	33	29	49	51	66	90	24	41	40	35	32	60	52	40	33	18	23	13	13	18	13	35	90
10-Jun	14	82	25	29	18	21	14	22	20	18	18	15	15	15	16	17	13	13	12	12	9	8	9	9	82
11-Jun	13	18	16	34	86	56	46	20	21	25	28	21	28	21	28	30	15	30	21	15	8	16	15	38	86
12-Jun	88	41	54	59	44	64	38	14	23	19	21	36	29	24	21	23	12	10	11	12	23	19	76	32	88
13-Jun	22	20	17	23	38	13	14	57	25	46	58	74	23	23	14	10	17	10	15	24	13	13	10	9	74
14-Jun	9	12	8	8	9	10	9	8	8	9	10	8	11	9	14	27	19	20	12	13	13	11	9	12	27
15-Jun	12	11	10	15	10	10	16	16	13	11	21	15	11	13	12	15	29	21	28	22	20	84	70	25	84
16-Jun	13	16	18	18	17	17	13	13	20	19	13	14	27	17	19	16	16	15	17	13	33	19	19	20	33
17-Jun	18	17	20	23	16	16	19	19	27	26	24	31	24	26	25	24	25	48	11	16	16	26	13	24	48
18-Jun	83	48	40	18	17	20	9	21	13	19	14	16	19	15	14	11	10	11	12	8	7	7	7	7	83
19-Jun	7	7	7	8	7	7	8	8	9	9	8	8	11	9	11	9	11	12	13	11	12	14	13	15	15
20-Jun	13	16	16	16	10	12	14	10	9	15	13	16	14	16	18	8	19	14	15	9	11	8	19	8	19
21-Jun	15	14	12	30	7	7	18	10	14	16	18	19	42	28	14	19	15	16	22	15	9	27	84	44	84
22-Jun	37	64	44	76	55	19	58	67	22	22	23	42	40	81	28	24	26	24	21	23	23	54	61	65	81
23-Jun	14	13	83	22	42	26	17	29	90	78	19	45	33	57	65	80	63	61	29	22	UO	27	7	16	90
24-Jun	56	25	20	23	11	13	17	18	18	23	26	28	36	33	71	32	32	10	21	10	14	9	8	9	71
25-Jun	10	8	9	8	8	11	19	13	20	15	29	22	27	47	42	63	25	45	38	73	25	48	56	56	73
26-Jun	47	68	52	19	61	52	32	20	33	21	9	49	45	28	61	70	77	75	36	28	68	63	64	82	82
27-Jun	31	24	17	25	15	32	12	11	20	24	17	25	35	32	36	55	41	22	32	37	60	88	71	54	88
28-Jun	49	15	12	23	13	20	22	21	19	24	20	33	42	53	24	32	74	11	22	22	56	37	13	14	74
29-Jun	19	8	8	9	16	19	15	17	18	21	22	23	20	37	27	23	37	25	16	15	13	9	12	14	37
30-Jun	17	19	18	22	22	21	17	21	19	22	27	27	33	30	28	27	29	28	24	22	21	22	13	24	33

88	82	83	79	86	64	66	90	90	93	91	74	100	84	71	80	77	75	78	73	68	88	84	82	
Diurnal Maximum																								

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS506
JACKFISH 1
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
JUNE 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	6.9	0	1.8	0
H2S (ppb) Average	684	35	36	99.86	10.5	1	0.7	0
NO2 (ppb) Average	684	35	36	99.86	9.4	0	3.1	-
NO (ppb) Average	684	35	36	99.86	6.4	-	1.3	-
NOX (ppb) Average	684	35	36	99.86	15.8	-	3.9	-
Temperature 2 m (C) Average	720	0	0	100	28.8	-	22	-
Relative Humidity (%) Average	720	0	0	100	98.6	-	95.5	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	15	-	10	-
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 - JACKFISH 1 (AMS506)
 JUNE 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	0.46	0.7	-	0	0	0.1	0.2	0.5	1.3	6.9
H2S (ppb) Average	684	0.36	0.6	-	0	0	0.1	0.2	0.4	0.8	10.5
NO2 (ppb) Average	684	1.72	1.3	-	0.1	0.5	0.7	1.3	2.4	3.6	9.4
NO (ppb) Average	684	0.3	0.6	-	0	0	0	0.1	0.3	0.8	6.4
NOX (ppb) Average	684	2.01	1.8	-	0.1	0.5	0.8	1.5	2.7	4.1	15.8
Temperature 2 m (C) Average	720	16.57	5.3	-	4.4	9.6	12.2	16.3	20.7	24	28.8
Relative Humidity (%) Average	720	68.45	21	-	19.1	40	51.2	67.4	90	96.3	98.6
Wind Speed 10 m (km/h) Average	719	5.2	3	-	0	2	3	4	7	10	15
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, NO2	28 Jun 2023 10:00	28 Jun 2023 10:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	03 Jun 2023 02:00	03 Jun 2023 02:00	1	Flat line in sensor output signal



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 6.9 ppb on Jun 21 17:00	Maximum Daily Average: 1.8 ppb on Jun 21		Hours of Data:	687
Minimum Value: 0.0 ppb on Jun 3 03:00	Minimum Daily Average: 0.0 ppb on Jun 25		Hours of Missing Data:	33
Maximum Diurnal Average: 0.8 ppb at hour 17	Minimum Diurnal Average: 0.2 ppb at hour 2		Hours of Calibration:	33
Monthly Average: 0.46 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.3 P ₉₉ = 3.4		Percent Operational Time:	100.0

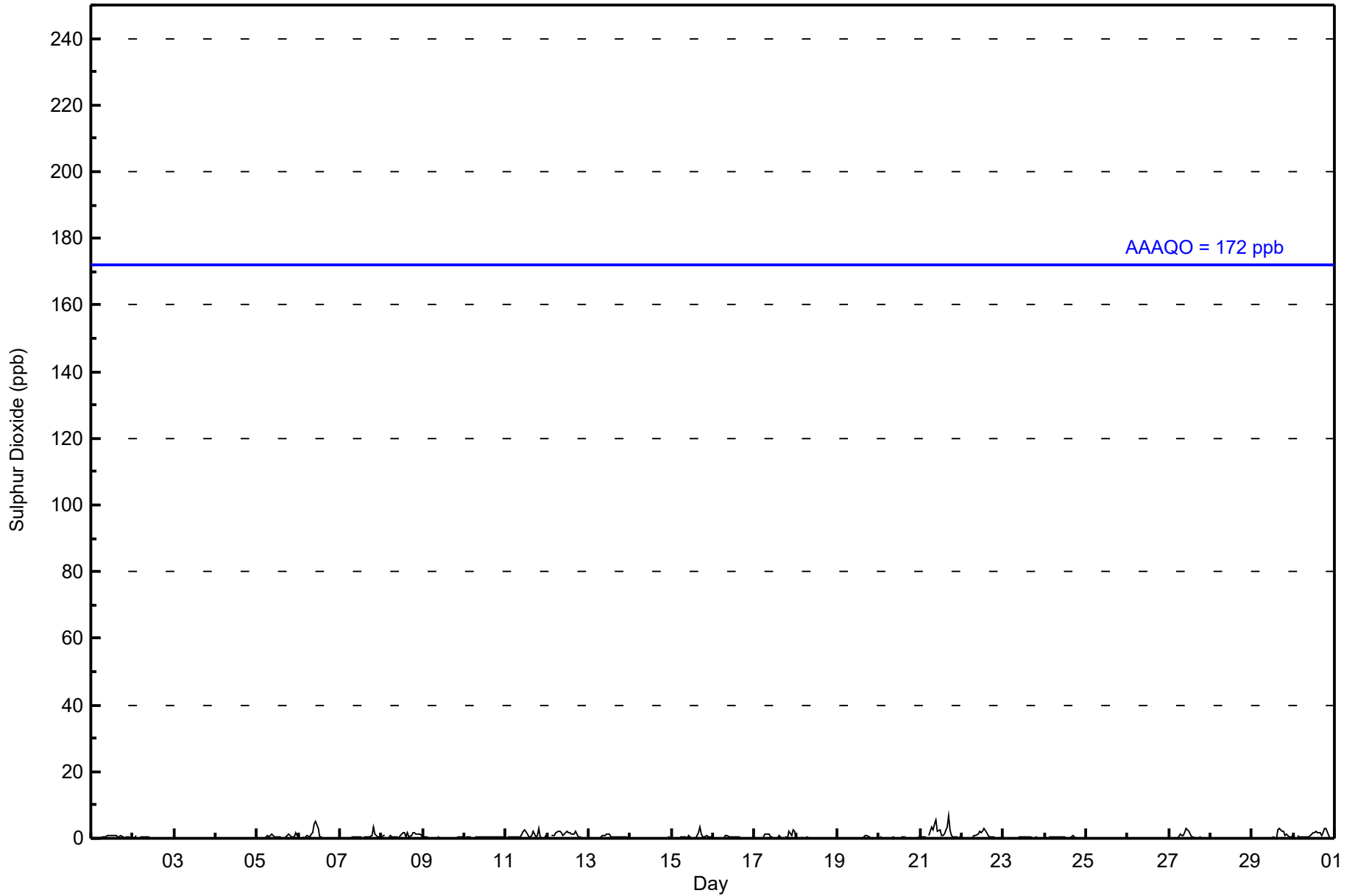
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.6	0.2	Z	0.1	0.1	0.2	0.4	0.6	0.6	0.9	0.9	0.8	0.8	1.0	0.8	0.6	0.4	1.0	0.5	0.2	0.2	0.4	0.3	0.1	0.5	1.0
2-Jun	0.1	0.1	0.7	Z	0.5	0.3	0.3	0.5	0.6	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.1	0.2	0.7
3-Jun	0.1	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
4-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
5-Jun	Z	0.1	0.1	0.1	0.2	0.3	0.8	0.6	1.2	1.1	0.4	0.3	0.3	0.2	0.2	0.1	0.1	1.0	1.4	0.7	0.6	0.5	1.7	1.0	0.6	1.7
6-Jun	0.2	Z	0.4	0.1	0.4	0.7	0.5	1.2	1.7	4.2	5.2	3.1	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.2
7-Jun	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.2	0.5	0.5	0.4	0.3	0.3	0.1	0.2	0.2	0.3	0.5	1.0	3.4	1.4	1.0	0.3	0.2	0.5	3.4
8-Jun	0.5	0.9	0.8	Z	0.2	0.9	0.5	0.5	0.6	0.6	0.2	0.9	1.6	1.6	0.4	1.5	0.4	0.7	1.6	1.8	1.3	1.2	1.2	0.8	0.9	1.8
9-Jun	0.6	0.5	0.2	0.2	Z	0.1	0.1	0.0	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.6
10-Jun	0.2	0.3	0.3	0.5	0.4	Z	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.5
11-Jun	Z	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.6	1.1	2.0	2.6	1.2	0.3	0.6	0.9	2.0	0.4	0.9	3.1	0.2	0.0	0.1	0.7	0.8	3.1
12-Jun	0.5	Z	0.9	0.7	0.9	1.6	2.0	2.3	1.8	1.0	1.3	2.0	1.7	1.8	1.1	1.3	1.9	1.3	0.5	0.3	0.1	0.1	0.1	0.0	1.1	2.3
13-Jun	0.1	0.0	Z	0.0	0.1	0.0	0.1	0.5	0.7	0.9	1.4	1.3	1.2	0.6	0.4	0.6	0.4	0.4	0.4	0.3	0.2	0.3	0.2	0.1	0.4	1.4
14-Jun	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.1	0.6	0.1	0.1	0.6
15-Jun	0.0	0.0	0.0	0.1	Z	0.2	0.3	0.3	0.3	0.2	0.7	0.1	0.1	0.1	0.1	1.8	3.2	1.1	0.4	0.6	0.6	0.2	0.3	0.2	0.5	3.2
16-Jun	0.2	0.2	0.0	0.0	0.0	Z	0.0	1.0	1.0	0.4	0.4	0.4	0.5	0.3	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	1.0
17-Jun	Z	0.1	0.2	0.1	0.1	0.2	1.3	1.2	1.1	0.6	0.3	0.2	0.0	0.0	0.7	0.3	0.2	0.1	0.3	0.2	2.0	0.7	2.4	2.0	0.6	2.4
18-Jun	0.5	0.3	Z	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
19-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.1	1.0
20-Jun	0.0	0.2	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.2	0.2	0.5	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.5	0.1	0.5
21-Jun	0.2	0.3	0.5	0.4	Z	0.7	3.3	2.6	4.4	5.5	2.1	2.4	0.9	1.1	1.4	3.6	6.9	2.7	0.8	0.6	0.4	0.3	0.2	0.2	1.8	6.9
22-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.7	0.8	1.3	2.3	1.8	2.0	3.1	1.9	0.8	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.7	3.1
23-Jun	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.4	0.4	0.4	0.4	0.6	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.6
24-Jun	0.1	Z	0.2	0.3	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.6	0.2	0.2	0.2	0.0	0.2	0.2	0.1	0.3	0.6
25-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
27-Jun	0.0	0.0	0.0	0.1	Z	0.0	1.2	0.9	0.9	1.6	2.8	2.2	1.5	0.5	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.6	2.8
28-Jun	0.2	0.1	0.1	0.1	0.1	Z	0.2	0.2	C	C	C	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
29-Jun	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	2.3	2.9	2.0	2.2	1.0	1.1	0.3	0.4	0.4	0.7	2.9
30-Jun	1.4	Z	0.9	0.5	0.3	0.3	0.4	0.6	0.4	0.3	0.6	1.7	1.5	1.9	1.8	1.7	0.8	1.7	2.8	3.0	0.7	0.0	0.0	0.0	1.0	3.0
																								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
Jackfish 1 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 1 - June 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 1 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	58	38	24	10	6	11	37	42	117	68	39	22	27	28	46	113	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	58	38	24	10	6	11	37	42	117	68	39	22	27	28	46	113	686

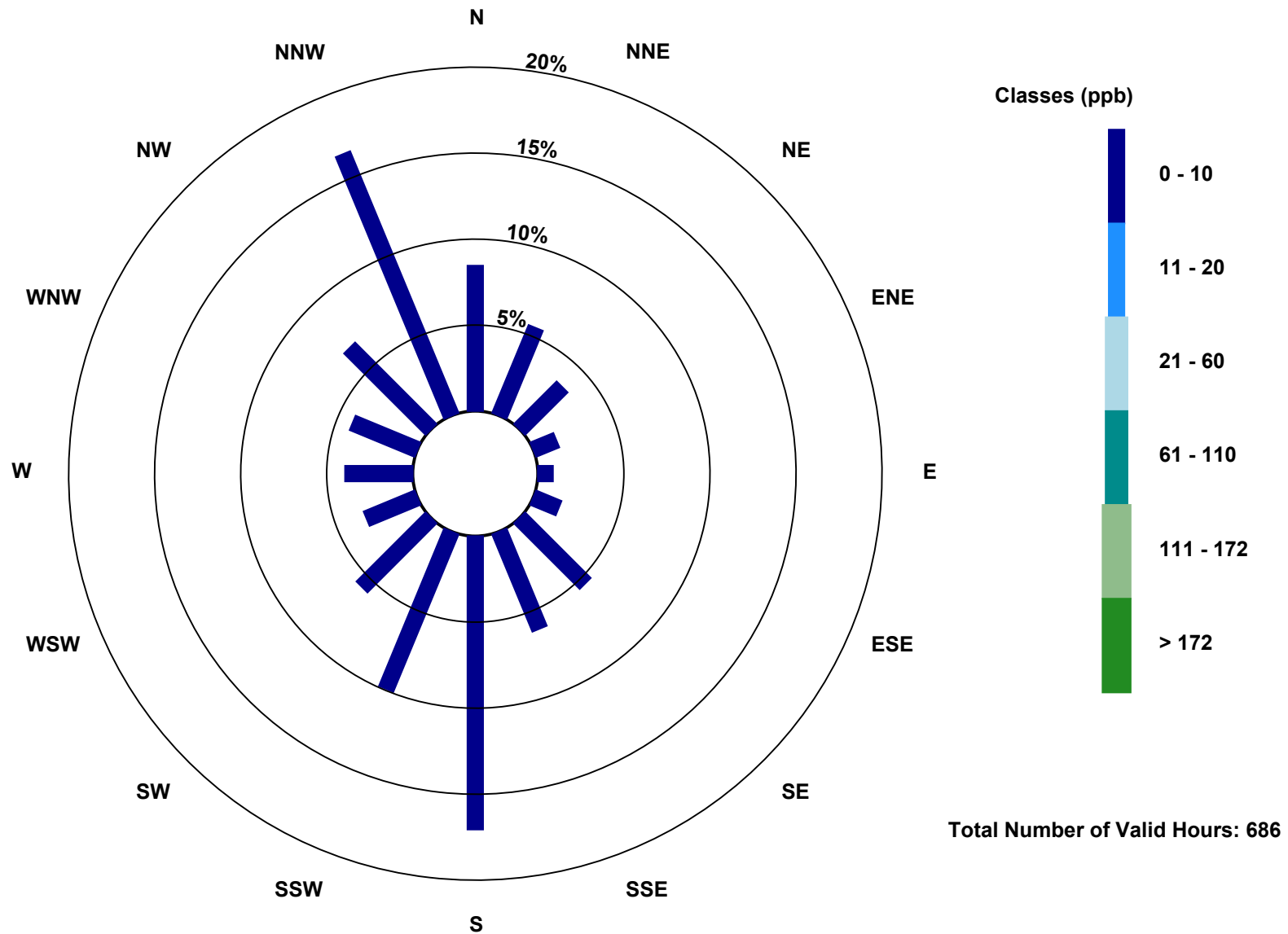
Total Number of Valid Hours: 686

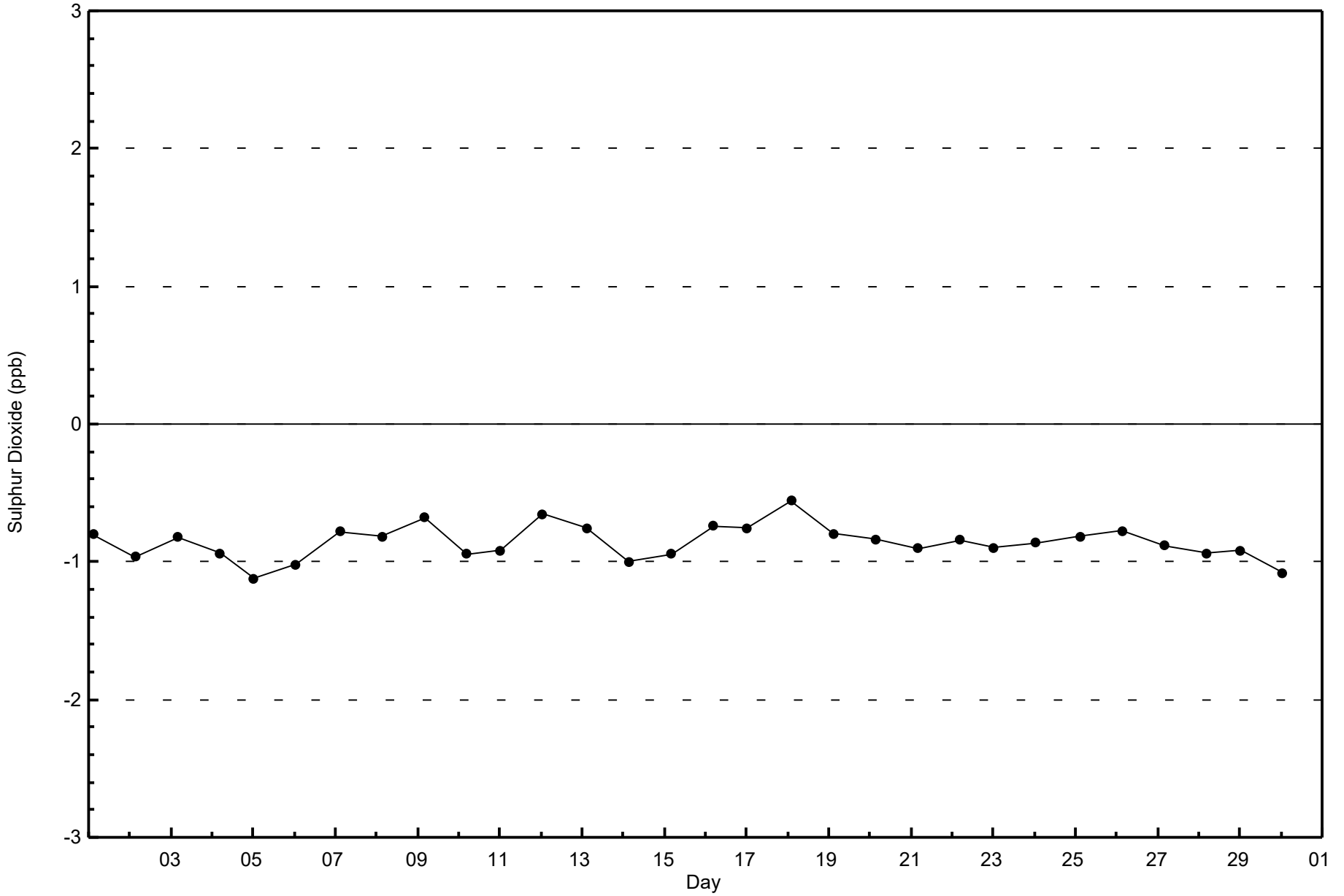
Total Number of Hours: 720

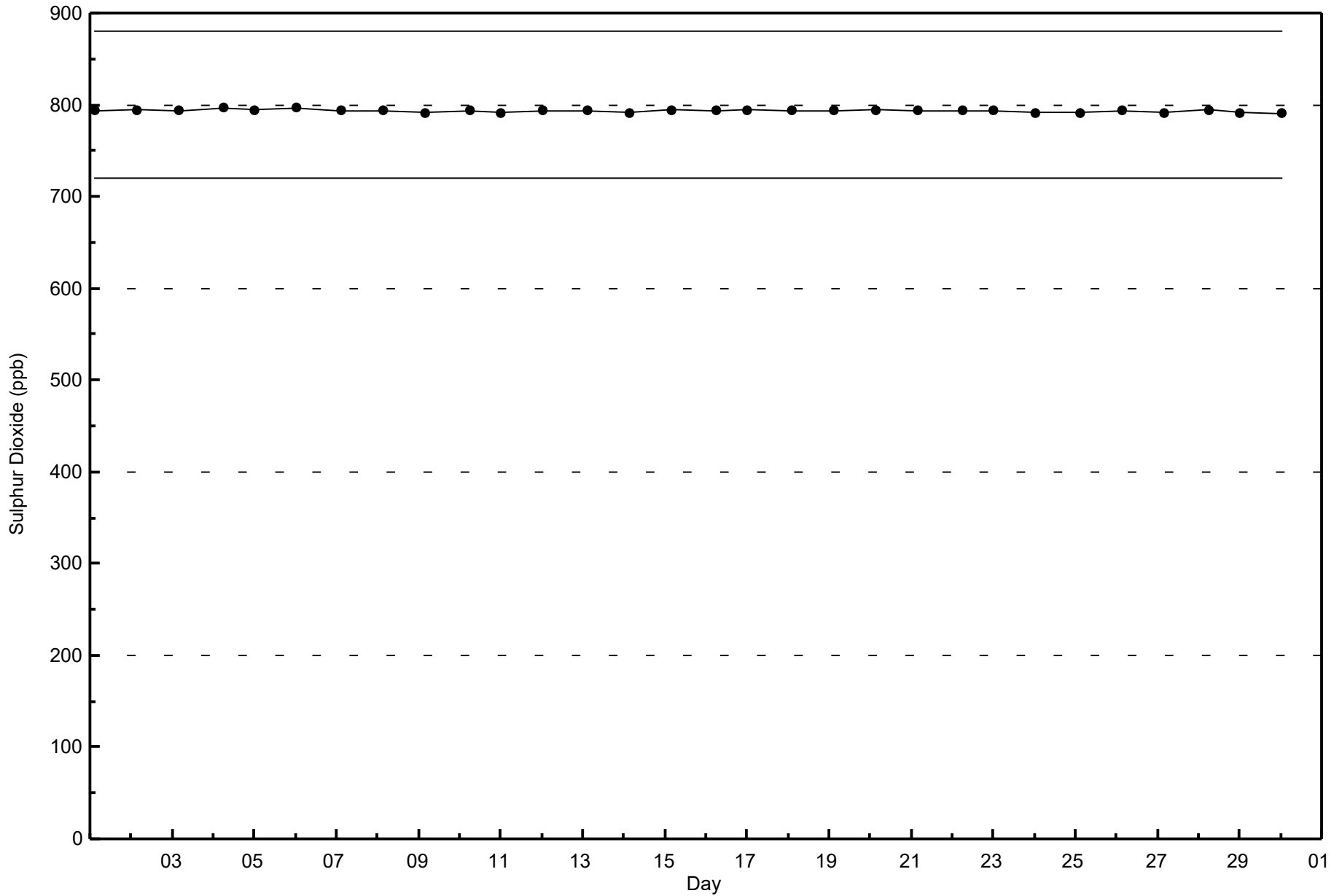


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Jackfish 1







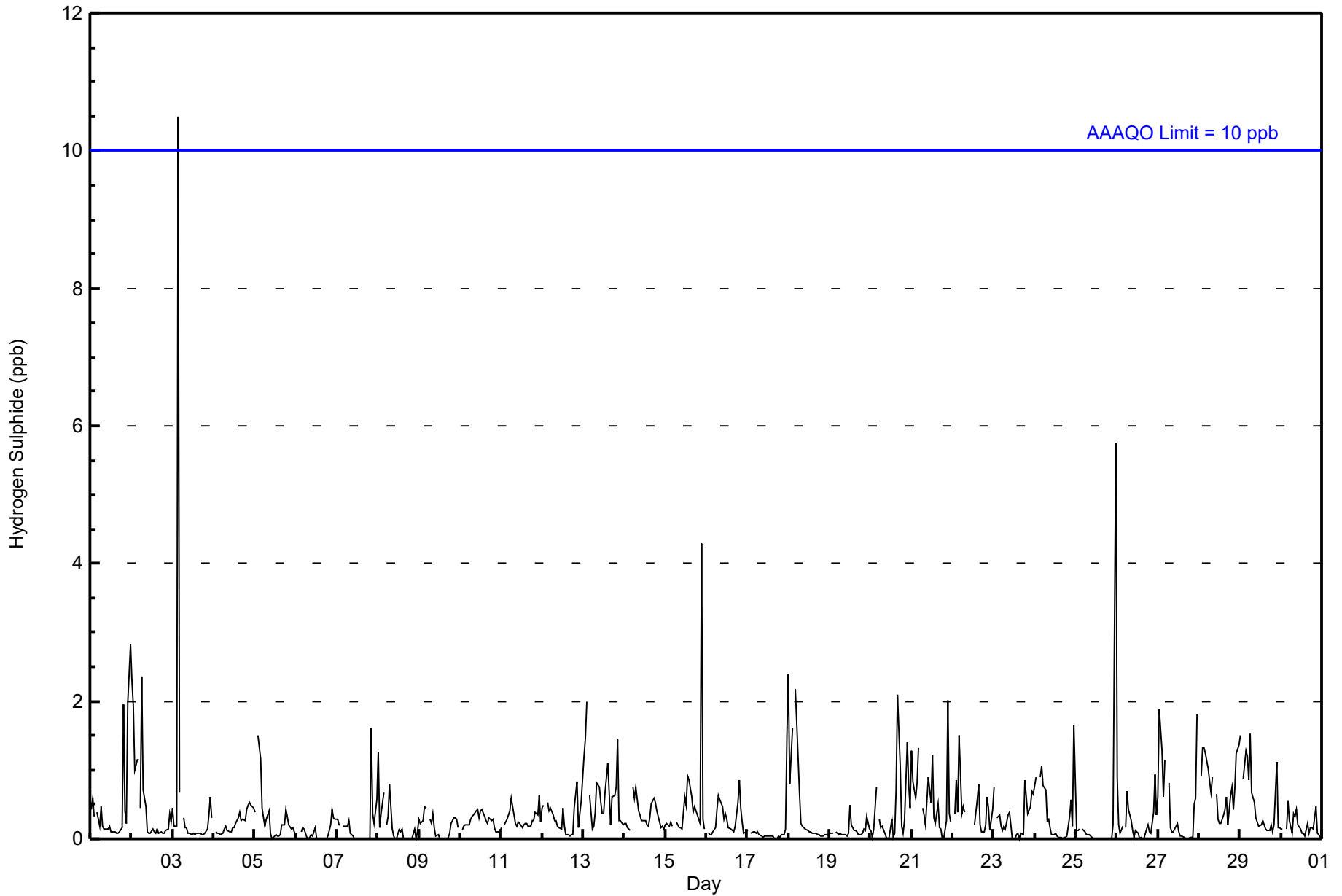


Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 0	Hours in Service:	720
Maximum Value: 10.5 ppb on Jun 3 04:00	Maximum Daily Average: 0.7 ppb on Jun 28		Hours of Data:	684
Minimum Value: 0.0 ppb on Jun 5 11:00	Minimum Daily Average: 0.1 ppb on Jun 6		Hours of Missing Data:	36
Maximum Diurnal Average: 0.9 ppb at hour 4	Minimum Diurnal Average: 0.2 ppb at hour 14		Hours of Calibration:	35
Monthly Average: 0.36 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.8 P ₉₉ = 2.2		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	0.4	0.6	0.3	Z	0.4	0.2	0.5	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	2.0	0.4	0.2	2.0	2.8	0.5	2.8
2-Jun	2.3	1.9	1.0	1.2	Z	0.5	2.4	0.7	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	0.4	0.2	0.5	2.4
3-Jun	0.5	0.2	0.2	10.5	0.7	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.6	0.3	0.6	10.5
4-Jun	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.2	0.5
5-Jun	0.4	Z	1.5	1.2	0.4	0.3	0.2	0.3	0.4	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.4	0.3	0.2	0.1	0.2	0.1	0.3	1.5
6-Jun	0.1	0.1	Z	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.3	0.1	0.4
7-Jun	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.4	0.2	0.6	0.2	1.6
8-Jun	1.3	0.2	0.4	0.7	Z	0.2	0.3	0.8	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	1.3
9-Jun	0.3	0.2	0.3	0.5	0.5	Z	0.3	0.2	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.5
10-Jun	Z	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.3	0.4
11-Jun	0.2	Z	0.2	0.3	0.3	0.4	0.6	0.5	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	0.6	0.3	0.3	0.6
12-Jun	0.5	0.5	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.8	0.2	0.4	0.5	0.3	0.8
13-Jun	1.2	1.5	2.0	Z	0.6	0.1	0.2	0.4	0.8	0.8	0.5	0.4	0.4	0.7	1.1	0.7	0.2	0.6	0.6	0.7	1.4	0.3	0.3	0.2	0.7	2.0
14-Jun	0.2	0.2	0.2	0.1	Z	0.7	0.6	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.5	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.3	0.7
15-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.6	0.5	0.9	0.9	0.6	0.4	0.5	0.4	0.3	0.2	4.3	0.3	0.2	0.5	4.3
16-Jun	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.6	0.5	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.5	0.9	0.4	0.2	0.1	0.1	0.3	0.9
17-Jun	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.5	0.1	1.5
18-Jun	2.4	0.8	1.6	Z	2.2	1.7	0.7	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	0.0	0.1	0.1	0.1	0.5	2.4
19-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.5
20-Jun	0.1	0.0	0.1	0.8	Z	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.3	0.0	0.1	0.7	2.1	1.0	0.2	0.1	0.3	1.4	0.8	0.4	0.4	2.1
21-Jun	1.3	0.8	0.6	0.8	1.3	Z	0.4	0.4	0.2	0.6	0.9	0.5	1.2	0.3	0.2	0.5	0.2	0.1	0.0	0.0	0.3	2.0	0.4	0.2	0.6	2.0
22-Jun	Z	0.4	0.9	0.4	1.5	0.4	0.5	0.4	C	C	C	C	C	0.2	0.6	0.8	0.2	0.1	0.1	0.2	0.6	0.4	0.1	0.4	0.5	1.5
23-Jun	0.8	Z	0.3	0.3	0.2	0.1	0.2	0.1	0.3	0.4	0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.9	0.6	0.4	0.5	0.7	0.7	0.3	0.9
24-Jun	0.8	0.9	Z	0.9	1.1	0.8	0.7	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.2	1.7	0.4	1.7
25-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	5.8	0.3	0.3	5.8
26-Jun	0.9	0.2	0.1	0.2	Z	0.2	0.7	0.4	0.3	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.4	0.9	0.3	0.2	0.9
27-Jun	0.6	1.9	1.3	0.6	1.1	Z	0.8	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	1.8	0.4	0.4	1.9
28-Jun	Z	0.9	1.3	1.3	1.2	1.0	0.8	0.7	0.9	M	0.7	0.3	0.2	0.2	0.4	0.4	0.6	0.2	0.6	0.8	0.4	0.7	1.2	1.4	0.7	1.4
29-Jun	1.5	Z	0.9	1.3	1.2	0.9	1.5	0.7	0.5	0.3	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	1.1	0.2	0.2	0.5	1.5
30-Jun	0.1	0.2	Z	0.1	0.6	0.3	0.1	0.4	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.5	0.1	0.1	0.0	0.2	0.6

0.7	0.5	0.5	0.9	0.6	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.7	Diurnal Average	
2.4	1.9	2.0	10.5	2.2	1.7	2.4	0.8	0.9	0.8	0.9	0.6	1.2	0.9	1.1	0.8	2.1	1.0	0.9	2.0	1.6	4.3	2.0	5.8	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
Jackfish 1 - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	680	99.42	99.42
3 - 4	2	0.29	99.71
5 - 7	1	0.15	99.85
8 - 11	0	0.00	99.85
> 11	1	0.15	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Jackfish 1 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	58	38	23	10	5	12	35	41	121	67	39	22	27	27	46	108	679
3 - 4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
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	1	0	1
Totals	58	38	23	10	5	12	35	41	122	68	39	22	27	27	47	109	683

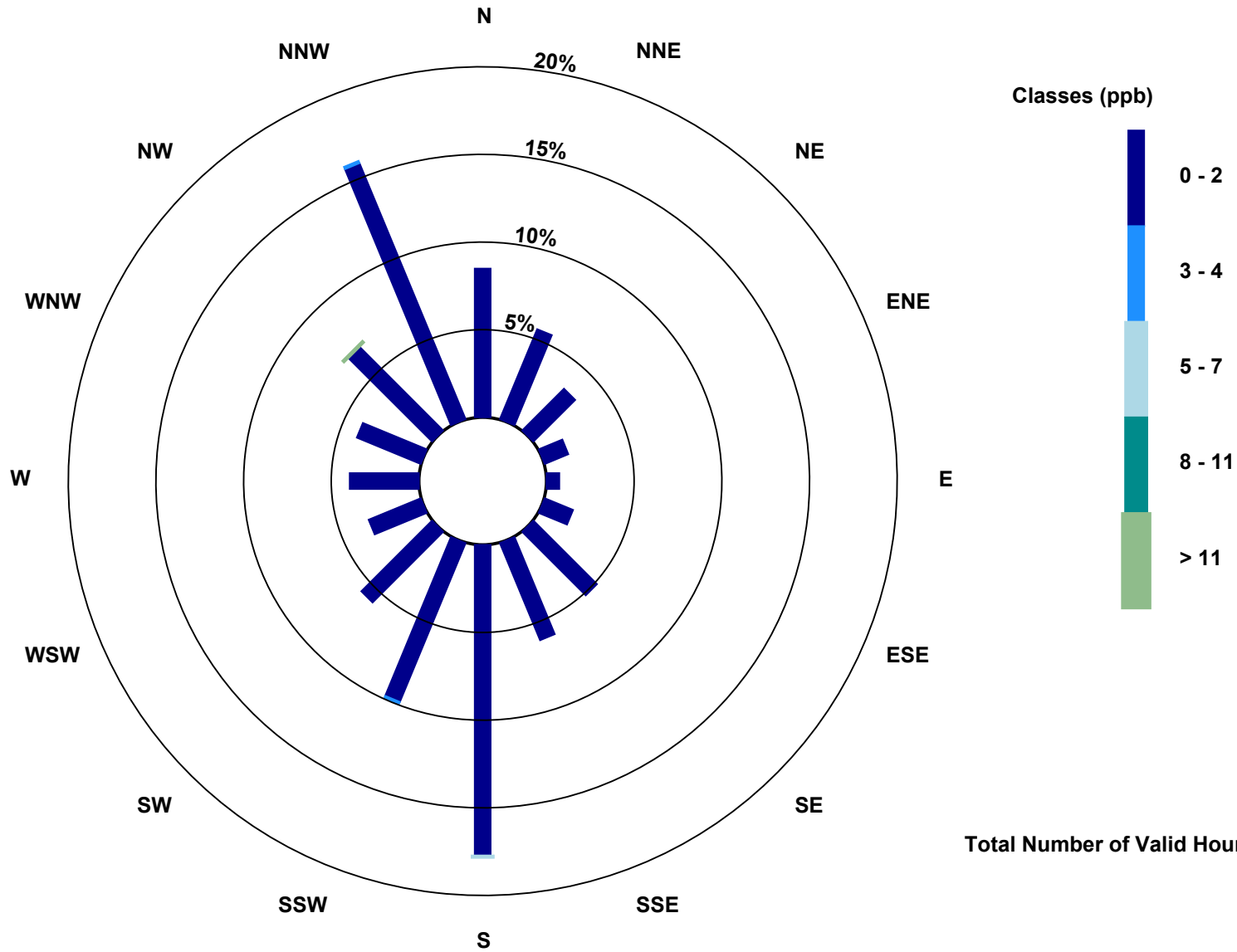
Total Number of Valid Hours: 683

Total Number of Hours: 720

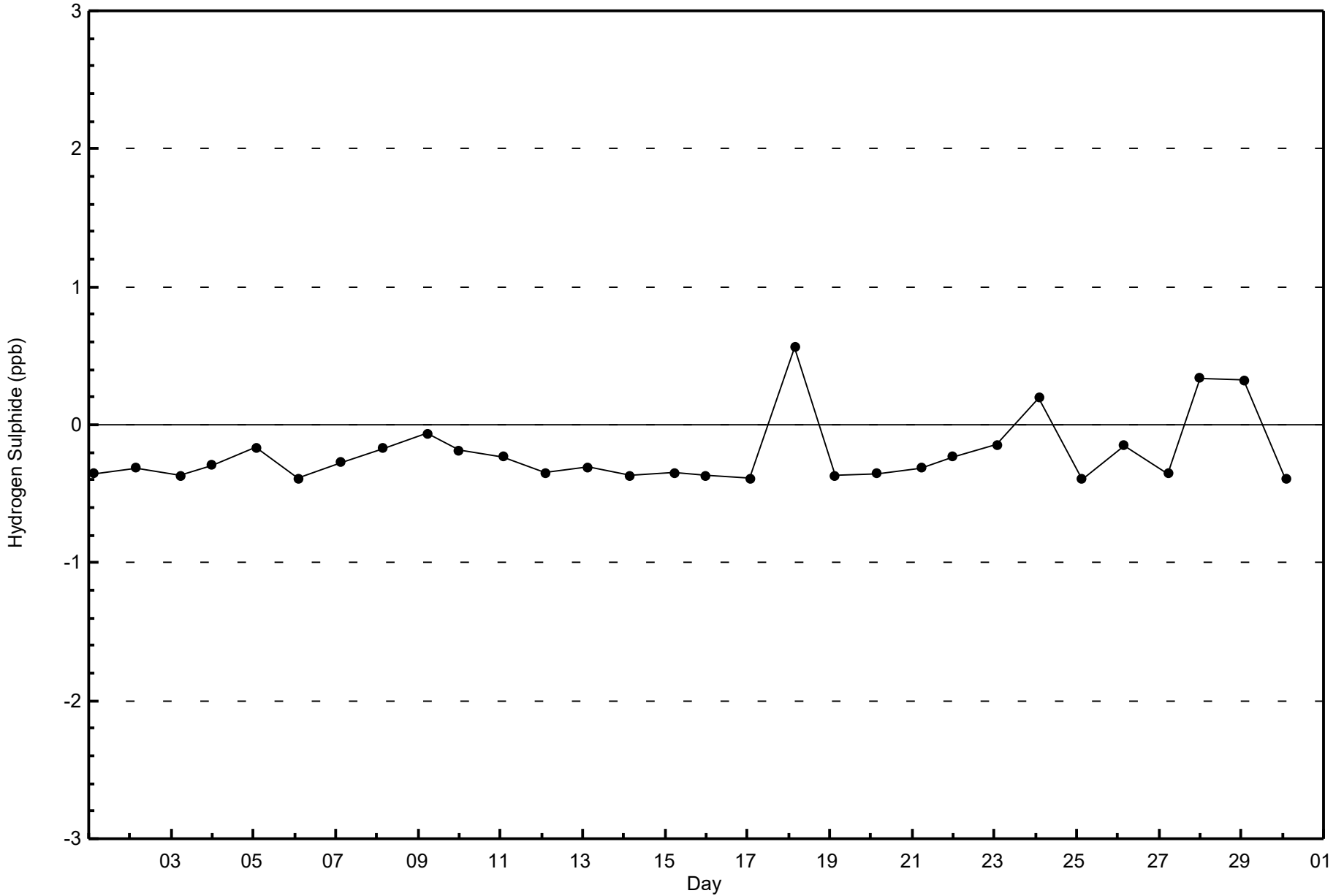


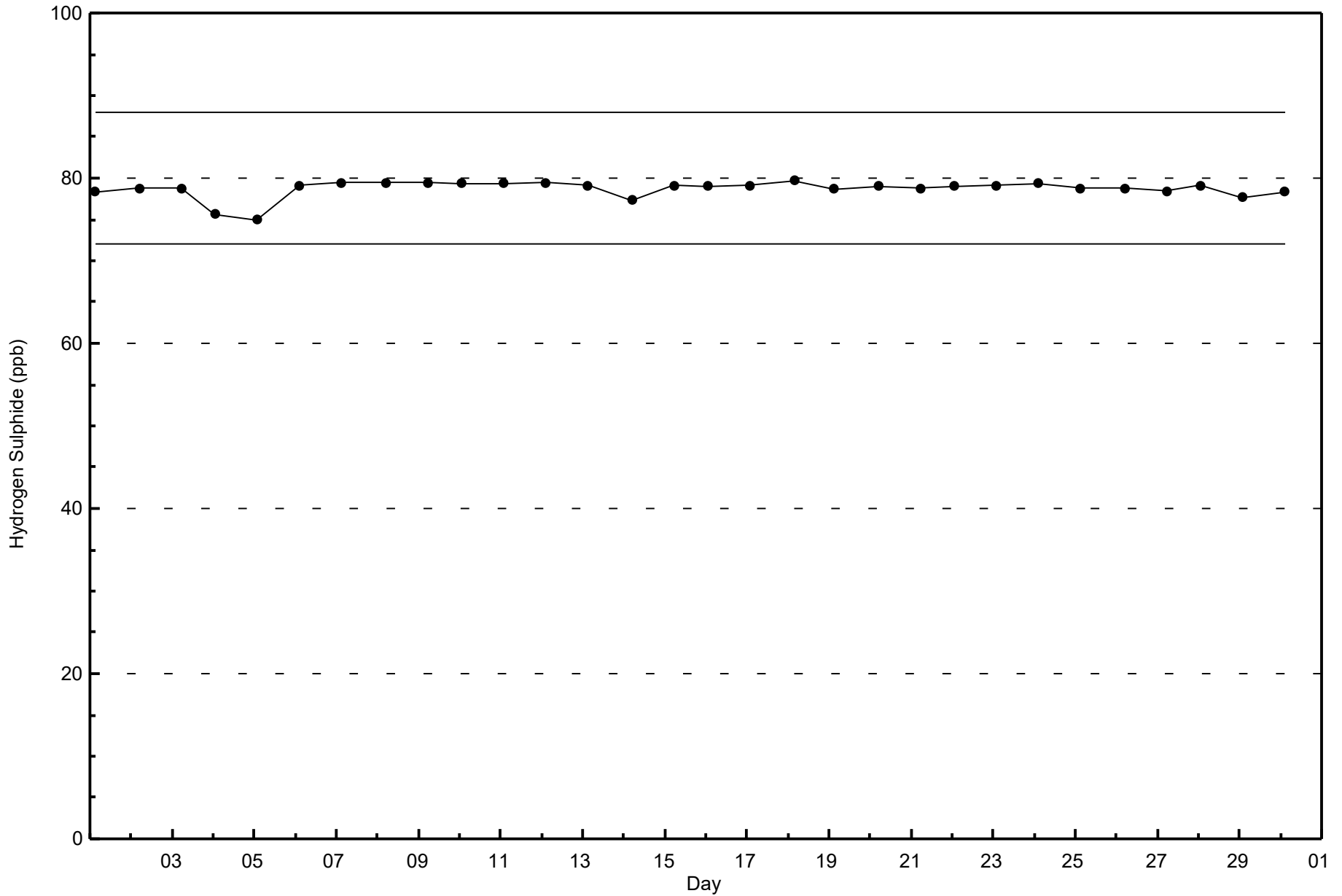
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 1



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association
Summary of Hour Averages

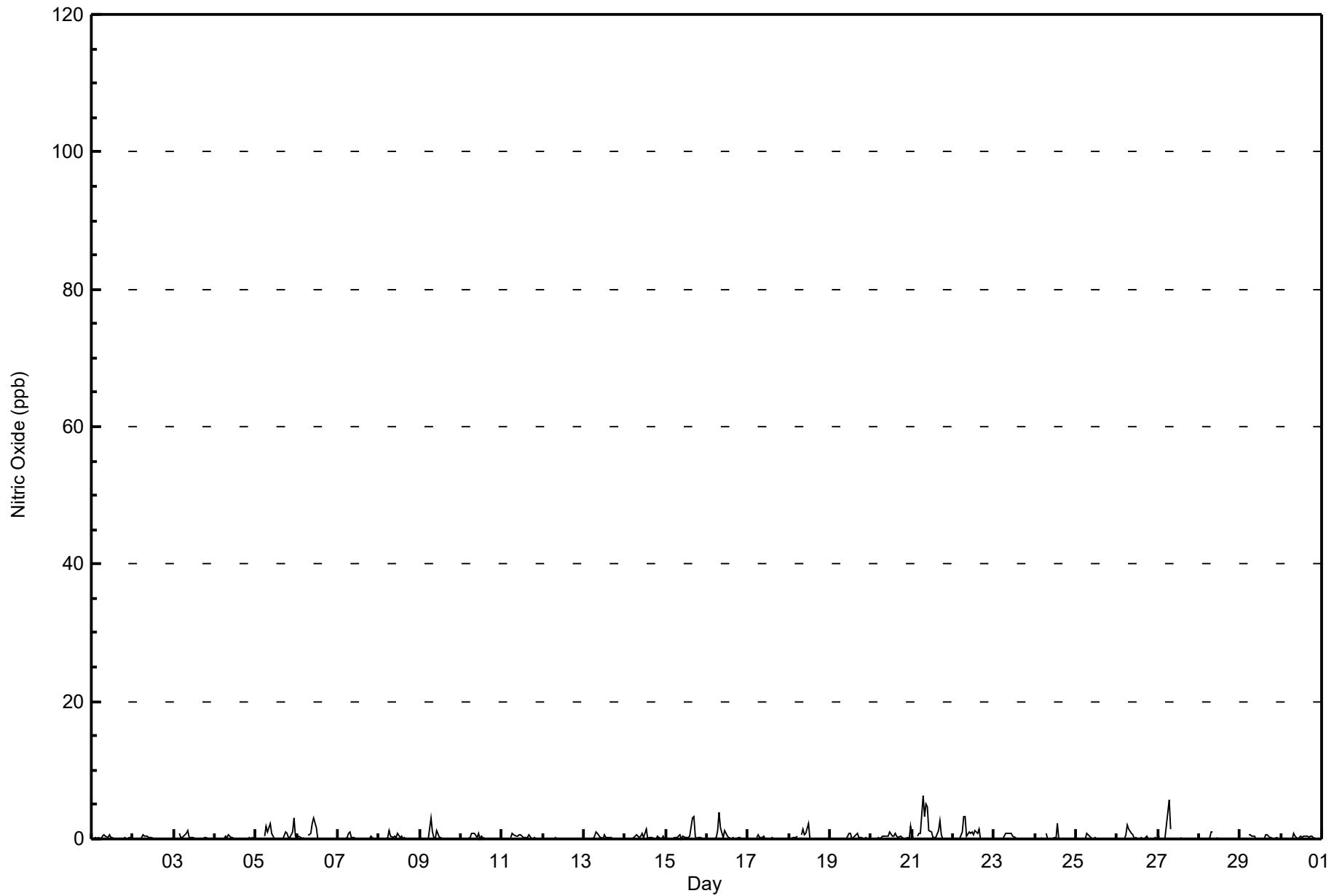
Nitric Oxide (NO) - ppb
Jackfish 1 - June 2023

Maximum Value: 6.4 ppb on Jun 21 07:00		Maximum Daily Average: 1.3 ppb on Jun 21		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 2 20:00		Minimum Daily Average: 0.0 ppb on Jun 12		Hours of Data: 684																						
Maximum Diurnal Average: 1.2 ppb at hour 7		Minimum Diurnal Average: 0.0 ppb at hour 21		Hours of Missing Data: 36																						
Monthly Average: 0.30 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.8 P ₉₉ = 3.2		Hours of Calibration: 35																						
				Percent Operational Time: 99.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	Z	0.1	0.3	0.0	0.1	0.1	0.3	0.5	0.5	0.2	0.6	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.6
2-Jun	0.1	Z	0.1	0.1	0.1	0.2	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.7
3-Jun	0.1	0.1	Z	0.7	0.3	0.3	0.6	0.8	1.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.1	0.1	0.1	1.3
4-Jun	0.1	0.1	0.1	Z	0.1	0.1	0.4	0.3	0.5	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	0.5
5-Jun	0.1	0.1	0.0	0.0	Z	0.4	1.8	1.0	2.2	0.8	0.4	0.0	0.1	0.0	0.0	0.0	0.0	1.0	0.8	0.2	0.1	1.0	3.0	0.4	0.4	3.0
6-Jun	0.0	0.3	0.2	0.0	0.1	Z	0.5	0.6	0.8	2.3	3.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
7-Jun	Z	0.0	0.0	0.0	0.0	0.1	0.8	1.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	1.1
8-Jun	0.0	Z	0.0	0.1	0.0	0.1	1.3	0.5	0.3	0.3	0.2	0.8	0.3	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
9-Jun	0.0	0.1	Z	0.0	0.1	0.1	3.0	1.1	0.2	0.1	1.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	3.0
10-Jun	0.0	0.0	0.0	Z	0.0	0.2	0.8	0.8	0.8	0.1	0.8	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	0.0	0.8
11-Jun	0.1	0.0	0.1	0.0	Z	0.1	0.8	0.7	0.5	0.3	0.6	0.6	0.1	0.1	0.2	0.2	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.8
12-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.8	0.3	0.2	0.1	0.7	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	1.0
14-Jun	0.0	Z	0.0	0.0	0.0	0.1	0.5	0.6	0.3	0.4	0.9	0.3	1.4	0.1	0.1	0.2	0.1	0.0	0.1	0.5	0.1	0.1	0.3	0.0	0.0	1.4
15-Jun	0.0	0.0	Z	0.0	0.0	0.2	0.3	0.4	0.5	0.1	0.5	0.2	0.2	0.2	0.3	3.0	3.3	0.3	0.1	0.3	0.2	0.0	0.1	0.0	0.0	3.3
16-Jun	0.0	0.0	0.0	Z	0.1	0.3	1.1	3.8	1.7	0.3	1.2	0.8	0.5	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.0	3.8
17-Jun	0.0	0.0	0.0	0.0	Z	0.2	0.6	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6
18-Jun	0.0	0.1	0.2	0.2	0.1	0.4	Z	0.6	1.5	0.6	0.9	2.2	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	2.2
19-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.9	0.9	0.1	0.3	0.6	0.9	0.2	0.1	0.1	0.0	0.3	0.1	0.1	0.0	0.9
20-Jun	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.5	0.4	0.4	0.3	1.1	0.4	0.5	0.8	0.3	0.2	0.3	0.2	0.1	0.0	0.2	0.1	1.9	0.0	1.9
21-Jun	0.1	0.3	Z	0.5	0.9	0.9	6.4	3.2	5.1	4.6	1.2	1.1	0.2	0.1	0.3	1.2	2.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4
22-Jun	0.1	0.1	0.1	Z	0.0	1.0	3.2	3.2	0.5	1.0	0.8	1.0	0.7	1.3	0.8	1.4	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	3.2
23-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.5	0.8	0.9	0.8	0.8	0.3	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	0.9
24-Jun	0.1	0.1	0.1	0.1	0.1	Z	0.8	0.0	0.0	0.0	0.0	0.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
25-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
26-Jun	0.1	Z	0.0	0.0	0.1	0.5	2.1	1.4	0.9	0.7	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	2.1
27-Jun	0.1	0.4	Z	0.1	0.2	2.0	5.7	1.5	C	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	0.0	5.7
28-Jun	0.0	0.0	0.0	Z	0.0	0.1	0.3	1.1	0.9	M	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.1
29-Jun	0.1	0.1	0.0	0.0	Z	0.5	0.6	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.7
30-Jun	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.9	0.4	0.2	0.0	0.4	0.2	0.5	0.5	0.4	0.2	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.9
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 1 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Jackfish 1 - June 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
Jackfish 1 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	37	23	10	6	12	38	41	122	67	41	21	26	27	46	112	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	54	37	23	10	6	12	38	41	122	67	41	21	26	27	46	112	683

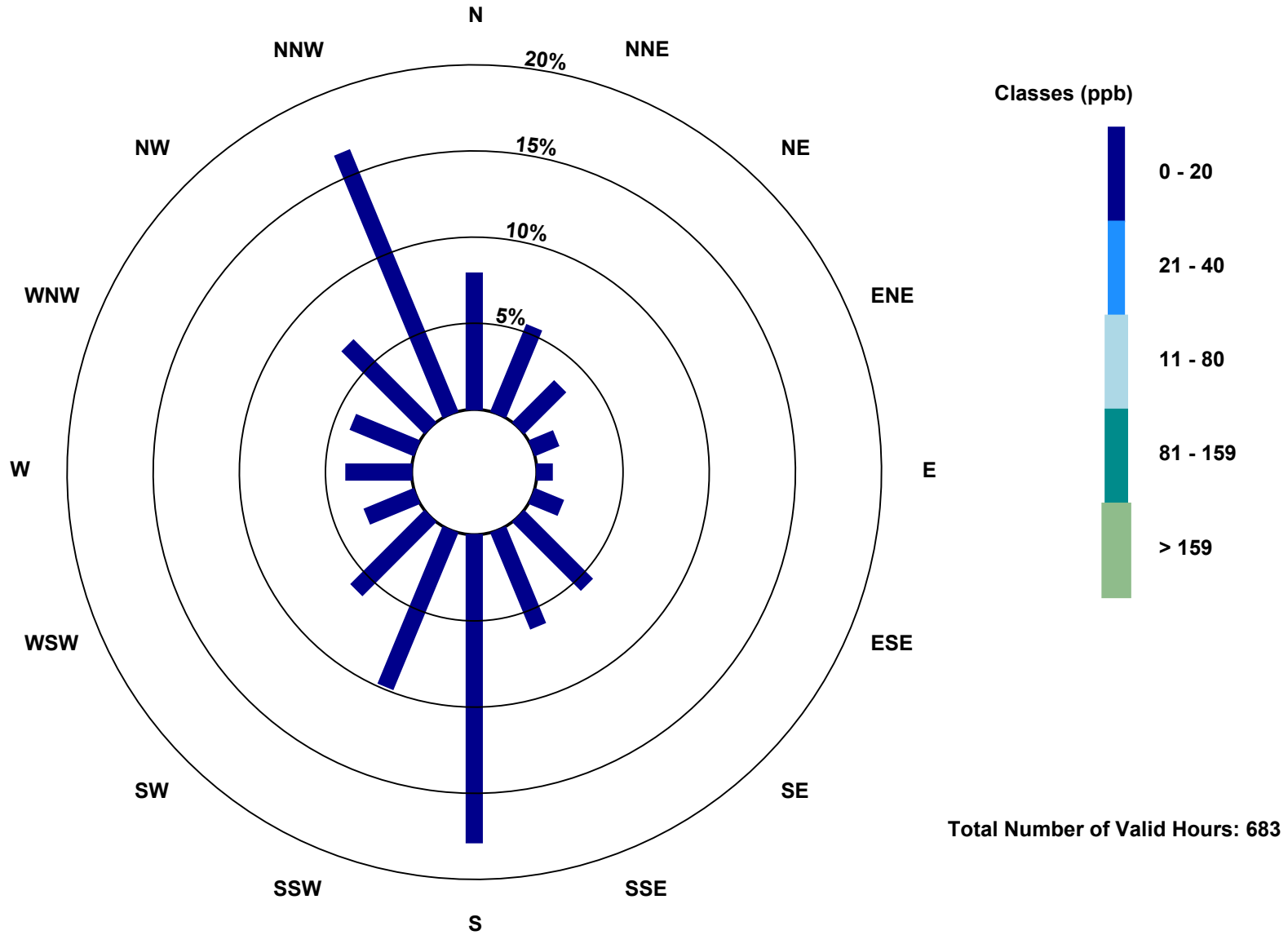
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

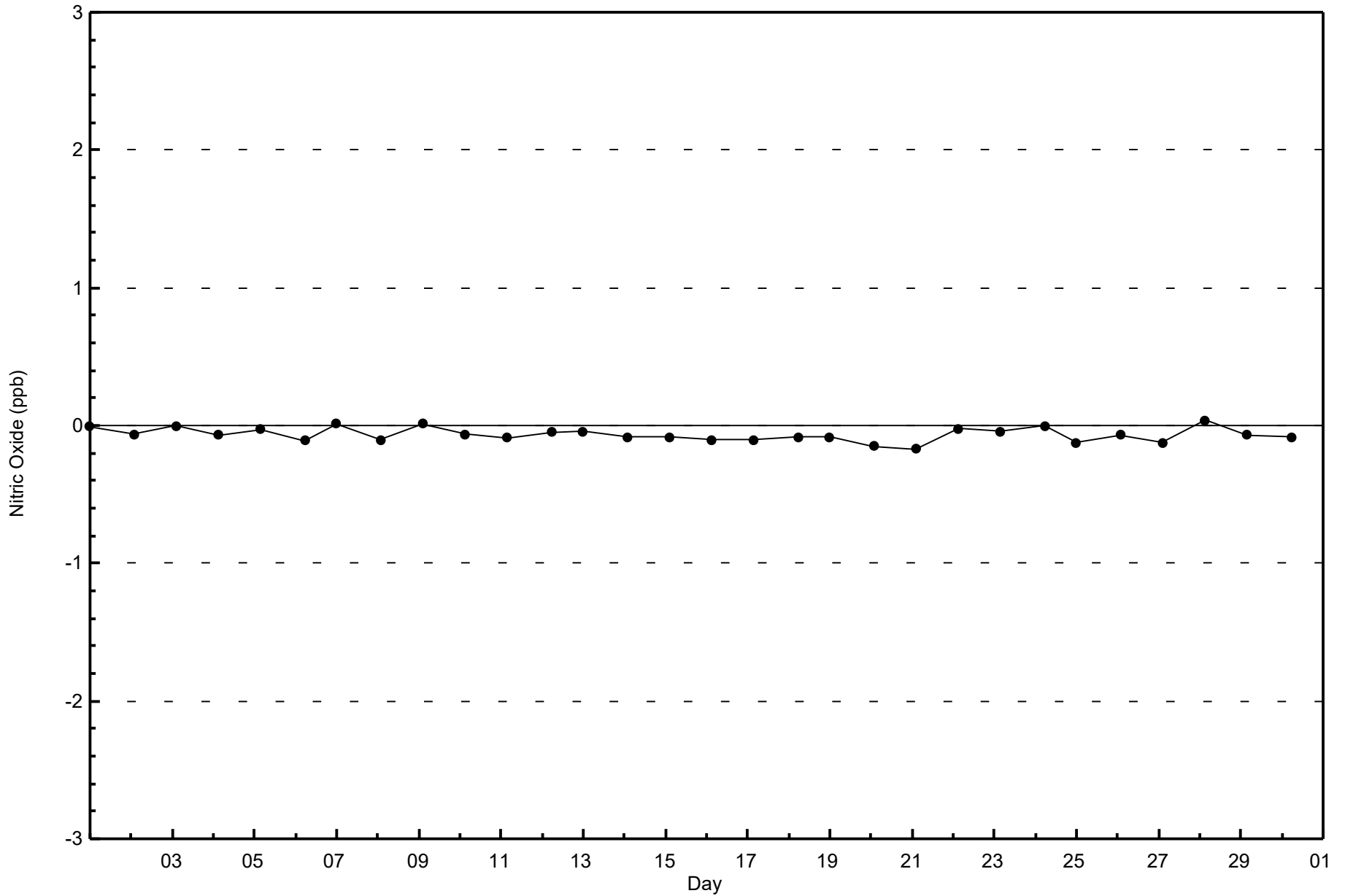
Nitric Oxide (NO) - ppb
Jackfish 1





Wood Buffalo Environmental Association
Zero Responses

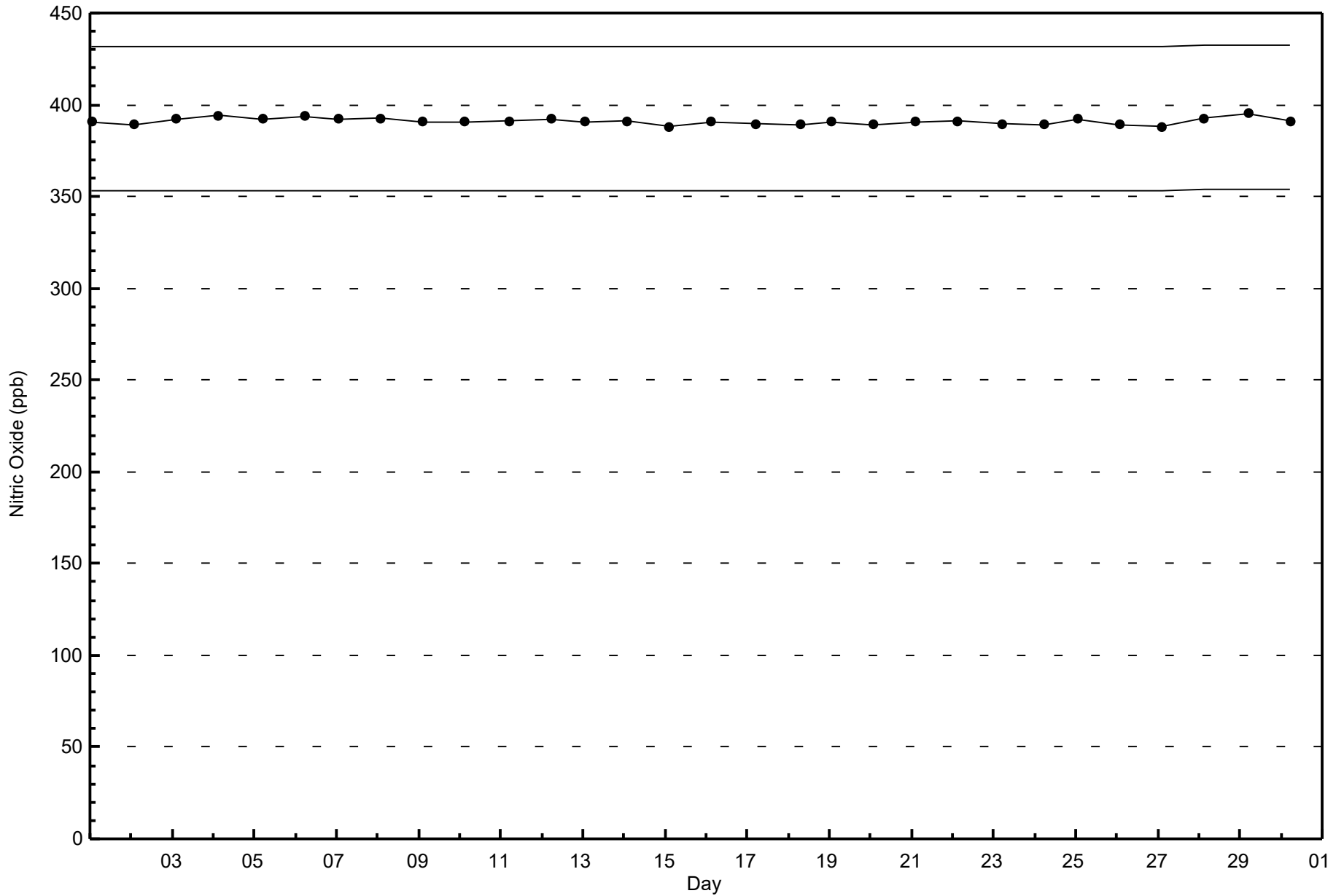
Nitric Oxide (NO) - ppb
Jackfish 1 - June 2023





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Jackfish 1 - June 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

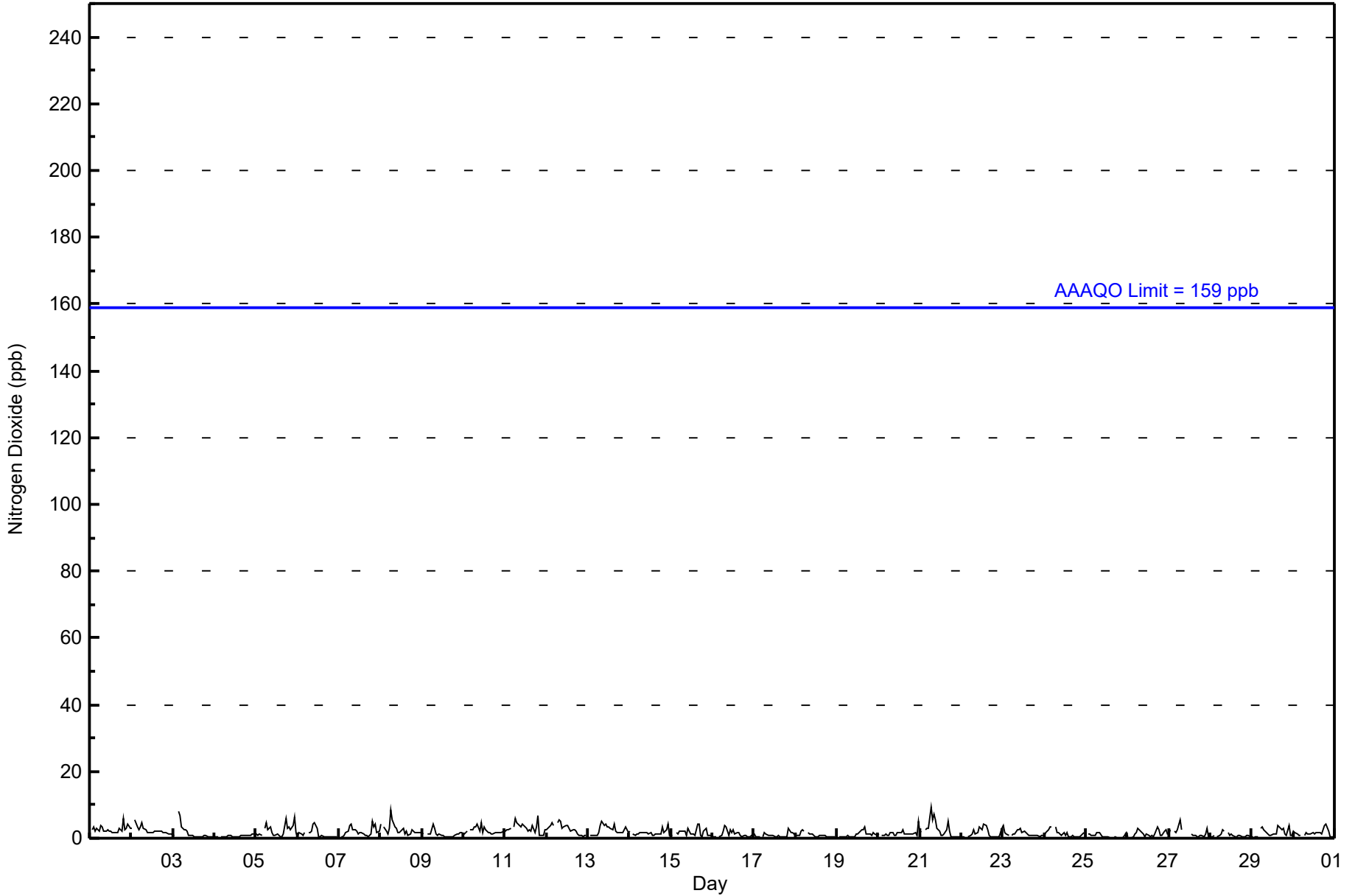
Jackfish 1 - June 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720				
Maximum Value: 9.4 ppb on Jun 21 07:00		Maximum Daily Average: 3.1 ppb on Jun 11																	Hours of Data:	684						
Minimum Value: 0.1 ppb on Jun 25 20:00		Minimum Daily Average: 0.6 ppb on Jun 4																	Hours of Missing Data:	36						
Maximum Diurnal Average: 3.1 ppb at hour 7		Minimum Diurnal Average: 1.3 ppb at hour 21																	Hours of Calibration:	35						
Monthly Average: 1.72 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.7 Median = 1.3 Q ₃ = 2.4 P ₉₀ = 3.6 P ₉₉ = 6.2																	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-Jun	Z	2.6	3.6	2.1	3.1	2.1	3.7	3.2	2.1	2.3	2.7	2.3	2.1	1.8	1.7	1.5	1.6	2.8	2.1	5.8	2.4	3.1	4.4	3.1	2.7	5.8
2-Jun	2.8	Z	5.3	3.2	2.7	3.2	4.5	3.0	2.5	1.6	1.6	1.8	1.9	2.1	2.2	2.2	2.0	2.2	1.9	1.7	1.6	1.4	1.2	1.1	2.3	5.3
3-Jun	0.9	0.9	Z	7.9	6.6	3.3	2.4	2.4	2.1	0.9	0.9	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.7	0.9	0.4	0.4	0.4	0.4	1.5	7.9
4-Jun	0.3	0.3	0.3	Z	0.3	0.3	0.5	0.5	1.0	0.9	0.6	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	1.2	1.4	0.6	1.4
5-Jun	1.3	1.0	1.3	0.9	Z	2.8	4.8	2.7	3.5	1.6	0.7	1.0	1.3	0.7	0.6	0.6	1.1	5.9	2.9	3.5	2.5	4.0	6.5	1.8	2.3	6.5
6-Jun	0.6	1.8	1.2	0.7	1.8	Z	1.5	1.9	2.3	4.2	4.5	2.8	0.6	0.6	0.7	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.5	1.3	4.5
7-Jun	Z	0.5	0.6	0.9	1.6	2.2	3.9	4.2	2.6	2.6	2.1	1.3	1.5	1.6	1.1	0.8	0.8	0.6	1.2	5.2	3.6	4.2	1.7	2.1	2.0	5.2
8-Jun	4.1	Z	3.4	2.2	1.4	3.0	8.5	5.5	3.2	3.1	1.5	1.9	2.4	2.8	1.3	2.1	1.0	1.4	2.6	2.1	1.9	1.7	1.7	1.6	2.6	8.5
9-Jun	1.6	1.4	Z	1.4	1.3	1.1	4.1	2.8	1.3	1.0	1.3	0.8	1.0	0.5	0.5	0.5	0.5	0.6	0.6	0.9	1.1	1.2	1.8	1.5	1.3	4.1
10-Jun	1.4	1.7	2.3	Z	2.5	2.7	3.4	3.6	4.1	2.1	4.7	1.8	3.5	2.5	1.6	1.7	1.4	1.3	1.5	1.6	1.5	1.9	1.7	2.0	2.3	4.7
11-Jun	2.2	2.6	2.7	3.1	Z	3.5	6.1	4.7	3.7	3.6	4.4	4.0	2.8	2.3	2.5	2.3	3.9	1.7	3.2	6.9	0.8	0.7	1.0	2.5	3.1	6.9
12-Jun	2.6	2.9	4.0	4.8	4.0	Z	4.6	5.4	5.2	2.9	3.6	3.8	4.0	3.1	2.1	2.4	2.7	2.3	1.3	1.0	0.8	0.6	0.7	0.9	2.9	5.4
13-Jun	Z	0.8	0.8	0.7	0.8	0.9	1.8	3.9	5.2	3.9	4.2	3.3	3.3	2.8	2.6	4.2	2.3	1.8	1.8	1.6	1.6	2.5	3.2	1.7	2.4	5.2
14-Jun	2.2	Z	1.1	1.0	1.1	1.2	1.6	1.7	1.5	1.9	1.7	1.3	1.6	0.9	0.8	1.1	1.1	1.2	1.1	3.3	1.9	2.4	4.4	1.0	1.6	4.4
15-Jun	0.7	1.0	Z	1.7	1.2	2.1	2.1	2.2	2.3	0.8	3.1	1.1	1.3	1.2	1.0	4.1	4.1	1.0	0.6	2.1	3.0	0.7	0.9	0.9	1.7	4.1
16-Jun	0.5	0.5	0.4	Z	0.4	1.0	2.2	3.8	3.3	1.0	2.7	1.8	2.4	1.4	1.5	1.5	0.8	0.6	1.0	0.7	0.6	0.4	0.6	1.2	1.3	3.8
17-Jun	1.2	0.5	0.5	0.4	Z	0.6	1.8	1.2	1.0	0.9	0.7	0.9	0.6	0.5	0.9	0.6	0.5	0.5	0.6	0.6	2.9	1.5	1.8	1.4	1.0	2.9
18-Jun	0.7	0.7	1.0	2.0	2.5	2.3	Z	1.8	1.2	1.1	1.1	0.3	0.6	0.6	0.8	0.9	0.9	0.7	0.4	0.4	0.3	0.3	0.4	0.4	0.9	2.5
19-Jun	Z	0.5	0.6	0.6	0.5	0.5	0.9	0.6	0.6	0.5	0.6	1.4	1.4	1.8	2.7	2.4	3.6	1.4	1.2	1.2	0.8	1.6	1.1	1.0	1.2	3.6
20-Jun	1.2	Z	0.9	1.0	1.2	0.8	0.9	1.8	1.9	1.0	1.0	1.7	1.8	1.8	2.5	1.2	1.1	1.4	1.1	1.4	1.3	1.6	1.0	5.0	1.5	5.0
21-Jun	1.6	2.1	Z	2.6	3.1	2.9	9.4	5.3	7.0	5.6	3.1	2.1	1.0	0.9	1.4	2.4	5.1	2.2	0.6	0.6	0.5	0.5	0.4	0.5	2.6	9.4
22-Jun	0.4	0.3	0.2	Z	0.3	0.8	1.1	2.6	1.4	1.8	3.4	2.8	2.6	4.4	4.0	2.6	1.0	0.5	0.5	0.5	0.5	0.4	0.4	2.9	1.5	4.4
23-Jun	4.0	1.6	1.4	0.7	Z	0.7	1.4	1.1	2.6	2.7	3.1	1.7	2.0	1.5	1.3	0.9	0.8	0.7	0.9	1.0	0.8	0.6	0.7	0.7	1.4	4.0
24-Jun	1.0	1.9	2.6	3.3	3.2	Z	3.5	1.6	1.7	1.2	0.8	1.6	0.8	1.6	0.5	0.5	1.0	0.5	0.5	0.4	0.5	1.0	1.2	1.5	1.4	3.5
25-Jun	Z	1.1	1.3	0.9	1.0	0.9	1.7	1.7	1.5	0.5	0.4	0.4	0.3	0.4	0.2	0.2	0.2	0.4	0.2	0.1	0.1	0.1	0.4	1.6	0.7	1.7
26-Jun	0.4	Z	0.2	0.3	1.1	1.9	3.1	2.4	1.9	1.2	0.6	1.1	0.9	0.5	1.0	0.5	1.3	3.3	2.6	0.9	0.9	2.1	2.4	1.2	1.4	3.3
27-Jun	1.2	2.5	Z	2.3	1.8	2.6	5.6	2.4	Z	C	C	C	C	C	1.4	1.0	0.7	0.4	0.6	0.8	0.7	0.3	1.3	3.0	1.6	5.6
28-Jun	0.4	0.4	0.7	Z	0.5	0.7	1.4	2.7	2.2	M	1.7	0.8	1.1	1.0	0.6	0.4	0.7	0.7	0.6	0.5	0.4	0.8	0.9	0.5	0.9	2.7
29-Jun	0.3	0.2	0.4	0.6	Z	2.8	3.6	2.4	1.9	1.3	1.0	0.8	1.1	1.1	1.3	3.9	3.6	2.6	2.8	1.1	1.0	3.8	0.7	0.9	1.7	3.9
30-Jun	2.2	1.9	1.1	0.9	0.7	Z	0.8	1.9	1.4	1.1	1.1	1.8	1.4	1.6	1.6	1.8	1.2	2.4	3.8	4.1	2.3	0.6	0.5	0.5	1.6	4.1
																								Diurnal Average		
																								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
Jackfish 1 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Jackfish 1 - June 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
Jackfish 1 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	37	23	10	6	12	38	41	122	67	41	21	26	27	46	112	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	54	37	23	10	6	12	38	41	122	67	41	21	26	27	46	112	683

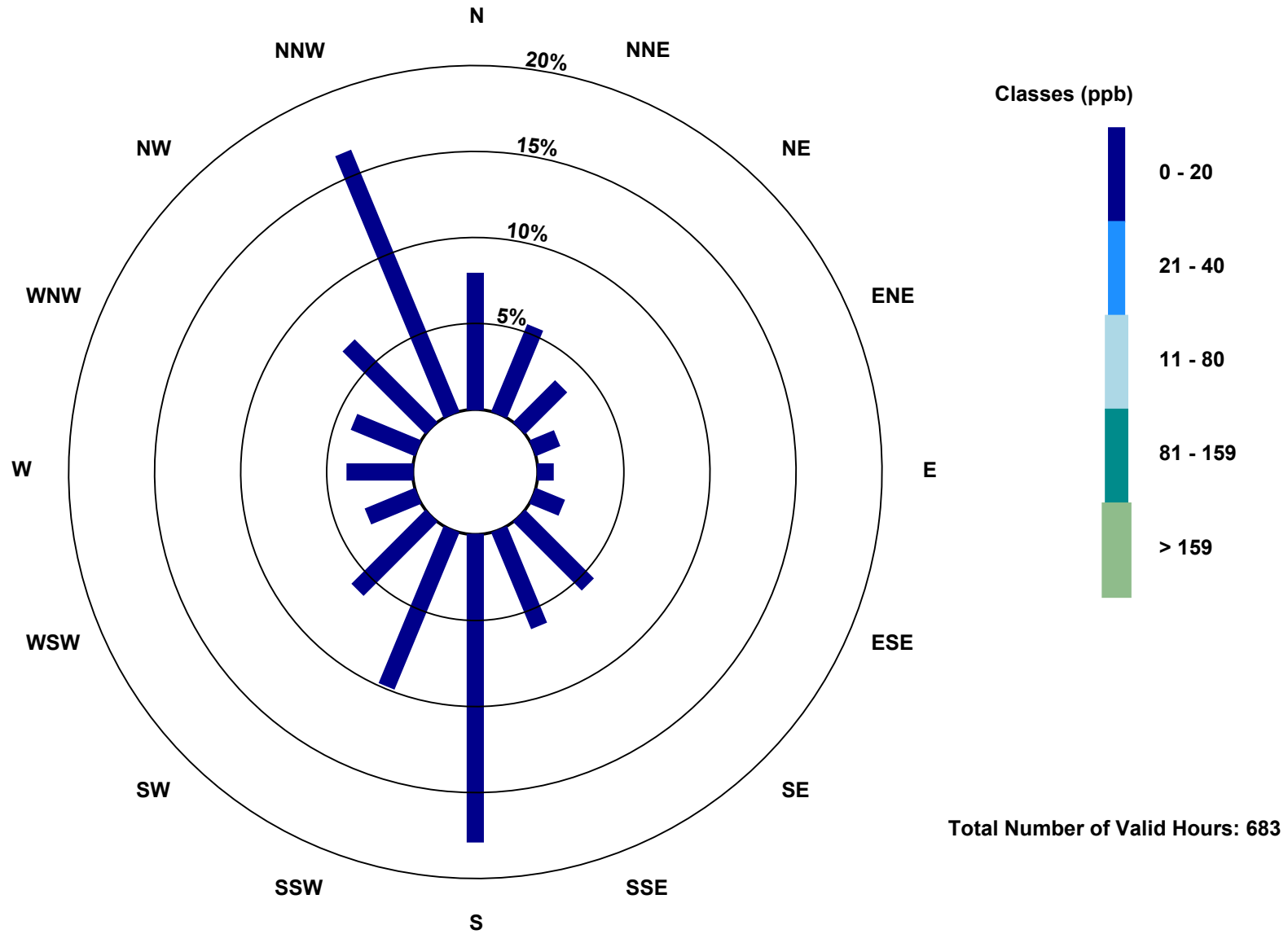
Total Number of Valid Hours: 683

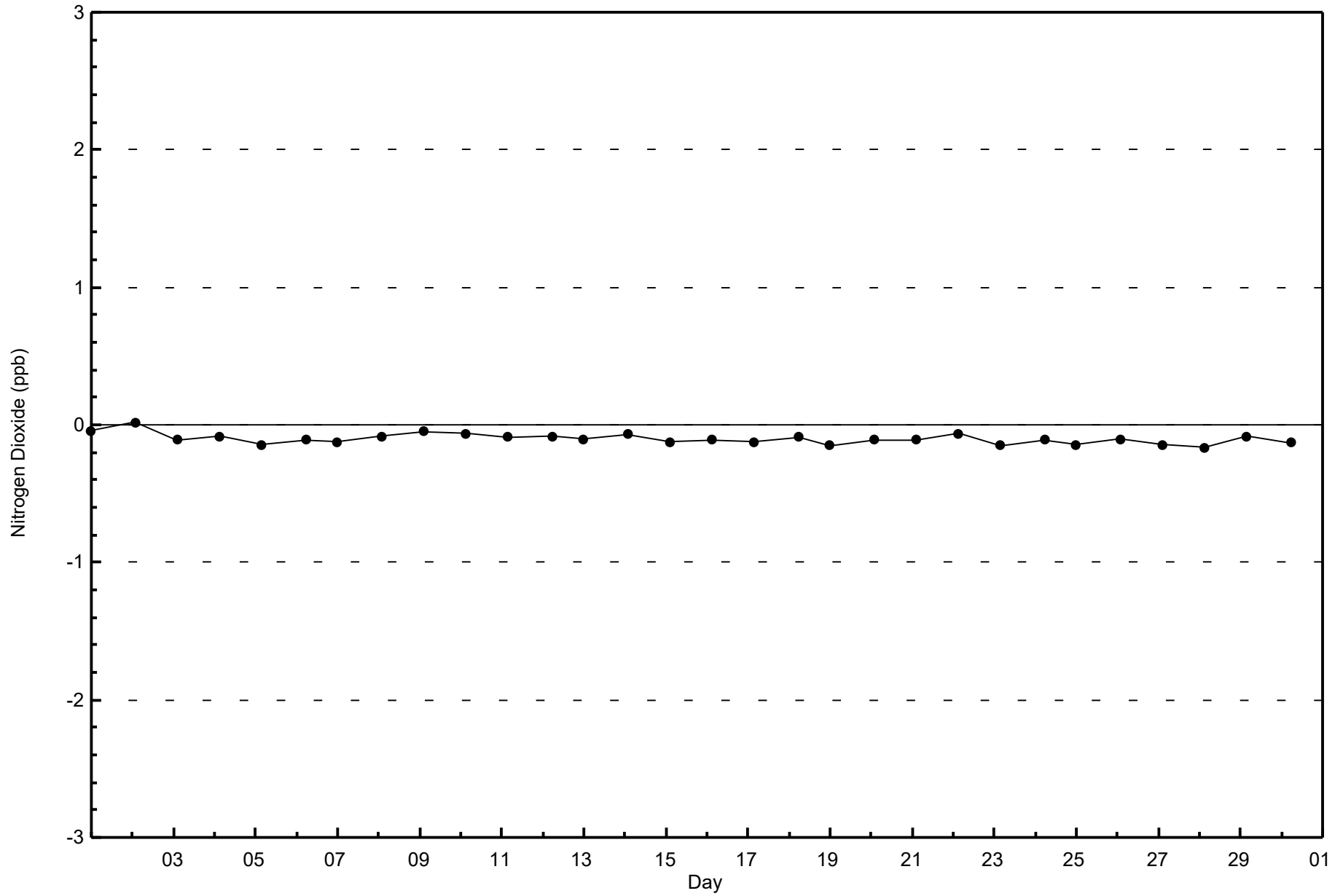
Total Number of Hours: 720

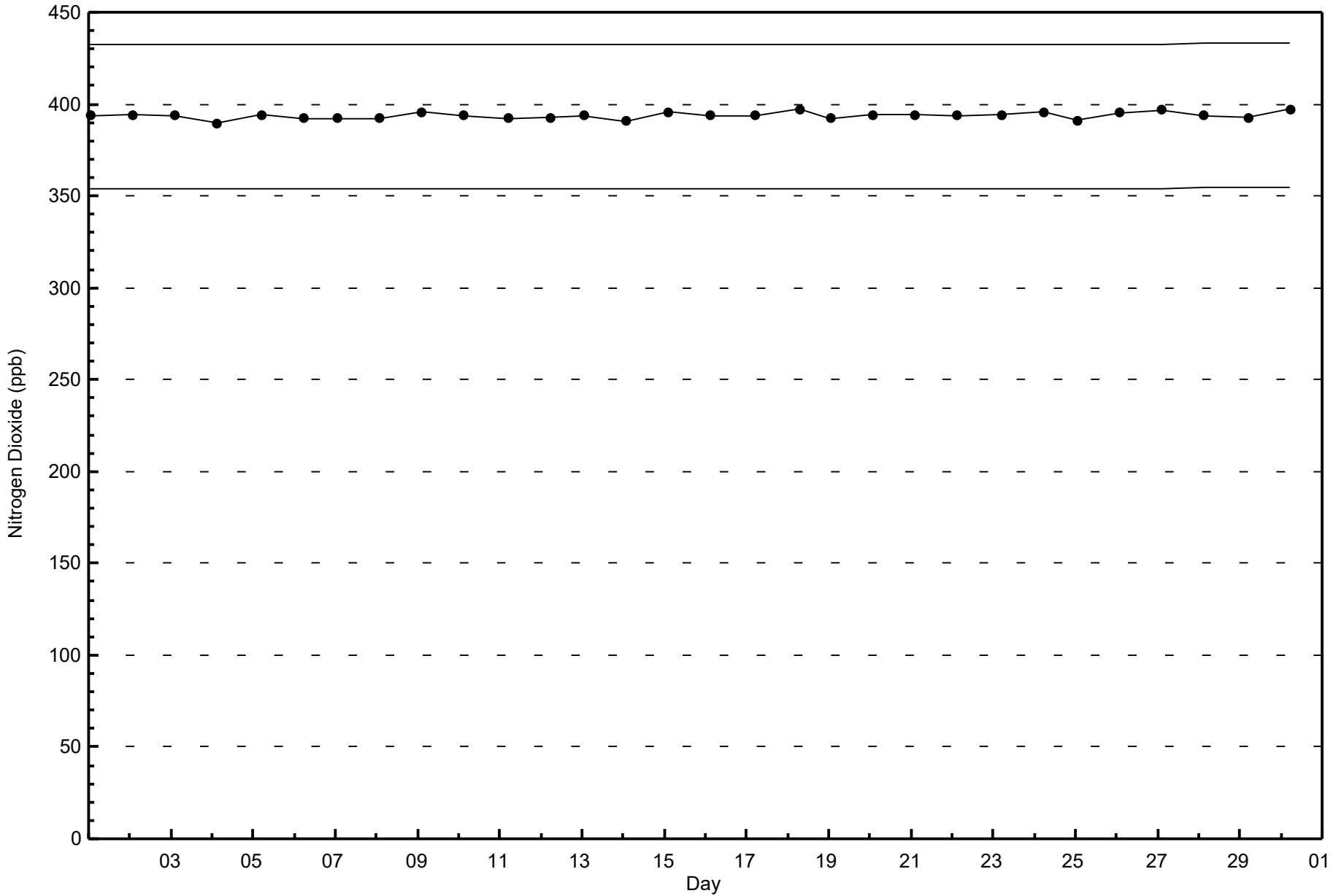


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 1









Wood Buffalo Environmental Association
Summary of Hour Averages

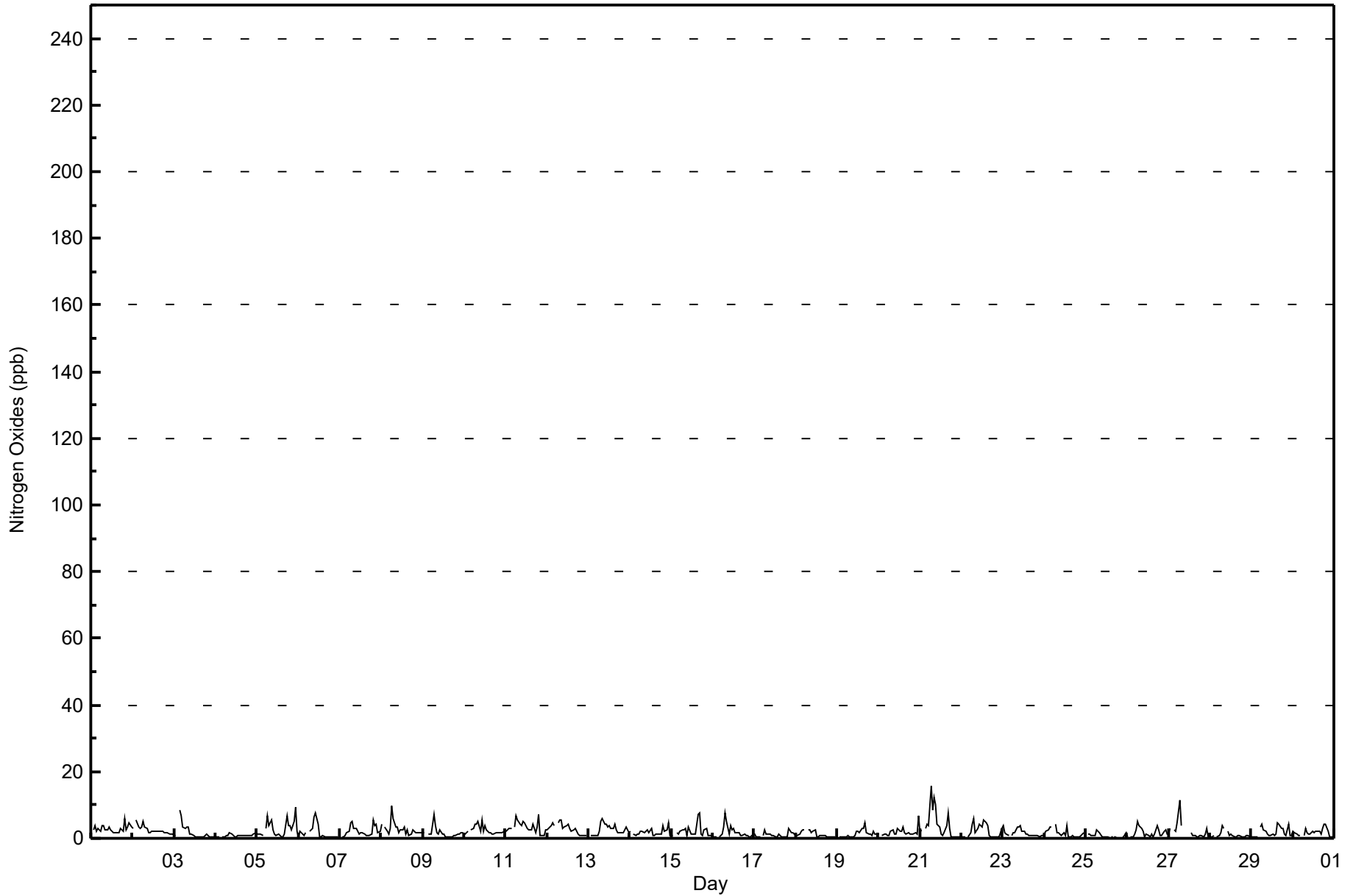
Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - June 2023

Maximum Value: 15.8 ppb on Jun 21 07:00 Maximum Daily Average: 3.9 ppb on Jun 21																				Hours in Service: 720 Hours of Data: 684						
Minimum Value: 0.1 ppb on Jun 25 22:00 Minimum Daily Average: 0.8 ppb on Jun 25 Maximum Diurnal Average: 4.3 ppb at hour 7 Minimum Diurnal Average: 1.3 ppb at hour 21 Monthly Average: 2.01 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.5 Q ₃ = 2.7 P ₉₀ = 4.1 P ₉₉ = 8.5																				Hours of Missing Data: 36 Hours of Calibration: 35 Percent Operational Time: 99.9						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	Z	2.7	3.9	2.1	3.2	2.2	4.0	3.7	2.6	2.5	3.3	2.4	2.2	1.9	1.8	1.6	1.6	2.9	2.2	6.0	2.5	3.2	4.6	3.3	2.9	6.0
2-Jun	2.9	Z	5.4	3.3	2.8	3.4	5.2	3.5	2.8	1.8	1.7	1.9	2.0	2.1	2.2	2.2	2.0	2.2	1.9	1.7	1.6	1.4	1.3	1.2	2.5	5.4
3-Jun	1.0	1.0	Z	8.6	6.9	3.6	3.0	3.2	3.4	1.2	1.2	0.9	0.6	0.5	0.5	0.5	0.5	0.5	0.9	1.2	0.5	0.5	0.5	0.5	1.8	8.6
4-Jun	0.4	0.4	0.4	Z	0.4	0.4	0.9	0.8	1.5	1.2	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.3	1.5	0.8	1.5
5-Jun	1.4	1.1	1.3	0.9	Z	3.2	6.6	3.7	5.7	2.4	1.1	1.0	1.4	0.7	0.6	0.6	1.1	6.9	3.7	3.7	2.6	5.0	9.5	2.2	2.9	9.5
6-Jun	0.6	2.1	1.4	0.7	1.9	Z	2.0	2.5	3.1	6.5	7.5	4.3	0.6	0.6	0.7	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.5	1.7	7.5
7-Jun	Z	0.5	0.6	0.9	1.6	2.3	4.7	5.3	2.8	2.8	2.1	1.3	1.5	1.6	1.1	0.8	0.8	0.6	1.3	5.5	3.8	4.2	1.7	2.1	2.2	5.5
8-Jun	4.1	Z	3.4	2.3	1.4	3.1	9.8	6.0	3.5	3.4	1.7	2.7	2.7	3.2	1.3	2.4	1.0	1.4	2.6	2.1	1.9	1.7	1.7	1.6	2.8	9.8
9-Jun	1.6	1.5	Z	1.4	1.4	1.2	7.1	3.9	1.5	1.1	2.6	1.1	1.2	0.5	0.5	0.5	0.5	0.6	0.6	0.9	1.1	1.3	1.9	1.5	1.5	7.1
10-Jun	1.4	1.7	2.3	Z	2.5	2.9	4.2	4.4	4.9	2.2	5.5	1.9	3.9	2.7	1.7	1.8	1.4	1.3	1.5	1.6	1.5	1.9	1.7	2.0	2.5	5.5
11-Jun	2.3	2.6	2.8	3.1	Z	3.6	6.9	5.4	4.2	3.9	5.0	4.6	2.9	2.4	2.7	2.5	4.4	1.7	3.2	7.1	0.8	0.7	1.0	2.5	3.3	7.1
12-Jun	2.6	2.9	4.0	4.8	4.0	Z	4.7	5.5	5.3	2.9	3.6	3.8	4.1	3.1	2.1	2.5	2.8	2.3	1.3	1.0	0.8	0.6	0.7	0.9	2.9	5.5
13-Jun	Z	0.8	0.8	0.7	0.8	0.9	2.2	4.9	6.0	4.2	4.4	3.4	4.0	3.1	2.8	4.4	2.4	1.9	1.8	1.6	1.6	2.6	3.3	1.8	2.6	6.0
14-Jun	2.2	Z	1.1	1.0	1.1	1.3	2.1	2.3	1.8	2.3	2.6	1.6	3.0	1.0	0.9	1.3	1.2	1.2	1.2	3.8	2.0	2.5	4.7	1.0	1.9	4.7
15-Jun	0.7	1.0	Z	1.7	1.2	2.3	2.4	2.6	2.8	0.9	3.6	1.3	1.5	1.4	1.3	7.1	7.4	1.3	0.7	2.4	3.2	0.7	1.0	0.9	2.2	7.4
16-Jun	0.5	0.5	0.4	Z	0.5	1.3	3.3	7.6	5.0	1.3	3.9	2.6	2.9	1.5	1.6	1.6	0.9	0.7	1.2	0.9	0.7	0.5	0.6	1.3	1.8	7.6
17-Jun	1.2	0.5	0.5	0.4	Z	0.8	2.4	1.5	1.2	1.2	0.7	0.9	0.6	0.5	1.1	0.7	0.5	0.5	0.6	0.6	3.0	1.5	1.8	1.4	1.0	3.0
18-Jun	0.7	0.8	1.2	2.2	2.6	2.7	Z	2.4	2.7	1.7	2.0	2.5	0.6	0.6	0.8	1.0	0.9	0.7	0.4	0.4	0.3	0.3	0.4	0.4	1.2	2.7
19-Jun	Z	0.5	0.6	0.6	0.5	0.5	1.0	0.6	0.6	0.6	0.9	2.3	2.3	1.9	3.0	3.0	4.5	1.6	1.3	1.3	0.8	1.9	1.2	1.1	1.4	4.5
20-Jun	1.3	Z	0.9	1.1	1.3	0.9	1.0	2.3	2.3	1.4	1.3	2.8	2.2	2.3	3.3	1.5	1.3	1.7	1.3	1.5	1.3	1.8	1.1	6.9	1.9	6.9
21-Jun	1.7	2.4	Z	3.1	4.0	3.8	15.8	8.5	12.1	10.2	4.3	3.2	1.2	1.0	1.7	3.6	7.8	2.8	0.6	0.6	0.5	0.5	0.4	0.5	3.9	15.8
22-Jun	0.5	0.4	0.3	Z	0.3	1.8	4.3	5.8	1.9	2.8	4.2	3.8	3.3	5.7	4.8	4.0	1.0	0.5	0.5	0.5	0.6	0.5	0.4	2.9	2.2	5.8
23-Jun	4.0	1.6	1.4	0.7	Z	0.7	1.9	1.9	3.5	3.5	3.9	2.0	2.3	1.5	1.3	0.9	0.8	0.7	0.9	1.0	0.8	0.6	0.7	0.7	1.6	4.0
24-Jun	1.1	2.0	2.7	3.4	3.3	Z	4.3	1.6	1.7	1.2	0.8	1.8	0.8	3.8	0.5	0.5	1.0	0.5	0.5	0.4	0.5	1.0	1.2	1.5	1.6	4.3
25-Jun	Z	1.1	1.3	0.9	1.0	0.9	2.5	2.3	1.8	0.5	0.4	0.6	0.3	0.4	0.2	0.2	0.2	0.4	0.2	0.1	0.1	0.1	0.4	1.6	0.8	2.5
26-Jun	0.5	Z	0.2	0.3	1.2	2.4	5.2	3.8	2.8	1.9	0.6	1.4	0.9	0.5	1.1	0.5	1.3	3.7	2.6	0.9	0.9	2.1	2.6	1.2	1.7	5.2
27-Jun	1.3	2.9	Z	2.4	2.0	4.6	11.3	3.9	C	C	C	C	C	1.5	1.0	0.7	0.4	0.6	0.8	0.7	0.3	1.3	3.0	0.5	2.2	11.3
28-Jun	0.4	0.4	0.7	Z	0.5	0.8	1.7	3.8	3.1	M	2.0	0.8	1.1	1.0	0.6	0.4	0.7	0.7	0.6	0.5	0.4	0.8	0.9	0.6	1.0	3.8
29-Jun	0.4	0.3	0.4	0.6	Z	3.3	4.2	2.7	2.2	1.4	1.0	0.8	1.1	1.1	1.3	4.5	4.3	2.8	3.0	1.1	1.0	4.0	0.7	0.9	1.9	4.5
30-Jun	2.2	1.9	1.1	0.9	0.8	Z	0.8	2.8	1.8	1.3	1.1	2.2	1.6	2.1	2.1	2.2	1.4	2.8	4.2	4.3	2.3	0.6	0.5	0.5	1.8	4.3
																								Diurnal Average		
																								Diurnal Maximum		
																								1.5 4.1		
																								1.3 2.9		
																								1.6 5.4		
																								1.9 8.6		
																								1.9 6.9		
																								2.1 4.6		
																								4.3 15.8		
																								3.6 8.5		
																								3.3 12.1		
																								2.4 10.2		
																								2.5 7.5		
																								2.1 4.6		
																								1.8 4.1		
																								1.7 5.7		
																								1.5 4.8		
																								1.8 7.1		
																								1.8 7.8		
																								1.6 6.9		
																								1.4 4.2		
																								1.8 7.1		
																								1.3 3.8		
																								1.5 5.0		
																								1.7 9.5		
																								1.5 6.9		
																								Z - zerspan		
																								C - Calibration		
																								M - Maintenance		



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - June 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
Jackfish 1 - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	37	23	10	6	12	38	41	122	67	41	21	26	27	46	112	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	54	37	23	10	6	12	38	41	122	67	41	21	26	27	46	112	683

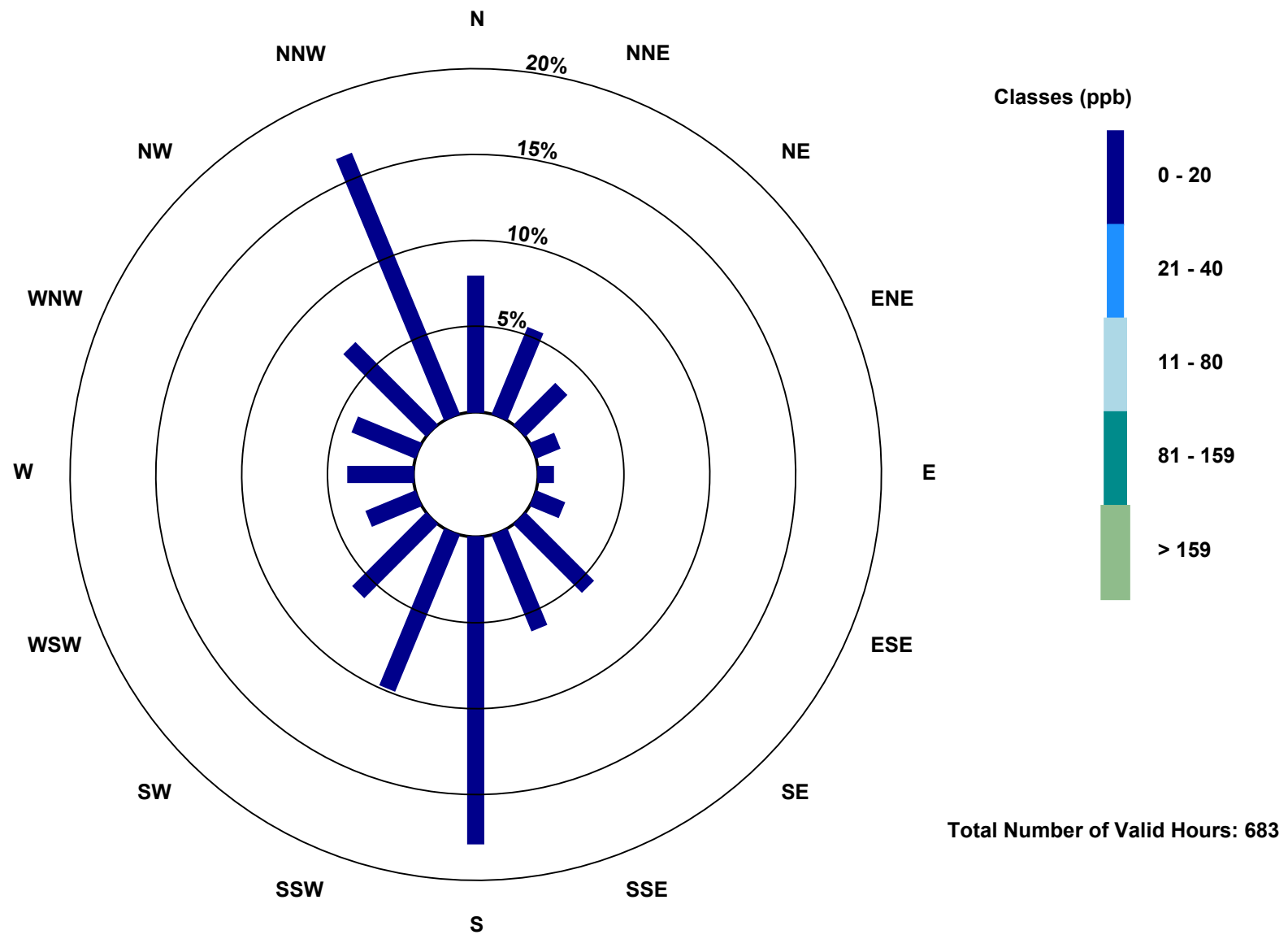
Total Number of Valid Hours: 683

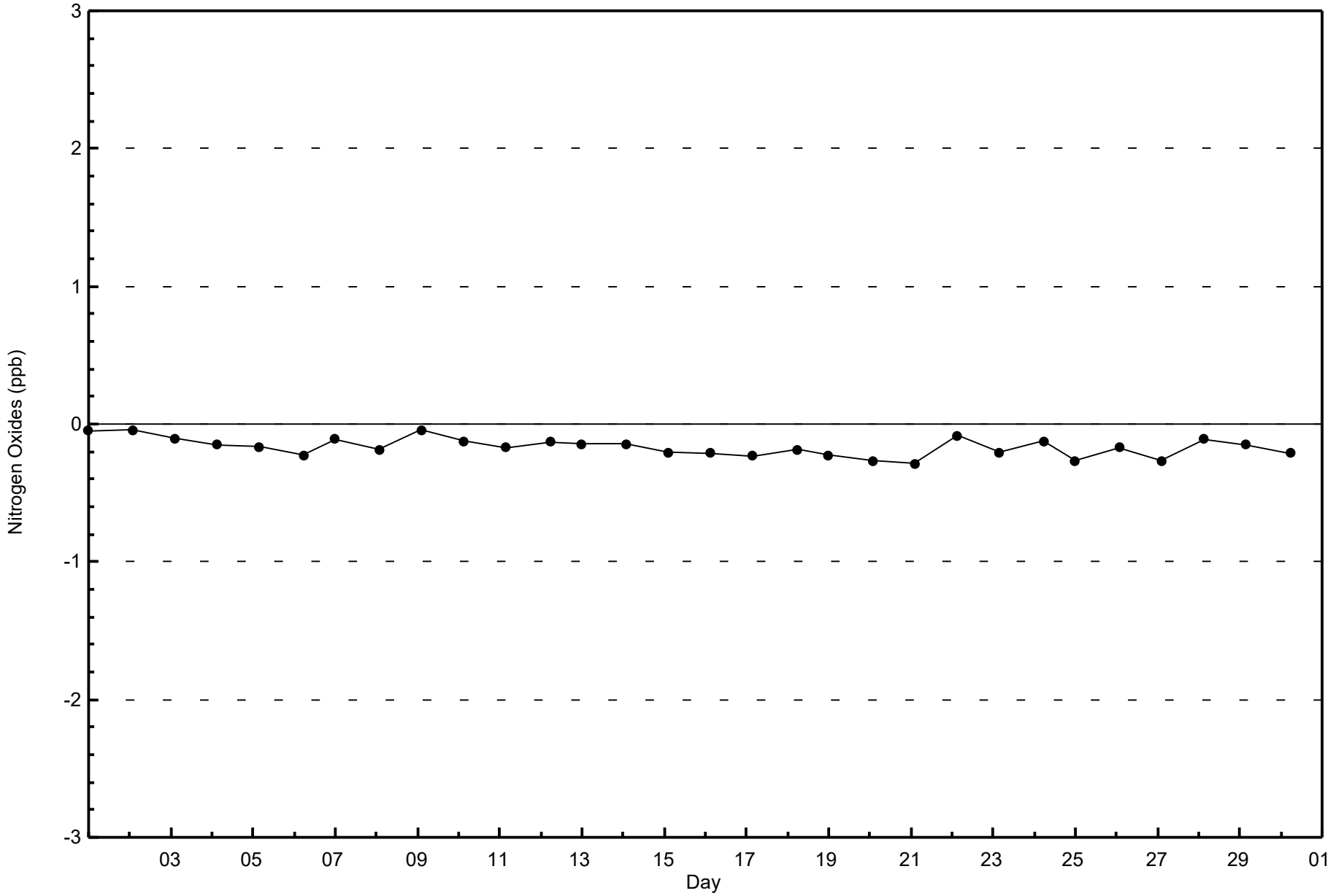
Total Number of Hours: 720

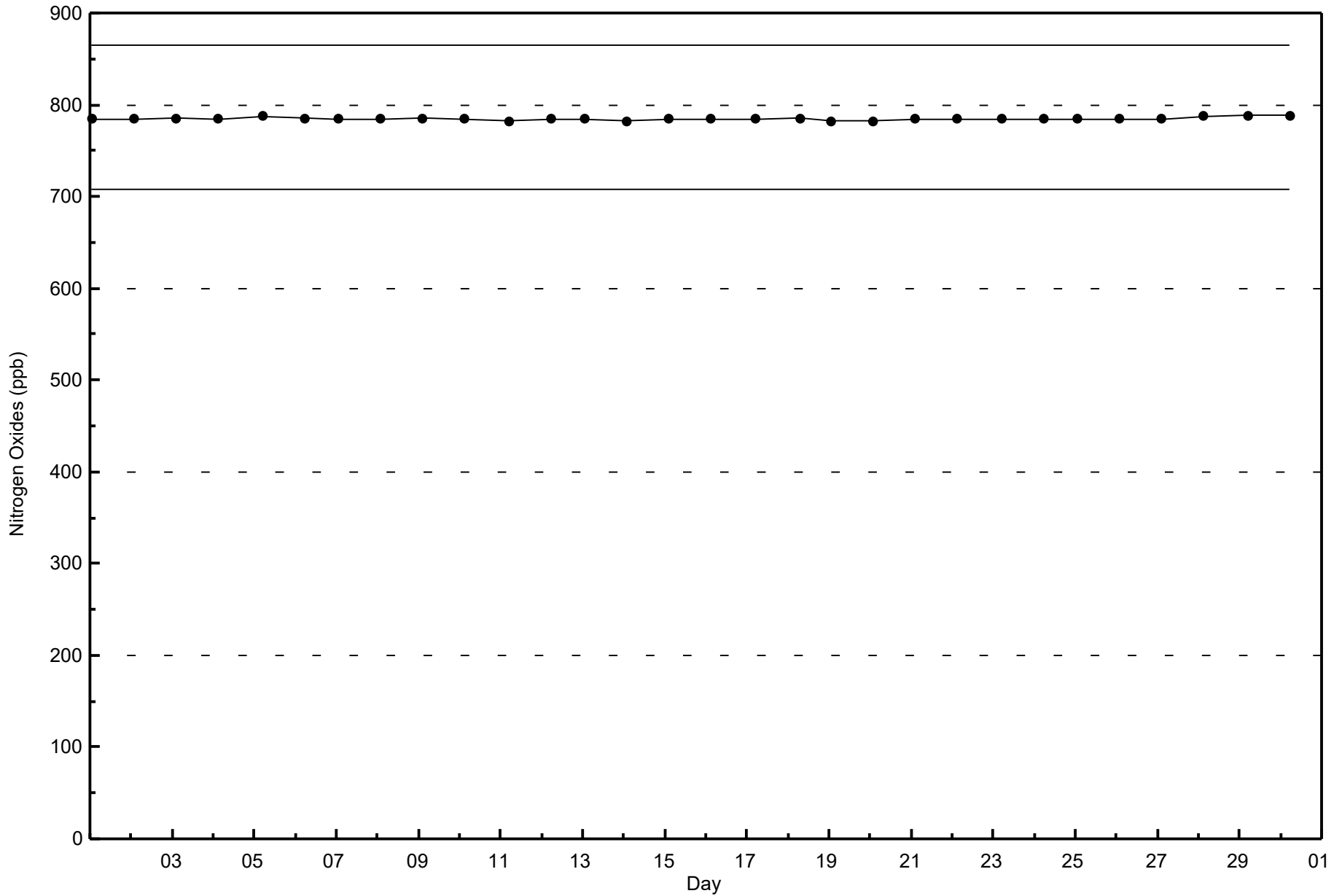


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 1









Wood Buffalo Environmental Association
Summary of Hour Averages

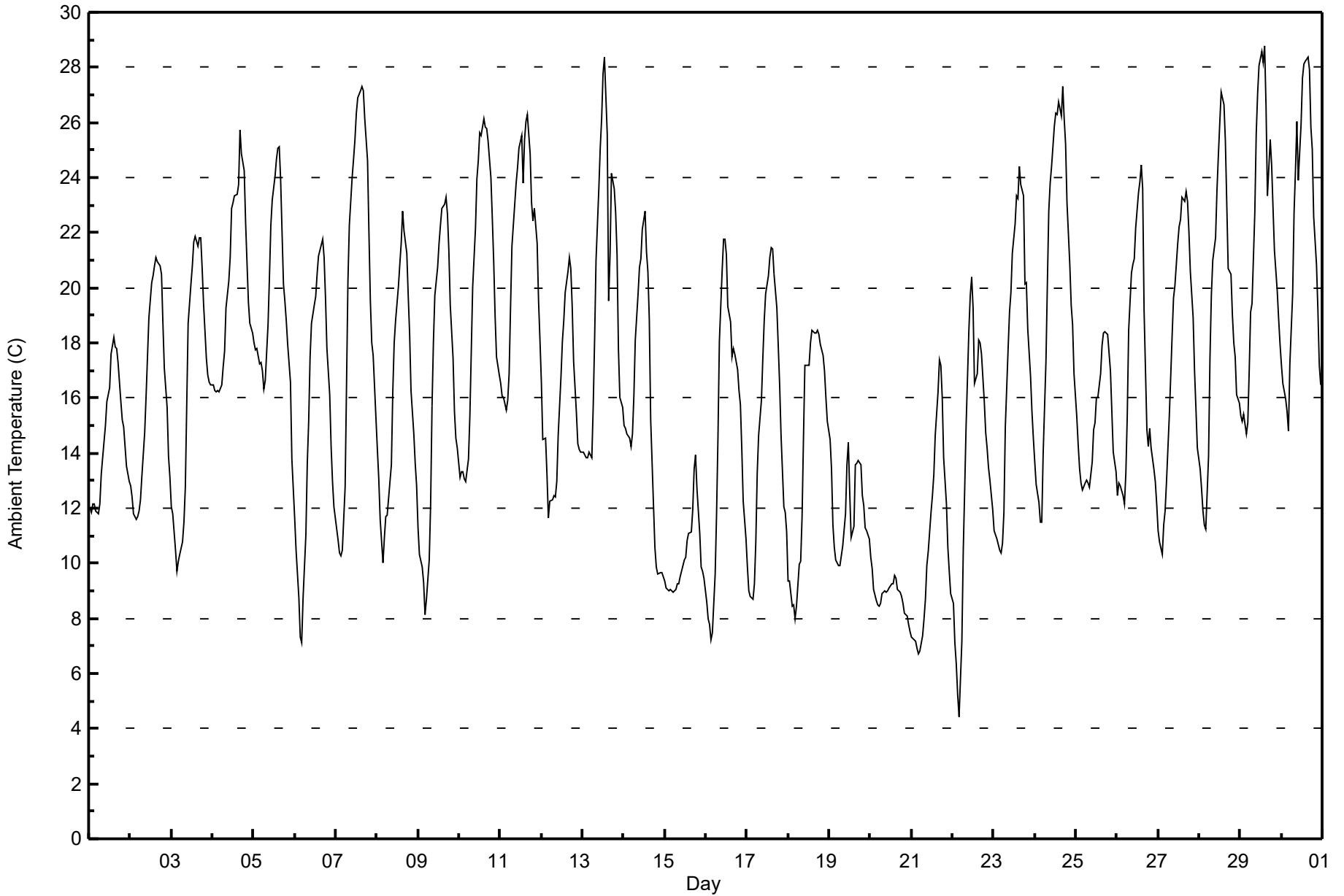
Ambient Temperature (AT) - C
Jackfish 1 - June 2023

Maximum Value: 28.8 C on Jun 29 15:00 Minimum Value: 4.4 C on Jun 22 05:00 Maximum Diurnal Average: 21.3 C at hour 15 Monthly Average: 16.57 C		Maximum Daily Average: 22.0 C on Jun 30 Minimum Daily Average: 8.9 C on Jun 20 Minimum Diurnal Average: 11.2 C at hour 5 Percentiles: P ₁ = 7.1 P ₁₀ = 9.6 Q ₁ = 12.2 Median = 16.3 Q ₃ = 20.7 P ₉₀ = 24.0 P ₉₉ = 28.0		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-Jun	12.0	11.8	12.2	12.1	11.9	11.8	12.1	13.2	13.8	15.0	15.9	16.1	16.4	17.6	18.2	17.8	17.8	17.3	15.9	15.2	15.0	14.2	13.5	13.0	14.6	18.2																						
2-Jun	12.8	12.4	11.8	11.6	11.7	11.9	12.3	13.2	14.7	16.1	17.5	18.9	20.2	20.4	20.8	21.1	20.9	20.8	20.5	18.7	17.1	15.7	13.9	13.1	16.2	21.1																						
3-Jun	12.1	11.8	10.5	9.7	10.1	10.3	10.8	11.5	12.8	15.7	18.7	20.1	20.8	21.7	21.9	21.5	21.8	21.8	20.7	19.4	17.4	16.8	16.6	16.5	16.3	21.9																						
4-Jun	16.5	16.3	16.2	16.3	16.2	16.5	17.1	17.7	19.3	20.3	21.1	22.9	23.1	23.3	23.4	23.7	25.7	24.9	24.3	22.4	20.9	19.5	18.7	18.4	20.2	25.7																						
5-Jun	18.0	17.8	17.8	17.2	17.3	17.0	16.3	16.6	18.6	20.4	22.3	23.2	24.0	24.7	25.1	25.1	23.9	20.1	19.6	18.8	17.9	16.6	13.8	12.7	19.4	25.1																						
6-Jun	11.6	10.5	8.7	7.3	7.1	8.7	11.0	13.6	15.2	17.5	18.7	19.4	19.7	20.5	21.1	21.6	21.8	21.1	19.7	17.8	16.1	14.2	13.0	12.1	15.3	21.8																						
7-Jun	11.2	10.8	10.4	10.3	10.5	12.7	16.5	20.2	22.3	24.0	24.7	25.4	26.3	26.9	27.1	27.3	27.1	26.2	24.6	22.0	19.5	18.0	17.6	15.3	19.9	27.3																						
8-Jun	14.2	13.1	11.6	10.0	10.9	11.7	11.7	12.4	13.6	16.2	18.0	18.8	20.0	20.9	21.6	22.8	22.1	21.3	19.7	18.3	16.3	14.7	13.6	12.8	16.1	22.8																						
9-Jun	11.3	10.3	9.8	9.3	8.1	8.7	10.1	12.2	15.7	18.1	19.7	20.8	21.6	22.3	22.9	23.0	23.3	22.7	21.3	19.4	17.4	15.5	14.5	14.2	16.3	23.3																						
10-Jun	13.1	13.3	13.3	13.1	13.0	13.8	15.3	17.7	20.0	22.2	24.0	24.6	25.6	25.5	26.2	25.8	25.8	25.3	24.0	22.5	20.9	19.0	17.5	16.9	19.9	26.2																						
11-Jun	16.5	16.1	16.0	15.6	15.9	16.9	19.3	21.5	23.0	23.8	24.4	25.1	25.5	23.8	25.4	26.0	26.3	24.9	23.1	22.4	22.9	21.6	19.5	18.1	21.4	26.3																						
12-Jun	16.6	14.5	14.5	13.2	11.7	12.3	12.3	12.5	12.4	13.0	14.6	16.8	18.0	18.8	19.8	20.6	21.1	20.7	19.3	17.3	15.5	14.3	14.1	14.1	15.8	21.1																						
13-Jun	14.0	13.9	13.9	13.8	14.1	13.9	15.7	18.1	21.0	23.6	25.1	26.2	27.8	28.4	25.6	19.5	21.2	24.2	23.6	22.7	21.2	17.7	16.0	15.6	19.9	28.4																						
14-Jun	15.0	14.9	14.7	14.6	14.3	14.7	16.1	18.1	19.8	20.8	21.1	22.1	22.8	21.3	20.6	18.9	15.2	12.1	10.6	9.9	9.6	9.7	9.6	9.5	15.7	22.8																						
15-Jun	9.3	9.1	9.0	9.0	9.0	9.0	9.0	9.2	9.3	9.5	9.7	10.1	12.8	10.9	11.1	11.1	12.0	13.4	13.9	12.7	11.1	9.9	9.7	9.5	10.3	13.9																						
16-Jun	8.6	8.0	7.8	7.2	7.5	9.6	11.8	14.6	18.1	20.7	21.7	21.8	21.2	19.3	18.8	17.5	17.8	17.6	17.0	16.3	15.8	14.1	12.3	10.9	14.8	21.8																						
17-Jun	9.9	9.0	8.8	8.7	9.3	10.8	13.3	14.7	15.9	17.4	18.8	19.8	20.4	21.1	21.4	21.4	20.5	19.3	17.9	16.5	14.6	12.0	11.9	11.1	15.2	21.4																						
18-Jun	9.4	9.4	8.5	8.5	8.0	8.4	10.0	10.1	11.7	14.5	17.2	17.2	17.2	18.0	18.4	18.4	18.3	18.5	18.3	18.0	17.6	17.0	16.0	15.1	14.3	18.5																						
19-Jun	14.5	13.4	11.4	10.6	10.1	9.9	9.9	10.3	10.6	11.8	13.6	14.4	12.5	10.9	11.3	13.6	13.6	13.7	13.6	12.4	12.1	11.3	11.2	10.9	12.0	14.5																						
20-Jun	10.2	9.8	9.1	8.7	8.5	8.4	8.5	8.9	9.0	9.0	9.0	9.1	9.3	9.3	9.6	9.5	9.0	8.9	8.8	8.5	8.2	8.1	7.8	7.5	8.9	10.2																						
21-Jun	7.3	7.2	7.2	6.9	6.7	6.8	7.4	8.0	8.7	9.9	10.4	11.9	12.5	13.2	14.7	16.2	17.4	17.2	16.0	13.8	12.2	10.6	9.7	8.9	10.9	17.4																						
22-Jun	8.5	7.1	6.3	5.2	4.4	7.1	10.5	12.7	15.0	18.5	19.7	20.4	19.3	16.5	16.9	18.1	18.0	17.6	15.8	14.8	14.2	13.5	13.0	11.9	13.5	20.4																						
23-Jun	11.2	11.0	10.9	10.5	10.4	10.8	11.8	14.9	17.8	19.1	19.8	21.2	22.3	23.3	23.2	24.4	23.7	23.3	20.1	20.2	18.5	16.8	15.5	14.5	17.3	24.4																						
24-Jun	13.7	12.8	12.2	11.5	11.5	14.0	17.4	20.1	22.8	23.8	24.4	25.9	26.3	26.3	26.7	26.2	27.3	26.1	25.2	23.1	20.8	19.4	18.7	16.9	20.5	27.3																						
25-Jun	15.3	14.3	13.4	12.9	12.7	12.9	13.0	12.9	12.7	13.7	14.8	15.1	16.0	16.0	16.9	17.9	18.4	18.4	18.3	17.6	17.0	15.5	14.0	13.3	15.1	18.4																						
26-Jun	12.4	12.9	12.8	12.4	12.1	13.2	15.4	18.5	20.5	20.8	21.0	22.1	23.4	23.9	24.4	23.6	19.2	14.8	14.2	14.9	14.2	13.4	13.0	12.1	16.9	24.4																						
27-Jun	11.2	10.8	10.3	11.4	11.9	12.9	15.4	16.8	18.3	19.6	20.1	21.6	22.2	22.5	23.3	23.1	23.5	23.1	22.0	20.6	18.9	17.0	15.6	14.2	17.8	23.5																						
28-Jun	13.4	12.7	11.9	11.4	11.2	13.9	17.5	19.7	21.0	21.8	23.6	24.8	26.0	27.1	26.6	25.3	23.0	20.7	20.5	19.0	18.0	17.5	16.1	15.8	19.1	27.1																						
29-Jun	15.4	15.2	15.4	14.7	15.1	17.0	19.1	19.4	22.7	25.6	27.1	28.0	28.6	28.2	28.8	26.6	23.4	25.4	24.5	22.9	21.4	19.9	18.9	17.9	21.7	28.8																						
30-Jun	17.2	16.5	16.0	15.5	14.8	17.2	19.8	22.7	24.2	26.0	23.9	25.9	27.6	28.1	28.2	28.4	27.9	25.8	25.0	22.6	20.8	19.2	17.2	16.5	22.0	28.4																						
																								12.7	12.2	11.7	11.3	11.2	12.1	13.5	15.1	16.7	18.3	19.4	20.3	20.9	21.0	21.3	21.2	20.9	20.2	19.3	18.0	16.8	15.4	14.4	13.6	Diurnal Average
																								18.0	17.8	17.8	17.2	17.3	17.2	19.8	22.7	24.2	26.0	27.1	28.0	28.6	28.4	28.8	28.4	27.9	26.2	25.2	23.1	22.9	21.6	19.5	18.4	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Jackfish 1 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Jackfish 1 - June 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	89	12.36	12.36
10 - 20	425	59.03	71.39
> 20	206	28.61	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

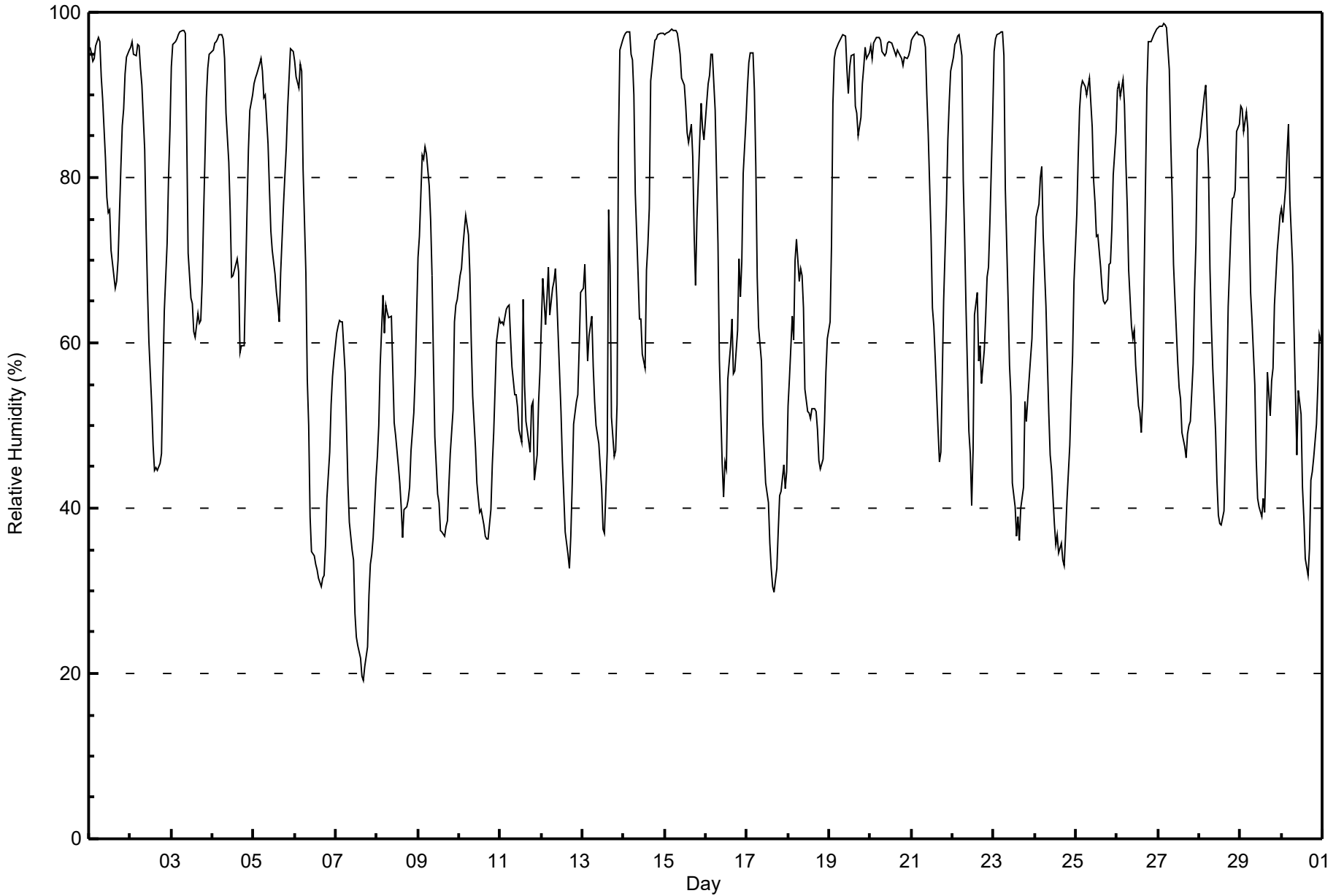
Relative Humidity (RH) - %
Jackfish 1 - June 2023

Maximum Value: 98.6 % on Jun 27 04:00 Maximum Daily Average: 95.5 % on Jun 20 Minimum Value: 19.1 % on Jun 7 17:00 Minimum Daily Average: 38.5 % on Jun 7 Maximum Diurnal Average: 86.9 % at hour 5 Minimum Diurnal Average: 52.8 % at hour 15 Monthly Average: 68.45 % Percentiles: P ₁ = 27.7 P ₁₀ = 40.0 Q ₁ = 51.2 Median = 67.4 Q ₃ = 90.0 P ₉₀ = 96.3 P ₉₉ = 97.9																						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 Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jun	95.8	95.1	94.0	94.4	95.9	97.0	96.5	92.2	89.5	82.4	77.7	75.8	76.2	71.2	68.1	66.5	67.5	70.0	81.2	86.4	88.3	92.5	94.6	95.5	85.2	97.0
2-Jun	95.7	96.5	95.0	94.7	96.1	95.9	93.2	91.2	83.4	73.9	66.5	60.1	52.6	47.6	44.6	44.9	44.7	45.4	46.6	55.9	64.0	72.0	79.9	85.5	71.9	96.5
3-Jun	93.4	96.1	96.5	96.8	97.3	97.6	97.7	97.8	97.4	85.0	70.8	65.5	64.7	61.4	60.7	63.5	62.4	62.8	67.4	75.2	89.6	93.2	94.8	95.1	82.6	97.8
4-Jun	95.4	96.2	96.5	96.9	97.3	97.4	96.7	94.4	87.7	81.8	76.0	67.9	68.1	68.8	70.2	68.7	58.8	59.7	59.7	67.8	75.8	83.4	88.1	90.0	81.0	97.4
5-Jun	91.4	92.0	92.6	93.8	94.4	92.8	89.7	89.9	84.0	78.6	73.5	71.2	68.3	66.0	64.6	62.5	68.4	76.5	80.2	83.5	88.4	95.5	95.4	95.3	82.9	95.5
6-Jun	94.0	92.2	90.9	93.7	92.9	81.1	68.6	55.5	50.0	38.9	34.8	34.3	33.3	32.5	31.5	30.5	31.5	31.9	35.5	41.2	46.7	52.5	56.0	57.9	54.5	94.0
7-Jun	61.2	62.0	62.7	62.6	62.6	56.4	49.9	42.9	38.2	35.0	33.7	27.2	24.4	23.4	21.9	19.6	19.1	20.8	23.2	29.6	33.2	34.4	36.5	43.6	38.5	62.7
8-Jun	46.3	50.0	57.2	65.8	61.2	64.5	63.8	63.0	63.2	56.7	50.4	48.8	45.1	43.1	40.2	36.4	39.8	40.1	41.0	42.5	46.9	51.6	56.1	63.4	51.5	65.8
9-Jun	70.3	72.9	82.7	82.3	83.7	82.9	79.0	74.9	68.1	58.0	48.6	41.7	40.6	37.3	37.1	36.7	37.8	38.5	42.7	46.7	51.9	62.5	64.6	65.3	58.6	83.7
10-Jun	68.1	69.0	71.4	73.5	75.4	73.1	68.3	60.0	53.5	47.3	43.0	41.1	39.5	39.8	38.0	36.6	36.2	36.2	39.8	45.3	49.2	54.5	60.1	62.9	53.4	75.4
11-Jun	62.3	62.5	62.2	64.1	64.4	64.5	60.6	57.2	53.7	53.7	52.2	49.5	48.0	65.3	55.0	50.6	49.3	46.7	52.3	52.9	43.4	46.4	52.8	56.7	55.3	65.3
12-Jun	62.4	67.8	62.1	65.5	69.1	63.4	66.6	67.4	69.1	65.4	60.8	51.7	45.8	41.5	37.1	34.4	32.8	36.6	42.9	50.2	52.8	53.7	59.6	66.1	55.2	69.1
13-Jun	66.5	69.5	63.6	57.7	60.8	63.2	57.1	52.8	50.0	47.7	45.2	42.3	37.5	36.9	47.0	76.1	69.2	51.0	46.3	46.9	52.5	84.2	95.5	96.6	59.0	96.6
14-Jun	97.2	97.5	97.7	97.6	95.0	94.2	89.9	78.2	68.4	63.0	62.9	58.7	57.0	68.8	71.8	76.3	91.7	95.1	96.6	96.8	97.2	97.5	97.5	97.4	85.2	97.7
15-Jun	97.3	97.4	97.6	97.8	97.9	97.9	97.8	97.5	96.2	94.9	92.1	91.2	88.7	85.4	84.2	86.4	82.6	73.3	66.9	75.2	84.6	89.0	86.0	84.5	89.3	97.9
16-Jun	89.1	91.4	92.3	94.9	95.0	88.2	80.3	72.1	58.0	45.4	41.3	45.7	44.7	55.6	59.7	62.9	56.3	56.6	61.4	70.1	65.7	69.8	80.6	87.0	69.3	95.0
17-Jun	90.9	93.9	95.1	95.1	90.6	81.4	68.0	61.9	57.8	50.3	46.7	43.0	40.6	35.7	32.8	30.6	29.8	32.7	37.3	41.5	42.0	45.3	42.3	44.4	55.4	95.1
18-Jun	52.5	55.8	63.2	60.3	70.0	72.5	67.5	69.0	68.2	64.2	54.5	51.8	51.6	50.9	52.0	52.0	51.7	49.4	45.8	44.7	46.0	50.4	56.4	60.6	56.7	72.5
19-Jun	62.6	71.8	88.9	94.5	95.4	96.3	96.7	96.9	97.3	97.1	93.0	90.1	93.4	94.8	95.0	88.6	87.9	85.0	87.3	91.3	93.5	95.7	94.4	95.2	90.9	97.3
20-Jun	95.9	94.5	96.3	96.9	97.0	96.9	96.5	95.3	94.7	95.1	96.2	96.5	96.4	95.8	95.3	94.7	95.4	94.7	94.4	93.6	94.5	94.5	94.7	95.5	95.5	97.0
21-Jun	96.6	97.0	97.5	97.7	97.2	97.2	97.2	96.8	95.7	90.0	85.2	73.1	64.3	62.1	58.1	49.5	45.6	46.8	55.8	65.1	76.8	84.5	89.2	92.9	79.7	97.7
22-Jun	94.6	96.0	96.4	97.1	97.3	94.8	79.7	72.6	63.9	49.3	46.7	40.3	46.9	63.5	66.0	57.8	59.7	55.1	59.1	63.2	68.0	69.1	74.7	87.5	70.8	97.3
23-Jun	95.3	96.8	97.3	97.5	97.7	97.6	94.8	78.6	65.1	57.3	53.5	43.1	40.3	36.7	39.0	36.1	40.1	42.5	52.9	50.5	53.3	58.1	60.6	66.5	64.6	97.7
24-Jun	71.2	75.3	76.8	80.0	81.4	73.1	64.3	57.8	51.5	46.4	44.6	38.1	35.6	36.9	34.6	35.8	33.7	33.1	36.8	41.0	47.7	53.6	58.5	67.5	53.1	81.4
25-Jun	75.5	82.5	88.3	90.8	91.7	91.1	90.0	91.0	92.1	86.1	79.7	76.9	72.8	73.0	69.1	66.6	65.1	64.8	65.3	69.4	69.7	73.8	80.4	85.4	78.8	92.1
26-Jun	90.8	91.4	89.9	91.9	88.9	81.8	76.4	68.9	62.1	60.5	61.5	57.3	52.3	51.6	49.1	53.1	67.5	90.7	96.4	96.4	96.5	97.3	97.7	97.9	77.8	97.9
27-Jun	98.1	98.3	98.4	98.6	98.5	98.2	93.0	84.5	77.8	69.4	65.4	57.6	54.6	53.2	49.1	47.5	46.1	49.0	49.9	50.6	57.4	66.2	72.0	83.4	71.5	98.6
28-Jun	84.9	86.8	88.4	90.0	91.1	80.7	69.0	62.1	57.0	49.3	43.3	39.1	38.1	38.0	39.6	46.9	54.8	64.4	73.9	77.5	77.6	78.5	85.7	86.5	66.8	91.1
29-Jun	88.7	88.3	85.6	88.0	85.9	75.0	66.1	62.7	54.9	46.0	41.2	40.2	39.0	41.1	39.4	46.0	56.4	51.3	55.4	57.0	64.5	71.2	73.3	75.5	62.2	88.7
30-Jun	76.2	74.5	78.8	83.0	86.5	77.2	69.3	61.4	54.0	46.5	54.2	51.3	42.6	38.8	33.9	31.8	35.0	43.4	44.5	46.1	50.2	54.8	61.0	60.2	56.5	86.5
82.0 83.7 85.2 86.4 86.9 84.1 79.5 74.9 70.1 63.8 59.8 55.7 53.4 53.9 52.8 53.0 53.9 54.8 58.0 61.8 65.6 70.9 74.6 78.1																								Diurnal Average		
98.1 98.3 98.4 98.6 98.5 98.2 97.8 97.8 97.4 97.1 96.2 96.5 96.4 95.8 95.3 94.7 95.4 95.1 96.6 96.8 97.2 97.5 97.7 97.9																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 1 - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Jackfish 1 - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	2	0.28	0.28
20 - 40	70	9.72	10.00
40 - 60	194	26.94	36.94
60 - 80	199	27.64	64.58
80 - 100	255	35.42	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 15 km/h on Jun 19 07:00	Maximum Daily Speed Average: 9.9 km/h on Jun 20	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 30 21:00	Minimum Daily Speed Average: 0.4 km/h on Jun 12	Hours of Data: 719
Maximum Diurnal Speed Average: 2.5 km/h at hour 16	Minimum Diurnal Speed Average: 0.4 km/h at hour 21	Hours of Missing Data: 1
Monthly Average Velocity: 1.2 km/h 328.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 4 Q ₃ = 7 P ₉₀ = 10 P ₉₉ = 14	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-Jun	NNW11	NNW6	N8	NE7	NNW7	NNW8	NNW7	NNW6	N7	NNW9	N8	NNW8	NNW6	N6	N9	N10	NNW8	NNW6	NNW6	NNW8	NNW7	NNW7	NNW8	NNW8	NNW7.2	NNW11	
2-Jun	NNW10	NNW8	NNW12	NNW9	NNW8	NNW7	NNW9	NNW9	NNW11	N12	N13	N12	N12	N11	N10	N9	NNE8	NNE6	NE4	ENE2	ENE2	ENE1	SSE3	S2	N7.1	N13	
3-Jun	S3	UO	WNW2	NW4	NW2	NNW4	N5	N5	NE5	N6	N5	ENE6	E7	ESE9	SE9	ESE8	ESE9	ESE10	ESE8	SE6	SE3	S2	SSE2	ESE3	E2.9	ESE10	
4-Jun	SE4	ENE1	NE3	NE3	ESE5	SE7	SE8	SE7	SSE6	SSE6	SSE7	SSE8	SSE9	SSE10	SSE8	SSE7	S6	S4	S4	S2	S4	S3	S3	S3	SSE4.8	SSE10	
5-Jun	S2	SSE2	N1	SSE3	NW2	NW3	NW2	NNW5	NNW7	NNW9	N9	N8	NNE8	NE7	ENE7	SE10	SE2	NW6	NNW10	NNW4	NW4	NW4	NW5	NNW4	N3.0	SE10	
6-Jun	NW4	NW5	WNW4	SSW1	WSW2	NW4	NW4	WNW4	NW4	NW5	NW6	NW5	WNW6	WNW4	WSW4	WSW5	W5	SW5	SW4	SSW3	SSE2	SSE3	S3	S3	W2.7	WNW6	
7-Jun	S3	S3	S3	S4	S4	S4	S5	SSW5	SSW7	SW6	WNW6	WSW6	WSW5	SW7	W6	W6	WNW5	W4	WNW3	N1	NW3	NW3	NNW6	NNW3	WSW2.9	SW7	
8-Jun	W3	WSW3	SW3	SW2	WSW2	WNW3	NNW4	NNW6	N5	N4	N6	N7	N7	N7	NNW7	N7	N7	NNE8	NE6	NE2	N2	E1	SSE3	S4	N2.8	NNE8	
9-Jun	SSW3	S3	S5	SSW4	S3	S2	S2	S3	SE3	SE4	SE6	SE8	SE6	SE6	SSE5	SE6	SSE6	SSE5	SSW3	S2	S3	S3	S3	S4	SSE3.8	SE8	
10-Jun	S3	S4	S5	S4	S4	S5	S4	S5	SSW6	SSW7	SSW7	S7	SSW6	S7	S7	S6	S6	SSW6	S6	S4	S5	S5	S5	S4	S5.3	SSW7	
11-Jun	S5	S5	S6	S6	S5	SSW4	SSW4	SW5	W4	WNW4	NW6	NNW7	NNW7	SSW1	NW3	NNW6	NW5	NNW9	NNW4	NW3	NNW8	NNW7	NNW3	WSW3	WNW2.3	NNW9	
12-Jun	NW3	WNW2	NNW5	NW3	WSW2	W2	W2	W2	W1	WSW1	WSW1	W1	NW2	N2	NNW2	N3	NE2	SE2	SE6	SE5	SSE4	SSE3	SE2	NNE2	WNW0.4	SE6	
13-Jun	SE3	SE4	SE5	SE6	SSE6	SSE6	S6	S5	S5	SSW5	S4	SSW3	SE5	SSE8	S6	N6	ESE4	SSE8	SSE8	SSE12	SE13	SW2	NNE3	NW2	SSE4.3	SE13	
14-Jun	N3	N3	NE3	ESE6	SE8	SE5	SE6	SE8	SE6	SE3	ENE5	ESE7	E6	NNW11	NNW11	NNW11	NNW11	NNW11	NNW12	NNW14	NNW13	N9	NNW12	NNW10	NNW11	N4.0	NNW14
15-Jun	NNW11	NNW12	NNW12	NNW10	NNW10	NNW11	NNW11	NNW11	NNW13	NNW13	NNW12	NNW12	NNW13	NNW12	NNW11	NW9	NW9	NNW9	NNW11	NNW11	NNW4	S1	SSW2	SSW4	SW4	NNW8.8	NNW13
16-Jun	SW5	SW4	SW4	WSW4	WSW4	SW4	SSW3	S3	SSW4	SSW6	SSW6	SSW5	SSW6	WSW4	W3	W4	SW4	S3	S1	S2	SW5	SSW4	SW4	WSW2	SW3.7	SSW6	
17-Jun	SSW3	SW4	SSW4	SSW4	SSW5	SW5	W4	WNW5	W4	W5	WNW6	W6	WNW6	WNW5	W6	WNW7	W5	WNW4	W3	WNW1	NNE1	S1	SSW3	SSW3	W3.3	WNW7	
18-Jun	SE1	SSW2	WSW1	WNW1	SSW1	NNW4	NNE4	NNE6	N5	NNE8	NE9	NE9	NE10	NNE12	N14	N13	N13	NNE12	NNE13	NNE13	NNE14	NNE14	NE14	NNE14	NNE8.0	NE14	
19-Jun	NNE14	NNE15	NNE13	NNE14	NNE13	NNE14	NNE15	NNE15	NE10	NE7	NE6	NE5	NW2	NNW3	W2	NW3	WNW2	WSW2	SW0	SSE0	S1	WNW2	NNW8	NNW9	NNE6.2	NNE15	
20-Jun	NNW9	NNW8	NNW10	NNW10	NNW10	NNW11	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW10	NNW9	NNW8	NNW9	NW6	NNW9.9	NNW12	
21-Jun	NNW8	NW7	NW7	NNW9	NNW8	NW7	NW6	NW5	NW4	NW6	NW6	NNW9	NNW11	NNW8	N6	NNW5	NW5	NE4	E7	ESE6	SSE3	SE3	SE3	S3	NNW4.1	NNW11	
22-Jun	SSW3	SSW5	S4	SSW2	S3	S2	N3	NE3	E2	SE1	NNW1	NNE2	NNW6	W1	S1	SW1	SSW2	SSW3	S2	SSW1	SSE2	S2	SW2	SW1	SSW1.0	NNW6	
23-Jun	S2	S3	S3	S3	S4	S4	SSE4	SSE5	S4	SSW3	SSW3	SE5	SSE4	S3	SSW3	SSW4	S4	S1	S2	S2	SSW1	S2	SSE2	S3	S2.9	SSE5	
24-Jun	S4	S4	S4	S4	S3	S2	SSW3	SW3	SSW3	SW4	W4	WSW4	SW4	WSW5	W4	W3	W3	SW4	SW2	SSW4	S2	N3	N6	NNW6	SW2.1	NNW6	
25-Jun	N6	N5	NNE4	N5	NNE5	NNE8	N8	N7	NNE8	NNE8	NNE7	NNE7	NNE7	NNE6	NNE6	N6	NNE6	N4	ENE1	NE2	ENE1	NW2	S1		NNE5.1	N8	
26-Jun	S3	SSE3	SSE4	S3	S4	S4	S4	S4	S5	S4	WSW2	SSW4	SSW4	SW4	SSW3	SW3	NNW7	NNW6	SW2	SSW4	WSW1	W1	SSW2	S2	SSW2.3	NNW7	
27-Jun	S3	S3	S2	SSW2	S2	NNW2	NNW5	N7	NNE6	N7	N5	N7	N7	N8	N9	N8	N8	NNE7	NE7	NE5	ENE2	SSE2	SSE3	S3	N3.1	N9	
28-Jun	S2	S3	S4	S3	SSE3	S2	S4	SSW3	SSE4	SSE6	S5	SE7	S5	W1	SSE4	SSE2	SW4	NE1	S2	SSW2	SSW3	SSW2	S2	S2	S2.8	SE7	
29-Jun	S2	SSE3	S3	S3	SSE3	S3	S4	SSW4	SSW5	SSW6	SW6	SW6	SW6	SW6	SW6	WSW6	NW3	WNW2	NNW2	SSW2	SW1	S1	SSW3	SSW3	SSW3.0	SW6	
30-Jun	SW3	SW4	SW4	SW4	SSW3	SW4	SSW4	SSW3	S4	SSW3	WSW3	WNW3	NW5	NW5	WNW6	NW3	WNW1	NW3	NW3	NW3	S0	ESE1	SE1	E1	WSW1.8	WNW6	

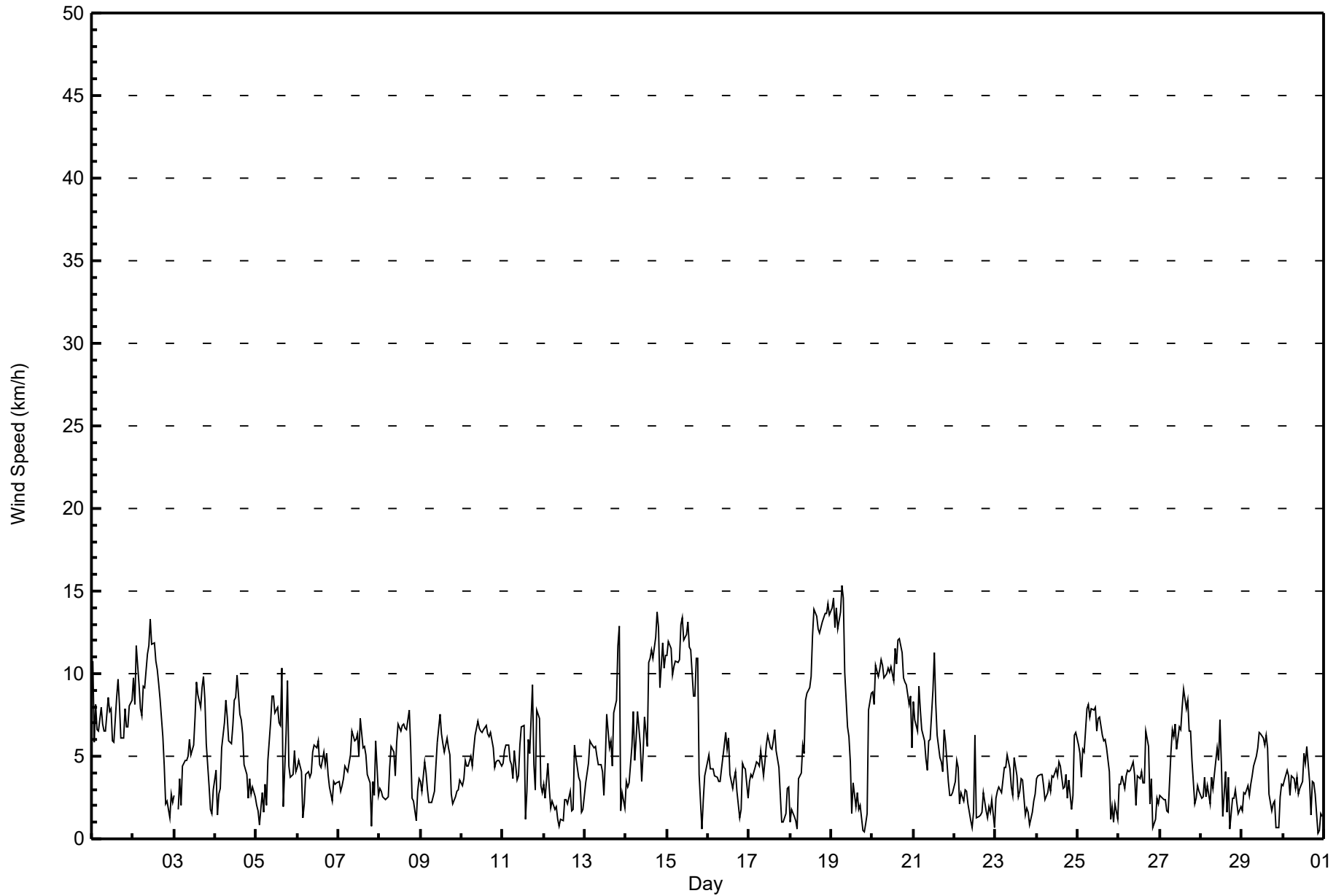
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NNE14	NNE15	NNE13	NNE14	NNE13	NNE14	NNE15	NNE15	NNW13	NNW13	N13	NNW12	NNW13	NNE12	N14	N13	N13	NNE12	NNW14	NNE13	NNE14	NNE14	NE14	NNE14		Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Jackfish 1 - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 1 - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	434	60.36	60.36
6 - 11	244	33.94	94.30
12 - 19	41	5.70	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
Jackfish 1 - June 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	19	7	13	8	3	4	20	28	120	58	35	21	23	23	35	17	434
6 - 11	33	18	10	2	3	8	18	15	10	11	7	2	4	6	13	84	244
12 - 19	7	15	1	0	0	0	1	1	0	0	0	0	0	0	0	16	41
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	59	40	24	10	6	12	39	44	130	69	42	23	27	29	48	117	719

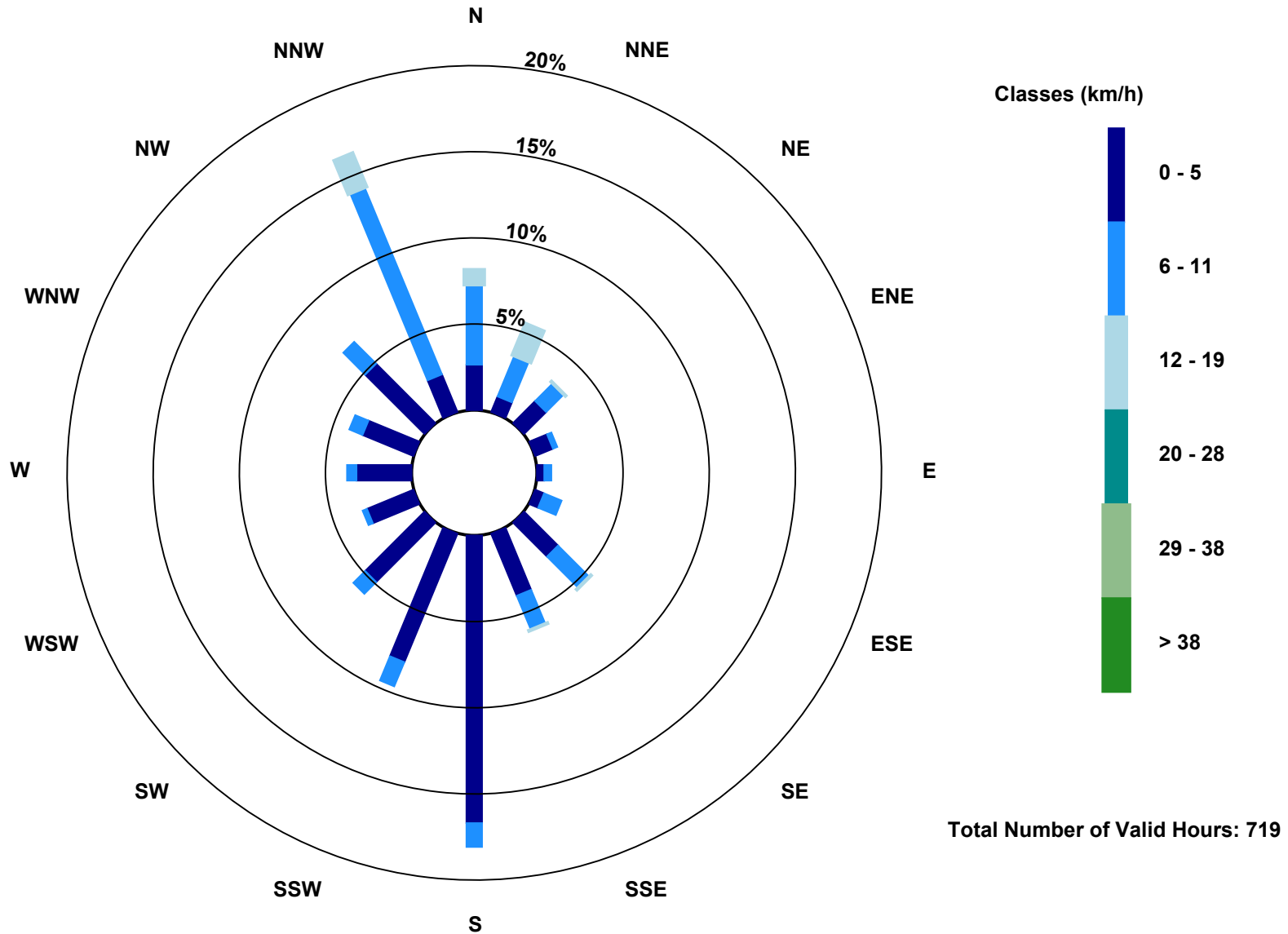
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Jackfish 1





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Jackfish 1 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Jun 19 02:00	Hours of Data: 719
Minimum Value: 0 km/h on Jun 21 23:00	Hours of Missing Data: 1
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: 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-Jun	3	2	4	4	3	2	2	2	2	3	2	2	2	2	3	3	2	3	1	2	1	1	2	2	4
2-Jun	3	2	3	3	2	2	3	2	4	4	4	4	4	4	4	3	3	2	2	1	1	1	1	1	4
3-Jun	1	UO	1	1	1	1	1	1	2	2	2	2	3	4	3	3	3	3	3	2	1	1	1	3	4
4-Jun	2	1	1	1	2	2	3	3	2	2	3	3	4	3	3	3	3	2	2	1	1	1	1	1	4
5-Jun	0	1	1	1	1	2	1	2	2	2	3	3	3	3	3	4	3	3	2	2	1	2	2	2	4
6-Jun	2	2	2	1	1	2	2	1	1	2	2	2	3	2	2	3	3	3	2	2	1	1	1	1	3
7-Jun	1	1	1	1	2	1	2	2	3	3	3	3	3	3	3	3	2	3	2	1	2	3	1	1	3
8-Jun	1	0	1	1	1	1	2	1	1	2	2	2	2	3	2	3	3	3	2	2	1	1	1	0	3
9-Jun	1	1	1	1	1	0	1	1	1	1	2	3	3	2	2	2	2	2	1	1	1	1	1	1	3
10-Jun	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	3
11-Jun	2	2	2	2	2	2	2	2	2	2	2	3	3	1	2	2	3	2	3	2	2	2	2	1	3
12-Jun	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	2
13-Jun	1	1	1	2	2	2	2	2	2	2	2	2	3	4	3	3	2	3	3	5	5	3	1	2	5
14-Jun	2	1	1	2	2	2	2	3	3	2	2	3	3	4	3	3	3	3	3	4	3	3	2	3	4
15-Jun	3	3	3	2	2	2	3	3	4	4	3	3	4	3	4	3	3	3	3	4	1	1	1	1	4
16-Jun	2	1	1	1	2	2	2	1	2	3	3	3	3	3	2	3	2	1	1	1	2	2	2	2	3
17-Jun	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	3
18-Jun	1	1	1	1	1	2	2	2	2	3	4	4	4	5	5	4	5	5	5	5	5	5	5	6	6
19-Jun	5	6	5	5	5	5	6	6	4	3	2	3	1	2	1	1	1	1	1	1	1	2	2	2	6
20-Jun	2	2	2	2	3	3	3	2	3	3	3	3	3	3	3	3	3	4	2	2	2	2	2	2	4
21-Jun	2	2	2	3	2	2	2	2	2	3	2	3	3	2	2	2	2	2	2	2	1	0	0	0	3
22-Jun	1	1	1	1	2	1	1	1	1	1	1	3	3	2	2	2	1	1	1	1	1	1	1	1	3
23-Jun	1	1	1	1	1	1	1	2	2	1	2	3	2	2	2	2	2	1	1	1	1	1	1	1	3
24-Jun	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	2	2	2	1	1	1	3	2	2	3
25-Jun	1	1	2	2	2	3	3	2	3	3	3	3	2	3	3	2	2	2	2	1	1	1	1	1	3
26-Jun	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	5	2	2	2	1	1	1	1	5
27-Jun	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	3	3	3	2	1	1	1	1	3
28-Jun	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	3	3	1	1	1	1	1	1	3
29-Jun	1	1	1	1	1	2	2	2	2	3	3	3	3	2	3	3	1	1	1	1	1	1	1	1	3
30-Jun	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	2	1	1	1	1	1	3

5	6	5	5	5	5	6	6	4	4	4	4	4	4	5	5	4	5	5	5	5	5	5	5	6	
Diurnal Maximum																									

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Jackfish 1 - June 2023

Direction of Maximum Speed: 16 deg on Jun 19 07:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 337.2 deg on Jun 20	Hours of Data: 719
Direction of Minimum Speed: 183 deg on Jun 30 21:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 0.4 deg on Jun 12	Percent Operational Time: 99.9
Monthly Average Direction: 328.5 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-Jun	334	332	350	48	329	332	331	347	351	347	354	342	339	356	1	356	343	341	333	333	335	338	328	329	343.1
2-Jun	329	328	335	339	334	328	330	333	340	353	359	1	358	352	3	5	17	28	43	66	62	64	166	180	351.5
3-Jun	177	UO	288	310	321	333	352	356	46	5	9	66	85	118	125	115	122	116	120	126	138	176	153	109	92.8
4-Jun	124	62	44	51	107	128	139	145	151	159	156	152	148	152	158	158	171	180	179	187	169	178	183	178	150.1
5-Jun	172	168	355	163	304	318	307	332	339	348	360	8	16	51	64	127	144	321	333	327	321	314	311	302	352.4
6-Jun	309	309	302	208	252	317	309	300	311	317	312	310	283	286	256	237	259	235	221	199	168	167	169	170	273.6
7-Jun	175	178	180	183	182	183	186	205	209	232	284	244	256	221	262	273	292	278	298	9	321	318	340	327	242.9
8-Jun	260	238	216	217	256	291	334	341	352	353	8	11	352	354	340	353	5	23	41	47	353	94	163	176	351.8
9-Jun	196	172	188	198	188	184	184	171	141	138	146	143	141	145	165	141	157	159	192	183	182	183	175	174	163.4
10-Jun	174	179	186	187	182	178	190	189	192	197	197	186	194	189	182	184	188	194	191	190	181	171	171	178	186.3
11-Jun	182	181	182	181	188	193	198	218	280	292	325	332	338	213	316	328	318	336	328	318	335	334	332	249	292.3
12-Jun	306	295	330	324	252	269	264	261	270	257	252	273	318	353	340	351	38	141	127	132	149	158	140	29	295.9
13-Jun	140	146	140	145	152	164	172	185	182	203	177	202	143	151	183	351	118	152	154	152	146	227	19	309	157.4
14-Jun	7	8	52	117	131	131	143	142	137	140	64	109	94	347	348	338	333	334	331	337	349	340	336	334	2.4
15-Jun	335	332	335	332	334	335	336	336	337	335	336	329	331	329	325	319	321	331	334	329	171	205	212	214	329.5
16-Jun	219	215	222	240	246	216	199	190	199	202	203	198	208	248	278	262	219	188	169	177	216	206	230	243	216.5
17-Jun	211	223	198	210	208	215	281	287	276	272	283	279	299	293	273	301	278	297	275	303	23	175	213	207	263.0
18-Jun	126	212	246	285	198	327	23	13	8	18	37	39	35	23	8	9	4	16	22	24	25	25	36	32	20.9
19-Jun	27	32	22	21	26	18	16	20	38	42	46	40	305	332	270	321	294	242	222	162	190	285	334	337	16.5
20-Jun	342	342	334	333	335	334	334	339	347	344	343	340	339	342	342	333	335	334	335	336	335	335	332	323	337.2
21-Jun	328	325	322	328	327	326	317	322	315	319	324	328	333	339	2	336	322	44	87	121	147	129	138	184	335.6
22-Jun	195	192	188	213	190	173	351	47	91	133	348	33	332	275	187	232	209	209	189	210	161	181	230	228	202.1
23-Jun	175	190	183	174	178	174	167	168	175	201	195	146	161	187	194	199	178	182	169	181	197	179	168	174	176.9
24-Jun	174	173	172	175	178	185	198	229	201	230	275	240	227	240	270	274	272	230	225	202	189	4	8	339	230.5
25-Jun	349	1	33	7	13	17	9	5	13	25	33	13	15	13	29	23	11	15	4	70	37	66	306	173	14.8
26-Jun	171	166	164	173	177	187	176	188	185	186	249	210	210	216	209	227	342	336	232	207	256	274	196	182	202.2
27-Jun	184	184	179	202	191	333	333	350	15	4	359	350	350	3	353	359	357	32	35	35	71	150	163	184	5.3
28-Jun	190	185	172	172	163	178	175	197	168	149	169	146	175	274	166	158	231	46	178	197	213	192	176	177	175.8
29-Jun	179	168	178	171	166	177	181	192	210	210	225	229	222	214	218	256	317	291	337	200	218	179	203	209	211.7
30-Jun	222	221	216	216	210	222	209	205	181	196	252	292	318	313	302	308	282	312	322	304	183	114	132	98	254.9

301.0 287.7 298.7 290.4 261.5 303.5 318.6 319.7 336.0 328.4 339.7 343.8 337.6 337.4 330.1 333.4 330.8 341.9 355.4 15.4 19.1 328.4 317.5 290.4

Diurnal Average

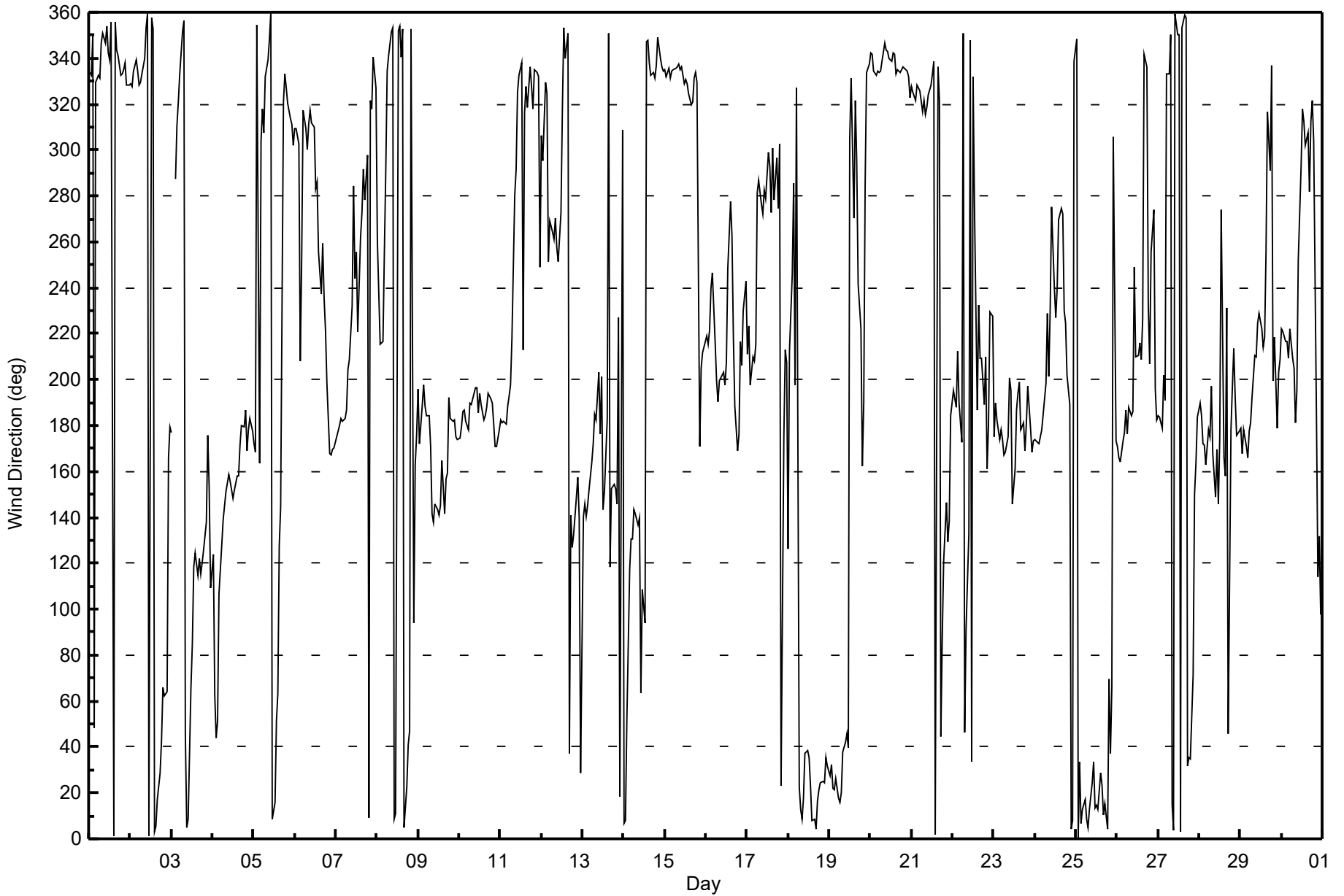
UO - Unstable Operation

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Jackfish 1 - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 1 - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 113 deg on Jun 7 20:00																	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9								
Minimum Value: 9 deg on Jun 6 22:00																									
Percentiles: P ₁ = 11 P ₁₀ = 16 Q ₁ = 24 Median = 37 Q ₃ = 57 P ₉₀ = 77 P ₉₉ = 98																									
Day	Hourly Period Ending At (MST)																							Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
1-Jun	20	29	41	56	29	15	16	26	26	25	30	25	21	33	31	29	23	27	12	14	12	14	16	16	56
2-Jun	16	17	15	18	16	17	17	16	21	28	32	33	31	31	35	37	37	39	44	21	16	19	24	10	44
3-Jun	16	UO	22	13	61	14	29	28	41	37	49	46	47	36	29	34	28	28	20	19	11	21	32	61	
4-Jun	29	39	34	38	34	22	26	32	37	38	35	34	33	34	43	43	46	51	48	29	19	15	26	21	51
5-Jun	11	63	82	19	82	42	72	36	22	26	32	38	41	50	53	30	95	33	18	41	38	69	42	56	95
6-Jun	57	39	45	101	73	56	54	65	59	60	62	75	79	81	79	76	81	66	71	47	16	9	10	15	101
7-Jun	14	22	21	23	25	34	49	53	57	70	75	72	82	64	82	78	83	85	93	113	30	71	11	31	113
8-Jun	14	11	20	29	27	28	26	16	30	55	39	35	42	45	43	39	49	38	44	47	28	65	24	12	65
9-Jun	17	22	9	12	12	10	24	29	27	27	35	38	45	47	44	37	36	39	38	25	18	19	20	21	47
10-Jun	19	30	38	41	39	41	57	56	55	54	54	53	57	49	54	52	53	54	53	43	37	22	24	30	57
11-Jun	35	31	34	33	48	48	48	59	74	80	45	39	37	98	75	46	45	18	49	59	15	14	51	22	98
12-Jun	34	30	14	40	26	17	36	48	45	45	85	71	51	61	73	58	73	68	23	20	21	15	63	73	85
13-Jun	40	20	21	25	28	22	31	51	57	65	63	90	59	51	50	37	53	36	35	33	32	95	50	81	95
14-Jun	44	33	47	24	23	24	32	33	53	60	54	46	58	27	25	22	16	16	15	18	28	18	15	17	60
15-Jun	15	16	17	16	16	16	16	17	17	17	16	16	17	17	19	22	23	20	18	70	80	24	28	30	80
16-Jun	27	33	25	25	41	61	68	65	60	56	55	58	50	79	98	81	62	55	34	31	60	57	65	82	98
17-Jun	57	54	51	59	51	58	82	72	82	83	70	77	74	83	75	74	86	89	95	112	97	45	20	26	112
18-Jun	93	40	36	39	78	25	42	26	34	35	46	44	39	38	33	32	29	33	35	34	34	37	38	38	93
19-Jun	39	38	34	34	37	33	32	33	42	45	38	63	71	73	56	45	76	45	97	69	51	76	15	17	97
20-Jun	21	20	17	16	17	18	20	18	23	21	20	18	19	21	21	18	17	18	18	16	17	16	16	26	26
21-Jun	16	18	20	19	20	19	27	31	43	37	25	23	20	24	38	59	53	63	34	27	23	19	27	18	63
22-Jun	13	10	13	40	26	64	48	53	82	92	100	99	33	94	89	83	51	61	37	39	26	45	41	86	100
23-Jun	59	40	30	16	23	25	25	30	48	56	64	59	64	76	81	78	67	89	51	53	31	28	12	12	89
24-Jun	14	14	12	14	19	47	43	49	82	85	85	83	86	86	82	84	88	69	92	41	31	98	34	19	98
25-Jun	16	24	43	33	30	32	33	32	36	38	40	40	37	35	45	50	39	47	47	49	40	42	15	75	75
26-Jun	11	21	18	21	32	38	50	56	54	59	78	66	66	67	80	57	64	28	64	41	76	84	45	42	84
27-Jun	19	25	44	37	52	69	28	26	37	33	42	37	37	39	31	37	33	51	41	38	25	27	20	12	69
28-Jun	15	10	13	24	14	33	31	40	40	39	48	38	64	96	63	79	51	105	58	38	53	28	27	20	105
29-Jun	26	14	26	18	34	60	57	63	57	60	62	61	64	59	64	70	77	76	82	47	68	73	36	33	82
30-Jun	18	19	21	23	29	30	33	50	52	83	81	68	59	86	69	86	107	66	61	60	75	37	39	40	107
																	Diurnal Maximum								
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS508
KIRBY NORTH
JUNE 2023**

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

July 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS 508)
 JUNE 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	14.5	0	3.3	0
H2S (ppb) Average	617	39	103	91.11	0.5	0	0.3	0
THC (ppm) Average	682	36	38	99.72	2.6	-	2.4	-
NO2 (ppb) Average	618	36	102	90.83	5.1	0	2	-
NO (ppb) Average	618	36	102	90.83	4.4	-	0.8	-
NOX (ppb) Average	618	36	102	90.83	9	-	2.3	-
Temperature 2 m (C) Average	718	0	2	99.72	27.2	-	21	-
Relative Humidity (%) Average	718	0	2	99.72	100	-	94.9	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	30	-	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 - KIRBY NORTH (AMS508)
JUNE 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	682	0.65	1.6	-	0	0	0	0.2	0.5	1.4	14.5
H2S (ppb) Average	617	0.11	0.1	-	0	0	0	0.1	0.2	0.2	0.5
THC (ppm) Average	682	2.27	0.1	-	2.1	2.2	2.2	2.3	2.3	2.4	2.6
NO2 (ppb) Average	618	0.99	0.7	-	0	0.2	0.5	0.8	1.3	1.9	5.1
NO (ppb) Average	618	0.16	0.4	-	0	0	0	0	0.2	0.4	4.4
NOX (ppb) Average	618	1.15	0.9	-	0	0.2	0.6	1	1.4	2.1	9
Temperature 2 m (C) Average	718	16.09	5.1	-	4.9	9.1	12.3	16	20.1	23.2	27.2
Relative Humidity (%) Average	718	67.94	21.9	-	16.6	38	50.2	66.8	90.1	96.8	100
Wind Speed 10 m (km/h) Average	719	11	5	-	0	5	7	10	14	18	30
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)
JUNE 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS (except NO2)	19 Jun 2023 08:00	19 Jun 2023 08:00	1	Maintenance - station logger/modem reset
H2S, SO2, THC	19 Jun 2023 10:00	19 Jun 2023 10:00	1	Maintenance - sample manifold cleaned
H2S	02 Jun 2023 08:00	02 Jun 2023 09:00	2	Maintenance - reinitiated daily QA check
H2S	14 Jun 2023 18:00	15 Jun 2023 08:00	15	Maintenance - stabilization post maintenance
H2S	21 Jun 2023 15:00	21 Jun 2023 19:00	5	Unstable Operation - excessive baseline drift
H2S	22 Jun 2023 10:00	22 Jun 2023 12:00	3	Unstable Operation - excessive baseline drift
H2S	23 Jun 2023 11:00	23 Jun 2023 20:00	10	Unstable Operation - excessive baseline drift
H2S	24 Jun 2023 10:00	24 Jun 2023 21:00	12	Unstable Operation - excessive baseline drift
H2S	26 Jun 2023 11:00	26 Jun 2023 18:00	8	Unstable Operation - excessive baseline drift
H2S	28 Jun 2023 11:00	28 Jun 2023 15:00	5	Maintenance - baseline adjustment
H2S	30 Jun 2023 09:00	30 Jun 2023 10:00	2	Maintenance - reinitiated daily QA check
NO2	15 Jun 2023 22:00	16 Jun 2023 12:00	15	Unstable Operation - flatline in analyzer output signal
NO2	16 Jun 2023 13:00	16 Jun 2023 14:00	2	Maintenance - analyzer rebooted
NO2	17 Jun 2023 09:00	18 Jun 2023 11:00	27	Unstable Operation - flatline in analyzer output signal
NO2	18 Jun 2023 15:00	19 Jun 2023 08:00	18	Maintenance - stabilization post analyzer replacement
NO2	20 Jun 2023 09:00	20 Jun 2023 10:00	2	Unstable Operation - flatline in analyzer output signal
NO2	23 Jun 2023 17:00	23 Jun 2023 18:00	2	Unstable Operation - flatline in analyzer output signal
Relative Humidity, Temperature	16 Jun 2023 13:00	16 Jun 2023 13:00	1	Maintenance - sensor replaced



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Kirby North - June 2023

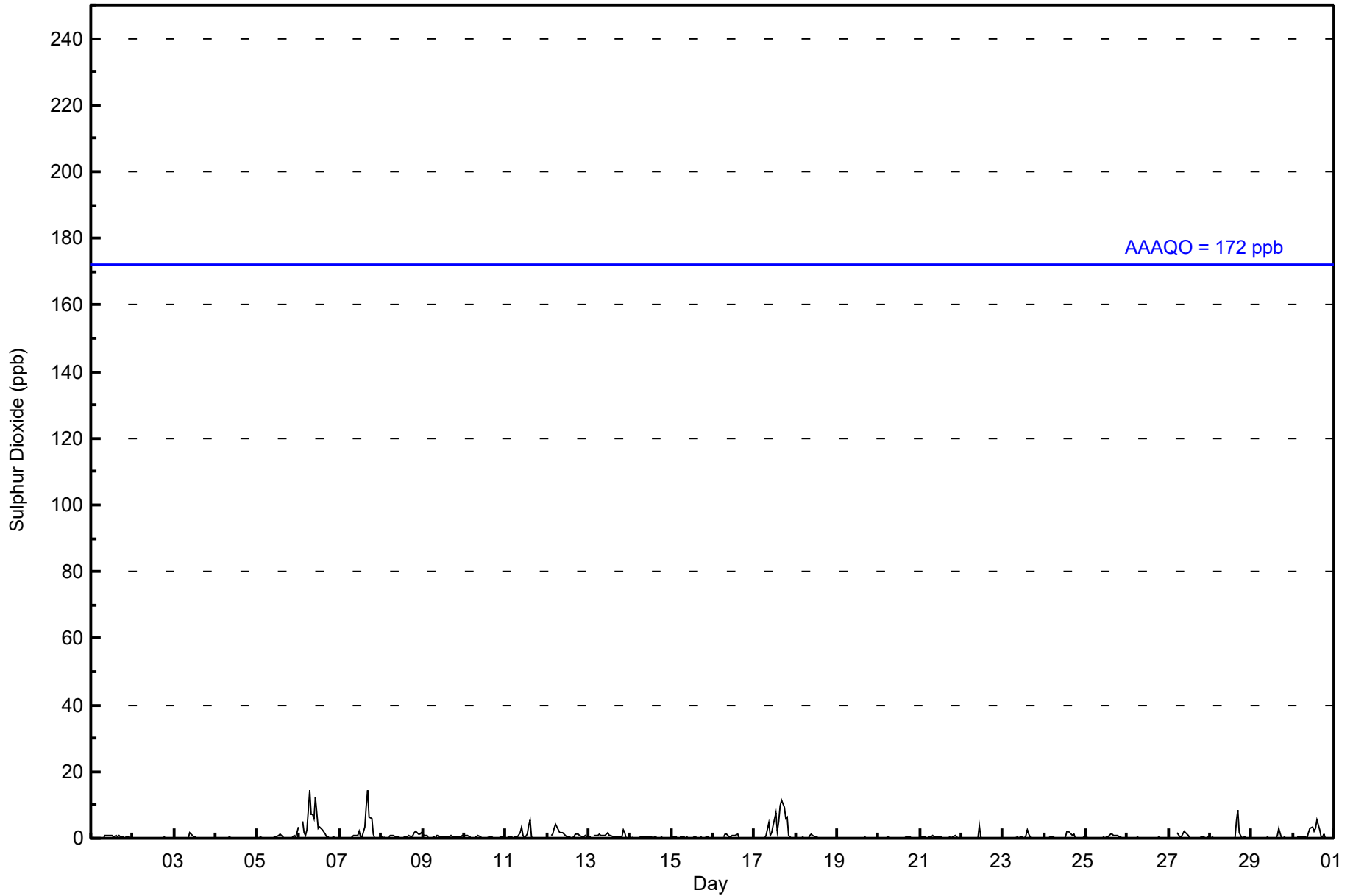
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Hours of Data: 682						
Maximum Value: 14.5 ppb on Jun 6 07:00		Maximum Daily Average: 3.3 ppb on Jun 6		Hours of Missing Data: 38																	Hours of Calibration: 36						
Minimum Value: 0.0 ppb on Jun 2 02:00		Minimum Daily Average: 0.0 ppb on Jun 26		Hours of Calibration: 36																	Percent Operational Time: 99.7						
Maximum Diurnal Average: 1.6 ppb at hour 17		Minimum Diurnal Average: 0.2 ppb at hour 23		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.4 P ₉₉ = 8.7																							
Monthly Average: 0.65 ppb																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jun	0.1	0.3	Z	0.2	0.1	0.2	0.0	0.2	0.8	0.8	0.8	0.7	0.7	0.6	0.7	0.5	0.7	0.5	0.2	0.2	0.2	0.4	0.3	0.0	0.4	0.8	
2-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.1	0.4	
3-Jun	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	1.8	1.1	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	
4-Jun	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.2	0.2	
5-Jun	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.3	0.4	0.7	1.3	0.9	0.3	0.1	0.0	0.0	0.1	0.1	0.8	0.6	1.7	0.4	1.7	
6-Jun	3.6	Z	5.2	1.5	0.7	2.7	14.5	7.4	7.4	5.9	12.1	2.9	3.6	3.1	2.5	1.4	0.2	0.4	0.1	0.2	0.2	0.0	0.0	0.1	3.3	14.5	
7-Jun	0.1	0.0	Z	0.2	0.2	0.2	0.2	0.6	0.9	0.7	0.9	2.1	0.4	0.4	3.3	9.8	14.3	6.3	5.9	1.3	0.0	0.1	0.1	0.2	2.1	14.3	
8-Jun	0.2	0.2	0.3	Z	0.3	0.9	1.0	0.9	0.6	0.3	0.3	0.2	0.2	0.3	0.3	0.5	0.7	0.5	0.7	1.8	2.1	1.5	1.4	1.6	0.7	2.1	
9-Jun	1.4	0.9	0.7	0.4	Z	0.2	0.4	0.2	0.7	0.7	0.6	0.3	0.3	0.4	0.4	0.3	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.8	0.5	1.4	
10-Jun	0.7	0.8	0.9	0.6	0.6	Z	0.3	0.3	0.6	0.3	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.7	0.4	0.9	
11-Jun	Z	0.5	0.4	0.3	0.2	0.2	0.2	0.2	1.6	3.2	0.8	0.1	1.3	4.0	5.7	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.9	5.7	
12-Jun	0.2	Z	0.9	1.4	3.1	4.2	2.6	1.8	1.7	1.7	1.2	0.5	0.3	0.4	0.2	0.5	1.1	1.1	1.3	0.9	0.4	0.4	1.0	0.2	1.2	4.2	
13-Jun	0.5	0.6	Z	0.8	0.7	0.9	1.1	1.0	0.8	1.0	1.4	1.8	1.0	0.7	0.2	0.3	0.5	0.5	0.5	0.6	2.8	1.6	0.2	0.1	0.8	2.8	
14-Jun	0.2	0.1	0.2	Z	0.1	0.1	0.2	0.5	0.6	0.6	0.5	0.6	0.4	0.0	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.2	0.3	0.6	
15-Jun	0.2	0.4	0.5	0.4	Z	0.3	0.3	0.5	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.5	
16-Jun	0.1	0.2	0.1	0.1	0.2	Z	0.3	1.2	1.2	0.4	0.4	0.9	0.6	0.9	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	
17-Jun	Z	0.1	0.1	0.0	0.0	0.1	0.0	1.0	4.5	0.9	1.6	4.0	7.4	2.2	4.9	9.9	11.6	9.2	5.9	6.3	1.0	0.0	0.0	0.0	3.1	11.6	
18-Jun	0.1	Z	0.0	0.0	0.3	0.1	0.1	0.2	0.7	1.1	0.7	0.5	0.2	0.2	C	C	C	C	C	C	0.0	0.0	0.0	0.0	--	1.1	
19-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	M	0.0	M	0.1	0.2	0.0	0.0	0.1	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5	
20-Jun	0.0	0.1	0.1	Z	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	
21-Jun	0.2	0.3	0.3	0.6	Z	0.6	0.6	0.7	0.4	0.2	0.3	0.6	0.5	0.1	0.0	0.0	0.0	0.5	0.0	0.3	1.0	0.3	0.1	0.1	0.3	1.0	
22-Jun	0.1	0.2	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.0	3.7	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	3.7	
23-Jun	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.2	0.3	0.4	0.1	0.9	2.5	1.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.5	
24-Jun	0.0	Z	0.1	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	2.1	1.9	1.3	0.8	1.4	0.1	0.1	0.1	0.1	0.2	0.2	0.5	2.1	
25-Jun	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.4	0.4	1.2	1.5	0.8	0.8	0.9	0.3	0.3	0.0	0.0	0.0	0.3	1.5	
26-Jun	0.0	0.0	0.0	Z	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
27-Jun	0.0	0.0	0.0	0.0	Z	1.7	0.3	0.5	1.3	1.9	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.1	0.0	0.2	0.4	1.9		
28-Jun	0.2	0.2	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	5.3	8.5	1.7	0.0	0.4	0.5	0.1	0.1	0.0	0.7	8.5	
29-Jun	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.2	0.2	0.9	2.8	0.1	0.0	0.3	0.0	0.2	0.1	0.1	0.2	2.8	
30-Jun	0.1	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.2	1.7	2.8	3.5	2.3	3.2	5.5	2.4	0.4	0.3	1.1	0.0	0.0	0.0	0.0	0.0	1.1	5.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.3 3.6			
																								0.2 0.9			
																								0.4 5.2			
																								0.3 1.5			
																								0.3 3.1			
																								0.5 4.2			
																								0.8 14.5			
																								0.6 7.4			
																								0.8 7.4			
																								0.8 5.9			
																								1.1 12.1			
																								0.7 4.0			
																								0.7 7.4			
																								0.7 4.0			
																								1.1 5.7			
																								1.3 9.9			
																								1.6 14.3			
																								0.9 9.2			
																								0.7 5.9			
																								0.5 6.3			
																								0.4 2.8			
																								0.2 1.6			
																								0.2 1.4			
																								0.2 1.7			

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 North - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby North - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	678	99.41	99.41
11 - 20	4	0.59	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Kirby North - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	66	55	65	29	19	17	25	40	92	38	68	42	17	19	26	60	678
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	66	55	65	29	19	17	25	40	92	38	68	42	19	21	26	60	682

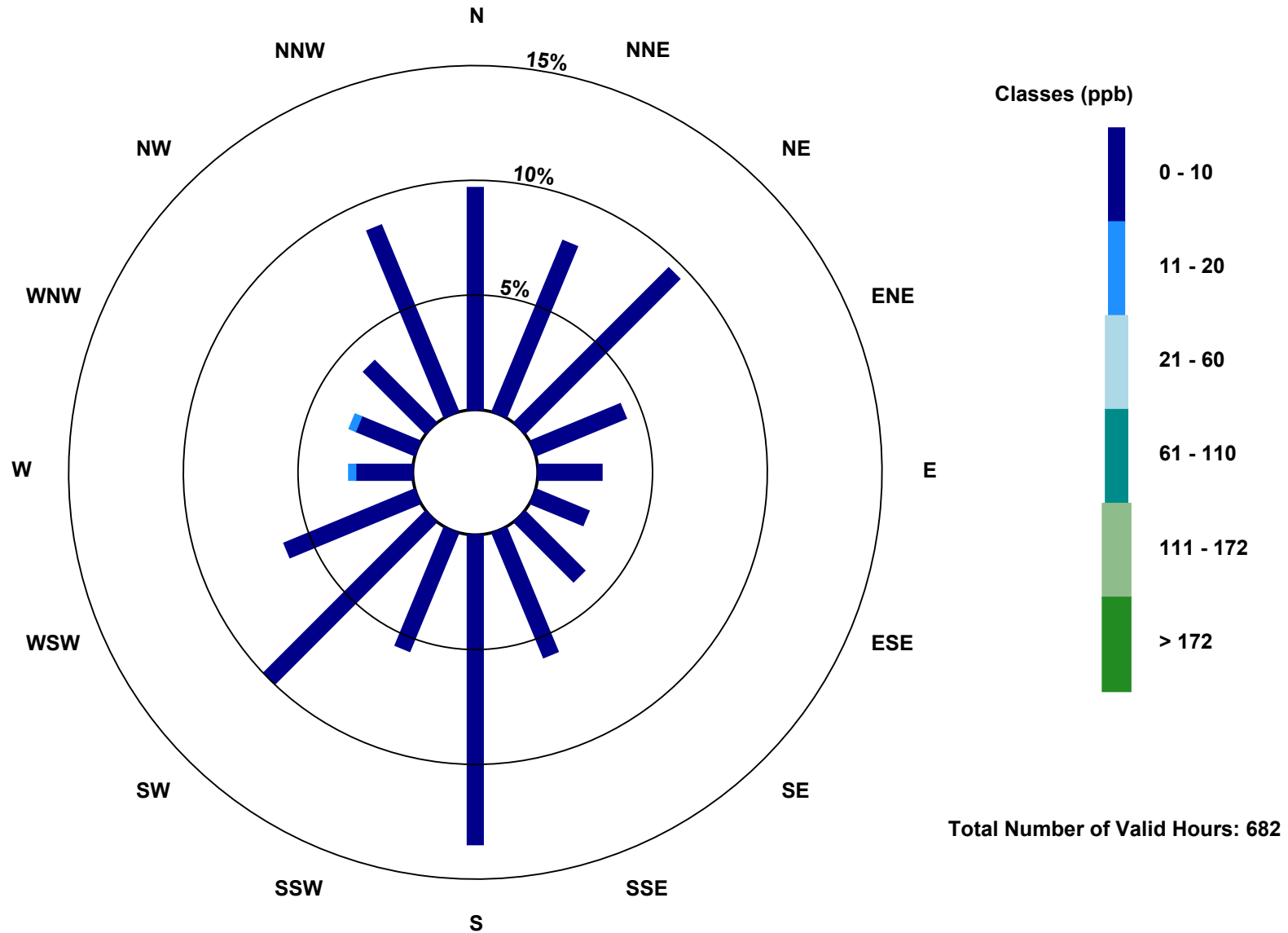
Total Number of Valid Hours: 682

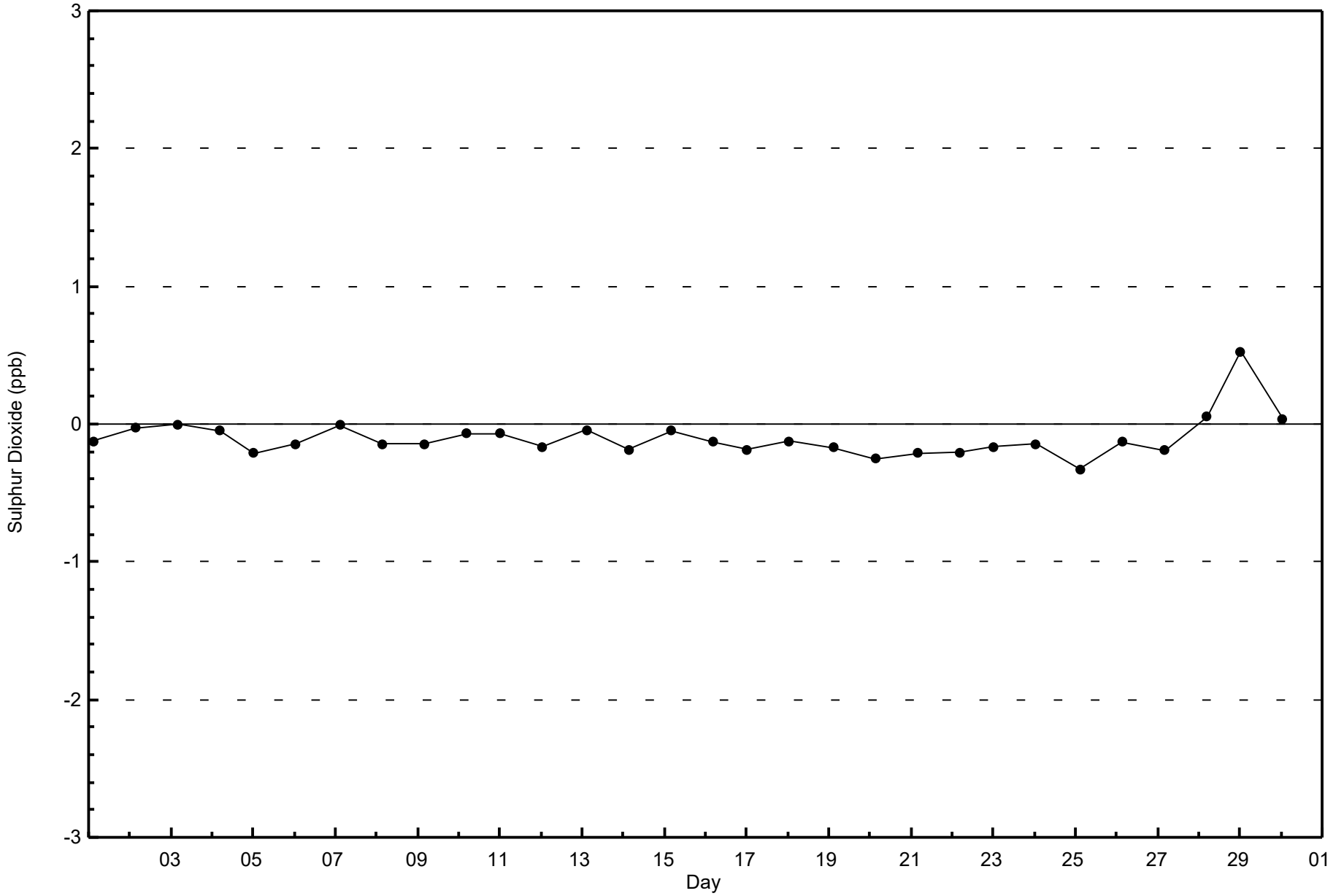
Total Number of Hours: 720

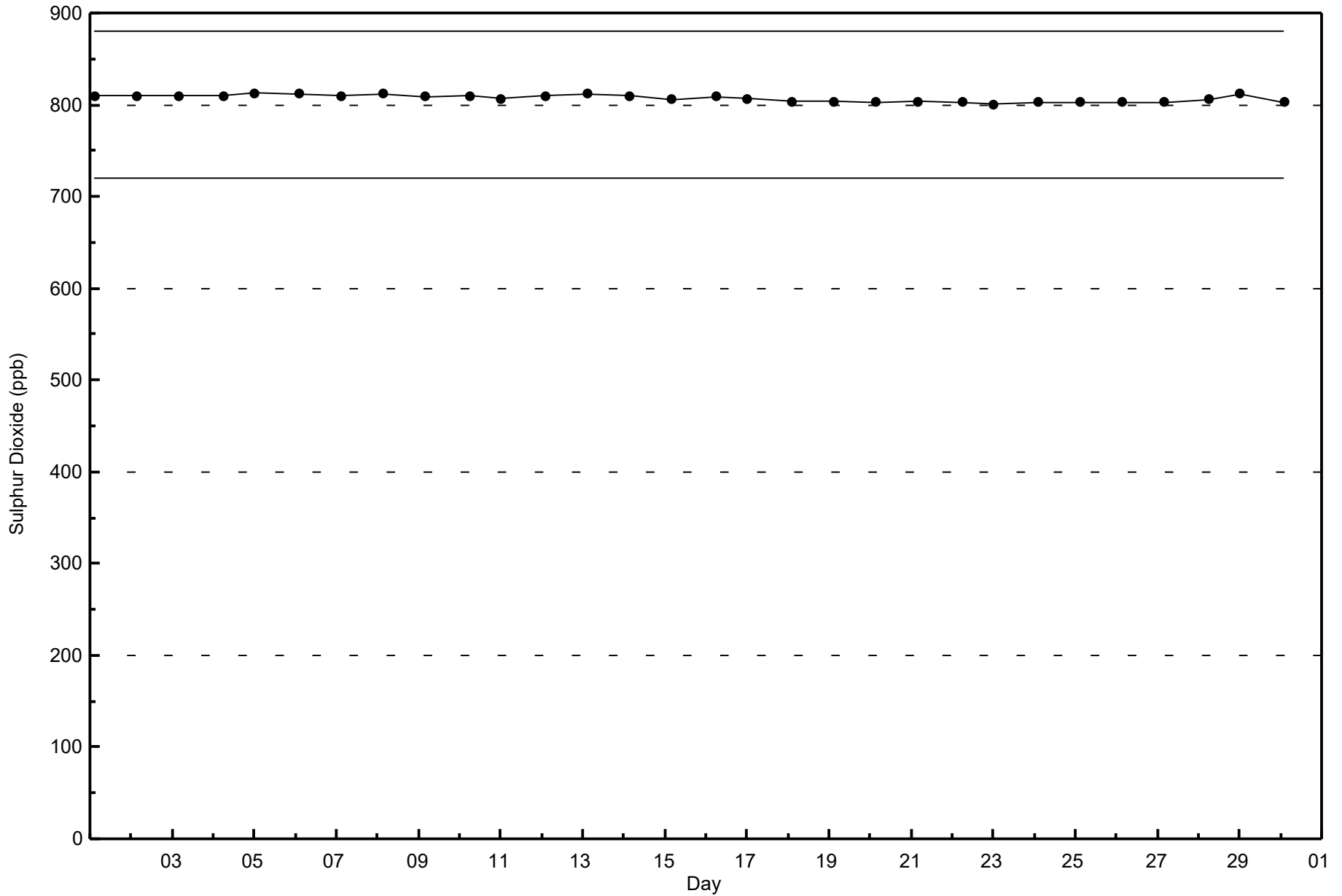


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Sulphur Dioxide (SO₂) - ppb
Kirby North



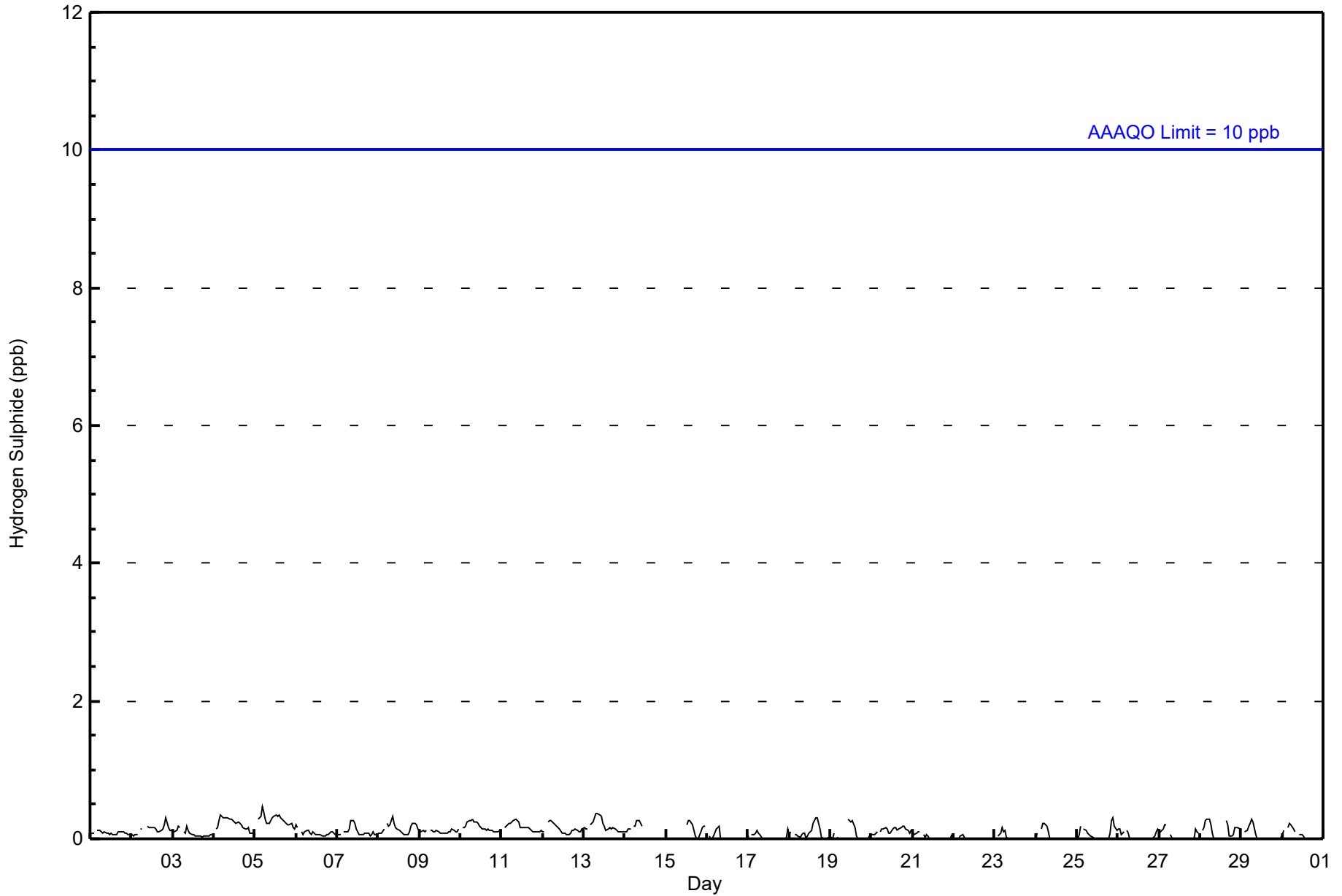






Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Kirby North - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Kirby North - June 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	617	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: 617

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Kirby North - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	48	54	67	29	20	18	24	38	94	34	46	32	16	21	24	52	617
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	48	54	67	29	20	18	24	38	94	34	46	32	16	21	24	52	617

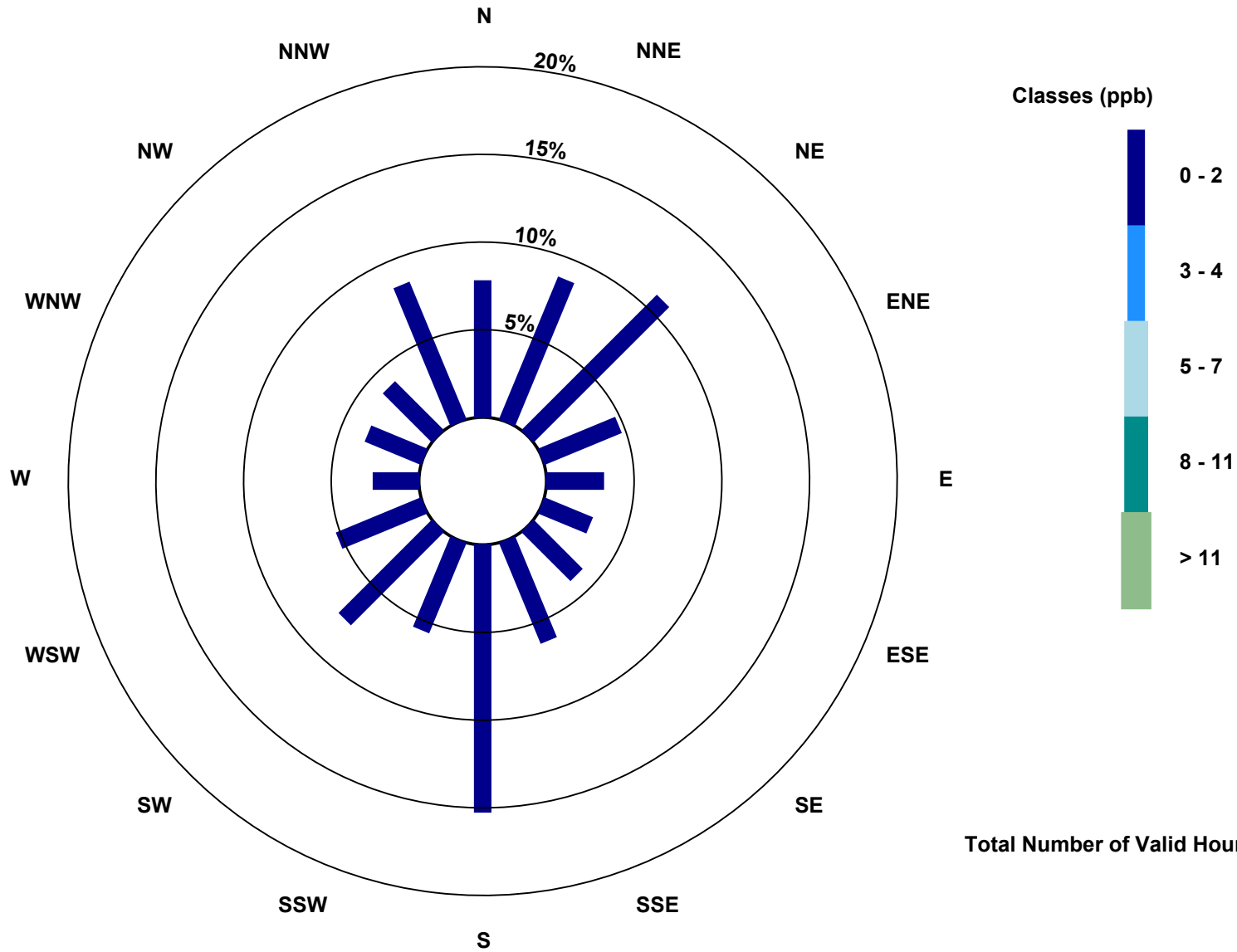
Total Number of Valid Hours: 617

Total Number of Hours: 720

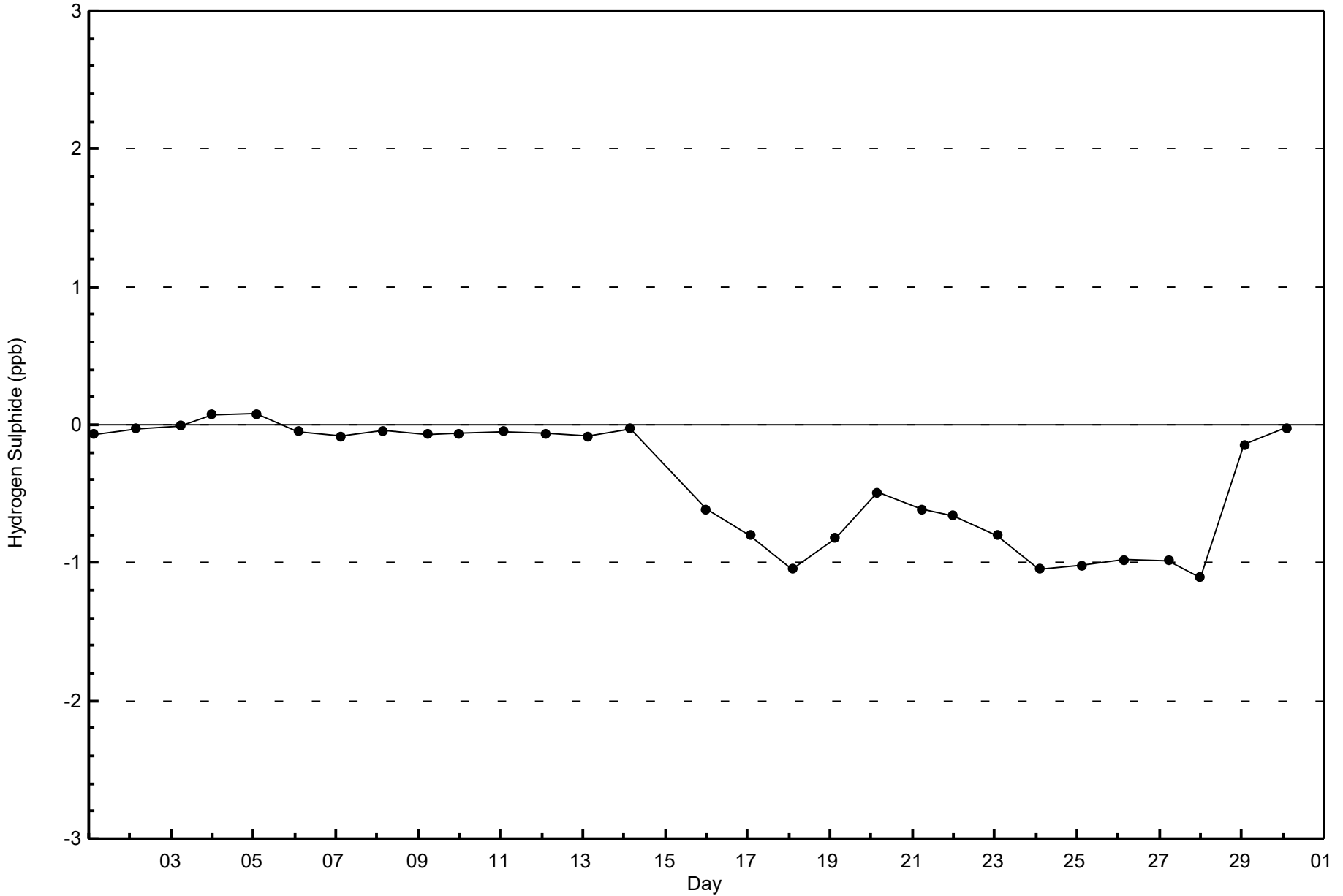


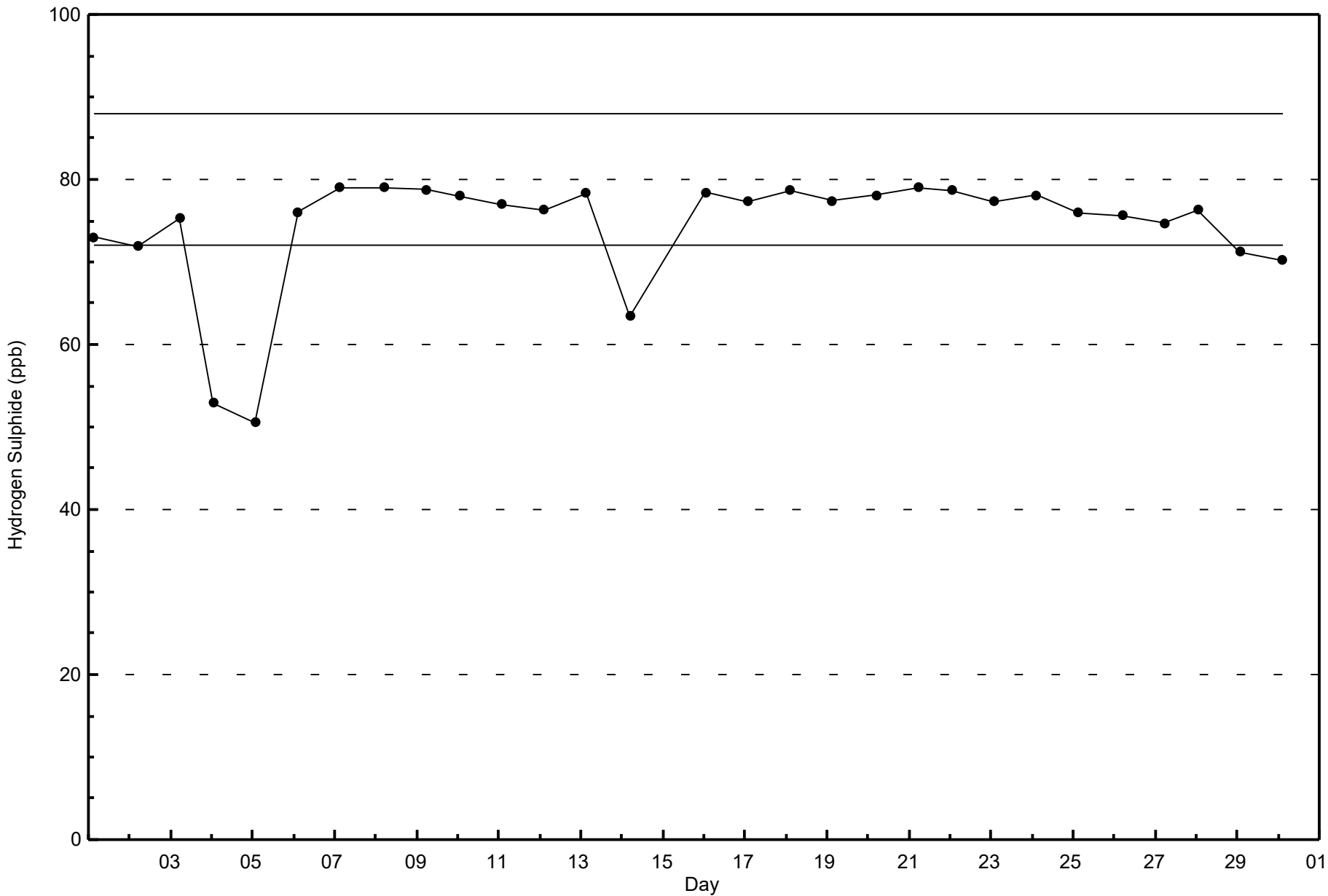
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Hydrogen Sulphide (H₂S) - ppb
Kirby North



Total Number of Valid Hours: 617







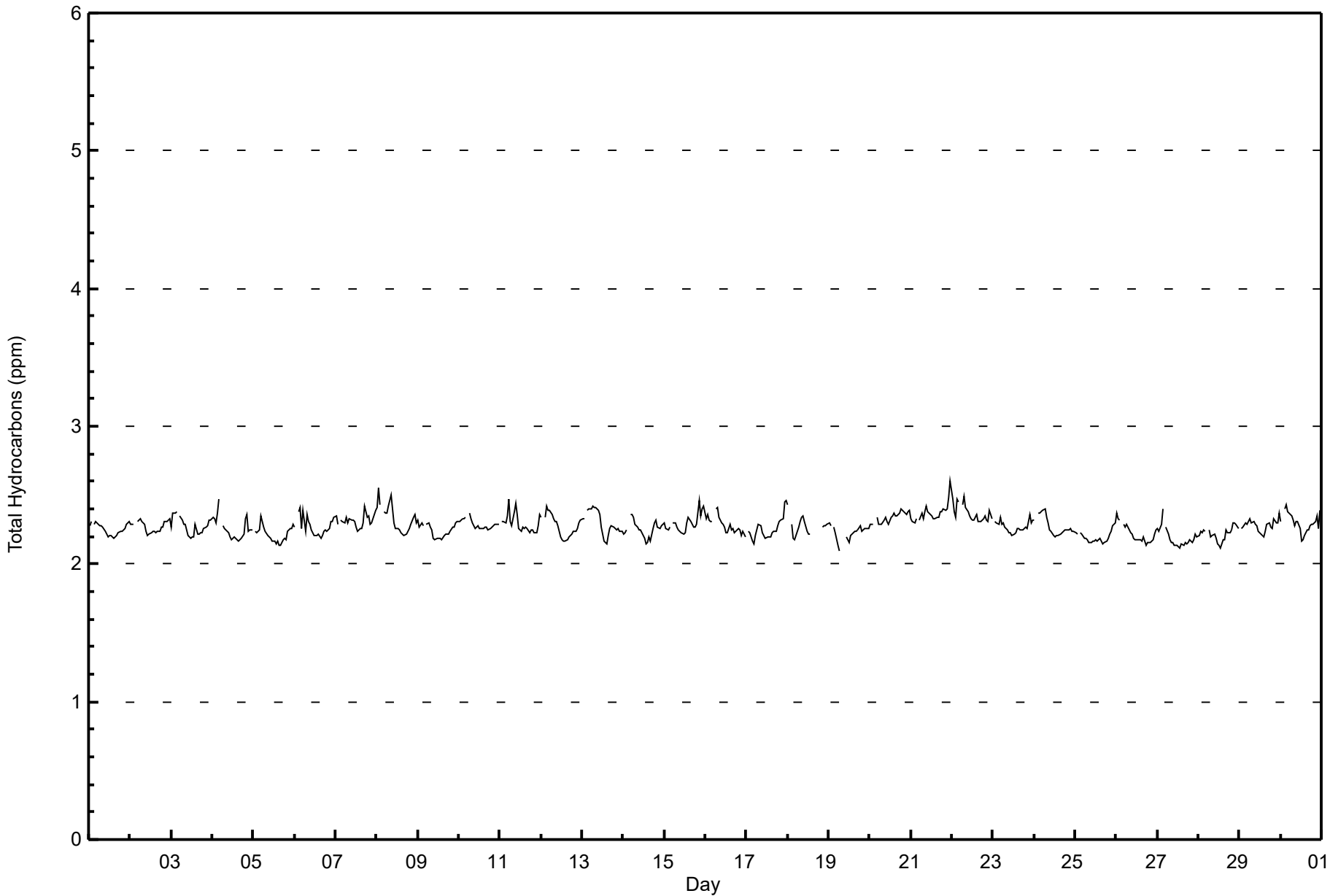
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Kirby North - June 2023

Maximum Value: 2.6 ppm on Jun 22 00:00		Maximum Daily Average: 2.4 ppm on Jun 21		Hours in Service: 720																							
Minimum Value: 2.1 ppm on Jun 19 07:00		Minimum Daily Average: 2.2 ppm on Jun 27		Hours of Data: 682																							
Maximum Diurnal Average: 2.3 ppm at hour 5		Minimum Diurnal Average: 2.2 ppm at hour 14		Hours of Missing Data: 38																							
Monthly Average: 2.27 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.5		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-Jun	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
2-Jun	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
3-Jun	2.3	2.4	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
4-Jun	2.3	2.3	2.3	2.4	2.5	Z	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	2.4	2.2	2.2	2.2	2.2	2.2	2.5
5-Jun	Z	2.2	2.2	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3
6-Jun	2.3	Z	2.4	2.4	2.3	2.4	2.2	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
7-Jun	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	2.2	2.3	2.3	2.3	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.4
8-Jun	2.4	2.5	2.4	Z	2.4	2.4	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.5
9-Jun	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	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
10-Jun	2.3	2.3	2.3	2.3	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
11-Jun	Z	2.3	2.3	2.3	2.4	2.5	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.5
12-Jun	2.3	Z	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4
13-Jun	2.3	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.4
14-Jun	2.2	2.2	2.3	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
15-Jun	2.3	2.3	2.2	2.3	Z	2.3	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	2.5	2.4	2.4	2.4	2.3	2.2	2.5
16-Jun	2.3	2.4	2.3	2.3	2.3	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4
17-Jun	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.5	2.3	2.5
18-Jun	2.4	Z	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.2	2.2	2.2	C	C	C	C	C	C	2.3	2.3	2.3	2.3	2.3	2.2	2.4
19-Jun	2.3	2.3	Z	2.3	2.2	2.1	2.1	M	2.1	M	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3
20-Jun	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	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
21-Jun	2.3	2.3	2.3	2.3	Z	2.3	2.4	2.3	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	2.5	2.6	2.4	2.2	2.6
22-Jun	2.5	2.4	2.3	2.5	2.4	Z	2.4	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.5
23-Jun	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4
24-Jun	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.4
25-Jun	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	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
26-Jun	2.4	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	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
27-Jun	2.3	2.2	2.3	2.4	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
28-Jun	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3
29-Jun	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
30-Jun	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.4
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby North - June 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	682	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: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Kirby North - June 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	66	55	65	29	19	17	25	40	92	38	68	42	19	21	26	60	682
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	66	55	65	29	19	17	25	40	92	38	68	42	19	21	26	60	682

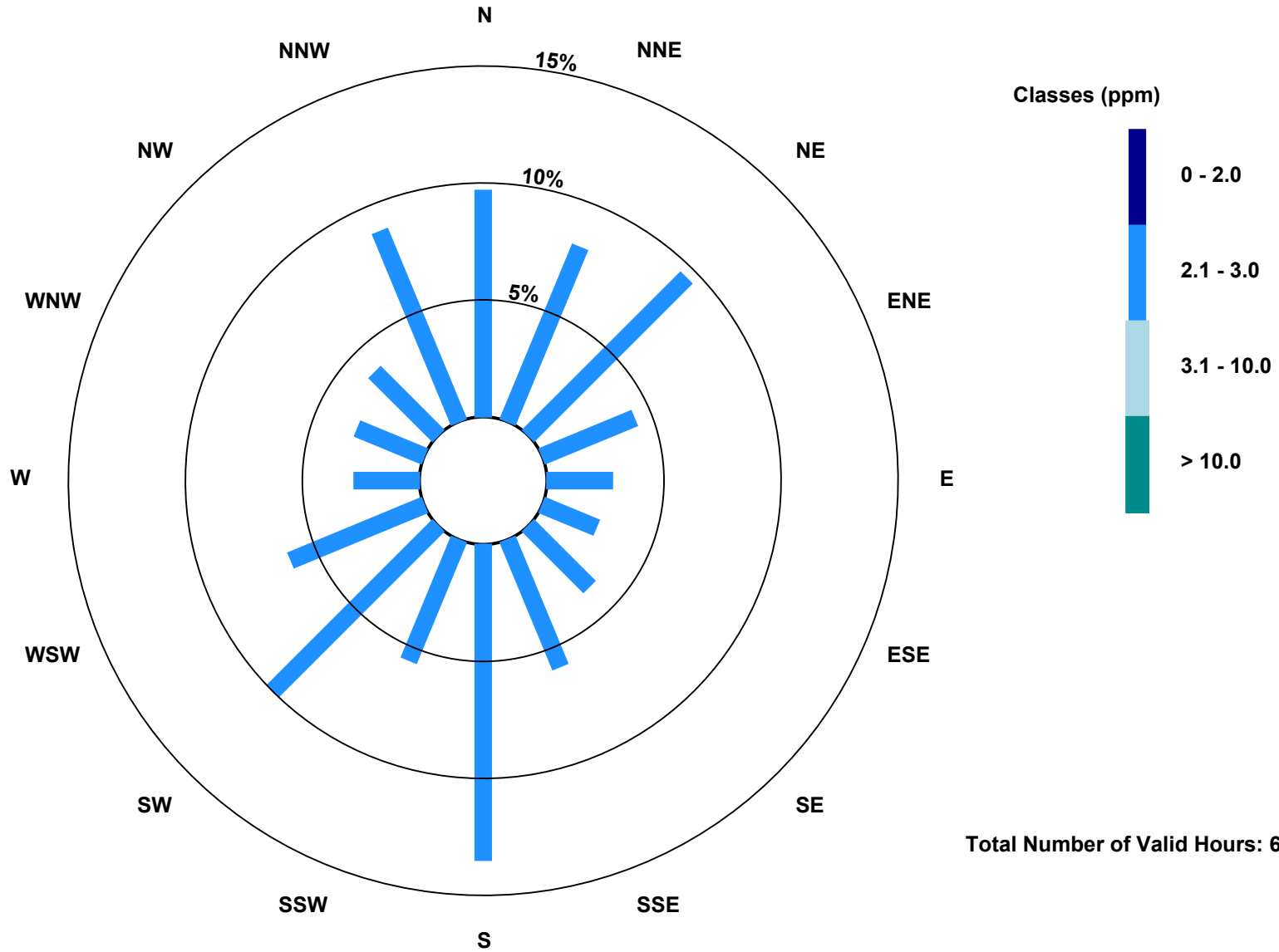
Total Number of Valid Hours: 682

Total Number of Hours: 720

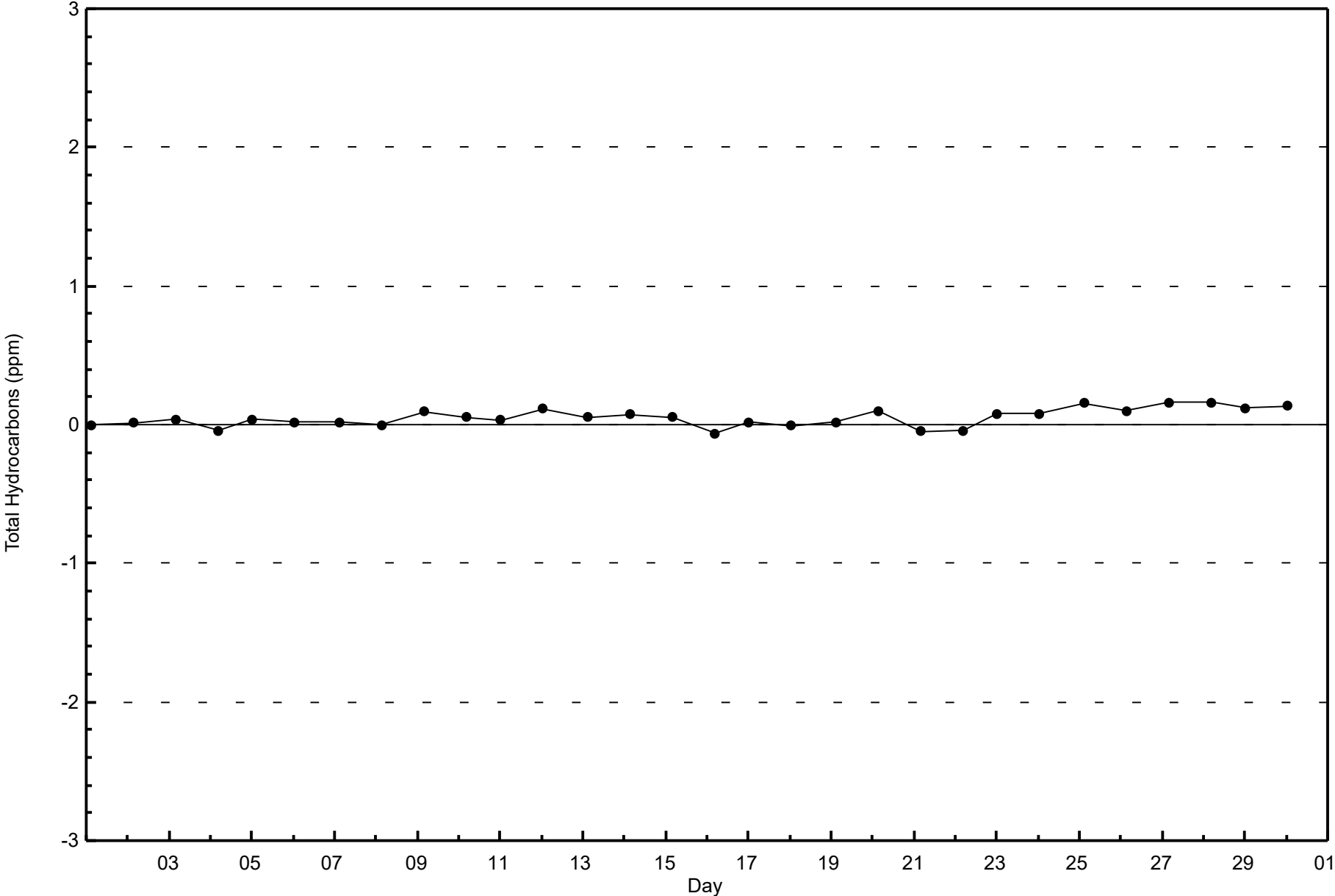


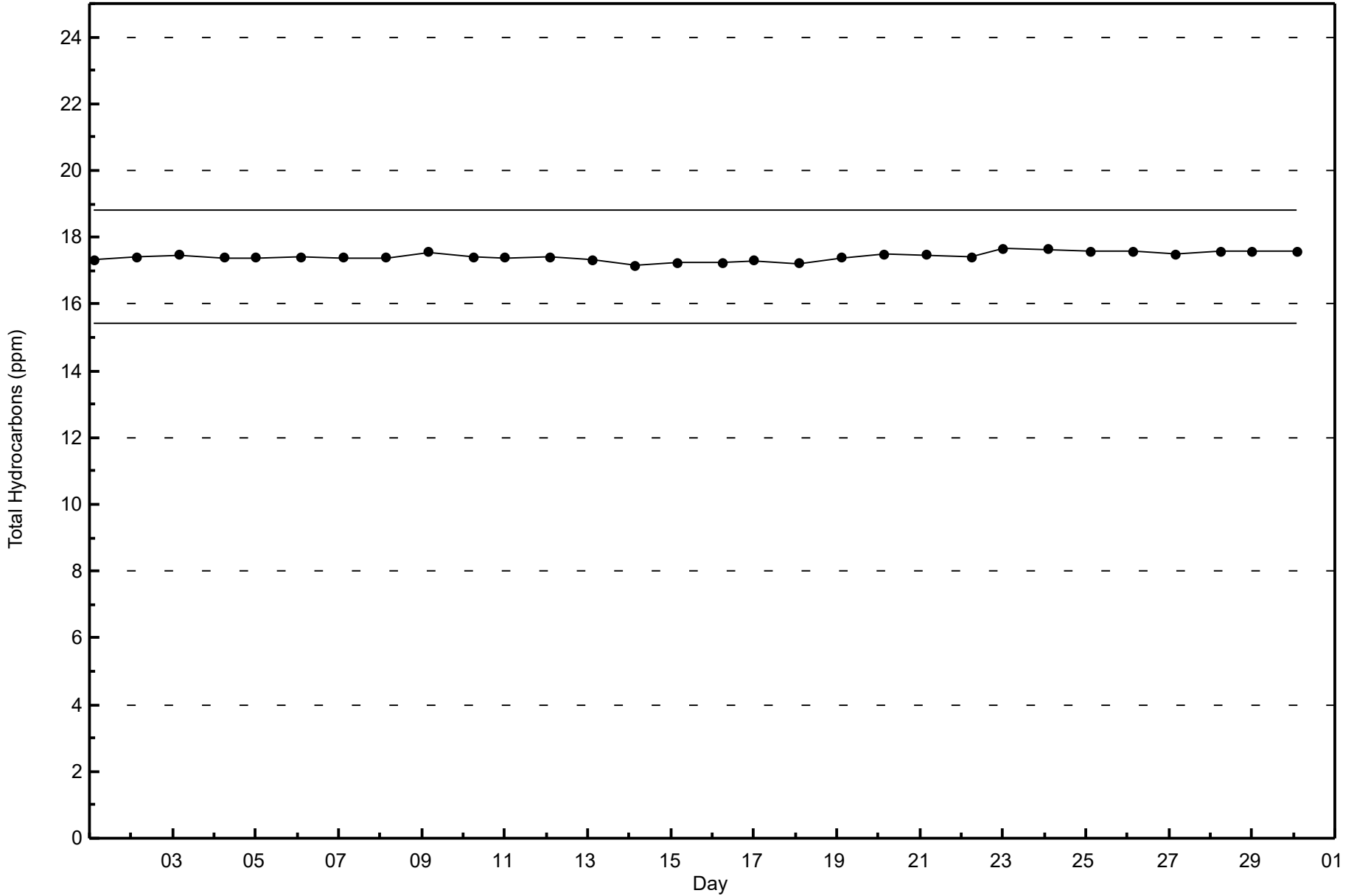
Wood Buffalo Environmental Association
Wind Rose Jun 2023

Total Hydrocarbons (THC) - ppm
Kirby North



Total Number of Valid Hours: 682







Wood Buffalo Environmental Association
Summary of Hour Averages

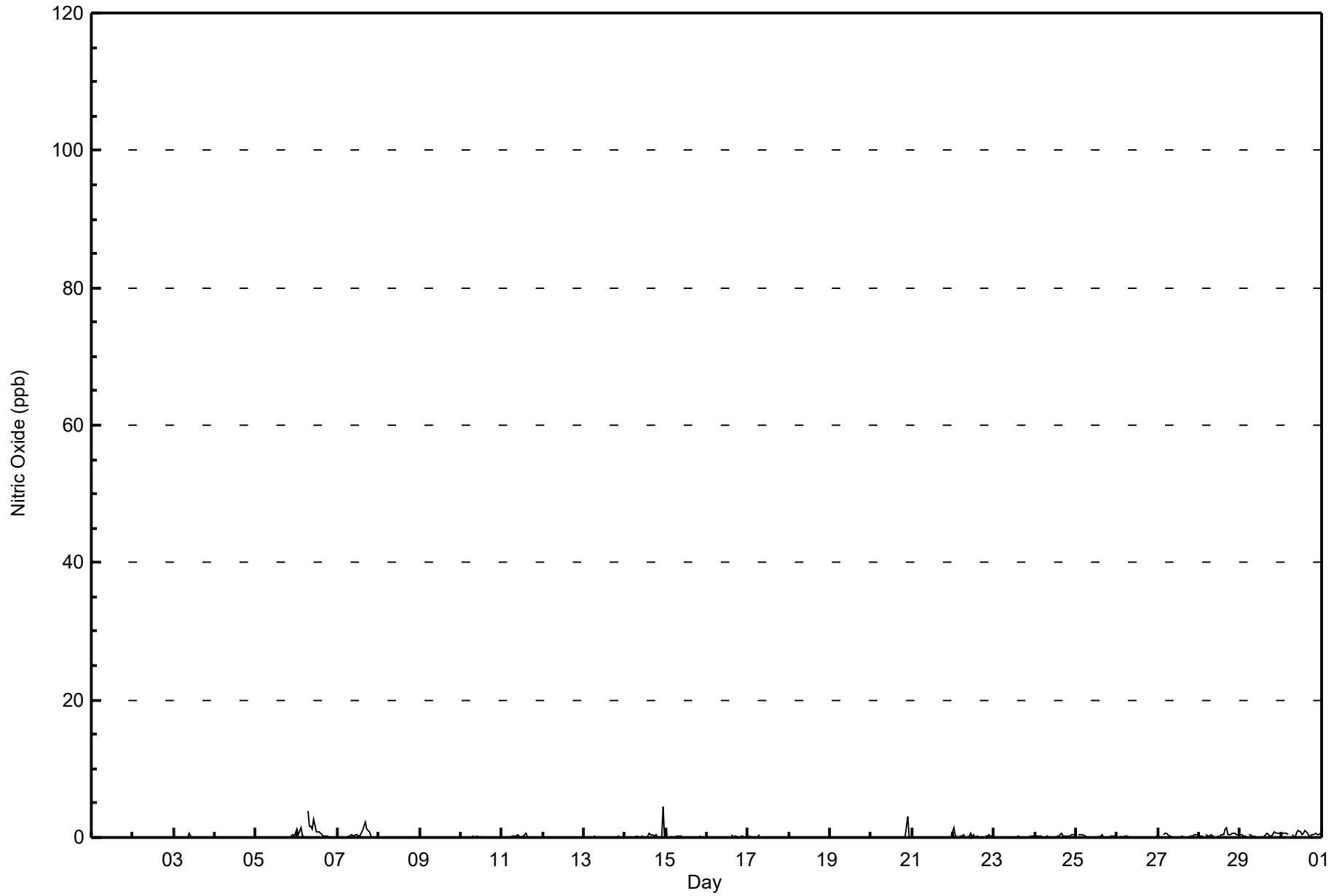
Nitric Oxide (NO) - ppb
Kirby North - June 2023

Maximum Value: 4.4 ppb on Jun 14 23:00		Maximum Daily Average: 0.8 ppb on Jun 6		Hours in Service: 720																								
Minimum Value: 0.0 ppb on Jun 1 02:00		Minimum Daily Average: 0.0 ppb on Jun 1		Hours of Data: 618																								
Maximum Diurnal Average: 0.3 ppb at hour 23		Minimum Diurnal Average: 0.1 ppb at hour 20		Hours of Missing Data: 102																								
Monthly Average: 0.16 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.2 P ₉₀ = 0.4 P ₉₉ = 1.6		Hours of Calibration: 36																								
				Percent Operational Time: 90.8																								
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-Jun	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
2-Jun	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
3-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
4-Jun	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
5-Jun	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	0.5	0.2	0.7	0.1	0.1	0.7	
6-Jun	1.3	0.4	1.4	0.3	0.2	Z	3.9	1.7	1.7	1.2	2.7	0.8	0.9	0.9	0.6	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.9	
7-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.4	0.3	0.1	0.3	0.9	1.5	2.2	1.1	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.4	2.2	
8-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
9-Jun	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
10-Jun	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
11-Jun	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.3	0.3	0.4	0.1	0.0	0.1	0.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
12-Jun	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	
13-Jun	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.3	0.3	
14-Jun	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.6	0.5	0.4	0.1	0.3	0.1	0.0	0.1	4.4	0.0	0.3	4.4	0.0	
15-Jun	0.0	0.5	Z	0.2	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	UO	UO	UO	0.1	0.5		
16-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	0.4	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	--	0.4	0.2	
17-Jun	0.0	0.2	0.0	0.1	Z	0.1	0.1	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.4	0.4	
18-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	M	M	M	M	M	M	M	M	M	M	--	--	--	
19-Jun	M	M	M	M	M	M	M	M	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	--	0.0	0.0	
20-Jun	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	UO	UO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.1	3.0	0.0	
21-Jun	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	0.1	0.1	
22-Jun	1.4	0.3	0.2	Z	0.3	0.2	0.4	0.0	0.0	0.2	0.5	0.0	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.3	0.4	0.3	0.2	0.2	1.4	1.4	
23-Jun	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	0.2	0.1	UO	UO	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.1	0.3	0.3	
24-Jun	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.6	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.2	0.6	0.6	
25-Jun	Z	0.5	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.2	0.2	0.5	0.5	
26-Jun	0.2	Z	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.3	
27-Jun	0.1	0.0	Z	0.4	0.7	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.2	0.7	0.7	
28-Jun	0.2	0.2	0.2	Z	0.3	0.2	0.3	0.3	0.1	0.0	0.1	0.2	0.1	0.4	0.4	1.2	1.4	0.4	0.4	0.6	0.7	0.6	0.5	0.4	0.4	1.4	1.4	
29-Jun	0.4	0.3	0.3	0.3	Z	0.3	0.4	0.3	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.5	0.2	0.2	0.5	0.8	0.5	0.6	0.6	0.3	0.8	0.8	
30-Jun	0.5	0.5	0.5	0.6	0.5	Z	0.4	0.2	0.1	0.7	1.0	0.8	0.5	0.7	1.1	0.7	0.2	0.3	0.3	0.3	0.5	0.5	0.5	0.6	0.5	1.1	1.1	
		0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.2	Diurnal Average		
		1.4	0.5	1.4	0.6	0.7	0.7	3.9	1.7	1.7	1.2	2.7	0.8	0.9	0.9	1.1	1.5	2.2	1.1	0.8	0.6	0.8	3.0	4.4	0.7	Diurnal Maximum		
Z - zerospan		C - Calibration					M - Maintenance					UO - Unstable Operation																



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Kirby North - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Kirby North - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	618	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: 618

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby North - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	61	52	41	30	20	16	25	39	86	30	66	32	16	21	22	61	618
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	61	52	41	30	20	16	25	39	86	30	66	32	16	21	22	61	618

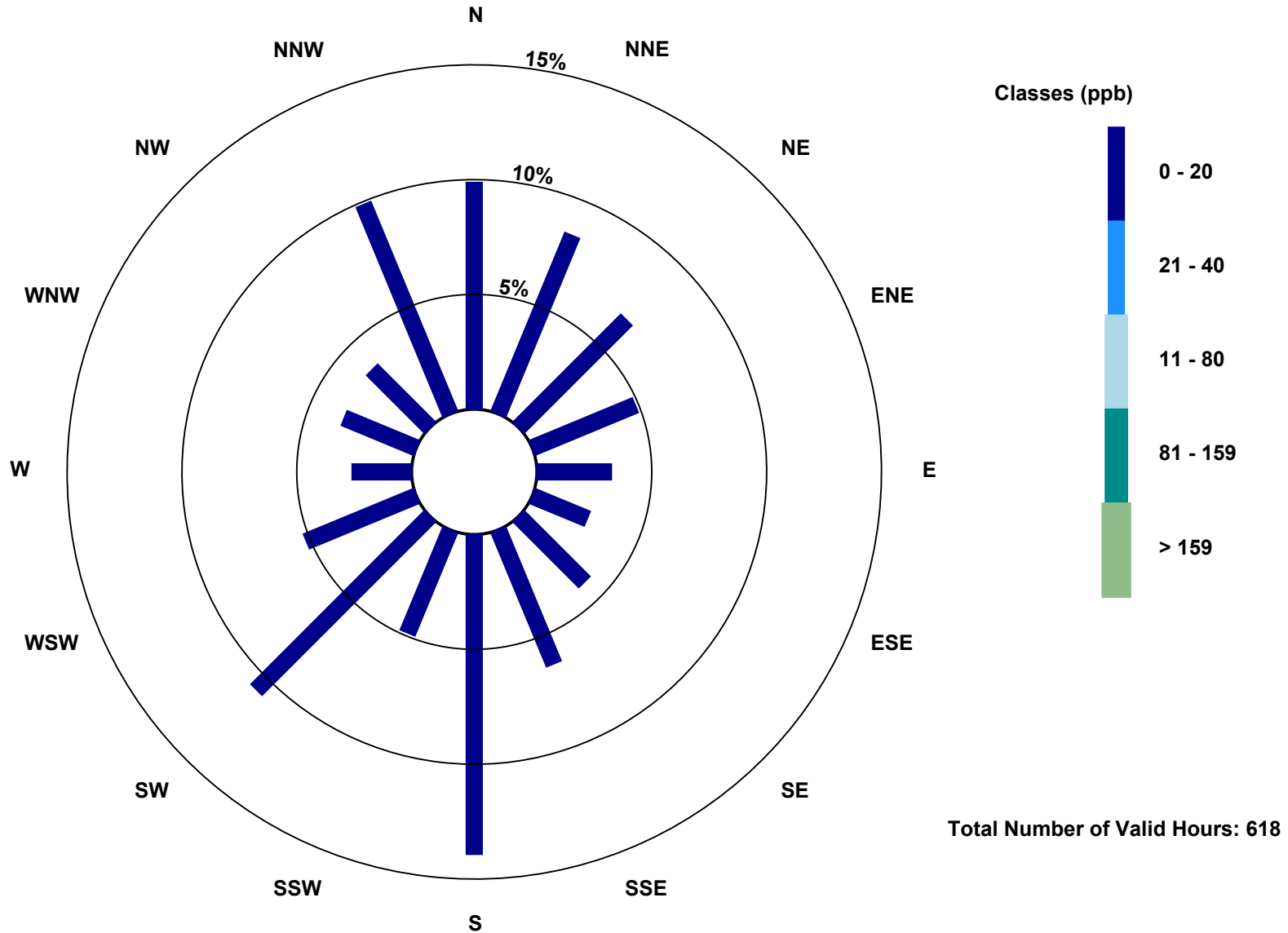
Total Number of Valid Hours: 618

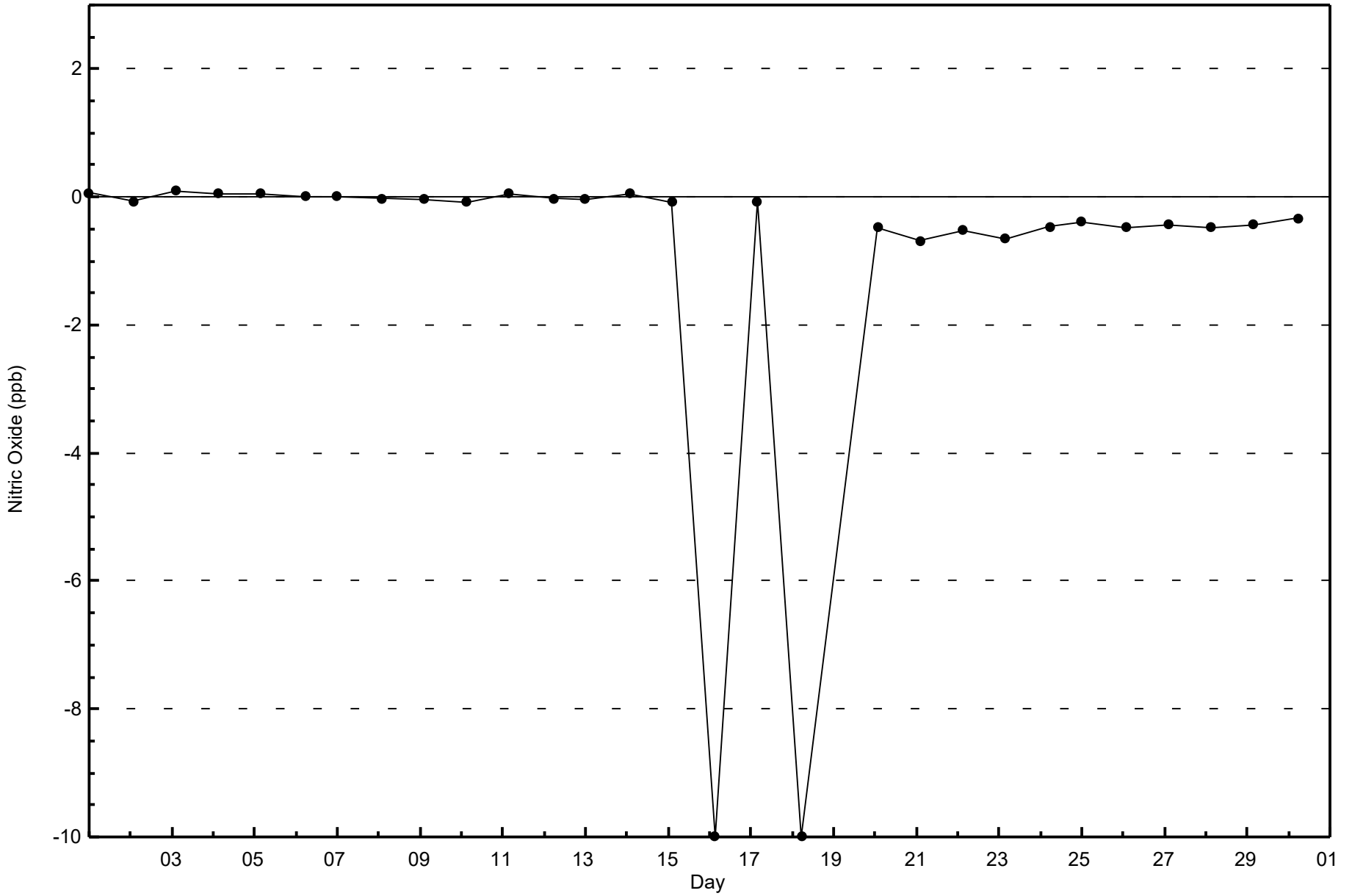
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitric Oxide (NO) - ppb
Kirby North

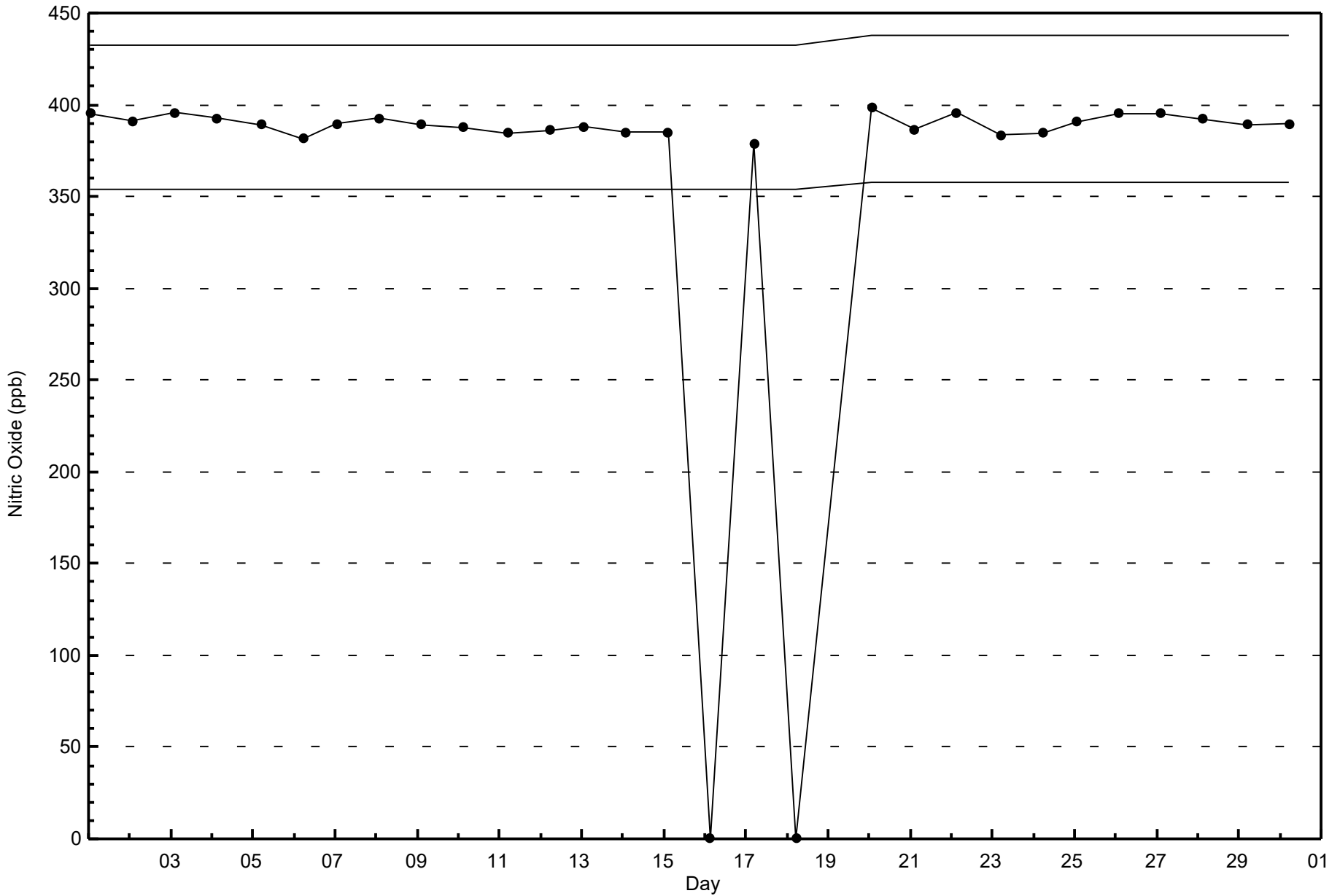






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Kirby North - June 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

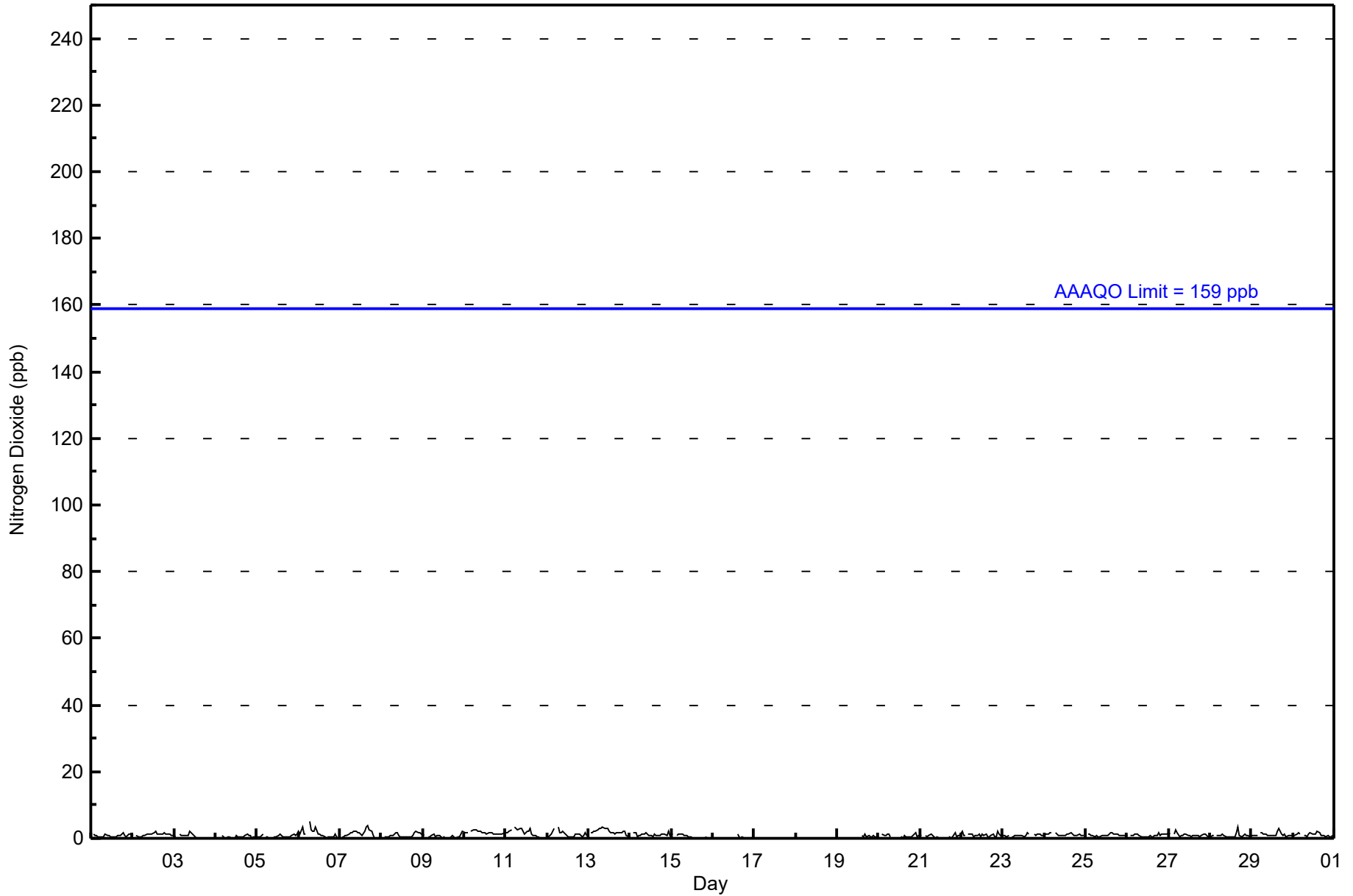
Nitrogen Dioxide (NO₂) - ppb
Kirby North - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 720																								
Maximum Value: 5.1 ppb on Jun 6 07:00		Maximum Daily Average: 2.0 ppb on Jun 13																								
Minimum Value: 0.0 ppb on Jun 3 15:00		Hours of Data: 618																								
Maximum Diurnal Average: 1.4 ppb at hour 7		Hours of Missing Data: 102																								
Monthly Average: 0.99 ppb		Hours of Calibration: 36																								
Minimum Daily Average: 0.4 ppb on Jun 4		Percent Operational Time: 90.8																								
Minimum Diurnal Average: 0.8 ppb at hour 20		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 0.8 Q ₃ = 1.3 P ₉₀ = 1.9 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-Jun	Z	1.4	0.8	0.8	0.6	0.6	0.4	0.4	1.1	1.0	0.7	0.5	0.5	0.5	0.7	1.0	0.9	1.9	0.7	0.5	0.8	1.1	1.1	0.8	1.9	
2-Jun	0.7	Z	0.8	0.6	0.4	0.6	0.8	1.0	1.2	1.1	1.1	1.4	1.9	2.0	1.3	1.1	1.4	1.4	1.7	1.4	1.1	1.1	1.0	0.7	2.0	
3-Jun	0.8	0.4	Z	1.2	0.9	0.8	0.7	0.7	0.7	2.2	1.5	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	
4-Jun	0.0	0.0	0.0	Z	1.0	0.0	0.0	0.4	0.3	0.2	0.2	0.8	0.5	0.3	0.3	0.5	0.8	1.1	0.9	0.9	0.2	0.5	0.6	0.4	1.1	
5-Jun	0.6	0.5	0.5	1.2	Z	0.4	0.3	0.1	0.0	0.1	0.3	0.4	0.7	1.2	1.0	0.5	0.4	0.5	0.3	0.4	0.9	1.1	0.7	1.1	1.2	
6-Jun	2.2	1.4	3.3	1.4	1.3	Z	5.1	2.7	2.2	2.1	3.4	1.1	1.1	1.0	0.7	0.3	0.2	0.6	0.6	0.3	0.5	1.1	0.5	0.2	5.1	
7-Jun	Z	0.3	0.4	0.9	0.9	1.1	1.7	1.5	2.3	2.1	1.9	1.8	1.1	1.0	2.2	3.3	4.0	2.6	2.3	0.8	0.0	0.2	0.2	0.3	4.0	
8-Jun	0.4	Z	0.6	0.6	0.5	1.0	0.8	0.8	1.7	1.5	0.8	0.6	0.5	0.6	0.6	0.4	0.4	0.3	0.8	1.8	2.1	1.9	1.9	1.4	2.1	
9-Jun	1.4	0.9	Z	0.6	0.3	0.7	1.1	0.5	0.9	0.7	0.8	0.2	0.3	0.1	0.1	0.2	0.6	0.7	0.6	0.2	0.4	0.6	1.1	2.1	2.1	
10-Jun	1.8	1.9	1.6	Z	2.2	2.5	2.5	2.6	2.3	2.1	1.9	1.8	1.5	1.4	1.6	1.6	1.5	1.2	1.3	1.3	1.3	1.2	1.4	1.7	2.6	
11-Jun	1.9	1.9	2.1	2.5	Z	3.4	3.0	2.7	3.1	3.0	2.1	1.2	2.0	2.2	2.9	1.1	0.9	0.8	0.5	0.3	0.2	0.2	0.2	0.2	3.4	
12-Jun	0.2	0.3	1.3	2.3	3.0	Z	3.6	1.9	1.8	2.2	1.8	0.8	0.4	0.5	0.3	0.4	1.1	1.2	1.4	1.1	0.6	0.8	1.9	1.0	3.6	
13-Jun	Z	1.5	1.8	2.0	2.1	2.4	3.1	3.0	3.2	3.0	3.1	2.8	2.3	1.5	1.6	1.1	1.9	1.5	1.5	1.8	2.3	2.0	0.7	0.6	3.2	
14-Jun	0.4	Z	1.8	1.6	0.6	0.9	0.9	1.3	1.4	1.6	1.2	1.0	0.8	0.5	1.3	0.8	0.7	1.0	1.1	1.3	1.2	0.8	2.2	0.9	2.2	
15-Jun	1.2	1.2	Z	1.0	1.1	1.2	1.1	1.0	0.9	0.8	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	UO	UO	UO	1.2	
16-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	1.4	0.4	0.2	0.3	0.0	0.2	0.1	0.0	0.0	0.3	1.4	
17-Jun	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0	
18-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	M	M	M	M	M	M	M	M	M	M	M	--
19-Jun	M	M	M	M	M	M	M	M	M	C	C	C	C	C	0.7	0.6	1.3	0.6	0.7	0.6	0.6	0.7	0.3	0.5	1.3	
20-Jun	0.4	Z	1.3	0.9	0.9	1.1	1.2	0.6	UO	UO	0.2	0.1	0.1	0.3	0.2	0.8	0.6	0.5	0.5	0.5	0.7	1.5	0.5	0.7	1.5	
21-Jun	0.9	0.9	Z	0.9	0.6	0.9	1.1	0.9	0.6	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.4	1.5	0.6	0.9	0.8	1.5	
22-Jun	2.1	0.7	0.8	Z	1.3	1.2	1.2	0.6	0.7	0.8	1.4	0.3	1.4	0.8	1.1	0.6	0.6	1.0	1.1	0.6	0.6	2.1	1.1	0.6	2.1	
23-Jun	1.0	0.7	0.5	0.7	Z	0.6	0.6	0.7	1.0	0.8	0.9	0.7	0.6	1.0	1.8	1.3	UO	UO	1.2	0.9	1.1	1.2	1.0	0.9	1.8	
24-Jun	1.0	1.1	1.2	1.5	1.6	Z	1.7	1.2	1.0	0.9	0.7	0.7	0.9	1.3	1.1	1.6	1.4	1.0	0.7	0.7	1.2	0.9	0.8	0.9	1.7	
25-Jun	Z	1.1	1.2	1.0	0.7	0.6	0.7	0.5	0.4	0.7	1.0	0.7	1.0	1.0	1.5	1.5	1.2	1.1	1.3	0.7	0.8	0.8	0.8	0.9	1.5	
26-Jun	0.7	Z	0.9	0.7	1.2	1.4	1.4	0.7	0.4	0.5	0.5	0.5	0.5	0.7	0.6	0.5	1.0	0.8	1.5	1.0	1.1	1.2	1.3	1.3	1.5	
27-Jun	1.6	1.3	Z	1.4	2.4	1.7	0.5	0.8	1.0	1.1	1.2	0.8	0.7	0.5	0.7	0.8	0.8	0.7	0.6	1.0	1.2	1.2	0.7	0.6	2.4	
28-Jun	0.5	0.8	0.8	Z	1.0	0.7	1.0	1.2	0.8	0.6	0.5	0.6	0.4	0.6	0.5	1.7	3.6	1.0	0.5	0.7	1.1	1.0	0.8	0.6	3.6	
29-Jun	0.7	1.0	0.9	1.0	Z	1.6	1.7	1.3	1.1	1.0	1.0	0.9	0.9	0.8	1.0	2.0	2.8	1.1	0.8	1.4	0.6	0.8	0.7	0.7	2.8	
30-Jun	0.8	0.9	1.3	1.9	1.1	Z	0.8	0.7	0.5	1.1	1.7	1.3	1.1	1.2	2.2	1.9	0.8	0.9	0.8	0.4	0.8	0.6	0.6	0.7	2.2	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Kirby North - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Kirby North - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	618	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: 618

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby North - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	61	52	41	30	20	16	25	39	86	30	66	32	16	21	22	61	618
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	61	52	41	30	20	16	25	39	86	30	66	32	16	21	22	61	618

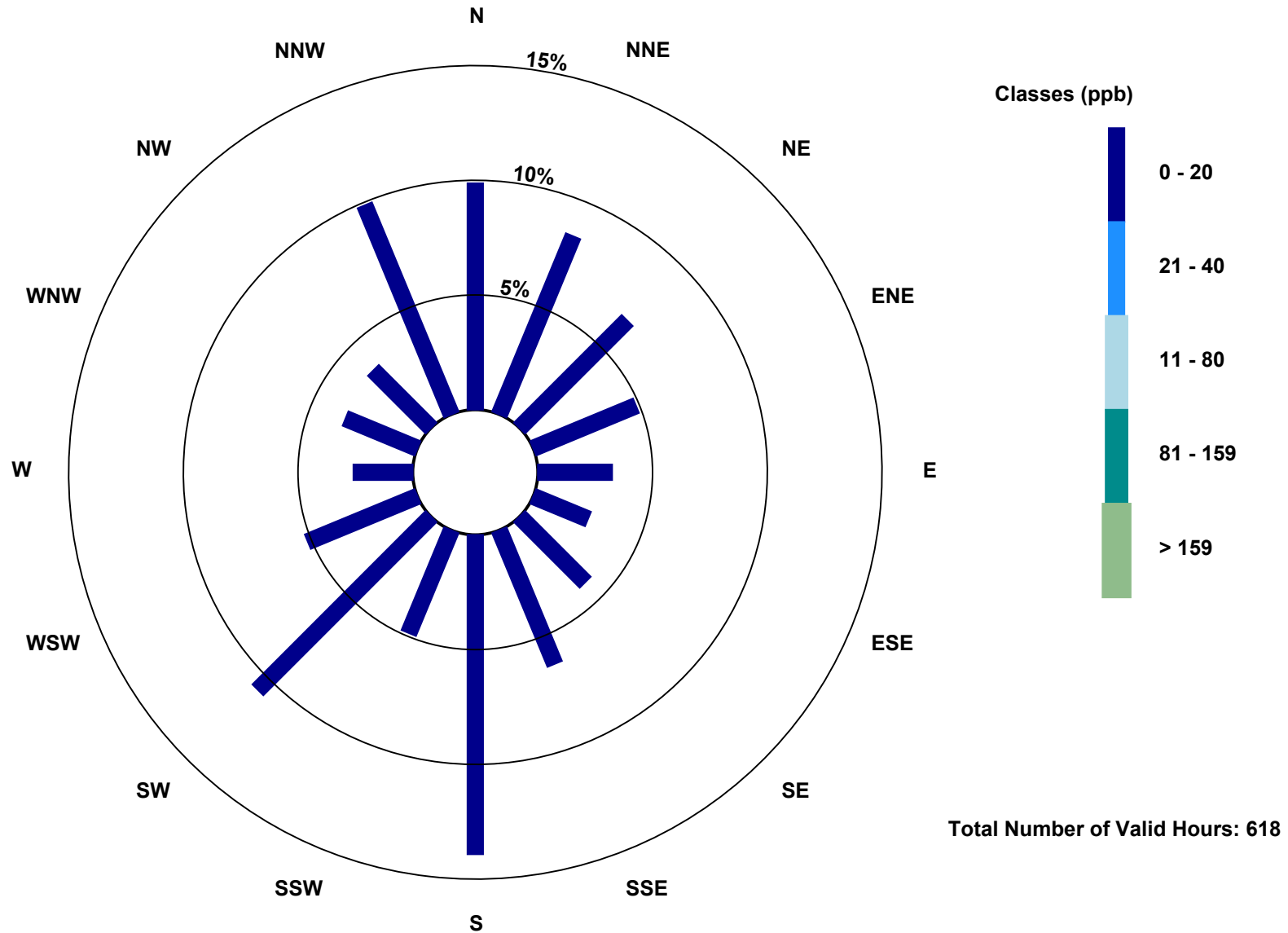
Total Number of Valid Hours: 618

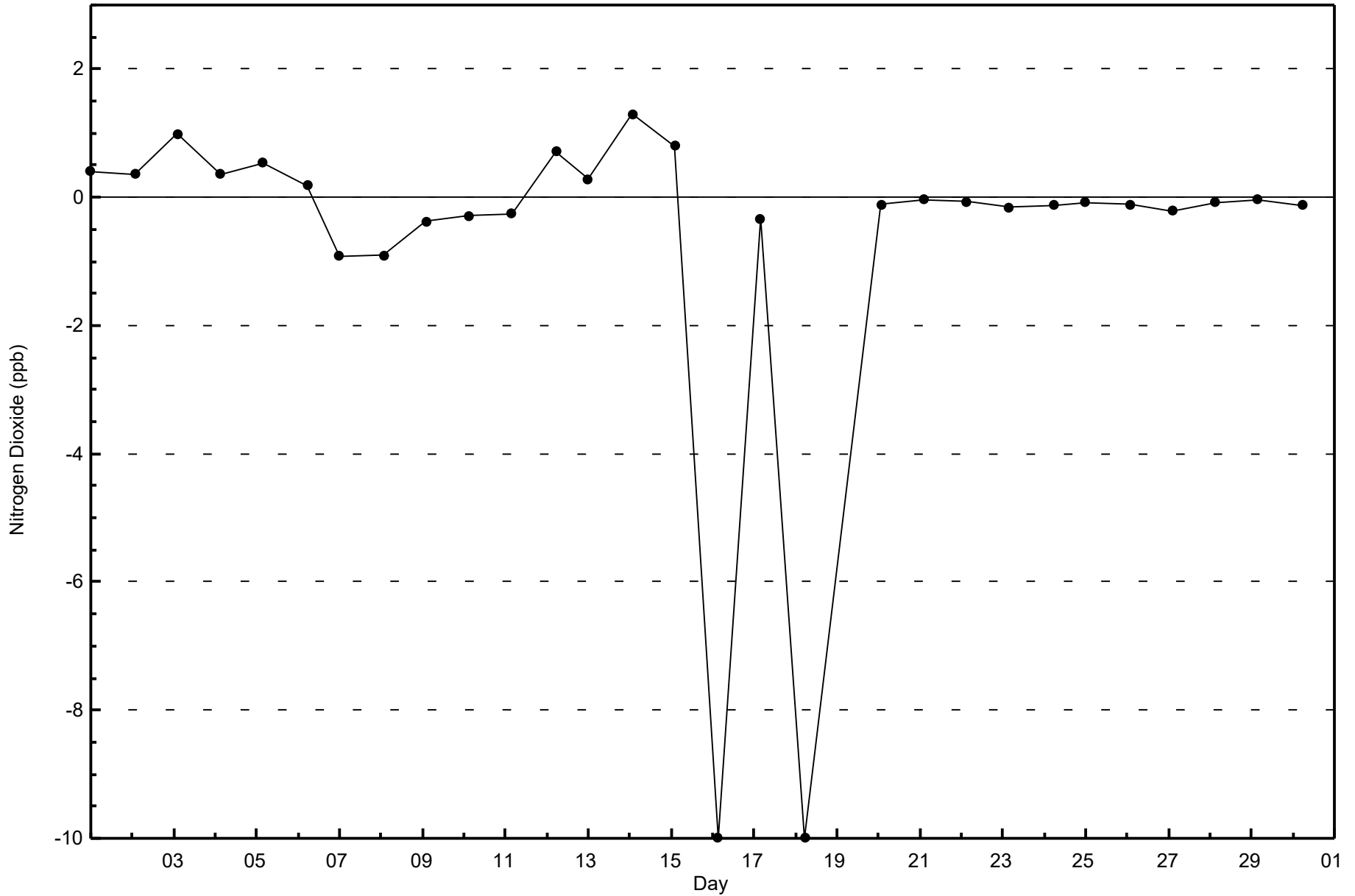
Total Number of Hours: 720

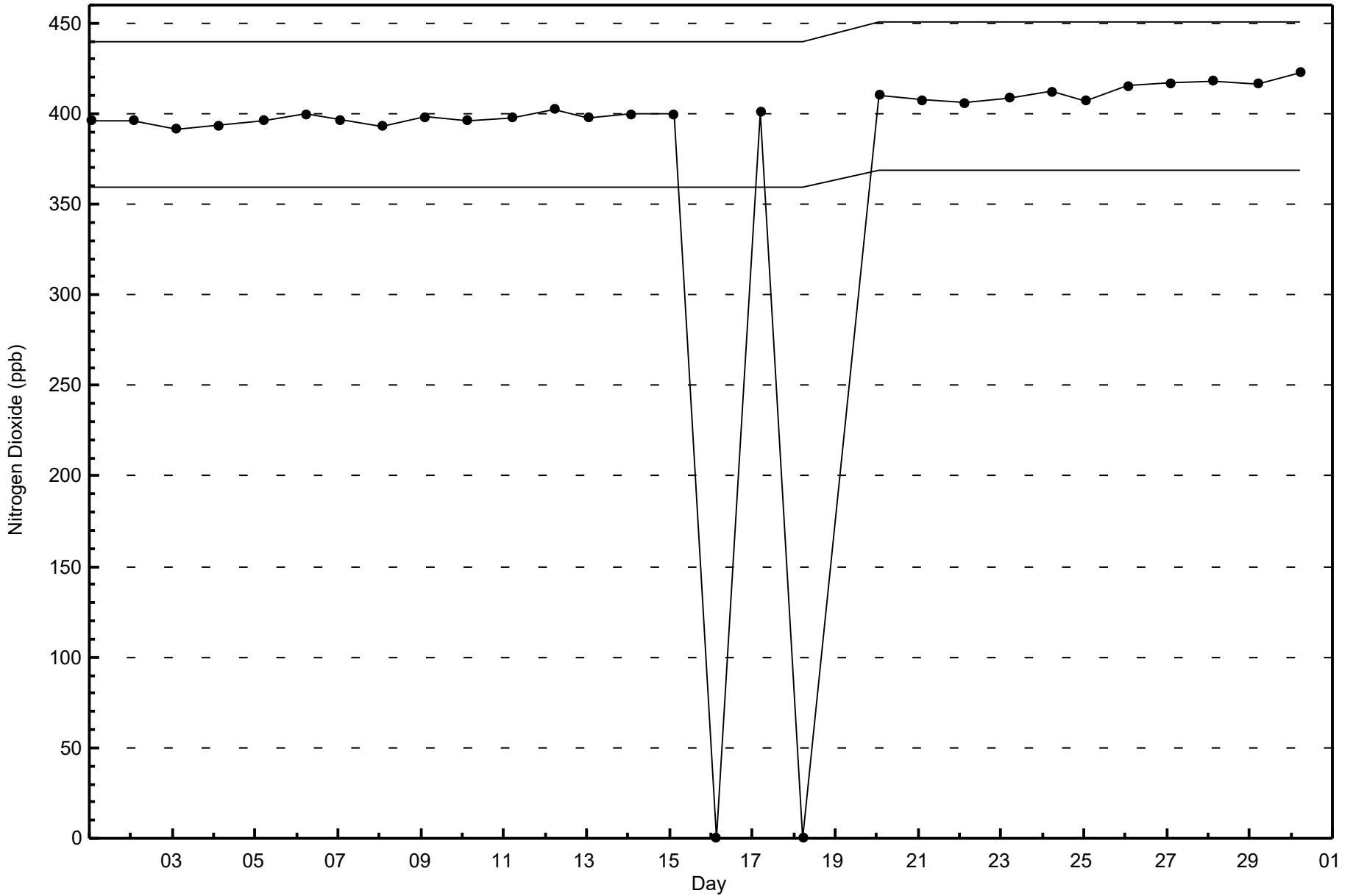


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Dioxide (NO₂) - ppb
Kirby North









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Kirby North - June 2023

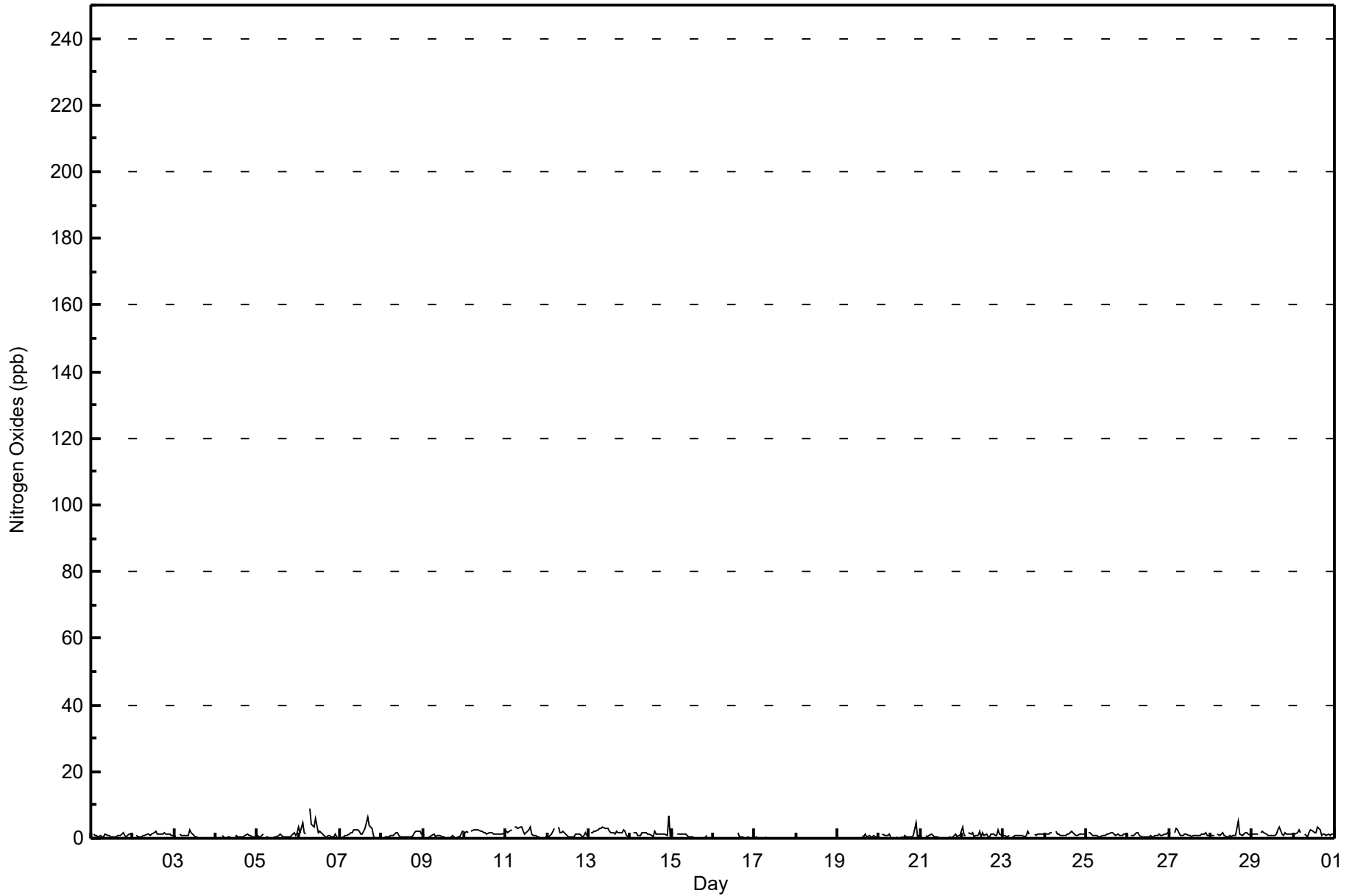
Maximum Value: 9.0 ppb on Jun 6 07:00		Maximum Daily Average: 2.3 ppb on Jun 6		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Jun 3 17:00		Minimum Daily Average: 0.4 ppb on Jun 4		Hours of Data: 618																						
Maximum Diurnal Average: 1.6 ppb at hour 7		Minimum Diurnal Average: 0.8 ppb at hour 20		Hours of Missing Data: 102																						
Monthly Average: 1.15 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.6 Median = 1.0 Q ₃ = 1.4 P ₉₀ = 2.1 P ₉₉ = 4.6		Hours of Calibration: 36																						
				Percent Operational Time: 90.8																						
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-Jun	Z	1.4	0.8	0.8	0.6	0.6	0.4	0.4	1.1	1.0	0.7	0.5	0.5	0.5	0.7	1.0	0.9	1.9	0.7	0.5	0.8	1.1	1.1	0.8	1.9	
2-Jun	0.7	Z	0.8	0.6	0.4	0.6	0.8	1.0	1.2	1.1	1.1	1.4	1.9	2.0	1.3	1.1	1.4	1.4	1.7	1.4	1.1	1.1	1.0	0.7	2.0	
3-Jun	0.8	0.4	Z	1.2	0.9	0.8	0.7	0.7	0.7	2.7	1.8	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	
4-Jun	0.0	0.0	0.0	Z	1.0	0.0	0.0	0.4	0.3	0.2	0.2	0.2	0.8	0.5	0.3	0.5	0.8	1.2	0.9	0.9	0.2	0.5	0.6	0.4	1.2	
5-Jun	0.6	0.5	0.5	1.2	Z	0.4	0.3	0.1	0.0	0.1	0.3	0.4	0.7	1.2	1.0	0.5	0.4	0.5	0.3	0.4	0.9	1.6	0.9	1.8	1.8	
6-Jun	3.5	1.8	4.7	1.7	1.5	Z	9.0	4.4	3.9	3.3	6.1	1.9	2.0	1.9	1.3	0.5	0.4	0.8	0.7	0.3	0.5	1.1	0.5	0.2	9.0	
7-Jun	Z	0.3	0.4	0.9	0.9	1.1	1.8	1.6	2.6	2.3	2.3	2.1	1.2	1.3	3.1	4.8	6.2	3.7	3.1	1.0	0.0	0.2	0.2	0.3	6.2	
8-Jun	0.4	Z	0.6	0.6	0.5	1.0	0.8	0.8	1.7	1.5	0.8	0.6	0.6	0.6	0.4	0.4	0.3	0.8	1.8	2.1	1.9	1.9	1.4	2.1	2.1	
9-Jun	1.4	0.9	Z	0.6	0.3	0.7	1.2	0.5	1.0	0.8	0.8	0.2	0.3	0.1	0.1	0.2	0.6	0.7	0.6	0.2	0.4	0.6	1.1	2.1	2.1	
10-Jun	1.8	1.9	1.6	Z	2.2	2.5	2.5	2.7	2.4	2.2	2.0	1.8	1.5	1.4	1.6	1.6	1.5	1.2	1.3	1.3	1.3	1.2	1.4	1.7	2.7	
11-Jun	1.9	1.9	2.1	2.5	Z	3.5	3.2	3.0	3.4	3.4	2.2	1.2	2.1	2.6	3.5	1.2	0.9	0.8	0.5	0.3	0.2	0.2	0.2	0.2	3.5	
12-Jun	0.2	0.3	1.3	2.3	3.0	Z	3.6	1.9	1.8	2.2	1.8	0.8	0.4	0.5	0.3	0.4	1.1	1.2	1.4	1.1	0.6	0.8	1.9	1.0	3.6	
13-Jun	Z	1.5	1.8	2.0	2.1	2.4	3.2	3.1	3.2	3.1	3.1	2.8	2.3	1.5	1.6	1.1	1.9	1.5	1.5	1.8	2.6	2.1	0.7	0.6	3.2	
14-Jun	0.4	Z	1.8	1.6	0.6	1.0	0.9	1.5	1.5	1.7	1.3	1.1	0.8	0.6	1.9	1.3	1.1	1.1	1.4	1.4	1.2	0.9	6.6	0.9	6.6	
15-Jun	1.2	1.7	Z	1.2	1.1	1.2	1.2	1.1	1.1	0.9	0.5	0.3	0.3	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.8	UO	UO	UO	1.7	
16-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	1.8	0.4	0.3	0.4	0.1	0.2	0.2	0.1	0.1	0.5	1.8	
17-Jun	0.0	0.2	0.0	0.1	Z	0.1	0.1	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.4	
18-Jun	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	M	M	M	M	M	M	M	M	M	M	M	--
19-Jun	M	M	M	M	M	M	M	M	C	C	C	C	C	C	0.7	0.6	1.3	0.6	0.7	0.6	0.6	0.7	0.3	0.5	1.3	
20-Jun	0.4	Z	1.3	0.9	0.9	1.1	1.2	0.6	UO	UO	0.2	0.1	0.1	0.3	0.2	0.8	0.6	0.5	0.5	0.5	0.7	4.5	0.5	0.7	4.5	
21-Jun	0.9	0.9	Z	0.9	0.6	0.9	1.1	0.9	0.6	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.4	1.5	0.6	0.9	0.9	1.5	
22-Jun	3.5	1.0	1.0	Z	1.6	1.4	1.6	0.6	0.7	1.0	1.9	0.3	1.8	0.9	1.2	0.6	0.6	1.1	1.1	0.8	0.9	2.5	1.4	0.8	3.5	
23-Jun	1.0	0.7	0.5	0.7	Z	0.6	0.6	0.7	1.0	0.8	0.9	0.7	0.6	1.0	2.0	1.4	UO	UO	1.2	0.9	1.2	1.4	1.3	1.2	2.0	
24-Jun	1.2	1.3	1.4	1.7	1.8	Z	2.0	1.4	1.1	0.9	0.7	0.7	0.9	1.4	1.4	2.2	1.6	1.1	0.8	0.9	1.5	1.3	1.2	1.3	2.2	
25-Jun	Z	1.6	1.6	1.4	1.0	0.8	0.7	0.5	0.4	0.7	1.0	0.7	1.1	1.1	1.8	1.8	1.2	1.1	1.3	0.7	1.0	1.0	1.1	1.1	1.8	
26-Jun	0.9	Z	1.0	0.8	1.3	1.6	1.6	0.7	0.4	0.5	0.5	0.5	0.5	0.7	0.6	0.5	1.0	0.8	1.5	1.0	1.1	1.2	1.4	1.6	1.6	
27-Jun	1.7	1.3	Z	1.8	3.1	2.4	0.7	0.9	1.0	1.1	1.2	0.8	0.7	0.5	0.8	0.9	0.9	0.8	0.7	1.1	1.4	1.5	1.0	1.0	3.1	
28-Jun	0.7	1.0	1.0	Z	1.3	0.9	1.3	1.5	0.9	0.6	0.6	0.8	0.5	1.0	0.9	2.9	5.0	1.4	0.9	1.3	1.8	1.6	1.3	1.0	5.0	
29-Jun	1.1	1.3	1.2	1.3	Z	1.9	2.1	1.6	1.2	1.0	1.0	0.9	1.0	0.9	1.1	2.4	3.3	1.3	1.0	1.9	1.4	1.3	1.3	1.3	3.3	
30-Jun	1.3	1.4	1.8	2.5	1.6	Z	1.2	0.9	0.6	1.8	2.7	2.1	1.6	1.9	3.3	2.6	1.0	1.2	1.1	0.7	1.3	1.1	1.1	1.3	3.3	
																								Diurnal Average		
																								Diurnal Maximum		
																								1.1 3.5		
																								1.1 1.9		
																								1.2 4.7		
																								2.5 9.0		
																								3.1 4.4		
																								3.5 9.0		
																								9.0 4.4		
																								3.9 3.4		
																								6.1 2.8		
																								2.3 2.6		
																								2.3 3.5		
																								4.8 6.2		
																								3.7 3.1		
																								1.9 2.6		
																								4.5 6.6		
																								2.1 2.1		

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Kirby North - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Kirby North - June 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	618	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: 618

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby North - June 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	61	52	41	30	20	16	25	39	86	30	66	32	16	21	22	61	618
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	61	52	41	30	20	16	25	39	86	30	66	32	16	21	22	61	618

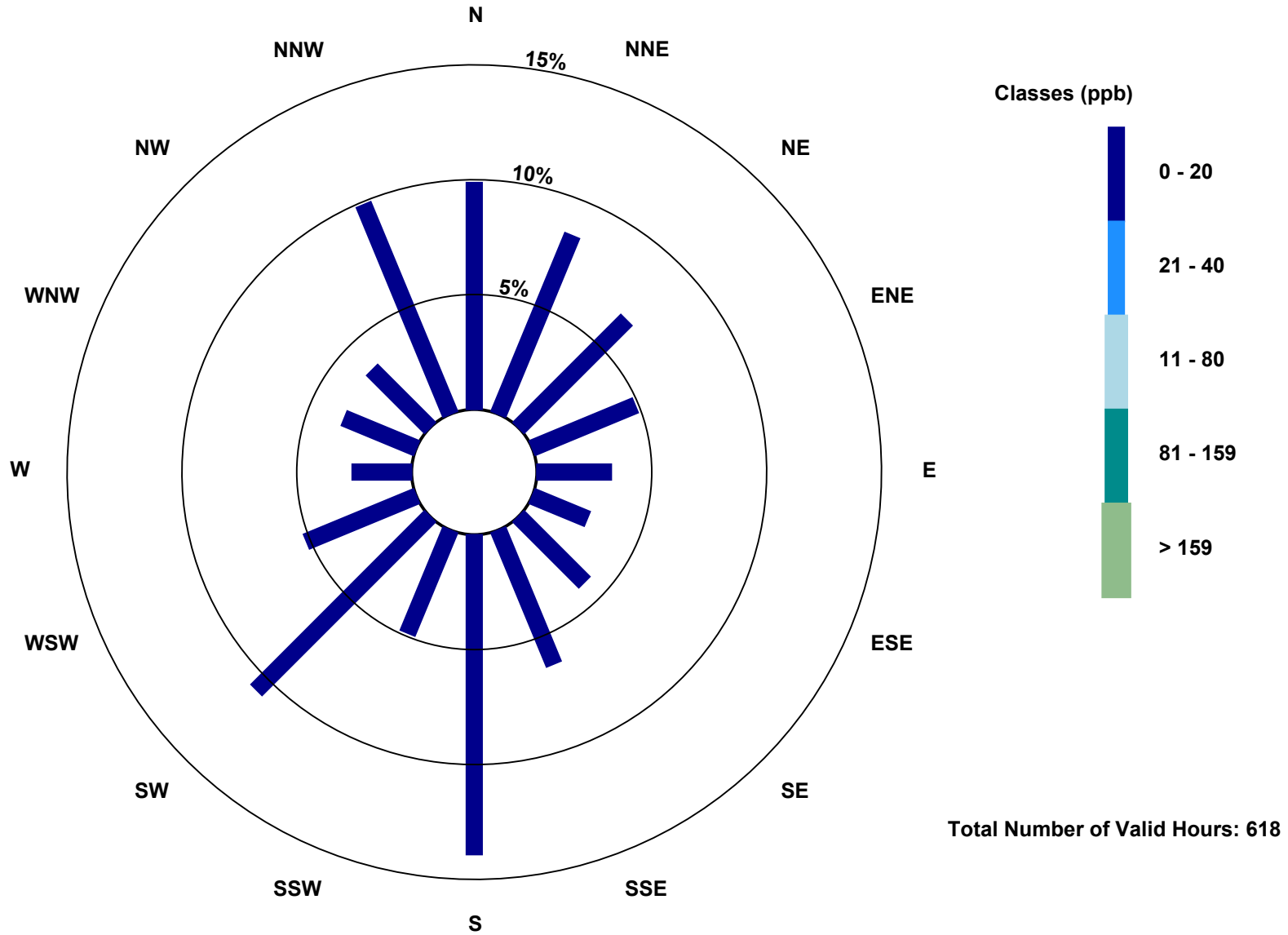
Total Number of Valid Hours: 618

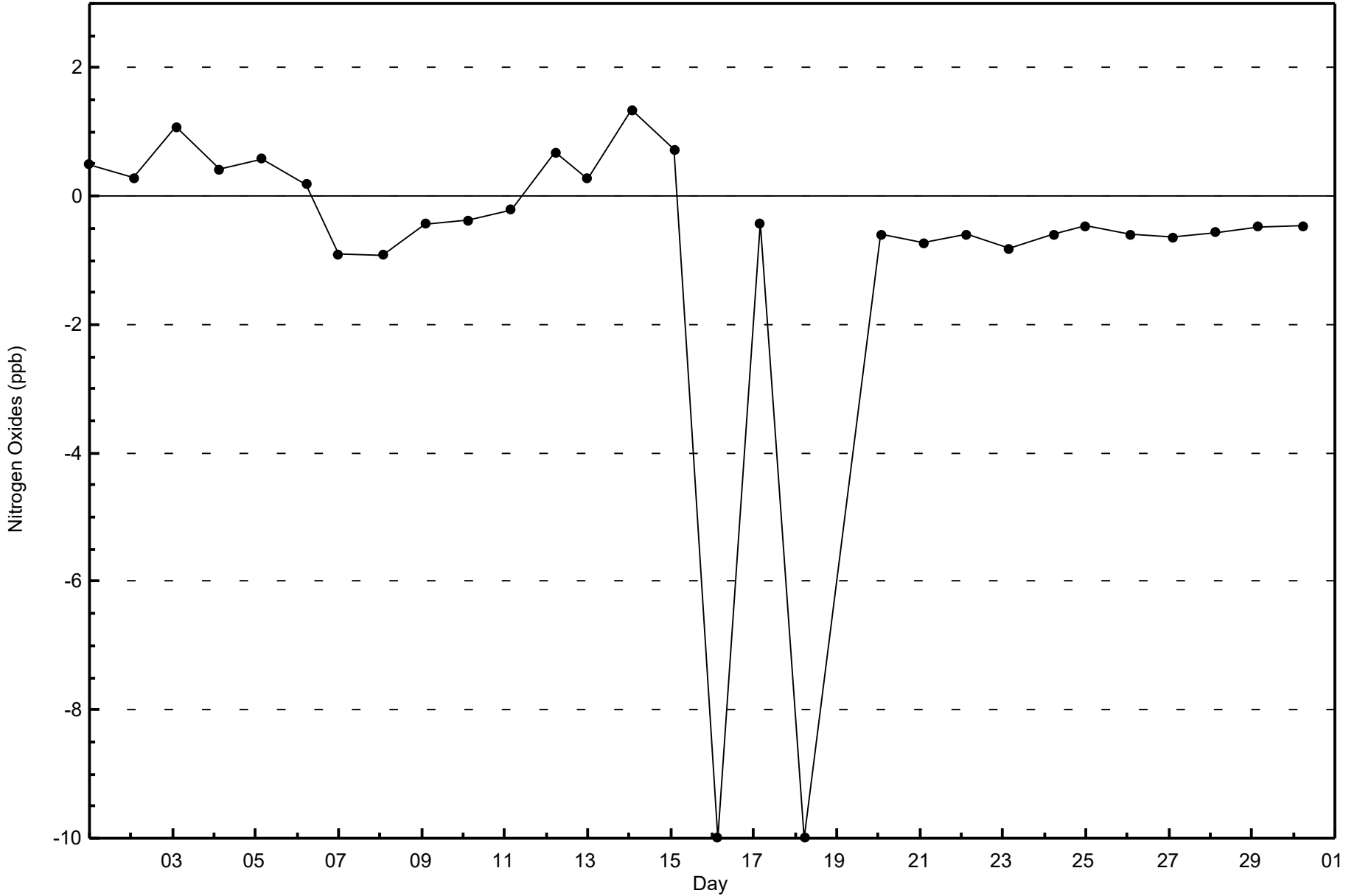
Total Number of Hours: 720

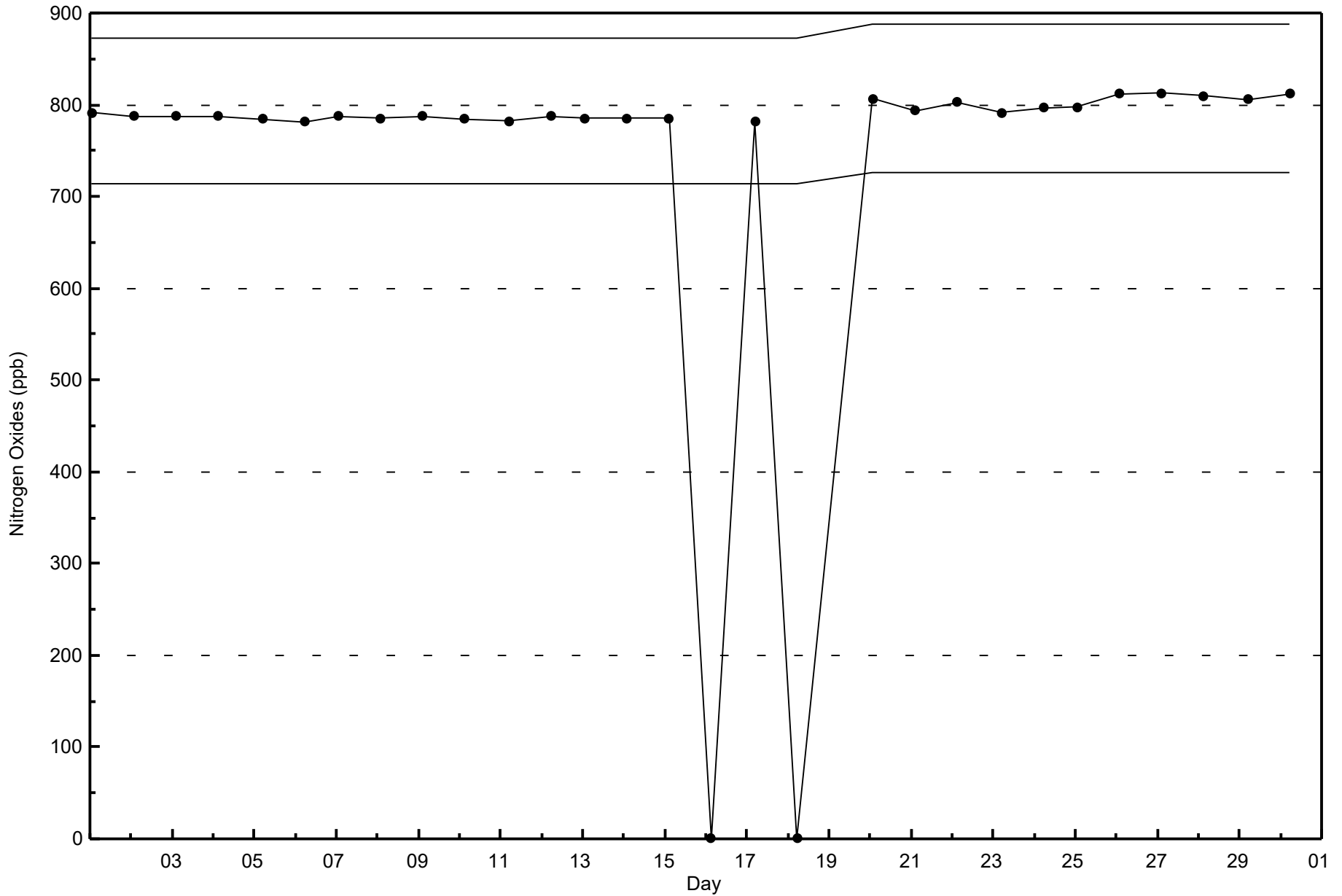


Wood Buffalo Environmental Association
Wind Rose Jun 2023

Nitrogen Oxides (NO_x) - ppb
Kirby North





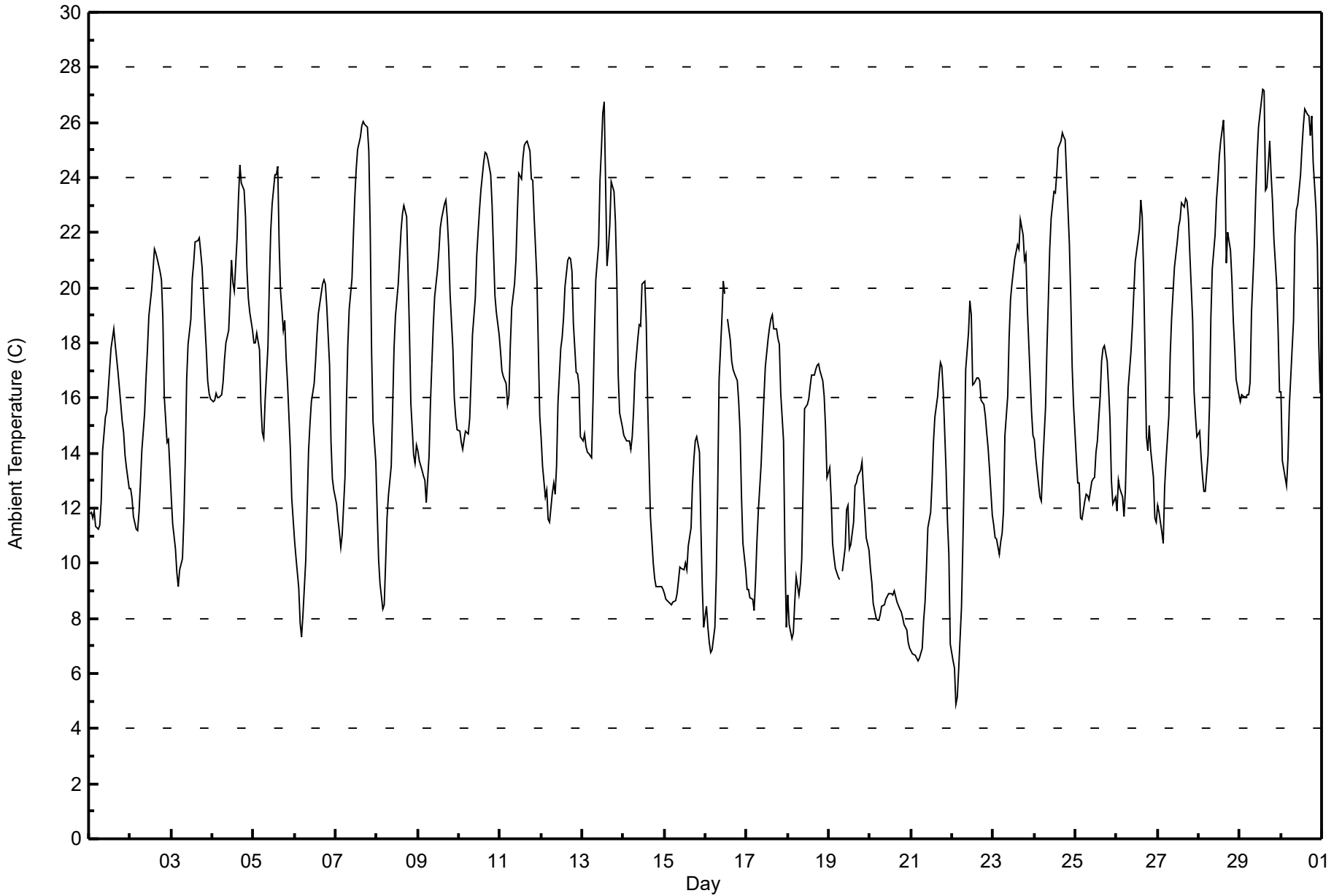




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Kirby North - June 2023

Maximum Value: 27.2 C on Jun 29 14:00 Minimum Value: 4.9 C on Jun 22 03:00 Maximum Diurnal Average: 20.3 C at hour 15 Monthly Average: 16.09 C		Maximum Daily Average: 21.0 C on Jun 29 Minimum Daily Average: 8.4 C on Jun 20 Minimum Diurnal Average: 11.3 C at hour 5 Percentiles: P ₁ = 6.6 P ₁₀ = 9.1 Q ₁ = 12.3 Median = 16.0 Q ₃ = 20.1 P ₉₀ = 23.2 P ₉₉ = 26.2		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 Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jun	11.8	11.9	11.6	11.9	11.3	11.3	11.4	12.3	14.1	15.3	15.5	16.3	17.0	17.8	18.5	17.9	17.4	16.9	15.8	15.2	14.8	13.9	13.5	12.7	14.4	18.5																						
2-Jun	12.7	12.4	11.7	11.2	11.2	11.9	12.9	14.1	15.5	16.7	17.8	19.0	19.9	20.6	21.4	21.3	21.0	20.6	20.3	18.9	16.1	14.4	14.5	13.5	16.2	21.4																						
3-Jun	12.4	11.4	10.5	9.7	9.2	9.8	10.2	11.6	13.8	16.7	18.0	18.9	20.4	20.9	21.7	21.7	21.8	21.3	20.8	19.7	17.7	16.6	16.2	16.0	16.1	21.8																						
4-Jun	15.9	15.9	16.2	16.0	16.0	16.1	16.6	17.4	18.0	18.5	19.7	21.0	20.2	19.9	21.8	23.3	24.5	23.8	23.6	22.6	20.7	19.6	19.1	18.4	19.4	24.5																						
5-Jun	18.0	18.0	18.3	17.7	15.8	14.7	14.5	15.9	17.8	20.1	22.1	23.0	24.1	24.1	24.4	21.6	19.9	18.5	18.8	17.4	16.5	14.1	12.4	11.6	18.3	24.4																						
6-Jun	10.8	10.2	9.1	7.8	7.3	8.1	10.1	12.1	14.1	15.1	15.9	16.5	17.4	18.3	19.1	19.8	20.1	20.3	20.1	19.3	17.2	14.4	13.1	12.7	14.5	20.3																						
7-Jun	12.2	11.6	11.1	10.6	11.1	13.1	15.7	17.9	19.2	20.3	21.9	23.3	24.3	25.0	25.5	25.9	26.0	25.9	25.9	25.0	22.1	17.7	15.1	13.7	19.2	26.0																						
8-Jun	11.9	10.1	9.3	8.4	8.5	10.0	11.6	12.4	13.5	15.6	17.8	19.0	20.2	21.1	22.1	22.7	23.0	22.6	20.6	18.4	15.8	13.9	13.7	14.3	15.7	23.0																						
9-Jun	14.1	13.7	13.4	13.2	13.0	12.2	13.9	15.8	17.2	18.6	19.7	20.6	21.3	22.2	22.5	23.0	23.2	22.5	21.4	19.8	17.8	16.0	15.3	14.8	17.7	23.2																						
10-Jun	14.8	14.4	14.1	14.5	14.8	14.7	15.2	16.7	18.3	19.6	21.1	22.0	22.8	23.6	24.6	24.9	24.9	24.7	24.1	23.0	21.4	19.7	19.1	18.3	19.6	24.9																						
11-Jun	17.7	17.0	16.8	16.5	15.8	16.1	17.9	19.3	20.2	21.0	22.7	24.2	23.9	24.7	25.2	25.3	25.3	25.0	24.0	23.9	22.6	20.3	17.8	15.4	20.8	25.3																						
12-Jun	14.6	13.5	12.4	12.6	11.6	11.5	12.6	12.9	12.5	13.5	15.8	17.8	18.2	18.9	20.1	21.0	21.1	21.0	20.6	18.7	16.9	16.9	16.5	14.6	16.1	21.1																						
13-Jun	14.4	14.7	14.2	14.0	14.0	13.8	15.8	18.3	20.3	21.6	23.9	25.0	26.3	26.7	20.8	21.4	22.2	23.9	23.5	22.4	20.4	16.8	15.5	15.0	19.4	26.7																						
14-Jun	14.7	14.5	14.5	14.4	14.1	14.6	15.5	17.0	18.2	18.7	18.6	20.2	20.2	18.7	15.9	13.7	11.7	10.0	9.4	9.1	9.2	9.2	9.1	9.0	14.2	20.2																						
15-Jun	8.9	8.7	8.6	8.5	8.5	8.6	8.7	8.9	9.3	9.9	9.8	9.8	10.0	9.7	10.6	11.3	12.9	13.8	14.4	14.6	14.1	11.4	9.2	7.7	10.3	14.6																						
16-Jun	8.5	7.7	7.1	6.7	6.9	7.7	9.5	12.6	16.7	18.8	20.2	19.8	M	18.8	18.1	17.4	17.1	16.9	16.6	15.9	14.7	12.4	10.7	9.7	13.5	20.2																						
17-Jun	9.0	9.0	8.7	8.7	8.3	9.3	10.8	11.9	13.6	14.9	16.0	17.1	18.1	18.6	18.9	19.0	18.5	18.5	18.2	17.9	16.2	14.5	10.4	7.7	13.9	19.0																						
18-Jun	8.8	7.8	7.3	7.5	8.6	9.5	8.8	9.2	10.2	12.9	15.6	15.7	15.9	16.4	16.8	16.8	17.0	17.2	17.2	17.0	16.6	16.1	14.9	13.1	13.2	17.2																						
19-Jun	13.5	12.3	10.7	10.2	9.8	9.5	9.4	DF	9.7	10.6	12.0	12.1	10.5	10.7	11.5	12.8	12.9	13.2	13.4	13.7	12.7	11.8	10.9	10.5	11.5	13.7																						
20-Jun	9.8	9.3	8.6	8.0	7.9	7.9	8.1	8.5	8.5	8.7	8.8	8.9	8.9	8.9	9.0	8.8	8.6	8.3	8.2	8.0	7.8	7.6	7.1	6.9	8.4	9.8																						
21-Jun	6.8	6.7	6.7	6.6	6.5	6.6	6.9	7.9	8.6	9.8	11.3	11.9	12.9	14.4	15.3	16.1	16.8	17.3	17.1	16.2	13.4	11.6	10.3	7.1	11.0	17.3																						
22-Jun	6.5	6.2	4.9	5.1	6.2	8.4	10.7	13.5	17.0	18.4	19.5	19.0	16.5	16.5	16.7	16.7	16.6	15.9	15.8	15.4	14.8	14.2	13.4	11.7	13.3	19.5																						
23-Jun	11.4	10.9	10.9	10.3	10.8	11.1	11.9	14.6	16.1	18.2	19.6	20.1	21.0	21.3	21.6	21.4	22.5	21.9	21.0	21.2	19.3	16.8	15.5	14.6	16.8	22.5																						
24-Jun	14.5	13.8	12.9	12.4	12.3	13.6	15.7	17.8	19.6	21.4	22.5	23.5	23.5	24.1	25.1	25.3	25.7	25.5	25.4	24.1	21.6	19.6	17.1	15.7	19.7	25.7																						
25-Jun	13.8	12.9	12.9	11.7	11.6	12.2	12.5	12.5	12.3	13.0	13.1	13.1	14.1	14.4	16.1	17.3	17.8	17.9	17.3	16.4	15.2	13.0	12.2	12.4	14.0	17.9																						
26-Jun	11.9	13.0	12.7	12.4	11.7	12.6	14.7	16.4	17.7	18.6	19.8	21.0	21.7	22.1	23.2	22.6	20.6	14.6	14.1	15.0	14.1	13.1	11.6	11.5	16.1	23.2																						
27-Jun	12.1	11.8	11.1	10.8	12.8	13.7	15.3	17.6	18.9	19.8	20.8	21.7	22.2	22.5	23.1	22.9	23.2	23.2	22.5	21.2	18.8	16.2	15.4	14.6	18.0	23.2																						
28-Jun	14.8	13.9	13.2	12.6	12.6	14.0	15.7	18.9	20.7	21.9	23.2	23.9	24.7	25.3	26.1	24.6	20.9	22.0	21.4	20.3	18.8	17.8	16.7	16.1	19.2	26.1																						
29-Jun	15.9	16.1	16.1	16.0	16.1	16.1	16.6	19.1	21.5	23.3	24.8	25.8	26.7	27.2	27.2	23.5	23.7	25.3	24.1	23.1	21.8	20.1	18.4	16.2	21.0	27.2																						
30-Jun	16.2	13.7	13.1	12.8	13.8	15.7	17.8	18.8	21.9	22.8	23.1	24.1	25.0	25.9	26.5	26.3	26.2	25.5	26.2	24.5	22.9	21.5	18.0	16.2	20.8	26.5																						
																								12.6	12.1	11.6	11.3	11.3	11.8	12.9	14.5	15.8	17.1	18.3	19.1	19.6	20.0	20.3	20.2	20.1	19.8	19.4	18.6	17.1	15.4	14.1	13.1	Diurnal Average
																								18.0	18.0	18.3	17.7	16.1	16.1	17.9	19.3	21.9	23.3	24.8	25.8	26.7	27.2	27.2	26.3	26.2	25.9	26.2	25.0	22.9	21.5	19.1	18.4	Diurnal Maximum
M - Maintenance DF - DAS Failure																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Kirby North - June 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	99	13.79	13.79
10 - 20	437	60.86	74.65
> 20	182	25.35	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

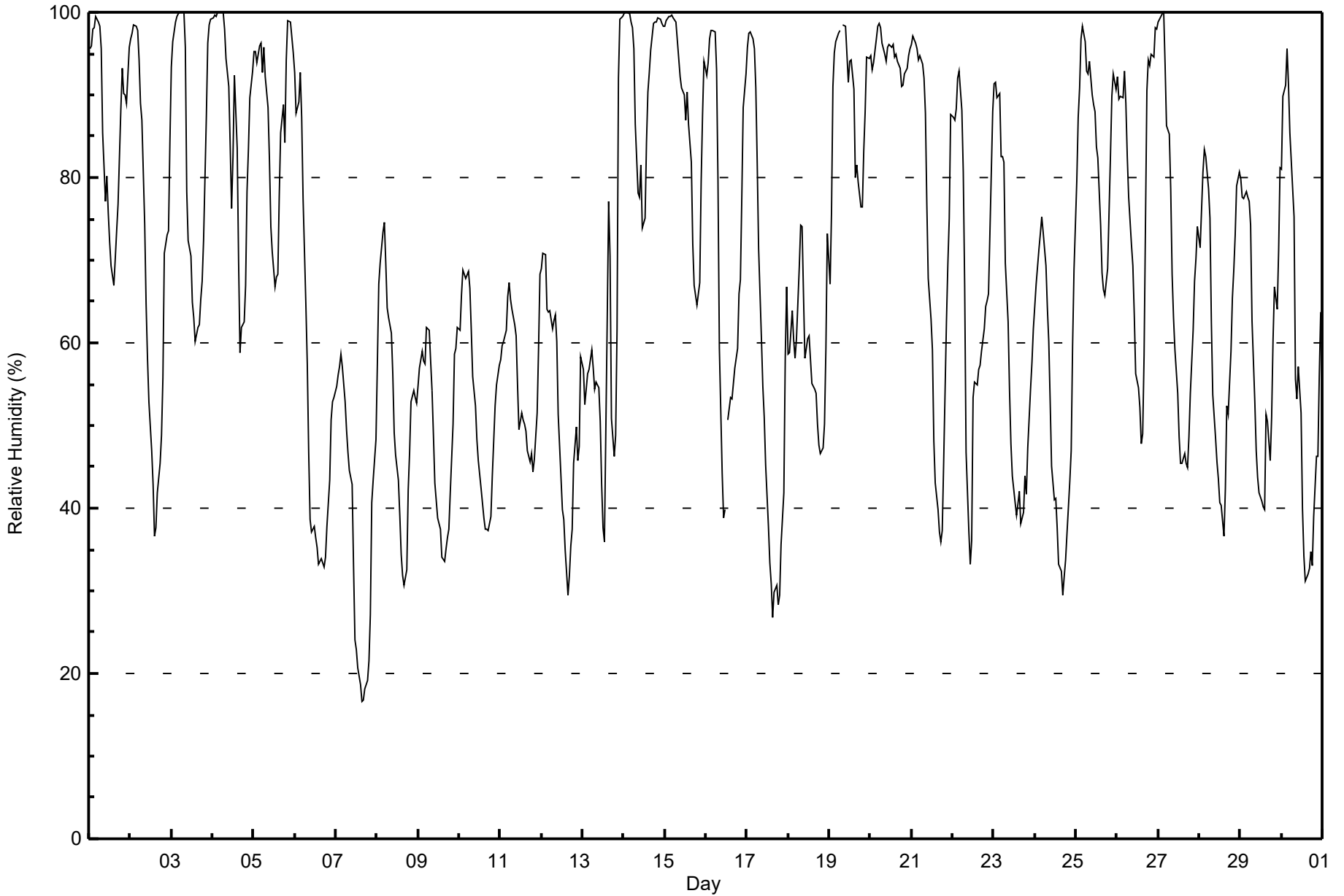
Relative Humidity (RH) - %
Kirby North - June 2023

Maximum Value: 100.0 % on Jun 3 06:00		Maximum Daily Average: 94.9 % on Jun 20		Hours in Service: 720																																													
Minimum Value: 16.6 % on Jun 7 16:00		Minimum Daily Average: 37.1 % on Jun 7		Hours of Data: 718																																													
Maximum Diurnal Average: 85.5 % at hour 4		Minimum Diurnal Average: 52.4 % at hour 15		Hours of Missing Data: 2																																													
Monthly Average: 67.94 %		Percentiles: P ₁ = 23.1 P ₁₀ = 38.0 Q ₁ = 50.2 Median = 66.8 Q ₃ = 90.1 P ₉₀ = 96.8 P ₉₉ = 100.0		Hours of Calibration: 0																																													
				Percent Operational Time: 99.7																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jun	95.6	95.9	98.0	98.1	99.4	98.8	98.4	95.6	85.5	77.0	80.1	75.7	72.3	69.3	66.9	70.1	73.6	76.8	88.3	93.2	90.2	90.1	89.0	95.7	86.4	99.4																							
2-Jun	96.7	97.4	98.4	98.3	97.9	94.2	89.0	86.9	74.5	64.7	58.2	53.0	47.0	42.8	36.6	37.6	41.8	45.4	48.8	55.8	70.8	73.0	73.6	84.5	69.5	98.4																							
3-Jun	93.4	96.5	98.9	99.5	99.8	100.0	100.0	100.0	95.7	78.3	72.3	70.5	64.9	63.1	60.2	61.9	62.2	65.3	67.4	72.4	87.4	96.3	98.4	99.1	83.5	100.0																							
4-Jun	99.4	99.7	99.5	100.0	100.0	100.0	100.0	98.0	94.5	91.1	83.9	76.3	82.5	92.4	83.6	69.9	58.8	61.9	62.6	66.9	78.3	83.5	89.7	93.0	86.1	100.0																							
5-Jun	95.2	95.3	93.8	96.0	96.2	92.6	95.8	92.3	88.6	82.1	74.1	71.1	66.7	68.0	68.2	77.8	85.4	88.8	84.2	94.3	99.0	98.8	97.0	95.1	87.4	99.0																							
6-Jun	92.8	87.9	89.2	92.7	87.3	77.4	64.6	57.5	46.7	38.7	37.1	37.7	36.4	35.3	33.2	34.0	33.3	32.9	34.0	37.7	43.4	50.7	52.9	53.4	53.6	92.8																							
7-Jun	54.8	56.1	57.1	58.7	57.2	52.8	49.5	46.8	44.5	42.8	33.1	24.0	22.9	20.7	18.7	16.6	16.7	18.1	19.2	21.5	27.2	40.7	43.4	48.3	37.1	58.7																							
8-Jun	57.4	67.1	69.6	73.3	74.5	69.7	64.3	63.1	61.2	56.2	49.1	46.4	43.4	39.2	34.5	31.9	30.7	32.6	42.2	46.7	52.8	54.2	53.4	52.8	52.8	74.5																							
9-Jun	54.7	57.0	59.0	57.8	57.4	61.8	61.6	57.8	54.3	48.7	43.1	38.9	38.1	37.4	34.1	33.6	35.0	36.4	37.5	41.9	50.2	58.6	59.4	61.9	49.0	61.9																							
10-Jun	61.5	65.8	68.9	68.3	67.8	68.6	66.6	61.5	56.0	52.3	48.3	45.8	44.1	42.4	38.8	37.5	37.5	37.3	39.1	43.9	48.2	52.5	54.9	57.3	52.7	68.9																							
11-Jun	58.0	59.7	60.2	61.4	65.6	67.2	65.3	64.0	62.2	60.8	54.9	49.5	51.5	50.7	50.1	49.3	47.0	45.6	46.7	44.4	46.0	51.5	59.4	68.3	55.8	68.3																							
12-Jun	69.0	70.8	70.6	64.1	63.7	63.8	61.6	62.7	63.4	60.2	51.4	43.7	39.8	38.7	35.0	29.5	31.8	35.5	37.5	45.5	49.8	45.7	47.5	58.4	51.7	70.8																							
13-Jun	56.7	52.5	54.4	56.2	56.8	59.1	56.9	54.5	55.2	54.5	50.6	42.8	37.7	36.0	63.1	77.2	70.6	50.8	46.2	48.9	61.7	92.1	99.1	99.6	59.7	99.6																							
14-Jun	99.9	100.0	100.0	99.9	98.8	98.2	95.6	86.5	78.1	77.7	81.6	73.9	75.1	84.2	90.3	92.7	95.4	98.7	98.8	99.3	99.1	98.7	98.3	92.5	100.0	100.0																							
15-Jun	98.4	99.1	99.4	99.6	99.7	99.3	98.9	96.6	94.4	92.3	90.9	90.0	86.9	90.3	86.5	81.9	72.0	67.0	65.7	64.6	67.3	79.4	87.6	94.0	87.6	99.7																							
16-Jun	92.4	93.9	96.8	97.8	97.7	97.6	93.1	79.7	59.3	44.3	38.8	39.9	M	50.6	53.4	53.2	55.0	57.0	59.3	65.9	67.7	77.7	88.4	92.6	71.8	97.8																							
17-Jun	95.8	97.5	97.6	96.8	95.6	90.9	81.7	71.4	60.5	54.7	51.0	45.2	37.8	33.5	30.8	26.9	29.9	30.6	28.3	29.5	35.6	41.9	58.3	66.8	57.8	97.6																							
18-Jun	58.6	58.8	63.9	60.4	58.2	60.6	69.2	74.3	74.1	65.9	58.1	60.5	60.8	58.0	55.2	54.4	53.9	50.2	47.7	46.6	47.2	50.2	59.3	73.1	59.1	74.3																							
19-Jun	67.2	75.8	91.0	95.1	96.5	97.5	97.9	DF	98.6	98.3	94.9	91.5	94.0	94.3	90.6	80.0	81.6	79.5	76.4	76.5	83.2	88.0	94.6	94.4	88.6	98.6																							
20-Jun	94.7	93.0	93.8	96.8	98.3	98.7	98.2	96.4	94.9	94.1	95.7	96.1	95.7	96.1	94.6	95.0	94.1	93.2	91.0	91.2	92.6	93.3	94.8	95.6	94.9	98.7																							
21-Jun	96.0	97.1	96.3	95.7	94.3	94.8	93.7	92.0	87.8	76.8	67.8	62.9	59.2	48.1	43.1	39.8	37.1	35.9	37.3	45.3	62.6	69.5	75.1	87.6	70.7	97.1																							
22-Jun	87.3	87.0	88.4	92.1	92.9	88.1	80.7	66.9	46.9	37.2	33.2	36.1	53.4	55.3	54.9	56.9	57.2	59.1	61.7	64.4	65.0	65.9	73.2	88.0	66.3	92.9																							
23-Jun	91.4	91.5	89.7	90.1	82.5	82.5	81.9	69.7	62.6	54.2	47.8	43.9	40.7	39.2	40.5	42.0	38.2	39.5	43.9	41.8	47.2	54.5	57.6	61.7	59.8	91.5																							
24-Jun	64.4	67.1	71.3	73.3	75.3	73.4	69.4	64.2	60.1	53.0	45.1	41.0	41.2	37.6	33.3	32.4	29.6	31.6	33.6	36.9	43.1	47.0	59.7	68.9	52.2	75.3																							
25-Jun	79.7	87.3	90.9	96.7	98.3	96.5	92.8	92.6	94.0	89.9	88.9	88.0	83.7	82.4	74.3	68.4	66.5	65.8	69.0	75.8	82.6	89.9	92.5	90.7	84.9	98.3																							
26-Jun	92.1	89.5	89.8	89.7	92.8	89.0	82.5	77.6	71.8	69.3	63.5	56.2	54.6	52.2	47.8	48.9	58.5	90.4	94.2	93.6	94.8	94.7	98.1	98.0	78.7	98.1																							
27-Jun	98.8	99.1	99.8	100.0	93.6	86.2	85.2	78.6	68.4	63.1	59.2	53.9	48.6	45.4	45.5	46.6	45.4	44.9	48.6	53.9	61.5	67.4	70.1	74.0	68.2	100.0																							
28-Jun	71.5	76.0	80.7	83.3	82.6	78.6	75.2	62.5	53.8	48.5	45.7	43.6	40.7	40.3	36.6	42.3	52.5	51.4	58.9	65.4	68.8	73.1	78.9	80.7	62.1	83.3																							
29-Jun	79.9	77.7	77.4	78.3	77.7	77.1	74.2	62.7	52.9	47.0	43.8	41.8	40.9	40.2	39.8	51.4	50.6	45.7	51.0	60.4	66.8	64.1	71.2	81.1	60.6	81.1																							
30-Jun	81.0	89.8	91.2	95.6	91.4	85.4	78.7	75.3	55.6	53.2	57.2	51.6	40.0	34.2	31.2	32.1	32.6	34.7	33.0	39.0	46.3	46.2	56.1	63.7	58.1	95.6																							
																								81.1	82.7	84.5	85.5	85.0	83.3	80.7	75.4	69.9	64.2	60.0	56.4	55.2	53.9	52.4	52.4	52.5	53.4	55.1	58.8	64.6	69.6	74.4	79.2	Diurnal Average	
																								99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.6	98.3	95.7	96.1	95.7	96.1	94.6	95.0	95.4	98.7	98.8	98.8	99.3	99.1	99.1	99.6	Diurnal Maximum	
M - Maintenance																								DF - DAS Failure																									



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Kirby North - June 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Kirby North - June 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	5	0.70	0.70
20 - 40	83	11.56	12.26
40 - 60	200	27.86	40.11
60 - 80	179	24.93	65.04
80 - 100	241	33.57	98.61

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Kirby North - June 2023

Maximum Speed: 30 km/h on Jun 19 01:00	Maximum Daily Speed Average: 18.0 km/h on Jun 18	Hours in Service: 720
Minimum Speed Value: 0 km/h on Jun 17 23:00	Minimum Daily Speed Average: 3.9 km/h on Jun 12	Hours of Data: 719
Maximum Diurnal Speed Average: 4.3 km/h at hour 16	Minimum Diurnal Speed Average: 0.5 km/h at hour 21	Hours of Missing Data: 1
Monthly Average Velocity: 1.3 km/h 334.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 14 P ₉₀ = 18 P ₉₉ = 27	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-Jun	N13	N11	NE12	N9	N10	N10	N10	NNE10	NNE15	NNE16	NNE12	N12	NNE11	NNE8	NNE11	NE14	NNE11	N6	NNW7	NNW5	NNW7	N7	N9	NNW9	N9.7	NNE16
2-Jun	NNW9	N11	NNE12	N9	N8	NNW8	N11	NNE15	NNE21	NNE23	NNE22	NNE20	NNE20	NNE18	NNE21	NE17	NE13	ENE10	E9	ENE6	E5	E7	ESE8	SE6	NNE11.1	NNE23
3-Jun	SE5	E4	NE5	NNE6	NE8	NE9	NNE10	NE9	NE12	ENE13	ENE12	ENE10	ENE12	E11	ENE11	E13	E13	E10	ESE9	ESE9	SE6	E4	E7	ENE8.2	E13	
4-Jun	ENE6	E8	ENE8	NE8	ENE10	E9	ESE10	SE10	SE10	SSE8	SSE9	SSE10	SW6	SSW6	SW10	SSW10	SW11	SSW9	SW7	S3	SE3	SSE7	SSE8	SSE7	SSE5.0	SW11
5-Jun	S6	S5	S7	SSW5	NW12	NW10	NNW8	NNE5	N12	NNE15	NE16	ENE14	ENE12	ENE14	ENE15	NNE9	N9	NNW14	NNW11	NNW10	NNW11	NNW22	WNW17	WNW18	N6.1	WNW22
6-Jun	WNW17	WNW15	WNW12	WSW11	WSW11	WSW11	WNW14	W11	W14	WNW14	WNW16	WSW17	WSW16	WSW17	WSW16	SW15	SW15	SW14	SW13	SW11	S6	SSE7	SSE8	SSE10	WSW10.8	WSW17
7-Jun	S10	S9	S9	S8	S9	S11	S11	SW16	SW17	SW15	SW14	WSW15	SW15	WSW18	WSW21	WSW19	W20	WSW17	W15	WNW12	NNW6	NNW7	NNE7	NNE7	WSW8.9	WSW21
8-Jun	NNE6	NNE4	ESE2	ENE2	NNE2	NNE2	NNE7	NNE11	NE13	NE11	NNE9	N10	NNE10	NNW13	N11	N9	NNE10	NNE11	NE14	ENE10	ENE10	ENE10	E10	ESE9	NNE7.3	ENE14
9-Jun	SE8	E8	ESE8	SE9	SE8	SSE6	SSE6	SE8	SSE10	SSE10	SE11	SE12	ESE11	ESE9	ESE9	SE9	SSE9	SSE10	SSE10	SSE7	S7	S8	SSE9	S12	SE8.2	S12
10-Jun	S13	S14	S13	S16	S18	S17	S17	S17	S17	S18	S16	S17	S17	S16	S17	S16	S15	S15	S14	S12	S11	SSE11	S12	S13	S15.1	S18
11-Jun	S12	S12	S12	S12	S9	S10	SSW11	SW14	WSW15	WNW12	NW11	NNW10	NNW10	NNW13	WNW12	NW14	NW14	NW11	NW7	NW8	NNW7	NNW6	N2	NNW2	W5.2	WSW15
12-Jun	NNW5	NNE4	NE7	NNE7	N7	N5	N6	N5	N4	NNE4	NNE3	NNE5	N6	N6	ENE6	ENE5	ENE6	ENE6	E8	ESE8	SE9	SE11	SSE8	NE6	NE3.9	SE11
13-Jun	ESE4	SE8	SSE6	SSE7	SSE9	SSE8	S9	S10	S11	SSW13	SW9	SW9	WSW7	SSW6	S9	SE7	E8	SE14	SE17	SE19	SSE8	NNW8	NE11	NNE10	SSE5.9	SE19
14-Jun	NE10	NE11	NE14	ENE11	ENE6	NE5	E6	SE9	ESE5	NNE7	N14	NNE17	NNE17	N18	NNW18	NNW17	N21	N18	N20	N19	N17	N17	N18	N19	NNE11.8	N21
15-Jun	N17	N19	N18	N16	N15	N16	NNW17	N19	N20	N21	NNW20	NNW21	NNW20	NNW20	NNW21	NNW20	NNW20	NNW18	NNW13	NNW8	NW5	WSW4	SE2	SSW5	NNW14.5	N21
16-Jun	SSW10	S9	S10	S10	S10	S10	S9	S9	SSW11	SSW15	SSW16	SSW15	SW18	WSW14	WSW17	WSW15	SW12	SW8	SSW6	SSW10	SW13	SW14	SW12	SW11	SSW11.0	SW18
17-Jun	SW11	SW11	SW11	SW12	SSW10	SW11	SW12	WSW16	WSW16	WSW18	WSW19	WSW20	WSW21	WSW21	WSW23	W23	W21	W16	W14	WNW12	NW9	NW8	SSE0	S1	WSW12.9	WSW23
18-Jun	NW6	NNE2	NE6	NE8	NE8	NE11	NE12	NE10	NE13	NE16	NE21	NE21	NE21	NE23	NNE28	NNE24	NNE24	NE27	NE26	NE27	NE28	NE29	NE25	NE26	NE18.0	NE29
19-Jun	NE30	NE30	NE25	NE26	NE27	NE27	NNE29	DF	NE25	NE17	NE16	ENE8	NNE5	NNE5	SSW2	SW8	W7	W6	NW6	NNW7	NNW5	NNW8	N9	N16	NNE12.3	NE30
20-Jun	N15	N14	N12	NNW11	NNW12	NNW14	N15	N17	N18	N17	N15	N17	N18	N16	NNW18	NNW17	NNW18	NNW17	N16	N14	N11	NNW9	NNW9	NNW10	N14.5	N18
21-Jun	NNW12	NNW11	NNW13	NNW13	NNW13	NNW12	NW10	NW12	NW10	NNW12	NNW13	N14	N11	NNW16	NNW14	NNW13	NNW11	NW11	NW9	NNE5	ESE8	SE8	SSE8	ENE2	NNW8.6	NNW16
22-Jun	SE3	SSE4	S5	S5	S7	S8	SSW6	SSW7	SSW6	WSW8	WSW10	W9	W6	ENE1	WNW2	SE1	SW8	SW7	S5	S5	SSE6	S5	W4	NNE5	SSW3.9	WSW10
23-Jun	ESE1	SSE8	SSE7	SSE8	SSE10	SSE10	S8	S9	S8	SSW9	SSW7	WSW7	SW8	WSW9	W10	WSW10	SW8	SW8	SSW7	SW8	SSW5	S5	SSE6	SSE7	SSW6.1	SSE10
24-Jun	SSE7	SSE7	SSE8	S7	S9	S8	SSW9	SSW9	SW10	SW13	SW15	SW15	SW13	WSW12	WSW13	WSW12	WSW11	SW11	SW10	SW11	SSW7	S4	NE10	NNE10	SW7.5	SW15
25-Jun	NE11	NE11	NE12	NE12	NE15	NE16	NE15	NE15	NE18	NE19	NE14	NE12	NE13	NE12	NE12	NE12	NE12	NE9	NE7	NE5	NE5	NE5	NE5	NE4	NE11.2	NE19
26-Jun	ENE3	SSE8	S8	S7	S8	S9	S10	SSW10	SW9	SW9	SW11	SW10	SW11	SW12	SW15	SW12	W4	NNE13	S5	SSW11	SW10	NW1	E0	WSW4	SSW6.2	SW15
27-Jun	SW7	SSW8	SSW7	WSW5	W8	W10	NNW7	NNE8	N10	N10	N11	NNW11	N14	N12	N13	NNE14	NNE13	NNE11	ENE12	ENE10	E8	E7	SE6	SE7	NNE4.6	N14
28-Jun	SE8	SSE7	S6	S6	S7	S7	S7	S7	S8	SSW9	S7	S7	SW9	SW8	SW10	SW9	WSW13	WNW15	N8	ESE5	S6	S7	S7	S7	SSW5.6	WNW15
29-Jun	S7	S7	S8	S8	S9	S9	S9	SSW11	SSW14	SW17	SW18	SW18	SW19	SW19	SW20	W15	WNW9	NW10	NW8	SW5	SSW6	SW9	SW8	SSW5	SW9.3	SW20
30-Jun	SW6	S5	S4	S2	S8	S8	SSW8	SSW5	SW8	WSW11	WNW12	W11	WSW15	WSW16	WNW13	W10	WNW10	NW9	NW10	NNW7	NW5	NW8	NNW3	NW4	W5.7	WSW16

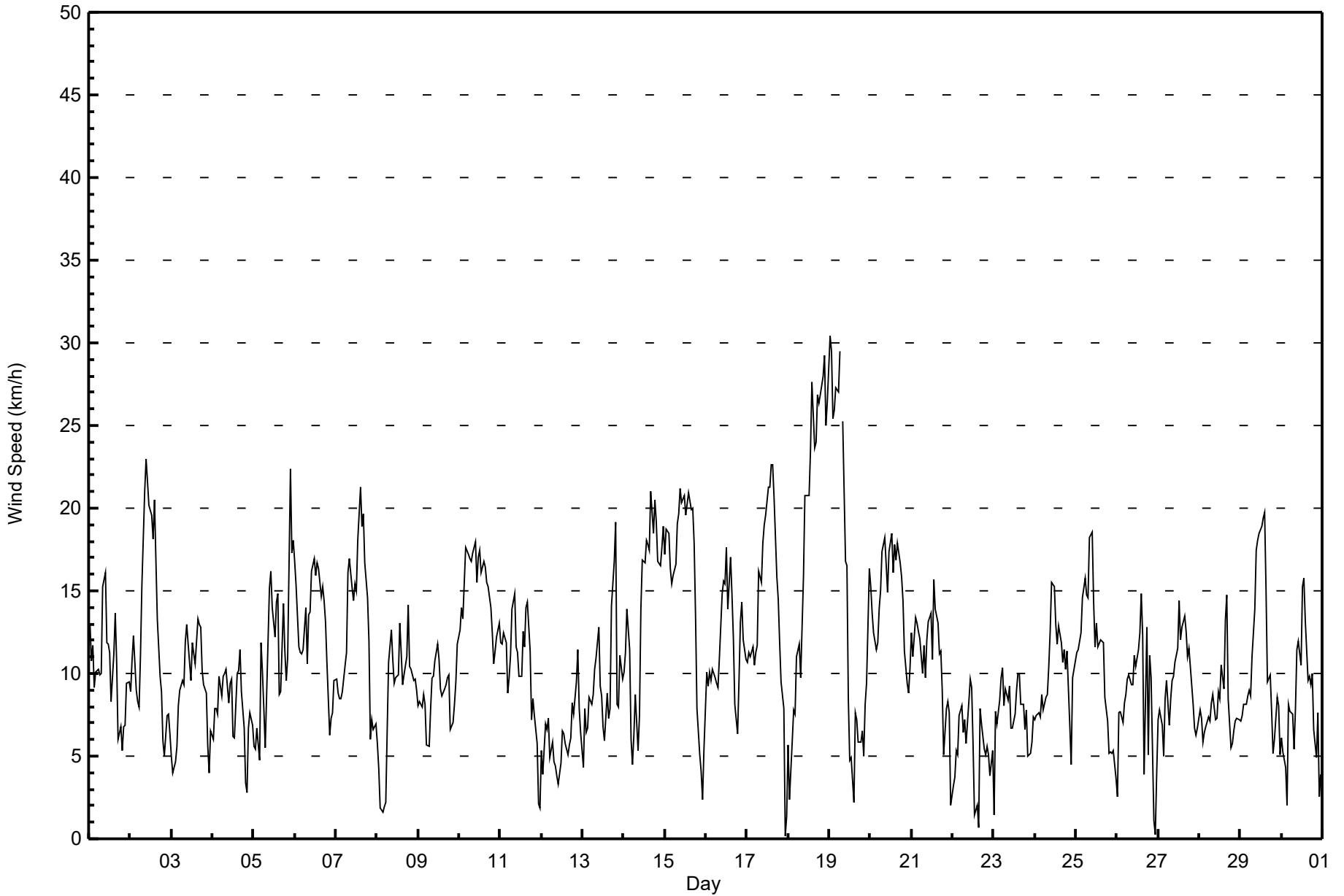
NE1.3	E1.6	E2.1	ESE1.3	ESE0.9	ESE0.6	NNE0.6	SW1.0	NNW1.2	NNW1.9	NW2.7	NW2.8	NW3.2	NW4.1	WNW4.2	NW4.3	NW4.2	NNW3.6	N1.7	NNE0.8	ENE0.5	N0.7	ENE1.6	NE1.7	Diurnal Average	
NE30	NE30	NE25	NE26	NE27	NE27	NNE29	N19	NE25	NNE23	NNE22	NNW21	WSW21	NE23	NNE28	NNE24	NNE24	NE27	NE26	NE27	NE28	NE29	NE25	NE26	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Kirby North - June 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby North - June 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	81	11.27	11.27
6 - 11	366	50.90	62.17
12 - 19	223	31.02	93.18
20 - 28	45	6.26	99.44
29 - 38	4	0.56	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
Kirby North - June 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	14	7	5	4	5	5	2	14	6	0	4	2	1	4	5	81
6 - 11	26	23	20	17	13	12	18	40	61	27	39	11	10	4	17	28	366
12 - 19	35	13	28	9	3	1	3	0	27	5	29	22	5	16	4	23	223
20 - 28	4	9	15	0	0	0	0	0	0	0	1	5	3	1	1	6	45
29 - 38	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	60	73	31	20	18	26	42	102	38	69	42	20	22	26	62	719

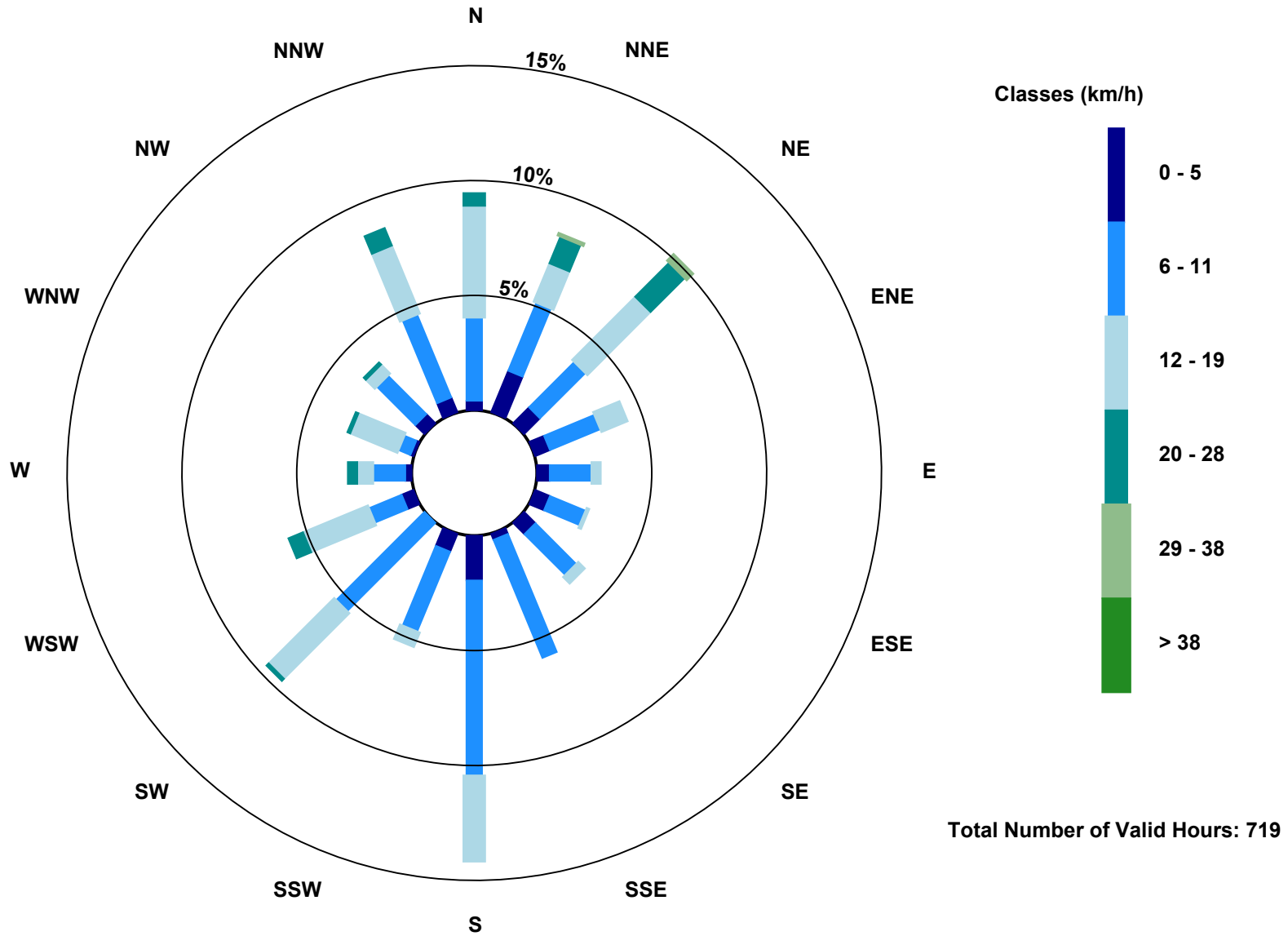
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Jun 2023

Wind Speed (WS) - km/h
Kirby North





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Kirby North - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jun 13 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: 0 km/h on Jun 18 04:00	
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-Jun	4	4	4	2	2	2	2	2	3	4	3	3	3	2	3	3	3	2	1	1	2	2	2	2	4
2-Jun	2	3	2	2	2	2	3	4	5	5	5	5	4	4	5	5	3	3	2	1	1	1	1	1	5
3-Jun	1	1	1	1	1	2	2	2	3	3	4	3	4	3	3	4	4	4	3	3	2	1	1	1	4
4-Jun	1	1	2	2	2	2	2	3	3	2	3	3	3	4	3	3	3	3	2	1	1	1	2	1	4
5-Jun	1	1	1	3	3	3	3	2	3	4	4	3	4	4	4	4	4	4	3	3	5	6	5	5	6
6-Jun	4	4	3	2	2	2	4	3	4	4	5	4	4	5	5	4	4	4	3	3	1	1	1	2	5
7-Jun	2	2	2	2	2	2	3	5	4	4	3	4	4	5	5	5	6	5	4	3	2	3	1	1	6
8-Jun	1	1	1	1	1	2	2	3	2	2	2	3	4	4	3	4	3	3	3	2	1	1	1	2	4
9-Jun	2	2	2	2	2	2	2	2	2	3	3	3	3	4	3	3	3	3	3	1	2	2	2	3	4
10-Jun	3	4	3	4	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3	4	5
11-Jun	3	3	3	3	2	2	3	3	3	3	3	3	3	4	3	4	4	3	2	3	2	1	2	1	4
12-Jun	2	2	1	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	3	2	3
13-Jun	2	2	2	1	2	2	2	3	3	4	3	3	4	4	6	4	4	4	5	5	7	3	3	3	7
14-Jun	2	2	3	4	2	1	2	3	2	3	3	4	4	4	4	4	5	5	4	5	5	4	4	4	5
15-Jun	4	4	4	4	4	4	4	4	5	6	5	6	5	5	6	5	6	5	4	3	2	2	1	3	6
16-Jun	2	1	2	2	2	2	2	3	3	5	6	5	5	4	5	4	3	2	2	5	4	3	2	2	6
17-Jun	2	2	2	3	3	2	3	3	4	4	5	4	6	5	6	6	5	5	4	3	3	1	2	1	6
18-Jun	1	1	1	0	1	2	2	2	2	4	4	5	5	5	6	6	6	6	6	6	6	6	6	5	6
19-Jun	6	7	6	6	6	6	7	DF	6	5	3	4	2	3	2	2	2	2	2	2	1	2	2	4	7
20-Jun	4	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	4	4	4	3	2	2	2	5
21-Jun	3	3	3	4	4	3	2	3	3	3	4	4	3	5	4	4	3	3	2	2	1	1	1	1	5
22-Jun	1	3	3	2	1	2	2	2	2	2	3	4	3	2	2	2	3	2	1	1	1	1	2	1	4
23-Jun	1	2	2	2	2	2	2	3	3	3	3	3	3	4	3	4	3	3	2	2	1	1	1	1	4
24-Jun	2	2	1	1	1	2	2	2	2	4	4	4	4	5	4	4	3	4	3	3	1	2	2	2	5
25-Jun	2	2	3	2	3	3	3	3	4	5	4	3	3	3	3	3	3	3	2	1	1	1	0	1	5
26-Jun	1	3	2	2	2	2	2	3	4	3	3	4	3	3	4	4	5	5	3	3	2	2	1	3	5
27-Jun	2	2	2	2	2	3	2	2	2	3	4	4	4	4	4	5	4	3	3	3	1	2	1	1	5
28-Jun	1	1	1	1	1	1	2	2	2	2	3	3	4	4	4	5	4	4	2	1	1	1	1	1	5
29-Jun	1	1	2	2	2	2	2	3	5	4	4	4	5	5	5	6	3	3	3	2	1	1	2	3	6
30-Jun	3	2	4	2	2	2	2	2	2	3	4	4	4	5	4	3	3	3	3	2	2	1	1	2	5

6	7	6	6	6	6	7	5	6	6	6	6	6	6	5	6	6	6	6	6	6	7	6	6	5	
Diurnal Maximum																									

DF - DAS Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Kirby North - June 2023

Direction of Maximum Speed: 40 deg on Jun 19 01:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 39.9 deg on Jun 18	Hours of Data: 719
Direction of Minimum Speed: 153 deg on Jun 17 23:00	Direction of Minimum Daily Speed Average: 3.9 deg on Jun 12
Direction of Minimum Speed: 153 deg on Jun 17 23:00	Hours of Missing Data: 1
Monthly Average Direction: 334.5 deg	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jun	8	356	50	6	352	3	2	16	27	21	12	359	16	14	23	36	22	10	339	348	342	351	351	337	9.6
2-Jun	339	354	15	0	353	342	1	14	20	27	17	18	16	16	25	36	53	57	79	77	95	90	105	124	25.9
3-Jun	135	91	42	24	46	36	32	38	50	58	70	66	71	80	74	82	88	82	101	109	116	130	97	79	73.1
4-Jun	61	79	74	54	76	100	116	139	145	158	158	150	220	208	220	207	217	200	230	189	127	152	161	167	153.2
5-Jun	169	171	173	198	311	323	333	15	6	28	46	58	69	65	69	20	11	335	344	330	290	293	301	295	353.2
6-Jun	292	295	288	251	243	253	293	268	276	283	284	252	256	251	247	231	226	234	230	218	191	166	167	166	252.4
7-Jun	170	170	171	181	177	173	188	219	219	234	234	249	233	245	248	256	265	257	279	300	336	346	20	27	237.3
8-Jun	17	14	111	61	28	21	18	24	34	38	19	6	16	341	357	358	19	32	56	65	61	71	92	104	33.3
9-Jun	125	99	122	130	132	162	150	146	157	150	134	124	121	105	112	130	152	162	162	161	176	177	168	171	142.5
10-Jun	174	172	176	177	180	181	180	184	186	186	183	180	178	177	174	174	175	177	178	175	169	168	171	172	177.5
11-Jun	174	169	172	174	186	187	204	220	258	291	310	327	282	301	285	309	314	320	317	321	331	334	11	341	268.1
12-Jun	341	24	34	12	8	9	349	350	10	27	28	13	5	8	57	57	70	76	98	110	130	136	150	48	49.8
13-Jun	110	137	150	147	152	162	172	177	188	213	214	228	242	200	172	146	89	143	139	131	165	336	49	19	157.6
14-Jun	40	43	56	77	64	46	97	135	108	21	6	27	13	4	342	337	351	350	4	5	4	1	358	1	13.3
15-Jun	358	357	357	0	358	358	348	359	354	349	340	340	341	330	324	328	334	334	332	330	304	255	130	194	343.1
16-Jun	205	191	189	181	184	181	179	188	192	206	205	205	223	241	251	241	227	216	195	213	223	234	232	232	213.0
17-Jun	217	221	214	223	212	217	228	248	255	248	250	253	257	251	252	270	269	273	264	284	305	315	153	189	251.7
18-Jun	309	25	55	45	55	48	42	37	38	48	48	48	43	38	33	32	30	35	41	41	42	40	47	39	39.9
19-Jun	40	41	42	42	43	38	33	DF	41	50	42	66	15	13	196	234	263	267	304	336	335	334	359	8	30.7
20-Jun	11	360	354	348	342	348	352	353	2	3	4	3	358	353	346	342	336	342	350	352	349	344	341	334	351.9
21-Jun	330	330	329	332	339	329	319	322	322	332	340	353	356	333	337	332	340	309	317	14	118	146	159	73	335.0
22-Jun	136	163	172	180	177	184	194	207	212	241	258	276	270	77	286	136	214	216	189	169	160	191	267	31	208.0
23-Jun	122	158	163	154	163	160	171	176	179	195	208	243	229	250	278	253	231	227	198	215	200	175	163	162	197.1
24-Jun	165	167	165	172	172	175	204	212	226	223	221	221	235	246	243	248	247	234	224	216	207	191	38	20	216.7
25-Jun	35	49	48	36	35	39	34	41	47	49	48	47	43	36	56	50	41	46	56	45	40	41	47	48	43.7
26-Jun	75	152	170	178	174	172	181	201	226	233	223	232	228	227	230	231	269	16	176	195	214	313	81	240	210.1
27-Jun	227	210	207	241	260	277	346	19	5	3	353	348	3	359	8	18	33	32	57	73	86	86	135	146	13.6
28-Jun	136	153	170	182	177	172	182	182	199	177	174	227	233	228	232	251	282	4	104	181	190	180	180	174	197.6
29-Jun	180	179	178	186	189	187	190	208	213	219	223	221	224	225	227	272	294	316	326	236	206	226	218	201	221.5
30-Jun	228	182	170	183	177	187	198	198	216	255	296	274	247	253	283	261	284	312	313	333	315	309	347	316	261.1
	39.3	84.9	95.9	102.3	112.2	113.5	18.0	231.1	339.0	326.5	325.5	315.7	305.9	304.8	301.7	304.5	317.0	331.4	354.8	21.4	74.8	359.2	71.5	40.7	

Diurnal Average

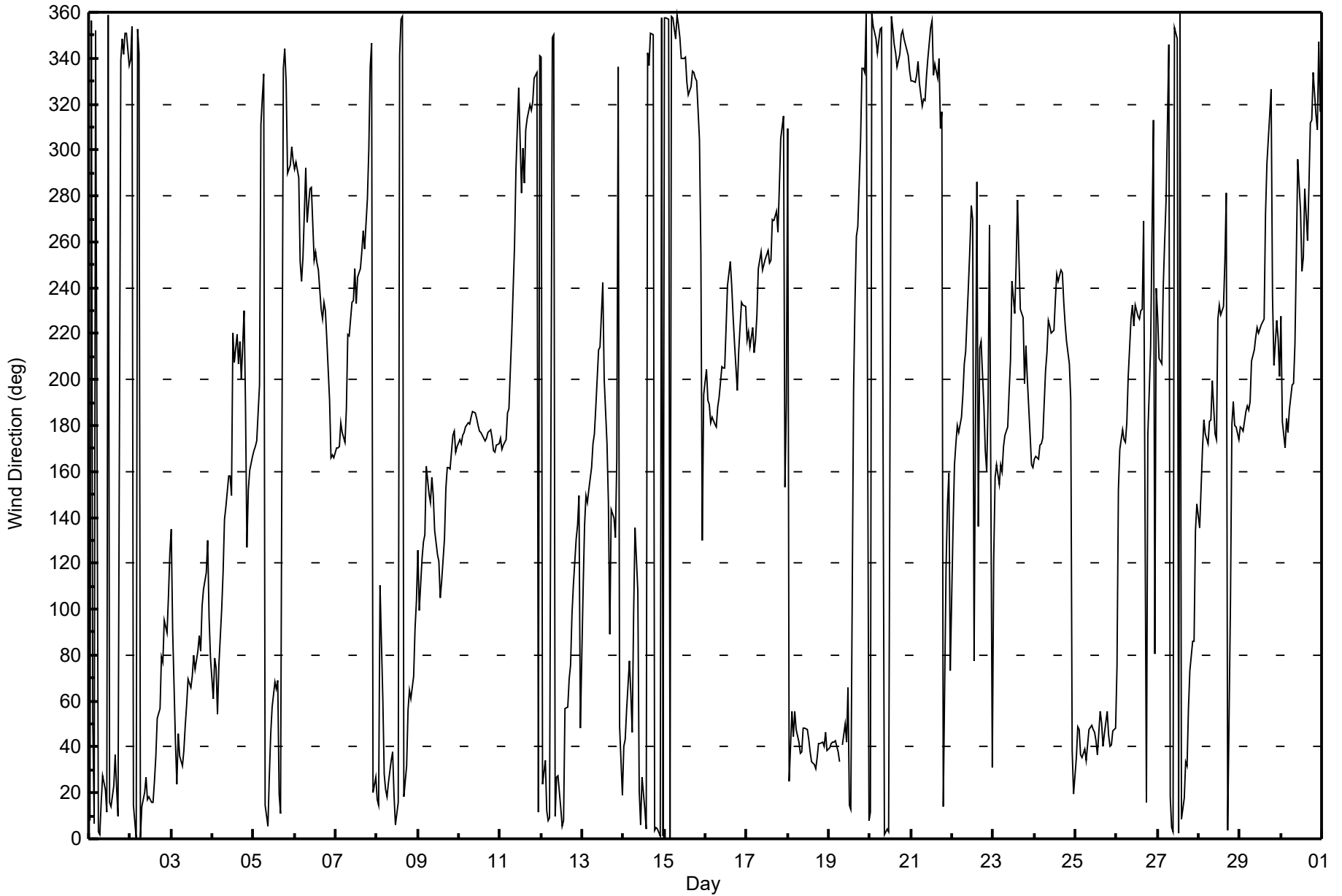
DF - DAS Failure

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Kirby North - June 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Kirby North - June 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Jun 26 23:00	Hours of Data: 719
Minimum Value: 5 deg on Jun 2 21:00	Hours of Missing Data: 1
Percentiles: P ₁ = 8 P ₁₀ = 12 Q ₁ = 16 Median = 19 Q ₃ = 25 P ₉₀ = 37 P ₉₉ = 73	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-Jun	23	38	31	42	17	17	17	14	14	18	20	21	18	26	22	16	15	18	15	18	19	18	18	16	42
2-Jun	18	19	17	15	17	20	18	15	15	15	17	20	19	21	17	20	19	20	19	14	5	6	11	8	21
3-Jun	6	44	22	9	8	11	13	14	18	22	25	27	23	25	26	21	21	20	17	15	13	10	24	11	44
4-Jun	14	13	16	12	18	17	17	18	19	22	23	26	48	50	23	29	20	27	19	41	34	15	17	14	50
5-Jun	11	10	12	47	18	17	20	28	17	20	22	20	26	21	18	42	31	22	20	22	36	17	18	16	47
6-Jun	17	16	20	16	14	20	17	23	25	25	26	21	20	19	20	24	19	19	18	17	18	10	11	11	26
7-Jun	14	16	15	14	17	18	21	19	17	19	23	23	23	20	17	26	19	20	24	16	14	16	23	9	26
8-Jun	5	16	48	53	45	55	12	9	12	15	25	30	33	28	29	42	26	28	15	12	9	7	10	16	55
9-Jun	17	20	14	14	12	20	20	19	18	24	28	26	31	34	32	27	27	21	16	14	16	16	18	18	34
10-Jun	18	18	19	19	20	20	21	20	22	23	24	23	22	26	26	24	22	22	21	20	18	19	20	19	26
11-Jun	19	18	17	19	19	19	19	20	22	25	26	29	28	29	31	21	20	17	19	20	15	15	46	42	46
12-Jun	17	30	8	14	8	12	12	15	15	12	18	22	20	28	38	46	28	19	15	14	13	14	46	31	46
13-Jun	36	18	18	15	17	20	19	21	23	22	31	37	63	58	44	29	40	19	17	16	74	50	14	33	74
14-Jun	17	12	12	17	19	21	27	24	39	28	17	14	18	24	18	18	19	20	17	16	17	17	19	18	39
15-Jun	18	18	17	17	17	19	18	19	20	21	19	17	19	16	17	17	18	17	19	17	25	53	61	49	61
16-Jun	13	12	12	12	13	15	16	23	25	23	25	23	24	18	14	17	16	17	20	27	18	13	12	13	27
17-Jun	14	14	16	15	19	17	18	14	16	17	16	21	18	16	21	22	21	24	25	22	18	12	82	70	82
18-Jun	11	47	14	8	9	11	10	10	11	15	16	15	14	14	13	13	13	12	13	13	13	13	14	12	47
19-Jun	12	13	13	13	14	13	13	DF	13	18	13	61	46	69	66	21	26	33	26	18	18	15	17	16	69
20-Jun	16	18	17	18	17	18	18	18	17	17	17	17	19	19	19	19	17	19	17	18	18	18	17	16	19
21-Jun	15	16	15	16	16	14	16	18	17	20	27	21	26	25	24	26	26	23	19	52	17	11	11	48	52
22-Jun	41	44	59	39	9	18	23	21	36	28	39	37	47	82	83	80	20	14	17	11	9	22	55	37	83
23-Jun	93	15	17	17	19	17	18	22	24	31	50	53	45	38	32	19	31	23	23	19	18	9	11	8	93
24-Jun	14	12	10	12	12	15	17	18	19	25	21	21	23	25	26	25	22	24	23	16	15	54	14	24	54
25-Jun	13	10	19	9	10	12	14	15	16	16	20	19	15	19	22	26	23	31	19	12	14	15	10	20	31
26-Jun	53	18	18	19	18	19	21	28	32	25	24	30	23	20	20	17	63	42	69	19	18	81	100	47	100
27-Jun	17	12	16	39	26	27	27	19	23	27	31	28	28	25	27	25	32	26	20	14	8	21	13	10	39
28-Jun	11	11	11	15	14	14	19	25	26	35	48	35	40	25	39	29	24	54	39	17	15	14	13	13	54
29-Jun	13	15	16	15	16	17	18	20	18	17	19	19	18	18	17	33	28	21	19	36	15	11	15	54	54
30-Jun	42	30	39	52	15	18	21	31	25	21	28	36	17	22	29	36	43	21	24	17	15	14	36	32	52
	93	47	59	53	45	55	27	31	39	35	50	61	63	82	83	80	63	54	69	52	74	81	100	70	

Diurnal Maximum

DF - DAS Failure



Appendix 1 - Summary of Ambient Air Quality Objectives (AAAOs) and Ambient Air Quality Guidelines (AAAQGs) in June 2023

<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	1Jun23, 01:00	414291	1-hr	120	119.6	exc
Fort Chip	PM2.5	1Jun23, 02:00	414291	1-hr	100	99.8	exc
Fort Chip	PM2.5	1Jun23, 03:00	414291	1-hr	81	80.8	exc
Fort Chip	PM2.5	1Jun23, 04:00	414291	1-hr	104	104.4	exc
Fort Chip	PM2.5	1Jun23, 05:00	414291	1-hr	142	141.8	exc
Fort Chip	PM2.5	1Jun23, 06:00	414291	1-hr	155	154.5	exc
Fort Chip	PM2.5	1Jun23, 07:00	414291	1-hr	198	198.4	exc
Fort Chip	PM2.5	1Jun23, 08:00	414291	1-hr	214	214.5	exc
Fort Chip	PM2.5	1Jun23, 09:00	414291	1-hr	221	220.9	exc
Ft. McKay S	PM2.5	1Jun23, 09:00	414293	1-hr	89	88.9	exc
Bertha Ganter	PM2.5	1Jun23, 10:00	414290	1-hr	85	-	ret
Fort Chip	PM2.5	1Jun23, 10:00	414291	1-hr	314	313.8	exc
Fort Chip	PM2.5	1Jun23, 11:00	414291	1-hr	413	412.9	exc
Fort Chip	PM2.5	1Jun23, 12:00	414291	1-hr	232	232.5	exc
Fort Chip	PM2.5	1Jun23, 13:00	414291	1-hr	160	159.8	exc
Fort Chip	PM2.5	1Jun23, 14:00	414291	1-hr	233	233.0	exc
Fort Chip	PM2.5	1Jun23, 15:00	414291	1-hr	327	326.9	exc
Fort Chip	PM2.5	1Jun23, 16:00	414291	1-hr	171	171.2	exc
Fort Chip	PM2.5	1Jun23, 17:00	414291	1-hr	131	131.1	exc
Wapasu	PM2.5	1Jun23, 18:00	414294	1-hr	96	95.7	exc
Fort Hills	PM2.5	1Jun23, 18:00	414127	1-hr	92	92.0	exc
Fort Chip	PM2.5	1Jun23, 18:00	414291	1-hr	136	136.1	exc
Wapasu	PM2.5	1Jun23, 19:00	414294	1-hr	87	87.2	exc
Fort Hills	PM2.5	1Jun23, 19:00	414127	1-hr	83	83.3	exc
Fort Chip	PM2.5	1Jun23, 19:00	414291	1-hr	103	102.7	exc
Wapasu	PM2.5	1Jun23, 20:00	414294	1-hr	90	89.6	exc
Wapasu	PM2.5	1Jun23, 21:00	414294	1-hr	147	146.6	exc
Fort Hills	PM2.5	1Jun23, 21:00	414127	1-hr	251	251.0	exc
Ells River	PM2.5	1Jun23, 21:00	414128	1-hr	89	89.3	exc
Barge Landing	PM2.5	1Jun23, 21:00	414292	1-hr	103	102.8	exc
Fort Chip	PM2.5	1Jun23, 22:00	414291	1-hr	129	128.6	exc
Wapasu	PM2.5	1Jun23, 22:00	414294	1-hr	215	214.7	exc
Fort Hills	PM2.5	1Jun23, 22:00	414127	1-hr	299	299.3	exc
Ells River	PM2.5	1Jun23, 22:00	414128	1-hr	152	152.2	exc
Barge Landing	PM2.5	1Jun23, 22:00	414292	1-hr	282	281.6	exc
Ft. McKay S	PM2.5	1Jun23, 22:00	414293	1-hr	116	115.6	exc
Fort Chip	PM2.5	1Jun23, 23:00	414291	1-hr	194	194.3	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>
Wapasu	PM2.5	1Jun23, 23:00	414294	1-hr	153	153.2	exc
Fort Hills	PM2.5	1Jun23, 23:00	414127	1-hr	142	141.7	exc
Ells River	PM2.5	1Jun23, 23:00	414128	1-hr	156	156.3	exc
Barge Landing	PM2.5	1Jun23, 23:00	414292	1-hr	297	297.1	exc
Ft. McKay S	PM2.5	1Jun23, 23:00	414293	1-hr	158	158.1	exc
Bertha Ganter	PM2.5	1Jun23, 24:00		24-hr	57	0	nae
Fort Chip	PM2.5	1Jun23, 24:00	414291	1-hr	250	249.9	exc
Wapasu	PM2.5	1Jun23, 24:00	414294	1-hr	107	106.6	exc
Fort Hills	PM2.5	1Jun23, 24:00	414127	1-hr	89	89.0	exc
Fort Hills	PM2.5	1Jun23, 24:00	414127	24-hr	78	78.1	exc
Ells River	PM2.5	1Jun23, 24:00	414128	1-hr	87	87.1	exc
Buffalo Viewpoint	PM2.5	1Jun23, 24:00	414295	24-hr	43	42.8	exc
Patricia McInnes	PM2.5	1Jun23, 24:00	414296	24-hr	41	41.1	exc
Athabasca Valley	PM2.5	1Jun23, 24:00	414289	24-hr	37	36.8	exc
Fort Chip	PM2.5	1Jun23, 24:00	414291	24-hr	177	177.2	exc
Barge Landing	PM2.5	1Jun23, 24:00	414292	1-hr	253	253.1	exc
Barge Landing	PM2.5	1Jun23, 24:00	414292	24-hr	79	78.6	exc
Ft. McKay S	PM2.5	1Jun23, 24:00	414293	1-hr	213	212.8	exc
Ft. McKay S	PM2.5	1Jun23, 24:00	414293	24-hr	73	72.9	exc
Anzac	PM2.5	1Jun23, 24:00	414301	24-hr	35	35.4	exc
Wapasu	PM2.5	1Jun23, 24:00	414294	24-hr	77	76.8	exc
Stony Mtn.	PM2.5	1Jun23, 24:00	414298	24-hr	34	34.4	exc
Conklin	PM2.5	1Jun23, 24:00	414297	24-hr	37	37.3	exc
Janvier	PM2.5	1Jun23, 24:00	414299	24-hr	41	41.3	exc
Surmont 2	PM2.5	1Jun23, 24:00	414300	24-hr	30	29.9	exc
Ells River	PM2.5	1Jun23, 24:00	414128	24-hr	59	59.1	exc
Fort Chip	PM2.5	2Jun23, 01:00	414291	1-hr	260	259.6	exc
Ft. McKay S	PM2.5	2Jun23, 01:00	414293	1-hr	237	237.3	exc
Wapasu	PM2.5	2Jun23, 01:00	414294	1-hr	94	94.1	exc
Fort Hills	PM2.5	2Jun23, 01:00	414168	1-hr	85	85.3	exc
Ells River	PM2.5	2Jun23, 01:00	414169	1-hr	81	80.6	exc
Buffalo Viewpoint	PM2.5	2Jun23, 01:00	414295	1-hr	82	82.2	exc
Barge Landing	PM2.5	2Jun23, 01:00	414292	1-hr	155	154.5	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>
Fort Chip	PM2.5	2Jun23, 02:00	414291	1-hr	345	344.9	exc
Ft. McKay S	PM2.5	2Jun23, 02:00	414293	1-hr	178	178.1	exc
Wapasu	PM2.5	2Jun23, 02:00	414294	1-hr	93	93.1	exc
Fort Hills	PM2.5	2Jun23, 02:00	414168	1-hr	91	90.9	exc
Ells River	PM2.5	2Jun23, 02:00	414169	1-hr	87	87.2	exc
Buffalo Viewpoint	PM2.5	2Jun23, 02:00	414295	1-hr	157	157.5	exc
Barge Landing	PM2.5	2Jun23, 02:00	414292	1-hr	136	136.3	exc
Fort Chip	PM2.5	2Jun23, 03:00	414291	1-hr	384	383.5	exc
Ft. McKay S	PM2.5	2Jun23, 03:00	414293	1-hr	162	161.9	exc
Wapasu	PM2.5	2Jun23, 03:00	414294	1-hr	92	91.7	exc
Fort Hills	PM2.5	2Jun23, 03:00	414168	1-hr	98	97.8	exc
Ells River	PM2.5	2Jun23, 03:00	414169	1-hr	91	91.0	exc
Buffalo Viewpoint	PM2.5	2Jun23, 03:00	414295	1-hr	162	162.0	exc
Barge Landing	PM2.5	2Jun23, 03:00	414292	1-hr	146	146.0	exc
Buffalo Viewpoint	PM2.5	2Jun23, 04:00	414295	1-hr	148	147.6	exc
Fort Chip	PM2.5	2Jun23, 04:00	414291	1-hr	482	481.5	exc
Ft. McKay S	PM2.5	2Jun23, 04:00	414293	1-hr	136	136.4	exc
Wapasu	PM2.5	2Jun23, 04:00	414294	1-hr	96	96.2	exc
Fort Hills	PM2.5	2Jun23, 04:00	414168	1-hr	89	89.0	exc
Ells River	PM2.5	2Jun23, 04:00	414169	1-hr	90	90.3	exc
Barge Landing	PM2.5	2Jun23, 04:00	414292	1-hr	95	94.8	exc
Buffalo Viewpoint	PM2.5	2Jun23, 05:00	414295	1-hr	117	116.5	exc
Fort Chip	PM2.5	2Jun23, 05:00	414291	1-hr	503	503.1	exc
Ft. McKay S	PM2.5	2Jun23, 05:00	414293	1-hr	115	115.3	exc
Wapasu	PM2.5	2Jun23, 05:00	414294	1-hr	122	122.2	exc
Janvier	PM2.5	2Jun23, 05:00	414299	1-hr	83	83.1	exc
Surmont 2	PM2.5	2Jun23, 05:00	414300	1-hr	94	93.8	exc
Patricia McInnes	PM2.5	2Jun23, 05:00	414296	1-hr	141	140.9	exc
Buffalo Viewpoint	PM2.5	2Jun23, 06:00	414295	1-hr	97	96.9	exc
Fort Chip	PM2.5	2Jun23, 06:00	414291	1-hr	478	477.6	exc
Ft. McKay S	PM2.5	2Jun23, 06:00	414293	1-hr	104	103.5	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>
Anzac	PM2.5	2Jun23, 06:00	414301	1-hr	80	80.3	exc
Wapasu	PM2.5	2Jun23, 06:00	414294	1-hr	152	151.5	exc
Stony Mtn.	PM2.5	2Jun23, 06:00	414298	1-hr	94	94.1	exc
Conklin	PM2.5	2Jun23, 06:00	414297	1-hr	104	104.1	exc
Janvier	PM2.5	2Jun23, 06:00	414299	1-hr	106	105.7	exc
Surmont 2	PM2.5	2Jun23, 06:00	414300	1-hr	118	118.1	exc
Patricia McInnes	PM2.5	2Jun23, 06:00	414296	1-hr	144	144.4	exc
Athabasca Valley	PM2.5	2Jun23, 06:00	414289	1-hr	111	110.9	exc
Buffalo Viewpoint	PM2.5	2Jun23, 07:00	414295	1-hr	114	114.2	exc
Fort Chip	PM2.5	2Jun23, 07:00	414291	1-hr	352	352.0	exc
Ft. McKay S	PM2.5	2Jun23, 07:00	414293	1-hr	87	86.8	exc
Wapasu	PM2.5	2Jun23, 07:00	414294	1-hr	189	188.8	exc
Stony Mtn.	PM2.5	2Jun23, 07:00	414298	1-hr	104	103.9	exc
Conklin	PM2.5	2Jun23, 07:00	414297	1-hr	111	111.0	exc
Janvier	PM2.5	2Jun23, 07:00	414299	1-hr	131	131.4	exc
Surmont 2	PM2.5	2Jun23, 07:00	414300	1-hr	101	100.9	exc
Patricia McInnes	PM2.5	2Jun23, 07:00	414296	1-hr	122	121.8	exc
Athabasca Valley	PM2.5	2Jun23, 07:00	414289	1-hr	128	128.1	exc
Fort Chip	PM2.5	2Jun23, 08:00	414291	1-hr	294	293.5	exc
Ft. McKay S	PM2.5	2Jun23, 08:00	414293	1-hr	90	90.2	exc
Anzac	PM2.5	2Jun23, 08:00	414301	1-hr	96	96.3	exc
Wapasu	PM2.5	2Jun23, 08:00	414294	1-hr	200	200.3	exc
Stony Mtn.	PM2.5	2Jun23, 08:00	414298	1-hr	110	110.2	exc
Conklin	PM2.5	2Jun23, 08:00	414297	1-hr	125	124.5	exc
Janvier	PM2.5	2Jun23, 08:00	414299	1-hr	124	123.9	exc
Patricia McInnes	PM2.5	2Jun23, 08:00	414296	1-hr	115	115.3	exc
Athabasca Valley	PM2.5	2Jun23, 08:00	414289	1-hr	113	113.2	exc
Buffalo Viewpoint	PM2.5	2Jun23, 09:00	414295	1-hr	154	154.4	exc
Fort Chip	PM2.5	2Jun23, 09:00	414291	1-hr	259	259.2	exc
Ft. McKay S	PM2.5	2Jun23, 09:00	414293	1-hr	150	150.1	exc
Anzac	PM2.5	2Jun23, 09:00	414301	1-hr	115	114.9	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>
Wapasu	PM2.5	2Jun23, 09:00	414294	1-hr	160	160.3	exc
Stony Mtn.	PM2.5	2Jun23, 09:00	414298	1-hr	113	113.3	exc
Conklin	PM2.5	2Jun23, 09:00	414297	1-hr	120	119.6	exc
Janvier	PM2.5	2Jun23, 09:00	414299	1-hr	115	115.3	exc
Fort Hills	PM2.5	2Jun23, 09:00	414168	1-hr	192	191.5	exc
Surmont 2	PM2.5	2Jun23, 09:00	414300	1-hr	83	82.9	exc
Ells River	PM2.5	2Jun23, 09:00	414169	1-hr	168	167.9	exc
Patricia McInnes	PM2.5	2Jun23, 09:00	414296	1-hr	152	151.8	exc
Athabasca Valley	PM2.5	2Jun23, 09:00	414289	1-hr	117	117.3	exc
Barge Landing	PM2.5	2Jun23, 09:00	414292	1-hr	80	80.2	exc
Buffalo Viewpoint	PM2.5	2Jun23, 10:00	414295	1-hr	173	173.4	exc
Patricia McInnes	PM2.5	2Jun23, 10:00	414296	1-hr	155	155.0	exc
Fort Chip	PM2.5	2Jun23, 10:00	414291	1-hr	202	202.1	exc
Ft. McKay S	PM2.5	2Jun23, 10:00	414293	1-hr	275	275.0	exc
Anzac	PM2.5	2Jun23, 10:00	414301	1-hr	114	113.8	exc
Wapasu	PM2.5	2Jun23, 10:00	414294	1-hr	150	150.4	exc
Stony Mtn.	PM2.5	2Jun23, 10:00	414298	1-hr	80	80.2	exc
Conklin	PM2.5	2Jun23, 10:00	414297	1-hr	92	92.3	exc
Janvier	PM2.5	2Jun23, 10:00	414299	1-hr	89	88.7	exc
Fort Hills	PM2.5	2Jun23, 10:00	414168	1-hr	244	244.4	exc
Ells River	PM2.5	2Jun23, 10:00	414169	1-hr	285	285.4	exc
Athabasca Valley	PM2.5	2Jun23, 10:00	414289	1-hr	140	140.1	exc
Barge Landing	PM2.5	2Jun23, 10:00	414292	1-hr	202	202.0	exc
Surmont 2	PM2.5	2Jun23, 10:00	414300	1-hr	90	89.8	exc
Buffalo Viewpoint	PM2.5	2Jun23, 11:00	414295	1-hr	147	146.9	exc
Patricia McInnes	PM2.5	2Jun23, 11:00	414296	1-hr	139	139.1	exc
Fort Chip	PM2.5	2Jun23, 11:00	414291	1-hr	164	164.1	exc
Ft. McKay S	PM2.5	2Jun23, 11:00	414293	1-hr	233	233.2	exc
Anzac	PM2.5	2Jun23, 11:00	414301	1-hr	146	145.7	exc
Wapasu	PM2.5	2Jun23, 11:00	414294	1-hr	153	152.9	exc
Stony Mtn.	PM2.5	2Jun23, 11:00	414298	1-hr	84	83.5	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>
Conklin	PM2.5	2Jun23, 11:00	414297	1-hr	94	94.5	exc
Janvier	PM2.5	2Jun23, 11:00	414299	1-hr	91	90.8	exc
Fort Hills	PM2.5	2Jun23, 11:00	414168	1-hr	264	264.4	exc
Ells River	PM2.5	2Jun23, 11:00	414169	1-hr	208	207.9	exc
Athabasca Valley	PM2.5	2Jun23, 11:00	414289	1-hr	128	127.8	exc
Barge Landing	PM2.5	2Jun23, 11:00	414292	1-hr	233	233.1	exc
Buffalo Viewpoint	PM2.5	2Jun23, 12:00	414295	1-hr	178	178.2	exc
Patricia McInnes	PM2.5	2Jun23, 12:00	414296	1-hr	146	145.5	exc
Fort Chip	PM2.5	2Jun23, 12:00	414291	1-hr	165	165.0	exc
Ft. McKay S	PM2.5	2Jun23, 12:00	414293	1-hr	224	223.8	exc
Anzac	PM2.5	2Jun23, 12:00	414301	1-hr	136	136.1	exc
Wapasu	PM2.5	2Jun23, 12:00	414294	1-hr	158	157.6	exc
Stony Mtn.	PM2.5	2Jun23, 12:00	414298	1-hr	104	104.1	exc
Conklin	PM2.5	2Jun23, 12:00	414297	1-hr	115	114.9	exc
Janvier	PM2.5	2Jun23, 12:00	414299	1-hr	98	98.3	exc
Fort Hills	PM2.5	2Jun23, 12:00	414168	1-hr	257	256.6	exc
Ells River	PM2.5	2Jun23, 12:00	414169	1-hr	216	216.1	exc
Athabasca Valley	PM2.5	2Jun23, 12:00	414289	1-hr	126	126.3	exc
Barge Landing	PM2.5	2Jun23, 12:00	414292	1-hr	219	218.9	exc
Buffalo Viewpoint	PM2.5	2Jun23, 13:00	414295	1-hr	190	190.1	exc
Patricia McInnes	PM2.5	2Jun23, 13:00	414296	1-hr	144	144.1	exc
Athabasca Valley	PM2.5	2Jun23, 13:00	414289	1-hr	119	119.3	exc
Fort Chip	PM2.5	2Jun23, 13:00	414291	1-hr	148	147.9	exc
Barge Landing	PM2.5	2Jun23, 13:00	414292	1-hr	235	234.7	exc
Ft. McKay S	PM2.5	2Jun23, 13:00	414293	1-hr	226	225.8	exc
Anzac	PM2.5	2Jun23, 13:00	414301	1-hr	127	127.2	exc
Wapasu	PM2.5	2Jun23, 13:00	414294	1-hr	156	155.7	exc
Stony Mtn.	PM2.5	2Jun23, 13:00	414298	1-hr	130	129.5	exc
Conklin	PM2.5	2Jun23, 13:00	414297	1-hr	135	134.5	exc
Janvier	PM2.5	2Jun23, 13:00	414299	1-hr	105	105.5	exc
Fort Hills	PM2.5	2Jun23, 13:00	414168	1-hr	306	306.5	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>
Surmont 2	PM2.5	2Jun23, 11:00	414300	1-hr	104	103.9	exc
Surmont 2	PM2.5	2Jun23, 12:00	414300	1-hr	107	106.6	exc
Surmont 2	PM2.5	2Jun23, 13:00	414300	1-hr	111	111.1	exc
Ells River	PM2.5	2Jun23, 13:00	414169	1-hr	236	235.7	exc
Buffalo Viewpoint	PM2.5	2Jun23, 14:00	414295	1-hr	181	181.1	exc
Patricia McInnes	PM2.5	2Jun23, 14:00	414296	1-hr	145	144.9	exc
Athabasca Valley	PM2.5	2Jun23, 14:00	414289	1-hr	112	112.3	exc
Fort Chip	PM2.5	2Jun23, 14:00	414291	1-hr	106	105.5	exc
Barge Landing	PM2.5	2Jun23, 14:00	414292	1-hr	237	237.1	exc
Ft. McKay S	PM2.5	2Jun23, 14:00	414293	1-hr	227	227.0	exc
Anzac	PM2.5	2Jun23, 14:00	414301	1-hr	120	120.2	exc
Wapasu	PM2.5	2Jun23, 14:00	414294	1-hr	157	156.9	exc
Stony Mtn.	PM2.5	2Jun23, 14:00	414298	1-hr	116	115.8	exc
Conklin	PM2.5	2Jun23, 14:00	414297	1-hr	137	137.3	exc
Janvier	PM2.5	2Jun23, 14:00	414299	1-hr	112	112.4	exc
Fort Hills	PM2.5	2Jun23, 14:00	414168	1-hr	310	310.2	exc
Surmont 2	PM2.5	2Jun23, 14:00	414300	1-hr	96	96.4	exc
Ells River	PM2.5	2Jun23, 14:00	414169	1-hr	220	220.0	exc
Buffalo Viewpoint	PM2.5	2Jun23, 15:00	414295	1-hr	167	167.2	exc
Patricia McInnes	PM2.5	2Jun23, 15:00	414296	1-hr	170	170.0	exc
Athabasca Valley	PM2.5	2Jun23, 15:00	414289	1-hr	135	135.2	exc
Fort Chip	PM2.5	2Jun23, 15:00	414291	1-hr	92	91.7	exc
Barge Landing	PM2.5	2Jun23, 15:00	414292	1-hr	252	252.1	exc
Ft. McKay S	PM2.5	2Jun23, 15:00	414293	1-hr	266	265.9	exc
Anzac	PM2.5	2Jun23, 15:00	414301	1-hr	109	109.4	exc
Wapasu	PM2.5	2Jun23, 15:00	414294	1-hr	167	167.1	exc
Conklin	PM2.5	2Jun23, 15:00	414297	1-hr	103	103.3	exc
Janvier	PM2.5	2Jun23, 15:00	414299	1-hr	108	108.6	exc
Fort Hills	PM2.5	2Jun23, 15:00	414168	1-hr	292	291.8	exc
Surmont 2	PM2.5	2Jun23, 15:00	414300	1-hr	96	96.2	exc
Ells River	PM2.5	2Jun23, 15:00	414169	1-hr	256	255.9	exc
Bertha Ganter	PM2.5	2Jun23, 15:00	414290	1-hr	254	253.9	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>
Buffalo Viewpoint	PM2.5	2Jun23, 16:00	414295	1-hr	181	181.1	exc
Athabasca Valley	PM2.5	2Jun23, 16:00	414289	1-hr	160	160.0	exc
Barge Landing	PM2.5	2Jun23, 16:00	414292	1-hr	232	232.4	exc
Ft. McKay S	PM2.5	2Jun23, 16:00	414293	1-hr	281	281.2	exc
Wapasu	PM2.5	2Jun23, 16:00	414294	1-hr	150	149.8	exc
Conklin	PM2.5	2Jun23, 16:00	414297	1-hr	109	108.7	exc
Janvier	PM2.5	2Jun23, 16:00	414299	1-hr	105	104.9	exc
Fort Hills	PM2.5	2Jun23, 16:00	414168	1-hr	251	250.5	exc
Ells River	PM2.5	2Jun23, 16:00	414169	1-hr	260	259.5	exc
Bertha Ganter	PM2.5	2Jun23, 16:00	414290	1-hr	248	248.0	exc
Buffalo Viewpoint	PM2.5	2Jun23, 17:00	414295	1-hr	204	203.9	exc
Athabasca Valley	PM2.5	2Jun23, 17:00	414289	1-hr	153	153.2	exc
Fort Chip	PM2.5	2Jun23, 17:00	414291	1-hr	84	84.1	exc
Barge Landing	PM2.5	2Jun23, 17:00	414292	1-hr	213	212.7	exc
Ft. McKay S	PM2.5	2Jun23, 17:00	414293	1-hr	270	270.4	exc
Wapasu	PM2.5	2Jun23, 17:00	414294	1-hr	129	128.8	exc
Conklin	PM2.5	2Jun23, 17:00	414297	1-hr	103	102.5	exc
Janvier	PM2.5	2Jun23, 17:00	414299	1-hr	105	105.3	exc
Fort Hills	PM2.5	2Jun23, 17:00	414168	1-hr	189	189.5	exc
Ells River	PM2.5	2Jun23, 17:00	414169	1-hr	230	230.0	exc
Bertha Ganter	PM2.5	2Jun23, 17:00	414290	1-hr	234	233.7	exc
Surmont 2	PM2.5	2Jun23, 16:00	414300	1-hr	92	91.7	exc
Surmont 2	PM2.5	2Jun23, 17:00	414300	1-hr	82	82.3	exc
Buffalo Viewpoint	PM2.5	2Jun23, 18:00	414295	1-hr	197	196.8	exc
Athabasca Valley	PM2.5	2Jun23, 18:00	414289	1-hr	162	162.1	exc
Barge Landing	PM2.5	2Jun23, 18:00	414292	1-hr	142	142.3	exc
Ft. McKay S	PM2.5	2Jun23, 18:00	414293	1-hr	208	207.6	exc
Anzac	PM2.5	2Jun23, 18:00	414301	1-hr	101	100.5	exc
Wapasu	PM2.5	2Jun23, 18:00	414294	1-hr	116	116.0	exc
Stony Mtn.	PM2.5	2Jun23, 18:00	414298	1-hr	86	85.9	exc
Conklin	PM2.5	2Jun23, 18:00	414297	1-hr	103	103.3	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>
Janvier	PM2.5	2Jun23, 18:00	414299	1-hr	101	100.9	exc
Fort Hills	PM2.5	2Jun23, 18:00	414168	1-hr	128	127.6	exc
Surmont 2	PM2.5	2Jun23, 18:00	414300	1-hr	87	86.7	exc
Ells River	PM2.5	2Jun23, 18:00	414169	1-hr	145	145.1	exc
Bertha Ganter	PM2.5	2Jun23, 18:00	414290	1-hr	155	155.4	exc
Bertha Ganter	PM2.5	2Jun23, 19:00	414290	1-hr	124	124.2	exc
Buffalo Viewpoint	PM2.5	2Jun23, 19:00	414295	1-hr	152	152.4	exc
Athabasca Valley	PM2.5	2Jun23, 19:00	414289	1-hr	165	164.8	exc
Barge Landing	PM2.5	2Jun23, 19:00	414292	1-hr	119	119.4	exc
Ft. McKay S	PM2.5	2Jun23, 19:00	414293	1-hr	156	155.6	exc
Anzac	PM2.5	2Jun23, 19:00	414301	1-hr	100	100.1	exc
Wapasu	PM2.5	2Jun23, 19:00	414294	1-hr	98	98.0	exc
Stony Mtn.	PM2.5	2Jun23, 19:00	414298	1-hr	97	97.1	exc
Conklin	PM2.5	2Jun23, 19:00	414297	1-hr	111	110.9	exc
Janvier	PM2.5	2Jun23, 19:00	414299	1-hr	100	100.4	exc
Fort Hills	PM2.5	2Jun23, 19:00	414168	1-hr	104	104.5	exc
Surmont 2	PM2.5	2Jun23, 19:00	414300	1-hr	87	87.4	exc
Ells River	PM2.5	2Jun23, 19:00	414169	1-hr	117	117.3	exc
Bertha Ganter	PM2.5	2Jun23, 20:00	414290	1-hr	94	93.6	exc
Buffalo Viewpoint	PM2.5	2Jun23, 20:00	414295	1-hr	112	112.1	exc
Athabasca Valley	PM2.5	2Jun23, 20:00	414289	1-hr	142	142.5	exc
Barge Landing	PM2.5	2Jun23, 20:00	414292	1-hr	87	87.1	exc
Ft. McKay S	PM2.5	2Jun23, 20:00	414293	1-hr	127	127.3	exc
Anzac	PM2.5	2Jun23, 20:00	414301	1-hr	100	99.7	exc
Stony Mtn.	PM2.5	2Jun23, 20:00	414298	1-hr	98	97.6	exc
Conklin	PM2.5	2Jun23, 20:00	414297	1-hr	108	108.0	exc
Janvier	PM2.5	2Jun23, 20:00	414299	1-hr	98	97.8	exc
Fort Hills	PM2.5	2Jun23, 20:00	414168	1-hr	85	85.0	exc
Ells River	PM2.5	2Jun23, 20:00	414169	1-hr	90	90.0	exc
Bertha Ganter	PM2.5	2Jun23, 21:00	414290	1-hr	81	80.9	exc
Buffalo Viewpoint	PM2.5	2Jun23, 21:00	414295	1-hr	96	96.5	exc
Athabasca Valley	PM2.5	2Jun23, 21:00	414289	1-hr	101	101.2	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	2Jun23, 21:00	414293	1-hr	100	100.5	exc
Anzac	PM2.5	2Jun23, 21:00	414301	1-hr	93	93.4	exc
Stony Mtn.	PM2.5	2Jun23, 21:00	414298	1-hr	100	100.2	exc
Conklin	PM2.5	2Jun23, 21:00	414297	1-hr	120	120.0	exc
Janvier	PM2.5	2Jun23, 21:00	414299	1-hr	87	86.5	exc
Buffalo Viewpoint	PM2.5	2Jun23, 22:00	414295	1-hr	88	88.1	exc
Athabasca Valley	PM2.5	2Jun23, 22:00	414289	1-hr	84	84.3	exc
Ft. McKay S	PM2.5	2Jun23, 22:00	414293	1-hr	95	95.1	exc
Anzac	PM2.5	2Jun23, 22:00	414301	1-hr	85	85.5	exc
Stony Mtn.	PM2.5	2Jun23, 22:00	414298	1-hr	98	98.3	exc
Conklin	PM2.5	2Jun23, 22:00	414297	1-hr	103	103.4	exc
Janvier	PM2.5	2Jun23, 22:00	414299	1-hr	81	81.0	exc
Ft. McKay S	PM2.5	2Jun23, 23:00	414293	1-hr	88	88.3	exc
Stony Mtn.	PM2.5	2Jun23, 23:00	414298	1-hr	87	87.0	exc
Conklin	PM2.5	2Jun23, 23:00	414297	1-hr	100	100.0	exc
Anzac	PM2.5	2Jun23, 24:00	414301	24-hr	88	88.0	exc
Wapasu	PM2.5	2Jun23, 24:00	414294	24-hr	121	121.0	exc
Stony Mtn.	PM2.5	2Jun23, 24:00	414298	1-hr	82	82.4	exc
Stony Mtn.	PM2.5	2Jun23, 24:00	414298	24-hr	88	88.0	exc
Conklin	PM2.5	2Jun23, 24:00	414297	1-hr	97	97.2	exc
Conklin	PM2.5	2Jun23, 24:00	414297	24-hr	101	100.6	exc
Janvier	PM2.5	2Jun23, 24:00	414299	24-hr	91	90.6	exc
Fort Hills	PM2.5	2Jun23, 24:00	414168	24-hr	145	145.2	exc
Surmont 2	PM2.5	2Jun23, 24:00	414300	24-hr	80	80.1	exc
Ells River	PM2.5	2Jun23, 24:00	414169	24-hr	138	137.8	exc
Bertha Ganter	PM2.5	2Jun23, 24:00	414290	24-hr	80	-	ret
Buffalo Viewpoint	PM2.5	2Jun23, 24:00	414295	24-hr	138	137.8	exc
Athabasca Valley	PM2.5	2Jun23, 24:00	414289	24-hr	103	103.1	exc
Fort Chip	PM2.5	2Jun23, 24:00	414291	24-hr	198	197.7	exc
Barge Landing	PM2.5	2Jun23, 24:00	414292	24-hr	138	138.3	exc
Ft. McKay S	PM2.5	2Jun23, 24:00	414293	24-hr	171	171.4	exc
Stony Mtn.	PM2.5	3Jun23, 01:00	414298	1-hr	85	84.9	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>
Conklin	PM2.5	3Jun23, 01:00	414297	1-hr	102	101.9	exc
Janvier	PM2.5	3Jun23, 01:00	414299	1-hr	80	80.5	exc
Stony Mtn.	PM2.5	3Jun23, 02:00	414298	1-hr	84	84.1	exc
Conklin	PM2.5	3Jun23, 02:00	414297	1-hr	95	94.9	exc
Stony Mtn.	PM2.5	3Jun23, 03:00	414298	1-hr	84	84.5	exc
Conklin	PM2.5	3Jun23, 03:00	414297	1-hr	89	89.2	exc
Conklin	PM2.5	3Jun23, 04:00	414297	1-hr	85	84.7	exc
Jackfish 1	H2S	3Jun23, 04:00	414172	1-hr	10	10.5	exc
Conklin	PM2.5	3Jun23, 05:00	414297	1-hr	82	82.0	exc
Fort Chip	PM2.5	3Jun23, 06:00	414291	1-hr	88	88.3	exc
Conklin	PM2.5	3Jun23, 06:00	414297	1-hr	81	81.5	exc
Patricia McInnes	PM2.5	2Jun23, 16:00	414296	1-hr	197	197.1	exc
Patricia McInnes	PM2.5	2Jun23, 17:00	414296	1-hr	191	191.1	exc
Patricia McInnes	PM2.5	2Jun23, 18:00	414296	1-hr	194	194.3	exc
Patricia McInnes	PM2.5	2Jun23, 19:00	414296	1-hr	197	197.3	exc
Patricia McInnes	PM2.5	2Jun23, 20:00	414296	1-hr	178	178.4	exc
Patricia McInnes	PM2.5	2Jun23, 21:00	414296	1-hr	122	122.1	exc
Patricia McInnes	PM2.5	2Jun23, 22:00	414296	1-hr	105	104.5	exc
Patricia McInnes	PM2.5	2Jun23, 23:00	414296	1-hr	86	86.5	exc
Patricia McInnes	PM2.5	2Jun23, 24:00	414296	24-hr	129	129.1	exc
Fort Chip	PM2.5	3Jun23, 19:00	414291	1-hr	81	81.3	exc
Fort Chip	PM2.5	3Jun23, 20:00	414291	1-hr	87	86.7	exc
Buffalo Viewpoint	PM2.5	3Jun23, 24:00	414295	24-hr	31	31.3	exc
Barge Landing	PM2.5	3Jun23, 24:00	414292	24-hr	35	34.6	exc
Ft. McKay S	PM2.5	3Jun23, 24:00	414293	24-hr	44	44.2	exc
Stony Mtn.	PM2.5	3Jun23, 24:00	414298	24-hr	35	34.8	exc
Conklin	PM2.5	3Jun23, 24:00	414297	24-hr	41	41.4	exc
Janvier	PM2.5	3Jun23, 24:00	414299	24-hr	32	32.4	exc
Fort Hills	PM2.5	3Jun23, 24:00	414200	24-hr	40	39.9	exc
Ells River	PM2.5	3Jun23, 24:00	414201	24-hr	36	35.9	exc
Bertha Ganter	PM2.5	3Jun23, 24:00	414290	24-hr	36	35.6	exc
Patricia McInnes	PM2.5	3Jun23, 24:00	414296	24-hr	37	36.6	exc
Fort Chip	PM2.5	3Jun23, 24:00	414291	24-hr	48	48.2	exc
Barge Landing	PM2.5	7Jun23, 14:00	414728	1-hr	88	88.3	exc
Ft. McKay S	PM2.5	7Jun23, 14:00	414729	1-hr	115	114.7	exc
Fort Hills	PM2.5	7Jun23, 14:00	414428	1-hr	150	149.5	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>
Ells River	PM2.5	7Jun23, 14:00	414429	1-hr	147	147.3	exc
Bertha Ganter	PM2.5	7Jun23, 14:00	414730	1-hr	96	96.2	exc
Buffalo Viewpoint	PM2.5	7Jun23, 15:00	414731	1-hr	87	86.6	exc
Barge Landing	PM2.5	7Jun23, 15:00	414728	1-hr	102	102.3	exc
Ft. McKay S	PM2.5	7Jun23, 15:00	414729	1-hr	144	144.5	exc
Fort Hills	PM2.5	7Jun23, 15:00	414428	1-hr	159	158.9	exc
Ells River	PM2.5	7Jun23, 15:00	414429	1-hr	123	122.5	exc
Bertha Ganter	PM2.5	7Jun23, 15:00	414730	1-hr	108	108.4	exc
Buffalo Viewpoint	PM2.5	7Jun23, 16:00	414731	1-hr	107	107.2	exc
Barge Landing	PM2.5	7Jun23, 16:00	414728	1-hr	116	115.8	exc
Ft. McKay S	PM2.5	7Jun23, 16:00	414729	1-hr	155	154.6	exc
Wapasu	PM2.5	7Jun23, 16:00	414732	1-hr	105	105.3	exc
Fort Hills	PM2.5	7Jun23, 16:00	414428	1-hr	95	94.7	exc
Ells River	PM2.5	7Jun23, 16:00	414429	1-hr	110	110.3	exc
Bertha Ganter	PM2.5	7Jun23, 16:00	414730	1-hr	121	120.8	exc
Buffalo Viewpoint	PM2.5	7Jun23, 17:00	414731	1-hr	129	129.2	exc
Barge Landing	PM2.5	7Jun23, 17:00	414728	1-hr	99	98.8	exc
Ft. McKay S	PM2.5	7Jun23, 17:00	414729	1-hr	140	140.0	exc
Wapasu	PM2.5	7Jun23, 17:00	414732	1-hr	116	115.7	exc
Fort Hills	PM2.5	7Jun23, 17:00	414428	1-hr	86	86.0	exc
Ells River	PM2.5	7Jun23, 17:00	414429	1-hr	97	97.2	exc
Bertha Ganter	PM2.5	7Jun23, 17:00	414730	1-hr	104	104.5	exc
Buffalo Viewpoint	PM2.5	7Jun23, 18:00	414731	1-hr	119	118.7	exc
Barge Landing	PM2.5	7Jun23, 18:00	414728	1-hr	96	96.3	exc
Ft. McKay S	PM2.5	7Jun23, 18:00	414729	1-hr	142	142.2	exc
Wapasu	PM2.5	7Jun23, 18:00	414732	1-hr	100	100.2	exc
Ells River	PM2.5	7Jun23, 18:00	414429	1-hr	95	94.8	exc
Bertha Ganter	PM2.5	7Jun23, 18:00	414730	1-hr	102	101.5	exc
Buffalo Viewpoint	PM2.5	7Jun23, 19:00	414731	1-hr	129	129.1	exc
Patricia McInnes	PM2.5	7Jun23, 19:00	414733	1-hr	89	88.7	exc
Athabasca Valley	PM2.5	7Jun23, 19:00	414734	1-hr	93	93.1	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	7Jun23, 19:00	414728	1-hr	111	111.3	exc
Ft. McKay S	PM2.5	7Jun23, 19:00	414729	1-hr	143	142.7	exc
Wapasu	PM2.5	7Jun23, 19:00	414732	1-hr	89	88.5	exc
Bertha Ganter	PM2.5	7Jun23, 19:00	414730	1-hr	113	112.9	exc
Bertha Ganter	PM2.5	7Jun23, 20:00	414730	1-hr	95	94.6	exc
Buffalo Viewpoint	PM2.5	7Jun23, 20:00	414731	1-hr	134	134.2	exc
Patricia McInnes	PM2.5	7Jun23, 20:00	414733	1-hr	117	116.6	exc
Athabasca Valley	PM2.5	7Jun23, 20:00	414734	1-hr	126	126.1	exc
Barge Landing	PM2.5	7Jun23, 20:00	414728	1-hr	96	95.9	exc
Ft. McKay S	PM2.5	7Jun23, 20:00	414729	1-hr	129	128.7	exc
Bertha Ganter	PM2.5	7Jun23, 21:00	414730	1-hr	96	96.2	exc
Buffalo Viewpoint	PM2.5	7Jun23, 21:00	414731	1-hr	130	129.6	exc
Patricia McInnes	PM2.5	7Jun23, 21:00	414733	1-hr	119	119.1	exc
Athabasca Valley	PM2.5	7Jun23, 21:00	414734	1-hr	136	135.8	exc
Barge Landing	PM2.5	7Jun23, 21:00	414728	1-hr	93	93.3	exc
Ft. McKay S	PM2.5	7Jun23, 21:00	414729	1-hr	143	143.5	exc
Anzac	PM2.5	7Jun23, 21:00	414736	1-hr	97	97.5	exc
Buffalo Viewpoint	PM2.5	7Jun23, 22:00	414731	1-hr	116	115.8	exc
Patricia McInnes	PM2.5	7Jun23, 22:00	414733	1-hr	115	114.7	exc
Athabasca Valley	PM2.5	7Jun23, 22:00	414734	1-hr	132	131.6	exc
Ft. McKay S	PM2.5	7Jun23, 22:00	414729	1-hr	134	134.4	exc
Anzac	PM2.5	7Jun23, 22:00	414736	1-hr	127	127.1	exc
Buffalo Viewpoint	PM2.5	7Jun23, 23:00	414731	1-hr	104	104.1	exc
Patricia McInnes	PM2.5	7Jun23, 23:00	414733	1-hr	106	106.2	exc
Athabasca Valley	PM2.5	7Jun23, 23:00	414734	1-hr	125	124.9	exc
Ft. McKay S	PM2.5	7Jun23, 23:00	414729	1-hr	91	91.2	exc
Anzac	PM2.5	7Jun23, 23:00	414736	1-hr	115	115.0	exc
Surmont 2	PM2.5	7Jun23, 23:00	414737	1-hr	83	83.0	exc
Buffalo Viewpoint	PM2.5	7Jun23, 24:00	414731	1-hr	88	88.4	exc
Patricia McInnes	PM2.5	7Jun23, 24:00	414733	1-hr	89	88.9	exc
Athabasca Valley	PM2.5	7Jun23, 24:00	414734	1-hr	120	120.4	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	7Jun23, 24:00	414729	1-hr	89	89.1	exc
Ft. McKay S	PM2.5	7Jun23, 24:00	414729	24-hr	69	68.9	exc
Anzac	PM2.5	7Jun23, 24:00	414736	1-hr	113	113.5	exc
Anzac	PM2.5	7Jun23, 24:00	414736	24-hr	38	37.8	exc
Wapasu	PM2.5	7Jun23, 24:00	414732	24-hr	33	33.0	exc
Fort Hills	PM2.5	7Jun23, 24:00	414428	24-hr	35	35.1	exc
Surmont 2	PM2.5	7Jun23, 24:00	414737	1-hr	87	87.4	exc
Ells River	PM2.5	7Jun23, 24:00	414429	24-hr	41	41.3	exc
Bertha Ganter	PM2.5	7Jun23, 24:00	414730	24-hr	48	48.1	exc
Buffalo Viewpoint	PM2.5	7Jun23, 24:00	414731	24-hr	56	56.0	exc
Patricia McInnes	PM2.5	7Jun23, 24:00	414733	24-hr	40	39.7	exc
Athabasca Valley	PM2.5	7Jun23, 24:00	414734	24-hr	44	44.3	exc
Barge Landing	PM2.5	7Jun23, 24:00	414728	24-hr	46	46.3	exc
Buffalo Viewpoint	PM2.5	8Jun23, 01:00	414731	1-hr	91	90.5	exc
Athabasca Valley	PM2.5	8Jun23, 01:00	414734	1-hr	114	114.2	exc
Ft. McKay S	PM2.5	8Jun23, 01:00	414729	1-hr	84	83.9	exc
Anzac	PM2.5	8Jun23, 01:00	414736	1-hr	119	118.7	exc
Surmont 2	PM2.5	8Jun23, 01:00	414737	1-hr	85	85.4	exc
Athabasca Valley	PM2.5	8Jun23, 02:00	414734	1-hr	112	111.6	exc
Anzac	PM2.5	8Jun23, 02:00	414736	1-hr	113	112.7	exc
Stony Mtn.	PM2.5	8Jun23, 02:00	414738	1-hr	92	92.2	exc
Janvier	PM2.5	8Jun23, 02:00	414739	1-hr	81	80.6	exc
Surmont 2	PM2.5	8Jun23, 02:00	414737	1-hr	89	88.6	exc
Athabasca Valley	PM2.5	8Jun23, 03:00	414734	1-hr	99	98.7	exc
Anzac	PM2.5	8Jun23, 03:00	414736	1-hr	104	103.9	exc
Stony Mtn.	PM2.5	8Jun23, 03:00	414738	1-hr	105	105.1	exc
Janvier	PM2.5	8Jun23, 03:00	414739	1-hr	368	367.6	exc
Surmont 2	PM2.5	8Jun23, 03:00	414737	1-hr	82	82.5	exc
Anzac	PM2.5	8Jun23, 04:00	414736	1-hr	96	95.7	exc
Stony Mtn.	PM2.5	8Jun23, 04:00	414738	1-hr	112	111.8	exc
Janvier	PM2.5	8Jun23, 04:00	414739	1-hr	420	419.9	exc
Surmont 2	PM2.5	8Jun23, 04:00	414737	1-hr	81	80.9	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>
Anzac	PM2.5	8Jun23, 05:00	414736	1-hr	91	90.6	exc
Stony Mtn.	PM2.5	8Jun23, 05:00	414738	1-hr	107	107.1	exc
Janvier	PM2.5	8Jun23, 05:00	414739	1-hr	572	572.4	exc
Stony Mtn.	PM2.5	8Jun23, 06:00	414738	1-hr	105	104.7	exc
Janvier	PM2.5	8Jun23, 06:00	414739	1-hr	442	430.9	exc
Stony Mtn.	PM2.5	8Jun23, 07:00	414738	1-hr	109	109.0	exc
Conklin	PM2.5	8Jun23, 07:00	414740	1-hr	80	80.4	exc
Janvier	PM2.5	8Jun23, 07:00	414739	1-hr	133	132.6	exc
Stony Mtn.	PM2.5	8Jun23, 08:00	414738	1-hr	160	159.8	exc
Conklin	PM2.5	8Jun23, 08:00	414740	1-hr	156	156.4	exc
Janvier	PM2.5	8Jun23, 08:00	414739	1-hr	91	90.7	exc
Stony Mtn.	PM2.5	8Jun23, 09:00	414738	1-hr	102	102.4	exc
Conklin	PM2.5	8Jun23, 09:00	414740	1-hr	133	133.0	exc
Buffalo Viewpoint	PM2.5	8Jun23, 24:00	414731	24-hr	39	39.3	exc
Patricia McInnes	PM2.5	8Jun23, 24:00	414733	24-hr	35	34.7	exc
Barge Landing	PM2.5	8Jun23, 24:00	414728	24-hr	31	31.2	exc
Ft. McKay S	PM2.5	8Jun23, 24:00	414729	24-hr	48	47.5	exc
Anzac	PM2.5	8Jun23, 24:00	414736	24-hr	48	50.5	exc
Stony Mtn.	PM2.5	8Jun23, 24:00	414738	24-hr	62	62.4	exc
Surmont 2	PM2.5	8Jun23, 24:00	414737	24-hr	40	40.3	exc
Ells River	PM2.5	8Jun23, 24:00	414500	24-hr	32	32.4	exc
Bertha Ganter	PM2.5	8Jun23, 24:00	414730	24-hr	33	33.2	exc
Athabasca Valley	PM2.5	8Jun23, 24:00	414734	24-hr	51	50.7	exc
Conklin	PM2.5	8Jun23, 24:00	414740	24-hr	52	51.6	exc
Janvier	PM2.5	8Jun23, 24:00	414739	24-hr	109	109.0	exc
Fort Hills	PM2.5	8Jun23, 24:00	414501	24-hr	33	32.9	exc
Janvier	PM2.5	9Jun23, 06:00	414739	1-hr	276	275.5	exc
Janvier	PM2.5	9Jun23, 07:00	414739	1-hr	432	432.1	exc
Janvier	PM2.5	9Jun23, 08:00	414739	1-hr	417	416.6	exc
Janvier	PM2.5	9Jun23, 09:00	414739	1-hr	375	375.3	exc
Janvier	PM2.5	9Jun23, 10:00	414739	1-hr	193	192.6	exc
Janvier	PM2.5	9Jun23, 11:00	414739	1-hr	96	95.8	exc
Fort Chip	PM2.5	9Jun23, 16:00	414741	1-hr	96	96.0	exc
Fort Chip	PM2.5	9Jun23, 17:00	414741	1-hr	107	107.5	exc
Fort Chip	PM2.5	9Jun23, 18:00	414741	1-hr	83	83.1	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>
Lower Camp	H2S	9Jun23, 19:00	414557	1-hr	13	12.7	exc
Conklin	PM2.5	9Jun23, 21:00	414740	1-hr	136	135.5	exc
Conklin	PM2.5	9Jun23, 22:00	414740	1-hr	107	107.3	exc
Bertha Ganter	PM2.5	9Jun23, 24:00	414730	24-hr	34	33.7	exc
Buffalo Viewpoint	PM2.5	9Jun23, 24:00	414731	24-hr	30	30.1	exc
Athabasca Valley	PM2.5	9Jun23, 24:00	414734	24-hr	29	29.3	exc
Fort Chip	PM2.5	9Jun23, 24:00	414741	24-hr	47	47.0	exc
Barge Landing	PM2.5	9Jun23, 24:00	414728	24-hr	33	32.5	exc
Janvier	PM2.5	9Jun23, 24:00	414739	24-hr	98	98.4	exc
Fort Hills	PM2.5	9Jun23, 24:00	414569	24-hr	36	36.5	exc
Ells River	PM2.5	9Jun23, 24:00	414570	24-hr	33	32.5	exc
Ft. McKay S	PM2.5	9Jun23, 24:00	414729	24-hr	43	42.6	exc
Stony Mtn.	PM2.5	9Jun23, 24:00	414738	24-hr	32	31.6	exc
Conklin	PM2.5	9Jun23, 24:00	414740	24-hr	49	49.2	exc
Anzac	PM2.5	10Jun23, 02:00	414736	1-hr	93	92.7	exc
Conklin	PM2.5	10Jun23, 06:00	414740	1-hr	82	82.2	exc
Conklin	PM2.5	10Jun23, 07:00	414740	1-hr	88	87.9	exc
Surmont 2	PM2.5	10Jun23, 07:00	414737	1-hr	111	111.0	exc
Surmont 2	PM2.5	10Jun23, 08:00	414737	1-hr	100	100.3	exc
Surmont 2	PM2.5	10Jun23, 09:00	414737	1-hr	83	82.5	exc
Ft. McKay S	PM2.5	10Jun23, 10:00	414729	1-hr	81	80.5	exc
Anzac	PM2.5	10Jun23, 15:00	414736	1-hr	86	86.0	exc
Anzac	PM2.5	10Jun23, 16:00	414736	1-hr	189	189.5	exc
Anzac	PM2.5	10Jun23, 17:00	414736	1-hr	152	152.5	exc
Anzac	PM2.5	10Jun23, 18:00	414736	1-hr	100	100.4	exc
Wapasu	PM2.5	10Jun23, 18:00	414732	1-hr	94	93.6	exc
Wapasu	PM2.5	10Jun23, 19:00	414732	1-hr	105	104.9	exc
Wapasu	PM2.5	10Jun23, 20:00	414732	1-hr	104	103.9	exc
Anzac	PM2.5	10Jun23, 22:00	414736	1-hr	105	104.8	exc
Anzac	PM2.5	10Jun23, 23:00	414736	1-hr	165	164.7	exc
Bertha Ganter	PM2.5	10Jun23, 24:00	414730	24-hr	53	52.5	exc
Buffalo Viewpoint	PM2.5	10Jun23, 24:00	414731	24-hr	51	51.4	exc
Patricia McInnes	PM2.5	10Jun23, 24:00	414733	24-hr	32	31.7	exc
Athabasca Valley	PM2.5	10Jun23, 24:00	414734	24-hr	53	52.7	exc
Fort Chip	PM2.5	10Jun23, 24:00	414741	1-hr	102	102.1	exc
Fort Chip	PM2.5	10Jun23, 24:00	414741	24-hr	47	46.5	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>
Anzac	PM2.5	10Jun23, 24:00	414736	1-hr	121	120.9	exc
Wapasu	PM2.5	10Jun23, 24:00	414732	24-hr	64	63.8	exc
Stony Mtn.	PM2.5	10Jun23, 24:00	414738	24-hr	50	49.6	exc
Conklin	PM2.5	10Jun23, 24:00	414740	24-hr	59	58.5	exc
Janvier	PM2.5	10Jun23, 24:00	414739	24-hr	44	44.5	exc
Fort Hills	PM2.5	10Jun23, 24:00	414620	24-hr	57	56.9	exc
Surmont 2	PM2.5	10Jun23, 24:00	414737	1-hr	169	168.9	exc
Barge Landing	PM2.5	10Jun23, 24:00	414728	24-hr	52	52.0	exc
Ft. McKay S	PM2.5	10Jun23, 24:00	414729	24-hr	68	67.9	exc
Anzac	PM2.5	10Jun23, 24:00	414736	24-hr	89	88.9	exc
Surmont 2	PM2.5	10Jun23, 24:00	414737	24-hr	59	59.2	exc
Ells River	PM2.5	10Jun23, 24:00	414621	24-hr	52	52.4	exc
Fort Chip	PM2.5	11Jun23, 01:00	414741	1-hr	119	118.8	exc
Surmont 2	PM2.5	11Jun23, 01:00	414737	1-hr	152	152.3	exc
Fort Chip	PM2.5	11Jun23, 05:00	414741	1-hr	83	83.2	exc
Fort Chip	PM2.5	11Jun23, 06:00	414741	1-hr	83	82.5	exc
Fort Chip	PM2.5	11Jun23, 07:00	414741	1-hr	92	92.1	exc
Ft. McKay S	PM2.5	11Jun23, 07:00	414729	1-hr	87	86.6	exc
Bertha Ganter	PM2.5	11Jun23, 08:00	414730	1-hr	86	86.1	exc
Buffalo Viewpoint	PM2.5	11Jun23, 08:00	414731	1-hr	88	88.4	exc
Fort Chip	PM2.5	11Jun23, 08:00	414741	1-hr	94	94.4	exc
Ft. McKay S	PM2.5	11Jun23, 08:00	414729	1-hr	111	111.4	exc
Fort Hills	PM2.5	11Jun23, 08:00	414651	1-hr	101	100.7	exc
Ells River	PM2.5	11Jun23, 08:00	414652	1-hr	92	92.1	exc
Bertha Ganter	PM2.5	11Jun23, 09:00	414730	1-hr	96	96.3	exc
Buffalo Viewpoint	PM2.5	11Jun23, 09:00	414731	1-hr	95	95.0	exc
Ft. McKay S	PM2.5	11Jun23, 09:00	414729	1-hr	116	115.7	exc
Fort Hills	PM2.5	11Jun23, 09:00	414651	1-hr	117	117.0	exc
Ells River	PM2.5	11Jun23, 09:00	414652	1-hr	100	100.1	exc
Barge Landing	PM2.5	11Jun23, 09:00	414728	1-hr	94	93.8	exc
Bertha Ganter	PM2.5	11Jun23, 10:00	414730	1-hr	81	81.3	exc
Buffalo Viewpoint	PM2.5	11Jun23, 10:00	414731	1-hr	86	85.9	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	11Jun23, 10:00	414729	1-hr	103	103.3	exc
Anzac	PM2.5	11Jun23, 10:00	414736	1-hr	96	96.5	exc
Wapasu	PM2.5	11Jun23, 10:00	414732	1-hr	104	103.6	exc
Stony Mtn.	PM2.5	11Jun23, 10:00	414738	1-hr	104	104.0	exc
Conklin	PM2.5	11Jun23, 10:00	414740	1-hr	103	103.1	exc
Fort Hills	PM2.5	11Jun23, 10:00	414651	1-hr	88	88.2	exc
Ells River	PM2.5	11Jun23, 10:00	414652	1-hr	83	82.8	exc
Athabasca Valley	PM2.5	11Jun23, 10:00	414734	1-hr	103	102.9	exc
Ft. McKay S	PM2.5	11Jun23, 11:00	414729	1-hr	89	89.1	exc
Anzac	PM2.5	11Jun23, 11:00	414736	1-hr	112	111.9	exc
Wapasu	PM2.5	11Jun23, 11:00	414732	1-hr	122	121.7	exc
Stony Mtn.	PM2.5	11Jun23, 11:00	414738	1-hr	108	109.1	exc
Conklin	PM2.5	11Jun23, 11:00	414740	1-hr	111	111.4	exc
Janvier	PM2.5	11Jun23, 11:00	414739	1-hr	87	86.9	exc
Surmont 2	PM2.5	11Jun23, 11:00	414737	1-hr	85	84.7	exc
Athabasca Valley	PM2.5	11Jun23, 11:00	414734	1-hr	122	121.8	exc
Anzac	PM2.5	11Jun23, 12:00	414736	1-hr	138	137.8	exc
Wapasu	PM2.5	11Jun23, 12:00	414732	1-hr	126	126.4	exc
Stony Mtn.	PM2.5	11Jun23, 12:00	414738	1-hr	92	91.9	exc
Conklin	PM2.5	11Jun23, 12:00	414740	1-hr	98	97.5	exc
Janvier	PM2.5	11Jun23, 12:00	414739	1-hr	92	91.7	exc
Surmont 2	PM2.5	11Jun23, 12:00	414737	1-hr	96	96.0	exc
Athabasca Valley	PM2.5	11Jun23, 12:00	414734	1-hr	116	115.7	exc
Anzac	PM2.5	11Jun23, 13:00	414736	1-hr	147	147.5	exc
Stony Mtn.	PM2.5	11Jun23, 13:00	414738	1-hr	85	84.8	exc
Conklin	PM2.5	11Jun23, 13:00	414740	1-hr	90	89.9	exc
Janvier	PM2.5	11Jun23, 13:00	414739	1-hr	87	87.5	exc
Surmont 2	PM2.5	11Jun23, 13:00	414737	1-hr	102	101.6	exc
Athabasca Valley	PM2.5	11Jun23, 13:00	414734	1-hr	91	91.0	exc
Anzac	PM2.5	11Jun23, 14:00	414736	1-hr	128	127.6	exc
Stony Mtn.	PM2.5	11Jun23, 14:00	414738	1-hr	92	91.8	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>
Conklin	PM2.5	11Jun23, 14:00	414740	1-hr	100	100.2	exc
Janvier	PM2.5	11Jun23, 14:00	414739	1-hr	102	102.1	exc
Surmont 2	PM2.5	11Jun23, 14:00	414737	1-hr	136	136.2	exc
Anzac	PM2.5	11Jun23, 15:00	414736	1-hr	87	87.3	exc
Stony Mtn.	PM2.5	11Jun23, 15:00	414738	1-hr	85	84.9	exc
Conklin	PM2.5	11Jun23, 15:00	414740	1-hr	94	94.5	exc
Janvier	PM2.5	11Jun23, 15:00	414739	1-hr	135	135.4	exc
Surmont 2	PM2.5	11Jun23, 15:00	414737	1-hr	116	115.6	exc
Stony Mtn.	PM2.5	11Jun23, 16:00	414738	1-hr	103	102.9	exc
Conklin	PM2.5	11Jun23, 16:00	414740	1-hr	106	106.3	exc
Janvier	PM2.5	11Jun23, 16:00	414739	1-hr	127	127.2	exc
Surmont 2	PM2.5	11Jun23, 16:00	414737	1-hr	84	83.8	exc
Fort Chip	PM2.5	11Jun23, 17:00	414741	1-hr	85	84.5	exc
Stony Mtn.	PM2.5	11Jun23, 17:00	414738	1-hr	124	124.2	exc
Conklin	PM2.5	11Jun23, 17:00	414740	1-hr	138	138.0	exc
Janvier	PM2.5	11Jun23, 17:00	414739	1-hr	122	122.4	exc
Wapasu	PM2.5	11Jun23, 18:00	414732	1-hr	138	138.1	exc
Stony Mtn.	PM2.5	11Jun23, 18:00	414738	1-hr	95	94.5	exc
Conklin	PM2.5	11Jun23, 18:00	414740	1-hr	109	108.6	exc
Janvier	PM2.5	11Jun23, 18:00	414739	1-hr	95	95.2	exc
Wapasu	PM2.5	11Jun23, 19:00	414732	1-hr	98	97.6	exc
Janvier	PM2.5	11Jun23, 19:00	414739	1-hr	83	82.6	exc
Fort Chip	PM2.5	11Jun23, 20:00	414741	1-hr	126	125.6	exc
Fort Chip	PM2.5	11Jun23, 21:00	414741	1-hr	386	386.4	exc
Wapasu	PM2.5	11Jun23, 21:00	414732	1-hr	100	100.4	exc
Fort Hills	PM2.5	11Jun23, 21:00	414651	1-hr	95	94.8	exc
Fort Chip	PM2.5	11Jun23, 22:00	414741	1-hr	281	280.8	exc
Wapasu	PM2.5	11Jun23, 22:00	414732	1-hr	108	107.7	exc
Fort Hills	PM2.5	11Jun23, 22:00	414651	1-hr	180	179.7	exc
Ells River	PM2.5	11Jun23, 22:00	414652	1-hr	81	81.0	exc
Barge Landing	PM2.5	11Jun23, 22:00	414728	1-hr	97	97.3	exc
Bertha Ganter	PM2.5	11Jun23, 23:00	414730	1-hr	82	81.7	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>
Fort Chip	PM2.5	11Jun23, 23:00	414741	1-hr	104	104.3	exc
Ft. McKay S	PM2.5	11Jun23, 23:00	414729	1-hr	104	103.8	exc
Wapasu	PM2.5	11Jun23, 23:00	414732	1-hr	113	112.8	exc
Fort Hills	PM2.5	11Jun23, 23:00	414651	1-hr	173	173.0	exc
Ells River	PM2.5	11Jun23, 23:00	414652	1-hr	92	92.1	exc
Buffalo Viewpoint	PM2.5	11Jun23, 23:00	414731	1-hr	85	85.1	exc
Barge Landing	PM2.5	11Jun23, 23:00	414728	1-hr	113	113.4	exc
Bertha Ganter	PM2.5	11Jun23, 24:00	414730	1-hr	90	89.7	exc
Bertha Ganter	PM2.5	11Jun23, 24:00	414730	24-hr	50	49.6	exc
Buffalo Viewpoint	PM2.5	11Jun23, 24:00	414731	1-hr	95	94.8	exc
Barge Landing	PM2.5	11Jun23, 24:00	414728	1-hr	99	98.9	exc
Ft. McKay S	PM2.5	11Jun23, 24:00	414729	1-hr	114	113.5	exc
Ft. McKay S	PM2.5	11Jun23, 24:00	414729	24-hr	63	62.9	exc
Anzac	PM2.5	11Jun23, 24:00	414736	24-hr	61	61.2	exc
Wapasu	PM2.5	11Jun23, 24:00	414732	1-hr	127	126.9	exc
Wapasu	PM2.5	11Jun23, 24:00	414732	24-hr	74	74.2	exc
Stony Mtn.	PM2.5	11Jun23, 24:00	414738	24-hr	62	61.8	exc
Conklin	PM2.5	11Jun23, 24:00	414740	24-hr	67	66.7	exc
Janvier	PM2.5	11Jun23, 24:00	414739	24-hr	63	63.5	exc
Fort Hills	PM2.5	11Jun23, 24:00	414651	1-hr	161	160.5	exc
Fort Hills	PM2.5	11Jun23, 24:00	414651	24-hr	70	69.9	exc
Surmont 2	PM2.5	11Jun23, 24:00	414737	24-hr	61	60.8	exc
Ells River	PM2.5	11Jun23, 24:00	414652	1-hr	107	106.5	exc
Ells River	PM2.5	11Jun23, 24:00	414652	24-hr	55	55.3	exc
Buffalo Viewpoint	PM2.5	11Jun23, 24:00	414731	24-hr	51	51.0	exc
Athabasca Valley	PM2.5	11Jun23, 24:00	414734	24-hr	55	54.7	exc
Fort Chip	PM2.5	11Jun23, 24:00	414741	24-hr	92	92.0	exc
Barge Landing	PM2.5	11Jun23, 24:00	414728	24-hr	51	51.4	exc
Bertha Ganter	PM2.5	12Jun23, 01:00	415119	1-hr	122	122.5	exc
Buffalo Viewpoint	PM2.5	12Jun23, 01:00	415120	1-hr	107	106.7	exc
Barge Landing	PM2.5	12Jun23, 01:00	412121	1-hr	149	148.9	exc
Ft. McKay S	PM2.5	12Jun23, 01:00	415122	1-hr	119	119.1	exc
Wapasu	PM2.5	12Jun23, 01:00	412123	1-hr	264	263.9	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>
Fort Hills	PM2.5	12Jun23, 01:00	414753	1-hr	124	123.7	exc
Ells River	PM2.5	12Jun23, 01:00	414726	1-hr	119	118.9	exc
Bertha Ganter	PM2.5	12Jun23, 02:00	415119	1-hr	122	122.1	exc
Buffalo Viewpoint	PM2.5	12Jun23, 02:00	415120	1-hr	130	130.4	exc
Barge Landing	PM2.5	12Jun23, 02:00	412121	1-hr	228	228.0	exc
Ft. McKay S	PM2.5	12Jun23, 02:00	415122	1-hr	119	118.6	exc
Wapasu	PM2.5	12Jun23, 02:00	412123	1-hr	208	207.6	exc
Fort Hills	PM2.5	12Jun23, 02:00	414753	1-hr	130	130.3	exc
Ells River	PM2.5	12Jun23, 02:00	414726	1-hr	129	128.9	exc
Bertha Ganter	PM2.5	12Jun23, 03:00	415119	1-hr	120	119.7	exc
Buffalo Viewpoint	PM2.5	12Jun23, 03:00	415120	1-hr	151	151.1	exc
Barge Landing	PM2.5	12Jun23, 03:00	412121	1-hr	167	166.9	exc
Ft. McKay S	PM2.5	12Jun23, 03:00	415122	1-hr	134	134.0	exc
Wapasu	PM2.5	12Jun23, 03:00	412123	1-hr	239	239.3	exc
Stony Mtn.	PM2.5	12Jun23, 03:00	415124	1-hr	163	162.6	exc
Fort Hills	PM2.5	12Jun23, 03:00	414753	1-hr	139	138.7	exc
Surmont 2	PM2.5	12Jun23, 03:00	415125	1-hr	83	83.3	exc
Ells River	PM2.5	12Jun23, 03:00	414726	1-hr	124	123.5	exc
Bertha Ganter	PM2.5	12Jun23, 04:00	415119	1-hr	123	122.7	exc
Buffalo Viewpoint	PM2.5	12Jun23, 04:00	415120	1-hr	122	121.9	exc
Barge Landing	PM2.5	12Jun23, 04:00	412121	1-hr	124	123.6	exc
Ft. McKay S	PM2.5	12Jun23, 04:00	415122	1-hr	146	145.7	exc
Anzac	PM2.5	12Jun23, 04:00	415126	1-hr	93	93.5	exc
Wapasu	PM2.5	12Jun23, 04:00	412123	1-hr	302	301.7	exc
Stony Mtn.	PM2.5	12Jun23, 04:00	415124	1-hr	89	88.6	exc
Fort Hills	PM2.5	12Jun23, 04:00	414753	1-hr	189	188.6	exc
Surmont 2	PM2.5	12Jun23, 04:00	415125	1-hr	104	104.1	exc
Ells River	PM2.5	12Jun23, 04:00	414726	1-hr	129	128.8	exc
Buffalo Viewpoint	PM2.5	12Jun23, 05:00	415120	1-hr	154	154.5	exc
Barge Landing	PM2.5	12Jun23, 05:00	412121	1-hr	129	129.5	exc
Ft. McKay S	PM2.5	12Jun23, 05:00	415122	1-hr	156	156.4	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	12Jun23, 05:00	415126	1-hr	113	112.5	exc
Wapasu	PM2.5	12Jun23, 05:00	412123	1-hr	344	343.6	exc
Janvier	PM2.5	12Jun23, 05:00	415127	1-hr	83	82.8	exc
Fort Hills	PM2.5	12Jun23, 05:00	414753	1-hr	149	149.4	exc
Surmont 2	PM2.5	12Jun23, 05:00	415125	1-hr	106	105.8	exc
Ells River	PM2.5	12Jun23, 05:00	414726	1-hr	145	145.3	exc
Bertha Ganter	PM2.5	12Jun23, 05:00	415119	1-hr	140	140.1	exc
Buffalo Viewpoint	PM2.5	12Jun23, 06:00	415120	1-hr	180	180.1	exc
Patricia McInnes	PM2.5	12Jun23, 06:00	415128	1-hr	84	83.7	exc
Athabasca Valley	PM2.5	12Jun23, 06:00	415129	1-hr	96	95.6	exc
Barge Landing	PM2.5	12Jun23, 06:00	412121	1-hr	138	138.3	exc
Ft. McKay S	PM2.5	12Jun23, 06:00	415122	1-hr	166	166.4	exc
Anzac	PM2.5	12Jun23, 06:00	415126	1-hr	118	118.4	exc
Wapasu	PM2.5	12Jun23, 06:00	412123	1-hr	365	365.3	exc
Stony Mtn.	PM2.5	12Jun23, 06:00	415124	1-hr	85	84.9	exc
Janvier	PM2.5	12Jun23, 06:00	415127	1-hr	118	117.6	exc
Fort Hills	PM2.5	12Jun23, 06:00	414753	1-hr	130	130.1	exc
Surmont 2	PM2.5	12Jun23, 06:00	415125	1-hr	111	110.5	exc
Ells River	PM2.5	12Jun23, 06:00	414726	1-hr	148	148.5	exc
Bertha Ganter	PM2.5	12Jun23, 06:00	415119	1-hr	138	137.9	exc
Buffalo Viewpoint	PM2.5	12Jun23, 07:00	415120	1-hr	221	221.4	exc
Patricia McInnes	PM2.5	12Jun23, 07:00	415128	1-hr	92	92.3	exc
Athabasca Valley	PM2.5	12Jun23, 07:00	415129	1-hr	117	116.6	exc
Barge Landing	PM2.5	12Jun23, 07:00	412121	1-hr	144	143.5	exc
Ft. McKay S	PM2.5	12Jun23, 07:00	415122	1-hr	201	200.8	exc
Anzac	PM2.5	12Jun23, 07:00	415126	1-hr	147	147.4	exc
Wapasu	PM2.5	12Jun23, 07:00	412123	1-hr	184	183.6	exc
Stony Mtn.	PM2.5	12Jun23, 07:00	415124	1-hr	89	89.1	exc
Janvier	PM2.5	12Jun23, 07:00	415127	1-hr	166	166.4	exc
Fort Hills	PM2.5	12Jun23, 07:00	414753	1-hr	110	109.6	exc
Surmont 2	PM2.5	12Jun23, 07:00	415125	1-hr	123	123.2	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>
Ells River	PM2.5	12Jun23, 07:00	414726	1-hr	169	168.6	exc
Bertha Ganter	PM2.5	12Jun23, 07:00	415119	1-hr	145	145.5	exc
Conklin	PM2.5	12Jun23, 07:00	415130	1-hr	126	125.9	exc
Buffalo Viewpoint	PM2.5	12Jun23, 08:00	415120	1-hr	141	141.0	exc
Patricia McInnes	PM2.5	12Jun23, 08:00	415128	1-hr	104	104.1	exc
Athabasca Valley	PM2.5	12Jun23, 08:00	415129	1-hr	135	135.0	exc
Barge Landing	PM2.5	12Jun23, 08:00	412121	1-hr	129	129.1	exc
Ft. McKay S	PM2.5	12Jun23, 08:00	415122	1-hr	206	206.1	exc
Anzac	PM2.5	12Jun23, 08:00	415126	1-hr	168	167.6	exc
Wapasu	PM2.5	12Jun23, 08:00	412123	1-hr	126	125.7	exc
Stony Mtn.	PM2.5	12Jun23, 08:00	415124	1-hr	109	108.6	exc
Janvier	PM2.5	12Jun23, 08:00	415127	1-hr	490	489.8	exc
Fort Hills	PM2.5	12Jun23, 08:00	414753	1-hr	101	101.2	exc
Surmont 2	PM2.5	12Jun23, 08:00	415125	1-hr	126	125.9	exc
Ells River	PM2.5	12Jun23, 08:00	414726	1-hr	122	121.6	exc
Bertha Ganter	PM2.5	12Jun23, 08:00	415119	1-hr	134	133.5	exc
Conklin	PM2.5	12Jun23, 08:00	415130	1-hr	113	112.5	exc
Buffalo Viewpoint	PM2.5	12Jun23, 09:00	415120	1-hr	139	139.3	exc
Patricia McInnes	PM2.5	12Jun23, 09:00	415128	1-hr	138	138.4	exc
Athabasca Valley	PM2.5	12Jun23, 09:00	415129	1-hr	175	175.3	exc
Barge Landing	PM2.5	12Jun23, 09:00	412121	1-hr	86	85.6	exc
Ft. McKay S	PM2.5	12Jun23, 09:00	415122	1-hr	146	146.4	exc
Anzac	PM2.5	12Jun23, 09:00	415126	1-hr	178	178.2	exc
Wapasu	PM2.5	12Jun23, 09:00	412123	1-hr	88	87.9	exc
Stony Mtn.	PM2.5	12Jun23, 09:00	415124	1-hr	129	128.6	exc
Conklin	PM2.5	12Jun23, 09:00	415130	1-hr	136	135.6	exc
Janvier	PM2.5	12Jun23, 09:00	415127	1-hr	413	413.5	exc
Fort Hills	PM2.5	12Jun23, 09:00	414753	1-hr	185	184.7	exc
Surmont 2	PM2.5	12Jun23, 09:00	415125	1-hr	110	110.4	exc
Ells River	PM2.5	12Jun23, 09:00	414726	1-hr	116	118.4	exc
Bertha Ganter	PM2.5	12Jun23, 09:00	415119	1-hr	95	95.1	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	12Jun23, 10:00	415120	1-hr	173	173.0	exc
Patricia McInnes	PM2.5	12Jun23, 10:00	415128	1-hr	151	151.3	exc
Athabasca Valley	PM2.5	12Jun23, 10:00	415129	1-hr	252	252.0	exc
Barge Landing	PM2.5	12Jun23, 10:00	412121	1-hr	162	162.5	exc
Ft. McKay S	PM2.5	12Jun23, 10:00	415122	1-hr	163	162.8	exc
Anzac	PM2.5	12Jun23, 10:00	415126	1-hr	186	185.7	exc
Wapasu	PM2.5	12Jun23, 10:00	412123	1-hr	217	216.9	exc
Stony Mtn.	PM2.5	12Jun23, 10:00	415124	1-hr	147	147.0	exc
Conklin	PM2.5	12Jun23, 10:00	415130	1-hr	190	189.9	exc
Janvier	PM2.5	12Jun23, 10:00	415127	1-hr	162	165.1	exc
Fort Hills	PM2.5	12Jun23, 10:00	414753	1-hr	332	332.3	exc
Surmont 2	PM2.5	12Jun23, 10:00	415125	1-hr	107	107.0	exc
Ells River	PM2.5	12Jun23, 10:00	414726	1-hr	188	188.2	exc
Bertha Ganter	PM2.5	12Jun23, 10:00	415119	1-hr	161	161.4	exc
Buffalo Viewpoint	PM2.5	12Jun23, 11:00	415120	1-hr	187	187.3	exc
Patricia McInnes	PM2.5	12Jun23, 11:00	415128	1-hr	126	126.1	exc
Athabasca Valley	PM2.5	12Jun23, 11:00	415129	1-hr	235	234.5	exc
Barge Landing	PM2.5	12Jun23, 11:00	412121	1-hr	203	203.1	exc
Ft. McKay S	PM2.5	12Jun23, 11:00	415122	1-hr	239	238.8	exc
Anzac	PM2.5	12Jun23, 11:00	415126	1-hr	234	233.5	exc
Wapasu	PM2.5	12Jun23, 11:00	412123	1-hr	228	227.8	exc
Stony Mtn.	PM2.5	12Jun23, 11:00	415124	1-hr	154	154.4	exc
Conklin	PM2.5	12Jun23, 11:00	415130	1-hr	143	142.6	exc
Fort Hills	PM2.5	12Jun23, 11:00	414753	1-hr	349	348.9	exc
Ells River	PM2.5	12Jun23, 11:00	414726	1-hr	273	273.4	exc
Bertha Ganter	PM2.5	12Jun23, 11:00	415119	1-hr	205	205.0	exc
Janvier	PM2.5	12Jun23, 11:00	415127	1-hr	126	125.8	exc
Buffalo Viewpoint	PM2.5	12Jun23, 12:00	415120	1-hr	167	166.6	exc
Patricia McInnes	PM2.5	12Jun23, 12:00	415128	1-hr	117	117.4	exc
Athabasca Valley	PM2.5	12Jun23, 12:00	415129	1-hr	201	201.3	exc
Barge Landing	PM2.5	12Jun23, 12:00	412121	1-hr	256	256.0	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>
Ft. McKay S	PM2.5	12Jun23, 12:00	415122	1-hr	258	257.8	exc
Anzac	PM2.5	12Jun23, 12:00	415126	1-hr	208	208.0	exc
Wapasu	PM2.5	12Jun23, 12:00	412123	1-hr	315	314.7	exc
Stony Mtn.	PM2.5	12Jun23, 12:00	415124	1-hr	117	116.6	exc
Conklin	PM2.5	12Jun23, 12:00	415130	1-hr	141	141.0	exc
Janvier	PM2.5	12Jun23, 12:00	415127	1-hr	130	130.3	exc
Fort Hills	PM2.5	12Jun23, 12:00	414753	1-hr	370	369.8	exc
Ells River	PM2.5	12Jun23, 12:00	414726	1-hr	283	283.2	exc
Bertha Ganter	PM2.5	12Jun23, 12:00	415119	1-hr	261	261.0	exc
Fort Chip	O3	10Jun23, 17:00	414697	1-hr	83	83.3	exc
Buffalo Viewpoint	PM2.5	12Jun23, 13:00	415120	1-hr	161	161.3	exc
Patricia McInnes	PM2.5	12Jun23, 13:00	415128	1-hr	101	101.1	exc
Athabasca Valley	PM2.5	12Jun23, 13:00	415129	1-hr	184	184.0	exc
Barge Landing	PM2.5	12Jun23, 13:00	412121	1-hr	293	292.6	exc
Ft. McKay S	PM2.5	12Jun23, 13:00	415122	1-hr	300	300.1	exc
Anzac	PM2.5	12Jun23, 13:00	415126	1-hr	220	220.2	exc
Wapasu	PM2.5	12Jun23, 13:00	412123	1-hr	274	274.1	exc
Conklin	PM2.5	12Jun23, 13:00	415130	1-hr	85	85.0	exc
Janvier	PM2.5	12Jun23, 13:00	415127	1-hr	130	130.2	exc
Fort Hills	PM2.5	12Jun23, 13:00	414753	1-hr	357	357.2	exc
Ells River	PM2.5	12Jun23, 13:00	414726	1-hr	353	353.2	exc
Bertha Ganter	PM2.5	12Jun23, 13:00	415119	1-hr	300	300.3	exc
Surmont 2	PM2.5	12Jun23, 13:00	415125	1-hr	116	115.8	exc
Buffalo Viewpoint	PM2.5	12Jun23, 14:00	415120	1-hr	165	165.4	exc
Patricia McInnes	PM2.5	12Jun23, 14:00	415128	1-hr	132	132.3	exc
Barge Landing	PM2.5	12Jun23, 14:00	412121	1-hr	283	283.1	exc
Ft. McKay S	PM2.5	12Jun23, 14:00	415122	1-hr	323	322.8	exc
Anzac	PM2.5	12Jun23, 14:00	415126	1-hr	194	194.4	exc
Wapasu	PM2.5	12Jun23, 14:00	412123	1-hr	259	259.0	exc
Conklin	PM2.5	12Jun23, 14:00	415130	1-hr	89	89.2	exc
Janvier	PM2.5	12Jun23, 14:00	415127	1-hr	120	119.9	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>
Fort Hills	PM2.5	12Jun23, 14:00	414753	1-hr	342	341.7	exc
Ells River	PM2.5	12Jun23, 14:00	414726	1-hr	333	333.4	exc
Bertha Ganter	PM2.5	12Jun23, 14:00	415119	1-hr	308	308.3	exc
Surmont 2	PM2.5	12Jun23, 14:00	415125	1-hr	126	125.7	exc
Athabasca Valley	PM2.5	12Jun23, 14:00	415129	1-hr	217	216.7	exc
Buffalo Viewpoint	PM2.5	12Jun23, 15:00	415120	1-hr	149	148.6	exc
Patricia McInnes	PM2.5	12Jun23, 15:00	415128	1-hr	161	161.2	exc
Athabasca Valley	PM2.5	12Jun23, 15:00	415129	1-hr	273	272.7	exc
Barge Landing	PM2.5	12Jun23, 15:00	412121	1-hr	268	268.5	exc
Ft. McKay S	PM2.5	12Jun23, 15:00	415122	1-hr	319	318.9	exc
Anzac	PM2.5	12Jun23, 15:00	415126	1-hr	180	179.5	exc
Wapasu	PM2.5	12Jun23, 15:00	412123	1-hr	239	238.8	exc
Janvier	PM2.5	12Jun23, 15:00	415127	1-hr	114	114.4	exc
Fort Hills	PM2.5	12Jun23, 15:00	414753	1-hr	318	317.6	exc
Ells River	PM2.5	12Jun23, 15:00	414726	1-hr	301	301.0	exc
Bertha Ganter	PM2.5	12Jun23, 15:00	415119	1-hr	300	300.2	exc
Surmont 2	PM2.5	12Jun23, 15:00	415125	1-hr	131	131.5	exc
Buffalo Viewpoint	PM2.5	12Jun23, 16:00	415120	1-hr	187	186.5	exc
Patricia McInnes	PM2.5	12Jun23, 16:00	415128	1-hr	143	142.5	exc
Athabasca Valley	PM2.5	12Jun23, 16:00	415129	1-hr	271	271.3	exc
Barge Landing	PM2.5	12Jun23, 16:00	412121	1-hr	257	257.0	exc
Ft. McKay S	PM2.5	12Jun23, 16:00	415122	1-hr	321	321.1	exc
Anzac	PM2.5	12Jun23, 16:00	415126	1-hr	188	187.5	exc
Wapasu	PM2.5	12Jun23, 16:00	412123	1-hr	215	215.1	exc
Janvier	PM2.5	12Jun23, 16:00	415127	1-hr	98	98.2	exc
Fort Hills	PM2.5	12Jun23, 16:00	414753	1-hr	307	306.5	exc
Ells River	PM2.5	12Jun23, 16:00	414726	1-hr	290	290.0	exc
Bertha Ganter	PM2.5	12Jun23, 16:00	415119	1-hr	287	286.9	exc
Surmont 2	PM2.5	12Jun23, 16:00	415125	1-hr	134	134.2	exc
Buffalo Viewpoint	PM2.5	12Jun23, 17:00	415120	1-hr	210	210.3	exc
Patricia McInnes	PM2.5	12Jun23, 17:00	415128	1-hr	124	123.8	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>
Athabasca Valley	PM2.5	12Jun23, 17:00	415129	1-hr	252	251.7	exc
Barge Landing	PM2.5	12Jun23, 17:00	412121	1-hr	247	247.1	exc
Ft. McKay S	PM2.5	12Jun23, 17:00	415122	1-hr	301	300.8	exc
Anzac	PM2.5	12Jun23, 17:00	415126	1-hr	161	161.2	exc
Wapasu	PM2.5	12Jun23, 17:00	412123	1-hr	196	196.5	exc
Janvier	PM2.5	12Jun23, 17:00	415127	1-hr	88	87.6	exc
Fort Hills	PM2.5	12Jun23, 17:00	414753	1-hr	262	262.3	exc
Ells River	PM2.5	12Jun23, 17:00	414726	1-hr	273	273.4	exc
Bertha Ganter	PM2.5	12Jun23, 17:00	415119	1-hr	266	265.9	exc
Surmont 2	PM2.5	12Jun23, 17:00	415125	1-hr	123	122.8	exc
Buffalo Viewpoint	PM2.5	12Jun23, 18:00	415120	1-hr	222	221.9	exc
Patricia McInnes	PM2.5	12Jun23, 18:00	415128	1-hr	109	109.3	exc
Athabasca Valley	PM2.5	12Jun23, 18:00	415129	1-hr	227	226.9	exc
Barge Landing	PM2.5	12Jun23, 18:00	412121	1-hr	226	226.2	exc
Ft. McKay S	PM2.5	12Jun23, 18:00	415122	1-hr	283	283.3	exc
Anzac	PM2.5	12Jun23, 18:00	415126	1-hr	128	128.5	exc
Wapasu	PM2.5	12Jun23, 18:00	412123	1-hr	173	173.3	exc
Janvier	PM2.5	12Jun23, 18:00	415127	1-hr	88	88.0	exc
Fort Hills	PM2.5	12Jun23, 18:00	414753	1-hr	222	221.7	exc
Ells River	PM2.5	12Jun23, 18:00	414726	1-hr	247	247.3	exc
Bertha Ganter	PM2.5	12Jun23, 18:00	415119	1-hr	241	241.3	exc
Surmont 2	PM2.5	12Jun23, 18:00	415125	1-hr	107	106.9	exc
Buffalo Viewpoint	PM2.5	12Jun23, 19:00	415120	1-hr	226	226.3	exc
Patricia McInnes	PM2.5	12Jun23, 19:00	415128	1-hr	100	99.8	exc
Athabasca Valley	PM2.5	12Jun23, 19:00	415129	1-hr	213	212.6	exc
Barge Landing	PM2.5	12Jun23, 19:00	412121	1-hr	197	197.3	exc
Ft. McKay S	PM2.5	12Jun23, 19:00	415122	1-hr	264	263.9	exc
Anzac	PM2.5	12Jun23, 19:00	415126	1-hr	127	126.7	exc
Wapasu	PM2.5	12Jun23, 19:00	412123	1-hr	143	142.7	exc
Janvier	PM2.5	12Jun23, 19:00	415127	1-hr	89	89.0	exc
Fort Hills	PM2.5	12Jun23, 19:00	414753	1-hr	211	211.1	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>
Ells River	PM2.5	12Jun23, 19:00	414726	1-hr	214	213.8	exc
Bertha Ganter	PM2.5	12Jun23, 19:00	415119	1-hr	214	214.3	exc
Surmont 2	PM2.5	12Jun23, 19:00	415125	1-hr	108	108.4	exc
Buffalo Viewpoint	PM2.5	12Jun23, 20:00	415120	1-hr	205	204.7	exc
Patricia McInnes	PM2.5	12Jun23, 20:00	415128	1-hr	97	97.4	exc
Athabasca Valley	PM2.5	12Jun23, 20:00	415129	1-hr	194	194.3	exc
Barge Landing	PM2.5	12Jun23, 20:00	412121	1-hr	159	159.5	exc
Ft. McKay S	PM2.5	12Jun23, 20:00	415122	1-hr	225	225.1	exc
Anzac	PM2.5	12Jun23, 20:00	415126	1-hr	131	130.8	exc
Wapasu	PM2.5	12Jun23, 20:00	412123	1-hr	110	110.1	exc
Conklin	PM2.5	12Jun23, 20:00	415130	1-hr	85	85.2	exc
Janvier	PM2.5	12Jun23, 20:00	415127	1-hr	91	91.1	exc
Fort Hills	PM2.5	12Jun23, 20:00	414753	1-hr	184	184.2	exc
Ells River	PM2.5	12Jun23, 20:00	414726	1-hr	205	204.9	exc
Bertha Ganter	PM2.5	12Jun23, 20:00	415119	1-hr	177	176.9	exc
Surmont 2	PM2.5	12Jun23, 20:00	415125	1-hr	103	102.8	exc
Buffalo Viewpoint	PM2.5	12Jun23, 21:00	415120	1-hr	173	173.2	exc
Patricia McInnes	PM2.5	12Jun23, 21:00	415128	1-hr	104	104.4	exc
Athabasca Valley	PM2.5	12Jun23, 21:00	415129	1-hr	182	181.7	exc
Barge Landing	PM2.5	12Jun23, 21:00	412121	1-hr	131	130.6	exc
Ft. McKay S	PM2.5	12Jun23, 21:00	415122	1-hr	179	178.9	exc
Anzac	PM2.5	12Jun23, 21:00	415126	1-hr	130	130.0	exc
Wapasu	PM2.5	12Jun23, 21:00	412123	1-hr	97	96.8	exc
Conklin	PM2.5	12Jun23, 21:00	415130	1-hr	121	121.4	exc
Janvier	PM2.5	12Jun23, 21:00	415127	1-hr	91	91.2	exc
Fort Hills	PM2.5	12Jun23, 21:00	414753	1-hr	156	156.3	exc
Ells River	PM2.5	12Jun23, 21:00	414726	1-hr	185	185.0	exc
Bertha Ganter	PM2.5	12Jun23, 21:00	415119	1-hr	140	140.3	exc
Surmont 2	PM2.5	12Jun23, 21:00	415125	1-hr	101	101.1	exc
Buffalo Viewpoint	PM2.5	12Jun23, 22:00	415120	1-hr	155	155.4	exc
Patricia McInnes	PM2.5	12Jun23, 22:00	415128	1-hr	95	94.9	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	12Jun23, 22:00	415129	1-hr	184	184.1	exc
Barge Landing	PM2.5	12Jun23, 22:00	412121	1-hr	112	111.9	exc
Ft. McKay S	PM2.5	12Jun23, 22:00	415122	1-hr	151	151.1	exc
Anzac	PM2.5	12Jun23, 22:00	415126	1-hr	125	125.3	exc
Wapasu	PM2.5	12Jun23, 22:00	412123	1-hr	128	128.2	exc
Janvier	PM2.5	12Jun23, 22:00	415127	1-hr	96	96.5	exc
Fort Hills	PM2.5	12Jun23, 22:00	414753	1-hr	144	144.4	exc
Ells River	PM2.5	12Jun23, 22:00	414726	1-hr	157	157.3	exc
Bertha Ganter	PM2.5	12Jun23, 22:00	415119	1-hr	122	122.1	exc
Surmont 2	PM2.5	12Jun23, 22:00	415125	1-hr	95	94.7	exc
Bertha Ganter	PM2.5	12Jun23, 23:00	415119	1-hr	108	107.8	exc
Buffalo Viewpoint	PM2.5	12Jun23, 23:00	415120	1-hr	155	155.0	exc
Patricia McInnes	PM2.5	12Jun23, 23:00	415128	1-hr	88	87.9	exc
Athabasca Valley	PM2.5	12Jun23, 23:00	415129	1-hr	172	172.1	exc
Barge Landing	PM2.5	12Jun23, 23:00	412121	1-hr	108	108.3	exc
Ft. McKay S	PM2.5	12Jun23, 23:00	415122	1-hr	138	138.3	exc
Anzac	PM2.5	12Jun23, 23:00	415126	1-hr	121	120.8	exc
Wapasu	PM2.5	12Jun23, 23:00	412123	1-hr	267	267.3	exc
Janvier	PM2.5	12Jun23, 23:00	415127	1-hr	100	100.3	exc
Fort Hills	PM2.5	12Jun23, 23:00	414753	1-hr	117	117.5	exc
Ells River	PM2.5	12Jun23, 23:00	414726	1-hr	137	136.7	exc
Surmont 2	PM2.5	12Jun23, 23:00	415125	1-hr	93	92.8	exc
Bertha Ganter	PM2.5	12Jun23, 24:00	415119	1-hr	104	103.6	exc
Buffalo Viewpoint	PM2.5	12Jun23, 24:00	415120	1-hr	150	149.9	exc
Athabasca Valley	PM2.5	12Jun23, 24:00	415129	1-hr	159	159.1	exc
Barge Landing	PM2.5	12Jun23, 24:00	412121	1-hr	91	90.6	exc
Ft. McKay S	PM2.5	12Jun23, 24:00	415122	1-hr	129	128.6	exc
Ft. McKay S	PM2.5	12Jun23, 24:00	415122	24-hr	208	207.7	exc
Anzac	PM2.5	12Jun23, 24:00	415126	1-hr	112	112.2	exc
Anzac	PM2.5	12Jun23, 24:00	415126	24-hr	144	143.8	exc
Wapasu	PM2.5	12Jun23, 24:00	412123	1-hr	303	302.9	exc
Janvier	PM2.5	12Jun23, 24:00	415127	1-hr	99	99.2	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 Hills	PM2.5	12Jun23, 24:00	414753	1-hr	142	142.2	exc
Ells River	PM2.5	12Jun23, 24:00	414726	1-hr	141	141.0	exc
Ells River	PM2.5	12Jun23, 24:00	414726	24-hr	199	199.3	exc
Bertha Ganter	PM2.5	12Jun23, 24:00	415119	24-hr	181	180.6	exc
Buffalo Viewpoint	PM2.5	12Jun23, 24:00	415120	24-hr	168	168.0	exc
Patricia McInnes	PM2.5	12Jun23, 24:00	415128	24-hr	102	101.6	exc
Athabasca Valley	PM2.5	12Jun23, 24:00	415129	24-hr	171	170.7	exc
Barge Landing	PM2.5	12Jun23, 24:00	412121	24-hr	179	178.6	exc
Wapasu	PM2.5	12Jun23, 24:00	412123	24-hr	220	220.1	exc
Stony Mtn.	PM2.5	12Jun23, 24:00	415124	24-hr	81	81.2	exc
Conklin	PM2.5	12Jun23, 24:00	415130	24-hr	89	88.8	exc
Janvier	PM2.5	12Jun23, 24:00	415127	24-hr	130	130.1	exc
Janvier	TRS	12Jun23, 24:00	414727	24-hr	-	-	ret
Fort Hills	PM2.5	12Jun23, 24:00	414753	24-hr	211	211.2	exc
Surmont 2	PM2.5	12Jun23, 24:00	415125	1-hr	89	89.1	exc
Surmont 2	PM2.5	12Jun23, 24:00	415125	24-hr	101	101.4	exc
Bertha Ganter	PM2.5	13Jun23, 01:00	415119	1-hr	97	97.0	exc
Buffalo Viewpoint	PM2.5	13Jun23, 01:00	415120	1-hr	112	111.9	exc
Athabasca Valley	PM2.5	13Jun23, 01:00	415129	1-hr	140	140.1	exc
Barge Landing	PM2.5	13Jun23, 01:00	412121	1-hr	100	99.7	exc
Ft. McKay S	PM2.5	13Jun23, 01:00	415122	1-hr	125	124.7	exc
Anzac	PM2.5	13Jun23, 01:00	415126	1-hr	107	106.6	exc
Wapasu	PM2.5	13Jun23, 01:00	412123	1-hr	201	200.8	exc
Janvier	PM2.5	13Jun23, 01:00	415127	1-hr	101	100.7	exc
Fort Hills	PM2.5	13Jun23, 01:00	414821	1-hr	130	129.9	exc
Ells River	PM2.5	13Jun23, 01:00	414832	1-hr	138	138.0	exc
Surmont 2	PM2.5	13Jun23, 01:00	415125	1-hr	89	88.7	exc
Bertha Ganter	PM2.5	13Jun23, 02:00	415119	1-hr	103	102.5	exc
Buffalo Viewpoint	PM2.5	13Jun23, 02:00	415120	1-hr	114	114.1	exc
Athabasca Valley	PM2.5	13Jun23, 02:00	415129	1-hr	125	125.3	exc
Barge Landing	PM2.5	13Jun23, 02:00	412121	1-hr	122	121.5	exc
Ft. McKay S	PM2.5	13Jun23, 02:00	415122	1-hr	122	122.4	exc
Anzac	PM2.5	13Jun23, 02:00	415126	1-hr	80	80.2	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>
Wapasu	PM2.5	13Jun23, 02:00	412123	1-hr	161	161.2	exc
Janvier	PM2.5	13Jun23, 02:00	415127	1-hr	99	99.3	exc
Fort Hills	PM2.5	13Jun23, 02:00	414821	1-hr	127	127.1	exc
Ells River	PM2.5	13Jun23, 02:00	414832	1-hr	134	133.7	exc
Surmont 2	PM2.5	13Jun23, 02:00	415125	1-hr	94	93.7	exc
Bertha Ganter	PM2.5	13Jun23, 03:00	415119	1-hr	119	119.4	exc
Buffalo Viewpoint	PM2.5	13Jun23, 03:00	415120	1-hr	103	103.4	exc
Athabasca Valley	PM2.5	13Jun23, 03:00	415129	1-hr	103	103.1	exc
Barge Landing	PM2.5	13Jun23, 03:00	412121	1-hr	121	121.2	exc
Ft. McKay S	PM2.5	13Jun23, 03:00	415122	1-hr	123	123.2	exc
Wapasu	PM2.5	13Jun23, 03:00	412123	1-hr	165	164.9	exc
Janvier	PM2.5	13Jun23, 03:00	415127	1-hr	94	93.9	exc
Fort Hills	PM2.5	13Jun23, 03:00	414821	1-hr	126	126.2	exc
Ells River	PM2.5	13Jun23, 03:00	414832	1-hr	125	125.0	exc
Surmont 2	PM2.5	13Jun23, 03:00	415125	1-hr	89	89.5	exc
Bertha Ganter	PM2.5	13Jun23, 04:00	415119	1-hr	118	118.5	exc
Buffalo Viewpoint	PM2.5	13Jun23, 04:00	415120	1-hr	84	84.0	exc
Athabasca Valley	PM2.5	13Jun23, 04:00	415129	1-hr	87	87.1	exc
Barge Landing	PM2.5	13Jun23, 04:00	412121	1-hr	91	91.3	exc
Ft. McKay S	PM2.5	13Jun23, 04:00	415122	1-hr	130	129.6	exc
Wapasu	PM2.5	13Jun23, 04:00	412123	1-hr	134	133.8	exc
Janvier	PM2.5	13Jun23, 04:00	415127	1-hr	85	84.8	exc
Fort Hills	PM2.5	13Jun23, 04:00	414821	1-hr	124	124.2	exc
Ells River	PM2.5	13Jun23, 04:00	414832	1-hr	123	122.5	exc
Bertha Ganter	PM2.5	13Jun23, 05:00	415119	1-hr	118	118.4	exc
Athabasca Valley	PM2.5	13Jun23, 05:00	415129	1-hr	88	88.4	exc
Barge Landing	PM2.5	13Jun23, 05:00	412121	1-hr	98	98.0	exc
Ft. McKay S	PM2.5	13Jun23, 05:00	415122	1-hr	128	128.2	exc
Wapasu	PM2.5	13Jun23, 05:00	412123	1-hr	117	116.6	exc
Janvier	PM2.5	13Jun23, 05:00	415127	1-hr	88	88.4	exc
Fort Hills	PM2.5	13Jun23, 05:00	414821	1-hr	119	119.0	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	13Jun23, 05:00	414832	1-hr	117	117.3	exc
Bertha Ganter	PM2.5	13Jun23, 06:00	415119	1-hr	114	113.8	exc
Buffalo Viewpoint	PM2.5	13Jun23, 06:00	415120	1-hr	84	83.8	exc
Athabasca Valley	PM2.5	13Jun23, 06:00	415129	1-hr	92	92.5	exc
Barge Landing	PM2.5	13Jun23, 06:00	412121	1-hr	110	110.0	exc
Ft. McKay S	PM2.5	13Jun23, 06:00	415122	1-hr	130	130.5	exc
Wapasu	PM2.5	13Jun23, 06:00	412123	1-hr	99	98.8	exc
Conklin	PM2.5	13Jun23, 06:00	415130	1-hr	83	83.2	exc
Janvier	PM2.5	13Jun23, 06:00	415127	1-hr	87	86.8	exc
Fort Hills	PM2.5	13Jun23, 06:00	414821	1-hr	114	114.2	exc
Ells River	PM2.5	13Jun23, 06:00	414832	1-hr	112	112.5	exc
Anzac	PM2.5	13Jun23, 03:00	415126	1-hr	99	99.3	exc
Anzac	PM2.5	13Jun23, 04:00	415126	1-hr	105	105.0	exc
Anzac	PM2.5	13Jun23, 05:00	415126	1-hr	104	104.4	exc
Anzac	PM2.5	13Jun23, 06:00	415126	1-hr	94	94.5	exc
Surmont 2	PM2.5	13Jun23, 06:00	415125	1-hr	81	81.4	exc
Bertha Ganter	PM2.5	13Jun23, 07:00	415119	1-hr	108	107.9	exc
Buffalo Viewpoint	PM2.5	13Jun23, 07:00	415120	1-hr	85	84.7	exc
Athabasca Valley	PM2.5	13Jun23, 07:00	415129	1-hr	103	103.0	exc
Barge Landing	PM2.5	13Jun23, 07:00	412121	1-hr	101	100.8	exc
Ft. McKay S	PM2.5	13Jun23, 07:00	415122	1-hr	132	131.9	exc
Anzac	PM2.5	13Jun23, 07:00	415126	1-hr	103	102.7	exc
Wapasu	PM2.5	13Jun23, 07:00	412123	1-hr	99	99.1	exc
Stony Mtn.	PM2.5	13Jun23, 07:00	415124	1-hr	93	93.5	exc
Conklin	PM2.5	13Jun23, 07:00	415130	1-hr	103	103.4	exc
Janvier	PM2.5	13Jun23, 07:00	415127	1-hr	86	86.4	exc
Fort Hills	PM2.5	13Jun23, 07:00	414821	1-hr	105	105.4	exc
Surmont 2	PM2.5	13Jun23, 07:00	415125	1-hr	81	81.0	exc
Ells River	PM2.5	13Jun23, 07:00	414832	1-hr	112	112.1	exc
Bertha Ganter	PM2.5	13Jun23, 08:00	415119	1-hr	105	104.7	exc
Buffalo Viewpoint	PM2.5	13Jun23, 08:00	415120	1-hr	90	90.4	exc
Athabasca Valley	PM2.5	13Jun23, 08:00	415129	1-hr	111	111.1	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	13Jun23, 08:00	412121	1-hr	97	97.1	exc
Ft. McKay S	PM2.5	13Jun23, 08:00	415122	1-hr	129	128.9	exc
Anzac	PM2.5	13Jun23, 08:00	415126	1-hr	101	100.6	exc
Wapasu	PM2.5	13Jun23, 08:00	412123	1-hr	102	101.7	exc
Stony Mtn.	PM2.5	13Jun23, 08:00	415124	1-hr	121	120.8	exc
Conklin	PM2.5	13Jun23, 08:00	415130	1-hr	141	140.5	exc
Fort Hills	PM2.5	13Jun23, 08:00	414821	1-hr	103	103.2	exc
Ells River	PM2.5	13Jun23, 08:00	414832	1-hr	102	102.2	exc
Bertha Ganter	PM2.5	13Jun23, 09:00	415119	1-hr	106	105.8	exc
Buffalo Viewpoint	PM2.5	13Jun23, 09:00	415120	1-hr	97	96.6	exc
Athabasca Valley	PM2.5	13Jun23, 09:00	415129	1-hr	109	109.1	exc
Barge Landing	PM2.5	13Jun23, 09:00	412121	1-hr	101	100.7	exc
Ft. McKay S	PM2.5	13Jun23, 09:00	415122	1-hr	128	127.6	exc
Anzac	PM2.5	13Jun23, 09:00	415126	1-hr	94	93.6	exc
Wapasu	PM2.5	13Jun23, 09:00	412123	1-hr	107	107.2	exc
Stony Mtn.	PM2.5	13Jun23, 09:00	415124	1-hr	155	155.0	exc
Conklin	PM2.5	13Jun23, 09:00	415130	1-hr	164	163.7	exc
Janvier	PM2.5	13Jun23, 09:00	415127	1-hr	92	91.6	exc
Fort Hills	PM2.5	13Jun23, 09:00	414821	1-hr	102	101.7	exc
Bertha Ganter	PM2.5	13Jun23, 10:00	415119	1-hr	108	108.3	exc
Buffalo Viewpoint	PM2.5	13Jun23, 10:00	415120	1-hr	100	99.7	exc
Athabasca Valley	PM2.5	13Jun23, 10:00	415129	1-hr	104	103.9	exc
Barge Landing	PM2.5	13Jun23, 10:00	412121	1-hr	105	104.8	exc
Ft. McKay S	PM2.5	13Jun23, 10:00	415122	1-hr	131	130.9	exc
Anzac	PM2.5	13Jun23, 10:00	415126	1-hr	107	107.4	exc
Wapasu	PM2.5	13Jun23, 10:00	412123	1-hr	113	113.3	exc
Stony Mtn.	PM2.5	13Jun23, 10:00	415124	1-hr	154	154.2	exc
Conklin	PM2.5	13Jun23, 10:00	415130	1-hr	169	169.2	exc
Janvier	PM2.5	13Jun23, 10:00	415127	1-hr	110	110.1	exc
Fort Hills	PM2.5	13Jun23, 10:00	414821	1-hr	100	100.3	exc
Surmont 2	PM2.5	13Jun23, 10:00	415125	1-hr	87	86.5	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	13Jun23, 11:00	415119	1-hr	110	110.3	exc
Buffalo Viewpoint	PM2.5	13Jun23, 11:00	415120	1-hr	103	103.3	exc
Athabasca Valley	PM2.5	13Jun23, 11:00	415129	1-hr	102	102.0	exc
Barge Landing	PM2.5	13Jun23, 11:00	412121	1-hr	108	107.9	exc
Ft. McKay S	PM2.5	13Jun23, 11:00	415122	1-hr	139	139.3	exc
Anzac	PM2.5	13Jun23, 11:00	415126	1-hr	108	107.7	exc
Wapasu	PM2.5	13Jun23, 11:00	412123	1-hr	116	116.0	exc
Stony Mtn.	PM2.5	13Jun23, 11:00	415124	1-hr	144	145.7	exc
Conklin	PM2.5	13Jun23, 11:00	415130	1-hr	151	150.5	exc
Janvier	PM2.5	13Jun23, 11:00	415127	1-hr	112	112.3	exc
Fort Hills	PM2.5	13Jun23, 11:00	414821	1-hr	99	98.9	exc
Surmont 2	PM2.5	13Jun23, 11:00	415125	1-hr	107	107.1	exc
Bertha Ganter	PM2.5	13Jun23, 12:00	415119	1-hr	115	115.3	exc
Buffalo Viewpoint	PM2.5	13Jun23, 12:00	415120	1-hr	98	97.6	exc
Athabasca Valley	PM2.5	13Jun23, 12:00	415129	1-hr	94	94.0	exc
Barge Landing	PM2.5	13Jun23, 12:00	412121	1-hr	111	111.3	exc
Ft. McKay S	PM2.5	13Jun23, 12:00	415122	1-hr	136	136.3	exc
Anzac	PM2.5	13Jun23, 12:00	415126	1-hr	102	101.7	exc
Wapasu	PM2.5	13Jun23, 12:00	412123	1-hr	109	108.8	exc
Stony Mtn.	PM2.5	13Jun23, 12:00	415124	1-hr	126	125.5	exc
Conklin	PM2.5	13Jun23, 12:00	415130	1-hr	140	140.2	exc
Fort Hills	PM2.5	13Jun23, 12:00	414821	1-hr	103	103.1	exc
Surmont 2	PM2.5	13Jun23, 12:00	415125	1-hr	102	101.8	exc
Bertha Ganter	PM2.5	13Jun23, 13:00	415119	1-hr	111	111.1	exc
Buffalo Viewpoint	PM2.5	13Jun23, 13:00	415120	1-hr	91	91.1	exc
Barge Landing	PM2.5	13Jun23, 13:00	412121	1-hr	106	105.8	exc
Ft. McKay S	PM2.5	13Jun23, 13:00	415122	1-hr	134	133.8	exc
Anzac	PM2.5	13Jun23, 13:00	415126	1-hr	82	81.8	exc
Wapasu	PM2.5	13Jun23, 13:00	412123	1-hr	100	99.9	exc
Stony Mtn.	PM2.5	13Jun23, 13:00	415124	1-hr	129	129.4	exc
Conklin	PM2.5	13Jun23, 13:00	415130	1-hr	131	131.1	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>
Janvier	PM2.5	13Jun23, 13:00	415127	1-hr	118	118.3	exc
Fort Hills	PM2.5	13Jun23, 13:00	414821	1-hr	105	104.6	exc
Bertha Ganter	PM2.5	13Jun23, 14:00	415119	1-hr	98	98.4	exc
Buffalo Viewpoint	PM2.5	13Jun23, 14:00	415120	1-hr	93	93.5	exc
Barge Landing	PM2.5	13Jun23, 14:00	412121	1-hr	98	97.9	exc
Ft. McKay S	PM2.5	13Jun23, 14:00	415122	1-hr	119	119.1	exc
Wapasu	PM2.5	13Jun23, 14:00	412123	1-hr	102	101.9	exc
Stony Mtn.	PM2.5	13Jun23, 14:00	415124	1-hr	112	111.8	exc
Conklin	PM2.5	13Jun23, 14:00	415130	1-hr	125	125.4	exc
Janvier	PM2.5	13Jun23, 14:00	415127	1-hr	110	109.5	exc
Fort Hills	PM2.5	13Jun23, 14:00	414821	1-hr	106	105.9	exc
Surmont 2	PM2.5	13Jun23, 14:00	415125	1-hr	89	88.8	exc
Bertha Ganter	PM2.5	13Jun23, 15:00	415119	1-hr	107	106.7	exc
Buffalo Viewpoint	PM2.5	13Jun23, 15:00	415120	1-hr	118	118.1	exc
Barge Landing	PM2.5	13Jun23, 15:00	412121	1-hr	103	102.5	exc
Ft. McKay S	PM2.5	13Jun23, 15:00	415122	1-hr	119	119.4	exc
Wapasu	PM2.5	13Jun23, 15:00	412123	1-hr	117	117.1	exc
Stony Mtn.	PM2.5	13Jun23, 15:00	415124	1-hr	92	91.7	exc
Conklin	PM2.5	13Jun23, 15:00	415130	1-hr	116	116.0	exc
Janvier	PM2.5	13Jun23, 15:00	415127	1-hr	102	102.3	exc
Fort Hills	PM2.5	13Jun23, 15:00	414821	1-hr	105	105.3	exc
Surmont 2	PM2.5	13Jun23, 15:00	415125	1-hr	90	90.4	exc
Bertha Ganter	PM2.5	13Jun23, 16:00	415119	1-hr	117	116.7	exc
Buffalo Viewpoint	PM2.5	13Jun23, 16:00	415120	1-hr	122	121.7	exc
Barge Landing	PM2.5	13Jun23, 16:00	412121	1-hr	108	107.9	exc
Ft. McKay S	PM2.5	13Jun23, 16:00	415122	1-hr	134	134.3	exc
Anzac	PM2.5	13Jun23, 16:00	415126	1-hr	94	93.9	exc
Wapasu	PM2.5	13Jun23, 16:00	412123	1-hr	116	115.6	exc
Fort Hills	PM2.5	13Jun23, 16:00	414821	1-hr	117	116.7	exc
Surmont 2	PM2.5	13Jun23, 16:00	415125	1-hr	88	88.0	exc
Bertha Ganter	PM2.5	13Jun23, 17:00	415119	1-hr	114	114.1	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	13Jun23, 17:00	415120	1-hr	116	116.2	exc
Athabasca Valley	PM2.5	13Jun23, 17:00	415129	1-hr	118	117.9	exc
Barge Landing	PM2.5	13Jun23, 17:00	412121	1-hr	106	105.6	exc
Ft. McKay S	PM2.5	13Jun23, 17:00	415122	1-hr	131	131.5	exc
Anzac	PM2.5	13Jun23, 17:00	415126	1-hr	92	91.8	exc
Wapasu	PM2.5	13Jun23, 17:00	412123	1-hr	106	105.6	exc
Fort Hills	PM2.5	13Jun23, 17:00	414821	1-hr	141	140.6	exc
Bertha Ganter	PM2.5	13Jun23, 18:00	415119	1-hr	138	137.5	exc
Buffalo Viewpoint	PM2.5	13Jun23, 18:00	415120	1-hr	128	128.3	exc
Athabasca Valley	PM2.5	13Jun23, 18:00	415129	1-hr	119	119.0	exc
Barge Landing	PM2.5	13Jun23, 18:00	412121	1-hr	133	133.0	exc
Ft. McKay S	PM2.5	13Jun23, 18:00	415122	1-hr	157	156.8	exc
Wapasu	PM2.5	13Jun23, 18:00	412123	1-hr	127	126.6	exc
Fort Hills	PM2.5	13Jun23, 18:00	414821	1-hr	139	138.5	exc
Bertha Ganter	PM2.5	13Jun23, 19:00	415119	1-hr	132	132.3	exc
Buffalo Viewpoint	PM2.5	13Jun23, 19:00	415120	1-hr	125	125.4	exc
Athabasca Valley	PM2.5	13Jun23, 19:00	415129	1-hr	128	127.8	exc
Barge Landing	PM2.5	13Jun23, 19:00	412121	1-hr	132	131.9	exc
Ft. McKay S	PM2.5	13Jun23, 19:00	415122	1-hr	159	158.7	exc
Wapasu	PM2.5	13Jun23, 19:00	412123	1-hr	136	136.4	exc
Fort Hills	PM2.5	13Jun23, 19:00	414821	1-hr	138	137.5	exc
Bertha Ganter	PM2.5	13Jun23, 20:00	415119	1-hr	116	116.2	exc
Buffalo Viewpoint	PM2.5	13Jun23, 20:00	415120	1-hr	116	116.3	exc
Athabasca Valley	PM2.5	13Jun23, 20:00	415129	1-hr	133	133.2	exc
Barge Landing	PM2.5	13Jun23, 20:00	412121	1-hr	107	107.3	exc
Ft. McKay S	PM2.5	13Jun23, 20:00	415122	1-hr	142	141.5	exc
Wapasu	PM2.5	13Jun23, 20:00	412123	1-hr	123	122.9	exc
Fort Hills	PM2.5	13Jun23, 20:00	414821	1-hr	100	99.9	exc
Bertha Ganter	PM2.5	13Jun23, 21:00	415119	1-hr	80	80.4	exc
Buffalo Viewpoint	PM2.5	13Jun23, 21:00	415120	1-hr	109	108.8	exc
Athabasca Valley	PM2.5	13Jun23, 21:00	415129	1-hr	108	107.6	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>
Ft. McKay S	PM2.5	13Jun23, 21:00	415122	1-hr	104	104.2	exc
Wapasu	PM2.5	13Jun23, 21:00	412123	1-hr	116	116.2	exc
Athabasca Valley	PM2.5	13Jun23, 22:00	415129	1-hr	104	104.4	exc
Wapasu	PM2.5	13Jun23, 22:00	412123	1-hr	87	86.8	exc
Athabasca Valley	PM2.5	13Jun23, 23:00	415129	1-hr	103	103.3	exc
Ft. McKay S	PM2.5	13Jun23, 23:00	415122	1-hr	86	85.9	exc
Fort Hills	PM2.5	13Jun23, 23:00	414821	1-hr	83	83.3	exc
Buffalo Viewpoint	PM2.5	13Jun23, 24:00	415120	24-hr	98	97.7	exc
Patricia McInnes	PM2.5	13Jun23, 24:00	415128	24-hr	46	45.7	exc
Athabasca Valley	PM2.5	13Jun23, 24:00	415129	1-hr	81	81.2	exc
Athabasca Valley	PM2.5	13Jun23, 24:00	415129	24-hr	100	100.5	exc
Barge Landing	PM2.5	13Jun23, 24:00	412121	24-hr	101	101.0	exc
Ft. McKay S	PM2.5	13Jun23, 24:00	415122	1-hr	94	94.1	exc
Ft. McKay S	PM2.5	13Jun23, 24:00	415122	24-hr	125	125.4	exc
Stony Mtn.	PM2.5	13Jun23, 24:00	415124	24-hr	84	83.7	exc
Conklin	PM2.5	13Jun23, 24:00	415130	24-hr	91	90.7	exc
Janvier	PM2.5	13Jun23, 24:00	415127	24-hr	78	78.2	exc
Fort Hills	PM2.5	13Jun23, 24:00	414821	1-hr	95	95.5	exc
Fort Hills	PM2.5	13Jun23, 24:00	414821	24-hr	109	108.7	exc
Bertha Ganter	PM2.5	13Jun23, 24:00	415119	24-hr	106	105.7	exc
Anzac	PM2.5	13Jun23, 24:00	415126	24-hr	75	92.0	exc
Wapasu	PM2.5	13Jun23, 24:00	412123	24-hr	114	114.4	exc
Surmont 2	PM2.5	13Jun23, 24:00	415125	24-hr	70	70.4	exc
Ft. McKay S	PM2.5	14Jun23, 01:00	415122	1-hr	94	93.9	exc
Ft. McKay S	PM2.5	14Jun23, 02:00	415122	1-hr	86	86.2	exc
Anzac	PM2.5	14Jun23, 04:00	415126	1-hr	111	-	ret
Wapasu	PM2.5	14Jun23, 04:00	412123	1-hr	85	85.0	exc
Anzac	PM2.5	14Jun23, 05:00	415126	1-hr	123	-	ret
Stony Mtn.	PM2.5	14Jun23, 05:00	415124	1-hr	83	83.3	exc
Conklin	PM2.5	14Jun23, 05:00	415130	1-hr	96	96.4	exc
Janvier	PM2.5	14Jun23, 05:00	415127	1-hr	106	105.6	exc
Anzac	PM2.5	14Jun23, 06:00	415126	1-hr	111	-	ret
Stony Mtn.	PM2.5	14Jun23, 06:00	415124	1-hr	99	99.4	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>
Conklin	PM2.5	14Jun23, 06:00	415130	1-hr	103	103.4	exc
Janvier	PM2.5	14Jun23, 06:00	415127	1-hr	108	108.0	exc
Surmont 2	PM2.5	14Jun23, 06:00	415125	1-hr	91	91.4	exc
Anzac	PM2.5	14Jun23, 07:00	415126	1-hr	113	-	ret
Stony Mtn.	PM2.5	14Jun23, 07:00	415124	1-hr	97	97.4	exc
Conklin	PM2.5	14Jun23, 07:00	415130	1-hr	101	100.8	exc
Janvier	PM2.5	14Jun23, 07:00	415127	1-hr	98	98.4	exc
Surmont 2	PM2.5	14Jun23, 07:00	415125	1-hr	94	94.4	exc
Ells River	PM2.5	13Jun23, 09:00	414832	1-hr	99	98.5	exc
Ells River	PM2.5	13Jun23, 10:00	414832	1-hr	97	97.0	exc
Ells River	PM2.5	13Jun23, 11:00	414832	1-hr	96	96.5	exc
Ells River	PM2.5	13Jun23, 12:00	414832	1-hr	101	101.1	exc
Ells River	PM2.5	13Jun23, 13:00	414832	1-hr	102	102.0	exc
Ells River	PM2.5	13Jun23, 14:00	414832	1-hr	91	91.1	exc
Ells River	PM2.5	13Jun23, 15:00	414832	1-hr	99	98.7	exc
Ells River	PM2.5	13Jun23, 16:00	414832	1-hr	101	101.1	exc
Ells River	PM2.5	13Jun23, 17:00	414832	1-hr	120	119.8	exc
Ells River	PM2.5	13Jun23, 18:00	414832	1-hr	136	136.2	exc
Ells River	PM2.5	13Jun23, 19:00	414832	1-hr	134	133.7	exc
Ells River	PM2.5	13Jun23, 20:00	414832	1-hr	115	114.9	exc
Ells River	PM2.5	13Jun23, 24:00	414832	1-hr	99	98.6	exc
Ells River	PM2.5	13Jun23, 24:00	414832	24-hr	107	106.9	exc
Anzac	PM2.5	14Jun23, 08:00	415126	1-hr	107	-	ret
Stony Mtn.	PM2.5	14Jun23, 08:00	415124	1-hr	87	87.1	exc
Conklin	PM2.5	14Jun23, 08:00	415130	1-hr	84	83.9	exc
Janvier	PM2.5	14Jun23, 08:00	415127	1-hr	88	88.5	exc
Surmont 2	PM2.5	14Jun23, 08:00	415125	1-hr	82	82.0	exc
Anzac	PM2.5	14Jun23, 09:00	415126	1-hr	103	-	ret
Stony Mtn.	PM2.5	14Jun23, 24:00	415124	24-hr	43	43.3	exc
Conklin	PM2.5	14Jun23, 24:00	415130	24-hr	45	45.0	exc
Janvier	PM2.5	14Jun23, 24:00	415127	24-hr	42	41.8	exc
Surmont 2	PM2.5	14Jun23, 24:00	415125	24-hr	31	31.3	exc
Anzac	PM2.5	14Jun23, 24:00	415126	24-hr	46	-	ret
Buffalo Viewpoint	PM2.5	17Jun23, 14:00	415120	1-hr	103	103.3	exc
Ft. McKay S	PM2.5	17Jun23, 14:00	415122	1-hr	114	114.4	exc
Bertha Ganter	PM2.5	17Jun23, 14:00	415119	1-hr	87	86.8	exc
Buffalo Viewpoint	PM2.5	17Jun23, 15:00	415120	1-hr	84	84.4	exc
Barge Landing	PM2.5	17Jun23, 15:00	412121	1-hr	111	110.6	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>
Ft. McKay S	PM2.5	17Jun23, 15:00	415122	1-hr	156	156.2	exc
Wapasu	PM2.5	17Jun23, 15:00	412123	1-hr	103	103.1	exc
Bertha Ganter	PM2.5	17Jun23, 15:00	415119	1-hr	115	115.0	exc
Barge Landing	PM2.5	17Jun23, 16:00	412121	1-hr	103	103.3	exc
Ft. McKay S	PM2.5	17Jun23, 16:00	415122	1-hr	117	116.8	exc
Wapasu	PM2.5	17Jun23, 16:00	412123	1-hr	135	134.7	exc
Ells River	PM2.5	17Jun23, 16:00	415056	1-hr	98	95.2	exc
Bertha Ganter	PM2.5	17Jun23, 16:00	415119	1-hr	96	95.6	exc
Wapasu	PM2.5	17Jun23, 17:00	412123	1-hr	132	131.9	exc
Fort Hills	PM2.5	17Jun23, 17:00	415055	1-hr	84	84.4	exc
Ft. McKay S	PM2.5	17Jun23, 24:00	415122	24-hr	37	37.3	exc
Wapasu	PM2.5	17Jun23, 24:00	412123	24-hr	37	37.3	exc
Janvier	TRS	18Jun23, 24:00	415043	24-hr	-	-	ret
Barge Landing	PM2.5	19Jun23, 09:00	415433	1-hr	133	133.5	exc
Barge Landing	PM2.5	19Jun23, 10:00	415433	1-hr	108	107.7	exc
Ft. McKay S	PM2.5	29Jun23, 24:00	415860	24-hr	32	31.6	exc
Barge Landing	PM2.5	29Jun23, 24:00	415861	24-hr	30	30.0	exc
Ells River	PM2.5	29Jun23, 24:00	415680	24-hr	29	29.0	nae
Firebag	H2S	30Jun23, 01:00	415681	1-hr	-	-	ret
Firebag	H2S	30Jun23, 02:00	415681	1-hr	-	-	ret
Fort Chip	PM2.5	30Jun23, 03:00	415862	1-hr	82	81.5	exc
Firebag	H2S	30Jun23, 03:00	415681	1-hr	-	-	ret
Fort Chip	PM2.5	30Jun23, 04:00	415862	1-hr	90	89.8	exc
Fort Chip	PM2.5	30Jun23, 05:00	415862	1-hr	84	84.1	exc
Fort Chip	PM2.5	30Jun23, 08:00	415862	1-hr	95	95.2	exc
Fort Chip	PM2.5	30Jun23, 09:00	415862	1-hr	90	89.9	exc
Fort Chip	PM2.5	30Jun23, 10:00	415862	1-hr	90	90.5	exc
Fort Chip	PM2.5	30Jun23, 22:00	415862	1-hr	250	249.8	exc
Conklin	PM2.5	30Jun23, 22:00	415863	1-hr	137	137.3	exc
Fort Chip	PM2.5	30Jun23, 23:00	415862	1-hr	300	300.5	exc
Buffalo Viewpoint	PM2.5	30Jun23, 24:00	415864	1-hr	100	100.4	exc
Fort Chip	PM2.5	30Jun23, 24:00	415862	1-hr	226	226.0	exc
Ft. McKay S	PM2.5	30Jun23, 24:00	415860	1-hr	83	83.1	exc
Wapasu	PM2.5	30Jun23, 24:00	415865	24-hr	35	34.6	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	30Jun23, 24:00	415743	1-hr	99	99.5	exc
Fort Hills	PM2.5	30Jun23, 24:00	415743	24-hr	35	34.9	exc
Ells River	PM2.5	30Jun23, 24:00	415744	24-hr	30	30.4	exc
Fort Chip	PM2.5	30Jun23, 24:00	415862	24-hr	86	86.0	exc
Bertha Ganter	O3	2Jun23, 15:00	417240	1-hr	76.6	76.6	late
Buffalo Viewpoint	O3	2Jun23, 14:00	417239	1-hr	77	77	late

*status legend:

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

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

July 31, 2023
1:57:55 PM
Request # 4575638

Submitted by: EN6138_BAS
Submission Date: Jul 31, 2023 1:57:11 PM

File Type

Calibration Report

File Name

CAL-WBEA-202306.pdf

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

July 31, 2023
3:03:37 PM
Request # 4575697

Submitted by: EN6138_BAS
Submission Date: Jul 31, 2023 3:02:59 PM

File Type

Ambient Data

File Name

AMB-WBEA-202306-V00.xml

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

July 31, 2023
4:32:04 PM
Request # 4575760

Submitted by: EN6138_BAS
Submission Date: Jul 31, 2023 4:31:44 PM

File Type
Airshed Monitoring Report

File Name
WBEA-202306.pdf

Total Number of Files: 1

*** End of Report ***



End of Report