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Wood Buffalo Environmental Association

MARCH 2023
MONTHLY REPORT

CONTINUOUS MONITORING
April 29, 2023

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

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April 29, 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 March 2023
Wood Buffalo Environmental Association

Enclosed is the March 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
AMS02 - Mildred Lake
AMS03 - Lower Camp (Meteorology)
AMS04 - Buffalo Viewpoint
AMS05 - Mannix
AMS06 - Patricia McInnes
AMS07 - Athabasca Valley
AMS08 - Fort Chipewyan
AMS09 - Barge Landing
AMS11 - Lower Camp (Air Quality)
AMS13 - Fort McKay South
AMS14 - Anzac
AMS17 - Wapasu
AMS18 - Stony Mountain
AMS19 - Firebag
AMS20 - MacKay River
AMS21 - Conklin
AMS22 - Janvier
AMS23 - Fort Hills
AMS25 - Waskōw ohci Pimâtisiwin
AMS26 - Christina Lake
AMS27 - Jackfish 2/3
AMS29 - Surmont 2
AMS30 - Ells River
AMS506 – Jackfish 1
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	EPEA Approval No.
Athabasca Oil Corporation	289664-00-00; 241311-00-00
Canadian Natural	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
Teck Resources Ltd.	00247548-00-00
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 Local 1909
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, NH_3, NO_2, O_3, SO_2, and TRS.

There were two ground-level concentrationS in excess of the 1-hour H_2S objective reported to AEPA; following data validation and processing these exceedances were confirmed.

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

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

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

Site	Parameter	Date / Time	Reference	Period	Reported	Final	Status*
Lower Camp	H2S	17Mar23, 19:00	410686	1-hr	14	13.8	exc
Lower Camp	H2S	17Mar23, 20:00	410686	1-hr	11	10.7	exc
Fort Hills	PM2.5	21Mar23, 04:00	410847	1-hr	108	108.1	exc
Fort Hills	PM2.5	26Mar23, 22:00	411000	1-hr	85	85.0	exc
Fort Hills	PM2.5	26Mar23, 23:00	411000	1-hr	96	95.8	exc
Fort Hills	PM2.5	26Mar23, 24:00	411000	1-hr	92	92.0	exc
Fort Hills	PM2.5	26Mar23, 24:00	411000	24-hr	40	40.4	exc
Fort Hills	PM2.5	27Mar23, 01:00	411036	1-hr	82	81.5	exc
Fort Hills	PM2.5	27Mar23, 02:00	411036	1-hr	91	90.6	exc
Surmont 2	PM2.5	27Mar23, 07:00	411039	1-hr	91	90.7	exc
Bertha Ganter	PM2.5	28Mar23, 06:00	411041	1-hr	100	99.6	exc
Fort Hills	PM2.5	27Mar23, 24:00	411036	1-hr	230	229.6	exc
Fort Hills	PM2.5	28Mar23, 01:00	411042	1-hr	95	95.2	exc
Fort Hills	PM2.5	28Mar23, 02:00	411042	1-hr	134	133.8	exc
Fort Hills	PM2.5	28Mar23, 04:00	411042	1-hr	125	125.4	exc
Fort Hills	PM2.5	27Mar23, 24:00	411036	24-hr	40	40.4	exc
Bertha Ganter	PM2.5	28Mar23, 24:00	411069	24-hr	31	31.3	exc
Fort Hills	PM2.5	28Mar23, 24:00	411070	1-hr	81	81.4	exc
Fort Hills	PM2.5	28Mar23, 24:00	411070	24-hr	37	36.5	exc
Fort Hills	PM2.5	29Mar23, 03:00	411076	1-hr	88	88.5	exc

Fort Hills	PM2.5	29Mar23, 24:00	411123	24-hr	32	32.2	exc
Fort Hills	PM2.5	30Mar23, 05:00	411185	1-hr	126	126.3	exc
Ells River	TSP	25Mar23, 24:00	411644	24-hr	167	167	exc

*status legend:

late exceedance, raw values were not found to be in exceedance in real time, and/or were not reported, but final values were found to be an exceedance after data processing.

exc exceedance, raw values reported in real time were confirmed to be in exceedance after data processing.

nae not an exceedance, raw values reported in real time were found not in exceedance after data processing.

ret retracted, reported exceedance was found to be not an exceedance after investigation of measurement system status and/or validation of raw data in conjunction with all associated measurement parameters.

2.0 Data Processing and Validation

Concentrations reported in near real-time were raw values. The final values were determined after processing data for reporting. For all parameters, except $PM_{2.5}$, the final 5-minute data values were determined by subtracting the daily zero responses, interpolated to the time of each raw 5-minute value, from the raw 5-minute data values. The $PM_{2.5}$ analyzers do not have the capability of performing zero's, therefore, the raw 5-minute values are validated through a comparison with associated parameters at the same, or a nearby, AMS. The final 5-minute data values were then rounded to one decimal place greater than the reporting precision indicated in the Air Monitoring Directive (AMD). The final 1-hour data values were calculated from final 5-minute data values and then rounded to reporting precision. The final 24-hour data values were calculated from final 1-hour values.

After data processing and validation, NO_2 concentrations were re-calculated from baseline-corrected NO_X and NO concentrations. Specifically, the NO concentration was subtracted from the NO_X concentration to determine the NO_2 concentration.

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

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

3.0 Operational Status

3.1 Continuous Monitoring

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

1. All air monitoring analyzers and sensors, which includes SO_2, H_2S, and meteorological parameters, at the Waskōw ohci Pimâtisiwin AMS operated less than 90% for the month of March 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 Environments and Protected Areas (AEPA) on March 23,

2023 (reference number 410890). A verbal and written report was also submitted for the same event in January and February (reference numbers 409189 and 409260, respectively).

On January 27, power to the Waskōw ohci Pimâtisiwin AMS was disconnected by the electricity service provider due to a misunderstanding in the transfer of station ownership between two other parties. At that time, the error was addressed, and the station owner indicated the service provider would restore power when their schedule permitted. On March 15, the WBEA was notified that power was restored and proceeded to complete all necessary instrument maintenance and calibrations to return the station to normal operation. Subsequent data observation confirmed that the station resumed normal operation on March 16.

2. The relative humidity (RH) and ambient temperature (AT) sensor at the 20-meter elevation at Lower Camp Met Tower operated less than 90% of March 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 March 29, 2023 (reference number 411093).

   On March 3, the WBEA determined that the RH/AT sensor was causing communication issues for other sensors on the met tower, therefore, the sensor was disabled to avoid additional data loss. Historically, the WBEA is reliant on a third party to climb the tower and replace these sensors, however, to reduce downtime and improve efficiency, the WBEA elected to train internal resources to complete the work. The sensor was replaced, and returned to normal operation, on March 31.

3. The THC, NMHC, and CH_4 analyzer at the Barge Landing AMS operated for less than 90% of March 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported report to Alberta Environment and Protected Areas (AEPA) on March 30, 2023 (reference number 411152).

   This instrument is a semi-continuous gas chromatograph that requires the CH_4 and NMHC peaks to remain within the data capture windows. In early March, these peaks shifted outside of the optimal data capture windows and as a result, the baseline shifted outside of the normal range. Throughout March, the WBEA performed multiple maintenance activities, including two adjustments of the optimal data capture window, replacement of the actuator and pump, and associated as founds and calibrations. Ultimately, the analyzer was replaced, and normal operation resumed, on March 28, 2023. Data throughout March, associated with the event and maintenance activities, were invalidated for a total of 204 hours of downtime, resulting in an operational time of 72%.

3.2 Intermittent Monitoring

The results for time-integrated sampling of precipitation, PAH, VOC, ECOC, $PM_{2.5}$, and PM_{10} will be submitted in the 2023 Annual Report.

3.3 General Network Notes

The Ammonia (NH_3) 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 (CH_4) measurements are collected at some air monitoring stations in the WBEA network using the Thermo Environmental model 55i direct CH_4/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 NH_3 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 NH_3 gas, this is an inherent behavior in the NH_3 analyzer operations due to the properties of the NH_3 gas. Data for 1 hour following the daily spans have been reported as invalid for a total of 29 hours this month.

Unstable operations due to excessive baseline noise in the output signal of the NH_3 analyzer on March 1 and 28 resulted in 5 hours of invalid data.

Cleaning of the sample manifold on March 30 interrupted the normal operations of all gaseous analyzers, except for the NH_3 analyzer, for 1 hour.

Maintenance to replace the sample pump and subsequent stabilization of the NH_3 analyzer on March 30 and 31 resulted in 13 hours of invalid data.

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

Station 2, Mildred Lake

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Cleaning of the sample manifold on March 16 interrupted the normal operations of the SO_2 and THC/NMHC/CH_4 analyzers for 2 hours.

A flatline in the output signal of the wind sensor on March 5 resulted in 1 hour of invalid data.

Station 3, Lower Camp – Meteorology

On March 3, the WBEA determined that the Relative Humidity and Temperature sensor at a 20-meter elevation was causing communication issues for other sensors on the met tower. Therefore, the sensor was disabled to avoid additional data loss. This event resulted in a total of 673 hours of invalid data. The sensor was replaced and returned to normal operations on March 31.

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

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Station 4, Buffalo Viewpoint

Maintenance to replace the internal lamp of the O_3 analyzer on March 6 and 7 resulted in 25 hours of downtime.

Maintenance to reboot the THC/NMHC/CH_4 analyzer on March 7 resulted in one hour of down time.

Maintenance to verify the daily QA check on March 8 interrupted the normal operations of the NO_2, O_3, and THC/NMHC/CH_4 analyzers for 1 hour.

An internal audit on March 9 interrupted the normal operations of O_3 analyzers for 3 hours.

Maintenance to replace the THC/NMHC/CH_4 analyzer on March 28 and 29 resulted in 23 hours of downtime.

Maintenance to replace the $PM_{2.5}$ analyzer on March 28 and 29 resulted in 20 hours of downtime.

Station 5, Mannix

Maintenance to replace a sample manifold part on March 4 affected the normal operations of all the gaseous analyzers for 4 hours.

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Maintenance to replace the zero-air generator on March 10 affected the normal operations of all the gaseous analyzers for 1 to 2 hours.

Unstable operation due to a flatline on the THC/NMHC/CH_4 analyzer signal output on March 10 resulted in 6 hours of invalid data.

Maintenance to verify the daily QA check on March 12 interrupted the normal operations of the SO_2 and THC/NMHC/CH_4 analyzers for 1 hour.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH_4 analyzer on March 16 resulted in 3 hours of downtime.

Station 6, Patricia McInnes

The NH_3 analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. NH_3 analyzers require additional time for stabilization after being exposed to high concentrations, this is due to the physical properties of the NH_3 gas. Data for 1 to 3 hours following each daily span has been reported as invalid for a total of 43 hours this month.

Cleaning of the sample manifold on March 9 interrupted the normal operations of the SO_2, NH_3, NO_2, THC/NMHC/CH_4, and TRS analyzers for 1 hour.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH_4 analyzer on March 24 resulted in 2 hours of downtime.

Station 7, Athabasca Valley

Maintenance to replace the support gas cylinder of the THC/NMHC/CH_4 analyzer on March 31 resulted in 1 hour of downtime.

Maintenance to reset the datalogger on March 14 resulted in 1 hour of invalid data for the Barometric Pressure sensor.

Station 8, Fort Chipewyan

An internal audit on March 1 interrupted the normal operations of CO, CO_2, O_3, and $PM_{2.5}$ analyzers for 1 to 2 hours.

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Station power failure on March 17 affected the normal operations CO and NO_2 analyzers for 1 to 2 hours.

Stabilization of the CO analyzer post power failure on March 17 resulted in 2 hours of invalid data.

Station 9, Barge Landing

Unstable operations due to excessive baseline drift in the output signal of the analyzer THC/NMHC/CH_4 throughout the month resulted in 155 hours of invalid data.

Maintenance to adjust the retention window times on the THC/NMHC/CH_4 analyzer on March 10 and 20 resulted in 7 hours of invalid data.

Analyzer failure due to non-responsive output signal of the THC/NMHC/CH_4 analyzer on March 27 and 28 resulted in 33 hours of invalid data.

A flatline in the output signal of the wind sensor on March 5 and 6 resulted in 2 hours of invalid data.

Station 11, Lower Camp

An internal audit on March 10 interrupted the normal operations of all continuous air monitoring analyzers for 2 to 4 hours.

Maintenance to reset the data logger on March 26 interrupted the normal operations of all parameters for 1 hour.

Maintenance to replace the temperature and relative humidity sensor on March 28 resulted in 1 hour of downtime.

Station 13, Fort McKay South

An internal audit on March 16 and 17 interrupted the normal operations of all air quality analyzers for 2 to 5 hours.

Cleaning of the sample manifold on March 23 interrupted the normal operations of the O3, SO_2, THC/NMHC/CH_4, and TRS analyzers for 2 hours.

Maintenance to replace the THC/NMHC/CH_4 analyzer on March 3 resulted in 6 hours of downtime.

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

Automated daily zero-response checks of the O_3 analyzer did not meet WBEA's QC acceptance criteria for the month of March. Therefore, the calibrator zeros from the March, and April multi-point calibrations were used to validate the analyzer baseline response.

Station 14, Anzac

Maintenance to replace the support gas cylinder of the THC/NMHC/CH_4 analyzer on March 1 resulted in 1 hour of downtime.

A flatline in the output signal of the wind on March 15 and 28 resulted in 3 hours of invalid data.

Station 17, Wapasu

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

A flatline in the output signal of the wind on March 15 resulted in 1 hour of invalid data.

Station 18, Stony Mountain

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Station 19, Firebag

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Analyzer failure due to a non-responsive THC analyzer on March 3 resulted in 3 hours of invalid data.

Maintenance to reinitiate the QA check on March 3 interrupted the normal operations of the THC analyzer for 1 hour.

Station 20, MacKay River

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Maintenance to address baseline drift on March 8 interrupted the normal operations of the H_2S analyzer for 6 hours.

Maintenance to reset the logger and the modem on March 15 interrupted the normal operation of all parameters, except for the precipitation collector, for 1 hour.

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

Station 21, Conklin

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH_4 analyzer on March 17 resulted in 2 hours of downtime.

Automated daily zero-response checks of the O_3 analyzer did not meet WBEA's QC acceptance criteria for the month of March. Therefore, the calibrator zeros from the February, March, and April multi-point calibrations were used to validate the analyzer baseline response.

Station 22, Janvier

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

A flatline in the output signal of the wind sensor on March 1 and 16 resulted in 4 hours of invalid data.

Station 23, Fort Hills

Analyzer failure due to a non-responsive NO_2 analyzer on March 3 and 4 resulted in 27 hours of invalid data.

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Maintenance to reinitiate the QA check on March 4 interrupted the normal operations of the NO_2 analyzer for 1 hour.

Maintenance to reset the logger and the modem on March 15 interrupted the normal operation of all parameters for 1 hour.

Maintenance to clean the optical chamber on March 17 interrupted the normal operation of the $PM_{2.5}$ analyzer for 1 hour.

Analyzer failure due to a non-responsive $PM_{2.5}$ analyzer on March 17 and 18 resulted in 24 hours of invalid data.

Maintenance to reinitiate the $PM_{2.5}$ analyzer normal operations on March 18 resulted in 1 hour of downtime

A flatline in the output signal of the wind sensor on March 15 resulted in 1 hour of invalid data.

Station 25, Waskōw ohci Pimâtisiwin

Station power cut-off since January 27 affected the normal operations of all analyzers and sensors on March for 366 hours.

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

Station 26, Christina Lake

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Maintenance to reinitiate the QA check on March 11 interrupted the normal operations of the NO_2 analyzer for 1 hour.

The daily span check for the H_2S analyzer was outside the 10% AMD criteria for multiple days throughout March due to a faulty external valve which was replaced during the routine calibration on March 22.

Station 27, Jackfish 2/3

Failure to record data of all parameters on March 6, 13, and 19 resulted in 3 hours of invalid data.

Station 29, Surmont 2

Maintenance to reset the data logger on March 1 interrupted the normal operations of all parameters for 1 hour.

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Maintenance to reinitiate the QA check on March 13 and 17 interrupted the normal operations of the NO_2 analyzer for 5 hours.

An internal audit on March 15 interrupted the normal operations of all air quality analyzers for 2 to 3 hours.

Maintenance to replace the H_2S analyzer on March 29 and 30 resulted in 22 hours of downtime.

Maintenance to reset the data logger on March 30 interrupted the normal operations of all parameters (except H_2S) for 1 hour.

Maintenance to adjust the declination of the wind sensor cross-arm on March 15 resulted in 1 hour of invalid data.
Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 12 hours of invalid data.

The daily span check for the NO_2 analyzer was outside the 10% AMD criteria on March 17 to 19 due to an interruption in the station calibrator configuration.

Station 30, Ells River

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Unstable operations due to excessive baseline drift in the output signal of the THC/NMHC/CH_4 analyzer on March 27 resulted in 6 hours of invalid data.

A flatline in the output signal of the wind sensor on March 1 and 6 the month resulted in 2 hours of invalid data.

Station 506, Jackfish 1

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Station 508, Kirby North

Failure to record data of all parameters on March 6, due to logging system program reset, resulted in 1 hour of invalid data.

Unstable operations due to station temperature fluctuation on March 13 and 14 interrupted the normal operations of the THC analyzer for 15 hours.

A flatline in the output signal of the wind sensor on March 15, 19, and 24 resulted in 5 hours of invalid data.

If additional information is required, please contact either Sanjay Prasad at (780) 799-8216 or the Wood Buffalo Environmental Association at (780) 799-4420.

Yours sincerely,

Wood Buffalo Environmental Association

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

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

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

Emilie Briggs
Operations Manager

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Created: Apr 28 2023 14:50

APPROVAL NUMBERS	REPORT DATE MONTH	YEAR
289664-00-00	03	2023

241311-00-00
20809-02-00
149968-01-00
237382-00-00
48522-01-00
240008-00-00

CONTINUOUS AMBIENT MONITORING

	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE MAXIMUM CONCENTRATION	ONE-HOUR AVERAGE NO. READINGS > REGULATION	24-HOUR AVERAGE MAXIMUM CONCENTRATION	24-HOUR AVERAGE NO. READINGS > REGULATION
48263-01-00	SO2(ppb)	1	100	38	0	9.9	0
224816-00-00	SO2(ppb)	2	100	65.8	0	8.0	0
151469-01-00	SO2(ppb)	4	100	35.4	0	8.2	0
189942-00-00	SO2(ppb)	5	99	50.9	0	9.7	0
206355-00-00	SO2(ppb)	6	100	41.6	0	10.8	0
46586-00-00	SO2(ppb)	7	100	35.9	0	7.8	0
73203-02-00	SO2(ppb)	8	100	6.0	0	4.0	0
216466-01-00	SO2(ppb)	9	100	44.6	0	7.1	0
137467-01-00	SO2(ppb)	11	99	43.6	0	7.9	0
236394-00-00	SO2(ppb)	13	100	45.9	0	9.4	0
254465-00-00	SO2(ppb)	14	100	22.6	0	3.3	0
094-03-00	SO2(ppb)	17	100	17.8	0	3.4	0
80105-01-00	SO2(ppb)	18	100	10.1	0	2.3	0
305529-00-00	SO2(ppb)	19	100	14.7	0	2.2	0
318401-00-00	SO2(ppb)	20	100	30.2	0	7.7	0
026-03-00	SO2(ppb)	21	100	10.1	0	1.2	0
364232-00-00	SO2(ppb)	22	100	5.3	0	1.7	0
228044-00-00	SO2(ppb)	23	100	63.5	0	10.4	0
247548-00-00	SO2(ppb)	25	51	37.6	0	9.4	0
231302-00-00	SO2(ppb)	26	100	15.8	0	3.8	0
153125-01-00	SO2(ppb)	27	100	9.7	0	2.2	0
	SO2(ppb)	29	99	12.6	0	2.5	0
	SO2(ppb)	30	100	43.3	0	6.6	0
	SO2(ppb)	506	100	26.6	0	6.2	0
	SO2(ppb)	508	100	20.0	0	2.9	0
	H2S(ppb)	1	100	5.4	0	1.2	0
	H2S(ppb)	2	100	5.5	0	1.2	0
	H2S(ppb)	4	100	3.0	0	0.7	0
	H2S(ppb)	5	99	6.2	0	1.5	0
	H2S(ppb)	11	99	13.8	2	1.8	0
	H2S(ppb)	17	100	0.8	0	0.4	0
	H2S(ppb)	19	100	2.6	0	0.8	0
	H2S(ppb)	20	99	3.2	0	0.6	0
	H2S(ppb)	25	51	2.0	0	0.9	0
	H2S(ppb)	26	100	1.2	0	0.3	0
	H2S(ppb)	27	100	0.6	0	0.2	0
	H2S(ppb)	29	96	0.4	0	0.3	0
	H2S(ppb)	506	100	0.6	0	0.2	0
	H2S(ppb)	508	100	1.0	0	0.1	0
	TRS(ppb)	1	100	6.1	0	1.5	0
	TRS(ppb)	6	100	1.5	0	0.4	0
	TRS(ppb)	7	100	1.6	0	0.5	0
	TRS(ppb)	8	100	0.4	0	0.3	0
	TRS(ppb)	9	100	2.9	0	1.2	0
	TRS(ppb)	13	99	2.9	0	1.0	0
	TRS(ppb)	14	100	2.1	0	0.6	0
	TRS(ppb)	18	100	0.3	0	0.2	0
	TRS(ppb)	21	100	0.5	0	0.4	0
	TRS(ppb)	22	100	0.4	0	0.2	0
	TRS(ppb)	23	100	2.7	0	1.1	0
	TRS(ppb)	30	100	1.5	0	0.8	0
	THC(ppm)	1	100	3.6	-	2.5	-
	THC(ppm)	2	100	4.0	-	2.7	-
	THC(ppm)	4	97	3.6	-	2.5	-
	THC(ppm)	5	98	6.0	-	3.0	-
	THC(ppm)	6	100	3.3	-	2.2	-
	THC(ppm)	7	100	2.7	-	2.2	-
	THC(ppm)	9	78	3.6	-	2.4	-
	THC(ppm)	11	100	3.3	-	2.4	-
	THC(ppm)	13	99	3.7	-	2.5	-
	THC(ppm)	14	100	3.3	-	2.1	-
	THC(ppm)	17	100	2.6	-	2.3	-

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REPORT DATE	
MONTH	YEAR
03	2023

CONTINUOUS AMBIENT MONITORING

APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE MAXIMUM CONCENTRATION	ONE-HOUR AVERAGE NO. READINGS > REGULATION	24-HOUR AVERAGE MAXIMUM CONCENTRATION	24-HOUR AVERAGE NO. READINGS > REGULATION
289664-00-00	THC(ppm)	18	100	2.2	-	2.1	-
241311-00-00	THC(ppm)	19	99	2.6	-	2.3	-
20809-02-00	THC(ppm)	20	100	3.1	-	2.4	-
149968-01-00	THC(ppm)	21	100	2.4	-	2.2	-
237382-00-00	THC(ppm)	22	100	2.3	-	2.1	-
48522-01-00	THC(ppm)	23	100	36.3	-	4.2	-
240008-00-00	THC(ppm)	29	99	2.4	-	2.3	-
48263-01-00	THC(ppm)	30	99	3.1	-	2.4	-
224816-00-00	THC(ppm)	508	98	2.8	-	2.5	-
151469-01-00	O3(ppb)	1	100	47.2	0	33.8	-
189942-00-00	O3(ppb)	4	96	51.8	0	39.0	-
206355-00-00	O3(ppb)	6	100	55.6	0	43.4	-
46586-00-00	O3(ppb)	7	100	49.0	0	37.1	-
73203-02-00	O3(ppb)	8	100	53.5	0	46.2	-
216466-01-00	O3(ppb)	13	99	49.2	0	35.0	-
137467-01-00	O3(ppb)	14	100	54.0	0	47.3	-
236394-00-00	O3(ppb)	17	100	54.8	0	50.0	-
254465-00-00	O3(ppb)	18	100	54.4	0	50.8	-
094-03-00	O3(ppb)	21	100	57.5	0	49.7	-
80105-01-00	O3(ppb)	22	100	59.2	0	53.0	-
305529-00-00	NO2(ppb)	1	100	51.3	0	22.5	-
318401-00-00	NO2(ppb)	4	100	47.2	0	25.5	-
026-03-00	NO2(ppb)	6	100	41.9	0	21.0	-
364232-00-00	NO2(ppb)	7	100	42.2	0	21.0	-
228044-00-00	NO2(ppb)	8	100	10.4	0	6.5	-
247548-00-00	NO2(ppb)	9	100	53.8	0	27.3	-
231302-00-00	NO2(ppb)	13	99	46.8	0	20.1	-
153125-01-00	NO2(ppb)	14	100	27.7	0	8.9	-
	NO2(ppb)	17	100	21.6	0	6.3	-
	NO2(ppb)	18	100	10.2	0	2.7	-
	NO2(ppb)	19	100	51.0	0	9.6	-
	NO2(ppb)	20	100	29.9	0	12.8	-
	NO2(ppb)	21	100	18.4	0	5.8	-
	NO2(ppb)	22	100	10.3	0	3.8	-
	NO2(ppb)	23	96	55.4	0	31.8	-
	NO2(ppb)	26	100	25.2	0	9.0	-
	NO2(ppb)	27	100	7.4	0	3.1	-
	NO2(ppb)	29	99	13.7	0	5.9	-
	NO2(ppb)	30	100	40.2	0	16.4	-
	NO2(ppb)	506	100	16.8	0	5.1	-
	NO2(ppb)	508	100	10.6	0	4.0	-
	CO(ppm)	1	100	0.5	0	0.2	-
	CO(ppm)	7	100	1.6	0	0.3	-
	CO(ppm)	8	97	0.1	0	0.1	-
	CO(ppm)	18	100	0.2	0	0.2	-
	CO2(ppm)	1	100	465.9	-	450.0	-
	CO2(ppm)	8	100	452.9	-	450.0	-
	CO2(ppm)	18	100	451.4	-	448.5	-
	NH3(ppb)	1	94	0.0	0	0.0	-
	NH3(ppb)	6	94	0.0	0	0.0	-
	PM2.5(ug/m3)	1	100	99.6	1	31.3	1
	PM2.5(ug/m3)	4	97	46.5	0	21.0	0
	PM2.5(ug/m3)	6	100	27.7	0	10.8	0
	PM2.5(ug/m3)	7	100	76.5	0	11.8	0
	PM2.5(ug/m3)	8	100	14.5	0	5.5	0
	PM2.5(ug/m3)	9	100	59.6	0	25.1	0
	PM2.5(ug/m3)	13	100	59.2	0	22.6	0
	PM2.5(ug/m3)	14	100	53.9	0	8.9	0
	PM2.5(ug/m3)	17	100	30.3	0	8.1	0
	PM2.5(ug/m3)	18	100	19.5	0	8.8	0
	PM2.5(ug/m3)	21	100	44.7	0	9.7	0
	PM2.5(ug/m3)	22	100	20.6	0	8.4	0
	PM2.5(ug/m3)	23	96	229.6	13	40.4	4
	PM2.5(ug/m3)	29	99	90.7	1	14.6	0

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

Created: Apr 28 2023 14:50

REPORT DATE	
MONTH	YEAR
03	2023

CONTINUOUS AMBIENT MONITORING

APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE MAXIMUM CONCENTRATION	ONE-HOUR AVERAGE NO. READINGS > REGULATION	24-HOUR AVERAGE MAXIMUM CONCENTRATION	24-HOUR AVERAGE NO. READINGS > REGULATION
289664-00-00	PM2.5(ug/m3)	30	100	30	0	13.7	0
241311-00-00	WS(km/h)	1	100	-	-	-	-
20809-02-00	WS(km/h)	2	100	-	-	-	-
149968-01-00	WS(km/h)	4	100	-	-	-	-
237382-00-00	WS(km/h)	5	100	-	-	-	-
48522-01-00	WS(km/h)	6	100	-	-	-	-
240008-00-00	WS(km/h)	7	100	-	-	-	-
48263-01-00	WS(km/h)	8	100	-	-	-	-
224816-00-00	WS(km/h)	9	100	-	-	-	-
151469-01-00	WS(km/h)	11	100	-	-	-	-
189942-00-00	WS(km/h)	13	99	-	-	-	-
206355-00-00	WS(km/h)	14	100	-	-	-	-
46586-00-00	WS(km/h)	17	100	-	-	-	-
73203-02-00	WS(km/h)	18	100	-	-	-	-
216466-01-00	WS(km/h)	19	100	-	-	-	-
137467-01-00	WS(km/h)	20	99	-	-	-	-
236394-00-00	WS(km/h)	21	99	-	-	-	-
254465-00-00	WS(km/h)	22	99	-	-	-	-
094-03-00	WS(km/h)	23	99	-	-	-	-
80105-01-00	WS(km/h)	25	49	-	-	-	-
318401-00-00	WS(km/h)	26	100	-	-	-	-
026-03-00	WS(km/h)	27	100	-	-	-	-
364232-00-00	WS(km/h)	29	98	-	-	-	-
228044-00-00	WS(km/h)	30	100	-	-	-	-
247548-00-00	WS(km/h)	506	100	-	-	-	-
231302-00-00	WS(km/h)	508	99	-	-	-	-
153125-01-00							

SIGNATURE OF ASSOCIATION REPRESENTATIVE

FOR ALBERTA ENVIRONMENT USE ONLY

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS01
BERTHA GANTER - FORT MCKAY
MARCH 2023

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

April 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	706	35	38	99.6	38	0	9.9	0
H2S(ppb) Average	703	38	41	99.6	5.4	0	1.2	0
TRS(ppb) Average	702	39	42	99.6	6.1	0	1.5	0
THC(ppm) Average	706	35	38	99.6	3.6	-	2.5	-
NMHC(ppm) Average	706	35	38	99.6	1.389	-	0.132	-
CH4(ppm) Average	706	35	38	99.6	2.9	-	2.3	-
O3 (ppb) Average	706	35	38	99.6	47.2	0	33.8	-
NO2 (ppb) Average	704	37	40	99.6	51.3	0	22.5	-
NO (ppb) Average	704	37	40	99.6	78.5	-	26	-
NOX (ppb) Average	704	37	40	99.6	115.7	-	44.4	-
NH3 (ppb) Average	646	50	98	93.55	0	0	0	-
PM2.5 (ug/m3) Average	739	4	5	99.87	99.6	1	31.3	1
CO(ppm) Average	706	35	38	99.6	0.5	0	0.2	0
CO2(ppm) Average	706	35	38	99.6	465.9	0	450	0
Temperature 2 m (C) Average	743	0	1	99.87	10.5	-	0.1	-
Temperature 10 m (C) Average	743	0	1	99.87	10.3	-	1	-
Relative Humidity (%) Average	743	0	1	99.87	90.6	-	82.6	-
Wind Speed 10 m (km/h) Average	741	0	3	99.6	19	-	16	-
Wind Direction 10 m (deg) Average	741	0	3	99.6	-	-	-	-
Precipitation (mm) Total	743	0	1	99.87	1	-	8.8	-
Leaf Wetness (% of range) Average	743	0	1	99.87	23.8	-	1.2	-
Global Solar Radiation (W/m2) Average	743	0	1	99.87	664.4	-	202.2	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	706	1.91	4.6	-	0	0	0.1	0.1	1.3	5.7	38
H2S (ppb) Average	703	0.27	0.4	-	0	0	0.1	0.1	0.3	0.7	5.4
TRS (ppb) Average	702	0.64	0.5	-	0.3	0.4	0.4	0.5	0.7	1.2	6.1
THC (ppm) Average	706	2.14	0.2	-	1.9	2	2	2.1	2.2	2.4	3.6
NMHC(ppm) Average	706	0.042	0.08	-	0	0	0	0	0.1	0.1	1.389
CH4(ppm) Average	706	2.1	0.1	-	1.9	2	2	2.1	2.2	2.3	2.9
O3 (ppb) Average	706	24.18	10.3	-	0.8	9.2	16.5	25.8	32.7	36.3	47.2
NO2 (ppb) Average	704	12.07	8.3	-	0	3.2	5.8	10.6	16.5	23.4	51.3
NO (ppb) Average	704	3.66	8.5	-	0	0	0	0.7	3.9	9	78.5
NOX (ppb) Average	704	15.73	13.7	-	0	3.6	7.3	12.9	19.9	29	115.7
NH3 (ppb) Average	646	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	739	11.31	9.4	-	0.5	4.4	5.4	8.6	13.6	21	99.6
CO(ppm) Average	706	0.19	0	-	0.1	0.2	0.2	0.2	0.2	0.2	0.5
CO2(ppm) Average	706	432.06	7.7	-	420	424.5	426.6	430.4	435.3	442.9	465.9
Temperature 2 m (C) Average	743	-9.97	7.1	-	-32.1	-18.8	-14.3	-9.6	-5.2	-1.5	10.5
Temperature 10 m (C) Average	743	-9.65	6.9	-	-31.2	-18.1	-13.9	-9.4	-5	-1.2	10.3
Relative Humidity (%) Average	743	66.6	13.2	-	26.4	47.1	57.7	68.3	77.3	82.4	90.6
Wind Speed 10 m (km/h) Average	741	7.5	5	-	0	2	4	7	11	14	19
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	743	-	-	15.3	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	743	0.13	0.9	-	0	0	0	0	0	0.1	23.8
Global Solar Radiation (W/m2) Average	743	139.49	193.9	-	0	0	0	5.1	260.4	481.6	664.4

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
ALL GASEOUS ANALYZERS (except NH3)	30 Mar 2023 14:00	30 Mar 2023 15:00	2	Maintenance - sample manifold cleaned
NH3	02 Mar 2023 07:00	30 Mar 2023 04:00	29	Stabilization after daily QA check
NH3	01 Mar 2023 01:00	01 Mar 2023 02:00	2	Unstable Operation - excessive baseline noise
NH3	28 Mar 2023 08:00	28 Mar 2023 10:00	3	Unstable Operation - excessive baseline noise
NH3	30 Mar 2023 22:00	31 Mar 2023 10:00	13	Maintenance - stabilization post maintenance
Wind Speed, Wind Direction	01 Mar 2023 04:00	01 Mar 2023 04:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	01 Mar 2023 07:00	01 Mar 2023 07:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 38.0 ppb on Mar 22 15:00

Maximum Daily Average: 9.9 ppb on Mar 22

Minimum Value: 0.0 ppb on Mar 3 00:00

Maximum Diurnal Average: 5.0 ppb at hour 13

Monthly Average: 1.91 ppb

Minimum Daily Average: 0.0 ppb on Mar 5

Minimum Diurnal Average: 0.3 ppb at hour 5

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.1 Q_3 = 1.3 P_{90} = 5.7 P_{99} = 23.6

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.8	Z	1.9	1.1	0.6	0.5	0.7	0.9	0.5	2.0	10.6	10.9	14.4	10.1	6.2	3.3	2.0	1.6	0.6	0.4	0.4	0.7	1.5	2.2	3.2	14.4
2-Mar	1.7	2.6	Z	4.1	4.5	4.7	7.6	3.3	1.9	4.0	5.4	4.4	2.3	1.0	0.4	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	2.1	7.6
3-Mar	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.3
4-Mar	0.0	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.4	0.4	0.0	0.0	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
5-Mar	0.0	0.0	0.0	0.0	0.0	Z	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	DF	0.0	0.4
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.5	6.0	12.2	5.7	4.2	Z	3.8	0.6	0.3	0.1	0.0	0.0	0.0	0.2	1.5	12.2
7-Mar	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3	4.1	5.6	4.2	5.1	4.7	6.0	6.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.7	6.0
8-Mar	2.0	Z	0.3	0.2	0.0	0.0	0.0	0.1	0.2	5.0	6.6	4.2	15.5	10.5	4.6	3.6	3.0	0.8	0.1	0.1	0.1	0.3	1.6	1.0	2.6	15.5
9-Mar	0.2	0.2	Z	0.3	0.3	0.3	0.5	0.6	1.0	6.3	8.2	23.2	16.6	10.4	9.6	9.7	5.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1	4.1	23.2
10-Mar	0.1	0.1	0.3	Z	0.2	0.7	0.5	0.7	1.4	4.3	7.1	10.2	4.8	4.0	3.5	4.7	3.5	0.2	0.2	0.2	0.2	0.2	0.2	0.1	2.1	10.2
11-Mar	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.2	1.1	3.2	3.4	1.5	1.6	1.9	1.4	1.2	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.8	3.4
12-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.0	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	0.1	0.2
13-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	C	C	C	C	0.1	0.1	0.1	0.1	0.0	0.1	0.2
14-Mar	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	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2
15-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
16-Mar	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.3	2.6	4.5	11.2	15.3	19.7	19.6	8.6	6.8	10.1	6.5	3.5	4.2	3.5	1.2	0.8	5.2	19.7
17-Mar	1.4	3.6	2.7	1.2	Z	3.0	2.4	1.6	2.0	3.2	8.3	20.3	16.9	18.6	13.9	8.2	5.3	3.2	2.9	2.2	1.5	0.9	0.6	0.6	5.4	20.3
18-Mar	0.6	0.6	0.6	0.6	1.8	Z	2.2	1.4	2.1	1.7	1.8	2.8	2.1	2.0	2.7	1.3	1.5	1.7	1.0	0.6	0.3	0.3	0.1	0.1	1.3	2.8
19-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.4	14.8	7.3	2.3	1.2	1.3	1.5	3.8	0.5	0.3	0.1	0.1	0.0	0.1	0.1	1.7	14.8
20-Mar	0.1	Z	0.1	0.1	0.0	0.1	0.0	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	0.0	0.1	0.2
21-Mar	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.0	0.1	0.7	7.3	24.7	28.5	32.4	18.0	3.0	1.8	1.0	0.6	5.2	32.4
22-Mar	0.8	0.1	0.7	Z	0.7	0.3	0.1	0.3	0.6	1.1	14.3	23.6	27.6	37.2	38.0	37.5	17.8	7.2	7.5	4.0	2.5	2.5	2.0	1.5	9.9	38.0
23-Mar	1.1	0.8	0.7	0.8	Z	3.7	2.0	1.3	2.6	1.6	1.0	0.8	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.8	3.7
24-Mar	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	1.0	15.7	12.3	5.8	7.5	3.5	1.0	0.6	2.1	15.7
25-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
26-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
27-Mar	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.2	0.6	0.6	0.9	0.5	0.8	2.6	5.7	12.0	8.3	7.4	2.0	0.4	0.3	0.3	0.2	0.2	1.9	12.0
28-Mar	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.3	1.0	3.1	7.7	14.1	15.0	12.2	9.9	7.0	7.2	5.7	6.8	5.0	7.4	5.5	5.9	4.4	5.2	15.0
29-Mar	3.6	2.7	2.1	1.4	Z	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.6	3.6
30-Mar	0.0	0.1	0.0	0.1	0.0	Z	0.1	0.2	0.9	2.5	0.6	0.2	0.2	M	M	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	2.5
31-Mar	Z	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2
	0.5	0.5	0.4	0.4	0.3	0.5	0.6	0.4	0.6	1.7	3.4	4.8	5.0	4.8	4.3	3.9	3.3	2.8	2.5	1.3	0.9	0.7	0.5	0.5	Diurnal Average	
	3.6	3.6	2.7	4.1	4.5	4.7	7.6	3.3	2.6	6.4	14.8	23.6	27.6	37.2	38.0	37.5	24.7	28.5	32.4	18.0	7.5	5.5	5.9	4.4	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	672	95.18	95.18
11 - 20	25	3.54	98.73
21 - 60	9	1.27	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - March 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	120	101	29	21	24	13	28	123	82	8	8	10	9	33	27	34	670
11 - 20	0	0	0	0	0	0	0	18	7	0	0	0	0	0	0	0	25
21 - 60	0	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	120	101	29	21	24	13	28	146	93	8	8	10	9	33	27	34	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 5.4 ppb on Mar 1 12:00

Maximum Daily Average: 1.2 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 4 13:00

Maximum Diurnal Average: 0.5 ppb at hour 12

Monthly Average: 0.27 ppb

Minimum Daily Average: 0.0 ppb on Mar 20

Minimum Diurnal Average: 0.2 ppb at hour 18

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.1 Q_3 = 0.3 P_{90} = 0.7 P_{99} = 1.6

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	38
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.7	1.5	Z	1.8	1.3	1.0	1.3	1.5	1.2	1.6	5.0	5.4	2.3	0.3	0.6	0.3	0.2	0.2	0.1	0.0	0.0	0.1	0.2	0.4	1.2	5.4
2-Mar	0.9	1.2	0.9	Z	1.2	1.1	1.9	0.5	0.2	0.4	1.0	1.2	0.7	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.9
3-Mar	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
4-Mar	0.1	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
5-Mar	Z	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	DF	0.1	0.3
6-Mar	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.5	Z	0.6	0.4	0.4	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.6
7-Mar	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
8-Mar	0.1	0.1	Z	0.3	0.1	0.1	0.0	0.1	0.2	0.5	0.4	0.3	0.6	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.6
9-Mar	0.1	0.2	0.2	Z	0.5	0.5	0.5	0.5	0.5	1.1	0.8	1.4	0.7	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.4
10-Mar	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.0	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.3
11-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2
12-Mar	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
13-Mar	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	C	C	C	C	C	C	C	0.1	0.0	0.0	0.1	0.1	0.0	0.1	--	0.2
14-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
15-Mar	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3
16-Mar	0.2	0.3	0.4	0.3	Z	0.5	0.5	0.4	0.3	0.3	0.2	0.4	0.3	0.4	0.6	0.5	0.6	0.5	0.3	0.6	1.2	1.1	0.8	0.7	0.5	1.2
17-Mar	0.8	0.9	0.6	0.5	0.5	Z	1.0	0.7	0.7	0.4	0.9	1.9	1.7	1.6	1.2	0.7	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.8	1.9
18-Mar	Z	0.7	0.4	0.4	0.9	0.9	1.0	0.8	0.9	0.8	0.5	0.5	0.3	0.2	0.1	0.0	0.1	0.1	0.4	0.4	0.3	0.3	0.2	0.1	0.5	1.0
19-Mar	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.7	0.4	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.7
20-Mar	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
21-Mar	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.3	0.3	0.0	0.0	0.0	0.4	0.8	0.9	1.1	0.7	0.3	0.3	0.4	0.5	0.3	1.1
22-Mar	0.7	0.4	0.7	0.7	Z	0.9	0.8	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.9	0.4	0.2	0.3	0.3	0.3	0.4	0.9
23-Mar	0.4	0.5	0.7	0.8	1.0	Z	1.4	1.0	1.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.3	1.4
24-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.3	0.3	0.2	0.4
25-Mar	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.5	0.4	0.7	0.8	0.3	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.8
26-Mar	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3
27-Mar	0.1	0.2	0.1	Z	0.4	0.2	0.2	0.2	0.7	0.9	0.5	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.3	0.9
28-Mar	0.2	0.2	0.2	0.2	Z	0.4	0.2	0.3	1.1	1.3	1.1	0.5	0.3	0.2	0.2	0.2	0.4	0.6	0.9	0.8	1.0	0.6	1.0	1.0	0.6	1.3
29-Mar	0.9	0.8	0.7	0.6	0.5	Z	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.9
30-Mar	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.9	1.3	0.3	0.2	0.2	M	M	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.2	1.3
31-Mar	0.1	Z	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.4
	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
	0.9	1.5	0.9	1.8	1.3	1.1	1.9	1.5	1.4	1.6	5.0	5.4	2.3	1.6	1.2	0.7	0.8	0.9	1.1	0.8	1.2	1.1	1.0	1.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	701	99.72	99.72
3 - 4	0	0.00	99.72
5 - 7	2	0.28	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	120	96	29	21	23	13	29	144	95	9	7	10	8	34	24	37	699
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	1	1	0	0	0	0	0	0	0	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	120	96	29	21	23	13	29	145	96	9	7	10	8	34	24	37	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 701

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 6.1 ppb on Mar 1 12:00 Maximum Daily Average: 1.5 ppb on Mar 1

Minimum Value: 0.3 ppb on Mar 15 03:00 Minimum Daily Average: 0.4 ppb on Mar 14

Maximum Diurnal Average: 0.9 ppb at hour 11 Minimum Diurnal Average: 0.5 ppb at hour 18

Monthly Average: 0.64 ppb Percentiles: $P_1 = 0.3$ $P_{10} = 0.4$ $Q_1 = 0.4$ Median = 0.5 $Q_3 = 0.7$ $P_{90} = 1.2$ $P_{99} = 2.0$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	39
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.9	1.7	Z	1.7	1.4	1.2	1.5	1.9	1.5	2.0	5.9	6.1	2.7	0.7	1.1	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.6	0.8	1.5	6.1
2-Mar	1.2	1.5	1.3	Z	1.5	1.6	2.3	1.0	0.6	0.9	1.5	1.6	1.2	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	2.3
3-Mar	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	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	0.5	0.4	0.5	0.5
4-Mar	0.4	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5
5-Mar	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	DF	0.4	0.5
6-Mar	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	Z	0.6	0.7	0.8	0.9	0.8	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.9
7-Mar	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.6
8-Mar	0.5	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.5	1.0	0.8	0.8	1.1	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.6	1.1
9-Mar	0.5	0.5	0.6	Z	0.8	0.8	0.8	0.8	0.7	1.6	1.2	1.8	1.0	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.7	1.8
10-Mar	0.4	0.4	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.6	0.6	0.7	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.7
11-Mar	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.6	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
12-Mar	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5
13-Mar	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	C	C	C	C	C	C	C	C	0.4	0.4	0.4	0.4	0.4	0.4	--	0.5
14-Mar	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
15-Mar	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.4	0.4	0.4	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	0.5	0.4	0.5
16-Mar	0.5	0.6	0.8	0.7	Z	0.8	0.8	0.7	0.7	0.7	0.6	0.8	0.7	0.8	1.1	1.1	1.2	0.9	0.7	1.2	1.9	1.6	1.3	1.1	0.9	1.9
17-Mar	1.3	1.4	1.1	0.9	1.0	Z	1.4	1.1	1.0	0.8	1.5	2.8	2.5	2.4	1.9	1.3	1.1	1.0	1.2	1.2	1.3	1.2	1.0	1.2	1.4	2.8
18-Mar	Z	1.2	0.9	0.9	1.5	1.5	1.6	1.3	1.5	1.3	1.0	1.1	0.8	0.7	0.6	0.5	0.6	0.6	0.8	0.8	0.6	0.6	0.6	0.5	0.9	1.6
19-Mar	0.5	Z	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	1.1	0.8	0.5	0.5	0.5	0.6	0.8	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.6	1.1
20-Mar	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
21-Mar	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.9	1.3	1.4	1.7	1.2	0.7	0.7	0.8	1.0	0.7	1.7
22-Mar	1.2	0.9	1.2	1.2	Z	1.4	1.4	1.2	0.8	0.7	0.6	0.6	0.5	0.5	0.6	0.5	0.7	0.9	1.6	1.0	0.7	0.9	0.9	0.9	0.9	1.6
23-Mar	0.9	0.9	1.0	1.2	1.7	Z	2.0	1.5	1.9	0.8	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	0.7	2.0
24-Mar	Z	0.3	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	0.5	0.5	0.5	0.6	1.0	0.9	0.7	0.7	0.5	1.0
25-Mar	0.8	Z	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.8
26-Mar	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5
27-Mar	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	1.0	1.2	0.9	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.6	1.2
28-Mar	0.5	0.5	0.5	0.5	Z	0.6	0.5	0.6	1.4	1.5	1.5	0.9	0.6	0.6	0.6	0.6	1.0	1.2	1.8	1.5	1.8	1.1	1.8	1.8	1.0	1.8
29-Mar	1.7	1.5	1.3	1.1	0.9	Z	0.9	0.8	0.9	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.7	1.7
30-Mar	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.5	1.2	1.9	0.7	0.5	0.5	M	M	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	1.9
31-Mar	0.5	Z	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.6
	0.6	0.7	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.7	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	Diurnal Average	
	1.7	1.7	1.3	1.7	1.7	1.6	2.3	1.9	1.9	2.0	5.9	6.1	2.7	2.4	1.9	1.3	1.3	1.4	1.8	1.5	1.9	1.6	1.8	1.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	698	99.43	99.43
3 - 4	2	0.28	99.72
5 - 7	2	0.28	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	119	96	29	21	23	13	29	143	94	9	7	10	8	34	24	37	696
3 - 4	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
5 - 7	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	96	29	21	23	13	29	145	96	9	7	10	8	34	24	37	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 3.6 ppm on Mar 28 11:00

Maximum Daily Average: 2.5 ppm on Mar 18

Minimum Value: 1.9 ppm on Mar 11 02:00

Minimum Daily Average: 2.0 ppm on Mar 7

Maximum Diurnal Average: 2.2 ppm at hour 11

Minimum Diurnal Average: 2.0 ppm at hour 16

Monthly Average: 2.14 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.2 P_{90} = 2.4 P_{99} = 2.8

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.5	Z	2.9	2.8	2.7	2.7	2.7	2.8	2.7	2.6	2.4	2.3	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.3	2.9
2-Mar	2.3	2.3	Z	2.3	2.3	2.1	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.3
3-Mar	2.3	2.1	2.1	Z	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.2	2.4	2.1	2.0	2.0	2.0	2.0	2.1	2.4
4-Mar	2.0	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.2
5-Mar	2.1	2.1	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	DF	2.0	2.1
6-Mar	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.0	2.0	2.0	2.0	Z	2.0	2.0	1.9	2.2	1.9	1.9	2.0	1.9	2.1	2.3
7-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.1
8-Mar	2.1	Z	2.1	2.1	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	1.9	1.9	2.1	1.9	1.9	2.0	2.0	2.0	2.1
9-Mar	2.0	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1
10-Mar	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.5	2.3	2.0	2.0	2.5
11-Mar	1.9	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.2
12-Mar	2.3	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.3
13-Mar	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.3	2.4	2.2	2.2	2.2	2.1	2.1	C	C	C	C	2.3	2.4	2.4	2.2	2.2	2.2	2.4
14-Mar	2.2	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2
15-Mar	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.5	2.5	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.5
16-Mar	2.3	2.4	2.3	Z	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.4
17-Mar	2.2	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.4	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.4	2.7	3.0	2.7	2.6	2.3	3.0
18-Mar	2.5	2.4	2.4	2.2	2.3	Z	2.6	2.6	2.6	2.6	2.5	2.4	2.3	2.3	2.1	2.0	2.1	2.2	2.8	2.9	2.8	3.0	2.7	2.4	2.5	3.0
19-Mar	Z	2.4	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.4
20-Mar	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.2
21-Mar	2.2	2.4	Z	2.2	2.2	2.2	2.2	2.3	2.1	2.1	2.4	2.4	2.0	2.0	2.0	2.1	2.3	2.4	2.4	2.4	2.2	2.3	2.3	2.5	2.2	2.5
22-Mar	2.4	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.5	2.7	2.7	2.2	2.7
23-Mar	2.8	2.7	2.9	2.8	Z	2.8	2.7	2.6	2.5	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.9
24-Mar	2.0	2.0	2.0	2.3	2.5	Z	2.1	2.1	2.0	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.2	2.4	2.3	2.3	2.1	2.5
25-Mar	Z	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.4	3.0	3.2	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.3	3.2
26-Mar	2.2	Z	2.0	2.1	2.2	2.1	2.0	2.0	2.4	2.3	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.4
27-Mar	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.0	2.1	2.1	2.3
28-Mar	2.2	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.4	2.8	3.6	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	3.6
29-Mar	2.1	2.2	2.3	2.6	Z	2.5	2.6	2.4	2.4	2.3	2.5	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.2	2.6
30-Mar	2.1	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.4	2.4	2.1	2.0	2.1	M	M	2.0	2.0	2.0	2.1	2.1	2.3	2.3	2.2	2.2	2.2	2.4
31-Mar	Z	2.1	2.3	2.5	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.2	2.5
	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	Diurnal Average	
	2.8	2.7	2.9	2.8	2.7	2.8	2.7	2.8	2.7	3.0	3.6	2.4	2.3	2.3	2.3	2.5	2.5	2.4	2.8	2.9	2.8	3.0	2.7	2.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	283	40.08	40.09
2.1 - 3.0	421	59.63	99.72
3.1 - 10.0	2	0.28	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	32	51	13	9	9	9	19	83	21	0	1	2	3	6	8	17	283
2.1 - 3.0	88	50	16	11	15	4	9	62	72	8	7	8	6	27	19	17	419
3.1 - 10.0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	120	101	29	21	24	13	28	146	93	8	8	10	9	33	27	34	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 1.389 ppm on Mar 28 11:00

Maximum Daily Average: 0.132 ppm on Mar 28

Minimum Value: 0.000 ppm on Mar 1 14:00

Minimum Daily Average: 0.002 ppm on Mar 14

Maximum Diurnal Average: 0.098 ppm at hour 11

Minimum Diurnal Average: 0.011 ppm at hour 15

Monthly Average: 0.042 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.1 P_{90} = 0.1 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.071	Z	0.243	0.174	0.154	0.111	0.122	0.182	0.122	0.126	0.159	0.090	0.001	0.000	0.001	0.000	0.009	0.003	0.000	0.000	0.000	0.010	0.004	0.060	0.071	0.243
2-Mar	0.115	0.100	Z	0.103	0.099	0.001	0.060	0.000	0.000	0.000	0.015	0.095	0.088	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.115
3-Mar	0.054	0.004	0.024	Z	0.002	0.015	0.059	0.016	0.000	0.000	0.000	0.000	0.000	0.003	0.028	0.017	0.051	0.058	0.050	0.010	0.000	0.000	0.000	0.000	0.017	0.059
4-Mar	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	0.002	0.030	0.004	0.003	0.000	0.006	0.002	0.030
5-Mar	0.009	0.017	0.000	0.002	0.011	Z	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.007	DF	0.002	0.017
6-Mar	0.001	0.042	0.017	0.057	0.066	0.080	0.084	0.098	0.112	0.095	0.096	0.000	0.001	0.000	0.000	Z	0.008	0.004	0.000	0.269	0.000	0.008	0.000	0.003	0.045	0.269
7-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	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	0.062	0.053	0.005	0.062
8-Mar	0.076	Z	0.066	0.066	0.000	0.000	0.000	0.001	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.021	0.011	0.076
9-Mar	0.004	0.068	Z	0.018	0.011	0.017	0.026	0.054	0.050	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.068
10-Mar	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	0.027	0.000	0.000	0.086	0.050	0.000	0.007	0.086
11-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.022	0.001	0.000	0.001	0.000	0.000	0.000	0.004	0.018	0.015	0.051	0.010	0.000	0.004	0.006	0.007	0.000	0.004	0.006	0.051
12-Mar	0.023	0.013	0.002	0.001	0.000	Z	0.000	0.001	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.035	0.045	0.006	0.045
13-Mar	Z	0.032	0.033	0.073	0.083	0.068	0.035	0.010	0.044	0.066	0.023	0.042	0.022	0.013	0.013	C	C	C	C	0.066	0.076	0.074	0.038	0.023	0.044	0.083
14-Mar	0.023	Z	0.000	0.001	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	0.009	0.000	0.000	0.000	0.000	0.000	0.002	0.023
15-Mar	0.000	0.000	Z	0.000	0.022	0.041	0.000	0.000	0.001	0.000	0.010	0.000	0.000	0.000	0.078	0.207	0.281	0.147	0.030	0.047	0.094	0.051	0.113	0.109	0.053	0.281
16-Mar	0.095	0.130	0.112	Z	0.037	0.106	0.113	0.044	0.050	0.088	0.017	0.010	0.042	0.012	0.000	0.000	0.000	0.018	0.028	0.016	0.093	0.132	0.110	0.098	0.059	0.132
17-Mar	0.110	0.068	0.003	0.023	Z	0.017	0.033	0.028	0.137	0.025	0.010	0.004	0.000	0.000	0.000	0.017	0.026	0.106	0.164	0.181	0.184	0.235	0.177	0.148	0.074	0.235
18-Mar	0.129	0.112	0.060	0.018	0.059	Z	0.140	0.133	0.141	0.150	0.197	0.177	0.179	0.141	0.037	0.000	0.064	0.070	0.170	0.173	0.141	0.195	0.184	0.149	0.122	0.197
19-Mar	Z	0.145	0.044	0.044	0.092	0.078	0.047	0.017	0.020	0.074	0.036	0.009	0.000	0.037	0.020	0.042	0.008	0.017	0.055	0.005	0.000	0.000	0.000	0.000	0.034	0.145
20-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.021	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.006	0.036	0.032	0.022	0.008	0.066
21-Mar	0.026	0.069	Z	0.056	0.050	0.016	0.005	0.078	0.003	0.001	0.084	0.074	0.000	0.000	0.000	0.008	0.114	0.145	0.154	0.122	0.059	0.100	0.122	0.143	0.062	0.154
22-Mar	0.093	0.076	0.088	Z	0.105	0.099	0.106	0.129	0.025	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.041	0.128	0.188	0.202	0.057	0.202
23-Mar	0.237	0.211	0.190	0.166	Z	0.190	0.183	0.157	0.147	0.052	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.000	0.000	0.000	0.067	0.237
24-Mar	0.000	0.000	0.002	0.078	0.104	Z	0.017	0.006	0.001	0.118	0.110	0.065	0.000	0.000	0.000	0.000	0.054	0.006	0.068	0.065	0.063	0.137	0.154	0.166	0.053	0.166
25-Mar	Z	0.207	0.196	0.180	0.179	0.178	0.179	0.160	0.131	0.353	0.309	0.129	0.004	0.010	0.050	0.002	0.000	0.000	0.000	0.000	0.000	0.021	0.003	0.048	0.102	0.353
26-Mar	0.082	Z	0.003	0.014	0.046	0.013	0.000	0.003	0.068	0.073	0.072	0.052	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.056	0.061	0.059	0.026	0.082
27-Mar	0.001	0.008	Z	0.000	0.010	0.005	0.001	0.001	0.062	0.108	0.186	0.073	0.031	0.029	0.000	0.000	0.000	0.000	0.005	0.067	0.127	0.017	0.001	0.010	0.032	0.186
28-Mar	0.033	0.068	0.058	Z	0.080	0.119	0.084	0.056	0.104	0.338	1.389	0.390	0.186	0.078	0.032	0.012	0.000	0.000	0.000	0.000	0.000	0.012	0.003	0.002	0.132	1.389
29-Mar	0.005	0.010	0.110	0.309	Z	0.274	0.303	0.235	0.225	0.119	0.122	0.071	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.057	0.049	0.052	0.085	0.309
30-Mar	0.027	0.026	0.019	0.015	0.009	Z	0.013	0.018	0.125	0.120	0.024	0.006	0.015	M	M	0.003	0.001	0.000	0.015	0.005	0.130	0.083	0.082	0.079	0.039	0.130
31-Mar	Z	0.005	0.086	0.121	0.089	0.098	0.081	0.083	0.087	0.094	0.097	0.085	0.033	0.028	0.045	0.019	0.013	0.004	0.001	0.008	0.035	0.000	0.000	0.000	0.048	0.121
	0.047	0.054	0.052	0.058	0.050	0.059	0.055	0.049	0.054	0.065	0.098	0.045	0.020	0.012	0.011	0.012	0.023	0.020	0.026	0.036	0.034	0.047	0.048	0.050	Diurnal Average	
	0.237	0.211	0.243	0.309	0.179	0.274	0.303	0.235	0.225	0.353	1.389	0.390	0.186	0.141	0.078	0.207	0.281	0.147	0.170	0.269	0.184	0.235	0.188	0.202	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	350	49.58	49.58
0.006 - 0.05	157	22.24	71.81
0.06 - 0.1	148	20.96	92.78
> 0.1	51	7.22	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	60	65	11	10	13	8	17	89	30	1	1	2	4	10	10	19	350
0.006 - 0.05	24	24	12	5	4	2	4	25	22	2	1	1	2	13	6	10	157
0.06 - 0.1	34	11	5	4	4	3	6	23	30	3	1	6	2	5	7	3	147
> 0.1	2	1	1	2	3	0	1	9	11	2	5	1	1	5	4	2	50
Totals	120	101	29	21	24	13	28	146	93	8	8	10	9	33	27	34	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.9 ppm on Mar 25 11:00

Maximum Daily Average: 2.3 ppm on Mar 18

Minimum Value: 1.9 ppm on Mar 11 02:00

Maximum Diurnal Average: 2.2 ppm at hour 10

Monthly Average: 2.10 ppm

Minimum Daily Average: 2.0 ppm on Mar 7

Minimum Diurnal Average: 2.0 ppm at hour 16

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.2 P_{90} = 2.3 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	2.4	Z	2.6	2.6	2.5	2.5	2.6	2.6	2.5	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.6
2-Mar	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2
3-Mar	2.2	2.1	2.1	Z	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.3
4-Mar	2.0	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.2
5-Mar	2.1	2.1	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	DF	2.0	2.1
6-Mar	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.2
7-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.1
8-Mar	2.0	Z	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	1.9	1.9	2.1	1.9	1.9	2.0	2.0	2.0	2.1
9-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1
10-Mar	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.4	2.3	2.0	2.0	2.4
11-Mar	1.9	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.1
12-Mar	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2
13-Mar	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.2	2.2	2.1	2.1	C	C	C	C	2.3	2.3	2.3	2.2	2.1	2.2	2.3
14-Mar	2.2	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2
15-Mar	2.1	2.0	Z	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
16-Mar	2.2	2.2	2.2	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2
17-Mar	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.7	2.5	2.4	2.2	2.7
18-Mar	2.4	2.3	2.3	2.2	2.2	Z	2.5	2.5	2.4	2.5	2.3	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.6	2.7	2.7	2.8	2.5	2.3	2.3	2.8
19-Mar	Z	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	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2
20-Mar	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.0	2.2
21-Mar	2.2	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.3	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.2	2.1	2.2	2.2	2.4	2.2	2.4
22-Mar	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.4	2.5	2.5	2.2	2.5
23-Mar	2.6	2.5	2.7	2.6	Z	2.6	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	2.1	2.0	2.0	2.0	2.0	2.2	2.7
24-Mar	2.0	2.0	2.0	2.2	2.4	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.4
25-Mar	Z	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.7	2.9	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.9
26-Mar	2.2	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3
27-Mar	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.2
28-Mar	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.5	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.5
29-Mar	2.1	2.2	2.2	2.3	Z	2.2	2.3	2.2	2.2	2.2	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.4
30-Mar	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.3	2.3	2.1	2.0	2.1	M	M	2.0	2.0	2.0	2.1	2.0	2.2	2.2	2.2	2.1	2.1	2.3
31-Mar	Z	2.1	2.2	2.4	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.4
	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
	2.6	2.5	2.7	2.6	2.5	2.6	2.6	2.6	2.5	2.7	2.9	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.7	2.7	2.8	2.5	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	303	42.92	42.92
2.1 - 3.0	403	57.08	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	35	52	13	10	10	9	20	91	23	0	1	2	4	7	8	18	303
2.1 - 3.0	85	49	16	11	14	4	8	55	70	8	7	8	5	26	19	16	401
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	120	101	29	21	24	13	28	146	93	8	8	10	9	33	27	34	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 78.5 ppb on Mar 1 03:00

Maximum Daily Average: 26.0 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 2 19:00

Minimum Daily Average: 0.8 ppb on Mar 14

Maximum Diurnal Average: 11.6 ppb at hour 10

Minimum Diurnal Average: 0.2 ppb at hour 24

Monthly Average: 3.66 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.7 Q_3 = 3.9 P_{90} = 9.0 P_{99} = 48.7

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	37
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	46.2	64.4	78.5	73.1	58.2	Z	58.2	50.2	48.6	44.1	28.3	21.4	13.6	5.1	2.8	1.8	1.9	1.3	0.1	0.0	0.0	0.0	0.1	0.1	26.0	78.5
2-Mar	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.7	2.4	3.9	4.3	4.1	2.6	1.4	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.3
3-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.7	3.0	C	C	C	C	C	C	2.2	1.1	4.2	0.5	0.0	0.0	0.0	0.0	--	4.2
4-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.4	4.6	1.8	0.6	0.0	0.0	0.5	1.4	1.9	3.7	1.7	0.1	0.0	0.1	0.3	0.0	0.9	0.8	4.6
5-Mar	0.4	1.7	0.4	Z	0.3	0.4	0.0	4.4	5.4	3.0	1.7	4.9	4.8	5.6	3.4	1.9	1.4	0.4	0.0	0.0	0.2	0.0	2.4	DF	1.9	5.6
6-Mar	0.2	0.8	1.7	0.9	1.6	2.4	0.6	7.2	18.8	34.5	42.4	11.1	17.6	Z	4.5	5.9	2.6	0.7	0.0	0.1	0.0	0.0	0.0	0.0	6.7	42.4
7-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	1.6	3.4	3.3	2.5	2.2	3.0	2.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.4
8-Mar	0.0	0.1	0.0	0.0	0.0	Z	0.0	1.3	4.7	10.5	5.1	3.2	8.8	5.8	4.1	2.1	1.7	0.5	0.1	0.1	0.0	0.1	0.1	0.2	2.1	10.5
9-Mar	Z	0.0	0.1	0.1	0.1	0.4	0.5	7.5	10.1	10.9	8.3	12.1	6.4	3.3	3.8	2.3	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.9	12.1
10-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.3	3.5	5.4	2.9	2.9	2.2	1.7	0.6	0.0	0.0	0.0	0.0	3.2	2.0	0.0	1.1	5.4
11-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	1.0	4.9	4.4	3.1	2.6	4.0	5.9	3.5	4.3	1.2	0.2	0.0	0.0	0.0	0.0	0.1	1.5	5.9
12-Mar	0.2	0.0	0.0	Z	0.0	0.0	0.0	1.0	5.2	6.5	8.7	8.7	9.8	7.0	4.9	3.5	2.9	1.6	0.1	0.0	0.0	0.0	0.0	0.0	2.6	9.8
13-Mar	0.0	0.0	0.1	0.0	Z	0.0	1.5	5.0	11.8	13.8	8.5	10.6	9.4	7.9	5.7	4.4	3.1	0.8	0.1	0.0	0.1	0.1	0.0	0.0	3.6	13.8
14-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.3	1.0	1.4	1.9	2.5	3.1	3.2	1.9	1.3	0.9	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.8	3.2
15-Mar	Z	0.0	0.0	0.0	0.2	0.2	0.7	3.0	4.8	10.2	16.4	9.3	8.7	9.0	13.0	15.0	7.2	3.3	0.9	0.1	0.6	0.5	0.6	2.5	4.6	16.4
16-Mar	5.3	Z	5.0	0.1	0.6	2.0	3.8	4.2	8.1	5.9	4.8	8.1	8.1	10.2	9.5	4.1	1.8	1.4	0.4	0.0	0.9	0.8	0.3	0.1	3.7	10.2
17-Mar	0.2	0.1	Z	0.0	0.0	0.0	0.4	4.8	11.8	9.2	8.6	10.8	9.0	8.5	5.8	3.2	1.9	1.0	0.2	0.0	0.4	0.1	0.5	2.9	3.4	11.8
18-Mar	3.2	0.6	0.1	Z	0.0	0.0	0.3	3.9	6.2	5.5	4.2	3.7	3.0	2.2	1.2	0.5	1.1	1.5	13.7	15.1	12.5	10.8	1.5	0.1	4.0	15.1
19-Mar	0.1	0.1	0.0	0.0	Z	0.1	1.3	3.5	6.9	7.0	7.3	5.6	3.5	4.0	4.1	3.5	2.4	0.7	0.1	0.0	0.0	0.0	0.0	0.0	2.2	7.3
20-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.4	0.3	0.3	2.3	4.2	4.5	3.5	2.3	1.7	0.9	0.6	0.2	0.0	0.0	0.1	0.1	0.1	0.9	4.5
21-Mar	Z	0.4	0.2	0.1	0.2	0.0	0.6	8.4	4.5	3.2	19.6	17.0	2.3	2.3	2.6	3.9	9.3	7.0	3.6	0.2	0.0	0.3	0.0	0.0	3.7	19.6
22-Mar	0.0	Z	0.0	0.0	0.0	0.0	3.2	11.8	7.9	6.0	5.6	7.2	7.7	9.1	9.2	8.0	2.6	0.7	0.2	0.0	0.0	0.0	0.0	0.0	3.4	11.8
23-Mar	0.0	3.5	Z	8.2	1.1	0.1	2.0	5.2	12.2	5.2	1.7	2.0	1.3	2.1	1.9	1.1	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	2.1	12.2
24-Mar	0.0	0.0	0.0	Z	0.1	0.1	1.3	5.0	9.4	7.9	7.6	6.1	3.8	3.3	2.6	3.0	1.4	1.6	0.3	0.0	0.0	0.0	0.2	0.0	2.3	9.4
25-Mar	0.3	0.4	0.7	0.7	Z	0.4	3.3	21.4	12.4	36.8	56.6	17.8	3.8	2.6	2.0	1.6	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	7.0	56.6
26-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.7	5.0	18.3	12.3	10.8	8.8	5.9	6.4	4.9	2.9	1.9	1.0	0.2	0.0	0.0	0.1	0.0	0.3	3.4	18.3
27-Mar	Z	0.0	0.0	0.0	1.3	0.1	2.4	10.0	26.5	22.9	9.2	4.8	1.6	1.7	2.0	2.6	1.8	0.9	0.5	0.0	0.0	0.0	0.0	0.0	3.8	26.5
28-Mar	0.0	Z	0.0	0.2	0.3	1.2	3.7	13.5	34.9	48.7	8.8	8.2	5.7	4.7	3.6	2.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	6.0	48.7
29-Mar	0.0	0.0	Z	0.2	0.2	0.0	2.9	3.4	5.0	4.2	12.1	4.3	2.0	1.0	0.5	0.5	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	1.6	12.1
30-Mar	0.0	0.0	0.0	Z	0.1	0.1	2.5	11.9	34.1	24.5	7.7	4.8	6.5	M	M	1.2	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	4.5	34.1
31-Mar	0.0	0.0	4.9	9.9	Z	2.6	0.9	4.8	7.5	9.5	10.7	8.4	5.6	3.5	3.3	2.3	1.5	0.7	0.2	0.0	0.0	0.0	0.0	0.0	3.3	10.7
	2.2	2.8	3.5	3.6	2.5	0.4	2.9	6.4	10.5	11.6	10.5	7.4	5.6	4.4	3.9	3.0	2.1	1.0	0.8	0.5	0.5	0.5	0.3	0.2	Diurnal Average	
	46.2	64.4	78.5	73.1	58.2	2.6	58.2	50.2	48.6	48.7	56.6	21.4	17.6	10.2	13.0	15.0	9.3	7.0	13.7	15.1	12.5	10.8	2.4	2.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	682	96.88	96.88
21 - 40	10	1.42	98.30
11 - 80	12	1.70	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - March 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	122	96	26	18	23	13	26	139	92	9	6	10	8	31	24	39	682
21 - 40	1	0	1	0	0	0	2	5	1	0	0	0	0	0	0	0	10
11 - 80	1	0	0	1	0	0	2	1	2	0	2	0	0	1	0	0	10
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	96	27	19	23	13	30	145	95	9	8	10	8	32	24	39	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 51.3 ppb on Mar 18 20:00

Maximum Daily Average: 22.5 ppb on Mar 18

Minimum Value: 0.0 ppb on Mar 3 00:00

Minimum Daily Average: 4.5 ppb on Mar 7

Maximum Diurnal Average: 17.2 ppb at hour 2

Minimum Diurnal Average: 6.5 ppb at hour 15

Monthly Average: 12.07 ppb

Percentiles: P_1 = 0.4 P_{10} = 3.2 Q_1 = 5.8 Median = 10.6 Q_3 = 16.5 P_{90} = 23.4 P_{99} = 36.8

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	37
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	29.6	33.7	37.2	34.4	29.7	Z	30.3	29.6	23.3	22.0	20.0	17.0	12.4	6.6	5.0	5.5	9.7	14.0	14.1	9.1	7.2	7.8	10.5	14.0	18.4	37.2
2-Mar	Z	17.3	20.1	16.2	19.1	11.3	13.3	7.9	6.4	7.8	7.6	7.7	7.8	6.5	4.3	3.2	1.7	1.3	0.6	0.9	0.8	0.5	0.2	0.0	7.1	20.1
3-Mar	19.4	Z	8.0	3.9	4.1	3.3	3.6	6.5	6.3	9.4	C	C	C	C	C	C	9.8	13.3	29.1	15.0	7.4	8.9	7.0	7.8	--	29.1
4-Mar	6.8	17.0	Z	12.6	11.2	9.8	9.9	19.1	15.3	4.2	1.0	0.0	0.0	0.8	2.2	5.0	10.7	13.0	15.0	19.3	17.9	15.2	12.4	23.9	10.5	23.9
5-Mar	20.6	21.3	15.6	Z	12.7	10.5	5.4	6.9	6.9	3.1	1.9	4.7	4.8	5.8	4.3	3.8	5.2	6.9	8.4	12.3	17.4	13.2	20.0	DF	9.6	21.3
6-Mar	13.2	16.2	16.7	14.7	16.4	16.8	14.2	14.5	12.6	16.5	19.9	9.4	13.9	Z	8.2	11.9	9.6	7.8	5.5	4.9	4.1	5.7	5.4	4.5	11.4	19.9
7-Mar	5.3	4.2	3.3	4.2	Z	2.2	2.8	3.7	3.3	5.3	7.6	7.1	5.1	5.0	6.5	6.1	2.6	1.5	2.2	4.0	2.7	2.8	4.6	10.7	4.5	10.7
8-Mar	12.5	20.0	16.6	13.9	6.6	Z	8.9	14.7	14.4	16.3	7.5	5.1	11.0	8.5	7.1	5.3	6.8	4.4	5.9	7.2	4.0	6.1	13.6	15.7	10.1	20.0
9-Mar	Z	9.8	13.3	13.8	19.0	21.8	23.2	24.4	17.0	13.6	9.9	12.4	7.8	4.8	6.4	5.2	4.2	3.9	1.8	0.9	0.7	0.4	0.5	1.2	9.4	24.4
10-Mar	1.5	Z	2.0	1.5	1.9	2.6	2.5	3.2	3.0	4.4	7.2	6.6	4.5	4.0	3.6	4.2	3.3	1.3	1.3	2.2	5.7	31.7	23.6	7.2	5.6	31.7
11-Mar	0.9	1.1	Z	2.4	3.7	3.3	2.3	2.6	4.6	8.8	7.6	5.2	3.9	6.5	10.9	10.2	14.8	11.2	14.3	13.5	12.2	13.8	12.4	21.9	8.2	21.9
12-Mar	23.4	13.1	11.1	Z	10.0	10.6	12.9	10.9	15.2	11.9	11.6	11.1	12.2	8.6	6.7	7.3	9.5	10.6	12.0	12.6	13.7	12.2	15.1	18.9	12.2	23.4
13-Mar	23.2	26.4	27.4	24.8	Z	26.0	23.4	20.8	20.1	16.9	9.4	10.7	10.1	10.5	9.3	10.5	10.9	8.2	11.6	18.0	22.0	21.2	14.0	14.9	17.0	27.4
14-Mar	13.6	10.6	9.7	10.5	8.4	Z	9.6	9.3	8.5	6.6	7.9	8.2	6.7	7.1	5.0	5.4	5.8	2.1	0.5	3.4	11.0	12.2	9.6	11.1	7.9	13.6
15-Mar	Z	6.2	2.9	10.8	18.9	18.7	17.6	12.7	8.1	9.7	12.7	8.0	7.6	8.2	12.5	16.6	13.2	14.0	17.0	23.4	29.0	26.0	25.3	25.5	15.0	29.0
16-Mar	25.4	Z	30.1	22.0	21.0	26.7	27.2	18.5	14.1	11.2	6.6	7.5	7.6	9.5	10.1	6.6	5.4	9.4	13.7	13.8	27.6	31.3	28.1	25.8	17.4	31.3
17-Mar	28.9	24.1	Z	17.3	16.7	19.6	16.6	16.2	16.0	11.1	9.9	12.1	11.2	11.2	10.1	8.1	8.3	10.8	13.5	14.8	21.2	21.1	28.9	27.6	16.3	28.9
18-Mar	34.5	29.7	25.5	Z	19.3	23.2	20.6	20.1	15.9	11.4	9.1	7.8	6.5	5.9	3.9	2.3	6.0	13.7	44.7	51.3	49.1	46.6	37.2	32.4	22.5	51.3
19-Mar	31.5	35.2	29.2	25.6	Z	22.9	20.9	14.7	13.4	11.4	12.1	10.2	7.5	8.4	9.5	10.2	8.4	8.8	9.6	3.0	1.1	0.8	0.7	0.5	12.9	35.2
20-Mar	0.5	0.4	0.7	0.5	0.4	Z	1.8	7.2	3.7	2.3	6.6	7.6	6.3	5.1	4.0	3.5	3.0	3.6	5.4	6.7	10.6	16.2	17.1	15.6	5.6	17.1
21-Mar	Z	25.5	18.3	14.4	14.9	12.7	14.1	16.2	10.3	6.5	18.6	16.1	3.3	3.5	4.3	7.7	20.3	24.6	35.3	32.6	18.0	19.9	17.7	17.1	16.2	35.3
22-Mar	13.4	Z	14.7	13.7	21.1	18.6	19.5	19.2	12.8	8.9	8.6	9.8	10.7	12.9	14.4	15.2	9.7	8.5	11.6	8.7	9.0	10.4	14.0	13.5	13.0	21.1
23-Mar	17.9	28.1	Z	34.0	31.7	25.5	27.5	20.7	21.6	10.1	4.6	4.7	3.4	4.5	4.8	4.5	3.2	4.6	6.4	8.7	4.5	0.4	0.2	0.4	11.8	34.0
24-Mar	1.3	5.4	11.2	Z	25.4	23.8	18.8	14.2	14.9	11.0	9.5	8.0	5.8	5.3	4.8	6.4	4.7	10.0	10.6	10.9	12.7	26.8	27.8	21.2	12.6	27.8
25-Mar	23.8	22.2	21.6	20.4	Z	16.7	16.2	15.5	10.9	22.3	31.5	17.4	6.1	4.8	3.8	4.1	3.0	3.0	3.3	4.7	7.0	10.5	9.4	16.2	12.8	31.5
26-Mar	16.9	22.8	15.1	14.3	17.4	Z	11.8	11.4	18.1	13.0	10.3	8.3	7.2	7.6	5.7	5.6	5.4	5.8	5.2	4.0	10.4	14.3	14.7	17.7	11.4	22.8
27-Mar	Z	11.8	11.3	8.2	15.5	12.4	13.1	14.2	18.9	17.4	10.5	6.4	2.7	3.0	3.7	5.3	5.4	5.7	11.6	15.6	11.0	15.0	18.4	19.0	11.1	19.0
28-Mar	18.5	Z	16.9	17.3	17.6	17.9	16.5	14.9	22.6	25.5	15.4	11.8	8.9	7.7	7.4	6.4	6.0	4.9	5.9	5.7	7.6	13.0	11.2	8.0	12.5	25.5
29-Mar	8.3	8.1	Z	22.0	18.2	12.9	18.6	12.3	12.4	14.9	24.0	13.4	7.5	4.7	3.9	3.8	4.5	3.7	6.1	8.7	13.6	19.0	15.8	14.7	11.8	24.0
30-Mar	14.1	15.1	12.4	Z	11.3	10.6	11.5	14.3	21.7	20.7	11.3	8.1	10.8	M	M	6.5	7.3	9.7	9.3	10.5	13.2	18.2	24.7	24.0	13.6	24.7
31-Mar	21.3	22.3	36.5	39.2	Z	36.8	21.3	24.3	24.4	20.2	16.9	12.6	8.5	6.3	6.4	5.5	5.4	5.5	7.8	12.5	14.9	2.9	1.7	4.3	15.5	39.2
	16.4	17.2	16.4	15.9	15.1	16.0	14.7	14.2	13.4	12.1	11.2	9.2	7.4	6.5	6.5	6.7	7.2	7.9	10.9	11.6	12.5	14.3	14.3	14.5	Diurnal Average	
	34.5	35.2	37.2	39.2	31.7	36.8	30.3	29.6	24.4	25.5	31.5	17.4	13.9	12.9	14.4	16.6	20.3	24.6	44.7	51.3	49.1	46.6	37.2	32.4	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 (NO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	598	84.94	84.94
21 - 40	102	14.49	99.43
11 - 80	4	0.57	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - March 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	99	89	23	18	21	13	28	139	67	6	5	9	7	25	19	30	598
21 - 40	24	6	4	1	2	0	2	6	28	3	3	1	1	7	4	8	100
11 - 80	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	96	27	19	23	13	30	145	95	9	8	10	8	32	24	39	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 115.7 ppb on Mar 1 03:00

Maximum Daily Average: 44.4 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 4 13:00

Minimum Daily Average: 5.3 ppb on Mar 7

Maximum Diurnal Average: 23.9 ppb at hour 9

Minimum Diurnal Average: 9.0 ppb at hour 18

Monthly Average: 15.73 ppb

Percentiles: P_1 = 0.4 P_{10} = 3.6 Q_1 = 7.3 Median = 12.9 Q_3 = 19.9 P_{90} = 29.0 P_{99} = 75.7

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	37
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	75.8	98.1	115.7	107.5	87.9	Z	88.5	79.8	71.9	66.1	48.3	38.4	26.0	11.7	7.8	7.3	11.6	15.3	14.2	9.1	7.2	7.8	10.6	14.1	44.4	115.7
2-Mar	Z	17.5	20.3	16.4	19.3	11.4	13.4	8.1	7.1	10.2	11.5	12.0	11.9	9.1	5.7	3.9	1.8	1.3	0.6	0.9	0.8	0.5	0.2	0.0	8.0	20.3
3-Mar	19.4	Z	8.0	3.9	4.1	3.3	3.6	6.6	7.0	12.4	C	C	C	C	C	C	12.0	14.4	33.3	15.5	7.4	8.9	7.0	7.8	--	33.3
4-Mar	6.8	17.0	Z	12.6	11.2	9.8	9.9	20.5	19.9	6.0	1.6	0.0	0.0	1.3	3.6	6.9	14.4	14.7	15.1	19.3	18.0	15.5	12.4	24.8	11.4	24.8
5-Mar	21.0	23.0	16.0	Z	13.0	10.9	5.4	11.3	12.3	6.1	3.6	9.6	9.6	11.4	7.7	5.7	6.6	7.3	8.4	12.3	17.6	13.2	22.4	DF	11.6	23.0
6-Mar	13.4	17.0	18.4	15.6	18.0	19.2	14.8	21.7	31.4	51.0	62.3	20.5	31.5	Z	12.7	17.8	12.2	8.5	5.5	5.0	4.1	5.7	5.4	4.5	18.1	62.3
7-Mar	5.3	4.2	3.3	4.2	Z	2.2	2.8	3.8	3.8	6.9	11.0	10.4	7.6	7.2	9.5	8.3	3.0	1.5	2.2	4.0	2.7	2.8	4.6	10.7	5.3	11.0
8-Mar	12.5	20.1	16.6	13.9	6.6	Z	8.9	16.0	19.1	26.8	12.6	8.3	19.8	14.3	11.2	7.4	8.5	4.9	6.0	7.3	4.0	6.2	13.7	15.9	12.2	26.8
9-Mar	Z	9.8	13.4	13.9	19.1	22.2	23.7	31.9	27.1	24.5	18.2	24.5	14.2	8.1	10.2	7.5	5.3	4.2	1.8	0.9	0.7	0.4	0.5	1.2	12.3	31.9
10-Mar	1.5	Z	2.0	1.5	1.9	2.6	2.5	3.3	3.4	5.7	10.7	12.0	7.4	6.9	5.8	5.9	3.9	1.3	1.3	2.2	5.7	34.9	25.6	7.2	6.7	34.9
11-Mar	0.9	1.1	Z	2.4	3.7	3.3	2.3	2.7	5.6	13.7	12.0	8.3	6.5	10.5	16.8	13.7	19.1	12.4	14.5	13.5	12.2	13.8	12.4	22.0	9.7	22.0
12-Mar	23.6	13.1	11.1	Z	10.0	10.6	12.9	11.9	20.4	18.4	20.3	19.8	22.0	15.6	11.6	10.8	12.4	12.2	12.1	12.6	13.7	12.2	15.1	18.9	14.8	23.6
13-Mar	23.2	26.4	27.5	24.8	Z	26.0	24.9	25.8	31.9	30.7	17.9	21.3	19.5	18.4	15.0	14.9	14.0	9.0	11.7	18.0	22.1	21.3	14.0	14.9	20.6	31.9
14-Mar	13.6	10.6	9.7	10.5	8.4	Z	9.6	9.6	9.5	8.0	9.8	10.7	9.8	10.3	6.9	6.7	6.7	2.3	0.5	3.4	11.0	12.3	9.7	11.2	8.7	13.6
15-Mar	Z	6.2	2.9	10.8	19.1	18.9	18.3	15.7	12.9	19.9	29.1	17.3	16.3	17.2	25.5	31.6	20.4	17.3	17.9	23.5	29.6	26.5	25.9	28.0	19.6	31.6
16-Mar	30.7	Z	35.1	22.1	21.6	28.7	31.0	22.7	22.2	17.1	11.4	15.6	15.7	19.7	19.6	10.7	7.2	10.8	14.1	13.8	28.5	32.1	28.4	25.9	21.1	35.1
17-Mar	29.1	24.2	Z	17.3	16.7	19.6	17.0	21.0	27.8	20.3	18.5	22.9	20.2	19.7	15.9	11.3	10.2	11.8	13.7	14.8	21.6	21.2	29.4	30.5	19.8	30.5
18-Mar	37.7	30.3	25.6	Z	19.3	23.2	20.9	24.0	22.1	16.9	13.3	11.5	9.5	8.1	5.1	2.8	7.1	15.2	58.4	66.4	61.6	57.4	38.7	32.5	26.4	66.4
19-Mar	31.6	35.3	29.2	25.6	Z	23.0	22.2	18.2	20.3	18.4	19.4	15.8	11.0	12.4	13.6	13.7	10.8	9.5	9.7	3.0	1.1	0.8	0.7	0.5	15.0	35.3
20-Mar	0.5	0.4	0.7	0.5	0.4	Z	1.8	7.6	4.0	2.6	8.9	11.8	10.8	8.6	6.3	5.2	3.9	4.2	5.6	6.7	10.6	16.3	17.2	15.7	6.5	17.2
21-Mar	Z	25.9	18.5	14.5	15.1	12.7	14.7	24.6	14.8	9.7	38.2	33.1	5.6	5.8	6.9	11.6	29.6	31.6	38.9	32.8	18.0	20.2	17.7	17.1	19.9	38.9
22-Mar	13.4	Z	14.7	13.7	21.1	18.6	22.7	31.0	20.7	14.9	14.2	17.0	18.4	22.0	23.6	23.2	12.3	9.2	11.8	8.7	9.0	10.4	14.0	13.5	16.4	31.0
23-Mar	17.9	31.6	Z	42.2	32.8	25.6	29.5	25.9	33.8	15.3	6.3	6.7	4.7	6.6	6.7	5.6	3.8	5.0	6.6	8.7	4.5	0.4	0.2	0.4	13.9	42.2
24-Mar	1.3	5.4	11.2	Z	25.5	23.9	20.1	19.2	24.3	18.9	17.1	14.1	9.6	8.6	7.4	9.4	6.1	11.6	10.9	10.9	12.7	26.8	28.0	21.2	15.0	28.0
25-Mar	24.1	22.6	22.3	21.1	Z	17.1	19.5	36.9	23.3	59.1	88.1	35.2	9.9	7.4	5.8	5.7	3.7	3.3	3.3	4.7	7.0	10.5	9.4	16.2	19.8	88.1
26-Mar	16.9	22.8	15.1	14.3	17.4	Z	12.5	16.4	36.4	25.3	21.1	17.1	13.1	14.0	10.6	8.5	7.3	6.8	5.4	4.0	10.4	14.4	14.7	18.0	14.9	36.4
27-Mar	Z	11.8	11.3	8.2	16.8	12.5	15.5	24.2	45.4	40.3	19.7	11.2	4.3	4.7	5.7	7.9	7.2	6.6	12.1	15.6	11.0	15.0	18.4	19.0	15.0	45.4
28-Mar	18.5	Z	16.9	17.5	17.9	19.1	20.2	28.4	57.5	74.2	24.2	20.0	14.6	12.4	11.0	8.4	7.1	5.3	5.9	5.7	7.6	13.0	11.2	8.0	18.5	74.2
29-Mar	8.3	8.1	Z	22.2	18.4	12.9	21.5	15.7	17.4	19.1	36.1	17.7	9.5	5.7	4.4	4.3	5.3	4.0	6.2	8.7	13.6	19.0	15.8	14.7	13.4	36.1
30-Mar	14.1	15.1	12.4	Z	11.4	10.7	14.0	26.2	55.8	45.2	19.0	12.9	17.3	M	M	7.7	8.3	10.2	9.4	10.5	13.2	18.2	24.7	24.0	18.1	55.8
31-Mar	21.3	22.3	41.4	49.1	Z	39.4	22.2	29.1	31.9	29.7	27.6	21.0	14.1	9.8	9.7	7.8	6.9	6.2	8.0	12.5	14.9	2.9	1.7	4.3	18.9	49.1
	18.5	20.0	20.0	19.5	17.6	16.4	17.6	20.6	23.9	23.6	21.7	16.6	13.0	11.0	10.4	9.7	9.3	9.0	11.8	12.1	13.0	14.9	14.5	14.8	Diurnal Average	
	75.8	98.1	115.7	107.5	87.9	39.4	88.5	79.8	71.9	74.2	88.1	38.4	31.5	22.0	25.5	31.6	29.6	31.6	58.4	66.4	61.6	57.4	38.7	32.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	543	77.13	77.13
21 - 40	135	19.18	96.31
11 - 80	20	2.84	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - March 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	91	86	23	15	17	11	26	124	55	5	4	8	6	25	17	30	543
21 - 40	29	9	3	3	6	2	0	17	36	4	2	2	2	6	6	8	135
11 - 80	4	1	1	0	0	0	4	4	3	0	1	0	0	0	1	1	20
81 - 159	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	96	27	19	23	13	30	145	95	9	8	10	8	32	24	39	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 47.2 ppb on Mar 18 14:00

Maximum Daily Average: 33.8 ppb on Mar 20

Minimum Value: 0.8 ppb on Mar 1 01:00

Maximum Diurnal Average: 32.8 ppb at hour 16

Monthly Average: 24.18 ppb

Minimum Daily Average: 14.1 ppb on Mar 1

Minimum Diurnal Average: 16.0 ppb at hour 6

Percentiles: P_1 = 1.0 P_{10} = 9.2 Q_1 = 16.5 Median = 25.8 Q_3 = 32.7 P_{90} = 36.3 P_{99} = 41.1

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.8	0.9	1.1	Z	1.0	1.0	0.8	1.6	4.0	8.7	15.8	C	C	C	C	31.5	27.5	22.6	20.1	25.2	27.3	28.0	26.1	23.6	14.1	31.5
2-Mar	20.1	22.3	19.7	23.4	Z	28.3	25.5	30.5	31.3	30.5	31.2	32.7	32.8	32.6	34.0	34.7	34.0	32.6	33.8	32.6	32.4	33.3	35.4	37.4	30.5	37.4
3-Mar	15.4	24.0	27.8	30.3	29.3	Z	30.0	28.4	28.4	24.8	25.5	25.2	27.3	27.3	23.7	26.3	23.8	20.4	5.1	18.1	25.2	24.7	27.3	26.3	24.6	30.3
4-Mar	Z	16.4	15.3	15.4	14.8	14.5	22.8	14.5	18.0	29.1	31.8	32.2	32.0	31.5	30.2	27.6	21.9	19.8	18.8	14.3	15.3	16.7	16.4	8.1	20.8	32.2
5-Mar	10.9	Z	12.0	9.4	9.4	11.4	17.6	16.5	17.0	21.4	27.0	26.3	26.7	26.4	27.3	27.7	25.9	23.9	22.1	17.2	11.1	12.8	7.2	DF	18.5	27.7
6-Mar	9.2	5.8	4.0	5.4	3.6	2.3	4.0	4.0	7.4	10.1	12.2	Z	19.9	25.1	27.5	25.3	28.0	29.2	31.7	29.6	28.1	26.9	29.3	31.7	17.4	31.7
7-Mar	30.5	31.8	Z	32.0	33.9	34.2	33.2	32.6	33.4	32.0	30.3	30.9	32.4	32.8	32.0	33.1	36.4	36.7	35.3	33.5	34.2	34.0	32.8	28.2	32.9	36.7
8-Mar	27.0	20.1	22.8	Z	31.6	31.4	28.4	22.5	22.9	22.1	30.7	33.5	29.3	32.3	33.5	35.1	33.8	36.0	33.6	31.1	34.1	31.2	23.9	20.2	29.0	36.0
9-Mar	27.6	23.4	19.5	18.2	Z	11.9	10.2	9.2	17.1	22.2	27.1	25.5	30.8	34.0	32.3	32.8	33.0	32.4	33.9	33.9	33.6	33.7	34.3	34.0	26.5	34.3
10-Mar	33.5	33.8	33.1	34.1	33.4	Z	32.0	30.9	31.0	29.6	27.2	28.4	29.9	30.2	31.1	32.0	33.4	34.4	33.2	30.6	27.1	3.5	12.0	28.1	29.2	34.4
11-Mar	Z	33.4	30.5	27.6	27.9	28.3	23.6	21.9	24.8	25.6	27.1	29.9	31.7	30.4	26.7	27.3	22.8	24.5	20.3	20.1	20.5	19.2	21.1	12.6	25.1	33.4
12-Mar	10.8	Z	22.4	24.3	23.5	22.8	20.6	22.0	18.6	21.9	22.2	22.7	22.1	25.3	27.0	26.2	23.9	23.2	22.7	21.7	20.2	21.3	18.4	14.9	21.7	27.0
13-Mar	11.0	7.8	Z	8.7	8.3	7.0	8.7	10.9	12.8	18.5	26.2	26.1	26.4	25.7	26.6	26.2	27.1	29.3	24.9	17.3	13.6	14.9	21.4	20.7	18.3	29.3
14-Mar	22.9	25.8	27.0	Z	28.6	29.9	28.0	28.8	29.9	31.9	30.9	30.8	32.2	31.9	33.8	33.4	32.5	35.2	35.9	32.7	25.4	24.0	26.4	24.7	29.7	35.9
15-Mar	22.6	28.3	30.7	23.0	Z	14.0	13.0	17.1	23.4	21.8	20.9	25.8	26.5	26.9	24.0	21.2	24.6	22.5	18.7	11.5	5.7	5.0	4.3	1.6	18.8	30.7
16-Mar	1.0	1.1	2.7	10.8	9.4	Z	3.0	13.4	19.4	23.7	28.2	27.6	28.5	26.9	27.0	29.9	32.7	30.0	25.1	23.5	10.5	6.9	8.2	9.2	17.3	32.7
17-Mar	Z	9.5	17.7	15.1	15.4	12.6	15.0	16.4	18.1	24.3	27.3	28.6	31.4	31.0	33.4	36.9	39.3	38.6	33.8	25.4	15.0	11.8	5.0	4.4	22.0	39.3
18-Mar	3.7	Z	15.3	23.0	23.1	19.5	22.6	23.1	29.7	36.4	41.5	43.5	45.9	47.2	47.0	45.9	43.1	36.1	7.7	1.2	1.3	1.0	5.6	7.5	24.8	47.2
19-Mar	10.2	6.9	Z	12.4	10.0	9.1	10.8	17.9	22.7	29.0	30.6	31.0	34.0	34.4	33.8	33.8	36.5	35.0	32.9	37.7	39.9	40.4	40.3	39.7	27.4	40.4
20-Mar	38.8	38.6	38.3	Z	38.5	38.2	36.1	31.5	34.4	35.6	32.4	31.7	33.5	35.3	37.3	37.4	38.3	36.6	34.5	32.7	29.4	23.1	22.4	22.5	33.8	38.8
21-Mar	15.3	9.7	16.7	16.4	Z	13.8	14.7	10.2	20.5	25.1	17.6	21.8	36.7	37.1	37.5	34.8	25.6	22.3	12.1	12.8	23.6	19.6	19.1	17.7	20.9	37.5
22-Mar	20.4	20.8	18.1	17.5	12.6	Z	10.6	11.1	23.0	30.4	34.5	35.3	35.9	34.4	34.1	33.4	38.9	40.6	37.0	38.3	35.2	31.1	24.0	22.3	27.8	40.6
23-Mar	Z	8.1	2.5	4.7	7.3	13.1	10.7	17.1	18.8	35.3	40.8	40.9	41.2	38.5	38.5	39.1	39.2	37.4	34.7	32.3	36.2	39.5	39.9	39.0	28.5	41.2
24-Mar	37.5	Z	26.4	18.7	12.0	11.5	12.3	17.2	22.2	27.0	28.6	30.4	34.8	35.5	37.7	37.4	39.2	34.6	34.9	31.1	27.7	13.7	9.3	12.1	25.7	39.2
25-Mar	7.6	6.1	Z	4.6	8.0	5.8	5.4	9.8	13.9	11.4	10.1	24.2	35.5	37.6	38.2	38.1	40.0	40.1	40.5	38.5	33.5	28.9	28.2	20.6	22.9	40.5
26-Mar	18.8	12.7	19.7	Z	14.7	16.3	19.5	21.0	16.1	21.9	25.1	27.3	29.5	29.9	32.5	33.1	34.0	33.8	33.8	32.7	24.6	20.7	19.4	14.4	24.0	34.0
27-Mar	17.3	17.6	17.9	19.9	Z	12.6	9.7	12.3	12.2	16.5	27.0	32.6	37.4	37.9	36.9	36.4	36.6	36.3	29.5	24.4	28.5	24.4	20.9	15.8	24.4	37.9
28-Mar	13.4	10.6	10.4	7.9	7.5	Z	6.4	8.6	9.5	10.8	32.7	32.1	34.6	35.1	35.1	35.7	35.9	37.3	36.9	36.7	34.6	28.6	29.4	28.6	24.3	37.3
29-Mar	Z	25.4	22.6	10.4	11.7	15.9	7.6	14.2	15.8	21.8	17.5	27.3	32.5	34.6	35.3	35.6	35.4	36.4	33.4	30.8	24.7	18.4	19.2	17.6	23.7	36.4
30-Mar	15.7	Z	13.5	13.1	9.4	8.8	6.0	5.7	6.4	13.7	24.9	29.9	27.6	M	M	33.6	33.0	30.8	30.3	28.3	24.9	18.8	12.9	14.0	19.1	33.6
31-Mar	16.6	15.4	Z	1.0	2.0	2.5	15.9	13.9	14.0	17.7	21.2	25.3	30.3	34.4	35.1	35.5	36.4	36.2	33.2	27.9	21.9	38.1	36.5	32.1	23.6	38.1
	17.6	17.5	18.8	16.4	16.4	16.0	16.3	17.3	19.9	23.6	26.6	29.6	31.6	32.5	32.7	32.8	32.7	31.8	28.4	26.6	24.7	22.4	21.8	21.0	Diurnal Average	
	38.8	38.6	38.3	34.1	38.5	38.2	36.1	32.6	34.4	36.4	41.5	43.5	45.9	47.2	47.0	45.9	43.1	40.6	40.5	38.5	39.9	40.4	40.3	39.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	241	34.14	34.14
21 - 50	465	65.86	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - March 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	41	20	4	2	7	2	5	16	46	8	4	8	6	29	22	20	240
21 - 50	80	79	25	19	17	11	23	126	51	0	1	3	3	3	6	18	465
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	121	99	29	21	24	13	28	142	97	8	5	11	9	32	28	38	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 1 24-hr: 1

Maximum Value: 99.6 $\mu g/m^3$ on Mar 28 06:00

Maximum Daily Average: 31.3 $\mu g/m^3$ on Mar 28

Minimum Value: 0.5 $\mu g/m^3$ on Mar 2 19:00

Maximum Diurnal Average: 16.2 $\mu g/m^3$ at hour 10

Monthly Average: 11.31 $\mu g/m^3$

Minimum Daily Average: 4.1 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 8.3 $\mu g/m^3$ at hour 18

Percentiles: P_1 = 1.9 P_{10} = 4.4 Q_1 = 5.4 Median = 8.6 Q_3 = 13.6 P_{90} = 21.0 P_{99} = 45.9

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Hours of Calibration:	4
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	13.1	14.1	14.3	15.2	11.5	12.4	13.6	12.9	10.3	11.5	9.7	8.6	10.5	7.6	5.7	5.7	6.9	7.5	6.3	5.4	6.3	6.8	8.2	9.2	9.7	15.2
2-Mar	10.5	10.9	11.5	10.8	10.6	11.4	10.8	11.5	11.2	12.9	13.0	12.8	11.4	7.6	5.0	3.1	1.0	0.8	0.5	0.6	0.6	0.6	1.2	1.3	7.1	13.0
3-Mar	5.4	5.5	5.4	4.7	4.4	4.5	4.6	5.3	5.8	6.1	6.7	6.2	6.5	7.2	9.5	7.6	8.7	10.0	11.4	6.4	4.6	4.8	4.6	4.5	6.3	11.4
4-Mar	4.0	5.0	5.2	4.7	4.6	4.3	4.4	5.6	6.1	4.0	3.1	3.0	3.0	3.3	4.1	5.0	8.1	8.9	7.4	11.6	10.3	9.2	6.7	11.5	6.0	11.6
5-Mar	8.3	7.8	5.2	5.9	4.4	4.8	3.7	3.7	4.2	4.3	4.4	6.9	6.3	6.0	5.2	5.0	5.2	5.7	5.7	6.6	8.3	7.6	8.0	DF	5.8	8.3
6-Mar	9.6	12.4	11.5	9.6	9.3	9.2	8.2	8.5	8.6	12.6	15.8	15.1	24.6	18.9	7.5	10.2	8.4	5.9	3.7	3.2	3.1	4.5	5.4	4.7	9.6	24.6
7-Mar	4.8	3.8	3.2	3.4	3.4	3.1	3.4	3.7	4.1	4.9	5.4	5.1	4.8	4.6	4.7	4.7	3.5	2.8	3.1	3.2	3.2	3.6	4.9	7.3	4.1	7.3
8-Mar	6.6	9.9	9.0	7.7	4.7	4.4	5.7	9.6	7.1	11.6	8.1	7.5	9.0	6.7	8.6	7.5	11.1	8.5	9.4	6.5	4.9	6.1	15.4	19.2	8.5	19.2
9-Mar	12.1	12.7	14.7	15.8	14.7	12.8	22.8	18.5	18.2	15.2	12.1	11.8	12.2	9.8	10.8	9.8	10.2	8.0	3.8	3.7	3.7	3.9	3.9	4.6	11.1	22.8
10-Mar	5.1	4.1	4.8	4.9	4.3	4.6	4.8	4.9	5.1	6.2	8.0	8.5	7.3	6.6	6.0	6.7	6.2	5.3	4.9	5.3	8.0	18.1	14.4	7.2	6.7	18.1
11-Mar	4.0	4.0	4.0	4.1	4.0	4.5	3.9	4.3	5.2	9.3	10.2	7.5	7.6	8.7	9.6	9.5	8.4	6.7	6.6	6.8	6.7	5.8	5.4	5.6	6.4	10.2
12-Mar	5.6	5.8	5.5	5.0	4.8	4.7	4.6	4.8	5.0	4.8	4.6	4.8	5.2	5.0	4.7	5.0	5.3	5.7	5.6	5.4	5.6	5.7	5.8	6.1	5.2	6.1
13-Mar	6.2	6.2	6.4	6.3	6.5	6.7	6.6	6.6	6.8	6.7	6.4	7.2	8.6	9.8	10.7	13.3	11.9	8.6	10.3	12.7	11.6	10.4	9.7	10.0	8.6	13.3
14-Mar	7.4	5.6	5.5	5.3	5.0	4.9	4.6	4.5	4.5	4.4	4.3	4.4	4.5	4.3	4.0	3.9	4.0	3.8	3.7	3.9	4.4	4.4	4.5	4.6	4.6	7.4
15-Mar	4.7	4.3	4.1	4.5	5.4	5.4	4.8	4.8	5.2	5.5	6.3	5.6	5.7	5.7	6.1	6.7	6.4	5.9	5.6	6.0	20.6	9.2	12.3	7.3	6.6	20.6
16-Mar	6.8	6.5	7.1	6.0	5.9	6.6	6.7	6.5	6.5	9.3	8.9	12.3	11.1	15.4	14.9	12.5	9.9	7.2	8.3	9.9	12.4	11.7	10.9	9.4	9.3	15.4
17-Mar	9.8	13.6	8.1	7.9	7.7	8.3	8.1	8.1	9.8	8.1	10.6	11.5	11.8	13.5	13.2	9.6	9.7	8.5	10.0	12.1	13.6	13.8	10.2	13.2	10.4	13.8
18-Mar	10.9	10.0	7.9	8.1	10.7	11.9	13.5	12.5	12.6	11.5	11.0	10.9	9.4	9.1	6.2	4.1	4.9	5.7	7.3	7.2	5.8	5.5	5.7	5.5	8.7	13.5
19-Mar	5.0	5.3	5.0	5.2	6.3	12.2	6.0	6.1	7.4	7.6	8.2	7.8	6.9	7.2	7.8	8.6	8.9	7.5	7.5	6.3	5.2	5.1	5.1	5.1	6.8	12.2
20-Mar	4.9	4.8	4.4	4.2	4.1	4.1	4.9	5.7	5.1	4.9	5.3	5.4	5.5	5.4	4.9	4.8	4.5	4.4	4.6	5.2	7.1	10.7	11.6	11.8	5.8	11.8
21-Mar	14.8	15.8	12.6	9.6	9.9	9.2	9.4	11.0	7.6	6.6	20.0	19.0	7.7	7.1	9.2	9.6	24.7	27.3	17.0	12.6	14.2	15.4	18.0	16.6	13.5	27.3
22-Mar	13.0	10.2	18.2	13.5	17.1	17.0	18.3	29.1	12.7	10.8	14.6	18.6	19.4	20.0	16.9	18.5	13.7	12.1	14.0	14.2	13.8	12.9	17.4	14.7	15.9	29.1
23-Mar	15.2	15.5	17.0	18.0	21.0	24.9	20.9	21.2	22.0	14.6	10.2	9.6	8.0	9.0	8.6	7.9	6.9	7.0	7.1	7.5	6.3	5.1	5.0	4.8	12.2	24.9
24-Mar	5.0	7.3	11.0	15.9	21.7	21.3	15.7	17.2	25.9	23.2	19.6	16.8	11.8	9.6	8.5	8.0	8.5	12.6	13.1	11.9	13.3	17.8	19.4	17.0	14.7	25.9
25-Mar	16.5	16.5	16.7	25.8	12.5	13.2	12.3	14.4	14.2	43.9	66.6	35.9	13.8	9.4	8.4	7.6	7.2	6.5	8.1	8.6	9.4	14.6	14.2	21.0	17.4	66.6
26-Mar	21.6	28.7	20.6	19.6	22.9	21.1	18.0	18.6	37.7	32.7	28.0	26.9	23.4	23.7	19.5	18.3	15.8	15.5	14.4	8.9	17.5	36.6	37.8	60.4	24.5	60.4
27-Mar	24.0	22.5	16.3	11.7	18.5	11.4	17.2	22.0	46.5	40.9	26.8	19.1	10.7	10.8	10.1	11.7	13.2	12.6	19.9	31.4	26.3	29.6	33.1	28.3	21.4	46.5
28-Mar	29.8	52.7	27.3	45.0	34.8	99.6	19.6	30.1	69.3	74.0	36.1	23.0	24.5	20.6	16.6	14.7	14.0	11.3	13.5	13.2	14.0	21.9	24.9	20.7	31.3	99.6
29-Mar	19.6	15.1	14.1	27.3	22.2	14.9	22.1	18.5	21.3	15.6	30.3	18.3	13.3	9.2	9.0	8.6	10.6	5.8	7.8	8.4	12.0	15.7	13.8	13.3	15.3	30.3
30-Mar	11.6	12.3	17.0	10.5	8.4	7.5	9.5	18.2	47.6	44.6	17.6	C	C	C	C	11.7	11.2	10.4	9.8	15.1	16.8	17.3	22.6	24.6	17.2	47.6
31-Mar	20.4	22.2	37.3	44.7	38.3	40.1	21.1	24.9	33.0	32.8	34.1	27.0	20.9	15.3	14.5	12.7	9.1	7.3	7.5	8.5	9.8	6.1	4.7	4.8	20.7	44.7
	10.9	12.0	11.3	12.3	11.6	13.6	10.6	12.0	15.7	16.2	15.0	12.6	10.8	9.9	9.0	8.8	9.0	8.3	8.3	8.7	9.7	11.0	11.8	12.5	Diurnal Average	
	29.8	52.7	37.3	45.0	38.3	99.6	22.8	30.1	69.3	74.0	66.6	35.9	24.6	23.7	19.5	18.5	24.7	27.3	19.9	31.4	26.3	36.6	37.8	60.4	Diurnal Maximum	

C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	187	25.30	25.30
6 - 15	408	55.21	80.51
16 - 25	99	13.40	93.91
26 - 80	44	5.95	99.86
> 81.0	1	0.14	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	42	28	9	3	8	8	15	39	2	0	1	3	5	7	4	13	187
6 - 15	56	59	17	15	13	2	11	90	76	5	3	8	1	15	17	18	406
16 - 25	14	10	2	1	2	4	2	13	21	4	2	0	2	8	6	8	99
26 - 80	16	3	1	2	1	0	2	8	1	0	1	0	1	6	1	1	44
> 81.0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	128	100	29	21	24	14	30	150	100	9	8	11	9	36	28	40	737

Total Number of Valid Hours: 737

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 737

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.5 ppm on Mar 1 08:00

Maximum Daily Average: 0.2 ppm on Mar 17

Minimum Value: 0.1 ppm on Mar 11 01:00

Maximum Diurnal Average: 0.2 ppm at hour 8

Monthly Average: 0.19 ppm

Minimum Daily Average: 0.1 ppm on Mar 7

Minimum Diurnal Average: 0.2 ppm at hour 4

Percentiles: P_1 = 0.1 P_{10} = 0.2 Q_1 = 0.2 Median = 0.2 Q_3 = 0.2 P_{90} = 0.2 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	0.2	0.2	0.2	0.3	0.2	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	0.2	0.2	0.2	0.2	0.2	0.2	0.5
2-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
3-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
4-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5-Mar	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	DF	0.2	0.2
6-Mar	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
7-Mar	0.2	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
8-Mar	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	C	C	C	C	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
9-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
10-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
11-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
12-Mar	0.1	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
13-Mar	0.2	0.2	0.2	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
16-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
17-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3
18-Mar	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
19-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
20-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
21-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3
22-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3
23-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
24-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
26-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3
27-Mar	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
28-Mar	0.2	0.2	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3
29-Mar	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
30-Mar	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	M	M	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
31-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3
	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.5	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	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm

Wood Buffalo Environmental Association

Hourly Averages

Carbon Monoxide (CO) - ppm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	705	99.86	99.86
0.4 - 0.5	1	0.14	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Monoxide (CO) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 0.3	121	100	29	21	23	13	30	145	90	7	7	11	8	33	27	38	703
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	121	100	29	21	23	13	30	145	90	7	8	11	8	33	27	38	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Monoxide (CO) - ppm

Fort McKay - Bertha Ganter

Classes (ppm)

- 0 - 0.3
- 0.4 - 0.5
- 0.6 - 0.7
- 0.8 - 1.4
- 1.5 - 10
- > 10

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Dioxide (CO_2) - ppm

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 465.9 ppm on Mar 1 04:00

Maximum Daily Average: 450.0 ppm on Mar 1

Minimum Value: 420.0 ppm on Mar 26 18:00

Maximum Diurnal Average: 436.8 ppm at hour 8

Monthly Average: 432.06 ppm

Minimum Daily Average: 423.5 ppm on Mar 8

Minimum Diurnal Average: 429.1 ppm at hour 18

Percentiles: P_1 = 421.1 P_{10} = 424.5 Q_1 = 426.6 Median = 430.4 Q_3 = 435.3 P_{90} = 442.9 P_{99} = 460.9

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	457.8	462.5	465.9	463.8	464.8	465.7	465.5	457.5	457.0	453.1	450.5	446.1	439.7	437.9	437.9	438.9	441.2	440.4	440.7	440.7	439.7	440.9	441.8	450.0	465.9
2-Mar	443.7	Z	443.0	443.1	444.1	444.6	448.1	443.0	443.0	445.0	448.3	446.7	442.8	439.5	437.2	435.6	434.1	433.8	433.3	434.1	434.1	433.8	433.3	433.0	439.9	448.3
3-Mar	440.4	442.5	Z	436.8	436.8	434.9	435.1	436.2	435.4	434.8	438.2	435.8	437.1	436.6	436.6	439.5	437.3	435.3	436.0	434.1	433.4	432.8	431.2	431.2	436.0	442.5
4-Mar	431.9	431.8	433.5	Z	434.6	434.7	433.6	431.4	432.7	430.7	429.1	428.2	427.8	428.2	429.2	429.2	430.6	429.3	428.1	428.6	430.0	430.4	430.0	432.2	430.7	434.7
5-Mar	431.5	433.2	432.9	437.7	Z	437.8	432.6	439.2	438.6	430.8	426.1	427.1	429.0	433.3	432.4	428.7	427.4	426.9	427.5	430.5	433.5	430.7	436.2	DF	432.0	439.2
6-Mar	430.9	436.8	439.3	437.2	439.6	443.9	439.2	447.3	454.4	443.9	445.5	438.9	462.8	439.5	Z	430.7	429.4	428.8	427.3	427.1	427.3	428.7	427.9	425.7	437.1	462.8
7-Mar	425.5	425.3	425.4	425.6	425.3	Z	425.7	425.9	426.0	427.7	429.1	C	C	C	C	424.6	421.9	420.7	421.1	421.8	422.2	422.6	421.8	422.0	424.2	429.1
8-Mar	Z	422.7	422.5	422.3	422.0	423.1	423.7	426.4	424.0	425.8	424.6	424.5	430.6	425.8	422.2	421.7	422.3	420.5	421.8	423.3	421.3	422.3	422.8	423.8	423.5	430.6
9-Mar	422.2	Z	423.1	423.1	429.0	433.8	430.0	429.4	426.2	430.8	431.1	436.4	430.7	427.0	426.9	426.4	425.0	423.1	423.0	422.9	423.0	423.1	423.3	423.6	426.7	436.4
10-Mar	423.8	423.6	Z	423.9	424.2	424.8	425.1	425.5	425.7	427.1	428.7	429.9	427.2	427.6	427.2	427.8	427.4	425.4	425.1	425.6	425.7	429.3	428.2	425.8	426.3	429.9
11-Mar	424.3	424.5	424.4	Z	426.2	427.2	427.5	427.2	426.6	426.3	426.7	425.8	424.9	427.3	428.8	427.6	429.4	426.4	424.9	425.3	425.6	424.5	423.9	424.9	426.1	429.4
12-Mar	425.3	425.5	425.1	425.2	Z	424.6	425.1	424.5	424.4	427.1	426.6	423.9	424.2	423.8	423.7	423.8	424.7	424.5	424.3	424.6	424.8	425.4	426.8	428.1	425.0	428.1
13-Mar	428.9	429.2	429.1	429.0	429.2	Z	430.5	432.0	430.2	428.7	430.4	433.3	429.3	428.1	429.4	428.9	428.6	430.4	430.1	430.5	430.4	430.8	430.5	431.3	430.0	433.3
14-Mar	Z	431.4	431.2	430.0	430.4	430.7	430.6	431.1	429.7	428.5	428.7	429.4	429.9	430.1	428.6	429.0	428.3	426.7	426.1	426.2	427.2	427.7	428.4	429.0	429.1	431.4
15-Mar	428.1	Z	425.6	426.4	429.5	430.1	429.4	429.3	427.5	428.1	428.3	425.2	425.7	430.8	443.6	441.2	436.8	430.6	429.8	427.6	433.6	432.6	432.9	441.3	431.1	443.6
16-Mar	442.6	440.0	Z	430.6	432.4	432.6	433.9	432.0	429.4	432.7	434.1	436.8	437.7	443.9	443.2	433.3	428.5	433.5	430.5	431.2	432.8	432.4	432.0	431.2	434.2	443.9
17-Mar	433.4	433.4	432.1	Z	433.0	433.8	433.3	435.3	440.0	440.0	438.3	448.7	444.9	442.7	441.8	435.7	433.5	430.1	431.3	436.0	434.5	434.7	435.2	438.2	436.5	448.7
18-Mar	437.4	436.6	433.8	431.7	Z	433.8	434.0	435.0	434.4	432.6	432.7	433.3	431.0	430.1	428.7	424.8	427.9	429.5	436.6	436.0	433.5	432.2	431.9	431.8	432.6	437.4
19-Mar	432.7	433.6	431.0	431.6	434.9	Z	433.9	433.9	435.2	433.4	436.5	433.8	430.4	431.0	430.9	430.5	428.4	427.4	427.6	426.9	425.8	425.4	425.4	425.4	430.7	436.5
20-Mar	Z	425.6	425.8	425.6	425.7	425.7	426.3	428.3	426.5	426.5	428.7	429.1	428.3	425.8	425.3	425.2	425.0	425.4	425.9	428.7	429.8	428.3	428.5	429.5	426.9	429.8
21-Mar	429.3	Z	433.7	434.9	436.9	434.1	432.7	448.1	433.9	430.0	431.8	432.3	427.6	427.9	428.9	433.7	451.3	451.3	461.0	452.2	439.7	445.6	443.8	441.8	438.4	461.0
22-Mar	437.4	436.0	Z	441.6	441.7	441.3	446.6	459.2	441.3	436.4	440.9	446.8	444.3	445.7	445.2	445.0	437.2	435.1	435.8	435.7	437.9	440.6	446.9	444.9	441.9	459.2
23-Mar	444.9	448.2	451.5	Z	444.5	444.5	448.9	448.5	447.3	436.3	432.2	430.5	430.3	428.7	428.2	427.8	428.3	427.0	426.7	427.0	427.0	426.0	425.9	425.9	435.0	451.5
24-Mar	425.6	425.8	426.9	428.4	Z	431.2	438.1	435.9	429.8	429.9	429.4	428.9	429.4	429.8	428.5	426.5	428.2	436.3	433.3	432.6	433.7	434.7	441.5	439.5	431.5	441.5
25-Mar	443.9	443.8	446.8	448.0	441.7	Z	447.4	445.0	443.1	441.9	437.3	430.3	427.2	426.2	425.1	426.0	424.9	426.7	423.2	423.2	423.3	425.1	424.6	428.1	433.6	448.0
26-Mar	Z	432.3	425.3	425.4	430.7	427.4	424.9	424.5	425.7	425.6	426.9	425.7	423.4	422.9	421.1	420.7	420.9	420.0	420.1	420.2	421.3	423.2	423.5	430.1	424.4	432.3
27-Mar	427.3	Z	429.1	427.8	437.2	435.8	438.5	434.4	432.7	431.0	427.7	424.6	422.1	423.5	425.0	426.7	425.7	425.5	426.9	425.3	424.5	428.1	426.4	429.5	428.5	438.5
28-Mar	429.9	431.0	Z	436.5	437.3	441.4	442.1	444.9	440.0	442.9	441.1	443.2	436.3	432.4	431.7	430.8	430.0	428.0	428.1	427.5	429.4	432.8	431.7	431.5	434.8	444.9
29-Mar	432.2	434.2	435.5	Z	440.0	435.9	449.7	442.7	441.0	432.0	430.9	429.4	426.3	424.7	424.1	424.3	424.9	424.0	423.9	424.4	425.3	426.8	430.1	432.1	431.0	449.7
30-Mar	432.8	433.7	435.2	433.9	Z	440.2	445.8	446.5	443.3	437.1	429.2	431.9	432.3	M	M	428.7	427.9	429.2	430.3	431.3	429.4	431.2	430.5	431.3	433.9	446.5
31-Mar	430.0	430.6	433.4	434.0	433.5	Z	431.6	433.1	434.5	434.4	433.1	431.2	430.4	430.4	429.7	428.7	429.0	429.0	428.5	429.6	434.0	429.1	429.6	429.4	431.2	434.5
	432.1	433.4	433.0	432.9	434.8	435.1	435.8	436.8	434.8	433.4	433.1	433.1	432.3	431.1	430.8	429.7	429.5	429.1	429.3	429.4	429.5	430.0	430.5	431.1	Diurnal Average	
	444.9	457.8	462.5	465.9	463.8	464.8	465.7	465.5	457.5	457.0	453.1	450.5	462.8	445.7	445.2	445.0	451.3	451.3	461.0	452.2	440.7	445.6	446.9	444.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Dioxide (CO_2) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	3	0.42	0.42
420 - 440	604	85.55	85.98
440 - 460	91	12.89	98.87
460 - 480	8	1.13	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Dioxide (CO_2) - ppm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
400 - 420	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
420 - 440	117	98	27	19	19	13	26	110	66	4	2	7	6	30	23	37	604
440 - 460	2	1	2	2	4	0	4	32	25	3	4	3	2	2	4	1	91
460 - 480	0	0	0	0	0	0	0	1	1	0	2	1	0	1	0	0	6
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	121	100	29	21	23	13	30	143	92	7	8	11	8	33	27	38	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Dioxide (CO_2) - ppm

Fort McKay - Bertha Ganter

Classes (ppm)

- 400 - 420
- 420 - 440
- 440 - 460
- 460 - 480
- 480 - 500
- > 500

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0

Maximum Value: 0.0 ppb on Mar 1 03:00

Maximum Daily Average: 0.0 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 1 03:00

Minimum Daily Average: 0.0 ppb on Mar 1

Maximum Diurnal Average: 0.0 ppb at hour 1

Minimum Diurnal Average: 0.0 ppb at hour 1

Monthly Average: 0.00 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.0

Hours in Service:	744
Hours of Data:	646
Hours of Missing Data:	98
Hours of Calibration:	50
Percent Operational Time:	93.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	UO	UO	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
2-Mar	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
3-Mar	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
4-Mar	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
5-Mar	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	DF	0.0	0.0
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
7-Mar	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
8-Mar	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
9-Mar	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
10-Mar	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
11-Mar	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
12-Mar	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
13-Mar	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
14-Mar	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
15-Mar	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
16-Mar	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
17-Mar	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
18-Mar	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
19-Mar	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
20-Mar	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
21-Mar	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
22-Mar	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
23-Mar	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
24-Mar	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
25-Mar	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
26-Mar	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
27-Mar	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
28-Mar	Z	RE	0.0	0.0	0.0	0.0	0.0	UO	UO	UO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Mar	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
30-Mar	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	C	C	M	M	M	--	0.0
31-Mar	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	--	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation RE - Recovery

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

Wood Buffalo Environmental Association

Hourly Averages

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	646	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 646

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	103	90	27	21	23	12	27	139	86	8	7	11	8	27	25	30	644
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	103	90	27	21	23	12	27	139	86	8	7	11	8	27	25	30	644

Total Number of Valid Hours: 644

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 644

Wood Buffalo Environmental Association

Zero Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Span Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 10.3 C on Mar 18 16:00

Maximum Daily Average: 1.0 C on Mar 18

Minimum Value: -31.2 C on Mar 6 07:00

Minimum Daily Average: -21.0 C on Mar 5

Maximum Diurnal Average: -4.4 C at hour 17

Minimum Diurnal Average: -15.2 C at hour 7

Monthly Average: -9.65 C

Percentiles: P_1 = -27.3 P_{10} = -18.1 Q_1 = -13.9 Median = -9.4 Q_3 = -5.0 P_{90} = -1.2 P_{99} = 6.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-23.5	-22.9	-22.6	-23.8	-25.0	-25.8	-26.4	-25.5	-25.2	-20.9	-16.7	-13.3	-11.1	-9.5	-8.2	-7.8	-7.8	-8.4	-9.3	-9.7	-9.9	-9.2	-9.0	-8.6	-15.8	-7.8
2-Mar	-8.2	-7.7	-7.5	-7.3	-7.1	-7.0	-6.7	-6.5	-6.4	-5.4	-3.4	-1.2	1.2	1.8	2.9	3.8	1.7	2.1	1.7	1.0	0.7	0.5	0.2	-0.2	-2.4	3.8
3-Mar	-2.6	-4.9	-6.8	-8.1	-8.8	-9.2	-9.5	-10.0	-10.7	-10.7	-10.7	-10.8	-10.5	-10.0	-9.6	-9.5	-9.9	-10.1	-10.5	-11.1	-11.8	-13.2	-14.4	-15.1	-9.9	-2.6
4-Mar	-15.4	-15.4	-15.5	-15.8	-15.9	-16.0	-16.8	-17.4	-17.4	-17.2	-16.6	-16.2	-15.8	-15.1	-14.4	-13.9	-14.5	-15.0	-16.0	-16.9	-17.9	-19.1	-20.8	-20.7	-16.5	-13.9
5-Mar	-21.9	-23.6	-24.4	-26.4	-27.0	-27.0	-27.1	-26.8	-24.0	-21.1	-18.9	-17.9	-17.1	-16.4	-15.6	-14.8	-15.0	-16.0	-17.2	-18.3	-20.5	-22.5	-24.0	DF	-21.0	-14.8
6-Mar	-26.1	-27.5	-28.7	-28.9	-30.2	-30.7	-31.2	-30.6	-27.7	-25.2	-21.5	-17.8	-15.3	-13.2	-12.1	-10.5	-10.1	-10.5	-10.9	-11.6	-12.3	-13.1	-12.7	-12.4	-19.6	-10.1
7-Mar	-12.6	-12.6	-12.3	-12.1	-12.2	-12.5	-12.9	-13.0	-13.1	-12.6	-12.1	-11.9	-11.5	-10.6	-9.2	-7.6	-6.7	-6.8	-7.5	-8.2	-8.7	-8.9	-8.9	-8.3	-10.5	-6.7
8-Mar	-8.7	-9.7	-10.8	-11.9	-12.6	-13.5	-14.5	-14.8	-14.5	-13.2	-11.4	-9.8	-8.7	-7.3	-6.2	-5.6	-5.2	-5.6	-6.8	-8.5	-9.7	-11.1	-12.0	-13.2	-10.2	-5.2
9-Mar	-14.1	-15.2	-17.0	-18.3	-19.1	-19.1	-20.1	-20.0	-18.8	-16.5	-13.9	-11.6	-9.9	-9.1	-8.4	-7.9	-7.3	-7.4	-8.0	-8.5	-9.1	-9.4	-9.6	-9.2	-12.8	-7.3
10-Mar	-9.4	-10.0	-10.2	-10.4	-10.5	-10.5	-10.6	-10.5	-10.3	-9.9	-9.2	-8.0	-7.9	-7.1	-6.6	-5.9	-5.4	-5.7	-6.1	-6.8	-7.0	-7.3	-7.1	-7.2	-8.3	-5.4
11-Mar	-7.6	-8.2	-8.7	-9.2	-9.3	-9.5	-10.0	-10.5	-9.3	-8.0	-7.4	-6.5	-5.3	-4.7	-4.1	-4.2	-4.4	-5.4	-7.1	-7.9	-9.0	-9.9	-10.5	-10.8	-7.8	-4.1
12-Mar	-11.1	-11.5	-12.1	-12.7	-13.4	-14.1	-14.6	-15.0	-14.8	-14.5	-14.4	-14.1	-13.4	-12.6	-12.1	-11.3	-11.5	-11.7	-12.1	-12.4	-12.8	-13.4	-13.9	-14.5	-13.1	-11.1
13-Mar	-15.2	-16.0	-16.6	-17.0	-17.3	-18.0	-18.9	-19.2	-17.3	-15.6	-13.9	-12.1	-10.2	-8.9	-8.0	-7.4	-6.4	-6.6	-7.2	-8.2	-8.6	-8.9	-9.9	-10.5	-12.4	-6.4
14-Mar	-10.7	-10.9	-11.2	-11.4	-11.8	-12.2	-12.4	-12.8	-13.2	-13.2	-12.6	-12.2	-11.8	-11.4	-11.3	-11.3	-11.6	-11.9	-12.4	-12.8	-13.1	-13.5	-13.8	-14.2	-12.2	-10.7
15-Mar	-14.6	-14.9	-15.4	-15.9	-16.9	-17.3	-17.5	-17.1	-15.0	-13.6	-12.5	-11.7	-10.5	-9.9	-9.2	-8.6	-8.2	-8.2	-9.2	-10.4	-11.8	-14.0	-15.4	-16.3	-13.1	-8.2
16-Mar	-16.7	-16.4	-14.6	-14.6	-14.4	-14.5	-14.5	-13.9	-13.1	-12.0	-11.2	-9.7	-8.4	-7.1	-5.9	-4.5	-3.7	-3.6	-4.4	-5.4	-6.5	-7.4	-8.4	-9.0	-10.0	-3.6
17-Mar	-9.6	-9.5	-9.7	-10.9	-11.7	-12.3	-12.9	-12.1	-10.4	-8.2	-5.3	-2.7	-0.2	2.1	4.8	6.5	7.9	8.3	6.9	3.8	1.6	0.4	-1.2	-2.4	-3.2	8.3
18-Mar	-2.7	-2.8	-2.4	-3.0	-3.8	-4.8	-5.4	-5.9	-4.2	-2.2	-0.1	2.1	4.4	6.6	8.6	10.3	9.7	8.7	6.7	4.6	2.6	0.4	-0.8	-2.1	1.0	10.3
19-Mar	-2.2	-3.1	-4.8	-5.5	-6.7	-7.8	-8.7	-8.3	-6.1	-4.7	-2.6	-1.2	0.3	1.4	2.1	2.2	2.6	2.0	0.9	-0.8	-1.8	-2.3	-2.7	-3.1	-2.5	2.6
20-Mar	-3.4	-3.7	-4.1	-4.8	-5.4	-6.3	-6.9	-6.7	-6.6	-6.1	-5.3	-5.0	-4.6	-3.2	-2.0	-2.0	-2.3	-3.2	-4.5	-6.1	-7.7	-9.0	-10.0	-11.1	-5.4	-2.0
21-Mar	-12.0	-13.6	-14.8	-15.9	-17.3	-18.8	-18.9	-17.9	-16.6	-14.1	-12.3	-9.2	-7.9	-6.3	-5.3	-4.2	-4.0	-3.9	-4.9	-6.2	-7.5	-8.6	-10.4	-11.3	-10.9	-3.9
22-Mar	-11.8	-13.4	-13.4	-13.8	-14.0	-15.4	-16.2	-14.7	-12.4	-9.1	-6.0	-4.1	-2.5	-1.0	0.5	1.7	2.6	3.0	2.4	0.9	-1.1	-1.8	-3.7	-4.5	-6.2	3.0
23-Mar	-4.9	-5.9	-6.9	-6.7	-6.7	-6.4	-6.5	-6.8	-4.1	-1.1	-0.4	-0.3	-0.9	-1.8	-1.2	-1.7	-2.7	-3.3	-4.6	-5.5	-6.1	-6.2	-5.8	-5.8	-4.3	-0.3
24-Mar	-6.2	-7.0	-8.3	-9.8	-10.6	-11.9	-13.2	-12.3	-11.0	-10.0	-8.2	-6.4	-5.1	-3.9	-2.7	-2.0	-1.7	-1.4	-2.2	-3.5	-5.1	-6.5	-8.3	-10.2	-7.0	-1.4
25-Mar	-11.7	-13.4	-15.1	-16.4	-16.8	-18.2	-18.8	-17.9	-14.2	-10.3	-6.6	-4.8	-3.8	-3.3	-3.0	-3.2	-3.9	-5.0	-6.8	-8.5	-9.7	-11.2	-12.8	-14.3	-10.4	-3.0
26-Mar	-15.8	-17.1	-18.4	-19.2	-20.1	-21.2	-22.0	-21.6	-19.5	-17.7	-16.4	-14.1	-12.6	-11.3	-10.7	-10.4	-10.2	-10.7	-11.8	-13.1	-14.1	-15.3	-16.6	-18.2	-15.8	-10.2
27-Mar	-18.8	-20.2	-21.8	-22.8	-24.7	-25.6	-26.2	-24.3	-21.5	-17.2	-13.4	-10.7	-9.2	-8.0	-7.0	-6.0	-5.3	-5.0	-6.4	-8.2	-9.4	-10.6	-11.6	-14.1	-14.5	-5.0
28-Mar	-15.6	-17.8	-19.1	-20.9	-22.1	-23.0	-23.7	-21.7	-18.9	-14.8	-11.1	-8.4	-6.2	-4.7	-3.2	-2.0	-1.5	-1.1	-1.2	-1.5	-1.8	-2.0	-2.1	-2.5	-10.3	-1.1
29-Mar	-3.1	-3.7	-4.3	-4.7	-5.8	-6.5	-6.4	-5.0	-3.8	-2.4	-1.6	-1.2	-0.9	-1.0	-1.0	-0.9	-0.7	-1.4	-2.1	-3.0	-3.8	-5.0	-6.3	-7.4	-3.4	-0.7
30-Mar	-9.5	-11.0	-11.1	-13.0	-14.3	-14.9	-15.1	-14.0	-11.9	-8.8	-5.8	-4.6	-3.7	-3.2	-2.8	-2.3	-1.9	-2.1	-2.3	-2.8	-3.5	-4.3	-5.0	-6.5	-7.3	-1.9
31-Mar	-7.8	-8.2	-8.5	-8.2	-8.3	-8.1	-8.0	-7.6	-7.0	-6.0	-4.9	-3.9	-2.6	-1.0	0.3	0.9	1.6	1.8	1.2	0.0	-1.1	-1.0	-1.6	-2.7	-3.8	1.8
	-11.4	-12.2	-12.8	-13.5	-14.2	-14.8	-15.2	-14.9	-13.5	-11.7	-9.9	-8.4	-7.2	-6.1	-5.2	-4.5	-4.4	-4.7	-5.5	-6.6	-7.6	-8.5	-9.3	-9.5	Diurnal Average	
	-2.2	-2.8	-2.4	-3.0	-3.8	-4.8	-5.4	-5.0	-3.8	-1.1	-0.1	2.1	4.4	6.6	8.6	10.3	9.7	8.7	6.9	4.6	2.6	0.5	0.2	-0.2	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	55	7.40	7.40
-20 - 0	638	85.87	93.27
0 - 10	49	6.59	99.87
10 - 20	1	0.13	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 10.5 C on Mar 18 16:00

Maximum Daily Average: 0.1 C on Mar 18

Minimum Value: -32.1 C on Mar 6 07:00

Minimum Daily Average: -21.9 C on Mar 5

Maximum Diurnal Average: -4.3 C at hour 17

Minimum Diurnal Average: -15.8 C at hour 7

Monthly Average: -9.97 C

Percentiles: P_1 = -28.5 P_{10} = -18.8 Q_1 = -14.3 Median = -9.6 Q_3 = -5.2 P_{90} = -1.5 P_{99} = 6.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-24.5	-23.8	-23.7	-24.7	-25.7	-26.4	-27.1	-27.5	-25.9	-21.6	-16.2	-12.8	-10.9	-9.1	-7.9	-7.7	-8.0	-8.7	-10.6	-10.6	-10.2	-9.5	-9.4	-8.8	-16.3	-7.7
2-Mar	-8.3	-7.7	-7.5	-7.3	-7.2	-7.0	-6.8	-6.7	-6.3	-5.3	-3.0	-0.6	1.3	2.1	3.1	3.9	1.8	1.9	1.2	0.5	0.4	0.2	0.0	-0.4	-2.4	3.9
3-Mar	-2.6	-4.9	-6.7	-8.1	-8.8	-9.1	-9.4	-9.9	-10.6	-10.5	-10.4	-10.5	-10.1	-9.6	-9.2	-9.2	-9.7	-10.0	-10.4	-10.9	-11.8	-13.2	-14.4	-15.1	-9.8	-2.6
4-Mar	-15.3	-15.4	-15.5	-15.8	-15.9	-16.2	-16.8	-17.4	-17.3	-17.1	-16.6	-16.1	-15.7	-15.0	-14.3	-13.8	-14.4	-15.1	-16.2	-17.4	-18.9	-21.0	-22.9	-22.2	-16.8	-13.8
5-Mar	-23.8	-25.4	-26.0	-27.8	-28.5	-28.9	-28.4	-27.4	-23.7	-20.9	-18.4	-17.7	-16.9	-16.2	-15.5	-14.8	-15.1	-16.3	-18.5	-20.8	-22.5	-24.5	-25.5	DF	-21.9	-14.8
6-Mar	-27.7	-28.4	-29.0	-30.3	-30.6	-31.5	-32.1	-31.1	-28.2	-25.0	-21.0	-17.5	-15.0	-12.7	-11.7	-10.2	-10.0	-10.5	-11.1	-12.7	-13.9	-14.4	-13.1	-12.5	-20.0	-10.0
7-Mar	-12.8	-12.7	-12.4	-12.2	-12.2	-12.6	-13.0	-13.1	-13.1	-12.6	-11.9	-11.7	-11.3	-10.3	-8.8	-7.4	-6.7	-6.8	-7.6	-8.5	-9.1	-9.5	-9.2	-8.5	-10.6	-6.7
8-Mar	-8.9	-10.0	-11.2	-13.0	-13.5	-14.2	-15.3	-15.4	-14.5	-13.1	-11.1	-9.4	-8.4	-6.9	-5.9	-5.4	-5.2	-5.9	-7.3	-9.1	-10.3	-11.6	-12.6	-14.3	-10.5	-5.2
9-Mar	-15.3	-17.6	-18.7	-20.2	-21.1	-21.4	-21.8	-20.8	-18.5	-16.3	-13.6	-11.3	-9.7	-8.8	-8.2	-7.8	-7.3	-7.6	-8.3	-8.7	-9.2	-9.5	-9.7	-9.3	-13.4	-7.3
10-Mar	-9.5	-10.1	-10.3	-10.5	-10.5	-10.6	-10.7	-10.5	-10.3	-9.8	-9.0	-7.6	-7.5	-6.4	-6.1	-5.6	-5.2	-5.7	-6.2	-7.0	-7.1	-7.4	-7.3	-7.3	-8.3	-5.2
11-Mar	-7.8	-8.3	-9.2	-10.1	-9.7	-10.1	-10.6	-10.6	-9.0	-7.9	-7.4	-6.3	-5.1	-4.5	-3.7	-3.8	-4.3	-5.4	-7.1	-7.9	-9.0	-9.9	-10.4	-10.8	-7.9	-3.7
12-Mar	-11.1	-11.5	-12.1	-12.7	-13.5	-14.1	-14.7	-15.0	-14.7	-14.4	-14.3	-13.9	-13.2	-12.4	-11.9	-11.2	-11.5	-11.7	-12.2	-12.4	-12.9	-13.5	-14.0	-14.6	-13.1	-11.1
13-Mar	-15.4	-16.3	-16.9	-17.2	-17.6	-18.4	-19.5	-19.4	-17.2	-15.5	-13.8	-11.9	-10.1	-8.8	-7.9	-7.4	-6.5	-6.7	-7.3	-8.2	-8.6	-9.0	-9.9	-10.6	-12.5	-6.5
14-Mar	-10.7	-10.9	-11.2	-11.4	-11.8	-12.2	-12.4	-12.8	-13.1	-13.2	-12.6	-12.1	-11.7	-11.3	-11.2	-11.2	-11.6	-11.9	-12.4	-12.8	-13.1	-13.5	-13.9	-14.3	-12.2	-10.7
15-Mar	-14.8	-15.3	-16.0	-16.6	-18.3	-18.5	-17.8	-17.4	-15.1	-13.6	-12.5	-11.7	-10.2	-9.5	-8.8	-8.3	-7.9	-8.4	-10.2	-12.4	-14.0	-15.6	-16.8	-17.0	-13.6	-7.9
16-Mar	-16.9	-16.7	-14.7	-14.6	-14.6	-14.5	-14.2	-13.7	-13.0	-11.7	-11.0	-9.6	-8.2	-6.8	-5.7	-4.4	-3.6	-3.9	-4.7	-5.9	-6.9	-7.9	-9.0	-9.4	-10.1	-3.6
17-Mar	-10.4	-10.5	-10.2	-11.3	-12.1	-12.5	-13.1	-12.2	-10.5	-8.2	-5.2	-2.6	-0.1	2.2	4.9	6.5	7.8	7.8	4.0	1.1	-0.9	-2.6	-3.6	-4.1	-4.0	7.8
18-Mar	-4.6	-5.5	-5.1	-5.1	-5.1	-6.3	-6.5	-6.5	-4.1	-2.2	0.0	2.2	4.5	6.9	8.7	10.5	9.6	8.1	5.7	3.2	1.0	-1.2	-2.6	-3.3	0.1	10.5
19-Mar	-3.6	-4.6	-5.5	-6.1	-7.9	-9.0	-9.6	-8.8	-6.9	-4.6	-2.2	-1.1	0.4	1.7	2.4	2.5	3.0	2.1	0.7	-1.1	-1.9	-2.4	-2.8	-3.2	-2.9	3.0
20-Mar	-3.5	-3.8	-4.2	-4.8	-5.5	-6.5	-6.9	-6.6	-6.3	-5.7	-4.8	-4.8	-4.6	-3.2	-2.0	-2.0	-2.4	-3.4	-4.7	-6.3	-7.9	-9.6	-10.5	-11.9	-5.5	-2.0
21-Mar	-13.4	-15.2	-16.4	-17.6	-18.8	-20.0	-19.8	-19.2	-17.0	-13.6	-11.7	-8.6	-7.2	-5.3	-4.6	-3.6	-3.7	-4.0	-5.2	-7.3	-8.3	-9.9	-12.0	-12.8	-11.5	-3.6
22-Mar	-13.2	-15.2	-14.8	-15.6	-14.9	-16.9	-18.1	-16.0	-12.3	-8.9	-5.7	-3.8	-2.2	-0.6	0.8	1.9	2.8	2.9	1.9	-0.6	-3.0	-4.0	-5.3	-6.5	-7.0	2.9
23-Mar	-7.1	-7.8	-8.7	-8.0	-6.8	-6.6	-7.1	-7.2	-4.2	-1.3	-0.2	-0.1	-0.5	-1.6	-1.1	-1.6	-2.6	-3.3	-4.7	-5.7	-6.5	-6.6	-6.2	-6.1	-4.7	-0.1
24-Mar	-6.4	-7.3	-9.0	-10.6	-11.6	-13.8	-15.3	-13.3	-10.6	-9.5	-7.7	-6.0	-4.7	-3.1	-1.9	-1.5	-1.4	-1.5	-2.5	-5.1	-6.7	-8.4	-10.4	-12.0	-7.5	-1.4
25-Mar	-13.6	-15.4	-16.2	-17.3	-18.5	-19.2	-19.7	-18.3	-14.6	-10.2	-6.2	-4.4	-3.5	-3.0	-2.8	-3.0	-3.8	-5.1	-7.0	-8.6	-10.0	-11.5	-12.9	-14.5	-10.8	-2.8
26-Mar	-16.0	-17.6	-18.9	-19.6	-20.7	-22.2	-22.9	-21.6	-19.3	-17.5	-16.1	-13.9	-12.3	-11.0	-10.4	-10.2	-10.1	-10.8	-11.9	-13.4	-14.8	-16.1	-17.9	-19.5	-16.0	-10.1
27-Mar	-21.3	-21.9	-23.2	-24.0	-25.2	-25.5	-26.0	-24.0	-21.1	-16.7	-12.8	-9.9	-8.4	-7.2	-6.4	-5.3	-4.7	-4.8	-6.6	-8.7	-9.8	-11.2	-12.8	-16.3	-14.7	-4.7
28-Mar	-17.8	-19.8	-21.5	-21.7	-23.0	-23.3	-24.1	-21.6	-18.2	-14.0	-10.5	-7.8	-5.8	-4.2	-2.9	-1.8	-1.4	-1.1	-1.3	-1.6	-2.0	-2.1	-2.3	-3.2	-10.5	-1.1
29-Mar	-3.6	-4.7	-5.5	-6.8	-7.8	-7.4	-7.1	-5.4	-3.5	-2.1	-1.3	-1.0	-0.7	-0.9	-0.9	-0.8	-0.7	-1.4	-2.2	-3.2	-4.3	-6.2	-8.0	-9.6	-4.0	-0.7
30-Mar	-10.9	-12.4	-13.5	-14.3	-15.2	-15.3	-15.4	-13.7	-11.5	-8.1	-5.2	-4.2	-3.3	-2.9	-2.5	-2.1	-1.7	-2.1	-2.3	-2.9	-3.7	-4.6	-5.1	-6.7	-7.5	-1.7
31-Mar	-8.0	-8.4	-8.5	-8.2	-8.2	-8.1	-8.0	-7.6	-6.9	-5.9	-4.7	-3.7	-2.4	-0.9	0.3	0.9	1.5	1.6	0.8	-0.7	-2.0	-1.5	-2.7	-3.5	-4.0	1.6
	-12.2	-13.1	-13.6	-14.3	-14.9	-15.4	-15.8	-15.2	-13.5	-11.5	-9.6	-8.1	-6.9	-5.8	-4.9	-4.3	-4.3	-4.8	-5.9	-7.3	-8.3	-9.3	-10.1	-10.3	Diurnal Average	
	-2.6	-3.8	-4.2	-4.8	-5.1	-6.3	-6.5	-5.4	-3.5	-1.3	0.0	2.2	4.5	6.9	8.7	10.5	9.6	8.1	5.7	3.2	1.0	0.2	0.0	-0.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	62	8.34	8.34
-20 - 0	637	85.73	94.08
0 - 10	43	5.79	99.87
10 - 20	1	0.13	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 90.6 % on Mar 19 06:00

Maximum Daily Average: 82.6 % on Mar 14

Minimum Value: 26.4 % on Mar 18 16:00

Minimum Daily Average: 46.6 % on Mar 8

Maximum Diurnal Average: 76.4 % at hour 4

Minimum Diurnal Average: 52.8 % at hour 16

Monthly Average: 66.60 %

Percentiles: P_1 = 34.6 P_{10} = 47.1 Q_1 = 57.7 Median = 68.3 Q_3 = 77.3 P_{90} = 82.4 P_{99} = 87.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	75.1	77.5	76.6	74.2	73.4	72.1	72.2	72.7	72.2	71.5	68.8	66.2	64.7	61.0	59.2	59.7	63.3	67.7	75.9	77.9	76.9	76.2	77.3	77.1	71.2	77.9
2-Mar	78.5	86.9	87.5	87.8	88.4	86.1	85.3	82.6	81.4	77.4	70.3	63.0	58.9	60.5	60.2	61.0	86.6	84.4	79.1	78.8	77.8	77.1	71.9	65.7	76.5	88.4
3-Mar	79.0	78.1	76.4	75.5	73.0	72.4	74.1	71.9	69.0	67.6	68.9	67.5	64.8	62.8	62.8	60.7	66.6	73.6	82.2	82.6	80.1	76.5	72.0	70.1	72.0	82.6
4-Mar	71.2	73.2	75.9	79.3	79.7	80.2	74.7	73.0	72.4	65.3	59.2	57.0	55.1	53.0	52.2	54.4	59.6	64.5	63.5	65.5	69.0	75.2	75.3	76.0	67.7	80.2
5-Mar	74.6	74.3	74.3	72.4	71.1	70.8	71.5	70.8	67.1	62.6	54.3	52.5	50.9	50.1	49.1	47.0	47.5	50.6	57.3	64.5	68.9	73.0	74.2	DF	63.0	74.6
6-Mar	73.2	71.7	69.0	69.8	69.0	68.3	69.4	67.9	66.1	64.4	59.0	55.4	58.2	56.8	61.9	63.6	68.8	73.7	73.6	75.7	79.8	81.6	74.7	72.4	68.5	81.6
7-Mar	73.1	77.4	79.1	78.8	75.1	74.4	74.6	73.5	76.6	73.8	70.0	70.0	68.0	66.2	61.3	56.1	50.5	48.1	48.7	49.3	49.6	51.6	49.6	47.6	64.3	79.1
8-Mar	46.7	47.8	50.0	55.5	55.4	57.5	60.5	61.9	58.2	54.2	48.1	43.6	40.5	36.4	35.2	33.0	33.4	32.6	35.6	40.2	42.1	46.5	48.8	53.7	46.6	61.9
9-Mar	55.9	63.3	67.4	71.4	74.6	75.4	76.0	72.9	64.0	58.0	50.8	45.9	44.5	43.7	45.9	45.7	44.0	45.1	47.2	48.5	50.4	57.0	61.5	59.8	57.0	76.0
10-Mar	60.9	67.4	71.6	74.6	72.6	69.7	69.4	68.1	67.8	66.8	64.9	59.4	63.4	59.8	58.5	56.7	55.2	62.8	65.6	71.8	73.1	75.3	71.9	67.8	66.5	75.3
11-Mar	62.8	62.3	65.9	69.7	65.3	65.8	71.4	73.9	68.0	60.4	60.2	58.6	57.1	56.4	56.3	60.6	64.9	70.9	77.4	81.2	84.9	85.2	84.3	84.6	68.7	85.2
12-Mar	85.4	85.1	83.9	82.2	80.5	79.6	79.4	79.8	80.3	75.2	73.8	71.6	70.7	70.5	69.7	70.3	73.1	75.0	76.7	79.1	81.3	82.2	82.3	82.5	77.9	85.4
13-Mar	82.1	82.1	82.0	81.7	81.5	81.4	80.3	80.4	81.1	79.7	75.7	71.7	70.5	68.8	65.3	64.2	63.8	64.9	65.9	67.9	70.0	71.3	79.4	84.0	74.8	84.0
14-Mar	85.0	85.0	84.7	84.8	84.5	84.2	84.2	83.6	82.8	81.6	81.1	80.9	80.8	81.1	81.4	81.1	82.1	82.6	82.4	82.4	81.7	81.4	80.9	81.4	82.6	85.0
15-Mar	81.2	81.3	82.5	82.7	81.0	81.3	81.1	80.7	77.1	70.1	66.2	64.0	60.8	61.2	62.3	62.0	61.5	63.9	73.9	82.2	83.8	84.4	83.2	81.2	74.6	84.4
16-Mar	80.8	81.1	81.1	80.1	82.0	82.4	82.5	82.0	79.0	74.9	72.4	69.5	67.2	66.4	65.6	63.6	64.2	66.1	70.1	75.4	79.7	82.2	85.5	85.6	75.8	85.6
17-Mar	86.5	87.2	84.5	86.0	86.6	86.0	85.7	83.4	78.4	72.2	65.0	61.2	58.5	55.5	51.2	49.0	45.5	44.2	57.3	73.1	82.3	85.0	83.5	84.3	72.2	87.2
18-Mar	82.4	82.4	74.4	67.0	63.0	66.4	64.3	64.4	56.7	52.0	47.0	43.9	40.3	36.1	31.8	26.4	29.6	33.6	43.2	51.1	57.2	66.2	71.4	76.0	55.3	82.4
19-Mar	75.0	79.0	82.8	84.9	88.5	90.6	90.2	88.9	85.0	72.6	62.9	59.6	56.0	52.0	50.0	50.1	50.4	54.8	60.7	65.1	68.0	69.2	69.8	70.2	69.8	90.6
20-Mar	69.2	68.4	66.2	63.2	64.2	63.7	63.3	64.8	71.6	74.9	77.3	75.6	71.1	67.9	60.8	56.0	54.4	53.1	53.9	55.4	56.9	61.2	62.5	65.9	64.2	77.3
21-Mar	71.2	77.7	81.4	80.7	80.6	80.1	80.4	78.0	80.4	73.7	67.8	62.9	62.9	55.4	51.1	45.9	47.9	48.0	52.4	60.8	65.4	71.7	78.5	82.5	68.2	82.5
22-Mar	84.4	85.7	86.3	85.8	85.3	82.9	81.5	81.8	80.3	68.9	60.0	55.1	51.1	47.9	43.9	42.1	40.5	42.0	45.8	54.2	63.7	68.2	73.8	78.9	66.3	86.3
23-Mar	79.9	80.8	83.8	81.9	77.1	75.5	77.4	77.6	67.4	55.7	55.5	57.7	60.1	63.6	60.3	61.1	64.7	65.6	69.0	71.4	71.8	72.6	68.6	67.1	69.4	83.8
24-Mar	67.2	68.3	72.9	77.6	79.8	83.7	83.7	79.7	69.8	65.5	59.4	54.1	49.6	45.3	38.3	36.9	42.1	41.6	41.9	49.5	54.1	62.9	71.8	75.5	61.3	83.7
25-Mar	80.7	82.5	82.4	81.9	82.0	80.0	79.6	78.1	71.0	60.7	52.6	47.7	44.0	41.6	40.9	40.6	40.0	44.3	49.8	57.6	62.2	64.6	65.0	66.1	62.3	82.5
26-Mar	66.0	68.5	68.5	70.3	73.3	75.5	75.2	71.0	65.6	60.0	58.5	54.5	49.0	45.9	42.9	41.0	40.1	40.9	43.1	47.1	51.9	56.5	61.6	68.3	58.1	75.5
27-Mar	72.2	72.1	73.9	74.4	73.4	71.5	69.9	70.0	68.1	60.7	52.9	47.4	43.2	40.6	38.6	36.0	34.6	34.5	42.8	47.9	47.7	49.6	51.8	65.0	55.8	74.4
28-Mar	71.4	75.2	77.7	77.2	75.7	74.1	73.3	69.9	67.3	59.8	51.2	47.1	44.0	42.9	41.6	40.9	41.4	41.9	42.9	44.4	45.0	45.5	45.8	51.0	56.1	77.7
29-Mar	51.0	56.2	59.7	65.9	75.2	75.8	76.7	73.9	66.8	66.9	70.3	72.8	71.5	71.3	69.6	66.7	61.4	60.5	61.3	61.7	62.0	67.7	75.9	80.6	67.6	80.6
30-Mar	83.3	85.5	85.9	84.6	83.2	81.9	81.4	81.3	81.6	71.6	56.5	52.4	49.8	47.8	47.2	46.8	47.7	48.6	49.7	51.0	53.8	56.4	58.1	62.0	64.5	85.9
31-Mar	64.7	64.6	66.4	66.5	66.8	67.5	68.1	67.7	67.3	67.1	66.7	66.5	65.0	62.1	59.7	57.7	56.7	57.5	60.5	67.0	74.1	68.6	72.4	76.0	65.7	76.0
	73.2	75.1	76.0	76.4	76.2	76.0	76.0	75.0	72.3	67.3	62.8	59.9	57.8	55.8	54.0	52.8	54.3	56.0	59.7	63.9	66.6	69.1	70.4	72.0	Diurnal Average	
	86.5	87.2	87.5	87.8	88.5	90.6	90.2	88.9	85.0	81.6	81.1	80.9	80.8	81.1	81.4	81.1	86.6	84.4	82.4	82.6	84.9	85.2	85.5	85.6	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 1.0 mm on Mar 14 09:00

Maximum Daily Total: 8.8 mm on Mar 14

Minimum Value: 0.0 mm on Mar 1 01:00

Minimum Daily Total: 0.0 mm on Mar 1

Maximum Diurnal Total: 1.3 mm at hour 9

Minimum Diurnal Total: 0.2 mm at hour 13

Monthly Total: 15.30 mm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	Maximum
1-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.1	0.3	0.3	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.4
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.4	0.2
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	0.2	0.8	0.3
12-Mar	0.1	0.3	0.3	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	1.2	0.3
13-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.9	0.5
14-Mar	0.4	0.6	0.5	0.7	0.6	0.8	0.7	0.5	1.0	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.6	0.4	0.3	0.2	0.1	0.1	0.0	0.0	8.8	1.0
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
16-Mar	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.3	0.1	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	1.0	0.3
17-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
21-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.6	1.3	1.1	1.3	0.9	1.1	0.8	0.6	1.3	0.3	0.2	0.4	0.2	0.3	0.3	0.3	0.8	0.4	0.5	0.3	0.5	0.3	0.7	0.7	Diurnal Average	
	0.4	0.6	0.5	0.7	0.6	0.8	0.7	0.5	1.0	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.6	0.4	0.3	0.2	0.3	0.1	0.4	0.5	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	729	98.12	98.12
0.4 - 0.5	7	0.94	99.06
0.6 - 0.7	5	0.67	99.73
0.8 - 1.4	2	0.27	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 23.8 % on Mar 2 17:00

Maximum Daily Average: 1.2 % on Mar 2

Minimum Value: 0.0 % on Mar 1 01:00

Minimum Daily Average: 0.0 % on Mar 3

Maximum Diurnal Average: 0.8 % at hour 17

Minimum Diurnal Average: 0.0 % at hour 11

Monthly Average: 0.13 %

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	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	0.0	0.0	0.0	0.3
2-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	2.9	1.0	0.7	0.0	0.0	0.0	0.0	1.2	23.8
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.3
17-Mar	0.5	1.0	1.4	1.7	2.0	2.2	2.4	2.6	2.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.3	0.8	2.6
18-Mar	1.7	2.1	2.4	2.5	2.3	2.1	1.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.5
19-Mar	0.0	0.0	0.2	0.7	1.1	1.5	1.9	2.2	2.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.5
20-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.3	0.6	0.8	1.0	1.0	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2
23-Mar	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
24-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
25-Mar	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
26-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.4	0.6	0.9	1.0	1.1	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.1	Diurnal Average	
	1.7	2.1	2.4	2.5	2.3	2.2	2.4	2.6	2.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0	23.8	2.9	1.0	0.7	0.0	0.2	0.7	1.3	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Leaf Wetness (LW) - %

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Leaf Wetness (LW) - %

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	692	93.14	93.14
0.4 - 0.5	7	0.94	94.08
0.6 - 0.7	7	0.94	95.02
0.8 - 1.4	17	2.29	97.31
1.5 - 10	19	2.56	99.87
> 10	1	0.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - March 2023

Maximum Value: 664.4 W/m2 on Mar 23 13:00

Maximum Daily Average: 202.2 W/m2 on Mar 27

Minimum Value: 0.0 W/m2 on Mar 1 01:00

Minimum Daily Average: 48.3 W/m2 on Mar 14

Maximum Diurnal Average: 485.1 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 1

Monthly Average: 139.49 W/m2

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 5.1 Q_3 = 260.4 P_{90} = 481.6 P_{99} = 603.3

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5	172.2	289.7	412.7	492.1	481.9	397.4	375.2	176.0	61.6	26.0	0.4	0.0	0.0	0.0	0.0	0.0	121.5	492.1
2-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	85.3	199.8	346.5	446.9	483.9	289.4	297.4	141.2	64.4	25.1	0.3	0.0	0.0	0.0	0.0	0.0	99.7	483.9
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	34.3	114.2	173.4	220.3	256.1	264.4	239.3	200.4	107.6	30.7	0.6	0.0	0.0	0.0	0.0	0.0	68.6	264.4
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	63.9	165.0	252.3	323.8	336.2	391.4	370.9	184.9	120.7	36.3	0.7	0.0	0.0	0.0	0.0	0.0	94.0	391.4
5-Mar	0.0	0.0	0.0	0.0	0.0	0.0	2.0	80.1	221.3	361.0	480.3	521.8	514.0	478.8	402.7	279.2	106.0	14.5	0.0	0.0	0.0	0.0	0.0	DF	150.5	521.8
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	45.4	185.0	326.6	436.0	467.2	430.8	372.8	254.7	251.5	141.8	27.2	1.9	0.0	0.0	0.0	0.0	0.0	122.5	467.2
7-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.2	15.9	71.2	139.4	241.4	230.1	251.2	265.1	274.0	223.2	114.1	42.6	3.0	0.1	0.1	0.0	0.0	0.0	78.0	274.0
8-Mar	0.0	0.1	0.1	0.0	0.1	0.1	0.5	33.8	122.8	256.4	410.0	452.5	464.7	498.7	439.8	327.5	183.6	38.5	3.5	0.0	0.0	0.1	0.0	0.0	134.7	498.7
9-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.0	69.7	220.0	335.8	432.2	495.2	517.3	493.4	425.4	299.7	182.4	30.1	3.5	0.0	0.0	0.0	0.0	0.0	146.1	517.3
10-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.5	20.9	90.7	152.6	252.6	519.5	393.1	550.9	442.5	250.3	132.5	40.3	3.0	0.0	0.0	0.0	0.0	0.0	118.7	550.9
11-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.8	26.8	121.6	304.8	323.5	415.6	504.6	448.6	329.6	211.2	132.7	32.2	2.6	0.0	0.0	0.0	0.0	0.0	118.9	504.6
12-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.2	31.0	90.4	188.3	223.3	275.1	287.0	349.3	351.7	197.4	119.7	59.8	3.7	0.0	0.0	0.0	0.0	0.0	90.7	351.7
13-Mar	0.0	0.0	0.0	0.0	0.0	0.0	2.4	28.0	106.8	225.0	426.2	493.6	496.8	370.8	308.4	208.8	147.6	45.4	3.9	0.0	0.0	0.0	0.0	0.0	119.3	496.8
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.3	11.6	52.0	86.6	94.0	125.8	213.7	189.0	170.9	119.5	64.3	27.9	3.6	0.0	0.0	0.0	0.0	0.0	48.3	213.7
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	2.5	109.5	281.6	418.1	508.7	551.6	566.8	553.0	491.4	378.8	243.8	55.7	6.5	0.0	0.0	0.0	0.0	0.0	173.7	566.8
16-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.8	32.9	147.3	160.6	368.6	575.9	592.7	568.7	505.4	392.3	252.2	61.1	7.5	0.0	0.0	0.0	0.0	0.0	152.8	592.7
17-Mar	0.0	0.0	0.0	0.0	0.1	0.0	10.3	149.8	307.2	468.4	519.6	553.3	582.7	570.1	505.1	394.0	256.3	66.3	7.9	0.0	0.0	0.0	0.0	0.0	183.0	582.7
18-Mar	0.0	0.0	0.0	0.0	0.1	0.2	10.0	113.1	255.8	389.3	492.3	560.9	590.9	577.2	517.8	406.3	266.8	70.1	8.8	0.0	0.0	0.0	0.0	0.0	177.5	590.9
19-Mar	0.0	0.0	0.0	0.0	0.0	0.0	15.7	185.3	360.5	449.6	421.5	388.5	405.9	430.6	375.4	264.9	329.4	68.8	13.2	0.1	0.0	0.0	0.0	0.0	154.6	449.6
20-Mar	0.0	0.0	0.1	0.0	0.1	0.1	5.1	28.2	69.2	115.5	199.6	325.5	508.2	600.8	508.6	421.3	283.8	78.8	10.4	0.0	0.0	0.0	0.0	0.0	131.5	600.8
21-Mar	0.0	0.0	0.0	0.0	0.0	0.0	16.3	75.7	118.7	194.6	280.2	431.7	609.2	597.3	539.8	416.0	247.3	95.0	12.7	0.4	0.0	0.1	0.0	0.0	151.5	609.2
22-Mar	0.0	0.0	0.0	0.0	0.0	0.0	15.2	166.7	302.6	465.5	510.6	573.4	601.9	585.2	527.0	419.5	282.1	96.3	13.5	0.1	0.0	0.0	0.0	0.0	190.0	601.9
23-Mar	0.0	0.0	0.0	0.0	0.0	0.0	11.9	92.0	250.8	417.7	513.2	572.6	664.4	584.0	486.6	273.4	221.7	84.8	13.1	0.0	0.0	0.0	0.0	0.0	174.4	664.4
24-Mar	0.0	0.0	0.0	0.0	0.0	0.0	31.5	188.8	352.1	456.6	528.2	580.7	605.8	593.6	544.4	439.7	306.1	112.3	14.9	0.0	0.0	0.0	0.0	0.0	198.1	605.8
25-Mar	0.0	0.0	0.0	0.0	0.0	0.0	26.5	200.0	350.1	462.1	511.6	566.8	606.1	590.7	534.9	434.3	302.5	115.2	16.0	0.0	0.0	0.0	0.0	0.0	196.5	606.1
26-Mar	0.0	0.0	0.0	0.0	0.0	0.0	21.8	161.8	312.4	430.9	519.9	585.4	577.5	569.4	476.0	428.6	287.4	111.6	18.8	0.0	0.0	0.0	0.0	0.0	187.6	585.4
27-Mar	0.0	0.0	0.0	0.0	0.0	0.1	56.4	173.5	341.3	457.6	535.3	600.1	624.7	606.7	555.2	448.9	309.8	122.9	19.2	0.0	0.0	0.0	0.0	0.0	202.2	624.7
28-Mar	0.0	0.0	0.0	0.0	0.0	0.3	42.1	185.0	327.7	440.1	541.1	594.4	626.3	604.2	473.9	296.6	172.7	90.8	19.2	0.2	0.0	0.0	0.0	0.0	183.9	626.3
29-Mar	0.0	0.0	0.0	0.0	0.0	0.0	16.6	85.9	123.6	137.2	224.2	232.3	239.5	171.9	147.4	168.0	207.6	99.0	25.5	0.0	0.0	0.0	0.0	0.0	78.3	239.5
30-Mar	0.0	0.0	0.0	0.0	0.0	0.3	20.5	67.0	162.6	316.8	430.6	479.4	438.4	353.7	284.2	180.8	155.0	47.9	16.3	0.1	0.0	0.0	0.0	0.0	123.1	479.4
31-Mar	0.0	0.0	0.0	0.0	0.0	0.3	12.8	51.6	79.3	180.9	319.6	434.4	566.8	590.3	537.4	443.0	321.3	144.7	26.0	0.3	0.0	0.0	0.0	0.0	154.5	590.3
	0.0	0.0	0.0	0.0	0.0	0.0	10.5	80.3	186.4	293.8	384.8	454.4	485.1	468.0	409.4	299.3	197.6	64.5	9.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.0	0.1	0.1	0.0	0.1	0.3	56.4	200.0	360.5	468.4	541.1	600.1	664.4	606.7	555.2	448.9	329.4	144.7	26.0	0.4	0.1	0.1	0.0	0.0	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - March 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	400	53.84	53.84
21 - 100	63	8.48	62.31
101 - 300	114	15.34	77.66
301 - 600	156	21.00	98.65
601 - 900	10	1.35	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - March 2023

Maximum Speed: 19 km/h on Mar 14 03:00

Maximum Daily Speed Average: 15.5 km/h on Mar 14

Minimum Speed Value: 0 km/h on Mar 9 05:00

Minimum Daily Speed Average: 1.2 km/h on Mar 24

Maximum Diurnal Speed Average: 3.4 km/h at hour 13

Minimum Diurnal Speed Average: 0.2 km/h at hour 3

Monthly Average Velocity: 1.5 km/h 77.3 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 11$ $P_{90} = 14$ $P_{99} = 18$

Hours in Service: 744

Hours of Data: 741

Hours of Missing Data: 3

Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	S4	S5	SW2	UO	WNW1	WSW2	UO	SW1	N1	SSE3	S9	SSE12	SSE12	S11	SSE14	SSE12	SSE8	SSE6	E4	SE5	SSE7	SSE9	SSE7	SSE7	SSE6.0	SSE14
2-Mar	SSE11	SSE14	SSE15	SSE15	S14	SSE13	S13	S12	S14	S12	S10	SSE5	ENE2	SSE6	SSE8	SW5	WSW5	W5	WNW8	W4	WSW5	W7	WNW9	NW15	S6.4	SSE15
3-Mar	NNE11	NNE9	NE8	NE8	NE7	NE7	NE7	NNE9	NNE8	NNE7	NE8	NNE8	NE6	ENE4	ENE6	NE6	NE5	NNE3	NNE4	ENE4	NNE7	NNE11	NNE8	NNE8	NNE6.7	NNE11
4-Mar	NNE5	N2	W2	NW3	NNW1	NNE3	NNE6	NNE4	N6	N11	NNW14	NNW18	NNW18	NNW19	NW13	NNE9	NNE7	NNE7	NNE6	N5	NNW5	WNW5	NW3	NNW7	NNW6.8	NNW19
5-Mar	NW5	WNW3	WNW3	WNW2	W2	WSW2	WNW3	WNW3	E1	E3	E6	ENE5	ENE6	NE6	NE6	NE5	ENE5	ENE4	N3	NNW3	WNW2	NW3	NW2	DF	NNE1.6	NE6
6-Mar	NW3	WNW1	WSW1	NW2	WSW2	WSW1	NW2	WSW2	E1	SE3	SE5	SSE8	SSE8	S8	SSE8	S9	S8	S7	SE5	E3	E3	SE1	SSE9	SSE11	SSE3.4	SSE11
7-Mar	SSE8	SSE11	SSE10	SSE11	SSE12	SSE12	SSE11	SSE12	SSE13	SSE15	SSE17	SSE15	SSE16	S12	S10	SSE10	SSE12	SE10	SE8	ESE5	SSE6	SSE4	SSE6	SSE11	SSE10.5	SSE17
8-Mar	SSE10	SSE9	SSE5	SE4	SE5	SSE5	SSE4	SSE6	SSE7	SSE10	SSE11	S10	S12	S14	S11	S9	S8	S8	SSE5	SSE6	SSE6	SSE5	SSE8	SSE3	SSE7.4	S14
9-Mar	SSE2	N1	NNW3	NNW3	ESE0	SSE3	S5	S5	S9	SSE10	S10	S12	SSE17	SSE15	S18	SSE18	SSE16	SE11	SE12	SSE14	SSE14	SSE16	SSE17	SSE18	SSE9.7	S18
10-Mar	SSE18	SSE15	SSE13	SSE15	SSE15	SSE17	SSE14	SSE14	SSE14	SSE15	SSE15	S15	S14	S13	SSE8	SSE9	SSE6	SE10	E4	N5	N7	N6	E2	SE5	SSE9.5	SSE18
11-Mar	SSE8	SE5	E2	E3	SE2	SSE1	N2	NNE3	SE1	N2	NNW3	NNW3	ENE4	N5	NE4	ENE5	NNE8	NNE11	NNE11	N10	N12	NNE9	NNE8	NNE8	NNE4.1	NNE12
12-Mar	N8	N11	N11	N13	N12	N11	N11	N9	N8	NNE9	N11	NNE8	NNE7	NNE9	NNE10	NNE9	NNE12	N11	NNE9	N10	N10	N10	N10	N11	N9.9	N13
13-Mar	N10	N9	N9	N10	N10	N7	NNE4	NE3	NNE4	N9	N11	NNE11	N12	NNE10	NNE13	N15	N18	N17	N17	N17	N16	N17	N16	N17	N11.6	N18
14-Mar	N17	N18	N19	N17	N18	N17	N17	N18	N17	N19	N16	N16	N14	N13	N14	N14	N15	N15	N15	N15	N14	N13	N12	N10	N15.5	N19
15-Mar	NNW9	NNW6	NNW6	NNW5	WNW4	WNW4	NNW1	N4	NNE3	E4	ENE4	NNE6	E6	E7	E7	ENE6	E5	ENE2	NNW3	NNW3	WNW2	NW2	WNW1	SSW1	NNE2.4	NNW9
16-Mar	S2	S4	S5	S3	E1	N3	NE1	S2	S6	SSE9	SSE13	SSE13	SSE13	SSE12	SSE13	SSE12	SSE13	S13	S10	S7	S9	S7	S6	S6	SSE7.2	SSE13
17-Mar	SSE1	S7	S10	S8	S8	S7	S8	S8	SSE8	SSE14	S14	S15	SSE14	SSE12	SSE10	SSE11	SSE7	S6	S4	S3	S6	SSW5	WSW1	S6	S7.9	S15
18-Mar	S3	S4	S4	S5	S7	S6	S8	S7	S9	SSE10	SSE10	SSE10	SSE9	SE7	SSE7	ENE3	NE7	NNE6	NNE7	N5	NW5	NNW4	NW3	N3	SSE3.0	SSE10
19-Mar	NNW2	N2	NNE3	N4	WNW1	N2	N3	NNE2	SE2	SSE7	SSE4	NNE4	NNE4	NNE3	ENE3	E2	SSE5	SSE6	S7	SE10	SE13	SE11	SE11	SE6	ESE2.8	SE13
20-Mar	ESE5	ESE6	ESE5	SE10	ESE6	ESE6	ESE4	SSE4	ENE3	NNE2	NE4	NNE11	NNE14	NNE15	NNE14	NNE17	NNE17	N17	N16	N14	NNE10	N8	NNE5	NNW5	NNE6.9	NNE17
21-Mar	NW4	SSW2	SE1	WSW2	WNW3	NNW5	NNW4	NW1	NNE1	E2	ESE5	ESE3	SE6	SSE5	SSE6	SSE6	S8	S9	S6	S4	S6	S5	S5	S5	S2.5	S9
22-Mar	SSE3	NNE2	S5	S3	S3	NNW2	W1	SSE1	SSE6	SSE10	SSE14	SSE15	SSE14	SSE14	SSE13	SSE13	S12	S10	S6	S4	S2	WSW1	SSE1	S4	SSE6.2	SSE15
23-Mar	SW3	S2	S4	S7	S8	S6	S5	SSE3	NE1	NNE10	NE10	NNE11	NE12	NNE15	NNE13	NNE12	NE11	NNE12	NNE11	N9	NNW9	NW6	NW8	NNW11	NNE4.8	NNE15
24-Mar	N11	N11	N5	NNE2	NNE2	NNW1	SW1	ESE1	E4	ESE4	E4	ENE4	ENE5	ESE4	SSE5	SSE9	SSE10	SSE9	S6	NNE2	N3	NNW3	NW1	WNW3	E1.2	N11
25-Mar	NW1	W2	SW3	SW2	NW3	NNW1	WNW1	N3	E1	NE3	ENE4	ENE6	NE8	NE8	NE9	NE11	NE11	NNE12	NNE13	N12	N10	N12	N11	N10	NNE5.5	NNE13
26-Mar	N8	NNW7	NW7	NNW3	NNW1	NNE2	NW4	N5	N6	N8	N10	N11	NNE10	N10	N14	NNE13	NNE12	NNE13	N11	N8	N7	N3	N2	W2	N7.0	N14
27-Mar	WNW4	WNW3	WNW1	WNW2	SSW3	SSW2	S2	S5	SSE9	SSE11	SSE11	SE10	SE10	SE11	SSE12	SSE9	SSE5	ENE2	NNE6	NNE6	NNE8	NNE5	N4	WNW4	SSE2.8	SSE12
28-Mar	WNW5	NW3	WNW3	WNW1	WNW2	SW2	SSW3	SSE2	SSE6	SE7	SSE12	SSE15	SSE16	SSE18	SSE16	SSE14	SSE13	SSE12	S11	S12	S12	S9	S3	NW2	SSE7.0	SSE18
29-Mar	N1	WNW3	NW3	WNW3	WNW4	NW2	SSW1	NW2	E1	NNE3	N6	NNE8	NNE11	NNE11	NNE10	NNE12	NNE14	NNE11	NNE10	NNE9	N6	NW4	WNW3	W3	N4.9	NNE14
30-Mar	NW1	WNW1	WNW2	WNW2	SSW3	SSW3	S2	S2	SSE3	SE3	NE4	NNE7	NE6	NNE8	NNE8	NNE7	NNE8	NNE10	NE7	NNE6	NNE6	N6	N7	N6	NNE3.5	NNE10
31-Mar	N6	NNW7	N6	N6	N6	N7	N9	NNW10	N10	N10	N11	N14	N15	N14	N14	NNW17	NNW17	NNW14	NNW10	NW4	NE3	E3	NNE3	N5	N8.9	NNW17
	NNE1.1	NNE0.6	NE0.2	E0.4	SSE0.6	ESE0.5	SE0.4	ESE0.8	SE2.0	ESE2.7	ESE2.9	E2.9	E3.4	E2.9	ESE3.0	E2.8	ENE2.8	NE2.8	NNE3.2	NNE3.0	NNE2.1	NNE1.8	NNE1.3	N1.1	Diurnal Average	
	SSE18	N18	N19	N17	N18	N17	N17	N18	N17	N19	SSE17	NNW18	NNW18	NNW19	S18	SSE18	N18	N17	N17	N17	N16	N17	SSE17	SSE18	Diurnal Maximum	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	296	39.95	39.95
6 - 11	288	38.87	78.81
12 - 19	157	21.19	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	26	25	10	17	20	10	14	25	33	9	8	11	8	34	24	22	296
6 - 11	57	59	19	4	4	4	14	61	50	0	0	0	1	2	3	10	288
12 - 19	45	19	1	0	0	0	2	64	17	0	0	0	0	0	1	8	157
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	128	103	30	21	24	14	30	150	100	9	8	11	9	36	28	40	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 km/h on Mar 23 13:00

Minimum Value: 0 km/h on Mar 6 10:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - March 2023

Direction of Maximum Speed: 0 deg on Mar 14 03:00
Direction of Maximum Daily Speed Average: 358.9 deg on Mar 14

Direction of Minimum Speed: 107 deg on Mar 9 05:00

Direction of Minimum Daily Speed Average: 1.2 deg on Mar 24

Monthly Average Direction: 77.3 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	184	187	224	UO	285	242	UO	219	11	160	173	168	165	171	166	165	158	152	99	144	163	166	161	168	166.2
2-Mar	166	165	167	165	171	168	176	178	177	169	171	153	68	151	166	226	248	259	292	270	242	265	294	308	188.6
3-Mar	14	24	39	38	35	35	37	29	33	32	35	33	45	61	76	46	40	19	14	61	26	20	26	24	33.1
4-Mar	28	8	276	322	344	18	32	27	10	0	336	333	334	329	326	17	32	17	21	4	328	298	321	343	348.6
5-Mar	311	292	284	292	277	258	301	296	100	89	86	76	70	51	46	54	64	69	349	327	295	324	306	DF	21.8
6-Mar	317	301	256	308	247	255	304	255	90	138	144	154	154	172	165	175	176	170	124	88	86	137	165	165	163.3
7-Mar	152	154	151	152	155	149	155	161	162	164	165	161	156	173	173	159	147	124	124	112	147	150	168	167	155.5
8-Mar	168	167	153	134	145	150	165	163	160	167	166	175	179	179	176	184	186	179	163	151	162	166	168	147	168.2
9-Mar	151	10	344	334	107	162	179	175	169	167	170	178	166	163	171	167	163	143	140	147	149	154	148	154	159.5
10-Mar	155	152	163	163	158	163	157	157	160	164	158	171	170	174	152	153	153	127	86	8	6	2	86	132	155.3
11-Mar	148	133	96	89	143	157	7	14	129	356	342	333	59	1	51	71	18	19	18	10	11	13	27	23	29.6
12-Mar	11	7	5	4	5	3	4	3	11	21	8	28	25	13	21	21	14	11	12	4	2	3	358	356	8.9
13-Mar	355	354	355	357	357	0	32	55	32	6	7	13	9	20	14	10	10	4	356	2	5	7	4	359	5.5
14-Mar	3	0	0	4	3	2	359	1	351	357	0	1	359	358	351	358	350	350	353	3	1	2	6	358	358.9
15-Mar	348	346	342	333	300	299	327	8	33	100	62	32	85	95	81	74	87	71	342	328	285	318	300	203	23.2
16-Mar	188	171	181	183	87	356	46	174	172	168	162	155	160	157	161	168	168	169	172	171	174	178	171	181	166.9
17-Mar	155	185	176	174	172	170	183	178	168	166	174	169	166	164	168	162	166	172	180	181	188	194	239	180	172.4
18-Mar	182	189	176	188	182	174	178	171	170	158	160	154	152	145	153	77	39	32	19	350	324	338	323	351	155.1
19-Mar	344	7	22	359	298	6	352	31	130	158	161	13	29	27	72	79	160	152	171	143	134	133	130	129	120.2
20-Mar	102	108	114	130	114	114	110	153	63	30	56	22	12	16	22	14	15	7	7	11	18	9	24	341	30.2
21-Mar	314	210	128	257	292	330	338	311	15	91	103	107	145	152	155	158	172	185	183	174	186	170	171	173	171.1
22-Mar	163	27	175	170	170	348	265	164	167	161	162	157	157	156	163	165	171	173	172	173	182	247	162	186	164.7
23-Mar	221	170	189	185	179	190	174	158	35	26	43	29	42	25	26	33	42	23	25	8	344	325	326	345	23.7
24-Mar	350	356	352	15	32	340	218	105	101	110	90	73	72	117	157	161	156	163	172	23	358	345	304	299	86.7
25-Mar	308	279	232	220	313	327	292	11	86	56	63	63	46	38	43	34	36	30	24	11	6	355	359	353	20.5
26-Mar	10	338	325	347	331	18	319	352	6	11	357	11	21	11	4	16	17	12	10	7	354	359	358	269	3.7
27-Mar	292	300	287	294	207	198	179	171	159	166	157	140	141	143	150	160	152	78	27	21	19	18	355	292	147.1
28-Mar	297	309	303	294	290	221	212	167	158	143	162	158	160	161	163	162	162	167	169	171	169	173	178	324	168.3
29-Mar	358	289	325	295	286	322	198	320	88	25	10	22	22	24	25	21	21	21	21	16	359	314	287	265	7.5
30-Mar	304	298	285	300	206	201	182	180	150	132	40	29	37	28	22	23	25	19	36	31	20	6	2	354	22.4
31-Mar	349	347	351	354	352	354	350	348	352	356	354	4	355	3	356	341	342	341	335	317	48	80	23	8	352.5
	14.9	28.3	45.6	84.8	151.1	119.1	124.3	120.3	129.6	122.2	121.6	100.2	100.4	98.4	101.3	88.0	75.1	53.5	32.0	28.7	27.2	14.9	25.9	355.9	
	Diurnal Average																								

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 98 deg on Mar 29 07:00

Minimum Value: 6 deg on Mar 23 22:00

Percentiles: P_1 = 10 P_{10} = 12 Q_1 = 14 Median = 19 Q_3 = 30 P_{90} = 53 P_{99} = 86

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	16	16	32	UO	78	20	UO	63	39	76	14	13	12	15	14	12	13	13	20	16	13	12	14	14	78
2-Mar	11	12	12	12	13	12	14	13	13	13	14	28	60	15	15	54	44	42	22	40	42	30	22	13	60
3-Mar	19	19	29	23	26	22	25	22	22	28	25	26	34	45	30	27	28	21	15	34	20	20	19	18	45
4-Mar	22	24	27	17	71	22	22	18	17	17	22	17	17	17	33	27	24	18	15	12	22	11	37	16	71
5-Mar	20	20	61	72	17	32	29	49	80	23	26	29	36	34	29	28	28	22	33	27	33	24	26	DF	80
6-Mar	17	28	88	30	57	55	58	46	56	12	14	11	13	19	18	18	16	17	11	19	29	71	12	12	88
7-Mar	19	13	12	12	12	13	12	12	12	13	14	14	14	16	16	18	17	16	15	20	15	20	15	14	20
8-Mar	14	13	12	17	13	9	17	11	9	13	14	18	16	16	20	21	20	13	17	14	12	17	11	52	52
9-Mar	81	88	21	25	83	19	13	19	12	16	17	18	14	15	14	15	15	18	12	11	12	14	11	13	88
10-Mar	14	13	13	13	13	13	14	13	14	14	14	16	16	18	29	26	30	19	38	11	13	18	59	21	59
11-Mar	11	13	46	20	55	79	49	16	70	74	45	40	54	41	51	34	21	18	17	16	15	16	17	16	79
12-Mar	14	13	13	14	14	14	13	14	15	19	18	23	23	24	22	22	17	17	16	14	13	14	14	14	24
13-Mar	13	12	13	15	13	13	38	41	26	18	17	19	20	22	20	16	18	18	18	18	18	17	18	19	41
14-Mar	17	19	19	16	16	17	16	17	16	16	17	16	16	17	14	15	15	14	16	16	16	17	16	15	19
15-Mar	13	19	18	16	19	10	34	17	37	25	40	35	26	20	30	29	26	48	23	28	53	68	77	78	78
16-Mar	42	29	16	29	66	36	44	60	18	17	12	10	11	11	11	12	11	10	10	13	12	13	14	15	66
17-Mar	93	22	13	9	11	12	13	12	11	10	12	13	12	13	14	10	10	10	9	18	10	15	91	39	93
18-Mar	64	15	13	12	14	13	11	11	14	10	11	11	12	12	13	50	23	18	16	18	16	23	29	32	64
19-Mar	80	36	19	20	33	21	24	42	49	15	74	36	39	51	61	50	53	18	14	10	13	12	13	27	80
20-Mar	34	28	19	14	21	16	22	37	37	46	45	20	22	20	22	19	21	22	19	18	19	15	61	50	61
21-Mar	30	52	64	52	35	20	20	60	36	47	22	41	18	32	24	28	18	18	15	13	14	15	11	16	64
22-Mar	63	35	26	15	57	47	90	77	16	12	12	11	11	11	11	12	12	12	11	21	48	82	73	11	90
23-Mar	42	74	40	27	19	28	25	59	72	24	28	32	37	21	22	23	29	20	20	20	14	6	10	17	74
24-Mar	16	17	15	58	43	69	40	62	27	37	47	46	57	60	38	16	12	11	17	43	19	15	77	11	77
25-Mar	26	61	45	62	65	92	74	26	41	41	44	40	36	35	31	30	24	22	21	19	16	18	19	18	92
26-Mar	16	21	8	23	83	33	23	31	28	26	24	25	32	31	25	26	25	22	20	18	22	57	50	43	83
27-Mar	11	25	53	59	19	30	58	16	10	12	12	13	16	15	15	19	26	65	19	19	20	23	28	23	65
28-Mar	13	17	21	29	59	33	30	53	15	9	11	12	13	11	12	13	11	11	10	11	11	13	68	53	68
29-Mar	34	39	23	14	12	44	98	46	45	41	38	26	22	21	24	23	22	22	22	20	22	24	12	13	98
30-Mar	37	92	43	30	41	31	65	34	19	31	54	27	34	24	23	23	20	20	23	24	17	21	23	32	92
31-Mar	28	21	24	23	22	23	21	18	20	22	22	22	23	26	24	18	17	16	16	51	54	32	17	17	54
Diurnal Maximum	93	92	88	72	83	92	98	77	80	76	74	46	60	60	61	54	53	65	38	51	54	82	91	78	

DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS02
MILDRED LAKE
MARCH 2023

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

April 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	707	34	37	99.6	65.8	0	8	0
H2S (ppb) Average	708	35	36	99.87	5.5	0	1.2	0
THC (ppm) Average	707	34	37	99.6	4	-	2.7	-
NMHC(ppm) Average	707	34	37	99.6	0.444	-	0.091	-
CH4(ppm) Average	707	34	37	99.6	3.9	-	2.6	-
Temperature (C) Average	743	0	1	99.87	9.2	-	0.5	-
Relative Humidity (%) Average	743	0	1	99.87	93.8	-	85.9	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	22	-	16	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	2.2	5.1	-	0	0	0.2	0.5	1.6	6.1	65.8
H2S (ppb) Average	708	0.41	0.6	-	0	0.1	0.1	0.2	0.4	0.9	5.5
THC (ppm) Average	707	2.19	0.3	-	2	2	2	2.1	2.3	2.5	4
NMHC(ppm) Average	707	0.039	0.062	-	0	0	0	0	0.1	0.1	0.444
CH4(ppm) Average	707	2.15	0.2	-	2	2	2	2.1	2.2	2.4	3.9
Temperature 2 m (C) Average	743	-9.64	6.8	-	-29.6	-18.2	-13.7	-9.6	-5.1	-1.2	9.2
Relative Humidity (%) Average	743	68.09	13.6	-	30.9	48.1	59	69.5	78.7	84.9	93.8
Wind Speed 10 m (km/h) Average	742	9.3	4	-	1	4	6	9	12	15	22
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
SO2,THC/NMHC/CH4	16 Mar 2023 10:00	16 Mar 2023 11:00	2	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	06 Mar 2023 05:00	06 Mar 2023 05:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 65.8 ppb on Mar 21 15:00

Maximum Daily Average: 8.0 ppb on Mar 21

Minimum Value: 0.0 ppb on Mar 4 09:00

Minimum Daily Average: 0.1 ppb on Mar 4

Maximum Diurnal Average: 4.5 ppb at hour 17

Minimum Diurnal Average: 1.0 ppb at hour 8

Monthly Average: 2.20 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.2 Median = 0.5 Q_3 = 1.6 P_{90} = 6.1 P_{99} = 23.9

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	6.1	5.5	6.1	Z	3.4	7.9	3.5	0.8	0.7	1.8	3.9	1.3	1.1	1.3	1.1	2.2	3.0	5.3	4.1	8.0	6.2	16.2	18.5	21.0	5.6	21.0
2-Mar	21.5	25.4	13.2	17.6	Z	4.2	11.7	1.7	4.5	7.6	23.5	10.2	3.0	2.3	1.8	0.8	6.2	5.8	2.1	1.0	2.9	0.8	0.5	0.4	7.3	25.4
3-Mar	0.3	0.4	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.4	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.6
4-Mar	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
5-Mar	0.0	Z	0.0	0.0	0.0	0.4	0.4	0.4	0.2	0.0	0.4	0.7	0.6	0.3	0.4	9.9	8.4	2.9	3.6	2.6	1.3	0.6	0.4	DF	1.5	9.9
6-Mar	0.3	0.3	0.3	0.4	0.4	0.8	0.6	1.0	1.2	1.1	0.5	Z	2.1	1.6	1.2	0.8	1.5	1.0	0.7	1.1	1.8	1.7	2.9	0.8	1.0	2.9
7-Mar	2.0	8.2	Z	1.5	2.3	7.3	3.7	4.8	3.2	1.6	0.7	1.4	1.5	2.1	3.7	4.6	6.4	3.9	0.3	10.9	3.0	1.4	1.4	1.5	3.4	10.9
8-Mar	1.6	1.5	7.6	Z	6.8	1.5	1.0	2.7	1.5	0.8	C	C	C	1.3	0.3	0.3	0.3	4.2	5.5	2.9	15.3	0.9	1.0	1.2	2.9	15.3
9-Mar	1.8	13.0	1.5	4.0	Z	0.4	0.2	0.4	0.4	1.1	0.9	1.1	0.5	0.9	0.6	0.4	0.6	1.2	8.1	19.1	29.2	4.5	20.5	6.2	5.1	29.2
10-Mar	7.4	6.3	1.2	4.7	5.4	Z	3.0	4.2	4.9	1.6	1.2	0.7	1.1	2.5	3.0	1.7	2.2	0.5	0.2	0.3	0.8	4.5	2.9	1.3	2.7	7.4
11-Mar	Z	3.6	3.7	0.6	0.4	1.9	1.2	2.3	0.9	4.5	3.5	7.0	7.8	2.5	2.3	0.6	1.0	0.8	0.2	0.1	0.1	0.1	0.0	0.0	2.0	7.8
12-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.2
13-Mar	0.0	0.2	Z	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2
14-Mar	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Mar	0.1	0.1	0.0	0.1	Z	0.2	0.2	0.1	0.3	0.6	0.6	0.5	0.6	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.5	0.8	0.6	0.5	0.3	0.8
16-Mar	8.3	5.3	0.5	0.7	2.2	Z	3.4	2.1	0.6	M	M	0.3	0.7	0.7	1.2	1.0	12.9	16.8	15.6	5.5	3.7	2.3	1.8	1.3	4.1	16.8
17-Mar	Z	1.9	0.4	0.2	0.5	0.2	1.1	0.6	0.5	0.7	2.8	0.8	0.8	16.8	26.0	24.7	19.1	21.9	3.0	1.0	0.6	0.7	0.5	0.4	5.4	26.0
18-Mar	0.4	Z	0.5	0.5	0.4	0.3	0.9	1.7	0.8	0.8	6.5	1.4	3.8	8.7	5.7	20.7	17.7	4.6	1.6	0.8	0.7	0.6	0.4	0.4	3.5	20.7
19-Mar	0.3	0.3	Z	0.2	0.2	0.1	0.3	1.0	8.2	12.9	7.0	4.6	2.2	8.5	1.8	0.9	4.5	10.0	3.3	3.7	0.8	0.5	0.4	1.7	3.2	12.9
20-Mar	1.1	0.9	1.4	Z	5.0	0.5	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.6	5.0
21-Mar	0.1	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.3	0.5	5.0	24.0	65.8	37.7	34.7	10.8	2.5	1.4	0.8	0.5	0.3	0.5	8.0	65.8
22-Mar	0.4	0.4	8.5	16.3	1.5	Z	2.0	0.5	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.2	1.3	1.1	0.9	0.9	0.7	0.6	0.7	0.6	1.9	16.3
23-Mar	Z	0.3	0.3	1.6	0.4	0.4	0.4	0.5	1.1	1.7	1.0	0.7	0.6	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.7
24-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.8	0.6	6.3	11.3	4.6	8.5	7.9	7.7	6.1	1.5	1.8	1.5	2.6	11.3
25-Mar	0.8	0.6	Z	0.5	0.6	0.7	0.6	0.8	0.5	1.0	0.7	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.4	1.0
26-Mar	0.3	0.2	0.1	Z	0.2	0.1	0.1	0.1	0.2	1.1	0.5	0.3	0.3	0.4	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	1.1
27-Mar	0.2	0.2	0.3	0.3	Z	0.2	0.3	0.5	0.3	0.5	1.0	1.3	10.8	4.3	4.2	6.3	11.0	6.8	4.0	1.7	0.5	0.4	0.4	0.2	2.4	11.0
28-Mar	0.0	0.1	0.0	0.1	0.3	Z	0.5	1.7	1.2	0.4	0.4	2.2	1.4	0.7	0.6	0.9	0.7	0.6	0.4	0.4	3.6	10.8	3.1	1.6	1.4	10.8
29-Mar	Z	2.3	2.6	2.2	0.7	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.5	2.6
30-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.5	1.0	6.1	7.5	0.5	0.8	0.9	1.8	1.0	1.4	0.3	0.5	0.2	0.2	0.2	0.2	0.1	0.0	1.1	7.5
31-Mar	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3
	2.1	3.0	1.9	2.0	1.2	1.1	1.2	1.0	1.3	1.6	2.0	1.4	1.6	2.7	4.2	4.2	4.5	3.5	2.1	2.3	2.6	1.6	1.9	1.4	Diurnal Average	
	21.5	25.4	13.2	17.6	6.8	7.9	11.7	4.8	8.2	12.9	23.5	10.2	10.8	24.0	65.8	37.7	34.7	21.9	15.6	19.1	29.2	16.2	20.5	21.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	671	94.91	94.91
11 - 20	23	3.25	98.16
21 - 60	12	1.70	99.86
61 - 110	1	0.14	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - March 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	139	69	13	10	10	42	118	92	41	19	6	5	5	15	32	54	670
11 - 20	0	0	0	0	0	1	17	3	2	0	0	0	0	0	0	0	23
21 - 60	0	0	0	0	0	1	6	2	3	0	0	0	0	0	0	0	12
61 - 110	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	139	69	13	10	10	44	141	97	47	19	6	5	5	15	32	54	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Mildred Lake

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 5.5 ppb on Mar 30 09:00 Maximum Daily Average: 1.2 ppb on Mar 2

Minimum Value: 0.0 ppb on Mar 25 13:00 Minimum Daily Average: 0.1 ppb on Mar 26

Maximum Diurnal Average: 0.7 ppb at hour 4 Minimum Diurnal Average: 0.2 ppb at hour 13

Monthly Average: 0.41 ppb Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.1 Median = 0.2 Q_3 = 0.4 P_{90} = 0.9 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.0	1.5	2.5	2.0	Z	2.3	1.2	0.3	0.2	0.4	0.8	0.2	0.1	0.1	0.1	0.3	0.5	1.0	0.7	1.5	1.3	3.0	3.2	3.5	1.2	3.5
2-Mar	3.7	4.7	1.9	3.7	2.3	0.8	Z	0.2	0.8	1.5	3.7	1.4	0.4	0.2	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	1.2	4.7
3-Mar	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
4-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
5-Mar	0.1	0.0	Z	0.2	0.3	0.7	0.6	0.7	0.5	0.2	0.1	0.3	0.2	0.1	0.1	0.2	0.5	0.3	0.7	0.8	0.9	0.8	0.7	DF	0.4	0.9
6-Mar	0.9	0.7	0.6	0.7	0.8	1.0	0.9	0.9	0.6	0.5	0.3	0.2	Z	0.4	0.4	0.2	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.2	0.5	1.0
7-Mar	0.4	1.1	0.4	Z	0.4	0.6	0.6	0.8	0.6	0.3	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.4	1.1
8-Mar	0.1	0.1	0.7	0.2	Z	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.6	1.1	0.4	1.6	0.1	0.1	0.2	0.3	1.6
9-Mar	0.3	1.7	0.2	0.5	0.3	Z	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.5	0.8	2.2	0.4	1.2	0.6	0.4	2.2
10-Mar	Z	0.6	0.2	0.6	0.5	0.2	0.4	0.6	0.7	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.7
11-Mar	0.3	Z	1.0	0.2	0.1	0.6	0.8	1.2	0.5	0.5	0.4	0.6	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.2
12-Mar	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	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1
13-Mar	0.1	0.1	0.2	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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
14-Mar	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
15-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.4	0.2	0.2	0.6	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.5	0.7	0.7	0.7	0.3	0.7
16-Mar	Z	2.9	0.4	0.5	0.8	1.4	1.0	0.8	0.2	C	C	C	C	0.2	0.1	0.2	2.0	2.3	2.4	1.0	0.6	0.3	0.4	0.3	0.9	2.9
17-Mar	0.3	Z	0.2	0.1	0.2	0.2	0.8	0.4	0.3	0.3	0.6	0.2	0.2	2.4	3.4	3.3	2.7	3.4	1.5	0.5	0.2	0.2	0.2	0.1	0.9	3.4
18-Mar	0.1	0.1	Z	0.4	0.7	0.5	0.7	1.3	0.5	0.3	1.4	0.3	0.5	1.2	0.4	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.5	1.4
19-Mar	0.3	0.2	0.2	Z	0.4	0.5	0.6	1.1	2.8	1.7	0.7	0.6	0.4	0.9	0.3	0.2	0.7	1.2	0.6	0.7	0.2	0.2	0.2	0.4	0.7	2.8
20-Mar	0.4	0.4	0.4	0.8	Z	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.8
21-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.4	0.3	0.2	0.3	0.4	0.6	0.8	1.1	1.2	1.5	1.2	0.5	0.3	0.2	0.2	0.2	0.3	0.2	0.5	1.5
22-Mar	Z	0.3	2.5	4.1	0.7	0.8	0.9	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.2	0.2	0.5	4.1
23-Mar	0.4	Z	0.3	1.2	0.4	0.3	0.3	0.3	0.7	0.5	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	1.2
24-Mar	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.5	1.0	0.2	1.0
25-Mar	1.1	1.2	1.1	Z	1.4	2.2	1.5	1.3	0.6	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	0.5	2.2
26-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
27-Mar	0.1	0.2	0.4	0.5	0.5	Z	0.4	0.5	0.4	0.2	0.3	0.2	0.1	0.1	0.1	0.3	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.5
28-Mar	Z	0.3	0.3	0.3	0.5	0.7	0.8	1.2	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	1.7	0.3	0.3	0.4	1.7
29-Mar	0.3	Z	0.7	0.7	0.7	0.5	0.4	0.5	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.7
30-Mar	0.3	0.5	Z	0.7	0.6	0.6	0.8	1.5	5.5	4.4	0.4	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.8	5.5
31-Mar	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.2	0.4
	0.4	0.7	0.6	0.7	0.5	0.6	0.5	0.5	0.6	0.5	0.4	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.3	Diurnal Average	
	3.7	4.7	2.5	4.1	2.3	2.3	1.5	1.5	5.5	4.4	3.7	1.4	0.8	2.4	3.4	3.3	2.7	3.4	2.4	1.5	2.2	3.0	3.2	3.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	690	97.46	97.46
3 - 4	16	2.26	99.72
5 - 7	2	0.28	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	140	69	12	10	10	41	130	93	49	18	7	5	5	15	31	54	689
3 - 4	0	0	0	0	0	2	11	2	1	0	0	0	0	0	0	0	16
5 - 7	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	140	69	12	10	10	44	142	95	50	18	7	5	5	15	31	54	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - March 2023

Maximum Value: 4.0 ppm on Mar 18 05:00

Maximum Daily Average: 2.7 ppm on Mar 22

Minimum Value: 2.0 ppm on Mar 25 20:00

Minimum Daily Average: 2.0 ppm on Mar 4

Maximum Diurnal Average: 2.3 ppm at hour 2

Minimum Diurnal Average: 2.1 ppm at hour 15

Monthly Average: 2.19 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.3 P_{90} = 2.5 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.7	2.9	2.7	Z	2.8	2.7	2.5	2.3	2.3	2.1	2.1	2.3	2.3	2.1	2.1	2.2	2.3	2.2	2.1	2.3	2.3	2.3	2.2	2.2	2.3	2.9
2-Mar	2.2	2.2	2.2	2.2	Z	2.4	2.2	2.2	2.6	2.8	2.3	2.3	2.1	2.2	2.4	2.7	2.2	2.2	2.2	2.3	2.1	2.3	2.3	2.0	2.3	2.8
3-Mar	2.1	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1
4-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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
5-Mar	2.0	Z	2.0	2.0	2.0	2.4	2.5	2.7	2.5	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.5	3.0	2.8	2.7	2.8	2.7	DF	2.3	3.0
6-Mar	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.0	2.0	Z	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.3
7-Mar	2.0	2.1	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1
8-Mar	2.0	2.0	2.0	Z	2.1	2.0	2.2	2.0	2.0	2.1	C	C	C	2.0	2.0	2.0	2.0	2.0	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.3
9-Mar	2.0	2.1	2.0	2.1	Z	2.5	2.5	2.6	2.6	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.6
10-Mar	2.0	2.0	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	2.1	2.2	2.2	2.0	2.2
11-Mar	Z	2.4	2.4	2.1	2.0	2.2	2.4	2.4	2.5	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5
12-Mar	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
13-Mar	2.1	2.2	Z	2.4	2.5	2.4	2.2	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.5
14-Mar	2.2	2.1	2.2	Z	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.1	2.2
15-Mar	2.2	2.2	2.0	2.1	Z	2.2	2.2	2.1	2.3	2.7	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.3	2.3	2.3	2.4	2.5	2.6	2.6	2.3	2.7
16-Mar	3.2	2.9	2.1	2.3	2.2	Z	2.3	2.2	2.1	M	M	2.2	2.2	2.2	2.1	2.3	2.1	2.1	2.3	2.6	2.2	2.0	2.1	2.3	2.3	3.2
17-Mar	Z	2.2	2.8	2.4	2.2	2.6	2.4	2.2	2.1	2.6	2.2	2.4	2.3	2.1	2.2	2.2	2.2	2.3	2.1	2.0	2.1	2.0	2.0	2.0	2.3	2.8
18-Mar	2.0	Z	2.0	2.9	4.0	2.8	2.9	3.9	2.9	2.9	2.2	2.2	2.1	2.2	2.1	2.0	2.6	2.4	2.0	2.0	2.1	2.3	2.6	2.8	2.5	4.0
19-Mar	2.4	2.6	Z	2.2	2.2	2.4	2.4	2.5	2.8	2.3	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.8
20-Mar	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	2.1
21-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.2	2.4	2.4	2.7	2.6	2.3	2.4	2.3	2.3	2.2	2.3	2.2	2.0	2.1	3.5	2.6	2.3	3.5
22-Mar	2.6	2.7	2.3	2.2	2.5	Z	2.4	2.0	2.2	2.4	2.2	2.2	2.2	2.2	2.0	2.2	2.4	2.9	3.8	4.0	3.9	3.7	3.0	3.2	2.7	4.0
23-Mar	Z	2.9	2.3	2.6	2.2	2.2	2.1	2.2	2.5	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.9
24-Mar	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.5	2.2	2.2	2.2	2.2	2.4	2.7	2.1	2.7
25-Mar	3.3	3.7	Z	2.7	2.6	2.5	2.4	2.7	3.2	2.9	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	2.3	3.7
26-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
27-Mar	2.0	2.0	2.2	2.3	Z	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3
28-Mar	2.0	2.0	2.1	2.2	2.3	Z	2.4	2.3	2.3	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.2	2.1	2.6	2.6	2.5	2.3	2.5	3.1	2.3	3.1
29-Mar	Z	2.6	2.3	2.4	2.5	2.8	2.4	2.7	2.4	2.5	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.8
30-Mar	2.0	Z	2.2	2.2	2.2	2.3	2.5	2.6	2.7	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.7
31-Mar	2.2	2.2	Z	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.2	2.4
	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average	
	3.3	3.7	2.8	2.9	4.0	2.8	2.9	3.9	3.2	2.9	2.5	2.7	2.6	2.3	2.4	2.7	2.6	2.9	3.8	4.0	3.9	3.7	3.5	3.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mildred Lake - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	295	41.73	41.73
2.1 - 3.0	399	56.44	98.16
3.1 - 10.0	13	1.84	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mildred Lake - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	89	59	11	4	7	9	57	12	6	7	3	1	0	4	9	17	295
2.1 - 3.0	50	10	2	6	3	35	82	77	39	12	3	4	5	11	22	37	398
3.1 - 10.0	0	0	0	0	0	0	2	8	2	0	0	0	0	0	1	0	13
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	139	69	13	10	10	44	141	97	47	19	6	5	5	15	32	54	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Mildred Lake

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - March 2023

Maximum Value: 0.444 ppm on Mar 16 01:00

Maximum Daily Average: 0.091 ppm on Mar 15

Minimum Value: 0.000 ppm on Mar 1 14:00

Minimum Daily Average: 0.001 ppm on Mar 4

Maximum Diurnal Average: 0.072 ppm at hour 2

Minimum Diurnal Average: 0.011 ppm at hour 15

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 in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.099	0.094	0.126	Z	0.085	0.082	0.040	0.001	0.009	0.001	0.001	0.016	0.007	0.000	0.000	0.001	0.013	0.020	0.010	0.058	0.081	0.044	0.028	0.027	0.037	0.126
2-Mar	0.038	0.016	0.019	0.016	Z	0.040	0.016	0.017	0.040	0.060	0.058	0.039	0.012	0.032	0.063	0.148	0.043	0.053	0.031	0.048	0.001	0.067	0.015	0.019	0.039	0.148
3-Mar	0.010	0.007	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.005	0.040	0.001	0.000	0.000	0.000	0.003	0.040
4-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.017	0.001	0.000	0.000	0.000	0.005	0.000	0.001	0.017
5-Mar	0.000	Z	0.000	0.000	0.000	0.054	0.054	0.090	0.058	0.001	0.000	0.067	0.006	0.000	0.000	0.009	0.035	0.044	0.107	0.089	0.079	0.081	0.071	DF	0.038	0.107
6-Mar	0.057	0.062	0.051	0.073	0.077	0.072	0.060	0.033	0.006	0.001	0.006	Z	0.015	0.012	0.001	0.001	0.001	0.034	0.072	0.107	0.001	0.000	0.000	0.000	0.032	0.107
7-Mar	0.000	0.002	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.018	0.128	0.039	0.000	0.000	0.000	0.000	0.009	0.128
8-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.027	0.001	0.000	0.004	C	C	C	0.000	0.001	0.000	0.000	0.006	0.286	0.160	0.016	0.000	0.000	0.000	0.025	0.286
9-Mar	0.000	0.000	0.000	0.006	Z	0.022	0.006	0.024	0.014	0.022	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.064	0.044	0.003	0.024	0.115	0.017	0.000	0.016	0.115
10-Mar	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	0.004	0.001	0.000	0.002	0.013	0.000	0.001	0.018	0.122	0.143	0.141	0.019	0.143
11-Mar	Z	0.176	0.273	0.086	0.002	0.102	0.302	0.310	0.053	0.017	0.005	0.002	0.001	0.000	0.000	0.005	0.060	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.310
12-Mar	0.000	Z	0.000	0.000	0.000	0.054	0.031	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.023	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.003	0.005	0.054
13-Mar	0.047	0.076	Z	0.121	0.141	0.128	0.072	0.000	0.000	0.025	0.100	0.089	0.080	0.035	0.002	0.000	0.001	0.086	0.073	0.046	0.021	0.000	0.000	0.002	0.050	0.141
14-Mar	0.087	0.046	0.075	Z	0.000	0.013	0.018	0.036	0.028	0.002	0.012	0.033	0.074	0.056	0.017	0.005	0.001	0.000	0.000	0.001	0.015	0.016	0.059	0.048	0.028	0.087
15-Mar	0.036	0.014	0.001	0.023	Z	0.072	0.031	0.001	0.013	0.083	0.113	0.099	0.076	0.008	0.001	0.009	0.047	0.093	0.146	0.171	0.258	0.266	0.255	0.267	0.091	0.267
16-Mar	0.444	0.290	0.049	0.075	0.009	Z	0.030	0.073	0.019	M	M	0.000	0.000	0.002	0.000	0.017	0.003	0.003	0.036	0.077	0.022	0.005	0.043	0.059	0.060	0.444
17-Mar	Z	0.022	0.030	0.034	0.013	0.011	0.060	0.017	0.011	0.060	0.016	0.023	0.014	0.012	0.003	0.015	0.031	0.035	0.001	0.003	0.000	0.000	0.000	0.000	0.018	0.060
18-Mar	0.000	Z	0.000	0.074	0.164	0.075	0.104	0.174	0.120	0.083	0.032	0.056	0.046	0.083	0.053	0.007	0.070	0.047	0.021	0.000	0.017	0.147	0.283	0.215	0.081	0.283
19-Mar	0.126	0.261	Z	0.109	0.099	0.197	0.265	0.266	0.288	0.085	0.048	0.062	0.044	0.008	0.014	0.009	0.003	0.001	0.019	0.002	0.047	0.049	0.011	0.067	0.090	0.288
20-Mar	0.076	0.086	0.037	Z	0.024	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.011	0.011	0.000	0.000	0.000	0.000	0.011	0.086
21-Mar	0.000	0.000	0.000	0.000	Z	0.008	0.037	0.021	0.038	0.086	0.086	0.121	0.137	0.075	0.131	0.085	0.068	0.065	0.079	0.042	0.003	0.024	0.158	0.048	0.057	0.158
22-Mar	0.031	0.098	0.018	0.005	0.043	Z	0.038	0.000	0.024	0.054	0.046	0.018	0.007	0.041	0.000	0.001	0.039	0.049	0.217	0.368	0.323	0.119	0.083	0.108	0.075	0.368
23-Mar	Z	0.107	0.054	0.108	0.042	0.043	0.023	0.070	0.119	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.032	0.048	0.024	0.032	0.119
24-Mar	0.000	Z	0.024	0.072	0.000	0.000	0.000	0.000	0.000	0.002	0.024	0.077	0.037	0.003	0.019	0.017	0.067	0.137	0.089	0.104	0.089	0.103	0.112	0.165	0.050	0.165
25-Mar	0.269	0.338	Z	0.136	0.118	0.104	0.126	0.145	0.255	0.287	0.077	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.088	0.087	0.338
26-Mar	0.016	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.005	0.035	0.079	0.060	0.013	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.079
27-Mar	0.000	0.015	0.048	0.048	Z	0.019	0.013	0.085	0.040	0.008	0.024	0.068	0.019	0.001	0.004	0.001	0.034	0.022	0.000	0.000	0.001	0.000	0.000	0.000	0.019	0.085
28-Mar	0.000	0.000	0.025	0.029	0.046	Z	0.074	0.073	0.074	0.004	0.000	0.001	0.009	0.003	0.008	0.000	0.000	0.002	0.087	0.094	0.038	0.018	0.061	0.120	0.033	0.120
29-Mar	Z	0.093	0.065	0.142	0.209	0.206	0.094	0.131	0.082	0.098	0.099	0.057	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.209
30-Mar	0.000	Z	0.039	0.041	0.041	0.055	0.078	0.084	0.139	0.131	0.066	0.004	0.012	0.002	0.001	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.139
31-Mar	0.033	0.058	Z	0.083	0.103	0.102	0.107	0.102	0.109	0.112	0.068	0.017	0.039	0.014	0.003	0.002	0.014	0.012	0.024	0.036	0.024	0.000	0.000	0.000	0.046	0.112
	0.053	0.072	0.036	0.049	0.047	0.056	0.055	0.057	0.050	0.043	0.032	0.033	0.023	0.013	0.011	0.011	0.018	0.029	0.048	0.048	0.035	0.039	0.046	0.047	Diurnal Average	
	0.444	0.338	0.273	0.142	0.209	0.206	0.302	0.310	0.288	0.287	0.113	0.121	0.137	0.083	0.131	0.148	0.070	0.137	0.286	0.368	0.323	0.266	0.283	0.267	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	319	45.12	45.12
0.006 - 0.05	203	28.71	73.83
0.06 - 0.1	152	21.50	95.33
> 0.1	33	4.67	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	84	58	11	3	6	5	75	24	9	5	4	2	1	4	9	19	319
0.006 - 0.05	30	5	0	3	2	13	45	41	18	8	1	2	3	7	11	14	203
0.06 - 0.1	22	5	2	2	2	21	15	26	18	5	1	1	1	3	8	19	151
> 0.1	3	1	0	2	0	5	6	6	2	1	0	0	0	1	4	2	33
Totals	139	69	13	10	10	44	141	97	47	19	6	5	5	15	32	54	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Mildred Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.9 ppm on Mar 18 05:00

Maximum Daily Average: 2.6 ppm on Mar 22

Minimum Value: 2.0 ppm on Mar 25 20:00

Maximum Diurnal Average: 2.3 ppm at hour 2

Monthly Average: 2.15 ppm

Minimum Daily Average: 2.0 ppm on Mar 4

Minimum Diurnal Average: 2.1 ppm at hour 15

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.2 P_{90} = 2.4 P_{99} = 3.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	2.6	2.8	2.6	Z	2.7	2.6	2.4	2.3	2.3	2.1	2.1	2.3	2.3	2.1	2.1	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.3	2.8
2-Mar	2.2	2.2	2.1	2.2	Z	2.4	2.2	2.2	2.5	2.7	2.2	2.2	2.1	2.2	2.3	2.6	2.2	2.1	2.1	2.2	2.1	2.3	2.2	2.0	2.2	2.7
3-Mar	2.0	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
4-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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
5-Mar	2.0	Z	2.0	2.0	2.0	2.4	2.4	2.6	2.5	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.4	2.9	2.7	2.6	2.7	2.6	DF	2.3	2.9
6-Mar	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	Z	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.3
7-Mar	2.0	2.1	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	2.1
8-Mar	2.0	2.0	2.0	Z	2.1	2.0	2.2	2.0	2.0	2.1	C	C	C	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.2
9-Mar	2.0	2.1	2.0	2.1	Z	2.5	2.5	2.6	2.5	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.6
10-Mar	2.0	2.0	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	2.1	2.0	2.1
11-Mar	Z	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.4	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	2.1	2.4
12-Mar	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
13-Mar	2.1	2.2	Z	2.3	2.4	2.2	2.1	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	2.1	2.0	2.0	2.0	2.1	2.4
14-Mar	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.2
15-Mar	2.1	2.2	2.0	2.1	Z	2.2	2.1	2.1	2.2	2.6	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.6
16-Mar	2.8	2.6	2.1	2.2	2.2	Z	2.3	2.2	2.1	M	M	2.2	2.2	2.2	2.1	2.3	2.1	2.1	2.3	2.5	2.2	2.0	2.1	2.2	2.2	2.8
17-Mar	Z	2.1	2.8	2.4	2.2	2.6	2.4	2.2	2.1	2.5	2.1	2.4	2.3	2.1	2.2	2.1	2.2	2.3	2.1	2.0	2.1	2.0	2.0	2.0	2.2	2.8
18-Mar	2.0	Z	2.0	2.8	3.9	2.8	2.8	3.7	2.8	2.8	2.1	2.1	2.1	2.2	2.1	2.0	2.5	2.3	2.0	2.0	2.1	2.2	2.4	2.5	2.4	3.9
19-Mar	2.3	2.3	Z	2.1	2.1	2.2	2.2	2.2	2.5	2.2	2.1	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.5
20-Mar	2.0	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
21-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.2	2.3	2.3	2.6	2.4	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.0	2.1	3.4	2.5	2.2	3.4
22-Mar	2.5	2.6	2.2	2.2	2.4	Z	2.4	2.0	2.2	2.3	2.2	2.2	2.1	2.1	2.0	2.2	2.4	2.8	3.5	3.6	3.6	3.6	2.9	3.1	2.6	3.6
23-Mar	Z	2.8	2.3	2.5	2.2	2.1	2.1	2.1	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.8
24-Mar	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.1	2.0	2.2	2.3	2.1	2.1	2.1	2.1	2.3	2.5	2.1	2.5
25-Mar	3.0	3.4	Z	2.6	2.4	2.4	2.3	2.5	2.9	2.6	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.4
26-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
27-Mar	2.0	2.0	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2
28-Mar	2.0	2.0	2.1	2.1	2.2	Z	2.4	2.3	2.2	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.2	2.1	2.6	2.5	2.5	2.3	2.4	3.0	2.2	3.0
29-Mar	Z	2.5	2.2	2.2	2.3	2.6	2.3	2.6	2.3	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	2.2	2.6
30-Mar	2.0	Z	2.1	2.1	2.2	2.3	2.5	2.5	2.6	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.6
31-Mar	2.1	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.2	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	2.1	2.3
	2.2	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	Diurnal Average	
	3.0	3.4	2.8	2.8	3.9	2.8	2.8	3.7	2.9	2.8	2.4	2.6	2.4	2.2	2.3	2.6	2.5	2.8	3.5	3.6	3.6	3.6	3.4	3.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Mildred Lake - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	325	45.97	45.97
2.1 - 3.0	373	52.76	98.73
3.1 - 10.0	9	1.27	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Mildred Lake - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	95	61	11	4	7	23	57	13	7	7	4	1	1	4	11	19	325
2.1 - 3.0	44	8	2	6	3	21	83	77	39	12	2	4	4	11	21	35	372
3.1 - 10.0	0	0	0	0	0	0	1	7	1	0	0	0	0	0	0	0	9
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	139	69	13	10	10	44	141	97	47	19	6	5	5	15	32	54	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Mildred Lake

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Mildred Lake - March 2023

Maximum Value: 9.2 C on Mar 18 16:00

Maximum Daily Average: 0.5 C on Mar 18

Minimum Value: -29.6 C on Mar 6 07:00

Minimum Daily Average: -21.0 C on Mar 5

Maximum Diurnal Average: -4.4 C at hour 16

Minimum Diurnal Average: -14.8 C at hour 7

Monthly Average: -9.64 C

Percentiles: P_1 = -27.0 P_{10} = -18.2 Q_1 = -13.7 Median = -9.6 Q_3 = -5.1 P_{90} = -1.2 P_{99} = 6.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-24.1	-24.7	-24.6	-25.1	-23.9	-23.1	-22.6	-20.8	-19.4	-17.4	-15.0	-12.6	-10.4	-8.7	-7.9	-7.6	-8.3	-8.6	-9.0	-9.0	-8.6	-8.4	-8.1	-7.8	-14.8	-7.6
2-Mar	-8.0	-8.1	-8.1	-7.9	-7.6	-7.4	-7.0	-7.0	-6.6	-5.4	-3.3	0.4	2.2	3.0	3.9	4.1	3.5	2.9	2.0	1.4	0.8	0.3	0.1	-0.7	-2.2	4.1
3-Mar	-1.2	-3.2	-6.2	-7.6	-8.6	-9.0	-9.6	-10.0	-10.5	-11.0	-10.5	-10.4	-10.4	-10.1	-9.2	-9.1	-9.3	-10.1	-10.8	-11.9	-12.1	-12.9	-14.5	-15.3	-9.7	-1.2
4-Mar	-15.7	-16.0	-16.1	-16.2	-16.3	-16.5	-16.9	-17.9	-17.9	-17.6	-16.8	-15.9	-15.5	-15.0	-14.3	-14.1	-14.4	-15.2	-16.4	-17.6	-18.5	-21.2	-21.2	-20.6	-16.8	-14.1
5-Mar	-21.4	-21.9	-22.7	-24.6	-26.7	-26.7	-27.4	-24.9	-22.3	-20.0	-18.9	-18.0	-16.8	-16.4	-15.8	-15.2	-15.2	-16.7	-18.7	-20.8	-22.8	-24.2	-25.3	DF	-21.0	-15.2
6-Mar	-26.4	-27.2	-27.9	-28.3	-29.2	-29.5	-29.6	-29.3	-25.9	-23.2	-20.2	-17.2	-14.3	-12.6	-10.9	-10.6	-10.4	-10.8	-11.6	-11.9	-11.6	-12.0	-12.5	-13.1	-19.0	-10.4
7-Mar	-13.1	-12.5	-12.4	-12.6	-12.7	-12.9	-13.2	-13.4	-13.3	-12.7	-12.4	-11.8	-11.2	-9.8	-8.3	-7.0	-7.1	-7.1	-8.0	-8.4	-8.6	-8.8	-8.6	-8.8	-10.6	-7.0
8-Mar	-9.6	-10.6	-11.4	-11.9	-13.0	-13.6	-14.7	-14.8	-14.2	-12.7	-11.4	-10.3	-8.5	-7.1	-6.3	-5.8	-5.7	-6.6	-7.9	-9.8	-10.8	-11.7	-12.5	-13.2	-10.6	-5.7
9-Mar	-13.9	-14.4	-14.9	-16.2	-16.9	-17.8	-18.1	-18.8	-17.9	-16.3	-14.0	-11.2	-9.7	-8.9	-8.3	-7.7	-7.7	-7.9	-8.4	-8.7	-9.5	-10.0	-9.6	-9.7	-12.3	-7.7
10-Mar	-10.2	-10.7	-11.1	-10.9	-11.1	-11.4	-11.2	-11.2	-10.8	-9.9	-8.9	-8.3	-8.0	-7.2	-6.4	-5.3	-5.2	-5.8	-6.7	-6.8	-6.7	-6.8	-7.6	-8.1	-8.6	-5.2
11-Mar	-8.6	-8.8	-9.0	-9.5	-9.8	-10.0	-10.1	-10.3	-9.4	-8.5	-7.6	-6.3	-4.7	-4.1	-3.4	-3.4	-4.0	-4.5	-6.3	-8.0	-8.9	-9.7	-10.4	-11.0	-7.8	-3.4
12-Mar	-11.5	-11.6	-12.0	-12.5	-13.0	-13.7	-14.5	-14.9	-14.7	-14.1	-13.5	-13.2	-13.1	-12.6	-12.0	-11.7	-11.3	-11.8	-12.5	-12.8	-13.1	-13.6	-14.2	-14.6	-13.0	-11.3
13-Mar	-15.1	-15.8	-16.4	-17.3	-18.2	-18.4	-18.4	-18.4	-17.8	-16.3	-14.7	-12.3	-10.6	-8.8	-7.7	-6.6	-5.9	-6.3	-6.9	-6.6	-6.5	-7.5	-8.3	-8.8	-12.1	-5.9
14-Mar	-9.8	-10.2	-10.6	-11.0	-11.1	-11.4	-11.7	-12.1	-12.6	-13.0	-13.0	-12.4	-11.6	-11.2	-11.2	-11.2	-11.5	-12.0	-12.5	-13.1	-13.4	-13.7	-14.0	-14.5	-12.0	-9.8
15-Mar	-15.0	-15.8	-16.7	-17.5	-18.5	-19.4	-17.3	-16.9	-15.7	-14.3	-12.7	-11.6	-10.4	-9.6	-8.8	-8.0	-8.3	-9.7	-10.6	-13.9	-15.1	-16.3	-17.1	-16.2	-14.0	-8.0
16-Mar	-15.2	-15.1	-14.6	-14.7	-14.2	-14.0	-13.8	-13.7	-13.4	-12.5	-11.2	-9.9	-8.3	-7.0	-5.6	-4.6	-4.0	-4.2	-5.4	-6.4	-6.6	-7.3	-8.1	-8.5	-9.9	-4.0
17-Mar	-8.6	-9.4	-10.5	-10.9	-11.6	-11.2	-12.9	-12.8	-10.4	-7.7	-5.3	-2.8	-0.3	2.8	5.3	7.1	8.3	7.3	2.6	0.2	-0.2	-0.5	-1.9	-2.2	-3.6	8.3
18-Mar	-1.8	-2.0	-3.3	-5.1	-7.0	-7.7	-8.2	-6.4	-5.0	-2.5	-0.1	2.1	4.1	6.2	8.1	9.2	8.9	8.9	6.9	5.0	2.9	1.0	-1.3	-1.1	0.5	9.2
19-Mar	-1.6	-2.5	-3.5	-4.7	-7.1	-8.7	-9.6	-7.9	-5.2	-4.0	-2.2	-0.3	-0.2	0.3	0.8	1.2	1.2	0.4	-0.6	-2.0	-2.6	-3.2	-3.5	-3.8	-2.9	1.2
20-Mar	-3.9	-4.2	-4.9	-5.9	-6.5	-7.3	-8.0	-7.7	-7.4	-7.4	-6.5	-5.0	-4.4	-2.8	-1.8	-1.3	-1.7	-3.0	-4.5	-6.2	-7.9	-9.4	-10.7	-12.3	-5.9	-1.3
21-Mar	-13.4	-14.7	-17.3	-18.0	-18.2	-19.2	-18.4	-18.0	-15.6	-13.7	-12.0	-9.8	-7.8	-6.7	-5.4	-4.9	-4.8	-4.9	-6.3	-8.1	-9.1	-10.2	-10.3	-10.3	-11.5	-4.8
22-Mar	-10.6	-11.9	-10.8	-11.0	-13.5	-13.8	-13.9	-13.7	-11.3	-7.6	-5.0	-3.1	-1.6	-0.1	1.0	2.0	2.6	2.5	1.1	0.0	-1.0	-1.1	-1.4	-2.5	-5.2	2.6
23-Mar	-4.0	-5.8	-7.4	-7.9	-7.7	-6.2	-6.8	-6.2	-2.8	-0.9	-0.1	0.0	0.3	-0.8	-1.2	-1.0	-2.1	-3.4	-4.6	-6.0	-7.0	-8.7	-8.1	-7.8	-4.4	0.3
24-Mar	-7.0	-7.3	-8.6	-9.6	-10.9	-13.0	-14.0	-12.0	-10.8	-9.6	-8.0	-6.2	-4.6	-3.6	-2.8	-2.3	-1.9	-2.3	-3.7	-4.9	-6.7	-9.7	-11.2	-12.2	-7.6	-1.9
25-Mar	-13.2	-14.5	-15.3	-15.8	-16.7	-17.5	-17.2	-14.6	-13.0	-10.2	-7.1	-4.5	-3.3	-2.6	-2.4	-2.6	-3.1	-4.3	-6.1	-8.0	-9.7	-11.0	-12.5	-14.2	-10.0	-2.4
26-Mar	-16.0	-17.5	-18.4	-19.6	-20.5	-21.5	-22.1	-20.9	-18.6	-16.7	-15.4	-13.8	-12.2	-10.9	-10.0	-10.0	-10.0	-10.4	-11.8	-13.3	-14.5	-15.4	-16.6	-18.7	-15.6	-10.0
27-Mar	-21.0	-21.7	-22.6	-23.6	-24.2	-24.2	-23.5	-22.6	-19.1	-15.9	-13.0	-10.8	-9.1	-7.4	-6.7	-6.2	-6.1	-6.3	-7.5	-9.0	-9.8	-11.1	-13.7	-16.2	-14.6	-6.1
28-Mar	-18.6	-19.1	-19.7	-20.7	-21.1	-22.2	-22.4	-19.6	-17.1	-14.2	-10.2	-7.5	-5.8	-4.4	-2.7	-2.0	-1.7	-1.5	-1.9	-2.6	-2.6	-2.3	-2.4	-2.7	-10.2	-1.5
29-Mar	-3.2	-3.9	-4.0	-5.3	-7.2	-6.1	-4.8	-3.6	-2.5	-2.3	-1.8	-1.1	-0.7	-0.8	-0.8	-1.0	-0.8	-1.5	-2.5	-3.3	-4.0	-5.1	-7.3	-10.0	-3.5	-0.7
30-Mar	-11.0	-11.8	-12.6	-13.2	-13.9	-13.6	-13.3	-11.6	-9.2	-6.3	-4.9	-3.4	-2.8	-2.0	-1.4	-1.0	-1.2	-1.4	-2.1	-2.7	-3.3	-4.1	-5.2	-6.4	-6.6	-1.0
31-Mar	-7.1	-7.3	-7.7	-8.2	-8.2	-8.3	-8.1	-7.6	-6.8	-5.4	-4.0	-2.4	-1.1	-0.1	0.5	1.4	1.7	1.4	0.5	-1.9	-1.4	-0.6	-1.5	-2.5	-3.5	1.7
	-11.6	-12.3	-12.9	-13.7	-14.4	-14.7	-14.8	-14.2	-12.8	-11.3	-9.7	-8.1	-6.8	-5.8	-4.9	-4.4	-4.4	-4.9	-6.1	-7.3	-8.0	-8.9	-9.7	-9.8	Diurnal Average	
	-1.2	-2.0	-3.3	-4.7	-6.5	-6.1	-4.8	-3.6	-2.5	-0.9	-0.1	2.1	4.1	6.2	8.1	9.2	8.9	8.9	6.9	5.0	2.9	1.0	0.1	-0.7	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Mildred Lake - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	52	7.00	7.00
-20 - 0	644	86.68	93.67
0 - 10	47	6.33	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mildred Lake - March 2023

Maximum Value: 93.8 % on Mar 19 07:00

Maximum Daily Average: 85.9 % on Mar 14

Minimum Value: 30.9 % on Mar 18 18:00

Minimum Daily Average: 48.8 % on Mar 8

Maximum Diurnal Average: 79.2 % at hour 7

Minimum Diurnal Average: 54.9 % at hour 16

Monthly Average: 68.09 %

Percentiles: P_1 = 36.7 P_{10} = 48.1 Q_1 = 59.0 Median = 69.5 Q_3 = 78.7 P_{90} = 84.9 P_{99} = 89.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	79.2	79.1	79.0	78.6	79.4	79.9	80.3	81.4	82.0	81.4	73.9	68.3	64.6	62.1	61.5	62.7	66.6	69.4	72.4	75.2	76.3	76.4	76.7	76.8	74.3	82.0
2-Mar	81.7	87.9	88.1	90.0	89.3	88.0	85.8	84.7	83.1	79.2	73.7	62.6	60.7	61.2	58.7	59.1	65.8	70.2	75.0	74.6	76.9	76.6	70.3	68.1	75.5	90.0
3-Mar	67.7	80.8	77.7	77.7	76.3	74.5	73.7	75.8	73.9	71.9	67.7	67.5	67.1	65.4	63.6	63.5	61.1	72.1	82.8	87.5	86.8	83.2	76.3	77.4	73.8	87.5
4-Mar	74.6	75.4	77.5	79.7	81.2	83.1	82.1	77.9	77.2	73.9	68.7	62.1	58.3	56.5	52.8	54.4	60.3	62.5	67.1	68.0	69.7	76.9	80.9	75.6	70.7	83.1
5-Mar	77.3	76.6	77.4	79.7	78.7	79.0	78.0	78.8	74.7	63.0	57.6	59.8	54.9	51.6	50.0	50.5	52.8	56.5	64.5	70.1	75.1	76.7	78.0	DF	67.9	79.7
6-Mar	78.3	77.5	77.2	76.7	75.6	75.8	76.1	75.6	75.8	70.2	62.8	59.6	59.2	62.7	65.2	69.4	75.5	76.1	75.4	76.3	74.1	72.9	73.2	75.9	72.4	78.3
7-Mar	79.5	81.9	80.7	78.4	76.6	75.8	75.7	77.3	78.2	74.5	72.3	71.9	70.7	64.8	59.5	53.6	49.0	49.9	48.6	49.6	50.5	50.4	49.6	48.3	65.3	81.9
8-Mar	48.6	49.8	51.4	51.8	55.3	57.3	60.8	60.8	59.7	55.1	50.4	48.8	45.7	40.4	37.2	36.9	36.2	38.9	41.6	44.8	47.8	47.8	50.3	52.6	48.8	60.8
9-Mar	54.3	54.6	55.5	59.7	61.7	64.1	64.7	66.0	63.3	59.1	53.6	49.3	46.4	47.3	46.7	46.4	47.3	49.1	51.2	52.6	56.8	62.7	61.3	63.1	55.7	66.0
10-Mar	68.3	77.2	80.5	80.6	76.3	76.4	74.4	73.9	73.1	69.5	65.5	64.9	70.4	67.0	62.5	58.0	60.0	63.2	69.4	69.9	66.9	63.9	67.6	68.4	69.5	80.6
11-Mar	66.0	66.5	64.6	62.8	63.8	66.0	69.1	72.2	69.5	65.7	64.0	61.9	58.8	57.7	56.7	56.5	67.8	72.8	80.2	83.3	85.3	86.3	85.9	86.7	69.6	86.7
12-Mar	86.8	86.4	85.1	84.1	83.8	84.9	84.3	83.0	79.2	76.7	75.8	73.9	74.2	74.1	73.9	73.5	75.0	79.0	81.1	83.1	84.2	84.5	84.7	84.9	80.7	86.8
13-Mar	85.2	85.4	85.3	84.9	84.2	84.0	83.8	83.6	83.5	83.1	79.9	75.1	71.4	68.3	65.7	64.2	64.1	67.5	71.7	72.7	72.2	79.2	87.2	89.1	78.0	89.1
14-Mar	89.4	89.1	88.5	88.2	88.2	87.9	87.6	87.1	85.8	84.7	84.5	84.5	82.9	82.9	84.3	84.4	85.9	85.8	85.3	85.0	85.3	85.4	84.8	85.0	85.9	89.4
15-Mar	85.2	85.8	86.0	85.1	83.9	83.5	84.5	84.2	83.2	76.2	70.5	69.9	66.7	65.6	66.3	66.3	68.4	74.5	82.2	87.8	87.5	85.8	84.9	85.5	79.2	87.8
16-Mar	86.1	86.1	85.9	85.2	82.8	83.7	84.0	84.4	79.6	76.6	74.4	72.1	67.4	66.2	65.7	66.3	66.9	68.9	73.3	76.6	77.7	78.1	80.4	82.0	77.1	86.1
17-Mar	83.5	83.6	84.3	85.6	87.5	85.9	86.9	84.1	76.5	71.8	67.4	63.2	59.2	54.6	51.5	49.0	43.8	45.0	69.2	69.0	59.3	57.5	61.5	58.8	68.3	87.5
18-Mar	51.8	50.3	52.8	59.6	65.9	68.1	68.5	62.7	57.2	55.3	50.7	45.0	40.2	37.4	34.3	32.2	33.9	30.9	36.8	42.7	49.7	58.1	67.7	66.8	50.8	68.5
19-Mar	68.1	72.1	76.3	80.0	88.6	93.8	93.8	90.6	75.2	69.7	64.2	59.5	61.7	61.0	61.2	60.3	60.3	65.1	69.5	73.1	72.4	73.8	73.4	72.9	72.4	93.8
20-Mar	70.7	70.5	69.3	67.8	68.4	68.7	66.2	64.2	70.2	77.4	79.0	78.4	75.4	64.8	62.0	58.9	57.2	55.8	55.9	56.5	58.7	61.2	64.1	68.9	66.3	79.0
21-Mar	72.2	76.2	84.0	86.5	84.2	83.1	83.9	83.7	84.2	77.5	72.0	69.5	65.9	63.4	59.4	59.2	57.1	55.7	60.1	66.7	70.6	75.2	78.1	81.3	72.9	86.5
22-Mar	83.6	86.9	84.7	82.3	86.7	86.7	85.3	84.5	76.4	67.4	59.9	54.5	50.7	47.1	45.6	45.4	45.4	47.8	54.4	56.5	59.5	59.6	58.5	62.4	65.5	86.9
23-Mar	67.6	73.4	79.2	81.9	79.9	78.3	78.1	75.7	67.6	55.5	52.4	57.1	55.3	59.9	59.8	56.3	60.9	64.0	67.2	72.5	74.8	82.7	83.6	81.5	69.4	83.6
24-Mar	75.1	75.4	77.5	76.3	78.1	84.0	87.4	77.6	72.0	68.5	63.9	59.1	52.3	49.3	46.3	45.8	43.9	46.2	51.3	52.0	59.3	69.5	75.2	78.1	65.2	87.4
25-Mar	80.2	84.0	86.4	86.7	84.5	84.1	83.9	80.3	77.0	65.7	53.1	42.8	39.2	38.8	36.6	35.7	33.1	37.0	42.8	55.0	61.2	62.4	66.4	68.3	61.9	86.7
26-Mar	68.7	71.2	69.3	72.7	73.6	76.0	77.5	73.6	63.3	57.7	54.5	55.8	53.7	45.6	40.6	38.2	37.2	38.1	42.5	46.4	49.4	52.0	56.5	63.3	57.4	77.5
27-Mar	71.7	74.6	78.6	79.1	78.4	79.4	78.7	76.6	68.8	59.0	52.9	49.1	44.1	39.8	41.7	42.3	42.0	41.6	46.7	47.9	47.3	49.2	56.1	65.2	58.8	79.4
28-Mar	71.5	71.9	74.8	77.9	80.8	80.8	80.4	76.1	67.0	57.7	48.8	44.3	45.4	44.9	44.3	45.7	46.7	48.1	50.6	51.6	52.5	47.0	46.8	50.9	58.6	80.8
29-Mar	51.9	54.5	54.0	58.9	69.9	77.8	78.9	75.0	72.6	72.5	70.9	71.6	70.9	70.7	68.1	67.2	62.0	60.2	60.1	61.8	62.0	65.7	73.8	83.2	67.3	83.2
30-Mar	86.0	88.6	88.9	89.6	88.0	87.7	88.1	88.5	84.3	68.6	52.8	47.7	48.5	45.9	44.3	41.9	42.0	45.4	47.5	52.0	54.1	57.0	59.7	63.6	65.0	89.6
31-Mar	67.5	68.7	69.9	73.1	73.6	72.8	72.9	71.7	70.8	67.6	64.2	61.9	62.4	59.7	59.9	58.6	57.8	59.2	62.9	71.8	69.6	66.9	69.9	72.0	66.9	73.6
	73.5	75.5	76.5	77.5	78.2	79.1	79.2	77.8	74.3	69.4	64.6	61.7	59.5	57.3	55.7	54.9	55.7	57.9	62.6	65.6	66.9	68.5	70.4	71.9	Diurnal Average	
	89.4	89.1	88.9	90.0	89.3	93.8	93.8	90.6	85.8	84.7	84.5	84.5	82.9	82.9	84.3	84.4	85.9	85.8	85.3	87.8	87.5	86.3	87.2	89.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Mildred Lake - March 2023

Maximum Speed: 22 km/h on Mar 10 00:00

Maximum Daily Speed Average: 15.9 km/h on Mar 14

Minimum Speed Value: 1 km/h on Mar 25 01:00

Minimum Daily Speed Average: 0.2 km/h on Mar 24

Maximum Diurnal Speed Average: 3.9 km/h at hour 19

Minimum Diurnal Speed Average: 1.6 km/h at hour 13

Monthly Average Velocity: 2.4 km/h 82.2 deg

Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 12$ $P_{90} = 15$ $P_{99} = 18$

Hours in Service: 744

Hours of Data: 742

Hours of Missing Data: 2

Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE4	ESE3	ESE2	S3	S4	S4	S6	SSE8	SSE9	SSE13	SSE14	SSE10	SE11	SE12	SE11	SSE11	SE10	SE12	SE12	SE10	ESE12	SE13	SE15	SE16	SE9.0	SE16
2-Mar	SE11	SE14	SE18	SE16	SE14	SE16	SE16	SSE12	SE12	SE13	SE10	SSE6	S8	WNW5	NW7	WNW9	WNW15	W14	WNW15	WNW13	W10	WNW11	NW17	NW18	SSW3.5	NW18
3-Mar	NW16	NNE11	NNE14	NNE11	NNE10	NNE10	NNE11	NE10	NNE10	NNE11	NNE10	NNE9	NNE10	NE8	NNW7	N10	NNE8	N7	N7	N5	NNE7	NNE11	NNE13	NNE10	NNE9.2	NW16
4-Mar	NNE9	NE5	N3	NNW5	N4	NE2	NNE8	NNE9	NNE8	N10	NNW12	NW15	NW16	NW16	NNW15	NNW12	N12	N10	NNE7	NNE6	N6	N5	NNW6	N8	N7.7	NW16
5-Mar	NNE7	N8	N7	NNW5	WNW2	SW3	WNW4	WNW5	NW8	NW7	NW6	S9	SSW7	S6	S5	SSE7	SSE9	SE7	SSE5	SE4	SE3	ESE3	E3	DF	SSW0.6	SSE9
6-Mar	NE4	NNE3	ENE2	ESE4	UO	S2	S4	SSW3	S4	SSW4	S7	SSE9	SSE7	SSE9	SSE9	SSE9	SE11	ESE10	ESE8	ESE9	SE13	SE17	SE15	SE14	SE6.8	SE17
7-Mar	SE14	SE11	SE13	SE15	SE16	SE16	SE16	SE17	SE17	SE16	SE17	SE14	SE13	SE14	SE14	SE15	ESE14	ESE11	ESE13	SE10	SE17	SE16	SE17	SE16	SE14.5	SE17
8-Mar	SE14	SE14	SE13	SE13	SE10	SE10	SE6	SE10	SE12	SSE12	SSE12	SSE12	SSE8	SSE10	S9	SSE10	SE11	SE8	ESE9	ESE8	SE9	SSE16	SE16	SE15	SE10.9	SE16
9-Mar	SE15	SE15	SE16	SE9	SE10	SSE9	SSE11	SSE9	SSE11	SE14	SSE10	SSE13	SSE15	SE15	SE18	SE18	SE16	ESE15	SE15	SE18	ESE16	ESE18	SE20	SE22	SE14.2	SE22
10-Mar	SE21	SE19	SE16	SE17	SE19	SE17	SE17	SE16	SE15	SE15	SE16	SE18	SE14	ESE13	SE12	SE11	SE14	ESE12	E9	NE5	E6	ESE12	ESE11	ESE9	SE13.4	SE21
11-Mar	SE9	SE7	ESE6	ESE7	ESE6	ESE4	ESE4	SE2	SSE7	SE8	S9	S8	S10	SSE7	SE9	ESE8	NNE8	NNE9	NNE12	N12	N13	N12	N13	N12	E3.4	N13
12-Mar	N13	N13	N13	N13	N11	N9	N9	N9	NNE11	N11	N11	NNW13	NNW12	NNW12	NNW14	N11	N11	N11	N12	N13	N12	N13	N14	N13	N11.6	NNW14
13-Mar	N12	N11	N12	N11	N8	N9	N8	N11	N10	N11	NNW12	NNW12	NW11	N12	N13	N15	N14	N12	N11	NNE9	N10	NNE12	N12	N14	N11.1	N15
14-Mar	N16	N17	N18	N17	N17	N15	N16	N16	N18	N19	N18	N15	N17	N16	N16	N16	NNW14	NNW16	N17	N16	N14	N14	N14	N13	N15.9	N19
15-Mar	N12	NNW6	N6	N5	NNW3	NNW5	NNW6	NNW6	NW4	SSW4	SSW6	WSW8	W7	WNW8	NW8	NW9	NW7	NNW5	NNW5	N5	NW2	ENE1	SSW2	SE3	NW3.8	N12
16-Mar	SE5	ESE6	ESE7	ESE4	SE7	ESE3	SE4	SE4	S8	SE6	SE11	SSE11	SSE11	SSE11	SE12	SE11	SE12	SE11	SE9	SE9	SE12	SE12	SE10	SSE12	SE8.4	SE12
17-Mar	SE13	SSE10	SSE12	SSE11	SSE11	SSE12	SSE8	S7	S9	SSE11	SE12	SSE13	SSE13	SE12	SE11	SE8	SSE6	S2	S3	SW3	WSW2	SSW4	S6	SW5	SSE7.9	SE13
18-Mar	SW6	SW10	SSW5	SSE4	SSE4	S6	ESE4	SSE6	SSE9	SSE9	SE10	SE9	SE9	SSE7	SSE6	SSE6	S6	NNE4	NNE8	NNE8	N7	N7	NNW8	NNW10	SSE2.6	SE10
19-Mar	N10	N9	N9	NNE6	N3	N4	NNE1	ENE1	SE6	SE7	SE8	SSE8	SSE11	SSE10	SSE11	SSE12	SE10	SE10	SE12	ESE9	ESE10	ESE12	ESE11	ESE10	SE5.0	SE12
20-Mar	ESE10	SE7	SE7	SE7	ESE6	ENE5	ENE7	ENE8	ENE9	E7	E4	N7	N12	NNE13	NNE14	NNE13	N17	N18	N16	N16	NNE14	N15	N11	N8	NNE7.7	N18
21-Mar	N7	N4	N2	WNW3	NNW5	N3	NNW5	NNW4	NNW5	NW3	SSW5	S6	S7	S7	S7	S8	SSE8	SSE8	SSE6	SSE7	SSE7	SSE7	SE9	SE10	SSE2.5	SE10
22-Mar	SE10	SE6	SE12	SE9	S6	S6	S7	SSW6	S7	SSE11	SSE12	SSE12	SSE12	SSE11	SE12	SSE12	SSE11	SE11	SSE9	SSE8	SSE7	SSE8	SSE8	SSE9	SSE9.0	SSE12
23-Mar	S4	S4	SE2	S5	S6	S6	S5	SSW5	NNW6	N12	NNE16	NNE15	NNE14	NNE14	N17	NNE18	NE17	NNE15	N14	N10	N6	W1	W1	NW4	NNE5.7	NNE18
24-Mar	N7	N7	N8	NNE9	NNE5	NNE3	NE5	NNE6	N7	NW7	WNW7	SW7	WSW5	SW5	WSW3	S7	SSE8	SSE9	SSE8	SSE6	SSE5	E4	SE3	SE3	NNE0.2	SSE9
25-Mar	S1	S1	S3	SSE2	ENE2	NE3	S1	N3	NW7	NW7	NW10	N11	N9	N12	NNE12	NNE13	NNE12	NE15	NNE13	N11	N9	N10	N10	N11	N6.7	NE15
26-Mar	N8	NNW8	N9	N5	NNE4	NNE4	N6	N7	N4	WNW4	NW9	NW11	NW11	NNW11	NNW14	N15	N14	N12	N12	N12	N11	N10	N6	N5	N8.4	NNW15
27-Mar	NNW6	NW3	SSW3	S3	SSW3	SSW4	S5	S5	SSE6	SSE8	SSE9	SSE9	SSE8	SSE7	SSE11	SE11	ESE9	ESE7	ESE3	NNE7	NNE8	NNE8	NNE5	NE4	SE3.1	SE11
28-Mar	NNE4	N5	N6	N3	SSW3	S3	S4	S3	SSW4	S6	SSE10	SSE11	SSE12	SE14	SE13	SE13	SE14	SE11	SE12	SE13	SE10	SE10	SSE7	SSE4	SSE6.5	SSE14
29-Mar	NNE2	NNW5	NNW6	NNW4	WNW3	NW7	NW3	NNW3	NNW7	NNW9	NNW9	NNW11	N14	N14	NNE13	NNE11	N15	NNE12	NNE12	NNE9	N7	N6	N5	N4	N7.3	N15
30-Mar	WNW1	SSW2	SSW3	SSW2	ENE2	S2	SSE2	ESE3	ESE2	SE3	ENE4	SE3	SSW7	SSW6	WSW6	ESE1	NNE8	NE8	NNE9	NE6	NNE5	NNE6	N7	NNW8	NE1.1	NNE9
31-Mar	NNW9	N9	NNW9	NNW8	N9	N8	NNW9	NNW11	N11	N10	NNW12	NNW13	NNW16	NNW15	NW16	NW15	NW14	NNW10	NW7	NNE3	E7	E13	E14	E11	N8.1	NW16
	ENE2.7	ENE2.4	E2.6	E2.4	ESE2.4	ESE2.1	ESE2.0	E1.7	E1.7	ESE2.3	ESE2.3	SE2.0	SE1.6	ESE1.7	ENE1.7	E2.6	ENE3.4	ENE3.7	NE3.9	NE3.8	ENE3.3	ENE3.8	ENE3.5	ENE3.0	Diurnal Average	
	SE21	SE19	N18	N17	SE19	SE17	SE17	SE17	NNW18	N19	N18	SE18	N17	N16	SE18	NNE18	NE17	N18	N17	SE18	SE17	ESE18	SE20	SE22	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 (WS) - km/h

Mildred Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 9 23:00

Minimum Value: 0 km/h on Mar 30 00:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	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-Mar	1	1	2	1	1	1	2	1	2	3	3	2	3	2	2	2	3	4	3	3	3	3	3	3	4
2-Mar	3	3	4	4	4	4	4	2	3	3	2	2	2	3	3	3	6	4	5	4	4	3	4	4	6
3-Mar	4	3	3	3	3	2	3	3	3	3	3	3	2	2	3	2	2	2	2	1	2	3	3	3	4
4-Mar	2	1	1	1	1	2	2	2	2	2	2	4	4	4	4	3	3	3	2	1	1	1	2	2	4
5-Mar	1	2	2	1	1	1	2	2	3	2	3	2	2	2	1	2	2	2	1	1	1	2	1	DF	3
6-Mar	1	1	1	2	UO	1	1	1	1	1	2	2	2	2	2	2	3	3	2	2	3	4	3	3	4
7-Mar	3	3	3	4	4	4	3	4	4	3	3	3	3	3	3	4	4	3	3	3	4	3	3	3	4
8-Mar	3	3	3	2	2	2	2	2	2	2	3	2	2	2	2	3	2	2	2	2	3	3	3	3	3
9-Mar	3	3	3	2	2	2	2	2	2	3	2	4	3	4	4	4	4	4	4	5	4	4	6	5	6
10-Mar	5	4	4	4	5	4	4	4	4	4	4	4	3	3	3	3	3	3	2	1	2	4	4	2	5
11-Mar	2	2	1	2	1	1	1	0	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
12-Mar	3	3	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3	2	2	3	3	3	3	3	3
13-Mar	3	2	2	2	1	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	3	3	3	3
14-Mar	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	4	2	3	3	3	3	2	3	2	4
15-Mar	2	3	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	2	1	2	1	3
16-Mar	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	3
17-Mar	4	2	2	2	3	3	2	1	1	2	2	2	2	2	2	2	1	2	1	1	1	1	2	2	4
18-Mar	2	3	3	2	2	2	1	1	2	2	2	1	1	1	1	1	2	3	2	2	1	1	1	1	3
19-Mar	1	1	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3
20-Mar	3	3	3	2	2	2	2	2	2	2	1	4	3	4	4	4	4	4	3	3	4	4	3	2	4
21-Mar	1	2	1	1	1	1	1	1	2	1	1	1	2	2	1	1	1	2	1	1	1	1	2	2	2
22-Mar	2	3	2	4	1	1	1	1	2	3	3	3	2	2	2	2	2	2	1	1	2	2	2	2	4
23-Mar	3	2	2	1	2	2	3	1	2	4	4	3	4	4	5	5	4	4	4	3	1	1	1	2	5
24-Mar	2	1	2	2	3	2	1	2	2	2	2	2	2	2	2	1	2	2	1	2	1	1	1	2	3
25-Mar	1	2	1	1	1	1	1	2	2	2	3	3	3	3	4	4	3	4	4	3	2	3	3	3	4
26-Mar	2	2	2	2	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	2	2	3	1	1	3
27-Mar	1	1	1	1	0	1	1	1	1	1	2	2	2	2	3	2	2	2	1	3	2	2	1	1	3
28-Mar	1	1	1	2	1	1	1	1	1	1	2	2	3	3	2	3	3	2	2	2	2	2	1	1	3
29-Mar	1	1	1	1	2	1	2	2	2	2	2	3	4	3	4	3	4	4	3	3	2	1	1	0	4
30-Mar	1	1	1	1	1	2	1	1	1	2	2	2	1	1	2	3	2	3	2	2	1	1	2	1	3
31-Mar	1	1	2	1	1	1	2	2	2	2	2	3	3	3	3	3	3	2	1	2	2	3	3	4	4
Diurnal Maximum	5	4	4	4	5	4	4	4	4	4	4	4	4	4	5	5	6	4	5	5	4	4	6	5	

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Mildred Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Mildred Lake - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	157	21.16	21.16
6 - 11	348	46.90	68.06
12 - 19	234	31.54	99.60
20 - 28	3	0.40	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Mildred Lake - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	18	13	7	7	3	13	12	8	24	16	4	3	2	8	6	13	157
6 - 11	65	38	4	3	5	22	53	72	28	5	3	2	2	4	17	25	348
12 - 19	63	21	2	0	2	10	83	21	0	0	0	0	1	3	9	19	234
20 - 28	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	146	72	13	10	10	45	151	101	52	21	7	5	5	15	32	57	742

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Mildred Lake

Total Number of Valid Hours: 742

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Mildred Lake - March 2023

Direction of Maximum Speed: 136 deg on Mar 10 00:00
Direction of Maximum Daily Speed Average: 354.8 deg on Mar 14

Direction of Minimum Speed: 179 deg on Mar 25 01:00

Direction of Minimum Daily Speed Average: 0.2 deg on Mar 24

Monthly Average Direction: 82.2 deg

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	161	115	119	173	180	169	173	164	162	148	150	151	140	144	145	147	138	140	137	126	121	127	129	137	142.9
2-Mar	128	135	143	132	140	145	144	159	142	139	130	154	185	291	312	299	282	273	283	285	275	291	306	310	194.9
3-Mar	315	17	25	17	24	21	23	35	32	30	25	32	25	42	348	349	26	354	2	5	12	12	25	18	16.0
4-Mar	30	34	3	329	7	51	31	29	19	360	337	321	315	313	330	338	359	0	25	13	352	352	346	7	351.3
5-Mar	15	9	358	345	289	225	291	292	318	323	318	187	195	187	172	165	156	141	157	141	126	114	82	DF	197.4
6-Mar	53	22	74	113	UO	170	190	200	184	192	171	162	154	162	163	155	128	118	110	112	139	141	140	141	142.1
7-Mar	138	129	138	140	140	138	139	139	139	142	142	136	143	142	133	124	123	108	111	126	144	144	145	139	135.9
8-Mar	138	137	139	140	135	132	133	142	145	151	153	148	162	165	174	156	146	128	119	102	145	148	143	138	142.8
9-Mar	140	136	145	142	146	159	159	168	155	146	147	155	156	146	135	140	141	123	126	135	120	116	129	136	139.8
10-Mar	136	140	140	138	136	136	137	135	133	138	135	144	133	123	125	143	128	111	81	54	94	116	112	117	129.8
11-Mar	128	132	118	107	107	122	123	137	150	140	181	176	178	154	145	114	33	12	12	8	7	8	9	9	81.9
12-Mar	6	4	4	4	6	358	2	1	12	6	354	345	345	343	344	350	11	352	358	0	4	1	3	1	358.8
13-Mar	1	355	358	356	356	0	9	10	1	349	348	343	323	354	353	1	7	353	353	20	8	14	9	5	358.4
14-Mar	359	357	355	358	1	2	357	357	349	349	353	356	358	355	349	351	341	345	353	357	357	358	2	359	354.8
15-Mar	357	342	354	4	327	347	342	341	323	195	205	250	259	298	323	324	310	330	345	356	312	62	192	129	322.0
16-Mar	126	112	107	119	143	117	137	125	173	142	143	149	153	149	139	141	134	132	132	138	140	142	140	154	139.6
17-Mar	142	151	164	163	152	154	160	189	171	149	142	148	147	133	133	133	150	175	175	219	247	210	183	215	156.1
18-Mar	225	216	205	155	163	180	120	150	168	153	143	142	146	147	157	160	171	24	33	23	6	355	338	346	147.2
19-Mar	356	358	358	19	9	351	12	67	146	138	146	156	165	161	165	154	143	143	140	120	111	106	110	114	123.9
20-Mar	115	124	127	128	120	78	66	64	68	83	84	9	5	18	19	22	1	354	360	4	12	10	8	360	29.6
21-Mar	1	11	349	285	327	351	347	342	342	306	196	189	178	188	183	172	152	153	148	158	165	155	141	137	163.6
22-Mar	140	145	141	146	177	175	181	197	175	155	151	156	154	158	141	149	149	146	148	152	158	160	159	160	154.8
23-Mar	179	175	132	170	183	176	188	211	337	10	29	29	23	23	3	12	35	21	6	3	7	276	273	318	17.8
24-Mar	350	356	1	20	24	12	35	15	3	310	285	232	245	227	250	180	160	157	159	154	147	98	131	140	31.2
25-Mar	179	177	179	155	69	52	187	10	326	320	323	353	8	5	17	21	18	37	22	6	358	360	352	354	5.8
26-Mar	4	341	0	6	18	24	9	6	353	302	318	312	322	335	340	349	355	3	352	358	358	3	358	351	349.1
27-Mar	345	308	208	183	192	193	187	177	168	168	166	158	156	154	156	137	117	118	120	23	12	20	31	39	139.1
28-Mar	15	1	2	353	195	175	187	176	210	181	163	163	149	146	145	139	144	140	146	143	141	143	149	147	148.5
29-Mar	33	331	343	330	298	324	317	330	333	346	340	338	2	7	24	17	0	27	29	22	11	359	3	350	359.9
30-Mar	285	206	202	197	66	188	160	113	122	139	75	140	203	203	240	109	32	36	32	40	20	13	349	343	45.4
31-Mar	346	350	345	347	349	351	347	347	351	352	346	340	329	343	325	323	325	329	324	30	90	94	100	97	351.7
	65.7	68.6	78.9	88.5	106.0	110.9	102.9	94.3	98.5	111.2	118.9	138.9	138.7	101.7	78.2	81.6	70.2	58.4	51.6	51.0	66.0	75.4	78.1	76.8	
	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

Mildred Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Mar 25 02:00

Minimum Value: 7 deg on Mar 29 06:00

Percentiles: $P_1 = 8$ $P_{10} = 12$ $Q_1 = 14$ Median = 17 $Q_3 = 22$ $P_{90} = 35$ $P_{99} = 72$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	21	20	41	16	13	22	15	10	17	11	15	17	16	15	19	13	15	17	16	17	17	17	17	14	41
2-Mar	17	16	15	17	16	13	15	15	15	14	17	43	34	60	41	24	23	20	17	18	24	17	14	13	60
3-Mar	19	21	18	19	19	17	19	19	19	18	23	28	25	25	40	18	23	21	15	13	17	19	19	19	40
4-Mar	20	17	23	8	13	53	18	16	18	22	20	18	15	17	17	21	17	16	17	17	11	9	16	14	53
5-Mar	13	14	13	16	48	28	45	25	16	20	36	16	23	20	24	19	12	13	20	20	21	40	30	DF	48
6-Mar	12	20	32	21	UO	36	15	16	18	24	25	15	24	15	19	16	18	20	16	18	15	14	14	12	36
7-Mar	15	18	14	14	15	16	15	14	15	15	15	17	15	19	19	20	18	21	17	18	14	12	12	14	21
8-Mar	14	14	13	12	15	15	14	10	11	14	16	19	30	21	19	23	15	18	16	16	16	12	12	13	30
9-Mar	12	14	10	13	10	16	13	14	12	11	17	17	17	19	18	16	14	19	20	18	18	18	19	15	20
10-Mar	16	14	14	15	16	17	15	16	17	16	18	15	20	22	26	23	20	20	13	27	27	19	17	17	27
11-Mar	16	19	17	13	15	17	15	38	18	28	18	22	19	35	29	33	30	24	17	17	16	17	16	16	38
12-Mar	15	15	17	16	17	15	16	16	19	21	23	17	18	15	16	19	20	15	14	14	16	16	15	15	23
13-Mar	15	14	13	14	12	13	18	17	17	15	14	17	15	19	18	18	18	13	13	21	24	18	15	15	24
14-Mar	15	14	16	15	16	15	14	15	13	12	14	14	15	15	13	15	12	12	14	14	13	13	14	13	16
15-Mar	13	38	12	13	40	16	9	12	15	56	25	25	35	34	21	18	19	23	15	8	59	79	80	41	80
16-Mar	26	18	15	18	21	60	53	39	17	21	17	12	15	12	16	16	15	15	13	13	13	12	16	16	60
17-Mar	15	19	13	15	14	13	15	12	15	12	15	13	13	15	15	14	13	76	33	42	53	18	19	25	76
18-Mar	23	19	67	54	30	11	28	21	15	14	13	15	11	11	14	13	22	88	13	14	13	10	8	9	88
19-Mar	10	12	13	16	42	30	18	54	22	23	22	25	21	17	15	14	16	14	17	19	17	17	18	19	54
20-Mar	17	25	22	18	20	20	15	17	17	21	33	71	22	25	27	27	19	15	17	17	16	17	17	15	71
21-Mar	16	18	34	13	19	15	21	20	19	60	27	18	24	23	24	18	19	13	14	11	11	14	11	12	60
22-Mar	16	28	12	38	25	15	16	16	25	18	16	17	17	16	17	15	13	12	9	9	11	13	13	12	38
23-Mar	61	51	50	31	25	19	27	22	39	21	22	24	25	24	24	21	22	23	20	18	15	67	45	12	67
24-Mar	15	11	11	16	53	26	15	22	26	33	32	30	57	52	59	22	16	13	13	11	17	23	29	54	59
25-Mar	83	94	21	50	41	49	73	39	17	17	14	23	34	32	33	22	25	20	21	18	18	17	15	15	94
26-Mar	17	18	16	20	22	19	11	14	41	44	18	17	22	21	21	21	19	20	15	16	14	16	13	15	44
27-Mar	7	40	43	17	12	12	12	17	17	18	20	18	23	25	20	22	24	19	34	18	16	15	14	23	43
28-Mar	20	16	11	15	20	21	19	25	20	24	18	17	16	14	15	15	12	14	11	12	13	14	13	47	47
29-Mar	42	16	11	41	53	7	58	67	14	16	18	23	21	20	23	22	19	22	18	17	18	12	13	8	67
30-Mar	66	46	12	50	56	43	57	24	36	53	50	65	22	25	27	84	30	28	18	20	16	16	12	8	84
31-Mar	8	9	9	9	8	9	9	10	13	15	15	18	17	16	15	12	12	13	12	47	15	12	13	15	47
Diurnal Maximum	83	94	67	54	56	60	73	67	41	60	50	71	57	60	59	84	30	88	34	47	59	79	80	54	

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Mildred Lake - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS03
LOWER CAMP METEOROLOGY
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
MARCH 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	71	0	673	9.54	4.6	-	-1.5	-
Temperature 45 m (C) Average	743	0	1	99.87	9.7	-	1.4	-
Temperature 100 m (C) Average	743	0	1	99.87	9.5	-	2.6	-
Temperature 163 m (C) Average	743	0	1	99.87	9.5	-	3.2	-
Relative Humidity 20 m (%) Average	71	0	673	9.54	88.1	-	72.4	-
Relative Humidity 45 m (%) Average	743	0	1	99.87	93.5	-	85.9	-
Relative Humidity 100 m (%) Average	743	0	1	99.87	87.4	-	83.5	-
Relative Humidity 163 m (%) Average	743	0	1	99.87	90.5	-	85.2	-
Wind Speed 20 m (km/h) Average	743	0	1	99.87	22	-	16.0	-
Wind Speed 45 m (km/h) Average	743	0	1	99.87	36	-	23.0	-
Wind Speed 100 m (km/h) Average	743	0	1	99.87	42	-	29.0	-
Wind Speed 163 m (km/h) Average	742	0	2	99.73	45	-	32.0	-
Wind Direction 20 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 45 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 100 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 163 m (deg) Average	742	0	2	99.73	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	743	0	1	99.87	0.5	-	0.0	-
Vertical Wind Speed 45 m (km/h) Average	743	0	1	99.87	1.5	-	0.8	-
Vertical Wind Speed 100 m (km/h) Average	743	0	1	99.87	2.1	-	0.7	-
Vertical Wind Speed 163 m (km/h) Average	742	0	2	99.73	3.5	-	1.2	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
Temperature 20 m (C) Average	71	-6.37	8	-	-23.8	-21.9	-8.6	-6.6	0.3	2.8	4.6
Temperature 45 m (C) Average	743	-9.06	6.7	-	-27.8	-17.5	-13.2	-9	-4.6	-0.8	9.7
Temperature 100 m (C) Average	743	-8.95	6.4	-	-25.1	-17.3	-13.4	-9.2	-4.4	-0.9	9.5
Temperature 163 m (C) Average	743	-8.95	6.3	-	-23.1	-16.9	-13.5	-9.1	-4.6	-0.9	9.5
Relative Humidity 20 m (%) Average	71	69.62	9.4	-	51.3	55.7	62.4	70	77.6	79.5	88.1
Relative Humidity 45 m (%) Average	743	65.88	14.5	-	28	44.5	56.2	67.9	77.2	84.4	93.5
Relative Humidity 100 m (%) Average	743	63.06	14.2	-	24.9	41.7	53.9	65.4	74.1	81	87.4
Relative Humidity 163 m (%) Average	743	64.01	14.7	-	24.7	42.5	54.5	66.5	75.2	81.8	90.5
Wind Speed 20 m (km/h) Average	743	8.6	5	-	0	2	4	8	13	16	22
Wind Speed 45 m (km/h) Average	743	12.6	7	-	0	4	7	12	18	23	36
Wind Speed 100 m (km/h) Average	743	15.5	8	-	0	5	9	15	21	27	42
Wind Speed 163 m (km/h) Average	742	17.9	9	-	1	7	11	17	23	30	45
Wind Direction 20 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	743	-0.27	0.4	-	-1.5	-0.8	-0.5	-0.1	0	0.1	0.5
Vertical Wind Speed 45 m (km/h) Average	743	0.13	0.4	-	-1.1	-0.2	-0.1	0	0.3	0.7	1.5
Vertical Wind Speed 100 m (km/h) Average	743	0.22	0.5	-	-1.3	-0.3	-0.1	0.2	0.5	0.8	2.1
Vertical Wind Speed 163 m (km/h) Average	742	0.35	0.6	-	-1.4	-0.3	0	0.3	0.6	1.1	3.5

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 01:00	06 Mar 2023 01:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	03 Mar 2023 12:00	31 Mar 2023 12:00	673	Sensor Polling Disabled
Wind Speed, Wind Direction, Vertical Wind Speed at 163m	01 Mar 2023 09:00	01 Mar 2023 09:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - March 2023

Maximum Value: 4.6 C on Mar 2 15:00

Maximum Daily Average: -1.5 C on Mar 2

Minimum Value: -23.8 C on Mar 1 08:00

Minimum Daily Average: -14.5 C on Mar 1

Maximum Diurnal Average: 0.0 C at hour 16

Minimum Diurnal Average: -12.9 C at hour 8

Monthly Average: -6.37 C

Percentiles: P_1 = -23.8 P_{10} = -21.9 Q_1 = -8.6 Median = -6.6 Q_3 = 0.3 P_{90} = 2.8 P_{99} = 4.4

Hours in Service:	744
Hours of Data:	71
Hours of Missing Data:	673
Hours of Calibration:	0
Percent Operational Time:	9.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	-21.9	-21.9	-22.6	-23.3	-23.4	-23.8	-23.7	-23.8	-22.1	-19.1	-15.6	-12.8	-10.5	-8.3	-7.5	-7.0	-7.2	-7.7	-8.1	-7.9	-7.7	-7.5	-7.3	-6.9	-14.5	-6.9
2-Mar	-6.9	-7.2	-7.2	-7.0	-6.6	-6.5	-5.9	-5.6	-5.7	-4.9	-3.1	0.2	2.9	3.4	4.6	4.4	4.3	3.4	3.0	2.4	0.9	0.2	1.0	0.5	-1.5	4.6
3-Mar	-0.1	-2.6	-5.3	-6.4	-7.7	-8.3	-8.8	-9.2	-9.7	-10.3	-9.6	M	M	M	M	M	M	M	M	M	M	M	M	M	--	-0.1
4-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
5-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
6-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
7-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
8-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
9-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
10-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
11-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
12-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
13-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
14-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
15-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
16-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
17-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
18-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
19-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
20-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
21-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
22-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
23-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
24-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
25-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
26-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
27-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
28-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
29-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
30-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
31-Mar	M	M	M	M	M	M	M	M	M	M	M	M	-0.2	0.5	1.5	2.5	2.8	2.8	1.7	0.8	-0.7	-0.1	-0.7	-1.8	--	2.8
	-9.6	-10.6	-11.7	-12.3	-12.6	-12.9	-12.8	-12.9	-12.5	-11.4	-9.5	-6.3	-2.6	-1.5	-0.5	0.0	0.0	-0.5	-1.1	-1.6	-2.5	-2.5	-2.3	-2.8	Diurnal Average	
	-0.1	-2.6	-5.3	-6.4	-6.6	-6.5	-5.9	-5.6	-5.7	-4.9	-3.1	0.2	2.9	3.4	4.6	4.4	4.3	3.4	3.0	2.4	0.9	0.2	1.0	0.5	Diurnal Maximum	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	9	12.68	12.68
-20 - 0	42	59.15	71.83
0 - 10	20	28.17	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 71

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 45 m (AT45m) - C

Lower Camp Met Tower - March 2023

Maximum Value: 9.7 C on Mar 18 18:00

Maximum Daily Average: 1.4 C on Mar 18

Minimum Value: -27.8 C on Mar 6 08:00

Minimum Daily Average: -19.9 C on Mar 5

Maximum Diurnal Average: -4.0 C at hour 17

Minimum Diurnal Average: -14.1 C at hour 8

Monthly Average: -9.06 C

Percentiles: P_1 = -25.6 P_{10} = -17.5 Q_1 = -13.2 Median = -9.0 Q_3 = -4.6 P_{90} = -0.8 P_{99} = 7.4

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-21.4	-21.7	-22.4	-23.1	-23.1	-23.2	-23.1	-22.9	-22.0	-19.4	-16.4	-13.4	-10.8	-8.9	-7.9	-7.3	-7.5	-7.8	-7.9	-8.0	-7.9	-7.7	-7.5	-7.1	-14.5	-7.1
2-Mar	-7.2	-7.5	-7.5	-7.3	-7.0	-6.8	-6.3	-5.9	-5.9	-5.3	-3.5	-0.3	2.7	3.1	4.2	4.1	4.0	3.2	2.7	2.1	0.9	0.3	0.8	0.1	-1.8	4.2
3-Mar	-0.5	-3.0	-5.7	-7.2	-8.1	-8.7	-9.2	-9.6	-10.2	-10.8	-10.3	-9.9	-10.0	-9.7	-8.7	-8.6	-9.2	-9.9	-10.5	-11.2	-11.5	-12.5	-14.0	-14.8	-9.3	-0.5
4-Mar	-15.2	-15.5	-15.7	-15.8	-15.9	-16.0	-16.5	-17.5	-17.6	-17.0	-16.0	-15.5	-15.0	-14.2	-13.8	-13.3	-14.0	-14.7	-15.9	-16.9	-17.4	-18.1	-19.3	-20.0	-16.1	-13.3
5-Mar	-20.5	-21.5	-22.6	-23.0	-23.6	-24.4	-25.3	-25.4	-24.3	-21.4	-19.6	-18.5	-17.3	-15.9	-14.5	-13.9	-14.8	-15.1	-15.7	-16.9	-18.4	-20.7	-22.2	-23.3	-19.9	-13.9
6-Mar	DF	-26.0	-26.2	-25.7	-26.7	-27.0	-27.1	-27.8	-27.8	-25.3	-21.3	-18.2	-15.4	-12.9	-11.2	-10.8	-10.3	-10.3	-10.7	-10.8	-10.9	-11.4	-11.8	-12.2	-18.2	-10.3
7-Mar	-12.4	-12.2	-11.7	-12.0	-12.3	-12.7	-12.9	-13.1	-13.1	-12.8	-12.7	-12.4	-11.5	-9.9	-8.4	-7.2	-6.7	-6.7	-7.6	-7.6	-7.7	-7.9	-7.7	-8.1	-10.3	-6.7
8-Mar	-8.7	-9.6	-10.4	-11.3	-11.8	-12.4	-12.8	-13.4	-13.6	-12.6	-11.6	-10.8	-8.8	-7.2	-6.6	-5.9	-5.6	-5.7	-6.9	-8.2	-9.2	-10.4	-11.4	-12.4	-9.9	-5.6
9-Mar	-12.8	-13.7	-14.4	-14.6	-15.8	-16.8	-17.7	-18.5	-18.3	-16.6	-14.1	-11.5	-10.1	-9.4	-8.6	-7.7	-7.1	-7.4	-7.9	-8.4	-9.1	-9.6	-9.2	-9.3	-12.0	-7.1
10-Mar	-9.8	-10.2	-10.3	-10.4	-10.9	-10.8	-10.8	-10.9	-10.6	-10.0	-9.3	-9.1	-8.7	-7.8	-6.8	-5.6	-5.4	-5.6	-6.2	-6.1	-6.1	-6.5	-7.1	-7.5	-8.4	-5.4
11-Mar	-7.9	-8.3	-8.7	-9.1	-9.2	-9.2	-9.5	-9.7	-9.1	-8.3	-7.5	-6.6	-5.3	-4.4	-3.7	-3.3	-3.4	-4.0	-5.7	-7.4	-8.3	-9.2	-10.0	-10.5	-7.4	-3.3
12-Mar	-11.0	-11.1	-11.6	-12.2	-12.7	-13.3	-14.0	-14.4	-14.2	-13.7	-12.8	-11.7	-11.8	-11.4	-10.6	-10.7	-11.0	-11.1	-11.9	-12.4	-12.7	-13.1	-13.8	-14.3	-12.4	-10.6
13-Mar	-14.8	-15.5	-16.2	-16.9	-17.8	-18.5	-18.6	-18.4	-17.2	-15.5	-13.9	-11.1	-9.7	-7.5	-6.6	-5.7	-5.1	-5.0	-4.5	-4.7	-5.0	-6.6	-7.9	-8.2	-11.3	-4.5
14-Mar	-8.7	-9.2	-9.7	-10.0	-10.1	-10.5	-10.9	-11.2	-12.1	-12.4	-12.4	-12.1	-11.1	-10.5	-10.6	-10.6	-11.0	-11.5	-12.1	-12.7	-13.0	-13.4	-13.6	-14.1	-11.4	-8.7
15-Mar	-14.6	-15.1	-15.6	-16.2	-17.0	-17.6	-18.1	-17.0	-15.7	-14.6	-14.3	-13.6	-12.2	-11.1	-9.8	-8.8	-8.1	-7.8	-8.8	-10.1	-11.3	-12.7	-14.1	-14.7	-13.3	-7.8
16-Mar	-14.6	-14.6	-14.2	-13.8	-13.8	-13.7	-13.7	-13.5	-12.9	-12.2	-11.4	-10.2	-8.9	-7.4	-6.0	-4.6	-3.9	-3.5	-3.8	-4.6	-5.7	-6.8	-7.0	-7.9	-9.5	-3.5
17-Mar	-8.3	-9.0	-9.7	-11.0	-12.3	-12.7	-13.1	-13.3	-11.7	-9.2	-6.4	-3.5	-0.4	2.7	5.3	7.1	8.2	8.5	7.8	6.1	4.8	2.2	1.1	0.2	-2.8	8.5
18-Mar	-0.9	-1.1	-1.3	-1.9	-2.9	-3.8	-5.0	-5.3	-4.6	-3.0	-1.2	1.4	3.5	5.8	7.6	8.9	9.5	9.7	8.2	6.1	4.1	1.6	0.0	-2.2	1.4	9.7
19-Mar	-3.3	-3.9	-5.1	-5.4	-6.3	-7.5	-7.9	-7.3	-6.1	-4.4	-2.7	-1.4	-0.9	-0.6	0.5	1.0	1.1	0.7	0.1	-1.2	-2.2	-2.8	-3.1	-3.3	-3.0	1.1
20-Mar	-3.4	-3.8	-4.5	-5.3	-5.9	-6.7	-7.6	-7.4	-7.2	-7.2	-6.9	-4.9	-4.2	-2.4	-1.4	-0.9	-1.0	-2.1	-3.8	-5.8	-7.5	-9.0	-10.4	-11.4	-5.4	-0.9
21-Mar	-12.6	-13.6	-14.4	-14.9	-16.5	-17.1	-17.9	-18.3	-17.3	-15.1	-12.6	-9.8	-8.1	-6.7	-5.8	-5.0	-4.5	-4.3	-4.9	-5.9	-6.9	-8.1	-8.2	-9.3	-10.7	-4.3
22-Mar	-10.0	-10.8	-11.3	-11.4	-12.8	-13.2	-13.4	-12.9	-11.1	-8.2	-5.3	-3.4	-2.0	-0.4	1.0	2.1	2.9	3.4	3.2	2.2	0.6	-0.1	-1.2	-2.2	-4.8	3.4
23-Mar	-3.5	-4.3	-4.8	-5.8	-6.4	-6.2	-6.3	-6.1	-3.9	-0.7	0.4	0.3	0.0	-1.0	-1.1	-0.8	-2.4	-3.1	-4.2	-5.6	-6.3	-6.8	-6.7	-6.5	-3.8	0.4
24-Mar	-6.6	-6.9	-7.6	-9.0	-10.4	-11.1	-11.9	-12.0	-10.6	-9.4	-8.9	-7.4	-5.3	-3.9	-3.1	-1.8	-1.3	-1.9	-2.3	-2.8	-3.7	-5.4	-7.6	-8.9	-6.7	-1.3
25-Mar	-10.7	-12.4	-12.6	-13.6	-14.6	-17.0	-16.9	-15.8	-13.7	-11.5	-7.4	-3.8	-2.8	-2.2	-2.0	-2.3	-2.9	-3.9	-5.6	-7.5	-9.0	-10.6	-12.2	-14.0	-9.4	-2.0
26-Mar	-15.7	-16.9	-18.2	-19.4	-20.0	-21.1	-21.7	-21.3	-18.5	-16.2	-13.9	-13.7	-11.9	-10.4	-9.0	-9.1	-9.2	-9.7	-10.9	-12.7	-14.1	-15.1	-15.8	-16.6	-15.0	-9.0
27-Mar	-17.9	-18.9	-19.9	-21.2	-22.3	-23.2	-23.0	-23.1	-20.9	-17.5	-14.4	-11.5	-9.4	-8.1	-7.3	-6.7	-6.1	-5.9	-6.1	-7.4	-9.4	-10.8	-11.6	-12.9	-14.0	-5.9
28-Mar	-14.6	-16.8	-17.7	-18.6	-19.1	-20.4	-20.9	-20.6	-18.1	-14.5	-10.9	-8.5	-6.9	-5.5	-3.8	-2.5	-1.4	-0.8	-0.6	-1.3	-1.8	-1.7	-1.6	-2.1	-9.6	-0.6
29-Mar	-2.4	-2.8	-3.6	-3.7	-4.4	-5.3	-4.9	-4.4	-3.7	-2.9	-1.5	-0.7	-0.6	-0.7	-0.8	-0.9	-0.7	-1.5	-2.0	-2.8	-3.6	-4.5	-5.3	-6.1	-2.9	-0.6
30-Mar	-7.4	-9.2	-10.8	-11.4	-13.3	-13.1	-13.0	-13.2	-11.7	-6.6	-4.5	-3.1	-2.9	-1.9	-1.6	-1.0	-0.5	-1.0	-1.5	-1.6	-2.1	-2.8	-3.8	-5.3	-6.0	-0.5
31-Mar	-6.2	-7.1	-7.7	-7.9	-8.0	-7.9	-7.9	-7.4	-6.2	-4.6	-3.1	-1.5	-0.6	0.1	1.1	2.1	2.5	2.6	1.7	1.0	0.9	0.0	-0.8	-1.9	-2.8	2.6
	-10.1	-11.4	-12.0	-12.6	-13.3	-13.8	-14.1	-14.1	-13.2	-11.6	-9.9	-8.3	-7.0	-5.8	-4.8	-4.2	-4.0	-4.3	-5.0	-5.9	-6.8	-7.8	-8.5	-9.3	Diurnal Average	
	-0.5	-1.1	-1.3	-1.9	-2.9	-3.8	-4.9	-4.4	-3.7	-0.7	0.4	1.4	3.5	5.8	7.6	8.9	9.5	9.7	8.2	6.1	4.8	2.2	1.1	0.2	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Lower Camp Met Tower - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	45	6.06	6.06
-20 - 0	640	86.14	92.19
0 - 10	58	7.81	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 100 m (AT100m) - C

Lower Camp Met Tower - March 2023

Maximum Value: 9.5 C on Mar 18 18:00

Maximum Daily Average: 2.6 C on Mar 18

Minimum Value: -25.1 C on Mar 6 09:00

Minimum Daily Average: -19.3 C on Mar 5

Maximum Diurnal Average: -4.5 C at hour 17

Minimum Diurnal Average: -13.3 C at hour 8

Monthly Average: -8.95 C

Percentiles: P_1 = -23.5 P_{10} = -17.3 Q_1 = -13.4 Median = -9.2 Q_3 = -4.4 P_{90} = -0.9 P_{99} = 8.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-18.2	-19.2	-20.1	-21.0	-20.6	-19.5	-20.3	-19.4	-20.0	-18.3	-16.2	-13.7	-11.6	-9.8	-8.5	-7.9	-7.9	-8.0	-8.0	-8.1	-8.3	-8.0	-7.8	-7.5	-13.7	-7.5
2-Mar	-7.5	-7.9	-7.8	-7.6	-7.3	-7.2	-6.7	-6.3	-6.2	-5.4	-3.9	-0.6	1.6	2.6	3.5	3.9	3.7	3.0	2.4	1.8	1.1	0.7	0.4	-0.3	-2.1	3.9
3-Mar	-0.9	-3.5	-6.3	-7.8	-8.7	-9.2	-9.8	-10.2	-10.7	-11.3	-10.9	-10.5	-10.5	-10.2	-9.3	-9.2	-9.7	-10.5	-11.0	-11.5	-11.9	-13.0	-14.5	-15.4	-9.9	-0.9
4-Mar	-15.8	-16.1	-16.2	-16.3	-16.4	-16.5	-17.1	-18.1	-18.2	-17.6	-16.7	-16.2	-15.9	-15.1	-14.6	-14.0	-14.6	-15.3	-16.4	-17.4	-17.8	-18.3	-18.4	-20.0	-16.6	-14.0
5-Mar	-20.7	-21.4	-22.0	-22.2	-22.2	-22.4	-23.1	-23.7	-22.8	-21.2	-20.0	-18.7	-17.8	-16.4	-14.8	-14.6	-15.3	-15.5	-15.7	-16.2	-17.1	-18.1	-19.7	-20.6	-19.3	-14.6
6-Mar	DF	-23.0	-23.7	-23.9	-24.2	-24.3	-24.3	-25.1	-25.1	-23.2	-20.9	-18.1	-15.3	-13.2	-11.8	-11.2	-10.8	-10.8	-11.0	-11.2	-11.3	-11.9	-12.2	-12.5	-17.4	-10.8
7-Mar	-12.8	-12.6	-12.2	-12.5	-12.8	-13.2	-13.4	-13.6	-13.7	-13.4	-13.4	-13.1	-12.2	-10.6	-9.0	-7.8	-7.2	-7.2	-8.0	-8.0	-7.9	-8.0	-7.9	-8.4	-10.8	-7.2
8-Mar	-8.9	-9.8	-10.6	-11.3	-11.9	-12.6	-13.1	-13.6	-14.0	-13.1	-12.1	-11.4	-9.6	-7.9	-7.2	-6.4	-6.1	-6.2	-7.2	-8.4	-9.5	-10.5	-11.5	-12.2	-10.2	-6.1
9-Mar	-12.5	-13.1	-14.0	-14.4	-15.7	-16.6	-17.6	-18.2	-18.1	-16.8	-14.6	-12.1	-10.8	-10.0	-9.2	-8.3	-7.6	-7.9	-8.3	-8.9	-9.5	-10.0	-9.6	-9.8	-12.2	-7.6
10-Mar	-10.3	-10.7	-10.7	-10.9	-11.4	-11.3	-11.3	-11.4	-11.2	-10.6	-9.9	-9.8	-9.3	-8.5	-7.5	-6.2	-6.0	-6.1	-6.6	-6.5	-6.5	-6.8	-7.4	-7.9	-8.9	-6.0
11-Mar	-8.2	-8.5	-8.9	-9.5	-9.7	-9.7	-10.0	-10.2	-9.8	-9.1	-8.1	-7.2	-5.9	-5.0	-4.4	-3.9	-4.0	-4.6	-6.3	-7.9	-8.8	-9.7	-10.5	-11.0	-8.0	-3.9
12-Mar	-11.4	-11.6	-12.1	-12.7	-13.2	-13.8	-14.5	-14.9	-14.8	-14.3	-13.4	-12.2	-12.4	-12.1	-11.2	-11.3	-11.5	-11.6	-12.4	-12.9	-13.2	-13.6	-14.3	-14.9	-12.9	-11.2
13-Mar	-15.4	-16.1	-16.8	-17.4	-18.2	-18.7	-19.0	-19.0	-17.8	-16.3	-14.5	-11.7	-10.3	-8.1	-7.2	-6.2	-5.6	-5.1	-4.7	-5.1	-5.5	-7.0	-8.2	-8.7	-11.8	-4.7
14-Mar	-9.1	-9.6	-10.1	-10.4	-10.5	-10.9	-11.3	-11.7	-12.4	-13.0	-12.9	-12.7	-11.7	-11.1	-11.2	-11.2	-11.6	-12.1	-12.6	-13.2	-13.5	-13.9	-14.1	-14.4	-11.9	-9.1
15-Mar	-14.9	-15.4	-15.6	-16.0	-16.5	-16.7	-16.6	-16.3	-15.8	-15.0	-14.3	-13.4	-12.2	-11.2	-9.8	-8.7	-8.1	-7.9	-8.8	-9.6	-10.1	-10.8	-12.1	-13.4	-12.9	-7.9
16-Mar	-13.7	-13.9	-14.3	-14.1	-14.2	-14.2	-14.1	-14.0	-13.4	-12.8	-12.0	-10.7	-9.4	-7.8	-6.5	-5.2	-4.2	-3.7	-3.5	-3.9	-5.0	-6.4	-6.9	-7.7	-9.6	-3.5
17-Mar	-8.2	-8.1	-7.1	-7.7	-9.5	-10.3	-10.3	-10.7	-9.5	-7.9	-6.0	-3.1	-0.3	2.7	5.3	6.8	8.2	9.0	9.2	9.0	7.3	5.3	3.6	2.2	-1.3	9.2
18-Mar	1.4	1.2	1.1	0.6	0.1	-0.6	-2.5	-3.2	-3.1	-2.5	-1.3	1.3	3.8	5.9	7.8	8.9	9.2	9.5	8.1	6.3	5.3	3.3	1.9	1.0	2.6	9.5
19-Mar	-0.6	-2.1	-3.2	-4.4	-5.2	-5.7	-5.5	-5.8	-6.1	-5.1	-3.3	-1.9	-1.3	-1.1	0.0	0.6	0.6	0.3	-0.3	-1.6	-2.7	-3.3	-3.6	-3.8	-2.7	0.6
20-Mar	-3.9	-4.3	-5.0	-5.7	-6.3	-7.1	-8.0	-7.9	-7.8	-7.7	-7.4	-5.4	-4.7	-3.0	-2.0	-1.5	-1.6	-2.6	-4.3	-6.2	-8.0	-9.5	-10.8	-11.8	-5.9	-1.5
21-Mar	-12.7	-13.7	-14.4	-14.8	-15.4	-15.9	-16.7	-17.2	-16.7	-14.9	-13.1	-10.1	-8.8	-7.4	-6.6	-5.6	-5.1	-4.8	-5.3	-6.1	-6.3	-6.8	-7.3	-8.4	-10.6	-4.8
22-Mar	-8.7	-9.3	-9.5	-9.8	-10.6	-10.6	-11.3	-11.5	-10.5	-8.1	-5.8	-4.0	-2.6	-1.0	0.5	1.5	2.4	3.0	3.0	2.7	1.3	1.1	0.0	-0.5	-4.1	3.0
23-Mar	-1.5	-2.5	-2.2	-3.3	-3.3	-3.8	-4.4	-4.5	-3.5	-0.7	-0.1	-0.2	-0.6	-1.6	-1.7	-1.4	-3.0	-3.7	-4.7	-5.9	-6.5	-7.1	-6.9	-6.6	-3.3	-0.1
24-Mar	-6.7	-7.1	-7.8	-8.9	-9.8	-11.4	-12.1	-11.7	-10.7	-10.1	-9.3	-7.9	-5.9	-4.6	-3.8	-2.4	-1.9	-2.4	-2.6	-2.9	-3.5	-4.7	-5.4	-6.5	-6.7	-1.9
25-Mar	-7.6	-10.3	-10.8	-11.5	-12.4	-14.8	-14.8	-13.8	-13.5	-11.6	-8.2	-4.4	-3.4	-2.7	-2.6	-2.9	-3.5	-4.5	-6.1	-7.9	-9.4	-11.0	-12.6	-14.4	-8.9	-2.6
26-Mar	-16.1	-17.3	-18.4	-19.4	-20.4	-20.8	-21.6	-20.3	-18.8	-17.6	-14.7	-14.5	-12.7	-11.1	-9.5	-9.7	-9.8	-10.3	-11.4	-13.1	-14.5	-15.5	-16.0	-16.6	-15.4	-9.5
27-Mar	-16.9	-17.4	-18.3	-19.0	-19.4	-20.4	-20.9	-20.9	-19.4	-16.6	-14.5	-12.0	-10.0	-8.8	-8.0	-7.4	-6.8	-6.5	-6.6	-7.5	-9.4	-10.7	-11.9	-12.9	-13.4	-6.5
28-Mar	-13.4	-13.8	-15.1	-16.4	-17.0	-18.5	-18.1	-17.9	-17.3	-14.6	-11.2	-9.1	-7.5	-6.0	-4.4	-2.9	-1.9	-1.1	-0.8	-1.3	-1.8	-1.7	-1.6	-1.6	-9.0	-0.8
29-Mar	-2.3	-2.8	-3.3	-3.6	-3.8	-4.1	-4.6	-3.8	-3.6	-2.9	-2.2	-1.4	-1.2	-1.4	-1.4	-1.5	-1.3	-2.0	-2.6	-3.3	-4.0	-4.4	-4.9	-5.6	-3.0	-1.2
30-Mar	-6.1	-7.2	-7.9	-9.6	-10.6	-10.9	-11.3	-11.1	-10.2	-7.5	-4.7	-3.9	-3.4	-2.4	-2.2	-1.7	-1.1	-1.5	-2.0	-2.0	-2.4	-2.8	-3.1	-3.9	-5.4	-1.1
31-Mar	-4.7	-5.4	-6.0	-6.9	-6.9	-6.8	-7.3	-7.7	-6.8	-5.3	-3.6	-2.1	-1.3	-0.6	0.2	1.2	1.7	1.9	1.3	0.9	1.0	-0.4	-1.3	-2.3	-2.8	1.9
	-9.6	-10.7	-11.3	-11.9	-12.4	-12.8	-13.3	-13.3	-12.9	-11.8	-10.3	-8.7	-7.5	-6.4	-5.4	-4.7	-4.5	-4.7	-5.3	-6.0	-6.7	-7.5	-8.2	-8.9	Diurnal Average	
	1.4	1.2	1.1	0.6	0.1	-0.6	-2.5	-3.2	-3.1	-0.7	-0.1	1.3	3.8	5.9	7.8	8.9	9.2	9.5	9.2	9.0	7.3	5.3	3.6	2.2	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 100 m (AT100m) - C

Lower Camp Met Tower - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	33	4.44	4.44
-20 - 0	651	87.62	92.06
0 - 10	59	7.94	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 163 m (AT163m) - C

Lower Camp Met Tower - March 2023

Maximum Value: 9.5 C on Mar 18 16:00

Maximum Daily Average: 3.2 C on Mar 18

Minimum Value: -23.1 C on Mar 6 09:00

Minimum Daily Average: -19.1 C on Mar 5

Maximum Diurnal Average: -5.0 C at hour 17

Minimum Diurnal Average: -12.8 C at hour 8

Monthly Average: -8.95 C

Percentiles: P_1 = -22.1 P_{10} = -16.9 Q_1 = -13.5 Median = -9.1 Q_3 = -4.6 P_{90} = -0.9 P_{99} = 8.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	-15.7	-17.2	-17.4	-18.6	-18.3	-18.0	-17.5	-17.8	-17.8	-16.5	-15.4	-13.8	-12.0	-10.3	-9.1	-8.4	-8.4	-8.4	-8.2	-8.2	-8.5	-8.3	-8.0	-7.7	-12.9	-7.7
2-Mar	-7.9	-8.2	-8.1	-7.9	-7.7	-7.5	-7.0	-6.7	-6.5	-5.1	-3.2	-0.4	0.9	2.1	2.8	3.5	3.2	2.5	1.9	1.4	0.9	0.4	-0.2	-0.9	-2.4	3.5
3-Mar	-1.5	-4.0	-6.8	-8.4	-9.3	-9.8	-10.4	-10.8	-11.3	-11.9	-11.4	-11.1	-11.1	-10.8	-9.9	-9.7	-10.3	-11.0	-11.6	-12.0	-12.4	-13.6	-15.1	-16.0	-10.4	-1.5
4-Mar	-16.4	-16.7	-16.8	-16.9	-17.0	-17.0	-17.7	-18.7	-18.8	-18.2	-17.4	-16.9	-16.5	-15.9	-15.4	-14.8	-15.1	-15.8	-17.0	-17.9	-18.3	-18.5	-18.6	-20.1	-17.2	-14.8
5-Mar	-21.0	-21.7	-22.3	-22.5	-22.3	-22.2	-22.1	-22.5	-21.7	-21.0	-20.4	-19.1	-18.4	-16.5	-15.2	-14.9	-15.8	-16.1	-16.0	-16.1	-16.9	-17.6	-18.3	-18.9	-19.1	-14.9
6-Mar	DF	-19.6	-21.1	-20.5	-21.2	-22.0	-22.2	-22.5	-23.1	-22.0	-20.3	-18.0	-15.4	-13.5	-12.2	-11.6	-11.4	-11.4	-11.4	-11.7	-11.7	-12.3	-12.6	-12.9	-16.5	-11.4
7-Mar	-13.1	-13.0	-12.7	-13.0	-13.3	-13.7	-13.9	-14.2	-14.2	-14.0	-14.0	-13.6	-12.8	-11.2	-9.6	-8.4	-7.8	-7.8	-8.5	-8.4	-8.3	-8.3	-8.3	-8.7	-11.3	-7.8
8-Mar	-9.2	-10.1	-10.9	-11.5	-12.2	-13.0	-13.5	-14.1	-14.4	-13.6	-12.6	-11.8	-10.1	-8.5	-7.8	-7.0	-6.5	-6.7	-7.6	-8.9	-10.0	-10.9	-11.8	-12.2	-10.6	-6.5
9-Mar	-12.7	-13.2	-13.9	-14.5	-15.3	-16.0	-16.8	-17.2	-17.5	-16.8	-14.8	-12.5	-11.4	-10.6	-9.8	-8.8	-8.1	-8.5	-8.8	-9.4	-10.0	-10.5	-10.2	-10.4	-12.4	-8.1
10-Mar	-10.9	-11.3	-11.2	-11.4	-11.9	-11.8	-11.8	-12.0	-11.8	-11.2	-10.6	-10.4	-9.9	-9.0	-8.1	-6.8	-6.7	-6.7	-7.1	-6.9	-7.0	-7.3	-7.9	-8.3	-9.5	-6.7
11-Mar	-8.4	-8.6	-9.0	-9.9	-10.1	-10.1	-10.5	-10.7	-10.4	-9.7	-8.7	-7.7	-6.5	-5.6	-5.0	-4.6	-4.6	-5.2	-6.8	-8.5	-9.3	-10.2	-11.1	-11.6	-8.4	-4.6
12-Mar	-12.0	-12.1	-12.6	-13.2	-13.8	-14.4	-15.0	-15.5	-15.3	-14.7	-13.9	-12.8	-12.9	-12.6	-11.8	-11.9	-12.1	-12.2	-12.9	-13.4	-13.7	-14.1	-14.7	-15.3	-13.4	-11.8
13-Mar	-15.8	-16.5	-17.2	-17.9	-18.6	-18.9	-19.3	-19.3	-18.1	-16.5	-14.9	-12.3	-10.8	-8.5	-7.7	-6.7	-6.0	-5.3	-5.1	-5.5	-6.0	-7.4	-8.4	-9.1	-12.2	-5.1
14-Mar	-9.4	-9.8	-10.4	-10.7	-10.9	-11.3	-11.7	-12.1	-12.6	-13.5	-13.4	-13.1	-12.2	-11.5	-11.7	-11.7	-12.0	-12.5	-13.1	-13.7	-14.0	-14.4	-14.6	-14.9	-12.3	-9.4
15-Mar	-15.3	-15.7	-15.9	-16.0	-16.6	-16.7	-16.8	-16.3	-15.4	-15.0	-14.7	-13.5	-12.5	-11.4	-10.1	-9.0	-8.5	-8.3	-9.2	-9.6	-9.7	-9.9	-10.5	-11.5	-12.8	-8.3
16-Mar	-12.7	-13.6	-14.2	-14.3	-14.6	-14.5	-14.5	-14.4	-13.9	-13.4	-12.4	-11.1	-9.8	-8.2	-6.9	-5.6	-4.5	-3.9	-3.5	-3.8	-4.7	-5.7	-6.5	-7.1	-9.7	-3.5
17-Mar	-7.5	-7.0	-6.1	-6.6	-7.8	-7.7	-8.2	-8.5	-8.1	-7.2	-5.2	-2.7	0.0	3.2	5.6	7.5	8.7	9.2	9.3	9.2	8.5	7.0	5.2	3.6	-0.2	9.3
18-Mar	2.6	1.6	1.1	0.9	0.3	-0.7	-1.5	-2.1	-2.1	-1.5	0.1	1.4	3.8	6.0	8.5	9.5	9.3	9.2	7.6	6.5	5.9	4.5	3.5	2.1	3.2	9.5
19-Mar	0.8	-0.1	-1.2	-2.0	-2.4	-4.1	-5.1	-5.8	-6.3	-5.5	-3.6	-2.2	-1.7	-1.4	-0.5	0.1	0.2	-0.2	-0.9	-2.2	-3.3	-3.9	-4.2	-4.4	-2.5	0.8
20-Mar	-4.5	-4.8	-5.5	-6.1	-6.9	-7.7	-8.4	-8.5	-8.3	-8.3	-7.4	-6.1	-5.2	-3.5	-2.6	-2.0	-2.2	-3.1	-4.8	-6.8	-8.6	-10.0	-11.3	-12.2	-6.5	-2.0
21-Mar	-12.8	-13.9	-13.7	-14.4	-14.4	-14.1	-15.2	-16.2	-16.1	-14.7	-12.9	-9.7	-9.2	-7.8	-7.0	-6.1	-5.6	-5.3	-5.8	-6.4	-6.2	-6.5	-7.2	-8.2	-10.4	-5.3
22-Mar	-8.5	-8.9	-9.0	-9.0	-9.4	-9.3	-10.2	-10.9	-9.9	-8.3	-6.2	-4.6	-3.2	-1.5	0.1	1.0	1.9	2.5	2.6	2.6	2.1	1.9	1.4	0.9	-3.8	2.6
23-Mar	0.3	-0.8	-1.0	-1.2	-0.9	-1.2	-1.2	-2.3	-2.4	-1.3	-0.7	-0.7	-1.0	-2.1	-2.2	-1.9	-3.6	-4.3	-5.3	-6.5	-6.8	-7.1	-7.2	-6.9	-2.8	0.3
24-Mar	-7.1	-7.6	-8.3	-9.2	-10.2	-11.7	-12.5	-12.2	-11.0	-10.5	-9.5	-8.1	-6.4	-5.0	-4.4	-2.8	-2.4	-2.9	-3.0	-3.2	-3.6	-4.4	-5.0	-5.6	-6.9	-2.4
25-Mar	-6.1	-7.6	-8.8	-9.8	-9.8	-11.8	-13.1	-13.3	-11.3	-9.7	-8.2	-5.0	-3.9	-3.3	-3.2	-3.4	-3.9	-5.0	-6.7	-8.5	-9.9	-11.4	-12.9	-14.8	-8.4	-3.2
26-Mar	-16.5	-17.8	-18.5	-19.2	-20.1	-19.3	-19.7	-20.3	-18.9	-18.2	-15.6	-15.1	-13.4	-11.8	-10.1	-10.2	-10.3	-10.8	-12.0	-13.5	-14.8	-15.5	-15.7	-16.5	-15.6	-10.1
27-Mar	-16.8	-17.3	-17.6	-17.9	-18.1	-18.7	-19.2	-18.2	-18.6	-16.5	-14.5	-12.4	-10.4	-9.3	-8.6	-7.9	-7.4	-7.0	-7.1	-7.8	-8.9	-10.6	-12.2	-12.1	-13.1	-7.0
28-Mar	-11.9	-13.3	-13.7	-14.2	-14.3	-16.2	-15.9	-16.0	-15.7	-14.1	-11.6	-9.6	-7.9	-6.4	-4.8	-3.4	-2.4	-1.3	-0.8	-1.1	-1.2	-1.7	-1.6	-1.6	-8.4	-0.8
29-Mar	-1.9	-2.4	-3.1	-3.0	-3.5	-3.4	-3.4	-3.3	-3.6	-3.2	-2.6	-2.0	-1.8	-1.9	-2.0	-2.1	-1.9	-2.6	-3.2	-3.9	-4.5	-4.9	-4.8	-5.4	-3.1	-1.8
30-Mar	-5.7	-6.1	-6.8	-7.6	-8.9	-9.1	-8.4	-8.5	-8.4	-7.6	-5.1	-4.4	-3.7	-2.7	-2.6	-2.4	-1.8	-2.1	-2.6	-2.6	-2.8	-3.1	-3.4	-3.9	-5.0	-1.8
31-Mar	-4.4	-5.1	-5.3	-5.7	-6.1	-6.6	-6.5	-6.3	-6.3	-5.5	-3.9	-2.5	-1.7	-1.1	-0.3	0.6	1.3	1.5	1.0	0.8	0.5	-0.9	-1.9	-2.8	-2.8	1.5
	-9.4	-10.4	-10.9	-11.4	-11.8	-12.2	-12.6	-12.8	-12.6	-11.8	-10.5	-9.1	-8.0	-6.8	-5.9	-5.2	-5.0	-5.1	-5.7	-6.3	-6.9	-7.6	-8.2	-8.8	Diurnal Average	
	2.6	1.6	1.1	0.9	0.3	-0.7	-1.2	-2.1	-2.1	-1.3	0.1	1.4	3.8	6.0	8.5	9.5	9.3	9.2	9.3	9.2	8.5	7.0	5.2	3.6	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 163 m (AT163m) - C

Lower Camp Met Tower - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	23	3.10	3.10
-20 - 0	659	88.69	91.79
0 - 10	61	8.21	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 20m (RH20m) - %

Lower Camp Met Tower - March 2023

Maximum Value: 88.1 % on Mar 2 04:00

Maximum Daily Average: 72.4 % on Mar 1

Minimum Value: 51.3 % on Mar 31 17:00

Minimum Daily Average: 72.3 % on Mar 2

Maximum Diurnal Average: 80.7 % at hour 2

Minimum Diurnal Average: 55.7 % at hour 15

Monthly Average: 69.62 %

Percentiles: P_1 = 51.3 P_{10} = 55.7 Q_1 = 62.4 Median = 70.0 Q_3 = 77.6 P_{90} = 79.5 P_{99} = 86.6

Hours in Service:	744
Hours of Data:	71
Hours of Missing Data:	673
Hours of Calibration:	0
Percent Operational Time:	9.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	79.6	79.3	78.5	78.1	77.9	77.6	77.6	77.4	77.5	78.5	79.0	77.8	67.2	60.4	59.2	59.2	61.6	65.3	68.5	69.8	71.5	71.7	72.4	72.5	72.4	79.6
2-Mar	76.5	85.3	85.9	88.1	85.2	83.5	80.4	79.0	79.5	75.8	72.2	63.7	55.3	58.4	54.8	57.3	59.9	67.8	70.0	71.0	78.0	77.7	67.2	63.0	72.3	88.1
3-Mar	61.9	77.5	74.1	73.8	73.1	69.9	69.2	71.2	69.7	66.5	62.8	M	M	M	M	M	M	M	M	M	M	M	M	M	--	77.5
4-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
5-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
6-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
7-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
8-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
9-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
10-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
11-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
12-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
13-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
14-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
15-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
16-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
17-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
18-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
19-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
20-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
21-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
22-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
23-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
24-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
25-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
26-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
27-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
28-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
29-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
30-Mar	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
31-Mar	M	M	M	M	M	M	M	M	M	M	M	M	55.4	55.7	53.3	51.3	51.3	51.5	57.7	60.5	66.8	63.7	65.1	67.5	--	67.5
	72.7	80.7	79.5	80.0	78.7	77.0	75.8	75.9	75.5	73.6	71.3	70.8	59.3	58.2	55.7	55.9	57.6	61.5	65.4	67.1	72.1	71.0	68.2	67.7	Diurnal Average	
	79.6	85.3	85.9	88.1	85.2	83.5	80.4	79.0	79.5	78.5	79.0	77.8	67.2	60.4	59.2	59.2	61.6	67.8	70.0	71.0	78.0	77.7	72.4	72.5	Diurnal Maximum	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 20m (RH20m) - %

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity 20m (RH20m) - %

Lower Camp Met Tower - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	14	19.72	19.72
60 - 80	51	71.83	91.55
80 - 100	6	8.45	100.00

Total Number of Valid Hours: 71

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 45m (RH45m) - %

Lower Camp Met Tower - March 2023

Maximum Value: 93.5 % on Mar 19 07:00

Maximum Daily Average: 85.9 % on Mar 14

Minimum Value: 28.0 % on Mar 18 18:00

Minimum Daily Average: 44.6 % on Mar 8

Maximum Diurnal Average: 77.5 % at hour 7

Minimum Diurnal Average: 52.7 % at hour 16

Monthly Average: 65.88 %

Percentiles: P_1 = 32.8 P_{10} = 44.5 Q_1 = 56.2 Median = 67.9 Q_3 = 77.2 P_{90} = 84.4 P_{99} = 89.4

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	82.0	81.4	80.8	80.3	80.1	80.0	80.1	80.1	80.1	81.6	82.0	76.9	69.1	63.0	61.1	60.7	63.1	66.1	68.7	70.6	72.7	72.9	73.7	73.8	74.2	82.0
2-Mar	77.9	86.8	87.3	89.3	86.7	84.9	82.0	80.9	81.3	77.8	74.8	66.2	57.0	60.0	56.8	57.8	60.6	68.4	70.8	72.0	78.1	77.2	68.1	64.4	73.6	89.3
3-Mar	63.5	79.5	76.0	75.7	75.0	71.7	71.1	73.1	71.6	68.5	65.6	65.0	64.1	62.5	59.8	59.6	59.1	67.9	79.6	86.0	86.3	80.3	75.6	73.6	71.3	86.3
4-Mar	71.4	71.5	73.5	77.5	78.3	79.0	78.8	75.4	74.0	69.2	62.0	61.7	54.5	53.4	49.6	49.5	56.4	59.0	64.7	64.6	65.8	68.1	73.0	73.7	66.9	79.0
5-Mar	73.6	75.6	75.8	77.7	79.6	79.2	78.1	76.7	73.2	64.6	61.2	58.7	54.4	49.5	45.6	45.9	50.6	52.0	53.2	57.4	62.7	69.7	73.4	76.7	65.2	79.6
6-Mar	DF	77.1	77.2	77.2	76.2	76.2	76.2	75.4	74.8	75.8	75.6	72.0	69.1	70.2	66.0	71.2	74.6	74.1	72.3	72.6	71.7	70.2	70.8	73.1	73.5	77.2
7-Mar	78.5	81.2	77.9	75.9	74.9	74.7	75.1	78.3	79.8	75.2	74.5	72.4	69.6	62.3	57.6	51.8	46.8	46.8	47.2	45.4	45.3	45.4	44.1	43.8	63.5	81.2
8-Mar	44.4	46.2	47.6	50.2	51.4	52.8	54.8	56.0	55.9	53.4	49.8	48.0	42.8	37.3	34.6	31.5	29.7	31.6	35.4	38.5	39.6	43.3	46.4	49.6	44.6	56.0
9-Mar	50.7	53.0	55.9	57.0	60.7	64.1	66.0	67.5	65.9	61.9	57.3	49.1	45.5	47.1	46.2	44.8	43.6	45.4	47.5	49.0	53.1	60.0	58.4	60.7	54.6	67.5
10-Mar	67.9	76.8	77.9	78.2	74.9	73.2	72.1	72.6	71.7	68.7	66.0	69.2	70.1	67.5	61.8	56.3	57.8	62.0	67.5	66.1	62.7	62.4	65.0	63.6	68.0	78.2
11-Mar	60.7	61.2	60.0	59.5	60.6	62.3	66.3	68.9	67.3	64.4	61.8	60.3	57.9	55.4	53.8	54.2	59.2	70.6	77.9	80.0	83.4	85.7	84.4	85.7	66.7	85.7
12-Mar	85.2	85.2	83.5	83.3	82.9	81.9	80.9	79.3	77.3	74.2	70.5	66.5	69.5	70.2	68.4	69.5	72.6	75.2	80.5	82.0	83.8	84.3	83.8	83.8	78.1	85.2
13-Mar	84.1	84.1	84.5	84.8	85.2	84.7	83.8	83.3	79.9	75.6	74.3	68.0	67.4	62.5	61.6	62.0	61.7	63.8	64.3	65.7	66.4	78.0	86.4	88.9	75.0	88.9
14-Mar	89.1	89.5	88.9	89.1	88.3	88.7	88.8	88.3	87.1	84.6	83.8	83.1	80.3	82.3	83.4	84.5	86.4	86.7	86.2	85.3	85.2	84.3	84.4	84.6	85.9	89.5
15-Mar	85.3	86.6	86.5	86.0	86.1	85.0	84.8	83.8	80.2	76.5	77.4	76.5	72.4	70.0	67.4	66.5	66.7	67.1	74.1	80.3	83.7	87.0	90.3	89.0	79.6	90.3
16-Mar	86.1	84.8	79.4	79.1	80.2	80.2	83.4	82.9	78.6	75.5	73.2	71.3	70.0	67.6	65.9	65.6	64.6	64.5	68.9	71.9	74.2	76.6	77.8	80.5	75.1	86.1
17-Mar	82.2	82.3	84.6	87.1	87.8	88.4	87.9	86.2	80.8	74.1	68.9	63.3	57.5	52.5	48.8	46.5	43.4	40.8	38.5	41.0	47.0	60.2	60.2	56.3	65.3	88.4
18-Mar	55.0	49.2	47.7	49.5	51.9	54.2	57.3	60.1	58.6	55.8	50.5	44.8	41.0	37.2	34.8	32.8	29.9	28.0	32.1	38.3	45.3	56.0	62.3	72.9	47.7	72.9
19-Mar	77.3	79.5	83.7	84.9	87.5	91.6	93.5	89.1	78.0	70.7	65.1	61.5	60.9	61.2	59.5	57.4	57.8	60.2	63.5	68.1	70.0	72.2	71.2	70.7	72.3	93.5
20-Mar	68.1	65.8	63.0	63.2	63.3	63.4	63.1	62.2	66.8	75.3	79.3	75.8	72.4	63.2	60.2	57.8	54.7	52.1	52.1	54.3	57.0	60.0	62.7	65.5	63.4	79.3
21-Mar	69.7	73.6	76.0	77.7	83.0	84.7	84.8	83.8	82.1	78.5	74.1	69.1	67.6	63.1	59.5	56.9	54.7	54.0	56.0	59.9	64.3	69.2	72.9	78.7	70.6	84.8
22-Mar	82.7	85.8	87.0	84.3	87.1	86.7	85.4	82.1	76.7	71.8	60.9	52.0	48.5	45.9	42.6	42.1	41.9	42.6	45.0	49.6	56.2	58.2	61.7	63.7	64.2	87.1
23-Mar	67.1	69.3	70.4	74.3	76.1	75.2	75.0	74.7	67.9	54.5	49.8	55.2	55.6	60.0	59.3	55.6	60.8	61.9	65.4	70.1	71.9	75.6	76.2	76.1	66.6	76.2
24-Mar	74.0	72.1	70.5	72.7	77.9	79.3	79.3	77.5	69.7	66.0	70.5	65.9	55.4	52.0	48.3	42.8	42.0	40.5	43.5	41.3	46.7	52.0	57.5	66.7	61.0	79.3
25-Mar	69.4	75.5	73.0	76.3	78.4	84.3	85.8	80.5	72.1	65.1	55.2	39.2	35.5	34.9	33.3	32.9	30.0	32.8	39.9	52.8	58.4	61.2	64.9	67.3	58.3	85.8
26-Mar	69.0	69.8	70.0	70.9	71.6	73.3	75.6	71.7	62.2	56.6	48.8	56.5	51.3	43.6	35.0	33.5	32.9	34.9	38.7	43.3	47.0	50.3	53.2	55.7	54.8	75.6
27-Mar	61.0	66.9	75.6	78.2	79.1	79.7	79.2	77.9	75.4	67.9	59.4	50.6	47.1	42.1	40.8	41.8	40.5	38.6	38.6	40.4	43.8	47.2	46.2	48.3	56.9	79.7
28-Mar	56.0	65.1	71.0	73.4	77.8	80.2	80.1	79.3	71.3	59.5	49.1	44.0	42.7	41.0	40.4	39.5	35.8	34.5	35.0	38.1	42.2	44.7	43.0	43.4	53.6	80.2
29-Mar	45.1	48.6	54.0	53.5	60.4	63.6	72.8	73.4	70.3	69.2	68.4	70.0	70.6	70.5	68.6	65.9	60.7	58.9	57.0	59.4	61.3	64.4	67.6	70.1	63.5	73.4
30-Mar	76.2	84.5	90.6	89.9	90.7	91.8	89.2	87.4	86.5	68.7	54.4	46.2	46.6	42.5	44.1	41.3	41.4	45.0	44.0	56.5	59.4	56.4	57.2	60.8	64.6	91.8
31-Mar	63.9	67.6	70.7	73.4	74.6	72.6	72.5	72.2	69.0	65.4	61.6	58.8	58.1	58.5	56.3	54.2	53.8	53.7	57.9	60.6	59.9	64.2	66.7	69.0	64.0	74.6
	70.6	73.4	74.2	75.2	76.4	77.0	77.5	76.8	73.7	69.3	65.4	61.9	58.9	56.4	53.9	52.7	52.7	54.2	57.0	60.0	62.8	65.7	67.1	68.7	Diurnal Average	
	89.1	89.5	90.6	89.9	90.7	91.8	93.5	89.1	87.1	84.6	83.8	83.1	80.3	82.3	83.4	84.5	86.4	86.7	86.2	86.0	86.3	87.0	90.3	89.0	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 45m (RH45m) - %

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity 45m (RH45m) - %

Lower Camp Met Tower - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	36	4.85	4.85
40 - 60	204	27.46	32.30
60 - 80	366	49.26	81.56
80 - 100	137	18.44	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 100m (RH100m) - %

Lower Camp Met Tower - March 2023

Maximum Value: 87.4 % on Mar 30 05:00

Maximum Daily Average: 83.5 % on Mar 14

Minimum Value: 24.9 % on Mar 17 20:00

Minimum Daily Average: 39.7 % on Mar 18

Maximum Diurnal Average: 73.8 % at hour 7

Minimum Diurnal Average: 51.6 % at hour 17

Monthly Average: 63.06 %

Percentiles: P_1 = 30.8 P_{10} = 41.7 Q_1 = 53.9 Median = 65.4 Q_3 = 74.1 P_{90} = 81.0 P_{99} = 86.7

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	81.6	80.0	79.7	78.5	78.7	79.5	78.8	79.4	78.7	79.7	80.8	80.6	77.4	71.3	61.4	59.9	61.8	64.2	66.0	67.9	70.5	71.0	71.8	72.3	73.8	81.6
2-Mar	76.7	84.2	85.1	87.2	85.6	83.4	80.7	79.5	79.7	76.1	74.2	64.1	58.1	58.8	56.5	54.2	57.8	65.1	68.3	69.7	73.1	72.0	66.0	62.6	71.6	87.2
3-Mar	61.8	78.3	75.4	74.9	74.2	70.9	70.3	72.2	70.8	67.6	64.6	64.1	63.0	61.6	59.2	58.9	58.3	66.8	77.3	81.6	81.7	78.6	75.0	72.2	70.0	81.7
4-Mar	70.1	70.1	71.5	74.9	76.0	76.6	77.0	74.1	72.5	68.2	61.4	61.1	54.5	53.8	49.8	49.3	55.7	58.1	63.8	63.4	64.3	65.8	67.4	69.7	65.4	77.0
5-Mar	70.8	71.9	72.6	73.2	74.6	73.3	73.2	73.0	71.1	60.0	58.9	55.5	53.3	48.0	44.0	46.1	49.7	51.2	51.4	53.8	55.1	58.1	64.8	70.0	61.4	74.6
6-Mar	DF	74.3	74.6	75.0	74.9	75.0	74.6	74.0	73.0	72.3	68.6	69.4	66.6	63.7	62.0	69.9	72.7	72.3	69.9	70.8	69.9	68.1	68.5	70.3	70.9	75.0
7-Mar	75.4	78.6	75.3	73.6	72.5	72.5	73.0	75.9	77.8	74.1	73.7	71.3	68.7	61.5	56.7	50.6	45.5	45.9	45.4	43.7	43.2	43.0	41.9	42.1	61.7	78.6
8-Mar	43.3	44.7	45.8	47.0	48.5	51.0	54.3	55.5	54.4	53.2	49.5	48.1	42.6	36.8	34.1	30.7	28.4	31.0	34.1	37.2	38.4	41.3	45.0	46.7	43.4	55.5
9-Mar	48.4	50.3	52.9	56.9	61.0	64.3	65.9	68.4	65.8	62.2	57.6	48.7	44.9	46.6	45.7	44.0	42.8	44.4	45.9	47.3	51.9	58.6	57.0	59.1	53.8	68.4
10-Mar	66.4	75.1	76.0	76.6	73.5	71.8	70.7	71.5	70.6	68.0	65.3	68.3	69.4	66.8	61.3	55.9	57.0	61.2	66.2	63.8	60.5	60.0	63.4	61.8	66.7	76.6
11-Mar	58.9	59.0	57.3	57.7	59.0	61.6	65.7	68.3	67.4	64.3	61.2	59.5	57.2	54.8	53.2	53.9	58.4	69.8	76.8	78.8	82.0	84.0	83.3	83.7	65.7	84.0
12-Mar	83.7	83.7	82.3	81.9	81.4	80.2	79.1	78.2	76.0	73.3	70.0	65.5	68.4	70.0	67.6	68.4	71.3	73.9	78.9	80.5	82.2	82.6	82.3	82.5	76.8	83.7
13-Mar	82.8	82.8	82.7	82.3	81.6	81.0	80.4	80.1	80.0	79.8	77.6	68.3	67.2	61.9	61.0	61.1	60.9	62.1	62.0	63.9	65.2	75.7	83.4	85.6	73.7	85.6
14-Mar	86.7	87.0	86.7	86.7	85.8	85.6	85.9	85.5	84.1	82.5	82.1	81.3	79.3	80.6	81.6	82.2	83.2	83.8	83.3	82.1	82.1	81.5	81.8	81.8	83.5	87.0
15-Mar	82.2	83.6	83.1	82.2	82.1	82.2	82.3	81.3	78.8	75.6	74.6	73.2	70.1	67.2	66.2	65.3	65.6	65.8	70.8	73.5	75.1	76.8	82.4	84.9	76.0	84.9
16-Mar	81.4	77.8	75.7	76.6	78.3	77.8	80.3	80.8	78.1	75.3	73.0	70.5	69.3	66.5	65.3	65.3	64.4	62.5	65.8	68.3	71.6	74.5	76.1	79.1	73.1	81.4
17-Mar	80.1	77.4	77.6	76.9	83.0	82.6	82.3	79.5	76.8	69.8	68.0	61.9	57.0	51.5	46.2	44.1	39.5	31.9	26.3	24.9	29.0	35.7	38.7	39.3	57.5	83.0
18-Mar	38.4	37.7	35.2	35.5	36.5	38.5	44.8	47.8	49.4	51.5	49.0	42.7	37.3	34.1	31.7	31.1	27.3	26.9	30.9	36.5	40.1	45.9	49.4	54.3	39.7	54.3
19-Mar	60.9	65.7	70.9	75.0	77.7	81.7	78.8	76.7	74.1	70.3	64.1	59.5	59.4	60.2	58.6	56.0	56.6	58.2	61.2	66.4	68.6	71.0	70.1	69.4	67.1	81.7
20-Mar	66.5	64.3	61.5	61.5	61.9	61.5	61.5	60.8	65.9	74.3	77.7	75.2	71.7	62.6	59.5	56.9	53.9	51.3	50.9	53.1	56.0	58.8	61.2	63.9	62.2	77.7
21-Mar	66.7	69.8	72.0	73.7	75.7	78.0	80.7	80.8	79.7	76.3	73.7	67.9	67.3	63.3	59.5	56.4	54.2	53.5	55.0	58.5	58.9	62.9	69.1	74.6	67.8	80.8
22-Mar	77.2	79.8	81.7	77.4	81.8	81.6	75.9	77.7	77.7	70.7	59.2	51.3	47.8	45.3	41.2	41.3	41.1	41.5	42.7	44.9	50.9	53.2	54.8	58.7	60.6	81.8
23-Mar	57.1	58.9	57.5	61.1	62.4	64.5	66.6	69.4	65.6	51.5	48.7	54.3	55.1	59.6	58.5	54.9	60.3	61.4	64.4	68.3	69.6	73.6	73.5	72.1	62.0	73.6
24-Mar	69.3	69.0	68.5	69.0	71.0	76.2	76.7	72.5	67.3	66.0	68.0	63.5	54.6	50.8	47.9	42.2	41.7	39.6	40.3	36.8	42.7	48.0	48.4	51.8	57.6	76.7
25-Mar	57.2	65.5	68.9	68.4	69.0	75.5	76.3	70.6	71.9	67.6	54.8	38.0	34.5	34.0	32.5	32.1	29.3	32.3	39.5	52.2	56.5	59.6	63.5	65.6	54.8	76.3
26-Mar	67.4	68.3	67.5	67.5	69.7	71.0	72.1	65.1	58.4	60.4	49.0	55.9	51.5	43.3	33.7	32.6	32.2	34.1	37.9	42.4	46.3	49.6	51.6	53.8	53.4	72.1
27-Mar	55.0	58.7	62.8	66.6	70.1	72.5	75.4	71.2	68.6	61.8	57.4	48.2	45.6	41.5	40.0	41.2	40.1	38.1	37.9	38.3	41.3	44.1	44.6	46.4	52.8	75.4
28-Mar	47.7	49.3	52.5	58.5	62.7	71.9	74.5	74.1	68.5	59.9	46.9	43.2	42.0	40.2	39.5	38.1	35.3	33.1	31.3	34.2	38.3	40.3	39.7	38.7	48.3	74.5
29-Mar	42.8	43.5	42.1	45.5	50.7	69.6	73.7	72.4	72.0	69.9	67.8	69.5	69.8	69.7	67.8	64.9	59.8	57.9	55.9	58.3	59.9	60.4	61.4	63.6	61.2	73.7
30-Mar	65.2	70.1	75.0	83.0	87.4	87.4	87.2	86.8	85.7	69.7	52.0	46.2	45.4	41.5	43.0	40.9	41.0	44.3	43.6	56.6	58.1	56.8	54.4	54.0	61.5	87.4
31-Mar	55.3	57.8	60.3	69.4	70.2	67.5	68.4	69.0	67.2	64.1	60.5	58.2	57.7	58.0	56.2	54.1	53.5	53.1	56.0	57.6	56.6	62.7	65.4	67.6	61.1	70.2
	65.9	68.3	68.7	70.1	71.5	73.1	73.8	73.3	71.9	68.3	64.2	60.8	58.3	55.7	53.0	51.7	51.6	52.8	54.8	57.3	59.3	61.7	63.1	64.5	Diurnal Average	
	86.7	87.0	86.7	87.2	87.4	87.4	87.2	86.8	85.7	82.5	82.1	81.3	79.3	80.6	81.6	82.2	83.2	83.8	83.3	82.1	82.2	84.0	83.4	85.6	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 100m (RH100m) - %

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity 100m (RH100m) - %

Lower Camp Met Tower - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	58	7.81	7.81
40 - 60	227	30.55	38.36
60 - 80	369	49.66	88.02
80 - 100	89	11.98	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 163 m (RH163m) - %

Lower Camp Met Tower - March 2023

Maximum Value: 90.5 % on Mar 2 04:00

Maximum Daily Average: 85.2 % on Mar 14

Minimum Value: 24.7 % on Mar 17 20:00

Minimum Daily Average: 37.1 % on Mar 18

Maximum Diurnal Average: 73.7 % at hour 8

Minimum Diurnal Average: 53.7 % at hour 16

Monthly Average: 64.01 %

Percentiles: P_1 = 29.2 P_{10} = 42.5 Q_1 = 54.5 Median = 66.5 Q_3 = 75.2 P_{90} = 81.8 P_{99} = 88.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	79.9	82.6	81.7	80.3	80.7	81.0	81.7	81.1	80.5	81.2	82.0	82.8	80.2	75.4	67.5	63.0	64.6	66.5	70.5	71.6	73.2	74.2	75.2	75.7	76.4	82.8
2-Mar	80.4	88.2	89.0	90.5	89.5	87.0	84.4	83.0	82.1	77.4	72.8	64.1	61.9	61.7	60.1	56.0	59.8	67.4	70.8	71.9	73.8	74.0	68.5	65.1	74.1	90.5
3-Mar	64.7	81.6	79.4	78.9	78.1	74.6	73.9	75.8	74.2	70.7	67.6	67.2	66.0	64.6	62.7	61.7	61.1	70.1	80.6	84.1	82.2	81.0	77.7	74.6	73.0	84.1
4-Mar	72.6	72.8	73.8	77.1	78.2	78.0	79.2	76.3	74.9	70.4	63.9	63.5	56.7	56.7	52.6	52.4	58.2	60.8	66.4	65.6	66.6	68.2	68.6	70.6	67.7	79.2
5-Mar	71.9	73.2	73.9	74.6	74.9	71.9	65.4	67.1	64.5	59.8	58.7	56.1	54.8	48.1	45.1	47.7	51.6	53.4	53.6	52.8	52.8	54.6	57.9	65.5	60.4	74.9
6-Mar	DF	66.9	74.7	75.1	77.2	76.9	76.3	75.7	73.7	72.5	70.9	69.3	68.2	67.0	65.2	72.9	75.4	74.2	71.4	73.6	72.9	70.4	71.1	74.1	72.4	77.2
7-Mar	77.9	79.8	77.6	75.4	74.5	74.5	75.2	78.3	79.2	76.6	76.7	74.3	71.6	64.6	59.6	53.1	47.5	48.1	46.6	45.0	44.1	43.9	43.6	44.4	63.8	79.8
8-Mar	45.8	46.5	48.6	48.4	50.0	53.9	56.0	58.0	57.8	56.1	51.4	50.3	44.6	38.8	35.7	32.2	29.7	32.2	34.6	37.9	39.6	42.4	46.0	49.5	45.2	58.0
9-Mar	52.6	54.6	55.3	58.1	63.4	66.8	70.4	72.9	70.3	66.2	59.8	50.9	47.1	48.6	47.8	46.2	45.0	46.1	47.3	48.5	54.3	60.9	58.9	61.4	56.4	72.9
10-Mar	69.1	77.5	78.7	79.2	76.1	75.1	73.4	74.3	73.5	71.2	68.3	71.3	72.4	69.9	64.1	58.7	60.1	64.2	69.0	65.9	62.8	62.1	66.1	64.3	69.5	79.2
11-Mar	61.6	60.9	58.2	59.4	61.2	65.4	69.2	71.9	71.0	67.5	64.1	61.9	59.7	57.5	56.0	56.9	61.2	72.8	80.4	82.4	85.7	87.0	86.5	86.6	68.5	87.0
12-Mar	86.7	86.4	85.4	84.8	84.0	83.0	81.6	80.9	78.7	75.8	72.6	68.2	71.1	72.2	70.3	71.4	74.3	77.4	81.6	83.7	84.6	84.7	84.2	84.1	79.5	86.7
13-Mar	83.7	83.0	82.5	81.8	81.0	80.6	80.0	79.7	79.9	80.8	81.9	82.1	75.5	64.2	64.0	64.4	64.4	65.0	64.8	66.5	68.4	78.8	85.1	87.3	76.1	87.3
14-Mar	88.4	88.5	88.3	88.0	87.4	86.9	87.1	86.6	85.6	84.1	84.3	83.6	82.2	82.7	83.6	83.9	84.2	84.4	84.3	83.7	84.0	84.0	84.5	84.2	85.2	88.5
15-Mar	84.1	84.2	83.8	83.0	82.8	83.2	83.0	82.1	80.6	78.7	77.3	75.1	72.5	70.0	69.1	68.1	68.7	68.5	73.1	73.9	75.5	75.8	80.6	88.0	77.6	88.0
16-Mar	84.7	80.9	77.2	78.8	80.1	79.5	82.9	83.1	80.7	78.7	76.2	73.2	71.9	68.9	68.0	68.4	67.2	66.1	66.8	68.7	72.4	75.5	78.7	81.3	75.4	84.7
17-Mar	81.3	79.3	74.4	73.0	77.4	76.9	79.0	79.5	74.1	69.9	68.0	63.1	57.7	50.4	45.6	43.0	38.9	28.9	25.5	24.7	25.6	28.3	31.4	33.2	55.4	81.3
18-Mar	33.9	34.6	34.6	34.1	35.4	38.5	41.9	44.1	45.1	45.4	41.9	41.2	36.8	33.8	30.3	26.9	26.5	28.4	32.2	36.7	37.4	40.6	43.4	47.8	37.1	47.8
19-Mar	54.6	57.7	62.4	66.2	67.8	74.7	75.1	76.3	75.7	72.2	65.3	61.1	61.3	62.3	61.0	58.6	58.7	60.7	63.8	69.3	71.8	74.4	73.5	72.3	66.5	76.3
20-Mar	69.4	67.0	64.5	63.9	64.4	64.0	64.8	63.4	69.0	77.6	79.1	78.6	74.9	65.2	62.2	59.4	56.6	54.0	53.5	55.6	58.6	61.3	63.8	66.5	64.9	79.1
21-Mar	68.1	71.5	71.2	73.9	75.8	75.8	79.1	82.6	82.1	79.6	76.6	68.6	69.0	65.8	62.0	58.7	56.9	56.0	56.2	60.0	59.7	63.2	71.1	75.5	69.1	82.6
22-Mar	78.0	79.2	80.1	79.0	80.2	76.5	74.0	79.3	79.1	72.5	61.2	53.8	50.1	47.4	42.5	43.3	43.2	43.5	44.0	45.2	52.1	52.9	51.9	52.8	60.9	80.2
23-Mar	48.9	51.9	52.4	54.9	57.1	57.2	61.1	65.7	64.0	53.6	50.9	56.1	56.9	61.6	60.9	57.3	62.9	64.1	67.7	71.0	72.0	74.9	75.5	73.7	61.3	75.5
24-Mar	71.3	72.0	71.5	71.8	72.9	77.6	78.9	75.2	69.4	67.7	66.2	60.5	56.2	52.0	49.7	43.8	43.6	41.3	37.9	35.6	40.3	45.1	44.0	42.3	57.8	78.9
25-Mar	44.4	49.6	52.7	55.8	69.1	74.3	74.8	76.8	72.5	57.9	51.6	39.5	36.0	35.6	33.8	33.3	30.3	33.3	41.0	54.7	57.0	61.6	65.5	67.7	52.9	76.8
26-Mar	68.9	70.2	70.0	68.2	73.0	71.6	67.5	62.6	67.1	63.1	52.1	57.3	53.0	45.0	35.3	33.7	33.4	35.3	39.2	43.3	47.3	49.9	50.3	54.6	54.6	73.0
27-Mar	56.7	57.3	58.4	59.5	60.1	67.7	74.0	67.9	65.0	60.3	55.8	49.4	46.5	43.0	41.2	42.6	41.7	39.7	39.0	38.9	39.5	42.7	44.6	45.4	51.5	74.0
28-Mar	43.9	47.7	49.4	50.6	51.2	68.8	70.1	68.7	62.9	55.5	48.0	44.9	43.4	41.5	40.8	38.6	36.7	33.8	32.5	31.7	32.5	37.9	37.3	36.4	46.0	70.1
29-Mar	38.7	42.4	43.9	49.3	62.0	75.7	73.6	72.5	73.3	73.2	71.4	73.5	73.5	73.2	71.2	68.4	63.0	61.0	59.0	61.3	62.1	62.7	60.2	61.2	63.6	75.7
30-Mar	62.0	64.0	69.4	74.8	80.2	78.5	75.1	75.4	72.1	61.6	50.9	47.6	46.3	42.4	43.6	42.3	43.6	46.6	46.4	59.5	59.6	57.8	54.8	54.5	58.7	80.2
31-Mar	54.7	58.5	62.0	71.1	71.0	70.4	69.6	69.4	67.8	66.2	62.9	60.2	59.7	59.7	58.5	56.8	55.8	55.3	58.2	58.7	58.8	65.4	68.7	70.8	62.9	71.1
	66.0	68.1	68.6	69.7	71.5	73.1	73.5	73.7	72.5	69.2	65.5	62.9	60.6	57.7	55.2	53.7	53.7	54.8	56.7	58.8	60.2	62.5	63.5	64.9	Diurnal Average	
	88.4	88.5	89.0	90.5	89.5	87.0	87.1	86.6	85.6	84.1	84.3	83.6	82.2	82.7	83.6	83.9	84.2	84.4	84.3	84.1	85.7	87.0	86.5	88.0	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 163 m (RH163m) - %

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity 163 m (RH163m) - %

Lower Camp Met Tower - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	59	7.94	7.94
40 - 60	204	27.46	35.40
60 - 80	375	50.47	85.87
80 - 100	105	14.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - March 2023

Maximum Speed: 22 km/h on Mar 10 00:00

Maximum Daily Speed Average: 15.5 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 28 05:00

Minimum Daily Speed Average: 1.5 km/h on Mar 30

Maximum Diurnal Speed Average: 3.7 km/h at hour 17

Minimum Diurnal Speed Average: 1.6 km/h at hour 2

Monthly Average Velocity: 2.4 km/h 98.8 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 8 $Q_3 = 13$ $P_{90} = 16$ $P_{99} = 21$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE6	SSE5	SSE5	SSE7	SSE7	SSE8	SE8	SSE5	SE2	SE3	SE3	SSE11	SE13	SE15	SE17	SSE17	SSE14	SE12	SE10	ESE12	ESE14	SE13	SE13	SE12	SE9.4	SSE17
2-Mar	SE16	SE15	SE15	SE14	SE17	SE19	SE16	SSE18	SE14	SE19	SE14	ESE6	SSW4	SW5	W2	WSW8	W17	WSW17	WNW16	WNW10	W10	W10	NW14	NW16	S4.9	SE19
3-Mar	NW15	N10	N13	N11	N10	N10	NNE10	NNE10	NNE11	N12	N11	N9	N10	N8	NNW6	N8	NNE9	N6	N5	NNW3	N4	N12	N11	NNE10	N9.0	NW15
4-Mar	NNE7	NNE5	NNW3	WNW3	WNW2	NW2	NNE7	NNE7	N8	N11	N11	NNW11	NW14	NNW12	NNW12	NNW11	N12	N10	NNE8	NNW6	NNW4	NNW4	NW3	NW5	NNW6.9	NW14
5-Mar	NNW3	NW3	NW3	NW3	NNW3	NW4	NW3	NW3	NW2	WSW3	SW7	SW8	SW8	WSW5	S4	SSE4	SSE10	SE7	SSE2	NW2	NNW4	NW3	NW2	NNW2	WSW1.6	SSE10
6-Mar	DF	WNW3	NW2	W0	NW3	NW1	WSW1	NW2	WSW2	SSE4	SE2	SSE3	SE6	SE6	SSE8	SE9	SE13	ESE13	ESE8	ESE12	SE19	SE19	ESE19	SE16	SE6.2	SE19
7-Mar	ESE14	ESE10	SE15	SE16	SE15	SE16	SE15	SE16	SE15	SE16	SE15	SE14	SE15	ESE16	ESE16	SE17	SE17	ESE11	SE11	SE19	SE19	SE18	SE21	SE17	SE15.5	SE21
8-Mar	SE14	SE12	SE11	SSE9	SE11	SSE15	SE20	SE12	SE8	SE15	SE15	SE13	ESE8	SE12	SE13	SE18	SE17	SE13	ESE8	ESE9	SE14	SE14	SE11	SE9	SE12.4	SE20
9-Mar	SE10	SE8	SE8	SE12	ESE4	E3	ESE4	ESE4	SE7	SE13	SE8	SE13	SE19	SE20	SE22	SE20	SE20	ESE15	SE18	SE21	SE21	SE18	SE20	SE22	SE13.6	SE22
10-Mar	SE20	SE20	SE22	SE18	SE21	SE22	SE19	SE16	SE16	SE17	SE18	ESE17	ESE16	ESE13	ESE15	ESE13	SE17	ESE10	E5	NE5	ESE5	SE13	SE14	ESE13	SE14.9	SE22
11-Mar	ESE10	SE5	SE5	E4	ESE3	SE7	ESE4	SE3	SE3	SE6	SSE8	SSE11	SE8	SE9	SE7	SE7	SE4	NNE9	N12	NNW12	N10	NNW9	N10	N9	E2.7	NNW12
12-Mar	N9	NNW9	NNW11	NNW9	NNW10	N10	N9	N10	NNW10	NNW11	N11	NNW11	NNW9	NNW8	NNW10	N10	N12	N10	NNW6	NNW8	NNW6	NNW7	NNW6	NNW7	NNW9.1	N12
13-Mar	NNW7	NNW8	NNW9	NNW8	NNW5	NNW4	NNW4	NNW6	NNW5	NNW6	NW6	NW8	NW9	NNW11	N13	N14	N14	N10	N8	NNE9	NNE10	N10	N13	N13	N8.4	N14
14-Mar	N13	NNW13	NNW14	N13	N17	N14	NNW13	NNW13	NNW12	NNW13	NNW13	NNW14	NNW10	NNW9	NNW10	NNW11	NNW11	NNW12	NNW14	NNW16	N14	N13	NNW9	N8	NNW12.4	N17
15-Mar	NNW8	WNW3	NW2	W2	WNW3	NW3	NW3	WNW2	WSW1	WSW7	WSW12	WSW16	WSW13	WSW14	WSW12	WSW11	WSW10	W4	W3	WSW3	WNW2	S1	SSW1	SSE1	WSW4.8	WSW16
16-Mar	S1	SE3	SSE3	SSE3	ESE2	SE3	NNE2	SSE2	SSE6	SSE7	SE11	SE11	SE12	SE12	SE13	SE11	SE17	SE14	SE10	SE8	SE8	ESE6	SE6	ESE6	SE7.1	SE17
17-Mar	ESE3	SE7	SE14	SE13	SE10	SE9	SE10	SE11	SSE12	SE10	SE13	SE11	SE14	SE16	SE12	SE9	SE8	SE7	SE5	SE1	ESE5	SSE5	SE10	SSE7	SE9.1	SE16
18-Mar	S6	SSE9	SE12	SE11	SE9	SE8	SE11	SE14	SE15	SE10	SE12	SE11	SE12	SE9	SE7	SE7	S5	NW3	NNE10	NNW6	NNW5	NNW4	NW3	NW3	SE5.8	SE15
19-Mar	WNW3	NW4	WNW4	WNW1	NW2	NW2	W1	WNW2	SSE1	SE7	SE9	SSE12	SSE13	SE12	SE14	SE15	SE13	SE12	SE13	ESE9	SE10	ESE10	ESE7	SE9	SE6.1	SE15
20-Mar	ESE7	ESE8	ESE12	ESE6	ESE8	E5	ENE5	NE5	NE6	E6	SSE4	WSW2	N12	N14	N15	N16	N18	N18	N15	N14	N14	N13	NNW8	NNW5	NNE6.5	N18
21-Mar	NNW3	NNW2	NW4	NNW3	NW4	NW4	NNW2	NW3	NW1	WSW1	S2	SSW3	S4	SSE5	SSE6	SSE8	SSE8	SSE8	SE8	SSE4	ESE2	SE3	SE7	SE8	SSE2.0	SE8
22-Mar	SE6	SE4	SE7	SE6	SSE6	SE8	SE3	SE4	SE4	SE11	SE10	SSE16	S17	S14	S15	SE12	SE11	SE12	SSE11	SE5	ESE3	ESE4	SSE2	ESE6	SSE7.8	S17
23-Mar	SE2	SSE4	SE9	SE9	SE14	SE12	SE12	SE9	WNW1	N8	N15	N16	NNE15	NNE16	NNE15	N18	NNE17	NNE17	N14	N7	N5	NW2	NW1	NW1	NE5.5	N18
24-Mar	NNW5	NNW7	NNW9	N8	N3	NW4	NNW4	NW4	NW4	WNW6	SW12	WSW11	WSW6	SW5	SW5	SSW4	SE5	SE11	SSE9	SE7	SSE1	NNW5	WNW1	NNW1	W1.6	SW12
25-Mar	N1	NW2	SE2	SSE1	NNW1	NW2	NW2	NW2	NNW3	N4	NNW3	N12	N14	N13	N14	N14	NNE14	NNE17	N14	N10	N9	NNW8	NNW9	NNW9	N7.1	NNE17
26-Mar	NNW5	NNW5	NNW5	N4	N2	N6	NNW3	NNW4	N3	NNE4	N5	W8	NW8	NW10	N11	N14	N14	N15	N12	NNW8	NNW8	NNW6	NNW3	NNW3	NNW6.4	N15
27-Mar	NW4	NNW4	NNW2	NW2	NNW2	W1	SE2	SE7	SE7	SE9	SE11	SE8	ESE6	E6	SE11	SE11	ESE8	ESE6	SE3	NNW6	NNW6	NNW3	NE3	NNW3	ESE2.7	SE11
28-Mar	NNW4	NW4	NW4	NNW3	SE0	NW1	SSE3	SE9	SSE4	ESE4	SE10	SE13	SE14	SE17	SE16	SSE16	SSE21	SSE20	SSE20	SE18	SE13	SE7	SE9	SE7	SE8.5	SSE21
29-Mar	NNW2	NNW4	NW3	NW3	WNW3	NW3	NNW2	NNW2	NNW2	NNW4	NNW5	NNW9	N13	NNE12	NNE12	NNE11	NNE15	NNE12	NNE11	N8	NNW4	NNW2	WSW1	NW3	N5.5	NNE15
30-Mar	NW2	SSW0	SW1	NW1	NNW1	SSW0	ESE2	SE3	SE3	ENE0	NNW3	NW3	SW5	SW3	WSW6	NNW1	N1	NNE5	NE9	ENE4	NE3	N8	N9	NNW7	N1.5	N9
31-Mar	NNW3	N7	N9	NNW4	NNW4	NNW4	NNW5	NNW4	NNW5	NNW6	NNW8	NW10	NW15	NW15	NW13	NW11	NW11	NNW7	W2	E2	NNE1	SE7	ESE10	ESE8	NNW4.9	NW15
	E1.6	E1.6	E2.1	ESE2.3	ESE2.3	ESE2.4	ESE2.8	ESE2.6	ESE2.3	ESE2.8	SE2.8	SE2.3	SE1.9	ESE2.6	ESE3.0	ESE3.3	E3.7	ENE3.5	ENE2.9	ENE2.7	ENE2.5	ENE2.3	E2.7	E2.4	Diurnal Average	
	SE20	SE20	SE22	SE18	SE21	SE22	SE20	SSE18	SE16	SE19	SE18	ESE17	SE19	SE20	SE22	SE20	SSE21	SSE20	SSE20	SE21	SE21	SE19	SE21	SE22	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 22 06:00

Minimum Value: 1 km/h on Mar 30 02:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	252	33.92	33.92
6 - 11	263	35.40	69.31
12 - 19	210	28.26	97.58
20 - 28	18	2.42	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower

Classes (km/h)

- 0 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - March 2023

Maximum Speed: 36 km/h on Mar 10 06:00

Maximum Daily Speed Average: 23.2 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 15 22:00

Minimum Daily Speed Average: 1.5 km/h on Mar 30

Maximum Diurnal Speed Average: 5.5 km/h at hour 18

Minimum Diurnal Speed Average: 2.4 km/h at hour 13

Monthly Average Velocity: 4.1 km/h 89.4 deg

Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 7$ Median = 12 $Q_3 = 18$ $P_{90} = 23$ $P_{99} = 31$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	SE11	SE7	SSE7	SE7	SSE7	SE9	SE9	SE7	ESE6	ESE8	SE7	SE14	SE16	SE19	SE20	SE20	SE16	SE19	ESE19	ESE21	ESE22	SE22	SE20	SE20	SE13.6	SE22
2-Mar	SE26	SE23	SE24	SE25	SE26	SE29	SE24	SSE21	SE19	SE26	SE20	ESE9	SW5	SW7	WNW4	W12	W24	WSW24	W22	WNW14	WSW16	W14	NW19	NW23	SSE7.1	SE29
3-Mar	NW21	N15	N19	N17	N14	N14	NNE14	NNE15	N17	N18	N16	N12	N14	N10	NNW8	N11	NNE13	N9	N9	N6	N8	N18	N18	NNE15	N13.4	NW21
4-Mar	NNE10	NNE8	N4	NW4	NW3	NW3	NNE10	NNE10	N12	N15	N16	NNW15	NW19	NNW17	NNW18	NNW15	N17	N16	NNE12	NNW9	NNW8	NNW9	NNW6	NNW10	NNW10.5	NW19
5-Mar	NNW10	NNW11	NNW9	NW5	WNW4	WSW9	WSW7	WSW9	W3	WSW3	SW6	SW8	SW8	WSW5	S3	SSE4	SE10	SE9	SE5	ESE3	NNW3	NNW7	NNW5	NNW3	W2.2	NNW11
6-Mar	DF	NNW6	NW4	SSE3	S4	SSE4	SSE6	SE5	SSE5	SE5	SE3	SE4	SE7	SE8	SE9	SE13	SE19	ESE19	ESE14	ESE19	SE30	SE29	SE28	SE26	SE10.9	SE30
7-Mar	ESE22	ESE17	SE22	SE24	SE24	SE24	SE23	SE24	SE23	SE23	ESE23	ESE22	ESE21	ESE24	ESE23	SE24	SE24	ESE16	SE15	SE27	SE28	SE27	SE32	SE27	SE23.2	SE32
8-Mar	SE22	SE20	SE18	SE13	SE18	SE21	SE24	SE20	SE12	SE20	SE20	SE17	ESE11	SE16	SE18	SE21	SE23	SE20	ESE14	ESE16	SE21	SE24	SE19	SE18	SE18.6	SE24
9-Mar	SE22	SE16	SE14	SE20	SE9	ESE4	ESE5	ESE7	SE11	SE16	SE10	SE18	SE25	SE26	SE31	SE29	SE30	ESE21	SE28	SE31	SE29	SE27	SE31	SE34	SE20.5	SE34
10-Mar	SE31	SE31	SE33	SE28	SE32	SE36	SE29	SE24	SE25	SE26	SE26	ESE24	ESE23	ESE19	ESE20	ESE18	SE24	ESE15	E8	ENE6	ESE11	SE23	SE21	ESE20	SE22.8	SE36
11-Mar	ESE16	SE9	SE8	ESE9	ESE6	SE10	ESE6	SE4	SE4	SE7	SSE8	SSE11	ESE11	SE12	ESE9	SE8	ESE5	NNE12	N17	N18	N15	N13	N16	N15	ENE4.5	N18
12-Mar	N14	N14	N18	NNW14	N15	N16	N14	N15	N13	NNW15	N14	NNW14	NNW12	NNW11	NNW13	N14	N17	N15	NNW11	NNW13	NNW11	NNW12	NNW11	NNW11	N13.5	N18
13-Mar	NNW11	NNW11	NNW12	NNW12	NNW9	NNW9	NNW8	NNW8	NNW8	NNW8	NNW8	NNW9	NW11	NNW14	N18	N22	N22	N14	NNE12	NE14	NNE14	N15	N20	N22	N12.3	N22
14-Mar	N19	NNW20	NNW22	N20	N24	N20	NNW19	NNW19	NNW20	NNW20	NNW18	NNW19	NNW14	NNW13	NNW15	NNW16	NNW18	NNW18	NNW21	NNW22	N19	N19	NNW14	NNW13	NNW18.3	N24
15-Mar	NNW12	NW5	NNW6	NNW6	WNW5	NW3	NW5	NNW6	NW3	WSW6	WSW10	WSW17	WSW14	WSW15	WSW13	WSW12	W11	NW6	NNW6	NNW4	WNW3	SW0	WSW1	SE3	W5.3	WSW17
16-Mar	SE6	ESE9	ESE7	SE5	SE4	SE5	E3	SE5	SE8	SSE8	SE13	SE13	SE13	SE13	SE15	SE14	SE21	SE20	SE17	SE15	SE17	ESE12	SE11	ESE9	SE10.8	SE21
17-Mar	ESE9	SE10	SE19	SE18	SE14	SE12	SE9	SE11	SE12	SE11	SE15	SE15	SE17	SE19	SE16	ESE12	SE9	SE7	SSE6	SSW6	SE9	SE11	SE14	SE11	SE12.0	SE19
18-Mar	SE10	SE17	SE17	SE13	SE14	SE15	SE14	SE16	SE16	SE13	SE16	SE12	SE11	SE8	SE7	SSE6	S6	NNW4	NNE16	N10	N11	NNW8	NNW8	NNW7	ESE7.0	SE17
19-Mar	NNW6	N9	NNW7	N7	NNW2	NW4	WSW1	NNW2	SE6	SE9	SE10	SE13	SE14	SE14	SE15	SE19	SE19	SE19	SE21	ESE15	ESE16	ESE15	ESE11	SE14	SE8.3	SE21
20-Mar	ESE10	ESE13	ESE18	ESE11	ESE13	E9	ENE9	ENE8	NE10	E8	SE5	WNW2	N17	N20	N23	N24	N26	N29	N24	N23	N21	N19	N14	NNW10	NNE10.3	N29
21-Mar	NNW7	N6	NNW7	NW6	NNW6	NW5	NW3	NNW3	NW3	NW2	SSW3	SSW3	S4	SSE5	SE6	SE8	SSE8	SSE9	SSE9	SE7	SE8	SE10	SE18	SE16	SE2.6	SE18
22-Mar	SE14	SE11	SE17	SE15	SE8	SE14	SE7	SE8	SE9	SE13	SE12	SSE18	S18	SSE15	S16	SE14	SE13	SE15	SE14	SE13	SE6	ESE8	SE6	SE11	SE12.0	S18
23-Mar	ESE8	SE7	SE13	SE12	SE18	SE15	SE14	SE9	WNW4	N13	N24	NNE22	NNE22	NNE23	NNE22	N26	NNE24	NNE24	N21	N13	N9	NNW4	W3	WNW4	NNE8.8	N26
24-Mar	NNW10	NNW13	NNW15	N15	NNE8	NNW6	NNW6	NW7	NNW6	WNW7	WSW12	WSW11	WSW6	SW5	SW6	SSW4	SE5	SE12	SSE11	SSE10	S3	N4	NNE1	NNE1	NW2.3	NNW15
25-Mar	S0	NNW3	SE5	SE7	SE4	NNW5	W2	NNW2	NW4	WNW4	NW5	N17	N19	N17	N19	N19	NNE20	NNE24	N21	N16	N15	NNW14	NNW15	NNW14	N9.6	NNE24
26-Mar	NNW8	NNW9	NNW11	N9	N5	N8	N7	NNW8	NNW2	NNW4	N6	W9	NW10	NW13	N15	N20	N20	N22	N18	NNW14	NNW14	NNW11	NNW7	NNW6	NNW10.0	N22
27-Mar	NNW6	WNW3	W4	WNW2	W2	SSE1	SE7	SE11	ESE8	ESE9	SE11	SE9	ESE6	E7	SE12	SE13	ESE10	ESE8	SE5	N8	N9	N6	NE4	NE5	ESE3.8	SE13
28-Mar	NNW5	NNW7	NW6	NW2	S1	S2	SE9	SE11	SE4	ESE4	SE12	SE16	SE17	SE20	SE19	SE20	SSE23	SSE23	SSE23	SE24	SE23	SE14	SE11	SE8	SE10.8	SE24
29-Mar	NNE2	NNW6	NNW5	NW3	W4	NW4	WSW1	NNW3	NNW3	NNW6	NNW7	NNW13	N18	NNE19	NNE18	N17	NNE22	NNE18	NNE17	N12	N7	NNW4	NNW2	NW3	N8.1	NNE22
30-Mar	NW2	SSW1	W1	S1	NNW1	SSW1	SE7	SE7	SE5	ENE1	NNW3	NW3	SW4	WSW3	WSW6	N1	NE1	NNE7	NE13	E7	E5	NNE7	N9	N9	NE1.5	NE13
31-Mar	NNW7	NNW9	NNW11	NNW6	NW5	NNW6	NNW7	NNW6	NNW8	NNW8	NNW12	NW12	NW18	NW19	NW17	NW14	NW13	NNW11	NW3	ENE3	ESE5	SE10	ESE14	ESE14	NNW6.5	NW19
	E3.9	ENE3.7	E3.9	E4.2	ESE4.2	ESE4.2	ESE4.5	ESE3.9	E3.5	E4.0	ESE3.7	ESE2.9	E2.4	E3.4	E3.9	E4.6	E5.2	ENE5.5	ENE5.2	ENE4.7	E4.7	E4.5	E4.8	E4.7	Diurnal Average	
	SE31	SE31	SE33	SE28	SE32	SE36	SE29	SE24	SE25	SE26	SE26	ESE24	SE25	SE26	SE31	SE29	SE30	N29	SE28	SE31	SE30	SE29	SE32	SE34	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Mar 23 10:00

Minimum Value: 1 km/h on Mar 6 00:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	131	17.63	17.63
6 - 11	231	31.09	48.72
12 - 19	243	32.71	81.43
20 - 28	120	16.15	97.58
29 - 38	18	2.42	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower

Classes (km/h)

- 0 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - March 2023

Maximum Speed: 42 km/h on Mar 10 06:00

Maximum Daily Speed Average: 28.8 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 30 02:00

Minimum Daily Speed Average: 1.1 km/h on Mar 5

Maximum Diurnal Speed Average: 7.0 km/h at hour 23

Minimum Diurnal Speed Average: 2.3 km/h at hour 13

Monthly Average Velocity: 5.1 km/h 96.0 deg

Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 9$ Median = 15 $Q_3 = 21$ $P_{90} = 27$ $P_{99} = 37$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE12	SE9	SE11	SSE9	SSE10	SE13	SSE11	SSE15	SE15	SE17	SE16	SE19	SSE18	SE21	SE21	SE22	SE20	SE26	SE27	SE29	SE29	SE28	SE28	SE27	SE18.7	SE29
2-Mar	SE31	SE31	SE32	SE34	SE33	SE34	SE30	SSE26	SE23	SE29	SE21	SE10	SW8	WSW11	WNW6	W17	W31	WSW31	W30	WNW20	W24	W19	NW26	NW31	S9.4	SE34
3-Mar	NW27	N16	N19	NNE18	NNE15	NNE14	NNE16	NNE17	NNE18	N19	N16	N12	N14	N11	N8	N11	NNE13	N10	N10	N10	N10	N19	N19	NNE17	N14.5	NW27
4-Mar	NNE12	NNE9	N6	NNW6	NNW6	N5	NNE12	NNE11	N13	N16	NNW17	NNW17	NW21	NNW18	NNW21	NNW16	N19	N18	NNE15	N11	N12	NNW12	NNW13	N16	N12.8	NW21
5-Mar	N13	N14	N13	NNW12	NW8	WNW8	NW7	WNW7	NW7	WNW4	W5	WSW5	WSW7	W4	SSW2	SSE3	SE9	SE11	SE9	SSE9	SSE6	SE3	ESE5	ESE6	NW1.1	N14
6-Mar	DF	ESE6	SE8	SE11	SE10	SSE7	SE8	SSE4	SSE3	S5	S5	SE7	SSE9	SSE9	SE13	SE18	SE22	ESE24	ESE21	SE26	SE36	SE35	SE35	SE34	SE15.3	SE36
7-Mar	SE29	SE25	SE30	SE30	SE30	SE29	SE28	SE29	SE28	SE28	SE27	SE26	SE24	SE27	ESE27	SE29	SE26	ESE19	SE20	SE33	SE37	SE38	SE40	SE34	SE28.8	SE40
8-Mar	SE31	SE28	SE25	SE23	SE28	SE29	SE26	SE24	SE18	SE23	SE20	SE18	ESE14	SE19	SE20	SE22	SE24	SE23	ESE21	SE23	SE29	SE34	SE29	SE29	SE24.1	SE34
9-Mar	SE32	SE28	SE22	SE25	SE17	SSE10	SSE9	SSE9	SE15	SE19	SE11	SE22	SE29	SE29	SE34	SE33	SE34	SE28	SE33	SE37	SE34	SE32	SE38	SE41	SE25.8	SE41
10-Mar	SE38	SE37	SE39	SE34	SE38	SE42	SE36	SE30	SE31	SE31	SE29	SE27	ESE25	ESE21	ESE21	ESE20	SE27	ESE18	ESE12	ESE11	SE15	SE26	SE27	SE25	SE27.4	SE42
11-Mar	SE22	SE17	SE16	ESE14	ESE10	SE14	SE10	SE7	SE6	SE8	SE7	SE11	ESE12	SE13	ESE10	SE9	ESE6	NNE13	N18	N19	N17	N16	N18	N17	E6.8	SE22
12-Mar	N17	N18	N21	N19	N18	N19	N16	N18	N14	N15	N15	NNW15	NNW13	NNW12	N15	N15	N17	N17	N15	N18	N16	N17	N16	NNW14	N16.2	N21
13-Mar	NNW15	NNW15	NNW16	NNW16	NNW14	NNW15	NNW12	NNW11	NNW9	NNW10	NNW9	NNW10	NW12	N15	N20	N25	NNE23	NNE15	NE16	NE19	NE17	NNE17	N21	N23	N14.4	N25
14-Mar	N22	N24	N27	N24	N27	N22	N23	N23	NNW27	NNW27	N24	N23	NNW18	NNW16	NNW18	NNW20	NNW24	NNW25	NNW27	N26	N23	N23	N18	N17	N22.6	N27
15-Mar	NNW18	NNW12	NNW12	N12	NNW10	NNW10	NNW11	NNW11	NW5	WNW4	W7	W13	W11	W12	W8	W7	WNW6	NNW10	N8	N7	NNW6	N4	E2	ESE11	NW6.5	NNW18
16-Mar	SE14	ESE17	ESE15	SE10	SE8	SE8	SE5	SE7	SSE8	SSE8	SE14	SE11	SE12	SE11	SE14	SE14	SE21	SE24	SE22	SE22	SE23	SE18	SE21	SE14	SE14.1	SE24
17-Mar	SE20	SE18	SSE23	SSE22	SSE19	SSE16	SE19	SE21	SSE16	SSE19	SE18	SSE18	SSE17	SE17	SE15	SE12	SE8	SW7	SW13	SW20	SSW13	SSW10	S9	S9	SSE14.1	SSE23
18-Mar	S8	SSE9	SSE10	SSE14	S14	S14	SSE14	SSE15	SSE15	SE13	SE14	SE10	SSE8	SSE6	S5	S5	SSE5	N7	NNE24	NNE18	NNE16	NNE12	N9	NNW15	SE4.5	NNE24
19-Mar	NNW15	N12	N12	NNE6	N2	N7	ESE5	ESE8	SE12	SE13	ESE10	SE13	SE13	SE13	SE14	SE19	SE20	SE23	SE24	SE19	SE20	ESE19	ESE14	SE19	ESE10.1	SE24
20-Mar	ESE14	SE18	ESE22	SE15	ESE14	ESE12	E12	ENE10	NE9	E8	SE4	NNW5	N18	N22	N25	N26	N28	N30	N27	N26	N24	N23	N19	N15	NNE11.7	N30
21-Mar	N12	N8	N10	NNW9	NNW11	NNW9	NNW12	NW6	NNW9	NW4	WSW2	W2	SSE5	S6	SE6	SE7	SSE8	S9	S11	SSE10	SSE16	SSE18	SSE22	SE23	SSE2.2	SE23
22-Mar	SSE23	SE20	SE27	SE25	SE23	SE27	SE18	SSE9	SE16	SSE15	SSE14	SSE19	SSE18	S16	S16	SE14	SE14	SE17	SE16	SE19	SE14	SSE16	SE16	SSE17	SSE17.5	SE27
23-Mar	SSE12	SSE8	S7	S6	S10	SSE13	S9	SW9	NW8	N18	N25	NNE23	NNE24	NNE24	NNE24	N28	NNE26	NNE27	NNE24	N18	N17	N8	WNW4	NW7	NNE9.4	N28
24-Mar	N18	N18	N21	N21	NNE19	N9	N9	N8	NNW9	WNW8	W10	W9	WNW6	WSW4	SW6	SW4	SSE5	SSE12	SSE14	SSE15	SSE10	S4	S6	SSE7	NNW2.4	N21
25-Mar	SSE6	SE6	SSE4	SSE6	SE6	ESE4	ESE1	NNE2	NW8	WNW8	WNW7	N19	N20	N19	N20	N21	NNE22	NNE25	N23	N20	N19	N18	N19	NNW18	N10.5	NNE25
26-Mar	N11	NNW12	NNW17	N15	NNE7	NNE13	N7	NNE4	E2	WNW4	NNW5	W9	NW11	NW14	N17	N21	N22	N23	N20	N18	N18	N16	N12	N8	N12.0	N23
27-Mar	NNW11	NNW8	WNW2	NW1	W2	SW5	S5	S4	SSE5	SSE6	SE11	SSE8	SE6	ESE7	SE12	SE13	ESE11	ESE8	SE5	NNE12	NNE14	NNE8	ENE5	ENE6	ESE3.2	NNE14
28-Mar	ENE4	NNE7	NE6	NNE3	SE2	SE7	SSE6	SSE8	SE9	SSE8	SSE13	SSE17	SE17	SE20	SE20	SSE20	SSE23	SSE25	SSE29	SSE27	SE24	SE19	SE14	SSE11	SSE12.9	SSE29
29-Mar	E3	NNW6	N7	NNW6	WNW4	NW10	NW5	WNW5	WNW5	NNW11	NNW8	NNW14	N20	NNE21	NNE20	NNE19	NNE24	NNE21	NNE20	NNE15	N10	N11	NNE8	N6	N10.4	NNE24
30-Mar	NNW5	ENE0	SW1	SE5	SSE3	S3	S3	SE6	SE6	ESE3	NNW2	NW2	SW3	WSW3	W6	NNE1	ENE1	NE8	NE15	ESE13	E10	E7	E9	E9	E2.8	NE15
31-Mar	E4	NE4	N5	N6	N5	NNE6	N10	NNW10	NNW12	N11	NNW13	NNW13	NNW20	NNW23	NW21	NW16	NW16	NNW14	NNW9	NNE5	ESE11	ESE16	ESE18	ESE17	N7.0	NNW23
	E5.8	E6.0	E5.8	E5.9	ESE5.6	ESE5.6	ESE5.0	ESE4.1	ESE3.8	ESE4.1	ESE3.9	ESE3.2	E2.3	E3.3	E4.1	E4.8	E5.7	ENE6.1	ENE6.2	E6.4	E6.7	E6.6	E7.0	E6.5	Diurnal Average	
	SE38	SE37	SE39	SE34	SE38	SE42	SE36	SE30	SE31	SE31	SE29	SE27	SE29	SE29	SE34	SE33	SE34	WSW31	SE33	SE37	SE37	SE38	SE40	SE41	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Mar 9 12:00

Minimum Value: 0 km/h on Mar 30 02:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	78	10.50	10.50
6 - 11	198	26.65	37.15
12 - 19	248	33.38	70.52
20 - 28	158	21.27	91.79
29 - 38	57	7.67	99.46
> 38	4	0.54	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower - March 2023

Maximum Speed: 45 km/h on Mar 10 00:00

Maximum Daily Speed Average: 32.1 km/h on Mar 7

Minimum Speed Value: 1 km/h on Mar 21 11:00

Minimum Daily Speed Average: 1.9 km/h on Mar 5

Maximum Diurnal Speed Average: 9.7 km/h at hour 22

Minimum Diurnal Speed Average: 2.8 km/h at hour 13

Monthly Average Velocity: 6.4 km/h 100.9 deg

Percentiles: $P_1 = 2$ $P_{10} = 7$ $Q_1 = 11$ Median = 17 $Q_3 = 23$ $P_{90} = 30$ $P_{99} = 42$

Hours in Service: 744

Hours of Data: 742

Hours of Missing Data: 2

Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE15	SE14	SE19	SE19	SE18	SE20	SE23	SE21	UO	SE23	SE24	SE19	SSE19	SE22	SE20	SSE21	SE22	SE31	SE29	SE34	SE34	SE32	SE31	SSE30	SE23.4	SE34
2-Mar	SSE32	SE33	SE33	SE35	SSE34	SE34	SE33	SSE30	SSE28	SSE31	SSE19	S8	SW12	WSW15	W9	W21	W35	W35	WNW34	WNW24	W28	WNW24	NW33	NW36	SSW11.5	NW36
3-Mar	NW31	N16	NNE19	NNE17	NNE15	NNE14	NNE17	NNE18	NNE18	NNE20	NNE16	N12	NNE13	NNE11	N9	N11	NNE14	N11	N12	NNE11	NNE12	NNE20	NNE19	NNE20	NNE14.9	NW31
4-Mar	NNE14	NNE10	NNE8	NNW7	N8	N7	NNE14	NNE13	NNE14	N17	NNW17	NNW18	NW22	NNW19	NNW22	NNW16	N19	N18	NNE18	NNE16	N16	N15	N18	NNE26	N14.5	NNE26
5-Mar	NNE20	NNE22	NNE18	N13	NNW12	NW11	NNW14	NW16	NW17	NNW13	NW6	W4	W6	WNW2	SSW1	SSE3	SE8	SE10	SE11	SSE14	SSE16	SSE16	S15	SSE14	N1.9	NNE22
6-Mar	DF	SSE15	SSE11	SSE12	SSE10	SSE8	SE11	SSE9	SSE11	SSE11	SSE13	SSE11	SSE12	SSE11	SE17	SE21	SE24	SE28	SE25	SE30	SE39	SE40	SE39	SE36	SE18.9	SE40
7-Mar	SE33	SE30	SE34	SE34	SE34	SE34	SE32	SE33	SE32	SE29	SE28	SE28	SE25	SE29	SE30	SE31	SE29	SE21	SE24	SE37	SE42	SE42	SE43	SE37	SE32.1	SE43
8-Mar	SE34	SE31	SE28	SE28	SE31	SE29	SSE27	SE23	SE22	SSE21	SSE18	SE17	SE15	SE20	SE21	SE21	SE22	SE24	SE26	SE27	SE32	SE38	SE35	SE33	SE25.9	SE38
9-Mar	SE32	SE29	SE25	SSE24	SE22	SSE18	SSE16	SSE17	SSE21	SSE20	SSE11	SE25	SE28	SE29	SE33	SE33	SE34	SE33	SE38	SE43	SE41	SE38	SE43	SE45	SE28.9	SE45
10-Mar	SE42	SE41	SE41	SE38	SE42	SE43	SE39	SE35	SE34	SE32	SE30	SE28	SE26	SE22	ESE22	ESE22	SE28	ESE19	ESE16	ESE16	SE21	SE31	SE33	SE30	SE30.4	SE43
11-Mar	SE26	SE21	SE21	SE20	SE15	SE16	SE14	SE11	SE9	SE9	SE7	SE11	ESE13	SE13	ESE11	SE9	E6	NNE14	NNE18	NNE19	NNE17	NNE17	NNE19	NNE19	E9.0	SE26
12-Mar	NNE19	NNE20	N21	N20	N19	N19	N19	N19	N14	N14	N14	N14	N13	N13	N15	N15	N16	N18	N17	N19	N18	N19	N19	N16	N17.0	N21
13-Mar	N16	N16	N17	N18	N15	N16	N14	N13	N10	N11	N11	N12	NNW12	N15	N19	NNE26	NNE26	NE17	ENE18	ENE20	NE19	NE20	NNE23	NNE27	NNE15.9	NNE27
14-Mar	NNE25	NNE25	N29	NNE28	NNE30	NNE26	NNE25	N25	N25	N30	N25	N22	N19	N17	N20	N23	N24	N26	N29	N26	N24	N22	N18	N19	N23.9	NNE30
15-Mar	N19	N16	N14	NNE17	N13	N14	N12	N13	N7	NNW5	NW8	WNW9	WNW8	WNW9	NW7	NW7	NW9	N10	NNE10	NE12	NNE10	ENE7	ESE4	SE9	N7.9	N19
16-Mar	SE21	SE20	SE20	SE16	SE13	SE13	SE7	SE9	SSE9	SSE8	SSE13	SSE10	SSE11	SSE11	SSE13	SSE13	SE19	SE22	SSE23	SSE23	SSE28	SSE27	SE29	SSE24	SE16.6	SE29
17-Mar	SE31	SE23	SSE29	SSE30	SSE27	SSE27	SSE22	SSE22	SSE24	SSE25	SE22	SSE21	SSE18	SSE18	SSE16	S13	SSW6	WSW15	SW21	WSW28	SW22	SW23	SW20	SW20	S17.6	SE31
18-Mar	SW17	SW13	SW9	SSW11	SSW13	SW15	SSW12	SSW11	S11	S10	S9	S9	S6	SSW5	SSW3	SSW3	SE3	NNE10	NE28	NE25	NE21	NE19	NE18	NNE11	SSE1.9	NE28
19-Mar	NNE13	NE12	NE10	ENE9	ESE12	SE8	SE13	SE15	SE18	SE16	ESE10	ESE11	SE12	SE13	SE14	SE18	SE19	SE22	SE24	SE20	SE23	ESE22	ESE17	SE23	ESE14.0	SE24
20-Mar	ESE17	SE21	SE23	SE18	ESE17	ESE14	E13	ENE10	ENE8	E7	E3	NNW8	N17	NNE21	NNE25	NNE25	N27	N29	N29	NNE31	NNE28	N26	N22	N19	NE12.8	NNE31
21-Mar	NNE18	NNE14	NNE16	N11	NNW14	NNW16	N17	N11	NNW10	NE3	SSE1	NNW2	SE5	S5	SE6	SE7	SSE8	S9	S17	S18	SSE23	SSE27	SSE30	SSE31	SE3.5	SSE31
22-Mar	SSE30	SSE26	SE29	SE29	SE26	SE31	SE24	SSE16	SSE21	SSE18	SSE17	SSE19	SSE19	S15	SSE14	SSE13	SE13	SE16	SSE17	SSE22	SSE19	SSE18	SSE18	SSE20	SSE20.2	SE31
23-Mar	S19	SSW10	WSW6	W4	S8	S15	SSW14	WSW22	NW12	NNE21	NNE24	NNE23	NNE24	NNE25	NNE24	NNE28	NNE28	NNE31	NNE26	NNE23	N27	N18	NNW8	NNW12	NNE11.2	NNE31
24-Mar	N22	N19	N20	N19	NNE21	NNE16	NNE14	NNE18	NNE12	NW7	WNW7	WNW7	NW6	W3	WSW6	SW3	S4	SSE12	S16	SSE17	SSE17	SSE15	S15	S11	NNE2.9	N22
25-Mar	S5	S7	S8	SSW7	WNW3	N10	NW5	NNW11	N10	N10	NNW13	N20	N19	N19	NNE20	NNE21	NNE22	NNE26	NNE24	NNE23	NNE24	N21	N20	N19	N12.6	NNE26
26-Mar	NNE14	N13	N16	N18	NNE12	NE9	ENE5	ESE8	SE3	WNW4	NNW5	WNW9	NW11	NNW15	N17	N21	N22	NNE23	N20	N21	N25	NNE27	NNE25	NNE12	N13.0	NNE27
27-Mar	NNE8	N9	NNW9	NNW6	NW5	SW1	S6	S6	S8	SSW8	S9	S7	SSE6	SE6	SE11	SE13	ESE11	ESE8	ESE4	NE14	NE24	NE13	E9	ESE12	E4.0	NE24
28-Mar	ESE11	ENE6	NE5	NNE6	E4	SSE7	SSE13	SSE12	S13	S14	S15	SSE16	SSE16	SSE19	SSE19	SSE20	SSE22	S25	S26	S30	SSE29	SSE20	SSE15	S13	SSE14.2	S30
29-Mar	SSW3	NW4	NNW11	NNW12	NNW12	NNW17	NNW15	N12	NNW11	N10	N9	NNW14	N20	NNE21	NNE21	NNE19	NNE25	NNE23	NNE23	NNE19	NNE15	N12	NE16	NNE10	N13.5	NNE25
30-Mar	NNE8	NNE4	NNW3	NNW4	NNW7	NNW3	ESE3	E3	ESE6	E5	NE2	NNW2	SW2	WNW2	WNW4	ENE2	E2	NE9	ENE16	ESE16	ESE15	ESE12	ESE15	ESE17	E4.2	ESE17
31-Mar	ESE14	SE13	ESE10	ESE10	ESE8	E4	ENE8	NE8	NNE14	NNE13	N13	N14	NNW20	NNW22	NNW21	NNW18	NNW16	NNW13	NNW12	ENE5	ESE17	ESE23	ESE22	ESE19	NE6.1	ESE23
	ESE8.2	ESE8.0	ESE7.4	ESE7.3	ESE7.4	ESE6.9	ESE6.9	ESE5.5	ESE5.0	ESE4.9	ESE3.9	ESE3.3	E2.8	E3.7	E4.5	E5.0	E6.2	ENE6.8	ENE7.0	E8.5	E9.6	ESE9.7	ESE9.7	ESE8.8	Diurnal Average	
	SE42	SE41	SE41	SE38	SE42	SE43	SE39	SE35	SE34	SE32	SE30	SE28	SE28	SE29	SE33	SE33	W35	W35	SE38	SE43	SE42	SE42	SE43	SE45	Diurnal Maximum	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Mar 9 12:00

Minimum Value: 0 km/h on Mar 27 04:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	50	6.74	6.74
6 - 11	141	19.00	25.74
12 - 19	263	35.44	61.19
20 - 28	187	25.20	86.39
29 - 38	85	11.46	97.84
> 38	16	2.16	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower

Total Number of Valid Hours: 742

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Lower Camp Met Tower - March 2023

Direction of Maximum Speed: 135 deg on Mar 10 00:00
Direction of Maximum Daily Speed Average: 127.1 deg on Mar 7

Direction of Minimum Speed: 141 deg on Mar 28 05:00

Direction of Minimum Daily Speed Average: 1.5 deg on Mar 30

Monthly Average Direction: 98.8 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	151	150	163	156	164	161	145	155	144	137	145	151	145	141	146	149	148	128	126	114	114	128	127	132	140.3
2-Mar	133	131	129	128	135	138	138	153	139	132	133	120	202	226	279	258	269	256	284	286	260	264	311	313	173.6
3-Mar	317	6	5	9	10	7	21	18	12	9	8	358	2	359	345	4	22	10	2	347	351	357	7	13	3.8
4-Mar	22	13	346	299	301	313	14	15	2	352	353	343	316	336	337	347	352	360	26	339	331	340	321	316	347.4
5-Mar	328	322	320	325	332	317	312	320	309	238	226	231	228	251	187	157	147	146	153	321	332	325	318	332	253.7
6-Mar	DF	303	320	269	326	312	241	324	240	151	127	158	131	136	148	131	129	116	110	121	128	130	123	126	128.0
7-Mar	120	120	130	129	127	128	128	128	130	131	126	124	125	122	119	129	135	121	137	130	128	126	128	127	127.1
8-Mar	130	133	134	149	145	148	144	141	143	144	142	137	114	139	136	144	137	129	114	119	129	132	137	133	136.7
9-Mar	138	145	143	143	106	89	103	116	124	142	137	138	141	139	138	143	133	122	137	137	137	132	132	135	135.3
10-Mar	133	134	135	131	131	132	129	127	126	125	132	123	117	116	119	118	128	113	84	38	116	136	132	117	125.9
11-Mar	122	144	140	95	104	129	123	137	145	137	162	165	124	130	125	137	124	23	359	346	349	347	355	354	89.2
12-Mar	350	348	345	343	346	351	358	352	347	347	351	346	339	340	346	355	355	351	337	342	341	340	342	340	347.1
13-Mar	339	342	342	345	338	343	338	344	334	331	325	325	315	347	350	6	9	360	5	33	23	6	352	358	351.8
14-Mar	351	345	344	350	352	352	346	346	333	343	345	345	342	335	338	338	337	338	342	347	349	349	344	352	344.6
15-Mar	345	296	315	281	294	325	315	301	244	239	241	242	241	241	239	239	252	264	270	249	285	169	210	158	254.2
16-Mar	181	136	147	148	121	144	14	151	148	155	140	136	140	137	140	138	142	140	139	132	127	121	128	118	137.6
17-Mar	110	134	136	135	133	126	138	145	147	134	138	136	143	143	140	127	135	142	141	130	123	156	137	154	137.9
18-Mar	169	150	142	134	143	146	135	133	132	133	136	138	138	140	135	142	172	325	23	348	338	327	326	311	134.3
19-Mar	286	317	300	291	319	323	261	303	147	140	140	149	147	143	144	136	136	136	131	121	125	121	115	126	136.8
20-Mar	120	112	116	122	120	85	63	48	55	82	155	245	355	3	6	2	359	358	2	359	351	351	344	340	19.6
21-Mar	339	346	309	336	325	321	338	315	326	252	191	198	184	163	148	152	150	166	145	149	119	127	136	136	155.9
22-Mar	144	142	144	145	150	138	142	135	127	143	143	160	171	170	177	139	144	145	150	133	102	114	148	123	149.4
23-Mar	132	161	143	146	139	135	135	131	303	355	5	11	24	27	12	9	26	18	7	351	352	307	316	310	36.1
24-Mar	339	343	344	3	11	320	333	314	321	297	232	239	248	223	221	207	145	146	148	141	166	346	302	340	270.0
25-Mar	356	322	137	166	337	324	323	319	328	0	341	354	353	3	8	7	17	13	360	357	356	346	346	344	358.2
26-Mar	335	339	345	353	3	0	337	339	5	12	2	261	307	317	1	351	356	1	349	331	328	330	332	332	342.2
27-Mar	321	328	340	320	335	273	140	136	138	136	137	135	117	93	142	135	118	117	139	345	336	336	34	339	117.9
28-Mar	329	316	316	327	141	319	156	146	148	116	134	143	137	137	139	147	156	156	157	144	134	142	142	131	144.6
29-Mar	339	335	313	323	298	325	346	327	344	338	342	347	357	15	24	13	23	30	22	8	344	330	250	315	1.7
30-Mar	316	193	233	325	330	206	116	124	127	65	335	316	227	223	250	348	349	30	36	64	38	359	352	341	356.2
31-Mar	331	352	353	347	346	337	343	348	341	340	333	325	318	318	317	318	320	333	260	100	25	136	114	104	337.0
Diurnal Average	84.7	81.7	99.7	104.9	106.6	109.8	106.5	111.1	105.6	111.7	127.3	141.2	124.9	113.1	110.4	102.2	99.1	78.5	65.9	63.9	75.5	78.6	88.1	83.8	

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 109 deg on Mar 30 10:00

Minimum Value: 4 deg on Mar 18 08:00

Percentiles: $P_1 = 6$ $P_{10} = 10$ $Q_1 = 14$ Median = 18 $Q_3 = 26$ $P_{90} = 48$ $P_{99} = 90$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	6	9	11	8	6	9	9	13	85	24	26	9	11	14	10	8	11	15	17	16	16	18	16	19	85
2-Mar	15	16	18	21	16	16	17	12	12	12	14	27	86	62	94	23	19	14	23	25	15	14	15	15	94
3-Mar	25	20	17	17	18	17	17	19	18	17	20	19	18	19	20	24	18	22	16	18	29	15	19	19	29
4-Mar	25	17	24	20	38	50	18	19	18	14	19	24	24	23	21	19	15	19	14	20	33	16	32	12	50
5-Mar	56	26	41	24	17	29	26	34	27	50	14	19	18	48	31	16	7	11	67	40	20	34	24	28	67
6-Mar	DF	17	26	67	16	56	45	18	56	15	28	22	14	13	19	18	16	15	16	16	15	13	13	14	67
7-Mar	15	22	16	15	15	15	15	14	15	17	18	18	18	18	17	17	14	20	14	13	13	14	14	16	22
8-Mar	15	15	15	15	17	11	6	12	17	14	12	15	26	23	20	10	11	16	17	18	15	15	19	23	26
9-Mar	18	25	25	18	51	30	16	15	25	8	13	17	16	14	14	17	16	16	13	12	11	14	15	13	51
10-Mar	15	14	13	15	14	14	15	16	16	17	16	17	17	19	16	20	16	22	29	19	38	14	14	12	38
11-Mar	19	19	36	32	35	14	20	25	39	20	13	16	23	20	24	49	68	17	20	13	13	14	16	15	68
12-Mar	16	15	15	16	14	15	16	15	14	13	17	19	19	19	18	18	14	17	17	16	19	16	17	17	19
13-Mar	18	17	15	16	20	15	16	18	18	20	18	21	21	21	13	17	14	15	15	15	14	22	11	12	22
14-Mar	12	13	14	14	11	12	13	14	16	17	15	14	16	17	17	16	16	17	14	11	12	12	14	12	17
15-Mar	14	47	39	30	21	24	11	21	59	21	8	6	6	6	7	9	10	20	23	28	61	65	70	75	75
16-Mar	72	26	42	46	54	57	36	52	22	22	11	12	9	10	9	11	8	11	21	21	27	42	31	24	72
17-Mar	69	28	9	12	19	9	8	8	8	10	11	16	9	9	11	13	11	8	29	75	20	21	8	21	75
18-Mar	12	7	9	7	7	15	7	4	6	14	15	9	6	6	10	7	34	55	13	14	16	15	16	29	55
19-Mar	15	23	28	61	50	40	67	49	91	28	16	8	7	10	9	12	14	13	15	19	20	19	19	21	91
20-Mar	18	29	21	28	22	37	26	28	26	21	29	59	16	18	18	19	16	14	15	15	13	12	17	19	59
21-Mar	32	35	15	16	13	11	53	22	71	82	45	25	17	26	21	13	10	19	15	25	36	20	21	12	82
22-Mar	32	89	25	39	46	68	51	20	44	6	11	15	10	11	8	14	10	8	10	64	26	23	48	14	89
23-Mar	56	62	9	6	6	10	6	15	86	23	18	21	21	22	23	21	19	19	18	20	19	34	76	50	86
24-Mar	16	13	13	12	49	26	36	20	43	41	8	13	45	46	31	38	31	9	11	15	85	17	83	66	85
25-Mar	49	45	31	75	90	51	50	28	26	34	47	21	16	21	21	21	21	17	18	15	17	13	13	13	90
26-Mar	18	15	18	33	31	18	20	17	34	35	30	46	33	30	21	18	17	16	14	13	13	15	24	32	46
27-Mar	17	13	45	22	77	42	30	8	9	9	9	14	22	23	17	20	20	18	39	11	14	43	38	48	77
28-Mar	10	12	13	22	99	75	24	9	25	24	13	17	13	12	12	15	5	5	6	11	19	28	11	12	99
29-Mar	55	22	36	29	29	17	63	68	27	21	22	19	17	26	22	21	19	20	18	17	29	38	53	21	68
30-Mar	61	84	71	77	37	95	25	33	34	109	41	53	49	46	30	90	98	62	18	36	27	7	24	19	109
31-Mar	32	15	8	20	16	17	15	18	20	19	18	22	16	15	17	17	18	17	61	68	103	30	22	21	103
Diurnal Maximum	72	89	71	77	99	95	67	68	91	109	47	59	86	62	94	90	98	62	67	75	103	65	83	75	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - March 2023

Direction of Maximum Speed: 131 deg on Mar 10 06:00
Direction of Maximum Daily Speed Average: 125.7 deg on Mar 7

Direction of Minimum Speed: 220 deg on Mar 15 22:00

Direction of Minimum Daily Speed Average: 1.5 deg on Mar 30

Monthly Average Direction: 89.4 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	132	127	149	139	147	137	127	131	116	119	132	139	141	135	142	143	140	125	120	118	117	125	125	129	130.6
2-Mar	132	129	128	127	132	134	134	150	136	132	129	118	214	234	290	262	268	255	281	283	254	267	309	312	168.6
3-Mar	317	10	8	10	10	8	22	17	11	8	9	0	6	1	346	8	21	10	7	355	354	360	6	13	5.1
4-Mar	19	14	352	316	325	326	16	13	3	354	352	341	314	334	339	346	353	2	24	346	335	334	332	335	348.7
5-Mar	340	347	333	320	303	249	255	252	272	257	229	233	232	255	186	149	142	142	139	118	348	342	345	334	272.0
6-Mar	DF	342	323	149	170	153	157	146	152	137	126	131	133	136	134	127	126	117	112	123	129	130	125	126	128.1
7-Mar	122	116	128	127	125	126	127	127	127	125	122	120	123	120	119	126	132	120	133	129	130	128	129	126	125.7
8-Mar	128	128	124	126	126	136	140	137	134	137	137	132	114	132	132	140	135	128	116	120	129	131	130	124	130.6
9-Mar	127	133	142	139	125	114	117	121	128	138	133	134	134	134	134	136	130	122	133	133	132	129	130	132	131.7
10-Mar	131	132	133	129	130	131	127	125	126	124	127	121	118	118	119	117	125	115	93	73	120	132	128	119	125.0
11-Mar	120	126	125	108	107	124	121	129	134	129	154	156	120	129	123	132	108	22	1	349	352	350	358	357	78.2
12-Mar	354	351	349	346	350	353	2	355	349	348	353	348	339	341	347	357	357	354	341	344	343	343	344	341	349.2
13-Mar	340	341	342	345	338	336	337	342	335	334	330	327	315	348	353	7	10	5	30	41	26	7	354	358	354.6
14-Mar	352	346	345	352	353	354	347	347	334	345	345	346	343	337	339	339	336	337	341	348	350	350	344	347	345.2
15-Mar	342	321	333	331	299	323	325	348	313	244	248	243	245	243	247	251	264	309	329	339	292	220	249	130	277.2
16-Mar	140	121	121	133	131	136	86	142	144	147	134	133	136	135	135	136	138	135	137	139	129	118	127	119	133.1
17-Mar	118	129	136	135	128	125	128	136	134	125	133	131	143	139	135	121	125	136	155	193	132	128	127	127	132.8
18-Mar	143	136	138	133	133	136	127	133	133	129	130	133	135	141	140	149	173	335	27	357	349	336	336	337	123.1
19-Mar	339	351	342	355	338	316	253	327	146	127	130	144	145	137	139	133	133	134	130	121	123	120	116	124	125.8
20-Mar	120	116	116	120	119	92	71	59	56	84	145	291	359	4	5	3	0	359	3	2	355	355	349	342	22.5
21-Mar	337	352	333	315	333	321	316	339	315	305	205	205	176	161	141	146	151	166	151	139	132	134	135	129	141.9
22-Mar	136	138	137	133	139	138	141	132	130	144	144	159	169	168	174	133	138	139	142	139	125	123	134	124	143.0
23-Mar	122	136	130	131	131	128	133	138	303	357	4	13	23	26	12	10	25	16	8	358	3	330	261	282	32.7
24-Mar	344	344	344	360	17	337	340	324	328	297	239	244	257	232	229	205	141	145	156	152	169	349	17	32	309.3
25-Mar	184	328	134	144	143	334	278	328	326	302	308	356	356	5	7	7	16	13	2	360	357	347	345	345	359.7
26-Mar	340	337	345	1	2	5	349	344	332	346	355	267	307	319	1	351	357	3	352	337	333	334	345	332	344.0
27-Mar	328	282	263	301	276	156	136	129	122	119	126	132	120	97	136	129	116	113	130	359	350	351	49	37	109.2
28-Mar	343	344	319	322	187	188	135	131	137	122	132	139	135	137	139	144	154	154	158	143	131	135	135	136	140.7
29-Mar	20	336	341	305	269	311	254	338	343	332	339	348	357	14	23	11	20	29	21	11	352	336	330	315	2.2
30-Mar	304	200	275	188	341	213	135	132	128	77	328	322	232	240	257	350	44	33	39	90	84	19	5	358	37.9
31-Mar	335	338	341	329	321	336	338	342	342	342	334	325	319	319	316	317	321	329	312	63	105	131	112	107	336.9
	85.5	76.5	88.4	97.8	105.3	109.0	106.4	103.9	98.5	99.1	107.8	114.0	99.3	94.1	89.4	83.4	84.0	69.2	63.1	72.1	82.4	81.9	84.9	83.0	
	Diurnal Average																								

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 96 deg on Mar 30 17:00

Minimum Value: 3 deg on Mar 18 06:00

Percentiles: $P_1 = 4$ $P_{10} = 6$ $Q_1 = 8$ Median = 11 $Q_3 = 17$ $P_{90} = 31$ $P_{99} = 78$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	6	8	9	7	8	9	4	8	12	6	13	7	10	10	8	7	10	7	7	8	7	9	9	10	13
2-Mar	8	9	9	10	8	8	11	11	8	6	5	21	79	54	76	21	14	10	20	20	11	11	12	11	79
3-Mar	23	14	9	11	12	11	11	13	12	10	13	14	12	16	12	19	13	13	7	12	11	11	13	11	23
4-Mar	16	12	19	12	26	41	14	14	10	9	12	20	19	17	16	13	9	15	9	16	18	10	13	10	41
5-Mar	10	6	15	12	37	9	7	7	63	56	20	18	18	44	41	31	6	10	24	28	46	9	12	12	63
6-Mar	DF	7	30	40	22	14	11	15	16	9	19	11	17	11	15	10	8	9	8	8	6	6	6	6	40
7-Mar	7	11	9	8	8	7	7	7	9	10	10	12	11	10	11	10	8	14	9	6	6	7	7	8	14
8-Mar	9	9	7	13	10	8	4	4	12	8	7	12	18	17	15	6	4	10	9	11	8	7	10	9	18
9-Mar	8	10	7	6	24	23	13	11	13	6	9	12	12	10	7	12	8	9	6	6	6	6	7	6	24
10-Mar	7	6	5	6	6	5	7	9	9	9	9	9	9	12	10	14	9	17	16	16	23	5	6	6	23
11-Mar	9	13	14	13	15	10	12	15	28	19	14	17	16	12	18	33	59	11	15	7	7	9	9	9	59
12-Mar	9	8	8	11	8	8	10	10	9	9	12	14	15	14	12	11	6	12	11	9	10	9	10	10	15
13-Mar	11	11	10	10	10	7	9	12	11	13	15	17	16	19	8	11	7	18	14	10	11	20	5	5	20
14-Mar	7	8	8	9	6	6	8	9	10	10	9	8	11	12	11	10	9	10	8	6	7	7	8	8	12
15-Mar	8	28	8	14	22	25	10	6	50	27	9	3	4	4	5	7	8	22	13	50	26	93	56	63	93
16-Mar	14	15	26	31	22	39	35	36	18	20	6	8	5	6	4	7	4	5	6	7	9	14	18	13	39
17-Mar	24	15	5	6	7	6	8	7	6	8	8	9	6	4	5	8	8	10	18	27	20	6	5	6	27
18-Mar	5	3	4	6	3	3	4	5	9	9	7	5	5	8	13	8	27	59	8	12	5	7	5	11	59
19-Mar	12	11	11	10	33	19	61	69	35	19	13	6	4	7	5	5	6	4	7	13	12	12	10	13	69
20-Mar	10	14	10	16	15	18	13	19	17	11	29	70	10	11	11	13	10	7	9	8	7	7	11	11	70
21-Mar	10	7	10	10	15	15	25	29	26	41	42	36	23	26	17	10	10	19	14	16	10	5	4	6	42
22-Mar	7	36	7	16	28	25	14	12	14	7	11	13	9	11	7	9	6	5	7	13	14	10	8	6	36
23-Mar	10	19	3	4	3	6	6	19	51	19	11	15	17	17	18	16	14	12	11	13	11	23	16	28	51
24-Mar	8	7	8	6	24	19	23	11	23	33	8	14	43	59	23	30	26	9	11	11	44	57	92	71	92
25-Mar	87	22	50	9	46	29	29	42	9	21	32	15	10	13	15	15	17	11	12	11	12	7	9	8	87
26-Mar	10	9	12	14	22	10	9	7	58	42	26	32	28	25	15	12	12	10	9	8	8	9	14	10	58
27-Mar	14	20	10	34	50	88	9	6	8	8	7	14	17	17	15	15	14	11	14	25	13	19	27	28	88
28-Mar	18	10	13	22	70	35	6	6	18	20	11	13	9	8	10	12	4	3	6	9	5	9	7	11	70
29-Mar	59	10	21	22	18	14	69	60	45	15	17	15	13	20	17	14	14	13	12	12	13	18	33	26	69
30-Mar	37	72	83	71	38	42	5	7	23	72	38	48	43	45	27	95	96	62	14	21	14	18	16	14	96
31-Mar	17	12	6	12	18	11	11	12	13	13	13	15	12	12	12	13	12	11	69	66	48	16	16	12	69
Diurnal Maximum	87	72	83	71	70	88	69	69	63	72	42	70	79	59	76	95	96	62	69	66	48	93	92	71	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - March 2023

Direction of Maximum Speed: 134 deg on Mar 10 06:00
Direction of Maximum Daily Speed Average: 129.6 deg on Mar 7

Direction of Minimum Speed: 69 deg on Mar 30 02:00

Direction of Minimum Daily Speed Average: 1.1 deg on Mar 5

Monthly Average Direction: 96.0 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	149	146	135	151	149	142	156	150	143	136	131	136	148	136	143	144	139	130	130	130	126	132	132	137	137.5
2-Mar	140	135	135	135	139	139	138	152	145	142	133	126	227	245	287	264	268	258	281	282	260	277	308	312	184.1
3-Mar	316	10	11	14	14	15	21	19	16	10	11	2	6	3	350	6	20	6	6	6	6	6	11	15	7.0
4-Mar	20	19	360	332	344	349	22	16	7	355	348	337	317	328	337	340	353	2	21	1	353	343	345	2	352.0
5-Mar	2	7	353	339	319	284	319	298	308	298	269	241	249	263	197	147	141	144	145	148	159	132	115	112	316.3
6-Mar	DF	113	135	135	143	147	146	160	168	172	169	141	154	148	130	132	128	123	122	128	133	133	132	133	134.1
7-Mar	129	125	134	131	129	129	130	130	130	129	124	124	126	124	123	127	130	123	129	132	135	136	135	134	129.6
8-Mar	137	136	133	128	131	139	145	140	136	142	142	136	119	132	134	140	136	129	121	126	133	137	135	132	134.5
9-Mar	136	134	136	140	141	150	150	153	143	139	141	136	136	136	137	138	133	124	133	133	130	128	133	134	135.3
10-Mar	133	134	136	132	133	134	131	130	129	128	131	125	121	121	121	120	128	116	108	106	125	128	127	125	128.1
11-Mar	126	127	125	119	119	126	124	129	131	126	145	145	121	127	120	130	105	25	7	359	1	360	3	4	88.9
12-Mar	3	359	354	351	356	356	3	359	353	350	352	348	342	343	350	358	1	358	349	350	351	350	351	347	353.4
13-Mar	345	345	346	348	344	345	347	347	341	341	342	333	326	352	357	11	15	26	50	51	37	22	7	6	2.3
14-Mar	2	356	353	3	2	5	357	356	344	346	350	349	347	341	342	343	339	340	345	351	354	352	351	353	351.0
15-Mar	346	337	340	355	340	337	330	338	326	284	278	261	264	260	272	278	297	334	3	4	342	4	97	123	322.3
16-Mar	127	117	118	127	132	129	126	142	152	151	138	142	141	144	139	145	141	136	140	144	144	141	140	143	137.8
17-Mar	135	137	148	155	155	162	138	138	154	155	139	147	150	142	140	133	143	215	224	230	201	194	175	187	157.3
18-Mar	176	159	160	164	175	182	164	162	164	143	137	146	152	158	174	177	167	1	31	25	20	21	9	341	131.3
19-Mar	347	353	350	13	359	351	120	121	132	126	118	129	139	132	136	135	133	135	132	126	126	123	118	127	120.2
20-Mar	122	124	121	125	118	104	88	67	56	87	129	335	2	6	6	6	3	1	4	6	2	0	357	354	28.5
21-Mar	352	8	357	338	334	336	333	318	332	325	247	268	157	170	141	142	158	171	170	154	158	154	148	145	147.1
22-Mar	149	144	137	133	138	136	138	163	145	152	155	160	168	169	171	135	137	140	142	143	145	149	146	149	146.4
23-Mar	155	166	173	178	170	166	180	231	311	8	8	14	23	26	14	11	28	20	12	6	8	357	285	322	16.8
24-Mar	354	353	351	4	21	9	3	0	346	303	262	263	283	247	235	214	154	148	167	157	157	174	176	160	344.0
25-Mar	147	143	153	149	140	116	107	13	322	302	303	359	356	4	8	10	16	15	6	5	3	355	350	348	4.2
26-Mar	354	348	347	6	13	19	359	14	90	299	335	278	313	325	360	353	358	6	359	350	349	358	9	350	352.6
27-Mar	339	328	291	323	265	222	173	184	162	159	140	148	136	112	134	130	115	111	124	25	24	25	67	72	104.8
28-Mar	75	30	46	19	139	144	162	155	144	168	151	149	144	146	146	149	153	160	164	153	142	135	142	159	147.3
29-Mar	99	336	350	329	300	325	307	298	303	334	338	345	356	14	21	13	18	26	21	16	6	351	19	349	1.4
30-Mar	343	69	227	139	159	177	171	137	128	119	345	312	231	253	273	25	78	40	46	106	100	86	96	95	93.8
31-Mar	86	41	349	359	3	12	358	345	348	350	342	333	327	327	323	322	326	330	333	21	119	120	113	114	353.5
	98.0	94.3	95.4	100.7	111.0	116.4	110.4	114.5	109.5	109.8	108.0	107.9	91.5	87.6	81.7	81.5	81.9	71.9	71.5	84.6	95.5	95.5	100.0	99.9	
	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 100 m (WD100m) - deg

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 99 deg on Mar 30 17:00

Minimum Value: 2 deg on Mar 19 18:00

Percentiles: $P_1 = 3$ $P_{10} = 5$ $Q_1 = 6$ Median = 9 $Q_3 = 13$ $P_{90} = 23$ $P_{99} = 64$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	6	11	8	9	7	8	9	7	12	5	5	4	10	9	9	7	8	4	4	5	5	6	6	7	12
2-Mar	6	5	6	6	6	6	8	9	11	8	6	28	51	34	64	18	10	7	16	18	9	16	9	7	64
3-Mar	21	9	7	8	10	11	9	10	10	8	11	12	9	12	14	17	10	10	5	6	10	9	10	9	21
4-Mar	12	11	12	6	11	22	12	12	8	10	14	17	13	15	12	14	7	13	6	12	14	6	8	9	22
5-Mar	9	7	10	4	21	18	6	12	20	38	27	27	29	48	66	23	8	9	14	11	21	38	12	8	66
6-Mar	DF	14	5	4	7	9	8	10	21	12	15	9	10	11	8	6	6	6	5	5	4	4	4	3	21
7-Mar	4	7	6	5	6	5	5	5	6	6	6	7	7	7	7	7	7	11	7	5	4	4	4	4	11
8-Mar	5	6	5	5	4	5	5	3	6	7	6	10	12	12	11	6	3	9	7	7	6	3	5	3	12
9-Mar	4	4	6	3	7	11	11	12	11	6	8	9	8	7	6	10	6	7	5	5	6	5	5	4	12
10-Mar	5	4	4	4	4	3	5	5	5	5	6	7	7	8	7	9	6	13	11	11	11	5	5	3	13
11-Mar	5	5	6	7	9	5	8	8	21	13	16	15	11	9	14	15	50	9	11	7	7	8	7	7	50
12-Mar	8	6	5	6	7	5	8	7	8	6	8	9	11	12	10	10	7	9	7	5	5	5	6	5	12
13-Mar	6	6	6	6	4	4	5	7	9	9	11	12	12	14	7	8	6	22	8	7	12	15	5	4	22
14-Mar	5	5	5	8	5	5	6	7	6	6	6	5	7	9	7	7	5	5	5	4	5	3	4	5	9
15-Mar	3	7	6	5	11	6	5	5	9	29	16	7	7	5	11	15	13	10	13	7	9	16	59	9	59
16-Mar	4	6	8	14	16	11	12	15	14	17	6	11	9	9	6	9	4	3	4	4	5	8	9	12	17
17-Mar	9	8	4	5	6	6	5	4	5	7	7	6	6	5	8	9	10	27	5	4	11	14	13	17	27
18-Mar	14	10	7	7	9	5	6	5	5	13	9	11	12	12	12	8	25	59	4	6	5	10	20	5	59
19-Mar	4	5	7	12	30	7	39	14	10	9	12	11	6	7	5	3	4	2	5	11	8	8	8	7	39
20-Mar	7	9	6	9	11	10	8	12	14	11	37	46	8	9	9	10	8	6	7	7	7	6	7	7	46
21-Mar	9	11	9	22	6	5	3	9	10	25	43	58	27	25	10	9	10	17	10	18	10	7	5	5	58
22-Mar	4	5	5	4	4	5	12	14	7	7	12	10	7	9	6	9	6	5	6	5	6	5	5	5	14
23-Mar	5	8	13	17	14	14	13	20	47	9	8	11	12	13	16	13	13	11	9	9	7	15	22	17	47
24-Mar	7	3	4	4	8	15	17	15	12	27	14	16	40	61	20	23	27	9	9	9	10	64	25	13	64
25-Mar	15	10	18	9	7	29	36	51	27	12	28	12	8	10	14	13	14	8	9	9	10	6	6	5	51
26-Mar	7	13	9	5	18	10	10	20	62	59	32	30	22	19	11	9	10	8	7	5	6	8	10	10	62
27-Mar	4	19	23	47	20	41	21	14	17	17	11	17	18	24	13	11	9	8	8	27	14	24	14	18	47
28-Mar	28	12	15	20	69	22	22	9	33	31	10	12	10	8	8	8	4	4	4	5	6	6	7	5	69
29-Mar	58	8	7	7	18	6	43	25	26	7	11	11	10	17	13	11	12	11	9	9	12	7	12	11	58
30-Mar	9	66	69	10	31	36	20	31	14	54	55	65	41	47	30	74	99	49	14	13	7	14	13	14	99
31-Mar	63	50	43	17	13	11	8	8	7	8	11	12	9	8	7	9	8	7	13	48	15	12	11	8	63
Diurnal Maximum	63	66	69	47	69	41	43	51	62	59	55	65	51	61	66	74	99	59	16	48	21	64	59	18	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 163 m (WD163m) - deg

Lower Camp Met Tower - March 2023

Direction of Maximum Speed: 136 deg on Mar 10 00:00
Direction of Maximum Daily Speed Average: 133.1 deg on Mar 7

Direction of Minimum Speed: 164 deg on Mar 21 11:00

Direction of Minimum Daily Speed Average: 1.9 deg on Mar 5

Monthly Average Direction: 100.9 deg

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	157	139	140	136	138	136	142	140	UO	140	137	142	159	139	145	147	141	134	138	138	134	141	142	147	140.9
2-Mar	148	142	143	144	147	146	146	157	157	164	164	176	236	255	276	266	270	262	283	284	270	287	309	314	204.2
3-Mar	317	7	19	24	24	25	27	26	23	18	20	10	12	12	352	9	21	5	5	16	21	17	21	22	13.3
4-Mar	27	27	13	348	0	1	33	25	16	1	347	335	320	329	337	339	356	5	23	17	8	352	356	15	359.5
5-Mar	17	22	16	3	348	317	334	318	315	334	314	281	268	301	202	156	144	146	144	158	166	168	170	168	354.8
6-Mar	DF	163	157	151	150	150	134	156	157	153	161	157	154	149	131	134	129	129	130	131	137	136	137	139	140.4
7-Mar	136	133	138	134	132	131	133	132	132	132	129	128	127	128	127	128	130	125	128	134	138	140	140	141	133.1
8-Mar	143	142	140	136	139	146	150	146	141	151	151	142	127	135	136	141	137	130	125	130	137	141	140	140	139.6
9-Mar	144	141	141	147	144	150	155	155	152	147	155	139	139	138	140	142	136	127	133	132	130	128	134	136	138.8
10-Mar	135	135	139	135	135	137	134	132	131	132	133	129	125	124	123	123	129	120	118	118	128	128	130	131	130.8
11-Mar	134	136	134	127	130	135	133	136	137	126	135	131	121	124	118	124	101	33	20	14	18	17	15	15	98.1
12-Mar	16	13	5	3	6	4	9	6	6	2	357	353	350	354	358	5	9	7	5	6	8	7	9	5	4.9
13-Mar	1	359	358	359	4	7	9	9	6	360	355	351	343	2	7	19	30	55	63	65	49	40	28	19	18.5
14-Mar	19	16	11	18	16	17	13	11	360	354	359	2	2	356	353	354	350	351	353	1	1	1	8	9	4.2
15-Mar	359	353	1	17	11	9	355	5	360	329	314	288	291	285	309	311	326	349	24	35	32	62	104	133	357.0
16-Mar	139	134	129	135	129	127	144	140	163	160	148	159	153	157	150	158	145	142	150	151	147	148	145	148	144.9
17-Mar	141	143	156	157	153	156	155	158	157	164	145	148	150	158	165	180	196	244	236	247	230	232	214	222	174.6
18-Mar	226	228	223	211	213	215	210	206	191	179	172	173	186	199	198	197	139	21	38	41	41	51	52	29	149.6
19-Mar	28	47	53	71	118	134	133	129	135	125	104	112	125	126	132	134	129	130	131	128	127	123	122	129	120.0
20-Mar	123	129	127	130	122	112	100	75	65	89	79	345	10	13	13	14	11	7	10	14	12	11	9	10	37.4
21-Mar	15	31	30	4	344	344	354	352	348	37	164	327	137	176	145	139	161	172	177	172	167	159	153	153	124.4
22-Mar	153	152	145	145	146	144	141	150	147	152	163	163	167	170	167	147	140	145	153	149	147	147	152	157	151.0
23-Mar	169	198	239	268	169	181	208	258	325	19	16	19	26	30	20	18	33	25	18	16	11	8	343	348	13.9
24-Mar	3	3	360	11	25	28	24	29	12	322	302	303	311	273	244	233	170	152	169	158	164	167	182	185	25.0
25-Mar	190	185	176	194	297	351	320	344	359	354	333	6	2	9	14	17	21	21	15	15	15	11	6	3	7.4
26-Mar	17	4	350	4	33	47	78	108	137	284	330	303	321	333	4	359	5	12	9	8	10	22	30	29	9.1
27-Mar	21	355	337	348	315	218	176	182	191	198	172	171	162	131	138	132	113	112	112	41	47	54	84	111	99.1
28-Mar	105	57	43	19	101	157	164	157	172	175	169	164	157	157	155	158	161	175	180	170	165	152	160	171	160.3
29-Mar	199	311	343	341	338	336	345	357	337	352	353	345	1	19	24	19	22	30	25	25	23	11	34	30	8.0
30-Mar	26	32	331	332	338	337	115	91	111	88	47	328	227	294	290	58	86	49	57	110	104	108	118	119	81.6
31-Mar	121	129	123	111	115	82	74	56	24	16	3	349	338	339	333	331	335	341	343	66	121	115	112	120	43.2
Diurnal Average	108.1	107.6	104.0	103.9	107.9	114.8	113.9	110.3	111.0	113.3	109.4	102.9	89.9	86.3	82.2	83.2	80.9	77.8	77.9	92.2	100.4	104.3	107.2	110.6	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 163 m (WD163m) - deg

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Mar 5 15:00

Minimum Value: 2 deg on Mar 1 07:00

Percentiles: $P_1 = 3$ $P_{10} = 4$ $Q_1 = 5$ Median = 7 $Q_3 = 11$ $P_{90} = 16$ $P_{99} = 62$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	7	5	3	4	4	3	2	2	UO	3	3	6	9	10	11	9	8	3	4	4	5	8	6	7	11
2-Mar	7	6	7	6	7	7	8	8	9	7	12	62	32	25	36	13	8	6	13	14	9	13	7	6	62
3-Mar	20	10	7	9	9	11	7	9	8	8	11	12	10	11	14	16	10	9	5	9	8	9	9	9	20
4-Mar	11	11	9	6	8	10	10	10	7	11	12	15	11	11	10	13	7	12	4	8	10	8	10	6	15
5-Mar	6	5	7	5	9	14	5	11	5	5	19	44	33	68	100	23	10	8	14	7	7	6	6	6	100
6-Mar	DF	6	10	6	5	7	6	9	11	13	6	11	7	8	6	5	5	4	3	4	4	3	4	3	13
7-Mar	4	5	5	4	4	4	4	3	4	5	5	5	6	5	5	6	5	9	6	5	4	4	4	4	9
8-Mar	5	5	4	5	4	6	5	5	5	9	9	12	13	12	10	6	4	7	4	5	6	4	4	4	13
9-Mar	4	4	5	5	4	5	5	5	6	4	9	9	8	7	6	11	7	4	5	4	4	5	4	4	11
10-Mar	3	3	4	4	3	4	4	4	4	4	5	6	6	8	6	8	5	10	9	7	7	5	4	3	10
11-Mar	3	4	4	4	6	3	4	3	14	10	14	14	10	8	12	13	44	10	10	8	8	7	7	6	44
12-Mar	7	7	6	6	7	6	7	6	9	8	7	9	9	10	10	10	8	7	6	5	5	5	5	5	10
13-Mar	5	6	5	5	4	3	4	5	8	8	7	11	13	12	9	7	9	12	6	5	10	9	5	4	13
14-Mar	5	5	4	5	5	5	6	6	4	5	4	5	6	7	5	5	4	3	3	4	4	5	6	5	7
15-Mar	4	5	7	3	11	5	6	7	12	24	16	11	12	12	15	16	11	15	7	5	6	10	28	19	28
16-Mar	3	7	5	10	7	6	10	14	12	16	9	13	11	10	9	8	5	5	6	4	4	4	4	6	16
17-Mar	4	5	4	4	5	3	5	3	3	4	8	5	6	11	12	9	18	10	4	3	5	6	13	7	18
18-Mar	5	9	11	9	5	5	9	11	11	10	13	14	15	15	20	16	33	61	3	3	5	5	4	12	61
19-Mar	4	12	9	14	14	10	9	9	8	6	12	12	9	5	6	4	5	3	4	7	6	6	7	5	14
20-Mar	7	7	5	7	8	7	7	8	14	15	49	29	8	10	9	10	8	6	6	6	6	6	6	5	49
21-Mar	7	9	7	15	3	3	4	4	4	54	84	89	28	21	13	11	11	16	6	11	4	6	5	5	89
22-Mar	4	5	5	5	5	5	4	7	4	6	11	8	7	8	7	13	9	7	8	8	5	4	3	4	13
23-Mar	7	25	19	22	21	7	13	8	44	10	9	10	11	11	14	12	10	9	9	8	4	6	14	5	44
24-Mar	5	3	4	4	5	9	12	6	14	23	17	15	33	56	20	22	33	9	6	6	7	8	7	7	56
25-Mar	10	9	9	16	24	13	23	10	11	12	14	10	9	9	14	13	13	7	8	9	9	6	6	6	24
26-Mar	10	15	3	10	5	9	12	10	42	30	33	25	16	16	12	9	10	7	7	5	5	5	5	5	42
27-Mar	3	11	7	7	18	58	10	10	7	12	13	16	20	27	16	13	8	10	15	14	5	16	11	8	58
28-Mar	5	30	17	15	17	22	8	5	9	7	9	12	10	9	8	6	6	3	5	5	6	9	9	8	30
29-Mar	47	37	5	4	6	5	12	9	10	11	14	13	9	15	12	11	10	10	8	8	8	10	6	9	47
30-Mar	4	6	18	36	14	25	36	12	7	26	46	80	62	57	35	69	82	28	15	10	5	8	7	7	82
31-Mar	15	15	9	9	29	18	5	16	5	7	12	14	9	8	6	6	6	7	6	47	10	9	9	8	47
Diurnal Maximum	47	37	19	36	29	58	36	16	44	54	84	89	62	68	100	69	82	61	15	47	10	16	28	19	

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 163 m (WD163m) - deg

Lower Camp Met Tower - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Lower Camp Met Tower - March 2023

Maximum Value: 0.5 km/h on Mar 13 17:00

Maximum Daily Average: 0.0 km/h on Mar 13

Minimum Value: -1.5 km/h on Mar 22 13:00

Minimum Daily Average: -0.7 km/h on Mar 7

Maximum Diurnal Average: -0.1 km/h at hour 4

Minimum Diurnal Average: -0.5 km/h at hour 13

Monthly Average: -0.27 km/h

Percentiles: P_1 = -1.2 P_{10} = -0.8 Q_1 = -0.5 Median = -0.1 Q_3 = 0.0 P_{90} = 0.1 P_{99} = 0.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	-0.2	-0.1	-0.2	-0.5	-0.3	-0.3	-0.1	-0.2	-0.2	-0.8	-1.0	-1.0	-1.2	-1.2	-1.0	-0.4	-0.2	-0.3	-0.6	-0.5	-0.8	-0.6	-0.5	0.0
2-Mar	-0.6	-0.7	-0.5	-0.4	-0.8	-0.8	-0.7	-1.0	-0.9	-0.9	-0.6	-0.1	-0.7	-0.3	-0.2	-0.5	-1.0	-1.1	-0.8	-0.2	-0.6	-0.6	-0.4	-0.4	-0.6	-0.1
3-Mar	-0.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	-0.2	0.0	-0.1	-0.1	-0.1	0.1	0.1	0.1	0.0	0.0	-0.2	0.0	0.2	0.0	0.2
4-Mar	0.2	0.1	0.0	-0.1	0.0	-0.1	0.1	0.0	0.0	-0.4	0.0	-0.1	-0.2	-0.3	0.2	-0.2	-0.2	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.2
5-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.9	-1.0	-0.8	-0.2	-0.6	-0.2	-0.6	-0.3	0.0	0.0	0.1	0.0	0.0	0.0	-0.2	0.1
6-Mar	DF	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.4	-0.5	-0.5	-0.3	-0.6	-0.5	-0.1	-0.5	-0.7	-1.0	-0.9	-0.6	-0.3	0.0
7-Mar	-0.5	-0.2	-0.6	-0.8	-0.6	-0.8	-0.6	-0.7	-0.5	-0.5	-0.5	-0.7	-0.7	-0.6	-0.6	-0.6	-0.8	-0.4	-0.4	-0.9	-0.9	-0.8	-1.1	-0.6	-0.7	-0.2
8-Mar	-0.4	-0.3	-0.4	-0.5	-0.3	-1.0	-1.3	-0.5	-0.2	-0.9	-0.9	-0.7	-0.1	-0.4	-0.7	-1.3	-1.0	-0.6	-0.2	-0.2	-0.5	-0.4	-0.2	-0.2	-0.6	-0.1
9-Mar	-0.1	-0.2	-0.1	-0.3	-0.1	0.0	0.0	0.0	-0.4	-0.9	-0.7	-0.7	-0.8	-1.1	-1.1	-0.8	-1.0	-0.6	-0.9	-1.0	-1.1	-1.0	-0.7	-1.2	-0.6	0.0
10-Mar	-0.8	-0.9	-1.1	-0.6	-0.8	-0.8	-0.6	-0.7	-0.5	-0.6	-0.9	-0.8	-0.9	-0.4	-1.0	-0.6	-0.8	-0.4	-0.1	0.2	-0.2	-0.5	-0.7	-0.5	-0.6	0.2
11-Mar	-0.4	-0.2	-0.1	-0.1	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.7	-0.8	-0.3	-0.5	-0.3	-0.3	-0.1	0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	-0.2	0.2
12-Mar	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	0.0	0.0	-0.1	-0.4	-0.3	-0.1	0.0	0.2	0.0	-0.2	-0.3	0.0	0.2	0.0	0.1	0.1	0.1	-0.1	-0.1	0.2
13-Mar	0.1	0.1	-0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	-0.1	-0.1	-0.2	-0.3	0.3	0.5	0.1	0.3	0.2	0.2	0.1	-0.2	0.1	0.0	0.5
14-Mar	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.2	0.0	-0.3	-0.2	0.0	0.0	0.1	0.0	0.1	0.2	-0.2	-0.3	-0.2	-0.3	-0.1	0.0	-0.1	0.2
15-Mar	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.7	-0.9	-1.0	-1.0	-0.9	-0.8	-0.6	-0.8	-0.3	-0.1	0.0	0.0	0.0	0.0	0.0	-0.3	0.0
16-Mar	0.0	0.0	-0.3	0.1	-0.1	-0.1	0.1	0.0	-0.3	-0.5	-0.8	-0.6	-0.9	-0.8	-1.1	-0.9	-1.1	-0.6	-0.4	-0.3	-0.3	-0.6	-0.3	-0.6	-0.4	0.1
17-Mar	0.0	-0.4	-0.3	-0.3	-0.6	-0.5	-0.5	-0.5	-0.4	-0.5	-1.1	-0.9	-0.9	-1.2	-0.7	-0.5	-0.5	-0.2	0.1	0.0	0.1	0.0	0.1	-0.2	-0.4	0.1
18-Mar	-0.3	-0.2	-0.1	0.1	0.0	0.0	0.0	-0.5	-1.1	-0.7	-0.8	-0.9	-0.8	-0.7	-0.6	-0.5	-0.4	-0.1	0.2	-0.1	0.0	-0.1	-0.1	-0.1	-0.3	0.2
19-Mar	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.5	-0.8	-0.9	-1.0	-1.0	-0.9	-0.7	-0.6	-0.7	-0.3	-0.5	-0.4	-0.2	-0.3	-0.4	0.0
20-Mar	-0.3	-0.3	-0.6	-0.1	-0.5	-0.1	0.1	0.0	0.0	-0.1	-0.4	-0.3	-0.2	0.0	-0.1	0.0	-0.2	0.1	0.2	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.2
21-Mar	0.0	0.0	-0.1	0.1	0.0	0.0	0.1	0.1	0.0	-0.1	-0.1	-0.5	-0.6	-0.7	-0.3	-0.8	-0.6	-0.5	-0.6	-0.1	0.0	0.0	0.1	0.1	-0.2	0.1
22-Mar	0.1	0.0	-0.2	-0.1	-0.2	-0.3	-0.2	-0.1	-0.2	-0.8	-0.7	-1.2	-1.5	-1.2	-0.9	-0.6	-0.6	-0.6	-0.3	0.1	0.0	0.0	0.0	-0.1	-0.4	0.1
23-Mar	0.0	-0.1	0.0	0.0	-0.5	-0.5	-0.4	-0.2	0.1	0.2	0.0	-0.1	-0.2	0.2	0.1	-0.1	0.1	0.0	0.1	0.1	-0.1	-0.1	0.0	0.0	0.0	0.2
24-Mar	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.2	-1.0	-0.8	-0.4	-0.5	-0.5	-0.4	-0.6	-0.7	-0.4	-0.1	0.0	0.1	0.0	0.0	-0.2	0.1
25-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.2	-0.1	-0.3	-0.1	-0.2	-0.1	0.1	0.0	-0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	0.2
26-Mar	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.3	0.1	0.0	-0.1	-0.3	-0.1	-0.2	-0.2	-0.1	0.1	0.0	0.1	0.0	-0.1	0.0	0.0	0.3
27-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	-0.7	-1.0	-0.6	-0.3	-0.2	-0.6	-0.5	-0.3	-0.3	-0.1	-0.1	-0.1	0.0	0.1	0.1	-0.2	0.1
28-Mar	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.1	-0.8	-0.6	-1.0	-1.3	-1.1	-0.8	-1.3	-1.1	-0.9	-0.8	-0.5	-0.2	-0.6	-0.2	-0.5	0.0
29-Mar	0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	0.0	0.1	0.1	-0.2	0.2	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.2
30-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.6	-0.3	-0.4	0.2	-0.4	-0.1	0.1	0.1	0.0	0.2	-0.1	-0.1	-0.1	0.2
31-Mar	0.0	-0.1	-0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.2	0.1	0.2	-0.8	-0.7	-0.3	-0.3	-0.3	0.0	-0.1	0.1	0.2	-0.3	-0.3	-0.2	-0.1	0.2
	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.3	-0.4	-0.5	-0.5	-0.5	-0.5	-0.4	-0.5	-0.3	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	Diurnal Average	
	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.0	0.2	0.2	0.3	0.5	0.2	0.3	0.2	0.2	0.2	0.1	0.2	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 4.0 km/h on Mar 10 06:00

Minimum Value: 0.1 km/h on Mar 30 03:00

Percentiles: P_1 = 0.1 P_{10} = 0.3 Q_1 = 0.7 Median = 1.3 Q_3 = 2.0 P_{90} = 2.7 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.3	0.3	0.3	0.3	0.3	0.5	0.8	0.5	0.5	0.5	0.9	1.2	1.5	2.3	2.0	1.7	1.5	2.0	1.8	2.2	2.6	2.7	2.4	2.5	2.7
2-Mar	3.2	2.8	2.9	3.2	3.2	3.3	2.9	1.8	2.0	2.7	2.3	1.6	1.2	1.2	1.3	1.3	3.0	2.6	2.8	2.0	1.5	1.3	2.4	3.0	3.3
3-Mar	2.7	1.8	2.3	2.0	1.9	1.7	1.8	2.0	2.1	2.2	2.0	1.6	1.9	1.5	1.3	1.5	1.6	1.2	0.8	0.4	0.6	1.9	2.0	2.0	2.7
4-Mar	1.4	1.0	0.6	0.4	0.4	0.3	1.5	1.3	1.4	1.7	2.1	2.3	2.8	2.4	2.6	2.0	1.9	1.6	1.2	0.9	0.8	0.5	0.4	0.6	2.8
5-Mar	0.5	0.4	0.7	0.2	0.2	0.4	0.3	0.4	0.3	0.8	1.0	1.1	1.2	1.5	0.8	0.9	0.9	0.6	0.3	0.2	0.3	0.2	0.2	0.2	1.5
6-Mar	DF	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.4	0.5	0.9	1.1	1.3	1.8	2.4	2.4	1.5	2.1	3.3	3.2	3.0	2.8	3.3
7-Mar	2.4	2.3	2.9	3.0	2.7	2.7	2.7	2.8	2.8	3.2	3.1	3.1	3.0	3.2	3.2	3.2	2.7	2.1	1.6	2.9	3.0	3.1	3.5	3.2	3.5
8-Mar	2.6	2.1	1.6	1.2	1.8	1.7	1.5	1.6	1.3	2.3	2.2	2.2	2.0	2.3	2.2	1.9	2.1	1.9	1.5	1.8	2.4	2.4	2.1	1.8	2.6
9-Mar	2.0	1.5	1.3	1.7	1.4	0.7	0.6	0.6	1.6	1.5	1.4	2.5	3.2	3.0	3.5	3.5	3.4	2.7	2.8	3.2	3.0	3.0	3.8	3.8	3.8
10-Mar	3.6	3.5	3.4	3.3	3.7	4.0	3.3	2.9	3.1	3.5	3.3	3.3	3.0	2.7	2.5	2.6	3.0	2.0	1.2	0.7	1.4	2.3	2.3	2.0	4.0
11-Mar	1.8	0.9	0.8	1.1	0.7	1.0	0.8	0.5	0.8	1.4	1.1	1.2	1.6	1.8	1.6	1.3	1.2	1.6	2.0	1.9	1.6	1.5	1.8	1.6	2.0
12-Mar	1.5	1.6	1.9	1.7	1.6	1.6	1.5	1.8	1.6	1.6	1.8	2.0	1.9	1.8	1.8	1.9	1.8	1.7	1.4	1.4	1.4	1.5	1.3	1.4	2.0
13-Mar	1.4	1.5	1.4	1.5	1.0	0.6	0.8	1.1	1.3	1.4	1.5	1.7	1.9	2.1	2.0	2.6	2.6	1.4	1.0	1.4	1.6	1.7	1.8	1.9	2.6
14-Mar	2.0	2.1	2.4	2.2	2.2	1.9	2.1	2.0	2.5	2.6	2.2	2.2	1.9	1.8	2.0	2.1	2.2	2.4	2.5	2.3	2.0	1.9	1.6	1.1	2.6
15-Mar	1.1	0.5	0.2	0.3	0.2	0.2	0.1	0.1	0.3	0.8	1.0	1.2	1.1	1.1	0.9	1.0	1.2	0.7	0.3	0.3	0.2	0.1	0.1	0.2	1.2
16-Mar	0.3	0.4	0.8	0.7	0.6	0.8	0.4	0.7	1.0	1.3	1.5	1.8	1.5	1.7	1.7	1.6	1.7	1.7	1.5	1.4	1.8	1.6	1.6	1.2	1.8
17-Mar	1.3	1.0	1.2	1.2	1.4	0.9	0.8	1.0	1.2	1.1	1.8	1.9	1.6	1.7	1.6	1.1	0.7	0.5	0.4	0.5	0.5	0.5	0.6	0.7	1.9
18-Mar	0.4	0.5	0.6	0.5	0.4	0.6	0.6	0.6	1.0	1.6	1.8	1.3	1.1	0.8	0.6	0.6	0.4	0.7	1.4	0.7	0.5	0.4	0.3	0.4	1.8
19-Mar	0.3	0.3	0.4	0.1	0.2	0.1	0.1	0.2	0.7	1.5	1.5	1.4	1.4	1.6	1.4	2.0	2.0	1.9	2.2	1.7	2.1	2.1	1.3	1.9	2.2
20-Mar	1.4	1.7	2.3	1.4	1.5	1.2	1.2	1.1	1.4	1.3	0.8	0.9	2.1	2.5	2.7	2.8	2.8	2.8	2.6	2.4	2.2	1.9	1.4	1.0	2.8
21-Mar	0.5	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.6	0.7	0.9	0.7	1.2	1.3	1.0	0.8	0.9	1.1	0.9	0.4	0.4	0.8	0.8	1.3
22-Mar	0.9	1.0	1.5	1.3	0.8	1.8	0.7	0.4	1.0	1.0	1.4	1.9	1.5	1.4	1.3	1.6	1.3	1.0	1.0	1.0	0.6	0.5	0.3	0.7	1.9
23-Mar	0.5	0.4	0.4	0.4	0.9	1.2	0.7	0.8	0.9	1.8	2.8	2.8	2.9	3.2	2.8	3.2	3.2	3.2	2.7	1.6	0.9	0.4	0.2	0.1	3.2
24-Mar	0.8	1.2	1.4	0.8	0.6	0.7	0.8	0.4	1.2	1.7	1.2	1.5	1.5	1.3	1.3	0.9	0.9	1.0	1.0	0.7	0.5	0.4	0.3	0.1	1.7
25-Mar	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.4	0.8	1.1	2.3	2.5	2.3	2.5	2.6	2.5	2.7	2.5	1.7	1.4	1.3	1.3	1.3	2.7
26-Mar	0.9	0.7	0.8	0.9	0.3	0.7	0.4	0.6	0.6	1.2	1.7	2.0	2.1	2.3	2.2	2.5	2.4	2.4	1.9	1.3	1.5	1.1	0.5	0.2	2.5
27-Mar	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.9	1.2	1.4	1.7	1.6	1.8	1.9	2.1	1.7	1.2	0.4	0.7	0.7	0.7	0.5	0.4	2.1
28-Mar	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.6	0.6	1.1	1.8	2.3	2.3	2.4	2.2	2.2	1.4	1.2	1.5	1.9	2.2	1.7	0.8	0.5	2.4
29-Mar	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.5	0.8	1.2	1.8	2.2	2.5	2.2	2.2	2.7	2.4	2.0	1.3	0.7	0.3	0.2	0.2	2.7
30-Mar	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.8	0.8	1.4	1.3	1.2	1.2	1.3	1.3	1.1	1.2	1.6	1.1	0.6	0.6	1.1	0.9	1.6
31-Mar	0.6	1.0	1.1	0.7	0.6	0.7	0.9	0.9	1.2	1.3	1.8	2.1	2.5	2.7	2.5	2.0	2.0	1.4	0.7	0.7	0.7	1.4	1.9	1.8	2.7
Diurnal Maximum	3.6	3.5	3.4	3.3	3.7	4.0	3.3	2.9	3.1	3.5	3.3	3.3	3.2	3.2	3.5	3.5	3.4	3.2	2.8	3.2	3.3	3.2	3.8	3.8	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Lower Camp Met Tower - March 2023

Maximum Value: 1.5 km/h on Mar 9 16:00

Maximum Daily Average: 0.8 km/h on Mar 8

Minimum Value: -1.1 km/h on Mar 3 00:00

Minimum Daily Average: -0.2 km/h on Mar 14

Maximum Diurnal Average: 0.3 km/h at hour 4

Minimum Diurnal Average: -0.1 km/h at hour 13

Monthly Average: 0.13 km/h

Percentiles: P_1 = -0.7 P_{10} = -0.2 Q_1 = -0.1 Median = 0.0 Q_3 = 0.3 P_{90} = 0.7 P_{99} = 1.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.7	0.4	0.2	0.3	0.1	0.1	0.2	0.1	0.2	-0.2	0.2	0.4	0.1	0.5	0.3	0.3	0.0	0.7	1.0	0.6	0.7	0.7	0.6	0.7	0.4	1.0
2-Mar	0.9	0.7	0.8	1.0	0.8	1.0	0.8	0.4	0.5	0.5	0.3	0.4	-0.6	0.0	0.0	-0.3	-0.9	-0.5	-0.9	-0.2	-0.2	-0.4	-0.7	-1.1	0.1	1.0
3-Mar	-0.9	0.4	-0.1	-0.1	0.1	0.1	0.0	0.0	0.2	0.0	-0.1	-0.1	-0.2	0.0	-0.4	-0.2	0.1	0.0	0.1	0.0	0.0	-0.1	0.0	0.2	0.0	0.4
4-Mar	0.2	0.1	0.0	-0.1	0.0	-0.1	0.0	0.1	0.0	-0.4	-0.1	-0.4	-0.8	-0.5	-0.1	-0.4	-0.3	0.1	0.1	-0.2	-0.1	-0.2	0.1	-0.1	-0.1	0.2
5-Mar	-0.1	0.1	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.6	-0.7	-0.5	0.2	-0.5	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	-0.1	0.2
6-Mar	DF	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	-0.1	0.0	-0.3	0.3	0.4	0.5	0.2	0.5	0.2	0.6	0.4	0.5	0.9	0.2	0.9
7-Mar	0.6	0.8	0.8	0.5	0.6	0.3	0.4	0.2	0.7	0.8	0.7	0.9	0.6	0.5	0.5	0.6	0.5	0.3	0.3	0.1	0.3	0.3	0.5	0.7	0.5	0.9
8-Mar	0.9	0.7	0.6	0.9	1.3	1.1	0.8	1.3	0.6	0.9	0.9	0.5	0.7	0.7	0.3	0.4	0.7	0.6	0.3	0.7	0.3	1.0	0.9	1.1	0.8	1.3
9-Mar	1.3	0.8	0.7	1.2	0.0	0.0	0.1	0.2	0.3	0.4	0.1	0.5	1.0	0.6	0.9	1.5	0.8	0.4	0.7	0.9	0.5	0.4	0.7	0.9	0.6	1.5
10-Mar	0.9	0.7	0.9	0.7	0.9	0.9	0.7	0.7	0.9	0.9	0.7	0.5	0.3	0.4	0.0	0.2	0.4	0.3	0.2	0.1	0.4	1.0	0.2	0.1	0.5	1.0
11-Mar	0.4	0.3	0.4	0.4	0.0	0.1	0.1	0.1	0.2	0.4	-0.1	0.0	0.2	0.1	0.2	0.5	0.4	0.4	-0.1	-0.2	-0.1	0.1	0.0	0.0	0.2	0.5
12-Mar	0.0	0.0	-0.3	0.0	-0.1	-0.1	0.0	-0.1	-0.3	-0.5	-0.3	-0.4	-0.4	0.0	-0.3	0.0	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.2	0.0
13-Mar	-0.1	0.0	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	-0.3	0.0	0.1	-0.1	0.1	0.0	-0.3	0.4	0.3	0.0	0.3	-0.1	0.0	-0.1	-0.1	0.0	0.0	0.4
14-Mar	0.0	-0.2	-0.4	-0.1	-0.2	-0.2	-0.3	-0.1	-0.3	-0.3	-0.3	-0.5	-0.2	-0.1	-0.3	-0.3	-0.4	-0.2	-0.5	-0.6	-0.2	-0.2	-0.1	0.1	-0.2	0.1
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	-0.2	-0.5	-0.2	-0.5	-0.4	-0.4	-0.2	-0.2	-0.3	0.0	0.0	0.0	0.0	0.1	0.2	-0.1	0.2
16-Mar	0.2	0.5	0.1	0.4	0.0	0.1	0.0	0.2	0.1	0.1	0.2	0.0	0.0	-0.1	0.0	0.0	0.8	0.7	0.9	1.0	0.4	-0.2	0.0	-0.5	0.2	1.0
17-Mar	0.2	0.0	0.9	0.8	0.1	-0.3	0.1	0.3	0.7	0.0	-0.1	0.0	0.6	0.5	0.6	0.0	-0.1	0.3	0.3	0.2	0.4	0.6	0.7	0.6	0.3	0.9
18-Mar	0.6	1.1	1.1	0.9	1.1	1.1	0.5	0.5	-0.5	0.1	0.1	-0.3	-0.1	-0.1	0.0	-0.1	0.0	0.2	0.2	-0.1	0.1	-0.1	0.0	-0.1	0.3	1.1
19-Mar	-0.1	0.0	-0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.0	0.0	0.4	0.7	0.8	0.6	0.4	0.4	0.2	0.2	0.3	0.2	0.8
20-Mar	0.1	0.3	0.4	0.4	0.1	0.3	0.2	0.2	0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.1	0.0	-0.3	0.0	0.1	-0.2	-0.1	0.0	-0.1	0.0	0.4
21-Mar	-0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0	0.1	0.0	0.0	0.2	-0.4	-0.4	-0.7	-0.1	-0.3	-0.2	0.1	-0.4	0.3	0.5	0.6	1.2	1.0	0.0	1.2
22-Mar	1.3	0.7	0.9	1.0	0.4	0.5	0.2	0.2	0.1	-0.1	0.0	-0.2	-0.7	-0.2	-0.1	0.4	0.3	0.7	1.0	1.0	0.1	0.2	0.3	0.5	0.4	1.3
23-Mar	0.4	0.5	0.7	0.7	0.5	0.2	0.3	0.4	-0.1	0.0	-0.1	-0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.1	0.1	0.1	-0.1	0.0	-0.1	0.2	0.7
24-Mar	-0.2	-0.1	-0.1	0.0	0.2	-0.1	-0.2	-0.3	-0.1	-0.2	-0.5	-0.2	0.2	0.4	-0.2	-0.5	-0.1	0.1	0.3	0.5	0.1	0.0	0.1	0.1	0.0	0.5
25-Mar	0.1	0.0	0.3	0.3	0.2	0.1	0.0	0.1	-0.1	0.2	0.2	-0.2	-0.5	-0.2	-0.3	-0.1	0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.3
26-Mar	-0.1	-0.1	0.0	0.2	0.0	-0.1	0.1	-0.1	0.0	0.5	-0.1	0.6	-0.1	-0.2	-0.1	-0.5	-0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.0	0.6
27-Mar	-0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	-0.1	-0.3	0.0	0.4	-0.1	0.1	0.3	0.3	0.2	0.2	-0.1	-0.2	0.0	0.0	0.1	0.1	0.5
28-Mar	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.1	-0.1	0.5	0.1	0.1	0.2	0.5	-0.2	0.1	0.2	1.0	0.8	0.4	0.0	0.3	0.2	1.0
29-Mar	0.1	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.3	0.1	0.2	0.3	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	0.0	0.0	0.3
30-Mar	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.3	0.1	-0.2	0.0	-0.1	-0.4	0.0	-0.1	0.3	-0.2	0.1	-0.1	0.5	0.0	-0.1	-0.3	-0.1	0.0	0.5
31-Mar	0.0	-0.3	-0.5	-0.1	-0.1	0.1	0.0	0.2	0.1	0.0	-0.2	0.3	-1.0	-0.9	-0.7	-0.5	-0.7	-0.3	0.1	0.2	0.2	0.1	0.1	0.1	-0.2	0.3
	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	Diurnal Average	
	1.3	1.1	1.1	1.2	1.3	1.1	0.8	1.3	0.9	0.9	0.9	0.9	1.0	0.7	0.9	1.5	0.8	0.8	1.0	1.0	0.8	1.0	1.2	1.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.2 km/h on Mar 23 17:00

Minimum Value: 0.1 km/h on Mar 30 03:00

Percentiles: P_1 = 0.1 P_{10} = 0.3 Q_1 = 0.7 Median = 1.2 Q_3 = 1.8 P_{90} = 2.3 P_{99} = 2.9

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.9	0.9	1.5	1.8	1.6	1.7	1.6	1.5	1.6	1.8	1.8	2.2	2.1	2.2	2.2
2-Mar	2.5	2.3	2.5	2.9	2.4	2.5	2.5	2.1	1.6	1.9	1.5	1.3	1.3	1.4	1.4	1.4	3.1	2.3	2.7	2.3	1.3	1.2	2.6	3.1	3.1
3-Mar	2.7	1.6	1.9	1.7	1.7	1.5	1.7	1.8	1.8	1.8	1.7	1.5	1.6	1.5	1.2	1.4	1.5	1.0	0.6	0.4	0.6	1.6	1.9	1.7	2.7
4-Mar	1.5	1.0	0.6	0.4	0.5	0.4	1.5	1.3	1.2	1.4	1.8	2.3	3.0	2.7	2.7	1.7	1.5	1.4	1.1	1.1	1.2	0.6	0.6	0.9	3.0
5-Mar	0.6	0.5	0.9	0.3	0.3	0.5	0.4	0.5	0.3	0.7	0.9	1.2	1.4	1.7	1.0	1.0	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.3	1.7
6-Mar	DF	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.8	0.8	1.5	1.6	1.8	1.8	1.3	1.7	2.1	2.0	2.2	1.9	2.2
7-Mar	1.8	2.1	2.5	2.3	2.1	2.0	2.0	2.2	2.3	2.7	2.7	2.8	2.4	2.7	2.7	2.8	2.0	1.8	1.5	2.0	2.0	2.4	2.6	2.5	2.8
8-Mar	2.4	2.0	1.5	1.6	2.0	1.8	1.2	0.8	1.3	1.8	1.4	1.8	2.0	2.3	1.9	1.4	0.9	1.1	1.3	1.7	2.1	2.1	2.1	1.8	2.4
9-Mar	2.0	1.8	1.1	1.3	1.7	1.0	0.7	0.8	1.5	1.0	1.2	2.3	2.7	2.4	2.6	2.9	2.5	2.3	2.0	2.4	2.3	2.2	2.6	2.6	2.9
10-Mar	2.6	2.3	2.1	2.2	2.5	2.4	2.5	2.5	2.5	2.8	2.6	2.6	2.2	2.1	2.0	2.2	2.3	1.8	1.1	0.8	1.3	1.4	1.8	1.3	2.8
11-Mar	1.5	1.1	1.1	1.1	0.8	0.9	0.9	0.6	1.0	1.4	1.3	1.5	1.6	1.5	1.6	1.4	1.2	1.4	1.7	1.3	1.2	1.3	1.5	1.3	1.7
12-Mar	1.4	1.4	1.6	1.6	1.4	1.3	1.3	1.3	1.4	1.2	1.6	1.9	2.0	1.8	1.7	1.6	1.3	1.4	1.3	1.3	1.4	1.4	1.4	1.3	2.0
13-Mar	1.5	1.5	1.5	1.4	1.1	0.8	0.8	1.1	1.3	1.4	1.5	1.7	2.2	1.7	1.6	2.2	1.9	1.3	1.2	1.4	1.6	1.6	1.1	1.2	2.2
14-Mar	1.5	1.8	2.0	1.7	1.6	1.3	1.6	1.7	2.4	2.3	2.0	1.8	1.8	2.1	1.9	1.9	2.1	2.3	2.1	1.7	1.6	1.5	1.4	1.1	2.4
15-Mar	1.0	0.7	0.3	0.4	0.3	0.3	0.3	0.2	0.4	0.4	0.8	0.7	0.5	0.6	0.6	0.8	0.8	0.7	0.3	0.2	0.3	0.1	0.2	0.3	1.0
16-Mar	0.5	0.6	1.1	1.1	0.8	1.0	0.4	0.7	1.0	1.4	1.1	1.3	1.0	1.1	1.1	1.2	0.8	1.0	1.1	1.1	1.5	1.5	2.0	1.1	2.0
17-Mar	1.6	1.1	0.8	1.1	1.1	1.1	0.7	1.0	0.9	1.0	1.0	1.3	1.0	1.0	0.9	0.8	0.6	0.5	0.7	1.1	0.9	0.8	0.7	0.8	1.6
18-Mar	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.9	1.1	1.2	0.7	0.6	0.5	0.5	0.4	0.3	0.9	1.4	0.9	0.3	0.5	0.3	0.5	1.4
19-Mar	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.4	0.9	1.6	1.4	1.0	0.7	1.0	0.9	1.0	1.2	0.9	1.4	1.3	1.6	1.7	1.3	1.8	1.8
20-Mar	1.2	1.6	1.7	1.2	1.1	1.1	1.2	1.1	1.4	1.1	0.8	1.1	1.5	2.2	2.4	2.4	2.3	1.9	2.2	1.9	1.9	1.4	1.3	1.0	2.4
21-Mar	0.6	0.3	0.3	0.3	0.3	0.1	0.2	0.3	0.4	0.6	0.8	0.8	0.8	1.2	1.4	0.9	0.8	1.2	1.4	1.2	0.8	0.6	0.8	1.0	1.4
22-Mar	1.0	1.1	1.1	1.2	0.8	1.5	0.9	0.7	1.0	0.9	1.4	2.2	1.9	2.0	1.5	1.4	0.8	0.7	0.9	1.0	0.8	0.5	0.6	0.6	2.2
23-Mar	0.7	0.7	0.3	0.4	0.7	0.8	0.7	0.9	1.0	1.6	2.3	2.5	2.7	3.0	2.8	2.9	3.2	3.1	2.4	1.6	1.0	0.5	0.3	0.2	3.2
24-Mar	0.8	1.1	1.3	0.5	0.7	1.0	1.0	0.6	1.1	1.9	1.2	1.6	1.9	1.6	1.6	0.9	1.0	0.9	1.2	0.9	0.7	0.5	0.4	0.2	1.9
25-Mar	0.2	0.2	0.3	0.3	0.2	0.3	0.1	0.1	0.4	0.8	1.3	2.0	1.8	2.1	2.2	2.3	2.2	2.5	2.1	1.6	1.3	1.0	1.1	1.1	2.5
26-Mar	0.9	0.8	0.9	0.8	0.4	0.5	0.3	0.5	0.6	1.4	1.6	2.4	2.6	2.6	2.1	2.1	2.0	1.9	1.5	1.3	1.3	1.2	0.8	0.3	2.6
27-Mar	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.5	0.7	1.0	1.8	1.8	1.8	2.0	1.9	1.5	1.0	0.3	0.8	1.0	0.9	0.6	0.5	2.0
28-Mar	0.2	0.3	0.2	0.2	0.1	0.3	0.3	0.4	0.6	1.0	1.4	2.2	1.9	1.9	1.8	1.7	1.4	1.1	1.6	1.4	1.4	1.4	0.9	0.5	2.2
29-Mar	0.4	0.3	0.4	0.2	0.2	0.2	0.3	0.3	0.5	0.8	1.2	1.8	1.9	2.4	2.2	2.1	2.4	2.5	2.1	1.3	0.8	0.5	0.3	0.2	2.5
30-Mar	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.6	0.8	1.4	1.5	1.3	1.5	1.5	1.4	1.2	1.3	1.5	1.2	0.7	0.6	1.1	0.9	1.5
31-Mar	0.8	0.8	0.6	0.4	0.5	0.7	0.9	0.9	1.2	1.3	1.8	2.2	2.7	2.9	2.9	2.3	2.1	1.5	0.9	1.1	0.9	1.8	2.0	1.5	2.9
Diurnal Maximum	2.7	2.3	2.5	2.9	2.5	2.5	2.5	2.5	2.5	2.8	2.7	2.8	3.0	3.0	2.9	2.9	3.2	3.1	2.7	2.4	2.3	2.4	2.6	3.1	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Vertical Wind Speed 100 m (VW100m) - km/h

Lower Camp Met Tower - March 2023

Maximum Value: 2.1 km/h on Mar 9 16:00

Maximum Daily Average: 0.7 km/h on Mar 8

Minimum Value: -1.3 km/h on Mar 2 17:00

Minimum Daily Average: -0.1 km/h on Mar 21

Maximum Diurnal Average: 0.4 km/h at hour 4

Minimum Diurnal Average: 0.0 km/h at hour 11

Monthly Average: 0.22 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.3 Q_1 = -0.1 Median = 0.2 Q_3 = 0.5 P_{90} = 0.8 P_{99} = 1.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.2	0.0	0.1	0.0	0.2	0.1	0.0	0.1	0.5	0.1	0.7	0.6	0.2	0.5	0.5	0.1	0.1	0.4	0.9	0.7	0.9	1.3	0.6	1.4	0.4	1.4
2-Mar	1.4	0.6	1.1	1.7	1.4	1.3	1.1	0.1	0.3	-0.4	-0.3	0.1	-0.5	-0.2	0.0	-0.3	-1.3	-1.0	-1.3	-0.3	-0.5	-0.6	-0.8	-1.3	0.0	1.7
3-Mar	-0.9	1.3	0.4	0.4	0.5	0.8	0.5	0.5	0.7	0.3	0.5	0.3	0.1	0.2	-0.4	-0.1	0.6	0.2	0.4	0.2	0.3	0.5	0.9	0.8	0.4	1.3
4-Mar	0.7	0.4	0.1	0.0	0.2	-0.1	0.4	0.5	0.4	0.1	0.1	-0.2	-0.8	0.1	0.1	-0.1	0.1	0.7	0.7	0.1	-0.1	0.1	0.1	0.5	0.2	0.7
5-Mar	0.2	0.5	0.2	0.2	0.0	-0.2	-0.1	-0.1	-0.1	-0.2	-1.1	-0.9	-0.7	-0.1	-0.5	-0.2	0.1	0.2	0.2	0.2	0.0	0.2	0.2	0.4	-0.1	0.5
6-Mar	DF	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	-0.1	0.0	-0.2	0.1	0.0	0.6	0.5	0.3	0.0	0.5	-0.4	-0.5	-0.7	-0.2	0.3	0.1	0.6
7-Mar	0.1	1.3	0.9	0.2	0.0	-0.2	0.1	0.0	0.5	1.2	1.0	1.4	0.8	0.4	0.5	0.4	-0.5	0.6	0.1	-1.1	-0.7	-0.6	-0.3	0.7	0.3	1.4
8-Mar	1.0	1.0	0.4	1.6	2.1	1.6	0.7	1.1	1.2	1.5	0.8	0.7	1.2	1.1	-0.1	-0.5	-0.5	-0.1	0.4	0.6	-0.3	0.3	0.7	1.3	0.7	2.1
9-Mar	1.7	1.3	0.7	1.3	0.4	-0.1	0.1	0.1	1.2	0.9	0.2	0.7	1.6	0.7	0.3	2.1	0.4	0.3	-0.3	0.0	-0.3	-0.4	-0.1	0.1	0.5	2.1
10-Mar	0.1	0.2	-0.2	-0.1	-0.1	-0.6	0.0	0.6	0.6	0.9	0.5	0.2	0.1	0.3	-0.3	0.2	-0.3	0.5	0.4	0.4	0.3	0.3	-0.2	-0.5	0.1	0.9
11-Mar	0.3	0.6	0.9	0.9	0.2	-0.1	0.1	-0.1	0.3	0.5	-0.3	0.2	0.2	0.0	0.2	1.2	0.6	1.2	0.4	0.4	0.4	0.4	0.4	0.6	0.4	1.2
12-Mar	0.7	0.6	0.3	0.4	0.4	0.3	0.4	0.2	0.0	-0.2	-0.1	-0.4	-0.3	0.5	0.2	0.5	0.2	0.3	0.4	0.3	0.2	0.5	0.4	0.3	0.2	0.7
13-Mar	0.1	0.1	0.0	0.2	0.0	0.1	0.1	0.1	-0.2	0.2	0.3	0.1	0.8	0.6	0.1	1.0	0.9	0.9	0.6	0.3	0.3	0.4	0.2	0.4	0.3	1.0
14-Mar	0.4	0.2	0.5	0.8	0.4	0.4	0.3	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	0.3	0.4	0.5	0.5	0.3	0.8
15-Mar	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	-0.2	-0.4	-0.3	-0.7	-0.4	-0.4	-0.2	-0.3	0.0	0.2	0.3	0.1	0.2	0.1	0.3	0.0	0.3
16-Mar	0.2	0.7	0.3	0.1	0.1	0.2	0.0	0.1	0.0	0.3	-0.1	-0.2	-0.4	-0.4	-0.3	-0.2	0.1	0.1	1.1	1.5	0.9	0.0	0.1	-0.6	0.2	1.5
17-Mar	0.8	-0.3	1.1	0.8	0.6	-1.3	0.2	0.2	0.7	-1.0	-0.1	1.4	1.1	0.1	-0.1	-0.2	-0.5	-0.1	0.0	-0.1	-0.6	-0.3	-0.3	-0.3	0.1	1.4
18-Mar	-0.1	0.0	0.0	0.0	-0.3	-0.3	-0.1	0.0	0.0	0.0	-0.1	-0.2	0.0	0.0	-0.1	-0.3	0.0	0.4	1.1	0.5	1.0	0.8	0.3	0.2	0.1	1.1
19-Mar	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.0	0.1	0.6	-0.1	-0.3	-0.3	-0.4	-0.6	-0.4	0.0	0.3	0.1	0.5	0.3	0.0	0.4	0.4	0.1	0.6
20-Mar	0.1	0.2	0.3	0.8	0.2	0.7	0.5	0.5	0.7	0.0	0.0	0.3	0.2	0.4	0.4	0.3	0.9	0.3	0.9	0.8	0.5	0.5	0.6	0.0	0.4	0.9
21-Mar	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	-0.1	-0.2	0.0	-0.5	-0.7	-1.0	-0.3	-0.4	-0.6	0.0	-1.0	0.1	0.3	0.5	0.3	0.6	-0.1	0.6
22-Mar	1.5	1.1	1.2	0.9	0.4	1.7	0.5	0.0	0.2	0.3	-0.2	-0.1	-1.0	-0.4	-0.1	0.1	-0.3	0.5	0.9	1.0	0.2	0.1	0.5	0.7	0.4	1.7
23-Mar	0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.2	0.4	0.7	0.3	1.1	1.0	1.5	1.4	0.6	1.1	1.4	0.8	0.9	0.0	0.0	-0.1	0.4	1.5
24-Mar	0.1	0.3	0.3	0.4	1.2	0.3	0.0	0.1	0.1	-0.1	-0.8	-0.3	0.7	1.3	-0.3	-0.6	-0.1	-0.2	0.2	0.5	-0.2	0.1	-0.1	0.0	0.1	1.3
25-Mar	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	-0.1	-0.4	-0.2	0.2	-0.3	0.0	0.6	0.7	0.9	0.5	0.4	0.6	0.4	0.2	0.2	0.4	0.2	0.9
26-Mar	0.3	0.1	0.3	0.6	0.2	0.4	0.3	0.1	0.1	0.2	-0.2	0.7	0.3	0.1	0.0	0.1	0.6	0.5	0.5	-0.1	-0.1	-0.1	0.3	0.1	0.2	0.7
27-Mar	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.1	0.0	0.0	0.4	0.4	0.0	0.1	0.8	0.7	0.5	0.1	0.3	0.1	0.8
28-Mar	0.2	0.5	0.3	0.1	0.1	0.2	0.1	0.1	0.4	-0.2	-0.3	0.8	-0.1	-0.1	-0.1	0.7	-0.9	-0.8	-0.6	0.6	0.6	0.7	-0.3	0.1	0.1	0.8
29-Mar	0.2	0.0	0.2	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.3	0.2	1.2	0.9	1.0	0.8	0.8	0.6	0.6	0.3	0.5	0.4	0.2	0.3	1.2
30-Mar	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.1	-0.7	-0.1	0.2	-0.3	-0.3	-0.2	0.4	0.2	0.5	0.7	1.3	0.4	0.2	0.4	0.7	0.2	1.3
31-Mar	0.2	0.3	-0.1	0.1	0.2	0.2	-0.1	0.1	0.3	0.3	0.3	0.8	-0.6	-0.6	-0.7	-0.5	-0.7	-0.3	0.0	0.1	0.1	0.0	0.4	0.5	0.0	0.8
	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.0	0.2	0.1	0.1	0.0	0.2	0.1	0.3	0.3	0.4	0.2	0.2	0.2	0.3	Diurnal Average	
	1.7	1.3	1.2	1.7	2.1	1.7	1.1	1.1	1.2	1.5	1.0	1.4	1.6	1.3	1.5	2.1	0.9	1.2	1.4	1.5	1.0	1.3	0.9	1.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Vertical Wind Speed 100 m (VW100m) - km/h

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.7 km/h on Mar 9 16:00

Minimum Value: 0.1 km/h on Mar 30 03:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.8 Median = 1.3 Q_3 = 1.8 P_{90} = 2.4 P_{99} = 3.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.5	0.7	0.6	0.7	0.8	0.6	0.8	0.6	1.0	0.8	1.0	1.0	1.9	2.1	2.2	2.0	2.0	1.6	1.4	1.8	1.8	2.0	2.0	2.1	2.2
2-Mar	2.6	2.0	2.1	2.4	2.3	2.6	2.5	2.6	2.6	2.2	1.4	1.6	1.7	1.7	1.6	1.5	2.5	1.7	2.4	2.3	1.0	1.5	2.5	2.6	2.6
3-Mar	2.5	1.8	2.0	1.9	1.9	1.8	1.9	1.9	1.9	1.9	2.1	1.6	1.8	1.7	1.6	1.6	1.7	1.0	0.7	0.4	0.7	1.9	2.0	2.1	2.5
4-Mar	1.8	1.2	0.6	0.3	0.6	0.5	1.5	1.6	1.3	1.5	2.0	2.7	3.2	3.2	2.8	2.2	1.4	1.5	1.0	1.3	1.7	0.7	1.0	1.4	3.2
5-Mar	1.0	1.1	1.2	0.3	0.4	0.5	0.3	0.4	0.3	1.0	1.1	1.2	1.5	1.7	1.3	1.1	0.8	0.7	0.8	0.9	1.0	0.7	0.6	0.5	1.7
6-Mar	DF	0.5	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.8	0.9	1.6	1.3	1.8	1.6	1.1	1.5	1.8	1.6	1.9	1.4	1.9
7-Mar	1.5	2.0	2.3	2.2	2.1	1.9	1.9	1.9	2.4	2.5	2.4	2.6	2.4	2.5	2.8	3.0	2.2	2.1	1.8	2.0	1.9	2.1	2.1	2.1	3.0
8-Mar	2.1	1.9	1.4	1.6	1.7	1.8	1.7	1.3	1.5	2.0	1.8	1.9	2.3	2.8	2.5	1.7	1.1	1.3	1.1	1.7	2.2	1.7	2.0	1.4	2.8
9-Mar	1.6	1.4	1.2	1.5	1.6	1.0	0.8	0.8	1.6	1.3	1.1	2.4	2.8	3.0	3.1	3.7	2.6	2.4	2.2	2.5	2.5	2.4	2.6	2.4	3.7
10-Mar	2.4	2.2	1.9	1.9	2.0	1.8	2.3	2.3	2.3	2.4	2.7	2.4	2.6	2.6	2.4	2.6	2.2	2.0	1.3	1.3	1.6	1.8	1.6	1.1	2.7
11-Mar	1.5	1.0	1.2	1.1	1.1	0.7	1.0	0.7	1.1	1.5	1.3	1.4	1.7	2.0	1.7	1.9	1.5	1.8	1.7	1.4	1.1	1.2	1.5	1.4	2.0
12-Mar	1.5	1.3	1.2	1.3	1.2	1.1	1.5	1.3	1.2	1.2	1.5	1.9	2.2	1.9	1.9	1.8	1.3	1.3	1.1	1.0	0.9	1.1	1.0	1.1	2.2
13-Mar	1.2	1.3	1.2	1.2	0.8	0.5	0.6	0.9	1.0	1.3	1.5	1.8	2.3	1.9	1.6	2.4	2.2	1.7	1.3	1.5	1.7	1.7	0.9	1.4	2.4
14-Mar	1.3	1.2	1.4	1.5	1.4	1.4	1.2	1.4	1.5	2.0	1.5	1.3	1.6	1.9	1.8	1.8	1.5	1.5	1.6	1.2	1.2	0.9	0.9	1.0	2.0
15-Mar	0.7	0.7	0.2	0.5	0.5	0.3	0.2	0.3	0.3	0.7	0.9	0.6	0.6	0.4	0.8	1.0	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.4	1.0
16-Mar	0.5	0.5	1.3	1.3	1.1	1.0	0.4	0.7	1.1	1.5	1.2	1.3	1.2	1.3	1.2	1.4	1.4	1.1	1.3	1.2	1.4	1.7	2.3	1.7	2.3
17-Mar	2.2	1.7	1.1	1.2	1.3	1.0	0.9	0.9	0.8	1.5	1.6	1.1	1.1	1.4	1.5	1.0	0.9	0.7	0.8	0.8	1.2	1.4	1.0	1.2	2.2
18-Mar	0.6	0.8	0.8	0.6	0.5	0.4	0.7	0.8	0.5	0.7	1.0	0.9	0.8	0.6	0.3	0.3	0.4	1.5	1.2	0.9	0.7	0.7	0.5	0.3	1.5
19-Mar	0.3	0.4	0.4	0.5	0.3	0.3	0.5	0.8	1.2	1.4	1.0	1.1	0.8	1.0	1.1	1.1	1.1	0.7	1.1	1.2	1.7	1.8	1.5	1.8	1.8
20-Mar	1.2	1.4	1.4	1.4	1.2	1.0	0.8	1.0	1.9	1.3	0.6	1.7	1.6	2.4	2.7	2.7	2.7	2.1	2.4	2.4	2.2	1.6	1.3	1.0	2.7
21-Mar	0.9	0.8	0.7	0.4	0.3	0.1	0.3	0.4	0.3	0.5	0.8	0.8	1.1	1.2	1.1	0.9	0.9	1.6	1.4	2.0	1.6	1.4	1.5	1.7	2.0
22-Mar	1.3	1.3	1.2	1.1	1.3	1.4	1.2	0.9	1.3	1.1	1.9	2.9	2.4	2.0	1.7	1.9	1.3	1.2	1.3	1.2	0.9	0.7	0.8	0.7	2.9
23-Mar	0.6	1.0	0.4	0.5	0.5	0.7	0.5	0.9	1.0	1.7	2.6	3.1	3.6	3.4	3.5	3.2	3.5	3.4	2.9	1.9	1.4	0.9	0.5	0.3	3.6
24-Mar	1.0	0.5	0.7	0.5	0.9	1.6	1.5	0.8	1.0	2.0	1.3	1.7	2.3	1.9	1.7	1.0	1.1	1.0	1.4	1.2	1.2	1.0	0.6	0.3	2.3
25-Mar	0.3	0.5	0.3	0.4	0.4	0.3	0.1	0.2	0.3	0.8	1.6	2.2	2.0	2.4	2.8	2.7	2.6	2.6	2.3	1.8	1.6	1.0	0.8	0.9	2.8
26-Mar	0.7	0.9	0.7	0.6	0.5	0.7	0.5	0.5	0.4	1.6	1.6	2.6	3.1	3.0	2.4	2.4	2.3	2.2	1.5	1.0	1.2	1.3	1.3	0.6	3.1
27-Mar	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.3	0.4	0.4	1.0	1.5	1.7	2.1	2.2	2.1	1.9	0.9	0.3	0.9	1.3	1.2	1.0	0.7	2.2
28-Mar	0.3	0.4	0.4	0.3	0.1	0.4	0.4	0.5	0.8	0.9	1.6	2.6	2.2	2.1	2.1	1.9	1.5	0.9	0.9	1.5	1.7	1.4	1.1	0.6	2.6
29-Mar	0.5	0.2	0.2	0.3	0.2	0.3	0.4	0.2	0.6	0.7	1.3	1.9	2.1	3.0	2.6	2.4	2.7	3.0	2.5	1.5	1.1	0.7	0.7	0.3	3.0
30-Mar	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.4	0.9	1.1	2.0	1.5	1.7	1.8	1.6	1.5	1.2	1.6	1.2	0.8	0.6	1.1	1.2	2.0
31-Mar	1.1	1.3	0.8	0.5	0.6	0.5	0.6	0.8	1.1	1.2	1.8	2.3	2.2	2.5	2.1	2.2	1.7	1.3	0.9	1.4	1.3	2.7	2.6	1.5	2.7
Diurnal Maximum	2.6	2.2	2.3	2.4	2.3	2.6	2.5	2.6	2.6	2.5	2.7	3.1	3.6	3.4	3.5	3.7	3.5	3.4	2.9	2.5	2.5	2.7	2.6	2.6	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Vertical Wind Speed 163 m (VW163m) - km/h

Lower Camp Met Tower - March 2023

Maximum Value: 3.5 km/h on Mar 9 16:00

Maximum Daily Average: 1.2 km/h on Mar 1

Minimum Value: -1.4 km/h on Mar 7 20:00

Minimum Daily Average: -0.1 km/h on Mar 19

Maximum Diurnal Average: 0.6 km/h at hour 4

Minimum Diurnal Average: 0.1 km/h at hour 17

Monthly Average: 0.35 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.3 Q_1 = 0.0 Median = 0.3 Q_3 = 0.6 P_{90} = 1.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.2	0.4	0.7	0.8	0.7	1.0	1.3	1.5	UO	1.6	2.0	1.6	0.7	0.6	1.0	1.1	0.8	0.7	1.1	1.3	1.5	2.4	1.7	2.6	1.2	2.6
2-Mar	2.0	1.7	2.0	3.0	2.8	1.9	1.5	0.1	0.3	-0.4	-0.2	-0.1	-0.3	0.3	0.3	1.0	0.6	0.8	0.4	0.8	1.4	0.5	0.1	-0.4	0.8	3.0
3-Mar	-0.2	1.1	0.5	0.3	0.4	0.5	0.2	0.3	0.5	0.0	0.4	0.2	-0.3	0.3	-0.5	-0.1	0.5	0.3	0.4	0.3	0.4	0.6	1.0	0.5	0.3	1.1
4-Mar	0.3	0.3	0.0	0.2	0.4	-0.1	0.5	0.3	0.4	0.1	0.4	0.2	0.0	0.9	0.7	0.5	0.0	0.6	0.7	0.1	0.0	0.3	0.3	1.0	0.3	1.0
5-Mar	0.3	0.8	0.5	0.3	0.4	0.3	0.4	0.4	0.0	0.0	-1.2	-0.7	-0.1	-0.1	-0.6	-0.2	0.1	0.3	0.3	0.2	0.1	-0.1	0.1	0.0	0.1	0.8
6-Mar	DF	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.0	0.3	0.1	-0.1	0.5	0.3	0.7	0.6	-0.3	-0.5	-0.1	-0.8	-0.5	-0.9	0.0	1.0	0.1	1.0
7-Mar	0.1	1.4	1.4	0.2	-0.4	-0.5	-0.1	-0.2	0.4	1.8	1.5	1.4	0.8	0.4	-0.1	0.2	-1.0	0.5	-0.1	-1.4	-0.9	-0.5	-0.1	1.3	0.3	1.8
8-Mar	1.9	1.9	0.7	1.7	2.4	2.4	1.8	1.3	1.9	2.0	0.8	1.0	1.0	1.4	-0.6	-0.9	-0.8	-0.5	0.4	0.4	-0.4	0.3	1.0	1.5	0.9	2.4
9-Mar	1.8	2.0	1.3	1.4	1.1	0.2	0.7	0.6	2.7	2.0	0.8	1.3	2.7	0.7	0.6	3.5	0.6	0.3	-0.4	0.2	-0.5	-0.6	0.0	0.4	1.0	3.5
10-Mar	0.5	0.2	0.0	-0.2	-0.3	-0.4	0.0	0.5	0.3	1.1	0.5	-0.1	-0.6	-0.4	-1.1	-0.3	-0.7	0.3	0.0	0.1	0.0	0.5	-0.1	-1.1	0.0	1.1
11-Mar	0.1	0.7	1.1	1.4	0.3	-0.1	0.2	0.1	0.2	0.4	-0.3	0.6	-0.3	-0.5	-0.1	1.5	0.6	0.9	0.2	0.4	0.6	0.5	0.5	0.4	0.4	1.5
12-Mar	0.6	0.7	0.4	0.5	0.2	0.2	0.2	0.0	0.1	-0.1	-0.2	-0.5	0.2	0.8	0.3	0.8	0.2	0.3	0.5	0.3	0.3	0.5	0.4	0.2	0.3	0.8
13-Mar	0.2	0.2	0.2	0.3	0.3	0.0	0.1	0.1	0.0	0.3	0.3	-0.1	1.4	0.8	0.1	0.7	0.6	0.8	-0.2	-0.7	-0.3	0.2	0.4	0.5	0.3	1.4
14-Mar	0.6	0.1	0.4	1.1	0.4	0.4	0.2	0.2	0.4	0.9	0.5	0.5	0.5	0.8	0.7	0.6	0.6	0.6	0.3	0.0	0.2	0.4	0.5	0.5	0.5	1.1
15-Mar	0.6	0.5	0.3	0.6	0.7	0.4	0.5	0.4	0.4	-0.1	-0.2	0.1	-0.1	0.2	-0.1	0.1	-0.1	0.3	0.4	0.4	0.3	-0.1	0.1	0.3	0.2	0.7
16-Mar	0.5	0.4	0.2	0.2	0.2	0.2	-0.1	0.2	0.0	0.3	-0.1	-0.2	-0.5	-0.5	-0.2	0.0	-0.3	0.2	1.4	1.4	1.8	0.6	0.4	-0.5	0.2	1.8
17-Mar	1.4	-0.5	1.3	1.1	1.0	-1.0	0.6	0.2	0.8	-1.0	0.3	2.1	1.3	-0.6	-0.2	-0.4	-0.3	0.5	1.0	1.0	0.6	0.5	0.0	0.2	0.4	2.1
18-Mar	0.5	0.3	0.1	0.2	0.3	0.3	0.2	0.2	0.1	-0.2	0.1	-0.2	0.0	0.0	0.0	-0.1	0.1	0.2	0.5	-0.1	0.3	0.1	0.1	0.4	0.1	0.5
19-Mar	0.6	0.1	0.1	-0.2	0.2	0.1	-0.1	-0.1	0.2	0.5	-0.4	-0.5	-0.7	-0.7	-1.2	-0.5	0.0	0.0	-0.3	0.3	0.1	-0.1	0.1	0.3	-0.1	0.6
20-Mar	-0.1	-0.3	0.0	0.9	-0.1	0.6	0.1	0.2	0.4	-0.2	0.0	0.6	0.0	0.1	0.1	0.0	0.7	0.2	1.0	1.0	0.3	0.5	0.7	0.1	0.3	1.0
21-Mar	0.4	0.4	0.6	0.5	0.5	0.5	0.5	0.3	0.3	0.1	0.0	-0.2	-0.5	-0.9	-0.6	-0.5	-0.7	0.2	-1.1	-0.1	1.0	1.0	0.4	1.3	0.2	1.3
22-Mar	2.3	1.3	2.2	2.2	0.9	2.9	1.1	0.5	1.0	1.0	-0.1	-0.2	-0.5	0.2	0.7	0.3	-0.5	0.7	1.3	1.6	0.3	-0.1	0.7	0.6	0.8	2.9
23-Mar	0.1	0.1	0.2	0.1	0.1	-0.3	0.1	0.6	0.4	0.3	0.6	-0.5	0.5	0.4	1.9	1.5	0.0	1.0	1.7	1.1	1.1	0.0	0.2	0.2	0.5	1.9
24-Mar	0.0	0.3	0.4	0.3	1.1	0.8	-0.2	0.5	0.5	0.1	-0.6	-0.3	1.5	1.9	-0.1	-0.5	-0.1	0.0	0.7	0.7	-0.2	0.2	-0.1	-0.1	0.3	1.9
25-Mar	-0.1	0.1	-0.1	0.0	0.1	0.2	0.1	0.3	0.2	0.2	0.1	0.2	-0.5	-0.5	0.7	0.8	0.7	0.1	0.4	0.5	0.5	0.3	0.4	0.6	0.2	0.8
26-Mar	0.6	0.3	0.5	0.6	0.4	0.1	0.1	0.2	0.1	-0.1	-0.2	1.2	0.7	0.1	-0.2	0.3	0.6	0.4	0.4	-0.2	-0.3	-0.1	0.5	0.4	0.3	1.2
27-Mar	0.4	0.4	0.2	0.2	0.1	0.1	0.0	0.0	-0.1	0.1	-0.1	-0.5	-0.5	-0.5	-0.1	0.1	0.0	-0.3	0.1	0.6	0.5	0.5	-0.1	-0.1	0.0	0.6
28-Mar	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.0	-0.3	-0.6	1.1	-0.4	-0.2	-0.3	0.8	-0.9	-1.0	-0.3	0.7	1.4	1.4	-0.2	0.1	0.1	1.4
29-Mar	0.1	0.2	0.4	0.4	0.3	0.4	0.4	0.2	0.3	0.2	0.1	0.8	0.4	1.1	0.6	0.8	0.6	0.4	0.7	0.6	0.6	0.8	0.5	0.4	0.5	1.1
30-Mar	0.4	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	-0.2	-0.4	-0.1	-0.2	-0.1	0.0	0.0	0.5	0.4	0.1	0.9	0.0	0.1	0.3	0.6	0.1	0.9
31-Mar	0.6	0.1	0.4	0.2	0.3	0.1	-0.1	0.2	1.1	0.8	0.6	1.6	0.1	0.1	-0.2	0.1	-0.4	0.3	0.3	0.1	0.0	-0.4	0.2	0.3	0.3	1.6
	0.6	0.5	0.5	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.1	0.3	0.2	0.2	0.1	0.4	0.1	0.3	0.4	0.4	0.3	0.3	0.3	0.4	Diurnal Average	
	2.3	2.0	2.2	3.0	2.8	2.9	1.8	1.5	2.7	2.0	2.0	2.1	2.7	1.9	1.9	3.5	0.8	1.0	1.7	1.6	1.8	2.4	1.7	2.6	Diurnal Maximum	

DF - DAS Failure

UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Vertical Wind Speed 163 m (VW163m) - km/h

Lower Camp Met Tower - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 4.6 km/h on Mar 9 16:00

Minimum Value: 0.1 km/h on Mar 27 04:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.8 Median = 1.3 Q_3 = 2.0 P_{90} = 2.5 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.5	0.6	0.7	0.6	0.6	0.7	0.8	0.9	UO	1.1	1.1	2.0	2.1	2.1	2.4	2.1	1.9	1.7	1.9	2.1	2.0	2.3	2.1	2.5	2.5
2-Mar	3.0	2.3	2.6	2.7	3.0	3.2	3.2	2.9	3.3	2.1	1.8	1.9	2.0	2.3	2.1	1.4	2.2	1.6	2.2	2.3	1.4	1.8	2.5	2.5	3.3
3-Mar	2.0	1.8	2.0	2.1	2.0	1.8	1.8	1.9	1.9	1.9	2.4	2.0	1.9	1.7	1.8	1.8	1.7	1.0	0.5	0.5	0.7	2.1	2.2	2.3	2.4
4-Mar	2.0	1.4	0.8	0.3	0.5	0.7	1.6	1.7	1.4	1.7	2.4	2.8	3.7	3.4	3.0	2.3	1.3	1.5	0.9	1.2	2.0	1.0	1.2	1.5	3.7
5-Mar	1.1	1.3	1.4	0.5	0.3	0.6	0.3	0.5	0.3	1.0	1.4	1.7	1.8	1.7	1.7	0.9	0.9	0.9	0.8	1.3	1.4	1.0	1.1	0.9	1.8
6-Mar	DF	1.0	0.6	0.4	0.3	0.3	0.4	0.4	0.7	0.7	0.6	0.7	0.8	1.1	1.4	1.1	1.5	1.3	1.0	1.4	2.1	1.7	2.2	1.9	2.2
7-Mar	1.8	2.0	2.6	2.2	2.1	1.7	1.7	1.7	2.2	2.3	2.1	2.3	2.6	2.4	2.5	2.9	2.4	2.3	2.1	2.3	2.4	2.4	2.9	2.4	2.9
8-Mar	2.4	2.0	1.6	1.8	1.7	1.9	1.9	1.6	1.9	2.7	2.4	2.0	2.3	3.3	2.7	2.1	1.3	1.1	0.7	1.7	2.5	2.3	2.4	2.2	3.3
9-Mar	2.4	1.9	1.4	1.6	1.5	1.1	0.9	0.9	1.4	1.2	1.3	2.7	3.1	3.7	3.9	4.6	3.2	2.0	2.4	2.6	2.8	2.7	2.3	2.5	4.6
10-Mar	2.3	2.2	2.6	1.9	1.8	2.3	2.1	2.1	2.1	2.2	2.9	2.2	2.6	2.7	2.6	2.7	2.1	2.0	1.4	1.2	2.0	2.3	1.7	1.2	2.9
11-Mar	1.6	1.3	1.3	1.0	1.0	0.6	0.7	0.6	1.2	1.3	1.3	1.4	2.0	2.1	2.0	2.3	1.7	1.7	2.0	1.6	1.6	1.4	1.7	1.4	2.3
12-Mar	1.8	1.8	1.3	1.3	1.4	1.2	1.7	1.1	1.3	1.0	1.4	1.9	2.2	2.0	2.0	1.9	1.6	1.4	1.1	0.9	0.9	1.0	1.0	0.8	2.2
13-Mar	0.8	0.9	0.8	0.7	0.5	0.4	0.5	0.6	0.7	0.8	1.3	1.7	2.3	2.2	1.8	2.7	2.1	1.9	1.2	1.3	1.6	1.7	1.0	1.4	2.7
14-Mar	1.4	1.3	1.3	1.9	1.6	1.7	1.3	1.5	0.9	1.3	1.1	0.9	1.2	1.3	1.4	1.2	1.0	0.9	0.9	1.0	1.3	0.8	1.1	1.1	1.9
15-Mar	0.6	0.4	0.3	0.6	0.6	0.3	0.3	0.3	0.3	0.8	1.0	0.9	0.8	0.9	0.8	1.1	0.8	0.6	0.4	0.3	0.3	0.3	0.2	0.5	1.1
16-Mar	0.7	0.6	1.1	1.1	0.9	0.7	0.5	0.7	1.3	1.6	1.3	1.4	1.2	1.3	1.2	1.4	1.5	1.5	1.5	1.3	1.4	1.8	1.9	1.7	1.9
17-Mar	2.0	2.0	1.6	1.6	1.7	1.4	1.2	0.9	0.9	1.9	2.1	1.0	1.5	1.8	1.4	0.7	1.0	0.9	0.5	0.4	0.8	1.2	1.2	0.8	2.1
18-Mar	0.7	1.0	1.1	1.0	0.8	0.8	0.9	0.9	0.8	0.6	1.1	0.9	0.8	0.5	0.3	0.2	0.5	1.5	0.8	0.3	0.4	0.5	0.4	0.3	1.5
19-Mar	0.3	0.4	0.4	0.7	0.6	0.7	0.5	0.8	1.3	1.1	1.0	1.1	1.0	0.8	1.1	1.1	1.0	0.6	1.0	1.1	1.7	1.6	1.4	1.6	1.7
20-Mar	1.3	1.4	1.3	1.6	1.2	1.1	0.6	0.9	1.8	1.2	0.6	1.8	1.8	2.9	3.2	3.3	3.1	2.5	2.7	2.4	2.4	1.8	1.4	1.0	3.3
21-Mar	1.0	1.2	0.9	0.5	0.2	0.2	0.2	0.2	0.3	0.4	0.7	0.7	0.9	1.5	0.9	0.9	1.1	1.9	1.0	2.1	1.2	1.6	2.0	1.9	2.1
22-Mar	1.3	1.6	1.5	1.7	1.9	1.7	1.2	0.9	1.4	1.3	2.1	3.1	2.5	2.2	1.9	2.2	1.5	1.6	1.4	1.4	1.2	1.0	0.9	0.9	3.1
23-Mar	0.7	1.4	0.4	0.3	0.5	0.6	0.7	0.9	0.8	2.0	3.2	3.4	3.8	3.5	4.0	4.0	3.5	3.1	3.1	2.3	1.3	1.1	0.7	0.5	4.0
24-Mar	1.2	0.5	0.5	0.5	0.6	1.8	1.7	1.0	1.0	2.2	1.3	1.1	2.7	2.1	1.6	0.8	1.2	0.9	1.4	1.5	1.2	1.3	0.6	0.2	2.7
25-Mar	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.5	1.5	2.2	2.1	2.7	3.3	3.5	3.0	2.7	2.4	1.9	1.8	1.3	0.8	0.6	3.5
26-Mar	1.1	1.1	0.4	0.6	0.6	0.6	0.7	0.4	0.3	1.7	2.1	2.9	3.3	3.0	2.4	2.5	2.9	2.4	1.9	1.1	1.4	1.1	1.1	0.7	3.3
27-Mar	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.6	1.3	1.5	1.7	2.3	2.3	2.4	1.8	1.0	0.4	0.7	0.9	1.5	1.1	0.8	2.4
28-Mar	0.4	0.5	0.3	0.2	0.3	0.3	0.5	0.4	0.6	1.0	1.6	2.7	2.1	2.4	2.0	1.6	1.3	0.6	0.4	0.9	1.4	2.0	1.4	0.8	2.7
29-Mar	0.5	0.5	0.3	0.3	0.2	0.3	0.4	0.3	0.7	0.5	1.1	2.4	2.3	3.3	2.9	2.9	2.8	2.9	2.4	1.6	1.3	0.9	0.7	0.5	3.3
30-Mar	0.2	0.1	0.1	0.3	0.3	0.1	0.2	0.3	0.2	0.5	0.9	2.0	1.7	1.8	2.0	1.6	1.8	1.2	1.3	1.0	0.7	0.8	1.2	1.5	2.0
31-Mar	1.4	1.9	1.0	0.5	0.8	0.6	0.4	0.6	0.5	0.8	1.6	2.4	2.0	1.8	1.5	1.7	1.2	0.9	0.9	1.8	1.6	2.6	2.8	1.5	2.8
Diurnal Maximum	3.0	2.3	2.6	2.7	3.0	3.2	3.2	2.9	3.3	2.7	3.2	3.4	3.8	3.7	4.0	4.6	3.5	3.1	3.1	2.6	2.8	2.7	2.9	2.5	

DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS04
BUFFALO VIEWPOINT
MARCH 2023

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

April 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	35.4	0	8.2	0
H2S (ppb) Average	710	34	34	100	3	0	0.7	0
THC (ppm) Average	684	35	60	96.64	3.6	-	2.5	-
NMHC(ppm) Average	684	35	60	96.64	0.55	-	0.186	-
CH4(ppm) Average	684	35	60	96.64	3.5	-	2.3	-
O3(ppb) Average	682	33	62	96.1	51.8	0	39	-
NO2(ppb) Average	708	35	36	99.87	47.2	0	25.5	-
NO(ppb) Average	708	35	36	99.87	76.5	-	13.4	-
NOX(ppb) Average	708	35	36	99.87	118.4	-	38.8	-
PM2.5(ug/m3) Average	722	2	22	97.31	46.5	0	21	0
Temperature (C) Average	744	0	0	100	10	-	1.1	-
Relative Humidity (%) Average	744	0	0	100	91.9	-	87	-
Wind Speed 10 m (km/h) Average	744	0	0	100	20	-	13	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	1.07	3.2	-	0	0	0	0.2	0.7	2.1	35.4
H2S (ppb) Average	710	0.22	0.3	-	0	0	0.1	0.1	0.3	0.5	3
THC (ppm) Average	684	2.05	0.2	-	1.9	1.9	1.9	2	2.1	2.3	3.6
NMHC(ppm) Average	684	0.013	0.056	-	0	0	0	0	0	0	0.55
CH4(ppm) Average	684	2.04	0.2	-	1.9	1.9	1.9	2	2.1	2.2	3.5
O3(ppb) Average	682	28.52	9.6	-	1.6	13.2	24.9	30.2	34.4	38.5	51.8
NO2(ppb) Average	708	8.68	8.8	-	0	1.4	2.5	5.4	11.9	20.9	47.2
NO(ppb) Average	708	2.75	7.2	-	0	0	0.1	0.5	1.8	8.4	76.5
NOX(ppb) Average	708	11.42	14.2	-	0	1.6	2.9	6.5	13.6	27.6	118.4
PM2.5(ug/m3) Average	722	8.55	6.3	-	0.4	4	4.9	6.4	9.7	16.3	46.5
Temperature 2 m (C) Average	744	-9.6	6.9	-	-30.3	-18	-13.8	-9.5	-5.1	-1	10
Relative Humidity (%) Average	744	67.59	14.8	-	27.2	45.1	57.6	69.6	79.5	85.3	91.9
Wind Speed 10 m (km/h) Average	744	8.4	3	-	1	4	6	8	11	13	20
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4, NO2	08 Mar 2023 08:00	08 Mar 2023 08:00	1	Maintenance - verify daily QA response
O3	08 Mar 2023 07:00	08 Mar 2023 07:00	1	Maintenance - verify daily QA response
O3	06 Mar 2023 10:00	07 Mar 2023 10:00	25	Maintenance- repalced analyzer lamp
O3	09 Mar 2023 11:00	09 Mar 2023 13:00	3	Maintenance - WBEA internal audit
THC/NMHC/CH4	07 Mar 2023 08:00	07 Mar 2023 08:00	1	Maintenance - analyzer rebooted
THC/NMHC/CH4	28 Mar 2023 10:00	29 Mar 2023 08:00	23	Maintenance - replaced analyser
PM2.5	28 Mar 2023 12:00	29 Mar 2023 07:00	20	Maintenance - replaced analyser

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 35.4 ppb on Mar 21 16:00

Maximum Daily Average: 8.2 ppb on Mar 24

Minimum Value: 0.0 ppb on Mar 3 21:00

Maximum Diurnal Average: 3.3 ppb at hour 16

Monthly Average: 1.07 ppb

Minimum Daily Average: 0.0 ppb on Mar 12

Minimum Diurnal Average: 0.2 ppb at hour 6

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.2 Q_3 = 0.7 P_{90} = 2.1 P_{99} = 17.4

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	3.0	1.9	1.2	1.0	0.6	0.5	0.6	0.5	0.7	0.8	0.9	1.2	1.2	1.1	1.0	1.2	1.1	1.0	1.0	1.0	1.1	1.2	1.0	1.1	3.0
2-Mar	0.8	Z	0.7	0.8	0.8	0.9	1.0	1.1	1.1	1.0	0.9	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.3	0.6	1.1
3-Mar	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.5	0.6	0.4	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.6
4-Mar	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	2.0	2.6	0.0	0.0	1.5	1.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.6
5-Mar	0.0	0.0	0.0	0.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.7	2.1	2.6	7.1	7.2	4.4	2.9	2.3	3.6	3.8	3.7	3.1	2.1	7.2
6-Mar	2.6	3.0	2.4	0.9	0.5	0.8	0.7	0.7	0.8	0.5	0.5	1.1	1.1	1.3	1.0	0.9	0.9	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.9	3.0
7-Mar	0.0	0.1	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4
8-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
9-Mar	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.5	1.9	1.0	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.9
10-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2
11-Mar	0.0	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4
12-Mar	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	0.1	0.0	0.0	0.1
13-Mar	0.1	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.1	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	1.1
14-Mar	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	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.0
15-Mar	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.3	1.1	10.1	7.8	1.1	3.0	3.8	1.4	0.3	0.2	0.1	0.2	0.2	0.3	0.3	1.3	10.1
16-Mar	1.2	1.4	Z	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.6	0.6	0.7	1.0	0.9	0.7	0.5	0.4	0.3	0.5	0.6	0.6	0.5	1.4
17-Mar	0.5	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.5
18-Mar	0.0	0.1	0.1	0.2	Z	0.3	0.4	0.6	0.4	0.5	0.5	0.5	0.5	0.6	4.6	16.4	7.2	4.2	2.1	0.6	0.5	0.4	0.3	0.4	1.8	16.4
19-Mar	0.3	0.2	0.2	0.3	0.6	Z	0.7	1.0	0.5	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.3	1.0
20-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	3.1	5.3	3.9	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.3
21-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	1.1	1.7	5.8	12.7	22.1	35.4	27.4	4.5	1.6	1.3	0.8	0.3	0.1	0.1	5.0	35.4
22-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.9	1.2	1.2	1.3	1.3	1.1	1.0	0.9	0.9	0.6	0.4	0.4	0.4	0.4	0.6	1.3
23-Mar	0.4	0.4	0.3	Z	0.2	0.1	0.3	0.3	0.3	1.1	0.9	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1
24-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.8	12.1	23.2	21.8	26.3	8.5	23.6	17.5	10.8	9.8	9.2	7.7	6.5	6.3	4.2	8.2	26.3
25-Mar	2.6	2.1	1.5	0.5	0.4	Z	0.4	0.5	0.8	1.6	7.9	1.2	0.4	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.9	7.9
26-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.9	11.0	6.2	14.0	11.7	4.1	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.1	2.2	14.0
27-Mar	0.1	Z	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.9	4.2	7.2	5.8	4.6	3.3	2.4	1.7	1.6	1.1	0.4	0.3	0.6	0.5	1.5	7.2
28-Mar	0.4	0.2	Z	0.1	0.1	0.2	C	C	C	C	0.3	0.6	1.0	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.7	0.9	1.1	1.1	0.6	1.1
29-Mar	0.9	0.9	0.6	Z	0.2	0.1	0.0	0.1	0.1	0.4	0.3	2.8	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.3	2.8
30-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	1.8	12.3	6.9	8.2	3.0	3.2	1.9	2.4	1.5	0.3	1.2	0.8	0.5	0.4	0.5	2.0	12.3
31-Mar	0.5	0.2	0.6	0.4	0.2	Z	0.2	0.2	0.3	0.3	0.4	0.3	2.6	0.7	1.7	2.6	1.4	0.7	0.6	0.5	0.5	0.3	0.2	0.2	0.7	2.6
	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.6	2.0	2.4	2.6	2.4	2.1	3.3	2.4	1.1	0.8	0.6	0.6	0.5	0.5	0.4	Diurnal Average	
	2.6	3.0	2.4	1.2	1.0	0.9	1.0	1.1	1.7	3.1	12.3	23.2	21.8	26.3	22.1	35.4	27.4	10.8	9.8	9.2	7.7	6.5	6.3	4.2	Diurnal Maximum	

Z - zerospan C - Calibration

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	694	97.75	97.75
11 - 20	9	1.27	99.01
21 - 60	7	0.99	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - March 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	133	88	20	7	8	52	106	150	26	4	5	8	14	13	27	33	694
11 - 20	0	2	0	0	0	1	1	1	0	0	0	0	0	2	1	1	9
21 - 60	2	3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	7
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	93	20	7	8	54	108	151	26	4	5	8	14	15	28	34	710

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 710

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.0 ppb on Mar 30 11:00

Maximum Daily Average: 0.7 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 1 16:00

Maximum Diurnal Average: 0.4 ppb at hour 11

Monthly Average: 0.22 ppb

Minimum Daily Average: 0.0 ppb on Mar 7

Minimum Diurnal Average: 0.1 ppb at hour 17

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.1 Q_3 = 0.3 P_{90} = 0.5 P_{99} = 1.5

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.1	Z	0.4	0.2	0.1	0.2	0.1	0.1	0.1	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	0.2	0.1	0.1	0.4
2-Mar	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
3-Mar	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.1	0.3
4-Mar	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.2	0.4
5-Mar	0.1	0.1	0.0	0.2	0.4	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.4
6-Mar	0.4	0.7	0.6	0.5	0.4	0.2	0.3	0.4	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
7-Mar	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	0.0	0.0	0.0	0.0	0.1
8-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9-Mar	0.0	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2
10-Mar	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.0	0.1	0.2
11-Mar	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2
12-Mar	0.2	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2
13-Mar	Z	0.2	0.2	0.3	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5
14-Mar	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.4
15-Mar	0.3	0.7	Z	0.3	0.4	1.5	0.8	1.2	1.0	1.0	0.8	0.8	0.6	0.3	0.9	0.8	0.6	0.5	0.6	0.6	0.7	1.0	0.7	0.8	0.7	1.5
16-Mar	0.7	0.6	0.3	Z	0.1	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.7
17-Mar	0.1	0.1	0.1	0.1	Z	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	0.1	0.1	0.2	0.2	0.1	0.1	0.2
18-Mar	0.1	0.1	0.1	0.2	0.3	Z	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.0	0.5	0.1	0.1	0.2	0.3	0.7	0.2	1.0
19-Mar	Z	0.8	0.5	0.5	0.5	0.7	1.1	1.7	0.8	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.4	1.7
20-Mar	0.2	Z	0.1	0.1	0.1	0.2	0.3	0.6	0.5	0.4	0.8	0.7	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8
21-Mar	0.1	0.1	Z	0.2	0.5	0.8	1.0	1.0	1.2	1.0	1.1	0.8	0.6	1.0	1.3	1.3	0.7	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.6	1.3
22-Mar	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2
23-Mar	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.7	0.3	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	0.2	0.7
24-Mar	0.2	0.2	0.1	0.2	0.1	Z	0.2	0.3	0.2	0.4	0.6	0.7	0.5	0.5	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7
25-Mar	Z	0.5	0.4	0.3	0.4	0.6	0.8	1.2	1.7	2.0	1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.4	2.0
26-Mar	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.5	0.5	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
27-Mar	0.1	0.5	Z	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.5
28-Mar	0.2	0.2	0.3	Z	0.4	0.5	0.5	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
29-Mar	0.2	0.2	1.6	1.6	Z	0.7	0.7	0.5	0.5	0.4	0.5	0.5	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	1.6
30-Mar	0.3	0.3	0.3	0.3	0.4	Z	0.3	0.4	0.5	1.2	3.0	1.6	1.2	0.4	0.5	0.4	0.4	0.3	0.1	0.2	0.3	0.4	0.3	0.3	0.6	3.0
31-Mar	Z	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.1	0.1	0.1	0.4	0.6
	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	Diurnal Average	
	0.7	0.8	1.6	1.6	0.5	1.5	1.1	1.7	1.7	2.0	3.0	1.6	1.2	1.0	1.3	1.3	0.7	1.0	0.6	0.6	0.7	1.0	0.7	0.8	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 (H_2S) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	709	99.86	99.86
3 - 4	1	0.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	133	93	20	7	8	53	109	150	26	4	4	7	13	15	29	38	709
3 - 4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	133	94	20	7	8	53	109	150	26	4	4	7	13	15	29	38	710

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 710

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - March 2023

Maximum Value: 3.6 ppm on Mar 25 09:00

Maximum Daily Average: 2.5 ppm on Mar 31

Minimum Value: 1.9 ppm on Mar 26 20:00

Minimum Daily Average: 1.9 ppm on Mar 8

Maximum Diurnal Average: 2.1 ppm at hour 8

Minimum Diurnal Average: 2.0 ppm at hour 15

Monthly Average: 2.05 ppm

Percentiles: P_1 = 1.9 P_{10} = 1.9 Q_1 = 1.9 Median = 2.0 Q_3 = 2.1 P_{90} = 2.3 P_{99} = 3.0

Hours in Service:	744
Hours of Data:	684
Hours of Missing Data:	60
Hours of Calibration:	35
Percent Operational Time:	96.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
2-Mar	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
3-Mar	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	1.9	2.0	2.1
4-Mar	1.9	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.0	2.0	2.1
5-Mar	1.9	1.9	2.0	2.1	Z	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
6-Mar	2.0	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3
7-Mar	1.9	1.9	1.9	1.9	1.9	Z	1.9	M	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
8-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0
9-Mar	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
10-Mar	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	1.9	1.9	2.0	2.2
11-Mar	1.9	1.9	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
12-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0
13-Mar	2.0	2.1	2.1	2.2	2.3	Z	2.4	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	2.0	2.1	2.4
14-Mar	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.1	2.1	2.1	2.2
15-Mar	2.0	Z	2.2	2.0	2.2	2.6	2.5	2.7	2.5	2.5	2.5	2.3	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.6	2.4	2.2	2.3	2.3	2.7
16-Mar	2.2	2.2	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.2
17-Mar	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	2.0	2.0	2.0	2.0	2.0
18-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.0	2.0	2.1	2.4	2.7	2.0	2.7
19-Mar	3.0	2.4	2.5	2.4	2.2	Z	2.4	2.7	2.3	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	1.9	1.9	1.9	2.1	3.0
20-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0
21-Mar	1.9	Z	2.0	2.0	2.3	2.3	2.8	3.0	3.0	2.8	2.6	2.4	2.2	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.0
22-Mar	2.0	2.0	Z	2.0	1.9	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	2.0	2.0	2.0	2.0
23-Mar	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.0	2.1	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.4
24-Mar	2.0	2.0	2.0	2.0	Z	1.9	1.9	1.9	2.0	2.1	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.4
25-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.5	2.9	3.6	3.3	2.6	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	3.6
26-Mar	Z	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
27-Mar	2.0	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.2
28-Mar	1.9	1.9	Z	2.1	2.1	2.1	C	C	C	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	2.1
29-Mar	M	M	M	M	M	M	M	M	C	C	C	2.8	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	--	2.8
30-Mar	2.1	2.1	2.1	2.2	Z	2.2	2.1	2.2	2.4	2.8	2.9	2.5	2.4	2.4	2.2	2.2	2.2	2.1	2.1	2.4	2.4	2.4	3.0	2.2	2.3	3.0
31-Mar	2.1	2.1	2.3	2.4	2.5	Z	2.6	2.6	2.5	2.6	2.4	2.3	2.3	2.2	2.2	2.6	2.6	2.6	2.9	3.0	3.0	2.4	2.2	2.1	2.5	3.0
	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	3.0	2.4	2.5	2.4	2.5	2.6	2.8	3.0	3.6	3.3	2.9	2.8	2.4	2.4	2.4	2.6	2.6	2.6	2.9	3.0	3.0	2.4	3.0	2.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	509	74.42	74.42
2.1 - 3.0	173	25.29	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	86	69	13	2	2	50	98	122	21	3	4	6	12	2	9	10	509
2.1 - 3.0	48	24	7	4	6	4	6	18	4	1	1	2	1	10	17	20	173
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	134	93	20	6	8	54	104	140	25	4	5	8	13	12	27	31	684

Total Number of Valid Hours: 684

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint

Total Number of Valid Hours: 684

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint - March 2023

Maximum Value: 0.550 ppm on Mar 31 20:00

Maximum Daily Average: 0.186 ppm on Mar 31

Minimum Value: 0.000 ppm on Mar 1 02:00

Minimum Daily Average: 0.000 ppm on Mar 1

Maximum Diurnal Average: 0.030 ppm at hour 12

Minimum Diurnal Average: 0.001 ppm at hour 6

Monthly Average: 0.013 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} = 0.3

Hours in Service:	744
Hours of Data:	684
Hours of Missing Data:	60
Hours of Calibration:	35
Percent Operational Time:	96.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.008	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
4-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-Mar	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
6-Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8-Mar	Z	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12-Mar	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
13-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.121
14-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
15-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.162	0.083	0.001	0.000	0.012	0.162
16-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18-Mar	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	0.192	0.181	0.016	0.192
19-Mar	0.132	0.001	0.199	0.112	0.002	Z	0.015	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	0.023	0.199
20-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.017
22-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.005	0.105	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.105
25-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.050	0.300	0.133	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.300
26-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.030	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.054
27-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	C	C	C	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	0.000
29-Mar	M	M	M	M	M	M	M	M	C	C	C	0.488	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.488
30-Mar	0.008	0.008	0.003	0.001	Z	0.018	0.000	0.003	0.091	0.278	0.316	0.223	0.195	0.158	0.046	0.055	0.013	0.007	0.000	0.062	0.115	0.172	0.253	0.002	0.088	0.316
31-Mar	0.000	0.000	0.099	0.138	0.177	Z	0.217	0.237	0.196	0.211	0.155	0.110	0.108	0.014	0.053	0.300	0.341	0.309	0.485	0.550	0.341	0.140	0.099	0.004	0.186	0.550
	0.006	0.001	0.012	0.010	0.007	0.001	0.012	0.011	0.012	0.027	0.027	0.030	0.012	0.007	0.003	0.012	0.012	0.011	0.016	0.021	0.021	0.013	0.018	0.006	Diurnal Average	
	0.132	0.008	0.199	0.138	0.177	0.018	0.217	0.237	0.196	0.300	0.316	0.488	0.195	0.158	0.053	0.300	0.341	0.309	0.485	0.550	0.341	0.172	0.253	0.181	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	622	90.94	90.94
0.006 - 0.05	20	2.92	93.86
0.06 - 0.1	17	2.49	96.35
> 0.1	25	3.65	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 0.005	113	84	17	4	4	51	103	138	24	4	5	8	12	8	23	24	622
0.006 - 0.05	6	1	1	1	0	1	0	0	1	0	0	0	1	2	2	4	20
0.06 - 0.1	4	3	1	0	2	2	1	2	0	0	0	0	0	1	1	0	17
> 0.1	11	5	1	1	2	0	0	0	0	0	0	0	0	1	1	3	25
Totals	134	93	20	6	8	54	104	140	25	4	5	8	13	12	27	31	684

Total Number of Valid Hours: 684

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint

Total Number of Valid Hours: 684

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.5 ppm on Mar 25 09:00

Maximum Daily Average: 2.3 ppm on Mar 15

Minimum Value: 1.9 ppm on Mar 26 20:00

Minimum Daily Average: 1.9 ppm on Mar 8

Maximum Diurnal Average: 2.1 ppm at hour 8

Minimum Diurnal Average: 2.0 ppm at hour 17

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} = 2.8

Hours in Service:	744
Hours of Data:	684
Hours of Missing Data:	60
Hours of Calibration:	35
Percent Operational Time:	96.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
2-Mar	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
3-Mar	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	1.9	2.0	2.1
4-Mar	1.9	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.0	2.0	2.1
5-Mar	1.9	1.9	2.0	2.1	Z	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
6-Mar	2.0	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3
7-Mar	1.9	1.9	1.9	1.9	1.9	Z	1.9	M	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
8-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0
9-Mar	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
10-Mar	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	1.9	1.9	2.0	2.2
11-Mar	1.9	1.9	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
12-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0
13-Mar	2.0	2.1	2.1	2.2	2.3	Z	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	2.0	2.1	2.3
14-Mar	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.1	2.1	2.1	2.2
15-Mar	2.0	Z	2.2	2.0	2.2	2.6	2.5	2.7	2.5	2.5	2.5	2.3	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.2	2.3	2.3	2.7
16-Mar	2.2	2.2	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.2
17-Mar	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	2.0	2.0	2.0	2.0	2.0
18-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.0	2.0	2.1	2.2	2.5	2.0	2.5
19-Mar	2.8	2.4	2.3	2.2	2.2	Z	2.4	2.6	2.3	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	1.9	1.9	1.9	2.1	2.8
20-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0
21-Mar	1.9	Z	2.0	2.0	2.3	2.3	2.8	3.0	3.0	2.8	2.6	2.3	2.2	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.0
22-Mar	2.0	2.0	Z	2.0	1.9	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	2.0	2.0	2.0	2.0
23-Mar	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.0	2.1	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.4
24-Mar	2.0	2.0	2.0	2.0	Z	1.9	1.9	1.9	2.0	2.1	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.3
25-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.5	2.9	3.5	3.0	2.5	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	3.5
26-Mar	Z	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
27-Mar	2.0	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.2
28-Mar	1.9	1.9	Z	2.1	2.1	2.1	C	C	C	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	2.1
29-Mar	M	M	M	M	M	M	M	M	C	C	C	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	--	2.4
30-Mar	2.1	2.1	2.1	2.2	Z	2.2	2.1	2.2	2.3	2.6	2.6	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.3	2.3	2.2	2.7	2.2	2.2	2.7
31-Mar	2.1	2.1	2.2	2.2	2.3	Z	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.7	2.2	2.1	2.1	2.3	2.7
	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.8	2.4	2.3	2.2	2.3	2.6	2.8	3.0	3.5	3.0	2.6	2.4	2.2	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.7	2.4	2.7	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Buffalo Viewpoint - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	509	74.42	74.42
2.1 - 3.0	174	25.44	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Buffalo Viewpoint - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	86	69	13	2	2	50	98	122	21	3	4	6	12	2	9	10	509
2.1 - 3.0	48	24	7	4	6	4	6	18	4	1	1	2	1	10	18	20	174
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	134	93	20	6	8	54	104	140	25	4	5	8	13	12	27	31	684

Total Number of Valid Hours: 684

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Buffalo Viewpoint

Total Number of Valid Hours: 684

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Buffalo Viewpoint - March 2023

Maximum Value: 76.5 ppb on Mar 29 03:00

Maximum Daily Average: 13.4 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 18:00

Minimum Daily Average: 0.1 ppb on Mar 8

Maximum Diurnal Average: 7.7 ppb at hour 9

Minimum Diurnal Average: 0.3 ppb at hour 20

Monthly Average: 2.75 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.5 Q_3 = 1.8 P_{90} = 8.4 P_{99} = 35.3

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	4.2	0.4	15.4	Z	0.5	0.5	0.2	0.2	1.5	1.6	3.1	2.7	1.1	0.9	0.7	0.6	0.6	0.5	0.2	0.1	0.1	0.1	0.3	0.3	1.6	15.4
2-Mar	0.4	0.4	0.4	0.6	Z	0.6	0.3	0.6	0.7	1.4	1.2	0.7	0.9	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.4	1.4
3-Mar	0.0	0.0	0.1	0.2	0.0	Z	0.0	0.0	C	C	C	C	C	0.9	0.9	1.4	1.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5
4-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	3.3	2.8	0.8	0.0	1.2	0.9	1.5	1.6	0.0	0.0	0.0	0.0	0.0	0.2	0.6	3.3
5-Mar	0.0	Z	0.0	0.2	6.5	0.6	0.1	0.5	0.8	3.3	4.2	5.5	2.7	2.5	2.4	2.6	2.3	1.0	0.4	0.7	0.8	0.3	0.3	0.5	1.7	6.5
6-Mar	1.5	10.1	9.7	1.5	12.1	0.5	2.1	9.3	16.3	8.5	2.7	3.4	3.1	1.5	1.1	0.7	0.4	0.3	0.5	0.0	0.1	0.0	0.0	0.0	3.6	16.3
7-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.4	0.0	0.7	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9
8-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	M	0.1	0.0	0.0	0.2	0.6	0.0	0.0	0.3	0.3	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.1	0.6
9-Mar	0.0	0.0	0.2	0.0	Z	0.5	0.0	0.9	1.8	1.9	1.7	1.3	0.5	0.2	0.0	0.3	0.1	0.5	0.0	0.0	0.2	0.3	0.1	0.0	0.5	1.9
10-Mar	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.3	0.4	0.3	0.1	0.1	0.8	1.2	2.0	2.9	1.7	0.8	0.8	0.7	0.4	1.1	0.5	0.6	2.9
11-Mar	Z	0.4	0.7	1.3	0.7	0.7	0.5	0.8	1.0	1.0	1.8	2.2	1.5	2.5	3.4	2.3	1.3	1.2	0.6	0.5	0.1	0.4	0.1	0.4	1.1	3.4
12-Mar	0.5	Z	0.4	0.4	0.5	0.6	0.3	1.3	0.7	0.9	1.7	1.8	2.6	2.8	3.2	1.9	0.8	0.8	0.8	0.3	0.3	0.1	0.0	0.6	1.0	3.2
13-Mar	0.2	0.4	Z	0.7	1.0	1.7	1.3	1.7	2.5	3.6	4.2	5.7	13.4	9.9	2.0	2.2	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	2.2	13.4
14-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	2.3	3.4	3.4	6.3	7.3	6.4	5.9	3.6	4.1	1.5	0.3	0.2	0.2	0.2	0.2	0.2	2.0	7.3
15-Mar	0.3	0.6	1.0	0.7	Z	16.9	14.2	36.2	32.8	34.3	31.3	25.0	19.5	10.8	12.4	11.8	8.7	9.8	6.6	2.3	4.1	9.5	10.6	7.6	13.4	36.2
16-Mar	8.6	4.7	0.5	0.2	0.4	Z	0.4	0.6	0.8	0.9	1.2	1.0	1.1	1.4	1.5	0.9	1.1	0.6	0.2	0.3	0.4	0.2	0.3	0.1	1.2	8.6
17-Mar	Z	0.4	0.5	0.1	0.2	0.4	0.3	2.9	2.4	1.4	1.8	2.3	1.6	1.9	1.8	1.0	0.4	0.1	0.0	0.1	0.3	0.2	0.3	0.2	0.9	2.9
18-Mar	0.0	Z	0.3	0.1	0.5	0.3	0.4	6.0	5.5	2.9	2.2	0.8	1.0	0.9	0.6	0.7	0.4	0.8	0.3	0.0	0.0	0.1	0.5	0.2	1.1	6.0
19-Mar	13.0	5.1	Z	0.4	0.3	0.8	3.8	25.1	18.4	1.8	4.3	4.7	4.8	1.0	0.9	1.1	1.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	3.8	25.1
20-Mar	0.1	0.0	0.0	Z	0.2	0.0	0.7	1.4	0.3	1.1	1.4	1.2	2.2	1.4	1.1	0.9	0.9	0.9	0.3	0.0	0.3	0.3	0.3	0.3	0.7	2.2
21-Mar	0.1	0.4	0.3	0.5	Z	2.5	25.8	43.6	34.5	35.4	32.6	20.8	11.4	14.6	15.6	20.4	8.5	1.4	0.0	0.0	0.1	0.1	0.2	0.0	11.7	43.6
22-Mar	0.0	0.1	0.0	0.0	0.0	Z	0.1	1.0	0.3	0.3	0.6	0.4	0.6	0.9	0.6	0.5	0.6	0.3	0.0	0.2	0.0	0.2	0.0	0.2	0.3	1.0
23-Mar	Z	0.5	0.0	0.0	0.3	0.0	0.3	0.7	0.9	9.0	4.4	1.1	0.8	0.6	0.6	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.9	9.0
24-Mar	0.2	Z	0.0	0.0	0.0	0.0	0.5	3.0	2.0	3.9	9.7	15.1	9.8	9.4	3.0	3.8	2.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	2.8	15.1
25-Mar	0.0	0.0	Z	0.0	0.8	0.3	10.4	42.8	61.4	47.8	23.1	5.7	1.4	0.7	0.1	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	8.5	61.4
26-Mar	0.0	0.2	0.0	Z	0.2	0.3	1.5	9.2	6.8	8.9	13.2	10.1	12.1	8.7	3.6	1.0	0.4	0.2	0.1	0.3	0.5	0.0	0.2	0.1	3.4	13.2
27-Mar	0.3	2.9	0.9	0.3	Z	1.8	10.4	8.5	7.1	5.1	4.8	4.7	2.8	1.9	1.3	0.8	0.7	0.9	0.0	0.0	0.0	0.2	0.0	0.0	2.4	10.4
28-Mar	0.0	0.0	0.0	0.4	0.0	Z	3.4	6.7	9.5	2.9	1.4	0.6	0.6	0.5	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	9.5
29-Mar	Z	0.0	76.5	73.5	8.8	0.4	0.5	0.8	2.0	5.7	9.5	7.8	3.3	1.1	0.5	0.2	0.3	0.3	0.4	0.5	0.1	0.2	0.3	0.5	8.4	76.5
30-Mar	0.5	Z	0.8	0.6	0.7	0.9	3.1	8.4	10.3	18.0	22.7	12.6	8.3	3.7	2.6	2.2	2.0	1.2	1.0	0.6	0.5	0.7	0.6	0.5	4.5	22.7
31-Mar	0.7	0.8	Z	1.0	1.3	2.4	9.7	11.9	9.0	9.7	7.1	5.5	9.0	5.9	6.7	3.2	2.2	1.5	0.6	0.7	0.3	0.5	0.0	0.2	3.9	11.9
	1.2	1.0	4.1	3.2	1.4	1.3	2.9	7.5	7.7	7.2	6.6	5.1	4.2	3.1	2.4	2.2	1.5	1.0	0.4	0.3	0.3	0.5	0.5	0.4	Diurnal Average	
	13.0	10.1	76.5	73.5	12.1	16.9	25.8	43.6	61.4	47.8	32.6	25.0	19.5	14.6	15.6	20.4	8.7	9.8	6.6	2.3	4.1	9.5	10.6	7.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	689	97.32	97.32
21 - 40	13	1.84	99.15
11 - 80	6	0.85	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Buffalo Viewpoint - March 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	133	87	19	6	8	54	109	151	25	3	4	9	14	14	25	28	689
21 - 40	0	2	0	0	0	0	1	0	0	0	0	0	0	2	3	5	13
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	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	133	89	19	6	8	54	110	151	25	3	4	9	14	16	30	37	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Buffalo Viewpoint

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 47.2 ppb on Mar 19 01:00

Maximum Daily Average: 25.5 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 20:00

Maximum Diurnal Average: 14.0 ppb at hour 6

Monthly Average: 8.68 ppb

Minimum Daily Average: 1.7 ppb on Mar 2

Minimum Diurnal Average: 4.5 ppb at hour 15

Percentiles: P_1 = 0.5 P_{10} = 1.4 Q_1 = 2.5 Median = 5.4 Q_3 = 11.9 P_{90} = 20.9 P_{99} = 37.1

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	17.0	17.7	25.3	Z	14.0	12.9	7.3	5.9	5.2	3.1	4.1	3.0	0.9	1.0	1.4	1.6	2.5	4.0	3.6	3.7	3.9	4.0	2.4	2.3	6.4	25.3
2-Mar	2.1	1.9	2.0	2.0	Z	2.6	3.3	3.6	3.7	3.6	2.2	1.5	1.6	1.2	0.9	0.8	0.6	0.4	0.2	0.0	0.2	0.0	1.5	3.2	1.7	3.7
3-Mar	2.4	3.8	2.8	2.7	1.1	Z	2.7	2.0	C	C	C	C	C	2.4	3.5	6.2	8.0	9.0	16.0	16.9	14.6	3.9	1.0	0.8	5.5	16.9
4-Mar	Z	1.2	1.5	2.0	1.7	1.4	4.1	2.9	3.6	4.4	6.9	5.2	1.9	0.8	2.6	2.7	6.2	9.8	8.5	5.7	6.3	5.6	18.9	14.5	5.1	18.9
5-Mar	3.0	Z	3.7	13.3	28.9	17.6	9.0	7.8	3.6	6.5	5.8	6.7	4.2	4.0	4.3	5.7	8.5	11.2	19.0	21.2	20.6	16.6	20.6	28.5	11.8	28.9
6-Mar	28.0	32.4	32.7	25.7	24.8	17.0	17.5	20.9	16.6	9.2	3.9	4.6	5.0	3.6	4.0	2.9	3.7	5.8	12.4	8.4	2.1	3.0	2.6	1.3	12.0	32.7
7-Mar	1.5	2.1	Z	0.9	0.5	2.6	2.7	1.9	1.6	1.5	1.3	1.0	2.0	2.7	1.5	4.1	5.5	9.2	15.8	7.7	1.4	1.3	1.3	0.8	3.1	15.8
8-Mar	0.6	0.6	0.8	Z	4.1	2.0	1.4	M	3.7	2.2	1.9	2.2	2.5	1.0	0.6	2.7	3.9	2.6	19.0	14.3	2.8	1.1	0.6	1.1	3.3	19.0
9-Mar	0.7	0.5	1.1	1.3	Z	2.4	3.7	9.2	6.4	4.3	3.1	2.0	1.1	0.8	0.5	0.6	0.5	7.0	3.1	4.4	5.2	6.1	1.1	0.4	2.8	9.2
10-Mar	0.4	0.6	0.7	0.7	1.4	Z	1.2	1.4	0.9	0.9	0.7	0.6	0.7	1.0	2.2	4.6	9.1	11.3	8.6	19.5	21.7	8.6	18.1	4.3	5.2	21.7
11-Mar	Z	6.4	18.3	25.6	17.9	8.6	1.9	3.0	1.6	2.0	1.8	2.5	1.4	4.0	6.1	5.7	4.3	7.6	7.6	2.9	2.8	3.2	4.9	4.1	6.3	25.6
12-Mar	3.8	Z	1.4	1.4	1.6	6.1	7.3	7.6	2.7	1.7	2.4	2.6	3.4	4.7	4.5	4.0	2.8	4.6	4.7	6.6	5.3	4.4	2.9	3.7	3.9	7.6
13-Mar	9.4	12.1	Z	20.8	26.6	29.3	23.0	10.6	6.8	7.2	7.6	8.2	15.5	11.4	4.1	4.9	4.2	7.8	12.5	11.2	4.8	2.4	2.6	9.3	11.0	29.3
14-Mar	13.2	7.2	11.8	Z	3.3	3.1	7.6	9.2	12.5	12.4	12.3	14.6	14.1	12.5	13.6	11.6	15.4	11.6	7.3	8.5	15.7	18.7	17.2	14.0	11.6	18.7
15-Mar	9.5	22.3	22.9	17.7	Z	37.4	35.8	34.1	27.8	24.0	21.2	18.2	16.1	10.4	13.4	15.0	15.5	25.3	34.6	36.1	38.5	38.5	37.2	34.2	25.5	38.5
16-Mar	32.0	29.2	13.4	2.3	0.7	Z	1.0	2.1	2.1	1.4	0.8	1.2	1.1	1.5	1.7	1.7	3.2	4.1	2.8	2.4	3.1	2.9	2.1	2.1	5.0	32.0
17-Mar	Z	4.1	3.8	2.6	2.6	4.6	7.7	12.0	5.9	2.9	2.8	3.3	3.0	3.4	3.9	2.9	1.0	0.8	0.7	7.1	10.0	18.6	8.7	4.9	5.1	18.6
18-Mar	3.8	Z	3.6	7.1	11.9	10.7	14.6	24.8	13.8	6.9	5.2	2.8	3.2	2.9	2.6	3.0	2.4	8.4	12.6	6.6	6.8	20.3	36.1	35.4	10.7	36.1
19-Mar	47.2	45.9	Z	27.8	27.2	31.4	30.9	33.4	23.2	4.8	8.2	8.4	8.8	2.7	3.0	4.4	6.1	10.5	4.7	2.8	11.2	8.0	9.9	9.0	16.1	47.2
20-Mar	13.5	9.7	5.8	Z	6.1	10.2	18.8	11.9	2.4	4.8	5.2	2.8	5.3	4.0	2.4	2.1	2.5	5.0	6.4	2.0	1.2	2.1	1.7	3.0	5.6	18.8
21-Mar	4.9	8.3	4.3	7.9	Z	32.4	35.7	33.8	30.7	29.2	26.3	20.9	14.1	18.0	19.6	26.1	18.6	7.1	5.5	8.7	9.6	8.4	7.4	5.1	16.6	35.7
22-Mar	3.1	2.9	1.8	1.9	1.5	Z	3.6	7.0	1.9	1.8	2.2	1.4	2.1	2.1	2.0	2.2	2.2	2.3	2.7	2.9	4.2	5.9	5.8	7.3	3.1	7.3
23-Mar	Z	7.4	8.0	6.7	5.6	8.3	10.2	6.3	3.6	17.8	9.0	2.9	2.6	1.9	2.4	2.5	2.3	2.4	2.0	4.8	7.0	8.1	12.4	12.7	6.4	17.8
24-Mar	7.8	Z	12.1	8.0	3.9	7.0	13.4	14.6	6.6	7.8	13.7	18.0	12.9	14.2	7.0	9.7	8.2	7.9	11.5	11.0	8.8	9.1	11.0	10.8	10.2	18.0
25-Mar	12.7	11.2	Z	8.2	19.4	18.8	26.5	32.7	32.7	33.9	24.5	10.3	3.8	2.0	1.7	1.4	1.6	2.7	1.6	2.2	2.2	2.0	2.0	7.4	11.4	33.9
26-Mar	4.7	4.8	5.5	Z	5.4	10.6	16.7	20.5	11.4	11.9	14.4	12.7	14.7	11.3	5.9	3.0	2.4	3.0	3.8	6.4	3.7	3.2	3.8	6.7	8.1	20.5
27-Mar	13.3	34.5	24.9	19.3	Z	18.7	22.1	14.3	9.5	6.8	6.7	6.7	5.1	4.1	3.6	3.8	3.8	6.9	8.9	14.8	13.9	14.6	11.3	8.8	12.0	34.5
28-Mar	6.0	6.6	14.3	17.7	12.6	Z	17.8	13.6	11.6	6.4	3.7	2.5	2.4	2.5	1.5	1.9	2.9	2.9	3.2	2.6	2.3	3.1	2.3	2.0	6.2	17.8
29-Mar	Z	5.1	41.9	44.5	34.1	21.1	13.4	6.9	8.1	18.2	23.0	17.7	9.2	2.8	0.9	1.3	1.8	1.8	1.5	2.8	1.5	1.5	4.0	4.0	11.6	44.5
30-Mar	4.4	Z	9.4	5.5	8.0	12.6	12.9	12.7	10.7	15.6	22.0	18.6	13.5	7.1	6.1	4.7	6.1	7.7	7.3	4.8	2.7	4.3	8.1	9.0	9.3	22.0
31-Mar	10.6	10.6	Z	22.7	28.4	35.3	35.3	30.1	23.1	19.1	12.8	9.4	12.8	9.8	11.9	7.9	8.1	9.3	10.0	22.6	11.7	5.9	1.5	4.3	15.4	35.3
	9.8	11.1	10.5	11.4	11.3	14.0	13.2	13.2	9.8	9.1	8.5	7.1	6.2	4.9	4.5	4.9	5.3	6.8	8.3	8.8	7.9	7.6	8.4	8.2	Diurnal Average	
	47.2	45.9	41.9	44.5	34.1	37.4	35.8	34.1	32.7	33.9	26.3	20.9	16.1	18.0	19.6	26.1	18.6	25.3	34.6	36.1	38.5	38.5	37.2	35.4	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 (NO_2) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	632	89.27	89.27
21 - 40	72	10.17	99.44
11 - 80	4	0.56	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Buffalo Viewpoint - March 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	123	79	18	5	8	51	105	139	23	3	4	7	14	11	19	23	632
21 - 40	8	10	1	1	0	3	5	12	2	0	0	2	0	5	11	12	72
11 - 80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	133	89	19	6	8	54	110	151	25	3	4	9	14	16	30	37	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Buffalo Viewpoint

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 118.4 ppb on Mar 29 03:00

Maximum Daily Average: 38.8 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 22:00

Minimum Daily Average: 2.1 ppb on Mar 2

Maximum Diurnal Average: 20.7 ppb at hour 8

Minimum Diurnal Average: 6.8 ppb at hour 17

Monthly Average: 11.42 ppb

Percentiles: P_1 = 0.5 P_{10} = 1.6 Q_1 = 2.9 Median = 6.5 Q_3 = 13.6 P_{90} = 27.6 P_{99} = 65.1

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	21.2	18.1	40.7	Z	14.5	13.4	7.5	6.1	6.7	4.7	7.2	5.7	2.0	1.9	2.1	2.2	3.1	4.5	3.8	3.8	4.0	4.1	2.7	2.6	7.9	40.7
2-Mar	2.5	2.3	2.4	2.6	Z	3.2	3.6	4.2	4.4	5.0	3.4	2.2	2.5	1.8	1.3	0.9	0.6	0.4	0.2	0.0	0.4	0.0	1.6	3.2	2.1	5.0
3-Mar	2.4	3.8	2.9	2.9	1.1	Z	2.7	2.0	C	C	C	C	C	3.3	4.4	7.6	9.5	9.6	16.0	16.9	14.6	3.9	1.0	0.8	5.9	16.9
4-Mar	Z	1.2	1.5	2.0	1.7	1.4	4.1	2.9	3.9	5.7	10.2	8.0	2.7	0.8	3.8	3.6	7.7	11.4	8.5	5.7	6.3	5.6	18.9	14.7	5.7	18.9
5-Mar	3.0	Z	3.7	13.5	35.4	18.2	9.1	8.3	4.4	9.8	10.0	12.2	6.9	6.5	6.7	8.3	10.8	12.2	19.4	21.9	21.4	16.9	20.9	29.0	13.4	35.4
6-Mar	29.5	42.5	42.4	27.2	36.9	17.5	19.6	30.2	32.9	17.7	6.6	8.0	8.1	5.1	5.1	3.6	4.1	6.1	12.9	8.4	2.2	3.0	2.6	1.3	15.6	42.5
7-Mar	1.5	2.1	Z	0.9	0.5	2.6	2.8	1.9	1.8	1.5	1.3	1.0	2.2	3.1	1.5	4.8	6.4	9.5	15.8	7.7	1.4	1.3	1.3	0.8	3.2	15.8
8-Mar	0.6	0.6	0.8	Z	4.1	2.0	1.4	M	3.8	2.2	1.9	2.4	3.1	1.0	0.6	3.0	4.2	2.6	19.2	14.6	2.8	1.1	0.6	1.1	3.3	19.2
9-Mar	0.7	0.5	1.3	1.3	Z	2.9	3.7	10.1	8.2	6.2	4.8	3.3	1.6	1.0	0.5	0.9	0.6	7.5	3.1	4.4	5.4	6.4	1.2	0.4	3.3	10.1
10-Mar	0.4	0.6	0.7	0.7	1.5	Z	1.2	1.4	1.2	1.3	1.0	0.7	0.8	1.8	3.4	6.6	12.0	13.0	9.4	20.3	22.4	9.0	19.2	4.8	5.8	22.4
11-Mar	Z	6.8	19.0	26.9	18.6	9.3	2.4	3.8	2.6	3.0	3.6	4.7	2.9	6.5	9.5	8.0	5.6	8.8	8.2	3.4	2.9	3.6	5.0	4.5	7.4	26.9
12-Mar	4.3	Z	1.8	1.8	2.1	6.7	7.6	8.9	3.4	2.6	4.1	4.4	6.0	7.5	7.7	5.9	3.6	5.4	5.5	6.9	5.6	4.5	2.9	4.3	4.9	8.9
13-Mar	9.6	12.5	Z	21.5	27.6	31.0	24.3	12.3	9.3	10.8	11.8	13.9	28.9	21.3	6.1	7.1	4.9	8.3	12.5	11.2	4.8	2.4	2.6	9.3	13.2	31.0
14-Mar	13.2	7.2	11.8	Z	3.3	3.1	7.6	9.6	14.8	15.8	15.7	20.9	21.4	18.9	19.5	15.2	19.5	13.1	7.6	8.7	15.9	18.9	17.4	14.2	13.6	21.4
15-Mar	9.8	22.9	23.9	18.4	Z	54.3	50.0	70.3	60.6	58.3	52.5	43.2	35.6	21.2	25.8	26.8	24.2	35.1	41.2	38.4	42.6	48.0	47.8	41.8	38.8	70.3
16-Mar	40.6	33.9	13.9	2.5	1.1	Z	1.4	2.7	2.9	2.3	2.0	2.2	2.2	2.9	3.2	2.6	4.3	4.7	3.0	2.7	3.5	3.1	2.4	2.2	6.2	40.6
17-Mar	Z	4.5	4.3	2.7	2.8	5.0	8.0	14.9	8.3	4.3	4.6	5.6	4.6	5.3	5.7	3.9	1.4	0.9	0.7	7.2	10.3	18.8	9.0	5.1	6.0	18.8
18-Mar	3.8	Z	3.9	7.2	12.4	11.0	15.0	30.8	19.3	9.8	7.4	3.6	4.2	3.8	3.2	3.7	2.8	9.2	12.9	6.6	6.8	20.4	36.6	35.6	11.7	36.6
19-Mar	60.2	51.0	Z	28.2	27.5	32.2	34.7	58.5	41.6	6.6	12.5	13.1	13.6	3.7	3.9	5.5	7.4	11.6	4.7	2.8	11.2	8.0	9.9	9.0	19.9	60.2
20-Mar	13.6	9.7	5.8	Z	6.3	10.2	19.5	13.3	2.7	5.9	6.6	4.0	7.5	5.4	3.5	3.0	3.4	5.9	6.7	2.0	1.5	2.4	2.0	3.3	6.3	19.5
21-Mar	5.0	8.7	4.6	8.4	Z	34.9	61.5	77.4	65.2	64.6	58.9	41.7	25.5	32.6	35.2	46.5	27.1	8.5	5.5	8.7	9.7	8.5	7.6	5.1	28.3	77.4
22-Mar	3.1	3.0	1.8	1.9	1.5	Z	3.7	8.0	2.2	2.1	2.8	1.8	2.7	3.0	2.6	2.7	2.8	2.6	2.7	3.1	4.2	6.1	5.8	7.5	3.4	8.0
23-Mar	Z	7.9	8.0	6.7	5.9	8.3	10.5	7.0	4.5	26.8	13.4	4.0	3.4	2.5	3.0	3.1	2.5	2.6	2.0	4.8	7.0	8.1	12.5	12.8	7.3	26.8
24-Mar	8.0	Z	12.1	8.0	3.9	7.0	13.9	17.6	8.6	11.7	23.4	33.1	22.7	23.6	10.0	13.5	10.4	8.7	11.5	11.0	8.8	9.1	11.0	10.8	13.0	33.1
25-Mar	12.7	11.2	Z	8.2	20.2	19.1	36.9	75.5	94.1	81.7	47.6	16.0	5.2	2.7	1.8	1.8	1.7	2.8	1.6	2.3	2.2	2.0	2.0	7.4	19.9	94.1
26-Mar	4.7	5.0	5.5	Z	5.6	10.9	18.2	29.7	18.2	20.8	27.6	22.8	26.8	20.0	9.5	4.0	2.8	3.2	3.9	6.7	4.2	3.2	4.0	6.8	11.5	29.7
27-Mar	13.6	37.4	25.8	19.6	Z	20.5	32.5	22.8	16.6	11.9	11.5	11.4	7.9	6.0	4.9	4.6	4.5	7.8	8.9	14.8	13.9	14.8	11.3	8.8	14.4	37.4
28-Mar	6.0	6.6	14.3	18.1	12.6	Z	21.2	20.3	21.1	9.3	5.1	3.1	3.0	3.0	1.5	2.0	3.1	2.9	3.2	2.6	2.3	3.1	2.3	2.0	7.3	21.2
29-Mar	Z	5.1	118.4	118.0	42.9	21.5	13.9	7.7	10.1	23.9	32.5	25.5	12.5	3.9	1.4	1.5	2.1	2.1	1.9	3.3	1.6	1.7	4.3	4.5	20.0	118.4
30-Mar	4.9	Z	10.2	6.1	8.7	13.5	16.0	21.1	21.0	33.6	44.7	31.2	21.8	10.8	8.7	6.9	8.1	8.9	8.3	5.4	3.2	5.0	8.7	9.5	13.7	44.7
31-Mar	11.3	11.4	Z	23.7	29.7	37.7	45.0	42.0	32.1	28.8	19.9	14.9	21.8	15.7	18.6	11.1	10.3	10.8	10.6	23.3	12.0	6.4	1.5	4.5	19.3	45.0
	11.0	12.2	14.7	14.6	12.6	15.3	16.1	20.7	17.5	16.3	15.1	12.2	10.3	8.0	6.9	7.1	6.8	7.8	8.8	9.0	8.2	8.0	8.9	8.6	Diurnal Average	
	60.2	51.0	118.4	118.0	42.9	54.3	61.5	77.4	94.1	81.7	58.9	43.2	35.6	32.6	35.2	46.5	27.1	35.1	41.2	38.4	42.6	48.0	47.8	41.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	594	83.90	83.90
21 - 40	77	10.88	94.77
11 - 80	33	4.66	99.44
81 - 159	4	0.56	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint - March 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	112	74	17	5	8	51	103	134	22	2	4	7	14	5	15	21	594
21 - 40	16	13	1	1	0	3	5	12	2	1	0	2	0	7	7	7	77
11 - 80	5	2	1	0	0	0	2	5	1	0	0	0	0	4	7	6	33
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	133	89	19	6	8	54	110	151	25	3	4	9	14	16	30	37	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 51.8 ppb on Mar 17 18:00

Maximum Daily Average: 39.0 ppb on Mar 22

Minimum Value: 1.6 ppb on Mar 6 02:00

Maximum Diurnal Average: 35.0 ppb at hour 16

Monthly Average: 28.52 ppb

Minimum Daily Average: 13.0 ppb on Mar 15

Minimum Diurnal Average: 19.9 ppb at hour 7

Percentiles: P_1 = 2.6 P_{10} = 13.2 Q_1 = 24.9 Median = 30.2 Q_3 = 34.4 P_{90} = 38.5 P_{99} = 46.4

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	33
Percent Operational Time:	96.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	11.2	9.3	Z	6.3	10.5	12.3	18.3	21.5	22.5	26.3	26.0	27.5	29.8	30.3	30.9	31.2	30.0	27.8	27.9	28.7	29.6	30.7	33.1	33.3	24.1	33.3
2-Mar	33.2	33.3	33.4	Z	33.6	32.9	31.5	30.9	30.8	30.8	32.7	33.9	34.0	34.3	34.3	34.8	34.2	34.1	33.3	32.7	32.9	32.3	30.3	31.2	32.9	34.8
3-Mar	31.8	29.2	29.6	29.6	Z	28.2	27.9	28.0	27.6	28.8	28.3	28.7	28.4	28.5	27.5	25.7	24.1	22.4	16.8	15.5	16.4	25.6	28.9	29.5	26.4	31.8
4-Mar	29.6	29.3	28.4	27.2	27.2	Z	25.3	27.2	27.1	26.4	24.7	26.6	28.4	28.8	27.7	27.7	24.4	21.7	22.5	25.9	25.6	25.1	13.9	19.4	25.7	29.6
5-Mar	Z	26.6	26.7	17.2	3.8	12.7	18.7	19.6	24.3	22.3	24.3	23.8	26.3	26.9	27.1	26.0	23.6	20.5	14.2	11.7	12.2	14.9	11.5	6.3	19.2	27.1
6-Mar	6.3	1.6	1.7	4.1	4.1	7.5	7.3	C	C	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	7.5
7-Mar	M	M	M	M	M	M	M	M	M	M	C	C	34.1	34.2	36.6	34.8	33.7	30.3	23.8	30.1	35.8	36.2	36.5	38.0	--	38.0
8-Mar	38.1	37.8	Z	36.4	33.5	34.7	M	34.5	32.9	34.5	34.9	35.1	35.8	36.9	37.6	36.5	35.7	36.6	20.1	25.0	35.1	35.6	35.4	34.1	34.4	38.1
9-Mar	34.0	33.6	33.2	Z	32.6	30.8	29.1	23.6	26.0	30.5	M	M	M	36.9	36.2	36.1	35.6	29.5	32.4	29.9	29.2	28.3	34.1	34.9	31.8	36.9
10-Mar	34.4	34.0	33.7	34.4	Z	33.8	32.9	32.3	32.3	32.6	33.0	33.3	33.7	34.2	33.9	32.0	28.1	25.5	26.9	16.4	15.9	27.7	20.5	32.3	30.2	34.4
11-Mar	29.1	28.0	16.8	10.9	16.1	Z	31.8	30.9	32.7	32.6	33.0	33.0	34.7	33.2	32.1	33.3	34.4	29.7	27.9	30.1	29.3	28.1	27.0	27.9	28.8	34.7
12-Mar	Z	29.5	30.6	30.3	30.3	26.0	25.5	24.9	29.3	30.1	29.5	29.9	29.6	29.4	29.4	29.5	29.7	27.9	27.8	26.7	29.0	30.0	31.4	29.9	29.0	31.4
13-Mar	24.4	Z	17.9	13.0	7.8	5.3	11.0	22.4	25.4	26.1	26.8	27.4	23.0	27.4	30.9	30.7	32.0	29.7	25.9	27.3	33.4	33.7	33.1	26.3	24.4	33.7
14-Mar	23.0	28.6	Z	28.4	32.8	33.5	29.4	28.6	27.0	27.6	27.6	26.4	27.1	28.6	27.3	28.9	25.5	28.3	30.7	28.3	21.2	18.5	19.7	22.4	26.9	33.5
15-Mar	25.7	14.3	14.0	Z	11.2	1.8	3.2	5.5	12.2	15.3	18.4	20.7	22.2	25.9	24.5	25.3	23.3	15.3	7.1	4.7	2.8	1.7	2.0	2.4	13.0	25.9
16-Mar	2.7	5.3	20.4	31.4	Z	33.1	32.0	31.0	30.6	31.4	31.7	31.3	31.6	31.7	32.7	35.0	33.9	33.1	33.3	33.0	31.3	31.0	30.7	30.2	29.1	35.0
17-Mar	30.0	27.6	27.1	28.3	28.4	Z	23.8	21.1	27.1	32.1	33.3	33.4	34.2	36.4	39.4	43.9	50.3	51.8	51.4	40.5	36.0	25.3	31.0	39.0	34.4	51.8
18-Mar	Z	43.4	44.2	40.1	35.0	34.9	30.4	24.8	30.3	38.6	42.4	45.3	46.1	47.6	48.4	49.1	48.2	41.5	37.5	41.6	39.4	25.1	13.1	14.1	37.4	49.1
19-Mar	3.6	Z	13.2	16.2	11.7	6.8	7.6	7.9	17.1	37.1	34.0	34.5	35.7	40.5	40.7	39.3	38.4	33.5	37.8	39.3	30.8	33.7	31.5	31.6	27.1	40.7
20-Mar	28.2	31.4	Z	33.7	33.2	29.1	20.9	27.5	35.6	33.5	33.5	35.4	33.2	35.6	37.9	39.5	39.0	35.8	33.7	37.1	37.2	36.0	36.0	33.8	33.8	39.5
21-Mar	31.9	29.1	31.6	Z	19.3	5.2	2.7	5.4	8.3	12.8	17.1	22.9	28.3	27.3	27.3	23.5	29.7	37.4	37.9	32.7	30.2	28.6	27.1	30.5	23.8	37.9
22-Mar	33.5	33.5	34.7	34.7	Z	35.5	33.6	30.8	35.6	37.6	39.6	41.9	42.0	43.0	44.4	45.2	45.6	45.7	45.2	43.4	40.7	37.3	37.3	36.0	39.0	45.7
23-Mar	36.4	36.6	33.6	33.1	31.2	Z	28.6	33.4	37.1	28.2	37.6	42.3	42.6	42.2	41.0	41.5	41.4	40.4	40.0	36.4	34.3	33.0	26.9	27.6	35.9	42.6
24-Mar	Z	27.4	25.2	28.7	33.1	30.1	24.2	23.3	30.8	30.7	28.9	26.4	30.3	32.2	37.0	36.5	37.8	37.1	33.6	31.9	31.7	30.3	29.3	27.5	30.6	37.8
25-Mar	24.0	Z	21.1	22.4	13.1	13.1	7.2	5.2	8.0	14.0	22.5	32.9	37.9	40.3	41.3	41.2	42.3	42.0	42.3	42.0	40.2	38.8	36.7	29.5	28.6	42.3
26-Mar	30.9	30.3	Z	29.3	28.3	22.9	17.4	14.8	22.5	24.5	25.3	27.0	26.4	29.1	31.9	34.8	37.7	34.8	34.4	32.4	32.5	32.0	30.9	28.1	28.6	37.7
27-Mar	21.1	3.5	10.9	Z	14.2	10.8	6.3	12.9	19.2	27.0	29.4	30.7	33.8	35.3	36.4	36.6	37.1	34.5	32.5	25.3	26.3	24.8	27.4	29.7	24.6	37.1
28-Mar	32.2	31.3	23.5	15.2	Z	13.2	9.6	13.6	19.2	32.3	36.8	38.5	38.6	38.4	39.7	39.6	39.7	40.0	40.2	40.6	40.2	39.3	40.1	40.0	32.2	40.6
29-Mar	37.4	34.8	3.2	1.8	8.3	Z	24.4	28.9	29.6	24.4	22.1	26.6	32.9	37.0	38.4	38.3	37.7	38.4	38.5	37.0	37.5	37.3	34.4	34.0	29.7	38.5
30-Mar	Z	23.1	21.4	20.5	21.2	13.2	9.6	13.1	15.1	16.8	17.7	23.3	28.8	34.2	34.7	36.0	35.4	33.8	32.9	36.0	37.7	36.0	31.8	27.2	26.1	37.7
31-Mar	23.9	Z	18.5	13.5	8.8	4.7	5.6	9.7	15.5	19.7	26.4	29.4	28.4	31.9	31.9	36.1	35.5	33.3	31.3	21.7	29.3	36.8	40.6	35.8	24.7	40.6
	26.3	26.6	23.8	23.5	21.2	20.5	19.9	21.8	25.2	27.7	29.2	31.0	32.3	33.9	34.6	35.0	34.8	33.1	31.3	30.1	30.1	29.8	28.7	28.8	Diurnal Average	
	38.1	43.4	44.2	40.1	35.0	35.5	33.6	34.5	37.1	38.6	42.4	45.3	46.1	47.6	48.4	49.1	50.3	51.8	51.4	43.4	40.7	39.3	40.6	40.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Buffalo Viewpoint - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	116	17.01	17.01
21 - 50	564	82.70	99.71
51 - 82	2	0.29	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Buffalo Viewpoint - March 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	13	11	3	1	0	5	12	25	2	2	1	3	3	5	11	19	116
21 - 50	119	84	17	6	7	46	82	116	21	2	2	4	11	10	17	20	564
51 - 82	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	95	20	7	7	51	94	141	23	4	4	8	14	15	28	39	682

Total Number of Valid Hours: 682

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Buffalo Viewpoint

Total Number of Valid Hours: 682

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Buffalo Viewpoint - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 46.5 $\mu g/m^3$ on Mar 25 10:00

Maximum Daily Average: 21.0 $\mu g/m^3$ on Mar 27

Minimum Value: 0.4 $\mu g/m^3$ on Mar 2 21:00

Maximum Diurnal Average: 11.4 $\mu g/m^3$ at hour 11

Monthly Average: 8.55 $\mu g/m^3$

Minimum Daily Average: 4.2 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 6.8 $\mu g/m^3$ at hour 22

Percentiles: P_1 = 1.3 P_{10} = 4.0 Q_1 = 4.9 Median = 6.4 Q_3 = 9.7 P_{90} = 16.3 P_{99} = 33.4

Hours in Service:	744
Hours of Data:	722
Hours of Missing Data:	22
Hours of Calibration:	2
Percent Operational Time:	97.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	5.8	6.9	8.4	8.2	6.4	5.9	4.4	3.7	3.8	3.3	3.5	4.0	4.1	4.9	5.2	5.2	5.5	6.8	7.3	8.4	9.2	10.1	10.0	10.3	6.3	10.3
2-Mar	10.3	11.2	10.7	10.8	11.1	11.8	11.9	12.6	13.1	13.5	11.1	7.3	6.0	3.6	1.9	1.1	0.9	0.8	0.5	0.5	0.4	0.4	0.8	2.5	6.5	13.5
3-Mar	2.7	4.5	6.7	5.9	5.4	5.4	5.2	5.4	5.6	6.2	6.2	5.9	6.1	5.8	6.4	7.7	7.7	7.2	9.0	9.1	8.0	5.7	4.6	4.3	6.1	9.1
4-Mar	4.1	4.3	4.1	4.1	4.2	4.4	4.9	3.8	3.8	3.9	4.9	5.4	4.3	3.7	4.4	4.5	5.7	6.5	5.2	4.5	3.7	4.4	9.3	7.0	4.8	9.3
5-Mar	3.6	3.6	3.6	6.6	9.7	6.6	4.9	4.6	4.6	5.0	5.4	9.3	6.9	7.5	7.9	9.0	10.1	11.7	19.8	18.8	15.4	11.8	10.7	11.8	8.7	19.8
6-Mar	11.6	21.2	22.4	18.1	11.9	10.3	12.0	15.1	15.3	8.3	4.6	4.8	4.8	4.3	4.7	4.1	4.0	4.4	5.7	4.4	3.8	4.0	4.1	3.8	8.6	22.4
7-Mar	3.6	3.8	3.6	3.4	3.4	3.9	3.8	3.7	3.8	3.9	4.0	4.3	4.5	4.8	4.8	5.2	4.7	4.8	6.7	5.2	3.8	3.5	3.4	3.3	4.2	6.7
8-Mar	3.2	3.2	3.6	3.6	4.2	3.6	3.8	4.0	4.8	4.1	4.3	4.3	4.3	4.2	4.2	5.9	6.8	4.6	20.4	13.2	4.8	4.0	3.9	3.6	5.3	20.4
9-Mar	3.6	3.5	3.4	3.6	3.4	3.7	4.7	5.3	6.2	5.4	4.3	4.2	4.1	4.3	4.0	4.1	4.0	9.7	6.3	5.5	7.9	7.1	4.7	4.0	4.9	9.7
10-Mar	3.9	4.2	4.3	4.2	4.2	4.3	4.5	4.7	4.9	5.8	5.6	5.7	5.6	5.5	6.3	8.4	11.7	11.4	9.7	14.1	12.3	5.9	6.9	4.6	6.6	14.1
11-Mar	4.5	4.7	6.2	7.8	6.0	5.2	4.2	4.2	4.9	4.3	4.6	5.3	5.3	8.0	9.8	8.5	8.1	6.8	6.2	5.4	4.8	4.7	4.6	4.5	5.8	9.8
12-Mar	4.6	4.3	4.2	4.4	4.5	4.9	5.1	5.0	4.1	3.9	4.0	4.2	4.4	4.6	4.6	4.6	4.5	4.6	4.6	5.3	5.3	5.1	5.2	5.5	4.6	5.5
13-Mar	6.2	6.4	6.7	6.8	7.1	7.8	7.6	6.2	5.9	6.1	6.6	6.8	9.7	12.5	6.4	6.2	6.0	6.5	9.0	10.6	6.2	5.2	5.0	6.3	7.1	12.5
14-Mar	7.5	5.6	5.6	5.4	4.6	4.4	4.9	4.8	4.9	4.9	5.0	5.2	5.4	5.2	5.0	4.7	6.6	4.4	4.1	4.3	4.8	5.1	5.0	5.1	5.1	7.5
15-Mar	5.0	5.5	5.7	5.1	5.7	6.4	7.2	7.1	8.0	9.3	13.3	15.4	10.1	7.6	9.3	13.2	10.9	8.3	8.8	8.7	9.7	9.4	9.4	9.6	8.7	15.4
16-Mar	13.2	12.9	6.4	5.0	4.7	4.4	4.7	5.1	5.2	4.6	4.7	4.7	4.8	5.2	5.4	5.8	6.4	6.8	6.5	6.4	6.1	5.7	5.0	5.0	6.0	13.2
17-Mar	5.1	5.7	5.7	5.3	5.0	5.3	5.9	5.8	5.4	5.2	5.6	6.5	5.8	6.3	6.2	5.6	6.2	6.8	7.1	8.0	9.2	10.2	8.0	6.7	6.4	10.2
18-Mar	6.5	6.3	6.1	6.5	7.1	7.0	6.7	8.6	7.0	8.2	8.1	7.9	7.6	6.6	5.7	7.8	6.0	7.2	7.8	5.0	5.0	6.1	8.1	9.1	7.0	9.1
19-Mar	9.4	7.3	7.3	7.2	7.3	8.3	11.2	15.5	10.4	6.8	7.3	7.7	7.3	6.1	6.0	5.9	6.0	6.4	6.0	6.3	6.9	6.1	6.3	6.1	7.5	15.5
20-Mar	6.4	6.6	5.9	6.1	6.5	7.7	14.1	10.7	7.3	7.2	9.3	8.5	6.5	5.7	5.7	5.1	5.2	5.5	5.5	5.0	4.8	5.4	5.3	5.8	6.7	14.1
21-Mar	5.5	5.1	5.2	7.1	11.1	13.8	16.7	18.3	18.0	20.1	23.6	21.1	15.1	16.8	17.2	18.2	11.4	8.3	7.8	9.6	10.1	10.1	9.7	8.0	12.8	23.6
22-Mar	6.6	6.2	5.7	5.4	5.7	5.8	5.2	5.5	5.4	5.6	6.3	7.4	8.0	8.5	8.5	8.6	9.0	8.6	7.8	8.3	8.7	9.5	9.9	10.1	7.4	10.1
23-Mar	9.6	9.9	9.6	10.4	9.8	11.2	12.8	11.4	9.1	16.3	10.9	8.1	8.4	7.6	7.6	8.0	7.3	6.8	6.3	6.5	6.2	7.5	9.1	8.9	9.1	16.3
24-Mar	7.8	9.8	10.2	8.3	5.7	6.9	7.4	8.3	8.0	9.9	26.9	38.4	20.3	26.7	13.0	18.0	14.1	11.4	11.6	12.1	10.8	11.0	11.6	10.9	13.3	38.4
25-Mar	10.8	11.5	11.8	10.1	11.1	14.3	18.7	22.7	33.1	46.5	33.5	16.1	8.3	5.9	5.2	5.1	4.9	5.5	5.6	5.9	6.2	5.7	6.1	9.0	13.1	46.5
26-Mar	7.2	6.5	8.7	7.5	7.5	9.7	13.5	18.1	17.9	22.2	31.9	28.4	32.9	29.7	15.7	7.4	6.3	7.4	8.2	7.8	7.6	6.3	6.8	9.4	13.5	32.9
27-Mar	16.5	43.7	28.7	23.9	21.4	22.2	26.5	29.0	34.9	23.3	20.1	18.0	13.8	11.0	9.9	9.5	10.0	19.7	22.7	31.6	19.4	18.5	16.4	12.9	21.0	43.7
28-Mar	10.4	9.8	13.5	32.2	22.6	25.8	30.7	34.7	36.7	C	C	M	M	M	M	M	M	M	M	M	M	M	M	M	--	36.7
29-Mar	M	M	M	M	M	M	M	5.3	5.6	10.4	17.2	16.9	10.3	5.1	3.3	3.6	3.2	3.3	3.0	3.5	3.3	3.8	4.3	5.2	--	17.2
30-Mar	5.7	5.3	6.8	7.8	8.2	8.6	8.3	8.6	12.1	19.0	30.1	25.9	19.3	10.9	10.2	7.3	9.2	8.9	6.8	5.1	3.7	4.0	6.1	6.9	10.2	30.1
31-Mar	9.5	13.6	15.7	16.6	23.6	28.6	34.1	32.6	27.6	26.7	19.1	17.4	19.3	14.2	12.6	11.0	12.2	10.3	9.7	14.7	9.6	6.6	4.5	5.7	16.5	34.1
	7.0	8.4	8.2	8.6	8.3	8.9	10.2	10.7	10.9	10.7	11.4	10.8	9.1	8.4	7.2	7.3	7.2	7.4	8.2	8.5	7.3	6.8	6.8	6.9	Diurnal Average	
	16.5	43.7	28.7	32.2	23.6	28.6	34.1	34.7	36.7	46.5	33.5	38.4	32.9	29.7	17.2	18.2	14.1	19.7	22.7	31.6	19.4	18.5	16.4	12.9	Diurnal Maximum	

C - Calibration M - Maintenance

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Buffalo Viewpoint - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	258	35.73	35.73
6 - 15	388	53.74	89.47
16 - 25	48	6.65	96.12
26 - 80	28	3.88	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 722

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Buffalo Viewpoint - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	59	28	4	0	3	12	52	55	11	0	1	1	11	2	8	11	258
6 - 15	66	54	12	6	5	40	53	85	14	3	3	6	3	8	13	17	388
16 - 25	9	10	4	0	0	3	4	5	0	1	1	1	0	1	3	6	48
26 - 80	5	5	0	0	0	0	2	4	1	0	0	1	0	3	5	2	28
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	139	97	20	6	8	55	111	149	26	4	5	9	14	14	29	36	722

Total Number of Valid Hours: 722

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Buffalo Viewpoint

Total Number of Valid Hours: 722

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - March 2023

Maximum Value: 10.0 C on Mar 17 17:00

Maximum Daily Average: 1.1 C on Mar 18

Minimum Value: -30.3 C on Mar 6 08:00

Minimum Daily Average: -20.3 C on Mar 5

Maximum Diurnal Average: -4.0 C at hour 16

Minimum Diurnal Average: -15.2 C at hour 7

Monthly Average: -9.60 C

Percentiles: P_1 = -26.6 P_{10} = -18.0 Q_1 = -13.8 Median = -9.5 Q_3 = -5.1 P_{90} = -1.0 P_{99} = 8.0

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-24.9	-25.1	-26.5	-27.1	-25.8	-25.2	-24.0	-23.0	-20.5	-17.3	-14.3	-11.5	-9.5	-8.3	-7.5	-7.3	-7.9	-9.3	-9.9	-9.6	-8.6	-8.4	-8.2	-8.0	-15.3	-7.3
2-Mar	-8.1	-8.2	-8.3	-8.1	-7.8	-7.7	-7.5	-7.3	-6.8	-5.0	-0.2	1.9	2.9	3.6	4.2	4.1	3.5	2.6	1.9	1.0	0.4	0.0	-0.2	-0.8	-2.1	4.2
3-Mar	-1.2	-2.1	-5.4	-7.2	-8.4	-9.0	-9.5	-10.0	-10.3	-10.7	-10.2	-9.9	-9.7	-9.8	-9.3	-8.4	-9.1	-10.3	-10.8	-12.0	-12.8	-13.0	-14.4	-15.4	-9.5	-1.2
4-Mar	-15.8	-16.0	-16.2	-16.3	-16.4	-16.5	-16.7	-17.8	-18.0	-17.3	-16.2	-15.2	-15.0	-14.2	-13.3	-12.8	-13.9	-15.7	-16.9	-18.3	-19.1	-19.3	-19.7	-20.4	-16.6	-12.8
5-Mar	-21.6	-22.9	-22.8	-22.8	-24.5	-24.7	-25.1	-25.1	-22.3	-21.2	-18.9	-18.0	-17.1	-16.3	-15.4	-14.8	-14.9	-16.5	-18.0	-19.9	-20.9	-21.2	-21.5	-22.0	-20.3	-14.8
6-Mar	-23.0	-24.4	-25.3	-27.5	-29.7	-29.8	-29.9	-30.3	-26.7	-22.7	-18.7	-15.8	-13.9	-12.1	-11.2	-10.6	-10.8	-11.4	-12.3	-12.8	-12.2	-12.4	-13.2	-13.8	-18.8	-10.6
7-Mar	-14.2	-13.3	-12.8	-12.9	-13.0	-13.4	-13.7	-13.7	-13.0	-12.6	-12.4	-11.8	-11.2	-9.5	-7.7	-6.6	-7.0	-7.1	-8.2	-8.6	-9.3	-9.5	-9.0	-8.7	-10.8	-6.6
8-Mar	-9.5	-10.7	-12.0	-13.2	-14.0	-14.7	-14.8	-15.1	-14.3	-12.3	-11.2	-10.3	-8.7	-7.2	-6.2	-5.7	-5.8	-6.7	-8.8	-10.1	-11.2	-12.2	-13.3	-14.5	-10.9	-5.7
9-Mar	-15.2	-15.7	-16.5	-17.6	-18.4	-19.4	-20.3	-21.0	-18.3	-15.4	-13.0	-10.7	-9.5	-8.8	-8.2	-7.9	-7.5	-7.9	-8.7	-9.2	-9.8	-10.3	-9.9	-9.9	-12.9	-7.5
10-Mar	-10.4	-10.8	-11.3	-11.0	-11.2	-11.5	-11.5	-11.4	-11.0	-10.0	-8.8	-8.2	-7.4	-6.3	-5.8	-5.5	-5.6	-6.1	-6.7	-6.9	-6.8	-7.1	-8.0	-8.6	-8.7	-5.5
11-Mar	-9.4	-9.7	-10.1	-10.5	-10.6	-10.5	-10.4	-10.7	-9.4	-8.4	-7.1	-6.0	-4.8	-4.3	-3.6	-3.4	-3.7	-4.5	-6.1	-7.8	-8.8	-9.7	-10.6	-11.0	-8.0	-3.4
12-Mar	-11.5	-11.7	-12.2	-12.5	-13.0	-13.6	-14.6	-14.9	-14.3	-13.6	-12.5	-11.6	-11.8	-11.7	-11.0	-11.0	-11.2	-11.8	-12.7	-13.0	-13.1	-13.9	-14.6	-14.5	-12.8	-11.0
13-Mar	-14.8	-15.4	-16.1	-16.8	-17.9	-18.4	-17.8	-17.7	-17.3	-15.8	-14.4	-11.9	-10.1	-8.4	-7.6	-7.0	-6.3	-6.8	-6.8	-6.8	-6.4	-7.6	-8.4	-8.9	-11.9	-6.3
14-Mar	-9.7	-10.2	-10.7	-11.1	-11.1	-11.3	-11.8	-12.0	-12.4	-12.8	-12.7	-12.1	-11.0	-10.4	-10.9	-11.0	-11.0	-11.7	-12.4	-12.9	-13.4	-13.7	-14.1	-14.7	-11.9	-9.7
15-Mar	-15.2	-16.4	-17.2	-17.9	-18.0	-17.0	-16.8	-15.7	-13.2	-13.1	-12.6	-11.6	-10.4	-9.8	-8.4	-8.1	-8.3	-8.9	-10.5	-12.1	-12.4	-14.4	-16.1	-16.6	-13.4	-8.1
16-Mar	-17.4	-16.7	-14.9	-14.6	-14.5	-14.3	-14.1	-13.8	-13.2	-12.3	-10.3	-9.5	-7.7	-6.2	-4.7	-3.7	-3.6	-4.2	-5.6	-6.7	-8.0	-8.4	-8.9	-9.4	-10.1	-3.6
17-Mar	-9.7	-10.7	-11.8	-12.1	-12.7	-13.2	-13.7	-12.9	-10.1	-6.2	-3.5	-1.4	1.6	4.2	6.5	9.6	10.0	9.9	8.0	4.6	1.4	-0.8	-2.2	-1.8	-2.8	10.0
18-Mar	-1.6	-1.2	-1.5	-3.2	-5.1	-6.1	-7.1	-6.0	-4.5	-1.0	1.1	3.7	5.3	8.0	9.7	9.8	9.8	8.7	5.2	3.6	1.7	0.2	-1.2	-1.7	1.1	9.8
19-Mar	-3.1	-3.7	-4.3	-5.6	-6.6	-8.5	-8.4	-7.3	-5.2	-4.3	-2.7	-1.0	-0.5	0.0	0.8	1.3	0.8	0.1	-0.8	-2.2	-3.0	-3.7	-4.2	-4.3	-3.2	1.3
20-Mar	-4.3	-4.8	-5.5	-6.4	-7.3	-8.3	-8.6	-8.2	-7.3	-7.2	-6.8	-5.6	-4.4	-2.7	-1.6	-1.5	-1.9	-3.4	-5.7	-7.1	-8.9	-10.3	-11.9	-13.4	-6.4	-1.5
21-Mar	-14.6	-15.4	-15.9	-16.0	-16.8	-17.1	-18.1	-17.7	-15.3	-13.4	-10.8	-9.8	-8.1	-6.9	-5.4	-4.3	-4.2	-4.1	-5.7	-7.8	-9.6	-11.8	-13.5	-12.3	-11.4	-4.1
22-Mar	-12.0	-12.4	-12.7	-13.6	-14.2	-14.1	-14.6	-13.1	-10.3	-7.3	-4.8	-2.8	-1.1	0.7	2.0	2.8	3.3	3.2	1.8	-0.6	-2.6	-3.4	-3.8	-4.6	-5.6	3.3
23-Mar	-4.8	-5.1	-6.5	-7.3	-8.4	-8.3	-7.5	-6.1	-2.7	-0.7	0.3	0.6	0.8	0.2	-0.3	-1.3	-2.5	-3.8	-5.2	-7.1	-8.2	-7.9	-7.5	-7.4	-4.4	0.8
24-Mar	-7.6	-8.1	-9.4	-11.2	-11.8	-12.9	-13.3	-12.6	-10.4	-9.3	-8.1	-6.7	-5.4	-4.2	-3.2	-2.1	-1.7	-1.8	-3.1	-4.7	-6.6	-7.9	-7.9	-10.3	-7.5	-1.7
25-Mar	-11.9	-12.9	-14.0	-16.5	-17.3	-16.9	-16.6	-14.8	-12.6	-9.7	-7.1	-4.0	-2.5	-1.9	-1.7	-2.2	-3.1	-4.6	-6.7	-9.4	-11.3	-12.3	-14.0	-15.4	-10.0	-1.7
26-Mar	-17.0	-18.5	-19.3	-20.6	-21.4	-22.2	-22.5	-21.1	-19.6	-17.2	-15.5	-13.6	-11.8	-10.1	-9.0	-9.4	-10.4	-10.8	-12.9	-15.1	-15.9	-17.1	-17.4	-18.5	-16.1	-9.0
27-Mar	-19.0	-19.3	-21.7	-22.8	-24.6	-25.8	-27.7	-25.1	-19.8	-15.2	-12.3	-10.0	-8.4	-7.5	-6.5	-6.1	-5.9	-5.8	-7.0	-9.1	-11.7	-12.7	-13.5	-14.3	-14.7	-5.8
28-Mar	-14.8	-16.5	-17.5	-20.7	-23.2	-24.4	-24.9	-22.5	-17.8	-12.8	-9.3	-6.9	-5.1	-3.6	-1.8	-1.1	-1.2	-1.3	-1.6	-2.3	-2.6	-2.9	-2.8	-3.0	-10.0	-1.1
29-Mar	-3.3	-3.9	-4.6	-5.2	-5.2	-5.6	-4.7	-4.0	-2.9	-1.8	-1.2	-0.1	0.1	0.1	-0.2	-0.8	-0.9	-1.7	-2.7	-3.6	-4.7	-5.9	-6.3	-6.8	-3.2	0.1
30-Mar	-8.9	-11.4	-12.2	-13.4	-12.4	-14.0	-15.9	-14.2	-10.7	-6.6	-5.0	-3.7	-2.7	-1.7	-1.1	-0.9	-0.8	-1.3	-2.1	-2.3	-2.6	-3.0	-3.5	-5.7	-6.5	-0.8
31-Mar	-6.8	-5.6	-6.2	-7.2	-7.7	-7.8	-7.9	-7.4	-6.6	-5.2	-3.2	-1.6	0.0	0.5	1.4	2.3	2.1	1.3	-0.1	-0.9	-1.2	-1.0	-1.4	-2.8	-3.0	2.3
	-11.7	-12.2	-12.9	-13.8	-14.5	-14.9	-15.2	-14.6	-12.8	-10.9	-9.1	-7.6	-6.4	-5.3	-4.4	-4.0	-4.2	-4.9	-6.2	-7.4	-8.3	-9.1	-9.7	-10.3	Diurnal Average	
	-1.2	-1.2	-1.5	-3.2	-5.1	-5.6	-4.7	-4.0	-2.7	-0.7	1.1	3.7	5.3	8.0	9.7	9.8	10.0	9.9	8.0	4.6	1.7	0.2	-0.2	-0.8	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	52	6.99	6.99
-20 - 0	639	85.89	92.88
0 - 10	52	6.99	99.87
10 - 20	1	0.13	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Buffalo Viewpoint - March 2023

Maximum Value: 91.9 % on Mar 19 07:00

Maximum Daily Average: 87.0 % on Mar 14

Minimum Value: 27.2 % on Mar 18 17:00

Minimum Daily Average: 46.0 % on Mar 8

Maximum Diurnal Average: 79.0 % at hour 6

Minimum Diurnal Average: 53.8 % at hour 16

Monthly Average: 67.59 %

Percentiles: P_1 = 31.9 P_{10} = 45.1 Q_1 = 57.6 Median = 69.6 Q_3 = 79.5 P_{90} = 85.3 P_{99} = 89.1

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	79.6	79.8	77.9	76.7	78.5	79.0	80.0	80.7	79.3	77.2	72.1	66.2	62.2	61.1	60.0	60.7	64.5	70.6	75.6	76.9	76.5	76.6	76.9	77.1	73.6	80.7
2-Mar	81.4	86.9	88.4	89.4	89.1	88.6	87.9	86.6	84.7	79.5	64.5	58.2	56.7	58.9	58.2	56.8	64.3	69.2	73.0	77.1	78.3	80.0	80.7	72.7	75.5	89.4
3-Mar	69.6	73.2	79.1	79.6	78.4	76.2	74.9	76.2	76.5	73.8	68.8	67.1	66.7	65.6	64.3	62.7	63.6	72.9	83.2	86.0	87.1	85.1	81.2	79.0	74.6	87.1
4-Mar	76.6	76.0	77.2	80.3	81.8	82.4	82.5	79.5	78.2	76.1	73.5	70.5	65.7	57.6	55.4	52.2	61.3	65.6	69.4	70.1	71.8	73.3	75.7	74.6	72.0	82.5
5-Mar	76.3	78.5	78.3	77.8	77.2	77.1	76.5	75.4	72.3	71.4	65.1	62.8	57.7	54.5	49.8	47.9	48.9	53.0	58.7	63.6	67.6	68.4	70.4	71.5	66.7	78.5
6-Mar	73.9	76.6	77.3	75.2	73.7	74.2	74.5	73.5	71.0	65.6	56.3	54.1	53.7	57.4	59.4	67.3	75.2	74.5	72.0	73.6	75.2	73.9	74.1	76.6	69.9	77.3
7-Mar	82.7	83.3	80.3	80.1	79.0	80.0	79.7	80.0	78.6	72.4	69.8	68.2	70.5	62.9	56.6	51.8	48.4	48.9	49.8	48.9	51.6	51.1	48.1	45.1	65.3	83.3
8-Mar	45.1	47.4	50.2	53.9	56.1	58.5	57.9	58.7	56.0	49.1	45.7	42.9	39.5	34.6	32.3	32.6	32.9	33.6	41.1	43.8	45.0	46.2	48.1	52.2	46.0	58.7
9-Mar	55.0	56.0	57.7	61.3	63.6	67.3	71.0	72.1	62.2	53.2	46.3	41.8	40.5	42.1	41.8	42.3	43.1	47.3	50.4	51.1	55.3	61.9	58.2	61.2	54.3	72.1
10-Mar	65.9	73.6	80.2	80.6	78.7	76.9	75.8	74.1	72.2	66.5	60.6	58.9	58.7	56.6	55.4	55.2	58.3	62.4	67.6	69.5	66.9	64.7	66.7	70.9	67.4	80.6
11-Mar	69.2	67.7	67.2	65.9	66.7	67.1	67.4	69.1	64.5	60.1	56.2	54.4	53.0	53.6	53.0	54.5	60.1	70.9	81.8	83.9	85.3	86.6	86.3	86.4	68.0	86.6
12-Mar	87.0	86.8	86.2	85.5	85.1	84.9	84.5	83.7	79.9	77.2	74.5	70.9	71.5	72.1	70.8	71.8	75.8	79.3	82.1	83.4	84.7	84.7	84.8	84.7	80.5	87.0
13-Mar	84.8	84.6	84.5	84.2	83.7	83.3	83.5	83.4	82.5	80.9	78.4	74.1	71.3	68.3	68.7	68.2	69.6	72.2	72.3	74.2	74.9	85.6	88.7	89.4	78.8	89.4
14-Mar	89.3	89.2	88.6	88.5	88.6	88.3	88.0	87.6	86.3	85.3	85.1	85.3	84.9	84.9	86.0	86.9	87.5	87.4	87.3	87.0	86.8	86.5	86.2	85.7	87.0	89.3
15-Mar	85.4	84.4	84.1	83.5	83.8	84.3	84.0	84.1	83.4	81.9	82.1	83.0	83.3	83.6	84.3	84.5	85.4	86.2	86.8	88.0	87.9	86.1	85.4	84.4	84.6	88.0
16-Mar	83.9	84.7	85.6	85.4	85.3	85.4	85.7	85.6	85.2	84.1	82.3	81.5	77.4	70.4	66.6	66.1	66.7	69.1	74.8	78.0	80.8	81.3	81.8	84.5	79.7	85.7
17-Mar	86.0	87.7	89.3	88.7	88.2	87.4	87.8	85.3	79.8	70.4	62.8	58.3	54.0	51.3	49.7	42.6	31.5	27.7	29.4	41.4	53.1	62.9	65.1	56.7	64.0	89.3
18-Mar	50.0	45.2	43.5	48.4	55.5	59.7	62.7	58.2	54.1	46.6	42.0	37.8	35.7	31.5	29.1	28.4	27.2	29.7	41.2	46.2	52.1	58.2	65.0	67.2	46.5	67.2
19-Mar	74.2	75.7	77.9	83.3	84.4	90.3	91.9	85.9	69.7	66.5	62.6	58.4	57.1	55.7	54.7	54.2	57.4	61.7	64.1	69.5	72.7	74.7	75.9	74.6	70.5	91.9
20-Mar	72.0	69.3	66.7	64.7	66.7	65.9	67.6	67.9	66.7	73.4	79.6	76.7	76.8	67.3	62.6	61.8	61.6	61.4	64.3	62.8	64.2	65.2	68.0	72.8	67.8	79.6
21-Mar	75.7	78.8	82.0	80.9	85.0	84.9	83.9	82.9	82.7	78.4	69.6	69.7	67.1	64.6	59.3	54.2	48.8	49.2	54.5	63.7	70.7	78.5	84.7	84.8	72.3	85.0
22-Mar	86.4	87.5	87.4	87.8	87.1	86.4	85.9	83.0	77.7	66.4	55.0	48.8	45.0	41.6	39.4	39.6	40.2	41.5	46.4	53.7	60.8	63.5	64.9	67.6	64.3	87.8
23-Mar	68.0	68.6	73.9	76.2	78.5	77.7	76.1	74.7	64.9	58.0	52.6	56.3	55.7	58.2	59.4	60.9	63.3	66.8	70.0	75.7	78.2	79.0	77.8	77.6	68.7	79.0
24-Mar	77.7	78.8	80.1	82.9	81.5	85.0	85.1	80.1	69.3	66.2	64.4	60.8	54.7	51.3	45.8	41.4	38.7	39.9	42.9	49.3	55.9	60.3	60.9	70.2	63.5	85.1
25-Mar	74.9	81.8	81.5	85.9	84.1	85.7	84.8	82.5	76.8	67.5	57.8	45.6	39.6	39.0	39.4	40.6	39.5	41.2	46.6	59.1	67.1	67.5	71.0	73.5	63.9	85.9
26-Mar	72.6	74.8	74.4	76.4	76.6	77.2	78.9	74.8	68.2	61.8	61.2	57.1	56.1	48.5	41.9	40.5	42.2	45.3	50.0	56.0	56.8	58.4	58.6	62.3	61.3	78.9
27-Mar	68.3	73.6	76.2	77.8	76.0	76.4	73.9	72.4	65.2	53.3	46.5	42.4	39.0	37.2	36.3	37.1	36.9	38.7	42.0	49.5	53.7	55.4	57.6	58.0	56.0	77.8
28-Mar	57.1	62.9	66.8	75.3	77.3	77.1	76.4	72.4	60.6	49.3	41.2	37.8	36.5	35.6	34.9	36.5	38.6	41.3	39.7	40.8	41.9	45.2	42.8	41.8	51.2	77.3
29-Mar	46.1	49.1	65.1	66.2	67.7	76.3	77.3	73.6	72.6	71.2	69.8	67.0	68.8	69.5	68.5	68.8	67.7	64.9	63.8	65.6	66.6	69.4	70.8	71.3	67.4	77.3
30-Mar	77.5	88.4	89.0	88.4	89.0	86.4	84.2	84.7	80.6	66.7	63.2	55.5	50.2	45.0	42.8	44.3	45.3	50.5	53.0	60.0	62.0	60.9	59.8	66.3	66.4	89.0
31-Mar	68.6	65.0	72.1	79.2	78.2	78.6	77.4	75.2	73.1	70.1	64.2	60.9	59.0	59.3	58.1	55.7	57.5	61.3	67.0	69.7	69.9	68.6	69.5	74.1	68.0	79.2
	72.9	74.7	76.4	77.7	78.2	79.0	79.0	77.5	73.4	68.4	63.7	60.4	58.3	56.1	54.3	53.8	54.9	57.6	61.3	65.1	67.8	69.7	70.5	71.4	Diurnal Average	
	89.3	89.2	89.3	89.4	89.1	90.3	91.9	87.6	86.3	85.3	85.1	85.3	84.9	84.9	86.0	86.9	87.5	87.4	87.3	88.0	87.9	86.6	88.7	89.4	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - March 2023

Maximum Speed: 20 km/h on Mar 2 18:00

Maximum Daily Speed Average: 12.5 km/h on Mar 14

Minimum Speed Value: 1 km/h on Mar 19 06:00

Maximum Diurnal Speed Average: 3.7 km/h at hour 17

Monthly Average Velocity: 2.2 km/h 70.3 deg

Minimum Daily Speed Average: 0.8 km/h on Mar 5

Minimum Diurnal Speed Average: 1.2 km/h at hour 9

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 8 $Q_3 = 11$ $P_{90} = 13$ $P_{99} = 17$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	SSE8	SE6	SSE5	SSE6	SSE5	SSE6	SSE5	SSE5	SE6	SSE6	SE6	SE8	SSE10	SSE11	SSE9	SE11	SE7	SE6	SE7	SE8	SE12	SSE12	SE11	SSE12	SSE7.7	SSE12
2-Mar	SSE12	SSE13	SSE13	SSE13	SSE12	SSE12	SSE12	SSE12	SSE10	SSE9	SSW7	WSW12	WSW13	W13	W12	W13	W17	W20	W16	W10	WSW13	W12	NW11	NW16	SW6.7	W20
3-Mar	NW16	NNW14	NNE14	NNE13	NNE11	NNE10	NNE10	NNE12	NNE10	NNE11	NNE10	NNE8	NNE9	NNE8	N5	N8	N7	N6	N6	NNE6	N2	NNE12	NNE15	NNE12	NNE9.2	NW16
4-Mar	NNE10	NE7	NNE5	NNW2	SW2	S3	NE7	NE12	NE8	NNE6	N7	NW12	NW14	NW15	NW13	NW11	N12	NNE13	NNE11	NNE11	N7	N5	NNW5	NNE8	N6.9	NW15
5-Mar	NNE6	N8	NNW6	NNW2	WSW4	WSW5	W5	W5	WNW6	WNW6	NNW5	NNE6	NNE5	NE6	NE7	ESE6	SE7	SE7	SSE5	SSE6	SSE6	SE7	ESE5	SE6	ENE0.8	N8
6-Mar	ESE4	NE3	SSE2	SSE6	SSE6	SE7	SSE8	S6	SSE4	SSE7	SSE7	SSE6	ESE7	SSE7	SE7	SE8	ESE9	ESE8	ESE6	SE6	SSE10	SE9	SE8	SE7	SE6.3	SSE10
7-Mar	SE6	SE8	SE11	SE9	SE10	SE9	SE8	SE8	SE9	SSE12	SE13	SE12	ESE10	SE10	SSE12	SE13	ESE15	ESE13	ESE10	SE10	SE8	SE8	SSE9	SSE11	SE10.0	ESE15
8-Mar	SSE11	SSE10	SSE6	SE4	SE5	SSE7	SSE8	SSE8	S5	S9	SSE10	SE9	ESE9	SE9	SSE7	ESE9	ESE12	SE9	ESE9	SE9	SE8	SSE8	SSE8	SE7	SE7.8	ESE12
9-Mar	SE8	SSE8	SSE7	S7	S7	S6	SSE4	SSE6	SSE7	SSE8	S9	SSE13	SSE11	SSE13	SSE15	SE16	SE12	SE13	SE14	SE15	SE15	SE14	SE14	SE14	SE10.4	SE16
10-Mar	SE13	SE12	SE11	SE11	SE12	SE13	SE13	SE12	SE12	SSE13	SE14	SE14	SE12	ESE12	ESE9	ESE10	ESE13	ESE12	E6	ESE4	SE5	SE9	SE10	SE8	SE10.5	SE14
11-Mar	SE6	SE6	SE4	SSE4	SSE4	SSE6	SSE6	SSE6	SE7	ESE9	ESE5	ESE5	ESE9	ESE9	ESE8	E7	E7	NNE7	NNE13	NNE14	NNE14	N15	N15	NNE15	ENE4.4	NNE15
12-Mar	N14	N13	N13	N13	N12	N12	NNW10	NNW9	N11	N10	N11	N12	N12	N12	N12	N11	N10	N11	N13	N12	N12	N12	N11	N10	N11.5	N14
13-Mar	N11	N11	N12	N13	NNW10	NNW10	N9	N13	N9	N9	N9	N9	NNW8	N11	N14	N14	NNE13	NNE9	NE7	ENE5	NE9	NNE12	N14	N13	N10.0	N14
14-Mar	N12	N13	N14	N15	N15	N15	N15	N13	N17	N13	N12	N12	N11	N12	N14	N14	N11	N14	N15	N11	N9	N9	N9	NNW8	N12.5	N17
15-Mar	NNW11	NNW7	N7	N7	NNW6	NW5	NW5	NNW3	NNW2	NW4	WNW5	WNW6	NW6	WNW6	NW5	WNW5	WNW6	NW5	NW5	NNW3	WNW4	SSE2	S4	SE4	NW4.0	NNW11
16-Mar	SSE5	SSE6	SE7	SE7	SE7	SSE5	SE4	SSE6	SSE5	SSE8	SSE8	SSE7	SSE8	SSE8	SSE8	SSE9	SE10	SE9	SSE7	S8	SSE9	SSE9	SSE9	S9	SSE7.3	SE10
17-Mar	SSE9	SSE6	SSE8	SSE10	SSE9	SSE7	SSE7	SSE8	SSE9	SSE9	SSE9	SSE8	SSE8	SE8	SE8	W2	W9	WSW8	SW8	S7	SSE9	SSE10	SE10	SSE8	SSE6.9	SE10
18-Mar	S7	SSW6	S2	SE7	SE9	SSE8	SE8	SE8	SSE5	SSE5	SE8	SE7	SE7	SE5	ESE4	ESE6	SE5	NE4	NE11	NE7	N6	NNE8	NNE7	N7	ESE3.6	NE11
19-Mar	N8	N7	N7	NNE7	ENE4	NNW1	ESE3	SE4	SSE3	ESE11	ESE10	SE9	ESE11	ESE11	ESE12	ESE11	ESE11	SE10	SE11	ESE13	ESE12	ESE11	ESE9	ESE9	ESE6.8	ESE13
20-Mar	ESE10	ESE12	SE10	ESE10	ESE11	ESE7	ESE4	NE6	NE8	ENE7	NNE6	NNE5	N8	N12	N13	NNE15	N15	N18	N17	N19	NNE14	N16	N9	N10	NNE7.5	N19
21-Mar	N9	N5	NNW4	NW6	NNW6	NW5	NNW4	NW5	NNW4	NNW3	NW3	NNE6	NNE7	NNE8	NNE5	N4	SE5	SSE6	SSE7	SSE7	SSE5	SSE6	SSE6	SSE9	N1.2	SSE9
22-Mar	SSE9	SSE9	SSE8	S7	SSE7	SSE8	S4	SSE6	SSE7	S10	S11	S11	S10	SSE8	SSE9	SE10	SE8	SSE8	SSE6	SSE5	SSE5	SSE5	SSE7	SSE4	SSE7.5	S11
23-Mar	S4	SSE5	SSE9	SE11	SSE10	SSE9	S7	WSW4	NW8	N8	NNE10	NNE13	NNE12	NNE15	NNE15	N19	NE18	NNE17	N17	NNE11	NNE8	NE4	NNE3	N7	NNE5.8	N19
24-Mar	N10	NNE8	N6	N9	NNE8	NNE5	NNE6	NNE5	N4	NW5	WNW4	N5	NNE6	NNE7	NNE5	ESE6	SE7	SSE6	SSE7	SSE6	SSE6	SE5	ENE3	SSE3	NE2.6	N10
25-Mar	SSE5	SW2	SSE2	S5	SSW1	NW5	WNW3	NNW5	NNW5	NW7	NW7	NNW9	N7	N11	N13	NNE12	NNE12	NNE15	NNE17	N14	N9	N11	N11	NNE10	N6.5	NNE17
26-Mar	N10	N8	N10	N5	NNE7	N6	NNE7	NNE6	NNE5	N5	WNW5	NW7	NW8	NNW8	NNW10	N13	N13	N12	N13	N13	N13	NNE11	NNE8	N5	N8.2	N13
27-Mar	NW6	WNW6	WSW2	WSW3	SW3	SSW3	SSE7	SSE7	SE5	SE6	ESE7	SE6	SE5	SE7	SE8	ESE11	ESE9	SE6	SE5	NNE4	NNE10	NNE9	NE5	NNE7	ESE2.9	ESE11
28-Mar	NNE6	N6	NNE7	NW1	SSE5	SSE6	SSE7	SE5	S4	S7	S8	SSE10	SSE10	SSE11	SSE10	SE9	SE10	SE8	SSE9	SSE9	SSE9	SSE7	SSE7	SSE5	SSE5.7	SSE11
29-Mar	ENE2	NNW4	NNW5	NNW6	WNW6	NW6	WNW4	W3	WNW6	NNW6	N7	N8	N15	N16	NNE14	NNE14	N16	NNE15	NNE12	NNE9	N4	N4	NNE3	NNW4	N7.0	N16
30-Mar	WNW2	S4	S4	SW3	NW4	W2	SSE5	SE5	SSE3	NE2	NNE5	N6	N5	N5	N6	NNE7	ENE6	NE7	NE9	E8	E8	E6	ENE5	NNE6	NE2.8	NE9
31-Mar	NNE5	E4	NE6	NNE7	NNE7	NNE7	N7	N8	NNE9	N9	N11	N11	N12	N14	N12	NNW9	NNW9	NNW8	N6	NNE4	E4	ESE9	ESE9	SE6	NNE6.2	N14
	ENE2.1	ENE1.6	ENE1.8	E1.7	ESE1.8	ESE1.5	ESE1.8	E1.7	E1.2	ESE1.7	E1.4	ENE1.9	ENE2.1	NE3.0	NE3.1	ENE3.3	ENE3.7	NE3.5	NE3.5	ENE3.3	ENE2.7	ENE3.1	ENE3.1	ENE2.5	Diurnal Average	
	NW16	NNW14	NNE14	N15	N15	N15	N15	N13	N17	N13	SE14	SE14	N15	N16	NNE15	N19	NE18	W20	NNE17	N19	SE15	N16	NNE15	NW16	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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 km/h on Mar 9 16:00

Minimum Value: 0 km/h on Mar 6 06:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Buffalo Viewpoint - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	158	21.24	21.24
6 - 11	426	57.26	78.49
12 - 19	159	21.37	99.87
20 - 28	1	0.13	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Buffalo Viewpoint - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	13	15	5	5	2	8	16	30	10	2	4	5	5	8	13	17	158
6 - 11	64	52	14	2	6	37	75	113	18	2	1	1	2	8	11	20	426
12 - 19	62	30	1	0	0	10	23	16	0	0	0	3	6	0	6	2	159
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	139	97	20	7	8	55	114	159	28	4	5	9	14	16	30	39	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Buffalo Viewpoint

Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - March 2023

Direction of Maximum Speed: 261 deg on Mar 2 18:00
Direction of Maximum Daily Speed Average: 355.6 deg on Mar 14

Direction of Minimum Speed: 339 deg on Mar 19 06:00

Direction of Minimum Daily Speed Average: 0.8 deg on Mar 5

Monthly Average Direction: 70.3 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	159	144	166	156	153	158	157	156	146	147	136	137	167	149	148	146	140	135	144	146	140	147	145	149	148.3
2-Mar	150	149	153	148	154	155	154	167	157	152	204	240	243	270	276	264	269	261	272	262	256	267	311	322	226.2
3-Mar	320	331	23	15	21	18	32	16	21	28	17	30	30	32	10	355	8	360	357	16	355	21	16	19	12.1
4-Mar	30	36	23	331	215	191	40	34	34	24	358	324	311	317	326	323	2	12	26	29	359	351	344	23	359.6
5-Mar	15	359	341	330	253	256	279	274	298	303	344	21	23	44	43	120	145	140	157	162	149	142	117	127	61.4
6-Mar	110	51	152	153	165	146	149	169	157	166	153	159	118	148	141	133	121	121	121	135	151	139	144	145	141.7
7-Mar	130	134	140	137	135	131	135	129	141	149	140	145	123	131	148	136	119	116	123	129	132	142	147	147	134.9
8-Mar	149	150	154	141	134	153	158	158	170	171	162	140	112	146	154	119	118	127	123	126	135	156	148	139	142.6
9-Mar	146	153	162	175	169	175	165	151	152	155	182	154	155	147	149	143	137	126	129	131	126	126	133	136	144.8
10-Mar	139	137	140	142	132	137	137	137	137	150	143	136	143	121	122	113	114	114	99	118	125	132	141	140	132.7
11-Mar	131	133	140	148	154	156	155	157	145	120	123	120	111	116	113	89	85	22	12	13	19	11	10	12	72.7
12-Mar	8	359	354	356	357	352	348	348	1	1	360	358	358	357	353	349	354	354	352	356	356	357	0	355	356.1
13-Mar	355	353	351	350	343	347	355	359	355	352	357	358	340	351	358	356	12	13	47	77	34	16	11	6	1.5
14-Mar	3	3	356	3	3	9	359	358	351	350	355	353	352	350	354	350	352	358	353	354	351	349	353	347	355.6
15-Mar	348	348	353	353	334	326	304	331	347	306	294	299	307	293	311	286	295	309	305	345	294	155	173	138	318.7
16-Mar	164	149	146	142	129	148	141	160	168	163	168	158	157	147	155	155	144	138	152	170	161	168	165	172	155.3
17-Mar	160	155	167	163	159	157	158	166	168	154	149	151	156	124	124	259	262	251	217	187	165	155	143	153	164.8
18-Mar	175	200	186	127	133	148	138	128	162	156	125	129	129	130	113	122	124	34	43	43	8	14	17	351	111.7
19-Mar	354	356	11	28	62	339	107	127	147	114	123	127	121	117	116	122	120	127	133	114	119	120	117	122	110.4
20-Mar	113	119	124	118	122	117	104	47	50	75	33	33	7	6	11	16	359	355	2	10	14	11	3	2	32.7
21-Mar	358	349	338	317	331	317	333	309	341	332	308	17	18	14	31	2	125	158	163	163	167	156	156	158	10.2
22-Mar	160	157	160	169	165	163	177	164	166	173	173	173	176	149	158	143	146	155	165	167	151	158	159	152	162.0
23-Mar	184	162	149	144	150	156	169	239	305	356	22	21	25	20	14	6	34	26	11	14	19	39	18	353	27.8
24-Mar	1	12	3	5	19	16	20	19	4	306	293	5	21	27	31	122	128	151	163	165	162	136	61	152	36.7
25-Mar	147	215	162	184	209	322	298	345	345	311	307	346	3	359	356	13	21	27	18	3	356	353	1	13	360.0
26-Mar	8	352	2	355	21	4	15	13	13	0	300	320	309	332	348	349	349	353	354	1	7	12	30	355	355.7
27-Mar	318	282	240	237	234	201	156	148	146	128	117	124	144	128	132	116	114	127	134	26	28	32	43	16	113.6
28-Mar	19	6	13	309	166	149	168	146	191	172	171	149	154	149	156	135	131	128	148	151	161	153	156	167	148.2
29-Mar	67	327	334	328	300	319	295	266	301	345	0	354	6	7	23	26	3	23	30	20	11	354	13	338	0.4
30-Mar	300	173	174	234	315	273	159	132	150	52	19	6	7	3	1	20	60	45	38	84	82	85	76	30	50.1
31-Mar	21	93	39	33	17	16	11	7	13	10	356	355	349	357	356	346	347	346	350	26	99	113	112	126	14.5
Diurnal Average	59.1	70.3	71.7	88.1	104.4	119.7	115.3	98.5	80.0	105.5	94.0	70.4	59.7	50.7	47.7	56.3	62.4	51.6	46.6	62.7	78.4	75.5	75.9	64.8	

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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 92 deg on Mar 25 05:00

Minimum Value: 5 deg on Mar 17 21:00

Percentiles: $P_1 = 7$ $P_{10} = 14$ $Q_1 = 18$ Median = 22 $Q_3 = 28$ $P_{90} = 34$ $P_{99} = 68$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	7	7	13	9	12	16	17	19	21	27	29	33	30	32	31	27	28	25	23	28	24	27	28	26	33
2-Mar	28	28	30	28	30	29	28	27	30	28	41	21	22	19	20	12	15	11	16	19	13	14	20	20	41
3-Mar	21	28	19	20	20	19	20	20	20	20	22	22	21	22	25	20	24	17	22	15	68	19	19	21	68
4-Mar	20	19	25	44	71	47	26	18	18	23	25	23	21	20	22	23	22	18	19	18	27	19	22	17	71
5-Mar	14	12	20	53	31	15	17	25	24	23	41	24	33	26	20	29	28	18	23	14	12	12	14	13	53
6-Mar	17	45	74	9	16	8	13	9	16	23	34	39	23	36	38	27	22	20	18	24	29	28	27	24	74
7-Mar	24	24	28	27	25	24	25	25	31	30	30	32	28	31	31	32	20	21	25	25	24	26	26	28	32
8-Mar	28	27	30	31	21	25	25	24	30	31	33	35	23	38	56	31	19	22	22	25	23	25	25	25	56
9-Mar	25	28	27	22	22	21	14	18	25	29	29	31	37	31	30	28	28	24	25	24	23	23	25	27	37
10-Mar	29	27	26	27	23	27	26	24	25	31	29	28	30	27	40	22	20	20	22	24	28	24	27	27	40
11-Mar	26	20	27	26	24	24	24	22	33	21	66	55	22	23	28	31	30	38	19	18	15	17	16	16	66
12-Mar	16	17	17	18	19	20	21	20	18	18	18	19	18	18	19	20	20	19	18	18	17	17	17	19	21
13-Mar	16	18	17	17	15	17	19	19	18	22	20	18	25	24	19	19	23	33	29	35	28	19	19	21	35
14-Mar	17	18	19	18	18	17	19	20	18	19	18	19	19	19	20	19	20	19	20	20	17	16	18	21	21
15-Mar	19	16	14	11	12	17	18	28	51	31	29	23	25	22	38	24	17	15	14	21	18	82	35	38	82
16-Mar	21	20	25	25	22	32	37	29	34	27	32	36	34	29	31	28	24	21	21	21	23	22	25	25	37
17-Mar	26	23	21	20	25	23	20	18	21	25	27	27	25	17	15	64	18	15	10	18	5	9	11	8	64
18-Mar	32	30	69	28	6	11	18	12	21	33	21	25	22	29	54	25	16	32	17	14	8	6	8	16	69
19-Mar	13	11	9	16	21	82	47	18	45	18	24	23	22	18	18	22	19	22	27	20	21	22	19	24	82
20-Mar	20	22	23	21	21	21	34	22	20	29	25	35	21	21	21	22	20	21	19	17	17	17	22	12	35
21-Mar	16	18	28	12	16	9	36	26	24	47	56	18	19	16	41	48	56	26	24	22	19	18	19	24	56
22-Mar	25	26	27	28	27	30	22	27	30	29	30	31	34	35	37	29	32	26	21	20	18	17	19	20	37
23-Mar	52	44	8	6	9	17	23	44	38	18	21	22	23	21	23	21	23	20	19	18	13	21	23	17	52
24-Mar	14	16	14	17	13	14	14	14	21	22	50	45	22	23	55	46	25	28	23	22	16	34	49	37	55
25-Mar	33	35	68	14	92	32	28	14	26	22	27	25	25	21	19	24	21	20	19	16	17	18	15	16	92
26-Mar	15	18	13	16	18	17	6	10	17	30	39	25	28	32	26	20	19	18	19	14	15	13	12	27	39
27-Mar	21	9	47	27	18	27	7	10	18	29	28	43	54	42	39	23	21	20	15	73	13	13	30	9	73
28-Mar	8	15	16	63	29	13	17	22	26	27	31	33	34	29	33	33	26	22	26	27	27	22	24	15	63
29-Mar	50	27	19	22	13	17	26	50	21	33	18	27	21	22	23	21	20	25	20	19	20	13	11	24	50
30-Mar	45	26	21	38	30	49	9	11	32	79	31	20	36	31	24	29	30	23	17	20	10	13	16	15	79
31-Mar	11	45	34	17	11	9	11	16	17	19	18	22	23	19	23	25	21	16	18	16	21	20	20	25	45
Diurnal Maximum	52	45	74	63	92	82	47	50	51	79	66	55	54	42	56	64	56	38	29	73	68	82	49	38	

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS05
MANNIX
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	705	35	39	99.46	50.9	0	9.7	0
H2S (ppb) Average	704	36	40	99.46	6	0	1.5	0
THC (ppm) Average	696	35	48	98.25	6	-	3	-
NMHC(ppm) Average	696	35	48	98.25	0.987	-	0.155	-
CH4(ppm) Average	696	35	48	98.25	5.5	-	2.8	-
Temperature 2 m (C) Average	743	0	1	99.87	8.8	-	0.2	-
Temperature 20 m (C) Average	743	0	1	99.87	9.5	-	1.9	-
Temperature 45 m (C) Average	743	0	1	99.87	9.3	-	2.5	-
Temperature 75 m (C) Average	743	0	1	99.87	9.2	-	2.9	-
Temperature 90 m (C) Average	743	0	1	99.87	9.1	-	2.9	-
Relative Humidity 2 m (%) Average	743	0	1	99.87	90	-	86	-
Relative Humidity 20 m (%) Average	743	0	1	99.87	92	-	87	-
Relative Humidity 45 m (%) Average	743	0	1	99.87	91	-	87	-
Relative Humidity 75 m (%) Average	743	0	1	99.87	92	-	88	-
Relative Humidity 90 m (%) Average	743	0	1	99.87	95	-	90	-
Wind Speed 20 m (km/h) Average	743	0	1	99.87	29	-	18	-
Wind Speed 45 m (km/h) Average	743	0	1	99.87	38	-	22	-
Wind Speed 75 m (km/h) Average	743	0	1	99.87	40	-	25	-
Wind Speed 90 m (km/h) Average	743	0	1	99.87	40	-	26	-
Wind Direction 20 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 45 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 75 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 90 m (deg) Average	743	0	1	99.87	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	743	0	1	99.87	1.4	-	0.8	-
Vertical Wind Speed 45 m (km/h) Average	743	0	1	99.87	2.1	-	0.7	-
Vertical Wind Speed 75 m (km/h) Average	743	0	1	99.87	2.4	-	0.7	-
Vertical Wind Speed 90 m (km/h) Average	743	0	1	99.87	2.5	-	0.7	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	705	2.41	4.6	-	0	0.1	0.2	0.6	2.1	7.4	50.9
H2S (ppb) Average	704	0.46	0.7	-	0	0.1	0.1	0.2	0.5	1	6.2
THC (ppm) Average	696	2.18	0.4	-	2	2	2	2.1	2.2	2.4	6
NMHC(ppm) Average	696	0.046	0.102	-	0	0	0	0	0	0.1	0.987
CH4(ppm) Average	696	2.14	0.3	-	2	2	2	2.1	2.1	2.3	5.5
Temperature 2 m (C) Average	743	-9.21	6.4	-	-27.1	-17.4	-13.2	-9.1	-4.8	-1.1	8.8
Temperature 20 m (C) Average	743	-9.1	6.4	-	-25.7	-17.2	-13.3	-9.3	-4.5	-1.3	9.5
Temperature 45 m (C) Average	743	-9.1	6.3	-	-24.2	-17.2	-13.4	-9.4	-4.6	-1.3	9.3
Temperature 75 m (C) Average	743	-9.09	6.3	-	-22.6	-17.1	-13.6	-9.3	-4.7	-1.2	9.2
Temperature 90 m (C) Average	743	-9.13	6.3	-	-22.6	-17.2	-13.6	-9.2	-4.8	-1.2	9.1
Relative Humidity 2 m (%) Average	743	66.8	13	-	32	47	57	68	78	83	90
Relative Humidity 20 m (%) Average	743	65.5	15	-	26	43	56	67	77	83	92
Relative Humidity 45 m (%) Average	743	65.1	15	-	24	42	56	67	77	83	91
Relative Humidity 75 m (%) Average	743	65.5	15	-	24	42	55	67	78	84	92
Relative Humidity 90 m (%) Average	743	65.9	16	-	24	42	56	68	78	85	95
Wind Speed 20 m (km/h) Average	743	11.1	5	-	0	4	7	11	15	18	29
Wind Speed 45 m (km/h) Average	743	14.5	6	-	0	6	10	14	19	23	38
Wind Speed 75 m (km/h) Average	743	15.7	7	-	1	6	10	15	21	26	40
Wind Speed 90 m (km/h) Average	743	16.6	8	-	1	6	11	16	22	27	40
Wind Direction 20 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	743	0.19	0.5	-	-1.4	-0.5	-0.2	0.2	0.6	0.8	1.4
Vertical Wind Speed 45 m (km/h) Average	743	0.15	0.5	-	-0.9	-0.4	-0.2	0.1	0.5	0.7	2.1
Vertical Wind Speed 75 m (km/h) Average	743	0.13	0.4	-	-0.8	-0.4	-0.1	0.1	0.3	0.6	2.4
Vertical Wind Speed 90 m (km/h) Average	743	0.24	0.5	-	-1.5	-0.4	-0.1	0.2	0.5	0.9	2.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	04 Mar 2023 10:00	04 Mar 2023 10:00	4	Maintenance - replaced sample manifold part
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
SO2,THC/NMHC/CH4	10 Mar 2023 11:00	10 Mar 2023 11:00	1	Maintenance - zero air generator replaced
SO2,THC/NMHC/CH4	12 Mar 2023 09:00	12 Mar 2023 09:00	1	Maintenance - verify daily QA response
H2S	10 Mar 2023 12:00	10 Mar 2023 13:00	2	Maintenance - zero air generator replaced
THC/NMHC/CH4	10 Mar 2023 05:00	10 Mar 2023 10:00	6	Unstable Operation - flatline in analyzer output signal
THC/NMHC/CH4	16 Mar 2023 10:00	16 Mar 2023 12:00	3	Maintenance - replaced support gas cylinder

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 50.9 ppb on Mar 24 14:00

Maximum Daily Average: 9.7 ppb on Mar 24

Minimum Value: 0.0 ppb on Mar 8 20:00

Maximum Diurnal Average: 4.1 ppb at hour 12

Monthly Average: 2.41 ppb

Minimum Daily Average: 0.1 ppb on Mar 8

Minimum Diurnal Average: 1.5 ppb at hour 6

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.2 Median = 0.6 Q_3 = 2.1 P_{90} = 7.4 P_{99} = 21.3

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	35
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	4.0	2.1	Z	0.8	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.8	1.1	1.0	1.1	1.0	1.1	1.0	0.9	0.9	0.8	0.8	0.9	0.7	0.9	4.0
2-Mar	0.6	0.5	Z	0.5	0.5	0.6	0.7	0.7	0.8	0.8	C	C	C	C	C	0.6	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.4	0.8
3-Mar	5.4	0.8	0.3	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.3	4.0	4.6	7.4	6.3	4.9	1.4	0.8	3.1	0.3	0.7	0.5	0.5	0.2	1.8	7.4
4-Mar	0.2	0.2	0.1	1.4	Z	0.3	0.2	0.1	0.4	M	3.5	0.8	2.1	2.8	0.3	1.5	0.5	0.6	0.2	0.1	1.7	5.1	3.0	4.2	1.3	5.1
5-Mar	1.5	0.5	5.5	9.3	1.2	0.5	0.5	Z	0.4	0.7	0.5	0.8	5.1	9.6	13.0	6.6	3.5	4.5	3.7	4.9	3.3	3.0	2.9	DF	3.7	13.0
6-Mar	2.3	2.0	1.3	1.2	0.9	0.8	0.9	0.7	0.8	0.6	0.6	0.9	1.1	1.7	1.4	Z	0.8	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.9	2.3
7-Mar	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.5
8-Mar	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
9-Mar	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.4	0.9	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9
10-Mar	0.1	0.1	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.1	M	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	0.3
11-Mar	0.1	0.2	0.2	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.9	1.4	0.6	0.9	0.3	0.3	1.4
12-Mar	0.3	8.9	13.8	10.2	14.5	9.6	8.0	3.1	M	7.2	9.5	6.6	1.7	1.3	1.8	3.8	3.2	2.5	8.5	12.8	8.0	24.4	12.0	9.8	7.9	24.4
13-Mar	Z	18.2	14.0	19.3	9.9	11.2	26.3	22.9	16.8	2.8	3.0	2.3	1.2	5.4	7.6	8.4	1.0	0.6	0.4	0.4	0.4	0.3	0.3	0.5	7.5	26.3
14-Mar	1.8	Z	12.3	10.0	13.6	10.5	10.5	8.6	3.4	4.8	7.6	13.0	10.7	4.0	0.7	0.6	0.4	0.3	2.2	5.5	9.7	4.9	2.0	0.9	6.0	13.6
15-Mar	2.1	0.5	Z	1.9	2.5	0.4	0.7	0.4	4.2	3.3	2.4	1.7	7.1	7.2	8.7	9.2	1.2	1.3	0.4	0.5	0.3	0.4	0.5	0.9	2.5	9.2
16-Mar	1.2	0.4	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.2	1.4	1.1	0.9	0.6	0.4	0.4	0.4	0.4	0.3	0.5	1.4
17-Mar	0.3	0.2	0.2	0.1	Z	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.0	0.9	0.8	0.7	0.5	0.3	0.4	0.3	0.3	0.5	1.0
18-Mar	0.2	0.2	0.3	0.4	0.5	Z	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	3.0	3.2	9.4	15.7	3.5	0.7	0.6	0.5	0.5	4.1	2.1	15.7
19-Mar	Z	16.5	17.1	10.3	2.1	1.1	0.8	0.7	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	2.4	17.1
20-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.3	5.0	1.5	4.4	4.9	2.8	2.2	5.8	9.3	18.9	8.8	6.8	16.7	3.8	18.9
21-Mar	23.9	1.2	Z	4.7	0.5	2.5	4.1	0.6	3.4	12.2	5.4	33.1	9.7	9.2	12.8	12.4	5.3	1.7	1.6	1.1	0.6	0.4	0.3	0.3	6.4	33.1
22-Mar	0.3	0.4	0.3	Z	0.4	0.3	0.3	0.3	0.4	0.6	0.9	1.1	1.3	1.2	1.2	1.3	1.2	1.0	0.8	0.6	0.6	0.5	0.4	0.4	0.7	1.3
23-Mar	0.4	0.4	0.2	0.2	Z	0.3	0.2	0.4	0.7	3.1	1.4	1.5	3.4	1.6	0.6	0.2	0.2	0.1	0.1	0.2	0.2	0.2	3.3	5.9	1.1	5.9
24-Mar	3.6	3.4	7.4	1.5	0.2	0.1	Z	0.2	2.0	3.5	3.4	7.0	30.7	50.9	17.1	13.5	12.3	15.5	21.4	9.9	7.5	5.4	4.0	3.2	9.7	50.9
25-Mar	Z	1.8	1.2	0.7	0.6	0.7	0.8	5.0	15.9	4.6	2.4	2.1	5.6	2.9	1.2	1.3	0.4	0.5	0.5	1.6	1.8	2.3	6.9	9.3	3.0	15.9
26-Mar	6.7	3.2	Z	7.1	0.5	0.5	0.5	0.6	0.7	0.9	5.6	13.2	9.4	1.3	1.9	5.9	4.7	1.3	0.5	1.7	10.0	1.6	0.4	0.2	3.4	13.2
27-Mar	1.9	0.3	Z	0.3	0.2	0.4	0.6	0.4	0.4	0.7	2.9	12.4	6.8	4.7	4.1	3.0	2.0	1.7	1.3	1.9	1.2	0.5	0.7	0.3	2.1	12.4
28-Mar	0.3	0.3	4.0	Z	0.7	0.5	0.7	0.5	0.3	0.3	8.4	3.2	1.0	0.8	0.9	0.9	0.8	0.7	0.6	0.6	1.2	1.3	1.2	1.3	1.3	8.4
29-Mar	1.1	0.8	2.2	1.7	Z	0.8	0.6	0.4	0.6	2.6	6.6	5.0	2.6	1.5	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.7	1.7	1.3	6.6
30-Mar	1.3	0.3	0.1	0.1	0.1	Z	0.4	0.2	0.3	0.5	0.9	6.4	1.3	0.7	0.4	1.0	1.1	1.2	1.2	1.0	0.6	0.4	0.4	0.3	0.9	6.4
31-Mar	Z	0.3	0.3	0.2	0.2	0.2	0.1	0.2	3.2	4.6	1.6	3.8	0.9	0.7	0.7	0.4	0.4	0.3	0.3	0.4	0.1	0.1	0.0	0.0	0.8	4.6
	2.3	2.3	3.4	3.2	1.9	1.5	2.0	1.6	1.9	1.9	2.5	4.1	3.9	4.1	3.1	3.0	1.8	1.8	1.9	1.8	2.3	2.1	1.6	2.1	Diurnal Average	
	23.9	18.2	17.1	19.3	14.5	11.2	26.3	22.9	16.8	12.2	9.5	33.1	30.7	50.9	17.1	13.5	12.3	15.7	21.4	12.8	18.9	24.4	12.0	16.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mannix - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	668	94.75	94.75
11 - 20	29	4.11	98.87
21 - 60	8	1.13	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mannix - March 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	85	71	12	10	14	24	182	120	19	7	2	3	24	23	41	31	668
11 - 20	10	0	0	0	0	2	0	4	1	1	0	0	1	0	1	9	29
21 - 60	2	0	0	0	0	0	0	1	0	0	0	0	1	1	1	2	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	97	71	12	10	14	26	182	125	20	8	2	3	26	24	43	42	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Mannix

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 6.2 ppb on Mar 19 03:00

Maximum Daily Average: 1.5 ppb on Mar 13

Minimum Value: 0.0 ppb on Mar 28 17:00

Maximum Diurnal Average: 0.9 ppb at hour 4

Monthly Average: 0.46 ppb

Minimum Daily Average: 0.1 ppb on Mar 9

Minimum Diurnal Average: 0.2 ppb at hour 17

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.1 Median = 0.2 Q_3 = 0.5 P_{90} = 1.0 P_{99} = 4.2

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	36
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.8	0.8	0.5	Z	0.4	0.5	0.2	0.1	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	0.1	0.1	0.2	0.2	0.8
2-Mar	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3
3-Mar	0.3	0.3	0.2	0.2	Z	0.3	0.3	0.5	0.5	0.2	0.3	0.4	0.2	0.3	0.5	0.6	0.3	0.3	0.9	0.2	0.6	0.4	0.4	0.3	0.4	0.9
4-Mar	0.3	0.6	0.3	0.4	0.5	Z	0.3	0.4	0.3	M	0.6	0.2	0.2	0.1	0.1	0.3	0.1	0.1	0.3	0.2	0.2	0.9	0.6	0.2	0.3	0.9
5-Mar	0.2	0.1	Z	0.7	0.3	0.4	0.6	0.3	0.3	0.4	0.3	0.1	0.3	0.4	0.5	0.4	0.3	0.4	0.7	0.6	0.4	0.5	0.4	DF	0.4	0.7
6-Mar	0.4	0.4	0.5	0.4	0.5	0.7	0.9	0.8	0.6	0.3	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.9
7-Mar	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	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
8-Mar	0.1	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.3
9-Mar	0.0	0.0	0.1	Z	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.2
10-Mar	0.0	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.0	M	M	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.3	0.3	0.2	0.1	0.3
11-Mar	0.2	0.3	0.3	0.4	0.3	Z	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.4
12-Mar	Z	0.7	1.0	1.5	0.7	0.4	0.4	0.3	0.3	0.5	1.1	0.8	0.2	0.1	0.2	0.6	0.5	0.4	1.7	1.5	0.7	2.2	1.1	2.4	0.8	2.4
13-Mar	4.2	3.6	2.8	3.7	1.8	2.4	4.7	4.2	3.0	0.5	0.5	Z	0.2	0.7	0.8	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.1	0.1	1.5	4.7
14-Mar	0.1	0.3	Z	1.3	0.6	0.4	0.6	0.9	0.7	1.7	1.6	1.1	2.7	0.8	0.1	0.2	0.2	0.2	1.1	1.6	0.5	0.3	0.2	0.1	0.7	2.7
15-Mar	0.6	0.2	0.4	Z	1.1	0.8	0.6	0.6	1.6	C	C	C	C	C	0.3	0.3	0.3	0.4	0.7	1.0	1.0	0.8	0.8	0.7	0.7	1.6
16-Mar	0.9	0.3	0.2	0.2	Z	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	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.9
17-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.4	0.2	0.4	0.2	0.3	0.2	0.6
18-Mar	Z	0.1	0.2	0.2	0.4	0.5	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.6	0.7	0.3	1.1	0.7	0.3	1.6	0.4	1.6
19-Mar	4.8	Z	6.2	5.3	3.1	1.7	1.3	0.9	0.5	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.3	1.2	6.2
20-Mar	0.2	0.1	Z	0.1	0.1	0.2	0.4	0.5	0.7	0.4	0.3	0.1	0.5	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.9	0.5	0.7	2.5	0.4	2.5
21-Mar	1.7	0.0	1.6	Z	0.4	0.8	1.5	0.8	1.4	2.6	0.7	0.7	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.3	0.3	0.3	0.1	0.2	0.7	2.6
22-Mar	0.2	0.3	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.3	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	0.2	0.3
23-Mar	0.1	0.1	0.3	0.3	0.3	Z	0.3	0.5	0.6	0.8	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.7	0.6	0.3	0.8
24-Mar	0.5	Z	1.4	0.5	0.2	0.2	0.3	0.2	0.3	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.5	0.3	0.3	0.3	0.5	0.4	0.4	1.4
25-Mar	0.4	Z	0.5	0.5	0.9	1.4	1.1	3.1	5.8	1.7	0.9	0.5	0.4	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.5	0.5	1.5	1.4	1.0	5.8
26-Mar	1.1	1.0	0.2	1.9	Z	0.9	1.8	1.0	0.4	0.4	0.7	0.9	0.6	0.2	0.2	0.2	0.4	0.1	0.2	1.0	4.5	2.1	0.2	0.2	0.9	4.5
27-Mar	1.0	0.3	0.4	Z	0.5	0.6	0.8	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.9	0.5	0.4	1.0
28-Mar	0.9	1.3	3.0	1.7	Z	0.9	1.1	0.7	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	0.4	3.0
29-Mar	0.1	0.2	1.3	1.2	1.3	Z	0.9	0.7	0.7	1.5	1.4	0.8	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.4	1.0	0.6	1.5
30-Mar	Z	0.5	0.4	0.4	0.5	1.7	0.8	0.6	0.6	0.6	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.3	0.2	0.4	1.7
31-Mar	0.2	Z	0.4	0.2	0.3	0.3	0.3	0.8	2.9	2.1	0.4	1.0	0.2	0.2	0.2	0.2	0.2	0.3	0.7	0.8	0.2	0.1	0.1	0.1	0.5	2.9
	0.7	0.5	0.8	0.9	0.6	0.6	0.7	0.7	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.5	Diurnal Average	
	4.8	3.6	6.2	5.3	3.1	2.4	4.7	4.2	5.8	2.6	1.6	1.1	2.7	0.8	0.8	0.6	0.5	0.6	1.7	1.6	4.5	2.2	1.5	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mannix - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	686	97.44	97.44
3 - 4	12	1.70	99.15
5 - 7	6	0.85	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mannix - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	88	69	12	10	14	27	182	125	18	8	4	3	24	24	41	37	686
3 - 4	2	1	0	0	0	0	1	0	0	0	0	0	0	0	1	7	12
5 - 7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	93	71	12	10	14	27	183	125	18	8	4	3	24	24	42	46	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Mannix

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - March 2023

Maximum Value: 6.0 ppm on Mar 29 03:00

Maximum Daily Average: 3.0 ppm on Mar 15

Minimum Value: 2.0 ppm on Mar 2 19:00

Minimum Daily Average: 2.0 ppm on Mar 7

Maximum Diurnal Average: 2.3 ppm at hour 6

Minimum Diurnal Average: 2.1 ppm at hour 15

Monthly Average: 2.18 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.2 P_{90} = 2.4 P_{99} = 3.9

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	35
Percent Operational Time:	98.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2
2-Mar	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	2.3
3-Mar	2.3	2.2	2.2	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.3
4-Mar	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	M	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.6	2.1	2.1	2.6
5-Mar	2.1	2.1	2.1	2.1	2.4	2.1	2.1	Z	2.0	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	DF	2.1	2.4
6-Mar	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	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
7-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	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
8-Mar	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.2
9-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.2
10-Mar	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	M	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.1	2.0	--	2.3
11-Mar	2.0	2.1	2.1	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.2
12-Mar	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	M	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
13-Mar	Z	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.6	2.7	2.5	2.7	2.6	2.1	2.0	2.1	2.1	2.0	2.2	2.1	2.1	2.1	2.1	2.3	2.7
14-Mar	2.0	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.4	2.6	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.2	2.6
15-Mar	2.4	2.5	Z	2.6	3.0	5.0	3.1	3.7	3.9	2.8	2.5	2.3	2.2	2.3	2.3	2.3	2.2	2.4	2.5	5.8	3.9	2.8	2.8	2.6	3.0	5.8
16-Mar	2.5	2.1	2.1	Z	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	2.1	2.5
17-Mar	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	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
18-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.0	2.1	2.0	2.0	2.2	2.2	2.1	2.2	2.1	2.9	2.1	2.9
19-Mar	Z	3.4	2.8	3.5	3.1	2.7	2.4	2.4	2.2	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.3	3.5
20-Mar	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	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	2.3
21-Mar	2.1	2.0	Z	2.9	3.8	2.6	2.6	2.7	2.9	2.6	2.8	2.4	2.3	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.4	3.8
22-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
23-Mar	2.1	2.1	2.2	2.1	Z	2.1	2.1	2.2	2.4	2.6	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	2.3	2.1	2.6
24-Mar	2.1	2.1	2.1	2.1	2.0	2.0	Z	2.2	2.1	2.2	2.2	2.1	2.3	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.3
25-Mar	Z	2.1	2.1	2.1	2.2	2.3	2.2	3.2	3.3	4.4	3.2	2.6	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.4	4.4
26-Mar	2.2	2.1	Z	2.1	2.2	2.2	2.4	2.4	2.1	2.1	2.4	2.3	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.4	2.2	2.0	2.1	2.2	2.4
27-Mar	2.2	2.1	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.1	2.4
28-Mar	2.7	2.6	2.5	Z	2.2	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.7
29-Mar	2.0	2.2	6.0	4.8	Z	4.2	3.2	2.4	3.0	2.9	2.5	2.3	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.9	2.7	6.0
30-Mar	3.1	2.5	2.3	2.1	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.4	2.2	2.2	3.1
31-Mar	Z	2.1	2.3	2.2	2.2	2.2	2.2	2.5	2.5	2.3	2.1	2.2	2.4	2.4	2.4	2.3	2.8	3.2	3.5	3.1	2.2	2.0	2.0	2.0	2.4	3.5
	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	Diurnal Average	
	3.1	3.4	6.0	4.8	3.8	5.0	3.2	3.7	3.9	4.4	3.2	2.6	2.7	2.6	2.4	2.4	2.8	3.2	3.5	5.8	3.9	2.8	2.8	2.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mannix - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	279	40.09	40.09
2.1 - 3.0	395	56.75	96.84
3.1 - 10.0	22	3.16	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mannix - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	38	9	0	0	8	5	117	77	12	3	0	2	5	2	0	1	279
2.1 - 3.0	56	61	12	9	6	21	58	45	8	5	2	1	19	19	35	38	395
3.1 - 10.0	3	1	0	1	0	0	1	0	0	0	0	0	2	3	8	3	22
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	97	71	12	10	14	26	176	122	20	8	2	3	26	24	43	42	696

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Mannix

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 696

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mannix - March 2023

Maximum Value: 0.987 ppm on Mar 19 04:00

Maximum Daily Average: 0.155 ppm on Mar 29

Minimum Value: 0.000 ppm on Mar 1 01:00

Minimum Daily Average: 0.001 ppm on Mar 9

Maximum Diurnal Average: 0.076 ppm at hour 9

Minimum Diurnal Average: 0.021 ppm at hour 15

Monthly Average: 0.046 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.1 P_{99} = 0.5

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	35
Percent Operational Time:	98.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.018	0.034	0.027	0.007	0.000	0.004	0.034
2-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.001	0.018
3-Mar	0.075	0.050	0.089	Z	0.086	0.095	0.126	0.073	0.052	0.100	0.024	0.007	0.012	0.011	0.010	0.030	0.032	0.031	0.037	0.059	0.011	0.089	0.166	0.163	0.062	0.166
4-Mar	0.133	0.080	0.042	0.015	Z	0.008	0.065	0.135	0.129	M	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.004	0.084	0.128	0.087	0.027	0.050	0.024	0.046	0.135
5-Mar	0.118	0.060	0.005	0.002	0.029	0.000	0.001	Z	0.000	0.060	0.058	0.000	0.006	0.000	0.001	0.021	0.035	0.000	0.000	0.000	0.000	0.000	0.000	DF	0.018	0.118
6-Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.008	Z	0.000	0.045	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.045
7-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014
8-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.040	0.004	0.021	0.043	0.000	0.000	0.000	0.000	0.000	0.006	0.043
9-Mar	0.000	0.000	Z	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	0.013	0.000	0.002	0.001	0.000	0.000	0.000	0.001	0.013
10-Mar	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	M	0.000	0.000	0.000	0.000	0.004	0.032	0.007	0.011	0.131	0.083	0.047	0.004	0.000	--	0.131
11-Mar	0.000	0.000	0.000	0.010	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.024	0.000	0.002	0.000	0.016	0.044	0.000	0.037	0.054	0.002	0.005	0.009	0.054
12-Mar	0.015	0.001	0.000	0.000	0.001	0.003	0.022	0.025	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.006	0.004	0.025
13-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.003	0.033	0.080	0.045	0.051	0.067	0.002	0.000	0.029	0.007	0.003	0.019	0.023	0.079	0.060	0.050	0.025	0.080
14-Mar	0.000	Z	0.000	0.000	0.003	0.011	0.002	0.006	0.000	0.000	0.007	0.026	0.000	0.000	0.000	0.014	0.069	0.041	0.000	0.004	0.000	0.000	0.000	0.000	0.008	0.069
15-Mar	0.002	0.056	Z	0.090	0.106	0.233	0.096	0.176	0.208	0.141	0.062	0.020	0.058	0.137	0.101	0.116	0.035	0.182	0.168	0.414	0.313	0.246	0.271	0.243	0.151	0.414
16-Mar	0.104	0.000	0.000	Z	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	0.020	0.000	0.000	0.000	0.000	0.000	0.006	0.104
17-Mar	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	0.009	0.000	0.002	0.161	0.025	0.000	0.000	0.000	0.000	0.000	0.009	0.161
18-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.009	0.000	0.000	0.000	0.007	0.040	0.343	0.005	0.052	0.005	0.005	0.157	0.188	0.061	0.086	0.027	0.167	0.050	0.343
19-Mar	Z	0.787	0.238	0.987	0.673	0.300	0.177	0.147	0.066	0.000	0.001	0.010	0.003	0.002	0.000	0.002	0.000	0.000	0.000	0.006	0.030	0.000	0.012	0.056	0.152	0.987
20-Mar	0.002	Z	0.000	0.000	0.000	0.002	0.025	0.089	0.268	0.112	0.003	0.000	0.038	0.012	0.001	0.005	0.006	0.005	0.004	0.024	0.010	0.002	0.008	0.000	0.027	0.268
21-Mar	0.006	0.001	Z	0.093	0.182	0.136	0.191	0.167	0.216	0.262	0.285	0.127	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.285
22-Mar	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	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.030
23-Mar	0.010	0.013	0.038	0.000	Z	0.000	0.000	0.071	0.163	0.159	0.036	0.027	0.044	0.043	0.048	0.117	0.136	0.070	0.135	0.091	0.096	0.005	0.000	0.056	0.059	0.163
24-Mar	0.000	0.000	0.002	0.052	0.000	0.022	Z	0.175	0.078	0.019	0.106	0.069	0.109	0.020	0.011	0.002	0.000	0.002	0.042	0.000	0.000	0.001	0.000	0.000	0.031	0.175
25-Mar	Z	0.000	0.000	0.000	0.063	0.140	0.052	0.239	0.376	0.787	0.533	0.258	0.018	0.005	0.013	0.060	0.099	0.117	0.082	0.003	0.049	0.014	0.000	0.000	0.126	0.787
26-Mar	0.140	0.079	Z	0.007	0.110	0.139	0.257	0.302	0.037	0.005	0.124	0.163	0.143	0.115	0.024	0.002	0.013	0.019	0.002	0.013	0.110	0.057	0.004	0.036	0.083	0.302
27-Mar	0.040	0.011	Z	0.040	0.021	0.049	0.041	0.065	0.009	0.066	0.049	0.038	0.000	0.006	0.001	0.000	0.002	0.001	0.000	0.006	0.041	0.142	0.325	0.204	0.050	0.325
28-Mar	0.526	0.473	0.296	Z	0.013	0.102	0.120	0.009	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	0.067	0.526
29-Mar	0.000	0.011	0.497	0.490	Z	0.800	0.445	0.073	0.257	0.241	0.117	0.069	0.022	0.037	0.047	0.066	0.068	0.036	0.050	0.015	0.019	0.000	0.006	0.205	0.155	0.800
30-Mar	0.228	0.106	0.034	0.000	0.068	Z	0.015	0.079	0.108	0.057	0.027	0.016	0.056	0.027	0.071	0.002	0.002	0.102	0.054	0.000	0.000	0.002	0.090	0.003	0.050	0.228
31-Mar	Z	0.000	0.036	0.000	0.000	0.038	0.047	0.256	0.233	0.075	0.022	0.007	0.124	0.222	0.264	0.155	0.115	0.142	0.224	0.188	0.081	0.000	0.003	0.000	0.097	0.264
	0.054	0.062	0.053	0.069	0.054	0.074	0.058	0.073	0.076	0.076	0.055	0.032	0.027	0.037	0.021	0.023	0.022	0.033	0.038	0.042	0.035	0.028	0.033	0.041	Diurnal Average	
	0.526	0.787	0.497	0.987	0.673	0.800	0.445	0.302	0.376	0.787	0.533	0.258	0.143	0.343	0.264	0.155	0.136	0.182	0.224	0.414	0.313	0.246	0.325	0.243	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Mannix - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	384	55.17	55.17
0.006 - 0.05	150	21.55	76.72
0.06 - 0.1	101	14.51	91.24
> 0.1	61	8.76	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Mannix - March 2023

Concentration Ranges (ppm)	**Wind Direction**																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	45	0	1	2	8	14	142	104	17	2	1	2	9	3	12	22	384
0.006 - 0.05	34	28	0	5	5	7	24	14	1	4	0	0	2	9	10	7	150
0.06 - 0.1	11	33	6	1	1	5	6	3	2	1	0	1	11	5	9	6	101
> 0.1	7	10	5	2	0	0	4	1	0	1	1	0	4	7	12	7	61
Totals	97	71	12	10	14	26	176	122	20	8	2	3	26	24	43	42	696

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Mannix

Total Number of Valid Hours: 696

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 5.5 ppm on Mar 29 03:00

Maximum Daily Average: 2.8 ppm on Mar 15

Minimum Value: 2.0 ppm on Mar 2 19:00

Minimum Daily Average: 2.0 ppm on Mar 7

Maximum Diurnal Average: 2.3 ppm at hour 6

Minimum Diurnal Average: 2.1 ppm at hour 16

Monthly Average: 2.14 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.1 P_{90} = 2.3 P_{99} = 3.6

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	35
Percent Operational Time:	98.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
2-Mar	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2
3-Mar	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.2
4-Mar	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.0	2.0	M	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.6	2.0	2.1	2.6
5-Mar	2.0	2.0	2.1	2.1	2.4	2.1	2.1	Z	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	DF	2.1	2.4
6-Mar	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	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
7-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	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
8-Mar	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.2
9-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.2
10-Mar	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	M	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	--	2.2
11-Mar	2.0	2.1	2.1	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	2.0	2.0	2.0	2.2
12-Mar	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	M	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
13-Mar	Z	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.6	2.6	2.5	2.6	2.5	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.3	2.6
14-Mar	2.0	Z	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.4	2.6	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.2	2.6
15-Mar	2.4	2.5	Z	2.5	2.9	4.8	3.0	3.5	3.7	2.6	2.4	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	5.3	3.6	2.6	2.6	2.4	2.8	5.3
16-Mar	2.4	2.1	2.1	Z	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	2.4
17-Mar	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
18-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.7	2.1	2.7
19-Mar	Z	2.6	2.6	2.5	2.5	2.4	2.2	2.2	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.2	2.6
20-Mar	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
21-Mar	2.1	2.0	Z	2.9	3.6	2.4	2.4	2.5	2.6	2.3	2.5	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.3	3.6
22-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
23-Mar	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	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	2.1	2.2	2.1	2.4
24-Mar	2.1	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2
25-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.9	2.9	3.6	2.7	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	3.6
26-Mar	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.0	2.0	2.1	2.3
27-Mar	2.2	2.1	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
28-Mar	2.1	2.1	2.2	Z	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
29-Mar	2.0	2.1	5.5	4.3	Z	3.4	2.8	2.3	2.8	2.7	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.7	2.5	5.5
30-Mar	2.9	2.4	2.2	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.3	2.2	2.2	2.9
31-Mar	Z	2.1	2.3	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.7	3.1	3.3	2.9	2.1	2.0	2.0	2.0	2.3	3.3
	2.1	2.1	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	Diurnal Average	
	2.9	2.6	5.5	4.3	3.6	4.8	3.0	3.5	3.7	3.6	2.7	2.5	2.6	2.5	2.2	2.4	2.7	3.1	3.3	5.3	3.6	2.6	2.6	2.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Mannix - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	341	48.99	48.99
2.1 - 3.0	343	49.28	98.28
3.1 - 10.0	12	1.72	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Mannix - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	45	50	4	3	8	7	119	78	12	4	0	2	5	2	1	1	341
2.1 - 3.0	52	21	8	7	6	19	57	44	8	4	2	1	20	19	36	39	343
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	6	2	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	97	71	12	10	14	26	176	122	20	8	2	3	26	24	43	42	696

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Mannix

Total Number of Valid Hours: 696

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2 m (AT2m) - C

Mannix - March 2023

Maximum Value: 8.8 C on Mar 18 17:00

Maximum Daily Average: 0.2 C on Mar 18

Minimum Value: -27.1 C on Mar 6 07:00

Minimum Daily Average: -20.2 C on Mar 5

Maximum Diurnal Average: -4.3 C at hour 16

Minimum Diurnal Average: -14.1 C at hour 7

Monthly Average: -9.21 C

Percentiles: P_1 = -24.9 P_{10} = -17.4 Q_1 = -13.2 Median = -9.1 Q_3 = -4.8 P_{90} = -1.1 P_{99} = 6.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-22.3	-23.0	-23.3	-22.1	-21.7	-22.2	-21.0	-20.0	-18.9	-16.8	-14.6	-11.7	-9.6	-8.8	-7.7	-7.5	-8.2	-8.7	-8.8	-8.7	-8.4	-8.3	-8.0	-8.0	-14.1	-7.5
2-Mar	-8.2	-8.2	-8.2	-8.0	-7.7	-7.7	-7.2	-7.1	-6.7	-5.5	-2.6	1.7	2.8	3.6	3.7	3.9	3.4	2.5	2.0	0.9	0.1	-0.3	-0.1	-0.7	-2.2	3.9
3-Mar	-1.2	-2.2	-4.9	-6.9	-8.0	-8.7	-9.3	-9.8	-10.3	-10.6	-10.1	-9.1	-9.5	-9.6	-8.8	-7.8	-8.6	-9.8	-10.7	-12.0	-12.6	-12.6	-14.1	-15.0	-9.3	-1.2
4-Mar	-15.4	-15.8	-16.0	-16.1	-16.2	-16.2	-16.5	-17.7	-17.8	-17.0	-15.5	-14.7	-14.0	-14.1	-13.6	-13.5	-13.5	-14.9	-16.5	-17.4	-17.9	-19.5	-20.6	-19.3	-16.2	-13.5
5-Mar	-20.5	-21.2	-21.9	-22.7	-23.5	-24.8	-25.1	-25.8	-23.7	-20.6	-18.8	-17.2	-16.2	-16.3	-16.3	-15.4	-15.6	-16.8	-18.9	-19.4	-20.1	-21.2	-21.9	DF	-20.2	-15.4
6-Mar	-23.0	-24.0	-25.0	-25.6	-26.4	-27.1	-27.1	-26.7	-23.3	-21.3	-19.0	-16.5	-14.3	-12.5	-11.2	-10.6	-10.5	-10.9	-11.3	-11.6	-11.8	-12.5	-13.0	-13.3	-17.8	-10.5
7-Mar	-13.2	-12.6	-12.5	-12.8	-13.0	-13.3	-13.5	-13.6	-13.3	-12.6	-12.1	-11.8	-10.8	-9.2	-7.7	-7.0	-6.9	-7.3	-8.2	-8.6	-9.0	-9.0	-8.7	-8.9	-10.7	-6.9
8-Mar	-9.7	-10.6	-11.5	-12.3	-13.0	-13.5	-14.2	-14.6	-13.7	-12.3	-11.2	-10.2	-8.1	-7.3	-6.4	-6.2	-6.2	-7.0	-8.1	-9.5	-11.1	-11.9	-12.7	-13.6	-10.6	-6.2
9-Mar	-14.1	-14.6	-16.3	-17.3	-18.2	-18.7	-19.5	-19.8	-18.3	-16.1	-13.2	-10.7	-9.4	-9.1	-8.6	-7.8	-7.6	-8.1	-8.7	-9.2	-9.8	-10.2	-9.9	-10.1	-12.7	-7.6
10-Mar	-10.6	-10.9	-11.2	-11.1	-11.4	-11.6	-11.5	-11.5	-10.9	-10.0	-8.8	-8.6	-7.7	-7.1	-6.7	-6.0	-5.8	-6.1	-6.4	-6.4	-6.7	-7.4	-8.3	-8.4	-8.8	-5.8
11-Mar	-9.0	-9.1	-9.9	-9.7	-9.7	-9.9	-10.1	-10.5	-9.6	-8.3	-7.0	-5.7	-4.6	-4.4	-4.0	-3.7	-3.6	-3.8	-5.0	-6.9	-8.1	-8.8	-9.8	-10.4	-7.6	-3.6
12-Mar	-11.0	-11.2	-11.7	-12.2	-12.7	-13.3	-14.0	-14.4	-13.6	-12.7	-11.0	-10.3	-10.4	-10.1	-9.7	-9.6	-10.5	-11.1	-11.8	-12.3	-12.5	-13.0	-13.5	-13.9	-11.9	-9.6
13-Mar	-14.4	-14.9	-15.7	-16.4	-17.4	-18.4	-17.8	-17.7	-16.8	-15.3	-13.3	-10.8	-8.7	-7.5	-6.1	-5.4	-4.6	-4.5	-4.6	-4.9	-5.3	-6.1	-7.4	-8.0	-10.9	-4.5
14-Mar	-8.5	-8.6	-9.1	-9.5	-9.7	-10.3	-10.4	-10.6	-11.1	-11.9	-11.7	-11.0	-10.0	-9.6	-9.8	-10.2	-10.7	-11.3	-12.1	-12.6	-12.9	-13.4	-13.8	-14.5	-11.0	-8.5
15-Mar	-15.2	-16.1	-16.7	-17.4	-17.8	-18.3	-17.2	-16.2	-14.4	-13.3	-12.1	-11.3	-10.5	-10.1	-8.9	-8.5	-8.3	-8.7	-11.1	-12.6	-13.7	-14.6	-15.7	-15.3	-13.5	-8.3
16-Mar	-14.1	-13.9	-14.0	-14.4	-14.3	-14.2	-14.0	-13.8	-13.4	-12.4	-11.1	-9.5	-8.3	-7.0	-5.7	-4.9	-4.4	-4.4	-5.8	-7.5	-7.0	-8.6	-9.1	-9.6	-10.0	-4.4
17-Mar	-9.9	-10.0	-11.3	-12.2	-12.7	-12.9	-13.0	-11.9	-10.4	-7.8	-5.3	-2.2	0.6	3.0	5.2	6.8	7.1	6.9	4.4	2.0	1.5	-0.9	-1.8	-3.1	-3.7	7.1
18-Mar	-3.4	-3.9	-4.5	-5.5	-6.0	-7.0	-7.6	-5.6	-3.7	-1.9	0.2	2.2	3.9	5.4	7.0	8.0	8.8	8.7	6.5	4.4	2.3	0.4	-0.8	-2.4	0.2	8.8
19-Mar	-3.3	-4.2	-5.8	-6.3	-7.3	-8.7	-8.2	-6.3	-5.2	-4.0	-2.7	-1.5	-0.7	-0.3	0.7	1.0	0.6	-0.1	-1.0	-2.2	-3.0	-3.6	-4.0	-4.0	-3.3	1.0
20-Mar	-4.3	-4.8	-5.6	-6.5	-7.1	-8.1	-8.1	-8.0	-7.7	-7.7	-7.5	-6.1	-4.4	-3.0	-1.5	-1.0	-1.4	-2.3	-4.2	-6.0	-7.5	-9.2	-10.5	-12.4	-6.0	-1.0
21-Mar	-13.2	-14.1	-15.8	-16.7	-16.9	-16.5	-17.2	-16.5	-14.9	-13.8	-11.6	-9.2	-7.5	-6.5	-5.8	-5.3	-4.9	-5.1	-6.6	-8.8	-10.4	-11.3	-9.9	-11.2	-11.2	-4.9
22-Mar	-11.9	-12.5	-11.6	-11.9	-12.7	-12.7	-12.7	-12.2	-9.9	-7.0	-4.1	-2.2	-1.1	-0.1	1.2	2.3	2.7	2.4	0.6	-1.2	-0.8	-2.6	-3.2	-3.5	-5.2	2.7
23-Mar	-4.7	-5.5	-6.7	-7.9	-7.3	-6.1	-6.7	-5.8	-2.5	0.0	0.9	1.0	0.8	0.3	-1.2	-1.6	-2.4	-3.6	-4.6	-5.9	-7.0	-7.7	-7.0	-6.5	-4.1	1.0
24-Mar	-6.7	-7.8	-8.7	-9.6	-11.2	-11.9	-12.1	-11.1	-10.0	-8.0	-6.9	-5.6	-4.2	-3.5	-3.1	-3.1	-2.4	-2.6	-3.9	-5.7	-7.0	-7.9	-8.9	-9.6	-7.1	-2.4
25-Mar	-10.8	-11.9	-13.2	-14.6	-15.6	-15.9	-16.6	-14.6	-11.4	-8.6	-5.4	-3.5	-2.2	-1.8	-2.0	-2.3	-3.1	-4.1	-5.8	-7.7	-9.3	-10.7	-12.4	-14.2	-9.1	-1.8
26-Mar	-15.5	-17.1	-18.1	-19.1	-19.9	-20.6	-20.8	-19.0	-17.1	-15.9	-14.3	-13.2	-11.0	-9.4	-8.6	-8.6	-9.3	-10.0	-11.4	-12.7	-13.9	-15.1	-16.2	-17.0	-14.7	-8.6
27-Mar	-18.8	-20.0	-20.4	-21.1	-21.0	-22.2	-22.5	-20.0	-18.1	-15.3	-13.2	-10.8	-8.8	-8.2	-7.3	-6.6	-6.3	-6.3	-6.9	-8.6	-10.1	-11.2	-11.5	-13.2	-13.7	-6.3
28-Mar	-14.5	-15.4	-16.9	-18.6	-20.2	-20.5	-20.0	-17.7	-15.2	-12.1	-9.9	-7.6	-5.8	-4.6	-3.2	-2.3	-1.7	-1.6	-2.0	-2.6	-2.7	-2.8	-2.7	-3.0	-9.3	-1.6
29-Mar	-3.2	-3.6	-4.5	-4.4	-5.2	-5.5	-4.6	-4.0	-2.7	-1.6	-1.1	-0.1	-0.1	-0.5	-0.9	-1.0	-1.1	-1.8	-2.7	-3.5	-4.3	-5.9	-7.0	-8.4	-3.2	-0.1
30-Mar	-9.2	-10.3	-11.3	-12.3	-12.8	-12.7	-13.0	-11.8	-9.9	-6.6	-5.3	-4.0	-3.0	-2.0	-1.3	-1.2	-1.2	-1.3	-1.4	-2.1	-2.3	-2.7	-3.1	-3.5	-6.0	-1.2
31-Mar	-3.9	-4.0	-4.2	-4.7	-5.1	-5.2	-5.4	-5.3	-5.0	-3.9	-2.4	-0.6	0.7	1.2	1.8	1.9	2.1	1.9	0.6	-1.0	0.2	-0.3	-1.3	-2.3	-1.8	2.1
	-11.1	-11.7	-12.5	-13.1	-13.6	-14.0	-14.1	-13.5	-12.2	-10.7	-9.1	-7.4	-6.2	-5.5	-4.7	-4.3	-4.3	-4.8	-6.0	-7.1	-7.8	-8.7	-9.2	-9.4	Diurnal Average	
	-1.2	-2.2	-4.2	-4.4	-5.1	-5.2	-4.6	-4.0	-2.5	0.0	0.9	2.2	3.9	5.4	7.0	8.0	8.8	8.7	6.5	4.4	2.3	0.4	-0.1	-0.7	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 2 m (AT2m) - C

Mannix - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	42	5.65	5.65
-20 - 0	650	87.48	93.14
0 - 10	51	6.86	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 20 m (AT20m) - C

Mannix - March 2023

Maximum Value: 9.5 C on Mar 18 17:00

Maximum Daily Average: 1.9 C on Mar 18

Minimum Value: -25.7 C on Mar 6 07:00

Minimum Daily Average: -19.7 C on Mar 5

Maximum Diurnal Average: -4.6 C at hour 17

Minimum Diurnal Average: -13.6 C at hour 8

Monthly Average: -9.10 C

Percentiles: P_1 = -23.9 P_{10} = -17.2 Q_1 = -13.3 Median = -9.3 Q_3 = -4.5 P_{90} = -1.3 P_{99} = 7.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-19.4	-19.9	-20.0	-19.8	-20.1	-20.3	-19.8	-19.6	-19.2	-17.7	-15.6	-13.2	-10.9	-9.3	-8.2	-7.7	-8.1	-8.3	-8.3	-8.4	-8.3	-8.1	-7.8	-7.9	-13.6	-7.7
2-Mar	-8.3	-8.4	-8.3	-8.1	-7.8	-7.7	-7.2	-7.0	-6.8	-5.9	-3.4	0.6	1.4	3.0	3.4	3.8	3.6	2.6	2.2	1.3	0.5	0.0	0.1	-0.5	-2.4	3.8
3-Mar	-1.0	-2.3	-5.2	-7.2	-8.3	-8.9	-9.5	-10.1	-10.6	-11.1	-10.8	-10.5	-10.4	-10.3	-9.6	-9.2	-9.3	-10.2	-10.9	-11.5	-11.9	-12.7	-14.3	-15.2	-9.6	-1.0
4-Mar	-15.6	-16.1	-16.2	-16.3	-16.3	-16.5	-16.7	-17.9	-18.2	-17.9	-17.4	-16.8	-16.3	-15.7	-15.2	-14.8	-14.5	-15.2	-16.4	-17.3	-17.7	-18.4	-19.0	-19.2	-16.7	-14.5
5-Mar	-20.5	-21.1	-21.8	-22.2	-22.8	-23.9	-24.6	-25.1	-24.2	-21.7	-20.2	-19.0	-17.6	-16.8	-15.9	-15.5	-15.6	-15.8	-16.1	-16.7	-17.6	-18.5	-19.3	DF	-19.7	-15.5
6-Mar	-20.2	-21.6	-22.4	-23.0	-23.9	-25.1	-25.7	-25.3	-24.2	-22.5	-20.1	-17.8	-15.4	-13.5	-12.0	-11.3	-11.0	-10.8	-11.0	-11.4	-11.7	-12.4	-12.8	-13.1	-17.4	-10.8
7-Mar	-13.1	-12.6	-12.5	-12.8	-13.0	-13.4	-13.6	-13.8	-13.7	-13.4	-13.0	-12.7	-11.8	-10.1	-8.5	-7.6	-7.3	-7.3	-8.1	-8.4	-8.8	-8.6	-8.4	-8.6	-10.9	-7.3
8-Mar	-9.3	-10.0	-10.8	-11.7	-12.6	-13.1	-13.8	-14.4	-14.2	-13.2	-12.3	-11.3	-9.2	-8.0	-7.0	-6.4	-6.2	-6.5	-7.7	-9.0	-10.5	-11.4	-12.2	-13.0	-10.6	-6.2
9-Mar	-13.7	-14.1	-15.0	-15.9	-16.8	-17.7	-18.6	-19.1	-18.9	-17.2	-14.6	-12.2	-10.8	-10.0	-9.2	-8.3	-7.7	-7.9	-8.6	-9.1	-9.8	-10.0	-9.8	-10.1	-12.7	-7.7
10-Mar	-10.5	-10.9	-11.1	-11.1	-11.6	-11.7	-11.6	-11.7	-11.3	-10.6	-9.9	-9.7	-8.9	-8.0	-7.1	-6.1	-6.0	-6.2	-6.4	-6.4	-6.7	-7.2	-8.0	-8.2	-9.0	-6.0
11-Mar	-8.8	-9.0	-9.4	-9.6	-9.7	-9.9	-10.1	-10.5	-10.5	-9.8	-8.2	-6.9	-5.6	-5.0	-4.3	-4.0	-3.9	-4.0	-5.3	-7.2	-8.3	-8.9	-10.0	-10.7	-7.9	-3.9
12-Mar	-11.2	-11.3	-11.7	-12.3	-12.9	-13.5	-14.2	-14.7	-14.8	-14.2	-13.5	-13.0	-12.9	-12.5	-12.0	-11.5	-11.5	-11.6	-12.1	-12.4	-12.7	-13.1	-13.6	-14.2	-12.8	-11.2
13-Mar	-14.9	-15.4	-16.1	-16.7	-17.6	-18.4	-18.2	-18.2	-17.6	-16.7	-14.9	-13.0	-11.3	-9.7	-7.6	-6.2	-4.9	-4.5	-4.7	-5.0	-5.4	-6.3	-7.6	-8.2	-11.6	-4.5
14-Mar	-8.7	-8.7	-9.4	-9.7	-9.9	-10.4	-10.5	-10.9	-11.9	-12.8	-12.7	-12.0	-11.7	-11.4	-11.3	-11.4	-11.5	-11.9	-12.5	-12.9	-13.2	-13.6	-13.9	-14.4	-11.6	-8.7
15-Mar	-15.0	-15.4	-15.6	-16.0	-16.6	-17.2	-16.8	-16.7	-16.4	-14.6	-14.3	-13.2	-12.1	-11.0	-9.7	-8.9	-8.4	-8.6	-9.5	-9.9	-10.7	-11.1	-12.4	-13.3	-13.1	-8.4
16-Mar	-13.3	-13.6	-14.1	-14.4	-14.4	-14.4	-14.2	-14.0	-13.8	-13.0	-12.0	-10.6	-9.3	-7.6	-6.2	-5.3	-4.5	-3.9	-4.4	-5.2	-6.0	-7.2	-8.1	-9.1	-9.9	-3.9
17-Mar	-9.5	-9.5	-10.2	-11.3	-12.1	-12.6	-12.2	-11.8	-11.2	-8.8	-6.5	-3.5	-0.6	2.5	5.0	6.8	7.6	8.8	8.4	8.0	7.2	4.5	2.4	2.0	-2.4	8.8
18-Mar	1.2	0.1	-0.8	-1.8	-2.3	-3.4	-4.5	-5.1	-4.5	-3.0	-0.9	1.2	3.4	5.9	8.0	8.8	9.5	9.3	7.5	5.9	4.7	2.8	1.8	0.9	1.9	9.5
19-Mar	-1.0	-2.3	-3.0	-3.9	-3.8	-5.2	-6.0	-6.3	-6.1	-5.2	-3.5	-2.4	-1.9	-1.3	-0.1	0.3	0.3	-0.2	-1.1	-2.2	-3.0	-3.7	-4.0	-4.0	-2.9	0.3
20-Mar	-4.3	-4.9	-5.6	-6.5	-7.2	-7.8	-8.1	-8.2	-8.1	-8.1	-7.9	-6.3	-5.3	-4.0	-2.5	-1.8	-1.9	-2.6	-4.2	-6.0	-7.6	-9.2	-10.3	-11.7	-6.3	-1.8
21-Mar	-12.4	-13.5	-14.1	-15.2	-15.3	-15.2	-15.9	-16.8	-15.6	-14.3	-12.8	-10.5	-8.4	-7.1	-5.9	-5.3	-5.0	-5.1	-5.8	-6.6	-7.2	-7.9	-8.6	-9.4	-10.6	-5.0
22-Mar	-9.7	-10.2	-10.9	-11.3	-12.2	-12.2	-12.3	-12.5	-10.9	-8.5	-5.7	-4.1	-2.6	-0.9	0.5	1.8	2.7	2.9	2.5	2.0	1.2	0.0	-1.3	-2.4	-4.8	2.9
23-Mar	-2.9	-3.7	-3.6	-4.3	-5.8	-5.8	-6.3	-6.0	-3.9	-1.5	-0.4	-0.2	-0.3	-0.9	-2.0	-2.1	-2.8	-3.8	-4.7	-5.8	-6.5	-7.0	-6.6	-6.3	-3.9	-0.2
24-Mar	-6.6	-7.2	-7.8	-9.1	-10.2	-11.1	-11.9	-11.8	-11.1	-10.1	-9.0	-7.6	-6.0	-5.0	-3.6	-2.5	-2.2	-2.5	-3.0	-3.7	-4.4	-5.3	-6.1	-7.2	-6.9	-2.2
25-Mar	-8.3	-9.4	-10.5	-11.7	-13.0	-14.1	-15.2	-14.6	-12.8	-11.0	-8.3	-5.6	-3.9	-3.2	-2.9	-3.0	-3.5	-4.3	-5.8	-7.6	-9.2	-10.5	-12.0	-13.8	-8.9	-2.9
26-Mar	-15.2	-16.6	-17.8	-18.8	-19.8	-20.0	-20.1	-19.5	-18.6	-17.1	-16.2	-15.0	-13.4	-11.7	-10.6	-9.8	-9.9	-10.2	-11.3	-12.6	-13.7	-14.9	-15.7	-16.1	-15.2	-9.8
27-Mar	-17.1	-18.2	-18.7	-18.9	-19.9	-20.9	-21.0	-20.6	-19.1	-16.7	-14.5	-12.3	-10.0	-8.5	-7.7	-7.2	-6.5	-6.2	-6.6	-7.1	-8.9	-10.1	-11.1	-11.8	-13.3	-6.2
28-Mar	-12.7	-13.6	-15.0	-16.0	-17.2	-18.5	-18.2	-18.3	-16.5	-13.9	-11.5	-9.4	-7.6	-5.8	-4.2	-3.1	-2.1	-1.7	-1.7	-2.4	-2.5	-2.6	-2.4	-2.6	-9.1	-1.7
29-Mar	-2.6	-2.7	-3.5	-3.8	-4.1	-4.5	-4.3	-4.3	-3.2	-2.5	-2.2	-1.6	-1.2	-1.2	-1.4	-1.5	-1.5	-2.1	-2.7	-3.3	-3.8	-4.3	-4.8	-5.3	-3.0	-1.2
30-Mar	-6.2	-7.1	-8.2	-9.9	-10.3	-11.0	-12.0	-11.9	-10.2	-7.0	-5.6	-4.2	-3.5	-2.4	-1.9	-1.6	-1.5	-1.5	-1.6	-2.1	-2.3	-2.5	-2.9	-3.4	-5.4	-1.5
31-Mar	-3.8	-4.1	-4.3	-4.9	-5.3	-5.4	-5.7	-5.7	-5.6	-4.7	-3.4	-2.4	-1.5	-0.8	0.0	0.5	1.1	1.2	0.8	0.6	0.9	-0.1	-1.1	-2.1	-2.3	1.2
	-10.2	-10.8	-11.4	-12.1	-12.7	-13.2	-13.5	-13.6	-13.0	-11.8	-10.4	-8.9	-7.6	-6.5	-5.5	-4.8	-4.6	-4.8	-5.5	-6.2	-6.9	-7.7	-8.4	-8.6	Diurnal Average	
	1.2	0.1	-0.8	-1.8	-2.3	-3.4	-4.3	-4.3	-3.2	-1.5	-0.4	1.2	3.4	5.9	8.0	8.8	9.5	9.3	8.4	8.0	7.2	4.5	2.4	2.0	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 20 m (AT20m) - C

Mannix - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	28	3.77	3.77
-20 - 0	662	89.10	92.87
0 - 10	53	7.13	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 45 m (AT45m) - C

Mannix - March 2023

Maximum Value: 9.3 C on Mar 18 18:00

Maximum Daily Average: 2.5 C on Mar 18

Minimum Value: -24.2 C on Mar 6 07:00

Minimum Daily Average: -19.5 C on Mar 5

Maximum Diurnal Average: -4.8 C at hour 17

Minimum Diurnal Average: -13.4 C at hour 8

Monthly Average: -9.10 C

Percentiles: P_1 = -22.7 P_{10} = -17.2 Q_1 = -13.4 Median = -9.4 Q_3 = -4.6 P_{90} = -1.3 P_{99} = 8.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	-17.8	-18.1	-18.5	-19.2	-19.2	-19.2	-19.1	-19.2	-19.2	-17.9	-15.7	-13.2	-11.1	-9.4	-8.4	-7.9	-8.2	-8.5	-8.5	-8.6	-8.5	-8.2	-8.0	-8.1	-13.3	-7.9
2-Mar	-8.5	-8.6	-8.6	-8.3	-8.0	-8.0	-7.4	-7.2	-6.9	-6.1	-3.5	0.4	1.1	2.7	3.3	3.7	3.5	2.5	2.1	1.3	0.5	0.1	0.0	-0.6	-2.5	3.7
3-Mar	-1.2	-2.5	-5.5	-7.5	-8.6	-9.2	-9.8	-10.4	-10.9	-11.4	-11.2	-10.9	-10.7	-10.7	-9.9	-9.5	-9.6	-10.4	-11.1	-11.6	-12.1	-12.9	-14.6	-15.5	-9.9	-1.2
4-Mar	-15.9	-16.3	-16.5	-16.5	-16.6	-16.7	-17.0	-18.2	-18.4	-18.2	-17.8	-17.1	-16.6	-16.0	-15.5	-15.1	-14.8	-15.4	-16.6	-17.5	-17.9	-18.5	-18.9	-19.4	-17.0	-14.8
5-Mar	-20.7	-21.3	-21.9	-22.2	-22.6	-22.6	-23.0	-23.8	-23.5	-21.9	-20.4	-19.3	-18.0	-17.1	-16.1	-15.9	-15.9	-15.9	-15.9	-16.3	-16.9	-17.8	-18.6	DF	-19.5	-15.9
6-Mar	-19.5	-20.3	-20.6	-21.6	-22.1	-23.7	-24.2	-23.6	-24.1	-22.8	-20.4	-18.0	-15.7	-13.6	-12.3	-11.5	-11.2	-11.0	-11.2	-11.6	-11.9	-12.6	-13.0	-13.3	-17.1	-11.0
7-Mar	-13.3	-12.8	-12.8	-13.1	-13.3	-13.6	-13.8	-14.0	-14.0	-13.6	-13.2	-12.9	-12.0	-10.3	-8.6	-7.7	-7.4	-7.5	-8.2	-8.6	-9.0	-8.7	-8.6	-8.8	-11.1	-7.4
8-Mar	-9.5	-10.2	-11.0	-11.8	-12.7	-13.3	-13.9	-14.5	-14.4	-13.5	-12.5	-11.4	-9.4	-8.3	-7.2	-6.6	-6.3	-6.7	-7.8	-9.2	-10.7	-11.5	-12.3	-13.2	-10.8	-6.3
9-Mar	-13.9	-14.3	-15.1	-15.9	-16.7	-17.4	-17.9	-18.6	-19.0	-17.5	-15.0	-12.4	-11.0	-10.2	-9.4	-8.5	-7.9	-8.1	-8.8	-9.3	-10.0	-10.3	-10.1	-10.3	-12.8	-7.9
10-Mar	-10.8	-11.1	-11.3	-11.3	-11.8	-12.0	-11.9	-11.9	-11.6	-10.8	-10.1	-9.9	-9.0	-8.2	-7.4	-6.4	-6.3	-6.4	-6.6	-6.5	-6.9	-7.4	-8.1	-8.4	-9.3	-6.3
11-Mar	-9.0	-9.1	-9.4	-9.7	-9.9	-10.1	-10.3	-10.7	-10.7	-10.0	-8.4	-7.1	-5.7	-5.2	-4.6	-4.3	-4.2	-4.3	-5.6	-7.4	-8.5	-9.2	-10.2	-10.9	-8.1	-4.2
12-Mar	-11.4	-11.5	-11.9	-12.6	-13.1	-13.7	-14.5	-15.0	-15.0	-14.6	-13.9	-13.4	-13.2	-12.8	-12.4	-11.8	-11.8	-11.8	-12.3	-12.6	-12.9	-13.3	-13.8	-14.4	-13.1	-11.4
13-Mar	-15.1	-15.6	-16.3	-16.9	-17.8	-18.5	-18.5	-18.6	-18.1	-17.1	-15.5	-13.6	-11.7	-9.9	-7.8	-6.5	-5.1	-4.7	-4.9	-5.2	-5.6	-6.6	-7.8	-8.4	-11.9	-4.7
14-Mar	-8.9	-8.9	-9.5	-9.9	-10.1	-10.7	-10.7	-11.1	-12.1	-13.0	-12.9	-12.4	-11.9	-11.7	-11.6	-11.7	-11.8	-12.2	-12.8	-13.1	-13.4	-13.8	-14.1	-14.6	-11.8	-8.9
15-Mar	-15.2	-15.5	-15.7	-15.9	-16.3	-16.6	-16.7	-16.8	-16.1	-15.0	-14.8	-13.5	-12.2	-11.2	-10.0	-9.1	-8.6	-8.8	-9.3	-9.4	-9.8	-10.4	-11.6	-12.7	-13.0	-8.6
16-Mar	-13.3	-13.8	-14.3	-14.6	-14.6	-14.6	-14.4	-14.3	-14.0	-13.2	-12.2	-10.8	-9.4	-7.8	-6.5	-5.6	-4.7	-4.0	-4.2	-4.9	-6.0	-7.1	-8.1	-8.8	-10.1	-4.0
17-Mar	-9.4	-9.4	-9.6	-10.4	-11.3	-11.8	-10.2	-10.5	-10.8	-8.7	-6.6	-3.7	-0.7	2.5	5.1	6.9	8.2	9.1	9.2	8.8	8.0	6.3	4.3	3.5	-1.7	9.2
18-Mar	2.4	1.8	0.8	0.2	-0.5	-1.9	-3.5	-4.6	-4.6	-3.3	-1.1	1.2	3.7	5.8	8.0	8.8	9.1	9.3	7.7	6.2	5.5	4.0	2.6	1.8	2.5	9.3
19-Mar	-0.1	-0.5	-1.1	-2.3	-3.0	-4.7	-5.8	-6.0	-6.3	-5.5	-3.8	-2.6	-1.9	-1.4	-0.3	0.2	0.2	-0.4	-1.4	-2.4	-3.2	-3.9	-4.2	-4.2	-2.7	0.2
20-Mar	-4.5	-5.1	-5.8	-6.6	-7.3	-8.0	-8.2	-8.4	-8.4	-8.4	-8.1	-6.6	-5.6	-4.4	-2.9	-2.2	-2.2	-2.8	-4.3	-6.1	-7.8	-9.3	-10.4	-11.7	-6.5	-2.2
21-Mar	-12.4	-13.6	-14.1	-14.7	-15.1	-15.0	-15.8	-16.6	-15.8	-14.5	-13.0	-10.7	-8.4	-7.6	-6.4	-5.8	-5.4	-5.4	-5.9	-6.3	-6.7	-7.4	-8.5	-9.0	-10.6	-5.4
22-Mar	-9.3	-9.7	-10.3	-10.8	-11.5	-11.7	-12.0	-12.5	-11.1	-8.9	-6.1	-4.4	-2.9	-1.3	0.1	1.4	2.4	2.7	2.6	2.4	1.4	0.3	-1.0	-2.0	-4.7	2.7
23-Mar	-1.8	-2.9	-2.0	-2.4	-3.3	-4.7	-5.7	-5.0	-3.3	-1.8	-0.7	-0.5	-0.6	-1.3	-2.4	-2.4	-3.1	-4.1	-4.9	-6.0	-6.6	-7.1	-6.7	-6.4	-3.6	-0.5
24-Mar	-6.8	-7.4	-7.9	-9.1	-10.3	-11.2	-12.1	-12.0	-11.4	-10.5	-9.4	-7.8	-6.4	-5.4	-4.0	-2.5	-2.5	-2.8	-3.1	-3.3	-3.9	-4.7	-5.7	-6.2	-6.9	-2.5
25-Mar	-7.5	-8.2	-9.7	-10.8	-11.3	-12.5	-13.5	-14.1	-13.0	-11.3	-8.6	-5.9	-4.3	-3.5	-3.2	-3.4	-3.8	-4.6	-6.0	-7.7	-9.4	-10.7	-12.1	-13.8	-8.7	-3.2
26-Mar	-15.4	-16.8	-18.0	-19.0	-20.0	-19.4	-20.0	-19.7	-18.9	-17.6	-16.6	-15.3	-13.7	-12.1	-10.9	-10.1	-10.2	-10.5	-11.5	-12.7	-13.8	-15.0	-15.7	-16.1	-15.4	-10.1
27-Mar	-16.7	-17.5	-17.5	-18.2	-18.7	-19.1	-20.3	-20.5	-19.4	-17.2	-14.7	-12.5	-10.2	-8.8	-8.0	-7.5	-6.7	-6.5	-6.8	-7.1	-8.8	-10.1	-11.1	-11.4	-13.1	-6.5
28-Mar	-12.1	-13.5	-14.5	-15.2	-16.5	-17.4	-17.2	-17.8	-16.7	-14.5	-11.9	-9.7	-7.9	-6.2	-4.6	-3.4	-2.4	-1.9	-1.8	-2.4	-2.6	-2.5	-2.4	-2.3	-9.1	-1.8
29-Mar	-2.3	-2.1	-3.0	-3.4	-3.6	-4.1	-4.1	-4.1	-3.4	-2.9	-2.5	-2.0	-1.6	-1.6	-1.8	-1.8	-1.8	-2.4	-2.9	-3.5	-4.0	-4.4	-4.9	-5.2	-3.1	-1.6
30-Mar	-5.7	-6.3	-7.2	-8.1	-9.0	-10.0	-10.6	-11.2	-10.1	-7.4	-6.0	-4.6	-3.8	-2.7	-2.3	-1.9	-1.8	-1.8	-1.8	-2.4	-2.5	-2.7	-3.0	-3.5	-5.3	-1.8
31-Mar	-4.0	-4.3	-4.5	-5.1	-5.5	-5.6	-5.9	-5.9	-5.8	-5.1	-3.7	-2.8	-1.9	-1.2	-0.4	0.2	0.8	1.0	0.9	0.9	0.8	-0.3	-1.3	-2.3	-2.5	1.0
	-10.0	-10.5	-11.1	-11.7	-12.3	-12.8	-13.2	-13.4	-13.1	-12.1	-10.7	-9.1	-7.8	-6.7	-5.8	-5.1	-4.8	-5.0	-5.5	-6.2	-6.9	-7.6	-8.3	-8.5	Diurnal Average	
	2.4	1.8	0.8	0.2	-0.5	-1.9	-3.5	-4.1	-3.3	-1.8	-0.7	1.2	3.7	5.8	8.0	8.8	9.1	9.3	9.2	8.8	8.0	6.3	4.3	3.5	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Mannix - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	24	3.23	3.23
-20 - 0	664	89.37	92.60
0 - 10	55	7.40	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 75 m (AT75m) - C

Mannix - March 2023

Maximum Value: 9.2 C on Mar 18 18:00

Maximum Daily Average: 2.9 C on Mar 18

Minimum Value: -22.6 C on Mar 6 08:00

Minimum Daily Average: -19.4 C on Mar 5

Maximum Diurnal Average: -5.0 C at hour 17

Minimum Diurnal Average: -13.1 C at hour 8

Monthly Average: -9.09 C

Percentiles: P_1 = -22.3 P_{10} = -17.1 Q_1 = -13.6 Median = -9.3 Q_3 = -4.7 P_{90} = -1.2 P_{99} = 8.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-16.8	-17.1	-17.7	-18.4	-18.3	-18.1	-18.4	-18.7	-19.0	-17.9	-15.9	-13.6	-11.2	-9.7	-8.6	-8.2	-8.4	-8.6	-8.6	-8.7	-8.6	-8.3	-8.2	-8.3	-13.1	-8.2
2-Mar	-8.6	-8.8	-8.8	-8.5	-8.3	-8.2	-7.6	-7.4	-7.1	-6.0	-3.2	0.2	0.8	2.5	3.0	3.5	3.2	2.3	1.8	1.1	0.4	-0.1	-0.1	-0.8	-2.7	3.5
3-Mar	-1.4	-2.8	-5.8	-7.8	-8.9	-9.5	-10.1	-10.7	-11.2	-11.8	-11.5	-11.1	-11.0	-11.0	-10.2	-9.8	-9.9	-10.6	-11.2	-11.8	-12.3	-13.2	-14.9	-15.8	-10.2	-1.4
4-Mar	-16.2	-16.7	-16.8	-16.8	-16.9	-16.9	-17.3	-18.5	-18.7	-18.5	-18.0	-17.4	-16.9	-16.4	-15.8	-15.4	-15.1	-15.7	-16.9	-17.8	-18.1	-18.7	-18.9	-19.6	-17.3	-15.1
5-Mar	-20.8	-21.5	-22.0	-22.3	-22.5	-22.4	-22.5	-22.5	-22.4	-22.0	-20.7	-19.6	-18.2	-17.3	-16.5	-15.9	-15.9	-16.1	-16.0	-16.2	-16.7	-17.4	-18.1	DF	-19.4	-15.9
6-Mar	-19.1	-19.1	-19.5	-20.0	-20.6	-21.7	-22.3	-22.6	-22.5	-22.0	-20.5	-17.9	-15.5	-13.6	-12.4	-11.8	-11.5	-11.2	-11.5	-11.8	-12.2	-12.9	-13.2	-13.5	-16.6	-11.2
7-Mar	-13.5	-13.1	-13.1	-13.3	-13.6	-13.9	-14.1	-14.3	-14.3	-13.9	-13.5	-13.2	-12.3	-10.6	-9.0	-8.1	-7.7	-7.8	-8.5	-8.8	-9.1	-8.9	-8.8	-9.1	-11.4	-7.7
8-Mar	-9.7	-10.4	-11.1	-11.9	-12.8	-13.5	-14.0	-14.7	-14.7	-13.8	-12.8	-11.8	-9.6	-8.5	-7.5	-6.9	-6.7	-6.9	-8.0	-9.4	-10.8	-11.6	-12.5	-13.3	-11.0	-6.7
9-Mar	-13.9	-14.3	-15.1	-15.7	-16.4	-17.3	-18.0	-18.5	-18.8	-17.6	-15.1	-12.6	-11.2	-10.6	-9.7	-8.8	-8.2	-8.4	-9.1	-9.6	-10.2	-10.5	-10.3	-10.6	-12.9	-8.2
10-Mar	-11.1	-11.4	-11.6	-11.6	-12.1	-12.2	-12.2	-12.2	-11.9	-11.2	-10.4	-10.2	-9.4	-8.5	-7.7	-6.7	-6.6	-6.7	-6.9	-6.7	-7.1	-7.6	-8.2	-8.6	-9.5	-6.6
11-Mar	-9.2	-9.3	-9.5	-9.9	-10.1	-10.3	-10.5	-10.9	-10.9	-10.2	-8.6	-7.3	-6.0	-5.5	-4.9	-4.7	-4.5	-4.6	-5.8	-7.7	-8.8	-9.4	-10.3	-10.9	-8.3	-4.5
12-Mar	-11.6	-11.6	-12.1	-12.8	-13.4	-14.0	-14.7	-15.3	-15.3	-14.9	-14.1	-13.7	-13.5	-13.1	-12.6	-12.1	-12.1	-12.1	-12.5	-12.9	-13.2	-13.5	-14.0	-14.6	-13.3	-11.6
13-Mar	-15.2	-15.7	-16.4	-17.1	-17.8	-18.5	-18.7	-18.8	-18.4	-17.1	-15.6	-13.8	-12.1	-10.3	-8.1	-6.8	-5.3	-5.0	-5.1	-5.5	-5.9	-6.9	-8.1	-8.7	-12.1	-5.0
14-Mar	-9.1	-9.1	-9.6	-10.1	-10.3	-10.9	-10.9	-11.3	-12.2	-12.9	-13.0	-12.6	-12.2	-11.9	-12.0	-12.0	-12.1	-12.5	-13.0	-13.3	-13.6	-14.1	-14.4	-14.8	-12.0	-9.1
15-Mar	-15.3	-15.6	-15.8	-16.0	-16.4	-16.6	-16.8	-16.9	-16.0	-15.4	-15.0	-13.9	-12.7	-11.4	-10.3	-9.3	-8.8	-8.9	-9.2	-9.5	-9.9	-10.1	-11.0	-11.9	-13.0	-8.8
16-Mar	-13.2	-13.9	-14.5	-14.7	-14.7	-14.8	-14.7	-14.5	-14.2	-13.4	-12.3	-11.0	-9.5	-7.8	-6.5	-5.7	-4.8	-4.1	-4.0	-4.7	-5.9	-7.0	-7.8	-8.3	-10.1	-4.0
17-Mar	-8.8	-8.8	-8.5	-9.5	-10.8	-9.9	-8.7	-8.4	-8.6	-7.8	-6.1	-3.6	-0.7	2.6	5.2	7.3	8.8	9.2	9.2	8.8	8.5	7.2	5.2	3.8	-1.0	9.2
18-Mar	2.6	2.1	1.1	0.7	0.0	-0.8	-2.0	-2.9	-3.0	-2.7	-1.2	1.0	3.5	5.7	7.9	9.0	9.1	9.2	7.7	6.5	5.8	4.4	3.2	2.5	2.9	9.2
19-Mar	1.2	0.2	-0.5	-1.6	-2.9	-4.4	-5.7	-6.2	-6.4	-5.6	-4.0	-2.9	-2.2	-1.6	-0.5	-0.1	-0.1	-0.7	-1.6	-2.6	-3.5	-4.1	-4.4	-4.5	-2.7	1.2
20-Mar	-4.8	-5.4	-6.1	-6.8	-7.5	-8.1	-8.4	-8.7	-8.8	-8.7	-8.5	-7.0	-5.8	-4.7	-3.2	-2.5	-2.5	-3.1	-4.5	-6.3	-8.1	-9.5	-10.5	-11.7	-6.7	-2.5
21-Mar	-12.4	-13.7	-13.9	-14.7	-14.4	-14.2	-15.7	-16.5	-16.1	-14.7	-13.1	-10.8	-8.7	-7.8	-6.6	-5.7	-5.6	-5.6	-6.1	-6.3	-6.6	-7.1	-8.2	-8.8	-10.6	-5.6
22-Mar	-9.1	-9.4	-9.7	-9.8	-10.1	-10.7	-11.2	-12.1	-11.0	-8.7	-6.4	-4.7	-3.1	-1.5	-0.1	1.3	2.3	2.7	2.7	2.4	1.5	0.6	0.2	-0.4	-4.3	2.7
23-Mar	-0.6	-1.9	-1.3	-2.2	-2.0	-1.9	-1.1	-2.0	-2.4	-2.0	-1.0	-0.9	-1.0	-1.6	-2.8	-2.7	-3.5	-4.4	-5.2	-6.2	-6.8	-7.3	-6.8	-6.6	-3.1	-0.6
24-Mar	-7.0	-7.6	-8.1	-9.2	-10.5	-11.4	-12.2	-12.2	-11.6	-10.8	-9.7	-8.1	-6.7	-5.7	-4.1	-2.4	-2.5	-2.9	-3.2	-3.3	-3.7	-4.6	-5.6	-6.0	-7.1	-2.4
25-Mar	-6.7	-7.8	-9.4	-9.2	-9.8	-11.3	-12.4	-13.8	-12.8	-11.4	-8.9	-6.3	-4.6	-3.9	-3.6	-3.7	-4.2	-4.9	-6.3	-8.0	-9.6	-10.9	-12.3	-13.7	-8.6	-3.6
26-Mar	-15.4	-16.8	-18.2	-19.2	-19.7	-18.7	-19.9	-19.6	-18.9	-17.8	-16.8	-15.6	-14.1	-12.5	-11.3	-10.5	-10.5	-10.8	-11.8	-12.9	-14.0	-15.2	-15.9	-16.0	-15.5	-10.5
27-Mar	-16.6	-17.2	-17.3	-18.1	-18.5	-18.7	-19.2	-19.7	-19.1	-17.5	-15.0	-12.8	-10.3	-9.0	-8.2	-7.7	-7.0	-6.7	-7.0	-7.2	-8.8	-10.0	-11.1	-11.2	-13.1	-6.7
28-Mar	-11.3	-12.0	-14.3	-14.4	-14.7	-15.5	-16.3	-16.2	-16.0	-14.8	-12.2	-10.0	-8.1	-6.4	-4.8	-3.7	-2.6	-2.1	-2.0	-2.5	-2.4	-2.2	-2.2	-2.1	-8.7	-2.0
29-Mar	-2.0	-2.0	-2.3	-2.9	-3.2	-3.7	-4.0	-3.9	-3.6	-3.2	-2.8	-2.3	-1.9	-1.9	-2.1	-2.2	-2.1	-2.7	-3.2	-3.8	-4.2	-4.6	-5.1	-5.4	-3.1	-1.9
30-Mar	-5.8	-6.0	-6.5	-7.3	-8.1	-8.8	-9.3	-9.5	-8.9	-8.0	-6.3	-5.0	-4.1	-3.2	-2.6	-2.3	-2.1	-2.1	-2.1	-2.7	-2.7	-2.9	-3.2	-3.8	-5.1	-2.1
31-Mar	-4.2	-4.5	-4.8	-5.4	-5.7	-5.8	-6.1	-6.1	-6.0	-5.4	-4.1	-3.0	-2.2	-1.4	-0.7	-0.1	0.6	1.0	1.1	0.9	0.6	-0.6	-1.6	-2.5	-2.7	1.1
	-9.9	-10.4	-10.9	-11.5	-12.0	-12.3	-12.7	-13.1	-12.9	-12.2	-10.9	-9.4	-8.1	-7.0	-6.0	-5.3	-5.0	-5.2	-5.7	-6.3	-7.0	-7.6	-8.3	-8.5	Diurnal Average	
	2.6	2.1	1.1	0.7	0.0	-0.8	-1.1	-2.0	-2.4	-2.0	-1.0	1.0	3.5	5.7	7.9	9.0	9.1	9.2	9.2	8.8	8.5	7.2	5.2	3.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 75 m (AT75m) - C

Mannix - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	19	2.56	2.56
-20 - 0	671	90.31	92.87
0 - 10	53	7.13	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 90 m (AT90m) - C

Mannix - March 2023

Maximum Value: 9.1 C on Mar 17 18:00

Maximum Daily Average: 2.9 C on Mar 18

Minimum Value: -22.6 C on Mar 5 05:00

Minimum Daily Average: -19.4 C on Mar 5

Maximum Diurnal Average: -5.2 C at hour 17

Minimum Diurnal Average: -13.0 C at hour 8

Monthly Average: -9.13 C

Percentiles: P_1 = -22.1 P_{10} = -17.2 Q_1 = -13.6 Median = -9.2 Q_3 = -4.8 P_{90} = -1.2 P_{99} = 8.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-16.2	-16.8	-17.5	-18.1	-17.9	-17.9	-18.4	-18.7	-18.9	-17.8	-15.8	-13.5	-11.4	-9.7	-8.8	-8.3	-8.5	-8.7	-8.7	-8.8	-8.7	-8.3	-8.2	-8.3	-13.1	-8.2
2-Mar	-8.6	-8.9	-8.9	-8.6	-8.4	-8.3	-7.7	-7.5	-7.1	-6.0	-3.0	0.0	0.7	2.3	2.9	3.4	3.1	2.2	1.7	1.0	0.4	-0.1	-0.2	-0.9	-2.8	3.4
3-Mar	-1.5	-2.9	-5.9	-7.9	-9.1	-9.7	-10.3	-10.8	-11.4	-11.9	-11.6	-11.3	-11.2	-11.1	-10.4	-10.0	-10.0	-10.8	-11.4	-11.9	-12.4	-13.3	-15.1	-16.0	-10.3	-1.5
4-Mar	-16.4	-16.8	-16.9	-17.0	-17.0	-17.0	-17.4	-18.7	-18.9	-18.7	-18.2	-17.6	-17.1	-16.5	-16.0	-15.5	-15.2	-15.8	-17.0	-17.9	-18.3	-18.7	-18.8	-19.7	-17.4	-15.2
5-Mar	-20.9	-21.6	-22.1	-22.4	-22.6	-22.4	-22.5	-22.5	-22.3	-22.1	-20.8	-19.7	-18.4	-17.5	-16.6	-16.1	-16.2	-16.2	-16.1	-16.2	-16.7	-17.3	-17.9	DF	-19.4	-16.1
6-Mar	-18.9	-18.9	-19.4	-19.6	-20.1	-21.4	-21.7	-22.2	-22.1	-21.8	-20.5	-17.6	-15.3	-13.5	-12.5	-11.9	-11.6	-11.4	-11.6	-11.9	-12.3	-13.0	-13.3	-13.6	-16.5	-11.4
7-Mar	-13.6	-13.2	-13.2	-13.5	-13.7	-14.0	-14.2	-14.4	-14.4	-14.1	-13.7	-13.4	-12.4	-10.7	-9.1	-8.2	-7.9	-7.9	-8.6	-8.9	-9.3	-8.9	-8.9	-9.2	-11.5	-7.9
8-Mar	-9.8	-10.5	-11.2	-12.0	-12.8	-13.5	-14.1	-14.9	-14.8	-14.0	-12.9	-11.8	-9.7	-8.7	-7.6	-7.0	-6.8	-7.1	-8.1	-9.5	-10.9	-11.7	-12.6	-13.4	-11.1	-6.8
9-Mar	-14.0	-14.4	-15.1	-15.7	-16.3	-17.2	-17.8	-18.6	-18.8	-17.8	-15.3	-12.7	-11.4	-10.7	-9.9	-9.0	-8.4	-8.5	-9.2	-9.7	-10.4	-10.6	-10.5	-10.7	-13.0	-8.4
10-Mar	-11.2	-11.6	-11.7	-11.7	-12.3	-12.4	-12.3	-12.3	-12.0	-11.3	-10.6	-10.3	-9.4	-8.6	-7.8	-6.9	-6.7	-6.8	-7.0	-6.9	-7.2	-7.8	-8.3	-8.7	-9.7	-6.7
11-Mar	-9.2	-9.3	-9.6	-9.9	-10.2	-10.4	-10.6	-11.0	-11.0	-10.4	-8.8	-7.5	-6.1	-5.6	-5.0	-4.8	-4.7	-4.7	-6.0	-7.8	-8.9	-9.4	-10.2	-10.7	-8.4	-4.7
12-Mar	-11.7	-11.7	-12.2	-12.9	-13.5	-14.2	-14.9	-15.4	-15.5	-15.0	-14.3	-13.8	-13.6	-13.3	-12.7	-12.2	-12.3	-12.3	-12.7	-13.0	-13.3	-13.6	-14.1	-14.6	-13.4	-11.7
13-Mar	-15.3	-15.8	-16.4	-17.1	-17.8	-18.4	-18.7	-18.9	-18.5	-17.2	-15.7	-13.8	-12.2	-10.5	-8.3	-6.9	-5.4	-5.1	-5.3	-5.6	-6.1	-7.0	-8.2	-8.8	-12.2	-5.1
14-Mar	-9.1	-9.2	-9.7	-10.2	-10.4	-11.0	-11.0	-11.4	-12.2	-12.8	-13.0	-12.6	-12.3	-12.0	-12.1	-12.1	-12.2	-12.6	-13.1	-13.4	-13.7	-14.1	-14.5	-14.9	-12.1	-9.1
15-Mar	-15.4	-15.7	-15.8	-16.1	-16.4	-16.6	-16.8	-16.9	-16.2	-15.7	-15.1	-14.0	-12.9	-11.8	-10.5	-9.5	-9.0	-9.0	-9.2	-9.5	-9.9	-10.0	-10.7	-11.7	-13.1	-9.0
16-Mar	-13.2	-14.0	-14.6	-14.8	-14.8	-14.8	-14.7	-14.6	-14.4	-13.6	-12.5	-11.2	-9.7	-8.1	-6.8	-6.0	-5.0	-4.2	-4.0	-4.6	-5.9	-6.9	-7.6	-8.3	-10.2	-4.0
17-Mar	-8.5	-8.6	-8.0	-8.8	-10.0	-8.5	-8.3	-8.0	-7.9	-7.5	-5.8	-3.5	-0.8	2.5	5.0	7.2	8.7	9.1	9.1	8.7	8.7	7.5	5.4	3.8	-0.8	9.1
18-Mar	2.7	2.2	1.2	0.7	0.0	-0.7	-1.7	-2.7	-2.6	-2.4	-1.1	0.9	3.3	5.4	7.5	8.8	8.8	9.0	7.6	6.6	5.8	4.4	3.6	2.7	2.9	9.0
19-Mar	1.4	0.2	-0.4	-1.5	-3.0	-4.4	-5.7	-6.3	-6.4	-5.8	-4.2	-3.1	-2.3	-1.7	-0.5	-0.2	-0.2	-0.8	-1.8	-2.8	-3.6	-4.3	-4.5	-4.6	-2.8	1.4
20-Mar	-4.9	-5.5	-6.2	-7.0	-7.6	-8.2	-8.5	-8.8	-8.9	-8.9	-8.6	-7.1	-6.0	-4.8	-3.4	-2.7	-2.6	-3.3	-4.6	-6.4	-8.2	-9.6	-10.5	-11.8	-6.8	-2.6
21-Mar	-12.4	-13.6	-13.7	-14.6	-14.2	-13.9	-15.5	-16.3	-16.1	-14.8	-13.2	-10.9	-8.8	-8.0	-6.9	-6.0	-5.8	-5.8	-6.2	-6.3	-6.5	-6.9	-8.1	-8.6	-10.6	-5.8
22-Mar	-9.0	-9.2	-9.4	-9.4	-9.6	-10.0	-10.9	-11.9	-10.8	-8.8	-6.6	-4.9	-3.3	-1.7	-0.3	1.0	2.0	2.4	2.6	2.3	1.5	0.9	0.9	0.1	-4.2	2.6
23-Mar	-0.2	-1.4	-1.3	-1.9	-1.3	-1.4	-0.6	-1.1	-2.1	-2.1	-1.2	-1.1	-1.1	-1.8	-2.9	-2.9	-3.7	-4.6	-5.4	-6.4	-6.9	-7.4	-6.9	-6.7	-3.0	-0.2
24-Mar	-7.1	-7.7	-8.2	-9.3	-10.6	-11.6	-12.2	-12.2	-11.7	-10.9	-9.8	-8.2	-6.8	-5.9	-4.4	-2.7	-2.9	-3.1	-3.4	-3.4	-3.7	-4.4	-5.4	-5.9	-7.2	-2.7
25-Mar	-6.7	-7.4	-9.0	-8.1	-8.6	-10.8	-11.7	-13.3	-12.7	-11.4	-8.9	-6.4	-4.8	-4.0	-3.7	-3.9	-4.3	-5.1	-6.4	-8.1	-9.6	-11.0	-12.4	-13.7	-8.4	-3.7
26-Mar	-15.4	-16.8	-18.2	-19.3	-19.6	-18.5	-19.8	-19.9	-19.1	-18.0	-17.0	-15.7	-14.2	-12.6	-11.4	-10.7	-10.7	-11.0	-11.9	-13.0	-14.1	-15.3	-16.0	-15.9	-15.6	-10.7
27-Mar	-16.6	-17.2	-17.3	-18.1	-18.5	-18.6	-19.0	-19.2	-19.1	-17.7	-15.2	-13.0	-10.4	-9.2	-8.4	-7.9	-7.2	-6.9	-7.2	-7.4	-8.8	-10.0	-11.1	-11.3	-13.1	-6.9
28-Mar	-11.3	-11.8	-13.4	-13.9	-14.1	-15.0	-15.9	-16.0	-16.0	-15.0	-12.4	-10.2	-8.3	-6.6	-5.1	-3.8	-2.8	-2.2	-2.0	-2.6	-2.2	-2.0	-2.1	-2.1	-8.6	-2.0
29-Mar	-2.0	-2.1	-2.2	-2.7	-3.1	-3.5	-3.9	-3.8	-3.7	-3.3	-3.0	-2.4	-2.1	-2.1	-2.3	-2.3	-2.3	-2.8	-3.4	-3.9	-4.4	-4.7	-5.2	-5.5	-3.2	-2.0
30-Mar	-5.8	-6.0	-6.4	-7.2	-7.9	-8.6	-8.7	-9.0	-8.5	-8.0	-6.5	-5.1	-4.2	-3.3	-2.8	-2.4	-2.2	-2.2	-2.2	-2.8	-2.9	-3.0	-3.3	-3.9	-5.1	-2.2
31-Mar	-4.3	-4.6	-4.9	-5.5	-5.8	-5.9	-6.2	-6.2	-6.1	-5.5	-4.2	-3.2	-2.3	-1.6	-0.8	-0.2	0.5	0.9	1.0	0.9	0.5	-0.7	-1.7	-2.6	-2.9	1.0
	-9.8	-10.3	-10.9	-11.4	-11.8	-12.2	-12.6	-13.0	-12.9	-12.3	-10.9	-9.5	-8.2	-7.1	-6.2	-5.5	-5.2	-5.3	-5.8	-6.4	-7.0	-7.7	-8.3	-8.5	Diurnal Average	
	2.7	2.2	1.2	0.7	0.0	-0.7	-0.6	-1.1	-2.1	-2.1	-1.1	0.9	3.3	5.4	7.5	8.8	8.8	9.1	9.1	8.7	8.7	7.5	5.4	3.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 90 m (AT90m) - C

Mannix - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	18	2.42	2.42
-20 - 0	671	90.31	92.73
0 - 10	54	7.27	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mannix - March 2023

Maximum Value: 90 % on Mar 19 06:00

Maximum Daily Average: 86.1 % on Mar 14

Minimum Value: 32 % on Mar 18 17:00

Minimum Daily Average: 46.8 % on Mar 8

Maximum Diurnal Average: 77.7 % at hour 7

Minimum Diurnal Average: 55.0 % at hour 16

Monthly Average: 66.8 %

Percentiles: $P_1 = 37$ $P_{10} = 47$ $Q_1 = 57$ Median = 68 $Q_3 = 78$ $P_{90} = 83$ $P_{99} = 88$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Mar	79	79	79	80	79	79	80	79	78	73	71	64	61	60	60	61	65	68	71	72	74	75	75	76	72.3	80
2-Mar	81	87	88	89	88	88	85	84	81	77	69	59	57	58	60	59	63	71	72	77	80	81	79	71	75.1	89
3-Mar	69	76	78	77	76	74	72	73	73	71	68	65	66	65	63	61	61	67	79	83	86	83	75	73	72.3	86
4-Mar	72	70	72	74	76	81	80	75	74	72	64	61	60	55	53	51	56	60	66	66	68	73	77	74	68.0	81
5-Mar	73	74	76	77	77	76	76	75	72	65	59	52	52	55	55	51	52	55	63	65	67	70	73	DF	65.6	77
6-Mar	75	75	77	77	76	76	76	75	70	61	57	54	54	57	59	70	76	71	68	72	72	73	74	76	69.6	77
7-Mar	81	80	79	77	77	77	77	80	80	73	71	70	67	60	56	52	48	50	49	49	50	50	48	46	64.5	81
8-Mar	47	48	50	53	55	55	56	57	54	50	48	46	39	37	36	37	35	38	42	43	46	47	49	53	46.8	57
9-Mar	53	53	59	61	64	66	68	68	62	54	47	44	44	47	47	46	47	50	52	52	57	63	58	63	55.2	68
10-Mar	69	79	82	81	77	76	75	74	72	68	63	66	65	63	63	61	61	65	68	66	64	66	69	68	69.2	82
11-Mar	64	63	63	63	63	66	69	70	66	60	57	55	55	58	58	59	61	64	78	81	83	85	85	86	67.1	86
12-Mar	86	85	85	85	83	82	81	79	77	73	67	64	65	67	68	67	72	75	80	81	81	83	82	83	77.1	86
13-Mar	84	83	83	82	82	81	82	81	79	77	75	70	66	64	63	64	64	65	65	66	68	78	88	89	75.0	89
14-Mar	89	89	89	88	88	88	88	88	86	85	85	85	84	84	84	85	86	86	86	86	85	85	84	84	86.1	89
15-Mar	84	83	84	83	83	83	83	82	78	78	77	77	77	78	77	77	77	77	81	85	86	86	84	85	81.0	86
16-Mar	85	83	81	81	79	80	82	81	80	79	75	72	70	68	67	66	66	67	72	79	77	81	82	84	76.4	85
17-Mar	85	83	85	87	87	86	86	81	73	67	63	58	54	53	51	49	47	46	50	52	47	56	60	61	65.2	87
18-Mar	56	55	56	59	61	64	67	59	54	51	47	42	40	38	35	33	32	33	38	44	51	59	61	67	50.1	67
19-Mar	74	80	83	86	88	90	90	81	71	67	65	62	61	61	58	58	61	64	67	71	73	75	75	74	72.3	90
20-Mar	71	68	65	64	63	66	66	65	67	75	78	77	74	69	61	60	59	57	56	56	59	61	65	71	65.5	78
21-Mar	73	75	81	82	82	82	83	83	81	78	72	67	61	59	57	55	54	56	60	70	76	81	76	82	72.0	83
22-Mar	84	87	84	83	84	83	80	77	70	62	54	49	47	46	45	44	44	48	54	60	57	63	65	64	63.9	87
23-Mar	68	71	76	82	79	75	75	72	62	55	48	54	55	58	62	61	63	65	67	70	74	80	79	76	67.7	82
24-Mar	75	77	77	77	81	81	79	73	69	62	59	54	50	49	45	42	41	45	47	52	58	62	66	68	62.0	81
25-Mar	68	71	73	78	83	84	83	79	70	64	52	46	38	40	39	37	35	36	43	55	61	64	69	73	60.0	84
26-Mar	73	75	74	76	78	79	79	72	60	55	55	55	51	51	46	40	38	39	42	46	52	55	58	62	58.8	79
27-Mar	69	73	76	78	76	76	78	72	63	55	49	46	42	42	41	42	43	42	45	49	51	53	50	54	56.8	78
28-Mar	58	61	69	76	79	80	79	69	57	47	46	45	44	44	45	44	42	44	46	46	45	45	46	46	54.3	80
29-Mar	50	57	63	63	65	73	76	75	74	72	70	69	71	71	71	69	66	63	61	62	64	69	75	82	68.0	82
30-Mar	83	87	87	87	87	87	86	86	81	64	54	54	50	45	42	47	51	52	57	63	61	60	59	59	66.2	87
31-Mar	60	62	64	71	71	71	73	73	74	69	64	61	59	60	59	60	61	63	67	72	65	67	69	71	66.0	74
	72.2	73.8	75.3	76.6	76.9	77.5	77.7	75.4	71.3	66.4	62.2	59.5	57.4	56.8	55.7	55.0	55.7	57.5	61.0	64.3	65.9	68.6	69.5	70.7	Diurnal Average	
	89	89	89	89	88	90	90	88	86	85	85	85	84	84	84	85	86	86	86	86	86	86	88	89	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Mannix - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	22	2.96	2.96
40 - 60	200	26.92	29.88
60 - 80	379	51.01	80.89
80 - 100	142	19.11	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 20m (RH20m) - %

Mannix - March 2023

Maximum Value: 92 % on Mar 14 00:00

Maximum Daily Average: 86.6 % on Mar 14

Minimum Value: 26 % on Mar 17 20:00

Minimum Daily Average: 42.4 % on Mar 18

Maximum Diurnal Average: 76.5 % at hour 7

Minimum Diurnal Average: 53.9 % at hour 17

Monthly Average: 65.5 %

Percentiles: P_1 = 31 P_{10} = 43 Q_1 = 56 Median = 67 Q_3 = 77 P_{90} = 83 P_{99} = 90

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Mar	84	83	82	81	81	81	81	80	79	77	75	71	65	61	60	61	63	66	69	71	73	74	74	75	73.6	84
2-Mar	81	88	89	92	89	89	85	84	82	79	73	61	61	58	58	57	60	68	70	75	79	79	77	69	75.1	92
3-Mar	66	75	79	78	77	75	73	74	74	72	70	68	68	66	65	63	62	67	80	83	85	82	75	74	73.0	85
4-Mar	73	71	72	75	77	82	81	75	75	74	70	68	66	58	56	53	57	60	66	66	68	70	72	73	69.1	82
5-Mar	74	74	78	78	78	78	77	76	74	70	64	58	56	56	52	50	51	51	52	53	55	59	62	DF	64.2	78
6-Mar	64	68	70	73	74	77	76	76	71	67	61	59	58	60	62	72	77	71	66	72	72	73	73	76	69.4	77
7-Mar	81	79	79	77	77	77	77	80	81	75	73	73	69	62	56	50	46	47	46	47	47	46	44	43	63.7	81
8-Mar	43	44	46	49	52	52	54	55	55	52	49	48	41	36	35	34	32	34	39	40	43	43	46	49	44.6	55
9-Mar	50	51	54	57	59	62	66	67	65	58	51	46	45	46	46	44	44	47	49	50	55	61	56	62	53.8	67
10-Mar	69	79	82	81	77	76	75	75	73	69	65	68	67	64	62	59	60	64	67	65	63	64	68	67	69.1	82
11-Mar	63	62	60	60	61	64	68	70	69	65	61	58	57	57	56	57	59	63	79	83	84	87	87	89	67.5	89
12-Mar	89	87	86	86	84	83	82	80	81	79	76	74	75	76	77	75	76	78	82	82	82	84	83	85	80.8	89
13-Mar	85	85	84	84	83	82	83	83	82	83	83	83	82	77	69	66	64	64	65	65	67	79	91	92	78.4	92
14-Mar	92	91	91	90	89	89	88	89	87	85	85	85	84	84	85	86	86	85	86	85	85	85	83	83	86.6	92
15-Mar	85	85	85	85	85	85	84	83	82	78	80	78	76	73	69	68	67	69	72	78	81	84	90	90	79.6	90
16-Mar	83	78	76	77	75	77	79	79	78	78	75	72	70	67	68	66	65	64	67	70	74	77	79	83	73.9	83
17-Mar	85	83	84	87	88	88	86	83	79	72	67	62	57	52	49	45	42	34	30	26	28	36	42	36	60.1	88
18-Mar	36	38	41	44	45	49	53	56	56	54	48	43	38	34	30	29	28	26	33	39	43	49	50	55	42.4	56
19-Mar	65	73	73	77	75	80	80	79	76	73	66	64	62	62	58	58	59	62	65	70	72	75	75	73	69.6	80
20-Mar	70	66	63	62	62	64	65	64	67	76	79	77	78	72	64	61	59	56	54	55	57	60	64	68	65.2	79
21-Mar	71	74	76	78	79	80	82	83	83	80	79	74	65	61	56	54	53	55	57	61	63	67	72	78	70.1	83
22-Mar	80	82	84	83	84	82	79	79	75	68	59	53	49	46	44	42	41	43	44	45	48	51	56	60	61.5	84
23-Mar	60	63	63	65	72	72	73	73	69	59	49	56	57	59	63	61	62	64	67	70	73	77	76	73	65.6	77
24-Mar	73	74	73	75	78	78	79	77	75	70	67	61	55	51	45	39	38	41	40	42	46	50	53	54	59.8	79
25-Mar	54	56	60	65	73	80	84	82	77	73	59	48	38	39	37	34	31	33	40	53	60	63	67	70	57.3	84
26-Mar	73	75	72	76	79	80	76	72	66	61	61	59	55	53	46	38	36	37	39	43	50	53	55	59	59.0	80
27-Mar	63	65	72	72	70	73	73	72	68	60	53	48	42	40	39	39	40	38	41	42	44	47	46	48	54.0	73
28-Mar	50	53	62	62	68	77	76	70	62	52	47	44	42	41	40	39	36	38	38	39	39	39	38	39	49.5	77
29-Mar	41	42	53	55	58	72	76	76	75	75	73	73	73	72	71	68	64	61	59	60	61	62	65	66	64.6	76
30-Mar	70	74	78	88	89	88	89	86	82	63	52	52	49	43	40	43	49	49	54	61	59	56	55	56	63.6	89
31-Mar	56	57	61	70	69	70	72	73	75	70	66	64	63	64	61	60	61	62	63	62	60	64	68	69	65.0	75
	68.6	70.2	71.8	73.6	74.4	76.2	76.5	75.9	74.0	69.9	65.7	62.8	60.0	57.7	55.4	53.9	53.9	54.8	57.3	59.7	61.8	64.4	65.9	67.2	Diurnal Average	
	92	91	91	92	89	89	89	89	87	85	85	85	84	84	85	86	86	85	86	85	85	87	91	92	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 20m (RH20m) - %

Mannix - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	50	6.73	6.73
40 - 60	191	25.71	32.44
60 - 80	376	50.61	83.04
80 - 100	126	16.96	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 45m (RH45m) - %

Mannix - March 2023

Maximum Value: 91 % on Mar 2 04:00

Maximum Daily Average: 86.6 % on Mar 14

Minimum Value: 24 % on Mar 17 20:00

Minimum Daily Average: 39.5 % on Mar 18

Maximum Diurnal Average: 75.5 % at hour 7

Minimum Diurnal Average: 54.1 % at hour 17

Monthly Average: 65.1 %

Percentiles: $P_1 = 30$ $P_{10} = 42$ $Q_1 = 56$ Median = 67 $Q_3 = 77$ $P_{90} = 83$ $P_{99} = 89$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Mar	84	81	79	79	79	79	80	79	79	78	76	71	65	61	61	61	64	67	69	71	74	74	75	76	73.3	84
2-Mar	81	88	89	91	89	88	85	85	82	80	73	61	61	58	58	56	60	68	70	74	78	79	76	69	74.9	91
3-Mar	65	76	80	79	78	75	74	75	75	73	71	69	69	67	66	64	63	68	80	83	85	83	76	75	73.7	85
4-Mar	73	72	73	76	78	82	82	76	76	75	71	68	67	58	57	54	58	61	67	66	69	70	72	74	69.9	82
5-Mar	75	75	78	79	78	78	73	75	73	70	64	59	57	57	53	52	53	52	51	51	53	56	59	DF	63.8	79
6-Mar	61	63	65	68	70	74	75	73	71	69	63	60	59	61	63	73	77	71	67	73	73	74	74	77	68.9	77
7-Mar	82	80	79	78	77	77	77	80	82	76	74	73	69	62	56	51	46	47	46	47	47	46	44	43	64.1	82
8-Mar	43	44	46	49	52	52	54	56	56	53	49	47	41	37	35	34	32	34	38	40	43	43	46	49	44.7	56
9-Mar	50	51	54	56	58	61	62	64	65	59	52	46	44	46	46	44	44	47	50	50	56	62	57	63	53.6	65
10-Mar	70	80	83	82	78	77	76	76	74	70	65	68	67	64	63	60	61	65	68	65	63	64	68	67	69.7	83
11-Mar	63	62	59	61	61	65	69	71	70	66	61	59	57	57	57	58	60	64	79	84	85	87	87	89	67.9	89
12-Mar	89	87	86	86	85	83	83	82	82	80	78	76	76	77	78	76	77	79	83	83	83	85	84	85	81.7	89
13-Mar	85	85	84	84	83	83	83	82	82	83	84	85	81	74	68	66	65	64	65	66	68	80	89	90	78.4	90
14-Mar	90	89	89	89	88	88	87	88	87	85	86	86	85	85	85	86	86	86	87	86	86	86	84	85	86.6	90
15-Mar	86	86	85	85	85	85	84	84	83	83	83	77	73	72	70	68	68	70	73	76	78	80	86	88	79.5	88
16-Mar	82	78	76	78	76	78	80	79	79	79	76	72	70	68	68	67	66	65	66	69	73	76	79	83	74.2	83
17-Mar	85	83	81	84	87	87	81	79	79	73	67	61	56	51	48	43	37	30	25	24	26	29	32	30	57.5	87
18-Mar	32	32	34	36	38	43	49	54	55	54	48	42	37	34	30	29	28	27	32	37	39	42	46	51	39.5	55
19-Mar	63	62	64	70	71	77	79	78	77	73	67	64	62	61	58	57	59	62	66	70	73	75	75	73	68.1	79
20-Mar	70	67	63	62	62	65	65	65	68	77	80	78	79	73	65	62	59	56	54	55	57	61	64	69	65.6	80
21-Mar	72	74	77	78	79	79	83	84	83	81	79	74	65	63	58	56	55	56	57	59	61	65	72	77	70.3	84
22-Mar	79	81	81	81	82	80	78	79	76	69	59	53	50	46	44	42	41	42	42	43	47	49	54	57	60.7	82
23-Mar	55	59	56	57	61	66	70	71	67	59	50	56	57	60	63	61	62	65	67	70	73	77	75	73	63.9	77
24-Mar	73	74	73	75	78	78	80	78	75	72	68	61	56	52	47	40	39	42	38	40	44	47	48	45	59.3	80
25-Mar	48	48	55	62	66	74	83	81	77	75	59	49	38	39	37	34	31	32	40	53	60	63	67	71	55.9	83
26-Mar	73	75	73	77	80	76	73	72	67	62	62	60	56	53	46	38	36	36	39	43	49	52	55	58	58.8	80
27-Mar	61	63	66	69	72	71	70	71	69	62	54	49	43	40	39	39	41	39	41	41	42	45	45	46	53.1	72
28-Mar	48	51	58	57	64	70	74	64	61	53	47	43	42	40	40	39	36	36	36	37	36	36	36	36	47.6	74
29-Mar	39	40	47	51	57	74	76	75	75	76	74	74	74	73	72	68	64	62	59	60	61	62	65	65	64.2	76
30-Mar	67	68	73	79	85	88	86	87	83	63	52	54	50	44	41	44	50	49	54	60	59	56	54	56	62.5	88
31-Mar	56	57	61	70	69	70	72	74	75	70	67	65	64	64	62	61	60	60	60	60	59	65	68	70	64.9	75
	67.7	68.7	70.0	71.9	73.1	75.0	75.5	75.3	74.3	70.9	66.4	63.3	60.2	58.0	55.8	54.3	54.1	54.9	57.0	59.2	61.3	63.5	64.9	66.3	Diurnal Average	
	90	89	89	91	89	88	87	88	87	85	86	86	85	85	85	86	86	86	87	86	86	87	89	90	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 45m (RH45m) - %

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity 45m (RH45m) - %

Mannix - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	58	7.81	7.81
40 - 60	193	25.98	33.78
60 - 80	371	49.93	83.71
80 - 100	121	16.29	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 75m (RH75m) - %

Mannix - March 2023

Maximum Value: 92 % on Mar 2 04:00

Maximum Daily Average: 88.0 % on Mar 14

Minimum Value: 24 % on Mar 17 20:00

Minimum Daily Average: 38.1 % on Mar 18

Maximum Diurnal Average: 74.8 % at hour 8

Minimum Diurnal Average: 54.9 % at hour 17

Monthly Average: 65.5 %

Percentiles: P_1 = 29 P_{10} = 42 Q_1 = 55 Median = 67 Q_3 = 78 P_{90} = 84 P_{99} = 90

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	81	79	77	78	79	79	79	79	79	79	77	73	66	63	62	62	65	68	70	72	75	75	75	76	73.7	81
2-Mar	82	90	90	92	90	90	86	86	83	81	73	62	62	59	58	57	60	68	71	75	78	80	76	69	75.8	92
3-Mar	66	77	82	81	80	77	75	77	77	74	72	71	70	69	68	65	65	70	81	85	87	84	77	76	75.2	87
4-Mar	75	74	74	77	79	82	83	77	78	77	72	70	68	60	58	55	60	63	68	67	70	72	73	75	71.1	83
5-Mar	76	76	79	79	79	78	73	73	69	71	65	60	58	58	55	52	53	52	52	51	52	54	56	DF	64.0	79
6-Mar	60	60	62	64	65	69	71	71	69	68	64	60	60	64	65	75	78	72	69	74	74	75	75	77	68.3	78
7-Mar	82	80	81	79	79	78	78	82	83	77	75	75	70	63	57	52	47	48	47	47	48	46	45	43	65.1	83
8-Mar	44	44	46	49	52	53	54	56	57	54	50	49	41	37	36	35	33	35	39	40	43	43	47	50	45.3	57
9-Mar	50	51	53	55	57	60	62	64	64	60	53	47	45	48	47	45	45	48	50	51	57	63	58	64	54.1	64
10-Mar	71	81	84	83	80	79	77	77	76	71	67	70	69	65	64	61	62	66	69	66	64	66	69	68	71.1	84
11-Mar	64	62	59	62	62	66	70	72	71	67	62	60	59	59	58	59	61	65	81	85	87	89	89	89	69.1	89
12-Mar	89	89	89	88	87	85	84	83	83	82	79	77	78	79	79	77	79	81	84	84	84	86	85	86	83.3	89
13-Mar	86	86	85	84	84	83	83	83	83	84	85	86	87	80	70	68	66	66	66	67	69	81	91	92	79.6	92
14-Mar	91	90	91	90	89	89	88	89	88	87	88	88	87	86	87	88	88	88	88	88	87	87	86	87	88.0	91
15-Mar	87	86	86	86	85	85	85	84	84	84	84	85	82	74	71	70	70	71	75	76	78	80	84	87	80.7	87
16-Mar	81	79	77	79	77	79	81	80	80	80	77	73	70	68	68	67	66	65	66	69	73	76	79	83	74.8	83
17-Mar	85	81	79	81	87	83	78	75	74	72	67	61	56	51	48	41	35	28	25	24	25	27	29	30	55.9	87
18-Mar	31	31	33	34	37	40	44	47	49	50	48	43	38	34	31	29	28	27	32	37	37	41	44	49	38.1	50
19-Mar	57	56	60	66	71	76	79	79	77	74	68	65	63	62	59	59	60	63	67	72	74	77	77	74	68.1	79
20-Mar	71	68	64	63	63	66	66	67	69	78	82	81	80	75	66	63	60	58	55	56	58	62	65	70	66.9	82
21-Mar	73	74	80	80	77	78	83	85	85	83	80	75	66	64	59	56	55	56	58	59	61	65	73	78	71.0	85
22-Mar	79	80	79	77	77	76	74	79	76	69	60	54	50	47	44	43	41	42	42	43	46	48	49	50	59.4	80
23-Mar	51	56	54	57	57	57	60	67	65	59	51	58	58	61	64	62	63	66	68	71	74	78	76	74	62.9	78
24-Mar	74	75	74	75	79	79	80	78	76	73	69	63	57	54	47	40	39	42	38	37	43	46	46	42	59.4	80
25-Mar	43	47	55	55	69	81	86	80	79	76	60	50	39	40	38	35	31	33	40	54	61	64	69	73	56.5	86
26-Mar	75	77	75	79	81	74	73	72	67	63	64	61	57	54	47	39	37	37	40	43	49	53	55	57	59.5	81
27-Mar	62	61	60	67	73	76	68	67	67	63	55	50	44	41	40	40	41	40	42	41	41	43	45	46	53.0	76
28-Mar	47	49	56	57	73	65	63	56	56	54	48	44	43	41	40	39	36	36	35	36	35	34	35	36	46.4	73
29-Mar	38	40	47	54	63	76	77	76	77	77	76	75	75	75	73	70	65	63	60	61	63	63	66	65	65.5	77
30-Mar	66	65	67	73	81	86	83	83	80	61	53	55	51	45	42	45	51	50	55	61	60	56	55	57	61.7	86
31-Mar	57	58	62	71	71	71	73	75	76	72	68	66	65	65	63	61	60	59	58	59	60	66	69	71	65.7	76
	67.6	68.5	69.7	71.5	73.6	74.7	74.7	74.8	74.1	71.6	67.5	64.8	61.8	59.3	56.9	55.1	54.9	55.6	57.7	59.8	61.8	63.8	65.1	66.4	Diurnal Average	
	91	90	91	92	90	90	88	89	88	87	88	88	87	86	87	88	88	88	88	88	87	89	91	92	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 75m (RH75m) - %

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity 75m (RH75m) - %

Mannix - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	57	7.67	7.67
40 - 60	191	25.71	33.38
60 - 80	357	48.05	81.43
80 - 100	138	18.57	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 90m (RH90m) - %

Mannix - March 2023

Maximum Value: 95 % on Mar 14 00:00

Maximum Daily Average: 89.9 % on Mar 14

Minimum Value: 24 % on Mar 17 21:00

Minimum Daily Average: 37.9 % on Mar 18

Maximum Diurnal Average: 75.0 % at hour 8

Minimum Diurnal Average: 55.4 % at hour 17

Monthly Average: 65.9 %

Percentiles: $P_1 = 29$ $P_{10} = 42$ $Q_1 = 56$ Median = 68 $Q_3 = 78$ $P_{90} = 85$ $P_{99} = 93$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Mar	80	78	77	78	79	79	80	80	80	80	77	72	67	62	62	63	65	68	70	73	75	75	76	77	73.9	80
2-Mar	83	92	93	95	93	92	88	88	84	82	72	62	63	60	59	57	61	69	71	76	79	81	76	69	76.9	95
3-Mar	66	78	83	82	81	78	76	78	77	75	73	72	71	70	68	66	65	71	82	86	88	85	78	77	76.1	88
4-Mar	75	74	75	78	80	82	83	78	79	77	73	70	69	60	59	56	60	63	69	68	71	72	72	76	71.7	83
5-Mar	76	77	80	80	79	78	73	72	70	72	65	61	58	59	54	53	54	53	53	51	52	54	56	DF	64.3	80
6-Mar	60	59	61	62	64	68	69	70	68	68	65	60	61	64	66	75	79	73	69	75	75	76	75	78	68.3	79
7-Mar	83	81	81	80	79	79	79	82	84	78	75	75	71	64	57	52	47	49	47	48	48	46	45	44	65.6	84
8-Mar	44	45	47	49	52	53	54	57	57	55	51	48	41	38	36	35	33	35	39	40	43	44	47	50	45.6	57
9-Mar	50	51	53	55	57	60	62	64	64	61	54	47	46	48	47	45	46	49	51	51	58	63	59	65	54.3	65
10-Mar	72	82	85	84	81	80	78	78	76	72	68	70	69	66	64	62	63	67	70	66	65	66	70	68	71.7	85
11-Mar	64	62	59	62	62	66	71	73	72	68	63	61	59	59	58	59	62	66	81	87	89	92	91	91	69.9	92
12-Mar	92	92	91	90	89	88	86	85	85	83	80	78	79	79	80	78	80	82	86	86	86	88	87	88	84.9	92
13-Mar	87	87	86	85	85	84	83	83	83	84	85	87	88	80	70	68	66	66	67	68	70	82	94	95	80.6	95
14-Mar	94	93	93	92	91	91	90	90	90	88	89	89	89	89	89	90	89	89	89	89	89	88	88	88	89.9	94
15-Mar	87	87	87	86	86	86	85	85	84	84	85	85	85	81	73	71	71	72	76	76	78	79	84	88	81.7	88
16-Mar	82	79	78	79	78	79	81	81	81	81	77	74	71	69	69	68	67	65	66	69	73	76	80	84	75.3	84
17-Mar	85	82	78	80	85	78	77	75	74	72	67	61	57	51	48	41	34	28	25	25	24	26	29	30	55.4	85
18-Mar	31	31	33	34	37	40	43	47	47	48	47	43	38	34	31	29	28	28	32	36	37	40	43	48	37.9	48
19-Mar	53	57	60	66	72	76	80	80	78	75	69	66	63	63	59	59	60	63	67	72	75	77	77	75	68.4	80
20-Mar	72	68	65	64	63	66	67	67	70	79	82	81	81	76	66	64	61	58	56	56	59	62	65	70	67.5	82
21-Mar	74	73	80	81	77	78	83	85	86	85	81	76	67	65	60	57	56	57	58	60	61	65	74	78	71.6	86
22-Mar	79	80	78	75	75	73	73	79	76	70	61	54	51	48	45	43	42	42	42	43	46	47	47	49	59.1	80
23-Mar	50	54	54	56	56	57	61	66	64	60	52	58	59	62	65	63	64	67	69	72	75	79	76	75	63.0	79
24-Mar	74	76	75	76	79	80	80	78	77	74	70	63	58	54	48	40	39	42	38	36	41	44	44	41	59.6	80
25-Mar	44	47	55	52	62	78	79	79	79	76	60	50	39	40	38	35	31	33	41	55	61	65	69	74	55.9	79
26-Mar	76	78	77	80	82	75	73	73	69	64	65	62	58	55	47	39	37	37	40	43	50	53	55	57	60.1	82
27-Mar	63	63	60	65	70	74	70	65	66	64	55	50	44	41	40	40	42	40	42	42	41	43	45	46	53.0	74
28-Mar	48	48	55	57	73	62	60	55	56	55	48	44	43	41	41	39	37	36	34	36	35	34	35	36	46.2	73
29-Mar	39	40	50	58	68	78	77	76	77	78	77	76	76	75	74	70	66	63	60	62	63	63	66	65	66.7	78
30-Mar	65	64	66	72	80	84	81	79	71	58	53	55	52	46	42	45	51	50	55	62	60	57	55	57	60.9	84
31-Mar	57	59	63	72	71	72	74	75	76	72	69	67	65	65	63	62	60	59	58	59	61	66	70	71	66.1	76
	68.0	68.9	70.3	71.8	73.8	74.6	74.7	75.0	74.3	72.2	68.0	65.1	62.5	60.1	57.4	55.7	55.4	56.1	58.2	60.3	62.2	64.2	65.5	66.9	Diurnal Average	
	94	93	93	95	93	92	90	90	90	88	89	89	89	89	89	90	89	89	89	89	89	92	94	95	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity 90m (RH90m) - %

Mannix - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	53	7.13	7.13
40 - 60	189	25.44	32.57
60 - 80	360	48.45	81.02
80 - 100	141	18.98	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - March 2023

Maximum Speed: 29 km/h on Mar 20 20:00

Maximum Daily Speed Average: 17.8 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 25 06:00

Minimum Daily Speed Average: 1.0 km/h on Mar 5

Maximum Diurnal Speed Average: 5.2 km/h at hour 22

Minimum Diurnal Speed Average: 1.2 km/h at hour 13

Monthly Average Velocity: 3.4 km/h 104.2 deg

Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 7$ Median = 11 $Q_3 = 15$ $P_{90} = 18$ $P_{99} = 22$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE11	SSE10	SSE11	SSE12	SSE11	SSE11	SSE15	SSE16	SE11	SE14	SE12	SE11	SSE11	SE10	SE12	SE14	SE14	SE17	SE17	SE17	SE17	SE16	SE16	SE17	SE13.4	SE17
2-Mar	SE17	SE20	SE20	SE19	SE20	SE18	SE19	SSE18	SSE19	SSE14	SSE9	SW16	SW16	W14	W12	WSW14	W21	W23	W24	W13	WSW12	W13	WNW16	NW20	SSW7.9	W24
3-Mar	NW21	NNW10	NNE14	NNE15	NNE13	NNE11	NNE13	NNE15	NE15	NNE16	NNE9	N9	NNE10	NNE9	N6	NNW10	N7	N8	N8	N7	NNW3	NNE15	NNE19	NNE16	N10.7	NW21
4-Mar	NNE13	NE10	NNE8	N5	NW2	WNW5	NNE9	NNE12	NNE10	N9	NNW10	NW15	NW16	NW17	NW16	NW11	NNW13	N13	NNE12	NNE14	NNE13	N7	N5	NNE15	N9.2	NW17
5-Mar	NNE12	NNE14	N11	NNW6	WNW5	W10	W9	WNW12	WNW6	W3	W7	WNW5	N5	NE2	ESE4	SSE6	SSE9	SSE8	SSE10	SSE10	S10	SSE11	SSE9	DF	SW1.0	NNE14
6-Mar	SSE9	SE9	SSE8	SSE8	SSE8	SSE6	SSE6	SSE8	S5	S6	SSE8	SSE9	SSE7	SSE7	SSE8	SE11	SE15	SE14	SE14	SE16	SE19	SE19	SE17	SE14	SE10.2	SE19
7-Mar	SE15	SE15	SE16	SE18	SE17	SE16	SE14	SE16	SE17	SE19	SE17	SE17	SE15	SE16	SE19	SE20	SE19	ESE16	SE16	SE21	SE22	SE22	SE23	SE22	SE17.8	SE23
8-Mar	SE21	SE18	SE15	SE16	SE15	SE13	SE13	SE10	SE12	SE10	SE13	SE10	SSE8	SSE10	SE11	ESE12	SE15	SE14	SE13	SE17	SE15	SE18	SE17	SE16	SE13.8	SE21
9-Mar	SE18	SE15	SE10	SE11	SE11	SE12	SE13	SSE12	SE11	SSE9	SSE9	SSE14	SSE17	SE19	SE21	SE21	SE18	SE17	SE18	SE20	SE19	SE20	SE20	SE23	SE15.7	SE23
10-Mar	SE20	SE17	SE17	SE17	SE20	SE21	SE19	SE17	SE16	SE18	SE20	SE19	SE16	SE14	ESE12	ESE12	ESE14	SE13	ESE11	ESE9	SE12	SE13	SE17	SE16	SE15.7	SE21
11-Mar	SE14	SE11	SE11	SE9	SE12	SE10	SE10	SSE10	SE13	SE10	SE7	SSE7	SE8	ESE9	E10	E9	E8	ENE8	NNE12	N15	NNE15	N14	N18	N17	E6.1	N18
12-Mar	N17	N17	N11	NNW10	N11	N11	N11	N10	NNW8	N8	NW9	NW12	NW13	NW12	NW12	NNW10	N11	N12	NNW10	N13	N18	N13	N16	N10	N11.3	N18
13-Mar	NNW9	NNW9	NNW8	NNW9	NNW8	NNW7	NNW7	NNW6	NNW6	NW7	NW9	NW9	NW11	NNW10	N12	N17	ENE11	E10	E13	ENE19	ENE18	NE13	NNE14	NNE16	N7.6	ENE19
14-Mar	N16	N15	N15	N17	N20	N19	N19	N16	NNW14	NNW18	N17	N13	NNW10	NW12	NW12	NNW13	NW15	NNW16	NNW15	NNW13	N12	N9	N9	N10	N13.9	N20
15-Mar	NW6	NW7	NNW6	N5	NNW5	NW7	NW6	NW4	W4	WSW1	WNW6	W6	W6	W7	W6	W6	WNW7	WNW8	WNW6	NNW5	WNW6	NE3	SW3	SE4	WNW4.3	WNW8
16-Mar	SE11	SE12	SE14	SE14	SE15	SE12	SE9	SSE11	SSE8	SSE7	SSE8	SSE9	SSE10	SSE10	SSE12	SSE13	SSE13	SE10	SE9	SSE11	SE14	SE11	SE11	SE13	SE10.9	SE15
17-Mar	SE13	SE15	SSE15	SSE16	SE13	SSE14	SSE16	SSE13	SSE12	SSE13	SSE14	SSE15	SSE11	SE9	SE9	SE8	SE7	SSW2	SSW6	SSW8	SSW10	S8	SSE11	S8	SSE10.6	SSE16
18-Mar	S8	S10	SSE10	SSE12	SSE12	SSE14	SSE12	SSE12	SSE13	SSE8	SE7	SE8	SE5	SE4	ESE3	SE3	S3	NNW2	NNE12	NNE11	NNE9	N11	N10	N7	SE4.2	SSE14
19-Mar	N6	N8	N4	NNE8	SE5	SSE5	SE4	SE4	SE10	SE12	ESE9	ESE10	SE12	SE15	SE15	SE15	SE15	SE15	SE20	SE15	SE15	SE17	SE10	SE12	SE9.2	SE20
20-Mar	SE13	SE18	SE18	SE17	SE17	SE10	E5	NE9	NE11	NE9	ENE7	ESE4	WNW2	N10	N15	N18	N19	N21	N24	N29	N28	N23	N18	NNW7	NE8.6	N29
21-Mar	N11	N8	NW4	NW7	NW7	NNW6	NNW3	WNW5	NNW3	NW1	W4	W3	SSE2	SW2	S3	SSE5	SSE8	SSE10	S8	S9	SSE11	SSE12	SSE15	SSE15	S2.0	SSE15
22-Mar	SSE12	SSE13	SE16	SE16	SE16	SE18	SSE16	SSE12	SSE11	SSE12	SSE13	SSE17	SSE14	SSE13	SSE15	SSE13	SSE10	SSE11	SSE10	SSE11	SE11	SE9	SE11	SE11	SSE12.8	SE18
23-Mar	SE10	SSE4	SSE5	S7	SSE8	SSE13	SSE9	S3	NW4	N12	NNE16	NNE16	NNE16	NNE17	NNE20	NNE20	NNE21	NNE19	NNE19	NNE16	N11	N8	NNW5	N8	NNE7.4	NNE21
24-Mar	N11	N8	N10	NNE10	N5	NNE7	NNE11	NNE9	NNE8	NW8	W6	W6	WNW4	NW5	SSW3	ESE2	SE5	SSE10	SSE9	S9	S9	SSE8	SSE6	SSE9	NNE1.0	N11
25-Mar	SSE8	SSE8	SSE5	S2	ESE1	NNW0	W4	N4	NNW5	NW7	NW11	NNW10	N13	N12	NNE13	NNE16	NNE16	NNE19	N18	N19	N16	N13	N11	NNW14	N7.5	N19
26-Mar	NNE11	N7	NNW9	N7	NNE11	N9	NNE5	NE2	SSW2	W2	W6	W8	WNW8	WNW11	NW13	N12	N13	N15	N20	N21	N18	N15	N12	NNE10	N8.8	N21
27-Mar	NNW4	WNW8	WNW7	NW3	WNW7	WNW3	SW3	S4	SSE5	SSE6	SSE6	SSE7	SE4	SE4	SE6	SE9	SE7	ESE6	E5	NNE3	NNE11	NNE10	ENE11	NE8	ESE1.6	NNE11
28-Mar	NNE7	NE5	NNE5	N4	S1	SSW5	SSE6	SSE7	SSE8	S7	SSE13	SSE16	SSE14	SSE13	SSE14	SE16	SSE16	SSE13	SSE14	SSE12	SSE11	SE9	SSE8	SSE8	SSE8.3	SSE16
29-Mar	S2	WNW2	NW6	WNW5	WNW5	WNW4	W3	W5	NW5	NNW7	NNW6	NNW10	N13	NNE17	NNE17	NNE18	NNE18	NNE17	NNE13	NNE8	NNE7	N5	N6	NW3	N6.8	NNE18
30-Mar	N2	NW1	WNW1	W1	N3	SE1	SSE2	E1	SE2	ENE5	E5	ESE3	ESE4	E5	NE4	E6	ENE6	NE9	ENE10	E13	E12	E10	ESE11	ESE9	E4.3	E13
31-Mar	ESE8	SE11	ESE11	ESE10	SE10	E5	NNE4	NE6	N8	N8	N6	NW9	WNW14	NW14	WNW14	NW13	NW11	NW8	NNW3	ENE4	ESE9	ESE12	ESE12	SE13	NE2.5	NW14
	ESE3.9	ESE4.2	ESE3.9	ESE4.2	SE4.3	SE4.1	SE3.8	SE3.6	ESE3.4	ESE2.8	SE2.3	SSE2.1	SSE1.2	E1.3	E2.0	E3.2	E3.8	ENE3.9	ENE4.0	ENE4.9	E5.1	E5.2	E4.9	E4.4	Diurnal Average	
	SE21	SE20	SE20	SE19	N20	SE21	N19	SSE18	SSE19	SE19	SE20	SE19	SSE17	SE19	SE21	SE21	NNE21	W23	N24	N29	N28	N23	SE23	SE23	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 12:00

Minimum Value: 1 km/h on Mar 30 02:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	113	15.21	15.21
6 - 11	297	39.97	55.18
12 - 19	296	39.84	95.02
20 - 28	36	4.85	99.87
29 - 38	1	0.13	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	11	4	5	2	5	8	11	9	8	5	2	1	9	12	10	11	113
6 - 11	42	24	6	6	6	12	47	70	12	3	0	0	12	11	19	27	297
12 - 19	40	42	1	2	3	7	116	51	0	0	2	3	3	4	14	8	296
20 - 28	7	3	0	0	0	0	21	0	0	0	0	0	3	0	2	0	36
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	101	73	12	10	14	27	195	130	20	8	4	4	27	27	45	46	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 20 m (WS20m) - km/h

Mannix

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - March 2023

Maximum Speed: 38 km/h on Mar 20 20:00

Maximum Daily Speed Average: 21.3 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 25 05:00

Minimum Daily Speed Average: 0.9 km/h on Mar 5

Maximum Diurnal Speed Average: 7.0 km/h at hour 21

Minimum Diurnal Speed Average: 1.2 km/h at hour 13

Monthly Average Velocity: 4.6 km/h 94.9 deg

Percentiles: $P_1 = 2$ $P_{10} = 6$ $Q_1 = 10$ Median = 14 $Q_3 = 19$ $P_{90} = 23$ $P_{99} = 28$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SE15	SE16	SE18	SE21	SE20	SE21	SE23	SE24	SE17	SE19	SE16	SE12	SSE14	SE13	SE14	SE17	SE18	SE22	SE23	SE22	SE22	SE22	SE21	SE22	SE18.8	SE24
2-Mar	SE22	SE25	SE25	SE25	SE25	SE23	SE26	SSE23	SSE25	SSE19	SSE13	SW22	SW21	WSW17	W15	WSW18	W25	W27	W28	WSW17	WSW18	W18	WNW23	NW28	SSW10.6	W28
3-Mar	WNW28	NNW12	NNE18	NNE18	NNE17	NNE14	NNE16	NNE19	NNE19	NNE19	NNE11	NNW11	N12	NNE10	N7	NNW13	N9	N11	N11	N10	NNW4	NNE20	NNE24	NNE20	N13.7	WNW28
4-Mar	NNE17	NE12	NNE10	N6	NW3	WNW7	NNE11	NNE15	NNE12	N11	NW13	NW18	NW20	NW21	NW20	NW13	NNW17	N17	NNE17	NNE19	NNE17	N9	N8	N19	N11.9	WNW21
5-Mar	NNE17	N19	N16	N9	NW7	W14	WNW14	W19	WNW11	WNW4	W7	WNW6	NNW6	NNE3	ESE4	SSE7	SSE10	SE10	SE14	SSE16	SSE18	SSE17	SSE16	DF	WSW0.9	N19
6-Mar	SE14	SE15	SE15	SE11	SE13	SSE11	SE8	SE13	SSE12	SSE10	SSE9	SSE9	SSE8	SE8	SSE10	SE13	SE19	ESE15	SE18	SE20	SE23	SE23	SE22	SE19	SE13.9	SE23
7-Mar	SE18	SE19	SE21	SE23	SE20	SE19	SE18	SE20	SE20	SE22	SE20	SE19	ESE16	SE19	SE22	ESE22	SE22	ESE17	ESE18	SE25	SE28	SE29	SE29	SE28	SE21.3	SE29
8-Mar	SE27	SE24	SE22	SE23	SE21	SE19	SE19	SE14	SE14	SE12	SE15	SE11	SE9	SSE12	SE14	ESE14	SE17	SE16	ESE17	SE21	SE21	SE24	SE23	SE22	SE17.8	SE27
9-Mar	SE24	SE21	SE16	SE17	SE18	SE18	SE21	SE19	SE15	SE11	SSE11	SE16	SE20	SE21	SE24	SE25	SE22	ESE19	SE23	ESE22	ESE21	SE24	SE25	SE28	SE19.9	SE28
10-Mar	SE24	SE21	SE22	SE21	SE24	SE26	SE23	SE21	SE19	SE21	SE22	SE22	SE18	SE17	ESE14	ESE14	ESE16	ESE14	ESE13	ESE11	ESE15	ESE14	ESE19	SE19	SE18.7	SE26
11-Mar	SE17	SE15	SE14	ESE9	SE15	SE14	SE13	SE13	SE15	SE11	SE8	SE7	SE9	ESE10	E11	E10	E10	NE9	N15	N20	N20	N18	N24	N22	E7.6	N24
12-Mar	N21	N24	N16	NNW15	N15	N16	N15	N14	NNW10	N11	NW11	NW14	NW16	NW14	NW14	NNW12	N14	N16	NNW13	N18	N24	N17	N22	N15	N15.1	N24
13-Mar	NNW12	NNW12	NNW12	NNW12	NNW11	NNW10	NNW8	NNW8	NNW7	NW8	NW10	NW11	NW13	NW13	N15	N23	ENE14	E12	ENE16	ENE23	ENE22	NE17	N18	N21	N10.2	ENE23
14-Mar	N23	N21	N21	N24	N28	N25	N27	N22	NNW20	NNW25	N22	N18	NNW12	NW15	NW15	NW17	NW19	NW21	NNW21	NNW19	N17	N14	N14	N15	NNW19.1	N28
15-Mar	NW9	NNW10	NNW9	N8	NNW9	NNW10	NNW7	NNW6	NNW2	W1	WNW6	W6	W6	W7	WNW7	W6	WNW7	WNW9	NW7	N9	NNW6	NE6	SE2	ESE7	NW4.9	NNW10
16-Mar	SE16	SE14	SE18	SE19	SE19	SE15	SE12	SE13	SE9	SSE8	SE9	SSE10	SE11	SE11	SE14	SSE14	SE16	SE13	SE15	SE18	SE20	SE17	SE18	SE20	SE14.4	SE20
17-Mar	SE19	SE21	SE23	SE23	SE22	SE23	SE25	SE21	SSE18	SSE20	SE19	SSE18	SE14	SE12	SE12	SSE12	SSE8	SW7	SW10	SSW13	SSW17	S15	S19	SSW16	SSE15.2	SE25
18-Mar	SSW15	SSW16	S12	SSE14	SSE15	SSE20	SSE19	SSE18	SSE16	SSE11	SE9	SE8	SE6	SE5	SE4	SE4	S4	NNW3	NNE18	NNE17	NNE16	NNE16	NNE15	N12	SE5.1	SSE20
19-Mar	N12	NNE14	N10	NE11	ESE10	SE8	SE6	ESE5	SE13	SE14	ESE11	ESE11	SE14	SE17	SE17	SE18	SE18	SE19	SE24	ESE18	ESE17	SE20	ESE12	ESE14	ESE11.3	SE24
20-Mar	ESE15	SE22	SE21	SE21	SE20	SE13	E7	NE10	NE13	NE11	ENE8	E4	NW2	N13	N20	N23	N25	N28	N33	N38	N37	N31	N25	NNW11	NNE11.9	N38
21-Mar	N16	N12	N7	NW8	NW12	NNW11	NNW7	NW8	NNW5	WNW1	W4	WSW2	S2	SW3	S3	SSE5	SSE8	SSE12	S14	SSE16	SSE17	SSE19	SSE22	SSE22	SSE2.5	SSE22
22-Mar	SSE19	SSE21	SE24	SE24	SE25	SE28	SE24	SE18	SSE14	SSE15	SSE15	SSE19	SSE15	SSE15	SSE17	SSE15	SSE12	SSE13	SSE14	SE17	SE17	SE14	SE17	SE17	SE17.7	SE28
23-Mar	SE18	SSE9	S7	SSW7	SSE12	SSE20	SSE16	SSW5	WNW10	N16	N20	N19	N20	N20	NNE24	NNE25	NNE26	NNE25	N24	N20	N16	N11	N9	N11	NNE8.7	NNE26
24-Mar	N15	N11	N14	NNE16	N7	NNE10	NNE15	N13	N9	NW9	W6	W6	WNW4	NW5	SSW3	SE2	SE6	SSE10	SSE13	SSE15	SSE16	SSE14	SSE10	SSE10	NNE1.4	NNE16
25-Mar	SSE10	SE9	SSE7	S6	WNW0	NNW4	NW4	NNW6	NW6	NW8	NW13	NNW12	N15	N14	N16	N20	NNE20	NNE24	N23	N26	N22	N18	N15	NNW18	N10.0	N26
26-Mar	N15	N10	NNW13	N10	NNE13	NNE11	NE5	NE2	SSW2	W2	W6	W8	WNW9	WNW13	WNW14	N15	N16	N20	N26	N29	N25	N21	N17	NNE14	N11.5	N29
27-Mar	N9	NW9	NW8	N4	WNW5	WNW5	WSW3	S5	S6	SSE6	SE6	SSE8	SSE4	SE5	SE7	SE10	ESE8	ESE6	E6	NNE4	NNE15	NNE14	ENE14	ENE11	ENE2.4	NNE15
28-Mar	NE9	NE7	NNE8	NNE6	E2	SSE6	SSE7	SSE12	SSE11	S10	SSE15	SSE17	SSE16	SSE16	SSE17	SE18	SE19	SSE17	SSE20	SSE18	SE17	SE15	SE13	SE13	SE11.1	SSE20
29-Mar	SE4	WNW3	NNW11	NW10	NW8	NW10	NW5	WNW6	NW7	NNW8	NNW7	NW12	NNW16	NNE21	NNE21	NNE22	NNE23	NNE22	NNE17	NNE12	NNE9	N7	N8	N4	N9.8	NNE23
30-Mar	N4	NNE4	NNE2	NW2	NNW6	NNW2	E1	ESE2	SE2	ENE5	E5	E3	ESE4	ENE5	NNE5	E6	ENE6	NE11	ENE11	E16	E14	E12	ESE13	ESE10	ENE5.2	E16
31-Mar	ESE10	ESE13	ESE12	ESE12	SE11	E7	NE5	NE8	NNE9	N9	N8	NW11	WNW16	WNW17	WNW16	NW15	NW14	NNW10	NNW7	ENE7	E12	ESE14	E14	ESE15	NE3.6	WNW17
	E5.6	E5.9	E5.6	ESE6.1	ESE6.1	ESE5.8	ESE5.7	ESE4.9	ESE4.2	ESE3.5	ESE2.7	SSE2.1	SE1.2	ENE1.6	ENE2.5	ENE3.9	E4.7	ENE5.0	ENE5.5	ENE6.9	E7.0	E7.0	E6.8	E5.9	Diurnal Average	
	WNW28	SE25	SE25	SE25	N28	SE28	N27	SE24	SSE25	NNW25	SE22	SE22	SW21	ESE21	SE24	SE25	NNE26	N28	N33	N38	N37	N31	SE29	SE28	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 45 m (WS45m) - km/h

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 13:00

Minimum Value: 1 km/h on Mar 15 20:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 45 m (WS45m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	64	8.61	8.61
6 - 11	191	25.71	34.32
12 - 19	313	42.13	76.45
20 - 28	168	22.61	99.06
29 - 38	7	0.94	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 45 m (WS45m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	3	6	2	2	5	4	8	2	4	3	1	2	3	7	6	6	64
6 - 11	28	10	9	5	7	12	25	25	4	1	2	0	9	10	19	25	191
12 - 19	43	30	3	3	6	27	93	51	4	5	0	4	4	6	18	16	313
20 - 28	36	15	0	2	0	4	87	9	0	0	2	0	3	3	4	3	168
29 - 38	5	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	7
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	61	14	12	18	47	215	87	12	9	5	6	19	26	47	50	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 45 m (WS45m) - km/h

Mannix

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - March 2023

Maximum Speed: 40 km/h on Mar 20 20:00

Maximum Daily Speed Average: 21.8 km/h on Mar 14

Minimum Speed Value: 1 km/h on Mar 21 10:00

Maximum Diurnal Speed Average: 7.7 km/h at hour 21

Monthly Average Velocity: 4.9 km/h 93.5 deg

Minimum Daily Speed Average: 0.6 km/h on Mar 5

Minimum Diurnal Speed Average: 1.2 km/h at hour 13

Percentiles: $P_1 = 2$ $P_{10} = 6$ $Q_1 = 10$ Median = 15 $Q_3 = 21$ $P_{90} = 26$ $P_{99} = 32$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SE18	SE19	SE21	SE23	SE26	SE25	SE28	SE28	SE23	SE24	SE19	SE13	SSE15	SE12	SE15	SE17	SE18	SE22	SE26	SE22	SE24	SE26	SE25	SE27	SE21.4	SE28
2-Mar	SE27	SE28	SE27	SE29	SE28	SE27	SE30	SSE28	SSE29	SSE24	S17	SW25	SW22	WSW18	W16	WSW20	W27	W30	W31	W21	WSW22	W21	WNW27	NW32	SSW12.6	NW32
3-Mar	WNW31	NNW14	NNE20	NNE21	NNE19	NNE17	NNE18	NNE21	NNE20	NNE22	NNE11	N11	NNE12	NNE10	N8	NNW15	N9	N12	N13	NNE12	N5	NNE22	NNE27	NNE23	N15.2	WNW31
4-Mar	NNE19	NE13	NNE12	N6	NW4	NW7	NNE12	NNE17	NNE14	N12	NNW13	NW18	NW20	NW21	NW21	NW14	NNW19	N19	NNE20	NNE23	NNE19	N12	N12	N22	N13.5	NNE23
5-Mar	NNE22	NNE23	N20	N12	NNW10	WNW13	WNW13	WNW18	NW16	WNW6	WNW7	WNW6	N6	NNE3	ESE4	SSE7	SSE10	SE10	SE14	SSE19	SSE23	SSE22	SSE22	DF	NNW0.6	NNE23
6-Mar	SSE19	SE21	SE17	SE15	SE14	SE12	SE6	SE15	SE19	SE16	SSE11	SSE11	SE9	SE10	SSE11	SE14	SE15	SE12	SE17	SE18	SE24	SE19	SE24	SE21	SE15.3	SE24
7-Mar	SE15	SE20	SE23	SE22	SE16	SE15	SE16	SE18	SE19	SE22	SE20	SE16	SE12	SE15	SE19	SE16	SE17	ESE12	ESE14	SE24	SE26	SE31	SE32	SE32	SE19.5	SE32
8-Mar	SE31	SE27	SE26	SE27	SE25	SE24	SE24	SE17	SE16	SE13	SE15	SE11	SE9	SSE13	SE12	ESE11	SE13	SE14	ESE12	SE20	SE24	SE28	SE27	SE25	SE19.2	SE31
9-Mar	SE29	SE26	SE21	SSE22	SE20	SE17	SE20	SE20	SE16	SE13	SSE13	SE16	SE20	SE17	SE23	SE26	SE22	ESE15	SE23	ESE17	ESE16	SE19	SE24	SE28	SE20.1	SE29
10-Mar	SE25	SE20	SE24	SE18	SE21	SE25	SE22	SE20	SE19	SE21	SE19	SE20	SE17	SE14	ESE11	ESE11	ESE13	ESE11	ESE10	ESE9	ESE11	ESE10	SE13	SE14	SE16.4	SE25
11-Mar	SE17	SE12	SE11	ESE7	SE14	SE15	SE14	SE15	SE14	SE8	SE7	SSE7	SE9	ESE9	E10	E10	E9	NE10	NNE16	N22	NNE23	N21	N25	NNE25	E7.7	N25
12-Mar	N24	N26	N19	N17	N18	N19	N18	N16	N11	N11	NNW11	NNW14	NW15	NNW14	NNW14	NNW12	N14	N17	N16	N21	N25	N20	N24	N18	N16.8	N26
13-Mar	N14	N14	N14	N14	NNW12	N13	N9	N9	NNW8	NNW7	NNW9	NW10	NW13	NNW13	N17	N24	ENE14	E13	ENE18	ENE25	ENE25	NE19	NNE20	NNE23	NNE11.9	ENE25
14-Mar	N24	N24	N25	N27	N31	N28	N29	N25	NNW23	N28	N24	N21	N13	NNW16	NNW18	NNW19	NW22	NNW24	NNW24	N22	N20	N17	N18	N18	N21.8	N31
15-Mar	NNW11	NNW12	N12	N11	N11	N10	N8	N8	NNE3	WNW2	NW5	W6	W6	W7	WNW7	WNW6	WNW7	NW8	NNW6	NNE10	NNE7	NE7	ESE2	SE6	NNW5.4	NNW12
16-Mar	SE16	SE11	SE16	SE22	SE18	SE13	SE15	SE14	SE9	SSE8	SE8	SSE10	SE10	SSE11	SSE14	SSE15	SE19	SE18	SE20	SSE23	SE26	SE22	SE24	SE23	SE15.9	SE26
17-Mar	SE25	SE26	SE27	SE27	SSE26	SE27	SE28	SE28	SSE27	SSE27	SSE26	SSE22	SSE17	SSE16	SSE14	S13	SSW8	WSW11	SW13	SW16	SW22	SW19	SSW22	SW22	SSE18.0	SE28
18-Mar	SW20	SSW20	SSW15	S12	SSW14	S14	S15	SSE16	SSE16	SSE13	SE10	SSE9	SSE7	SSE6	SSE4	SE4	S3	N4	NNE22	NNE22	NNE20	NE19	NE19	NNE13	SE4.2	NNE22
19-Mar	NNE13	NE12	NE8	ENE12	ESE9	SE10	SE5	ESE5	SE12	SE11	ESE9	ESE9	SE13	SE13	SE15	SE13	SE13	SE14	SE24	SE15	ESE13	SE15	ESE10	ESE11	ESE10.4	SE24
20-Mar	ESE12	SE19	SE16	SE17	SE15	SE10	E7	ENE11	NE13	NE11	ENE8	E4	NNW2	NNE14	N22	N25	N27	N30	N35	N40	N39	N33	N27	N16	NNE13.3	N40
21-Mar	N19	N16	N11	NNW10	NNW16	NNW17	NNW11	NNW10	NNW5	WNW1	W3	WSW2	S3	SW3	S4	SSE6	SSE9	SSE13	S16	SSE19	SSE24	SSE26	SSE29	SSE30	SE2.9	SSE30
22-Mar	SSE26	SSE26	SE29	SE29	SE29	SE34	SE29	SE24	SSE19	SSE17	SSE16	SSE20	SSE16	SSE15	SSE17	SSE15	SSE13	SSE15	SSE17	SE20	SE20	SSE18	SE22	SE24	SE21.1	SE34
23-Mar	SSE24	S14	SW7	SW4	SSE7	SSE17	S16	W15	WNW16	N19	NNE22	NNE20	N21	NNE21	NNE27	NNE28	NNE29	NNE28	NNE27	NNE24	N21	N14	N11	N13	NNE10.0	NNE29
24-Mar	N18	N13	N16	NNE20	NNE9	NNE13	NNE19	NNE17	N10	NW8	WNW6	W6	WNW5	NW6	SSW2	SE2	SSE5	SSE10	SSE14	SSE18	SSE19	SSE19	SSE15	S14	NE1.9	NNE20
25-Mar	S12	SSE12	SSE10	WSW4	NW5	NNW9	NNW5	NNW9	NNW7	NW7	NW13	NNW13	N16	N14	NNE17	NNE21	NNE23	NNE26	N26	N28	N25	NNE22	N18	N20	N11.4	N28
26-Mar	NNE17	N14	NNW15	N12	NNE15	NE10	ENE6	E2	S2	W2	WNW6	W8	WNW9	NW13	NW15	N15	N17	N22	N28	N33	N29	N24	NNE19	NNE18	N12.6	N33
27-Mar	N11	NNW9	NNW9	N4	NW3	NW3	W6	SW6	SSW8	S6	SSE6	SSE8	SSE4	SE4	SE7	SE9	ESE7	ESE6	E5	NE5	NNE19	NE17	ENE16	ENE13	ENE2.9	NNE19
28-Mar	ENE7	ENE7	NE8	NNE6	NE3	SE8	SSE13	SE18	SSE15	S11	SSE15	SSE17	SSE16	SSE17	SSE18	SE19	SSE20	SSE20	SSE24	SSE23	SSE23	SSE22	SSE18	SSE16	SSE13.6	SSE24
29-Mar	SSE5	NW5	NNW14	NNW16	NNW13	NNW15	NNW9	NW7	NNW9	NNW8	N7	NNW13	N18	NNE23	NNE23	NNE25	NNE27	NNE25	NNE19	NNE13	NNE11	NNE8	N8	N6	N12.1	NNE27
30-Mar	NNE5	NNE5	NNE4	NW3	NNW7	NNW5	N3	E4	E6	ENE7	E5	E3	ESE4	ENE5	NE5	E6	ENE6	NE12	ENE12	E15	E14	E10	ESE11	ESE9	ENE5.6	E15
31-Mar	ESE8	SE11	ESE10	ESE10	SE9	E7	NE5	NE9	NNE10	NNE10	N8	NNW10	NW16	NW17	WNW16	NW15	NNW15	NNW10	N8	ENE9	ESE11	ESE13	ESE12	ESE11	NE4.0	NW17
	ESE6.2	ESE6.4	E6.0	E6.3	ESE5.8	ESE5.9	ESE6.1	ESE5.7	ESE5.0	ESE4.3	ESE3.1	SSE1.9	SE1.2	ENE1.6	ENE2.5	ENE3.7	ENE4.4	ENE5.1	ENE6.0	ENE7.6	E7.7	E7.3	E7.3	E6.5	Diurnal Average	
	WNW31	SE28	SE29	SE29	N31	SE34	SE30	SE28	SSE29	N28	SSE26	SW25	SW22	NNE23	NNE27	NNE28	NNE29	W30	N35	N40	N39	N33	SE32	NW32	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 75 m (WS75m) - km/h

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Mar 7 21:00

Minimum Value: 0 km/h on Mar 27 05:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 7$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 75 m (WS75m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	57	7.67	7.67
6 - 11	173	23.28	30.96
12 - 19	283	38.09	69.04
20 - 28	201	27.05	96.10
29 - 38	27	3.63	99.73
> 38	2	0.27	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 75 m (WS75m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	4	5	4	1	6	4	4	4	4	1	2	2	2	3	6	5	57
6 - 11	23	10	6	9	8	24	24	19	2	2	2	1	6	9	7	21	173
12 - 19	44	27	8	6	3	12	83	42	10	2	3	1	2	6	10	24	283
20 - 28	33	40	0	2	0	0	80	26	0	3	4	2	3	1	4	3	201
29 - 38	7	1	0	0	0	0	12	3	0	0	0	0	2	1	1	0	27
> 38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Totals	113	83	18	18	17	40	203	94	16	8	11	6	15	20	28	53	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 75 m (WS75m) - km/h

Mannix

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - March 2023

Maximum Speed: 40 km/h on Mar 20 20:00

Maximum Daily Speed Average: 22.9 km/h on Mar 1

Minimum Speed Value: 1 km/h on Mar 24 16:00

Minimum Daily Speed Average: 1.2 km/h on Mar 5

Maximum Diurnal Speed Average: 8.4 km/h at hour 21

Minimum Diurnal Speed Average: 1.2 km/h at hour 13

Monthly Average Velocity: 5.2 km/h 91.4 deg

Percentiles: $P_1 = 2$ $P_{10} = 6$ $Q_1 = 11$ Median = 16 $Q_3 = 22$ $P_{90} = 27$ $P_{99} = 33$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SE19	SE23	SE24	SE24	SE27	SE25	SE29	SE29	SE25	SE27	SE21	SE14	SSE15	SE13	SE15	SE18	SE20	SE24	SE27	SE25	SE27	SE28	SE26	SE28	SE22.9	SE29
2-Mar	SE28	SE29	SE28	SE30	SE29	SE28	SE31	SSE29	SSE30	SSE25	S18	SW25	SW22	WSW19	W16	WSW20	W27	W31	W32	W22	WSW23	W23	WNW29	NW34	SSW13.0	NW34
3-Mar	WNW33	NNW15	NNE20	NNE21	NNE20	NNE17	NNE19	NNE21	NNE20	NNE22	NNE12	N11	N13	NNE10	N8	NNW16	N10	N13	N14	N12	N5	NNE23	NNE27	NNE23	N15.6	WNW33
4-Mar	NNE20	NNE13	NNE13	N7	NW4	NW7	NNE12	NNE18	NNE15	N13	NNW13	NW18	NW20	NW22	NW22	NW14	NNW20	N20	NNE22	NNE25	N20	NNW14	NNW15	N23	N14.3	NNE25
5-Mar	N24	N25	N21	N14	NNW11	WNW13	NW13	NW17	NW17	WNW6	WNW8	WNW5	N6	NNE3	ESE4	SSE7	SSE9	SE10	SE13	SSE19	SSE23	SSE23	SSE24	DF	N1.2	N25
6-Mar	SSE20	SSE22	SSE18	SSE16	SSE15	SE12	SE10	SE18	SE19	SE18	SSE11	SE11	SE10	SE11	SE12	SE14	SE16	ESE15	SE18	SE20	SE25	SE22	SE26	SE22	SE16.6	SE26
7-Mar	SE18	SE22	SE24	SE24	SE19	ESE18	SE18	SE20	SE21	SE23	SE21	SE17	ESE15	ESE18	SE21	ESE20	ESE20	ESE17	ESE19	SE26	SE29	SE33	SE33	SE33	SE21.9	SE33
8-Mar	SE31	SE28	SE27	SE28	SE27	SE25	SE24	SE19	SE18	SE13	SE15	SE12	SE10	SSE12	SE13	ESE14	ESE15	ESE15	ESE15	SE21	SE25	SE29	SE29	SE27	SE20.3	SE31
9-Mar	SE30	SE27	SE23	SE23	SE19	SE16	SE19	SE20	SE16	SE14	SSE13	SE16	SE20	SE21	SE24	SE27	SE23	ESE19	SE25	ESE22	ESE22	ESE23	SE27	SE30	SE21.4	SE30
10-Mar	SE28	SE23	SE26	SE21	SE24	SE27	SE24	SE22	SE20	SE21	SE21	SE21	SE18	SE16	ESE14	ESE14	ESE17	ESE14	ESE13	ESE12	ESE14	ESE14	ESE18	ESE18	SE19.0	SE28
11-Mar	SE19	SE14	ESE13	ESE11	SE14	SE16	SE14	SE15	SE15	SE10	SE7	SE7	SE9	ESE10	E11	E11	E10	NE10	NNE16	N22	NNE24	N22	N25	NNE25	E8.6	NNE25
12-Mar	N25	N26	N20	N18	N19	N20	N19	N17	N11	N11	NNW11	NNW14	NW16	NNW14	NNW14	NNW13	N14	N18	N17	N22	N25	N22	N24	N19	N17.5	N26
13-Mar	N15	N15	N15	N15	N13	N14	N10	N10	NNW8	N7	NNW9	NNW10	NW13	NNW13	N17	N24	ENE16	E14	ENE19	ENE26	ENE25	NE19	NNE21	NNE24	NNE12.7	ENE26
14-Mar	N24	N24	N26	N28	N31	N28	N29	N26	N24	N29	N25	N22	N14	NNW16	NNW20	NNW21	NW23	NNW25	NNW26	N23	N21	N19	N19	N19	N22.6	N31
15-Mar	NNW13	NNW14	N13	N12	N12	N10	N9	N8	NNE4	WNW2	NW6	W6	W6	W7	WNW7	WNW6	WNW7	NW8	N6	NNE11	NNE8	NE7	ESE2	SE8	NNW5.9	NNW14
16-Mar	SE16	ESE13	SE15	SE22	SE19	SE12	SE15	SE13	SE9	SSE8	SE8	SSE9	SE10	SSE11	SSE14	SSE15	SE19	SE19	SSE21	SSE23	SE26	SE23	SE25	SE22	SE16.0	SE26
17-Mar	SE27	SE28	SE26	SE27	SSE27	SSE30	SE30	SE29	SSE30	SSE29	SSE27	SSE23	SSE17	SSE17	SSE15	S13	SW9	WSW13	SW14	SW17	SW24	SW22	SSW22	SW24	SSE18.7	SSE30
18-Mar	SW23	SW21	SSW16	SSW11	SSW14	SSW13	S12	S12	SSE12	SSE12	SE11	SSE9	SSE7	S5	S4	SE4	S3	N5	NNE23	NNE23	NNE21	NE19	NE21	NNE14	SSE3.1	NNE23
19-Mar	NNE13	NE11	ENE7	E13	ESE12	SE11	ESE6	ESE7	SE12	SE11	ESE11	ESE10	SE13	SE14	SE15	ESE14	ESE15	ESE16	SE24	ESE18	ESE17	ESE18	ESE12	ESE14	ESE11.9	SE24
20-Mar	ESE14	SE20	ESE18	SE19	ESE17	ESE11	E7	ENE10	NE12	NE11	ENE8	E4	N3	NNE15	N22	N25	N28	N30	N35	N40	N39	N33	N27	N18	NNE13.6	N40
21-Mar	N20	N19	N14	NNW11	NNW16	NNW20	NNW14	NNW11	NNW6	NW2	W3	WSW2	SSE2	SW3	S3	SSE5	SSE8	SSE13	S16	SSE20	SSE25	SSE28	SSE32	SSE33	SE2.8	SSE33
22-Mar	SSE28	SE28	SE30	SE30	SE31	SE35	SE32	SE26	SE20	SE18	SSE16	SSE19	SSE15	SSE15	SSE16	SSE14	SSE12	SSE15	SSE18	SE21	SE20	SSE19	SSE25	SSE27	SE22.0	SE35
23-Mar	SSE21	S11	WSW8	W3	SSE4	S13	SSW13	W21	WNW18	N20	NNE22	N21	N21	N21	NNE27	NNE29	NNE29	NNE29	NNE28	N25	N22	N16	N12	N14	N11.2	NNE29
24-Mar	N20	N14	N16	NNE21	NNE10	NNE15	NNE21	NNE19	N10	NW8	WNW6	W5	WNW4	NW6	SSW2	SE1	SSE5	SSE10	SSE14	SSE17	SSE20	SSE22	S17	S14	NNE2.2	SSE22
25-Mar	S9	SSE10	SSE11	SW4	NW5	NNW11	NNW8	NNW10	NNW9	NNW6	NW13	NNW13	N16	N14	N17	NNE21	NNE23	NNE26	N26	N28	N26	N22	N19	N20	N12.1	N28
26-Mar	N18	N15	NNW16	N13	N15	ENE10	E6	ESE2	S2	W1	WNW6	W7	WNW9	NW13	NW15	N16	N17	N22	N28	N33	N30	N25	NNE20	NNE18	N12.9	N33
27-Mar	N12	NNW8	NNW9	N6	NW4	NW3	W5	WSW6	SSW8	S6	SSE6	SSE7	SSE4	SE4	SE7	SE9	ESE8	ESE6	E6	NE5	NNE20	NE18	E17	E13	ENE3.2	NNE20
28-Mar	E7	ENE7	NE5	N5	NNE4	SE9	SE14	SE18	SSE15	S12	SSE15	SSE17	SSE16	SSE16	SSE18	SSE19	SSE19	SSE21	SSE25	SSE24	SSE25	SSE24	SSE19	SSE16	SSE14.0	SSE25
29-Mar	S4	NW7	NNW15	NNW18	NNW14	NNW17	NNW12	NNW7	NNW9	NNW8	N7	NNW13	NNW18	NNE23	NNE23	NNE26	NNE27	NNE26	NNE20	NNE14	NNE11	NNE9	N9	NNE7	N13.1	NNE27
30-Mar	NNE6	NNE7	NNE5	NNW3	NNW7	NNW5	NE3	ENE5	ENE8	ENE8	E5	E3	E4	ENE6	NE5	E7	ENE7	NE12	ENE13	E17	E15	ESE14	ESE14	ESE11	ENE6.4	E17
31-Mar	ESE10	ESE13	ESE12	ESE12	ESE10	E8	NE5	NE9	NE10	NNE10	N8	NNW11	NW16	NW17	WNW16	NW15	NNW15	NNW10	N8	E10	ESE14	ESE17	ESE15	ESE13	NE4.6	ESE17
	E6.4	E6.7	E6.2	E6.6	ESE6.2	ESE6.0	ESE6.4	ESE5.8	ESE5.1	ESE4.5	ESE3.3	SE1.9	ESE1.2	ENE1.8	ENE2.6	ENE4.0	ENE4.8	ENE5.5	ENE6.5	ENE8.2	E8.4	E8.0	E7.9	E6.9	Diurnal Average	
	WNW33	SE29	SE30	SE30	SE31	SE35	SE32	SE29	SSE30	N29	SSE27	SW25	SW22	NNE23	NNE27	NNE29	NNE29	W31	N35	N40	N39	N33	SE33	NW34	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 90 m (WS90m) - km/h

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Mar 23 09:00

Minimum Value: 0 km/h on Mar 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:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 90 m (WS90m) - km/h

Mannix - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	54	7.27	7.27
6 - 11	148	19.92	27.19
12 - 19	272	36.61	63.80
20 - 28	222	29.88	93.67
29 - 38	45	6.06	99.73
> 38	2	0.27	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 90 m (WS90m) - km/h

Mannix - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	4	4	5	1	4	3	3	5	6	1	2	1	5	3	5	2	54
6 - 11	19	10	6	9	10	12	20	14	3	2	1	2	4	8	6	22	148
12 - 19	47	16	5	3	6	44	55	37	9	4	2	2	1	3	13	25	272
20 - 28	47	36	1	2	0	5	80	26	0	1	7	2	4	0	4	7	222
29 - 38	8	3	0	0	0	0	22	7	0	0	0	0	2	2	1	0	45
> 38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Totals	127	69	17	15	20	64	180	89	18	8	12	7	16	16	29	56	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 90 m (WS90m) - km/h

Mannix

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Mannix - March 2023

Direction of Maximum Speed: 11 deg on Mar 20 20:00
Direction of Maximum Daily Speed Average: 133.1 deg on Mar 7

Direction of Minimum Speed: 348 deg on Mar 25 06:00

Direction of Minimum Daily Speed Average: 1.0 deg on Mar 5

Monthly Average Direction: 104.2 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	160	158	155	151	156	157	154	152	146	139	141	144	154	136	146	142	134	133	135	131	131	132	135	138	142.9
2-Mar	141	138	138	136	138	141	140	158	158	149	151	219	224	259	267	252	270	265	268	263	256	268	295	311	205.4
3-Mar	305	340	20	18	18	21	21	29	34	22	29	352	15	22	355	342	358	356	352	9	329	16	30	20	10.1
4-Mar	30	45	18	3	309	283	15	30	23	355	327	319	313	309	317	318	344	357	26	19	17	5	358	12	353.6
5-Mar	16	14	6	345	286	268	277	282	288	279	275	294	352	51	114	157	161	148	158	168	169	160	150	DF	235.0
6-Mar	149	145	152	156	163	152	162	162	170	171	164	163	164	159	159	140	132	130	135	136	138	133	135	133	145.4
7-Mar	130	134	137	135	135	132	132	132	133	135	136	134	131	130	131	130	133	120	127	137	132	134	139	138	133.1
8-Mar	138	136	133	134	135	141	145	143	139	146	141	136	149	154	143	121	133	134	128	136	137	136	135	135	137.2
9-Mar	138	137	140	145	145	146	145	149	145	149	162	153	151	131	138	139	137	131	141	132	131	133	134	136	139.6
10-Mar	134	133	136	131	132	135	134	135	134	138	133	135	134	133	120	107	121	125	116	117	132	133	132	134	131.0
11-Mar	137	137	138	133	137	139	138	150	135	131	138	153	131	112	95	92	96	58	12	5	13	11	11	10	93.6
12-Mar	11	8	355	346	357	359	3	360	344	351	326	320	317	323	319	336	360	3	347	358	3	356	6	359	351.0
13-Mar	343	338	335	336	329	335	335	337	327	312	312	309	312	327	358	7	71	89	83	75	68	48	14	12	7.9
14-Mar	7	2	350	3	6	10	6	4	339	344	352	355	335	324	326	328	320	327	333	344	354	356	357	353	349.3
15-Mar	310	324	337	349	328	326	320	312	280	240	290	269	268	264	281	272	282	303	290	334	299	54	227	134	299.9
16-Mar	141	137	137	144	138	145	144	150	151	150	147	155	148	149	147	157	147	144	142	147	140	140	140	145	144.7
17-Mar	137	142	154	156	146	147	152	153	152	152	148	152	147	136	140	145	146	207	192	198	205	171	167	182	155.3
18-Mar	184	172	152	150	155	161	155	152	156	148	141	142	133	135	122	131	177	327	26	23	15	9	6	353	131.9
19-Mar	0	5	3	25	125	161	141	127	138	140	120	123	136	139	139	138	138	136	137	129	127	133	125	125	128.1
20-Mar	131	137	134	135	138	139	95	52	50	54	63	108	297	11	3	5	5	8	10	11	9	10	10	336	38.2
21-Mar	5	5	324	308	320	343	329	285	347	310	274	265	155	229	173	154	160	166	181	176	163	155	153	158	178.9
22-Mar	157	153	143	142	146	143	148	155	157	161	161	165	160	160	163	162	156	158	151	149	140	140	145	143	152.4
23-Mar	143	163	159	180	154	157	162	169	308	6	15	14	14	12	20	21	22	28	17	13	5	0	347	351	24.3
24-Mar	355	349	359	25	350	14	18	14	16	313	279	263	283	310	207	120	146	157	166	169	172	162	148	147	20.6
25-Mar	160	155	149	173	104	348	276	357	340	306	308	330	5	5	17	14	19	16	11	8	11	9	350	344	3.5
26-Mar	14	354	334	1	16	11	16	52	202	278	275	269	298	303	307	353	4	11	9	8	4	9	10	16	354.2
27-Mar	328	283	284	322	283	282	214	170	155	157	150	153	143	131	140	135	130	111	101	18	15	26	64	45	102.6
28-Mar	32	40	29	355	169	199	168	155	161	176	161	157	154	150	154	146	151	153	157	153	147	146	148	149	150.6
29-Mar	169	300	315	303	291	299	271	260	309	342	340	327	350	22	25	23	25	29	29	31	22	355	350	322	2.0
30-Mar	0	316	282	278	353	137	167	101	133	78	92	104	114	83	36	84	71	42	77	90	89	98	106	115	85.4
31-Mar	117	129	117	107	132	91	27	34	9	9	8	323	303	304	302	310	321	325	335	60	103	108	102	131	37.9
Diurnal Average	103.8	110.8	113.2	115.3	126.0	131.5	125.5	124.0	123.6	117.6	129.5	163.5	149.4	88.5	91.4	86.3	91.2	77.0	76.7	78.4	84.9	90.1	90.5	93.2	

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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 95 deg on Mar 31 19:00

Minimum Value: 3 deg on Mar 18 05:00

Percentiles: $P_1 = 5$ $P_{10} = 8$ $Q_1 = 9$ Median = 12 $Q_3 = 18$ $P_{90} = 31$ $P_{99} = 79$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	4	4	6	8	6	8	7	6	12	10	11	13	13	13	15	12	8	7	8	7	8	8	8	7	15
2-Mar	8	7	7	7	8	11	11	10	8	10	15	29	16	28	16	15	14	11	8	10	9	10	10	14	29
3-Mar	13	34	10	10	10	12	11	11	11	13	26	24	15	17	32	16	29	22	26	25	35	10	11	11	35
4-Mar	12	13	18	16	48	21	16	14	15	26	17	13	17	18	10	15	17	16	12	11	11	14	40	10	48
5-Mar	12	11	11	29	14	9	13	6	30	37	27	26	50	76	29	23	9	10	6	6	5	7	7	DF	76
6-Mar	9	9	6	16	10	15	10	16	23	18	16	8	10	11	13	12	8	10	8	8	8	8	7	7	23
7-Mar	8	8	8	8	9	8	8	8	8	8	9	9	11	10	9	11	8	14	14	9	8	8	8	8	14
8-Mar	8	8	8	7	8	9	8	10	10	11	11	16	21	16	19	16	11	11	13	8	9	8	8	8	21
9-Mar	8	8	9	8	6	7	6	6	8	10	16	10	11	9	12	10	10	10	11	10	10	9	8	8	16
10-Mar	9	10	9	8	8	8	9	8	9	10	10	9	11	14	18	16	14	14	16	16	14	9	8	8	18
11-Mar	9	8	9	9	8	9	9	8	9	9	17	20	32	24	16	18	23	26	11	10	10	11	8	8	32
12-Mar	8	9	15	13	16	15	14	15	16	18	19	14	11	15	12	20	13	13	15	15	11	13	11	15	20
13-Mar	12	12	13	12	12	13	13	17	15	9	11	11	11	21	18	9	34	12	13	10	11	20	9	9	34
14-Mar	9	12	11	12	9	9	9	13	13	11	11	14	16	11	13	12	10	11	11	12	12	16	22	14	22
15-Mar	18	18	17	36	28	10	9	19	32	80	17	20	18	13	26	19	9	15	9	20	23	49	40	60	80
16-Mar	10	9	8	9	9	9	12	13	12	12	14	13	13	11	10	8	8	9	8	7	8	9	8	9	14
17-Mar	8	9	5	5	9	8	6	6	7	8	8	8	10	11	11	10	11	64	15	10	6	20	8	7	64
18-Mar	15	9	9	6	3	4	5	6	6	14	16	17	13	18	19	18	37	68	8	8	8	7	5	20	68
19-Mar	14	10	31	12	37	24	34	25	14	12	16	17	11	8	8	9	9	8	8	14	15	10	15	15	37
20-Mar	13	10	9	8	8	11	23	14	10	17	17	28	95	19	13	12	11	10	9	9	9	9	10	26	95
21-Mar	13	27	17	12	10	13	63	20	34	78	18	44	79	66	51	19	14	17	14	8	5	5	7	8	79
22-Mar	8	7	7	7	7	7	11	8	7	7	10	9	9	12	8	8	10	6	6	8	7	8	6	8	12
23-Mar	7	47	34	18	16	13	14	40	54	23	14	13	16	18	15	12	12	12	12	12	15	14	19	12	54
24-Mar	11	12	12	15	36	14	12	15	15	24	27	18	60	45	78	37	25	10	11	9	7	9	8	6	78
25-Mar	12	6	14	28	53	84	34	21	32	14	11	32	20	22	18	12	13	11	10	9	10	11	17	10	84
26-Mar	13	26	14	17	7	7	9	50	67	80	28	18	26	16	31	22	17	12	9	9	12	9	10	7	80
27-Mar	32	8	9	30	6	80	25	17	13	19	15	20	41	41	24	21	25	23	21	79	12	9	13	14	80
28-Mar	9	20	14	21	68	44	18	11	19	21	10	8	14	11	11	10	8	9	8	8	9	8	14	7	68
29-Mar	86	65	12	15	25	26	29	21	24	32	23	17	21	18	14	12	13	13	13	14	16	19	18	21	86
30-Mar	56	27	80	73	57	69	40	64	34	29	20	50	40	38	54	40	31	10	24	11	9	11	11	15	80
31-Mar	16	14	15	16	13	33	18	21	12	12	29	28	10	10	11	11	10	14	95	62	16	16	15	14	95
Diurnal Maximum	86	65	80	73	68	84	63	64	67	80	29	50	95	76	78	40	37	68	95	79	35	49	40	60	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - March 2023

Direction of Maximum Speed: 6 deg on Mar 20 20:00
Direction of Maximum Daily Speed Average: 127.2 deg on Mar 7

Direction of Minimum Speed: 290 deg on Mar 25 05:00

Direction of Minimum Daily Speed Average: 0.9 deg on Mar 5

Monthly Average Direction: 94.9 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	141	132	132	140	142	140	142	140	138	133	134	137	148	132	142	137	128	127	130	125	127	129	131	134	134.7
2-Mar	137	133	133	132	133	137	135	152	154	151	159	214	220	252	261	247	264	260	263	258	253	264	291	306	200.8
3-Mar	300	333	14	14	13	17	17	23	26	17	20	348	10	18	351	339	354	353	350	9	347	12	24	15	5.2
4-Mar	24	36	13	359	312	294	14	24	19	353	325	315	307	304	314	317	342	352	21	15	12	356	358	8	350.2
5-Mar	12	10	2	353	310	274	282	281	296	284	277	295	345	26	107	150	152	136	144	158	162	159	153	DF	250.8
6-Mar	141	136	131	130	135	147	137	141	154	158	163	158	151	141	151	134	127	122	128	130	132	126	129	128	135.9
7-Mar	124	129	132	129	127	125	126	126	127	131	131	127	123	124	124	122	125	115	119	130	126	130	135	134	127.2
8-Mar	135	132	130	131	130	137	142	137	134	141	136	130	143	151	136	114	124	125	120	129	132	132	131	130	132.1
9-Mar	133	133	136	143	145	141	142	142	138	139	156	145	144	124	131	134	131	122	133	123	123	125	128	131	134.0
10-Mar	128	128	133	126	127	129	129	129	129	132	127	129	128	125	112	102	115	118	109	109	122	122	123	125	124.6
11-Mar	130	128	128	120	130	131	131	141	129	125	131	146	127	108	89	88	92	52	9	2	9	7	5	7	84.3
12-Mar	7	4	354	346	357	357	1	358	344	349	325	317	316	322	318	335	357	1	347	358	1	356	2	359	350.0
13-Mar	344	338	337	337	331	340	337	341	329	320	315	311	309	326	356	3	65	81	77	69	62	42	11	9	6.4
14-Mar	3	359	351	360	1	5	2	0	337	342	351	356	339	323	324	325	318	324	329	343	354	355	358	354	347.7
15-Mar	318	329	344	1	341	344	337	327	342	268	294	269	264	260	285	275	285	300	306	5	347	38	144	123	320.4
16-Mar	133	127	130	136	131	135	139	142	143	148	140	150	142	144	143	152	142	139	141	145	136	137	140	141	139.1
17-Mar	134	133	143	144	146	142	134	137	148	153	146	148	145	139	141	154	157	229	221	212	213	190	175	203	155.6
18-Mar	207	196	179	158	167	160	155	151	151	150	137	140	134	143	138	137	174	347	21	20	20	23	23	3	132.9
19-Mar	0	19	11	47	111	140	128	107	130	131	113	118	130	131	132	129	129	128	130	122	119	125	114	115	116.0
20-Mar	122	130	126	127	129	130	84	50	46	49	59	94	318	10	1	2	3	4	6	6	5	5	6	348	31.8
21-Mar	3	4	349	325	318	341	332	307	339	289	267	250	169	223	179	152	155	161	173	163	154	150	148	150	159.6
22-Mar	150	149	132	131	137	135	137	144	151	153	156	159	155	155	157	156	151	152	147	140	137	140	142	138	144.7
23-Mar	144	168	179	200	156	156	160	204	292	6	11	10	9	8	15	16	18	22	11	9	6	1	350	350	19.4
24-Mar	353	350	356	15	358	12	14	11	9	313	278	262	287	305	194	130	144	150	161	162	164	159	156	157	32.0
25-Mar	150	138	148	171	290	343	317	327	324	305	306	328	1	2	11	10	14	12	8	4	7	7	350	343	0.3
26-Mar	11	352	332	359	12	20	35	52	196	274	276	267	296	300	303	351	0	7	4	3	1	5	7	13	353.5
27-Mar	352	310	314	352	297	299	251	189	177	162	146	156	149	130	135	128	121	104	89	26	19	28	65	60	73.6
28-Mar	47	42	28	22	94	166	158	147	154	174	159	153	149	147	148	141	146	150	152	148	144	145	146	145	143.3
29-Mar	141	293	327	323	315	317	321	286	321	340	343	326	345	15	19	18	20	23	23	23	21	2	352	355	359.0
30-Mar	5	17	17	315	342	341	91	116	129	68	79	93	102	72	33	79	66	36	71	83	83	96	102	110	73.9
31-Mar	109	122	109	102	124	84	34	35	14	7	1	321	301	303	298	304	319	327	341	62	98	103	98	122	35.1
	95.7	99.9	98.2	102.2	114.1	119.3	114.2	115.2	117.8	111.7	118.0	152.0	134.2	74.3	77.3	73.8	79.4	65.4	69.2	71.1	79.5	86.8	88.0	87.3	
	Diurnal Average																								

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 45 m (WD45m) - deg

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Mar 25 05:00

Minimum Value: 2 deg on Mar 6 03:00

Percentiles: $P_1 = 3$ $P_{10} = 5$ $Q_1 = 7$ Median = 9 $Q_3 = 14$ $P_{90} = 24$ $P_{99} = 67$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	4	6	6	4	3	4	4	4	9	8	8	10	12	10	12	11	5	6	6	6	7	6	5	5	12
2-Mar	6	5	6	6	6	8	8	8	6	8	19	14	11	24	14	14	12	10	8	9	6	8	8	12	24
3-Mar	11	34	7	7	7	9	8	8	8	10	21	21	11	12	25	12	24	21	22	10	23	7	8	8	34
4-Mar	9	11	13	14	36	17	16	10	10	24	14	11	15	17	9	13	15	14	8	8	8	14	21	7	36
5-Mar	9	8	7	13	15	9	12	3	14	31	23	24	39	59	28	19	8	7	5	5	3	4	4	DF	59
6-Mar	5	5	2	6	4	12	11	6	9	13	13	8	11	12	12	9	6	10	5	7	7	6	5	5	13
7-Mar	5	7	7	6	7	6	6	7	7	7	8	8	10	8	7	9	7	12	11	7	6	6	7	7	12
8-Mar	6	6	5	5	5	7	5	8	9	9	9	12	18	14	17	15	10	11	12	7	6	6	6	5	18
9-Mar	6	6	7	5	3	3	3	3	6	8	12	9	10	8	10	9	8	11	10	10	8	8	7	7	12
10-Mar	7	8	7	6	7	6	7	7	8	8	8	8	9	13	17	13	12	13	14	14	12	9	6	6	17
11-Mar	7	5	7	9	6	7	7	6	6	7	15	19	29	22	15	16	20	24	9	6	8	8	4	4	29
12-Mar	5	4	11	9	11	11	10	13	13	13	16	11	8	12	10	18	10	9	11	11	6	10	6	9	18
13-Mar	8	11	9	10	9	9	9	14	11	9	8	10	9	19	14	5	33	11	11	9	10	18	6	6	33
14-Mar	4	7	7	7	5	5	4	8	10	7	8	9	14	9	10	9	8	8	9	10	8	10	15	11	15
15-Mar	16	14	13	17	14	5	12	22	41	91	14	18	15	11	23	20	10	13	13	14	17	18	41	15	91
16-Mar	7	8	5	7	7	7	9	12	10	12	11	10	12	9	6	6	7	6	6	5	5	6	5	7	12
17-Mar	6	5	3	5	3	4	4	5	5	6	6	6	7	8	8	11	14	34	12	12	3	16	12	4	34
18-Mar	6	7	14	6	5	4	3	3	4	13	9	12	10	11	13	12	32	65	5	5	3	5	4	9	65
19-Mar	4	9	7	21	28	12	17	14	11	11	14	15	9	6	6	8	7	6	6	12	12	9	15	13	28
20-Mar	13	8	8	6	6	10	23	11	8	14	15	37	92	14	8	7	7	6	5	5	5	5	5	17	92
21-Mar	9	17	11	11	6	7	25	12	19	76	18	40	67	59	43	17	16	13	8	7	2	3	5	5	76
22-Mar	5	5	4	4	3	4	7	6	6	5	8	7	8	10	6	6	9	5	4	5	4	5	3	5	10
23-Mar	4	36	25	16	13	9	7	55	33	14	9	10	14	17	13	9	10	9	8	9	11	12	12	10	55
24-Mar	9	9	10	11	28	12	8	12	12	21	25	13	39	32	72	45	25	9	7	6	4	6	6	4	72
25-Mar	12	8	11	7	95	75	26	20	16	10	9	29	17	18	15	9	10	9	7	5	6	7	13	8	95
26-Mar	10	21	11	10	6	12	9	48	66	67	22	15	20	13	30	20	14	8	4	5	8	5	6	5	67
27-Mar	11	8	8	17	8	24	26	19	13	22	15	20	40	37	22	19	23	24	13	47	12	9	13	11	47
28-Mar	10	16	7	9	29	32	16	5	16	12	9	6	11	9	9	8	6	7	5	6	7	5	9	6	32
29-Mar	32	63	6	10	15	12	24	18	19	30	20	15	19	16	10	9	10	10	10	11	11	16	9	18	63
30-Mar	9	10	82	26	34	48	52	27	38	26	17	42	37	31	49	40	28	7	24	9	8	9	9	13	82
31-Mar	14	13	13	14	12	31	12	15	13	9	26	26	7	7	8	9	8	11	34	42	14	14	13	12	42
Diurnal Maximum	32	63	82	26	95	75	52	55	66	91	26	42	92	59	72	45	33	65	34	47	23	18	41	18	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - March 2023

Direction of Maximum Speed: 8 deg on Mar 20 20:00
Direction of Maximum Daily Speed Average: 354.4 deg on Mar 14

Direction of Minimum Speed: 293 deg on Mar 21 10:00

Direction of Minimum Daily Speed Average: 0.6 deg on Mar 5

Monthly Average Direction: 93.5 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	139	133	134	135	137	134	135	136	138	135	134	139	151	137	145	141	133	132	135	132	133	137	137	139	136.4
2-Mar	141	137	137	137	138	141	139	153	158	162	179	216	222	254	263	248	265	261	266	261	255	266	295	308	203.3
3-Mar	303	332	15	17	17	19	21	26	27	19	22	353	13	20	353	345	359	356	355	12	1	16	26	18	8.1
4-Mar	27	36	17	0	318	308	19	26	21	356	332	318	310	307	319	321	346	355	24	18	13	352	350	11	354.4
5-Mar	14	12	5	360	330	284	302	301	307	289	288	298	350	27	108	150	150	135	143	154	160	163	157	DF	348.2
6-Mar	149	146	145	143	146	142	127	137	139	145	158	148	139	135	147	137	129	125	132	132	135	129	134	134	138.6
7-Mar	128	135	136	132	129	128	130	129	131	136	135	130	126	127	129	124	127	117	120	132	131	135	137	138	131.3
8-Mar	138	138	136	136	135	142	144	140	138	144	140	133	145	153	138	118	126	126	121	131	135	137	136	135	136.5
9-Mar	137	138	142	147	143	138	142	142	139	142	152	144	146	128	136	138	134	123	135	123	123	127	132	135	136.9
10-Mar	133	132	136	130	131	133	132	133	133	135	131	132	132	128	115	106	119	119	112	111	123	122	124	126	128.3
11-Mar	132	130	127	120	131	133	133	141	133	130	133	148	130	108	91	90	94	56	13	7	14	11	10	12	80.6
12-Mar	10	6	0	353	2	2	5	4	351	353	335	327	324	332	329	342	360	5	353	3	5	3	6	4	356.5
13-Mar	355	350	350	350	347	356	352	353	343	346	331	326	317	335	1	8	67	82	78	71	66	46	16	15	15.4
14-Mar	10	5	360	6	6	10	7	6	346	352	358	360	349	333	329	331	324	330	336	350	1	3	5	1	354.4
15-Mar	333	338	355	7	357	1	359	352	24	289	306	276	270	261	294	288	296	317	344	20	12	48	111	130	340.4
16-Mar	133	126	132	137	133	134	141	142	144	154	143	152	145	148	147	154	145	144	146	149	141	142	146	143	142.3
17-Mar	141	134	139	141	149	141	137	140	155	160	152	150	153	151	153	176	205	239	229	223	225	214	195	214	163.3
18-Mar	218	212	204	183	192	185	175	162	159	160	141	148	147	162	160	142	174	6	25	29	32	41	40	24	140.9
19-Mar	20	43	50	78	117	137	127	110	132	130	114	120	133	131	133	128	128	128	133	124	119	125	117	118	117.0
20-Mar	123	132	127	130	128	127	83	60	51	55	62	89	346	14	5	6	7	7	8	8	8	9	10	359	29.2
21-Mar	7	11	4	344	335	340	340	327	345	293	264	247	171	222	184	155	156	162	171	159	156	152	150	152	143.0
22-Mar	150	147	137	138	139	136	136	139	147	149	158	159	158	158	158	156	152	153	149	142	140	147	146	146	145.8
23-Mar	158	174	235	215	155	167	185	261	285	11	14	13	11	13	18	19	21	23	14	12	11	7	357	354	12.9
24-Mar	358	358	1	16	12	15	17	17	9	320	286	265	295	313	196	143	150	151	161	160	162	165	167	170	45.1
25-Mar	169	159	161	250	320	337	339	335	338	322	317	335	4	6	12	14	18	16	11	9	11	12	358	357	3.1
26-Mar	13	358	341	3	13	51	65	93	190	274	282	273	300	304	308	357	4	10	8	7	5	9	13	19	0.1
27-Mar	5	338	333	353	318	324	273	219	202	179	155	165	152	127	139	131	120	104	91	38	31	43	76	78	72.5
28-Mar	77	63	37	20	46	136	149	139	148	172	164	157	151	151	152	146	150	155	155	152	151	152	154	154	147.0
29-Mar	158	321	336	339	335	329	330	316	334	343	352	331	349	18	22	20	22	25	25	26	27	13	1	11	3.0
30-Mar	14	26	30	326	336	345	358	82	80	67	82	87	102	72	42	83	70	39	73	85	87	101	108	115	68.9
31-Mar	115	125	116	105	124	91	49	52	32	18	8	328	308	311	302	308	328	340	4	74	102	105	102	120	35.5
Diurnal Average	102.1	102.3	96.9	97.9	105.6	110.4	110.0	110.4	119.2	114.7	120.1	146.9	127.0	64.8	68.1	65.7	69.1	57.8	66.5	70.0	81.3	90.2	93.6	91.2	

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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 89 deg on Mar 15 10:00

Minimum Value: 2 deg on Mar 22 06:00

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 13$ $P_{90} = 21$ $P_{99} = 58$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	4	3	3	3	2	3	2	3	5	5	7	8	10	10	10	10	6	6	5	7	6	4	4	4	10
2-Mar	5	3	4	4	5	6	6	7	6	6	18	12	9	22	14	13	11	9	8	9	5	8	7	10	22
3-Mar	11	32	5	5	6	7	6	7	6	7	18	18	9	11	26	11	21	18	17	5	22	6	5	6	32
4-Mar	7	10	12	17	30	13	18	8	8	22	13	10	15	17	8	13	13	12	6	5	7	15	18	6	30
5-Mar	6	6	5	6	17	9	14	2	6	22	21	26	43	60	29	15	7	6	6	6	3	2	4	DF	60
6-Mar	3	3	3	4	4	8	13	3	3	8	12	11	11	10	11	9	8	11	6	8	6	8	5	4	13
7-Mar	9	7	6	7	9	9	9	9	8	7	7	10	12	11	8	12	10	13	13	8	7	5	5	5	13
8-Mar	4	5	4	4	4	5	4	6	7	8	9	11	16	11	16	16	12	13	13	8	4	4	4	3	16
9-Mar	3	4	6	3	2	4	3	3	5	6	9	8	10	11	10	8	8	13	9	12	12	10	8	6	13
10-Mar	7	9	7	9	8	7	8	7	7	8	9	8	9	14	17	15	13	14	15	15	13	13	10	10	17
11-Mar	8	8	11	13	7	6	6	5	8	9	16	22	25	21	16	14	20	21	8	5	7	7	3	3	25
12-Mar	4	3	7	7	9	9	8	11	10	12	15	11	9	11	10	15	8	8	8	8	4	7	4	6	15
13-Mar	6	8	7	7	7	6	8	9	9	11	10	13	10	17	12	4	30	10	9	7	9	16	5	5	30
14-Mar	3	4	5	5	3	4	3	6	9	5	5	6	13	9	8	7	6	6	7	7	6	7	10	8	13
15-Mar	12	11	11	10	8	5	12	18	26	89	18	17	17	13	22	20	10	21	18	10	12	18	53	14	89
16-Mar	6	12	6	5	8	9	8	11	10	14	11	10	10	8	6	5	5	4	3	4	3	5	3	6	14
17-Mar	6	3	2	6	3	4	3	5	4	4	3	5	6	5	8	14	16	18	9	12	4	11	13	4	18
18-Mar	4	3	10	7	5	4	5	6	4	11	7	11	12	12	14	9	31	41	4	3	4	5	4	12	41
19-Mar	4	9	10	15	24	9	15	17	11	12	15	15	10	9	8	11	11	11	5	14	14	12	15	13	24
20-Mar	14	8	11	9	9	12	24	9	6	12	14	27	88	12	6	6	5	4	4	4	4	3	4	10	88
21-Mar	6	9	6	9	5	5	12	9	17	58	23	45	51	58	39	15	12	11	6	5	2	2	3	4	58
22-Mar	4	4	2	2	2	2	3	4	5	6	7	6	7	9	5	6	8	5	5	4	3	2	2	4	9
23-Mar	5	27	21	19	18	7	13	14	36	8	7	9	13	15	11	8	8	8	7	7	8	10	10	10	36
24-Mar	9	8	8	8	23	9	6	9	11	19	24	16	34	26	70	58	22	9	5	4	3	6	3	4	70
25-Mar	8	5	11	25	29	17	16	10	13	17	10	27	16	16	13	8	7	8	6	5	5	6	9	7	29
26-Mar	7	16	10	6	5	18	9	42	56	72	28	16	17	13	28	19	11	7	3	3	5	5	6	3	72
27-Mar	7	9	6	17	11	25	9	17	9	23	17	19	33	32	21	17	23	24	15	40	11	9	13	9	40
28-Mar	12	17	5	8	18	26	8	3	13	10	8	6	9	8	8	7	5	6	4	4	4	3	6	6	26
29-Mar	58	37	5	4	12	9	15	16	18	26	18	13	17	15	8	7	8	8	9	9	10	14	5	11	58
30-Mar	10	5	21	18	18	11	25	29	14	15	17	36	36	30	40	37	25	7	22	8	9	12	13	14	40
31-Mar	15	13	14	15	13	22	16	12	11	10	22	23	8	7	8	10	7	13	15	23	15	16	15	15	23
Diurnal Maximum	58	37	21	25	30	26	25	42	56	89	28	45	88	60	70	58	31	41	22	40	22	18	53	15	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 75 m (WD75m) - deg

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 90 m (WD90m) - deg

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 83 deg on Mar 23 05:00

Minimum Value: 1 deg on Mar 1 07:00

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 5$ Median = 8 $Q_3 = 12$ $P_{90} = 19$ $P_{99} = 58$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	4	2	2	3	2	2	1	3	3	3	5	8	10	10	11	10	5	5	4	5	5	4	4	4	11
2-Mar	4	3	4	4	4	6	6	7	6	6	16	11	9	20	14	12	11	8	7	9	5	8	7	9	20
3-Mar	10	30	4	5	5	6	5	6	6	7	17	17	9	11	25	9	19	18	16	4	20	5	5	5	30
4-Mar	7	9	11	15	26	12	19	7	8	20	11	9	14	16	7	12	12	11	4	4	6	13	17	5	26
5-Mar	5	5	5	5	16	8	12	4	5	19	19	23	39	59	32	15	7	5	8	6	3	3	5	DF	59
6-Mar	2	3	2	5	3	11	6	3	3	6	13	11	8	8	12	9	6	8	5	8	6	6	4	4	13
7-Mar	5	6	6	6	8	6	7	7	7	7	8	9	9	8	6	9	8	9	9	7	6	5	5	5	9
8-Mar	4	5	4	4	3	4	3	5	7	8	9	10	17	12	16	13	9	11	9	6	4	4	4	4	17
9-Mar	3	4	5	3	2	4	4	3	4	6	8	9	11	9	10	8	7	11	9	9	8	8	6	7	11
10-Mar	7	8	6	8	7	6	7	7	7	7	8	8	8	12	14	12	10	11	11	11	10	9	5	6	14
11-Mar	6	5	6	9	6	5	5	5	7	8	14	21	23	19	16	14	19	21	9	4	7	8	4	3	23
12-Mar	3	3	6	6	8	8	8	10	10	12	14	11	8	11	10	14	8	7	8	7	4	6	4	5	14
13-Mar	5	6	6	6	5	5	6	8	8	9	10	13	10	16	11	4	30	10	9	7	9	15	5	4	30
14-Mar	3	4	5	5	4	4	3	5	8	4	4	6	11	8	7	6	5	5	7	7	6	6	8	6	11
15-Mar	11	10	10	8	7	4	10	14	21	79	19	16	19	13	20	20	9	22	14	9	10	17	44	12	79
16-Mar	5	9	5	5	7	9	8	12	11	15	11	11	10	8	6	5	5	3	3	3	2	5	3	7	15
17-Mar	7	2	2	5	4	3	3	5	3	3	3	4	7	5	9	15	14	14	8	12	5	9	11	4	15
18-Mar	4	4	8	7	5	4	5	7	5	10	8	10	14	12	16	11	33	38	4	2	3	4	4	12	38
19-Mar	6	12	11	11	21	11	15	12	9	11	12	14	9	9	8	9	10	9	5	11	10	10	12	10	21
20-Mar	11	7	8	8	7	10	24	10	6	12	16	25	73	11	5	6	5	3	4	4	4	3	3	7	73
21-Mar	4	7	5	9	4	5	7	8	15	52	28	42	52	53	40	17	12	10	6	4	2	2	2	3	53
22-Mar	3	4	2	3	2	2	2	3	5	7	7	6	8	9	6	7	8	4	5	4	2	2	2	5	9
23-Mar	4	30	14	34	83	8	19	8	34	7	6	9	12	15	11	7	7	7	6	7	7	9	9	10	83
24-Mar	8	7	8	7	17	8	4	7	10	17	24	15	31	22	76	62	19	8	6	4	3	4	2	4	76
25-Mar	8	6	11	23	42	16	11	8	12	18	10	24	15	15	13	8	6	7	5	4	4	6	8	5	42
26-Mar	5	13	9	6	5	21	15	38	56	72	32	17	16	13	26	18	11	6	3	3	4	4	5	3	72
27-Mar	5	9	7	11	7	11	11	21	8	23	21	20	33	33	22	15	22	22	12	40	11	9	12	8	40
28-Mar	12	10	15	14	18	18	6	3	12	11	8	7	9	9	8	7	6	6	4	3	4	2	6	7	18
29-Mar	63	22	4	3	10	9	14	12	17	24	17	12	17	15	7	7	7	8	8	9	10	12	6	9	63
30-Mar	8	4	8	19	17	13	24	16	7	15	17	38	36	29	35	37	24	7	22	8	8	9	10	12	38
31-Mar	13	11	12	12	12	19	20	10	11	10	19	22	8	7	7	10	7	14	15	21	13	13	13	12	22
Diurnal Maximum	63	30	15	34	83	21	24	38	56	79	32	42	73	59	76	62	33	38	22	40	20	17	44	12	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 90 m (WD90m) - deg

Mannix - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - March 2023

Maximum Value: 1.4 km/h on Mar 20 00:00

Maximum Daily Average: 0.8 km/h on Mar 8

Minimum Value: -1.4 km/h on Mar 20 20:00

Minimum Daily Average: -0.5 km/h on Mar 14

Maximum Diurnal Average: 0.3 km/h at hour 8

Minimum Diurnal Average: 0.1 km/h at hour 21

Monthly Average: 0.19 km/h

Percentiles: P_1 = -0.8 P_{10} = -0.5 Q_1 = -0.2 Median = 0.2 Q_3 = 0.6 P_{90} = 0.8 P_{99} = 1.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.6	0.9	0.7	0.6	0.6	0.6	0.8	0.9	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.8	0.9	0.7	0.6	0.8	0.7	0.7	0.7	0.9
2-Mar	0.8	0.7	0.8	0.8	0.9	0.8	0.9	1.0	1.0	0.9	0.8	0.2	0.0	0.0	0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.3	-0.6	0.3	1.0
3-Mar	-0.5	-0.3	-0.5	-0.4	-0.4	-0.1	-0.3	-0.5	-0.1	-0.4	0.1	-0.2	-0.2	-0.2	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.7	-0.5	-0.5	-0.3	0.1
4-Mar	-0.4	0.1	-0.1	-0.1	0.0	0.0	-0.1	0.1	-0.1	-0.1	0.0	-0.5	-0.3	-0.6	-0.5	-0.3	-0.5	-0.4	-0.2	-0.3	-0.4	-0.2	-0.3	-0.6	-0.2	0.1
5-Mar	-0.3	-0.6	-0.3	-0.1	0.1	0.0	-0.2	-0.2	-0.1	0.0	-0.2	-0.3	0.2	0.3	0.2	0.2	0.3	0.5	0.6	0.3	0.4	0.6	0.5	DF	0.1	0.6
6-Mar	0.5	0.5	0.5	0.3	0.6	0.3	0.2	0.6	0.1	0.2	0.5	0.0	-0.1	0.1	0.3	0.4	0.7	0.9	0.8	0.6	0.6	0.7	0.9	0.7	0.5	0.9
7-Mar	0.5	0.6	0.8	0.7	0.7	0.5	0.5	0.6	0.7	0.8	0.8	0.7	0.7	0.7	0.6	0.9	0.7	1.1	1.0	0.9	0.9	0.8	0.9	0.8	0.7	1.1
8-Mar	0.8	0.9	0.9	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.4	0.5	0.3	0.5	0.9	0.7	0.9	0.9	0.7	0.6	0.8	0.8	0.8	0.8	1.0
9-Mar	0.7	0.9	0.7	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.3	0.7	0.9	0.7	0.7	1.0	0.6	1.0	0.8	1.0	0.6	0.7	0.8	0.7	0.7	1.0
10-Mar	0.7	0.5	0.6	0.5	0.8	0.8	0.8	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.9	0.9	1.2	0.8	0.8	0.8	0.6	0.7	0.5	0.6	0.7	1.2
11-Mar	0.6	0.4	0.6	0.9	0.3	0.6	0.5	0.5	0.5	0.3	0.4	0.2	0.6	0.6	0.3	0.4	0.3	0.3	-0.4	-0.5	-0.7	-0.5	-0.6	-0.7	0.2	0.9
12-Mar	-0.7	-0.6	-0.1	-0.3	-0.3	-0.1	-0.3	-0.3	0.0	0.1	0.2	-0.2	-0.3	0.0	-0.1	0.0	-0.5	-0.4	-0.3	-0.3	-0.9	-0.5	-0.6	-0.3	-0.3	0.2
13-Mar	-0.2	-0.3	-0.1	-0.3	-0.3	-0.3	-0.3	-0.1	-0.1	-0.2	-0.2	0.0	-0.3	-0.2	-0.3	-0.7	0.3	0.5	0.5	0.4	0.4	0.0	-0.7	-0.6	-0.1	0.5
14-Mar	-0.6	-0.5	-0.7	-0.8	-0.8	-0.8	-0.7	-0.7	-0.5	-0.6	-0.7	-0.4	-0.3	-0.5	-0.4	-0.4	-0.4	-0.6	-0.6	-0.6	-0.5	-0.3	-0.3	-0.3	-0.5	-0.3
15-Mar	0.0	-0.2	-0.3	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.1	-0.1	-0.3	-0.5	-0.5	0.1	-0.3	0.0	-0.1	0.0	-0.3	-0.2	0.0	0.0	0.3	-0.1	0.3
16-Mar	0.6	0.7	0.6	0.8	0.6	0.5	0.5	0.5	0.5	0.2	0.4	0.3	0.5	0.5	0.7	0.7	0.8	0.7	0.6	0.6	0.8	0.6	0.7	0.7	0.6	0.8
17-Mar	0.7	0.7	1.0	1.0	0.8	0.7	0.9	0.8	0.5	0.7	1.0	0.8	0.7	0.7	0.6	0.7	0.5	0.1	0.1	0.1	-0.1	0.2	0.4	0.2	0.6	1.0
18-Mar	0.1	0.2	0.3	0.6	0.6	0.8	0.6	0.6	0.7	0.5	0.7	0.4	0.5	0.4	0.3	0.2	0.3	0.0	-0.3	-0.3	-0.4	-0.5	-0.5	-0.3	0.2	0.8
19-Mar	-0.3	-0.3	-0.1	-0.2	0.2	0.3	0.0	0.4	0.7	0.8	0.8	0.8	0.8	1.0	0.7	1.0	0.9	0.9	0.7	1.1	1.2	1.2	1.2	1.4	0.6	1.4
20-Mar	1.1	0.7	0.6	0.5	0.6	0.9	0.6	0.2	0.0	0.2	0.1	0.1	0.1	-0.3	-0.6	-0.9	-0.8	-0.9	-0.7	-1.4	-1.1	-1.0	-0.5	-0.2	-0.1	1.1
21-Mar	-0.5	-0.2	-0.1	-0.1	-0.2	-0.4	0.0	0.0	0.1	0.0	-0.4	-0.1	0.3	0.6	0.5	0.2	0.2	0.4	0.2	0.2	0.6	0.6	0.8	0.9	0.2	0.9
22-Mar	0.7	0.7	0.7	0.7	0.7	0.9	0.7	0.5	0.5	0.3	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.6	0.5	0.6	0.9
23-Mar	0.6	0.2	0.2	0.2	0.3	0.7	0.3	0.1	-0.1	-0.4	-0.4	-0.5	-0.3	-0.7	-0.6	-0.4	-0.6	-0.3	-0.6	-0.6	-0.4	-0.3	-0.2	-0.5	-0.2	0.7
24-Mar	-0.4	-0.2	-0.3	-0.2	-0.1	-0.3	-0.2	0.0	-0.4	-0.2	0.0	-0.4	0.0	0.1	0.1	0.3	0.6	0.6	0.4	0.3	0.3	0.3	0.2	0.4	0.0	0.6
25-Mar	0.3	0.4	0.2	0.1	0.1	0.0	-0.1	-0.1	0.0	-0.3	-0.2	-0.3	-0.4	-0.2	-0.3	-0.5	-0.3	-0.7	-0.9	-0.8	-0.6	-0.5	-0.4	-0.5	-0.2	0.4
26-Mar	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.1	0.2	0.3	0.0	-0.1	-0.4	-0.2	-0.3	-0.3	-0.1	-0.5	-0.6	-0.9	-0.8	-0.6	-0.6	-0.5	-0.4	-0.3	0.3
27-Mar	-0.1	0.0	-0.1	-0.1	-0.3	0.0	0.0	0.4	0.1	0.4	0.2	0.2	0.3	0.4	0.3	0.6	0.7	0.4	0.2	-0.1	-0.4	-0.2	0.2	0.0	0.1	0.7
28-Mar	0.0	0.1	-0.1	-0.1	0.1	0.0	0.2	0.2	0.5	0.6	0.5	0.7	0.8	0.9	1.1	0.7	0.9	0.8	1.0	0.7	0.6	0.4	0.4	0.4	0.5	1.1
29-Mar	0.1	0.0	-0.2	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.2	0.1	-0.2	-0.3	-0.3	-0.5	-0.3	-0.1	-0.3	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	0.1
30-Mar	-0.1	-0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.0	0.1	0.1	0.4	0.1	-0.2	0.4	0.4	0.2	0.7	0.9	0.9	0.2	0.9
31-Mar	0.8	0.8	1.4	0.8	0.9	0.4	0.3	0.1	-0.2	-0.1	0.2	-0.2	-0.4	-0.4	-0.2	-0.4	-0.5	-0.2	0.1	0.3	0.5	0.6	0.8	1.0	0.3	1.4
	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	Diurnal Average	
	1.1	0.9	1.4	1.0	0.9	0.9	0.9	1.0	1.0	0.9	1.0	0.8	0.9	1.0	1.1	1.0	1.2	1.1	1.0	1.1	1.2	1.2	1.2	1.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.1 km/h on Mar 20 21:00

Minimum Value: 0.1 km/h on Mar 30 02:00

Percentiles: P_1 = 0.2 P_{10} = 0.5 Q_1 = 0.9 Median = 1.3 Q_3 = 1.8 P_{90} = 2.1 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.3	0.3	0.4	0.9	0.7	0.7	1.1	1.1	1.3	1.8	1.8	1.4	1.4	1.5	1.4	1.5	1.5	1.7	1.7	1.8	1.9	1.6	1.7	1.7	1.9
2-Mar	1.8	2.0	1.9	2.0	2.1	1.9	2.1	1.6	1.6	1.5	1.1	2.1	1.9	1.6	1.3	1.4	1.8	1.9	1.8	1.1	1.4	0.9	1.8	2.1	2.1
3-Mar	2.1	1.3	1.8	1.8	1.8	1.6	1.6	1.9	2.0	2.0	1.6	1.4	1.7	1.3	1.4	1.7	1.2	1.2	1.1	0.8	0.4	1.8	2.3	2.0	2.3
4-Mar	1.8	1.4	1.3	0.7	0.5	0.5	1.3	1.7	1.5	1.4	1.6	1.7	1.9	2.0	1.8	1.4	1.9	1.7	1.6	1.8	1.5	0.8	0.9	1.7	2.0
5-Mar	1.8	1.8	1.5	0.9	0.4	0.4	0.6	0.5	0.5	0.7	1.1	1.2	1.6	1.4	1.0	1.0	0.7	0.7	0.4	0.6	0.5	0.4	0.6	DF	1.8
6-Mar	0.5	0.6	0.3	0.4	0.4	0.4	0.4	0.4	1.0	1.2	1.2	0.8	0.9	1.0	1.1	1.4	1.7	1.8	1.5	1.7	2.1	2.0	1.9	1.4	2.1
7-Mar	1.6	1.7	1.9	2.0	1.9	1.8	1.6	1.8	1.9	1.9	1.9	1.9	1.8	2.1	2.3	2.5	2.2	2.0	2.3	2.4	2.3	2.2	2.6	2.3	2.6
8-Mar	2.2	1.8	1.7	1.7	1.6	1.6	1.4	1.4	1.5	1.3	1.4	1.3	1.5	1.4	1.5	1.7	1.7	1.7	1.7	1.9	1.7	1.9	1.9	1.7	2.2
9-Mar	2.0	1.8	1.3	1.2	1.0	1.1	1.1	0.9	1.1	1.1	1.2	1.5	1.9	2.3	2.4	2.4	2.2	2.4	2.3	2.7	2.5	2.4	2.3	2.6	2.7
10-Mar	2.3	2.1	1.9	1.8	2.3	2.2	2.2	1.9	1.8	2.1	2.2	2.0	1.9	1.7	1.8	1.8	2.1	1.8	1.5	1.3	1.6	1.6	1.8	1.8	2.3
11-Mar	1.6	1.3	1.3	1.3	1.3	1.4	1.3	0.9	1.5	1.1	1.3	1.2	1.4	1.4	1.5	1.4	1.2	1.1	1.3	1.9	1.8	1.6	2.0	1.8	2.0
12-Mar	1.7	2.1	1.7	1.6	1.7	1.9	1.7	1.6	1.3	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.5	1.6	1.4	2.1	2.2	1.8	2.0	1.5	2.2
13-Mar	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.9	0.9	0.8	1.1	1.2	1.3	1.5	1.8	2.2	1.7	1.2	1.7	2.1	2.2	1.7	1.6	1.7	2.2
14-Mar	1.9	2.0	1.9	2.2	2.6	2.1	2.4	1.9	1.8	2.4	2.1	2.0	1.4	1.5	1.7	1.8	1.7	1.9	1.9	1.8	1.8	1.6	1.7	1.5	2.6
15-Mar	0.9	0.8	0.6	0.6	0.7	0.6	0.4	0.5	0.5	0.8	1.1	1.1	1.0	1.0	1.2	0.7	0.7	0.5	0.2	0.3	0.2	0.3	0.2	0.4	1.2
16-Mar	1.2	1.5	1.5	1.6	1.7	1.3	1.2	1.1	0.9	0.9	1.0	1.1	1.2	1.2	1.2	1.1	1.4	1.1	0.9	0.8	1.4	1.1	1.3	1.1	1.7
17-Mar	1.5	1.6	0.9	0.9	1.3	1.4	1.0	0.9	0.9	1.2	1.5	1.4	1.3	1.1	1.0	1.0	0.6	0.7	0.3	0.4	0.6	0.4	0.5	0.4	1.6
18-Mar	0.5	0.4	0.5	0.6	0.3	0.5	0.5	0.9	0.9	0.9	1.0	0.8	0.8	0.8	0.6	0.5	0.6	0.4	1.1	1.0	0.6	0.5	0.5	0.5	1.1
19-Mar	0.4	0.6	0.4	0.4	0.4	0.4	0.6	0.6	1.3	1.5	1.5	1.5	1.4	1.6	1.5	1.7	1.8	1.8	2.1	2.0	2.1	2.3	1.5	1.9	2.3
20-Mar	1.7	2.1	2.0	1.9	1.8	1.4	0.8	1.1	1.4	1.4	1.1	1.0	1.0	1.7	2.1	2.3	2.4	2.5	2.8	3.1	3.1	2.8	1.9	1.2	3.1
21-Mar	1.1	1.1	0.5	0.5	0.6	0.7	0.5	0.5	0.8	1.0	0.9	1.2	1.3	1.3	1.3	1.1	1.0	1.2	0.9	0.5	0.4	0.7	1.3	1.1	1.3
22-Mar	0.9	1.0	1.4	1.5	1.5	1.8	1.6	1.1	1.0	1.0	1.3	1.5	1.3	1.4	1.2	1.0	0.9	0.7	0.5	0.7	1.1	0.7	0.9	1.1	1.8
23-Mar	0.9	0.6	0.3	0.3	0.6	1.0	0.8	0.5	0.9	1.9	2.1	2.1	2.3	2.3	2.7	2.6	2.7	2.6	2.3	2.1	1.6	1.1	0.7	1.1	2.7
24-Mar	1.5	1.2	1.2	1.3	1.0	0.9	1.4	1.5	1.3	1.1	1.3	1.2	1.6	1.4	1.3	1.0	1.0	0.8	0.7	0.5	0.5	0.3	0.3	0.6	1.6
25-Mar	0.4	0.3	0.3	0.1	0.2	0.2	0.3	0.5	0.9	1.0	1.4	1.8	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.3	1.9	1.7	1.5	1.3	2.3
26-Mar	1.3	1.1	1.1	0.8	1.0	0.7	0.4	0.7	1.2	1.2	1.3	1.4	1.7	1.8	1.9	1.9	1.9	2.0	2.3	2.7	2.5	1.7	1.2	0.8	2.7
27-Mar	0.4	0.2	0.2	0.2	0.5	0.4	0.2	0.7	0.9	1.2	1.4	1.5	1.5	1.4	1.7	1.6	1.3	1.0	0.7	0.5	0.9	0.8	1.2	0.6	1.7
28-Mar	0.4	0.5	0.3	0.2	0.2	0.4	0.4	0.7	1.2	1.7	1.5	1.5	1.6	1.6	1.7	1.6	1.4	1.3	1.2	1.2	1.2	0.9	0.9	0.6	1.7
29-Mar	0.4	0.3	0.4	0.4	0.5	0.8	0.5	0.5	0.8	1.1	1.2	1.5	2.0	2.4	2.3	2.2	2.5	2.4	1.9	1.3	1.0	0.4	0.3	0.3	2.5
30-Mar	0.2	0.1	0.2	0.1	0.3	0.2	0.2	0.3	0.6	1.2	1.2	1.2	1.1	1.3	1.2	1.3	1.0	1.0	1.3	1.4	1.2	1.3	1.6	1.6	1.6
31-Mar	1.3	1.5	1.7	1.4	1.3	0.9	0.7	0.9	1.1	1.3	1.5	1.4	1.5	1.6	1.5	1.4	1.2	0.9	0.6	0.5	1.4	2.1	1.8	1.8	2.1
Diurnal Maximum	2.3	2.1	2.0	2.2	2.6	2.2	2.4	1.9	2.0	2.4	2.2	2.1	2.3	2.4	2.7	2.6	2.7	2.6	2.8	3.1	3.1	2.8	2.6	2.6	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - March 2023

Maximum Value: 2.1 km/h on Mar 20 00:00

Maximum Daily Average: 0.7 km/h on Mar 19

Minimum Value: -0.9 km/h on Mar 20 21:00

Minimum Daily Average: -0.5 km/h on Mar 14

Maximum Diurnal Average: 0.2 km/h at hour 23

Minimum Diurnal Average: 0.0 km/h at hour 12

Monthly Average: 0.15 km/h

Percentiles: P_1 = -0.7 P_{10} = -0.4 Q_1 = -0.2 Median = 0.1 Q_3 = 0.5 P_{90} = 0.7 P_{99} = 1.3

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.5	0.9	0.7	0.6	0.7	0.7	0.7	0.7	0.5	0.6	0.6	0.8	0.6	0.4	0.6	0.5	0.4	0.6	0.7	0.4	0.5	0.8	0.7	0.7	0.6	0.9
2-Mar	0.6	0.6	0.6	0.7	0.5	0.5	0.9	1.1	0.9	0.9	0.9	-0.3	-0.6	-0.3	-0.3	-0.4	-0.6	-0.6	-0.6	-0.4	-0.6	-0.5	-0.8	-0.7	0.1	1.1
3-Mar	-0.6	-0.2	0.0	0.0	0.0	0.3	0.0	-0.1	-0.1	-0.1	0.2	0.0	-0.1	-0.1	0.3	-0.1	0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.3	-0.2	-0.1	0.3
4-Mar	-0.3	0.3	0.0	-0.3	-0.1	-0.2	0.3	0.5	0.3	0.1	0.0	-0.5	-0.2	-0.7	-0.5	-0.4	-0.6	-0.4	0.2	0.0	-0.2	-0.3	-0.3	-0.5	-0.2	0.5
5-Mar	0.1	-0.4	-0.1	-0.1	-0.1	-0.3	-0.5	-0.5	-0.4	-0.2	-0.4	-0.4	0.4	0.3	0.1	0.1	0.0	0.2	0.5	0.2	0.4	0.5	0.5	DF	0.0	0.5
6-Mar	0.5	0.5	0.6	0.3	0.8	0.3	0.2	0.8	0.1	0.1	0.0	-0.3	-0.2	0.2	0.1	0.1	0.2	0.8	0.4	0.3	0.3	0.3	0.6	0.5	0.3	0.8
7-Mar	0.1	0.3	0.5	0.2	0.2	0.1	0.0	0.1	0.3	0.3	0.5	0.1	0.5	0.2	0.2	0.5	0.2	1.1	1.2	0.4	0.4	0.6	0.5	0.6	0.4	1.2
8-Mar	0.6	0.8	0.8	0.8	0.7	0.7	0.8	0.6	0.5	0.6	0.5	0.2	0.3	0.0	0.2	1.3	0.5	1.0	1.3	0.5	0.5	0.6	0.7	0.8	0.6	1.3
9-Mar	0.6	0.7	0.7	0.5	0.4	0.5	0.6	0.3	0.2	0.4	0.0	0.4	0.5	0.3	0.4	0.8	0.4	0.9	0.4	0.6	0.1	0.1	0.3	0.3	0.4	0.9
10-Mar	0.3	0.2	0.3	0.1	0.5	0.4	0.3	0.2	0.4	0.3	0.1	0.2	0.4	0.6	0.9	1.1	1.4	1.1	1.1	1.1	0.5	0.4	0.0	0.1	0.5	1.4
11-Mar	0.4	0.2	0.4	0.7	0.1	0.4	0.4	0.3	0.0	-0.2	0.2	0.3	0.6	0.7	0.4	0.6	0.3	0.5	-0.2	-0.4	-0.3	-0.3	-0.5	-0.5	0.2	0.7
12-Mar	-0.4	-0.3	0.0	-0.3	0.0	0.2	-0.1	-0.2	0.1	0.1	0.8	-0.1	-0.2	0.2	0.0	0.5	-0.4	-0.2	-0.3	0.1	-0.7	-0.2	-0.5	-0.2	-0.1	0.8
13-Mar	-0.4	-0.3	-0.2	-0.4	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4	0.0	-0.1	-0.6	0.3	0.8	1.0	0.7	0.6	0.2	-0.2	-0.4	-0.1	1.0
14-Mar	-0.5	-0.5	-0.8	-0.7	-0.7	-0.6	-0.6	-0.5	-0.7	-0.7	-0.4	0.0	-0.5	-0.7	-0.4	-0.6	-0.5	-0.7	-0.9	-0.7	-0.3	-0.1	0.0	-0.1	-0.5	0.0
15-Mar	-0.1	-0.4	-0.4	-0.4	-0.4	-0.1	-0.3	-0.4	-0.2	0.1	-0.3	-0.4	-0.5	-0.9	0.1	-0.4	-0.3	-0.3	-0.2	-0.1	-0.2	0.0	0.0	0.1	-0.2	0.1
16-Mar	0.5	0.5	0.3	0.7	0.5	0.2	0.3	0.2	0.1	-0.2	0.2	0.2	0.6	0.1	0.4	0.5	0.6	0.5	0.6	0.6	0.8	0.6	0.5	0.4	0.4	0.8
17-Mar	0.8	0.7	0.8	0.7	0.6	0.7	1.1	1.0	0.4	0.8	0.6	0.6	0.5	0.7	0.4	0.6	0.3	-0.2	-0.3	-0.4	-0.5	-0.1	0.2	-0.4	0.4	1.1
18-Mar	-0.5	-0.4	-0.1	0.2	0.0	0.5	0.3	0.5	0.5	0.3	0.7	0.1	0.3	0.1	0.0	0.2	0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	0.1	0.7
19-Mar	-0.4	0.0	-0.1	0.0	0.3	0.3	0.1	0.3	0.5	0.7	1.2	1.6	0.7	0.6	0.3	0.7	0.7	0.8	0.2	1.2	1.4	1.2	1.9	2.1	0.7	2.1
20-Mar	1.5	0.2	0.3	0.2	0.1	1.3	1.0	0.4	0.1	0.2	0.2	0.1	-0.1	-0.2	-0.6	-0.7	-0.6	-0.7	-0.4	-0.8	-0.9	-0.7	0.1	-0.1	0.0	1.5
21-Mar	-0.4	-0.3	-0.2	-0.3	-0.4	-0.6	-0.2	-0.3	0.0	-0.1	-0.4	0.0	0.3	1.0	0.5	0.0	0.0	0.2	0.1	0.1	0.5	0.4	0.7	0.7	0.1	1.0
22-Mar	0.6	0.6	0.8	0.8	0.9	0.9	0.8	0.5	0.4	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.6	0.4	0.5	0.5	0.4	0.9
23-Mar	0.7	0.1	0.0	-0.1	0.4	0.5	0.1	-0.2	-0.3	-0.2	-0.3	-0.3	0.0	-0.2	-0.2	0.2	0.0	0.1	-0.2	-0.5	-0.1	-0.3	-0.1	-0.5	-0.1	0.7
24-Mar	-0.3	-0.1	-0.3	0.0	-0.2	-0.3	0.2	0.2	-0.5	-0.1	-0.1	-0.6	-0.3	0.1	0.3	0.2	0.6	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.0	0.6
25-Mar	0.1	0.3	0.2	0.1	-0.1	-0.1	-0.2	-0.3	0.1	-0.5	-0.3	-0.3	-0.2	0.4	-0.1	-0.3	-0.1	-0.4	-0.4	-0.6	-0.4	-0.3	-0.5	-0.6	-0.2	0.4
26-Mar	0.3	-0.2	-0.3	-0.3	-0.3	-0.2	0.0	0.3	0.6	-0.1	-0.1	-0.8	-0.5	-0.3	0.1	0.2	0.0	-0.2	-0.8	-0.7	-0.5	-0.7	-0.5	-0.1	-0.2	0.6
27-Mar	-0.1	-0.3	-0.3	-0.1	-0.2	-0.1	0.0	0.0	-0.2	0.4	-0.2	-0.1	0.1	0.4	0.1	0.8	0.9	0.5	0.2	-0.1	-0.1	0.1	0.3	0.2	0.1	0.9
28-Mar	0.2	0.1	0.0	0.0	0.0	-0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.7	0.6	1.0	0.7	0.5	0.7	0.8	0.7	0.8	0.6	0.5	0.3	0.4	1.0
29-Mar	0.1	-0.2	-0.4	-0.5	-0.4	-0.4	-0.4	-0.2	-0.1	-0.2	0.2	0.0	-0.1	0.2	0.1	0.2	0.4	0.0	0.0	0.0	-0.1	-0.1	-0.3	-0.2	-0.1	0.4
30-Mar	-0.1	0.0	0.0	0.0	-0.2	-0.1	0.0	0.1	-0.1	0.5	0.1	0.1	-0.2	0.2	0.2	0.5	0.4	-0.1	0.4	0.3	0.0	0.7	1.2	1.5	0.2	1.5
31-Mar	1.3	0.9	2.1	1.2	1.2	0.6	0.4	0.4	0.1	0.0	0.4	-0.4	-0.7	-0.5	-0.4	-0.4	-0.7	-0.3	-0.1	0.5	0.8	0.3	1.0	1.3	0.4	2.1
	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	Diurnal Average	
	1.5	0.9	2.1	1.2	1.2	1.3	1.1	1.1	0.9	0.9	1.2	1.6	0.7	1.0	1.0	1.3	1.4	1.1	1.3	1.2	1.4	1.2	1.9	2.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.1 km/h on Mar 9 20:00

Minimum Value: 0.1 km/h on Mar 30 02:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.9 Median = 1.5 Q_3 = 1.9 P_{90} = 2.3 P_{99} = 2.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.2	0.5	0.7	0.9	0.8	0.9	1.0	1.2	1.5	2.3	2.1	1.8	1.8	1.9	1.9	1.7	1.5	1.9	1.7	1.8	2.0	1.6	1.7	1.7	2.3
2-Mar	1.9	2.1	2.1	2.0	2.2	2.2	2.4	1.8	1.6	1.6	1.3	2.3	2.0	2.0	1.4	1.6	2.0	2.2	2.1	1.2	1.4	1.0	1.9	2.3	2.4
3-Mar	2.3	1.3	1.7	1.8	1.6	1.8	1.6	1.9	1.8	2.1	1.7	1.7	1.8	1.7	1.8	1.9	1.5	1.5	1.1	0.8	0.4	1.7	2.2	2.0	2.3
4-Mar	1.8	1.5	1.5	0.7	0.7	0.4	1.4	2.0	1.8	1.8	2.0	2.2	2.3	2.3	2.2	1.7	1.8	1.9	1.7	1.8	1.6	0.9	1.1	1.8	2.3
5-Mar	1.9	1.9	1.4	0.9	0.5	0.3	0.4	0.3	0.5	0.6	1.3	1.4	2.0	1.8	1.3	1.3	1.0	1.0	0.4	0.3	0.3	0.3	0.3	DF	2.0
6-Mar	0.6	0.7	0.4	0.5	0.4	0.6	0.4	0.5	0.9	1.0	1.2	0.9	0.8	1.2	1.4	1.7	1.8	2.2	1.5	2.1	2.3	2.1	1.8	1.3	2.3
7-Mar	1.5	1.8	2.3	2.1	2.2	1.9	1.7	2.0	2.1	2.5	2.2	2.0	2.3	2.5	2.3	2.9	2.5	2.4	2.8	2.7	2.6	2.2	3.0	2.7	3.0
8-Mar	2.4	2.0	1.8	1.6	1.5	1.7	1.4	1.7	1.9	1.6	1.8	1.6	1.9	1.9	1.9	2.2	1.9	1.9	2.2	2.1	1.9	2.1	2.1	1.7	2.4
9-Mar	2.1	1.8	1.4	1.1	0.6	0.8	0.6	0.6	1.2	1.4	1.3	2.1	2.4	2.5	2.7	3.0	2.6	2.9	2.9	3.1	3.0	2.7	2.6	2.9	3.1
10-Mar	2.8	2.6	2.5	2.0	2.6	2.3	2.5	2.2	2.1	2.4	2.5	2.2	2.3	2.2	2.5	2.1	2.8	2.4	2.1	1.8	2.1	2.1	1.8	1.8	2.8
11-Mar	1.7	1.2	1.3	1.6	1.3	1.6	1.5	1.1	1.5	1.4	1.7	1.7	2.0	1.9	1.8	2.0	1.5	1.4	1.2	1.6	1.7	1.5	1.2	1.1	2.0
12-Mar	1.3	1.4	1.7	1.7	1.8	1.9	1.7	1.6	1.5	1.8	1.9	2.1	2.0	2.1	1.9	2.1	1.6	1.5	1.5	2.2	1.6	1.9	1.5	1.5	2.2
13-Mar	1.1	1.1	1.2	1.2	1.0	0.9	0.8	1.0	0.9	0.8	1.1	1.2	1.4	1.9	1.9	1.6	1.8	1.4	1.9	2.3	2.3	1.6	1.3	1.5	2.3
14-Mar	1.2	1.7	1.7	1.8	2.0	1.6	1.8	1.7	1.9	2.3	1.9	2.0	1.7	1.6	2.0	2.1	1.9	2.1	2.1	2.0	1.7	1.6	1.7	1.7	2.3
15-Mar	1.2	1.1	0.8	0.8	0.7	0.3	0.4	0.6	0.6	1.0	1.0	1.2	1.1	1.0	1.5	0.8	0.5	0.4	0.2	0.3	0.2	0.2	0.2	0.5	1.5
16-Mar	1.3	1.7	1.4	1.9	1.7	1.4	1.5	1.3	1.1	1.2	1.5	1.5	1.6	1.8	1.4	1.3	1.5	1.3	0.8	0.7	1.5	1.0	1.2	0.9	1.9
17-Mar	1.5	1.5	0.8	0.7	0.8	1.0	0.7	0.9	0.7	1.2	1.5	1.5	1.2	1.4	1.0	1.2	0.9	1.0	0.4	0.4	0.3	0.5	0.6	0.5	1.5
18-Mar	0.7	0.6	0.6	0.5	0.4	0.5	0.4	0.6	0.7	0.8	1.2	0.9	0.7	0.7	0.4	0.6	0.7	0.6	1.2	1.1	0.4	0.4	0.3	0.4	1.2
19-Mar	0.4	0.5	0.4	0.5	0.6	0.6	0.7	0.8	1.6	2.0	1.9	2.1	1.9	1.9	1.8	2.1	2.0	2.0	2.1	2.4	2.6	2.8	1.8	2.3	2.8
20-Mar	2.4	2.2	2.3	2.0	1.8	1.8	1.0	1.1	1.4	1.4	1.3	1.2	1.1	1.8	1.8	2.0	2.1	1.9	2.0	2.4	2.5	2.0	1.5	1.5	2.5
21-Mar	1.1	1.2	0.6	0.5	0.6	0.8	0.6	0.5	0.8	0.9	0.9	1.4	1.5	1.6	1.7	1.4	1.2	1.0	0.6	0.3	0.5	0.7	1.3	1.3	1.7
22-Mar	1.2	0.6	1.0	1.1	0.9	1.4	1.4	1.2	1.0	1.0	1.7	1.7	1.6	1.6	1.3	1.2	0.9	0.8	0.5	0.7	0.8	0.6	0.6	0.9	1.7
23-Mar	0.7	0.6	0.6	0.2	0.5	0.9	0.6	0.7	1.0	1.9	2.0	2.3	2.6	2.4	2.7	2.7	2.8	2.5	2.4	2.2	1.9	1.4	1.0	1.3	2.8
24-Mar	1.7	1.3	1.1	1.3	1.2	1.3	1.5	1.6	1.5	1.4	1.6	1.3	1.9	1.7	1.7	1.1	1.5	1.1	0.4	0.3	0.2	0.3	0.3	0.3	1.9
25-Mar	0.3	0.3	0.5	0.2	0.2	0.2	0.3	0.5	1.0	1.1	1.8	2.0	2.3	2.5	2.6	2.3	2.3	2.0	1.9	1.6	1.5	1.6	1.7	1.1	2.6
26-Mar	1.3	1.2	1.4	0.9	1.0	0.6	0.4	0.9	1.4	1.5	1.8	1.8	2.0	2.3	2.5	2.3	2.0	1.9	1.6	2.0	2.4	1.4	1.0	0.8	2.5
27-Mar	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.7	0.8	1.6	1.6	1.9	1.8	1.9	2.2	2.3	1.8	1.4	0.9	0.5	1.1	0.9	1.3	0.8	2.3
28-Mar	0.5	0.5	0.3	0.2	0.2	0.4	0.4	0.7	1.4	1.7	1.9	1.8	2.1	2.0	2.2	2.0	1.5	1.4	1.3	1.2	1.3	0.9	1.1	0.6	2.2
29-Mar	0.6	0.4	0.4	0.7	0.6	0.8	0.8	0.4	1.0	1.3	1.5	1.9	2.3	2.5	2.5	2.5	2.6	2.5	2.0	1.5	1.3	0.6	0.4	0.4	2.6
30-Mar	0.2	0.1	0.2	0.1	0.3	0.3	0.2	0.2	0.4	1.5	1.5	1.3	1.6	1.6	1.7	1.7	1.4	1.0	1.4	1.5	1.4	1.6	1.8	1.8	1.8
31-Mar	1.7	1.9	2.1	1.9	1.6	1.1	0.8	1.0	1.0	1.3	1.9	1.7	1.5	1.7	1.8	1.5	1.2	1.0	0.5	0.9	2.0	2.7	2.5	2.1	2.7
Diurnal Maximum	2.8	2.6	2.5	2.1	2.6	2.3	2.5	2.2	2.1	2.5	2.5	2.3	2.6	2.5	2.7	3.0	2.8	2.9	2.9	3.1	3.0	2.8	3.0	2.9	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - March 2023

Maximum Value: 2.4 km/h on Mar 31 03:00

Maximum Daily Average: 0.7 km/h on Mar 31

Minimum Value: -0.8 km/h on Mar 7 06:00

Minimum Daily Average: -0.4 km/h on Mar 7

Maximum Diurnal Average: 0.2 km/h at hour 11

Minimum Diurnal Average: 0.0 km/h at hour 4

Monthly Average: 0.13 km/h

Percentiles: P_1 = -0.7 P_{10} = -0.4 Q_1 = -0.1 Median = 0.1 Q_3 = 0.3 P_{90} = 0.6 P_{99} = 1.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	-0.1	-0.1	0.0	0.1	0.0	-0.1	-0.3	-0.2	-0.3	0.0	0.5	0.3	0.0	0.4	0.2	-0.3	-0.5	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	0.5
2-Mar	-0.1	-0.3	-0.3	-0.5	-0.4	-0.3	0.0	0.8	0.7	0.9	1.0	0.0	-0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.2	0.1	0.1	0.4	0.5	0.2	1.0
3-Mar	0.5	0.5	0.1	0.3	0.5	0.5	0.2	0.1	-0.1	0.0	0.3	0.5	0.2	0.1	0.5	0.2	0.7	0.2	0.2	0.3	0.1	0.1	-0.2	0.0	0.2	0.7
4-Mar	-0.2	0.2	0.2	-0.3	0.2	0.2	0.5	0.4	0.4	0.4	0.7	0.0	0.7	0.3	0.1	0.0	-0.2	0.0	0.5	0.3	0.2	0.1	0.2	-0.2	0.2	0.7
5-Mar	0.3	-0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.5	0.3	-0.1	0.0	0.7	0.5	0.4	0.4	-0.1	-0.3	0.1	0.3	0.7	0.7	0.7	DF	0.3	0.7
6-Mar	0.3	0.2	0.2	0.0	0.3	0.0	0.0	0.2	0.0	0.1	0.0	-0.2	0.0	0.0	0.0	-0.4	-0.6	0.2	-0.3	-0.4	-0.5	-0.5	-0.4	-0.3	-0.1	0.3
7-Mar	-0.6	-0.4	-0.2	-0.6	-0.6	-0.8	-0.8	-0.6	-0.5	-0.5	-0.3	-0.5	0.0	-0.4	-0.6	0.1	-0.6	0.6	0.7	-0.5	-0.8	-0.5	-0.5	-0.6	-0.4	0.7
8-Mar	-0.7	-0.2	-0.2	-0.2	-0.2	0.1	0.2	0.0	0.1	0.3	0.0	-0.1	-0.1	0.0	0.0	1.4	0.2	0.7	1.0	-0.4	-0.3	-0.4	-0.3	-0.1	0.0	1.4
9-Mar	-0.3	-0.2	0.2	0.4	0.0	0.1	0.0	-0.2	-0.2	0.1	0.2	0.0	0.1	-0.4	-0.4	-0.2	-0.6	0.2	-0.4	-0.2	-0.5	-0.6	-0.6	-0.7	-0.2	0.4
10-Mar	-0.6	-0.4	-0.7	-0.7	-0.5	-0.7	-0.5	-0.5	-0.6	-0.6	-0.6	-0.7	-0.5	0.0	0.7	0.9	1.2	1.1	0.8	0.9	0.2	0.0	-0.5	-0.5	-0.1	1.2
11-Mar	-0.3	-0.2	-0.1	0.5	-0.4	-0.2	-0.1	0.0	-0.5	-0.6	0.1	0.5	0.7	0.9	0.5	0.5	0.0	0.5	0.1	0.0	0.0	0.0	-0.2	-0.2	0.1	0.9
12-Mar	-0.2	0.1	0.6	0.0	0.6	0.6	0.3	0.6	0.4	0.5	1.6	0.3	0.1	0.6	0.6	1.3	-0.2	0.2	0.1	0.8	-0.6	0.3	-0.3	0.1	0.3	1.6
13-Mar	0.0	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	-0.1	0.2	0.1	0.5	0.2	-0.3	0.3	0.8	0.7	0.3	0.4	0.3	0.1	0.0	0.2	0.8
14-Mar	-0.1	-0.1	-0.3	-0.3	-0.3	-0.2	-0.4	-0.2	-0.1	-0.2	0.1	0.7	-0.1	-0.3	-0.1	0.0	-0.1	-0.2	-0.3	-0.1	0.1	0.5	0.7	0.5	0.0	0.7
15-Mar	0.2	-0.1	-0.1	-0.1	0.0	0.2	0.0	-0.2	0.0	0.2	0.1	0.0	-0.1	-0.8	0.5	-0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.5
16-Mar	-0.1	0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.6	-0.1	0.0	0.5	0.1	0.1	0.2	0.3	0.0	0.2	0.0	-0.1	0.0	0.6
17-Mar	0.2	-0.1	0.0	0.0	0.3	-0.1	-0.1	0.2	0.4	0.9	0.5	0.4	0.5	0.5	0.4	0.5	0.2	0.1	0.1	-0.1	-0.1	0.0	0.2	-0.2	0.2	0.9
18-Mar	-0.2	-0.2	-0.1	0.1	0.0	0.2	0.1	0.4	0.5	0.2	0.3	0.1	0.2	0.2	0.0	0.2	0.2	0.0	0.1	0.1	0.1	0.1	-0.1	0.2	0.1	0.5
19-Mar	0.2	0.2	0.2	-0.1	0.1	0.1	0.2	0.4	0.2	0.6	1.5	1.9	0.3	0.0	-0.6	0.3	-0.1	0.2	-0.6	0.8	0.9	0.8	2.4	2.3	0.5	2.4
20-Mar	1.2	-0.5	-0.4	-0.7	-0.5	1.2	1.2	0.4	0.1	-0.1	0.2	0.0	0.0	0.0	-0.4	-0.6	-0.4	-0.5	-0.2	-0.7	-0.8	-0.5	0.7	0.4	0.0	1.2
21-Mar	-0.1	0.1	-0.1	0.0	0.0	-0.1	0.2	-0.1	0.0	0.1	-0.1	0.1	0.6	1.5	0.4	0.0	0.2	0.3	0.2	0.4	0.5	0.2	0.3	0.3	0.2	1.5
22-Mar	0.3	0.2	-0.4	-0.3	-0.1	-0.3	-0.1	-0.1	0.2	0.1	0.5	0.4	0.0	0.0	0.2	0.1	0.2	0.3	0.2	-0.1	-0.1	0.1	0.1	0.1	0.1	0.5
23-Mar	0.9	0.4	0.1	0.1	0.3	0.4	0.0	0.1	0.2	-0.1	-0.2	-0.3	0.1	0.1	0.1	0.1	0.1	0.2	-0.1	-0.5	0.5	0.0	0.3	-0.1	0.1	0.9
24-Mar	0.2	0.5	0.0	0.3	0.2	-0.3	0.5	0.6	-0.2	0.2	0.0	-0.5	-0.1	0.6	0.7	0.0	0.6	0.2	0.4	0.5	0.6	0.4	0.3	0.2	0.2	0.7
25-Mar	0.2	0.5	0.3	0.1	0.1	0.0	0.1	0.0	0.3	-0.1	0.0	0.3	0.2	1.3	0.1	-0.2	0.0	0.0	-0.1	-0.4	0.1	0.1	0.0	-0.1	0.1	1.3
26-Mar	0.8	-0.1	0.3	0.1	0.0	0.0	0.2	0.4	1.0	0.0	0.2	-0.5	-0.1	0.1	0.9	0.7	0.6	0.0	-0.6	-0.6	-0.2	-0.4	-0.2	0.1	0.1	1.0
27-Mar	0.2	0.1	0.0	0.1	0.0	0.1	0.2	0.1	-0.1	0.3	-0.2	0.0	0.0	0.4	0.2	1.0	0.9	0.7	0.4	0.3	0.2	0.3	0.1	0.1	0.2	1.0
28-Mar	0.1	0.2	0.2	0.1	0.1	0.1	0.3	0.0	0.3	0.2	0.2	0.0	0.5	0.4	0.6	0.2	0.1	0.6	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.7
29-Mar	0.2	0.1	0.0	0.0	0.0	0.0	-0.5	0.1	0.4	0.3	0.5	0.3	0.3	0.6	0.2	0.2	0.4	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.6
30-Mar	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.2	0.0	0.3	0.4	0.4	0.6	-0.1	0.3	-0.1	-0.3	0.5	1.4	2.0	0.3	2.0
31-Mar	1.8	0.7	2.4	1.2	1.5	0.9	0.8	0.8	0.3	0.3	1.0	0.0	-0.2	0.1	0.2	0.2	-0.3	0.1	0.4	0.8	0.7	-0.2	1.0	1.1	0.7	2.4
	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	Diurnal Average	
	1.8	0.7	2.4	1.2	1.5	1.2	1.2	0.8	1.0	0.9	1.6	1.9	0.7	1.5	0.9	1.4	1.2	1.1	1.0	0.9	0.9	0.8	2.4	2.3	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.4 km/h on Mar 10 17:00

Minimum Value: 0.1 km/h on Mar 27 05:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.8 Median = 1.4 Q_3 = 1.9 P_{90} = 2.4 P_{99} = 3.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.4	1.0	0.9	0.9	0.7	1.0	0.9	1.0	1.2	1.8	1.9	1.7	1.7	2.1	2.0	1.9	1.4	1.9	1.6	1.8	1.8	1.4	1.3	1.4	2.1
2-Mar	1.4	1.5	1.8	1.7	1.8	1.8	2.0	1.5	1.4	1.5	1.3	2.2	1.9	2.0	1.6	1.7	2.1	2.4	2.3	1.2	1.3	1.0	1.8	2.2	2.4
3-Mar	2.2	1.4	1.3	1.4	1.5	1.5	1.4	1.7	1.6	2.0	1.9	2.2	2.0	1.9	2.1	2.0	1.7	1.5	1.0	0.7	0.4	1.5	1.7	1.8	2.2
4-Mar	1.4	1.4	1.5	0.9	0.8	0.4	1.5	1.8	1.8	1.7	2.4	2.3	2.5	2.6	2.2	1.7	1.7	1.9	1.5	1.5	1.6	1.0	1.4	1.7	2.6
5-Mar	1.6	1.9	1.3	0.8	0.5	0.3	0.5	0.4	0.6	0.6	1.4	1.6	2.2	2.1	1.4	1.4	0.9	0.9	0.5	0.3	0.3	0.3	0.3	DF	2.2
6-Mar	0.3	0.4	0.2	0.2	0.3	0.6	0.9	0.5	0.6	0.6	1.0	0.8	0.9	1.3	1.4	1.6	1.7	2.4	1.5	2.1	2.2	2.0	1.6	1.1	2.4
7-Mar	1.5	1.7	2.1	2.0	2.1	1.8	1.8	2.0	2.2	2.5	2.3	2.2	2.4	2.6	2.2	3.0	2.4	3.1	3.2	2.6	2.4	2.2	2.6	2.3	3.2
8-Mar	2.0	1.9	1.5	1.3	1.2	1.3	0.9	1.4	1.8	1.5	1.8	1.7	1.9	1.9	2.1	2.9	2.4	2.5	2.9	2.0	1.6	1.9	1.8	1.4	2.9
9-Mar	1.5	1.4	1.0	0.6	0.3	0.7	0.4	0.4	0.7	1.1	1.1	1.9	2.5	2.7	2.8	3.1	2.4	3.2	2.9	3.2	3.3	2.6	2.5	2.9	3.3
10-Mar	2.7	2.7	2.4	1.9	2.4	2.3	2.4	2.1	2.2	2.4	2.4	2.4	2.3	2.4	2.8	3.0	3.4	2.8	2.7	2.4	2.5	2.5	1.9	1.9	3.4
11-Mar	1.7	1.2	1.4	1.8	1.3	1.3	1.3	0.9	1.5	1.4	1.8	1.7	2.2	2.4	2.3	2.6	1.9	1.5	1.0	1.4	1.3	1.2	0.9	0.7	2.6
12-Mar	1.0	1.1	1.6	1.5	1.7	1.7	1.6	1.6	1.6	2.0	2.3	2.2	2.0	2.2	2.0	2.3	1.6	1.3	1.5	2.2	1.3	2.0	1.4	1.4	2.3
13-Mar	1.0	1.0	1.1	1.1	0.8	0.7	0.7	1.0	0.8	0.8	1.1	1.1	1.5	2.0	2.0	1.3	2.3	1.6	2.0	2.3	2.4	1.5	1.1	1.3	2.4
14-Mar	1.0	1.2	1.5	1.4	1.4	1.2	1.0	1.4	1.7	1.6	1.7	1.6	1.8	1.4	1.9	1.8	1.6	1.7	1.7	1.7	1.4	1.4	1.6	1.6	1.9
15-Mar	1.4	1.2	1.0	0.9	0.8	0.5	0.7	0.5	0.6	0.8	0.9	1.3	1.2	1.0	1.5	0.9	0.7	0.5	0.3	0.3	0.2	0.2	0.2	0.7	1.5
16-Mar	1.2	1.8	1.3	1.4	1.4	1.2	1.2	1.1	1.1	1.2	1.6	1.5	1.7	1.6	1.3	1.3	1.1	0.9	0.5	0.4	0.8	0.6	0.7	0.6	1.8
17-Mar	1.0	1.0	0.6	0.7	0.5	0.7	0.7	0.9	0.7	0.8	0.9	1.2	0.9	1.0	1.0	1.4	1.1	1.3	0.6	0.6	0.3	0.7	0.7	0.9	1.4
18-Mar	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.5	0.7	1.0	0.7	0.7	0.5	0.4	0.6	0.6	0.7	0.9	0.5	0.2	0.3	0.3	0.4	1.0
19-Mar	0.4	0.5	0.5	0.8	1.2	0.8	0.9	1.2	1.7	2.2	2.5	2.4	2.3	2.2	1.8	2.4	2.1	2.2	1.8	2.9	3.1	2.9	2.3	2.8	3.1
20-Mar	2.8	2.0	2.4	2.1	1.9	1.9	1.4	1.0	1.2	1.3	1.4	1.2	1.2	1.9	1.7	1.8	1.8	1.6	1.6	2.1	2.2	1.4	1.2	1.5	2.8
21-Mar	0.8	1.2	0.7	0.6	0.4	0.6	0.7	0.4	0.8	0.7	0.6	1.3	1.7	1.9	1.7	1.5	1.4	1.1	0.6	0.3	0.4	0.5	1.1	1.2	1.9
22-Mar	1.1	0.5	0.6	0.6	0.6	0.7	0.9	1.0	0.9	1.0	1.6	1.7	1.7	1.6	1.4	1.3	0.9	0.7	0.5	0.6	0.4	0.3	0.5	0.6	1.7
23-Mar	0.5	0.7	0.6	0.2	0.3	0.5	0.5	0.7	1.1	1.6	2.0	2.2	2.5	2.5	2.6	2.5	2.7	2.4	2.1	2.2	2.1	1.7	1.4	1.5	2.7
24-Mar	1.6	1.6	1.3	1.0	1.6	1.4	1.3	1.4	1.2	1.3	1.6	1.3	2.0	1.8	1.8	1.1	1.6	1.0	0.4	0.2	0.2	0.4	0.3	0.3	2.0
25-Mar	0.5	0.4	0.3	0.2	0.2	0.3	0.2	0.5	1.2	0.9	1.6	2.1	2.5	2.8	2.5	2.2	1.9	2.0	1.6	1.3	1.4	1.5	1.5	0.9	2.8
26-Mar	1.1	1.2	1.4	0.8	0.7	0.6	0.5	0.9	1.5	1.6	2.0	1.7	2.4	2.5	2.8	2.3	2.0	1.6	1.2	1.3	2.1	1.4	0.9	0.7	2.8
27-Mar	0.6	0.3	0.2	0.2	0.1	0.1	0.3	0.4	0.7	1.5	1.4	2.0	2.0	2.0	2.4	2.6	2.1	1.6	1.1	0.7	0.9	0.8	1.3	0.9	2.6
28-Mar	0.5	0.4	0.3	0.2	0.2	0.5	0.4	0.4	1.3	1.6	1.9	1.7	2.1	2.0	2.1	1.7	1.3	1.1	1.0	1.0	0.9	0.6	1.1	0.6	2.1
29-Mar	0.6	0.4	0.3	0.6	0.6	0.7	1.0	0.4	1.1	1.5	1.6	2.2	2.5	2.5	2.3	2.2	2.2	2.3	1.6	1.5	1.5	0.7	0.4	0.5	2.5
30-Mar	0.3	0.2	0.2	0.2	0.3	0.3	0.1	0.4	0.4	1.4	1.5	1.4	1.9	1.8	2.0	2.0	1.8	0.9	1.7	1.6	1.7	2.5	2.8	2.4	2.8
31-Mar	2.2	2.3	2.6	2.6	1.9	1.6	0.8	1.0	1.0	1.3	2.2	1.9	1.6	1.7	1.8	1.6	1.2	0.9	0.6	1.3	3.0	3.4	3.2	2.6	3.4
Diurnal Maximum	2.8	2.7	2.6	2.6	2.4	2.3	2.4	2.1	2.2	2.5	2.5	2.4	2.5	2.8	2.8	3.1	3.4	3.2	3.2	3.2	3.3	3.4	3.2	2.9	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - March 2023

Maximum Value: 2.5 km/h on Mar 19 23:00

Maximum Daily Average: 0.7 km/h on Mar 12

Minimum Value: -1.5 km/h on Mar 7 06:00

Minimum Daily Average: -0.5 km/h on Mar 7

Maximum Diurnal Average: 0.4 km/h at hour 23

Minimum Diurnal Average: 0.0 km/h at hour 12

Monthly Average: 0.24 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.4 Q_1 = -0.1 Median = 0.2 Q_3 = 0.5 P_{90} = 0.9 P_{99} = 1.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.5	0.2	0.3	0.4	0.6	0.2	0.4	0.3	0.6	0.5	0.1	0.5	0.1	0.1	0.4	0.3	-0.2	-0.6	0.3	-0.2	0.3	0.5	0.6	0.5	0.3	0.6
2-Mar	0.5	0.5	0.4	0.2	0.3	0.2	0.5	0.5	0.2	0.2	0.5	-0.7	-0.9	-0.2	-0.2	-0.4	-0.5	-0.5	-0.4	-0.3	-0.4	-0.4	0.0	0.3	0.0	0.5
3-Mar	0.2	0.7	0.7	0.9	1.1	1.0	0.6	0.7	0.4	0.5	0.5	0.7	0.5	0.2	0.6	0.4	0.9	0.3	0.4	0.5	0.1	0.8	0.6	0.6	0.6	1.1
4-Mar	0.3	0.6	0.4	-0.3	0.0	0.0	0.7	0.9	0.7	0.5	0.7	-0.1	0.5	0.3	-0.1	-0.1	-0.1	0.3	1.2	1.1	0.7	0.5	0.5	0.5	0.4	1.2
5-Mar	1.0	0.7	0.7	0.4	0.3	-0.1	0.1	0.0	0.4	0.1	-0.3	-0.2	0.6	0.4	0.4	0.3	-0.3	-0.3	0.1	0.1	0.1	0.1	0.2	DF	0.2	1.0
6-Mar	0.3	0.3	0.3	0.1	0.3	0.1	-0.3	0.5	0.4	0.3	-0.2	-0.1	0.2	-0.1	-0.2	-0.3	-1.0	-0.2	-0.4	-0.6	-0.2	-0.9	0.0	0.0	-0.1	0.5
7-Mar	-1.0	-0.1	0.1	-0.6	-0.9	-1.5	-0.9	-0.9	-0.5	-0.3	-0.3	-0.8	-0.2	-0.6	-1.0	-0.4	-1.1	0.5	0.5	-0.6	-1.1	-0.1	0.1	0.0	-0.5	0.5
8-Mar	0.1	0.4	0.4	0.5	0.5	0.6	0.6	0.4	0.4	0.3	0.1	-0.2	-0.3	-0.3	0.1	1.6	0.0	0.6	0.9	-0.6	-0.1	0.3	0.4	0.4	0.3	1.6
9-Mar	0.5	0.5	0.7	0.7	0.5	0.4	0.7	0.5	0.1	0.2	0.1	0.1	0.1	-0.7	-0.3	0.1	-0.4	0.0	-0.4	-0.6	-1.0	-1.1	-0.7	-0.5	0.0	0.7
10-Mar	-0.5	-0.4	-0.4	-0.9	-0.7	-0.5	-0.4	-0.5	-0.5	-0.5	-0.8	-0.7	-0.5	-0.1	0.9	1.1	1.3	1.2	0.8	0.9	0.0	-0.3	-1.3	-1.1	-0.2	1.3
11-Mar	-0.2	-0.6	-0.3	0.1	-0.6	-0.3	-0.2	0.2	-0.4	-0.9	0.0	0.6	0.6	1.2	0.7	0.7	0.1	0.6	0.5	0.4	0.7	0.6	0.5	0.5	0.2	1.2
12-Mar	0.5	0.7	1.1	0.4	1.1	1.2	0.9	1.1	0.5	0.7	1.8	0.2	0.1	0.8	0.6	1.5	0.0	0.7	0.4	1.4	-0.1	0.8	0.2	0.6	0.7	1.8
13-Mar	0.3	0.4	0.6	0.3	0.3	0.3	0.1	0.2	0.1	0.1	-0.1	0.1	0.0	0.5	0.6	0.3	0.9	1.2	1.2	1.0	0.9	0.8	0.7	0.6	0.5	1.2
14-Mar	0.6	0.5	0.2	0.4	0.5	0.5	0.4	0.5	0.3	0.4	0.7	1.2	0.1	-0.2	0.0	0.1	-0.3	-0.1	0.0	0.3	0.6	1.1	1.4	1.3	0.4	1.4
15-Mar	0.3	0.0	0.1	0.2	0.0	0.3	0.1	-0.1	0.0	0.0	-0.1	-0.4	-0.4	-1.2	0.3	-0.2	-0.2	-0.1	0.1	0.5	0.3	0.2	0.1	0.0	0.0	0.5
16-Mar	-0.2	0.1	-0.5	0.2	-0.2	-0.2	0.1	-0.2	-0.2	-0.3	-0.2	-0.2	0.6	-0.3	-0.1	0.1	0.1	0.3	0.3	0.3	0.7	0.7	0.4	0.3	0.1	0.7
17-Mar	0.7	0.4	1.0	0.5	0.3	0.4	0.7	0.8	0.0	0.3	0.3	0.3	0.2	0.3	0.1	0.0	-0.2	-0.2	-0.4	-0.5	-0.8	-0.6	-0.5	-0.8	0.1	1.0
18-Mar	-0.8	-0.6	-0.6	-0.4	-0.5	-0.3	-0.3	-0.1	0.0	-0.1	0.4	0.0	0.0	-0.1	-0.2	0.0	0.0	-0.1	0.8	0.8	0.8	0.6	0.4	0.5	0.0	0.8
19-Mar	0.4	0.5	0.3	0.2	0.2	0.1	0.3	0.3	0.2	0.8	1.7	2.1	0.4	0.2	-0.6	0.4	0.0	0.1	-0.6	0.8	0.9	0.6	2.5	2.1	0.6	2.5
20-Mar	1.1	-0.8	-0.9	-0.9	-0.9	1.3	1.2	0.6	0.3	0.1	0.3	-0.1	-0.2	0.3	0.0	0.0	0.3	0.2	0.7	0.3	0.2	0.4	1.6	1.0	0.3	1.6
21-Mar	0.4	0.7	0.2	0.1	0.2	0.1	0.3	-0.1	-0.1	-0.1	-0.3	0.0	0.3	1.5	0.2	-0.2	-0.1	0.0	-0.2	-0.1	0.0	0.0	0.2	0.1	0.1	1.5
22-Mar	0.2	0.4	1.0	0.5	0.8	1.3	0.6	0.7	0.6	0.2	0.2	-0.1	-0.5	-0.4	-0.3	-0.3	0.0	0.0	0.1	0.3	0.4	0.2	0.2	0.2	0.3	1.3
23-Mar	0.2	-0.1	-0.1	0.0	0.1	-0.1	-0.4	-0.2	0.0	0.4	0.4	0.2	0.6	0.7	0.8	0.9	0.9	1.1	0.6	0.1	1.4	0.4	0.4	0.1	0.3	1.4
24-Mar	0.7	0.9	0.3	0.9	0.5	0.0	1.1	1.3	-0.1	0.1	-0.3	-0.8	-0.5	0.4	0.5	-0.5	0.4	-0.1	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.2	1.3
25-Mar	0.0	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.2	-0.1	-0.2	0.4	0.7	1.9	0.5	0.4	0.6	0.7	0.6	0.3	0.8	0.8	0.4	0.3	0.3	1.9
26-Mar	1.3	0.2	0.5	0.3	0.3	0.2	0.2	0.2	1.0	-0.2	0.0	-0.9	-0.4	-0.1	0.8	1.1	1.2	0.5	0.0	0.2	0.6	0.3	0.3	0.5	0.3	1.3
27-Mar	0.5	0.1	0.0	0.1	-0.1	0.0	0.0	-0.1	-0.4	0.0	-0.4	-0.2	-0.3	0.1	0.1	1.1	1.1	0.9	0.4	0.4	0.8	0.8	0.6	0.4	0.2	1.1
28-Mar	0.1	0.2	0.2	0.1	0.1	0.2	0.3	0.7	0.5	-0.2	-0.3	-0.4	0.3	0.2	0.4	0.2	0.0	0.3	0.3	0.4	0.4	0.3	0.3	0.1	0.2	0.7
29-Mar	0.0	0.0	0.1	0.3	0.1	0.1	-0.6	0.0	0.4	0.3	0.7	0.2	0.6	1.3	0.8	0.8	1.2	0.7	0.6	0.3	0.1	0.2	0.1	0.2	0.3	1.3
30-Mar	0.0	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.3	0.6	0.2	0.1	-0.1	0.4	0.4	0.5	0.6	0.1	0.5	0.4	0.1	0.7	1.5	2.0	0.4	2.0
31-Mar	1.8	0.6	2.2	1.2	1.8	1.0	0.8	1.2	0.5	0.6	1.3	-0.1	-0.3	0.0	0.0	0.0	-0.4	0.1	0.5	0.9	1.0	0.0	1.2	1.2	0.7	2.2
	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	Diurnal Average	
	1.8	0.9	2.2	1.2	1.8	1.3	1.2	1.3	1.0	0.8	1.8	2.1	0.7	1.9	0.9	1.6	1.3	1.2	1.2	1.4	1.4	1.1	2.5	2.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.4 km/h on Mar 10 17:00

Minimum Value: 0.1 km/h on Mar 24 21:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.8 Median = 1.4 Q_3 = 2.0 P_{90} = 2.5 P_{99} = 3.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Mar	0.4	0.5	0.6	0.7	0.4	0.8	0.5	0.6	0.9	1.3	1.6	1.8	1.7	2.1	2.1	1.9	1.2	1.7	1.3	1.6	1.5	1.3	1.2	1.4	2.1
2-Mar	1.3	1.3	1.6	1.5	1.7	1.8	2.0	1.4	1.4	1.5	1.5	2.3	1.9	2.2	1.6	1.7	2.1	2.4	2.3	1.2	1.3	1.0	1.8	2.1	2.4
3-Mar	2.0	1.4	1.2	1.3	1.3	1.4	1.3	1.7	1.6	1.9	2.0	2.3	2.2	2.0	2.2	2.0	2.0	1.5	1.0	0.8	0.4	1.3	1.6	1.7	2.3
4-Mar	1.3	1.4	1.7	1.0	0.9	0.4	1.5	1.8	1.7	1.8	2.7	2.4	2.7	2.7	2.1	1.7	1.6	1.8	1.4	1.4	1.7	1.0	1.4	1.7	2.7
5-Mar	1.5	1.8	1.4	0.8	0.5	0.4	0.4	0.3	0.6	0.7	1.5	1.8	2.5	2.3	1.5	1.5	0.9	0.8	0.6	0.2	0.2	0.2	0.2	DF	2.5
6-Mar	0.2	0.3	0.2	0.2	0.3	0.3	0.6	0.4	0.5	0.5	0.9	0.8	0.9	1.2	1.4	1.6	1.6	2.5	1.3	2.1	2.2	1.9	1.2	0.9	2.5
7-Mar	1.2	1.6	2.1	1.9	2.1	1.8	1.7	2.0	2.1	2.7	2.3	2.3	2.7	2.7	2.2	3.2	2.6	2.9	3.3	2.8	2.5	2.0	2.5	2.3	3.3
8-Mar	2.0	1.9	1.4	1.3	0.8	1.2	0.8	1.3	1.8	1.6	1.8	1.9	2.0	2.1	2.4	3.0	2.6	2.5	3.2	2.0	1.3	1.9	1.6	1.2	3.2
9-Mar	1.1	1.3	0.9	0.5	0.5	0.7	0.7	0.5	0.5	0.9	1.1	2.1	2.6	2.8	2.9	3.1	2.4	3.3	3.0	3.3	3.4	2.7	2.5	3.0	3.4
10-Mar	2.6	2.7	2.4	1.9	2.5	2.3	2.6	2.2	2.2	2.4	2.5	2.4	2.4	2.6	2.9	2.7	3.4	3.0	2.5	2.3	2.8	2.6	1.8	1.8	3.4
11-Mar	1.6	1.1	1.3	1.9	1.2	1.1	1.0	0.8	1.4	1.4	1.9	1.9	2.4	2.5	2.5	2.7	1.9	1.6	0.9	1.3	1.3	1.1	1.0	0.6	2.7
12-Mar	0.9	1.1	1.6	1.4	1.7	1.8	1.5	1.7	1.6	2.1	2.5	2.3	2.0	2.3	2.0	2.5	1.6	1.4	1.5	2.1	1.4	2.1	1.4	1.3	2.5
13-Mar	1.0	0.9	1.0	0.9	0.8	0.7	0.6	0.9	0.8	0.9	1.0	1.1	1.5	2.1	2.1	1.3	2.1	1.6	1.9	2.3	2.4	1.6	1.0	1.2	2.4
14-Mar	1.0	1.3	1.5	1.3	1.4	1.2	1.1	1.3	1.5	1.4	1.7	1.4	1.9	1.3	1.7	1.7	1.3	1.6	1.6	1.7	1.5	1.4	1.7	1.5	1.9
15-Mar	1.4	1.2	1.1	0.9	0.9	0.6	0.9	0.5	0.7	0.8	1.0	1.3	1.3	1.1	1.7	0.9	0.7	0.4	0.4	0.3	0.2	0.1	0.2	0.6	1.7
16-Mar	1.0	1.7	1.1	1.2	1.2	1.0	1.1	0.9	1.1	1.2	1.6	1.5	1.7	1.6	1.3	1.2	1.0	0.7	0.3	0.3	0.8	0.7	0.6	0.6	1.7
17-Mar	0.9	0.5	0.8	0.9	0.6	0.6	0.7	0.7	0.6	0.8	0.7	1.1	0.9	0.8	1.1	1.5	1.2	1.4	0.7	0.7	0.3	0.8	0.7	1.0	1.5
18-Mar	0.8	0.7	0.6	0.6	0.4	0.3	0.3	0.4	0.5	0.7	0.9	0.8	0.6	0.5	0.5	0.6	0.6	0.9	0.8	0.4	0.2	0.4	0.4	0.5	0.9
19-Mar	0.6	0.7	0.5	0.5	0.6	0.7	1.0	1.1	1.7	2.5	2.6	2.5	2.5	2.5	1.8	2.7	2.2	2.2	1.8	2.9	3.0	3.2	2.4	3.0	3.2
20-Mar	2.9	1.8	2.5	2.2	2.1	2.2	1.5	1.0	1.1	1.2	1.5	1.1	1.4	1.9	1.7	1.9	2.0	1.6	1.8	2.2	2.3	1.4	1.3	1.5	2.9
21-Mar	0.7	1.2	0.7	0.6	0.4	0.5	0.6	0.4	0.8	0.8	0.5	1.3	1.9	2.1	1.8	1.6	1.6	1.2	0.5	0.2	0.3	0.4	0.8	1.1	2.1
22-Mar	0.9	0.4	0.8	0.7	0.8	0.9	0.5	0.9	0.8	1.0	1.7	1.8	1.8	1.7	1.4	1.3	0.9	0.7	0.5	0.7	0.5	0.3	0.4	0.7	1.8
23-Mar	0.6	0.7	0.6	0.2	0.3	0.4	0.5	0.7	1.0	1.5	2.1	2.2	2.7	2.6	2.7	2.5	2.6	2.4	2.0	2.3	2.1	1.9	1.6	1.6	2.7
24-Mar	1.7	1.6	1.4	0.9	1.7	1.4	1.1	1.3	1.2	1.3	1.6	1.4	2.2	2.0	2.1	1.2	1.7	0.9	0.3	0.1	0.1	0.3	0.2	0.3	2.2
25-Mar	0.5	0.5	0.2	0.1	0.2	0.3	0.2	0.5	1.1	0.7	1.5	2.2	2.7	3.2	2.7	2.3	1.9	1.9	1.6	1.3	1.3	1.5	1.7	0.9	3.2
26-Mar	1.0	1.2	1.5	0.8	0.5	0.6	0.5	0.9	1.6	1.7	2.2	1.8	2.5	2.6	3.0	2.4	2.2	1.8	1.1	1.2	2.0	1.5	0.9	0.6	3.0
27-Mar	0.7	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.7	1.5	1.5	2.2	2.2	2.3	2.7	2.9	2.3	1.7	0.9	0.7	0.9	0.8	1.1	0.7	2.9
28-Mar	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.4	1.1	1.5	2.0	1.8	2.2	2.0	2.1	1.7	1.3	1.1	0.9	0.9	0.8	0.6	1.2	0.8	2.2
29-Mar	0.6	0.4	0.3	0.6	0.6	0.7	1.0	0.4	1.2	1.6	1.7	2.3	2.7	2.5	2.2	2.1	2.1	2.2	1.6	1.6	1.6	0.8	0.4	0.6	2.7
30-Mar	0.4	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.3	1.4	1.5	1.5	2.1	2.0	2.1	2.3	1.9	0.9	1.6	1.4	1.5	2.0	2.5	2.4	2.5
31-Mar	2.2	2.4	2.7	2.3	2.1	1.6	0.8	1.1	1.0	1.3	2.5	2.0	1.6	1.6	1.7	1.6	1.1	0.9	0.6	1.3	2.8	3.1	3.2	2.7	3.2
Diurnal Maximum	2.9	2.7	2.7	2.3	2.5	2.3	2.6	2.2	2.2	2.7	2.7	2.5	2.7	3.2	3.0	3.2	3.4	3.3	3.3	3.3	3.4	3.2	3.2	3.0	

DF - DAS Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS06
PATRICIA MCINNES
MARCH 2023

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

April 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	707	36	37	99.87	41.6	0	10.8	0
TRS (ppb) Average	707	36	37	99.87	1.5	0	0.4	0
THC (ppm) Average	705	36	39	99.6	3.3	-	2.2	-
NMHC(ppm) Average	705	36	39	99.6	0.264	-	0.02	-
CH4(ppm) Average	705	36	39	99.6	3	-	2.2	-
O3 (ppb) Average	709	35	35	100	55.6	0	43.4	-
NO2 (ppb) Average	706	37	38	99.87	41.9	0	21	-
NO (ppb) Average	706	37	38	99.87	53.2	-	9.1	-
NOX (ppb) Average	706	37	38	99.87	85	-	30.1	-
NH3 (ppb) Average	661	39	83	94.09	0	0	0	-
PM2.5 (ug/m3) Average	743	1	1	100	27.7	0	10.8	0
Temperature 2 m (C) Average	744	0	0	100	11.8	-	1.2	-
Relative Humidity (%) Average	744	0	0	100	90.5	-	88.6	-
Wind Speed 10 m (km/h) Average	744	0	0	100	24	-	15	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	1.76	3.7	-	0	0.1	0.2	0.5	1.4	5	41.6
TRS (ppb) Average	707	0.16	0.2	-	0	0	0.1	0.1	0.2	0.4	1.5
THC (ppm) Average	705	2.05	0.1	-	1.9	2	2	2	2.1	2.1	3.3
NMHC(ppm) Average	705	0.003	0.019	-	0	0	0	0	0	0	0.264
CH4(ppm) Average	705	2.05	0.1	-	1.9	2	2	2	2.1	2.1	3
O3 (ppb) Average	709	33.04	9.8	-	1.9	19.4	28.4	34.8	39.7	43.2	55.6
NO2 (ppb) Average	706	7.9	6.8	-	0.3	2.3	3.6	5.7	9.5	16	41.9
NO (ppb) Average	706	2.54	4	-	0	0.1	0.4	1.2	3	6.6	53.2
NOX (ppb) Average	706	10.43	9.5	-	0.3	3	4.6	7.4	12.3	22.5	85
NH3 (ppb) Average	661	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	743	6.14	3.3	-	0.3	3.3	4	5.2	7.3	10.6	27.7
Temperature 2 m (C) Average	744	-9.62	7.2	-	-30.7	-18.5	-14.2	-9.5	-4.9	-0.8	11.8
Relative Humidity (%) Average	744	67.86	15	-	25.8	46.4	56.1	70.3	80.3	85.9	90.5
Wind Speed 10 m (km/h) Average	744	9.8	4	-	0	4	6	10	13	15	24
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, TRS, THC, NO2, NH3	09 Mar 2023 15:00	09 Mar 2023 15:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	24 Mar 2023 10:00	24 Mar 2023 11:00	2	Maintenance - replaced support gas cylinder
NH3	01 Mar 2023 06:00	31 Mar 2023 06:00	43	Stabilization after daily QA check

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 41.6 ppb on Mar 15 18:00

Maximum Daily Average: 10.8 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 4 03:00

Maximum Diurnal Average: 3.4 ppb at hour 11

Monthly Average: 1.76 ppb

Minimum Daily Average: 0.1 ppb on Mar 8

Minimum Diurnal Average: 0.7 ppb at hour 8

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.2 Median = 0.5 Q_3 = 1.4 P_{90} = 5.0 P_{99} = 15.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.4	Z	0.6	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.8	1.0	1.1	1.2	1.4	1.4	1.1	1.0	1.0	1.0	0.9	0.8	0.7	0.8	2.4
2-Mar	0.6	0.5	Z	0.5	0.6	0.8	1.0	1.1	1.1	1.0	0.8	0.6	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.5	1.1
3-Mar	0.1	0.1	0.1	Z	8.7	13.0	6.4	0.6	0.3	0.3	0.5	4.7	11.3	7.7	10.7	13.2	10.4	3.4	2.0	2.3	1.0	0.6	0.3	0.1	4.3	13.2
4-Mar	0.1	0.0	0.0	0.0	Z	1.1	1.3	0.6	0.0	1.1	3.7	1.9	0.7	0.1	0.1	0.1	0.1	1.8	1.6	0.3	0.0	0.0	0.1	0.4	0.7	3.7
5-Mar	0.2	0.1	0.6	1.1	0.4	Z	0.1	0.1	0.3	2.7	12.0	5.2	4.6	10.6	13.3	14.5	11.4	9.6	7.3	4.5	3.0	2.9	2.4	1.9	4.7	14.5
6-Mar	1.5	1.4	1.3	1.3	1.3	1.0	0.6	0.4	0.3	0.3	0.5	0.8	0.9	1.4	2.0	Z	1.2	0.8	0.5	0.5	0.4	0.2	0.2	0.2	0.8	2.0
7-Mar	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
8-Mar	0.2	Z	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1	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	0.1	0.3
9-Mar	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.1	0.1	0.4	1.1	1.1	0.4	0.3	M	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	1.1
10-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3
11-Mar	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.4	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.4	3.9	4.6	0.5	4.6
12-Mar	6.3	5.1	1.6	0.5	1.0	Z	0.7	1.8	3.5	3.8	13.9	8.8	4.1	9.6	10.4	7.9	7.3	4.1	1.9	1.0	2.8	2.0	2.6	3.4	4.5	13.9
13-Mar	Z	3.5	5.1	5.5	7.8	6.6	11.9	7.1	10.8	C	C	C	C	C	5.3	3.9	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0	3.8	11.9
14-Mar	0.0	Z	2.6	1.2	1.9	2.3	1.7	1.2	1.3	2.0	3.3	4.4	5.7	9.6	9.5	8.8	10.3	12.1	5.0	1.8	1.9	1.7	1.1	0.3	3.9	12.1
15-Mar	0.2	0.4	Z	0.4	0.3	0.1	0.1	0.3	1.1	5.0	20.1	6.6	5.7	20.0	5.6	10.5	33.1	41.6	28.7	23.2	17.9	11.3	8.3	8.0	10.8	41.6
16-Mar	5.5	1.1	0.4	Z	0.3	0.4	0.1	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.8	1.0	1.0	0.8	0.7	0.8	1.1	0.9	0.7	0.7	0.8	5.5
17-Mar	0.4	0.4	0.3	0.3	Z	0.4	0.5	0.5	0.7	0.8	0.8	1.0	1.0	1.0	0.9	0.4	0.4	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.5	1.0
18-Mar	0.2	0.5	0.6	0.9	1.1	Z	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.6	0.6	2.1	4.9	3.4	4.5	2.6	1.4	1.3	1.2	1.3	4.9
19-Mar	Z	0.9	0.6	0.6	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.0	0.2	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.9
20-Mar	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	0.1	0.1	0.1	0.2	4.0	1.9	0.3	4.0
21-Mar	1.9	1.0	Z	5.0	0.6	1.0	0.5	0.8	0.8	1.5	5.3	9.1	2.1	1.6	1.6	1.8	2.8	1.6	0.8	0.3	0.2	0.2	0.1	0.1	1.8	9.1
22-Mar	0.1	0.0	0.1	Z	0.1	0.1	0.2	0.3	0.5	1.0	1.3	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.5	0.4	0.2	0.2	0.2	0.6	1.4
23-Mar	0.3	0.4	0.4	0.3	Z	0.4	0.5	0.6	0.8	1.5	4.6	5.1	2.2	3.0	2.4	2.2	0.7	0.2	0.2	0.2	0.2	0.1	0.1	0.6	1.2	5.1
24-Mar	2.5	1.0	0.7	0.4	0.6	Z	0.5	0.6	1.0	5.3	15.5	12.5	6.5	6.3	7.4	8.6	8.0	7.4	6.6	3.9	2.4	1.7	1.1	0.6	4.4	15.5
25-Mar	Z	0.8	0.6	0.5	0.5	0.3	0.4	0.5	1.3	6.3	7.8	8.7	4.6	4.2	4.4	4.2	1.2	0.0	0.0	0.0	0.4	0.8	2.0	1.2	2.2	8.7
26-Mar	0.4	Z	0.6	1.2	0.5	2.5	1.4	0.4	0.1	0.1	0.1	0.1	0.1	0.7	3.6	7.3	4.9	2.2	0.4	0.4	0.2	0.5	0.7	0.8	1.3	7.3
27-Mar	1.8	1.4	Z	0.0	0.1	0.0	0.0	0.3	0.9	2.1	4.2	3.6	3.8	2.2	2.0	1.7	1.3	1.0	1.0	0.6	0.3	0.3	0.5	0.7	1.3	4.2
28-Mar	0.4	0.2	0.2	Z	0.1	0.1	0.2	0.2	0.2	0.4	1.1	0.7	0.6	0.7	0.8	0.7	0.8	0.6	0.6	0.7	0.6	1.0	1.0	0.8	0.5	1.1
29-Mar	0.4	0.3	0.3	0.7	Z	0.6	0.2	0.4	1.0	2.3	2.7	4.1	5.9	3.5	2.2	1.2	0.4	0.2	0.2	0.1	0.2	0.2	0.1	0.2	1.2	5.9
30-Mar	0.2	0.1	0.1	0.2	0.1	Z	0.3	0.3	0.3	0.3	0.4	0.7	4.3	2.6	2.4	2.1	1.5	1.4	1.3	1.0	0.7	0.3	0.2	0.2	0.9	4.3
31-Mar	Z	0.2	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.5	1.2	1.6	1.4	0.9	0.2	0.2	0.1	0.0	0.1	0.4	1.6
	1.0	0.8	0.7	0.8	1.0	1.2	1.0	0.7	0.9	1.3	3.4	2.8	2.3	3.0	3.0	3.2	3.4	3.2	2.1	1.6	1.2	0.9	1.1	1.0	Diurnal Average	
	6.3	5.1	5.1	5.5	8.7	13.0	11.9	7.1	10.8	6.3	20.1	12.5	11.3	20.0	13.3	14.5	33.1	41.6	28.7	23.2	17.9	11.3	8.3	8.0	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 (SO_2) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	96.75	96.75
11 - 20	19	2.69	99.43
21 - 60	4	0.57	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	70	40	15	14	43	124	118	34	24	17	21	19	9	14	21	101	684
11 - 20	6	2	2	0	4	0	0	0	0	0	0	0	1	1	0	3	19
21 - 60	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	76	44	17	14	47	124	118	34	24	17	21	19	11	15	21	105	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.5 ppb on Mar 29 13:00

Maximum Daily Average: 0.4 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 4 16:00

Maximum Diurnal Average: 0.2 ppb at hour 6

Monthly Average: 0.16 ppb

Minimum Daily Average: 0.1 ppb on Mar 10

Minimum Diurnal Average: 0.1 ppb at hour 14

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} = 0.7

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.3	0.3	Z	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3
2-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1
3-Mar	0.1	0.0	0.0	0.2	Z	0.6	0.4	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.6
4-Mar	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
5-Mar	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	0.2	0.2	0.2	0.3	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.5
6-Mar	0.1	0.1	0.1	0.2	0.1	0.1	0.2	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	0.2
7-Mar	0.1	Z	0.1	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	0.0	0.1	0.1	0.1	0.1	0.1
8-Mar	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
9-Mar	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2
10-Mar	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1
11-Mar	0.0	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.6	0.5	0.1	0.6
12-Mar	Z	0.7	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.2	0.3	0.4	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.1	0.2	0.3	0.2	0.3	0.3	0.7
13-Mar	0.4	Z	0.4	0.3	0.4	0.4	0.7	0.7	0.6	0.6	0.4	0.3	0.4	0.5	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.7
14-Mar	0.1	0.1	Z	0.3	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.5
15-Mar	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.3	C	C	C	C	C	0.3	0.3	0.6	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.9
16-Mar	0.4	0.2	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.4
17-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.3	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	0.0	0.0	0.1	0.3
18-Mar	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.5	0.6	0.1	0.6
19-Mar	0.6	Z	0.6	0.6	0.5	0.5	0.4	0.2	0.1	0.1	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	0.2	0.6
20-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.2	0.1	0.5
21-Mar	0.1	0.2	0.2	Z	0.3	0.7	0.7	0.5	0.4	0.4	0.5	0.7	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.2	0.3	0.7
22-Mar	0.2	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	0.2	0.2	0.1	0.1	0.1	0.1	0.2
23-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.4
24-Mar	Z	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.7	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.7
25-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.7	1.2	0.8	0.7	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.2	0.3	1.2
26-Mar	0.1	0.1	Z	0.2	0.2	0.7	0.5	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.7
27-Mar	0.5	0.5	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.5
28-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	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	0.1	0.1	0.1	0.3
29-Mar	0.1	0.1	0.1	0.2	0.3	Z	0.1	0.1	0.1	0.5	0.6	0.3	1.5	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.5
30-Mar	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.3
31-Mar	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	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	0.2	0.2	0.1	0.2	0.2	Diurnal Average	
	0.6	0.7	0.6	0.6	0.5	0.7	0.7	0.7	0.7	1.2	0.8	0.7	1.5	0.5	0.5	0.4	0.6	0.9	0.8	0.8	0.7	0.6	0.6	0.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 2	79	44	15	14	47	124	117	34	24	19	19	19	9	15	22	106	707
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	79	44	15	14	47	124	117	34	24	19	19	19	9	15	22	106	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - March 2023

Maximum Value: 3.3 ppm on Mar 25 10:00

Maximum Daily Average: 2.2 ppm on Mar 15

Minimum Value: 1.9 ppm on Mar 8 13:00

Minimum Daily Average: 2.0 ppm on Mar 8

Maximum Diurnal Average: 2.1 ppm at hour 6

Minimum Diurnal Average: 2.0 ppm at hour 17

Monthly Average: 2.05 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.0 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
2-Mar	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
3-Mar	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1
4-Mar	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
5-Mar	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
6-Mar	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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
7-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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-Mar	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	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-Mar	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	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Mar	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
11-Mar	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	2.1	2.1	2.0	2.1
12-Mar	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
13-Mar	Z	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.1	C	C	C	C	C	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3
14-Mar	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.3
15-Mar	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
16-Mar	2.2	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.2
17-Mar	2.1	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.4	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	2.0	2.0	2.1	2.4
18-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2
19-Mar	Z	2.3	2.6	2.7	2.7	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	2.1	2.7
20-Mar	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	2.1	2.1	2.0	2.1
21-Mar	2.0	2.0	Z	2.1	2.1	2.4	2.3	2.2	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
22-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Mar	2.1	2.1	2.1	2.1	Z	2.2	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	2.1	2.1	2.1	2.1	2.2
24-Mar	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	M	M	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	2.1	2.2
25-Mar	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.6	3.3	2.6	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.3
26-Mar	2.0	Z	2.0	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
27-Mar	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1
28-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1
29-Mar	2.0	2.0	2.0	2.1	Z	2.2	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
30-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
31-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.2
	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	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	
	2.2	2.3	2.6	2.7	2.7	2.4	2.3	2.3	2.6	3.3	2.6	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	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Patricia McInnes - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	457	64.82	64.82
2.1 - 3.0	247	35.04	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Patricia McInnes - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	31	31	10	11	39	114	83	16	12	9	12	14	8	8	10	49	457
2.1 - 3.0	43	13	7	3	8	10	35	18	12	8	9	5	3	7	11	55	247
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	74	44	17	14	47	124	118	34	24	17	21	19	11	15	21	105	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Patricia McInnes

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - March 2023

Maximum Value: 0.264 ppm on Mar 25 10:00

Maximum Daily Average: 0.020 ppm on Mar 25

Minimum Value: 0.000 ppm on Mar 1 01:00

Minimum Daily Average: 0.000 ppm on Mar 2

Maximum Diurnal Average: 0.009 ppm at hour 9

Minimum Diurnal Average: 0.000 ppm at hour 1

Monthly Average: 0.003 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.1

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.086	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.086
2-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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-Mar	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
5-Mar	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	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.005
6-Mar	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	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
7-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
8-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
10-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11-Mar	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
12-Mar	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
13-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
14-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
15-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.056	0.003	0.000	0.000	0.002	0.003	0.056
16-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	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	0.002
17-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.240	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.006	0.015	0.003	0.000	0.000	0.012	0.240
18-Mar	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	0.012	0.004	0.000	0.000	0.000	0.000	0.001	0.012
19-Mar	Z	0.000	0.100	0.142	0.134	0.026	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.142
20-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.121	0.065	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	0.009	0.121
22-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23-Mar	0.000	0.000	0.002	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
24-Mar	0.000	0.000	0.000	0.000	0.000	Z	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	0.002	0.000	0.000	0.002
25-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.264	0.116	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.264
26-Mar	0.000	Z	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.033
27-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	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	0.002
28-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
29-Mar	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
30-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.021
31-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.155	0.000	0.000	0.000	0.000	0.007	0.155
	0.000	0.000	0.004	0.005	0.006	0.006	0.002	0.001	0.009	0.009	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.007	0.001	0.000	0.000	0.000	Diurnal Average	
	0.000	0.000	0.100	0.142	0.134	0.121	0.065	0.029	0.240	0.264	0.116	0.021	0.003	0.000	0.005	0.003	0.004	0.086	0.017	0.155	0.015	0.003	0.002	0.002	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	683	96.88	96.88
0.006 - 0.05	11	1.56	98.44
0.06 - 0.1	8	1.13	99.57
> 0.1	3	0.43	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	69	42	17	13	46	122	118	33	24	17	18	18	10	15	21	100	683
0.006 - 0.05	3	0	0	0	1	1	0	0	0	0	2	1	0	0	0	3	11
0.06 - 0.1	2	2	0	0	0	1	0	0	0	0	1	0	1	0	0	1	8
> 0.1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	3
Totals	74	44	17	14	47	124	118	34	24	17	21	19	11	15	21	105	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.0 ppm on Mar 25 10:00

Maximum Daily Average: 2.2 ppm on Mar 15

Minimum Value: 1.9 ppm on Mar 8 13:00

Maximum Diurnal Average: 2.1 ppm at hour 6

Monthly Average: 2.05 ppm

Minimum Daily Average: 2.0 ppm on Mar 8

Minimum Diurnal Average: 2.0 ppm at hour 18

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.0 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
Percent Operational Time:	99.6

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

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Patricia McInnes - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	461	65.39	65.39
2.1 - 3.0	244	34.61	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Patricia McInnes - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	31	31	10	12	39	115	83	16	12	10	13	14	8	8	10	49	461
2.1 - 3.0	43	13	7	2	8	9	35	18	12	7	8	5	3	7	11	56	244
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	74	44	17	14	47	124	118	34	24	17	21	19	11	15	21	105	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Patricia McInnes

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 55.6 ppb on Mar 17 18:00

Maximum Daily Average: 43.4 ppb on Mar 18

Minimum Value: 1.9 ppb on Mar 1 01:00

Minimum Daily Average: 17.6 ppb on Mar 15

Maximum Diurnal Average: 39.5 ppb at hour 15

Minimum Diurnal Average: 24.6 ppb at hour 6

Monthly Average: 33.04 ppb

Percentiles: P_1 = 3.7 P_{10} = 19.4 Q_1 = 28.4 Median = 34.8 Q_3 = 39.7 P_{90} = 43.2 P_{99} = 52.1

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	1.9	6.4	28.9	Z	31.1	30.7	30.7	31.0	30.3	31.5	32.6	32.7	34.0	35.9	35.4	34.6	32.5	30.2	28.5	32.0	33.8	35.4	36.4	36.4	30.1	36.4
2-Mar	37.1	38.8	38.9	39.1	Z	34.4	34.1	35.4	33.5	37.0	40.1	40.8	42.5	43.3	43.3	42.6	42.9	43.1	42.1	41.2	40.6	41.0	41.6	41.4	39.8	43.3
3-Mar	41.5	41.9	42.2	35.6	30.0	Z	28.1	28.2	29.5	33.2	36.1	35.3	32.0	31.8	29.3	28.8	28.4	26.6	25.0	27.5	25.7	19.6	24.4	33.3	31.0	42.2
4-Mar	Z	30.5	31.5	30.9	32.2	31.4	29.2	27.5	28.1	30.8	32.8	33.8	34.1	35.8	35.6	35.1	34.7	30.1	26.1	24.5	26.2	31.4	27.4	24.5	30.6	35.8
5-Mar	25.7	Z	27.7	28.5	21.9	18.1	11.1	15.1	31.7	32.1	30.9	30.3	32.4	30.4	30.6	29.7	28.1	19.1	7.5	13.7	11.8	13.0	14.1	13.0	22.5	32.4
6-Mar	12.4	12.8	12.7	10.7	14.7	11.2	6.8	13.0	25.9	27.6	29.0	Z	31.3	32.5	32.5	34.4	35.9	34.7	35.5	36.2	36.9	36.7	36.4	37.6	26.0	37.6
7-Mar	38.3	38.4	Z	38.4	37.6	34.7	33.4	36.2	37.9	38.4	38.7	39.1	39.6	39.9	40.7	40.8	39.2	37.1	36.6	38.9	38.5	38.7	40.4	40.6	38.4	40.8
8-Mar	40.7	40.7	39.1	Z	37.7	37.1	34.2	33.1	33.5	35.6	36.4	38.3	39.4	40.9	42.2	41.2	40.5	35.8	36.1	39.7	40.6	39.1	38.4	38.1	38.2	42.2
9-Mar	37.4	36.9	35.1	33.8	Z	22.5	15.6	18.9	30.3	33.1	34.4	C	C	C	C	37.9	37.4	37.4	36.6	35.7	36.2	36.9	37.8	38.0	33.3	38.0
10-Mar	37.2	37.3	37.6	38.2	37.9	Z	35.3	35.0	34.8	35.4	35.7	36.0	37.0	38.3	39.3	39.4	37.5	36.1	34.8	35.6	34.5	36.1	35.3	36.9	36.6	39.4
11-Mar	Z	31.3	33.5	32.9	35.4	33.8	33.8	35.4	36.5	36.4	36.7	37.4	39.3	41.0	41.5	42.3	41.2	40.1	35.9	36.1	32.5	29.1	25.9	25.0	35.3	42.3
12-Mar	24.8	Z	30.1	32.6	32.4	32.1	32.4	30.6	30.6	31.5	29.7	31.4	33.2	33.1	32.6	31.7	30.2	30.4	29.6	30.4	30.5	30.3	30.8	30.9	31.0	33.2
13-Mar	29.9	28.1	Z	20.4	17.0	12.2	4.9	10.4	18.9	25.9	27.5	28.9	30.8	30.6	32.0	30.7	35.0	35.6	40.0	39.9	41.9	41.4	41.1	39.2	28.8	41.9
14-Mar	35.2	32.6	30.2	Z	30.9	29.1	28.8	29.7	34.5	32.8	32.1	31.5	33.4	32.7	30.5	29.9	28.0	26.9	27.6	25.7	27.7	26.1	25.4	25.0	29.8	35.2
15-Mar	27.7	27.4	16.7	9.7	Z	13.0	13.0	17.5	21.4	28.0	28.4	30.2	30.4	27.4	30.2	27.2	22.3	14.0	5.8	3.6	2.8	3.3	2.2	2.6	17.6	30.4
16-Mar	6.7	23.5	34.0	34.2	31.3	Z	31.7	32.6	33.1	33.5	33.7	33.9	34.8	34.9	35.5	36.7	32.7	28.2	31.8	32.0	27.5	31.1	31.2	27.2	30.9	36.7
17-Mar	Z	31.8	28.2	20.4	13.9	10.4	12.6	15.1	19.7	29.4	32.8	33.5	35.7	37.7	40.3	54.4	49.2	55.6	43.9	33.4	27.9	37.7	49.0	51.6	33.2	55.6
18-Mar	52.4	Z	51.3	49.8	47.8	46.6	46.9	47.8	48.3	48.6	50.0	51.9	53.1	54.4	54.4	52.1	47.7	47.4	43.0	26.1	12.7	20.4	24.9	21.3	43.4	54.4
19-Mar	22.9	20.0	Z	2.6	3.3	6.9	13.6	30.1	40.0	42.0	43.7	43.7	43.5	44.9	45.8	45.8	45.0	43.2	43.0	43.2	42.8	43.6	43.9	43.7	34.7	45.8
20-Mar	43.3	43.2	43.0	Z	39.7	38.7	37.5	35.3	39.7	41.3	41.2	40.2	38.8	39.4	39.3	39.7	40.0	39.6	39.8	38.7	38.8	39.7	36.6	36.9	39.6	43.3
21-Mar	36.1	35.6	35.1	25.0	Z	10.1	5.3	16.3	20.2	22.7	26.5	28.7	40.4	37.0	38.0	38.7	38.5	36.1	29.4	20.9	23.0	17.1	25.5	25.7	27.5	40.4
22-Mar	23.0	21.7	30.6	37.1	34.4	Z	36.8	36.6	38.1	39.1	40.5	42.7	44.6	46.9	48.5	49.4	49.9	47.2	34.9	19.9	15.9	26.8	23.0	27.2	35.4	49.9
23-Mar	Z	36.5	29.6	34.4	14.0	18.5	39.1	44.8	43.2	41.7	40.7	45.8	48.0	47.4	47.1	46.1	46.1	44.5	43.0	41.7	40.2	36.5	35.8	33.9	39.1	48.0
24-Mar	35.7	Z	27.4	30.6	35.2	31.8	34.0	36.0	37.0	38.2	35.9	37.0	41.1	40.6	40.5	41.0	39.6	38.5	31.1	19.5	21.2	20.7	20.3	20.2	32.7	41.1
25-Mar	21.2	25.0	Z	19.6	20.9	20.4	19.9	16.5	18.6	16.7	26.3	33.5	38.4	42.9	44.5	44.0	45.1	46.8	46.1	44.5	43.6	42.6	39.9	38.9	32.9	46.8
26-Mar	38.5	33.7	31.8	Z	25.5	23.6	24.4	31.8	36.6	37.0	37.9	38.0	36.6	33.0	34.4	33.8	36.9	41.1	40.0	38.1	38.6	37.5	34.8	32.7	34.6	41.1
27-Mar	29.8	28.3	24.7	18.9	Z	10.0	10.2	15.0	19.7	26.8	31.2	35.8	39.3	39.7	39.8	41.1	42.0	40.6	33.6	21.1	27.7	27.8	27.5	21.4	28.3	42.0
28-Mar	22.2	20.8	21.2	20.8	16.8	Z	11.0	18.3	33.1	35.6	38.3	40.5	42.4	43.6	45.1	46.7	47.4	43.3	37.5	25.7	31.1	35.5	34.6	31.1	32.3	47.4
29-Mar	Z	40.2	44.3	42.0	31.7	31.6	40.1	43.6	42.6	38.0	37.5	40.3	41.9	41.4	42.6	42.3	41.7	41.0	40.3	40.0	33.3	28.4	33.8	29.7	38.6	44.3
30-Mar	21.2	Z	20.1	13.8	13.5	18.0	13.1	13.3	21.8	29.5	31.4	37.1	39.2	38.4	39.1	37.9	41.9	41.7	39.3	35.1	41.2	42.3	42.1	42.4	31.0	42.4
31-Mar	42.8	42.4	Z	41.0	37.2	31.5	25.4	31.4	38.7	42.6	40.6	41.6	42.4	49.6	53.2	45.4	43.6	42.3	35.8	33.3	42.6	47.1	46.2	44.1	40.9	53.2
	30.2	31.0	31.7	28.5	27.8	24.6	24.9	27.8	31.9	33.9	35.1	36.9	38.3	38.8	39.5	39.4	38.7	37.2	34.2	31.4	31.2	32.0	32.5	32.0	Diurnal Average	
	52.4	43.2	51.3	49.8	47.8	46.6	46.9	47.8	48.3	48.6	50.0	51.9	53.1	54.4	54.4	54.4	49.9	55.6	46.1	44.5	43.6	47.1	49.0	51.6	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	87	12.27	12.27
21 - 50	611	86.18	98.45
51 - 82	11	1.55	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 20	8	3	0	2	2	3	9	12	7	9	3	7	5	5	1	11	87
21 - 50	72	41	17	12	42	118	107	19	18	9	12	9	7	10	21	97	611
51 - 82	0	0	0	0	3	0	0	3	0	0	4	1	0	0	0	0	11
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	80	44	17	14	47	121	116	34	25	18	19	17	12	15	22	108	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Patricia McInnes

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Patricia McInnes - March 2023

Maximum Value: 53.2 ppb on Mar 25 10:00

Maximum Daily Average: 9.1 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 19:00

Minimum Daily Average: 0.6 ppb on Mar 2

Maximum Diurnal Average: 5.4 ppb at hour 10

Minimum Diurnal Average: 0.3 ppb at hour 2

Monthly Average: 2.54 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.4 Median = 1.2 Q_3 = 3.0 P_{90} = 6.6 P_{99} = 18.2

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	1.9	2.3	1.0	0.8	1.1	Z	2.0	1.4	3.1	2.6	2.8	3.2	2.8	2.8	2.5	2.2	2.2	2.9	3.0	1.3	1.2	0.8	0.4	0.4	1.9	3.2
2-Mar	Z	0.2	0.2	0.4	0.6	1.8	1.0	1.1	2.3	1.4	1.1	1.1	0.7	0.2	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.3
3-Mar	0.0	Z	0.0	0.1	0.4	0.2	0.4	0.5	1.3	1.7	1.0	1.9	4.0	4.0	5.3	5.0	3.7	1.8	1.5	0.4	0.6	0.9	0.7	0.4	1.6	5.3
4-Mar	0.4	0.4	Z	0.1	0.0	0.0	0.0	0.7	2.7	3.3	3.2	3.4	3.4	0.4	0.3	0.0	1.5	0.9	1.1	0.8	0.9	0.2	0.2	0.8	1.1	3.4
5-Mar	0.4	0.3	0.2	Z	0.0	0.0	4.4	4.0	0.6	1.7	5.0	5.8	3.3	6.5	6.9	6.3	4.3	6.6	8.3	1.6	2.2	1.0	0.1	0.1	3.0	8.3
6-Mar	0.2	0.1	0.1	2.4	0.2	1.5	9.5	9.3	4.4	4.0	3.8	3.3	3.2	Z	3.2	3.0	2.3	2.0	1.8	1.4	1.3	1.4	0.7	0.7	2.6	9.5
7-Mar	0.4	0.5	0.4	0.4	Z	3.2	2.4	1.5	1.3	C	C	C	C	C	C	1.3	1.3	1.5	1.5	0.7	1.0	0.5	0.3	0.5	--	3.2
8-Mar	0.3	0.3	0.4	0.4	0.7	Z	1.5	2.7	3.8	2.9	2.1	1.9	1.5	1.2	1.0	1.2	1.2	3.3	1.6	1.0	1.0	0.7	0.6	0.6	1.4	3.8
9-Mar	Z	0.5	0.5	0.6	1.2	3.8	2.9	11.3	4.7	5.4	4.9	7.7	4.5	3.0	M	2.5	1.8	1.3	1.1	1.5	1.0	0.7	0.7	0.6	2.8	11.3
10-Mar	0.3	Z	0.5	0.6	0.6	2.1	1.0	1.1	1.6	1.3	1.4	1.3	1.2	0.9	1.0	0.9	1.1	1.8	1.3	1.4	1.1	0.8	1.1	0.4	1.1	2.1
11-Mar	0.6	0.6	Z	0.4	0.6	3.3	1.5	1.0	1.1	1.6	1.9	2.1	1.5	0.8	0.8	0.7	1.0	1.5	1.3	0.3	0.4	0.3	0.2	0.1	1.0	3.3
12-Mar	0.1	0.0	0.1	Z	0.2	0.6	0.6	0.9	2.3	3.2	6.8	5.6	4.4	4.5	4.7	4.5	3.6	1.4	0.3	0.1	0.2	0.2	0.2	0.2	1.9	6.8
13-Mar	0.3	0.1	0.1	0.5	Z	1.3	3.3	8.8	9.6	6.7	8.4	7.8	8.4	7.9	6.8	5.5	15.5	20.5	1.6	1.1	0.9	0.6	0.2	0.1	5.0	20.5
14-Mar	0.1	0.2	0.2	0.4	0.2	Z	0.8	1.3	1.4	3.1	4.5	6.3	7.5	8.9	8.8	8.8	9.9	4.8	0.5	0.1	0.1	0.1	0.1	0.0	3.0	9.9
15-Mar	Z	0.0	0.1	0.3	0.2	0.9	3.2	5.6	12.3	8.1	10.8	9.1	9.5	16.5	10.5	13.5	18.3	17.3	19.7	21.7	10.2	1.5	4.8	15.6	9.1	21.7
16-Mar	8.2	Z	0.5	0.5	2.7	4.0	1.5	1.7	1.8	2.2	2.6	2.7	2.8	3.6	3.9	3.1	5.6	7.7	2.2	1.4	1.9	0.8	0.7	1.1	2.8	8.2
17-Mar	0.7	0.4	Z	1.6	3.5	9.6	10.8	17.6	18.9	6.9	4.8	5.2	4.9	4.9	4.5	1.0	2.3	0.3	0.4	0.6	0.7	0.4	0.2	0.2	4.4	18.9
18-Mar	0.1	0.1	0.0	Z	0.2	0.4	0.6	0.8	1.3	1.7	1.4	0.9	0.9	0.8	1.2	2.2	3.0	1.1	0.3	1.1	2.3	0.6	0.2	0.7	1.0	3.0
19-Mar	0.1	0.1	4.2	5.6	Z	6.3	9.2	5.7	1.8	1.2	0.7	0.7	1.1	1.3	1.1	1.1	1.0	1.5	1.7	0.6	0.4	0.4	0.2	0.2	2.0	9.2
20-Mar	0.1	0.2	0.3	0.5	1.0	Z	1.1	2.9	1.0	0.6	0.4	1.1	2.0	2.2	1.9	1.5	0.9	1.1	0.4	0.1	0.2	0.1	0.1	0.1	0.9	2.9
21-Mar	Z	0.1	0.0	0.4	0.4	12.3	15.0	7.5	11.1	13.9	13.2	13.2	4.7	7.5	6.5	5.1	4.4	3.7	2.3	1.9	1.2	2.4	0.8	0.1	5.6	15.0
22-Mar	0.1	Z	0.9	0.7	1.2	1.2	1.2	2.2	2.1	2.2	2.8	2.4	2.4	2.1	1.6	1.6	1.9	2.3	1.7	2.5	2.9	0.1	0.9	0.4	1.6	2.9
23-Mar	0.2	0.2	Z	0.4	3.7	3.9	0.4	0.6	2.5	4.2	6.0	3.5	1.8	2.7	1.7	1.2	1.0	1.0	0.3	0.2	0.0	0.0	0.1	0.1	1.5	6.0
24-Mar	0.0	0.1	0.1	Z	0.1	0.7	0.4	1.3	2.7	3.2	6.8	6.6	3.1	3.5	3.8	3.3	3.6	2.9	2.5	1.7	0.9	2.4	0.6	0.0	2.2	6.8
25-Mar	0.0	0.0	0.1	1.1	Z	0.0	2.5	6.7	27.2	53.2	27.1	13.8	8.4	3.6	2.2	2.0	1.3	0.8	0.4	0.3	0.2	0.1	0.2	0.1	6.6	53.2
26-Mar	0.0	0.2	0.4	0.5	0.4	Z	1.4	3.1	2.0	2.1	1.5	0.9	3.2	7.1	5.6	6.9	2.2	0.7	0.2	0.2	0.0	0.0	0.0	0.0	1.7	7.1
27-Mar	Z	0.0	0.0	0.0	0.0	0.2	3.0	10.2	14.3	7.8	4.4	2.8	1.8	2.4	2.1	1.8	1.5	1.8	1.4	3.1	2.2	0.3	0.0	0.0	2.7	14.3
28-Mar	0.0	Z	0.0	0.0	0.0	1.0	12.9	10.5	5.1	4.9	2.5	2.0	1.3	1.2	1.8	0.9	1.0	2.0	1.7	3.1	1.6	0.7	0.4	0.5	2.4	12.9
29-Mar	0.2	0.1	Z	0.1	0.2	0.2	0.3	0.3	0.8	4.9	4.7	4.0	4.2	3.1	1.6	1.2	0.9	1.0	0.5	0.3	0.2	0.2	0.0	0.0	1.3	4.9
30-Mar	0.0	0.1	0.0	Z	0.7	0.1	2.1	16.5	12.3	6.7	7.5	4.2	3.0	2.8	3.0	2.6	2.1	2.4	1.7	1.1	0.6	0.3	0.3	0.3	3.1	16.5
31-Mar	0.2	0.2	0.2	0.4	Z	3.6	2.8	2.4	1.2	0.6	2.0	2.9	4.0	1.8	0.8	1.6	1.7	1.8	1.1	2.4	1.5	0.5	0.4	0.4	1.5	4.0
	0.6	0.3	0.4	0.7	0.8	2.4	3.2	4.6	5.1	5.4	4.9	4.3	3.5	3.7	3.3	3.0	3.3	3.2	2.0	1.7	1.3	0.6	0.5	0.8	Diurnal Average	
	8.2	2.3	4.2	5.6	3.7	12.3	15.0	17.6	27.2	53.2	27.1	13.8	9.5	16.5	10.5	13.5	18.3	20.5	19.7	21.7	10.2	2.4	4.8	15.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	701	99.29	99.29
21 - 40	4	0.57	99.86
11 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Patricia McInnes - March 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	80	42	17	13	46	120	118	32	23	20	20	18	11	14	24	103	701
21 - 40	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	4
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	81	42	17	14	46	120	118	32	23	20	20	18	12	14	24	105	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Patricia McInnes

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 41.9 ppb on Mar 19 04:00

Maximum Daily Average: 21.0 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 2 23:00

Maximum Diurnal Average: 12.3 ppb at hour 20

Monthly Average: 7.90 ppb

Minimum Daily Average: 3.1 ppb on Mar 10

Minimum Diurnal Average: 4.6 ppb at hour 13

Percentiles: P_1 = 0.6 P_{10} = 2.3 Q_1 = 3.6 Median = 5.7 Q_3 = 9.5 P_{90} = 16.0 P_{99} = 34.3

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	19.5	18.9	6.6	4.1	4.6	Z	5.5	4.8	5.5	4.0	3.3	3.5	3.2	3.8	4.4	5.1	7.1	10.9	13.7	9.7	8.2	7.2	6.0	6.7	7.2	19.5
2-Mar	Z	4.4	4.1	4.5	5.6	9.8	8.8	7.7	9.8	5.4	3.3	2.8	2.2	1.4	1.2	1.4	1.4	0.9	0.7	0.6	0.6	0.7	0.3	0.5	3.4	9.8
3-Mar	0.4	Z	0.4	4.5	9.0	10.3	9.2	8.5	7.8	5.4	2.8	3.6	6.4	6.5	8.7	9.5	10.6	11.5	12.7	9.2	9.2	12.0	8.6	3.3	7.4	12.7
4-Mar	3.3	6.7	Z	5.7	3.5	3.5	4.3	7.1	8.8	5.7	3.9	3.8	3.1	0.4	0.4	0.4	2.2	6.1	10.7	10.9	10.8	4.6	4.1	6.0	5.0	10.9
5-Mar	10.6	7.6	5.5	Z	3.1	1.9	10.9	6.8	1.2	2.0	4.4	5.0	3.0	5.4	7.5	8.9	10.7	20.8	31.3	15.9	12.3	9.8	7.9	7.8	8.7	31.3
6-Mar	6.9	5.8	5.6	13.1	9.1	9.6	22.1	20.1	7.2	5.4	4.1	3.6	4.0	Z	5.1	5.6	5.2	6.6	6.2	5.6	3.9	4.1	4.5	3.3	7.2	22.1
7-Mar	2.3	1.7	1.8	1.9	Z	6.6	7.6	4.8	3.3	C	C	C	C	C	C	2.1	3.3	5.1	5.4	2.3	3.1	3.0	2.1	2.6	--	7.6
8-Mar	2.7	2.6	3.6	3.2	4.1	Z	7.1	8.2	7.3	4.8	3.7	2.7	2.3	1.8	1.7	2.0	2.8	7.3	6.7	5.0	4.3	3.4	2.7	2.7	4.0	8.2
9-Mar	Z	3.4	5.0	6.3	8.3	19.7	21.7	22.9	8.2	7.2	5.7	6.0	5.1	2.8	M	3.4	3.6	5.0	3.6	2.9	2.7	2.1	1.5	1.5	6.8	22.9
10-Mar	1.4	Z	1.7	1.7	1.9	4.1	3.1	3.1	3.0	2.1	2.0	1.9	1.8	1.4	1.7	1.8	2.6	3.8	4.9	6.2	7.5	4.7	5.8	3.8	3.1	7.5
11-Mar	5.0	8.0	Z	5.2	2.8	5.7	5.6	3.3	2.4	2.5	2.6	2.7	1.9	1.3	1.6	1.8	2.5	3.8	8.7	7.0	8.2	7.7	9.0	9.5	4.7	9.5
12-Mar	9.6	8.8	5.2	Z	3.8	3.9	3.3	4.8	5.1	4.6	7.3	5.7	4.0	4.5	5.2	6.3	7.5	6.5	6.9	5.4	5.8	6.1	6.6	6.6	5.8	9.6
13-Mar	7.6	8.9	12.5	15.5	Z	23.5	31.4	25.8	17.5	10.4	8.7	7.2	7.0	8.7	8.3	9.2	12.6	15.0	5.9	5.7	4.1	3.4	2.5	4.0	11.1	31.4
14-Mar	7.5	8.1	8.1	6.6	7.3	Z	10.3	9.5	5.3	8.5	10.2	10.7	10.0	11.4	13.9	14.4	16.2	16.9	14.2	14.8	11.5	12.3	12.4	12.3	11.0	16.9
15-Mar	Z	9.4	20.0	26.7	21.9	23.2	23.0	16.1	15.1	8.6	9.3	7.7	8.0	12.5	10.4	14.8	22.2	29.9	39.6	39.2	36.3	29.7	28.6	31.1	21.0	39.6
16-Mar	27.3	Z	2.3	2.5	6.3	7.3	5.1	4.0	3.7	3.7	2.9	3.4	3.3	4.4	4.6	4.7	9.1	15.0	11.1	9.6	12.4	7.3	7.0	10.8	7.3	27.3
17-Mar	6.4	4.8	Z	16.1	21.2	26.2	22.4	21.4	19.9	8.6	5.4	6.2	6.6	7.3	8.2	2.8	8.9	3.5	15.3	19.1	21.9	14.4	5.0	3.4	12.0	26.2
18-Mar	2.5	3.0	2.7	Z	5.7	6.3	5.9	5.6	5.2	5.0	3.8	2.9	2.9	2.8	3.8	7.1	11.4	8.6	9.6	28.9	39.7	26.6	17.2	12.7	9.6	39.7
19-Mar	10.9	14.1	36.4	41.9	Z	34.3	29.0	13.4	5.0	2.2	1.5	1.6	1.4	1.8	1.7	2.3	2.7	4.1	3.7	2.7	2.5	2.0	1.4	1.3	9.5	41.9
20-Mar	1.8	1.6	1.6	2.0	4.0	Z	5.9	9.1	3.5	1.6	1.6	2.7	4.1	3.6	3.7	3.7	3.3	4.0	4.0	3.6	4.1	3.4	5.4	4.5	3.6	9.1
21-Mar	Z	5.4	4.9	14.4	11.0	30.9	35.1	21.8	19.5	17.9	14.9	14.8	6.3	9.3	8.9	9.1	10.3	12.3	17.2	22.9	15.8	20.9	12.4	8.2	15.0	35.1
22-Mar	7.8	Z	8.0	4.9	7.9	6.2	4.8	4.8	3.6	3.6	4.0	3.5	3.7	3.6	3.7	4.3	4.7	8.5	20.7	32.2	33.9	10.1	10.4	11.4	9.0	33.9
23-Mar	10.8	7.9	Z	7.7	26.9	26.0	7.0	4.1	7.3	7.3	10.4	6.3	3.9	4.6	3.4	2.8	3.0	3.6	4.6	4.7	6.2	8.2	7.6	9.1	8.0	26.9
24-Mar	6.0	7.8	8.2	Z	5.1	8.4	6.2	5.0	5.2	4.5	7.7	7.4	4.5	5.2	6.0	6.2	7.8	9.9	17.1	25.5	18.5	14.6	9.9	6.0	8.8	25.5
25-Mar	4.4	3.7	4.5	8.3	Z	2.9	4.1	9.2	23.3	31.8	21.3	13.9	9.6	5.0	3.7	3.6	3.1	3.6	4.4	4.5	4.1	5.1	5.2	4.4	8.0	31.8
26-Mar	3.6	5.7	6.2	9.2	11.4	Z	12.6	7.8	3.3	2.9	2.0	1.3	3.6	7.4	6.8	9.4	4.5	2.9	2.1	3.7	3.4	2.6	3.7	4.8	5.3	12.6
27-Mar	Z	6.9	7.9	6.2	7.3	10.9	9.0	14.2	14.8	9.6	5.9	4.3	3.3	3.8	4.2	3.9	3.7	6.5	12.9	22.0	10.0	7.4	6.1	13.3	8.4	22.0
28-Mar	9.1	Z	8.1	6.4	5.1	10.0	14.6	15.1	8.4	6.9	3.7	3.3	2.3	2.4	2.6	2.0	2.8	7.4	12.5	25.8	19.4	13.7	13.8	16.8	9.2	25.8
29-Mar	10.1	6.8	Z	3.3	11.3	9.5	2.9	1.4	3.6	10.5	11.4	9.0	10.2	6.0	3.4	3.1	3.2	4.1	5.0	5.3	11.2	13.0	2.7	2.6	6.5	13.0
30-Mar	4.4	7.8	5.4	Z	8.1	3.6	5.8	15.5	15.5	9.6	9.6	7.0	5.7	6.3	5.5	6.9	5.0	5.2	7.5	12.0	5.4	3.5	3.6	3.0	7.0	15.5
31-Mar	2.3	2.4	1.9	3.4	Z	13.8	18.5	12.5	5.5	1.8	3.7	4.3	5.4	3.6	3.0	6.2	7.7	8.3	13.6	17.5	7.7	3.1	2.0	1.9	6.5	18.5
	7.1	6.6	6.9	8.7	8.3	12.2	11.7	10.3	8.2	6.8	6.0	5.3	4.6	4.8	4.9	5.3	6.5	8.3	10.7	12.3	11.1	8.6	7.0	7.0	Diurnal Average	
	27.3	18.9	36.4	41.9	26.9	34.3	35.1	25.8	23.3	31.8	21.3	14.8	10.2	12.5	13.9	14.8	22.2	29.9	39.6	39.2	39.7	29.7	28.6	31.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	657	93.06	93.06
21 - 40	48	6.80	99.86
11 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	76	39	17	13	45	117	110	27	21	17	18	16	10	13	22	96	657
21 - 40	4	3	0	1	1	3	8	5	2	3	2	2	2	1	2	9	48
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	81	42	17	14	46	120	118	32	23	20	20	18	12	14	24	105	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - March 2023

Maximum Value: 85.0 ppb on Mar 25 10:00

Maximum Daily Average: 30.1 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 2 23:00

Minimum Daily Average: 4.0 ppb on Mar 2

Maximum Diurnal Average: 14.9 ppb at hour 7

Minimum Diurnal Average: 6.9 ppb at hour 2

Monthly Average: 10.43 ppb

Percentiles: P_1 = 0.7 P_{10} = 3.0 Q_1 = 4.6 Median = 7.4 Q_3 = 12.3 P_{90} = 22.5 P_{99} = 47.2

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	21.4	21.2	7.6	4.9	5.7	Z	7.5	6.2	8.6	6.6	6.1	6.7	6.0	6.6	6.9	7.3	9.3	13.8	16.7	11.0	9.4	8.0	6.4	7.1	9.2	21.4
2-Mar	Z	4.6	4.3	4.9	6.2	11.6	9.8	8.8	12.1	6.8	4.4	3.9	2.9	1.6	1.3	1.8	1.7	0.9	0.7	0.6	0.6	0.7	0.3	0.5	4.0	12.1
3-Mar	0.4	Z	0.4	4.6	9.4	10.5	9.6	9.0	9.1	7.1	3.8	5.5	10.4	10.5	14.0	14.5	14.3	13.3	14.2	9.6	9.8	12.9	9.3	3.7	9.0	14.5
4-Mar	3.7	7.1	Z	5.8	3.5	3.5	4.3	7.8	11.5	9.0	7.1	7.2	6.5	0.8	0.7	0.4	3.7	7.0	11.8	11.7	11.7	4.8	4.3	6.8	6.1	11.8
5-Mar	11.0	7.9	5.7	Z	3.1	1.9	15.3	10.8	1.8	3.7	9.4	10.8	6.3	11.9	14.4	15.2	15.0	27.4	39.6	17.5	14.5	10.8	8.0	7.9	11.7	39.6
6-Mar	7.1	5.9	5.7	15.5	9.3	11.1	31.6	29.4	11.6	9.4	7.9	6.9	7.2	Z	8.3	8.6	7.5	8.6	8.0	7.0	5.2	5.5	5.2	4.0	9.8	31.6
7-Mar	2.7	2.2	2.2	2.3	Z	9.8	10.0	6.3	4.6	C	C	C	C	C	C	3.4	4.6	6.6	6.9	3.0	4.1	3.5	2.4	3.1	--	10.0
8-Mar	3.0	2.9	4.0	3.6	4.8	Z	8.6	10.9	11.1	7.7	5.8	4.6	3.8	3.0	2.7	3.2	4.0	10.6	8.3	6.0	5.3	4.1	3.3	3.3	5.4	11.1
9-Mar	Z	3.9	5.5	6.9	9.5	23.5	24.6	34.2	12.9	12.6	10.6	13.7	9.6	5.8	M	5.9	5.4	6.3	4.7	4.4	3.7	2.8	2.2	2.1	9.6	34.2
10-Mar	1.7	Z	2.2	2.3	2.5	6.2	4.1	4.2	4.6	3.4	3.4	3.2	3.0	2.3	2.7	2.7	3.7	5.6	6.2	7.6	8.6	5.5	6.9	4.2	4.2	8.6
11-Mar	5.6	8.6	Z	5.6	3.4	9.0	7.1	4.3	3.5	4.1	4.5	4.8	3.4	2.1	2.4	2.5	3.5	5.3	10.0	7.3	8.6	8.0	9.2	9.6	5.7	10.0
12-Mar	9.7	8.8	5.3	Z	4.0	4.5	3.9	5.7	7.4	7.8	14.1	11.3	8.4	9.0	9.9	10.8	11.1	7.9	7.2	5.5	6.0	6.3	6.8	6.8	7.7	14.1
13-Mar	7.9	9.0	12.6	16.0	Z	24.8	34.7	34.6	27.1	17.1	17.1	15.0	15.4	16.6	15.1	14.7	28.1	35.5	7.5	6.8	5.0	4.0	2.7	4.1	16.1	35.5
14-Mar	7.6	8.3	8.3	7.0	7.5	Z	11.1	10.8	6.7	11.6	14.7	17.0	17.5	20.3	22.7	23.2	26.1	21.7	14.7	14.9	11.6	12.4	12.5	12.3	14.0	26.1
15-Mar	Z	9.4	20.1	27.0	22.1	24.1	26.2	21.7	27.4	16.7	20.1	16.8	17.5	29.0	20.9	28.3	40.5	47.2	59.3	60.9	46.5	31.2	33.4	46.7	30.1	60.9
16-Mar	35.5	Z	2.8	3.0	9.0	11.3	6.6	5.7	5.5	5.9	5.5	6.1	6.1	8.0	8.5	7.8	14.7	22.7	13.3	11.0	14.3	8.1	7.7	11.9	10.0	35.5
17-Mar	7.1	5.2	Z	17.7	24.7	35.8	33.2	39.0	38.8	15.5	10.2	11.4	11.5	12.2	12.7	3.8	11.2	3.8	15.7	19.7	22.6	14.8	5.2	3.6	16.3	39.0
18-Mar	2.6	3.1	2.7	Z	5.9	6.7	6.5	6.4	6.5	6.7	5.2	3.8	3.8	3.6	5.0	9.3	14.4	9.7	9.9	30.0	42.0	27.2	17.4	13.4	10.5	42.0
19-Mar	11.0	14.2	40.6	47.5	Z	40.6	38.2	19.1	6.8	3.4	2.2	2.3	2.5	3.1	2.8	3.4	3.7	5.6	5.4	3.3	2.9	2.4	1.6	1.5	11.5	47.5
20-Mar	1.9	1.8	1.9	2.5	5.0	Z	7.0	12.0	4.5	2.2	2.0	3.8	6.1	5.8	5.6	5.2	4.2	5.1	4.4	3.7	4.3	3.5	5.5	4.6	4.5	12.0
21-Mar	Z	5.5	4.9	14.8	11.4	43.2	50.1	29.3	30.6	31.8	28.1	28.0	11.0	16.8	15.4	14.2	14.7	16.0	19.5	24.8	17.0	23.3	13.2	8.3	20.5	50.1
22-Mar	7.9	Z	8.9	5.6	9.1	7.4	6.0	7.0	5.7	5.8	6.8	5.9	6.1	5.7	5.3	5.9	6.6	10.8	22.4	34.7	36.8	10.2	11.3	11.8	10.6	36.8
23-Mar	11.0	8.1	Z	8.1	30.6	29.9	7.4	4.7	9.8	11.5	16.4	9.8	5.7	7.3	5.1	4.0	4.0	4.6	4.9	4.9	6.2	8.2	7.7	9.2	9.5	30.6
24-Mar	6.0	7.9	8.3	Z	5.2	9.1	6.6	6.3	7.9	7.7	14.5	14.0	7.6	8.7	9.8	9.5	11.4	12.8	19.6	27.2	19.4	17.0	10.5	6.0	11.0	27.2
25-Mar	4.4	3.7	4.6	9.4	Z	2.9	6.6	15.9	50.5	85.0	48.4	27.7	18.0	8.6	5.9	5.6	4.4	4.4	4.8	4.8	4.3	5.2	5.4	4.5	14.6	85.0
26-Mar	3.6	5.9	6.6	9.7	11.8	Z	14.0	10.9	5.3	5.0	3.5	2.2	6.8	14.5	12.4	16.3	6.7	3.6	2.3	3.9	3.4	2.6	3.7	4.8	6.9	16.3
27-Mar	Z	6.9	7.9	6.2	7.3	11.1	12.0	24.4	29.1	17.4	10.3	7.1	5.1	6.2	6.3	5.7	5.2	8.3	14.3	25.1	12.2	7.7	6.1	13.3	11.1	29.1
28-Mar	9.1	Z	8.1	6.4	5.1	11.0	27.5	25.6	13.5	11.8	6.2	5.3	3.6	3.6	4.4	2.9	3.8	9.4	14.2	28.9	21.0	14.4	14.2	17.3	11.6	28.9
29-Mar	10.3	6.9	Z	3.4	11.5	9.7	3.2	1.7	4.4	15.4	16.1	13.0	14.4	9.1	5.0	4.3	4.1	5.1	5.5	5.6	11.4	13.2	2.7	2.6	7.8	16.1
30-Mar	4.4	7.9	5.4	Z	8.8	3.7	7.9	32.0	27.8	16.3	17.1	11.2	8.7	9.1	8.5	9.5	7.1	7.6	9.2	13.1	6.0	3.8	3.9	3.3	10.1	32.0
31-Mar	2.5	2.6	2.1	3.8	Z	17.4	21.3	14.9	6.7	2.4	5.7	7.2	9.4	5.4	3.8	7.8	9.4	10.1	14.7	19.9	9.2	3.6	2.4	2.3	8.0	21.3
	7.7	6.9	7.3	9.4	9.1	14.6	14.9	14.8	13.3	12.2	10.9	9.5	8.1	8.5	8.2	8.3	9.8	11.5	12.8	14.0	12.4	9.2	7.5	7.8	Diurnal Average	
	35.5	21.2	40.6	47.5	30.6	43.2	50.1	39.0	50.5	85.0	48.4	28.0	18.0	29.0	22.7	28.3	40.5	47.2	59.3	60.9	46.5	31.2	33.4	46.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	626	88.67	88.67
21 - 40	65	9.21	97.88
11 - 80	14	1.98	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - March 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	72	39	13	12	42	115	106	22	21	17	17	16	10	11	22	91	626
21 - 40	6	0	4	2	3	5	11	10	2	3	2	2	0	3	2	10	65
11 - 80	3	3	0	0	1	0	1	0	0	0	1	0	2	0	0	3	14
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	81	42	17	14	46	120	118	32	23	20	20	18	12	14	24	105	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH_3) - ppb

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0

Maximum Value: 0.0 ppb on Mar 1 01:00

Maximum Daily Average: 0.0 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 1 01:00

Minimum Daily Average: 0.0 ppb on Mar 1

Maximum Diurnal Average: 0.0 ppb at hour 1

Minimum Diurnal Average: 0.0 ppb at hour 1

Monthly Average: 0.00 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.0

Hours in Service:	744
Hours of Data:	661
Hours of Missing Data:	83
Hours of Calibration:	39
Percent Operational Time:	94.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	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
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-Mar	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
4-Mar	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
5-Mar	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
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
7-Mar	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
8-Mar	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	C	C	C	C	C	C	C	C	RE	RE	RE	0.0	0.0	0.0	0.0	--	0.0
9-Mar	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Mar	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
11-Mar	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
12-Mar	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Mar	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Mar	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Mar	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
16-Mar	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
17-Mar	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
18-Mar	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
19-Mar	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Mar	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
21-Mar	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Mar	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
23-Mar	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
24-Mar	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
25-Mar	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
26-Mar	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
27-Mar	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
28-Mar	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
29-Mar	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
30-Mar	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
31-Mar	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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 Maximum	

Z - zerospan C - Calibration M - Maintenance RE - Recovery

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

Wood Buffalo Environmental Association

Hourly Averages

Ammonia (NH_3) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ammonia (NH_3) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	661	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 661

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ammonia (NH_3) - ppb

Patricia McInnes - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	78	40	17	14	43	109	111	31	22	18	16	16	12	14	21	99	661
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	78	40	17	14	43	109	111	31	22	18	16	16	12	14	21	99	661

Total Number of Valid Hours: 661

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ammonia (NH_3) - ppb

Patricia McInnes

Total Number of Valid Hours: 661

Wood Buffalo Environmental Association

Zero Responses

Ammonia (NH_3) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Span Responses

Ammonia (NH_3) - ppb

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Patricia McInnes - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 27.7 $\mu g/m^3$ on Mar 25 10:00

Maximum Daily Average: 10.8 $\mu g/m^3$ on Mar 27

Minimum Value: 0.3 $\mu g/m^3$ on Mar 2 23:00

Maximum Diurnal Average: 7.3 $\mu g/m^3$ at hour 20

Monthly Average: 6.14 $\mu g/m^3$

Minimum Daily Average: 3.2 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 5.2 $\mu g/m^3$ at hour 3

Percentiles: P_1 = 0.5 P_{10} = 3.3 Q_1 = 4.0 Median = 5.2 Q_3 = 7.3 P_{90} = 10.6 P_{99} = 17.3

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	1
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	7.8	6.3	2.8	2.1	2.1	2.0	2.1	3.2	5.4	2.4	2.5	2.9	3.4	3.7	3.9	4.4	5.1	6.7	8.3	6.8	6.9	7.2	7.3	11.8	4.9	11.8
2-Mar	8.0	7.6	7.6	7.9	8.4	9.2	9.4	9.8	10.3	10.9	9.7	7.2	4.8	1.8	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.6	4.9	10.9
3-Mar	1.3	1.6	1.7	4.1	5.7	5.9	5.5	7.1	7.1	6.3	6.5	5.6	5.5	6.9	10.9	12.3	11.4	11.8	11.1	7.4	9.6	6.2	6.7	5.0	6.8	12.3
4-Mar	4.6	4.9	3.8	5.9	5.6	4.5	3.8	3.8	3.7	3.9	5.0	4.3	3.6	2.8	3.0	2.8	2.9	5.7	6.0	10.1	10.7	6.3	4.0	4.7	4.8	10.7
5-Mar	9.5	6.4	4.3	5.2	3.0	2.5	6.8	5.2	3.0	4.0	7.2	6.0	5.2	9.0	13.0	11.1	10.0	9.9	15.0	9.8	7.1	6.4	5.8	5.5	7.1	15.0
6-Mar	5.3	4.6	4.4	4.9	4.2	4.7	7.9	7.2	4.2	6.9	3.8	3.7	4.7	3.5	4.3	4.0	3.7	3.7	5.8	4.2	4.0	3.8	5.6	3.1	4.7	7.9
7-Mar	3.0	2.8	2.7	2.5	2.5	2.6	2.9	3.0	3.4	3.0	3.5	3.4	3.5	3.8	3.7	3.2	3.1	3.2	3.2	2.6	2.8	2.9	2.4	6.1	3.2	6.1
8-Mar	4.5	4.1	5.8	3.1	2.8	2.8	2.9	4.7	3.4	3.4	4.2	4.0	3.5	3.7	3.5	3.8	4.2	4.7	4.3	3.5	3.4	3.4	3.1	3.1	3.7	5.8
9-Mar	2.8	2.5	2.8	3.0	2.9	4.4	4.1	7.6	4.2	3.8	4.0	4.3	4.5	3.6	3.6	3.7	3.9	4.1	4.6	4.5	4.0	4.0	3.7	3.6	3.9	7.6
10-Mar	3.7	3.5	3.2	3.2	3.3	3.4	3.4	3.7	4.1	4.6	4.7	4.5	4.3	4.5	4.5	4.5	4.4	4.3	4.5	9.1	8.5	5.0	6.5	4.6	4.6	9.1
11-Mar	3.9	4.1	3.2	3.3	3.2	3.0	3.2	3.1	3.2	3.4	3.8	4.1	4.2	3.7	3.5	4.9	4.0	4.3	4.4	5.0	7.2	8.1	5.9	5.8	4.3	8.1
12-Mar	5.0	4.4	3.6	3.4	3.4	3.4	3.4	3.8	4.0	4.1	3.8	3.9	3.8	3.8	4.0	4.3	4.3	4.0	4.0	3.8	4.1	4.7	4.4	4.7	4.0	5.0
13-Mar	5.0	4.9	5.7	5.3	5.9	6.4	7.1	6.6	6.0	5.7	5.5	5.1	5.3	5.6	5.8	7.3	6.3	4.7	4.4	4.6	3.8	3.7	3.5	3.7	5.3	7.3
14-Mar	3.7	4.5	5.1	4.2	4.2	4.1	4.1	4.1	3.7	4.5	4.9	4.0	4.0	5.4	6.4	6.2	6.2	6.3	6.3	4.3	3.7	3.8	3.8	3.9	4.6	6.4
15-Mar	3.8	4.2	5.2	5.1	4.8	5.2	5.3	5.4	6.0	5.7	5.8	5.4	5.7	6.3	C	8.4	12.7	12.1	11.7	12.1	12.5	12.2	14.4	19.1	8.2	19.1
16-Mar	11.6	4.8	3.6	3.5	3.6	3.8	3.8	3.9	3.7	3.8	3.9	4.3	4.4	4.8	4.9	5.4	6.2	6.4	5.5	5.1	5.5	4.7	5.2	5.4	4.9	11.6
17-Mar	4.6	4.0	4.2	5.0	5.0	5.2	5.4	6.1	6.1	5.2	4.8	4.9	6.0	5.6	5.8	4.3	6.3	5.2	7.2	7.9	7.9	8.8	5.2	4.4	5.6	8.8
18-Mar	4.0	4.3	4.4	4.5	4.3	4.5	5.0	5.9	6.7	6.9	6.3	5.6	5.9	7.1	5.1	5.6	6.6	4.5	4.8	12.9	10.8	10.4	9.4	5.5	6.3	12.9
19-Mar	5.8	8.4	9.7	9.4	8.4	7.7	5.0	5.2	4.4	4.3	5.0	4.8	5.0	4.7	5.0	5.0	4.8	5.5	4.9	4.8	4.7	4.6	4.4	4.0	5.6	9.7
20-Mar	3.7	3.4	3.3	3.3	3.5	3.8	4.4	4.9	4.0	3.8	3.8	4.0	4.2	4.6	4.8	5.7	4.9	5.3	5.2	5.7	6.7	5.7	5.9	4.8	4.6	6.7
21-Mar	3.9	4.1	4.9	6.6	5.7	12.4	12.3	12.0	11.8	11.8	10.6	9.6	6.6	8.6	8.8	8.8	8.5	9.0	8.1	11.4	11.6	12.4	7.9	11.1	9.1	12.4
22-Mar	6.9	4.9	4.5	4.1	4.4	4.0	4.4	4.6	5.1	4.9	6.1	6.3	6.6	7.1	7.0	6.9	6.7	6.9	12.2	13.6	17.0	7.8	10.7	7.0	7.1	17.0
23-Mar	6.2	7.1	7.8	7.2	10.0	8.9	8.5	7.8	7.3	6.5	9.3	7.8	6.4	6.2	6.2	5.9	5.7	5.5	5.5	5.3	5.5	9.2	7.3	9.7	7.2	10.0
24-Mar	7.9	7.3	7.0	6.1	5.4	7.0	5.6	5.7	6.2	5.4	5.9	5.8	5.5	6.2	6.7	7.1	7.9	7.8	8.9	13.2	11.5	9.4	9.2	5.9	7.3	13.2
25-Mar	5.1	4.4	4.4	5.5	4.8	4.5	5.4	7.6	16.7	27.7	17.4	11.2	10.4	7.9	5.9	5.2	4.6	4.7	5.9	6.5	6.7	9.5	8.3	5.8	8.2	27.7
26-Mar	5.3	6.4	7.1	8.6	10.4	12.1	13.6	7.3	5.2	4.9	4.6	4.7	10.4	23.2	16.7	15.0	8.9	5.6	5.8	7.3	6.0	5.7	6.3	7.6	8.7	23.2
27-Mar	8.3	9.2	10.5	11.0	11.5	11.4	10.5	14.2	18.8	16.7	12.6	9.5	7.7	7.4	7.7	7.3	6.9	7.1	9.4	12.5	7.8	7.4	11.1	22.5	10.8	22.5
28-Mar	18.3	18.1	16.8	15.3	14.7	15.4	14.6	14.6	7.5	10.0	7.1	6.7	6.1	5.7	5.5	5.1	5.9	7.3	7.9	15.8	8.5	7.6	8.5	9.0	10.5	18.3
29-Mar	10.0	4.5	4.2	4.9	9.0	8.5	4.6	3.2	4.7	7.7	11.2	8.4	11.3	8.7	6.1	5.2	4.5	4.3	3.8	3.9	5.5	9.6	4.5	4.9	6.4	11.3
30-Mar	4.8	5.4	5.1	4.9	5.3	7.9	9.9	12.2	8.5	7.0	8.4	7.6	7.6	7.8	7.1	6.9	4.5	4.2	4.4	5.3	4.1	3.3	2.9	2.4	6.1	12.2
31-Mar	2.3	2.3	2.2	2.4	3.1	4.0	6.7	6.8	4.1	3.5	7.4	9.2	14.0	11.4	8.5	11.8	12.1	11.0	12.7	7.8	6.6	6.7	5.0	7.6	7.0	14.0
	5.8	5.3	5.2	5.3	5.5	6.0	6.2	6.5	6.2	6.5	6.4	5.8	5.9	6.3	6.1	6.2	6.1	6.0	6.6	7.3	6.9	6.5	6.1	6.5	Diurnal Average	
	18.3	18.1	16.8	15.3	14.7	15.4	14.6	14.6	18.8	27.7	17.4	11.2	14.0	23.2	16.7	15.0	12.7	12.1	15.0	15.8	17.0	12.4	14.4	22.5	Diurnal Maximum	

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Patricia McInnes - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	401	53.97	53.97
6 - 15	328	44.15	98.12
16 - 25	13	1.75	99.87
26 - 80	1	0.13	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Patricia McInnes - March 2023

Concentration Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	20	22	6	8	22	109	78	12	9	6	9	12	8	10	14	56	401
6 - 15	61	20	10	6	25	21	44	20	16	14	12	7	4	4	12	52	328
16 - 25	2	2	0	0	0	0	3	2	0	0	0	0	0	1	0	3	13
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	83	44	16	14	47	130	125	34	25	20	21	19	12	15	26	112	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Patricia McInnes

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Patricia McInnes - March 2023

Maximum Value: 11.8 C on Mar 18 16:00

Maximum Daily Average: 1.2 C on Mar 18

Minimum Value: -30.7 C on Mar 6 03:00

Minimum Daily Average: -22.1 C on Mar 5

Maximum Diurnal Average: -3.8 C at hour 16

Minimum Diurnal Average: -15.2 C at hour 7

Monthly Average: -9.62 C

Percentiles: P_1 = -29.2 P_{10} = -18.5 Q_1 = -14.2 Median = -9.5 Q_3 = -4.9 P_{90} = -0.8 P_{99} = 7.6

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-27.7	-26.6	-20.2	-19.6	-19.7	-19.4	-19.7	-19.8	-18.9	-17.1	-14.5	-11.3	-9.1	-7.9	-7.8	-7.8	-7.8	-8.1	-8.6	-8.5	-8.7	-8.6	-8.7	-8.7	-13.9	-7.8
2-Mar	-8.7	-8.9	-8.9	-8.5	-8.3	-8.1	-8.0	-7.9	-7.3	-4.6	-1.7	0.4	2.3	4.0	3.7	3.7	3.8	3.0	1.4	0.9	0.5	0.4	0.2	-0.5	-2.4	4.0
3-Mar	-0.9	-1.5	-1.9	-3.3	-6.1	-7.4	-8.0	-8.8	-9.4	-9.8	-9.8	-9.3	-9.1	-9.0	-9.1	-8.8	-8.8	-9.4	-10.2	-11.3	-12.6	-14.5	-14.4	-14.7	-8.7	-0.9
4-Mar	-15.1	-15.3	-15.8	-15.9	-16.2	-16.4	-16.5	-16.4	-17.4	-17.2	-15.6	-15.1	-14.3	-13.8	-13.6	-13.6	-13.6	-14.2	-15.7	-16.9	-18.0	-19.0	-22.4	-22.8	-16.3	-13.6
5-Mar	-20.4	-22.2	-24.0	-24.0	-28.2	-30.3	-30.4	-29.1	-22.2	-19.5	-18.2	-17.4	-15.9	-15.0	-14.5	-13.9	-14.2	-15.4	-19.0	-24.4	-26.6	-27.5	-28.4	-29.2	-22.1	-13.9
6-Mar	-29.7	-30.1	-30.7	-28.5	-29.6	-30.6	-28.3	-26.3	-24.5	-23.2	-20.6	-17.4	-14.9	-12.6	-11.1	-10.1	-9.8	-10.5	-11.2	-11.5	-12.2	-12.8	-13.0	-12.8	-19.3	-9.8
7-Mar	-12.7	-12.9	-13.1	-13.2	-13.4	-13.4	-13.4	-13.5	-13.6	-13.4	-12.7	-11.6	-9.8	-8.6	-7.0	-6.6	-6.5	-6.7	-7.3	-8.0	-8.7	-8.9	-8.8	-9.4	-10.5	-6.5
8-Mar	-10.1	-11.0	-11.5	-12.0	-13.1	-14.1	-15.1	-15.3	-14.5	-13.8	-12.3	-10.0	-8.7	-7.3	-6.3	-5.7	-5.8	-6.9	-8.5	-9.6	-10.9	-12.0	-12.9	-13.5	-10.9	-5.7
9-Mar	-14.3	-15.0	-16.1	-17.0	-17.7	-18.4	-21.3	-19.9	-18.2	-16.9	-14.2	-11.4	-9.9	-9.1	-8.3	-7.3	-6.9	-6.8	-8.0	-8.9	-9.4	-9.6	-9.8	-10.1	-12.7	-6.8
10-Mar	-10.4	-11.0	-11.1	-11.2	-11.3	-11.5	-11.8	-11.7	-11.4	-10.5	-9.3	-8.9	-7.7	-6.6	-5.9	-5.2	-5.7	-5.9	-6.5	-6.8	-7.0	-7.6	-8.1	-8.5	-8.8	-5.2
11-Mar	-9.5	-10.2	-10.0	-10.0	-10.2	-10.6	-10.8	-11.0	-10.7	-9.2	-7.1	-5.6	-4.4	-3.5	-3.3	-3.4	-3.6	-4.1	-4.3	-5.3	-6.1	-7.8	-8.6	-9.4	-7.4	-3.3
12-Mar	-10.3	-11.0	-11.7	-12.0	-12.6	-13.4	-14.2	-14.2	-14.0	-13.2	-12.3	-11.6	-10.0	-9.3	-9.4	-9.8	-10.4	-11.4	-12.1	-12.4	-12.6	-13.2	-13.6	-13.7	-12.0	-9.3
13-Mar	-14.0	-14.3	-14.6	-15.2	-15.6	-16.0	-16.6	-16.6	-16.1	-15.2	-13.8	-11.8	-9.8	-8.7	-6.9	-6.6	-5.4	-5.2	-5.2	-5.3	-5.7	-6.7	-7.1	-7.4	-10.8	-5.2
14-Mar	-7.4	-7.7	-9.0	-9.8	-10.1	-10.1	-9.9	-9.8	-10.8	-10.9	-11.5	-11.6	-10.9	-10.0	-9.9	-10.1	-10.2	-10.6	-11.4	-12.1	-12.8	-13.4	-13.9	-14.8	-10.8	-7.4
15-Mar	-15.5	-16.5	-17.3	-17.9	-19.0	-18.7	-18.6	-19.4	-14.5	-10.3	-7.8	-5.2	-7.0	-7.5	-8.8	-8.4	-7.6	-8.2	-10.4	-15.3	-17.9	-19.6	-18.1	-16.8	-13.6	-5.2
16-Mar	-15.9	-14.1	-14.4	-15.2	-14.8	-14.4	-14.4	-14.5	-14.4	-13.4	-11.9	-10.6	-7.5	-6.4	-5.0	-3.5	-2.4	-2.8	-4.6	-5.5	-6.8	-7.9	-8.8	-9.9	-10.0	-2.4
17-Mar	-10.3	-10.8	-11.6	-12.7	-14.4	-14.6	-15.1	-15.3	-11.2	-8.0	-4.7	-1.1	2.1	4.6	7.0	9.0	9.6	9.7	6.8	-0.1	-2.8	-1.5	0.5	0.3	-3.5	9.7
18-Mar	-0.8	-1.2	-2.5	-3.3	-4.0	-4.9	-5.8	-5.3	-3.6	-1.9	0.5	3.5	6.5	8.1	11.2	11.8	11.0	10.9	5.7	3.6	1.4	-1.2	-3.7	-7.3	1.2	11.8
19-Mar	-8.8	-9.5	-7.8	-8.2	-10.9	-11.7	-11.1	-8.8	-5.3	-4.7	-2.5	-0.8	-0.1	1.2	2.2	2.0	0.5	-0.3	-1.0	-1.9	-2.9	-3.8	-4.4	-4.6	-4.3	2.2
20-Mar	-4.7	-4.9	-5.8	-6.6	-7.3	-7.9	-8.4	-8.2	-8.0	-7.4	-7.8	-7.7	-7.3	-6.4	-5.5	-5.3	-5.2	-5.3	-5.6	-7.2	-7.9	-8.6	-10.4	-12.0	-7.1	-4.7
21-Mar	-12.9	-13.8	-14.2	-14.7	-15.1	-15.3	-18.3	-15.8	-13.5	-11.7	-9.9	-8.6	-5.9	-5.1	-4.0	-3.2	-4.1	-4.6	-5.9	-9.6	-13.2	-14.3	-14.0	-16.6	-11.0	-3.2
22-Mar	-18.9	-19.2	-14.5	-12.4	-13.1	-13.3	-13.3	-12.9	-11.0	-8.2	-5.6	-3.1	-0.8	1.0	2.1	3.3	3.7	3.7	1.7	-2.8	-4.8	-7.8	-9.9	-10.0	-6.9	3.7
23-Mar	-7.9	-7.3	-6.8	-8.3	-9.9	-7.6	-5.5	-4.0	-1.5	0.6	0.3	1.1	1.0	1.2	0.3	-0.7	-1.4	-3.0	-4.5	-5.7	-7.0	-8.8	-9.8	-9.8	-4.4	1.2
24-Mar	-10.4	-12.6	-11.9	-10.3	-11.1	-12.2	-12.8	-12.1	-10.2	-8.4	-5.7	-4.3	-3.9	-2.2	-2.0	-1.1	-0.6	-1.9	-2.9	-6.6	-10.9	-13.4	-15.2	-16.9	-8.3	-0.6
25-Mar	-18.0	-18.1	-18.6	-18.8	-19.5	-20.6	-20.7	-17.4	-11.7	-8.4	-5.7	-4.2	-3.0	-1.9	-1.5	-1.6	-2.2	-3.3	-5.1	-7.2	-8.9	-10.6	-11.8	-13.3	-10.5	-1.5
26-Mar	-14.8	-16.1	-17.3	-17.8	-18.6	-19.8	-19.7	-18.7	-17.6	-15.9	-14.8	-12.5	-11.0	-9.5	-9.0	-8.6	-8.7	-9.7	-11.6	-13.1	-14.5	-16.1	-17.0	-17.7	-14.6	-8.6
27-Mar	-18.4	-19.7	-21.5	-25.3	-26.7	-27.6	-27.8	-23.4	-19.0	-14.9	-12.7	-10.1	-8.2	-7.0	-6.2	-5.6	-5.2	-5.8	-6.7	-10.5	-16.0	-17.6	-18.8	-18.9	-15.6	-5.2
28-Mar	-21.1	-22.2	-23.1	-24.6	-25.3	-25.9	-26.0	-20.2	-16.5	-14.3	-11.0	-8.1	-6.0	-3.9	-2.2	-1.2	-0.7	-1.0	-2.0	-2.5	-2.4	-2.7	-2.9	-3.0	-11.2	-0.7
29-Mar	-2.2	-2.2	-3.1	-4.1	-4.1	-5.4	-4.8	-3.4	-1.6	-1.3	-1.0	-0.5	0.0	0.0	0.0	-0.5	-1.0	-1.3	-2.3	-3.0	-3.9	-6.8	-9.6	-11.7	-3.1	0.0
30-Mar	-13.4	-14.5	-15.4	-16.1	-16.6	-16.9	-16.8	-13.5	-9.5	-6.8	-4.4	-2.5	-1.8	-1.9	-0.8	-0.5	-0.9	-1.1	-1.3	-1.7	-2.3	-2.8	-3.3	-3.7	-7.0	-0.5
31-Mar	-3.8	-4.0	-4.6	-5.4	-6.0	-6.2	-7.1	-5.9	-4.8	-4.1	-2.7	-0.7	1.5	2.7	2.6	2.2	2.3	2.5	1.2	0.8	0.1	-0.7	-1.4	-2.4	-1.8	2.7
	-12.6	-13.0	-13.2	-13.6	-14.5	-14.9	-15.2	-14.2	-12.3	-10.8	-9.1	-7.3	-5.9	-4.9	-4.2	-3.8	-3.8	-4.3	-5.6	-7.4	-8.7	-9.8	-10.6	-11.3	Diurnal Average	
	-0.8	-1.2	-1.9	-3.3	-4.0	-4.9	-4.8	-3.4	-1.5	0.6	0.5	3.5	6.5	8.1	11.2	11.8	11.0	10.9	6.8	3.6	1.4	0.4	0.5	0.3	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Patricia McInnes - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	47	6.32	6.32
-20 - 0	638	85.75	92.07
0 - 10	55	7.39	99.46
10 - 20	4	0.54	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Patricia McInnes - March 2023

Maximum Value: 90.5 % on Mar 15 12:00

Maximum Daily Average: 88.6 % on Mar 14

Minimum Value: 25.8 % on Mar 17 18:00

Minimum Daily Average: 46.7 % on Mar 18

Maximum Diurnal Average: 78.3 % at hour 7

Minimum Diurnal Average: 54.6 % at hour 16

Monthly Average: 67.86 %

Percentiles: P_1 = 33.5 P_{10} = 46.4 Q_1 = 56.1 Median = 70.3 Q_3 = 80.3 P_{90} = 85.9 P_{99} = 89.6

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	76.4	78.8	82.5	81.4	81.4	81.5	81.2	81.3	80.4	79.4	77.4	74.8	72.3	70.2	68.2	66.9	68.5	70.9	72.9	74.1	75.9	76.7	78.0	79.7	76.3	82.5
2-Mar	85.4	88.6	89.4	90.0	89.7	89.1	88.4	86.7	84.3	80.2	66.2	60.5	57.7	55.1	60.4	63.1	61.7	63.6	77.1	80.6	79.5	77.9	79.6	82.2	76.5	90.0
3-Mar	74.0	68.3	66.6	74.0	79.4	79.3	79.1	76.5	75.4	73.9	71.3	68.8	69.3	68.7	68.5	66.2	65.9	69.6	74.4	81.9	86.6	87.3	86.2	80.6	74.7	87.3
4-Mar	77.7	76.5	72.2	73.8	76.5	78.9	81.0	81.0	76.5	73.5	64.6	61.5	58.7	57.5	58.3	53.1	51.0	58.6	63.9	68.5	70.2	71.9	77.6	80.7	69.3	81.0
5-Mar	77.4	78.5	79.8	77.7	76.3	75.0	74.7	75.3	72.7	61.3	55.8	55.2	50.6	48.9	47.8	44.8	46.1	51.5	63.3	74.6	76.5	77.5	76.3	76.4	66.4	79.8
6-Mar	75.7	75.5	75.3	77.8	75.2	75.3	77.8	77.6	75.5	72.4	64.8	57.4	55.7	61.5	58.8	64.2	61.4	64.2	70.4	74.1	75.0	71.9	72.9	71.6	70.1	77.8
7-Mar	69.3	77.0	83.0	82.8	83.0	78.6	73.1	78.7	77.4	70.5	70.3	66.9	60.1	56.8	53.2	50.2	47.8	48.7	48.3	48.2	49.8	49.5	48.2	48.6	63.3	83.0
8-Mar	48.9	50.2	51.9	52.2	55.0	57.9	60.0	61.0	57.7	55.2	51.1	45.6	41.5	37.6	35.1	35.4	35.3	38.2	41.7	41.2	42.5	46.9	50.2	52.1	47.7	61.0
9-Mar	54.4	56.0	59.2	61.9	63.8	66.9	73.5	71.0	62.9	57.8	51.4	47.3	47.1	47.4	45.4	44.8	47.3	51.0	51.5	53.0	56.4	57.2	59.9	67.2	56.4	73.5
10-Mar	69.9	79.6	81.7	81.1	79.4	78.7	78.0	77.6	74.0	69.2	63.6	64.2	61.3	60.4	59.1	56.8	61.2	65.1	68.1	67.0	66.0	66.8	69.3	72.2	69.6	81.7
11-Mar	70.2	70.1	66.8	65.6	64.0	65.8	68.7	69.1	66.9	61.9	55.4	54.6	54.6	53.8	55.5	58.6	62.0	67.3	70.1	85.3	87.9	87.5	87.4	87.0	68.2	87.9
12-Mar	86.3	85.4	85.1	84.3	83.7	83.8	83.9	82.4	79.3	74.7	71.4	71.0	65.7	63.1	63.8	67.3	70.2	75.1	78.8	81.9	82.8	83.6	84.1	83.8	78.0	86.3
13-Mar	83.5	83.3	83.3	83.2	83.5	83.5	83.6	82.8	81.2	78.6	74.8	71.1	67.5	66.8	64.0	65.5	67.9	70.1	70.6	71.0	76.8	85.9	86.9	87.9	77.2	87.9
14-Mar	89.4	90.2	89.4	89.6	89.6	89.6	89.8	89.7	88.8	88.7	88.0	88.0	88.4	89.0	89.2	89.0	89.1	88.8	88.4	87.8	87.2	86.8	86.4	85.7	88.6	90.2
15-Mar	85.2	84.3	83.8	83.3	82.4	82.9	82.6	81.9	85.9	87.8	89.1	90.5	88.0	87.3	87.0	87.4	88.5	88.6	88.2	84.9	83.4	82.2	83.5	84.3	85.6	90.5
16-Mar	85.5	86.2	85.7	85.1	85.5	85.8	85.7	85.6	85.3	85.5	85.2	84.7	82.5	78.3	73.8	70.5	67.2	67.0	71.9	74.3	75.7	77.9	82.0	85.2	80.5	86.2
17-Mar	86.7	85.9	86.7	87.8	88.4	87.8	86.0	86.4	82.1	70.5	63.3	55.1	49.4	46.9	43.8	33.1	32.0	25.8	34.0	52.7	61.1	53.2	42.8	40.5	61.7	88.4
18-Mar	41.3	42.5	45.8	48.5	51.1	54.5	58.9	59.2	55.5	52.0	46.4	39.9	35.1	32.4	27.7	26.7	28.0	25.9	39.7	46.6	52.9	61.8	69.2	79.7	46.7	79.7
19-Mar	84.7	86.2	85.2	87.9	90.2	89.6	89.4	87.9	73.6	70.0	62.6	57.6	55.5	53.1	52.2	54.0	60.4	64.4	66.6	69.9	73.0	75.7	75.0	75.4	72.5	90.2
20-Mar	73.4	70.3	67.8	65.9	65.7	66.1	68.0	67.1	66.1	68.2	76.2	83.0	84.2	78.7	74.4	73.2	72.5	74.1	74.4	79.7	66.4	64.7	67.9	70.5	71.6	84.2
21-Mar	72.2	74.8	76.7	78.4	79.3	82.1	84.5	85.3	78.9	72.0	67.0	65.5	58.0	55.2	52.0	49.3	52.1	54.8	60.2	72.5	78.9	85.2	86.4	84.6	71.1	86.4
22-Mar	84.5	84.2	87.7	86.0	85.9	84.4	83.2	81.3	75.0	67.8	60.4	53.5	48.4	45.1	43.8	42.1	41.7	42.9	50.7	64.5	70.0	75.3	80.4	82.0	67.5	87.7
23-Mar	78.9	74.1	77.3	80.1	84.1	80.5	73.7	69.2	62.1	57.6	53.9	49.5	55.3	55.4	58.2	60.2	60.4	64.4	67.8	71.5	74.1	80.6	84.5	85.4	69.1	85.4
24-Mar	87.7	88.4	88.3	85.9	83.9	84.9	83.6	80.9	72.3	64.2	54.9	50.3	49.8	44.7	45.0	43.1	41.1	44.9	48.6	60.8	70.7	74.5	76.3	79.4	66.8	88.4
25-Mar	78.9	79.3	80.6	80.7	79.3	80.9	81.4	77.8	71.5	60.1	50.2	45.2	40.6	38.9	38.2	38.6	37.6	35.3	38.3	47.1	57.7	65.2	67.5	70.6	60.1	81.4
26-Mar	73.6	75.8	75.5	75.4	74.7	77.0	76.1	66.7	58.2	51.3	48.9	42.6	41.8	40.1	40.9	42.5	40.0	39.5	44.1	48.3	51.8	56.1	58.7	61.3	56.7	77.0
27-Mar	64.2	68.7	72.0	75.9	76.0	75.4	72.7	72.0	66.2	55.4	48.8	41.5	37.5	37.2	37.7	37.7	37.7	40.1	43.4	56.0	69.1	72.3	72.8	74.2	58.5	76.0
28-Mar	77.0	79.8	79.9	79.1	78.0	77.9	77.2	73.7	60.4	54.6	46.9	41.6	38.1	36.8	35.7	34.6	34.0	38.0	44.3	47.0	46.3	46.9	49.3	53.4	55.4	79.9
29-Mar	51.9	51.9	50.6	54.2	60.7	69.8	74.3	72.3	67.1	68.9	67.2	68.3	68.5	68.4	68.3	68.8	67.7	65.3	64.4	62.1	65.8	76.0	82.9	85.9	66.7	85.9
30-Mar	85.8	85.6	85.7	84.3	83.1	83.4	81.7	82.2	77.0	68.6	62.4	56.1	51.0	53.5	50.2	49.1	50.8	56.5	58.7	58.5	54.9	53.8	55.2	57.7	66.1	85.8
31-Mar	58.8	59.6	64.3	73.7	75.6	74.6	75.9	72.5	71.4	69.7	66.7	61.4	55.7	52.5	53.4	55.6	56.2	55.8	62.3	61.9	64.3	67.7	70.8	73.0	64.7	75.9
	74.5	75.3	76.1	77.0	77.6	78.1	78.3	77.2	72.9	68.4	63.7	60.4	57.7	56.2	55.2	54.6	54.9	57.0	61.2	66.1	68.7	70.8	72.5	74.1	Diurnal Average	
	89.4	90.2	89.4	90.0	90.2	89.6	89.8	89.7	88.8	88.7	89.1	90.5	88.4	89.0	89.2	89.0	89.1	88.8	88.4	87.8	87.9	87.5	87.4	87.9	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - March 2023

Maximum Speed: 24 km/h on Mar 2 18:00

Maximum Daily Speed Average: 15.3 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 6 05:00

Maximum Diurnal Speed Average: 5.1 km/h at hour 15

Monthly Average Velocity: 2.9 km/h 72.3 deg

Minimum Daily Speed Average: 1.5 km/h on Mar 21

Minimum Diurnal Speed Average: 1.3 km/h at hour 2

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 10 $Q_3 = 13$ $P_{90} = 15$ $P_{99} = 21$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE3	SE5	SE10	SE10	SE9	SE11	SE13	SE13	SE10	SE11	SE11	SE9	ESE10	ESE12	ESE14	ESE14	ESE12	ESE11	SE10	SE12	SE12	SE11	SE11	SE10	SE10.4	ESE14
2-Mar	SE11	SE13	SE13	SE14	SE13	SE11	SE12	SE12	SSE10	SSW12	SW21	SW23	WSW16	W21	WNW18	WSW15	WSW20	W24	WSW17	WSW17	W15	W13	W14	WNW15	SW8.5	W24
3-Mar	NW13	NW15	NW18	N12	N12	NNW12	N11	N13	N15	N15	N11	N11	NNE10	NNE11	NNE12	N9	NNE10	NNE9	N8	NNW6	NW5	W6	NNW12	N14	N10.1	NW18
4-Mar	NNW11	NNE11	NNE12	N7	NW4	W4	W5	NNE7	NNE12	N9	NNW8	NNW12	NNW14	NNW16	NNW18	NNW19	NNW16	N12	NNW11	N9	N8	NNW6	WNW5	NNW6	NNW9.3	NNW19
5-Mar	N9	NW5	NNW7	NNW6	NW6	W6	WSW4	WNW6	NW8	NNW9	N7	NE8	ENE6	E7	E7	E4	E6	ESE5	SE5	SSW3	SSW4	SSW4	S2	S2	N1.6	N9
6-Mar	S3	S2	SSE3	SE5	ENE0	SE2	SSE6	SSE6	SE10	SE8	SE8	SE7	SE5	SE10	ESE10	ESE13	ESE14	ESE14	SE14	SE13	ESE15	ESE14	ESE10	SE12	SE8.1	ESE15
7-Mar	ESE14	SE16	ESE15	ESE14	ESE13	ESE12	SE10	ESE13	SE17	SE17	SE15	ESE15	ESE16	ESE17	SE20	ESE18	ESE15	ESE15	ESE16	SE19	SE16	SE15	SE16	SE14	ESE15.3	SE20
8-Mar	SE14	SE15	SE12	SE12	SE12	SE14	SE11	SE9	SE8	ESE8	ESE9	ESE12	ESE13	SE13	SE14	ESE15	ESE13	ESE10	ESE11	ESE14	SE14	SE14	SE13	SE12	SE12.0	ESE15
9-Mar	ESE12	ESE11	SE9	SE9	SE8	SE8	SE7	SE6	SE8	SE9	SE12	ESE15	ESE15	ESE20	SE22	SE18	ESE16	SE16	ESE16	ESE16	ESE16	ESE18	ESE17	ESE18	SE13.3	SE22
10-Mar	ESE17	ESE16	SE16	SE17	ESE16	ESE16	ESE16	ESE16	SE17	SE17	SE17	ESE17	ESE17	ESE16	ESE13	ESE14	ESE16	ESE15	ESE12	ESE10	ESE11	ESE12	ESE10	ESE10	ESE14.7	ESE17
11-Mar	ESE6	ESE7	ESE9	ESE7	ESE11	ESE10	ESE9	ESE11	ESE13	ESE8	ESE7	E9	E12	ESE12	ESE11	ESE11	E9	E8	NE8	NNE10	N11	NNW12	NNW12	NNW12	E6.5	ESE13
12-Mar	NNW11	NW13	NW10	NNW12	NNW12	NNW12	NNW11	NNW12	N13	N11	N11	N11	N11	N12	NNW14	N14	N14	NNW14	NNW12	NNW15	NNW15	NNW13	NNW15	NNW14	NNW12.4	NNW15
13-Mar	NNW13	NNW12	NNW12	NNW11	N12	NNW12	NNW13	N11	N10	N10	N10	N8	N12	N14	N15	N15	NE14	ENE13	ENE13	ENE14	ENE15	NE13	NE13	NNE11	NNE10.8	N15
14-Mar	NNE11	N11	NNW15	N15	NNW14	N12	N11	N11	NNW14	NNW14	NNW18	NNW17	NNW17	NNW16	NNW16	NNW16	NNW15	NNW15	NNW13	NNW16	NNW15	NNW13	NNW12	NNW11	NNW13.8	NNW18
15-Mar	NNW11	NNW9	NNW9	NNW7	NW8	NNW7	NW6	WNW3	WNW4	NW3	N3	NW3	NE6	NE7	NE9	NE8	NNE6	NNE6	NNW3	W3	W4	WNW3	WSW3	SE2	NNW4.0	NNW11
16-Mar	ESE5	ESE8	SE15	ESE13	ESE9	ESE7	ESE10	SE11	SE10	SE7	SE6	SSE4	SE4	SSE6	SSE8	SSE8	ESE6	ESE6	SE9	SE9	SE9	SE9	SE9	SSE8	SE7.9	SE15
17-Mar	SE10	SE9	SSE9	SSE7	SSW6	S5	S4	SSE5	SSE7	SSE9	SSE10	SE9	SE8	SSE8	SE7	SW12	SSW8	WSW9	SW6	SW6	SW6	SSW10	SW10	SW13	S6.5	SW13
18-Mar	SW12	SW14	SW14	SW15	SW10	SSW11	SSW9	SSW13	SSW10	S9	S9	SSE8	SSE7	SSE6	E4	E3	ESE3	WSW1	NNW3	N8	N9	NNW7	NNW5	WNW4	SW4.4	SW15
19-Mar	NNW7	N8	N8	N6	NNE4	E6	ENE5	E6	ESE8	ESE14	ESE11	ESE11	E12	E12	E11	ESE12	ESE13	E12	ESE14	ESE16	ESE15	ESE15	ESE17	ESE15	E8.7	ESE17
20-Mar	ESE13	ESE13	ESE15	ESE13	ESE12	ESE12	ESE9	E7	NE10	NNE10	NNE11	NE10	E8	E6	SE5	S7	S8	S7	SSW4	NW4	N13	N14	NNW12	NNW12	ENE4.7	ESE15
21-Mar	NNW14	NNW10	NW13	NNW9	NNW8	NNE3	SW2	WSW3	N5	N3	NNW1	E2	NE3	E4	ENE4	E4	E7	SE7	SE7	SE6	S5	SE7	SE7	SE5	NE1.5	NNW14
22-Mar	SSE5	SSE6	SE9	SE10	SE9	SE12	SE14	SE14	SE14	ESE13	SE13	SE11	SE8	SE8	SE8	ESE8	SE8	SE7	SE4	SSE5	SSE6	S4	S5	S7	SE8.3	SE14
23-Mar	SSW8	S5	S1	WSW4	S4	SSW6	SW12	WSW11	SW8	N12	N18	NNE15	NNE14	NNE17	NNE20	N22	NNE22	NNE21	NNE18	N16	NNE9	N8	NNW7	N8	N7.2	NNE22
24-Mar	NW7	NW8	NNW7	NNW8	NNW10	NNW10	NNW9	NNW9	NNW9	N8	N5	NE5	NE7	E4	NE4	NE4	E4	E7	ESE5	SSE3	SSW5	SW5	SSW4	S4	N3.0	NNW10
25-Mar	S5	SW3	SSW2	SSW4	S1	WNW2	WNW3	N2	N8	NNW7	NNW11	N13	NNW14	N14	N13	N13	NNE16	NNE16	N14	N14	NNW13	NNW11	NNW14	NNW13	N8.1	NNE16
26-Mar	NNW12	NNW11	NNW11	N13	N13	NNW9	N8	ENE7	E6	NNE3	NNE6	NNE6	N7	NNE7	N9	N10	NNW13	NNW15	NNW12	NNW12	NNW12	NNW12	NNW11	NNW10	N8.9	NNW15
27-Mar	NW9	NW7	NW4	W2	SW3	SW3	SSW2	SSE3	SSE4	SE6	SSE7	SE7	SSE6	ESE7	E9	E10	E10	ESE9	E5	ESE3	WNW2	NNW5	NNW6	NNE6	ESE1.9	E10
28-Mar	NNW4	WNW3	NNW5	NW4	ESE0	SE2	SW2	SE4	SE7	S4	SSE6	SSE8	S6	SSE8	SSE9	S11	S10	SE8	ESE6	SE6	SE7	SE6	SE4	S3	SSE4.1	S11
29-Mar	WSW4	NNW6	NW9	NW8	NW6	NW7	NW7	WNW5	NNW7	N10	N10	N11	N15	NNE16	NNE17	NNE17	NNE18	NNE15	NNE15	NNE12	NNE7	N3	WNW4	NW4	N8.4	NNE18
30-Mar	W3	WSW3	WSW2	WSW2	WSW2	NNW2	WSW1	E1	ESE4	ESE2	E3	ESE4	ENE4	ENE7	E6	ENE5	E8	E9	ENE10	E9	E9	ESE10	ESE11	ESE10	E4.0	ESE11
31-Mar	ESE8	ESE10	ESE12	E9	E7	E6	E3	E4	NNE6	NNE9	N10	N10	N8	NE8	E8	N8	N8	N10	NNE7	ENE7	E10	E15	E14	E12	ENE6.3	E15
	NE1.3	ENE1.3	ENE1.6	ENE1.7	ENE1.9	E1.9	ESE1.9	ESE2.5	E3.1	ENE3.1	ENE2.8	ENE3.6	ENE4.4	ENE4.8	ENE5.1	ENE4.2	ENE4.7	ENE4.4	ENE4.0	ENE3.3	ENE2.9	ENE2.5	ENE2.0	ENE1.8	Diurnal Average	
	ESE17	SE16	NW18	SE17	ESE16	ESE16	ESE16	ESE16	SE17	SE17	SW21	SW23	NNW17	W21	SE22	N22	NNE22	W24	NNE18	SE19	SE16	ESE18	ESE17	ESE18	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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 17:00

Minimum Value: 0 km/h on Mar 30 04:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Patricia McInnes - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Patricia McInnes - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	139	18.68	18.68
6 - 11	329	44.22	62.90
12 - 19	264	35.48	98.39
20 - 28	12	1.61	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Patricia McInnes - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 5	6	3	4	5	13	9	13	9	16	10	6	11	6	12	8	8	139
6 - 11	45	22	10	5	28	46	63	25	9	8	6	2	2	1	13	44	329
12 - 19	31	16	3	4	6	74	47	0	0	2	7	5	2	2	5	60	264
20 - 28	1	3	0	0	0	1	2	0	0	0	2	1	2	0	0	0	12
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	83	44	17	14	47	130	125	34	25	20	21	19	12	15	26	112	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Patricia McInnes

Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Patricia McInnes - March 2023

Direction of Maximum Speed: 263 deg on Mar 2 18:00
Direction of Maximum Daily Speed Average: 122.3 deg on Mar 7

Direction of Minimum Speed: 77 deg on Mar 6 05:00

Direction of Minimum Daily Speed Average: 1.5 deg on Mar 21

Monthly Average Direction: 72.3 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	162	126	134	134	133	133	133	134	136	132	125	129	119	112	116	118	116	122	131	132	128	129	131	135	127.6
2-Mar	129	127	127	125	128	129	129	131	162	196	222	227	241	267	288	245	258	263	255	258	260	261	259	299	227.7
3-Mar	308	309	310	349	3	345	352	360	9	6	3	358	23	29	22	7	13	12	354	342	316	273	344	352	351.3
4-Mar	347	17	22	350	308	269	268	12	23	8	345	344	335	334	339	335	333	358	348	357	355	333	289	329	345.5
5-Mar	359	322	331	328	315	276	247	285	316	337	3	49	57	83	93	88	98	109	138	202	203	195	170	172	2.8
6-Mar	180	188	167	144	77	141	153	149	137	143	143	142	141	124	109	110	114	116	124	127	121	119	118	125	127.5
7-Mar	122	124	123	121	118	118	124	119	126	128	130	122	108	118	128	114	114	111	115	128	128	130	130	133	122.3
8-Mar	136	138	134	128	135	128	131	133	126	114	123	111	122	133	124	114	115	108	118	123	126	124	128	125	125.2
9-Mar	117	121	137	134	136	140	138	144	128	128	130	111	113	119	133	128	121	136	117	118	120	119	121	122	124.5
10-Mar	118	120	124	124	121	121	123	123	125	130	125	109	104	112	115	115	109	108	109	111	110	117	114	118	117.4
11-Mar	120	112	110	110	118	119	117	122	119	118	107	94	95	112	104	119	91	80	49	15	359	346	341	346	88.0
12-Mar	332	325	326	332	339	338	341	342	349	351	353	357	2	355	345	350	350	340	340	339	342	345	345	346	343.5
13-Mar	344	344	348	346	351	346	344	352	349	3	1	1	2	354	6	1	52	61	58	60	66	49	40	31	13.8
14-Mar	19	1	344	349	345	349	0	352	336	345	343	338	336	336	335	331	327	334	340	340	338	339	336	331	341.6
15-Mar	342	331	334	329	313	330	307	295	283	308	351	324	39	47	38	42	29	21	333	280	278	290	254	132	343.1
16-Mar	109	117	124	119	110	113	122	125	127	129	136	153	146	153	154	154	115	113	128	129	129	133	133	148	128.7
17-Mar	131	145	150	165	194	190	187	160	165	149	151	139	136	148	140	214	195	238	220	222	217	203	225	226	179.4
18-Mar	234	233	235	232	215	208	197	211	205	183	178	166	151	156	101	88	106	255	340	7	349	347	343	299	216.4
19-Mar	334	349	354	355	21	86	75	97	112	110	110	108	99	94	97	108	120	95	109	120	105	112	117	110	98.7
20-Mar	112	111	116	114	108	114	108	83	55	27	22	52	81	92	124	171	186	183	202	325	352	351	345	331	77.3
21-Mar	337	345	322	331	341	24	218	247	359	352	348	89	53	79	59	89	98	135	134	141	174	139	133	136	37.4
22-Mar	156	156	131	134	135	132	130	129	133	123	138	130	133	135	125	121	134	137	140	167	156	185	184	187	138.1
23-Mar	193	187	184	240	191	195	220	239	218	359	3	13	31	22	15	9	18	21	23	9	13	350	343	353	5.9
24-Mar	305	308	328	335	341	343	343	339	347	359	355	51	46	89	53	38	85	89	122	165	210	217	209	186	355.0
25-Mar	191	223	205	211	187	297	297	359	3	346	345	354	343	349	354	7	16	12	1	349	348	348	343	339	351.1
26-Mar	340	337	338	350	355	348	10	64	80	29	15	15	4	13	3	359	338	337	328	340	342	333	335	335	350.1
27-Mar	326	317	319	267	236	221	207	164	166	140	149	146	149	104	87	97	101	104	100	113	285	334	342	12	103.5
28-Mar	346	298	332	325	113	145	217	135	140	180	164	162	174	160	166	170	170	128	116	143	145	133	137	184	156.1
29-Mar	239	328	312	313	321	315	307	297	341	355	10	349	357	18	14	16	12	15	28	21	30	3	292	304	356.2
30-Mar	264	254	257	240	251	331	244	84	108	109	97	102	75	72	79	70	95	93	75	83	95	106	110	107	93.9
31-Mar	106	107	114	97	99	95	90	80	19	12	10	3	7	37	80	359	358	6	13	71	93	100	96	101	63.5
	48.7	59.9	63.9	72.9	76.4	98.5	115.6	107.6	89.9	74.7	71.6	71.0	64.0	70.0	66.4	66.8	69.1	64.5	68.6	66.6	68.7	78.3	69.6	58.5	
	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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Mar 28 05:00

Minimum Value: 5 deg on Mar 24 04:00

Percentiles: $P_1 = 7$ $P_{10} = 10$ $Q_1 = 12$ Median = 14 $Q_3 = 19$ $P_{90} = 31$ $P_{99} = 75$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	38	17	12	13	13	12	13	13	15	14	15	17	18	16	14	12	12	12	14	12	11	11	11	12	38
2-Mar	11	11	11	11	11	11	13	13	18	17	14	11	17	17	17	17	17	10	9	10	11	15	10	16	18
3-Mar	10	10	12	27	14	12	14	14	14	15	17	19	20	16	14	19	14	13	17	10	27	20	18	13	27
4-Mar	12	13	12	17	22	19	18	37	12	20	19	16	15	16	15	11	12	15	13	13	14	11	9	22	37
5-Mar	14	21	16	19	9	17	12	15	12	16	35	23	30	31	28	38	26	17	13	15	11	11	29	29	38
6-Mar	30	25	19	27	86	42	10	21	15	15	16	20	29	17	14	13	14	12	12	12	11	11	11	13	86
7-Mar	12	12	12	12	12	11	12	12	13	14	15	14	16	15	14	14	12	12	12	12	12	12	12	13	16
8-Mar	14	13	13	13	11	11	12	12	14	20	17	18	17	18	17	15	15	12	12	12	11	13	12	12	20
9-Mar	11	12	10	10	9	9	12	14	14	15	15	15	16	18	15	16	14	13	14	12	12	13	13	13	18
10-Mar	12	13	12	12	12	12	12	12	12	14	16	14	13	16	17	17	13	13	12	11	11	10	10	10	17
11-Mar	14	10	10	15	12	13	12	12	12	17	21	15	17	18	18	19	17	18	20	11	18	10	9	10	21
12-Mar	13	9	9	9	10	8	8	11	12	17	17	18	18	18	14	16	14	10	9	9	10	11	10	12	18
13-Mar	10	11	13	12	13	12	11	13	14	14	16	21	15	14	14	15	19	14	13	16	17	12	12	11	21
14-Mar	10	15	12	13	11	14	14	20	8	13	11	9	9	10	10	8	9	9	12	11	10	9	8	8	20
15-Mar	10	12	9	14	11	7	14	20	25	41	33	43	28	18	14	13	23	17	31	18	16	34	50	59	59
16-Mar	29	16	14	13	13	20	14	17	15	19	27	28	38	28	21	18	25	12	10	10	11	13	11	17	38
17-Mar	12	13	11	17	10	10	12	12	13	12	11	14	15	11	16	16	21	10	12	9	18	11	9	8	21
18-Mar	10	8	8	8	24	12	12	17	25	12	14	16	17	20	23	23	30	71	24	10	8	16	21	11	71
19-Mar	17	10	11	15	23	9	17	13	19	16	16	18	20	18	18	19	14	13	16	13	14	13	14	13	23
20-Mar	13	13	13	13	13	13	17	23	17	27	13	20	14	19	26	14	13	14	28	32	14	14	10	10	32
21-Mar	7	17	7	8	9	58	66	43	23	24	47	84	65	46	41	36	17	17	11	8	28	10	9	12	84
22-Mar	15	21	8	10	12	11	12	12	12	14	13	19	20	22	24	25	15	12	17	15	24	11	5	6	25
23-Mar	6	61	85	29	28	17	19	9	14	29	16	20	12	16	12	16	12	12	11	13	14	12	12	12	85
24-Mar	16	8	8	5	7	10	8	8	13	17	25	38	24	57	53	43	70	18	13	30	8	8	9	12	70
25-Mar	9	45	54	34	80	52	32	84	16	17	15	18	17	17	20	22	13	13	16	12	13	13	9	8	84
26-Mar	8	9	9	14	14	11	19	21	23	69	31	39	30	34	29	25	18	11	8	13	11	7	7	5	69
27-Mar	5	6	23	52	20	12	30	15	24	20	22	26	35	46	23	21	17	12	10	16	55	34	13	25	55
28-Mar	40	10	25	53	94	55	41	39	19	40	22	19	36	25	20	17	14	13	12	14	9	13	36	68	94
29-Mar	59	32	7	11	15	14	9	17	19	20	17	18	16	15	16	14	15	14	13	11	9	20	11	35	59
30-Mar	19	16	35	30	44	28	51	82	23	78	71	37	43	23	36	48	28	22	12	10	11	14	12	13	82
31-Mar	16	13	13	12	12	16	26	40	16	13	14	19	31	35	27	31	17	15	19	12	14	11	13	12	40
Diurnal Maximum	59	61	85	53	94	58	66	84	25	78	71	84	65	57	53	48	70	71	31	32	55	34	50	68	

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Patricia McInnes - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS07
ATHABASCA VALLEY
MARCH 2023

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

April 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	35.9	0	7.8	0
TRS (ppb) Average	708	36	36	100	1.6	0	0.5	0
THC (ppm) Average	709	34	35	99.87	2.7	-	2.2	-
NMHC (ppm) Average	709	34	35	99.87	0.202	-	0.045	-
CH4(ppm) Average	709	34	35	99.87	2.6	-	2.2	-
O3 (ppb) Average	709	35	35	100	49	0	37.1	-
NO2 (ppb) Average	707	37	37	100	42.2	0	21	-
NO (ppb) Average	707	37	37	100	34.9	-	13	-
NOX (ppb) Average	707	37	37	100	65.6	-	34	-
PM2.5 (ug/m3) Average	743	1	1	100	76.5	0	11.8	0
CO(ppm) Average	709	35	35	100	1.6	0	0.3	-
Temperature 2 m (C) Average	744	0	0	100	10.3	-	-1	-
Relative Humidity (%) Average	744	0	0	100	89.3	-	84.2	-
Barometric Pressure (inHg) Average	743	0	1	99.87	29.8	-	29.8	-
Wind Speed 10 m (km/h) Average	744	0	0	100	24	-	14	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	1.35	3.1	-	0	0.1	0.1	0.3	1.1	3.6	35.9
TRS (ppb) Average	708	0.22	0.2	-	0	0.1	0.1	0.2	0.2	0.4	1.6
THC (ppm) Average	709	2.07	0.1	-	2	2	2	2.1	2.1	2.2	2.7
NMHC (ppm) Average	709	0.004	0.021	-	0	0	0	0	0	0	0.202
CH4(ppm) Average	709	2.07	0.1	-	2	2	2	2.1	2.1	2.2	2.6
O3 (ppb) Average	709	28.29	8.5	-	2.3	16.7	23.2	29.2	34.4	38.4	49
NO2 (ppb) Average	707	9.57	7	-	0.7	2.9	5	8	11.4	18.4	42.2
NO (ppb) Average	707	2.94	4.2	-	0	0.1	0.4	1.4	3.9	7.6	34.9
NOX (ppb) Average	707	12.51	9.7	-	1	3.8	6.5	10	15.2	23.3	65.6
PM2.5 (ug/m3) Average	743	6.62	4.5	-	0.6	3.4	4.2	5.5	8	10.6	76.5
CO(ppm) Average	709	0.17	0.1	-	0.1	0.1	0.1	0.2	0.2	0.2	1.6
Temperature 2 m (C) Average	744	-9.45	7.2	-	-30	-18.9	-13.7	-9.1	-4.7	-0.3	10.3
Relative Humidity (%) Average	744	64.15	13.9	-	26.1	43.8	54	66.4	75	81.1	89.3
Barometric Pressure (inHg) Average	743	29.14	0.3	-	28.1	28.7	29	29.1	29.4	29.6	29.8
Wind Speed 10 m (km/h) Average	744	7.9	5	-	0	2	4	8	12	14	24
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	31 Mar 2023 10:00	31 Mar 2023 10:00	1	Maintenance - replaced support gas cylinder
Barometric Pressure	14 Mar 2023 10:00	14 Mar 2023 10:00	1	Maintenance - station logger/modem reset

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 35.9 ppb on Mar 15 18:00

Maximum Daily Average: 7.8 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 4 23:00

Maximum Diurnal Average: 3.1 ppb at hour 18

Monthly Average: 1.35 ppb

Minimum Daily Average: 0.1 ppb on Mar 9

Minimum Diurnal Average: 0.3 ppb at hour 1

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.1 Median = 0.3 Q_3 = 1.1 P_{90} = 3.6 P_{99} = 14.3

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.6	1.0	1.4	1.6	1.2	0.4	0.5	0.6	0.3	0.3	0.3	0.7	1.2	1.4	1.6	1.4	1.2	1.1	1.0	0.9	0.7	0.7	0.6	0.9	1.6
2-Mar	0.5	Z	0.5	0.5	0.6	0.8	1.0	0.9	0.8	0.8	1.1	0.8	0.6	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.5	1.1
3-Mar	0.1	0.1	Z	2.4	1.9	0.3	0.2	0.1	0.1	0.2	0.2	0.4	8.3	6.7	10.3	13.1	6.8	1.6	1.8	2.0	1.5	0.7	0.3	0.1	2.6	13.1
4-Mar	0.0	0.0	0.0	Z	0.1	0.1	0.5	0.5	0.1	0.1	3.6	3.3	2.3	0.2	0.1	0.4	0.3	4.6	1.4	0.1	0.0	0.0	0.0	0.0	0.8	4.6
5-Mar	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	1.4	7.4	5.6	11.1	13.1	14.4	16.3	12.0	6.9	3.2	1.8	1.5	1.1	1.5	4.3	16.3
6-Mar	1.7	2.1	1.7	1.3	1.2	1.0	0.7	0.8	0.7	0.7	0.7	0.6	0.8	1.1	Z	1.6	1.1	0.8	0.5	0.5	0.4	0.3	0.2	0.2	0.9	2.1
7-Mar	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
8-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4
9-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	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	0.5
10-Mar	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
11-Mar	0.0	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4
12-Mar	0.2	2.8	3.2	1.8	1.4	Z	1.6	0.5	0.2	0.3	3.8	16.9	22.4	17.0	5.5	4.7	5.6	6.5	3.6	1.6	1.4	0.9	0.5	0.2	4.5	22.4
13-Mar	Z	1.7	3.5	4.8	6.2	5.7	5.4	4.3	4.0	7.1	7.9	6.4	3.9	4.5	3.9	2.0	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	3.2	7.9
14-Mar	0.1	Z	0.2	1.6	1.0	0.2	0.1	0.1	0.6	0.9	3.0	6.1	7.2	4.0	3.9	3.5	4.5	4.6	1.6	0.8	2.3	2.1	1.6	0.8	2.2	7.2
15-Mar	0.3	0.2	Z	0.6	0.6	0.5	0.3	0.5	0.4	1.8	5.9	7.0	5.4	7.8	10.6	7.7	13.9	35.9	31.3	17.6	12.0	8.8	5.9	3.6	7.8	35.9
16-Mar	1.4	1.0	0.5	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.9	1.1	0.9	0.9	0.9	0.7	0.7	0.8	0.6	0.4	0.3	0.6	1.4
17-Mar	0.2	0.1	0.2	0.2	Z	0.2	0.1	0.2	0.3	0.6	0.8	0.9	0.9	0.9	1.0	1.0	0.9	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.5	1.0
18-Mar	0.3	0.3	0.4	0.3	0.2	Z	0.2	0.2	0.4	0.6	0.7	0.6	0.5	0.5	0.6	8.7	12.4	10.1	3.4	2.5	1.9	0.8	0.8	0.6	2.0	12.4
19-Mar	Z	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	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	0.4
20-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.6
21-Mar	1.0	0.8	Z	0.7	0.4	0.5	0.5	0.9	1.7	1.8	1.9	3.2	2.9	1.2	1.5	1.8	1.7	1.1	0.5	0.4	0.2	0.1	0.1	0.1	1.1	3.2
22-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.4	0.9	1.2	1.3	1.2	1.1	1.1	1.0	1.0	0.9	0.8	0.5	0.3	0.3	0.2	0.2	0.6	1.3
23-Mar	0.2	0.2	0.1	0.2	Z	0.2	0.2	0.2	0.4	0.4	1.3	1.5	1.9	2.2	1.1	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.5	2.2
24-Mar	0.0	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	1.4	2.8	4.8	5.4	7.4	8.5	8.1	7.3	5.2	3.8	2.0	1.2	0.8	0.6	2.6	8.5
25-Mar	Z	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.3	0.5	2.6	4.2	4.0	1.1	1.7	1.7	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.9	4.2
26-Mar	0.8	Z	0.8	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	3.2	6.3	3.6	1.4	0.5	0.1	0.1	0.2	0.3	0.2	0.9	6.3
27-Mar	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.4	0.6	1.0	1.6	2.8	2.2	1.9	1.6	1.2	1.1	1.0	0.8	0.4	0.2	0.2	0.1	0.8	2.8
28-Mar	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.9	2.1	1.8	0.9	0.7	0.6	0.7	1.4	3.1	3.3	2.3	1.5	1.2	0.9	3.3
29-Mar	1.0	0.8	0.7	0.5	Z	0.3	0.3	0.3	0.4	0.7	4.5	4.6	7.1	1.9	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	1.1	7.1
30-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.2	0.2	2.3	2.5	2.3	1.7	1.4	1.3	1.1	0.8	0.6	0.3	0.2	0.2	0.7	2.5
31-Mar	Z	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5
	0.3	0.5	0.5	0.7	0.7	0.5	0.4	0.4	0.4	0.7	1.5	2.4	3.0	2.6	2.5	2.8	2.7	3.1	2.1	1.3	1.0	0.7	0.5	0.4	Diurnal Average	
	1.7	2.8	3.5	4.8	6.2	5.7	5.4	4.3	4.0	7.1	7.9	16.9	22.4	17.0	13.1	14.4	16.3	35.9	31.3	17.6	12.0	8.8	5.9	3.6	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 (SO_2) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	694	97.75	97.75
11 - 20	13	1.83	99.58
21 - 60	3	0.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - March 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	63	20	6	33	34	49	168	43	22	24	26	27	18	16	34	111	694
11 - 20	0	1	0	0	0	0	0	0	0	1	1	0	1	1	2	6	13
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	63	21	6	33	34	49	168	43	22	25	27	27	19	18	37	118	710

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 710

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.6 ppb on Mar 13 04:00

Maximum Daily Average: 0.5 ppb on Mar 13

Minimum Value: 0.0 ppb on Mar 13 20:00

Maximum Diurnal Average: 0.3 ppb at hour 12

Monthly Average: 0.22 ppb

Minimum Daily Average: 0.1 ppb on Mar 9

Minimum Diurnal Average: 0.2 ppb at hour 17

Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.1 Median = 0.2 Q_3 = 0.2 P_{90} = 0.4 P_{99} = 1.1

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.4	Z	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
2-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3-Mar	0.1	0.1	0.1	Z	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.5	0.4	0.4	0.4	0.4	0.2	0.2	0.3	0.4	0.5	0.5	0.4	0.3	0.5
4-Mar	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.3
5-Mar	0.3	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5
6-Mar	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	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3
7-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2
8-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
9-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
10-Mar	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
11-Mar	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	0.4	0.4	0.4	0.5	0.2	0.5
12-Mar	Z	0.9	0.6	0.4	0.4	0.4	0.7	0.3	0.2	0.2	0.6	0.7	0.9	0.6	0.4	0.5	0.5	0.5	0.7	0.5	0.3	0.4	0.4	0.3	0.5	0.9
13-Mar	0.3	Z	1.1	1.6	1.5	1.2	1.0	1.2	C	C	C	C	C	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.6
14-Mar	0.1	0.3	Z	0.9	0.8	0.3	0.3	0.3	0.4	0.3	0.4	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.5	0.4	0.3	0.4	0.9
15-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.5	1.1	1.2	1.0	0.9	0.8	0.7	0.6	0.5	1.2
16-Mar	0.4	0.3	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	0.2	0.1	0.1	0.1	0.1	0.4
17-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
18-Mar	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.2	0.2	0.2	0.2	0.5
19-Mar	0.2	Z	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
20-Mar	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	0.3	0.3	0.3	0.1	0.3
21-Mar	0.5	0.4	0.5	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.7	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.7
22-Mar	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
23-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.4	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.5
24-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.5	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.5
25-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.8	1.1	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.7	0.3	1.1
26-Mar	0.5	0.6	Z	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.3	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.6
27-Mar	0.3	0.3	0.3	Z	0.3	0.2	0.2	0.2	0.2	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	0.3
28-Mar	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2
29-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.9	0.6	0.7	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9
30-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
31-Mar	0.1	Z	0.2	0.1	0.1	0.1	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	0.1	0.1	0.1	0.1	0.2
	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
	0.5	0.9	1.1	1.6	1.5	1.2	1.0	1.2	0.4	0.9	0.8	1.1	0.9	0.6	0.4	0.5	0.5	1.1	1.2	1.0	0.9	0.8	0.7	0.7	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - March 2023

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

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	62	22	6	30	33	51	172	40	23	26	26	25	18	22	39	113	708
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	22	6	30	33	51	172	40	23	26	26	25	18	22	39	113	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - March 2023

Maximum Value: 2.7 ppm on Mar 25 12:00

Maximum Daily Average: 2.2 ppm on Mar 15

Minimum Value: 2.0 ppm on Mar 2 16:00

Minimum Daily Average: 2.0 ppm on Mar 20

Maximum Diurnal Average: 2.1 ppm at hour 4

Minimum Diurnal Average: 2.0 ppm at hour 17

Monthly Average: 2.07 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} = 2.4

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	341	48.10	48.10
2.1 - 3.0	368	51.90	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	33	11	4	20	20	33	94	9	5	7	4	10	12	12	22	45	341
2.1 - 3.0	30	10	2	13	14	16	74	34	17	18	23	17	7	6	15	72	368
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	63	21	6	33	34	49	168	43	22	25	27	27	19	18	37	117	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Athabasca Valley

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - March 2023

Maximum Value: 0.202 ppm on Mar 5 20:00

Maximum Daily Average: 0.045 ppm on Mar 18

Minimum Value: 0.000 ppm on Mar 1 02:00

Minimum Daily Average: 0.000 ppm on Mar 1

Maximum Diurnal Average: 0.015 ppm at hour 20

Minimum Diurnal Average: 0.000 ppm at hour 6

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 in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.202	0.112	0.000	0.000	0.000	0.014	0.202
6-Mar	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	Z	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.027
7-Mar	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
8-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
9-Mar	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
10-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.007
11-Mar	0.018	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018
12-Mar	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
13-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Mar	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	0.000	0.001
15-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.010	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011	0.000	0.000	0.003	0.000	0.003	0.048
16-Mar	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	0.009	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.038
17-Mar	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	0.008	0.113	0.165	0.125	0.081	0.089	0.020	0.121	0.013	0.000	0.032	0.165
18-Mar	0.001	0.064	0.146	0.136	0.029	Z	0.005	0.154	0.080	0.002	0.000	0.000	0.000	0.000	0.008	0.020	0.000	0.093	0.171	0.102	0.020	0.000	0.000	0.000	0.045	0.171
19-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
20-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.035	0.007	0.000	0.000	0.000	0.002	0.000	0.000	0.006	0.000	0.002	0.035
22-Mar	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	0.040	0.052	0.013	0.008	0.000	0.000	0.001	0.005	0.052
23-Mar	0.000	0.000	0.000	0.001	Z	0.000	0.000	0.003	0.016	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	0.001	0.016
24-Mar	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	0.009	0.000	0.000	0.000	0.000	0.000	0.009
25-Mar	Z	0.000	0.000	0.007	0.002	0.000	0.000	0.000	0.000	0.037	0.131	0.165	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.165
26-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.026	0.047	0.000	0.000	0.002	0.003	0.047
27-Mar	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	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.002
28-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29-Mar	0.000	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
30-Mar	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
31-Mar	Z	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	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.005
	0.001	0.003	0.005	0.006	0.001	0.000	0.000	0.005	0.003	0.003	0.004	0.005	0.000	0.001	0.002	0.007	0.005	0.008	0.010	0.015	0.007	0.004	0.001	0.000	Diurnal Average	
	0.018	0.064	0.146	0.136	0.029	0.000	0.005	0.154	0.080	0.048	0.131	0.165	0.012	0.008	0.035	0.113	0.165	0.125	0.171	0.202	0.112	0.121	0.013	0.007	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	659	92.95	92.95
0.006 - 0.05	32	4.51	97.46
0.06 - 0.1	13	1.83	99.29
> 0.1	5	0.71	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	61	20	6	31	32	45	157	37	18	20	26	27	17	17	33	112	659
0.006 - 0.05	0	1	0	2	2	4	3	3	4	4	0	0	2	0	3	4	32
0.06 - 0.1	2	0	0	0	0	0	6	2	0	1	1	0	0	1	0	0	13
> 0.1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	1	1	5
Totals	63	21	6	33	34	49	168	43	22	25	27	27	19	18	37	117	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.6 ppm on Mar 25 12:00

Maximum Daily Average: 2.2 ppm on Mar 15

Minimum Value: 2.0 ppm on Mar 2 16:00

Maximum Diurnal Average: 2.1 ppm at hour 4

Monthly Average: 2.07 ppm

Minimum Daily Average: 2.0 ppm on Mar 20

Minimum Diurnal Average: 2.0 ppm at hour 17

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} = 2.3

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	354	49.93	49.93
2.1 - 3.0	355	50.07	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	34	11	4	20	21	36	94	9	6	11	4	10	12	13	23	46	354
2.1 - 3.0	29	10	2	13	13	13	74	34	16	14	23	17	7	5	14	71	355
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	63	21	6	33	34	49	168	43	22	25	27	27	19	18	37	117	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Athabasca Valley

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 49.0 ppb on Mar 18 16:00

Maximum Daily Average: 37.1 ppb on Mar 31

Minimum Value: 2.3 ppb on Mar 15 20:00

Maximum Diurnal Average: 35.4 ppb at hour 15

Monthly Average: 28.29 ppb

Minimum Daily Average: 15.9 ppb on Mar 15

Minimum Diurnal Average: 20.6 ppb at hour 6

Percentiles: P_1 = 4.4 P_{10} = 16.7 Q_1 = 23.2 Median = 29.2 Q_3 = 34.4 P_{90} = 38.4 P_{99} = 45.4

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.2	4.3	Z	7.1	8.5	10.7	16.0	13.3	16.9	25.4	26.7	27.1	28.3	31.6	30.9	29.1	28.5	26.4	26.5	28.1	28.4	28.8	29.4	30.7	22.0	31.6
2-Mar	31.7	32.2	32.7	Z	33.0	30.3	29.6	29.9	29.4	29.3	32.1	35.9	36.5	37.1	36.6	36.7	35.8	36.4	35.9	34.8	34.4	34.5	35.1	35.5	33.7	37.1
3-Mar	35.4	36.9	36.8	27.6	Z	25.7	24.2	25.0	28.7	31.6	30.8	31.4	29.1	28.4	25.7	24.3	25.5	24.3	24.0	23.6	21.2	15.4	15.4	26.9	26.9	36.9
4-Mar	29.1	27.7	27.7	28.5	26.6	Z	25.0	26.0	25.0	30.8	29.7	29.9	29.2	32.0	32.2	32.0	31.6	26.4	23.2	21.2	21.2	19.4	19.6	20.2	26.7	32.2
5-Mar	Z	19.9	20.5	18.9	16.7	15.1	17.0	16.9	17.8	21.3	24.4	27.7	29.7	29.0	29.1	27.1	25.1	14.2	7.9	8.9	7.0	4.9	6.1	9.1	18.0	29.7
6-Mar	12.7	14.3	13.6	14.9	12.0	10.0	9.4	10.3	13.4	18.3	Z	22.0	26.6	26.2	25.8	31.0	31.6	30.2	27.9	27.2	28.4	28.2	29.2	30.3	21.5	31.6
7-Mar	31.1	Z	32.4	32.0	31.0	27.7	27.2	30.0	31.2	31.9	33.3	33.9	34.7	34.5	35.4	35.3	34.7	32.1	29.0	30.8	31.1	31.4	32.7	33.5	32.0	35.4
8-Mar	34.6	34.4	Z	34.5	32.5	30.6	26.9	25.7	27.4	27.7	32.6	33.8	34.5	35.8	36.0	35.9	35.1	33.3	27.8	26.3	31.0	27.8	27.7	29.6	31.4	36.0
9-Mar	29.5	30.2	30.4	Z	26.5	21.8	17.5	C	C	C	C	33.0	34.7	34.3	34.6	34.3	32.7	32.2	29.3	28.7	30.1	31.2	33.0	33.0	30.4	34.7
10-Mar	33.2	33.2	34.0	34.3	33.7	Z	30.6	30.2	30.4	31.9	31.9	32.1	33.5	34.5	35.4	35.3	33.9	33.7	28.6	24.1	23.0	26.9	29.5	25.6	31.3	35.4
11-Mar	Z	26.3	25.2	23.7	26.7	25.3	24.2	27.1	29.8	32.9	32.5	33.6	35.1	36.4	37.5	37.8	39.1	38.8	37.6	38.1	29.9	24.4	22.6	22.2	30.7	39.1
12-Mar	20.7	Z	23.1	27.4	27.8	26.1	23.0	27.9	30.1	30.7	30.0	26.7	27.1	28.7	30.7	30.1	28.7	25.6	23.6	24.7	25.5	26.4	27.3	27.7	26.9	30.7
13-Mar	27.1	26.6	Z	20.4	16.6	14.3	13.3	15.4	18.1	20.7	22.6	24.5	26.2	27.8	29.4	28.6	41.7	41.9	41.0	41.6	41.7	39.9	39.0	38.9	28.6	41.9
14-Mar	35.7	30.2	30.6	Z	25.8	26.1	29.5	25.6	27.9	29.2	29.0	29.7	30.0	31.1	30.1	30.1	27.7	24.9	22.4	25.9	22.2	24.5	26.6	27.7	27.9	35.7
15-Mar	27.2	26.4	23.2	18.1	Z	9.7	9.1	10.6	14.0	16.1	21.7	24.7	27.4	28.2	28.3	27.8	24.9	12.0	4.2	2.3	2.3	2.3	2.8	3.3	15.9	28.3
16-Mar	9.5	11.3	21.9	29.5	25.2	Z	25.8	25.5	26.5	28.5	30.6	31.4	31.9	32.2	33.1	32.5	31.1	23.1	23.1	26.4	24.2	26.9	27.9	28.6	26.4	33.1
17-Mar	Z	28.7	25.7	24.2	23.1	17.2	17.3	15.9	20.6	28.4	29.8	31.5	32.8	34.2	32.8	29.1	23.4	25.3	17.7	12.5	16.9	10.4	27.1	25.1	23.9	34.2
18-Mar	34.1	Z	17.5	19.5	24.7	26.5	20.8	22.0	30.0	33.2	37.2	42.7	45.4	46.1	47.1	49.0	45.3	27.9	15.4	11.4	15.1	20.4	18.5	18.3	29.0	49.0
19-Mar	14.1	12.6	Z	12.2	7.2	7.1	10.6	11.6	17.8	32.0	38.7	37.6	40.3	40.8	41.0	41.5	40.2	40.9	38.2	37.7	39.4	38.8	38.2	37.4	29.4	41.5
20-Mar	38.7	37.9	37.6	Z	35.3	31.7	31.4	31.6	38.1	38.2	37.9	37.7	37.9	36.4	35.9	34.5	34.4	34.4	34.4	34.2	30.0	33.0	33.3	33.5	35.1	38.7
21-Mar	31.2	30.2	26.1	23.6	Z	16.4	15.8	19.4	20.5	20.2	19.4	19.7	27.7	37.6	37.5	36.0	33.4	25.7	13.8	9.2	16.3	18.9	19.5	22.6	23.5	37.6
22-Mar	24.6	24.8	28.9	29.4	27.7	Z	29.9	30.1	31.4	34.0	35.3	37.8	40.1	41.8	42.9	41.1	36.8	25.2	14.3	19.9	24.1	18.9	31.4	34.3	30.6	42.9
23-Mar	Z	29.0	29.4	22.4	15.0	19.2	20.2	22.6	26.5	31.3	34.6	41.9	44.0	43.9	43.5	42.4	42.7	40.0	39.3	39.1	38.8	34.8	31.8	27.6	33.0	44.0
24-Mar	26.2	Z	23.1	20.9	22.7	20.1	14.7	14.9	18.2	23.8	31.2	33.4	38.1	38.1	37.7	38.8	38.4	36.2	20.2	14.5	18.4	21.3	19.1	22.3	25.7	38.8
25-Mar	22.9	24.8	Z	20.0	21.1	17.7	15.8	16.9	22.8	23.8	19.3	21.8	30.4	39.7	42.1	41.8	42.6	43.9	42.9	41.2	40.3	38.9	36.9	33.7	30.5	43.9
26-Mar	32.7	31.4	30.1	Z	27.8	21.5	24.0	36.9	36.1	34.8	35.5	34.8	31.9	29.0	30.5	29.9	34.3	37.0	34.3	33.8	33.9	32.6	29.4	27.7	31.7	37.0
27-Mar	27.5	24.0	22.1	20.1	Z	14.4	14.9	18.1	21.5	21.1	23.0	28.4	33.2	36.6	37.9	38.8	38.9	34.6	25.4	14.7	25.5	23.8	23.7	21.7	25.7	38.9
28-Mar	21.4	20.0	18.1	17.0	17.1	Z	17.0	18.9	27.0	30.0	31.0	31.5	36.7	38.4	39.2	39.2	38.6	35.8	32.1	31.6	33.1	35.0	36.0	35.8	29.6	39.2
29-Mar	Z	34.4	34.8	29.3	24.9	20.1	22.2	19.5	27.0	22.1	31.1	29.2	29.6	37.5	38.4	37.7	38.4	38.5	38.1	37.4	38.7	36.9	33.8	29.3	31.7	38.7
30-Mar	25.8	Z	24.2	23.4	19.6	18.2	19.0	21.4	24.1	25.1	23.9	27.6	34.3	36.3	35.7	35.1	38.2	39.3	40.0	39.3	37.4	37.7	36.0	36.0	30.3	40.0
31-Mar	36.0	35.8	Z	34.5	32.2	32.4	30.6	27.4	24.7	37.3	35.4	34.4	37.0	42.6	45.9	46.4	45.7	46.1	44.2	35.1	31.6	39.1	40.6	39.1	37.1	46.4
	26.8	26.4	26.8	23.6	23.7	20.6	21.1	22.2	25.1	28.1	30.0	31.2	33.4	35.1	35.4	35.1	34.8	31.8	27.8	26.6	27.1	26.9	27.7	28.0	Diurnal Average	
	38.7	37.9	37.6	34.5	35.3	32.4	31.4	36.9	38.1	38.2	38.7	42.7	45.4	46.1	47.1	49.0	45.7	46.1	44.2	41.6	41.7	39.9	40.6	39.1	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Athabasca Valley - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	128	18.05	18.05
21 - 50	581	81.95	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Athabasca Valley - March 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	5	5	3	8	4	5	8	10	9	17	20	10	6	5	7	6	128
21 - 50	59	17	3	25	28	44	161	31	14	7	7	16	13	15	31	110	581
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	22	6	33	32	49	169	41	23	24	27	26	19	20	38	116	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Athabasca Valley

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Athabasca Valley - March 2023

Maximum Value: 34.9 ppb on Mar 15 10:00

Maximum Daily Average: 13.0 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 14 00:00

Minimum Daily Average: 0.8 ppb on Mar 20

Maximum Diurnal Average: 6.7 ppb at hour 11

Minimum Diurnal Average: 0.4 ppb at hour 1

Monthly Average: 2.94 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.4 Median = 1.4 Q_3 = 3.9 P_{90} = 7.6 P_{99} = 19.9

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.9	2.0	1.4	1.1	Z	2.1	1.8	5.8	7.7	5.0	6.1	5.6	6.6	5.9	3.6	3.7	2.7	2.7	1.6	1.8	1.6	1.2	1.4	0.9	3.3	7.7
2-Mar	0.8	0.8	0.8	0.7	0.7	Z	1.2	1.6	2.4	4.9	3.9	1.5	1.2	0.7	0.6	0.9	0.8	0.3	0.4	0.3	0.2	0.1	0.1	0.1	1.1	4.9
3-Mar	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.7	0.9	1.8	2.0	3.1	3.5	5.0	5.6	3.2	1.1	0.4	0.3	0.2	1.1	0.3	0.1	1.3	5.6
4-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	2.4	1.3	3.5	3.6	4.8	1.1	0.5	0.5	0.4	0.8	0.2	0.5	0.1	0.1	0.1	0.4	0.9	4.8
5-Mar	0.1	0.2	Z	0.6	0.8	0.6	1.8	4.0	7.6	5.8	6.7	4.2	2.2	4.3	5.1	5.9	4.5	8.2	7.0	5.6	8.7	6.7	4.4	3.3	4.3	8.7
6-Mar	0.5	1.4	1.0	0.5	2.2	4.2	5.2	9.0	9.6	7.2	9.2	10.2	Z	5.2	5.6	2.7	2.4	1.9	1.8	2.0	1.5	1.4	1.1	1.1	3.8	10.2
7-Mar	0.8	0.8	0.8	Z	0.9	1.1	1.6	1.9	2.5	2.7	2.4	2.4	1.9	2.4	2.3	1.7	1.6	1.5	1.6	1.4	1.5	1.2	1.0	0.7	1.6	2.7
8-Mar	0.7	0.7	0.6	0.6	Z	1.2	1.5	2.5	8.7	10.2	3.0	2.6	2.7	2.3	2.2	1.4	1.5	1.3	1.5	1.8	1.6	1.3	0.7	0.8	2.2	10.2
9-Mar	1.0	1.0	0.8	0.8	0.8	Z	4.1	2.7	4.9	4.3	4.9	3.4	2.3	2.0	1.8	1.9	1.8	1.6	1.6	1.3	1.0	0.9	0.9	0.7	2.0	4.9
10-Mar	0.8	Z	0.7	0.7	0.8	1.1	1.2	C	C	C	C	C	C	1.9	1.6	1.2	1.4	0.9	1.3	1.3	1.5	0.9	0.2	0.6	--	1.9
11-Mar	0.2	0.3	Z	0.1	0.1	0.1	0.6	1.8	3.3	2.5	3.3	2.9	1.8	2.0	1.2	1.2	0.4	0.5	0.4	0.0	0.2	0.2	0.1	0.1	1.0	3.3
12-Mar	0.1	0.1	0.0	Z	0.0	0.1	0.1	0.6	1.1	1.7	2.9	7.5	9.4	7.0	3.4	2.9	2.5	1.7	0.4	0.1	0.1	0.0	0.1	0.0	1.8	9.4
13-Mar	0.0	0.1	0.1	0.1	Z	0.2	0.5	2.9	6.0	8.2	10.2	10.6	9.3	6.7	5.5	4.4	0.6	0.2	0.6	0.2	0.4	0.1	0.1	0.0	2.9	10.6
14-Mar	0.0	0.0	0.0	0.0	0.2	Z	0.2	1.2	2.3	3.4	4.6	6.3	8.1	7.1	6.6	5.6	5.7	3.3	0.7	0.1	0.1	0.1	0.0	0.0	2.4	8.1
15-Mar	Z	0.1	0.2	0.9	2.4	12.1	6.6	18.6	25.7	34.9	19.3	15.1	11.6	10.5	10.6	9.7	9.7	20.0	25.6	22.3	17.1	10.6	8.7	6.6	13.0	34.9
16-Mar	0.4	Z	0.4	0.8	1.0	1.1	1.5	3.1	5.0	4.8	4.0	2.6	3.8	4.0	3.1	3.3	3.9	6.5	2.7	1.5	1.6	2.4	1.1	0.6	2.6	6.5
17-Mar	0.7	0.8	Z	0.3	0.5	2.9	3.8	9.4	7.0	4.6	4.7	4.0	4.3	4.9	7.6	12.0	17.1	6.6	8.1	13.0	8.8	11.8	0.2	0.1	5.8	17.1
18-Mar	0.0	1.3	1.2	Z	0.7	0.7	2.9	7.5	4.9	5.1	5.2	3.9	2.7	2.6	2.9	1.8	2.1	7.3	5.3	1.7	1.7	1.2	0.6	0.3	2.8	7.5
19-Mar	0.4	1.8	0.1	0.2	Z	1.6	3.2	11.5	12.6	5.9	1.7	2.3	0.2	0.9	1.4	0.9	1.0	0.6	0.8	0.6	0.5	0.4	0.5	0.2	2.1	12.6
20-Mar	0.4	0.4	0.4	0.4	0.3	Z	0.6	1.6	0.4	0.7	0.6	0.8	0.5	1.8	1.9	2.6	2.4	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.8	2.6
21-Mar	Z	0.0	0.3	0.6	0.8	5.3	4.8	4.3	5.6	8.7	18.9	24.3	17.5	4.2	3.9	4.7	5.2	7.2	10.6	16.9	7.9	0.6	1.2	0.1	6.7	24.3
22-Mar	0.2	Z	0.7	0.8	0.9	1.5	1.9	3.1	4.1	3.6	4.3	3.3	2.9	2.9	2.7	4.5	6.2	10.9	14.7	6.0	1.5	3.9	0.6	0.1	3.5	14.7
23-Mar	0.2	0.9	Z	2.9	8.4	4.9	4.8	6.7	9.8	6.7	6.4	3.0	1.3	1.4	0.9	0.8	0.7	0.8	0.4	0.1	0.1	0.0	0.0	0.1	2.7	9.8
24-Mar	0.0	0.3	0.1	Z	0.2	0.1	2.7	8.2	12.0	11.6	6.1	5.3	2.6	2.8	3.0	2.3	1.8	1.5	4.2	2.2	2.6	0.7	1.7	0.3	3.1	12.0
25-Mar	0.2	0.3	1.1	1.6	Z	1.6	3.0	6.6	5.3	9.9	28.9	28.3	13.4	3.0	1.0	0.9	0.7	0.4	0.1	0.1	0.0	0.0	0.0	0.0	4.6	28.9
26-Mar	0.0	0.0	0.0	0.0	0.1	Z	0.6	0.3	0.4	1.4	0.3	1.0	4.7	8.9	6.8	7.1	3.5	0.7	0.3	0.1	0.2	0.0	0.0	0.0	1.6	8.9
27-Mar	Z	0.1	0.2	0.3	0.7	0.6	2.6	8.1	8.2	13.9	14.2	8.2	4.6	2.3	1.5	1.1	1.3	2.4	3.0	2.6	0.1	0.2	0.1	0.1	3.3	14.2
28-Mar	0.1	Z	0.5	0.8	0.9	1.5	2.8	8.5	2.7	5.4	5.8	7.1	3.4	2.4	2.0	2.0	2.1	2.0	1.7	0.9	0.9	0.6	0.4	0.4	2.4	8.5
29-Mar	0.4	0.2	Z	0.0	0.1	0.7	1.0	7.0	3.5	13.8	5.5	7.4	6.2	2.4	1.2	1.0	0.6	0.5	0.4	0.6	0.6	0.3	0.0	0.0	2.3	13.8
30-Mar	0.0	0.0	0.0	Z	0.5	0.8	0.9	3.8	4.6	6.8	11.4	9.3	3.8	1.9	2.1	2.1	1.1	0.7	0.4	0.4	0.6	0.4	0.3	0.1	2.3	11.4
31-Mar	0.1	0.3	0.2	0.2	Z	0.3	1.6	2.3	5.0	0.6	2.4	4.5	4.1	1.7	1.2	1.1	0.5	0.3	0.3	0.6	1.7	1.2	0.6	0.4	1.4	5.0
	0.4	0.5	0.5	0.6	1.0	1.8	2.1	4.8	5.9	6.6	6.7	6.4	4.9	3.6	3.2	3.1	2.9	3.1	3.2	2.8	2.1	1.6	0.8	0.6	Diurnal Average	
	3.9	2.0	1.4	2.9	8.4	12.1	6.6	18.6	25.7	34.9	28.9	28.3	17.5	10.5	10.6	12.0	17.1	20.0	25.6	22.3	17.1	11.8	8.7	6.6	Diurnal Maximum	

Z - zerospan C - Calibration

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Athabasca Valley - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	99.01	99.01
21 - 40	7	0.99	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Athabasca Valley - March 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	59	20	5	31	33	52	165	44	23	25	28	24	17	18	38	118	700
21 - 40	1	0	0	1	1	0	0	0	0	0	0	0	1	2	0	1	7
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	20	5	32	34	52	165	44	23	25	28	24	18	20	38	119	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Athabasca Valley

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 42.2 ppb on Mar 22 19:00

Maximum Daily Average: 21.0 ppb on Mar 15

Minimum Value: 0.7 ppb on Mar 26 11:00

Maximum Diurnal Average: 15.0 ppb at hour 20

Monthly Average: 9.57 ppb

Minimum Daily Average: 4.9 ppb on Mar 20

Minimum Diurnal Average: 5.1 ppb at hour 14

Percentiles: P_1 = 1.0 P_{10} = 2.9 Q_1 = 5.0 Median = 8.0 Q_3 = 11.4 P_{90} = 18.4 P_{99} = 36.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	25.5	23.7	21.6	17.7	Z	14.9	15.0	15.7	10.0	6.6	6.4	5.8	6.8	6.4	6.1	8.3	9.0	12.4	12.6	11.3	11.1	10.6	9.5	8.2	12.0	25.5
2-Mar	7.0	7.4	7.2	7.8	7.8	Z	10.5	10.4	10.9	11.3	7.7	3.2	2.8	2.4	2.8	2.4	3.2	2.7	2.3	2.5	2.4	2.2	2.2	1.4	5.2	11.3
3-Mar	Z	1.3	1.5	7.8	8.1	9.5	10.4	9.2	5.4	3.6	4.9	4.2	6.0	6.4	9.2	11.3	10.4	10.9	10.7	10.2	11.7	16.0	14.9	6.4	8.3	16.0
4-Mar	5.3	Z	6.8	5.7	7.1	7.2	8.5	6.9	9.2	3.2	4.6	4.5	5.0	1.4	0.9	1.0	1.5	7.3	10.3	12.0	13.7	15.4	13.0	9.3	6.9	15.4
5-Mar	9.7	9.7	Z	8.2	10.1	12.1	11.0	10.5	8.0	5.5	5.8	4.1	2.4	4.5	6.2	9.5	11.1	24.1	31.2	28.0	27.7	28.3	24.1	19.3	13.5	31.2
6-Mar	13.4	11.6	11.2	9.8	10.8	12.3	13.7	11.3	9.0	6.9	7.5	8.6	Z	7.3	9.0	6.3	6.1	7.7	10.9	11.5	10.3	10.3	8.9	7.3	9.6	13.7
7-Mar	6.3	4.5	4.9	Z	6.5	10.1	11.4	8.4	6.8	6.4	4.9	4.3	2.9	4.2	3.8	4.0	4.2	7.2	10.5	8.4	8.0	8.0	6.8	6.2	6.5	11.4
8-Mar	5.1	5.4	5.5	5.1	Z	8.2	12.3	14.0	13.0	10.7	4.7	3.8	3.8	3.2	3.7	3.2	4.0	5.5	12.1	16.0	10.8	12.4	10.6	8.2	7.9	16.0
9-Mar	7.7	6.6	5.8	8.0	7.7	Z	11.8	7.9	8.4	6.3	6.2	4.6	3.6	3.0	2.9	3.4	5.3	7.2	8.3	8.6	6.9	6.0	4.2	4.3	6.3	11.8
10-Mar	3.5	Z	3.6	4.0	4.1	4.5	6.7	C	C	C	C	C	C	3.0	2.9	2.9	3.4	3.5	9.6	15.0	15.5	10.9	8.4	13.4	--	15.5
11-Mar	12.5	9.0	Z	10.1	5.8	7.2	9.4	10.0	7.8	4.1	4.6	3.7	2.8	2.4	2.1	2.9	1.0	1.3	2.3	1.2	7.6	9.8	10.4	10.3	6.0	12.5
12-Mar	11.4	9.8	10.7	Z	6.2	8.0	11.1	6.0	3.7	3.4	4.2	8.3	8.7	6.9	4.3	4.9	6.4	9.4	11.1	9.2	8.1	7.8	7.4	7.7	7.6	11.4
13-Mar	7.8	8.2	9.9	13.8	Z	19.2	20.1	17.8	14.8	12.4	11.0	9.6	8.6	8.5	8.0	9.1	1.4	1.0	1.5	1.1	0.9	1.4	1.4	1.2	8.2	20.1
14-Mar	3.5	7.7	6.5	9.4	11.3	Z	7.5	12.2	10.0	9.9	10.9	11.1	11.1	9.9	11.4	11.6	14.4	17.0	18.8	13.3	16.3	12.7	9.9	8.4	11.1	18.8
15-Mar	Z	8.5	10.3	13.3	17.3	22.1	21.4	20.5	17.9	21.0	13.2	11.2	9.7	9.7	10.4	11.7	15.6	31.0	40.0	39.6	37.7	35.2	33.4	31.8	21.0	40.0
16-Mar	22.5	Z	11.5	6.8	11.9	10.6	11.1	11.6	10.9	8.2	5.3	3.4	4.1	4.8	4.5	5.8	8.1	18.6	19.3	13.7	14.9	10.6	8.6	7.0	10.2	22.5
17-Mar	5.9	6.3	Z	4.3	6.2	11.6	10.1	11.5	7.4	6.0	5.9	5.0	6.0	7.4	11.6	18.8	29.4	28.6	36.1	38.1	29.1	36.6	17.3	18.7	15.6	38.1
18-Mar	13.3	28.8	31.9	Z	18.4	14.4	19.9	19.9	11.0	8.7	9.0	7.8	6.5	7.2	8.5	5.8	8.4	28.5	37.9	35.7	28.0	18.4	19.0	17.1	17.6	37.9
19-Mar	19.4	18.9	15.6	17.1	Z	20.7	17.1	18.4	14.5	8.0	3.6	4.3	1.1	1.8	3.0	2.5	4.0	2.1	5.3	5.1	2.6	3.7	4.4	4.8	8.6	20.7
20-Mar	3.6	4.2	4.2	4.9	6.2	Z	10.3	9.4	1.6	1.1	1.2	1.5	1.0	3.1	3.8	5.9	6.5	6.2	5.7	5.4	9.1	6.7	6.5	5.6	4.9	10.3
21-Mar	Z	6.8	8.1	9.5	11.2	14.6	13.8	11.1	9.6	11.2	16.7	18.9	14.1	6.1	6.6	8.6	11.5	20.1	33.3	36.9	25.3	18.4	16.3	13.1	14.9	36.9
22-Mar	9.9	Z	8.0	7.4	8.2	9.5	9.5	9.3	7.9	5.8	6.1	5.3	5.0	5.3	5.7	9.4	15.7	30.5	42.2	31.5	22.2	27.4	11.7	6.4	13.0	42.2
23-Mar	7.5	10.8	Z	15.6	23.2	20.7	21.9	20.4	16.8	11.1	10.6	6.2	3.3	3.5	2.9	2.5	2.7	4.9	5.3	4.4	4.4	7.7	7.9	8.0	9.7	23.2
24-Mar	8.1	11.2	9.2	Z	6.3	7.5	11.3	11.2	11.7	11.8	7.7	7.0	3.9	4.5	5.1	4.9	5.4	8.0	26.4	31.5	23.0	15.6	15.8	11.0	11.2	31.5
25-Mar	10.4	9.5	12.1	12.4	Z	10.2	11.1	10.6	6.8	9.9	19.7	21.2	14.3	5.0	2.2	2.6	2.6	3.1	4.5	5.1	4.3	5.7	6.8	7.8	8.6	21.2
26-Mar	6.9	7.1	6.8	5.1	7.8	Z	11.3	1.0	0.9	2.1	0.7	1.5	5.1	8.9	8.6	11.0	6.0	3.6	6.0	6.1	6.4	6.9	7.9	8.1	5.9	11.3
27-Mar	Z	6.2	6.7	7.2	9.5	11.0	11.4	11.8	9.4	11.9	12.2	8.8	6.0	3.7	2.8	2.6	3.5	9.2	20.2	31.8	14.6	12.1	10.9	10.1	10.2	31.8
28-Mar	7.8	Z	9.9	9.3	8.1	11.4	10.0	10.2	4.0	6.5	6.7	8.3	5.1	3.8	3.9	5.0	7.1	10.5	14.9	15.4	13.2	10.8	9.0	8.2	8.7	15.4
29-Mar	9.0	7.9	Z	8.8	10.2	14.4	11.4	16.6	9.6	20.4	13.0	15.9	15.4	5.4	3.4	3.7	2.9	2.8	3.7	4.4	2.7	1.9	2.3	3.5	8.2	20.4
30-Mar	3.8	3.4	2.6	Z	6.2	6.5	4.6	7.7	7.6	7.9	12.5	11.2	7.0	4.8	5.0	6.0	4.6	3.1	2.1	1.9	4.7	3.7	6.0	5.2	5.6	12.5
31-Mar	5.3	5.8	5.0	7.0	Z	8.5	9.9	12.9	16.2	2.0	4.9	7.2	6.5	4.2	4.0	2.7	2.0	1.8	1.4	9.7	14.7	7.1	3.0	2.6	6.3	16.2
	9.3	9.2	9.1	9.1	9.4	11.8	12.1	11.8	9.4	8.1	7.7	7.4	6.2	5.1	5.3	6.1	7.0	10.6	14.7	15.0	13.2	12.3	10.3	9.1	Diurnal Average	
	25.5	28.8	31.9	17.7	23.2	22.1	21.9	20.5	17.9	21.0	19.7	21.2	15.4	9.9	11.6	18.8	29.4	31.0	42.2	39.6	37.7	36.6	33.4	31.8	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	657	92.93	92.93
21 - 40	49	6.93	99.86
11 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - March 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	59	19	5	28	34	50	157	34	19	17	23	24	17	18	35	118	657
21 - 40	1	1	0	4	0	2	8	9	4	8	5	0	1	2	3	1	49
11 - 80	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	20	5	32	34	52	165	44	23	25	28	24	18	20	38	119	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - March 2023

Maximum Value: 65.6 ppb on Mar 15 19:00

Maximum Daily Average: 34.0 ppb on Mar 15

Minimum Value: 1.0 ppb on Mar 26 11:00

Minimum Daily Average: 5.7 ppb on Mar 20

Maximum Diurnal Average: 17.9 ppb at hour 19

Minimum Diurnal Average: 8.5 ppb at hour 15

Monthly Average: 12.51 ppb

Percentiles: P_1 = 1.3 P_{10} = 3.8 Q_1 = 6.5 Median = 10.0 Q_3 = 15.2 P_{90} = 23.3 P_{99} = 50.9

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	29.4	25.7	23.0	18.8	Z	17.0	16.8	21.5	17.7	11.6	12.5	11.4	13.4	12.3	9.7	12.0	11.7	15.1	14.2	13.1	12.7	11.8	10.9	9.1	15.3	29.4
2-Mar	7.8	8.2	8.0	8.5	8.5	Z	11.7	12.0	13.3	16.2	11.6	4.7	4.0	3.1	3.4	3.3	4.0	3.0	2.7	2.8	2.6	2.3	2.3	1.5	6.3	16.2
3-Mar	Z	1.4	1.5	7.9	8.2	9.6	10.5	9.5	6.1	4.5	6.7	6.2	9.1	9.9	14.2	16.9	13.6	12.0	11.1	10.5	11.9	17.1	15.2	6.5	9.6	17.1
4-Mar	5.3	Z	6.8	5.7	7.1	7.2	8.7	7.3	11.6	4.5	8.1	8.1	9.8	2.5	1.4	1.5	1.9	8.1	10.5	12.5	13.8	15.5	13.1	9.7	7.9	15.5
5-Mar	9.8	9.9	Z	8.8	10.9	12.7	12.8	14.5	15.6	11.3	12.5	8.3	4.6	8.8	11.3	15.4	15.6	32.3	38.2	33.6	36.4	35.0	28.5	22.6	17.8	38.2
6-Mar	13.9	13.0	12.2	10.3	13.0	16.5	18.9	20.3	18.6	14.1	16.7	18.8	Z	12.5	14.6	9.0	8.5	9.6	12.7	13.5	11.8	11.7	10.0	8.4	13.4	20.3
7-Mar	7.1	5.3	5.7	Z	7.4	11.2	13.0	10.3	9.3	9.1	7.3	6.7	4.8	6.6	6.1	5.7	5.8	8.7	12.1	9.8	9.5	9.2	7.8	6.9	8.1	13.0
8-Mar	5.8	6.1	6.1	5.7	Z	9.4	13.8	16.5	21.7	20.9	7.7	6.4	6.5	5.5	5.9	4.6	5.5	6.8	13.6	17.8	12.4	13.7	11.3	9.0	10.1	21.7
9-Mar	8.7	7.6	6.6	8.8	8.5	Z	15.9	10.6	13.3	10.6	11.1	8.0	5.9	5.0	4.7	5.3	7.1	8.8	9.9	9.9	7.9	6.9	5.1	5.0	8.3	15.9
10-Mar	4.3	Z	4.3	4.7	4.9	5.6	7.9	C	C	C	C	C	C	4.9	4.5	4.1	4.8	4.4	10.9	16.3	17.0	11.8	8.6	14.0	--	17.0
11-Mar	12.7	9.3	Z	10.2	5.9	7.3	10.0	11.8	11.1	6.6	7.9	6.6	4.6	4.4	3.3	4.1	1.4	1.8	2.7	1.2	7.8	10.0	10.5	10.4	7.0	12.7
12-Mar	11.5	9.9	10.7	Z	6.2	8.1	11.2	6.6	4.8	5.1	7.1	15.8	18.1	13.9	7.7	7.8	8.9	11.1	11.5	9.3	8.2	7.8	7.5	7.7	9.4	18.1
13-Mar	7.8	8.3	10.0	13.9	Z	19.4	20.6	20.7	20.8	20.6	21.2	20.2	17.9	15.2	13.5	13.5	2.0	1.2	2.1	1.3	1.3	1.5	1.5	1.2	11.1	21.2
14-Mar	3.5	7.7	6.5	9.4	11.5	Z	7.7	13.4	12.3	13.3	15.5	17.4	19.2	17.0	18.0	17.2	20.1	20.3	19.5	13.4	16.4	12.8	9.9	8.4	13.5	20.3
15-Mar	Z	8.6	10.5	14.2	19.7	34.2	28.0	39.1	43.6	55.9	32.5	26.3	21.3	20.2	21.0	21.4	25.3	51.0	65.6	61.9	54.8	45.8	42.1	38.4	34.0	65.6
16-Mar	22.9	Z	11.9	7.6	12.9	11.7	12.6	14.7	15.9	13.0	9.3	6.0	7.9	8.8	7.6	9.1	12.0	25.1	22.0	15.2	16.5	13.0	9.7	7.6	12.7	25.1
17-Mar	6.6	7.1	Z	4.6	6.7	14.5	13.9	20.9	14.4	10.6	10.6	9.0	10.3	12.3	19.2	30.8	46.5	35.2	44.2	51.1	37.9	48.4	17.5	18.8	21.3	51.1
18-Mar	13.3	30.1	33.1	Z	19.1	15.1	22.8	27.4	15.9	13.8	14.2	11.7	9.2	9.8	11.4	7.6	10.5	35.8	43.2	37.4	29.7	19.6	19.6	17.4	20.3	43.2
19-Mar	19.8	20.7	15.7	17.3	Z	22.3	20.3	29.9	27.1	13.9	5.3	6.6	1.3	2.7	4.4	3.4	5.0	2.7	6.1	5.7	3.1	4.1	4.9	5.0	10.7	29.9
20-Mar	4.0	4.6	4.6	5.3	6.5	Z	10.9	11.0	2.0	1.8	1.8	2.3	1.5	4.9	5.7	8.5	8.9	7.3	6.3	5.5	9.1	6.7	6.5	5.6	5.7	11.0
21-Mar	Z	6.8	8.4	10.1	12.0	19.9	18.6	15.4	15.2	19.9	35.6	43.2	31.6	10.3	10.5	13.3	16.7	27.3	43.9	53.8	33.2	19.0	17.5	13.2	21.5	53.8
22-Mar	10.1	Z	8.7	8.2	9.1	11.0	11.4	12.4	12.0	9.4	10.4	8.6	7.9	8.2	8.4	13.9	21.9	41.4	56.9	37.5	23.7	31.3	12.3	6.5	16.6	56.9
23-Mar	7.7	11.7	Z	18.5	31.6	25.6	26.7	27.1	26.6	17.8	17.0	9.2	4.6	4.9	3.8	3.3	3.4	5.7	5.7	4.5	4.5	7.7	7.9	8.1	12.3	31.6
24-Mar	8.1	11.5	9.3	Z	6.5	7.6	14.0	19.4	23.7	23.4	13.8	12.3	6.5	7.3	8.1	7.2	7.2	9.5	30.6	33.7	25.6	16.3	17.5	11.3	14.4	33.7
25-Mar	10.6	9.8	13.2	14.0	Z	11.8	14.1	17.2	12.1	19.8	48.6	49.5	27.7	8.0	3.2	3.5	3.3	3.5	4.6	5.2	4.3	5.7	6.8	7.8	13.2	49.5
26-Mar	6.9	7.1	6.8	5.1	7.9	Z	11.9	1.3	1.3	3.5	1.0	2.5	9.8	17.8	15.4	18.1	9.5	4.3	6.3	6.2	6.6	6.9	7.9	8.1	7.5	18.1
27-Mar	Z	6.3	6.9	7.5	10.2	11.6	14.0	19.9	17.6	25.8	26.4	17.0	10.6	6.0	4.3	3.7	4.8	11.6	23.2	34.4	14.7	12.3	11.0	10.2	13.5	34.4
28-Mar	7.9	Z	10.4	10.1	9.0	12.9	12.8	18.7	6.7	11.9	12.5	15.4	8.5	6.2	5.9	7.0	9.2	12.5	16.6	16.3	14.1	11.4	9.4	8.6	11.0	18.7
29-Mar	9.4	8.1	Z	8.8	10.3	15.1	12.4	23.6	13.1	34.2	18.5	23.3	21.6	7.8	4.6	4.7	3.5	3.3	4.1	5.0	3.3	2.2	2.3	3.5	10.6	34.2
30-Mar	3.8	3.4	2.6	Z	6.7	7.3	5.5	11.5	12.2	14.7	23.9	20.5	10.8	6.7	7.1	8.1	5.7	3.8	2.5	2.3	5.3	4.1	6.3	5.3	7.8	23.9
31-Mar	5.4	6.1	5.2	7.2	Z	8.8	11.5	15.2	21.2	2.6	7.3	11.7	10.6	5.9	5.2	3.8	2.5	2.1	1.7	10.3	16.4	8.3	3.6	3.0	7.6	21.2
	9.8	9.8	9.6	9.7	10.4	13.6	14.2	16.7	15.2	14.7	14.5	13.8	11.0	8.7	8.5	9.3	9.9	13.7	17.9	17.8	15.2	13.9	11.1	9.6	Diurnal Average	
	29.4	30.1	33.1	18.8	31.6	34.2	28.0	39.1	43.6	55.9	48.6	49.5	31.6	20.2	21.0	30.8	46.5	51.0	65.6	61.9	54.8	48.4	42.1	38.4	Diurnal Maximum	

Z - zerospan C - Calibration

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	611	86.42	86.42
21 - 40	76	10.75	97.17
11 - 80	20	2.83	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - March 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	54	19	3	28	33	47	152	29	17	15	22	22	16	17	29	108	611
21 - 40	5	0	2	3	0	5	12	11	5	9	3	2	1	1	7	10	76
11 - 80	1	1	0	1	1	0	1	4	1	1	3	0	1	2	2	1	20
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	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	20	5	32	34	52	165	44	23	25	28	24	18	20	38	119	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 76.5 $\mu g/m^3$ on Mar 18 18:00

Maximum Daily Average: 11.8 $\mu g/m^3$ on Mar 27

Minimum Value: 0.6 $\mu g/m^3$ on Mar 2 22:00

Maximum Diurnal Average: 8.6 $\mu g/m^3$ at hour 19

Monthly Average: 6.62 $\mu g/m^3$

Minimum Daily Average: 3.2 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 5.3 $\mu g/m^3$ at hour 3

Percentiles: P_1 = 1.6 P_{10} = 3.4 Q_1 = 4.2 Median = 5.5 Q_3 = 8.0 P_{90} = 10.6 P_{99} = 18.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	1
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	6.5	5.5	5.5	6.1	5.9	5.0	3.2	3.8	3.9	4.0	4.2	4.0	4.2	4.1	4.4	5.2	5.6	6.7	7.3	7.5	7.8	7.6	7.1	7.4	5.5	7.8
2-Mar	7.8	8.3	8.3	8.6	8.9	9.1	9.9	10.4	11.0	11.3	11.1	8.5	5.7	3.4	2.0	1.9	1.8	1.2	0.9	0.9	0.8	0.6	0.9	0.8	5.6	11.3
3-Mar	1.4	1.8	2.0	6.3	7.7	8.2	8.0	7.9	5.5	5.4	7.0	8.0	7.5	8.2	8.6	10.0	11.8	9.4	8.6	9.8	11.5	10.7	9.7	5.6	7.5	11.8
4-Mar	4.5	4.1	4.1	4.2	5.2	7.1	5.6	4.4	3.7	3.3	4.5	4.9	4.5	3.6	3.2	3.4	3.4	6.0	9.7	8.6	9.3	8.4	8.0	7.0	5.4	9.7
5-Mar	5.8	5.7	5.2	5.0	5.4	5.0	4.5	4.4	4.9	5.8	6.8	5.8	4.1	6.4	10.7	15.5	8.8	13.7	15.4	15.1	10.6	9.6	7.6	7.0	7.9	15.5
6-Mar	6.1	5.5	5.5	4.7	5.2	5.7	6.3	6.7	5.7	5.1	4.6	5.9	4.9	4.9	5.5	3.7	3.4	3.2	3.4	3.8	3.7	3.5	3.6	3.4	4.8	6.7
7-Mar	3.1	2.9	2.8	2.8	2.6	2.8	3.1	3.1	3.3	3.3	3.4	3.5	3.7	4.0	3.7	3.2	2.8	2.9	3.4	3.7	3.6	3.4	3.3	3.1	3.2	4.0
8-Mar	2.8	2.7	2.9	2.6	2.6	2.9	3.5	3.6	3.6	4.1	3.7	3.8	3.9	3.6	3.7	3.4	3.5	3.6	4.7	5.5	3.8	5.1	4.8	3.5	3.7	5.5
9-Mar	3.1	3.0	3.0	2.9	3.1	3.8	4.5	4.0	4.1	3.9	4.7	4.6	4.1	4.0	3.7	4.0	4.3	4.3	4.3	4.0	3.7	3.6	3.4	3.4	3.8	4.7
10-Mar	3.3	3.5	3.4	3.4	3.5	3.6	3.7	3.9	4.8	4.9	4.7	4.5	4.6	4.7	4.6	4.6	4.1	3.8	4.1	4.6	5.1	4.6	4.2	4.4	4.2	5.1
11-Mar	4.7	4.8	4.5	4.3	4.3	3.8	3.9	3.5	3.4	3.3	5.1	4.6	4.3	3.8	3.5	3.7	3.7	3.6	3.7	3.8	6.5	9.5	8.3	8.1	4.7	9.5
12-Mar	7.1	5.5	4.7	4.0	3.9	4.2	4.5	4.2	4.0	4.0	4.8	4.9	5.0	4.9	4.6	4.6	4.6	4.6	4.9	4.9	4.5	5.2	5.1	5.4	4.8	7.1
13-Mar	6.1	5.8	6.4	6.7	6.9	6.8	6.9	7.6	7.3	7.3	7.7	7.2	7.2	6.8	6.7	8.3	4.8	4.0	3.9	3.7	3.5	3.6	3.4	3.4	5.9	8.3
14-Mar	3.6	4.5	4.5	4.9	4.8	4.5	4.4	4.5	4.6	4.1	4.2	4.7	4.7	4.3	4.3	5.1	6.8	6.2	4.6	3.8	4.4	4.7	4.5	4.3	4.6	6.8
15-Mar	4.3	4.3	4.5	5.1	5.5	5.5	5.8	6.1	6.6	8.4	9.5	8.4	6.4	6.0	5.9	6.4	7.0	11.6	13.5	12.7	11.2	9.9	10.0	9.4	7.7	13.5
16-Mar	7.9	6.8	5.0	3.7	3.8	3.8	3.9	4.0	3.9	4.0	4.1	4.0	4.4	4.6	4.8	5.0	5.6	7.0	7.0	6.4	5.7	5.1	4.7	4.5	5.0	7.9
17-Mar	4.3	4.0	4.0	4.1	4.2	4.5	4.4	4.8	4.7	4.8	5.2	5.1	5.4	5.9	7.3	10.0	10.5	9.6	10.0	10.2	7.5	9.6	7.7	6.5	6.4	10.5
18-Mar	5.4	6.2	6.4	5.7	4.9	4.4	4.5	5.0	4.8	5.4	7.4	8.7	8.4	7.8	8.7	5.0	6.6	76.5	49.5	10.4	8.4	5.6	5.4	5.1	11.1	76.5
19-Mar	5.6	6.1	6.3	6.9	6.8	6.7	6.4	5.8	6.2	5.5	4.6	5.3	4.4	4.6	5.0	4.8	5.0	4.8	5.0	5.1	4.7	4.8	4.5	4.3	5.4	6.9
20-Mar	3.7	3.6	3.4	3.4	3.5	3.9	4.1	5.3	4.4	4.0	4.0	3.9	4.0	4.7	5.1	5.8	6.2	6.1	6.1	6.2	6.2	6.6	6.9	6.0	4.9	6.9
21-Mar	6.1	6.0	7.4	7.0	7.6	9.1	8.5	9.1	11.4	12.7	14.1	15.7	22.3	14.8	8.1	8.6	8.8	9.9	11.9	12.2	10.7	9.0	9.3	9.2	10.4	22.3
22-Mar	6.9	6.3	5.0	4.5	4.6	4.5	4.5	4.8	5.1	6.1	7.7	7.6	7.5	7.9	7.9	8.8	10.4	12.9	17.9	16.4	13.2	12.4	8.9	7.6	8.3	17.9
23-Mar	7.7	7.7	7.2	8.2	9.0	8.5	8.5	8.5	10.0	11.5	12.7	9.1	7.0	6.6	6.8	6.5	6.2	5.7	5.5	5.6	5.7	7.0	8.7	13.5	8.0	13.5
24-Mar	9.3	9.2	7.8	7.5	7.4	7.4	9.3	10.7	11.7	12.2	8.8	7.8	5.2	5.7	6.5	7.1	6.9	7.1	13.6	14.5	16.1	12.1	10.9	8.6	9.3	16.1
25-Mar	8.0	7.6	7.6	7.7	6.2	6.4	6.7	8.0	6.7	9.2	18.9	21.4	15.1	8.1	4.9	5.1	5.4	6.4	7.1	9.4	6.8	8.9	8.7	9.1	8.7	21.4
26-Mar	8.3	7.5	8.0	7.0	8.8	12.8	13.1	5.0	4.3	5.3	4.0	4.6	13.9	29.3	24.9	17.0	16.0	6.6	7.6	7.2	8.2	10.4	13.8	15.1	10.8	29.3
27-Mar	28.8	11.5	11.0	10.6	14.8	17.9	13.5	11.4	11.7	12.9	16.1	14.4	10.6	8.2	7.6	6.8	7.1	8.5	11.7	14.6	9.0	8.6	7.6	7.7	11.8	28.8
28-Mar	7.8	7.8	7.8	8.0	9.2	8.6	9.1	9.4	7.6	8.3	9.1	9.6	7.5	6.1	5.9	6.2	6.7	7.9	9.0	9.4	8.0	6.7	5.9	5.3	7.8	9.6
29-Mar	5.2	5.1	5.1	5.9	7.0	8.8	8.6	9.8	8.0	14.0	11.5	13.6	14.6	9.6	8.2	6.8	4.5	4.0	4.9	4.6	3.6	3.0	3.2	3.7	7.2	14.6
30-Mar	3.6	3.5	3.4	3.2	4.3	4.6	4.7	6.0	6.8	6.8	9.3	9.8	8.9	7.3	6.9	6.4	4.0	3.2	3.2	3.3	3.2	3.2	2.9	3.2	5.1	9.8
31-Mar	2.9	2.6	2.5	2.7	3.4	3.6	4.5	5.5	C	3.7	6.8	12.7	14.6	11.2	9.4	7.3	6.3	6.3	5.2	6.2	6.2	5.4	4.4	3.7	6.0	14.6
	6.2	5.5	5.3	5.4	5.8	6.2	6.2	6.2	6.1	6.6	7.4	7.6	7.4	6.9	6.5	6.5	6.2	8.6	8.6	7.5	6.9	6.7	6.4	6.1	Diurnal Average	
	28.8	11.5	11.0	10.6	14.8	17.9	13.5	11.4	11.7	14.0	18.9	21.4	22.3	29.3	24.9	17.0	16.0	76.5	49.5	16.4	16.1	12.4	13.8	15.1	Diurnal Maximum	

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Athabasca Valley - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	368	49.53	49.53
6 - 15	358	48.18	97.71
16 - 25	13	1.75	99.46
26 - 80	4	0.54	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Athabasca Valley - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	27	7	4	15	15	38	128	24	7	8	9	11	8	10	10	47	368
6 - 15	37	14	2	18	19	13	50	19	17	17	21	16	12	9	22	72	358
16 - 25	1	1	0	0	0	1	1	1	0	1	0	0	0	1	4	2	13
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	22	6	33	34	52	179	44	24	26	30	27	20	22	38	121	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Athabasca Valley

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.6 ppm on Mar 5 20:00 Maximum Daily Average: 0.3 ppm on Mar 18

Minimum Value: 0.1 ppm on Mar 14 07:00 Minimum Daily Average: 0.1 ppm on Mar 14

Maximum Diurnal Average: 0.3 ppm at hour 20 Minimum Diurnal Average: 0.1 ppm at hour 5

Monthly Average: 0.17 ppm Percentiles: $P_1 = 0.1$ $P_{10} = 0.1$ $Q_1 = 0.1$ Median = 0.2 $Q_3 = 0.2$ $P_{90} = 0.2$ $P_{99} = 0.4$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.2	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2-Mar	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
3-Mar	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	0.2	0.1	0.1	0.2
4-Mar	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	0.2	0.1	0.1	0.2
5-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.4	1.6	1.0	0.2	0.2	0.2	0.3	1.6
6-Mar	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	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
7-Mar	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2
8-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
9-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2
10-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
11-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
12-Mar	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
13-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
14-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Mar	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3
16-Mar	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
17-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4	0.2	0.2	0.2	0.4
18-Mar	0.2	0.3	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.6
19-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3
20-Mar	Z	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	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
21-Mar	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.4
22-Mar	0.2	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.4
23-Mar	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2
24-Mar	0.1	0.5	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.5
25-Mar	0.2	0.2	0.2	0.2	0.1	Z	0.1	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	0.1	0.1	0.1	0.2	0.2
26-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.2	0.5	0.6	0.1	0.1	0.2	0.2	0.6
27-Mar	0.4	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4
28-Mar	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
29-Mar	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	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
30-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2
31-Mar	0.1	0.1	0.1	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	0.2	0.2	0.2	0.2	0.1	0.2	0.2
	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	Diurnal Average	
	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	1.6	1.0	0.4	0.2	0.2	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm

Wood Buffalo Environmental Association

Hourly Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	694	97.88	97.88
0.4 - 0.5	11	1.55	99.44
0.6 - 0.7	2	0.28	99.72
0.8 - 1.4	1	0.14	99.86
1.5 - 10	1	0.14	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Monoxide (CO) - ppm

Athabasca Valley - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 0.3	62	22	5	32	33	50	167	40	22	25	27	24	20	19	34	112	694
0.4 - 0.5	1	0	0	0	0	1	1	3	0	1	1	0	0	2	0	1	11
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
0.8 - 1.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1.5 - 10	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	63	22	5	32	33	51	170	43	22	26	28	24	20	21	35	114	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Monoxide (CO) - ppm

Athabasca Valley

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Span Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Athabasca Valley - March 2023

Maximum Value: 10.3 C on Mar 18 16:00

Maximum Daily Average: -1.0 C on Mar 31

Minimum Value: -30.0 C on Mar 6 08:00

Minimum Daily Average: -21.1 C on Mar 5

Maximum Diurnal Average: -3.1 C at hour 17

Minimum Diurnal Average: -15.5 C at hour 7

Monthly Average: -9.45 C

Percentiles: P_1 = -27.1 P_{10} = -18.9 Q_1 = -13.7 Median = -9.1 Q_3 = -4.7 P_{90} = -0.3 P_{99} = 6.8

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-25.1	-25.9	-26.3	-27.3	-27.0	-25.5	-23.5	-23.8	-23.9	-19.6	-16.4	-14.5	-10.1	-7.0	-6.8	-6.4	-6.4	-6.8	-7.1	-7.4	-7.7	-7.8	-8.0	-8.0	-15.3	-6.4
2-Mar	-8.2	-8.2	-8.0	-7.8	-7.3	-7.2	-7.0	-6.7	-6.4	-5.5	-2.1	1.4	3.6	4.9	4.9	4.6	4.9	4.2	2.6	2.1	1.6	1.3	1.1	0.4	-1.5	4.9
3-Mar	0.2	-0.2	-0.7	-2.8	-5.3	-6.3	-7.1	-7.8	-8.4	-8.8	-8.8	-8.5	-8.3	-8.0	-8.0	-8.1	-7.9	-8.3	-9.1	-10.2	-11.2	-12.9	-13.4	-13.7	-7.6	0.2
4-Mar	-13.9	-14.3	-14.8	-15.1	-15.1	-15.3	-15.3	-15.5	-16.3	-16.5	-15.8	-14.9	-14.1	-13.3	-13.1	-13.0	-12.8	-13.6	-14.7	-16.0	-17.1	-18.0	-19.8	-22.6	-15.5	-12.8
5-Mar	-22.2	-23.0	-24.9	-25.4	-26.0	-26.8	-26.4	-26.6	-24.5	-22.6	-19.5	-17.6	-16.5	-15.6	-14.9	-13.7	-13.8	-14.7	-16.6	-19.8	-21.6	-23.2	-24.8	-25.2	-21.1	-13.7
6-Mar	-26.4	-26.3	-27.1	-27.3	-28.8	-29.3	-29.5	-30.0	-28.5	-25.6	-22.2	-19.0	-14.8	-12.1	-10.6	-9.1	-8.9	-9.2	-9.7	-10.3	-10.9	-11.5	-11.9	-11.8	-18.8	-8.9
7-Mar	-11.6	-11.6	-11.8	-11.9	-12.2	-12.3	-12.3	-12.3	-12.6	-12.3	-11.8	-10.4	-9.1	-7.7	-6.1	-5.7	-5.4	-5.5	-6.2	-7.2	-7.8	-7.9	-8.0	-8.6	-9.5	-5.4
8-Mar	-9.3	-10.0	-10.4	-11.0	-12.3	-13.3	-14.0	-14.3	-13.7	-12.9	-11.1	-9.3	-8.0	-6.6	-5.4	-4.8	-4.9	-5.8	-7.3	-8.7	-9.8	-11.2	-12.1	-12.6	-10.0	-4.8
9-Mar	-13.4	-14.1	-14.8	-15.7	-17.8	-21.5	-22.8	-23.5	-20.3	-16.6	-13.6	-10.8	-9.7	-8.9	-7.5	-6.3	-5.8	-5.6	-7.0	-7.7	-8.1	-8.3	-8.7	-8.8	-12.4	-5.6
10-Mar	-9.1	-9.7	-9.8	-9.9	-10.0	-10.2	-10.4	-10.3	-10.1	-9.1	-8.8	-8.1	-7.2	-5.9	-4.9	-4.3	-4.6	-4.8	-5.4	-6.3	-7.5	-7.9	-8.4	-8.5	-8.0	-4.3
11-Mar	-10.4	-12.3	-13.5	-12.0	-11.7	-11.5	-11.2	-10.4	-9.9	-8.9	-7.3	-4.9	-3.9	-3.0	-2.4	-2.4	-2.7	-2.9	-3.3	-4.2	-5.1	-6.9	-7.5	-8.3	-7.4	-2.4
12-Mar	-9.3	-9.7	-10.5	-11.0	-11.7	-12.3	-13.3	-13.2	-13.4	-12.8	-12.0	-11.2	-10.1	-8.9	-8.6	-9.1	-9.5	-10.1	-10.8	-11.1	-11.5	-12.1	-12.5	-12.6	-11.1	-8.6
13-Mar	-13.0	-13.3	-13.7	-14.4	-14.8	-15.2	-15.9	-16.4	-16.3	-15.5	-14.3	-12.4	-10.0	-8.5	-6.7	-5.6	-4.0	-4.0	-4.1	-4.1	-4.7	-5.7	-6.3	-6.5	-10.2	-4.0
14-Mar	-6.7	-7.0	-7.5	-8.3	-8.4	-8.4	-8.8	-9.2	-9.5	-10.4	-10.9	-10.8	-10.4	-9.9	-9.6	-9.5	-9.6	-9.9	-10.6	-11.3	-11.7	-12.2	-12.7	-13.6	-9.9	-6.7
15-Mar	-14.3	-16.3	-18.2	-21.5	-22.1	-22.5	-23.5	-22.8	-21.0	-16.8	-14.5	-12.2	-10.1	-9.0	-8.1	-7.2	-7.1	-7.5	-9.5	-12.5	-15.6	-17.6	-17.2	-17.2	-15.2	-7.1
16-Mar	-16.6	-16.4	-14.8	-13.7	-13.9	-13.8	-13.7	-13.6	-13.5	-12.5	-11.2	-9.7	-7.6	-5.8	-4.2	-3.1	-2.2	-2.3	-3.3	-4.5	-5.7	-7.0	-8.4	-9.3	-9.5	-2.2
17-Mar	-10.5	-11.2	-14.3	-15.4	-15.6	-16.1	-17.2	-16.7	-14.7	-8.7	-5.6	-2.4	1.3	4.0	6.0	7.3	8.1	8.0	6.1	1.5	-1.6	-3.1	-4.2	-5.5	-5.0	8.1
18-Mar	-3.9	-5.5	-6.4	-7.6	-9.2	-9.6	-10.4	-9.9	-7.8	-4.9	-0.9	2.8	5.0	7.3	9.5	10.3	10.1	8.8	4.7	1.0	-2.1	-4.7	-5.8	-7.5	-1.5	10.3
19-Mar	-8.7	-9.8	-10.6	-11.0	-12.0	-12.7	-13.2	-11.6	-9.4	-5.5	-1.8	-0.6	0.0	1.3	2.5	2.5	1.6	0.6	0.1	-0.8	-1.8	-2.8	-3.3	-3.4	-4.6	2.5
20-Mar	-3.3	-3.7	-4.6	-5.5	-6.4	-7.0	-7.4	-7.5	-6.5	-6.4	-6.6	-7.0	-6.9	-5.8	-5.2	-4.3	-4.2	-4.3	-4.6	-5.0	-6.9	-7.4	-9.2	-11.1	-6.1	-3.3
21-Mar	-12.5	-14.8	-16.4	-17.2	-19.2	-19.7	-20.3	-17.3	-16.1	-14.6	-12.4	-10.7	-8.5	-6.2	-5.0	-4.2	-3.8	-4.1	-4.8	-6.9	-9.7	-12.7	-13.5	-13.9	-11.9	-3.8
22-Mar	-14.9	-16.6	-14.2	-14.4	-15.9	-14.3	-13.9	-12.8	-10.9	-8.1	-5.1	-2.4	-0.3	1.5	2.9	4.1	4.4	4.3	2.8	-0.2	-2.8	-3.9	-5.1	-6.9	-6.0	4.4
23-Mar	-7.2	-8.2	-9.8	-8.8	-9.7	-8.7	-8.3	-8.1	-6.1	-3.5	-0.8	1.5	1.7	1.9	1.2	0.2	-0.4	-1.6	-3.1	-4.6	-6.0	-6.9	-9.5	-12.2	-4.9	1.9
24-Mar	-13.3	-13.5	-13.3	-13.3	-15.4	-16.9	-17.6	-16.1	-13.7	-10.9	-7.6	-5.4	-4.4	-2.9	-2.3	-1.4	-0.4	-1.0	-2.2	-4.2	-7.0	-9.5	-11.4	-13.2	-9.0	-0.4
25-Mar	-14.3	-14.9	-15.7	-16.6	-17.7	-19.1	-20.1	-18.7	-16.5	-14.2	-10.0	-5.9	-2.9	-1.6	-1.3	-1.0	-1.2	-2.4	-4.1	-6.1	-7.7	-9.2	-10.4	-11.8	-10.2	-1.0
26-Mar	-13.3	-14.7	-16.1	-17.4	-18.2	-19.1	-19.3	-18.4	-17.4	-16.7	-15.4	-13.3	-11.6	-10.1	-8.9	-8.6	-8.2	-8.9	-10.2	-11.6	-12.9	-14.1	-15.3	-17.1	-14.0	-8.2
27-Mar	-20.3	-22.4	-23.6	-24.4	-25.3	-25.6	-25.9	-23.8	-20.9	-17.4	-13.5	-10.3	-8.5	-7.0	-5.9	-5.1	-4.4	-4.7	-5.4	-7.6	-11.3	-14.1	-15.9	-17.6	-15.1	-4.4
28-Mar	-19.0	-20.8	-21.6	-22.3	-23.3	-23.6	-24.6	-22.9	-19.9	-15.7	-12.6	-9.1	-5.8	-3.7	-1.9	-0.8	-0.2	-0.3	-0.9	-1.5	-2.0	-2.2	-2.6	-3.0	-10.8	-0.2
29-Mar	-3.3	-3.9	-4.4	-6.3	-7.4	-7.6	-7.2	-5.9	-4.5	-2.4	-0.9	-0.2	0.4	0.9	0.8	0.4	0.2	-0.2	-1.1	-1.8	-2.8	-4.6	-7.2	-9.0	-3.2	0.9
30-Mar	-11.7	-12.3	-13.7	-14.5	-15.2	-15.9	-16.4	-14.4	-11.8	-9.4	-6.6	-3.7	-1.9	-1.7	-0.5	0.1	0.2	0.0	-0.3	-1.1	-1.3	-2.1	-2.6	-3.3	-6.7	0.2
31-Mar	-3.2	-3.0	-3.5	-4.3	-5.1	-5.3	-5.8	-5.9	-4.7	-3.4	-1.9	-0.3	1.4	2.9	3.3	3.5	3.6	4.0	2.8	1.5	0.8	0.3	-0.3	-1.2	-1.0	4.0
	-11.9	-12.7	-13.4	-14.0	-14.8	-15.3	-15.5	-15.0	-13.8	-11.9	-9.7	-7.7	-6.0	-4.7	-3.8	-3.2	-3.1	-3.5	-4.6	-6.0	-7.4	-8.6	-9.5	-10.4	Diurnal Average	
	0.2	-0.2	-0.7	-2.8	-5.1	-5.3	-5.8	-5.9	-4.5	-2.4	-0.8	2.8	5.0	7.3	9.5	10.3	10.1	8.8	6.1	2.1	1.6	1.3	1.1	0.4	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Athabasca Valley - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	63	8.47	8.47
-20 - 0	615	82.66	91.13
0 - 10	64	8.60	99.73
10 - 20	2	0.27	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

Athabasca Valley - March 2023

Maximum Value: 29.8 inHg on Mar 8 10:00

Maximum Daily Average: 29.8 inHg on Mar 8

Minimum Value: 28.1 inHg on Mar 2 12:00

Minimum Daily Average: 28.2 inHg on Mar 2

Maximum Diurnal Average: 29.2 inHg at hour 10

Minimum Diurnal Average: 29.1 inHg at hour 18

Monthly Average: 29.14 inHg

Percentiles: P_1 = 28.2 P_{10} = 28.7 Q_1 = 29.0 Median = 29.1 Q_3 = 29.4 P_{90} = 29.6 P_{99} = 29.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.8	29.1
2-Mar	28.4	28.4	28.4	28.3	28.3	28.3	28.2	28.2	28.2	28.2	28.1	28.1	28.1	28.1	28.1	28.1	28.2	28.2	28.2	28.2	28.3	28.3	28.3	28.3	28.2	28.4
3-Mar	28.3	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.6	28.8
4-Mar	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	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.4	29.1	29.4
5-Mar	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.6
6-Mar	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.7
7-Mar	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.7	29.6	29.7
8-Mar	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8
9-Mar	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.6	29.7
10-Mar	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	29.2	29.2	29.3
11-Mar	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.3	29.4
12-Mar	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.3	29.4
13-Mar	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	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	29.0	29.2
14-Mar	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.8	28.8	M	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
15-Mar	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	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.1	29.3
16-Mar	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.4
17-Mar	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	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.3
18-Mar	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	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2
19-Mar	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.1	29.1	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
20-Mar	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
21-Mar	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1
22-Mar	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	29.0
23-Mar	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	28.8	29.0
24-Mar	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2
25-Mar	29.1	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	29.2	29.3	29.3	29.1	29.3
26-Mar	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.5	29.6
27-Mar	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.6
28-Mar	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.3	29.4
29-Mar	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	29.1	29.1	29.1	29.1	29.0	29.1
30-Mar	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
31-Mar	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	28.9
	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	Diurnal Average	
	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	Diurnal Maximum	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Barometric Pressure (BP) - inHg

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Athabasca Valley - March 2023

Maximum Value: 89.3 % on Mar 14 03:00

Maximum Daily Average: 84.2 % on Mar 14

Minimum Value: 26.1 % on Mar 18 16:00

Minimum Daily Average: 43.1 % on Mar 8

Maximum Diurnal Average: 74.5 % at hour 6

Minimum Diurnal Average: 50.0 % at hour 17

Monthly Average: 64.15 %

Percentiles: P_1 = 33.0 P_{10} = 43.8 Q_1 = 54.0 Median = 66.4 Q_3 = 75.0 P_{90} = 81.1 P_{99} = 87.9

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	73.7	73.1	72.8	72.0	72.1	73.1	74.6	74.4	74.0	76.0	71.9	62.3	56.7	54.6	55.7	56.4	58.8	61.8	64.0	66.7	69.0	70.7	72.2	73.0	67.9	76.0
2-Mar	78.6	84.6	85.6	86.9	84.5	81.7	80.5	78.0	76.4	74.7	65.4	57.5	53.2	52.0	54.0	61.3	60.0	58.8	71.8	75.6	75.3	74.8	74.8	79.1	71.9	86.9
3-Mar	74.4	63.6	62.3	72.0	74.5	73.7	73.1	71.3	70.2	68.2	67.0	65.3	63.4	63.2	62.0	61.9	60.7	61.3	64.7	74.7	81.9	83.5	83.9	77.9	69.8	83.9
4-Mar	71.2	69.4	67.4	67.5	69.7	71.4	73.2	75.9	70.8	66.5	63.9	58.7	56.4	53.4	52.8	49.2	48.0	53.0	57.5	61.3	63.4	65.3	70.1	74.4	63.8	75.9
5-Mar	75.6	74.1	73.6	73.2	72.6	72.3	72.4	71.7	71.9	69.0	61.0	52.5	49.2	47.7	46.3	42.7	42.0	45.3	53.0	65.3	69.2	71.5	73.1	73.9	63.3	75.6
6-Mar	73.4	72.9	72.1	71.6	70.7	70.5	70.1	69.6	69.7	70.4	67.1	59.7	52.6	52.3	53.1	58.0	55.9	57.8	63.6	67.8	66.4	64.1	65.0	64.2	64.9	73.4
7-Mar	63.5	71.1	76.2	74.2	75.1	72.0	68.4	68.5	69.1	62.9	62.3	58.0	52.3	50.7	47.0	43.6	41.5	41.9	42.4	44.6	45.4	45.7	44.7	44.5	56.9	76.2
8-Mar	45.0	45.7	46.6	47.1	50.4	52.3	53.8	55.2	53.3	50.6	45.5	41.1	38.0	34.1	32.1	31.4	30.9	32.6	37.4	38.7	38.5	42.0	45.3	47.2	43.1	55.2
9-Mar	49.2	50.7	52.1	54.7	58.6	67.3	69.4	70.7	66.0	55.9	48.9	43.7	43.7	43.4	40.7	39.6	40.7	44.2	44.7	46.7	49.4	50.3	52.5	56.9	51.7	70.7
10-Mar	59.2	70.2	74.1	73.3	70.2	68.9	69.0	68.5	66.0	61.5	59.7	58.4	56.7	55.4	52.8	51.7	56.1	58.8	61.4	63.6	67.4	66.0	68.0	68.5	63.5	74.1
11-Mar	71.5	78.1	82.5	76.7	71.8	71.3	70.9	65.8	62.4	59.7	56.2	51.6	51.3	51.0	51.9	54.1	56.9	58.0	63.1	73.1	79.9	83.0	82.3	84.1	67.0	84.1
12-Mar	86.0	82.8	80.4	79.4	79.1	78.6	80.0	78.5	75.9	71.5	69.0	69.8	65.5	62.1	61.3	64.7	67.6	70.2	72.8	75.9	78.5	79.9	79.1	78.0	74.4	86.0
13-Mar	78.9	79.6	77.9	78.2	77.8	77.1	76.9	76.4	75.7	74.0	70.9	67.6	63.3	64.3	61.1	61.4	62.3	63.3	63.4	63.9	71.3	80.6	82.4	83.1	72.1	83.1
14-Mar	85.9	89.1	89.3	88.6	88.6	88.8	88.5	88.1	87.4	85.6	83.9	83.1	81.0	81.3	80.9	80.1	81.1	82.5	82.6	81.9	81.4	81.6	80.2	78.7	84.2	89.3
15-Mar	79.5	81.1	80.7	77.7	76.8	76.3	75.3	75.6	75.9	76.5	70.7	65.6	60.8	58.8	56.4	55.2	56.5	60.3	68.7	76.3	81.1	80.6	80.4	80.3	72.0	81.1
16-Mar	80.7	80.8	80.8	73.3	72.7	73.0	73.5	73.7	73.0	70.1	66.6	63.5	58.5	56.9	55.7	54.4	54.3	56.2	60.5	64.7	67.0	70.8	75.7	78.5	68.1	80.8
17-Mar	80.5	79.2	81.2	82.8	82.9	82.1	81.0	79.6	76.2	67.4	61.2	56.0	50.9	48.0	46.5	45.4	44.0	41.6	46.8	62.1	70.5	78.2	71.2	70.7	66.1	82.9
18-Mar	57.7	63.7	66.6	69.1	76.0	80.6	82.5	79.7	69.9	61.8	52.2	42.9	38.8	34.7	31.5	26.1	27.8	33.7	47.7	62.1	72.5	81.0	82.4	85.8	59.5	85.8
19-Mar	87.8	88.0	86.8	86.4	85.7	84.8	84.3	85.0	86.4	76.3	60.6	57.0	54.4	53.0	51.2	51.6	54.9	58.6	60.4	63.6	66.4	68.8	68.5	69.1	70.4	88.0
20-Mar	65.1	62.9	60.3	58.8	59.7	60.4	61.4	60.8	59.3	61.9	67.1	76.0	81.6	75.6	70.8	68.1	67.0	67.6	70.0	74.0	72.0	62.7	62.2	65.9	66.3	81.6
21-Mar	69.0	73.5	77.2	78.1	78.5	78.5	77.4	79.7	79.8	76.0	70.7	66.6	63.3	57.6	54.3	51.0	51.1	52.4	55.4	64.0	69.9	79.9	82.3	82.7	69.5	82.7
22-Mar	83.0	82.1	83.1	80.9	82.6	81.8	79.8	76.2	71.6	66.0	58.3	51.7	47.5	44.5	42.3	40.5	40.0	41.1	46.8	57.9	67.3	70.3	71.4	74.8	64.2	83.1
23-Mar	75.1	76.1	81.4	79.1	80.9	79.1	77.0	75.2	68.2	61.0	55.4	48.3	51.6	52.6	54.8	56.0	54.1	56.8	59.8	63.5	67.8	71.6	79.5	84.0	67.0	84.0
24-Mar	83.8	83.6	83.8	83.7	81.9	80.9	79.9	80.6	81.9	81.9	63.6	53.7	48.3	45.5	43.9	40.8	38.1	39.5	45.0	52.5	63.2	69.5	73.8	75.7	65.6	83.8
25-Mar	75.8	74.1	72.8	75.8	75.0	77.8	77.3	75.0	68.9	66.6	59.3	49.2	41.3	37.5	37.3	36.3	34.8	32.3	33.9	40.1	50.0	58.2	60.7	64.3	57.3	77.8
26-Mar	67.1	69.6	70.7	70.1	70.2	70.4	70.7	58.5	52.8	51.4	46.8	42.3	41.5	41.0	42.0	43.1	39.3	37.0	39.8	42.1	45.7	48.9	52.3	57.6	53.0	70.7
27-Mar	67.2	71.5	72.6	73.0	73.1	72.7	72.1	70.2	64.0	57.7	50.4	44.7	39.8	36.4	33.9	34.1	33.9	35.0	37.8	44.0	55.7	66.7	69.5	73.0	56.2	73.1
28-Mar	75.0	75.6	76.5	75.8	74.3	74.7	73.3	71.3	66.3	57.0	50.6	44.1	37.6	37.0	36.1	34.9	33.4	35.2	36.4	36.0	36.4	36.8	37.7	40.8	52.2	76.5
29-Mar	42.5	47.5	50.5	60.7	67.6	69.2	71.1	71.6	68.7	63.2	67.3	65.5	64.6	63.8	62.7	62.5	60.6	58.9	58.0	56.6	58.3	64.5	73.2	80.9	62.9	80.9
30-Mar	84.8	84.9	84.0	83.0	82.3	81.7	80.9	81.4	76.6	70.0	64.0	60.4	53.6	52.6	50.2	47.3	47.1	51.8	53.2	53.2	48.8	49.2	51.1	54.2	64.4	84.9
31-Mar	55.7	54.7	58.7	66.9	68.3	67.1	66.4	67.8	65.3	64.3	62.2	59.3	55.5	50.7	50.5	49.9	50.4	49.4	53.5	57.4	60.4	61.8	64.0	65.6	59.4	68.3
	71.5	72.7	73.6	73.9	74.3	74.5	74.3	73.4	70.8	67.0	61.9	57.3	54.0	52.0	50.7	50.1	50.0	51.5	55.4	60.3	64.2	67.0	68.7	70.6	Diurnal Average	
	87.8	89.1	89.3	88.6	88.6	88.8	88.5	88.1	87.4	85.6	83.9	83.1	81.6	81.3	80.9	80.1	81.1	82.5	82.6	81.9	81.9	83.5	83.9	85.8	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Athabasca Valley - March 2023

Maximum Speed: 24 km/h on Mar 2 18:00

Maximum Daily Speed Average: 13.2 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 28 06:00

Minimum Daily Speed Average: 1.3 km/h on Mar 24

Maximum Diurnal Speed Average: 3.5 km/h at hour 17

Minimum Diurnal Speed Average: 0.4 km/h at hour 24

Monthly Average Velocity: 1.6 km/h 79.7 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 8 $Q_3 = 12$ $P_{90} = 14$ $P_{99} = 20$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE1	NE2	SW2	WNW2	W2	S2	ESE3	SSE2	E1	SE6	ESE5	N1	N1	SE14	SE14	SE13	SE14	SE13	SE13	SE14	SE12	SE12	SE13	SE13	SE6.6	SE14
2-Mar	SE12	SE11	SE12	SE10	SE12	SE14	SE15	SE15	SE16	SE13	S6	SW21	WSW13	W20	WNW16	WSW14	WSW12	W24	WSW16	WSW15	WSW10	W6	WNW10	WNW14	SW6.8	W24
3-Mar	WNW12	NW17	NW17	NNW16	NNW16	NNW14	NNW13	NNW14	N12	NNW14	NNW12	NNW10	NNW11	NNW11	N12	NNW10	N8	NNE7	N6	N7	NW3	WSW4	NNW8	NNW14	NNW10.5	NW17
4-Mar	NNW15	N8	N8	NNW7	N4	NNW3	WNW2	N6	N9	NNW11	N8	N10	NNW14	NNW20	NNW21	NNW20	NNW13	N9	N9	N8	NNW7	NW3	WNW3	W3	NNW8.8	NNW21
5-Mar	W5	WSW4	WSW5	WSW5	SW4	SW2	SSW6	S3	N1	WSW4	N4	N8	NNW7	NNW6	NNW7	NW2	NNE2	SSW2	SE3	SE1	SE2	ESE1	SE2	SSW2	W1.3	N8
6-Mar	ESE1	SW4	SSW3	S1	SSW2	S3	SSW3	SW3	SSW1	W1	WNW2	W1	SE7	SE5	ESE1	ESE11	SE15	SE14	SE11	SE10	SE10	SE8	SE8	SE11	SE4.7	SE15
7-Mar	SE10	SE15	SE13	SE13	SE11	SE7	SE9	SE16	SE15	SE15	SE15	SE13	ESE13	SE19	SE19	SE15	ESE12	SE13	SE11	SE13	SE15	SE12	SE13	SE12	SE13.2	SE19
8-Mar	SE13	SE13	SE12	SE12	SE12	SE11	SSE11	SSE8	SSE8	SSE7	SE11	SE12	SE12	SE15	SE12	SE12	ESE11	ESE10	SE7	SE6	SE9	SSE6	SSE5	SSE8	SE9.9	SE15
9-Mar	SSE10	SE11	SSE11	SE8	SE6	W1	SW4	WSW6	SSE6	SSE8	SE8	SE16	SE20	SE22	SE20	SE16	SE13	SE14	SE13	SE12	SE12	SE14	SE16	SE16	SE11.1	SE22
10-Mar	SE18	SE17	SE16	SE16	SE17	SE17	SE14	SE14	SE13	SE17	SE15	SE15	SE16	SE13	SE13	SE14	ESE13	ESE11	SE8	ESE4	SE4	ESE5	E3	SSE3	SE12.3	SE18
11-Mar	SSW3	WNW1	N1	E3	NNE3	ENE1	ESE2	SE6	SE8	SE10	SSE8	SE5	ESE9	ESE9	ESE10	ESE11	E11	ENE7	NNE6	N7	NNW10	N11	NNW11	N12	E3.1	N12
12-Mar	N11	NW11	NW10	NW11	NW10	NNW9	NNW8	NNW10	N10	N11	NNW10	NNW10	NNW12	NNW13	NNW13	NNW13	N13	NNW12	NNW12	NNW13	NNW13	NNW12	NNW11	NNW13	NNW11.1	NNW13
13-Mar	N11	NNW11	NNW13	NNW9	NNW11	NNW12	NNW12	N10	NNW11	NNW11	NNW10	NNW11	NNW11	NNW13	NNW14	N12	ENE17	ENE14	ENE11	ENE15	ENE13	NE9	NNE8	NNE8	N9.1	ENE17
14-Mar	N7	N7	N11	NNW12	N9	N9	N10	N9	NNW11	NNW17	NNW17	NNW16	NNW18	NNW16	NNW18	NNW16	NNW16	NNW16	NNW16	NNW15	NNW15	NNW13	NNW12	NW11	NNW12.9	NNW18
15-Mar	N8	WNW3	W4	SW3	SW4	SW5	S1	SSW1	E3	ENE2	W2	NNW2	N6	NNE8	NNW8	NW5	NW6	NW6	WNW3	W2	SW2	SW3	NNE1	SE3	NW2.0	NNE8
16-Mar	ENE4	NNE2	SE4	SE7	SSE6	SSE7	SSE8	SSE9	SSE8	S8	SSE7	SE7	SE6	SSE7	ESE7	ESE7	SE7	SSE8	SE8	SE8	SSE9	SSE8	SSE8	SSE8	SE6.6	SSE9
17-Mar	SE11	SE10	S3	SW3	WNW2	SW4	SW3	SSW6	SSW4	SE9	SE11	SE11	SE8	SE8	SE8	SSE9	SSE9	SSE10	SE9	SSW3	SSW3	SW2	S2	E5	SSE5.4	SE11
18-Mar	E7	SE4	SE5	SE7	SE7	SE8	SE4	SE5	SE9	SE8	E5	E6	E6	E5	E3	NW3	WNW2	WNW2	NW4	N2	NW4	SSW2	W4	WSW6	SE2.5	SE9
19-Mar	SW3	SW3	E2	ENE1	NNE1	ENE1	ENE1	NE2	NE2	SE7	SE11	SE10	E12	ESE10	ESE10	ESE11	SE12	E10	ESE10	SE14	ESE11	ESE11	SE11	ESE7	ESE6.5	SE14
20-Mar	SE13	ESE10	SE12	ESE7	ESE6	SE7	SE4	SSW1	E8	ENE9	NE10	ENE9	ENE6	S1	WSW6	SSE7	S7	S6	WSW4	NNW4	NNW9	NNW12	NNW12	NNW10	E2.5	SE13
21-Mar	NNW7	NW3	WNW2	W4	SW3	SW6	SW4	SW5	SW8	WSW4	NW2	WNW3	NW3	NNE3	ENE4	NW2	SSE6	S8	SSE5	SSE3	SSE4	S2	SSE3	SE1	SW1.6	SW8
22-Mar	NNE1	SSW1	SE10	SE6	SE5	SE10	SE11	SE10	SE10	SE13	SE11	SE9	SE10	SE8	SE6	SSE7	S8	S6	SSE4	SSW2	SSW2	SSW2	SSW4	SW6	SSE6.3	SE13
23-Mar	SSW6	S5	SW3	S3	S4	SSE6	SSE6	SE7	ESE6	NNE3	NNW13	NNW15	NNW14	NNW15	NNW18	N18	NNE20	NNE14	NNE13	N12	N8	N7	NNW3	W4	N5.3	NNE20
24-Mar	SSE1	ESE1	WSW2	WSW1	WSW4	WNW4	WSW3	SW2	WSW3	NW3	N6	N6	NNW7	NNE5	N5	NW3	WNW2	W2	SSW3	S1	SE2	SSE1	SSW1	SE1	NW1.3	NNW7
25-Mar	S2	S5	S3	S4	WSW1	NW1	WSW3	N1	ENE3	NNW3	N5	NNW8	NNW11	NNW14	NNW16	NNW14	N13	N13	N12	N10	NNW12	NNW11	N10	NNW13	NNW6.3	NNW16
26-Mar	NNW12	NNW9	NNW10	NNW12	NNW13	N11	NNE7	E8	E6	N2	NW5	NNW6	NNW8	NW9	NW11	NNW13	NW11	NW14	NW12	NNW15	NNW13	NNW12	NNW8	NNW5	NNW8.8	NNW15
27-Mar	WNW3	SW1	SW4	SW3	E1	NNE2	ENE1	ESE4	ESE5	ESE6	ESE6	E7	E7	E7	ENE6	E8	E8	SSE8	SE6	ESE1	NW3	N4	NW3	NW2	E2.5	SSE8
28-Mar	NW1	SW2	WSW3	SSW1	ENE2	N0	NNE1	E2	E7	SE5	ENE6	ENE5	ENE7	E9	E9	ESE8	SE8	SE9	SE9	SE10	SE11	SE11	SE10	SE9	ESE5.0	SE11
29-Mar	SE8	ESE4	ENE2	NNW2	WNW2	W2	WSW2	SW1	W2	NNW7	NNW11	NNW9	N9	N12	N14	N13	N14	N13	NNE12	NNE8	ENE6	E4	NNW3	WNW4	N5.0	N14
30-Mar	WSW3	WNW0	S0	NE2	NE1	NW1	E2	ESE5	ESE6	ENE3	N1	NNW3	NW4	NNW7	NW5	NW5	SE5	E8	ENE8	E6	ESE5	E4	ESE5	W1	ENE1.7	ENE8
31-Mar	ESE2	SE6	ESE7	SE5	SE3	ESE3	ESE4	SSW2	NW1	NNW8	NNW8	NNW9	NW8	W5	E3	E7	ENE8	ENE7	ENE10	ENE1	ESE4	ESE8	ESE10	ESE10	E2.9	ESE10
	E1.3	SE1.4	SE1.2	ESE1.0	ESE0.9	SE1.1	SE1.6	SE2.2	ESE2.7	E2.0	ENE2.0	NE2.0	NE2.9	NE2.7	NNE3.1	NE2.6	ENE3.5	E2.7	E2.3	ENE1.9	ENE1.6	ENE1.3	ENE1.1	ENE0.4	Diurnal Average	
	SE18	NW17	NW17	SE16	SE17	SE17	SE15	SE16	SE16	NNW17	NNW17	SW21	SE20	SE22	NNW21	NNW20	NNE20	W24	WSW16	ENE15	SE15	SE14	SE16	SE16	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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 7 14:00

Minimum Value: 1 km/h on Mar 21 12:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Athabasca Valley - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Athabasca Valley - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	264	35.48	35.48
6 - 11	293	39.38	74.87
12 - 19	177	23.79	98.66
20 - 28	10	1.34	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Athabasca Valley - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	14	11	4	15	15	20	21	12	18	22	26	18	17	18	24	9	264
6 - 11	36	7	2	14	18	29	76	32	6	4	3	4	1	1	11	49	293
12 - 19	15	3	0	4	1	3	79	0	0	0	0	5	0	3	4	60	177
20 - 28	0	1	0	0	0	0	3	0	0	0	1	0	2	0	0	3	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	65	22	6	33	34	52	179	44	24	26	30	27	20	22	39	121	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Athabasca Valley

Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Athabasca Valley - March 2023

Direction of Maximum Speed: 268 deg on Mar 2 18:00
Direction of Maximum Daily Speed Average: 131.5 deg on Mar 7

Direction of Minimum Speed: 351 deg on Mar 28 06:00

Direction of Minimum Daily Speed Average: 1.3 deg on Mar 24

Monthly Average Direction: 79.7 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	147	56	227	299	274	176	116	158	91	127	111	8	6	130	126	127	126	133	134	139	135	139	142	144	133.4
2-Mar	140	141	143	138	141	138	138	137	145	141	185	231	248	267	287	256	257	268	252	255	251	278	284	290	217.0
3-Mar	299	307	308	329	342	339	345	343	349	346	343	342	344	347	353	338	358	18	8	356	312	248	344	339	337.4
4-Mar	338	359	354	342	351	331	301	2	351	344	351	352	343	337	337	329	340	354	3	354	336	307	289	262	341.8
5-Mar	277	258	254	243	230	214	201	178	2	252	356	0	339	328	327	317	32	193	136	135	130	102	146	203	280.2
6-Mar	118	216	210	190	201	191	194	223	202	270	284	269	141	138	111	116	125	126	127	131	127	135	136	145	141.1
7-Mar	137	131	130	128	130	132	134	130	131	135	138	126	118	128	130	124	121	124	133	133	142	137	142	146	131.5
8-Mar	142	137	134	134	138	137	148	153	150	151	142	145	143	144	141	126	121	115	127	133	135	167	154	149	139.3
9-Mar	148	146	151	145	136	274	234	240	162	152	133	131	130	129	129	127	127	133	128	127	128	132	130	129	135.7
10-Mar	128	127	128	128	129	127	126	129	131	131	125	126	126	125	130	127	117	117	130	119	136	119	98	154	126.7
11-Mar	207	294	6	90	15	76	107	138	137	143	152	136	119	113	113	119	86	78	25	351	348	353	348	354	80.2
12-Mar	349	321	320	322	326	329	334	343	353	349	346	344	343	344	347	347	349	348	329	333	331	343	346	346	339.7
13-Mar	350	343	340	348	348	344	340	353	345	344	344	338	348	345	347	9	76	71	66	75	76	47	33	17	10.0
14-Mar	9	0	353	347	355	4	5	358	346	336	339	341	335	330	334	329	328	333	331	327	332	332	328	326	338.7
15-Mar	355	295	268	230	235	223	181	198	85	61	262	344	2	15	344	325	320	324	293	276	236	230	24	145	314.9
16-Mar	69	30	131	145	165	155	151	162	164	172	159	127	138	154	115	116	126	148	138	140	153	151	147	149	144.5
17-Mar	138	145	178	222	291	227	229	213	203	145	144	142	139	137	136	150	148	148	145	201	199	219	184	88	154.5
18-Mar	86	141	145	144	142	135	140	134	138	134	100	99	89	79	80	310	303	289	305	359	305	208	260	247	129.7
19-Mar	231	236	89	63	20	65	70	41	40	133	134	140	93	103	119	110	126	101	118	127	108	117	129	120	116.8
20-Mar	125	119	127	119	113	133	136	202	79	70	55	57	74	177	243	155	179	191	252	341	330	340	340	333	89.0
21-Mar	347	317	286	263	226	232	225	220	230	248	324	301	325	33	72	318	153	169	161	161	159	171	167	136	217.8
22-Mar	19	195	139	138	134	142	142	144	143	140	142	138	143	144	132	166	173	170	163	206	198	210	211	217	151.2
23-Mar	205	179	226	178	179	166	155	143	122	19	345	343	345	347	347	360	12	18	13	3	5	350	340	259	359.2
24-Mar	150	111	247	242	248	301	242	220	249	316	360	2	339	25	359	307	288	276	194	183	128	168	213	146	311.5
25-Mar	189	190	189	179	254	317	244	9	68	338	351	343	340	344	338	344	356	351	354	359	346	344	352	341	343.9
26-Mar	339	340	344	345	348	356	12	81	79	353	321	335	330	326	326	332	323	320	322	339	339	336	336	340	340.0
27-Mar	295	220	230	226	93	21	62	122	104	105	117	92	79	87	75	87	95	148	143	108	309	354	312	308	100.3
28-Mar	317	221	257	196	66	351	19	85	89	136	68	63	72	81	94	111	128	135	135	137	140	137	135	133	116.8
29-Mar	135	106	60	329	291	267	238	220	268	339	341	345	5	2	7	4	5	7	17	23	65	83	327	282	4.8
30-Mar	250	296	172	44	41	306	81	116	115	70	8	336	316	330	314	320	126	95	77	87	102	91	114	277	72.0
31-Mar	121	126	113	127	131	116	117	212	312	341	329	333	325	281	88	93	67	70	77	68	122	115	105	104	80.9
Diurnal Average	98.1	132.2	139.2	120.0	106.9	126.5	134.4	130.9	113.0	98.2	61.7	43.8	38.0	41.4	32.0	51.3	76.6	84.8	80.6	63.6	76.0	77.6	78.6	69.8	

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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 102 deg on Mar 6 04:00

Minimum Value: 7 deg on Mar 14 23:00

Percentiles: P_1 = 9 P_{10} = 13 Q_1 = 15 Median = 20 Q_3 = 39 P_{90} = 71 P_{99} = 96

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	84	41	59	46	42	68	46	83	93	31	36	81	91	14	14	14	12	13	13	14	13	13	11	11	93
2-Mar	13	14	12	13	15	12	12	13	14	13	60	12	21	14	17	18	17	11	12	11	12	46	26	24	60
3-Mar	11	8	10	10	15	16	15	14	18	16	16	18	16	17	21	12	22	22	16	18	44	34	25	13	44
4-Mar	9	21	20	15	23	20	55	20	18	15	19	19	20	13	14	13	18	19	20	18	11	30	27	56	56
5-Mar	28	29	26	14	28	61	51	78	82	39	45	22	17	14	12	80	58	81	52	86	60	84	54	64	86
6-Mar	92	30	69	102	78	63	55	71	86	90	68	87	23	29	101	20	16	14	15	14	16	22	17	15	102
7-Mar	16	13	14	13	13	16	17	13	14	17	16	20	20	16	15	18	18	16	16	14	13	15	14	16	20
8-Mar	15	15	14	16	15	15	13	18	17	25	17	17	22	15	19	21	20	20	23	33	17	30	43	20	43
9-Mar	14	12	13	17	47	96	72	16	40	24	21	16	14	14	14	16	17	15	14	15	15	15	14	14	96
10-Mar	13	14	15	14	13	14	15	15	16	15	17	17	18	21	24	23	20	20	17	29	24	25	70	65	70
11-Mar	39	19	74	54	29	85	75	25	17	17	23	34	26	28	27	26	13	16	27	18	17	24	18	18	85
12-Mar	18	10	10	10	9	9	9	15	20	18	16	15	13	14	17	17	18	17	10	10	9	14	17	17	20
13-Mar	18	13	12	18	17	16	15	20	15	14	14	11	17	15	17	28	15	12	14	16	20	24	19	16	28
14-Mar	19	22	20	17	22	20	20	19	20	7	14	14	9	9	9	9	10	9	9	8	8	9	7	9	22
15-Mar	20	40	29	73	33	20	72	72	71	42	47	45	33	20	14	22	13	10	21	68	53	46	79	66	79
16-Mar	51	40	69	24	27	20	20	19	19	16	21	31	33	25	30	23	21	13	15	18	21	23	28	24	69
17-Mar	18	22	64	75	76	47	66	22	57	30	16	14	20	20	19	11	10	9	20	27	38	67	65	25	76
18-Mar	17	31	22	18	17	23	46	34	16	18	20	20	12	8	51	62	46	29	16	60	36	71	32	12	71
19-Mar	63	33	71	58	79	67	59	20	45	69	19	24	15	27	30	22	17	18	19	15	20	21	18	24	79
20-Mar	17	21	17	23	27	21	44	98	33	22	18	17	22	77	19	26	19	24	28	25	19	15	16	13	98
21-Mar	27	78	57	27	60	30	64	73	7	30	42	23	50	52	41	65	54	18	20	22	31	50	45	76	78
22-Mar	95	73	15	69	57	20	15	18	19	14	14	18	20	24	36	30	13	10	25	50	59	35	29	16	95
23-Mar	15	30	57	41	45	31	25	17	28	64	15	14	16	18	18	22	18	20	20	20	20	14	47	47	64
24-Mar	74	99	82	97	18	19	37	37	25	38	21	21	19	48	43	49	71	60	48	75	55	75	72	64	99
25-Mar	61	13	18	59	91	75	29	72	22	47	26	15	16	17	13	17	21	20	21	20	18	17	19	10	91
26-Mar	12	14	14	15	17	18	35	10	20	68	19	33	19	19	22	17	21	12	13	12	9	10	9	39	68
27-Mar	43	86	16	32	68	38	83	58	35	30	28	25	17	26	25	16	19	22	16	85	27	59	65	70	86
28-Mar	75	66	42	83	40	98	63	67	17	72	12	32	19	16	30	24	19	13	13	13	13	16	18	23	98
29-Mar	28	30	28	45	58	66	89	92	59	14	12	17	20	22	24	21	21	22	18	17	19	14	39	26	92
30-Mar	52	89	86	61	83	77	81	37	24	72	76	71	62	11	24	31	82	21	10	9	23	39	36	86	89
31-Mar	93	25	24	26	64	64	37	71	76	16	13	13	31	26	77	33	24	21	12	99	38	23	19	19	99
Diurnal Maximum	95	99	86	102	91	98	89	98	93	90	76	87	91	77	101	80	82	81	52	99	60	84	79	86	

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Athabasca Valley - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS08
FORT CHIPEWYAN
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)

MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	34	35	99.87	6	0	4	0
TRS (ppb) Average	707	36	37	99.87	0.4	0	0.3	0
O3(ppb) Average	707	34	37	99.6	53.5	0	46.2	-
NO2(ppb) Average	705	37	39	99.73	10.4	0	6.5	-
NO(ppb) Average	705	37	39	99.73	3.9	-	1.2	-
NOX(ppb) Average	705	37	39	99.73	10.5	-	7.7	-
PM2.5(ug/m3) Average	739	3	5	99.73	14.5	0	5.5	0
CO(ppm) Average	689	36	55	97.45	0.1	0	0.1	-
CO2(ppm) Average	706	35	38	99.6	452.9	-	450	-
Temperature 2 m (C) Average	743	0	1	99.87	5.7	-	-2	-
Relative Humidity (%) Average	743	0	1	99.87	94.1	-	88.5	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	39	-	30	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Leaf Wetness (% of range) Average	743	0	1	99.87	1.8	-	0.8	-
Global Solar Radiation (W/m2) Average	743	0	1	99.87	664.2	-	208.9	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	709	0.26	0.8	-	0	0	0	0	0.1	0.4	6
TRS (ppb) Average	707	0.15	0	-	0.1	0.1	0.1	0.1	0.2	0.2	0.4
O3(ppb) Average	707	38.45	5.1	-	21.3	31.3	35.4	39.3	41.9	43.8	53.5
NO2(ppb) Average	705	0.99	1.4	-	0	0.3	0.4	0.5	0.9	2	10.4
NO(ppb) Average	705	0.11	0.3	-	0	0	0	0	0.1	0.2	3.9
NOX(ppb) Average	705	1.1	1.6	-	0	0.3	0.4	0.6	1	2.2	10.5
PM2.5(ug/m3) Average	739	3.59	1.3	-	1.3	2.4	2.8	3.4	4	5	14.5
CO(ppm) Average	689	0.03	0	-	0	0	0	0	0	0.1	0.1
CO2(ppm) Average	706	429.92	7.7	-	417.1	421.3	423.2	429.1	435.1	440.3	452.9
Temperature 2 m (C) Average	743	-13.77	6	-	-30.6	-21.8	-17.8	-13.6	-9.7	-6.3	5.7
Relative Humidity (%) Average	743	70.68	10.9	-	39.7	56.1	63.1	71.4	79	83.6	94.1
Wind Speed 10 m (km/h) Average	743	14.7	8	-	1	5	8	14	19	25	39
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	743	0.1	0.3	-	0	0	0	0	0	0.3	1.8
Global Solar Radiation (W/m2) Average	743	148.43	201.5	-	0	0	0	6.6	290.6	486.9	664.2

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 01:00	06 Mar 2023 01:00	1	DAS Failure - data not recorded
CO	01 Mar 2023 09:00	01 Mar 2023 10:00	2	Maintenance - WBEA internal audit
CO	17 Mar 2023 13:00	17 Mar 2023 14:00	2	Station power failure
CO	17 Mar 2023 15:00	18 Mar 2023 04:00	14	Stabilization after a power fialure
CO2	01 Mar 2023 09:00	01 Mar 2023 10:00	2	Maintenance - WBEA internal audit
O3	01 Mar 2023 11:00	01 Mar 2023 12:00	2	Maintenance - WBEA internal audit
PM2.5	01 Mar 2023 13:00	01 Mar 2023 13:00	1	Maintenance - WBEA internal audit
NO2	17 Mar 2023 13:00	17 Mar 2023 13:00	1	Station power failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 6.0 ppb on Mar 17 11:00 Maximum Daily Average: 4.0 ppb on Mar 17

Minimum Value: 0.0 ppb on Mar 1 03:00 Minimum Daily Average: 0.0 ppb on Mar 4

Maximum Diurnal Average: 0.4 ppb at hour 13 Minimum Diurnal Average: 0.0 ppb at hour 5

Monthly Average: 0.26 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.1 P_{90} = 0.4 P_{99} = 4.5

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.4	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.5
2-Mar	0.1	Z	0.2	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.6
3-Mar	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
4-Mar	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
5-Mar	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	0.1	0.0	0.1
6-Mar	DF	0.2	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.3
7-Mar	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
8-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	2.3	1.8	1.9	2.8	0.9	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	2.8
9-Mar	0.0	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.5	2.8	4.0	3.6	2.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.0
10-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.3
11-Mar	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	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1
12-Mar	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	0.1	0.0	0.1
13-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1
14-Mar	0.1	Z	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
15-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.5	0.5	0.4	0.5	0.5	0.2	0.2	0.2	0.3	0.8	3.1	4.9	0.5	4.9
17-Mar	5.6	4.5	2.3	1.7	Z	2.8	3.5	3.8	4.9	5.7	6.0	5.2	4.7	4.1	3.9	4.0	4.0	3.6	3.0	2.8	3.6	3.9	3.7	3.1	4.0	6.0
18-Mar	2.6	1.5	0.7	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.5	0.7	0.6	0.4	0.3	0.2	0.1	0.4	2.6
19-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
20-Mar	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
21-Mar	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
22-Mar	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.9	1.0	1.0	0.8	0.6	0.5	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.4	1.0
23-Mar	0.4	0.5	0.8	0.6	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
24-Mar	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
25-Mar	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	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
26-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1
28-Mar	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1
29-Mar	0.0	0.0	0.0	0.1	Z	0.7	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.7
30-Mar	0.1	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
31-Mar	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
	0.4	0.3	0.2	0.1	0.0	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	Diurnal Average	
	5.6	4.5	2.3	1.7	0.3	2.8	3.5	3.8	4.9	5.7	6.0	5.2	4.7	4.1	3.9	4.0	4.0	3.6	3.0	2.8	3.6	3.9	3.7	4.9	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - March 2023

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

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - March 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	22	9	38	140	238	35	23	20	7	5	13	10	17	37	51	44	709
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	9	38	140	238	35	23	20	7	5	13	10	17	37	51	44	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.4 ppb on Mar 18 00:00

Maximum Daily Average: 0.3 ppb on Mar 17

Minimum Value: 0.1 ppb on Mar 16 00:00

Maximum Diurnal Average: 0.2 ppb at hour 9

Monthly Average: 0.15 ppb

Minimum Daily Average: 0.1 ppb on Mar 31

Minimum Diurnal Average: 0.1 ppb at hour 1

Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.1 Median = 0.1 Q_3 = 0.2 P_{90} = 0.2 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2
2-Mar	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
3-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
4-Mar	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2
5-Mar	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
6-Mar	DF	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2
7-Mar	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
8-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
9-Mar	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	0.1	0.1	0.2	0.2	0.2	0.2
10-Mar	0.1	0.2	0.1	0.2	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2
11-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
12-Mar	Z	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	C	C	C	C	C	C	0.1	0.1	0.1	0.1	0.1	0.2	0.2	--	0.2
13-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	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
14-Mar	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	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
15-Mar	0.2	0.1	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
16-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2
17-Mar	0.3	0.3	0.2	0.2	0.2	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	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.4
18-Mar	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
19-Mar	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-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21-Mar	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	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
22-Mar	0.1	0.1	0.2	0.1	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
23-Mar	0.1	0.2	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2
24-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2
25-Mar	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
26-Mar	0.1	0.1	Z	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2
27-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2
28-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
29-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2
30-Mar	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
31-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.3	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	0.2	0.2	0.2	0.3	0.3	0.4	0.4	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	21	8	38	141	242	34	22	21	7	5	13	9	17	34	50	45	707
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	8	38	141	242	34	22	21	7	5	13	9	17	34	50	45	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan

Classes (ppb)

- **0 - 2**
- **3 - 4**
- **5 - 7**
- **8 - 11**
- **> 11**

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Chipewyan - March 2023

Maximum Value: 3.9 ppb on Mar 17 11:00

Maximum Daily Average: 1.2 ppb on Mar 17

Minimum Value: 0.0 ppb on Mar 1 01:00

Minimum Daily Average: 0.0 ppb on Mar 1

Maximum Diurnal Average: 0.3 ppb at hour 11

Minimum Diurnal Average: 0.0 ppb at hour 19

Monthly Average: 0.11 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} = 1.5

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	37
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	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	0.0	0.0	0.0	0.0	0.1
2-Mar	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	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
3-Mar	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.5
4-Mar	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3
5-Mar	0.1	0.2	Z	0.1	0.1	0.2	0.3	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.8
6-Mar	DF	0.2	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.4
7-Mar	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1
8-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9
9-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0
10-Mar	0.0	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
11-Mar	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
12-Mar	0.0	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.1	C	C	C	C	C	C	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.1
14-Mar	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.4
16-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
17-Mar	0.0	0.0	Z	0.1	0.0	0.0	0.2	1.0	3.0	3.8	3.9	3.3	PF	3.0	2.8	2.2	1.6	0.7	0.2	0.1	0.1	0.1	0.1	0.1	1.2	3.9
18-Mar	0.1	0.1	0.1	Z	0.0	0.0	0.2	0.5	0.3	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5
19-Mar	0.1	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	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2
20-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.3
21-Mar	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
22-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.6	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6
23-Mar	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2
24-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.6	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.6
25-Mar	0.0	0.1	0.1	0.1	Z	0.0	0.3	1.0	0.3	0.1	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	0.2	1.0
26-Mar	0.1	0.1	0.1	0.0	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.3
27-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
28-Mar	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	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
29-Mar	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.4	0.4	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	0.4
30-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	0.2	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	0.4
31-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	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	0.0	0.0	0.2
	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.1	0.2	0.1	0.1	0.2	0.2	0.3	1.0	3.0	3.8	3.9	3.3	0.6	3.0	2.8	2.2	1.6	0.7	0.2	0.1	0.2	0.3	0.3	0.2	Diurnal Maximum	

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

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 20	21	9	36	132	240	34	22	21	7	5	13	10	18	36	53	48	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	9	36	132	240	34	22	21	7	5	13	10	18	36	53	48	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Fort Chipewyan

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 10.4 ppb on Mar 17 02:00

Maximum Daily Average: 6.5 ppb on Mar 17

Minimum Value: 0.0 ppb on Mar 1 12:00

Maximum Diurnal Average: 1.6 ppb at hour 2

Monthly Average: 0.99 ppb

Minimum Daily Average: 0.3 ppb on Mar 1

Minimum Diurnal Average: 0.6 ppb at hour 13

Percentiles: P_1 = 0.0 P_{10} = 0.3 Q_1 = 0.4 Median = 0.5 Q_3 = 0.9 P_{90} = 2.0 P_{99} = 7.6

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	37
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.4	0.2	0.3	0.3	Z	0.5	0.4	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.5
2-Mar	0.4	0.4	0.6	0.9	1.3	Z	1.1	1.0	1.1	1.1	1.1	1.2	1.5	1.6	2.4	2.7	2.2	1.5	0.8	0.8	0.8	0.7	0.6	0.6	1.1	2.7
3-Mar	Z	0.7	0.6	0.7	0.5	0.5	0.5	1.7	1.9	0.9	0.6	0.2	0.8	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	1.9
4-Mar	0.4	Z	0.5	0.4	0.3	0.3	0.5	1.5	0.4	0.4	0.3	0.2	0.6	0.0	0.0	0.0	0.0	0.8	0.4	0.5	0.4	0.3	0.4	0.4	0.4	1.5
5-Mar	0.4	0.5	Z	0.8	0.8	0.4	1.4	2.6	1.0	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.7	0.4	0.8	0.3	0.9	4.8	2.0	0.8	4.8
6-Mar	DF	6.5	3.2	Z	0.5	0.3	0.2	0.5	0.2	0.1	0.0	0.0	0.0	0.0	1.1	1.1	0.5	0.6	0.6	0.8	1.8	0.6	0.5	0.5	0.9	6.5
7-Mar	0.5	0.5	0.4	0.5	Z	0.5	0.4	0.5	0.7	0.5	0.3	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.3	0.4	1.7	0.3	0.3	0.3	0.4	1.7
8-Mar	0.3	0.3	0.3	0.4	0.4	Z	0.5	0.4	0.6	1.1	1.9	1.6	1.3	1.7	0.7	0.9	1.1	1.1	0.4	0.4	0.3	0.2	0.3	0.3	0.7	1.9
9-Mar	Z	0.7	0.7	0.7	0.6	0.3	0.3	0.3	0.5	1.0	2.0	2.4	2.3	1.8	0.2	0.0	0.0	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.7	2.4
10-Mar	0.3	Z	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.8	1.0	0.9	2.1	3.1	2.9	1.8	2.0	0.9	3.1
11-Mar	2.2	2.1	Z	1.6	1.0	3.6	0.6	0.5	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.4	0.4	0.3	0.6	3.6
12-Mar	0.4	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	7.0	3.1	7.6	4.3	1.1	7.6
13-Mar	0.3	0.9	0.4	0.5	Z	1.7	1.5	C	C	C	C	C	C	0.5	0.6	0.7	0.6	0.4	0.7	0.7	0.6	0.6	0.5	0.5	--	1.7
14-Mar	0.5	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.9	0.7	0.5	0.9
15-Mar	Z	0.8	0.7	0.8	0.8	1.0	1.3	1.3	1.0	0.7	0.6	0.4	0.4	0.5	0.3	0.4	0.4	1.4	3.3	2.2	0.6	0.4	0.4	0.7	0.9	3.3
16-Mar	0.4	Z	0.5	0.4	0.7	0.5	0.4	0.6	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.8	0.7	0.6	0.6	0.7	1.8	4.1	6.7	1.1	6.7
17-Mar	9.2	10.4	Z	3.9	4.1	4.8	5.8	5.5	6.2	5.6	5.0	4.1	PF	4.7	5.2	5.3	5.5	5.6	5.7	7.4	10.4	10.2	10.0	8.9	6.5	10.4
18-Mar	8.0	5.7	3.4	Z	1.3	0.8	2.5	3.6	1.3	1.1	1.0	1.0	1.0	1.0	0.9	0.9	1.2	1.4	1.6	1.4	1.0	0.8	0.9	0.7	1.8	8.0
19-Mar	0.7	0.7	0.6	0.6	Z	0.9	0.7	0.8	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.7	0.8	0.8	0.8	0.6	0.9
20-Mar	0.8	0.9	1.0	1.0	0.7	Z	0.9	0.6	0.7	0.5	0.4	0.4	0.5	0.6	0.5	0.4	0.5	0.5	1.1	5.2	2.4	1.0	1.5	0.6	1.0	5.2
21-Mar	Z	1.2	1.5	2.5	3.7	5.2	1.8	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.5	0.3	0.3	0.4	0.4	0.9	5.2
22-Mar	0.4	Z	1.3	1.4	0.7	0.5	0.6	0.6	0.6	0.8	0.9	1.1	1.2	1.3	1.2	1.1	1.1	1.0	0.8	0.8	0.8	0.9	1.0	0.9	0.9	1.4
23-Mar	1.3	3.5	Z	2.9	4.7	1.3	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.4	0.4	1.1	4.7
24-Mar	0.4	0.6	0.6	Z	0.5	0.5	0.9	1.5	1.3	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.7	1.0	1.1	0.8	0.4	0.9	0.7	1.5
25-Mar	0.6	0.5	0.5	1.2	Z	2.5	3.9	4.0	1.0	0.5	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.5	0.7	0.8	1.0	0.9	1.0	0.7	1.0	4.0
26-Mar	0.6	1.0	1.0	1.2	1.3	Z	1.5	0.6	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.8	0.9	1.7	0.5	0.5	0.7	1.7
27-Mar	Z	1.0	0.8	1.0	1.7	1.1	1.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	1.1	2.5	2.0	3.5	0.7	1.0	3.5
28-Mar	0.8	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.8	1.0	0.8	0.7	0.5	0.6	0.7	0.6	0.5	0.5	0.6	1.0
29-Mar	0.6	0.6	Z	2.3	1.9	2.1	2.4	2.5	1.7	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.8	0.6	0.5	2.3	1.2	1.1	2.5
30-Mar	0.5	0.5	0.5	Z	1.6	1.2	0.4	1.4	0.8	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.4	0.3	0.3	0.6	1.6
31-Mar	0.3	0.4	0.3	0.4	Z	0.5	0.5	0.6	0.7	0.7	0.6	0.4	0.5	0.5	0.4	0.6	0.5	0.5	0.7	1.0	0.7	0.5	0.4	0.5	0.5	1.0
	1.2	1.6	0.8	1.1	1.2	1.2	1.1	1.2	0.9	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	1.2	1.4	1.2	1.5	1.2	Diurnal Average	
	9.2	10.4	3.4	3.9	4.7	5.2	5.8	5.5	6.2	5.6	5.0	4.1	2.3	4.7	5.2	5.3	5.5	5.6	5.7	7.4	10.4	10.2	10.0	8.9	Diurnal Maximum	

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

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	21	9	36	132	240	34	22	21	7	5	13	10	18	36	53	48	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	9	36	132	240	34	22	21	7	5	13	10	18	36	53	48	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - March 2023

Maximum Value: 10.5 ppb on Mar 17 21:00

Maximum Daily Average: 7.7 ppb on Mar 17

Minimum Value: 0.0 ppb on Mar 1 12:00

Minimum Daily Average: 0.3 ppb on Mar 1

Maximum Diurnal Average: 1.6 ppb at hour 2

Minimum Diurnal Average: 0.7 ppb at hour 13

Monthly Average: 1.10 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.3 Q_1 = 0.4 Median = 0.6 Q_3 = 1.0 P_{90} = 2.2 P_{99} = 9.0

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	37
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.4	0.2	0.3	0.3	Z	0.5	0.4	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.5
2-Mar	0.4	0.4	0.6	0.9	1.3	Z	1.2	1.1	1.1	1.1	1.1	1.2	1.5	1.6	2.6	2.8	2.2	1.5	0.8	0.8	0.8	0.7	0.6	0.6	1.2	2.8
3-Mar	Z	0.8	0.7	0.8	0.6	0.5	0.5	2.0	2.4	1.3	0.6	0.2	0.8	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	2.4
4-Mar	0.4	Z	0.6	0.4	0.4	0.3	0.5	1.8	0.5	0.4	0.3	0.2	0.6	0.0	0.0	0.0	0.0	0.8	0.4	0.5	0.4	0.3	0.4	0.5	0.4	1.8
5-Mar	0.5	0.7	Z	0.9	0.9	0.6	1.7	3.4	1.4	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.7	0.4	0.8	0.4	1.0	4.9	2.2	0.9	4.9
6-Mar	DF	6.7	3.3	Z	0.6	0.3	0.3	0.6	0.2	0.1	0.0	0.0	0.0	0.0	1.5	1.5	0.5	0.6	0.6	0.8	2.0	0.7	0.5	0.5	1.0	6.7
7-Mar	0.5	0.5	0.5	0.5	Z	0.5	0.4	0.5	0.7	0.5	0.3	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.3	0.4	1.8	0.4	0.3	0.4	0.4	1.8
8-Mar	0.3	0.3	0.3	0.4	0.4	Z	0.5	0.4	0.6	1.4	2.8	1.9	1.3	1.7	0.7	0.9	1.1	1.1	0.4	0.4	0.3	0.2	0.3	0.3	0.8	2.8
9-Mar	Z	0.8	0.7	0.7	0.6	0.3	0.3	0.3	0.5	1.1	2.8	3.4	2.8	1.9	0.2	0.0	0.0	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.8	3.4
10-Mar	0.3	Z	0.5	0.4	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.5	0.4	0.3	0.3	0.8	1.0	0.9	2.2	3.2	3.0	1.9	2.1	1.0	3.2
11-Mar	2.3	2.2	Z	1.7	1.0	3.6	0.6	0.5	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.4	0.4	0.4	0.7	3.6
12-Mar	0.4	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	7.0	3.1	7.6	4.3	1.2	7.6
13-Mar	0.3	0.9	0.4	0.5	Z	1.8	1.6	C	C	C	C	C	C	0.6	0.7	0.7	0.6	0.4	0.7	0.7	0.6	0.6	0.5	0.5	--	1.8
14-Mar	0.5	0.5	0.5	0.5	0.5	Z	0.5	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.9	1.0	0.8	0.6	1.0
15-Mar	Z	0.8	0.7	0.8	0.8	1.0	1.3	1.5	1.2	1.1	0.9	0.6	0.5	0.6	0.4	0.5	0.5	1.6	3.4	2.3	0.6	0.4	0.4	0.7	1.0	3.4
16-Mar	0.4	Z	0.5	0.4	0.7	0.5	0.4	0.6	0.4	0.5	0.7	0.8	1.0	1.0	1.0	1.1	1.0	0.7	0.6	0.6	0.7	1.8	4.1	6.7	1.1	6.7
17-Mar	9.2	10.4	Z	4.0	4.1	4.8	6.0	6.5	9.2	9.4	8.9	7.4	PF	7.7	8.0	7.5	7.1	6.3	5.9	7.5	10.5	10.3	10.1	9.0	7.7	10.5
18-Mar	8.1	5.8	3.5	Z	1.3	0.8	2.7	4.1	1.6	1.3	1.1	1.2	1.1	1.1	1.1	1.0	1.3	1.5	1.7	1.5	1.1	0.9	1.0	0.8	2.0	8.1
19-Mar	0.8	0.8	0.7	0.7	Z	1.0	0.8	0.9	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.8	0.7	0.9	0.9	0.7	0.9	0.8	0.9	0.8	1.0
20-Mar	0.8	0.9	1.0	1.0	0.7	Z	0.9	0.7	0.8	0.6	0.5	0.5	0.7	0.7	0.7	0.5	0.6	0.5	1.1	5.2	2.4	1.0	1.8	0.6	1.1	5.2
21-Mar	Z	1.2	1.5	2.5	3.9	5.2	1.8	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.3	0.3	0.4	0.4	1.0	5.2
22-Mar	0.4	Z	1.3	1.4	0.7	0.5	0.6	0.7	0.8	1.1	1.3	1.7	1.8	1.8	1.6	1.4	1.3	1.1	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.8
23-Mar	1.3	3.6	Z	3.0	4.8	1.4	0.8	0.8	1.0	1.0	0.8	0.8	0.7	0.7	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.4	1.2	4.8
24-Mar	0.4	0.6	0.6	Z	0.5	0.5	1.0	1.8	1.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.7	1.1	1.2	0.8	0.5	1.0	0.8	1.9
25-Mar	0.6	0.6	0.6	1.3	Z	2.5	4.2	5.0	1.3	0.6	0.6	0.5	0.5	0.5	0.8	0.6	0.6	0.6	0.8	0.9	1.1	1.0	1.1	0.8	1.2	5.0
26-Mar	0.7	1.1	1.1	1.2	1.4	Z	1.6	0.7	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.8	0.9	2.0	0.5	0.5	0.8	2.0
27-Mar	Z	1.0	0.8	1.0	1.7	1.1	1.4	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	1.1	2.5	2.0	3.5	0.7	1.0	3.5
28-Mar	0.8	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.8	1.1	1.3	1.0	0.8	0.6	0.6	0.7	0.6	0.5	0.5	0.6	1.3
29-Mar	0.6	0.6	Z	2.4	2.0	2.2	2.5	2.9	2.1	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.5	0.8	0.6	0.5	2.3	1.2	1.2	2.9
30-Mar	0.5	0.5	0.5	Z	1.6	1.2	0.4	1.8	1.0	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.3	0.3	0.6	1.8
31-Mar	0.3	0.4	0.3	0.4	Z	0.5	0.5	0.6	0.8	0.9	0.7	0.5	0.6	0.6	0.5	0.7	0.6	0.5	0.7	1.0	0.7	0.5	0.4	0.5	0.6	1.0
	1.2	1.6	0.9	1.1	1.3	1.3	1.2	1.4	1.1	1.0	1.0	0.9	0.7	0.9	0.9	0.9	0.8	0.9	0.9	1.2	1.4	1.2	1.6	1.3	Diurnal Average	
	9.2	10.4	3.5	4.0	4.8	5.2	6.0	6.5	9.2	9.4	8.9	7.4	2.8	7.7	8.0	7.5	7.1	6.3	5.9	7.5	10.5	10.3	10.1	9.0	Diurnal Maximum	

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

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - March 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	21	9	36	132	240	34	22	21	7	5	13	10	18	36	53	48	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	9	36	132	240	34	22	21	7	5	13	10	18	36	53	48	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 53.5 ppb on Mar 18 18:00

Maximum Daily Average: 46.2 ppb on Mar 18

Minimum Value: 21.3 ppb on Mar 12 23:00

Minimum Daily Average: 28.7 ppb on Mar 6

Maximum Diurnal Average: 40.1 ppb at hour 18

Minimum Diurnal Average: 36.6 ppb at hour 6

Monthly Average: 38.45 ppb

Percentiles: P_1 = 25.9 P_{10} = 31.3 Q_1 = 35.4 Median = 39.3 Q_3 = 41.9 P_{90} = 43.8 P_{99} = 50.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	34.6	34.7	Z	35.4	35.4	35.6	36.1	36.2	36.1	35.8	M	M	36.4	36.4	36.2	36.1	37.9	41.5	40.5	39.8	39.1	39.2	39.4	39.5	37.2	41.5
2-Mar	40.1	40.2	40.7	Z	42.0	42.2	42.1	42.4	42.8	42.8	42.9	42.8	43.4	44.1	43.4	42.8	43.2	40.9	40.7	40.2	38.4	37.2	35.7	34.9	41.1	44.1
3-Mar	34.2	33.7	33.6	34.4	Z	33.5	33.8	32.9	33.0	33.9	34.3	34.5	34.5	34.8	35.1	35.4	35.2	35.3	35.1	35.0	35.5	36.0	35.8	36.0	34.6	36.0
4-Mar	35.9	35.4	34.1	34.1	35.2	Z	35.1	34.1	34.6	33.6	32.6	32.6	32.8	34.0	35.2	38.0	38.7	37.4	36.4	36.2	36.5	38.2	40.2	39.8	35.7	40.2
5-Mar	Z	38.0	36.8	35.9	34.1	31.7	29.4	27.5	28.3	28.3	28.1	27.4	27.8	28.4	29.4	29.7	30.2	29.6	29.6	29.5	30.0	29.3	25.0	28.7	30.1	38.0
6-Mar	DF	Z	24.3	23.7	26.1	26.7	25.9	26.5	26.1	27.0	27.8	28.1	28.5	28.9	29.0	28.6	28.9	29.4	29.5	29.6	32.4	34.5	34.6	34.7	28.7	34.7
7-Mar	35.7	36.1	Z	36.8	37.0	37.3	37.7	38.0	38.3	38.8	38.8	40.7	41.8	41.9	41.9	41.9	41.5	41.5	41.8	41.7	40.3	41.6	40.9	41.7	39.7	41.9
8-Mar	41.8	41.4	41.0	Z	40.9	40.3	40.2	40.2	40.2	39.6	39.2	40.0	40.9	41.6	43.1	43.8	43.6	42.9	42.5	42.0	41.8	41.9	42.7	42.7	41.5	43.8
9-Mar	41.7	40.8	40.0	39.5	Z	38.7	38.4	38.2	38.0	37.6	37.6	38.6	39.9	40.4	42.2	40.6	40.0	40.0	39.8	39.6	39.2	38.4	38.0	37.8	39.3	42.2
10-Mar	37.5	37.3	37.4	37.6	38.9	Z	38.9	38.8	37.7	37.2	37.6	37.5	37.7	37.9	38.1	37.6	37.6	37.6	38.6	37.7	36.2	36.5	37.9	37.8	37.7	38.9
11-Mar	Z	37.0	37.8	36.8	33.4	30.6	34.5	35.1	35.7	35.2	36.7	38.9	39.1	39.9	39.4	38.9	36.3	36.7	36.8	36.9	36.8	36.7	36.4	36.7	36.6	39.9
12-Mar	36.6	Z	35.8	35.7	35.7	35.0	34.6	34.3	33.8	32.6	31.5	30.6	30.4	30.2	31.3	31.6	27.6	27.1	27.5	25.9	21.3	25.9	21.3	24.7	30.5	36.6
13-Mar	27.4	26.9	Z	26.1	25.6	26.1	26.2	26.4	28.2	28.5	28.0	28.4	33.3	C	C	C	37.5	38.9	38.9	39.5	40.4	41.8	42.3	42.1	32.6	42.3
14-Mar	42.2	42.2	42.1	Z	41.2	40.9	40.6	39.6	38.8	38.8	38.2	37.7	37.3	37.4	37.5	36.6	36.1	35.3	34.5	34.1	33.7	31.7	29.5	31.2	37.3	42.2
15-Mar	33.8	34.8	35.0	35.2	Z	34.5	33.9	33.8	33.8	33.7	33.5	33.1	33.3	33.8	36.2	38.6	39.4	38.9	37.4	38.9	40.8	40.6	40.3	39.9	36.2	40.8
16-Mar	39.8	39.6	39.6	39.5	39.2	Z	39.4	39.3	39.2	39.1	39.1	39.3	39.8	40.0	40.7	41.2	40.9	40.8	41.2	41.0	40.9	39.2	35.7	31.9	39.4	41.2
17-Mar	Z	26.6	31.0	33.4	32.6	31.4	30.5	31.3	31.9	33.4	35.2	37.1	38.5	39.7	41.4	42.4	42.9	43.0	42.9	40.5	36.3	34.2	32.4	33.0	35.7	43.0
18-Mar	32.4	Z	40.2	43.9	45.0	45.1	43.8	43.6	45.5	45.5	46.4	46.7	47.5	47.9	47.6	48.9	52.6	53.5	53.0	51.5	47.2	45.1	44.7	44.1	46.2	53.5
19-Mar	43.7	42.8	Z	41.8	41.4	41.6	42.0	41.6	41.6	41.7	42.2	42.6	42.5	42.7	42.3	42.4	42.1	41.8	41.3	41.5	41.9	41.6	42.1	42.5	42.1	43.7
20-Mar	42.7	42.7	42.6	Z	42.3	42.1	41.9	41.8	41.7	40.7	40.0	41.8	42.0	42.6	42.3	41.9	41.7	41.4	40.4	35.2	37.2	38.5	37.6	38.9	40.9	42.7
21-Mar	37.9	38.4	36.9	35.1	Z	32.6	35.1	36.5	36.4	36.2	36.2	36.0	36.1	36.4	36.8	37.0	37.5	38.1	38.0	37.5	38.3	38.9	39.3	40.4	37.0	40.4
22-Mar	41.4	41.9	41.2	41.4	42.9	Z	42.6	42.6	43.0	43.7	44.2	45.3	47.0	48.4	48.8	48.9	50.6	49.0	49.1	49.0	49.6	50.2	50.2	50.0	46.1	50.6
23-Mar	Z	46.2	45.9	45.6	41.2	44.9	45.6	44.8	44.5	45.0	45.5	45.5	45.1	45.0	44.7	44.3	44.6	46.2	45.7	44.5	44.3	43.3	43.0	42.5	44.7	46.2
24-Mar	42.0	Z	40.9	40.9	40.6	39.9	38.8	38.0	36.3	38.4	37.9	40.0	41.2	42.5	43.4	44.1	45.0	44.9	45.0	43.1	43.3	44.1	44.5	43.3	41.6	45.0
25-Mar	43.3	43.5	Z	42.0	40.1	39.6	37.4	36.0	39.7	42.3	42.1	41.9	41.0	40.0	40.5	40.1	42.1	40.1	37.6	34.7	32.6	32.1	32.2	31.8	38.8	43.5
26-Mar	31.4	30.8	30.5	Z	29.0	28.7	29.2	30.2	30.8	31.3	31.7	32.0	33.0	33.9	35.3	37.1	37.4	38.5	39.3	38.6	40.8	41.4	42.0	42.3	34.6	42.3
27-Mar	42.2	40.8	39.1	37.3	Z	36.3	33.4	35.0	34.7	33.2	36.3	40.6	41.1	41.3	41.8	42.6	41.8	42.7	42.0	41.2	40.2	39.8	37.0	38.7	39.1	42.7
28-Mar	38.9	39.5	40.3	40.7	40.6	Z	40.4	40.5	40.5	40.0	39.9	40.3	41.0	41.8	42.0	41.8	42.2	41.6	41.4	41.3	41.9	42.3	42.5	42.2	41.0	42.5
29-Mar	Z	42.1	42.1	38.5	38.4	36.5	35.2	35.4	40.0	43.6	44.1	45.6	44.9	44.8	44.9	44.3	44.5	44.2	44.1	43.8	43.9	44.0	40.5	41.6	42.0	45.6
30-Mar	40.7	Z	39.4	39.5	38.7	37.9	38.1	37.7	38.3	39.2	39.4	39.5	40.0	40.0	40.3	40.7	42.0	43.1	43.3	42.8	42.8	42.7	42.4	42.6	40.5	43.3
31-Mar	42.4	42.3	Z	42.3	42.1	42.5	42.5	42.3	42.5	42.0	42.0	42.2	41.9	41.9	41.9	41.7	41.5	41.1	41.1	40.9	41.5	41.9	41.9	41.6	41.9	42.5
	38.4	38.3	37.9	37.4	37.7	36.6	36.9	36.8	37.2	37.4	37.6	38.2	38.7	39.3	39.8	40.0	40.1	40.1	39.8	39.1	38.9	39.0	38.3	38.6	Diurnal Average	
	43.7	46.2	45.9	45.6	45.0	45.1	45.6	44.8	45.5	45.5	46.4	46.7	47.5	48.4	48.8	48.9	52.6	53.5	53.0	51.5	49.6	50.2	50.2	50.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Fort Chipewyan - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
21 - 50	702	99.29	99.29
51 - 82	5	0.71	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Fort Chipewyan - March 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 50	22	9	35	136	236	35	20	21	8	5	13	10	16	38	52	46	702
51 - 82	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	9	35	140	237	35	20	21	8	5	13	10	16	38	52	46	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Fort Chipewyan

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 14.5 $\mu g/m^3$ on Mar 12 23:00

Maximum Daily Average: 5.5 $\mu g/m^3$ on Mar 12

Minimum Value: 1.3 $\mu g/m^3$ on Mar 31 03:00

Maximum Diurnal Average: 4.3 $\mu g/m^3$ at hour 23

Monthly Average: 3.59 $\mu g/m^3$

Minimum Daily Average: 2.0 $\mu g/m^3$ on Mar 31

Minimum Diurnal Average: 3.3 $\mu g/m^3$ at hour 10

Percentiles: P_1 = 1.5 P_{10} = 2.4 Q_1 = 2.8 Median = 3.4 Q_3 = 4.0 P_{90} = 5.0 P_{99} = 9.0

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Hours of Calibration:	3
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.1	2.8	2.6	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.4	M	2.8	2.7	2.8	3.1	3.5	2.9	2.7	3.0	3.1	3.1	2.8	2.7	3.5
2-Mar	2.9	3.3	4.0	4.6	5.9	5.3	4.8	4.6	5.2	5.4	5.6	6.2	6.3	6.2	7.2	8.2	7.3	5.7	5.1	5.1	5.1	5.2	5.3	4.5	5.4	8.2
3-Mar	4.3	3.7	3.5	3.6	3.6	3.6	3.4	3.4	3.4	3.5	3.6	4.0	3.4	3.3	3.2	3.5	3.5	3.3	3.1	2.8	2.7	2.9	2.9	3.2	3.4	4.3
4-Mar	3.4	3.2	2.5	2.4	2.3	2.1	2.4	2.4	2.3	2.6	2.6	2.9	3.0	3.1	2.5	2.4	2.4	3.1	4.2	3.0	2.6	2.6	2.4	3.3	2.7	4.2
5-Mar	3.6	3.2	3.2	3.4	5.1	4.0	3.4	3.9	5.1	3.4	3.6	4.1	3.9	3.8	3.8	3.8	3.6	4.0	3.6	4.0	4.2	4.6	9.4	10.8	4.4	10.8
6-Mar	DF	9.7	6.5	5.2	3.6	3.6	3.5	4.0	3.4	3.5	3.4	3.4	3.4	3.5	4.4	4.3	3.5	3.5	3.5	3.5	3.5	3.2	3.2	3.2	4.0	9.7
7-Mar	3.0	2.9	2.9	2.8	2.7	2.7	2.4	2.5	2.8	2.4	2.3	2.3	2.3	2.4	2.4	2.6	2.6	2.7	2.3	2.6	3.4	2.2	2.2	2.1	2.6	3.4
8-Mar	2.0	2.1	2.2	2.2	2.3	2.7	2.7	2.6	2.4	2.8	3.5	3.6	3.6	3.5	3.3	3.3	3.2	3.0	2.6	2.8	2.5	2.5	2.4	2.3	2.8	3.6
9-Mar	2.3	2.5	2.5	2.6	2.7	2.6	2.6	2.5	2.6	2.9	4.1	4.3	4.1	3.6	3.2	3.0	3.0	2.8	2.7	2.7	2.6	2.5	2.5	2.6	2.9	4.3
10-Mar	2.7	2.7	2.8	2.8	2.9	3.0	3.1	3.3	3.5	3.7	3.8	3.7	3.6	3.6	3.7	3.5	3.8	3.9	3.8	4.9	7.1	6.0	4.4	5.8	3.8	7.1
11-Mar	5.2	5.1	3.9	3.8	3.3	3.6	3.2	3.2	3.2	3.3	3.4	2.6	2.8	3.0	3.8	3.8	3.1	3.0	3.0	3.0	3.4	3.2	3.3	3.1	3.4	5.2
12-Mar	3.0	2.9	3.0	3.1	3.2	3.3	3.3	3.4	3.6	4.0	4.5	5.2	5.4	5.4	6.3	5.5	5.4	5.5	5.7	9.3	9.7	8.5	14.5	8.0	5.5	14.5
13-Mar	4.9	5.7	5.3	5.4	5.6	5.8	6.0	6.3	5.7	C	C	C	4.8	4.6	4.2	4.2	4.0	3.7	3.6	3.8	3.5	3.2	3.2	3.1	4.6	6.3
14-Mar	2.9	2.6	2.4	2.4	2.7	2.9	3.0	3.3	3.7	3.5	3.5	3.7	3.8	3.9	3.7	3.9	4.0	4.2	4.4	4.6	4.5	4.8	5.4	4.7	3.7	5.4
15-Mar	4.2	4.2	3.9	3.7	3.8	3.8	4.0	4.0	4.2	4.1	4.2	4.3	4.3	4.3	3.8	3.4	3.2	3.5	4.4	3.5	3.4	2.7	2.9	3.3	3.8	4.4
16-Mar	2.8	2.8	2.8	2.8	3.1	2.5	2.6	2.6	2.6	2.8	2.9	2.9	3.1	3.1	3.2	3.4	3.2	2.7	2.6	2.6	3.0	3.5	4.4	4.9	3.0	4.9
17-Mar	5.8	5.6	4.8	4.4	4.2	4.3	4.6	4.6	5.2	5.2	5.0	4.7	4.8	4.5	4.4	4.4	4.4	4.3	4.4	4.4	4.8	5.1	5.3	5.1	4.8	5.8
18-Mar	4.9	4.1	3.4	2.6	2.4	2.2	2.2	3.0	3.0	2.6	2.6	2.5	2.7	2.2	2.7	2.8	3.6	4.0	4.3	4.1	3.9	3.8	3.9	3.9	3.2	4.9
19-Mar	3.8	3.7	3.7	3.6	3.5	3.6	3.7	3.9	4.0	4.4	4.4	4.0	4.0	3.8	3.5	3.5	3.5	3.6	3.6	4.1	3.7	4.1	3.5	3.6	3.8	4.4
20-Mar	3.3	3.4	3.5	3.3	3.4	3.3	3.4	3.8	3.7	3.1	2.7	3.3	3.4	3.4	3.2	3.0	2.9	3.0	3.1	2.7	2.8	3.5	3.7	3.1	3.3	3.8
21-Mar	4.3	3.4	3.0	3.1	5.5	4.4	4.0	2.9	2.1	2.0	2.1	2.1	2.2	2.3	2.3	2.6	2.5	2.8	3.1	2.8	2.2	2.3	2.9	2.9	2.9	5.5
22-Mar	3.2	3.3	3.6	3.7	3.6	3.4	3.4	3.4	3.4	3.6	3.7	4.0	4.2	4.3	4.3	3.9	4.1	3.8	3.8	3.8	3.8	4.0	4.2	4.2	3.8	4.3
23-Mar	4.5	5.7	5.4	5.4	10.0	5.0	4.3	4.1	3.9	4.2	4.2	4.5	4.0	4.1	4.0	3.9	3.8	3.7	3.7	3.7	3.6	3.4	3.3	3.3	4.4	10.0
24-Mar	3.3	3.6	3.3	3.3	3.3	3.3	3.6	4.3	3.9	3.3	3.2	3.2	3.2	3.2	3.3	3.3	3.4	3.4	3.7	3.8	5.0	4.4	3.6	5.2	3.6	5.2
25-Mar	3.5	3.4	3.5	3.5	3.5	3.9	7.8	5.5	4.1	3.2	3.3	3.4	3.5	3.4	3.6	3.5	3.6	3.8	3.8	3.9	3.9	3.9	3.8	3.7	3.9	7.8
26-Mar	3.7	3.7	4.0	3.6	3.6	3.4	3.9	3.5	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.0	3.1	3.1	3.2	3.3	4.4	3.6	3.4	3.5	3.4	4.4
27-Mar	3.7	3.4	3.3	3.3	3.4	4.5	3.4	3.3	3.3	3.3	3.3	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.4	4.1	5.9	5.9	10.5	4.4	4.1	10.5
28-Mar	3.8	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.8	3.9	3.9	3.6	3.3	3.3	3.4	3.4	3.3	3.3	3.4	3.9
29-Mar	3.4	3.5	3.6	4.5	4.9	6.4	7.4	7.4	5.0	1.8	1.8	1.5	1.8	2.2	2.2	2.3	2.5	2.2	2.2	2.5	2.5	3.3	7.4	8.1	3.8	8.1
30-Mar	3.1	2.4	2.3	2.3	2.7	2.4	2.7	2.9	3.0	2.9	2.9	2.8	2.8	2.6	2.6	2.5	2.1	1.6	2.0	2.3	1.6	1.5	1.4	1.3	2.4	3.1
31-Mar	1.4	1.5	1.3	1.5	1.8	1.6	1.6	1.7	1.7	2.1	2.2	2.1	2.1	2.1	2.4	2.6	2.6	2.5	2.9	2.8	2.3	2.1	2.0	2.0	2.0	2.9
	3.5	3.7	3.4	3.4	3.7	3.5	3.6	3.6	3.5	3.3	3.4	3.5	3.5	3.5	3.5	3.6	3.5	3.4	3.5	3.6	3.8	3.7	4.3	4.0	Diurnal Average	
	5.8	9.7	6.5	5.4	10.0	6.4	7.8	7.4	5.7	5.4	5.6	6.2	6.3	6.2	7.2	8.2	7.3	5.7	5.7	9.3	9.7	8.5	14.5	10.8	Diurnal Maximum	

C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Fort Chipewyan - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	694	93.91	93.91
6 - 15	45	6.09	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Fort Chipewyan - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	22	9	36	129	236	33	21	20	8	5	12	10	18	36	53	46	694
6 - 15	2	0	2	17	11	2	2	1	0	0	1	0	1	3	1	2	45
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	24	9	38	146	247	35	23	21	8	5	13	10	19	39	54	48	739

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Fort Chipewyan

Total Number of Valid Hours: 739

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.1 ppm on Mar 12 23:00 Maximum Daily Average: 0.1 ppm on Mar 27

Minimum Value: 0.0 ppm on Mar 2 07:00 Minimum Daily Average: 0.0 ppm on Mar 2

Maximum Diurnal Average: 0.0 ppm at hour 4 Minimum Diurnal Average: 0.0 ppm at hour 17

Monthly Average: 0.03 ppm Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.1 P_{99} = 0.1

Hours in Service:	744
Hours of Data:	689
Hours of Missing Data:	55
Hours of Calibration:	36
Percent Operational Time:	97.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	0.0	0.1	0.1	0.0	Z	0.1	0.0	M	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2-Mar	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
3-Mar	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
4-Mar	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	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5-Mar	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1
6-Mar	DF	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
7-Mar	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
8-Mar	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
9-Mar	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
10-Mar	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
11-Mar	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
12-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1
13-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
14-Mar	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
15-Mar	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
16-Mar	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
17-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	PF	PF	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	--	0.0
18-Mar	RE	RE	RE	RE	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
19-Mar	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
20-Mar	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
21-Mar	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1
22-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
23-Mar	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
24-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25-Mar	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
26-Mar	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
27-Mar	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
28-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
29-Mar	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	0.1	0.1	0.0	0.1
30-Mar	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
31-Mar	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure PF - Power Failure RE - Recovery

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm

Wood Buffalo Environmental Association

Hourly Averages

Carbon Monoxide (CO) - ppm

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm

Fort Chipewyan - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	689	100.00	100.00
0.4 - 0.5	0	0.00	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 689

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Monoxide (CO) - ppm

Fort Chipewyan - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.3	22	7	36	136	234	33	22	20	7	2	12	8	16	33	53	48	689
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	7	36	136	234	33	22	20	7	2	12	8	16	33	53	48	689

Total Number of Valid Hours: 689

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Monoxide (CO) - ppm

Fort Chipewyan

Total Number of Valid Hours: 689

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Dioxide (CO_2) - ppm

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 452.9 ppm on Mar 2 16:00

Maximum Daily Average: 450.0 ppm on Mar 2

Minimum Value: 417.1 ppm on Mar 26 19:00

Minimum Daily Average: 418.3 ppm on Mar 26

Maximum Diurnal Average: 431.0 ppm at hour 5

Minimum Diurnal Average: 429.3 ppm at hour 18

Monthly Average: 429.92 ppm

Percentiles: P_1 = 417.4 P_{10} = 421.3 Q_1 = 423.2 Median = 429.1 Q_3 = 435.1 P_{90} = 440.3 P_{99} = 451.6

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	438.9	438.7	439.0	439.2	439.5	Z	440.2	440.2	M	M	442.0	442.4	443.3	443.6	443.0	443.0	443.5	444.5	444.4	444.5	445.1	445.7	446.1	446.2	442.5	446.2
2-Mar	Z	447.0	447.9	448.9	449.8	449.8	449.7	449.9	450.4	451.6	451.6	451.8	451.8	451.8	452.4	452.9	452.0	450.4	449.5	449.2	448.7	448.0	447.5	447.1	450.0	452.9
3-Mar	447.1	Z	446.7	446.8	445.8	445.1	444.7	444.7	444.5	444.2	444.0	443.7	443.4	443.1	442.9	442.9	442.5	442.3	442.1	441.9	441.3	441.0	441.0	440.8	443.6	447.1
4-Mar	440.9	440.7	Z	440.4	440.3	440.5	440.5	440.4	439.6	439.0	438.4	437.9	437.8	437.5	437.2	436.6	436.4	436.4	436.3	436.0	435.7	435.5	435.1	435.0	438.0	440.9
5-Mar	434.8	435.0	435.1	Z	435.4	434.9	435.1	435.5	434.7	434.2	434.3	433.8	433.5	433.6	433.7	433.4	433.4	433.7	433.3	433.7	433.0	433.4	438.6	435.3	434.4	438.6
6-Mar	DF	439.8	435.5	436.4	Z	432.7	432.7	433.0	432.4	432.3	432.6	432.7	432.8	432.8	433.3	433.3	432.9	433.0	433.2	433.3	434.2	433.3	433.2	433.2	433.6	439.8
7-Mar	433.2	433.2	433.1	433.2	433.3	Z	433.2	433.3	433.4	433.2	433.1	433.1	433.1	433.0	433.0	433.0	433.0	432.9	432.6	432.5	434.1	432.5	432.8	432.2	433.0	434.1
8-Mar	Z	432.0	432.1	432.0	431.9	432.6	432.5	432.0	431.7	432.2	433.4	433.7	433.2	433.6	433.2	432.8	433.2	433.1	432.4	432.0	431.8	431.7	431.6	431.5	432.4	433.7
9-Mar	431.6	Z	432.2	432.7	432.9	432.8	433.0	433.3	433.6	434.4	436.1	436.7	436.7	436.6	435.9	435.0	435.1	435.1	435.3	435.6	435.7	435.9	436.3	436.5	434.7	436.7
10-Mar	436.7	436.8	Z	437.1	437.3	437.4	437.4	437.5	437.7	437.9	438.2	438.4	438.6	438.6	438.7	438.7	439.2	439.3	439.0	440.6	441.6	441.3	439.8	440.1	438.6	441.6
11-Mar	440.3	440.1	439.0	Z	438.9	439.1	438.1	437.6	437.2	437.1	436.8	436.4	436.3	436.2	436.2	436.1	436.2	436.1	436.0	435.9	436.0	436.1	436.0	435.7	437.1	440.3
12-Mar	435.7	435.5	435.4	435.4	Z	435.5	435.5	435.5	435.4	435.5	435.6	436.1	C	C	C	C	427.9	427.6	427.6	429.2	436.6	431.8	438.5	433.9	433.9	438.5
13-Mar	428.9	429.8	429.4	429.7	430.4	Z	429.9	430.4	429.4	429.4	430.0	430.3	431.0	431.3	431.5	432.1	431.9	431.5	431.7	431.4	431.3	431.2	431.1	431.4	430.7	432.1
14-Mar	Z	431.6	431.6	431.6	431.6	431.6	431.6	432.4	432.7	432.2	431.9	431.6	431.4	431.5	431.4	431.2	431.3	431.4	431.4	431.2	431.0	430.8	430.9	430.8	431.5	432.7
15-Mar	430.8	Z	430.7	430.8	430.6	430.4	430.7	431.0	430.1	429.6	429.2	429.0	429.0	429.0	428.8	428.7	428.6	429.3	430.8	429.7	428.6	428.4	428.4	428.6	429.6	431.0
16-Mar	428.3	428.4	Z	428.3	428.4	428.1	428.0	428.1	428.0	428.0	428.6	428.4	428.6	428.4	428.4	428.6	428.4	428.0	427.9	428.1	428.6	430.0	431.8	433.4	428.7	433.4
17-Mar	435.7	436.3	434.8	Z	435.3	436.0	436.7	436.5	437.9	438.1	437.5	436.7	436.1	434.1	432.8	430.6	429.3	428.0	427.6	428.3	429.9	430.8	431.4	430.8	433.5	438.1
18-Mar	430.8	429.1	426.6	424.5	Z	423.5	423.6	423.5	423.0	422.7	422.2	422.2	422.0	421.9	422.6	422.5	422.9	423.3	423.9	423.9	423.5	423.4	423.3	422.6	423.8	430.8
19-Mar	422.1	421.7	421.7	421.8	421.9	Z	421.7	421.8	421.6	421.4	421.3	421.4	421.3	421.4	421.5	421.4	421.6	421.6	421.9	422.1	421.9	422.5	422.4	422.5	421.8	422.5
20-Mar	Z	422.6	422.8	422.8	422.4	422.5	422.4	422.2	421.9	421.4	421.2	421.7	421.7	421.7	421.8	421.6	421.4	421.2	421.1	421.2	421.1	421.8	421.8	421.5	421.8	422.8
21-Mar	421.9	Z	422.3	423.2	425.4	426.8	424.5	421.5	420.8	420.9	421.0	421.1	421.1	421.4	421.5	421.8	421.9	422.2	422.5	422.5	422.3	422.5	423.1	423.5	422.4	426.8
22-Mar	424.0	424.3	Z	425.5	425.2	425.2	425.4	425.6	425.9	426.4	426.6	427.1	427.6	427.7	427.3	426.9	427.2	426.8	426.6	426.7	426.8	427.3	427.6	427.9	426.4	427.9
23-Mar	429.0	432.8	431.0	Z	432.0	429.5	428.2	427.7	427.0	426.5	425.9	425.6	425.4	425.2	424.9	424.6	424.2	423.8	423.6	423.4	423.1	422.9	422.6	422.6	426.2	432.8
24-Mar	422.5	422.8	422.8	422.6	Z	422.7	423.6	424.0	424.7	423.5	423.7	422.5	422.2	422.2	422.2	422.1	422.1	422.1	422.4	423.2	422.8	422.6	422.2	423.1	422.8	424.7
25-Mar	422.6	422.5	423.0	423.2	424.1	Z	426.3	428.5	424.5	421.8	421.5	421.2	421.1	421.0	420.9	420.5	420.4	420.4	420.6	420.6	420.6	420.5	420.2	420.0	422.0	428.5
26-Mar	Z	420.2	420.1	420.2	420.6	420.8	420.2	419.0	418.2	418.1	417.9	417.7	417.8	417.5	417.4	417.2	417.2	417.1	417.1	417.6	417.7	417.4	417.2	417.3	418.3	420.8
27-Mar	417.6	Z	418.2	418.9	419.8	419.7	421.5	420.7	422.7	423.2	421.4	420.0	419.9	419.6	419.3	419.0	419.2	419.1	419.5	420.2	422.0	421.7	423.9	420.8	420.3	423.9
28-Mar	420.9	420.5	Z	420.4	420.5	420.5	420.7	420.8	420.9	421.3	421.8	422.0	422.0	422.5	422.9	423.2	423.2	423.4	423.4	423.5	423.8	423.8	423.9	424.0	422.2	424.0
29-Mar	424.1	424.1	424.3	Z	426.8	427.5	428.2	428.6	426.3	423.8	423.4	423.0	423.2	423.4	423.4	423.5	423.3	423.2	423.4	423.6	423.6	423.6	426.3	424.9	424.6	428.6
30-Mar	424.7	424.5	424.4	424.6	Z	425.0	425.0	424.9	424.8	424.1	424.0	424.0	424.0	424.2	424.2	424.4	424.7	424.9	425.0	425.0	424.9	425.0	425.2	425.3	424.6	425.3
31-Mar	425.5	425.7	425.8	425.9	426.0	Z	426.1	426.1	426.1	426.3	426.5	426.3	426.4	426.5	426.4	426.4	426.5	426.6	426.8	426.9	426.7	426.8	426.9	426.9	426.4	426.9
	430.0	430.6	430.2	429.9	431.0	430.8	430.5	430.5	429.9	429.7	430.1	429.9	429.7	429.7	429.6	429.5	429.4	429.3	429.3	429.5	429.8	429.6	430.2	429.9	Diurnal Average	
	447.1	447.0	447.9	448.9	449.8	449.8	449.7	449.9	450.4	451.6	451.6	451.8	451.8	451.8	452.4	452.9	452.0	450.4	449.5	449.2	448.7	448.0	447.5	447.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Carbon Dioxide (CO_2) - ppm

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Dioxide (CO_2) - ppm

Fort Chipewyan - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	42	5.95	5.95
420 - 440	599	84.84	90.79
440 - 460	65	9.21	100.00
460 - 480	0	0.00	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Dioxide (CO_2) - ppm

Fort Chipewyan - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
400 - 420	0	0	0	9	15	2	3	2	0	1	0	1	6	2	1	0	42
420 - 440	21	7	35	124	209	26	17	18	7	3	13	8	13	25	27	46	599
440 - 460	1	0	1	6	16	7	3	0	0	0	0	0	0	7	22	2	65
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	22	7	36	139	240	35	23	20	7	4	13	9	19	34	50	48	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Dioxide (CO_2) - ppm

Fort Chipewyan

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C

Fort Chipewyan - March 2023

Maximum Value: 5.7 C on Mar 18 13:00

Maximum Daily Average: -2.0 C on Mar 18

Minimum Value: -30.6 C on Mar 6 07:00

Minimum Daily Average: -24.5 C on Mar 6

Maximum Diurnal Average: -10.2 C at hour 16

Minimum Diurnal Average: -17.1 C at hour 7

Monthly Average: -13.77 C

Percentiles: P_1 = -26.4 P_{10} = -21.8 Q_1 = -17.8 Median = -13.6 Q_3 = -9.7 P_{90} = -6.3 P_{99} = 1.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	-24.1	-25.0	-25.6	-25.7	-26.1	-25.7	-24.7	-24.4	-23.8	-23.1	-21.6	-20.0	-18.0	-16.5	-15.6	-14.9	-14.4	-11.2	-11.9	-12.9	-14.9	-15.9	-16.0	-16.1	-19.5	-11.2
2-Mar	-15.6	-15.6	-14.7	-12.8	-10.4	-9.9	-9.9	-9.6	-9.3	-9.0	-8.2	-7.5	-6.9	-6.5	-5.3	-4.6	-5.2	-5.8	-7.6	-8.6	-9.3	-10.3	-11.6	-12.5	-9.4	-4.6
3-Mar	-13.8	-15.1	-14.8	-14.7	-14.8	-15.4	-16.4	-16.6	-16.6	-15.7	-14.7	-13.7	-13.3	-13.3	-13.3	-13.5	-14.1	-14.9	-15.5	-16.5	-17.6	-18.6	-19.3	-19.9	-15.5	-13.3
4-Mar	-20.4	-21.0	-21.2	-21.3	-21.6	-21.9	-22.0	-21.8	-21.3	-21.0	-20.7	-20.7	-19.9	-18.9	-17.0	-16.4	-16.0	-16.7	-17.8	-18.8	-19.9	-20.9	-21.5	-22.4	-20.0	-16.0
5-Mar	-23.2	-23.8	-24.3	-25.1	-26.0	-25.7	-26.1	-26.7	-25.0	-23.9	-22.6	-20.1	-18.9	-18.6	-18.4	-18.0	-18.3	-19.3	-20.3	-21.0	-21.2	-22.1	-23.5	-22.2	-22.3	-18.0
6-Mar	DF	-25.7	-26.1	-26.7	-29.3	-29.3	-30.6	-29.5	-28.8	-27.1	-25.9	-25.2	-23.9	-23.0	-21.2	-20.7	-21.8	-22.9	-24.2	-24.4	-19.1	-19.1	-19.6	-19.8	-24.5	-19.1
7-Mar	-19.7	-19.8	-19.6	-19.8	-19.4	-19.0	-18.6	-17.9	-17.1	-16.5	-15.5	-13.6	-12.4	-12.3	-12.1	-11.6	-11.4	-11.4	-13.0	-13.6	-13.2	-12.3	-12.4	-12.4	-15.2	-11.4
8-Mar	-11.6	-11.7	-10.7	-11.0	-11.8	-14.2	-15.0	-14.4	-13.5	-13.1	-11.7	-10.5	-9.3	-8.3	-7.8	-7.5	-7.9	-9.6	-11.3	-14.2	-13.9	-15.5	-14.8	-13.4	-11.8	-7.5
9-Mar	-13.7	-14.5	-15.3	-16.8	-18.1	-18.2	-19.0	-19.5	-19.3	-18.9	-14.2	-11.4	-10.0	-9.4	-8.7	-8.7	-9.5	-11.2	-12.9	-13.5	-14.0	-14.1	-14.6	-14.9	-14.2	-8.7
10-Mar	-14.0	-13.2	-13.0	-12.8	-11.6	-11.6	-12.3	-12.6	-12.5	-12.0	-10.9	-10.4	-9.7	-9.0	-8.6	-8.7	-8.3	-8.6	-8.9	-9.1	-10.0	-9.9	-10.1	-10.3	-10.8	-8.3
11-Mar	-9.9	-10.0	-10.1	-10.1	-11.0	-11.3	-11.7	-11.9	-11.5	-11.1	-10.7	-11.1	-10.2	-9.7	-9.1	-8.8	-9.1	-9.8	-10.6	-11.2	-12.1	-12.7	-13.5	-13.9	-10.9	-8.8
12-Mar	-14.6	-15.5	-15.9	-16.2	-16.6	-17.1	-17.5	-17.7	-17.3	-17.0	-15.5	-14.7	-13.8	-12.8	-12.1	-11.6	-12.8	-14.7	-17.0	-18.3	-18.3	-17.9	-19.4	-19.9	-16.0	-11.6
13-Mar	-23.7	-22.7	-24.0	-25.0	-23.7	-22.1	-22.7	-23.9	-24.1	-22.3	-20.2	-18.0	-14.6	-14.0	-11.7	-11.9	-12.5	-13.2	-13.6	-13.7	-14.2	-14.8	-15.2	-15.7	-18.2	-11.7
14-Mar	-16.2	-16.7	-17.4	-17.7	-18.3	-18.7	-19.0	-19.2	-19.2	-18.5	-17.8	-17.3	-16.7	-16.0	-15.8	-15.6	-15.3	-15.1	-15.1	-15.0	-15.0	-15.1	-15.1	-15.2	-16.7	-15.0
15-Mar	-15.6	-16.0	-16.5	-16.8	-16.9	-17.2	-17.6	-17.5	-17.2	-16.6	-16.3	-15.7	-15.3	-14.8	-14.7	-14.3	-14.4	-14.5	-14.9	-15.4	-15.6	-16.8	-17.5	-17.2	-16.1	-14.3
16-Mar	-17.7	-18.2	-18.8	-18.4	-18.5	-18.5	-18.9	-19.0	-18.6	-17.3	-16.0	-14.7	-13.2	-12.8	-12.4	-12.0	-12.6	-13.8	-14.7	-14.9	-13.3	-11.3	-9.8	-7.9	-15.1	-7.9
17-Mar	-6.4	-6.3	-6.9	-7.8	-8.5	-8.6	-8.8	-8.5	-7.1	-5.9	-5.5	-4.7	-3.0	-0.8	0.5	1.2	1.7	2.2	1.7	1.6	1.5	0.1	-0.4	-0.5	-3.3	2.2
18-Mar	-1.1	-2.6	-4.4	-5.6	-6.2	-5.8	-5.8	-5.1	-3.9	-1.1	1.8	4.1	5.7	5.5	0.5	-0.5	-0.8	-1.9	-1.5	-2.4	-2.6	-3.2	-4.9	-6.4	-2.0	5.7
19-Mar	-8.3	-10.1	-11.7	-12.4	-13.2	-13.5	-13.3	-13.6	-13.6	-13.1	-12.3	-11.0	-9.6	-9.1	-9.0	-8.6	-8.8	-8.9	-9.4	-9.3	-9.0	-9.0	-10.2	-10.6	-10.7	-8.3
20-Mar	-10.7	-11.5	-12.0	-12.4	-12.8	-13.2	-13.2	-13.0	-13.0	-13.9	-14.3	-10.4	-9.3	-9.1	-9.3	-10.4	-10.6	-10.8	-10.8	-12.2	-12.8	-13.4	-15.3	-16.9	-12.1	-9.1
21-Mar	-16.8	-17.8	-18.7	-19.4	-20.1	-20.6	-21.8	-21.4	-20.6	-19.9	-19.1	-17.9	-16.3	-14.9	-14.4	-13.7	-13.8	-13.9	-14.5	-15.7	-16.8	-17.8	-15.5	-15.3	-17.4	-13.7
22-Mar	-15.5	-16.2	-15.7	-15.4	-15.0	-15.4	-14.4	-14.1	-13.5	-11.9	-11.0	-9.2	-7.5	-6.5	-6.3	-6.3	-5.7	-7.7	-9.2	-9.5	-9.8	-9.0	-6.4	-6.4	-10.7	-5.7
23-Mar	-6.9	-7.1	-7.6	-8.0	-8.3	-7.8	-7.8	-8.0	-7.7	-6.3	-5.4	-5.1	-5.0	-4.4	-4.4	-4.0	-3.3	-3.1	-4.1	-6.0	-7.6	-8.6	-9.7	-11.1	-6.5	-3.1
24-Mar	-12.3	-13.6	-14.6	-15.2	-15.6	-16.3	-17.3	-16.2	-14.6	-13.1	-11.4	-8.7	-7.1	-6.5	-6.0	-5.6	-4.9	-5.2	-6.3	-8.6	-9.6	-10.1	-10.3	-12.0	-10.9	-4.9
25-Mar	-12.0	-11.8	-13.5	-13.0	-13.9	-16.3	-17.4	-16.6	-17.5	-16.2	-16.5	-16.3	-16.2	-16.8	-16.0	-16.8	-16.8	-17.0	-17.5	-18.2	-18.6	-19.1	-19.2	-20.0	-16.4	-11.8
26-Mar	-20.3	-21.1	-22.0	-22.9	-23.3	-23.6	-24.1	-25.2	-24.6	-22.5	-20.9	-19.7	-18.8	-17.9	-17.4	-17.1	-17.1	-17.5	-17.3	-17.4	-17.6	-17.4	-18.1	-18.6	-20.1	-17.1
27-Mar	-18.8	-18.7	-19.9	-21.0	-21.7	-22.9	-24.3	-22.6	-20.0	-20.7	-18.4	-15.5	-13.3	-11.4	-10.0	-9.4	-11.4	-10.6	-12.3	-12.7	-13.3	-15.8	-18.7	-21.2	-16.9	-9.4
28-Mar	-20.7	-22.7	-23.6	-24.0	-25.1	-25.0	-25.1	-24.5	-22.8	-21.6	-19.5	-17.4	-14.4	-12.6	-11.8	-11.4	-11.3	-12.3	-13.0	-13.1	-12.5	-12.9	-13.6	-13.2	-17.7	-11.3
29-Mar	-12.6	-12.2	-12.1	-11.6	-11.1	-10.0	-9.0	-7.7	-5.2	-3.9	-3.8	-3.4	-2.6	-2.2	-1.7	-1.3	-2.8	-5.0	-6.5	-6.5	-6.8	-7.0	-8.4	-8.0	-6.7	-1.3
30-Mar	-8.8	-10.0	-10.9	-11.8	-13.2	-14.7	-15.2	-13.4	-12.4	-13.2	-12.4	-11.5	-10.4	-9.9	-9.3	-8.8	-8.8	-8.3	-8.4	-9.4	-10.2	-11.1	-11.6	-11.4	-11.0	-8.3
31-Mar	-11.7	-11.3	-11.5	-10.7	-10.1	-10.7	-10.3	-10.3	-9.6	-9.2	-8.6	-7.6	-6.6	-6.2	-5.5	-5.3	-5.7	-6.4	-7.2	-7.3	-7.5	-7.9	-8.3	-9.0	-8.5	-5.3
	-14.6	-15.4	-15.9	-16.2	-16.5	-16.8	-17.1	-16.8	-16.2	-15.3	-14.2	-12.9	-11.6	-10.9	-10.4	-10.2	-10.4	-10.9	-11.8	-12.5	-12.7	-13.2	-13.7	-14.0	Diurnal Average	
	-1.1	-2.6	-4.4	-5.6	-6.2	-5.8	-5.8	-5.1	-3.9	-1.1	1.8	4.1	5.7	5.5	0.5	1.2	1.7	2.2	1.7	1.6	1.5	0.1	-0.4	-0.5	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort Chipewyan - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	107	14.40	14.40
-20 - 0	623	83.85	98.25
0 - 10	13	1.75	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort Chipewyan - March 2023

Maximum Value: 94.1 % on Mar 11 00:00

Maximum Daily Average: 88.5 % on Mar 11

Minimum Value: 39.7 % on Mar 27 16:00

Minimum Daily Average: 56.8 % on Mar 8

Maximum Diurnal Average: 78.2 % at hour 7

Minimum Diurnal Average: 64.4 % at hour 16

Monthly Average: 70.68 %

Percentiles: P_1 = 44.7 P_{10} = 56.1 Q_1 = 63.1 Median = 71.4 Q_3 = 79.0 P_{90} = 83.6 P_{99} = 93.3

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	79.5	79.0	78.4	78.0	77.5	77.6	78.1	78.1	78.0	78.1	79.1	80.1	80.6	77.9	74.3	73.9	74.1	68.0	70.3	72.0	75.6	78.3	79.4	80.8	76.9	80.8
2-Mar	81.8	83.3	83.8	83.6	86.6	87.5	93.4	93.0	91.2	88.5	85.4	83.8	83.3	81.4	77.9	81.8	93.7	93.2	93.2	93.0	92.1	89.9	89.0	88.4	87.4	93.7
3-Mar	90.7	90.3	88.7	87.4	85.2	84.0	83.5	82.7	81.6	78.7	74.2	69.5	66.5	66.1	63.6	64.8	66.8	67.0	67.0	69.2	68.3	68.6	72.6	73.9	75.4	90.7
4-Mar	73.5	74.2	73.7	75.4	77.1	77.9	77.4	76.4	73.7	69.9	66.3	62.8	60.9	60.4	58.1	57.2	53.7	57.9	66.0	72.1	74.8	73.4	70.7	72.1	69.0	77.9
5-Mar	72.0	73.7	76.9	78.2	79.4	78.6	77.9	76.9	74.5	73.5	69.6	61.7	56.7	55.0	54.5	53.8	55.0	58.3	62.2	65.8	68.0	73.6	79.9	78.3	68.9	79.9
6-Mar	DF	79.2	79.1	78.0	76.7	76.8	75.3	75.5	74.8	75.0	75.1	75.3	75.6	75.9	72.6	70.7	71.1	71.3	73.9	74.5	64.6	63.4	65.8	69.2	73.5	79.2
7-Mar	70.4	75.1	78.7	81.7	82.0	81.6	81.3	81.7	80.9	80.5	80.1	77.2	74.9	79.8	85.5	88.2	88.2	87.9	89.9	87.3	80.4	64.3	61.8	69.6	79.5	89.9
8-Mar	68.1	69.7	62.9	58.1	57.7	61.8	63.1	63.0	60.2	59.2	56.2	52.7	49.8	46.8	44.8	42.9	44.9	50.7	53.8	62.9	58.4	63.0	59.0	54.0	56.8	69.7
9-Mar	55.7	57.2	58.5	61.7	64.6	64.6	66.9	67.5	66.5	66.1	56.6	50.4	47.7	45.5	44.0	45.0	49.1	54.8	58.9	60.1	62.0	63.6	64.0	64.0	58.1	67.5
10-Mar	64.3	66.1	68.9	73.9	69.6	68.9	77.3	83.0	79.8	74.4	71.4	70.3	69.6	66.9	66.6	68.5	63.8	67.0	69.7	69.3	73.5	84.6	93.3	94.1	73.1	94.1
11-Mar	94.1	93.9	93.6	93.5	91.7	91.3	90.6	90.2	88.6	84.7	82.1	86.4	86.2	87.8	89.0	88.8	85.3	86.1	87.9	87.9	87.2	87.3	86.5	84.4	88.5	94.1
12-Mar	83.6	81.5	81.5	82.2	81.6	81.5	81.1	79.9	77.4	74.8	69.8	67.9	65.3	62.5	59.1	55.8	61.3	65.7	74.7	81.6	85.0	84.3	85.7	84.4	75.3	85.7
13-Mar	83.3	82.1	80.2	79.0	79.8	80.3	79.5	78.3	77.6	78.9	79.8	80.3	69.9	66.6	61.5	63.3	64.6	64.5	63.1	58.9	56.8	55.7	56.6	59.3	70.8	83.3
14-Mar	62.5	65.4	67.5	68.0	69.0	69.4	69.7	70.4	71.0	70.0	67.6	65.5	65.7	65.0	64.4	63.5	62.9	62.7	62.2	61.8	62.0	62.2	60.9	60.7	65.4	71.0
15-Mar	63.5	65.0	67.0	68.9	66.3	68.0	69.7	68.2	68.4	71.4	72.2	73.6	73.5	72.3	75.0	74.6	75.2	73.3	73.3	76.5	74.6	74.5	75.8	75.4	71.5	76.5
16-Mar	76.2	76.6	77.6	76.9	76.6	77.0	77.8	77.8	77.6	75.4	74.7	75.5	72.9	73.3	74.6	74.9	77.6	79.3	80.0	80.8	80.7	82.3	82.9	83.6	77.6	83.6
17-Mar	81.0	79.4	79.4	80.8	81.7	81.6	81.3	78.5	71.9	67.8	70.9	69.6	65.2	61.5	60.5	54.8	53.7	53.7	57.0	59.2	61.5	68.2	72.4	71.0	69.3	81.7
18-Mar	71.3	73.8	75.1	76.6	78.5	80.6	79.8	74.5	68.9	60.0	51.2	45.9	41.8	45.6	69.6	69.2	67.4	69.5	63.6	66.2	64.1	64.8	69.5	71.9	66.6	80.6
19-Mar	74.0	74.6	76.6	78.1	78.5	80.9	84.3	83.8	82.5	83.0	80.6	78.1	72.3	68.8	66.9	65.4	65.1	65.2	66.4	65.4	63.6	64.3	65.6	65.6	72.9	84.3
20-Mar	65.0	65.6	66.0	67.2	67.4	68.3	69.7	67.7	64.7	69.9	74.4	60.5	59.4	59.2	59.6	63.5	63.5	59.4	54.5	57.9	61.5	65.0	70.7	76.1	64.9	76.1
21-Mar	76.1	79.7	82.2	86.4	85.8	84.0	82.4	79.9	79.2	79.6	80.0	80.4	79.8	79.4	81.2	79.4	80.5	78.6	77.9	80.5	82.8	84.5	81.0	79.6	80.9	86.4
22-Mar	78.9	79.9	80.3	82.4	83.0	84.0	83.6	82.1	80.0	76.5	73.7	69.6	66.6	64.5	68.9	72.8	67.9	75.3	77.3	76.0	76.6	75.3	69.9	72.0	75.7	84.0
23-Mar	74.0	73.4	75.3	77.5	78.6	76.6	84.9	83.5	82.9	79.6	76.1	73.5	71.7	68.7	67.5	63.5	58.8	53.9	54.6	59.4	61.3	63.5	65.1	68.7	70.5	84.9
24-Mar	72.9	77.6	81.4	82.8	83.9	86.0	87.6	80.5	70.9	68.6	64.0	56.1	51.2	48.4	47.2	45.8	43.0	43.8	45.9	54.9	57.6	59.4	59.8	67.3	64.0	87.6
25-Mar	67.4	67.0	72.3	71.4	73.6	84.0	86.3	78.9	79.3	74.8	73.1	72.5	71.2	69.6	62.3	64.5	56.9	51.2	49.3	49.9	51.3	52.1	51.5	53.3	66.0	86.3
26-Mar	53.9	56.0	58.4	60.2	60.6	61.6	63.5	66.0	69.1	67.9	68.2	68.7	67.5	66.7	68.3	69.5	69.0	68.2	61.5	58.7	59.8	59.4	62.8	64.7	63.8	69.5
27-Mar	65.3	65.5	70.4	73.5	75.1	77.3	77.7	69.8	60.7	63.6	62.0	55.0	57.2	51.7	42.5	39.7	51.1	44.7	48.8	50.2	52.0	58.4	67.9	73.2	60.6	77.7
28-Mar	72.7	76.1	77.7	80.1	81.8	81.3	79.7	78.4	76.3	75.1	70.8	67.5	61.5	63.2	67.3	66.7	66.7	73.1	77.3	77.7	76.0	76.4	76.7	77.2	74.1	81.8
29-Mar	77.1	76.8	77.3	79.0	81.0	81.4	80.1	79.4	83.0	79.8	75.9	63.2	58.2	54.6	48.9	46.3	56.7	65.4	60.8	57.4	54.6	54.4	60.8	57.6	67.1	83.0
30-Mar	56.5	59.6	61.5	65.4	73.7	80.4	82.1	76.5	73.1	76.9	78.6	78.5	77.2	76.4	75.3	73.1	62.6	52.5	50.3	54.5	57.1	59.6	61.1	60.5	67.6	82.1
31-Mar	63.8	61.6	64.8	64.3	62.2	61.6	59.3	59.3	57.8	59.5	57.6	54.4	52.9	52.2	52.0	53.5	55.3	57.6	60.5	61.1	61.1	62.3	63.3	64.3	59.3	64.8
	72.3	73.5	74.7	75.8	76.3	77.3	78.2	76.8	74.9	73.6	71.5	68.6	66.2	65.0	64.6	64.4	64.7	65.1	66.2	67.8	67.9	68.9	70.4	71.5	Diurnal Average	
	94.1	93.9	93.6	93.5	91.7	91.3	93.4	93.0	91.2	88.5	85.4	86.4	86.2	87.8	89.0	88.8	93.7	93.2	93.2	93.0	92.1	89.9	93.3	94.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Fort Chipewyan - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	1	0.13	0.13
40 - 60	128	17.23	17.36
60 - 80	462	62.18	79.54
80 - 100	152	20.46	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Fort Chipewyan - March 2023

Maximum Value: 1.8 % on Mar 1 08:00

Maximum Daily Average: 0.8 % on Mar 1

Minimum Value: 0.0 % on Mar 1 15:00

Minimum Daily Average: 0.0 % on Mar 4

Maximum Diurnal Average: 0.3 % at hour 7

Minimum Diurnal Average: 0.0 % at hour 15

Monthly Average: 0.10 %

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} = 1.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.8	1.5	1.2	0.9	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.8
2-Mar	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	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.1	0.4
3-Mar	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
6-Mar	DF	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
7-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.5	0.0	0.0	0.0	0.0	0.5
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.4
11-Mar	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.7
12-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.5	0.8	0.1	0.8
13-Mar	0.9	1.1	1.3	1.4	1.5	1.6	1.7	1.6	1.4	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.7
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
18-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
19-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.1	0.3	0.4	0.6	0.7	0.9	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	0.1	0.4	0.6	0.7	0.2	0.9
22-Mar	0.8	0.8	0.9	1.0	1.2	1.3	1.3	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.3
23-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.2	0.4	0.7	0.9	1.0	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	0.2	1.0
25-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
26-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
29-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	Diurnal Average	
	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.8	1.5	1.2	0.9	0.6	0.3	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.4	0.6	0.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Leaf Wetness (LW) - %

Fort Chipewyan - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	674	90.71	90.71
0.4 - 0.5	18	2.42	93.14
0.6 - 0.7	17	2.29	95.42
0.8 - 1.4	23	3.10	98.52
1.5 - 10	10	1.35	99.87
> 10	0	0.00	99.87

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Fort Chipewyan - March 2023

Maximum Value: 664.2 W/m2 on Mar 21 13:00

Maximum Daily Average: 208.9 W/m2 on Mar 27

Minimum Value: 0.0 W/m2 on Mar 1 04:00

Minimum Daily Average: 53.8 W/m2 on Mar 2

Maximum Diurnal Average: 514.9 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 2

Monthly Average: 148.43 W/m2

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 6.6 Q_3 = 290.6 P_{90} = 486.9 P_{99} = 632.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	40.1	200.2	298.5	368.0	428.0	476.9	496.4	398.4	391.0	175.9	23.8	0.4	0.0	0.0	0.0	0.0	0.0	137.4	496.4
2-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	38.8	74.2	128.0	193.3	280.9	230.4	178.2	77.1	57.6	20.8	0.4	0.0	0.0	0.0	0.0	0.0	53.8	280.9
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.7	71.3	199.4	395.2	403.0	359.4	265.2	254.3	150.3	79.9	18.9	0.7	0.0	0.0	0.0	0.0	0.0	92.0	403.0
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.2	22.3	86.1	180.0	316.5	413.0	453.3	311.1	411.0	267.0	163.5	41.8	1.0	0.0	0.0	0.0	0.0	0.0	111.1	453.3
5-Mar	0.0	0.0	0.0	0.0	0.0	0.0	3.0	89.8	219.7	210.9	412.7	535.5	512.6	464.1	379.9	267.5	130.4	14.2	0.1	0.0	0.0	0.0	0.0	0.0	135.0	535.5
6-Mar	DF	0.0	0.0	0.0	0.0	0.0	0.5	23.0	180.3	311.9	404.3	486.9	531.3	544.0	475.0	341.4	188.2	51.8	1.9	0.0	0.1	0.0	0.0	0.0	153.9	544.0
7-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.5	24.0	78.1	191.6	372.4	405.1	415.1	340.0	313.0	223.1	125.4	43.4	2.3	0.0	0.0	0.0	0.0	0.0	105.6	415.1
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.6	19.2	91.8	203.3	369.9	440.1	434.4	469.2	427.9	280.9	149.2	52.2	2.7	0.1	0.0	0.0	0.0	0.0	122.6	469.2
9-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.4	49.6	173.3	304.9	412.7	488.8	523.7	507.1	437.7	326.3	186.7	59.9	3.0	0.0	0.0	0.0	0.0	0.0	144.8	523.7
10-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.0	27.5	94.2	184.7	216.8	285.1	346.2	327.7	295.5	240.7	136.3	44.5	2.6	0.0	0.0	0.0	0.0	0.0	91.8	346.2
11-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.4	28.4	97.7	233.2	375.3	389.0	431.6	339.8	234.9	152.7	82.5	32.1	2.1	0.0	0.0	0.0	0.0	0.0	100.0	431.6
12-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.8	35.7	106.3	166.9	339.8	348.2	437.5	494.9	434.4	287.6	209.0	60.5	5.6	0.0	0.0	0.0	0.0	0.0	122.0	494.9
13-Mar	0.0	0.0	0.0	0.0	0.0	0.0	4.2	91.4	235.6	359.2	446.2	568.2	614.9	548.7	461.9	344.9	166.2	57.0	4.8	0.0	0.0	0.0	0.0	0.0	162.6	614.9
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	2.1	31.2	106.4	170.7	247.6	285.4	269.8	241.5	192.2	139.5	79.7	37.6	4.1	0.0	0.0	0.0	0.0	0.0	75.3	285.4
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	3.3	36.8	105.6	305.7	431.2	521.6	556.8	540.6	470.4	361.8	226.0	82.7	7.3	0.0	0.0	0.0	0.0	0.0	152.1	556.8
16-Mar	0.0	0.0	0.0	0.0	0.0	0.0	5.2	60.0	142.4	334.8	446.9	526.4	557.1	542.9	473.7	359.6	228.7	108.1	10.1	0.0	0.0	0.0	0.0	0.0	158.2	557.1
17-Mar	0.0	0.0	0.0	0.0	0.0	0.0	7.2	97.6	236.0	366.6	469.3	538.3	564.9	545.9	479.8	373.4	239.0	97.9	10.3	0.0	0.0	0.0	0.0	0.0	167.7	564.9
18-Mar	0.0	0.0	0.0	0.0	0.0	0.0	12.4	106.0	243.9	374.8	480.0	550.4	579.2	556.9	486.6	379.6	243.5	102.6	11.8	0.0	0.0	0.0	0.0	0.0	172.0	579.2
19-Mar	0.0	0.0	0.0	0.0	0.0	0.0	6.6	51.8	134.4	237.1	336.9	425.5	480.9	404.3	299.0	229.2	283.9	74.3	8.1	0.0	0.0	0.0	0.0	0.0	123.8	480.9
20-Mar	0.0	0.0	0.0	0.0	0.0	0.0	6.6	51.0	184.6	389.3	502.1	574.9	601.4	583.6	513.1	402.6	263.7	117.2	15.3	0.1	0.0	0.0	0.0	0.0	175.2	601.4
21-Mar	0.0	0.0	0.0	0.0	0.0	0.1	31.7	190.8	328.5	436.8	531.1	613.2	664.2	619.4	568.3	443.5	290.3	102.8	23.3	0.2	0.0	0.0	0.0	0.0	201.8	664.2
22-Mar	0.0	0.0	0.0	0.0	0.0	0.0	17.0	83.6	281.3	430.5	539.4	583.2	597.4	582.6	513.7	409.9	266.4	119.4	17.1	0.1	0.0	0.0	0.0	0.0	185.1	597.4
23-Mar	0.0	0.0	0.0	0.0	0.0	0.0	12.1	71.5	150.2	282.5	297.7	332.0	476.2	462.0	323.5	284.0	184.1	90.9	21.7	0.4	0.1	0.0	0.0	0.0	124.5	476.2
24-Mar	0.0	0.0	0.1	0.0	0.0	0.3	43.1	198.1	363.3	467.2	579.5	609.9	626.7	607.6	537.6	427.8	291.0	155.8	36.8	0.3	0.0	0.0	0.0	0.0	206.0	626.7
25-Mar	0.0	0.0	0.0	0.0	0.0	0.2	39.1	196.0	346.7	475.0	547.4	601.3	622.3	607.4	539.6	431.0	292.8	141.7	26.7	0.3	0.0	0.0	0.0	0.0	202.8	622.3
26-Mar	0.0	0.0	0.0	0.0	0.0	0.4	32.7	130.5	250.6	437.1	550.9	616.2	641.9	623.5	550.0	441.3	300.9	150.7	30.5	0.5	0.0	0.0	0.0	0.0	198.2	641.9
27-Mar	0.0	0.0	0.0	0.0	0.0	0.5	49.8	197.2	344.3	458.7	553.7	622.3	648.5	634.5	556.0	448.0	308.0	157.4	34.0	0.6	0.0	0.0	0.1	0.0	208.9	648.5
28-Mar	0.0	0.0	0.0	0.0	0.0	0.9	67.2	241.1	404.7	501.2	616.9	633.3	631.5	539.8	424.0	304.4	176.0	88.5	18.8	0.2	0.0	0.0	0.0	0.0	193.7	633.3
29-Mar	0.0	0.0	0.0	0.0	0.0	0.5	15.8	79.5	142.1	254.7	225.6	374.1	470.7	593.8	561.4	478.2	419.2	168.0	30.6	0.9	0.0	0.0	0.0	0.0	159.0	593.8
30-Mar	0.0	0.0	0.0	0.0	0.0	1.6	66.1	177.2	283.6	398.6	475.9	461.4	494.9	557.2	558.3	410.4	230.7	128.0	33.0	1.0	0.0	0.0	0.0	0.0	178.2	558.3
31-Mar	0.0	0.0	0.0	0.0	0.0	0.7	21.4	78.0	155.2	238.5	498.4	654.8	659.6	642.7	568.0	461.2	320.6	149.6	22.6	0.7	0.0	0.0	0.0	0.0	186.3	659.6
	0.0	0.0	0.0	0.0	0.0	0.2	14.7	82.3	189.6	305.8	415.8	480.9	514.9	491.1	429.6	327.0	209.5	83.7	12.6	0.2	0.0	0.0	0.0	0.0	Diurnal Average	
	0.0	0.0	0.1	0.0	0.0	1.6	67.2	241.1	404.7	501.2	616.9	654.8	664.2	642.7	568.3	478.2	419.2	168.0	36.8	1.0	0.1	0.0	0.1	0.0	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Global Radiation (GR) - W/m2

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Global Radiation (GR) - W/m2

Fort Chipewyan - March 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	390	52.49	52.49
21 - 100	67	9.02	61.51
101 - 300	106	14.27	75.77
301 - 600	157	21.13	96.90
601 - 900	23	3.10	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort Chipewyan - March 2023

Maximum Speed: 39 km/h on Mar 14 05:00

Maximum Daily Speed Average: 30.0 km/h on Mar 14

Minimum Speed Value: 1 km/h on Mar 25 06:00

Minimum Daily Speed Average: 1.1 km/h on Mar 27

Maximum Diurnal Speed Average: 10.6 km/h at hour 23

Minimum Diurnal Speed Average: 8.1 km/h at hour 6

Monthly Average Velocity: 9.5 km/h 72.8 deg

Percentiles: $P_1 = 1$ $P_{10} = 5$ $Q_1 = 8$ Median = 14 $Q_3 = 19$ $P_{90} = 25$ $P_{99} = 36$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	E16	E16	E17	E18	E21	E19	E19	E19	E21	E22	E21	E22	E24	E25	E23	E23	E19	SE26	SE31	SE29	ESE25	ESE22	E25	E28	E21.1	SE31
2-Mar	E29	E32	E32	E29	ESE30	ESE33	ESE30	ESE30	ESE27	E25	E22	E19	E22	ENE23	ENE13	NE8	ENE5	N5	NNW10	NNW9	NW10	NW11	NW11	WNW11	E14.9	ESE33
3-Mar	WNW11	WNW12	WNW11	WNW10	NW11	WNW13	WNW12	WNW13	NW13	NW14	NW16	NW16	NW16	NW17	NW17	NW16	NW14	NW14	NW13	NW13	NW16	NW15	NW13	NW13	NW13.5	NW17
4-Mar	NW14	NW14	NW13	WNW13	WNW13	WNW12	WNW11	WNW11	NW13	NW17	NW19	NNW16	NW16	NW18	NW15	NW14	NW13	NW13	NW13	NW11	NNW9	NNW9	NNW13	NW11	NW12.9	NW19
5-Mar	NW12	WNW8	WNW9	WNW9	NW8	NW11	NW10	WNW9	WNW8	W9	W9	WNW10	NW10	WSW11	WSW11	WSW9	W8	W5	SW6	WSW5	WNW5	NE1	ENE1	ENE4	WNW6.5	NW12
6-Mar	DF	E3	E7	E9	E10	E9	E10	E7	E15	E16	E16	E16	E17	E18	E16	E15	E15	E11	E10	E8	ENE16	ENE22	ENE21	E19	E13.3	ENE22
7-Mar	E22	E21	E24	E21	ENE22	ENE23	E25	E24	E23	E23	E24	ESE20	SE21	SE19	ESE19	ESE18	E16	E15	E13	E13	ENE10	E15	ESE19	E17	E18.6	E25
8-Mar	E19	E18	ESE16	SE15	SE13	E12	ENE11	SSE12	S24	S21	S20	SSE19	SSE18	SSE20	SSE20	SSE17	SSE13	E8	E14	E13	E15	E12	E10	SSE17	SE13.0	S24
9-Mar	S20	S16	SSE14	E10	E11	E12	E11	E15	E16	E14	SSE20	SSE20	SSE23	SSE24	SSE18	SE24	SE24	SE23	ESE24	ESE25	ESE23	E22	E23	E23	SE16.5	ESE25
10-Mar	E20	E19	E16	E17	SE18	SE18	ESE15	ESE17	ESE18	SE18	SE19	SE19	ESE17	ESE15	E15	ENE16	ENE12	NE11	NE8	ENE6	ENE8	ENE8	ENE7	ENE8	ESE13.1	E20
11-Mar	ENE8	ENE9	ENE6	NNE4	N6	NNE5	N8	N8	N9	N7	ENE5	E7	E8	ESE8	ESE5	ENE3	N10	NNW10	NNW10	NNW12	NNW12	NNW12	NNW14	N15	NNE6.2	N15
12-Mar	N16	N12	NNE7	N5	N6	N6	NNW8	NNW8	NNW5	NNW6	NNW7	NNW7	NW9	NW8	NW6	WNW7	WSW10	SW9	SSE2	E3	ENE4	ENE4	ENE5	E8	NNW4.5	N16
13-Mar	E7	E9	E8	E8	ENE8	ENE10	ENE9	ENE6	ENE6	E12	E13	E15	ENE21	ENE20	NE23	NE25	NE27	NE25	NE28	ENE33	ENE32	ENE32	ENE34	ENE35	ENE18.2	ENE35
14-Mar	ENE35	ENE38	ENE36	ENE37	ENE39	ENE36	NE36	ENE36	NE35	NE32	ENE31	NE29	NE28	NE26	NE26	NE21	NE25	NE28	ENE30	ENE29	ENE27	ENE24	ENE20	ENE19	ENE30.0	ENE39
15-Mar	NE18	NE18	NE18	ENE17	NE16	ENE17	ENE13	ENE12	ENE14	ENE14	ENE16	E16	E18	E19	E20	E18	E16	ENE12	ENE8	ENE14	E25	E22	E17	E16	ENE16.1	E25
16-Mar	E20	ENE19	E16	E18	E16	E18	E19	E18	E17	E13	E12	E14	E15	E15	E15	E17	E17	E20	E20	E17	E17	E15	ESE14	ESE12	E16.3	E20
17-Mar	SE11	SE11	SE12	SSE11	S12	S13	SSE10	SSE9	SSE7	SE5	ESE9	E9	E7	ENE6	ESE6	E7	E5	SE3	ESE4	SSW4	SSW5	SW12	WSW8	W7	SSE5.7	S13
18-Mar	W7	W8	WNW11	WNW13	WNW13	NW11	WNW12	WNW14	WNW14	WNW9	NW6	NW4	WNW6	NE4	ENE12	E20	ENE23	ENE18	ENE15	ENE18	ENE26	ENE30	ENE32	ENE32	NE6.6	ENE32
19-Mar	ENE27	ENE26	ENE22	ENE22	ENE25	ENE24	ENE25	ENE24	ENE23	ENE24	ENE22	ENE24	ENE24	ENE24	ENE23	NE21	ENE25	NE21	ENE26	ENE26	NE18	ENE17	ENE20	ENE22	ENE23.1	ENE27
20-Mar	ENE21	ENE19	ENE18	ENE17	ENE16	ENE14	ENE15	NE14	NE11	E15	E18	ENE20	ENE19	E20	ENE16	E23	E15	ENE14	NNE10	NNE12	NE10	ENE5	E4	ENE6	ENE14.2	E23
21-Mar	NE2	E2	NW1	WNW1	W2	NE2	ESE6	E9	E17	E18	E21	E19	E18	E18	E18	E16	E18	E18	E11	E10	E17	E16	E17	E15	E11.8	E21
22-Mar	E15	E14	E14	E15	E17	E16	E20	E21	E22	E20	E20	E17	E16	E14	E15	E16	E15	E15	E13	E10	E9	E12	E11	E10	E15.2	E22
23-Mar	E9	ENE8	ENE4	NE4	NNW5	NNW7	NNW8	NW12	NW13	NW14	NNW16	NNW15	NNW19	NNW16	NNW14	NNW13	NW13	NNW10	NNW10	NNW9	NNW8	N10	N11	N11	NNW9.5	NNW19
24-Mar	N7	N2	NNW6	N6	N7	NNW8	NNW5	NNW5	SW2	SW6	SSW4	SW8	SW9	W8	SW9	SW9	SW7	SW7	WSW6	WNW7	W5	W3	WNW5	N3	W3.6	SW9
25-Mar	NNW3	NNW2	NNW6	NNE7	ENE4	SSW1	N1	E2	E8	E16	E20	E24	E27	E30	ENE21	E24	ENE25	ENE23	NE23	ENE22	ENE20	ENE19	ENE21	ENE20	ENE14.2	E30
26-Mar	ENE21	ENE18	ENE18	ENE16	ENE15	ENE12	ENE10	E9	E13	E18	E17	E19	E21	E18	E14	E13	ESE8	E7	E3	SE2	SSW1	WSW4	W8	W7	E10.1	E21
27-Mar	W6	WSW6	W7	W6	W4	WNW5	WNW3	SW3	SW3	E3	ENE5	E7	ESE7	SE10	NW4	WNW7	SE10	SSE5	E5	SSE2	ESE2	E7	E6	E7	SE1.1	SE10
28-Mar	E9	E10	E10	E10	E12	E12	E11	E14	E12	E14	E14	E14	E14	E14	E15	E15	E12	E13	E12	E13	E12	E10	E7	E5	E11.8	E15
29-Mar	E4	E3	E1	WNW5	W6	WNW9	WNW7	W7	NW9	NNW14	NNW12	N13	NNW13	NNW15	NNW13	NW12	E8	ESE12	ESE10	SE2	WSW4	WNW4	NE4	NNW7	NNW4.4	NNW15
30-Mar	N10	NNW8	NNW8	N8	NNE7	NNW8	NNW4	NNE2	S4	E7	ESE8	E8	E8	E11	E11	E11	E15	E17	E18	E18	E18	E18	E17	E21	ENE8.6	E21
31-Mar	E22	E27	E27	ENE27	ENE29	ENE30	ENE29	ENE33	ENE34	ENE31	ENE30	ENE33	ENE30	ENE30	NE26	NE26	NE30	NE29	NE31	ENE32	ENE34	ENE34	ENE37	ENE38	ENE30.0	ENE38
	ENE9.7	ENE9.3	ENE8.7	ENE8.5	ENE8.3	ENE8.1	ENE8.4	ENE8.2	ENE8.5	ENE9.5	E9.8	E10.4	ENE10.4	E10.4	ENE9.5	ENE9.7	ENE10.3	ENE9.7	ENE9.9	ENE9.8	ENE10.3	ENE10.5	ENE10.6	ENE10.5	Diurnal Average	
	ENE35	ENE38	ENE36	ENE37	ENE39	ENE36	NE36	ENE36	ENE35	NE32	ENE31	ENE33	ENE30	E30	NE26	NE26	NE30	NE29	SE31	ENE33	ENE34	ENE34	ENE37	ENE38	Diurnal Maximum	

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 9 00:00

Minimum Value: 0 km/h on Mar 26 20:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Fort Chipewyan - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Fort Chipewyan - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	83	11.17	11.17
6 - 11	204	27.46	38.63
12 - 19	273	36.74	75.37
20 - 28	132	17.77	93.14
29 - 38	50	6.73	99.87
> 38	1	0.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Fort Chipewyan - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	5	3	6	12	13	3	4	3	1	5	3	3	5	7	3	7	83
6 - 11	15	5	5	20	53	8	4	4	0	0	9	7	14	20	16	24	204
12 - 19	4	1	5	37	129	13	8	8	3	0	1	0	0	12	35	17	273
20 - 28	0	0	16	43	51	7	5	6	4	0	0	0	0	0	0	0	132
29 - 38	0	0	6	33	5	4	2	0	0	0	0	0	0	0	0	0	50
> 38	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	24	9	38	146	251	35	23	21	8	5	13	10	19	39	54	48	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Fort Chipewyan

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort Chipewyan - March 2023

Direction of Maximum Speed: 58 deg on Mar 14 05:00
Direction of Maximum Daily Speed Average: 57.2 deg on Mar 14

Direction of Minimum Speed: 192 deg on Mar 25 06:00

Direction of Minimum Daily Speed Average: 1.1 deg on Mar 27

Monthly Average Direction: 72.8 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average
1-Mar	81	82	84	87	87	89	85	86	85	88	88	87	84	83	88	90	95	129	127	127	122	107	84	81	95.1
2-Mar	79	80	82	90	106	109	113	113	105	93	100	97	82	77	74	50	71	349	347	342	323	318	310	293	85.6
3-Mar	283	283	284	300	312	303	301	301	308	317	307	316	318	317	318	322	321	323	323	321	323	314	305	306	310.6
4-Mar	309	309	305	289	287	286	293	298	312	321	319	335	321	317	321	323	323	310	317	324	334	335	337	322	314.7
5-Mar	318	301	300	303	313	319	314	290	289	274	277	301	315	249	237	255	262	278	231	239	298	35	73	58	288.1
6-Mar	DF	90	81	83	93	90	93	94	97	93	97	91	93	90	89	83	86	85	84	88	73	76	78	83	86.8
7-Mar	82	84	82	84	78	78	81	79	81	83	84	106	128	124	118	114	90	84	90	83	77	99	116	89	91.6
8-Mar	89	98	119	135	137	93	78	147	176	179	174	163	158	156	164	166	155	100	94	84	90	98	92	165	136.4
9-Mar	172	169	154	92	84	92	92	89	90	88	151	157	160	165	147	138	131	124	118	112	113	101	87	88	124.0
10-Mar	95	96	92	101	131	140	112	115	122	124	129	126	118	109	100	78	67	52	50	69	64	74	77	73	103.1
11-Mar	70	74	64	28	0	19	358	11	3	355	69	98	101	108	106	76	350	347	348	347	348	346	346	350	16.1
12-Mar	351	356	13	1	354	349	346	347	333	344	341	327	319	311	322	292	244	231	162	94	70	59	78	82	342.9
13-Mar	96	86	91	82	74	75	62	68	74	82	83	80	68	71	52	55	51	45	55	57	58	58	60	62	63.0
14-Mar	60	60	58	59	58	60	56	59	56	54	57	53	51	50	49	50	54	53	58	63	66	65	63	61	57.2
15-Mar	56	56	56	57	55	62	61	59	64	65	77	88	83	79	87	85	85	68	62	63	81	85	83	80	71.8
16-Mar	88	78	80	85	80	82	83	82	84	89	90	90	88	89	89	88	91	94	97	95	95	100	112	112	89.6
17-Mar	129	136	143	151	171	185	160	148	152	146	112	93	89	74	104	92	91	127	123	204	198	227	238	259	147.3
18-Mar	269	277	288	289	300	304	290	286	296	292	312	318	290	52	76	80	78	72	60	69	72	71	67	69	38.7
19-Mar	59	59	58	58	59	62	61	62	62	59	57	59	57	61	59	53	62	56	60	57	53	60	57	63	59.1
20-Mar	67	63	60	59	57	57	58	52	53	86	97	72	72	81	73	84	79	64	30	29	42	61	86	65	66.2
21-Mar	56	79	310	303	274	55	103	99	97	100	94	97	97	97	94	89	94	83	82	92	95	90	87	87	92.3
22-Mar	97	85	91	87	86	85	92	87	91	92	86	86	90	91	90	91	86	95	100	96	88	89	90	87	89.8
23-Mar	80	77	67	40	330	334	327	323	321	322	327	335	341	339	333	327	325	342	343	334	345	3	359	353	341.9
24-Mar	350	350	345	351	352	348	337	334	235	222	201	232	222	260	236	227	228	230	256	287	265	267	291	357	272.3
25-Mar	335	335	344	16	57	192	4	85	89	87	93	91	90	88	71	89	76	67	56	58	57	61	72	73	73.3
26-Mar	72	64	65	62	63	69	66	91	101	96	95	97	91	95	100	98	105	97	98	126	200	257	280	270	84.3
27-Mar	265	258	266	268	276	298	288	222	215	95	74	94	108	136	326	297	127	166	96	147	116	85	86	84	133.8
28-Mar	82	88	91	92	92	89	86	94	90	95	97	97	92	92	89	89	89	97	97	95	97	96	90	85	92.2
29-Mar	88	95	90	295	281	294	283	273	325	344	344	349	339	337	332	326	91	111	119	124	243	296	38	337	339.9
30-Mar	358	348	347	356	14	335	345	15	190	101	102	89	95	92	90	91	80	80	79	80	81	85	86	84	71.8
31-Mar	81	80	81	78	76	75	71	74	74	70	65	59	59	61	54	51	52	52	55	61	67	67	71	72	66.9
Diurnal Average	69.6	70.5	70.6	68.2	69.0	68.3	66.8	72.9	77.8	76.6	81.8	80.1	78.5	80.7	75.9	75.9	75.4	72.3	70.2	68.2	69.3	70.3	67.9	68.4	

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 (WD) - deg

Fort Chipewyan - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 87 deg on Mar 21 03:00

Minimum Value: 2 deg on Mar 9 21:00

Percentiles: $P_1 = 4$ $P_{10} = 5$ $Q_1 = 7$ Median = 9 $Q_3 = 17$ $P_{90} = 27$ $P_{99} = 72$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	7	7	9	7	6	6	6	6	6	7	7	5	4	4	6	6	10	8	6	5	5	10	5	4	10
2-Mar	4	4	5	6	4	5	4	4	6	4	6	7	4	4	10	15	37	34	19	18	16	18	16	16	37
3-Mar	12	11	15	16	17	15	15	14	16	16	19	19	19	17	18	19	19	19	18	18	19	16	15	15	19
4-Mar	15	15	16	15	13	12	13	15	16	18	17	24	21	17	26	21	22	14	17	17	22	22	23	18	26
5-Mar	16	15	14	16	12	14	15	11	20	17	17	24	28	24	15	21	16	27	11	19	20	45	35	12	45
6-Mar	DF	27	10	6	5	7	6	15	5	7	8	5	6	3	4	4	4	10	8	12	8	6	5	5	27
7-Mar	5	6	6	7	6	5	5	5	5	7	4	20	8	6	4	4	13	7	6	7	11	7	6	4	20
8-Mar	4	7	8	10	13	16	18	40	7	7	8	9	9	9	8	9	25	12	9	8	5	8	15	27	40
9-Mar	5	6	22	12	11	9	6	5	6	13	10	9	8	10	11	7	8	6	3	4	2	7	5	6	22
10-Mar	5	6	6	9	9	9	13	7	7	7	7	8	7	5	13	5	12	8	7	10	12	8	7	9	13
11-Mar	10	7	10	28	17	30	20	17	21	25	45	7	6	6	16	51	23	18	18	18	17	17	17	17	51
12-Mar	18	25	26	23	21	29	37	35	55	29	27	27	25	28	39	33	14	11	59	20	11	6	12	12	59
13-Mar	8	8	8	6	11	8	14	13	15	8	8	8	9	12	9	9	8	10	8	8	7	7	8	8	15
14-Mar	8	7	8	8	8	9	9	9	9	10	10	9	10	11	11	12	9	9	8	8	8	7	8	8	12
15-Mar	7	8	8	8	8	7	7	7	8	10	6	8	8	6	3	3	4	11	8	10	4	4	4	6	11
16-Mar	7	5	7	7	11	6	7	6	6	5	4	4	4	5	5	5	4	5	5	5	4	6	6	10	11
17-Mar	11	14	14	13	16	11	17	19	26	28	16	12	9	11	18	10	17	41	34	64	16	12	14	16	64
18-Mar	21	12	9	10	9	9	8	10	10	14	35	81	47	71	10	5	5	13	9	8	6	7	8	8	81
19-Mar	8	9	9	8	8	8	8	9	9	8	9	9	9	9	9	11	9	9	8	8	9	7	8	8	11
20-Mar	8	9	8	8	10	9	11	12	13	9	5	15	11	12	20	5	15	20	15	11	12	18	43	13	43
21-Mar	58	55	87	84	65	62	12	8	5	5	5	5	6	5	5	7	6	4	6	9	6	6	7	7	87
22-Mar	12	9	11	8	7	10	8	7	6	8	6	5	5	5	5	7	6	8	8	14	6	10	8	5	14
23-Mar	17	22	60	69	34	26	23	18	19	19	22	27	23	25	24	25	20	25	24	17	16	17	16	15	69
24-Mar	24	56	24	25	22	19	28	35	45	9	42	23	14	32	20	13	13	9	31	12	19	19	13	36	56
25-Mar	18	73	22	14	71	86	70	35	14	8	5	6	6	6	11	10	12	11	9	9	8	9	9	9	86
26-Mar	9	9	9	8	8	9	10	13	7	5	5	4	5	6	6	6	9	7	22	27	49	20	5	10	49
27-Mar	15	12	8	10	18	7	31	19	11	54	8	11	15	8	81	66	11	32	23	50	39	11	9	6	81
28-Mar	6	8	5	5	5	6	6	5	7	4	4	5	4	4	4	5	5	5	5	4	4	6	11	16	16
29-Mar	17	20	59	15	21	9	17	16	28	24	25	27	26	26	26	28	66	6	6	72	54	72	53	23	72
30-Mar	20	24	33	25	32	28	75	72	41	11	8	11	13	7	4	5	4	4	4	5	5	5	6	6	75
31-Mar	5	6	6	6	7	8	9	8	8	10	10	9	9	9	9	9	9	8	9	9	9	10	9	9	10
Diurnal Maximum	58	73	87	84	71	86	75	72	55	54	45	81	47	71	81	66	66	41	59	72	54	72	53	36	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Fort Chipewyan - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS09
BARGE LANDING
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	44.6	0	7.1	0
TRS(ppb) Average	708	36	36	100	2.9	0	1.2	0
THC(ppm) Average	546	36	198	78.23	3.6	-	2.4	-
NMHC(ppm) Average	546	36	198	78.23	0.87	-	0.134	-
CH4(ppm) Average	546	36	198	78.23	2.7	-	2.3	-
NO2 (ppb) Average	708	36	36	100	53.8	0	27.3	-
NO (ppb) Average	708	36	36	100	101.6	-	28.3	-
NOX (ppb) Average	708	36	36	100	142.4	-	52.7	-
PM2.5(ug/m3) Average	743	1	1	100	59.6	0	25.1	0
Temperature (C) Average	744	0	0	100	11.1	-	1.1	-
Relative Humidity (%) Average	744	0	0	100	89	-	82.7	-
Barometric Pressure (inHg) Average	744	0	0	100	29.7	-	29.7	-
Wind Speed 20 m (km/h) Average	742	0	2	99.73	23	-	14	-
Wind Direction 20 m (deg) Average	742	0	2	99.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	1.75	5	-	0	0	0.1	0.2	0.8	4.1	44.6
TRS(ppb) Average	708	0.46	0.4	-	0.2	0.2	0.3	0.3	0.5	0.9	2.9
THC(ppm) Average	546	2.1	0.2	-	1.8	1.9	2	2	2.2	2.3	3.6
NMHC(ppm) Average	546	0.023	0.066	-	0	0	0	0	0	0.1	0.87
CH4(ppm) Average	546	2.08	0.1	-	1.8	1.9	2	2	2.1	2.3	2.7
NO2 (ppb) Average	708	15.39	10.7	-	0.4	3.3	6.5	13	22.6	31.1	53.8
NO (ppb) Average	708	6.96	14.3	-	0	0.1	0.3	1.6	6.1	16.9	101.6
NOX (ppb) Average	708	22.35	22.1	-	0.4	3.8	7.9	15.9	28.2	47.3	142.4
PM2.5(ug/m3) Average	743	9.85	8.2	-	0.4	3.6	4.5	7	12	20.5	59.6
Temperature (C) Average	744	-9.58	7.2	-	-31.1	-18.8	-13.9	-9.4	-4.7	-0.9	11.1
Relative Humidity (%) Average	744	65.46	13.5	-	26	45.8	56.1	67.8	76	81.9	89
Barometric Pressure (inHg) Average	744	29.06	0.3	-	28	28.7	28.9	29	29.3	29.5	29.7
Wind Speed 20 m (km/h) Average	742	10.2	4	-	1	4	7	10	14	16	23
Wind Direction 20 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	08 Mar 2023 16:00	09 Mar 2023 01:00	10	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	09 Mar 2023 03:00	10 Mar 2023 02:00	24	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	10 Mar 2023 04:00	10 Mar 2023 11:00	8	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	10 Mar 2023 12:00	10 Mar 2023 14:00	3	Maintenance - retention time adjusted
THC/NMHC/CH4	18 Mar 2023 06:00	19 Mar 2023 05:00	24	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	19 Mar 2023 07:00	20 Mar 2023 00:00	18	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	20 Mar 2023 02:00	20 Mar 2023 09:00	8	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	20 Mar 2023 10:00	20 Mar 2023 13:00	4	Maintenance - retention time adjusted
THC/NMHC/CH4	20 Mar 2023 17:00	20 Mar 2023 17:00	1	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	25 Mar 2023 13:00	26 Mar 2023 00:00	12	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	26 Mar 2023 02:00	26 Mar 2023 18:00	17	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	27 Mar 2023 03:00	28 Mar 2023 11:00	33	Analyzer Failure - inconsistent response
Wind Speed, Wind Direction	05 Mar 2023 23:00	06 Mar 2023 00:00	2	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 44.6 ppb on Mar 16 14:00

Maximum Daily Average: 7.1 ppb on Mar 22

Minimum Value: 0.0 ppb on Mar 4 21:00

Maximum Diurnal Average: 5.6 ppb at hour 12

Monthly Average: 1.75 ppb

Minimum Daily Average: 0.0 ppb on Mar 30

Minimum Diurnal Average: 0.2 ppb at hour 4

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.2 Q_3 = 0.8 P_{90} = 4.1 P_{99} = 26.2

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	0.8	0.9	0.6	0.7	0.8	0.8	0.9	1.3	1.7	1.1	14.6	20.7	8.5	11.0	3.5	2.1	0.9	0.6	0.4	0.4	0.7	0.9	1.6	3.3	20.7
2-Mar	2.5	Z	1.7	1.8	1.5	3.5	5.0	3.6	3.2	4.6	4.7	4.2	2.9	1.4	0.9	0.7	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	1.9	5.0
3-Mar	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2
4-Mar	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	1.3	0.1	0.0	0.1	0.8	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	1.3
5-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.3
6-Mar	0.1	0.2	0.3	0.2	0.4	0.3	0.0	0.4	0.1	1.4	3.1	24.8	27.7	8.2	Z	10.8	3.2	0.9	0.4	0.3	0.2	0.2	0.1	0.1	3.6	27.7
7-Mar	0.0	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.7	1.6	2.1	2.4	1.8	1.7	0.9	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.5	2.4
8-Mar	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	8.0	26.2	26.6	13.2	1.4	0.7	1.5	1.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	3.5	26.6
9-Mar	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.1	3.1	23.6	35.3	16.9	2.7	6.5	2.1	0.4	0.9	0.2	0.2	0.2	0.2	0.1	0.2	0.2	4.1	35.3
10-Mar	0.2	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.6	1.7	C	C	C	1.1	0.6	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.3	1.7
11-Mar	0.1	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.2	1.2	1.4	1.3	1.2	1.7	1.6	1.5	1.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.6	1.7
12-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.3
13-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
14-Mar	Z	0.2	0.2	0.1	0.1	0.1	0.3	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	0.0	0.0	0.0	0.0	0.1	0.3
15-Mar	0.1	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.2	0.5
16-Mar	0.4	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.6	0.8	5.3	12.1	18.3	44.6	37.5	7.7	8.1	11.0	7.3	1.7	0.7	0.6	0.4	0.3	6.9	44.6
17-Mar	0.3	0.2	0.3	Z	0.8	1.1	1.4	0.7	1.8	4.5	18.1	22.5	34.1	29.0	19.2	8.1	4.5	2.4	1.6	0.9	1.3	1.2	0.4	0.6	6.7	34.1
18-Mar	0.6	0.6	0.5	0.4	Z	0.8	0.8	1.0	1.3	1.1	1.8	2.0	2.1	1.5	1.3	1.5	1.3	1.4	1.0	0.3	0.3	0.1	0.1	0.0	0.9	2.1
19-Mar	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	1.2	11.3	4.8	1.0	1.0	1.4	1.5	1.6	0.9	0.3	0.1	0.0	0.0	0.0	0.0	1.1	11.3
20-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2
21-Mar	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.5	7.0	20.6	25.8	17.1	5.4	2.0	0.7	0.3	0.2	3.5	25.8
22-Mar	0.1	0.1	Z	0.2	0.2	0.2	0.5	0.5	1.1	8.8	12.6	19.3	16.3	23.9	18.6	21.5	20.4	9.1	4.2	2.6	1.4	1.1	0.8	0.6	7.1	23.9
23-Mar	0.5	0.8	0.6	Z	0.9	1.6	1.1	1.4	3.2	1.7	1.3	1.0	0.6	0.6	0.4	0.4	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.8	3.2
24-Mar	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.1	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.6	3.8	12.1	11.2	8.2	0.9	0.3	0.2	1.8	12.1
25-Mar	0.1	0.0	0.1	0.1	0.1	Z	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
26-Mar	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2
27-Mar	0.2	Z	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.3	1.1	3.0	7.4	8.9	5.6	0.5	0.0	0.0	0.0	0.0	0.0	1.3	8.9
28-Mar	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.6	5.4	12.0	12.9	13.3	9.3	7.8	5.4	6.8	5.0	2.4	4.0	4.6	4.4	3.8	2.9	4.4	13.3
29-Mar	2.1	2.0	2.3	Z	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.3
30-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
31-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2
	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.3	0.6	2.2	4.6	5.6	5.3	4.8	3.7	2.6	2.7	2.2	1.6	0.9	0.7	0.4	0.3	0.3	Diurnal Average	
	2.5	2.0	2.3	1.8	1.5	3.5	5.0	3.6	3.2	23.6	35.3	26.6	34.1	44.6	37.5	21.5	20.6	25.8	17.1	11.2	8.2	4.4	3.8	2.9	Diurnal Maximum	

Z - zerospan C - Calibration

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Barge Landing - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	672	94.65	94.65
11 - 20	22	3.10	97.75
21 - 60	16	2.25	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Barge Landing - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	63	128	57	24	6	13	80	115	36	7	9	18	7	12	19	76	670
11 - 20	0	0	0	0	0	1	0	10	10	0	0	0	0	1	0	0	22
21 - 60	0	0	0	0	0	0	0	2	10	4	0	0	0	0	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	63	128	57	24	6	14	80	127	56	11	9	18	7	13	19	76	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Barge Landing

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.9 ppb on Mar 1 13:00 Maximum Daily Average: 1.2 ppb on Mar 1

Minimum Value: 0.2 ppb on Mar 23 23:00 Minimum Daily Average: 0.2 ppb on Mar 20

Maximum Diurnal Average: 0.6 ppb at hour 10 Minimum Diurnal Average: 0.4 ppb at hour 24

Monthly Average: 0.46 ppb Percentiles: P_1 = 0.2 P_{10} = 0.2 Q_1 = 0.3 Median = 0.3 Q_3 = 0.5 P_{90} = 0.9 P_{99} = 1.8

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.8	Z	1.6	1.4	1.4	1.5	1.6	1.8	2.0	1.9	1.6	2.3	2.9	0.8	1.7	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.5	1.2	2.9
2-Mar	0.9	0.7	Z	0.5	0.5	1.2	1.2	1.4	1.4	1.4	1.1	1.2	1.0	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.7	1.4
3-Mar	0.4	0.4	0.3	Z	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4
4-Mar	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
5-Mar	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.5	0.5	0.3	0.5
6-Mar	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.6	0.4	1.1	1.2	1.4	1.3	0.9	1.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	1.4
7-Mar	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
8-Mar	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.4	0.7	1.0	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	1.0
9-Mar	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.3	1.3	1.3	1.3	1.0	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	1.3
10-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
11-Mar	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.3	0.4	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	0.4
12-Mar	0.4	0.3	0.3	0.3	0.3	Z	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
13-Mar	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4
14-Mar	0.3	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	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15-Mar	0.3	0.3	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	0.4	0.3	0.3	0.4	0.4	0.4	0.6	0.5	0.6	0.4	0.6
16-Mar	0.5	0.4	0.3	Z	0.5	0.5	0.6	0.4	0.7	0.5	0.7	1.0	0.9	1.0	1.2	0.8	0.7	0.9	0.6	0.4	0.3	0.2	0.2	0.2	0.6	1.2
17-Mar	0.4	0.5	0.6	0.9	Z	0.9	1.1	0.8	1.1	1.2	2.4	1.1	1.8	2.5	1.8	0.8	0.6	0.6	0.7	0.7	0.7	0.8	1.0	0.8	1.0	2.5
18-Mar	0.9	0.7	0.5	0.5	0.9	Z	1.2	1.2	1.2	0.7	0.7	0.7	0.6	0.5	0.3	0.4	0.4	0.6	0.8	0.5	0.4	0.4	0.3	0.3	0.6	1.2
19-Mar	Z	0.3	0.4	0.5	0.4	0.5	0.6	0.6	0.5	0.5	0.7	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.7
20-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.5
21-Mar	0.3	0.3	Z	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.8	1.2	1.3	1.5	0.9	1.0	1.0	0.8	0.5	0.6	1.5
22-Mar	0.3	0.4	0.4	Z	0.6	0.6	1.2	1.3	0.8	1.8	0.8	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.2	0.2	0.2	0.6	1.8
23-Mar	0.3	0.8	0.9	0.8	Z	1.7	1.8	1.8	2.0	C	C	C	C	C	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.7	2.0
24-Mar	0.2	0.2	0.3	0.2	0.3	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.8	1.6	1.2	0.4	0.5	0.5	0.4	1.6
25-Mar	Z	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6
26-Mar	0.3	Z	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
27-Mar	0.3	0.4	Z	0.3	0.4	0.4	0.5	0.4	0.7	0.8	0.6	0.5	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.5	0.3	0.5	0.5	0.4	0.4	0.8
28-Mar	0.4	0.4	0.4	Z	0.5	0.7	0.6	0.6	1.3	1.6	1.3	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.7	1.2	0.6	0.6	0.8	0.9	0.7	1.6
29-Mar	0.7	0.9	1.0	1.0	Z	0.9	0.8	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	1.0
30-Mar	0.3	0.4	0.3	0.4	0.5	Z	0.6	0.5	0.5	0.7	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.4	0.7
31-Mar	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4
	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
	0.9	0.9	1.6	1.4	1.4	1.7	1.8	1.8	2.0	1.9	2.4	2.3	2.9	2.5	1.8	0.8	1.2	1.3	1.5	1.6	1.2	1.0	1.0	0.9	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Barge Landing - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	99.72	99.72
3 - 4	2	0.28	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Barge Landing - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	62	127	54	24	6	15	81	129	53	10	9	18	6	12	19	79	704
3 - 4	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	127	54	24	6	15	81	130	54	10	9	18	6	12	19	79	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Barge Landing

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - March 2023

Maximum Value: 3.6 ppm on Mar 15 22:00

Maximum Daily Average: 2.4 ppm on Mar 15

Minimum Value: 1.8 ppm on Mar 26 19:00

Minimum Daily Average: 1.9 ppm on Mar 7

Maximum Diurnal Average: 2.2 ppm at hour 6

Minimum Diurnal Average: 2.0 ppm at hour 14

Monthly Average: 2.10 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} = 2.8

Hours in Service:	744
Hours of Data:	546
Hours of Missing Data:	198
Hours of Calibration:	36
Percent Operational Time:	78.2

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	2.6	2.5	2.4	2.3	2.5	2.5	2.5	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	2.0	2.0	2.1	2.2	2.6
2-Mar	2.1	Z	2.0	2.0	2.0	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
3-Mar	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.2
4-Mar	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.2	2.3	2.4	2.1	2.1	2.4
5-Mar	2.3	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.0	2.3
6-Mar	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2
7-Mar	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
8-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.0
9-Mar	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
10-Mar	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.0	--	2.2
11-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
12-Mar	2.0	2.0	2.0	2.1	Z	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.3
13-Mar	2.2	2.1	2.1	2.3	2.3	Z	2.5	2.4	2.2	2.2	2.5	2.3	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.0	2.2	2.3	2.5	2.2	2.5
14-Mar	Z	2.2	2.3	2.1	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.9	2.0	2.2	2.2	2.3	2.3	2.2	2.3
15-Mar	2.1	Z	2.0	2.3	2.7	2.3	2.1	2.0	2.0	2.2	2.2	2.1	2.1	2.1	2.3	2.5	2.3	2.1	2.4	2.6	2.5	3.6	3.4	3.4	2.4	3.6
16-Mar	2.5	2.2	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	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.5
17-Mar	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.6	2.5	2.3	2.1	2.6
18-Mar	2.2	2.1	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.2
19-Mar	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
20-Mar	Z	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	2.0	2.0	2.0	UO	2.0	2.0	2.0	2.1	2.2	2.1	2.3	--	2.3
21-Mar	2.2	Z	2.0	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.3	2.4	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	2.4
22-Mar	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
23-Mar	2.0	2.3	2.3	Z	2.2	2.5	2.5	2.5	2.5	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	1.9	2.0	2.1	2.5
24-Mar	2.0	2.2	2.3	2.3	Z	2.4	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.2	2.1	2.4
25-Mar	2.2	2.2	2.1	2.1	2.2	Z	2.3	2.2	2.1	2.7	2.8	2.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.8
26-Mar	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.8	1.9	2.0	2.1	2.1	2.0	--	2.1
27-Mar	1.9	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	1.9
28-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.1	2.5	2.4	--	2.5
29-Mar	2.2	2.3	2.2	Z	2.3	2.4	2.5	2.4	2.3	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	2.3	2.2	2.5
30-Mar	2.3	2.3	2.2	2.3	Z	2.9	2.5	2.8	2.7	2.4	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.2	2.0	2.1	2.1	2.3	2.3	2.1	2.3	2.9
31-Mar	2.1	2.1	2.2	2.1	2.1	Z	2.0	2.1	2.3	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.5
	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	Diurnal Average	
	2.5	2.6	2.5	2.4	2.7	2.9	2.5	2.8	2.7	2.7	2.8	2.4	2.2	2.2	2.3	2.5	2.3	2.2	2.4	2.6	2.5	3.6	3.4	3.4	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Barge Landing - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	275	50.37	50.37
2.1 - 3.0	268	49.08	99.45
3.1 - 10.0	3	0.55	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 546

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Barge Landing - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	6	54	25	14	3	6	43	62	19	2	2	7	3	5	5	19	275
2.1 - 3.0	47	47	17	9	1	1	7	29	24	6	5	8	4	6	11	44	266
3.1 - 10.0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	101	42	23	5	7	50	91	43	8	7	15	7	11	16	64	544

Total Number of Valid Hours: 544

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Barge Landing

Total Number of Valid Hours: 544

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing - March 2023

Maximum Value: 0.870 ppm on Mar 15 22:00

Maximum Daily Average: 0.134 ppm on Mar 15

Minimum Value: 0.000 ppm on Mar 1 13:00

Minimum Daily Average: 0.000 ppm on Mar 7

Maximum Diurnal Average: 0.059 ppm at hour 22

Minimum Diurnal Average: 0.004 ppm at hour 19

Monthly Average: 0.023 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.1 P_{99} = 0.2

Hours in Service:	744
Hours of Data:	546
Hours of Missing Data:	198
Hours of Calibration:	36
Percent Operational Time:	78.2

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.109	0.097	0.039	0.025	0.034	0.033	0.020	0.018	0.012	0.012	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.109
2-Mar	0.000	Z	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.003	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.007
3-Mar	0.004	0.005	Z	0.000	0.000	0.000	0.000	0.005	0.000	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.001	0.000	0.001	0.001	0.005
4-Mar	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
5-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
6-Mar	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	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
7-Mar	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
8-Mar	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	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.001
9-Mar	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
10-Mar	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	--	0.005
11-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.012	0.008	0.014	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.020
12-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.032
13-Mar	0.000	0.000	0.000	0.002	0.016	Z	0.021	0.060	0.008	0.000	0.021	0.005	0.000	0.002	0.001	0.000	0.000	0.000	0.001	0.020	0.001	0.037	0.002	0.009	0.009	0.060
14-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.014	0.030	0.001	0.000	0.000	0.000	0.005	0.076	0.000	0.000	0.018	0.102	0.178	0.154	0.088	0.039	0.052	0.124	0.870	0.638	0.683	0.134	0.870
16-Mar	0.240	0.106	Z	0.041	0.028	0.024	0.029	0.005	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.022	0.240
17-Mar	0.040	0.036	0.043	Z	0.000	0.000	0.009	0.077	0.037	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.009	0.006	0.050	0.113	0.100	0.081	0.026	0.113
18-Mar	0.065	0.025	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.065
19-Mar	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
20-Mar	Z	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	0.000	0.000	0.000	UO	0.000	0.000	0.000	0.000	0.069	0.050	0.134	--	0.134
21-Mar	0.068	Z	0.009	0.101	0.095	0.056	0.010	0.001	0.000	0.000	0.032	0.069	0.000	0.000	0.000	0.000	0.032	0.068	0.013	0.000	0.002	0.024	0.066	0.052	0.030	0.101
22-Mar	0.000	0.000	Z	0.022	0.005	0.021	0.004	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.022
23-Mar	0.003	0.081	0.079	Z	0.031	0.099	0.087	0.070	0.094	0.122	0.018	0.007	0.009	0.001	0.000	0.001	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.122
24-Mar	0.000	0.000	0.000	0.021	Z	0.277	0.018	0.000	0.000	0.049	0.079	0.092	0.049	0.056	0.025	0.000	0.000	0.000	0.000	0.000	0.038	0.084	0.016	0.083	0.038	0.277
25-Mar	0.067	0.064	0.039	0.043	0.063	Z	0.084	0.055	0.048	0.223	0.247	0.135	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.247
26-Mar	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.000	0.000	0.000	0.081	0.166	0.049	--	0.166
27-Mar	0.011	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.011
28-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	C	0.000	0.000	0.000	0.000	0.057	0.154	0.143	--	0.154
29-Mar	0.070	0.084	0.057	Z	0.053	0.090	0.137	0.114	0.077	0.049	0.023	0.018	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.027	0.008	0.033	0.078	0.073	0.043	0.137
30-Mar	0.067	0.109	0.061	0.082	Z	0.212	0.120	0.204	0.201	0.096	0.010	0.011	0.017	0.037	0.001	0.046	0.062	0.051	0.016	0.037	0.070	0.109	0.057	0.013	0.073	0.212
31-Mar	0.007	0.020	0.013	0.007	0.008	Z	0.000	0.001	0.043	0.076	0.023	0.003	0.002	0.000	0.000	0.016	0.013	0.024	0.015	0.031	0.018	0.000	0.000	0.000	0.014	0.076
	0.029	0.030	0.019	0.020	0.019	0.043	0.024	0.028	0.023	0.028	0.024	0.015	0.006	0.006	0.006	0.011	0.012	0.011	0.004	0.007	0.013	0.059	0.053	0.053	Diurnal Average	
	0.240	0.109	0.097	0.101	0.095	0.277	0.137	0.204	0.201	0.223	0.247	0.135	0.049	0.056	0.102	0.178	0.154	0.088	0.039	0.052	0.124	0.870	0.638	0.683	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	368	67.40	67.40
0.006 - 0.05	102	18.68	86.08
0.06 - 0.1	62	11.36	97.44
> 0.1	14	2.56	100.00

Total Number of Valid Hours: 546

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	37	72	23	11	3	6	42	73	22	4	7	10	4	8	5	39	366
0.006 - 0.05	10	20	11	7	1	0	5	9	16	1	0	1	1	0	4	16	102
0.06 - 0.1	4	7	7	4	0	1	3	7	4	2	0	3	2	3	7	8	62
> 0.1	3	2	1	1	1	0	0	2	1	1	0	1	0	0	0	1	14
Totals	54	101	42	23	5	7	50	91	43	8	7	15	7	11	16	64	544

Total Number of Valid Hours: 544

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing

Total Number of Valid Hours: 544

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.7 ppm on Mar 15 22:00

Maximum Daily Average: 2.3 ppm on Mar 15

Minimum Value: 1.8 ppm on Mar 26 19:00

Maximum Diurnal Average: 2.2 ppm at hour 6

Monthly Average: 2.08 ppm

Minimum Daily Average: 1.9 ppm on Mar 7

Minimum Diurnal Average: 2.0 ppm at hour 17

Percentiles: P_1 = 1.9 P_{10} = 1.9 Q_1 = 2.0 Median = 2.0 Q_3 = 2.1 P_{90} = 2.3 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	546
Hours of Missing Data:	198
Hours of Calibration:	36
Percent Operational Time:	78.2

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	2.5	2.4	2.3	2.3	2.4	2.4	2.5	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	2.0	2.0	2.1	2.2	2.5
2-Mar	2.1	Z	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
3-Mar	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.2
4-Mar	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.2	2.3	2.4	2.1	2.1	2.4
5-Mar	2.3	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.0	2.3
6-Mar	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2
7-Mar	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
8-Mar	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.0
9-Mar	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
10-Mar	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.0	--	2.2
11-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
12-Mar	2.0	2.0	2.0	2.1	Z	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.3
13-Mar	2.2	2.1	2.1	2.3	2.3	Z	2.4	2.3	2.2	2.2	2.5	2.3	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.0	2.2	2.3	2.5	2.2	2.5
14-Mar	Z	2.2	2.3	2.1	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.9	2.0	2.2	2.2	2.3	2.3	2.2	2.3
15-Mar	2.1	Z	2.0	2.3	2.6	2.3	2.1	2.0	2.0	2.2	2.2	2.1	2.1	2.0	2.2	2.3	2.1	2.1	2.4	2.5	2.4	2.7	2.7	2.7	2.3	2.7
16-Mar	2.3	2.1	Z	2.0	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	2.1	2.0	2.0	2.0	2.0	2.3
17-Mar	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.4	2.2	2.1	2.5
18-Mar	2.2	2.1	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.2
19-Mar	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
20-Mar	Z	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	2.0	2.0	2.0	UO	2.0	2.0	2.0	2.1	2.1	2.1	2.1	--	2.1
21-Mar	2.2	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.3	2.4	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	2.4
22-Mar	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
23-Mar	2.0	2.2	2.2	Z	2.2	2.4	2.4	2.4	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	1.9	2.0	2.1	2.4
24-Mar	2.0	2.2	2.3	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.3
25-Mar	2.1	2.1	2.1	2.1	2.2	Z	2.2	2.1	2.1	2.4	2.5	2.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.5
26-Mar	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.8	1.9	2.0	2.0	1.9	1.9	--	2.0
27-Mar	1.9	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	1.9
28-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.3	2.3	--	2.3
29-Mar	2.1	2.2	2.2	Z	2.2	2.3	2.4	2.3	2.2	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.2	2.4
30-Mar	2.2	2.2	2.2	2.3	Z	2.6	2.4	2.6	2.5	2.3	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.2	2.1	2.2	2.6
31-Mar	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.1	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.4
	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	Diurnal Average	
	2.3	2.5	2.4	2.3	2.6	2.6	2.4	2.6	2.5	2.4	2.5	2.4	2.2	2.2	2.2	2.3	2.1	2.2	2.4	2.5	2.4	2.7	2.7	2.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Barge Landing - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	294	53.85	53.85
2.1 - 3.0	252	46.15	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 546

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Barge Landing - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	6	58	27	17	3	6	43	66	22	2	2	7	3	6	6	20	294
2.1 - 3.0	48	43	15	6	2	1	7	25	21	6	5	8	4	5	10	44	250
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	101	42	23	5	7	50	91	43	8	7	15	7	11	16	64	544

Total Number of Valid Hours: 544

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Barge Landing

Total Number of Valid Hours: 544

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Barge Landing - March 2023

Maximum Value: 101.6 ppb on Mar 1 06:00

Maximum Daily Average: 28.3 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 2 19:00

Minimum Daily Average: 0.5 ppb on Mar 10

Maximum Diurnal Average: 16.3 ppb at hour 8

Minimum Diurnal Average: 2.2 ppb at hour 18

Monthly Average: 6.96 ppb

Percentiles: $P_1 = 0.0$ $P_{10} = 0.1$ $Q_1 = 0.3$ Median = 1.6 $Q_3 = 6.1$ $P_{90} = 16.9$ $P_{99} = 75.2$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	38.7	57.8	55.8	58.1	Z	101.6	93.8	64.6	45.5	47.8	30.4	18.2	15.4	5.7	5.2	2.5	2.7	1.6	0.8	3.5	0.4	0.3	0.1	0.0	28.3	101.6
2-Mar	0.1	0.2	0.3	0.2	0.1	Z	0.3	1.1	1.8	3.3	3.3	3.2	3.0	1.9	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.3
3-Mar	Z	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.7	1.8	2.0	2.7	2.5	3.5	5.1	2.5	2.1	2.2	8.7	0.1	0.1	0.1	0.0	0.1	1.5	8.7
4-Mar	0.1	Z	0.0	0.0	0.0	0.5	0.3	0.7	3.8	2.8	0.9	0.2	0.2	1.6	1.2	4.5	3.5	1.4	0.2	0.5	1.4	12.3	13.9	0.7	2.2	13.9
5-Mar	0.4	1.8	Z	5.9	5.4	12.1	1.7	0.3	0.2	0.6	4.9	8.4	5.5	5.8	2.8	2.2	1.7	0.7	2.4	4.6	16.5	27.9	56.4	45.8	9.3	56.4
6-Mar	24.8	40.7	67.3	53.0	75.4	72.1	26.7	94.0	11.1	32.5	36.0	25.7	Z	9.3	9.3	7.0	1.9	0.7	0.3	0.3	0.3	0.1	0.1	0.2	25.6	94.0
7-Mar	0.1	0.1	0.2	Z	0.2	0.4	0.5	0.7	1.1	1.4	2.1	2.4	1.8	1.4	1.5	0.9	0.5	0.2	0.1	0.2	0.9	0.1	0.0	0.0	0.7	2.4
8-Mar	0.0	0.0	0.0	0.0	Z	1.0	3.4	5.0	2.7	6.5	11.5	14.6	8.4	2.0	2.1	1.3	1.0	0.5	1.0	0.8	0.7	0.1	0.1	0.1	2.7	14.6
9-Mar	0.0	0.0	6.6	1.5	9.4	Z	11.2	15.9	11.7	18.1	17.9	13.0	4.0	3.8	2.5	1.5	1.3	0.5	0.3	0.4	0.2	0.2	0.1	0.1	5.2	18.1
10-Mar	Z	0.0	0.0	0.1	0.1	0.3	0.4	0.6	0.7	0.9	1.6	1.8	0.9	1.3	1.0	0.6	0.3	0.3	0.1	0.0	0.1	0.1	0.1	0.0	0.5	1.8
11-Mar	0.0	Z	0.1	0.7	0.1	0.2	0.7	5.5	6.8	2.5	3.1	2.5	3.9	5.0	5.8	4.2	4.7	0.7	0.1	0.1	0.1	0.0	0.1	0.0	2.1	6.8
12-Mar	0.0	0.0	Z	0.1	0.1	0.1	0.7	2.2	2.1	3.3	3.7	4.4	5.4	5.9	3.7	3.0	1.3	0.6	0.6	0.2	0.3	0.5	1.2	0.5	1.7	5.9
13-Mar	0.1	0.1	0.2	Z	7.1	10.1	23.9	25.2	12.4	21.2	21.9	17.4	10.9	4.9	6.1	6.6	2.8	2.5	1.5	2.2	0.7	1.4	1.9	3.5	8.0	25.2
14-Mar	0.5	0.2	0.2	0.2	Z	0.2	0.5	1.5	1.7	2.4	2.2	4.7	5.5	4.5	2.9	3.2	1.5	0.5	0.1	0.0	0.1	0.1	0.1	0.1	1.4	5.5
15-Mar	0.1	0.1	0.1	2.5	10.6	Z	1.3	3.0	10.9	23.0	C	C	C	C	C	22.9	7.1	5.1	16.9	45.8	59.0	86.8	68.3	94.0	25.4	94.0
16-Mar	Z	18.7	0.5	1.1	0.4	0.6	5.1	6.2	11.8	7.2	6.4	10.8	11.8	17.3	13.5	4.4	3.5	3.3	1.0	3.8	3.7	0.2	0.2	0.3	5.7	18.7
17-Mar	0.3	Z	7.6	3.2	3.5	9.9	6.0	14.1	14.1	11.7	15.3	11.0	13.6	13.6	8.0	3.8	2.5	1.8	3.6	7.2	4.4	2.5	0.2	0.8	6.9	15.3
18-Mar	1.9	0.9	Z	0.6	4.3	6.3	15.6	9.5	6.4	4.6	4.0	3.4	2.8	2.1	0.7	2.4	4.7	25.6	52.7	12.3	10.9	14.5	7.1	2.8	8.5	52.7
19-Mar	0.7	0.6	11.8	Z	0.4	0.1	19.6	25.8	11.7	9.1	8.8	6.0	2.5	5.4	7.0	4.7	4.5	1.6	0.3	0.1	0.0	0.0	0.0	0.0	5.3	25.8
20-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.5	0.6	0.4	0.3	2.7	5.5	2.2	1.6	1.1	2.4	1.4	1.2	0.3	0.1	0.1	0.1	0.1	0.2	0.9	5.5
21-Mar	0.2	0.3	0.1	0.1	0.1	Z	1.1	12.9	3.6	2.9	19.7	26.7	2.4	2.5	2.7	4.1	8.8	7.9	3.2	4.5	3.3	1.0	2.9	4.3	5.0	26.7
22-Mar	Z	1.3	0.7	0.3	10.6	2.9	56.3	56.4	8.6	11.6	4.7	5.2	4.5	6.4	4.5	4.1	3.3	1.7	0.7	16.2	1.3	1.0	1.0	1.1	8.9	56.4
23-Mar	1.7	Z	1.2	2.0	1.2	0.3	14.3	15.0	21.1	6.4	2.0	1.4	1.3	1.9	1.6	1.5	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0	3.2	21.1
24-Mar	0.0	0.0	Z	0.4	1.5	0.7	10.4	7.3	7.5	5.4	5.8	9.0	6.0	2.5	2.2	1.6	1.3	0.7	0.6	0.1	5.6	2.1	0.5	0.3	3.1	10.4
25-Mar	0.1	9.5	23.0	Z	16.8	10.4	7.9	10.4	10.8	35.9	40.2	7.6	2.9	1.6	1.4	1.2	0.7	0.4	0.2	0.0	0.0	0.1	0.0	0.1	7.9	40.2
26-Mar	0.4	0.5	0.0	0.1	Z	0.1	0.4	1.0	9.0	12.9	11.1	9.7	4.1	3.9	3.5	1.7	1.2	0.7	0.2	0.2	4.2	6.8	0.0	0.8	3.2	12.9
27-Mar	1.0	4.4	6.4	0.1	28.1	Z	48.1	32.0	42.4	30.0	8.6	3.8	1.3	1.3	1.5	1.8	1.8	0.9	0.6	0.2	0.4	0.1	0.1	0.0	9.3	48.1
28-Mar	Z	0.1	0.4	9.7	36.3	78.7	55.7	34.1	37.6	30.2	11.9	5.8	4.4	3.5	2.7	1.8	1.3	0.8	0.2	0.1	0.1	0.2	0.1	0.1	13.7	78.7
29-Mar	0.2	Z	0.1	0.3	14.6	1.1	16.6	10.5	3.3	4.2	6.1	5.2	2.0	0.6	0.5	0.5	0.6	0.3	0.2	0.1	0.0	1.2	8.2	13.1	3.9	16.6
30-Mar	5.4	15.9	Z	11.1	41.6	58.7	80.1	47.7	39.9	29.0	6.0	6.9	5.3	2.6	1.8	1.6	1.5	0.6	0.2	0.1	0.1	0.1	0.1	0.0	15.5	80.1
31-Mar	0.2	0.4	1.3	Z	0.6	0.1	0.2	1.5	7.5	17.0	7.6	11.1	7.2	4.2	3.0	2.7	1.8	1.3	0.4	0.1	0.0	0.0	0.0	0.0	3.0	17.0
	3.0	5.9	7.1	5.8	10.3	14.2	16.2	16.3	11.3	12.5	10.1	8.3	4.9	4.3	3.5	3.3	2.3	2.2	3.2	3.3	3.7	5.2	5.3	5.5	Diurnal Average	
	38.7	57.8	67.3	58.1	75.4	101.6	93.8	94.0	45.5	47.8	40.2	26.7	15.4	17.3	13.5	22.9	8.8	25.6	52.7	45.8	59.0	86.8	68.3	94.0	Diurnal Maximum	

Z - zerospan C - Calibration

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Barge Landing - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	646	91.24	91.24
21 - 40	30	4.24	95.48
11 - 80	27	3.81	99.29
81 - 159	5	0.71	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Barge Landing - March 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	54	116	57	22	4	15	77	127	41	4	4	11	6	12	20	76	646
21 - 40	6	6	0	1	0	0	0	3	3	2	1	6	0	0	1	1	30
11 - 80	1	2	0	0	0	0	3	2	8	2	3	2	0	0	0	2	25
81 - 159	1	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0	5
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	124	57	23	5	15	80	132	54	8	9	19	6	12	21	79	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Barge Landing

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 53.8 ppb on Mar 18 19:00

Maximum Daily Average: 27.3 ppb on Mar 15

Minimum Value: 0.4 ppb on Mar 2 23:00

Maximum Diurnal Average: 23.4 ppb at hour 7

Monthly Average: 15.39 ppb

Minimum Daily Average: 3.8 ppb on Mar 7

Minimum Diurnal Average: 7.4 ppb at hour 15

Percentiles: P_1 = 0.7 P_{10} = 3.3 Q_1 = 6.5 Median = 13.0 Q_3 = 22.6 P_{90} = 31.1 P_{99} = 43.8

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	34.1	36.7	38.6	43.5	Z	40.8	41.9	36.0	29.1	27.0	20.6	17.6	16.4	9.1	9.9	8.3	12.1	13.8	13.4	19.9	4.9	4.3	5.4	8.4	21.4	43.5
2-Mar	11.2	12.2	9.7	8.5	9.7	Z	18.2	21.3	13.5	12.1	8.6	7.4	6.8	5.7	4.0	2.6	1.0	0.9	0.6	0.5	0.6	0.5	0.4	1.3	6.8	21.3
3-Mar	Z	15.8	6.2	4.9	4.4	6.7	4.3	6.0	6.6	7.6	5.9	6.3	5.6	7.8	10.6	7.8	9.9	18.0	28.7	10.4	7.6	6.2	6.9	6.5	8.7	28.7
4-Mar	8.2	Z	14.6	15.5	13.7	14.8	7.4	10.7	13.9	6.7	1.9	0.6	0.7	2.7	2.4	9.8	10.8	10.4	10.7	22.9	30.0	31.6	32.9	26.1	13.0	32.9
5-Mar	27.8	30.5	Z	27.1	23.6	20.5	10.8	2.3	0.9	1.1	5.3	8.6	6.4	7.1	4.7	4.8	6.3	9.0	20.0	28.1	31.5	31.4	31.1	30.8	16.1	31.5
6-Mar	28.9	26.7	29.3	31.7	31.1	31.0	26.6	30.2	11.4	18.1	19.7	18.2	Z	11.8	15.7	14.6	7.6	5.9	9.2	11.4	13.0	4.1	1.5	1.9	17.4	31.7
7-Mar	2.3	1.3	1.7	Z	1.6	2.4	2.9	3.2	3.3	4.7	5.6	6.0	4.5	3.9	4.3	3.5	2.6	3.5	4.7	8.4	11.0	1.8	2.2	3.0	3.8	11.0
8-Mar	2.9	3.7	4.8	4.6	Z	12.2	19.6	18.1	9.9	13.7	16.7	18.2	12.3	4.4	4.8	4.3	4.7	6.8	18.3	10.4	7.9	5.8	7.7	3.1	9.3	19.6
9-Mar	3.2	5.8	14.8	15.8	25.8	Z	27.1	25.5	21.0	22.4	20.1	15.7	7.0	7.1	5.5	4.0	5.0	3.5	3.1	2.5	1.5	1.0	1.0	0.7	10.4	27.1
10-Mar	Z	0.7	1.1	1.5	1.0	2.1	3.0	3.3	2.6	3.3	4.4	3.4	2.3	2.7	2.7	2.3	1.9	2.8	3.3	5.6	10.3	15.5	17.1	7.9	4.4	17.1
11-Mar	1.1	Z	9.0	15.0	13.0	13.9	20.5	22.6	17.1	6.6	6.5	5.2	6.8	9.2	12.0	12.6	15.7	7.1	7.6	9.0	10.6	7.3	11.3	11.1	10.9	22.6
12-Mar	11.1	9.5	Z	20.2	17.9	18.0	24.0	17.1	9.0	8.4	7.4	7.7	9.1	8.9	6.3	7.2	5.5	5.5	15.9	20.7	23.7	27.3	28.8	26.1	14.6	28.8
13-Mar	21.6	21.3	22.3	Z	27.6	31.5	33.3	31.1	20.9	22.4	20.2	17.0	12.5	7.7	10.5	14.2	10.7	17.2	27.0	27.4	14.0	21.1	31.8	34.1	21.6	34.1
14-Mar	25.4	23.5	23.9	19.3	Z	24.9	28.4	23.4	13.2	10.5	9.3	13.8	12.1	10.8	8.7	11.8	9.1	6.1	8.4	12.3	14.1	16.5	22.3	17.2	15.9	28.4
15-Mar	12.9	18.0	19.3	27.5	36.2	Z	22.2	14.9	16.4	19.5	C	C	C	C	C	22.0	14.6	19.9	37.0	40.9	41.5	44.4	42.2	42.0	27.3	44.4
16-Mar	Z	29.6	11.6	24.9	24.1	24.4	27.3	22.1	19.8	13.1	10.7	11.9	12.8	17.0	16.0	9.4	10.6	17.5	17.2	31.1	35.2	11.6	6.4	11.2	18.1	35.2
17-Mar	22.6	Z	34.8	33.1	32.8	34.1	30.5	28.4	21.6	16.5	18.9	15.5	18.8	19.2	15.7	11.6	12.2	17.2	30.1	34.5	26.8	22.8	17.4	21.6	23.3	34.8
18-Mar	25.0	18.8	Z	12.0	22.7	31.6	38.5	29.5	21.0	13.3	10.4	8.9	8.1	7.0	2.8	8.1	18.5	43.8	53.8	49.5	48.8	47.8	46.3	44.5	26.6	53.8
19-Mar	36.0	37.9	43.0	Z	34.6	23.4	33.2	30.2	20.7	15.3	14.9	11.4	6.5	11.9	15.8	13.6	15.9	15.5	11.8	2.4	1.3	1.2	0.9	0.9	17.3	43.0
20-Mar	2.3	1.8	1.1	1.2	Z	7.7	12.3	8.2	4.0	1.9	8.3	10.9	4.3	3.3	2.6	5.7	4.5	7.7	9.9	12.8	15.9	15.3	15.8	19.2	7.7	19.2
21-Mar	23.4	20.5	5.7	12.2	13.6	Z	19.2	18.1	11.9	7.4	21.2	21.9	4.0	4.4	5.2	8.9	21.4	27.6	32.7	30.9	22.1	19.8	31.2	33.0	18.1	33.0
22-Mar	Z	22.2	25.6	26.1	32.5	30.3	40.6	38.9	18.3	18.2	9.8	10.1	9.2	12.6	10.7	11.8	13.8	15.1	23.2	40.8	31.5	18.3	17.6	18.7	21.6	40.8
23-Mar	25.5	Z	31.8	29.8	26.7	24.1	34.0	32.4	31.0	14.1	6.4	4.6	4.0	4.9	5.2	5.6	4.0	5.5	5.4	8.6	14.3	10.5	1.5	5.8	14.6	34.0
24-Mar	10.6	16.1	Z	24.7	30.4	23.1	30.6	21.9	15.5	9.9	9.5	12.9	9.0	5.4	5.6	5.1	5.7	6.3	15.4	21.9	35.1	37.7	31.0	32.3	18.1	37.7
25-Mar	28.5	28.6	32.0	Z	31.4	27.8	22.9	17.5	15.2	27.1	29.7	12.0	6.2	4.1	3.9	4.1	3.5	3.1	7.4	7.5	9.2	18.8	15.1	21.7	16.4	32.0
26-Mar	27.5	27.1	21.1	21.7	Z	12.5	10.5	5.3	13.5	15.2	13.3	11.6	6.5	6.4	6.7	4.2	4.2	4.4	3.6	16.9	34.0	31.7	13.0	19.3	14.4	34.0
27-Mar	16.5	15.9	20.1	7.6	28.0	Z	33.3	30.6	28.4	23.5	11.5	7.0	3.2	3.3	3.8	4.9	6.4	6.8	13.2	18.2	26.6	15.2	25.1	23.3	16.2	33.3
28-Mar	Z	23.5	22.5	24.5	30.2	34.5	32.9	28.3	26.1	28.5	19.6	10.4	9.0	7.7	7.5	7.2	8.2	8.2	7.7	7.2	11.9	15.3	16.5	18.5	17.6	34.5
29-Mar	21.3	Z	16.6	12.7	27.4	18.4	25.8	18.3	15.4	17.0	18.0	16.9	8.5	4.3	3.3	3.2	3.8	3.6	5.6	6.4	18.7	21.7	32.5	32.9	15.3	32.9
30-Mar	25.4	28.6	Z	25.5	26.4	30.0	32.9	30.2	27.4	23.6	10.0	11.7	10.1	7.7	6.6	8.0	9.5	8.2	5.2	10.6	18.5	23.4	21.8	16.1	18.1	32.9
31-Mar	20.3	31.3	31.6	Z	28.3	19.0	10.6	14.2	24.3	25.6	15.1	16.4	11.8	8.3	7.2	7.8	7.4	9.6	10.8	15.7	14.2	1.5	2.6	5.6	14.7	31.6
	18.3	19.5	19.0	18.9	22.9	21.5	23.4	20.6	16.2	14.7	12.7	11.3	8.1	7.5	7.4	8.0	8.6	10.7	14.9	17.6	18.9	17.1	17.3	17.6	Diurnal Average	
	36.0	37.9	43.0	43.5	36.2	40.8	41.9	38.9	31.0	28.5	29.7	21.9	18.8	19.2	16.0	22.0	21.4	43.8	53.8	49.5	48.8	47.8	46.3	44.5	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Barge Landing - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	494	69.77	69.77
21 - 40	196	27.68	97.46
11 - 80	18	2.54	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Barge Landing - March 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	22	103	52	16	4	13	69	91	32	3	4	11	4	9	14	47	494
21 - 40	36	17	5	7	0	2	10	40	19	5	5	8	2	3	7	28	194
11 - 80	4	4	0	0	1	0	1	1	3	0	0	0	0	0	0	4	18
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	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	124	57	23	5	15	80	132	54	8	9	19	6	12	21	79	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Barge Landing

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Barge Landing - March 2023

Maximum Value: 142.4 ppb on Mar 1 06:00

Maximum Daily Average: 52.7 ppb on Mar 15

Minimum Value: 0.4 ppb on Mar 2 23:00

Minimum Daily Average: 4.6 ppb on Mar 7

Maximum Diurnal Average: 39.6 ppb at hour 7

Minimum Diurnal Average: 10.9 ppb at hour 15

Monthly Average: 22.35 ppb

Percentiles: P_1 = 0.8 P_{10} = 3.8 Q_1 = 7.9 Median = 15.9 Q_3 = 28.2 P_{90} = 47.3 P_{99} = 110.2

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	72.8	94.5	94.4	101.6	Z	142.4	135.7	100.6	74.6	74.8	51.0	35.8	31.8	14.8	15.1	10.8	14.8	15.4	14.2	23.4	5.3	4.6	5.5	8.4	49.7	142.4
2-Mar	11.3	12.4	10.0	8.7	9.8	Z	18.5	22.4	15.3	15.4	11.9	10.6	9.8	7.6	5.2	3.0	1.0	0.9	0.6	0.5	0.6	0.5	0.4	1.3	7.7	22.4
3-Mar	Z	15.9	6.2	5.0	4.5	6.8	4.5	6.3	7.3	9.4	7.9	9.0	8.1	11.3	15.7	10.3	12.0	20.2	37.4	10.5	7.7	6.3	6.9	6.6	10.3	37.4
4-Mar	8.3	Z	14.6	15.5	13.7	15.3	7.7	11.4	17.7	9.5	2.8	0.8	0.9	4.3	3.6	14.3	14.3	11.8	10.9	23.4	31.4	43.9	46.8	26.8	15.2	46.8
5-Mar	28.2	32.3	Z	33.0	29.0	32.6	12.5	2.6	1.1	1.7	10.2	17.0	11.9	12.9	7.5	7.0	8.0	9.7	22.4	32.7	48.0	59.3	87.5	76.6	25.4	87.5
6-Mar	53.7	67.4	96.6	84.7	106.5	103.1	53.3	124.2	22.5	50.6	55.7	43.9	Z	21.1	25.0	21.6	9.5	6.6	9.5	11.7	13.3	4.2	1.6	2.1	43.0	124.2
7-Mar	2.4	1.4	1.9	Z	1.8	2.8	3.4	3.9	4.4	6.1	7.7	8.4	6.3	5.3	5.8	4.4	3.1	3.7	4.8	8.6	11.9	1.9	2.2	3.0	4.6	11.9
8-Mar	2.9	3.7	4.8	4.6	Z	13.2	23.0	23.1	12.6	20.2	28.2	32.8	20.7	6.4	6.9	5.6	5.7	7.3	19.3	11.2	8.6	5.9	7.8	3.2	12.1	32.8
9-Mar	3.2	5.8	21.4	17.3	35.2	Z	38.3	41.4	32.7	40.5	38.0	28.7	11.0	10.9	8.0	5.5	6.3	4.0	3.4	2.9	1.7	1.2	1.1	0.8	15.6	41.4
10-Mar	Z	0.7	1.1	1.6	1.1	2.4	3.4	3.9	3.3	4.2	6.0	5.2	3.2	4.0	3.7	2.9	2.2	3.1	3.4	5.6	10.4	15.6	17.2	7.9	4.9	17.2
11-Mar	1.1	Z	9.1	15.7	13.1	14.1	21.2	28.1	23.9	9.1	9.6	7.7	10.7	14.2	17.8	16.8	20.4	7.8	7.7	9.1	10.7	7.3	11.4	11.1	13.0	28.1
12-Mar	11.1	9.5	Z	20.3	18.0	18.1	24.7	19.3	11.1	11.7	11.1	12.1	14.5	14.8	10.0	10.2	6.8	6.1	16.5	20.9	24.0	27.8	30.0	26.6	16.3	30.0
13-Mar	21.7	21.4	22.5	Z	34.7	41.6	57.2	56.3	33.3	43.6	42.1	34.4	23.4	12.6	16.6	20.8	13.5	19.7	28.5	29.6	14.7	22.5	33.7	37.6	29.7	57.2
14-Mar	25.9	23.7	24.1	19.5	Z	25.1	28.9	24.9	14.9	12.9	11.5	18.5	17.6	15.3	11.6	15.0	10.6	6.6	8.5	12.3	14.2	16.6	22.4	17.3	17.3	28.9
15-Mar	13.0	18.1	19.4	30.0	46.8	Z	23.5	17.9	27.3	42.5	C	C	C	C	C	44.9	21.7	25.0	53.9	86.7	100.5	131.2	110.5	136.0	52.7	136.0
16-Mar	Z	48.3	12.1	26.0	24.5	25.0	32.4	28.3	31.6	20.3	17.1	22.7	24.6	34.3	29.5	13.8	14.1	20.8	18.2	34.9	38.9	11.8	6.6	11.5	23.8	48.3
17-Mar	22.9	Z	42.4	36.3	36.3	44.0	36.5	42.5	35.7	28.2	34.2	26.5	32.4	32.8	23.7	15.4	14.7	19.0	33.7	41.7	31.2	25.3	17.6	22.4	30.2	44.0
18-Mar	26.9	19.7	Z	12.6	27.0	37.9	54.1	39.0	27.4	17.9	14.4	12.3	10.9	9.1	3.5	10.5	23.2	69.4	106.5	61.8	59.7	62.3	53.4	47.3	35.1	106.5
19-Mar	36.7	38.5	54.8	Z	35.0	23.5	52.8	56.0	32.4	24.4	23.7	17.4	9.0	17.3	22.8	18.3	20.4	17.1	12.1	2.5	1.3	1.2	0.9	0.9	22.6	56.0
20-Mar	2.3	1.8	1.1	1.2	Z	7.8	12.8	8.8	4.4	2.2	11.0	16.4	6.5	4.9	3.7	8.1	5.9	8.9	10.2	12.9	16.0	15.4	15.9	19.4	8.6	19.4
21-Mar	23.6	20.8	5.8	12.3	13.7	Z	20.3	31.0	15.5	10.3	40.9	48.6	6.4	6.9	7.9	13.0	30.2	35.5	35.9	35.4	25.4	20.8	34.1	37.3	23.1	48.6
22-Mar	Z	23.5	26.3	26.4	43.1	33.2	96.9	95.3	26.9	29.8	14.5	15.3	13.7	19.0	15.2	15.9	17.1	16.8	23.9	57.0	32.8	19.3	18.6	19.8	30.4	96.9
23-Mar	27.2	Z	33.0	31.8	27.9	24.4	48.3	47.4	52.1	20.5	8.4	6.0	5.3	6.8	6.8	7.1	4.6	6.1	5.6	8.6	14.3	10.5	1.5	5.8	17.8	52.1
24-Mar	10.6	16.1	Z	25.1	31.9	23.8	41.0	29.2	23.0	15.3	15.3	21.9	15.0	7.9	7.8	6.7	7.0	7.0	16.0	22.0	40.7	39.8	31.5	32.6	21.2	41.0
25-Mar	28.6	38.1	55.0	Z	48.2	38.2	30.8	27.9	26.0	63.0	69.9	19.6	9.1	5.7	5.3	5.3	4.2	3.5	7.6	7.5	9.2	18.9	15.1	21.8	24.3	69.9
26-Mar	27.9	27.6	21.1	21.8	Z	12.6	10.9	6.3	22.5	28.1	24.4	21.3	10.6	10.3	10.2	5.9	5.4	5.1	3.8	17.1	38.2	38.5	13.0	20.1	17.5	38.5
27-Mar	17.5	20.3	26.5	7.7	56.1	Z	81.4	62.6	70.8	53.5	20.1	10.8	4.5	4.6	5.3	6.7	8.2	7.7	13.8	18.4	27.0	15.3	25.2	23.3	25.5	81.4
28-Mar	Z	23.6	22.9	34.2	66.5	113.2	88.6	62.4	63.7	58.7	31.5	16.2	13.4	11.2	10.2	9.0	9.5	9.0	7.9	7.3	12.0	15.5	16.6	18.6	31.4	113.2
29-Mar	21.5	Z	16.7	13.0	42.0	19.5	42.4	28.8	18.7	21.2	24.1	22.1	10.5	4.9	3.8	3.7	4.4	3.9	5.8	6.5	18.7	22.9	40.7	46.0	19.2	46.0
30-Mar	30.8	44.5	Z	36.6	68.0	88.7	113.0	77.9	67.3	52.6	16.0	18.6	15.4	10.3	8.4	9.6	11.0	8.8	5.4	10.7	18.6	23.5	21.9	16.1	33.6	113.0
31-Mar	20.5	31.7	32.9	Z	28.9	19.1	10.8	15.7	31.8	42.6	22.7	27.5	19.0	12.5	10.2	10.5	9.2	10.9	11.2	15.8	14.2	1.5	2.6	5.6	17.7	42.6
	21.3	25.4	26.0	24.7	33.2	35.7	39.6	36.9	27.5	27.1	22.7	19.6	13.0	11.8	10.9	11.4	10.9	12.8	18.0	20.9	22.6	22.3	22.6	23.0	Diurnal Average	
	72.8	94.5	96.6	101.6	106.5	142.4	135.7	124.2	74.6	74.8	69.9	48.6	32.4	34.3	29.5	44.9	30.2	69.4	106.5	86.7	100.5	131.2	110.5	136.0	Diurnal Maximum	

Z - zerospan C - Calibration

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Barge Landing - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	430	60.73	60.73
21 - 40	182	25.71	86.44
11 - 80	71	10.03	96.47
81 - 159	24	3.39	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Barge Landing - March 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	18	94	48	14	4	12	65	83	15	2	2	7	4	8	11	43	430
21 - 40	31	18	9	6	0	2	10	37	25	2	2	2	1	4	7	26	182
11 - 80	12	10	0	3	0	1	2	11	7	2	1	9	1	0	3	8	70
81 - 159	1	2	0	0	1	0	3	1	7	1	4	1	0	0	0	2	23
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	124	57	23	5	15	80	132	54	7	9	19	6	12	21	79	705

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Barge Landing

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 59.6 $\mu g/m^3$ on Mar 28 09:00

Maximum Daily Average: 25.1 $\mu g/m^3$ on Mar 28

Minimum Value: 0.4 $\mu g/m^3$ on Mar 2 19:00

Maximum Diurnal Average: 13.3 $\mu g/m^3$ at hour 10

Monthly Average: 9.85 $\mu g/m^3$

Minimum Daily Average: 3.1 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 6.4 $\mu g/m^3$ at hour 18

Percentiles: P_1 = 1.5 P_{10} = 3.6 Q_1 = 4.5 Median = 7.0 Q_3 = 12.0 P_{90} = 20.5 P_{99} = 43.7

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	1
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	7.5	10.3	10.1	8.2	9.2	13.6	13.3	11.5	11.7	9.8	7.3	5.5	9.8	6.3	5.4	4.9	5.0	4.8	4.7	5.0	4.7	5.3	6.1	6.6	7.8	13.6
2-Mar	7.8	8.5	7.8	7.7	8.1	9.6	9.8	10.3	10.9	11.7	11.2	10.5	9.8	6.0	3.7	2.2	0.7	0.5	0.4	0.5	0.4	0.4	0.7	1.1	5.8	11.7
3-Mar	4.9	5.2	4.5	4.0	4.2	4.4	4.0	5.1	5.5	6.0	5.3	5.3	6.0	6.9	9.0	6.2	7.4	9.6	8.0	4.2	4.5	4.4	4.3	4.0	5.5	9.6
4-Mar	3.9	4.3	4.7	4.8	4.5	4.2	3.3	3.6	4.4	4.0	3.1	3.0	2.9	3.8	3.6	6.7	6.1	5.9	5.3	8.2	12.9	16.5	16.5	9.0	6.1	16.5
5-Mar	10.6	8.6	8.5	8.0	12.0	18.3	8.3	3.2	2.8	2.9	5.6	7.7	5.1	5.2	4.4	4.5	5.6	6.9	11.2	13.2	16.9	23.5	33.8	30.0	10.7	33.8
6-Mar	17.6	28.1	28.0	19.3	22.4	19.5	12.9	15.5	9.9	13.0	12.6	9.2	9.6	7.8	8.3	9.0	4.7	3.0	3.0	3.3	3.8	3.0	2.5	2.7	11.2	28.1
7-Mar	2.9	2.7	2.7	2.7	2.5	2.5	2.6	2.6	2.8	3.1	3.5	3.4	3.4	3.4	3.8	3.7	3.3	3.4	3.5	3.7	3.6	2.5	2.5	2.7	3.1	3.8
8-Mar	2.5	2.6	3.3	3.5	3.8	4.0	4.8	5.3	3.8	5.1	7.5	7.9	6.7	4.0	5.3	4.7	4.7	4.5	7.3	4.8	4.4	3.9	5.9	3.5	4.8	7.9
9-Mar	2.9	3.2	5.3	4.5	7.4	7.8	8.6	6.5	13.2	15.9	9.2	11.5	10.8	9.6	8.8	7.1	6.5	3.8	3.6	3.1	3.1	3.1	3.1	3.1	6.7	15.9
10-Mar	3.1	3.0	3.1	3.2	3.1	3.2	3.4	3.6	3.8	4.4	5.0	5.0	4.3	4.3	4.4	4.4	4.4	4.2	4.9	4.4	5.8	9.4	8.8	5.1	4.5	9.4
11-Mar	3.1	3.4	4.9	5.0	7.4	7.0	8.2	9.0	10.5	7.0	7.4	7.8	8.3	6.4	7.0	6.8	6.0	5.1	4.7	4.8	4.8	3.8	3.9	3.8	6.1	10.5
12-Mar	4.1	4.3	4.3	4.4	4.3	4.2	4.3	4.0	3.9	3.7	3.6	3.8	4.3	4.0	4.0	3.9	4.0	3.8	4.5	4.5	5.0	5.1	5.1	5.2	4.3	5.2
13-Mar	4.9	4.7	4.7	4.9	5.1	5.5	5.8	6.6	5.3	5.7	6.4	7.1	6.8	7.4	7.6	10.2	7.9	11.7	13.8	9.8	7.1	8.7	11.5	9.8	7.5	13.8
14-Mar	5.5	4.7	4.7	4.2	4.1	4.1	3.9	4.0	3.8	3.7	3.7	3.7	3.7	3.5	3.4	3.5	3.5	3.3	3.4	3.7	3.7	3.8	3.9	3.9	3.9	5.5
15-Mar	3.8	4.1	4.1	4.4	4.6	4.3	4.2	4.2	4.6	5.4	5.3	5.1	4.8	4.6	5.6	6.3	5.2	4.8	5.9	7.1	8.7	10.0	8.5	10.3	5.7	10.3
16-Mar	9.5	7.1	3.9	4.6	4.8	4.7	4.6	4.2	5.4	5.0	8.1	12.3	16.1	32.6	32.7	6.9	6.9	5.4	5.9	6.4	6.4	4.7	4.0	4.3	8.6	32.7
17-Mar	5.6	6.3	6.5	7.3	7.0	6.8	7.0	6.0	7.0	7.9	10.0	7.1	9.2	10.4	10.9	7.8	7.0	6.2	9.7	8.5	7.3	9.3	8.3	8.1	7.8	10.9
18-Mar	7.8	7.3	6.2	5.9	7.5	9.5	11.1	9.9	9.7	7.9	7.4	8.0	7.4	6.9	3.6	4.7	5.1	6.8	8.1	4.9	4.4	4.7	4.4	3.9	6.8	11.1
19-Mar	3.6	3.8	4.4	5.7	4.9	4.2	5.4	8.8	7.0	5.7	6.0	5.8	5.1	5.2	5.8	5.8	6.2	6.3	6.0	4.5	3.9	3.8	3.7	3.8	5.2	8.8
20-Mar	4.7	3.8	3.5	3.7	3.7	7.2	7.8	5.4	4.1	3.4	4.0	4.5	4.0	3.8	3.6	3.8	3.6	3.5	3.9	5.0	6.7	9.6	8.9	12.5	5.2	12.5
21-Mar	14.7	13.1	7.2	10.6	9.3	9.5	8.8	10.1	6.4	5.5	15.4	19.5	5.8	5.6	6.6	7.5	18.0	21.3	12.8	14.7	13.7	11.8	15.6	13.1	11.5	21.3
22-Mar	8.4	11.1	12.6	12.6	17.4	14.8	19.8	24.6	9.2	13.4	9.7	11.0	9.5	10.9	9.7	10.7	10.8	9.6	10.2	16.7	12.9	7.2	7.2	8.7	12.0	24.6
23-Mar	7.2	11.6	13.8	14.3	13.4	15.9	16.4	16.8	22.9	13.4	6.9	6.4	C	6.5	6.3	6.1	4.9	5.2	5.2	5.7	6.3	6.1	3.9	5.9	9.6	22.9
24-Mar	8.8	8.2	8.5	12.1	20.5	20.3	19.6	21.3	20.5	13.9	13.4	16.1	11.4	7.2	7.1	5.7	6.2	6.4	12.0	14.8	15.7	14.8	14.9	13.4	13.0	21.3
25-Mar	13.0	13.6	18.9	21.5	19.8	16.1	14.7	10.0	16.5	39.1	47.1	17.5	8.4	5.4	4.8	4.7	4.7	5.6	8.4	10.9	10.6	18.6	14.1	17.2	15.1	47.1
26-Mar	23.7	29.8	21.4	21.1	21.4	17.8	11.3	7.9	21.1	27.5	25.8	26.7	17.5	15.3	15.6	9.9	9.2	6.2	7.6	16.3	34.4	44.0	15.8	25.4	19.7	44.0
27-Mar	18.4	17.6	16.4	8.7	15.1	16.5	24.6	26.6	41.2	38.1	19.8	12.0	7.6	7.3	7.4	7.5	10.2	9.3	17.3	22.0	26.8	21.4	36.3	30.0	19.1	41.2
28-Mar	30.1	27.8	27.1	34.8	44.1	45.6	46.8	43.7	59.6	49.1	29.8	16.7	16.9	14.6	10.9	10.3	9.5	7.5	6.8	8.0	13.7	15.6	15.5	18.9	25.1	59.6
29-Mar	24.8	27.9	19.9	20.0	22.5	19.6	21.1	14.3	11.9	11.4	17.0	14.6	9.9	7.0	6.6	6.4	7.7	5.0	6.9	10.0	18.7	23.4	36.5	27.5	16.3	36.5
30-Mar	16.8	26.1	17.0	22.6	25.1	36.2	33.0	32.1	28.6	27.1	15.6	20.6	21.2	12.6	9.6	11.0	13.0	9.0	7.0	12.8	14.7	21.2	21.5	16.2	19.6	36.2
31-Mar	18.0	30.5	31.1	24.8	26.6	20.3	11.7	11.8	28.4	43.6	22.2	26.8	20.0	12.8	11.2	13.3	9.9	8.9	8.6	9.6	10.9	4.6	4.1	3.8	17.2	43.6
	9.7	11.1	10.3	10.3	11.8	12.2	11.7	11.2	12.8	13.3	11.4	10.4	8.9	8.0	7.6	6.7	6.7	6.4	7.1	8.1	9.6	10.5	10.7	10.1	Diurnal Average	
	30.1	30.5	31.1	34.8	44.1	45.6	46.8	43.7	59.6	49.1	47.1	26.8	21.2	32.6	32.7	13.3	18.0	21.3	17.3	22.0	34.4	44.0	36.5	30.0	Diurnal Maximum	

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Barge Landing - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	287	38.63	38.63
6 - 15	323	43.47	82.10
16 - 25	87	11.71	93.81
26 - 80	46	6.19	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Barge Landing - March 2023

Concentration Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	30	48	24	8	2	11	64	36	6	1	1	4	2	5	6	39	287
6 - 15	20	64	24	11	3	4	17	92	35	4	5	8	2	6	8	20	323
16 - 25	9	10	10	6	1	1	2	6	8	4	2	3	3	2	5	15	87
26 - 80	6	6	1	0	0	0	1	3	8	2	1	4	0	0	2	10	44
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	128	59	25	6	16	84	137	57	11	9	19	7	13	21	84	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Barge Landing

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Barge Landing - March 2023

Maximum Value: 11.1 C on Mar 18 15:00

Maximum Daily Average: 1.1 C on Mar 18

Minimum Value: -31.1 C on Mar 6 07:00

Minimum Daily Average: -21.2 C on Mar 5

Maximum Diurnal Average: -3.6 C at hour 17

Minimum Diurnal Average: -15.5 C at hour 7

Monthly Average: -9.58 C

Percentiles: P_1 = -27.7 P_{10} = -18.8 Q_1 = -13.9 Median = -9.4 Q_3 = -4.7 P_{90} = -0.9 P_{99} = 7.5

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-24.7	-24.9	-24.6	-25.7	-25.3	-25.8	-26.2	-26.5	-24.1	-20.0	-16.6	-11.3	-8.8	-7.6	-6.4	-7.1	-7.8	-8.9	-10.2	-11.1	-9.6	-8.8	-8.7	-8.1	-15.8	-6.4
2-Mar	-7.7	-7.6	-7.5	-7.4	-7.2	-6.9	-6.7	-6.8	-6.2	-4.7	-1.6	0.4	3.0	3.9	4.5	4.0	1.6	1.8	1.3	0.7	0.6	0.4	0.0	-0.4	-2.0	4.5
3-Mar	-3.1	-5.3	-6.9	-8.2	-8.8	-9.2	-9.5	-10.0	-10.7	-10.4	-10.4	-10.4	-9.9	-9.3	-9.0	-9.0	-9.6	-10.0	-10.6	-11.3	-12.0	-13.3	-14.5	-15.1	-9.9	-3.1
4-Mar	-15.3	-15.4	-15.5	-15.7	-16.1	-16.2	-17.0	-17.6	-17.5	-16.7	-15.8	-15.0	-14.5	-13.7	-13.4	-13.4	-14.2	-15.2	-16.7	-17.5	-19.0	-21.5	-21.9	-21.1	-16.5	-13.4
5-Mar	-22.6	-23.2	-25.6	-26.3	-26.7	-27.4	-27.7	-26.7	-23.2	-19.9	-17.4	-16.3	-15.4	-14.5	-14.2	-13.8	-13.9	-16.3	-18.6	-20.6	-22.1	-24.1	-25.7	-26.7	-21.2	-13.8
6-Mar	-27.3	-28.8	-30.0	-29.9	-30.8	-31.0	-31.1	-30.5	-27.7	-24.2	-20.5	-15.6	-13.1	-11.6	-10.7	-9.6	-9.0	-10.3	-11.4	-12.9	-13.6	-13.2	-12.3	-12.7	-19.5	-9.0
7-Mar	-13.0	-12.7	-12.4	-12.4	-12.5	-12.8	-13.1	-13.2	-13.1	-12.1	-11.3	-10.9	-10.4	-9.2	-7.7	-6.6	-6.3	-6.9	-8.0	-9.3	-9.8	-9.0	-9.2	-8.6	-10.4	-6.3
8-Mar	-8.9	-10.2	-11.8	-13.1	-14.0	-14.8	-15.5	-15.4	-13.7	-11.9	-9.6	-8.2	-6.8	-4.9	-4.3	-4.4	-4.1	-5.1	-7.8	-9.7	-10.8	-12.4	-13.6	-14.3	-10.2	-4.1
9-Mar	-15.7	-16.9	-17.9	-18.5	-19.7	-19.8	-20.4	-20.3	-17.6	-14.7	-12.1	-9.9	-7.9	-6.8	-6.7	-6.9	-6.6	-7.7	-8.5	-8.9	-9.5	-9.7	-9.9	-9.5	-12.6	-6.6
10-Mar	-9.7	-10.2	-10.6	-10.7	-10.7	-10.9	-10.9	-10.7	-10.1	-9.2	-8.3	-6.1	-6.6	-5.5	-5.2	-5.4	-4.4	-5.6	-6.4	-7.1	-7.0	-7.7	-8.2	-8.1	-8.1	-4.4
11-Mar	-8.1	-8.7	-9.6	-9.7	-9.9	-10.0	-10.1	-10.2	-8.7	-7.3	-7.0	-6.0	-4.5	-3.5	-3.5	-3.4	-4.1	-5.6	-7.3	-8.1	-9.0	-10.1	-10.6	-10.9	-7.7	-3.4
12-Mar	-11.2	-11.4	-12.1	-12.6	-13.3	-13.9	-14.6	-15.0	-14.6	-14.2	-14.0	-13.6	-12.8	-11.8	-11.4	-11.0	-11.3	-11.7	-12.3	-12.5	-12.9	-13.6	-14.0	-14.7	-12.9	-11.0
13-Mar	-16.0	-17.6	-18.5	-19.5	-20.0	-20.4	-20.2	-18.8	-17.4	-15.2	-12.7	-11.4	-9.4	-8.4	-7.6	-7.1	-6.2	-6.6	-7.2	-7.9	-6.9	-7.7	-9.6	-10.4	-12.6	-6.2
14-Mar	-10.6	-10.8	-11.2	-11.3	-11.6	-12.0	-12.2	-12.7	-12.9	-13.0	-12.8	-11.8	-10.6	-10.4	-10.6	-10.8	-11.4	-12.0	-12.6	-13.0	-13.4	-13.7	-14.0	-14.4	-12.1	-10.4
15-Mar	-14.9	-15.5	-16.3	-17.8	-19.1	-19.3	-17.6	-17.1	-14.7	-11.4	-8.9	-7.2	-6.4	-5.8	-6.5	-7.4	-6.3	-6.2	-10.7	-13.6	-15.1	-16.3	-17.2	-17.5	-12.9	-5.8
16-Mar	-16.5	-16.0	-14.5	-15.1	-14.6	-14.2	-14.0	-13.4	-12.8	-10.6	-9.7	-7.0	-5.3	-4.3	-3.5	-2.4	-1.9	-2.4	-4.8	-6.7	-7.9	-8.5	-9.3	-9.8	-9.4	-1.9
17-Mar	-10.1	-11.0	-11.5	-12.1	-12.4	-12.5	-12.7	-11.8	-9.6	-5.9	-2.2	0.0	2.6	5.0	7.1	8.6	10.1	9.7	5.2	1.8	0.8	0.1	-2.7	-2.7	-2.8	10.1
18-Mar	-3.6	-3.7	-4.0	-4.8	-4.9	-5.5	-6.5	-5.3	-2.4	-0.2	2.6	5.1	7.3	9.8	11.1	10.4	9.2	7.6	4.4	2.7	1.3	-0.5	-1.4	-2.9	1.1	11.1
19-Mar	-3.7	-4.8	-6.2	-6.2	-7.4	-8.4	-9.7	-8.9	-5.6	-3.9	-1.9	-0.3	0.7	2.0	2.8	3.0	4.1	2.3	0.7	-1.2	-1.9	-2.4	-2.8	-3.2	-2.6	4.1
20-Mar	-3.6	-3.8	-4.2	-4.9	-5.7	-7.1	-6.9	-6.4	-6.1	-5.6	-4.9	-4.5	-3.8	-2.5	-1.5	-1.4	-2.0	-3.3	-5.0	-6.8	-8.3	-10.0	-11.0	-12.7	-5.5	-1.4
21-Mar	-13.0	-15.0	-15.9	-17.3	-18.2	-18.0	-18.7	-18.7	-16.1	-13.8	-11.5	-8.1	-6.3	-4.6	-3.7	-3.2	-2.8	-3.1	-5.0	-7.5	-9.1	-11.5	-12.1	-13.0	-11.1	-2.8
22-Mar	-13.6	-14.5	-14.7	-14.2	-14.7	-15.6	-16.2	-14.2	-10.5	-7.2	-3.9	-1.9	-0.1	1.6	2.7	3.6	4.3	4.1	1.8	-1.3	-2.6	-3.0	-4.0	-5.3	-5.8	4.3
23-Mar	-6.0	-5.9	-7.1	-7.1	-6.7	-6.2	-6.9	-6.2	-3.2	-0.7	0.5	0.6	0.0	-1.0	-0.4	-1.3	-2.6	-3.5	-5.0	-5.7	-6.1	-6.6	-6.6	-6.1	-4.2	0.6
24-Mar	-6.2	-7.5	-9.5	-11.8	-12.6	-13.1	-14.5	-13.2	-10.9	-8.6	-7.2	-5.6	-3.9	-2.6	-1.3	-0.4	0.1	0.0	-2.2	-4.6	-7.0	-8.3	-9.5	-11.3	-7.1	0.1
25-Mar	-12.6	-14.5	-16.0	-17.1	-17.8	-19.0	-19.8	-17.7	-14.2	-9.4	-5.9	-4.0	-2.6	-2.2	-2.0	-2.5	-3.3	-4.8	-7.2	-9.1	-10.5	-11.7	-13.2	-14.6	-10.5	-2.0
26-Mar	-16.3	-17.6	-18.8	-20.1	-21.2	-22.2	-22.4	-22.1	-19.9	-17.2	-14.7	-13.1	-11.4	-10.3	-9.6	-9.7	-9.6	-10.5	-12.1	-13.7	-14.7	-16.1	-17.2	-19.2	-15.8	-9.6
27-Mar	-20.4	-21.9	-23.1	-23.4	-24.9	-25.1	-24.9	-22.0	-18.7	-14.2	-11.2	-8.2	-6.5	-5.5	-4.9	-3.9	-3.6	-4.1	-6.9	-9.2	-10.9	-11.9	-13.2	-14.8	-13.9	-3.6
28-Mar	-17.2	-19.0	-20.6	-21.8	-22.9	-23.7	-23.9	-20.3	-17.2	-12.6	-9.1	-6.6	-4.1	-2.5	-1.4	-0.9	-0.7	-0.7	-1.3	-1.6	-1.8	-2.1	-2.4	-3.0	-9.9	-0.7
29-Mar	-3.4	-4.3	-5.0	-6.3	-8.4	-7.2	-6.2	-4.5	-2.7	-2.0	-1.2	-0.7	-0.7	-0.7	-0.8	-0.7	-0.8	-1.4	-2.4	-3.5	-4.7	-6.8	-8.4	-9.8	-3.9	-0.7
30-Mar	-11.1	-12.5	-13.3	-14.6	-15.3	-15.0	-14.4	-12.5	-10.4	-7.6	-4.5	-3.8	-2.7	-2.5	-2.0	-1.9	-1.7	-2.1	-2.5	-3.2	-4.1	-5.1	-5.3	-6.9	-7.3	-1.7
31-Mar	-8.3	-8.9	-9.2	-9.2	-9.1	-8.8	-8.5	-7.8	-6.7	-5.1	-4.1	-2.8	-1.0	0.0	1.2	2.3	2.9	2.5	1.0	-1.0	-1.9	-1.4	-2.2	-3.6	-3.7	2.9
	-12.1	-12.9	-13.7	-14.4	-14.9	-15.2	-15.5	-14.7	-12.9	-10.6	-8.6	-6.9	-5.5	-4.5	-3.8	-3.6	-3.6	-4.4	-6.1	-7.5	-8.4	-9.2	-10.0	-10.7	Diurnal Average	
	-3.1	-3.7	-4.0	-4.8	-4.9	-5.5	-6.2	-4.5	-2.4	-0.2	2.6	5.1	7.3	9.8	11.1	10.4	10.1	9.7	5.2	2.7	1.3	0.4	0.0	-0.4	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Barge Landing - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	60	8.06	8.06
-20 - 0	629	84.54	92.61
0 - 10	52	6.99	99.60
10 - 20	3	0.40	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Barge Landing - March 2023

Maximum Value: 89.0 % on Mar 19 06:00

Maximum Daily Average: 82.7 % on Mar 14

Minimum Value: 26.0 % on Mar 18 15:00

Minimum Daily Average: 45.0 % on Mar 8

Maximum Diurnal Average: 75.6 % at hour 5

Minimum Diurnal Average: 51.6 % at hour 15

Monthly Average: 65.46 %

Percentiles: P_1 = 31.9 P_{10} = 45.8 Q_1 = 56.1 Median = 67.8 Q_3 = 76.0 P_{90} = 81.9 P_{99} = 86.4

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	75.9	75.8	76.1	74.5	75.0	74.6	74.4	74.1	75.0	72.8	67.7	62.5	60.2	58.1	57.1	59.6	64.1	68.5	73.0	77.2	76.2	75.1	75.9	76.1	70.8	77.2
2-Mar	78.0	84.6	85.8	86.6	87.3	86.8	85.9	84.5	82.7	77.6	68.3	60.8	54.9	56.8	55.9	60.9	85.2	83.2	79.4	76.6	75.7	75.2	72.9	64.8	75.4	87.3
3-Mar	79.0	78.1	76.4	74.9	72.4	72.6	74.0	71.8	69.6	67.9	68.2	67.2	63.7	61.6	61.1	59.8	65.9	72.4	81.0	80.7	78.0	74.6	71.4	70.1	71.4	81.0
4-Mar	71.3	71.5	73.4	77.3	78.7	78.9	74.1	72.9	71.6	63.9	58.2	52.6	51.3	49.8	49.0	54.6	59.3	64.5	64.6	65.4	67.9	74.2	75.8	73.6	66.4	78.9
5-Mar	75.2	74.4	74.0	73.6	73.5	72.6	72.8	73.3	69.9	61.9	52.5	49.2	46.9	46.4	45.8	44.5	44.2	49.6	56.3	62.8	66.3	69.6	72.3	72.7	62.5	75.2
6-Mar	72.5	70.9	70.2	70.4	69.9	70.0	70.2	70.3	70.2	65.1	57.4	49.3	48.8	50.5	56.8	59.7	60.5	68.5	71.5	73.3	77.5	76.8	71.1	72.3	66.4	77.5
7-Mar	73.0	76.0	77.4	78.0	76.5	74.3	73.7	73.2	73.9	69.6	66.2	64.3	63.0	59.9	55.8	53.0	49.5	48.8	50.8	51.6	51.5	49.1	48.8	46.0	62.7	78.0
8-Mar	44.7	46.4	49.8	53.4	55.2	57.5	59.8	60.4	55.2	50.1	45.2	41.8	37.0	31.6	30.1	30.6	31.1	31.8	36.7	41.8	42.9	45.9	48.9	51.4	45.0	60.4
9-Mar	56.3	59.7	62.2	64.1	67.3	68.1	68.4	68.8	61.5	53.7	47.1	42.2	39.2	38.6	40.8	42.0	41.0	43.9	47.3	48.3	50.4	56.5	62.1	60.0	53.7	68.8
10-Mar	61.0	66.5	70.0	72.4	70.6	69.5	69.4	68.3	66.2	63.4	60.4	52.7	57.3	55.0	53.6	54.7	52.0	60.6	66.3	69.5	69.4	73.2	74.5	70.8	64.5	74.5
11-Mar	64.1	63.2	65.8	65.9	65.7	65.1	65.2	67.2	63.5	58.7	59.6	57.8	55.7	54.6	56.0	58.2	63.9	71.8	77.5	79.5	82.3	82.0	82.3	82.2	67.0	82.3
12-Mar	82.3	81.7	80.0	80.4	80.7	79.1	80.1	78.5	76.8	75.7	74.8	72.5	72.2	70.1	69.4	71.1	72.6	74.8	77.1	78.7	80.1	80.6	80.7	81.3	77.1	82.3
13-Mar	81.6	80.4	80.4	79.7	79.3	79.2	79.3	79.7	79.2	77.5	71.6	69.5	67.7	67.5	65.3	65.0	64.3	65.1	66.7	69.5	68.6	70.1	78.3	83.1	73.7	83.1
14-Mar	84.6	84.7	84.6	84.6	84.5	84.4	84.4	83.7	83.0	81.7	81.1	80.9	79.5	79.7	80.2	81.1	82.1	83.0	83.2	82.8	82.6	82.4	82.3	82.6	82.7	84.7
15-Mar	82.4	82.1	82.3	80.3	80.4	80.3	81.3	80.6	77.6	69.3	63.2	59.5	57.2	56.4	58.3	62.4	58.4	59.8	73.4	80.5	82.3	82.0	81.5	80.2	73.0	82.4
16-Mar	81.2	81.2	81.4	81.0	81.9	81.6	82.1	81.3	78.9	71.8	71.3	63.5	61.4	61.5	62.8	61.7	62.2	65.9	74.1	80.4	83.2	83.7	84.4	85.8	75.2	85.8
17-Mar	85.5	86.8	86.1	85.9	85.2	84.7	84.5	83.2	77.8	67.9	59.8	57.0	53.6	50.9	50.3	47.7	41.9	39.9	55.2	67.8	66.8	62.9	77.3	70.6	67.9	86.8
18-Mar	71.9	68.7	63.4	62.9	61.1	61.8	65.1	62.5	52.5	45.2	40.4	36.5	33.4	29.9	26.0	28.2	32.3	38.6	52.0	55.7	58.2	64.9	68.1	71.5	52.1	71.9
19-Mar	74.7	78.5	83.7	85.3	87.7	89.0	88.0	88.3	80.1	68.2	61.6	57.5	54.6	51.5	50.1	49.6	46.4	52.7	60.0	64.4	67.7	68.8	69.1	68.4	68.6	89.0
20-Mar	69.0	68.0	65.6	64.2	64.1	64.4	64.9	64.9	71.3	74.2	77.6	76.2	68.3	65.0	60.1	55.2	53.8	54.2	55.8	58.3	59.9	64.8	65.8	70.1	64.8	77.6
21-Mar	71.8	75.7	76.7	79.2	80.5	80.6	79.4	78.9	78.6	71.8	67.3	62.7	60.3	53.3	48.9	47.1	46.5	47.0	53.2	61.1	67.0	74.1	79.5	82.1	67.6	82.1
22-Mar	84.6	83.3	84.6	84.4	83.1	82.3	82.4	83.2	77.6	64.7	53.6	48.0	43.5	40.4	38.7	37.4	37.1	39.2	46.2	57.3	62.2	61.7	65.2	69.0	62.9	84.6
23-Mar	72.0	74.5	78.0	78.3	76.0	73.6	76.1	75.4	64.5	55.5	53.4	55.4	58.6	62.2	59.3	61.2	64.4	66.4	70.7	70.5	70.5	74.1	73.6	69.1	68.1	78.3
24-Mar	67.3	69.2	72.9	79.5	81.3	82.2	82.4	81.0	70.7	61.9	57.8	52.6	48.8	44.9	41.4	39.1	36.8	37.0	42.3	49.0	58.0	63.7	67.4	73.5	60.9	82.4
25-Mar	79.4	81.5	81.1	81.1	81.6	80.2	79.0	80.4	74.5	60.2	53.8	47.4	43.4	40.5	40.3	40.2	41.0	45.2	54.3	62.0	65.4	65.1	63.9	65.3	62.8	81.6
26-Mar	70.4	72.2	71.7	75.4	76.0	74.8	75.0	72.7	66.9	58.0	54.7	53.2	48.1	44.6	42.4	40.9	40.5	42.5	46.7	51.1	54.8	59.0	60.6	65.9	59.1	76.0
27-Mar	70.6	73.1	74.7	75.1	73.2	72.7	72.8	71.8	65.5	52.9	45.8	41.3	37.1	35.1	33.8	32.8	32.0	35.0	46.3	53.7	56.9	53.9	54.9	59.8	55.0	75.1
28-Mar	67.6	72.7	76.2	76.9	75.4	74.4	74.6	75.9	66.4	56.1	46.7	40.7	37.8	36.4	36.8	38.6	39.8	40.8	42.1	42.0	43.3	44.0	46.0	49.3	54.2	76.9
29-Mar	54.1	57.6	59.2	62.4	70.0	70.8	72.1	69.6	66.4	66.2	69.4	72.1	71.8	71.0	69.6	66.9	63.4	61.9	63.7	64.0	65.2	72.4	78.4	82.0	67.5	82.0
30-Mar	84.6	84.7	85.1	83.0	81.8	81.5	81.9	81.8	80.0	70.5	53.9	52.1	48.3	48.4	46.9	47.6	49.5	52.1	52.6	54.8	59.0	61.0	60.5	64.0	65.2	85.1
31-Mar	67.3	69.3	68.7	67.8	68.1	69.2	69.4	67.9	67.4	65.8	65.4	64.3	60.0	59.5	56.5	53.4	52.4	54.9	61.3	69.1	73.5	68.1	70.4	74.7	65.2	74.7
	72.7	74.0	74.8	75.4	75.6	75.4	75.6	75.0	71.5	65.2	60.4	56.9	54.3	52.6	51.6	51.8	52.7	55.5	60.7	64.5	66.5	68.1	69.8	70.6	Diurnal Average	
	85.5	86.8	86.1	86.6	87.7	89.0	88.0	88.3	83.0	81.7	81.1	80.9	79.5	79.7	80.2	81.1	85.2	83.2	83.2	82.8	83.2	83.7	84.4	85.8	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

Barge Landing - March 2023

Maximum Value: 29.7 inHg on Mar 8 11:00

Maximum Daily Average: 29.7 inHg on Mar 8

Minimum Value: 28.0 inHg on Mar 2 12:00

Minimum Daily Average: 28.1 inHg on Mar 2

Maximum Diurnal Average: 29.1 inHg at hour 10

Minimum Diurnal Average: 29.0 inHg at hour 18

Monthly Average: 29.06 inHg

Percentiles: P_1 = 28.1 P_{10} = 28.7 Q_1 = 28.9 Median = 29.0 Q_3 = 29.3 P_{90} = 29.5 P_{99} = 29.7

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.7	29.0
2-Mar	28.3	28.3	28.3	28.2	28.2	28.2	28.1	28.1	28.1	28.1	28.0	28.0	28.0	28.0	28.0	28.0	28.1	28.1	28.1	28.1	28.2	28.2	28.2	28.2	28.1	28.3
3-Mar	28.3	28.3	28.3	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.5	28.8
4-Mar	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.0	29.3
5-Mar	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.5
6-Mar	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6
7-Mar	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.5	29.6
8-Mar	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7
9-Mar	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.5	29.6
10-Mar	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	29.2	29.2	29.1	29.2
11-Mar	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3
12-Mar	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3
13-Mar	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	29.0	29.1
14-Mar	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.8
15-Mar	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.0	29.2
16-Mar	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.3
17-Mar	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	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2
18-Mar	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
19-Mar	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
20-Mar	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
21-Mar	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
22-Mar	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.9
23-Mar	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	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.7	28.9
24-Mar	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.0	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
25-Mar	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	29.2	29.2	29.2	29.2	29.1	29.2
26-Mar	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.5
27-Mar	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.5
28-Mar	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	29.1	29.3
29-Mar	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
30-Mar	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.9	29.0
31-Mar	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
	29.1	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	29.1	29.1	Diurnal Average	
	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Barometric Pressure (BP) - inHg

Barge Landing - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Barge Landing - March 2023

Maximum Speed: 23 km/h on Mar 23 16:00

Maximum Daily Speed Average: 14.0 km/h on Mar 14

Minimum Speed Value: 1 km/h on Mar 2 13:00

Minimum Daily Speed Average: 0.5 km/h on Mar 21

Maximum Diurnal Speed Average: 5.7 km/h at hour 20

Minimum Diurnal Speed Average: 1.5 km/h at hour 6

Monthly Average Velocity: 2.8 km/h 74.2 deg

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 7$ Median = 10 $Q_3 = 14$ $P_{90} = 16$ $P_{99} = 21$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	SSE8	SE10	SE6	SSE4	S2	S5	S7	S5	S3	S6	WSW3	S10	SSE13	SSE13	SSE16	SSE16	SE12	SE12	SE11	SE11	SE15	SE15	SE14	SSE12	SSE9.0	SSE16
2-Mar	SSE14	SSE16	SSE16	SSE19	SSE16	SSE15	SSE14	SSE16	S19	SSE15	SSE12	SSW2	W1	S5	SSW9	SW11	WSW14	WSW13	W14	W12	WSW12	WSW15	WNW12	WNW15	SSW8.1	SSE19
3-Mar	NNE12	NNE15	NE13	NE14	NE13	NE11	NE13	NNE16	NNE14	NNE12	NNE13	NNE12	NE9	NE6	NE8	NE9	NNE8	NNE6	NNE6	ENE7	NNE13	NNE18	NNE18	NE14	NE11.5	NNE18
4-Mar	NE11	NNE6	WNW3	NNW3	WNW3	NE6	NE13	NE8	NNE9	N11	NNW14	NW16	NW15	NW14	NNW11	NNE10	NNE12	NNE11	NNE11	N11	NNW8	NNW6	NNE9	N9	N8.0	NW16
5-Mar	N7	N8	WNW5	WNW3	NW3	W5	WNW7	NW5	WNW3	NNW4	NE6	ENE8	ENE10	ENE9	NE9	ENE11	ENE10	ENE9	ENE9	NE6	NNW4	N6	UO	UO	NNE4.1	ENE11
6-Mar	N7	N3	SE4	WSW3	SW3	SW4	SW4	SW5	SW3	WSW3	WSW5	SSW5	SSW7	SW6	S9	S8	SE12	SE11	ESE9	ESE9	SE9	SSE11	SSE15	SE13	SSE4.6	SSE15
7-Mar	SE12	SE16	SE15	SE13	SE14	SE15	SE15	SE17	SE17	SSE18	SSE19	SSE16	SSE18	SSE14	SSE13	SSE14	SE14	ESE12	ESE10	SE9	SE11	SE13	SSE10	SSE14	SE14.0	SSE19
8-Mar	SSE17	SSE14	SE11	SE12	SE12	SE11	SE9	SE11	SSE11	SSE12	S12	S13	S10	SSE13	SSE12	S9	S9	SSE10	SE9	ESE14	SE13	SE10	SE11	SE12	SSE11.0	SSE17
9-Mar	SSE5	SE7	SSE9	SSE7	SSE8	SSE9	SE11	SSE11	SSE11	S13	S14	S14	SSE19	SSE15	SSE21	SE19	SE17	SE15	SE16	SE18	SE20	SE20	SE22	SE23	SSE13.8	SE23
10-Mar	SE21	SE18	SSE16	SSE18	SE19	SE16	SE15	SE15	SE16	SSE17	SSE17	SSE15	SE15	SE14	SE11	SE13	SE9	SE12	E8	NE6	NE7	NE3	SSE5	SE7	SE12.1	SE21
11-Mar	SE7	SE5	SE6	ESE8	SE5	SSE5	SSE3	NE2	ESE4	NE4	NNE8	NNE7	N6	NNE8	NE9	NE7	NNE12	NNE15	NNE15	NNE15	NNE14	NNE14	NNE16	NNE15	NE6.3	NNE16
12-Mar	NNE17	NNE17	NNE17	N11	N11	N10	N8	NNE12	NNE14	NNE11	N12	NNE11	NNE9	NNE12	NNE13	NNE13	NNE14	NNE13	N12	N11	N12	N12	N12	N11	NNE12.1	NNE17
13-Mar	NNW9	NNW9	NNW7	NNW6	NNW6	NNW5	NNE3	NNE8	N5	NNE8	N8	NNE13	NNE15	NNE16	NNE17	N17	N20	N17	N15	NNE15	NNE20	NNE17	N14	N16	N11.5	N20
14-Mar	N16	N17	N17	N16	N15	N14	N15	N16	NNW15	NNW18	NNW18	N12	NNW10	NNW12	NNW14	NNW12	NNW14	NNW15	NNW16	NNW18	NNW14	NNW10	N8	NNW7	N14.0	NNW18
15-Mar	NNW11	NNW10	NNW8	N6	NNW3	NNW5	NNW9	NNW6	NNW4	NNE4	NE7	NE7	ENE7	ENE8	NE9	NNE6	NE5	NNE6	NNE6	NNE6	NNW4	N3	NNW6	E4	N5.2	NNW11
16-Mar	SSE8	SSE11	SSE8	S3	SE1	NW1	SSE2	SSE4	S6	S11	SSE12	SSE12	SSE12	S12	S13	SSE12	SSE15	SSE12	SSE11	SSE11	SSE12	SSE12	SSE10	SSE10	SSE9.0	SSE15
17-Mar	SSE8	S10	S13	SSE14	SSE12	SSE12	SSE13	S13	S14	SSE14	SSE14	S14	S14	S14	SSE12	SSE11	SSE8	SSE7	SE8	SE10	SSE10	SSE11	S6	SSE10	SSE11.2	S14
18-Mar	SSE8	SSE10	SSE10	SSE10	SSE12	SSE10	SSE12	SSE12	SSE9	SSE11	SSE10	SSE10	SSE9	SSE7	SSE5	NE7	NE14	NNE13	NNE14	NNE13	N9	N8	NNW12	NNW10	SE3.5	NE14
19-Mar	NNW8	NNW7	N6	NNE7	NNW6	NNW8	N7	NNW3	SSE5	WSW4	WNW5	NNE6	NNE7	NNE5	NE6	NNE4	NE5	SW1	SSE9	SE15	SE15	SE12	SE13	SE9	ENE2.4	SE15
20-Mar	ESE8	ESE10	ESE10	SE11	ESE9	ESE7	ESE9	ESE6	ENE3	NE4	NE9	NNE13	NNE16	NNE18	NNE21	NNE19	NNE21	NNE20	N16	N16	NNE13	NE14	NNE7	NNE10	NE9.2	NNE21
21-Mar	NNE9	ENE5	NE8	NNW4	WNW5	NNW13	NNW10	NNW4	NNW6	NW5	N2	N1	W5	WSW5	WSW5	WSW7	SSW7	SSW9	S8	SSE10	SSE11	SE9	SE12	SE9	SSW0.5	NNW13
22-Mar	SSE7	SSE7	SSE10	S8	SSE13	S8	S7	S7	S10	S13	S14	S12	SSE12	SSE11	SSE11	S12	S12	SSE12	SSE8	SE9	SE11	SSE9	SSE7	SSE10	SSE9.8	S14
23-Mar	S9	SSW7	SSE9	SSE10	SSE9	S6	SSE8	ESE7	ENE6	NE14	NE15	NE16	NE20	NNE20	NNE20	NNE23	NE20	NNE17	NNE19	NNE17	N14	NNW8	NNW9	NNW14	NE8.1	NNE23
24-Mar	NNW15	N10	N9	NNE8	NE6	ENE5	ENE6	ENE6	ENE6	ENE5	ENE6	NE7	ENE8	ENE9	ENE8	E9	SE7	S8	SSE9	ESE6	ENE7	ENE9	NE5	NNW7	NE4.9	NNW15
25-Mar	NW6	NNW5	S4	S4	NW3	NNW5	NW6	N7	NNW4	N3	N5	NE11	NE11	NE13	NE16	NE17	NNE18	NNE20	NNE21	NNE13	NNE11	NNE14	N12	N11	NNE8.6	NNE21
26-Mar	NE10	N9	N7	NNE3	E5	NE6	NW6	NNW7	NNW4	NW7	N9	NNE12	NNE13	NNE14	NNE14	NNE17	NNE18	NNE17	NNE16	NNE13	NNE13	NNE7	NNE7	NNW8	NNE9.3	NNE18
27-Mar	NNW9	NW5	WSW6	WNW4	WSW5	SSW6	SSW7	SSE6	SSE7	SSE10	S8	SSE8	SE6	SSE8	SSE9	SE6	S2	NE7	NE13	NE12	NE12	NE12	NNE5	NNW6	ESE1.9	NE13
28-Mar	NNW7	NNW9	N8	NNW4	NW4	SW4	S8	SSW6	S5	S8	S12	S14	SSE16	S16	SSE16	SSE15	SSE14	SSE15	SSE14	SSE14	SSE10	SSE9	SSE4	NW2	S6.7	SSE16
29-Mar	N4	N3	NNW8	NNW9	NW7	NW7	W4	NW4	NW5	NW4	N8	NNE11	NNE16	NNE16	NNE20	NNE18	NNE20	NNE20	NNE18	NNE16	NNE10	N7	WSW2	WSW4	N8.6	NNE20
30-Mar	WNW4	NNW2	W5	WNW5	WSW3	SSW5	S5	S5	WSW1	WSW1	NE7	NE9	NNE9	NNE11	NNE11	NNE11	NNE11	NNE13	NE14	NE14	NE12	N7	NNW9	NNW10	NNE5.1	NE14
31-Mar	NNW11	NNW11	NNW10	NNW9	NNW10	NNW8	NNW8	NNW8	NNW8	NNE10	NNE13	NNE14	N14	NNE16	N15	NNW15	NNW14	NNW13	NW10	N4	E10	E11	ENE8	NE8	N8.7	NNE16
Diurnal Average	NE2.5	ENE2.3	E2.0	ESE2.0	SE1.9	SE1.5	SE1.8	ESE2.0	SE2.1	SE1.8	E2.1	ENE2.8	E3.3	ENE3.9	ENE4.3	ENE4.3	NE4.8	NE5.0	NE5.5	ENE5.7	ENE4.6	ENE4.0	ENE2.9	NE2.3		
Diurnal Maximum	SE21	SE18	N17	SSE19	SE19	SE16	SE15	SE17	S19	SSE18	SSE19	SSE16	NE20	NNE20	NNE21	NNE23	NNE21	NNE20	NNE21	SE18	SE20	SE20	SE22	SE23		

UO - Unstable Operation

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 2 17:00

Minimum Value: 0 km/h on Mar 6 06:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	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-Mar	2	1	1	1	1	1	1	2	1	1	1	4	3	3	4	4	2	2	1	3	2	3	2	3	4
2-Mar	3	3	4	4	3	3	4	3	4	4	3	3	2	2	2	6	6	4	4	3	2	3	4	4	6
3-Mar	3	3	3	4	3	3	3	4	4	3	3	3	2	2	2	2	2	2	2	2	5	4	5	3	5
4-Mar	3	2	1	1	1	3	3	3	3	3	4	4	4	4	4	3	3	3	3	3	3	0	3	3	4
5-Mar	3	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	UO	UO	3
6-Mar	1	2	1	1	1	0	0	1	2	2	1	2	2	2	3	3	3	3	2	1	1	3	3	2	3
7-Mar	2	3	3	2	3	3	3	4	3	5	5	4	4	4	4	5	3	2	3	2	3	3	2	5	5
8-Mar	4	3	2	1	1	1	1	2	3	3	4	3	3	3	4	3	3	2	1	2	2	1	2	4	4
9-Mar	1	2	1	1	1	1	1	1	3	3	4	3	5	4	5	4	4	3	3	4	4	4	4	5	5
10-Mar	5	5	3	4	4	4	3	4	4	4	4	5	4	4	3	3	5	3	2	1	2	2	2	2	5
11-Mar	2	1	2	1	2	1	1	1	1	2	1	1	2	2	2	2	3	3	3	3	4	3	3	3	4
12-Mar	3	4	4	3	3	3	3	3	3	2	3	2	2	3	3	3	3	3	3	3	3	2	2	2	4
13-Mar	1	1	1	1	1	2	2	2	3	4	2	3	3	4	4	5	5	5	4	3	4	5	3	3	5
14-Mar	4	4	4	4	4	4	4	4	4	5	5	3	3	3	4	4	4	4	5	5	4	3	3	2	5
15-Mar	2	2	2	1	1	1	1	2	1	1	2	2	1	2	2	2	1	2	1	1	1	2	1	3	3
16-Mar	1	2	2	1	1	2	1	2	2	3	3	2	3	3	3	3	3	2	2	1	2	1	1	1	3
17-Mar	2	3	1	2	2	1	2	2	4	3	3	3	3	3	3	2	2	1	1	1	1	2	1	2	4
18-Mar	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	2	2	3	2	2	2	1	3
19-Mar	2	1	1	2	1	2	2	2	2	1	1	2	2	2	2	1	2	2	3	3	4	3	4	2	4
20-Mar	2	2	2	2	2	2	1	2	2	1	3	3	4	5	4	4	5	4	5	4	4	4	4	3	5
21-Mar	2	2	2	1	2	2	3	2	2	2	1	2	2	2	3	2	2	2	1	1	1	1	1	1	3
22-Mar	1	2	1	1	1	2	2	2	3	3	4	4	3	3	3	3	3	3	2	1	1	2	1	1	4
23-Mar	2	1	1	2	3	2	2	2	2	5	4	4	5	5	5	5	5	4	5	5	3	1	2	4	5
24-Mar	4	3	2	3	2	1	2	2	1	2	2	2	2	2	2	3	2	2	1	1	2	2	2	1	4
25-Mar	1	3	1	2	1	2	1	2	2	1	1	3	3	3	4	4	4	5	5	6	3	4	4	3	6
26-Mar	4	3	3	1	3	1	1	2	1	2	3	3	3	3	4	4	4	4	3	3	2	4	1	1	4
27-Mar	1	2	2	1	2	1	2	1	2	2	3	3	3	3	3	3	2	2	2	2	2	3	2	1	3
28-Mar	1	1	1	1	1	1	1	2	2	2	3	4	4	4	4	3	3	3	2	2	3	2	3	2	4
29-Mar	1	2	1	1	1	1	1	1	2	1	3	3	4	4	4	4	5	4	4	4	2	2	1	2	5
30-Mar	1	1	2	1	1	1	1	1	1	1	2	2	2	3	3	2	2	3	3	3	2	3	1	1	3
31-Mar	1	1	1	2	2	2	1	2	2	3	3	3	4	4	4	4	4	3	2	2	3	2	2	1	4
Diurnal Maximum	5	5	4	4	4	4	4	4	4	5	5	5	5	5	5	6	6	5	5	6	5	5	5	5	

UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Barge Landing - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Barge Landing - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	122	16.44	16.44
6 - 11	325	43.80	60.24
12 - 19	274	36.93	97.17
20 - 28	21	2.83	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Barge Landing - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	10	7	6	4	2	1	4	10	12	3	7	13	5	10	11	17	122
6 - 11	31	40	31	21	4	13	33	61	24	8	2	2	0	1	7	47	325
12 - 19	23	69	21	0	0	2	42	65	21	0	0	4	2	2	3	20	274
20 - 28	1	12	2	0	0	0	5	1	0	0	0	0	0	0	0	0	21
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	65	128	60	25	6	16	84	137	57	11	9	19	7	13	21	84	742

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 20 m (WS20m) - km/h

Barge Landing

Total Number of Valid Hours: 742

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Barge Landing - March 2023

Direction of Maximum Speed: 33 deg on Mar 23 16:00
Direction of Maximum Daily Speed Average: 348.9 deg on Mar 14

Direction of Minimum Speed: 271 deg on Mar 2 13:00

Direction of Minimum Daily Speed Average: 0.5 deg on Mar 21

Monthly Average Direction: 74.2 deg

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	148	140	135	148	171	177	171	187	179	183	245	182	168	167	165	164	142	135	129	133	138	144	144	153	154.7
2-Mar	156	150	149	148	158	160	165	168	169	163	160	203	271	174	197	230	250	253	277	260	246	256	284	299	195.2
3-Mar	18	22	43	48	45	45	39	27	26	29	31	32	40	47	50	39	31	16	20	77	28	32	27	37	34.3
4-Mar	34	17	286	335	301	38	37	47	31	349	336	309	307	323	332	29	32	25	22	8	346	330	17	4	359.0
5-Mar	357	7	282	295	305	273	287	309	302	330	55	65	66	61	55	66	72	74	70	48	337	356	UO	UO	30.4
6-Mar	349	353	145	257	215	221	235	224	219	242	245	198	207	227	185	174	145	133	123	108	132	150	151	143	165.6
7-Mar	138	139	134	133	133	136	140	142	146	150	153	151	152	157	160	154	130	116	121	133	145	144	148	156	143.0
8-Mar	153	147	131	136	132	135	136	139	153	168	169	178	171	147	168	191	180	160	136	122	144	143	146	133	150.0
9-Mar	147	145	158	149	152	158	145	148	159	171	180	181	164	163	152	140	143	129	125	135	133	136	135	142	147.9
10-Mar	139	141	148	150	146	143	143	144	145	153	153	153	142	141	137	128	127	125	82	56	38	37	151	139	138.6
11-Mar	146	140	128	120	124	147	157	34	114	50	19	20	11	29	37	36	18	26	14	18	14	15	17	18	35.6
12-Mar	18	23	17	9	6	5	7	17	24	14	11	21	30	25	24	20	16	12	8	6	9	10	5	351	14.3
13-Mar	341	339	343	344	341	342	17	20	1	14	1	18	13	23	15	11	11	6	358	14	33	19	355	354	7.3
14-Mar	358	359	358	5	358	357	354	355	341	341	347	350	344	342	346	339	334	336	343	348	347	347	352	341	348.9
15-Mar	339	343	344	350	339	331	337	338	333	18	44	40	60	60	41	24	42	33	12	24	333	11	343	93	10.7
16-Mar	156	147	158	169	133	313	157	157	188	173	166	163	167	172	171	166	164	160	148	152	148	156	148	165	161.3
17-Mar	161	174	169	164	165	159	168	174	174	166	163	173	175	170	164	166	162	157	136	146	167	165	191	167	166.1
18-Mar	163	166	167	161	168	166	156	159	162	166	165	156	156	152	156	40	35	30	32	29	359	5	339	333	124.4
19-Mar	335	347	11	17	343	338	351	347	158	242	293	12	29	23	45	23	35	230	160	132	127	131	135	128	64.3
20-Mar	108	118	118	130	117	111	110	116	78	48	39	30	24	21	25	17	13	15	7	11	16	37	14	27	39.3
21-Mar	22	66	53	336	299	341	345	332	328	315	358	359	269	254	239	254	208	199	179	150	162	138	134	137	208.2
22-Mar	163	154	157	181	161	184	175	176	176	176	171	178	168	165	166	170	169	168	161	144	143	150	166	154	165.8
23-Mar	172	197	155	155	159	170	156	118	67	34	44	43	40	28	32	33	43	27	25	13	351	331	331	343	37.9
24-Mar	348	350	350	15	49	58	74	69	77	71	57	50	59	66	63	80	142	169	161	120	66	59	52	340	55.1
25-Mar	325	340	188	190	309	333	322	352	334	359	357	34	34	34	41	37	32	31	24	17	13	14	1	2	17.1
26-Mar	34	8	352	22	85	46	326	333	333	325	354	17	27	28	22	23	24	17	17	15	16	23	18	337	14.2
27-Mar	336	312	258	286	237	208	199	166	165	167	187	147	137	149	154	132	172	47	47	48	39	55	33	345	113.5
28-Mar	337	348	349	332	305	224	179	193	180	183	177	182	167	170	164	159	160	159	158	157	154	149	149	310	168.8
29-Mar	0	358	331	330	314	315	278	314	320	323	10	20	24	27	25	25	23	28	23	28	14	356	252	250	8.8
30-Mar	300	329	264	302	251	203	185	172	254	249	56	36	29	30	30	23	20	24	46	43	42	9	343	339	19.2
31-Mar	343	339	336	336	334	333	329	330	336	14	22	13	349	16	9	336	330	329	320	5	94	95	71	54	357.0
Diurnal Average	48.4	70.2	100.7	110.2	127.7	127.8	127.6	116.3	131.6	133.6	91.3	78.3	78.8	73.1	73.8	63.6	55.9	52.3	49.2	59.7	63.2	70.1	62.0	50.9	

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg

Barge Landing - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 97 deg on Mar 2 13:00

Minimum Value: 3 deg on Mar 18 23:00

Percentiles: $P_1 = 5$ $P_{10} = 9$ $Q_1 = 12$ Median = 16 $Q_3 = 21$ $P_{90} = 34$ $P_{99} = 77$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	9	10	11	12	19	14	10	25	31	22	34	30	18	18	16	13	12	11	9	10	9	11	9	13	34
2-Mar	12	11	12	10	12	13	18	12	13	13	17	90	97	49	25	29	16	18	15	14	11	12	19	30	97
3-Mar	21	16	16	14	13	14	13	14	13	14	14	16	18	29	18	15	13	20	17	23	17	13	13	15	29
4-Mar	15	24	41	39	31	29	16	19	16	23	21	21	18	20	29	28	14	13	18	16	21	8	18	19	41
5-Mar	23	16	16	25	34	31	23	14	32	33	39	20	16	20	17	12	13	15	9	14	29	9	UO	UO	39
6-Mar	4	4	32	42	56	14	18	14	46	32	24	45	44	37	22	36	19	12	12	10	8	9	11	9	56
7-Mar	10	11	10	10	10	11	11	11	11	13	14	16	15	17	21	18	16	10	10	9	9	10	10	12	21
8-Mar	11	11	9	6	6	5	7	7	12	18	20	19	26	23	27	30	28	12	12	7	8	7	8	9	30
9-Mar	18	14	6	5	5	4	5	6	12	17	17	17	19	24	19	15	19	12	9	10	10	11	11	12	24
10-Mar	13	13	14	11	12	11	12	14	13	14	15	23	17	20	22	15	37	15	20	19	23	43	18	20	43
11-Mar	12	9	8	10	17	7	11	58	30	66	17	16	21	21	17	25	13	13	14	14	16	14	11	11	66
12-Mar	13	12	13	17	17	20	16	14	12	15	15	18	19	14	15	14	14	15	17	17	16	15	17	15	20
13-Mar	8	6	6	12	15	13	52	20	48	38	24	14	16	15	14	18	17	18	18	16	13	19	18	17	52
14-Mar	19	20	20	18	19	19	18	20	16	15	18	18	20	20	18	20	17	16	17	18	17	23	20	16	23
15-Mar	12	11	13	10	34	7	4	15	23	28	21	19	19	18	15	18	19	13	14	20	11	43	12	39	43
16-Mar	13	7	10	36	94	90	55	31	29	18	19	19	19	19	17	16	11	12	9	8	8	9	6	15	94
17-Mar	12	11	8	7	7	7	12	12	15	13	16	16	18	16	14	13	12	9	10	12	8	15	21	11	21
18-Mar	14	9	7	7	7	20	13	9	14	17	20	18	18	25	41	18	9	10	9	11	17	25	3	7	41
19-Mar	8	11	26	22	11	6	17	56	31	35	37	38	17	36	19	30	42	91	26	9	9	12	13	17	91
20-Mar	17	20	11	12	15	22	14	24	42	27	19	17	16	15	12	16	17	15	19	18	19	9	35	13	42
21-Mar	14	31	13	31	32	7	13	50	15	25	59	81	48	57	69	24	34	20	19	7	8	11	5	7	81
22-Mar	16	17	12	12	6	16	18	14	16	15	18	27	23	22	21	18	16	13	8	9	5	6	6	3	27
23-Mar	11	17	10	10	20	21	21	29	29	15	16	14	14	14	14	13	14	15	13	20	17	10	10	16	29
24-Mar	17	18	15	19	20	24	11	35	23	40	25	25	24	20	25	24	39	18	10	13	17	10	36	12	40
25-Mar	15	71	47	53	51	7	13	12	30	38	39	20	20	17	16	16	12	12	12	17	17	13	20	18	71
26-Mar	23	25	27	40	45	23	17	12	22	24	33	20	20	15	20	13	14	15	12	12	12	28	17	10	45
27-Mar	4	29	7	15	19	25	13	14	18	16	39	36	53	36	28	49	86	23	13	11	11	15	37	19	86
28-Mar	7	8	9	10	18	35	22	24	29	31	23	24	18	19	17	15	14	11	10	10	12	11	58	59	59
29-Mar	24	46	9	7	11	11	36	30	21	24	31	16	15	14	13	15	16	13	14	14	13	20	39	36	46
30-Mar	24	36	14	19	41	18	15	11	69	82	37	19	18	16	17	15	16	14	12	13	11	30	9	7	82
31-Mar	6	6	7	10	9	11	12	14	19	20	13	17	26	15	20	21	17	15	14	51	17	13	14	10	51
Diurnal Maximum	24	71	47	53	94	90	55	58	69	82	59	90	97	57	69	49	86	91	26	51	29	43	58	59	

UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Barge Landing - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS11
LOWER CAMP
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	704	36	40	99.46	43.6	0	7.9	0
H2S (ppb) Average	700	39	44	99.33	13.8	2	1.8	0
THC (ppm) Average	705	36	39	99.6	3.3	-	2.4	-
CH4(ppm) Average	705	36	39	99.6	3.2	-	2.4	-
NMHC(ppm) Average	705	36	39	99.6	0.202	-	0.051	-
Temperature (C) Average	742	0	2	99.73	9.7	-	-1.4	-
Relative Humidity (%) Average	742	0	2	99.73	96	-	84	-
Barometric Pressure (inHg) Average	743	0	1	99.87	29.9	-	29.9	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	29	-	21	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	704	1.4	4.3	-	0	0	0	0.2	0.7	2.6	43.6
H2S (ppb) Average	700	0.46	0.9	-	0	0	0.1	0.2	0.6	1	13.8
THC (ppm) Average	705	2.18	0.2	-	2	2	2.1	2.1	2.2	2.4	3.3
CH4(ppm) Average	705	2.17	0.2	-	2	2	2.1	2.1	2.2	2.4	3.2
NMHC(ppm) Average	705	0.01	0.026	-	0	0	0	0	0	0	0.202
Temperature 2 m (C) Average	742	-9.88	7.4	-	-31.8	-19.4	-13.9	-9.4	-5	-1.1	9.7
Relative Humidity (%) Average	742	69.01	12.9	-	34.3	49.9	59.7	71.6	79.1	83.9	96
Barometric Pressure (inHg) Average	743	29.25	0.3	-	28.2	28.9	29.1	29.2	29.5	29.7	29.9
Wind Speed 10 m (km/h) Average	743	9.5	6	-	0	2	4	9	13	18	29
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	10 Mar 2023 14:00	10 Mar 2023 16:00	3	Maintenance - WBEA internal audit
H2S	10 Mar 2023 13:00	10 Mar 2023 16:00	4	Maintenance - WBEA internal audit
THC/NMHC/CH4	10 Mar 2023 16:00	10 Mar 2023 17:00	2	Maintenance - WBEA internal audit
ALL PARAMETERS	26 Mar 2023 10:00	26 Mar 2023 10:00	1	Maintenance - station logger/modem reset
Relative Humidity, Temperature	28 Mar 2023 13:00	28 Mar 2023 13:00	1	Maintenance - sensor replaced

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 43.6 ppb on Mar 24 17:00

Maximum Daily Average: 7.9 ppb on Mar 24

Minimum Value: 0.0 ppb on Mar 4 22:00

Minimum Daily Average: 0.0 ppb on Mar 12

Maximum Diurnal Average: 4.0 ppb at hour 14

Minimum Diurnal Average: 0.2 ppb at hour 2

Monthly Average: 1.40 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.2 Q_3 = 0.7 P_{90} = 2.6 P_{99} = 22.7

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	36
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	1.7	Z	0.9	0.6	0.4	0.3	0.2	0.1	0.3	0.3	0.5	0.6	0.7	0.8	1.1	1.1	1.1	0.6	0.5	0.5	0.5	0.5	0.5	0.7	0.6	1.7
2-Mar	2.4	0.7	Z	1.8	2.1	9.7	5.0	3.6	2.7	1.8	1.4	3.6	7.9	3.5	5.7	1.1	0.7	0.4	2.3	1.4	1.8	1.2	0.6	0.3	2.7	9.7
3-Mar	0.3	0.3	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.2	0.0	0.1	0.0	0.1	0.0	0.2	0.4
4-Mar	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.6	0.2	0.0	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.6
5-Mar	0.0	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.7	1.2	0.6	0.5	0.5	0.9	16.1	20.3	7.8	3.6	1.6	1.6	0.7	0.3	0.1	2.5	20.3
6-Mar	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.3	0.3	0.6	0.6	Z	0.5	0.2	0.1	0.2	0.9	0.3	0.3	0.2	0.3	0.9
7-Mar	Z	0.2	0.9	0.4	0.2	0.2	0.1	0.2	0.2	0.2	C	C	C	C	C	0.0	0.1	0.0	0.0	0.0	0.5	0.4	0.6	0.1	0.2	0.9
8-Mar	0.4	Z	0.1	0.2	0.1	0.1	0.3	0.1	0.1	1.5	0.8	0.5	0.5	10.3	2.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.8	10.3
9-Mar	0.0	0.0	Z	2.2	4.5	7.7	0.7	0.5	0.5	0.1	0.8	10.8	12.6	7.7	21.2	11.0	4.6	0.3	1.0	0.3	0.1	0.1	0.1	0.2	3.8	21.2
10-Mar	0.2	0.1	1.4	Z	0.3	0.7	0.1	0.1	0.1	0.2	1.9	0.6	0.3	M	M	M	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.3	1.9
11-Mar	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
12-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2
14-Mar	0.1	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
15-Mar	0.0	0.1	Z	1.2	0.0	0.0	0.0	0.0	0.4	1.4	1.8	3.5	6.1	7.3	12.7	3.9	5.8	5.4	9.8	4.9	0.8	0.4	0.3	0.4	2.9	12.7
16-Mar	0.7	0.4	0.5	Z	0.3	0.2	0.1	0.4	0.5	1.5	0.5	0.4	0.6	0.6	0.6	0.9	1.0	0.8	1.0	8.9	13.7	1.5	13.0	4.6	2.3	13.7
17-Mar	6.6	0.8	0.3	0.3	Z	0.1	0.1	0.2	0.2	0.4	0.6	0.5	8.9	2.0	0.6	0.6	0.8	13.5	32.3	14.5	1.2	0.5	0.4	0.5	3.7	32.3
18-Mar	4.1	0.8	1.1	0.6	0.3	Z	0.2	0.3	0.6	0.6	0.5	0.5	0.5	0.7	5.1	5.5	24.2	19.2	1.5	0.9	0.9	1.1	0.6	0.4	3.1	24.2
19-Mar	Z	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.5	0.8	0.4	0.3	0.3	0.3	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.3	0.8
20-Mar	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.9	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.9
21-Mar	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	13.2	39.6	7.9	3.4	3.0	5.7	1.8	2.1	1.7	0.3	0.0	0.0	3.5	39.6
22-Mar	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.4	1.0	0.9	1.2	1.0	1.2	0.8	0.7	0.6	0.6	0.5	0.4	0.8	0.7	0.1	0.5	1.2
23-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.8	1.3	0.9	0.6	0.5	0.3	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	1.3
24-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.6	1.9	1.3	9.1	22.7	21.5	43.6	25.4	19.6	16.4	13.9	3.9	1.3	0.4	7.9	43.6
25-Mar	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.6	1.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	1.1
26-Mar	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	M	1.6	1.2	0.5	0.3	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.6
27-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.6	13.3	29.6	26.9	11.1	5.4	3.4	2.7	3.7	2.2	0.7	0.4	0.2	0.0	4.4	29.6
28-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	2.1	4.4	0.9	0.9	1.1	3.5	0.9	0.7	0.7	1.5	0.7	1.7	1.5	0.8	1.0	4.4
29-Mar	0.9	1.5	2.7	1.3	0.7	Z	0.4	0.4	0.5	0.4	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.5	2.7
30-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.2	3.8	1.4	0.9	0.9	1.1	0.7	0.1	0.6	0.4	0.2	0.2	0.2	0.5	3.8
31-Mar	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	0.3	0.3	0.2	0.2	0.1	1.3	1.6	0.4	0.1	0.1	0.0	0.3	1.6
	0.7	0.2	0.3	0.4	0.4	0.8	0.3	0.2	0.3	0.5	0.7	1.6	3.1	4.0	3.4	2.7	3.7	2.8	2.6	1.9	1.3	0.5	0.7	0.3	Diurnal Average	
	6.6	1.5	2.7	2.2	4.5	9.7	5.0	3.6	2.7	1.8	2.1	13.3	29.6	39.6	22.7	21.5	43.6	25.4	32.3	16.4	13.9	3.9	13.0	4.6	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 (SO_2) - ppb

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Lower Camp - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	677	96.16	96.16
11 - 20	17	2.41	98.58
21 - 60	10	1.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Lower Camp - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	76	57	14	10	11	40	205	41	2	2	1	11	16	25	80	86	677
11 - 20	1	0	0	0	1	0	10	3	0	0	0	1	0	1	0	0	17
21 - 60	0	0	0	0	1	2	5	1	0	0	0	0	1	0	0	0	10
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	77	57	14	10	13	42	220	45	2	2	1	12	17	26	80	86	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Lower Camp

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - March 2023

Number of Exceedences (AAAQO): 1-hr: 2 24-hr: 0

Maximum Value: 13.8 ppb on Mar 17 19:00

Maximum Daily Average: 1.8 ppb on Mar 17

Minimum Value: 0.0 ppb on Mar 2 18:00

Maximum Diurnal Average: 0.8 ppb at hour 6

Monthly Average: 0.46 ppb

Minimum Daily Average: 0.0 ppb on Mar 3

Minimum Diurnal Average: 0.1 ppb at hour 16

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.2 Q_3 = 0.6 P_{90} = 1.0 P_{99} = 3.4

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	39
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.3	1.5	Z	1.4	1.3	1.3	1.1	1.1	1.1	1.1	0.8	0.7	0.5	0.2	0.2	0.4	0.6	0.4	0.5	0.3	0.2	0.2	0.4	1.3	0.8	1.5
2-Mar	4.4	0.5	0.9	Z	4.3	8.0	2.2	2.1	0.9	0.6	0.3	1.0	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	8.0
3-Mar	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	0.0	0.1
4-Mar	0.0	0.0	0.0	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.3
5-Mar	Z	0.3	0.6	0.5	0.6	0.5	0.4	0.4	0.6	0.6	0.3	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.4	1.0	1.5	1.3	1.1	1.0	0.5	1.5
6-Mar	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.6	0.6	0.9	Z	0.5	0.6	0.7	0.8	0.2	0.1	0.3	0.2	0.2	0.0	0.0	0.0	0.1	0.4	0.9
7-Mar	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.1	0.1	0.0	0.0	0.2
8-Mar	0.1	0.2	Z	0.2	0.3	0.2	0.4	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.7	0.6	0.1	0.2	0.2	0.2	0.2	0.7
9-Mar	0.2	0.3	0.3	Z	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.0	0.3	0.0	0.0	0.2	0.3	0.2	0.2	0.3	0.2	0.1	0.2	0.4
10-Mar	0.2	0.0	0.1	0.0	Z	0.1	0.2	0.1	0.0	0.1	0.1	0.0	M	M	M	M	0.2	0.2	0.1	0.1	0.2	0.4	0.4	0.4	0.1	0.4
11-Mar	0.7	0.8	1.3	0.5	0.3	Z	0.6	0.2	0.4	0.3	0.4	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.3
12-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2
13-Mar	0.3	Z	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
14-Mar	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	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2
15-Mar	0.4	0.3	0.6	Z	0.2	0.8	0.9	1.3	1.0	0.7	0.7	0.6	0.5	0.8	0.7	0.5	0.5	0.5	0.6	0.4	0.4	0.5	0.3	0.3	0.6	1.3
16-Mar	0.6	0.4	0.5	0.4	Z	0.4	1.1	0.4	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.8	1.5	1.2	0.8	2.3	0.6	0.5	2.3
17-Mar	0.6	0.5	0.3	0.2	0.3	Z	0.4	0.4	0.6	0.4	0.7	0.3	0.5	0.1	0.2	0.0	0.2	4.8	13.8	10.7	3.4	1.7	1.1	0.8	1.8	13.8
18-Mar	Z	1.4	2.0	1.5	1.0	1.1	0.6	0.9	1.0	0.4	0.4	0.3	0.4	0.5	0.6	0.7	3.1	1.0	0.1	0.1	0.3	0.9	0.6	0.4	0.8	3.1
19-Mar	1.6	Z	1.4	1.8	2.1	1.4	1.4	1.7	1.2	0.5	0.3	0.4	0.3	0.1	0.2	0.1	0.2	0.2	0.3	0.4	0.7	0.6	0.8	0.6	0.8	2.1
20-Mar	0.6	0.4	Z	0.6	0.3	0.1	0.0	0.0	0.1	0.0	0.1	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.6
21-Mar	0.2	0.7	0.6	Z	0.9	1.5	2.0	1.9	1.2	0.4	0.3	0.3	1.0	1.7	0.7	0.4	0.4	0.9	0.5	0.5	1.2	1.0	0.7	0.7	0.9	2.0
22-Mar	0.7	0.7	0.7	0.7	Z	0.7	0.7	1.7	0.9	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.7	1.0	1.8	2.1	1.3	0.7	2.1
23-Mar	0.6	2.3	1.3	0.8	0.4	Z	0.6	0.6	0.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.4	2.3
24-Mar	Z	0.3	0.0	0.1	0.0	0.1	0.2	0.6	0.3	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.8	0.5	0.9	0.9	2.2	1.2	1.9	1.6	0.6	2.2
25-Mar	0.9	Z	0.4	0.3	0.4	2.3	1.4	1.3	1.4	1.3	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.5	2.3
26-Mar	0.1	0.2	Z	0.3	0.2	0.3	0.4	0.7	0.3	M	0.4	0.3	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.7
27-Mar	1.0	0.5	0.3	0.2	Z	0.2	0.2	0.4	0.9	0.9	0.7	3.6	2.1	1.0	0.4	0.2	0.3	0.1	0.2	0.3	0.0	0.1	0.1	0.2	0.6	3.6
28-Mar	0.8	0.4	0.9	0.3	0.0	Z	0.0	0.2	0.7	C	C	C	C	C	C	C	C	0.7	0.6	0.4	0.5	0.9	0.7	0.2	--	0.9
29-Mar	Z	1.0	0.9	1.3	1.5	1.0	0.9	0.8	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.9	0.4	1.5
30-Mar	0.4	Z	0.0	0.1	0.2	0.1	0.1	0.4	1.1	1.5	0.9	0.3	0.7	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	1.5
31-Mar	0.2	0.1	Z	0.1	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.6	0.3	0.3	0.1	0.2	0.2	0.6
	0.7	0.5	0.6	0.5	0.6	0.8	0.6	0.6	0.6	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.3	0.4	0.7	0.6	0.5	0.4	0.5	0.4	Diurnal Average	
	4.4	2.3	2.0	1.8	4.3	8.0	2.2	2.1	1.4	1.5	0.9	3.6	2.1	1.7	0.8	0.7	3.1	4.8	13.8	10.7	3.4	1.8	2.3	1.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	691	98.71	98.71
3 - 4	5	0.71	99.43
5 - 7	1	0.14	99.57
8 - 11	1	0.14	99.71
> 11	2	0.29	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	76	57	17	9	13	38	215	40	3	2	1	12	18	25	81	84	691
3 - 4	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0	5
5 - 7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Totals	76	57	17	9	13	39	221	42	3	2	1	12	18	25	81	84	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Lower Camp

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - March 2023

Maximum Value: 3.3 ppm on Mar 18 18:00

Maximum Daily Average: 2.4 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 23 17:00

Minimum Daily Average: 2.0 ppm on Mar 12

Maximum Diurnal Average: 2.2 ppm at hour 5

Minimum Diurnal Average: 2.1 ppm at hour 16

Monthly Average: 2.18 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.1 Median = 2.1 Q_3 = 2.2 P_{90} = 2.4 P_{99} = 2.7

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
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-Mar	2.5	Z	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.2	2.2	2.2	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.7
2-Mar	2.5	2.3	Z	2.4	2.5	2.7	2.4	2.3	2.2	2.2	2.3	2.7	2.3	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.3	2.7
3-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
4-Mar	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
5-Mar	2.1	2.1	2.2	2.2	2.3	Z	2.3	2.3	2.2	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.5	2.6	2.5	2.2	2.6
6-Mar	2.5	2.5	2.5	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.6	2.3	2.2	2.3	2.4	Z	2.2	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.3	2.6
7-Mar	Z	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	C	C	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
8-Mar	2.1	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.4	2.3	2.1	2.2	2.2	2.2	2.1	2.4
9-Mar	2.2	2.2	Z	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2
10-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	2.1	2.1	2.0	2.1	2.2	2.3	2.1	2.1	2.3
11-Mar	2.3	2.3	2.4	2.1	Z	2.2	2.2	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	2.0	2.1	2.4
12-Mar	2.1	2.1	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	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1
13-Mar	Z	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2
14-Mar	2.1	Z	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2
15-Mar	2.1	2.2	Z	2.3	2.3	2.3	2.4	2.4	2.2	2.3	2.7	2.6	2.4	2.4	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.3	2.2	2.4	2.7
16-Mar	2.3	2.3	2.3	Z	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
17-Mar	2.1	2.2	2.1	2.1	Z	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.5	3.1	2.9	2.8	2.7	2.4	2.3	2.3	3.1
18-Mar	2.4	2.3	2.4	2.4	2.3	Z	2.3	2.4	2.4	2.2	2.2	2.2	2.3	2.3	2.4	2.6	2.5	3.3	2.1	2.0	2.1	2.2	2.3	2.3	2.3	3.3
19-Mar	Z	2.6	2.7	2.6	2.6	2.7	2.6	2.7	2.6	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.3	2.7
20-Mar	2.2	Z	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	2.1	2.2
21-Mar	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.5	2.4	2.3	2.2	2.2	2.5
22-Mar	2.2	2.2	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.7	2.7	2.5	2.2	2.7
23-Mar	2.2	2.4	2.3	2.3	Z	2.2	2.4	2.3	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	2.0	2.0	2.1	2.4
24-Mar	2.1	2.1	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.7	2.5	2.4	2.2	2.7
25-Mar	Z	2.5	2.2	2.2	2.2	2.4	2.3	2.3	2.3	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.6
26-Mar	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2
27-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	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	2.3
28-Mar	2.1	2.1	2.1	2.1	Z	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	2.1	2.2	2.3	2.3	2.1	2.1	2.3
29-Mar	2.2	2.4	2.5	2.4	2.5	Z	2.3	2.3	2.3	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	2.1	2.1	2.2	2.5
30-Mar	Z	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.5	2.7	2.4	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.7
31-Mar	2.1	Z	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.1	2.2	2.4
	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average	
	2.5	2.6	2.7	2.6	2.6	2.7	2.6	2.7	2.6	2.7	2.7	2.7	2.4	2.4	2.4	2.6	2.5	3.3	3.1	2.9	2.8	2.7	2.7	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Lower Camp - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	118	16.74	16.74
2.1 - 3.0	585	82.98	99.72
3.1 - 10.0	2	0.28	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Lower Camp - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	33	22	8	4	1	6	10	4	0	0	0	0	1	2	7	20	118
2.1 - 3.0	44	35	6	6	12	37	209	41	2	2	1	12	16	23	73	66	585
3.1 - 10.0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	77	57	14	10	13	43	220	45	2	2	1	12	17	26	80	86	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Lower Camp

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Lower Camp - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.2 ppm on Mar 18 18:00

Maximum Daily Average: 2.4 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 23 17:00

Maximum Diurnal Average: 2.2 ppm at hour 5

Monthly Average: 2.17 ppm

Minimum Daily Average: 2.0 ppm on Mar 12

Minimum Diurnal Average: 2.1 ppm at hour 16

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.1 Median = 2.1 Q_3 = 2.2 P_{90} = 2.4 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
Percent Operational Time:	99.6

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

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Lower Camp - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	123	17.45	17.45
2.1 - 3.0	581	82.41	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Lower Camp - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	35	22	9	4	1	8	10	4	0	0	0	0	1	2	7	20	123
2.1 - 3.0	42	35	5	6	12	35	210	41	2	2	1	12	16	23	73	66	581
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	77	57	14	10	13	43	220	45	2	2	1	12	17	26	80	86	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Lower Camp

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp - March 2023

Maximum Value: 0.202 ppm on Mar 11 03:00

Maximum Daily Average: 0.051 ppm on Mar 19

Minimum Value: 0.000 ppm on Mar 1 12:00

Minimum Daily Average: 0.000 ppm on Mar 4

Maximum Diurnal Average: 0.019 ppm at hour 3

Minimum Diurnal Average: 0.001 ppm at hour 17

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} = 0.1

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.009	Z	0.067	0.052	0.025	0.008	0.007	0.015	0.010	0.009	0.004	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.006	0.001	0.000	0.022	0.010	0.067
2-Mar	0.092	0.000	Z	0.073	0.071	0.168	0.062	0.053	0.011	0.005	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.024	0.168
3-Mar	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-Mar	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
5-Mar	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	0.002	0.005	0.000	0.000	0.000	0.000	0.000	0.005
6-Mar	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	0.003	Z	0.000	0.022	0.001	0.016	0.000	0.000	0.000	0.000	0.002	0.022
7-Mar	Z	0.019	0.000	0.000	0.010	0.021	0.000	0.000	0.000	0.000	C	C	C	C	C	0.001	0.007	0.027	0.026	0.000	0.000	0.000	0.000	0.000	0.006	0.027
8-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.025	0.200	0.095	0.000	0.000	0.000	0.000	0.014	0.200
9-Mar	0.000	0.000	Z	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	0.072	0.013	0.000	0.029	0.070	0.009	0.000	0.008	0.072
10-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.000	M	M	0.005	0.000	0.000	0.032	0.043	0.046	0.049	0.009	0.049
11-Mar	0.112	0.102	0.202	0.029	Z	0.090	0.084	0.009	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.020	0.001	0.000	0.000	0.000	0.000	0.000	0.029	0.202
12-Mar	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
13-Mar	Z	0.001	0.009	0.016	0.018	0.006	0.000	0.000	0.000	0.000	0.002	0.010	0.046	0.018	0.000	0.000	0.000	0.000	0.010	0.012	0.000	0.000	0.000	0.000	0.006	0.046
14-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.007	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.002	0.040	0.012	0.005	0.004	0.040
15-Mar	0.002	0.001	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.065	0.078	0.062	0.070	0.053	0.017	0.017	0.015	0.058	0.073	0.095	0.096	0.050	0.022	0.034	0.096
16-Mar	0.039	0.027	0.031	Z	0.014	0.000	0.057	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.007	0.009	0.000	0.008	0.057
17-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.027	0.105	0.125	0.128	0.123	0.046	0.016	0.025	0.128
18-Mar	0.011	0.001	0.022	0.005	0.000	Z	0.008	0.022	0.019	0.002	0.011	0.001	0.000	0.000	0.001	0.036	0.002	0.122	0.008	0.000	0.000	0.000	0.033	0.092	0.017	0.122
19-Mar	Z	0.132	0.132	0.120	0.111	0.129	0.095	0.101	0.084	0.006	0.022	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.007	0.061	0.039	0.072	0.037	0.051	0.132
20-Mar	0.033	Z	0.044	0.034	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.044
21-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.030	0.001	0.007	0.021	0.001	0.000	0.000	0.000	0.000	0.001	0.038	0.002	0.000	0.000	0.005	0.038
22-Mar	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	0.023	0.078	0.087	0.061	0.011	0.087
23-Mar	0.002	0.000	0.000	0.000	Z	0.000	0.026	0.009	0.003	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	0.026
24-Mar	0.005	0.000	0.005	0.009	0.000	Z	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.060	0.073	0.063	0.010	0.073
25-Mar	Z	0.054	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.077	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.077
26-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	0.000	0.035	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.056
27-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.026	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.026
28-Mar	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	0.010	0.002	0.000	0.001	0.010
29-Mar	0.000	0.000	0.003	0.000	0.004	Z	0.006	0.013	0.028	0.002	0.016	0.021	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	0.028
30-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.106	0.062	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	0.009	0.106
31-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.003	0.002	0.000	0.001	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	0.003
	0.012	0.013	0.019	0.013	0.010	0.016	0.011	0.008	0.006	0.008	0.009	0.007	0.006	0.004	0.002	0.002	0.001	0.011	0.014	0.011	0.013	0.018	0.014	0.012	Diurnal Average	
	0.112	0.132	0.202	0.120	0.111	0.168	0.095	0.101	0.084	0.106	0.069	0.078	0.062	0.070	0.053	0.036	0.017	0.122	0.200	0.125	0.128	0.123	0.087	0.092	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	552	78.30	78.30
0.006 - 0.05	102	14.47	92.77
0.06 - 0.1	48	6.81	99.57
> 0.1	3	0.43	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	72	49	13	8	7	23	160	39	1	2	0	3	15	19	67	74	552
0.006 - 0.05	4	5	1	1	3	15	43	6	1	0	1	3	2	0	9	8	102
0.06 - 0.1	1	3	0	1	3	5	14	0	0	0	0	6	0	7	4	4	48
> 0.1	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Totals	77	57	14	10	13	43	220	45	2	2	1	12	17	26	80	86	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Lower Camp - March 2023

Maximum Value: 9.7 C on Mar 18 17:00

Maximum Daily Average: -1.4 C on Mar 18

Minimum Value: -31.8 C on Mar 6 08:00

Minimum Daily Average: -23.2 C on Mar 5

Maximum Diurnal Average: -3.7 C at hour 17

Minimum Diurnal Average: -16.0 C at hour 7

Monthly Average: -9.88 C

Percentiles: P_1 = -30.6 P_{10} = -19.4 Q_1 = -13.9 Median = -9.4 Q_3 = -5.0 P_{90} = -1.1 P_{99} = 6.6

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-24.6	-24.4	-25.9	-26.7	-26.9	-27.0	-26.2	-26.1	-24.4	-21.7	-16.0	-11.9	-8.7	-6.9	-6.3	-6.6	-7.5	-9.3	-9.5	-9.4	-8.1	-8.7	-8.4	-7.7	-15.8	-6.3
2-Mar	-7.0	-7.3	-7.3	-7.0	-6.8	-6.6	-6.2	-5.9	-5.9	-5.0	-2.4	0.8	2.7	3.8	4.5	4.1	3.9	3.1	2.7	2.0	1.0	0.2	0.7	0.2	-1.6	4.5
3-Mar	-0.3	-2.6	-5.2	-6.7	-7.7	-8.2	-8.8	-9.2	-9.7	-10.3	-9.9	-9.6	-9.6	-9.4	-8.6	-8.3	-8.7	-9.6	-10.2	-11.9	-12.6	-12.1	-13.5	-14.4	-9.0	-0.3
4-Mar	-14.8	-15.1	-15.3	-15.4	-15.5	-15.7	-16.1	-17.2	-17.3	-16.9	-16.3	-15.5	-14.6	-14.2	-13.9	-13.5	-13.7	-14.6	-16.2	-17.2	-18.6	-21.2	-23.8	-24.8	-16.6	-13.5
5-Mar	-26.3	-27.7	-28.9	-29.2	-30.0	-30.9	-31.1	-30.7	-29.0	-23.3	-19.0	-17.6	-16.6	-15.1	-14.1	-13.6	-14.0	-15.5	-18.5	-21.3	-23.6	-25.3	-26.7	-27.8	-23.2	-13.6
6-Mar	-28.6	-29.5	-30.2	-30.4	-30.9	-31.6	-31.8	-31.8	-31.0	-26.8	-22.6	-18.0	-14.4	-11.8	-10.0	-9.7	-9.7	-10.2	-11.7	-12.2	-11.6	-11.8	-12.1	-12.7	-20.1	-9.7
7-Mar	-12.6	-11.9	-11.7	-11.9	-12.2	-12.6	-12.8	-12.8	-12.3	-11.5	-11.7	-11.5	-10.4	-8.8	-7.6	-6.7	-6.2	-6.8	-8.4	-8.6	-8.9	-8.8	-8.7	-9.4	-10.2	-6.2
8-Mar	-10.4	-11.3	-11.7	-12.2	-13.1	-13.3	-13.9	-14.1	-13.4	-11.3	-9.9	-9.1	-7.7	-5.8	-5.2	-4.5	-5.3	-7.5	-10.0	-10.7	-11.7	-12.9	-13.5	-14.5	-10.5	-4.5
9-Mar	-14.8	-14.8	-14.6	-15.1	-17.1	-17.9	-19.7	-20.4	-17.7	-15.1	-12.7	-9.8	-8.2	-7.4	-6.9	-6.4	-6.7	-7.6	-8.6	-9.0	-9.4	-10.0	-9.7	-9.5	-12.0	-6.4
10-Mar	-10.0	-10.3	-10.7	-10.4	-10.7	-10.7	-10.6	-10.6	-10.0	-9.2	-8.0	-8.0	-7.7	-6.8	-5.7	-4.4	-4.8	-5.3	-6.1	-6.7	-6.4	-6.6	-8.3	-7.8	-8.2	-4.4
11-Mar	-8.8	-8.6	-8.9	-9.5	-9.3	-9.4	-9.6	-9.7	-8.5	-7.1	-6.3	-5.4	-4.2	-2.8	-2.7	-2.0	-2.5	-3.6	-5.2	-7.0	-8.0	-8.7	-9.5	-10.0	-7.0	-2.0
12-Mar	-10.5	-10.7	-11.2	-11.7	-12.2	-12.9	-13.6	-14.1	-14.0	-13.4	-12.7	-11.9	-11.9	-11.5	-10.8	-10.7	-10.7	-10.7	-11.7	-12.1	-12.3	-12.9	-13.6	-13.9	-12.2	-10.5
13-Mar	-14.4	-15.0	-15.8	-16.5	-17.8	-18.8	-18.3	-18.1	-17.2	-15.9	-14.1	-11.6	-9.6	-8.0	-6.6	-5.5	-5.0	-5.0	-4.9	-5.1	-4.8	-6.2	-7.5	-7.8	-11.2	-4.8
14-Mar	-8.3	-8.9	-9.3	-9.7	-9.7	-10.1	-10.5	-10.8	-11.7	-12.0	-12.0	-11.8	-10.9	-10.3	-10.3	-10.3	-10.7	-11.1	-11.7	-12.2	-12.6	-13.0	-13.3	-14.0	-11.0	-8.3
15-Mar	-14.7	-15.6	-17.0	-19.4	-21.1	-21.6	-21.3	-19.9	-17.2	-15.3	-14.0	-12.7	-11.3	-10.3	-9.2	-8.3	-8.2	-8.7	-10.8	-13.8	-16.4	-17.7	-18.8	-18.7	-15.1	-8.2
16-Mar	-18.4	-18.4	-15.8	-14.2	-14.0	-13.4	-13.9	-13.2	-12.3	-11.2	-9.9	-9.2	-7.4	-6.5	-5.1	-4.1	-3.4	-3.3	-4.1	-4.9	-6.5	-8.5	-8.2	-8.8	-9.8	-3.3
17-Mar	-9.2	-10.2	-12.1	-13.1	-13.6	-13.6	-14.0	-12.9	-11.2	-8.8	-5.4	-1.9	1.9	4.2	6.1	7.3	8.3	7.3	3.0	-1.1	-3.0	-3.8	-3.1	-3.0	-4.2	8.3
18-Mar	-5.5	-7.0	-7.2	-8.7	-10.6	-10.9	-11.1	-9.4	-4.5	-2.1	0.5	3.0	4.8	5.5	7.1	8.2	9.7	7.8	7.0	4.2	0.1	-3.1	-4.6	-5.6	-1.4	9.7
19-Mar	-7.1	-8.2	-9.4	-10.5	-11.0	-12.3	-13.0	-12.4	-9.2	-3.9	-1.1	0.7	1.4	0.7	1.5	1.7	1.5	0.5	-0.2	-2.0	-2.7	-2.8	-3.1	-3.6	-4.3	1.7
20-Mar	-3.8	-3.8	-4.4	-5.7	-6.0	-6.8	-7.4	-7.2	-6.8	-6.6	-6.0	-4.9	-4.0	-2.8	-1.8	-1.2	-1.3	-2.2	-3.8	-5.5	-7.3	-8.9	-10.4	-11.6	-5.4	-1.2
21-Mar	-13.5	-16.4	-17.7	-19.1	-20.5	-21.2	-22.1	-21.7	-18.5	-15.4	-12.7	-10.3	-7.9	-5.9	-4.7	-4.1	-3.8	-3.5	-5.4	-7.0	-10.7	-13.5	-15.1	-14.9	-12.7	-3.5
22-Mar	-12.4	-12.5	-12.1	-12.8	-13.8	-14.0	-14.8	-15.8	-11.6	-7.1	-3.9	-1.6	0.1	1.7	2.9	3.0	3.7	3.6	1.9	-0.1	-3.2	-4.2	-5.6	-7.8	-5.7	3.7
23-Mar	-8.4	-9.3	-9.1	-10.0	-8.2	-6.9	-7.4	-7.0	-4.7	-1.5	0.2	0.3	0.2	-0.7	-1.1	-0.7	-2.0	-2.9	-4.1	-5.3	-6.6	-7.8	-8.3	-8.0	-5.0	0.3
24-Mar	-7.6	-6.9	-8.0	-10.1	-11.4	-12.5	-14.4	-15.1	-10.8	-9.1	-8.0	-6.3	-4.7	-3.5	-2.4	-1.3	-1.1	-1.2	-2.8	-4.3	-6.7	-9.3	-12.0	-13.3	-7.6	-1.1
25-Mar	-15.2	-16.0	-17.4	-18.3	-19.1	-19.9	-21.0	-19.9	-16.8	-12.0	-7.3	-4.0	-3.0	-2.4	-2.1	-2.3	-2.8	-3.9	-5.5	-7.5	-9.0	-10.5	-11.9	-13.8	-10.9	-2.1
26-Mar	-15.4	-17.1	-18.1	-19.4	-20.8	-21.3	-22.5	-22.1	-19.7	M	-15.0	-13.1	-11.2	-10.0	-9.0	-8.9	-9.1	-9.6	-10.7	-12.8	-14.2	-15.3	-16.6	-20.5	-15.3	-8.9
27-Mar	-21.8	-23.7	-25.2	-26.2	-27.2	-27.8	-28.1	-25.8	-19.8	-16.3	-13.1	-10.4	-8.2	-7.0	-5.7	-5.4	-5.4	-5.7	-6.7	-9.2	-9.9	-12.2	-15.1	-17.3	-15.6	-5.4
28-Mar	-19.0	-20.7	-22.0	-23.6	-24.7	-25.5	-25.6	-22.6	-17.5	-14.5	-9.8	-6.7	M	-3.5	-2.3	-1.2	-0.6	-0.5	-0.6	-1.8	-2.6	-1.8	-2.3	-3.1	-11.0	-0.5
29-Mar	-3.2	-3.7	-4.0	-4.8	-6.6	-7.4	-7.3	-5.9	-4.4	-2.7	-1.5	-0.7	-0.4	-0.5	-0.5	-0.7	-0.5	-1.2	-2.1	-3.0	-3.8	-6.5	-8.7	-10.3	-3.8	-0.4
30-Mar	-12.1	-13.6	-14.9	-15.9	-16.6	-16.7	-16.4	-15.0	-11.3	-7.5	-4.8	-3.3	-2.5	-1.7	-1.1	-0.8	-0.2	-0.7	-1.4	-1.7	-2.7	-3.9	-4.6	-5.7	-7.3	-0.2
31-Mar	-6.7	-7.1	-7.5	-7.7	-7.8	-7.7	-7.6	-7.2	-6.0	-4.4	-2.8	-1.6	-0.4	0.3	1.2	2.1	2.5	2.4	1.1	-1.2	-2.9	-1.7	-1.1	-2.6	-3.1	2.5
	-12.4	-13.2	-13.8	-14.6	-15.3	-15.6	-16.0	-15.6	-13.7	-11.3	-9.3	-7.5	-6.1	-5.1	-4.2	-3.7	-3.7	-4.4	-5.7	-7.0	-8.2	-9.3	-10.2	-11.1	Diurnal Average	
	-0.3	-2.6	-4.0	-4.8	-6.0	-6.6	-6.2	-5.9	-4.4	-1.5	0.5	3.0	4.8	5.5	7.1	8.2	9.7	7.8	7.0	4.2	1.0	0.2	0.7	0.2	Diurnal Maximum	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Lower Camp - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	68	9.16	9.16
-20 - 0	620	83.56	92.72
0 - 10	54	7.28	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Lower Camp - March 2023

Maximum Value: 96.0 % on Mar 17 22:00

Maximum Daily Average: 84.0 % on Mar 14

Minimum Value: 34.3 % on Mar 18 17:00

Minimum Daily Average: 52.1 % on Mar 8

Maximum Diurnal Average: 78.4 % at hour 5

Minimum Diurnal Average: 54.8 % at hour 16

Monthly Average: 69.01 %

Percentiles: P_1 = 38.1 P_{10} = 49.9 Q_1 = 59.7 Median = 71.6 Q_3 = 79.1 P_{90} = 83.9 P_{99} = 89.6

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	78.6	77.9	77.0	76.3	76.5	76.7	77.0	76.9	77.5	79.8	77.6	65.8	59.7	58.6	58.2	59.3	63.5	71.8	74.2	76.6	74.5	78.6	79.4	79.5	73.0	79.8
2-Mar	81.0	87.3	87.9	89.6	88.3	86.1	83.8	80.8	81.4	77.7	71.7	63.3	57.1	59.2	57.2	60.5	63.7	69.6	71.9	73.6	78.3	78.6	70.4	65.7	74.4	89.6
3-Mar	64.0	78.4	75.1	74.7	73.7	70.8	70.2	72.1	70.8	68.1	66.2	66.0	65.8	63.6	61.9	60.9	59.7	67.8	78.8	85.2	88.4	79.4	74.5	72.8	71.2	88.4
4-Mar	69.4	70.8	72.0	75.9	75.6	77.5	77.9	72.5	73.0	69.0	64.2	64.5	55.2	55.8	51.9	51.9	56.7	59.2	64.9	65.0	68.8	76.7	80.3	78.9	67.8	80.3
5-Mar	77.1	76.3	75.3	75.2	74.3	73.7	73.4	73.2	74.0	75.6	60.7	56.0	51.5	47.3	45.7	46.1	50.0	53.7	62.8	73.1	77.9	78.8	77.7	76.1	66.9	78.8
6-Mar	75.5	74.8	73.9	73.7	72.9	72.5	72.4	72.3	72.7	75.9	77.4	70.4	60.9	59.8	61.5	67.8	74.8	74.0	75.7	77.2	76.2	74.4	73.2	76.5	72.4	77.4
7-Mar	80.4	80.6	79.5	77.5	76.8	76.6	77.6	80.2	78.9	73.9	73.1	71.6	69.6	64.1	60.0	57.8	54.5	55.1	57.2	54.9	56.9	55.0	57.4	57.9	67.8	80.6
8-Mar	55.8	56.9	54.2	54.8	57.8	58.0	61.4	60.2	58.0	55.2	51.8	50.3	45.2	40.0	38.3	36.0	41.6	47.2	53.8	50.7	51.7	55.2	56.5	59.2	52.1	61.4
9-Mar	59.5	58.6	57.4	58.3	65.1	67.6	71.5	73.0	63.9	58.3	55.1	49.4	48.7	49.9	49.4	48.1	50.8	51.7	56.7	57.6	60.0	66.5	65.8	65.5	58.7	73.0
10-Mar	71.6	78.6	80.5	80.0	77.4	76.6	75.6	75.3	73.4	70.7	67.6	70.5	70.4	67.7	62.4	57.3	62.4	63.8	67.9	71.5	68.2	66.1	72.6	66.4	70.6	80.5
11-Mar	66.6	64.6	63.1	66.3	64.3	65.3	68.5	69.2	65.9	62.0	58.8	57.4	58.1	55.4	55.2	54.7	59.1	71.8	77.0	78.5	81.5	83.7	81.9	83.2	67.2	83.7
12-Mar	82.7	83.1	81.3	81.1	80.9	80.0	77.9	77.3	76.1	73.9	71.6	69.4	72.1	72.0	70.5	70.4	72.4	74.0	79.2	79.9	81.8	82.2	81.8	81.3	77.2	83.1
13-Mar	81.4	81.3	81.7	82.0	82.7	83.6	81.9	80.8	78.2	76.6	75.1	70.7	67.7	65.4	63.0	63.4	63.6	65.0	66.4	68.0	67.3	78.3	85.2	86.9	74.9	86.9
14-Mar	87.5	87.8	86.9	87.1	86.4	86.9	86.8	86.6	84.9	82.4	81.7	81.7	78.9	81.4	81.8	82.7	84.2	84.3	83.6	83.0	83.3	81.7	81.5	82.3	84.0	87.8
15-Mar	83.5	84.5	84.1	83.2	82.2	81.5	80.9	80.6	77.8	74.0	76.0	73.9	70.6	68.9	67.5	66.7	67.8	69.7	79.6	85.2	87.1	84.7	83.9	82.9	78.2	87.1
16-Mar	83.0	83.0	84.6	84.3	82.7	81.2	84.5	81.9	76.9	72.3	67.8	68.6	65.8	65.4	64.1	63.6	62.7	64.8	71.3	74.1	76.5	81.6	80.8	82.5	75.2	84.6
17-Mar	83.1	84.3	86.9	87.1	86.1	86.0	85.7	80.5	73.4	69.7	65.4	60.0	53.5	52.7	49.7	47.7	48.1	54.2	70.0	89.0	93.8	96.0	85.4	74.9	73.5	96.0
18-Mar	80.6	78.7	76.3	77.3	81.9	81.3	79.7	73.0	63.1	59.9	55.8	52.3	48.5	45.8	39.7	38.1	34.3	41.9	37.6	46.2	62.8	79.1	85.2	87.7	62.8	87.7
19-Mar	92.4	92.8	93.2	91.6	91.6	89.4	89.6	88.5	87.0	71.1	63.5	57.4	58.5	62.8	62.7	64.2	64.3	71.5	71.4	76.3	77.5	75.6	74.0	76.7	76.8	93.2
20-Mar	74.3	69.4	66.3	68.0	68.3	64.8	63.7	62.9	66.9	74.2	77.0	77.6	73.5	65.8	62.5	60.3	57.4	54.5	53.7	54.5	56.8	60.0	62.7	65.9	65.0	77.6
21-Mar	73.3	83.9	85.2	84.9	83.0	82.4	80.2	80.8	82.3	81.1	75.8	72.1	67.3	59.7	55.6	56.3	53.3	51.1	58.1	64.0	78.4	87.5	87.8	86.3	73.8	87.8
22-Mar	86.4	87.9	86.6	86.0	85.7	85.3	84.1	83.1	77.1	66.1	58.6	48.3	43.2	41.4	39.6	48.7	46.0	45.4	50.1	59.2	72.0	77.7	83.1	86.3	67.8	87.9
23-Mar	83.9	87.5	86.0	86.5	83.3	78.9	78.4	76.3	69.7	60.2	54.3	59.2	58.8	63.0	62.6	59.4	62.3	63.1	66.4	69.2	73.0	79.6	82.7	81.5	71.9	87.5
24-Mar	81.1	73.6	72.4	76.9	82.3	82.4	83.2	83.2	72.6	67.7	66.7	61.8	54.7	50.1	47.0	43.2	50.1	44.8	48.2	49.8	61.8	73.7	81.2	83.8	66.3	83.8
25-Mar	84.0	86.2	83.8	82.5	82.9	83.2	82.0	80.3	78.5	73.6	62.4	44.7	41.5	41.1	39.6	39.3	36.1	38.6	43.3	54.9	60.0	62.6	65.3	68.1	63.1	86.2
26-Mar	69.5	73.0	72.2	72.3	75.8	76.6	77.9	75.6	70.0	M	58.8	58.6	56.2	48.4	40.7	40.0	39.7	40.4	42.2	50.3	53.3	55.6	58.8	71.4	59.9	77.9
27-Mar	77.6	79.1	78.2	77.1	76.4	75.9	75.4	75.5	72.1	66.1	58.1	54.0	49.0	43.5	45.1	46.5	45.5	46.3	43.2	58.7	51.5	58.2	66.9	74.1	62.2	79.1
28-Mar	79.0	81.2	81.2	79.8	79.1	77.7	77.5	79.2	71.6	62.8	54.3	49.7	M	46.1	43.8	40.7	34.8	34.3	36.2	46.8	57.8	45.9	54.1	58.2	59.6	81.2
29-Mar	57.6	65.0	65.8	70.0	76.7	78.2	78.1	75.0	73.5	71.4	69.9	72.2	71.3	71.5	70.3	67.5	63.1	61.3	59.9	60.2	63.7	74.4	81.1	86.5	70.2	86.5
30-Mar	87.0	86.7	85.8	85.4	83.9	83.3	82.9	83.1	83.5	75.1	59.7	48.6	48.3	42.1	43.3	42.9	45.0	49.7	48.5	61.4	63.7	63.6	63.1	66.0	65.9	87.0
31-Mar	70.0	70.6	72.6	74.7	74.9	74.8	73.9	72.5	70.0	66.8	64.6	62.7	60.7	60.9	58.8	56.5	56.4	57.4	63.5	74.6	79.7	74.9	69.3	75.3	68.2	79.7
	76.7	78.2	77.6	78.1	78.4	77.9	77.9	76.9	74.0	70.4	65.9	62.2	59.4	57.1	55.1	54.8	55.6	58.0	61.7	66.7	70.5	73.1	74.3	75.5	Diurnal Average	
	92.4	92.8	93.2	91.6	91.6	89.4	89.6	88.5	87.0	82.4	81.7	81.7	78.9	81.4	81.8	82.7	84.2	84.3	83.6	89.0	93.8	96.0	87.8	87.7	Diurnal Maximum	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

Lower Camp - March 2023

Maximum Value: 29.9 inHg on Mar 8 10:00

Maximum Daily Average: 29.9 inHg on Mar 8

Minimum Value: 28.2 inHg on Mar 2 12:00

Minimum Daily Average: 28.3 inHg on Mar 2

Maximum Diurnal Average: 29.3 inHg at hour 9

Minimum Diurnal Average: 29.2 inHg at hour 18

Monthly Average: 29.25 inHg

Percentiles: P_1 = 28.3 P_{10} = 28.9 Q_1 = 29.1 Median = 29.2 Q_3 = 29.5 P_{90} = 29.7 P_{99} = 29.9

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.9	29.2
2-Mar	28.5	28.5	28.5	28.4	28.4	28.4	28.3	28.3	28.3	28.3	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.3	28.5
3-Mar	28.4	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	28.7	29.0
4-Mar	29.0	29.0	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	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.5	29.5	29.2	29.5
5-Mar	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.7
6-Mar	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.8
7-Mar	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.8	29.7	29.8
8-Mar	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.8	29.8	29.9	29.9	29.9	29.9	29.9	29.9	29.9
9-Mar	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.7	29.8
10-Mar	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.3	29.4
11-Mar	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
12-Mar	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5
13-Mar	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	29.1	29.3
14-Mar	28.9	28.9	28.9	28.9	28.9	28.9	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	28.9	29.0
15-Mar	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.2	29.4
16-Mar	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.5
17-Mar	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.4
18-Mar	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
19-Mar	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	29.3
20-Mar	29.2	29.2	29.2	29.2	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
21-Mar	29.2	29.2	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3
22-Mar	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	28.8	28.9	29.1
23-Mar	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	28.9	29.1
24-Mar	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3
25-Mar	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.2	29.4
26-Mar	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.6	29.6	M	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.7
27-Mar	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.7
28-Mar	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.4	29.5
29-Mar	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
30-Mar	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2
31-Mar	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	Diurnal Average	
	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.8	29.8	29.9	29.9	29.9	29.9	29.9	Diurnal Maximum	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Barometric Pressure (BP) - inHg

Lower Camp - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Lower Camp - March 2023

Maximum Speed: 29 km/h on Mar 10 00:00

Maximum Daily Speed Average: 21.0 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 5 08:00

Minimum Daily Speed Average: 1.0 km/h on Mar 21

Maximum Diurnal Speed Average: 5.1 km/h at hour 17

Minimum Diurnal Speed Average: 1.8 km/h at hour 2

Monthly Average Velocity: 3.1 km/h 102.5 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 9 $Q_3 = 13$ $P_{90} = 18$ $P_{99} = 25$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SE2	ESE1	ESE1	SSE3	ESE1	SE3	SE6	ESE3	ESE4	ESE4	SE10	SE12	SE10	SE15	SE15	SSE14	SSE10	SE10	SSE7	SE14	SE19	SE16	SE15	SE15	SE8.7	SE19
2-Mar	SE19	SE19	SE20	SE21	SE19	SE21	SE18	SSE12	SE13	SE19	SE16	SE9	W1	WSW4	NW3	W9	W17	W18	WNW18	W12	W12	W11	NW15	NW19	S5.3	SE21
3-Mar	NW18	NNE14	NNE14	NNE14	NNE11	NNE11	NNE12	NNE12	NNE13	NNE15	NNE13	N10	NNE13	N10	NNW7	N9	NNE10	NNE8	N6	NW2	NW2	N12	NNE13	NNE12	NNE10.3	NW18
4-Mar	NE10	NNE6	N4	WNW4	WNW4	NNW3	NNE7	NNE8	NNE8	N10	N13	N13	NW17	NNW14	NNW15	N12	N12	NNE12	NNE9	NNW6	NNW4	NW3	NW3	WNW4	N7.5	NW17
5-Mar	N1	NW4	NNW3	NNW2	NW3	NW2	NW2	SSW0	NW2	WNW4	W6	W6	WNW7	W4	SE5	SE6	SE9	SE5	E1	NNW1	NW2	NW3	NW2	NNW2	WNW1.2	SE9
6-Mar	NW3	NW3	NW2	NNE1	NW4	NW2	NNW1	NW3	NW2	S1	ESE2	SE2	SE6	SE6	SE8	SE12	SE19	ESE17	ESE9	SE13	SE24	SE24	SE23	SE20	SE6.9	SE24
7-Mar	SE17	ESE16	SE19	SE22	SE21	SE21	SE19	SE20	SE23	SE23	SE22	SE22	SE21	SE23	SE25	SE24	SE21	SE18	SE14	SE19	SE24	SE23	SE25	SE20	SE21.0	SE25
8-Mar	SE15	SE10	SSE7	SSE5	SSE8	SSE13	SE14	SSE13	SE11	SE17	SE17	SE16	ESE14	SE15	SE16	SE17	SE17	SE16	SE12	SE11	SE12	SE14	SE12	SE9	SE12.9	SE17
9-Mar	SE10	SSE10	SSE10	SSE12	SE9	ESE4	ESE3	ESE4	SE12	SE13	SE9	SE17	SE22	SE22	SE25	SE22	SE25	SE21	SE22	SE24	SE23	SE22	SE25	SE29	SE16.4	SE29
10-Mar	SE27	SE26	SE25	SE24	SE27	SE29	SE25	SE23	SE24	SE26	SE25	SE24	SE22	SE19	ESE19	SE19	SE23	ESE16	E8	ENE7	SE9	SE19	SE17	ESE15	SE20.3	SE29
11-Mar	SE10	SE5	SE7	SE11	ESE4	SE3	SE3	SE1	SE6	SE9	SSE8	SSE9	SE11	SE13	SE12	SE10	ESE6	NNE12	N12	N10	N8	N9	N9	N9	ESE4.0	SE13
12-Mar	N8	N8	NNW9	NNW10	N9	N9	N11	N10	N10	NNW10	NNW11	NNW12	NNW12	NNW11	N11	N12	N12	N11	NNW8	NNW9	NNW8	NNW7	NNW6	NNW8	NNW9.3	NNW12
13-Mar	NNW9	NNW8	NNW9	NNW8	NW7	NW5	NNW5	NNW7	NW7	NW11	NW11	NW10	NW13	NNW11	N12	NNE18	NNE17	N11	NNE7	NE8	NE10	NNE11	N12	N14	N8.9	NNE18
14-Mar	N12	NNW10	NNW11	N11	N15	N12	NNW11	N10	NNW12	NNW12	NNW10	NNW10	NNW10	NNW10	NNW10	NNW11	NNW13	NNW12	NNW12	N12	N11	N10	NNW8	N6	NNW10.7	N15
15-Mar	NNW6	WNW5	W5	NW3	NW5	NW3	NW2	NW2	NNW1	W5	WSW11	WSW14	WSW12	WSW13	WSW12	WSW11	WSW12	W9	WSW7	WSW2	NW5	ESE1	NNE1	N1	W5.4	WSW14
16-Mar	SW1	E1	S2	S1	ESE2	SE2	NNW3	SE2	SE7	SE9	SE12	SE13	SE13	SE14	SE14	SE13	SE14	SSE14	SSE11	SSE11	SE13	SE8	SE11	ESE7	SE7.8	SE14
17-Mar	SE13	SE9	SE15	SE14	SE15	SE13	SSE11	SSE10	SE12	SE15	SE18	SE16	SE13	SE15	SE14	SE12	SE9	SSE5	SE6	SE3	ESE2	E3	SSE7	SSE6	SE10.5	SE18
18-Mar	SE3	SE7	SE7	SE7	SSE5	SE5	SE5	SE11	SE15	SE15	SE15	SE12	SE12	SE11	SE9	SE9	SSE5	WNW4	NNE9	NW5	WNW3	WNW4	NW4	WNW4	SE5.3	SE15
19-Mar	NW3	WNW4	NW3	NNW2	NW3	WNW1	NNE1	NW2	E1	SE9	SE11	SE12	SE13	SE13	SE14	SE16	SE16	SE13	SE18	SE14	SE16	SE16	ESE13	SE16	SE8.0	SE18
20-Mar	SE12	ESE14	ESE16	SE9	ESE13	ESE10	NE5	ENE7	ENE9	E8	SE6	ESE3	N11	N14	N19	NNE18	NNE19	N20	NNE19	N15	N13	N10	NNW8	NW6	NE7.3	N20
21-Mar	WNW4	W1	NW4	NW4	NW5	NNW3	WNW1	NNW3	NW3	NW3	NNE3	NNW4	E3	ESE4	SE5	SE9	SE8	SSE6	SE5	SE4	E1	ENE1	SE7	SE8	SE1.0	SE9
22-Mar	SE9	SSE6	SSE13	SSE11	SSE7	SSE13	SE5	ESE2	SE8	SE11	SE10	SSE11	SSE9	SSE8	SSE8	SE12	SE11	SE10	SSE8	SE7	ENE2	NNE1	NNE0	ESE4	SSE7.4	SSE13
23-Mar	SE4	ESE1	SE4	SE6	SE12	SE12	SE9	SE8	SSW1	N10	NNE18	NNE18	NNE19	NE18	NE19	NE21	NE20	NNE18	NNE16	N8	NNW4	W2	ESE2	N1	NE6.8	NE21
24-Mar	NW5	NNW7	NNW7	N4	WNW2	NW5	NNW4	NW4	NW6	NW8	WSW11	W9	WNW5	NNW3	W3	E1	SE6	SE9	SSE7	SSE4	N2	NW3	ENE1	N1	WNW2.3	WSW11
25-Mar	NE2	NW2	ESE2	NE1	N1	WNW3	NNE1	NNW2	NNW3	NNW6	WNW8	N13	N13	N15	NNE15	NNE15	NNE16	NNE19	N15	N10	N9	NNW8	NNW8	NNW8	N7.4	NNE19
26-Mar	NW6	NNW5	NNW5	NNW4	NNE2	NNW4	NNW4	NW4	N4	M	N5	W10	WNW10	NW12	N12	N14	N15	N16	N13	NW10	NW10	NW7	WNW4	N2	NNW6.8	N16
27-Mar	NW4	N2	NE1	NNE2	NNE1	NE1	E1	ESE3	SE9	SE12	SE12	SE11	SE7	ESE7	SE12	SE13	ESE11	ESE7	SE3	NW5	WNW7	NW3	NNE2	NNW3	ESE3.6	SE13
28-Mar	NW4	NW4	NW4	NNW2	NE1	N1	E1	SE5	SE5	ESE6	SE13	SE15	SE16	SE17	SE15	SSE12	SSE11	SSE11	SSE11	SSE13	SE15	SSE11	SE8	SE7	SE7.2	SE17
29-Mar	WNW1	NW4	WNW4	NW3	NW4	NW5	NW1	NW2	NNW3	NNW4	NNW6	N11	N14	NNE15	NNE16	NNE14	NNE17	NE15	NNE13	NNE8	NW5	NNW0	ENE1	NW3	N6.1	NNE17
30-Mar	NE1	ENE1	ENE2	NNE2	N1	E1	ENE2	NE2	ESE4	E3	NNW3	NNW3	WNW6	NW4	WNW6	NNW3	ESE4	NE7	NE10	ESE9	N2	NNW4	NW5	NW6	NNE1.8	NE10
31-Mar	NW4	N5	NNW5	NNW5	NNW4	N3	N5	N5	NNW6	NNW7	NNW10	NW15	NW17	NW19	NW16	NW13	NW12	NW8	WSW5	SSE2	N0	SE5	ESE13	ESE8	NNW5.5	NW19
	ESE2.1	ESE1.8	ESE2.4	ESE2.8	ESE2.6	ESE3.0	ESE2.8	ESE2.5	ESE3.3	ESE3.9	ESE3.6	ESE2.9	E2.2	E3.4	E4.3	E4.9	E5.1	E4.3	ENE3.3	E2.5	ESE2.5	ESE2.8	ESE3.4	ESE2.8	Diurnal Average	
	SE27	SE26	SE25	SE24	SE27	SE29	SE25	SE23	SE24	SE26	SE25	SE24	SE22	SE23	SE25	SE24	SE25	SE21	SE22	SE24	SE24	SE24	SE25	SE29	Diurnal Maximum	

M - Maintenance

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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 10 21:00

Minimum Value: 1 km/h on Mar 6 11:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Lower Camp - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Lower Camp - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	246	33.11	33.11
6 - 11	229	30.82	63.93
12 - 19	215	28.94	92.87
20 - 28	51	6.86	99.73
29 - 38	2	0.27	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Lower Camp - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	19	12	8	7	11	25	24	7	3	2	1	3	7	20	59	38	246
6 - 11	30	14	5	3	2	10	63	29	0	0	0	4	7	6	14	42	229
12 - 19	29	33	2	0	0	11	98	11	0	0	0	5	4	1	12	9	215
20 - 28	1	0	2	0	0	0	48	0	0	0	0	0	0	0	0	0	51
29 - 38	0	0	0	0	0	0	2	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	79	59	17	10	13	46	235	47	3	2	1	12	18	27	85	89	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Lower Camp

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Lower Camp - March 2023

Direction of Maximum Speed: 140 deg on Mar 10 00:00
Direction of Maximum Daily Speed Average: 131.6 deg on Mar 7

Direction of Minimum Speed: 198 deg on Mar 5 08:00

Direction of Minimum Daily Speed Average: 1.0 deg on Mar 21

Monthly Average Direction: 102.5 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	124	120	119	148	121	139	134	122	108	111	144	145	142	138	144	149	150	138	150	126	125	136	135	139	137.0
2-Mar	141	137	135	137	140	142	141	151	140	140	141	134	274	253	322	269	279	267	285	281	263	276	305	312	177.0
3-Mar	319	17	21	22	16	31	32	24	27	15	27	3	14	9	345	8	30	17	11	321	319	5	29	23	14.2
4-Mar	34	22	355	299	297	332	33	25	13	6	3	353	315	337	345	355	1	12	33	340	333	321	316	297	354.2
5-Mar	360	304	333	329	315	308	323	198	312	298	280	279	283	279	129	137	144	146	87	339	306	318	311	331	288.1
6-Mar	313	309	311	30	310	312	340	316	309	175	109	127	134	134	144	133	132	123	118	127	135	134	128	129	130.1
7-Mar	127	123	133	132	131	132	134	135	136	134	130	128	131	130	126	133	137	131	138	132	132	129	134	132	131.6
8-Mar	132	138	152	157	150	150	146	148	146	142	140	135	118	132	135	141	137	134	132	131	133	134	135	138	138.0
9-Mar	145	149	153	152	139	112	108	118	140	142	138	136	139	139	140	141	135	129	139	140	140	136	137	140	138.7
10-Mar	139	140	139	136	137	137	135	135	134	132	134	130	125	125	123	128	131	123	87	58	127	141	135	118	131.4
11-Mar	126	146	143	129	111	132	124	139	132	140	149	150	126	135	129	139	115	28	9	350	349	349	357	0	102.6
12-Mar	351	349	345	342	349	355	7	356	359	345	348	347	331	337	351	9	5	0	329	336	335	335	335	335	348.1
13-Mar	335	337	337	340	323	316	329	332	323	311	311	318	309	343	2	15	18	10	16	46	37	16	358	6	350.3
14-Mar	360	347	346	352	1	359	348	350	329	341	347	346	342	338	338	339	335	336	345	355	357	355	345	352	346.8
15-Mar	333	289	271	317	319	320	311	313	338	269	253	252	252	254	250	250	254	259	258	258	323	107	28	3	267.9
16-Mar	215	100	173	173	112	129	346	135	138	132	138	132	134	131	135	134	143	147	152	153	144	124	137	121	137.6
17-Mar	138	132	143	141	143	143	147	148	145	138	141	140	141	143	144	141	143	149	141	129	117	93	147	157	141.6
18-Mar	146	142	145	140	150	136	131	139	140	140	139	136	136	133	132	137	152	297	26	308	296	299	314	299	137.8
19-Mar	317	295	304	347	321	302	23	319	98	131	136	143	141	131	134	134	135	136	135	131	133	126	123	133	133.0
20-Mar	126	122	120	125	122	102	53	64	72	88	134	109	3	11	9	14	12	8	12	4	357	354	333	322	39.0
21-Mar	303	280	313	325	307	330	291	331	316	320	25	329	96	110	130	135	143	163	143	142	83	67	142	145	128.8
22-Mar	146	163	151	152	149	151	144	120	133	142	137	156	165	164	168	134	140	143	150	137	69	24	32	120	146.3
23-Mar	127	121	140	138	143	144	146	143	204	354	19	18	24	34	36	35	44	28	18	355	343	267	102	11	42.2
24-Mar	312	334	339	0	298	305	339	320	312	305	257	265	290	333	280	79	124	144	151	151	356	310	61	353	301.3
25-Mar	48	314	108	37	352	294	20	329	343	348	295	356	2	4	25	22	24	29	5	3	358	340	342	336	3.3
26-Mar	324	330	334	340	13	338	337	322	358	M	350	278	301	313	359	5	11	9	2	326	318	312	299	359	338.7
27-Mar	323	349	44	30	19	36	91	118	134	138	137	130	128	111	137	134	117	119	141	304	303	325	15	327	122.8
28-Mar	316	313	326	338	55	353	92	145	138	120	132	137	135	137	142	151	163	164	163	153	142	150	135	140	143.6
29-Mar	290	307	294	324	323	315	311	311	344	344	340	356	2	28	28	27	32	38	28	14	315	347	65	321	8.7
30-Mar	40	67	74	20	4	95	68	52	114	80	333	345	291	322	296	344	103	51	52	106	359	345	312	307	19.0
31-Mar	315	351	332	347	340	354	350	350	341	343	333	315	315	315	314	311	318	318	248	150	0	133	121	119	326.8
	107.0	101.3	115.9	113.2	115.4	119.4	104.6	104.8	111.1	113.7	120.7	116.6	94.6	94.0	95.2	96.7	95.4	79.2	68.4	87.5	105.6	105.7	109.5	104.1	
	Diurnal Average																								

M - Maintenance
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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 99 deg on Mar 2 13:00

Minimum Value: 3 deg on Mar 18 14:00

Percentiles: $P_1 = 5$ $P_{10} = 8$ $Q_1 = 11$ Median = 18 $Q_3 = 29$ $P_{90} = 53$ $P_{99} = 91$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	19	26	42	27	46	26	14	28	18	33	9	8	13	8	10	13	16	17	15	12	8	10	11	11	46
2-Mar	11	10	9	10	11	12	16	20	12	7	6	45	99	58	75	19	15	13	17	19	11	20	14	11	99
3-Mar	21	17	13	14	16	21	15	15	16	14	20	20	14	17	21	23	15	19	15	51	73	18	16	18	73
4-Mar	16	14	24	15	16	45	19	19	14	18	15	22	17	25	22	20	17	19	11	26	36	52	50	37	52
5-Mar	79	29	49	38	26	60	37	92	53	22	26	35	25	80	22	11	10	15	73	69	50	26	38	44	92
6-Mar	33	29	32	27	13	18	35	15	32	72	33	35	7	10	19	10	8	11	15	14	7	7	7	7	72
7-Mar	8	11	9	7	8	7	7	7	7	8	10	10	9	9	9	9	7	10	11	8	7	8	8	9	11
8-Mar	12	24	16	21	17	14	8	9	14	9	8	9	14	16	10	8	6	7	9	13	12	15	25	21	25
9-Mar	15	19	17	15	16	53	30	24	8	5	8	13	11	10	9	14	9	8	7	7	8	7	7	7	53
10-Mar	7	7	7	7	6	6	7	7	7	7	9	9	10	12	12	12	8	16	18	18	36	7	7	7	36
11-Mar	21	28	21	10	42	25	23	64	24	10	18	18	15	10	12	10	48	11	22	18	19	17	19	17	64
12-Mar	20	20	19	17	19	18	19	19	19	18	20	20	17	20	23	16	13	18	14	14	15	16	15	14	23
13-Mar	13	14	15	17	14	13	14	13	11	8	10	17	9	25	18	14	9	19	38	43	12	24	17	12	43
14-Mar	17	21	19	20	17	17	18	21	16	19	21	19	18	17	17	16	14	14	19	19	19	18	18	20	21
15-Mar	13	26	13	28	18	34	18	54	53	37	9	9	8	9	9	10	8	8	7	88	40	62	57	87	88
16-Mar	89	63	70	74	81	61	48	59	26	15	6	6	6	5	5	8	9	11	14	16	15	53	46	36	89
17-Mar	13	20	5	7	8	7	14	15	10	5	5	5	8	6	5	7	6	16	8	52	61	23	14	31	61
18-Mar	36	10	12	9	20	18	21	10	4	5	5	4	4	3	3	4	49	46	13	30	61	41	27	39	61
19-Mar	52	34	47	52	39	80	55	56	83	17	8	9	7	8	6	5	7	6	9	11	7	8	10	8	83
20-Mar	8	12	11	24	15	22	26	19	23	20	17	37	34	16	16	17	16	16	14	17	19	20	16	18	37
21-Mar	36	84	40	16	10	28	46	34	16	38	36	33	42	26	13	9	14	33	25	37	39	48	12	11	84
22-Mar	40	42	13	16	23	14	73	60	28	6	9	28	33	39	40	7	7	9	14	39	49	56	98	22	98
23-Mar	41	93	20	14	11	12	11	14	84	34	18	17	20	16	19	18	16	18	17	25	33	76	34	67	93
24-Mar	24	14	17	30	62	25	40	37	20	25	15	20	52	63	71	96	37	13	21	73	68	53	72	69	96
25-Mar	38	54	40	54	67	39	55	37	16	24	28	22	24	19	21	20	21	17	18	18	23	15	18	15	67
26-Mar	13	15	20	29	60	26	26	17	27	M	53	23	30	21	24	20	19	15	17	11	10	9	28	63	63
27-Mar	18	39	23	13	37	24	38	23	11	9	10	11	17	28	11	14	17	18	46	31	16	51	54	45	54
28-Mar	22	28	28	29	84	67	22	17	20	17	9	17	13	11	13	22	22	21	19	18	8	16	12	7	84
29-Mar	92	15	22	31	62	14	89	85	39	28	21	20	21	25	16	15	17	17	13	18	28	93	33	43	93
30-Mar	69	44	47	34	59	60	26	26	41	40	43	54	31	30	21	69	41	28	17	18	65	41	27	15	69
31-Mar	33	30	38	18	19	25	25	21	22	23	20	11	10	10	9	11	12	15	28	74	98	75	16	21	98
Diurnal Maximum	92	93	70	74	84	80	89	92	84	72	53	54	99	80	75	96	49	46	73	88	98	93	98	87	

M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Lower Camp - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS13
FORT MCKAY SOUTH
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	704	37	40	99.6	45.9	0	9.4	0
TRS(ppb) Average	702	37	42	99.33	2.9	0	1	0
THC(ppm) Average	698	37	46	98.79	3.7	-	2.5	-
NMHC(ppm) Average	698	37	46	98.79	0.58	-	0.057	-
CH4(ppm) Average	698	37	46	98.79	3.7	-	2.5	-
O3(ppb) Average	705	35	39	99.46	49.2	0	35	-
NO2(ppb) Average	703	36	41	99.33	46.8	0	20.1	-
NO(ppb) Average	703	36	41	99.33	229.4	-	41.8	-
NOX(ppb) Average	703	36	41	99.33	276.2	-	61.9	-
PM2.5(ug/m3) Average	739	3	5	99.73	59.2	0	22.6	0
ET(C) Average	744	0	0	100	10.8	-	-1.3	-
RH(%) Average	744	0	0	100	96.5	-	84	-
WS(km/h) Average	740	0	4	99.46	23	-	14	-
WD(deg) Average	740	0	4	99.46	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	704	2.08	4.7	-	0	0.2	0.3	0.5	1.4	5.3	45.9
TRS(ppb) Average	702	0.66	0.4	-	0.4	0.4	0.4	0.5	0.7	1.2	2.9
THC(ppm) Average	698	2.15	0.2	-	2	2	2	2.1	2.2	2.3	3.7
NMHC(ppm) Average	698	0.007	0.038	-	0	0	0	0	0	0	0.58
CH4(ppm) Average	698	2.14	0.2	-	2	2	2	2.1	2.2	2.3	3.7
O3(ppb) Average	705	23.65	11.4	-	0.6	6.4	15	25.8	33	37	49.2
NO2(ppb) Average	703	11.28	7.5	-	0.3	3.6	6	9.2	15.1	22.3	46.8
NO(ppb) Average	703	5.51	15.4	-	0	0	0	1.2	5.2	12.1	229.4
NOX(ppb) Average	703	16.8	20.3	-	0.3	4.2	7	11.6	19.6	31.5	276.2
PM2.5(ug/m3) Average	739	9.46	7.4	-	0.5	4.1	5.1	7.3	11.2	16.8	59.2
Temperature 2 m (C) Average	744	-10.64	7.6	-	-33.2	-20.9	-14.7	-10.2	-5.7	-1.7	10.8
Relative Humidity (%) Average	744	69.22	13.7	-	27.8	48.3	60.3	71.5	80.8	84.7	96.5
Wind Speed 10 m (km/h) Average	740	7.9	5	-	0	2	3	7	12	15	23
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2,THC/NMHC/CH4, TRS,O3	23 Mar 2023 11:00	23 Mar 2023 11:00	1	Maintenance - sample manifold cleaned
SO2	16 Mar 2023 16:00	16 Mar 2023 17:00	2	Maintenance - WBEA internal audit
TRS	16 Mar 2023 14:00	16 Mar 2023 17:00	4	Maintenance - WBEA internal audit
THC/NMHC/CH4	03 Mar 2023 11:00	03 Mar 2023 16:00	6	Maintenance - replaced instrument
THC/NMHC/CH4	17 Mar 2023 12:00	17 Mar 2023 13:00	2	Maintenance - WBEA internal audit
O3	17 Mar 2023 11:00	17 Mar 2023 13:00	3	Maintenance - WBEA internal audit
NO2	16 Mar 2023 11:00	16 Mar 2023 15:00	5	Maintenance - WBEA internal audit
PM2.5	16 Mar 2023 15:00	16 Mar 2023 16:00	2	Maintenance - WBEA internal audit
Wind Speed, Wind Direction	01 Mar 2023 05:00	01 Mar 2023 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	13 Mar 2023 07:00	13 Mar 2023 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	27 Mar 2023 03:00	27 Mar 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Mar 2023 02:00	28 Mar 2023 02:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 45.9 ppb on Mar 21 17:00

Maximum Daily Average: 9.4 ppb on Mar 22

Minimum Value: 0.0 ppb on Mar 4 21:00

Maximum Diurnal Average: 5.4 ppb at hour 16

Monthly Average: 2.08 ppb

Minimum Daily Average: 0.2 ppb on Mar 4

Minimum Diurnal Average: 0.5 ppb at hour 21

Percentiles: P_1 = 0.0 P_{10} = 0.2 Q_1 = 0.3 Median = 0.5 Q_3 = 1.4 P_{90} = 5.3 P_{99} = 21.5

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	37
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	5.3	4.7	Z	2.6	1.8	1.4	1.1	0.9	1.4	3.6	9.8	3.9	11.5	4.7	1.7	2.3	3.0	1.9	0.5	0.4	0.7	2.4	2.9	2.7	3.1	11.5
2-Mar	3.9	3.2	3.6	Z	4.9	4.2	5.5	2.6	1.9	3.3	C	C	C	C	C	C	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	--	5.5
3-Mar	0.5	0.6	0.5	0.5	Z	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.7	1.0	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.5	1.0
4-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6
5-Mar	Z	0.0	0.0	0.0	0.1	0.5	0.0	0.1	0.1	0.0	0.2	0.3	0.2	0.4	0.2	0.1	3.4	5.3	0.2	0.1	0.1	0.1	0.1	0.3	0.5	5.3
6-Mar	0.9	0.8	1.1	0.8	0.8	0.8	0.8	0.9	1.0	1.7	Z	5.9	3.6	3.6	4.3	8.2	3.1	1.0	0.6	0.4	0.3	0.7	1.1	5.7	2.1	8.2
7-Mar	6.1	Z	0.5	0.9	1.9	1.2	1.9	1.8	2.7	5.1	4.3	4.0	4.9	6.1	7.0	9.5	2.1	0.6	0.5	0.4	0.4	3.9	9.1	8.8	3.6	9.5
8-Mar	7.1	5.3	Z	1.9	0.6	0.9	0.7	0.7	1.8	2.1	0.8	3.8	16.7	16.0	8.5	4.8	3.3	1.3	1.0	0.4	0.9	1.9	3.2	2.0	3.7	16.7
9-Mar	0.4	0.7	0.9	Z	0.3	0.3	0.8	0.8	0.7	1.7	3.0	9.0	5.3	4.3	11.8	4.2	2.5	1.0	0.4	0.4	0.3	0.3	0.3	0.5	2.2	11.8
10-Mar	0.6	0.6	2.2	1.5	Z	5.1	3.7	3.4	3.6	4.5	5.4	7.5	3.6	4.2	10.6	13.8	5.2	0.9	0.8	0.8	0.6	0.7	0.5	0.6	3.5	13.8
11-Mar	0.5	0.6	0.6	0.5	0.6	Z	0.8	0.6	0.6	5.0	11.9	4.3	2.6	1.3	1.4	1.6	1.7	0.7	0.5	0.4	0.3	0.2	0.2	0.2	1.6	11.9
12-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3
13-Mar	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6
14-Mar	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.2	0.3	0.3	0.5
15-Mar	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.4	0.4	0.5	0.4	0.4	0.4	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.6
16-Mar	0.6	0.7	0.5	0.3	Z	0.3	0.3	0.3	0.8	6.4	9.9	13.9	17.4	19.8	14.5	M	M	6.4	4.0	2.8	1.3	0.7	0.8	0.6	4.9	19.8
17-Mar	0.7	0.3	0.3	0.9	0.3	Z	0.6	0.6	3.6	5.9	7.5	7.1	6.1	16.1	11.1	8.9	4.8	2.1	0.5	0.4	0.5	0.5	0.9	0.7	3.5	16.1
18-Mar	Z	0.7	0.3	0.1	0.1	0.1	0.1	0.3	0.3	0.6	1.0	1.0	1.0	4.9	5.9	3.2	2.3	1.9	1.0	0.5	0.4	0.4	0.4	0.3	1.2	5.9
19-Mar	0.3	Z	0.2	0.2	0.2	0.1	0.2	0.3	0.3	5.8	11.9	3.3	3.0	4.2	5.0	7.5	5.7	1.2	4.2	0.6	0.4	0.4	0.3	0.3	2.4	11.9
20-Mar	0.3	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6
21-Mar	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	3.4	3.5	29.3	45.9	36.0	18.9	3.8	1.3	0.6	0.4	0.4	6.4	45.9
22-Mar	0.4	0.4	0.3	0.7	Z	0.5	0.4	0.7	1.0	2.0	17.7	20.5	24.8	39.9	43.9	33.5	14.9	5.1	2.9	2.3	1.9	1.5	1.1	0.8	9.4	43.9
23-Mar	0.6	0.6	1.3	2.2	1.2	Z	0.8	0.9	3.0	2.5	M	1.0	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.9	3.0
24-Mar	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.7	4.3	21.5	8.0	2.6	0.8	0.5	0.4	0.2	1.8	21.5
25-Mar	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.3	0.6	0.9	0.9	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.9
26-Mar	0.2	0.2	Z	0.1	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.0	0.1	0.2	0.4
27-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.4	1.0	1.4	1.0	0.8	4.2	5.6	16.0	16.4	10.8	8.1	4.0	0.8	0.6	0.5	0.3	0.3	3.2	16.4
28-Mar	0.2	0.2	0.1	0.1	Z	0.2	0.1	0.3	1.3	7.8	11.3	11.1	11.0	14.0	9.6	6.7	6.8	2.7	1.4	1.0	1.1	3.9	3.6	2.1	4.2	14.0
29-Mar	1.7	1.1	0.9	0.7	0.5	Z	0.6	0.7	0.7	1.1	0.6	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.5	1.7
30-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.5	3.8	1.2	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.5	3.8
31-Mar	0.2	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6
	1.2	0.9	0.6	0.6	0.6	0.7	0.7	0.6	1.1	2.2	3.7	3.5	4.1	5.1	5.4	5.4	4.2	3.3	1.7	0.7	0.5	0.7	0.9	1.0	Diurnal Average	
	7.1	5.3	3.6	2.6	4.9	5.1	5.5	3.4	3.6	7.8	17.7	20.5	24.8	39.9	43.9	33.5	45.9	36.0	18.9	3.8	1.9	3.9	9.1	8.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	671	95.31	95.31
11 - 20	25	3.55	98.86
21 - 60	8	1.14	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - March 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	166	73	8	3	5	10	59	119	57	17	20	40	18	21	19	32	667
11 - 20	0	0	0	0	0	0	4	18	3	0	0	0	0	0	0	0	25
21 - 60	0	0	0	0	0	0	0	5	3	0	0	0	0	0	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	166	73	8	3	5	10	63	142	63	17	20	40	18	21	19	32	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Fort McKay South

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.9 ppb on Mar 1 08:00

Maximum Daily Average: 1.0 ppb on Mar 17

Minimum Value: 0.4 ppb on Mar 31 23:00

Maximum Diurnal Average: 0.8 ppb at hour 10

Monthly Average: 0.66 ppb

Minimum Daily Average: 0.4 ppb on Mar 20

Minimum Diurnal Average: 0.5 ppb at hour 21

Percentiles: $P_1 = 0.4$ $P_{10} = 0.4$ $Q_1 = 0.4$ Median = 0.5 $Q_3 = 0.7$ $P_{90} = 1.2$ $P_{99} = 2.3$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	37
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	2.6	2.6	2.3	Z	2.3	2.4	2.7	2.9	2.7	C	C	C	C	C	C	0.8	1.1	1.0	1.3	1.5	0.9	1.2	1.4	1.4	--	2.9
2-Mar	1.4	1.4	1.5	1.6	Z	1.4	1.8	0.6	0.5	0.5	1.7	2.0	1.2	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	2.0
3-Mar	0.5	0.5	0.5	0.4	0.4	Z	0.5	0.5	0.4	0.4	0.5	0.4	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
4-Mar	Z	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
5-Mar	0.4	Z	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.5	0.7
6-Mar	0.9	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	1.1	1.1	Z	0.7	0.8	0.9	0.9	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.8	0.8	1.1
7-Mar	1.1	0.5	Z	0.6	0.6	0.5	0.5	0.5	0.6	0.7	0.8	0.7	0.6	0.7	0.8	0.7	0.5	0.4	0.4	0.4	0.4	0.6	1.0	1.3	0.6	1.3
8-Mar	1.3	1.3	1.1	Z	1.0	1.0	0.9	0.8	0.8	0.8	0.4	0.8	1.2	0.8	0.7	0.6	0.5	0.5	0.6	0.5	0.7	0.7	0.7	0.8	0.8	1.3
9-Mar	0.8	1.6	1.7	1.6	Z	0.7	0.9	0.9	0.7	0.7	0.7	1.3	0.7	0.6	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.8	1.7
10-Mar	0.4	0.4	0.5	0.5	0.4	Z	0.7	0.6	0.5	0.7	0.6	0.7	0.5	0.5	0.7	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7
11-Mar	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	1.0	1.2	0.7	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	1.2
12-Mar	0.5	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.6
13-Mar	0.6	0.5	Z	0.5	0.4	0.5	0.5	0.5	0.6	0.7	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.7
14-Mar	0.5	0.5	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
15-Mar	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.6
16-Mar	0.6	0.6	0.8	0.7	0.7	Z	0.7	0.7	0.8	0.7	0.6	0.7	0.7	M	M	M	M	1.7	2.0	1.7	1.0	0.7	0.7	0.8	0.9	2.0
17-Mar	Z	0.7	0.6	0.7	0.6	0.5	1.0	0.9	1.2	0.8	1.6	1.6	0.8	1.1	1.5	1.6	1.2	1.2	1.1	1.1	1.0	0.7	0.8	0.7	1.0	1.6
18-Mar	0.7	Z	0.8	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.8
19-Mar	0.6	0.5	Z	0.5	0.5	0.5	0.6	0.6	0.7	1.0	1.4	0.7	0.6	1.0	1.1	1.3	1.0	0.6	1.4	0.4	0.4	0.4	0.4	0.4	0.7	1.4
20-Mar	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6
21-Mar	0.4	0.4	0.5	0.4	Z	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.7	1.4	1.4	1.8	1.7	1.3	1.1	1.0	0.7	0.6	0.8	1.8
22-Mar	0.5	0.6	0.6	0.9	1.4	Z	1.1	1.1	0.9	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.5	1.0	0.6	0.5	0.6	0.7	0.9	1.0	0.7	1.4
23-Mar	Z	1.2	1.3	1.5	1.4	1.4	1.5	1.4	1.9	1.3	M	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8	1.9
24-Mar	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.7	0.8	0.9	0.5	0.9
25-Mar	0.9	0.9	Z	0.8	0.7	0.6	0.6	0.7	0.8	0.9	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.9
26-Mar	0.5	0.5	0.5	Z	0.5	0.4	0.4	0.5	0.6	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	0.5	0.6
27-Mar	0.4	0.5	0.5	0.5	Z	0.5	0.4	0.6	1.0	1.4	0.7	0.5	0.6	0.5	0.6	0.8	0.8	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	1.4
28-Mar	0.6	0.6	0.6	0.6	0.6	Z	0.5	0.6	1.2	2.0	1.3	0.8	0.6	0.6	0.5	0.9	1.1	0.5	0.5	0.5	0.5	1.2	1.5	1.3	0.8	2.0
29-Mar	Z	1.2	1.2	1.2	1.0	0.9	0.8	0.8	0.7	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.7	1.2
30-Mar	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.6	1.8	2.5	1.3	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.7	2.5
31-Mar	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6
	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	Diurnal Average	
	2.6	2.6	2.3	1.6	2.3	2.4	2.7	2.9	2.7	2.5	1.7	2.0	1.2	1.1	1.5	1.6	1.4	1.8	2.0	1.7	1.1	1.2	1.5	1.4	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	697	99.29	99.29
3 - 4	5	0.71	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	166	73	8	4	6	10	61	140	59	19	19	40	20	20	18	30	693
3 - 4	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	1	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	166	73	8	4	6	10	61	140	61	19	19	40	20	21	19	31	698

Total Number of Valid Hours: 698

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Fort McKay South

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 698

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - March 2023

Maximum Value: 3.7 ppm on Mar 1 02:00

Maximum Daily Average: 2.5 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 20 02:00

Minimum Daily Average: 2.0 ppm on Mar 20

Maximum Diurnal Average: 2.3 ppm at hour 4

Minimum Diurnal Average: 2.1 ppm at hour 15

Monthly Average: 2.15 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.2 P_{90} = 2.3 P_{99} = 2.9

Hours in Service:	744
Hours of Data:	698
Hours of Missing Data:	46
Hours of Calibration:	37
Percent Operational Time:	98.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.6	3.7	Z	3.1	2.9	2.8	2.7	2.6	2.7	2.6	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	3.7
2-Mar	2.2	2.2	2.2	Z	2.2	2.3	2.2	2.2	2.1	2.3	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	--	2.3
3-Mar	2.2	2.2	2.1	2.1	Z	2.0	2.1	2.1	2.1	2.1	M	M	M	M	M	M	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	--	2.2
4-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
5-Mar	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2
6-Mar	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.4
7-Mar	2.1	Z	2.0	2.1	2.0	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	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1
8-Mar	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1
9-Mar	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
10-Mar	2.0	2.0	2.0	2.1	Z	2.1	2.1	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	2.1	2.1	2.0	2.0	2.0	2.1
11-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.2
12-Mar	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.3
13-Mar	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.5
14-Mar	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	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	2.1	2.1	2.1	2.2
15-Mar	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.3
16-Mar	2.2	2.2	2.2	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.2	2.3	2.3	2.1	2.1	2.1	2.3
17-Mar	2.1	2.1	2.1	2.3	2.2	Z	2.2	2.2	2.5	2.2	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.2	2.6	2.7	2.3	2.4	2.3	2.2	2.7
18-Mar	Z	2.4	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.5	2.3	2.2	2.1	2.0	2.0	2.0	2.2	2.7	2.7	2.7	2.6	2.5	2.5	2.3	2.7
19-Mar	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.2	2.2	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3
20-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
21-Mar	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.2	2.4	2.5	2.5	2.4	2.7	2.5	2.2	2.2	2.2	2.7
22-Mar	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	3.0	3.0	2.4	2.2	3.0
23-Mar	2.5	2.6	2.9	3.6	3.1	Z	2.7	2.6	2.5	2.3	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	2.3	3.6
24-Mar	Z	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.3
25-Mar	2.2	Z	2.4	2.4	2.3	2.2	2.2	2.3	2.4	2.8	2.5	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.8
26-Mar	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.4
27-Mar	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3
28-Mar	2.1	2.1	2.2	2.3	Z	2.2	2.2	2.2	2.4	2.8	2.8	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.8
29-Mar	2.2	2.2	2.3	2.4	2.5	Z	2.4	2.4	2.2	2.2	2.5	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.5
30-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.4
31-Mar	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.3
	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	Diurnal Average	
	3.6	3.7	2.9	3.6	3.1	2.8	2.7	2.6	2.7	2.8	2.8	2.3	2.2	2.2	2.2	2.2	2.4	2.5	2.7	2.7	2.7	3.0	3.0	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay South - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	204	29.23	29.23
2.1 - 3.0	489	70.06	99.28
3.1 - 10.0	5	0.72	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 698

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay South - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	47	29	3	2	3	6	35	41	7	1	2	5	4	5	4	10	204
2.1 - 3.0	115	42	5	1	2	4	29	100	52	16	17	35	14	16	15	22	485
3.1 - 10.0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	162	71	8	3	5	10	64	141	63	17	20	40	18	21	19	32	694

Total Number of Valid Hours: 694

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Fort McKay South

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 694

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South - March 2023

Maximum Value: 0.580 ppm on Mar 28 11:00

Maximum Daily Average: 0.057 ppm on Mar 28

Minimum Value: 0.000 ppm on Mar 1 01:00

Minimum Daily Average: 0.000 ppm on Mar 1

Maximum Diurnal Average: 0.029 ppm at hour 11

Minimum Diurnal Average: 0.000 ppm at hour 6

Monthly Average: 0.007 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.2

Hours in Service:	744
Hours of Data:	698
Hours of Missing Data:	46
Hours of Calibration:	37
Percent Operational Time:	98.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000
3-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	M	M	M	M	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000
4-Mar	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
5-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	0.000	0.000	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
7-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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
10-Mar	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-Mar	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
12-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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	0.066	0.110	0.124	0.018	0.000	0.000	0.000	0.000	0.014	0.124
16-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.016	0.004	0.034	0.001	0.003	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.034
17-Mar	0.000	0.000	0.000	0.063	0.032	Z	0.000	0.000	0.119	0.048	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.071	0.047	0.000	0.000	0.000	0.018	0.119
18-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.078	0.060	0.025	0.000	0.000	0.000	0.000	0.057	0.270	0.238	0.238	0.162	0.003	0.000	0.049	0.270
19-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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
21-Mar	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	0.026	0.041	0.046	0.000	0.070	0.016	0.000	0.000	0.009	0.070
22-Mar	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	0.030	0.125	0.126	0.010	0.013	0.126
23-Mar	0.012	0.057	0.000	0.000	0.017	Z	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	0.000	0.000	0.000	0.000	0.000	0.004	0.057
24-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.050	0.001	0.004	0.050
25-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.217	0.096	0.003	0.000	0.021	0.000	0.000	0.007	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.015	0.217
26-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.031	0.017	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.031
28-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.396	0.580	0.199	0.121	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057	0.580
29-Mar	0.000	0.000	0.021	0.155	0.217	Z	0.133	0.137	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.217
30-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.002	0.001	0.008	0.010	0.000	0.004	0.004	0.006	0.023	0.029	0.011	0.006	0.001	0.000	0.000	0.004	0.007	0.014	0.011	0.012	0.011	0.006	0.000	Diurnal Average	
	0.012	0.057	0.021	0.155	0.217	0.000	0.133	0.137	0.119	0.396	0.580	0.199	0.121	0.021	0.000	0.000	0.066	0.110	0.270	0.238	0.238	0.162	0.126	0.010	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	645	92.41	92.41
0.006 - 0.05	26	3.72	96.13
0.06 - 0.1	17	2.44	98.57
> 0.1	10	1.43	100.00

Total Number of Valid Hours: 698

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	156	68	8	3	5	10	60	131	52	14	19	32	18	20	17	28	641
0.006 - 0.05	0	3	0	0	0	0	3	4	8	2	0	4	0	1	0	1	26
0.06 - 0.1	4	0	0	0	0	0	0	4	3	1	1	2	0	0	0	2	17
> 0.1	2	0	0	0	0	0	1	2	0	0	0	2	0	0	2	1	10
Totals	162	71	8	3	5	10	64	141	63	17	20	40	18	21	19	32	694

Total Number of Valid Hours: 694

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South

Total Number of Valid Hours: 694

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Fort McKay South - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.7 ppm on Mar 1 02:00 Maximum Daily Average: 2.5 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 20 02:00 Minimum Daily Average: 2.0 ppm on Mar 20

Maximum Diurnal Average: 2.2 ppm at hour 4 Minimum Diurnal Average: 2.1 ppm at hour 15

Monthly Average: 2.14 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} = 2.9

Hours in Service:	744
Hours of Data:	698
Hours of Missing Data:	46
Hours of Calibration:	37
Percent Operational Time:	98.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.6	3.7	Z	3.1	2.9	2.8	2.7	2.6	2.7	2.6	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	3.7
2-Mar	2.2	2.2	2.2	Z	2.2	2.3	2.2	2.2	2.1	2.3	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	--	2.3
3-Mar	2.2	2.2	2.1	2.1	Z	2.0	2.1	2.1	2.1	2.1	M	M	M	M	M	M	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	--	2.2
4-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
5-Mar	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2
6-Mar	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.4
7-Mar	2.1	Z	2.0	2.1	2.0	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	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1
8-Mar	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1
9-Mar	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
10-Mar	2.0	2.0	2.0	2.1	Z	2.1	2.1	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	2.1	2.1	2.0	2.0	2.0	2.1
11-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.2
12-Mar	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.3
13-Mar	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.5
14-Mar	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	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	2.1	2.1	2.1	2.2
15-Mar	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
16-Mar	2.2	2.2	2.2	2.1	Z	2.2	2.2	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	2.3	2.3	2.1	2.1	2.1	2.3
17-Mar	2.1	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.4	2.2	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.6	2.3	2.4	2.3	2.2	2.6
18-Mar	Z	2.4	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.2	2.4	2.5	2.4	2.4	2.5	2.5	2.2	2.5
19-Mar	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.2	2.2	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3
20-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
21-Mar	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.2	2.3	2.4	2.5	2.4	2.6	2.5	2.2	2.2	2.2	2.6
22-Mar	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	2.9	2.9	2.3	2.2	2.9
23-Mar	2.4	2.6	2.9	3.6	3.1	Z	2.7	2.6	2.5	2.3	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	2.3	3.6
24-Mar	Z	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.3
25-Mar	2.2	Z	2.4	2.4	2.3	2.2	2.2	2.3	2.4	2.6	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.6
26-Mar	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.4
27-Mar	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3
28-Mar	2.1	2.1	2.2	2.3	Z	2.2	2.2	2.2	2.4	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.4
29-Mar	2.2	2.2	2.2	2.2	2.3	Z	2.3	2.2	2.2	2.2	2.5	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5
30-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.4
31-Mar	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.3
	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	Diurnal Average	
	3.6	3.7	2.9	3.6	3.1	2.8	2.7	2.6	2.7	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.9	2.9	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Fort McKay South - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	206	29.51	29.51
2.1 - 3.0	487	69.77	99.28
3.1 - 10.0	5	0.72	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 698

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Fort McKay South - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	47	30	3	2	3	6	36	41	7	1	2	5	4	5	4	10	206
2.1 - 3.0	115	41	5	1	2	4	28	100	52	16	17	35	14	16	15	22	483
3.1 - 10.0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	162	71	8	3	5	10	64	141	63	17	20	40	18	21	19	32	694

Total Number of Valid Hours: 694

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Fort McKay South

Total Number of Valid Hours: 694

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay South - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 49.2 ppb on Mar 18 13:00

Maximum Daily Average: 35.0 ppb on Mar 20

Minimum Value: 0.6 ppb on Mar 5 06:00

Maximum Diurnal Average: 33.9 ppb at hour 15

Monthly Average: 23.65 ppb

Minimum Daily Average: 13.8 ppb on Mar 5

Minimum Diurnal Average: 13.0 ppb at hour 6

Percentiles: P_1 = 0.7 P_{10} = 6.4 Q_1 = 15.0 Median = 25.8 Q_3 = 33.0 P_{90} = 37.0 P_{99} = 42.7

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	35
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	1.0	0.9	1.0	1.2	Z	1.1	1.3	2.0	4.5	8.8	18.3	26.9	28.1	32.9	34.8	34.1	26.9	15.9	8.4	7.4	19.2	25.9	21.6	19.9	14.9	34.8
2-Mar	32.2	31.8	23.4	27.7	27.5	Z	33.6	32.5	32.6	31.9	32.4	33.8	31.0	34.7	34.4	35.5	36.5	34.8	35.8	32.7	30.7	33.6	36.9	38.6	32.8	38.6
3-Mar	Z	24.9	31.8	33.5	32.4	32.1	32.2	31.6	30.4	28.9	29.4	29.2	29.6	28.7	27.4	25.2	24.8	21.2	17.2	11.9	26.7	28.5	29.6	30.6	27.7	33.5
4-Mar	30.3	Z	25.2	19.3	15.9	14.7	27.0	26.0	26.1	25.7	31.9	33.0	32.6	32.5	32.3	29.6	23.1	22.6	24.6	19.0	14.0	11.8	11.4	10.2	23.4	33.0
5-Mar	6.9	6.8	Z	4.4	1.4	0.6	5.9	10.4	11.4	20.0	28.2	28.8	28.7	29.2	30.6	29.7	29.6	17.6	12.7	9.7	2.3	0.9	1.2	0.9	13.8	30.6
6-Mar	0.7	0.7	0.8	0.8	0.7	0.6	0.6	1.8	4.6	7.0	17.1	22.3	Z	25.8	27.5	25.0	27.3	31.3	30.2	23.3	18.6	23.8	31.0	22.8	15.0	31.3
7-Mar	17.6	30.4	28.5	Z	30.3	32.0	31.2	31.7	32.0	31.0	30.0	30.6	32.5	32.1	31.2	31.6	35.9	36.8	36.9	36.9	33.7	26.8	20.4	18.1	30.4	36.9
8-Mar	25.1	33.0	29.9	19.2	Z	9.8	10.3	16.5	26.3	28.0	34.5	34.3	27.8	30.1	33.5	33.9	32.9	32.2	17.9	25.2	16.2	22.4	22.5	13.4	25.0	34.5
9-Mar	8.9	7.2	9.5	12.2	12.4	Z	3.6	4.3	19.4	30.1	31.7	29.9	34.7	36.6	33.8	35.7	34.6	31.2	34.3	32.2	31.8	33.9	34.7	34.2	25.1	36.6
10-Mar	Z	33.5	29.8	29.9	33.1	27.5	27.0	30.1	30.6	29.0	27.4	28.9	30.3	30.7	29.8	30.6	33.5	34.8	33.8	27.2	28.4	28.5	32.6	33.0	30.4	34.8
11-Mar	34.0	Z	18.3	19.7	15.4	6.8	5.6	9.7	22.9	22.4	22.6	28.7	31.6	33.0	30.8	27.8	24.7	27.1	23.2	21.7	18.7	24.1	25.2	26.6	22.6	34.0
12-Mar	26.2	16.6	Z	23.1	21.3	20.8	18.5	17.9	20.9	24.8	25.5	24.3	24.9	25.2	28.2	27.7	26.1	25.8	20.3	20.8	16.4	17.2	16.3	16.6	22.0	28.2
13-Mar	12.6	10.7	9.3	Z	7.6	7.2	6.3	10.2	12.2	14.2	22.6	26.0	26.2	28.8	28.3	25.5	27.1	27.1	26.2	18.2	15.4	10.6	16.1	21.5	17.8	28.8
14-Mar	21.0	25.3	27.4	23.6	Z	28.2	27.7	30.0	30.8	32.6	33.1	32.4	33.7	32.9	34.3	34.3	33.9	35.9	37.4	34.7	27.7	25.8	27.0	25.9	30.2	37.4
15-Mar	24.3	25.2	25.7	22.3	18.5	Z	12.6	12.4	19.8	23.3	23.2	25.9	27.9	30.2	27.4	25.1	22.0	24.9	15.8	11.4	9.7	4.8	1.2	0.9	18.9	30.2
16-Mar	Z	0.9	1.9	6.1	2.6	3.2	3.8	9.4	17.5	27.5	26.5	29.6	29.4	28.5	28.7	31.9	33.9	31.2	26.5	22.6	23.1	25.3	25.1	17.4	19.7	33.9
17-Mar	19.5	Z	21.1	17.7	20.3	24.3	10.7	16.0	19.5	23.6	M	M	M	31.6	35.0	37.5	35.9	20.1	6.1	1.6	1.2	1.1	1.1	1.1	17.3	37.5
18-Mar	1.1	1.4	Z	8.7	8.7	12.5	6.5	13.8	37.0	41.6	45.0	47.3	49.2	45.9	45.8	46.6	42.7	35.2	14.7	2.7	4.9	3.4	1.2	1.4	22.5	49.2
19-Mar	4.0	6.2	5.8	Z	3.0	2.3	3.3	9.4	23.0	28.6	32.7	35.2	36.2	33.2	34.6	38.8	37.7	34.9	31.2	40.4	40.9	41.9	42.1	40.9	26.4	42.1
20-Mar	39.9	38.8	38.7	38.8	Z	38.8	38.1	37.2	38.6	37.4	35.2	30.3	36.3	38.2	40.0	38.1	38.9	37.7	35.1	32.8	28.8	25.8	21.9	20.3	35.0	40.0
21-Mar	16.7	15.2	13.4	13.7	16.2	Z	12.6	12.9	18.3	22.4	22.8	27.1	36.9	35.4	35.5	27.8	21.5	19.6	11.3	12.8	15.0	16.3	16.9	16.9	19.9	36.9
22-Mar	Z	15.7	16.2	19.3	17.6	9.3	9.2	13.9	20.9	C	C	C	C	34.5	34.0	36.2	41.7	43.9	38.0	30.4	22.6	20.3	15.7	11.4	23.7	43.9
23-Mar	4.4	Z	0.7	0.7	2.2	3.8	6.1	9.0	20.5	29.4	M	42.6	42.4	40.0	39.7	40.4	39.4	38.4	36.3	34.7	34.7	38.4	36.7	37.0	26.2	42.6
24-Mar	38.0	33.2	Z	20.5	15.4	11.8	8.8	11.8	24.1	27.4	30.3	33.8	36.8	38.4	38.2	37.0	40.1	34.1	33.2	24.2	20.2	17.5	15.0	10.1	26.1	40.1
25-Mar	6.3	5.2	2.3	Z	4.6	7.6	8.5	10.1	13.0	15.4	18.6	28.5	37.6	39.5	39.9	39.7	41.5	41.8	41.4	39.4	35.8	29.3	27.0	23.1	24.2	41.8
26-Mar	18.2	14.7	14.9	15.1	Z	14.4	13.8	16.4	21.2	18.3	24.2	27.8	30.1	32.9	32.6	34.9	37.0	36.1	34.8	30.8	24.1	19.8	18.3	16.0	23.8	37.0
27-Mar	13.5	13.9	15.2	17.6	19.6	Z	18.9	11.5	10.0	18.0	30.6	35.0	39.0	37.5	35.5	34.9	35.9	36.0	28.5	21.3	28.2	25.2	18.7	17.8	24.5	39.0
28-Mar	Z	12.4	9.6	8.5	9.0	11.2	11.8	11.4	7.2	19.2	34.1	36.9	38.8	35.9	36.3	36.8	37.4	39.5	37.5	38.0	38.3	34.6	31.7	27.7	26.3	39.5
29-Mar	23.6	Z	13.5	11.5	3.8	3.4	6.6	9.5	19.1	20.4	17.3	27.5	34.0	36.9	37.1	37.2	37.2	38.3	36.9	35.3	29.5	20.6	17.0	15.7	23.1	38.3
30-Mar	13.4	13.1	Z	10.0	10.2	9.5	10.1	8.2	6.5	11.5	23.4	29.6	29.4	33.1	35.0	34.2	34.7	33.1	35.4	35.6	32.9	23.8	14.8	10.9	21.7	35.6
31-Mar	9.0	11.8	11.7	Z	5.1	3.8	10.2	14.5	11.2	15.5	19.7	25.8	30.7	35.7	37.4	36.7	37.7	37.3	35.9	28.2	22.9	22.3	25.2	21.0	22.1	37.7
	17.2	16.5	16.4	16.3	13.7	13.0	13.6	15.6	20.4	23.8	27.4	30.8	33.1	33.6	33.9	33.6	33.3	31.5	27.7	24.6	23.0	22.1	21.2	19.4	Diurnal Average	
	39.9	38.8	38.7	38.8	33.1	38.8	38.1	37.2	38.6	41.6	45.0	47.3	49.2	45.9	45.8	46.6	42.7	43.9	41.4	40.4	40.9	41.9	42.1	40.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	266	37.73	37.73
21 - 50	439	62.27	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Fort McKay South - March 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	39	10	3	1	1	3	12	27	36	16	17	36	15	14	14	19	263
21 - 50	126	65	4	2	5	8	52	115	25	1	5	4	3	4	5	15	439
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	165	75	7	3	6	11	64	142	61	17	22	40	18	18	19	34	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Fort McKay South

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort McKay South - March 2023

Maximum Value: 229.4 ppb on Mar 1 02:00

Maximum Daily Average: 41.8 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 2 06:00

Minimum Daily Average: 0.6 ppb on Mar 4

Maximum Diurnal Average: 14.4 ppb at hour 10

Minimum Diurnal Average: 0.4 ppb at hour 20

Monthly Average: 5.51 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 1.2 Q_3 = 5.2 P_{90} = 12.1 P_{99} = 57.1

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	36
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	229.4	203.6	120.2	85.3	61.0	48.9	37.3	57.1	59.5	24.9	10.6	9.6	2.9	1.5	1.3	3.2	3.5	0.3	0.1	0.0	0.0	0.1	0.1	41.8	229.4
2-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.7	5.2	4.9	5.7	2.1	2.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.7
3-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	1.6	2.2	2.3	2.4	2.9	4.0	5.3	2.7	1.3	0.2	0.7	0.2	0.0	0.0	0.0	1.1	5.3
4-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	1.5	4.1	0.9	0.0	0.0	0.1	0.3	1.5	3.6	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.6	4.1
5-Mar	0.2	0.1	0.1	0.7	Z	28.3	5.6	11.2	16.6	6.7	1.3	2.3	3.2	3.0	2.0	2.4	1.1	1.0	0.1	0.0	1.9	4.8	3.9	15.4	4.9	28.3
6-Mar	42.7	39.4	49.1	34.2	34.0	34.3	33.1	38.4	45.5	61.8	29.8	12.2	10.5	7.7	Z	7.2	3.2	0.7	0.1	0.0	0.0	0.0	0.0	0.1	21.0	61.8
7-Mar	0.1	0.0	0.1	0.1	0.0	Z	0.5	2.0	3.0	3.3	4.9	7.7	3.8	3.9	5.8	4.6	1.5	0.1	0.6	0.0	0.0	0.0	0.0	0.0	1.8	7.7
8-Mar	Z	0.0	1.7	1.0	5.6	30.9	13.9	10.0	4.4	8.4	5.8	5.1	12.4	13.4	6.0	3.7	2.6	1.8	6.6	0.2	32.6	0.8	0.0	0.1	7.3	32.6
9-Mar	0.1	Z	0.1	0.2	5.1	10.9	37.1	38.7	17.6	5.1	6.5	8.8	5.2	2.7	6.4	2.8	1.5	1.7	0.7	2.8	0.4	0.0	0.0	0.0	6.7	38.7
10-Mar	0.0	0.0	Z	0.0	0.5	0.5	3.7	0.7	2.0	2.4	4.8	5.6	6.8	4.8	5.9	5.9	1.3	1.1	1.9	0.2	0.0	0.1	0.0	0.0	2.1	6.8
11-Mar	0.0	0.0	0.0	Z	5.8	9.1	12.3	6.0	4.9	11.1	12.2	7.2	3.7	2.4	3.0	3.7	3.9	1.1	0.1	0.1	0.2	0.0	0.0	0.0	3.8	12.3
12-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.1	2.0	3.7	4.2	5.6	7.7	7.3	7.7	4.6	3.2	2.6	1.2	0.4	0.1	0.1	0.0	0.1	0.1	2.2	7.7
13-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.3	4.2	14.4	23.2	14.9	12.8	11.5	6.6	5.2	5.8	3.6	1.6	0.2	0.1	0.1	0.3	0.1	0.0	4.6	23.2
14-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	1.4	1.6	2.4	3.0	3.1	2.1	1.4	0.8	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.8	3.1
15-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	3.6	7.2	9.9	14.7	11.0	7.8	5.5	14.9	11.9	11.0	2.9	0.6	0.1	0.0	0.8	5.7	9.8	5.1	14.9
16-Mar	21.9	25.3	Z	1.4	3.5	2.8	3.1	7.4	8.6	3.9	M	M	M	M	M	3.7	2.1	1.6	0.4	0.1	0.1	0.1	0.1	0.1	4.8	25.3
17-Mar	0.1	0.0	0.0	Z	0.0	0.0	1.9	5.3	13.0	12.8	10.5	5.5	5.1	10.0	6.1	4.4	3.1	1.8	0.8	3.4	7.6	9.8	32.9	25.2	6.9	32.9
18-Mar	36.0	23.5	7.3	0.5	Z	0.2	1.8	6.3	2.9	2.6	2.8	1.8	1.3	3.6	3.1	1.4	1.7	1.9	3.8	2.9	0.5	0.9	3.7	2.4	4.9	36.0
19-Mar	0.7	0.3	0.2	0.3	0.4	Z	1.3	6.6	6.3	7.6	6.8	3.9	3.0	6.3	5.5	2.4	2.6	0.9	0.3	0.0	0.0	0.0	0.0	0.0	2.4	7.6
20-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	1.5	5.6	2.8	2.2	1.4	2.1	1.2	0.5	0.2	0.0	0.1	0.0	0.1	0.0	0.8	5.6
21-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.4	4.6	5.9	5.1	9.5	9.4	3.4	5.8	5.4	13.4	16.6	9.7	3.7	0.2	0.1	0.0	0.0	0.0	4.1	16.6
22-Mar	0.0	0.0	Z	0.0	0.4	0.2	2.0	11.4	14.6	3.1	5.8	5.6	7.3	10.6	11.6	7.6	2.7	0.7	0.1	0.0	0.0	0.0	0.0	0.0	3.6	14.6
23-Mar	0.6	2.2	42.8	Z	25.8	10.9	7.3	10.6	C	C	C	C	C	2.1	1.9	1.6	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	6.0	42.8
24-Mar	0.0	0.0	0.0	0.0	Z	0.0	1.1	5.2	7.5	7.7	6.5	4.2	2.6	2.7	3.5	3.7	1.5	2.7	0.5	0.0	0.0	0.0	0.0	0.0	2.2	7.7
25-Mar	0.1	0.1	0.3	0.3	0.1	Z	0.8	7.6	18.2	34.0	30.8	14.4	3.2	2.3	1.9	1.7	1.0	0.4	0.2	0.0	0.0	0.1	0.0	0.1	5.1	34.0
26-Mar	Z	0.1	0.1	0.0	0.0	0.0	0.6	4.6	8.1	20.0	12.6	8.7	6.6	4.2	4.3	2.6	1.4	0.8	0.3	0.1	0.0	0.0	0.0	0.0	3.3	20.0
27-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.2	16.8	42.3	22.0	6.7	3.4	2.1	2.6	3.8	3.9	2.5	1.2	0.5	0.1	0.0	0.0	0.0	0.0	4.7	42.3
28-Mar	0.0	0.0	Z	0.0	0.1	0.0	0.8	9.4	55.2	31.4	7.9	4.8	3.7	5.9	4.3	2.5	1.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	5.6	55.2
29-Mar	0.0	0.0	0.0	Z	0.2	0.3	3.1	7.3	5.9	32.2	15.2	5.9	2.3	0.9	0.6	0.7	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	3.3	32.2
30-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.5	11.4	39.8	30.1	10.9	5.5	6.3	3.2	2.0	1.7	1.3	0.8	0.2	0.0	0.0	0.0	0.1	0.1	5.0	39.8
31-Mar	0.1	0.1	0.4	1.1	0.6	Z	1.9	4.4	11.3	13.3	14.9	11.5	7.1	3.9	2.9	2.6	1.7	0.9	0.2	0.0	0.0	0.0	0.0	0.0	3.4	14.9
	4.0	12.3	11.8	6.2	6.4	7.3	5.9	8.8	14.0	14.4	9.6	6.6	5.2	4.5	4.2	3.8	2.7	1.5	0.8	0.4	1.4	0.6	1.5	1.7	Diurnal Average	
	42.7	229.4	203.6	120.2	85.3	61.0	48.9	38.7	57.1	61.8	30.8	14.4	12.4	13.4	14.9	13.4	16.6	9.7	6.6	3.4	32.6	9.8	32.9	25.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	659	93.74	93.74
21 - 40	29	4.13	97.87
11 - 80	11	1.56	99.43
81 - 159	2	0.28	99.72
> 159	2	0.28	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay South - March 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	158	72	8	4	4	9	57	138	53	13	18	35	18	16	19	34	656
21 - 40	5	0	0	0	0	1	6	4	4	3	0	1	2	3	0	0	29
11 - 80	0	0	0	0	1	1	3	0	0	2	1	1	0	0	1	1	11
81 - 159	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Totals	163	72	8	4	5	11	66	142	58	18	21	37	20	19	20	35	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Fort McKay South

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 46.8 ppb on Mar 1 02:00 Maximum Daily Average: 20.1 ppb on Mar 1

Minimum Value: 0.3 ppb on Mar 4 12:00 Minimum Daily Average: 5.2 ppb on Mar 20

Maximum Diurnal Average: 14.7 ppb at hour 3 Minimum Diurnal Average: 6.8 ppb at hour 14

Monthly Average: 11.28 ppb Percentiles: P_1 = 0.7 P_{10} = 3.6 Q_1 = 6.0 Median = 9.2 Q_3 = 15.1 P_{90} = 22.3 P_{99} = 32.6

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	36
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	46.8	42.4	33.6	29.2	26.7	26.9	25.2	23.6	25.1	18.5	9.5	8.1	4.0	3.0	4.3	13.0	22.4	18.4	18.9	12.9	10.7	18.1	20.9	20.1	46.8
2-Mar	9.2	Z	18.6	14.2	14.2	6.2	6.8	7.5	7.0	8.5	9.4	8.7	10.9	6.5	6.9	4.0	1.5	1.2	0.7	0.6	2.2	1.5	0.5	0.4	6.4	18.6
3-Mar	13.9	12.7	Z	2.3	2.4	2.6	2.9	4.2	5.8	6.6	5.8	5.4	5.1	6.1	7.7	10.4	10.8	13.9	17.0	22.2	6.4	5.4	5.2	4.3	7.8	22.2
4-Mar	4.2	5.3	3.8	Z	10.0	9.0	5.5	7.9	7.7	8.7	2.0	0.3	0.3	0.3	0.6	3.7	10.6	10.8	9.1	10.4	11.3	11.9	11.0	10.9	6.8	11.9
5-Mar	15.2	15.0	14.5	18.8	Z	24.4	16.2	13.6	12.7	6.2	1.7	2.5	3.1	3.5	2.7	4.0	4.2	11.0	12.1	14.4	23.4	25.8	24.1	24.8	12.8	25.8
6-Mar	26.4	25.2	24.6	22.1	22.3	21.9	20.8	19.7	19.4	22.3	15.8	10.6	10.2	9.8	Z	13.1	11.6	7.2	6.3	5.2	4.0	6.6	6.8	14.9	15.1	26.4
7-Mar	20.2	7.0	9.0	12.9	8.0	Z	6.6	7.1	5.6	7.6	9.1	7.4	7.4	8.0	8.5	10.7	4.9	2.2	1.5	1.4	2.5	7.3	17.3	21.8	8.4	21.8
8-Mar	Z	6.8	7.6	17.2	17.6	22.6	22.3	18.6	10.9	9.1	1.4	5.6	16.7	10.9	8.1	7.3	8.6	7.7	18.3	9.2	19.2	11.8	15.5	20.6	12.8	22.6
9-Mar	21.4	Z	21.4	17.8	13.5	15.9	31.2	29.3	16.0	6.1	5.2	7.8	4.3	4.1	5.8	1.7	3.9	8.3	2.9	5.6	3.6	1.7	1.6	2.5	10.1	31.2
10-Mar	2.6	2.6	Z	7.3	3.9	9.7	9.5	6.3	5.5	6.7	8.9	7.3	4.6	4.3	7.4	7.0	5.1	2.0	2.3	7.6	5.6	6.1	3.6	3.8	5.6	9.7
11-Mar	2.0	2.0	1.6	Z	7.4	14.6	15.4	12.4	7.8	14.2	15.4	9.2	5.6	4.6	7.6	11.0	14.2	10.2	12.5	13.3	15.5	10.2	9.5	8.2	9.8	15.5
12-Mar	8.4	18.4	16.5	11.2	Z	13.6	15.7	16.4	13.5	9.6	9.0	10.6	10.2	9.9	6.6	7.1	8.5	8.6	15.2	14.6	19.0	17.9	18.1	17.8	12.9	19.0
13-Mar	21.5	21.8	21.1	19.5	19.6	Z	18.3	18.9	21.2	22.4	14.6	12.4	12.0	8.9	9.3	12.5	12.1	12.3	12.4	18.6	22.1	27.7	21.0	15.5	17.2	27.7
14-Mar	Z	12.5	10.7	15.1	13.3	10.6	11.4	9.4	8.9	7.3	7.2	8.1	7.1	7.8	6.3	6.0	5.7	2.8	0.8	3.0	9.8	11.6	10.1	10.8	8.5	15.1
15-Mar	11.3	Z	3.9	3.6	4.7	5.5	6.6	7.8	9.6	10.0	11.9	9.2	7.0	5.6	14.4	14.1	17.2	12.6	14.0	13.2	12.7	18.7	24.2	23.1	11.3	24.2
16-Mar	23.3	22.7	Z	23.4	25.7	26.1	25.6	22.1	18.0	8.5	M	M	M	M	M	6.0	6.1	9.5	10.6	12.6	11.7	9.2	8.8	13.9	15.8	26.1
17-Mar	12.5	7.6	8.1	Z	8.3	7.5	21.8	15.1	18.1	14.2	11.5	7.2	7.2	12.3	10.1	10.4	11.0	10.0	7.5	13.9	17.7	18.1	21.6	20.9	12.7	21.8
18-Mar	26.8	29.2	26.0	21.5	Z	19.9	26.5	16.0	7.5	6.0	6.6	4.8	4.0	8.0	7.5	4.6	7.7	16.3	32.6	37.8	28.1	25.2	28.1	26.8	18.2	37.8
19-Mar	20.5	14.4	15.1	17.0	16.7	Z	15.8	11.5	11.7	12.3	11.3	7.5	6.5	13.7	13.1	7.7	8.4	9.9	11.7	1.6	1.1	0.7	0.7	0.9	10.0	20.5
20-Mar	Z	0.7	1.6	1.4	1.2	0.9	1.4	1.8	1.1	2.2	4.5	10.7	5.1	3.6	3.0	4.6	3.9	4.0	5.7	7.8	12.0	14.4	14.6	13.5	5.2	14.6
21-Mar	11.1	Z	11.7	10.8	7.4	7.3	7.2	8.8	11.0	9.4	13.0	10.9	4.7	7.5	8.1	19.6	28.9	30.6	34.3	26.6	19.9	14.5	12.1	10.8	14.2	34.3
22-Mar	7.0	8.8	Z	8.1	13.3	19.5	18.3	15.3	16.9	6.0	9.4	8.9	10.4	14.2	16.3	14.0	8.6	6.6	6.5	6.1	6.4	7.9	7.2	17.3	11.0	19.5
23-Mar	31.0	31.3	35.1	Z	35.6	30.9	24.9	20.8	C	C	C	C	C	4.4	4.9	4.8	4.3	4.7	5.5	6.8	6.6	1.4	1.3	2.3	14.3	35.6
24-Mar	1.6	4.6	6.6	7.6	Z	11.7	13.8	10.0	13.0	11.0	8.7	6.1	4.1	4.5	6.1	7.1	5.3	12.9	10.7	9.6	9.1	8.6	10.7	14.8	8.6	14.8
25-Mar	18.2	18.2	21.3	21.0	17.1	Z	9.3	9.4	14.8	25.9	25.3	15.1	5.4	4.3	4.0	4.1	3.5	2.8	4.1	5.7	6.4	11.1	11.6	13.5	11.8	25.9
26-Mar	Z	15.7	15.7	11.9	9.8	8.9	8.3	9.1	11.0	17.3	12.3	9.4	7.7	5.7	6.5	5.1	4.0	4.3	5.5	6.2	7.5	8.3	8.1	8.3	9.0	17.3
27-Mar	10.9	Z	7.5	4.9	3.6	2.7	2.3	17.3	25.2	17.5	8.4	4.8	4.2	4.3	6.3	7.6	6.7	6.5	10.3	16.4	10.5	11.6	11.9	11.1	9.2	25.2
28-Mar	9.7	10.3	Z	12.6	10.8	8.5	7.6	12.1	27.6	25.9	15.1	8.7	7.0	9.1	8.2	7.3	6.8	5.2	7.1	6.9	5.8	7.3	7.0	6.0	10.1	27.6
29-Mar	6.1	5.6	6.5	Z	21.0	22.6	19.8	18.2	14.6	30.4	26.8	15.8	8.0	4.3	3.8	3.9	4.1	3.1	4.4	4.9	7.4	7.9	7.7	7.5	11.1	30.4
30-Mar	6.0	5.2	5.3	4.6	Z	3.9	4.0	12.6	24.2	21.5	14.3	8.6	10.4	7.2	5.7	6.9	6.7	8.3	5.2	4.0	5.4	13.3	20.5	23.9	9.9	24.2
31-Mar	24.8	20.9	25.3	32.0	32.4	Z	27.4	23.5	28.5	24.1	20.0	13.9	9.9	6.9	6.1	6.4	6.0	6.2	6.1	5.4	5.0	5.2	3.6	2.8	14.9	32.4
	14.1	14.3	14.7	14.3	14.2	13.6	14.5	13.8	13.9	13.4	11.1	8.5	7.1	6.8	7.1	7.6	8.2	8.8	10.0	10.7	10.7	11.0	11.7	12.7	Diurnal Average	
	31.0	46.8	42.4	33.6	35.6	30.9	31.2	29.3	28.5	30.4	26.8	15.8	16.7	14.2	16.3	19.6	28.9	30.6	34.3	37.8	28.1	27.7	28.1	26.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	603	85.78	85.78
21 - 40	98	13.94	99.72
11 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - March 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	145	69	8	4	4	10	60	133	43	10	16	30	16	13	16	23	600
21 - 40	18	3	0	0	1	1	6	9	14	8	4	7	4	6	4	12	97
11 - 80	0	0	0	0	0	0	0	0	1	0	1	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	163	72	8	4	5	11	66	142	58	18	21	37	20	19	20	35	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - March 2023

Maximum Value: 276.2 ppb on Mar 1 02:00

Maximum Daily Average: 61.9 ppb on Mar 1

Minimum Value: 0.3 ppb on Mar 4 12:00

Minimum Daily Average: 6.0 ppb on Mar 20

Maximum Diurnal Average: 27.9 ppb at hour 9

Minimum Diurnal Average: 10.3 ppb at hour 18

Monthly Average: 16.80 ppb

Percentiles: P_1 = 0.7 P_{10} = 4.2 Q_1 = 7.0 Median = 11.6 Q_3 = 19.6 P_{90} = 31.5 P_{99} = 82.7

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	36
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	276.2	246.0	153.8	114.5	87.7	75.8	62.5	80.7	84.6	43.4	20.1	17.7	6.9	4.5	5.6	16.2	25.9	18.7	19.0	12.9	10.7	18.2	21.0	61.9	276.2
2-Mar	9.2	Z	18.6	14.2	14.2	6.2	6.8	7.7	7.8	11.2	14.6	13.6	16.6	8.6	9.4	4.9	1.5	1.2	0.7	0.6	2.2	1.5	0.5	0.4	7.5	18.6
3-Mar	13.9	12.7	Z	2.3	2.4	2.6	2.9	4.2	6.2	8.2	8.0	7.7	7.5	9.0	11.7	15.7	13.5	15.2	17.2	22.9	6.6	5.4	5.2	4.3	8.9	22.9
4-Mar	4.2	5.3	3.8	Z	10.0	9.0	5.5	8.2	9.2	12.8	2.9	0.3	0.3	0.4	0.9	5.2	14.2	12.3	9.2	10.4	11.3	11.9	11.0	10.9	7.4	14.2
5-Mar	15.4	15.1	14.6	19.5	Z	52.7	21.8	24.8	29.3	12.9	3.0	4.8	6.3	6.5	4.7	6.4	5.3	12.0	12.2	14.4	25.3	30.6	28.0	40.2	17.6	52.7
6-Mar	69.1	64.6	73.7	56.3	56.3	56.2	53.9	58.1	64.9	84.1	45.6	22.8	20.7	17.5	Z	20.3	14.8	7.9	6.4	5.2	4.0	6.6	6.8	15.0	36.1	84.1
7-Mar	20.3	7.0	9.1	13.0	8.0	Z	7.1	9.1	8.6	10.9	14.0	15.1	11.2	11.9	14.3	15.3	6.4	2.3	2.1	1.4	2.5	7.3	17.3	21.8	10.3	21.8
8-Mar	Z	6.8	9.3	18.2	23.2	53.5	36.2	28.6	15.3	17.5	7.2	10.7	29.1	24.3	14.1	11.0	11.2	9.5	24.9	9.4	51.8	12.6	15.5	20.7	20.0	53.5
9-Mar	21.5	Z	21.5	18.0	18.6	26.8	68.3	68.0	33.6	11.2	11.7	16.6	9.5	6.8	12.2	4.5	5.4	10.0	3.6	8.4	4.0	1.7	1.6	2.5	16.8	68.3
10-Mar	2.6	2.6	Z	7.3	4.4	10.2	13.2	7.0	7.5	9.1	13.7	12.9	11.4	9.1	13.3	12.9	6.4	3.1	4.2	7.8	5.6	6.2	3.6	3.8	7.7	13.7
11-Mar	2.0	2.0	1.6	Z	13.2	23.7	27.7	18.4	12.7	25.3	27.6	16.4	9.3	7.0	10.6	14.7	18.1	11.3	12.6	13.4	15.7	10.2	9.5	8.2	13.5	27.7
12-Mar	8.4	18.4	16.5	11.2	Z	13.6	15.8	18.4	17.2	13.8	14.6	18.3	17.5	17.6	11.2	10.3	11.1	9.8	15.6	14.7	19.1	17.9	18.2	17.9	15.1	19.1
13-Mar	21.6	21.9	21.2	19.6	19.7	Z	18.6	23.1	35.6	45.6	29.5	25.2	23.5	15.5	14.5	18.3	15.7	13.9	12.6	18.7	22.2	28.0	21.1	15.5	21.8	45.6
14-Mar	Z	12.5	10.7	15.1	13.3	10.6	11.4	9.7	9.9	8.7	8.8	10.5	10.1	10.9	8.4	7.4	6.5	3.0	0.8	3.0	9.8	11.7	10.1	10.9	9.3	15.1
15-Mar	11.3	Z	3.9	3.6	4.7	5.5	6.7	11.4	16.8	19.9	26.6	20.2	14.8	11.1	29.3	26.0	28.2	15.5	14.6	13.3	12.7	19.5	29.9	32.9	16.4	32.9
16-Mar	45.2	48.0	Z	24.8	29.2	28.9	28.7	29.5	26.6	12.4	M	M	M	M	M	9.7	8.2	11.1	11.0	12.7	11.8	9.3	8.9	14.0	20.5	48.0
17-Mar	12.6	7.6	8.1	Z	8.3	7.5	23.7	20.4	31.1	27.0	22.0	12.7	12.3	22.3	16.2	14.8	14.1	11.8	8.3	17.3	25.3	27.9	54.5	46.1	19.7	54.5
18-Mar	62.8	52.7	33.3	22.0	Z	20.1	28.3	22.3	10.4	8.6	9.4	6.6	5.3	11.6	10.6	6.0	9.4	18.2	36.4	40.7	28.6	26.1	31.8	29.2	23.1	62.8
19-Mar	21.2	14.7	15.3	17.3	17.1	Z	17.1	18.1	18.0	19.9	18.1	11.4	9.5	20.0	18.6	10.1	11.0	10.8	12.0	1.6	1.1	0.7	0.7	0.9	12.4	21.2
20-Mar	Z	0.7	1.6	1.4	1.2	0.9	1.4	1.9	1.2	2.5	6.0	16.3	7.9	5.8	4.4	6.7	5.1	4.5	5.9	7.8	12.1	14.4	14.7	13.5	6.0	16.3
21-Mar	11.1	Z	11.7	10.8	7.4	7.3	7.6	13.4	16.9	14.5	22.5	20.3	8.1	13.3	13.5	33.0	45.5	40.3	38.0	26.8	20.0	14.5	12.1	10.8	18.2	45.5
22-Mar	7.0	8.8	Z	8.1	13.7	19.7	20.3	26.7	31.5	9.1	15.2	14.5	17.7	24.8	27.9	21.6	11.3	7.3	6.6	6.1	6.4	7.9	7.2	17.3	14.6	31.5
23-Mar	31.6	33.5	77.9	Z	61.4	41.8	32.2	31.4	C	C	C	C	C	6.5	6.8	6.4	5.4	5.3	5.6	6.8	6.6	1.4	1.3	2.3	20.2	77.9
24-Mar	1.6	4.6	6.6	7.6	Z	11.7	14.9	15.2	20.5	18.7	15.2	10.3	6.7	7.2	9.6	10.8	6.8	15.6	11.2	9.6	9.1	8.6	10.7	14.8	10.8	20.5
25-Mar	18.3	18.3	21.6	21.3	17.2	Z	10.1	17.0	33.0	59.9	56.1	29.5	8.6	6.6	5.9	5.8	4.5	3.2	4.3	5.7	6.4	11.2	11.6	13.6	16.9	59.9
26-Mar	Z	15.8	15.8	11.9	9.8	8.9	8.9	13.7	19.1	37.3	24.9	18.1	14.3	9.9	10.8	7.7	5.4	5.1	5.8	6.3	7.5	8.3	8.1	8.3	12.2	37.3
27-Mar	10.9	Z	7.5	4.9	3.6	2.7	2.5	34.1	67.5	39.5	15.1	8.2	6.3	6.9	10.1	11.5	9.2	7.7	10.8	16.5	10.5	11.6	11.9	11.1	13.9	67.5
28-Mar	9.7	10.3	Z	12.6	10.9	8.5	8.4	21.5	82.8	57.3	23.0	13.5	10.7	15.0	12.5	9.8	8.2	5.7	7.3	6.9	5.8	7.3	7.0	6.0	15.7	82.8
29-Mar	6.1	5.6	6.5	Z	21.2	22.9	22.9	25.5	20.5	62.6	42.0	21.7	10.3	5.2	4.4	4.6	4.7	3.5	4.6	4.9	7.4	7.9	7.7	7.5	14.4	62.6
30-Mar	6.0	5.2	5.3	4.6	Z	3.9	4.5	24.0	64.0	51.6	25.2	14.1	16.7	10.4	7.7	8.6	8.0	9.1	5.4	4.0	5.4	13.3	20.6	24.0	14.8	64.0
31-Mar	24.9	21.0	25.7	33.1	33.0	Z	29.3	27.9	39.8	37.4	34.9	25.4	17.0	10.8	9.0	9.0	7.7	7.1	6.3	5.4	5.0	5.2	3.6	2.8	18.3	39.8
	18.0	26.6	26.4	20.5	20.6	20.9	20.4	22.6	27.9	27.8	20.7	15.1	12.3	11.3	11.3	11.4	10.9	10.3	10.8	11.0	12.1	11.5	13.2	14.5	Diurnal Average	
	69.1	276.2	246.0	153.8	114.5	87.7	75.8	68.0	82.8	84.6	56.1	29.5	29.1	24.8	29.3	33.0	45.5	40.3	38.0	40.7	51.8	30.6	54.5	46.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	543	77.24	77.24
21 - 40	113	16.07	93.31
11 - 80	38	5.41	98.72
81 - 159	6	0.85	99.57
> 159	2	0.28	99.86

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - March 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	134	63	6	4	4	9	51	114	39	6	16	30	15	13	14	22	540
21 - 40	23	9	2	0	0	0	7	24	12	7	2	5	3	3	5	11	113
11 - 80	6	0	0	0	0	2	6	4	6	5	0	2	2	3	1	1	38
81 - 159	0	0	0	0	1	0	2	0	0	0	2	0	0	0	0	0	5
> 159	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Totals	163	72	8	4	5	11	66	142	58	18	21	37	20	19	20	34	698

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Fort McKay South

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay South - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 59.2 $\mu g/m^3$ on Mar 28 09:00

Maximum Daily Average: 22.6 $\mu g/m^3$ on Mar 31

Minimum Value: 0.5 $\mu g/m^3$ on Mar 2 20:00

Maximum Diurnal Average: 15.6 $\mu g/m^3$ at hour 10

Monthly Average: 9.46 $\mu g/m^3$

Minimum Daily Average: 4.2 $\mu g/m^3$ on Mar 14

Minimum Diurnal Average: 7.6 $\mu g/m^3$ at hour 21

Percentiles: P_1 = 1.7 P_{10} = 4.1 Q_1 = 5.1 Median = 7.3 Q_3 = 11.2 P_{90} = 16.8 P_{99} = 42.0

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Hours of Calibration:	3
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	19.7	16.8	14.7	11.9	10.6	9.9	10.1	9.6	9.8	11.8	11.1	6.6	9.3	5.5	4.6	5.4	7.9	10.3	9.7	8.9	7.2	7.9	10.5	10.9	10.0	19.7
2-Mar	10.9	11.3	11.5	11.1	11.6	11.7	12.5	11.2	10.7	12.1	12.2	13.2	10.7	6.3	5.0	2.1	0.9	0.7	0.5	0.5	0.5	0.5	1.2	1.5	7.1	13.2
3-Mar	4.0	5.8	5.3	4.4	4.2	4.2	4.2	4.8	6.2	6.9	6.5	5.9	6.2	7.0	8.1	9.9	9.0	9.9	10.8	9.0	4.9	4.7	4.4	4.1	6.3	10.8
4-Mar	3.5	3.7	3.5	4.5	4.7	4.5	3.7	3.9	3.7	5.2	3.5	2.9	3.0	3.2	3.3	4.4	7.5	7.2	5.9	6.2	7.4	7.4	6.4	5.7	4.8	7.5
5-Mar	6.4	5.9	5.3	4.5	4.0	3.9	3.7	6.6	6.6	4.7	4.1	4.2	4.6	4.6	3.9	3.8	5.1	17.6	15.2	15.8	13.4	11.1	9.6	10.5	7.3	17.6
6-Mar	12.2	12.6	13.2	11.3	10.0	8.8	9.3	9.6	12.1	15.5	13.0	12.5	10.4	7.2	7.4	12.6	9.7	5.1	3.9	3.3	3.0	4.9	5.5	8.1	9.2	15.5
7-Mar	8.1	4.6	3.8	4.8	4.5	3.7	3.6	3.9	4.6	5.2	6.0	5.3	4.7	4.8	5.4	5.5	3.8	3.2	2.9	2.9	3.4	5.5	9.2	10.3	5.0	10.3
8-Mar	7.4	7.0	6.6	8.4	7.6	7.2	7.2	5.5	5.3	6.2	4.6	6.6	9.4	7.4	8.3	7.3	8.0	7.9	8.9	5.6	4.2	8.2	10.1	16.5	7.6	16.5
9-Mar	18.7	17.1	17.4	14.5	10.5	4.8	6.3	6.0	7.3	5.3	5.2	8.3	6.5	6.7	8.3	5.3	5.9	8.9	4.1	6.3	6.5	4.6	4.0	5.8	8.1	18.7
10-Mar	5.6	5.1	5.6	5.3	4.3	5.0	5.4	5.0	5.3	6.5	7.6	8.4	6.7	6.0	6.7	6.8	6.1	5.4	4.2	4.5	5.6	7.1	4.8	5.3	5.8	8.4
11-Mar	3.7	3.7	3.4	3.4	3.6	3.8	4.3	4.8	5.1	11.1	14.0	10.1	7.7	6.9	8.2	8.1	7.4	6.2	5.7	5.5	6.3	4.4	4.3	4.0	6.1	14.0
12-Mar	4.3	5.0	5.1	4.7	4.7	4.4	4.4	4.7	4.7	4.4	4.3	4.1	4.2	4.6	4.3	4.4	4.9	4.6	5.2	4.8	5.3	5.3	5.4	5.5	4.7	5.5
13-Mar	5.6	5.5	5.4	5.3	5.3	5.0	5.1	5.6	6.1	6.5	6.2	6.4	7.6	7.7	8.6	10.7	9.9	8.8	8.7	11.0	11.3	10.6	9.5	8.3	7.5	11.3
14-Mar	6.5	5.0	4.9	4.8	4.5	4.4	4.2	4.2	4.0	4.0	3.9	4.0	3.9	4.0	3.7	3.6	3.6	3.5	3.5	3.5	4.0	4.1	4.1	4.2	4.2	6.5
15-Mar	4.3	3.8	3.6	3.3	3.1	2.9	2.7	3.2	4.5	5.4	5.8	5.2	5.2	5.0	5.2	5.4	6.2	5.5	4.9	4.2	3.9	4.1	4.2	4.0	4.4	6.2
16-Mar	4.5	4.3	5.8	5.1	5.2	5.6	5.4	5.9	6.1	10.4	10.8	10.0	10.0	11.2	M	M	8.5	7.5	8.1	9.2	7.9	6.9	5.9	6.6	7.3	11.2
17-Mar	6.1	5.4	5.1	7.5	6.1	4.9	6.7	6.3	16.9	12.3	10.3	9.0	8.4	14.5	11.4	10.1	7.9	7.6	6.7	7.3	7.5	6.2	6.7	6.5	8.2	16.9
18-Mar	6.8	7.3	6.8	5.9	6.0	6.2	6.4	6.9	7.1	7.0	7.8	7.3	7.2	7.0	6.4	5.8	5.7	6.1	6.8	6.0	5.2	4.7	4.5	4.4	6.3	7.8
19-Mar	4.3	4.0	4.1	4.5	4.3	4.7	5.3	6.3	7.3	8.5	9.0	7.3	7.3	11.9	11.5	8.7	8.4	7.3	9.7	5.7	5.3	5.0	4.9	5.0	6.7	11.9
20-Mar	5.1	4.7	4.4	4.3	4.5	4.4	4.5	4.6	4.5	4.6	5.1	6.1	5.6	5.2	5.0	4.9	4.7	4.6	4.8	5.3	7.4	10.3	12.3	10.5	5.7	12.3
21-Mar	8.5	8.0	8.5	7.4	6.3	6.2	6.0	6.7	8.4	9.1	13.2	12.5	7.8	18.2	13.5	38.1	46.1	34.2	16.9	13.9	13.9	11.7	9.7	8.5	13.9	46.1
22-Mar	7.3	8.1	9.1	8.9	12.6	15.6	14.2	13.0	14.5	C	C	C	14.0	16.4	16.8	15.4	10.2	9.2	8.6	6.9	7.1	9.0	9.1	8.8	11.2	16.8
23-Mar	11.5	11.4	10.4	11.5	14.0	13.4	12.3	11.7	15.2	14.7	8.1	7.6	6.7	7.1	7.3	6.8	5.7	5.6	5.6	5.6	5.5	4.2	4.3	4.5	8.8	15.2
24-Mar	4.2	6.2	7.9	7.6	7.9	9.8	11.3	11.0	12.4	14.4	13.1	10.0	6.8	6.5	6.4	7.3	7.3	13.2	9.6	8.9	8.4	9.4	10.3	11.1	9.2	14.4
25-Mar	11.3	11.3	11.2	10.6	9.0	7.7	7.6	9.0	17.2	42.1	41.7	26.3	9.7	7.7	6.8	6.2	5.1	5.1	7.1	8.7	8.3	12.0	13.5	15.0	12.9	42.1
26-Mar	18.6	16.7	16.9	11.9	10.1	10.3	11.1	13.7	20.6	37.1	28.9	23.0	21.7	17.3	18.4	14.9	12.1	9.3	10.4	10.4	13.1	13.1	15.0	18.7	16.4	37.1
27-Mar	23.8	18.4	14.3	9.5	8.1	6.2	5.3	20.7	41.4	37.1	20.7	14.8	12.2	9.7	10.7	15.9	15.9	13.1	17.8	34.1	21.6	23.1	22.3	20.5	18.2	41.4
28-Mar	18.2	19.3	23.6	22.4	17.9	13.1	13.3	19.9	59.2	55.4	30.7	16.2	16.6	19.8	15.4	13.2	11.7	11.6	12.1	8.2	7.6	14.2	15.9	13.0	19.5	59.2
29-Mar	11.8	10.0	10.9	14.5	18.4	17.1	15.0	14.5	12.3	19.4	35.2	19.7	14.0	9.2	9.1	8.5	9.5	5.3	6.5	9.4	10.4	8.6	7.7	8.2	12.7	35.2
30-Mar	7.3	6.9	7.1	5.4	4.9	4.6	5.0	13.3	49.6	41.8	21.2	15.7	23.5	17.7	12.5	13.6	12.3	13.0	6.4	11.4	12.5	20.0	24.1	26.8	15.7	49.6
31-Mar	28.9	23.8	26.8	34.0	33.5	39.5	32.0	27.5	43.0	44.4	43.8	33.9	25.2	17.1	14.7	15.4	11.6	9.1	8.0	6.5	5.8	6.7	5.9	5.4	22.6	44.4
	9.7	9.0	9.1	8.8	8.4	8.2	8.0	9.0	13.9	15.6	13.6	10.8	9.6	9.1	8.6	9.3	9.0	8.6	7.7	8.0	7.6	8.2	8.6	9.0	Diurnal Average	
	28.9	23.8	26.8	34.0	33.5	39.5	32.0	27.5	59.2	55.4	43.8	33.9	25.2	19.8	18.4	38.1	46.1	34.2	17.8	34.1	21.6	23.1	24.1	26.8	Diurnal Maximum	

C - Calibration M - Maintenance

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Fort McKay South - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	238	32.21	32.21
6 - 15	413	55.89	88.09
16 - 25	59	7.98	96.08
26 - 80	29	3.92	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Fort McKay South - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	67	29	4	3	3	8	24	31	9	6	4	14	6	6	8	15	237
6 - 15	73	41	4	1	2	4	37	104	45	12	18	23	9	15	10	13	411
16 - 25	17	4	0	0	1	0	1	11	6	1	1	5	5	0	2	4	58
26 - 80	13	2	0	0	0	0	5	2	3	0	0	0	0	0	0	4	29
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	170	76	8	4	6	12	67	148	63	19	23	42	20	21	20	36	735

Total Number of Valid Hours: 735

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Fort McKay South

Total Number of Valid Hours: 735

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Fort McKay South - March 2023

Maximum Value: 10.8 C on Mar 18 16:00

Maximum Daily Average: -1.3 C on Mar 18

Minimum Value: -33.2 C on Mar 6 07:00

Minimum Daily Average: -23.6 C on Mar 5

Maximum Diurnal Average: -4.2 C at hour 17

Minimum Diurnal Average: -17.2 C at hour 7

Monthly Average: -10.64 C

Percentiles: P_1 = -30.8 P_{10} = -20.9 Q_1 = -14.7 Median = -10.2 Q_3 = -5.7 P_{90} = -1.7 P_{99} = 6.1

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-25.6	-25.3	-25.8	-27.1	-27.4	-28.1	-29.1	-29.2	-26.0	-20.1	-15.2	-12.3	-10.7	-9.1	-8.0	-7.8	-8.0	-9.0	-12.1	-13.9	-11.5	-9.5	-8.6	-7.8	-17.0	-7.8
2-Mar	-7.5	-7.6	-7.4	-7.3	-7.1	-7.1	-6.8	-6.8	-6.3	-5.1	-3.3	-0.4	1.2	2.3	3.1	4.3	2.0	2.1	1.6	0.6	0.0	0.0	0.0	-0.4	-2.3	4.3
3-Mar	-1.9	-4.6	-6.5	-7.9	-8.7	-9.0	-9.4	-9.8	-10.5	-10.6	-10.4	-10.6	-10.5	-9.8	-9.3	-9.3	-9.6	-10.2	-10.8	-10.9	-11.6	-13.0	-14.2	-15.0	-9.8	-1.9
4-Mar	-15.4	-15.5	-15.6	-15.9	-16.1	-16.4	-16.7	-17.5	-17.5	-16.9	-15.9	-15.3	-15.0	-14.5	-14.1	-13.6	-14.4	-15.1	-16.0	-18.6	-21.0	-23.6	-24.7	-26.3	-17.2	-13.6
5-Mar	-27.3	-28.3	-29.1	-29.7	-30.8	-31.3	-30.8	-29.7	-26.0	-21.1	-18.7	-17.7	-16.1	-15.3	-14.7	-14.1	-14.1	-16.9	-21.2	-23.5	-25.5	-26.7	-28.1	-29.0	-23.6	-14.1
6-Mar	-29.8	-30.6	-31.5	-32.1	-32.7	-33.1	-33.2	-32.9	-28.9	-22.8	-19.4	-17.1	-14.7	-12.8	-11.5	-10.3	-10.4	-10.7	-12.0	-14.3	-15.8	-14.6	-12.1	-12.6	-20.7	-10.3
7-Mar	-13.0	-12.8	-12.6	-12.3	-12.3	-12.7	-13.0	-13.2	-13.2	-12.6	-12.2	-11.9	-11.5	-10.4	-8.8	-7.4	-6.8	-6.8	-7.5	-8.3	-9.5	-10.6	-9.5	-8.8	-10.7	-6.8
8-Mar	-9.0	-10.0	-12.8	-15.5	-17.2	-18.0	-18.2	-17.2	-14.3	-12.5	-11.0	-9.7	-8.6	-7.0	-6.1	-5.2	-5.2	-6.0	-9.8	-12.0	-14.3	-14.4	-13.2	-15.5	-11.8	-5.2
9-Mar	-18.2	-19.9	-20.2	-21.9	-23.4	-24.2	-24.4	-23.5	-18.5	-15.4	-13.4	-11.4	-9.6	-8.6	-8.2	-7.7	-7.2	-7.6	-8.1	-8.7	-9.1	-9.6	-9.7	-9.3	-14.1	-7.2
10-Mar	-9.7	-10.2	-10.5	-10.6	-10.6	-10.8	-10.7	-10.6	-10.5	-9.9	-9.1	-8.0	-8.2	-7.1	-6.4	-5.8	-5.2	-5.6	-6.1	-6.8	-7.1	-7.0	-7.2	-7.3	-8.4	-5.2
11-Mar	-8.1	-9.4	-10.4	-11.5	-10.9	-11.0	-11.1	-10.9	-9.1	-6.9	-6.4	-5.2	-5.3	-4.3	-3.9	-4.2	-4.2	-5.2	-6.9	-7.8	-8.7	-9.8	-10.4	-10.8	-8.0	-3.9
12-Mar	-11.1	-11.3	-11.9	-12.6	-13.3	-14.0	-14.6	-14.9	-14.6	-14.3	-14.1	-13.9	-13.4	-12.6	-12.1	-11.4	-11.3	-11.8	-12.2	-12.4	-12.8	-13.4	-14.0	-14.5	-13.0	-11.1
13-Mar	-15.5	-16.5	-17.7	-18.9	-20.1	-21.9	-21.7	-19.5	-17.7	-15.8	-13.8	-11.9	-10.3	-8.8	-8.0	-7.4	-6.4	-6.6	-7.1	-8.0	-7.9	-8.3	-9.6	-10.3	-12.9	-6.4
14-Mar	-10.6	-10.8	-11.1	-11.3	-11.6	-12.1	-12.3	-12.6	-12.9	-13.1	-12.6	-12.1	-11.5	-11.2	-10.9	-11.0	-11.3	-11.7	-12.2	-12.7	-13.1	-13.4	-13.9	-14.3	-12.1	-10.6
15-Mar	-14.8	-15.6	-17.0	-19.0	-21.1	-21.5	-19.8	-17.9	-15.1	-13.6	-12.6	-11.5	-10.5	-9.4	-8.7	-8.6	-8.3	-8.4	-11.5	-14.8	-16.9	-18.3	-19.3	-18.5	-14.7	-8.3
16-Mar	-18.3	-17.6	-15.8	-15.8	-15.2	-14.6	-14.3	-13.9	-12.8	-11.5	-10.7	-8.9	-7.8	-6.4	-5.5	-4.5	-3.7	-3.8	-5.6	-7.3	-8.3	-8.4	-8.9	-10.5	-10.4	-3.7
17-Mar	-9.9	-12.5	-11.7	-11.5	-12.6	-11.8	-13.7	-12.7	-9.6	-7.4	-4.7	-1.6	0.3	2.8	5.6	7.0	8.6	6.3	-0.2	-2.3	-3.3	-4.2	-5.1	-6.6	-4.6	8.6
18-Mar	-7.1	-7.7	-8.1	-8.7	-9.3	-9.7	-10.5	-9.1	-3.9	-0.9	1.0	3.5	5.8	7.4	8.9	10.8	10.2	8.4	4.7	-0.3	-2.7	-3.7	-4.5	-5.7	-1.3	10.8
19-Mar	-6.8	-8.0	-8.6	-9.0	-10.2	-10.9	-12.0	-9.9	-6.0	-4.2	-1.6	-0.3	0.7	2.0	2.4	2.3	2.6	1.8	0.4	-1.1	-2.0	-2.4	-2.8	-3.4	-3.6	2.6
20-Mar	-3.6	-3.9	-4.3	-4.9	-5.5	-6.3	-6.9	-6.6	-6.5	-6.2	-5.5	-4.7	-4.6	-3.2	-2.2	-1.8	-2.2	-3.2	-4.7	-6.1	-7.8	-9.4	-11.9	-13.7	-5.6	-1.8
21-Mar	-16.7	-18.2	-19.2	-20.4	-21.3	-22.0	-23.0	-20.1	-15.7	-13.6	-11.5	-8.3	-7.3	-5.8	-4.9	-3.8	-3.8	-3.6	-6.7	-10.9	-13.5	-15.1	-16.2	-16.3	-13.3	-3.6
22-Mar	-15.3	-17.2	-18.2	-17.6	-17.0	-18.0	-19.3	-16.7	-11.2	-7.7	-5.1	-3.1	-1.9	-0.5	0.6	1.8	2.7	3.0	0.6	-3.4	-4.8	-6.3	-7.7	-9.0	-8.0	3.0
23-Mar	-9.8	-10.3	-10.8	-11.4	-8.2	-7.8	-8.7	-8.1	-4.8	-1.2	-0.2	-0.1	-0.7	-1.4	-1.2	-1.2	-2.3	-3.3	-4.6	-5.8	-6.4	-6.8	-6.6	-6.2	-5.3	-0.1
24-Mar	-6.2	-7.2	-9.7	-12.9	-15.4	-16.8	-18.0	-14.4	-10.8	-9.7	-7.7	-4.9	-4.3	-2.9	-2.5	-1.8	-1.0	-1.4	-3.1	-6.2	-9.4	-11.6	-13.5	-14.9	-8.6	-1.0
25-Mar	-16.6	-17.8	-18.9	-19.8	-20.4	-21.3	-21.7	-18.9	-14.3	-10.5	-7.0	-4.9	-3.9	-3.2	-3.0	-3.1	-3.7	-4.7	-6.8	-8.6	-10.0	-11.3	-13.0	-14.4	-11.6	-3.0
26-Mar	-16.2	-18.8	-19.8	-21.8	-23.2	-24.5	-24.7	-22.5	-19.5	-17.5	-15.6	-13.8	-12.4	-11.2	-10.3	-10.1	-10.3	-10.8	-12.0	-13.7	-16.6	-19.7	-21.6	-23.2	-17.1	-10.1
27-Mar	-24.2	-25.1	-25.9	-26.5	-27.6	-28.3	-28.8	-24.7	-20.6	-16.4	-12.0	-9.9	-8.7	-7.4	-6.5	-5.7	-5.1	-3.9	-6.7	-9.4	-10.8	-12.6	-16.6	-19.0	-15.9	-3.9
28-Mar	-20.7	-22.1	-23.4	-24.5	-25.2	-26.3	-26.1	-22.3	-17.6	-12.6	-10.2	-7.4	-5.6	-4.2	-2.9	-2.1	-1.6	-1.0	-1.3	-1.8	-2.2	-2.5	-2.9	-3.5	-11.2	-1.0
29-Mar	-3.9	-5.3	-6.3	-9.0	-10.7	-9.3	-8.0	-5.9	-2.9	-2.1	-1.5	-1.0	-0.6	-0.8	-0.8	-0.8	-0.8	-1.3	-2.1	-3.4	-5.2	-8.3	-10.6	-12.1	-4.7	-0.6
30-Mar	-13.6	-14.9	-15.8	-16.9	-17.5	-17.5	-16.9	-14.4	-11.2	-7.1	-4.9	-4.0	-3.2	-2.8	-2.4	-2.1	-1.6	-1.9	-2.3	-3.0	-4.0	-4.8	-5.6	-7.2	-8.2	-1.6
31-Mar	-8.8	-9.2	-8.8	-8.7	-8.6	-8.4	-7.9	-7.4	-6.8	-5.8	-4.4	-3.1	-2.0	-0.5	0.6	1.5	2.1	2.0	0.8	-1.9	-3.5	-3.5	-4.0	-5.7	-4.2	2.1
	-13.4	-14.3	-15.0	-15.9	-16.5	-16.9	-17.2	-15.9	-13.4	-11.1	-9.4	-7.8	-6.8	-5.7	-4.9	-4.3	-4.2	-4.7	-6.5	-8.3	-9.5	-10.4	-11.2	-12.0	Diurnal Average	
	-1.9	-3.9	-4.3	-4.9	-5.5	-6.3	-6.8	-5.9	-2.9	-0.9	1.0	3.5	5.8	7.4	8.9	10.8	10.2	8.4	4.7	0.6	0.0	0.0	0.0	-0.4	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Fort McKay South - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	83	11.16	11.16
-20 - 0	618	83.06	94.22
0 - 10	41	5.51	99.73
10 - 20	2	0.27	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay South - March 2023

Maximum Value: 96.5 % on Mar 17 21:00

Maximum Daily Average: 84.0 % on Mar 14

Minimum Value: 27.8 % on Mar 18 16:00

Minimum Daily Average: 53.3 % on Mar 8

Maximum Diurnal Average: 80.2 % at hour 4

Minimum Diurnal Average: 54.6 % at hour 16

Monthly Average: 69.22 %

Percentiles: P_1 = 35.5 P_{10} = 48.3 Q_1 = 60.3 Median = 71.5 Q_3 = 80.8 P_{90} = 84.7 P_{99} = 91.2

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	77.5	78.3	77.2	76.5	76.3	75.5	75.3	75.3	75.5	70.7	69.3	67.4	65.8	62.5	60.7	61.3	64.2	69.3	82.1	85.6	83.5	79.0	77.0	76.6	73.4	85.6
2-Mar	79.5	86.6	86.9	87.8	87.8	86.7	85.7	84.4	83.2	78.5	72.0	65.0	63.3	61.7	61.0	62.1	84.4	83.2	79.0	80.3	81.7	78.8	72.7	67.1	77.5	87.8
3-Mar	75.8	79.7	77.6	76.4	74.0	73.1	74.1	74.6	71.3	70.3	69.5	69.9	68.0	64.9	64.7	64.2	66.8	75.8	83.9	87.1	83.3	80.2	75.4	73.7	73.9	87.1
4-Mar	74.9	77.0	81.1	83.0	82.9	84.1	80.9	78.3	77.1	71.5	62.4	57.8	55.9	54.3	52.2	56.1	61.7	65.3	67.4	73.3	77.5	78.5	78.1	76.9	71.2	84.1
5-Mar	76.5	75.6	75.1	74.6	74.0	73.6	74.1	74.2	74.7	67.2	58.8	54.9	50.4	47.7	46.6	45.8	46.1	56.3	67.4	71.1	73.7	75.0	75.0	74.7	66.0	76.5
6-Mar	73.9	73.7	73.0	72.7	72.3	72.0	72.1	71.8	70.6	61.1	57.3	58.0	57.5	58.7	62.8	66.1	72.9	74.8	76.8	79.8	82.6	82.4	71.9	73.8	70.4	82.6
7-Mar	76.9	81.1	83.3	81.5	77.2	76.8	76.1	75.8	79.4	76.0	73.6	72.6	72.1	67.8	62.9	57.3	51.4	49.4	49.2	48.3	53.1	58.6	54.3	50.9	66.9	83.3
8-Mar	47.9	48.0	56.3	65.3	71.0	73.9	74.9	71.8	61.1	53.5	48.6	45.7	44.1	39.7	37.7	35.1	34.9	35.8	47.9	53.2	60.2	59.9	51.8	60.8	53.3	74.9
9-Mar	69.0	73.8	74.3	76.9	77.6	78.2	78.1	77.7	66.9	55.9	50.8	47.6	45.4	44.6	47.5	45.8	44.7	46.7	48.0	50.7	52.4	59.2	62.8	60.4	59.8	78.2
10-Mar	63.7	71.0	75.5	77.8	75.1	72.9	72.3	70.5	70.7	68.9	66.6	63.0	68.2	64.2	60.8	58.3	57.2	63.5	65.7	68.7	73.1	69.8	66.4	66.7	67.9	77.8
11-Mar	65.0	71.5	78.5	79.8	76.7	79.1	80.2	77.6	68.6	59.7	58.8	55.9	58.9	56.6	57.8	63.9	65.9	71.3	78.9	82.3	86.1	84.3	85.0	84.5	72.0	86.1
12-Mar	84.3	86.0	85.3	85.2	84.1	82.4	82.6	82.2	80.2	76.9	75.1	72.7	71.8	72.8	71.5	72.4	75.1	76.6	78.5	80.1	82.4	84.5	84.5	84.3	79.6	86.0
13-Mar	84.5	84.3	83.9	83.3	81.8	80.6	80.8	82.9	82.7	80.9	76.1	72.4	71.2	69.7	67.1	65.6	65.1	66.1	67.1	69.1	71.2	72.9	82.1	85.2	76.1	85.2
14-Mar	86.3	86.4	86.0	86.5	86.2	86.0	85.9	85.3	84.5	83.0	82.5	82.1	81.4	81.8	81.9	81.6	84.2	84.5	83.4	83.5	83.5	83.3	82.8	83.5	84.0	86.5
15-Mar	83.7	84.0	84.0	82.6	81.3	81.5	82.5	80.5	76.1	72.4	69.8	66.1	65.0	63.7	64.8	64.6	65.5	66.9	80.4	85.5	84.7	83.8	82.8	83.1	76.5	85.5
16-Mar	83.0	83.6	84.6	84.0	85.0	85.2	85.3	84.8	81.6	76.0	74.0	69.2	68.0	66.2	66.7	65.2	65.9	67.0	75.9	80.8	82.8	82.3	83.1	88.0	77.8	88.0
17-Mar	85.9	88.8	88.5	89.1	87.6	86.8	87.4	85.8	80.0	72.5	65.1	60.7	58.6	55.3	52.1	49.1	47.9	66.6	90.7	95.2	96.5	96.2	95.6	94.1	78.2	96.5
18-Mar	93.4	92.6	88.9	91.2	90.8	90.1	89.7	87.1	66.5	50.7	46.3	41.7	37.9	35.3	32.7	27.8	29.4	34.4	46.4	67.9	79.7	83.3	85.1	86.0	65.6	93.4
19-Mar	88.2	89.7	91.1	91.1	91.1	91.2	90.2	89.4	83.0	71.3	61.4	57.5	55.4	54.0	53.4	54.0	53.3	56.5	63.2	65.3	68.8	69.7	69.9	70.3	72.0	91.2
20-Mar	70.2	69.6	66.7	65.5	62.7	64.2	62.7	64.0	72.3	77.5	79.2	79.4	73.4	68.6	64.1	57.7	56.0	54.3	55.1	56.0	58.1	63.0	70.6	74.2	66.0	79.4
21-Mar	80.8	82.5	82.7	81.7	81.1	80.4	79.4	79.6	78.7	72.2	69.2	63.0	65.4	60.0	55.8	52.8	51.2	48.6	57.6	69.5	77.4	83.0	85.4	85.3	71.8	85.4
22-Mar	85.6	84.5	83.9	84.5	84.6	83.6	82.4	83.9	81.8	66.3	59.4	53.2	50.7	48.5	45.8	44.1	42.5	43.3	50.4	62.4	68.4	73.8	77.4	81.9	67.6	85.6
23-Mar	84.0	86.3	87.3	87.8	83.7	81.9	83.9	82.7	71.2	57.6	55.1	57.8	60.7	64.1	62.3	60.4	63.0	65.6	69.9	73.0	72.5	74.6	72.9	69.5	72.0	87.8
24-Mar	68.0	70.5	75.7	83.3	85.4	84.8	83.7	81.2	73.3	68.6	60.2	51.0	50.0	43.3	40.3	43.2	41.6	41.4	44.7	56.6	64.5	70.2	75.0	77.9	63.9	85.4
25-Mar	80.6	81.9	83.0	82.8	82.6	81.4	80.8	77.8	71.1	64.5	57.8	49.7	45.8	42.6	41.1	40.3	39.8	42.8	49.7	58.7	63.3	65.3	68.0	68.5	63.3	83.0
26-Mar	70.3	76.1	76.0	78.2	78.4	77.5	77.6	75.6	67.2	63.0	58.8	55.5	52.0	48.3	44.4	42.2	41.0	42.3	44.3	48.5	56.4	65.3	68.9	71.9	61.6	78.4
27-Mar	74.4	75.4	75.5	75.3	74.2	74.2	73.4	73.8	69.8	61.7	51.4	46.1	44.8	42.3	40.2	39.5	37.9	33.5	40.7	49.1	51.2	54.6	65.7	70.2	58.1	75.5
28-Mar	72.8	74.8	76.4	77.1	76.5	75.7	75.6	71.8	66.3	57.9	51.5	45.4	42.2	43.8	43.8	43.0	43.4	42.9	44.3	45.4	47.2	48.3	49.2	52.4	57.0	77.1
29-Mar	54.8	61.8	64.7	70.6	76.0	74.9	73.4	70.7	66.6	68.0	70.5	72.6	71.5	71.5	69.6	68.0	63.0	61.1	62.0	64.2	67.9	77.9	82.8	84.9	69.5	84.9
30-Mar	86.1	86.6	86.6	85.1	84.4	83.9	84.1	85.2	83.8	68.6	57.2	53.6	50.9	49.4	48.3	47.7	48.3	50.3	48.6	49.6	53.7	57.1	60.9	65.8	65.7	86.6
31-Mar	69.5	70.6	68.3	70.2	71.5	71.5	68.7	68.0	67.6	66.7	65.9	64.6	63.7	61.4	58.5	55.9	54.7	55.3	59.3	69.1	75.3	76.7	77.4	82.2	67.2	82.2
	76.4	78.5	79.3	80.2	79.8	79.5	79.2	78.2	74.3	68.0	63.7	60.4	59.0	56.9	55.4	54.6	55.5	57.8	63.2	68.1	71.4	73.3	73.9	75.0	Diurnal Average	
	93.4	92.6	91.1	91.2	91.1	91.2	90.2	89.4	84.5	83.0	82.5	82.1	81.4	81.8	81.9	81.6	84.4	84.5	90.7	95.2	96.5	96.2	95.6	94.1	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay South - March 2023

Maximum Speed: 23 km/h on Mar 10 00:00

Maximum Daily Speed Average: 14.1 km/h on Mar 14

Minimum Speed Value: 0 km/h on Mar 11 07:00

Maximum Diurnal Speed Average: 4.1 km/h at hour 14

Monthly Average Velocity: 1.6 km/h 73.4 deg

Minimum Daily Speed Average: 0.4 km/h on Mar 5

Minimum Diurnal Speed Average: 0.3 km/h at hour 23

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 3$ Median = 7 $Q_3 = 12$ $P_{90} = 15$ $P_{99} = 19$

Hours in Service: 744

Hours of Data: 740

Hours of Missing Data: 4

Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	S3	S1	SW1	SW1	UO	SW2	NW1	WNW1	NNW1	SE4	SE8	SSE15	SSE14	SSE16	SSE18	SSE14	SSE9	SSE6	NNW1	SSW1	SSE9	S11	SSE13	SSE15	SSE6.6	SSE18
2-Mar	SSE18	SSE18	SSE19	SSE18	SSE17	SSE15	SSE13	S13	S14	SSE14	SSE13	ESE5	E4	SE5	SSE7	SW7	W6	WSW7	W7	WSW5	SW5	WSW7	WNW9	NW11	S7.5	SSE19
3-Mar	N10	N14	NNE11	NNE11	NNE9	NNE9	NNE10	NNE11	NNE10	NNE10	NNE11	N11	N10	NNE5	N8	N9	N9	N6	N5	NNE4	NNE9	NNE12	NNE11	NNE10	NNE9.2	N14
4-Mar	NNE6	NE1	SW1	WNW2	W2	NE1	NNE8	NNE7	NNE5	N8	NNW12	NW13	NNW14	N16	N16	N12	NNE10	N8	N7	N1	WNW2	SW2	W1	WNW3	N5.7	N16
5-Mar	W2	SW2	WSW2	WSW2	WSW1	SSW2	NW2	NW2	NE2	NE3	NNE6	NE7	SSE5	ESE6	SE6	SSE6	SE5	S2	WNW3	W2	WSW3	W1	WSW2	WNW1	SSE0.4	NE7
6-Mar	WSW2	W1	SSW2	WNW1	WSW1	W1	N1	SSW1	ESE1	E2	SE7	SE9	SE7	SE8	SE7	SSE12	SSE11	SSE10	SE5	SE3	S1	SSE8	SSE13	SSE9	SSE4.6	SSE13
7-Mar	SSE9	SSE12	SSE9	SE11	SSE13	SSE13	SSE12	SSE15	SSE15	SSE17	SSE18	SSE18	SE17	SSE13	SE13	SSE12	SE13	ESE7	SE10	SE9	SE5	S6	S7	S9	SSE11.8	SSE18
8-Mar	SSE10	S11	SSE5	SE6	SSE5	SSE2	SSW2	S7	S9	SSE10	SSE16	SSE12	SE11	SE12	SSE10	S10	S10	S7	SSE4	SSE5	S5	S10	SSE10	SSW4	SSE7.8	SSE16
9-Mar	W1	S5	N3	SSE1	S2	SSE4	SSE2	SSE2	SSE12	SSE15	SSE17	SE11	SSE16	SSE15	SSE20	SSE20	SSE19	SE11	SE13	SE13	SE16	SE19	SE18	SE23	SSE11.1	SE23
10-Mar	SSE22	SSE19	SSE16	SSE14	SSE16	SSE16	SSE15	SSE17	SSE16	SE16	SE17	SE16	SE15	SE12	SSE13	SSE11	SSE9	SE8	E4	N5	N7	ENE4	SE5	SE6	SE11.3	SSE22
11-Mar	SE7	ENE1	N3	ESE3	SSE2	SSW1	W0	N3	SE2	SSE3	SSE3	SE1	NNE8	NNE7	NNE7	NNE9	N11	NNE13	N13	N11	N12	N14	N12	N13	NNE5.0	N14
12-Mar	N14	N12	N12	N12	N13	N12	N10	N8	NNE10	N12	N13	N12	N12	N12	N15	NNE11	N12	N13	N10	N12	N10	N9	N9	NNW9	N11.4	N15
13-Mar	NNW8	NNW7	NNW7	NNW6	N4	N2	UO	N4	NNE5	N9	NNE12	N15	N14	N14	N16	N18	N16	N15	N15	N14	N13	N15	N15	N16	N11.1	N18
14-Mar	N16	N17	N18	N16	N17	N16	N15	N17	N15	N16	N15	N14	N14	N13	N13	N13	N10	N12	N14	N12	N12	N12	N12	N9	N14.1	N18
15-Mar	NNW7	NNW6	NNW6	NW3	WSW3	WNW2	NW3	NNE2	NE4	NNE5	N7	NNE9	NNE8	NNE8	NNE9	N8	N7	N7	NNW3	WSW2	WSW3	W2	SW2	WSW1	N3.8	NNE9
16-Mar	SSW3	S1	S4	S2	N2	NNW2	NNE1	S1	SSE6	S10	SSE12	SSE12	SSE12	SSE13	SSE14	SSE13	SE13	SSE12	S8	S7	S10	SSE8	SSE8	SSE6	SSE6.9	SSE14
17-Mar	SSE5	S3	S9	S8	S8	S7	SSE6	S6	SSE9	SE14	SE12	SSE14	SSE14	SSE13	SSE12	SE10	SSE6	SSE5	SW4	SW3	SSW2	SSW3	WNW1	S3	SSE6.9	SSE14
18-Mar	SE1	ESE1	SSE3	S3	S2	SSE4	SSW2	SSE7	S10	SSE9	SSE11	SSE9	SSE8	SE8	SSE8	SSE6	NNE6	N9	N6	NNW4	NW3	NW3	NW2	WSW0	SSE2.5	SSE11
19-Mar	WNW0	SSW1	NNW2	NNW2	WSW2	WNW1	W1	NNE1	ESE3	SE7	SSE7	N4	NNE5	SW3	SW5	SSE7	SSE8	SSE10	S9	SE8	SE9	SE10	SE12	SE6	SSE3.4	SE12
20-Mar	E4	ESE3	ESE5	ESE6	ESE5	ENE5	ESE4	SE3	E4	NNE4	N5	N13	N17	NNE18	N19	N18	N20	N19	N16	N14	N13	NNE8	N4	NNE3	NNE7.7	N20
21-Mar	WSW2	SW3	WNW2	WSW4	WSW3	NW2	SW1	S2	N4	NNE4	NE4	SE4	SE7	SSE8	SSE7	S8	S9	S9	S5	S3	S3	SSW2	SSW3	SSE7	S2.6	S9
22-Mar	S6	SW1	S4	SSE6	SE2	N3	NW0	SSE1	SSE8	SSE16	S14	S13	SSE13	SSE13	SSE15	SSE14	SSE14	SSE11	S7	SSW2	WSW1	WSW1	WSW2	S3	SSE6.6	SSE16
23-Mar	S3	SSW2	SSW2	S4	S6	S4	S4	SSE2	N4	N12	NNE15	NNE14	NNE17	NNE17	NNE15	NNE17	NNE17	NNE15	N15	N11	NNW11	NNW6	NW5	NNW10	NNE7.0	NNE17
24-Mar	N9	N6	N5	NNW2	WSW2	WSW3	WSW3	SW1	N4	NNE5	NNE4	E3	SE4	SSE6	SE9	SSE10	SSE10	SSE10	S6	SSE0	WNW2	WNW2	WSW2	WSW2	SE0.9	SSE10
25-Mar	WSW3	SW2	SW2	WNW1	NW1	WSW1	W1	NNE2	NNE4	N7	N10	N12	NNE13	NNE12	NE13	NE14	NNE15	NNE17	NNE15	N12	N9	N10	N9	N8	NNE7.2	NNE17
26-Mar	N6	NW4	NNW4	NW2	WSW1	WNW2	NW4	SE2	NNE5	NNE9	NNE10	N12	N13	N15	N15	N17	N16	N16	N12	N7	N5	NW3	W2	W3	N7.0	N17
27-Mar	WSW2	WSW1	UO	NNE0	S2	SW1	S3	SSE4	SE7	SE10	SSE10	SSE10	SSE11	SSE13	SE12	SE11	SSE8	S2	NNE4	N6	N9	NNW7	NW4	WSW3	SE3.2	SSE13
28-Mar	W2	UO	SW2	WSW2	W1	S2	SW2	SSE0	SE3	SE8	SSE12	SSE14	SSE15	SSE17	SSE18	SE16	SE14	SSE13	SSE11	SSE12	SSE10	S4	S4	NW1	SSE7.4	SSE18
29-Mar	NNW2	WNW3	WSW1	WSW3	WSW2	NNW1	S2	NNW1	NNW3	N6	N8	N10	N14	NNE13	NNE15	NNE12	NNE16	NNE13	NNE11	N6	NNW3	W3	WSW4	WSW3	N5.2	NNE16
30-Mar	WSW1	SW2	W1	WSW1	SSW2	SSW1	WSW1	SSE3	SE3	SSE2	NNE3	N8	N10	N13	N13	N12	N11	N10	NNE9	N7	NNW7	N7	N8	N6	N4.7	N13
31-Mar	NNW5	NNW6	NNW6	N5	N5	N5	NNW8	NNW9	N10	N10	N13	N15	N15	N16	N15	N15	N13	NNW11	NW8	WNW3	WNW1	N2	NNE2	NNW3	N8.1	N16
	E0.5	ESE0.3	ESE0.3	SE0.8	SSE1.1	SE0.7	E0.3	ESE1.0	ESE2.2	ESE2.9	E3.5	E3.1	ENE3.4	E4.1	E3.9	E3.4	ENE3.1	NE3.1	NNE3.1	NNE2.2	N1.7	NNE1.1	ENE0.3	NE0.3	Diurnal Average	
	SSE22	SSE19	SSE19	SSE18	SSE17	N16	N15	N17	SSE16	SSE17	SSE18	SSE18	N17	NNE18	SSE20	SSE20	N20	N19	N16	N14	SE16	SE19	SE18	SE23	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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 17 01:00

Minimum Value: 0 km/h on Mar 11 03:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

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

UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay South - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay South - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	294	39.73	39.73
6 - 11	228	30.81	70.54
12 - 19	213	28.78	99.32
20 - 28	5	0.68	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay South - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	24	21	5	4	6	9	16	25	32	19	22	40	18	19	18	16	294
6 - 11	55	33	1	0	0	3	29	52	29	0	1	2	2	2	1	18	228
12 - 19	90	22	2	0	0	0	21	71	4	0	0	0	0	0	1	2	213
20 - 28	1	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	5
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	170	76	8	4	6	12	67	151	65	19	23	42	20	21	20	36	740

Total Number of Valid Hours: 740

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Fort McKay South

Total Number of Valid Hours: 740

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay South - March 2023

Direction of Maximum Speed: 146 deg on Mar 10 00:00
Direction of Maximum Daily Speed Average: 357.8 deg on Mar 14

Direction of Minimum Speed: 270 deg on Mar 11 07:00

Direction of Minimum Daily Speed Average: 0.4 deg on Mar 5

Monthly Average Direction: 73.4 deg

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	176	179	222	235	UO	224	318	295	335	135	144	161	153	155	156	156	151	157	336	200	167	173	165	165	160.7
2-Mar	165	162	163	160	166	161	168	172	172	165	147	118	86	146	152	234	265	246	280	246	216	255	287	304	178.1
3-Mar	1	6	28	29	25	33	22	15	19	21	17	9	9	16	5	10	3	9	10	23	16	16	21	20	16.0
4-Mar	31	49	233	297	277	56	25	17	24	8	336	322	334	349	358	9	19	6	10	1	297	234	274	295	354.2
5-Mar	279	233	240	246	248	203	311	316	38	39	28	35	165	110	133	151	127	176	294	267	255	275	243	291	146.7
6-Mar	245	259	213	284	239	270	349	199	116	93	137	141	144	146	137	147	149	151	145	144	169	160	154	156	150.7
7-Mar	150	148	148	144	149	147	150	151	151	148	148	149	145	147	143	147	145	118	135	139	145	170	180	169	148.1
8-Mar	168	170	154	145	165	160	200	182	170	155	155	150	145	144	154	187	184	172	166	151	186	172	167	197	163.8
9-Mar	271	188	353	157	190	166	167	167	155	157	152	141	154	153	147	157	159	142	139	144	144	145	145	146	150.6
10-Mar	147	148	152	154	151	150	147	153	150	146	141	140	145	134	154	154	155	126	81	10	7	60	140	136	143.7
11-Mar	145	67	351	121	163	197	270	2	138	149	154	139	17	22	14	19	3	12	4	11	8	6	8	8	16.4
12-Mar	10	9	5	356	358	359	360	1	12	5	2	360	1	5	4	18	7	4	4	2	359	357	351	348	2.5
13-Mar	346	337	341	340	350	356	UO	3	15	6	13	6	4	10	4	5	8	3	0	356	357	359	359	357	0.8
14-Mar	358	359	358	3	0	359	353	355	350	354	1	4	2	3	359	0	355	351	354	2	1	359	354	350	357.8
15-Mar	338	332	332	326	257	285	311	18	35	25	8	21	17	26	17	360	356	4	347	257	239	276	231	239	354.3
16-Mar	200	183	183	189	10	342	14	172	166	178	151	165	157	154	148	149	146	154	175	186	172	167	156	160	160.8
17-Mar	156	179	169	177	173	178	163	173	168	145	141	159	154	148	162	143	151	147	220	218	201	205	283	183	162.3
18-Mar	138	111	162	173	180	167	195	164	172	167	154	156	156	143	151	166	18	11	6	333	315	326	324	243	153.2
19-Mar	299	193	339	333	250	293	280	17	120	139	164	7	12	227	217	163	153	160	172	134	133	137	139	137	149.9
20-Mar	100	120	121	121	113	78	109	126	100	16	3	10	3	17	8	6	4	2	358	3	6	20	1	26	18.5
21-Mar	243	230	288	251	254	321	231	181	358	31	34	144	135	156	158	176	183	190	184	182	180	207	201	160	178.0
22-Mar	189	219	175	154	140	3	319	151	150	163	170	175	154	149	147	152	154	154	179	194	247	243	240	174	161.3
23-Mar	186	206	207	187	180	190	182	162	350	10	20	28	26	23	15	21	19	14	11	6	340	335	323	338	11.9
24-Mar	354	358	357	330	256	253	256	226	8	25	17	88	125	157	142	152	167	157	176	154	285	293	250	257	145.6
25-Mar	248	224	233	288	315	247	271	20	23	7	7	10	13	28	36	36	29	17	12	5	6	355	349	349	11.4
26-Mar	5	326	332	322	252	289	322	124	24	20	24	5	359	358	3	10	8	7	3	3	354	310	275	270	0.4
27-Mar	238	258	UO	16	186	225	181	158	139	138	152	147	150	151	140	141	156	173	15	1	1	348	321	250	144.1
28-Mar	260	UO	231	242	272	189	230	162	139	145	148	160	165	151	147	143	144	160	167	164	164	176	190	318	158.7
29-Mar	334	288	256	248	254	331	170	345	338	358	7	11	10	21	13	18	15	17	14	4	328	263	249	241	3.4
30-Mar	243	233	278	256	209	201	253	167	129	155	20	359	359	358	360	1	10	9	17	3	347	3	1	7	1.7
31-Mar	342	337	346	0	6	4	345	347	354	359	0	358	357	3	359	357	351	339	319	294	289	6	33	344	352.5
Diurnal Average	97.2	119.1	102.7	139.1	159.1	134.4	93.3	116.8	112.9	102.6	93.5	79.3	72.9	80.6	79.9	80.3	62.4	42.1	15.2	16.7	8.6	12.8	62.0	45.9	

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 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 98 deg on Mar 16 02:00

Minimum Value: 7 deg on Mar 17 03:00

Percentiles: $P_1 = 8$ $P_{10} = 11$ $Q_1 = 14$ Median = 17 $Q_3 = 30$ $P_{90} = 60$ $P_{99} = 86$

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	18	95	56	54	UO	54	38	40	64	12	13	14	11	12	11	11	11	19	75	70	10	13	9	8	95
2-Mar	9	10	9	10	9	10	14	11	10	12	9	45	39	16	21	50	42	35	28	29	21	27	27	23	50
3-Mar	29	14	19	19	18	18	16	17	16	18	20	21	20	45	24	17	15	13	12	18	15	18	17	17	45
4-Mar	18	71	46	39	63	68	20	16	19	19	24	24	25	19	16	22	17	15	19	74	26	47	71	25	74
5-Mar	23	19	45	36	45	26	49	62	26	30	28	36	68	46	38	36	32	87	41	43	34	45	32	44	87
6-Mar	14	45	37	49	57	68	45	58	35	38	17	10	16	15	21	15	11	10	14	16	64	14	9	9	68
7-Mar	10	10	11	12	11	10	10	10	10	10	11	10	12	13	14	13	12	19	16	13	11	15	15	15	19
8-Mar	12	10	13	13	12	67	69	10	9	15	13	16	16	15	20	20	14	16	16	15	17	12	10	28	69
9-Mar	70	34	54	93	82	19	60	80	11	12	12	16	15	15	14	11	14	15	14	12	11	11	11	11	93
10-Mar	11	11	10	11	11	12	12	10	11	11	14	15	12	20	12	17	22	27	32	18	10	38	30	20	38
11-Mar	11	66	13	58	23	47	76	23	77	42	73	81	29	23	26	19	20	17	14	15	13	14	13	14	81
12-Mar	15	15	16	14	13	13	14	15	17	16	13	15	13	15	16	18	18	14	12	14	13	12	12	12	18
13-Mar	11	10	9	10	20	66	UO	20	16	13	13	14	15	17	16	15	15	16	15	16	15	13	14	15	66
14-Mar	15	15	15	15	14	14	14	15	14	16	15	15	15	16	15	15	16	13	15	14	14	14	14	13	16
15-Mar	11	13	10	45	32	26	19	39	14	21	18	15	20	23	19	20	17	15	29	35	19	34	46	82	82
16-Mar	24	98	13	81	53	40	48	62	17	16	14	16	18	17	8	8	10	8	13	12	9	11	12	16	98
17-Mar	75	86	7	12	12	11	19	12	13	10	10	12	9	10	9	7	17	11	25	15	28	16	74	22	86
18-Mar	81	86	58	18	57	16	68	13	10	17	14	14	16	8	8	12	66	16	15	13	9	11	52	83	86
19-Mar	68	80	47	45	25	42	58	86	35	12	17	84	26	81	56	29	13	12	20	16	17	17	15	25	86
20-Mar	27	61	22	19	26	32	26	34	30	36	20	19	15	18	16	16	15	16	15	15	15	12	60	58	61
21-Mar	31	22	18	15	23	37	75	79	26	12	24	25	29	21	23	24	16	16	11	16	10	18	21	18	79
22-Mar	21	78	19	21	64	44	78	72	13	12	18	15	16	11	8	10	9	9	18	19	44	46	55	20	78
23-Mar	35	59	47	31	28	21	23	53	28	15	17	20	19	21	20	18	17	17	15	15	10	14	20	13	59
24-Mar	19	26	16	76	38	24	16	72	24	39	39	78	61	34	24	19	17	12	14	89	36	25	35	33	89
25-Mar	22	26	28	67	69	48	46	17	17	13	15	19	22	20	24	21	19	16	16	13	17	14	17	15	69
26-Mar	15	26	22	28	47	38	14	74	15	18	19	18	17	18	17	17	18	16	14	14	14	46	26	18	74
27-Mar	29	53	UO	80	31	43	32	18	7	8	21	16	13	18	23	26	19	80	66	17	13	14	15	14	80
28-Mar	20	UO	13	12	52	26	62	95	11	16	13	16	14	13	10	11	12	9	8	8	9	39	32	76	95
29-Mar	59	27	48	12	26	81	68	78	71	16	16	19	17	19	18	19	21	18	16	21	36	16	8	34	81
30-Mar	50	48	70	58	26	79	82	15	36	28	72	26	19	15	15	15	17	16	18	18	16	11	11	16	82
31-Mar	42	10	9	12	10	11	11	12	13	15	16	17	20	21	17	19	19	19	17	49	85	61	59	21	85
Diurnal Maximum	81	98	70	93	82	81	82	95	77	42	73	84	68	81	56	50	66	87	75	89	85	61	74	83	

UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Fort McKay South - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS14
ANZAC
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
MARCH 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	710	34	34	100	22.6	0	3.3	0
TRS(ppb) Average	709	35	35	100	2.1	0	0.6	0
THC(ppm) Average	709	34	35	99.87	3.3	-	2.1	-
NMHC(ppm) Average	709	34	35	99.87	0.612	-	0.071	-
CH4(ppm) Average	709	34	35	99.87	2.7	-	2.1	-
NO2(ppb) Average	707	37	37	100	27.7	0	8.9	-
NO(ppb) Average	707	37	37	100	41.6	-	4.7	-
NOX(ppb) Average	707	37	37	100	60.6	-	12.5	-
O3(ppb) Average	709	35	35	100	54	0	47.3	-
PM2.5(ug/m3) Average	742	2	2	100	53.9	0	8.9	0
AT 2m(C) Average	744	0	0	100	9.5	-	0.4	-
RH(%) Average	744	0	0	100	92.9	-	85.9	-
WS(km/h) Average	741	0	3	99.6	23	-	17	-
WD(deg) Average	741	0	3	99.6	-	-	-	-
Leaf Wetness (% of range) Average	744	0	0	100	1.9	-	0.6	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	710	1.22	2	-	0	0	0.2	0.6	1.5	2.8	22.6
TRS(ppb) Average	709	0.38	0.1	-	0.2	0.3	0.3	0.4	0.4	0.5	2.1
THC(ppm) Average	709	2.06	0.1	-	2	2	2	2	2.1	2.1	3.3
NMHC (ppm) Average	709	0.009	0.043	-	0	0	0	0	0	0	0.612
CH4(ppm) Average	709	2.05	0	-	2	2	2	2	2.1	2.1	2.7
NO2(ppb) Average	707	3.99	3.7	-	0.4	0.8	1.4	2.7	5.4	9.6	27.7
NO(ppb) Average	707	1.2	3	-	0	0	0	0.3	1.1	2.7	41.6
NOX(ppb) Average	707	5.18	6	-	0.4	0.8	1.5	3.3	6.7	11.2	60.6
O3(ppb) Average	709	34.9	8	-	10.8	23.1	29.8	35.7	39.7	44.2	54
PM2.5(ug/m3) Average	742	4.54	3.3	-	0.3	2.3	3	3.8	5.1	7.2	53.9
Temperature 2 m (C) Average	744	-9.78	6.9	-	-29.2	-18.2	-14.2	-9.5	-5.5	-1.2	9.5
Relative Humidity (%) Average	744	67.85	15.9	-	27.8	43	57.8	70.4	81.1	86.4	92.9
Wind Speed 20 m (km/h) Average	741	10.2	4	-	1	5	7	10	13	16	23
Wind Direction 20 m (deg) Average	741	49.5	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	0.12	0.3	-	0	0	0	0	0	0.5	1.9

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	01 Mar 2023 09:00	01 Mar 2023 09:00	1	Maintenance - replaced support gas cylinder
Wind Speed, Wind Direction	15 Mar 2023 19:00	15 Mar 2023 20:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	28 Mar 2023 06:00	28 Mar 2023 06:00	1	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 22.6 ppb on Mar 25 11:00

Maximum Daily Average: 3.3 ppb on Mar 3

Minimum Value: 0.0 ppb on Mar 3 05:00

Maximum Diurnal Average: 2.7 ppb at hour 11

Monthly Average: 1.22 ppb

Minimum Daily Average: 0.2 ppb on Mar 20

Minimum Diurnal Average: 0.6 ppb at hour 2

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.2 Median = 0.6 Q_3 = 1.5 P_{90} = 2.8 P_{99} = 8.5

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	0.2	0.3	0.4	0.3	0.5	0.6	0.4	0.3	0.5	1.0	1.0	1.5	1.5	1.5	1.2	1.1	1.2	1.4	1.3	1.0	0.7	0.6	0.6	0.8	1.5
2-Mar	0.9	Z	1.1	1.2	1.5	1.5	1.0	0.9	0.8	0.9	0.9	0.8	0.8	0.5	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.6	1.5
3-Mar	0.2	0.1	Z	0.1	0.0	0.2	4.3	12.3	3.6	0.5	0.6	0.8	1.7	4.1	3.7	4.8	5.7	7.3	10.4	5.2	3.4	3.2	2.2	1.2	3.3	12.3
4-Mar	0.5	0.2	0.1	Z	0.1	0.0	0.1	0.1	2.3	0.6	0.5	3.9	1.9	1.2	0.5	0.1	0.9	1.9	2.4	4.2	0.3	0.1	0.2	0.1	1.0	4.2
5-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.3	2.3	2.3	2.1	1.8	5.7	5.2	3.6	2.9	3.0	7.7	6.5	5.9	4.6	2.4	1.8	2.2	2.6	7.7
6-Mar	2.8	2.8	2.9	2.2	1.7	1.4	1.4	1.4	1.6	2.1	2.8	3.4	2.5	1.7	Z	0.8	1.0	0.8	0.7	0.5	0.3	0.4	1.4	2.4	1.7	3.4
7-Mar	1.5	0.6	1.7	2.3	0.4	Z	0.2	0.9	1.1	1.0	0.9	0.7	0.6	0.5	0.3	0.4	0.2	0.5	1.5	2.6	0.8	0.9	1.0	1.4	1.0	2.6
8-Mar	Z	0.8	2.4	0.8	0.7	0.9	0.6	0.3	0.9	0.9	1.0	1.2	0.7	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.6	0.1	0.0	0.0	0.5	2.4
9-Mar	0.1	Z	0.0	0.2	0.2	0.2	0.3	0.3	0.2	1.1	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.1	0.4	0.9	0.1	0.3	1.1
10-Mar	0.1	0.1	Z	1.5	0.5	2.3	1.8	1.3	1.1	1.6	0.5	0.3	0.6	0.5	0.3	0.4	0.1	0.1	0.1	0.1	0.3	0.3	0.7	0.4	0.7	2.3
11-Mar	2.0	1.6	0.3	Z	0.5	0.2	0.5	0.7	0.0	0.0	0.3	2.1	1.3	1.3	0.9	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.6	2.1
12-Mar	0.0	0.0	0.0	0.0	Z	2.1	3.3	2.7	1.7	1.4	1.0	0.8	0.5	0.5	0.6	3.1	3.4	2.3	1.1	1.4	1.7	1.9	0.9	0.5	1.3	3.4
13-Mar	0.9	0.5	0.6	0.7	0.7	Z	0.9	0.9	0.7	0.4	0.3	0.3	0.4	0.3	0.4	0.2	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.4	0.9
14-Mar	Z	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.6	2.0	1.8	2.3	4.1	7.5	7.6	8.5	4.1	1.9	1.3	1.3	1.9	8.5
15-Mar	1.2	Z	1.8	2.1	1.5	1.1	1.2	1.4	2.0	2.3	2.8	2.5	3.8	4.6	4.2	3.7	2.8	3.3	1.9	1.4	1.8	1.4	1.4	1.3	2.2	4.6
16-Mar	0.9	1.0	Z	2.3	0.2	2.5	1.9	2.6	2.4	1.5	1.8	1.8	1.2	1.1	1.1	2.2	2.2	1.5	1.1	0.9	0.9	0.8	0.9	0.9	1.5	2.6
17-Mar	0.7	0.6	0.5	Z	0.5	0.5	0.5	C	C	C	0.4	1.1	2.0	1.3	0.4	0.1	0.2	0.6	0.4	0.3	0.2	0.3	0.4	1.3	0.6	2.0
18-Mar	0.9	0.8	0.7	0.6	Z	0.8	0.7	0.6	0.9	2.3	1.7	1.1	0.4	0.3	0.2	0.2	0.1	0.3	0.6	0.4	0.3	0.3	0.3	0.6	0.6	2.3
19-Mar	0.1	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.9	1.3	1.1	0.6	0.3	0.2	0.2	0.1	0.2	0.0	0.1	0.2	0.5	0.4	0.6	0.7	0.4	1.3
20-Mar	Z	0.9	0.2	0.9	0.8	0.1	0.1	0.1	0.4	0.7	0.8	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	0.2	0.9
21-Mar	0.0	Z	0.3	1.1	1.9	3.3	3.8	6.4	6.2	7.2	3.9	0.6	1.3	1.4	1.4	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.8	7.2
22-Mar	0.0	0.3	Z	0.4	0.3	0.3	1.1	1.5	1.6	2.4	1.6	1.2	1.1	0.9	1.5	1.5	1.2	0.7	0.6	0.7	0.7	0.5	0.7	0.9	0.9	2.4
23-Mar	0.9	0.9	0.7	Z	0.9	1.1	1.2	1.1	2.5	2.2	0.7	2.1	2.6	1.0	0.8	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.9	2.6
24-Mar	0.1	0.1	0.2	0.1	Z	0.2	0.3	0.3	0.3	0.7	0.3	0.2	0.2	0.5	2.7	3.0	2.0	2.3	2.5	1.9	1.7	2.2	1.5	1.4	1.1	3.0
25-Mar	1.5	0.7	1.0	0.6	0.5	Z	0.4	0.3	0.7	2.8	22.6	14.4	4.9	2.0	1.0	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.1	2.4	22.6
26-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	2.2	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.5	0.1	0.0	0.3	2.2
27-Mar	0.0	Z	0.1	0.3	0.6	0.9	1.4	1.9	2.0	1.5	1.1	0.7	0.5	0.5	0.8	1.1	1.2	1.1	1.0	1.3	1.7	1.4	0.8	0.9	1.0	2.0
28-Mar	0.6	0.4	Z	0.3	0.3	0.3	0.3	0.2	0.3	0.7	4.9	2.1	2.9	3.0	2.6	6.0	8.0	2.4	1.0	0.7	0.6	0.5	0.2	0.1	1.7	8.0
29-Mar	0.0	0.1	0.1	Z	1.6	1.7	1.6	2.0	4.2	1.7	2.8	5.3	3.3	2.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	5.3
30-Mar	0.0	0.0	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.3	8.5	12.6	3.4	1.2	0.6	0.2	0.4	0.3	0.4	0.6	0.1	5.5	16.1	4.3	2.4	16.1
31-Mar	3.8	1.2	1.5	3.0	0.1	Z	0.2	8.4	1.9	4.9	15.2	0.8	0.5	0.5	0.4	0.4	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	1.9	15.2
	0.8	0.6	0.6	0.8	0.6	0.9	1.0	1.7	1.5	1.5	2.7	2.1	1.5	1.3	1.1	1.2	1.3	1.4	1.4	1.3	0.9	0.9	1.1	0.7	Diurnal Average	
	3.8	2.8	2.9	3.0	1.9	3.3	4.3	12.3	6.2	7.2	22.6	14.4	5.7	5.2	4.2	6.0	8.0	7.7	10.4	8.5	4.6	5.5	16.1	4.3	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 (SO_2) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	704	99.15	99.15
11 - 20	5	0.70	99.86
21 - 60	1	0.14	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Anzac - March 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	31	15	18	27	55	137	100	34	14	15	14	21	64	44	64	48	701
11 - 20	0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	1	5
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	1	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	31	15	18	29	55	138	100	34	14	15	14	21	66	44	64	49	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Anzac

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.1 ppb on Mar 25 11:00

Maximum Daily Average: 0.6 ppb on Mar 25

Minimum Value: 0.2 ppb on Mar 1 09:00

Minimum Daily Average: 0.3 ppb on Mar 4

Maximum Diurnal Average: 0.4 ppb at hour 11

Minimum Diurnal Average: 0.3 ppb at hour 1

Monthly Average: 0.38 ppb

Percentiles: $P_1 = 0.2$ $P_{10} = 0.3$ $Q_1 = 0.3$ Median = 0.4 $Q_3 = 0.4$ $P_{90} = 0.5$ $P_{99} = 0.8$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

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

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	709	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 2	30	15	17	30	57	136	100	33	14	14	15	17	68	46	62	52	706
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	15	17	30	57	136	100	33	14	14	15	17	68	46	62	52	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Anzac

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Anzac - March 2023

Maximum Value: 3.3 ppm on Mar 25 11:00

Maximum Daily Average: 2.1 ppm on Mar 25

Minimum Value: 2.0 ppm on Mar 18 18:00

Minimum Daily Average: 2.0 ppm on Mar 7

Maximum Diurnal Average: 2.1 ppm at hour 11

Minimum Diurnal Average: 2.0 ppm at hour 17

Monthly Average: 2.06 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.0 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	2.2	2.2	2.1	2.2	2.1	2.1	2.1	M	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2
2-Mar	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
3-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
4-Mar	2.1	2.1	2.0	Z	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	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1
5-Mar	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.2
6-Mar	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4
7-Mar	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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-Mar	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
10-Mar	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	2.1
11-Mar	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
12-Mar	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	2.1	2.1	2.1	2.1	2.1
13-Mar	2.1	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	2.1	2.2
14-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2
15-Mar	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Mar	2.0	2.0	Z	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.1	2.2
17-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	C	C	C	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	2.0	2.1	2.3
18-Mar	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
19-Mar	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
20-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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
21-Mar	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
22-Mar	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
24-Mar	2.1	2.1	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
25-Mar	2.0	2.0	2.0	2.0	2.1	Z	2.0	2.1	2.0	2.1	3.3	2.7	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	3.3
26-Mar	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	2.2	2.1	2.1	2.1	2.4	2.1	2.4
27-Mar	2.3	Z	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.1	2.1	2.4
28-Mar	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2
29-Mar	2.0	2.0	2.0	Z	2.0	2.1	2.3	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5
30-Mar	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1
31-Mar	2.0	2.0	2.1	2.1	2.0	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	2.1
	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	Diurnal Average	
	2.3	2.2	2.4	2.3	2.3	2.2	2.4	2.5	2.4	2.2	3.3	2.7	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.4	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Anzac - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	427	60.23	60.23
2.1 - 3.0	281	39.63	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Anzac - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2.0	28	15	15	29	48	101	52	17	8	9	7	9	19	19	28	23	427
2.1 - 3.0	3	0	3	0	7	37	47	17	6	6	7	12	46	25	36	26	278
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	15	18	29	55	138	99	34	14	15	14	21	66	44	64	49	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Anzac

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - March 2023

Maximum Value: 0.612 ppm on Mar 25 11:00

Maximum Daily Average: 0.071 ppm on Mar 27

Minimum Value: 0.000 ppm on Mar 1 03:00

Minimum Daily Average: 0.000 ppm on Mar 7

Maximum Diurnal Average: 0.026 ppm at hour 11

Minimum Diurnal Average: 0.000 ppm at hour 17

Monthly Average: 0.009 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 in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.002	0.000	0.000	0.002	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
2-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.015
3-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.010	0.004	0.001	0.010
4-Mar	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
5-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.208	0.219	0.000	0.000	0.000	0.000	0.019	0.219
6-Mar	0.000	0.000	0.000	0.000	0.000	0.084	0.301	0.004	0.000	0.013	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	0.017	0.301
7-Mar	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
8-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
12-Mar	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	0.003	0.000	0.001	0.000	0.002	0.001	0.010	0.000	0.001	0.010
13-Mar	0.000	0.001	0.001	0.000	0.004	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
14-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053	0.031	0.007	0.003	0.000	0.000	0.001	0.004	0.053
15-Mar	0.002	Z	0.000	0.005	0.005	0.025	0.082	0.037	0.025	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.008	0.082
16-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.045	0.000	0.000	0.000	0.000	0.000	0.004	0.045
17-Mar	0.000	0.000	0.000	Z	0.000	0.002	0.000	C	C	C	0.150	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.008	0.150
18-Mar	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	0.027	0.001	0.000	0.000	0.000	0.002	0.001	0.027
19-Mar	0.003	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	0.001	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.001	0.009
20-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.003	0.064
22-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
24-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
25-Mar	0.000	0.000	0.000	0.000	0.010	Z	0.000	0.000	0.000	0.033	0.612	0.257	0.088	0.024	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045	0.612
26-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.131	0.078	0.061	0.062	0.332	0.029	0.332
27-Mar	0.269	Z	0.304	0.241	0.249	0.147	0.131	0.055	0.116	0.038	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.018	0.005	0.058	0.071	0.304
28-Mar	0.000	0.023	Z	0.081	0.018	0.066	0.014	0.162	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.013	0.014	0.000	0.000	0.000	0.000	0.000	0.019	0.162
29-Mar	0.000	0.000	0.000	Z	0.000	0.069	0.146	0.223	0.194	0.075	0.000	0.016	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.223
30-Mar	0.003	0.016	0.012	0.002	Z	0.089	0.051	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.089
31-Mar	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
	0.011	0.002	0.012	0.013	0.011	0.019	0.023	0.016	0.015	0.006	0.026	0.009	0.003	0.001	0.000	0.000	0.000	0.002	0.011	0.012	0.003	0.003	0.003	0.013	Diurnal Average	
	0.269	0.023	0.304	0.241	0.249	0.147	0.301	0.223	0.194	0.075	0.612	0.257	0.088	0.024	0.007	0.002	0.003	0.053	0.208	0.219	0.078	0.061	0.062	0.332	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	640	90.27	90.27
0.006 - 0.05	36	5.08	95.35
0.06 - 0.1	19	2.68	98.03
> 0.1	14	1.97	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	31	15	17	29	54	132	89	32	13	11	12	16	49	32	58	48	638
0.006 - 0.05	0	0	1	0	1	6	4	1	1	2	2	3	4	6	4	1	36
0.06 - 0.1	0	0	0	0	0	0	1	1	0	2	0	2	7	3	2	0	18
> 0.1	0	0	0	0	0	0	5	0	0	0	0	0	6	3	0	0	14
Totals	31	15	18	29	55	138	99	34	14	15	14	21	66	44	64	49	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Anzac

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.7 ppm on Mar 25 11:00

Maximum Daily Average: 2.1 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 18 18:00

Maximum Diurnal Average: 2.1 ppm at hour 8

Monthly Average: 2.05 ppm

Minimum Daily Average: 2.0 ppm on Mar 30

Minimum Diurnal Average: 2.0 ppm at hour 17

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.0 Median = 2.0 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration M - Maintenance

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Anzac - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	449	63.33	63.33
2.1 - 3.0	260	36.67	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Anzac - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	28	15	15	29	48	102	56	18	9	10	8	12	24	21	30	23	448
2.1 - 3.0	3	0	3	0	7	36	43	16	5	5	6	9	42	23	34	26	258
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	15	18	29	55	138	99	34	14	15	14	21	66	44	64	49	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Anzac

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Anzac - March 2023

Maximum Value: 41.6 ppb on Mar 24 22:00

Maximum Daily Average: 4.7 ppb on Mar 24

Minimum Value: 0.0 ppb on Mar 7 01:00

Minimum Daily Average: 0.2 ppb on Mar 7

Maximum Diurnal Average: 2.7 ppb at hour 22

Minimum Diurnal Average: 0.1 ppb at hour 20

Monthly Average: 1.20 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.3 Q_3 = 1.1 P_{90} = 2.7 P_{99} = 15.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.7	0.0	1.0	0.0	Z	0.0	0.0	0.1	0.2	0.5	0.8	0.7	1.3	0.9	1.0	0.8	0.6	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.4	1.3
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	C	C	C	C	C	C	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	--	0.2
3-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.4	1.8	1.0	0.5	0.6	0.9	3.3	2.7	2.4	1.6	1.0	0.1	0.1	0.1	0.5	0.3	0.2	0.8	3.3
4-Mar	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.3	1.1	1.7	1.4	2.3	2.1	2.1	1.5	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.3
5-Mar	0.0	0.1	Z	0.4	2.2	2.9	3.9	3.0	2.4	2.4	2.1	2.1	3.0	2.6	1.8	2.5	0.5	0.3	1.0	0.2	3.3	20.6	15.4	5.4	3.4	20.6
6-Mar	3.4	1.8	0.4	0.4	7.2	9.5	7.3	6.1	3.2	2.4	2.4	2.6	Z	1.0	0.6	0.3	0.3	0.1	0.0	0.6	0.0	0.0	0.0	0.0	2.2	9.5
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.6	0.5	1.0	0.4	0.3	0.2	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.0
8-Mar	0.0	0.0	0.4	0.0	Z	0.0	0.0	0.1	0.5	0.8	1.2	1.7	1.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7
9-Mar	0.0	0.1	1.1	0.0	0.0	Z	0.0	0.1	0.3	0.9	0.8	0.5	0.1	0.1	0.1	0.1	0.0	0.5	0.0	1.7	0.0	0.0	0.0	0.0	0.3	1.7
10-Mar	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.4	1.1	1.6	0.4	0.2	0.9	2.4	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4
11-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	4.2	3.2	2.2	2.0	1.1	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.2
12-Mar	0.4	0.0	Z	0.1	0.3	0.1	0.4	1.1	2.4	4.6	2.8	3.1	1.9	1.5	2.2	1.9	1.4	0.9	0.3	0.2	0.4	0.2	0.4	0.2	1.2	4.6
13-Mar	0.2	0.2	0.2	Z	0.4	0.1	0.2	1.8	4.2	4.9	2.6	1.9	0.2	0.1	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.9
14-Mar	0.0	1.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.6	2.5	3.1	2.9	2.7	0.5	0.1	0.1	0.1	0.1	0.3	0.8	3.6
15-Mar	2.3	0.6	0.5	0.4	0.3	Z	0.5	2.7	5.5	5.4	4.9	3.0	2.6	2.6	2.7	2.3	1.8	1.5	0.3	0.1	22.7	7.3	11.9	0.3	3.6	22.7
16-Mar	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.6	1.7	1.5	2.2	2.4	1.9	0.9	1.2	2.2	1.3	0.6	0.3	0.0	0.0	0.1	0.1	0.7	0.8	2.4
17-Mar	0.6	Z	0.5	0.5	1.9	0.5	2.3	0.2	1.0	1.8	1.5	1.2	1.8	1.1	0.3	0.3	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.7	2.3
18-Mar	0.1	1.4	Z	0.6	0.1	0.0	0.2	0.2	0.5	0.7	0.5	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.4	1.1	0.3	1.4
19-Mar	1.5	1.1	0.0	Z	0.0	0.0	1.7	0.3	1.0	1.8	1.6	1.1	0.3	0.1	0.1	0.2	0.1	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.5	1.8
20-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	1.1	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.6	0.1	0.2	1.1
21-Mar	0.2	0.2	0.1	0.2	0.1	Z	1.5	1.6	4.5	3.3	2.8	0.4	1.3	1.6	1.3	1.0	1.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.5
22-Mar	Z	0.0	0.8	0.1	0.0	0.0	0.1	0.7	1.6	1.6	1.3	1.2	1.1	0.9	1.4	0.9	0.5	0.2	0.0	0.0	0.0	0.1	2.4	21.3	1.6	21.3
23-Mar	10.5	Z	0.0	0.1	0.2	0.3	0.7	1.8	0.7	0.4	0.3	1.0	3.1	1.6	1.1	0.6	0.2	0.1	0.0	0.0	0.0	0.1	2.8	0.7	1.2	10.5
24-Mar	0.6	0.5	Z	0.1	0.6	0.6	10.3	4.9	5.3	6.0	2.5	1.1	0.8	0.6	1.0	0.8	6.2	0.3	0.1	0.0	3.6	41.6	19.9	1.4	4.7	41.6
25-Mar	0.4	0.4	0.7	Z	2.7	0.0	5.4	2.6	1.0	4.0	27.6	17.7	8.0	5.5	3.2	1.6	0.7	0.3	0.1	0.0	0.0	0.0	0.0	1.3	3.6	27.6
26-Mar	0.4	0.4	0.4	0.1	Z	0.1	0.0	0.2	0.3	0.4	0.0	0.0	0.0	0.1	0.1	3.7	0.0	0.1	0.0	0.1	5.6	10.4	1.1	1.6	1.1	10.4
27-Mar	1.0	1.6	1.6	0.1	0.7	Z	1.6	1.6	2.2	1.7	1.0	0.8	0.7	0.4	0.5	0.5	0.4	0.2	0.2	0.1	0.0	0.0	0.3	2.9	0.9	2.9
28-Mar	Z	7.4	2.1	0.5	0.2	1.7	14.3	1.1	1.8	0.8	1.4	0.9	0.8	0.6	0.7	0.6	0.6	0.3	0.1	0.1	0.6	0.0	0.0	0.1	1.6	14.3
29-Mar	0.0	Z	0.1	0.1	0.1	0.1	1.1	3.0	3.6	1.9	1.5	2.5	2.4	2.6	1.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.9	3.6
30-Mar	0.8	3.3	Z	7.2	8.6	2.0	12.6	5.6	0.3	0.3	0.8	2.4	1.6	1.9	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	12.6
31-Mar	0.0	0.0	0.1	Z	0.7	0.0	0.1	0.9	0.8	1.1	1.6	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6
	0.9	0.8	0.4	0.4	1.0	0.7	2.1	1.4	1.7	1.8	2.4	1.9	1.4	1.3	1.0	0.9	0.7	0.4	0.1	0.1	1.2	2.7	1.8	1.2	Diurnal Average	
	10.5	7.4	2.1	7.2	8.6	9.5	14.3	6.1	5.5	6.0	27.6	17.7	8.0	5.5	3.2	3.7	6.2	2.7	1.0	1.7	22.7	41.6	19.9	21.3	Diurnal Maximum	

Z - zerospan C - Calibration

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	99.29	99.29
21 - 40	4	0.57	99.86
11 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Anzac - March 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	30	15	16	30	56	136	103	32	11	14	11	19	65	46	63	52	699
21 - 40	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	0	4
11 - 80	0	0	0	0	0	0	0	0	1	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	30	15	16	30	56	136	103	34	13	14	11	19	66	46	63	52	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Anzac

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 27.7 ppb on Mar 25 11:00

Maximum Daily Average: 8.9 ppb on Mar 15

Minimum Value: 0.4 ppb on Mar 8 19:00

Maximum Diurnal Average: 6.7 ppb at hour 7

Monthly Average: 3.99 ppb

Minimum Daily Average: 1.3 ppb on Mar 9

Minimum Diurnal Average: 2.2 ppb at hour 17

Percentiles: P_1 = 0.5 P_{10} = 0.8 Q_1 = 1.4 Median = 2.7 Q_3 = 5.4 P_{90} = 9.6 P_{99} = 15.8

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	6.0	3.2	5.2	4.0	Z	2.0	4.1	2.3	0.9	1.1	1.5	1.6	2.1	2.2	2.7	2.6	2.9	3.8	4.8	3.0	2.6	2.4	2.4	2.2	2.9	6.0
2-Mar	2.4	2.4	2.6	2.7	3.3	Z	3.0	C	C	C	C	C	C	1.3	1.6	1.0	1.0	1.0	0.9	0.8	0.7	0.7	0.8	0.7	--	3.3
3-Mar	Z	0.6	0.5	0.5	0.5	0.8	5.1	9.7	10.8	4.3	2.0	1.7	2.2	5.8	6.1	7.5	6.8	9.6	13.7	9.8	9.0	12.5	11.5	8.3	6.1	13.7
4-Mar	12.4	Z	3.6	1.1	1.4	1.6	3.7	5.9	5.1	4.0	2.3	3.0	2.6	2.8	2.4	0.8	1.2	2.3	3.2	7.5	1.9	1.4	1.6	1.4	3.2	12.4
5-Mar	1.9	5.4	Z	4.8	9.8	10.2	10.7	7.5	5.0	3.8	2.8	2.5	3.4	3.1	2.7	3.2	2.4	5.6	7.3	6.6	8.5	12.3	12.8	9.0	6.1	12.8
6-Mar	10.0	7.0	5.8	6.7	10.9	10.3	14.0	11.8	7.1	4.4	3.6	4.1	Z	2.1	1.7	1.1	1.6	1.8	2.0	1.2	0.8	1.6	4.6	6.6	5.3	14.0
7-Mar	3.2	1.4	4.1	Z	0.8	0.6	1.0	2.5	3.1	2.2	1.9	1.3	1.1	1.0	0.7	1.1	1.0	2.0	4.9	6.2	1.7	2.1	2.2	2.7	2.1	6.2
8-Mar	1.0	2.2	6.0	1.5	Z	3.3	2.0	1.2	2.7	2.4	2.3	2.9	1.9	1.0	0.6	0.6	0.5	0.5	0.4	0.5	2.7	0.7	0.8	0.8	1.7	6.0
9-Mar	0.7	0.6	1.8	0.9	1.1	Z	1.9	1.9	1.5	1.9	1.6	1.0	0.5	0.4	0.5	0.5	0.6	1.1	0.7	1.5	3.8	1.8	2.9	0.7	1.3	3.8
10-Mar	Z	0.8	1.4	4.2	1.6	6.6	4.6	5.4	3.6	3.6	1.2	0.8	1.7	2.0	1.3	1.5	0.9	0.8	0.8	0.6	1.1	1.1	2.1	1.4	2.1	6.6
11-Mar	4.3	Z	1.4	2.2	3.3	0.8	2.4	3.0	0.9	0.5	1.5	4.5	3.3	3.5	2.8	2.3	1.3	1.5	1.6	0.7	0.6	0.6	2.7	1.1	2.0	4.5
12-Mar	3.3	2.5	Z	2.5	5.4	8.4	9.6	7.8	7.1	6.1	4.7	4.4	3.5	3.1	4.8	4.9	5.5	7.5	8.8	9.3	10.4	10.3	8.6	8.4	6.4	10.4
13-Mar	9.7	11.0	9.3	Z	8.5	10.0	12.9	14.1	11.8	9.1	4.7	3.3	1.4	1.4	1.4	1.3	1.1	1.0	1.0	1.1	0.9	0.7	0.6	0.6	5.1	14.1
14-Mar	0.6	1.7	0.6	0.6	Z	0.6	0.5	0.5	0.5	0.5	0.6	0.6	2.2	5.8	5.0	6.5	8.7	14.9	14.9	14.3	13.6	11.6	9.6	10.6	5.4	14.9
15-Mar	12.4	11.0	10.9	10.3	9.7	Z	15.8	12.3	9.9	7.7	6.2	4.1	3.7	3.8	4.3	4.7	5.4	7.8	8.8	8.7	17.7	12.0	11.3	6.4	8.9	17.7
16-Mar	Z	3.7	6.5	6.6	0.8	7.5	5.6	6.6	5.6	3.8	4.1	3.3	2.9	2.2	2.7	4.6	4.0	4.2	4.4	2.6	1.8	2.2	2.2	2.8	3.9	7.5
17-Mar	3.0	Z	3.2	3.5	10.1	8.1	5.2	1.9	2.8	3.6	3.1	2.7	3.8	3.3	1.9	1.8	1.7	1.7	2.1	3.1	2.0	1.6	1.6	2.3	3.2	10.1
18-Mar	1.9	4.9	Z	3.0	2.0	1.9	3.0	2.6	3.0	3.3	2.7	2.4	1.9	1.4	1.2	1.1	1.0	1.1	3.3	2.8	2.4	2.4	3.7	5.9	2.6	5.9
19-Mar	8.6	7.2	1.3	Z	0.9	3.1	3.6	2.7	3.3	3.8	3.5	2.4	1.4	0.9	0.9	1.1	0.9	1.0	1.6	1.2	1.9	1.3	3.0	3.5	2.6	8.6
20-Mar	5.2	3.6	0.8	4.1	Z	0.6	0.4	0.6	1.7	2.8	2.5	0.8	0.5	0.5	0.5	0.5	0.4	0.4	0.6	0.7	2.2	7.3	4.4	3.7	1.9	7.3
21-Mar	4.0	5.6	7.3	8.1	7.5	Z	8.4	9.5	8.8	7.4	5.2	1.4	2.4	2.7	2.8	2.6	4.0	4.4	1.9	1.6	0.8	1.0	1.2	0.8	4.3	9.5
22-Mar	Z	1.1	2.1	1.0	0.9	2.9	4.5	4.2	3.1	3.2	2.5	2.3	2.4	2.4	3.5	3.5	3.2	2.6	2.6	2.4	2.4	3.7	6.7	18.0	3.5	18.0
23-Mar	14.0	Z	2.8	3.1	4.2	6.2	7.7	7.4	3.5	2.0	1.5	2.8	6.0	4.0	3.4	2.6	1.4	1.2	1.1	0.7	0.6	1.0	3.2	4.1	3.7	14.0
24-Mar	4.9	7.7	Z	6.4	5.5	6.0	12.5	9.5	9.2	8.8	4.2	2.3	1.8	1.8	2.5	2.6	0.8	2.6	3.2	3.0	5.2	19.0	10.9	4.4	5.9	19.0
25-Mar	3.5	5.3	5.0	Z	5.7	3.6	9.5	7.2	2.8	6.2	27.7	19.6	11.6	9.1	6.3	3.8	2.9	2.1	1.5	1.1	1.5	1.8	1.3	4.3	6.2	27.7
26-Mar	5.9	10.2	10.8	10.2	Z	3.0	0.7	0.9	1.0	1.0	0.4	0.5	0.5	0.4	0.5	1.9	0.5	0.6	1.2	5.6	11.2	14.3	10.3	11.8	4.5	14.3
27-Mar	11.1	13.1	13.8	6.5	10.1	Z	7.9	5.6	4.7	3.5	2.2	1.8	1.5	1.4	1.6	1.7	1.7	1.8	2.2	3.5	3.3	3.5	3.1	6.3	4.9	13.8
28-Mar	Z	8.5	10.7	9.3	5.8	9.0	16.7	3.3	4.2	1.8	2.8	2.0	2.0	1.9	2.1	2.3	2.9	2.6	2.6	3.6	9.1	2.1	1.3	1.5	4.7	16.7
29-Mar	1.4	Z	1.9	1.8	3.2	8.0	13.2	15.4	13.3	6.3	4.6	6.7	6.1	7.8	5.6	1.3	0.9	1.1	1.2	1.2	0.8	0.8	3.2	1.5	4.7	15.4
30-Mar	5.2	10.3	Z	8.0	13.5	6.8	17.5	12.5	1.6	1.2	2.1	4.5	3.7	1.8	1.0	0.7	0.7	0.7	0.6	0.6	0.6	2.1	2.9	2.0	4.4	17.5
31-Mar	1.5	2.7	4.1	Z	1.4	0.6	1.0	5.3	3.1	3.0	4.3	1.8	1.6	1.6	1.7	1.5	1.4	1.3	1.2	1.1	1.1	1.0	1.0	0.8	1.9	5.3
	5.3	5.1	4.8	4.4	4.9	4.7	6.7	6.0	4.7	3.8	3.7	3.1	2.7	2.7	2.5	2.4	2.2	2.9	3.4	3.4	4.0	4.4	4.3	4.3	Diurnal Average	
	14.0	13.1	13.8	10.3	13.5	10.3	17.5	15.4	13.3	9.1	27.7	19.6	11.6	9.1	6.3	7.5	8.7	14.9	14.9	14.3	17.7	19.0	12.8	18.0	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.86	99.86
21 - 40	1	0.14	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	30	15	16	30	56	136	103	34	13	14	11	19	65	46	63	52	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	15	16	30	56	136	103	34	13	14	11	19	66	46	63	52	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Anzac

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - March 2023

Maximum Value: 60.6 ppb on Mar 24 22:00

Maximum Daily Average: 12.5 ppb on Mar 15

Minimum Value: 0.4 ppb on Mar 20 07:00

Minimum Daily Average: 1.6 ppb on Mar 9

Maximum Diurnal Average: 8.8 ppb at hour 7

Minimum Diurnal Average: 2.9 ppb at hour 17

Monthly Average: 5.18 ppb

Percentiles: P_1 = 0.5 P_{10} = 0.8 Q_1 = 1.5 Median = 3.3 Q_3 = 6.7 P_{90} = 11.2 P_{99} = 30.7

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	6.7	3.2	6.2	4.0	Z	2.0	4.1	2.4	1.1	1.6	2.3	2.3	3.4	3.1	3.7	3.4	3.5	4.0	4.9	3.0	2.7	2.4	2.4	2.2	3.2	6.7
2-Mar	2.4	2.4	2.6	2.7	3.3	Z	3.0	C	C	C	C	C	C	1.5	1.8	1.1	1.0	1.1	1.0	0.9	0.8	0.8	0.9	0.8	--	3.3
3-Mar	Z	0.7	0.6	0.6	0.6	0.9	5.1	10.1	12.6	5.3	2.5	2.3	3.1	9.1	8.8	9.9	8.4	10.6	13.8	9.9	9.1	13.0	11.8	8.5	6.8	13.8
4-Mar	12.5	Z	3.6	1.1	1.4	1.6	3.8	6.2	6.2	5.7	3.7	5.3	4.7	4.9	3.9	1.1	1.6	2.6	3.2	7.5	1.9	1.4	1.6	1.4	3.8	12.5
5-Mar	1.9	5.5	Z	5.2	12.0	13.1	14.6	10.5	7.4	6.2	4.9	4.6	6.4	5.7	4.5	5.7	2.9	5.9	8.3	6.8	11.8	32.9	28.2	14.4	9.5	32.9
6-Mar	13.4	8.8	6.2	7.1	18.1	19.8	21.3	17.9	10.3	6.8	6.0	6.7	Z	3.1	2.3	1.4	1.9	1.9	2.0	1.8	0.8	1.6	4.6	6.6	7.4	21.3
7-Mar	3.2	1.4	4.1	Z	0.8	0.6	1.0	2.6	3.7	2.7	2.9	1.7	1.4	1.2	0.8	1.4	1.1	2.1	5.0	6.2	1.7	2.1	2.2	2.7	2.3	6.2
8-Mar	1.0	2.2	6.4	1.5	Z	3.3	2.0	1.3	3.2	3.2	3.5	4.6	2.9	1.3	0.7	0.6	0.5	0.5	0.4	0.5	2.7	0.7	0.8	0.8	1.9	6.4
9-Mar	0.7	0.7	2.9	0.9	1.1	Z	1.9	2.0	1.8	2.8	2.4	1.5	0.6	0.5	0.6	0.6	0.6	1.6	0.7	3.2	3.8	1.8	2.9	0.7	1.6	3.8
10-Mar	Z	0.8	1.4	4.2	1.6	6.7	4.7	5.8	4.7	5.2	1.6	1.0	2.6	4.4	1.6	1.9	1.2	0.8	0.8	0.6	1.1	1.1	2.1	1.4	2.5	6.7
11-Mar	4.3	Z	1.4	2.2	3.3	0.8	2.4	3.3	1.1	0.7	5.7	7.7	5.5	5.5	3.9	2.9	1.5	1.6	1.6	0.7	0.6	0.6	2.7	1.1	2.7	7.7
12-Mar	3.7	2.5	Z	2.6	5.7	8.5	10.0	8.9	9.5	10.7	7.5	7.5	5.4	4.6	7.0	6.8	6.9	8.4	9.1	9.5	10.8	10.5	9.0	8.6	7.6	10.8
13-Mar	9.9	11.2	9.5	Z	8.9	10.1	13.1	15.9	16.0	14.0	7.3	5.2	1.6	1.5	1.5	1.4	1.1	1.3	1.0	1.1	0.9	0.7	0.6	0.6	5.8	16.0
14-Mar	0.6	2.8	0.6	0.6	Z	0.6	0.5	0.5	0.5	0.5	0.6	0.6	3.2	9.4	7.5	9.6	11.6	17.6	15.4	14.4	13.7	11.7	9.7	10.9	6.2	17.6
15-Mar	14.7	11.6	11.4	10.7	10.0	Z	16.3	15.0	15.4	13.1	11.1	7.1	6.3	6.4	7.0	7.0	7.2	9.3	9.1	8.8	40.4	19.3	23.2	6.7	12.5	40.4
16-Mar	Z	3.7	6.6	6.6	0.8	7.5	5.7	7.2	7.3	5.3	6.3	5.7	4.8	3.1	3.9	6.8	5.3	4.8	4.7	2.6	1.8	2.3	2.3	3.5	4.7	7.5
17-Mar	3.6	Z	3.7	4.0	12.0	8.6	7.5	2.1	3.8	5.4	4.6	3.9	5.6	4.4	2.2	2.1	1.8	1.8	2.1	3.2	2.1	1.6	1.7	2.4	3.9	12.0
18-Mar	2.0	6.3	Z	3.6	2.1	1.9	3.2	2.8	3.5	4.0	3.2	2.8	2.2	1.5	1.3	1.2	1.0	1.1	3.4	2.8	2.4	2.4	4.1	7.0	2.9	7.0
19-Mar	10.1	8.3	1.3	Z	0.9	3.1	5.3	3.0	4.3	5.6	5.1	3.5	1.7	1.0	1.0	1.3	1.0	1.1	2.2	1.2	1.9	1.3	3.0	3.5	3.1	10.1
20-Mar	5.2	3.6	0.8	4.1	Z	0.6	0.4	0.6	2.0	3.9	3.5	0.9	0.5	0.5	0.5	0.5	0.4	0.4	0.6	0.7	2.5	8.4	5.0	3.8	2.1	8.4
21-Mar	4.2	5.8	7.4	8.3	7.6	Z	9.9	11.1	13.3	10.7	8.0	1.8	3.7	4.3	4.1	3.6	5.5	5.3	1.9	1.6	0.8	1.0	1.2	0.8	5.3	13.3
22-Mar	Z	1.1	2.9	1.1	0.9	2.9	4.6	4.9	4.7	4.8	3.8	3.5	3.5	3.3	4.9	4.4	3.7	2.8	2.6	2.4	2.4	3.8	9.1	39.3	5.1	39.3
23-Mar	24.5	Z	2.8	3.2	4.4	6.5	8.4	9.2	4.2	2.4	1.8	3.8	9.1	5.6	4.5	3.2	1.6	1.3	1.1	0.7	0.6	1.1	6.0	4.8	4.8	24.5
24-Mar	5.5	8.2	Z	6.5	6.1	6.6	22.8	14.4	14.5	14.8	6.7	3.4	2.6	2.4	3.5	3.4	7.0	2.9	3.3	3.0	8.8	60.6	30.8	5.8	10.6	60.6
25-Mar	3.9	5.7	5.7	Z	8.4	3.6	14.9	9.8	3.8	10.2	55.3	37.3	19.6	14.6	9.5	5.4	3.6	2.4	1.6	1.1	1.5	1.8	1.3	5.6	9.8	55.3
26-Mar	6.3	10.6	11.2	10.3	Z	3.1	0.7	1.1	1.3	1.4	0.4	0.5	0.5	0.5	0.6	5.6	0.5	0.7	1.2	5.7	16.8	24.7	11.4	13.4	5.6	24.7
27-Mar	12.1	14.7	15.4	6.6	10.8	Z	9.5	7.2	6.9	5.2	3.2	2.6	2.2	1.8	2.1	2.2	2.1	2.0	2.4	3.6	3.3	3.5	3.4	9.2	5.7	15.4
28-Mar	Z	15.9	12.8	9.8	6.0	10.7	31.0	4.4	6.0	2.6	4.2	2.9	2.8	2.5	2.8	2.9	3.5	2.9	2.7	3.7	9.7	2.1	1.3	1.6	6.3	31.0
29-Mar	1.4	Z	2.0	1.9	3.3	8.1	14.3	18.4	16.9	8.2	6.1	9.2	8.5	10.4	7.2	1.4	1.0	1.2	1.2	1.2	0.8	0.8	3.4	1.5	5.6	18.4
30-Mar	6.0	13.6	Z	15.2	22.1	8.8	30.1	18.1	1.9	1.5	2.9	6.9	5.3	3.7	1.1	0.8	0.8	0.7	0.6	0.6	0.6	2.1	2.9	2.0	6.5	30.1
31-Mar	1.5	2.7	4.2	Z	2.1	0.6	1.1	6.2	3.9	4.1	5.9	2.0	1.7	1.7	1.8	1.6	1.4	1.3	1.2	1.1	1.1	1.0	1.0	0.8	2.2	6.2
	6.2	5.9	5.1	4.8	5.9	5.4	8.8	7.4	6.4	5.6	6.1	5.0	4.2	4.0	3.4	3.3	2.9	3.3	3.5	3.6	5.2	7.1	6.1	5.6	Diurnal Average	
	24.5	15.9	15.4	15.2	22.1	19.8	31.0	18.4	16.9	14.8	55.3	37.3	19.6	14.6	9.5	9.9	11.6	17.6	15.4	14.4	40.4	60.6	30.8	39.3	Diurnal Maximum	

Z - zerospan C - Calibration

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	691	97.74	97.74
21 - 40	14	1.98	99.72
11 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Anzac - March 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	30	15	16	30	56	135	102	29	10	14	9	18	63	46	63	52	688
21 - 40	0	0	0	0	0	1	1	5	2	0	2	1	2	0	0	0	14
11 - 80	0	0	0	0	0	0	0	0	1	0	0	0	1	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	30	15	16	30	56	136	103	34	13	14	11	19	66	46	63	52	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Anzac

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 54.0 ppb on Mar 17 17:00

Maximum Daily Average: 47.3 ppb on Mar 18

Minimum Value: 10.8 ppb on Mar 6 07:00

Maximum Diurnal Average: 39.6 ppb at hour 16

Monthly Average: 34.90 ppb

Minimum Daily Average: 25.7 ppb on Mar 5

Minimum Diurnal Average: 29.1 ppb at hour 7

Percentiles: P_1 = 17.3 P_{10} = 23.1 Q_1 = 29.8 Median = 35.7 Q_3 = 39.7 P_{90} = 44.2 P_{99} = 52.2

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	22.9	31.2	Z	29.7	30.1	31.7	29.1	30.7	31.8	31.7	31.9	34.0	32.5	32.5	32.8	34.1	34.6	34.6	33.9	37.2	38.3	38.8	38.8	39.1	33.1	39.1
2-Mar	39.2	39.3	38.9	Z	36.0	35.8	36.6	35.9	35.0	36.2	36.6	37.0	38.3	39.3	39.0	38.8	38.5	38.4	38.0	38.1	37.8	38.4	38.5	39.6	37.8	39.6
3-Mar	39.9	39.2	38.5	38.6	Z	37.6	28.6	21.6	19.3	25.5	26.8	27.2	27.6	24.8	24.6	22.8	23.6	20.5	17.3	22.6	24.1	20.0	18.7	23.0	26.6	39.9
4-Mar	17.4	18.3	28.2	31.7	31.1	Z	27.9	25.2	25.8	27.1	29.6	30.2	30.5	30.5	30.8	31.9	31.3	30.0	28.4	23.6	29.9	31.3	30.6	30.5	28.3	31.9
5-Mar	Z	25.7	27.0	26.7	19.1	18.4	19.2	22.4	26.5	28.1	29.6	29.4	29.1	29.6	30.5	30.4	32.5	29.6	26.0	25.4	22.9	21.3	20.3	21.7	25.7	32.5
6-Mar	20.3	22.3	22.6	21.1	18.1	15.0	10.8	13.9	21.4	26.4	Z	28.6	32.6	34.5	34.8	35.7	34.8	35.0	36.3	36.3	35.9	35.3	32.5	30.7	27.6	36.3
7-Mar	33.6	Z	33.1	30.9	36.4	37.1	37.0	35.1	34.0	35.2	36.6	36.7	37.3	38.0	38.8	38.7	39.2	38.0	34.9	33.4	37.9	38.0	38.0	37.6	36.3	39.2
8-Mar	38.9	37.3	Z	37.2	36.2	34.3	35.2	35.8	34.0	34.1	34.6	34.8	36.6	38.1	38.6	38.4	37.7	38.2	40.4	39.4	35.4	36.4	35.8	35.8	36.7	40.4
9-Mar	35.7	35.6	34.5	Z	35.0	34.6	33.9	34.7	35.0	34.6	35.3	36.2	35.8	35.9	36.7	37.7	38.3	37.6	38.1	38.1	34.9	36.3	33.7	34.9	35.8	38.3
10-Mar	34.8	35.3	35.0	32.0	Z	28.3	29.7	28.5	29.9	30.2	32.3	33.6	33.9	34.3	35.0	35.1	35.6	35.6	36.1	36.4	35.5	35.4	34.5	35.7	33.6	36.4
11-Mar	32.6	32.6	34.1	31.8	29.8	Z	31.1	31.3	33.6	34.7	33.3	32.0	33.1	34.2	35.7	36.5	38.4	38.0	37.1	36.7	36.4	35.7	33.3	34.7	34.2	38.4
12-Mar	Z	31.7	35.3	34.0	25.0	17.7	17.7	20.8	24.1	25.2	26.8	28.4	31.2	32.1	30.7	32.3	31.1	27.4	24.4	22.8	20.9	20.2	21.6	21.6	26.2	35.3
13-Mar	20.4	Z	20.4	21.2	20.4	18.7	15.8	15.0	17.6	21.0	28.6	31.8	38.8	41.1	43.1	42.5	40.6	43.0	45.8	44.9	43.7	41.9	40.3	39.8	32.0	45.8
14-Mar	39.6	38.8	Z	38.2	38.0	38.1	38.3	38.3	38.4	38.8	39.0	39.3	37.3	33.9	35.0	33.4	31.8	25.4	24.5	23.7	22.9	23.9	25.0	23.0	33.2	39.6
15-Mar	20.7	20.8	19.8	Z	19.9	20.1	15.7	19.6	23.2	26.1	27.8	30.8	32.1	33.1	33.5	34.0	34.2	31.7	30.1	28.6	21.8	22.7	21.4	26.5	25.8	34.2
16-Mar	28.9	29.4	25.8	25.4	Z	24.1	25.7	25.0	26.2	28.3	28.7	29.1	30.2	33.9	33.8	32.6	32.7	32.4	31.3	32.9	33.5	32.2	31.9	31.6	29.8	33.9
17-Mar	30.7	28.5	30.4	29.2	22.8	Z	32.3	39.5	33.5	35.3	38.1	40.0	40.1	43.4	52.1	53.9	54.0	53.3	52.2	52.9	48.6	51.4	51.7	50.6	41.9	54.0
18-Mar	Z	49.4	47.8	50.4	50.7	47.2	45.5	46.3	46.6	48.5	49.1	50.6	52.0	52.4	52.9	53.0	51.4	50.1	45.8	41.0	39.3	40.4	40.4	37.3	47.3	53.0
19-Mar	30.3	Z	42.3	43.7	43.8	39.8	39.7	40.8	39.3	38.3	39.4	40.4	41.8	42.3	42.7	42.0	41.7	41.3	40.5	40.9	39.9	40.2	38.0	36.9	40.3	43.8
20-Mar	35.4	36.8	Z	35.4	35.7	37.9	37.8	37.6	36.8	35.8	36.1	37.8	37.7	38.1	38.4	38.6	39.0	39.6	39.3	37.1	31.4	27.2	30.3	28.3	36.0	39.6
21-Mar	27.1	26.5	28.3	Z	27.1	27.8	25.7	25.2	26.8	28.3	32.3	40.7	39.1	39.3	39.9	40.1	38.6	37.1	39.3	39.0	40.1	39.0	38.7	39.4	34.1	40.7
22-Mar	39.3	38.7	37.7	37.7	Z	36.1	35.4	35.8	37.4	38.5	40.3	42.0	44.9	47.0	48.2	48.9	49.6	50.8	50.6	52.0	51.7	46.9	45.0	33.3	42.9	52.0
23-Mar	38.7	43.3	44.1	42.5	40.7	Z	37.3	36.1	43.0	46.2	46.5	45.2	42.6	44.9	45.3	45.4	44.8	44.7	44.0	44.0	43.6	41.4	37.3	33.0	42.4	46.5
24-Mar	Z	26.9	26.7	28.8	28.9	25.2	22.0	24.6	27.2	30.1	36.5	39.6	41.1	42.3	42.5	43.7	45.0	45.2	43.7	40.8	37.2	27.4	29.8	35.6	34.4	45.2
25-Mar	35.2	Z	32.6	34.5	34.2	34.2	28.3	25.2	38.7	37.5	23.6	27.7	34.2	36.6	39.5	42.8	43.4	44.4	45.5	46.6	45.4	43.2	42.7	37.8	37.1	46.6
26-Mar	31.9	24.9	Z	23.2	21.8	33.1	34.7	35.9	34.8	34.3	35.5	36.1	37.0	38.1	38.0	39.7	40.9	39.9	38.2	30.8	24.5	22.7	27.6	22.3	32.4	40.9
27-Mar	20.8	19.7	18.5	Z	22.1	24.0	26.2	28.8	30.6	35.1	39.5	39.4	39.6	40.6	40.5	40.8	41.5	41.5	40.8	39.1	38.3	37.1	36.9	31.9	33.6	41.5
28-Mar	35.5	28.6	22.9	22.9	Z	25.8	23.4	30.2	35.3	40.3	41.1	43.2	43.8	44.0	44.1	44.6	44.3	44.8	44.3	41.0	35.5	43.5	44.0	44.1	37.7	44.8
29-Mar	43.6	44.0	44.1	43.3	40.5	Z	26.9	25.8	30.3	38.0	41.0	39.0	39.5	37.1	38.4	42.7	42.3	41.3	41.2	40.7	41.2	40.7	34.2	33.1	38.7	44.1
30-Mar	Z	28.0	25.8	24.6	18.8	24.3	15.5	C	C	C	C	39.6	41.0	43.2	43.9	43.6	43.6	43.3	43.3	43.0	42.5	40.6	39.6	40.1	36.0	43.9
31-Mar	40.0	Z	36.3	36.9	38.5	39.4	38.8	35.9	39.0	40.8	43.4	48.8	49.5	50.8	50.1	51.1	50.5	50.1	48.8	48.1	47.8	47.6	46.7	43.4	44.4	51.1
	32.1	32.0	31.9	32.8	30.8	30.2	29.1	30.0	31.8	33.7	35.2	36.4	37.4	38.3	39.0	39.6	39.5	38.8	38.1	37.3	36.1	35.4	34.8	34.0	Diurnal Average	
	43.6	49.4	47.8	50.4	50.7	47.2	45.5	46.3	46.6	48.5	49.1	50.6	52.0	52.4	52.9	53.9	54.0	53.3	52.2	52.9	51.7	51.4	51.7	50.6	Diurnal Maximum	

Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Anzac - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	34	4.80	4.80
21 - 50	653	92.10	96.90
51 - 82	22	3.10	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Anzac - March 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	0	0	0	0	0	0	5	1	0	0	2	2	11	4	7	2	34
21 - 50	31	14	17	27	53	137	98	30	12	11	11	14	54	39	53	49	650
51 - 82	0	0	0	1	1	1	0	3	1	5	1	3	1	1	3	1	22
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	14	17	28	54	138	103	34	13	16	14	19	66	44	63	52	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Anzac

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Anzac - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 53.9 $\mu g/m^3$ on Mar 17 20:00

Maximum Daily Average: 8.9 $\mu g/m^3$ on Mar 27

Minimum Value: 0.3 $\mu g/m^3$ on Mar 2 21:00

Maximum Diurnal Average: 6.1 $\mu g/m^3$ at hour 20

Monthly Average: 4.54 $\mu g/m^3$

Minimum Daily Average: 2.0 $\mu g/m^3$ on Mar 30

Minimum Diurnal Average: 3.7 $\mu g/m^3$ at hour 17

Percentiles: P_1 = 0.5 P_{10} = 2.3 Q_1 = 3.0 Median = 3.8 Q_3 = 5.1 P_{90} = 7.2 P_{99} = 15.0

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	2
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	3.1	2.9	3.0	2.3	2.3	2.1	2.2	2.0	1.6	1.8	2.1	3.2	3.1	3.5	3.9	4.5	4.9	5.8	6.4	6.5	6.4	6.9	7.0	7.0	3.9	7.0
2-Mar	7.3	7.7	7.9	7.5	7.4	8.6	8.6	8.3	8.9	7.2	5.9	5.4	3.0	2.3	2.3	1.0	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.5	4.3	8.9
3-Mar	0.9	0.6	1.1	1.4	1.4	1.6	4.3	6.0	6.2	5.0	3.9	4.0	4.8	5.2	5.2	5.3	5.2	5.2	6.6	6.5	5.9	8.7	9.3	7.4	4.7	9.3
4-Mar	7.0	5.7	3.8	3.1	2.9	3.0	4.6	4.1	4.4	4.6	3.2	4.1	3.8	3.7	3.4	2.7	3.0	3.3	3.4	5.2	3.1	2.5	2.4	2.4	3.7	7.0
5-Mar	2.6	3.4	3.3	3.3	3.9	4.0	4.0	3.9	3.8	4.0	4.0	3.6	4.1	4.3	3.9	3.7	3.0	3.4	4.4	8.5	8.4	24.2	27.4	6.7	6.1	27.4
6-Mar	6.9	7.2	5.2	6.3	6.0	4.8	4.1	4.4	6.7	3.4	3.0	2.9	2.5	2.3	2.4	2.3	2.5	2.3	2.3	2.6	2.5	2.2	2.1	2.3	3.7	7.2
7-Mar	2.4	2.5	2.4	2.2	2.3	2.2	2.6	2.5	2.6	2.8	3.2	3.3	3.3	3.1	2.5	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.4	3.3
8-Mar	2.5	2.9	2.6	2.6	2.4	2.4	2.8	3.0	2.7	2.9	2.9	2.8	2.8	2.6	2.5	2.5	3.1	2.9	2.5	2.1	2.6	2.4	2.4	2.3	2.6	3.1
9-Mar	2.4	2.1	2.3	2.4	2.2	2.4	2.5	3.0	2.7	2.8	3.0	3.0	2.7	2.7	2.9	2.9	3.0	3.0	3.0	2.9	2.7	2.9	3.0	3.0	2.7	3.0
10-Mar	2.7	3.0	3.1	3.1	3.4	3.2	3.3	3.4	4.3	4.1	3.9	3.9	3.8	3.8	3.7	3.5	3.3	3.2	3.1	2.9	2.9	3.1	3.2	3.0	3.4	4.3
11-Mar	2.9	2.9	3.2	2.8	2.9	2.8	2.7	3.1	2.8	2.8	2.9	3.0	3.0	3.1	3.2	3.1	2.5	3.0	2.8	3.0	2.9	2.6	2.8	3.1	2.9	3.2
12-Mar	3.7	3.5	5.9	3.9	4.2	5.3	4.6	4.6	4.2	4.2	4.1	4.2	4.0	4.0	3.8	3.9	3.9	4.5	5.0	5.5	5.5	5.3	5.0	4.6	4.5	5.9
13-Mar	4.8	4.9	4.8	4.7	4.7	4.8	5.1	5.3	6.0	5.7	4.5	4.3	3.7	3.6	3.5	3.4	3.5	3.4	3.4	3.5	3.2	3.0	2.8	2.8	4.1	6.0
14-Mar	2.5	2.4	2.4	2.5	2.4	2.5	2.7	2.7	2.7	2.6	2.6	2.6	3.0	3.8	3.6	3.5	4.2	5.4	5.3	5.0	4.6	3.8	3.6	4.1	3.4	5.4
15-Mar	4.1	3.9	3.7	4.0	4.3	5.0	5.3	5.3	5.5	5.3	5.1	4.7	5.0	5.2	5.3	5.0	4.6	4.5	4.0	4.2	4.4	5.2	5.0	4.6	4.7	5.5
16-Mar	3.9	3.3	3.3	3.3	3.6	3.3	3.4	3.4	3.5	3.5	3.7	3.5	3.5	3.6	3.8	4.1	3.8	4.0	3.9	4.4	3.4	3.4	3.5	3.6	3.6	4.4
17-Mar	3.7	3.7	3.9	3.8	4.4	4.4	3.7	3.1	3.8	4.2	3.7	3.6	3.7	3.7	4.0	4.4	4.5	4.3	6.3	53.9	5.4	3.7	3.8	3.7	6.1	53.9
18-Mar	3.8	7.2	6.3	7.2	7.7	5.3	4.9	5.6	5.6	6.0	5.1	4.3	3.8	3.3	3.7	3.7	3.2	2.8	3.3	3.2	3.1	3.2	3.4	3.1	4.5	7.7
19-Mar	3.6	3.7	2.6	2.5	2.9	3.2	3.5	3.6	3.6	3.6	3.6	3.6	3.7	3.5	3.6	3.8	3.8	3.9	4.0	4.1	4.3	4.2	3.8	3.6	3.6	4.3
20-Mar	3.3	3.2	2.8	3.0	3.2	2.9	2.9	3.0	3.1	3.3	3.2	3.3	3.3	3.5	3.8	3.9	4.1	4.2	4.2	4.3	4.4	4.9	4.3	4.1	3.6	4.9
21-Mar	4.4	5.3	6.5	6.2	5.6	4.6	5.6	6.5	6.1	7.5	6.7	4.2	5.0	5.7	5.6	5.4	5.0	4.6	4.7	4.2	4.0	3.7	3.5	3.3	5.2	7.5
22-Mar	3.4	3.4	6.3	4.4	3.6	4.1	4.4	4.0	4.3	4.8	5.2	5.5	5.6	5.4	5.6	5.6	5.5	5.6	7.3	13.1	9.5	7.6	7.2	7.9	5.8	13.1
23-Mar	8.7	9.6	9.9	8.8	8.5	8.8	8.5	8.5	6.2	5.0	4.6	4.8	6.2	5.5	5.2	5.1	4.6	4.3	4.1	4.0	4.1	4.1	4.7	4.7	6.2	9.9
24-Mar	5.0	6.7	6.7	8.6	21.7	21.9	12.1	11.2	9.5	7.5	5.1	4.1	4.0	4.0	4.1	4.1	3.8	3.7	3.7	3.7	4.3	4.2	4.1	3.8	7.0	21.9
25-Mar	3.8	4.0	4.5	3.8	3.8	3.8	4.0	5.6	5.0	5.7	22.3	13.9	9.7	7.8	6.7	6.5	6.1	4.6	3.6	3.4	3.8	4.0	4.1	4.1	6.0	22.3
26-Mar	6.2	11.5	13.8	14.4	14.9	6.6	3.3	3.4	3.6	3.5	3.3	3.2	3.2	3.1	3.1	2.9	2.7	3.1	3.8	9.0	9.1	7.8	9.8	12.1	6.6	14.9
27-Mar	14.5	15.0	13.8	13.4	12.1	12.2	10.2	10.2	9.4	15.6	14.3	5.9	4.6	4.2	4.5	4.9	4.9	5.0	8.6	7.7	6.1	5.4	5.0	5.0	8.9	15.6
28-Mar	5.1	4.9	5.5	6.0	5.1	6.6	6.1	7.0	5.9	4.2	4.5	4.9	4.7	4.6	4.7	4.9	5.1	4.6	4.8	4.2	4.4	4.0	3.2	2.5	4.9	7.0
29-Mar	2.6	3.0	2.9	3.2	4.6	9.3	12.3	14.7	10.4	5.7	3.9	6.2	7.7	8.7	9.3	3.8	2.4	2.7	2.6	3.0	2.1	1.4	1.4	1.6	5.2	14.7
30-Mar	2.1	2.4	2.9	3.1	2.7	2.6	C	C	2.3	2.0	2.4	2.2	1.9	1.6	1.4	1.3	1.4	1.3	1.2	1.3	1.5	1.7	2.3	2.0	2.0	3.1
31-Mar	1.8	2.1	2.3	2.0	1.9	1.8	2.1	2.9	3.4	4.3	5.5	6.6	6.1	6.5	6.2	6.3	5.8	5.3	4.5	4.4	4.4	4.3	4.2	3.6	4.1	6.6
	4.2	4.7	4.8	4.7	5.1	5.0	4.9	5.1	4.9	4.7	4.9	4.3	4.2	4.1	4.1	3.9	3.7	3.8	4.0	6.1	4.2	4.6	4.7	4.0	Diurnal Average	
	14.5	15.0	13.8	14.4	21.7	21.9	12.3	14.7	10.4	15.6	22.3	13.9	9.7	8.7	9.3	6.5	6.1	5.8	8.6	53.9	9.5	24.2	27.4	12.1	Diurnal Maximum	

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Anzac - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	593	79.92	79.92
6 - 15	142	19.14	99.06
16 - 25	5	0.67	99.73
26 - 80	2	0.27	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Anzac - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	29	15	17	27	52	132	89	25	7	10	7	17	38	34	50	42	591
6 - 15	2	0	1	3	5	11	20	8	6	6	7	4	31	12	15	10	141
16 - 25	0	0	0	0	0	0	0	1	0	0	0	0	3	1	0	0	5
26 - 80	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	15	18	30	57	143	109	35	14	16	14	21	72	47	65	52	739

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Anzac

Total Number of Valid Hours: 739

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C

Anzac - March 2023

Maximum Value: 9.5 C on Mar 17 15:00

Maximum Daily Average: 0.4 C on Mar 18

Minimum Value: -29.2 C on Mar 6 07:00

Minimum Daily Average: -22.0 C on Mar 5

Maximum Diurnal Average: -4.5 C at hour 16

Minimum Diurnal Average: -14.9 C at hour 7

Monthly Average: -9.78 C

Percentiles: P_1 = -26.1 P_{10} = -18.2 Q_1 = -14.2 Median = -9.5 Q_3 = -5.5 P_{90} = -1.2 P_{99} = 7.9

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-22.6	-18.9	-19.1	-19.2	-18.7	-18.1	-18.2	-18.2	-16.8	-14.7	-12.6	-10.3	-9.8	-9.5	-8.7	-7.6	-7.7	-8.3	-9.5	-9.3	-8.5	-8.5	-8.7	-8.8	-13.0	-7.6
2-Mar	-8.6	-8.7	-8.9	-9.0	-9.0	-8.0	-7.3	-6.9	-5.3	-2.3	-0.1	1.1	2.7	3.9	3.5	3.0	2.9	1.4	0.8	0.2	0.0	-0.2	-0.7	-0.9	-2.3	3.9
3-Mar	-1.3	-1.7	-2.2	-2.8	-3.1	-3.6	-5.0	-6.5	-7.7	-8.3	-8.6	-8.4	-7.8	-8.1	-7.9	-8.2	-8.9	-9.7	-10.4	-11.4	-11.8	-12.8	-13.4	-13.0	-7.6	-1.3
4-Mar	-13.8	-15.0	-15.9	-16.7	-17.0	-17.1	-17.2	-17.2	-17.0	-17.0	-17.0	-16.3	-15.4	-14.9	-14.5	-14.6	-14.9	-15.6	-16.8	-17.6	-19.1	-20.3	-21.2	-21.2	-16.8	-13.8
5-Mar	-22.0	-23.0	-24.2	-24.8	-27.3	-27.1	-26.4	-25.3	-22.3	-20.9	-20.2	-18.9	-18.2	-17.2	-16.3	-16.3	-16.3	-17.6	-21.4	-23.8	-24.2	-24.6	-25.2	-24.8	-22.0	-16.3
6-Mar	-24.1	-25.2	-25.8	-26.3	-26.5	-28.3	-29.2	-28.0	-22.8	-19.6	-16.7	-14.2	-12.0	-11.1	-11.3	-11.4	-11.3	-11.7	-12.3	-13.0	-13.6	-13.7	-13.6	-13.5	-18.1	-11.1
7-Mar	-13.5	-13.8	-13.9	-14.0	-13.9	-14.2	-14.6	-15.0	-15.1	-14.2	-12.8	-11.9	-10.7	-8.9	-7.9	-6.6	-5.9	-6.7	-7.6	-8.0	-8.7	-9.3	-10.0	-11.0	-11.2	-5.9
8-Mar	-11.8	-12.5	-13.7	-14.7	-15.5	-16.4	-16.4	-16.2	-16.0	-14.7	-13.2	-11.5	-9.9	-8.2	-7.4	-7.3	-8.0	-9.0	-11.0	-12.6	-13.7	-14.6	-15.4	-15.9	-12.7	-7.3
9-Mar	-16.5	-17.2	-17.7	-18.2	-18.6	-19.5	-20.4	-19.7	-18.2	-16.2	-14.4	-12.9	-11.8	-10.0	-8.2	-7.4	-7.4	-8.0	-8.5	-9.0	-9.9	-10.6	-11.2	-11.5	-13.5	-7.4
10-Mar	-12.0	-12.3	-12.3	-12.5	-12.7	-12.8	-13.0	-13.0	-12.0	-11.5	-11.2	-9.7	-8.2	-7.4	-6.6	-6.5	-6.2	-6.8	-7.7	-8.3	-8.7	-7.9	-8.2	-9.7	-9.9	-6.2
11-Mar	-10.2	-11.1	-11.1	-12.3	-13.5	-13.8	-14.6	-14.4	-12.5	-10.8	-9.2	-7.4	-6.5	-5.5	-4.6	-4.4	-3.8	-4.2	-5.6	-6.4	-6.7	-7.5	-8.1	-8.6	-8.9	-3.8
12-Mar	-8.6	-9.0	-8.1	-8.6	-9.8	-11.8	-12.5	-12.9	-12.6	-11.3	-10.9	-9.9	-8.8	-8.4	-8.0	-7.9	-8.3	-9.2	-10.4	-11.3	-12.1	-12.6	-13.0	-13.3	-10.4	-7.9
13-Mar	-13.5	-13.7	-13.7	-13.7	-13.8	-13.9	-14.2	-14.3	-13.4	-12.0	-10.5	-9.0	-7.1	-6.0	-4.9	-5.0	-5.8	-5.9	-6.1	-6.8	-7.0	-7.2	-7.4	-7.7	-9.7	-4.9
14-Mar	-7.8	-7.9	-7.9	-8.1	-8.6	-9.3	-10.0	-10.4	-10.4	-10.2	-9.7	-9.3	-9.2	-9.1	-9.1	-9.2	-9.7	-10.6	-12.0	-12.7	-13.0	-13.3	-13.7	-14.8	-10.2	-7.8
15-Mar	-16.6	-17.6	-18.7	-20.7	-21.1	-19.0	-18.6	-18.1	-16.4	-14.8	-13.6	-12.3	-10.7	-9.7	-9.2	-8.8	-8.4	-8.1	-11.9	-16.3	-17.9	-19.1	-17.8	-14.9	-15.0	-8.1
16-Mar	-14.7	-15.6	-15.5	-15.9	-15.9	-15.3	-15.3	-14.9	-14.1	-12.8	-11.2	-8.3	-6.5	-4.6	-3.4	-3.7	-3.7	-4.2	-6.2	-7.7	-8.3	-9.5	-9.7	-10.2	-10.3	-3.4
17-Mar	-11.6	-12.9	-12.6	-14.3	-15.4	-15.1	-12.0	-6.7	-4.4	-2.4	0.1	2.8	4.7	7.9	9.5	9.1	9.4	8.9	5.6	2.1	1.5	2.5	2.6	1.8	-1.6	9.5
18-Mar	0.8	-0.6	-1.4	-2.0	-3.1	-7.1	-10.7	-7.5	0.5	3.0	4.1	5.7	7.0	7.0	7.8	8.2	8.2	8.0	4.2	-1.1	-3.2	-5.0	-6.3	-7.6	0.4	8.2
19-Mar	-9.1	-9.8	-9.6	-8.4	-6.7	-8.0	-7.9	-7.1	-6.3	-5.7	-4.2	-3.0	-2.3	-1.4	-0.7	-0.5	-1.2	-2.3	-3.4	-4.3	-5.6	-6.2	-6.8	-6.7	-5.3	-0.5
20-Mar	-6.4	-6.5	-7.4	-8.4	-9.3	-10.0	-10.6	-10.7	-9.6	-8.7	-7.4	-7.8	-8.3	-8.0	-7.1	-7.3	-7.0	-6.9	-7.6	-12.0	-13.3	-14.7	-14.7	-17.8	-9.5	-6.4
21-Mar	-16.7	-14.0	-13.1	-13.3	-14.0	-15.2	-14.4	-13.8	-13.0	-11.9	-10.5	-9.4	-8.4	-6.9	-6.6	-5.9	-5.2	-5.9	-7.8	-9.7	-9.2	-10.7	-11.1	-11.5	-10.8	-5.2
22-Mar	-11.7	-12.3	-13.4	-14.1	-14.1	-14.8	-13.3	-11.8	-9.4	-7.1	-5.5	-3.3	-0.9	1.2	2.8	3.6	3.7	4.0	1.5	-1.3	-1.8	-5.1	-4.9	-5.8	-5.6	4.0
23-Mar	-5.2	-3.8	-4.4	-6.5	-7.6	-6.2	-6.6	-5.2	-0.5	1.7	2.1	2.5	2.0	2.1	1.7	0.7	-0.8	-2.6	-5.3	-7.1	-8.8	-11.3	-12.6	-14.3	-4.0	2.5
24-Mar	-13.5	-14.9	-16.6	-17.8	-16.6	-16.0	-18.2	-13.3	-10.4	-8.5	-7.1	-5.9	-5.6	-4.9	-4.3	-3.8	-3.5	-3.6	-5.3	-9.4	-11.8	-11.7	-13.8	-14.0	-10.4	-3.5
25-Mar	-14.1	-17.0	-16.0	-13.8	-14.3	-17.6	-18.0	-13.5	-7.6	-6.6	-5.8	-4.2	-2.8	-2.6	-2.5	-2.3	-2.3	-2.8	-4.5	-6.6	-8.3	-10.1	-11.9	-13.7	-9.1	-2.3
26-Mar	-16.9	-18.5	-20.3	-21.5	-22.5	-20.5	-22.0	-19.8	-18.8	-16.4	-15.5	-14.0	-12.7	-11.4	-10.7	-9.7	-9.9	-10.4	-11.6	-14.8	-16.6	-18.2	-17.9	-21.1	-16.3	-9.7
27-Mar	-23.3	-22.8	-23.5	-22.5	-22.2	-22.8	-20.5	-17.7	-15.6	-14.2	-12.6	-11.0	-9.9	-9.0	-8.4	-7.5	-7.1	-7.4	-8.5	-10.8	-13.8	-14.3	-15.8	-18.3	-15.0	-7.1
28-Mar	-20.6	-21.6	-23.4	-24.0	-24.0	-24.6	-23.9	-19.0	-14.2	-10.7	-8.8	-6.9	-5.2	-3.3	-2.1	-1.9	-2.5	-2.4	-3.1	-4.8	-6.1	-4.9	-3.3	-2.5	-11.0	-1.9
29-Mar	-3.1	-2.2	-2.0	-1.9	-3.1	-5.1	-6.4	-4.8	-3.1	-1.7	-1.3	-1.4	-1.1	-1.2	-1.2	-1.1	-1.2	-2.0	-3.0	-3.9	-4.6	-6.4	-9.7	-12.7	-3.5	-1.1
30-Mar	-13.7	-14.7	-15.6	-15.9	-17.0	-17.0	-16.1	-11.4	-7.0	-4.8	-4.3	-3.2	-2.9	-2.2	-1.6	-1.3	-1.2	-1.6	-2.2	-3.1	-3.8	-4.1	-4.6	-5.0	-7.3	-1.2
31-Mar	-4.6	-5.2	-6.2	-6.7	-7.7	-8.1	-8.4	-6.2	-4.9	-2.5	-1.5	-0.5	0.3	0.6	1.7	2.1	2.6	2.3	0.9	-0.5	-1.5	-2.4	-3.1	-3.9	-2.6	2.6
	-12.5	-12.9	-13.4	-13.8	-14.3	-14.7	-14.9	-13.5	-11.5	-9.9	-8.7	-7.4	-6.3	-5.4	-4.7	-4.5	-4.6	-5.1	-6.7	-8.4	-9.4	-10.1	-10.7	-11.4	Diurnal Average	
	0.8	-0.6	-1.4	-1.9	-3.1	-3.6	-5.0	-4.8	0.5	3.0	4.1	5.7	7.0	7.9	9.5	9.1	9.4	8.9	5.6	2.1	1.5	2.5	2.6	1.8	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Anzac - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	53	7.12	7.12
-20 - 0	636	85.48	92.61
0 - 10	55	7.39	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Anzac - March 2023

Maximum Value: 92.9 % on Mar 19 03:00

Maximum Daily Average: 85.9 % on Mar 14

Minimum Value: 27.8 % on Mar 18 17:00

Minimum Daily Average: 45.7 % on Mar 18

Maximum Diurnal Average: 80.2 % at hour 7

Minimum Diurnal Average: 53.9 % at hour 16

Monthly Average: 67.85 %

Percentiles: P_1 = 29.5 P_{10} = 43.0 Q_1 = 57.8 Median = 70.4 Q_3 = 81.1 P_{90} = 86.4 P_{99} = 90.8

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	81.7	82.9	82.4	82.7	82.6	82.5	82.4	82.7	80.1	75.6	72.2	66.6	65.1	65.4	66.2	65.4	66.9	70.2	75.4	77.5	77.1	77.3	77.5	77.6	75.7	82.9
2-Mar	79.9	86.1	87.1	86.6	83.7	81.2	82.2	81.9	74.8	72.9	65.4	62.6	58.8	52.4	55.5	68.1	65.3	70.5	75.3	81.5	80.3	79.9	83.1	79.3	74.8	87.1
3-Mar	81.4	83.8	76.7	71.8	71.4	72.2	78.0	81.4	83.3	80.8	76.1	74.1	70.8	69.6	69.1	70.5	71.9	71.7	77.1	81.0	81.8	86.1	88.9	87.2	77.4	88.9
4-Mar	86.2	85.0	82.4	78.1	80.0	79.8	80.6	81.0	79.6	76.8	71.4	63.4	59.9	60.8	60.0	59.9	57.8	58.5	62.2	67.4	71.8	75.6	78.9	78.1	72.3	86.2
5-Mar	79.3	78.9	80.0	78.7	77.3	78.1	77.8	76.8	74.6	71.3	66.2	60.9	57.8	55.7	52.1	51.8	50.5	52.9	64.3	73.5	75.3	74.7	74.6	76.1	69.1	80.0
6-Mar	75.2	75.0	76.2	76.3	76.2	74.6	75.5	75.5	69.7	63.3	60.4	55.8	62.7	63.7	63.6	64.2	69.2	75.1	76.0	78.3	73.8	72.3	67.4	63.9	70.2	78.3
7-Mar	62.1	67.9	68.3	63.8	61.2	67.1	71.4	73.5	71.3	64.7	61.4	60.7	58.4	53.4	50.1	48.3	44.7	47.3	46.6	45.3	45.4	45.6	46.6	48.0	57.2	73.5
8-Mar	50.3	52.1	54.3	56.8	59.1	62.0	62.2	61.7	60.9	56.4	51.8	47.0	43.2	39.1	36.1	35.9	37.9	39.3	41.0	44.2	49.4	52.0	54.9	56.4	50.2	62.2
9-Mar	57.7	59.5	61.0	62.2	63.6	66.1	68.8	67.2	60.6	55.1	53.2	52.3	50.6	47.0	46.3	47.7	49.9	52.6	57.7	62.7	61.9	65.3	69.1	68.5	58.6	69.1
10-Mar	73.4	79.9	81.5	81.2	81.4	81.9	82.6	81.7	76.2	71.7	71.6	67.1	63.7	61.6	59.6	62.4	62.1	65.3	68.1	68.7	70.4	65.5	66.2	72.3	71.5	82.6
11-Mar	70.1	70.5	68.8	72.1	75.2	76.1	77.7	78.2	72.4	71.5	68.5	65.3	64.0	61.8	59.0	58.6	57.8	59.0	60.6	59.4	59.5	62.3	71.2	80.5	67.5	80.5
12-Mar	82.4	83.3	82.9	83.9	88.2	89.1	88.1	86.4	83.1	75.5	73.1	71.8	69.9	72.0	72.7	72.7	74.6	77.6	80.2	84.0	85.9	86.1	86.2	86.5	80.7	89.1
13-Mar	86.3	86.2	86.1	85.9	86.2	86.3	86.5	86.3	84.5	80.5	78.2	71.9	65.6	64.4	61.8	64.4	71.5	71.8	71.3	85.5	88.7	88.5	88.1	89.7	79.8	89.7
14-Mar	89.5	91.1	91.5	91.3	91.5	90.9	90.2	89.4	88.1	85.9	83.1	81.1	80.5	80.9	79.4	77.8	79.6	82.3	85.1	86.9	86.0	85.7	86.3	86.4	85.9	91.5
15-Mar	86.9	85.5	85.2	83.4	84.7	86.8	85.7	84.2	81.7	79.5	77.4	71.9	66.3	62.4	61.8	61.0	59.9	59.2	71.6	85.4	85.6	84.6	86.3	86.0	77.6	86.9
16-Mar	86.7	85.8	85.7	85.0	84.4	84.3	84.1	83.6	80.9	77.0	72.0	65.4	65.3	64.9	65.5	63.9	60.4	61.0	66.9	73.4	80.5	87.6	88.9	88.0	76.7	88.9
17-Mar	90.6	90.6	90.0	89.5	89.2	89.3	90.5	78.9	65.0	58.5	54.7	49.4	46.4	40.6	31.2	29.1	28.0	28.6	34.8	43.4	43.3	37.5	33.1	33.5	56.9	90.6
18-Mar	36.1	38.4	39.9	41.0	45.7	57.6	73.1	65.4	40.2	36.2	36.0	33.9	32.4	31.2	28.2	27.8	27.8	28.5	39.3	57.8	65.3	68.3	71.1	76.1	45.7	76.1
19-Mar	85.2	90.9	92.9	90.9	85.0	88.4	88.9	84.3	76.5	72.9	68.1	63.7	62.2	60.2	59.6	59.4	62.4	66.9	71.6	76.2	81.9	82.5	82.8	82.4	76.5	92.9
20-Mar	79.7	76.8	74.4	75.0	78.0	78.9	76.7	77.9	74.8	73.4	68.6	79.3	86.3	86.9	84.1	83.7	82.5	81.1	81.1	89.8	89.4	88.2	89.1	86.0	80.9	89.8
21-Mar	88.1	88.0	86.1	85.1	85.0	85.8	86.9	89.7	86.3	81.2	77.3	75.2	70.7	64.4	63.3	62.4	60.3	61.7	67.4	75.1	77.6	86.9	88.4	88.0	78.4	89.7
22-Mar	87.9	87.4	87.8	86.9	85.6	85.2	84.0	80.9	74.6	69.0	63.6	59.1	53.0	47.1	42.5	40.7	41.3	40.8	47.3	54.5	55.6	65.5	68.7	68.7	65.7	87.9
23-Mar	69.6	63.8	65.0	72.7	77.6	74.4	76.1	69.9	58.7	55.6	52.6	51.7	50.9	48.5	51.3	52.6	56.7	60.0	68.0	72.7	78.0	85.1	90.4	89.1	66.3	90.4
24-Mar	88.6	88.0	87.2	87.1	88.7	86.8	85.4	88.3	82.8	74.8	68.0	58.9	53.6	49.4	45.7	41.9	37.8	35.4	39.1	53.3	61.3	59.8	68.3	70.9	66.7	88.7
25-Mar	71.6	78.7	80.4	73.5	71.4	81.6	82.2	67.5	51.0	50.9	55.7	48.7	42.8	39.5	39.0	37.9	36.7	35.6	35.3	35.1	39.2	47.8	56.9	67.4	55.3	82.2
26-Mar	77.5	82.6	83.9	81.3	81.1	80.1	77.0	68.6	59.4	50.2	47.1	44.1	41.3	37.6	36.2	33.6	33.6	35.1	39.4	52.3	63.0	67.4	63.2	71.6	58.6	83.9
27-Mar	77.3	76.6	77.3	76.0	75.6	76.5	73.3	64.3	55.9	51.1	44.7	41.0	39.6	39.7	39.1	38.4	37.5	38.2	41.1	46.3	56.3	56.8	63.4	69.8	56.5	77.3
28-Mar	74.7	78.2	79.3	79.3	80.2	77.4	78.0	69.9	55.8	42.6	40.2	34.4	33.1	32.4	29.9	29.2	31.1	31.9	35.2	40.9	45.1	42.7	52.4	55.7	52.1	80.2
29-Mar	55.4	57.9	64.4	57.6	55.9	60.3	65.7	62.6	69.7	67.7	67.1	68.4	69.2	70.1	69.6	64.7	63.3	65.4	64.3	66.2	68.2	69.9	80.9	89.1	66.4	89.1
30-Mar	88.2	89.4	87.1	86.1	84.7	85.4	84.4	83.9	73.9	63.5	59.1	53.3	47.1	45.4	43.6	42.9	44.3	43.8	44.3	48.0	51.3	53.5	55.9	57.1	63.2	89.4
31-Mar	54.5	67.8	82.6	85.2	88.8	87.6	89.2	83.2	78.9	68.8	65.5	62.2	59.8	58.9	55.3	53.7	50.9	52.4	57.6	61.9	65.6	71.5	75.6	78.2	69.0	89.2
	75.9	77.7	78.3	77.6	78.0	79.2	80.2	77.6	71.8	66.9	63.6	60.0	57.8	55.7	54.1	53.9	54.0	55.5	59.5	65.4	68.2	70.1	72.7	74.5	Diurnal Average	
	90.6	91.1	92.9	91.3	91.5	90.9	90.5	89.7	88.1	85.9	83.1	81.1	86.3	86.9	84.1	83.7	82.5	82.3	85.1	89.8	89.4	88.5	90.4	89.7	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Anzac - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	57	7.66	7.66
40 - 60	158	21.24	28.90
60 - 80	320	43.01	71.91
80 - 100	209	28.09	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Anzac - March 2023

Maximum Value: 1.9 % on Mar 17 08:00

Maximum Daily Average: 0.6 % on Mar 17

Minimum Value: 0.0 % on Mar 1 12:00

Minimum Daily Average: 0.0 % on Mar 2

Maximum Diurnal Average: 0.4 % at hour 7

Minimum Diurnal Average: 0.0 % at hour 12

Monthly Average: 0.12 %

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.5 P_{99} = 1.5

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.6	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.0	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0
2-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
5-Mar	0.0	0.1	0.3	0.4	0.5	0.7	0.9	1.0	0.9	0.8	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	0.0	0.3	1.0
6-Mar	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
7-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.3	0.4	0.4	0.4	0.5	0.4	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	0.0	0.1	0.3	0.4	0.4	0.2	0.5
16-Mar	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.2	0.6
17-Mar	0.8	1.1	1.4	1.6	1.7	1.8	1.9	1.9	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.9
18-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.3	0.4	0.6	0.9	1.0	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	0.2	1.0
20-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.6	0.8	0.1	0.8
21-Mar	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.7	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	0.2	0.3	0.9
22-Mar	0.5	0.8	1.0	1.2	1.4	1.5	1.6	1.6	1.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.6
23-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.4
24-Mar	0.5	0.7	1.0	1.2	1.3	1.4	1.4	1.5	1.4	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	0.0	0.5	1.5
25-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
28-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.1	0.3	0.5	0.7	0.8	0.9	1.0	0.9	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	0.3	1.0
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	0.1	0.2	0.2	0.3	0.3	0.3	0.4	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	0.0	0.0	0.0	0.1	Diurnal Average	
	0.9	1.1	1.4	1.6	1.7	1.8	1.9	1.9	1.5	1.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.8	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Leaf Wetness (LW) - %

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Leaf Wetness (LW) - %

Anzac - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	646	86.83	86.83
0.4 - 0.5	27	3.63	90.46
0.6 - 0.7	19	2.55	93.01
0.8 - 1.4	42	5.65	98.66
1.5 - 10	8	1.08	99.73
> 10	0	0.00	99.73

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Anzac - March 2023

Maximum Speed: 23 km/h on Mar 23 16:00

Maximum Daily Speed Average: 14.8 km/h on Mar 9

Minimum Speed Value: 1 km/h on Mar 18 09:00

Minimum Daily Speed Average: 1.5 km/h on Mar 21

Maximum Diurnal Speed Average: 3.9 km/h at hour 16

Minimum Diurnal Speed Average: 1.8 km/h at hour 12

Monthly Average Velocity: 2.2 km/h 105.2 deg

Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 7$ Median = 10 $Q_3 = 13$ $P_{90} = 16$ $P_{99} = 20$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	SE10	SE10	SE10	ESE11	SE11	SE12	ESE11	SE14	SE13	SE11	SE11	SE13	ESE14	ESE14	ESE13	SE11	SE8	ESE9	SE10	SE14	SSE17	SSE14	SE13	SE13	SE11.8	SSE17
2-Mar	SE14	SE17	SE17	SE16	SE16	SSE13	SE10	SE11	S11	SW14	SW19	SW21	WSW22	WSW21	WSW17	W16	W14	W19	W17	W20	W20	WSW20	WSW16	W19	SW10.6	WSW22
3-Mar	W17	WNW15	WNW18	WNW17	WNW16	NW15	NW17	NNW12	NNW11	NNW12	NNW10	NW9	NW9	NNW12	NNW9	NNW12	NNW10	NW9	NW9	NW9	NW9	W6	W8	WNW11	NW11.0	WNW18
4-Mar	NW12	NW11	NW10	NNW8	NW7	WNW8	WNW6	W7	NW11	NNW11	NNW13	NW20	NW18	NW18	NW18	NW22	NW22	NW17	NW11	NNW11	N13	N11	NNW11	NW11	NW12.3	NW22
5-Mar	NW11	WNW9	NW10	NW8	W7	WSW9	W9	W7	W8	WNW10	WNW11	W10	NW12	NW10	WNW6	N8	N7	NNE6	SE3	SE5	SE8	SSE10	SSE9	SSE12	WNW4.0	NW12
6-Mar	SE12	SE10	SE10	SE10	SE8	SE7	SE8	SE7	ESE7	E6	E8	E10	ESE13	SE16	SE17	SE16	ESE12	ESE13	ESE10	E12	ESE13	ESE14	ESE14	ESE14	ESE10.7	SE17
7-Mar	ESE15	ESE14	ESE15	ESE15	SE13	SE14	ESE11	ESE12	ESE14	ESE14	SE16	ESE15	ESE15	ESE15	ESE16	ESE17	ESE16	ESE14	ESE14	ESE16	ESE16	ESE16	ESE15	ESE14	ESE14.5	ESE17
8-Mar	ESE13	ESE13	ESE13	ESE15	ESE11	ESE11	ESE12	ESE11	E8	E11	E11	ESE12	E13	ESE14	E15	E15	E15	E13	E11	E10	ESE10	SE12	SE11	SE12	ESE11.7	E15
9-Mar	SE12	SE14	SE13	SE13	SE11	SE10	SE10	SE13	SE11	SE11	ESE15	ESE17	SE19	SE18	SE18	SE17	SE20	SE16	SE17	SE15	ESE13	ESE14	ESE19	SE20	SE14.8	SE20
10-Mar	SE19	SE18	SE16	ESE18	ESE16	ESE16	ESE15	ESE14	ESE15	ESE19	ESE16	ESE16	ESE16	ESE16	E17	ESE14	E14	E13	E12	E10	E9	SE13	ESE11	ESE11	ESE14.5	ESE19
11-Mar	ESE12	ESE10	ESE9	ESE8	ESE6	E7	ESE8	SE9	SE12	SE14	SE11	ESE11	ESE13	ESE14	ESE13	E13	ESE10	ESE8	ENE8	E10	E10	ESE10	ESE8	ESE8	ESE9.7	SE14
12-Mar	SE5	S6	S7	SW4	W4	NW4	W3	W6	W6	W4	N5	N7	NNW7	NNW7	NNW9	NNW8	NNW9	NW9	NW9	WNW8	WNW8	WNW8	W8	WNW7	WNW4.5	NNW9
13-Mar	W7	W6	W5	W4	WNW4	NW4	NW4	NW3	NNW2	NE4	E9	E10	E12	ENE16	ENE16	ENE18	NE17	ENE16	E17	ENE13	ENE13	ENE14	ENE15	NE15	ENE7.2	ENE18
14-Mar	ENE14	NE14	NE14	NE14	NE12	NE11	NE11	NE10	NE7	NNE6	NNE7	N10	NNW10	NW14	NW14	WNW14	WNW14	WNW12	NW13	WNW12	WNW13	NW12	NW10	WNW7	N7.6	WNW14
15-Mar	W7	W6	W7	W7	W7	WNW7	W6	WNW5	W5	WSW5	WSW7	W8	WNW5	NW6	NNW8	NNW7	NW5	NW3	UO	UO	SSE4	SSE6	SSE8	ESE10	W3.6	ESE10
16-Mar	ESE9	ESE10	ESE9	SE12	SE13	ESE9	ESE8	ESE9	ESE9	ESE7	ESE3	SSE2	SSW3	SW5	S3	SSE8	SE6	ESE6	ESE7	SE11	SE13	SE11	SE12	SE12	SE7.6	SE13
17-Mar	SE10	SE6	SE9	SE5	SSE8	SSE7	SSW8	S10	SSE6	SE7	SE6	SE7	ESE7	SE6	WSW8	WSW13	WSW12	SSW11	SSW8	S10	SSW12	SSW16	SSW18	SW14	S7.0	SSW18
18-Mar	SW12	SW9	SW9	SSW9	SSW10	S2	S6	S4	NNW1	W6	W8	W8	WNW9	NNW11	NW12	NW11	NW11	NW7	WNW6	WNW6	NW5	N5	NNE6	NNE6	W4.3	SW12
19-Mar	N4	NNE4	ENE7	E8	E9	ESE10	ESE12	ESE12	ESE13	ESE15	E14	ESE13	E13	E15	E15	ESE14	ESE14	ESE12	ESE10	ESE14	ESE14	ESE12	ESE12	ESE10	ESE11.1	E15
20-Mar	ESE12	ESE13	ESE14	ESE13	ESE11	E13	E14	E12	ESE13	E11	ENE6	NE8	N9	NNE7	NNE8	NNW9	NNE7	NNE7	NNE6	NNW7	NNW8	NNW8	NNW6	NW6	ENE5.8	E14
21-Mar	WNW6	W7	W9	W8	W8	W9	W9	WNW9	WNW7	WNW5	NNW4	N5	WNW1	SW3	NNW2	NE6	E5	SE7	SE6	SE9	SE12	SE12	SE13	SE14	SSW1.5	SE14
22-Mar	SE16	SE13	SE12	SE11	SE12	ESE10	ESE12	ESE13	SE13	ESE13	ESE14	ESE16	ESE15	ESE14	ESE12	ESE12	E11	ESE10	SSE8	SSE8	SSE8	S6	SSW7	S8	SE10.7	ESE16
23-Mar	S8	SSW9	SSE1	NNW5	WSW7	W9	SW7	SW7	W11	W15	W15	NW15	NNW19	NNW19	NNW18	NW23	NNW20	NNW20	N14	N14	N10	NW8	NW8	NW7	NW8.9	NW23
24-Mar	W5	W7	W6	W6	W6	W7	W8	W9	W8	W6	WNW6	WNW6	NNW8	N10	NNW10	N9	N7	N6	NE4	SE3	SSE6	S7	SSE7	SSE9	WNW3.1	NNW10
25-Mar	SSE9	S6	SSW5	SSW7	SSW7	NNW4	NW6	NW7	WNW10	W10	W9	W9	W9	NW13	NW16	NW18	NW16	NNW13	NNW11	NNW12	NNW12	NNW13	NNW13	NW9	NW7.3	NW18
26-Mar	WNW7	WSW6	W6	NNW5	N5	E8	E7	E9	ESE7	ESE4	NE6	NE8	ENE10	NNE7	N8	NNE8	N9	NNW7	NNW6	NW6	WSW6	WSW8	W12	W7	N2.5	W12
27-Mar	W9	W9	W9	WNW10	W10	W9	W12	WNW11	W8	WNW7	WNW6	N4	N6	NNW10	N11	N10	N7	ENE8	ESE6	ESE8	ESE8	SE9	SSE9	SE6	WNW2.9	W12
28-Mar	NE7	NE7	E1	SW4	WSW2	UO	ESE3	SE5	SE7	SSE8	ESE7	SSE5	SE6	SSE4	SSE5	SSE7	SE8	SE7	SSE5	SE5	SSE6	SSE8	SSE7	SSE7	SE4.7	SSE8
29-Mar	SSE6	W8	W8	WNW12	NW12	NW9	WNW6	WNW7	WNW10	W8	NW14	NW15	NW18	NW18	NNW16	NNW16	N15	N13	N13	N10	N11	NNE7	NNE3	W3	NW8.8	NW18
30-Mar	WSW4	WSW5	WSW5	SW5	SW5	SSW4	SW3	S2	ENE5	E5	ENE7	ENE8	ENE11	ENE13	ENE11	ENE11	ENE11	ENE12	ENE11	E8	E9	SE11	ESE10	ESE9	E4.9	ENE13
31-Mar	ESE11	ESE11	ESE9	ESE8	E8	E10	E9	ESE7	ESE8	E7	ENE8	E10	E10	E8	E9	ENE9	ENE10	ENE10	ENE12	ENE10	E10	E10	E9	E8	E8.8	ENE12
	SSE3.8	SE3.4	SSE3.0	SE2.5	SSE2.4	SE2.1	SE2.3	SE2.9	SE2.4	SE2.2	ESE2.0	E1.8	ENE2.6	NE2.9	NE3.2	NNE3.9	NNE3.8	NE3.5	ENE3.1	E2.8	ESE3.1	SE3.6	SE3.6	SE3.6	Diurnal Average	
	SE19	SE18	WNW18	ESE18	WNW16	ESE16	NW17	ESE14	ESE15	ESE19	SW19	SW21	WSW22	WSW21	NW18	NW23	NW22	NNW20	E17	W20	W20	WSW20	ESE19	SE20	Diurnal Maximum	

UO - Unstable Operation

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 17:00

Minimum Value: 1 km/h on Mar 30 05:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

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

UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Anzac - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Anzac - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	77	10.39	10.39
6 - 11	396	53.44	63.83
12 - 19	254	34.28	98.11
20 - 28	14	1.89	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Anzac - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	6	2	2	1	3	3	7	7	4	4	6	5	8	5	7	7	77
6 - 11	19	13	10	17	35	55	47	24	11	9	4	9	52	31	32	28	396
12 - 19	6	0	6	12	19	85	53	4	0	3	4	4	10	11	22	15	254
20 - 28	0	0	0	0	0	0	2	0	0	0	1	3	2	0	4	2	14
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	31	15	18	30	57	143	109	35	15	16	15	21	72	47	65	52	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Anzac

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Anzac - March 2023

Direction of Maximum Speed: 323 deg on Mar 23 16:00
Direction of Maximum Daily Speed Average: 127.2 deg on Mar 9

Direction of Minimum Speed: 334 deg on Mar 18 09:00

Direction of Minimum Daily Speed Average: 1.5 deg on Mar 21

Monthly Average Direction: 105.2 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	135	125	126	122	126	131	118	128	132	128	126	145	116	123	121	126	130	119	135	141	148	150	130	141	130.7
2-Mar	143	139	146	135	133	153	139	140	187	215	217	223	243	251	244	278	261	260	267	268	265	255	258	259	224.2
3-Mar	268	294	301	300	291	304	313	327	335	331	334	317	308	330	342	346	331	312	316	311	312	273	273	294	310.1
4-Mar	309	312	322	330	317	297	289	281	323	344	330	318	305	311	310	322	322	315	322	334	351	351	335	325	320.4
5-Mar	316	293	311	306	278	258	264	267	277	290	300	274	324	305	287	350	356	14	133	127	146	158	148	148	287.7
6-Mar	145	144	140	140	127	126	126	125	119	98	97	97	115	129	127	127	115	107	108	99	104	108	118	116	119.2
7-Mar	118	116	119	118	126	128	119	108	110	119	126	120	118	120	106	106	104	106	108	119	118	120	118	118	116.0
8-Mar	121	119	119	123	113	112	118	122	97	96	101	102	98	102	101	84	82	87	90	101	116	135	132	125	107.6
9-Mar	130	128	125	129	130	129	132	129	129	124	123	120	128	130	128	135	138	132	129	124	115	118	121	124	127.2
10-Mar	126	125	124	122	122	122	122	111	113	121	123	122	120	110	101	108	99	83	84	94	99	125	117	107	114.1
11-Mar	119	119	120	104	115	93	106	127	137	137	139	105	108	102	111	98	115	108	76	91	101	103	112	122	112.1
12-Mar	139	179	187	221	280	319	273	281	273	261	352	353	345	342	340	338	329	325	309	294	289	282	276	282	301.5
13-Mar	272	273	268	273	284	313	326	321	333	34	83	89	85	70	74	59	52	69	86	73	70	67	63	56	61.4
14-Mar	57	50	48	44	42	40	41	53	47	32	20	350	344	312	316	303	295	296	304	299	299	311	310	295	349.9
15-Mar	268	263	259	269	272	283	280	288	273	253	247	259	287	318	334	337	326	311	UO	UO	150	158	155	104	273.3
16-Mar	107	105	112	126	129	115	107	117	122	119	117	158	208	227	177	158	138	112	121	133	135	135	135	138	128.6
17-Mar	139	127	139	129	153	161	195	179	150	141	138	130	108	134	257	258	240	213	196	186	193	206	211	218	185.0
18-Mar	219	220	225	212	209	176	173	182	334	260	262	269	302	331	315	311	320	319	283	292	315	7	26	29	278.2
19-Mar	10	31	74	82	99	113	105	111	106	104	99	105	98	91	95	108	104	104	102	113	120	103	117	109	101.8
20-Mar	119	107	105	111	105	96	98	97	102	101	60	34	2	25	13	348	13	33	21	341	344	334	340	308	64.7
21-Mar	302	261	261	272	280	281	279	282	294	293	337	1	285	230	337	50	101	128	135	130	137	146	138	137	213.4
22-Mar	139	135	139	135	133	123	123	122	124	115	120	122	123	117	108	103	92	114	151	159	159	170	198	170	128.8
23-Mar	191	201	163	330	255	264	230	228	277	275	273	311	338	343	340	323	338	346	349	355	349	319	317	318	315.0
24-Mar	280	261	274	271	264	261	263	261	265	266	285	293	347	354	348	351	353	6	51	125	157	170	163	160	286.8
25-Mar	160	178	203	203	205	333	324	313	282	265	266	268	270	310	314	316	312	335	341	330	331	332	333	325	303.8
26-Mar	294	258	267	328	352	86	85	96	108	115	46	52	57	33	354	29	360	341	347	309	250	250	264	265	359.0
27-Mar	266	270	272	282	275	278	280	284	275	289	303	10	353	341	354	359	8	61	113	114	117	133	153	146	301.2
28-Mar	45	54	87	214	245	UO	105	127	141	149	123	155	143	158	154	153	140	145	161	145	148	161	168	166	143.1
29-Mar	158	267	267	300	306	305	286	292	299	272	322	310	317	325	334	348	352	358	2	2	3	16	12	265	323.6
30-Mar	239	238	237	231	229	211	223	187	62	84	73	75	68	72	78	78	60	60	68	80	101	124	114	108	90.1
31-Mar	117	110	110	105	83	93	97	107	114	98	78	87	82	95	95	76	66	61	60	70	85	94	93	98	89.8
Diurnal Average	146.3	145.9	147.1	139.5	148.2	130.7	129.5	131.4	127.7	132.8	102.4	90.2	59.3	45.2	39.3	29.4	33.6	49.4	68.8	90.5	111.8	134.1	137.2	136.4	

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Anzac - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 96 deg on Mar 18 09:00

Minimum Value: 3 deg on Mar 30 05:00

Percentiles: $P_1 = 6$ $P_{10} = 10$ $Q_1 = 13$ Median = 15 $Q_3 = 18$ $P_{90} = 26$ $P_{99} = 64$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	9	11	12	11	12	11	13	12	12	16	15	15	18	15	16	16	14	15	15	10	13	13	12	13	18
2-Mar	11	11	11	13	13	15	16	27	22	18	18	18	18	18	17	24	23	18	17	17	16	17	17	18	27
3-Mar	17	23	16	14	16	17	12	17	21	14	15	20	25	19	18	15	17	13	13	12	13	23	11	17	25
4-Mar	12	12	19	17	13	20	16	20	17	15	20	14	20	17	17	15	14	13	10	12	11	10	7	10	20
5-Mar	11	14	10	10	19	10	10	13	19	23	22	23	26	35	45	22	18	17	48	11	12	4	6	6	48
6-Mar	7	7	7	7	9	13	11	13	16	20	15	13	19	16	15	15	17	14	15	14	14	14	15	15	20
7-Mar	14	15	15	16	14	14	14	14	14	15	16	15	16	17	18	15	15	14	14	15	13	14	14	14	18
8-Mar	14	14	14	13	14	13	14	16	14	13	16	17	17	16	15	17	16	15	14	14	17	11	11	12	17
9-Mar	11	10	10	10	10	11	10	11	13	16	15	16	15	16	16	16	14	14	14	14	16	16	14	14	16
10-Mar	13	13	14	14	14	15	14	15	16	15	17	17	18	19	18	18	16	17	14	12	12	15	16	15	19
11-Mar	13	13	15	11	12	11	12	11	10	10	18	23	21	17	19	15	19	15	18	17	13	12	14	13	23
12-Mar	16	22	13	34	26	16	24	13	17	36	25	20	21	22	17	17	14	12	15	14	14	14	15	16	36
13-Mar	14	15	15	16	22	15	18	15	58	31	20	20	22	17	20	17	14	17	15	16	15	14	14	12	58
14-Mar	12	13	12	12	13	15	15	16	19	16	18	21	25	14	15	15	15	15	13	12	13	12	12	17	25
15-Mar	18	18	12	12	14	12	12	14	17	22	20	24	47	41	27	29	31	47	UO	UO	11	11	8	25	47
16-Mar	18	16	15	13	12	16	16	14	15	18	39	58	50	29	61	12	20	16	11	12	10	12	11	11	61
17-Mar	11	12	10	22	9	14	20	12	14	10	15	16	17	28	39	17	15	15	13	11	12	15	15	16	39
18-Mar	12	10	11	13	8	79	14	11	96	22	22	23	33	17	16	18	14	16	12	8	28	23	10	27	96
19-Mar	17	34	11	9	11	11	10	14	15	13	14	18	16	17	19	15	15	14	16	14	15	16	15	15	34
20-Mar	14	13	14	13	14	11	12	14	15	14	36	14	16	25	23	17	20	25	32	8	11	8	29	21	36
21-Mar	28	14	17	16	12	11	18	17	17	29	32	43	92	65	81	37	43	19	18	11	13	7	10	11	92
22-Mar	10	10	10	10	10	14	13	14	14	16	15	15	17	15	18	19	13	16	21	6	5	14	14	11	21
23-Mar	11	15	83	44	15	12	21	17	15	17	16	29	13	14	16	13	14	14	15	15	11	10	9	8	83
24-Mar	23	12	10	9	15	8	7	11	16	16	30	42	33	18	19	21	21	30	21	21	12	7	10	5	42
25-Mar	5	14	7	8	6	47	14	24	15	14	15	17	23	26	18	14	14	14	11	8	6	7	5	22	47
26-Mar	19	12	10	23	28	12	9	13	20	46	32	22	22	31	34	34	23	24	15	15	20	13	10	9	46
27-Mar	9	9	10	8	11	11	11	12	17	23	44	62	43	33	18	23	31	17	17	12	15	13	5	47	62
28-Mar	12	13	91	18	83	UO	15	17	15	13	24	31	27	38	47	19	18	13	14	11	12	14	44	26	91
29-Mar	17	29	20	14	11	12	19	22	17	18	19	16	14	16	16	14	18	16	16	14	14	11	32	11	32
30-Mar	8	11	6	5	3	15	43	29	14	34	31	26	20	18	19	20	14	13	13	14	15	12	12	12	43
31-Mar	13	16	16	15	10	10	11	14	19	23	27	22	22	21	24	26	22	18	12	13	13	14	14	14	27
Diurnal Maximum	28	34	91	44	83	79	43	29	96	46	44	62	92	65	81	37	43	47	48	21	28	23	44	47	

UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Anzac - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS17
WAPASU
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	35	36	99.87	17.8	0	3.4	0
H2S (ppb) Average	707	36	37	99.87	0.8	0	0.4	0
THC (ppm) Average	708	35	36	99.87	2.6	-	2.3	-
O3 (ppb) Average	708	35	36	99.87	54.8	0	50	-
NO2 (ppb) Average	707	36	37	99.87	21.6	0	6.3	-
NO (ppb) Average	707	36	37	99.87	13.1	-	1.4	-
NOX (ppb) Average	707	36	37	99.87	28.5	-	7.6	-
PM2.5 (ug/m3) Average	742	1	2	99.87	30.3	0	8.1	0
Temperature 2 m (C) Average	743	0	1	99.87	8.7	-	1.1	-
Relative Humidity (%) Average	743	0	1	99.87	90.7	-	86.5	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	21	-	16	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-
Precipitation (mm) Total	743	0	1	99.87	0.9	-	9	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
MARC H 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	0.43	1.4	-	0	0	0	0	0.3	0.9	17.8
H2S (ppb) Average	707	0.1	0.1	-	0	0	0	0	0.1	0.2	0.8
THC (ppm) Average	708	2.27	0	-	2.2	2.2	2.2	2.3	2.3	2.3	2.6
O3 (ppb) Average	708	39.17	7.1	-	7.9	29.9	34.9	40.1	44.2	47.5	54.8
NO2 (ppb) Average	707	2.49	3.2	-	0	0.2	0.5	1.4	3.1	6.1	21.6
NO (ppb) Average	707	0.48	1.1	-	0	0	0	0.1	0.4	1.4	13.1
NOX (ppb) Average	707	2.98	3.8	-	0	0.3	0.6	1.6	3.6	7.2	28.5
PM2.5 (ug/m3) Average	742	4.21	2.4	-	0.6	2.5	3.1	3.6	4.7	6.3	30.3
Temperature 2 m (C) Average	743	-10.34	7.1	-	-30.7	-20.5	-14.7	-10.1	-5.2	-2.3	8.7
Relative Humidity (%) Average	743	67.81	15.5	-	29.5	42.8	56.3	71.6	80.8	85.3	90.7
Wind Speed 10 m (km/h) Average	742	9.3	4	-	1	4	6	9	13	15	21
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	743	-	-	18.27	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction	15 Mar 2023 05:00	15 Mar 2023 05:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 17.8 ppb on Mar 18 11:00

Maximum Daily Average: 3.4 ppb on Mar 18

Minimum Value: 0.0 ppb on Mar 1 03:00

Maximum Diurnal Average: 1.2 ppb at hour 11

Monthly Average: 0.43 ppb

Minimum Daily Average: 0.0 ppb on Mar 3

Minimum Diurnal Average: 0.1 ppb at hour 23

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.3 P_{90} = 0.9 P_{99} = 6.6

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	0.5	0.0	0.0	0.0	0.1	0.3	0.5	0.8	0.9	0.4	0.5	0.4	0.3	0.4	0.4	0.5	0.6	0.4	0.2	0.2	0.5	0.5	0.4	0.4	0.9
2-Mar	0.3	Z	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.8	3.9	5.0	3.3	1.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.8	5.0
3-Mar	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
4-Mar	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
5-Mar	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	0.2	0.1	0.1	DF	0.0	0.2
6-Mar	0.1	0.1	0.1	0.3	1.0	0.3	0.3	0.3	0.7	1.5	1.4	1.0	1.1	1.2	Z	0.8	0.7	0.4	0.3	0.4	0.3	0.1	0.1	0.1	0.5	1.5
7-Mar	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
8-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
9-Mar	0.0	Z	0.0	0.0	0.1	0.2	0.3	0.7	0.8	0.4	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
10-Mar	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
11-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
12-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	1.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9
14-Mar	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	0.1	0.0	0.1
15-Mar	0.0	Z	0.1	0.1	0.1	0.0	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	0.0	0.0	0.0	0.0	0.1	0.2
16-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.9	0.6	3.6	7.7	1.7	0.3	0.2	0.3	0.3	0.5	0.7	7.7
17-Mar	0.7	0.5	0.4	Z	0.3	0.2	0.4	0.6	2.0	7.2	9.7	1.5	4.9	6.6	3.8	6.6	10.7	5.6	5.2	1.2	0.7	0.7	1.2	0.8	3.1	10.7
18-Mar	0.8	1.5	2.7	2.9	Z	3.0	3.9	4.9	6.5	15.0	17.8	9.5	3.5	2.6	1.2	0.8	0.7	0.4	0.1	0.1	0.1	0.1	0.1	0.0	3.4	17.8
19-Mar	1.3	0.1	0.1	0.1	0.1	Z	0.0	0.1	0.2	0.3	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	0.1	1.3
20-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.8	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	0.1	0.9
21-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.7	0.9	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9
22-Mar	0.0	0.0	Z	0.3	0.2	0.1	0.2	0.3	0.3	0.6	0.9	0.9	0.9	0.8	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.9
23-Mar	0.6	2.0	1.9	Z	3.4	2.2	1.2	2.9	2.2	1.3	0.6	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.4
24-Mar	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	2.1	0.1	2.1
25-Mar	1.7	1.8	1.8	1.0	0.4	Z	0.0	0.2	2.0	1.0	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	0.4	2.0
26-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
27-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.3	0.3	0.3	0.2	0.2	0.3	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.7
28-Mar	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5	0.8	0.4	0.6	0.7	2.8	3.0	1.5	0.5	0.5	0.7	1.2	1.1	0.9	0.7	3.0
29-Mar	0.9	1.3	0.7	Z	0.8	1.0	1.1	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3
30-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
31-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.4	2.1	0.3	0.0	0.1	0.3	0.2	0.2	0.2	1.3	1.7	0.4	0.0	0.0	0.4	2.1
	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.6	1.0	1.2	0.7	0.6	0.6	0.4	0.4	0.7	0.6	0.3	0.2	0.2	0.1	0.1	0.2	Diurnal Average	
	1.7	2.0	2.7	2.9	3.4	3.0	3.9	4.9	6.5	15.0	17.8	9.5	5.0	6.6	3.8	6.6	10.7	7.7	5.2	1.3	1.7	1.2	1.2	2.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	99.58	99.58
11 - 20	3	0.42	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Wapasu - March 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	104	38	27	27	25	51	127	127	32	18	17	7	8	8	13	75	704
11 - 20	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	104	38	27	27	25	51	127	127	33	18	19	7	8	8	13	75	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Wapasu

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.8 ppb on Mar 14 13:00

Maximum Daily Average: 0.4 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 18:00

Maximum Diurnal Average: 0.1 ppb at hour 5

Monthly Average: 0.10 ppb

Minimum Daily Average: 0.0 ppb on Mar 10

Minimum Diurnal Average: 0.0 ppb at hour 18

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} = 0.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.5	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.5
2-Mar	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.3
3-Mar	0.2	0.0	0.1	Z	0.2	0.1	0.2	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	0.0	0.0	0.1	0.2
4-Mar	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.1	0.4
5-Mar	0.6	0.3	0.3	0.3	0.4	Z	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	DF	0.2	0.6
6-Mar	0.1	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	Z	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2
7-Mar	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2
8-Mar	0.0	Z	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.2	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
9-Mar	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
10-Mar	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
11-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2
12-Mar	0.2	0.1	0.2	0.2	0.3	Z	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	0.0	0.0	0.0	0.1	0.5
13-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
14-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	0.6	0.5	0.6	0.7	0.2	0.2	0.4	0.6	0.7	0.5	0.3	0.3	0.8
15-Mar	0.3	0.4	Z	0.6	0.5	0.6	0.6	0.6	0.3	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.4	0.6
16-Mar	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
17-Mar	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
18-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
19-Mar	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
20-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.4	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	0.6
21-Mar	0.0	0.0	Z	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.3
22-Mar	0.1	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	0.0	0.1	0.1	0.1	0.1	0.2
23-Mar	0.1	0.1	0.0	0.1	Z	0.2	0.2	0.3	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.1	0.4
24-Mar	0.2	0.1	0.2	0.0	0.1	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
25-Mar	Z	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	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2
26-Mar	0.1	Z	0.3	0.2	0.2	0.1	0.4	0.3	0.2	0.2	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.4
27-Mar	0.1	0.0	Z	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
28-Mar	0.2	0.1	0.0	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
29-Mar	0.1	0.1	0.2	0.2	Z	0.5	0.4	0.8	0.4	0.8	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.8
30-Mar	0.0	0.0	0.0	0.1	0.1	Z	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2
31-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.4
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.6	0.4	0.3	0.6	0.5	0.6	0.6	0.8	0.4	0.8	0.4	0.4	0.8	0.6	0.5	0.6	0.7	0.3	0.3	0.4	0.6	0.7	0.5	0.4	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	105	37	26	28	26	49	127	129	32	17	19	7	8	8	13	75	706
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	105	37	26	28	26	49	127	129	32	17	19	7	8	8	13	75	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Wapasu

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Wapasu - March 2023

Maximum Value: 2.6 ppm on Mar 29 07:00

Maximum Daily Average: 2.3 ppm on Mar 5

Minimum Value: 2.2 ppm on Mar 22 18:00

Minimum Daily Average: 2.2 ppm on Mar 31

Maximum Diurnal Average: 2.3 ppm at hour 7

Minimum Diurnal Average: 2.2 ppm at hour 18

Monthly Average: 2.27 ppm

Percentiles: P_1 = 2.2 P_{10} = 2.2 Q_1 = 2.2 Median = 2.3 Q_3 = 2.3 P_{90} = 2.3 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Wapasu - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	708	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Wapasu - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	104	38	27	27	25	51	127	127	33	18	19	7	8	8	13	75	707
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	104	38	27	27	25	51	127	127	33	18	19	7	8	8	13	75	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Wapasu

Classes (ppm)

- **0 - 2.0**
- **2.1 - 3.0**
- **3.1 - 10.0**
- **> 10.0**

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 54.8 ppb on Mar 22 21:00

Maximum Daily Average: 50.0 ppb on Mar 22

Minimum Value: 7.9 ppb on Mar 15 07:00

Minimum Daily Average: 28.3 ppb on Mar 15

Maximum Diurnal Average: 42.6 ppb at hour 16

Minimum Diurnal Average: 34.6 ppb at hour 6

Monthly Average: 39.17 ppb

Percentiles: P_1 = 21.8 P_{10} = 29.9 Q_1 = 34.9 Median = 40.1 Q_3 = 44.2 P_{90} = 47.5 P_{99} = 53.7

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	19.2	32.3	Z	39.1	38.8	38.3	37.2	36.7	36.5	36.8	37.7	38.4	39.7	40.2	40.3	40.3	39.7	38.0	38.3	37.7	39.4	40.6	41.1	41.2	37.7	41.2
2-Mar	41.3	41.3	41.1	Z	41.0	40.8	40.5	40.5	40.8	40.4	40.1	39.1	39.3	39.3	41.6	42.6	40.8	40.3	37.4	22.3	31.4	31.2	35.3	32.9	38.3	42.6
3-Mar	32.2	37.4	36.9	37.3	Z	36.0	36.1	36.3	34.9	34.1	C	C	C	C	35.0	34.2	33.3	32.5	34.9	34.8	34.3	34.1	35.8	35.7	35.0	37.4
4-Mar	35.0	35.8	34.2	28.8	34.0	Z	34.1	35.0	33.8	33.6	33.5	33.5	33.2	32.9	32.9	31.8	33.3	35.4	34.9	35.3	30.2	28.9	27.5	25.5	32.7	35.8
5-Mar	Z	29.5	33.9	30.2	27.5	33.1	32.9	26.7	26.5	29.4	29.6	29.5	30.0	30.1	30.3	31.0	31.3	31.1	26.8	25.4	24.7	26.4	26.1	DF	29.2	33.9
6-Mar	30.0	32.1	31.9	31.5	29.4	31.4	30.9	31.3	34.2	36.6	Z	38.8	38.4	39.3	41.8	42.3	40.6	40.7	38.6	37.8	39.8	40.8	40.9	40.6	36.5	42.3
7-Mar	40.8	Z	41.1	41.4	41.3	41.4	41.2	40.7	40.6	41.1	41.3	40.9	41.4	42.2	42.6	42.1	42.3	42.4	42.5	42.7	42.8	43.1	43.1	43.4	41.8	43.4
8-Mar	43.3	43.5	Z	41.8	41.9	41.6	41.0	40.6	40.7	40.9	42.5	43.5	43.6	44.2	43.3	43.9	44.4	44.5	44.1	43.1	41.3	40.7	39.9	40.1	42.4	44.5
9-Mar	40.1	39.9	39.8	Z	39.1	38.9	38.7	38.5	38.6	40.2	39.0	38.8	40.6	41.9	42.1	41.5	40.8	39.1	38.5	38.2	38.1	38.6	38.5	38.3	39.5	42.1
10-Mar	38.6	39.5	39.6	39.8	Z	38.3	37.9	37.7	37.1	37.1	36.8	37.4	37.6	39.0	40.2	40.0	39.3	39.3	39.8	39.7	40.1	40.5	39.8	39.3	38.9	40.5
11-Mar	39.2	38.9	38.5	37.5	39.4	Z	38.7	38.2	36.0	38.4	37.9	36.2	34.4	39.1	35.4	33.3	32.4	36.7	35.3	36.5	36.3	32.8	33.6	34.0	36.5	39.4
12-Mar	Z	37.0	36.7	33.9	25.4	16.8	24.2	33.8	33.7	34.3	34.7	34.9	34.7	34.7	35.3	35.6	36.9	37.3	36.7	36.3	37.2	37.4	36.4	34.6	33.9	37.4
13-Mar	34.9	Z	36.3	35.3	30.5	28.3	26.7	28.9	32.1	34.7	32.1	24.4	28.6	40.5	44.9	45.8	45.9	45.1	44.2	41.9	42.4	43.2	43.2	42.9	37.1	45.9
14-Mar	42.4	42.4	Z	41.8	41.5	41.5	42.9	42.6	43.7	44.2	44.0	31.9	28.8	32.7	30.4	30.1	28.8	40.1	40.4	31.2	28.6	27.0	25.1	30.5	36.2	44.2
15-Mar	30.2	25.0	19.6	Z	12.7	8.5	7.9	14.5	32.1	35.8	36.2	32.9	30.0	33.4	35.5	37.3	34.3	34.6	34.1	29.9	26.4	30.2	35.4	34.9	28.3	37.3
16-Mar	35.4	36.8	38.4	38.8	Z	39.1	38.8	38.1	38.2	38.7	39.5	40.4	40.1	40.9	41.9	42.1	38.1	37.4	39.7	40.4	40.0	40.3	39.2	37.0	39.1	42.1
17-Mar	37.4	38.3	40.0	41.3	41.2	Z	41.9	42.4	42.9	42.8	43.0	47.3	47.5	47.9	48.9	50.0	49.9	44.6	44.6	45.2	47.6	47.8	48.5	49.2	44.8	50.0
18-Mar	Z	47.5	48.0	48.8	48.1	46.9	47.4	47.6	48.0	46.1	44.7	49.2	51.5	50.9	49.3	50.8	49.5	45.4	49.5	45.2	44.6	46.3	43.8	45.7	47.6	51.5
19-Mar	47.6	Z	49.2	49.0	48.1	45.9	44.6	43.3	43.6	46.2	45.3	43.4	46.5	48.1	48.3	48.1	48.2	46.7	46.2	46.1	46.5	46.7	46.1	45.6	46.5	49.2
20-Mar	45.5	45.2	Z	44.0	43.5	43.2	42.5	41.8	38.3	37.5	36.2	40.8	42.9	43.9	45.7	46.6	47.1	43.7	41.8	41.7	41.1	37.8	36.1	33.9	41.8	47.1
21-Mar	27.3	26.1	22.0	Z	23.2	23.8	24.7	29.5	40.6	42.4	37.9	35.6	39.0	41.6	44.1	41.2	40.9	41.1	37.8	31.4	30.4	42.1	45.2	45.2	35.4	45.2
22-Mar	45.6	45.6	44.8	44.2	Z	45.2	45.9	46.6	47.0	48.7	49.6	49.5	49.5	50.5	52.4	53.7	54.1	54.1	53.1	53.4	54.8	54.4	54.3	53.5	50.0	54.8
23-Mar	52.7	51.0	49.9	47.8	45.5	Z	43.1	40.1	35.9	47.4	49.3	49.4	47.9	47.2	48.1	47.3	47.7	47.1	46.4	41.4	39.7	39.4	37.8	34.9	45.1	52.7
24-Mar	Z	32.9	32.5	24.0	21.9	25.6	32.2	35.4	43.2	43.4	44.4	44.4	44.0	44.1	47.7	47.0	47.1	47.0	45.2	39.9	34.7	33.9	33.2	30.5	38.0	47.7
25-Mar	27.8	Z	40.7	36.9	33.3	29.9	27.2	27.0	32.4	41.7	45.0	43.4	47.0	47.1	49.2	49.3	49.5	49.3	50.3	49.5	45.8	43.4	39.0	36.8	40.9	50.3
26-Mar	30.4	34.5	Z	40.7	40.8	41.0	39.6	37.8	36.5	38.1	33.7	33.9	34.5	38.4	39.5	41.2	41.7	42.8	42.8	40.6	37.1	36.5	31.5	30.4	37.6	42.8
27-Mar	30.5	31.1	29.9	Z	22.2	24.6	24.8	30.7	35.6	39.9	42.6	44.7	44.4	44.8	44.6	44.8	44.7	43.2	41.3	39.7	39.4	43.3	42.8	39.2	37.8	44.8
28-Mar	36.5	38.8	36.0	33.8	Z	35.0	37.0	41.4	43.9	45.0	44.7	45.4	45.0	44.3	45.3	44.6	44.4	45.4	46.6	48.7	48.7	48.3	47.6	47.0	43.2	48.7
29-Mar	45.0	40.8	37.6	33.2	29.8	Z	24.5	22.1	34.2	26.4	37.8	41.1	42.7	44.2	44.7	44.9	44.9	45.8	45.8	44.4	38.8	32.7	28.3	25.2	37.2	45.8
30-Mar	Z	24.5	24.1	23.3	21.8	21.8	22.1	26.4	38.7	42.0	43.2	43.2	44.2	44.4	44.2	44.7	45.2	45.2	44.3	44.2	43.6	43.1	43.9	45.0	37.5	45.2
31-Mar	44.0	Z	44.2	44.4	44.2	42.8	42.8	43.2	44.3	44.9	45.0	42.3	53.6	54.3	53.8	52.9	53.3	51.5	51.5	47.7	43.8	44.5	44.2	43.7	46.8	54.3
	37.4	37.2	37.2	38.0	34.8	34.6	35.2	36.0	38.2	39.6	40.3	39.8	40.7	42.1	42.6	42.6	42.3	42.2	41.7	39.8	39.0	39.2	38.8	38.6	Diurnal Average	
	52.7	51.0	49.9	49.0	48.1	46.9	47.4	47.6	48.0	48.7	49.6	49.5	53.6	54.3	53.8	53.7	54.1	54.1	53.1	53.4	54.8	54.4	54.3	53.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	7	0.99	0.99
21 - 50	679	95.90	96.89
51 - 82	22	3.11	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Wapasu - March 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	1	0	0	1	2	0	0	1	0	0	0	0	0	0	0	1	6
21 - 50	99	35	26	28	22	46	126	122	30	17	19	7	8	7	13	74	679
51 - 82	1	0	0	0	3	4	1	7	3	1	0	0	0	1	1	0	22
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	101	35	26	29	27	50	127	130	33	18	19	7	8	8	14	75	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Wapasu

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Wapasu - March 2023

Maximum Value: 13.1 ppb on Mar 13 12:00

Maximum Daily Average: 1.4 ppb on Mar 13

Minimum Value: 0.0 ppb on Mar 1 02:00

Minimum Daily Average: 0.1 ppb on Mar 7

Maximum Diurnal Average: 1.8 ppb at hour 13

Minimum Diurnal Average: 0.1 ppb at hour 1

Monthly Average: 0.48 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.4 P_{90} = 1.4 P_{99} = 4.7

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.4	0.3	0.4	0.4	0.4	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.4
2-Mar	0.2	0.0	0.3	0.3	0.0	Z	0.3	0.4	0.4	0.6	0.9	2.1	2.1	1.6	0.8	0.5	0.7	0.3	0.4	0.6	0.4	0.5	0.5	0.5	0.6	2.1
3-Mar	Z	0.4	0.5	0.3	0.4	0.4	0.4	0.2	0.6	0.7	1.1	0.9	1.2	1.7	0.5	0.9	0.7	0.3	0.1	0.2	0.0	0.2	0.2	0.1	0.5	1.7
4-Mar	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.2	0.6	1.2	0.9	1.1	1.5	1.5	1.1	1.2	0.7	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.5	1.5
5-Mar	0.2	0.1	Z	0.1	0.1	0.0	0.0	1.6	3.2	2.1	2.2	2.1	1.9	2.3	2.2	1.4	0.7	0.0	0.0	0.0	0.1	0.0	0.0	DF	0.9	3.2
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.5	0.6	Z	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6
7-Mar	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.2
8-Mar	0.2	0.2	0.1	0.2	Z	0.1	0.2	0.1	0.3	0.4	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.4
9-Mar	0.4	0.2	0.4	0.2	0.4	Z	0.3	0.5	0.6	0.6	0.4	0.4	0.3	0.3	0.4	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.3	0.6
10-Mar	Z	0.2	0.2	0.4	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.5	0.2	0.3	0.4	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.5
11-Mar	0.1	Z	0.3	0.2	0.3	0.0	0.1	0.2	0.9	0.7	1.4	1.7	3.0	1.2	2.2	2.2	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.0
12-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.5	0.3	0.5	0.8	0.6	0.4	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.8
13-Mar	0.1	0.3	0.2	Z	0.3	0.1	0.2	0.3	2.4	1.1	2.5	13.1	11.3	0.5	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.4	13.1
14-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.7	5.1	4.4	5.0	3.8	2.3	0.3	0.0	0.0	0.0	0.0	0.0	0.2	1.0	5.1
15-Mar	0.0	0.1	0.0	0.0	0.1	Z	0.5	4.3	1.0	0.0	0.2	3.8	8.7	4.0	2.6	1.5	2.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	1.3	8.7
16-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	1.0	1.0	0.6	0.4	2.2	0.5	0.2	0.2	0.0	0.1	0.0	0.1	0.3	2.2
17-Mar	0.1	Z	0.3	0.0	0.2	0.0	0.1	0.1	0.4	1.3	1.9	0.5	1.6	2.1	1.8	1.4	1.3	1.1	0.3	0.0	0.1	0.0	0.2	0.2	0.7	2.1
18-Mar	0.1	0.0	Z	0.0	0.2	0.1	0.1	0.3	0.9	2.5	4.4	1.7	0.6	1.0	1.7	0.7	0.8	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.7	4.4
19-Mar	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.0	0.1	0.4
20-Mar	0.0	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.4	1.0	2.2	0.9	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2
21-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	2.2	3.5	2.5	1.7	1.5	1.8	1.3	0.6	0.2	0.2	0.0	0.0	0.2	0.2	0.7	3.5
22-Mar	Z	0.1	0.1	0.0	0.2	0.0	0.2	0.2	0.3	0.3	0.6	0.4	0.5	0.4	0.4	0.4	0.3	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.6
23-Mar	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.8	4.7	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.7
24-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.9	2.2	0.5	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.2
25-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.6	4.3	2.2	0.5	1.9	0.2	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	4.3
26-Mar	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.2	1.0	1.2	5.5	5.0	3.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.5
27-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.7	2.5	2.0	0.6	0.7	0.6	0.4	0.7	0.7	0.6	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.5	2.5
28-Mar	Z	0.2	0.0	0.3	0.3	0.1	0.3	0.3	0.2	0.3	0.9	0.8	1.0	1.9	1.4	1.3	0.7	0.2	0.1	0.0	0.0	0.2	0.0	0.0	0.5	1.9
29-Mar	0.0	Z	0.0	0.0	0.0	0.1	0.3	3.3	1.2	3.8	1.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.8
30-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.8	0.5	0.1	0.0	0.4	0.4	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
31-Mar	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.2	0.4	0.3	0.6	3.1	0.4	0.2	0.4	0.5	0.4	0.5	0.4	0.1	0.2	0.3	0.3	0.1	0.4	3.1
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.9	0.8	1.1	1.7	1.8	1.1	0.8	0.7	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.4	0.4	0.5	0.4	0.4	0.4	0.5	4.3	4.7	3.8	5.5	13.1	11.3	4.4	5.0	3.8	2.3	1.1	0.4	0.6	0.4	0.5	0.5	0.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Wapasu - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	99	37	26	28	26	51	127	131	33	17	19	7	8	8	15	74	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	99	37	26	28	26	51	127	131	33	17	19	7	8	8	15	74	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Wapasu

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 21.6 ppb on Mar 29 08:00

Maximum Daily Average: 6.3 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 9 01:00

Minimum Daily Average: 0.2 ppb on Mar 9

Maximum Diurnal Average: 3.3 ppb at hour 9

Minimum Diurnal Average: 1.7 ppb at hour 3

Monthly Average: 2.49 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.2 Q_1 = 0.5 Median = 1.4 Q_3 = 3.1 P_{90} = 6.1 P_{99} = 15.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	11.8	4.8	0.7	0.4	Z	1.2	1.6	1.5	1.5	1.2	0.8	0.8	0.8	0.7	0.8	0.8	1.1	2.0	1.5	1.5	1.3	1.4	1.7	1.8	1.8	11.8
2-Mar	1.8	2.0	1.9	1.6	2.1	Z	2.0	2.1	2.0	2.3	2.8	4.6	4.8	4.7	2.4	1.2	2.1	1.8	2.0	16.8	9.3	8.7	5.8	4.6	3.9	16.8
3-Mar	Z	2.5	2.1	0.4	0.5	1.0	0.6	1.2	2.5	2.0	2.5	2.2	2.1	2.9	1.4	1.9	3.0	3.4	1.2	0.6	1.4	2.3	1.1	1.5	1.8	3.4
4-Mar	2.1	Z	2.7	7.8	2.6	2.0	2.8	2.5	3.0	3.0	2.0	1.6	1.9	2.4	2.1	3.2	2.9	1.5	1.8	0.7	4.9	6.4	8.7	10.3	3.4	10.3
5-Mar	15.7	7.7	Z	7.4	9.0	2.0	1.3	7.0	7.9	3.8	3.2	2.7	2.4	2.4	2.9	2.6	2.5	2.0	2.1	5.0	8.3	6.6	7.2	DF	5.1	15.7
6-Mar	4.3	3.0	2.6	2.8	3.9	3.0	3.1	3.8	2.7	2.1	2.0	1.3	Z	1.4	1.0	1.2	1.3	0.9	1.3	1.1	0.9	1.0	0.6	0.6	2.0	4.3
7-Mar	0.9	0.6	0.6	Z	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.5	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.1	0.3	0.9
8-Mar	0.1	0.1	0.2	0.2	Z	0.1	0.2	0.4	0.2	0.5	0.3	0.2	0.2	0.2	0.4	0.4	0.3	0.5	0.4	0.2	1.2	0.5	0.5	0.1	0.3	1.2
9-Mar	0.0	0.1	0.0	0.1	0.3	Z	0.6	1.1	1.3	0.7	0.4	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.3	0.2	1.3
10-Mar	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.2	0.4	0.4	0.7	1.0	0.7	0.3	0.5	0.4	0.4	1.0
11-Mar	0.6	Z	0.6	1.7	0.5	0.8	0.9	1.2	4.1	1.8	3.3	4.1	7.5	3.2	6.7	9.0	7.9	3.2	3.4	1.2	1.4	2.0	0.3	0.2	2.9	9.0
12-Mar	0.2	0.1	Z	2.2	9.7	19.0	11.8	2.0	2.7	2.0	1.7	1.4	1.8	1.6	1.4	1.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.2	2.6	19.0
13-Mar	0.3	0.5	0.3	Z	0.1	0.1	0.2	0.6	6.3	2.5	3.3	15.4	11.2	1.3	0.5	0.4	0.3	0.3	0.2	0.4	0.0	0.2	0.1	0.0	1.9	15.4
14-Mar	0.2	0.2	0.2	0.0	Z	0.1	0.4	0.3	0.6	0.5	0.6	11.0	14.4	11.0	13.4	13.5	14.2	3.6	1.8	8.0	9.8	11.4	13.0	7.0	5.9	14.4
15-Mar	5.0	9.8	13.9	15.4	15.2	Z	16.5	12.9	2.4	0.3	0.4	4.8	8.7	4.8	3.6	3.2	5.5	4.8	3.6	2.9	2.8	3.6	2.5	2.2	6.3	16.5
16-Mar	Z	2.0	1.5	1.4	0.6	0.2	0.1	0.9	0.7	0.4	0.6	0.6	1.8	2.0	1.7	1.1	5.1	4.8	2.1	0.6	0.7	0.7	1.0	1.4	1.4	5.1
17-Mar	1.2	Z	0.7	1.0	0.8	0.8	0.8	1.0	1.8	3.4	4.3	1.6	3.6	5.0	4.8	4.6	6.0	11.2	8.9	3.4	3.2	2.7	2.2	2.1	3.3	11.2
18-Mar	3.2	4.7	Z	4.0	3.9	4.5	4.2	4.9	4.8	7.4	10.2	4.5	2.0	2.5	4.5	2.9	4.0	8.7	2.8	1.3	1.1	0.9	0.4	0.6	3.8	10.2
19-Mar	1.7	0.7	0.7	Z	0.5	0.8	0.8	2.2	2.1	1.5	1.2	1.0	0.7	0.7	0.9	0.5	0.7	0.6	0.5	0.9	0.4	0.3	0.2	0.2	0.9	2.2
20-Mar	0.1	0.2	0.4	0.6	Z	0.8	0.6	0.9	4.1	4.9	6.4	1.6	0.3	0.3	0.3	0.5	0.3	1.3	1.3	0.9	0.8	0.7	0.2	0.3	1.2	6.4
21-Mar	0.4	0.5	0.3	0.6	1.4	Z	2.0	1.2	0.5	2.2	5.8	6.5	4.3	3.3	3.6	4.4	4.9	5.1	7.0	6.8	5.9	1.9	0.5	0.2	3.0	7.0
22-Mar	Z	0.3	0.7	1.0	0.9	0.9	0.8	1.0	1.1	1.1	1.4	1.6	1.4	1.4	1.6	1.6	1.4	1.3	1.6	1.4	1.3	1.1	1.4	1.3	1.2	1.6
23-Mar	1.4	Z	2.2	2.8	3.8	3.1	3.5	8.0	14.0	C	C	C	C	C	1.2	1.0	0.7	1.0	1.0	4.3	5.4	5.7	6.3	6.9	4.0	14.0
24-Mar	5.9	6.2	Z	2.7	2.5	1.2	1.1	0.5	0.0	0.0	0.4	1.9	3.7	4.2	1.7	1.6	1.6	1.9	2.1	2.5	2.2	4.1	6.6	5.9	2.6	6.6
25-Mar	5.9	5.1	3.4	Z	3.4	2.9	3.0	3.7	9.9	5.0	1.4	3.5	0.8	1.4	1.0	0.6	0.5	0.6	0.2	0.2	0.2	0.3	0.0	0.3	2.3	9.9
26-Mar	1.3	0.9	1.9	0.8	Z	0.3	0.6	1.2	3.1	2.3	6.8	6.3	4.6	1.2	0.6	0.5	0.6	1.3	0.5	0.0	0.0	0.4	0.2	0.1	1.5	6.8
27-Mar	0.0	0.0	0.6	4.1	7.7	Z	4.6	4.3	6.1	4.3	1.9	1.6	1.5	1.3	1.7	1.9	2.3	3.4	4.5	4.3	5.0	1.4	0.9	2.2	2.9	7.7
28-Mar	Z	1.7	1.7	1.7	1.9	2.4	2.6	1.7	0.3	0.8	1.6	1.3	1.7	3.5	2.9	3.7	4.0	2.9	2.1	1.0	0.9	1.0	0.8	0.7	1.9	4.0
29-Mar	1.4	Z	2.6	2.6	5.6	13.5	18.1	21.6	10.1	18.3	8.6	4.2	2.4	1.5	1.3	1.0	1.2	0.3	0.1	0.6	0.6	0.3	0.5	0.8	5.1	21.6
30-Mar	0.9	1.3	Z	2.7	3.6	4.3	4.0	4.6	2.6	0.8	0.7	1.9	1.5	0.9	1.1	0.9	0.8	0.5	0.3	0.6	1.5	1.7	1.6	1.1	1.7	4.6
31-Mar	1.6	1.3	0.8	Z	1.0	2.1	2.4	2.8	2.0	1.3	2.4	7.3	0.9	0.9	1.3	2.0	2.2	3.2	2.3	4.0	3.7	0.4	0.2	0.3	2.0	7.3
	2.6	2.2	1.7	2.5	3.2	2.6	3.0	3.2	3.3	2.6	2.6	3.2	3.0	2.2	2.2	2.2	2.5	2.4	1.9	2.3	2.4	2.2	2.1	1.8	Diurnal Average	
	15.7	9.8	13.9	15.4	15.2	19.0	18.1	21.6	14.0	18.3	10.2	15.4	14.4	11.0	13.4	13.5	14.2	11.2	8.9	16.8	9.8	11.4	13.0	10.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.86	99.86
21 - 40	1	0.14	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Wapasu - March 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	98	37	26	28	26	51	127	131	33	17	19	7	8	8	15	74	705
21 - 40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	99	37	26	28	26	51	127	131	33	17	19	7	8	8	15	74	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Wapasu

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - March 2023

Maximum Value: 28.5 ppb on Mar 13 12:00

Maximum Daily Average: 7.6 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 24 10:00

Minimum Daily Average: 0.4 ppb on Mar 7

Maximum Diurnal Average: 4.9 ppb at hour 12

Minimum Diurnal Average: 1.8 ppb at hour 3

Monthly Average: 2.98 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.3 Q_1 = 0.6 Median = 1.6 Q_3 = 3.6 P_{90} = 7.2 P_{99} = 18.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	11.9	4.8	0.7	0.4	Z	1.2	1.6	1.6	1.7	1.6	1.1	1.2	1.2	1.1	1.0	1.1	1.3	2.2	1.6	1.6	1.3	1.5	1.8	2.0	2.0	11.9
2-Mar	2.0	2.0	2.2	1.9	2.1	Z	2.3	2.5	2.4	2.9	3.7	6.7	6.9	6.3	3.2	1.7	2.8	2.1	2.4	17.4	9.7	9.2	6.3	5.1	4.5	17.4
3-Mar	Z	2.9	2.6	0.7	0.9	1.4	1.0	1.4	3.1	2.7	3.6	3.1	3.3	4.6	1.9	2.8	3.7	3.7	1.3	0.8	1.4	2.5	1.3	1.6	2.3	4.6
4-Mar	2.1	Z	2.7	7.8	2.6	2.1	2.8	2.7	3.6	4.2	2.9	2.7	3.4	3.9	3.2	4.4	3.6	1.6	1.9	0.8	4.9	6.6	8.8	10.4	3.9	10.4
5-Mar	15.9	7.8	Z	7.5	9.1	2.0	1.3	8.6	11.1	5.9	5.4	4.8	4.3	4.7	5.1	4.0	3.2	2.0	2.1	5.0	8.4	6.6	7.2	DF	6.0	15.9
6-Mar	4.3	3.0	2.6	2.8	3.9	3.0	3.1	3.8	3.1	2.7	2.5	1.9	Z	1.9	1.2	1.2	1.3	0.9	1.3	1.1	0.9	1.0	0.6	0.7	2.1	4.3
7-Mar	0.9	0.6	0.7	Z	0.3	0.2	0.3	0.5	0.5	0.4	0.4	0.5	0.6	0.4	0.6	0.4	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.4	0.9
8-Mar	0.3	0.3	0.3	0.4	Z	0.2	0.4	0.5	0.5	0.9	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.7	0.7	0.5	1.5	0.7	0.7	0.4	0.5	1.5
9-Mar	0.4	0.3	0.4	0.3	0.7	Z	0.9	1.6	1.9	1.3	0.8	0.5	0.3	0.3	0.5	0.4	0.3	0.4	0.2	0.2	0.2	0.4	0.3	0.4	0.6	1.9
10-Mar	Z	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.6	0.4	0.5	0.8	0.6	0.6	0.6	0.6	0.7	1.0	1.2	0.9	0.4	0.7	0.5	0.6	1.2
11-Mar	0.7	Z	0.9	1.9	0.8	0.8	1.0	1.4	5.0	2.5	4.7	5.8	10.5	4.4	8.9	11.2	9.2	3.3	3.4	1.2	1.4	2.0	0.3	0.2	3.5	11.2
12-Mar	0.2	0.1	Z	2.2	9.7	19.0	11.8	2.0	3.2	2.6	2.2	1.7	2.3	2.4	2.0	1.6	0.2	0.3	0.4	0.4	0.2	0.4	0.4	0.4	2.9	19.0
13-Mar	0.4	0.8	0.5	Z	0.4	0.2	0.4	0.9	8.7	3.6	5.8	28.5	22.5	1.8	0.6	0.4	0.4	0.3	0.2	0.5	0.0	0.2	0.1	0.0	3.4	28.5
14-Mar	0.2	0.2	0.2	0.0	Z	0.1	0.4	0.3	0.6	0.5	0.6	13.7	19.5	15.4	18.4	17.3	16.5	3.9	1.8	8.0	9.8	11.4	13.0	7.2	6.9	19.5
15-Mar	5.0	9.9	13.9	15.4	15.3	Z	17.0	17.2	3.4	0.3	0.6	8.6	17.4	8.8	6.2	4.7	7.6	5.7	3.6	2.9	2.8	3.6	2.5	2.2	7.6	17.4
16-Mar	Z	2.0	1.5	1.4	0.6	0.2	0.1	0.9	0.8	0.5	0.6	0.7	2.8	3.0	2.3	1.5	7.3	5.3	2.3	0.8	0.7	0.8	1.0	1.5	1.7	7.3
17-Mar	1.3	Z	1.0	1.0	1.0	0.8	0.9	1.1	2.2	4.7	6.2	2.1	5.2	7.1	6.6	6.0	7.3	12.3	9.2	3.4	3.3	2.7	2.4	2.3	3.9	12.3
18-Mar	3.3	4.7	Z	4.0	4.1	4.6	4.3	5.2	5.7	9.9	14.6	6.2	2.6	3.5	6.2	3.6	4.8	9.6	2.9	1.3	1.1	0.9	0.4	0.6	4.5	14.6
19-Mar	1.7	0.8	0.7	Z	0.5	0.8	0.8	2.3	2.4	1.9	1.6	1.3	0.8	1.0	0.9	0.5	0.7	0.6	0.5	1.0	0.6	0.4	0.4	0.2	1.0	2.4
20-Mar	0.1	0.4	0.5	0.7	Z	1.0	0.7	1.1	4.5	5.9	8.6	2.5	0.3	0.3	0.3	0.5	0.3	1.5	1.3	0.9	0.8	0.7	0.2	0.3	1.5	8.6
21-Mar	0.4	0.5	0.3	0.6	1.4	Z	2.0	1.2	0.5	2.5	8.0	10.0	6.8	5.0	5.1	6.2	6.2	5.7	7.2	7.0	5.9	1.9	0.7	0.4	3.7	10.0
22-Mar	Z	0.4	0.8	1.0	1.1	0.9	1.0	1.2	1.4	1.4	2.0	2.0	1.9	1.8	2.0	2.0	1.7	1.5	1.6	1.5	1.4	1.1	1.5	1.4	1.4	2.0
23-Mar	1.4	Z	2.2	2.8	3.8	3.3	3.5	8.8	18.7	C	C	C	C	C	1.2	1.0	0.7	1.0	1.0	4.3	5.4	5.7	6.3	6.9	4.3	18.7
24-Mar	5.9	6.2	Z	2.7	2.5	1.2	1.1	0.5	0.0	0.0	0.4	2.7	5.6	6.4	2.2	2.0	1.7	2.0	2.1	2.5	2.2	4.1	6.6	5.9	2.9	6.6
25-Mar	5.9	5.1	3.4	Z	3.4	2.9	3.1	4.3	14.2	7.2	1.9	5.4	1.0	1.8	1.3	0.7	0.5	0.6	0.2	0.2	0.3	0.3	0.0	0.3	2.8	14.2
26-Mar	1.3	0.9	2.0	0.8	Z	0.3	0.6	1.4	4.1	3.5	12.3	11.3	8.2	1.8	0.7	0.5	0.6	1.3	0.5	0.0	0.0	0.4	0.2	0.1	2.3	12.3
27-Mar	0.0	0.0	0.6	4.1	7.7	Z	4.6	5.0	8.6	6.3	2.5	2.3	2.1	1.7	2.4	2.6	2.9	3.9	4.8	4.4	5.1	1.5	1.0	2.2	3.3	8.6
28-Mar	Z	1.9	1.7	2.0	2.2	2.5	2.9	2.0	0.5	1.1	2.5	2.1	2.7	5.4	4.3	5.0	4.7	3.1	2.2	1.0	0.9	1.2	0.8	0.7	2.3	5.4
29-Mar	1.4	Z	2.6	2.6	5.6	13.6	18.4	24.9	11.3	22.1	10.2	4.6	2.6	1.5	1.3	1.0	1.2	0.3	0.1	0.6	0.6	0.3	0.5	0.8	5.6	24.9
30-Mar	0.9	1.3	Z	2.7	3.6	4.3	4.2	5.4	3.1	0.9	0.7	2.3	1.9	1.2	1.3	0.9	0.9	0.6	0.3	0.6	1.5	1.7	1.6	1.1	1.9	5.4
31-Mar	1.6	1.3	0.9	Z	1.0	2.2	2.5	3.0	2.4	1.6	3.0	10.4	1.3	1.1	1.7	2.5	2.6	3.7	2.7	4.1	3.9	0.7	0.5	0.4	2.4	10.4
	2.7	2.3	1.8	2.6	3.3	2.7	3.1	3.7	4.2	3.4	3.7	4.9	4.8	3.3	3.0	2.9	3.1	2.6	2.0	2.4	2.5	2.3	2.2	1.9	Diurnal Average	
	15.9	9.9	13.9	15.4	15.3	19.0	18.4	24.9	18.7	22.1	14.6	28.5	22.5	15.4	18.4	17.3	16.5	12.3	9.2	17.4	9.8	11.4	13.0	10.4	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Wapasu - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.43	99.43
21 - 40	4	0.57	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Wapasu - March 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	96	37	26	28	26	51	127	131	33	17	19	7	8	8	15	73	702
21 - 40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	99	37	26	28	26	51	127	131	33	17	19	7	8	8	15	74	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Wapasu

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 30.3 $\mu g/m^3$ on Mar 29 07:00

Maximum Daily Average: 8.1 $\mu g/m^3$ on Mar 29

Minimum Value: 0.6 $\mu g/m^3$ on Mar 2 19:00

Maximum Diurnal Average: 5.6 $\mu g/m^3$ at hour 9

Monthly Average: 4.21 $\mu g/m^3$

Minimum Daily Average: 2.5 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 3.5 $\mu g/m^3$ at hour 22

Percentiles: P_1 = 1.5 P_{10} = 2.5 Q_1 = 3.1 Median = 3.6 Q_3 = 4.7 P_{90} = 6.3 P_{99} = 13.5

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	3.7	2.8	1.7	1.6	1.6	1.5	1.6	2.2	2.9	2.9	2.5	2.8	3.2	3.2	3.3	3.4	3.5	4.1	3.9	3.7	4.0	4.9	5.6	6.0	3.2	6.0
2-Mar	6.3	6.4	6.2	6.3	6.6	7.1	7.7	8.1	8.2	8.4	8.0	7.3	6.2	5.8	3.9	1.9	1.4	0.7	0.6	1.2	0.9	0.8	2.0	4.7	4.9	8.4
3-Mar	4.7	4.7	5.9	5.2	8.4	5.9	6.6	3.9	4.3	3.9	3.9	3.7	3.8	4.0	6.1	4.5	4.4	4.9	5.7	8.0	6.7	3.5	3.3	3.2	5.0	8.4
4-Mar	3.1	2.8	3.0	3.8	2.9	2.7	2.6	2.9	3.0	3.2	3.3	3.4	3.4	3.6	3.3	3.5	3.4	2.9	2.3	2.3	3.0	3.2	3.5	3.4	3.1	3.8
5-Mar	3.8	3.4	2.8	3.3	3.5	3.3	3.6	4.1	5.1	3.7	3.8	3.8	3.9	3.9	4.0	3.7	3.6	3.3	3.0	3.2	3.7	4.0	3.7	DF	3.7	5.1
6-Mar	3.4	3.1	3.2	3.2	3.6	3.4	3.2	3.2	3.0	2.8	2.8	2.5	2.7	2.9	2.4	2.7	2.4	2.5	2.5	2.8	3.0	2.6	2.4	2.3	2.9	3.6
7-Mar	2.3	2.2	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.5	2.9	3.3	3.4	3.7	3.2	2.5	2.4	2.6	2.5	2.3	2.2	2.0	2.1	2.1	2.5	3.7
8-Mar	2.1	2.2	2.2	2.2	2.3	2.4	2.5	2.6	3.0	3.3	2.9	2.6	2.5	2.4	2.5	2.5	2.5	2.9	3.5	3.8	3.8	3.3	2.6	2.4	2.7	3.8
9-Mar	2.3	2.3	2.2	2.3	2.4	2.6	2.7	2.9	3.1	3.0	3.0	2.9	2.7	2.6	2.8	2.7	2.7	3.4	3.2	3.1	3.0	2.9	3.1	3.0	2.8	3.4
10-Mar	2.9	2.9	2.9	3.0	3.2	3.4	3.7	3.8	3.8	3.6	3.6	3.6	3.7	3.8	3.9	3.9	3.8	3.6	3.3	3.2	3.2	3.2	3.1	3.3	3.4	3.9
11-Mar	3.1	3.0	3.2	3.8	3.4	3.4	3.1	3.1	3.2	3.4	3.6	5.5	5.0	3.9	5.0	5.6	5.3	4.2	4.1	3.4	3.2	3.2	2.9	2.9	3.8	5.6
12-Mar	3.5	3.4	3.1	3.1	3.5	3.7	3.4	3.0	3.0	2.8	2.9	2.8	2.9	3.0	3.0	3.1	3.0	3.2	3.3	3.3	3.5	3.6	3.6	3.6	3.2	3.7
13-Mar	3.6	3.5	3.5	3.5	3.2	3.1	3.0	3.2	4.1	3.8	3.6	5.2	5.2	3.5	3.5	3.7	3.6	3.4	3.4	3.2	3.1	3.1	3.1	3.2	3.5	5.2
14-Mar	3.2	3.2	3.1	3.0	2.8	2.9	3.1	3.1	3.0	3.0	2.9	3.4	3.6	3.6	3.6	3.4	3.4	2.7	2.5	3.3	3.6	3.7	3.7	3.5	3.2	3.7
15-Mar	3.3	3.8	3.8	3.7	3.3	3.0	2.9	3.4	3.9	3.7	3.7	4.1	4.8	4.2	4.0	3.8	4.1	4.0	3.5	3.2	2.8	2.9	3.1	3.4	3.6	4.8
16-Mar	3.4	3.3	3.2	3.2	3.2	3.2	3.3	3.3	3.4	3.3	3.3	3.2	3.3	3.7	4.1	4.2	4.2	4.3	4.1	3.9	3.9	3.8	3.7	3.7	3.6	4.3
17-Mar	3.7	3.6	3.8	3.7	3.6	3.6	3.5	3.5	3.3	3.5	3.5	3.1	3.1	3.2	3.2	3.7	4.8	5.9	5.0	4.0	4.3	4.5	4.6	4.6	3.9	5.9
18-Mar	4.7	4.6	4.5	4.6	4.9	5.3	4.9	5.4	5.9	11.1	7.1	4.9	3.1	3.3	3.3	3.1	3.3	3.6	3.0	2.6	2.4	2.3	2.2	2.2	4.3	11.1
19-Mar	3.1	3.2	3.3	3.5	3.5	3.6	3.7	4.3	4.0	4.9	5.1	3.8	3.9	3.6	3.5	3.5	3.5	3.9	4.2	3.9	3.5	3.4	3.6	3.4	3.7	5.1
20-Mar	3.2	3.1	3.2	3.2	3.2	3.2	3.3	3.4	3.6	4.0	3.8	3.4	3.5	3.6	3.5	3.3	3.3	3.2	3.3	3.3	3.3	3.2	2.9	2.7	3.3	4.0
21-Mar	2.4	2.2	2.0	2.4	3.4	3.6	3.3	3.2	3.5	4.1	5.5	6.8	5.2	4.7	4.6	5.1	5.1	5.2	6.5	6.3	5.4	4.3	3.8	3.6	4.3	6.8
22-Mar	3.5	3.5	3.6	3.5	3.6	3.7	4.0	4.5	4.2	4.8	6.1	5.6	5.0	5.3	5.6	5.6	5.4	5.2	5.2	5.1	5.2	5.4	5.4	5.5	4.8	6.1
23-Mar	5.9	6.4	7.2	7.4	7.8	7.5	7.5	8.8	9.0	6.6	5.3	C	4.6	4.8	4.8	4.5	4.4	4.3	4.1	4.5	4.5	4.7	5.1	4.8	5.8	9.0
24-Mar	4.8	4.8	4.1	3.7	3.5	3.2	3.3	3.3	3.3	3.3	3.4	4.7	7.2	9.5	6.6	5.5	5.2	4.9	4.9	4.5	4.2	5.3	5.9	6.1	4.8	9.5
25-Mar	5.8	5.5	5.2	4.9	4.3	4.0	4.1	5.1	9.1	5.8	4.0	6.3	4.0	4.1	3.9	3.6	3.8	4.4	4.2	4.2	3.8	3.5	3.3	3.3	4.6	9.1
26-Mar	4.9	4.2	3.5	3.7	3.7	5.1	8.4	8.4	20.4	12.9	13.5	11.2	10.6	6.0	4.4	3.9	5.5	7.2	4.2	3.6	3.3	3.2	3.0	2.7	6.6	20.4
27-Mar	2.7	2.7	2.6	2.6	3.2	3.4	3.5	9.9	14.2	10.0	8.0	6.1	5.8	5.7	6.6	8.0	8.4	8.3	7.8	7.0	5.3	4.5	4.3	5.0	6.1	14.2
28-Mar	5.0	5.2	4.8	4.4	4.3	4.3	8.2	10.9	6.2	9.5	7.3	5.6	7.9	12.2	15.3	11.6	13.5	12.9	6.4	5.6	4.6	4.4	4.3	4.1	7.4	15.3
29-Mar	4.9	7.6	6.7	6.4	9.2	19.0	30.3	26.6	12.8	17.4	7.6	7.3	5.0	4.3	3.6	3.8	4.7	2.5	1.9	3.0	3.2	2.5	2.4	2.6	8.1	30.3
30-Mar	2.8	2.1	2.6	4.1	4.8	4.7	4.2	4.5	4.0	2.8	2.9	4.1	4.3	4.5	4.4	3.3	2.8	1.8	1.3	2.0	3.2	3.0	2.7	2.3	3.3	4.8
31-Mar	2.1	1.9	1.7	2.0	2.4	3.7	5.5	6.1	11.6	5.8	4.8	4.9	5.2	6.0	5.8	5.7	6.1	5.8	5.5	5.0	3.5	2.6	2.4	2.5	4.5	11.6
	3.7	3.7	3.6	3.7	3.9	4.3	4.9	5.3	5.6	5.3	4.7	4.6	4.5	4.5	4.4	4.2	4.3	4.3	3.8	3.8	3.7	3.5	3.5	3.5	Diurnal Average	
	6.3	7.6	7.2	7.4	9.2	19.0	30.3	26.6	20.4	17.4	13.5	11.2	10.6	12.2	15.3	11.6	13.5	12.9	7.8	8.0	6.7	5.4	5.9	6.1	Diurnal Maximum	

C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Wapasu - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	630	84.91	84.91
6 - 15	107	14.42	99.33
16 - 25	3	0.40	99.73
26 - 80	2	0.27	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Wapasu - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	92	34	25	30	22	48	130	118	24	9	8	6	6	4	10	63	629
6 - 15	13	4	2	0	5	5	5	22	9	9	11	1	2	4	3	12	107
16 - 25	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	3
26 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	106	38	27	30	27	53	135	140	34	18	19	7	8	8	15	76	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Wapasu

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Wapasu - March 2023

Maximum Value: 8.7 C on Mar 18 15:00

Maximum Daily Average: 1.1 C on Mar 18

Minimum Value: -30.7 C on Mar 27 06:00

Minimum Daily Average: -21.5 C on Mar 5

Maximum Diurnal Average: -5.2 C at hour 16

Minimum Diurnal Average: -15.4 C at hour 6

Monthly Average: -10.34 C

Percentiles: P_1 = -26.4 P_{10} = -20.5 Q_1 = -14.7 Median = -10.1 Q_3 = -5.2 P_{90} = -2.3 P_{99} = 7.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-20.6	-19.3	-18.3	-17.9	-17.4	-17.3	-17.6	-17.8	-16.3	-14.1	-12.7	-11.4	-9.5	-8.3	-8.8	-9.1	-9.8	-11.0	-11.8	-12.3	-11.4	-10.1	-10.0	-9.9	-13.4	-8.3
2-Mar	-9.9	-9.8	-9.6	-9.6	-9.4	-9.2	-8.6	-8.1	-7.4	-5.8	-3.5	-0.9	0.3	1.0	1.6	2.0	1.5	0.4	0.1	-0.6	-0.8	-1.0	-1.8	-4.3	-3.9	2.0
3-Mar	-6.4	-8.2	-9.6	-10.6	-11.1	-11.5	-12.0	-12.5	-12.8	-13.2	-13.1	-13.2	-12.6	-12.1	-12.1	-12.0	-11.7	-12.5	-13.2	-13.7	-14.4	-15.6	-16.6	-17.4	-12.4	-6.4
4-Mar	-17.8	-17.9	-18.2	-18.3	-18.7	-19.3	-20.0	-20.3	-20.1	-19.5	-19.3	-18.8	-18.1	-17.8	-17.6	-17.8	-17.7	-18.6	-19.1	-19.8	-21.6	-21.7	-21.4	-22.2	-19.2	-17.6
5-Mar	-23.1	-23.4	-23.2	-23.2	-23.2	-23.5	-23.6	-23.6	-22.5	-22.2	-21.1	-20.3	-19.2	-18.1	-17.0	-16.4	-16.5	-18.5	-23.0	-23.7	-22.8	-23.2	-22.7	DF	-21.5	-16.4
6-Mar	-22.0	-21.8	-21.7	-21.7	-21.5	-21.4	-21.5	-21.2	-17.7	-14.9	-13.0	-11.5	-10.7	-10.4	-10.2	-10.3	-11.0	-12.0	-13.5	-13.8	-14.1	-14.5	-13.7	-13.8	-15.7	-10.2
7-Mar	-13.8	-13.8	-13.8	-13.9	-13.9	-14.4	-14.8	-15.0	-15.0	-14.2	-13.3	-12.3	-11.5	-9.9	-9.2	-9.2	-9.5	-10.0	-10.4	-10.2	-9.8	-9.7	-10.0	-10.4	-12.0	-9.2
8-Mar	-11.1	-11.7	-12.7	-13.6	-13.8	-14.3	-14.9	-15.4	-14.5	-12.4	-10.6	-8.9	-7.2	-6.4	-6.1	-5.8	-6.3	-7.9	-10.3	-11.5	-12.7	-13.7	-14.0	-13.9	-11.3	-5.8
9-Mar	-14.4	-15.0	-15.5	-16.3	-16.9	-17.3	-17.7	-17.1	-14.9	-12.4	-10.9	-10.0	-9.7	-9.1	-8.4	-8.3	-8.9	-10.2	-11.6	-11.6	-11.4	-11.6	-12.0	-12.1	-12.6	-8.3
10-Mar	-12.3	-12.5	-12.9	-12.9	-13.5	-13.2	-12.9	-12.7	-12.1	-11.3	-10.4	-9.3	-9.0	-7.5	-7.1	-6.8	-7.1	-7.9	-8.7	-8.7	-8.5	-8.5	-8.7	-9.2	-10.2	-6.8
11-Mar	-9.2	-9.4	-10.2	-10.6	-10.7	-11.0	-11.2	-11.2	-9.5	-8.3	-6.9	-6.1	-6.1	-4.4	-4.2	-4.8	-6.3	-7.1	-8.4	-9.1	-9.6	-11.3	-12.4	-13.2	-8.8	-4.2
12-Mar	-12.6	-12.3	-12.7	-13.3	-14.0	-15.3	-16.2	-16.3	-16.0	-15.3	-14.3	-14.0	-13.2	-12.5	-11.6	-11.7	-11.5	-12.2	-13.2	-14.1	-14.3	-14.9	-16.0	-16.9	-13.9	-11.5
13-Mar	-16.5	-15.4	-15.4	-17.3	-20.7	-22.5	-23.6	-20.5	-12.7	-11.0	-10.3	-9.3	-7.2	-5.7	-4.6	-5.2	-5.5	-5.6	-6.8	-8.2	-8.7	-8.9	-9.1	-9.2	-11.7	-4.6
14-Mar	-9.5	-9.8	-10.2	-10.7	-11.0	-11.2	-11.1	-11.2	-10.9	-10.4	-9.9	-11.1	-11.9	-11.7	-11.0	-11.4	-11.6	-11.4	-11.8	-13.4	-14.5	-15.3	-15.7	-15.5	-11.8	-9.5
15-Mar	-15.7	-16.2	-17.3	-18.9	-21.4	-23.4	-24.2	-22.0	-14.7	-12.6	-11.4	-10.8	-10.3	-9.7	-9.4	-9.0	-8.6	-9.4	-12.1	-15.9	-18.4	-17.0	-14.7	-14.8	-14.9	-8.6
16-Mar	-15.2	-15.3	-14.9	-14.7	-14.3	-13.8	-13.4	-12.7	-11.5	-10.5	-9.3	-7.6	-5.9	-4.4	-3.2	-2.7	-2.7	-3.6	-5.7	-7.1	-7.8	-8.2	-8.1	-7.5	-9.2	-2.7
17-Mar	-7.0	-7.2	-7.0	-6.6	-6.9	-7.5	-7.8	-6.7	-4.3	-2.1	0.3	2.9	4.9	6.1	6.6	7.3	7.7	7.3	4.0	0.3	0.7	-0.2	-0.2	-0.9	-0.7	7.7
18-Mar	-1.8	-2.3	-2.5	-3.1	-3.9	-4.5	-4.8	-3.7	-1.2	2.0	4.9	7.1	8.1	8.6	8.7	8.7	8.3	7.0	4.2	-0.7	-1.5	-2.4	-4.4	-3.9	1.1	8.7
19-Mar	-2.5	-3.1	-3.7	-4.9	-5.5	-6.1	-7.3	-6.3	-3.7	-0.7	0.5	0.8	1.6	2.7	3.0	3.0	2.4	-0.3	-2.7	-4.5	-5.0	-5.3	-5.1	-5.2	-2.4	3.0
20-Mar	-5.7	-6.0	-6.9	-7.2	-7.8	-8.5	-8.7	-8.8	-8.8	-8.2	-6.7	-4.7	-3.8	-3.0	-2.0	-2.3	-2.4	-3.5	-6.5	-8.6	-10.6	-14.2	-16.5	-18.5	-7.5	-2.0
21-Mar	-20.5	-22.1	-23.0	-24.0	-24.4	-21.8	-17.0	-13.8	-10.9	-9.6	-8.7	-8.2	-6.5	-4.9	-3.9	-3.6	-3.4	-3.5	-5.5	-11.1	-14.0	-10.8	-9.9	-10.0	-12.1	-3.4
22-Mar	-10.1	-10.1	-10.1	-10.4	-10.8	-10.7	-10.8	-9.7	-7.5	-5.0	-3.6	-2.4	-1.0	0.3	1.7	2.7	2.9	2.5	0.2	-1.7	-1.7	-1.8	-1.8	-2.3	-4.2	2.9
23-Mar	-2.7	-3.1	-3.1	-4.1	-3.8	-3.0	-3.3	-2.5	-2.6	-2.3	-2.1	-2.3	-4.0	-4.3	-4.8	-6.1	-6.4	-6.5	-7.0	-7.8	-8.0	-7.8	-7.9	-9.4	-4.8	-2.1
24-Mar	-10.1	-11.1	-14.4	-18.7	-20.6	-22.0	-21.1	-14.9	-10.7	-9.1	-7.8	-6.7	-5.7	-4.9	-4.0	-3.0	-2.6	-2.4	-4.9	-9.6	-13.2	-13.9	-13.9	-15.6	-10.9	-2.4
25-Mar	-17.6	-16.9	-14.4	-16.0	-19.2	-21.5	-22.6	-18.7	-8.7	-6.5	-5.3	-5.0	-4.5	-4.2	-4.3	-4.6	-5.1	-6.5	-8.8	-11.2	-12.9	-14.5	-17.0	-19.4	-11.9	-4.2
26-Mar	-22.6	-23.1	-21.6	-20.7	-21.1	-22.1	-22.7	-20.4	-17.0	-15.0	-14.6	-13.0	-11.8	-10.9	-11.0	-10.7	-10.9	-11.9	-13.7	-16.8	-21.3	-22.2	-24.7	-26.4	-17.8	-10.7
27-Mar	-27.1	-27.6	-28.7	-29.6	-30.4	-30.7	-30.5	-21.9	-15.6	-14.3	-12.7	-11.1	-9.7	-8.8	-8.1	-7.3	-7.2	-7.5	-9.6	-13.6	-15.5	-16.1	-17.7	-19.5	-17.5	-7.2
28-Mar	-21.4	-21.4	-23.6	-25.3	-26.5	-25.5	-23.1	-15.8	-12.1	-10.1	-8.1	-6.6	-5.1	-4.2	-3.1	-3.4	-3.1	-3.1	-3.6	-4.2	-4.4	-4.3	-4.2	-4.6	-11.1	-3.1
29-Mar	-4.7	-5.2	-6.2	-6.2	-5.7	-5.6	-5.1	-5.0	-4.4	-4.4	-4.1	-4.1	-3.9	-3.6	-3.1	-3.2	-3.5	-4.2	-4.7	-5.8	-9.8	-13.0	-15.5	-17.3	-6.2	-3.1
30-Mar	-18.3	-19.4	-20.3	-20.9	-21.1	-20.4	-18.4	-13.4	-8.7	-7.1	-5.6	-5.4	-4.4	-3.1	-2.7	-2.5	-2.3	-2.8	-3.5	-4.4	-4.7	-5.1	-5.7	-5.5	-9.4	-2.3
31-Mar	-6.3	-7.2	-7.8	-7.7	-7.5	-7.8	-7.1	-6.1	-5.3	-4.2	-2.2	-0.6	1.1	1.7	2.4	2.3	2.4	1.7	0.1	-1.5	-2.7	-4.0	-5.0	-5.7	-3.2	2.4
	-13.2	-13.5	-13.9	-14.5	-15.1	-15.4	-15.3	-13.7	-11.3	-9.8	-8.6	-7.6	-6.7	-5.8	-5.3	-5.2	-5.4	-6.2	-7.8	-9.5	-10.5	-11.0	-11.5	-11.8	Diurnal Average	
	-1.8	-2.3	-2.5	-3.1	-3.8	-3.0	-3.3	-2.5	-1.2	2.0	4.9	7.1	8.1	8.6	8.7	8.7	8.3	7.3	4.2	0.3	0.7	-0.2	-0.2	-0.9	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Wapasu - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	83	11.17	11.17
-20 - 0	612	82.37	93.54
0 - 10	48	6.46	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Wapasu - March 2023

Maximum Value: 90.7 % on Mar 12 01:00

Maximum Daily Average: 86.5 % on Mar 14

Minimum Value: 29.5 % on Mar 18 14:00

Minimum Daily Average: 47.0 % on Mar 18

Maximum Diurnal Average: 77.4 % at hour 7

Minimum Diurnal Average: 53.9 % at hour 15

Monthly Average: 67.81 %

Percentiles: P_1 = 33.0 P_{10} = 42.8 Q_1 = 56.3 Median = 71.6 Q_3 = 80.8 P_{90} = 85.3 P_{99} = 89.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	85.2	82.7	80.8	81.0	81.0	80.5	81.2	82.1	80.1	75.4	71.9	68.9	65.3	62.3	63.3	65.8	70.8	77.2	81.1	83.5	84.0	82.4	82.4	82.9	77.2	85.2
2-Mar	83.2	84.8	85.5	86.3	86.7	86.7	87.3	87.1	85.0	80.3	75.9	68.1	66.1	66.6	65.2	63.2	69.6	85.3	87.1	86.9	82.1	81.0	82.1	89.2	80.1	89.2
3-Mar	88.7	86.6	85.3	82.5	79.5	80.6	84.2	85.5	84.5	79.3	75.5	74.8	71.1	67.5	67.9	67.2	67.5	73.2	77.2	80.2	81.7	82.0	77.6	73.9	78.1	88.7
4-Mar	74.9	75.2	75.9	77.2	79.5	79.6	79.5	77.4	73.9	70.1	66.9	66.3	65.0	65.6	65.4	68.9	70.0	72.3	74.5	75.3	79.4	80.1	79.8	80.8	73.9	80.8
5-Mar	80.3	80.0	79.9	79.8	79.9	79.7	79.5	78.9	77.3	73.8	69.1	65.2	60.2	57.3	54.1	51.9	52.1	59.0	70.6	75.8	75.3	77.3	76.6	DF	71.0	80.3
6-Mar	75.0	74.1	73.4	72.8	72.0	71.7	71.6	70.9	61.2	52.7	47.2	42.7	42.9	47.8	50.1	54.6	61.7	66.3	74.8	76.3	76.8	78.2	79.5	77.3	65.5	79.5
7-Mar	79.0	78.7	78.0	77.7	75.5	75.8	78.0	76.2	75.4	71.0	68.4	69.5	69.7	65.0	63.1	57.5	54.0	53.6	52.4	51.5	50.0	48.7	49.5	49.9	65.3	79.0
8-Mar	51.3	52.5	55.2	57.2	56.8	58.2	60.1	61.3	58.2	51.6	44.5	38.8	35.5	33.1	34.2	33.0	32.2	36.1	42.9	46.9	50.0	53.4	55.1	53.9	48.0	61.3
9-Mar	54.2	56.3	57.5	59.8	61.4	61.9	63.3	61.5	54.0	46.0	43.1	42.2	41.2	41.0	42.9	43.6	46.0	50.2	54.7	55.0	56.5	64.6	74.3	76.7	54.5	76.7
10-Mar	77.4	78.8	79.3	78.0	77.8	76.9	76.9	77.2	75.3	71.3	67.3	64.6	65.9	61.0	59.8	59.7	63.5	68.8	73.3	78.1	76.5	68.2	65.9	66.1	71.1	79.3
11-Mar	64.3	63.7	65.9	67.7	67.1	70.1	77.0	78.2	71.9	68.0	65.2	62.0	63.6	57.0	57.1	62.0	76.3	81.0	86.0	88.7	89.8	90.4	90.1	89.5	73.0	90.4
12-Mar	90.7	89.0	88.4	88.4	87.8	86.9	86.4	85.9	84.8	81.3	77.9	77.6	76.3	75.2	74.3	76.8	78.0	82.3	85.9	87.3	86.7	86.2	86.1	85.3	83.6	90.7
13-Mar	85.9	86.2	85.3	85.1	81.7	81.1	80.2	82.6	79.7	75.4	75.6	74.4	67.0	67.7	65.0	67.4	67.5	67.8	71.3	73.4	75.7	78.0	79.4	82.3	76.5	86.2
14-Mar	84.7	85.8	87.1	87.0	87.6	88.0	87.3	87.3	86.6	84.2	82.2	84.7	85.4	85.0	85.7	86.7	88.0	88.8	88.8	87.8	87.2	86.7	86.5	86.6	86.5	88.8
15-Mar	86.3	85.9	84.8	83.6	81.5	80.0	79.7	81.4	83.1	81.2	80.8	81.2	82.0	82.0	83.0	82.3	82.7	83.3	86.9	85.7	84.4	87.5	87.5	86.4	83.5	87.5
16-Mar	85.3	84.8	84.0	82.9	82.9	83.4	84.9	84.9	83.2	80.5	78.7	75.5	71.6	67.9	65.3	65.6	67.5	70.5	78.6	82.4	82.6	82.5	82.3	83.6	78.8	85.3
17-Mar	82.6	81.9	80.1	75.4	76.0	77.2	76.7	73.1	66.1	60.2	54.8	50.7	47.1	44.7	43.2	40.8	40.0	40.2	49.3	63.0	56.7	58.9	57.5	56.2	60.5	82.6
18-Mar	53.9	51.1	49.0	49.5	51.4	53.3	54.1	51.2	45.3	40.1	35.5	31.8	30.0	29.5	29.7	29.9	31.2	35.9	41.9	57.8	62.7	65.0	73.2	74.8	47.0	74.8
19-Mar	71.1	73.3	76.1	80.1	80.4	80.4	83.3	77.6	66.7	57.0	52.7	51.1	49.4	46.9	46.6	46.6	48.4	60.7	70.4	77.8	79.1	77.3	76.4	73.3	66.8	83.3
20-Mar	68.6	68.0	81.8	85.6	84.6	82.5	82.4	83.7	83.2	82.2	78.1	75.1	69.6	64.2	60.7	59.1	55.1	54.5	60.0	63.5	69.0	77.4	84.5	85.8	73.3	85.8
21-Mar	84.7	82.9	81.5	80.4	80.1	81.9	85.0	85.9	84.7	79.8	72.8	68.5	61.8	53.9	45.3	46.5	46.3	44.9	49.7	63.8	73.8	75.3	75.7	79.7	70.2	85.9
22-Mar	80.5	81.8	81.2	80.4	81.0	78.7	75.9	70.3	64.8	55.5	50.0	47.5	43.9	41.9	39.4	38.1	38.9	40.3	47.4	55.4	56.7	56.8	56.9	58.5	59.2	81.8
23-Mar	59.6	61.1	61.7	64.8	65.4	66.1	69.1	66.9	60.7	57.0	64.1	63.5	70.9	70.3	70.8	76.9	75.8	76.8	78.8	85.9	87.8	85.7	86.2	87.8	71.4	87.8
24-Mar	89.5	89.6	87.6	84.4	82.7	81.7	83.3	81.6	72.8	64.5	55.5	48.5	42.6	39.7	33.8	35.5	37.0	36.5	42.4	53.0	63.5	69.6	69.0	70.2	63.1	89.6
25-Mar	73.2	72.5	67.2	71.3	77.8	80.6	81.1	76.0	54.8	45.7	40.4	40.9	38.4	37.7	33.2	34.4	36.8	44.7	55.7	64.0	69.2	73.1	77.1	80.1	59.4	81.1
26-Mar	80.2	81.4	82.4	81.0	79.4	77.8	76.3	69.5	59.6	55.9	53.0	44.8	40.8	36.6	36.2	35.3	36.9	40.9	46.9	54.7	64.3	70.3	71.3	74.4	60.4	82.4
27-Mar	75.3	75.9	75.3	74.7	74.1	73.8	73.4	71.1	56.2	49.8	43.1	37.2	38.4	37.2	37.1	35.9	35.7	36.8	41.5	50.1	55.3	58.1	61.5	67.9	55.6	75.9
28-Mar	70.7	72.4	75.1	77.0	77.8	79.4	77.6	58.6	45.1	41.6	39.0	37.7	37.3	37.7	37.6	39.3	40.0	40.9	42.8	42.8	42.7	42.4	45.1	47.4	52.0	79.4
29-Mar	50.1	55.6	58.7	61.4	63.1	63.9	67.9	74.2	78.0	83.3	83.7	85.1	83.7	77.5	70.3	67.5	64.2	65.0	66.7	71.9	81.6	87.1	87.7	86.9	72.3	87.7
30-Mar	85.8	84.5	83.6	83.0	82.4	82.5	83.5	83.8	63.0	47.6	43.2	46.2	43.3	40.7	40.9	40.9	41.0	42.6	44.8	49.0	49.5	51.3	56.9	60.3	59.6	85.8
31-Mar	61.2	62.9	64.3	64.1	65.1	69.0	72.2	76.1	75.1	71.6	65.3	60.2	56.0	52.3	49.3	50.4	52.4	54.8	61.8	68.2	72.2	74.4	77.9	80.0	64.9	80.0
	75.3	75.5	75.9	76.1	76.1	76.4	77.4	76.1	70.6	65.6	62.0	59.5	57.5	55.2	53.9	54.3	55.7	59.1	64.1	68.9	71.1	72.6	73.9	74.9	Diurnal Average	
	90.7	89.6	88.4	88.4	87.8	88.0	87.3	87.3	86.6	84.2	83.7	85.1	85.4	85.0	85.7	86.7	88.0	88.8	88.8	88.7	89.8	90.4	90.1	89.5	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Wapasu - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	46	6.19	6.19
40 - 60	173	23.28	29.48
60 - 80	315	42.40	71.87
80 - 100	209	28.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Wapasu - March 2023

Maximum Value: 0.9 mm on Mar 16 13:00

Maximum Daily Total: 9.0 mm on Mar 14

Minimum Value: 0.0 mm on Mar 1 01:00

Minimum Daily Total: 0.0 mm on Mar 1

Maximum Diurnal Total: 2.2 mm at hour 13

Minimum Diurnal Total: 0.2 mm at hour 20

Monthly Total: 18.27 mm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.1	0.1	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
7-Mar	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	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
10-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
12-Mar	0.0	0.5	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.8	0.5
13-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
14-Mar	0.3	0.3	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.2	0.2	0.3	0.7	0.4	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.0	0.0	0.0	9.0	0.7
15-Mar	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.2	0.0	0.3	0.8	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.3	2.8	0.8
16-Mar	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.9
17-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.1	0.0	0.2	0.2	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3
21-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.6	1.4	1.3	0.9	1.0	0.9	1.4	1.1	0.4	0.8	2.2	1.3	0.4	0.3	0.4	0.7	0.4	0.2	0.3	0.2	0.4	0.5	Diurnal Average	
	0.3	0.5	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.3	0.2	0.5	0.9	0.8	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.1	0.3	0.3	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Wapasu - March 2023

Maximum Speed: 21 km/h on Mar 9 21:00

Maximum Daily Speed Average: 15.6 km/h on Mar 9

Minimum Speed Value: 1 km/h on Mar 29 04:00

Minimum Daily Speed Average: 0.5 km/h on Mar 27

Maximum Diurnal Speed Average: 6.1 km/h at hour 5

Minimum Diurnal Speed Average: 0.7 km/h at hour 11

Monthly Average Velocity: 3.1 km/h 124.1 deg

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 13$ $P_{90} = 15$ $P_{99} = 18$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE7	SSE9	SSE13	SE12	SSE13	SSE13	SSE12	SSE13	SSE14	SSE14	SSE14	SSE12	SSE11	SSE12	SE14	SSE13	SSE12	SE12	SE14	SE14	SE15	SSE16	SSE15	SSE15	SSE12.8	SSE16
2-Mar	SSE16	SSE17	SSE16	SSE17	SSE17	SSE18	SSE19	SSE15	SSE15	S13	SSW13	SSW12	SW15	SW14	WSW13	WSW12	SW11	WSW11	WSW11	W7	W8	WNW9	NW9	NNW12	SSW8.1	SSE19
3-Mar	NNW11	N11	N10	NNE8	NNE8	N8	N9	N9	N9	N11	N11	N10	N9	N10	N8	N7	N7	NNW7	NNE6	N4	N11	N13	N13	N12	N9.2	N13
4-Mar	N11	N11	NNW8	N9	N9	N12	N12	N13	NNW13	NNW16	NNW14	NNW12	NNW12	NNW13	NNW13	NNW13	NNW15	N14	N10	N9	NNW5	NNW10	NNW15	NNW13	NNW11.7	NNW16
5-Mar	NNW13	NNW12	NNW10	NNW7	NW5	NW4	NW4	NW4	NNW9	NNW10	N10	NNW9	NNW11	NNW7	NNW5	NNW4	ENE3	ESE5	ESE5	SE6	SE6	SE7	SE7	DF	NNW4.1	NNW13
6-Mar	SE7	SE7	SE7	SSE7	SSE9	SSE10	SE9	SE8	SE9	SSE10	S10	SSW9	SSW10	SSW10	S9	SSW9	SSE10	SSE11	SE10	SE13	SE14	SE15	SE16	SSE15	SSE9.5	SE16
7-Mar	SE13	SE14	SE16	SSE15	SE15	SSE14	SSE15	SSE15	SSE14	SSE14	SSE13	SSE14	SSE15	SSE16	SSE15	SE15	SE14	SE14	SE16	SE18	SE20	SSE20	SSE18	SSE17	SSE15.3	SSE20
8-Mar	SSE15	SSE14	SSE14	SSE14	SSE14	SSE14	SSE14	SSE12	SSE12	S12	S11	S11	SSE9	SSE11	SE10	SE11	SE11	SE11	SE8	SE12	SE14	SE16	SSE15	SSE15	SSE12.3	SE16
9-Mar	SSE14	SSE16	SSE14	SSE13	SSE12	SSE11	SSE11	SSE13	SSE12	SSE13	SSE16	SSE18	SSE17	SSE18	SSE17	SSE17	SSE16	SE15	SE16	SE19	SE21	SE20	SE19	SE19	SSE15.6	SE21
10-Mar	SE17	SE16	SE16	SSE18	SE18	SE17	SE16	SE17	SE16	SE17	SE16	SE16	SE14	SSE12	SSE13	SSE12	SE12	SE11	SE9	SE13	SE14	SE15	SE15	SE13	SE14.7	SSE18
11-Mar	SE12	SSE10	SE9	SE9	SE10	SE8	SE8	SE7	SE5	S3	ESE2	NNW7	NNW8	N4	NNW8	NNW10	N9	N7	N7	NNE6	NNE6	NNE5	NNE5	NE6	ENE2.2	SE12
12-Mar	NE7	NNE7	NNE6	N7	N8	NNW7	N6	N7	N8	N7	N7	N7	N8	N8	N9	N9	NNE8	NNE7	NNE6	NNE6	NE8	NE7	NE6	NNE4	NNE6.7	N9
13-Mar	NE5	ENE5	ENE5	ENE4	NE4	ENE3	NE5	NE4	ENE3	NNW5	N7	N10	N9	NE9	E11	E11	E15	E12	ENE11	ENE10	E12	ENE11	ENE10	ENE9	ENE6.9	E15
14-Mar	ENE9	ENE9	NE8	NE9	NE8	NE6	NE8	NE7	ENE8	ENE7	ENE4	N6	NNW8	NNW8	NNW9	NNW10	NNW7	NE6	NNE4	NNW7	NNW8	NNW9	NNE4	N3	NNE5.8	NNW10
15-Mar	NW4	NW3	N3	NNE2	UO	E1	E3	ENE4	NNE5	N6	NNW6	NNW7	NW5	NNW7	NNW7	N7	N6	NNW6	NE4	E3	ESE4	SE7	SE7	SE9	NNE2.3	SE9
16-Mar	SE10	SE11	SE12	SE10	SE10	SE10	SE9	SE10	SSE9	S7	S8	S9	SSW8	SW8	SSW7	SSW8	SW9	S8	SSE8	SSE10	SSE10	SSE12	SSE13	SSE14	SSE8.7	SSE14
17-Mar	SSE14	SSE14	SSE12	SSE12	SSE11	SSE10	SSE11	S11	S10	S10	S10	SSW10	SSW11	SW13	SW16	SW16	SW14	SW9	S5	SSE6	SSE7	SSE7	SSE7	S8	S9.3	SW16
18-Mar	SSE8	SSE8	S8	S8	SSE8	SSE8	SSE8	SSE8	S7	S7	SW6	WSW6	WNW7	NW9	NNW10	N9	N10	N9	NNE6	ENE3	NE6	ENE4	E4	E6	SSE1.2	NNW10
19-Mar	ESE9	ESE7	ESE9	SE9	SE10	SE11	SE8	SE9	SE6	ESE4	SE3	NW6	ESE9	ESE11	ESE11	ESE11	ESE11	SE13	SE13	SE16	SE15	SE15	SE15	SE15	SE9.7	SE16
20-Mar	SE15	SE14	SE11	SE11	SE8	ESE4	E4	ENE4	E6	ESE6	ENE4	NNE7	NNE10	NNE11	NNE12	N12	N12	N13	N13	N10	N5	NNE1	NE5	NE4	NE4.8	SE15
21-Mar	E4	E4	SE3	ESE3	ESE4	ENE4	NE3	NNE2	NNE2	ESE3	NNW2	WNW6	W5	S4	SW5	W7	W5	WNW3	W3	SE3	SE6	SSE11	SSE13	SSE14	SSE1.9	SSE14
22-Mar	SSE14	SSE15	SSE15	SSE13	SSE13	SSE14	SSE13	SSE16	SSE14	S12	SSW13	S11	S11	S11	S11	S10	S10	S8	SSE7	SE10	SSE12	SSE11	SSE10	SSE8	SSE11.4	SSE16
23-Mar	SSE8	SSE7	SSE6	SSE7	SSE7	SSE6	SW2	NNW7	N11	N14	N16	N16	N16	N15	N16	N15	N14	N12	N12	NNW10	N7	N7	NNW7	NNW6	N6.7	N16
24-Mar	N4	N4	N3	NE3	E2	E3	E4	ENE3	N5	N6	NNW7	NNW8	N7	WNW6	WNW6	WNW4	W5	NW2	NE2	ENE3	SE4	SE6	SE5	SSE5	N1.7	NNW8
25-Mar	SE5	SSE7	SSE7	SE6	ESE4	ESE4	E4	ENE4	NNE6	NNE10	NNE10	N12	N14	N13	N13	N14	N13	N11	NNE9	NNE6	NNE6	NNE5	N4	N3	NNE5.4	N14
26-Mar	ENE3	ENE5	ESE3	ESE5	ESE6	ESE5	ESE5	ESE4	S1	NNW7	NNW10	NNW10	NNW12	NNW13	NNW14	NNW13	N12	N12	N8	NNE4	ENE3	NE4	NE3	E5	N4.3	NNW14
27-Mar	E5	SE4	SE4	SE4	SE4	SE4	SE6	SSE5	WSW6	SW7	SW6	SW6	NW7	W8	WNW7	NW5	NNW5	N6	NE5	NE5	ENE5	E6	ESE5	ESE4	SE0.5	W8
28-Mar	ESE4	ESE4	ESE4	ESE3	SE5	SE6	SE7	SSE7	S8	SSW9	S8	SSW9	SW10	SW13	SSW11	SW13	SSW11	SSW8	S8	S8	S8	SSE6	SE5	SSE5	S6.2	SW13
29-Mar	WSW1	N3	E1	NNW1	NW3	NW4	NW4	N7	NNW7	NNW8	NNW12	NNW14	NNW16	NNW17	NNW15	N15	NNW15	N11	N8	N5	SE2	SE3	ESE3	SE5	NNW6.3	NNW17
30-Mar	SE4	ESE4	SE4	ESE3	SE4	ESE3	SE3	ENE4	NNE6	N8	NNW6	N8	NNW7	N7	NNW9	N8	NNE5	NE6	N1	ESE7	ESE8	ESE9	ESE10	ESE13	ENE3.0	ESE13
31-Mar	ESE13	SE14	SE14	SE13	SE11	SE10	SE10	SE4	ESE3	E4	ESE6	E7	ESE11	ESE8	E9	ESE9	E10	E11	ESE10	ESE11	ESE13	ESE17	ESE17	ESE18	ESE10.3	ESE18
	SE5.5	SE5.7	SE5.9	SE5.9	SE6.1	SE5.4	SE5.1	SE4.4	SE3.0	SE1.6	S0.7	NW0.9	NW1.4	NW0.8	NNW0.9	NNW1.0	NE1.3	ENE2.4	E2.9	ESE4.3	ESE5.3	SE5.6	SE5.7	SE5.9	Diurnal Average	
	SE17	SSE17	SSE16	SSE18	SE18	SSE18	SSE19	SE17	SE16	SE17	SE16	SSE18	SSE17	SSE18	SSE17	SSE17	SSE16	SE15	SE16	SE19	SE21	SSE20	SE19	SE19	Diurnal Maximum	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Wapasu - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Wapasu - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	161	21.70	21.70
6 - 11	351	47.30	69.00
12 - 19	226	30.46	99.46
20 - 28	4	0.54	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Wapasu - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	14	13	14	21	15	27	22	3	4	0	2	1	4	2	11	8	161
6 - 11	63	24	13	9	9	20	52	48	27	15	9	4	4	6	4	44	351
12 - 19	30	1	0	0	3	6	58	88	3	3	8	2	0	0	0	24	226
20 - 28	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	4
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	107	38	27	30	27	53	135	140	34	18	19	7	8	8	15	76	742

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Wapasu

Total Number of Valid Hours: 742

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 9 21:00

Minimum Value: 0 km/h on Mar 30 02:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Wapasu - March 2023

Direction of Maximum Speed: 144 deg on Mar 9 21:00
Direction of Maximum Daily Speed Average: 149.0 deg on Mar 9

Direction of Minimum Speed: 334 deg on Mar 29 04:00

Direction of Minimum Daily Speed Average: 0.5 deg on Mar 27

Monthly Average Direction: 124.1 deg

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	149	149	148	146	149	152	152	148	156	155	157	163	166	163	146	157	154	141	144	145	146	152	151	152	151.6
2-Mar	152	147	148	150	147	152	151	161	167	188	192	209	232	236	239	248	236	238	257	275	268	284	321	345	194.9
3-Mar	340	354	360	15	12	359	4	3	356	3	356	4	355	2	353	358	358	347	13	4	360	349	2	357	358.6
4-Mar	357	349	346	349	352	350	352	350	344	339	342	341	341	344	344	334	344	352	1	358	348	344	341	341	346.3
5-Mar	341	344	345	332	318	315	311	315	330	337	349	344	330	329	336	347	58	104	111	133	136	139	141	DF	346.9
6-Mar	142	144	146	147	147	147	141	142	145	167	184	195	204	198	185	195	153	148	138	137	137	144	146	147	156.0
7-Mar	145	146	146	148	146	148	151	153	156	160	162	156	155	157	156	141	136	139	135	136	143	148	149	153	148.3
8-Mar	152	150	150	150	153	151	153	157	161	169	171	173	166	152	128	138	140	135	138	138	133	139	147	156	150.0
9-Mar	156	150	149	147	156	155	151	151	151	158	166	158	155	148	153	148	153	135	137	139	144	144	143	141	149.0
10-Mar	142	142	141	147	146	145	145	143	144	145	145	138	144	147	153	155	137	138	130	131	135	138	141	141	142.4
11-Mar	144	149	141	133	138	146	139	135	132	183	118	340	343	349	341	340	353	359	352	21	22	19	31	34	68.0
12-Mar	34	30	15	359	350	344	353	4	357	359	359	1	359	2	2	1	21	30	22	27	39	38	44	29	11.4
13-Mar	41	65	63	64	50	62	40	50	76	343	352	360	5	51	90	91	82	80	74	78	80	72	69	71	61.3
14-Mar	66	63	46	49	44	40	50	38	70	59	64	2	339	339	339	338	339	42	31	327	332	340	15	8	20.8
15-Mar	324	325	5	18	UO	86	89	70	33	8	342	334	326	338	344	4	357	338	45	99	118	139	135	138	20.4
16-Mar	141	142	138	139	142	138	136	141	149	178	175	177	202	216	194	198	216	188	162	157	156	150	154	155	161.0
17-Mar	152	155	157	166	161	160	166	169	171	181	179	198	210	223	221	225	224	228	188	150	158	153	168	171	182.6
18-Mar	166	168	172	169	166	164	161	162	169	186	221	241	293	310	336	357	354	358	30	75	44	62	89	97	156.7
19-Mar	114	114	120	125	125	125	137	134	125	122	128	323	107	114	114	119	123	129	130	135	135	135	134	135	125.8
20-Mar	134	130	135	134	133	106	87	74	93	104	75	19	25	25	12	9	7	2	352	356	4	20	50	53	54.4
21-Mar	87	80	141	116	103	76	43	29	22	118	327	299	260	190	228	270	269	282	267	142	137	148	152	151	157.6
22-Mar	154	154	156	157	155	154	152	155	160	169	193	189	174	178	191	191	182	179	152	144	147	152	156	156	163.6
23-Mar	159	161	161	151	150	154	231	329	350	356	353	357	358	7	357	357	3	358	351	344	349	352	343	341	358.6
24-Mar	2	352	4	41	89	90	89	71	3	3	331	332	356	296	290	288	277	317	47	74	132	141	133	152	4.2
25-Mar	140	147	147	144	114	118	94	67	17	22	14	352	352	355	356	352	358	5	13	17	20	25	3	6	17.3
26-Mar	73	77	122	119	122	116	115	118	186	332	333	346	341	340	342	348	356	352	357	13	68	49	53	94	11.0
27-Mar	94	128	129	125	135	134	137	147	239	223	233	227	312	275	300	308	330	8	35	42	69	88	110	109	130.7
28-Mar	106	107	116	119	134	141	142	156	170	201	188	203	219	222	205	223	203	193	173	175	170	167	136	149	180.7
29-Mar	239	354	91	334	318	318	315	350	341	336	330	334	344	344	346	349	348	5	4	8	139	136	121	140	346.8
30-Mar	129	120	133	122	128	121	128	61	24	1	343	2	344	352	344	355	32	40	352	123	117	122	120	120	64.4
31-Mar	122	124	128	128	130	124	126	132	120	87	108	95	102	120	99	103	100	98	104	107	115	115	116	118	114.7
Diurnal Average	128.9	128.5	133.7	134.0	135.6	135.4	132.7	130.2	130.4	140.1	179.4	307.8	320.6	308.6	342.7	345.8	49.0	70.4	87.7	111.7	120.2	125.0	124.0	126.7	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Wapasu - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Wapasu - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 87 deg on Mar 30 19:00

Minimum Value: 3 deg on Mar 27 07:00

Percentiles: $P_1 = 7$ $P_{10} = 14$ $Q_1 = 18$ Median = 22 $Q_3 = 28$ $P_{90} = 36$ $P_{99} = 74$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	12	16	16	17	19	17	18	18	20	21	23	26	26	29	23	24	21	16	18	16	18	19	18	20	29
2-Mar	19	18	19	19	19	19	18	29	29	30	30	29	20	20	23	25	18	20	26	27	27	28	40	20	40
3-Mar	20	23	26	30	31	27	27	27	25	26	25	28	27	26	25	27	27	18	27	27	25	22	28	26	31
4-Mar	23	21	20	21	22	21	24	22	19	17	21	22	22	21	22	20	20	23	26	24	20	16	16	15	26
5-Mar	15	16	17	15	19	19	22	23	21	20	28	29	28	55	44	55	59	16	7	11	8	8	8	DF	59
6-Mar	13	14	16	16	17	17	15	15	19	29	32	34	32	33	33	37	25	21	17	17	18	18	19	18	37
7-Mar	20	21	20	20	20	21	20	19	21	25	25	25	24	24	26	21	20	20	18	18	17	19	19	20	26
8-Mar	21	18	18	18	19	18	18	21	23	28	30	30	32	27	29	23	21	18	15	16	17	17	18	20	32
9-Mar	19	17	17	17	20	21	19	18	17	23	27	26	27	23	25	23	24	20	19	20	19	20	18	19	27
10-Mar	19	18	17	19	18	20	20	19	20	20	21	22	24	29	28	28	23	20	20	19	18	19	20	18	29
11-Mar	18	17	19	18	18	20	16	21	33	50	79	26	29	82	29	21	23	24	20	28	25	22	22	20	82
12-Mar	26	29	30	28	21	18	21	24	24	27	27	27	26	25	27	27	30	26	28	24	24	23	16	21	30
13-Mar	23	17	24	20	16	19	10	21	33	30	24	24	30	41	30	25	24	24	22	25	25	24	25	27	41
14-Mar	22	22	22	21	21	28	23	27	25	36	41	36	24	17	17	15	19	34	44	16	14	14	29	31	44
15-Mar	17	33	31	51	UO	36	28	14	30	29	34	31	54	31	31	34	24	19	26	28	22	8	13	15	54
16-Mar	16	18	18	18	19	19	20	18	21	30	29	29	30	27	33	30	28	27	20	19	22	19	19	19	33
17-Mar	19	21	22	23	22	20	24	25	28	30	29	26	25	23	18	19	18	15	24	11	11	10	16	16	30
18-Mar	14	18	19	18	16	14	14	18	25	29	31	38	42	38	25	30	25	26	19	24	14	14	11	20	42
19-Mar	15	16	18	18	18	19	22	18	36	36	73	50	40	24	23	24	22	19	19	18	19	17	17	17	73
20-Mar	19	20	21	21	25	48	30	31	26	23	50	36	31	33	31	30	31	29	22	23	25	74	12	12	74
21-Mar	7	20	11	8	14	28	33	44	81	67	86	44	56	67	58	49	54	58	38	55	9	14	17	16	86
22-Mar	19	19	19	22	20	20	19	18	23	28	28	32	31	32	34	32	30	29	17	16	16	16	20	19	34
23-Mar	18	16	15	9	15	12	70	30	23	27	25	27	27	30	28	26	29	26	21	18	20	24	20	14	70
24-Mar	28	26	24	47	38	18	13	35	23	32	40	31	38	55	57	66	46	70	33	18	12	14	8	24	70
25-Mar	9	7	5	9	18	24	11	21	31	32	31	26	29	31	27	24	27	30	29	31	20	21	15	24	32
26-Mar	41	11	58	13	13	12	15	18	82	36	23	29	26	24	24	24	27	25	26	24	12	17	38	8	82
27-Mar	8	20	8	8	5	3	3	14	26	31	45	58	49	41	48	50	63	36	18	16	14	14	10	8	63
28-Mar	9	10	13	13	9	6	9	19	28	27	33	35	33	23	30	21	25	26	24	26	26	25	18	11	35
29-Mar	64	29	36	87	21	19	26	25	22	21	19	19	20	22	25	25	25	28	28	26	49	14	15	6	87
30-Mar	7	10	8	16	11	17	12	22	28	28	59	34	31	34	28	27	52	33	87	21	17	19	18	19	87
31-Mar	18	19	18	17	17	19	18	53	51	34	35	32	32	43	38	28	29	25	21	19	21	19	19	19	53
Diurnal Maximum	64	33	58	87	38	48	70	53	82	67	86	58	56	82	58	66	63	70	87	55	49	74	40	31	

DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS18
STONY MOUNTAIN
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
MARCH 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	34	35	99.87	10.1	0	2.3	0
TRS(ppb) Average	707	36	37	99.87	0.3	0	0.2	0
THC(ppm) Average	709	34	35	99.87	2.2	-	2.1	-
NMHC(ppm) Average	709	34	35	99.87	0.019	-	0.003	-
CH4(ppm) Average	709	34	35	99.87	2.2	-	2.1	-
O3 (ppb) Average	708	35	36	99.87	54.4	0	50.8	-
NO2 (ppb) Average	706	37	38	99.87	10.2	0	2.7	-
NO (ppb) Average	706	37	38	99.87	8.3	-	0.4	-
NOX (ppb) Average	706	37	38	99.87	13.7	-	3.1	-
PM2.5 (ug/m3) Average	741	2	3	99.87	19.5	0	8.8	0
CO(ppm) Average	708	35	36	99.87	0.2	0	0.2	0
CO2(ppm) Average	707	36	37	99.87	451.4	0	448.5	0
Temperature 2 m (C) Average	743	0	1	99.87	9.9	-	1	-
Relative Humidity (%) Average	743	0	1	99.87	91.2	-	83.2	-
Wind Speed 20 m (km/h) Average	743	0	1	99.87	23	-	18	-
Wind Direction 20 m (deg) Average	743	0	1	99.87	-	-	-	-
Precipitation (mm) Total	743	0	1	99.87	1.5	-	5.9	-
Leaf Wetness (% of range) Average	743	0	1	99.87	4	-	2.5	-
Global Solar Radiation (W/m2) Average	743	0	1	99.87	750.8	-	220.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.68	1	-	0	0.1	0.2	0.4	0.8	1.4	10.1
TRS (ppb) Average	707	0.19	0	-	0.1	0.1	0.2	0.2	0.2	0.2	0.3
THC (ppm) Average	709	2.08	0	-	2	2	2.1	2.1	2.1	2.1	2.2
NMHC(ppm) Average	709	0	0.001	-	0	0	0	0	0	0	0.019
CH4(ppm) Average	709	2.08	0	-	2	2	2.1	2.1	2.1	2.1	2.2
O3 (ppb) Average	708	41.26	5.6	-	22.8	34.3	37.5	40.9	44.8	49.4	54.4
NO2 (ppb) Average	706	1.6	1.1	-	0.3	0.6	0.8	1.2	2.1	3.2	10.2
NO (ppb) Average	706	0.16	0.4	-	0	0	0	0	0.2	0.5	8.3
NOX (ppb) Average	706	1.75	1.3	-	0.3	0.6	0.9	1.3	2.3	3.4	13.7
PM2.5 (ug/m3) Average	741	4.1	2.3	-	0.3	2.3	3.1	3.6	4.3	6.3	19.5
CO(ppm) Average	708	0.15	0	-	0.1	0.1	0.1	0.2	0.2	0.2	0.2
CO2(ppm) Average	707	439.42	3.8	-	432	434.6	436.8	438.9	441.9	444.5	451.4
Temperature 2 m (C) Average	743	-7.84	6.6	-	-23.9	-16	-12.2	-8.2	-3.5	0.8	9.9
Relative Humidity (%) Average	743	63.28	17.1	-	21.9	38.7	51.1	65.1	77.6	85.1	91.2
Wind Speed 10 m (km/h) Average	743	11	4	-	2	6	8	11	14	17	23
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	743	-	-	8.99	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	743	1.7	0.7	-	0.4	1	1.3	1.6	1.8	2.7	4
Global Solar Radiation (W/m2) Average	743	141.51	201.4	-	0	0	0	5.8	273.1	478.8	750.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
MARCH 2023

MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 10.1 ppb on Mar 4 00:00

Maximum Daily Average: 2.3 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 8 09:00

Maximum Diurnal Average: 1.2 ppb at hour 10

Monthly Average: 0.68 ppb

Minimum Daily Average: 0.1 ppb on Mar 30

Minimum Diurnal Average: 0.4 ppb at hour 20

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.2 Median = 0.4 Q_3 = 0.8 P_{90} = 1.4 P_{99} = 4.8

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.1	Z	0.5	0.4	0.4	0.4	0.7	1.0	1.1	1.1	1.0	1.1	1.4	1.3	1.2	0.8	0.5	0.4	0.6	0.8	0.3	1.5	0.3	0.5	0.8	1.5
2-Mar	0.7	0.4	Z	0.5	0.7	0.5	0.5	0.8	1.1	1.2	1.1	0.8	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.5	1.2
3-Mar	0.2	0.2	0.3	Z	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.9	2.2	1.8	3.4	10.1	1.0	10.1
4-Mar	9.7	7.6	4.8	0.6	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.4	0.3	0.3	0.2	0.4	0.3	0.1	0.4	0.7	1.2	9.7
5-Mar	0.6	0.5	0.5	0.3	0.4	Z	2.3	3.8	2.2	0.9	1.5	1.6	0.5	0.4	0.5	0.7	0.8	0.7	0.7	0.6	1.0	1.5	1.5	DF	1.1	3.8
6-Mar	2.1	1.5	1.3	1.2	1.1	0.9	0.7	1.1	1.1	0.8	2.2	0.9	0.9	0.6	0.5	Z	0.5	0.3	0.4	0.4	0.4	1.2	1.0	0.9	1.0	2.2
7-Mar	Z	1.0	0.6	0.5	1.0	1.2	1.4	0.9	1.0	0.7	0.6	1.5	0.9	0.8	0.9	1.0	0.9	0.4	0.2	0.2	0.1	0.2	0.1	0.5	0.7	1.5
8-Mar	0.2	Z	0.2	0.4	0.4	0.3	0.7	0.7	0.0	0.0	0.2	0.9	0.4	0.6	0.9	0.7	0.7	0.6	0.1	0.0	0.9	1.1	0.1	0.3	0.4	1.1
9-Mar	0.6	0.5	Z	1.2	0.9	0.7	1.0	0.5	0.5	0.5	0.4	0.2	0.2	0.3	0.2	0.4	0.7	0.4	0.4	0.8	0.2	0.2	0.2	0.3	0.5	1.2
10-Mar	0.4	0.7	0.4	Z	0.3	0.3	0.4	0.4	0.6	0.7	0.5	0.4	0.4	0.7	0.6	0.7	0.5	0.7	0.6	0.1	0.3	0.5	0.9	1.3	0.5	1.3
11-Mar	0.8	1.6	0.8	0.8	Z	0.1	0.2	0.0	0.0	0.3	1.7	5.3	4.4	0.8	0.4	0.9	0.6	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.9	5.3
12-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.4	0.4	0.3	0.1	0.1	0.2	0.7	0.2	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.7
13-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.3	5.0	1.9	1.5	1.1	0.7	0.4	0.3	0.5	0.3	0.1	0.3	0.3	0.3	0.2	0.2	0.6	5.0
14-Mar	0.1	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	1.7	1.0	0.6	0.6	0.7	0.9	1.2	0.5	1.1	0.4	1.7
15-Mar	2.6	4.4	Z	4.2	4.0	3.3	4.1	5.5	3.6	3.1	2.4	1.6	1.3	1.1	1.4	1.7	1.8	1.3	0.9	0.8	1.2	1.0	0.5	0.4	2.3	5.5
16-Mar	0.6	0.6	0.6	Z	0.5	0.5	0.5	0.4	0.3	0.4	0.7	0.9	1.0	1.1	0.9	0.9	0.6	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.6	1.1
17-Mar	0.4	1.5	0.3	0.4	0.4	Z	0.3	0.4	0.7	0.7	0.5	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.8	1.4	1.2	0.6	0.5	1.5
18-Mar	Z	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.5	0.5	0.3	0.6	0.3	0.3	0.3	0.4	0.3	0.7	0.5	0.4	0.4	0.5	0.4	0.3	0.7
19-Mar	0.5	Z	0.9	0.8	0.8	0.6	0.4	0.5	1.4	4.7	4.8	4.6	2.5	1.3	0.9	0.9	0.8	0.6	0.5	0.3	0.7	1.2	0.4	0.4	1.3	4.8
20-Mar	0.7	0.7	Z	0.8	0.7	0.8	0.3	0.2	0.6	1.8	1.8	1.4	1.4	1.9	1.6	1.2	0.7	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.7	1.9
21-Mar	0.0	0.3	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.6	0.1	0.0	0.0	0.2	0.1	1.1
22-Mar	0.2	0.5	0.9	0.9	Z	0.2	0.7	0.8	0.0	0.1	0.8	1.2	1.1	0.8	1.0	1.1	0.9	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.7	1.2
23-Mar	0.5	0.8	0.7	0.6	0.5	Z	0.3	1.2	1.8	2.0	0.7	0.3	0.1	0.2	0.2	0.2	0.1	0.6	0.9	0.6	0.7	0.4	0.3	0.2	0.6	2.0
24-Mar	Z	0.2	0.1	0.1	0.1	0.2	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4
25-Mar	0.3	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.6	1.1	0.8	0.7	0.8	1.9	1.9	1.2	0.9	0.7	0.4	0.4	0.5	0.3	0.3	0.7	1.9
26-Mar	0.2	0.3	Z	0.8	0.6	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.8
27-Mar	0.2	0.1	0.2	Z	0.6	1.8	1.0	3.2	2.2	1.4	0.6	0.4	1.4	1.7	0.7	0.9	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.7	3.2
28-Mar	0.0	0.0	0.1	0.1	Z	0.3	0.8	1.3	0.9	5.2	3.1	2.5	2.0	1.1	0.5	0.3	0.4	0.5	0.5	0.2	0.1	0.1	0.2	0.4	0.9	5.2
29-Mar	0.5	0.8	0.8	0.8	0.5	Z	0.5	0.7	1.9	1.3	0.7	0.7	0.6	0.4	1.1	0.6	0.3	1.2	0.3	0.3	0.3	0.1	0.1	0.0	0.6	1.9
30-Mar	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	C	C	C	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.2	0.1	0.4
31-Mar	0.4	Z	0.3	0.3	0.2	0.2	0.4	0.8	1.0	0.9	0.8	0.6	0.9	1.0	0.9	0.8	0.9	1.1	0.9	0.6	0.3	0.1	0.1	0.2	0.6	1.1
	0.9	1.0	0.6	0.6	0.6	0.5	0.6	0.8	0.8	1.2	1.0	1.0	0.9	0.6	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.7	Diurnal Average	
	9.7	7.6	4.8	4.2	4.0	3.3	4.1	5.5	3.6	5.2	4.8	5.3	4.4	1.9	1.9	1.9	1.8	1.3	1.1	0.9	2.2	1.8	3.4	10.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Stony Mountain - March 2023

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

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Stony Mountain - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	69	49	46	35	34	21	60	73	58	61	44	15	18	24	43	59	709
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	49	46	35	34	21	60	73	58	61	44	15	18	24	43	59	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Stony Mountain

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.3 ppb on Mar 4 01:00 Maximum Daily Average: 0.2 ppb on Mar 1

Minimum Value: 0.1 ppb on Mar 31 23:00 Minimum Daily Average: 0.1 ppb on Mar 31

Maximum Diurnal Average: 0.2 ppb at hour 6 Minimum Diurnal Average: 0.2 ppb at hour 19

Monthly Average: 0.19 ppb Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.2 Median = 0.2 Q_3 = 0.2 P_{90} = 0.2 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	67	49	46	35	34	21	59	70	60	59	44	15	19	25	43	61	707
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	49	46	35	34	21	59	70	60	59	44	15	19	25	43	61	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Stony Mountain

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Stony Mountain - March 2023

Maximum Value: 2.2 ppm on Mar 20 11:00

Maximum Daily Average: 2.1 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 2 17:00

Minimum Daily Average: 2.0 ppm on Mar 3

Maximum Diurnal Average: 2.1 ppm at hour 10

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.08 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.1 Median = 2.1 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	94	13.26	13.26
2.1 - 3.0	615	86.74	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	15	7	4	8	2	0	0	1	4	4	2	1	12	10	7	17	94
2.1 - 3.0	54	42	42	27	32	21	60	72	54	57	42	14	6	14	36	42	615
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	69	49	46	35	34	21	60	73	58	61	44	15	18	24	43	59	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Stony Mountain

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain - March 2023

Maximum Value: 0.019 ppm on Mar 27 02:00

Maximum Daily Average: 0.003 ppm on Mar 27

Minimum Value: 0.000 ppm on Mar 1 01:00

Minimum Daily Average: 0.000 ppm on Mar 1

Maximum Diurnal Average: 0.001 ppm at hour 2

Minimum Diurnal Average: 0.000 ppm at hour 3

Monthly Average: 0.000 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.0

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
3-Mar	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-Mar	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
5-Mar	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	DF	0.000	0.000
6-Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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
7-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11-Mar	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
12-Mar	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
13-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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
17-Mar	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
18-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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
22-Mar	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-Mar	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-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.016	0.019	0.000	Z	0.013	0.013	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	0.003	0.019
28-Mar	0.000	0.000	0.000	0.007	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
29-Mar	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
30-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Diurnal Average	
	0.016	0.019	0.000	0.007	0.013	0.013	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	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	702	99.01	99.01
0.006 - 0.05	7	0.99	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	68	49	46	35	34	21	60	73	57	61	44	15	18	22	40	59	702
0.006 - 0.05	1	0	0	0	0	0	0	0	1	0	0	0	0	2	3	0	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	69	49	46	35	34	21	60	73	58	61	44	15	18	24	43	59	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.2 ppm on Mar 20 11:00 Maximum Daily Average: 2.1 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 2 17:00 Minimum Daily Average: 2.0 ppm on Mar 3

Maximum Diurnal Average: 2.1 ppm at hour 10 Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.08 ppm Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.1 Median = 2.1 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	94	13.26	13.26
2.1 - 3.0	615	86.74	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	15	7	4	8	2	0	0	1	4	4	2	1	12	10	7	17	94
2.1 - 3.0	54	42	42	27	32	21	60	72	54	57	42	14	6	14	36	42	615
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	69	49	46	35	34	21	60	73	58	61	44	15	18	24	43	59	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Stony Mountain

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Stony Mountain - March 2023

Maximum Value: 8.3 ppb on Mar 24 13:00

Maximum Daily Average: 0.4 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 4 05:00

Minimum Daily Average: 0.0 ppb on Mar 4

Maximum Diurnal Average: 0.7 ppb at hour 13

Minimum Diurnal Average: 0.0 ppb at hour 6

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} = 0.5 P_{99} = 1.5

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.4	0.6	0.7	0.7	0.6	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.3	0.6	0.7	0.8	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
3-Mar	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	0.0	0.0	0.0	0.1
4-Mar	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
5-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.5	0.6	0.6	0.9	0.9	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	DF	0.2	0.9
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	1.0	0.5	Z	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.6	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.2	0.2	0.4	0.2	0.2	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
9-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.5	0.8	0.7	0.5	0.2	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
10-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
11-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.8	2.0	1.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0
12-Mar	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	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
13-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.5	2.2	1.2	1.1	0.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.2
14-Mar	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	0.2	0.7	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
15-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.4	0.9	1.3	1.5	1.3	1.0	0.8	0.8	0.7	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.5
16-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.6	0.5	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
17-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.7	0.6	0.4	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.7
18-Mar	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
19-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.6	2.0	2.2	1.3	0.7	0.4	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.2
20-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.4	0.6	0.5	0.8	0.6	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
21-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
22-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	C	C	C	C	C	C	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	--	0.5
23-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
24-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	8.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	8.3
25-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.2	0.6	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
26-Mar	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	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.2	0.2	0.4	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
28-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.9	1.3	1.0	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9
29-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4
30-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	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	0.5
31-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.1	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	0.1	0.3	0.5	0.5	0.5	0.7	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5	0.9	2.2	2.2	2.0	8.3	0.8	0.8	0.7	0.5	0.3	0.1	0.0	0.0	0.0	0.1	0.0	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Stony Mountain - March 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	70	46	48	34	32	23	63	69	60	57	42	15	18	26	42	61	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	46	48	34	32	23	63	69	60	57	42	15	18	26	42	61	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Stony Mountain

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 10.2 ppb on Mar 4 00:00

Maximum Daily Average: 2.7 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 3 18:00

Maximum Diurnal Average: 2.0 ppb at hour 10

Monthly Average: 1.60 ppb

Minimum Daily Average: 0.8 ppb on Mar 26

Minimum Diurnal Average: 1.3 ppb at hour 15

Percentiles: P_1 = 0.4 P_{10} = 0.6 Q_1 = 0.8 Median = 1.2 Q_3 = 2.1 P_{90} = 3.2 P_{99} = 5.4

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.2	1.2	1.5	1.3	Z	1.7	2.1	3.0	2.4	2.1	1.9	2.0	2.1	2.2	2.4	2.3	2.4	2.3	2.7	2.6	2.7	2.8	2.0	2.1	2.1	3.0
2-Mar	2.8	3.1	3.2	3.2	3.8	Z	4.1	4.1	4.5	4.7	4.9	4.4	3.4	2.7	2.0	1.4	1.0	0.8	0.9	1.0	0.7	0.6	0.6	0.6	2.5	4.9
3-Mar	Z	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.3	0.5	1.9	5.8	5.6	7.3	10.2	1.7	10.2
4-Mar	9.6	Z	5.7	0.8	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.3	0.5	0.5	0.8	1.5	1.1	9.6
5-Mar	1.9	2.0	Z	1.2	1.4	2.4	4.0	4.1	1.8	1.0	1.3	1.2	0.6	0.6	0.6	0.6	0.7	0.9	0.8	1.2	4.3	2.8	2.9	DF	1.7	4.3
6-Mar	3.6	3.2	3.0	3.1	3.2	3.3	3.0	3.4	2.7	1.8	2.7	1.4	Z	1.1	1.0	0.9	0.9	0.9	1.3	1.3	0.6	1.4	1.3	1.4	2.0	3.6
7-Mar	1.6	2.1	1.5	Z	1.7	2.0	2.1	1.7	1.9	1.3	1.2	1.8	1.4	1.2	1.4	1.5	1.4	1.1	0.9	0.9	0.9	1.2	1.0	1.3	1.4	2.1
8-Mar	1.1	1.1	1.4	1.6	Z	1.1	1.3	1.8	1.3	0.8	0.7	1.2	0.7	0.8	1.1	1.0	1.0	1.0	0.6	0.6	1.5	1.5	0.7	1.0	1.1	1.8
9-Mar	1.7	1.9	2.4	2.6	2.8	Z	3.3	3.0	2.3	2.0	1.4	1.1	0.8	0.8	0.9	1.0	1.5	1.2	1.2	1.4	0.8	1.0	1.0	1.6	1.6	3.3
10-Mar	Z	1.6	1.3	1.1	1.1	1.2	1.0	1.1	1.2	1.1	1.1	1.2	1.3	1.6	1.6	1.4	1.0	1.1	1.1	1.4	1.3	1.1	1.2	1.4	1.2	1.6
11-Mar	1.3	Z	1.4	1.3	1.2	1.0	1.0	1.3	1.1	1.5	1.9	3.2	3.0	1.1	0.9	1.2	1.1	0.9	1.0	1.0	1.2	1.2	1.0	1.0	1.3	3.2
12-Mar	0.9	0.9	Z	1.0	1.1	1.2	1.2	1.2	1.1	1.1	1.0	0.9	0.9	0.8	1.1	1.3	1.8	1.8	1.2	1.1	1.0	1.1	1.1	1.3	1.1	1.8
13-Mar	0.9	0.9	0.9	Z	0.8	1.4	2.7	2.5	3.1	5.6	3.3	3.4	2.6	1.7	1.2	0.9	1.2	1.0	0.7	1.2	1.3	0.9	0.8	1.4	1.8	5.6
14-Mar	1.0	0.8	0.9	0.9	Z	1.0	1.2	0.7	0.5	0.4	0.4	0.5	0.6	1.2	2.7	2.9	1.8	1.5	1.2	1.2	1.6	1.8	1.4	1.5	1.2	2.9
15-Mar	2.8	3.9	4.0	4.8	4.3	Z	3.9	3.3	2.5	2.4	2.4	1.9	1.8	1.6	1.8	1.9	2.0	1.7	1.8	2.2	3.2	3.2	2.1	2.1	2.7	4.8
16-Mar	Z	1.9	2.0	2.0	2.6	3.2	3.4	3.2	3.4	2.8	1.9	1.7	1.7	1.7	1.4	1.2	1.0	1.0	1.1	1.0	3.4	2.9	1.8	1.0	2.1	3.4
17-Mar	1.0	1.7	Z	2.1	2.1	2.0	1.9	2.0	2.6	2.8	2.4	2.1	2.0	1.2	1.2	1.2	1.2	1.2	1.6	2.2	2.5	2.7	2.7	2.7	2.0	2.8
18-Mar	2.9	3.0	2.7	Z	2.3	2.3	2.3	2.3	2.5	3.2	3.1	2.3	1.7	1.2	1.2	1.1	0.9	0.8	1.1	1.2	1.4	1.1	2.1	2.1	1.9	3.2
19-Mar	1.7	1.3	1.1	1.0	Z	1.0	1.3	1.8	2.5	4.7	4.4	3.2	2.4	1.6	1.3	1.4	1.2	1.0	1.1	1.0	1.1	1.5	0.9	1.0	1.7	4.7
20-Mar	1.5	1.5	1.7	1.7	1.9	Z	2.6	2.0	2.3	3.3	3.4	3.3	3.2	3.3	2.6	2.2	1.6	0.9	0.7	0.6	0.5	0.5	0.5	0.7	1.8	3.4
21-Mar	Z	1.0	0.8	0.6	0.7	0.9	0.8	0.9	1.0	0.8	1.0	1.1	0.8	0.7	0.8	0.9	0.8	0.8	2.3	3.4	1.3	0.9	0.6	1.2	1.0	3.4
22-Mar	1.3	Z	1.8	1.8	1.8	1.6	2.0	1.7	1.3	C	C	C	C	C	C	2.9	2.8	2.6	2.6	2.8	2.8	3.0	3.0	3.2	--	3.2
23-Mar	3.9	4.7	Z	4.7	4.2	3.6	2.8	2.8	2.6	2.4	1.7	1.3	1.0	0.9	0.7	0.7	0.5	2.1	4.7	2.6	2.1	1.2	1.0	0.7	2.3	4.7
24-Mar	0.6	0.5	0.5	Z	0.5	0.6	0.7	0.8	1.0	0.9	0.7	0.8	5.4	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.8	5.4
25-Mar	0.5	0.7	0.7	0.7	Z	1.0	1.1	1.1	1.1	1.0	1.1	1.0	0.8	0.7	1.0	2.2	2.9	2.1	2.0	1.9	2.1	2.1	1.5	1.1	1.3	2.9
26-Mar	0.9	0.8	1.5	1.4	1.3	Z	2.0	1.1	0.6	0.6	0.6	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.8	1.0	0.4	0.5	0.8	2.0
27-Mar	Z	0.6	0.5	0.8	1.8	2.9	1.5	1.4	1.2	1.0	0.6	0.6	1.1	1.4	0.9	1.0	0.7	0.5	0.6	0.5	0.4	0.4	0.4	0.6	0.9	2.9
28-Mar	0.7	Z	0.7	0.8	0.8	0.8	1.1	1.1	1.7	3.7	2.5	2.0	1.7	1.1	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	1.1	3.7
29-Mar	0.9	1.3	Z	1.4	1.3	1.3	1.4	1.4	1.7	1.4	0.9	1.1	1.4	0.9	1.5	0.9	1.3	4.5	3.6	2.5	1.8	1.0	1.1	1.2	1.6	4.5
30-Mar	0.9	0.4	1.2	Z	0.6	0.6	0.7	0.6	0.8	0.9	1.0	1.2	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.9	1.1	0.9	1.2	0.8	1.2
31-Mar	1.1	1.1	1.2	1.5	Z	2.1	2.7	3.8	3.6	4.0	3.4	3.4	3.3	3.3	3.1	3.1	3.2	3.0	2.9	2.3	1.9	2.7	1.6	1.3	2.6	4.0
	1.9	1.6	1.7	1.7	1.8	1.6	1.9	1.9	1.8	2.0	1.8	1.7	1.6	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.7	1.6	1.4	1.6	Diurnal Average	
	9.6	4.7	5.7	4.8	4.3	3.6	4.1	4.1	4.5	5.6	4.9	4.4	5.4	3.3	3.1	3.1	3.2	4.5	4.7	3.4	5.8	5.6	7.3	10.2	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	70	46	48	34	32	23	63	69	60	57	42	15	18	26	42	61	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	46	48	34	32	23	63	69	60	57	42	15	18	26	42	61	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Stony Mountain - March 2023

Maximum Value: 13.7 ppb on Mar 24 13:00

Maximum Daily Average: 3.1 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 4 20:00

Minimum Daily Average: 0.8 ppb on Mar 26

Maximum Diurnal Average: 2.5 ppb at hour 10

Minimum Diurnal Average: 1.3 ppb at hour 18

Monthly Average: 1.75 ppb

Percentiles: P_1 = 0.4 P_{10} = 0.6 Q_1 = 0.9 Median = 1.3 Q_3 = 2.3 P_{90} = 3.4 P_{99} = 5.8

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.2	1.2	1.5	1.3	Z	1.7	2.1	3.1	2.6	2.5	2.5	2.7	2.8	2.8	2.9	2.6	2.5	2.4	2.7	2.6	2.7	2.8	2.0	2.1	2.3	3.1
2-Mar	2.8	3.1	3.2	3.2	3.8	Z	4.1	4.2	4.8	5.3	5.6	5.2	3.9	3.0	2.2	1.5	1.0	0.8	0.9	1.0	0.7	0.6	0.6	0.6	2.7	5.6
3-Mar	Z	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.5	1.9	5.8	5.6	7.3	10.2	1.7	10.2
4-Mar	9.6	Z	5.7	0.8	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.3	0.5	0.5	0.8	1.5	1.1	9.6
5-Mar	1.9	2.0	Z	1.2	1.4	2.4	4.0	4.6	2.4	1.6	2.2	2.1	0.9	0.8	0.8	0.8	0.8	0.9	0.8	1.2	4.3	2.8	2.9	DF	1.9	4.6
6-Mar	3.6	3.2	3.0	3.1	3.2	3.3	3.0	3.5	3.1	2.4	3.7	1.9	Z	1.4	1.1	1.0	1.0	0.9	1.3	1.3	0.6	1.4	1.3	1.4	2.2	3.7
7-Mar	1.6	2.1	1.5	Z	1.7	2.0	2.1	1.8	2.1	1.5	1.5	2.4	1.8	1.6	1.7	1.7	1.5	1.1	0.9	0.9	0.9	1.2	1.0	1.3	1.6	2.4
8-Mar	1.1	1.1	1.4	1.6	Z	1.1	1.3	1.9	1.5	1.0	0.9	1.6	0.9	1.0	1.5	1.3	1.2	1.0	0.6	0.6	1.5	1.5	0.7	1.0	1.2	1.9
9-Mar	1.7	1.9	2.4	2.6	2.8	Z	3.3	3.2	2.8	2.8	2.1	1.6	1.0	0.9	1.0	1.2	1.7	1.2	1.2	1.4	0.8	1.0	1.0	1.6	1.8	3.3
10-Mar	Z	1.6	1.3	1.1	1.1	1.2	1.0	1.1	1.3	1.3	1.4	1.5	1.6	1.9	1.8	1.6	1.1	1.1	1.1	1.4	1.3	1.1	1.2	1.4	1.3	1.9
11-Mar	1.3	Z	1.4	1.3	1.2	1.0	1.0	1.4	1.3	1.9	2.7	5.2	4.5	1.3	1.0	1.3	1.2	0.9	1.0	1.0	1.2	1.2	1.0	1.0	1.6	5.2
12-Mar	0.9	0.9	Z	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.0	1.0	0.9	1.2	1.5	1.9	1.9	1.2	1.1	1.0	1.1	1.1	1.3	1.2	1.9
13-Mar	0.9	0.9	0.9	Z	0.8	1.4	2.7	2.6	3.6	7.8	4.5	4.5	3.2	2.0	1.3	0.9	1.3	1.0	0.7	1.2	1.3	0.9	0.8	1.4	2.0	7.8
14-Mar	1.0	0.8	0.9	0.9	Z	1.0	1.2	0.7	0.5	0.4	0.4	0.5	0.7	1.4	3.4	3.5	2.0	1.6	1.2	1.2	1.6	1.8	1.4	1.5	1.3	3.5
15-Mar	2.8	3.9	4.0	4.8	4.3	Z	4.0	3.7	3.4	3.7	3.9	3.2	2.8	2.4	2.6	2.6	2.5	1.9	1.9	2.2	3.2	3.2	2.1	2.1	3.1	4.8
16-Mar	Z	1.9	2.0	2.0	2.6	3.2	3.4	3.4	4.0	3.4	2.4	2.3	2.2	2.1	1.7	1.4	1.1	1.1	1.1	1.0	3.4	2.9	1.8	1.0	2.2	4.0
17-Mar	1.0	1.7	Z	2.1	2.1	2.0	1.9	2.2	3.1	3.5	3.1	2.7	2.4	1.4	1.3	1.4	1.3	1.3	1.6	2.2	2.5	2.7	2.8	2.7	2.1	3.5
18-Mar	2.9	3.1	2.7	Z	2.3	2.3	2.3	2.4	2.7	3.6	3.6	2.6	2.0	1.3	1.3	1.2	1.0	0.8	1.1	1.2	1.4	1.1	2.1	2.1	2.1	3.6
19-Mar	1.7	1.3	1.1	1.0	Z	1.0	1.3	1.9	3.1	6.7	6.6	4.5	3.1	2.0	1.5	1.6	1.4	1.0	1.1	1.0	1.1	1.5	0.9	1.0	2.1	6.7
20-Mar	1.5	1.5	1.7	1.7	1.9	Z	2.6	2.1	2.7	3.9	3.9	4.1	3.8	4.1	3.2	2.5	1.7	0.9	0.7	0.6	0.5	0.5	0.5	0.7	2.1	4.1
21-Mar	Z	1.0	0.8	0.6	0.7	0.9	0.8	1.0	1.1	0.9	1.2	1.5	1.0	0.8	1.0	1.0	0.9	0.8	2.3	3.4	1.3	0.9	0.6	1.2	1.1	3.4
22-Mar	1.3	Z	1.8	1.8	1.8	1.6	2.0	1.8	1.5	C	C	C	C	C	C	3.4	3.0	2.7	2.6	2.8	2.8	3.0	3.0	3.2	--	3.4
23-Mar	3.9	4.7	Z	4.7	4.2	3.6	2.8	2.9	2.9	2.7	1.9	1.4	1.1	0.9	0.7	0.7	0.5	2.3	4.8	2.6	2.1	1.2	1.0	0.7	2.4	4.8
24-Mar	0.6	0.5	0.5	Z	0.5	0.6	0.7	0.8	1.1	1.1	0.9	1.0	13.7	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	1.2	13.7
25-Mar	0.5	0.7	0.7	0.7	Z	1.0	1.1	1.2	1.3	1.2	1.3	1.1	0.9	0.7	1.2	2.8	3.4	2.3	2.0	1.9	2.1	2.1	1.5	1.1	1.4	3.4
26-Mar	0.9	0.8	1.5	1.4	1.3	Z	2.0	1.2	0.7	0.7	0.7	0.6	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.8	1.0	0.4	0.5	0.8	2.0
27-Mar	Z	0.6	0.5	0.8	1.8	2.9	1.5	1.6	1.6	1.3	0.8	0.8	1.5	2.0	1.1	1.2	0.8	0.5	0.6	0.5	0.4	0.4	0.4	0.6	1.0	2.9
28-Mar	0.7	Z	0.7	0.8	0.8	0.8	1.1	1.2	2.2	5.6	3.8	3.0	2.5	1.5	0.8	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	1.4	5.6
29-Mar	0.9	1.3	Z	1.4	1.3	1.3	1.4	1.5	2.1	1.7	1.1	1.3	1.6	1.0	1.7	1.0	1.4	4.8	3.7	2.5	1.8	1.0	1.1	1.2	1.7	4.8
30-Mar	0.9	0.4	1.2	Z	0.6	0.6	0.7	0.7	0.9	1.1	1.3	1.7	1.1	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.9	1.1	0.9	1.2	0.9	1.7
31-Mar	1.1	1.1	1.2	1.5	Z	2.1	2.8	3.9	3.9	4.3	3.7	3.7	3.7	3.6	3.3	3.3	3.4	3.2	3.0	2.3	1.9	2.7	1.6	1.3	2.7	4.3
	1.9	1.6	1.7	1.7	1.8	1.6	1.9	2.1	2.1	2.5	2.3	2.2	2.3	1.5	1.5	1.5	1.4	1.3	1.4	1.4	1.7	1.6	1.4	1.6	Diurnal Average	
	9.6	4.7	5.7	4.8	4.3	3.6	4.1	4.6	4.8	7.8	6.6	5.2	13.7	4.1	3.4	3.5	3.4	4.8	4.8	3.4	5.8	5.6	7.3	10.2	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	70	46	48	34	32	23	63	69	60	57	42	15	18	26	42	61	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	46	48	34	32	23	63	69	60	57	42	15	18	26	42	61	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Stony Mountain

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 54.4 ppb on Mar 18 16:00

Maximum Daily Average: 50.8 ppb on Mar 18

Minimum Value: 22.8 ppb on Mar 4 00:00

Minimum Daily Average: 32.7 ppb on Mar 5

Maximum Diurnal Average: 43.9 ppb at hour 17

Minimum Diurnal Average: 38.5 ppb at hour 8

Monthly Average: 41.26 ppb

Percentiles: P_1 = 28.4 P_{10} = 34.3 Q_1 = 37.5 Median = 40.9 Q_3 = 44.8 P_{90} = 49.4 P_{99} = 53.3

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	34.1	33.9	33.7	Z	32.7	32.7	32.8	31.3	32.9	34.1	C	C	C	C	39.4	40.8	40.5	40.4	39.5	39.8	39.9	40.3	41.2	41.1	36.9	41.2
2-Mar	40.0	39.3	38.9	38.5	Z	37.1	36.6	36.4	36.0	35.7	36.0	37.1	39.2	40.5	41.2	41.8	42.3	42.8	41.9	41.7	40.9	41.6	41.5	41.2	39.5	42.8
3-Mar	41.2	42.5	43.1	43.3	42.9	Z	42.5	41.8	41.4	41.9	41.7	40.1	40.7	39.9	40.5	40.4	40.7	39.8	39.0	36.3	29.3	28.4	25.7	22.8	38.5	43.3
4-Mar	Z	24.2	26.7	34.8	35.0	33.4	33.9	33.7	34.3	35.2	35.5	35.3	35.7	36.1	36.0	35.9	35.8	35.0	34.1	33.3	32.6	32.2	31.4	30.3	33.5	36.1
5-Mar	30.7	Z	31.5	32.1	31.1	29.5	27.0	26.8	28.7	29.0	29.6	32.4	35.5	35.7	36.7	37.2	37.2	36.9	37.1	36.5	33.1	33.1	32.8	DF	32.7	37.2
6-Mar	32.6	32.6	33.1	32.3	31.3	30.6	30.6	30.4	32.3	34.4	33.7	Z	37.8	39.2	39.9	40.1	40.6	41.2	39.9	38.8	39.5	38.8	39.0	38.5	36.0	41.2
7-Mar	38.1	37.7	Z	39.6	38.8	38.0	37.1	36.8	36.3	36.6	36.7	36.6	38.1	39.3	40.6	42.0	42.7	42.9	43.1	43.2	42.9	42.2	41.0	39.6	39.6	43.2
8-Mar	39.1	38.6	37.7	Z	36.6	36.8	36.3	35.3	35.4	36.8	38.4	39.2	40.1	39.7	39.1	39.7	40.7	41.0	40.7	39.1	38.1	38.2	38.7	38.3	38.4	41.0
9-Mar	37.5	37.1	36.5	36.0	Z	35.2	34.3	34.2	34.5	34.1	34.8	35.1	35.8	37.1	37.3	37.6	37.9	38.0	37.4	36.9	38.0	37.7	37.3	36.9	36.4	38.0
10-Mar	36.8	35.4	35.5	35.3	34.5	Z	34.4	34.3	34.4	35.5	36.3	37.7	38.4	38.1	37.4	38.1	38.9	40.0	39.8	39.3	39.2	39.6	37.9	35.9	37.1	40.0
11-Mar	Z	37.3	37.5	37.2	36.4	35.8	35.9	34.3	34.0	33.4	33.4	33.7	35.2	39.2	40.1	40.1	41.3	41.2	40.9	41.1	40.7	40.3	40.0	38.7	37.7	41.3
12-Mar	37.9	Z	36.8	36.5	36.9	37.4	37.1	36.8	37.5	38.7	39.8	40.8	42.0	43.2	43.1	42.4	42.1	42.7	43.7	43.8	44.2	44.0	43.7	43.0	40.6	44.2
13-Mar	43.5	43.5	Z	44.3	43.4	41.6	40.2	41.0	38.3	36.8	41.1	42.2	44.0	45.6	45.8	45.7	45.2	44.3	43.9	43.2	42.9	42.7	42.6	41.9	42.8	45.8
14-Mar	41.3	41.1	40.6	Z	41.0	41.1	41.1	40.2	38.8	39.0	39.4	39.4	39.2	38.5	36.4	36.6	38.1	38.6	39.0	38.3	37.2	37.0	38.5	38.8	39.1	41.3
15-Mar	36.2	33.3	32.2	30.4	Z	30.7	30.9	31.7	32.3	33.0	34.2	35.5	37.0	38.5	38.5	38.5	38.7	39.4	38.1	37.2	35.6	35.2	36.9	36.3	35.2	39.4
16-Mar	36.1	37.5	36.9	35.7	32.9	Z	30.6	28.6	25.9	29.9	33.4	35.4	37.0	37.6	39.3	41.1	41.4	41.1	40.7	40.7	38.1	38.4	39.6	40.1	36.4	41.4
17-Mar	39.3	Z	38.1	37.2	37.3	38.5	39.3	41.3	42.5	41.5	42.3	44.7	47.9	51.7	53.0	52.8	53.6	53.0	53.4	52.3	50.9	49.7	49.5	50.3	46.1	53.6
18-Mar	49.7	48.0	Z	48.5	48.7	49.0	48.4	48.7	49.2	49.9	50.4	51.1	51.8	52.9	54.1	54.4	53.1	52.4	52.7	52.5	51.6	50.7	49.7	49.8	50.8	54.4
19-Mar	49.6	49.6	47.9	Z	46.2	45.1	43.5	43.2	42.5	40.0	40.5	43.7	45.7	46.7	46.8	47.0	46.4	45.3	44.3	43.4	41.4	40.7	41.9	42.3	44.5	49.6
20-Mar	41.3	40.8	42.1	40.9	Z	36.6	34.2	35.8	37.9	45.6	52.1	45.6	46.8	44.8	43.4	44.1	42.2	39.5	40.0	39.7	39.2	38.7	38.5	38.6	41.2	52.1
21-Mar	38.6	37.8	38.9	41.1	41.7	Z	39.9	39.6	38.9	40.1	39.9	40.1	42.3	44.2	43.9	44.5	44.3	44.4	42.5	39.1	41.0	41.4	41.2	39.7	41.1	44.5
22-Mar	Z	39.1	39.5	39.4	39.9	40.4	41.9	42.9	45.1	46.3	46.5	47.6	48.6	50.1	50.6	51.1	52.4	53.2	53.4	53.4	53.4	53.3	52.8	52.4	47.5	53.4
23-Mar	51.6	Z	49.4	48.7	47.8	48.3	48.5	47.1	47.0	47.7	49.0	49.2	49.6	49.6	49.6	48.3	47.6	46.3	43.5	44.1	43.7	44.8	44.0	44.1	47.4	51.6
24-Mar	44.4	44.0	Z	44.1	44.3	44.2	41.8	41.5	42.1	42.1	42.8	43.8	42.9	45.7	46.8	48.2	48.5	49.1	49.4	49.6	49.4	49.4	49.5	49.0	45.8	49.6
25-Mar	48.8	49.1	49.4	Z	46.4	46.0	46.6	47.7	47.4	47.8	48.1	49.9	49.7	50.4	50.4	48.8	48.2	48.2	48.7	46.7	45.2	44.3	44.9	44.8	47.7	50.4
26-Mar	44.8	44.2	42.7	42.3	Z	40.9	38.8	38.4	38.9	39.4	39.4	40.4	41.7	41.9	41.6	41.9	42.9	43.0	42.3	42.0	41.0	40.5	40.9	40.9	41.3	44.8
27-Mar	40.5	40.5	40.5	39.7	37.2	Z	37.7	38.1	38.4	41.5	42.9	42.5	41.5	41.9	44.0	43.5	44.4	45.3	44.7	44.6	44.4	44.1	44.2	44.2	42.0	45.3
28-Mar	Z	43.5	42.9	42.0	42.0	41.5	40.5	41.0	40.5	39.3	41.4	43.4	44.8	46.6	48.6	49.8	49.9	49.4	49.0	48.5	48.5	48.9	48.6	48.5	45.2	49.9
29-Mar	47.6	Z	46.2	45.9	45.8	45.6	45.2	44.4	43.2	43.9	45.4	44.9	44.2	44.3	43.9	44.7	44.2	40.4	41.0	41.6	41.6	41.7	41.1	40.9	43.8	47.6
30-Mar	40.8	41.1	Z	40.0	40.6	39.3	39.5	39.5	40.3	40.8	42.4	43.1	44.6	44.9	45.3	45.8	45.6	45.8	45.7	45.6	45.3	46.1	45.9	46.2	43.2	46.2
31-Mar	46.1	47.0	48.4	Z	50.7	50.8	50.8	49.7	50.8	50.1	50.4	49.4	49.3	50.9	51.5	52.1	52.4	52.0	51.4	51.1	49.9	47.9	48.5	48.4	50.0	52.4
	41.0	40.0	39.5	39.4	40.1	39.5	38.7	38.5	38.6	39.4	40.6	41.4	42.2	43.2	43.4	43.7	43.9	43.6	43.3	42.7	41.9	41.7	41.6	41.4	Diurnal Average	
	51.6	49.6	49.4	48.7	50.7	50.8	50.8	49.7	50.8	50.1	52.1	51.1	51.8	52.9	54.1	54.4	53.6	53.2	53.4	53.4	53.4	53.3	52.8	52.4	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Stony Mountain - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
21 - 50	666	94.07	94.07
51 - 82	42	5.93	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Stony Mountain - March 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 50	65	45	44	33	34	22	58	71	57	50	34	13	19	24	40	57	666
51 - 82	3	2	3	1	0	0	1	3	2	7	9	3	0	1	3	4	42
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	47	47	34	34	22	59	74	59	57	43	16	19	25	43	61	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Stony Mountain

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 19.5 $\mu g/m^3$ on Mar 23 03:00

Maximum Daily Average: 8.8 $\mu g/m^3$ on Mar 31

Minimum Value: 0.3 $\mu g/m^3$ on Mar 2 21:00

Maximum Diurnal Average: 4.6 $\mu g/m^3$ at hour 11

Monthly Average: 4.10 $\mu g/m^3$

Minimum Daily Average: 1.9 $\mu g/m^3$ on Mar 3

Minimum Diurnal Average: 3.7 $\mu g/m^3$ at hour 17

Percentiles: P_1 = 0.5 P_{10} = 2.3 Q_1 = 3.1 Median = 3.6 Q_3 = 4.3 P_{90} = 6.3 P_{99} = 13.0

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	2
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.5	1.7	2.1	3.4	2.7	3.1	3.3	3.3	3.4	3.5	4.4	5.2	5.9	5.9	6.2	6.9	6.3	6.3	6.5	6.5	6.5	6.7	6.9	7.1	4.8	7.1
2-Mar	7.6	8.1	8.8	9.5	10.9	11.9	12.2	12.3	12.7	13.1	12.4	10.2	6.4	4.3	2.6	1.0	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	6.1	13.1
3-Mar	0.6	1.0	1.0	1.0	0.8	0.8	0.9	1.1	1.2	1.1	1.0	0.8	0.9	1.2	1.5	1.5	1.5	1.6	1.8	2.8	4.6	4.5	5.1	7.2	1.9	7.2
4-Mar	7.5	7.0	6.3	4.3	3.9	3.8	4.1	4.1	4.2	3.9	3.8	3.5	3.2	3.2	3.3	3.3	3.3	3.1	3.1	3.0	2.7	2.7	2.8	3.2	3.9	7.5
5-Mar	3.0	2.9	3.0	2.7	2.9	3.3	4.1	4.3	3.6	3.1	2.8	2.3	1.9	1.8	1.8	1.8	1.9	1.9	1.9	2.1	2.5	2.9	2.8	DF	2.7	4.3
6-Mar	2.8	2.9	2.7	2.5	2.6	2.8	2.7	2.7	2.5	2.4	2.2	2.3	2.5	2.5	2.3	2.4	2.1	1.9	2.1	2.4	2.5	2.5	2.3	2.2	2.5	2.9
7-Mar	2.4	2.5	2.6	2.7	2.7	2.7	2.7	2.8	3.0	3.3	3.5	3.4	3.5	3.2	2.8	2.6	2.3	2.3	2.7	3.0	3.9	3.8	3.3	3.0	2.9	3.9
8-Mar	3.0	3.2	3.4	3.5	3.3	3.3	3.4	3.3	3.3	3.2	3.1	3.2	2.7	2.8	2.7	2.5	2.2	2.1	2.4	2.7	2.3	2.4	2.2	2.4	2.9	3.5
9-Mar	3.0	3.5	3.6	3.6	3.6	3.6	3.5	3.3	3.1	3.0	2.9	3.1	3.1	3.3	3.4	3.4	3.4	3.2	3.2	3.4	4.3	4.9	4.4	4.7	3.5	4.9
10-Mar	4.8	4.3	4.0	3.8	3.6	3.6	3.5	3.6	3.9	4.4	4.4	4.4	4.7	4.7	4.1	3.8	3.5	3.5	3.5	3.6	3.4	2.9	2.8	3.1	3.8	4.8
11-Mar	3.4	3.4	3.3	3.2	3.2	3.3	3.2	3.1	3.1	3.1	3.2	3.1	3.1	2.8	2.5	2.4	2.5	2.4	2.4	2.7	2.7	2.8	2.9	3.1	3.0	3.4
12-Mar	3.1	3.1	3.3	3.4	3.6	3.9	3.9	3.9	3.8	4.0	4.1	3.8	3.4	3.3	3.2	3.2	3.2	3.2	3.1	3.1	3.8	3.8	4.1	4.1	3.6	4.1
13-Mar	4.3	4.5	4.6	4.6	4.6	4.6	5.2	5.3	5.4	6.0	5.6	5.2	4.7	4.0	3.8	3.5	3.2	3.3	3.2	3.4	3.4	3.2	2.9	2.8	4.2	6.0
14-Mar	2.6	2.5	2.6	2.6	2.7	2.7	2.1	2.1	2.2	2.3	2.5	2.5	2.5	3.2	3.7	4.2	3.8	3.5	3.5	3.5	3.5	3.2	3.0	2.8	2.9	4.2
15-Mar	3.2	3.7	3.9	3.7	3.7	3.5	3.5	3.5	3.4	3.3	3.3	3.2	3.2	3.2	3.3	3.2	3.3	3.3	3.2	3.3	3.4	3.5	3.3	3.3	3.4	3.9
16-Mar	3.4	3.3	3.2	3.2	3.4	3.5	3.3	3.3	3.4	3.8	4.1	4.3	4.4	4.3	4.3	4.1	3.9	3.8	3.8	3.9	3.9	3.9	3.9	3.9	3.8	4.4
17-Mar	3.8	3.7	3.9	4.4	4.8	4.8	4.8	4.7	5.3	5.4	4.8	4.2	4.2	3.7	3.9	3.9	3.7	3.3	3.3	3.4	3.5	3.9	4.0	4.9	4.2	5.4
18-Mar	6.0	6.4	6.5	6.3	6.1	6.2	6.2	6.4	7.2	8.3	7.5	5.7	4.6	4.2	4.4	4.5	4.2	4.1	4.1	4.4	3.9	3.4	3.3	3.4	5.3	8.3
19-Mar	3.3	3.6	3.6	3.3	3.1	3.2	3.3	3.3	3.4	3.6	3.4	3.1	3.0	3.1	2.9	2.7	2.5	2.8	3.0	3.7	3.3	3.4	3.4	3.5	3.2	3.7
20-Mar	3.6	3.8	4.4	4.4	4.3	4.2	4.0	4.0	4.9	8.2	10.5	7.9	7.7	6.5	5.5	6.1	5.6	4.0	4.1	4.1	4.1	4.3	4.4	4.5	5.2	10.5
21-Mar	4.5	4.4	4.3	4.2	4.4	4.4	4.2	3.8	3.8	3.7	3.8	4.0	3.7	3.6	3.7	3.7	3.9	4.3	4.3	3.9	3.8	3.7	3.5	3.6	4.0	4.5
22-Mar	3.6	3.5	3.5	3.6	3.8	4.2	5.0	5.0	5.3	5.9	6.7	C	C	7.5	7.7	8.1	8.2	8.9	9.2	10.2	11.2	13.0	13.1	13.8	7.3	13.8
23-Mar	15.9	18.9	19.5	18.7	15.7	12.4	8.5	7.5	5.8	5.1	4.2	3.6	3.3	3.2	2.3	2.5	1.7	3.2	5.4	5.1	4.6	4.1	4.1	4.2	7.5	19.5
24-Mar	4.0	4.0	3.9	3.8	3.8	3.9	3.9	3.8	3.8	3.8	3.8	3.6	5.0	3.5	3.6	3.7	3.8	3.8	3.9	3.9	3.9	3.8	3.9	3.9	3.9	5.0
25-Mar	3.9	4.5	4.9	4.4	4.6	5.2	5.9	5.9	5.5	4.7	4.6	4.2	4.2	4.3	4.4	4.3	4.3	4.0	4.6	4.7	4.7	4.7	4.2	4.0	4.6	5.9
26-Mar	3.9	4.0	4.1	4.3	4.3	4.3	4.0	3.7	3.6	3.4	3.5	3.5	3.5	3.5	3.3	3.2	3.0	3.0	2.8	3.1	3.0	3.1	3.1	3.3	3.5	4.3
27-Mar	3.4	3.1	3.2	3.5	5.2	6.2	5.3	4.3	4.1	3.7	3.5	3.7	4.4	5.2	4.6	4.7	4.6	3.9	3.5	3.5	3.4	3.3	3.3	3.2	4.0	6.2
28-Mar	3.2	3.2	3.2	3.2	3.3	3.6	4.2	4.4	4.4	6.9	7.3	6.2	5.0	4.1	3.4	3.6	3.8	3.8	3.6	3.4	3.5	4.0	3.8	3.6	4.1	7.3
29-Mar	3.7	4.0	4.2	4.0	3.8	3.8	3.7	3.4	3.9	3.3	3.4	4.1	4.2	3.8	4.6	4.2	3.6	5.2	6.2	5.2	4.1	3.0	2.5	2.3	3.9	6.2
30-Mar	1.8	1.4	1.4	1.3	1.4	1.4	1.7	1.9	1.5	1.4	2.4	1.9	1.9	2.1	1.9	1.8	1.8	2.1	2.3	2.1	2.8	3.8	3.2	3.8	2.0	3.8
31-Mar	4.0	4.7	5.6	7.1	8.9	9.9	10.2	10.6	10.4	10.0	9.8	11.1	12.0	11.5	12.5	12.5	11.7	10.8	8.8	7.9	6.5	5.2	4.9	4.7	8.8	12.5
	4.0	4.2	4.3	4.3	4.4	4.4	4.4	4.3	4.4	4.5	4.6	4.2	4.1	4.0	3.9	3.8	3.7	3.7	3.7	3.8	3.9	3.9	3.8	4.0	Diurnal Average	
	15.9	18.9	19.5	18.7	15.7	12.4	12.2	12.3	12.7	13.1	12.4	11.1	12.0	11.5	12.5	12.5	11.7	10.8	9.2	10.2	11.2	13.0	13.1	13.8	Diurnal Maximum	

C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Stony Mountain - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	641	86.50	86.50
6 - 15	95	12.82	99.33
16 - 25	5	0.67	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Stony Mountain - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	65	43	44	32	33	23	63	68	44	39	35	12	17	23	38	62	641
6 - 15	7	6	5	3	1	0	1	8	18	23	10	1	2	4	6	0	95
16 - 25	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	5
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	49	49	35	34	23	64	76	62	62	47	16	19	27	44	62	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Stony Mountain

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.2 ppm on Mar 23 03:00

Maximum Daily Average: 0.2 ppm on Mar 17

Minimum Value: 0.1 ppm on Mar 5 17:00

Maximum Diurnal Average: 0.2 ppm at hour 3

Monthly Average: 0.15 ppm

Minimum Daily Average: 0.1 ppm on Mar 5

Minimum Diurnal Average: 0.1 ppm at hour 17

Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.1 Median = 0.2 Q_3 = 0.2 P_{90} = 0.2 P_{99} = 0.2

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm

Wood Buffalo Environmental Association

Hourly Averages

Carbon Monoxide (CO) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	708	100.00	100.00
0.4 - 0.5	0	0.00	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Monoxide (CO) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 0.3	70	45	46	35	33	22	61	72	60	60	44	14	18	27	40	61	708
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	45	46	35	33	22	61	72	60	60	44	14	18	27	40	61	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Monoxide (CO) - ppm

Stony Mountain

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Dioxide (CO_2) - ppm

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 451.4 ppm on Mar 13 10:00

Maximum Daily Average: 448.5 ppm on Mar 31

Minimum Value: 432.0 ppm on Mar 8 19:00

Minimum Daily Average: 433.5 ppm on Mar 8

Maximum Diurnal Average: 440.8 ppm at hour 10

Minimum Diurnal Average: 438.6 ppm at hour 17

Monthly Average: 439.42 ppm

Percentiles: P_1 = 432.8 P_{10} = 434.6 Q_1 = 436.8 Median = 438.9 Q_3 = 441.9 P_{90} = 444.5 P_{99} = 449.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	438.6	439.2	439.6	440.0	440.3	441.2	443.4	442.8	442.2	441.9	442.5	442.8	442.5	442.8	442.7	442.5	442.4	443.0	443.2	442.3	444.5	442.7	443.2	442.0	444.5
2-Mar	443.9	Z	444.2	444.3	445.1	444.8	444.9	445.0	445.6	446.1	446.4	445.6	443.5	442.3	441.2	440.3	439.9	440.4	439.8	439.4	439.1	439.2	439.0	439.0	442.6	446.4
3-Mar	439.4	439.6	Z	439.3	438.9	438.7	438.8	439.4	439.7	439.7	439.5	439.8	439.6	439.8	439.6	439.6	439.7	439.9	440.1	441.3	444.1	443.4	444.5	447.9	440.5	447.9
4-Mar	448.0	446.4	444.5	Z	439.4	439.3	439.3	439.5	439.3	438.8	438.6	438.2	437.9	437.7	437.7	437.8	437.5	437.2	436.8	436.8	436.8	436.6	436.1	436.1	439.0	448.0
5-Mar	436.3	436.1	435.0	434.4	Z	435.6	437.1	438.5	436.9	436.5	437.1	436.3	433.7	433.6	433.5	433.5	434.0	433.5	433.1	433.1	434.4	434.8	435.0	DF	435.1	438.5
6-Mar	436.4	435.9	435.6	435.8	436.1	436.3	435.7	436.3	436.3	435.3	436.5	434.3	434.1	433.2	Z	432.9	433.0	432.7	433.1	433.5	432.9	434.3	434.6	435.0	434.8	436.5
7-Mar	434.7	436.3	435.1	434.0	434.8	Z	435.8	435.4	435.5	434.7	434.4	435.5	434.6	434.2	434.0	434.1	434.0	433.2	432.9	432.6	432.6	432.8	433.0	434.0	434.3	436.3
8-Mar	Z	433.4	433.8	434.4	434.4	433.9	434.2	434.6	433.4	433.3	433.2	434.5	433.2	433.3	434.3	434.1	434.2	433.2	432.0	432.4	433.3	433.5	432.2	432.8	433.5	434.6
9-Mar	433.9	Z	435.1	435.6	435.6	435.7	436.6	436.3	436.4	436.6	436.3	435.2	434.5	434.7	435.2	435.7	436.6	436.0	436.2	437.4	436.0	436.2	436.4	437.0	435.9	437.4
10-Mar	437.1	437.7	Z	437.4	437.6	438.0	438.1	438.6	438.8	438.6	438.8	439.0	439.5	440.9	440.5	440.3	438.9	439.1	438.4	438.1	438.6	439.0	438.2	438.2	438.7	440.9
11-Mar	437.3	438.0	437.7	Z	437.3	436.9	436.7	437.1	436.8	437.3	439.7	446.5	445.1	438.3	437.4	437.9	437.6	436.9	436.7	436.8	436.6	436.5	435.9	436.1	438.0	446.5
12-Mar	436.4	436.6	436.6	436.7	Z	437.6	437.9	438.0	437.7	437.5	437.4	437.3	437.2	436.9	437.4	438.2	437.6	437.3	437.0	437.0	437.9	437.9	437.9	438.1	437.4	438.2
13-Mar	438.2	438.5	438.6	438.5	438.8	Z	440.3	440.5	444.1	451.4	446.7	445.9	444.9	442.4	440.8	439.8	440.7	440.1	439.6	441.2	441.7	441.0	440.7	440.4	441.5	451.4
14-Mar	Z	440.4	440.5	440.4	440.4	440.2	440.2	440.5	440.9	440.8	440.9	441.8	441.5	442.0	442.9	442.7	441.8	441.4	441.0	441.1	441.7	442.5	441.6	441.9	441.3	442.9
15-Mar	443.2	Z	443.9	444.5	444.5	444.4	444.2	443.5	442.1	442.9	443.3	441.6	440.7	439.9	439.9	440.2	439.8	439.2	438.9	438.8	439.7	439.6	437.9	438.1	441.3	444.5
16-Mar	438.5	437.8	Z	440.0	440.8	441.4	441.8	443.1	444.6	442.8	441.0	440.3	439.5	439.6	438.8	437.6	437.1	437.7	437.5	437.3	437.4	437.5	437.5	437.5	439.4	444.6
17-Mar	437.9	439.5	438.6	439.7	Z	439.7	439.2	438.7	438.8	439.6	439.1	438.2	437.3	434.9	435.1	435.8	435.5	436.2	437.0	437.9	438.6	439.7	439.5	439.2	438.1	439.7
18-Mar	439.2	439.5	438.8	438.3	438.0	Z	438.4	438.3	438.4	439.0	439.5	438.3	437.5	436.6	436.8	436.5	435.7	435.9	437.2	437.2	437.2	436.1	436.4	436.4	437.6	439.5
19-Mar	Z	436.7	437.1	437.1	437.2	438.2	439.3	440.2	442.5	449.3	450.1	447.2	443.6	440.9	439.5	439.3	438.9	438.9	439.7	439.5	440.5	441.4	440.3	440.5	440.8	450.1
20-Mar	442.1	Z	443.0	443.6	445.1	444.6	444.5	443.3	444.2	446.7	446.4	446.2	446.0	447.2	445.9	444.4	442.2	440.7	440.4	440.1	439.7	439.6	439.5	439.5	443.3	447.2
21-Mar	439.7	441.7	Z	439.5	439.9	440.6	440.1	440.0	439.8	439.2	440.0	440.2	439.0	438.6	438.8	438.8	438.9	439.5	443.0	441.9	440.2	439.8	440.0	441.2	440.0	443.0
22-Mar	441.9	442.7	443.2	Z	442.1	442.5	443.5	443.2	441.2	441.3	443.0	443.1	443.3	442.3	442.7	443.2	443.2	443.7	444.5	445.1	445.6	446.0	446.1	446.6	443.5	446.6
23-Mar	446.8	447.5	447.6	447.7	Z	445.3	444.0	444.5	443.7	442.7	439.9	439.3	438.8	438.7	438.3	438.8	438.4	440.5	443.0	442.5	442.1	440.8	440.5	439.9	442.2	447.7
24-Mar	439.3	439.2	439.0	438.9	438.8	Z	439.2	439.0	438.5	438.6	438.5	438.3	439.1	437.9	437.7	437.4	437.7	438.1	438.4	437.8	437.6	437.4	437.4	438.1	438.3	439.3
25-Mar	Z	439.0	439.6	441.1	441.6	442.0	441.8	440.9	441.0	440.5	440.3	438.7	438.5	438.0	438.2	438.7	438.5	438.0	438.4	438.1	438.3	438.0	437.7	437.7	439.3	442.0
26-Mar	437.5	Z	439.5	439.4	439.5	438.5	438.1	437.7	436.9	436.2	436.0	435.4	435.1	434.8	434.8	434.8	434.3	434.5	434.3	433.9	434.0	434.0	433.8	433.9	436.0	439.5
27-Mar	434.2	433.9	Z	434.4	435.2	437.0	435.3	436.3	436.5	435.4	434.3	434.4	435.6	436.4	435.6	435.9	435.7	435.3	435.5	435.2	435.2	435.4	435.6	435.8	435.4	437.0
28-Mar	436.3	436.3	436.9	Z	437.3	437.1	437.3	437.2	438.5	447.1	442.4	441.6	439.8	437.9	436.0	435.7	436.4	437.1	437.4	437.4	437.5	437.7	437.7	438.0	438.1	447.1
29-Mar	438.9	439.8	440.6	440.7	Z	440.9	441.0	441.1	441.5	C	C	C	C	C	443.0	442.4	442.9	445.2	444.4	443.7	443.4	442.9	443.2	443.1	442.1	445.2
30-Mar	442.8	442.4	442.7	442.7	442.8	Z	444.0	443.9	444.0	444.9	444.9	445.8	444.1	443.4	443.7	444.0	443.7	444.1	444.0	443.9	444.4	444.7	444.3	445.0	443.9	445.8
31-Mar	Z	445.8	446.1	446.7	447.3	447.9	448.4	450.3	450.0	449.8	449.6	449.1	449.4	449.0	448.6	448.7	449.1	450.2	450.4	449.3	447.8	447.4	447.3	448.3	448.5	450.4
	439.2	439.2	439.7	439.4	439.6	439.9	439.9	440.1	440.2	440.8	440.5	440.3	439.6	438.9	439.0	438.8	438.6	438.6	438.8	438.8	438.9	439.0	438.8	439.3	Diurnal Average	
	448.0	447.5	447.6	447.7	447.3	447.9	448.4	450.3	450.0	451.4	450.1	449.1	449.4	449.0	448.6	448.7	449.1	450.2	450.4	449.3	447.8	447.4	447.3	448.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Carbon Dioxide (CO_2) - ppm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Carbon Dioxide (CO_2) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	0	0.00	0.00
420 - 440	477	67.47	67.47
440 - 460	230	32.53	100.00
460 - 480	0	0.00	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Carbon Dioxide (CO_2) - ppm

Stony Mountain - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420 - 440	46	29	33	14	25	18	54	54	22	34	31	10	13	20	34	40	477
440 - 460	20	18	14	21	8	5	9	17	37	27	11	5	4	6	9	19	230
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	66	47	47	35	33	23	63	71	59	61	42	15	17	26	43	59	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Carbon Dioxide (CO_2) - ppm

Stony Mountain

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C

Stony Mountain - March 2023

Maximum Value: 9.9 C on Mar 18 15:00

Maximum Daily Average: 1.0 C on Mar 18

Minimum Value: -23.9 C on Mar 5 07:00

Minimum Daily Average: -19.2 C on Mar 5

Maximum Diurnal Average: -2.6 C at hour 15

Minimum Diurnal Average: -12.4 C at hour 7

Monthly Average: -7.84 C

Percentiles: P_1 = -22.5 P_{10} = -16.0 Q_1 = -12.2 Median = -8.2 Q_3 = -3.5 P_{90} = 0.8 P_{99} = 7.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-16.8	-16.3	-15.6	-15.3	-15.3	-15.0	-14.8	-16.1	-15.2	-13.7	-11.9	-9.7	-8.5	-7.5	-7.0	-7.5	-8.3	-9.1	-9.8	-10.5	-10.5	-10.5	-10.6	-10.7	-11.9	-7.0
2-Mar	-10.7	-10.6	-10.6	-10.4	-10.1	-9.9	-9.5	-8.8	-7.9	-6.4	-4.2	-0.9	2.2	3.4	4.5	4.0	3.5	2.3	0.1	-1.4	-1.9	-1.9	-2.3	-2.9	-3.8	4.5
3-Mar	-3.5	-3.4	-3.9	-4.0	-4.0	-3.8	-3.7	-4.0	-3.8	-2.9	-2.1	-1.9	-1.5	-1.5	-1.4	-2.4	-3.0	-3.9	-4.8	-6.3	-8.0	-9.0	-10.1	-11.5	-4.4	-1.4
4-Mar	-11.9	-12.0	-12.2	-12.6	-13.8	-15.7	-16.0	-16.2	-15.6	-14.8	-14.3	-14.0	-14.0	-13.8	-13.7	-13.9	-13.7	-15.3	-16.2	-17.8	-19.1	-20.3	-19.8	-20.4	-15.3	-11.9
5-Mar	-22.0	-22.7	-23.5	-23.7	-23.4	-23.6	-23.9	-23.2	-21.3	-19.0	-18.1	-16.0	-15.2	-15.1	-13.8	-13.5	-13.7	-15.6	-17.4	-17.6	-18.4	-19.8	-20.7	DF	-19.2	-13.5
6-Mar	-21.3	-22.5	-22.4	-21.3	-21.2	-20.8	-20.6	-20.5	-18.9	-15.8	-14.1	-13.0	-11.0	-10.9	-11.3	-10.9	-11.1	-12.0	-13.1	-13.8	-14.2	-14.6	-14.9	-14.9	-16.0	-10.9
7-Mar	-14.8	-15.0	-15.1	-15.3	-15.8	-16.5	-17.4	-18.1	-17.1	-15.2	-13.8	-11.7	-9.0	-7.0	-6.2	-6.0	-6.6	-7.4	-8.8	-10.1	-11.2	-12.2	-13.4	-14.3	-12.4	-6.0
8-Mar	-15.3	-16.5	-17.4	-18.4	-19.1	-19.1	-19.5	-19.8	-18.3	-14.8	-12.4	-9.4	-8.2	-7.1	-6.8	-6.8	-7.0	-8.1	-9.9	-11.9	-13.6	-15.0	-15.9	-16.9	-13.6	-6.8
9-Mar	-17.5	-18.2	-19.1	-19.9	-20.5	-21.5	-22.0	-22.0	-19.7	-17.0	-13.9	-11.4	-9.9	-9.2	-9.4	-9.0	-9.3	-10.1	-11.1	-11.7	-12.0	-12.2	-12.6	-13.2	-14.7	-9.0
10-Mar	-13.1	-13.1	-13.1	-13.5	-13.8	-13.9	-13.9	-13.7	-13.3	-12.0	-10.8	-9.1	-7.3	-6.8	-6.7	-6.6	-6.7	-6.8	-7.8	-8.3	-8.6	-8.7	-9.8	-10.6	-10.3	-6.6
11-Mar	-11.2	-12.1	-12.2	-12.4	-13.0	-14.5	-14.8	-14.3	-12.9	-11.6	-9.5	-7.0	-5.4	-4.3	-3.4	-3.6	-3.3	-3.8	-4.7	-5.5	-7.0	-7.6	-8.3	-9.0	-8.8	-3.3
12-Mar	-9.7	-10.3	-10.6	-11.0	-11.2	-11.3	-11.6	-11.7	-10.7	-9.5	-8.3	-7.1	-5.7	-5.0	-4.9	-4.4	-5.0	-5.4	-5.7	-6.1	-7.8	-9.8	-11.8	-13.2	-8.7	-4.4
13-Mar	-13.3	-13.1	-12.6	-12.8	-14.2	-15.1	-15.6	-14.4	-13.5	-12.1	-10.7	-8.6	-6.8	-6.0	-5.5	-5.3	-5.7	-6.8	-7.8	-8.2	-8.3	-8.5	-8.4	-8.3	-10.1	-5.3
14-Mar	-8.3	-8.3	-8.2	-8.1	-8.1	-8.1	-8.2	-8.4	-9.0	-8.9	-8.4	-7.8	-6.9	-7.3	-7.7	-8.2	-8.4	-8.6	-9.3	-10.0	-10.4	-10.6	-11.2	-12.4	-8.8	-6.9
15-Mar	-14.5	-15.9	-16.9	-17.6	-18.5	-19.4	-19.6	-18.1	-16.2	-13.6	-11.8	-9.6	-8.1	-7.0	-5.8	-5.4	-5.4	-5.9	-7.6	-8.9	-10.1	-11.0	-12.1	-13.3	-12.2	-5.4
16-Mar	-12.8	-11.8	-11.4	-11.5	-13.2	-13.3	-12.2	-11.7	-11.1	-9.3	-7.0	-4.1	-2.0	-2.4	-1.0	0.0	-0.2	-1.8	-3.6	-4.4	-4.8	-5.7	-5.6	-6.0	-7.0	0.0
17-Mar	-7.3	-7.7	-8.5	-8.4	-8.5	-8.4	-8.4	-7.2	-5.2	-2.8	1.3	5.2	7.3	8.4	8.7	8.4	7.9	6.4	4.1	2.7	0.8	-1.0	-2.0	-3.1	-0.7	8.7
18-Mar	-3.5	-4.2	-4.6	-5.1	-5.9	-6.5	-7.6	-7.1	-4.8	0.3	2.9	6.2	7.8	9.5	9.9	9.8	9.2	7.4	4.0	2.5	3.2	1.0	0.6	0.1	1.0	9.9
19-Mar	-0.1	-0.9	-1.8	-2.2	-2.7	-4.2	-5.8	-5.4	-4.1	-1.4	0.8	3.5	4.5	4.9	5.4	5.7	5.0	2.9	1.3	-0.4	-1.5	-2.1	-2.7	-2.8	-0.2	5.7
20-Mar	-3.0	-3.3	-4.0	-5.2	-5.5	-6.5	-7.7	-7.3	-5.5	-2.7	0.9	1.4	1.5	1.2	0.8	-1.0	-3.3	-5.8	-6.9	-7.8	-8.7	-9.1	-8.9	-9.0	-4.4	1.5
21-Mar	-9.1	-9.5	-10.0	-10.1	-10.0	-10.1	-10.2	-9.8	-9.2	-9.0	-8.3	-6.8	-4.7	-3.8	-2.8	-2.6	-2.9	-3.9	-5.3	-6.9	-8.3	-9.1	-10.0	-11.0	-7.6	-2.6
22-Mar	-11.6	-11.6	-11.9	-12.6	-12.6	-13.1	-12.6	-11.0	-8.2	-6.1	-4.4	-2.6	-0.9	1.5	2.5	2.9	2.9	1.8	0.0	-1.2	-2.3	-3.3	-4.4	-5.2	-5.2	2.9
23-Mar	-5.6	-5.4	-4.5	-4.2	-3.6	-2.7	-2.5	-2.4	1.0	4.1	6.1	6.7	7.2	6.5	5.6	4.8	5.4	3.5	0.1	-2.3	-4.3	-6.3	-8.0	-8.6	-0.4	7.2
24-Mar	-8.6	-8.6	-8.7	-9.0	-9.3	-9.5	-9.8	-9.8	-9.2	-8.3	-6.1	-4.8	-3.5	-2.8	-2.1	-1.3	-1.7	-1.9	-3.6	-5.0	-7.0	-6.5	-7.2	-7.1	-6.3	-1.3
25-Mar	-6.3	-6.5	-6.7	-8.8	-9.0	-8.9	-7.7	-5.2	-3.6	-1.7	-0.4	0.9	1.8	1.8	2.1	1.0	0.4	-1.6	-3.3	-4.5	-5.5	-6.1	-7.5	-9.2	-3.9	2.1
26-Mar	-10.3	-11.5	-13.1	-14.2	-14.7	-15.0	-15.8	-15.9	-14.3	-12.3	-11.1	-9.5	-8.5	-8.3	-8.1	-8.2	-8.6	-9.8	-11.2	-12.8	-13.7	-14.7	-15.9	-16.6	-12.3	-8.1
27-Mar	-17.7	-17.9	-18.6	-18.5	-18.2	-19.0	-18.5	-16.5	-14.1	-11.4	-10.4	-8.9	-7.5	-6.9	-6.5	-6.4	-6.8	-6.9	-8.4	-9.7	-9.6	-9.8	-10.0	-10.4	-12.0	-6.4
28-Mar	-10.5	-10.0	-10.6	-12.4	-14.3	-15.3	-15.8	-13.9	-11.3	-9.3	-6.9	-4.9	-4.6	-2.6	-1.4	-1.7	-1.1	-1.5	-1.8	-2.8	-4.2	-5.1	-5.3	-5.0	-7.2	-1.1
29-Mar	-5.3	-5.2	-4.8	-5.2	-4.5	-4.1	-4.7	-3.5	-2.2	-1.6	-1.2	-0.7	-1.0	-0.8	-0.5	-0.2	0.0	-1.2	-2.3	-2.9	-3.7	-4.5	-5.8	-6.2	-3.0	0.0
30-Mar	-6.6	-7.1	-8.2	-8.3	-8.5	-8.9	-8.5	-7.6	-6.3	-4.6	-2.2	-0.4	0.6	0.9	1.5	1.6	1.8	1.1	0.5	-0.3	-1.2	-1.5	-1.8	-2.2	-3.2	1.8
31-Mar	-2.6	-3.2	-3.8	-4.4	-5.1	-5.8	-5.9	-5.5	-4.1	-3.3	-1.9	-0.4	2.4	3.9	4.5	4.3	4.3	3.8	2.4	0.8	-0.2	-1.3	-2.3	-2.9	-1.1	4.5
	-10.5	-10.8	-11.1	-11.5	-11.9	-12.2	-12.4	-11.9	-10.5	-8.6	-6.8	-5.0	-3.7	-3.0	-2.6	-2.7	-2.9	-4.0	-5.4	-6.6	-7.5	-8.3	-9.0	-9.2	Diurnal Average	
	-0.1	-0.9	-1.8	-2.2	-2.7	-2.7	-2.5	-2.4	1.0	4.1	6.1	6.7	7.8	9.5	9.9	9.8	9.2	7.4	4.1	2.7	3.2	1.0	0.6	0.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Stony Mountain - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	24	3.23	3.23
-20 - 0	635	85.46	88.69
0 - 10	84	11.31	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Stony Mountain - March 2023

Maximum Value: 91.2 % on Mar 14 01:00

Maximum Daily Average: 83.2 % on Mar 14

Minimum Value: 21.9 % on Mar 28 15:00

Minimum Daily Average: 41.3 % on Mar 18

Maximum Diurnal Average: 77.6 % at hour 7

Minimum Diurnal Average: 47.0 % at hour 15

Monthly Average: 63.28 %

Percentiles: P_1 = 23.3 P_{10} = 38.7 Q_1 = 51.1 Median = 65.1 Q_3 = 77.6 P_{90} = 85.1 P_{99} = 90.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	81.5	81.5	82.5	83.0	83.5	83.7	83.4	83.0	82.4	80.6	74.7	66.3	63.1	62.1	62.9	65.3	70.8	75.0	78.5	81.5	82.5	82.0	81.6	82.6	77.3	83.7
2-Mar	84.7	84.9	82.9	81.7	80.7	80.0	79.1	76.4	72.8	67.1	62.0	53.6	47.2	44.9	41.8	42.5	41.1	42.2	66.9	84.5	84.3	80.9	84.8	86.3	68.9	86.3
3-Mar	79.2	68.0	69.3	73.9	81.7	85.2	85.2	80.0	71.2	64.3	63.8	65.9	61.7	62.5	56.2	59.0	58.2	64.2	69.0	72.7	78.8	85.3	83.5	77.4	71.5	85.3
4-Mar	77.2	78.6	79.6	76.3	74.7	79.5	78.0	77.2	74.0	66.2	65.0	61.8	59.1	58.2	56.4	56.6	54.2	59.8	63.9	68.0	73.2	78.8	77.6	77.0	69.6	79.6
5-Mar	78.6	77.2	77.3	77.4	77.6	77.2	77.7	76.9	75.2	68.9	63.0	52.4	47.6	47.2	43.8	42.8	43.5	50.1	56.6	56.9	56.7	60.8	63.5	DF	63.0	78.6
6-Mar	66.6	70.7	72.4	68.4	70.8	75.3	78.0	77.6	75.1	66.9	61.2	60.1	53.1	55.1	62.7	61.4	65.9	70.9	81.6	81.5	78.3	76.7	72.4	67.0	69.6	81.6
7-Mar	65.4	61.8	60.7	67.8	70.4	71.8	74.0	76.3	73.2	69.3	65.7	61.2	57.0	51.6	50.1	51.5	53.6	54.4	53.9	48.1	47.5	49.7	52.8	55.7	60.2	76.3
8-Mar	58.8	62.4	65.4	68.2	70.1	70.2	71.5	72.1	66.3	54.2	48.8	38.8	32.4	31.7	32.0	30.8	29.2	29.5	34.0	41.9	46.0	49.0	51.1	54.2	50.3	72.1
9-Mar	56.4	59.3	63.4	67.0	69.2	73.1	75.0	73.4	66.5	60.9	54.0	50.3	49.8	50.9	56.7	57.7	58.0	61.1	66.9	70.7	69.8	71.8	74.9	78.1	63.9	78.1
10-Mar	78.2	77.1	77.7	78.0	77.7	78.7	79.3	78.2	75.8	69.2	64.2	62.3	60.5	61.8	67.2	68.9	68.9	67.3	71.3	71.2	72.5	74.7	80.2	79.9	72.5	80.2
11-Mar	75.3	75.3	74.8	78.6	83.4	86.3	87.3	86.3	84.0	81.3	71.3	65.1	60.8	58.4	57.5	62.3	58.8	64.6	74.8	78.2	83.2	82.0	85.3	87.9	75.1	87.9
12-Mar	89.1	89.2	89.6	89.0	87.9	87.3	87.1	86.9	85.9	82.7	77.7	72.2	66.8	66.5	65.9	68.7	70.7	73.3	68.4	67.3	73.8	75.5	81.4	86.4	78.7	89.6
13-Mar	86.9	85.9	85.1	85.4	86.1	86.4	86.1	84.9	83.4	78.4	71.9	64.7	60.0	57.9	57.2	59.2	65.1	78.8	86.3	89.2	89.9	90.6	90.6	90.8	79.2	90.8
14-Mar	91.2	91.0	90.6	90.8	90.8	90.8	90.8	90.2	88.6	85.8	81.0	78.5	77.8	73.0	71.5	70.4	71.3	76.1	79.4	82.0	85.4	85.3	82.5	81.3	83.2	91.2
15-Mar	85.1	86.7	86.3	85.1	84.1	82.4	82.6	82.2	80.3	74.7	67.5	59.5	55.6	54.4	52.7	54.3	58.7	62.5	68.3	75.2	81.3	85.3	87.4	89.7	74.2	89.7
16-Mar	89.5	86.2	85.3	85.8	85.8	86.1	85.4	83.6	81.5	79.5	75.1	64.5	58.1	60.9	55.3	52.1	50.8	55.3	62.3	65.8	67.9	70.7	70.1	69.7	72.0	89.5
17-Mar	73.1	73.5	74.0	73.3	74.2	74.8	74.4	70.2	63.5	55.3	43.9	34.7	29.8	25.2	23.0	23.0	22.0	25.8	30.6	33.4	38.3	43.1	45.3	49.6	48.9	74.8
18-Mar	51.2	53.6	54.7	55.3	58.4	60.9	64.5	63.1	56.8	41.9	34.7	28.6	26.0	23.4	22.9	23.3	22.9	26.5	31.9	34.5	34.0	38.7	40.9	41.7	41.3	64.5
19-Mar	43.2	45.9	50.7	55.0	58.1	64.1	70.9	68.6	63.1	54.3	49.0	44.0	42.9	42.4	40.5	39.1	39.7	44.1	48.5	54.0	60.8	62.9	64.9	66.1	53.0	70.9
20-Mar	67.1	68.8	71.6	76.8	76.8	79.9	83.9	82.7	75.7	64.7	51.2	50.5	51.5	52.3	55.1	66.2	74.5	82.6	81.7	82.6	85.2	87.6	86.8	86.3	72.6	87.6
21-Mar	86.2	85.9	87.8	88.5	86.7	87.2	87.3	86.2	83.5	79.7	75.9	66.9	55.1	48.9	46.0	44.7	46.0	49.0	53.1	62.1	68.1	71.3	74.9	77.9	70.8	88.5
22-Mar	80.1	80.6	82.0	85.0	85.7	86.9	86.8	82.3	71.9	58.3	55.5	52.6	47.4	42.2	39.7	39.3	39.4	42.8	48.3	52.1	55.4	58.1	61.4	64.7	62.4	86.9
23-Mar	67.4	69.4	68.3	67.7	65.3	62.5	61.3	62.0	52.4	44.8	40.4	37.6	34.2	35.6	35.7	39.4	34.7	40.9	55.4	62.6	66.4	68.0	74.7	79.2	55.2	79.2
24-Mar	79.4	77.3	76.6	77.2	75.8	74.4	81.5	83.3	76.1	70.6	58.7	50.1	45.3	40.6	36.5	31.3	31.1	30.6	33.5	36.8	43.2	42.4	43.5	44.2	55.8	83.3
25-Mar	42.7	47.5	49.6	54.2	56.9	61.6	65.8	58.5	49.4	43.7	43.3	40.0	34.3	29.0	29.0	28.9	29.3	34.3	31.8	34.1	37.6	40.2	40.3	44.4	42.8	65.8
26-Mar	48.9	55.4	60.1	65.7	70.8	72.7	75.1	73.6	65.2	55.4	52.9	45.6	40.8	39.2	36.5	33.2	30.3	31.8	35.2	37.9	40.3	43.8	46.8	49.1	50.3	75.1
27-Mar	54.2	55.0	57.5	58.6	58.6	63.3	61.3	53.5	45.6	36.3	34.2	36.1	35.7	35.5	34.5	36.6	40.8	42.4	48.7	53.6	55.1	55.7	58.3	61.8	48.9	63.3
28-Mar	63.2	61.9	64.8	70.6	75.3	73.6	66.7	57.1	49.1	43.1	36.5	29.7	28.5	23.8	21.9	23.0	24.5	27.1	28.7	32.3	40.5	43.4	43.3	43.1	44.7	75.3
29-Mar	47.1	50.5	52.2	54.2	54.3	54.6	57.4	55.5	59.0	59.8	59.7	59.6	61.8	61.2	60.5	58.7	57.6	63.7	63.5	65.7	69.5	70.9	73.9	74.9	60.2	74.9
30-Mar	76.0	77.7	81.8	82.5	82.7	83.8	82.5	79.4	73.4	62.6	46.9	38.3	33.9	37.3	38.8	39.1	39.1	42.8	46.7	48.5	55.0	61.4	62.2	66.3	59.9	83.8
31-Mar	70.1	72.9	77.0	80.1	83.7	86.3	85.4	80.5	72.4	69.2	64.8	62.7	53.9	49.1	47.9	48.6	48.1	49.2	53.0	58.5	61.6	64.9	65.9	66.4	65.5	86.3
	70.8	71.3	72.6	74.2	75.4	76.8	77.6	75.5	70.7	64.2	58.5	53.4	49.4	47.8	47.0	47.7	48.4	52.2	57.2	60.8	63.9	66.2	67.8	69.3	Diurnal Average	
	91.2	91.0	90.6	90.8	90.8	90.8	90.8	90.2	88.6	85.8	81.0	78.5	77.8	73.0	71.5	70.4	74.5	82.6	86.3	89.2	89.9	90.6	90.6	90.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Stony Mountain - March 2023

Maximum Value: 1.5 mm on Mar 14 03:00

Maximum Daily Total: 5.9 mm on Mar 14

Minimum Value: 0.0 mm on Mar 1 01:00

Minimum Daily Total: 0.0 mm on Mar 3

Maximum Diurnal Total: 2.0 mm at hour 5

Minimum Diurnal Total: 0.0 mm at hour 10

Monthly Total: 8.99 mm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.1	0.3	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	0.6
2-Mar	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0
6-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
7-Mar	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
10-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
12-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	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
13-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.1	0.7	0.4
14-Mar	0.1	0.7	1.5	0.7	1.3	1.2	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	5.9	1.5
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
17-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.2	0.8	1.6	1.3	2.0	1.6	0.5	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.1	0.2	Diurnal Average	
	0.1	0.7	1.5	0.7	1.3	1.2	0.3	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.1	0.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Precipitation (PC) - mm

Stony Mountain - March 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	736	99.06	99.06
0.4 - 0.5	1	0.13	99.19
0.6 - 0.7	3	0.40	99.60
0.8 - 1.4	2	0.27	99.87
1.5 - 10	1	0.13	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Stony Mountain - March 2023

Maximum Value: 4.0 % on Mar 22 08:00

Maximum Daily Average: 2.5 % on Mar 12

Minimum Value: 0.4 % on Mar 18 17:00

Minimum Daily Average: 1.1 % on Mar 18

Maximum Diurnal Average: 2.3 % at hour 7

Minimum Diurnal Average: 1.1 % at hour 16

Monthly Average: 1.70 %

Percentiles: P_1 = 0.6 P_{10} = 1.0 Q_1 = 1.3 Median = 1.6 Q_3 = 1.8 P_{90} = 2.7 P_{99} = 3.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	2.8	2.8	2.8	2.8	2.8	2.9	2.9	3.0	3.1	2.9	2.3	1.7	1.6	1.5	1.5	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.2	3.1
2-Mar	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.4	1.3	1.2	1.3	1.2	1.4	1.5	1.7	1.8	1.8	1.9	1.9	1.7	1.9
3-Mar	1.9	1.7	1.7	1.7	1.8	1.8	1.8	2.0	1.7	1.6	1.6	1.6	1.5	1.4	1.3	1.5	1.3	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.7	2.0
4-Mar	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.4	1.6	1.7	1.8	1.9	2.1	2.3	2.4	1.8	2.4
5-Mar	2.6	2.7	2.9	3.0	3.1	3.2	3.3	3.4	3.4	3.3	3.1	2.3	1.5	1.3	1.1	0.9	1.1	1.6	1.7	1.7	1.8	1.8	1.8	DF	2.3	3.4
6-Mar	1.9	1.9	2.1	2.1	2.0	2.0	2.1	2.2	2.2	1.9	1.6	1.5	1.3	1.4	1.5	1.5	1.5	1.7	1.8	2.0	2.1	2.1	2.0	1.8	1.8	2.2
7-Mar	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.9	1.8	1.7	1.7	1.5	1.4	1.3	1.3	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.9
8-Mar	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.1	2.0	1.6	1.5	1.3	1.2	0.9	0.7	0.7	0.8	1.2	1.4	1.4	1.5	1.6	1.6	1.7	1.5	2.1
9-Mar	1.7	1.7	1.7	1.8	2.0	2.1	2.2	2.3	2.2	1.8	1.5	1.4	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	2.3
10-Mar	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.5	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.8	2.0	2.2	1.7	2.2
11-Mar	2.4	2.6	2.7	2.6	2.6	2.8	3.0	3.2	3.3	3.2	2.6	1.5	1.3	1.4	1.3	1.4	1.4	1.6	1.7	1.8	2.2	2.2	2.0	2.2	2.2	3.3
12-Mar	2.5	2.8	3.1	3.4	3.5	3.6	3.8	3.9	3.9	3.5	2.8	1.7	1.6	1.6	1.6	1.5	1.6	1.7	1.8	1.8	1.8	1.8	2.1	2.4	2.5	3.9
13-Mar	2.8	2.9	3.0	3.2	3.3	3.4	3.6	3.6	3.5	3.2	2.7	1.7	1.5	1.5	1.5	1.5	1.6	1.8	1.9	1.9	2.0	2.1	2.1	2.1	2.4	3.6
14-Mar	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.0	1.8	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.4
15-Mar	2.2	2.6	2.9	3.1	3.3	3.5	3.6	3.7	3.6	3.5	3.2	2.3	1.4	1.1	0.9	0.7	1.0	1.4	1.8	2.1	2.5	2.8	3.1	3.4	2.5	3.7
16-Mar	3.6	3.7	3.7	3.8	3.8	3.8	3.8	3.7	3.6	3.1	2.0	1.4	1.2	1.3	1.0	0.8	0.9	1.3	1.6	1.9	2.0	2.1	1.9	1.8	2.4	3.8
17-Mar	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.6	1.5	1.4	1.1	1.0	0.8	0.7	0.7	0.7	0.9	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.8
18-Mar	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.4	1.3	1.2	0.9	0.7	0.6	0.5	0.4	0.4	0.8	1.0	1.1	1.2	1.2	1.2	1.2	1.1	1.5
19-Mar	1.3	1.3	1.4	1.4	1.4	1.5	1.7	1.6	1.2	1.2	1.2	1.0	0.8	0.6	0.5	0.5	0.5	1.0	1.2	1.3	1.3	1.4	1.5	1.5	1.2	1.7
20-Mar	1.5	1.5	1.6	1.8	1.7	1.9	2.2	2.3	1.7	1.5	1.3	1.2	1.2	1.1	0.9	0.9	1.3	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.6	2.3
21-Mar	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.6	1.6	1.5	1.3	1.2	0.9	0.7	0.6	0.7	1.1	1.4	1.5	1.6	1.7	1.9	2.2	1.5	2.2
22-Mar	2.4	2.7	2.9	3.3	3.6	3.8	4.0	4.0	3.5	2.0	1.4	1.4	1.3	1.0	0.9	0.9	0.8	1.1	1.3	1.4	1.4	1.4	1.5	1.5	2.1	4.0
23-Mar	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.3	1.2	1.3	1.1	1.0	1.0	1.0	1.1	0.8	1.0	1.3	1.5	1.5	1.6	1.6	1.6	1.4	1.6
24-Mar	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.3	1.1	0.9	0.8	0.7	0.5	1.0	1.2	1.3	1.3	1.4	1.4	1.4	1.3	1.7
25-Mar	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.3	1.3	1.3	1.2	1.0	0.8	0.7	0.8	0.8	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.2	1.5
26-Mar	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.3	1.3	1.2	1.1	0.9	0.9	0.8	0.8	0.7	1.0	1.2	1.3	1.4	1.4	1.5	1.5	1.3	1.6
27-Mar	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.2	1.2	1.2	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.3	1.4	1.4	1.5	1.5	1.5	1.3	1.6
28-Mar	1.5	1.5	1.5	1.7	1.8	2.0	2.1	1.8	1.2	1.3	1.2	1.0	0.8	0.7	0.6	0.6	0.7	0.9	1.0	1.1	1.2	1.2	1.2	1.2	1.3	2.1
29-Mar	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.2	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.4	1.7
30-Mar	1.7	1.7	1.8	2.0	2.0	2.0	1.9	1.7	1.5	1.4	1.2	1.1	1.0	0.9	0.8	1.0	0.8	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.4	2.0
31-Mar	1.5	1.6	1.7	1.8	1.9	2.2	2.3	1.8	1.6	1.6	1.4	1.3	1.1	0.9	0.7	0.7	0.7	0.9	1.3	1.5	1.5	1.6	1.6	1.6	1.4	2.3
	1.9	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.1	1.9	1.7	1.4	1.2	1.1	1.1	1.1	1.1	1.3	1.5	1.6	1.6	1.7	1.7	1.8	Diurnal Average	
	3.6	3.7	3.7	3.8	3.8	3.8	4.0	4.0	3.9	3.5	3.2	2.3	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.1	2.5	2.8	3.1	3.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Leaf Wetness (LW) - %

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Leaf Wetness (LW) - %

Stony Mountain - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	7	0.94	0.94
0.6 - 0.7	22	2.96	3.90
0.8 - 1.4	234	31.49	35.40
1.5 - 10	448	60.30	95.69
> 10	0	0.00	95.69

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Stony Mountain - March 2023

Maximum Value: 750.8 W/m2 on Mar 26 13:00

Maximum Daily Average: 220.8 W/m2 on Mar 28

Minimum Value: 0.0 W/m2 on Mar 1 01:00

Minimum Daily Average: 31.2 W/m2 on Mar 14

Maximum Diurnal Average: 517.5 W/m2 at hour 13

Minimum Diurnal Average: 0.1 W/m2 at hour 5

Monthly Average: 141.51 W/m2

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 5.8 Q_3 = 273.1 P_{90} = 478.8 P_{99} = 689.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	27.6	56.7	146.0	244.4	272.5	377.2	275.6	189.9	78.7	23.6	0.8	0.0	0.0	0.0	0.0	0.0	70.9	377.2
2-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	17.9	97.8	209.6	245.6	408.9	456.9	385.0	326.1	150.1	130.3	27.1	0.9	0.3	0.4	0.0	0.2	0.5	102.4	456.9
3-Mar	0.3	0.0	0.0	0.0	0.0	0.0	0.1	8.4	65.6	175.8	285.6	244.4	287.5	297.0	259.2	164.0	178.0	24.8	0.5	0.0	0.0	0.0	0.0	0.0	83.0	297.0
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.2	25.2	81.6	187.5	198.7	273.7	266.8	300.1	270.4	195.3	204.7	29.5	1.3	0.0	0.0	0.0	0.0	0.0	84.8	300.1
5-Mar	0.0	0.0	0.1	0.0	0.0	0.0	3.8	55.2	249.3	359.8	444.0	557.3	441.6	356.6	348.1	324.6	134.5	15.4	0.6	0.0	0.0	0.0	0.0	DF	143.1	557.3
6-Mar	0.1	0.4	0.3	0.1	0.0	0.0	0.7	25.5	122.9	286.9	327.2	384.6	511.7	312.5	217.7	209.7	129.3	27.9	1.7	0.0	0.0	0.0	0.0	0.0	106.6	511.7
7-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.8	29.4	74.2	166.9	226.6	318.8	429.0	477.3	333.1	196.5	140.6	56.8	3.6	0.0	0.0	0.0	0.0	0.0	102.2	477.3
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.0	30.4	129.4	300.0	429.0	513.6	569.5	528.9	410.1	368.2	213.7	42.7	3.4	0.0	0.1	0.2	0.3	0.5	147.5	569.5
9-Mar	0.4	0.3	0.3	0.5	0.6	0.4	1.6	31.1	178.7	294.2	455.3	516.1	508.9	406.4	299.8	252.2	113.0	38.7	2.4	0.0	0.0	0.0	0.0	0.0	129.2	516.1
10-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.8	18.9	82.8	214.3	326.6	375.1	450.8	306.1	213.5	157.5	88.0	42.5	3.1	0.0	0.0	0.0	0.0	0.0	95.0	450.8
11-Mar	0.0	0.0	0.0	0.0	0.0	0.2	2.1	33.8	88.2	187.0	335.2	572.2	454.5	283.9	313.4	175.1	134.4	54.7	2.5	0.0	0.3	0.1	0.1	0.1	109.9	572.2
12-Mar	0.1	0.1	0.1	0.1	0.0	0.0	2.0	35.0	140.3	181.4	237.4	345.9	404.5	337.9	267.6	281.6	77.2	31.2	3.0	0.0	0.0	0.4	0.5	0.5	97.8	404.5
13-Mar	0.0	0.0	0.0	0.0	0.2	0.2	2.7	34.6	99.9	307.0	388.5	388.3	365.4	277.1	175.2	136.6	62.2	24.5	2.6	0.0	0.0	0.0	0.0	0.0	94.4	388.5
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.8	22.4	56.9	113.7	110.7	110.9	96.9	87.5	79.6	45.2	16.4	2.5	0.0	0.0	0.0	0.0	0.0	31.2	113.7
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	3.1	46.4	174.0	271.8	353.5	390.7	480.1	540.2	450.3	481.7	231.3	60.9	5.6	0.0	0.0	0.0	0.0	0.1	145.4	540.2
16-Mar	0.1	0.0	0.0	0.0	0.0	0.0	1.0	13.6	55.8	104.8	155.1	557.3	577.0	358.7	493.7	462.0	295.4	68.7	7.2	0.7	0.8	0.8	0.7	0.6	131.4	577.0
17-Mar	0.4	0.4	0.3	0.3	0.2	0.1	6.5	68.3	240.3	376.1	534.7	608.7	661.9	563.4	517.0	443.9	282.6	75.0	7.8	0.5	0.6	0.5	0.6	0.5	182.9	661.9
18-Mar	0.3	0.4	0.2	0.3	0.3	0.3	8.1	79.8	252.2	386.1	546.5	622.5	669.0	588.5	518.7	447.0	291.0	79.5	9.1	0.1	0.0	0.1	0.1	0.4	187.5	669.0
19-Mar	0.0	0.0	0.0	0.0	0.0	0.0	8.5	84.1	258.6	392.1	538.3	546.1	616.6	576.3	518.5	446.1	284.6	62.8	8.7	0.0	0.0	0.0	0.0	0.0	180.9	616.6
20-Mar	0.0	0.2	0.1	0.0	0.0	0.0	6.9	74.0	154.3	291.4	509.3	577.7	457.1	455.4	471.2	407.1	179.4	36.4	7.7	0.0	0.0	0.0	0.0	0.0	151.2	577.7
21-Mar	0.0	0.0	0.0	0.0	0.0	0.0	7.8	58.4	171.3	168.2	224.8	545.8	637.6	592.7	539.2	479.0	310.4	103.6	12.9	0.2	0.2	0.3	0.5	0.6	160.6	637.6
22-Mar	0.4	0.5	0.4	0.4	0.1	0.2	13.9	139.6	335.5	411.2	391.8	389.1	476.9	564.1	556.1	460.5	306.6	102.0	13.3	0.7	0.5	0.5	0.4	0.4	173.5	564.1
23-Mar	0.3	0.1	0.0	0.0	0.2	0.1	18.3	118.8	302.5	474.9	570.9	662.2	598.7	420.6	356.1	256.8	296.9	135.5	19.5	0.0	0.0	0.0	0.0	0.0	176.4	662.2
24-Mar	0.0	0.0	0.0	0.0	0.0	0.0	8.5	56.8	159.0	283.7	607.6	675.4	714.9	590.2	588.6	494.8	334.8	120.3	14.5	0.4	0.2	0.4	0.2	0.4	193.8	714.9
25-Mar	0.4	0.1	0.2	0.0	0.0	0.3	18.9	127.8	313.8	421.9	468.2	629.1	699.1	608.3	558.4	459.1	312.5	102.8	15.5	0.1	0.0	0.0	0.0	0.0	197.4	699.1
26-Mar	0.0	0.0	0.0	0.0	0.0	0.1	14.6	95.5	295.4	447.4	556.7	642.7	750.8	568.0	533.5	417.0	360.0	131.3	18.0	0.2	0.0	0.0	0.5	0.8	201.4	750.8
27-Mar	0.1	0.0	0.0	0.0	0.0	0.3	28.4	155.4	333.8	465.2	543.4	652.4	699.4	628.1	562.2	396.5	226.4	153.7	20.4	0.7	0.1	0.2	0.3	0.2	202.8	699.4
28-Mar	0.0	0.0	0.0	0.0	0.0	0.4	31.2	168.8	351.5	478.2	613.3	704.0	736.0	657.0	583.7	508.0	313.9	123.3	29.1	0.6	0.2	0.3	0.1	0.0	220.8	736.0
29-Mar	0.0	0.0	0.0	0.0	0.0	0.4	30.8	168.9	345.0	421.9	437.3	391.5	257.7	238.2	237.7	207.1	153.1	52.1	15.3	0.4	0.0	0.0	0.0	0.0	123.2	437.3
30-Mar	0.0	0.0	0.0	0.0	0.0	0.7	27.6	96.8	195.6	352.8	539.4	643.5	733.4	466.3	522.6	365.4	312.2	92.6	16.9	0.4	0.0	0.0	0.0	0.0	181.9	733.4
31-Mar	0.0	0.0	0.0	0.0	0.0	0.9	25.9	88.9	268.7	178.0	286.7	475.6	747.6	592.0	562.3	504.9	353.8	157.9	26.4	0.5	0.0	0.0	0.0	0.0	177.9	747.6
	0.1	0.1	0.1	0.1	0.1	0.2	8.9	64.5	182.8	287.4	388.3	482.8	517.5	443.6	398.9	326.4	212.1	68.2	8.9	0.2	0.1	0.1	0.1	0.2	Diurnal Average	
	0.4	0.5	0.4	0.5	0.6	0.9	31.2	168.9	351.5	478.2	613.3	704.0	750.8	657.0	588.6	508.0	360.0	157.9	29.1	0.7	0.8	0.8	0.7	0.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Global Radiation (GR) - W/m2

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Global Radiation (GR) - W/m2

Stony Mountain - March 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	403	54.24	54.24
21 - 100	66	8.88	63.12
101 - 300	110	14.80	77.93
301 - 600	139	18.71	96.64
601 - 900	25	3.36	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Stony Mountain - March 2023

Maximum Speed: 23 km/h on Mar 2 09:00

Maximum Daily Speed Average: 15.2 km/h on Mar 17

Minimum Speed Value: 2 km/h on Mar 5 18:00

Maximum Diurnal Speed Average: 4.2 km/h at hour 2

Monthly Average Velocity: 1.3 km/h 169.4 deg

Minimum Daily Speed Average: 1.8 km/h on Mar 16

Minimum Diurnal Speed Average: 0.6 km/h at hour 13

Percentiles: $P_1 = 3$ $P_{10} = 6$ $Q_1 = 8$ Median = 11 $Q_3 = 14$ $P_{90} = 17$ $P_{99} = 21$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	S10	S13	S11	SSE9	SSE10	SSE12	SSE12	SSE10	S11	S14	S17	SSW17	SSW19	S18	S15	SSW16	SSW17	S16	S18	S22	SSW23	S20	SSW20	S17	S14.9	SSW23
2-Mar	S16	S16	S15	S17	S20	SSW21	SSW22	SSW23	SSW23	SSW23	SSW21	SW18	WSW17	WSW18	W19	WNW17	WNW17	W14	NW21	WNW19	WNW16	WNW15	W15	W15	SW13.3	SSW23
3-Mar	W18	W20	W16	WNW15	WNW13	WNW11	W10	W12	W12	WNW14	NW12	NNW12	NW14	NNW14	NNW13	NNW14	NNW14	NNW11	N13	N9	NNE8	NNE7	NNE9	NNE9	NW10.0	W20
4-Mar	N7	N4	NW5	NNW11	NNW12	NW12	NNW14	NW12	NW14	NW13	NNW12	NNW13	NW15	NNW15	NNW17	NNW14	NNW15	N12	N11	N10	N9	N9	N10	NNE10	NNW11.1	NNW17
5-Mar	N9	N7	NNW6	NW6	WNW7	NW8	NW8	NW6	NW6	N6	N8	N8	NNW7	NNE6	NNW6	NNW6	NW4	ENE2	E5	NE8	ENE10	E11	E11	DF	N4.8	E11
6-Mar	ESE9	SE9	SSE11	SSW9	SSW8	S8	S9	S9	S10	SSE10	SE9	SE12	SSE11	SE12	SSE11	SE10	SE11	SSE10	SE8	SE10	SE11	SE12	SE12	SE11	SSE9.3	SE12
7-Mar	SE12	SE12	SE14	SSE13	SSE14	SSE13	SSE13	SSE11	SSE12	SSE12	SSE12	SSE12	SSE14	SSE16	SSE16	SSE19	SSE18	SSE16	SSE15	SSE15	SSE13	SSE10	SE12	SE12	SSE13.5	SSE19
8-Mar	SE12	SE12	SE12	SE13	SE14	SE13	SE11	SE13	SSE13	SE11	SE12	ESE13	SE13	E11	E12	E12	E12	ESE10	ESE9	E12	ESE11	SSE13	SSE13	S13	SE11.1	SE14
9-Mar	S13	S11	S9	S8	S9	SSE8	SSE10	SSE11	SSE12	SE12	SE15	SE17	SSE18	SSE19	SSE17	SSE16	SSE15	SSE16	SE17	SE17	SE16	SE19	SSE17	SSE14	SSE13.5	SE19
10-Mar	SSE16	SSE14	SSE12	SSE13	SE13	SE12	SE13	SE13	SE15	SE16	SE15	SE14	SE13	SE13	SE13	SE13	ESE14	ESE13	SE10	SE11	SE9	SE13	ESE10	ESE10	SE12.7	SE16
11-Mar	ESE12	E9	E8	E6	ESE6	ESE8	ESE7	E7	E5	E5	E7	E9	ESE10	SE9	SE10	ESE9	SSE8	SSE9	SE7	SSE8	S9	SSW11	SSW11	SSW11	SE6.6	ESE12
12-Mar	SSW10	SSW11	SSW10	SSW10	SW11	SW12	SW11	SSW10	SSW11	SSW9	S8	S11	SSW11	SSW10	SSW12	SSE9	SSE9	SSE8	S8	S9	SW12	SSW10	SW7	SSW9	SSW9.6	SSW12
13-Mar	SW10	SW9	SW8	SW5	S5	SSW8	SSE6	E5	ENE6	ENE8	ENE11	E13	E14	ENE16	ENE17	ENE18	ENE18	ENE18	ENE18	ENE15	ENE14	ENE13	ENE12	NE10	E8.0	ENE18
14-Mar	NE9	NE8	NE7	NE7	NNE6	NNE9	NNE8	N9	N10	N10	N12	N9	NNW12	NNW19	NNW18	NW17	NNW15	NNW13	NNW13	NNW10	NNW9	NNW10	NNW12	NNW10	N9.9	NNW19
15-Mar	NNW11	NNW11	NNW10	NNW10	NNW7	NW7	NNW8	NW6	NNW4	NNE4	NNE4	N6	N7	N7	N6	NE7	NE6	NE4	E6	ESE9	ESE9	E9	E8	SE9	NNE4.4	NNW11
16-Mar	SSE10	S9	SW6	S7	SE6	SE7	SSW6	W3	WNW5	NW10	NNW8	NNW6	N9	NNE8	N8	NNW9	NW8	NNW8	NNW3	S4	SSW7	SSW9	SW11	SSW13	WSW1.8	SSW13
17-Mar	SSW15	SSW16	SSW17	SW18	SW20	SW19	SW20	SW20	SW19	SSW14	SW9	SSW8	SW9	WSW12	WSW14	SW15	SW15	SW13	SW14	SW15	SSW16	SSW17	SSW18	SSW19	SW15.2	SW20
18-Mar	SSW21	SSW20	SW20	SW18	SW14	SW16	SW17	SW17	SW11	W7	NW7	NW6	NNW8	WNW8	NW10	NW9	NNW8	NNW9	NNW8	N7	NE8	NE6	ENE6	S3	WSW5.5	SSW21
19-Mar	NNW7	NNW8	N8	NNE8	NNE8	NE9	NE9	NE7	NE5	NE4	ENE7	E10	ENE12	ENE13	ENE13	E12	E12	ENE13	ENE11	E11	ESE11	SE8	SE12	SSE9	ENE7.2	ENE13
20-Mar	SE6	S11	S7	ESE4	NE4	E3	N5	E4	SSE7	SSW5	SE3	N7	N8	NNE11	NE15	NE17	NNE15	NNE15	NNE14	N16	NNE14	N11	N10	N10	NNE5.8	NE17
21-Mar	N9	N10	N10	N9	N8	N9	N9	N9	NNE9	NNE8	N6	NE6	NNE6	NE6	E5	E4	ESE6	E10	ESE9	SE10	SSE12	SSE11	S12	S15	NE3.5	S15
22-Mar	S15	SSW16	SSW15	S17	S16	S14	S16	S16	S19	S18	S16	S15	S14	SSW14	SW13	SW13	SW11	SW10	SSW11	SSW14	SSW16	SSW16	SSW17	SSW18	SSW14.5	S19
23-Mar	SW20	SW19	WSW9	WSW15	WSW14	W16	WNW18	NW11	NW7	WNW6	NW12	NNW16	NNW15	NNW16	NNW20	NNW15	NNW14	NNE14	NNE15	NNE14	NNE15	NNE14	NNE14	NNE12	NNW8.5	SW20
24-Mar	NE12	NE11	NNE10	NE11	NE9	NE10	NNE7	NNE8	NNE7	NE7	NE8	NNE7	N5	NNE6	N7	N6	N5	NW4	WNW3	W5	WSW5	WSW4	N3	WSW9	NNE5.0	NE12
25-Mar	SW10	WSW10	WSW11	SW12	SW12	WSW13	W10	WNW10	WNW10	NW9	NNW10	NNW10	NNW13	N14	N15	N17	N16	N14	NNE10	NE8	NE8	NNE9	NNE10	N9	NNW6.5	N17
26-Mar	NNE9	N9	N8	N8	N8	NNE7	NNE8	NE8	NE7	NE8	NE10	NE10	NE10	NE11	NE13	ENE11	NE13	NE13	NE11	NE10	NE9	ENE9	E7	SE6	NE8.6	NE13
27-Mar	WNW4	NW7	NW8	WNW9	WNW10	NW11	NW10	NW8	NNW7	NNW7	NW8	NNW10	NW11	WNW13	WNW14	NW12	NNW13	NW13	NW7	WNW7	W6	WSW9	W10	W10	NW8.6	WNW14
28-Mar	WNW12	NW12	NW8	N7	N7	N9	NE10	ENE6	E7	E7	ENE3	N5	N7	NW6	WNW10	NW10	W9	WSW9	SW8	SW11	SW15	SW17	SW18	SW19	W3.9	SW19
29-Mar	SW17	SW17	SW16	SW13	W12	WNW10	NW10	NNW10	N12	NNE12	N13	N13	NNE11	N12	N11	N8	NNE10	NE14	NNE11	NE8	NE8	NE9	ENE9	ENE8	N5.1	SW17
30-Mar	NE9	NE6	ENE5	ENE5	ESE5	SSE6	S6	S6	S6	S4	SE7	ESE8	SSE10	SSE10	S12	SSW11	SSW10	SSW6	S7	SSW9	S9	SSE11	SSE12	SSE13	SSE6.2	SSE13
31-Mar	SSE11	SSE11	SSE11	SSE10	SSE11	SSE13	SSE14	S11	S10	SSE6	SSE5	SSE5	S3	S2	NNE6	N8	N8	NNE8	NE10	NE11	NE12	ENE10	ENE9	ENE5	ESE4.4	SSE14
Diurnal Average	S4.1	SSW4.2	SSW3.6	SSW3.5	SSW3.2	SSW2.9	SSW2.6	SSW2.2	SSW2.3	S1.3	E1.0	ENE1.6	NE0.6	NNE1.2	N1.9	N2.1	NNE1.8	NE2.1	ENE2.4	ESE2.3	SE2.9	SE3.4	SSE3.4	S4.0		
Diurnal Maximum	SSW21	W20	SSW20	SW18	S20	SSW21	SSW22	SSW23	SSW23	SSW23	SSW21	SW18	SSW19	NNW19	NNW20	SSE19	SSE18	ENE18	NW21	S22	SSW23	S20	SSW20	SW19		

DF - DAS Failure

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 19:00

Minimum Value: 0 km/h on Mar 5 19:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Stony Mountain - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Stony Mountain - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	50	6.73	6.73
6 - 11	387	52.09	58.82
12 - 19	285	38.36	97.17
20 - 28	21	2.83	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Stony Mountain - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	6	2	4	5	8	2	1	2	6	1	1	2	2	3	3	2	50
6 - 11	53	35	37	16	18	17	24	34	27	27	15	6	6	12	28	32	387
12 - 19	13	12	8	14	8	4	39	40	28	23	27	8	10	12	12	27	285
20 - 28	0	0	0	0	0	0	0	0	3	11	4	0	1	0	1	1	21
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	72	49	49	35	34	23	64	76	64	62	47	16	19	27	44	62	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 20 m (WS20m) - km/h

Stony Mountain

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Stony Mountain - March 2023

Direction of Maximum Speed: 213 deg on Mar 2 09:00
Direction of Maximum Daily Speed Average: 217.6 deg on Mar 17

Direction of Minimum Speed: 69 deg on Mar 5 18:00

Direction of Minimum Daily Speed Average: 1.8 deg on Mar 16

Monthly Average Direction: 169.4 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	169	180	175	165	159	162	161	161	174	184	187	198	193	191	189	196	192	191	183	189	193	190	192	188	184.4
2-Mar	177	179	177	180	189	195	195	205	213	212	211	214	242	249	261	298	284	279	305	292	301	285	275	261	233.4
3-Mar	260	279	278	292	303	299	281	269	271	290	310	329	305	334	347	338	346	334	350	8	28	29	25	22	314.8
4-Mar	8	2	322	330	338	326	329	321	319	325	327	334	319	331	332	342	343	354	356	351	358	351	2	14	338.1
5-Mar	9	360	338	308	298	322	326	311	323	350	350	352	345	12	341	340	322	69	79	56	60	79	99	DF	1.3
6-Mar	112	134	168	192	192	180	180	180	183	163	139	133	150	142	147	141	143	153	135	126	125	131	128	127	148.3
7-Mar	134	131	138	151	158	160	156	151	159	159	156	149	148	150	156	156	156	151	149	151	148	148	141	138	150.1
8-Mar	139	140	141	142	135	134	139	142	148	139	139	117	143	96	79	84	98	115	108	94	120	149	160	178	129.5
9-Mar	188	183	183	174	188	168	151	158	151	140	131	144	147	153	152	156	159	147	141	137	140	143	147	149	152.5
10-Mar	154	155	149	147	143	138	137	136	135	144	135	140	133	135	130	126	119	118	129	128	127	127	112	109	134.6
11-Mar	115	95	92	99	105	117	102	88	80	79	84	82	105	129	142	113	149	156	144	165	180	196	195	198	129.0
12-Mar	205	200	213	207	214	214	214	210	212	206	189	185	193	199	202	167	155	161	173	178	216	201	218	211	199.1
13-Mar	218	218	222	229	177	198	167	79	70	73	63	80	82	72	63	68	71	67	76	78	77	70	60	50	80.3
14-Mar	47	44	41	39	13	29	28	4	3	2	0	351	337	328	327	323	328	335	332	337	336	342	340	343	349.8
15-Mar	345	346	341	333	328	325	333	325	348	16	25	356	356	4	11	34	47	49	98	104	110	89	95	128	17.4
16-Mar	168	182	217	175	136	131	198	271	300	316	332	344	357	12	2	341	321	341	341	179	203	197	214	212	254.2
17-Mar	212	204	212	216	220	217	217	218	215	210	216	206	218	249	246	236	234	219	215	223	210	206	207	207	217.6
18-Mar	211	212	214	216	217	217	214	222	231	281	317	323	347	295	305	308	330	345	333	0	55	56	67	184	247.2
19-Mar	339	347	2	13	14	34	48	54	51	49	64	91	78	72	75	95	79	70	78	84	107	126	141	158	70.2
20-Mar	142	176	171	105	49	101	7	83	166	200	143	3	3	28	43	47	28	20	15	11	12	7	3	7	31.6
21-Mar	1	357	359	7	359	351	354	8	19	23	9	37	30	40	81	79	104	97	113	139	150	155	169	185	53.1
22-Mar	188	194	198	190	187	179	177	179	189	188	184	181	190	195	214	225	234	223	203	209	206	210	209	213	197.4
23-Mar	216	218	249	241	258	280	296	318	313	299	324	336	343	342	340	340	336	14	21	21	31	21	24	28	326.9
24-Mar	46	36	33	48	35	43	28	22	31	36	48	23	356	12	351	353	7	310	293	271	257	249	3	241	17.1
25-Mar	235	238	238	221	234	241	268	288	303	323	343	343	345	356	350	354	353	1	16	35	42	32	20	9	328.2
26-Mar	14	8	359	6	10	19	26	41	42	41	51	40	40	44	48	57	52	47	44	39	39	59	93	129	40.2
27-Mar	303	319	319	302	289	306	309	313	331	335	318	340	316	293	291	321	329	322	326	302	280	251	263	277	306.7
28-Mar	303	310	323	350	353	6	37	66	84	99	61	353	7	316	295	304	275	248	227	216	219	221	221	221	276.9
29-Mar	222	226	228	235	262	288	307	340	6	14	3	5	13	8	360	6	31	43	26	49	43	50	60	58	353.0
30-Mar	51	49	63	74	115	152	177	171	172	184	125	121	165	168	184	204	201	192	171	194	179	166	159	166	161.5
31-Mar	157	165	162	159	156	155	164	172	176	162	165	153	186	180	14	10	6	27	43	45	55	60	74	75	123.0
Diurnal Average	188.0	199.1	206.7	203.3	208.2	204.9	206.7	203.7	197.6	187.0	100.7	72.3	47.9	20.0	352.4	11.1	20.9	51.5	70.1	104.9	129.6	144.3	151.1	179.0	

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

Stony Mountain - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 100 deg on Mar 31 14:00

Minimum Value: 6 deg on Mar 11 06:00

Percentiles: $P_1 = 9$ $P_{10} = 12$ $Q_1 = 15$ Median = 19 $Q_3 = 25$ $P_{90} = 34$ $P_{99} = 67$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	13	14	16	14	14	14	16	17	18	22	23	26	24	25	30	24	23	21	20	19	19	18	19	19	30
2-Mar	18	18	18	18	18	18	18	20	21	20	20	23	27	27	27	25	26	25	23	23	21	24	24	24	27
3-Mar	26	23	21	22	22	23	25	23	25	24	27	28	26	25	18	20	18	20	18	24	18	20	19	16	28
4-Mar	14	15	25	18	18	20	19	20	20	22	24	24	23	21	19	19	21	15	14	12	12	11	12	13	25
5-Mar	10	14	19	12	13	12	17	18	19	21	24	39	37	42	41	45	44	64	6	13	13	12	12	DF	64
6-Mar	8	21	12	10	9	9	10	11	16	25	25	23	31	25	27	27	20	20	16	15	14	12	14	14	31
7-Mar	15	14	17	18	18	17	14	11	19	23	21	27	24	26	26	21	22	22	18	17	15	15	12	12	27
8-Mar	10	8	8	9	9	11	9	11	14	21	23	27	25	37	21	26	21	17	20	14	17	12	12	12	37
9-Mar	13	12	11	10	12	18	9	13	16	20	20	24	22	23	25	24	23	20	19	18	16	17	17	18	25
10-Mar	17	19	17	17	19	18	19	19	17	20	21	25	25	25	23	20	18	18	15	15	16	17	14	12	25
11-Mar	11	12	11	12	12	6	11	13	13	20	20	27	26	25	29	25	30	28	22	19	17	20	17	17	30
12-Mar	16	15	18	15	18	19	18	17	20	26	28	27	30	32	27	40	26	22	23	24	23	21	21	12	40
13-Mar	12	13	13	17	14	9	27	30	21	22	21	19	18	20	15	18	17	15	16	16	16	15	15	17	30
14-Mar	19	17	18	20	15	20	20	12	15	15	15	17	20	19	20	21	19	18	17	17	16	15	15	13	21
15-Mar	12	13	11	14	12	11	10	21	17	27	47	30	26	35	39	30	25	40	12	10	9	10	12	12	47
16-Mar	13	12	28	31	12	21	31	48	25	19	22	27	27	25	36	32	35	17	16	77	11	13	16	15	77
17-Mar	16	15	16	16	16	17	16	17	19	19	28	34	39	35	34	27	27	24	18	19	16	16	17	17	39
18-Mar	18	21	20	21	20	18	16	18	24	33	31	40	31	42	35	34	33	16	12	29	10	9	21	84	84
19-Mar	6	11	13	13	14	17	12	16	19	30	26	24	25	24	24	25	20	15	15	16	15	14	12	17	30
20-Mar	19	19	20	52	39	60	10	48	25	49	92	23	28	21	20	19	17	18	18	16	16	15	15	15	92
21-Mar	13	15	14	17	14	13	12	16	22	25	31	36	52	39	61	71	65	18	16	13	12	13	15	15	71
22-Mar	14	15	16	15	17	16	18	20	23	25	27	28	29	29	29	30	31	28	17	16	17	17	17	17	31
23-Mar	17	17	42	21	22	23	22	24	25	35	25	22	21	20	19	19	21	33	17	17	18	18	18	21	42
24-Mar	18	20	19	20	23	18	19	15	30	34	44	39	58	39	36	51	39	53	30	13	7	63	31	29	63
25-Mar	16	15	18	13	17	15	20	20	23	24	25	31	23	23	23	20	20	17	18	17	15	17	16	13	31
26-Mar	14	12	10	10	11	17	16	18	22	25	24	27	34	26	22	27	22	19	17	15	15	14	13	12	34
27-Mar	69	16	7	10	12	11	13	16	23	32	54	39	38	35	31	32	26	23	17	14	18	13	18	20	69
28-Mar	20	19	17	12	10	9	14	15	22	37	68	52	33	65	41	32	33	26	25	18	21	19	19	20	68
29-Mar	18	18	18	18	23	21	18	17	19	21	22	20	21	22	19	25	23	19	18	18	17	15	17	14	25
30-Mar	16	18	13	15	17	10	13	22	36	56	43	40	39	43	33	33	36	33	36	23	22	19	19	21	56
31-Mar	17	19	18	16	15	14	16	21	24	35	50	59	85	100	60	23	21	21	15	14	15	12	16	23	100
Diurnal Maximum	69	23	42	52	39	60	31	48	36	56	92	59	85	100	61	71	65	64	36	77	23	63	31	84	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Stony Mountain - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS19
FIREBAG
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	35	36	99.87	14.7	0	2.2	0
H2S (ppb) Average	707	36	37	99.87	2.6	0	0.8	0
THC (ppm) Average	704	35	40	99.33	2.6	-	2.3	-
NO2 (ppb) Average	707	36	37	99.87	51	0	9.6	-
NO (ppb) Average	707	36	37	99.87	53.7	-	4.9	-
NOX (ppb) Average	707	36	37	99.87	104.7	-	14.4	-
Temperature 2 m (C) Average	743	0	1	99.87	7.6	-	1.2	-
Relative Humidity (%) Average	743	0	1	99.87	93.4	-	82.8	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	31	-	23	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	0.51	1.3	-	0	0	0	0.1	0.5	1.1	14.7
H2S (ppb) Average	707	0.15	0.3	-	0	0	0	0.1	0.1	0.3	2.6
THC (ppm) Average	704	2.23	0.1	-	2.1	2.2	2.2	2.2	2.3	2.3	2.6
NO2 (ppb) Average	707	4.85	6.5	-	0.2	0.4	1.2	2.6	5.4	11.6	51
NO (ppb) Average	707	1.48	3.3	-	0	0	0.1	0.6	1.5	3.3	53.7
NOX (ppb) Average	707	6.33	9.1	-	0.2	0.4	1.5	3.4	7.4	15.2	104.7
Temperature 2 m (C) Average	743	-10.89	6.4	-	-26.1	-19.6	-15	-11.2	-6.2	-2.9	7.6
Relative Humidity (%) Average	743	69.07	14.8	-	30.4	45.5	58.6	72.5	81.2	85.1	93.4
Wind Speed 10 m (km/h) Average	743	13.2	6	-	1	5	9	13	17	22	31
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
THC	03 Mar 2023 09:00	03 Mar 2023 12:00	3	Analyzer Failure - inconsistent response
THC	03 Mar 2023 12:00	03 Mar 2023 12:00	1	Maintenance - reinitiated daily QA check

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Firebag - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 14.7 ppb on Mar 30 19:00

Maximum Daily Average: 2.2 ppb on Mar 18

Minimum Value: 0.0 ppb on Mar 4 04:00

Maximum Diurnal Average: 1.1 ppb at hour 10

Monthly Average: 0.51 ppb

Minimum Daily Average: 0.0 ppb on Mar 12

Minimum Diurnal Average: 0.2 ppb at hour 21

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.5 P_{90} = 1.1 P_{99} = 6.6

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.9	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.9	0.4	0.1	0.2	0.4	0.5	0.6	0.6	1.9
2-Mar	0.5	0.5	Z	0.6	0.7	0.7	0.8	0.8	0.7	0.9	0.8	1.7	3.2	3.6	3.1	0.9	0.6	0.2	0.1	0.2	0.4	0.2	0.2	0.2	0.9	3.6
3-Mar	0.2	0.1	0.1	Z	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2
4-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
5-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.3	0.3	DF	0.2	0.5
6-Mar	0.2	0.2	0.2	0.3	1.1	0.4	0.3	0.2	0.4	1.0	1.2	1.2	1.1	1.1	1.0	Z	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.5	1.2
7-Mar	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
8-Mar	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
9-Mar	0.1	0.1	Z	0.1	0.2	0.2	0.3	0.6	0.6	0.8	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.8
10-Mar	0.2	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.4	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4
11-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.4	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	0.4
12-Mar	0.1	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Mar	Z	0.0	0.6	0.4	0.3	0.4	0.1	0.2	4.0	0.7	1.0	0.6	0.7	0.5	1.0	0.3	0.3	0.4	0.4	0.6	0.3	0.3	0.2	0.3	0.6	4.0
14-Mar	0.3	Z	0.5	0.2	0.3	0.4	0.6	0.6	0.3	0.3	0.3	0.6	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	0.6
15-Mar	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	0.1	0.1	0.0	0.0	0.1	0.0	0.1
16-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	0.8	0.7	1.5	3.8	2.6	0.6	0.4	0.4	0.5	0.6	0.6	3.8
17-Mar	0.9	0.7	0.6	0.6	Z	0.5	0.4	0.6	1.4	6.3	0.7	0.8	1.4	2.6	0.7	1.0	4.0	6.1	2.2	0.3	0.4	0.5	0.5	0.5	1.5	6.3
18-Mar	0.4	0.9	1.7	2.1	1.9	Z	2.6	3.9	10.6	9.9	5.8	2.5	2.7	1.2	0.6	0.7	0.5	0.3	0.3	0.2	0.2	0.1	0.2	0.9	2.2	10.6
19-Mar	Z	0.3	2.0	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0
20-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.4	6.6	0.4	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	6.6
21-Mar	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.4	1.3	0.8	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	1.3
22-Mar	0.0	0.0	0.1	Z	0.3	0.2	0.2	0.4	0.5	0.6	0.8	0.9	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.5	0.6	0.6	0.5	0.4	0.5	1.0
23-Mar	0.6	1.0	1.3	1.8	Z	2.3	1.6	1.5	2.7	1.9	0.9	0.7	0.4	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.7	2.7
24-Mar	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	0.1	0.0	0.1	1.0	0.1	1.0
25-Mar	Z	1.4	1.5	1.3	0.9	0.5	0.7	2.7	1.8	0.6	0.4	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	0.6	2.7
26-Mar	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.6	3.6	0.3	1.3	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	3.6
27-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.4	1.2	1.2	0.4	0.5	0.1	0.2	0.3	0.2	0.3	0.4	0.2	0.0	0.0	0.1	0.2	0.3	1.2
28-Mar	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.4	1.4	0.6	0.5	0.5	0.8	1.3	0.9	0.6	0.3	1.4
29-Mar	0.7	1.0	1.3	1.1	Z	1.7	1.5	0.9	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.7
30-Mar	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	1.4	2.0	0.3	1.1	0.7	14.7	12.0	0.2	3.6	0.1	1.4	1.6	14.7
31-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.5	4.2	1.3	0.8	0.6	0.7	0.4	0.3	1.5	1.4	1.7	7.8	9.5	8.1	1.8	9.5
	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.5	0.9	1.1	0.9	0.6	0.5	0.6	0.4	0.3	0.4	0.5	0.8	0.6	0.2	0.5	0.5	0.5	Diurnal Average	
	1.9	1.4	2.0	2.1	1.9	2.3	2.6	3.9	10.6	9.9	6.6	4.2	3.2	3.6	3.1	1.0	4.0	6.1	14.7	12.0	1.7	7.8	9.5	8.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Firebag - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	99.58	99.58
11 - 20	3	0.42	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Firebag - March 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	35	38	15	42	44	94	126	46	40	20	13	10	15	25	67	75	705
11 - 20	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	3
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	38	15	42	46	94	126	46	40	21	13	10	15	25	67	75	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Firebag

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Firebag - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.6 ppb on Mar 13 08:00

Maximum Daily Average: 0.8 ppb on Mar 13

Minimum Value: 0.0 ppb on Mar 4 20:00

Maximum Diurnal Average: 0.4 ppb at hour 6

Monthly Average: 0.15 ppb

Minimum Daily Average: 0.0 ppb on Mar 12

Minimum Diurnal Average: 0.1 ppb at hour 13

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} = 1.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.7	0.2	Z	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.7
2-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	C	C	C	C	C	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2
3-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1
4-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5-Mar	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.4	0.3	0.2	DF	0.1	0.6
6-Mar	0.1	0.1	0.1	0.3	0.4	0.5	0.2	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.5
7-Mar	0.0	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
8-Mar	0.0	0.0	Z	0.0	0.1	0.4	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.4
9-Mar	0.1	0.2	0.1	Z	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
10-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
11-Mar	0.1	0.2	0.2	0.1	0.3	Z	0.6	0.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
12-Mar	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
13-Mar	0.4	Z	0.5	1.5	0.7	2.3	1.8	2.6	2.1	0.5	0.5	0.2	0.1	0.2	0.2	0.4	0.3	0.4	0.7	0.8	0.1	0.3	0.2	0.4	0.8	2.6
14-Mar	0.4	0.1	Z	0.7	1.1	1.4	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4
15-Mar	0.0	0.0	0.1	Z	0.3	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.8	0.7	0.4	0.1	0.1	0.2	0.8
16-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
17-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2
18-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.8
19-Mar	0.1	Z	0.1	0.0	0.5	0.2	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.5
20-Mar	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.0	0.5	1.1	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1
21-Mar	0.0	0.6	2.5	Z	1.5	0.5	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.2	0.3	0.1	0.3	2.5
22-Mar	0.2	0.2	0.2	0.3	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.3
23-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
24-Mar	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	0.1	0.0	0.1	0.0	0.1	0.5	1.9	1.2	0.4	0.4	0.2	1.9
25-Mar	0.3	Z	0.2	0.3	0.4	0.9	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.9
26-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
27-Mar	0.0	0.6	1.5	Z	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8	0.9	0.2	1.5
28-Mar	0.6	0.6	0.7	0.6	Z	1.2	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.2
29-Mar	0.2	0.2	0.1	0.2	0.3	Z	0.6	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.6
30-Mar	Z	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.3
31-Mar	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.3	0.7	0.9	0.5	0.2	0.2	0.2	0.2	0.9
	0.2	0.2	0.3	0.2	0.3	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	Diurnal Average	
	0.7	0.6	2.5	1.5	1.5	2.3	1.8	2.6	2.1	1.1	0.6	0.3	0.1	0.2	0.2	0.4	0.3	0.4	0.7	0.9	1.9	1.2	0.8	0.9	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Firebag - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	99.86	99.86
3 - 4	1	0.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Firebag - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	35	37	16	42	46	94	129	46	40	18	9	10	15	27	66	76	706
3 - 4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	37	16	43	46	94	129	46	40	18	9	10	15	27	66	76	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Firebag

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Firebag - March 2023

Maximum Value: 2.6 ppm on Mar 29 07:00

Maximum Daily Average: 2.3 ppm on Mar 5

Minimum Value: 2.1 ppm on Mar 18 14:00

Minimum Daily Average: 2.2 ppm on Mar 22

Maximum Diurnal Average: 2.3 ppm at hour 6

Minimum Diurnal Average: 2.2 ppm at hour 16

Monthly Average: 2.23 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.2 Median = 2.2 Q_3 = 2.3 P_{90} = 2.3 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	35
Percent Operational Time:	99.3

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

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Firebag - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	704	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: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Firebag - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	35	38	15	42	46	94	126	46	40	21	13	10	15	25	65	73	704
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	35	38	15	42	46	94	126	46	40	21	13	10	15	25	65	73	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Firebag

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Firebag - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Firebag - March 2023

Maximum Value: 53.7 ppb on Mar 25 06:00

Maximum Daily Average: 4.9 ppb on Mar 6

Minimum Value: 0.0 ppb on Mar 2 19:00

Minimum Daily Average: 0.0 ppb on Mar 3

Maximum Diurnal Average: 5.0 ppb at hour 6

Minimum Diurnal Average: 0.5 ppb at hour 18

Monthly Average: 1.48 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.6 Q_3 = 1.5 P_{90} = 3.3 P_{99} = 13.2

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	13.8	3.3	3.7	1.8	2.8	Z	3.2	1.9	1.7	3.5	3.8	3.8	2.8	6.0	2.4	1.6	1.5	2.5	0.8	1.1	0.9	0.5	0.4	0.3	2.8	13.8
2-Mar	Z	0.3	0.3	0.3	0.5	1.4	0.5	1.7	6.3	3.4	1.4	1.4	1.4	1.6	1.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	6.3
3-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.9	1.5	1.0	0.8	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5
5-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.6	2.9	3.0	0.9	0.2	0.8	0.8	0.7	0.4	0.3	0.8	9.0	11.1	6.8	4.0	5.7	DF	2.2	11.1
6-Mar	2.0	1.5	2.0	7.4	15.7	29.9	3.2	2.4	2.9	8.0	8.1	5.8	3.2	Z	3.3	2.9	3.7	2.3	2.7	2.4	1.1	1.9	0.7	0.5	4.9	29.9
7-Mar	0.7	0.8	1.7	1.2	Z	2.6	1.0	0.5	0.7	1.2	1.5	1.1	1.3	0.6	0.8	1.4	1.6	1.5	1.6	1.8	1.6	0.4	0.3	0.3	1.1	2.6
8-Mar	0.3	0.3	0.5	0.2	2.5	Z	12.5	15.2	7.3	7.7	4.4	3.0	3.9	2.6	1.8	2.1	2.6	2.3	0.9	1.0	0.9	2.0	0.6	0.3	3.3	15.2
9-Mar	Z	6.4	0.4	0.4	7.3	12.6	3.0	1.0	1.7	1.3	4.1	1.8	2.3	1.0	0.9	1.3	1.1	0.8	1.1	0.7	0.5	0.4	0.4	0.4	2.2	12.6
10-Mar	0.5	Z	0.4	0.5	0.6	0.8	0.6	0.9	1.2	1.1	0.6	0.7	1.1	0.7	0.8	0.8	1.1	0.7	0.8	0.6	0.4	0.5	0.5	0.6	0.7	1.2
11-Mar	0.4	0.5	Z	0.3	0.6	0.9	0.5	1.3	2.4	2.1	1.5	0.5	1.3	1.3	1.9	1.2	1.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.4
12-Mar	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	0.1	0.2	0.0	0.2
13-Mar	0.1	0.2	0.3	0.2	Z	0.4	0.4	1.4	3.2	1.5	1.1	0.7	1.1	0.8	1.2	0.6	0.4	0.3	0.6	0.8	0.3	0.2	0.3	0.3	0.7	3.2
14-Mar	0.2	0.8	0.8	0.6	0.8	Z	0.8	0.9	0.5	0.6	0.7	1.4	0.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4
15-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.1	0.1	0.9	4.1	4.6	2.8	1.0	0.1	0.2	4.7	2.1	3.3	2.2	1.5	1.2	4.7
16-Mar	2.2	Z	2.3	1.7	0.6	0.7	0.9	1.0	0.9	4.5	6.0	4.5	2.7	2.3	0.4	15.8	0.4	0.7	1.2	0.4	0.4	0.7	1.4	2.1	2.3	15.8
17-Mar	0.8	3.1	Z	4.5	7.6	8.4	0.9	0.4	1.7	2.5	1.0	0.8	0.7	0.7	0.3	0.4	0.5	0.4	0.4	2.4	5.7	4.9	0.3	1.1	2.2	8.4
18-Mar	1.2	1.2	1.0	Z	1.3	1.1	0.9	1.3	2.2	3.0	1.9	0.7	0.6	0.4	0.5	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.8	3.0
19-Mar	0.2	0.4	0.3	1.0	Z	0.7	0.8	1.3	1.0	0.6	0.6	0.4	0.5	0.5	0.4	0.6	0.6	0.5	0.4	0.3	0.2	0.2	13.2	0.7	1.1	13.2
20-Mar	0.9	0.4	0.4	0.6	0.8	Z	0.4	0.3	1.2	1.4	1.6	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	0.4	1.6
21-Mar	Z	1.4	3.0	31.9	0.5	0.0	0.0	0.0	0.2	0.9	2.4	1.9	1.3	0.9	1.0	1.7	0.9	0.6	0.7	4.3	9.2	6.9	10.3	0.6	3.5	31.9
22-Mar	5.1	Z	3.1	3.2	0.6	0.9	0.4	0.8	1.2	2.5	3.2	2.7	1.6	1.9	1.1	1.6	1.3	0.7	0.9	0.5	3.2	8.6	7.3	2.1	2.4	8.6
23-Mar	0.4	0.4	Z	0.2	0.3	0.4	0.1	1.2	2.7	1.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.7
24-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.2	0.6	1.3	2.3	1.0	1.0	0.7	0.4	0.9	1.2	3.3	2.3	2.2	1.0	6.1
25-Mar	0.5	1.9	0.4	1.3	Z	53.7	5.7	4.0	2.7	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	3.1	53.7
26-Mar	0.0	0.7	1.9	2.3	2.4	Z	3.0	4.0	2.1	2.3	0.6	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	0.9	4.0
27-Mar	Z	1.6	3.9	3.6	2.6	8.4	10.7	5.8	0.8	1.4	2.0	1.0	0.7	0.4	0.5	0.8	0.7	0.7	0.2	0.0	0.0	0.2	0.1	0.4	2.0	10.7
28-Mar	0.5	Z	1.7	2.3	6.1	6.4	2.1	1.9	2.0	0.4	0.4	0.4	0.2	1.3	0.9	0.6	0.5	0.5	0.1	0.2	0.1	0.1	3.0	1.4	1.4	6.4
29-Mar	0.7	0.0	Z	0.0	0.0	0.1	2.3	3.6	1.3	0.7	1.0	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.7	5.5
30-Mar	6.1	0.6	0.7	Z	0.1	0.1	0.7	0.9	0.3	0.2	0.1	0.1	0.1	2.6	3.4	0.6	0.8	0.3	0.5	0.8	0.7	0.6	0.7	0.3	0.9	6.1
31-Mar	0.5	0.7	0.7	2.0	Z	1.0	0.9	0.9	0.9	0.5	1.1	1.2	0.7	0.6	0.9	0.9	0.5	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.7	2.0
	1.4	1.0	1.1	2.6	2.1	5.0	1.8	2.0	1.7	1.8	1.7	1.3	1.1	1.2	1.1	1.3	0.8	0.5	0.7	1.1	1.2	1.3	1.6	0.7	Diurnal Average	
	13.8	6.4	3.9	31.9	15.7	53.7	12.5	15.2	7.3	8.0	8.1	5.8	3.9	6.0	4.6	15.8	3.7	2.5	9.0	11.1	9.2	8.6	13.2	5.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Firebag - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.58	99.58
21 - 40	2	0.28	99.86
11 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Firebag - March 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	35	37	15	42	47	91	132	44	42	20	12	9	14	28	61	75	704
21 - 40	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	1	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	35	37	15	42	47	91	133	45	42	20	12	9	15	28	61	75	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Firebag

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Firebag - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 51.0 ppb on Mar 25 06:00

Maximum Daily Average: 9.6 ppb on Mar 27

Minimum Value: 0.2 ppb on Mar 3 19:00

Maximum Diurnal Average: 12.3 ppb at hour 6

Monthly Average: 4.85 ppb

Minimum Daily Average: 0.5 ppb on Mar 12

Minimum Diurnal Average: 1.7 ppb at hour 13

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 1.2 Median = 2.6 Q_3 = 5.4 P_{90} = 11.6 P_{99} = 29.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	27.4	8.0	7.7	5.9	8.0	Z	9.3	5.0	3.7	4.6	4.6	4.6	3.0	6.2	3.2	2.6	4.0	7.0	4.2	4.8	3.9	2.8	3.2	3.3	6.0	27.4
2-Mar	Z	2.9	2.8	2.7	3.3	5.7	4.0	6.5	12.4	6.7	3.2	3.2	3.5	4.1	3.2	1.8	2.9	2.4	1.3	8.4	7.5	4.9	5.1	1.6	4.4	12.4
3-Mar	1.6	Z	0.7	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.5	C	C	C	C	C	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.6
4-Mar	0.2	0.3	Z	3.3	0.5	0.2	0.2	0.4	1.5	0.9	0.8	1.1	1.8	1.3	1.2	1.7	0.9	0.7	0.5	0.2	0.2	0.6	1.2	0.7	0.9	3.3
5-Mar	1.0	0.4	0.4	Z	4.5	4.9	4.4	8.4	6.1	4.1	1.2	0.4	0.9	0.9	1.0	0.8	1.2	8.6	26.5	25.3	21.9	17.9	14.1	DF	7.0	26.5
6-Mar	7.7	8.6	10.6	20.5	28.6	37.2	10.4	6.8	6.3	8.9	8.5	5.7	3.6	Z	4.5	4.8	7.0	6.9	9.1	7.5	4.5	5.3	2.4	1.6	9.4	37.2
7-Mar	2.1	2.5	4.3	2.9	Z	6.2	3.0	1.2	1.7	2.1	2.2	1.7	1.9	1.0	1.5	2.4	3.0	4.0	5.1	5.3	4.4	1.3	1.0	1.2	2.7	6.2
8-Mar	1.2	1.5	2.0	1.3	6.6	Z	20.5	21.7	10.7	10.2	5.4	3.4	4.6	2.9	2.5	3.1	4.8	9.0	8.0	7.0	5.9	5.9	2.0	1.5	6.2	21.7
9-Mar	Z	14.6	1.7	2.1	15.5	24.6	10.0	3.8	3.8	2.3	4.2	2.0	2.3	1.3	1.4	2.0	1.9	2.0	2.5	1.6	1.3	1.1	1.3	1.2	4.5	24.6
10-Mar	1.3	Z	1.4	1.6	1.9	2.3	1.9	2.1	2.2	1.7	1.1	1.2	1.5	1.3	1.5	1.4	2.4	2.3	3.6	2.4	2.8	2.3	2.1	2.6	2.0	3.6
11-Mar	2.2	3.5	Z	2.9	4.7	7.3	4.8	6.3	4.4	3.6	2.9	1.4	2.2	2.2	2.4	3.0	5.8	2.1	1.1	0.8	0.6	0.7	0.5	0.4	2.9	7.3
12-Mar	0.4	0.4	0.4	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.5	2.9	0.5	2.9
13-Mar	2.4	2.9	7.1	7.8	Z	11.8	9.5	10.4	8.2	2.9	2.3	1.5	1.9	1.7	2.6	2.1	2.0	2.0	3.3	5.2	2.2	1.9	1.9	2.5	4.2	11.8
14-Mar	2.6	5.1	5.6	3.6	4.7	Z	5.1	4.8	2.3	2.4	2.5	3.8	0.9	0.5	0.4	0.3	0.5	0.4	0.5	0.5	0.4	0.3	1.3	0.4	2.1	5.6
15-Mar	Z	0.7	4.0	0.6	10.6	17.1	9.9	2.0	0.6	0.4	0.4	0.5	1.2	4.4	5.3	4.4	2.5	0.5	1.2	20.4	16.3	11.2	6.7	6.2	5.5	20.4
16-Mar	6.8	Z	6.2	5.0	2.6	3.1	3.6	2.8	1.9	6.5	7.6	5.2	3.1	2.9	1.2	5.5	1.5	3.2	11.6	5.0	2.6	3.7	4.6	5.7	4.4	11.6
17-Mar	4.1	8.2	Z	12.0	17.4	23.6	6.3	2.3	3.7	4.4	1.9	1.8	1.7	1.8	1.3	1.5	2.3	3.9	12.4	22.6	23.6	23.6	3.4	3.6	8.1	23.6
18-Mar	5.2	6.4	6.4	Z	6.7	6.7	5.8	6.3	6.8	6.9	4.3	2.0	1.9	1.5	1.5	1.8	1.8	1.5	1.2	1.3	0.8	0.6	1.2	4.3	3.6	6.9
19-Mar	3.2	5.1	3.0	6.7	Z	6.0	5.8	4.5	2.8	1.7	1.7	1.4	1.5	1.3	1.2	1.6	2.2	2.3	2.3	1.7	1.9	1.7	4.7	1.7	2.9	6.7
20-Mar	1.3	2.0	2.3	3.7	4.6	Z	2.4	1.7	5.1	4.6	3.5	2.0	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	1.7	5.1
21-Mar	Z	11.4	16.6	31.6	9.8	1.6	0.7	0.6	1.3	2.6	4.4	3.2	2.1	1.6	2.0	3.3	2.7	3.8	3.9	19.2	25.5	16.7	19.7	3.3	8.2	31.6
22-Mar	10.5	Z	7.5	8.6	3.9	4.3	2.9	2.9	2.6	3.7	4.5	3.4	2.8	3.1	2.6	3.4	3.5	3.3	6.9	7.0	15.6	27.0	23.5	11.6	7.2	27.0
23-Mar	3.2	2.9	Z	5.5	8.3	9.2	4.2	9.4	8.0	3.4	1.6	1.3	0.9	0.7	0.7	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.6	2.8	9.4
24-Mar	1.7	0.5	1.8	Z	0.6	0.6	0.4	9.4	0.4	0.4	0.4	0.8	1.4	2.3	4.0	2.5	3.3	3.8	5.1	12.4	25.7	27.6	29.6	27.3	7.0	29.6
25-Mar	25.1	26.3	20.3	30.6	Z	51.0	26.3	12.4	6.1	1.8	0.8	0.6	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	9.0	51.0
26-Mar	0.5	6.6	7.8	7.5	7.9	Z	7.9	8.4	3.3	3.2	1.0	2.7	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	2.7	8.4
27-Mar	Z	11.0	25.6	25.6	23.1	41.2	30.5	12.7	2.1	2.5	3.0	1.7	1.5	1.0	1.3	1.9	2.2	3.2	4.4	3.9	1.7	2.5	7.8	10.8	9.6	41.2
28-Mar	13.7	Z	12.6	18.1	28.1	20.7	12.8	5.6	3.8	1.1	0.9	0.9	0.7	2.2	1.9	1.7	2.2	3.0	2.3	3.1	1.8	2.4	14.1	18.0	7.5	28.1
29-Mar	18.6	6.2	Z	5.0	13.5	19.9	28.4	20.4	6.9	3.2	3.3	2.9	1.1	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	20.9	6.7	28.4
30-Mar	29.6	18.9	19.3	Z	10.4	8.9	9.1	4.4	1.2	0.7	0.5	0.6	0.6	3.8	5.9	1.9	3.5	2.9	3.9	6.6	4.4	3.8	4.6	2.0	6.4	29.6
31-Mar	2.5	3.1	3.2	8.0	Z	4.7	4.2	3.4	3.1	1.9	2.8	2.8	1.8	1.9	2.4	2.8	2.4	1.7	3.9	4.5	5.4	2.5	2.3	2.4	3.2	8.0
	6.8	6.2	7.0	8.6	8.7	12.3	7.9	6.0	4.0	3.2	2.7	2.1	1.7	1.9	2.0	2.0	2.3	2.7	4.1	5.8	5.9	5.5	5.2	4.7	Diurnal Average	
	29.6	26.3	25.6	31.6	28.6	51.0	30.5	21.7	12.4	10.2	8.5	5.7	4.6	6.2	5.9	5.5	7.0	9.0	26.5	25.3	25.7	27.6	29.6	27.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Firebag - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	670	94.77	94.77
21 - 40	35	4.95	99.72
11 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Firebag - March 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	35	37	15	42	46	86	123	37	36	19	9	9	14	27	61	74	670
21 - 40	0	0	0	0	1	5	10	8	6	1	2	0	0	1	0	1	35
11 - 80	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	37	15	42	47	91	133	45	42	20	12	9	15	28	61	75	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Firebag

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Firebag - March 2023

Maximum Value: 104.7 ppb on Mar 25 06:00

Maximum Daily Average: 14.4 ppb on Mar 6

Minimum Value: 0.2 ppb on Mar 4 01:00

Minimum Daily Average: 0.5 ppb on Mar 3

Maximum Diurnal Average: 17.3 ppb at hour 6

Minimum Diurnal Average: 2.8 ppb at hour 13

Monthly Average: 6.33 ppb

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 1.5 Median = 3.4 Q_3 = 7.4 P_{90} = 15.2 P_{99} = 37.2

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	41.2	11.3	11.4	7.7	10.8	Z	12.5	6.9	5.4	8.1	8.4	8.4	5.8	12.2	5.6	4.2	5.5	9.5	5.0	5.9	4.8	3.3	3.6	3.6	8.7	41.2
2-Mar	Z	3.2	3.1	3.0	3.8	7.1	4.5	8.2	18.7	10.1	4.6	4.6	4.9	5.7	4.2	2.1	3.1	2.4	1.3	8.4	7.5	4.9	5.1	1.6	5.3	18.7
3-Mar	1.6	Z	0.7	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.5	C	C	C	C	C	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.6
4-Mar	0.2	0.3	Z	3.3	0.5	0.2	0.2	0.4	2.0	1.4	1.3	2.0	3.3	2.3	2.0	2.5	1.1	0.7	0.5	0.2	0.2	0.6	1.2	0.7	1.2	3.3
5-Mar	1.0	0.4	0.4	Z	4.5	4.9	4.5	10.0	9.0	7.1	2.1	0.6	1.7	1.7	1.7	1.2	1.5	9.4	35.5	36.4	28.7	21.9	19.8	DF	9.3	36.4
6-Mar	9.7	10.1	12.6	27.9	44.3	67.1	13.6	9.2	9.2	16.9	16.6	11.5	6.8	Z	7.8	7.7	10.7	9.2	11.8	9.9	5.6	7.2	3.1	2.1	14.4	67.1
7-Mar	2.8	3.3	6.0	4.1	Z	8.8	4.0	1.7	2.4	3.3	3.7	2.8	3.2	1.6	2.3	3.8	4.6	5.5	6.7	7.1	6.0	1.7	1.3	1.5	3.8	8.8
8-Mar	1.5	1.8	2.5	1.5	9.1	Z	33.0	36.9	18.0	17.9	9.8	6.4	8.5	5.5	4.3	5.2	7.4	11.3	8.9	8.0	6.8	7.9	2.6	1.8	9.4	36.9
9-Mar	Z	21.0	2.1	2.5	22.8	37.2	13.0	4.8	5.5	3.6	8.3	3.8	4.6	2.3	2.3	3.3	3.0	2.8	3.6	2.3	1.8	1.5	1.7	1.6	6.8	37.2
10-Mar	1.8	Z	1.8	2.1	2.5	3.1	2.5	3.0	3.4	2.8	1.7	1.9	2.6	2.0	2.3	2.2	3.5	3.0	4.4	3.0	3.2	2.8	2.6	3.2	2.7	4.4
11-Mar	2.6	4.0	Z	3.2	5.3	8.2	5.3	7.6	6.8	5.7	4.4	1.9	3.5	3.5	4.3	4.2	7.7	2.3	1.1	0.8	0.6	0.7	0.5	0.4	3.7	8.2
12-Mar	0.4	0.4	0.4	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.6	3.1	0.5	3.1
13-Mar	2.5	3.1	7.4	8.0	Z	12.2	9.9	11.8	11.4	4.4	3.4	2.2	3.0	2.5	3.8	2.7	2.4	2.3	3.9	6.0	2.5	2.1	2.2	2.8	4.9	12.2
14-Mar	2.8	5.9	6.4	4.2	5.5	Z	5.9	5.7	2.8	3.0	3.2	5.2	1.2	0.6	0.4	0.3	0.7	0.5	0.5	0.5	0.4	0.3	1.3	0.4	2.5	6.4
15-Mar	Z	0.7	4.0	0.6	10.6	17.1	10.0	2.3	0.8	0.4	0.5	0.6	2.1	8.5	9.9	7.2	3.5	0.6	1.4	25.1	18.4	14.5	8.9	7.7	6.8	25.1
16-Mar	9.0	Z	8.5	6.7	3.2	3.8	4.5	3.8	2.8	11.0	13.6	9.7	5.8	5.2	1.6	21.3	1.9	3.9	12.8	5.4	3.0	4.4	6.0	7.8	6.8	21.3
17-Mar	4.9	11.3	Z	16.5	25.0	32.0	7.2	2.7	5.4	6.9	2.9	2.6	2.4	2.5	1.6	1.9	2.8	4.3	12.8	25.0	29.3	28.5	3.7	4.7	10.3	32.0
18-Mar	6.4	7.6	7.4	Z	8.0	7.8	6.7	7.6	9.0	9.9	6.2	2.7	2.5	1.9	2.0	2.3	2.1	1.6	1.2	1.3	0.8	0.6	1.3	4.4	4.4	9.9
19-Mar	3.4	5.5	3.3	7.7	Z	6.7	6.6	5.8	3.8	2.3	2.3	1.8	2.0	1.8	1.6	2.2	2.8	2.8	2.7	2.0	2.1	1.9	17.9	2.4	4.0	17.9
20-Mar	2.2	2.4	2.7	4.3	5.4	Z	2.8	2.0	6.3	6.0	5.1	3.2	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	2.1	6.3
21-Mar	Z	12.8	19.6	63.5	10.3	1.6	0.7	0.6	1.5	3.5	6.8	5.1	3.4	2.5	3.0	5.0	3.6	4.4	4.6	23.5	34.7	23.6	30.0	3.9	11.7	63.5
22-Mar	15.6	Z	10.6	11.8	4.5	5.2	3.3	3.7	3.8	6.2	7.7	6.1	4.4	5.0	3.7	5.0	4.8	4.0	7.8	7.5	18.8	35.6	30.8	13.7	9.5	35.6
23-Mar	3.6	3.3	Z	5.7	8.6	9.6	4.3	10.6	10.7	4.7	2.0	1.5	1.0	0.8	0.7	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.6	3.1	10.7
24-Mar	1.7	0.5	1.8	Z	0.6	0.6	0.4	15.5	0.4	0.4	0.4	1.0	2.0	3.6	6.3	3.5	4.3	4.5	5.5	13.3	26.9	30.9	31.9	29.5	8.1	31.9
25-Mar	25.6	28.2	20.7	31.9	Z	104.7	32.0	16.4	8.8	2.5	1.1	0.6	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	12.1	104.7
26-Mar	0.5	7.3	9.7	9.8	10.3	Z	10.9	12.4	5.4	5.5	1.6	4.7	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	3.6	12.4
27-Mar	Z	12.6	29.5	29.2	25.7	49.6	41.2	18.5	2.9	3.9	5.0	2.7	2.2	1.4	1.8	2.7	2.9	3.9	4.6	3.9	1.7	2.7	7.9	11.2	11.6	49.6
28-Mar	14.2	Z	14.3	20.4	34.2	27.1	14.9	7.5	5.8	1.5	1.3	1.3	0.9	3.5	2.8	2.3	2.7	3.5	2.4	3.3	1.9	2.5	17.1	19.4	8.9	34.2
29-Mar	19.3	6.2	Z	5.0	13.5	20.0	30.7	24.0	8.2	3.9	4.3	3.7	1.3	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	26.4	7.4	30.7
30-Mar	35.7	19.5	20.0	Z	10.5	9.0	9.8	5.3	1.5	0.9	0.6	0.7	0.7	6.4	9.3	2.5	4.3	3.2	4.4	7.4	5.1	4.4	5.3	2.3	7.3	35.7
31-Mar	3.0	3.8	3.9	10.0	Z	5.7	5.1	4.3	4.0	2.4	3.9	4.0	2.5	2.5	3.3	3.7	2.9	1.9	4.1	4.6	5.6	2.7	2.5	2.8	3.9	10.0
	8.2	7.2	8.1	11.2	10.8	17.3	9.7	8.1	5.7	5.1	4.3	3.5	2.8	3.0	3.0	3.4	3.0	3.2	4.8	6.9	7.1	6.8	6.8	5.4	Diurnal Average	
	41.2	28.2	29.5	63.5	44.3	104.7	41.2	36.9	18.7	17.9	16.6	11.5	8.5	12.2	9.9	21.3	10.7	11.3	35.5	36.4	34.7	35.6	31.9	29.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Firebag - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	659	93.21	93.21
21 - 40	41	5.80	99.01
11 - 80	6	0.85	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Firebag - March 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	35	37	15	41	46	85	121	34	33	19	9	9	14	27	60	74	659
21 - 40	0	0	0	1	1	6	9	10	9	1	1	0	0	1	1	1	41
11 - 80	0	0	0	0	0	0	3	1	0	0	2	0	0	0	0	0	6
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	37	15	42	47	91	133	45	42	20	12	9	15	28	61	75	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Firebag

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Firebag - March 2023

Maximum Value: 7.6 C on Mar 18 14:00

Maximum Daily Average: 1.2 C on Mar 18

Minimum Value: -26.1 C on Mar 27 06:00

Minimum Daily Average: -22.0 C on Mar 5

Maximum Diurnal Average: -6.4 C at hour 16

Minimum Diurnal Average: -14.9 C at hour 6

Monthly Average: -10.89 C

Percentiles: P_1 = -24.2 P_{10} = -19.6 Q_1 = -15.0 Median = -11.2 Q_3 = -6.2 P_{90} = -2.9 P_{99} = 6.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-19.8	-20.0	-21.0	-20.7	-20.1	-20.4	-20.9	-20.5	-18.7	-15.7	-15.0	-13.8	-11.8	-10.9	-11.1	-11.2	-11.2	-11.9	-13.5	-14.1	-13.5	-10.9	-10.7	-10.8	-15.3	-10.7
2-Mar	-10.7	-10.6	-10.4	-10.3	-10.1	-9.9	-9.7	-9.3	-8.8	-6.9	-4.8	-2.4	-0.8	0.1	0.6	1.0	0.6	-0.6	-0.6	-1.1	-1.5	-1.6	-2.2	-4.4	-4.8	1.0
3-Mar	-6.2	-8.5	-10.2	-11.5	-11.9	-12.4	-12.9	-13.3	-13.4	-13.8	-14.0	-14.0	-13.4	-12.7	-13.0	-12.8	-12.5	-13.2	-14.3	-14.8	-15.2	-16.2	-17.0	-18.1	-13.1	-6.2
4-Mar	-18.7	-18.9	-19.0	-19.2	-19.6	-20.3	-21.0	-21.2	-21.2	-20.6	-20.3	-20.0	-19.3	-18.9	-18.8	-18.8	-18.9	-19.8	-20.2	-20.8	-22.0	-21.5	-22.2	-23.0	-20.2	-18.7
5-Mar	-23.5	-24.1	-24.2	-24.1	-23.9	-24.3	-24.3	-24.5	-23.8	-23.2	-22.4	-21.7	-20.5	-19.6	-18.5	-17.7	-17.1	-18.4	-22.0	-20.9	-22.0	-22.9	-22.9	DF	-22.0	-17.1
6-Mar	-21.9	-22.3	-22.6	-22.8	-22.9	-22.5	-22.4	-22.8	-20.8	-17.4	-15.1	-13.3	-12.4	-12.1	-12.1	-12.3	-12.7	-13.2	-14.4	-14.9	-15.5	-15.8	-15.0	-14.6	-17.1	-12.1
7-Mar	-14.7	-14.8	-14.7	-14.7	-15.0	-15.3	-15.7	-15.9	-15.9	-15.5	-14.7	-14.2	-12.9	-11.8	-11.4	-10.9	-10.4	-10.8	-10.8	-10.9	-10.9	-10.6	-10.8	-11.2	-13.1	-10.4
8-Mar	-11.7	-12.3	-13.5	-14.5	-14.6	-14.9	-15.6	-16.0	-15.5	-13.9	-12.5	-11.2	-9.5	-8.7	-8.4	-8.0	-8.4	-9.4	-11.0	-12.8	-14.0	-15.0	-15.1	-15.3	-12.6	-8.0
9-Mar	-15.4	-15.8	-16.5	-17.5	-18.1	-18.4	-18.7	-18.3	-16.8	-14.6	-12.9	-12.2	-11.8	-11.1	-10.6	-10.6	-10.8	-11.8	-12.4	-12.5	-12.5	-12.5	-12.7	-12.9	-14.1	-10.6
10-Mar	-13.1	-13.5	-13.6	-13.9	-14.6	-14.2	-13.9	-13.6	-13.2	-12.7	-12.2	-11.4	-10.7	-9.6	-9.0	-8.7	-8.9	-9.1	-9.6	-9.9	-9.8	-9.7	-9.9	-10.3	-11.5	-8.7
11-Mar	-10.4	-11.1	-12.2	-11.9	-12.4	-12.3	-12.6	-12.5	-11.5	-8.7	-6.3	-6.2	-5.8	-5.5	-5.2	-5.3	-5.8	-6.7	-8.1	-9.2	-10.2	-11.1	-12.2	-13.5	-9.4	-5.2
12-Mar	-13.6	-13.1	-13.2	-13.5	-14.2	-14.8	-15.8	-16.6	-16.2	-15.4	-13.9	-12.9	-12.4	-11.9	-11.8	-11.5	-12.1	-12.8	-13.7	-14.9	-15.0	-15.4	-16.2	-15.0	-14.0	-11.5
13-Mar	-14.4	-14.4	-14.0	-13.8	-14.3	-15.2	-15.7	-15.5	-14.1	-11.3	-8.7	-7.6	-7.4	-6.8	-6.7	-7.0	-6.6	-6.7	-7.6	-8.9	-9.5	-9.8	-10.0	-10.2	-10.7	-6.6
14-Mar	-10.4	-10.5	-10.9	-11.3	-11.5	-11.5	-11.6	-11.7	-11.7	-11.6	-11.4	-11.3	-11.1	-10.9	-10.9	-11.0	-11.7	-12.4	-12.8	-13.1	-13.7	-14.4	-14.8	-15.1	-12.0	-10.4
15-Mar	-15.6	-16.2	-17.1	-18.5	-19.4	-20.4	-20.2	-18.7	-16.4	-14.7	-12.7	-11.3	-10.3	-9.5	-9.2	-9.5	-9.9	-10.0	-11.2	-13.5	-14.0	-14.2	-15.6	-16.6	-14.4	-9.2
16-Mar	-17.3	-16.9	-16.5	-16.0	-15.5	-15.0	-14.6	-14.0	-13.0	-11.8	-10.7	-9.3	-7.3	-5.5	-4.3	-3.8	-4.0	-5.0	-7.1	-8.6	-9.1	-9.7	-9.4	-8.3	-10.5	-3.8
17-Mar	-7.6	-7.8	-7.6	-7.6	-8.4	-9.3	-9.1	-6.4	-4.9	-3.1	-0.8	2.6	3.9	4.8	5.4	5.9	6.3	6.2	4.0	0.8	-0.2	-0.7	0.3	0.0	-1.4	6.3
18-Mar	-0.9	-1.6	-2.1	-2.7	-3.3	-4.2	-5.1	-4.3	-1.5	1.8	5.2	7.2	7.6	7.6	7.3	7.3	7.1	5.9	3.3	0.3	-0.6	-1.6	-2.5	-1.5	1.2	7.6
19-Mar	-3.0	-4.1	-5.4	-7.4	-8.2	-9.0	-9.9	-9.2	-7.4	-5.2	-3.3	-2.9	-2.1	-0.9	-0.4	0.0	-0.7	-2.3	-4.4	-6.0	-6.4	-6.3	-6.1	-6.4	-4.9	0.0
20-Mar	-6.9	-7.0	-7.8	-8.6	-9.4	-10.1	-10.1	-10.4	-10.4	-10.1	-9.1	-7.0	-6.1	-5.4	-3.7	-3.4	-3.8	-4.5	-6.1	-8.8	-11.6	-13.9	-15.3	-16.3	-8.6	-3.4
21-Mar	-16.8	-19.0	-19.5	-19.1	-18.4	-13.7	-12.1	-11.4	-11.2	-10.6	-9.8	-8.8	-7.0	-5.1	-4.7	-4.0	-4.3	-4.4	-6.2	-9.2	-10.7	-11.2	-11.4	-12.0	-10.9	-4.0
22-Mar	-11.1	-11.1	-11.6	-12.1	-12.5	-12.9	-13.1	-12.2	-10.0	-7.9	-6.1	-4.4	-3.3	-1.9	-0.3	0.6	0.8	0.7	-0.8	-2.7	-2.6	-2.8	-3.4	-4.5	-6.1	0.8
23-Mar	-3.6	-3.3	-3.6	-4.5	-3.9	-2.1	-0.9	-1.9	-3.4	-2.8	-2.9	-3.1	-4.3	-5.2	-6.0	-7.2	-7.7	-7.6	-7.9	-8.6	-8.9	-9.1	-8.9	-10.6	-5.3	-0.9
24-Mar	-13.0	-12.9	-15.3	-16.9	-16.5	-18.2	-19.0	-15.4	-11.8	-9.8	-8.3	-6.8	-6.1	-5.5	-4.8	-3.9	-3.6	-3.7	-5.2	-9.4	-13.3	-13.2	-13.1	-15.6	-10.9	-3.6
25-Mar	-16.3	-15.7	-14.0	-14.3	-16.4	-19.2	-19.2	-14.6	-9.1	-7.6	-6.6	-5.9	-5.5	-5.3	-5.4	-5.8	-6.5	-7.7	-9.6	-11.8	-13.7	-15.9	-17.5	-18.2	-11.7	-5.3
26-Mar	-19.0	-21.3	-19.8	-21.4	-22.4	-23.2	-23.7	-22.3	-19.3	-15.9	-14.2	-12.7	-11.8	-11.7	-10.9	-11.2	-11.6	-12.6	-14.2	-16.6	-18.1	-19.4	-21.0	-21.9	-17.3	-10.9
27-Mar	-21.6	-24.0	-25.1	-25.9	-25.7	-26.1	-25.1	-19.7	-15.8	-14.3	-12.8	-11.6	-10.7	-9.8	-9.2	-8.6	-8.2	-9.0	-10.6	-13.4	-14.6	-14.8	-15.8	-19.0	-16.3	-8.2
28-Mar	-19.2	-20.7	-23.1	-23.8	-22.7	-22.3	-21.3	-17.3	-13.8	-11.3	-9.5	-7.8	-6.3	-5.5	-4.7	-4.3	-4.4	-4.4	-4.7	-5.1	-5.2	-4.8	-4.9	-5.2	-11.4	-4.3
29-Mar	-5.7	-6.0	-6.2	-6.0	-5.2	-5.3	-5.4	-5.4	-5.0	-4.9	-4.5	-4.9	-4.9	-4.6	-4.4	-4.3	-4.7	-5.4	-5.7	-6.6	-9.3	-11.6	-12.4	-13.0	-6.3	-4.3
30-Mar	-14.4	-15.3	-15.4	-15.9	-15.9	-15.9	-14.1	-11.8	-9.5	-7.5	-6.3	-5.8	-4.5	-4.4	-3.6	-3.1	-3.3	-3.5	-4.0	-5.0	-5.8	-6.6	-7.1	-6.9	-8.6	-3.1
31-Mar	-7.7	-8.9	-9.5	-9.7	-9.4	-9.5	-8.8	-7.9	-6.6	-5.4	-4.1	-2.5	-1.5	-0.5	0.2	0.6	0.7	0.4	-0.8	-2.5	-4.0	-5.2	-6.2	-7.1	-4.8	0.7
	-13.0	-13.6	-14.0	-14.5	-14.7	-14.9	-14.9	-14.0	-12.6	-11.0	-9.7	-8.6	-7.7	-7.0	-6.6	-6.4	-6.6	-7.2	-8.5	-9.9	-10.8	-11.2	-11.7	-11.9	Diurnal Average	
	-0.9	-1.6	-2.1	-2.7	-3.3	-2.1	-0.9	-1.9	-1.5	1.8	5.2	7.2	7.6	7.6	7.3	7.3	7.1	6.2	4.0	0.8	-0.2	-0.7	0.3	0.0	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Firebag - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	70	9.42	9.42
-20 - 0	640	86.14	95.56
0 - 10	33	4.44	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Firebag - March 2023

Maximum Value: 93.4 % on Mar 3 00:00

Maximum Daily Average: 82.8 % on Mar 12

Minimum Value: 30.4 % on Mar 18 13:00

Minimum Daily Average: 44.8 % on Mar 18

Maximum Diurnal Average: 77.9 % at hour 7

Minimum Diurnal Average: 56.2 % at hour 16

Monthly Average: 69.07 %

Percentiles: P_1 = 33.8 P_{10} = 45.5 Q_1 = 58.6 Median = 72.5 Q_3 = 81.2 P_{90} = 85.1 P_{99} = 89.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	82.8	81.2	80.8	81.1	81.4	81.2	80.9	81.0	81.1	81.9	81.0	77.4	70.4	67.2	68.7	70.3	73.1	77.8	82.4	85.1	86.1	84.5	84.2	84.7	79.4	86.1
2-Mar	85.0	85.5	85.2	85.4	85.7	85.9	86.8	87.3	87.1	81.4	79.0	72.0	68.3	66.9	66.6	65.7	70.7	93.2	92.6	89.7	84.1	81.7	81.6	93.4	81.7	93.4
3-Mar	91.9	87.8	87.4	85.3	83.2	82.2	84.3	85.0	84.3	80.3	75.0	73.7	70.6	68.6	70.2	69.0	68.2	72.1	78.1	81.5	83.4	81.9	80.2	73.9	79.1	91.9
4-Mar	73.3	74.5	75.9	79.0	80.1	80.2	77.8	76.4	73.5	67.5	64.5	63.3	64.3	64.5	65.4	69.8	71.0	74.6	76.7	77.8	79.4	78.8	79.9	79.6	73.7	80.2
5-Mar	78.7	78.1	77.8	77.9	78.0	77.7	77.6	77.0	76.4	76.2	75.8	74.9	66.3	62.1	58.6	55.6	53.5	59.1	71.5	70.6	73.9	75.3	75.4	DF	71.7	78.7
6-Mar	71.5	72.5	72.9	73.3	74.1	72.4	72.1	73.0	66.8	59.1	52.2	48.2	49.4	53.3	57.8	62.3	67.0	69.7	75.0	75.5	76.2	78.5	80.5	79.0	68.0	80.5
7-Mar	80.0	79.5	79.6	78.0	75.8	74.7	78.4	77.4	75.7	74.0	72.7	72.6	73.0	71.4	68.2	57.6	53.8	52.2	51.1	51.2	51.1	50.6	51.3	51.5	66.7	80.0
8-Mar	51.3	52.6	56.7	58.4	58.5	59.4	61.1	62.4	61.0	56.0	50.7	45.7	40.7	39.5	38.9	37.2	36.4	39.5	44.2	49.0	53.2	56.4	57.1	57.4	51.0	62.4
9-Mar	56.9	57.9	60.2	63.0	64.5	64.9	64.9	63.1	58.4	52.7	50.2	50.0	49.4	48.1	49.9	50.9	51.5	54.6	57.2	57.3	59.8	69.0	76.7	77.7	58.7	77.7
10-Mar	78.8	80.6	79.8	79.9	79.9	79.2	79.3	79.4	77.8	75.6	74.2	72.5	71.3	68.0	68.2	67.3	69.7	72.1	76.7	83.4	80.3	71.3	69.0	68.4	75.1	83.4
11-Mar	67.6	68.9	71.6	68.6	71.2	73.1	77.1	79.5	76.2	65.6	58.1	61.3	58.3	56.0	56.2	58.5	64.5	75.9	82.5	87.4	89.5	89.6	88.5	87.3	72.2	89.6
12-Mar	87.3	87.2	87.1	86.8	86.2	85.6	84.8	84.0	83.6	83.3	82.0	76.5	74.6	73.6	73.6	75.6	78.9	81.9	85.1	86.9	86.2	85.2	84.9	85.7	82.8	87.3
13-Mar	85.6	85.7	85.3	85.1	84.4	85.0	85.1	84.1	82.3	79.6	73.9	71.7	69.4	69.0	71.3	72.2	70.1	70.1	73.1	75.5	78.2	80.9	81.9	83.0	78.4	85.7
14-Mar	84.7	84.5	84.7	84.7	84.9	84.6	83.2	82.8	83.3	82.7	81.0	78.6	79.8	79.3	78.8	79.6	82.2	81.9	83.8	82.8	82.9	82.5	82.7	82.5	82.4	84.9
15-Mar	81.3	81.4	83.0	83.4	84.0	82.7	83.2	83.0	81.8	79.7	73.6	71.3	70.6	69.6	70.9	73.9	76.9	78.2	84.6	88.4	88.4	86.6	85.0	84.0	80.2	88.4
16-Mar	83.3	80.5	78.9	79.3	79.2	79.4	81.6	82.1	81.2	79.5	78.2	76.2	71.8	68.5	65.8	64.2	66.9	71.2	78.2	82.1	81.2	82.5	82.4	83.5	77.4	83.5
17-Mar	82.0	80.8	79.3	76.0	77.5	78.7	77.7	69.6	65.7	61.7	57.3	49.9	48.1	46.1	44.5	42.8	42.5	42.1	49.0	56.6	60.7	60.7	52.5	49.4	60.5	82.0
18-Mar	46.7	46.1	45.7	46.8	48.0	51.2	53.6	52.0	46.1	41.3	35.5	31.1	30.4	30.6	31.5	32.0	32.6	36.7	43.4	51.3	54.1	59.4	63.7	64.1	44.8	64.1
19-Mar	69.7	74.9	80.2	87.6	90.0	91.2	91.0	87.0	79.8	72.0	63.8	62.0	62.0	59.6	58.7	56.5	60.6	68.6	76.4	83.4	84.2	80.8	79.3	75.5	74.8	91.2
20-Mar	67.4	65.5	74.4	82.6	83.0	78.9	78.6	80.9	81.3	82.0	79.9	78.3	76.4	71.5	65.1	62.1	61.4	64.2	61.4	63.4	70.2	76.6	81.5	84.3	73.8	84.3
21-Mar	86.1	83.6	82.3	82.3	82.8	86.7	87.9	88.2	88.0	87.9	87.4	78.4	62.7	53.7	48.6	42.8	45.4	46.9	52.8	63.4	70.9	74.4	77.8	82.7	72.6	88.2
22-Mar	82.7	83.1	83.9	84.5	85.1	85.0	83.6	79.3	75.1	68.0	61.1	55.1	52.5	50.1	46.1	44.6	45.3	46.3	51.8	58.7	58.3	58.6	61.1	64.6	65.2	85.1
23-Mar	61.0	59.7	62.2	64.8	65.6	65.5	62.5	64.4	61.8	57.1	65.1	64.8	70.3	71.7	74.0	79.3	78.9	78.6	81.2	86.9	89.9	88.4	85.2	89.4	72.0	89.9
24-Mar	89.7	88.0	86.2	85.0	85.2	83.4	83.1	83.4	81.2	66.7	56.6	49.6	42.1	38.0	35.1	32.1	37.2	38.7	44.1	57.3	68.8	70.5	65.8	71.3	64.1	89.7
25-Mar	71.1	69.3	62.1	66.6	73.3	79.9	82.1	73.2	54.9	46.4	42.7	40.2	37.8	37.7	34.0	33.8	37.7	47.5	58.9	65.9	71.5	77.0	82.1	83.7	59.6	83.7
26-Mar	85.0	82.5	78.8	79.3	79.3	77.6	74.3	68.7	62.0	51.8	44.4	40.6	35.5	34.2	33.8	35.5	37.3	39.6	44.7	53.0	59.6	63.7	68.6	72.1	58.4	85.0
27-Mar	70.9	78.8	79.9	79.6	80.0	77.9	77.8	72.1	55.2	47.2	42.3	38.7	39.4	40.3	39.4	38.2	37.7	40.1	43.6	49.1	51.7	54.6	58.9	67.3	56.7	80.0
28-Mar	68.6	71.4	76.3	78.0	75.7	75.0	71.7	61.5	51.7	45.8	42.2	41.3	41.0	41.2	41.5	43.8	44.2	44.7	45.6	44.8	44.7	44.1	51.4	55.9	54.2	78.0
29-Mar	55.8	58.0	58.8	66.6	68.9	67.4	72.1	78.8	82.8	86.2	86.3	88.4	87.9	81.5	74.4	70.9	71.5	67.5	69.1	70.5	80.8	88.7	89.0	87.9	75.4	89.0
30-Mar	87.7	87.2	87.0	86.1	86.5	86.2	85.9	79.9	62.4	51.3	44.5	43.6	41.4	43.4	42.4	41.4	44.6	47.5	49.0	50.3	52.3	54.7	60.7	62.1	61.6	87.7
31-Mar	63.1	65.5	67.5	68.9	69.1	70.4	73.8	78.7	80.9	75.9	70.1	65.5	64.7	59.9	56.8	57.4	57.6	58.7	65.1	71.0	75.1	77.9	81.7	84.6	69.2	84.6
	75.1	75.3	75.9	76.9	77.4	77.5	77.9	76.6	72.9	68.3	64.6	61.7	59.4	57.6	56.6	56.2	57.7	61.0	65.4	69.3	71.8	73.1	74.2	75.5	Diurnal Average	
	91.9	88.0	87.4	87.6	90.0	91.2	91.0	88.2	88.0	87.9	87.4	88.4	87.9	81.5	78.8	79.6	82.2	93.2	92.6	89.7	89.9	89.6	89.0	93.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Firebag - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	34	4.58	4.58
40 - 60	167	22.48	27.05
60 - 80	331	44.55	71.60
80 - 100	211	28.40	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Firebag - March 2023

Maximum Speed: 31 km/h on Mar 9 12:00

Maximum Daily Speed Average: 22.5 km/h on Mar 7

Minimum Speed Value: 1 km/h on Mar 25 05:00

Minimum Daily Speed Average: 2.0 km/h on Mar 30

Maximum Diurnal Speed Average: 7.1 km/h at hour 24

Minimum Diurnal Speed Average: 0.4 km/h at hour 15

Monthly Average Velocity: 4.2 km/h 108.5 deg

Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 9$ Median = 13 $Q_3 = 17$ $P_{90} = 22$ $P_{99} = 26$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SE12	SE13	SE11	SE11	SE11	SE12	SE12	SE12	SE13	SE15	SE17	SE16	SE17	SE20	SE21	SE23	SE20	ESE17	ESE16	ESE16	SE17	SE24	SE23	SE23	SE16.0	SE24
2-Mar	SE24	SE24	SE25	SE26	SE25	SE25	SE25	SE25	SSE24	SSE25	S20	SSW19	SW21	SW21	SW17	SW15	SW14	SW14	WSW16	WSW15	WSW14	W17	W14	NW14	S12.7	SE26
3-Mar	NW15	NNW15	NNW15	NNW14	NNW11	NNW14	NNW14	NNW13	NW13	NNW14	NW18	NW16	NW15	NW13	NNW10	NW10	NW10	NNW12	NNW9	NNW6	NNW14	NNW17	NNW16	NW19	NNW13.4	NW19
4-Mar	NW20	NW17	NW15	NW13	NW16	NW17	NW19	NW20	NW21	WNW24	WNW23	WNW20	WNW18	WNW20	WNW21	WNW18	NW19	NW19	NNW19	NW15	NW13	NW17	NW19	NW18	NW18.0	WNW24
5-Mar	NW21	NW22	NW19	NW14	WNW11	WNW10	WNW10	WNW8	NW12	NW15	NW14	NW12	NW11	NW9	WNW9	WNW7	W2	ESE2	ESE6	ESE10	ESE10	ESE10	SE9	DF	NW6.8	NW22
6-Mar	SE12	SE10	SE10	SE6	SE9	SSE13	SE12	SE11	SE11	SE16	SSE15	SSE13	SSE13	SSE13	SE13	SE15	SE14	SE16	ESE13	ESE16	ESE16	ESE19	SE19	SE20	SE13.4	SE20
7-Mar	SE19	SE18	SE20	SE22	ESE22	SE20	SE22	SE26	SE24	SE25	SE23	SE23	SE24	SE24	ESE24	ESE21	ESE23	ESE22	ESE20	ESE22	SE24	SE26	SE25	SE25	SE22.5	SE26
8-Mar	SE23	SE24	SE19	SE18	SE18	SSE14	SE16	SSE17	SSE18	SSE21	SE18	SE21	SE18	ESE15	ESE16	SE15	ESE16	ESE12	ESE11	ESE12	ESE16	ESE18	SE19	SE19	SE16.9	SE24
9-Mar	SE19	SE17	SE18	SE15	SE16	SE14	SE15	SE16	SE17	SE18	SE25	SE31	SE25	SE24	ESE22	ESE23	ESE24	ESE21	ESE24	ESE27	SE27	SE25	SE25	SE24	SE21.1	SE31
10-Mar	SE23	ESE20	ESE23	SE22	SE21	SE22	SE22	ESE20	ESE22	SE23	SE22	ESE19	SE18	ESE19	SE20	ESE18	SE20	ESE19	ESE16	ESE16	ESE15	ESE18	ESE18	ESE15	ESE19.5	SE23
11-Mar	ESE14	SE11	ESE9	ESE11	ESE9	ESE9	ESE8	ESE9	ESE9	ESE4	WNW1	ESE8	SE11	SE11	SE9	SE8	SE7	NNW7	N8	N11	N8	NNE9	NNE9	NNE11	E5.5	ESE14
12-Mar	NNE10	N9	N9	NNW10	NNW9	NNW8	NNW8	NNW10	NNW9	NNW8	NNW8	NNW8	NNW9	NNW10	N12	N12	N12	N11	NNE10	NNE9	NNE11	NNE10	NE10	NE10	N9.0	N12
13-Mar	NE10	ENE9	ENE12	ENE9	ENE9	ENE6	ENE9	ENE12	E10	ENE14	ENE17	E21	E18	ENE17	ENE20	ENE19	ENE20	ENE18	ENE20	ENE23	ENE26	ENE26	ENE24	ENE24	ENE16.2	ENE26
14-Mar	ENE21	ENE23	NE16	NE16	NE17	ENE18	ENE24	ENE25	ENE23	ENE22	ENE17	ENE14	NNE10	NNE12	NNE14	NNE13	NNE14	NNE14	NNE9	NE11	NNE11	NNE10	N8	NNE10	NE14.7	ENE25
15-Mar	NNE10	NNE5	NW1	NW5	NW7	NW6	NW6	N6	N8	N10	NNW8	NW8	WNW7	NW6	NW7	NNW9	N9	NNW5	NNE7	ENE4	E7	ESE10	SE11	ESE12	N3.8	ESE12
16-Mar	SE11	SE15	ESE15	SE15	SE14	SE14	ESE12	SE14	SE16	SSE14	SSE15	SE14	SSE9	SSE8	S7	S7	SSW12	S14	SSE11	SSE13	SE17	SE16	SE18	SSE20	SE12.5	SSE20
17-Mar	SE18	SSE18	SE18	SSE17	SSE16	SSE14	SSE16	S18	S19	S16	S15	S14	SSW17	SSW19	SSW20	SSW22	SSW20	SSW12	S7	SSE10	SSE11	S10	S14	S16	S14.5	SSW22
18-Mar	S16	S15	S16	S15	S13	S11	S11	S9	SSW9	SSW8	SW6	W10	WNW12	NW12	NW14	NNW14	NNW15	NNW15	NNW10	NNE9	N8	NNE8	NE7	ENE11	WSW2.7	S16
19-Mar	E10	E12	E15	E13	ESE10	ESE11	E10	E12	ESE11	E11	ESE10	E12	ESE14	ESE12	ESE12	ESE11	E13	ESE15	ESE15	ESE17	ESE16	ESE17	ESE16	ESE17	ESE12.9	ESE17
20-Mar	ESE17	ESE17	ESE15	ESE11	ESE13	ESE12	E10	E10	ENE9	ENE10	E9	NE9	NNE13	NNE17	N15	N18	N17	N16	N15	NNW16	N10	N9	N7	NNE6	NE8.2	N18
21-Mar	NE5	ENE3	NE3	SE2	NNE2	NNE5	NNE5	NNE8	NE6	E2	SSE3	SSW4	ESE4	SE2	SSE3	ESE2	ESE4	ESE2	SW2	S6	SE9	SSE13	SSE15	SE16	ESE3.2	SE16
22-Mar	SSE18	SSE19	SE18	SE17	SE18	SE19	SE20	SE20	SE21	SSE20	SSE18	SSE17	SE17	SSE15	S15	S13	SSE14	SSE14	SE13	SE13	SSE16	SSE14	SSE13	SSE11	SSE16.2	SE21
23-Mar	S13	SSW11	SSW8	S6	S6	SSW7	W10	WNW14	NW16	NW18	NNW21	NNW21	NNW21	NNW24	NNW23	NNW21	NNW25	NNW20	NNW16	NW11	NW11	NW12	NNW12	NW7	NW11.0	NNW25
24-Mar	NNW4	NW5	WNW5	NW4	NW2	NNW2	N2	N2	NNW6	NNW8	NW7	W6	WSW6	W8	WNW7	W7	WNW7	NW2	NE5	ENE5	E4	SE6	SE6	SE5	NW2.1	NNW8
25-Mar	S5	S6	S7	S5	SW1	W3	NNW5	N7	N11	N16	N15	NNW17	NNW17	NNW17	NNW17	NNW18	NNW19	NNW19	NNW16	NNW13	N9	N8	NNE8	NNE3	NNW8.7	NNW19
26-Mar	NE4	ENE5	E15	E14	E12	E13	E14	ESE6	E5	E3	NE5	ESE6	NNE8	N10	NNW11	NNW15	NNW16	NNW16	NNW14	NNW11	N10	N7	N7	NNE8	NNE5.8	NNW16
27-Mar	NE6	ESE3	SSE3	S3	S4	SW3	SW4	SSW3	WSW7	WSW6	W4	W4	W9	W9	WNW10	W9	W8	NNW9	NNW9	N9	NE10	NE9	E6	E4	WNW2.1	WNW10
28-Mar	ESE6	ESE4	ESE3	E4	ESE6	ESE4	ESE8	SSE8	SSE10	S8	S8	S10	SW12	SSW15	SSW15	SSW17	SSW16	S15	S14	SSE14	S16	S12	SSE8	SE5	S8.5	SSW17
29-Mar	S2	WNW7	NW5	WNW6	WNW7	WNW7	WNW8	NW9	NW11	NW14	NW15	NW19	NW22	NW25	NW24	NNW21	NNW20	NNW18	NNW12	NNW7	NW5	NW5	NW6	SW2	NW11.0	NW25
30-Mar	SSW3	WSW3	WSW3	WSW4	WSW6	WNW6	NW5	NNW6	NNW9	NW8	NW7	NNW6	S3	S6	S4	SSE4	NE4	NNE7	E10	E12	E13	E13	E12	E15	ENE2.0	E15
31-Mar	E15	E15	E15	E14	E13	E14	E13	E11	E11	E9	E10	E12	E15	E12	E12	ENE13	ENE14	ENE16	E15	ENE17	E21	E22	E21	E20	E14.4	E22
	ESE6.5	ESE6.3	ESE6.6	ESE6.2	ESE5.8	ESE5.5	ESE5.4	ESE5.1	ESE4.5	ESE3.5	SE2.8	SE2.6	SE1.7	SE0.8	E0.4	ENE0.8	ENE1.9	NE3.4	ENE4.4	E5.5	E6.3	ESE6.7	ESE6.6	ESE7.1	Diurnal Average	
	SE24	SE24	SE25	SE26	SE25	SE25	SE25	SE26	SE24	SE25	SE25	SE31	SE25	NW25	NW24	SE23	NNW25	ESE22	ESE24	ESE27	SE27	SE26	SE25	SE25	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

Firebag - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Firebag - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	79	10.63	10.63
6 - 11	233	31.36	41.99
12 - 19	307	41.32	83.31
20 - 28	123	16.55	99.87
29 - 38	1	0.13	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Firebag - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 5	2	5	6	4	5	11	4	4	7	3	5	3	4	2	10	4	79
6 - 11	23	26	8	10	12	25	21	9	16	5	1	4	9	16	18	30	233
12 - 19	10	7	3	15	28	43	61	29	19	10	5	3	2	5	33	34	307
20 - 28	0	0	0	15	4	18	51	6	1	3	2	0	0	5	8	10	123
29 - 38	0	0	0	0	0	0	1	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	35	38	17	44	49	97	138	48	43	21	13	10	15	28	69	78	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Firebag

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Firebag - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 13 20:00

Minimum Value: 0 km/h on Mar 29 21:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Firebag - March 2023

Direction of Maximum Speed: 139 deg on Mar 9 12:00
Direction of Maximum Daily Speed Average: 126.7 deg on Mar 7

Direction of Minimum Speed: 225 deg on Mar 25 05:00

Direction of Minimum Daily Speed Average: 2.0 deg on Mar 30

Monthly Average Direction: 108.5 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	145	138	138	128	127	128	127	130	139	143	144	143	137	146	137	137	138	120	111	115	124	138	138	137	134.3
2-Mar	138	134	132	136	132	136	137	143	150	168	186	202	219	226	226	233	224	227	239	256	251	263	276	313	181.8
3-Mar	315	330	332	342	344	339	333	332	318	332	326	321	322	324	341	317	326	333	345	334	329	330	331	320	329.2
4-Mar	323	320	308	313	323	322	323	318	314	303	299	296	298	302	296	303	316	322	329	325	320	320	318	317	313.1
5-Mar	317	322	319	311	297	285	290	295	308	312	318	311	310	307	299	294	267	115	117	117	119	120	135	DF	310.6
6-Mar	139	139	141	143	144	147	136	130	134	145	149	152	153	152	140	138	138	137	123	116	116	123	129	131	136.4
7-Mar	128	127	125	126	123	124	131	135	131	132	132	130	130	131	123	117	117	116	115	118	124	130	133	135	126.7
8-Mar	136	137	130	134	142	148	146	152	150	151	143	140	141	121	121	126	119	121	114	108	113	121	130	137	133.7
9-Mar	139	143	136	137	143	145	140	140	139	137	142	139	133	130	120	122	122	119	117	122	125	125	125	124	130.8
10-Mar	124	119	123	125	125	127	126	122	123	126	126	122	125	122	125	122	127	117	105	108	113	120	121	121	121.9
11-Mar	123	124	111	111	111	119	115	109	113	123	293	104	128	138	146	138	146	347	356	1	11	27	21	18	96.6
12-Mar	13	5	357	346	336	335	337	343	343	341	331	328	339	345	354	357	1	8	12	14	19	24	35	53	358.2
13-Mar	54	59	70	67	72	71	69	73	79	71	68	79	80	75	77	72	70	69	59	62	68	69	66	68	69.5
14-Mar	67	63	52	52	53	59	64	64	66	66	67	63	31	18	17	18	26	31	32	34	27	19	9	29	48.3
15-Mar	23	31	315	319	311	312	321	352	7	360	328	317	301	316	317	338	3	336	33	76	97	114	128	116	1.9
16-Mar	125	125	123	125	134	133	123	124	130	152	149	145	161	160	188	190	210	179	158	147	142	144	146	148	145.0
17-Mar	146	149	142	154	153	157	167	177	175	180	172	191	201	208	209	210	207	212	175	159	162	169	183	188	178.1
18-Mar	190	190	189	189	190	191	187	187	194	210	223	274	287	304	321	329	346	347	346	15	8	28	37	72	254.3
19-Mar	90	93	90	97	103	103	99	101	111	96	112	93	106	114	123	116	96	110	113	110	110	113	119	119	106.4
20-Mar	119	108	104	105	106	105	94	86	66	77	84	37	20	14	0	353	351	7	350	346	352	7	10	12	43.2
21-Mar	45	58	44	124	33	19	29	24	34	97	165	194	106	125	148	117	115	121	224	175	146	150	147	140	118.5
22-Mar	147	152	146	146	142	137	138	137	143	150	154	156	142	147	177	169	167	164	144	137	149	153	156	160	149.6
23-Mar	180	193	204	189	191	195	265	296	315	324	327	329	329	331	330	329	329	334	328	321	323	323	330	316	316.1
24-Mar	343	325	299	312	320	335	350	2	334	338	312	270	243	272	287	278	292	323	46	72	94	126	138	144	310.3
25-Mar	175	190	175	172	225	268	343	355	5	357	354	334	334	327	330	341	339	346	346	343	349	3	13	16	342.7
26-Mar	34	76	96	97	99	99	97	102	81	97	54	106	29	353	331	336	329	341	347	345	351	4	9	29	31.1
27-Mar	34	106	147	174	183	216	217	205	238	240	262	274	273	273	288	280	274	336	345	11	34	55	79	101	299.6
28-Mar	106	106	107	99	110	119	121	149	157	177	182	184	215	198	200	206	198	187	175	165	175	174	157	134	173.7
29-Mar	182	294	313	292	299	289	295	314	313	307	309	307	318	317	317	327	331	337	340	333	317	311	323	231	316.1
30-Mar	201	252	246	242	257	302	325	335	345	324	320	339	171	170	176	166	54	31	85	93	93	92	96	88	67.2
31-Mar	91	95	100	95	97	94	95	90	90	86	87	87	92	88	79	70	61	68	82	76	82	87	86	89	86.0
Diurnal Average	117.3	118.9	118.4	121.4	122.8	123.2	116.5	113.1	114.7	121.8	128.2	131.4	136.8	132.1	93.0	57.0	57.0	53.4	64.4	82.1	94.2	102.4	107.0	107.8	

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

Firebag - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Firebag - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 78 deg on Mar 15 03:00

Minimum Value: 4 deg on Mar 27 01:00

Percentiles: $P_1 = 5$ $P_{10} = 7$ $Q_1 = 9$ Median = 11 $Q_3 = 15$ $P_{90} = 23$ $P_{99} = 65$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	6	7	8	8	8	7	7	8	7	8	8	9	10	11	11	9	8	11	10	11	9	8	7	7	11
2-Mar	8	9	8	7	8	9	7	9	8	12	10	15	12	12	15	14	14	12	13	14	14	14	23	14	23
3-Mar	13	11	13	11	12	12	13	11	12	13	13	14	13	16	16	18	19	10	12	16	13	13	12	11	19
4-Mar	11	11	12	13	10	11	11	10	12	13	13	14	15	13	13	14	13	11	11	10	8	9	10	10	15
5-Mar	10	9	10	11	13	10	11	11	13	13	16	19	22	26	19	24	71	61	5	7	7	8	9	DF	71
6-Mar	6	6	5	18	12	7	7	5	7	8	9	13	16	17	12	11	12	9	11	9	10	9	8	8	18
7-Mar	8	8	9	9	9	10	9	8	9	9	9	9	10	10	11	11	11	10	10	10	9	8	8	8	11
8-Mar	8	7	8	8	8	9	8	8	8	8	10	12	11	17	12	11	10	9	10	12	11	10	8	7	17
9-Mar	8	8	7	7	8	7	6	6	6	8	10	10	13	10	13	11	11	10	10	9	9	9	9	9	13
10-Mar	9	10	9	9	9	8	9	9	9	10	11	12	14	13	15	14	11	10	11	11	10	10	9	9	15
11-Mar	10	11	11	11	11	10	10	13	15	26	75	27	22	15	20	16	11	66	12	13	12	11	5	5	75
12-Mar	9	12	14	11	10	10	9	10	13	16	13	17	18	21	17	14	14	12	10	9	10	8	9	15	21
13-Mar	19	15	9	10	10	16	12	7	13	10	11	9	10	15	11	12	12	12	14	12	10	10	10	10	19
14-Mar	10	10	13	10	11	13	10	10	10	11	11	13	28	15	11	12	11	11	11	10	10	10	18	11	28
15-Mar	10	24	78	15	5	6	12	14	12	15	17	23	25	35	28	23	18	33	15	29	11	10	9	10	78
16-Mar	10	9	9	9	8	9	9	9	8	11	9	10	16	19	33	30	16	9	8	7	7	7	7	7	33
17-Mar	8	7	7	7	7	5	5	6	6	8	10	15	13	12	13	12	10	11	20	6	4	6	5	6	20
18-Mar	6	7	6	6	6	6	7	8	9	13	28	19	20	17	17	14	18	14	12	4	9	4	6	14	28
19-Mar	9	9	8	10	12	12	11	10	11	19	14	15	12	19	13	13	15	12	12	10	11	10	11	10	19
20-Mar	11	11	13	15	13	12	14	11	13	13	17	28	14	14	23	18	17	20	18	9	9	9	7	8	28
21-Mar	14	9	11	29	35	9	14	12	15	42	17	57	22	30	32	52	32	74	64	29	9	8	8	7	74
22-Mar	8	8	8	8	7	7	6	7	8	8	11	13	11	15	14	17	11	8	9	8	7	6	6	5	17
23-Mar	10	10	10	13	17	25	11	17	18	15	16	17	15	15	15	16	13	13	11	11	10	9	9	7	25
24-Mar	15	25	12	7	16	19	26	20	13	21	24	40	43	35	38	31	31	62	14	9	18	13	5	16	62
25-Mar	14	18	5	6	69	32	21	9	14	16	20	17	17	17	19	16	16	14	11	10	10	10	4	65	69
26-Mar	14	17	8	8	8	8	8	32	16	47	42	43	41	28	39	18	14	13	10	6	8	10	7	8	47
27-Mar	4	42	10	14	7	12	11	14	18	34	63	77	32	33	29	33	44	18	8	14	6	12	13	12	77
28-Mar	9	12	13	13	9	14	10	7	10	16	30	23	22	19	18	17	13	9	8	6	7	9	23	17	30
29-Mar	49	12	9	14	10	10	12	11	15	12	13	13	14	13	13	14	13	14	13	19	5	13	10	49	49
30-Mar	13	18	25	15	11	13	5	9	13	23	38	30	55	16	22	51	57	26	22	11	9	9	11	8	57
31-Mar	10	10	10	9	10	9	10	10	11	12	19	14	18	28	20	19	13	11	11	10	10	9	9	10	28
Diurnal Maximum	49	42	78	29	69	32	26	32	18	47	75	77	55	35	39	52	71	74	64	29	18	14	23	65	

DF - DAS Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS20
MACKAY RIVER
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	707	35	37	99.73	30.2	0	7.7	0
H2S (ppb) Average	700	36	44	98.92	3.2	0	0.6	0
THC (ppm) Average	707	35	37	99.73	3.1	-	2.4	-
NO2 (ppb) Average	706	36	38	99.73	29.9	0	12.8	-
NO (ppb) Average	706	36	38	99.73	15.2	-	4	-
NOX (ppb) Average	706	36	38	99.73	33.9	-	14.9	-
Temperature 2 m (C) Average	743	0	1	99.87	11	-	0.9	-
Relative Humidity (%) Average	743	0	1	99.87	90.7	-	86.7	-
Wind Speed 10 m (km/h) Average	738	0	6	99.19	14	-	11	-
Wind Direction 10 m (deg) Average	738	0	6	99.19	-	-	-	-
Precipitation (mm) Total	743	0	1	99.87	2.1	-	10.1	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	1.65	3.5	-	0	0	0.1	0.5	1.2	4.6	30.2
H2S (ppb) Average	700	0.28	0.2	-	0	0.1	0.2	0.2	0.3	0.5	3.2
THC (ppm) Average	707	2.31	0.1	-	2	2.2	2.2	2.3	2.4	2.4	3.1
NO2 (ppb) Average	706	3.82	4.5	-	0.2	0.7	1	2	4.7	10	29.9
NO (ppb) Average	706	0.7	1.9	-	0	0	0	0	0.5	1.8	15.2
NOX (ppb) Average	706	4.51	5.6	-	0.2	0.7	1	2.3	5.6	11.6	33.9
Temperature 2 m (C) Average	743	-9.71	7.5	-	-31.2	-19.6	-14.2	-9.4	-4.8	-0.7	11
Relative Humidity (%) Average	743	68.79	16.1	-	20.4	44	58.4	73.4	82	86.2	90.7
Wind Speed 10 m (km/h) Average	738	6.4	3	-	0	2	4	7	8	10	14
Wind Direction 10 m (deg) Average	738	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	743	-	-	26.7	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
ALL PARAMETERS (except PC)	15 Mar 2023 08:00	15 Mar 2023 08:00	1	Maintenance - station logger/modem reset
H2S	08 Mar 2023 11:00	08 Mar 2023 16:00	6	Maintenance - baseline adjustment
Wind Speed, Wind Direction	21 Mar 2023 08:00	21 Mar 2023 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Mar 2023 03:00	24 Mar 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Mar 2023 07:00	24 Mar 2023 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	27 Mar 2023 00:00	27 Mar 2023 00:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mackay River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 30.2 ppb on Mar 26 11:00

Maximum Daily Average: 7.7 ppb on Mar 26

Minimum Value: 0.0 ppb on Mar 4 00:00

Minimum Daily Average: 0.1 ppb on Mar 17

Maximum Diurnal Average: 4.5 ppb at hour 12

Minimum Diurnal Average: 0.3 ppb at hour 7

Monthly Average: 1.65 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.5 Q_3 = 1.2 P_{90} = 4.6 P_{99} = 17.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	1.0	0.7	0.7	0.5	0.5	0.5	0.4	0.5	0.5	0.4	C	C	C	C	0.9	0.9	0.9	0.6	0.6	0.8	1.5	1.6	1.2	0.8	1.6
2-Mar	1.1	Z	1.4	1.3	1.3	1.1	1.0	0.9	0.6	0.5	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.5	1.4
3-Mar	3.1	4.8	Z	5.7	1.4	0.1	0.1	2.2	4.3	3.7	9.7	12.5	9.2	2.9	5.8	0.8	0.2	0.1	0.3	0.0	0.6	1.6	0.1	0.0	3.0	12.5
4-Mar	0.5	2.8	1.7	Z	1.0	1.1	0.4	0.7	0.0	0.0	0.6	1.9	3.6	2.0	2.0	2.7	1.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.6
5-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	1.9	3.7	5.3	4.7	6.1	0.8	0.0	0.0	0.8	3.5	4.6	5.1	4.1	DF	1.9	6.1
6-Mar	3.1	2.1	1.6	0.6	0.5	0.4	0.3	0.4	0.8	2.6	1.8	1.1	0.7	1.0	Z	1.0	1.0	1.2	1.0	0.6	0.4	0.3	0.3	0.2	1.0	3.1
7-Mar	0.2	0.1	0.1	0.0	0.0	Z	0.1	0.2	0.3	0.6	0.6	0.6	0.8	0.6	0.7	0.7	0.4	0.3	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.8
8-Mar	Z	0.4	0.6	0.4	0.2	0.2	0.1	0.0	0.3	1.0	1.0	0.9	0.7	0.4	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.3	1.0
9-Mar	0.1	Z	0.1	0.2	0.0	0.2	0.3	0.4	0.6	0.6	1.3	1.5	1.5	0.9	0.7	0.9	0.7	0.9	0.5	0.7	0.4	0.3	0.2	0.5	0.6	1.5
10-Mar	0.7	0.7	Z	0.8	0.9	0.4	0.3	0.2	0.3	0.3	0.4	0.6	0.4	0.5	0.6	0.5	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.4	0.9
11-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.2	0.3	0.4	0.4	0.2	0.1	0.0	0.8	6.7	9.8	8.4	7.7	1.6	9.8
12-Mar	5.3	2.0	0.6	0.2	Z	0.9	0.3	0.0	3.0	6.8	13.5	22.5	4.6	0.9	0.9	12.2	12.0	8.7	9.7	0.6	0.6	0.7	2.2	6.0	5.0	22.5
13-Mar	4.0	3.5	5.0	5.9	0.9	Z	0.2	0.5	0.3	4.4	4.8	9.2	8.2	4.0	12.6	20.8	14.7	8.4	4.7	2.9	1.5	0.5	1.8	1.6	5.2	20.8
14-Mar	Z	4.6	1.1	0.7	1.8	2.3	1.5	0.5	0.3	1.1	0.7	0.8	1.1	1.2	0.8	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.3	0.1	1.0	4.6
15-Mar	0.1	Z	0.1	0.0	0.0	0.0	0.0	M	0.0	0.5	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.6	3.5	16.5	13.7	1.7	16.5
16-Mar	14.5	14.1	6.3	Z	1.2	0.8	0.7	0.5	0.6	1.6	2.7	4.8	12.4	3.4	1.0	1.3	0.8	1.1	0.8	0.7	0.6	0.5	0.4	0.3	3.1	14.5
17-Mar	0.2	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
18-Mar	0.0	0.1	0.1	0.4	0.6	Z	0.6	0.6	0.4	0.3	0.2	0.3	0.3	3.8	1.8	1.1	1.0	0.0	0.3	2.5	2.7	0.8	0.6	0.6	0.8	3.8
19-Mar	Z	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
20-Mar	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	10.6	6.1	1.5	0.6	12.3	5.3	0.8	1.3	0.1	0.1	0.1	0.1	0.1	0.1	1.8	12.3
21-Mar	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	4.8	12.8	9.4	5.8	3.7	3.0	3.1	4.0	3.5	2.6	1.5	1.1	1.0	0.9	0.7	2.5	12.8
22-Mar	0.5	0.4	0.3	Z	0.3	0.2	0.2	0.2	0.4	1.1	1.1	1.3	1.4	1.5	1.3	1.2	1.0	0.7	0.9	0.9	0.9	0.6	0.6	0.7	0.8	1.5
23-Mar	0.6	0.6	0.6	0.3	Z	0.4	0.3	0.2	0.1	0.3	0.3	8.5	1.1	1.0	0.8	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.7	8.5
24-Mar	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.2	0.6	10.9	6.1	2.1	4.5	5.5	1.9	0.4	0.5	0.3	2.1	4.4	3.5	2.4	2.6	2.1	10.9
25-Mar	Z	0.9	0.7	0.5	0.3	0.2	0.2	0.4	1.1	0.5	10.8	6.1	0.2	0.1	0.2	0.5	0.8	12.2	19.9	0.6	0.1	0.0	0.1	0.1	2.5	19.9
26-Mar	0.0	Z	0.1	0.4	1.2	3.6	0.5	8.1	16.5	22.9	30.2	28.4	19.0	17.7	14.2	11.1	0.2	0.9	1.4	0.1	0.1	0.1	0.1	0.1	7.7	30.2
27-Mar	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	7.7	9.1	4.3	2.0	1.7	0.9	1.2	0.3	0.6	1.3	2.3	0.4	0.4	0.3	0.4	0.4	1.4	9.1
28-Mar	0.2	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.5	0.7	1.1	1.2	0.8	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.2	0.1	0.0	0.4	1.2
29-Mar	0.0	1.7	0.1	0.1	Z	0.1	0.0	0.1	1.1	2.2	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.3	2.2
30-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	1.0	1.4	3.0	4.1	2.3	1.7	1.7	1.6	1.4	1.3	1.4	1.2	0.8	0.7	1.2	1.1	4.1
31-Mar	Z	0.8	0.8	0.6	0.5	0.7	0.4	0.4	0.8	0.5	0.8	1.4	1.6	1.1	0.7	1.1	2.7	4.9	5.0	3.1	0.6	0.5	0.3	0.1	1.3	5.0
	1.4	1.6	0.8	0.8	0.5	0.5	0.3	0.6	1.3	2.2	4.0	4.5	3.0	2.0	2.6	2.3	1.5	1.7	1.8	0.8	1.0	1.1	1.4	1.3	Diurnal Average	
	14.5	14.1	6.3	5.9	1.8	3.6	1.5	8.1	16.5	22.9	30.2	28.4	19.0	17.7	14.2	20.8	14.7	12.2	19.9	3.5	6.7	9.8	16.5	13.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mackay River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	679	96.04	96.04
11 - 20	23	3.25	99.29
21 - 60	5	0.71	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mackay River - March 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	28	94	46	16	41	97	113	43	37	22	13	17	16	20	36	35	674
11 - 20	6	6	4	0	0	3	1	0	0	0	0	0	0	0	2	1	23
21 - 60	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	100	51	16	41	100	114	43	37	22	13	17	16	20	38	36	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Mackay River

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Mackay River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.2 ppb on Mar 24 07:00

Maximum Daily Average: 0.6 ppb on Mar 24

Minimum Value: 0.0 ppb on Mar 1 10:00

Minimum Daily Average: 0.1 ppb on Mar 1

Maximum Diurnal Average: 0.4 ppb at hour 8

Minimum Diurnal Average: 0.2 ppb at hour 20

Monthly Average: 0.28 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.1 Q_1 = 0.2 Median = 0.2 Q_3 = 0.3 P_{90} = 0.5 P_{99} = 1.0

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	36
Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.1	Z	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	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2
2-Mar	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.3	0.3	0.3	C	C	C	C	C	0.7	0.4	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.7
3-Mar	1.0	0.8	0.3	Z	0.7	0.3	0.3	0.4	0.6	0.4	0.4	0.5	0.5	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.6	2.1	0.2	0.3	0.5	2.1
4-Mar	0.2	0.2	0.2	0.1	Z	0.2	0.2	0.8	0.2	0.1	0.3	0.3	0.3	0.1	0.2	0.4	0.4	0.4	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.8
5-Mar	0.1	0.3	0.6	0.7	0.6	Z	0.4	0.4	0.2	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	DF	0.2	0.7
6-Mar	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2
7-Mar	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
8-Mar	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	M	M	M	M	M	M	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	--	0.2
9-Mar	0.0	0.1	Z	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2
10-Mar	0.2	0.2	0.1	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	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.3
11-Mar	0.1	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.7	0.6	0.6	0.2	0.7
12-Mar	0.6	0.6	0.6	0.5	0.5	Z	0.4	0.3	0.4	0.5	0.5	0.7	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.3	0.3	0.3	0.4	0.5	0.5	0.7
13-Mar	Z	0.5	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.3	0.5	0.5	0.6	0.4	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.5	0.7
14-Mar	0.8	Z	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.8
15-Mar	0.2	0.2	Z	0.2	0.3	0.2	0.4	M	0.4	0.8	0.2	0.3	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.7	0.3	0.8
16-Mar	0.8	1.0	0.6	0.4	Z	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	1.0
17-Mar	0.1	0.1	0.2	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
18-Mar	Z	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.4
19-Mar	0.5	Z	0.6	0.6	0.6	0.7	0.8	0.5	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.3	0.8
20-Mar	0.0	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.4
21-Mar	0.2	0.2	0.2	Z	0.4	0.4	0.5	0.7	0.1	0.0	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.7
22-Mar	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.0	0.2	0.3
23-Mar	0.1	0.1	0.8	0.9	0.6	Z	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.9
24-Mar	Z	0.3	0.2	0.3	0.4	1.4	3.2	2.5	0.6	0.2	0.5	0.3	0.2	0.2	0.4	0.3	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.6	3.2
25-Mar	0.3	Z	0.3	0.4	0.3	0.2	0.8	1.6	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.4	0.4	1.6
26-Mar	0.4	0.3	Z	0.4	0.4	0.5	0.4	0.7	0.8	0.8	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.4	0.8
27-Mar	0.3	0.2	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.9	0.3	0.0	0.1	0.3	0.4	0.2	0.9
28-Mar	0.6	0.5	0.5	0.5	Z	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.6
29-Mar	0.2	1.6	0.3	0.8	0.2	Z	0.2	0.3	0.8	0.9	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.4	1.6
30-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.3	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5
31-Mar	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.8	0.8	0.8	0.6	0.5	0.3	0.2	0.3	0.4	0.3	0.4	0.3	0.4	0.2	0.2	0.4	0.8
	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	Diurnal Average	
	1.0	1.6	0.8	0.9	0.7	1.4	3.2	2.5	0.8	0.9	0.8	0.8	0.6	0.5	0.6	0.7	0.7	0.7	0.9	0.7	0.7	2.1	0.6	0.7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mackay River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	699	99.86	99.86
3 - 4	1	0.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mackay River - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2	38	101	51	15	42	95	112	46	38	18	14	15	15	19	40	36	695
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	101	51	15	42	95	112	46	38	18	14	15	15	19	40	36	695

Total Number of Valid Hours: 695

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Mackay River

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 695

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mackay River - March 2023

Maximum Value: 3.1 ppm on Mar 19 07:00

Maximum Daily Average: 2.4 ppm on Mar 19

Minimum Value: 2.0 ppm on Mar 2 17:00

Minimum Daily Average: 2.2 ppm on Mar 7

Maximum Diurnal Average: 2.4 ppm at hour 8

Minimum Diurnal Average: 2.3 ppm at hour 18

Monthly Average: 2.31 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.2 Median = 2.3 Q_3 = 2.4 P_{90} = 2.4 P_{99} = 2.8

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	C	C	C	C	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
2-Mar	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.4
3-Mar	2.2	2.2	Z	2.2	2.2	2.2	2.2	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	2.4	2.2	2.2	2.3	2.5
4-Mar	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
5-Mar	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	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	DF	2.3	2.3
6-Mar	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
7-Mar	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
8-Mar	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
9-Mar	2.2	Z	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	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
10-Mar	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
11-Mar	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.4	2.4	2.4	2.3	2.4
12-Mar	2.4	2.5	2.5	2.5	Z	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.5
13-Mar	2.5	2.4	2.4	2.4	2.4	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.6	2.5	2.5	2.4	2.6
14-Mar	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4
15-Mar	2.3	Z	2.3	2.4	2.4	2.4	2.4	M	2.5	2.6	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.6
16-Mar	2.5	2.5	2.5	Z	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5
17-Mar	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
18-Mar	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.3	2.5
19-Mar	Z	2.8	2.8	2.8	2.9	3.0	3.1	2.7	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	2.3	2.3	2.4	3.1
20-Mar	2.3	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.6
21-Mar	2.6	2.6	Z	2.5	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.6
22-Mar	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	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4
23-Mar	2.4	2.4	2.5	2.5	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5
24-Mar	2.3	2.3	2.3	2.3	2.3	Z	2.6	2.6	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	2.3	2.3	2.3	2.3	2.6
25-Mar	Z	2.2	2.3	2.3	2.3	2.3	2.4	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.6
26-Mar	2.3	Z	2.3	2.3	2.5	2.5	2.4	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6
27-Mar	2.3	2.3	Z	2.3	2.3	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.4	2.3	2.4
28-Mar	2.4	2.4	2.4	Z	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4
29-Mar	2.3	2.4	2.3	2.5	Z	2.4	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.5
30-Mar	2.3	2.3	2.3	2.3	2.3	Z	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	2.4
31-Mar	Z	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.8	2.8	2.8	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.4	2.8
	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	Diurnal Average	
	2.6	2.8	2.8	2.8	2.9	3.0	3.1	2.7	2.6	2.8	2.8	2.8	2.6	2.6	2.4	2.5	2.4	2.4	2.4	2.5	2.5	2.6	2.5	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mackay River - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	4	0.57	0.57
2.1 - 3.0	702	99.29	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mackay River - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
2.1 - 3.0	38	100	50	16	41	100	114	43	37	22	13	13	16	20	38	36	697
3.1 - 10.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	100	51	16	41	100	114	43	37	22	13	17	16	20	38	36	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Mackay River

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Mackay River - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Mackay River - March 2023

Maximum Value: 15.2 ppb on Mar 31 11:00

Maximum Daily Average: 4.0 ppb on Mar 26

Minimum Value: 0.0 ppb on Mar 2 19:00

Minimum Daily Average: 0.0 ppb on Mar 9

Maximum Diurnal Average: 2.4 ppb at hour 12

Minimum Diurnal Average: 0.0 ppb at hour 21

Monthly Average: 0.70 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.5 P_{90} = 1.8 P_{99} = 12.0

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.5	0.5	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.5	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
3-Mar	Z	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.5	0.7	1.8	2.5	2.0	1.1	1.6	2.7	1.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.7
4-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.4	0.8	0.5	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
5-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.5	0.9	1.1	0.9	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	0.2	1.1
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.8	0.7	0.5	Z	0.5	0.6	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
9-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.3	0.3	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
10-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
11-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
12-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.5	2.0	4.1	8.2	13.0	7.3	7.0	6.1	7.8	7.0	2.8	0.7	0.0	0.0	0.0	0.0	0.0	2.9	13.0
13-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	1.0	4.5	6.0	6.6	7.5	4.7	5.3	7.6	3.7	1.8	0.2	0.0	0.0	0.0	0.0	0.0	2.2	7.6
14-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.5	0.6	0.9	1.5	2.0	1.7	1.4	1.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.0
15-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	M	0.9	5.5	2.9	1.7	1.1	0.9	0.7	0.5	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.7	5.5
16-Mar	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.6	2.1	2.5	3.5	4.0	4.0	2.1	0.9	0.8	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.9	4.0
17-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
18-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
19-Mar	0.0	0.0	0.0	0.0	Z	0.3	2.8	3.2	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	0.0	0.4	3.2
20-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.3	2.7	1.9	3.3	5.8	4.2	2.5	1.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	1.0	5.8
21-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.1	1.0	1.6	1.7	2.4	2.1	1.4	0.8	0.6	0.6	0.7	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.6	2.4
22-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.7	0.6	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
23-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.2	3.7	3.0	1.9	1.4	1.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.7	3.7
24-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	2.4	2.2	2.2	1.2	0.7	0.9	1.0	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.4
25-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.7	2.6	2.3	4.1	3.3	1.5	1.8	1.6	2.1	1.4	1.3	0.4	0.0	0.0	0.0	0.0	0.0	1.0	4.1
26-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.8	8.2	13.7	12.9	14.8	13.0	9.2	6.9	5.3	4.2	1.5	1.1	0.5	0.0	0.0	0.0	0.0	0.0	4.0	14.8
27-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.7	2.3	2.7	1.9	0.9	0.5	0.3	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.7
28-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.8	0.4	0.5	0.6	0.6	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
29-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.0	1.7	1.5	1.2	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.3	1.7
30-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	0.9	1.0	1.0	1.3	1.7	0.8	0.6	0.6	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.4	1.7
31-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.7	12.2	15.2	12.4	9.5	2.8	1.3	1.0	1.3	1.4	0.7	0.1	0.0	0.0	0.0	0.0	2.6	15.2
	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	1.1	1.9	2.3	2.4	2.1	1.5	1.3	1.3	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.1	0.1	0.0	0.2	0.0	0.3	2.8	8.2	13.7	12.9	15.2	13.0	9.5	7.0	6.1	7.8	7.0	2.8	0.7	0.1	0.0	0.0	0.0	0.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Mackay River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Mackay River - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	37	99	52	15	43	96	110	47	38	22	14	17	16	21	38	37	702
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	99	52	15	43	96	110	47	38	22	14	17	16	21	38	37	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Mackay River

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Mackay River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 29.9 ppb on Mar 19 07:00

Maximum Daily Average: 12.8 ppb on Mar 13

Minimum Value: 0.2 ppb on Mar 4 19:00

Maximum Diurnal Average: 5.4 ppb at hour 1

Monthly Average: 3.82 ppb

Minimum Daily Average: 0.8 ppb on Mar 8

Minimum Diurnal Average: 3.1 ppb at hour 9

Percentiles: P_1 = 0.4 P_{10} = 0.7 Q_1 = 1.0 Median = 2.0 Q_3 = 4.7 P_{90} = 10.0 P_{99} = 21.0

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.2	4.0	4.3	3.7	Z	2.3	2.1	1.9	1.7	1.3	1.1	1.3	1.4	1.6	1.9	2.1	2.4	2.6	2.5	2.8	3.1	3.8	3.5	3.1	2.5	4.3
2-Mar	3.1	3.0	3.2	3.3	3.4	Z	3.5	3.5	3.5	3.3	3.1	2.5	1.7	1.1	1.0	0.9	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.5	1.9	3.5
3-Mar	Z	2.9	1.0	2.8	1.2	0.4	1.2	4.5	6.0	4.1	4.5	4.8	4.5	3.5	4.9	6.7	8.4	5.9	8.0	7.7	1.1	2.0	0.7	1.6	3.8	8.4
4-Mar	3.6	Z	3.4	1.5	2.9	2.0	1.6	2.6	1.7	0.5	0.6	1.1	1.3	1.0	0.9	1.3	1.2	1.0	0.2	0.3	0.6	0.5	0.3	0.8	1.3	3.6
5-Mar	1.3	1.1	Z	1.1	1.1	1.4	1.7	1.4	1.0	0.3	0.7	1.2	1.4	1.4	1.8	0.6	0.5	0.4	1.3	4.2	6.2	6.8	6.2	DF	2.0	6.8
6-Mar	4.7	3.5	2.8	2.4	2.3	2.2	2.1	2.0	1.7	2.3	1.7	1.3	Z	1.4	1.8	1.8	2.3	3.1	3.1	1.9	1.2	1.0	1.0	0.9	2.1	4.7
7-Mar	0.8	0.7	0.7	Z	0.6	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.1	1.3	1.3	1.0	1.0	0.9	0.9	0.7	0.8	0.9	0.8	0.9	1.3
8-Mar	0.7	0.8	0.9	0.8	Z	0.8	0.7	0.7	0.8	1.1	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.7	0.5	0.6	0.6	0.7	0.7	0.6	0.8	1.1
9-Mar	0.6	0.6	0.7	0.7	0.6	Z	0.8	0.9	1.0	1.1	1.1	C	C	C	C	C	0.9	0.9	0.8	0.9	0.9	0.8	0.7	0.8	0.8	1.1
10-Mar	Z	0.9	0.9	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.1	1.2	1.1	1.3	1.0	0.6	0.7	0.7	0.8	0.9	1.3
11-Mar	0.8	Z	0.7	0.6	0.7	0.8	0.8	0.7	0.8	0.7	0.7	0.7	0.6	0.8	1.3	1.5	1.0	0.8	1.0	12.3	10.0	12.4	11.8	17.9	3.5	17.9
12-Mar	16.3	15.1	Z	15.7	13.4	11.2	8.2	5.5	7.0	8.0	10.1	12.3	8.8	8.6	9.1	12.9	16.0	14.5	16.0	9.7	10.7	10.2	13.5	18.0	11.8	18.0
13-Mar	18.4	14.8	11.9	Z	10.2	7.7	6.2	5.1	5.1	10.6	10.9	10.7	9.5	7.1	10.4	15.1	14.1	15.8	16.2	17.5	15.6	21.2	18.7	21.0	12.8	21.2
14-Mar	20.4	14.0	7.7	6.0	Z	8.4	7.6	4.1	3.2	2.7	2.8	3.1	3.9	4.2	5.4	4.8	5.4	5.3	4.5	4.2	4.4	5.8	2.8	3.0	5.8	20.4
15-Mar	2.7	2.3	2.1	1.9	1.8	Z	2.3	M	1.7	6.7	3.6	2.4	1.8	1.6	1.6	1.6	1.6	2.8	3.1	2.6	3.0	7.3	19.3	21.2	4.3	21.2
16-Mar	24.1	Z	16.3	8.7	4.7	3.5	2.8	3.4	5.0	5.0	5.8	5.2	5.4	3.7	2.5	2.7	2.1	2.8	2.7	2.2	1.6	1.2	1.2	1.0	4.9	24.1
17-Mar	0.9	0.9	Z	1.0	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.2	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.5	0.7	0.7	0.9	1.3
18-Mar	0.6	0.7	0.9	Z	1.4	1.5	1.4	1.6	1.5	1.3	1.2	1.2	1.0	1.8	1.0	0.8	0.8	0.5	0.5	1.8	3.4	2.9	3.8	6.8	1.7	6.8
19-Mar	12.4	23.0	18.8	17.8	Z	26.1	29.9	13.1	1.8	1.6	1.5	1.2	1.3	1.0	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.9	1.0	1.0	6.9	29.9
20-Mar	1.1	1.1	1.2	1.1	1.0	Z	0.9	0.8	1.1	1.6	8.4	6.1	9.3	12.9	8.8	5.6	4.2	3.7	4.8	3.2	4.6	8.6	9.5	11.4	4.8	12.9
21-Mar	Z	11.5	9.9	8.1	5.9	4.3	4.0	3.6	3.9	3.0	3.9	3.5	2.4	1.9	1.8	1.9	2.9	4.7	5.4	4.4	5.2	4.9	4.0	2.6	4.5	11.5
22-Mar	1.7	Z	1.0	0.9	0.9	0.9	1.0	1.1	1.2	1.9	2.0	2.4	2.4	2.4	2.2	2.1	2.0	1.8	2.4	2.9	2.6	2.1	2.0	2.6	1.8	2.9
23-Mar	2.8	2.6	Z	2.2	1.7	1.6	1.5	1.2	0.9	0.9	0.9	7.9	7.6	6.6	5.2	4.2	4.4	5.5	4.5	5.9	6.0	6.9	6.5	5.8	4.1	7.9
24-Mar	5.0	4.4	3.8	Z	2.7	2.3	1.7	1.6	5.1	4.1	4.1	2.4	1.7	2.2	2.5	1.7	1.4	1.1	0.8	2.3	4.8	4.6	3.6	2.9	2.9	5.1
25-Mar	2.3	2.0	1.8	1.5	Z	1.2	1.4	2.7	6.2	4.7	7.1	5.4	3.4	3.8	3.4	5.0	4.7	7.4	7.4	2.9	4.3	7.0	5.1	6.0	4.2	7.4
26-Mar	5.6	5.0	6.5	5.9	10.0	Z	11.9	20.0	18.0	13.8	13.5	12.5	10.1	8.6	7.7	8.0	6.2	7.5	10.0	9.7	8.3	6.6	5.1	4.1	9.3	20.0
27-Mar	Z	3.6	3.5	3.4	3.4	3.2	2.8	2.2	4.3	4.3	3.2	1.6	1.2	1.0	1.0	0.6	0.8	1.0	1.5	0.8	1.5	1.8	2.9	7.5	2.5	7.5
28-Mar	10.8	Z	11.3	10.8	8.5	7.0	5.5	3.0	1.4	1.5	1.4	1.5	1.5	1.3	1.0	1.1	0.8	0.9	0.8	0.7	0.7	0.6	0.6	0.6	3.2	11.3
29-Mar	0.6	1.4	Z	0.6	0.5	0.6	0.6	0.7	1.2	1.3	0.7	0.6	0.5	0.5	4.4	4.7	3.9	4.5	5.4	3.2	2.1	1.6	1.4	1.2	1.8	5.4
30-Mar	1.0	0.9	0.7	Z	0.7	0.7	0.8	1.8	2.6	2.7	2.4	3.3	3.9	2.4	1.9	2.1	2.4	2.9	3.8	4.3	2.3	1.5	1.2	0.9	2.1	4.3
31-Mar	0.9	0.8	0.7	0.7	Z	0.9	0.9	1.1	3.0	21.1	18.7	16.0	13.0	5.8	4.1	4.2	5.7	9.1	11.7	12.7	10.4	9.4	3.6	1.0	6.8	21.1
	5.4	4.7	4.5	4.0	3.3	3.6	3.5	3.1	3.1	3.7	3.9	3.9	3.6	3.1	3.1	3.3	3.3	3.6	4.0	4.1	3.8	4.4	4.3	4.9	Diurnal Average	
	24.1	23.0	18.8	17.8	13.4	26.1	29.9	20.0	18.0	21.1	18.7	16.0	13.0	12.9	10.4	15.1	16.0	15.8	16.2	17.5	15.6	21.2	19.3	21.2	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 (NO_2) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Mackay River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	98.87	98.87
21 - 40	8	1.13	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Mackay River - March 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	37	96	50	15	42	95	109	47	38	22	14	17	16	21	38	37	694
21 - 40	0	3	2	0	1	1	1	0	0	0	0	0	0	0	0	0	8
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	99	52	15	43	96	110	47	38	22	14	17	16	21	38	37	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Mackay River

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Mackay River - March 2023

Maximum Value: 33.9 ppb on Mar 31 11:00

Maximum Daily Average: 14.9 ppb on Mar 13

Minimum Value: 0.2 ppb on Mar 4 19:00

Minimum Daily Average: 0.9 ppb on Mar 9

Maximum Diurnal Average: 6.3 ppb at hour 12

Minimum Diurnal Average: 3.3 ppb at hour 5

Monthly Average: 4.51 ppb

Percentiles: P_1 = 0.4 P_{10} = 0.7 Q_1 = 1.0 Median = 2.3 Q_3 = 5.6 P_{90} = 11.6 P_{99} = 26.7

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	3.2	4.0	4.3	3.7	Z	2.3	2.1	2.0	2.0	1.7	1.6	1.9	1.9	2.1	2.3	2.5	2.7	2.7	2.5	2.8	3.1	3.8	3.5	3.1	2.7	4.3
2-Mar	3.1	3.0	3.2	3.3	3.4	Z	3.5	3.5	3.6	3.7	3.6	2.9	1.9	1.1	1.1	0.9	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.5	2.0	3.7
3-Mar	Z	3.0	1.0	3.0	1.2	0.4	1.2	4.6	6.5	4.8	6.3	7.3	6.5	4.6	6.5	9.4	10.3	6.4	8.0	7.7	1.1	2.0	0.7	1.6	4.5	10.3
4-Mar	3.6	Z	3.4	1.5	2.9	2.0	1.6	2.7	1.9	0.5	0.7	1.5	2.1	1.5	1.4	1.7	1.5	1.1	0.2	0.3	0.6	0.5	0.3	0.8	1.5	3.6
5-Mar	1.3	1.1	Z	1.1	1.1	1.4	1.7	1.7	1.3	0.3	1.2	2.1	2.5	2.3	2.8	0.8	0.5	0.4	1.3	4.2	6.2	6.8	6.2	DF	2.2	6.8
6-Mar	4.7	3.5	2.8	2.4	2.3	2.2	2.1	2.2	2.3	3.1	2.4	1.8	Z	1.9	2.4	2.4	2.7	3.3	3.1	1.9	1.2	1.0	1.0	0.9	2.3	4.7
7-Mar	0.8	0.7	0.7	Z	0.6	0.6	0.6	0.7	0.9	1.1	1.2	1.2	1.4	1.4	1.6	1.5	1.1	1.0	0.9	0.9	0.7	0.8	0.9	0.8	0.9	1.6
8-Mar	0.7	0.8	0.9	0.8	Z	0.8	0.7	0.7	0.9	1.4	1.3	1.2	1.1	1.2	1.1	1.2	1.0	0.7	0.5	0.6	0.6	0.7	0.7	0.6	0.9	1.4
9-Mar	0.6	0.6	0.7	0.7	0.6	Z	0.8	0.9	1.2	1.4	1.4	C	C	C	C	C	0.9	0.9	0.8	0.9	0.9	0.8	0.7	0.8	0.9	1.4
10-Mar	Z	0.9	0.9	1.0	1.0	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.2	1.3	1.2	1.3	1.0	0.6	0.7	0.7	0.8	0.9	1.3
11-Mar	0.8	Z	0.7	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.7	1.0	1.6	1.8	1.1	0.8	1.0	12.3	10.0	12.4	11.8	17.9	3.5	17.9
12-Mar	16.3	15.1	Z	15.7	13.4	11.2	8.2	6.0	9.0	12.1	18.3	25.3	16.1	15.6	15.2	20.7	23.0	17.3	16.7	9.7	10.7	10.2	13.5	18.0	14.7	25.3
13-Mar	18.4	14.8	11.9	Z	10.2	7.7	6.2	5.3	6.1	15.1	16.9	17.3	17.0	11.8	15.7	22.7	17.8	17.6	16.4	17.5	15.6	21.2	18.7	21.0	14.9	22.7
14-Mar	20.4	14.0	7.7	6.0	Z	8.4	7.6	4.2	3.5	3.2	3.4	4.0	5.4	6.2	7.1	6.2	6.6	5.9	4.6	4.2	4.4	5.8	2.8	3.0	6.3	20.4
15-Mar	2.7	2.3	2.1	1.9	1.8	Z	2.3	M	2.6	12.2	6.5	4.1	2.9	2.5	2.3	2.1	2.0	3.2	3.2	2.6	3.0	7.3	19.3	21.2	5.0	21.2
16-Mar	24.2	Z	16.3	8.7	4.7	3.5	2.8	4.0	7.1	7.5	9.3	9.2	9.4	5.8	3.4	3.5	2.5	3.1	2.8	2.2	1.6	1.2	1.2	1.0	5.9	24.2
17-Mar	0.9	0.9	Z	1.0	0.9	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.4	1.2	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.7	0.7	1.0	1.5
18-Mar	0.6	0.7	0.9	Z	1.4	1.5	1.4	1.7	1.7	1.5	1.3	1.3	1.1	2.2	1.2	0.9	0.9	0.5	0.5	1.8	3.4	2.9	3.8	6.8	1.7	6.8
19-Mar	12.4	23.0	18.8	17.8	Z	26.4	32.7	16.3	2.1	1.9	1.9	1.4	1.4	1.1	1.2	1.2	1.0	0.9	0.9	0.8	0.8	0.9	1.0	1.0	7.3	32.7
20-Mar	1.1	1.1	1.2	1.1	1.0	Z	0.9	0.9	1.3	1.9	11.1	8.0	12.6	18.7	13.0	8.1	5.4	4.2	4.9	3.2	4.6	8.6	9.5	11.4	5.8	18.7
21-Mar	Z	11.5	9.9	8.1	5.9	4.3	4.1	4.6	5.5	4.7	6.3	5.6	3.8	2.7	2.4	2.5	3.6	5.4	5.6	4.4	5.2	4.9	4.0	2.6	5.1	11.5
22-Mar	1.7	Z	1.0	0.9	0.9	0.9	1.0	1.1	1.3	2.3	2.6	3.1	3.0	2.9	2.6	2.4	2.1	1.8	2.4	2.9	2.6	2.1	2.0	2.6	2.0	3.1
23-Mar	2.8	2.6	Z	2.2	1.7	1.6	1.5	1.2	0.9	0.9	1.0	11.1	11.3	9.6	7.1	5.6	5.5	6.2	4.6	5.9	6.0	6.9	6.5	5.8	4.7	11.3
24-Mar	5.0	4.4	3.8	Z	2.7	2.3	1.8	2.0	7.5	6.3	6.3	3.6	2.4	3.1	3.5	2.2	1.6	1.2	0.8	2.3	4.8	4.6	3.6	2.9	3.4	7.5
25-Mar	2.3	2.0	1.8	1.5	Z	1.2	1.4	3.4	8.8	7.0	11.2	8.7	4.9	5.6	5.0	7.1	6.1	8.7	7.8	2.9	4.3	7.0	5.1	6.0	5.2	11.2
26-Mar	5.6	5.0	6.5	5.9	10.0	Z	12.7	28.2	31.7	26.7	28.3	25.5	19.3	15.5	13.0	12.2	7.7	8.6	10.5	9.7	8.3	6.6	5.1	4.1	13.3	31.7
27-Mar	Z	3.6	3.5	3.4	3.4	3.2	3.0	2.9	6.6	7.0	5.1	2.5	1.7	1.3	1.2	0.7	0.8	1.1	1.6	0.8	1.5	1.8	2.9	7.5	2.9	7.5
28-Mar	10.8	Z	11.3	10.8	8.5	7.0	5.9	3.8	1.8	2.0	2.0	2.1	2.0	1.7	1.2	1.2	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.6	3.4	11.3
29-Mar	0.6	1.4	Z	0.6	0.5	0.6	0.6	0.8	1.4	1.5	0.7	0.6	0.5	0.5	6.1	6.2	5.1	5.2	5.7	3.2	2.1	1.6	1.4	1.2	2.1	6.2
30-Mar	1.0	0.9	0.7	Z	0.7	0.7	0.9	2.3	3.5	3.7	3.4	4.6	5.6	3.2	2.5	2.7	2.9	3.2	4.0	4.3	2.3	1.5	1.2	0.9	2.5	5.6
31-Mar	0.9	0.8	0.7	0.7	Z	0.9	0.9	1.2	3.7	33.3	33.9	28.4	22.5	8.6	5.4	5.2	7.0	10.5	12.4	12.8	10.4	9.4	3.6	1.0	9.3	33.9
	5.4	4.7	4.5	4.0	3.3	3.6	3.6	3.7	4.2	5.5	6.2	6.3	5.7	4.6	4.4	4.6	4.1	4.0	4.1	4.1	3.8	4.4	4.3	4.9	Diurnal Average	
	24.2	23.0	18.8	17.8	13.4	26.4	32.7	28.2	31.7	33.3	33.9	28.4	22.5	18.7	15.7	22.7	23.0	17.6	16.7	17.5	15.6	21.2	19.3	21.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Mackay River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	686	97.17	97.17
21 - 40	20	2.83	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Mackay River - March 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	33	89	49	15	42	95	109	47	38	22	14	17	16	21	38	37	682
21 - 40	4	10	3	0	1	1	1	0	0	0	0	0	0	0	0	0	20
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	99	52	15	43	96	110	47	38	22	14	17	16	21	38	37	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Mackay River

Total Number of Valid Hours: 702

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Mackay River - March 2023

Maximum Value: 11.0 C on Mar 18 16:00

Maximum Daily Average: 0.9 C on Mar 18

Minimum Value: -31.2 C on Mar 5 07:00

Minimum Daily Average: -21.9 C on Mar 5

Maximum Diurnal Average: -3.6 C at hour 16

Minimum Diurnal Average: -16.0 C at hour 7

Monthly Average: -9.71 C

Percentiles: P_1 = -29.3 P_{10} = -19.6 Q_1 = -14.2 Median = -9.4 Q_3 = -4.8 P_{90} = -0.7 P_{99} = 8.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-25.2	-23.9	-23.1	-20.6	-19.7	-19.3	-19.7	-20.4	-18.6	-14.5	-12.1	-10.5	-8.9	-8.7	-8.3	-7.7	-7.6	-8.1	-9.4	-8.5	-8.6	-8.1	-7.9	-8.0	-13.6	-7.6
2-Mar	-8.1	-8.1	-8.1	-8.0	-7.6	-7.4	-7.3	-7.1	-6.7	-5.2	-2.9	-0.3	2.9	2.8	3.0	3.0	2.2	0.6	-0.2	-0.9	-0.8	-1.1	-1.6	-1.9	-2.9	3.0
3-Mar	-2.2	-2.8	-3.2	-3.6	-4.4	-4.9	-5.9	-8.1	-9.6	-9.8	-8.8	-7.1	-6.8	-6.8	-7.4	-7.8	-8.1	-8.6	-10.0	-11.5	-12.3	-13.4	-14.1	-14.9	-8.0	-2.2
4-Mar	-15.5	-16.1	-16.4	-16.6	-16.8	-16.8	-16.7	-16.7	-16.2	-16.1	-15.4	-15.3	-14.6	-14.1	-13.5	-14.1	-14.4	-14.7	-15.8	-17.9	-20.3	-21.0	-22.5	-24.5	-16.8	-13.5
5-Mar	-26.4	-27.7	-28.7	-29.6	-29.5	-30.1	-31.2	-30.8	-23.7	-19.9	-18.1	-16.8	-15.2	-14.2	-13.5	-12.8	-13.6	-16.0	-18.6	-20.1	-21.7	-22.5	-23.5	DF	-21.9	-12.8
6-Mar	-24.7	-24.9	-25.3	-27.3	-28.6	-30.0	-30.3	-30.0	-25.2	-18.9	-15.5	-13.0	-12.0	-11.3	-11.5	-10.6	-11.1	-11.9	-12.7	-13.2	-14.1	-14.1	-14.5	-14.6	-18.6	-10.6
7-Mar	-14.5	-14.2	-14.2	-14.4	-14.3	-14.6	-14.6	-14.6	-14.3	-13.5	-13.1	-12.6	-11.7	-11.1	-9.5	-8.0	-6.7	-7.3	-9.0	-9.7	-10.5	-10.9	-9.8	-10.2	-11.8	-6.7
8-Mar	-10.9	-11.9	-13.7	-16.0	-17.1	-17.0	-19.0	-20.7	-17.5	-14.3	-12.7	-11.5	-10.4	-8.9	-7.6	-7.2	-7.4	-8.3	-11.1	-12.7	-13.3	-13.9	-14.8	-15.2	-13.0	-7.2
9-Mar	-16.6	-17.6	-19.2	-20.6	-22.3	-21.2	-22.0	-22.0	-18.1	-14.6	-12.5	-11.4	-9.7	-9.1	-8.5	-8.3	-8.0	-8.4	-8.8	-9.3	-9.4	-9.8	-10.1	-10.4	-13.7	-8.0
10-Mar	-10.9	-11.1	-11.3	-11.5	-11.8	-12.2	-12.4	-12.5	-12.2	-11.3	-9.7	-8.6	-8.2	-7.9	-6.9	-6.8	-7.1	-7.1	-7.3	-7.6	-7.9	-8.2	-8.5	-9.8	-9.5	-6.8
11-Mar	-10.3	-11.5	-12.6	-11.4	-11.1	-11.3	-11.8	-13.4	-10.5	-8.0	-6.8	-5.7	-5.0	-4.6	-4.0	-4.3	-4.3	-5.1	-5.8	-7.0	-8.5	-9.5	-10.0	-10.7	-8.5	-4.0
12-Mar	-11.5	-12.1	-12.4	-12.5	-13.1	-13.9	-14.6	-15.5	-14.7	-13.5	-12.1	-10.5	-9.7	-9.2	-9.6	-10.2	-10.9	-12.5	-13.2	-13.6	-14.0	-14.4	-14.6	-14.7	-12.6	-9.2
13-Mar	-14.9	-15.4	-15.8	-16.4	-16.8	-17.1	-17.3	-16.9	-16.0	-14.8	-13.6	-11.8	-10.2	-8.1	-7.9	-8.1	-8.5	-8.6	-8.5	-8.6	-8.7	-9.2	-9.5	-10.0	-12.2	-7.9
14-Mar	-10.6	-11.2	-11.6	-11.8	-12.0	-12.3	-12.7	-13.0	-12.8	-12.3	-12.0	-11.4	-10.8	-9.8	-10.1	-10.2	-10.2	-10.6	-11.5	-12.1	-12.7	-13.5	-14.4	-15.7	-11.9	-9.8
15-Mar	-17.2	-19.7	-21.4	-22.1	-22.5	-23.7	-24.7	-23.8	-17.2	-12.1	-11.3	-10.5	-9.4	-8.0	-7.5	-7.2	-7.6	-8.1	-10.8	-13.9	-16.1	-14.9	-12.7	-12.0	-14.8	-7.2
16-Mar	-12.0	-11.6	-11.5	-12.3	-12.7	-12.7	-12.8	-13.7	-11.4	-9.8	-8.4	-5.9	-3.3	-1.8	-0.9	-0.9	0.2	-1.4	-4.0	-5.4	-6.3	-7.6	-8.2	-8.1	-7.6	0.2
17-Mar	-7.4	-7.6	-8.0	-7.7	-8.2	-9.2	-8.7	-8.3	-5.5	-1.6	1.7	4.5	6.4	7.7	9.0	9.6	9.4	8.0	2.8	-1.3	-2.5	-3.1	-0.1	-0.6	-0.9	9.6
18-Mar	-2.1	-2.5	-3.0	-4.1	-5.2	-6.1	-7.1	-5.9	-2.6	1.2	4.6	6.4	8.9	9.7	10.2	11.0	10.8	7.9	2.6	0.8	-0.8	-3.0	-4.6	-4.9	0.9	11.0
19-Mar	-6.1	-6.0	-5.4	-7.5	-8.4	-9.2	-11.0	-8.2	-3.9	-1.6	1.7	2.5	2.9	3.4	3.5	2.8	2.5	0.4	-1.3	-2.7	-3.7	-4.3	-5.0	-5.5	-2.9	3.5
20-Mar	-5.8	-6.4	-6.2	-6.7	-6.9	-7.4	-9.1	-9.0	-8.1	-7.3	-6.6	-6.4	-5.8	-5.0	-3.7	-2.3	-2.2	-3.4	-5.2	-7.2	-9.2	-10.5	-11.8	-14.0	-6.9	-2.2
21-Mar	-16.7	-17.9	-19.5	-20.6	-21.4	-22.2	-22.6	-19.6	-12.5	-9.3	-7.7	-6.4	-5.2	-4.1	-3.2	-2.6	-2.3	-3.9	-6.0	-8.3	-9.3	-10.4	-11.0	-11.9	-11.4	-2.3
22-Mar	-12.7	-13.0	-13.3	-12.9	-13.2	-13.5	-13.8	-12.5	-8.9	-5.7	-3.8	-1.2	1.2	2.7	4.3	5.5	6.0	5.4	2.4	-1.1	-2.4	-3.7	-2.5	-0.7	-4.5	6.0
23-Mar	-1.8	-2.8	-4.3	-6.8	-6.9	-6.0	-6.6	-5.1	-1.0	1.4	2.4	2.2	2.7	2.8	1.8	1.0	-0.3	-2.5	-4.8	-6.6	-7.9	-9.5	-11.9	-13.8	-3.5	2.8
24-Mar	-14.8	-15.5	-15.6	-16.6	-18.6	-20.1	-20.9	-17.4	-10.1	-6.4	-6.0	-5.1	-3.8	-2.4	-1.6	-0.4	-0.1	-1.1	-3.9	-6.1	-7.6	-9.8	-12.2	-12.8	-9.5	-0.1
25-Mar	-13.9	-14.9	-15.9	-17.2	-18.4	-19.8	-20.1	-15.9	-9.1	-5.7	-4.6	-3.4	-3.3	-2.3	-0.8	-0.6	-1.6	-3.5	-6.0	-8.4	-10.3	-11.8	-14.0	-16.0	-9.9	-0.6
26-Mar	-17.4	-17.3	-16.3	-16.7	-17.3	-17.7	-18.5	-17.8	-16.8	-15.1	-13.9	-12.0	-10.7	-10.1	-9.4	-8.9	-10.4	-11.1	-12.2	-14.3	-17.2	-20.0	-21.8	-23.6	-15.3	-8.9
27-Mar	-24.8	-25.9	-26.9	-27.9	-28.4	-28.9	-28.9	-25.3	-16.0	-12.5	-10.7	-8.8	-7.7	-6.6	-5.6	-4.9	-5.0	-4.8	-6.0	-10.0	-14.0	-16.8	-17.9	-19.2	-16.0	-4.8
28-Mar	-20.5	-22.1	-23.5	-24.1	-25.0	-25.5	-25.7	-20.8	-12.0	-9.7	-7.8	-6.1	-3.6	-1.6	-0.6	-0.1	0.3	0.0	-0.9	-1.6	-2.0	-2.0	-1.8	-2.1	-9.9	0.3
29-Mar	-2.0	-2.0	-3.2	-5.4	-7.6	-9.2	-8.1	-5.7	-3.4	-1.7	-0.6	0.1	0.8	1.7	1.4	0.3	-0.3	-1.5	-3.0	-4.0	-5.6	-8.3	-10.4	-12.1	-3.7	1.7
30-Mar	-13.3	-14.6	-15.9	-16.7	-17.0	-16.4	-14.8	-11.5	-5.9	-4.1	-3.9	-3.6	-3.1	-2.5	-2.0	-2.0	-2.3	-2.5	-2.9	-3.3	-3.6	-4.0	-4.2	-4.2	-7.3	-2.0
31-Mar	-4.8	-5.4	-6.5	-7.5	-7.6	-7.0	-6.8	-6.5	-5.9	-5.2	-3.5	-1.9	-0.5	0.8	1.5	1.8	1.7	1.1	-0.7	-2.7	-3.3	-3.6	-3.4	-3.3	-3.3	1.8
	-12.8	-13.3	-13.9	-14.6	-15.2	-15.6	-16.0	-15.1	-11.8	-9.4	-7.9	-6.5	-5.3	-4.4	-3.8	-3.6	-3.8	-4.8	-6.5	-8.0	-9.2	-10.1	-10.6	-10.8	Diurnal Average	
	-1.8	-2.0	-3.0	-3.6	-4.4	-4.9	-5.9	-5.1	-1.0	1.4	4.6	6.4	8.9	9.7	10.2	11.0	10.8	8.0	2.8	0.8	-0.8	-1.1	-0.1	-0.6	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Mackay River - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	68	9.15	9.15
-20 - 0	615	82.77	91.92
0 - 10	57	7.67	99.60
10 - 20	3	0.40	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mackay River - March 2023

Maximum Value: 90.7 % on Mar 19 05:00

Maximum Daily Average: 86.7 % on Mar 14

Minimum Value: 20.4 % on Mar 18 16:00

Minimum Daily Average: 46.1 % on Mar 18

Maximum Diurnal Average: 80.0 % at hour 7

Minimum Diurnal Average: 53.0 % at hour 16

Monthly Average: 68.79 %

Percentiles: P_1 = 27.6 P_{10} = 44.0 Q_1 = 58.4 Median = 73.4 Q_3 = 82.0 P_{90} = 86.2 P_{99} = 89.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	78.7	81.0	81.2	83.4	82.8	82.8	83.0	82.5	81.6	78.4	73.7	70.6	67.9	69.4	70.1	70.9	73.4	77.2	81.6	79.8	80.9	80.2	80.6	85.3	78.2	85.3
2-Mar	88.6	88.9	89.1	89.6	88.1	88.5	88.1	85.2	85.9	81.2	74.2	70.5	60.5	61.7	65.7	62.6	66.9	81.0	86.6	89.2	86.1	87.5	87.6	87.9	80.9	89.6
3-Mar	86.7	78.1	73.3	71.7	74.7	79.1	81.9	83.4	81.5	78.6	74.2	67.9	67.1	68.7	69.2	67.8	73.9	78.3	84.8	87.6	83.3	83.0	83.7	85.2	77.7	87.6
4-Mar	85.2	84.0	82.7	82.2	81.9	82.9	83.7	83.8	79.4	71.7	62.6	59.0	55.2	54.9	53.5	58.1	56.1	59.2	63.3	66.8	74.3	75.4	77.6	79.2	71.4	85.2
5-Mar	80.4	78.8	77.3	75.6	75.6	74.9	74.3	72.8	69.2	62.7	56.8	54.4	50.2	47.4	45.8	43.0	45.7	55.7	61.6	65.1	69.3	70.8	73.2	DF	64.4	80.4
6-Mar	76.3	76.3	77.0	76.6	75.8	74.0	75.0	73.4	71.9	70.0	66.0	60.5	59.3	57.3	59.6	60.2	65.1	73.8	79.3	80.1	82.5	84.9	85.5	84.8	72.7	85.5
7-Mar	84.0	83.9	84.3	84.5	84.4	84.3	84.4	84.1	81.9	77.3	75.9	76.2	75.2	76.0	76.6	76.5	70.2	66.7	70.4	68.7	72.4	77.6	67.9	61.9	76.9	84.5
8-Mar	60.3	61.6	66.4	75.2	77.1	74.5	78.4	82.4	72.4	59.4	53.5	50.5	47.2	41.8	37.7	36.7	37.6	39.9	50.3	54.4	54.6	53.0	54.9	56.2	57.3	82.4
9-Mar	60.6	63.1	68.5	71.8	75.7	73.6	75.2	75.3	64.3	55.6	48.5	44.9	43.6	44.0	47.4	47.6	49.4	59.5	62.6	63.7	69.8	72.2	71.4	74.0	61.8	75.7
10-Mar	78.5	79.0	79.8	78.9	78.8	81.8	82.6	83.0	79.9	75.5	64.7	58.5	58.7	63.4	60.2	62.6	70.3	69.8	68.5	71.6	73.1	71.6	72.7	76.5	72.5	83.0
11-Mar	77.6	81.6	84.9	82.6	77.7	74.7	76.0	80.4	67.6	61.1	59.9	58.1	57.5	56.0	55.0	59.1	59.0	62.6	69.7	82.0	86.8	88.1	88.5	88.4	72.3	88.5
12-Mar	87.3	88.2	87.7	86.8	85.9	85.9	85.1	84.4	80.6	77.0	74.9	70.7	69.9	67.8	70.4	71.7	73.8	77.9	82.0	83.5	84.6	85.3	85.8	85.8	80.5	88.2
13-Mar	85.6	85.5	85.4	85.4	85.5	85.5	85.3	85.0	84.3	82.6	80.6	79.2	76.7	73.1	72.9	72.7	74.7	76.5	79.4	81.9	86.8	88.6	89.1	88.8	82.1	89.1
14-Mar	88.0	87.7	87.5	87.3	87.2	86.8	86.6	85.8	85.0	84.0	84.5	84.5	85.6	85.3	86.7	87.4	87.9	88.4	88.6	88.5	88.0	87.3	86.6	85.4	86.7	88.6
15-Mar	84.6	82.0	81.4	81.0	80.5	79.3	78.8	78.8	82.2	80.6	80.7	81.3	82.1	82.6	83.0	83.3	84.2	87.0	88.4	87.2	85.9	87.2	88.1	88.2	83.3	88.4
16-Mar	88.2	88.5	88.3	87.7	87.4	87.5	87.3	85.9	84.3	85.0	84.4	81.1	74.4	66.4	58.6	66.6	58.2	72.7	86.3	86.2	85.9	88.4	88.8	88.1	81.5	88.8
17-Mar	84.3	83.7	83.5	80.9	81.3	85.4	82.7	80.3	71.5	61.9	57.8	55.4	51.5	44.5	34.5	26.7	24.7	27.3	46.2	69.5	74.8	73.5	47.8	44.9	61.4	85.4
18-Mar	48.8	47.3	47.9	51.4	56.0	59.3	63.5	59.1	48.3	40.6	35.4	32.1	26.8	24.5	22.1	20.4	22.1	28.0	42.9	50.6	60.1	67.7	74.1	76.9	46.1	76.9
19-Mar	81.7	81.4	80.0	86.5	90.7	88.5	90.1	85.0	72.3	62.4	51.7	49.2	48.2	47.0	45.9	47.8	50.0	58.3	65.4	70.5	74.0	76.7	79.5	80.1	69.3	90.7
20-Mar	80.2	81.8	80.5	79.1	77.8	76.2	79.8	77.1	69.7	65.0	70.0	79.2	79.9	79.8	71.7	63.6	59.2	60.6	66.0	68.1	72.5	72.0	72.1	78.9	73.4	81.8
21-Mar	85.6	86.0	85.3	84.0	82.7	81.8	80.7	78.4	70.4	63.3	59.8	54.4	51.5	45.8	40.9	35.6	37.3	47.9	53.7	61.5	69.6	76.2	81.7	84.9	66.6	86.0
22-Mar	86.9	87.4	86.9	84.9	85.2	84.3	83.9	79.9	69.2	56.7	50.0	43.4	38.3	35.7	33.3	31.5	30.9	32.3	42.1	54.4	58.7	63.9	59.0	52.4	59.6	87.4
23-Mar	56.1	60.9	67.1	75.0	76.5	73.7	76.8	72.4	58.4	50.8	48.7	49.1	46.8	46.3	50.0	52.9	56.5	62.8	71.7	78.1	82.3	87.0	89.6	90.3	65.8	90.3
24-Mar	87.8	86.8	85.4	84.5	83.0	82.0	81.6	79.0	72.1	60.2	57.6	52.1	47.9	41.1	35.4	30.1	29.8	30.9	36.6	48.1	57.1	64.1	69.8	69.2	61.3	87.8
25-Mar	73.7	75.2	75.9	77.6	78.2	81.4	80.4	71.4	58.7	42.7	40.8	36.3	34.9	32.9	31.3	32.6	36.6	40.9	43.8	51.4	59.1	68.7	73.9	79.6	57.4	81.4
26-Mar	82.6	82.1	79.3	76.1	74.8	72.8	70.5	68.1	66.2	60.1	55.9	50.3	46.4	43.9	38.6	36.7	39.9	41.6	46.5	52.2	59.9	68.1	72.6	75.1	60.8	82.6
27-Mar	75.3	73.2	74.6	73.8	73.5	72.9	72.9	68.7	55.0	44.9	39.7	35.9	37.1	37.5	36.7	36.3	37.4	37.3	39.7	50.2	59.9	64.7	70.0	74.7	55.9	75.3
28-Mar	76.1	75.1	75.6	75.5	74.8	74.4	73.6	69.8	49.5	42.4	38.4	35.8	33.7	33.3	33.4	31.7	31.6	32.8	36.2	38.3	40.8	42.4	44.4	47.7	50.3	76.1
29-Mar	52.4	53.8	56.6	62.7	71.0	78.3	74.0	71.5	70.6	67.3	67.8	64.7	60.1	54.0	59.3	65.5	65.9	70.2	74.5	73.9	76.0	82.8	87.6	87.0	68.6	87.6
30-Mar	87.8	85.9	85.3	84.7	84.1	83.7	82.8	81.5	70.6	58.8	56.5	54.9	50.4	48.3	49.4	52.2	56.6	60.8	61.8	64.0	64.7	60.9	56.9	56.1	66.6	87.8
31-Mar	66.7	71.3	73.8	76.4	79.7	81.4	81.5	79.9	77.7	71.7	64.6	60.7	57.0	54.4	52.1	52.6	53.6	56.8	64.1	71.5	74.7	76.5	76.3	76.8	68.8	81.5
	77.9	78.1	78.5	79.1	79.6	79.7	80.0	78.3	72.0	65.5	61.6	58.8	56.2	54.3	53.1	53.0	54.1	58.5	64.3	69.0	72.5	75.0	75.4	76.3	Diurnal Average	
	88.6	88.9	89.1	89.6	90.7	88.5	90.1	85.9	85.9	85.0	84.5	84.5	85.6	85.3	86.7	87.4	87.9	88.4	88.6	89.2	88.0	88.6	89.6	90.3	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Mackay River - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	57	7.67	7.67
40 - 60	153	20.59	28.26
60 - 80	299	40.24	68.51
80 - 100	234	31.49	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Mackay River - March 2023

Maximum Value: 2.1 mm on Mar 14 12:00

Maximum Daily Total: 10.1 mm on Mar 14

Minimum Value: 0.0 mm on Mar 1 15:00

Minimum Daily Total: 0.0 mm on Mar 4

Maximum Diurnal Total: 3.3 mm at hour 12

Minimum Diurnal Total: 0.1 mm at hour 19

Monthly Total: 26.70 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} = 0.7

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.4	0.1	0.1	0.2	0.4	1.9	0.3	0.6	0.5	1.3	0.7	0.8	0.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	8.6	1.9
2-Mar	0.3	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.3
3-Mar	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.2
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
7-Mar	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.0	0.0	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	2.2	0.3
8-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.2
12-Mar	0.1	0.1	0.1	0.3	0.2	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	0.1	0.1	0.0	0.0	1.3	0.3
13-Mar	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.6	0.7	1.9	0.7
14-Mar	0.7	0.7	0.7	1.0	0.5	0.4	0.4	0.3	0.5	0.5	0.2	2.1	0.6	0.3	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.0	0.0	10.1	2.1
15-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
17-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2
21-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1.8	1.5	1.4	1.9	1.2	2.5	1.2	1.3	1.1	1.8	0.9	3.3	1.3	1.1	0.2	0.3	0.4	0.1	0.1	0.5	0.4	0.4	1.0	1.2	Diurnal Average	
	0.7	0.7	0.7	1.0	0.5	1.9	0.4	0.6	0.5	1.3	0.7	2.1	0.6	0.7	0.2	0.3	0.3	0.1	0.1	0.2	0.2	0.3	0.6	0.7	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Precipitation (PC) - mm

Mackay River - March 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	720	96.90	96.90
0.4 - 0.5	9	1.21	98.12
0.6 - 0.7	9	1.21	99.33
0.8 - 1.4	3	0.40	99.73
1.5 - 10	2	0.27	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Mackay River - March 2023

Maximum Speed: 14 km/h on Mar 9 15:00

Maximum Daily Speed Average: 8.9 km/h on Mar 9

Minimum Speed Value: 0 km/h on Mar 15 03:00

Maximum Diurnal Speed Average: 3.7 km/h at hour 20

Monthly Average Velocity: 2.0 km/h 84.4 deg

Minimum Daily Speed Average: 0.7 km/h on Mar 24

Minimum Diurnal Speed Average: 1.0 km/h at hour 11

Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 8$ $P_{90} = 10$ $P_{99} = 13$

Hours in Service: 744

Hours of Data: 738

Hours of Missing Data: 6

Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SE5	SE5	SE4	SE4	SE4	SE5	SE5	SE4	SE5	SSE7	SSE9	S10	SSE10	SSE10	SSE9	SSE8	SSE6	SE5	SE7	SE8	SSE8	SSE9	SSE10	SSE10	SSE6.7	SSE10
2-Mar	SSE10	SSE11	SSE11	SSE10	S12	SSE13	S12	S11	SSW13	SSW13	SSW13	SSW11	WSW13	W11	WSW10	WSW12	WSW12	WSW8	W7	WSW8	WSW9	WSW8	W9	W8	SSW8.1	WSW13
3-Mar	NW8	WNW10	WNW11	WNW11	WNW8	WNW6	NW5	N5	NNE8	NNE6	NE4	N6	NNW5	N7	N7	NNW8	NNW8	NW7	NNW7	NNW4	NW7	NW7	WNW6	NNW4	NNW5.8	WNW11
4-Mar	NE3	ENE3	ENE3	NE3	SE0	SSW3	WNW1	NW4	NNW9	NNW11	NW11	NW12	NW12	NW13	NW13	NW12	NW9	NW9	N9	NNW6	NW4	NNW3	NW2	W3	NW5.6	NW13
5-Mar	W2	WNW0	SSE1	SSE1	SW1	SSW1	SSW1	ESE1	N4	N6	N4	N6	N5	N7	NNW6	W5	WNW3	ESE3	SE6	SE6	SE5	SE6	SE5	DF	NNE0.9	N7
6-Mar	SSE4	SSE5	SSE5	SE2	SE3	SE2	SE1	ESE2	SE3	SE6	SSE6	SE6	SE8	ESE9	ESE10	ESE11	ESE9	ESE7	ESE6	ESE7	ESE7	ESE7	ESE8	ESE7	ESE5.5	ESE11
7-Mar	ESE8	ESE8	ESE8	ESE8	ESE8	ESE7	ESE8	ESE7	ESE8	SE10	SE10	SE9	ESE9	ESE9	ESE8	ESE7	SSE7	ESE7	ESE5	ESE7	SE6	SE6	SE8	SE7	ESE7.5	SE10
8-Mar	SE7	SE5	SE5	ESE5	SE5	SE5	SE4	ESE3	SE5	SE9	SE7	ESE7	ESE6	ESE9	ESE9	E9	E9	E5	E4	ESE7	ESE7	ESE9	ESE8	SE8	ESE6.3	ESE9
9-Mar	SE7	SE7	SE5	SE4	SE5	SE6	SE5	SE5	SE6	SE9	SE10	SE11	SE11	ESE13	ESE14	SE13	SE11	SE11	SE10	SE9	ESE10	SE11	SE12	SE12	SE8.9	ESE14
10-Mar	SE10	SE9	SE8	SE8	ESE8	ESE7	ESE7	ESE7	ESE9	ESE9	ESE10	ESE9	ESE11	ESE11	ESE10	ESE10	E8	E8	E8	E8	ESE8	ESE8	ESE8	ESE7	ESE8.5	ESE11
11-Mar	ESE7	ESE5	ESE3	ESE5	ESE6	ESE6	ESE4	ESE4	ESE6	ESE7	SE8	ESE9	ESE9	ESE10	E7	ESE6	E7	E5	ENE5	NE8	NE8	NE8	NNE8	NNE7	E5.4	ESE10
12-Mar	NNE7	NNE6	NNE6	NE6	NNE6	NNE5	NNE6	NNE6	NNE6	NNE6	N7	N7	N8	N8	N9	NNE9	NNE9	NNE8	NE6	NNE7	NNE7	NNE7	NNE7	NNE7	NNE6.8	NNE9
13-Mar	NNE7	NNE7	NNE6	NNE7	NNE8	NNE8	NNE7	NNE8	NNE6	NNE8	NNE9	NE8	NE10	NE10	NE11	NE11	NE13	NE11	NE11	NE10	NNE9	NNE10	NNE9	NNE9	NNE8.7	NE13
14-Mar	NNE9	NNE10	NNE10	NNE10	NNE9	NNE9	NNE10	NNE9	NNE10	NNE9	NNE8	N8	N7	N8	NNW7	NNW8	NNW7	NNW6	N7	N7	N6	NNE7	NNE6	N4	NNE7.6	NNE10
15-Mar	N3	N1	SSW0	W0	ESE1	UO	SE1	SSW1	WNW1	NNW3	NW3	NW5	NW4	NW5	NNW5	NW5	NNW6	NNE5	ENE2	ESE2	ESE3	SE3	ESE5	SE4	N1.2	NNW6
16-Mar	SE3	ESE6	ESE6	E5	ENE2	ESE2	NE1	WNW1	W0	W3	SW3	SSE1	NW1	SSW2	S4	SE7	SW4	SE5	SE4	SE7	SE7	SE6	SE6	SSE6	SE2.9	SE7
17-Mar	SSE8	SSE8	S8	S10	S9	SSE8	S8	S8	S6	SSW6	SSW7	SSW8	SSW8	SSW8	SW10	WSW11	WSW10	SW7	SSW4	S5	S5	S6	S9	S8	SSW7.0	WSW11
18-Mar	S8	S9	S8	S8	S8	S7	S7	SSW7	SW5	WSW6	W5	W6	WSW3	NNW4	NW5	NW2	WSW1	SSW2	E3	NE3	NE3	NE1	NNE2	NNE2	SSW2.6	S9
19-Mar	NNE2	NE4	NE5	NNE3	NNE3	E2	NE1	E4	ESE6	ESE7	E5	E8	ENE8	E9	ESE11	ESE11	E9	E8	E9	ESE11	E7	ESE11	E8	E7	E6.2	ESE11
20-Mar	E6	E5	ESE7	ESE9	E5	ESE7	NE3	NE6	NE8	NNE9	NNE9	NNE11	NNE11	NNE11	NNE11	NNE13	NNE13	NNE13	NNE8	NNE7	NNE6	NNE8	NNE5	NNE3	NE7.3	NNE13
21-Mar	N3	WNW1	NW1	WNW1	NNW0	W1	ESE1	UO	NE5	NNE2	NW5	NW6	NNW6	NW8	NNW6	NW6	NNE2	ESE9	ESE7	SE6	SE8	SE7	SE7	SE7	NE1.2	ESE9
22-Mar	SE5	SE5	SE6	SE7	SE6	SE6	SE5	SE7	SSE9	S9	S7	S6	SSE6	SSE7	S6	S5	S6	SSW6	SE6	SE5	SSE6	S6	S7	SSW10	SSE6.0	SSW10
23-Mar	S7	SW3	N1	SSE1	SSE3	S5	SW4	WSW5	W6	WNW7	NNW9	NNE8	NNE9	NNE11	NNE12	NNE13	NNE13	NNE12	NE11	NNE10	NE8	NE4	E1	SSE1	NNE3.8	NNE13
24-Mar	SSE2	SSE1	UO	SSE1	SE2	SE1	UO	NNW2	NNE3	W1	NNW5	NNW7	NNW7	NW8	NNW9	WNW4	WNW4	WNW4	S2	SE5	SE6	SE4	SE4	SSE6	NNW0.7	NNW9
25-Mar	SE4	SE3	SE2	SE2	SE2	SSW0	NNE1	NNW2	NNW5	NNE9	N9	N10	NNE7	NE6	N6	NNE8	NNE10	NE11	NE10	NE9	NE8	NE6	NE4	NE4	NNE4.7	NE11
26-Mar	NNE3	NNW4	N5	N6	NNE7	NNE6	NNE7	NNE7	NNE6	N8	N8	N9	N10	N10	NNE10	N9	NNE9	NNE7	NE8	NNE5	NE2	NNE2	SSE1	UO	NNE6.2	N10
27-Mar	ESE1	SSE2	SSE2	SE2	SE2	SE2	SE2	S1	WSW3	WSW4	WNW4	WNW4	NW6	WNW8	NW8	W8	WNW9	NW10	NW8	ENE2	ESE2	NE2	NNE2	N1	WNW2.1	NW10
28-Mar	SSE1	SE1	E1	SSE2	SE2	SE2	SE3	SE4	SSE5	SSE7	S6	S8	SSW7	SW7	SW7	SW8	SW7	S8	S5	S6	SSE6	S6	SSW7	SW5	S4.5	S8
29-Mar	WSW4	NW6	NW5	NW4	NW3	NNW3	NW0	SW1	NW6	NW9	NNW12	NNW10	N8	NW8	NNE10	NE11	NE11	NNE11	NE8	NE7	NE4	NE2	SSE1	SE2	N4.4	NNW12
30-Mar	SSE2	SE2	SE2	SE2	SE1	SE1	ESE1	ENE1	E4	ESE4	SE7	ESE8	ESE9	ESE8	SE7	SE8	ESE8	E9	E7	ENE6	E5	E7	E7	E7	ESE5.0	ESE9
31-Mar	E6	E5	ENE4	ENE3	E4	E6	ENE4	NE6	NE7	NNE7	NNE8	NNE8	NNE10	ENE9	E7	E8	E8	NE8	NE7	NE4	ENE3	ENE3	E5	ESE8	ENE5.4	NNE10
	ESE2.4	ESE2.1	ESE2.2	ESE2.2	ESE2.2	ESE2.4	ESE1.8	ESE1.6	E1.6	E1.1	NE1.0	NE1.6	NE1.9	NE2.7	NE2.6	NE2.1	NE2.3	ENE3.2	ENE3.7	E3.7	E3.2	E3.0	ESE2.9	ESE2.7	Diurnal Average	
	SSE10	SSE11	WNW11	WNW11	SSE12	SSE13	S12	S11	SSW13	SSW13	SSW13	NW12	WSW13	NW13	ESE14	SE13	NNE13	NNE13	NE11	ESE11	ESE10	SE11	SE12	SE12	Diurnal Maximum	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Mackay River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Mackay River - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	266	36.04	36.04
6 - 11	444	60.16	96.21
12 - 19	28	3.79	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 738

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Mackay River - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	10	17	20	12	17	22	63	20	8	9	8	6	9	12	18	15	266
6 - 11	29	80	31	4	27	79	56	28	31	11	6	8	7	9	17	21	444
12 - 19	0	7	1	0	0	2	3	2	1	3	0	3	0	0	5	1	28
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	39	104	52	16	44	103	122	50	40	23	14	17	16	21	40	37	738

Total Number of Valid Hours: 738

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Mackay River

Total Number of Valid Hours: 738

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Mackay River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 2 16:00

Minimum Value: 0 km/h on Mar 24 05:00

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	738
Hours of Missing Data:	6
Hours of Calibration:	0
Percent Operational Time:	99.2

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Mackay River - March 2023

Direction of Maximum Speed: 123 deg on Mar 9 15:00
Direction of Maximum Daily Speed Average: 132.4 deg on Mar 9

Direction of Minimum Speed: 206 deg on Mar 15 03:00

Direction of Minimum Daily Speed Average: 0.7 deg on Mar 24

Monthly Average Direction: 84.4 deg

Hours in Service:	744
Hours of Data:	738
Hours of Missing Data:	6
Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	129	124	129	138	140	131	128	134	138	157	167	173	167	168	156	166	162	131	129	145	147	164	160	156	151.5
2-Mar	159	157	156	155	169	166	174	189	193	197	203	213	242	271	258	251	256	257	260	248	249	249	267	276	213.7
3-Mar	304	302	296	302	300	290	307	360	29	31	45	351	335	5	5	345	331	326	343	333	323	311	288	331	328.4
4-Mar	42	68	75	41	139	200	297	317	328	331	321	309	305	306	317	314	313	326	350	336	321	334	305	270	322.3
5-Mar	264	294	166	151	234	194	198	115	6	4	353	359	349	351	345	280	291	109	124	126	125	130	131	DF	32.4
6-Mar	153	165	160	126	134	129	135	121	143	133	168	143	139	112	104	111	114	110	115	113	110	111	109	109	123.7
7-Mar	113	111	115	113	109	114	117	120	123	139	132	130	121	107	109	122	155	113	105	116	127	132	137	137	121.5
8-Mar	146	140	126	120	126	129	125	119	131	146	141	112	104	107	107	97	89	92	98	108	113	117	120	124	117.4
9-Mar	135	130	139	143	138	143	144	138	138	143	143	140	138	104	123	135	128	141	134	129	122	125	131	132	132.4
10-Mar	133	127	127	125	118	112	111	112	115	107	104	119	110	103	107	108	90	98	98	98	107	112	115	120	111.5
11-Mar	119	116	111	108	109	110	110	114	108	121	125	115	111	109	95	106	99	84	64	34	39	36	30	17	91.3
12-Mar	18	30	23	34	30	28	21	19	32	17	358	3	360	11	3	18	17	23	36	29	23	21	30	26	19.5
13-Mar	22	20	16	17	19	23	24	24	26	21	23	37	54	45	37	40	41	40	39	40	31	32	27	31	31.9
14-Mar	33	30	27	29	26	22	19	22	17	21	16	5	358	10	331	341	345	347	360	10	8	17	16	1	12.5
15-Mar	9	355	206	261	104	UO	146	202	292	328	315	311	325	326	337	316	328	14	69	120	109	144	116	137	351.4
16-Mar	124	115	120	101	61	102	48	289	275	260	229	157	310	197	185	126	222	143	137	134	134	142	146	154	140.5
17-Mar	163	167	169	180	177	166	176	179	182	211	211	205	204	209	226	241	241	235	201	178	186	179	186	189	195.2
18-Mar	183	186	181	180	184	183	186	195	216	237	259	269	256	328	315	322	249	197	100	56	52	51	33	31	204.3
19-Mar	24	35	35	28	32	93	54	101	112	120	88	92	78	81	102	103	101	90	96	112	94	106	98	92	91.8
20-Mar	83	79	102	105	99	103	54	46	36	23	21	25	24	25	31	24	25	31	30	26	32	29	22	17	39.9
21-Mar	4	291	309	290	327	277	110	UO	36	31	317	322	330	322	332	326	23	112	111	126	125	128	132	129	52.5
22-Mar	143	140	136	136	136	141	140	142	164	182	171	183	166	167	169	169	187	196	133	137	149	177	185	192	161.8
23-Mar	188	226	6	148	152	181	221	242	264	299	335	22	22	15	13	16	21	28	39	33	37	35	96	156	14.6
24-Mar	158	160	UO	148	142	141	UO	336	30	271	346	342	329	326	336	286	291	298	186	130	135	137	144	149	335.2
25-Mar	144	132	139	141	141	213	27	331	344	20	8	355	18	45	359	21	32	39	36	34	35	37	34	38	28.7
26-Mar	31	336	358	9	19	18	15	28	28	359	358	3	358	5	13	10	21	21	40	33	40	27	162	UO	13.3
27-Mar	121	150	150	144	144	140	145	175	241	239	285	289	309	300	318	280	302	324	323	60	115	55	19	358	301.0
28-Mar	150	139	96	151	134	130	137	133	167	151	173	174	207	217	214	218	219	187	171	170	160	171	192	222	181.8
29-Mar	257	310	324	314	324	328	325	217	308	314	330	345	353	322	17	34	42	32	47	46	44	40	151	141	357.8
30-Mar	148	136	133	131	139	131	107	78	82	105	125	112	106	103	130	124	113	95	83	73	85	94	98	100	105.9
31-Mar	87	84	77	58	88	82	63	46	48	14	14	21	21	76	91	93	84	56	42	52	58	63	99	104	61.9
Diurnal Average	120.7	115.6	111.4	109.7	113.0	119.8	113.9	102.2	82.4	79.6	45.7	44.9	39.8	39.6	39.1	48.8	43.9	57.3	67.5	82.1	89.2	99.5	115.3	120.1	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Mackay River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Mackay River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 107 deg on Mar 24 10:00

Minimum Value: 5 deg on Mar 27 03:00

Percentiles: P_1 = 11 P_{10} = 16 Q_1 = 21 Median = 25 Q_3 = 34 P_{90} = 52 P_{99} = 87

Hours in Service:	744
Hours of Data:	738
Hours of Missing Data:	6
Hours of Calibration:	0
Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	12	11	13	18	18	20	19	22	23	26	29	27	30	29	28	24	27	21	19	23	22	26	25	25	30
2-Mar	24	25	24	26	25	24	24	23	20	22	26	32	45	41	46	47	47	48	49	53	47	45	42	34	53
3-Mar	23	22	25	24	25	26	46	35	24	24	42	40	45	28	29	27	20	23	26	19	22	19	23	50	50
4-Mar	31	43	29	28	81	34	63	27	24	21	24	24	30	23	24	23	22	24	23	23	20	30	63	21	81
5-Mar	18	86	41	60	53	59	58	54	27	34	60	45	52	42	38	54	56	54	14	13	15	13	14	DF	86
6-Mar	15	16	14	36	12	57	39	22	16	21	30	34	31	26	20	21	19	18	17	16	16	15	16	17	57
7-Mar	18	19	18	19	18	18	19	20	22	24	24	25	24	24	25	32	29	28	17	18	18	20	22	23	32
8-Mar	24	25	18	13	13	15	15	16	20	23	33	30	31	25	25	31	33	31	19	14	15	14	15	15	33
9-Mar	16	17	18	15	13	14	15	16	23	24	29	29	33	25	25	26	25	27	21	21	21	22	21	24	33
10-Mar	24	20	21	22	20	18	18	18	17	21	24	27	28	24	27	23	32	27	24	24	18	16	18	18	32
11-Mar	17	16	23	14	16	16	15	16	16	30	28	28	31	31	41	38	30	31	30	23	25	24	22	25	41
12-Mar	24	19	25	22	21	22	23	24	28	37	26	31	29	28	25	27	26	26	26	26	23	23	27	24	37
13-Mar	24	24	23	24	22	24	24	23	27	27	26	26	28	26	26	24	25	25	24	22	23	23	23	22	28
14-Mar	25	26	23	24	25	25	24	24	26	26	24	27	26	24	25	22	24	25	26	24	23	26	27	25	27
15-Mar	36	82	100	63	38	UO	42	33	64	54	67	44	40	47	38	38	24	23	35	20	18	26	17	28	100
16-Mar	24	16	19	21	42	44	85	84	91	74	47	85	94	85	67	26	48	27	18	18	20	24	17	18	94
17-Mar	19	18	18	15	17	18	17	19	22	27	28	29	30	37	38	45	45	44	19	14	17	14	15	16	45
18-Mar	15	14	15	15	15	16	15	23	35	45	54	49	70	62	51	87	102	57	36	27	25	36	50	18	102
19-Mar	16	19	18	17	21	36	54	34	23	25	50	34	32	33	26	23	29	28	25	19	31	17	26	28	54
20-Mar	30	36	28	21	29	23	27	23	26	31	26	25	25	28	29	28	25	24	23	23	17	22	24	25	36
21-Mar	24	63	37	28	40	35	74	UO	30	67	49	34	41	27	40	31	92	21	17	14	15	15	18	18	92
22-Mar	22	20	22	24	24	24	25	23	26	27	38	52	55	43	50	68	43	30	27	19	13	12	13	17	68
23-Mar	16	50	80	59	23	26	37	46	56	42	26	30	29	30	27	28	27	24	24	24	23	25	37	72	80
24-Mar	19	29	UO	26	21	12	UO	23	39	107	66	49	42	40	33	66	58	36	58	14	16	15	16	10	107
25-Mar	15	14	16	16	56	94	74	36	33	28	35	28	40	53	53	36	28	25	23	20	22	22	15	15	94
26-Mar	27	20	22	25	23	24	23	25	35	27	30	32	34	31	32	37	23	26	23	21	50	44	85	UO	85
27-Mar	9	20	5	6	9	8	15	79	77	57	66	74	70	45	45	46	30	25	25	37	18	36	22	50	79
28-Mar	32	19	43	13	16	11	11	21	29	32	46	36	58	59	46	47	41	29	22	23	25	21	21	28	59
29-Mar	48	22	16	13	15	15	80	76	34	23	23	33	37	42	32	29	28	25	25	24	18	16	63	53	80
30-Mar	9	11	13	19	60	54	69	34	36	60	36	29	28	31	44	34	23	29	31	33	34	28	25	25	69
31-Mar	31	29	27	25	29	29	34	21	27	27	31	32	36	41	40	39	34	32	23	22	29	25	28	20	41
Diurnal Maximum	48	86	100	63	81	94	85	84	91	107	67	85	94	85	67	87	102	57	58	53	50	45	85	72	

DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS21
CONKLIN
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	34	35	99.87	10.1	0	1.2	0
TRS(ppb) Average	707	36	37	99.87	0.5	0	0.4	0
THC(ppm) Average	707	34	37	99.6	2.4	-	2.2	-
NMHC(ppm) Average	707	34	37	99.6	0.053	-	0.006	-
CH4(ppm) Average	707	34	37	99.6	2.4	-	2.2	-
O3 (ppb) Average	708	35	36	99.87	57.5	0	49.7	-
NO2 (ppb) Average	707	36	37	99.87	18.4	0	5.8	-
NO (ppb) Average	707	36	37	99.87	8.5	-	1.4	-
NOX (ppb) Average	707	36	37	99.87	22.7	-	6.7	-
PM2.5 (ug/m3) Average	741	2	3	99.87	44.7	0	9.7	0
Temperature 2 m (C) Average	743	0	1	99.87	9.6	-	-0.9	-
Relative Humidity (%) Average	743	0	1	99.87	91.4	-	83.1	-
Wind Speed 10 m (km/h) Average	733	0	11	98.52	19	-	11	-
Wind Direction 10 m (deg) Average	733	0	11	98.52	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.55	0.8	-	0	0	0.1	0.3	0.8	1.3	10.1
TRS (ppb) Average	707	0.38	0	-	0.2	0.3	0.4	0.4	0.4	0.4	0.5
THC (ppm) Average	707	2.12	0.1	-	2	2.1	2.1	2.1	2.1	2.2	2.4
NMHC(ppm) Average	707	0.001	0.003	-	0	0	0	0	0	0	0.053
CH4(ppm) Average	707	2.12	0.1	-	2	2.1	2.1	2.1	2.1	2.2	2.4
O3 (ppb) Average	708	38.76	9.8	-	13.3	23.1	32.9	40.7	45.6	50.5	57.5
NO2 (ppb) Average	707	2.39	2.1	-	0	0.8	1.2	1.8	2.8	4.5	18.4
NO (ppb) Average	707	0.36	0.7	-	0	0	0	0.1	0.4	0.9	8.5
NOX (ppb) Average	707	2.74	2.5	-	0.3	0.8	1.3	2	3.3	5.2	22.7
PM2.5 (ug/m3) Average	741	5.36	3.6	-	0.3	2.7	3.5	4.4	6	9.5	44.7
Temperature 2 m (C) Average	743	-9.21	8.2	-	-31.4	-20.1	-14.3	-8.1	-3.8	0.7	9.6
Relative Humidity (%) Average	743	65.88	16.9	-	22.6	39.9	54.7	70.5	79.8	84.4	91.4
Wind Speed 10 m (km/h) Average	733	6.2	4	-	0	1	3	6	9	12	19
Wind Direction 10 m (deg) Average	733	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
THC/NMHC/CH4	17 Mar 2023 11:00	17 Mar 2023 12:00	2	Maintenance - replaced support gas cylinder
Wind Speed, Wind Direction	11 Mar 2023 03:00	11 Mar 2023 04:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Mar 2023 20:00	15 Mar 2023 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	19 Mar 2023 07:00	19 Mar 2023 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	26 Mar 2023 22:00	27 Mar 2023 01:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Mar 2023 02:00	28 Mar 2023 03:00	2	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 10.1 ppb on Mar 4 00:00 Maximum Daily Average: 1.2 ppb on Mar 3

Minimum Value: 0.0 ppb on Mar 1 01:00 Minimum Daily Average: 0.0 ppb on Mar 26

Maximum Diurnal Average: 1.1 ppb at hour 11 Minimum Diurnal Average: 0.2 ppb at hour 5

Monthly Average: 0.55 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.3 Q_3 = 0.8 P_{90} = 1.3 P_{99} = 4.0

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	0.0	Z	0.0	0.0	0.1	0.6	0.7	0.3	0.7	1.0	1.1	1.1	1.0	1.0	1.2	0.7	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.5	1.2
2-Mar	0.3	0.3	0.4	Z	0.5	0.7	0.8	1.9	1.5	1.4	1.2	0.9	0.6	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.6	1.9
3-Mar	0.3	0.4	0.3	0.3	Z	0.1	0.2	0.2	0.3	0.2	C	C	C	0.0	0.0	0.0	0.0	0.0	0.1	1.6	1.9	2.6	5.2	10.1	1.2	10.1
4-Mar	7.4	4.8	2.6	1.9	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.1	0.1	0.2	0.1	0.9	7.4
5-Mar	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.7	2.5	1.7	0.7	0.4	0.4	0.5	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	DF	0.4	2.5
6-Mar	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4	Z	1.7	1.3	1.5	1.1	1.2	1.1	0.8	0.5	0.4	0.4	0.4	1.1	0.8	0.6	1.7
7-Mar	1.1	Z	1.4	0.9	0.6	0.7	1.0	0.7	0.8	0.8	0.8	1.2	1.0	0.7	0.9	0.8	0.5	0.7	0.6	0.9	0.8	1.8	2.4	2.6	1.0	2.6
8-Mar	1.1	0.2	Z	0.1	0.0	0.0	0.0	0.0	0.1	1.8	3.1	1.7	1.4	0.8	1.1	1.5	0.8	0.9	0.1	0.1	0.2	0.5	0.2	0.1	0.7	3.1
9-Mar	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	1.2	0.8	0.4	0.5	0.5	0.7	0.6	0.6	0.5	0.5	2.2	0.4	0.2	0.6	0.5	0.5	2.2
10-Mar	0.9	0.9	0.7	0.8	Z	0.6	1.3	2.0	2.2	1.0	0.9	1.1	1.0	1.2	0.9	0.7	1.0	0.4	0.2	0.2	0.1	0.9	0.2	0.2	0.8	2.2
11-Mar	0.2	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.1	2.8	5.0	2.2	1.3	0.8	1.0	0.8	0.7	0.6	0.6	0.4	0.2	0.1	0.1	0.7	5.0
12-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.6	1.4	1.4	0.7	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3	1.4
13-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.4	1.3	0.9	0.4	0.3	0.2	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.3	1.7
14-Mar	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.8	1.6	1.3	1.1	0.9	0.9	1.0	0.9	1.3	4.6	0.7	4.6
15-Mar	4.1	2.1	1.0	Z	0.3	0.3	0.2	0.2	1.7	3.1	1.8	1.2	0.9	1.0	1.2	1.3	1.1	0.9	0.6	0.4	0.3	0.2	0.2	0.2	1.1	4.1
16-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.5	0.9	1.2	1.0	0.7	0.7	0.7	0.8	0.5	0.3	0.1	0.0	0.0	0.0	0.4	1.2
17-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	0.5	0.4	0.4	0.2	0.0	0.1	0.2	0.1	0.1	0.3	0.7	2.0	1.6	1.8	0.4	2.0
18-Mar	Z	0.5	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.2	0.3	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.5
19-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4	5.3	1.3	1.2	0.8	0.7	0.8	0.6	0.4	0.5	0.5	0.3	0.4	0.4	0.3	0.7	5.3
20-Mar	0.3	0.5	Z	0.4	0.3	0.3	0.3	0.3	0.5	1.0	1.3	1.4	3.4	2.3	1.1	1.2	0.6	0.3	0.3	0.2	0.3	0.1	0.2	0.2	0.7	3.4
21-Mar	0.2	0.3	0.2	Z	0.1	0.2	0.2	0.3	0.3	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.6	0.9	0.6	0.2	0.0	0.0	0.2	0.9
22-Mar	0.0	0.0	0.1	0.1	Z	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.8	0.9	0.8	0.7	0.6	0.5	0.3	0.8	0.9	1.2	0.5	0.4	1.2
23-Mar	0.4	0.3	0.5	0.6	0.4	Z	0.2	0.9	1.6	1.6	0.5	0.6	0.2	0.1	0.0	0.1	0.0	0.8	0.8	0.4	0.4	0.1	0.0	0.0	0.4	1.6
24-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.1	0.3
25-Mar	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.6	0.8	0.6	0.6	0.6	1.1	1.7	1.2	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.5	1.7
26-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.4	1.4	0.3	0.5	0.5	2.0	0.9	0.6	0.6	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.4	2.0
28-Mar	0.0	0.1	0.1	0.0	Z	0.1	0.0	0.1	0.6	2.0	3.4	2.2	2.0	2.2	1.3	0.3	0.4	0.6	0.5	0.4	0.1	0.1	0.1	0.0	0.7	3.4
29-Mar	0.1	0.2	0.3	0.4	0.4	Z	0.2	0.4	1.8	1.1	0.3	0.5	0.8	0.4	0.8	0.8	0.8	1.3	0.7	0.5	0.2	0.1	0.1	0.1	0.5	1.8
30-Mar	Z	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.5	0.6	1.4	1.6	0.6	0.4	0.6	0.5	0.6	0.4	0.2	0.3	0.3	0.3	0.5	0.4	1.6
31-Mar	0.5	Z	0.4	0.4	0.4	0.4	0.5	1.0	1.2	1.2	1.9	1.6	0.9	0.8	0.8	0.8	0.9	1.1	0.8	0.4	0.2	0.2	0.2	0.3	0.7	1.9
	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.5	0.9	1.1	1.0	0.9	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.8	Diurnal Average	
	7.4	4.8	2.6	1.9	0.6	0.7	1.3	2.0	2.2	3.1	5.3	5.0	3.4	2.3	1.3	1.7	1.3	1.3	0.9	2.2	1.9	2.6	5.2	10.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Conklin - March 2023

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

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Conklin - March 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	49	36	20	18	12	43	104	90	65	50	21	19	27	28	61	56	699
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	36	20	18	12	43	104	90	65	50	21	19	27	28	61	56	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Conklin

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.5 ppb on Mar 4 00:00 Maximum Daily Average: 0.4 ppb on Mar 23

Minimum Value: 0.2 ppb on Mar 22 16:00 Minimum Daily Average: 0.3 ppb on Mar 22

Maximum Diurnal Average: 0.4 ppb at hour 10 Minimum Diurnal Average: 0.4 ppb at hour 6

Monthly Average: 0.38 ppb Percentiles: P_1 = 0.3 P_{10} = 0.3 Q_1 = 0.4 Median = 0.4 Q_3 = 0.4 P_{90} = 0.4 P_{99} = 0.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	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
2-Mar	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
3-Mar	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5
4-Mar	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5
5-Mar	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	DF	0.4	0.4
6-Mar	0.3	0.4	0.3	0.3	0.4	0.4	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	0.5
7-Mar	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
8-Mar	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4
9-Mar	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
10-Mar	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
11-Mar	Z	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
12-Mar	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
13-Mar	0.4	0.4	Z	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
14-Mar	0.4	0.4	0.4	Z	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15-Mar	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
16-Mar	0.3	0.3	0.3	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
17-Mar	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
18-Mar	0.4	Z	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
19-Mar	0.4	0.4	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
20-Mar	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	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
21-Mar	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
22-Mar	0.3	0.4	0.4	0.3	0.3	Z	0.4	0.3	0.3	C	C	C	C	C	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4
23-Mar	Z	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
24-Mar	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4
25-Mar	0.3	0.3	Z	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	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
26-Mar	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
27-Mar	0.3	0.3	0.3	0.3	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
28-Mar	0.4	0.4	0.4	0.3	0.3	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
29-Mar	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
30-Mar	0.4	Z	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
31-Mar	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 2	47	36	20	18	12	45	103	89	60	50	21	19	28	31	63	55	697
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	36	20	18	12	45	103	89	60	50	21	19	28	31	63	55	697

Total Number of Valid Hours: 697

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Conklin

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 697

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Conklin - March 2023

Maximum Value: 2.4 ppm on Mar 18 06:00

Maximum Daily Average: 2.2 ppm on Mar 16

Minimum Value: 2.0 ppm on Mar 23 15:00

Minimum Daily Average: 2.1 ppm on Mar 29

Maximum Diurnal Average: 2.2 ppm at hour 7

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.12 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.1 Q_3 = 2.1 P_{90} = 2.2 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

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

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Conklin - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	34	4.81	4.81
2.1 - 3.0	673	95.19	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Conklin - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	4	0	0	0	0	0	0	0	4	2	1	2	7	2	9	3	34
2.1 - 3.0	45	36	20	18	12	43	104	90	61	48	19	16	20	26	52	53	663
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	49	36	20	18	12	43	104	90	65	50	20	18	27	28	61	56	697

Total Number of Valid Hours: 697

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Conklin

Classes (ppm)

- **0 - 2.0**
- **2.1 - 3.0**
- **3.1 - 10.0**
- **> 10.0**

Total Number of Valid Hours: 697

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Conklin - March 2023

Maximum Value: 0.053 ppm on Mar 1 08:00

Maximum Daily Average: 0.006 ppm on Mar 16

Minimum Value: 0.000 ppm on Mar 1 02:00

Minimum Daily Average: 0.000 ppm on Mar 7

Maximum Diurnal Average: 0.003 ppm at hour 8

Minimum Diurnal Average: 0.000 ppm at hour 18

Monthly Average: 0.001 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.014	0.000	Z	0.000	0.000	0.000	0.001	0.053	0.041	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	0.005	0.053
2-Mar	0.000	0.000	0.001	Z	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
3-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.011	0.001	0.011
4-Mar	0.009	0.011	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	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	0.001	0.011
5-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DF	0.000	0.000
6-Mar	0.000	0.001	0.000	0.000	0.000	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	0.001	0.016	0.013	0.001	0.016
7-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
9-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
10-Mar	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.002
11-Mar	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
12-Mar	Z	0.001	0.000	0.000	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
13-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
14-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16-Mar	0.000	0.000	0.000	0.000	Z	0.005	0.014	0.028	0.035	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.021	0.013	0.004	0.008	0.006	0.035
17-Mar	0.002	0.000	0.000	0.000	0.000	Z	0.004	0.001	0.000	0.000	M	M	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.002	0.000	0.000	0.000	0.001	0.004
18-Mar	Z	0.000	0.001	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	0.001	0.003	0.003	0.000	0.001	0.006
19-Mar	0.000	Z	0.000	0.000	0.000	0.002	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002
20-Mar	0.001	0.001	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
21-Mar	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
22-Mar	0.008	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.008
23-Mar	0.002	0.002	0.004	0.002	0.002	Z	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004
24-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.001
25-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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	0.003	0.000	0.000	0.003
28-Mar	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-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.004	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	0.004
30-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.000	0.000	0.000	0.000	0.001	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	Diurnal Average	
	0.014	0.011	0.004	0.002	0.006	0.005	0.014	0.053	0.041	0.005	0.002	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.005	0.003	0.021	0.013	0.016	0.013	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Conklin - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	691	97.74	97.74
0.006 - 0.05	16	2.26	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Conklin - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 0.005	48	35	20	18	11	40	101	89	62	50	20	18	27	28	60	54	681
0.006 - 0.05	1	1	0	0	1	3	3	1	3	0	0	0	0	0	1	2	16
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	36	20	18	12	43	104	90	65	50	20	18	27	28	61	56	697

Total Number of Valid Hours: 697

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Conklin

Total Number of Valid Hours: 697

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.4 ppm on Mar 18 06:00

Maximum Daily Average: 2.2 ppm on Mar 16

Minimum Value: 2.0 ppm on Mar 23 15:00

Maximum Diurnal Average: 2.2 ppm at hour 7

Monthly Average: 2.12 ppm

Minimum Daily Average: 2.1 ppm on Mar 29

Minimum Diurnal Average: 2.1 ppm at hour 17

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.1 Q_3 = 2.1 P_{90} = 2.2 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

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

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Conklin - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	35	4.95	4.95
2.1 - 3.0	672	95.05	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Conklin - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	4	1	0	0	0	0	0	0	4	2	1	2	7	2	9	3	35
2.1 - 3.0	45	35	20	18	12	43	104	90	61	48	19	16	20	26	52	53	662
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	49	36	20	18	12	43	104	90	65	50	20	18	27	28	61	56	697

Total Number of Valid Hours: 697

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Conklin

Total Number of Valid Hours: 697

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Conklin - March 2023

Maximum Value: 8.5 ppb on Mar 15 15:00

Maximum Daily Average: 1.4 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 3 19:00

Minimum Daily Average: 0.0 ppb on Mar 26

Maximum Diurnal Average: 1.0 ppb at hour 10

Minimum Diurnal Average: 0.0 ppb at hour 3

Monthly Average: 0.36 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.4 P_{90} = 0.9 P_{99} = 3.9

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.0	0.3	0.1	0.0	0.1	0.1	0.3	0.8	0.8	1.2	1.3	1.2	0.7	0.7	0.5	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.4	1.3
2-Mar	0.2	Z	0.1	0.1	0.2	0.3	0.3	0.2	0.5	1.0	1.3	1.0	0.7	0.6	0.5	0.5	6.1	0.1	0.1	0.1	0.2	1.8	0.1	0.0	0.7	6.1
3-Mar	0.0	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.0	0.2	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4
4-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	3.3	0.2	0.6	0.1	0.1	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.3
5-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	1.2	2.1	2.3	1.0	0.6	0.4	0.3	0.3	0.3	0.2	0.1	0.0	0.1	0.9	0.0	0.0	DF	0.4	2.3
6-Mar	0.0	4.3	0.1	0.1	0.1	0.1	0.1	0.5	2.2	3.3	2.0	1.0	0.9	1.0	Z	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.7	4.3
7-Mar	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.1	0.3	0.8	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.8
8-Mar	Z	0.1	0.1	0.0	0.0	0.3	0.4	0.5	1.2	1.0	1.0	0.5	0.4	0.5	0.5	0.5	0.2	0.1	0.0	0.0	0.0	5.5	2.7	0.1	0.7	5.5
9-Mar	0.1	Z	0.0	0.1	0.4	0.5	0.3	0.5	1.6	1.6	0.6	0.3	0.5	0.3	0.4	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.6
10-Mar	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
11-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	1.9	1.7	1.1	2.0	0.9	0.3	0.2	0.2	0.2	0.2	0.0	0.1	0.3	0.2	0.2	0.3	0.5	2.0
12-Mar	0.1	0.0	0.0	0.0	Z	0.2	0.3	0.3	0.5	0.5	0.5	0.4	0.5	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.5
13-Mar	0.0	0.1	0.0	0.2	0.0	Z	0.0	0.6	0.6	1.5	1.2	1.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5
14-Mar	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	0.2	0.6	0.8	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2
15-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.2	2.7	3.8	3.1	1.8	1.4	1.3	0.8	8.5	0.7	0.4	0.1	1.0	3.9	0.3	1.5	0.0	0.0	1.4	8.5
16-Mar	0.5	0.0	Z	0.0	0.1	0.2	0.0	0.3	1.1	2.1	1.1	1.0	0.8	0.4	0.3	0.2	0.3	0.1	0.3	4.5	0.4	0.4	0.2	0.2	0.6	4.5
17-Mar	0.4	0.1	0.0	Z	0.1	0.4	0.1	0.7	1.1	1.1	0.9	0.7	0.8	0.3	0.1	0.2	0.2	0.0	0.3	0.3	0.3	1.4	0.1	0.2	0.4	1.4
18-Mar	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.2	0.3	0.4	4.0	0.6	0.4	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.0
19-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.9	1.0	2.4	1.6	0.5	0.5	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.4
20-Mar	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.7	0.9	0.6	0.8	0.7	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
21-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.6	0.1	0.1	0.0	0.1	0.6
22-Mar	0.1	0.0	Z	0.0	0.0	0.0	1.7	4.3	0.6	0.4	0.6	0.6	0.8	0.7	0.7	0.6	0.4	0.1	0.1	0.4	0.1	0.0	0.0	0.0	0.5	4.3
23-Mar	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.2	0.5	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
24-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.4
25-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.6	1.3	0.6	0.4	0.2	0.1	0.0	0.0	0.1	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3
26-Mar	Z	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2
27-Mar	0.0	Z	0.0	0.1	0.1	0.1	0.2	0.5	1.6	0.9	0.3	0.2	0.3	0.7	0.4	0.5	0.2	0.0	0.0	0.0	2.2	0.0	0.0	0.1	0.4	2.2
28-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	1.0	0.8	0.9	1.5	0.9	0.9	0.9	0.4	0.6	0.1	0.1	0.1	2.2	0.2	0.1	0.1	0.1	0.5	2.2
29-Mar	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.2	0.5	C	C	C	C	C	0.2	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
30-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.4	0.5	0.5	0.5	0.6	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.6
31-Mar	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.3	0.9	0.4	0.5	0.6	0.5	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
	0.1	0.2	0.0	0.0	0.1	0.1	0.2	0.6	0.8	1.0	1.0	0.6	0.5	0.4	0.5	0.4	0.4	0.1	0.1	0.4	0.2	0.4	0.1	0.0	Diurnal Average	
	0.5	4.3	0.3	0.2	0.4	0.5	1.7	4.3	3.8	3.3	4.0	2.0	1.3	1.0	8.5	2.5	6.1	0.3	1.0	4.5	2.2	5.5	2.7	0.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Conklin - March 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	44	37	20	18	12	45	105	89	63	52	20	18	26	33	62	55	699
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	37	20	18	12	45	105	89	63	52	20	18	26	33	62	55	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Conklin

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 18.4 ppb on Mar 16 21:00

Maximum Daily Average: 5.8 ppb on Mar 16

Minimum Value: 0.0 ppb on Mar 2 17:00

Maximum Diurnal Average: 3.8 ppb at hour 22

Monthly Average: 2.39 ppb

Minimum Daily Average: 1.1 ppb on Mar 26

Minimum Diurnal Average: 1.4 ppb at hour 15

Percentiles: P_1 = 0.4 P_{10} = 0.8 Q_1 = 1.2 Median = 1.8 Q_3 = 2.8 P_{90} = 4.5 P_{99} = 10.7

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	3.1	3.7	3.5	3.3	3.3	3.8	3.8	4.5	2.9	2.5	2.4	2.3	2.2	2.5	2.7	2.9	3.1	2.8	2.5	2.2	2.1	2.3	2.3	2.9	4.5
2-Mar	2.8	Z	3.3	3.3	3.5	4.7	5.5	5.0	4.6	4.8	4.6	4.1	3.3	3.0	2.4	2.9	0.0	2.0	1.6	1.6	1.8	3.1	1.0	0.7	3.0	5.5
3-Mar	0.7	1.2	Z	1.4	1.4	1.7	1.4	1.1	1.2	1.3	1.1	0.9	0.9	0.5	0.8	0.5	1.3	0.8	0.7	4.8	5.8	6.9	8.7	10.6	2.4	10.6
4-Mar	7.7	6.3	4.5	Z	0.8	1.3	1.7	1.6	1.5	1.4	2.2	0.8	1.3	0.8	0.6	2.0	0.5	0.4	0.5	0.4	0.5	0.6	1.1	1.5	1.7	7.7
5-Mar	1.5	2.1	2.5	2.5	Z	2.3	2.8	4.0	3.2	3.3	1.7	1.2	0.9	1.0	0.8	0.9	1.1	1.9	3.6	3.1	6.5	10.1	10.4	DF	3.1	10.4
6-Mar	6.9	8.2	6.2	5.7	4.4	4.7	4.1	3.9	4.4	4.0	3.4	1.8	1.6	1.9	Z	1.8	1.9	1.9	1.4	1.3	2.2	2.9	1.8	1.5	3.4	8.2
7-Mar	2.1	1.8	1.9	1.8	1.7	Z	2.3	1.7	1.9	1.7	1.5	1.5	1.4	1.3	1.4	1.3	1.1	1.3	1.5	1.8	2.3	2.4	2.5	2.6	1.8	2.6
8-Mar	Z	1.7	1.9	2.0	1.9	2.9	2.4	2.3	2.7	2.4	2.1	1.2	1.0	1.1	1.3	1.8	1.2	1.4	1.2	0.6	1.5	10.7	13.6	12.6	3.1	13.6
9-Mar	8.8	Z	4.0	2.1	2.1	2.3	2.3	2.4	3.1	3.1	1.0	0.9	1.1	1.0	1.0	1.0	1.5	1.3	1.5	2.2	0.9	0.8	1.3	1.4	2.0	8.8
10-Mar	1.6	1.5	Z	1.9	1.7	1.2	1.7	2.0	1.8	1.4	1.4	1.5	1.5	1.4	1.2	1.1	1.2	1.3	1.2	1.1	1.1	1.2	0.7	1.0	1.4	2.0
11-Mar	1.1	1.1	1.6	Z	2.4	1.8	2.3	2.2	4.3	3.0	2.2	3.2	1.9	1.1	0.9	1.1	1.6	1.6	1.7	2.1	3.5	2.5	1.8	2.4	2.1	4.3
12-Mar	2.5	2.0	2.7	1.9	Z	2.5	3.0	2.2	1.7	1.6	1.5	1.3	1.6	1.2	1.4	1.5	2.0	2.3	2.4	2.6	2.1	1.4	1.3	2.0	1.9	3.0
13-Mar	1.5	1.7	1.6	1.8	1.8	Z	2.9	3.7	3.0	3.5	3.2	3.4	2.1	1.4	1.1	0.8	1.0	0.8	0.7	1.5	1.2	0.7	0.6	0.6	1.8	3.7
14-Mar	Z	0.6	0.6	0.6	0.8	0.6	0.7	0.7	0.5	0.5	0.7	0.6	0.6	1.2	2.4	3.8	3.0	2.2	2.0	2.3	2.2	1.7	1.9	3.2	1.5	3.8
15-Mar	3.6	Z	3.0	3.8	3.8	4.6	6.5	7.7	5.3	4.2	2.4	2.2	2.1	1.8	2.2	2.1	1.8	1.9	8.7	13.3	9.8	17.4	8.9	6.8	5.4	17.4
16-Mar	5.9	4.8	Z	4.9	6.8	5.7	5.3	5.5	5.6	5.5	3.2	2.1	1.8	1.7	1.4	1.2	1.8	1.6	5.1	18.2	18.4	12.7	8.1	5.3	5.8	18.4
17-Mar	3.5	2.6	2.0	Z	2.1	2.7	2.5	2.3	2.3	2.6	2.6	2.0	2.2	1.4	1.1	1.3	1.5	1.5	2.7	4.4	4.1	10.7	6.4	3.7	3.0	10.7
18-Mar	2.5	2.2	2.3	1.9	Z	2.6	3.2	2.3	2.4	2.7	5.8	2.9	2.3	1.8	1.4	2.0	1.2	1.4	1.5	2.7	4.7	6.3	2.9	2.9	2.7	6.3
19-Mar	2.5	2.2	2.0	1.8	1.7	Z	2.4	3.3	3.1	4.1	3.6	1.9	1.9	1.4	1.3	1.5	1.2	0.9	1.2	1.1	0.8	1.3	1.8	1.5	1.9	4.1
20-Mar	Z	1.8	2.0	2.0	1.6	1.4	1.2	1.3	1.4	2.6	3.3	3.4	4.6	2.9	1.9	1.9	1.4	0.9	0.7	0.6	0.6	1.1	0.8	0.6	1.7	4.6
21-Mar	0.5	Z	2.0	0.9	1.1	1.0	1.2	1.1	0.8	0.7	1.3	1.0	1.0	0.7	0.8	0.9	0.8	0.9	2.0	2.1	4.5	2.2	1.1	1.3	1.3	4.5
22-Mar	1.6	2.1	Z	2.2	1.9	1.8	7.9	10.6	2.0	1.7	2.3	2.1	2.3	2.6	3.0	3.1	3.0	2.8	3.6	4.7	4.1	3.3	3.6	3.1	3.3	10.6
23-Mar	3.2	3.5	5.3	Z	4.4	4.8	4.3	4.5	3.8	2.9	1.9	1.9	1.4	1.1	0.9	1.3	0.9	3.4	5.1	2.6	2.0	1.1	1.0	0.7	2.7	5.3
24-Mar	0.7	0.6	0.6	0.6	Z	0.6	0.7	0.7	0.8	0.9	0.8	0.8	0.8	0.9	0.9	1.0	0.9	1.1	4.9	8.4	4.9	2.8	2.7	2.8	1.7	8.4
25-Mar	2.1	1.0	0.8	1.0	1.1	Z	8.4	5.4	2.2	1.7	1.1	0.9	0.8	0.8	0.8	2.3	3.4	2.5	2.2	2.0	1.8	1.7	1.9	2.2	2.1	8.4
26-Mar	Z	1.7	1.4	1.3	1.2	2.7	2.0	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	2.0	2.6	2.4	2.3	1.1	2.7
27-Mar	1.9	Z	1.3	1.5	1.9	2.0	2.2	1.9	2.9	1.9	0.9	0.9	0.9	1.7	1.3	1.3	1.2	0.7	0.7	0.9	7.4	1.7	1.8	1.3	1.7	7.4
28-Mar	1.5	1.4	Z	1.6	1.6	1.3	1.4	2.5	2.1	2.0	2.8	2.0	1.9	1.9	1.3	1.4	0.9	1.0	1.7	5.6	5.1	1.2	1.2	0.9	1.9	5.6
29-Mar	1.1	1.1	1.3	Z	1.5	1.9	2.4	1.6	1.9	C	C	C	C	C	1.3	1.2	1.6	5.2	4.3	2.4	0.8	0.8	1.4	2.6	1.9	5.2
30-Mar	0.6	0.4	0.6	0.6	Z	0.9	1.0	2.4	1.9	1.6	1.3	1.4	1.4	0.8	0.5	0.7	0.7	0.9	1.3	1.4	1.5	1.5	1.1	1.3	1.1	2.4
31-Mar	1.4	1.7	1.4	1.7	1.9	Z	2.5	3.7	4.2	4.0	4.0	3.6	3.3	3.0	3.1	3.1	3.0	2.9	2.5	2.2	2.3	1.7	1.8	2.0	2.7	4.2
	2.7	2.2	2.3	2.1	2.2	2.4	3.0	3.0	2.6	2.5	2.2	1.8	1.7	1.5	1.4	1.6	1.5	1.7	2.3	3.3	3.5	3.8	3.2	2.8	Diurnal Average	
	8.8	8.2	6.2	5.7	6.8	5.7	8.4	10.6	5.6	5.5	5.8	4.1	4.6	3.0	3.1	3.8	3.4	5.2	8.7	18.2	18.4	17.4	13.6	12.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Conklin - March 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	44	37	20	18	12	45	105	89	63	52	20	18	26	33	62	55	699
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	37	20	18	12	45	105	89	63	52	20	18	26	33	62	55	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Conklin

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Conklin - March 2023

Maximum Value: 22.7 ppb on Mar 16 20:00

Maximum Daily Average: 6.7 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 26 19:00

Minimum Daily Average: 1.1 ppb on Mar 26

Maximum Diurnal Average: 4.1 ppb at hour 22

Minimum Diurnal Average: 1.8 ppb at hour 18

Monthly Average: 2.74 ppb

Percentiles: P_1 = 0.4 P_{10} = 0.8 Q_1 = 1.3 Median = 2.0 Q_3 = 3.3 P_{90} = 5.2 P_{99} = 13.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	3.1	4.0	3.6	3.3	3.4	3.9	4.1	5.3	3.7	3.7	3.7	3.5	2.9	3.2	3.2	3.3	3.4	3.0	2.8	2.4	2.3	2.5	2.5	3.4	5.3
2-Mar	3.0	Z	3.4	3.4	3.7	5.0	5.8	5.2	5.1	5.8	5.9	5.1	4.0	3.6	2.9	3.4	6.1	2.1	1.7	1.7	2.0	4.9	1.1	0.7	3.7	6.1
3-Mar	0.7	1.3	Z	1.5	1.5	1.8	1.4	1.1	1.3	1.5	1.3	1.0	1.1	0.5	1.0	0.5	2.7	0.8	0.7	4.8	5.8	6.9	8.7	10.6	2.5	10.6
4-Mar	7.7	6.3	4.5	Z	0.8	1.3	1.7	1.6	1.7	1.8	5.5	1.0	1.9	0.9	0.7	4.5	0.5	0.4	0.5	0.4	0.5	0.6	1.1	1.5	2.1	7.7
5-Mar	1.5	2.1	2.5	2.5	Z	2.3	2.8	5.2	5.3	5.6	2.7	1.8	1.3	1.3	1.1	1.2	1.3	2.0	3.6	3.2	7.4	10.1	10.4	DF	3.5	10.4
6-Mar	6.9	12.5	6.3	5.8	4.5	4.8	4.2	4.4	6.6	7.3	5.4	2.8	2.5	2.9	Z	2.3	2.3	2.1	1.5	1.4	2.3	3.0	1.8	1.5	4.1	12.5
7-Mar	2.1	1.8	1.9	1.8	1.8	Z	2.3	1.8	2.2	2.5	2.0	2.0	1.9	1.7	1.8	1.6	1.3	1.4	1.6	1.9	2.3	2.4	2.5	2.6	2.0	2.6
8-Mar	Z	1.8	2.0	2.0	1.9	3.2	2.8	2.8	3.9	3.4	3.1	1.7	1.4	1.6	1.8	2.3	1.4	1.5	1.2	0.6	1.5	16.2	16.3	12.7	3.8	16.3
9-Mar	8.9	Z	4.0	2.2	2.5	2.8	2.6	2.9	4.7	4.7	1.6	1.2	1.6	1.3	1.4	1.3	1.9	1.6	1.5	2.2	0.9	0.8	1.3	1.4	2.4	8.9
10-Mar	1.6	1.6	Z	1.9	1.7	1.2	1.8	2.1	2.1	1.7	1.8	2.0	2.0	1.7	1.4	1.2	1.3	1.4	1.3	1.1	1.1	1.2	0.7	1.0	1.5	2.1
11-Mar	1.1	1.1	1.6	Z	2.4	1.8	2.3	2.6	6.2	4.7	3.3	5.2	2.8	1.4	1.1	1.3	1.8	1.8	1.7	2.2	3.8	2.7	2.0	2.7	2.5	6.2
12-Mar	2.6	2.0	2.7	1.9	Z	2.7	3.3	2.5	2.2	2.1	2.0	1.7	2.1	1.5	1.6	1.8	2.3	2.6	2.6	2.8	2.2	1.4	1.4	2.1	2.2	3.3
13-Mar	1.5	1.8	1.6	2.0	1.8	Z	2.9	4.3	3.6	5.0	4.4	4.6	2.6	1.5	1.1	0.8	1.0	0.8	0.7	1.5	1.2	0.7	0.6	0.6	2.0	5.0
14-Mar	Z	0.6	0.6	0.6	0.8	0.6	0.7	0.7	0.5	0.5	0.8	0.6	0.6	1.4	3.0	4.6	4.2	2.3	2.0	2.3	2.2	1.7	1.9	3.2	1.6	4.6
15-Mar	3.6	Z	3.0	3.8	3.8	4.6	6.7	10.4	9.1	7.3	4.2	3.6	3.4	2.6	10.7	2.8	2.2	2.0	9.7	17.2	10.1	18.9	8.9	6.8	6.7	18.9
16-Mar	6.4	4.8	Z	4.9	6.9	5.9	5.3	5.8	6.7	7.6	4.3	3.1	2.6	2.1	1.7	1.4	2.1	1.7	5.4	22.7	18.8	13.1	8.3	5.5	6.4	22.7
17-Mar	3.9	2.7	2.0	Z	2.2	3.1	2.6	3.0	3.4	3.7	3.5	2.7	3.0	1.7	1.2	1.5	1.7	1.5	3.0	4.7	4.4	12.1	6.5	3.9	3.4	12.1
18-Mar	2.5	2.2	2.3	1.9	Z	2.8	3.3	2.5	2.7	3.1	9.8	3.5	2.7	2.0	1.5	2.2	1.2	1.4	1.5	2.7	4.7	6.3	2.9	2.9	3.0	9.8
19-Mar	2.5	2.2	2.0	1.8	1.7	Z	2.4	4.2	4.1	6.5	5.2	2.4	2.4	1.6	1.5	1.7	1.3	0.9	1.2	1.1	0.8	1.3	1.8	1.5	2.3	6.5
20-Mar	Z	1.9	2.0	2.0	1.6	1.5	1.2	1.4	1.6	3.3	4.2	4.0	5.4	3.6	2.2	2.1	1.4	0.9	0.7	0.6	0.6	1.1	0.8	0.6	1.9	5.4
21-Mar	0.5	Z	2.0	0.9	1.1	1.0	1.2	1.2	0.9	0.8	1.6	1.3	1.4	0.9	0.9	1.0	0.9	0.9	2.0	2.1	5.1	2.3	1.2	1.3	1.4	5.1
22-Mar	1.7	2.1	Z	2.2	1.9	1.8	9.6	14.9	2.6	2.1	2.9	2.7	3.1	3.3	3.7	3.7	3.4	2.9	3.7	5.1	4.2	3.3	3.6	3.1	3.8	14.9
23-Mar	3.2	3.5	5.3	Z	4.4	4.9	4.4	4.7	4.3	3.3	2.1	2.1	1.4	1.1	0.9	1.3	0.9	3.6	5.1	2.6	2.0	1.1	1.0	0.7	2.8	5.3
24-Mar	0.7	0.6	0.6	0.6	Z	0.6	0.7	0.7	0.8	1.0	0.9	0.9	0.9	1.1	1.0	1.1	1.0	1.1	5.3	8.6	5.0	2.8	2.7	2.8	1.8	8.6
25-Mar	2.1	1.0	0.8	1.0	1.1	Z	9.0	6.7	2.8	2.1	1.3	1.0	0.8	0.8	0.9	2.9	4.0	2.7	2.2	2.0	1.8	1.7	1.9	2.2	2.3	9.0
26-Mar	Z	1.7	1.4	1.3	1.2	2.9	2.0	0.7	0.8	0.7	0.6	0.5	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.3	2.1	2.6	2.4	2.3	1.1	2.9
27-Mar	1.9	Z	1.3	1.6	2.0	2.1	2.4	2.4	4.5	2.8	1.2	1.1	1.2	2.4	1.7	1.8	1.4	0.7	0.7	0.9	9.6	1.7	1.8	1.4	2.1	9.6
28-Mar	1.5	1.4	Z	1.6	1.6	1.3	1.5	3.5	2.9	2.9	4.3	2.9	2.8	2.8	1.7	2.0	1.0	1.1	1.8	7.8	5.3	1.3	1.3	1.0	2.4	7.8
29-Mar	1.1	1.1	1.4	Z	1.5	2.0	2.5	1.8	2.4	C	C	C	C	C	1.5	1.3	1.7	5.5	4.4	2.4	0.8	0.8	1.4	2.6	2.0	5.5
30-Mar	0.6	0.4	0.6	0.6	Z	0.9	1.2	2.8	2.4	2.1	1.8	2.0	2.0	1.0	0.6	0.8	0.8	1.0	1.4	1.6	1.6	1.6	1.2	1.3	1.3	2.8
31-Mar	1.4	1.7	1.4	1.7	2.0	Z	2.6	4.0	5.1	4.4	4.5	4.2	3.8	3.4	3.4	3.4	3.2	3.0	2.5	2.2	2.3	1.7	1.8	2.0	2.9	5.1
	2.7	2.4	2.4	2.1	2.3	2.5	3.1	3.6	3.5	3.5	3.2	2.4	2.2	1.8	1.9	2.0	1.9	1.8	2.4	3.7	3.7	4.1	3.3	2.8	Diurnal Average	
	8.9	12.5	6.3	5.8	6.9	5.9	9.6	14.9	9.1	7.6	9.8	5.2	5.4	3.6	10.7	4.6	6.1	5.5	9.7	22.7	18.8	18.9	16.3	12.7	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.86	99.86
21 - 40	1	0.14	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Conklin - March 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	44	37	20	18	12	45	105	89	62	52	20	18	26	33	62	55	698
21 - 40	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	37	20	18	12	45	105	89	63	52	20	18	26	33	62	55	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Conklin

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 57.5 ppb on Mar 18 16:00

Maximum Daily Average: 49.7 ppb on Mar 23

Minimum Value: 13.3 ppb on Mar 15 22:00

Maximum Diurnal Average: 46.0 ppb at hour 17

Monthly Average: 38.76 ppb

Minimum Daily Average: 26.7 ppb on Mar 5

Minimum Diurnal Average: 30.1 ppb at hour 7

Percentiles: P_1 = 16.5 P_{10} = 23.1 Q_1 = 32.9 Median = 40.7 Q_3 = 45.6 P_{90} = 50.5 P_{99} = 55.9

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	18.5	20.8	21.3	23.3	Z	26.8	28.8	30.1	27.0	34.9	36.8	37.9	38.7	40.1	40.7	41.8	41.2	42.2	41.1	42.1	42.5	42.9	43.0	42.4	35.0	43.0
2-Mar	41.4	40.8	40.6	40.3	40.0	Z	37.1	37.8	37.8	37.7	37.9	39.2	40.8	42.3	43.2	42.9	43.6	43.8	43.3	43.8	42.3	42.4	43.3	43.0	41.1	43.8
3-Mar	Z	44.1	44.6	44.5	44.0	43.4	43.5	43.0	42.9	43.1	43.0	41.9	42.1	41.9	42.0	42.4	41.9	41.5	40.8	32.6	30.5	27.9	25.6	23.4	39.6	44.6
4-Mar	27.9	Z	29.9	31.2	36.1	33.9	33.9	33.9	34.4	35.8	36.3	37.0	36.4	37.1	37.2	35.9	37.3	36.6	35.9	34.0	30.7	27.3	26.3	22.8	33.4	37.3
5-Mar	21.2	20.1	Z	17.6	17.1	16.5	16.0	17.9	22.7	28.2	31.4	33.6	36.3	37.2	38.3	39.2	39.2	37.3	31.3	28.4	23.5	18.4	16.0	DF	26.7	39.2
6-Mar	16.8	13.9	14.1	16.0	21.2	19.7	19.5	17.2	18.7	23.4	31.1	37.1	Z	39.5	41.3	40.9	41.1	41.1	40.5	39.6	37.8	36.5	38.6	39.6	29.8	41.3
7-Mar	38.5	38.4	39.9	Z	40.8	39.8	38.4	37.0	37.4	38.2	38.7	39.0	40.8	42.4	43.7	44.8	45.7	45.2	44.8	44.0	42.2	40.8	39.1	37.9	40.8	45.7
8-Mar	36.1	31.6	26.7	25.6	Z	23.9	22.2	23.1	26.2	35.7	37.8	40.8	41.0	40.7	40.9	41.6	42.7	42.1	41.1	40.1	38.8	28.0	20.5	17.5	33.2	42.7
9-Mar	19.5	21.9	21.2	23.1	23.7	Z	22.4	22.4	26.2	32.9	C	C	C	C	39.2	39.6	39.9	40.4	39.3	38.3	39.8	39.6	39.1	38.6	31.9	40.4
10-Mar	Z	37.7	37.3	36.1	35.5	35.9	35.6	34.9	34.9	36.8	37.8	39.0	39.9	39.8	39.8	40.3	41.1	41.6	41.5	40.6	41.4	40.8	37.8	34.6	38.3	41.6
11-Mar	30.0	Z	24.5	24.9	25.7	24.0	20.2	19.1	21.8	28.1	33.8	34.5	38.4	40.8	42.3	42.6	43.1	43.0	42.7	42.2	40.8	41.5	40.9	38.8	34.1	43.1
12-Mar	37.1	31.7	Z	24.8	21.6	20.1	17.8	19.8	27.7	39.1	42.3	43.4	43.9	45.7	45.3	44.2	44.7	45.7	44.8	43.2	44.6	46.0	44.3	39.7	37.3	46.0
13-Mar	38.1	39.0	36.9	Z	29.2	25.4	24.9	27.1	34.6	37.6	43.0	43.7	46.6	47.8	47.7	47.7	47.3	46.6	46.0	45.0	44.8	44.6	44.2	44.2	40.5	47.8
14-Mar	44.5	44.4	44.2	43.6	Z	42.9	43.0	41.7	40.4	40.9	41.0	41.2	41.1	40.3	38.7	37.3	38.7	39.8	40.0	38.6	38.0	39.5	39.4	37.6	40.7	44.5
15-Mar	34.7	31.9	27.7	25.1	22.8	Z	17.9	16.5	22.9	31.8	34.8	36.8	38.1	40.2	38.8	40.3	40.9	40.1	31.7	24.4	22.0	13.3	18.3	16.5	29.0	40.9
16-Mar	Z	18.2	20.4	21.0	21.9	22.9	23.4	23.0	24.2	26.2	31.5	35.3	36.9	38.7	40.8	42.2	43.1	42.8	37.8	21.7	17.0	16.9	18.9	20.4	28.1	43.1
17-Mar	24.1	Z	22.1	22.0	18.8	18.4	18.2	18.6	25.7	41.2	45.3	47.5	50.8	54.0	56.2	55.5	55.6	55.6	54.2	53.5	52.2	44.0	46.2	51.5	40.5	56.2
18-Mar	51.5	47.0	Z	40.7	35.5	32.7	39.2	40.1	50.5	51.3	50.1	53.9	54.5	56.1	57.3	57.5	56.0	54.6	52.5	44.4	36.3	32.1	34.5	32.0	46.1	57.5
19-Mar	30.6	29.0	27.9	Z	25.0	23.8	23.0	22.0	33.8	40.1	43.7	47.0	48.2	49.2	49.6	49.5	48.7	47.5	46.6	45.5	44.0	42.5	39.9	38.0	38.9	49.6
20-Mar	35.8	34.8	34.4	33.6	Z	37.6	37.8	37.3	38.2	40.9	49.1	54.3	53.9	45.8	45.9	46.4	43.6	42.0	42.1	41.8	41.0	40.3	40.4	40.6	41.6	54.3
21-Mar	40.9	39.7	40.6	44.0	44.0	Z	40.3	39.6	40.8	42.2	41.5	42.5	44.0	45.6	45.7	45.9	46.2	46.6	44.0	41.1	37.3	32.6	30.5	28.2	41.0	46.6
22-Mar	Z	34.1	35.0	34.1	30.6	27.9	22.0	19.6	44.1	48.3	49.0	50.0	51.3	52.8	53.5	53.6	55.0	55.9	54.7	50.4	53.5	54.9	53.5	51.7	45.0	55.9
23-Mar	51.9	Z	49.9	51.5	51.0	49.8	47.6	47.5	49.1	50.3	52.1	52.3	52.9	52.8	52.7	51.2	50.5	48.6	46.3	46.6	46.8	47.3	46.6	47.1	49.7	52.9
24-Mar	47.0	46.8	Z	46.8	46.8	46.8	44.6	43.9	44.5	44.8	45.4	46.3	46.9	47.9	49.1	50.8	51.3	50.0	43.4	36.7	30.7	29.1	27.5	29.1	43.3	51.3
25-Mar	27.9	30.6	32.9	Z	30.7	26.4	17.7	27.3	43.3	50.2	50.6	53.2	52.7	53.4	53.8	52.0	51.1	51.3	51.0	48.2	43.5	37.9	34.6	30.9	41.3	53.8
26-Mar	33.3	29.9	29.5	28.9	Z	36.3	39.5	40.9	40.8	40.5	41.0	42.4	44.0	45.1	44.9	45.7	45.9	45.7	44.5	42.3	36.0	32.9	30.7	28.4	38.6	45.9
27-Mar	26.4	26.2	25.1	24.2	26.5	Z	25.6	29.5	33.6	42.3	44.7	44.6	45.0	43.9	45.9	46.5	46.4	47.8	46.8	42.7	32.7	36.6	36.1	32.9	37.1	47.8
28-Mar	Z	30.6	30.1	26.3	24.2	21.6	21.9	25.4	39.6	41.9	43.7	47.1	47.6	47.4	49.5	52.1	52.6	52.2	50.5	43.0	46.8	51.2	50.5	50.6	41.1	52.6
29-Mar	50.5	Z	49.5	49.0	48.3	45.3	40.0	42.7	46.0	47.0	48.7	48.3	47.0	47.6	47.2	47.6	46.9	42.6	42.4	43.7	44.4	43.7	38.1	36.2	45.3	50.5
30-Mar	42.6	42.7	Z	33.9	28.0	25.9	25.2	29.3	37.0	41.4	43.5	44.5	45.6	47.6	48.0	48.3	48.6	48.3	47.8	48.1	47.8	48.3	48.6	48.1	42.1	48.6
31-Mar	47.8	47.3	47.9	Z	45.9	42.7	45.6	49.9	52.8	53.2	52.7	52.8	52.7	54.2	55.3	55.9	56.4	55.6	54.8	50.1	42.1	38.8	34.3	30.6	48.7	56.4
	35.2	33.6	32.9	32.0	32.1	31.2	30.1	30.9	35.5	39.5	41.9	43.6	44.8	45.3	45.6	45.9	46.0	45.6	44.0	41.2	39.1	37.4	36.4	35.8	Diurnal Average	
	51.9	47.3	49.9	51.5	51.0	49.8	47.6	49.9	52.8	53.2	52.7	54.3	54.5	56.1	57.3	57.5	56.4	55.9	54.8	53.5	53.5	54.9	53.5	51.7	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	42	5.93	5.93
21 - 50	595	84.04	89.97
51 - 82	71	10.03	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Conklin - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	0	0	0	0	0	4	9	10	7	6	1	1	1	0	0	3	42
21 - 50	47	35	19	17	12	38	88	77	52	32	12	12	22	28	50	44	585
51 - 82	3	3	0	1	0	1	4	2	4	13	8	4	5	4	13	6	71
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	50	38	19	18	12	43	101	89	63	51	21	17	28	32	63	53	698

Total Number of Valid Hours: 698

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Conklin

Total Number of Valid Hours: 698

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 44.7 $\mu g/m^3$ on Mar 22 01:00

Maximum Daily Average: 9.7 $\mu g/m^3$ on Mar 22

Minimum Value: 0.3 $\mu g/m^3$ on Mar 2 21:00

Maximum Diurnal Average: 7.3 $\mu g/m^3$ at hour 1

Monthly Average: 5.36 $\mu g/m^3$

Minimum Daily Average: 2.2 $\mu g/m^3$ on Mar 3

Minimum Diurnal Average: 4.0 $\mu g/m^3$ at hour 17

Percentiles: P_1 = 0.8 P_{10} = 2.7 Q_1 = 3.5 Median = 4.4 Q_3 = 6.0 P_{90} = 9.5 P_{99} = 18.8

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	2
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	2.4	1.7	1.8	1.5	1.5	1.9	3.1	4.4	9.1	4.1	4.7	5.0	5.6	6.5	6.1	6.6	6.5	7.1	6.6	7.5	7.1	7.7	7.9	7.5	5.2	9.1
2-Mar	8.0	8.8	9.4	10.0	11.9	13.0	13.1	12.5	13.1	13.5	12.5	10.5	7.2	4.8	3.0	1.3	0.9	0.8	0.5	0.3	0.3	0.4	0.4	0.6	6.5	13.5
3-Mar	0.5	1.0	1.1	1.0	1.0	0.9	1.0	1.5	1.2	1.2	1.2	1.0	0.9	1.3	2.0	2.2	2.2	2.1	2.0	4.5	5.0	5.5	6.2	6.8	2.2	6.8
4-Mar	7.3	10.1	5.8	5.5	4.2	4.0	4.2	4.2	4.4	4.3	4.1	3.8	3.7	3.5	3.6	3.9	3.6	3.3	5.5	3.0	3.2	3.1	11.1	3.0	4.7	11.1
5-Mar	5.3	3.3	4.1	9.9	9.2	5.2	7.8	4.2	4.9	4.4	3.4	3.0	2.7	2.2	2.3	2.1	2.3	2.8	3.5	3.7	4.6	5.0	16.5	DF	4.9	16.5
6-Mar	10.6	8.3	7.5	4.3	2.2	3.6	3.1	3.9	6.2	4.7	2.9	2.6	2.7	2.8	2.6	2.5	2.4	2.2	2.4	2.6	2.8	2.9	2.5	2.3	3.8	10.6
7-Mar	2.5	2.5	2.6	2.8	2.8	2.8	2.9	2.9	3.3	4.9	4.0	3.7	3.6	3.2	2.8	2.6	2.7	2.5	2.9	3.3	3.5	3.5	3.1	3.0	3.1	4.9
8-Mar	3.4	6.8	3.3	3.0	4.2	3.9	5.8	3.3	3.6	3.7	3.6	3.5	3.2	3.2	3.0	2.4	2.2	2.5	4.1	3.0	3.1	4.5	7.2	4.6	3.8	7.2
9-Mar	3.2	2.7	4.2	2.9	6.9	4.0	2.3	2.4	4.5	3.6	3.1	3.2	3.4	3.5	3.7	3.6	3.6	3.5	3.4	3.8	4.7	4.9	4.3	4.0	3.7	6.9
10-Mar	4.4	4.3	4.0	3.8	3.8	3.7	3.6	4.1	4.2	4.6	4.7	4.7	4.9	4.7	4.1	3.8	3.6	3.6	3.7	4.5	3.5	2.9	3.3	4.7	4.1	4.9
11-Mar	4.0	3.4	4.4	8.1	5.4	4.1	7.4	5.7	4.2	4.2	3.5	3.3	3.4	3.1	2.7	2.4	2.7	2.6	3.1	2.9	4.4	6.6	3.2	3.4	4.1	8.1
12-Mar	3.4	3.3	4.0	5.8	3.3	2.9	2.9	3.0	3.4	4.1	4.4	4.0	3.8	3.7	4.2	3.6	3.4	5.0	4.0	3.5	4.3	4.4	5.8	11.6	4.2	11.6
13-Mar	6.4	6.2	5.1	4.0	4.5	9.2	4.1	4.6	5.7	5.7	5.9	5.6	5.1	4.2	4.0	3.6	3.5	3.6	3.6	3.9	4.0	3.4	3.0	3.1	4.7	9.2
14-Mar	4.3	3.5	3.5	2.9	2.9	3.4	2.4	2.1	2.3	2.4	2.6	2.6	2.7	3.4	3.8	4.5	4.2	4.1	3.8	3.9	4.0	4.2	3.4	3.5	3.4	4.5
15-Mar	3.7	4.0	3.6	6.9	8.0	5.4	5.0	4.7	3.7	3.9	3.9	3.6	3.5	3.4	3.5	3.4	3.5	3.4	4.2	4.5	4.3	5.3	5.5	4.9	4.4	8.0
16-Mar	3.9	5.2	3.1	5.4	11.2	4.1	4.4	4.8	4.0	3.8	4.3	4.4	4.6	5.0	4.6	4.5	4.2	4.3	4.5	12.1	12.8	4.8	8.8	7.8	5.7	12.8
17-Mar	4.3	3.7	3.2	3.4	3.5	5.4	9.9	3.8	4.4	5.3	5.4	4.6	4.5	4.1	4.2	4.3	4.2	3.6	3.7	16.2	7.1	5.9	4.5	6.5	5.2	16.2
18-Mar	14.2	5.6	5.2	5.5	6.3	5.9	9.5	10.3	7.1	7.3	7.8	6.6	5.5	4.9	5.2	4.9	5.1	4.8	4.5	4.7	7.5	7.9	6.4	11.8	6.9	14.2
19-Mar	11.7	8.9	9.4	9.5	7.7	8.2	14.2	7.0	9.1	5.3	3.7	3.5	3.4	3.3	3.2	2.9	2.7	3.0	3.5	4.7	3.8	4.6	5.0	4.9	6.0	14.2
20-Mar	5.9	4.5	4.9	6.8	4.3	4.6	4.8	4.1	4.5	6.7	9.3	10.8	9.7	6.0	5.7	6.1	5.2	4.2	4.3	4.6	4.5	4.6	4.9	4.7	5.7	10.8
21-Mar	4.6	4.8	4.3	4.3	4.3	4.7	4.6	4.5	4.4	4.0	4.8	4.5	3.9	3.8	4.1	4.1	4.6	5.0	4.7	4.8	6.5	12.8	4.9	3.8	4.9	12.8
22-Mar	44.7	9.2	4.7	4.9	5.3	4.6	6.4	4.9	6.9	6.6	8.3	7.6	7.7	7.8	7.9	8.5	8.4	8.7	9.6	12.4	10.7	12.1	12.3	12.8	9.7	44.7
23-Mar	14.5	16.8	19.1	20.9	20.3	20.3	17.7	11.4	6.7	5.5	4.5	4.7	3.5	3.3	3.0	2.9	1.9	4.4	5.7	5.1	4.7	4.5	4.5	4.3	8.8	20.9
24-Mar	4.1	4.1	4.1	3.9	3.9	4.0	4.0	4.0	4.0	3.9	3.9	3.9	4.0	3.9	4.2	3.9	3.9	3.8	8.6	13.6	30.7	18.5	8.8	7.3	6.6	30.7
25-Mar	11.5	4.7	4.0	4.9	7.3	9.6	6.5	6.0	6.9	5.5	5.0	4.5	4.4	4.8	4.6	5.0	5.2	4.5	5.5	5.4	4.9	4.6	4.7	4.4	5.6	11.5
26-Mar	16.3	4.7	3.6	3.9	3.5	4.3	15.1	3.8	4.1	3.8	3.6	3.7	3.8	3.7	3.4	3.2	3.1	3.2	3.0	3.1	3.4	3.2	7.5	9.5	5.0	16.3
27-Mar	6.1	4.9	4.7	4.9	6.4	6.1	6.0	14.3	8.2	5.7	4.6	4.5	4.7	5.7	5.4	5.0	5.2	4.3	4.7	6.3	13.2	10.8	19.0	23.2	7.7	23.2
28-Mar	5.5	11.1	5.9	4.5	6.1	3.6	3.4	8.3	5.5	6.6	9.0	7.0	6.5	5.9	4.5	3.8	3.9	4.6	12.9	11.3	5.4	5.6	4.7	4.0	6.2	12.9
29-Mar	4.0	4.1	4.2	4.6	5.0	7.0	14.3	15.3	3.7	3.4	C	C	4.6	3.6	4.7	4.1	4.0	6.5	7.7	6.5	3.7	12.8	7.0	5.1	6.2	15.3
30-Mar	2.0	1.3	2.9	2.5	4.9	4.6	6.5	5.6	7.4	5.0	4.4	4.7	5.3	3.2	2.6	3.7	2.8	4.1	6.4	6.9	6.2	6.3	4.7	3.8	4.5	7.4
31-Mar	4.0	4.4	5.0	6.7	6.4	7.4	9.5	11.9	11.8	11.2	10.3	10.9	11.4	11.7	11.5	12.2	11.2	10.0	8.0	7.8	9.8	7.6	5.9	5.5	8.8	12.2
	7.3	5.4	4.9	5.5	5.7	5.6	6.6	5.9	5.6	5.1	5.1	4.9	4.6	4.3	4.2	4.1	4.0	4.1	4.9	5.8	6.3	6.2	6.4	6.1	Diurnal Average	
	44.7	16.8	19.1	20.9	20.3	20.3	17.7	15.3	13.1	13.5	12.5	10.9	11.4	11.7	11.5	12.2	11.2	10.0	12.9	16.2	30.7	18.5	19.0	23.2	Diurnal Maximum	

C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Conklin - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	525	70.85	70.85
6 - 15	202	27.26	98.11
16 - 25	12	1.62	99.73
26 - 80	2	0.27	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Conklin - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	37	26	18	16	10	38	88	66	22	24	12	17	20	24	56	48	522
6 - 15	11	12	3	2	2	6	20	28	43	27	7	2	7	9	7	9	195
16 - 25	0	0	0	0	0	1	1	2	1	1	3	0	1	0	1	1	12
26 - 80	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	38	21	18	12	45	109	97	67	52	22	19	28	33	64	58	731

Total Number of Valid Hours: 731

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Conklin

Total Number of Valid Hours: 731

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Conklin - March 2023

Maximum Value: 9.6 C on Mar 18 16:00

Maximum Daily Average: -0.9 C on Mar 23

Minimum Value: -31.4 C on Mar 6 03:00

Minimum Daily Average: -22.9 C on Mar 5

Maximum Diurnal Average: -2.1 C at hour 16

Minimum Diurnal Average: -16.0 C at hour 7

Monthly Average: -9.21 C

Percentiles: P_1 = -29.5 P_{10} = -20.1 Q_1 = -14.3 Median = -8.1 Q_3 = -3.8 P_{90} = 0.7 P_{99} = 8.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-20.1	-19.7	-18.8	-17.8	-16.9	-15.8	-14.9	-16.2	-17.2	-13.0	-11.3	-9.3	-8.2	-7.1	-6.8	-6.4	-7.2	-8.0	-8.9	-9.5	-9.4	-9.4	-9.5	-9.6	-12.1	-6.4
2-Mar	-9.7	-9.7	-9.6	-9.3	-8.9	-8.5	-8.1	-7.1	-6.4	-5.5	-3.3	-0.5	2.0	3.7	5.0	4.6	4.2	3.0	1.0	-0.5	-1.1	-0.9	-1.3	-2.3	-2.9	5.0
3-Mar	-3.4	-2.2	-2.8	-2.8	-3.0	-3.0	-2.8	-3.1	-2.8	-2.1	-1.9	-1.6	-1.1	-1.2	-1.2	-1.7	-1.9	-2.9	-3.8	-6.3	-7.8	-8.7	-9.7	-10.6	-3.7	-1.1
4-Mar	-11.0	-11.2	-11.4	-11.5	-12.5	-14.7	-15.2	-15.4	-14.9	-14.0	-13.6	-13.0	-13.0	-13.1	-13.0	-13.1	-13.4	-14.3	-15.2	-18.1	-21.6	-24.0	-25.2	-25.6	-15.3	-11.0
5-Mar	-27.4	-28.0	-28.5	-29.3	-30.2	-30.7	-30.8	-28.7	-23.4	-19.8	-18.1	-16.5	-15.5	-15.1	-13.9	-13.4	-13.3	-15.6	-21.0	-24.4	-26.5	-28.1	-29.3	DF	-22.9	-13.3
6-Mar	-29.7	-30.5	-31.4	-29.3	-26.6	-25.7	-25.1	-26.2	-24.3	-20.0	-15.4	-12.8	-10.9	-10.1	-10.3	-10.0	-10.1	-10.8	-12.0	-13.4	-14.4	-15.1	-14.8	-14.2	-18.4	-10.0
7-Mar	-14.1	-14.7	-14.1	-14.2	-14.7	-15.4	-16.3	-17.7	-16.2	-14.3	-12.6	-10.4	-8.1	-6.4	-5.3	-5.0	-5.2	-6.5	-7.8	-9.3	-11.1	-12.4	-13.6	-14.7	-11.7	-5.0
8-Mar	-16.7	-20.5	-22.3	-23.6	-24.5	-25.5	-26.5	-25.8	-21.8	-15.3	-12.3	-9.4	-8.0	-7.1	-6.5	-6.2	-6.2	-7.4	-9.7	-11.7	-14.1	-17.6	-20.8	-23.0	-15.9	-6.2
9-Mar	-24.8	-26.0	-27.3	-28.0	-28.8	-29.6	-29.6	-29.2	-24.2	-17.3	-13.4	-11.1	-9.2	-8.6	-8.5	-8.4	-8.5	-9.0	-9.9	-10.6	-10.8	-11.0	-11.5	-11.8	-17.0	-8.4
10-Mar	-11.8	-12.0	-12.0	-12.4	-12.7	-12.7	-12.6	-12.7	-12.3	-11.4	-10.3	-8.3	-7.0	-6.0	-5.7	-5.7	-5.6	-6.0	-7.0	-8.1	-7.5	-7.7	-8.8	-12.3	-9.5	-5.6
11-Mar	-15.7	-18.2	-18.1	-16.1	-15.1	-16.9	-19.9	-20.7	-18.0	-13.0	-9.1	-7.2	-4.8	-3.3	-2.6	-2.4	-2.5	-3.0	-3.8	-4.7	-6.7	-7.3	-7.7	-8.9	-10.2	-2.4
12-Mar	-9.6	-11.6	-12.9	-13.4	-13.8	-13.6	-14.5	-14.6	-11.7	-8.8	-7.4	-6.4	-5.3	-4.4	-4.1	-4.0	-3.8	-4.2	-4.8	-5.5	-6.7	-9.1	-11.7	-15.1	-9.0	-3.8
13-Mar	-14.8	-14.6	-15.0	-15.8	-17.3	-19.5	-19.9	-18.0	-16.1	-12.4	-9.7	-8.1	-6.0	-4.8	-4.2	-4.1	-4.8	-6.0	-7.0	-7.3	-7.4	-7.6	-7.5	-7.3	-10.6	-4.1
14-Mar	-7.2	-7.2	-7.2	-7.2	-7.3	-7.3	-7.3	-7.6	-8.3	-8.3	-7.9	-7.5	-6.6	-6.4	-6.9	-7.4	-7.6	-7.8	-8.4	-9.4	-9.9	-9.9	-10.6	-12.6	-8.1	-6.4
15-Mar	-16.2	-18.9	-21.7	-23.6	-25.2	-26.4	-26.8	-25.4	-19.0	-14.6	-12.2	-10.4	-8.2	-7.3	-5.8	-4.7	-4.6	-5.6	-9.3	-13.8	-16.9	-18.9	-20.1	-20.7	-15.7	-4.6
16-Mar	-20.5	-19.1	-17.2	-16.3	-15.6	-15.0	-14.2	-13.4	-12.4	-10.7	-8.0	-5.3	-3.6	-2.1	-0.9	-0.5	-0.3	-1.1	-4.8	-9.1	-12.6	-14.5	-16.1	-17.4	-10.4	-0.3
17-Mar	-17.1	-16.3	-18.5	-18.7	-20.2	-20.5	-20.3	-18.3	-10.5	-3.1	0.7	3.9	6.4	7.9	8.4	8.4	8.1	7.1	4.4	1.1	-0.6	-2.1	-3.5	-2.9	-4.8	8.4
18-Mar	-4.6	-8.3	-11.4	-12.6	-14.2	-14.8	-13.5	-12.8	-6.0	-2.8	1.6	4.5	6.9	8.8	9.3	9.6	9.4	8.4	3.7	-2.1	-4.6	-6.2	-7.7	-9.2	-2.9	9.6
19-Mar	-10.5	-11.5	-12.4	-13.2	-14.0	-14.7	-15.5	-13.0	-6.4	-2.9	1.0	3.5	5.0	5.6	5.8	6.2	5.6	3.9	2.0	0.2	-1.1	-2.4	-4.2	-4.8	-3.7	6.2
20-Mar	-5.5	-5.1	-6.7	-8.1	-7.7	-6.5	-7.6	-6.9	-5.3	-2.9	0.2	2.4	2.8	1.8	0.7	-0.9	-3.2	-5.2	-6.0	-6.9	-7.7	-8.1	-8.0	-8.1	-4.5	2.8
21-Mar	-8.3	-8.5	-8.9	-9.0	-8.9	-9.2	-9.5	-9.4	-8.6	-8.1	-7.6	-6.7	-5.0	-3.7	-2.8	-2.5	-2.8	-3.4	-5.1	-7.4	-9.7	-13.1	-15.2	-16.8	-7.9	-2.5
22-Mar	-17.2	-16.5	-16.8	-17.7	-18.8	-20.0	-20.1	-17.6	-8.3	-5.3	-3.9	-2.4	0.1	1.5	2.6	3.1	3.4	3.0	0.7	-2.5	-2.4	-3.2	-4.6	-6.6	-7.1	3.4
23-Mar	-6.6	-8.4	-5.9	-4.9	-5.4	-6.2	-7.2	-3.9	0.7	3.4	5.5	6.5	6.8	6.7	6.1	5.4	5.9	4.0	0.9	-1.7	-3.7	-5.4	-7.3	-7.6	-0.9	6.8
24-Mar	-7.6	-7.6	-7.7	-8.0	-8.2	-8.4	-8.8	-8.8	-8.1	-6.7	-6.3	-4.5	-2.8	-2.0	-1.3	-1.1	-0.9	-1.0	-3.3	-7.2	-10.0	-12.4	-14.1	-14.2	-6.7	-0.9
25-Mar	-15.2	-15.0	-14.9	-14.5	-14.1	-15.4	-15.7	-12.3	-5.2	-2.0	-0.7	0.7	1.5	1.9	1.9	1.5	0.6	-0.8	-2.6	-4.5	-8.1	-11.1	-13.0	-14.5	-7.1	1.9
26-Mar	-15.9	-17.6	-18.9	-20.1	-20.7	-17.1	-16.1	-15.4	-13.2	-12.3	-10.3	-8.5	-8.6	-8.1	-7.5	-7.5	-7.8	-8.7	-10.4	-13.5	-17.5	-19.6	-21.5	-23.2	-14.2	-7.5
27-Mar	-24.6	-25.5	-25.9	-26.7	-26.6	-27.2	-26.9	-22.9	-15.9	-12.4	-10.8	-9.6	-8.0	-7.4	-6.4	-6.1	-6.2	-6.6	-8.1	-11.3	-12.0	-12.6	-15.1	-18.3	-15.6	-6.1
28-Mar	-19.9	-19.4	-18.0	-17.8	-20.1	-22.6	-24.0	-19.4	-13.4	-10.1	-7.4	-5.6	-4.3	-2.9	-1.8	-1.6	-1.0	-1.0	-1.5	-3.8	-3.5	-4.5	-5.0	-4.4	-9.7	-1.0
29-Mar	-4.1	-4.5	-4.4	-4.7	-5.0	-6.5	-8.5	-5.9	-2.0	-1.1	-0.9	-0.6	-0.4	-0.2	0.2	0.6	0.8	-0.5	-1.6	-2.6	-3.7	-4.9	-7.4	-7.7	-3.2	0.8
30-Mar	-6.4	-6.9	-9.2	-10.0	-10.1	-9.9	-9.5	-8.0	-5.9	-3.8	-2.2	-0.7	0.8	1.8	2.2	2.3	2.7	2.1	1.5	0.9	-0.2	-0.6	-0.8	-1.1	-3.0	2.7
31-Mar	-1.7	-2.5	-3.4	-3.9	-5.4	-6.9	-6.8	-4.6	-2.9	-1.8	-0.8	1.1	2.5	3.7	4.8	5.1	5.3	4.9	3.2	0.1	-3.0	-4.7	-5.7	-6.1	-1.2	5.3
	-13.5	-14.1	-14.6	-14.9	-15.2	-15.7	-16.0	-14.9	-11.6	-8.8	-6.7	-5.0	-3.5	-2.7	-2.2	-2.1	-2.3	-3.2	-5.0	-7.2	-8.8	-10.1	-11.3	-11.7	Diurnal Average	
	-1.7	-2.2	-2.8	-2.8	-3.0	-3.0	-2.8	-3.1	0.7	3.4	5.5	6.5	6.9	8.8	9.3	9.6	9.4	8.4	4.4	1.1	-0.2	-0.6	-0.8	-1.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Conklin - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	76	10.23	10.23
-20 - 0	582	78.33	88.56
0 - 10	85	11.44	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Conklin - March 2023

Maximum Value: 91.4 % on Mar 14 05:00

Maximum Daily Average: 83.1 % on Mar 14

Minimum Value: 22.6 % on Mar 18 17:00

Minimum Daily Average: 50.4 % on Mar 28

Maximum Diurnal Average: 80.3 % at hour 7

Minimum Diurnal Average: 46.9 % at hour 15

Monthly Average: 65.88 %

Percentiles: P_1 = 24.6 P_{10} = 39.9 Q_1 = 54.7 Median = 70.5 Q_3 = 79.8 P_{90} = 84.4 P_{99} = 88.9

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	80.6	81.2	81.7	82.3	83.4	84.6	84.7	82.2	82.3	79.0	72.5	65.6	64.2	62.8	64.2	64.6	69.3	71.9	76.5	78.7	78.8	78.2	77.8	79.6	76.1	84.7
2-Mar	82.8	82.2	80.7	78.5	77.1	75.9	75.1	71.2	67.9	64.4	59.8	53.5	48.1	45.0	41.5	43.9	40.7	41.8	64.5	80.8	82.4	76.9	80.7	82.8	66.6	82.8
3-Mar	81.6	65.1	66.2	71.1	77.3	82.2	82.2	79.2	69.5	63.9	66.9	68.3	62.5	62.4	56.3	56.4	54.3	61.9	65.0	69.7	78.4	82.7	78.8	76.9	69.9	82.7
4-Mar	73.0	74.7	77.3	77.9	72.9	77.4	77.0	76.0	73.4	66.2	63.2	58.1	59.1	59.0	56.8	55.3	55.2	57.5	61.6	69.7	78.2	79.5	79.2	78.1	69.0	79.5
5-Mar	77.1	76.9	76.7	75.8	74.8	74.2	75.4	74.3	69.7	67.6	61.5	53.9	48.9	47.4	44.0	42.6	43.3	49.9	65.0	69.1	71.2	73.9	74.1	DF	64.7	77.1
6-Mar	73.9	75.3	74.7	75.3	74.3	75.1	75.4	75.8	72.3	65.4	64.0	63.0	56.4	53.1	63.5	62.6	63.8	68.3	77.0	79.4	80.1	79.3	72.4	66.0	70.3	80.1
7-Mar	64.3	63.4	57.4	60.9	64.5	67.4	70.7	75.3	71.1	67.0	63.0	58.5	54.6	51.3	49.2	49.8	50.9	52.4	51.1	47.6	52.1	54.6	57.0	60.4	58.9	75.3
8-Mar	65.7	76.1	78.6	79.1	78.3	78.6	78.6	76.8	73.2	56.2	48.3	38.6	34.6	33.0	31.1	29.0	27.3	30.7	36.6	44.0	50.8	62.4	71.6	73.9	56.4	79.1
9-Mar	75.3	76.3	78.0	76.8	75.7	76.1	75.0	74.1	67.3	59.2	54.7	51.0	48.9	51.1	54.7	59.0	57.6	58.2	64.6	70.2	67.5	67.2	70.6	73.2	65.9	78.0
10-Mar	73.3	74.1	74.3	73.7	74.9	75.6	75.3	75.4	73.4	67.2	64.2	61.0	60.5	60.5	63.1	64.6	62.9	66.0	67.5	70.8	69.4	72.1	76.0	83.7	70.0	83.7
11-Mar	87.2	85.1	84.2	84.5	84.5	82.9	81.7	80.7	80.6	79.0	70.8	68.3	60.0	55.9	54.9	56.5	56.3	62.3	72.4	75.8	81.8	80.2	82.1	86.6	74.8	87.2
12-Mar	88.1	88.8	88.9	86.8	86.2	86.0	85.5	84.9	84.5	80.0	75.1	70.9	69.0	66.0	68.0	71.7	65.3	63.4	65.4	65.7	68.3	72.1	80.4	86.5	77.0	88.9
13-Mar	85.9	85.3	85.1	84.3	84.0	82.9	83.1	83.4	82.2	75.8	67.8	63.3	57.4	54.0	53.3	56.0	63.7	77.4	85.5	88.2	87.9	88.0	88.1	88.2	77.1	88.2
14-Mar	88.2	89.6	91.0	90.8	91.4	91.1	90.9	89.6	87.1	84.2	81.5	77.6	77.9	76.6	74.4	73.5	73.1	74.0	77.8	85.6	84.8	82.3	80.3	81.2	83.1	91.4
15-Mar	87.3	84.8	81.5	79.9	78.1	77.3	77.2	77.6	77.2	73.6	66.7	62.6	57.4	56.3	54.9	54.9	56.4	59.9	72.7	85.1	85.7	84.2	82.5	81.7	73.1	87.3
16-Mar	81.5	81.6	82.2	83.1	83.5	83.5	83.1	82.9	81.0	76.5	73.2	66.6	60.8	59.2	56.7	54.6	52.9	54.7	67.0	81.2	86.3	86.8	85.3	86.2	74.6	86.8
17-Mar	85.6	85.6	83.3	83.1	81.7	81.5	81.5	82.6	78.6	57.9	45.7	37.5	31.8	27.5	23.9	24.6	24.6	26.1	31.7	40.3	45.1	48.6	51.8	50.2	54.6	85.6
18-Mar	55.8	66.5	75.3	78.9	81.5	82.8	82.2	78.8	60.4	51.3	38.9	32.3	27.9	24.0	22.8	24.6	22.6	26.0	37.7	60.6	76.3	79.9	81.5	83.4	56.3	83.4
19-Mar	85.3	87.0	87.1	88.6	87.6	87.2	86.6	83.5	68.9	58.0	48.8	44.5	41.7	40.6	39.3	36.9	37.2	41.4	46.4	53.8	61.5	66.6	74.5	77.9	63.8	88.6
20-Mar	80.7	79.0	84.0	86.8	84.1	81.8	85.1	81.3	74.7	66.0	54.7	48.4	49.1	50.3	58.4	67.0	76.6	82.4	81.8	81.4	83.4	84.9	83.7	83.6	74.6	86.8
21-Mar	83.7	83.6	84.4	83.4	82.5	85.5	87.3	86.6	81.7	75.9	73.2	66.6	57.5	50.0	48.1	47.9	48.3	48.6	55.3	66.6	75.2	83.4	85.3	85.3	71.9	87.3
22-Mar	85.4	85.8	85.0	84.0	82.8	82.0	81.6	83.2	75.8	56.8	55.9	52.6	45.9	42.9	40.9	39.9	39.9	41.1	48.3	59.4	57.7	59.7	64.4	71.5	63.4	85.8
23-Mar	71.8	77.5	74.0	70.5	71.4	74.5	78.5	68.4	54.5	47.4	43.2	39.5	36.2	35.3	34.2	39.5	34.5	42.7	54.4	61.9	64.1	67.8	74.2	77.0	58.0	78.5
24-Mar	76.2	73.1	72.8	74.2	73.2	71.7	80.1	82.1	74.7	64.1	59.7	50.1	44.4	40.5	36.5	31.5	29.2	32.8	44.3	57.7	74.2	78.7	81.6	79.3	61.8	82.1
25-Mar	81.2	80.9	79.1	79.1	79.8	79.9	80.0	72.2	53.7	45.5	43.8	41.0	31.5	29.3	28.8	26.3	26.5	30.4	30.3	36.6	51.4	63.3	67.5	72.6	54.6	81.2
26-Mar	74.1	78.2	80.2	81.7	81.0	79.2	77.6	72.8	61.0	55.9	49.2	42.1	39.9	36.5	31.8	27.6	26.8	28.8	33.9	44.6	59.9	67.0	71.5	74.9	57.3	81.7
27-Mar	76.6	78.1	77.6	78.9	76.0	75.6	75.9	69.0	52.3	40.7	37.1	38.5	37.7	38.2	36.7	37.3	38.9	44.5	50.7	61.8	66.5	67.8	73.7	78.8	58.7	78.9
28-Mar	81.4	79.2	77.9	79.8	81.9	82.0	79.9	75.7	58.7	46.0	37.7	29.0	26.8	25.9	23.6	23.4	25.4	28.0	30.8	41.9	40.0	44.2	46.0	45.7	50.4	82.0
29-Mar	47.0	49.6	51.8	53.6	55.9	63.1	69.9	60.8	58.4	59.5	59.8	59.9	60.2	59.6	58.3	56.4	56.7	61.4	64.1	66.7	69.5	73.1	82.4	81.8	61.6	82.4
30-Mar	76.3	77.8	84.9	87.2	87.0	86.1	84.6	80.7	72.0	62.8	53.8	44.6	37.0	35.0	37.9	38.1	38.5	41.9	46.3	48.5	52.2	58.2	60.3	61.1	60.5	87.2
31-Mar	65.2	69.4	74.5	78.1	82.7	86.8	87.7	78.5	68.0	63.8	61.3	55.8	53.3	50.1	46.7	45.8	44.9	45.5	51.4	63.4	78.2	83.0	84.9	85.3	66.9	87.7
	77.2	77.8	78.4	79.0	79.0	79.7	80.3	77.9	71.2	63.8	58.6	53.7	49.7	47.7	46.9	47.1	47.2	50.7	57.3	64.7	69.6	72.5	74.8	76.4	Diurnal Average	
	88.2	89.6	91.0	90.8	91.4	91.1	90.9	89.6	87.1	84.2	81.5	77.6	77.9	76.6	74.4	73.5	76.6	82.4	85.5	88.2	87.9	88.0	88.1	88.2	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Conklin - March 2023

Maximum Speed: 19 km/h on Mar 2 10:00

Maximum Daily Speed Average: 10.3 km/h on Mar 10

Minimum Speed Value: 0 km/h on Mar 30 04:00

Maximum Diurnal Speed Average: 2.0 km/h at hour 22

Monthly Average Velocity: 0.8 km/h 161.6 deg

Minimum Daily Speed Average: 0.5 km/h on Mar 16

Minimum Diurnal Speed Average: 0.2 km/h at hour 13

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 6 $Q_3 = 9$ $P_{90} = 12$ $P_{99} = 16$

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	SE2	SE2	SSE2	SSE3	SE3	SE4	SE4	SE3	E1	S9	S14	S12	SSW12	S13	S13	S10	S11	S9	SSE11	S12	S13	S10	S9	SSE8	S7.6	S14
2-Mar	SSE8	SSE9	SSE6	SSE9	S10	S10	S9	SSW11	SSW18	SSW19	SSW17	SW17	SW12	WSW13	WSW15	WNW11	W10	W8	WNW11	W12	W8	W9	W11	WSW11	SW8.8	SSW19
3-Mar	WSW11	W13	W10	W9	WNW7	WNW5	W6	WSW7	W8	W9	WNW8	WNW7	WNW9	NW11	NW8	NW11	NW10	NW8	NNW12	NNE8	NNE7	NE6	NNE8	NNE7	WNW6.4	W13
4-Mar	N6	NNW4	NNW3	NW5	NW8	NW6	WNW7	NW7	WNW7	WNW7	NW8	NW8	WNW8	WNW8	NW10	NW10	NNW12	NNW12	NNW8	NNW4	NW2	NNW2	NNW3	NNW2	NW6.4	NNW12
5-Mar	NW1	SSW1	S1	SSE1	S0	SSW0	S1	S2	SE1	NNW3	NNW7	NNW8	NNW7	W4	WSW5	W3	WSW4	W1	SSW1	WNW0	WNW1	WSW0	S1	DF	WNW1.3	NNW8
6-Mar	SSE1	S1	SSE1	SE2	SE2	W1	SSW0	NNW1	NNW1	SSE2	SE6	SE10	SE9	SE8	SSE10	SE8	SE10	SE9	SE6	SE5	SE4	SE4	SE6	ESE6	SE4.5	SE10
7-Mar	ESE6	ESE6	SE10	SE10	SSE9	SSE6	SE6	SE5	SSE6	SSE10	SSE10	SE9	SSE13	SSE15	SSE14	SSE17	SSE16	SSE16	SSE11	SSE8	SE6	SE6	SE5	SE5	SSE9.2	SSE17
8-Mar	SE4	SSE3	SSE3	SSE3	SSE3	SSE2	SSE1	SSE3	SE4	ESE7	ESE7	ESE12	ESE11	ESE10	E10	ESE11	ESE10	SE8	E5	ESE7	ESE5	SSE2	S2	SSE2	ESE5.3	ESE12
9-Mar	SE3	SSE2	SSE2	SSE2	SSE3	SSE2	SE3	SE3	SSE3	SE7	SE13	SE16	SE15	SSE17	SSE16	SSE14	SSE14	SSE15	SE15	SE14	SE14	SE16	SE13	SE12	SE9.6	SSE17
10-Mar	SSE13	SSE10	SSE11	SE12	SE11	SE10	SE12	SE11	SE12	SE15	SE13	SE12	SE13	SE13	SE13	SE12	SE11	ESE10	SE7	ESE5	ESE8	SE11	ESE5	NE2	SE10.3	SE15
11-Mar	NNW1	NW3	UO	UO	SSE1	S1	SSW1	SSW1	S1	S2	SE5	SE9	ESE8	ESE10	ESE10	ESE8	SSE7	SSE9	SSE6	SSE6	S5	SSW6	S6	S4	SE3.9	ESE10
12-Mar	S4	SSE3	SSW1	SE2	SSE3	SE2	SSE2	SSE2	SE3	SSW6	SSW8	SSW9	SSW8	SSW9	SSW8	SSW6	S7	S8	S5	SSE8	SSW9	SSW7	SSE3	S3	S4.9	SSW9
13-Mar	S5	SSE4	SSE3	SSE4	ESE1	S3	SE4	SSE3	SE4	ESE4	ENE8	SE8	ENE9	ENE11	ENE10	ENE11	ENE12	ENE11	ENE10	ENE8	ENE7	NE7	NE5	NE5	E5.2	ENE12
14-Mar	NE6	NE5	NNE5	N4	NNW5	NNE7	NNE5	N7	N10	N9	N9	NNW8	NNW8	NW9	NW10	NW9	NW9	NW8	NW6	NNW5	NW4	NW7	NW7	NNW6	NNW6.2	N10
15-Mar	NW3	N2	NNW1	WNW1	NW1	WSW1	SSE1	S1	SSE2	SW2	SSW3	NW2	WSW2	NNW7	NW6	N3	ESE2	SE4	ESE2	UO	NNW1	SSW1	SW1	SSE2	WNW0.6	NNW7
16-Mar	SE2	SE3	SE1	SE2	SSE2	SSE2	S1	NNW1	NW3	NW3	NNW5	NW5	N5	N2	N3	N5	WNW5	NW5	NW1	S2	SSE3	SE4	SSE4	SE3	NNW0.5	NW5
17-Mar	SE6	SE7	SE6	SE5	ESE4	ESE2	SE3	ESE3	SE4	SW6	WSW7	SW7	SW9	SW10	WSW13	SW12	SW12	SSW9	SSW6	SSW6	SSW7	S6	S6	SSW9	SSW5.2	WSW13
18-Mar	W0	N3	NE1	NNE2	S3	SSE6	SE3	SE1	SW8	SW6	W3	WNW5	WSW4	WNW6	NW7	W6	NW6	NW6	NW4	W1	S3	S2	SSE3	W1	W1.8	SW8
19-Mar	WSW1	SSW1	S1	SSE2	SSW0	NW1	UO	SSW1	N2	WSW1	ESE6	ESE8	E7	ENE9	ENE9	ENE9	ENE9	ENE7	E6	E6	ESE7	E3	SE4	E0	E3.4	ENE9
20-Mar	W1	SSE3	N1	NNE1	NNW3	ENE1	NNW4	SE1	ESE2	N2	ESE2	SE3	ENE5	NNE11	NNE13	NNE13	NNE11	N12	N10	N13	N10	N9	N8	N9	NNE5.2	NNE13
21-Mar	N8	NNW9	N8	NNW9	NNW7	NW6	NNW5	N5	NNE7	NE7	NNE5	N5	NW4	N3	ESE5	SE9	SE8	ESE8	ESE6	SE5	SE4	SSE3	SSE3	SSE3	NNE2.3	NNW9
22-Mar	S3	SSW2	SW1	ESE2	SE2	SE3	SE0	SE2	SSE9	S12	S12	S13	S10	SSW13	SSW12	SSW9	SW9	WSW8	SSW5	S7	S9	S9	SSE6	SE7	S6.2	SSW13
23-Mar	SSE4	ESE2	W2	SW7	SW8	SW7	SSE5	W2	WNW3	WNW4	NW8	NW9	NNW12	NW13	NW14	NW10	NW10	NNE12	N11	NNE11	NNE11	NNE8	NNE9	NNE10	NNW4.7	NW14
24-Mar	NNE8	NE8	NE7	NNE8	NNE6	NE6	N6	N6	NE5	NE6	NNE5	N1	E3	SE6	WSW2	W5	W4	WNW3	SW1	W1	SSE2	SSE1	SSW1	S2	NNE2.4	NNE8
25-Mar	SSE2	SE3	SE3	ESE3	ESE2	N1	NNW2	N2	WNW0	NW6	NW8	NW8	NNW13	NW11	NNW14	NNW15	NNW15	NNW14	N7	N4	NNW2	NNW3	NNW3	NW3	NNW4.7	NNW15
26-Mar	NNW3	NNW4	NNW1	NNW2	NNW4	NNW6	NNW5	N5	ENE3	NNE6	NE7	NNE7	N11	N10	NE10	NE10	NNE10	NE10	NNE9	N3	NNW3	UO	UO	UO	NNE5.6	N11
27-Mar	UO	SSE2	S2	SSE2	S3	S3	SSW4	S3	SSW1	WNW4	NW5	NW7	WNW7	WNW7	WNW8	NW9	WNW8	NW8	NW3	SSW1	S3	SE3	SE2	NW0	WNW2.3	NW9
28-Mar	SE1	UO	UO	SE1	NW1	WNW1	NNW2	NW0	SE2	SE5	SSW2	NW2	NW5	WNW1	NW5	WNW7	WNW6	WSW6	SSW4	S5	SSW11	SSW9	SSW10	SSW12	SW2.8	SSW12
29-Mar	SW13	SW13	SW14	WSW9	SSW6	SSW3	SSW2	NNW5	N12	N13	N11	N11	N10	NNW11	NNW11	N7	NNE9	NNE12	NNE7	NE3	NNE4	NE2	E1	NE2	NNW3.7	SW14
30-Mar	NE4	NNE3	WNW1	N0	S1	SSE2	SSE2	SE3	ESE1	SE2	E4	E5	ESE3	SW5	SSW6	S6	S7	SSW7	S6	S8	S7	S8	SSE8	SSE8	SSE3.2	S8
31-Mar	SE7	SE5	SSE6	SE6	SE5	SSE6	SE5	SSE4	S6	SE3	ESE5	SE3	NNE2	W2	NW6	N8	N8	NNE9	NNE7	N4	WNW2	NNW3	NNW2	NW2	E1.2	NNE9
Diurnal Average	SSE1.3	SSE1.1	SSE1.2	SSE1.3	S1.1	SSE1.2	SSE1.0	SSE0.6	S0.9	S1.3	SSE1.0	SSE1.2	SSW0.2	WSW0.8	W1.2	NW0.4	W0.3	ENE0.6	ENE1.2	ESE1.4	SSE1.8	SSE2.0	SSE1.6	SSE1.2		
Diurnal Maximum	SW13	SW13	SW14	SE12	SE11	SE10	SE12	SSW11	SSW18	SSW19	SSW17	SW17	SE15	SSE17	SSE16	SSE17	SSE16	SSE16	SE15	SE14	SE14	SE16	SSE13	SSW12		

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

Conklin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Conklin - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	347	47.34	47.34
6 - 11	306	41.75	89.09
12 - 19	80	10.91	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Conklin - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	22	9	10	3	8	22	60	54	33	22	5	9	15	15	25	35	347
6 - 11	24	25	11	14	4	22	32	29	25	23	10	7	11	18	37	14	306
12 - 19	4	4	0	1	0	1	17	14	9	7	7	3	2	0	2	9	80
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	38	21	18	12	45	109	97	67	52	22	19	28	33	64	58	733

Total Number of Valid Hours: 733

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Conklin

Total Number of Valid Hours: 733

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 2 15:00

Minimum Value: 0 km/h on Mar 9 08:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Hours of Calibration:	0
Percent Operational Time:	98.5

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Conklin - March 2023

Direction of Maximum Speed: 209 deg on Mar 2 10:00
Direction of Maximum Daily Speed Average: 134.2 deg on Mar 10

Direction of Minimum Speed: 353 deg on Mar 30 04:00

Direction of Minimum Daily Speed Average: 0.5 deg on Mar 16

Monthly Average Direction: 161.6 deg

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	136	136	156	153	142	141	134	131	96	180	188	188	198	186	179	189	188	188	167	179	185	179	174	166	177.9
2-Mar	158	164	162	163	178	181	186	192	209	209	210	216	232	248	255	282	273	267	291	279	281	273	262	241	227.1
3-Mar	244	271	262	276	284	284	262	246	263	274	293	296	292	312	308	320	319	315	341	19	33	35	15	17	302.0
4-Mar	353	347	327	316	315	304	301	305	302	297	312	310	288	301	310	317	329	337	334	337	315	331	347	337	317.5
5-Mar	322	212	173	155	188	209	170	170	132	328	345	337	341	280	256	278	258	264	197	285	293	242	188	DF	300.0
6-Mar	162	169	147	143	139	261	203	339	328	155	126	128	129	132	153	126	136	142	137	124	124	132	124	118	133.9
7-Mar	117	122	127	146	154	152	144	137	151	159	161	144	159	163	160	157	165	152	154	151	137	136	132	124	150.0
8-Mar	140	151	167	156	164	150	168	153	145	106	103	119	118	105	97	111	118	124	94	115	122	166	171	162	121.6
9-Mar	145	157	154	149	153	153	137	143	152	141	146	134	144	152	157	147	161	155	142	135	140	142	146	142	146.2
10-Mar	148	147	148	146	139	139	134	130	134	142	139	128	131	133	134	129	132	120	136	116	123	130	112	46	134.2
11-Mar	329	326	UO	UO	158	183	195	198	184	177	132	134	109	108	121	113	151	162	147	159	178	193	191	188	145.8
12-Mar	176	152	196	141	157	131	150	162	140	212	193	207	209	201	205	203	172	188	170	166	200	198	160	180	186.8
13-Mar	174	167	147	155	115	173	127	148	137	121	69	125	62	64	61	77	67	62	72	68	61	52	36	36	81.5
14-Mar	44	41	28	6	340	13	18	350	350	353	352	338	330	312	307	306	308	317	325	334	316	324	326	327	338.8
15-Mar	323	358	327	298	305	244	161	182	166	231	212	312	249	336	318	357	102	130	123	UO	330	212	228	158	303.4
16-Mar	145	144	136	126	149	151	180	342	321	322	332	324	353	350	354	351	289	311	306	181	152	142	163	124	334.6
17-Mar	135	131	124	124	113	102	134	119	131	221	240	228	232	226	239	221	214	213	213	201	196	185	184	196	198.5
18-Mar	277	4	55	28	178	166	126	141	232	221	273	295	240	287	306	278	318	309	315	280	190	179	155	271	260.9
19-Mar	243	196	183	166	208	313	UO	204	350	246	116	121	82	75	59	75	63	69	79	81	109	96	140	89	86.7
20-Mar	278	148	5	22	342	73	346	124	115	350	115	139	61	17	14	26	23	6	8	357	354	349	357	352	11.5
21-Mar	352	347	350	347	340	320	343	2	12	40	15	355	310	354	122	139	129	119	119	128	142	154	154	155	31.7
22-Mar	187	199	234	123	125	141	139	131	165	170	176	172	177	207	213	209	225	237	197	182	183	181	155	134	184.7
23-Mar	156	114	274	214	222	221	160	275	297	291	306	308	328	325	323	314	314	18	11	21	14	19	23	14	334.7
24-Mar	26	41	39	13	28	46	6	7	40	53	17	358	101	146	241	273	277	290	224	281	163	160	206	177	26.6
25-Mar	168	145	130	110	115	8	347	350	298	308	322	311	340	319	331	335	345	347	359	10	344	328	327	317	337.6
26-Mar	335	341	334	338	339	348	346	2	75	13	46	19	3	3	34	34	29	38	22	357	329	UO	UO	UO	14.3
27-Mar	UO	166	180	156	191	186	198	175	196	302	308	308	303	297	292	313	302	316	317	209	184	142	127	307	282.6
28-Mar	140	UO	UO	141	324	296	329	308	133	142	198	317	322	284	305	294	282	253	202	186	210	205	211	213	229.9
29-Mar	227	224	222	244	212	207	195	328	350	1	351	355	356	343	330	1	25	25	25	41	27	37	88	46	334.7
30-Mar	39	13	302	353	176	149	147	124	114	129	96	94	119	223	212	189	172	195	170	186	173	173	155	153	164.4
31-Mar	144	143	147	144	132	150	139	158	175	139	113	126	29	259	326	352	350	25	21	359	290	331	330	319	93.6
Diurnal Average	158.3	151.8	162.0	157.9	172.8	167.6	150.6	156.8	178.3	188.4	166.6	168.3	194.6	240.9	273.7	319.1	267.7	62.2	77.0	119.3	156.3	157.6	153.9	156.6	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Conklin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Conklin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 112 deg on Mar 25 09:00

Minimum Value: 6 deg on Mar 17 03:00

Percentiles: P_1 = 10 P_{10} = 15 Q_1 = 19 Median = 26 Q_3 = 39 P_{90} = 73 P_{99} = 93

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Hours of Calibration:	0
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	19	17	24	19	17	12	12	17	81	21	18	22	22	22	21	24	21	23	18	18	20	19	20	18	81
2-Mar	16	16	27	15	16	16	18	24	17	16	19	21	22	25	28	30	29	23	28	29	30	26	20	21	30
3-Mar	24	25	21	28	30	28	22	23	24	30	32	34	32	25	34	22	26	27	25	22	24	28	24	27	34
4-Mar	17	18	25	27	22	25	29	26	28	33	32	32	33	31	28	26	21	19	17	18	38	37	18	43	43
5-Mar	68	60	53	73	78	58	19	25	61	63	32	34	57	67	46	53	37	51	79	90	59	78	19	DF	90
6-Mar	67	47	26	27	42	65	83	20	75	63	23	21	33	41	24	27	16	14	18	14	14	17	16	15	83
7-Mar	16	12	15	17	14	13	12	10	22	19	25	25	21	23	21	19	24	17	15	12	12	13	13	15	25
8-Mar	15	11	20	16	11	43	48	8	14	23	27	23	28	27	30	25	19	14	30	16	23	33	22	18	48
9-Mar	14	14	17	12	14	13	11	11	23	24	21	16	23	20	18	20	17	19	16	15	16	15	15	15	24
10-Mar	16	15	16	17	14	15	15	15	17	17	19	22	22	21	24	20	18	17	15	17	14	16	28	42	42
11-Mar	79	41	UO	UO	11	14	53	69	22	49	52	17	30	25	27	30	42	19	21	19	15	17	15	14	79
12-Mar	13	20	76	20	10	14	17	10	26	18	21	24	27	26	28	34	26	18	15	19	24	27	24	24	76
13-Mar	18	25	33	14	54	16	19	20	22	51	37	29	38	34	34	34	31	32	32	32	33	30	27	30	54
14-Mar	33	31	29	29	22	25	31	20	18	21	22	23	25	27	28	26	28	21	22	20	21	17	17	17	33
15-Mar	22	41	70	85	68	74	85	62	43	78	52	80	83	37	37	77	80	17	38	UO	55	74	72	35	85
16-Mar	37	18	86	48	42	75	77	53	36	35	33	38	56	95	87	78	35	25	74	34	30	15	20	42	95
17-Mar	10	9	6	10	17	42	37	35	16	27	19	23	24	24	25	23	25	19	19	20	16	12	14	17	42
18-Mar	93	48	79	46	56	21	43	69	22	21	59	32	38	37	35	31	34	25	13	70	14	20	14	79	93
19-Mar	70	74	39	20	81	83	UO	60	80	66	42	31	43	38	37	37	35	36	33	31	19	47	28	94	94
20-Mar	74	53	88	74	32	80	17	88	71	79	83	74	52	26	25	30	27	22	22	21	18	18	21	18	88
21-Mar	16	16	20	19	24	17	16	27	31	35	52	73	65	83	76	23	23	18	16	20	13	21	18	20	83
22-Mar	38	59	84	63	62	35	100	47	24	21	22	21	33	25	27	25	26	22	20	9	15	17	30	14	100
23-Mar	33	78	78	34	22	29	24	89	48	33	31	34	24	25	23	28	30	28	24	21	22	25	26	23	89
24-Mar	26	32	27	24	29	29	21	24	43	51	64	104	88	42	91	43	48	32	61	66	25	64	67	43	104
25-Mar	19	28	14	30	35	91	19	69	112	37	30	43	26	31	26	22	22	19	19	24	36	15	14	14	112
26-Mar	19	19	76	76	34	16	21	27	82	32	39	57	33	38	39	35	32	26	21	28	22	UO	UO	UO	82
27-Mar	UO	20	19	16	17	15	13	22	67	50	46	46	43	39	36	33	32	26	50	97	23	26	35	88	97
28-Mar	80	UO	UO	79	70	38	51	88	84	30	73	87	54	100	54	34	36	32	29	14	17	17	16	17	100
29-Mar	19	19	18	29	21	19	60	25	21	25	26	25	27	22	20	31	26	23	25	34	23	34	58	69	69
30-Mar	30	28	53	90	75	27	24	35	81	78	60	63	84	86	53	50	45	24	21	22	16	17	18	17	90
31-Mar	13	13	12	11	19	9	11	35	30	52	42	74	79	88	59	38	33	25	21	21	57	27	28	34	88
Diurnal Maximum	93	78	88	90	81	91	100	89	112	79	83	104	88	100	91	78	80	51	79	97	59	78	72	94	

DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS22
JANVIER
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	707	36	37	99.87	5.3	0	1.7	0
TRS(ppb) Average	707	36	37	99.87	0.4	0	0.2	0
THC(ppm) Average	707	36	37	99.87	2.3	-	2.1	-
NMHC(ppm) Average	707	36	37	99.87	0.022	-	0.001	-
CH4(ppm) Average	707	36	37	99.87	2.3	-	2.1	-
O3 (ppb) Average	708	35	36	99.87	59.2	0	53	-
NO2 (ppb) Average	707	36	37	99.87	10.3	0	3.8	-
NO (ppb) Average	707	36	37	99.87	3.7	-	1	-
NOX (ppb) Average	707	36	37	99.87	12.3	-	4.8	-
PM2.5 (ug/m3) Average	741	2	3	99.87	20.6	0	8.4	0
Temperature 2 m (C) Average	743	0	1	99.87	11.4	-	0.8	-
Relative Humidity (%) Average	743	0	1	99.87	90.1	-	81.2	-
Wind Speed 20 m (km/h) Average	739	0	5	99.33	22	-	14	-
Wind Direction 20 m (deg) Average	739	0	5	99.33	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	0.52	0.8	-	0	0	0	0.2	0.6	1.4	5.3
TRS (ppb) Average	707	0.13	0	-	0.1	0.1	0.1	0.1	0.1	0.2	0.4
THC (ppm) Average	707	2.07	0	-	1.9	2	2	2.1	2.1	2.1	2.3
NMHC(ppm) Average	707	0	0.001	-	0	0	0	0	0	0	0.022
CH4(ppm) Average	707	2.07	0	-	1.9	2	2	2.1	2.1	2.1	2.3
O3 (ppb) Average	708	41.17	7.8	-	17.5	30.1	36.4	42	46.2	50.8	59.2
NO2 (ppb) Average	707	1.54	1.7	-	0	0	0.3	0.9	2.2	3.7	10.3
NO (ppb) Average	707	0.28	0.5	-	0	0	0	0.1	0.3	0.7	3.7
NOX (ppb) Average	707	1.82	2	-	0	0	0.4	1.1	2.8	4.4	12.3
PM2.5 (ug/m3) Average	741	4.56	2.4	-	0.4	2.6	3.3	4.1	5.1	7.1	20.6
Temperature 2 m (C) Average	743	-8.3	7.4	-	-29.9	-18.1	-12.7	-7.8	-3.3	0.2	11.4
Relative Humidity (%) Average	743	61.29	17	-	20.3	35.8	49.6	63.7	75	82.7	90.1
Wind Speed 20 m (km/h) Average	739	7.6	4	-	0	3	5	7	10	12	22
Wind Direction 20 m (deg) Average	739	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction	01 Mar 2023 01:00	01 Mar 2023 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	01 Mar 2023 04:00	01 Mar 2023 04:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	16 Mar 2023 22:00	16 Mar 2023 23:00	2	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 5.3 ppb on Mar 25 12:00

Maximum Daily Average: 1.7 ppb on Mar 3

Minimum Value: 0.0 ppb on Mar 7 21:00

Maximum Diurnal Average: 0.9 ppb at hour 13

Monthly Average: 0.52 ppb

Minimum Daily Average: 0.0 ppb on Mar 26

Minimum Diurnal Average: 0.2 ppb at hour 5

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.2 Q_3 = 0.6 P_{90} = 1.4 P_{99} = 4.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.2	1.0	2.5	2.1	1.5	1.1	1.8	1.4	1.3	0.7	0.9	1.3	1.2	0.8	0.8	2.5
2-Mar	1.1	Z	0.8	0.5	0.7	1.6	2.7	2.3	1.5	1.4	1.2	0.9	0.6	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.7	2.7
3-Mar	0.2	0.2	Z	0.2	0.2	0.4	0.3	0.2	0.3	0.4	0.9	0.6	4.0	2.0	1.2	1.8	1.9	1.9	2.0	2.6	4.0	4.8	5.1	4.5	1.7	5.1
4-Mar	4.6	3.3	1.0	Z	0.3	0.5	0.5	0.5	0.6	0.5	0.8	2.9	3.1	1.2	0.4	0.2	0.1	0.2	0.4	1.2	1.3	1.3	1.0	0.3	1.1	4.6
5-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.1	3.0	4.3	3.4	2.6	2.0	1.8	1.6	1.5	1.6	2.5	3.6	2.8	1.6	1.3	DF	1.6	4.3
6-Mar	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.9	0.6	0.6	Z	0.5	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.9
7-Mar	0.1	0.1	0.1	0.2	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3
8-Mar	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
10-Mar	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
11-Mar	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	0.4	0.5	0.0	0.5
12-Mar	0.1	0.2	0.2	0.3	0.1	Z	0.2	0.2	0.5	0.5	0.4	0.7	0.6	0.7	0.4	0.6	1.1	1.1	0.6	0.5	0.6	0.8	0.8	0.8	0.5	1.1
13-Mar	Z	0.8	0.6	0.5	0.4	0.4	0.2	0.2	0.4	0.3	0.6	0.7	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8
14-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.9	1.1	1.6	2.6	3.7	3.4	2.9	0.7	3.7
15-Mar	3.7	2.9	Z	2.0	0.9	0.9	0.5	0.5	0.9	1.1	C	C	C	C	C	1.3	0.8	1.1	1.0	0.5	0.2	0.0	0.0	0.0	1.0	3.7
16-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.1	1.9	2.0	2.2	1.9	1.6	0.7	0.5	0.4	0.3	0.2	0.6	2.2
17-Mar	0.2	0.3	0.3	0.4	Z	0.9	0.9	0.8	1.1	0.9	0.8	0.6	0.6	0.7	0.5	0.5	0.5	0.4	0.4	0.4	0.6	1.5	2.8	2.5	0.8	2.8
18-Mar	1.8	1.2	0.8	0.5	0.4	Z	0.2	0.2	0.2	0.2	0.3	0.4	0.7	0.6	0.5	0.5	0.7	0.8	0.6	0.4	0.4	0.3	0.2	0.2	0.5	1.8
19-Mar	Z	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.3
20-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.4
21-Mar	0.2	0.3	Z	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
22-Mar	0.0	0.0	0.0	Z	0.2	0.6	0.9	0.2	0.9	0.7	1.4	1.9	1.6	1.9	0.9	0.8	1.1	1.2	1.0	0.9	0.7	0.8	0.9	0.8	0.8	1.9
23-Mar	1.1	1.2	1.4	1.0	Z	0.5	0.5	0.5	0.7	1.0	1.2	0.6	0.3	0.2	0.9	1.1	1.0	0.8	0.5	0.3	0.4	0.2	0.1	0.0	0.7	1.4
24-Mar	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.4	0.4	0.4	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.4
25-Mar	Z	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.4	1.2	5.3	3.7	2.7	3.0	1.9	0.6	0.6	0.6	0.6	0.3	0.1	0.1	0.1	1.0	5.3
26-Mar	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.6	0.5	0.4	0.5	0.5	0.6	0.9	1.5	0.9	0.6	0.7	0.2	0.0	0.4	1.5
28-Mar	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.8	1.1	0.8	0.8	0.8	0.6	0.5	0.4	0.2	0.3	0.1	0.0	0.0	0.3	1.1
29-Mar	0.0	0.0	0.0	0.0	Z	0.3	0.3	2.4	2.4	1.1	0.8	0.5	0.9	1.4	1.9	1.8	1.6	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.7	2.4
30-Mar	0.1	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.7	0.7	0.7	0.5	0.5	0.6	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.7
31-Mar	Z	0.4	0.4	0.3	0.5	0.4	0.6	0.8	0.9	1.0	0.9	0.7	0.5	0.5	0.4	0.2	0.4	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.4	1.0
	0.6	0.5	0.2	0.3	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.8	0.9	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	Diurnal Average	
	4.6	3.3	1.4	2.0	0.9	1.6	2.7	2.4	2.4	3.0	4.3	5.3	4.0	2.7	3.0	2.0	2.2	1.9	2.5	3.6	4.0	4.8	5.1	4.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 10	51	157	65	40	35	27	46	32	48	74	54	16	16	9	19	15	704
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	51	157	65	40	35	27	46	32	48	74	54	16	16	9	19	15	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Janvier

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.4 ppb on Mar 15 13:00 Maximum Daily Average: 0.2 ppb on Mar 15

Minimum Value: 0.1 ppb on Mar 27 03:00 Minimum Daily Average: 0.1 ppb on Mar 11

Maximum Diurnal Average: 0.1 ppb at hour 13 Minimum Diurnal Average: 0.1 ppb at hour 18

Monthly Average: 0.13 ppb Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.1 Median = 0.1 Q_3 = 0.1 P_{90} = 0.2 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.1	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3-Mar	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3
4-Mar	0.4	0.3	0.2	0.2	Z	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	0.2	0.1	0.1	0.2	0.4
5-Mar	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	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	DF	0.1	0.2
6-Mar	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
7-Mar	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
8-Mar	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
9-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
10-Mar	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
11-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
12-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2
13-Mar	0.2	Z	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
14-Mar	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	0.2	0.2	0.2	0.1	0.2
15-Mar	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4
16-Mar	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
17-Mar	0.1	0.1	0.1	0.1	0.1	Z	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	0.2	0.2	0.1	0.2
18-Mar	Z	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
19-Mar	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
20-Mar	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-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
22-Mar	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	0.2	0.1	0.2	0.2	0.2	0.1	0.2
23-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2
24-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
25-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
26-Mar	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	0.1	0.1	0.1	0.1	0.1	0.2
27-Mar	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
28-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
29-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.2	C	C	C	C	C	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3
30-Mar	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
31-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	49	153	67	42	36	27	44	32	50	72	57	15	16	10	19	14	703
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	153	67	42	36	27	44	32	50	72	57	15	16	10	19	14	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Janvier

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Janvier - March 2023

Maximum Value: 2.3 ppm on Mar 15 08:00

Maximum Daily Average: 2.1 ppm on Mar 15

Minimum Value: 1.9 ppm on Mar 2 17:00

Minimum Daily Average: 2.0 ppm on Mar 2

Maximum Diurnal Average: 2.1 ppm at hour 8

Minimum Diurnal Average: 2.0 ppm at hour 18

Monthly Average: 2.07 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1
2-Mar	2.0	Z	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1
3-Mar	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1
4-Mar	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1
5-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	DF	2.1	2.1
6-Mar	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2
7-Mar	2.0	2.0	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9-Mar	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
10-Mar	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11-Mar	2.1	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	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1
12-Mar	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
13-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1
14-Mar	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1
15-Mar	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.2	2.1	C	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
17-Mar	2.2	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2
18-Mar	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	2.0	2.0	2.1	2.1
19-Mar	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1
20-Mar	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1
21-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1
22-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Mar	2.1	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
24-Mar	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1
25-Mar	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	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2
26-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1
27-Mar	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
28-Mar	2.1	2.2	2.2	Z	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.3
29-Mar	2.0	2.0	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
30-Mar	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1
31-Mar	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	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1
	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Janvier - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	230	32.53	32.53
2.1 - 3.0	477	67.47	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Janvier - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2.0	19	60	15	15	13	7	15	14	9	11	14	8	13	4	7	6	230
2.1 - 3.0	32	97	50	25	22	20	31	18	39	63	40	8	3	5	12	9	474
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	51	157	65	40	35	27	46	32	48	74	54	16	16	9	19	15	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Janvier

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Janvier - March 2023

Maximum Value: 0.022 ppm on Mar 11 04:00

Maximum Daily Average: 0.001 ppm on Mar 11

Minimum Value: 0.000 ppm on Mar 1 02:00

Minimum Daily Average: 0.000 ppm on Mar 1

Maximum Diurnal Average: 0.001 ppm at hour 4

Minimum Diurnal Average: 0.000 ppm at hour 6

Monthly Average: 0.000 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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	0.012	0.001	0.012
5-Mar	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	0.005	0.000	DF	0.000	0.005
6-Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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
7-Mar	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
8-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	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	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
11-Mar	0.000	0.000	0.000	0.022	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.022
12-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
13-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.002
16-Mar	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	0.003	0.000	0.000	0.000	0.000	0.000	0.003
17-Mar	0.000	0.005	0.006	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
18-Mar	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
19-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.003
22-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23-Mar	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
24-Mar	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	0.003	0.007	0.000	0.000	0.007
25-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.001
26-Mar	0.007	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
27-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	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	0.001	0.002	0.000	0.000	0.000	0.000	0.001	0.011
29-Mar	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
30-Mar	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
31-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.000	0.000	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	
	0.007	0.005	0.006	0.022	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.005	0.000	0.000	0.001	0.003	0.000	0.005	0.007	0.012	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Janvier - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	701	99.15	99.15
0.006 - 0.05	6	0.85	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Janvier - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	49	155	65	40	35	27	46	32	48	73	54	16	16	9	19	14	698
0.006 - 0.05	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	6
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	51	157	65	40	35	27	46	32	48	74	54	16	16	9	19	15	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Janvier

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.3 ppm on Mar 15 08:00

Maximum Daily Average: 2.1 ppm on Mar 15

Minimum Value: 1.9 ppm on Mar 2 17:00

Maximum Diurnal Average: 2.1 ppm at hour 8

Monthly Average: 2.07 ppm

Minimum Daily Average: 2.0 ppm on Mar 2

Minimum Diurnal Average: 2.0 ppm at hour 18

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.0 Median = 2.1 Q_3 = 2.1 P_{90} = 2.1 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1
2-Mar	2.0	Z	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1
3-Mar	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1
4-Mar	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1
5-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	DF	2.1	2.1
6-Mar	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2
7-Mar	2.0	2.0	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
8-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9-Mar	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
10-Mar	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11-Mar	2.1	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1
12-Mar	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
13-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1
14-Mar	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1
15-Mar	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.2	2.1	C	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
17-Mar	2.2	2.1	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2
18-Mar	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	2.0	2.0	2.1	2.1
19-Mar	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1
20-Mar	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1
21-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1
22-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Mar	2.1	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
24-Mar	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1
25-Mar	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	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2
26-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1
27-Mar	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
28-Mar	2.1	2.2	2.2	Z	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.3
29-Mar	2.0	2.0	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
30-Mar	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1
31-Mar	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	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1
	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Janvier - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	231	32.67	32.67
2.1 - 3.0	476	67.33	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Janvier - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	19	61	15	15	13	7	15	14	9	11	14	8	13	4	7	6	231
2.1 - 3.0	32	96	50	25	22	20	31	18	39	63	40	8	3	5	12	9	473
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	51	157	65	40	35	27	46	32	48	74	54	16	16	9	19	15	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Janvier

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Janvier - March 2023

Maximum Value: 3.7 ppb on Mar 16 19:00

Maximum Daily Average: 1.0 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 1 02:00

Minimum Daily Average: 0.0 ppb on Mar 20

Maximum Diurnal Average: 0.6 ppb at hour 14

Minimum Diurnal Average: 0.1 ppb at hour 4

Monthly Average: 0.28 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.3 P_{90} = 0.7 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.4	1.1	0.5	0.7	1.1	1.1	0.7	0.4	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.1
2-Mar	0.0	0.0	0.1	0.0	0.0	Z	0.2	0.0	0.3	0.4	0.5	1.0	0.6	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.0
3-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.1	1.0	0.6	0.4	0.3	0.0	0.0	0.0	0.0	0.3	0.1	0.3	2.2
4-Mar	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.2	1.5	1.8	1.5	0.4	0.2	0.1	0.0	0.1	0.1	0.6	0.2	0.4	1.8	0.4	1.8
5-Mar	0.8	0.5	Z	0.4	0.2	0.2	0.2	0.4	0.8	1.9	3.0	2.4	1.8	1.6	1.6	1.0	0.7	0.5	0.1	0.2	0.2	0.6	0.3	DF	0.9	3.0
6-Mar	0.8	0.7	0.0	0.2	0.1	0.0	0.0	0.4	1.3	1.6	1.5	1.4	Z	0.5	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.0	0.0	0.1	0.4	1.6
7-Mar	0.0	0.0	0.0	Z	0.0	0.2	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.3
8-Mar	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.4	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.3	0.0	0.2	0.2	0.1	0.1	0.4
9-Mar	0.0	0.0	0.1	0.0	0.0	Z	0.2	1.2	1.3	0.8	0.3	0.5	C	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3
10-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.1	0.1	0.1	0.5	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.5
11-Mar	0.1	0.2	Z	0.1	0.0	0.1	0.2	1.3	0.1	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.2	1.3
12-Mar	0.0	0.0	0.1	Z	0.2	0.0	0.1	0.1	0.3	0.2	0.4	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.8
13-Mar	0.3	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.5	0.6	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
14-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.0	0.0	0.1	0.2	0.2	0.3	0.1	0.3
15-Mar	Z	0.0	0.2	0.0	0.6	0.8	1.6	2.5	2.3	2.4	1.5	1.3	1.6	2.1	1.4	1.2	0.8	0.5	0.3	0.6	0.2	0.1	0.3	0.1	1.0	2.5
16-Mar	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.4	0.6	0.7	0.6	0.7	0.8	0.6	0.4	3.7	1.4	1.9	3.5	0.0	2.4	0.8	3.7
17-Mar	0.6	0.4	Z	0.2	0.5	0.5	0.6	0.4	0.9	1.0	1.1	0.8	0.5	0.7	0.2	0.1	0.3	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.4	1.1
18-Mar	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.2	0.5	0.1	0.0	0.6	1.8	0.2	1.8
19-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
20-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.3	0.3	0.3	0.5	0.5	0.2	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.1	0.2	0.5
22-Mar	0.1	Z	0.0	0.1	0.3	0.0	0.3	0.6	1.0	0.5	0.6	0.8	0.7	1.0	1.0	0.3	0.3	0.1	0.1	0.3	0.1	0.0	0.1	0.0	0.4	1.0
23-Mar	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.3	0.3	0.6	0.4	0.0	0.1	0.0	0.2	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
24-Mar	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.2	1.0	0.8	0.4	0.4	0.4	2.7	0.8	0.4	0.3	0.2	0.3	0.2	0.0	0.0	0.2	0.1	0.4	2.7
25-Mar	0.1	0.0	0.2	0.2	Z	0.6	0.1	0.3	0.2	0.3	0.4	1.0	0.9	0.6	0.8	1.1	0.7	0.3	0.0	0.4	0.1	0.0	0.0	0.0	0.4	1.1
26-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.3	0.0	0.1	0.3
27-Mar	Z	0.0	0.1	0.1	0.3	0.2	0.5	1.2	0.6	0.7	0.5	0.5	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.3	0.1	0.0	0.1	0.0	0.3	1.2
28-Mar	0.0	Z	0.0	0.0	0.1	2.3	0.6	0.9	0.6	0.5	0.4	0.5	0.4	0.3	0.2	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.3	2.3
29-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.5	0.6	0.2	0.3	0.3	0.1	0.3	0.7	1.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1
30-Mar	0.0	0.1	0.5	Z	0.1	0.0	0.0	0.0	0.2	0.2	0.2	0.6	0.5	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.6
31-Mar	0.0	0.1	0.2	0.2	Z	0.3	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.3
	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.4	0.3	0.3	0.1	0.2	0.2	0.1	0.2	0.1	0.3	Diurnal Average	
	0.8	0.7	0.5	0.4	0.6	2.3	1.6	2.5	2.3	2.4	3.0	2.4	2.2	2.7	1.6	1.2	0.8	0.5	3.7	1.4	1.9	3.5	0.6	2.4	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Janvier - March 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	54	154	67	42	36	29	44	31	44	71	58	14	16	9	19	15	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	154	67	42	36	29	44	31	44	71	58	14	16	9	19	15	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Janvier

Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 10.3 ppb on Mar 19 00:00

Maximum Daily Average: 3.8 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 4 17:00

Maximum Diurnal Average: 2.2 ppb at hour 24

Monthly Average: 1.54 ppb

Minimum Daily Average: 0.0 ppb on Mar 10

Minimum Diurnal Average: 1.0 ppb at hour 11

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.3 Median = 0.9 Q_3 = 2.2 P_{90} = 3.7 P_{99} = 7.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.9	2.8	2.6	2.5	Z	1.1	0.9	1.0	1.3	2.1	1.1	1.5	2.5	2.4	2.2	2.3	3.3	3.4	3.5	3.0	3.3	3.3	3.1	2.7	2.3	3.5
2-Mar	3.4	2.8	3.3	2.6	3.3	Z	6.8	5.9	4.4	3.8	4.0	4.7	3.0	2.7	2.6	1.4	1.0	1.0	0.9	0.7	0.8	0.6	0.3	0.4	2.6	6.8
3-Mar	Z	0.6	0.3	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.4	0.3	5.8	4.8	3.4	2.5	2.9	4.3	5.9	6.8	7.2	8.1	9.4	9.3	3.2	9.4
4-Mar	8.2	Z	3.2	0.7	0.3	5.4	4.1	2.5	2.1	1.2	0.5	2.7	3.4	2.7	1.0	0.3	0.0	0.2	0.5	1.7	4.6	3.7	3.7	5.1	2.5	8.2
5-Mar	2.5	3.7	Z	2.1	2.0	1.7	1.8	1.5	1.4	2.8	3.6	2.8	2.3	1.9	2.0	2.0	2.3	3.8	4.1	5.6	5.1	4.5	4.9	DF	2.9	5.6
6-Mar	4.3	3.8	4.9	4.3	4.4	3.9	4.3	2.7	2.1	2.0	2.1	2.3	Z	1.0	0.6	0.6	0.4	0.4	0.7	0.5	0.4	0.2	0.2	0.3	2.0	4.9
7-Mar	0.2	0.1	0.1	Z	0.2	0.3	0.1	0.3	0.4	0.2	0.3	0.2	0.4	0.1	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.4
8-Mar	0.1	0.3	0.2	0.1	Z	0.3	0.7	1.3	0.4	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.2	1.1	0.2	0.6	0.5	0.6	0.3	1.3
9-Mar	0.5	0.2	0.8	0.6	1.1	Z	3.9	6.1	3.7	1.0	0.5	0.7	C	C	C	C	C	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.1	6.1
10-Mar	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
11-Mar	0.1	0.4	Z	0.2	1.0	1.2	3.2	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.1	0.0	0.0	0.0	0.8	0.7	0.6	3.7
12-Mar	0.5	0.8	0.9	Z	1.2	0.8	0.7	0.5	0.7	0.6	0.4	0.3	0.3	0.3	0.2	0.6	1.2	1.3	1.4	1.6	3.0	4.7	4.8	7.2	1.5	7.2
13-Mar	7.6	7.4	6.7	6.4	Z	1.6	1.1	0.7	1.2	1.1	0.9	0.7	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	7.6
14-Mar	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	0.6	2.1	1.9	2.0	2.6	3.1	4.8	5.4	5.0	1.2	5.4
15-Mar	Z	5.6	5.9	5.2	5.7	5.2	6.5	5.8	3.6	3.1	1.7	1.6	1.9	2.5	2.1	2.1	2.1	2.8	4.7	4.5	5.0	3.7	3.7	3.0	3.8	6.5
16-Mar	3.4	Z	3.4	2.3	1.7	0.8	0.4	0.5	0.7	0.8	0.6	0.7	0.9	1.1	1.3	1.7	1.9	2.5	8.6	3.8	4.5	7.5	1.9	7.1	2.5	8.6
17-Mar	2.6	2.2	Z	2.8	2.9	4.1	4.9	3.1	2.7	2.4	2.5	1.9	1.4	1.4	0.7	0.7	1.0	1.0	1.4	1.8	1.4	2.1	2.9	2.9	2.2	4.9
18-Mar	2.3	2.0	1.9	Z	1.6	1.5	1.5	2.0	1.7	1.8	1.9	2.1	2.2	1.7	1.4	1.1	1.2	1.7	3.4	2.3	1.7	1.0	1.3	10.3	2.2	10.3
19-Mar	1.1	1.5	2.2	2.5	Z	2.7	3.3	1.0	0.4	0.3	0.3	0.2	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.0	0.1	0.1	0.4	0.0	0.8	3.3
20-Mar	0.0	0.0	0.0	0.4	0.0	Z	0.1	0.0	0.5	0.0	0.0	0.0	0.2	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
21-Mar	Z	0.3	0.4	0.5	0.7	1.3	1.5	2.2	2.2	1.3	0.7	0.5	0.5	0.6	0.8	0.6	0.4	0.6	0.1	0.0	0.3	0.7	1.5	0.5	0.8	2.2
22-Mar	0.7	Z	1.5	1.5	1.5	4.2	3.9	1.7	2.8	1.2	1.5	1.8	1.7	2.2	2.3	1.8	2.0	2.1	2.8	2.6	1.9	1.5	1.9	1.9	2.0	4.2
23-Mar	2.1	3.4	Z	3.5	3.2	2.8	2.8	3.5	2.8	2.5	1.7	0.7	0.2	0.1	1.3	3.3	2.9	2.8	1.0	0.4	0.5	0.1	0.0	0.0	1.8	3.5
24-Mar	0.0	0.0	0.0	Z	1.4	1.6	0.7	1.9	2.7	1.5	0.8	0.6	0.5	2.6	1.0	0.8	0.8	0.9	1.6	1.6	1.6	1.8	2.1	1.7	1.2	2.7
25-Mar	1.5	1.3	1.1	1.1	Z	1.9	1.6	1.5	0.8	0.6	0.6	1.9	1.7	1.6	2.0	3.4	2.8	2.7	2.2	2.9	2.7	0.5	0.2	0.4	1.6	3.4
26-Mar	0.7	0.3	0.2	0.1	0.8	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.6	2.6	0.9	0.7	0.3	2.6
27-Mar	Z	1.2	1.0	0.5	2.0	2.1	2.1	1.9	1.3	1.3	1.0	0.8	0.6	0.5	0.5	0.5	0.7	0.8	1.6	2.1	1.9	1.2	3.2	3.6	1.4	3.6
28-Mar	4.5	Z	2.8	3.8	3.6	7.2	4.4	2.1	1.0	0.9	0.7	0.7	0.9	0.5	0.6	0.8	0.5	0.5	0.6	1.4	1.3	0.4	0.3	0.3	1.7	7.2
29-Mar	0.2	0.4	Z	0.7	0.9	0.8	1.3	2.8	3.6	1.5	1.6	1.3	0.7	1.5	2.4	3.3	3.9	0.4	0.3	0.6	0.5	0.6	0.2	0.0	1.3	3.9
30-Mar	0.2	1.3	2.3	Z	3.7	1.5	1.1	0.8	0.6	0.3	0.2	0.9	0.6	0.7	0.5	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.7	3.7
31-Mar	0.0	0.0	0.3	0.5	Z	2.1	1.5	1.6	2.1	2.2	1.6	1.1	0.8	0.9	1.0	0.7	0.9	0.5	0.6	2.1	0.5	0.7	0.8	0.4	1.0	2.2
	1.8	1.6	1.8	1.7	1.7	2.2	2.1	1.9	1.5	1.2	1.0	1.1	1.2	1.2	1.0	1.1	1.2	1.2	1.7	1.6	1.7	1.8	1.8	2.2	Diurnal Average	
	8.2	7.4	6.7	6.4	5.7	7.2	6.8	6.1	4.4	3.8	4.0	4.7	5.8	4.8	3.4	3.4	3.9	4.3	8.6	6.8	7.2	8.1	9.4	10.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	54	154	67	42	36	29	44	31	44	71	58	14	16	9	19	15	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	154	67	42	36	29	44	31	44	71	58	14	16	9	19	15	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Janvier

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Janvier - March 2023

Maximum Value: 12.3 ppb on Mar 16 19:00

Maximum Daily Average: 4.8 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 9 20:00

Minimum Daily Average: 0.1 ppb on Mar 20

Maximum Diurnal Average: 2.5 ppb at hour 24

Minimum Diurnal Average: 1.3 ppb at hour 18

Monthly Average: 1.82 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.4 Median = 1.1 Q_3 = 2.8 P_{90} = 4.4 P_{99} = 8.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.9	2.8	2.7	2.5	Z	1.1	0.9	1.0	1.7	3.2	1.6	2.2	3.6	3.5	2.9	2.7	3.6	3.6	3.5	3.1	3.3	3.3	3.1	2.7	2.6	3.6
2-Mar	3.4	2.8	3.4	2.6	3.3	Z	7.0	5.9	4.7	4.2	4.5	5.7	3.6	3.2	3.2	1.4	1.0	1.0	0.9	0.7	0.9	0.6	0.3	0.4	2.8	7.0
3-Mar	Z	0.6	0.3	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.4	0.3	8.0	6.9	4.4	3.1	3.3	4.6	5.9	6.8	7.2	8.1	9.7	9.4	3.5	9.7
4-Mar	8.2	Z	3.2	0.7	0.4	5.5	4.2	2.6	2.4	1.5	0.7	4.2	5.2	4.2	1.4	0.5	0.1	0.2	0.6	1.8	5.2	3.9	4.1	6.9	2.9	8.2
5-Mar	3.3	4.2	Z	2.5	2.2	1.9	2.0	1.9	2.2	4.7	6.6	5.2	4.1	3.5	3.6	3.0	3.0	4.3	4.2	5.8	5.3	5.1	5.2	DF	3.8	6.6
6-Mar	5.1	4.5	4.9	4.5	4.5	3.9	4.3	3.1	3.4	3.6	3.6	3.7	Z	1.5	0.8	0.8	0.5	0.6	0.9	0.6	0.6	0.2	0.2	0.4	2.4	5.1
7-Mar	0.2	0.1	0.1	Z	0.2	0.5	0.1	0.5	0.7	0.4	0.5	0.4	0.6	0.2	0.3	0.3	0.4	0.4	0.5	0.2	0.2	0.4	0.2	0.2	0.3	0.7
8-Mar	0.2	0.4	0.3	0.2	Z	0.5	0.8	1.7	0.5	0.2	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.3	0.3	1.4	0.2	0.8	0.7	0.7	0.5	1.7
9-Mar	0.5	0.2	0.9	0.6	1.1	Z	4.1	7.3	5.0	1.8	0.8	1.2	C	C	C	C	C	0.5	0.3	0.0	0.0	0.0	0.0	0.0	1.3	7.3
10-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.1	0.1	0.1	0.8	0.1	0.1	0.0	0.0	0.1	0.1	0.4	0.1	0.8
11-Mar	0.2	0.6	Z	0.3	1.0	1.3	3.4	5.0	0.1	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.3	2.4	0.1	0.0	0.1	0.8	0.7	0.8	5.0
12-Mar	0.5	0.8	1.0	Z	1.4	0.8	0.8	0.6	1.0	0.8	0.8	0.6	0.5	0.4	0.4	0.7	1.3	1.4	1.4	1.6	3.0	4.7	4.8	8.0	1.6	8.0
13-Mar	7.9	7.4	6.7	6.4	Z	1.6	1.1	0.7	1.5	1.6	1.5	1.0	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	7.9
14-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.7	2.4	2.1	2.0	2.6	3.2	5.0	5.6	5.3	1.3	5.6
15-Mar	Z	5.6	6.1	5.2	6.3	6.0	8.1	8.3	5.9	5.5	3.2	2.9	3.5	4.6	3.5	3.3	2.9	3.3	5.0	5.1	5.2	3.8	4.0	3.1	4.8	8.3
16-Mar	3.5	Z	3.4	2.3	1.7	0.8	0.5	0.6	0.9	1.2	1.0	1.3	1.6	1.7	2.0	2.5	2.5	2.9	12.3	5.2	6.4	11.0	1.9	9.5	3.3	12.3
17-Mar	3.2	2.6	Z	3.0	3.4	4.6	5.5	3.5	3.6	3.4	3.6	2.7	1.9	2.1	0.9	0.8	1.3	1.1	1.8	2.1	1.4	2.1	2.9	2.9	2.6	5.5
18-Mar	2.3	2.0	2.0	Z	1.6	1.5	1.5	2.1	1.9	2.0	2.2	2.3	2.5	2.0	1.4	1.1	1.2	1.7	3.6	2.8	1.8	1.0	1.9	12.1	2.4	12.1
19-Mar	1.1	1.5	2.2	2.5	Z	2.8	3.7	1.1	0.4	0.3	0.3	0.2	0.4	0.5	0.5	0.4	0.2	0.3	0.3	0.0	0.1	0.1	0.4	0.0	0.8	3.7
20-Mar	0.0	0.0	0.0	0.4	0.0	Z	0.1	0.0	0.6	0.0	0.0	0.0	0.2	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
21-Mar	Z	0.3	0.4	0.5	0.7	1.3	1.5	2.4	2.7	1.7	1.0	0.8	0.8	1.1	1.3	0.8	0.5	0.7	0.1	0.0	0.4	1.0	1.7	0.6	1.0	2.7
22-Mar	0.8	Z	1.5	1.6	1.8	4.2	4.2	2.3	3.8	1.7	2.1	2.6	2.4	3.2	3.3	2.1	2.3	2.2	2.9	2.9	2.0	1.5	2.0	1.9	2.4	4.2
23-Mar	2.1	3.5	Z	3.5	3.2	2.8	2.8	3.8	3.1	3.1	2.1	0.7	0.3	0.1	1.5	3.9	3.3	3.0	1.0	0.4	0.5	0.1	0.0	0.0	1.9	3.9
24-Mar	0.0	0.0	0.1	Z	1.4	1.6	0.7	2.1	3.7	2.3	1.2	1.0	0.9	5.3	1.8	1.2	1.1	1.1	1.9	1.8	1.6	1.8	2.3	1.8	1.6	5.3
25-Mar	1.6	1.3	1.3	1.3	Z	2.5	1.7	1.8	1.0	0.9	1.0	2.9	2.6	2.2	2.8	4.5	3.5	3.0	2.2	3.3	2.8	0.5	0.2	0.4	2.0	4.5
26-Mar	0.7	0.3	0.2	0.1	0.8	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.5	0.7	2.9	1.2	0.7	0.4	2.9
27-Mar	Z	1.2	1.1	0.6	2.3	2.3	2.6	3.1	1.9	2.0	1.5	1.3	0.9	0.7	0.8	0.7	0.8	0.9	1.8	2.4	2.0	1.2	3.3	3.6	1.7	3.6
28-Mar	4.5	Z	2.8	3.8	3.7	9.5	5.0	3.0	1.6	1.4	1.1	1.2	1.3	0.8	0.8	1.1	0.5	0.5	0.6	1.6	1.5	0.4	0.3	0.3	2.1	9.5
29-Mar	0.2	0.4	Z	0.7	0.9	0.8	1.3	3.3	4.2	1.7	1.9	1.6	0.8	1.8	3.1	4.4	4.4	0.5	0.3	0.6	0.5	0.6	0.2	0.0	1.5	4.4
30-Mar	0.2	1.4	2.8	Z	3.8	1.5	1.1	0.8	0.8	0.5	0.4	1.5	1.1	1.1	0.8	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	3.8
31-Mar	0.0	0.1	0.5	0.7	Z	2.4	1.6	1.7	2.3	2.5	1.8	1.2	0.9	1.0	1.1	0.8	1.1	0.5	0.6	2.4	0.5	0.7	0.8	0.4	1.1	2.5
	1.9	1.7	1.8	1.8	1.8	2.4	2.3	2.3	2.0	1.7	1.5	1.6	1.7	1.8	1.5	1.4	1.4	1.3	1.9	1.8	1.8	2.0	1.9	2.5	Diurnal Average	
	8.2	7.4	6.7	6.4	6.3	9.5	8.1	8.3	5.9	5.5	6.6	5.7	8.0	6.9	4.4	4.5	4.4	4.6	12.3	6.8	7.2	11.0	9.7	12.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	54	154	67	42	36	29	44	31	44	71	58	14	16	9	19	15	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	154	67	42	36	29	44	31	44	71	58	14	16	9	19	15	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Janvier

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 59.2 ppb on Mar 18 16:00

Maximum Daily Average: 53.0 ppb on Mar 18

Minimum Value: 17.5 ppb on Mar 6 06:00

Minimum Daily Average: 30.6 ppb on Mar 5

Maximum Diurnal Average: 46.1 ppb at hour 17

Minimum Diurnal Average: 35.7 ppb at hour 7

Monthly Average: 41.17 ppb

Percentiles: P_1 = 22.2 P_{10} = 30.1 Q_1 = 36.4 Median = 42.0 Q_3 = 46.2 P_{90} = 50.8 P_{99} = 57.0

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	29.4	25.6	Z	22.2	24.7	28.9	26.8	27.4	27.2	28.8	30.5	33.1	38.3	40.0	41.8	42.8	42.0	41.7	41.5	41.8	41.3	41.6	42.0	42.8	34.9	42.8
2-Mar	42.0	42.4	42.0	Z	41.5	39.5	36.6	36.9	38.3	39.5	39.5	39.2	42.3	43.7	44.5	46.2	45.6	45.4	44.9	44.3	43.4	43.6	44.3	44.9	42.2	46.2
3-Mar	44.6	44.0	43.7	44.2	Z	43.1	43.2	43.1	42.9	43.3	42.5	42.3	32.8	33.7	35.6	36.4	36.5	35.2	32.7	30.5	29.2	27.5	24.8	23.9	37.2	44.6
4-Mar	25.2	26.3	32.0	36.7	36.3	Z	28.6	32.1	32.5	32.7	35.0	31.7	31.6	32.4	35.7	37.0	36.9	36.0	34.8	33.1	30.2	30.2	30.6	29.9	32.5	37.0
5-Mar	Z	28.0	27.3	28.3	27.9	27.7	26.6	24.7	24.6	30.4	30.6	32.2	34.4	35.9	36.0	36.6	36.4	34.0	32.5	30.9	30.7	29.6	28.2	DF	30.6	36.6
6-Mar	27.1	26.5	23.0	23.1	20.5	17.5	19.5	20.3	18.2	20.1	Z	30.7	31.3	36.8	41.9	42.5	43.5	43.5	43.4	43.5	43.5	41.9	41.2	40.6	32.2	43.5
7-Mar	40.6	Z	41.0	42.2	43.2	43.1	42.7	42.2	41.5	41.6	41.8	42.3	43.9	45.7	47.1	47.9	48.2	48.0	46.9	45.6	45.0	44.2	44.1	43.5	44.0	48.2
8-Mar	42.7	42.1	Z	41.3	40.8	39.4	38.7	37.9	39.2	40.3	42.3	42.5	42.4	42.7	43.8	43.6	43.4	43.7	43.6	41.8	42.0	40.9	40.4	39.5	41.5	43.8
9-Mar	39.4	38.1	34.0	Z	31.0	30.3	27.2	24.8	25.8	33.2	36.4	37.3	40.0	40.7	41.7	42.3	42.1	42.2	42.6	42.9	41.7	41.0	40.6	40.9	37.2	42.9
10-Mar	41.1	40.3	39.4	39.1	38.8	Z	38.3	38.0	37.8	38.8	40.2	41.6	42.4	40.9	42.6	43.5	42.4	41.6	41.5	40.5	39.6	39.9	40.6	39.7	40.4	43.5
11-Mar	Z	38.2	37.3	34.6	30.2	29.6	27.7	28.0	32.9	33.4	35.7	38.2	39.7	40.6	41.9	43.2	44.1	43.1	40.8	42.9	44.1	44.0	43.5	42.5	38.1	44.1
12-Mar	42.5	Z	39.8	38.9	37.4	36.9	38.5	39.4	39.1	41.0	42.6	43.6	44.7	46.1	46.6	46.4	45.4	45.6	46.2	39.7	35.2	32.0	30.5	26.7	40.2	46.6
13-Mar	24.3	22.5	Z	21.2	29.8	38.7	39.9	40.5	40.8	38.5	40.6	44.3	46.3	48.1	47.9	48.5	49.8	49.0	48.4	48.1	47.8	47.0	46.2	45.0	41.4	49.8
14-Mar	45.2	46.0	46.6	Z	45.7	44.8	42.2	42.1	42.7	42.5	42.5	42.8	42.7	42.9	43.0	42.5	41.2	41.7	41.1	39.5	38.0	35.7	34.0	32.4	41.7	46.6
15-Mar	31.4	29.8	28.3	28.4	Z	27.2	23.7	24.6	25.5	31.0	35.1	36.5	36.8	37.1	39.5	40.4	41.2	40.7	37.6	36.9	34.3	34.6	32.8	30.2	33.2	41.2
16-Mar	29.3	27.1	25.7	27.3	26.9	Z	30.4	30.7	30.7	30.9	31.9	33.4	35.3	37.5	38.2	38.0	38.8	38.0	32.0	36.4	35.1	31.3	34.7	27.1	32.5	38.8
17-Mar	Z	30.6	31.3	32.6	31.2	30.0	29.0	33.5	36.9	40.2	43.3	46.3	50.0	53.7	57.0	57.6	58.3	58.4	56.4	54.1	55.1	54.1	52.5	52.2	45.4	58.4
18-Mar	52.7	Z	52.9	52.5	52.9	53.0	51.9	50.8	52.3	53.4	53.6	54.5	55.2	56.6	58.4	59.2	59.0	57.1	52.0	52.1	50.8	48.7	47.9	42.0	53.0	59.2
19-Mar	47.8	42.3	Z	41.7	34.1	33.3	34.8	36.4	40.6	44.6	45.7	47.7	49.3	50.6	49.9	49.7	49.1	47.8	46.6	46.3	45.6	44.8	44.4	44.4	44.2	50.6
20-Mar	44.6	44.5	43.5	Z	42.0	41.7	40.4	40.5	40.2	41.0	41.2	41.4	42.6	44.3	42.6	42.5	43.3	42.7	42.6	41.8	41.5	41.7	41.6	41.4	42.2	44.6
21-Mar	41.4	41.2	40.9	40.8	Z	38.7	37.3	36.3	37.3	40.1	42.3	42.9	43.3	43.3	44.2	44.8	45.4	44.9	45.1	44.6	43.6	41.5	40.0	40.8	41.8	45.4
22-Mar	41.0	36.4	34.1	36.2	28.6	Z	30.9	24.9	40.4	46.6	49.6	50.7	51.7	52.5	54.1	55.1	56.2	56.8	54.9	54.0	54.6	55.1	55.1	55.6	46.7	56.8
23-Mar	Z	51.0	50.3	50.5	51.8	50.9	50.4	47.4	47.5	47.3	49.7	52.7	52.1	52.2	51.1	49.5	49.8	49.0	48.3	48.5	47.5	47.6	47.8	47.5	49.6	52.7
24-Mar	47.1	Z	45.8	44.5	41.2	40.7	40.7	39.1	38.8	41.5	43.7	45.1	46.5	46.7	48.2	48.9	49.0	48.9	47.2	47.4	45.8	45.0	43.6	42.0	44.7	49.0
25-Mar	38.7	36.3	Z	38.8	38.6	39.8	40.6	43.0	44.9	46.9	49.2	47.8	49.4	51.0	51.4	50.1	48.7	49.7	49.3	47.2	47.4	50.0	49.7	47.3	45.9	51.4
26-Mar	46.2	46.1	45.4	Z	41.0	40.6	40.6	41.3	40.9	41.7	42.6	42.0	42.7	43.9	45.2	46.4	46.3	45.2	44.8	43.3	41.4	36.9	36.4	34.6	42.4	46.4
27-Mar	34.6	33.0	32.6	32.1	Z	29.9	29.1	31.6	34.6	37.5	41.6	42.3	43.6	44.5	46.3	47.7	47.3	46.9	44.0	42.0	40.6	41.4	35.4	32.2	38.7	47.7
28-Mar	31.7	32.1	32.1	26.0	27.6	Z	24.7	26.8	32.6	41.2	C	C	C	C	49.8	50.3	51.3	52.4	52.2	50.6	50.2	50.8	51.4	51.6	41.3	52.4
29-Mar	Z	51.2	50.9	50.4	49.1	48.4	46.0	43.9	43.9	47.7	47.8	47.8	48.1	47.6	46.4	44.7	43.8	47.1	46.7	45.1	44.6	44.6	44.7	45.0	46.8	51.2
30-Mar	44.1	Z	37.5	38.2	31.3	32.8	32.9	35.4	38.0	41.7	44.6	44.4	45.4	46.0	47.1	47.9	48.3	46.0	45.8	45.0	44.4	44.1	43.8	41.6	42.0	48.3
31-Mar	43.2	43.6	Z	44.7	46.3	46.4	47.8	50.1	53.8	54.1	55.1	56.0	55.9	55.3	55.2	55.1	55.2	55.2	53.9	51.4	50.8	49.1	49.5	50.9	51.2	56.0
	39.2	37.1	38.3	36.8	36.7	37.4	35.7	35.9	37.5	39.7	42.0	42.5	43.4	44.4	45.6	46.0	46.1	45.7	44.5	43.6	42.7	42.0	41.4	40.6	Diurnal Average	
	52.7	51.2	52.9	52.5	52.9	53.0	51.9	50.8	53.8	54.1	55.1	56.0	55.9	56.6	58.4	59.2	59.0	58.4	56.4	54.1	55.1	55.1	55.1	55.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb

Wood Buffalo Environmental Association

Hourly Averages

Ozone (O_3) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ozone (O_3) - ppb

Janvier - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	6	0.85	0.85
21 - 50	625	88.28	89.12
51 - 82	77	10.88	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Ozone (O_3) - ppb

Janvier - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	0	0	0	0	0	0	2	1	2	1	0	0	0	0	0	0	6
21 - 50	50	147	59	40	34	24	42	32	41	49	38	12	16	8	18	11	621
51 - 82	3	9	6	1	3	1	1	1	5	20	20	3	0	1	2	1	77
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	156	65	41	37	25	45	34	48	70	58	15	16	9	20	12	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Ozone (O_3) - ppb

Janvier

Classes (ppb)

- **0 - 20**
- **21 - 50**
- **51 - 82**
- **> 83**

Total Number of Valid Hours: 704

Wood Buffalo Environmental Association

Zero Responses

Ozone (O_3) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Span Responses

Ozone (O_3) - ppb

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 20.6 $\mu g/m^3$ on Mar 28 01:00

Maximum Daily Average: 8.4 $\mu g/m^3$ on Mar 23

Minimum Value: 0.4 $\mu g/m^3$ on Mar 2 21:00

Maximum Diurnal Average: 5.2 $\mu g/m^3$ at hour 7

Monthly Average: 4.56 $\mu g/m^3$

Minimum Daily Average: 2.2 $\mu g/m^3$ on Mar 30

Minimum Diurnal Average: 3.9 $\mu g/m^3$ at hour 18

Percentiles: P_1 = 0.7 P_{10} = 2.6 Q_1 = 3.3 Median = 4.1 Q_3 = 5.1 P_{90} = 7.1 P_{99} = 14.4

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	2
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	5.8	3.3	2.2	3.2	3.0	2.3	1.9	2.4	2.6	1.9	1.9	2.8	4.6	5.2	6.0	6.8	6.5	6.1	6.2	6.3	6.5	6.7	6.7	6.9	4.5	6.9
2-Mar	7.4	8.4	9.0	9.8	10.3	11.2	11.8	12.5	11.8	12.0	12.4	10.9	8.6	5.8	3.7	8.5	0.5	0.5	0.8	0.6	0.4	1.5	0.4	1.0	6.7	12.5
3-Mar	2.1	1.2	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.4	1.9	1.9	4.6	5.0	4.3	4.8	4.6	4.8	5.0	5.0	5.2	5.4	6.0	6.4	3.1	6.4
4-Mar	7.3	7.4	5.3	4.3	3.9	5.2	4.6	3.8	3.7	4.0	3.9	4.4	5.0	4.3	3.6	3.2	3.2	3.2	3.0	3.5	4.3	5.6	4.1	4.5	4.4	7.4
5-Mar	4.1	5.8	3.6	3.2	2.9	2.9	3.0	2.7	5.0	4.4	4.4	3.9	3.8	3.4	3.3	3.2	3.2	3.6	4.2	6.0	6.4	9.8	5.1	DF	4.3	9.8
6-Mar	8.2	5.8	7.7	5.4	4.5	5.4	5.6	3.3	4.3	3.9	3.6	3.3	3.4	3.0	2.5	3.0	2.9	2.9	3.4	4.9	3.0	2.4	2.4	2.4	4.0	8.2
7-Mar	2.4	2.2	2.3	2.4	2.6	2.6	2.7	2.9	3.1	3.1	3.6	3.2	3.1	2.9	2.2	2.2	2.2	2.2	2.4	2.5	2.6	2.5	2.8	2.7	2.6	3.6
8-Mar	2.9	3.1	3.2	3.0	3.0	3.3	3.6	4.1	3.4	3.3	3.3	3.4	3.1	3.0	2.8	2.5	2.6	3.0	3.3	3.5	2.8	2.9	2.5	2.6	3.1	4.1
9-Mar	3.0	2.1	2.3	2.9	3.5	5.4	10.2	9.1	7.8	4.3	3.3	3.5	3.3	3.5	3.4	3.5	3.2	3.4	3.2	3.3	3.6	3.4	3.2	3.3	4.1	10.2
10-Mar	3.5	3.4	3.5	3.6	3.6	3.5	3.6	4.0	4.3	4.4	4.5	4.3	4.7	4.0	3.8	3.6	3.5	3.1	3.0	3.1	3.2	3.4	3.5	3.7	3.7	4.7
11-Mar	3.5	3.5	3.6	3.3	3.5	3.5	3.5	3.5	3.2	3.1	3.1	3.1	3.1	3.0	3.1	2.9	2.8	2.7	3.2	2.7	2.7	2.6	2.9	3.1	3.1	3.6
12-Mar	3.3	3.3	3.3	3.4	3.4	3.5	3.8	4.1	4.1	4.2	4.3	4.0	3.8	5.1	3.4	3.4	3.6	3.5	3.3	3.7	4.0	4.2	4.4	4.8	3.8	5.1
13-Mar	5.1	4.7	4.7	4.6	4.6	4.4	4.5	4.7	5.2	5.2	5.4	5.0	4.9	4.6	4.3	4.0	3.5	3.3	3.3	3.1	2.8	2.7	2.6	2.7	4.2	5.4
14-Mar	2.9	3.1	3.4	3.2	2.5	2.4	2.5	2.6	2.7	2.7	2.8	2.8	2.9	2.8	2.9	3.0	3.8	4.2	4.2	4.2	4.0	4.4	4.5	4.4	3.3	4.5
15-Mar	4.7	4.7	4.5	4.4	4.2	4.0	3.8	3.9	3.9	3.9	3.8	3.8	3.7	3.7	3.5	3.5	3.5	3.4	3.6	3.6	11.3	6.5	4.2	4.2	4.3	11.3
16-Mar	3.9	4.0	4.5	4.4	4.4	3.6	3.3	3.3	3.7	3.7	3.6	3.9	3.7	3.7	3.8	3.8	3.9	4.0	4.4	4.2	4.7	4.9	7.3	5.7	4.2	7.3
17-Mar	4.8	4.3	4.3	4.6	4.5	4.5	4.8	4.8	4.9	4.7	4.8	4.5	4.2	4.0	4.1	4.2	4.4	4.7	4.5	3.8	3.6	3.8	3.9	4.0	4.4	4.9
18-Mar	4.3	4.7	5.2	6.1	6.8	7.0	7.2	7.3	6.8	7.3	7.1	6.5	5.3	4.5	4.5	4.8	4.5	4.2	4.7	5.2	3.6	3.7	3.7	3.9	5.4	7.3
19-Mar	5.7	8.2	12.2	4.7	6.2	7.8	5.0	4.3	3.9	3.9	3.9	3.9	3.8	3.7	3.2	3.2	3.3	3.5	3.7	3.9	3.9	3.9	3.6	3.5	4.7	12.2
20-Mar	3.3	3.3	3.2	3.3	3.1	3.2	3.3	3.6	3.7	3.4	3.5	3.8	4.1	4.7	4.1	4.2	4.3	4.3	4.5	4.4	4.5	4.6	4.7	4.6	3.9	4.7
21-Mar	4.6	4.6	4.5	4.5	4.5	4.7	4.7	4.9	4.6	4.5	4.4	4.3	4.3	4.4	4.5	4.3	4.2	4.0	3.9	3.6	3.8	5.3	5.7	3.9	4.4	5.7
22-Mar	3.7	3.9	3.6	3.6	3.7	5.4	4.3	4.3	5.3	5.6	5.9	6.6	6.8	7.0	7.1	7.0	6.9	7.3	7.8	7.8	8.1	9.3	10.7	12.0	6.4	12.0
23-Mar	12.7	13.4	14.5	15.7	17.5	16.7	17.5	14.7	10.4	7.4	6.2	3.6	2.0	2.5	3.4	4.7	5.2	5.4	5.1	4.6	4.7	4.6	4.3	4.2	8.4	17.5
24-Mar	4.2	4.0	4.1	4.2	4.4	4.8	4.5	5.4	5.5	5.2	4.7	4.8	4.3	4.2	4.2	3.9	4.0	4.0	5.0	4.2	5.9	8.8	12.1	5.0	5.1	12.1
25-Mar	6.2	5.5	4.1	4.2	4.2	5.1	4.4	4.8	4.7	4.5	5.2	6.6	6.2	5.5	5.1	5.2	5.1	5.5	4.8	6.6	6.0	6.1	4.4	4.7	5.2	6.6
26-Mar	5.5	5.0	5.2	4.5	4.6	3.7	3.6	3.8	3.7	3.6	3.9	4.1	3.5	3.3	3.4	3.2	3.2	3.2	3.5	4.4	4.5	7.3	7.7	4.9	4.3	7.7
27-Mar	4.0	3.8	3.6	3.9	3.8	3.9	7.7	5.7	6.0	5.6	4.7	5.0	4.4	5.0	4.9	5.1	5.4	6.3	7.6	7.2	7.3	5.3	6.6	14.7	5.7	14.7
28-Mar	20.6	14.4	11.2	11.3	10.8	7.9	12.5	10.1	6.2	5.2	5.4	5.1	5.1	4.5	4.5	4.7	4.2	4.1	4.6	6.1	5.4	4.3	4.0	4.2	7.3	20.6
29-Mar	4.1	3.8	3.9	4.2	4.1	4.0	4.0	5.0	6.6	4.4	4.5	3.8	C	C	5.5	6.7	7.1	4.1	3.6	4.0	4.0	3.2	2.7	1.4	4.3	7.1
30-Mar	2.6	2.0	2.4	1.6	3.7	2.0	2.0	2.4	2.4	3.3	2.6	1.7	1.8	2.3	2.5	2.1	2.2	1.5	1.3	1.5	1.7	2.0	2.0	2.7	2.2	3.7
31-Mar	2.0	2.2	2.6	3.5	5.2	5.5	7.1	8.0	9.1	8.8	7.6	7.2	6.8	7.2	8.2	7.5	7.9	6.3	6.5	5.8	5.6	5.7	7.9	5.7	6.3	9.1
	5.1	4.8	4.8	4.6	4.8	4.8	5.2	5.0	5.0	4.6	4.5	4.4	4.3	4.2	4.1	4.3	4.0	3.9	4.1	4.3	4.5	4.7	4.7	4.6	Diurnal Average	
	20.6	14.4	14.5	15.7	17.5	16.7	17.5	14.7	11.8	12.0	12.4	10.9	8.6	7.2	8.2	8.5	7.9	7.3	7.8	7.8	11.3	9.8	12.1	14.7	Diurnal Maximum	

C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Janvier - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	600	80.97	80.97
6 - 15	136	18.35	99.33
16 - 25	5	0.67	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Janvier - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	43	139	58	41	34	26	46	31	27	48	39	12	15	8	18	13	598
6 - 15	10	21	10	2	3	3	1	3	24	28	17	4	2	2	2	2	134
16 - 25	0	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	5
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	161	68	43	37	29	47	34	51	78	58	16	17	10	20	15	737

Total Number of Valid Hours: 737

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Janvier

Total Number of Valid Hours: 737

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Janvier - March 2023

Maximum Value: 11.4 C on Mar 18 16:00

Maximum Daily Average: 0.8 C on Mar 18

Minimum Value: -29.9 C on Mar 6 06:00

Minimum Daily Average: -20.7 C on Mar 5

Maximum Diurnal Average: -1.9 C at hour 16

Minimum Diurnal Average: -14.1 C at hour 7

Monthly Average: -8.30 C

Percentiles: P_1 = -27.5 P_{10} = -18.1 Q_1 = -12.7 Median = -7.8 Q_3 = -3.3 P_{90} = 0.2 P_{99} = 9.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-21.0	-21.2	-21.2	-21.1	-20.5	-19.9	-19.5	-19.2	-18.1	-16.8	-14.2	-11.0	-8.4	-6.6	-5.8	-5.8	-6.3	-7.1	-8.1	-8.7	-9.0	-9.1	-9.0	-8.9	-13.2	-5.8
2-Mar	-9.2	-9.2	-9.2	-9.0	-8.7	-8.5	-8.2	-8.0	-6.9	-5.1	-3.3	-1.2	2.2	4.4	5.5	5.5	4.8	3.1	1.5	0.3	0.4	-0.1	-0.5	-0.5	-2.5	5.5
3-Mar	-0.5	-0.8	-1.0	-1.1	-1.3	-1.6	-2.1	-2.1	-1.9	-1.7	-1.8	-1.4	-2.9	-3.0	-2.9	-4.0	-5.0	-6.3	-8.2	-8.7	-9.5	-11.2	-12.1	-11.8	-4.3	-0.5
4-Mar	-11.5	-11.4	-11.4	-11.7	-12.7	-13.6	-14.7	-15.4	-15.1	-14.1	-13.1	-13.3	-13.1	-13.0	-12.1	-12.4	-12.7	-13.4	-15.1	-17.0	-18.3	-19.3	-20.5	-21.8	-14.5	-11.4
5-Mar	-23.4	-24.3	-25.6	-26.1	-27.1	-26.9	-27.9	-28.5	-23.7	-20.0	-18.1	-16.7	-15.5	-13.6	-13.4	-12.5	-12.5	-15.0	-17.7	-19.3	-21.1	-22.9	-24.1	DF	-20.7	-12.5
6-Mar	-26.2	-27.0	-28.2	-28.9	-29.4	-29.9	-29.2	-28.4	-26.4	-23.1	-19.7	-16.1	-13.6	-10.6	-9.0	-8.0	-8.7	-9.0	-10.6	-11.5	-12.1	-12.5	-12.6	-12.7	-18.5	-8.0
7-Mar	-13.0	-13.1	-13.1	-13.0	-13.4	-13.8	-14.4	-14.9	-14.6	-13.7	-11.8	-9.9	-6.9	-5.1	-4.0	-4.0	-4.1	-4.6	-6.1	-7.5	-8.6	-9.9	-10.8	-12.0	-10.1	-4.0
8-Mar	-13.3	-14.2	-15.1	-15.3	-16.3	-17.5	-17.7	-18.0	-15.4	-12.5	-10.2	-9.0	-7.4	-6.5	-5.6	-5.4	-6.2	-8.1	-9.9	-11.7	-12.6	-13.5	-14.9	-17.2	-12.2	-5.4
9-Mar	-18.5	-19.8	-22.0	-23.9	-25.1	-26.1	-27.0	-27.1	-24.8	-18.8	-15.6	-12.3	-8.6	-7.5	-7.0	-6.6	-7.2	-7.5	-8.1	-9.2	-9.7	-9.9	-10.2	-10.4	-15.1	-6.6
10-Mar	-10.7	-11.1	-11.6	-11.5	-11.6	-11.6	-11.7	-11.6	-11.4	-10.5	-9.1	-7.4	-5.8	-5.2	-4.5	-4.3	-4.5	-5.2	-5.7	-6.4	-7.3	-7.7	-8.5	-10.4	-8.6	-4.3
11-Mar	-11.7	-13.2	-13.9	-14.5	-14.6	-15.1	-15.8	-15.3	-13.6	-11.3	-8.3	-6.2	-4.7	-4.0	-3.2	-2.1	-1.9	-2.4	-3.2	-3.7	-4.3	-5.2	-6.0	-6.9	-8.4	-1.9
12-Mar	-7.3	-7.7	-8.2	-8.3	-9.2	-9.6	-9.5	-9.5	-8.6	-7.3	-6.4	-5.3	-4.4	-3.9	-3.2	-3.1	-3.4	-3.6	-3.8	-5.2	-6.9	-7.9	-9.3	-10.8	-6.8	-3.1
13-Mar	-11.0	-10.9	-11.1	-11.5	-12.1	-12.7	-13.0	-13.2	-12.1	-9.6	-8.9	-7.3	-5.4	-4.8	-4.1	-4.1	-4.3	-5.8	-6.6	-6.7	-6.7	-6.7	-6.7	-6.7	-8.4	-4.1
14-Mar	-6.6	-6.5	-6.3	-6.4	-6.6	-6.9	-8.0	-8.3	-8.5	-8.4	-8.3	-7.8	-6.8	-6.2	-6.5	-7.0	-7.5	-8.2	-9.5	-11.1	-11.6	-13.2	-14.6	-16.1	-8.6	-6.2
15-Mar	-16.4	-17.8	-18.8	-19.4	-21.4	-20.7	-20.9	-20.9	-17.1	-13.7	-11.6	-9.6	-8.0	-6.6	-5.4	-4.7	-4.7	-4.9	-8.3	-10.6	-12.4	-13.4	-14.8	-15.2	-13.2	-4.7
16-Mar	-16.0	-16.7	-16.8	-17.2	-17.2	-16.7	-16.1	-15.4	-14.3	-12.8	-10.4	-8.2	-5.3	-4.6	-3.3	-1.9	-1.1	-1.3	-4.9	-7.1	-8.6	-10.2	-11.7	-13.3	-10.5	-1.1
17-Mar	-14.1	-13.8	-13.9	-13.8	-14.3	-13.9	-14.4	-12.0	-8.5	-4.7	-0.8	2.5	5.8	7.9	9.2	9.8	9.9	9.0	5.8	3.3	2.5	1.8	0.5	-0.8	-2.4	9.9
18-Mar	-1.9	-3.0	-3.9	-4.3	-4.9	-5.4	-6.6	-6.4	-4.6	-2.4	0.6	4.2	8.1	10.0	9.6	11.4	10.8	9.1	5.7	2.8	-0.2	-2.2	-3.6	-4.4	0.8	11.4
19-Mar	-3.6	-5.9	-7.1	-7.1	-9.4	-9.8	-10.2	-8.9	-5.5	-3.8	-2.2	-0.1	2.3	3.6	4.6	4.8	4.0	2.6	0.2	-1.1	-2.1	-2.7	-2.8	-3.7	-2.7	4.8
20-Mar	-4.5	-5.2	-5.8	-6.2	-7.1	-7.9	-8.7	-8.3	-8.0	-5.7	-4.9	-5.1	-4.2	-2.9	-3.1	-4.6	-5.5	-5.7	-6.6	-7.3	-7.4	-7.5	-7.6	-7.8	-6.2	-2.9
21-Mar	-8.4	-8.8	-8.7	-8.8	-9.3	-9.9	-10.1	-10.2	-10.1	-9.5	-9.0	-8.1	-6.8	-5.6	-4.6	-3.9	-3.7	-4.0	-6.0	-7.5	-8.9	-10.7	-12.2	-12.8	-8.2	-3.7
22-Mar	-12.6	-14.2	-15.9	-15.3	-17.5	-14.9	-14.9	-16.3	-9.2	-6.0	-3.1	-1.3	0.2	2.0	3.5	4.7	5.3	4.9	1.8	-1.2	-1.2	-2.0	-2.3	-3.0	-5.4	5.3
23-Mar	-4.2	-5.6	-6.4	-6.6	-5.9	-6.8	-6.5	-6.0	-3.2	0.2	4.2	6.4	7.3	8.0	6.3	4.7	3.5	2.1	-0.8	-3.1	-5.3	-7.2	-6.9	-6.6	-1.6	8.0
24-Mar	-6.8	-7.3	-7.6	-8.4	-10.5	-10.4	-10.7	-10.9	-8.3	-6.1	-5.7	-3.9	-3.0	-1.9	-1.1	-0.5	-0.1	-0.2	-2.3	-4.2	-6.7	-8.2	-9.2	-10.4	-6.0	-0.1
25-Mar	-12.3	-13.2	-12.9	-12.0	-12.1	-11.6	-11.6	-9.4	-6.4	-3.1	-1.1	-0.6	0.1	0.6	0.7	0.7	0.0	-0.9	-2.8	-4.7	-5.9	-6.9	-8.3	-10.3	-6.0	0.7
26-Mar	-11.5	-12.4	-13.4	-15.4	-16.8	-17.8	-18.9	-18.5	-16.6	-15.6	-13.6	-11.6	-10.3	-9.0	-8.3	-8.0	-8.2	-8.9	-10.5	-12.1	-14.0	-16.2	-17.8	-19.2	-13.5	-8.0
27-Mar	-20.6	-22.0	-22.9	-23.8	-24.8	-25.2	-25.3	-22.6	-18.1	-13.1	-10.8	-9.5	-8.1	-6.6	-6.5	-5.3	-5.0	-6.0	-7.7	-10.5	-12.4	-13.6	-15.5	-17.4	-14.7	-5.0
28-Mar	-18.2	-19.4	-20.2	-22.4	-22.7	-23.7	-24.4	-21.0	-16.8	-12.2	-8.0	-6.1	-4.1	-3.1	-2.0	-1.2	-1.0	-1.1	-1.7	-2.6	-3.1	-2.8	-3.1	-3.2	-10.2	-1.0
29-Mar	-3.4	-3.3	-3.3	-3.3	-3.5	-3.5	-3.8	-1.9	-2.0	-1.2	-0.6	-0.1	0.5	0.8	0.8	0.9	0.0	-0.7	-1.6	-3.1	-3.8	-4.0	-4.8	-5.8	-2.1	0.9
30-Mar	-7.5	-8.6	-9.9	-9.8	-9.8	-10.1	-9.8	-8.4	-6.3	-3.6	-2.3	-1.0	0.7	1.4	1.8	2.7	2.5	1.4	0.4	-0.5	-1.4	-2.4	-2.8	-2.8	-3.6	2.7
31-Mar	-2.6	-2.7	-3.0	-3.1	-3.3	-4.7	-4.4	-2.9	-2.6	-1.3	0.3	0.9	1.6	2.8	4.0	4.8	5.4	4.8	3.0	0.8	-1.1	-3.1	-3.6	-3.3	-0.6	5.4
	-11.2	-11.9	-12.5	-12.9	-13.5	-13.8	-14.1	-13.5	-11.6	-9.3	-7.3	-5.7	-4.0	-2.9	-2.2	-1.9	-2.2	-3.0	-4.8	-6.3	-7.4	-8.4	-9.2	-9.5	Diurnal Average	
	-0.5	-0.8	-1.0	-1.1	-1.3	-1.6	-2.1	-1.9	-1.9	0.2	4.2	6.4	8.1	10.0	9.6	11.4	10.8	9.1	5.8	3.3	2.5	1.8	0.5	-0.5	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Janvier - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	54	7.27	7.27
-20 - 0	609	81.97	89.23
0 - 10	78	10.50	99.73
10 - 20	2	0.27	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Janvier - March 2023

Maximum Value: 90.1 % on Mar 14 04:00

Maximum Daily Average: 81.2 % on Mar 14

Minimum Value: 20.3 % on Mar 18 16:00

Minimum Daily Average: 43.2 % on Mar 18

Maximum Diurnal Average: 74.4 % at hour 7

Minimum Diurnal Average: 44.5 % at hour 16

Monthly Average: 61.29 %

Percentiles: P_1 = 22.5 P_{10} = 35.8 Q_1 = 49.6 Median = 63.7 Q_3 = 75.0 P_{90} = 82.7 P_{99} = 88.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	76.2	75.7	75.4	75.8	76.3	76.6	76.8	76.5	75.0	71.9	70.5	67.3	62.4	58.0	56.6	58.3	62.2	66.5	70.4	73.1	74.8	75.6	74.9	74.9	70.9	76.8
2-Mar	81.4	83.1	82.9	79.4	76.4	77.3	78.5	77.1	73.6	67.6	62.8	57.1	47.5	43.2	40.6	41.0	46.5	57.0	66.9	75.6	74.2	74.4	78.9	79.5	67.6	83.1
3-Mar	77.5	78.1	77.2	76.8	74.9	73.7	75.8	73.8	71.0	68.3	73.5	63.7	70.1	69.5	61.8	60.7	61.7	66.5	79.8	78.5	75.6	80.3	83.8	82.8	73.1	83.8
4-Mar	79.2	77.8	72.6	68.4	70.7	75.4	76.2	73.7	72.4	69.9	63.4	66.6	65.7	65.3	50.5	49.8	51.5	54.5	59.0	62.4	68.0	71.1	72.8	74.7	67.1	79.2
5-Mar	75.8	74.6	73.5	72.6	71.9	72.1	70.9	69.7	68.0	60.3	54.1	49.6	46.2	40.7	39.8	38.0	37.3	44.9	53.3	58.2	62.9	68.0	70.4	DF	59.7	75.8
6-Mar	72.0	71.1	69.9	69.7	69.0	68.6	69.4	69.4	67.7	65.6	62.8	54.8	54.8	55.2	51.4	45.1	50.3	52.9	52.4	57.9	64.1	62.4	55.2	52.2	61.0	72.0
7-Mar	50.5	49.7	48.6	47.2	53.8	54.8	53.0	53.1	56.1	56.6	52.3	48.8	47.0	45.2	45.4	46.8	47.6	46.7	42.5	36.0	36.7	40.3	43.1	45.8	47.8	56.6
8-Mar	49.1	51.7	54.5	54.8	57.4	61.4	62.9	63.7	53.9	44.7	38.8	35.0	31.8	30.2	27.8	27.2	28.9	32.1	35.7	40.1	41.8	43.7	47.2	54.7	44.6	63.7
9-Mar	59.1	61.0	67.6	72.1	71.9	71.5	70.7	70.1	66.2	53.3	46.7	44.1	43.1	43.0	43.8	43.1	48.2	50.1	52.2	55.7	58.0	56.7	55.5	57.2	56.7	72.1
10-Mar	64.7	65.4	66.0	67.3	67.2	68.8	67.4	68.1	69.7	64.8	62.2	57.7	55.1	56.1	54.4	53.9	59.5	63.9	62.5	60.1	60.5	62.7	66.3	71.4	63.1	71.4
11-Mar	72.0	77.8	80.8	80.0	81.3	80.1	80.3	78.0	72.8	66.1	60.6	58.7	57.0	56.1	53.8	49.7	48.6	50.9	56.3	59.6	66.8	68.2	74.2	78.6	67.0	81.3
12-Mar	81.4	84.2	86.1	86.7	86.9	86.4	84.8	84.0	80.0	73.6	70.7	68.3	67.0	68.0	65.7	65.5	73.2	72.4	69.5	81.8	86.8	87.0	87.9	87.6	78.6	87.9
13-Mar	87.0	85.7	85.2	85.0	83.8	82.3	81.5	80.8	78.8	70.3	69.2	62.2	54.4	53.0	53.8	56.0	55.9	73.6	84.0	87.0	87.5	87.6	88.1	88.6	75.9	88.6
14-Mar	88.5	89.1	89.6	90.1	90.0	89.0	88.1	88.0	86.8	84.2	80.6	78.3	75.2	69.4	71.3	76.8	70.8	68.0	73.1	78.7	79.1	79.6	82.7	81.8	81.2	90.1
15-Mar	81.7	80.4	79.4	78.7	76.9	77.6	76.5	75.8	74.2	68.7	61.0	56.4	54.5	53.9	53.4	54.1	55.9	56.5	69.6	78.1	82.6	84.5	83.7	81.7	70.7	84.5
16-Mar	80.9	80.2	80.2	79.9	79.8	79.9	80.0	80.0	78.7	75.1	66.9	61.4	54.7	57.6	55.7	52.7	52.0	53.3	67.8	79.2	84.2	86.3	87.3	85.1	72.5	87.3
17-Mar	83.9	84.5	83.9	84.1	83.6	83.4	83.1	82.6	76.7	64.7	53.6	44.9	36.3	31.4	26.8	24.6	21.9	20.8	26.5	34.0	34.9	36.1	39.2	42.0	53.5	84.5
18-Mar	45.4	49.1	52.0	53.8	56.1	57.1	60.8	59.4	53.8	48.3	40.9	33.4	26.4	23.3	23.6	20.3	21.6	24.9	30.7	36.0	46.2	56.3	59.2	59.3	43.2	60.8
19-Mar	58.9	67.2	72.8	73.9	78.7	81.9	85.7	82.9	68.8	63.0	58.0	53.8	48.3	44.2	39.8	37.6	39.6	43.5	52.1	59.2	63.4	65.1	64.4	66.2	61.2	85.7
20-Mar	67.3	68.7	70.0	72.3	70.8	68.0	70.2	65.8	63.8	56.8	56.7	68.2	77.0	73.4	76.0	80.6	81.3	81.5	81.1	83.2	81.6	80.8	82.0	82.8	73.3	83.2
21-Mar	83.2	82.9	82.6	83.5	83.7	84.6	84.7	82.7	80.0	78.0	75.5	69.8	63.9	60.2	56.1	54.1	54.2	55.4	64.7	72.2	75.4	80.1	83.7	85.2	74.0	85.2
22-Mar	83.5	82.0	81.3	82.6	78.4	82.8	81.5	78.0	75.5	63.4	52.1	45.6	43.1	39.0	36.4	34.1	33.5	34.6	43.5	52.5	52.1	54.8	55.1	56.6	59.3	83.5
23-Mar	60.4	65.5	68.0	70.3	68.7	72.3	72.6	70.0	61.7	53.1	43.8	37.1	28.3	27.1	34.4	40.9	44.5	49.1	56.2	59.8	65.7	73.2	72.6	68.1	56.8	73.2
24-Mar	69.3	74.1	75.1	78.3	84.7	86.9	86.3	87.4	83.0	64.8	57.3	47.8	43.1	38.8	34.8	33.2	32.0	32.2	37.6	40.6	47.8	52.3	55.6	59.8	58.4	87.4
25-Mar	68.3	71.0	69.9	65.9	66.9	65.5	65.4	57.7	48.3	41.3	36.4	34.7	30.9	26.4	24.2	25.6	28.7	27.1	29.1	35.2	36.5	33.8	37.9	47.5	44.8	71.0
26-Mar	55.0	60.6	64.7	70.7	73.5	71.2	66.7	59.6	50.7	46.2	40.7	39.0	34.2	30.1	28.0	26.5	26.8	28.8	32.7	37.9	43.7	53.2	58.6	62.5	48.4	73.5
27-Mar	66.4	69.9	71.2	70.9	71.9	71.1	70.0	66.2	53.9	40.6	34.7	33.2	32.6	31.6	33.6	32.4	32.8	35.6	38.2	46.5	53.6	55.7	63.7	69.3	51.9	71.9
28-Mar	70.7	72.7	73.6	74.8	74.9	73.0	72.3	67.8	58.7	47.2	36.1	32.3	25.6	21.4	20.9	20.9	21.9	23.2	26.1	30.1	33.2	33.9	39.1	41.8	45.5	74.9
29-Mar	43.0	44.5	47.1	49.0	52.0	52.7	57.1	57.6	57.5	58.6	58.9	58.7	56.4	56.0	57.4	57.1	57.9	58.9	58.9	63.2	65.3	64.9	67.9	70.4	57.1	70.4
30-Mar	77.2	81.5	84.9	84.3	83.6	84.3	82.8	77.6	69.0	57.8	49.3	43.3	38.5	35.0	32.4	30.6	31.2	35.6	37.5	40.0	45.2	48.7	49.7	52.0	56.3	84.9
31-Mar	52.8	57.2	61.9	65.6	69.5	75.5	75.6	69.3	67.4	60.2	52.5	50.4	48.6	48.7	45.8	42.5	40.9	43.0	50.8	58.8	63.7	70.5	71.1	68.8	58.8	75.6
	69.8	71.5	72.5	73.0	73.7	74.4	74.4	72.5	68.2	61.5	56.2	52.3	49.0	46.8	45.0	44.5	45.8	48.5	53.6	58.4	61.7	64.1	66.2	67.6	Diurnal Average	
	88.5	89.1	89.6	90.1	90.0	89.0	88.1	88.0	86.8	84.2	80.6	78.3	77.0	73.4	76.0	80.6	81.3	81.5	84.0	87.0	87.5	87.6	88.1	88.6	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Janvier - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Janvier - March 2023

Maximum Speed: 22 km/h on Mar 2 14:00

Maximum Daily Speed Average: 11.5 km/h on Mar 2

Minimum Speed Value: 0 km/h on Mar 1 11:00

Maximum Diurnal Speed Average: 3.4 km/h at hour 18

Monthly Average Velocity: 1.1 km/h 79.7 deg

Minimum Daily Speed Average: 0.2 km/h on Mar 27

Minimum Diurnal Speed Average: 0.2 km/h at hour 10

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 5$ Median = 7 $Q_3 = 10$ $P_{90} = 12$ $P_{99} = 18$

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	UO	NNE2	ENE2	UO	NNE1	N2	NNE3	NNE3	N3	NNE3	WSW0	WSW4	S8	S10	S12	S14	S14	S14	S15	S13	SSW12	S10	S11	SSW11	S5.8	S15
2-Mar	S9	S10	S11	SSW11	SSW10	SSW11	SSW10	SSW10	SSW14	SW14	SW13	SW13	SW19	SW22	WSW19	W19	W18	WNW18	W18	W14	W13	W11	WSW11	WSW13	WSW11.5	SW22
3-Mar	W12	W9	W10	W10	WNW10	W8	W10	W7	NW7	NW9	NNW7	NW8	NNE12	NNE10	NNE10	NNE12	NNE10	NNE12	NNE10	NNE8	N7	NNE7	N4	NW3	NNW5.8	W12
4-Mar	WNW2	NW5	NNW7	NW9	NW6	NNE5	NNE8	NNE7	NNW1	SW7	NW10	NNE10	NNE11	NNE8	NW12	NW13	NW11	NNW9	N9	NNE7	NNE5	NNE5	NNE7	N3	NNW6.0	NW13
5-Mar	W3	N4	WSW3	SW3	SW5	SW4	SW3	SSW4	SW4	NE3	ENE3	NE4	NE6	NE4	ENE5	NE4	ENE5	NE4	NE7	NE3	NE3	N1	NE2	DF	NE1.3	NE7
6-Mar	S3	S2	S1	SSE1	SE1	S1	S3	SSW2	SSE1	SE1	NNW1	NNE4	NNE6	NE8	ENE8	SE6	SSE5	SE3	SSE7	SSE8	ESE7	ESE9	SE9	SE10	SE3.0	SE10
7-Mar	ESE9	ESE9	SE9	SE10	SSE11	SSE10	SSE8	SE8	SSE9	SSE9	SSE8	SSE9	SSE13	S16	SSE16	SSE19	SSE16	SSE12	SE11	SE13	SE11	SE12	SE11	SE9	SSE10.9	SSE19
8-Mar	SE7	SE9	SE8	SE8	SE6	SE5	ESE7	ESE5	SE7	SE5	SSE7	ESE9	ENE10	NE13	ENE13	ENE12	ENE13	E13	E10	E8	E7	ESE6	SE5	ESE3	ESE7.1	E13
9-Mar	E1	ESE4	SE4	ESE3	E2	SSW2	ESE1	SW2	W1	N3	NNE5	N4	SSE12	S14	SSE16	S17	S14	SSE12	SSE11	SE15	SE11	SE11	SE9	SE9	SSE6.2	S17
10-Mar	SSE10	SE10	SE8	SSE8	SSE9	SE9	SE9	SE9	SE9	SE10	SE10	SE11	SE11	E9	SE11	SE12	E11	E12	ESE12	ESE12	ESE11	ESE9	ESE6	NE6	SE9.1	E12
11-Mar	NE4	NNE4	NNE3	NNE2	NNE3	NNE5	NNE3	NNE4	N3	NNE4	NE4	ENE7	NE6	NNE8	NNE7	NE6	ENE7	E6	E3	SSE5	S7	S10	S10	SSW10	ENE2.3	SSW10
12-Mar	SSW9	S7	S7	S6	S6	SSW7	SSW9	SSW8	SW7	SW8	SW7	SSW8	SW8	WSW8	SW6	S6	SSW2	WSW3	S5	NNE7	NNE7	NNE4	N3	NE3	SSW4.0	SSW9
13-Mar	NE4	ENE3	ESE3	ENE3	E4	E5	E5	E4	ENE4	NE4	NNE10	NNE9	NE9	NE12	NE13	NE15	ENE15	ENE13	ENE12	ENE10	NE10	NE10	NNE8	NNE7	NE7.4	ENE15
14-Mar	NNE8	NNE8	NE9	NNE8	NNE8	NNE13	NE11	NNE8	NNE9	NNE10	NNE12	NNE9	NNW8	N8	N8	NNW7	NW11	NW12	NW8	NW7	NW7	NNW4	NNW3	W3	N7.2	NNE13
15-Mar	WNW3	WNW3	WNW1	N2	SSW5	SW5	SW4	SSW5	SW3	NW1	E1	ENE4	ENE3	NE6	NE6	ENE5	E5	NE6	NE8	NE6	E3	N1	NNE1	SW1	NE1.2	NE8
16-Mar	SE2	NE2	NNE2	NNE2	N3	N3	N4	NNE4	N2	NNE3	NE2	NE2	NNE4	NNE8	NNE5	NNE5	NE4	NNE4	NE4	ESE1	NNW1	UO	UO	SSW4	NNE2.6	NNE8
17-Mar	S5	S6	SSW5	S6	SSW7	SSW10	SSW10	SSW11	SSW11	SW9	SW10	SW11	SW10	SW12	SW14	WSW13	SW13	SW13	SSW10	SSW12	SW12	SSW13	SW12	SSW14	SW10.1	SSW14
18-Mar	SSW12	SSW10	SSW9	SSW10	SSW10	SW12	SW9	SW11	SW12	SW10	SSW6	S5	SSE4	NE5	E8	NE5	NNE8	NNE11	NNE8	N2	WNW2	SSW3	SSW3	SW3	SSW3.7	SSW12
19-Mar	N4	NNE4	NNW2	NNE7	NNE7	NNE7	NNE6	NNE7	N4	N6	NNE8	NNE10	NNE9	E11	ENE10	ENE11	E11	ENE10	ENE10	E10	ENE6	ENE5	ESE5	ENE6	NE6.3	ENE11
20-Mar	E7	ESE9	E6	NE6	ENE6	ENE5	NNE5	NE4	NNE5	NNE7	NNE8	N9	NNE11	NNE12	NNE14	NNE15	NNE14	NNE12	NNE13	NNE10	NNE11	NNE11	N9	N5	NNE8.0	NNE15
21-Mar	N7	NNE5	N6	N6	NNE7	N4	N4	N7	NNE10	NNE10	NE10	NE10	NE9	NNE9	NNE8	NNE8	ENE9	E7	E8	ESE9	ESE7	SE5	SSE3	S5	NE5.4	NE10
22-Mar	S6	S5	S5	S7	SSE6	S9	S7	S7	S10	S12	SSW13	S13	S13	S13	SW11	SW7	SW9	WSW8	SSW8	SSW9	SSW10	SSW11	SSW14	SSW12	SSW9.1	SSW14
23-Mar	SSW10	SSW8	S8	SSW11	SW10	SSW11	SW9	SSW8	SW9	SW10	WSW7	NW13	NW13	NNW12	N12	NNE14	NNE17	N16	NNE14	NNE16	NNE15	NNE13	NNE12	NNE14	NNW3.7	NNE17
24-Mar	NNE9	NNE8	NNE8	NNE6	NNE5	N3	N4	NNE5	NE3	NE7	NE8	NE9	NE8	NNE6	ENE4	NE4	E6	ENE5	E5	ENE6	NNE5	NNE3	N2	ENE2	NE5.1	NNE9
25-Mar	S2	SSW5	SSW7	SSW10	SSW9	SSW9	SSW9	SSW8	SW7	SW3	NNE11	NE14	NNE15	NNE15	NNE15	NNE15	N15	N12	N8	NNE5	NNE6	NNE10	NNE8	NNE6	NNE3.7	NNE15
26-Mar	NNE6	NNE7	NNE7	NNE6	NNE8	NNE8	N7	NNE10	N7	NNE7	NNE9	NNE10	NNE10	N10	NNE11	NNE12	NE12	NNE11	NNE10	NE8	ENE5	NNE2	WSW2	SSW2	NNE7.4	NE12
27-Mar	SSW3	SSW2	SSW3	SSW3	SSW5	SSW7	SSW6	SSW7	SSW4	ESE2	NE6	E5	ENE7	ENE6	W3	WNW12	NW10	N8	ENE5	E4	WSW1	SE1	NE3	NNE3	SW0.2	WNW12
28-Mar	NNE3	SSW2	S3	N3	NNW2	NE2	SW3	SSW3	WNW2	WNW2	NNW0	ENE3	SSW3	WSW7	SW9	SW11	SW12	SSW12	SW7	SSW7	SSW8	SW12	SW11	SSW11	SW4.6	SSW12
29-Mar	SSW12	SW11	WSW10	SW8	SW5	WSW6	NNW5	N7	NNE7	N7	NNE8	N9	N10	N10	NNE12	NNE14	N12	NNE12	NNE11	NNE8	NNE8	NE7	NNE8	NNE7	N4.9	NNE14
30-Mar	NNE4	N2	SW2	S3	E1	SSW2	SSW1	SW1	N2	NE3	E5	ESE5	NNE5	NE8	NNE7	NE7	NE7	NE11	ENE10	NE9	E9	ENE6	E5	E3	ENE3.8	NE11
31-Mar	E5	ESE6	ESE7	SE7	SSE6	SE5	SSE5	SSE7	S7	SE7	E5	NE6	NE4	E5	NE8	NNE7	NNE8	N10	NNE8	NE9	NE8	NNE6	NNE5	NNE7	ENE3.7	N10
	SSE1.5	SSE1.4	SSE1.6	S1.6	S1.5	S1.8	S1.4	S1.2	SSW1.1	SW0.2	NNE1.5	NE2.5	NE2.8	NE2.8	NE2.7	NE2.6	NE2.9	NE3.4	NE3.4	ENE3.1	ENE2.1	E1.8	ESE1.2	SSE1.1	Diurnal Average	
	W12	SW11	S11	SSW11	SSE11	NNE13	NE11	SSW11	SSW14	SW14	SSW13	NE14	SW19	SW22	WSW19	W19	W18	WNW18	W18	NNE16	NNE15	NNE13	SSW14	SSW14	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 20 m (WS20m) - km/h

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 14:00

Minimum Value: 0 km/h on Mar 18 21:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Hours of Calibration:	0
Percent Operational Time:	99.3

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Janvier - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Janvier - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	246	33.29	33.29
6 - 11	376	50.88	84.17
12 - 19	116	15.70	99.86
20 - 28	1	0.14	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Janvier - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	28	43	26	19	19	12	10	8	13	23	16	6	4	7	3	9	246
6 - 11	22	91	36	18	16	15	33	17	25	44	27	7	7	1	12	5	376
12 - 19	5	27	6	6	2	2	4	9	13	11	14	3	6	2	5	1	116
20 - 28	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	161	68	43	37	29	47	34	51	78	58	16	17	10	20	15	739

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed 20 m (WS20m) - km/h

Janvier

Total Number of Valid Hours: 739

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Janvier - March 2023

Direction of Maximum Speed: 230 deg on Mar 2 14:00
Direction of Maximum Daily Speed Average: 237.7 deg on Mar 2

Direction of Minimum Speed: 253 deg on Mar 1 11:00

Direction of Minimum Daily Speed Average: 0.2 deg on Mar 27

Monthly Average Direction: 79.7 deg

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	UO	32	68	UO	29	8	19	21	5	22	253	255	190	189	191	191	184	186	183	186	194	184	190	192	187.9
2-Mar	182	180	188	194	194	193	192	204	207	220	223	227	232	230	250	275	276	284	280	274	269	268	256	257	237.7
3-Mar	263	267	272	280	303	277	273	278	316	310	339	323	22	28	31	28	29	21	25	12	7	20	6	321	336.8
4-Mar	286	304	339	313	318	18	24	23	348	232	308	25	26	19	322	316	323	340	5	15	12	17	21	8	347.1
5-Mar	276	352	246	224	226	219	216	197	224	49	71	45	41	46	75	52	76	55	36	50	45	6	36	DF	47.4
6-Mar	190	176	177	153	132	188	188	192	149	138	338	12	24	40	76	133	163	135	152	152	112	118	126	130	123.9
7-Mar	123	119	125	141	161	152	147	146	156	154	156	156	164	169	157	163	157	165	142	140	141	139	140	140	149.8
8-Mar	136	137	128	137	138	132	123	114	133	143	147	104	59	54	70	64	75	87	91	94	100	121	129	105	102.3
9-Mar	94	112	142	108	97	204	120	231	279	2	13	5	151	176	163	182	170	157	154	139	142	140	143	140	152.6
10-Mar	148	146	139	158	151	141	138	138	127	146	144	137	126	99	133	136	99	99	110	111	117	122	106	55	127.3
11-Mar	47	18	27	15	21	24	16	14	6	18	35	66	47	27	24	37	60	83	97	156	172	173	184	198	65.0
12-Mar	199	188	175	174	178	196	203	208	217	236	228	208	221	249	215	174	199	248	186	13	19	13	10	41	207.6
13-Mar	48	70	102	57	82	100	99	85	69	51	12	30	41	47	45	43	58	65	58	57	48	41	33	29	51.2
14-Mar	30	32	35	25	24	32	35	16	15	17	13	12	348	1	357	344	312	317	322	315	324	331	334	274	1.4
15-Mar	297	290	285	5	211	215	217	208	225	323	90	57	71	46	40	57	97	55	37	54	87	352	18	233	52.6
16-Mar	137	49	23	31	4	8	4	32	351	18	37	34	25	31	23	32	53	22	36	104	330	UO	UO	211	27.2
17-Mar	178	182	199	189	202	202	206	207	212	220	221	219	235	226	232	237	222	226	209	202	214	212	220	211	214.6
18-Mar	209	198	195	206	213	214	216	216	226	221	210	187	163	56	94	53	29	26	30	5	299	199	197	234	204.8
19-Mar	11	24	342	27	26	27	19	20	9	11	15	15	29	87	78	75	83	75	76	81	69	74	104	75	52.1
20-Mar	80	102	97	48	59	74	32	48	18	15	21	10	16	14	18	19	22	15	16	16	14	13	9	3	26.4
21-Mar	6	12	8	5	13	357	359	9	16	31	34	41	39	32	18	24	71	80	86	104	123	138	153	169	41.6
22-Mar	175	183	188	181	167	181	177	178	183	185	194	189	174	186	223	214	227	240	213	199	206	200	199	205	194.8
23-Mar	199	206	180	205	218	206	223	204	225	228	242	308	319	330	355	17	13	10	12	17	21	21	29	33	335.9
24-Mar	19	18	28	20	15	2	0	30	52	41	39	40	36	33	76	52	92	65	84	78	24	25	10	64	38.5
25-Mar	187	200	205	201	210	208	206	212	232	235	31	34	33	31	30	22	10	3	10	20	27	23	22	14	18.3
26-Mar	19	25	28	20	28	19	9	30	4	16	22	23	16	3	28	31	34	28	23	43	57	22	240	205	23.7
27-Mar	207	196	204	194	205	212	204	207	197	115	45	93	78	66	271	293	318	3	58	93	238	124	49	16	216.0
28-Mar	22	201	180	10	336	47	220	203	287	297	341	68	196	250	228	215	217	210	216	206	193	215	227	211	217.7
29-Mar	209	234	240	233	220	254	327	10	20	6	16	7	8	357	20	22	7	19	18	30	27	36	21	18	0.8
30-Mar	18	2	229	190	88	212	203	228	3	45	85	117	15	41	32	47	40	42	60	55	79	78	96	93	57.5
31-Mar	101	102	112	143	162	141	161	163	173	141	101	46	56	88	38	17	14	11	28	40	43	20	16	18	69.4
Diurnal Average	166.4	151.4	161.7	180.2	183.6	183.6	189.5	178.2	211.0	221.1	29.3	38.6	45.3	42.7	46.1	35.8	42.5	36.2	55.8	78.2	78.6	100.5	122.5	158.6	

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 20 m (WD20m) - deg

Janvier - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 103 deg on Mar 28 11:00

Minimum Value: 7 deg on Mar 19 04:00

Percentiles: $P_1 = 8$ $P_{10} = 13$ $Q_1 = 17$ Median = 21 $Q_3 = 29$ $P_{90} = 46$ $P_{99} = 90$

Hours in Service:	744
Hours of Data:	739
Hours of Missing Data:	5
Hours of Calibration:	0
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	UO	36	20	UO	18	19	26	9	20	21	98	42	27	29	26	18	18	17	17	17	15	17	16	16	98
2-Mar	19	18	18	19	17	14	14	18	16	21	19	21	20	24	23	23	26	17	20	20	19	20	19	20	26
3-Mar	20	18	19	17	21	23	19	16	26	26	41	35	16	15	13	15	14	16	13	19	20	14	30	35	41
4-Mar	42	25	34	29	29	19	15	17	79	26	35	19	20	33	35	30	31	36	21	15	14	18	13	25	79
5-Mar	21	21	37	23	15	16	20	12	18	80	49	43	22	54	39	38	30	19	11	19	21	18	20	DF	80
6-Mar	24	35	75	36	63	72	16	11	42	44	85	24	17	21	23	45	55	91	22	20	24	18	18	18	91
7-Mar	18	15	18	24	25	24	24	25	27	25	28	35	29	26	25	23	24	22	20	20	22	19	19	19	35
8-Mar	18	15	15	17	19	16	13	12	19	35	33	28	24	17	20	19	20	18	18	15	18	23	18	28	35
9-Mar	91	9	12	11	28	60	84	54	40	37	21	69	33	28	26	21	24	24	26	20	25	25	27	24	91
10-Mar	23	23	30	30	25	23	27	24	22	28	29	25	34	40	34	25	27	20	20	18	16	19	27	17	40
11-Mar	20	16	12	16	11	8	10	10	28	23	48	25	37	19	22	22	19	26	47	39	15	15	14	13	48
12-Mar	13	14	14	14	14	13	13	15	23	27	31	31	37	25	44	31	68	58	34	26	18	18	32	16	68
13-Mar	15	22	48	24	16	13	16	27	20	40	21	25	28	19	18	14	18	20	17	18	13	13	13	13	48
14-Mar	14	17	13	17	19	16	14	20	19	18	21	17	39	30	36	36	26	23	25	21	26	29	25	44	44
15-Mar	26	29	89	38	19	17	17	10	27	92	90	48	63	23	21	45	30	29	7	16	21	88	48	86	92
16-Mar	51	54	73	64	25	33	35	26	51	66	63	68	48	23	28	24	33	11	21	55	45	UO	UO	66	73
17-Mar	18	14	14	18	14	8	8	13	18	21	25	25	24	27	23	25	24	20	17	12	12	15	17	14	27
18-Mar	15	13	14	14	15	14	13	16	19	23	30	29	41	60	21	40	13	13	8	27	22	62	22	16	62
19-Mar	43	12	39	7	9	9	9	12	31	29	22	21	27	19	22	21	20	18	16	20	22	31	38	19	43
20-Mar	18	18	31	17	27	30	13	34	23	24	19	23	20	18	18	17	16	17	17	18	17	18	23	35	35
21-Mar	26	23	22	22	20	33	28	24	17	17	12	17	17	25	22	23	26	21	17	16	16	29	36	19	36
22-Mar	18	25	17	13	17	15	18	21	21	19	24	24	25	25	31	55	36	22	18	10	11	11	12	14	55
23-Mar	20	14	17	12	36	12	16	20	18	19	37	27	31	41	40	18	20	22	19	20	17	16	16	16	41
24-Mar	20	17	14	15	13	28	20	30	22	13	15	19	26	44	54	68	31	24	17	12	16	23	22	42	68
25-Mar	48	20	10	9	9	8	10	16	19	83	20	13	12	14	17	20	23	27	19	12	12	12	12	13	83
26-Mar	11	11	12	13	9	16	20	11	34	28	23	26	26	25	27	20	17	23	14	15	14	52	24	39	52
27-Mar	24	20	12	24	11	9	8	13	27	74	25	46	35	37	94	29	36	33	29	12	60	57	26	16	94
28-Mar	18	85	67	53	52	64	12	45	51	67	103	71	81	50	35	28	23	19	16	11	12	18	17	16	103
29-Mar	16	23	18	18	21	28	33	24	21	32	27	30	33	32	21	20	25	21	18	13	16	14	20	15	33
30-Mar	8	56	21	20	63	38	100	81	74	38	58	66	55	37	37	23	21	13	16	19	20	23	25	57	100
31-Mar	20	16	14	15	19	18	21	25	27	26	55	25	38	60	29	33	24	16	12	10	13	11	11	13	60
Diurnal Maximum	91	85	89	64	63	72	100	81	79	92	103	71	81	60	94	68	68	91	47	55	60	88	48	86	

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Janvier - March 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS23
FORT HILLS
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
MARCH 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	707	35	37	99.73	63.5	0	10.4	0
TRS(ppb) Average	701	41	43	99.73	2.7	0	1.1	0
THC(ppm) Average	707	35	37	99.73	36.3	-	4.2	-
NMHC(ppm) Average	707	35	37	99.73	0.915	-	0.321	-
CH4(ppm) Average	707	35	37	99.73	36	-	4.1	-
NO2 (ppb) Average	676	38	68	95.97	55.4	0	31.8	-
NO (ppb) Average	676	38	68	95.97	146.2	-	24.4	-
NOX (ppb) Average	676	38	68	95.97	191.7	-	54.3	-
PM2.5 (ug/m3) Average	716	0	28	96.24	229.6	13	40.4	4
Temperature 2 m (C) Average	742	0	2	99.73	8.5	-	0	-
Relative Humidity (%) Average	742	0	2	99.73	91.6	-	83	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	31	-	24	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	1.53	4.3	-	0	0	0	0.1	0.7	4.1	63.5
TRS (ppb) Average	701	0.3	0.3	-	0.1	0.1	0.2	0.2	0.3	0.6	2.7
THC (ppm) Average	707	2.45	1.4	-	2	2.1	2.1	2.2	2.5	2.9	36.3
NMHC(ppm) Average	707	0.094	0.128	-	0	0	0	0	0.1	0.3	0.915
CH4(ppm) Average	707	2.36	1.4	-	2	2.1	2.1	2.2	2.3	2.7	36
NO2 (ppb) Average	676	17.89	11.2	-	0.7	5.1	8.8	15.7	25.1	35.1	55.4
NO (ppb) Average	676	8.46	15.5	-	0	0.2	0.9	2.9	9.2	22.8	146.2
NOX (ppb) Average	676	26.35	23.6	-	0.8	6.6	11.7	19.9	33.2	53.4	191.7
PM2.5 (ug/m3) Average	716	13.95	17.9	-	0.6	4	5.3	8.8	14.9	26	229.6
Temperature 2 m (C) Average	742	-10.04	6.7	-	-32.1	-18.3	-14.2	-10	-5.4	-1.7	8.5
Relative Humidity (%) Average	742	68.98	12.2	-	29.4	50.7	60.9	70.4	78.8	84	91.6
Wind Speed 10 m (km/h) Average	740	11.3	6	-	0	3	6	10	16	21	31
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
ALL PARAMETERS	15 Mar 2023 08:00	15 Mar 2023 08:00	1	Maintenance - station logger/modem reset
NO2	03 Mar 2023 09:00	04 Mar 2023 11:00	27	Analyzer Failure - inconsistent response
NO2	04 Mar 2023 12:00	04 Mar 2023 12:00	1	Maintenance - to reestablish normal operations
PM2.5	17 Mar 2023 13:00	17 Mar 2023 13:00	1	Maintenance - to clean the optical chamber
PM2.5	17 Mar 2023 14:00	18 Mar 2023 13:00	24	Analyzer Failure - inconsistent response
PM2.5	18 Mar 2023 14:00	18 Mar 2023 14:00	1	Maintenance - to reestablish normal operations
Wind Speed, Wind Direction	15 Mar 2023 21:00	15 Mar 2023 21:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 63.5 ppb on Mar 16 16:00

Maximum Daily Average: 10.4 ppb on Mar 16

Minimum Value: 0.0 ppb on Mar 5 19:00

Maximum Diurnal Average: 4.1 ppb at hour 16

Monthly Average: 1.53 ppb

Minimum Daily Average: 0.0 ppb on Mar 26

Minimum Diurnal Average: 0.3 ppb at hour 5

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.7 P_{90} = 4.1 P_{99} = 17.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	6.5	7.6	6.0	3.6	3.5	2.9	2.5	2.6	1.2	0.8	1.7	4.1	14.3	14.7	9.2	4.5	1.3	1.0	0.9	0.8	0.8	0.8	0.6	4.0	14.7
2-Mar	0.5	Z	1.1	0.8	1.3	2.9	4.9	6.5	4.8	4.8	5.5	C	C	C	C	0.7	0.3	0.4	0.6	0.4	0.5	0.2	0.3	0.2	1.9	6.5
3-Mar	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2
4-Mar	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	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5-Mar	0.2	0.2	0.3	0.3	Z	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	DF	0.1	0.3
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7	2.9	1.9	13.4	14.7	Z	13.1	14.1	13.6	9.4	4.6	0.9	0.5	0.3	0.3	3.9	14.7
7-Mar	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.6	2.4	2.1	1.5	0.8	1.6	0.7	0.5	0.1	0.1	0.2	0.1	0.1	0.0	0.5	2.4
8-Mar	Z	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	1.8	8.3	23.3	12.6	3.4	2.4	1.9	1.3	2.6	3.4	1.7	0.3	0.2	0.2	0.1	2.8	23.3
9-Mar	0.2	Z	0.1	0.1	0.2	0.3	0.3	0.1	0.4	9.1	12.3	15.3	4.0	0.6	1.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.9	15.3
10-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	1.6	0.4	0.5	0.3	0.5	0.7	0.4	0.2	0.2	0.4	0.4	0.3	0.3	0.3	1.6
11-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.5	1.0	5.5	3.1	4.8	5.0	3.4	1.4	0.8	0.4	0.2	0.2	0.1	0.1	0.1	0.1	1.2	5.5
12-Mar	0.1	0.2	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.1	0.1	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	0.3
13-Mar	0.2	0.2	0.1	0.3	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3
14-Mar	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
15-Mar	0.0	Z	0.0	0.0	0.1	0.0	0.0	M	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.5	0.6	0.5	0.4	0.1	0.1	0.6
16-Mar	0.8	0.4	0.1	Z	0.0	0.0	0.0	0.0	0.2	14.5	12.0	13.8	13.2	16.6	32.6	63.5	21.7	15.7	14.9	12.9	3.4	1.1	0.6	0.5	10.4	63.5
17-Mar	0.4	0.4	0.4	2.3	Z	1.2	2.9	4.7	4.6	4.9	8.5	11.3	24.6	11.1	4.6	4.1	1.0	2.6	2.0	1.4	1.8	1.5	0.9	0.5	4.2	24.6
18-Mar	0.4	0.3	0.2	0.2	0.2	Z	0.4	0.4	0.6	0.6	0.8	1.0	1.7	2.2	3.4	5.9	3.9	0.8	0.5	0.8	0.7	0.5	0.3	0.4	1.1	5.9
19-Mar	Z	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.4	0.7	2.1	4.7	11.5	7.7	2.2	1.7	1.1	0.6	0.5	0.4	0.1	0.1	0.1	0.1	1.6	11.5
20-Mar	0.1	Z	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
21-Mar	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.6	6.8	14.2	8.1	2.5	2.1	1.9	1.7	14.2
22-Mar	1.0	0.8	0.7	Z	1.0	1.4	1.8	5.5	4.6	6.6	12.2	11.2	15.5	18.1	17.1	17.4	13.9	15.2	13.8	6.2	3.0	2.2	1.0	0.7	7.4	18.1
23-Mar	0.7	1.0	0.9	0.9	Z	1.3	1.6	1.6	1.6	1.0	0.8	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.6	1.6
24-Mar	0.1	0.1	0.1	0.2	0.1	Z	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.3
25-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
26-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	0.1	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	0.6	0.6	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.2	0.6
28-Mar	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	2.0	4.8	1.7	1.8	1.9	3.6	3.3	3.5	5.7	5.5	2.0	1.8	3.1	2.8	2.9	2.0	5.7
29-Mar	2.9	1.5	0.9	0.9	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	0.2	0.1	0.1	0.3	2.9
30-Mar	0.2	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.2	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.4
31-Mar	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	0.0	0.1	0.1	0.1	0.1	0.1
	0.3	0.5	0.5	0.5	0.3	0.5	0.5	0.8	0.7	1.6	2.6	3.2	3.7	3.3	3.0	4.1	2.3	2.0	1.9	1.5	0.8	0.5	0.4	0.3	Diurnal Average	
	2.9	6.5	7.6	6.0	3.6	3.5	4.9	6.5	4.8	14.5	12.3	23.3	24.6	18.1	32.6	63.5	21.7	15.7	14.9	14.2	8.1	3.1	2.8	2.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	671	94.91	94.91
11 - 20	31	4.38	99.29
21 - 60	4	0.57	99.86
61 - 110	1	0.14	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Hills - March 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	122	142	37	19	17	20	83	104	34	13	9	3	4	14	17	31	669
11 - 20	1	0	2	0	0	1	6	15	5	1	0	0	0	0	0	0	31
21 - 60	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	4
61 - 110	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	123	142	39	19	17	21	93	120	39	14	9	3	4	14	17	31	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Fort Hills

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.7 ppb on Mar 1 14:00 Maximum Daily Average: 1.1 ppb on Mar 1

Minimum Value: 0.1 ppb on Mar 19 21:00 Minimum Daily Average: 0.1 ppb on Mar 14

Maximum Diurnal Average: 0.4 ppb at hour 8 Minimum Diurnal Average: 0.2 ppb at hour 23

Monthly Average: 0.30 ppb Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.2 Median = 0.2 Q_3 = 0.3 P_{90} = 0.6 P_{99} = 1.4

Hours in Service:	744
Hours of Data:	701
Hours of Missing Data:	43
Hours of Calibration:	41
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.5	Z	2.1	2.1	1.5	1.3	1.3	1.4	1.7	0.9	0.5	1.2	1.8	2.7	1.4	0.9	0.6	1.2	0.5	0.3	0.4	0.3	0.3	0.3	1.1	2.7
2-Mar	0.4	0.5	Z	0.3	0.3	0.5	0.8	1.5	1.0	0.6	0.7	0.6	0.7	0.7	0.6	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.5	1.5
3-Mar	0.2	0.2	0.2	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3
4-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
5-Mar	0.2	0.2	0.2	0.3	0.3	Z	0.3	0.4	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	DF	0.3	0.8
6-Mar	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.6	0.5	0.8	0.7	0.5	Z	0.9	0.9	0.9	0.7	0.4	0.4	0.3	0.4	0.5	0.9
7-Mar	Z	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	0.3	0.3	0.2	0.2	0.2	0.2	0.3
8-Mar	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.5	0.5	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.5
9-Mar	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.2	1.2	1.0	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.3	1.2
10-Mar	0.1	0.1	0.1	Z	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	0.4	0.2	0.2	0.2	0.3	0.2	0.4
11-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.7	0.6	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.7
12-Mar	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
13-Mar	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3
14-Mar	0.1	Z	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
15-Mar	0.2	0.1	Z	0.2	0.2	0.2	0.2	M	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3
16-Mar	0.3	0.4	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.4	0.5	1.0	0.8	0.8	0.7	1.1	0.7	0.9	0.8	0.5	0.4	0.3	0.2	0.2	0.5	1.1
17-Mar	0.2	0.3	0.4	0.9	0.6	Z	0.9	1.2	0.6	C	C	C	C	C	C	C	C	C	C	0.4	0.5	0.6	0.4	0.3	--	1.2
18-Mar	Z	0.3	0.3	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.5	0.7	0.7	0.8	0.7	0.5	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.4	0.8
19-Mar	0.2	Z	0.2	0.2	0.5	0.3	0.3	0.3	0.4	0.4	0.6	0.8	1.0	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	1.0
20-Mar	0.1	0.2	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.3	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	0.2	0.1	0.3
21-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.6	0.9	0.8	0.6	0.8	0.8	0.3	0.9
22-Mar	0.6	0.4	0.4	0.5	Z	0.9	0.6	0.3	0.4	0.6	0.5	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.4	0.9
23-Mar	0.2	0.4	0.6	0.8	0.8	Z	1.0	0.9	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.3	1.0
24-Mar	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.3	0.3	0.2	0.5
25-Mar	0.3	Z	0.3	0.3	0.3	0.5	0.5	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.5
26-Mar	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.3
27-Mar	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
28-Mar	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.9	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.3	0.9
29-Mar	0.6	0.6	0.6	0.6	0.6	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.6
30-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
31-Mar	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3
	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	Diurnal Average	
	0.6	0.6	2.1	2.1	1.5	1.3	1.3	1.5	1.7	1.2	1.0	1.2	1.8	2.7	1.4	1.1	0.9	1.2	0.9	0.9	0.8	0.6	0.8	0.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	700	99.86	99.86
3 - 4	1	0.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	**Wind Direction** N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	122	143	39	19	18	22	87	119	38	13	8	3	5	15	15	32	698
3 - 4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	122	143	39	19	18	22	88	119	38	13	8	3	5	15	15	32	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Fort Hills

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 699

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 36.3 ppm on Mar 20 07:00

Maximum Daily Average: 4.2 ppm on Mar 20

Minimum Value: 2.0 ppm on Mar 2 22:00

Maximum Diurnal Average: 3.5 ppm at hour 7

Monthly Average: 2.45 ppm

Minimum Daily Average: 2.1 ppm on Mar 14

Minimum Diurnal Average: 2.2 ppm at hour 16

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.2 Q_3 = 2.5 P_{90} = 2.9 P_{99} = 4.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	4.0	4.8	4.3	2.9	2.7	2.7	2.7	4.6	3.7	2.5	2.6	3.0	3.1	3.0	2.1	2.4	3.3	4.3	3.4	3.7	3.1	3.3	3.2	3.3	4.8
2-Mar	2.9	Z	2.6	2.9	2.3	2.1	2.3	2.2	2.2	2.2	2.2	C	C	C	C	2.2	2.7	2.4	2.0	2.1	2.2	2.0	2.0	2.2	2.3	2.9
3-Mar	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.3
4-Mar	2.0	2.0	2.0	Z	2.0	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.1	2.3	2.1	2.1	2.3
5-Mar	2.2	2.2	2.2	2.2	Z	2.1	2.2	3.0	3.3	2.5	2.4	2.5	2.3	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.3	2.3	DF	2.4	3.3
6-Mar	2.2	2.1	2.2	2.2	2.3	2.3	2.5	2.7	2.7	2.7	2.9	2.7	2.5	2.5	Z	2.1	2.2	2.3	2.5	2.9	2.6	3.1	3.2	2.8	2.5	3.2
7-Mar	2.4	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.5	2.7	2.7	2.8	2.4	2.3	2.3	2.8
8-Mar	Z	2.4	2.2	2.4	2.6	2.5	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.4	3.3	2.9	2.9	2.4	2.5	2.4	3.3
9-Mar	2.6	Z	2.3	2.7	3.5	3.9	3.2	3.0	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.6	2.4	2.3	2.5	2.3	2.2	2.5	3.9
10-Mar	2.2	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.6	2.8	2.4	2.2	2.3	2.3	2.2	2.8
11-Mar	2.2	2.3	2.4	Z	2.6	2.4	2.6	2.5	2.4	2.9	3.0	2.8	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	3.0
12-Mar	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.3
13-Mar	2.3	2.3	2.3	2.3	2.3	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	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.3
14-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1
15-Mar	2.1	Z	2.2	2.1	2.1	2.1	2.0	M	2.2	2.2	2.1	2.1	2.1	2.3	2.5	2.6	2.1	2.1	2.4	2.9	2.8	2.8	2.5	2.3	2.3	2.9
16-Mar	4.4	3.5	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.4	2.3	2.4	2.2	2.2	2.3	2.2	2.1	2.4	4.4
17-Mar	2.1	2.4	2.4	2.3	Z	2.2	2.2	2.3	2.5	2.6	2.4	2.2	2.2	2.2	2.2	2.2	2.7	2.6	4.4	3.3	2.8	2.7	2.4	2.3	2.5	4.4
18-Mar	2.4	2.3	2.4	2.2	2.1	Z	2.7	2.6	2.5	2.6	2.8	3.1	3.9	4.1	3.7	3.0	3.0	3.1	3.2	2.8	2.4	2.5	2.4	2.6	2.8	4.1
19-Mar	Z	2.1	2.1	2.1	2.4	2.2	2.2	2.6	2.2	2.8	4.1	3.6	2.7	3.4	2.3	2.3	2.2	2.2	2.2	2.1	2.3	2.2	2.5	6.0	2.6	6.0
20-Mar	2.5	Z	3.7	6.4	2.5	4.3	36.3	6.9	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.2	4.2	36.3
21-Mar	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.8	3.1	2.2	2.6	2.7	2.7	2.9	2.8	3.3	10.0	8.0	4.0	4.0	2.6	3.2	10.0
22-Mar	3.2	3.8	3.3	Z	2.6	3.1	3.3	2.4	2.3	2.3	2.2	2.2	2.3	2.1	2.1	2.1	2.3	2.1	2.2	2.8	2.9	2.7	2.2	2.7	2.6	3.8
23-Mar	2.8	2.7	3.2	3.5	Z	2.9	3.2	3.6	2.7	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.4	3.6
24-Mar	2.0	2.1	2.2	2.2	2.1	Z	2.1	2.2	2.5	2.3	2.7	2.7	2.4	2.4	2.4	2.4	2.5	2.4	2.6	2.8	3.1	3.4	2.3	2.1	2.4	3.4
25-Mar	Z	2.1	2.3	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3
26-Mar	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.3	2.1	2.1	2.1	2.1	2.5
27-Mar	2.1	2.1	Z	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.4	2.4	2.4	2.3	2.5	2.4	2.9	2.9	2.4	2.3	2.1	2.3	2.9
28-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.3	2.3	2.4	2.8	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.4	2.9	2.6	2.4	2.3	2.9
29-Mar	2.5	2.7	3.0	2.8	Z	2.7	2.4	2.4	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.4	2.6	2.2	2.2	2.2	2.3	3.0
30-Mar	2.5	2.3	2.2	2.2	2.1	Z	2.8	2.4	2.7	3.2	2.9	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.7	3.2	2.2	2.1	2.1	2.4	3.2
31-Mar	Z	2.2	2.1	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.2	2.1	2.2	2.4	2.2	2.4
	2.4	2.4	2.5	2.6	2.3	2.4	3.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.5	2.7	2.7	2.5	2.4	2.4	Diurnal Average	
	4.4	4.0	4.8	6.4	3.5	4.3	36.3	6.9	4.6	3.7	4.1	3.6	3.9	4.1	3.7	3.0	3.0	3.3	4.4	10.0	8.0	4.0	4.0	6.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort Hills - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	37	5.23	5.23
2.1 - 3.0	612	86.56	91.80
3.1 - 10.0	57	8.06	99.86
> 10.0	1	0.14	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort Hills - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	16	11	0	0	0	0	0	0	0	0	0	0	0	3	3	4	37
2.1 - 3.0	104	128	38	19	13	18	69	108	35	11	8	3	4	11	14	27	610
3.1 - 10.0	3	3	1	0	4	3	24	11	4	3	1	0	0	0	0	0	57
> 10.0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Totals	123	142	39	19	17	21	93	120	39	14	9	3	4	14	17	31	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Fort Hills

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills - March 2023

Maximum Value: 0.915 ppm on Mar 18 15:00

Maximum Daily Average: 0.321 ppm on Mar 18

Minimum Value: 0.000 ppm on Mar 4 02:00

Minimum Daily Average: 0.003 ppm on Mar 14

Maximum Diurnal Average: 0.180 ppm at hour 20

Minimum Diurnal Average: 0.048 ppm at hour 5

Monthly Average: 0.094 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.1 P_{90} = 0.3 P_{99} = 0.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.354	0.581	0.478	0.266	0.253	0.248	0.257	0.393	0.253	0.071	0.113	0.245	0.272	0.220	0.015	0.069	0.217	0.402	0.632	0.358	0.252	0.224	0.228	0.278	0.632
2-Mar	0.228	Z	0.105	0.149	0.045	0.036	0.107	0.122	0.041	0.020	0.054	C	C	C	C	0.030	0.170	0.084	0.009	0.053	0.133	0.001	0.002	0.072	0.077	0.228
3-Mar	0.030	0.007	Z	0.039	0.023	0.039	0.074	0.014	0.003	0.007	0.002	0.003	0.089	0.079	0.058	0.044	0.061	0.022	0.010	0.041	0.017	0.003	0.015	0.003	0.030	0.089
4-Mar	0.001	0.000	0.002	Z	0.004	0.092	0.046	0.077	0.005	0.003	0.000	0.002	0.000	0.002	0.009	0.045	0.024	0.020	0.028	0.022	0.037	0.014	0.032	0.035	0.022	0.092
5-Mar	0.033	0.011	0.012	0.004	Z	0.001	0.009	0.184	0.226	0.160	0.095	0.094	0.070	0.065	0.038	0.026	0.075	0.070	0.102	0.109	0.106	0.038	0.035	DF	0.071	0.226
6-Mar	0.006	0.002	0.006	0.014	0.058	0.037	0.120	0.233	0.252	0.286	0.381	0.266	0.170	0.173	Z	0.001	0.035	0.080	0.107	0.249	0.212	0.235	0.195	0.136	0.141	0.381
7-Mar	0.013	0.032	0.063	0.057	0.034	Z	0.009	0.011	0.024	0.007	0.000	0.001	0.000	0.001	0.001	0.000	0.022	0.187	0.207	0.249	0.241	0.197	0.022	0.005	0.060	0.249
8-Mar	Z	0.019	0.001	0.011	0.033	0.036	0.002	0.001	0.003	0.029	0.013	0.054	0.012	0.004	0.001	0.002	0.002	0.050	0.084	0.273	0.237	0.173	0.028	0.049	0.048	0.273
9-Mar	0.063	Z	0.003	0.013	0.123	0.175	0.141	0.082	0.009	0.043	0.044	0.055	0.002	0.002	0.000	0.000	0.000	0.033	0.141	0.136	0.022	0.085	0.055	0.055	0.056	0.175
10-Mar	0.028	0.015	Z	0.004	0.023	0.000	0.002	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.002	0.050	0.144	0.215	0.170	0.054	0.108	0.116	0.041	0.215
11-Mar	0.008	0.003	0.039	Z	0.055	0.041	0.076	0.062	0.043	0.209	0.276	0.333	0.237	0.031	0.008	0.003	0.005	0.006	0.005	0.002	0.014	0.002	0.003	0.003	0.064	0.333
12-Mar	0.003	0.006	0.003	0.004	Z	0.007	0.001	0.003	0.001	0.003	0.002	0.011	0.057	0.064	0.012	0.011	0.059	0.094	0.009	0.003	0.005	0.007	0.009	0.071	0.019	0.094
13-Mar	0.060	0.044	0.060	0.059	0.065	Z	0.010	0.007	0.004	0.003	0.003	0.002	0.001	0.002	0.002	0.000	0.003	0.000	0.005	0.024	0.017	0.016	0.018	0.021	0.018	0.065
14-Mar	Z	0.004	0.007	0.010	0.004	0.004	0.001	0.001	0.001	0.001	0.005	0.001	0.000	0.002	0.003	0.006	0.004	0.000	0.001	0.002	0.000	0.005	0.003	0.008	0.003	0.010
15-Mar	0.008	Z	0.025	0.008	0.011	0.018	0.001	M	0.029	0.030	0.014	0.006	0.022	0.133	0.217	0.224	0.025	0.031	0.100	0.302	0.309	0.269	0.142	0.069	0.091	0.309
16-Mar	0.380	0.296	0.006	Z	0.003	0.002	0.001	0.002	0.011	0.076	0.047	0.056	0.048	0.089	0.086	0.077	0.102	0.029	0.111	0.059	0.051	0.083	0.012	0.001	0.071	0.380
17-Mar	0.012	0.101	0.098	0.107	Z	0.022	0.038	0.077	0.225	0.244	0.125	0.058	0.045	0.044	0.050	0.085	0.152	0.200	0.608	0.370	0.277	0.229	0.122	0.060	0.145	0.608
18-Mar	0.098	0.050	0.064	0.008	0.005	Z	0.125	0.123	0.109	0.128	0.235	0.359	0.625	0.903	0.915	0.506	0.510	0.717	0.504	0.433	0.266	0.262	0.188	0.239	0.321	0.915
19-Mar	Z	0.022	0.044	0.010	0.118	0.095	0.092	0.170	0.056	0.343	0.683	0.648	0.358	0.697	0.168	0.147	0.080	0.085	0.096	0.048	0.098	0.056	0.118	0.021	0.185	0.697
20-Mar	0.126	Z	0.091	0.099	0.094	0.159	0.252	0.135	0.097	0.003	0.020	0.026	0.014	0.031	0.006	0.016	0.010	0.009	0.003	0.003	0.007	0.014	0.060	0.097	0.060	0.252
21-Mar	0.118	0.032	Z	0.001	0.005	0.002	0.002	0.001	0.001	0.130	0.346	0.254	0.021	0.182	0.242	0.229	0.300	0.241	0.179	0.192	0.145	0.074	0.190	0.178	0.133	0.346
22-Mar	0.172	0.145	0.160	Z	0.130	0.192	0.138	0.095	0.073	0.072	0.048	0.053	0.073	0.033	0.013	0.013	0.111	0.015	0.030	0.189	0.226	0.185	0.029	0.147	0.102	0.226
23-Mar	0.185	0.199	0.377	0.418	Z	0.286	0.374	0.436	0.285	0.110	0.085	0.047	0.037	0.017	0.006	0.002	0.021	0.014	0.047	0.009	0.001	0.001	0.000	0.002	0.128	0.436
24-Mar	0.001	0.001	0.051	0.036	0.007	Z	0.015	0.005	0.270	0.145	0.286	0.264	0.183	0.204	0.198	0.233	0.233	0.234	0.309	0.539	0.560	0.450	0.111	0.025	0.189	0.560
25-Mar	Z	0.033	0.035	0.024	0.027	0.004	0.011	0.082	0.056	0.081	0.094	0.133	0.019	0.005	0.016	0.017	0.016	0.016	0.069	0.043	0.007	0.015	0.005	0.000	0.035	0.133
26-Mar	0.003	Z	0.007	0.003	0.003	0.004	0.012	0.091	0.112	0.003	0.005	0.069	0.059	0.023	0.008	0.011	0.002	0.025	0.064	0.274	0.178	0.019	0.001	0.000	0.042	0.274
27-Mar	0.000	0.003	Z	0.025	0.022	0.018	0.001	0.002	0.001	0.001	0.012	0.003	0.041	0.141	0.194	0.165	0.160	0.214	0.140	0.292	0.287	0.210	0.072	0.006	0.087	0.292
28-Mar	0.005	0.007	0.002	Z	0.005	0.022	0.065	0.060	0.123	0.386	0.173	0.172	0.187	0.169	0.136	0.032	0.032	0.057	0.006	0.017	0.084	0.323	0.240	0.172	0.107	0.386
29-Mar	0.161	0.165	0.177	0.204	Z	0.161	0.105	0.132	0.066	0.035	0.018	0.005	0.000	0.000	0.004	0.003	0.020	0.066	0.065	0.264	0.364	0.074	0.073	0.029	0.095	0.364
30-Mar	0.008	0.003	0.011	0.007	0.010	Z	0.182	0.095	0.170	0.334	0.415	0.128	0.115	0.092	0.077	0.064	0.072	0.046	0.051	0.312	0.475	0.084	0.031	0.015	0.122	0.475
31-Mar	Z	0.078	0.016	0.117	0.088	0.078	0.063	0.017	0.023	0.007	0.005	0.002	0.009	0.007	0.013	0.006	0.006	0.030	0.097	0.217	0.131	0.090	0.080	0.195	0.060	0.217
	0.070	0.063	0.076	0.073	0.048	0.069	0.075	0.086	0.088	0.102	0.115	0.107	0.091	0.115	0.093	0.065	0.077	0.095	0.120	0.180	0.162	0.114	0.072	0.069	Diurnal Average	
	0.380	0.354	0.581	0.478	0.266	0.286	0.374	0.436	0.393	0.386	0.683	0.648	0.625	0.903	0.915	0.506	0.510	0.717	0.608	0.632	0.560	0.450	0.240	0.239	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	158	22.35	22.35
0.006 - 0.05	227	32.11	54.46
0.06 - 0.1	164	23.20	77.65
> 0.1	158	22.35	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills - March 2023

Concentration							**Wind Direction**										
Ranges (ppm)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	38	47	1	1	1	0	6	32	3	3	0	0	0	8	7	11	158
0.006 - 0.05	45	60	14	4	0	1	19	46	12	3	1	2	3	3	3	11	227
0.06 - 0.1	30	18	13	10	5	2	32	25	9	3	2	0	1	3	4	6	163
> 0.1	10	17	11	4	11	18	36	17	15	5	6	1	0	0	3	3	157
Totals	123	142	39	19	17	21	93	120	39	14	9	3	4	14	17	31	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 36.0 ppm on Mar 20 07:00

Maximum Daily Average: 4.1 ppm on Mar 20

Minimum Value: 2.0 ppm on Mar 2 22:00

Maximum Diurnal Average: 3.4 ppm at hour 7

Monthly Average: 2.36 ppm

Minimum Daily Average: 2.1 ppm on Mar 14

Minimum Diurnal Average: 2.1 ppm at hour 16

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.2 Q_3 = 2.3 P_{90} = 2.7 P_{99} = 4.2

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	3.7	4.2	3.8	2.7	2.4	2.4	2.5	4.2	3.4	2.5	2.5	2.7	2.8	2.7	2.0	2.4	3.1	3.9	2.8	3.3	2.9	3.1	3.0	3.0	4.2
2-Mar	2.7	Z	2.5	2.7	2.2	2.1	2.2	2.1	2.1	2.1	2.2	C	C	C	C	2.1	2.5	2.3	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.7
3-Mar	2.1	2.1	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2
4-Mar	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2
5-Mar	2.2	2.1	2.2	2.2	Z	2.1	2.2	2.8	3.0	2.3	2.3	2.4	2.3	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.2	2.2	DF	2.3	3.0
6-Mar	2.2	2.1	2.2	2.2	2.3	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.3	2.3	Z	2.1	2.1	2.3	2.4	2.6	2.4	2.9	3.0	2.7	2.4	3.0
7-Mar	2.4	2.3	2.3	2.3	2.2	Z	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.6	2.4	2.3	2.3	2.6
8-Mar	Z	2.4	2.2	2.3	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	2.3	2.3	3.0	2.7	2.8	2.3	2.5	2.3	3.0
9-Mar	2.5	Z	2.3	2.7	3.4	3.7	3.1	2.9	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.3	2.3	2.4	2.3	2.2	2.4	3.7
10-Mar	2.2	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.6	2.2	2.1	2.2	2.2	2.2	2.6
11-Mar	2.2	2.3	2.4	Z	2.5	2.4	2.6	2.4	2.3	2.7	2.7	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	2.3	2.7
12-Mar	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	2.3	2.1	2.3
13-Mar	2.3	2.2	2.3	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
14-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1
15-Mar	2.1	Z	2.2	2.0	2.1	2.1	2.0	M	2.2	2.2	2.1	2.0	2.1	2.2	2.3	2.4	2.1	2.1	2.3	2.6	2.5	2.5	2.4	2.3	2.2	2.6
16-Mar	4.1	3.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.3	4.1
17-Mar	2.1	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.5	2.4	3.8	2.9	2.6	2.4	2.3	2.2	2.4	3.8
18-Mar	2.3	2.2	2.3	2.2	2.1	Z	2.6	2.5	2.4	2.5	2.5	2.7	3.2	3.2	2.8	2.5	2.5	2.4	2.7	2.4	2.2	2.3	2.2	2.4	2.5	3.2
19-Mar	Z	2.0	2.1	2.0	2.2	2.1	2.1	2.4	2.2	2.5	3.4	2.9	2.3	2.7	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.4	6.0	2.5	6.0
20-Mar	2.4	Z	3.6	6.3	2.4	4.2	36.0	6.7	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	4.1	36.0
21-Mar	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.5	2.9	2.2	2.4	2.5	2.5	2.6	2.6	3.2	9.8	7.8	3.9	3.8	2.5	3.0	9.8
22-Mar	3.0	3.7	3.1	Z	2.5	2.9	3.2	2.3	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.6	2.7	2.5	2.2	2.6	2.5	3.7
23-Mar	2.6	2.5	2.9	3.1	Z	2.6	2.9	3.1	2.4	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	2.3	3.1
24-Mar	2.0	2.1	2.2	2.2	2.1	Z	2.1	2.2	2.2	2.2	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.6	3.0	2.2	2.1	2.2	3.0
25-Mar	Z	2.1	2.3	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
26-Mar	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2
27-Mar	2.1	2.1	Z	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.3	2.3	2.2	2.1	2.2	2.2	2.6	2.7	2.2	2.2	2.1	2.2	2.7
28-Mar	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.6	2.3	2.3	2.2	2.6
29-Mar	2.3	2.6	2.8	2.6	Z	2.6	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.8
30-Mar	2.5	2.3	2.2	2.2	2.1	Z	2.6	2.3	2.5	2.9	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.7	2.1	2.1	2.1	2.3	2.9
31-Mar	Z	2.2	2.1	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.3
	2.4	2.3	2.4	2.5	2.3	2.4	3.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.4	2.6	2.5	2.4	2.3	2.4	Diurnal Average	
	4.1	3.7	4.2	6.3	3.4	4.2	36.0	6.7	4.2	3.4	3.4	2.9	3.2	3.2	2.8	2.5	2.6	3.1	3.9	9.8	7.8	3.9	3.8	6.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Fort Hills - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	54	7.64	7.64
2.1 - 3.0	619	87.55	95.19
3.1 - 10.0	33	4.67	99.86
> 10.0	1	0.14	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Fort Hills - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	22	19	0	0	0	0	0	1	0	0	0	0	1	3	4	4	54
2.1 - 3.0	100	123	39	19	15	19	79	108	36	13	9	3	3	11	13	27	617
3.1 - 10.0	1	0	0	0	2	2	14	10	3	1	0	0	0	0	0	0	33
> 10.0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Totals	123	142	39	19	17	21	93	120	39	14	9	3	4	14	17	31	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Fort Hills

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 146.2 ppb on Mar 1 03:00

Maximum Daily Average: 24.4 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 19:00

Maximum Diurnal Average: 14.5 ppb at hour 10

Monthly Average: 8.46 ppb

Minimum Daily Average: 2.1 ppb on Mar 14

Minimum Diurnal Average: 4.1 ppb at hour 6

Percentiles: P_1 = 0.0 P_{10} = 0.2 Q_1 = 0.9 Median = 2.9 Q_3 = 9.2 P_{90} = 22.8 P_{99} = 83.0

Hours in Service:	744
Hours of Data:	676
Hours of Missing Data:	68
Hours of Calibration:	38
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	16.8	87.7	146.2	119.1	Z	34.0	31.9	35.9	96.3	62.7	C	C	C	C	C	C	C	C	57.5	36.8	43.9	42.4	30.4	19.9	--	146.2
2-Mar	10.9	1.0	0.1	0.9	0.3	Z	0.4	0.7	2.5	2.3	6.9	7.3	23.1	41.7	36.8	1.5	4.7	1.3	0.0	0.2	0.0	0.1	0.0	0.6	6.2	41.7
3-Mar	Z	1.1	0.8	0.8	0.6	0.6	2.0	1.9	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	2.0
4-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	0.2	4.7	5.4	5.6	3.3	2.2	2.5	9.5	11.0	9.6	9.1	11.4	--	11.4
5-Mar	23.7	30.6	Z	10.2	2.7	0.0	0.9	15.1	29.8	10.1	15.2	20.1	16.5	7.2	5.5	7.5	6.1	2.6	1.1	5.4	20.3	12.6	5.4	DF	11.3	30.6
6-Mar	4.5	2.0	2.2	2.3	9.0	7.8	15.3	22.1	23.9	26.4	35.0	32.5	Z	24.8	8.6	5.3	6.3	6.3	8.3	26.7	8.0	24.8	21.2	9.1	14.5	35.0
7-Mar	0.5	0.3	0.4	Z	0.3	0.1	0.6	1.4	5.5	4.6	1.5	2.0	2.2	1.2	0.7	1.5	6.6	26.3	1.1	3.3	14.1	12.4	0.2	0.1	3.8	26.3
8-Mar	0.0	0.4	0.2	0.1	Z	1.0	0.0	0.2	1.0	4.2	7.0	11.5	9.1	3.5	1.9	2.0	1.7	3.0	2.9	17.9	5.6	11.9	1.4	1.4	3.8	17.9
9-Mar	2.7	0.7	0.4	0.5	18.7	Z	8.6	9.3	4.2	11.3	11.2	10.6	4.9	1.9	1.9	1.0	1.5	2.1	4.8	2.5	1.1	2.2	1.0	0.6	4.5	18.7
10-Mar	Z	0.8	0.7	0.8	0.9	0.7	0.2	0.9	2.6	1.6	0.7	1.2	0.7	1.1	1.9	3.0	2.7	2.6	2.2	10.3	34.9	34.1	26.7	22.5	6.7	34.9
11-Mar	0.2	Z	3.3	3.7	1.1	0.2	6.9	5.9	11.8	20.3	34.7	27.8	23.4	8.5	4.4	3.2	2.3	1.1	0.4	0.4	0.8	0.5	0.3	0.8	7.0	34.7
12-Mar	0.5	0.5	Z	1.0	3.1	3.1	1.3	3.2	3.9	3.0	4.8	4.2	4.2	6.2	3.3	3.6	3.4	2.3	3.8	2.9	2.5	3.7	8.2	13.8	3.8	13.8
13-Mar	11.8	14.6	15.5	Z	26.5	32.4	10.3	9.9	12.8	11.6	8.4	5.2	4.2	3.1	4.9	3.6	2.6	0.6	0.8	0.9	0.9	0.6	1.2	1.8	8.0	32.4
14-Mar	1.0	1.1	1.3	1.2	Z	0.6	0.6	0.9	2.4	3.5	5.4	5.0	4.1	2.9	3.8	4.9	2.4	0.9	0.4	0.5	0.8	0.9	1.3	2.5	2.1	5.4
15-Mar	1.7	0.9	6.3	9.8	30.5	Z	0.5	M	21.4	20.2	14.6	8.3	10.1	17.9	21.0	13.4	2.8	2.5	9.6	82.9	97.4	83.3	54.6	26.8	24.4	97.4
16-Mar	120.6	Z	0.0	0.0	0.0	0.0	0.0	0.4	2.5	9.7	11.9	15.1	13.9	14.2	11.9	18.2	11.3	3.9	1.5	0.3	0.8	2.1	0.2	0.1	10.4	120.6
17-Mar	0.2	1.9	Z	0.5	0.1	0.2	0.8	4.8	7.1	16.7	12.4	8.4	9.9	6.4	4.1	3.7	1.5	6.6	58.6	32.9	5.7	1.7	0.0	0.0	8.0	58.6
18-Mar	0.4	0.1	0.4	Z	0.0	2.8	6.3	7.5	8.2	10.7	13.0	14.5	49.2	40.2	24.8	25.8	42.0	25.8	11.4	79.9	72.1	49.0	13.3	20.4	22.5	79.9
19-Mar	24.2	2.7	5.8	0.4	Z	9.4	25.1	18.9	17.4	61.6	79.4	56.0	23.4	37.3	10.6	9.0	7.4	2.1	1.9	0.0	0.1	0.1	0.3	0.0	17.1	79.4
20-Mar	0.3	0.8	0.5	0.2	5.0	Z	6.3	11.0	13.8	4.5	4.8	3.1	3.3	3.6	2.1	2.8	3.5	1.3	1.2	0.6	0.7	1.1	1.6	3.6	3.3	13.8
21-Mar	Z	0.9	0.1	3.4	0.2	0.7	0.5	2.4	7.1	13.7	38.8	25.5	5.6	18.2	19.3	17.4	25.8	19.4	3.9	0.1	0.1	0.0	8.4	0.1	9.2	38.8
22-Mar	0.1	Z	1.0	0.0	0.0	1.6	1.3	3.1	7.1	8.3	5.2	3.4	3.5	3.8	3.9	4.0	7.1	2.1	0.6	0.0	0.2	0.1	0.0	11.8	2.9	11.8
23-Mar	13.6	3.7	Z	21.3	1.2	0.5	6.2	24.4	13.6	4.2	3.1	2.5	2.1	2.2	1.9	2.0	1.3	0.9	1.6	0.1	0.0	0.0	0.0	0.1	4.6	24.4
24-Mar	0.0	0.6	4.1	Z	1.7	2.9	1.3	3.8	10.9	14.1	14.0	21.5	15.7	11.0	10.2	8.3	8.0	3.2	2.9	2.7	4.6	22.5	10.8	2.5	7.7	22.5
25-Mar	0.1	0.1	2.9	4.4	Z	0.7	8.6	34.6	32.6	24.7	11.1	3.9	2.4	2.7	1.3	1.6	1.2	0.9	0.8	0.8	0.3	0.4	0.9	0.6	6.0	34.6
26-Mar	2.1	1.6	3.3	3.4	4.6	Z	7.0	12.5	13.4	6.8	6.6	5.2	3.9	2.6	1.8	1.8	0.9	0.9	2.3	2.7	4.7	3.0	0.7	0.4	4.0	13.4
27-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.9	1.6	6.9	5.9	5.9	8.4	8.1	6.8	3.9	3.9	2.7	7.2	10.2	1.4	0.5	1.6	3.3	10.2
28-Mar	2.7	Z	0.7	2.7	0.2	1.8	0.6	2.4	7.1	12.1	13.5	8.1	4.7	2.5	1.7	1.1	1.0	0.6	0.2	0.0	0.7	9.5	1.0	0.4	3.3	13.5
29-Mar	2.9	3.6	Z	4.8	0.3	0.5	0.8	3.6	1.9	4.1	3.0	0.9	1.6	0.9	2.0	1.6	1.5	1.1	1.2	1.2	9.1	16.1	7.0	1.1	3.1	16.1
30-Mar	0.3	0.0	0.0	Z	0.0	0.3	1.9	1.9	17.8	43.5	21.2	3.3	1.9	1.4	1.1	1.0	1.4	1.5	1.7	2.7	8.8	1.4	0.4	0.2	5.0	43.5
31-Mar	0.6	3.5	2.7	5.5	Z	1.5	4.0	2.8	3.4	3.2	2.7	3.1	3.6	2.0	1.7	2.0	1.4	3.6	2.5	1.1	0.0	0.1	0.2	9.9	2.7	9.9
	9.3	6.2	8.0	7.9	4.5	4.1	5.0	8.3	13.2	14.5	14.0	11.3	9.0	9.7	7.1	5.6	5.7	4.5	6.3	11.1	12.0	11.6	6.9	5.7	Diurnal Average	
	120.6	87.7	146.2	119.1	30.5	34.0	31.9	35.9	96.3	62.7	79.4	56.0	49.2	41.7	36.8	25.8	42.0	26.3	58.6	82.9	97.4	83.3	54.6	26.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	599	88.61	88.61
21 - 40	53	7.84	96.45
11 - 80	16	2.37	98.82
81 - 159	8	1.18	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort Hills - March 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	99	118	34	16	7	18	77	110	38	12	6	3	4	15	10	31	598
21 - 40	15	5	3	0	7	2	6	6	3	0	3	0	0	0	2	1	53
11 - 80	1	4	0	0	2	1	6	0	0	1	0	0	0	0	1	0	16
81 - 159	0	1	0	0	0	0	2	1	1	1	0	0	0	0	1	0	7
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	128	37	16	16	21	91	117	42	14	9	3	4	15	14	32	674

Total Number of Valid Hours: 674

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Fort Hills

Total Number of Valid Hours: 674

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 55.4 ppb on Mar 18 20:00

Maximum Daily Average: 31.8 ppb on Mar 18

Minimum Value: 0.7 ppb on Mar 4 13:00

Maximum Diurnal Average: 27.6 ppb at hour 21

Monthly Average: 17.89 ppb

Minimum Daily Average: 11.0 ppb on Mar 14

Minimum Diurnal Average: 8.8 ppb at hour 15

Percentiles: P_1 = 2.0 P_{10} = 5.1 Q_1 = 8.8 Median = 15.7 Q_3 = 25.1 P_{90} = 35.1 P_{99} = 45.6

Hours in Service:	744
Hours of Data:	676
Hours of Missing Data:	68
Hours of Calibration:	38
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	33.3	41.2	45.5	43.6	Z	33.6	34.4	33.7	37.8	28.9	C	C	C	C	C	C	C	C	39.5	38.7	39.3	39.5	39.2	38.3	--	45.5
2-Mar	36.3	30.5	21.1	26.2	14.7	Z	16.5	14.8	11.7	7.1	9.4	9.7	20.0	30.0	23.9	5.3	15.8	9.3	2.0	6.4	7.3	1.1	0.8	17.3	14.7	36.3
3-Mar	Z	16.1	14.0	13.5	10.5	12.2	18.1	14.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	18.1
4-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	0.7	4.6	5.5	8.4	8.3	11.4	21.7	32.9	36.3	32.7	30.3	34.9	--	36.3
5-Mar	37.1	37.0	Z	29.4	18.4	9.6	15.2	22.3	21.9	9.1	10.2	12.7	11.2	6.6	5.8	9.7	13.8	17.0	23.1	26.7	29.7	27.7	24.8	DF	19.0	37.1
6-Mar	23.3	22.5	21.2	22.2	22.9	21.6	22.8	22.8	18.5	15.9	18.5	17.5	Z	17.1	11.9	10.6	16.4	24.1	31.9	36.1	34.1	35.3	35.1	32.7	23.3	36.1
7-Mar	15.7	17.4	21.8	Z	19.5	12.3	21.6	14.8	15.5	9.5	3.7	3.9	4.0	2.4	1.9	3.9	14.9	35.4	26.2	35.9	38.1	37.2	19.2	12.0	16.8	38.1
8-Mar	7.6	18.5	8.4	17.3	Z	23.1	2.9	3.6	3.7	8.2	8.9	12.1	10.1	5.2	3.6	5.0	6.3	18.4	31.9	38.2	33.5	35.2	13.1	26.5	14.8	38.2
9-Mar	34.0	15.3	12.9	21.8	35.8	Z	33.8	27.0	9.8	13.1	11.8	10.7	6.1	3.2	3.6	2.6	5.1	13.6	28.7	24.3	22.6	24.7	19.9	17.2	17.3	35.8
10-Mar	Z	19.0	16.1	17.9	19.2	12.6	11.7	12.5	11.2	5.1	2.2	2.4	1.7	2.5	4.3	6.5	9.5	17.3	27.5	32.9	38.8	39.2	38.5	37.2	16.8	39.2
11-Mar	15.3	Z	22.9	29.0	25.4	21.9	30.8	25.1	23.1	21.9	26.0	22.7	19.2	11.1	7.8	8.0	8.4	7.3	8.1	9.2	16.2	12.6	11.5	16.7	17.4	30.8
12-Mar	13.2	13.4	Z	14.4	20.7	20.7	14.8	15.8	11.4	6.3	5.9	5.4	5.6	7.3	4.8	6.0	8.6	11.2	22.8	23.3	21.1	22.2	30.4	31.9	14.7	31.9
13-Mar	30.5	32.3	32.8	Z	36.0	38.1	30.3	23.6	19.2	15.1	9.1	5.9	5.6	4.4	7.6	7.6	7.4	4.3	13.1	15.5	17.7	14.6	14.7	16.4	17.5	38.1
14-Mar	13.6	13.1	13.6	16.8	Z	9.6	8.9	10.1	10.3	8.6	10.9	10.9	8.0	5.4	6.8	10.6	7.6	3.8	2.8	11.2	14.2	12.3	19.3	23.8	11.0	23.8
15-Mar	19.7	17.6	32.1	32.3	38.7	Z	8.9	M	20.2	15.4	10.8	6.6	7.9	13.2	15.7	13.2	5.5	9.5	25.0	43.4	44.0	43.1	40.3	32.7	22.5	44.0
16-Mar	44.5	Z	7.8	5.0	5.8	6.4	2.7	4.4	5.7	12.5	11.6	11.7	10.7	11.5	11.6	17.6	16.8	14.5	21.5	22.5	31.8	34.6	15.0	7.7	14.5	44.5
17-Mar	16.2	23.1	Z	23.8	15.1	12.9	17.7	15.5	11.5	16.1	12.3	9.5	11.3	9.0	7.3	8.0	6.0	21.6	50.5	49.7	32.2	26.8	17.1	13.8	18.6	50.5
18-Mar	25.8	15.5	24.6	Z	8.6	30.7	32.5	26.2	17.1	16.2	16.8	17.7	35.3	35.2	30.1	33.0	38.0	41.9	41.0	55.4	53.1	50.5	45.1	41.6	31.8	55.4
19-Mar	45.7	30.7	36.7	20.8	Z	39.2	46.9	35.1	25.4	38.0	41.7	36.1	25.1	31.7	16.7	15.9	20.7	15.2	26.5	10.0	14.8	19.4	21.6	10.2	27.1	46.9
20-Mar	22.0	22.6	20.9	25.7	26.9	Z	33.6	27.2	26.1	12.2	9.0	5.1	4.7	5.1	3.8	5.5	7.8	5.7	11.4	13.8	18.7	19.7	22.3	27.3	16.4	33.6
21-Mar	Z	19.2	14.5	17.4	14.6	16.8	11.5	8.6	11.3	16.4	27.1	19.3	6.7	15.8	19.5	21.0	30.8	34.0	28.7	25.2	25.7	14.7	29.1	23.9	19.6	34.0
22-Mar	23.6	Z	25.4	14.7	12.3	24.5	18.5	11.1	11.8	10.7	7.8	5.8	6.1	6.9	7.7	8.9	16.9	12.0	15.7	22.5	34.2	28.9	12.2	39.0	16.4	39.0
23-Mar	38.6	32.8	Z	42.8	35.1	26.6	35.6	35.7	23.3	9.8	7.0	5.6	5.1	4.8	4.2	5.0	5.2	6.0	16.4	6.6	3.6	0.8	1.6	2.1	15.4	42.8
24-Mar	4.1	15.4	34.0	Z	28.1	24.0	19.7	12.8	16.9	16.9	14.8	18.9	15.9	13.7	13.9	14.1	17.3	15.4	21.0	35.0	32.7	36.5	30.2	21.3	20.5	36.5
25-Mar	21.1	20.3	20.3	20.0	Z	12.4	24.7	32.9	26.2	22.2	13.5	6.3	3.9	3.6	3.0	4.0	3.8	5.1	9.2	15.7	14.6	10.8	15.6	20.1	14.3	32.9
26-Mar	25.3	22.0	29.7	27.0	28.2	Z	27.2	22.6	17.3	9.2	7.9	6.9	5.4	3.9	3.4	3.6	2.8	3.9	14.1	20.4	31.0	20.7	9.1	7.0	15.2	31.0
27-Mar	Z	2.7	5.9	9.2	7.1	5.3	2.7	2.3	2.1	2.5	7.8	7.4	8.2	11.8	12.5	12.9	10.9	16.8	20.8	35.6	36.3	19.1	23.2	15.7	12.1	36.3
28-Mar	14.1	Z	14.0	13.5	8.4	15.6	8.5	7.4	10.9	14.8	14.8	10.6	7.6	5.1	4.9	4.7	5.8	6.7	6.8	10.7	21.5	36.1	24.7	20.3	12.5	36.1
29-Mar	25.2	26.0	Z	27.1	17.3	20.1	13.4	17.4	12.1	17.8	10.6	5.1	5.7	4.1	5.7	5.1	6.5	8.4	14.5	20.2	34.7	41.1	33.8	20.1	17.0	41.1
30-Mar	15.2	9.1	10.2	Z	7.9	15.1	17.8	9.1	17.1	25.4	21.2	7.2	4.7	3.7	3.4	4.2	7.6	10.4	18.6	27.0	36.9	23.6	22.8	18.1	14.6	36.9
31-Mar	24.1	32.2	30.4	35.5	Z	23.2	29.4	17.7	13.4	10.3	8.8	7.8	7.0	4.1	3.8	5.0	4.4	15.1	24.3	26.8	14.6	11.2	13.2	29.5	17.0	35.5
	24.0	21.8	21.5	22.7	19.9	19.5	20.4	18.1	15.9	14.3	12.9	10.8	9.4	9.8	8.8	9.2	11.3	14.3	21.5	25.7	27.6	25.7	22.5	22.6	Diurnal Average	
	45.7	41.2	45.5	43.6	38.7	39.2	46.9	35.7	37.8	38.0	41.7	36.1	35.3	35.2	30.1	33.0	38.0	41.9	50.5	55.4	53.1	50.5	45.1	41.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	431	63.76	63.76
21 - 40	224	33.14	96.89
11 - 80	21	3.11	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: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Hills - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	64	91	27	10	8	10	42	90	27	11	5	2	3	13	9	19	431
21 - 40	45	33	9	6	7	11	46	24	14	3	4	1	1	2	4	13	223
11 - 80	6	4	1	0	1	0	3	3	1	0	0	0	0	0	1	0	20
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	128	37	16	16	21	91	117	42	14	9	3	4	15	14	32	674

Total Number of Valid Hours: 674

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Fort Hills

Total Number of Valid Hours: 674

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 191.7 ppb on Mar 1 03:00

Maximum Daily Average: 54.3 ppb on Mar 18

Minimum Value: 0.8 ppb on Mar 23 22:00

Maximum Diurnal Average: 39.6 ppb at hour 21

Monthly Average: 26.35 ppb

Minimum Daily Average: 13.1 ppb on Mar 14

Minimum Diurnal Average: 14.8 ppb at hour 16

Percentiles: P_1 = 2.3 P_{10} = 6.6 Q_1 = 11.7 Median = 19.9 Q_3 = 33.2 P_{90} = 53.4 P_{99} = 127.0

Hours in Service:	744
Hours of Data:	676
Hours of Missing Data:	68
Hours of Calibration:	38
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	50.1	128.9	191.7	162.7	Z	67.6	66.3	69.6	134.1	91.6	C	C	C	C	C	C	C	C	97.0	75.5	83.2	81.9	69.6	58.2	--	191.7
2-Mar	47.2	31.5	21.2	27.1	15.0	Z	16.9	15.5	14.2	9.4	16.3	17.0	43.1	71.7	60.7	6.8	20.5	10.6	2.0	6.6	7.3	1.2	0.8	17.9	20.9	71.7
3-Mar	Z	17.2	14.8	14.3	11.1	12.8	20.1	16.1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	20.1
4-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	0.9	9.3	10.9	14.0	11.6	13.6	24.2	42.4	47.3	42.3	39.4	46.3	--	47.3
5-Mar	60.8	67.6	Z	39.6	21.1	9.6	16.1	37.4	51.7	19.2	25.4	32.8	27.7	13.8	11.3	17.2	19.9	19.6	24.2	32.1	50.0	40.3	30.2	DF	30.3	67.6
6-Mar	27.8	24.5	23.4	24.5	31.9	29.4	38.1	44.9	42.4	42.3	53.5	50.0	Z	41.9	20.5	15.9	22.7	30.4	40.2	62.8	42.1	60.1	56.3	41.8	37.7	62.8
7-Mar	16.2	17.7	22.2	Z	19.8	12.4	22.2	16.2	21.0	14.1	5.2	5.9	6.2	3.6	2.6	5.4	21.5	61.7	27.3	39.2	52.2	49.6	19.4	12.1	20.6	61.7
8-Mar	7.6	18.9	8.6	17.4	Z	24.1	2.9	3.8	4.7	12.4	15.9	23.6	19.2	8.7	5.5	7.0	8.0	21.4	34.8	56.1	39.1	47.1	14.5	27.9	18.7	56.1
9-Mar	36.7	16.0	13.3	22.3	54.5	Z	42.4	36.3	14.0	24.4	23.0	21.3	11.0	5.1	5.5	3.6	6.6	15.7	33.5	26.8	23.7	26.9	20.9	17.8	21.8	54.5
10-Mar	Z	19.8	16.8	18.7	20.1	13.3	11.9	13.4	13.8	6.7	2.9	3.6	2.4	3.6	6.2	9.5	12.2	19.9	29.7	43.2	73.7	73.3	65.2	59.7	23.5	73.7
11-Mar	15.5	Z	26.2	32.7	26.5	22.1	37.7	31.0	34.9	42.2	60.7	50.5	42.6	19.6	12.2	11.2	10.7	8.4	8.5	9.6	17.0	13.1	11.8	17.5	24.4	60.7
12-Mar	13.7	13.9	Z	15.4	23.8	23.8	16.1	19.0	15.3	9.3	10.7	9.6	9.8	13.5	8.1	9.6	12.0	13.5	26.6	26.2	23.6	25.9	38.6	45.7	18.4	45.7
13-Mar	42.3	46.9	48.3	Z	62.5	70.5	40.6	33.5	32.0	26.7	17.5	11.1	9.8	7.5	12.5	11.2	10.0	4.9	13.9	16.4	18.6	15.2	15.9	18.2	25.5	70.5
14-Mar	14.6	14.2	14.9	18.0	Z	10.2	9.5	11.0	12.7	12.1	16.3	15.9	12.1	8.3	10.6	15.5	10.0	4.7	3.2	11.7	15.0	13.2	20.6	26.3	13.1	26.3
15-Mar	21.4	18.5	38.4	42.1	69.2	Z	9.4	M	41.6	35.6	25.4	14.9	18.0	31.1	36.7	26.6	8.3	12.0	34.6	126.3	141.4	126.4	94.9	59.5	46.9	141.4
16-Mar	165.1	Z	7.8	5.0	5.8	6.4	2.7	4.8	8.2	22.2	23.5	26.8	24.6	25.7	23.5	35.8	28.1	18.4	23.0	22.8	32.6	36.7	15.2	7.8	24.9	165.1
17-Mar	16.4	25.0	Z	24.3	15.2	13.1	18.5	20.3	18.6	32.8	24.7	17.9	21.2	15.4	11.4	11.7	7.5	28.2	109.1	82.6	37.9	28.5	17.1	13.8	26.6	109.1
18-Mar	26.2	15.6	25.0	Z	8.6	33.5	38.8	33.7	25.3	26.9	29.8	32.2	84.5	75.4	54.9	58.8	80.0	67.7	52.4	135.3	125.2	99.5	58.4	62.0	54.3	135.3
19-Mar	69.9	33.4	42.5	21.2	Z	48.6	72.0	54.0	42.8	99.6	121.1	92.1	48.5	69.0	27.3	24.9	28.1	17.3	28.4	10.0	14.9	19.5	21.9	10.2	44.2	121.1
20-Mar	22.3	23.4	21.4	25.9	31.9	Z	39.9	38.2	39.9	16.7	13.8	8.2	8.0	8.7	5.9	8.3	11.3	7.0	12.6	14.4	19.4	20.8	23.9	30.9	19.7	39.9
21-Mar	Z	20.1	14.6	20.8	14.8	17.5	12.0	11.0	18.4	30.1	65.9	44.8	12.3	34.0	38.8	38.4	56.6	53.4	32.6	25.3	25.8	14.7	37.5	24.0	28.9	65.9
22-Mar	23.7	Z	26.4	14.7	12.3	26.1	19.8	14.2	18.9	19.0	13.0	9.2	9.6	10.7	11.6	12.9	24.0	14.1	16.3	22.5	34.4	29.0	12.2	50.8	19.4	50.8
23-Mar	52.2	36.5	Z	64.1	36.3	27.1	41.8	60.1	36.9	14.0	10.1	8.1	7.2	7.0	6.1	7.0	6.5	6.9	18.0	6.7	3.6	0.8	1.6	2.2	20.0	64.1
24-Mar	4.1	16.0	38.1	Z	29.8	26.9	21.0	16.6	27.8	31.0	28.8	40.4	31.6	24.7	24.1	22.4	25.3	18.6	23.9	37.7	37.3	59.0	41.0	23.8	28.3	59.0
25-Mar	21.2	20.4	23.2	24.4	Z	13.1	33.3	67.5	58.8	46.9	24.6	10.2	6.3	6.3	4.3	5.6	5.0	6.0	10.0	16.5	14.9	11.2	16.5	20.7	20.3	67.5
26-Mar	27.4	23.6	33.0	30.4	32.8	Z	34.2	35.1	30.7	16.0	14.5	12.1	9.3	6.5	5.2	5.4	3.7	4.8	16.4	23.1	35.7	23.7	9.8	7.4	19.2	35.7
27-Mar	Z	2.7	5.9	9.2	7.1	5.3	2.8	2.8	3.0	4.1	14.7	13.3	14.1	20.2	20.6	19.7	14.8	20.7	23.5	42.8	46.5	20.5	23.7	17.3	15.5	46.5
28-Mar	16.8	Z	14.7	16.2	8.6	17.4	9.1	9.8	18.0	26.9	28.3	18.7	12.3	7.6	6.6	5.8	6.8	7.3	7.0	10.7	22.2	45.6	25.7	20.7	15.8	45.6
29-Mar	28.1	29.6	Z	31.9	17.6	20.6	14.2	21.0	14.0	21.9	13.6	6.0	7.3	5.0	7.7	6.7	8.0	9.5	15.7	21.4	43.8	57.2	40.8	21.2	20.1	57.2
30-Mar	15.5	9.1	10.2	Z	7.9	15.4	19.7	11.0	34.9	68.9	42.4	10.5	6.6	5.1	4.5	5.2	9.0	11.9	20.3	29.7	45.7	25.0	23.2	18.3	19.6	68.9
31-Mar	24.7	35.7	33.1	41.0	Z	24.7	33.4	20.5	16.8	13.5	11.5	10.9	10.6	6.1	5.5	7.0	5.8	18.7	26.8	27.9	14.6	11.3	13.4	39.4	19.7	41.0
	33.4	28.0	29.4	30.6	24.3	23.7	25.5	26.5	29.2	28.8	26.9	22.1	18.4	19.5	15.9	14.8	17.1	18.8	27.8	36.8	39.6	37.3	29.3	28.3	Diurnal Average	
	165.1	128.9	191.7	162.7	69.2	70.5	72.0	69.6	134.1	99.6	121.1	92.1	84.5	75.4	60.7	58.8	80.0	67.7	109.1	135.3	141.4	126.4	94.9	62.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure AF - Analyzer Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	348	51.48	51.48
21 - 40	209	30.92	82.40
11 - 80	97	14.35	96.75
81 - 159	19	2.81	99.56
> 159	3	0.44	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort Hills - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	53	84	24	9	5	3	21	81	24	8	3	0	2	11	7	13	348
21 - 40	32	27	6	7	3	11	47	27	14	4	3	3	2	3	3	16	208
11 - 80	29	13	7	0	6	6	16	7	3	1	3	0	0	1	2	3	97
81 - 159	1	4	0	0	2	1	6	1	0	1	0	0	0	0	2	0	18
> 159	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3
Totals	115	128	37	16	16	21	91	117	42	14	9	3	4	15	14	32	674

Total Number of Valid Hours: 674

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Fort Hills

Total Number of Valid Hours: 674

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 13 24-hr: 4

Maximum Value: 229.6 $\mu g/m^3$ on Mar 28 00:00

Maximum Daily Average: 40.4 $\mu g/m^3$ on Mar 27

Minimum Value: 0.6 $\mu g/m^3$ on Mar 2 19:00

Maximum Diurnal Average: 23.7 $\mu g/m^3$ at hour 24

Monthly Average: 13.95 $\mu g/m^3$

Minimum Daily Average: 4.1 $\mu g/m^3$ on Mar 14

Minimum Diurnal Average: 8.3 $\mu g/m^3$ at hour 18

Percentiles: P_1 = 2.6 P_{10} = 4.0 Q_1 = 5.3 Median = 8.8 Q_3 = 14.9 P_{90} = 26.0 P_{99} = 91.8

Hours in Service:	744
Hours of Data:	716
Hours of Missing Data:	28
Hours of Calibration:	0
Percent Operational Time:	96.2

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	8.3	13.0	16.4	14.9	10.0	8.8	9.2	10.4	14.8	11.3	5.8	7.2	7.8	9.8	10.6	6.0	7.1	11.5	12.9	8.5	8.7	8.7	8.0	8.0	9.9	16.4
2-Mar	7.8	9.0	8.3	8.0	8.1	8.7	10.1	10.6	11.9	13.3	13.4	12.9	13.1	12.1	10.0	3.2	1.6	1.0	0.6	0.8	1.1	0.9	1.1	4.7	7.2	13.4
3-Mar	5.1	5.5	4.8	4.6	4.6	4.6	5.4	7.0	6.2	6.1	4.9	5.3	6.6	8.0	7.3	11.4	10.6	6.6	4.5	4.6	6.0	6.2	5.2	5.9	6.1	11.4
4-Mar	3.9	3.4	3.0	3.3	3.3	4.9	5.1	6.2	4.7	2.8	2.5	2.8	2.8	4.6	5.6	7.5	6.7	7.6	13.1	12.1	9.6	7.1	6.9	7.8	5.7	13.1
5-Mar	8.2	11.4	11.3	5.6	4.8	5.1	6.5	8.4	9.7	8.7	8.8	13.1	11.1	10.4	7.9	11.3	17.1	10.9	29.0	31.8	28.7	12.3	9.2	DF	12.2	31.8
6-Mar	7.3	6.8	6.7	7.5	13.0	10.7	10.9	25.6	18.3	15.5	20.7	16.1	19.4	23.3	18.0	10.9	8.5	11.3	20.1	24.8	16.0	17.1	15.9	11.6	14.8	25.6
7-Mar	6.4	7.0	7.0	4.7	4.6	4.9	4.4	3.9	4.3	4.6	5.0	4.5	4.6	4.0	3.7	3.8	4.5	6.0	4.7	6.1	7.5	7.7	5.1	3.6	5.1	7.7
8-Mar	3.2	4.5	3.2	4.9	7.1	7.3	3.0	2.9	3.4	5.0	4.9	6.7	7.1	5.0	4.0	4.8	5.2	6.5	9.1	23.6	32.7	25.8	11.9	13.4	8.6	32.7
9-Mar	22.2	9.9	5.4	7.7	21.7	28.2	16.8	16.7	6.9	10.9	9.2	8.4	9.7	8.9	9.0	6.6	10.1	11.8	17.7	23.9	14.5	15.8	15.6	16.0	13.5	28.2
10-Mar	20.0	16.0	10.7	8.1	12.7	8.0	8.0	8.9	10.0	7.9	5.2	5.0	5.4	6.3	6.1	6.6	7.5	14.6	13.8	20.6	12.4	11.2	10.1	8.9	10.2	20.6
11-Mar	6.8	5.4	13.1	16.9	15.7	12.9	15.4	14.0	13.1	13.9	21.3	17.6	14.0	6.8	5.1	4.6	4.8	4.9	4.9	5.8	4.5	4.1	3.9	4.0	9.7	21.3
12-Mar	4.5	5.0	4.5	4.3	4.3	4.5	4.3	4.0	4.1	3.8	4.0	3.9	4.1	4.1	4.1	4.3	4.7	5.3	6.1	5.2	4.9	5.1	6.2	5.3	4.6	6.2
13-Mar	5.1	5.1	6.0	6.8	6.6	9.7	6.0	5.9	6.0	5.7	5.3	5.3	6.2	5.4	7.7	6.1	4.6	4.3	5.6	8.2	6.3	6.0	6.0	8.1	6.2	9.7
14-Mar	5.4	4.9	5.5	5.0	4.3	4.1	4.1	4.0	3.9	3.9	3.8	4.0	3.9	3.7	3.6	3.7	3.7	3.4	3.6	3.7	3.9	4.2	3.9	4.1	4.1	5.5
15-Mar	4.1	3.9	4.6	5.3	5.2	5.9	4.3	M	5.5	5.7	5.4	4.8	4.8	5.5	5.9	5.5	4.2	4.1	7.0	16.5	19.9	13.6	8.1	6.8	6.8	19.9
16-Mar	11.0	8.7	4.0	3.8	3.9	3.8	3.6	3.7	3.9	11.4	10.1	8.8	11.1	14.2	16.3	33.6	14.4	8.8	6.7	6.7	7.0	7.5	5.6	4.6	8.9	33.6
17-Mar	5.2	6.0	6.6	7.5	6.3	5.6	6.6	7.1	8.9	10.0	9.5	8.1	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	10.0
18-Mar	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	9.1	7.3	8.5	5.9	4.4	6.0	5.3	4.4	3.8	3.9	--	9.1
19-Mar	3.9	3.9	4.5	4.2	4.6	5.3	9.6	7.6	8.8	9.6	12.0	12.2	8.8	9.5	6.9	6.3	5.8	5.1	5.6	5.2	4.2	4.1	3.9	4.1	6.5	12.2
20-Mar	4.2	4.7	4.7	5.4	4.6	4.2	12.7	11.4	5.2	4.2	3.9	3.6	3.7	3.6	3.4	3.6	3.6	3.5	4.0	6.9	8.8	10.9	11.5	31.4	6.8	31.4
21-Mar	27.9	22.1	16.7	108.1	74.5	17.3	13.9	9.9	14.8	14.7	28.2	26.0	7.2	11.1	13.7	9.8	9.6	7.5	10.2	14.6	10.2	7.6	14.5	14.3	21.0	108.1
22-Mar	13.7	12.1	11.0	10.5	8.8	10.0	15.6	7.2	8.3	8.9	9.1	9.1	10.0	10.1	10.2	9.8	11.6	9.6	9.3	10.1	10.0	9.8	6.9	7.5	10.0	15.6
23-Mar	9.3	11.3	13.2	14.4	13.4	14.7	14.4	14.8	19.6	15.3	10.5	7.9	6.5	6.1	5.6	5.4	5.5	5.0	5.7	4.8	4.8	4.2	4.0	5.5	9.2	19.6
24-Mar	5.6	6.8	14.4	26.3	14.0	10.1	8.0	14.1	18.0	27.5	25.2	28.6	25.2	17.7	14.9	11.4	10.8	8.6	8.4	13.4	15.0	24.2	22.0	10.8	15.9	28.6
25-Mar	9.2	11.3	36.1	45.0	32.8	15.5	13.4	18.8	26.6	25.6	20.6	14.9	8.1	6.2	6.0	6.5	6.6	7.0	10.1	19.8	17.7	11.8	16.4	21.8	17.0	45.0
26-Mar	21.4	24.7	33.2	49.2	28.2	28.8	34.6	55.7	37.7	23.9	36.0	28.1	25.4	22.6	22.3	33.1	13.9	17.8	40.9	48.9	71.1	85.0	95.8	92.0	40.4	95.8
27-Mar	81.5	90.6	78.0	22.0	15.0	25.9	5.9	6.1	4.9	5.1	13.9	13.7	16.8	28.1	25.6	26.4	23.3	20.8	24.2	58.1	57.4	43.5	54.4	229.6	40.4	229.6
28-Mar	95.2	133.8	64.2	125.4	58.2	28.1	15.2	16.4	17.7	25.3	23.3	18.6	15.9	13.0	10.6	8.2	9.6	9.6	9.0	9.3	16.0	42.9	30.4	81.4	36.5	133.8
29-Mar	45.0	75.5	88.5	71.1	42.7	71.5	54.7	36.7	16.7	19.7	14.7	8.9	15.0	11.1	14.8	10.8	8.4	7.2	8.8	14.0	28.2	38.0	23.7	46.3	32.2	88.5
30-Mar	22.2	12.2	11.3	13.5	126.3	47.9	22.5	7.4	14.1	33.6	44.2	23.8	18.0	16.1	12.2	8.5	8.5	10.0	13.8	18.9	27.2	19.3	20.0	10.3	23.4	126.3
31-Mar	16.5	28.0	24.9	33.8	23.9	14.3	21.7	25.0	22.2	23.3	21.6	21.0	21.5	11.3	11.4	13.6	12.3	11.2	11.2	14.0	14.9	12.3	9.5	15.0	18.1	33.8
	16.3	18.7	17.4	21.6	19.4	14.4	12.2	12.8	11.7	12.6	13.4	11.7	10.8	10.3	9.7	9.7	8.4	8.3	10.8	14.9	15.8	15.7	14.7	23.7	Diurnal Average	
	95.2	133.8	88.5	125.4	126.3	71.5	54.7	55.7	37.7	33.6	44.2	28.6	25.4	28.1	25.6	33.6	23.3	20.8	40.9	58.1	71.1	85.0	95.8	229.6	Diurnal Maximum	

M - Maintenance DF - DAS Failure AF - Analyzer Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Fort Hills - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	199	27.79	27.79
6 - 15	349	48.74	76.54
16 - 25	91	12.71	89.25
26 - 80	64	8.94	98.18
> 81.0	13	1.82	100.00

Total Number of Valid Hours: 716

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Fort Hills - March 2023

Concentration Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	57	57	8	3	0	2	15	30	4	5	0	1	3	5	4	5	199
6 - 15	45	57	22	11	12	13	50	77	27	5	5	2	2	4	6	10	348
16 - 25	17	18	6	4	2	4	16	8	6	2	1	0	0	3	2	1	90
26 - 80	10	12	4	1	3	2	6	3	2	2	1	0	0	3	3	12	64
> 81.0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	3	6	13
Totals	130	144	40	19	17	21	87	118	40	14	8	3	5	16	18	34	714

Total Number of Valid Hours: 714

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Fort Hills

Total Number of Valid Hours: 714

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Fort Hills - March 2023

Maximum Value: 8.5 C on Mar 18 16:00

Maximum Daily Average: 0.0 C on Mar 18

Minimum Value: -32.1 C on Mar 6 07:00

Minimum Daily Average: -21.3 C on Mar 5

Maximum Diurnal Average: -4.7 C at hour 17

Minimum Diurnal Average: -15.0 C at hour 7

Monthly Average: -10.04 C

Percentiles: P_1 = -27.8 P_{10} = -18.3 Q_1 = -14.2 Median = -10.0 Q_3 = -5.4 P_{90} = -1.7 P_{99} = 5.2

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-21.8	-21.6	-20.5	-22.6	-22.7	-22.9	-23.2	-24.2	-22.8	-19.4	-18.7	-15.3	-13.1	-11.1	-9.2	-8.3	-9.1	-10.3	-11.1	-12.0	-12.6	-11.8	-11.5	-11.3	-16.1	-8.3
2-Mar	-12.3	-8.5	-8.0	-7.9	-7.6	-7.3	-7.0	-7.2	-7.8	-6.3	-5.0	-2.7	-1.9	-0.8	1.3	3.3	3.0	2.3	1.2	1.1	0.9	0.6	0.0	-2.9	-3.3	3.3
3-Mar	-5.2	-7.1	-8.0	-8.8	-9.2	-9.4	-10.0	-10.7	-11.2	-11.3	-11.8	-11.4	-10.3	-10.2	-10.1	-9.6	-9.6	-10.5	-11.1	-11.7	-13.2	-14.3	-14.9	-15.4	-10.6	-5.2
4-Mar	-15.5	-15.5	-15.8	-15.8	-15.8	-16.7	-17.7	-17.9	-17.9	-17.6	-17.1	-16.4	-15.7	-15.0	-14.6	-14.7	-14.6	-15.6	-16.6	-18.1	-20.7	-22.5	-20.6	-21.2	-17.1	-14.6
5-Mar	-21.8	-22.1	-24.1	-25.4	-25.6	-24.7	-26.5	-26.7	-23.8	-20.1	-19.2	-18.6	-17.4	-16.1	-16.3	-15.3	-14.8	-16.5	-19.1	-22.2	-23.2	-24.2	-25.7	DF	-21.3	-14.8
6-Mar	-27.0	-28.4	-29.7	-30.0	-31.0	-31.5	-32.1	-31.7	-28.6	-23.7	-20.7	-16.9	-13.5	-12.0	-11.5	-11.1	-10.7	-11.4	-13.7	-13.4	-14.7	-16.4	-16.7	-16.4	-20.5	-10.7
7-Mar	-14.6	-13.1	-13.0	-12.8	-12.7	-12.8	-13.5	-14.0	-13.7	-12.9	-12.3	-11.9	-11.5	-11.0	-10.0	-9.5	-9.3	-8.7	-8.2	-9.3	-11.1	-11.6	-10.2	-11.0	-11.6	-8.2
8-Mar	-10.2	-11.4	-11.9	-13.7	-14.5	-14.6	-14.9	-14.8	-14.3	-13.5	-12.0	-10.2	-8.9	-7.6	-6.3	-5.5	-3.7	-5.7	-8.5	-10.0	-10.9	-11.5	-13.2	-14.3	-10.9	-3.7
9-Mar	-15.5	-16.5	-16.1	-17.5	-19.1	-19.9	-20.2	-20.2	-19.2	-16.9	-14.1	-11.6	-9.9	-9.1	-8.4	-8.1	-8.0	-8.4	-8.9	-9.7	-10.1	-10.0	-9.8	-9.8	-13.2	-8.0
10-Mar	-9.6	-10.1	-10.5	-10.9	-10.8	-11.0	-11.1	-11.0	-10.7	-10.0	-9.3	-8.5	-7.6	-7.5	-7.0	-6.2	-5.9	-6.2	-6.8	-7.9	-7.6	-7.9	-8.0	-8.1	-8.8	-5.9
11-Mar	-7.5	-8.4	-9.6	-9.9	-9.6	-9.3	-9.7	-9.4	-9.0	-7.7	-6.6	-5.9	-6.0	-5.3	-4.8	-4.8	-5.4	-6.8	-8.0	-9.3	-10.1	-10.7	-11.0	-11.3	-8.2	-4.8
12-Mar	-11.6	-12.1	-12.8	-13.4	-14.0	-14.5	-15.1	-15.3	-15.1	-15.1	-14.7	-14.0	-13.1	-12.2	-11.4	-11.5	-11.5	-11.7	-12.4	-12.7	-13.2	-13.8	-14.6	-15.6	-13.4	-11.4
13-Mar	-16.1	-16.6	-16.9	-17.3	-17.9	-18.1	-18.0	-18.3	-17.6	-15.7	-14.0	-11.7	-10.2	-9.7	-8.7	-7.4	-6.8	-7.3	-8.6	-9.7	-10.2	-10.5	-10.7	-11.0	-12.9	-6.8
14-Mar	-11.3	-11.5	-11.7	-12.1	-12.6	-13.0	-13.2	-13.8	-14.0	-13.4	-12.7	-12.5	-12.3	-12.0	-11.8	-11.8	-12.1	-12.5	-12.8	-13.2	-13.5	-13.7	-14.0	-14.5	-12.7	-11.3
15-Mar	-14.7	-14.8	-15.5	-16.2	-17.0	-16.8	-16.8	M	-16.0	-14.9	-13.7	-12.4	-10.6	-8.3	-7.9	-8.2	-7.1	-8.1	-10.9	-13.5	-15.1	-16.4	-16.5	-16.6	-13.4	-7.1
16-Mar	-14.7	-14.4	-14.4	-14.3	-14.0	-14.0	-13.7	-13.7	-13.2	-12.2	-11.3	-10.0	-8.4	-7.0	-5.9	-5.0	-4.6	-4.8	-6.0	-6.7	-8.1	-9.9	-9.8	-9.6	-10.2	-4.6
17-Mar	-10.0	-11.0	-11.6	-12.1	-12.4	-12.3	-12.3	-11.8	-9.6	-8.5	-5.6	-2.7	-0.5	2.0	4.5	5.5	8.0	5.3	4.1	2.3	1.3	0.6	-0.6	-1.1	-3.7	8.0
18-Mar	-3.0	-3.5	-3.6	-4.9	-5.2	-5.9	-6.7	-6.7	-5.1	-3.1	-1.1	0.9	3.6	5.6	7.0	8.5	7.8	6.8	5.1	3.2	1.6	0.2	-0.7	-1.9	0.0	8.5
19-Mar	-2.4	-2.8	-3.5	-4.8	-6.5	-7.4	-8.3	-8.9	-7.3	-4.8	-2.4	-0.9	-0.4	0.2	1.2	2.1	1.9	1.8	1.0	-0.5	-1.4	-2.1	-2.7	-3.3	-2.6	2.1
20-Mar	-3.6	-3.5	-3.9	-4.3	-5.3	-6.0	-6.3	-6.3	-5.8	-5.9	-5.7	-5.7	-4.4	-2.8	-2.5	-2.4	-2.9	-3.8	-5.3	-7.0	-8.5	-9.8	-10.6	-11.4	-5.6	-2.4
21-Mar	-11.9	-13.5	-15.0	-17.0	-17.6	-18.6	-19.3	-18.9	-15.7	-13.9	-11.5	-8.6	-7.8	-6.3	-4.7	-4.1	-4.0	-3.7	-5.2	-7.2	-8.5	-8.9	-10.7	-11.3	-11.0	-3.7
22-Mar	-13.1	-11.8	-12.7	-13.5	-15.0	-15.6	-16.5	-15.4	-12.6	-9.5	-6.5	-4.6	-2.9	-1.1	0.4	1.4	1.8	1.8	0.6	-0.8	-2.6	-3.8	-3.8	-4.1	-6.7	1.8
23-Mar	-4.7	-4.0	-5.4	-5.4	-5.2	-5.5	-5.3	-4.8	-1.8	-1.3	-1.1	-1.5	-2.5	-2.0	-1.4	-1.9	-2.9	-4.0	-5.1	-5.6	-5.9	-5.8	-5.6	-5.9	-3.9	-1.1
24-Mar	-6.6	-8.0	-9.3	-10.5	-11.4	-12.8	-15.2	-14.3	-11.3	-9.9	-7.9	-7.0	-5.5	-4.1	-3.5	-2.6	-1.5	-1.2	-2.5	-5.3	-7.3	-8.2	-9.0	-9.9	-7.7	-1.2
25-Mar	-11.9	-13.7	-14.6	-16.1	-16.2	-16.2	-17.3	-14.9	-12.9	-9.7	-7.2	-5.0	-3.9	-3.6	-3.4	-3.8	-4.5	-5.8	-7.7	-9.6	-10.8	-12.3	-14.0	-15.4	-10.4	-3.4
26-Mar	-16.7	-17.6	-18.3	-19.0	-19.9	-21.0	-21.8	-21.5	-20.5	-18.4	-16.2	-14.1	-12.8	-11.7	-11.1	-10.8	-10.7	-11.3	-12.2	-13.2	-14.4	-16.0	-17.0	-18.8	-16.0	-10.7
27-Mar	-19.6	-21.0	-22.5	-22.9	-23.6	-24.1	-24.6	-22.2	-19.3	-15.7	-12.4	-10.2	-8.7	-7.5	-6.9	-5.9	-5.7	-6.1	-7.5	-8.9	-10.1	-10.8	-13.9	-15.5	-14.4	-5.7
28-Mar	-17.0	-17.8	-20.0	-20.8	-20.8	-22.4	-22.3	-20.6	-16.7	-13.1	-10.1	-7.8	-5.7	-4.0	-2.8	-2.2	-1.7	-1.4	-1.7	-2.3	-2.2	-2.4	-2.8	-3.3	-10.1	-1.4
29-Mar	-3.7	-5.4	-6.9	-7.7	-7.9	-6.0	-5.7	-4.2	-3.0	-2.5	-1.9	-1.4	-1.3	-1.1	-1.2	-1.0	-1.3	-1.9	-2.6	-3.4	-4.4	-6.0	-8.7	-9.1	-4.1	-1.0
30-Mar	-9.2	-10.7	-12.8	-13.1	-13.7	-12.7	-12.5	-11.7	-9.5	-7.6	-5.1	-4.3	-4.0	-3.5	-2.7	-2.3	-2.2	-2.5	-2.9	-3.5	-4.2	-5.5	-6.6	-7.1	-7.1	-2.2
31-Mar	-7.9	-8.5	-8.8	-8.9	-8.9	-8.7	-8.3	-7.9	-7.4	-6.8	-5.8	-4.6	-2.8	-1.4	-0.4	0.7	1.1	1.3	0.7	0.2	0.0	-1.1	-1.9	-3.3	-4.1	1.3
	-12.0	-12.4	-13.1	-13.9	-14.3	-14.6	-15.0	-14.6	-13.3	-11.7	-10.1	-8.6	-7.4	-6.3	-5.5	-4.9	-4.7	-5.4	-6.5	-7.7	-8.7	-9.6	-10.2	-10.3	Diurnal Average	
	-2.4	-2.8	-3.5	-4.3	-5.2	-5.5	-5.3	-4.2	-1.8	-1.3	-1.1	0.9	3.6	5.6	7.0	8.5	8.0	6.8	5.1	3.2	1.6	0.6	0.0	-1.1	Diurnal Maximum	

M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Fort Hills - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	57	7.68	7.68
-20 - 0	641	86.39	94.07
0 - 10	44	5.93	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort Hills - March 2023

Maximum Value: 91.6 % on Mar 19 08:00

Maximum Daily Average: 83.0 % on Mar 14

Minimum Value: 29.4 % on Mar 8 17:00

Minimum Daily Average: 49.6 % on Mar 8

Maximum Diurnal Average: 78.0 % at hour 7

Minimum Diurnal Average: 57.0 % at hour 16

Monthly Average: 68.98 %

Percentiles: P_1 = 41.6 P_{10} = 50.7 Q_1 = 60.9 Median = 70.4 Q_3 = 78.8 P_{90} = 84.0 P_{99} = 89.1

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	81.3	81.1	81.2	79.7	79.7	79.6	79.3	78.4	79.2	81.2	81.2	82.5	73.1	66.3	65.0	64.3	68.4	71.6	75.6	78.6	82.2	81.6	82.2	81.9	77.3	82.5
2-Mar	85.9	89.0	89.0	89.7	89.7	89.2	88.2	86.8	86.4	83.3	76.5	67.7	67.7	69.3	69.6	64.9	69.0	72.7	73.9	67.7	69.2	67.3	63.5	81.7	77.4	89.7
3-Mar	80.9	79.8	79.0	76.4	75.6	76.0	73.7	70.9	70.4	70.8	70.4	67.5	62.6	63.7	64.9	62.6	66.2	79.5	76.3	75.0	75.1	71.7	70.3	70.0	72.0	80.9
4-Mar	70.8	69.7	72.5	74.6	66.6	70.9	71.3	70.0	67.5	57.5	58.4	57.4	56.0	58.7	57.1	60.3	60.5	61.2	63.4	67.1	75.5	78.2	74.6	74.6	66.4	78.2
5-Mar	75.1	74.6	76.7	77.5	76.8	73.9	75.6	75.3	71.2	60.4	57.3	58.5	56.5	51.9	53.7	50.9	48.9	54.5	61.3	74.7	76.6	78.0	77.6	DF	66.8	78.0
6-Mar	76.1	75.2	74.1	73.4	72.9	72.4	72.0	72.5	74.3	74.7	67.0	54.0	49.7	50.0	60.9	65.4	67.0	69.4	79.9	83.9	84.1	84.8	84.7	83.6	71.7	84.8
7-Mar	81.3	78.4	82.0	83.4	81.4	79.0	78.2	78.5	76.9	75.2	74.3	71.3	72.1	71.6	70.0	71.8	74.6	69.2	56.3	58.1	62.6	61.9	54.4	56.3	71.6	83.4
8-Mar	52.5	54.2	53.2	57.6	59.6	59.8	60.5	60.2	59.4	56.8	54.4	50.7	45.5	39.3	35.3	33.0	29.4	34.9	43.9	49.1	48.6	46.9	50.8	54.2	49.6	60.5
9-Mar	58.9	59.7	57.7	61.7	66.9	69.7	70.5	70.7	65.5	61.1	54.2	48.0	45.2	46.3	47.0	47.8	48.4	50.2	53.4	56.3	54.9	60.1	65.1	67.1	57.8	70.7
10-Mar	64.9	68.8	72.9	75.4	74.9	73.1	73.6	73.7	72.3	70.4	67.7	64.3	61.9	69.4	66.8	61.8	59.6	64.3	74.1	78.8	84.0	83.6	83.1	81.5	71.7	84.0
11-Mar	68.7	70.4	72.4	70.8	69.1	64.7	66.7	67.0	67.0	62.6	59.9	60.9	64.0	60.3	61.2	64.8	71.5	73.9	79.9	84.5	85.4	83.9	84.2	84.3	70.7	85.4
12-Mar	84.0	83.9	82.2	82.0	79.8	80.3	79.2	78.6	77.9	75.1	72.2	71.1	70.4	71.1	72.1	71.0	71.0	73.9	76.5	78.6	81.7	82.8	83.3	84.5	77.6	84.5
13-Mar	84.7	84.8	84.3	84.0	83.6	83.4	83.3	82.7	83.2	82.9	79.0	73.6	72.2	69.5	65.9	65.0	64.4	64.3	65.8	69.0	70.5	72.0	72.5	77.9	75.8	84.8
14-Mar	83.4	84.1	85.0	85.2	85.0	84.8	84.9	83.8	83.2	82.5	82.0	82.4	81.7	81.5	81.2	81.5	82.9	83.2	83.3	82.9	82.3	82.6	81.4	81.6	83.0	85.2
15-Mar	81.2	82.1	82.3	82.4	83.7	84.1	83.8	M	77.8	73.6	70.3	65.8	59.5	54.6	56.9	61.7	58.3	62.9	74.0	82.4	86.2	85.9	85.1	84.8	74.8	86.2
16-Mar	86.1	85.5	83.3	82.7	82.3	85.0	84.2	83.3	80.7	79.3	77.3	73.8	72.0	70.9	70.6	71.6	71.3	72.5	77.7	79.8	83.3	89.2	86.7	86.8	79.8	89.2
17-Mar	86.2	86.9	88.5	89.2	88.5	87.1	86.3	84.6	80.3	77.2	71.2	66.4	64.3	60.8	58.1	57.4	42.3	58.0	60.3	64.1	64.2	71.4	67.2	63.5	71.8	89.2
18-Mar	67.4	66.2	63.7	66.8	65.8	64.7	65.7	65.4	61.7	59.5	55.5	53.6	48.3	43.4	41.1	36.1	38.6	43.1	47.1	53.3	57.7	61.2	62.1	67.0	56.5	67.4
19-Mar	71.5	74.1	76.8	81.4	86.3	88.8	90.3	91.6	85.2	76.8	68.3	63.1	62.4	62.5	58.4	53.9	55.9	55.6	60.7	66.8	71.9	74.0	74.0	74.2	71.8	91.6
20-Mar	75.8	76.5	74.9	72.1	71.0	70.5	73.2	81.8	86.8	84.6	82.0	75.6	72.8	65.5	59.6	55.8	53.6	54.0	56.1	57.0	59.9	62.3	62.9	65.0	68.7	86.8
21-Mar	66.4	71.0	76.7	82.8	83.3	83.1	82.6	82.6	81.4	74.0	69.1	66.9	70.4	65.0	58.2	52.9	50.5	44.9	53.8	62.1	67.9	70.0	77.1	79.9	69.7	83.3
22-Mar	86.8	85.6	87.7	89.7	87.8	87.4	85.4	86.3	86.0	75.9	62.9	57.1	55.2	50.3	47.4	46.5	50.4	50.4	56.0	62.4	69.6	72.2	68.1	69.3	69.8	89.7
23-Mar	71.8	70.0	75.2	75.8	75.6	76.7	75.8	75.2	58.5	60.7	61.3	64.2	68.2	65.5	62.7	64.0	66.8	70.0	72.9	73.5	73.0	70.5	67.2	66.9	69.2	76.7
24-Mar	68.6	70.2	73.1	76.0	77.0	79.7	86.7	86.3	75.3	70.1	63.8	62.5	57.2	53.7	50.9	47.9	44.4	43.8	50.0	62.8	76.5	77.3	70.1	68.0	66.3	86.7
25-Mar	76.4	82.9	84.3	85.7	84.1	82.7	82.6	78.5	74.0	69.9	62.4	50.8	45.7	43.0	43.4	43.1	47.4	52.0	58.9	63.6	65.7	67.4	66.8	65.8	65.7	85.7
26-Mar	67.1	65.8	65.9	65.6	67.1	69.6	71.9	71.0	67.9	64.4	60.9	56.2	51.7	49.2	47.1	44.4	44.2	44.5	46.5	49.8	54.0	58.4	59.8	65.1	58.7	71.9
27-Mar	67.3	70.3	75.6	77.1	75.9	75.0	74.5	71.1	65.9	57.2	55.7	48.2	46.4	47.6	46.8	42.8	43.2	42.3	43.9	47.1	48.6	50.7	58.2	64.9	58.2	77.1
28-Mar	68.4	70.2	76.4	76.7	76.0	79.3	79.3	76.5	69.6	58.7	50.7	46.7	45.6	43.4	45.9	48.3	53.2	51.3	50.9	58.6	57.9	59.0	60.3	60.1	61.0	79.3
29-Mar	64.4	74.4	78.8	79.4	80.6	83.1	82.2	78.2	72.6	76.8	78.5	76.0	75.6	73.2	72.9	68.5	63.9	64.8	64.5	62.0	63.2	69.1	81.8	82.5	73.6	83.1
30-Mar	81.6	84.9	89.0	88.5	86.8	87.7	86.9	85.7	83.0	75.6	57.0	49.2	48.9	45.5	44.6	45.5	45.1	48.1	48.0	50.8	55.0	60.4	63.8	63.6	65.6	89.0
31-Mar	64.5	66.4	66.5	67.6	68.7	70.2	69.4	68.8	70.6	72.8	72.3	69.8	65.6	63.4	61.8	60.3	59.5	61.5	65.9	69.4	68.5	70.7	71.1	76.5	67.6	76.5
	74.2	75.4	76.8	77.8	77.5	77.8	78.0	77.2	74.6	71.0	66.9	63.1	60.9	58.9	58.0	57.0	57.1	59.4	62.9	66.8	69.5	71.1	71.3	72.8	Diurnal Average	
	86.8	89.0	89.0	89.7	89.7	89.2	90.3	91.6	86.8	84.6	82.0	82.5	81.7	81.5	81.2	81.5	82.9	83.2	83.3	84.5	86.2	89.2	86.7	86.8	Diurnal Maximum	

M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Fort Hills - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	7	0.94	0.94
40 - 60	163	21.97	22.91
60 - 80	408	54.99	77.90
80 - 100	164	22.10	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort Hills - March 2023

Maximum Speed: 31 km/h on Mar 14 03:00

Maximum Daily Speed Average: 23.7 km/h on Mar 14

Minimum Speed Value: 0 km/h on Mar 11 09:00

Maximum Diurnal Speed Average: 7.2 km/h at hour 18

Monthly Average Velocity: 4.3 km/h 53.8 deg

Minimum Daily Speed Average: 1.2 km/h on Mar 5

Minimum Diurnal Speed Average: 2.6 km/h at hour 5

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 6$ Median = 10 $Q_3 = 16$ $P_{90} = 21$ $P_{99} = 26$

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE4	SE5	SSE5	S3	S4	SSE5	S5	S3	SSW3	SE1	N2	ENE2	E2	SE6	SE11	SSE16	SSE12	SE12	SE12	SE11	SE9	SE6	SE8	SE5	SE5.9	SSE16
2-Mar	SE4	SE13	SE15	SE15	SSE12	SSE12	S15	S15	SSE15	S15	SSE9	NNE2	E5	SE11	SSE11	SW13	WSW12	W13	WNW12	W9	WNW8	NW15	WNW18	NNE18	S4.9	NNE18
3-Mar	NNE17	NNE17	NE14	NE13	NE10	NE11	NNE14	NNE14	NNE13	NNE14	NNE15	NNE11	ENE6	NNE7	NE6	ENE4	E1	NNE8	NE9	NE11	NNE19	NNE24	NNE16	NNE12	NNE11.6	NNE24
4-Mar	N12	N7	WNW5	NW6	N9	NNE13	NNE16	NNE13	N12	NNW16	NW12	NNW11	NW10	NNE9	NNE10	NE10	NNE13	NNE14	NNE13	NNE9	N2	NNW3	NNE9	NNE10	N8.9	NNW16
5-Mar	NNE7	NNE7	N3	WNW5	W4	WNW3	SW6	S4	SW2	SW0	SSE5	SE9	ESE8	E7	SE8	ESE6	E5	E4	E4	NW2	NNW4	NNW4	NNW4	DF	E1.2	SE9
6-Mar	NNW4	N2	W2	ENE1	SW1	S1	SE2	S3	SSE5	SSE4	SW5	NW1	E2	NE1	SE9	S7	SSE4	NE3	ENE3	E4	ESE3	SE4	SE6	SSE7	SE2.1	SE9
7-Mar	SSE10	SSE17	SE17	SE16	SE19	SSE21	SE17	SE17	SE18	SSE19	SSE22	SSE22	SSE19	SSE16	SSE8	NNW6	N10	NE6	ESE7	ESE4	NE3	SE4	SSE6	SSE9	SE11.3	SSE22
8-Mar	SSE13	SSE13	SSE16	SSE15	SSE15	SSE18	SSE16	SSE13	SSE11	SSE10	SE10	SE12	SSE13	SSE10	S8	SSW7	ENE2	WNW3	SW2	SE10	SE13	SE16	SE13	SE10	SSE10.5	SSE18
9-Mar	SE5	SSE5	SE7	SSE9	SE9	SSE14	SE12	SSE7	SSE9	SSE10	S13	S10	SSE20	SSE23	SSE21	SSE22	SSE20	SSE16	SE15	SE14	SE17	SE17	SE21	SE20	SSE13.6	SSE23
10-Mar	SSE23	SSE21	SSE21	SSE17	SSE21	SSE21	SE17	SE16	SE19	SSE18	SSE20	SSE17	SSE18	SSE14	SSE10	SE9	E5	NE6	ENE5	NNE4	N9	N10	N10	NNE7	SE10.6	SSE23
11-Mar	SSE8	SSE3	SE4	S5	S4	SSE7	UO	SSE2	WSW0	ESE4	NNE3	NE4	N7	N9	N11	N13	NNE19	NNE20	NNE21	N23	N20	N22	NNE20	NNE21	NNE8.1	N23
12-Mar	NNE24	N22	N25	N22	NNE22	N21	NNE21	NNE17	NNE17	NNE17	NNE15	NNE13	NE12	NE13	NNE15	NNE16	NNE14	NNE15	NNE15	NNE16	N18	N17	N17	N16	NNE17.3	N25
13-Mar	N14	N14	N18	N18	N14	N11	N13	NNE11	N11	NNE12	NNE16	NNE19	NNE24	NNE26	NNE26	NNE26	N24	N22	N25	NNE26	N24	NNE24	N24	N24	N19.5	NNE26
14-Mar	N23	N27	NNE31	NNE29	N27	N27	NNE25	N26	N26	N26	N22	NNE24	NNE25	N24	N22	N21	N21	N20	N19	N22	N21	N21	N22	N20	N23.7	NNE31
15-Mar	N15	N11	N10	NNE14	N9	N6	NNW6	M	N6	N6	N8	N8	NNE5	ENE4	E3	SE5	ENE4	ENE5	NE6	NNE5	UO	NW3	NW2	NW3	N5.5	N15
16-Mar	SE7	SSE10	SSE7	S5	SSW5	SSW5	SSE8	S7	SSW9	S11	SSE13	SE14	SE13	SE14	SE14	SE13	SSE13	SSE12	SSE10	SSE9	SSE8	S7	SSE8	SSE7	SSE9.0	SE14
17-Mar	SSE9	SSE15	SSE8	S9	SSE8	SSE11	SSE20	SSE16	SSE14	SE19	SSE19	SSE18	SE18	SSE18	S15	SSE14	SW12	SE10	SE10	SSE10	S4	SE4	S3	SE8	SSE11.7	SSE20
18-Mar	SE12	SSE11	SSE10	SSE11	SSE11	SE13	SSE12	SE11	SE12	SE11	SE12	SE12	ESE8	E6	E6	E4	NNE7	NNE10	NE8	NNE7	NNE10	N13	N13	N14	ESE5.5	N14
19-Mar	N15	N16	NNE17	NNE16	N11	N11	N7	N4	N4	NNE3	E5	E3	N4	N6	N6	N6	N8	N5	NNW3	S10	SE17	SE14	SE13	SSE10	NE4.7	SE17
20-Mar	SE9	ESE5	SE6	SSE10	SE10	SE8	SSE3	N6	NNE10	NNE14	NNE16	NNE18	NNE21	NNE23	NNE22	NNE20	NNE23	NNE23	NNE17	NNE23	N23	NNE22	NNE16	NNE11	NNE11.8	NNE23
21-Mar	NNE11	NNW8	WNW3	NW5	NW5	WNW2	WNW3	WNW3	NNW5	NNW4	SW2	SE4	SE9	SE8	E6	ESE7	ESE6	ESE5	S5	SSE8	SSE10	SE10	SSE9	S6	SE1.9	NNE11
22-Mar	S4	SE10	SSE9	S7	S5	SSW7	S7	SSW8	SW8	S12	S14	S12	SSE15	SSE12	SSE12	SSE13	SE14	SSE12	SSE8	SSE5	S3	SSE6	SE10	SE9	SSE8.7	SSE15
23-Mar	SE12	SE9	SE9	SSE11	SE9	SE8	ESE8	ESE6	NNE19	NNE21	NE21	NNE21	NE21	NNE20	NNE25	NNE23	NNE21	NNE22	NNE21	N17	N9	NNW7	N12	N15	NE10.9	NNE25
24-Mar	N14	N12	NNE8	NNE10	NNE13	N7	WSW4	N2	NNE8	NNW2	ESE5	SE7	SE7	ESE7	ESE9	ESE8	ESE7	ESE5	ENE4	ENE5	NNE3	N5	N8	NNW8	NE4.2	N14
25-Mar	NNW6	NW3	NNW3	NNW5	N6	N8	NNW9	N10	NNW7	N10	N10	NE15	NE14	NE14	NE16	NE18	NE18	NNE19	NNE19	NNE16	NNE18	N22	NNE19	NNE15	NNE11.8	N22
26-Mar	NNE14	N18	NNE6	NNE8	N12	N13	N9	N8	N10	NNE13	NNE17	NNE14	NNE15	NNE16	NNE19	NNE20	NNE21	NNE20	NNE16	NE15	NNE11	NNW6	NNW7	NNW6	NNE12.8	NNE21
27-Mar	NW4	WNW3	NNW2	S4	S4	SSE5	SSE8	SSE9	SSE9	SSE7	SE9	SE10	SE9	ESE10	ESE9	E8	ENE8	NE9	NE13	NE12	NE12	NE7	NW5	NNW5	E3.7	NE13
28-Mar	NNW8	N4	NNW5	NNW6	NNW3	SSW3	S5	SSE8	SSE10	SSW12	SSW15	S15	S16	S16	SSE19	SSE22	SSE20	SSE17	SSE16	SE11	SE10	SE10	SSE5	SW1	SSE8.0	SSE22
29-Mar	ENE1	NNW1	NW3	NNW4	WNW3	NNW3	WNW3	NNW4	N4	NNE9	NNE12	NNE12	NNE23	NNE21	NNE23	NNE24	NNE23	NE18	NE17	NNE14	NNE10	N3	WNW5	WNW5	NNE9.2	NNE24
30-Mar	NW3	NW4	NW3	W2	S1	S5	SSE4	SSE3	S3	SSW2	E6	ENE7	ENE7	NE8	NE8	NE8	NE7	NE10	NE12	NE13	NNE11	N14	N14	N16	NE4.9	N16
31-Mar	N14	N13	N14	N15	N15	N15	N17	N20	N19	N16	NNE15	N15	N15	N18	N21	N20	N22	N18	N15	NNE11	ENE9	ENE9	ENE6	NNE6	N14.3	N22
	NE4.1	NE3.8	ENE3.0	ENE2.7	ENE2.6	E2.7	E2.6	E2.6	ENE2.6	ENE2.7	E3.4	ENE4.6	ENE5.5	ENE5.6	ENE5.7	ENE5.5	NE6.5	NE7.2	NE6.9	NE6.8	NE6.2	NNE5.8	NNE4.8	NNE5.3	Diurnal Average	
	NNE24	N27	NNE31	NNE29	N27	N27	NNE25	N26	N26	N26	N22	NNE24	NNE25	NNE26	NNE26	NNE26	N24	NNE23	N25	NNE26	N24	NNE24	N24	N24	Diurnal Maximum	

M - Maintenance DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Fort Hills - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Fort Hills - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	169	22.84	22.84
6 - 11	241	32.57	55.41
12 - 19	229	30.95	86.35
20 - 28	99	13.38	99.73
29 - 38	2	0.27	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Fort Hills - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	13	7	4	12	12	8	12	16	22	5	7	2	3	13	14	19	169
6 - 11	37	31	17	7	6	14	45	49	10	6	1	0	1	1	2	14	241
12 - 19	44	62	17	0	0	0	39	45	11	3	1	1	1	2	2	1	229
20 - 28	36	42	2	0	0	0	2	17	0	0	0	0	0	0	0	0	99
29 - 38	0	2	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	144	40	19	18	22	98	127	43	14	9	3	5	16	18	34	740

Total Number of Valid Hours: 740

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Fort Hills

Total Number of Valid Hours: 740

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 20 23:00

Minimum Value: 0 km/h on Mar 1 07:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

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

M - Maintenance DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort Hills - March 2023

Direction of Maximum Speed: 12 deg on Mar 14 03:00
Direction of Maximum Daily Speed Average: 8.4 deg on Mar 14

Direction of Minimum Speed: 243 deg on Mar 11 09:00

Direction of Minimum Daily Speed Average: 1.2 deg on Mar 5

Monthly Average Direction: 53.8 deg

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	154	139	147	190	171	163	169	187	192	142	351	73	98	127	140	159	148	143	137	132	127	134	135	144	144.6
2-Mar	143	140	144	138	162	158	171	172	166	178	159	28	88	140	163	214	241	266	282	280	297	313	295	17	186.6
3-Mar	17	24	37	43	51	43	30	25	20	22	23	24	57	15	47	78	86	19	51	40	25	22	24	21	29.7
4-Mar	5	350	284	310	355	31	22	20	2	343	313	334	319	18	24	41	29	26	24	16	359	348	20	14	5.7
5-Mar	15	21	349	282	266	293	219	191	219	236	158	134	117	90	129	112	90	99	90	323	341	334	332	DF	94.8
6-Mar	346	7	265	75	226	175	141	179	151	148	224	316	101	45	131	171	147	53	69	95	119	125	136	148	137.3
7-Mar	152	148	144	140	143	147	141	142	146	152	155	155	155	162	158	344	2	39	107	108	40	144	156	147	144.3
8-Mar	156	154	153	149	147	152	158	159	158	164	144	142	150	167	184	210	57	286	232	129	135	138	146	138	152.4
9-Mar	140	151	142	150	145	152	146	148	152	159	186	177	166	160	161	158	155	147	127	124	130	139	146	146	150.7
10-Mar	147	147	148	148	147	149	146	140	144	154	159	162	163	167	151	143	97	41	71	28	5	6	7	16	141.9
11-Mar	147	165	146	180	170	159	UO	150	243	114	31	46	356	359	5	7	13	19	14	9	7	11	15	14	18.4
12-Mar	13	10	9	9	12	9	14	20	21	23	20	15	34	39	19	25	32	31	21	13	11	10	9	4	16.4
13-Mar	2	4	6	8	9	9	11	15	11	15	17	16	18	16	12	13	9	5	8	12	7	12	10	10	10.7
14-Mar	8	10	12	13	8	8	12	9	11	7	8	15	13	7	5	9	7	360	2	5	4	5	10	9	8.4
15-Mar	2	360	8	13	6	349	328	M	360	3	0	9	20	58	85	135	69	72	36	27	UO	315	304	322	10.8
16-Mar	129	151	164	181	207	195	163	177	192	191	149	138	134	135	139	141	148	153	151	150	152	172	164	164	155.2
17-Mar	151	154	160	170	160	160	158	157	166	140	148	153	144	150	169	163	216	137	142	150	184	133	172	142	156.0
18-Mar	142	151	147	151	154	145	153	139	146	135	135	131	116	82	82	85	21	32	45	27	15	8	5	7	105.8
19-Mar	8	10	18	15	1	9	5	353	358	31	97	80	9	0	7	4	7	352	348	175	135	127	140	153	35.5
20-Mar	146	115	143	151	128	139	157	355	12	16	18	27	22	25	23	24	26	21	14	16	11	12	14	20	27.6
21-Mar	23	348	292	306	318	301	302	284	328	335	234	138	133	125	99	114	119	122	172	157	163	143	166	190	136.5
22-Mar	181	132	163	183	190	200	176	197	214	190	180	186	154	167	168	154	143	160	162	156	182	164	144	139	167.7
23-Mar	146	132	143	149	144	137	123	110	31	32	37	30	36	29	13	17	26	25	24	7	351	339	351	1	35.0
24-Mar	3	9	17	19	17	2	245	8	19	343	114	131	129	111	117	110	107	106	71	57	22	6	355	348	41.8
25-Mar	341	306	329	339	350	352	347	1	343	3	7	35	36	38	42	39	38	32	32	23	14	9	19	19	19.0
26-Mar	16	5	15	23	11	5	10	4	6	17	13	20	15	29	26	30	28	33	29	35	18	348	344	331	17.9
27-Mar	306	292	342	186	181	167	163	162	161	168	126	128	129	116	113	86	58	49	45	39	41	49	314	345	98.9
28-Mar	339	350	328	330	348	212	177	151	153	207	203	188	179	178	164	158	155	162	159	144	137	144	153	229	168.5
29-Mar	75	342	322	337	293	344	296	327	357	12	14	12	23	19	23	17	22	35	41	32	29	3	287	286	16.4
30-Mar	318	321	315	274	189	175	162	167	181	205	95	69	62	44	53	46	41	39	44	39	24	8	4	2	34.2
31-Mar	2	5	7	4	2	0	5	7	8	7	14	11	9	6	3	8	6	7	356	22	78	75	60	22	10.2
	39.8	53.1	64.0	60.1	66.3	92.1	99.2	87.1	65.4	65.7	78.9	73.6	75.6	69.4	65.4	61.2	44.3	40.5	41.3	39.5	36.5	29.8	25.6	27.5	
	Diurnal Average																								

M - Maintenance DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Fort Hills - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Fort Hills - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 96 deg on Mar 5 10:00

Minimum Value: 3 deg on Mar 18 22:00

Percentiles: $P_1 = 4$ $P_{10} = 7$ $Q_1 = 9$ Median = 12 $Q_3 = 19$ $P_{90} = 35$ $P_{99} = 76$

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	33	16	10	20	23	16	6	29	22	68	40	35	75	64	14	11	9	8	7	7	11	31	9	9	75
2-Mar	16	8	7	7	9	10	10	11	8	11	23	57	35	9	25	18	9	22	15	19	26	13	20	14	57
3-Mar	12	11	11	12	13	11	12	10	10	10	11	13	30	22	23	40	67	12	10	15	9	10	11	10	67
4-Mar	13	22	19	23	17	10	8	8	14	13	17	18	23	18	15	15	14	10	8	9	61	64	10	7	64
5-Mar	10	8	61	24	26	31	9	29	36	96	13	20	20	30	19	24	24	20	12	48	11	17	17	DF	96
6-Mar	20	33	50	55	53	70	47	26	13	32	53	95	60	79	18	20	52	30	23	28	18	19	9	8	95
7-Mar	8	6	6	6	7	6	6	6	6	6	7	7	10	9	50	28	10	49	21	26	17	58	8	7	58
8-Mar	5	4	4	5	4	4	4	7	6	10	14	10	11	23	34	36	49	56	53	15	7	7	5	7	56
9-Mar	8	7	10	7	10	5	11	8	7	15	19	21	13	9	8	9	7	8	13	15	7	10	7	7	21
10-Mar	7	7	6	6	7	7	7	8	8	11	10	10	8	11	16	25	44	11	43	61	7	8	8	32	61
11-Mar	11	49	16	31	58	7	UO	47	85	31	50	53	23	16	12	10	11	11	10	8	11	10	10	8	85
12-Mar	7	10	10	10	8	9	8	7	9	9	11	13	12	12	11	11	11	11	8	8	7	8	9	13	13
13-Mar	12	12	9	6	6	9	7	10	20	11	10	9	8	8	9	8	10	12	9	8	9	9	9	10	20
14-Mar	10	9	8	8	11	9	7	11	8	11	11	7	8	10	11	9	11	12	13	12	12	11	8	9	13
15-Mar	12	14	9	5	7	12	13	M	12	13	12	12	27	43	53	24	39	12	19	34	UO	51	40	50	53
16-Mar	14	10	12	14	21	18	12	13	13	14	16	8	8	8	7	8	8	5	6	8	7	11	9	6	21
17-Mar	8	4	7	10	19	9	8	9	12	8	8	6	7	6	12	18	19	12	12	11	60	79	32	12	79
18-Mar	11	11	14	10	12	5	13	7	9	7	7	9	19	16	18	20	18	9	9	10	7	3	6	5	20
19-Mar	5	6	8	9	11	7	8	39	23	50	27	45	19	11	11	11	8	17	39	34	9	13	10	19	50
20-Mar	10	18	21	9	12	18	14	48	17	9	12	13	11	11	13	11	10	9	12	9	8	8	12	10	48
21-Mar	11	29	51	12	8	29	33	39	13	32	49	24	13	18	29	22	15	10	21	11	8	10	18	18	51
22-Mar	23	10	13	9	14	19	9	11	8	13	15	16	13	19	21	17	7	8	17	8	18	20	7	6	23
23-Mar	11	14	10	12	27	15	17	35	12	11	12	13	14	12	12	10	11	11	11	16	11	8	18	14	35
24-Mar	12	10	10	6	5	60	21	16	15	91	30	21	25	25	22	24	26	25	23	26	11	13	11	11	91
25-Mar	9	28	26	15	11	8	10	11	12	13	18	13	16	14	14	13	11	11	12	11	9	8	9	8	28
26-Mar	11	9	63	18	7	12	12	14	11	14	11	17	14	14	12	14	11	11	10	10	7	13	4	14	63
27-Mar	45	32	61	15	9	13	10	9	14	21	15	18	24	25	25	27	19	13	8	9	11	60	28	13	61
28-Mar	12	20	12	10	32	46	16	14	14	9	13	14	13	16	13	7	6	8	7	7	9	10	56	74	74
29-Mar	64	76	27	12	41	47	54	19	19	12	10	19	10	12	12	12	12	12	10	10	9	47	25	14	76
30-Mar	24	27	30	42	92	10	21	42	31	55	35	27	27	22	24	25	20	13	8	10	14	11	12	12	92
31-Mar	11	9	8	11	12	13	10	9	11	12	11	12	14	15	12	12	12	11	13	25	14	16	24	30	30
	64	76	63	55	92	70	54	48	85	96	53	95	75	79	53	40	67	56	53	61	61	79	56	74	
	Diurnal Maximum																								

M - Maintenance DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS25
WASKŌW OHCI PIMÂTISIWIN
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)
MARCH 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	357	21	387	50.81	37.6	0	9.4	0
H2S(ppb) Average	358	20	386	50.81	2	0	0.9	0
Temperature 2 m (C) Average	378	0	366	50.81	10.5	0	-0.4	0
Relative Humidity (%) Average	378	0	366	50.81	92.6	-	75.4	-
Wind Speed 10 m (km/h) Average	365	0	379	49.06	13	0	7	0
Wind Direction 10 m (deg) Average	365	0	379	49.06	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKÕW OHCI PIMÂTISIWIN (AMS25)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	357	2.4	5.7	-	0	0	0	0.2	1.5	6.9	37.6
H2S (ppb) Average	358	0.38	0.3	-	0	0.1	0.2	0.3	0.5	0.9	2
Temperature 2 m (C) Average	378	-7.67	7.1	-	-27.6	-17.8	-11.9	-6.7	-2.8	-0.2	10.5
Relative Humidity (%) Average	378	66.08	14.8	-	27.1	45	54.4	67.2	78.1	84.8	92.6
Wind Speed 10 m (km/h) Average	365	4.7	3	-	0	1	2	4	7	9	13
Wind Direction 10 m (deg) Average	365	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKÕW OHCI PIMÂTISIWIN (AMS25)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	01 Mar 2023 01:00	16 Mar 2023 06:00	366	Station power failure
Wind Speed, Wind Direction	16 Mar 2023 07:00	30 Mar 2023 01:00	13	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Waskow ohci Pimatisiwin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 37.6 ppb on Mar 22 15:00

Maximum Daily Average: 9.4 ppb on Mar 22

Minimum Value: 0.0 ppb on Mar 19 05:00

Minimum Daily Average: 0.0 ppb on Mar 20

Maximum Diurnal Average: 6.0 ppb at hour 14

Minimum Diurnal Average: 0.2 ppb at hour 5

Monthly Average: 2.40 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.2 Q_3 = 1.5 P_{90} = 6.9 P_{99} = 30.9

Hours in Service:	744
Hours of Data:	357
Hours of Missing Data:	387
Hours of Calibration:	21
Percent Operational Time:	50.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Mar	PF	PF	PF	PF	PF	PF	C	C	C	C	C	C	15.6	20.0	16.0	6.9	6.7	10.3	6.0	2.8	2.7	2.6	1.1	0.7	--	20.0
17-Mar	1.0	1.3	1.4	0.8	Z	1.9	1.8	1.5	1.3	2.7	8.1	21.9	17.1	18.9	13.7	7.5	5.5	3.5	2.8	1.5	0.8	0.5	0.4	0.4	5.1	21.9
18-Mar	0.4	0.3	0.3	0.3	1.3	Z	1.4	1.1	2.4	1.9	2.1	3.0	2.1	2.3	4.1	1.4	1.6	1.6	1.1	0.6	0.6	0.4	0.3	0.2	1.3	4.1
19-Mar	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	4.9	14.5	7.6	2.7	1.3	1.5	1.6	4.8	0.5	0.4	0.1	0.1	0.1	0.0	0.0	1.8	14.5
20-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.9	8.4	26.1	30.4	31.5	17.1	3.5	1.3	0.5	0.3	5.2	31.5
22-Mar	0.4	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.4	1.2	13.2	23.1	27.2	36.3	37.6	34.7	15.6	6.7	7.1	4.1	2.0	1.8	1.5	1.0	9.4	37.6
23-Mar	0.8	0.6	0.5	0.6	Z	2.8	1.4	1.1	2.4	1.7	1.1	0.8	0.5	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	2.8
24-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	1.1	14.1	11.7	6.1	4.2	1.9	0.8	0.5	1.8	14.1
25-Mar	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	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	0.1	0.5
26-Mar	0.0	Z	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	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2
27-Mar	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.7	0.7	1.0	0.6	1.0	2.8	6.1	12.6	8.8	7.0	2.2	0.4	0.3	0.2	0.2	0.1	2.0	12.6
28-Mar	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.1	0.7	2.8	7.8	14.0	15.3	12.4	10.0	6.7	6.7	5.5	6.8	5.2	6.6	4.9	5.5	4.3	5.0	15.3
29-Mar	3.3	1.7	1.7	0.9	Z	0.3	0.4	0.5	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.5	3.3
30-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.9	2.8	0.7	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.3	2.8
31-Mar	Z	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
	0.5	0.4	0.4	0.2	0.2	0.5	0.4	0.3	0.7	1.3	3.3	4.8	5.2	6.0	5.7	5.0	4.8	5.0	4.4	2.4	1.3	0.9	0.7	0.5	Diurnal Average	
	3.3	1.7	1.7	0.9	1.3	2.8	1.8	1.5	2.4	4.9	14.5	23.1	27.2	36.3	37.6	34.7	26.1	30.4	31.5	17.1	6.6	4.9	5.5	4.3	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 (SO_2) - ppb

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Waskow ohci Pimatisiwin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	332	93.00	93.00
11 - 20	16	4.48	97.48
21 - 60	9	2.52	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: 357

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Waskow ohci Pimatisiwin - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	37	42	23	8	8	12	45	41	7	4	5	11	14	11	21	32	321
11 - 20	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	16
21 - 60	0	0	0	0	0	0	6	2	1	0	0	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	42	23	8	8	12	63	47	8	4	5	11	14	11	21	32	346

Total Number of Valid Hours: 346

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Waskow ohci Pimatisiwin

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 346

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.0 ppb on Mar 17 12:00

Maximum Daily Average: 0.9 ppb on Mar 17

Minimum Value: 0.0 ppb on Mar 20 06:00

Maximum Diurnal Average: 0.6 ppb at hour 9

Monthly Average: 0.38 ppb

Minimum Daily Average: 0.1 ppb on Mar 20

Minimum Diurnal Average: 0.2 ppb at hour 16

Percentiles: P_1 = 0.1 P_{10} = 0.1 Q_1 = 0.2 Median = 0.3 Q_3 = 0.5 P_{90} = 0.9 P_{99} = 1.5

Hours in Service:	744
Hours of Data:	358
Hours of Missing Data:	386
Hours of Calibration:	20
Percent Operational Time:	50.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Mar	PF	PF	PF	PF	PF	PF	C	C	C	C	C	0.5	0.4	0.5	0.6	0.5	0.7	0.6	0.4	0.6	1.1	1.2	1.0	0.8	--	1.2
17-Mar	0.9	0.9	0.7	0.6	0.6	Z	0.9	0.9	0.7	0.5	1.0	2.0	1.7	1.7	1.3	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.7	0.9	2.0
18-Mar	Z	0.5	0.4	0.4	1.0	1.0	1.0	0.9	1.2	0.9	0.7	0.7	0.4	0.3	0.2	0.1	0.2	0.3	0.4	0.5	0.5	0.4	0.3	0.3	0.5	1.2
19-Mar	0.2	Z	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.8	0.5	0.3	0.2	0.3	0.3	0.6	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.8
20-Mar	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.6	0.9	1.0	1.2	0.8	0.4	0.4	0.4	0.6	0.4	1.2
22-Mar	0.8	0.7	0.6	0.7	Z	0.9	0.9	0.8	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.9	0.4	0.3	0.4	0.3	0.4	0.5	0.9
23-Mar	0.4	0.5	0.7	0.8	1.1	Z	1.5	1.2	1.5	0.6	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	0.4	1.5
24-Mar	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.2	0.4
25-Mar	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.7	0.8	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.8
26-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3
27-Mar	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.3	0.8	1.0	0.6	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.4	0.2	0.3	0.3	0.3	0.3	1.0
28-Mar	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.4	1.0	1.3	1.1	0.6	0.4	0.3	0.2	0.3	0.5	0.6	1.0	0.9	1.0	0.6	1.0	1.0	0.6	1.3
29-Mar	0.9	0.8	0.7	0.6	0.6	Z	0.6	0.6	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	0.2	0.2	0.1	0.3	0.9
30-Mar	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.9	1.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	1.5
31-Mar	0.2	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.4
	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.5	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	Diurnal Average	
	0.9	0.9	0.7	0.8	1.1	1.0	1.5	1.2	1.5	1.5	1.1	2.0	1.7	1.7	1.3	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.0	1.0	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	358	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: 358

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	37	42	23	8	8	11	64	48	9	4	5	11	16	11	20	31	348
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	42	23	8	8	11	64	48	9	4	5	11	16	11	20	31	348

Total Number of Valid Hours: 348

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 348

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Waskow ohci Pimatisiwin - March 2023

Maximum Value: 10.5 C on Mar 18 16:00

Maximum Daily Average: -0.4 C on Mar 18

Minimum Value: -27.6 C on Mar 27 07:00

Minimum Daily Average: -16.0 C on Mar 26

Maximum Diurnal Average: -0.7 C at hour 17

Minimum Diurnal Average: -15.2 C at hour 7

Monthly Average: -7.67 C

Percentiles: P_1 = -25.2 P_{10} = -17.8 Q_1 = -11.9 Median = -6.7 Q_3 = -2.8 P_{90} = -0.2 P_{99} = 7.9

Hours in Service:	744
Hours of Data:	378
Hours of Missing Data:	366
Hours of Calibration:	0
Percent Operational Time:	50.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Mar	PF	PF	PF	PF	PF	PF	-14.6	-13.9	-13.1	-11.6	-10.5	-8.6	-7.2	-5.9	-4.8	-4.0	-3.5	-4.1	-5.3	-7.0	-8.4	-9.3	-10.3	-10.4	-8.5	-3.5
17-Mar	-11.0	-11.9	-11.9	-12.7	-13.8	-13.4	-14.2	-13.7	-11.2	-7.9	-4.9	-2.1	0.6	3.0	5.3	6.6	7.8	7.4	3.9	-0.2	-2.2	-3.4	-4.2	-4.7	-4.5	7.8
18-Mar	-5.8	-7.1	-7.5	-7.3	-6.3	-7.5	-8.0	-7.6	-5.1	-1.8	0.6	3.2	5.8	8.0	9.8	10.5	9.3	7.9	5.9	2.4	-0.2	-2.1	-3.2	-4.0	-0.4	10.5
19-Mar	-4.9	-5.8	-6.8	-7.1	-8.8	-9.6	-10.1	-10.0	-7.7	-4.3	-2.2	-1.3	0.3	1.6	2.4	2.4	3.0	2.0	0.3	-1.6	-2.0	-2.5	-2.8	-3.3	-3.3	3.0
20-Mar	-3.7	-3.9	-4.4	-4.9	-5.6	-7.2	-7.3	-6.6	-6.3	-6.1	-5.3	-4.7	-4.2	-2.7	-1.7	-1.7	-2.2	-3.2	-4.7	-6.2	-7.8	-9.4	-10.8	-11.7	-5.5	-1.7
21-Mar	-14.0	-15.8	-17.1	-18.3	-19.4	-19.9	-20.3	-20.4	-16.9	-14.0	-11.7	-9.0	-6.8	-5.4	-4.1	-3.5	-3.7	-4.1	-5.7	-8.0	-9.9	-11.5	-13.5	-14.3	-12.0	-3.5
22-Mar	-14.0	-15.6	-16.8	-17.0	-17.1	-17.4	-18.7	-17.7	-13.1	-8.7	-5.3	-3.1	-1.3	0.2	1.4	2.3	2.8	2.5	0.9	-1.4	-3.5	-4.8	-6.1	-7.4	-7.5	2.8
23-Mar	-8.2	-8.9	-9.6	-9.4	-7.9	-7.1	-7.6	-7.5	-4.8	-1.2	-0.3	0.0	-0.6	-1.3	-0.7	-1.4	-2.5	-3.3	-4.6	-5.6	-6.3	-6.5	-6.0	-5.9	-4.9	0.0
24-Mar	-6.2	-7.1	-9.4	-11.2	-12.4	-14.4	-15.9	-14.9	-11.4	-9.7	-7.8	-6.1	-4.7	-3.2	-1.8	-1.2	-1.1	-1.4	-2.9	-4.9	-7.1	-9.0	-10.9	-12.5	-7.8	-1.1
25-Mar	-14.1	-15.4	-16.8	-17.8	-18.3	-19.3	-20.1	-18.9	-15.3	-9.1	-7.0	-4.4	-3.4	-2.8	-2.7	-3.0	-3.7	-4.8	-6.9	-8.5	-9.8	-11.3	-12.8	-14.3	-10.9	-2.7
26-Mar	-15.9	-17.3	-18.4	-19.7	-21.0	-21.9	-22.6	-21.6	-19.8	-17.6	-15.9	-13.6	-12.0	-10.6	-10.1	-9.9	-9.9	-10.5	-11.8	-13.2	-14.6	-16.3	-18.4	-20.4	-16.0	-9.9
27-Mar	-21.7	-23.1	-24.1	-24.9	-26.3	-27.0	-27.6	-25.3	-21.6	-16.7	-12.5	-9.4	-7.9	-6.7	-5.7	-5.1	-4.8	-4.9	-6.6	-8.5	-9.7	-11.2	-13.5	-16.5	-15.0	-4.8
28-Mar	-18.4	-19.9	-21.3	-22.6	-23.5	-24.5	-25.1	-23.3	-19.1	-14.0	-10.3	-7.3	-5.1	-3.7	-2.5	-1.6	-1.4	-1.2	-1.5	-1.9	-2.2	-2.4	-2.5	-3.2	-10.8	-1.2
29-Mar	-3.6	-4.9	-5.4	-7.6	-8.9	-8.1	-7.6	-5.9	-4.3	-2.5	-1.5	-1.0	-0.6	-0.8	-0.9	-0.7	-0.7	-1.4	-2.2	-3.2	-4.3	-6.7	-8.6	-10.4	-4.3	-0.6
30-Mar	-11.5	-13.0	-14.0	-14.9	-15.8	-16.1	-15.9	-14.3	-11.8	-8.5	-5.6	-4.2	-3.4	-3.0	-2.4	-2.0	-1.7	-2.0	-2.4	-3.0	-3.7	-4.6	-5.1	-6.7	-7.7	-1.7
31-Mar	-7.9	-8.3	-8.5	-8.2	-8.2	-8.1	-7.9	-7.5	-6.9	-5.9	-4.6	-3.6	-2.1	-0.6	0.7	1.2	1.8	1.8	0.9	-0.9	-2.4	-2.5	-2.6	-3.5	-3.9	1.8
	-10.7	-11.9	-12.8	-13.6	-14.2	-14.8	-15.2	-14.3	-11.8	-8.7	-6.6	-4.7	-3.3	-2.1	-1.1	-0.7	-0.7	-1.2	-2.7	-4.5	-5.9	-7.1	-8.2	-9.3	Diurnal Average	
	-3.6	-3.9	-4.4	-4.9	-5.6	-7.1	-7.3	-5.9	-4.3	-1.2	0.6	3.2	5.8	8.0	9.8	10.5	9.3	7.9	5.9	2.4	-0.2	-2.1	-2.5	-3.2	Diurnal Maximum	

PF - Power Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Waskow ohci Pimatisiwin - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	23	6.08	6.08
-20 - 0	319	84.39	90.48
0 - 10	35	9.26	99.74
10 - 20	1	0.26	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 378

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Waskow ohci Pimatisiwin - March 2023

Maximum Value: 92.6 % on Mar 19 06:00

Maximum Daily Average: 75.4 % on Mar 16

Minimum Value: 27.1 % on Mar 18 16:00

Minimum Daily Average: 58.1 % on Mar 27

Maximum Diurnal Average: 80.0 % at hour 4

Minimum Diurnal Average: 48.4 % at hour 16

Monthly Average: 66.08 %

Percentiles: P_1 = 34.9 P_{10} = 45.0 Q_1 = 54.4 Median = 67.2 Q_3 = 78.1 P_{90} = 84.8 P_{99} = 91.3

Hours in Service:	744
Hours of Data:	378
Hours of Missing Data:	366
Hours of Calibration:	0
Percent Operational Time:	50.8

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Mar	PF	PF	PF	PF	PF	PF	84.2	83.4	80.5	75.6	71.8	66.5	64.3	63.9	63.5	63.0	65.0	67.9	73.3	80.8	85.3	88.0	90.3	90.4	75.4	90.4
17-Mar	89.2	89.6	88.2	88.2	87.5	87.1	86.8	86.7	83.8	72.0	63.8	60.0	56.5	54.0	51.5	52.2	47.7	47.0	60.0	82.0	90.7	91.9	92.3	89.6	74.9	92.3
18-Mar	88.7	90.6	89.7	82.1	71.8	74.8	73.0	70.8	61.8	50.9	45.7	42.2	39.3	34.8	30.5	27.1	31.3	34.9	42.5	55.9	66.4	73.1	76.8	78.2	59.7	90.6
19-Mar	80.8	84.6	88.3	89.8	91.1	92.6	92.1	90.3	86.0	70.7	62.1	59.9	55.9	52.9	51.0	52.2	52.5	57.4	65.1	70.5	70.7	71.9	71.5	72.2	72.2	92.6
20-Mar	71.8	72.0	70.2	66.5	65.3	70.5	68.5	66.0	73.1	76.5	79.8	75.4	69.2	66.0	59.5	55.1	54.1	52.8	54.4	55.7	57.1	61.7	64.8	66.7	65.5	79.8
21-Mar	75.5	80.4	82.4	82.1	81.5	81.2	80.9	79.1	80.0	73.4	68.8	64.5	61.7	55.6	50.2	46.7	49.2	49.0	54.5	63.4	71.5	78.3	83.4	87.2	70.0	87.2
22-Mar	88.1	86.4	84.5	85.7	84.2	84.0	81.9	81.9	82.3	67.2	58.6	54.0	50.1	47.7	44.2	43.7	42.4	44.5	49.7	57.0	67.7	72.9	76.5	80.7	67.3	88.1
23-Mar	82.4	82.6	85.6	85.8	80.8	78.2	80.5	79.9	69.8	55.2	56.0	57.7	61.0	62.6	59.5	61.3	65.2	66.1	69.2	71.4	72.0	73.2	69.2	67.0	70.5	85.8
24-Mar	67.0	68.3	75.6	81.9	83.0	85.6	84.5	83.0	74.8	66.9	59.1	54.3	50.0	45.1	37.5	39.2	45.6	44.2	44.1	52.6	62.5	69.7	74.3	78.1	63.6	85.6
25-Mar	81.2	83.5	84.2	83.9	83.5	82.3	81.1	80.9	73.7	55.6	54.8	48.4	45.1	43.4	42.1	42.0	41.5	44.6	50.6	58.5	62.9	65.3	65.6	66.8	63.4	84.2
26-Mar	66.6	70.0	69.4	72.9	78.0	79.0	77.7	71.8	67.1	59.6	56.5	52.7	48.3	45.8	41.5	40.9	40.2	41.6	43.8	47.9	52.7	59.4	68.7	72.5	59.4	79.0
27-Mar	74.9	76.5	77.2	76.4	75.7	75.0	74.2	74.7	70.9	60.9	52.2	46.8	43.4	41.2	39.7	38.4	36.8	36.8	44.7	48.8	48.0	51.1	59.2	70.7	58.1	77.2
28-Mar	75.2	78.0	79.3	79.3	78.6	77.1	76.6	76.1	70.4	58.2	51.1	47.4	45.3	44.3	43.5	43.2	44.1	44.9	46.4	48.3	48.7	50.2	48.1	54.9	58.7	79.3
29-Mar	54.6	63.5	64.8	70.9	76.5	77.3	76.9	73.9	70.1	68.4	70.2	72.9	71.4	71.3	69.4	66.8	61.6	60.9	61.8	62.3	62.7	72.8	79.8	83.8	69.3	83.8
30-Mar	85.9	87.9	87.5	86.5	85.3	84.2	83.4	82.9	81.6	71.6	58.2	52.3	50.9	48.2	47.6	47.1	48.3	49.1	50.6	53.2	55.1	57.3	58.9	63.1	65.7	87.9
31-Mar	65.5	65.5	67.2	67.6	67.2	68.0	67.6	67.2	66.9	66.1	65.4	65.3	63.1	60.5	57.3	55.7	55.1	56.0	60.3	68.6	76.8	75.7	72.8	76.2	65.7	76.8
	76.5	78.6	79.6	80.0	79.3	79.8	79.4	78.0	74.6	65.6	60.9	57.5	54.7	52.3	49.3	48.4	48.8	49.9	54.4	61.0	65.7	69.5	72.0	74.9	Diurnal Average	
	89.2	90.6	89.7	89.8	91.1	92.6	92.1	90.3	86.0	76.5	79.8	75.4	71.4	71.3	69.4	66.8	65.2	67.9	73.3	82.0	90.7	91.9	92.3	90.4	Diurnal Maximum	

PF - Power Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Waskow ohci Pimatisiwin - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	12	3.17	3.17
40 - 60	120	31.75	34.92
60 - 80	164	43.39	78.31
80 - 100	82	21.69	100.00

Total Number of Valid Hours: 378

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin - March 2023

Maximum Speed: 13 km/h on Mar 20 16:00

Maximum Daily Speed Average: 6.9 km/h on Mar 31

Minimum Speed Value: 0 km/h on Mar 17 01:00

Maximum Diurnal Speed Average: 3.9 km/h at hour 14

Monthly Average Velocity: 1.5 km/h 51.9 deg

Minimum Daily Speed Average: 0.8 km/h on Mar 24

Minimum Diurnal Speed Average: 0.1 km/h at hour 6

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 4 $Q_3 = 7$ $P_{90} = 9$ $P_{99} = 12$

Hours in Service:	744
Hours of Data:	365
Hours of Missing Data:	379
Percent Operational Time:	49.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	----
16-Mar	PF	PF	PF	PF	PF	PF	UO	SSE2	SSE4	SE6	SE8	SE7	SE8	SE7	SE8	SE8	SSE8	SE9	SSE7	SSE4	SSE5	SSE4	SSE4	SSE3	----	SSE9
17-Mar	NE0	SSE3	SE5	SE3	SE3	SE4	SSE5	SSE4	SE5	SE9	SSE10	SE9	SE9	SE7	SE7	SE6	SSE4	SSE4	S2	SSE2	S3	SSE3	UO	SSE4	SSE4.7	SSE10
18-Mar	SSW1	SSW2	SSE1	S2	SSE4	SSE4	SSE5	SSE5	SSE5	SE6	SE7	SE6	SE5	SE4	SE4	E2	NE5	NE6	NNE5	NW4	WNW3	NW3	NW3	NW2	SE1.7	SE7
19-Mar	SSW0	ESE1	WSW0	NW2	WSW1	WNW1	NW2	N1	ESE2	SE5	SSE3	N5	N4	NE4	E3	ENE2	SE4	SE4	SE4	SE5	ESE5	ESE4	ESE5	ESE3	ESE1.6	SE5
20-Mar	E3	E3	E3	ESE5	E3	E3	ENE2	SE2	NE2	N3	NNE5	NNE9	NNE10	NNE12	NNE11	N13	N13	N12	N10	N10	NNE8	NNE5	NNE3	NW3	NNE5.4	N13
21-Mar	W2	S1	WSW2	WSW2	W2	NW3	WNW3	UO	NNW2	NE1	ENE3	NE3	ESE5	SE4	SSE4	SSE5	SSE6	S6	SSE3	SSE2	SSE3	SE1	SE1	SE2	SSE1.4	S6
22-Mar	ESE1	NNE0	S1	E1	E1	NNW2	UO	ESE0	SSE4	SE6	SE8	SE8	SE8	SE8	SE8	SE8	SSE8	SSE7	SSE4	SSE1	SW1	NW1	NNW0	S1	SE3.4	SE8
23-Mar	SSW1	SSW0	S2	SSE4	SSE5	SSE4	SE3	SE2	NNW2	NNE9	NE8	NE7	NE9	NNE12	NNE10	NNE10	NE9	NNE9	NNE10	N7	NNW7	NW6	NW6	NNW8	NNE4.1	NNE12
24-Mar	NNW9	NNW7	NW3	NNW2	UO	W1	WSW2	NW1	NE2	NE3	ENE3	ENE4	NE4	E4	SSE5	SE6	SE6	SE5	SSE4	NNW1	NW2	W2	SW0	W2	NE0.8	NNW9
25-Mar	W1	W1	WSW1	W1	WNW2	WNW1	WSW1	N2	NE1	ENE2	NNE5	NE5	NE6	NE6	NE7	NE8	NE8	NNE10	NNE10	N9	N6	NNW7	N8	NNW7	NNE4.0	NNE10
26-Mar	N6	NW4	NW6	NNW2	NW1	UO	WNW3	NNW3	NNE3	NNE7	N8	N8	N9	NNE8	N10	N11	NNE9	NNE8	N7	N6	NNW5	NNW2	WNW2	WSW2	N5.1	N11
27-Mar	W3	W2	UO	UO	UO	UO	UO	SE4	SE6	SSE8	SE7	SE6	ESE6	SE7	SE7	SE6	SE4	ENE3	NNE4	NNE4	NNE5	NNE3	NW3	W2	ESE2.6	SSE8
28-Mar	W3	W2	W2	W1	W1	SW1	SW1	SE2	SSE4	SE4	SE7	SE9	SE9	SE10	SE10	SE9	SE8	SSE7	SSE8	SSE8	SSE8	SSE6	SE2	NW1	SSE4.2	SE10
29-Mar	UO	WNW2	WNW2	W2	W2	NW1	ESE1	N0	ENE1	N2	N5	NNE7	NNE9	NNE8	NNE9	NNE9	NNE11	NNE8	NNE7	N7	NNW4	WSW3	WSW2	WSW2	N3.6	NNE11
30-Mar	UO	SW2	WNW2	WSW1	SSE1	S1	SSE0	SE1	SE3	SE3	N4	NNE7	N7	N8	NNE7	NNE6	NNE7	NNE8	NE5	NE5	N4	N4	N7	N6	NNE3.3	N8
31-Mar	NNW6	NW6	NNW5	NNW5	NNW6	NNW5	NNW7	NNW8	NNW8	NNW8	N9	N11	NNW11	N11	NNW11	NNW12	NNW12	NNW10	NW7	NW3	N1	WNW0	N3	NNW3	NNW6.9	NNW12
Diurnal Average	NNW1.6	WNW0.9	WNW0.7	SW0.3	SSW0.3	SW0.1	WSW0.4	ESE0.4	ESE1.4	E2.3	E2.7	ENE3.6	ENE3.8	ENE3.9	ENE3.5	ENE3.2	ENE3.3	NE3.0	NE2.7	NNE2.3	NNE1.3	NNW0.9	NNW1.4	NW1.3		
Diurnal Maximum	NNW9	NNW7	NW6	ESE5	NNW6	NNW5	NNW7	NNW8	NNW8	NNE9	SSE10	N11	NNW11	NNE12	NNE11	N13	N13	N12	NNE10	N10	NNE8	NNW7	N8	NNW8		

UO - Unstable Operation PF - Power Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	225	61.64	61.64
6 - 11	133	36.44	98.08
12 - 19	7	1.92	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: 365

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin - March 2023

Wind Speed Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 5	12	12	13	8	10	11	29	38	8	5	5	12	18	11	18	15	225
6 - 11	22	28	10	0	0	1	38	13	1	0	0	0	0	0	4	16	133
12 - 19	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7
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	37	42	23	8	10	12	67	51	9	5	5	12	18	11	22	33	365

Total Number of Valid Hours: 365

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin

Total Number of Valid Hours: 365

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 km/h on Mar 20 15:00

Minimum Value: 0 km/h on Mar 17 20:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 1 $Q_3 = 2$ $P_{90} = 3$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	365
Hours of Missing Data:	379
Hours of Calibration:	0
Percent Operational Time:	49.1

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

UO - Unstable Operation PF - Power Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Waskow ohci Pimatisiwin - March 2023

Direction of Maximum Speed: 5 deg on Mar 20 16:00
Direction of Maximum Daily Speed Average: 340.1 deg on Mar 31

Direction of Minimum Speed: 35 deg on Mar 17 01:00

Direction of Minimum Daily Speed Average: 0.8 deg on Mar 24

Monthly Average Direction: 51.9 deg

Hours in Service:	744
Hours of Data:	365
Hours of Missing Data:	379
Percent Operational Time:	49.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
16-Mar	PF	PF	PF	PF	PF	PF	UO	168	155	145	139	134	135	133	141	144	148	146	147	147	150	157	148	161	--
17-Mar	35	162	144	141	135	140	159	147	144	144	150	146	146	144	145	140	150	162	178	149	175	168	UO	162	149.0
18-Mar	195	197	167	178	163	152	165	149	154	134	133	129	127	127	142	90	34	36	21	315	292	317	307	315	129.2
19-Mar	194	122	251	318	257	302	325	0	109	138	156	356	7	34	82	71	142	137	146	125	115	108	104	110	104.7
20-Mar	80	86	95	107	93	86	78	141	54	356	17	16	12	16	22	5	10	3	4	8	16	13	29	326	20.9
21-Mar	279	182	245	246	269	311	298	UO	338	43	63	56	121	146	156	151	161	169	161	153	166	146	143	133	160.2
22-Mar	103	22	178	96	100	337	UO	123	151	132	139	133	134	134	138	140	147	152	151	154	231	305	345	169	140.3
23-Mar	206	201	174	165	151	164	137	136	334	15	37	36	41	15	25	28	39	21	19	360	328	310	311	333	18.5
24-Mar	337	346	314	344	UO	270	256	324	54	55	72	58	55	90	153	140	132	143	153	341	308	275	232	280	56.0
25-Mar	270	260	239	265	289	282	254	350	47	59	14	54	36	50	44	48	38	24	20	360	351	343	352	341	14.6
26-Mar	2	309	319	331	305	UO	302	338	22	12	351	7	6	20	4	8	18	18	8	355	338	343	288	240	357.9
27-Mar	276	268	UO	UO	UO	UO	UO	146	143	149	134	131	122	132	129	137	136	67	31	19	15	21	305	275	120.8
28-Mar	277	278	276	272	278	216	222	140	149	128	134	134	134	137	140	143	144	148	147	150	148	147	143	305	146.4
29-Mar	UO	283	291	263	274	321	119	351	74	2	5	12	18	20	29	21	21	25	27	10	339	258	245	254	7.2
30-Mar	UO	228	285	258	159	175	161	143	136	142	9	18	11	9	16	15	19	15	41	38	11	349	350	350	14.1
31-Mar	339	326	341	348	347	344	341	340	341	346	349	349	346	353	348	329	333	328	310	310	7	282	353	344	340.1
Diurnal Average	327.8	299.8	283.3	233.1	193.2	217.9	240.0	106.5	115.0	93.2	84.5	62.1	60.4	61.4	69.5	60.1	59.5	49.6	41.5	21.1	11.7	346.3	343.2	319.7	

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Waskow ohci Pimatisiwin - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Waskow ohci Pimatisiwin - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 103 deg on Mar 31 22:00

Minimum Value: 9 deg on Mar 29 04:00

Percentiles: P_1 = 13 P_{10} = 18 Q_1 = 21 Median = 26 Q_3 = 42 P_{90} = 63 P_{99} = 88

Hours in Service:	744
Hours of Data:	365
Hours of Missing Data:	379
Hours of Calibration:	0
Percent Operational Time:	49.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Maximum
1-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
2-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
3-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
4-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
5-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
6-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
7-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
8-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
9-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
10-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
11-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
12-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
13-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
14-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
15-Mar	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
16-Mar	PF	PF	PF	PF	PF	PF	UO	49	32	23	22	24	22	23	22	21	19	18	21	24	21	20	22	30	49
17-Mar	94	43	27	26	43	21	14	16	23	20	22	21	20	21	22	20	24	16	14	20	17	32	UO	47	94
18-Mar	87	49	71	29	26	19	18	20	24	23	22	23	20	23	22	51	20	19	19	17	15	25	30	27	87
19-Mar	97	63	79	35	62	31	55	69	54	24	72	27	43	39	49	59	35	32	23	21	25	22	25	33	97
20-Mar	40	22	28	26	22	19	29	48	38	31	27	27	23	24	26	23	23	22	22	21	22	25	77	58	77
21-Mar	29	31	25	38	17	20	27	UO	29	55	30	53	41	66	49	37	27	26	24	27	28	43	38	44	66
22-Mar	59	80	73	84	87	30	UO	78	24	25	25	24	24	22	23	25	22	18	21	59	83	33	78	70	87
23-Mar	58	80	54	40	31	39	32	64	63	24	28	30	28	25	27	26	23	25	23	26	17	11	13	18	80
24-Mar	16	20	27	66	UO	49	42	60	50	46	56	42	40	47	48	23	23	22	26	63	50	36	90	19	90
25-Mar	26	72	87	76	78	62	46	35	45	36	34	36	35	31	27	26	27	23	25	22	20	18	21	17	87
26-Mar	21	28	12	61	81	UO	20	62	48	21	27	31	26	33	26	23	28	23	21	17	14	75	54	20	81
27-Mar	18	48	UO	UO	UO	UO	UO	16	19	20	22	26	30	30	28	27	35	46	21	20	21	37	33	43	48
28-Mar	13	12	32	15	30	51	56	48	19	25	22	23	24	21	21	22	21	19	17	20	18	22	78	83	83
29-Mar	UO	38	24	9	27	52	84	48	45	41	26	25	25	25	26	26	23	25	25	24	33	21	40	18	84
30-Mar	UO	54	60	44	70	86	75	53	25	37	59	27	24	21	27	24	23	22	21	20	19	18	16	18	86
31-Mar	22	15	18	24	18	16	15	15	16	20	20	21	25	26	23	19	18	17	24	81	88	103	22	23	103
Diurnal Maximum	97	80	87	84	87	86	84	78	63	55	72	53	43	66	49	59	35	46	26	81	88	103	90	83	

UO - Unstable Operation PF - Power Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS26
CHRISTINA LAKE
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	35	36	99.87	15.8	0	3.8	0
H2S (ppb) Average	706	37	38	99.87	1.2	0	0.3	0
NO2 (ppb) Average	706	36	38	99.73	25.2	0	9	-
NO (ppb) Average	706	36	38	99.73	29.6	-	5.4	-
NOX (ppb) Average	706	36	38	99.73	51.8	-	13.8	-
Temperature 2 m (C) Average	743	0	1	99.87	10	-	-0.6	-
Relative Humidity (%) Average	743	0	1	99.87	91.9	-	85.2	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	24	-	16	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	1.15	1.9	-	0	0	0.1	0.4	1.2	3.4	15.8
H2S (ppb) Average	706	0.08	0.1	-	0	0	0	0	0.1	0.2	1.2
NO2 (ppb) Average	706	4.33	4.2	-	0.4	0.9	1.5	3.1	5.3	9.6	25.2
NO (ppb) Average	706	1.39	2.9	-	0	0	0.1	0.5	1.6	3.1	29.6
NOX (ppb) Average	706	5.71	6.5	-	0.5	1.1	1.8	3.9	7.1	12.2	51.8
Temperature 2 m (C) Average	743	-8.2	7	-	-28.2	-16.8	-12.7	-8.1	-3.5	0.5	10
Relative Humidity (%) Average	743	65.09	16.3	-	22.4	40.2	54.1	67.9	78.1	84.7	91.9
Wind Speed 10 m (km/h) Average	743	9.9	5	-	1	4	6	9	13	17	24
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
NO2	11 Mar 2023 10:00	11 Mar 2023 10:00	1	Maintenance - reinitiated daily QA check

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Christina Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 15.8 ppb on Mar 23 16:00

Maximum Daily Average: 3.8 ppb on Mar 4

Minimum Value: 0.0 ppb on Mar 8 04:00

Maximum Diurnal Average: 2.3 ppb at hour 16

Monthly Average: 1.15 ppb

Minimum Daily Average: 0.0 ppb on Mar 9

Minimum Diurnal Average: 0.4 ppb at hour 20

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.4 Q_3 = 1.2 P_{90} = 3.4 P_{99} = 9.2

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	Z	0.3	0.4	0.5	0.8	0.4	0.4	0.7	2.0	4.5	2.6	3.8	1.9	2.2	2.4	3.6	1.1	0.7	3.1	1.1	0.6	0.7	0.5	1.6	1.6	4.5
2-Mar	4.1	Z	4.4	6.6	4.2	0.7	1.1	1.1	2.7	2.6	1.4	1.4	1.0	0.6	0.4	1.2	1.6	0.7	9.1	1.6	2.4	2.0	0.8	0.3	2.3	9.1
3-Mar	0.4	0.2	Z	0.3	0.6	0.4	0.2	0.3	0.3	0.6	2.6	10.5	10.7	7.5	4.2	5.6	2.3	0.5	0.9	1.6	2.0	2.4	3.8	5.8	2.8	10.7
4-Mar	6.4	6.2	3.1	Z	1.6	4.1	5.4	7.4	6.5	4.1	5.1	2.5	7.3	8.1	6.9	4.2	2.6	1.0	0.7	0.4	0.5	0.7	1.5	1.1	3.8	8.1
5-Mar	0.4	0.4	0.4	0.7	Z	0.5	0.4	0.4	0.9	1.2	2.5	1.5	1.1	4.6	0.8	1.2	1.3	0.8	0.3	0.7	0.7	0.3	0.1	DF	1.0	4.6
6-Mar	0.0	0.1	0.1	0.1	0.2	0.3	0.5	0.6	0.9	1.6	1.0	0.8	0.5	0.5	Z	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.4	1.6
7-Mar	0.2	0.1	0.2	0.2	0.3	Z	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.7	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.3	0.7
8-Mar	Z	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	0.0	0.1
9-Mar	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
10-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
11-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.9	0.1	0.3	0.3	0.1	0.9
12-Mar	0.2	0.1	0.1	0.4	Z	0.8	0.7	0.5	0.8	1.6	1.8	1.1	1.1	0.8	0.5	0.9	0.4	1.5	0.6	0.5	0.4	0.5	0.4	0.3	0.7	1.8
13-Mar	0.3	0.5	0.6	0.5	0.2	Z	0.1	0.2	0.5	0.6	0.5	0.4	0.3	0.2	0.3	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.6
14-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	1.7	2.8	6.1	7.1	7.2	2.1	0.9	1.3	4.3	1.9	2.3	4.9	1.9	7.2
15-Mar	5.1	Z	6.2	5.1	3.3	3.4	2.8	2.0	2.3	2.1	0.8	0.8	2.2	3.0	0.7	0.7	0.8	0.7	0.6	0.7	0.4	0.3	0.2	0.1	1.9	6.2
16-Mar	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.5	0.7	6.1	2.1	2.0	1.6	0.7	3.8	4.6	1.9	0.9	0.3	0.2	0.3	0.3	0.3	1.2	6.1
17-Mar	0.3	1.4	0.6	Z	0.6	0.6	0.9	0.9	1.0	1.2	2.2	2.1	1.9	1.0	0.4	0.5	0.6	0.2	0.2	0.3	0.8	1.9	1.5	1.3	1.0	2.2
18-Mar	1.7	1.8	1.3	0.4	Z	0.4	0.4	0.4	0.7	1.5	1.5	3.7	3.4	3.4	2.8	5.9	3.6	1.9	0.3	0.4	0.3	0.3	0.2	0.2	1.6	5.9
19-Mar	0.2	0.2	0.1	0.2	0.2	Z	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.4
20-Mar	Z	0.2	0.3	0.2	0.0	0.1	0.1	0.3	0.8	5.9	5.5	3.8	3.2	1.6	0.9	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.9
21-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.8	1.1	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1.1
22-Mar	0.8	8.5	Z	0.6	6.4	1.9	0.5	2.9	3.1	1.1	4.7	2.1	1.6	0.9	1.1	1.1	1.5	1.5	1.4	0.7	0.8	1.0	0.7	1.1	2.0	8.5
23-Mar	1.0	1.0	1.4	Z	0.7	1.0	0.8	2.0	1.9	2.2	C	C	C	C	9.1	15.8	9.1	0.9	0.5	0.3	0.2	0.2	0.1	0.1	2.5	15.8
24-Mar	0.1	0.1	0.2	0.2	Z	0.2	0.3	0.2	0.0	0.1	0.5	0.4	0.2	0.1	0.2	0.7	1.8	0.5	0.8	0.5	0.2	0.0	0.0	0.0	0.3	1.8
25-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	4.6	9.2	3.4	3.8	5.9	5.2	2.2	2.2	2.0	0.9	0.5	0.2	0.3	0.3	0.2	0.1	1.8	9.2
26-Mar	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	1.0	0.8	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	1.0
27-Mar	0.3	Z	0.2	0.2	0.2	0.1	0.2	0.2	3.3	4.0	4.7	3.2	6.7	6.0	4.2	10.0	11.2	3.0	1.3	0.1	0.1	0.2	0.1	0.1	2.6	11.2
28-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.4	0.8	2.2	10.0	8.3	2.9	1.0	0.9	0.6	0.5	0.8	1.0	0.8	0.8	0.2	0.6	1.4	10.0
29-Mar	0.9	1.0	1.8	Z	1.4	0.9	1.9	9.8	3.5	1.8	0.9	0.5	0.3	0.3	0.2	0.4	1.1	1.2	0.5	0.3	0.2	0.2	0.1	0.1	1.3	9.8
30-Mar	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	4.4	2.3	2.6	0.2	1.2	0.7	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.3	0.7	0.3	0.6	4.4
31-Mar	0.6	0.8	0.6	0.4	0.1	Z	0.6	0.7	1.5	1.4	0.6	1.4	2.4	1.5	3.5	2.4	1.7	1.3	0.3	0.1	0.0	0.1	0.0	0.0	1.0	3.5
	0.9	0.9	0.9	0.7	0.8	0.6	0.6	1.0	1.4	1.7	1.8	1.9	2.2	1.9	1.7	2.3	1.9	0.7	0.8	0.4	0.5	0.5	0.5	0.6	Diurnal Average	
	6.4	8.5	6.2	6.6	6.4	4.1	5.4	9.8	6.5	9.2	6.1	10.5	10.7	8.1	9.1	15.8	11.2	3.0	9.1	1.6	4.3	2.4	3.8	5.8	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Christina Lake - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	704	99.44	99.44
11 - 20	4	0.56	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Christina Lake - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	17	80	57	35	37	47	70	80	85	61	32	26	11	14	46	6	704
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	17	80	57	35	37	47	70	80	85	61	32	26	11	16	48	6	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Christina Lake

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Christina Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.2 ppb on Mar 15 02:00 Maximum Daily Average: 0.3 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 1 01:00 Minimum Daily Average: 0.0 ppb on Mar 9

Maximum Diurnal Average: 0.2 ppb at hour 2 Minimum Diurnal Average: 0.0 ppb at hour 20

Monthly Average: 0.08 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} = 0.7

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.2
2-Mar	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.5	1.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.0
3-Mar	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
4-Mar	0.0	0.3	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	0.3	0.1	0.0	0.0	0.3
5-Mar	0.0	0.3	0.3	0.2	0.3	Z	0.4	0.2	0.4	0.0	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	0.1	0.4
6-Mar	0.2	0.4	0.3	0.4	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
7-Mar	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-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9-Mar	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
10-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
11-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3
12-Mar	0.1	0.0	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
13-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Mar	0.0	Z	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.3	0.1	0.0	0.1	0.2	0.3	0.4	0.2	0.4	0.5	0.2	0.5	0.2	0.1	0.2	0.2	0.5
15-Mar	0.5	1.2	Z	0.8	0.9	1.1	0.6	0.4	0.3	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	0.2	0.3	1.2
16-Mar	0.4	0.3	0.3	Z	0.1	0.0	0.1	0.1	0.3	0.1	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.4
17-Mar	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
18-Mar	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	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6
19-Mar	Z	0.2	0.2	0.1	0.2	0.5	0.7	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	0.1	0.7
20-Mar	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	0.0	0.0	0.1	0.0	0.1
21-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
22-Mar	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	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	--	0.1
23-Mar	0.0	0.2	0.4	0.3	Z	0.3	0.0	0.1	0.2	0.1	0.1	0.2	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4
24-Mar	0.2	0.1	0.1	0.1	0.1	Z	0.2	0.4	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.6
25-Mar	Z	0.3	0.2	0.3	0.6	0.2	0.3	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.5	0.2	0.6
26-Mar	0.1	Z	0.1	0.1	0.0	0.0	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	0.0	0.1	0.0	0.0	0.0	0.1	0.2
27-Mar	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.4	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.4
28-Mar	0.1	0.1	0.0	Z	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.6	0.8	0.5	0.0	0.1	0.9
29-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.3
30-Mar	0.3	0.0	0.2	0.1	0.1	Z	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3
31-Mar	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	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	0.1
	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	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	Diurnal Average	
	0.5	1.2	0.4	0.8	0.9	1.1	0.7	0.7	0.5	1.0	0.6	0.3	0.2	0.2	0.3	0.4	0.2	0.4	0.9	0.3	0.6	0.8	0.5	0.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Christina Lake - March 2023

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

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Christina Lake - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	17	79	58	36	36	47	68	83	80	62	29	26	11	16	51	7	706
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	79	58	36	36	47	68	83	80	62	29	26	11	16	51	7	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Christina Lake

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Christina Lake - March 2023

Maximum Value: 29.6 ppb on Mar 19 08:00

Maximum Daily Average: 5.4 ppb on Mar 19

Minimum Value: 0.0 ppb on Mar 1 01:00

Minimum Daily Average: 0.2 ppb on Mar 24

Maximum Diurnal Average: 4.6 ppb at hour 8

Minimum Diurnal Average: 0.3 ppb at hour 24

Monthly Average: 1.39 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.5 Q_3 = 1.6 P_{90} = 3.1 P_{99} = 15.6

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.1	0.1	Z	0.7	0.1	0.9	1.6	2.2	2.4	3.2	12.4	12.0	2.1	1.3	3.0	5.1	7.3	0.4	0.1	0.1	0.4	0.1	2.4	12.4
2-Mar	0.0	0.2	0.2	0.1	0.3	Z	0.2	2.4	1.9	1.9	2.2	3.7	1.1	1.2	0.8	0.5	0.5	0.1	5.0	0.2	0.5	0.4	0.0	0.0	1.0	5.0
3-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	1.3	5.5	6.3	3.9	2.3	2.4	1.3	0.9	0.4	0.1	0.0	0.0	0.0	0.1	1.1	6.3
4-Mar	0.1	Z	0.6	1.1	1.3	1.3	2.1	2.8	2.9	1.6	2.3	1.2	3.9	4.7	3.2	1.9	1.7	1.5	2.6	2.8	0.0	0.1	0.0	0.0	1.7	4.7
5-Mar	0.4	0.2	Z	1.0	1.0	0.9	1.3	4.6	17.8	2.0	2.5	1.8	1.7	3.2	3.1	1.0	0.6	0.8	0.5	1.2	2.1	2.0	2.8	DF	2.4	17.8
6-Mar	1.0	2.6	1.5	0.2	2.0	3.6	1.0	3.5	4.6	4.2	1.3	1.0	Z	0.9	0.6	0.6	0.7	0.4	0.1	0.3	0.2	0.3	0.1	0.1	1.3	4.6
7-Mar	0.1	0.1	0.1	Z	0.3	0.2	0.8	0.8	0.7	1.0	0.7	1.0	0.9	1.0	0.6	0.5	0.4	0.6	0.4	0.3	0.1	0.1	0.0	0.1	0.5	1.0
8-Mar	0.1	0.0	0.0	0.1	Z	0.5	3.6	3.8	0.8	0.4	0.5	0.3	0.3	0.2	0.2	0.1	0.3	0.6	0.3	0.3	0.2	0.6	1.0	0.7	0.6	3.8
9-Mar	3.3	0.4	1.7	2.5	5.4	Z	4.1	15.8	2.2	0.5	0.3	0.2	0.5	0.5	0.4	0.3	0.5	0.3	0.1	0.0	0.1	0.0	0.0	0.0	1.7	15.8
10-Mar	Z	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.5	0.5	0.4	0.4	0.1	0.4	0.3	0.3	0.3	0.4	0.1	0.0	0.0	0.0	0.0	1.2	0.3	1.2
11-Mar	0.9	Z	0.4	0.9	0.9	7.0	10.9	24.7	26.7	M	2.6	1.1	0.3	0.2	0.4	0.3	0.4	0.7	0.3	0.3	0.4	0.2	0.3	0.1	3.6	26.7
12-Mar	0.1	0.0	Z	0.6	0.6	0.9	2.2	1.9	1.6	2.2	2.8	1.3	1.0	2.9	1.1	1.3	0.7	0.4	2.8	0.1	1.0	0.4	0.7	1.1	1.2	2.9
13-Mar	2.7	1.4	0.3	Z	5.2	1.7	2.4	2.3	2.5	2.8	1.3	0.6	0.5	0.6	0.4	0.3	0.4	0.2	0.1	0.0	0.0	0.0	0.2	0.0	1.1	5.2
14-Mar	0.0	0.0	0.0	0.0	Z	0.2	0.5	0.2	0.4	0.6	0.3	0.5	1.8	1.5	2.6	3.1	3.1	0.4	1.3	0.9	0.7	1.3	1.1	0.5	0.9	3.1
15-Mar	0.8	1.1	2.6	1.3	0.9	Z	1.8	7.5	4.4	5.1	2.7	1.8	2.3	2.2	0.9	0.9	1.0	1.8	0.3	0.6	0.6	1.8	0.9	2.1	2.0	7.5
16-Mar	Z	0.2	0.6	0.5	0.6	0.7	0.8	0.6	2.2	4.3	3.9	2.7	2.1	1.1	0.5	1.9	1.6	0.5	0.3	1.8	1.2	3.4	0.6	0.1	1.4	4.3
17-Mar	0.5	Z	0.2	0.1	1.1	1.6	1.3	2.3	3.0	2.4	3.6	2.4	1.1	0.6	0.3	0.3	0.4	0.1	0.0	0.3	2.2	0.1	0.1	0.2	1.1	3.6
18-Mar	0.0	0.7	Z	1.9	2.9	3.1	8.8	3.9	2.3	1.5	2.3	2.4	1.6	1.5	1.2	1.9	1.0	0.3	0.1	0.0	0.7	0.5	0.5	0.8	1.7	8.8
19-Mar	4.4	0.7	2.3	Z	8.5	18.5	24.0	29.6	24.4	7.3	1.7	0.5	0.3	0.2	0.3	0.2	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.1	5.4	29.6
20-Mar	0.0	0.5	0.0	0.3	Z	0.6	0.5	1.1	0.6	2.5	1.6	1.0	0.8	0.8	0.4	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5	2.5
21-Mar	0.0	0.0	0.0	0.4	0.5	Z	0.1	0.1	0.2	0.4	0.4	0.4	0.6	0.4	0.6	1.0	0.9	0.2	0.1	0.4	0.1	0.4	0.1	0.0	0.3	1.0
22-Mar	Z	0.2	0.2	0.2	0.5	0.3	0.6	1.6	1.1	0.8	2.9	2.0	1.1	1.7	1.7	1.2	0.7	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.8	2.9
23-Mar	0.0	Z	0.2	0.8	6.0	0.8	0.2	0.9	1.6	1.8	2.6	2.4	2.0	3.7	4.3	5.9	3.0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	1.6	6.0
24-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.6	0.5	0.3	0.2	0.2	0.3	0.5	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.2	0.6
25-Mar	0.2	0.0	0.1	Z	0.9	0.8	3.8	5.6	4.4	3.1	1.9	1.8	2.4	2.7	0.5	0.8	1.1	0.5	0.2	0.1	0.0	0.1	0.0	0.0	1.3	5.6
26-Mar	0.0	0.0	0.0	0.5	Z	0.1	0.1	0.4	0.9	2.2	1.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.8	0.0	0.1	0.3	2.2
27-Mar	0.6	2.2	0.1	2.5	0.7	Z	3.2	8.2	8.0	2.6	3.0	2.3	3.5	3.1	2.0	4.7	5.0	1.1	0.4	0.1	0.0	0.0	0.2	0.0	2.3	8.2
28-Mar	Z	0.4	0.0	0.8	1.3	1.6	10.4	11.7	7.1	5.2	1.9	5.5	4.0	1.6	1.3	0.4	0.2	0.1	0.1	0.3	0.0	0.0	0.0	0.0	2.3	11.7
29-Mar	0.7	Z	0.0	0.0	0.0	0.0	0.7	3.6	2.3	1.2	0.8	C	C	C	C	C	0.6	0.5	0.1	0.0	0.0	0.1	0.0	0.1	0.6	3.6
30-Mar	0.2	0.0	Z	3.2	1.6	1.6	1.4	0.9	1.0	1.0	0.8	0.4	0.8	0.5	0.3	0.1	2.0	1.1	0.5	0.1	0.0	0.0	0.0	0.0	0.8	3.2
31-Mar	0.0	0.0	0.1	Z	0.2	0.3	0.5	0.6	0.5	0.4	0.3	0.6	0.9	0.7	1.6	0.9	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.6
	0.6	0.4	0.4	0.7	1.6	1.8	2.8	4.6	4.1	2.1	1.7	1.6	1.9	1.8	1.1	1.2	1.1	0.6	0.8	0.4	0.3	0.4	0.3	0.3	Diurnal Average	
	4.4	2.6	2.6	3.2	8.5	18.5	24.0	29.6	26.7	7.3	3.9	5.5	12.4	12.0	4.3	5.9	5.0	5.1	7.3	2.8	2.2	3.4	2.8	2.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Christina Lake - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	701	99.29	99.29
21 - 40	5	0.71	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Christina Lake - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	14	73	60	32	37	48	67	81	84	60	31	27	12	15	53	7	701
21 - 40	0	0	0	1	1	0	0	1	2	0	0	0	0	0	0	0	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	73	60	33	38	48	67	82	86	60	31	27	12	15	53	7	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Christina Lake

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Christina Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 25.2 ppb on Mar 19 07:00

Maximum Daily Average: 9.0 ppb on Mar 18

Minimum Value: 0.4 ppb on Mar 8 15:00

Minimum Daily Average: 1.0 ppb on Mar 10

Maximum Diurnal Average: 9.0 ppb at hour 7

Minimum Diurnal Average: 2.3 ppb at hour 15

Monthly Average: 4.33 ppb

Percentiles: $P_1 = 0.5$ $P_{10} = 0.9$ $Q_1 = 1.5$ Median = 3.1 $Q_3 = 5.3$ $P_{90} = 9.6$ $P_{99} = 22.4$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.9	2.2	2.5	2.8	Z	2.5	2.6	3.7	5.3	5.6	3.4	4.0	6.6	7.2	4.2	4.2	6.2	5.3	8.1	3.2	2.8	2.8	2.9	3.8	4.1	8.1
2-Mar	5.1	6.4	5.1	7.0	6.3	Z	4.8	10.3	8.5	6.9	5.6	6.8	3.9	3.1	1.9	2.5	2.5	2.7	7.7	2.5	3.6	2.8	2.0	2.6	4.8	10.3
3-Mar	Z	1.4	1.3	1.7	2.0	2.3	2.9	2.9	2.4	1.5	2.7	6.3	5.9	4.9	3.1	3.8	2.6	2.5	2.3	4.0	4.8	5.6	6.7	7.7	3.5	7.7
4-Mar	7.8	Z	6.1	7.0	4.1	2.9	5.1	5.9	4.5	2.8	3.2	1.9	4.0	5.0	3.4	2.9	2.8	2.8	4.9	4.8	1.1	2.3	3.8	3.0	4.0	7.8
5-Mar	3.7	2.3	Z	6.0	12.7	11.1	11.7	11.1	20.1	3.1	3.1	2.0	2.0	3.6	3.0	1.9	2.0	3.6	7.3	6.5	10.4	11.3	10.7	DF	6.8	20.1
6-Mar	5.4	7.7	8.9	4.7	5.2	7.6	6.8	10.1	8.4	6.5	2.4	1.7	Z	1.3	1.1	1.3	1.6	1.6	1.0	1.1	1.0	1.4	0.8	0.5	3.8	10.1
7-Mar	0.7	0.5	0.4	Z	1.2	1.2	3.4	4.4	2.4	2.1	1.5	1.6	1.2	1.8	1.4	1.1	1.3	1.7	2.3	1.8	1.1	0.5	0.5	0.4	1.5	4.4
8-Mar	0.8	0.5	0.6	1.0	Z	1.6	16.0	12.4	1.8	0.8	0.8	0.6	0.6	0.5	0.4	0.5	0.7	1.2	1.1	0.8	0.9	1.5	2.5	2.6	2.2	16.0
9-Mar	4.0	4.1	8.0	10.3	14.1	Z	16.2	23.8	4.1	0.8	0.6	0.6	0.8	1.1	0.8	1.2	1.8	1.4	0.8	0.7	0.8	0.7	0.5	0.6	4.3	23.8
10-Mar	Z	0.8	1.1	0.8	0.7	0.8	1.1	0.9	1.3	1.1	1.2	1.1	1.0	1.1	0.9	0.8	0.8	1.2	0.9	0.7	0.5	0.5	0.7	3.1	1.0	3.1
11-Mar	3.1	Z	9.4	9.4	10.2	16.3	18.6	23.6	23.3	M	4.2	1.6	0.6	0.6	0.8	0.8	1.0	1.4	1.9	1.4	3.0	2.7	2.8	2.2	6.3	23.6
12-Mar	2.2	1.7	Z	3.7	5.0	4.5	5.9	9.6	4.9	5.0	4.0	2.3	2.3	3.9	2.3	3.4	2.8	3.1	4.0	2.5	4.7	5.6	6.5	4.6	4.1	9.6
13-Mar	10.3	5.6	3.5	Z	6.9	9.9	6.8	6.2	5.0	5.1	2.7	1.8	1.7	1.6	1.6	1.2	1.7	1.4	1.4	1.5	2.2	1.9	2.0	0.9	3.6	10.3
14-Mar	1.1	1.2	1.6	1.7	Z	2.4	3.2	3.3	1.6	1.8	0.9	1.1	2.2	2.6	4.3	5.3	7.0	2.7	5.4	4.6	4.4	5.2	5.2	4.8	3.2	7.0
15-Mar	5.9	7.2	10.2	8.7	9.0	Z	16.0	17.6	7.8	5.9	3.0	2.1	2.7	2.8	1.7	1.8	2.8	4.6	3.1	5.5	9.8	9.6	9.2	11.0	6.9	17.6
16-Mar	Z	3.9	8.6	7.3	4.5	4.1	10.7	4.6	7.4	8.6	6.3	3.8	2.7	2.2	1.8	3.4	4.2	2.5	4.1	15.4	10.1	11.8	5.8	5.1	6.0	15.4
17-Mar	5.3	Z	4.3	3.8	6.0	10.2	8.7	7.8	6.4	4.3	5.5	4.1	2.7	1.8	1.4	1.7	2.5	1.9	3.1	8.2	8.9	7.5	6.6	7.6	5.2	10.2
18-Mar	6.7	12.4	Z	9.4	13.6	23.7	22.4	11.3	8.4	5.3	6.0	6.1	4.9	4.1	3.5	4.4	4.0	2.2	1.4	1.8	11.6	9.6	19.4	15.0	9.0	23.7
19-Mar	20.7	13.4	16.2	Z	17.9	24.4	25.2	22.2	21.6	10.4	3.2	1.6	1.1	1.1	1.2	1.1	1.7	1.6	2.2	3.0	0.8	0.8	0.9	0.8	8.4	25.2
20-Mar	1.3	3.9	1.3	1.8	Z	4.7	4.5	3.5	2.6	7.8	5.3	4.5	4.8	4.0	2.7	1.6	1.1	1.0	0.9	0.9	0.6	0.6	0.6	0.8	2.6	7.8
21-Mar	0.7	0.6	0.7	2.7	3.5	Z	1.1	1.2	1.1	1.3	1.1	1.1	1.3	1.2	1.3	2.4	2.9	1.5	0.8	1.8	1.1	1.5	1.1	0.8	1.4	3.5
22-Mar	Z	9.1	3.1	2.2	7.1	4.0	3.5	4.9	3.1	1.9	4.2	3.6	3.0	3.7	4.2	4.1	3.7	3.8	4.5	5.0	4.2	4.9	4.4	5.2	4.2	9.1
23-Mar	4.8	Z	8.6	11.6	22.5	14.8	8.3	6.9	6.7	5.4	6.0	5.1	4.4	6.3	6.7	9.5	5.7	3.7	3.8	2.0	1.3	1.1	0.8	0.8	6.4	22.5
24-Mar	1.1	1.1	Z	1.0	1.6	1.0	1.3	1.2	0.6	0.7	1.6	1.2	0.8	0.9	0.9	1.3	2.0	1.4	2.4	3.3	3.0	3.8	5.4	3.9	1.8	5.4
25-Mar	5.1	4.7	5.0	Z	7.4	13.6	15.7	11.5	10.3	5.6	3.9	3.2	3.9	4.2	2.0	2.6	4.3	3.9	3.7	3.2	3.3	3.4	2.5	1.1	5.4	15.7
26-Mar	1.4	1.6	1.8	3.4	Z	1.3	1.6	2.4	2.3	3.4	2.0	0.7	0.5	0.5	0.4	0.6	0.5	0.4	0.7	2.4	3.4	3.2	2.2	2.0	1.7	3.4
27-Mar	5.5	8.1	15.0	15.4	8.1	Z	12.0	12.0	9.7	3.8	3.6	2.9	4.3	4.0	3.2	6.4	6.6	3.6	1.9	2.0	1.8	2.3	4.9	3.9	6.1	15.4
28-Mar	Z	7.5	4.4	8.9	7.1	15.0	18.5	15.6	10.7	7.7	3.2	7.6	5.7	2.9	1.9	1.5	1.4	1.4	1.6	3.1	2.0	1.6	0.9	1.4	5.7	18.5
29-Mar	2.6	Z	3.4	3.6	4.1	5.0	9.6	9.5	4.8	2.3	1.9	C	C	C	C	C	3.2	4.4	2.6	1.1	1.3	2.3	1.7	3.1	3.7	9.6
30-Mar	3.7	1.3	Z	7.4	5.9	7.6	10.1	3.5	3.9	2.0	1.6	0.9	1.4	1.2	1.0	0.9	2.9	2.8	2.7	1.0	1.7	1.4	1.6	1.4	3.0	10.1
31-Mar	2.3	2.6	2.2	Z	2.2	4.0	4.7	4.1	4.1	3.8	3.0	3.2	3.8	3.5	5.3	4.1	3.8	3.5	2.6	2.0	4.1	5.6	3.7	1.8	3.5	5.6
	4.4	4.3	5.1	5.5	7.3	7.6	9.0	8.6	6.6	4.1	3.2	2.8	2.8	2.8	2.3	2.6	2.8	2.5	2.9	3.2	3.6	3.7	3.8	3.4	Diurnal Average	
	20.7	13.4	16.2	15.4	22.5	24.4	25.2	23.8	23.3	10.4	6.3	7.6	6.6	7.2	6.7	9.5	7.0	5.3	8.1	15.4	11.6	11.8	19.4	15.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Christina Lake - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	98.44	98.44
21 - 40	11	1.56	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Christina Lake - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	14	73	60	32	37	48	66	81	82	59	29	27	12	15	53	7	695
21 - 40	0	0	0	1	1	0	1	1	4	1	2	0	0	0	0	0	11
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	73	60	33	38	48	67	82	86	60	31	27	12	15	53	7	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Christina Lake

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Christina Lake - March 2023

26 - 31

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Christina Lake - March 2023

Maximum Value: 51.8 ppb on Mar 19 08:00

Maximum Daily Average: 13.8 ppb on Mar 19

Minimum Value: 0.5 ppb on Mar 26 18:00

Minimum Daily Average: 1.3 ppb on Mar 10

Maximum Diurnal Average: 13.3 ppb at hour 8

Minimum Diurnal Average: 3.1 ppb at hour 18

Monthly Average: 5.71 ppb

Percentiles: P_1 = 0.5 P_{10} = 1.1 Q_1 = 1.8 Median = 3.9 Q_3 = 7.1 P_{90} = 12.2 P_{99} = 37.6

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.9	2.2	2.6	2.9	Z	3.2	2.7	4.6	6.9	7.8	5.8	7.2	19.0	19.2	6.3	5.5	9.2	10.4	15.4	3.6	2.9	2.9	3.3	3.9	6.5	19.2
2-Mar	5.1	6.6	5.3	7.1	6.6	Z	5.0	12.7	10.4	8.8	7.8	10.5	5.0	4.3	2.7	3.0	3.0	2.8	12.7	2.7	4.1	3.2	2.0	2.6	5.8	12.7
3-Mar	Z	1.4	1.3	1.7	2.0	2.3	2.9	3.0	2.6	1.9	4.0	11.8	12.2	8.8	5.4	6.2	3.9	3.4	2.7	4.1	4.8	5.6	6.7	7.8	4.6	12.2
4-Mar	7.9	Z	6.7	8.1	5.4	4.2	7.2	8.7	7.4	4.4	5.5	3.1	7.9	9.7	6.6	4.8	4.5	4.3	7.5	7.6	1.1	2.4	3.8	3.0	5.7	9.7
5-Mar	4.1	2.5	Z	7.0	13.7	12.0	13.0	15.7	37.9	5.1	5.6	3.8	3.7	6.8	6.1	2.9	2.6	4.4	7.8	7.7	12.5	13.3	13.5	DF	9.2	37.9
6-Mar	6.4	10.3	10.4	4.9	7.2	11.2	7.8	13.6	13.0	10.7	3.7	2.7	Z	2.2	1.7	1.9	2.3	2.0	1.1	1.4	1.2	1.7	0.9	0.6	5.2	13.6
7-Mar	0.8	0.6	0.5	Z	1.5	1.4	4.2	5.2	3.1	3.1	2.2	2.6	2.1	2.8	2.0	1.6	1.7	2.3	2.7	2.1	1.2	0.6	0.5	0.5	2.0	5.2
8-Mar	0.9	0.5	0.6	1.1	Z	2.1	19.6	16.2	2.6	1.2	1.3	0.9	0.9	0.7	0.6	0.6	1.0	1.8	1.4	1.1	1.1	2.1	3.5	3.3	2.8	19.6
9-Mar	7.3	4.5	9.7	12.8	19.5	Z	20.3	39.6	6.3	1.3	0.9	0.8	1.3	1.6	1.2	1.5	2.3	1.7	0.9	0.7	0.9	0.7	0.5	0.6	6.0	39.6
10-Mar	Z	0.8	1.1	0.8	0.8	1.1	1.6	1.3	1.8	1.6	1.6	1.5	1.1	1.5	1.2	1.1	1.1	1.6	1.0	0.7	0.5	0.5	0.7	4.3	1.3	4.3
11-Mar	4.0	Z	9.8	10.3	11.1	23.3	29.5	48.3	50.0	M	6.8	2.7	0.9	0.8	1.2	1.1	1.4	2.1	2.2	1.7	3.4	2.9	3.1	2.3	10.0	50.0
12-Mar	2.3	1.7	Z	4.3	5.6	5.4	8.1	11.5	6.5	7.2	6.8	3.6	3.3	6.8	3.4	4.7	3.5	3.5	6.8	2.6	5.7	6.0	7.2	5.7	5.3	11.5
13-Mar	13.0	7.0	3.8	Z	12.1	11.6	9.2	8.5	7.5	7.9	4.0	2.4	2.2	2.2	2.0	1.5	2.1	1.6	1.5	1.5	2.2	1.9	2.2	0.9	4.7	13.0
14-Mar	1.1	1.2	1.6	1.7	Z	2.6	3.7	3.5	2.0	2.4	1.2	1.6	4.0	4.1	6.9	8.4	10.1	3.1	6.7	5.5	5.1	6.5	6.3	5.3	4.1	10.1
15-Mar	6.7	8.3	12.8	10.0	9.9	Z	17.8	25.1	12.2	11.0	5.7	3.9	5.0	5.0	2.6	2.7	3.8	6.4	3.4	6.1	10.4	11.4	10.1	13.1	8.8	25.1
16-Mar	Z	4.1	9.2	7.8	5.1	4.8	11.5	5.2	9.6	12.9	10.2	6.5	4.8	3.3	2.3	5.3	5.8	3.0	4.4	17.2	11.3	15.2	6.4	5.2	7.4	17.2
17-Mar	5.8	Z	4.5	3.9	7.1	11.8	10.0	10.1	9.4	6.7	9.1	6.5	3.8	2.4	1.7	2.0	2.9	2.0	3.1	8.5	11.1	7.6	6.7	7.8	6.3	11.8
18-Mar	6.7	13.1	Z	11.3	16.5	26.8	31.2	15.2	10.7	6.8	8.3	8.5	6.5	5.6	4.7	6.3	5.0	2.5	1.5	1.8	12.3	10.1	19.9	15.8	10.7	31.2
19-Mar	25.1	14.1	18.5	Z	26.4	42.9	49.2	51.8	46.0	17.7	4.9	2.1	1.4	1.3	1.5	1.3	2.2	1.8	2.3	3.1	0.8	0.8	0.9	0.9	13.8	51.8
20-Mar	1.3	4.4	1.3	2.1	Z	5.3	5.0	4.6	3.2	10.3	6.9	5.5	5.6	4.8	3.1	1.8	1.2	1.0	1.0	1.0	0.6	0.6	0.6	0.8	3.1	10.3
21-Mar	0.7	0.6	0.7	3.1	4.0	Z	1.2	1.3	1.3	1.7	1.5	1.5	1.9	1.6	1.9	3.4	3.8	1.7	0.9	2.2	1.2	1.9	1.2	0.8	1.7	4.0
22-Mar	Z	9.3	3.3	2.4	7.6	4.3	4.1	6.5	4.2	2.7	7.1	5.6	4.1	5.4	5.9	5.3	4.4	4.1	4.7	5.1	4.2	4.9	4.4	5.2	5.0	9.3
23-Mar	4.8	Z	8.8	12.4	28.5	15.6	8.5	7.8	8.3	7.2	8.6	7.5	6.4	10.0	11.0	15.4	8.7	4.0	3.9	2.1	1.3	1.1	0.8	0.8	8.0	28.5
24-Mar	1.1	1.1	Z	1.0	1.6	1.0	1.4	1.3	0.7	0.8	2.2	1.7	1.1	1.1	1.1	1.6	2.5	1.6	2.6	3.4	3.1	3.8	5.4	4.0	2.0	5.4
25-Mar	5.3	4.7	5.1	Z	8.3	14.4	19.5	17.1	14.7	8.7	5.8	5.0	6.3	6.9	2.5	3.4	5.4	4.4	3.9	3.3	3.3	3.5	2.5	1.1	6.7	19.5
26-Mar	1.4	1.6	1.8	3.9	Z	1.4	1.7	2.8	3.2	5.6	3.3	1.0	0.7	0.6	0.6	0.8	0.6	0.5	0.8	2.5	3.5	4.0	2.2	2.1	2.0	5.6
27-Mar	6.1	10.3	15.1	17.9	8.8	Z	15.2	20.2	17.7	6.4	6.6	5.2	7.8	7.1	5.2	11.1	11.6	4.7	2.3	2.1	1.8	2.3	5.1	3.9	8.5	20.2
28-Mar	Z	7.9	4.4	9.7	8.4	16.6	28.9	27.3	17.8	12.9	5.1	13.1	9.7	4.5	3.2	1.9	1.6	1.5	1.7	3.4	2.0	1.6	0.9	1.4	8.0	28.9
29-Mar	3.3	Z	3.4	3.6	4.1	5.0	10.3	13.1	7.1	3.5	2.7	C	C	C	C	C	3.8	4.9	2.7	1.1	1.3	2.4	1.7	3.2	4.3	13.1
30-Mar	3.9	1.3	Z	10.6	7.5	9.2	11.5	4.4	4.9	3.0	2.4	1.3	2.2	1.7	1.3	1.0	4.9	3.9	3.2	1.1	1.7	1.4	1.6	1.4	3.7	11.5
31-Mar	2.3	2.6	2.3	Z	2.4	4.3	5.2	4.7	4.6	4.2	3.3	3.8	4.7	4.2	6.9	5.0	4.3	3.7	2.7	2.0	4.1	5.6	3.7	1.8	3.8	6.9
	5.0	4.7	5.6	6.2	8.9	9.4	11.8	13.3	10.8	6.2	4.9	4.5	4.7	4.6	3.4	3.8	3.9	3.1	3.7	3.5	3.9	4.1	4.1	3.7	Diurnal Average	
	25.1	14.1	18.5	17.9	28.5	42.9	49.2	51.8	50.0	17.7	10.2	13.1	19.0	19.2	11.0	15.4	11.6	10.4	15.4	17.2	12.5	15.2	19.9	15.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Christina Lake - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	688	97.45	97.45
21 - 40	12	1.70	99.15
11 - 80	6	0.85	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Christina Lake - March 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	14	73	60	32	36	48	64	79	81	58	29	27	12	15	53	7	688
21 - 40	0	0	0	0	1	0	3	2	2	2	2	0	0	0	0	0	12
11 - 80	0	0	0	1	1	0	0	1	3	0	0	0	0	0	0	0	6
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	73	60	33	38	48	67	82	86	60	31	27	12	15	53	7	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Christina Lake

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Christina Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Christina Lake - March 2023

Maximum Value: 10.0 C on Mar 18 16:00

Maximum Daily Average: -0.6 C on Mar 31

Minimum Value: -28.2 C on Mar 6 03:00

Minimum Daily Average: -19.7 C on Mar 5

Maximum Diurnal Average: -2.4 C at hour 16

Minimum Diurnal Average: -13.5 C at hour 7

Monthly Average: -8.20 C

Percentiles: P_1 = -25.2 P_{10} = -16.8 Q_1 = -12.7 Median = -8.1 Q_3 = -3.5 P_{90} = 0.5 P_{99} = 7.7

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-19.2	-17.3	-16.1	-15.3	-14.5	-14.2	-14.0	-14.3	-13.9	-12.9	-11.5	-9.4	-7.8	-7.1	-7.1	-7.2	-8.0	-8.8	-9.3	-9.6	-9.6	-9.6	-9.7	-9.8	-11.5	-7.1
2-Mar	-9.8	-9.8	-9.8	-9.6	-9.2	-8.9	-8.4	-7.7	-5.9	-4.3	-1.8	0.4	1.9	3.4	4.7	5.3	4.7	3.4	2.2	0.0	-0.7	-0.8	-1.7	-2.6	-2.7	5.3
3-Mar	-2.8	-3.3	-3.8	-4.2	-4.4	-4.3	-3.9	-3.7	-3.4	-2.1	-1.3	-1.3	-0.6	-0.7	-0.7	-1.0	-1.7	-2.7	-4.2	-7.3	-8.5	-9.3	-10.0	-11.0	-4.0	-0.6
4-Mar	-11.3	-11.1	-11.3	-11.5	-11.9	-13.2	-14.2	-14.8	-14.6	-14.1	-13.5	-13.2	-12.9	-12.8	-13.0	-13.1	-13.4	-13.8	-14.6	-15.4	-17.4	-18.0	-19.1	-19.9	-14.1	-11.1
5-Mar	-21.2	-20.6	-21.4	-21.0	-22.2	-23.2	-24.4	-24.1	-23.1	-20.9	-18.7	-16.5	-15.5	-15.0	-14.0	-13.4	-13.4	-14.5	-18.5	-20.4	-22.3	-24.2	-25.7	DF	-19.7	-13.4
6-Mar	-27.0	-27.6	-28.2	-27.0	-24.7	-23.0	-21.6	-21.5	-20.3	-15.9	-14.5	-13.2	-11.8	-10.2	-10.4	-10.0	-10.1	-11.0	-12.3	-13.8	-14.4	-15.1	-15.2	-14.9	-17.2	-10.0
7-Mar	-14.3	-14.1	-14.3	-14.6	-14.9	-15.6	-16.3	-16.7	-15.4	-13.9	-12.0	-9.9	-7.9	-6.5	-5.1	-4.9	-5.7	-6.7	-8.1	-9.4	-10.9	-11.4	-12.5	-13.9	-11.5	-4.9
8-Mar	-15.5	-16.8	-16.7	-17.8	-18.3	-18.9	-20.9	-21.3	-17.5	-14.8	-11.4	-9.8	-8.8	-7.8	-7.1	-6.6	-6.8	-7.7	-9.9	-12.0	-13.7	-14.9	-15.7	-17.5	-13.7	-6.6
9-Mar	-20.4	-21.3	-22.9	-24.2	-24.2	-25.1	-25.2	-24.3	-19.6	-15.8	-13.0	-11.4	-9.8	-9.2	-8.7	-8.3	-8.5	-9.2	-10.4	-10.7	-10.8	-11.5	-11.8	-12.0	-15.4	-8.3
10-Mar	-12.4	-12.5	-12.3	-12.7	-12.8	-12.8	-13.0	-13.2	-12.2	-11.7	-10.1	-8.2	-7.2	-6.3	-5.9	-5.6	-5.7	-5.9	-6.6	-7.1	-7.1	-7.9	-9.1	-10.7	-9.5	-5.6
11-Mar	-11.7	-13.6	-14.3	-13.6	-13.5	-14.2	-16.2	-17.1	-14.8	-10.8	-9.4	-6.7	-4.4	-3.6	-3.2	-2.6	-2.6	-3.2	-3.8	-4.8	-6.0	-6.7	-7.6	-8.5	-8.9	-2.6
12-Mar	-8.9	-10.0	-10.2	-10.1	-10.1	-10.5	-11.1	-11.1	-9.9	-8.7	-7.0	-5.8	-5.0	-4.5	-4.1	-3.9	-4.0	-4.2	-4.7	-6.1	-8.3	-10.0	-11.8	-13.9	-8.1	-3.9
13-Mar	-15.2	-14.6	-14.7	-16.3	-17.9	-19.0	-19.7	-18.1	-15.1	-12.3	-9.8	-8.2	-6.2	-5.1	-4.2	-4.6	-5.3	-6.1	-6.9	-7.2	-7.3	-7.4	-7.4	-7.2	-10.7	-4.2
14-Mar	-7.1	-7.2	-7.2	-7.1	-7.2	-7.3	-7.4	-7.5	-7.7	-8.4	-8.4	-7.8	-6.7	-6.4	-6.9	-7.6	-7.8	-8.2	-8.5	-9.3	-9.8	-10.2	-10.7	-11.9	-8.1	-6.4
15-Mar	-13.1	-14.3	-15.0	-16.1	-16.7	-17.8	-19.2	-20.1	-17.4	-14.6	-12.9	-11.3	-8.9	-7.0	-6.3	-6.0	-5.6	-6.0	-7.8	-10.6	-13.9	-16.1	-16.9	-18.0	-13.0	-5.6
16-Mar	-18.7	-18.8	-16.4	-15.0	-14.8	-13.9	-12.7	-12.0	-10.6	-9.6	-7.4	-6.1	-4.0	-2.3	-2.3	-0.5	-0.2	-1.0	-2.7	-7.1	-10.2	-12.0	-13.0	-11.5	-9.3	-0.2
17-Mar	-10.4	-11.5	-9.7	-9.3	-9.7	-10.5	-10.7	-8.9	-6.0	-2.7	1.5	4.4	6.6	7.7	8.1	8.2	7.8	6.8	5.1	1.6	0.0	-0.7	-1.8	-3.1	-1.5	8.2
18-Mar	-4.0	-5.5	-6.2	-8.5	-9.0	-10.7	-9.9	-7.8	-4.8	-2.5	0.9	4.2	6.6	8.8	9.2	10.0	9.7	8.8	7.1	4.2	-1.2	-3.9	-5.4	-6.4	-0.7	10.0
19-Mar	-8.1	-8.8	-10.1	-10.5	-11.5	-12.2	-12.8	-10.9	-5.4	-2.3	0.5	3.0	4.1	4.5	4.9	5.2	4.5	3.2	1.0	-0.7	-1.5	-2.0	-3.3	-3.4	-3.0	5.2
20-Mar	-3.5	-4.1	-5.0	-6.0	-6.7	-6.8	-7.2	-6.0	-4.0	-2.0	0.7	2.0	2.6	2.2	0.2	-2.2	-3.8	-5.5	-6.3	-6.8	-7.6	-7.7	-7.9	-8.0	-4.1	2.6
21-Mar	-8.2	-8.4	-8.7	-8.7	-8.7	-9.0	-9.5	-9.7	-9.4	-8.5	-8.2	-7.5	-6.1	-5.1	-3.9	-3.2	-3.3	-4.2	-5.6	-7.4	-9.2	-9.8	-10.7	-10.8	-7.7	-3.2
22-Mar	-11.3	-10.9	-11.3	-11.6	-11.7	-12.4	-14.5	-11.3	-7.9	-5.7	-4.0	-2.8	-0.7	0.8	2.1	3.2	3.5	3.1	1.5	-0.8	-2.0	-3.2	-4.2	-5.3	-4.9	3.5
23-Mar	-6.1	-6.8	-6.8	-7.2	-7.4	-6.0	-4.3	-3.3	-1.4	2.3	5.9	6.2	6.8	6.9	6.4	5.7	5.5	2.2	0.4	-2.0	-3.9	-5.8	-7.5	-7.8	-1.2	6.9
24-Mar	-7.7	-7.7	-7.8	-8.0	-8.1	-8.4	-8.6	-8.7	-7.9	-7.6	-6.7	-5.5	-4.2	-3.2	-2.5	-1.2	-1.4	-1.7	-2.7	-5.4	-8.1	-10.3	-11.6	-12.9	-6.6	-1.2
25-Mar	-13.2	-13.6	-12.7	-12.3	-11.9	-12.4	-12.5	-10.1	-4.3	-1.5	-0.3	1.2	1.8	1.8	0.8	0.8	0.3	-1.2	-3.1	-4.5	-5.6	-7.7	-8.5	-8.7	-5.7	1.8
26-Mar	-10.8	-11.8	-13.0	-14.3	-16.0	-16.9	-16.9	-16.2	-15.1	-13.0	-10.9	-10.1	-9.4	-9.0	-8.6	-8.7	-9.1	-9.5	-10.8	-12.6	-14.0	-15.6	-18.2	-19.9	-12.9	-8.6
27-Mar	-21.4	-22.3	-23.4	-24.3	-25.0	-25.3	-25.4	-21.1	-15.6	-11.9	-10.8	-9.4	-8.2	-7.4	-6.5	-6.2	-6.1	-6.3	-7.2	-8.6	-10.6	-11.6	-11.8	-13.7	-14.2	-6.1
28-Mar	-15.4	-15.2	-14.2	-16.0	-16.3	-18.8	-19.6	-15.9	-12.5	-9.1	-6.9	-5.9	-4.8	-2.7	-2.1	-1.6	-1.5	-1.3	-1.9	-2.8	-3.3	-4.0	-4.0	-3.1	-8.3	-1.3
29-Mar	-2.9	-3.3	-3.5	-3.4	-3.3	-4.3	-5.0	-2.9	-2.1	-1.4	-1.6	-1.2	-0.6	-0.5	-0.2	0.1	-0.1	-1.1	-2.0	-2.7	-4.3	-5.7	-6.7	-7.1	-2.7	0.1
30-Mar	-7.1	-7.5	-8.5	-9.8	-9.9	-9.4	-9.2	-7.8	-5.9	-4.7	-2.7	-1.6	0.2	1.4	2.0	2.1	2.1	1.8	1.3	0.5	-0.4	-0.6	-0.8	-1.3	-3.2	2.1
31-Mar	-1.7	-2.2	-2.8	-3.3	-3.8	-4.6	-5.2	-4.4	-3.3	-1.8	-1.4	0.5	2.5	5.1	4.6	4.8	5.1	4.7	3.0	1.2	-0.6	-2.3	-3.7	-4.4	-0.6	5.1
	-11.6	-12.0	-12.2	-12.6	-12.8	-13.2	-13.5	-12.7	-10.5	-8.5	-6.7	-5.2	-3.8	-2.9	-2.6	-2.4	-2.6	-3.4	-4.7	-6.4	-7.8	-8.9	-9.8	-10.0	Diurnal Average	
	-1.7	-2.2	-2.8	-3.3	-3.3	-4.3	-3.9	-2.9	-1.4	2.3	5.9	6.2	6.8	8.8	9.2	10.0	9.7	8.8	7.1	4.2	0.0	-0.6	-0.8	-1.3	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

Christina Lake - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	42	5.65	5.65
-20 - 0	618	83.18	88.83
0 - 10	82	11.04	99.87
10 - 20	1	0.13	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Christina Lake - March 2023

Maximum Value: 91.9 % on Mar 14 07:00

Maximum Daily Average: 85.2 % on Mar 14

Minimum Value: 22.4 % on Mar 18 16:00

Minimum Daily Average: 49.4 % on Mar 28

Maximum Diurnal Average: 79.5 % at hour 7

Minimum Diurnal Average: 48.5 % at hour 16

Monthly Average: 65.09 %

Percentiles: P_1 = 25.0 P_{10} = 40.2 Q_1 = 54.1 Median = 67.9 Q_3 = 78.1 P_{90} = 84.7 P_{99} = 89.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	82.4	82.6	83.2	84.0	84.2	84.2	83.4	82.7	80.1	77.5	73.9	68.3	64.0	64.0	65.8	67.7	71.7	75.5	78.3	79.9	79.8	78.7	78.1	78.1	77.0	84.2
2-Mar	80.6	80.1	80.0	78.7	78.1	77.5	76.6	75.0	67.5	62.4	57.2	53.2	50.1	46.4	43.0	40.3	39.8	42.5	52.7	73.3	79.3	75.9	78.9	83.1	65.5	83.1
3-Mar	78.7	71.2	69.3	70.1	73.1	77.6	80.6	79.6	75.0	65.6	63.1	64.6	61.4	60.0	56.0	53.9	54.2	59.1	64.2	73.0	78.3	78.4	76.6	81.4	69.4	81.4
4-Mar	81.1	76.5	75.1	78.4	76.3	74.0	75.6	75.7	74.6	70.7	63.6	62.7	60.8	60.6	59.4	58.4	57.7	58.0	61.3	62.6	69.0	70.0	72.9	74.0	68.7	81.1
5-Mar	75.8	76.6	77.7	77.1	78.1	78.5	78.5	76.2	77.0	72.8	65.7	56.2	50.0	49.6	45.6	43.3	43.2	47.3	60.3	62.6	68.3	73.1	74.7	DF	65.6	78.5
6-Mar	73.9	75.0	75.6	76.1	76.3	76.3	76.9	76.2	73.5	62.8	63.1	64.4	57.3	51.1	58.7	57.3	60.5	68.9	74.4	76.5	74.4	74.7	72.5	67.7	69.3	76.9
7-Mar	60.7	55.3	55.1	58.0	62.3	66.3	69.1	70.6	67.5	65.0	61.2	55.6	52.4	51.8	51.0	51.3	52.3	52.3	51.0	50.5	49.7	48.2	50.9	54.5	56.8	70.6
8-Mar	59.8	63.2	63.1	66.5	68.1	69.5	75.7	74.7	64.8	56.6	45.7	40.6	37.9	35.4	32.6	29.8	29.5	30.7	36.2	43.4	47.6	50.2	52.1	57.2	51.3	75.7
9-Mar	66.7	69.8	72.6	75.0	76.4	76.1	76.5	75.1	66.6	60.2	55.8	53.3	52.0	53.2	55.2	57.9	56.4	59.0	69.2	70.9	66.3	67.6	68.7	72.1	65.5	76.5
10-Mar	75.0	76.1	73.1	74.0	75.5	75.8	75.7	76.5	71.3	68.8	66.2	63.4	63.1	63.0	63.0	62.5	64.2	64.2	65.1	66.2	66.6	72.7	72.5	76.2	69.6	76.5
11-Mar	74.6	78.6	82.0	81.0	82.5	85.3	85.4	83.2	81.5	75.4	74.5	67.2	60.7	57.9	58.4	56.8	56.9	61.1	64.0	67.5	74.2	76.0	79.1	85.3	72.9	85.4
12-Mar	87.3	88.8	87.8	86.1	85.7	86.1	86.6	86.3	82.8	80.2	75.5	71.8	69.4	67.1	65.8	65.5	64.6	64.0	61.9	63.6	68.6	74.0	79.4	84.9	76.4	88.8
13-Mar	86.3	85.7	85.2	85.8	84.6	83.3	82.6	82.9	80.9	74.9	69.1	65.5	60.4	57.1	57.0	60.6	68.2	75.1	82.9	85.2	84.2	85.9	86.1	86.2	77.3	86.3
14-Mar	86.8	89.5	91.0	90.8	91.5	91.6	91.9	91.9	91.0	88.6	86.7	85.0	81.5	81.3	82.7	78.9	77.8	77.5	81.8	80.7	81.4	82.6	82.1	79.5	85.2	91.9
15-Mar	81.7	85.1	84.1	86.1	86.0	84.6	83.5	81.8	82.8	76.9	69.9	66.2	60.7	57.2	58.3	59.4	59.8	63.1	69.9	80.5	86.9	86.0	85.2	83.8	75.8	86.9
16-Mar	83.3	82.7	84.7	85.1	85.5	86.0	86.3	85.3	81.9	77.3	73.6	68.8	61.5	57.5	59.8	54.1	53.9	56.5	61.9	78.1	87.2	88.5	88.5	88.6	75.7	88.6
17-Mar	84.8	84.4	80.3	78.1	79.2	81.5	82.4	77.0	67.2	58.3	47.1	38.4	32.1	28.2	25.0	24.9	25.0	26.0	29.2	38.7	44.0	46.0	48.9	52.4	53.3	84.8
18-Mar	55.3	60.2	62.6	71.5	71.7	77.8	74.8	67.9	57.5	52.5	43.6	34.6	29.3	25.6	24.4	22.4	23.8	24.2	27.0	33.9	54.3	64.5	69.5	73.1	50.1	77.8
19-Mar	78.4	76.7	81.9	83.3	84.8	85.8	85.1	76.5	61.0	52.6	49.6	46.8	45.4	44.6	43.3	41.6	42.6	44.2	50.2	59.3	63.4	65.1	69.4	69.9	62.6	85.8
20-Mar	70.5	72.6	75.4	78.4	80.6	82.2	82.7	78.9	73.1	66.3	55.9	52.7	49.6	53.3	66.0	77.1	82.3	85.9	86.3	86.4	86.8	87.0	86.2	85.8	75.1	87.0
21-Mar	85.8	86.2	86.2	85.6	85.9	86.0	87.2	86.5	84.0	78.8	75.9	71.4	64.2	58.1	52.2	49.7	50.0	54.5	61.7	68.3	75.4	78.9	80.9	80.6	73.9	87.2
22-Mar	82.1	81.6	82.0	84.7	86.2	86.7	87.0	82.3	73.5	62.8	57.3	53.8	49.0	44.8	42.5	40.3	40.0	42.0	46.3	54.2	57.1	60.4	63.5	67.0	63.6	87.0
23-Mar	70.7	73.9	75.2	78.3	80.5	77.4	69.8	65.3	59.6	50.4	42.2	40.6	37.0	35.3	35.3	37.9	37.2	50.9	57.2	63.2	65.6	69.6	76.3	79.6	59.5	80.5
24-Mar	77.9	75.0	72.0	72.3	72.7	73.3	73.2	73.3	69.0	68.6	63.2	56.3	48.0	40.7	39.6	36.0	35.5	36.0	38.2	49.5	60.9	73.4	72.9	78.3	60.7	78.3
25-Mar	75.6	78.0	75.4	74.4	73.3	75.1	78.3	72.5	56.5	45.0	44.9	39.7	35.4	31.1	34.8	32.4	29.6	34.9	38.2	36.6	39.3	45.7	46.2	43.0	51.5	78.3
26-Mar	48.9	53.5	61.6	67.3	73.3	77.0	77.6	73.2	66.9	57.5	51.9	49.8	45.5	38.3	32.4	32.1	32.9	33.0	34.8	40.1	44.0	48.6	63.9	68.3	53.0	77.6
27-Mar	70.1	71.6	72.0	74.0	74.6	74.4	73.7	65.6	54.9	41.2	40.6	39.9	38.9	39.2	38.2	38.9	38.6	41.8	46.6	51.7	57.1	61.3	63.2	67.7	55.7	74.6
28-Mar	74.5	74.6	74.0	76.9	78.6	81.8	80.9	70.7	57.3	46.5	39.9	36.6	32.5	27.9	22.5	23.7	25.5	28.3	31.5	33.3	37.7	42.4	44.2	43.5	49.4	81.8
29-Mar	46.8	49.7	51.6	52.9	53.0	55.8	58.6	54.0	56.4	58.9	63.3	62.5	60.6	61.6	60.9	60.2	62.9	64.4	65.4	66.8	70.3	74.2	75.7	77.3	61.0	77.3
30-Mar	78.7	80.0	83.0	86.6	87.4	86.1	85.9	81.8	74.1	66.7	54.2	47.5	37.4	33.4	37.0	39.4	40.7	42.4	45.5	47.6	54.5	57.3	58.5	58.9	61.0	87.4
31-Mar	65.1	69.7	73.0	76.0	78.5	80.7	81.5	77.6	70.8	65.4	64.4	59.6	55.4	48.4	49.8	49.4	47.9	49.3	54.4	59.4	65.9	72.7	77.7	80.9	65.6	81.5
	74.2	75.0	75.7	77.2	78.2	79.2	79.5	76.7	71.0	64.7	59.9	56.0	51.7	49.2	48.9	48.5	49.2	52.0	56.4	61.4	65.8	68.7	70.8	72.6	Diurnal Average	
	87.3	89.5	91.0	90.8	91.5	91.6	91.9	91.9	91.0	88.6	86.7	85.0	81.5	81.3	82.7	78.9	82.3	85.9	86.3	86.4	87.2	88.5	88.5	88.6	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Christina Lake - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	73	9.83	9.83
40 - 60	183	24.63	34.45
60 - 80	338	45.49	79.95
80 - 100	149	20.05	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Christina Lake - March 2023

Maximum Speed: 24 km/h on Mar 23 15:00

Maximum Daily Speed Average: 13.1 km/h on Mar 2

Minimum Speed Value: 1 km/h on Mar 16 09:00

Minimum Daily Speed Average: 0.6 km/h on Mar 16

Maximum Diurnal Speed Average: 2.8 km/h at hour 21

Minimum Diurnal Speed Average: 0.4 km/h at hour 14

Monthly Average Velocity: 1.3 km/h 129.4 deg

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 13$ $P_{90} = 17$ $P_{99} = 21$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	E6	SE4	SE5	E5	SE7	SSE10	SSE10	SSE10	SSE11	S13	S15	S15	SSW15	S15	S15	S18	S15	S16	S15	S14	S14	S14	S10	S12	S11.1	S18
2-Mar	S11	S13	S16	S13	S15	S13	S12	SSW12	SSW14	SW19	SW19	SW21	WSW21	WSW18	WSW20	W21	W17	WSW12	W19	W18	W16	W14	WSW12	SW13	SW13.1	WSW21
3-Mar	WSW16	WSW15	WSW15	WSW12	WSW12	WSW12	WSW11	WSW12	WSW11	WSW12	W17	WNW16	WNW17	NW21	NW21	NW21	NW20	NW18	N16	NNE16	NNE16	NNE12	NNE14	NNE14	WNW9.9	NW21
4-Mar	NE8	N8	N10	NW9	NW16	NW19	WNW16	WNW15	WNW16	NW15	NW14	NW16	WNW16	WNW17	NW20	NW20	NW20	NW19	NNW17	NNW17	NNE10	NNE10	NNE11	NNE11	NW13.0	NW20
5-Mar	NNE8	NNE11	NNE9	N9	W6	W2	SSW2	S3	SSE2	E4	NNW3	N7	N8	NNW6	SW6	E3	ESE4	SE4	S4	E6	ESE4	SE4	S3	DF	NNE1.6	NNE11
6-Mar	S3	S4	S3	SSE3	SSE3	SE2	S2	S2	S4	SE6	SSE13	SSE15	ESE12	SSE13	SSE13	SSE12	SSE11	SSE10	ESE9	ESE7	ESE6	E7	E7	E7	SE6.5	SSE15
7-Mar	ESE8	SE9	SE14	SSE15	SSE13	SSE11	SE7	SSE8	SSE10	SSE12	SSE11	SSE11	SSE15	SSE15	SSE20	SSE22	SSE22	SSE16	SSE10	SSE9	SE9	SE12	SE11	ESE8	SSE12.2	SSE22
8-Mar	E7	ESE9	ESE9	ESE8	SE10	ESE8	SE4	E5	SE9	SE8	SSE12	ESE13	ESE11	ESE12	ESE12	E13	E13	ESE11	E10	E12	ESE9	SSE6	SE7	SE5	ESE8.9	E13
9-Mar	ESE5	ESE6	SE3	SSE3	S5	S5	ESE5	SE5	ESE5	SE11	SSE16	SSE18	SE21	SSE19	SSE20	SSE17	SSE19	SSE18	SE18	SE18	SE19	SE16	SE15	SE13	SE12.1	SE21
10-Mar	SE11	SE12	SSE18	SSE14	SE12	SE12	SE12	SE12	SE16	SE15	SSE16	SSE17	SE15	SSE16	SSE18	SE14	ESE15	ESE14	ESE12	ESE10	SE14	ESE13	ESE7	E5	SE13.0	SSE18
11-Mar	ESE7	E6	NE3	ENE3	E3	SSE3	SE3	SSE2	E1	ENE4	ENE7	ENE8	SE11	SE10	ESE10	SE9	SE12	SSE13	SSE9	S10	S10	SSW11	SSW7	S4	SE5.3	SSE13
12-Mar	S5	S6	SSW6	SSW7	SSW6	S6	SSE5	SSE5	SSW8	SSW8	SSW8	SSW8	SSW9	SSW13	S14	SSW10	S11	S9	S10	SSW13	SSW11	SSW7	S6	SSE5	S8.0	S14
13-Mar	SE4	SSE4	S4	SE3	ESE5	ESE4	E6	E5	ENE5	ENE8	ENE9	ENE12	NE13	NE18	NE20	ENE22	ENE21	ENE19	ENE16	ENE16	ENE13	ENE12	NE10	NE12	ENE10.0	ENE22
14-Mar	NE12	NE10	NE8	NNE9	NNE9	NE11	NE12	NNE8	N12	NNE13	NNE13	NNW10	NW15	NW17	NW20	NW22	WNW18	NW18	NW14	NW15	NW15	NW16	NW14	NW15	NNW10.9	NW22
15-Mar	NW13	NW12	NW13	NW9	WNW7	WNW5	WSW2	E1	NE2	E4	E5	NE8	SE4	ENE4	NE7	NE11	ENE7	SE5	E8	SE6	SE3	ESE4	S2	S4	NNE2.0	NW13
16-Mar	SSW4	ESE3	SSE2	E5	ESE4	E4	SE2	E3	SSE1	NNE2	NW9	N5	NE3	N6	NE9	NNW8	NW8	NW9	WNW4	S4	SSE4	S5	SSE4	SSW6	N0.6	NW9
17-Mar	SSW7	S5	S8	S6	S7	S6	SSE6	S7	S9	S8	SSW8	SSW9	SW12	SW15	SW17	SW17	SW17	SW16	SW11	SSW9	SSW11	SSW12	SSW11	SSW6	SSW9.3	SW17
18-Mar	SSE4	S4	S3	SE2	S7	SW5	S7	SSE4	SW6	SW8	SW4	SSW4	SE4	NW3	N4	WNW11	WNW10	NW14	NW13	NNE7	SSE3	SSW6	SSW5	SSW3	WSW2.5	NW14
19-Mar	SW4	S4	SSW5	SSW4	S3	S3	S3	S2	ENE2	NE4	NE7	ENE9	NE13	NE15	NE16	ENE16	NE18	ENE16	E11	E11	ESE8	SE8	ESE8	SE7	E5.7	NE18
20-Mar	ESE5	ESE5	E7	E8	ENE7	ESE7	E7	ESE6	SE8	S7	ENE3	ENE6	ESE5	NE13	NNE21	NNE21	NNE18	NNE18	NNE17	NNE19	NNE16	NNE12	NNE12	NNE11	NE8.2	NNE21
21-Mar	NNE11	NNE12	NNE14	N10	N8	NNE9	NE10	NNE10	NNE9	NE13	NE12	NE11	NE9	NE9	ENE6	ENE5	E5	ESE9	SE10	SE8	SE8	SE8	SSE7	SSE9	NE6.1	NNE14
22-Mar	SSE9	S12	SSW13	S13	S11	SE9	E8	SSE9	S17	S19	S18	S17	S15	SSW15	SSW14	SW11	SW11	WSW11	SW8	SSW8	S10	S10	SSW10	S8	S10.8	S19
23-Mar	SSE6	SSE5	E4	S4	SSW5	WSW6	WSW11	WSW9	SW8	SSW6	NW12	NW18	NNW19	NW20	NW24	NW21	NW18	NNE22	NNE18	NNE18	NNE17	NNE17	NNE17	NE15	NNW7.3	NW24
24-Mar	NNE15	NNE15	NNE14	NNE13	NE11	NNE11	NNE10	NNE9	NE8	NE9	NE9	NE8	NE7	NE7	NE9	E5	ESE4	E4	ESE6	SSE6	S5	SW5	SSE4	SSW2	NE6.2	NNE15
25-Mar	S4	SSW4	S3	ESE3	ENE3	SSE4	S3	SSE3	WSW3	NW12	NW13	NW13	NW16	NW14	NNE14	NNE15	N17	NNE18	NNE14	NNE9	NNE6	NNE8	NNE8	N10	N5.7	NNE18
26-Mar	NE6	NE5	NNE6	NE5	NNE7	NNE8	NE8	NE8	NNE7	NNE6	NNE10	NNE12	NNE14	NNE13	NNE15	NNE15	NNE15	NNE16	NE15	NE8	NE8	ENE5	SSE3	SSW4	NNE8.4	NNE16
27-Mar	SSW3	SSW4	S5	SSW4	SSW3	SSW4	SSW4	S3	ESE3	NW8	NW13	NW10	NW12	W12	W12	WNW16	NW17	W15	WNW12	WNW6	SE4	S6	S6	SSE3	W4.7	NW17
28-Mar	SSW2	SW6	SSW4	E3	SSW4	ENE3	SSW3	SE1	ENE3	NE4	NE4	ENE6	NE6	SW5	WSW9	WSW9	WSW11	SW11	SSW7	SSW8	SW11	SW13	SW13	SW19	SW4.3	SW19
29-Mar	SW18	SW17	SW18	WSW10	WSW8	WSW9	WSW6	NW14	N13	NNE16	NNE16	NNE14	N13	NNE14	NNE13	N12	NE16	NE20	NNE13	NNE11	NE9	ENE6	NE7	NE7	N5.9	NE20
30-Mar	NE6	ENE5	ENE5	SE3	SSE4	S3	SE3	SSE4	S6	SSW7	ESE5	E8	SE9	SSE7	SSW7	SSW5	SSW9	SSW9	SSW7	S13	SSW11	SSW10	SSE10	SSE10	SSE5.1	S13
31-Mar	SSE11	SSE10	SSE10	SSE10	SSE10	SE9	SE8	SSE11	SSE11	SE8	SE8	SE5	ENE5	NE2	NNE9	NE11	NE9	NNE12	NNE12	NNE10	NE6	NE5	E2	S2	ESE4.4	NNE12
	SE2.2	SE2.2	SSE2.5	SSE2.0	SSE2.5	SSE2.1	SSE2.3	SSE2.0	SSE2.3	SSE1.7	SE0.6	E1.3	E0.7	WNW0.4	N1.1	NNW1.5	N1.1	NE1.6	NE2.1	E2.7	ESE2.8	SE2.7	SE2.3	SE1.9	Diurnal Average	
	SW18	SW17	SSE18	SSE15	NW16	NW19	WNW16	WNW15	S17	SW19	SW19	SW21	WSW21	NW21	NW24	SSE22	SSE22	NNE22	W19	NNE19	SE19	NNE17	NNE17	SW19	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

Christina Lake - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Christina Lake - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	182	24.50	24.50
6 - 11	287	38.63	63.12
12 - 19	246	33.11	96.23
20 - 28	28	3.77	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Christina Lake - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	2	1	10	14	20	18	23	25	35	22	5	2	1	2	1	1	182
6 - 11	9	32	34	12	17	23	28	32	27	34	11	13	1	4	7	3	287
12 - 19	6	45	14	8	2	9	19	25	28	9	15	11	9	10	33	3	246
20 - 28	0	3	2	2	0	0	1	4	0	0	1	2	1	0	12	0	28
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	81	60	36	39	50	71	86	90	65	32	28	12	16	53	7	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Christina Lake

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Christina Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Mar 2 19:00

Minimum Value: 0 km/h on Mar 9 08:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Christina Lake - March 2023

Direction of Maximum Speed: 321 deg on Mar 23 15:00
Direction of Maximum Daily Speed Average: 229.7 deg on Mar 2

Direction of Minimum Speed: 149 deg on Mar 16 09:00

Direction of Minimum Daily Speed Average: 0.6 deg on Mar 16

Monthly Average Direction: 129.4 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	98	145	127	101	142	147	151	153	162	185	187	186	194	190	188	181	190	186	181	185	189	183	178	182	176.3
2-Mar	173	172	171	178	188	190	187	197	213	221	224	225	237	239	245	261	268	256	281	269	270	267	247	235	229.7
3-Mar	249	253	245	256	248	241	240	244	250	258	280	302	299	313	322	317	322	326	349	29	29	31	24	26	303.0
4-Mar	36	353	2	317	321	317	285	295	302	316	313	313	301	302	315	316	322	326	335	340	29	15	16	14	325.0
5-Mar	32	14	21	350	265	266	212	181	166	88	335	5	1	328	230	93	104	142	175	93	104	125	172	DF	31.0
6-Mar	178	182	177	153	157	140	179	170	173	145	152	151	114	160	167	155	164	158	121	104	104	98	97	100	143.5
7-Mar	119	124	140	154	152	154	143	151	153	152	162	153	147	162	155	167	152	160	160	148	128	131	129	122	149.2
8-Mar	87	105	121	117	127	117	136	101	128	129	153	111	104	104	103	100	99	116	99	101	123	147	146	144	115.0
9-Mar	115	106	143	154	176	181	113	129	117	139	157	152	146	149	153	156	162	150	142	134	145	139	143	145	146.2
10-Mar	140	139	153	150	141	137	132	129	143	144	154	152	143	148	155	131	118	121	117	117	130	116	106	96	136.8
11-Mar	113	101	51	71	84	168	139	149	98	66	68	73	140	130	102	138	144	155	168	171	182	197	195	186	139.4
12-Mar	171	182	197	194	198	175	162	148	193	201	211	210	201	200	186	196	185	181	188	195	199	200	191	166	191.1
13-Mar	146	162	177	134	117	103	94	96	71	63	74	62	55	54	52	62	70	67	75	78	69	66	54	53	70.4
14-Mar	54	56	52	26	18	35	45	14	6	16	18	344	322	317	319	318	297	318	321	321	313	324	317	316	341.5
15-Mar	318	317	325	304	284	301	246	95	56	79	81	51	127	69	46	50	64	130	91	136	125	106	177	186	25.6
16-Mar	199	113	149	79	104	99	146	93	149	28	309	6	36	7	35	334	310	306	285	186	168	176	155	200	1.5
17-Mar	192	183	190	187	183	177	165	184	188	183	212	209	230	234	232	229	233	224	223	204	198	194	195	197	208.3
18-Mar	165	185	174	124	174	222	183	163	223	218	217	199	140	306	358	298	289	311	323	28	161	202	213	209	239.3
19-Mar	218	183	204	203	180	189	186	187	78	50	49	58	55	56	55	57	53	67	82	88	113	125	106	126	80.1
20-Mar	112	119	99	91	73	112	95	110	127	184	58	78	106	34	17	25	25	21	17	14	17	22	21	24	42.7
21-Mar	21	21	15	358	3	14	35	24	30	38	38	48	55	56	72	66	98	115	136	134	127	139	152	163	55.2
22-Mar	167	185	193	185	171	145	98	157	179	183	175	183	187	196	196	220	232	245	235	195	189	189	194	182	187.7
23-Mar	167	159	88	176	202	245	245	252	221	213	308	326	329	323	321	305	322	31	26	32	30	27	24	36	342.8
24-Mar	32	32	28	31	42	33	32	30	34	53	45	51	52	49	52	100	119	91	115	150	179	214	164	195	50.0
25-Mar	175	199	191	119	67	158	178	162	258	318	321	313	307	314	23	22	6	24	32	33	26	28	27	11	0.2
26-Mar	35	36	28	34	29	31	34	35	25	19	33	18	13	22	27	25	20	24	34	41	42	69	162	207	28.9
27-Mar	205	203	185	195	195	195	195	189	106	322	324	322	321	278	281	298	310	279	299	288	146	174	187	153	279.5
28-Mar	206	222	212	81	208	66	210	141	66	44	42	73	42	226	251	245	237	236	210	204	225	221	222	225	221.4
29-Mar	224	228	226	239	253	252	258	309	357	12	16	22	4	18	17	357	35	34	25	31	35	58	54	38	357.9
30-Mar	38	62	69	124	162	170	144	166	179	206	106	94	128	147	193	193	205	196	199	190	194	193	162	152	165.8
31-Mar	156	156	155	152	150	143	140	156	166	144	132	134	78	46	27	42	35	25	23	28	40	43	89	179	107.5
Diurnal Average	134.6	145.7	153.7	147.2	165.1	157.0	150.9	159.2	163.3	158.5	140.9	84.1	81.8	299.7	10.8	345.4	356.6	42.7	49.1	91.9	121.6	134.6	133.0	138.1	

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Christina Lake - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Christina Lake - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 97 deg on Mar 18 14:00

Minimum Value: 6 deg on Mar 26 20:00

Percentiles: $P_1 = 7$ $P_{10} = 10$ $Q_1 = 12$ Median = 16 $Q_3 = 24$ $P_{90} = 39$ $P_{99} = 82$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	16	14	15	16	10	11	10	11	12	15	12	17	18	18	16	16	16	13	12	14	13	14	16	16	18
2-Mar	15	15	16	18	13	15	14	16	16	11	12	13	14	16	19	20	18	17	23	18	17	19	15	10	23
3-Mar	19	18	12	17	14	8	9	14	16	18	23	22	23	18	15	13	14	14	32	10	10	10	12	10	32
4-Mar	11	28	22	15	11	13	17	18	19	16	21	19	22	21	16	14	15	15	10	22	9	8	10	13	28
5-Mar	16	11	14	26	36	81	61	31	55	39	89	58	40	49	41	65	41	33	31	34	25	30	34	DF	89
6-Mar	18	10	24	34	30	40	32	28	31	39	18	19	18	25	15	19	16	12	13	7	6	7	7	9	40
7-Mar	10	11	13	12	13	12	16	19	16	13	19	22	20	20	17	16	12	13	13	8	8	10	9	19	22
8-Mar	7	14	8	6	8	7	16	19	10	15	32	21	26	23	20	19	15	11	9	8	13	15	7	9	32
9-Mar	20	10	30	47	12	17	12	11	34	18	14	16	15	14	16	15	14	16	14	12	11	11	12	11	47
10-Mar	10	12	11	13	13	12	12	13	15	16	17	19	21	18	13	16	13	12	10	10	15	11	12	9	21
11-Mar	12	14	25	12	38	20	16	13	53	15	11	28	28	31	25	37	23	12	13	10	17	11	11	11	53
12-Mar	10	9	17	13	15	11	13	11	20	12	16	26	22	17	17	21	22	15	12	12	11	10	18	10	26
13-Mar	18	13	14	13	15	16	9	11	13	15	16	12	17	10	9	11	10	11	10	10	11	10	10	10	18
14-Mar	9	9	13	15	12	14	10	13	14	12	12	35	15	12	11	11	18	9	14	15	9	12	13	10	35
15-Mar	11	10	14	32	28	88	83	83	81	17	22	24	47	59	21	11	21	19	7	16	32	27	42	35	88
16-Mar	28	21	51	16	24	31	55	20	83	68	26	41	82	62	26	52	30	20	79	23	29	10	37	15	83
17-Mar	12	12	13	16	12	25	20	16	12	13	16	17	17	16	16	16	13	12	10	9	10	10	12	26	26
18-Mar	52	17	45	58	19	26	22	30	19	15	69	53	31	97	90	37	30	13	27	35	42	10	8	28	97
19-Mar	19	39	15	27	27	22	58	50	51	31	24	13	13	13	12	12	10	14	7	11	15	21	11	14	58
20-Mar	39	23	19	18	11	13	29	16	20	30	52	39	59	15	14	12	14	14	13	14	14	14	13	13	59
21-Mar	13	13	12	19	22	23	12	12	12	12	18	19	26	27	35	44	50	27	8	6	11	10	11	9	50
22-Mar	9	11	10	12	13	14	8	27	12	14	13	14	22	18	17	27	16	16	19	11	11	12	13	11	27
23-Mar	11	40	60	21	16	32	12	24	16	42	47	18	17	22	17	18	32	10	10	11	10	10	12	14	60
24-Mar	13	9	10	12	15	15	13	11	20	24	31	39	33	43	23	37	40	44	12	14	21	13	16	71	71
25-Mar	31	15	26	27	36	41	24	34	73	17	22	21	28	45	18	26	24	16	10	7	7	9	9	11	73
26-Mar	13	17	22	16	7	7	9	16	17	27	33	22	19	18	15	15	15	13	8	6	7	23	37	9	37
27-Mar	17	11	11	13	18	16	26	38	39	64	22	36	41	28	34	25	24	22	23	67	22	32	36	29	67
28-Mar	80	30	63	61	70	36	24	68	18	32	32	39	37	70	32	27	21	15	13	7	12	10	14	11	80
29-Mar	10	10	10	19	17	14	65	28	27	17	16	15	21	15	18	27	12	10	12	10	10	10	7	9	65
30-Mar	21	18	20	23	29	25	21	16	36	23	61	32	36	47	65	71	22	14	15	12	11	13	18	18	71
31-Mar	11	10	12	15	11	11	13	14	14	18	19	67	49	91	22	14	18	13	9	8	13	8	33	33	91
Diurnal Maximum	80	40	63	61	70	88	83	83	83	68	89	67	82	97	90	71	50	44	79	67	42	32	42	71	

DF - DAS Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS27
JACKFISH 2/3
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	707	34	37	99.6	9.7	0	2.2	0
H2S (ppb) Average	705	36	39	99.6	0.6	0	0.2	0
NO2 (ppb) Average	706	35	38	99.6	7.4	0	3.1	-
NO (ppb) Average	706	35	38	99.6	3.9	-	0.7	-
NOX (ppb) Average	706	35	38	99.6	9.4	-	3.8	-
Temperature 2 m (C) Average	741	0	3	99.6	9.1	-	-0.2	-
Relative Humidity (%) Average	741	0	3	99.6	90.8	-	84.1	-
Wind Speed 10 m (km/h) Average	741	0	3	99.6	17	-	12	-
Wind Direction 10 m (deg) Average	741	0	3	99.6	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	0.74	1	-	0	0	0.1	0.4	0.9	1.8	9.7
H2S (ppb) Average	705	0.16	0.1	-	0	0.1	0.1	0.2	0.2	0.3	0.6
NO2 (ppb) Average	706	1.56	1.3	-	0	0.2	0.6	1.2	2.2	3.3	7.4
NO (ppb) Average	706	0.23	0.4	-	0	0	0	0	0.3	0.7	3.9
NOX (ppb) Average	706	1.79	1.5	-	0	0.2	0.7	1.4	2.5	3.8	9.4
Temperature 2 m (C) Average	741	-8.12	6.6	-	-24.5	-16.6	-12.5	-8.2	-4	0.3	9.1
Relative Humidity (%) Average	741	63.96	16.9	-	22.2	39	52.6	66	78.8	84.1	90.8
Wind Speed 10 m (km/h) Average	741	6.6	3	-	0	3	5	7	8	10	17
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
ALL PARAMETERS	13 Mar 2023 08:00	13 Mar 2023 08:00	1	DAS Failure - data not recorded
ALL PARAMETERS	19 Mar 2023 10:00	19 Mar 2023 10:00	1	DAS Failure - data not recorded

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 9.7 ppb on Mar 15 11:00 Maximum Daily Average: 2.2 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 3 17:00 Minimum Daily Average: 0.0 ppb on Mar 9

Maximum Diurnal Average: 1.9 ppb at hour 12 Minimum Diurnal Average: 0.4 ppb at hour 7

Monthly Average: 0.74 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.4 Q_3 = 0.9 P_{90} = 1.8 P_{99} = 5.1

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.2	0.4	0.6	0.8	0.6	0.4	0.7	1.1	1.6	1.3	2.4	1.4	1.2	1.3	1.1	0.7	1.2	1.3	1.2	1.3	0.9	1.4	1.8	1.1	2.4
2-Mar	0.6	Z	0.4	0.4	1.2	1.4	0.4	0.8	1.0	1.1	0.8	0.5	0.4	0.5	0.3	0.1	0.2	0.0	2.4	0.1	0.6	0.2	0.1	0.6	0.6	2.4
3-Mar	0.6	0.1	Z	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.6	1.5	1.5	0.7	0.4	0.1	0.0	0.0	0.1	0.9	1.7	1.8	2.1	3.7	0.7	3.7
4-Mar	4.8	5.2	4.1	Z	0.5	0.1	0.1	0.2	0.5	0.5	0.7	0.7	0.3	1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.8	5.2
5-Mar	0.2	0.1	0.0	0.0	Z	0.1	0.3	0.6	1.7	1.7	0.9	0.7	0.6	0.6	2.3	2.8	0.4	0.6	0.3	0.2	0.8	0.8	0.7	DF	0.7	2.8
6-Mar	0.9	0.9	0.8	0.9	0.9	0.7	1.4	1.3	1.0	0.9	0.6	0.6	0.8	0.5	Z	0.5	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.6	1.4
7-Mar	0.1	0.2	0.3	0.2	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.3	0.5
8-Mar	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	C	C	C	0.8	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.8
9-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
10-Mar	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3
11-Mar	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.5	0.9	1.9	0.6	0.9	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.3	1.9
12-Mar	0.0	0.0	0.6	0.4	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.1	0.1	0.4	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
13-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	DF	0.7	3.4	5.8	6.5	2.7	0.6	0.3	1.3	0.4	0.2	1.6	2.5	1.6	1.1	0.8	0.3	1.4	6.5
14-Mar	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	1.0	0.9	0.5	0.4	0.4	3.0	2.4	1.2	0.6	0.5	0.6	0.7	0.8	0.6	2.2	0.8	3.0
15-Mar	3.2	3.4	Z	3.2	2.2	1.7	1.5	1.8	4.5	2.6	9.7	5.1	2.0	1.7	1.0	1.0	1.3	1.4	1.3	0.9	0.7	0.5	0.3	0.3	2.2	9.7
16-Mar	0.3	0.4	0.4	Z	0.6	0.7	0.8	0.7	0.5	1.8	1.3	2.1	1.5	0.9	1.1	0.8	0.7	0.8	0.4	0.4	0.3	0.3	0.4	0.4	0.8	2.1
17-Mar	0.4	0.4	1.1	0.7	Z	0.3	0.3	0.3	0.4	0.5	0.6	0.8	0.3	0.5	0.5	0.2	0.1	0.0	0.0	0.0	0.8	1.1	1.0	0.6	0.5	1.1
18-Mar	0.4	0.2	0.1	0.0	0.0	Z	0.0	0.0	0.5	2.4	4.9	4.6	0.1	0.6	0.4	0.5	0.4	0.5	0.1	0.3	0.3	1.3	3.5	1.1	1.0	4.9
19-Mar	Z	0.4	0.7	1.3	0.8	0.8	0.7	0.7	0.7	DF	1.7	1.8	1.1	0.3	0.5	1.0	1.5	2.1	1.8	0.5	0.3	0.2	0.2	0.3	0.9	2.1
20-Mar	0.6	Z	1.0	1.4	0.8	0.7	0.8	0.9	1.2	1.7	1.7	1.7	1.2	1.2	1.7	0.9	0.7	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.9	1.7
21-Mar	0.2	0.3	Z	0.3	0.2	0.3	0.2	0.1	0.2	0.1	1.6	1.1	0.3	2.2	4.4	4.7	4.6	2.2	0.1	0.1	0.0	0.0	0.0	0.3	1.0	4.7
22-Mar	0.1	0.2	0.3	Z	0.2	0.1	0.1	0.0	0.3	1.0	0.9	0.6	0.8	0.7	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.5	0.8	0.6	0.5	1.0
23-Mar	0.7	0.7	1.0	0.8	Z	1.0	1.1	1.0	2.2	2.8	1.7	2.0	0.4	0.2	0.2	0.1	0.2	1.2	0.8	0.6	0.4	0.3	0.3	0.5	0.9	2.8
24-Mar	1.2	0.6	0.8	0.5	0.9	Z	0.2	0.7	2.3	2.7	3.1	3.7	3.3	2.7	2.0	2.0	2.8	1.0	0.7	0.5	1.2	1.8	1.2	0.6	1.6	3.7
25-Mar	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.6	0.9	2.3	0.8	0.9	1.0	0.5	0.8	0.8	1.4	0.5	0.6	0.5	0.3	0.2	0.3	0.2	0.6	2.3
26-Mar	0.1	Z	0.1	0.3	0.1	0.1	0.5	1.2	0.2	0.4	6.3	5.1	1.0	0.3	0.6	0.8	0.7	0.1	0.1	0.7	1.0	0.2	0.2	0.1	0.9	6.3
27-Mar	0.1	0.0	Z	0.1	0.1	0.1	0.2	0.8	2.5	1.5	0.9	1.4	0.8	1.9	2.2	1.3	2.0	1.5	1.4	0.3	0.1	0.0	0.1	0.1	0.8	2.5
28-Mar	0.2	0.3	0.7	Z	0.0	0.0	0.3	1.2	2.2	2.8	2.6	7.3	4.0	0.8	1.9	0.8	0.5	0.8	0.6	0.4	0.2	0.2	0.2	0.2	1.2	7.3
29-Mar	0.2	0.5	0.8	0.9	Z	1.4	0.5	1.7	2.8	1.8	0.9	0.5	0.6	0.8	0.6	0.6	0.8	2.7	0.9	0.4	0.2	0.2	0.1	0.3	0.9	2.8
30-Mar	0.4	0.1	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.4
31-Mar	Z	0.4	0.2	0.1	0.1	0.2	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.2	0.8	1.3	1.3	0.8	0.7	0.2	0.4	0.3	0.2	0.1	0.5	1.3
	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.6	1.0	1.2	1.7	1.9	0.9	0.8	1.0	0.9	0.8	0.6	0.6	0.4	0.5	0.4	0.5	0.5	Diurnal Average	
	4.8	5.2	4.1	3.2	2.2	1.7	1.5	1.8	4.5	3.4	9.7	7.3	4.0	2.7	4.4	4.7	4.6	2.7	2.4	2.5	1.7	1.8	3.5	3.7	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3 - March 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	17	79	57	35	34	44	71	82	84	63	30	26	11	16	51	7	707
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	79	57	35	34	44	71	82	84	63	30	26	11	16	51	7	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.6 ppb on Mar 15 22:00

Maximum Daily Average: 0.2 ppb on Mar 3

Minimum Value: 0.0 ppb on Mar 2 21:00

Maximum Diurnal Average: 0.2 ppb at hour 9

Monthly Average: 0.16 ppb

Minimum Daily Average: 0.1 ppb on Mar 8

Minimum Diurnal Average: 0.1 ppb at hour 6

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} = 0.4

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	36
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
2-Mar	0.1	0.1	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.0	0.3	0.2	0.3	0.2	0.4
3-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3
4-Mar	0.4	0.3	0.3	0.3	Z	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.4
5-Mar	0.3	0.2	0.2	0.3	0.3	Z	0.3	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.4	DF	0.2	0.5
6-Mar	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.2	0.2	0.1	0.1	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
7-Mar	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2
8-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2
9-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2
10-Mar	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
11-Mar	0.1	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2
12-Mar	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.1	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	0.3	0.2	0.3
13-Mar	Z	0.3	0.2	0.2	0.2	0.3	0.1	DF	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4
14-Mar	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3
15-Mar	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.4	0.1	0.6	0.4	0.1	0.2	0.6
16-Mar	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	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.3
17-Mar	0.1	0.1	0.1	0.1	0.1	Z	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	0.1	0.2	0.2	0.2	0.2	0.1	0.2
18-Mar	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3
19-Mar	0.5	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.4	DF	0.4	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.2	0.4	0.1	0.1	0.2	0.2	0.2	0.5
20-Mar	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
21-Mar	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
22-Mar	0.1	0.2	0.1	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3
23-Mar	0.3	0.3	0.3	0.4	0.4	Z	0.3	0.3	0.3	C	C	C	C	C	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.4
24-Mar	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25-Mar	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.3
26-Mar	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
27-Mar	0.1	0.1	0.0	Z	0.2	0.1	0.2	0.3	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.3
28-Mar	0.1	0.1	0.1	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1
29-Mar	0.1	0.1	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3
30-Mar	Z	0.2	0.1	0.2	0.5	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.5
31-Mar	0.2	Z	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2
	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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
	0.5	0.3	0.3	0.4	0.5	0.3	0.3	0.3	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.4	0.3	0.6	0.4	0.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	705	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: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	43	65	44	25	19	35	50	84	95	58	49	38	17	27	35	21	705
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	65	44	25	19	35	50	84	95	58	49	38	17	27	35	21	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H2S) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Jackfish 2/3 - March 2023

Maximum Value: 3.9 ppb on Mar 15 11:00

Maximum Daily Average: 0.7 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 1 01:00

Minimum Daily Average: 0.0 ppb on Mar 3

Maximum Diurnal Average: 0.7 ppb at hour 11

Minimum Diurnal Average: 0.1 ppb at hour 3

Monthly Average: 0.23 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.3 P_{90} = 0.7 P_{99} = 1.9

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	Z	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	0.5
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
3-Mar	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
4-Mar	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
5-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	3.4	1.1	0.1	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	0.3	3.4
6-Mar	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Mar	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
9-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.2	0.2	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	0.2
10-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3
11-Mar	0.1	Z	0.0	0.1	0.0	0.1	0.2	0.3	0.5	0.6	1.0	0.9	0.6	0.6	0.5	0.5	0.5	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	1.0
12-Mar	0.5	0.2	Z	0.4	0.6	0.8	0.5	1.6	0.9	0.6	0.7	0.5	0.4	0.8	0.5	0.6	0.4	0.5	0.1	0.0	0.2	0.2	0.3	0.4	0.5	1.6
13-Mar	0.3	0.3	0.3	Z	1.1	0.3	0.3	DF	0.6	1.2	1.4	1.3	0.3	0.3	0.2	0.5	0.2	0.3	0.0	0.0	0.0	0.1	0.0	0.1	0.4	1.4
14-Mar	0.1	0.1	0.2	0.2	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.0	0.4	1.1	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1
15-Mar	Z	0.0	0.0	0.0	0.1	0.0	0.1	1.7	1.6	1.6	3.9	3.2	1.4	1.0	0.8	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.9
16-Mar	0.0	Z	0.0	0.0	0.1	0.0	0.3	0.0	0.6	0.8	0.6	1.1	1.0	0.4	0.3	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.2	0.3	1.1
17-Mar	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.7	0.7	1.1	0.8	0.6	0.3	0.3	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.2	1.1
18-Mar	0.0	0.0	0.0	Z	0.0	0.6	0.1	0.8	0.6	3.1	1.9	1.9	0.1	0.3	0.0	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.4	3.1
19-Mar	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.4	1.8	DF	2.5	1.5	0.5	0.5	0.4	0.3	0.6	0.4	0.3	0.3	0.3	0.2	0.4	0.5	0.5	2.5
20-Mar	0.5	0.5	0.3	0.4	0.5	Z	0.4	0.7	0.6	0.9	0.6	0.8	0.6	0.5	0.8	0.3	0.5	0.3	0.3	0.2	0.0	0.0	0.2	0.2	0.4	0.9
21-Mar	Z	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.5	0.9	1.4	1.6	1.4	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.4	1.6
22-Mar	0.0	Z	0.1	0.0	0.1	0.4	0.2	0.6	0.5	1.2	0.9	0.9	0.8	0.9	1.0	0.8	0.5	0.4	0.4	0.3	0.4	0.1	0.3	0.3	0.5	1.2
23-Mar	0.2	0.4	Z	0.2	0.1	0.4	0.3	0.6	1.8	1.3	0.8	0.7	0.2	0.2	0.2	0.2	0.0	0.4	0.1	0.1	0.1	0.1	0.0	0.2	0.4	1.8
24-Mar	0.1	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.5	0.9	0.9	1.1	1.2	0.7	1.0	0.2	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.2
25-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	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	0.1	0.7
26-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.3	0.4	2.7	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	2.7
27-Mar	Z	0.0	0.0	0.0	0.0	0.5	0.2	0.9	0.8	0.7	0.4	0.5	0.4	0.9	0.9	0.6	0.6	0.4	0.2	0.4	0.2	0.4	0.4	0.1	0.4	0.9
28-Mar	0.3	Z	0.4	0.1	0.1	0.0	0.0	0.4	0.2	0.6	C	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	0.6
29-Mar	0.2	0.0	Z	0.0	0.0	0.1	0.1	0.5	0.6	0.5	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
30-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
31-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.2	0.2	0.4	0.4	0.2	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.6	0.6	0.7	0.7	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.5	0.5	0.4	0.4	1.1	0.8	0.5	1.7	3.4	3.1	3.9	3.2	1.4	1.0	1.4	1.6	1.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 20	42	63	46	25	19	33	54	78	98	56	50	39	16	28	38	21	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	63	46	25	19	33	54	78	98	56	50	39	16	28	38	21	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Jackfish 2/3

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 7.4 ppb on Mar 15 08:00

Maximum Daily Average: 3.1 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 18:00

Maximum Diurnal Average: 2.4 ppb at hour 8

Monthly Average: 1.56 ppb

Minimum Daily Average: 0.2 ppb on Mar 8

Minimum Diurnal Average: 1.1 ppb at hour 20

Percentiles: P_1 = 0.0 P_{10} = 0.2 Q_1 = 0.6 Median = 1.2 Q_3 = 2.2 P_{90} = 3.3 P_{99} = 5.8

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.3	0.5	0.9	1.4	Z	2.1	1.2	1.6	2.4	2.5	2.1	2.6	1.9	2.0	2.3	2.3	2.6	2.5	2.4	2.0	2.1	1.8	2.4	3.0	2.0	3.0
2-Mar	2.0	1.7	1.8	1.8	2.6	Z	3.2	3.2	4.2	4.2	4.1	3.7	2.6	1.8	1.2	0.7	0.4	0.0	2.0	0.0	0.0	0.0	0.0	0.2	1.8	4.2
3-Mar	Z	0.0	0.5	0.2	0.0	0.0	0.4	0.9	0.1	0.0	0.9	1.0	1.0	0.4	0.1	0.0	0.0	0.0	0.0	1.3	3.9	4.5	5.2	6.5	1.2	6.5
4-Mar	6.3	Z	5.1	3.6	0.7	0.5	0.3	0.3	0.4	0.2	0.6	0.7	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	1.0	0.9	6.3
5-Mar	1.0	0.9	Z	1.0	1.6	4.0	2.7	4.0	5.8	2.8	1.2	1.0	1.0	1.2	2.0	2.7	0.6	0.6	0.5	0.3	1.6	2.0	2.0	DF	1.8	5.8
6-Mar	1.4	1.4	1.2	1.7	2.4	3.1	3.7	3.8	3.2	1.8	1.6	0.9	Z	0.8	1.0	1.3	1.0	1.6	0.2	0.2	0.0	0.0	0.2	0.3	1.4	3.8
7-Mar	0.6	0.7	0.8	Z	0.5	0.7	0.7	1.1	1.5	1.0	1.1	1.5	1.1	0.6	0.9	0.7	0.4	0.4	0.1	0.2	0.5	0.0	0.0	0.0	0.7	1.5
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.9	0.6	0.3	0.1	1.3	0.1	0.1	0.1	0.1	0.0	0.2	1.3
9-Mar	0.5	1.1	0.9	1.1	0.6	Z	1.3	0.7	1.2	0.8	0.4	0.7	0.7	0.5	0.8	0.7	1.0	0.9	0.5	0.4	0.5	0.5	0.4	0.9	0.7	1.3
10-Mar	Z	0.8	0.9	1.4	0.7	0.5	0.8	0.8	0.9	1.1	1.4	1.4	1.2	1.2	1.2	0.9	1.1	1.2	1.0	0.7	0.4	0.5	0.4	0.4	0.9	1.4
11-Mar	0.3	Z	0.5	0.3	0.4	0.3	2.0	1.3	1.0	1.4	1.8	1.4	1.1	1.1	0.7	0.9	0.7	1.0	0.8	0.8	1.2	1.6	1.1	1.1	1.0	2.0
12-Mar	1.0	1.5	Z	1.7	2.2	2.4	2.8	3.7	1.9	1.2	0.8	1.0	0.9	1.3	1.3	1.9	1.5	1.3	1.2	1.8	1.9	0.9	0.7	0.7	1.5	3.7
13-Mar	0.9	0.9	1.1	Z	2.8	2.9	1.7	DF	2.3	3.6	3.9	3.8	2.3	1.1	0.6	1.2	0.7	0.2	1.6	2.6	1.5	1.2	0.8	0.7	1.7	3.9
14-Mar	0.8	0.4	0.2	1.0	1.0	Z	1.8	1.5	0.8	1.1	1.0	0.6	0.6	0.9	3.3	3.9	2.1	1.9	1.4	1.3	1.3	1.3	1.0	1.7	1.3	3.9
15-Mar	Z	3.9	4.0	4.6	4.1	4.4	3.8	7.4	4.2	3.1	5.2	3.7	2.1	1.9	1.5	1.7	1.9	2.2	3.5	3.0	2.2	1.5	1.1	1.2	3.1	7.4
16-Mar	1.2	Z	1.5	2.0	2.8	2.3	2.7	2.3	2.6	3.2	2.3	2.5	2.3	1.6	1.6	1.6	1.6	1.4	1.2	1.0	1.0	1.1	1.0	1.5	1.8	3.2
17-Mar	2.1	2.1	Z	2.9	2.3	2.3	2.6	2.7	2.7	2.9	2.8	2.6	2.1	1.7	1.5	1.6	1.7	1.3	1.9	1.7	2.5	3.6	4.2	3.8	2.4	4.2
18-Mar	3.7	3.7	3.3	Z	2.6	4.5	3.3	3.8	4.1	6.3	6.6	6.3	2.2	1.8	1.6	2.3	1.7	1.7	1.2	1.4	1.1	1.9	3.9	1.6	3.1	6.6
19-Mar	1.2	1.1	1.4	2.2	Z	1.4	1.8	3.7	5.7	DF	5.3	3.0	1.1	0.7	0.8	1.0	1.4	1.6	1.6	0.6	0.4	0.3	0.4	0.8	1.7	5.7
20-Mar	1.0	1.1	1.3	2.2	2.1	Z	2.3	2.8	2.2	2.7	2.9	3.3	3.0	2.6	3.3	1.9	1.2	0.7	0.6	0.3	0.2	0.2	0.1	0.2	1.7	3.3
21-Mar	Z	0.2	0.6	0.6	0.3	0.6	0.9	0.5	0.6	0.5	1.7	1.2	0.8	2.0	3.2	3.4	4.3	3.1	0.7	0.5	0.4	0.5	0.5	1.1	1.2	4.3
22-Mar	1.0	Z	1.7	2.0	1.9	1.6	1.8	2.1	1.8	2.7	2.9	2.2	2.5	2.4	2.8	2.8	2.3	2.3	2.8	2.3	2.2	2.8	3.9	3.3	2.4	3.9
23-Mar	3.9	4.1	Z	4.5	4.7	5.5	4.8	4.7	6.1	3.7	2.8	2.5	0.7	0.6	0.7	0.8	0.7	2.6	3.9	2.1	1.3	0.7	0.8	0.4	2.7	6.1
24-Mar	1.8	0.9	0.9	Z	1.4	0.8	0.6	1.4	2.3	2.4	2.3	2.7	2.3	1.9	1.8	1.7	2.7	1.6	1.3	3.1	4.2	2.3	1.5	1.4	1.9	4.2
25-Mar	1.2	0.8	0.7	1.0	Z	2.0	2.2	2.9	2.9	3.3	1.2	1.2	1.0	0.5	1.0	0.6	2.8	2.2	3.7	2.4	2.0	1.8	1.1	1.3	1.7	3.7
26-Mar	0.8	0.6	0.5	0.9	0.6	Z	2.4	3.8	2.0	1.9	5.5	3.8	0.9	0.6	0.5	0.7	0.5	0.1	0.0	0.7	1.8	1.0	1.0	0.2	1.3	5.5
27-Mar	Z	0.0	0.0	0.4	0.4	2.1	1.2	2.8	2.2	1.0	0.7	0.9	0.7	1.1	1.8	1.2	1.7	1.4	1.8	1.0	1.1	1.1	1.8	1.5	1.2	2.8
28-Mar	1.3	Z	1.6	1.3	1.3	1.6	1.4	3.1	1.9	2.1	C	C	C	C	1.4	0.8	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	1.0	3.1
29-Mar	0.3	0.6	Z	0.9	1.5	2.3	1.8	2.4	1.7	1.3	1.2	0.5	0.8	1.5	1.1	0.7	0.7	5.1	3.5	1.4	0.8	1.1	1.9	2.8	1.6	5.1
30-Mar	1.9	0.5	0.5	Z	1.1	1.0	0.9	0.2	0.3	0.1	0.2	0.6	0.4	0.4	0.1	0.0	0.0	0.8	0.3	0.1	0.5	0.5	0.3	0.4	0.5	1.9
31-Mar	0.9	1.0	0.6	0.6	Z	1.7	3.0	2.5	2.4	2.3	2.1	1.9	2.3	2.0	2.0	2.4	2.5	2.0	1.5	0.8	1.1	0.7	0.5	0.4	1.6	3.0
	1.4	1.2	1.3	1.6	1.6	1.9	1.9	2.4	2.3	2.0	2.2	2.0	1.4	1.2	1.4	1.4	1.3	1.4	1.4	1.1	1.2	1.2	1.3	1.3	Diurnal Average	
	6.3	4.1	5.1	4.6	4.7	5.5	4.8	7.4	6.1	6.3	6.6	6.3	3.0	2.6	3.3	3.9	4.3	5.1	3.9	3.1	4.2	4.5	5.2	6.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	42	63	46	25	19	33	54	78	98	56	50	39	16	28	38	21	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	63	46	25	19	33	54	78	98	56	50	39	16	28	38	21	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3 - March 2023

27 - 31

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3 - March 2023

Maximum Value: 9.4 ppb on Mar 18 10:00

Maximum Daily Average: 3.8 ppb on Mar 15

Minimum Value: 0.0 ppb on Mar 2 20:00

Minimum Daily Average: 0.2 ppb on Mar 8

Maximum Diurnal Average: 2.9 ppb at hour 11

Minimum Diurnal Average: 1.2 ppb at hour 20

Monthly Average: 1.79 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.2 Q_1 = 0.7 Median = 1.4 Q_3 = 2.5 P_{90} = 3.8 P_{99} = 7.9

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	35
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.3	0.5	0.9	1.4	Z	2.1	1.2	1.6	2.4	2.5	2.1	3.1	1.9	2.0	2.3	2.3	2.6	2.5	2.4	2.0	2.1	1.8	2.4	3.0	2.0	3.1
2-Mar	2.0	1.7	1.8	1.8	2.6	Z	3.2	3.2	4.2	4.3	4.4	3.8	2.6	1.8	1.2	0.7	0.4	0.0	2.0	0.0	0.0	0.0	0.0	0.2	1.8	4.4
3-Mar	Z	0.0	0.5	0.2	0.0	0.0	0.4	0.9	0.1	0.0	0.9	1.0	1.0	0.4	0.1	0.0	0.0	0.0	0.0	1.3	3.9	4.5	5.2	6.5	1.2	6.5
4-Mar	6.3	Z	5.1	3.6	0.7	0.5	0.3	0.3	0.4	0.2	0.6	0.7	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	1.0	0.9	6.3
5-Mar	1.0	0.9	Z	1.0	1.6	4.0	2.7	4.0	9.2	3.9	1.3	1.0	1.0	1.2	2.5	3.3	0.6	0.6	0.5	0.3	1.6	2.0	2.0	DF	2.1	9.2
6-Mar	1.4	1.4	1.2	1.7	2.4	3.3	3.7	3.8	3.7	1.8	1.6	0.9	Z	0.8	1.0	1.3	1.0	1.6	0.2	0.2	0.0	0.0	0.2	0.3	1.5	3.8
7-Mar	0.6	0.7	0.8	Z	0.5	0.7	0.7	1.1	1.5	1.0	1.1	1.5	1.1	0.6	0.9	0.7	0.4	0.4	0.1	0.2	0.5	0.0	0.0	0.0	0.7	1.5
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.9	0.6	0.3	0.1	1.3	0.1	0.1	0.1	0.1	0.0	0.2	1.3
9-Mar	0.5	1.1	0.9	1.1	0.6	Z	1.3	0.7	1.3	1.0	0.6	0.9	0.7	0.5	0.9	0.7	1.1	0.9	0.5	0.4	0.5	0.5	0.4	0.9	0.8	1.3
10-Mar	Z	0.8	0.9	1.4	0.7	0.5	0.8	0.8	0.9	1.1	1.7	1.7	1.4	1.5	1.3	1.0	1.2	1.2	1.0	0.7	0.4	0.6	0.5	0.5	1.0	1.7
11-Mar	0.4	Z	0.5	0.4	0.4	0.4	2.2	1.6	1.5	2.0	2.8	2.3	1.7	1.7	1.2	1.4	1.2	1.3	1.2	1.2	1.5	1.9	1.5	1.5	1.4	2.8
12-Mar	1.5	1.7	Z	2.1	2.8	3.2	3.3	5.3	2.8	1.8	1.5	1.5	1.3	2.1	1.8	2.5	1.9	1.8	1.3	1.8	2.1	1.1	1.0	1.1	2.1	5.3
13-Mar	1.2	1.2	1.4	Z	3.9	3.2	2.0	DF	2.9	4.8	5.3	5.1	2.6	1.4	0.8	1.7	0.9	0.5	1.6	2.6	1.5	1.3	0.8	0.8	2.2	5.3
14-Mar	0.9	0.5	0.4	1.2	1.1	Z	1.9	1.7	0.9	1.2	1.1	0.8	0.6	1.3	4.4	4.9	2.5	1.9	1.4	1.3	1.3	1.3	1.0	1.7	1.5	4.9
15-Mar	Z	3.9	4.0	4.6	4.2	4.4	3.9	9.1	5.8	4.7	9.1	6.9	3.5	2.9	2.3	2.1	2.2	2.3	3.5	3.0	2.2	1.5	1.1	1.2	3.8	9.1
16-Mar	1.2	Z	1.5	2.0	2.9	2.3	3.0	2.3	3.2	4.0	2.9	3.6	3.3	2.0	1.9	1.7	1.7	1.6	1.3	1.0	1.1	1.1	1.0	1.7	2.1	4.0
17-Mar	2.1	2.1	Z	2.9	2.3	2.4	3.0	3.4	3.4	4.0	3.6	3.2	2.4	2.0	1.6	1.8	1.9	1.3	2.0	1.7	2.5	3.6	4.3	3.8	2.7	4.3
18-Mar	3.7	3.7	3.3	Z	2.6	5.1	3.4	4.6	4.7	9.4	8.5	8.2	2.3	2.1	1.6	2.9	1.8	1.8	1.2	1.4	1.1	1.9	4.0	1.6	3.5	9.4
19-Mar	1.3	1.1	1.4	2.2	Z	1.4	1.8	4.1	7.5	DF	7.8	4.5	1.6	1.2	1.2	1.3	2.0	2.0	1.9	0.9	0.7	0.5	0.8	1.3	2.2	7.8
20-Mar	1.5	1.6	1.6	2.6	2.6	Z	2.7	3.5	2.8	3.6	3.5	4.1	3.6	3.1	4.1	2.2	1.7	1.0	0.9	0.5	0.2	0.2	0.3	0.4	2.1	4.1
21-Mar	Z	0.2	0.8	0.7	0.4	0.6	0.9	0.5	0.7	0.8	2.2	1.9	1.3	2.9	4.6	5.0	5.7	3.5	0.9	0.6	0.4	0.5	0.5	1.1	1.6	5.7
22-Mar	1.0	Z	1.8	2.0	2.0	2.0	2.0	2.7	2.3	3.9	3.8	3.1	3.3	3.3	3.8	3.6	2.8	2.7	3.2	2.6	2.6	2.9	4.2	3.6	2.8	4.2
23-Mar	4.1	4.5	Z	4.7	4.8	5.9	5.1	5.3	7.9	5.0	3.6	3.2	0.9	0.8	0.9	1.0	0.7	3.0	4.0	2.2	1.4	0.8	0.8	0.6	3.1	7.9
24-Mar	1.9	0.9	0.9	Z	1.4	0.9	0.6	1.5	2.8	3.3	3.2	3.8	3.5	2.6	2.8	1.9	3.3	1.6	1.4	3.1	4.2	2.3	1.5	1.4	2.2	4.2
25-Mar	1.2	0.8	0.7	1.0	Z	2.0	2.2	3.0	3.3	4.0	1.2	1.2	1.0	0.5	1.0	0.6	2.8	2.2	3.7	2.4	2.0	1.8	1.1	1.3	1.8	4.0
26-Mar	0.8	0.6	0.5	0.9	0.6	Z	2.4	3.9	2.3	2.3	8.2	5.8	1.1	0.6	0.5	0.7	0.5	0.1	0.0	0.7	1.9	1.0	1.0	0.2	1.6	8.2
27-Mar	Z	0.0	0.0	0.4	0.4	2.6	1.4	3.7	3.0	1.7	1.1	1.4	1.1	2.0	2.7	1.8	2.3	1.8	2.0	1.4	1.3	1.5	2.2	1.6	1.6	3.7
28-Mar	1.6	Z	2.0	1.4	1.4	1.6	1.4	3.5	2.1	2.7	C	C	C	C	1.4	0.8	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	1.1	3.5
29-Mar	0.5	0.6	Z	0.9	1.5	2.4	1.9	2.9	2.3	1.8	1.4	0.5	0.9	1.6	1.1	0.8	0.7	5.5	3.5	1.4	0.8	1.1	1.9	2.8	1.7	5.5
30-Mar	1.9	0.5	0.5	Z	1.1	1.0	0.9	0.2	0.3	0.1	0.2	0.9	0.5	0.5	0.1	0.1	0.0	1.0	0.3	0.1	0.5	0.5	0.3	0.4	0.5	1.9
31-Mar	0.9	1.0	0.6	0.6	Z	1.7	3.0	2.5	2.7	2.5	2.3	2.3	2.7	2.2	2.3	2.8	2.7	2.0	1.5	0.8	1.1	0.7	0.5	0.4	1.7	3.0
	1.5	1.2	1.3	1.6	1.8	2.1	2.0	2.7	2.9	2.6	2.9	2.6	1.7	1.6	1.7	1.7	1.5	1.5	1.5	1.2	1.3	1.2	1.3	1.4	Diurnal Average	
	6.3	4.5	5.1	4.7	4.8	5.9	5.1	9.1	9.2	9.4	9.1	8.2	3.6	3.3	4.6	5.0	5.7	5.5	4.0	3.1	4.2	4.5	5.2	6.5	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3 - March 2023

Concentration Ranges (ppb)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	42	63	46	25	19	33	54	78	98	56	50	39	16	28	38	21	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	63	46	25	19	33	54	78	98	56	50	39	16	28	38	21	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 706

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Jackfish 2/3 - March 2023

Maximum Value: 9.1 C on Mar 18 17:00

Maximum Daily Average: -0.2 C on Mar 18

Minimum Value: -24.5 C on Mar 5 06:00

Minimum Daily Average: -19.6 C on Mar 5

Maximum Diurnal Average: -2.6 C at hour 16

Minimum Diurnal Average: -12.8 C at hour 7

Monthly Average: -8.12 C

Percentiles: P_1 = -22.7 P_{10} = -16.6 Q_1 = -12.5 Median = -8.2 Q_3 = -4.0 P_{90} = 0.3 P_{99} = 7.4

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-17.0	-16.9	-16.5	-16.0	-15.4	-15.1	-15.1	-15.3	-14.9	-13.7	-11.9	-9.7	-8.5	-7.8	-7.9	-8.0	-9.1	-9.8	-10.3	-10.6	-10.5	-10.6	-10.6	-10.7	-12.2	-7.8
2-Mar	-10.8	-10.8	-10.8	-10.6	-10.2	-9.7	-9.3	-8.5	-7.1	-5.4	-3.3	-0.8	1.5	3.1	3.8	4.4	3.7	2.1	0.8	-1.4	-2.0	-2.6	-3.2	-3.6	-3.8	4.4
3-Mar	-4.1	-4.5	-4.9	-5.0	-5.3	-5.3	-4.8	-4.6	-4.0	-3.0	-2.2	-1.6	-1.7	-1.2	-1.1	-0.5	-1.9	-3.3	-4.1	-6.1	-8.1	-9.3	-10.2	-11.0	-4.5	-0.5
4-Mar	-11.7	-11.9	-12.1	-12.2	-12.5	-14.1	-15.2	-15.5	-15.2	-14.8	-13.8	-13.4	-13.4	-13.5	-13.4	-13.5	-13.5	-14.9	-16.0	-17.8	-19.3	-20.4	-21.1	-21.4	-15.0	-11.7
5-Mar	-22.7	-22.5	-22.9	-23.9	-23.9	-24.5	-24.0	-23.7	-21.2	-18.7	-17.4	-16.3	-15.9	-15.3	-13.8	-13.3	-13.4	-15.7	-18.6	-19.4	-19.9	-21.2	-21.6	DF	-19.6	-13.3
6-Mar	-20.2	-20.6	-21.9	-21.9	-21.4	-20.8	-20.8	-20.8	-19.9	-17.1	-15.5	-13.2	-11.2	-11.3	-11.0	-11.0	-10.9	-12.0	-13.1	-13.7	-14.0	-14.3	-14.6	-14.5	-16.1	-10.9
7-Mar	-14.6	-14.9	-15.2	-15.5	-16.0	-16.7	-17.4	-17.8	-16.5	-14.9	-13.0	-10.8	-8.8	-7.2	-6.1	-6.2	-6.8	-7.6	-9.2	-10.8	-12.0	-12.4	-13.3	-14.3	-12.4	-6.1
8-Mar	-15.6	-16.4	-16.8	-17.5	-18.0	-18.5	-18.9	-18.9	-17.5	-14.9	-11.7	-10.1	-8.6	-7.6	-6.8	-6.6	-7.1	-8.3	-10.2	-11.7	-13.4	-14.7	-16.0	-17.1	-13.4	-6.6
9-Mar	-17.6	-18.9	-19.9	-21.0	-22.0	-22.8	-23.0	-22.4	-20.2	-17.3	-13.8	-11.8	-10.1	-9.9	-9.3	-9.1	-9.5	-10.4	-11.4	-11.7	-12.0	-12.5	-12.9	-12.7	-15.1	-9.1
10-Mar	-13.2	-13.2	-13.3	-13.8	-13.9	-13.8	-13.8	-13.9	-13.3	-12.7	-11.0	-9.3	-7.8	-7.2	-7.0	-6.6	-6.7	-7.1	-8.0	-7.9	-8.1	-8.8	-9.8	-10.8	-10.5	-6.6
11-Mar	-11.5	-11.9	-12.3	-12.1	-12.5	-13.6	-14.4	-14.1	-12.9	-10.9	-9.1	-6.5	-4.8	-4.2	-3.6	-3.3	-3.8	-4.2	-4.9	-6.0	-7.2	-8.2	-8.9	-9.5	-8.8	-3.3
12-Mar	-9.9	-11.2	-11.4	-11.1	-11.4	-11.6	-12.2	-12.1	-10.9	-9.1	-7.6	-6.4	-5.6	-5.0	-4.9	-4.7	-4.6	-5.2	-6.0	-7.7	-9.5	-11.3	-12.5	-13.2	-9.0	-4.6
13-Mar	-14.3	-14.5	-15.4	-16.9	-17.1	-17.0	-16.6	DF	-14.0	-12.4	-9.8	-8.4	-6.5	-5.3	-4.6	-4.4	-5.5	-6.6	-7.6	-8.0	-8.5	-8.3	-8.3	-8.2	-10.4	-4.4
14-Mar	-8.2	-8.2	-8.2	-8.2	-8.1	-8.1	-8.1	-8.0	-8.0	-8.4	-7.9	-7.9	-6.4	-6.9	-7.3	-8.1	-8.4	-8.7	-9.2	-10.0	-10.5	-10.4	-10.9	-11.6	-8.6	-6.4
15-Mar	-13.8	-15.4	-16.7	-17.1	-18.2	-19.0	-19.3	-18.6	-16.1	-14.0	-12.4	-10.3	-8.2	-6.8	-5.7	-5.2	-5.2	-6.3	-9.1	-10.5	-11.9	-11.5	-12.7	-13.6	-12.4	-5.2
16-Mar	-12.5	-12.2	-12.0	-11.8	-12.3	-12.0	-12.2	-11.8	-10.4	-7.7	-6.2	-4.8	-2.6	-1.5	-1.5	-0.8	-0.4	-1.5	-4.8	-6.6	-7.4	-8.8	-8.6	-9.2	-7.5	-0.4
17-Mar	-9.4	-11.2	-10.8	-11.2	-11.6	-11.4	-11.7	-11.0	-7.3	-2.9	1.0	4.4	6.1	7.1	7.6	7.8	7.4	6.2	3.6	0.8	-0.8	-1.9	-2.7	-3.5	-2.3	7.8
18-Mar	-4.3	-4.9	-5.4	-6.3	-7.1	-8.1	-9.0	-8.4	-5.8	-3.1	0.8	4.0	7.3	8.3	8.9	8.9	9.1	7.8	3.9	2.1	-0.1	-1.0	-1.2	-1.5	-0.2	9.1
19-Mar	-2.3	-2.6	-3.1	-4.0	-4.2	-4.7	-5.7	-5.3	-2.0	DF	2.4	3.7	5.1	5.5	5.7	5.9	5.4	3.4	1.0	-0.3	-1.2	-2.0	-3.0	-3.2	-0.2	5.9
20-Mar	-3.4	-3.5	-3.8	-4.4	-5.4	-5.2	-5.3	-5.2	-4.2	-2.0	1.0	2.0	2.1	2.6	2.3	-0.1	-3.0	-5.2	-6.6	-7.3	-8.1	-8.4	-8.6	-8.8	-3.7	2.6
21-Mar	-8.8	-9.1	-9.3	-9.5	-9.7	-9.7	-9.9	-9.9	-9.3	-8.8	-8.1	-6.8	-5.2	-4.7	-3.9	-3.4	-3.2	-4.2	-6.2	-7.9	-8.8	-9.7	-11.0	-12.0	-7.9	-3.2
22-Mar	-12.6	-13.2	-12.5	-12.4	-13.3	-14.1	-14.3	-13.2	-8.5	-6.2	-4.4	-2.5	-1.2	0.4	1.9	2.7	3.1	2.3	0.0	-1.6	-3.1	-4.3	-5.5	-6.3	-5.8	3.1
23-Mar	-6.5	-6.5	-5.6	-5.0	-4.9	-5.1	-4.9	-4.0	-1.6	1.7	5.5	6.7	7.2	6.8	6.0	4.7	4.6	3.4	0.2	-2.2	-4.2	-5.9	-7.7	-8.5	-1.1	7.2
24-Mar	-8.5	-8.5	-8.7	-8.8	-9.0	-9.2	-9.5	-9.4	-8.1	-6.8	-6.2	-5.2	-4.0	-3.1	-2.2	-1.2	-1.1	-1.7	-3.8	-6.1	-7.1	-8.0	-8.3	-7.7	-6.3	-1.1
25-Mar	-7.3	-7.8	-8.1	-8.0	-8.4	-9.2	-9.3	-7.9	-5.1	-2.3	-0.3	0.6	1.5	1.9	2.1	1.5	0.9	-1.0	-3.4	-4.8	-6.1	-7.2	-8.5	-10.0	-4.4	2.1
26-Mar	-11.4	-12.4	-13.5	-14.4	-15.1	-15.3	-15.9	-15.9	-14.0	-12.0	-11.1	-9.3	-8.6	-8.0	-7.4	-7.8	-8.7	-9.7	-11.4	-13.5	-15.0	-16.4	-17.2	-17.7	-12.6	-7.4
27-Mar	-18.0	-19.0	-19.9	-19.5	-19.3	-19.5	-19.4	-17.3	-13.2	-11.7	-10.6	-9.4	-8.4	-7.9	-6.9	-6.5	-6.4	-7.0	-8.4	-10.7	-11.3	-11.4	-11.1	-12.6	-12.7	-6.4
28-Mar	-13.0	-12.6	-11.6	-12.8	-14.8	-15.9	-16.6	-14.4	-11.5	-9.1	-7.4	-6.0	-4.9	-4.0	-2.7	-2.1	-1.9	-1.9	-2.6	-3.6	-4.3	-5.3	-5.3	-4.5	-7.9	-1.9
29-Mar	-4.3	-4.8	-4.9	-4.8	-4.7	-5.1	-5.5	-3.5	-1.5	-0.9	-0.4	-0.5	-0.3	-0.7	-0.5	-0.3	-0.1	-1.4	-2.6	-3.5	-4.8	-5.9	-7.0	-7.7	-3.1	-0.1
30-Mar	-7.5	-8.1	-8.8	-9.4	-8.7	-8.6	-8.4	-7.7	-6.6	-4.8	-2.4	-1.1	0.1	0.8	1.5	1.3	1.4	0.9	0.3	-0.6	-1.4	-1.4	-1.7	-2.3	-3.5	1.5
31-Mar	-2.8	-3.4	-4.0	-4.6	-5.1	-5.8	-6.2	-5.7	-4.3	-3.2	-2.0	0.4	2.4	4.2	5.3	6.1	5.8	4.9	2.5	0.0	-1.3	-1.9	-3.1	-3.2	-1.0	6.1
	-10.9	-11.3	-11.6	-11.9	-12.2	-12.6	-12.8	-12.2	-10.5	-8.9	-6.7	-5.2	-3.9	-3.2	-2.7	-2.6	-2.9	-4.0	-5.6	-7.1	-8.1	-8.9	-9.6	-9.7	Diurnal Average	
	-2.3	-2.6	-3.1	-4.0	-4.2	-4.7	-4.8	-3.5	-1.5	1.7	5.5	6.7	7.3	8.3	8.9	8.9	9.1	7.8	3.9	2.1	-0.1	-1.0	-1.2	-1.5	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Jackfish 2/3 - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	28	3.78	3.78
-20 - 0	635	85.70	89.47
0 - 10	78	10.53	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Jackfish 2/3 - March 2023

Maximum Value: 90.8 % on Mar 14 06:00

Maximum Daily Average: 84.1 % on Mar 14

Minimum Value: 22.2 % on Mar 28 15:00

Minimum Daily Average: 45.1 % on Mar 25

Maximum Diurnal Average: 77.7 % at hour 7

Minimum Diurnal Average: 47.3 % at hour 16

Monthly Average: 63.96 %

Percentiles: P_1 = 24.1 P_{10} = 39.0 Q_1 = 52.6 Median = 66.0 Q_3 = 78.8 P_{90} = 84.1 P_{99} = 89.8

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	79.6	80.3	81.2	81.9	82.6	82.9	83.1	83.0	82.1	80.2	75.3	69.1	65.4	65.3	68.9	70.7	75.5	79.3	81.9	83.4	83.0	82.6	81.7	81.8	78.4	83.4
2-Mar	83.4	83.3	82.9	82.5	81.6	80.7	80.0	77.5	71.0	65.7	61.6	55.8	49.9	45.8	43.8	40.7	44.8	46.1	56.1	78.3	81.2	81.0	85.5	87.5	68.6	87.5
3-Mar	81.8	73.5	71.1	71.0	75.7	81.4	82.6	82.0	75.1	67.7	64.6	62.7	63.8	57.9	58.0	51.1	55.1	60.0	65.2	70.1	75.7	81.3	81.3	80.3	70.4	82.6
4-Mar	83.4	81.5	79.8	79.6	77.0	75.5	76.7	75.6	73.8	67.8	60.5	60.1	59.5	57.9	55.4	55.2	53.5	58.7	62.8	69.0	73.1	77.6	79.2	77.8	69.6	83.4
5-Mar	78.2	78.0	77.2	76.1	76.1	75.7	77.0	76.1	74.2	67.1	61.8	51.9	49.2	47.4	43.5	41.9	42.0	48.1	59.0	62.8	63.7	66.5	69.8	DF	63.6	78.2
6-Mar	62.3	62.0	65.4	67.3	69.8	71.4	70.9	70.8	70.5	64.9	64.3	60.9	51.4	58.1	59.4	63.5	63.9	72.4	77.1	75.8	73.8	70.5	64.3	59.5	66.3	77.1
7-Mar	57.2	55.9	58.0	62.2	66.7	69.6	72.4	73.8	69.6	66.3	61.7	57.3	53.7	52.0	49.5	51.6	52.7	52.7	48.6	49.8	52.1	49.8	52.6	55.5	58.0	73.8
8-Mar	59.0	61.4	62.3	64.3	65.9	67.6	68.5	67.6	62.0	55.2	45.1	37.5	34.0	31.0	29.1	28.3	28.7	31.8	36.6	39.8	44.6	47.5	50.7	54.2	48.9	68.5
9-Mar	56.4	60.2	63.2	65.8	68.3	70.7	71.9	71.8	66.0	60.2	54.0	51.3	50.5	53.3	55.9	57.3	57.1	62.2	70.8	71.7	69.2	71.0	74.9	76.5	63.8	76.5
10-Mar	76.9	78.4	77.6	78.2	79.5	79.5	79.0	78.9	76.0	71.9	68.9	67.4	64.7	65.1	69.4	69.7	68.5	70.2	71.5	68.9	71.7	75.8	76.8	76.4	73.4	79.5
11-Mar	73.1	73.9	77.7	80.5	82.5	84.8	84.5	84.4	82.4	79.3	73.7	64.9	60.0	59.1	57.9	56.4	61.2	68.0	70.3	80.1	80.0	81.7	84.7	88.0	74.5	88.0
12-Mar	88.0	88.2	88.0	86.8	86.8	86.7	86.4	86.0	84.6	82.3	75.6	71.8	68.3	66.5	65.2	64.6	63.3	63.2	65.1	67.0	71.3	77.0	80.9	83.6	77.0	88.2
13-Mar	85.1	84.7	83.7	82.6	82.3	82.4	82.8	DF	81.6	80.2	70.2	63.8	58.6	55.7	55.0	56.0	63.0	73.9	85.0	87.6	88.7	88.8	89.1	89.4	77.0	89.4
14-Mar	90.1	90.4	90.5	90.7	90.6	90.8	90.6	90.3	89.1	86.4	82.3	81.3	75.8	76.5	76.0	74.1	74.2	78.4	81.6	81.9	86.6	84.9	83.7	81.6	84.1	90.8
15-Mar	83.9	85.0	85.4	85.1	83.8	82.9	82.0	81.6	80.1	76.1	71.1	65.4	61.9	59.9	58.0	57.3	58.5	66.9	81.2	82.8	85.5	85.1	86.0	86.3	76.3	86.3
16-Mar	86.0	84.5	83.1	82.8	83.3	81.9	81.7	81.6	80.6	78.1	72.8	68.9	61.7	58.0	58.7	56.6	54.4	58.6	73.3	80.3	81.6	84.2	82.2	82.0	74.9	86.0
17-Mar	80.9	83.4	81.5	81.7	82.9	83.0	84.0	82.3	71.8	59.9	45.9	35.8	30.7	26.8	24.3	23.5	23.4	24.9	31.1	39.1	44.2	47.0	49.2	52.6	53.8	84.0
18-Mar	54.9	56.8	58.3	60.0	63.8	67.7	70.2	68.5	60.4	53.6	41.4	33.7	26.5	23.9	23.5	24.4	24.0	26.2	33.9	37.9	49.3	49.9	47.8	49.1	46.1	70.2
19-Mar	51.4	52.1	54.5	58.3	61.2	63.2	67.4	65.2	53.9	DF	42.9	41.7	40.7	40.2	39.0	38.0	38.8	42.0	48.4	54.8	58.4	62.4	66.8	68.0	52.6	68.0
20-Mar	69.0	70.1	71.2	74.3	80.6	81.6	81.9	82.5	76.2	65.3	53.2	47.7	45.3	43.2	51.8	65.3	76.0	86.4	88.2	88.9	88.8	89.2	88.8	88.5	73.1	89.2
21-Mar	88.4	88.4	88.5	88.2	87.7	87.8	87.8	87.6	85.6	81.1	77.4	67.8	58.8	54.8	50.0	46.6	46.4	51.1	61.6	67.7	70.7	74.6	78.8	81.1	73.3	88.5
22-Mar	83.4	84.7	85.7	86.0	86.3	85.3	84.8	84.9	77.5	61.2	54.6	50.9	47.5	43.1	40.5	39.4	39.4	42.0	49.8	54.1	58.8	62.0	66.3	69.6	64.1	86.3
23-Mar	71.5	73.1	72.8	71.8	71.5	73.0	71.4	67.8	59.6	50.9	41.7	36.3	32.4	33.9	35.7	41.1	38.9	43.6	56.9	63.6	67.0	69.3	75.5	80.4	58.3	80.4
24-Mar	81.0	79.6	75.8	75.4	75.4	78.3	78.2	75.8	66.6	60.1	55.8	50.5	43.0	39.5	37.0	34.2	33.4	34.9	41.5	51.7	54.8	55.5	55.7	50.5	57.7	81.0
25-Mar	46.8	49.0	53.4	53.8	58.1	65.0	69.3	67.5	60.0	47.5	41.3	40.2	36.8	29.4	28.2	28.5	26.9	30.6	38.7	38.4	38.8	41.2	43.9	47.8	45.1	69.3
26-Mar	50.2	55.3	61.5	66.6	70.6	72.7	74.2	72.1	63.1	53.7	52.2	45.6	41.6	36.9	31.6	27.6	27.6	30.1	33.2	39.3	44.4	48.7	53.9	54.5	50.3	74.2
27-Mar	56.8	60.3	63.4	61.4	60.4	61.1	60.5	56.3	42.4	37.1	35.7	37.9	35.5	38.3	36.7	36.3	36.7	43.6	47.8	56.4	59.7	60.9	58.6	63.4	50.3	63.4
28-Mar	69.6	70.0	68.1	70.8	75.6	79.2	78.3	66.5	52.3	42.7	34.7	30.7	27.9	22.4	22.2	22.4	24.5	27.2	29.1	32.5	38.7	42.9	43.6	43.6	46.5	79.2
29-Mar	47.5	50.9	53.2	54.7	55.7	57.7	59.9	54.8	54.3	54.7	55.8	57.3	58.1	60.5	60.3	59.7	58.1	65.0	66.6	68.0	72.2	75.1	77.6	79.1	60.7	79.1
30-Mar	78.4	81.1	83.6	86.8	85.2	84.2	84.1	81.0	75.0	63.5	45.1	36.5	33.0	35.9	38.6	40.3	40.7	43.4	46.1	49.3	57.5	57.9	58.7	62.3	60.3	86.8
31-Mar	68.2	72.7	76.4	80.3	83.5	85.6	86.3	82.8	74.4	69.5	66.6	60.1	55.4	50.2	46.2	43.4	44.1	46.6	54.3	62.5	67.1	68.4	71.7	74.1	66.3	86.3
	71.7	72.5	73.4	74.4	75.8	77.1	77.7	75.9	70.7	65.0	58.3	53.6	49.7	48.0	47.4	47.3	48.2	52.5	58.5	63.0	66.2	68.1	69.7	70.8	Diurnal Average	
	90.1	90.4	90.5	90.7	90.6	90.8	90.6	90.3	89.1	86.4	82.3	81.3	75.8	76.5	76.0	74.1	76.0	86.4	88.2	88.9	88.8	89.2	89.1	89.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Jackfish 2/3 - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	81	10.93	10.93
40 - 60	208	28.07	39.00
60 - 80	282	38.06	77.06
80 - 100	170	22.94	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Jackfish 2/3 - March 2023

Maximum Speed: 17 km/h on Mar 2 16:00

Maximum Daily Speed Average: 9.8 km/h on Mar 2

Minimum Speed Value: 0 km/h on Mar 20 05:00

Maximum Diurnal Speed Average: 3.3 km/h at hour 3

Monthly Average Velocity: 1.6 km/h 181.0 deg

Minimum Daily Speed Average: 0.8 km/h on Mar 5

Minimum Diurnal Speed Average: 0.5 km/h at hour 17

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 5$ Median = 7 $Q_3 = 8$ $P_{90} = 10$ $P_{99} = 13$

Hours in Service: 744

Hours of Data: 741

Hours of Missing Data: 3

Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE7	SSE6	S7	SSE5	SSE5	SSE6	SSE6	SSE6	S7	S9	S10	S9	SSW11	SSW11	S10	S10	S10	S9	S9	S10	SSW12	S9	S10	S10	S8.2	SSW12
2-Mar	S9	S10	S10	S10	S9	SSW10	S9	SSW11	SSW13	SSW13	SSW13	SW14	WSW16	WSW16	WSW16	WSW17	W10	WSW10	W11	W12	W10	WSW10	WSW10	SW12	SW9.8	WSW17
3-Mar	WSW14	WSW13	WSW13	WSW12	WSW9	WSW8	WSW9	WSW10	WSW9	WSW11	W10	WNW9	WNW9	W11	NW7	NW8	NNW7	NW6	NW6	NNE7	NNE7	NNE7	NNE6	NNE6	W6.0	WSW14
4-Mar	N4	N3	N3	WNW3	NW6	NW6	NW8	NW8	NW7	WNW8	WNW7	WNW8	WNW8	WNW9	NW8	NW8	NW8	NNW7	NNW6	W1	N2	NW1	N3	N4	NW5.2	WNW9
5-Mar	N4	N4	NW1	SSW2	WSW3	SSW2	S1	SW3	WNW3	NNW4	NW6	N6	N4	NNE3	WSW1	SSW1	NE3	NE3	SSE1	S3	SE3	ESE2	ESE3	DF	N0.8	N6
6-Mar	SSE5	SSE7	SSE8	S8	SSE7	SSE6	SSE6	SSE7	SSE6	SSE6	SE7	SE7	SSE8	SSE8	SE7	SE6	SSE6	SE6	ESE5	ESE6	ESE5	SE7	SE7	SE7	SSE6.2	SSE8
7-Mar	SE6	SE6	SE6	SSE8	SSE7	SSE8	S5	SSE5	S8	SSE9	SSE7	SSE9	SSE10	SSE10	SSE11	SSE11	SSE11	SSE9	SSE7	SE4	SE5	SE7	SE5	SE5	SSE7.3	SSE11
8-Mar	SE4	SE4	SE5	ESE5	ESE6	ESE5	ESE5	SSE6	SE7	SE7	SE9	SSE9	SE7	ESE9	E8	E8	E8	E7	E6	ESE6	ESE5	SSE5	SSE6	S6	ESE5.9	SE9
9-Mar	S6	S5	S5	SSE5	S5	SSE5	SSE5	SSE6	SSE6	SE7	SE9	SE9	SE10	SSE11	SSE10	SSE9	SSE9	SSE8	SE9	SE9	SE10	SE8	SE6	SSE8	SSE7.4	SSE11
10-Mar	SSE7	SSE6	SSE7	SE7	SE6	SE7	SE7	SE7	SE7	SE8	SE7	SE10	ESE9	SE9	SE9	ESE8	ESE8	ESE8	ESE5	ESE5	ESE8	ESE7	ESE5	E6	SE7.0	SE10
11-Mar	ESE6	ESE6	E4	ESE3	E3	SE4	ESE4	ESE3	NNE3	NE5	ENE6	ENE7	ESE7	E8	ESE7	SE7	SE5	SSE6	SSE4	SSE3	S4	SSW5	SSW4	S4	ESE3.7	E8
12-Mar	S4	S3	S4	S4	S4	S5	S4	S5	S5	SSW7	SW8	SSW7	SSW8	S9	S8	SSW8	S7	S6	SSE5	S6	SSW7	SSW8	SSW6	SSW6	SSW5.8	S9
13-Mar	S5	S6	S7	S5	S4	SSE5	SSE5	DF	SE4	ENE6	ENE9	ENE9	ENE10	NE10	NE12	ENE12	ENE14	ENE13	ENE11	ENE9	ENE8	ENE9	NE8	NE7	ENE6.0	ENE14
14-Mar	NE6	NE6	NE5	NNE3	N3	NNE5	NE5	N3	NNW4	NNW6	N6	NNW5	NW6	NW8	WNW10	WNW9	NW8	NW6	NW6	NW5	NW4	NW5	NW6	NW5	NNW4.5	WNW10
15-Mar	NNW3	NNW3	WNW1	NNW1	SSW1	SSW1	NE1	NNW0	NNE3	NE4	NE5	NE4	NE4	NNE5	N4	N5	N4	NE3	E3	ESE4	ESE4	E5	SE3	SSE3	NE1.8	NE5
16-Mar	S5	S7	S6	S5	SSE7	SSE8	S8	S6	SSW5	W4	NW4	NW3	N4	N7	N6	NNE4	NNW4	NW2	SSE2	S2	SSW5	S6	SSE7	S8	S2.3	S8
17-Mar	S8	S9	S9	S10	S11	S10	S10	S10	S10	SSW10	SW10	SW9	WSW10	WSW13	WSW13	WSW13	SW12	SW11	SW8	SSW6	SSW7	S7	S8	SSW8	SSW8.8	WSW13
18-Mar	SSW8	SSW9	SSW9	SW9	SSW7	SSW8	SSW8	SSW10	SW11	SW9	W5	WSW5	NNW6	NW4	W7	W7	WNW5	WNW4	WSW2	NNW1	NNE1	E1	ENE0	ESE1	SW4.3	SW11
19-Mar	SW4	SW2	NNE1	WSW1	NNE4	NNE6	NE6	NE4	NE4	DF	NE7	ENE8	ENE8	NE10	NE11	ENE9	E8	ENE9	ENE6	E6	ESE6	SSE8	SSE8	S9	ENE4.2	NE11
20-Mar	S8	S7	S8	S5	E0	SSE3	SSE4	SE2	S5	S6	S4	SSW5	SW8	SW4	N7	NNE13	NNE12	NNE10	N8	N9	N8	N6	N6	N5	NE0.8	NNE13
21-Mar	N4	N6	N5	N6	NNW5	N4	NNW5	N5	NNE5	N6	NNE6	N5	NNE6	NE5	ENE4	NE6	NE6	E4	ESE5	SE4	SSE5	SSE6	SSE8	SSE8	NE2.6	SSE8
22-Mar	S7	SSE6	S7	S7	S7	S7	S8	S7	SSW12	SSW12	SSW12	SSW11	SSW12	SSW11	SSW11	SW11	SW10	SW9	SW5	SSW7	S7	S8	S10	S10	SSW8.6	SSW12
23-Mar	S10	SSW10	SSW7	SW9	SW10	SW10	WSW9	W7	WSW5	WSW6	NW7	WNW8	NW9	NW8	NW8	NW9	NW8	NNE9	NNE10	NNE11	NNE9	NNE9	NNE10	NNE9	WNW3.2	NNE11
24-Mar	NE8	NE8	NNE8	NNE7	NE7	NNE5	NNE5	NNE6	NE7	NNE7	ENE9	NE7	NNE5	ENE1	WNW2	WNW1	W2	N2	ESE2	SSE3	S3	S4	S4	SSW6	NE2.9	ENE9
25-Mar	SSW7	SW7	SW7	SW8	SSW8	SW8	SW8	WSW7	WSW7	WNW6	WNW6	NW7	NW7	NW8	NW9	NNW8	NNW9	NNW9	NNE7	NNE6	NNE5	NNE5	NNE4	NNE4	WNW3.3	NW9
26-Mar	NNE3	N4	NNE4	NNE5	NNE5	NNE5	NNE6	NE7	NE6	NE7	NE8	NNE7	NE9	NNE8	NNE9	NE9	NNE10	NNE8	NNE8	NNE5	NE4	ENE3	E4	SE3	NNE5.8	NNE10
27-Mar	SSE3	SSW4	SW3	SW4	SW5	SW6	WSW5	W4	NNW5	NNW5	WNW6	WNW8	W7	W8	W9	WNW8	WNW9	WNW7	WNW5	SW3	SW3	SW6	SW7	SW8	W4.7	WNW9
28-Mar	WSW6	W6	W3	SE1	NE2	NNE3	NNE5	NE6	ENE6	E5	E2	SW2	WSW5	SW7	WSW8	WSW8	WSW8	WSW8	SW5	SW7	SW11	SW10	SW11	SW12	SW3.5	SW12
29-Mar	SW12	SW10	SW10	SW10	SW9	WSW7	W5	NW5	N6	N9	N9	NNW7	N7	N7	N6	N7	NNE8	NE10	NNE9	NE5	NNE5	NE5	NE5	NE4	NNW2.7	SW12
30-Mar	NNE3	NNE2	NE3	NE3	E3	SSE2	S4	S4	S6	SSW5	SE3	SSE5	SSW5	SW7	SW7	SSW8	SSW7	S6	SSW5	SSW6	S5	S8	SSE6	SSE7	S3.7	S8
31-Mar	SSE5	SSE5	SSE5	SSE7	SSE7	SSE7	SSE8	S9	S7	S6	SSE5	S4	SW4	SW4	WNW4	N4	NNE5	NNE6	NNE6	NNE5	NE5	NE5	E2	SSW3	SSE2.3	S9
	S3.2	S3.1	S3.3	S3.2	S2.9	S3.0	S2.7	S2.4	S2.3	SSW1.9	S0.8	SSW1.0	SW1.0	WSW1.6	W1.3	WNW0.8	NNW0.5	NE0.7	E1.0	ESE1.5	SE1.6	SSE2.3	SSE2.4	S2.9	Diurnal Average	
	WSW14	WSW13	WSW13	WSW12	S11	SW10	S10	SSW11	SSW13	SSW13	SSW13	SW14	WSW16	WSW16	WSW16	WSW17	ENE14	ENE13	W11	W12	SSW12	WSW10	SW11	SW12	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

Jackfish 2/3 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Jackfish 2/3 - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	268	36.17	36.17
6 - 11	442	59.65	95.82
12 - 19	31	4.18	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Jackfish 2/3 - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	24	32	23	4	12	19	17	27	33	15	14	9	6	9	11	13	268
6 - 11	20	33	23	18	8	16	37	60	69	37	34	21	10	19	28	9	442
12 - 19	0	2	1	3	0	0	0	0	0	8	5	11	1	0	0	0	31
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	44	67	47	25	20	35	54	87	102	60	53	41	17	28	39	22	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Jackfish 2/3

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Jackfish 2/3 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 16:00

Minimum Value: 0 km/h on Mar 5 20:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

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

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Jackfish 2/3 - March 2023

Direction of Maximum Speed: 257 deg on Mar 2 16:00
Direction of Maximum Daily Speed Average: 225.9 deg on Mar 2

Direction of Minimum Speed: 80 deg on Mar 20 05:00

Direction of Minimum Daily Speed Average: 0.8 deg on Mar 5

Monthly Average Direction: 181.0 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	166	166	170	164	157	162	160	159	173	188	180	190	193	196	186	184	191	189	190	190	192	183	191	183	182.2
2-Mar	174	172	169	174	180	192	186	194	207	208	213	221	237	244	246	257	273	251	268	267	276	252	247	235	225.9
3-Mar	243	248	241	249	256	250	245	250	255	258	269	289	294	281	317	324	330	323	318	22	33	29	28	22	281.1
4-Mar	7	1	354	302	311	313	309	309	306	301	302	290	302	299	313	321	326	334	333	273	3	316	1	3	316.7
5-Mar	9	11	322	212	239	208	181	227	298	342	322	1	8	31	238	212	34	39	152	169	134	109	113	DF	357.6
6-Mar	155	158	167	170	168	166	166	167	166	159	145	145	150	162	143	139	147	131	109	104	119	127	124	127	147.8
7-Mar	127	129	142	159	166	162	174	165	171	166	159	151	151	165	155	151	160	155	153	141	127	137	135	139	153.3
8-Mar	146	142	128	117	105	106	115	150	145	144	131	147	130	109	94	85	94	87	101	103	121	154	156	171	122.4
9-Mar	175	175	174	166	169	166	160	154	153	146	140	135	145	152	152	149	158	148	131	127	137	142	145	154	149.7
10-Mar	154	153	147	138	132	128	134	129	136	141	138	134	122	139	133	111	108	109	112	119	121	102	103	99	127.5
11-Mar	106	119	101	105	99	125	122	105	31	40	64	75	106	89	122	134	143	151	165	161	185	194	197	186	119.3
12-Mar	186	187	190	189	186	182	177	175	186	211	214	206	201	191	186	194	178	184	164	187	207	212	207	202	193.6
13-Mar	182	184	175	172	169	167	164	DF	133	75	67	71	65	53	46	61	68	63	70	68	63	64	51	38	77.8
14-Mar	42	45	41	24	3	30	41	10	341	345	357	333	315	304	294	300	306	317	313	317	308	317	311	322	334.8
15-Mar	329	340	297	333	207	195	46	336	29	34	37	52	34	13	356	7	6	37	99	116	111	94	136	159	44.0
16-Mar	170	170	175	171	166	163	172	180	197	274	306	309	10	353	8	15	332	323	162	180	193	179	167	182	184.5
17-Mar	187	182	177	177	181	183	180	180	189	202	217	235	238	238	239	237	231	230	224	208	196	186	191	195	206.0
18-Mar	198	192	193	214	199	192	199	205	229	231	267	254	346	307	265	265	298	285	256	336	29	86	59	118	228.3
19-Mar	229	217	31	258	17	28	41	48	50	DF	55	62	62	46	54	63	80	71	68	79	123	153	162	170	75.1
20-Mar	171	182	179	174	80	163	168	143	173	175	174	210	215	236	11	21	26	18	9	9	8	7	353	356	43.7
21-Mar	4	0	355	355	338	349	344	4	18	6	18	2	32	50	77	53	36	87	111	131	151	159	163	167	39.6
22-Mar	169	168	190	183	174	175	173	187	193	193	201	192	197	203	205	220	224	231	220	194	189	182	186	187	194.5
23-Mar	189	192	205	214	215	230	240	265	245	246	305	293	314	311	320	309	308	19	30	27	18	19	31	24	299.3
24-Mar	34	35	31	27	35	26	21	20	51	31	68	37	22	67	290	291	271	2	113	164	172	180	179	213	40.1
25-Mar	210	216	219	217	210	217	224	239	258	282	303	316	317	314	308	332	338	344	29	30	26	25	19	12	291.7
26-Mar	16	8	17	20	25	24	25	38	39	56	45	18	34	23	21	34	32	33	32	29	35	66	97	131	33.6
27-Mar	168	206	224	231	229	230	245	267	329	332	298	284	269	259	278	298	283	285	288	222	224	225	221	229	261.7
28-Mar	251	266	276	131	42	29	21	51	70	98	90	235	249	231	256	247	242	238	214	215	226	215	216	218	232.7
29-Mar	220	223	218	223	225	238	259	306	356	2	9	346	351	349	353	350	20	36	25	38	22	52	47	56	337.0
30-Mar	33	31	52	56	97	154	176	170	173	208	127	162	201	218	226	200	195	190	200	192	190	187	155	167	181.7
31-Mar	161	164	168	168	166	166	164	171	170	173	157	188	228	217	287	10	17	19	28	29	42	53	86	194	153.9
Diurnal Average	179.6	182.1	181.1	184.9	183.1	181.5	181.0	186.2	188.3	200.8	170.4	206.0	223.5	238.6	262.0	289.8	332.6	49.3	81.1	116.0	142.8	151.1	159.4	176.5	

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 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Jackfish 2/3 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 115 deg on Mar 15 03:00

Minimum Value: 9 deg on Mar 13 05:00

Percentiles: P_1 = 11 P_{10} = 17 Q_1 = 24 Median = 34 Q_3 = 44 P_{90} = 56 P_{99} = 99

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	27	25	25	33	34	32	38	39	31	30	31	37	31	30	33	29	30	27	27	27	25	28	25	25	39
2-Mar	26	28	28	25	27	26	26	26	22	22	22	22	22	23	24	30	35	23	35	34	33	19	17	16	35
3-Mar	18	19	16	19	24	18	16	19	26	30	34	43	44	40	50	51	45	53	45	41	34	29	33	34	53
4-Mar	43	43	43	43	36	42	43	46	39	43	44	41	43	43	46	49	44	44	46	94	70	70	35	37	94
5-Mar	26	30	73	23	11	44	87	45	56	57	59	53	73	89	99	104	46	19	63	12	31	47	20	DF	104
6-Mar	32	24	18	17	19	19	21	20	24	37	39	48	48	39	44	41	44	40	33	33	35	41	41	41	48
7-Mar	45	41	40	40	45	42	55	49	37	37	42	38	40	42	38	40	37	37	53	50	42	40	49	47	55
8-Mar	49	56	42	33	30	29	37	38	43	44	39	41	48	44	42	41	33	27	27	30	38	41	38	22	56
9-Mar	21	20	19	18	17	18	24	31	38	37	40	44	42	42	44	38	45	41	41	40	42	43	48	42	48
10-Mar	45	48	42	43	47	47	40	43	44	44	44	38	37	40	41	38	36	32	31	35	39	30	30	23	48
11-Mar	31	34	28	32	24	25	22	34	23	23	34	43	41	32	47	41	44	40	38	54	43	30	29	27	54
12-Mar	27	31	26	26	21	21	17	18	30	29	27	36	34	35	39	33	36	30	37	30	23	19	21	22	39
13-Mar	13	10	10	10	9	11	19	DF	48	30	32	32	31	30	25	31	28	29	26	27	26	25	26	24	48
14-Mar	26	27	25	44	50	40	31	39	48	46	48	51	50	46	38	43	43	47	48	44	45	41	43	44	51
15-Mar	59	68	115	114	92	62	80	100	42	37	58	74	76	58	67	61	48	27	27	16	18	16	40	22	115
16-Mar	17	17	14	40	18	19	16	17	19	43	56	62	90	51	48	77	58	76	33	59	15	14	15	12	90
17-Mar	14	12	14	12	11	12	9	11	14	17	20	22	22	22	23	24	23	19	18	18	22	20	20	23	24
18-Mar	21	20	22	21	19	17	14	14	17	17	38	41	60	73	41	39	49	66	52	100	55	37	33	77	100
19-Mar	16	51	91	54	20	12	17	18	28	DF	29	34	38	35	26	35	32	26	25	24	38	31	30	25	91
20-Mar	25	25	24	28	98	64	47	61	32	34	61	59	37	78	65	34	33	36	42	40	43	40	43	40	98
21-Mar	49	42	42	43	44	49	41	45	45	43	50	69	55	69	88	53	48	58	31	36	34	26	25	26	88
22-Mar	21	25	25	27	25	23	24	26	28	28	28	30	35	31	32	28	26	20	26	20	16	17	16	15	35
23-Mar	14	15	57	15	15	17	18	33	27	26	44	45	51	47	50	45	44	51	29	35	38	37	28	35	57
24-Mar	28	29	31	32	28	34	37	40	42	51	34	57	70	100	97	98	85	93	55	15	12	10	11	18	100
25-Mar	17	17	17	16	15	14	14	16	29	43	51	46	53	58	47	51	46	46	30	26	19	23	27	32	58
26-Mar	29	30	27	23	15	23	24	23	35	35	36	50	44	48	42	40	34	32	26	23	25	20	21	19	50
27-Mar	23	15	20	11	12	13	16	31	42	59	56	52	53	47	43	45	44	41	39	28	29	17	15	13	59
28-Mar	22	18	53	95	29	20	15	17	33	52	100	96	73	41	40	43	30	24	21	19	19	19	19	20	100
29-Mar	20	18	18	15	15	25	23	50	49	42	46	51	50	50	48	49	39	31	33	28	31	22	23	22	51
30-Mar	29	44	23	22	37	34	16	27	40	52	80	66	78	42	45	39	37	32	30	30	31	32	43	34	80
31-Mar	43	35	34	31	27	27	32	28	36	38	49	85	66	72	76	70	44	31	25	18	17	15	72	25	85
Diurnal Maximum	59	68	115	114	98	64	87	100	56	59	100	96	90	100	99	104	85	93	63	100	70	70	72	77	

DF - DAS Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS29
SURMONT 2
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	704	35	40	99.33	12.6	0	2.5	0
H2S (ppb) Average	679	38	65	96.37	0.4	0	0.3	0
THC(ppm) Average	704	35	40	99.33	2.4	-	2.3	-
NO2 (ppb) Average	696	37	48	98.52	13.7	0	5.9	-
NO (ppb) Average	696	37	48	98.52	4.5	-	0.9	-
NOX (ppb) Average	696	37	48	98.52	13.7	-	6.6	-
PM2.5 (ug/m3) Average	737	2	7	99.33	90.7	1	14.6	0
Temperature 2 m (C) Average	741	0	3	99.6	9.7	-	1	-
Relative Humidity (%) Average	741	0	3	99.6	91.1	-	83.7	-
Wind Speed 10 m (km/h) Average	726	0	18	97.58	18	-	10	-
Wind Direction 10 m (deg) Average	726	0	18	97.58	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	704	0.63	1.2	-	0	0	0.1	0.3	0.7	1.5	12.6
H2S (ppb) Average	679	0.06	0.1	-	0	0	0	0	0.1	0.2	0.4
THC (ppm) Average	704	2.23	0.1	-	2.1	2.2	2.2	2.2	2.3	2.3	2.4
NO2 (ppb) Average	696	2.3	2.3	-	0.3	0.4	0.7	1.6	2.9	5.3	13.7
NO (ppb) Average	696	0.28	0.6	-	0	0	0	0	0.3	0.8	4.5
NOX (ppb) Average	696	2.57	2.5	-	0.3	0.4	0.7	1.8	3.4	6.3	13.7
PM2.5 (ug/m3) Average	737	4.51	5.7	-	0.3	2.1	2.7	3.5	4.7	6.7	90.7
Temperature 2 m (C) Average	741	-9.48	7.4	-	-29.3	-18.7	-13.9	-9.1	-4.6	-0.7	9.7
Relative Humidity (%) Average	741	67.5	17.1	-	23.2	40.1	56	71.7	81.5	86.4	91.1
Wind Speed 10 m (km/h) Average	726	5.2	3	-	0	2	3	5	7	9	18
Wind Direction 10 m (deg) Average	726	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	01 Mar 2023 09:00	01 Mar 2023 09:00	1	Maintenance - station logger/modem reset
ALL PARAMETERS (except H2S)	30 Mar 2023 11:00	30 Mar 2023 11:00	1	Maintenance - station logger/modem reset
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
SO2	15 Mar 2023 12:00	15 Mar 2023 13:00	2	Maintenance - WBEA internal audit
H2S	15 Mar 2023 11:00	15 Mar 2023 13:00	3	Maintenance - WBEA internal audit
THC	15 Mar 2023 14:00	15 Mar 2023 15:00	2	Maintenance - WBEA internal audit
NO2	15 Mar 2023 11:00	15 Mar 2023 13:00	3	Maintenance - WBEA internal audit
PM2.5	15 Mar 2023 13:00	15 Mar 2023 14:00	2	Maintenance - WBEA internal audit
H2S	29 Mar 2023 14:00	30 Mar 2023 11:00	22	Maintenance - analyzer replaced
NO2	13 Mar 2023 15:00	13 Mar 2023 17:00	3	Maintenance - reinitiated daily QA check
NO2	17 Mar 2023 09:00	17 Mar 2023 10:00	2	Maintenance - reinitiated daily QA check
Wind Speed, Wind Direction	15 Mar 2023 15:00	15 Mar 2023 15:00	1	Maintenance - declination realigned
Wind Speed, Wind Direction	05 Mar 2023 08:00	05 Mar 2023 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	12 Mar 2023 08:00	12 Mar 2023 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Mar 2023 21:00	18 Mar 2023 21:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	23 Mar 2023 00:00	23 Mar 2023 01:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Mar 2023 04:00	24 Mar 2023 05:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	27 Mar 2023 03:00	27 Mar 2023 08:00	6	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Mar 2023 05:00	28 Mar 2023 05:00	1	Flat line in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 12.6 ppb on Mar 25 11:00

Maximum Daily Average: 2.5 ppb on Mar 3

Minimum Value: 0.0 ppb on Mar 1 08:00

Maximum Diurnal Average: 1.4 ppb at hour 11

Monthly Average: 0.63 ppb

Minimum Daily Average: 0.0 ppb on Mar 8

Minimum Diurnal Average: 0.2 ppb at hour 2

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.3 Q_3 = 0.7 P_{90} = 1.5 P_{99} = 6.4

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	35
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	M	0.1	0.5	0.7	0.8	1.0	0.9	0.9	0.8	0.8	0.6	0.4	0.4	0.4	0.3	0.4	0.4	1.0
2-Mar	0.3	Z	0.3	0.7	0.7	1.2	1.9	2.6	2.4	0.6	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.6	2.6
3-Mar	0.0	0.3	Z	0.0	0.0	0.0	0.1	0.2	1.0	6.3	5.2	1.4	1.3	1.9	2.0	2.3	2.6	4.3	5.4	7.9	7.2	3.6	2.3	2.3	2.5	7.9
4-Mar	1.2	0.5	0.4	Z	0.2	0.2	1.1	3.1	3.1	6.8	2.7	0.9	0.9	0.8	0.3	0.2	0.1	0.6	0.8	0.3	1.6	0.5	0.2	0.1	1.2	6.8
5-Mar	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.1	1.5	3.8	3.6	3.3	4.2	2.2	2.2	2.9	3.4	2.9	1.3	0.7	0.6	0.4	0.4	DF	1.5	4.2
6-Mar	0.6	0.4	0.4	0.3	0.3	0.4	0.5	0.6	1.1	1.8	1.4	1.4	1.6	1.3	Z	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.6	0.1	0.7	1.8
7-Mar	0.1	0.0	0.1	0.3	0.1	Z	0.1	0.1	0.1	0.6	0.6	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
8-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2
9-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.3
10-Mar	0.2	0.3	Z	0.2	0.7	0.2	0.4	0.6	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.6	0.8	0.5	0.3	0.4	0.8
11-Mar	0.4	0.5	0.3	Z	0.3	0.2	0.2	0.2	0.4	0.8	0.5	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.2	0.8
12-Mar	0.1	0.1	0.3	0.4	Z	0.3	0.2	0.1	0.4	0.7	2.8	0.7	0.6	1.2	0.9	1.0	1.0	0.7	1.8	2.7	2.0	0.8	0.7	0.6	0.9	2.8
13-Mar	0.5	0.4	0.5	0.5	0.4	Z	0.2	0.3	0.3	0.2	C	C	C	C	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5
14-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.3	0.4	0.6	0.9	2.6	5.0	7.1	7.4	5.8	2.5	1.2	1.5	7.4
15-Mar	0.7	Z	0.3	0.2	0.3	0.2	0.2	0.1	0.6	2.1	0.9	M	M	1.4	1.2	1.9	2.7	3.0	1.5	0.9	0.6	0.3	0.2	0.2	0.9	3.0
16-Mar	0.2	0.2	Z	0.7	0.2	0.2	0.2	0.5	0.4	0.3	0.5	1.1	1.6	1.4	1.4	1.3	1.6	1.7	0.9	0.6	0.4	0.4	0.4	0.3	0.7	1.7
17-Mar	0.3	0.3	0.2	Z	0.2	0.1	0.2	0.2	0.6	0.6	0.3	0.5	0.5	0.6	0.4	0.2	0.3	0.2	1.7	2.2	6.0	1.0	0.6	0.7	0.8	6.0
18-Mar	0.5	0.4	0.4	1.3	Z	1.7	1.4	0.7	1.1	0.8	0.6	0.5	0.7	0.8	0.6	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.6	1.7
19-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.2
20-Mar	Z	0.2	0.0	0.1	0.2	0.1	0.2	0.0	0.1	0.3	0.6	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	0.6
21-Mar	0.2	Z	0.3	0.1	0.2	0.3	0.4	0.2	0.2	0.5	0.7	0.7	0.9	1.3	0.9	0.7	0.5	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.4	1.3
22-Mar	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.7	1.0	1.0	0.6	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.4	0.3	0.4	0.5	0.3	1.0
23-Mar	0.6	0.3	0.3	Z	0.5	0.7	0.3	0.3	0.6	1.2	0.4	0.1	0.5	1.5	0.6	0.6	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.4	1.5
24-Mar	0.3	0.2	0.1	0.1	Z	0.2	0.2	0.1	0.3	0.5	0.1	0.1	0.2	0.1	0.4	0.4	0.5	0.7	0.7	0.4	0.1	0.1	0.0	0.1	0.3	0.7
25-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.7	5.4	12.6	7.8	6.4	3.6	0.7	0.5	0.2	0.0	0.0	0.2	0.8	1.2	0.8	0.2	1.8	12.6
26-Mar	Z	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
27-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.3	0.4	1.8	1.8	2.0	2.0	2.4	1.6	1.1	0.7	0.4	0.2	0.1	0.7	2.4
28-Mar	0.0	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.8	3.0	1.3	1.1	0.8	0.8	1.1	1.0	0.8	0.6	1.0	0.8	0.5	0.3	0.9	0.7	3.0
29-Mar	0.2	0.3	0.5	Z	1.2	1.9	1.4	1.8	2.0	1.6	0.9	0.7	2.7	1.3	1.4	0.9	1.3	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.9	2.7
30-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.6	M	0.4	0.0	0.1	0.3	1.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.2	1.2
31-Mar	Z	0.0	0.4	0.2	0.2	0.1	0.0	0.1	0.3	0.8	1.4	1.1	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	1.4
	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.7	1.3	1.4	0.9	0.9	0.8	0.6	0.7	0.7	0.8	0.8	0.9	1.0	0.6	0.4	0.3	Diurnal Average	
	1.2	0.5	0.5	1.3	1.2	1.9	1.9	3.1	3.1	6.8	12.6	7.8	6.4	3.6	2.2	2.9	3.4	4.3	5.4	7.9	7.4	5.8	2.5	2.3	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Surmont 2 - March 2023

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

Total Number of Valid Hours: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Surmont 2 - March 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	72	49	13	18	25	77	92	23	9	17	22	119	42	28	39	44	689
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	73	49	13	18	25	77	92	23	9	17	22	119	42	28	39	44	690

Total Number of Valid Hours: 690

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Surmont 2

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 690

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.4 ppb on Mar 13 04:00 Maximum Daily Average: 0.3 ppb on Mar 16

Minimum Value: 0.0 ppb on Mar 1 04:00 Minimum Daily Average: 0.0 ppb on Mar 6

Maximum Diurnal Average: 0.1 ppb at hour 7 Minimum Diurnal Average: 0.0 ppb at hour 11

Monthly Average: 0.06 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} = 0.3

Hours in Service:	744
Hours of Data:	679
Hours of Missing Data:	65
Hours of Calibration:	38
Percent Operational Time:	96.4

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	M	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.2
2-Mar	0.1	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	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
3-Mar	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2
4-Mar	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-Mar	0.0	0.0	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	DF	0.0	0.1
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
7-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
8-Mar	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9-Mar	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	0.1	0.0	0.0	0.1
10-Mar	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
11-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
12-Mar	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.1	0.3
13-Mar	Z	0.3	0.3	0.4	0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.4
14-Mar	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.2
15-Mar	0.0	0.0	Z	0.0	0.3	0.2	0.2	0.0	0.2	0.2	M	M	M	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.3
16-Mar	0.2	0.2	0.3	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.4
17-Mar	0.2	0.1	0.1	0.1	Z	0.1	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	0.1	0.0	0.0	0.0	0.0	0.2
18-Mar	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	0.1	0.1	0.0	0.1
19-Mar	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
20-Mar	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
21-Mar	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2
22-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1
23-Mar	0.2	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.1	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	0.1	0.0	0.1	0.2
24-Mar	0.0	0.1	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
25-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.2
26-Mar	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1
27-Mar	0.1	0.1	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	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2
28-Mar	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
29-Mar	0.1	0.0	0.1	0.1	Z	0.2	0.3	0.3	0.3	0.2	C	C	C	M	M	M	M	M	M	M	M	M	M	M	--	0.3
30-Mar	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
31-Mar	0.0	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	0.1	0.1	0.1	0.1	0.0	0.1	0.2
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	Diurnal Average	
	0.2	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Surmont 2 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	679	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: 679

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Surmont 2 - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	65	47	13	18	29	70	93	23	9	17	21	111	40	30	39	40	665
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	65	47	13	18	29	70	93	23	9	17	21	111	40	30	39	40	665

Total Number of Valid Hours: 665

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Surmont 2

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 665

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.4 ppm on Mar 25 13:00

Maximum Daily Average: 2.3 ppm on Mar 5

Minimum Value: 2.1 ppm on Mar 2 21:00

Maximum Diurnal Average: 2.2 ppm at hour 23

Monthly Average: 2.23 ppm

Minimum Daily Average: 2.2 ppm on Mar 31

Minimum Diurnal Average: 2.2 ppm at hour 24

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.2 Median = 2.2 Q_3 = 2.3 P_{90} = 2.3 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	35
Percent Operational Time:	99.3

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

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Surmont 2 - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	704	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: 704

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Surmont 2 - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	74	49	12	18	25	77	92	23	9	17	22	119	42	28	39	45	691
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	74	49	12	18	25	77	92	23	9	17	22	119	42	28	39	45	691

Total Number of Valid Hours: 691

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Surmont 2

Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

Total Number of Valid Hours: 691

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 4.5 ppb on Mar 25 13:00 Maximum Daily Average: 0.9 ppb on Mar 25

Minimum Value: 0.0 ppb on Mar 6 23:00 Minimum Daily Average: 0.0 ppb on Mar 8

Maximum Diurnal Average: 0.8 ppb at hour 10 Minimum Diurnal Average: 0.0 ppb at hour 24

Monthly Average: 0.28 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.3 P_{90} = 0.8 P_{99} = 2.9

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	37
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	M	0.2	0.5	0.7	0.8	0.7	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.3	0.3	0.5	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
3-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	3.0	2.4	1.2	0.7	1.4	1.5	0.9	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.6	3.0
4-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.2	0.7	2.7	1.8	1.6	1.5	1.0	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.7
5-Mar	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.9	1.7	3.2	3.2	2.4	2.4	1.3	1.3	1.3	0.9	0.4	0.1	0.1	0.0	0.0	0.0	DF	0.9	3.2
6-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	1.0	0.9	Z	0.7	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
10-Mar	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
11-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	1.4	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4
12-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.6	0.2	0.3	1.3	1.6	1.2	0.9	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.6
13-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	1.4	0.7	0.9	0.7	0.5	0.2	M	M	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4
14-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	1.0	1.2	0.8	0.8	0.2	0.0	0.1	0.0	0.0	0.0	0.2	1.2
15-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.6	1.1	2.1	4.2	M	M	M	1.5	1.0	1.0	1.4	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.7	4.2
16-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	C	C	C	C	C	C	1.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	--	1.2
17-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	M	M	0.3	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4
18-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.5	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
19-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	0.2	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
20-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
21-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.4	0.7	0.6	0.8	1.6	2.3	1.5	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.3
22-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.0	0.8	0.5	0.4	0.4	0.4	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.0
23-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.2	0.3	0.1	0.3	1.3	1.1	1.0	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.3
24-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.2	1.0	2.1	2.0	0.5	0.6	0.5	0.5	0.8	0.7	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.1
25-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.7	0.7	1.7	2.9	2.8	4.5	3.3	1.5	1.4	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.9	4.5
26-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.3	0.2	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	0.1	0.3
27-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.3	1.0	0.8	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.0
28-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.5	2.6	2.9	0.4	1.5	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.9
29-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.7	0.8	1.0	0.4	0.3	0.9	0.7	1.2	1.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2
30-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.9	0.7	0.5	M	0.2	0.0	0.0	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9
31-Mar	0.0	0.0	0.0	0.0	Z	0.1	1.0	0.6	0.2	0.4	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.7	0.8	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0.0	0.0	0.1	0.0	0.0	0.1	1.0	2.6	2.9	4.2	3.2	2.8	4.5	3.3	1.6	1.5	1.4	0.8	0.2	0.1	0.1	0.1	0.1	0.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Surmont 2 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Surmont 2 - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	70	48	11	18	27	76	96	21	8	16	23	115	41	28	39	45	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	70	48	11	18	27	76	96	21	8	16	23	115	41	28	39	45	682

Total Number of Valid Hours: 682

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Surmont 2

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 682

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Surmont 2 - March 2023

29 - 31

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 13.7 ppb on Mar 14 20:00

Maximum Daily Average: 5.9 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 3 05:00

Maximum Diurnal Average: 3.2 ppb at hour 7

Monthly Average: 2.30 ppb

Minimum Daily Average: 0.5 ppb on Mar 9

Minimum Diurnal Average: 1.6 ppb at hour 13

Percentiles: P_1 = 0.3 P_{10} = 0.4 Q_1 = 0.7 Median = 1.6 Q_3 = 2.9 P_{90} = 5.3 P_{99} = 11.0

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	37
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.8	2.0	1.1	1.2	Z	0.6	0.5	0.5	M	0.5	1.0	1.3	1.6	1.9	1.9	2.0	2.1	2.3	2.3	2.2	2.0	2.1	1.9	1.8	1.6	2.8
2-Mar	1.8	1.8	1.9	2.7	3.2	Z	6.8	7.1	4.8	3.3	3.1	3.0	2.3	1.5	1.4	1.1	0.8	0.9	1.0	0.6	0.5	0.4	0.4	0.4	2.2	7.1
3-Mar	Z	0.5	0.4	0.4	0.3	0.4	0.3	0.3	1.4	5.9	8.0	5.8	2.7	2.5	3.7	5.2	5.9	9.1	11.0	11.5	11.2	8.8	7.0	7.4	4.8	11.5
4-Mar	5.0	Z	8.3	6.3	3.6	2.0	2.2	4.1	3.9	6.8	4.1	3.0	2.0	1.7	1.1	0.5	0.8	1.3	2.1	1.6	4.7	2.3	1.9	1.5	3.1	8.3
5-Mar	1.2	2.2	Z	4.1	3.7	4.9	4.9	4.4	3.3	4.4	4.1	3.0	2.8	1.9	2.1	2.8	3.6	6.1	8.7	11.6	8.9	8.6	9.5	DF	4.9	11.6
6-Mar	8.3	5.4	3.9	3.0	2.3	1.7	1.5	1.5	1.6	1.9	2.0	2.1	Z	1.8	0.9	0.8	0.8	0.8	0.9	1.7	0.8	0.5	0.7	0.4	2.0	8.3
7-Mar	0.4	0.4	0.4	Z	0.3	0.4	0.4	0.4	0.6	1.1	1.2	0.9	0.7	0.5	0.6	0.6	0.7	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.6	1.2
8-Mar	0.4	0.4	0.4	0.3	Z	0.4	0.9	0.6	0.5	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.7	0.4	0.6	0.4	0.3	0.4	0.6	0.5	0.9
9-Mar	0.5	0.3	0.3	0.3	0.3	Z	0.9	0.5	0.4	0.9	0.8	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.9
10-Mar	Z	0.5	0.6	0.5	0.7	0.5	0.5	0.6	0.7	0.7	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.6	0.7
11-Mar	0.4	Z	0.5	0.9	0.8	1.8	8.2	10.3	1.9	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	1.2	0.6	0.4	1.4	10.3
12-Mar	0.7	1.2	Z	2.8	4.0	3.7	3.2	2.6	1.4	1.2	2.2	1.3	1.7	4.7	5.4	5.3	5.3	6.3	6.7	7.4	7.6	9.0	8.1	7.1	4.3	9.0
13-Mar	6.4	6.6	7.2	Z	6.0	6.3	5.5	5.4	4.9	2.5	2.2	1.8	1.6	1.1	M	M	M	1.3	1.0	1.0	0.8	0.7	0.6	0.5	3.2	7.2
14-Mar	0.7	0.5	0.5	0.7	Z	0.8	0.7	0.7	0.5	0.6	0.6	0.5	0.5	1.1	2.1	3.0	3.5	6.8	10.4	13.7	13.0	9.9	8.2	6.6	3.7	13.7
15-Mar	6.3	4.8	3.8	3.7	4.5	Z	6.1	3.9	4.2	5.6	M	M	M	2.4	2.2	2.4	4.3	6.0	6.6	7.7	11.4	12.7	10.9	8.8	5.9	12.7
16-Mar	Z	3.1	2.3	1.8	0.9	0.7	0.8	1.1	1.6	0.9	C	C	C	C	C	C	3.2	3.3	2.9	2.5	2.1	1.9	1.7	1.4	--	3.3
17-Mar	1.2	Z	1.4	1.2	1.2	1.4	1.3	1.6	M	M	1.2	1.4	1.2	1.0	1.0	0.9	0.9	0.9	3.6	3.9	7.3	2.3	1.6	1.3	1.8	7.3
18-Mar	1.0	0.8	Z	2.3	3.0	3.7	4.7	4.4	3.6	2.6	2.1	1.6	1.5	1.6	1.6	1.2	1.0	1.4	1.7	1.2	1.3	0.9	1.3	1.9	2.0	4.7
19-Mar	2.2	1.9	1.6	Z	2.1	2.4	3.2	2.5	1.1	1.6	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.7	0.8	0.8	0.7	0.5	0.5	0.5	1.3	3.2
20-Mar	0.4	0.4	1.0	0.4	Z	0.3	0.4	0.4	0.5	0.5	1.2	1.7	0.7	0.6	0.5	0.6	0.8	0.6	0.7	0.6	0.6	0.6	1.4	2.0	0.7	2.0
21-Mar	1.5	2.2	4.1	5.0	5.1	Z	6.5	2.4	2.0	2.7	1.9	2.0	2.8	3.4	2.7	2.2	2.1	2.4	1.7	1.3	0.9	0.6	0.4	0.4	2.4	6.5
22-Mar	Z	0.7	1.1	1.1	1.0	1.1	1.2	2.0	2.4	2.4	1.9	1.7	1.7	1.8	1.9	2.3	2.0	2.2	2.6	2.2	3.0	2.9	3.4	3.1	2.0	3.4
23-Mar	4.2	Z	4.0	3.7	2.8	2.8	2.4	2.8	2.2	1.3	1.3	0.9	1.2	3.7	3.1	3.4	2.8	2.0	2.1	2.0	1.2	1.3	1.4	2.0	2.4	4.2
24-Mar	2.5	2.3	Z	2.1	2.1	3.3	4.4	3.5	4.6	3.6	1.4	1.3	1.1	1.4	1.9	2.1	2.2	3.2	3.4	5.0	3.5	3.8	4.9	7.3	3.1	7.3
25-Mar	5.1	3.4	2.8	Z	5.0	3.7	3.5	2.8	2.0	3.6	5.7	5.2	7.6	6.2	3.6	3.8	3.0	2.6	2.5	1.9	1.5	2.0	2.2	3.4	3.6	7.6
26-Mar	2.5	2.1	1.8	2.0	Z	2.8	2.4	1.3	1.0	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.9	0.7	2.0	2.2	1.1	2.8
27-Mar	2.9	3.0	2.7	2.2	2.0	Z	3.4	2.5	1.5	1.1	1.0	1.0	1.1	1.4	1.4	1.7	1.8	2.3	2.5	2.5	4.7	5.6	4.4	3.4	2.4	5.6
28-Mar	Z	2.7	2.4	2.4	1.9	2.6	4.9	5.9	4.6	1.1	2.7	1.3	1.1	0.9	0.8	0.9	1.2	1.3	1.9	2.6	1.3	1.4	1.5	2.9	2.2	5.9
29-Mar	1.7	Z	1.0	1.1	1.4	2.5	4.4	6.2	5.1	4.3	1.6	1.3	3.4	3.3	4.7	5.2	1.7	1.0	1.0	0.9	0.9	0.7	0.8	0.8	2.4	6.2
30-Mar	0.7	0.8	Z	2.1	2.8	3.4	3.8	3.3	1.8	1.5	M	0.6	0.4	0.5	0.6	1.6	0.9	0.5	0.5	0.3	1.0	0.8	0.3	0.6	1.3	3.8
31-Mar	0.4	0.4	1.0	1.1	Z	6.8	9.9	2.6	1.2	2.0	2.3	2.3	1.5	1.2	1.1	1.1	1.0	0.9	0.8	1.0	1.5	1.4	1.0	0.9	1.9	9.9
	2.4	1.9	2.2	2.1	2.4	2.3	3.2	2.8	2.3	2.2	2.0	1.7	1.6	1.7	1.7	1.8	1.9	2.2	2.7	2.9	3.1	2.7	2.6	2.4	Diurnal Average	
	8.3	6.6	8.3	6.3	6.0	6.8	9.9	10.3	5.1	6.8	8.0	5.8	7.6	6.2	5.4	5.3	5.9	9.1	11.0	13.7	13.0	12.7	10.9	8.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Surmont 2 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Surmont 2 - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
							Wind Direction										
0 - 20	70	48	11	18	27	76	96	21	8	16	23	115	41	28	39	45	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	70	48	11	18	27	76	96	21	8	16	23	115	41	28	39	45	682

Total Number of Valid Hours: 682

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Surmont 2

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 682

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 13.7 ppb on Mar 14 20:00

Maximum Daily Average: 6.6 ppb on Mar 15

Minimum Value: 0.3 ppb on Mar 9 04:00

Minimum Daily Average: 0.5 ppb on Mar 8

Maximum Diurnal Average: 3.4 ppb at hour 7

Minimum Diurnal Average: 1.9 ppb at hour 2

Monthly Average: 2.57 ppb

Percentiles: P_1 = 0.3 P_{10} = 0.4 Q_1 = 0.7 Median = 1.8 Q_3 = 3.4 P_{90} = 6.3 P_{99} = 11.4

Hours in Service:	744
Hours of Data:	696
Hours of Missing Data:	48
Hours of Calibration:	37
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	2.8	2.0	1.1	1.2	Z	0.6	0.5	0.5	M	0.7	1.5	2.0	2.4	2.6	2.4	2.3	2.3	2.4	2.3	2.2	2.0	2.1	1.9	1.8	1.8	2.8
2-Mar	1.8	1.8	1.9	2.7	3.2	Z	6.9	7.3	5.1	3.6	3.6	3.6	2.8	1.8	1.6	1.3	0.9	1.0	1.0	0.6	0.5	0.4	0.4	0.4	2.4	7.3
3-Mar	Z	0.5	0.4	0.4	0.3	0.4	0.3	0.3	1.5	6.9	11.0	8.2	3.9	3.2	5.1	6.7	6.8	9.7	11.1	11.6	11.3	8.9	7.1	7.5	5.4	11.6
4-Mar	5.0	Z	8.4	6.3	3.6	2.0	2.2	4.3	4.6	9.5	5.9	4.6	3.5	2.7	1.5	0.7	1.0	1.4	2.2	1.6	4.7	2.3	1.9	1.5	3.5	9.5
5-Mar	1.2	2.2	Z	4.1	3.7	5.0	5.0	5.3	5.0	7.6	7.3	5.4	5.2	3.2	3.4	4.1	4.5	6.5	8.8	11.7	8.9	8.6	9.5	DF	5.7	11.7
6-Mar	8.3	5.4	3.9	3.0	2.3	1.7	1.5	1.6	2.0	2.7	3.0	3.0	Z	2.5	1.1	1.0	0.9	0.8	0.9	1.7	0.8	0.5	0.7	0.4	2.2	8.3
7-Mar	0.4	0.4	0.4	Z	0.3	0.4	0.4	0.4	0.6	1.3	1.5	1.1	0.8	0.6	0.6	0.6	0.7	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.6	1.5
8-Mar	0.4	0.4	0.4	0.3	Z	0.4	0.9	0.6	0.5	0.7	0.5	0.6	0.4	0.4	0.4	0.4	0.5	0.7	0.4	0.6	0.4	0.3	0.4	0.6	0.5	0.9
9-Mar	0.5	0.3	0.3	0.3	0.3	Z	0.9	0.5	0.5	1.2	1.2	0.6	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	1.2
10-Mar	Z	0.5	0.6	0.5	0.7	0.5	0.5	0.6	0.8	0.8	0.6	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.6	0.8
11-Mar	0.4	Z	0.5	0.9	0.8	1.8	8.3	11.7	2.5	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	1.2	0.6	0.4	1.5	11.7
12-Mar	0.7	1.2	Z	2.8	4.0	3.7	3.2	2.9	1.6	1.4	2.8	1.5	2.0	6.0	7.0	6.5	6.2	6.9	6.8	7.4	7.6	9.0	8.1	7.1	4.6	9.0
13-Mar	6.4	6.6	7.2	Z	6.0	6.3	5.5	5.8	6.3	3.2	3.1	2.5	2.1	1.3	M	M	M	1.3	1.0	1.0	0.8	0.7	0.6	0.5	3.4	7.2
14-Mar	0.7	0.5	0.5	0.7	Z	0.8	0.7	0.7	0.5	0.6	0.7	0.6	0.5	1.4	3.1	4.2	4.3	7.6	10.6	13.7	13.1	9.9	8.2	6.6	3.9	13.7
15-Mar	6.3	4.8	3.8	3.7	4.5	Z	6.7	5.0	6.3	9.8	M	M	M	3.9	3.2	3.4	5.7	6.8	6.8	7.7	11.4	12.7	10.9	8.8	6.6	12.7
16-Mar	Z	3.1	2.3	1.8	0.9	0.7	0.8	1.2	1.8	1.2	C	C	C	C	C	C	4.4	3.8	3.0	2.5	2.1	1.9	1.7	1.4	--	4.4
17-Mar	1.2	Z	1.4	1.2	1.2	1.4	1.3	1.8	M	M	1.5	1.8	1.6	1.2	1.1	1.0	1.0	1.0	3.7	4.0	7.4	2.3	1.6	1.3	1.9	7.4
18-Mar	1.0	0.8	Z	2.3	3.0	3.7	4.8	4.9	4.4	3.1	2.5	1.9	1.8	1.9	1.9	1.4	1.1	1.5	1.7	1.2	1.3	0.9	1.3	1.9	2.2	4.9
19-Mar	2.2	1.9	1.6	Z	2.1	2.4	3.3	3.0	1.3	2.1	1.3	1.2	1.1	0.9	0.8	0.7	0.7	0.7	0.8	0.8	0.7	0.5	0.5	0.5	1.3	3.3
20-Mar	0.4	0.4	1.0	0.4	Z	0.3	0.4	0.4	0.6	0.6	1.5	2.1	0.9	0.7	0.6	0.7	0.9	0.7	0.7	0.6	0.6	0.6	1.4	2.0	0.8	2.1
21-Mar	1.5	2.2	4.1	5.0	5.1	Z	6.6	2.6	2.4	3.4	2.5	2.8	4.4	5.7	4.2	3.0	2.7	2.7	1.8	1.3	0.9	0.6	0.4	0.4	2.9	6.6
22-Mar	Z	0.7	1.1	1.1	1.0	1.1	1.2	2.3	3.1	3.4	2.7	2.2	2.1	2.2	2.3	2.8	2.2	2.3	2.7	2.2	3.0	2.9	3.4	3.1	2.2	3.4
23-Mar	4.2	Z	4.0	3.7	2.8	2.8	2.5	3.2	2.6	1.5	1.6	1.0	1.5	5.0	4.2	4.4	3.4	2.2	2.2	2.0	1.2	1.3	1.4	2.0	2.6	5.0
24-Mar	2.5	2.3	Z	2.1	2.1	3.3	4.6	4.5	6.7	5.6	1.9	1.9	1.6	1.9	2.7	2.8	2.8	3.6	3.5	5.0	3.5	3.8	4.9	7.3	3.5	7.3
25-Mar	5.1	3.4	2.8	Z	5.0	3.7	3.6	3.5	2.7	5.3	8.6	8.0	12.1	9.5	5.1	5.2	3.8	2.9	2.6	1.9	1.5	2.0	2.2	3.4	4.5	12.1
26-Mar	2.5	2.1	1.8	2.0	Z	2.8	2.5	1.5	1.3	0.8	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.9	0.7	2.0	2.2	1.2	2.8
27-Mar	2.9	3.0	2.7	2.2	2.0	Z	3.7	3.5	2.3	1.5	1.4	1.5	1.6	2.0	1.9	2.2	2.3	2.6	2.6	2.5	4.7	5.6	4.4	3.4	2.7	5.6
28-Mar	Z	2.7	2.4	2.4	1.9	2.6	5.4	8.5	7.5	1.5	4.2	2.0	1.5	1.2	1.0	1.1	1.4	1.4	1.9	2.6	1.3	1.4	1.5	2.9	2.6	8.5
29-Mar	1.7	Z	1.0	1.1	1.4	2.5	4.6	6.9	5.9	5.3	2.0	1.6	4.3	4.0	5.9	6.2	1.9	1.1	1.0	0.9	0.9	0.7	0.8	0.8	2.7	6.9
30-Mar	0.7	0.8	Z	2.1	2.8	3.4	4.0	4.2	2.5	2.0	M	0.8	0.4	0.5	0.7	2.0	1.0	0.5	0.5	0.3	1.0	0.8	0.3	0.6	1.5	4.2
31-Mar	0.4	0.4	1.0	1.1	Z	6.9	10.9	3.2	1.4	2.4	2.8	2.6	1.6	1.3	1.2	1.2	1.1	1.0	0.9	1.0	1.5	1.4	1.0	0.9	2.1	10.9
	2.4	1.9	2.2	2.1	2.4	2.4	3.4	3.3	2.9	3.0	2.8	2.3	2.2	2.3	2.2	2.3	2.2	2.4	2.7	2.9	3.1	2.7	2.6	2.4	Diurnal Average	
	8.3	6.6	8.4	6.3	6.0	6.9	10.9	11.7	7.5	9.8	11.0	8.2	12.1	9.5	7.0	6.7	6.8	9.7	11.1	13.7	13.1	12.7	10.9	8.8	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Surmont 2 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Surmont 2 - March 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	70	48	11	18	27	76	96	21	8	16	23	115	41	28	39	45	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	70	48	11	18	27	76	96	21	8	16	23	115	41	28	39	45	682

Total Number of Valid Hours: 682

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Surmont 2

Total Number of Valid Hours: 682

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 1 24-hr: 0

Maximum Value: 90.7 $\mu g/m^3$ on Mar 27 07:00

Maximum Daily Average: 14.6 $\mu g/m^3$ on Mar 27

Minimum Value: 0.3 $\mu g/m^3$ on Mar 2 22:00

Maximum Diurnal Average: 9.3 $\mu g/m^3$ at hour 7

Monthly Average: 4.51 $\mu g/m^3$

Minimum Daily Average: 2.2 $\mu g/m^3$ on Mar 7

Minimum Diurnal Average: 3.6 $\mu g/m^3$ at hour 2

Percentiles: P_1 = 0.4 P_{10} = 2.1 Q_1 = 2.7 Median = 3.5 Q_3 = 4.7 P_{90} = 6.7 P_{99} = 25.3

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Hours of Calibration:	2
Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.3	1.1	1.4	1.5	1.4	1.4	1.3	1.4	M	1.7	2.1	2.4	2.9	3.8	4.4	5.2	7.0	6.4	6.0	5.8	6.3	6.0	6.4	6.7	3.6	7.0
2-Mar	7.0	6.7	6.6	6.8	7.5	8.6	8.2	8.8	9.5	8.7	8.6	7.6	5.1	2.6	1.5	0.6	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	4.5	9.5
3-Mar	0.4	0.5	0.5	0.9	1.0	1.1	1.2	1.3	2.0	4.6	6.0	5.6	4.5	4.9	4.7	4.6	4.7	5.2	5.5	5.4	6.5	5.7	5.8	6.4	3.7	6.5
4-Mar	5.7	4.5	5.4	4.5	3.9	3.3	3.1	3.2	3.4	5.9	4.6	4.0	3.5	3.3	3.1	2.9	2.7	2.8	3.2	2.9	4.0	2.8	2.5	2.4	3.6	5.9
5-Mar	2.3	2.6	3.0	3.4	3.3	3.0	2.9	2.9	3.1	4.0	4.4	3.7	3.8	3.3	3.3	3.5	3.7	3.7	3.7	3.9	3.6	3.4	3.3	DF	3.4	4.4
6-Mar	3.5	3.4	3.1	2.7	2.3	2.1	2.2	2.3	2.5	2.5	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.0	2.1	2.1	2.0	2.1	2.1	2.4	3.5
7-Mar	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.9	3.1	3.1	2.9	2.5	2.0	1.9	1.8	1.8	1.8	2.0	2.2	2.1	2.2	2.2	2.2	3.1
8-Mar	2.4	2.5	2.5	2.5	2.4	2.4	2.5	2.7	2.9	2.9	2.8	2.7	2.6	2.4	2.3	2.2	2.2	2.5	2.3	2.3	2.2	2.0	2.1	2.0	2.4	2.9
9-Mar	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.9	2.2	2.6	2.6	2.5	2.6	2.7	2.7	2.8	3.0	3.0	2.8	2.6	3.0	3.3	3.1	3.0	2.4	3.3
10-Mar	2.7	2.6	2.8	3.2	3.3	3.3	3.2	3.3	3.5	3.7	3.9	3.9	3.8	3.8	3.6	3.4	3.2	2.8	2.8	2.9	3.1	3.1	3.1	3.1	3.2	3.9
11-Mar	2.8	2.8	2.6	2.5	2.3	2.3	3.1	3.4	2.8	2.7	2.9	2.9	2.7	2.4	2.3	2.4	2.4	2.3	2.3	2.4	2.5	2.5	2.4	2.4	2.6	3.4
12-Mar	2.4	2.7	2.9	3.1	3.1	3.2	3.3	3.0	3.1	3.6	3.8	3.6	3.6	3.8	3.8	4.0	3.8	3.8	3.9	3.9	4.4	4.3	3.9	3.7	3.5	4.4
13-Mar	3.6	3.5	3.7	4.0	4.0	4.5	5.0	5.4	5.0	3.9	4.3	4.5	4.2	C	C	3.5	3.6	3.6	3.5	3.3	3.1	2.6	2.9	2.7	3.8	5.4
14-Mar	2.6	2.5	2.2	2.1	2.2	2.2	2.2	2.4	2.5	2.5	2.6	2.6	2.6	2.6	3.0	3.1	3.0	4.1	4.1	4.4	4.6	4.4	3.9	3.4	3.0	4.6
15-Mar	3.2	3.1	2.9	2.7	3.1	2.9	2.9	2.7	3.7	3.9	3.6	3.6	M	M	3.3	3.6	4.1	4.4	4.3	4.2	4.3	3.9	3.6	3.4	3.5	4.4
16-Mar	3.1	3.0	3.3	3.2	3.1	3.1	3.1	3.2	3.2	3.1	3.0	3.1	3.2	3.2	3.3	3.4	3.4	3.3	3.3	3.3	3.0	3.0	3.2	3.2	3.2	3.4
17-Mar	3.3	3.4	3.3	3.3	3.3	3.2	2.3	2.3	2.2	2.7	2.9	3.1	3.2	3.4	3.6	4.0	4.6	4.9	4.5	4.0	3.6	3.5	3.4	3.2	3.4	4.9
18-Mar	3.0	3.0	3.6	3.7	4.1	4.7	5.0	5.1	5.3	5.8	4.6	4.0	4.0	3.6	3.5	3.4	3.5	2.9	2.9	2.6	2.4	2.4	2.5	2.4	3.7	5.8
19-Mar	2.6	2.8	2.5	2.9	2.8	3.9	3.7	3.2	3.3	3.5	3.6	3.6	3.5	3.5	3.5	3.5	3.6	3.7	3.9	4.0	4.0	4.0	3.9	3.7	3.5	4.0
20-Mar	3.4	3.0	2.8	2.7	2.7	2.7	2.8	2.8	3.0	3.1	3.2	3.2	3.3	3.2	3.6	3.6	3.9	4.1	4.1	4.0	4.1	4.2	4.3	4.3	3.4	4.3
21-Mar	4.3	4.4	4.8	5.1	4.8	4.9	4.9	4.3	3.9	4.1	4.1	4.2	4.4	4.7	4.5	4.3	4.4	4.4	4.1	3.8	3.5	3.2	3.1	3.2	4.2	5.1
22-Mar	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.7	3.8	4.2	4.8	5.4	5.4	5.4	5.5	5.8	5.6	5.6	5.3	5.2	5.8	5.8	6.1	7.7	4.8	7.7
23-Mar	9.0	9.1	9.3	9.3	9.6	9.4	7.6	5.8	5.3	4.0	3.3	2.7	3.2	4.7	4.8	5.0	5.2	4.6	4.1	3.9	4.0	4.0	4.0	4.2	5.7	9.6
24-Mar	4.4	4.2	4.6	4.7	5.3	6.5	6.3	8.7	5.1	4.3	4.0	4.0	3.7	3.8	3.8	4.0	4.0	3.9	3.8	4.3	4.7	6.1	5.5	5.1	4.8	8.7
25-Mar	4.4	3.8	4.7	5.1	5.5	7.9	14.0	11.0	8.8	7.3	9.7	8.0	6.9	5.9	4.7	5.1	5.6	5.7	5.6	4.5	4.2	4.4	4.4	4.7	6.3	14.0
26-Mar	5.6	5.6	4.7	6.2	9.3	20.8	21.8	10.1	8.5	6.2	4.0	3.9	4.0	3.8	3.8	3.6	4.7	5.5	4.9	9.0	27.2	17.1	14.9	9.4	8.9	27.2
27-Mar	9.0	8.9	8.0	12.1	13.3	48.4	90.7	29.4	14.7	5.6	5.0	4.8	5.3	5.3	7.6	5.2	6.4	6.3	6.1	7.1	10.5	13.3	12.3	16.2	14.6	90.7
28-Mar	12.8	7.6	7.7	5.9	8.1	31.0	57.1	72.5	42.1	4.1	4.6	4.3	4.3	5.0	4.3	6.0	6.3	6.4	6.5	5.4	3.9	3.3	4.2	3.5	13.2	72.5
29-Mar	3.5	3.6	3.7	3.5	11.9	7.4	9.7	10.5	7.7	7.1	4.9	3.2	4.2	4.6	6.0	8.0	4.0	3.3	2.6	2.3	2.1	1.9	1.5	2.9	5.0	11.9
30-Mar	2.1	1.8	1.8	2.7	3.2	6.8	7.4	8.4	6.3	1.6	M	1.2	1.1	1.1	1.4	1.5	1.6	1.3	1.4	1.3	1.3	1.3	1.3	1.4	2.6	8.4
31-Mar	1.5	1.6	1.7	1.7	1.8	3.0	3.3	2.8	4.2	6.0	5.9	5.9	5.4	5.2	4.9	5.1	5.0	4.7	4.5	4.3	6.8	5.1	4.5	4.8	4.2	6.8
	3.8	3.6	3.7	3.8	4.4	6.8	9.3	7.4	5.9	4.2	4.2	3.9	3.7	3.7	3.7	3.8	3.9	3.9	3.7	3.8	4.6	4.2	4.1	4.1	Diurnal Average	
	12.8	9.1	9.3	12.1	13.3	48.4	90.7	72.5	42.1	8.7	9.7	8.0	6.9	5.9	7.6	8.0	7.0	6.4	6.5	9.0	27.2	17.1	14.9	16.2	Diurnal Maximum	

C - Calibration M - Maintenance DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Surmont 2 - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	612	83.04	83.04
6 - 15	113	15.33	98.37
16 - 25	4	0.54	98.91
26 - 80	7	0.95	99.86
> 81.0	1	0.14	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Surmont 2 - March 2023

Concentration Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 5	61	46	10	17	28	78	85	17	7	15	18	94	34	24	33	39	606
6 - 15	12	4	2	1	1	1	13	7	2	2	3	28	9	8	6	8	107
16 - 25	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	4
26 - 80	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	5
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	50	12	18	29	79	98	24	9	17	23	127	44	32	40	47	722

Total Number of Valid Hours: 722

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Surmont 2

Total Number of Valid Hours: 722

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Surmont 2 - March 2023

Maximum Value: 9.7 C on Mar 18 15:00

Maximum Daily Average: 1.0 C on Mar 18

Minimum Value: -29.3 C on Mar 5 07:00

Minimum Daily Average: -21.9 C on Mar 5

Maximum Diurnal Average: -3.5 C at hour 16

Minimum Diurnal Average: -15.1 C at hour 7

Monthly Average: -9.48 C

Percentiles: P_1 = -28.4 P_{10} = -18.7 Q_1 = -13.9 Median = -9.1 Q_3 = -4.6 P_{90} = -0.7 P_{99} = 8.5

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	-23.6	-23.0	-19.8	-19.4	-18.3	-17.7	-17.8	-18.1	M	-13.9	-12.5	-11.6	-10.7	-9.1	-7.8	-7.1	-7.0	-8.0	-9.6	-9.6	-8.9	-9.3	-9.5	-9.4	-13.1	-7.0
2-Mar	-9.3	-9.7	-9.7	-9.7	-9.5	-8.5	-7.3	-6.4	-4.9	-3.5	-2.7	-1.0	1.6	3.7	3.6	2.9	2.3	0.5	-0.1	0.0	-0.1	-0.4	-1.0	-1.2	-2.9	3.7
3-Mar	-1.0	-1.2	-1.3	-2.2	-2.3	-2.8	-3.3	-3.7	-3.8	-5.0	-6.0	-6.2	-5.6	-6.0	-6.4	-6.5	-7.6	-8.8	-9.7	-10.5	-11.7	-12.6	-12.9	-12.4	-6.2	-1.0
4-Mar	-12.3	-13.0	-14.1	-15.3	-15.9	-16.6	-16.9	-16.9	-16.4	-15.7	-15.3	-15.3	-14.5	-13.9	-13.8	-13.7	-14.6	-15.8	-16.9	-18.7	-18.6	-19.3	-20.6	-21.7	-16.1	-12.3
5-Mar	-21.8	-22.5	-24.1	-24.5	-25.6	-27.3	-29.3	-28.3	-23.2	-20.4	-18.8	-17.4	-15.7	-15.5	-14.7	-14.4	-15.1	-18.3	-21.6	-24.1	-25.7	-27.1	-28.0	DF	-21.9	-14.4
6-Mar	-28.9	-29.1	-28.5	-28.8	-29.0	-27.7	-26.7	-24.8	-20.8	-14.8	-13.7	-13.6	-12.7	-12.1	-11.3	-10.9	-10.3	-11.4	-13.7	-14.5	-14.0	-13.7	-13.8	-13.8	-18.3	-10.3
7-Mar	-13.9	-14.2	-14.3	-14.1	-14.3	-14.7	-15.1	-15.2	-14.8	-14.0	-13.2	-11.6	-9.4	-6.8	-5.1	-4.5	-4.8	-5.2	-6.4	-7.7	-8.5	-9.4	-10.4	-11.4	-10.8	-4.5
8-Mar	-12.5	-13.9	-16.0	-17.4	-17.6	-18.2	-18.1	-17.0	-15.8	-14.3	-12.5	-9.9	-8.1	-7.3	-6.5	-6.3	-6.7	-9.3	-11.7	-14.2	-14.9	-16.1	-17.9	-19.5	-13.4	-6.3
9-Mar	-21.0	-21.7	-22.5	-23.2	-24.1	-24.5	-25.4	-24.6	-19.2	-15.5	-14.4	-12.9	-11.0	-8.9	-7.5	-7.4	-7.4	-8.2	-8.8	-9.4	-10.2	-10.6	-10.7	-11.2	-15.0	-7.4
10-Mar	-12.4	-12.9	-12.7	-12.7	-12.7	-12.7	-13.0	-12.9	-12.4	-12.0	-10.8	-9.4	-7.8	-6.9	-6.7	-6.3	-5.8	-5.7	-6.7	-7.6	-7.5	-8.3	-10.6	-12.2	-9.9	-5.7
11-Mar	-12.9	-13.6	-15.4	-16.1	-16.1	-17.2	-18.5	-17.6	-12.5	-9.9	-7.8	-6.3	-5.5	-4.2	-3.9	-3.5	-3.2	-3.8	-4.6	-5.9	-7.2	-8.6	-8.2	-8.8	-9.6	-3.2
12-Mar	-8.9	-8.6	-10.4	-10.1	-9.4	-9.7	-10.5	-11.5	-8.7	-6.9	-6.4	-5.5	-5.2	-6.6	-7.1	-7.4	-7.4	-7.9	-8.6	-9.2	-10.1	-10.9	-11.3	-12.3	-8.8	-5.2
13-Mar	-11.6	-11.5	-11.8	-11.9	-12.0	-12.3	-12.4	-12.5	-11.7	-10.6	-9.7	-8.5	-7.1	-6.1	-6.2	-6.0	-6.0	-6.2	-7.1	-7.4	-7.3	-7.1	-7.2	-7.3	-9.1	-6.0
14-Mar	-7.2	-7.2	-7.3	-7.6	-7.9	-8.5	-9.1	-9.7	-9.8	-9.6	-9.4	-9.0	-8.2	-7.8	-7.3	-8.2	-9.0	-9.8	-10.9	-12.6	-13.6	-13.8	-13.9	-14.6	-9.7	-7.2
15-Mar	-16.0	-17.8	-19.1	-20.5	-20.3	-22.3	-23.3	-22.5	-16.2	-13.2	-12.1	-10.3	-8.6	-7.1	-6.5	-6.5	-6.5	-8.6	-11.9	-14.5	-16.6	-18.3	-18.7	-17.5	-14.8	-6.5
16-Mar	-17.5	-17.5	-15.1	-14.8	-15.6	-14.7	-13.8	-13.6	-13.1	-12.2	-9.7	-7.8	-5.6	-4.5	-2.3	-1.0	-1.9	-4.6	-7.1	-9.6	-11.8	-12.5	-12.8	-13.0	-10.5	-1.0
17-Mar	-12.5	-12.3	-12.2	-13.2	-13.8	-14.3	-8.7	-6.1	-2.8	1.1	3.7	5.8	7.2	7.5	8.5	9.1	8.9	6.3	2.7	0.3	1.3	2.1	2.2	1.9	-1.1	9.1
18-Mar	1.2	1.0	-0.1	-3.6	-4.7	-5.9	-7.4	-6.9	-2.0	2.2	5.9	8.4	9.5	9.5	9.7	9.6	9.3	6.7	2.4	-1.2	-3.4	-4.1	-5.1	-6.8	1.0	9.7
19-Mar	-7.5	-8.4	-8.8	-9.6	-10.3	-11.0	-11.9	-9.9	-4.2	-2.0	-0.6	0.3	1.6	1.6	1.4	1.1	1.3	-0.7	-3.0	-3.8	-4.6	-5.2	-5.5	-5.9	-4.4	1.6
20-Mar	-6.2	-6.6	-6.5	-6.8	-7.3	-8.0	-8.9	-8.4	-7.3	-6.5	-5.2	-6.1	-6.0	-6.5	-7.0	-7.3	-7.1	-7.3	-7.7	-7.9	-8.0	-8.6	-10.2	-10.4	-7.4	-5.2
21-Mar	-9.9	-9.8	-10.0	-10.8	-11.3	-11.5	-11.7	-12.1	-11.4	-10.0	-9.7	-8.8	-7.2	-5.6	-4.6	-3.8	-4.1	-6.4	-9.1	-11.4	-12.8	-13.1	-13.1	-12.7	-9.6	-3.8
22-Mar	-13.6	-14.4	-15.5	-14.3	-15.0	-15.5	-14.1	-12.0	-10.0	-8.1	-4.6	-1.9	0.3	2.1	3.3	4.2	4.3	2.1	-1.6	-3.8	-4.2	-5.9	-7.1	-7.2	-6.3	4.3
23-Mar	-7.2	-6.9	-6.5	-7.9	-6.5	-6.2	-8.3	-6.4	-3.0	3.0	4.4	5.3	5.1	4.4	3.8	2.7	1.4	-1.1	-3.6	-5.9	-7.7	-8.4	-9.2	-9.9	-3.1	5.3
24-Mar	-9.2	-9.8	-11.4	-12.9	-15.0	-13.0	-11.5	-11.8	-8.3	-6.8	-6.1	-4.9	-3.6	-2.5	-2.0	-1.4	-1.6	-2.6	-5.7	-8.6	-11.1	-13.2	-14.5	-15.7	-8.5	-1.4
25-Mar	-16.9	-17.8	-17.5	-17.8	-17.9	-18.1	-17.5	-14.2	-6.0	-3.5	-3.3	-2.3	-1.1	-0.7	-0.7	-1.4	-1.5	-2.4	-3.9	-5.5	-7.0	-9.1	-10.4	-12.3	-8.7	-0.7
26-Mar	-13.6	-15.9	-18.3	-19.7	-21.2	-21.8	-21.9	-18.9	-17.0	-15.4	-13.3	-12.3	-11.6	-10.4	-9.8	-9.6	-9.5	-10.6	-12.0	-15.2	-18.0	-20.6	-21.9	-23.6	-15.9	-9.5
27-Mar	-24.9	-25.7	-26.5	-27.4	-28.0	-28.6	-28.7	-23.7	-15.9	-12.2	-11.6	-10.3	-7.8	-7.5	-7.1	-7.0	-6.8	-8.0	-11.1	-13.7	-16.4	-18.2	-18.3	-20.0	-16.9	-6.8
28-Mar	-21.5	-22.6	-23.6	-24.7	-25.6	-26.0	-26.2	-21.9	-14.7	-9.4	-7.1	-5.3	-3.8	-2.5	-1.9	-1.3	-1.4	-1.6	-2.8	-4.1	-4.9	-3.7	-2.4	-2.5	-10.9	-1.3
29-Mar	-2.6	-2.8	-3.2	-3.5	-3.0	-3.1	-4.4	-3.5	-2.4	-2.0	-1.0	-0.6	-0.8	-0.7	-0.8	-1.1	-1.2	-1.7	-2.7	-3.9	-4.3	-5.5	-7.7	-10.0	-3.0	-0.6
30-Mar	-12.1	-13.7	-15.2	-15.9	-17.0	-16.8	-15.1	-11.1	-6.2	-3.7	M	-1.9	-0.8	-0.2	0.2	1.0	0.9	-0.3	-1.6	-3.0	-3.5	-4.0	-4.2	-4.0	-6.4	1.0
31-Mar	-4.3	-5.0	-5.7	-7.2	-8.7	-10.3	-11.2	-7.5	-4.3	-2.7	-0.7	0.0	0.6	1.6	2.6	4.3	4.0	2.8	0.5	-2.3	-3.2	-3.8	-3.9	-5.1	-2.9	4.3
	-12.6	-13.2	-13.7	-14.3	-14.7	-15.0	-15.1	-13.9	-10.6	-8.6	-7.5	-6.2	-4.9	-4.2	-3.7	-3.5	-3.7	-5.0	-6.9	-8.6	-9.5	-10.3	-10.9	-11.0	Diurnal Average	
	1.2	1.0	-0.1	-2.2	-2.3	-2.8	-3.3	-3.5	-2.0	3.0	5.9	8.4	9.5	9.5	9.7	9.6	9.3	6.7	2.7	0.3	1.3	2.1	2.2	1.9	Diurnal Maximum	

M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Surmont 2 - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	64	8.64	8.64
-20 - 0	614	82.86	91.50
0 - 10	63	8.50	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Surmont 2 - March 2023

Maximum Value: 91.1 % on Mar 14 02:00

Maximum Daily Average: 83.7 % on Mar 14

Minimum Value: 23.2 % on Mar 18 17:00

Minimum Daily Average: 46.1 % on Mar 18

Maximum Diurnal Average: 80.7 % at hour 7

Minimum Diurnal Average: 51.0 % at hour 15

Monthly Average: 67.50 %

Percentiles: P_1 = 25.3 P_{10} = 40.1 Q_1 = 56.0 Median = 71.7 Q_3 = 81.5 P_{90} = 86.4 P_{99} = 90.4

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	78.7	79.6	83.4	82.4	81.9	81.2	81.1	80.7	M	74.4	73.3	70.8	70.9	68.8	68.4	68.0	69.2	73.3	80.9	81.8	79.1	80.2	80.7	80.6	76.9	83.4
2-Mar	83.0	85.7	86.1	86.7	85.6	81.8	83.9	77.0	70.9	69.3	69.2	70.1	62.2	54.2	54.3	61.6	61.1	81.2	79.2	79.2	78.9	78.5	79.5	79.8	75.0	86.7
3-Mar	78.3	76.3	76.5	80.3	69.4	70.7	72.5	71.3	70.2	75.3	75.2	74.1	68.4	67.5	65.4	64.6	72.2	81.9	81.9	80.8	83.8	84.7	86.3	84.5	75.5	86.3
4-Mar	82.7	82.1	82.5	82.5	81.5	79.7	78.4	77.3	76.9	74.1	71.6	67.3	59.6	57.3	56.7	55.5	58.6	62.0	64.5	70.6	71.2	72.8	76.1	78.6	71.7	82.7
5-Mar	79.5	79.7	79.1	78.9	77.3	75.5	73.6	73.2	70.7	67.5	61.7	55.7	50.3	48.9	46.1	44.8	45.8	56.0	66.0	70.8	73.9	74.4	74.9	DF	66.3	79.7
6-Mar	74.6	74.1	75.3	74.3	74.0	76.4	76.4	76.3	72.1	59.2	54.7	61.6	63.3	62.0	58.6	62.0	61.3	65.9	77.1	80.7	75.3	69.0	66.6	61.8	68.8	80.7
7-Mar	66.8	69.6	68.9	60.8	62.7	67.4	72.7	69.0	63.3	62.1	61.7	58.8	52.7	49.1	50.8	52.0	54.2	54.9	58.2	52.6	42.1	42.7	44.9	48.1	57.8	72.7
8-Mar	50.8	55.6	65.8	73.0	70.8	72.3	71.1	65.5	59.2	52.8	47.3	40.4	34.7	32.5	30.7	29.7	31.3	41.1	46.4	55.8	57.0	58.1	64.4	66.8	53.0	73.0
9-Mar	69.9	71.5	73.2	74.7	76.1	76.9	77.2	76.7	64.3	53.2	51.9	50.2	46.5	45.5	45.4	47.4	48.1	53.6	58.2	60.2	63.8	66.6	63.2	67.4	61.7	77.2
10-Mar	77.5	83.4	83.9	81.2	81.8	81.0	83.9	83.5	81.1	78.5	74.7	71.0	65.6	64.1	67.4	68.2	64.7	62.4	63.2	64.3	62.9	63.8	74.1	79.6	73.4	83.9
11-Mar	78.1	78.5	80.2	81.3	79.8	82.9	84.0	81.4	74.1	69.2	63.3	61.2	59.9	56.1	55.4	55.3	54.0	57.1	63.3	69.4	66.1	71.0	73.9	79.0	69.8	84.0
12-Mar	81.8	84.9	89.2	87.9	85.0	87.0	88.5	87.7	80.4	71.5	71.1	72.8	77.6	82.1	84.1	84.5	83.9	84.8	86.4	87.6	87.0	86.5	86.1	86.9	83.6	89.2
13-Mar	87.1	87.0	87.1	87.4	87.7	88.6	90.2	89.4	85.2	81.6	78.5	77.6	72.2	69.2	69.8	69.6	72.1	71.9	80.4	88.7	90.1	90.8	90.4	90.5	82.6	90.8
14-Mar	91.0	91.1	90.9	90.8	90.5	90.0	89.4	87.7	86.4	84.5	82.0	79.7	75.7	73.9	68.0	71.8	74.6	79.2	83.8	86.3	86.5	85.4	84.6	84.7	83.7	91.1
15-Mar	84.6	83.7	82.6	81.1	81.1	79.1	78.5	78.2	78.0	72.8	71.0	66.4	64.1	60.6	58.5	59.6	57.5	65.3	79.0	84.6	84.8	83.4	81.8	80.6	74.9	84.8
16-Mar	81.9	82.8	85.2	84.4	84.0	84.4	84.7	83.7	82.2	79.3	75.8	70.8	65.0	63.6	56.2	53.7	59.7	77.4	88.0	89.3	89.3	88.7	88.6	88.7	78.7	89.3
17-Mar	89.2	88.6	88.5	88.0	87.3	87.0	86.6	83.3	74.1	52.7	46.9	48.9	45.3	38.1	32.5	28.5	25.8	31.8	42.9	54.5	44.5	37.1	33.8	33.0	57.0	89.2
18-Mar	33.3	33.6	39.1	52.3	57.9	61.9	67.6	66.4	49.9	36.4	29.8	25.1	23.5	25.4	25.7	25.3	23.2	31.1	45.8	59.7	72.1	69.3	72.7	78.6	46.1	78.6
19-Mar	81.0	81.7	82.0	82.8	83.3	85.2	86.7	79.5	67.2	59.4	56.0	51.5	46.7	47.5	49.3	51.8	52.4	59.7	69.7	72.8	75.4	77.2	77.8	78.5	69.0	86.7
20-Mar	78.6	77.4	73.6	70.7	71.0	71.7	74.1	71.5	67.7	72.7	75.7	79.5	80.3	84.6	86.0	86.3	84.9	83.8	85.0	85.6	84.3	84.8	88.5	88.9	79.5	88.9
21-Mar	88.0	87.9	87.8	88.0	87.9	88.1	88.3	90.4	88.3	85.1	80.8	76.5	70.1	63.9	60.4	57.4	58.6	70.2	85.2	87.7	88.5	88.5	88.7	88.6	81.0	90.4
22-Mar	88.1	87.2	86.4	87.1	85.2	85.1	86.0	84.0	78.2	74.1	63.7	53.6	46.6	41.8	39.5	38.1	38.9	49.3	68.5	75.6	77.1	82.8	82.8	85.2	70.2	88.1
23-Mar	83.9	84.7	84.4	84.4	78.7	74.8	84.3	81.6	70.4	49.5	43.4	35.4	37.8	42.3	42.8	47.1	49.5	56.9	62.4	68.9	75.8	78.7	81.5	83.8	66.0	84.7
24-Mar	84.4	86.2	89.2	88.3	86.7	87.8	87.2	85.3	77.0	65.0	58.0	52.8	47.5	44.0	42.0	39.9	39.5	40.3	48.3	58.4	66.7	71.7	75.4	76.3	66.6	89.2
25-Mar	78.9	81.1	80.1	81.6	81.3	83.2	83.5	75.4	48.8	40.7	41.7	38.2	30.1	25.3	27.2	33.7	31.3	34.4	37.8	39.3	37.6	42.4	47.7	56.5	52.4	83.5
26-Mar	64.0	72.2	75.6	79.7	80.1	79.3	77.5	64.9	53.5	47.8	41.2	39.2	37.3	34.1	32.0	30.6	30.0	33.6	38.7	50.6	57.7	66.3	68.4	69.8	55.2	80.1
27-Mar	71.9	73.7	75.1	76.7	75.7	74.7	74.9	68.7	50.8	40.1	39.2	37.9	34.2	34.6	34.5	34.8	35.1	38.1	48.5	54.4	64.1	68.3	70.8	74.1	56.3	76.7
28-Mar	75.5	76.8	76.9	77.4	77.5	77.2	74.5	70.4	54.8	38.4	34.0	30.8	28.2	24.2	23.5	25.2	26.2	27.8	34.7	39.6	41.0	40.5	42.1	47.3	48.5	77.5
29-Mar	49.6	51.0	61.5	65.7	61.9	64.6	73.1	68.1	66.1	68.4	64.8	61.9	64.3	65.3	64.6	66.7	62.9	63.3	65.1	67.3	67.6	72.0	78.6	83.4	65.7	83.4
30-Mar	86.2	87.1	86.3	84.9	84.2	83.9	81.8	77.1	65.8	55.2	M	40.5	35.7	35.2	36.8	37.7	37.8	40.2	44.4	45.3	48.4	51.2	51.6	50.6	58.6	87.1
31-Mar	58.0	76.6	82.2	85.3	87.6	88.4	88.2	80.7	76.7	69.3	57.7	52.5	54.2	52.0	47.2	42.4	45.6	50.2	56.8	67.0	70.5	73.6	74.8	78.1	67.3	88.4
	76.0	77.8	79.3	80.0	79.2	79.6	80.7	77.6	70.1	63.9	60.5	57.2	53.9	52.1	51.0	51.4	51.9	57.4	64.2	68.7	69.8	71.0	72.6	74.3	Diurnal Average	
	91.0	91.1	90.9	90.8	90.5	90.0	90.2	90.4	88.3	85.1	82.0	79.7	80.3	84.6	86.0	86.3	84.9	84.8	88.0	89.3	90.1	90.8	90.4	90.5	Diurnal Maximum	

M - Maintenance DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Surmont 2 - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	74	9.99	9.99
40 - 60	146	19.70	29.69
60 - 80	305	41.16	70.85
80 - 100	216	29.15	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Surmont 2 - March 2023

Maximum Speed: 18 km/h on Mar 2 12:00

Maximum Daily Speed Average: 9.1 km/h on Mar 7

Minimum Speed Value: 0 km/h on Mar 30 08:00

Minimum Daily Speed Average: 1.3 km/h on Mar 16

Maximum Diurnal Speed Average: 3.0 km/h at hour 14

Minimum Diurnal Speed Average: 0.3 km/h at hour 20

Monthly Average Velocity: 0.6 km/h 77.0 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 3$ Median = 5 $Q_3 = 7$ $P_{90} = 9$ $P_{99} = 13$

Hours in Service:	744
Hours of Data:	726
Hours of Missing Data:	18
Percent Operational Time:	97.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	WSW2	WSW2	SSW4	S2	SSE3	SSE5	SSE5	SE4	M	SE7	SE8	SE8	SE9	SE8	SE7	SE7	SSE5	SSE5	SE4	SE6	SSE8	SSE8	SSE6	SE7	SSE5.4	SE9
2-Mar	SE7	SE8	SE8	SE8	SE8	SSE7	SE6	S4	W12	WSW12	WSW14	WSW18	WSW18	W16	W12	W11	W12	W10	W9	W10	W11	WNW10	WNW8	W10	WSW6.7	WSW18
3-Mar	WNW10	WNW9	WNW9	NNW7	NW12	NW9	NW8	NW8	NNW5	NNE6	N7	N7	N6	NNE7	N7	NNE6	N7	N6	N5	NNW5	NW4	NW3	WNW3	WNW2	NNW5.6	NW12
4-Mar	NW4	NNW5	NNW5	NNW5	N6	N5	NNW4	NW3	NNW3	NNE5	N7	N9	N10	NNW10	NNW9	NNW10	NNW9	NNW8	NNW5	NW4	NNW5	N6	NW5	NW4	NNW5.7	NNW10
5-Mar	NW5	WNW4	WNW3	WNW3	WNW3	W5	W2	UO	NW3	N7	N6	N6	N6	NNE7	NNE6	NNE6	NNE5	NW2	W3	WSW3	WSW2	WSW3	WSW3	DF	NNW2.7	NNE7
6-Mar	WSW3	WSW3	WSW3	WSW2	WSW3	W3	W3	SSW3	SSW2	SSE6	SE8	SE8	SE8	SE9	ESE9	ESE9	ESE8	SE6	SE2	SSW2	SE4	SE7	SE7	SE7	SE3.8	ESE9
7-Mar	ESE9	ESE9	ESE8	ESE9	SE9	SE8	SE7	SE7	SE9	SE10	SE10	ESE10	SSE9	SE10	SE12	SE12	SE12	SE11	SE6	SE8	SE9	SE9	SE10	SE10	SE9.1	SE12
8-Mar	SE8	SE6	SSW2	SSW2	SSE4	SSE3	SE4	SE5	SE7	SE7	SE7	ESE8	ESE10	ESE11	ESE9	ESE9	ESE8	ENE7	ESE4	SE3	SSE3	SW2	W2	WSW3	SE4.7	ESE11
9-Mar	WSW3	WSW3	WSW4	WSW4	WSW2	WSW4	WSW4	SW3	SE5	SE7	SE10	SE11	SE11	SE12	SE14	ESE13	SE9	SE11	ESE11	ESE11	SE11	SE11	SE9	SE9	SE6.3	SE14
10-Mar	ESE9	ESE8	SE8	SE10	ESE9	ESE8	ESE8	ESE8	ESE9	ESE12	SE11	ESE11	ESE12	ESE10	ESE10	ESE9	ESE9	ESE10	ESE11	ESE8	ESE8	ESE7	S1	SSE3	ESE8.6	ESE12
11-Mar	SW2	WSW2	W3	WSW4	WSW2	W2	WSW2	WSW2	SSW3	S5	SE5	SE7	SE9	ESE10	SE8	SSE6	SE6	SSE4	SE4	ESE2	SE3	SW2	SW2	WSW2	SSE2.7	ESE10
12-Mar	SW2	SSW2	WSW2	WSW3	WSW2	WSW1	SW2	UO	WNW1	W2	S2	ESE2	ENE4	NNE6	N6	N5	N4	N4	NNW4	NNW4	NNW4	NW4	NNW3	NW3	NW1.7	NNE6
13-Mar	NW2	NNW2	NW3	NW2	N3	NNE3	N3	N2	NNW1	E4	E5	E7	E8	E9	E8	E9	E8	E9	E8	E5	E4	ENE4	ENE6	E6	ENE4.0	E9
14-Mar	E6	E6	ENE6	ENE6	NE5	NNE5	NNE5	NNE5	NNE5	NNE4	N5	N6	N7	N7	N8	N9	NNW6	NNW6	NW5	NW4	NW4	NW5	NW5	NW4	N4.3	N9
15-Mar	WNW4	WNW3	W3	WNW2	W3	WNW2	WNW3	NNW1	NNW3	NNW4	N5	NNW5	N4	NE6	M	NE6	NNE5	NNE3	W2	WSW3	WSW3	WSW3	WSW2	WSW1	NNW2.1	NE6
16-Mar	WSW2	SSW1	SE3	ESE4	ESE5	ESE4	ESE4	ESE4	SE3	ESE5	E3	N1	N4	NNE4	NNE3	NE4	E2	SE3	WSW1	WSW2	SW3	SW3	SW3	SW2	ESE1.3	ESE5
17-Mar	SW3	SSW2	SSE2	SSE2	SW1	WSW1	W6	WSW2	S1	WSW5	WSW5	SSE3	SSW4	WSW10	WSW8	WSW8	WSW8	WSW6	WSW2	WSW2	WSW5	WSW9	WSW13	WSW14	WSW4.7	WSW14
18-Mar	WSW12	WSW11	WSW4	NE1	SW1	SW2	W1	SW2	E1	WNW3	SSW0	NNE2	NNE6	NNE6	NNE6	NNE6	NNE7	N3	W4	WSW4	UO	WSW2	W1	WSW0	NW1.7	WSW12
19-Mar	WSW1	WSW2	WSW2	WSW1	WSW1	WSW1	WSW1	SE1	E3	E4	ESE6	ENE7	E8	ENE9	ENE9	ENE8	ENE6	E7	E6	ESE7	ESE6	ESE6	ESE5	ESE5	E3.7	ENE9
20-Mar	ESE6	ESE4	ESE5	ESE7	ESE5	ESE4	ESE5	ESE7	E7	ESE5	E4	N6	NNE5	N4	NNE6	NNW6	N7	N7	N4	N4	NNW3	NW4	WNW4	NW4	NE2.5	ESE7
21-Mar	NW3	NNW4	NNW4	NW4	NW3	WNW3	NW4	NW5	NNW4	NNE4	NNE4	NNE4	N3	NNE4	NNE5	ENE4	E5	ESE5	SSW1	WSW2	SW3	S2	SSW3	S4	N1.5	NW5
22-Mar	SE4	SE1	E1	SSE2	SE3	ESE3	E4	SE6	SE7	SE8	SE8	SE9	SE10	ESE10	SE9	SE7	SSE6	S3	WSW2	SW2	SSW3	WSW1	SSW2	UO	SE4.3	ESE10
23-Mar	UO	WSW1	SW1	NW1	W4	W4	WSW2	WSW3	WSW4	W9	WNW9	WNW10	NNW8	N10	N11	NNW11	N12	N11	N10	N9	N8	N4	NW4	WNW3	NNW5.1	N12
24-Mar	WNW3	WNW3	W3	UO	UO	WNW2	NW1	N2	NNW5	NNW5	NNW6	N6	NNE5	N6	NNE6	NNE5	N5	N4	N2	WSW2	WSW3	WSW3	WSW3	WSW3	NNW2.4	N6
25-Mar	WSW3	WSW3	WSW3	WSW3	WSW2	WSW2	WSW3	WNW2	NE1	N8	N7	N8	NNE8	N9	N9	N11	NNW9	NNW7	NNW6	NW4	NW4	NW3	WNW4	WNW4	NNW3.8	N11
26-Mar	WNW3	W2	WSW2	W1	W1	W1	NW0	ENE2	NNE1	N4	NNE5	NNE6	N7	NNE6	NNE8	NNE7	NNE7	NNE4	NNE3	WSW3	WSW4	WSW1	WSW3	WSW2	N2.1	NNE8
27-Mar	WSW1	W0	UO	UO	UO	UO	UO	UO	N3	N5	NE5	NE4	N3	ENE5	N6	NE5	NNE6	NE2	SW2	WSW3	SW2	WSW2	WSW2	WSW2	N1.7	N6
28-Mar	WSW2	WSW2	WSW2	WSW1	UO	WSW2	WSW2	SW0	SW1	SSE4	SE4	ESE8	ESE7	W6	W7	W7	WSW7	WSW7	WSW3	SSW2	SSE2	WSW4	WSW6	WSW6	SW2.4	ESE8
29-Mar	WSW8	WSW7	W3	W3	WNW4	NW6	NW4	NNW5	NNW7	NNW8	NNW8	N10	NNW10	N10	NNW9	N9	N8	NNE7	N5	N5	NNE5	NNE5	W2	WSW4	NNW4.9	NNW10
30-Mar	WSW2	WSW2	WSW1	WSW2	WSW1	WSW2	WSW1	E0	NNW0	ESE6	M	ESE7	ESE8	ESE8	SE7	SE3	NNE5	NE6	ENE5	E2	ESE5	ESE5	ESE4	SE5	ESE2.5	ESE8
31-Mar	SE5	ESE5	SE2	WSW2	W2	WSW2	WSW2	ENE1	SE5	SE6	ESE5	SE4	E4	E4	ESE5	ESE4	ENE7	NE6	NE4	W2	W3	WSW2	W2	W2	ESE1.7	ENE7
Diurnal Average	SW1.2	SW1.1	SW0.8	S0.6	SSW0.5	SW0.7	SW0.4	ESE0.6	ESE0.6	E1.3	E1.8	ENE2.4	ENE2.6	ENE3.0	NE2.8	NE2.7	NE2.5	NE2.2	NE1.0	WSW0.3	S0.7	SSW0.6	SW1.4	SW1.5		
Diurnal Maximum	WSW12	WSW11	WNW9	SE10	NW12	NW9	NW8	NW8	W12	WSW12	WSW14	WSW18	WSW18	W16	SE14	ESE13	W12	SE11	ESE11	ESE11	W11	SE11	WSW13	WSW14		

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 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Surmont 2 - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	429	59.09	59.09
6 - 11	276	38.02	97.11
12 - 19	21	2.89	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: 726

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Surmont 2 - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	29	28	9	8	16	26	25	16	9	17	23	107	29	25	35	27	429
6 - 11	44	22	4	10	15	50	68	8	0	0	0	13	11	7	4	20	276
12 - 19	1	0	0	0	0	3	5	0	0	0	0	7	4	0	1	0	21
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	74	50	13	18	31	79	98	24	9	17	23	127	44	32	40	47	726

Total Number of Valid Hours: 726

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Surmont 2

Total Number of Valid Hours: 726

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Mar 2 13:00

Minimum Value: 1 km/h on Mar 31 21:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	726
Hours of Missing Data:	18
Hours of Calibration:	0
Percent Operational Time:	97.6

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

M - Maintenance DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Surmont 2 - March 2023

Direction of Maximum Speed: 257 deg on Mar 2 12:00
Direction of Maximum Daily Speed Average: 132.8 deg on Mar 7

Direction of Minimum Speed: 85 deg on Mar 30 08:00

Direction of Minimum Daily Speed Average: 1.3 deg on Mar 16

Monthly Average Direction: 77.0 deg

Hours in Service:	744
Hours of Data:	726
Hours of Missing Data:	18
Percent Operational Time:	97.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average
1-Mar	244	248	195	169	165	160	147	132	M	133	136	139	131	134	136	143	167	149	125	140	149	148	154	143	146.3
2-Mar	130	137	137	135	140	147	138	170	259	258	257	257	255	262	275	271	269	278	272	279	280	282	284	279	252.1
3-Mar	288	297	303	332	308	316	304	316	337	15	8	5	1	19	10	32	9	2	355	338	318	304	290	290	333.8
4-Mar	324	339	340	334	351	350	337	321	340	12	6	357	350	333	343	345	347	347	332	307	329	350	315	318	342.1
5-Mar	323	303	288	296	283	259	274	UO	319	353	3	353	8	31	25	15	31	316	262	249	252	251	250	DF	332.8
6-Mar	246	244	245	246	251	259	265	197	200	147	135	135	143	131	123	118	118	125	127	210	137	126	125	124	143.9
7-Mar	123	123	119	122	132	132	129	128	133	141	139	123	147	136	138	136	130	130	144	144	141	133	133	130	132.8
8-Mar	132	142	212	201	156	156	145	140	136	128	126	113	113	112	120	122	105	78	108	131	161	235	262	254	128.3
9-Mar	248	247	253	252	245	252	252	226	138	135	134	132	138	128	129	123	144	127	123	121	132	124	126	124	138.4
10-Mar	121	123	125	124	121	121	119	118	116	120	128	119	115	116	114	108	108	110	114	122	119	119	183	164	119.0
11-Mar	232	238	259	256	256	261	254	251	197	181	132	131	131	114	145	150	134	147	136	115	136	218	218	238	160.7
12-Mar	232	202	251	239	252	239	221	UO	292	264	185	112	61	12	350	349	350	357	342	335	329	322	331	308	325.2
13-Mar	322	328	317	313	7	15	9	352	335	88	100	91	92	91	79	85	81	88	84	85	87	76	77	81	74.9
14-Mar	80	83	74	68	43	24	32	15	15	20	8	1	355	357	351	349	331	343	324	317	311	317	319	316	4.3
15-Mar	297	287	277	286	281	297	296	327	342	341	357	340	359	34	M	34	27	17	272	245	248	249	244	244	326.7
16-Mar	245	204	129	118	112	111	104	106	136	123	90	10	2	25	17	38	95	124	251	242	233	231	225	216	114.1
17-Mar	229	212	160	156	230	246	266	250	174	243	239	158	201	243	244	249	254	245	245	243	245	253	252	252	242.2
18-Mar	253	256	250	48	235	215	259	214	79	293	200	24	21	24	19	13	15	355	259	255	UO	248	264	248	305.2
19-Mar	247	249	248	245	246	246	250	135	99	100	113	70	92	76	61	71	68	89	84	106	106	106	111	111	91.3
20-Mar	115	108	115	114	123	123	105	102	100	104	97	7	16	2	15	344	353	2	1	352	339	317	298	308	50.2
21-Mar	307	330	340	317	309	302	324	323	336	33	14	22	8	13	19	60	86	112	207	251	236	188	194	183	350.0
22-Mar	136	125	98	159	140	105	99	124	131	126	127	136	127	123	125	141	152	171	247	219	201	245	202	UO	135.8
23-Mar	UO	241	232	307	275	270	237	246	248	279	286	294	337	359	358	347	355	356	357	355	7	350	311	298	328.5
24-Mar	295	285	263	UO	UO	284	319	354	348	330	339	5	27	11	25	19	357	11	353	248	244	237	239	240	338.4
25-Mar	239	237	239	237	240	239	242	301	41	6	8	359	13	1	4	349	343	348	343	311	322	318	297	282	337.5
26-Mar	292	268	245	265	266	261	305	65	20	5	21	23	7	25	24	16	14	16	24	258	247	240	242	247	356.9
27-Mar	240	260	UO	UO	UO	UO	UO	UO	355	11	36	34	2	62	2	40	32	38	233	246	234	245	243	247	10.1
28-Mar	244	244	247	249	UO	244	248	226	217	147	128	106	117	265	263	263	245	248	245	211	158	244	246	245	229.8
29-Mar	242	253	275	269	303	321	317	335	342	344	344	355	346	350	348	352	1	18	4	3	23	25	266	249	338.2
30-Mar	245	252	250	243	243	250	238	85	344	108	M	105	120	118	125	139	25	55	57	80	119	115	114	130	111.2
31-Mar	129	120	134	241	260	250	242	72	133	131	108	130	91	87	102	103	59	49	38	276	261	249	268	270	107.9
Diurnal Average	221.1	225.3	224.2	180.7	208.6	236.2	228.0	113.8	103.4	92.1	84.9	70.5	72.8	60.7	54.3	47.8	39.7	51.7	40.7	253.3	189.5	208.2	229.6	220.8	

M - Maintenance DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Surmont 2 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Surmont 2 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 109 deg on Mar 17 09:00

Minimum Value: 8 deg on Mar 11 08:00

Percentiles: P_1 = 11 P_{10} = 22 Q_1 = 29 Median = 36 Q_3 = 48 P_{90} = 60 P_{99} = 97

Hours in Service:	744
Hours of Data:	726
Hours of Missing Data:	18
Hours of Calibration:	0
Percent Operational Time:	97.6

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-Mar	18	23	54	67	57	49	46	44	M	32	33	41	37	39	42	41	51	52	52	43	57	51	60	58	67
2-Mar	46	40	43	41	44	56	66	92	38	24	24	25	26	30	28	29	28	31	26	26	27	28	28	25	92
3-Mar	29	31	33	38	33	36	31	38	48	36	31	32	37	36	39	42	37	34	36	36	32	22	20	24	48
4-Mar	34	31	29	30	29	35	33	37	40	45	38	35	34	38	36	35	34	34	32	22	32	39	30	28	45
5-Mar	29	33	27	30	20	11	13	UO	50	35	40	42	62	48	43	44	45	60	20	33	15	19	10	DF	62
6-Mar	17	14	12	13	18	23	26	54	59	43	32	35	39	39	35	28	25	45	81	69	59	28	29	27	81
7-Mar	25	30	26	31	32	31	32	36	36	44	41	32	50	45	44	40	36	32	46	48	41	38	38	33	50
8-Mar	35	44	45	52	46	51	44	40	37	41	38	35	30	28	34	36	31	27	46	81	58	47	38	12	81
9-Mar	23	23	15	16	18	20	17	46	49	43	36	39	43	38	35	29	43	28	26	25	36	27	30	28	49
10-Mar	21	25	32	24	25	24	21	22	24	21	35	25	23	32	26	30	24	21	19	25	27	28	79	63	79
11-Mar	73	43	14	15	42	29	13	8	56	53	63	40	38	27	51	52	45	52	57	93	60	62	51	37	93
12-Mar	47	47	39	57	47	52	31	UO	58	42	76	96	60	35	27	27	34	32	31	28	29	33	31	34	96
13-Mar	28	31	25	23	40	41	40	45	57	54	36	37	33	32	32	32	30	27	29	41	36	46	36	29	57
14-Mar	32	30	36	38	40	45	46	45	39	40	34	35	33	34	35	33	36	35	32	30	29	33	32	28	46
15-Mar	23	21	18	17	20	28	35	94	42	51	50	41	57	49	M	35	40	53	27	25	17	16	17	49	94
16-Mar	36	101	54	30	32	39	31	25	55	40	50	104	62	56	83	55	89	44	16	19	31	25	34	40	104
17-Mar	34	41	47	46	28	46	31	80	109	58	36	67	59	28	36	33	28	33	23	38	49	29	25	23	109
18-Mar	23	26	91	99	44	67	22	58	81	49	98	93	58	48	48	44	39	61	13	18	UO	22	15	54	99
19-Mar	49	34	17	60	62	55	42	99	65	69	49	35	35	34	33	33	37	29	29	25	29	40	27	30	99
20-Mar	35	51	49	22	45	45	26	23	21	42	42	32	46	49	39	32	33	31	42	40	47	35	24	30	51
21-Mar	28	32	34	28	21	25	30	33	36	39	58	55	78	76	56	59	52	30	56	14	31	72	66	67	78
22-Mar	54	85	83	58	48	61	43	43	47	44	40	42	34	33	38	48	50	61	15	32	46	48	65	UO	85
23-Mar	UO	22	57	48	36	21	45	22	32	29	37	37	46	38	38	36	33	38	39	37	38	43	31	29	57
24-Mar	26	23	12	UO	UO	28	40	56	33	46	52	55	64	51	54	55	37	45	65	41	34	25	15	17	65
25-Mar	15	13	14	13	12	10	9	54	85	30	36	38	38	34	35	33	40	37	38	32	39	37	24	23	85
26-Mar	23	63	48	37	43	56	63	79	103	53	56	48	43	57	43	41	41	53	54	20	14	37	11	27	103
27-Mar	44	54	UO	UO	UO	UO	UO	UO	55	58	59	73	90	58	39	43	44	81	32	13	26	52	10	17	90
28-Mar	12	35	43	12	UO	17	39	87	80	62	73	35	57	54	47	37	33	28	31	54	70	60	29	37	87
29-Mar	23	25	41	35	32	29	25	36	35	31	36	34	36	38	33	33	39	41	44	41	33	42	35	16	44
30-Mar	15	23	47	36	36	22	51	91	90	38	M	31	46	54	55	92	58	43	42	91	38	30	33	38	92
31-Mar	42	35	69	46	13	32	35	101	54	45	67	57	58	75	62	75	40	31	56	46	11	31	16	17	101
Diurnal Maximum	73	101	91	99	62	67	66	101	109	69	98	104	90	76	83	92	89	81	81	93	70	72	79	67	

M - Maintenance DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS30
ELLS RIVER
MARCH 2023

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

April 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
MARCH 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	34	35	99.87	43.3	0	6.6	0
TRS (ppb) Average	707	36	37	99.87	1.5	0	0.8	0
THC (ppm) Average	703	34	41	99.06	3.1	-	2.4	-
NMHC (ppm) Average	703	34	41	99.06	0.246	-	0.03	-
CH4 (ppm) Average	703	34	41	99.06	3.1	-	2.4	-
NO2 (ppb) Average	707	36	37	99.87	40.2	0	16.4	-
NO (ppb) Average	707	36	37	99.87	87.3	-	21.2	-
NOX (ppb) Average	707	36	37	99.87	114.8	-	37.6	-
PM2.5 (ug/m3) Average	741	2	3	99.87	30	0	13.7	0
Temperature 2 m (C) Average	743	0	1	99.87	9.7	-	1	-
Relative Humidity (%) Average	743	0	1	99.87	90.1	-	80.5	-
Wind Speed 10 m (km/h) Average	741	0	3	99.6	27	-	21	-
Wind Direction 10 m (deg) Average	741	0	3	99.6	-	-	-	-
Global Solar Radiation (W/m2) Average	743	0	1	99.87	613.5	-	193.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	1.75	4.3	-	0	0	0	0.1	1.1	5.4	43.3
TRS (ppb) Average	707	0.55	0.2	-	0.4	0.4	0.4	0.5	0.6	0.8	1.5
THC (ppm) Average	703	2.14	0.1	-	2	2	2	2.1	2.2	2.3	3.1
NMHC(ppm) Average	703	0.004	0.021	-	0	0	0	0	0	0	0.246
CH4(ppm) Average	703	2.13	0.1	-	2	2	2	2.1	2.2	2.3	3.1
NO2 (ppb) Average	707	8.74	6.5	-	0.2	1.6	3.9	7.3	12	17.4	40.2
NO (ppb) Average	707	2.79	7.4	-	0	0	0.1	0.2	2.9	6.9	87.3
NOX (ppb) Average	707	11.54	11.8	-	0.4	1.9	4.7	9.3	14.4	21.2	114.8
PM2.5 (ug/m3) Average	741	6.75	4.5	-	0.4	3.2	3.8	5.2	8.1	11.8	30
Temperature 2 m (C) Average	743	-10.47	7.5	-	-33.4	-20.1	-14.7	-10	-5.5	-1.6	9.7
Relative Humidity (%) Average	743	65.51	12.7	-	27.8	46.1	57.4	67.5	75.7	80.5	90.1
Wind Speed 10 m (km/h) Average	741	10.2	6	-	0	2	5	10	14	19	27
Wind Direction 10 m (deg) Average	741	76.9	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	743	133.55	185.4	-	0	0	0	5.3	251	455.6	613.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
THC/NMHC/CH4	27 Mar 2023 13:00	27 Mar 2023 18:00	6	Unstable Operation - excessive baseline drift
Wind Speed, Wind Direction	01 Mar 2023 07:00	01 Mar 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	06 Mar 2023 04:00	06 Mar 2023 04:00	1	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 43.3 ppb on Mar 21 19:00 Maximum Daily Average: 6.6 ppb on Mar 22

Minimum Value: 0.0 ppb on Mar 2 20:00 Minimum Daily Average: 0.0 ppb on Mar 14

Maximum Diurnal Average: 4.1 ppb at hour 12 Minimum Diurnal Average: 0.4 ppb at hour 8

Monthly Average: 1.75 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 1.1 P_{90} = 5.4 P_{99} = 21.7

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	1.4	2.0	0.1	0.4	0.4	0.4	0.2	0.5	0.5	C	C	C	10.9	15.0	10.5	2.9	1.9	1.1	0.8	0.4	0.4	0.2	0.2	2.5	15.0
2-Mar	0.8	Z	5.8	5.4	5.2	7.5	5.3	3.1	2.0	2.5	2.0	1.0	2.0	1.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.0	7.5
3-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	1.2	1.4	0.3	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4
4-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.2	0.4	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.4
5-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.7	0.5	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	DF	0.2	0.7
6-Mar	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	18.3	24.2	11.5	6.2	Z	11.6	9.9	3.3	1.2	0.5	0.3	0.2	0.2	1.2	3.9	24.2
7-Mar	3.7	0.8	0.3	0.3	0.7	Z	1.3	1.6	2.5	4.7	4.4	4.1	3.8	7.6	6.7	8.2	5.5	1.1	0.7	0.4	0.3	0.3	4.2	7.9	3.1	8.2
8-Mar	Z	3.9	3.2	1.0	0.4	0.2	1.0	1.0	1.2	3.3	15.7	26.8	3.8	9.9	8.3	4.8	7.3	5.7	3.8	1.1	0.1	1.7	5.2	6.0	5.0	26.8
9-Mar	1.2	Z	0.6	0.2	0.5	0.2	0.1	0.2	6.6	18.9	21.0	12.6	10.4	6.8	7.9	9.5	4.5	2.2	0.1	0.2	0.0	0.1	0.1	0.4	4.5	21.0
10-Mar	1.1	0.8	Z	2.7	1.5	4.4	5.1	4.0	5.5	6.4	5.8	7.1	7.2	5.7	8.0	3.2	4.9	1.6	0.3	0.3	0.3	0.2	0.3	0.3	3.3	8.0
11-Mar	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.9	3.7	15.0	6.3	5.5	3.0	2.6	1.4	0.6	0.3	0.2	0.1	0.1	0.1	0.1	1.8	15.0
12-Mar	0.1	0.1	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	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
13-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
14-Mar	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
15-Mar	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2
16-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.3	0.9	3.3	2.0	2.2	1.2	1.6	4.5	14.5	9.5	8.5	5.5	4.8	5.4	6.5	8.0	5.8	3.7	14.5
17-Mar	12.9	1.9	13.2	Z	0.9	0.7	0.6	0.7	0.6	0.6	0.6	2.1	4.6	1.4	1.2	0.6	1.4	2.5	2.2	1.9	1.1	0.4	0.3	0.3	2.3	13.2
18-Mar	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	1.0	1.7	0.6	0.3	0.2	0.1	0.2	0.2	0.4	1.7
19-Mar	0.1	0.0	0.0	0.1	0.0	Z	0.0	0.1	0.2	1.1	34.8	21.8	8.0	4.7	3.0	1.8	1.8	1.3	3.2	2.6	0.2	0.1	0.1	0.1	3.7	34.8
20-Mar	Z	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	1.6	4.5	23.3	43.3	25.6	5.6	1.2	0.7	0.4	4.6	43.3
22-Mar	0.2	0.7	Z	0.1	0.1	0.1	0.0	0.1	15.2	31.1	3.9	1.0	4.1	14.3	12.1	15.5	19.9	18.1	6.4	2.3	2.0	1.8	1.5	0.9	6.6	31.1
23-Mar	0.7	0.6	0.6	Z	0.6	0.5	0.5	0.5	1.3	1.2	1.0	0.7	0.5	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.2	0.9	0.1	0.5	1.3
24-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	2.6	0.3	0.3	0.3	0.2	0.2	0.5	3.6	15.0	10.4	5.8	3.3	0.6	0.3	1.9	15.0
25-Mar	0.1	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	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	0.0	0.1	0.2
26-Mar	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	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.1	0.9	2.7	5.8	9.0	3.7	0.6	0.3	0.2	0.2	0.1	0.0	1.1	9.0
28-Mar	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.0	0.1	4.6	0.5	1.1	1.5	1.7	2.7	2.1	4.6	5.8	4.9	2.6	3.0	4.3	3.6	3.3	2.0	5.8
29-Mar	3.1	1.5	0.7	Z	0.4	0.2	0.2	0.3	0.3	0.3	0.4	0.6	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.4	3.1
30-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.5
31-Mar	0.1	0.0	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	1.0	0.5	1.1	0.4	0.4	0.6	0.5	0.4	1.2	2.6	4.0	4.1	2.3	2.7	2.7	3.1	2.9	2.8	2.9	1.8	0.8	0.7	0.9	0.9	Diurnal Average	
	12.9	3.9	13.2	5.4	5.2	7.5	5.3	4.0	15.2	31.1	34.8	26.8	11.5	14.3	15.0	15.5	19.9	23.3	43.3	25.6	5.8	6.5	8.0	7.9	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	680	95.91	95.91
11 - 20	20	2.82	98.73
21 - 60	9	1.27	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Ells River - March 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	55	147	82	12	18	21	38	87	69	32	14	13	25	33	13	19	678
11 - 20	0	0	1	0	0	0	1	9	9	0	0	0	0	0	0	0	20
21 - 60	0	0	0	0	0	0	2	3	4	0	0	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	147	83	12	18	21	41	99	82	32	14	13	25	33	13	19	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Ells River

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.5 ppb on Mar 16 19:00 Maximum Daily Average: 0.8 ppb on Mar 17

Minimum Value: 0.4 ppb on Mar 20 21:00 Minimum Daily Average: 0.4 ppb on Mar 20

Maximum Diurnal Average: 0.6 ppb at hour 19 Minimum Diurnal Average: 0.5 ppb at hour 16

Monthly Average: 0.55 ppb Percentiles: P_1 = 0.4 P_{10} = 0.4 Q_1 = 0.4 Median = 0.5 Q_3 = 0.6 P_{90} = 0.8 P_{99} = 1.2

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

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

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	52	147	83	13	19	19	40	100	81	33	14	16	20	35	13	20	705
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	147	83	13	19	19	40	100	81	33	14	16	20	35	13	20	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Reduced Sulphur (TRS) - ppb

Ells River

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Reduced Sulphur (TRS) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Ells River - March 2023

Maximum Value: 3.1 ppm on Mar 2 13:00

Maximum Daily Average: 2.4 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 2 19:00

Minimum Daily Average: 2.0 ppm on Mar 14

Maximum Diurnal Average: 2.2 ppm at hour 5

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.14 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} = 2.6

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	34
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	2.5	2.6	2.4	2.6	2.8	2.8	2.6	3.0	2.9	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	3.0
2-Mar	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.3	2.2	2.2	3.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	3.1
3-Mar	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2
4-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2
5-Mar	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	DF	2.1	2.1
6-Mar	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.5	2.4	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.5
7-Mar	2.1	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1
8-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9-Mar	2.1	Z	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3
10-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.2
11-Mar	2.1	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2
12-Mar	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1
13-Mar	2.0	2.0	2.1	2.0	2.0	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	2.0	2.0	2.0	2.0	2.1
14-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.3
15-Mar	2.1	Z	2.5	2.1	2.2	2.5	2.6	2.5	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6
16-Mar	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.4	2.2	2.4
17-Mar	2.4	2.2	2.3	Z	2.6	2.4	2.5	2.8	2.7	2.4	2.2	2.3	2.4	2.6	2.5	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.8
18-Mar	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.2	2.4	2.2	2.1	2.2	2.5	2.6	2.2	2.6
19-Mar	2.1	2.0	2.1	2.1	2.3	Z	2.3	2.1	2.3	2.2	2.2	2.1	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3
20-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.5
21-Mar	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.4
22-Mar	2.3	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.3
23-Mar	2.4	2.3	2.3	Z	2.2	2.2	2.1	2.1	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.2	2.2	2.4	2.2	2.2	2.5
24-Mar	2.2	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.5	2.2	2.5
25-Mar	2.5	2.5	2.4	2.4	2.4	Z	2.4	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.5
26-Mar	Z	2.0	2.0	2.0	2.2	2.3	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.3
27-Mar	2.3	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	UO	UO	UO	UO	UO	UO	2.2	2.1	2.1	2.1	2.2	2.3	--	2.3
28-Mar	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.3	2.4	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4
29-Mar	2.2	2.2	2.5	Z	2.5	2.3	2.2	2.1	2.3	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.5
30-Mar	2.3	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.3
31-Mar	2.0	2.1	2.0	2.2	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.0	2.3
	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	Diurnal Average	
	2.5	2.5	2.6	2.4	2.6	2.8	2.8	2.8	3.0	2.9	2.5	2.4	3.1	2.6	2.5	2.2	2.2	2.2	2.4	2.3	2.3	2.4	2.5	2.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Ells River - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	191	27.17	27.17
2.1 - 3.0	511	72.69	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Ells River - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	13	79	17	2	5	9	13	30	3	0	5	3	3	2	4	3	191
2.1 - 3.0	41	68	65	9	13	12	24	69	79	32	9	10	22	31	9	16	509
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	147	82	11	18	21	37	99	82	32	14	13	25	33	13	19	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Ells River

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 701

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Ells River - March 2023

Maximum Value: 0.246 ppm on Mar 17 01:00

Maximum Daily Average: 0.030 ppm on Mar 17

Minimum Value: 0.000 ppm on Mar 1 02:00

Minimum Daily Average: 0.000 ppm on Mar 1

Maximum Diurnal Average: 0.013 ppm at hour 1

Minimum Diurnal Average: 0.000 ppm at hour 17

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 in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	34
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
3-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-Mar	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	DF	0.000	0.000
6-Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.091	0.064	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.091
7-Mar	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
8-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
10-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12-Mar	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
13-Mar	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.084	0.138	0.148	0.147	0.024	0.148
17-Mar	0.246	0.044	0.079	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.109	0.113	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.246
18-Mar	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	0.032	0.047	0.000	0.000	0.000	0.000	0.000	0.003	0.047
19-Mar	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-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.023	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	0.001	0.023
24-Mar	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	0.047	0.019	0.000	0.000	0.017	0.101	0.008	0.101
25-Mar	0.099	0.076	0.044	0.027	0.023	Z	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.099
26-Mar	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Mar	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	UO	UO	UO	UO	UO	UO	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000
28-Mar	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.009	0.052	0.000	0.000	0.000	0.070	0.128	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.128
29-Mar	0.000	0.020	0.189	Z	0.179	0.087	0.012	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.189
30-Mar	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
31-Mar	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
	0.013	0.005	0.012	0.001	0.008	0.003	0.001	0.001	0.001	0.002	0.001	0.004	0.006	0.006	0.007	0.002	0.000	0.001	0.003	0.002	0.003	0.004	0.005	0.008	Diurnal Average	
	0.246	0.076	0.189	0.027	0.179	0.087	0.012	0.013	0.023	0.052	0.024	0.091	0.109	0.113	0.128	0.050	0.000	0.032	0.047	0.034	0.084	0.138	0.148	0.147	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Ells River - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	664	94.45	94.45
0.006 - 0.05	20	2.84	97.30
0.06 - 0.1	16	2.28	99.57
> 0.1	3	0.43	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Ells River - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 0.005	55	147	80	11	16	21	35	95	68	29	14	13	21	25	13	19	662
0.006 - 0.05	0	0	2	0	2	0	0	3	5	2	0	0	2	4	0	0	20
0.06 - 0.1	0	0	0	0	0	0	2	1	8	1	0	0	1	3	0	0	16
> 0.1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	3
Totals	55	147	82	11	18	21	37	99	82	32	14	13	25	33	13	19	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Non Methane Hydrocarbons (NMHC) - ppm

Ells River

Total Number of Valid Hours: 701

Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3.1 ppm on Mar 2 13:00

Maximum Daily Average: 2.4 ppm on Mar 1

Minimum Value: 2.0 ppm on Mar 2 19:00

Minimum Daily Average: 2.0 ppm on Mar 14

Maximum Diurnal Average: 2.2 ppm at hour 9

Minimum Diurnal Average: 2.1 ppm at hour 17

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} = 2.6

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	34
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	2.5	2.6	2.4	2.6	2.8	2.8	2.6	3.0	2.9	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	3.0
2-Mar	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.3	2.2	2.2	3.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	3.1
3-Mar	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2
4-Mar	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2
5-Mar	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	DF	2.1	2.1
6-Mar	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.5	2.3	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.5
7-Mar	2.1	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1
8-Mar	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9-Mar	2.1	Z	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3
10-Mar	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.2
11-Mar	2.1	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2
12-Mar	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1
13-Mar	2.0	2.0	2.1	2.0	2.0	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	2.0	2.0	2.0	2.0	2.1
14-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.3
15-Mar	2.1	Z	2.5	2.1	2.2	2.5	2.6	2.5	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6
16-Mar	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.3
17-Mar	2.2	2.2	2.2	Z	2.6	2.4	2.5	2.8	2.7	2.4	2.2	2.3	2.3	2.5	2.5	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.8
18-Mar	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.2	2.4	2.2	2.1	2.2	2.5	2.6	2.2	2.6
19-Mar	2.1	2.0	2.1	2.1	2.3	Z	2.3	2.1	2.3	2.2	2.2	2.1	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3
20-Mar	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.5
21-Mar	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.4
22-Mar	2.3	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.3
23-Mar	2.4	2.3	2.3	Z	2.2	2.2	2.1	2.1	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.2	2.2	2.4	2.2	2.2	2.5
24-Mar	2.2	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.2	2.4
25-Mar	2.4	2.4	2.4	2.4	2.4	Z	2.4	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.5
26-Mar	Z	2.0	2.0	2.0	2.2	2.3	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.3
27-Mar	2.3	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	UO	UO	UO	UO	UO	UO	2.2	2.1	2.1	2.1	2.2	2.3	--	2.3
28-Mar	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.3	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4
29-Mar	2.2	2.2	2.4	Z	2.3	2.2	2.1	2.1	2.3	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.4
30-Mar	2.3	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.3
31-Mar	2.0	2.1	2.0	2.2	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.0	2.3
	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	Diurnal Average	
	2.4	2.5	2.6	2.4	2.6	2.8	2.8	2.8	3.0	2.9	2.5	2.3	3.1	2.5	2.5	2.2	2.2	2.2	2.4	2.3	2.3	2.3	2.5	2.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Methane (CH_4) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Methane (CH_4) - ppm

Ells River - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	193	27.45	27.45
2.1 - 3.0	509	72.40	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Methane (CH_4) - ppm

Ells River - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	13	79	17	2	5	9	13	31	4	0	5	3	3	2	4	3	193
2.1 - 3.0	41	68	65	9	13	12	24	68	78	32	9	10	22	31	9	16	507
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	147	82	11	18	21	37	99	82	32	14	13	25	33	13	19	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Methane (CH_4) - ppm

Ells River

Total Number of Valid Hours: 701

Wood Buffalo Environmental Association

Zero Responses

Methane (CH_4) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Methane (CH_4) - ppm

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Ells River - March 2023

Maximum Value: 87.3 ppb on Mar 1 09:00

Maximum Daily Average: 21.2 ppb on Mar 1

Minimum Value: 0.0 ppb on Mar 2 05:00

Minimum Daily Average: 0.1 ppb on Mar 14

Maximum Diurnal Average: 8.5 ppb at hour 11

Minimum Diurnal Average: 0.1 ppb at hour 24

Monthly Average: 2.79 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.2 Q_3 = 2.9 P_{90} = 6.9 P_{99} = 41.0

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	8.9	34.6	41.3	17.9	Z	56.7	65.9	43.6	87.3	71.8	20.6	12.5	8.6	7.6	5.3	2.7	1.2	1.6	0.2	0.1	0.0	0.0	0.0	0.0	21.2	87.3
2-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.3	1.0	3.5	5.0	5.9	15.6	3.1	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	15.6
3-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.9	3.9	4.5	4.1	4.0	4.8	4.5	3.3	1.1	0.2	0.7	0.1	0.1	0.1	0.1	1.5	4.8
4-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.9	1.8	2.6	0.6	0.2	0.2	0.2	1.6	1.2	2.2	1.0	0.2	0.1	0.1	0.1	0.1	0.0	0.6	2.6
5-Mar	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.9	0.7	0.2	1.4	2.1	6.6	5.2	4.3	2.9	2.2	0.9	0.1	0.0	0.0	0.0	0.0	DF	1.3	6.6
6-Mar	0.0	0.0	0.0	0.0	0.1	0.1	0.1	2.5	5.6	9.6	50.3	35.3	Z	9.2	15.7	6.2	3.7	1.2	0.2	0.0	0.0	0.0	0.0	0.0	6.1	50.3
7-Mar	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.2	0.8	1.7	3.2	3.5	3.1	3.3	3.0	3.4	1.6	0.4	0.1	0.1	0.0	0.0	0.1	0.1	1.1	3.5
8-Mar	0.1	0.0	0.4	0.1	Z	0.1	0.1	2.2	2.9	7.0	10.6	12.1	3.9	7.6	5.4	2.9	2.8	1.7	0.7	0.7	0.0	0.0	0.0	0.1	2.7	12.1
9-Mar	0.1	0.1	0.1	0.1	0.1	Z	4.7	7.4	9.4	16.0	18.6	9.2	6.2	2.8	2.9	2.4	1.0	0.6	0.1	0.2	0.2	0.1	0.1	0.1	3.6	18.6
10-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.9	1.7	3.8	4.9	4.2	3.3	3.6	1.4	1.1	0.3	0.0	0.0	0.4	1.1	0.1	0.1	1.2	4.9
11-Mar	0.0	Z	0.0	0.0	0.0	0.5	0.1	0.6	1.6	2.0	3.9	8.7	12.0	11.4	6.9	4.7	2.7	0.9	0.1	0.0	0.0	0.0	0.1	0.1	2.4	12.0
12-Mar	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.8	3.1	4.3	4.1	4.8	4.9	4.2	3.6	3.3	2.1	0.7	0.2	0.1	0.1	0.0	0.0	0.1	1.6	4.9
13-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.3	3.5	6.9	7.5	2.4	4.2	5.6	3.3	2.7	1.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	7.5
14-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
15-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.8	2.3	1.0	C	C	C	C	C	2.6	5.4	3.7	1.8	0.8	0.5	0.0	0.0	0.1	0.1	1.1	5.4
16-Mar	Z	0.4	0.2	0.1	0.1	0.1	0.1	1.1	6.0	8.3	17.1	5.3	7.9	5.3	2.7	4.6	4.7	1.7	0.3	0.0	0.1	0.1	0.1	0.1	2.9	17.1
17-Mar	0.2	Z	0.1	6.7	19.1	7.7	27.2	55.0	33.1	13.9	9.3	5.2	7.3	7.5	6.7	3.0	1.2	2.2	0.4	0.1	0.1	0.1	0.2	0.0	9.0	55.0
18-Mar	0.1	0.0	Z	0.1	0.1	0.0	0.0	0.2	0.2	1.2	14.9	9.9	7.5	2.5	0.6	0.3	1.7	4.1	1.4	0.0	0.0	0.1	0.0	0.1	2.0	14.9
19-Mar	0.0	0.0	0.0	Z	0.1	0.0	0.1	3.2	17.1	7.2	13.7	9.4	10.8	11.9	7.6	5.0	3.6	2.3	0.5	0.1	0.1	0.1	0.1	0.0	4.0	17.1
20-Mar	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.2	0.9	11.6	6.6	2.8	2.7	1.7	1.7	1.5	1.3	0.5	0.1	0.1	0.1	0.1	0.1	0.1	1.4	11.6
21-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.3	2.2	5.6	5.5	4.2	2.7	2.3	1.9	1.9	3.0	2.6	6.0	4.1	1.1	0.1	0.2	0.0	0.1	1.9	6.0
22-Mar	Z	0.1	0.1	0.1	0.1	0.1	1.1	4.6	9.5	6.6	4.3	4.8	2.9	2.3	1.8	1.9	3.0	2.0	0.3	0.1	0.3	0.1	0.1	0.2	2.0	9.5
23-Mar	0.2	Z	0.1	0.1	0.1	0.1	0.1	3.2	14.5	4.8	1.8	2.2	1.8	1.7	1.5	0.6	0.8	0.4	0.2	0.0	0.0	0.0	0.0	0.0	1.5	14.5
24-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.7	4.0	11.0	10.3	9.2	4.5	4.6	3.8	3.4	3.2	1.1	0.3	0.0	0.0	0.1	0.0	0.0	2.4	11.0
25-Mar	0.2	0.1	0.0	Z	0.0	0.3	2.7	7.1	7.8	20.0	15.0	4.2	2.5	1.9	1.4	1.5	1.3	0.7	0.2	0.1	0.1	0.1	0.1	0.1	2.9	20.0
26-Mar	0.1	0.0	0.1	0.1	Z	0.1	0.2	3.4	9.7	8.4	6.0	5.6	3.7	4.4	2.8	2.2	1.6	0.8	0.4	0.1	0.1	0.1	0.2	0.0	2.2	9.7
27-Mar	0.0	0.1	0.1	0.1	0.1	Z	0.2	0.4	1.0	0.8	0.7	2.0	3.8	1.6	1.0	0.8	0.9	0.8	1.9	0.0	0.1	0.1	0.1	0.1	0.7	3.8
28-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.6	2.3	7.8	14.8	7.1	4.7	5.1	2.6	1.7	1.0	1.4	0.8	0.3	0.1	0.1	0.0	0.0	0.1	2.2	14.8
29-Mar	0.0	Z	0.5	0.1	0.0	0.0	0.3	0.5	0.9	1.4	6.8	3.5	0.8	0.8	0.8	0.7	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.8	6.8
30-Mar	0.1	0.2	Z	0.1	0.4	0.0	0.3	0.8	1.4	3.4	6.7	7.7	4.8	3.4	2.1	1.8	1.8	1.0	0.4	0.0	0.0	0.1	0.0	0.0	1.6	7.7
31-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.5	1.5	3.0	3.7	4.3	2.8	1.7	0.7	0.5	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.8	4.3
	0.4	1.4	1.7	1.0	0.8	2.6	3.4	4.9	7.9	8.4	8.5	6.4	5.1	4.1	3.3	2.4	1.9	1.2	0.5	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	8.9	34.6	41.3	17.9	19.1	56.7	65.9	55.0	87.3	71.8	50.3	35.3	15.6	11.9	15.7	6.2	4.7	6.0	4.1	1.1	0.4	1.1	0.2	0.2	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	694	98.16	98.16
21 - 40	5	0.71	98.87
11 - 80	7	0.99	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	50	147	84	13	19	19	39	97	81	27	14	16	23	34	11	19	693
21 - 40	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	5
11 - 80	0	0	0	0	0	0	0	2	1	2	0	0	1	0	0	0	6
81 - 159	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	50	147	84	13	19	19	40	100	85	30	14	16	24	34	11	19	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Ells River

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 40.2 ppb on Mar 21 20:00

Maximum Daily Average: 16.4 ppb on Mar 17

Minimum Value: 0.2 ppb on Mar 4 12:00

Minimum Daily Average: 1.0 ppb on Mar 14

Maximum Diurnal Average: 10.7 ppb at hour 3

Minimum Diurnal Average: 5.5 ppb at hour 16

Monthly Average: 8.74 ppb

Percentiles: P_1 = 0.5 P_{10} = 1.6 Q_1 = 3.9 Median = 7.3 Q_3 = 12.0 P_{90} = 17.4 P_{99} = 29.9

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	22.2	28.9	29.0	19.3	Z	24.6	24.6	19.2	27.5	27.8	15.0	11.6	9.1	9.0	8.1	7.8	6.5	14.0	16.8	16.3	10.9	8.6	8.8	9.6	16.3	29.0
2-Mar	10.7	6.9	10.0	11.5	9.4	Z	8.8	9.3	8.4	10.6	9.2	8.9	16.9	6.4	4.0	1.4	1.1	0.9	0.7	0.6	0.5	0.5	0.4	0.4	6.0	16.9
3-Mar	Z	10.1	8.8	6.0	11.1	11.2	9.3	4.7	7.1	9.4	8.4	7.8	7.0	7.3	8.6	10.9	11.0	12.1	18.1	26.4	13.6	6.9	5.3	6.0	9.9	26.4
4-Mar	7.5	Z	8.9	7.9	7.2	7.3	11.6	12.8	7.2	5.0	0.9	0.2	0.3	0.3	2.6	2.6	6.7	7.9	9.1	11.9	9.5	12.3	9.2	6.5	6.8	12.8
5-Mar	5.6	4.8	Z	6.0	4.4	4.0	3.6	2.3	1.2	0.3	1.7	2.1	6.1	5.3	5.1	4.9	6.7	10.1	13.1	10.5	9.0	8.0	7.6	DF	5.6	13.1
6-Mar	7.1	8.8	11.3	11.0	12.6	11.8	12.0	9.2	5.3	7.6	24.1	20.8	Z	11.3	19.3	12.7	12.0	12.4	12.7	11.2	6.3	5.8	7.6	8.5	11.4	24.1
7-Mar	14.1	7.3	5.3	Z	4.5	4.1	3.9	4.2	4.1	5.3	7.8	7.4	5.7	6.3	6.9	8.3	6.0	4.9	9.0	7.7	3.9	3.3	7.6	18.6	6.8	18.6
8-Mar	13.5	6.8	11.9	22.5	Z	7.6	13.5	19.0	11.4	13.3	13.9	13.7	5.6	10.3	8.8	6.7	9.8	14.2	19.9	18.2	3.7	6.2	12.2	19.7	12.3	22.5
9-Mar	17.0	17.0	15.9	15.0	18.7	Z	30.2	20.9	14.5	18.0	17.8	9.0	7.4	4.4	5.2	5.3	3.2	5.4	1.8	2.6	1.8	0.8	0.8	1.6	10.2	30.2
10-Mar	Z	2.2	3.8	5.5	3.6	5.8	7.6	5.3	5.4	5.9	8.1	6.7	6.6	5.2	6.1	3.6	4.7	3.0	1.5	5.9	20.6	29.9	23.3	16.3	8.1	29.9
11-Mar	6.5	Z	2.2	2.8	2.6	4.4	5.3	5.5	5.9	4.1	6.2	11.0	12.3	13.9	10.7	10.3	9.7	8.6	5.6	3.2	5.3	5.4	9.5	7.5	6.9	13.9
12-Mar	7.2	1.5	Z	1.0	1.9	1.2	2.2	7.1	10.3	8.5	6.2	6.6	6.7	5.6	5.0	6.2	6.8	5.2	9.6	13.5	10.6	3.3	3.7	2.7	5.8	13.5
13-Mar	0.7	0.7	1.5	Z	2.8	4.3	13.1	16.5	15.3	10.8	3.5	5.6	6.7	4.9	4.5	4.0	1.4	0.8	0.7	2.5	2.5	2.4	1.7	0.9	4.7	16.5
14-Mar	1.1	0.6	0.7	1.2	Z	0.6	0.9	0.7	0.5	0.8	0.7	0.7	0.8	0.7	0.8	1.0	1.6	2.4	4.1	0.6	0.5	0.7	0.6	1.4	1.0	4.1
15-Mar	1.9	8.6	7.3	3.1	9.5	Z	21.8	10.9	2.4	C	C	C	C	C	3.5	7.4	7.5	8.6	17.4	22.5	17.9	14.4	11.8	11.1	10.4	22.5
16-Mar	Z	18.3	21.2	12.8	10.2	8.1	5.6	8.7	13.7	13.2	10.2	6.2	7.9	6.4	4.8	8.0	9.6	9.1	9.3	13.3	15.8	21.5	20.8	17.1	11.8	21.5
17-Mar	15.3	Z	16.2	27.9	35.4	33.5	34.9	33.1	24.9	15.3	10.7	8.0	11.4	12.0	12.6	7.0	5.2	12.9	12.3	11.8	17.8	10.2	6.4	2.8	16.4	35.4
18-Mar	3.7	0.7	Z	0.7	0.6	1.0	1.1	2.0	1.0	3.0	17.5	13.4	11.6	5.8	2.1	1.6	6.7	22.3	23.9	10.2	9.7	15.0	20.3	18.8	8.4	23.9
19-Mar	4.8	5.5	14.9	Z	17.6	10.9	8.5	14.4	26.0	13.3	19.8	14.6	15.0	17.4	13.7	11.2	11.4	17.6	12.3	8.4	2.0	1.4	1.1	1.0	11.4	26.0
20-Mar	0.8	2.7	1.8	0.9	Z	1.6	1.7	3.0	5.1	23.6	13.3	4.9	3.8	2.8	3.0	3.0	3.4	2.8	1.5	3.4	1.8	5.9	9.0	14.9	5.0	23.6
21-Mar	17.6	14.8	16.5	13.2	9.4	Z	5.8	4.9	8.0	9.4	7.3	3.9	3.3	3.2	3.4	6.1	7.5	22.4	37.9	40.2	20.2	24.9	18.5	19.1	13.8	40.2
22-Mar	Z	15.0	16.9	19.5	16.6	13.7	11.9	7.6	13.5	10.5	7.0	7.2	5.0	4.7	4.5	5.4	9.8	11.9	7.3	6.2	14.4	9.0	15.2	17.4	10.9	19.5
23-Mar	22.6	Z	13.6	13.5	10.7	6.5	2.7	8.2	19.7	9.4	4.0	4.3	3.8	3.6	3.6	1.9	4.0	3.1	5.4	7.7	2.9	5.5	10.5	2.7	7.4	22.6
24-Mar	2.7	1.2	Z	3.3	6.0	3.9	3.2	2.6	6.4	13.0	11.5	10.2	6.3	6.8	6.2	7.1	8.8	7.4	10.5	12.0	17.6	18.1	15.4	16.0	8.5	18.1
25-Mar	16.7	15.9	14.1	Z	15.4	15.4	14.0	9.3	10.8	19.4	15.3	6.1	3.9	3.4	2.8	3.3	3.7	3.2	3.8	6.1	8.1	2.9	2.5	7.0	8.8	19.4
26-Mar	11.4	3.9	1.5	5.6	Z	15.7	2.6	7.4	12.0	9.1	6.3	5.8	4.5	5.4	4.1	3.9	4.0	4.3	4.9	8.0	13.6	16.3	13.8	10.7	7.6	16.3
27-Mar	10.5	9.9	7.0	5.0	4.1	Z	1.9	1.4	1.7	1.6	1.4	2.9	5.6	3.7	3.6	3.9	5.1	7.9	22.7	16.6	14.6	14.8	15.6	16.6	7.7	22.7
28-Mar	Z	13.1	12.5	12.3	10.8	8.8	5.7	5.7	9.9	17.2	10.0	7.6	7.7	5.4	5.2	4.5	6.6	7.1	8.9	9.4	9.6	8.2	8.2	9.2	8.9	17.2
29-Mar	8.3	Z	21.6	25.8	14.8	7.9	7.0	4.5	6.0	6.4	15.9	11.1	3.5	3.9	3.6	2.8	1.7	2.7	3.0	5.2	10.7	13.8	10.9	11.9	8.8	25.8
30-Mar	17.4	13.4	Z	7.9	7.2	4.1	3.4	2.5	3.8	6.3	9.5	11.4	8.2	7.0	5.3	6.5	7.7	8.9	10.4	11.6	14.1	17.8	3.9	3.6	8.3	17.8
31-Mar	1.5	1.6	4.0	Z	3.6	3.4	2.5	2.5	3.1	4.6	6.0	6.2	6.4	4.5	3.5	2.2	1.9	1.2	2.0	3.8	14.4	6.9	10.7	29.6	5.5	29.6
	9.6	8.5	10.7	10.0	9.6	8.5	9.1	8.6	9.4	10.1	9.6	7.9	6.9	6.2	5.8	5.5	6.2	8.2	10.2	10.6	9.8	9.7	9.4	10.3	Diurnal Average	
	22.6	28.9	29.0	27.9	35.4	33.5	34.9	33.1	27.5	27.8	24.1	20.8	16.9	17.4	19.3	12.7	12.0	22.4	37.9	40.2	20.6	29.9	23.3	29.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	667	94.34	94.34
21 - 40	40	5.66	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Ells River - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	49	142	81	12	19	19	39	94	73	24	14	16	24	32	10	18	666
21 - 40	1	5	3	1	0	0	1	6	12	6	0	0	0	2	1	1	39
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	50	147	84	13	19	19	40	100	85	30	14	16	24	34	11	19	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Ells River

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Ells River - March 2023

Maximum Value: 114.8 ppb on Mar 1 09:00

Maximum Daily Average: 37.6 ppb on Mar 1

Minimum Value: 0.4 ppb on Mar 3 00:00

Minimum Daily Average: 1.1 ppb on Mar 14

Maximum Diurnal Average: 18.5 ppb at hour 10

Minimum Diurnal Average: 7.9 ppb at hour 16

Monthly Average: 11.54 ppb

Percentiles: P_1 = 0.5 P_{10} = 1.9 Q_1 = 4.7 Median = 9.3 Q_3 = 14.4 P_{90} = 21.2 P_{99} = 63.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	31.1	63.5	70.3	37.2	Z	81.3	90.5	62.8	114.8	99.6	35.6	24.1	17.7	16.6	13.4	10.5	7.7	15.6	17.0	16.4	10.9	8.6	8.8	9.6	37.6	114.8
2-Mar	10.7	6.9	10.0	11.5	9.4	Z	8.8	9.6	9.4	14.1	14.2	14.8	32.5	9.5	5.3	1.5	1.1	0.9	0.7	0.6	0.5	0.5	0.4	0.4	7.5	32.5
3-Mar	Z	10.1	8.8	6.0	11.1	11.2	9.3	4.7	7.9	12.3	12.3	12.3	11.1	11.3	13.4	15.4	14.3	13.2	18.3	27.1	13.7	7.0	5.4	6.1	11.4	27.1
4-Mar	7.6	Z	9.0	8.0	7.3	7.4	11.7	13.7	9.0	7.6	1.5	0.4	0.5	0.5	4.2	3.8	8.9	8.9	9.3	12.0	9.6	12.4	9.3	6.5	7.3	13.7
5-Mar	5.6	4.9	Z	6.1	4.5	4.1	3.7	3.2	1.9	0.5	3.1	4.2	12.7	10.5	9.4	7.8	8.9	11.0	13.2	10.5	9.0	8.0	7.6	DF	6.8	13.2
6-Mar	7.1	8.8	11.3	11.0	12.7	11.9	12.1	11.7	10.9	17.2	74.4	56.1	Z	20.5	35.0	18.9	15.7	13.6	12.9	11.2	6.3	5.8	7.6	8.5	17.4	74.4
7-Mar	14.1	7.3	5.3	Z	4.5	4.2	3.9	4.4	4.9	7.0	11.0	10.9	8.8	9.6	9.9	11.7	7.6	5.3	9.1	7.8	3.9	3.3	7.7	18.7	7.9	18.7
8-Mar	13.6	6.8	12.3	22.6	Z	7.7	13.6	21.2	14.3	20.3	24.5	25.8	9.5	17.9	14.2	9.6	12.6	15.9	20.6	18.9	3.7	6.2	12.2	19.8	14.9	25.8
9-Mar	17.1	17.1	16.0	15.1	18.8	Z	34.9	28.3	23.9	34.0	36.4	18.2	13.6	7.2	8.1	7.7	4.2	6.0	1.9	2.8	2.0	0.9	0.9	1.7	13.8	36.4
10-Mar	Z	2.3	3.9	5.6	3.7	5.9	7.7	5.6	6.3	7.6	11.9	11.6	10.8	8.5	9.7	5.0	5.8	3.3	1.5	5.9	21.0	31.0	23.4	16.4	9.3	31.0
11-Mar	6.5	Z	2.2	2.8	2.6	4.9	5.4	6.1	7.5	6.1	10.1	19.7	24.3	25.3	17.6	15.0	12.4	9.5	5.7	3.2	5.3	5.4	9.6	7.6	9.3	25.3
12-Mar	7.2	1.5	Z	1.0	2.0	1.3	2.3	7.9	13.4	12.8	10.3	11.4	11.6	9.8	8.6	9.5	8.9	5.9	9.8	13.6	10.7	3.3	3.7	2.8	7.4	13.6
13-Mar	0.7	0.7	1.5	Z	2.8	4.3	13.4	20.0	22.2	18.3	5.9	9.8	12.3	8.2	7.2	5.4	1.6	0.8	0.7	2.5	2.5	2.4	1.7	0.9	6.3	22.2
14-Mar	1.1	0.6	0.7	1.2	Z	0.7	0.9	0.7	0.6	0.9	0.8	0.8	1.0	0.9	0.9	1.2	1.8	2.6	4.2	0.6	0.5	0.7	0.6	1.4	1.1	4.2
15-Mar	1.9	8.6	7.3	3.1	9.5	Z	22.6	13.2	3.4	C	C	C	C	C	6.1	12.8	11.2	10.4	18.2	23.0	17.9	14.4	11.9	11.2	11.5	23.0
16-Mar	Z	18.7	21.4	12.9	10.3	8.2	5.7	9.8	19.7	21.5	27.3	11.5	15.8	11.7	7.5	12.6	14.3	10.8	9.6	13.3	15.9	21.6	20.9	17.2	14.7	27.3
17-Mar	15.5	Z	16.3	34.6	54.5	41.2	62.1	88.1	58.0	29.2	20.0	13.2	18.7	19.5	19.3	10.0	6.4	15.1	12.7	11.9	17.9	10.3	6.6	2.8	25.4	88.1
18-Mar	3.8	0.7	Z	0.8	0.7	1.0	1.1	2.2	1.2	4.2	32.4	23.3	19.1	8.3	2.7	1.9	8.4	26.4	25.3	10.2	9.7	15.1	20.3	18.9	10.3	32.4
19-Mar	4.8	5.5	14.9	Z	17.7	10.9	8.6	17.6	43.1	20.5	33.5	24.0	25.8	29.3	21.3	16.2	15.0	19.9	12.8	8.5	2.1	1.5	1.2	1.0	15.5	43.1
20-Mar	0.8	2.7	1.9	0.9	Z	1.6	1.7	3.2	6.0	35.2	19.9	7.7	6.5	4.5	4.7	4.5	4.7	3.3	1.6	3.5	1.9	6.0	9.1	15.0	6.4	35.2
21-Mar	17.7	14.9	16.6	13.3	9.5	Z	6.1	7.1	13.6	14.9	11.5	6.6	5.6	5.1	5.3	9.1	10.1	28.4	42.0	41.3	20.3	25.1	18.5	19.2	15.7	42.0
22-Mar	Z	15.1	17.0	19.6	16.7	13.8	13.0	12.2	23.0	17.1	11.3	12.0	7.9	7.0	6.3	7.3	12.8	13.9	7.6	6.3	14.7	9.1	15.3	17.6	12.9	23.0
23-Mar	22.8	Z	13.7	13.6	10.8	6.6	2.8	11.4	34.2	14.2	5.8	6.5	5.6	5.3	5.1	2.5	4.8	3.5	5.6	7.7	2.9	5.5	10.5	2.7	8.9	34.2
24-Mar	2.7	1.2	Z	3.3	6.0	3.9	3.3	3.3	10.4	24.0	21.8	19.4	10.8	11.4	10.0	10.5	12.0	8.5	10.8	12.0	17.6	18.2	15.4	16.0	11.0	24.0
25-Mar	16.9	16.0	14.1	Z	15.4	15.7	16.7	16.4	18.6	39.4	30.3	10.3	6.4	5.3	4.2	4.8	5.0	3.9	4.0	6.2	8.2	3.0	2.6	7.1	11.8	39.4
26-Mar	11.5	3.9	1.6	5.7	Z	15.8	2.8	10.8	21.7	17.5	12.3	11.4	8.2	9.8	6.9	6.1	5.6	5.1	5.3	8.1	13.7	16.4	14.0	10.7	9.8	21.7
27-Mar	10.5	10.0	7.1	5.1	4.2	Z	2.1	1.8	2.7	2.4	2.1	4.9	9.4	5.3	4.6	4.7	6.0	8.7	24.6	16.6	14.7	14.9	15.7	16.7	8.5	24.6
28-Mar	Z	13.2	12.6	12.4	10.9	8.9	6.3	8.0	17.7	32.0	17.1	12.3	12.8	8.0	6.9	5.5	8.0	7.9	9.2	9.5	9.7	8.2	8.2	9.3	11.1	32.0
29-Mar	8.3	Z	22.1	25.9	14.8	7.9	7.3	5.0	6.9	7.8	22.7	14.6	4.3	4.7	4.4	3.5	2.0	3.1	3.2	5.3	10.8	13.9	11.0	12.0	9.6	25.9
30-Mar	17.5	13.6	Z	8.0	7.6	4.1	3.7	3.3	5.2	9.7	16.2	19.1	13.0	10.4	7.4	8.3	9.5	9.9	10.8	11.6	14.1	17.9	3.9	3.6	9.9	19.1
31-Mar	1.5	1.6	4.0	Z	3.6	3.4	2.6	2.7	3.6	6.1	9.0	9.9	10.7	7.3	5.2	2.9	2.4	1.3	2.0	3.8	14.4	7.0	10.8	29.8	6.3	29.8
	9.9	9.9	12.4	11.1	10.4	11.1	12.5	13.4	17.3	18.5	18.2	14.2	12.0	10.3	9.2	7.9	8.1	9.4	10.7	10.7	9.9	9.8	9.5	10.4	Diurnal Average	
	31.1	63.5	70.3	37.2	54.5	81.3	90.5	88.1	114.8	99.6	74.4	56.1	32.5	29.3	35.0	18.9	15.7	28.4	42.0	41.3	21.0	31.0	23.4	29.8	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Ells River - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	631	89.25	89.25
21 - 40	59	8.35	97.60
11 - 80	12	1.70	99.29
81 - 159	4	0.57	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Ells River - March 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	43	135	81	12	18	19	36	88	62	23	14	16	23	32	10	18	630
21 - 40	7	11	3	1	1	0	3	9	16	4	0	0	0	2	1	1	59
11 - 80	0	1	0	0	0	0	1	2	5	2	0	0	1	0	0	0	12
81 - 159	0	0	0	0	0	0	0	1	2	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	50	147	84	13	19	19	40	100	85	29	14	16	24	34	11	19	704

Total Number of Valid Hours: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Ells River

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 30.0 $\mu g/m^3$ on Mar 27 22:00

Maximum Daily Average: 13.7 $\mu g/m^3$ on Mar 26

Minimum Value: 0.4 $\mu g/m^3$ on Mar 2 20:00

Maximum Diurnal Average: 9.2 $\mu g/m^3$ at hour 11

Monthly Average: 6.75 $\mu g/m^3$

Minimum Daily Average: 3.0 $\mu g/m^3$ on Mar 14

Minimum Diurnal Average: 5.0 $\mu g/m^3$ at hour 8

Percentiles: P_1 = 1.1 P_{10} = 3.2 Q_1 = 3.8 Median = 5.2 Q_3 = 8.1 P_{90} = 11.8 P_{99} = 25.0

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	2
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	6.6	11.3	17.3	10.4	11.6	11.8	10.4	6.7	10.5	10.9	6.3	8.3	6.7	6.5	7.0	6.4	5.0	6.0	5.8	5.8	4.9	4.7	4.8	4.7	7.9	17.3
2-Mar	5.4	9.6	9.9	9.7	9.7	12.8	10.6	9.8	9.5	10.7	10.6	9.8	10.7	7.2	3.9	1.2	0.5	0.4	0.4	0.4	0.4	0.5	0.9	1.0	6.1	12.8
3-Mar	3.7	4.4	4.4	3.8	4.0	4.0	4.0	4.4	4.9	5.1	5.2	5.0	4.9	5.2	5.5	6.8	6.4	6.1	6.5	5.1	4.4	4.1	3.7	3.7	4.8	6.8
4-Mar	3.6	3.8	3.6	3.5	3.5	3.4	4.0	3.8	3.3	3.4	2.7	2.3	2.2	2.5	3.4	3.3	5.2	6.1	6.0	6.9	4.2	5.7	4.4	4.3	4.0	6.9
5-Mar	4.0	3.6	4.0	4.5	3.1	2.7	2.3	2.4	2.6	3.0	3.8	4.1	6.9	5.8	5.2	4.3	4.7	5.1	6.6	6.3	7.5	7.4	10.6	DF	4.8	10.6
6-Mar	6.8	9.1	10.3	7.2	7.5	6.5	5.9	5.0	5.0	8.1	14.2	20.4	17.5	7.4	21.8	11.5	7.4	6.1	5.1	3.4	3.0	3.1	3.8	4.5	8.4	21.8
7-Mar	5.8	4.1	3.3	3.6	3.4	3.2	2.9	3.2	3.5	4.1	5.2	5.2	4.4	4.0	4.1	4.5	3.9	3.3	3.5	2.8	2.3	2.3	4.9	8.1	4.0	8.1
8-Mar	6.7	5.1	6.1	8.8	6.8	3.9	5.4	5.3	4.9	7.7	10.2	12.4	5.6	5.8	6.2	6.4	6.9	8.4	10.5	10.2	4.4	6.0	7.3	14.3	7.3	14.3
9-Mar	15.9	15.6	12.3	9.9	7.0	9.2	11.5	7.3	8.5	19.9	21.7	12.5	6.9	7.1	7.0	6.3	5.1	7.4	2.9	2.8	2.9	3.1	3.0	3.8	8.7	21.7
10-Mar	4.2	3.6	4.2	4.6	4.1	3.9	4.5	4.2	4.4	5.2	6.7	6.9	6.2	5.0	5.8	4.5	4.7	4.3	3.8	5.5	9.3	7.5	6.7	6.1	5.2	9.3
11-Mar	3.9	3.0	3.2	3.3	3.0	3.0	3.2	3.8	4.6	5.1	7.0	7.7	9.0	8.1	6.5	5.4	4.8	4.9	4.2	3.5	3.5	3.1	3.4	3.2	4.6	9.0
12-Mar	3.2	3.1	3.1	2.9	2.7	2.7	2.7	2.8	3.3	3.4	3.4	3.4	3.6	3.6	3.8	3.8	4.0	4.0	4.1	4.2	3.7	3.4	3.4	3.5	3.4	4.2
13-Mar	3.3	3.4	3.5	3.6	3.6	3.7	3.9	4.1	4.3	4.2	3.6	4.2	5.8	5.8	6.0	5.2	3.7	3.4	3.5	3.9	4.0	3.8	4.1	4.1	4.1	6.0
14-Mar	3.6	3.5	3.6	3.5	3.5	3.3	3.2	3.2	3.1	3.1	2.9	2.8	2.8	2.8	2.8	2.6	2.7	2.9	2.9	2.7	2.8	2.8	2.7	2.8	3.0	3.6
15-Mar	2.8	3.2	3.2	3.0	3.3	3.7	3.9	3.7	3.6	3.7	4.0	4.0	3.6	3.6	3.5	3.7	3.7	3.6	4.0	4.2	3.6	3.3	3.2	3.2	3.6	4.2
16-Mar	4.3	4.1	4.1	3.6	3.5	3.5	3.3	3.8	4.5	C	C	5.8	5.8	5.8	5.6	5.9	8.2	8.6	8.3	9.2	8.2	13.6	15.4	11.1	6.6	15.4
17-Mar	8.5	6.2	9.8	6.7	6.5	5.9	6.7	7.4	6.5	5.2	5.1	6.6	7.1	6.8	6.1	4.6	4.9	6.9	6.7	6.9	6.5	5.6	5.3	4.9	6.4	9.8
18-Mar	4.8	4.7	4.7	4.8	4.7	4.6	4.6	4.5	4.3	4.8	6.6	5.9	5.1	4.6	3.5	2.8	3.3	4.9	4.9	4.2	3.9	4.0	3.6	3.3	4.5	6.6
19-Mar	2.6	2.7	3.4	4.0	3.9	3.6	3.8	4.5	5.9	7.3	25.2	10.7	6.5	7.0	5.7	5.6	6.1	6.0	6.2	6.5	4.0	3.8	3.8	3.9	6.0	25.2
20-Mar	3.9	3.9	3.6	3.6	3.3	3.8	4.3	4.3	3.9	8.9	4.7	3.8	4.0	3.8	3.6	3.7	3.5	3.4	3.3	3.5	3.5	4.2	4.9	7.9	4.2	8.9
21-Mar	11.0	8.0	6.6	5.5	4.4	4.1	4.1	4.8	5.3	5.7	5.3	4.7	4.8	4.9	5.0	9.2	8.1	19.8	29.4	24.8	10.9	10.2	8.8	9.1	8.9	29.4
22-Mar	10.4	7.9	7.9	8.5	7.3	6.3	5.9	6.1	11.3	12.4	6.5	8.2	7.6	7.4	7.3	7.3	9.6	11.8	8.9	7.5	9.2	7.9	7.9	7.5	8.3	12.4
23-Mar	7.1	6.8	6.1	6.0	5.7	5.3	4.4	4.9	9.9	10.8	7.2	7.5	7.0	6.0	6.0	4.6	5.2	4.9	4.4	5.0	4.1	4.9	5.1	4.2	6.0	10.8
24-Mar	4.2	3.7	3.6	4.2	5.2	4.9	4.3	4.7	7.2	14.9	13.4	13.0	9.3	9.1	6.9	6.0	6.4	7.0	9.9	10.5	10.6	11.3	10.3	11.4	8.0	14.9
25-Mar	10.9	11.5	8.4	8.7	7.8	8.1	9.2	8.7	10.8	20.1	17.6	12.0	8.9	7.1	5.4	5.6	5.1	4.8	5.3	6.7	9.0	5.0	4.1	7.0	8.7	20.1
26-Mar	8.9	6.0	3.8	6.1	13.1	14.8	4.4	9.1	19.5	19.7	14.4	17.7	15.2	17.4	14.0	13.3	10.9	9.6	9.8	12.7	25.9	26.7	17.9	18.9	13.7	26.7
27-Mar	16.2	12.3	8.3	5.8	5.0	3.8	3.8	3.7	3.9	4.9	4.8	5.9	12.2	10.1	8.7	8.0	8.4	10.2	23.9	18.0	28.5	30.0	26.7	24.9	12.0	30.0
28-Mar	23.3	18.5	16.2	14.5	12.3	9.1	8.1	7.9	12.9	26.1	14.8	12.5	19.1	14.4	11.8	8.4	9.6	10.7	11.0	9.7	8.0	7.8	8.0	8.8	12.6	26.1
29-Mar	8.7	9.3	21.0	23.9	13.5	7.4	5.3	4.6	5.0	6.7	17.9	13.1	6.9	8.5	6.8	6.3	3.3	3.9	4.0	5.5	8.9	10.5	9.0	9.2	9.1	23.9
30-Mar	11.7	8.3	6.0	5.4	6.1	4.2	3.6	4.3	3.4	5.2	14.4	18.5	10.5	9.0	6.6	7.7	8.2	7.9	9.1	9.2	14.6	16.1	5.0	4.7	8.3	18.5
31-Mar	2.8	2.2	3.4	5.0	4.1	4.4	3.4	3.2	4.0	6.2	9.4	13.1	16.4	11.3	7.9	5.5	4.8	3.6	3.2	3.3	6.8	6.1	5.4	8.0	6.0	16.4
	7.1	6.5	6.7	6.4	5.9	5.5	5.1	5.0	6.3	8.5	9.2	8.6	7.8	6.9	6.6	5.8	5.6	6.3	7.0	6.8	7.2	7.4	6.7	7.1	Diurnal Average	
	23.3	18.5	21.0	23.9	13.5	14.8	11.5	9.8	19.5	26.1	25.2	20.4	19.1	17.4	21.8	13.3	10.9	19.8	29.4	24.8	28.5	30.0	26.7	24.9	Diurnal Maximum	

C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 $\mu g/m^3$ 24-hr 29 $\mu g/m^3$

Wood Buffalo Environmental Association

Hourly Averages

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

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

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

Ells River - March 2023

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
0 - 5	388	52.36	52.36
6 - 15	313	42.24	94.60
16 - 25	33	4.45	99.06
26 - 80	7	0.94	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

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

Ells River - March 2023

Concentration Ranges ($\mu g/m^3$)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	37	112	47	7	11	18	18	46	16	11	10	10	11	13	10	11	388
6 - 15	15	32	35	5	8	3	21	55	63	22	6	6	14	16	3	7	311
16 - 25	4	7	1	1	0	0	2	5	3	1	0	0	1	7	0	1	33
26 - 80	1	1	1	0	0	0	0	0	2	0	0	0	0	1	0	1	7
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	152	84	13	19	21	41	106	84	34	16	16	26	37	13	20	739

Total Number of Valid Hours: 739

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

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

Ells River

Total Number of Valid Hours: 739

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Ells River - March 2023

Maximum Value: 9.7 C on Mar 18 16:00

Maximum Daily Average: 1.0 C on Mar 18

Minimum Value: -33.4 C on Mar 6 07:00

Minimum Daily Average: -23.2 C on Mar 5

Maximum Diurnal Average: -4.6 C at hour 16

Minimum Diurnal Average: -16.4 C at hour 7

Monthly Average: -10.47 C

Percentiles: P_1 = -30.3 P_{10} = -20.1 Q_1 = -14.7 Median = -10.0 Q_3 = -5.5 P_{90} = -1.6 P_{99} = 6.7

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-26.5	-25.1	-24.8	-26.6	-26.8	-27.5	-28.6	-29.2	-26.9	-21.5	-15.8	-12.9	-11.0	-9.8	-8.7	-8.4	-8.5	-9.3	-11.4	-13.5	-13.4	-13.9	-16.0	-15.3	-18.0	-8.4
2-Mar	-13.6	-8.1	-7.7	-7.6	-7.4	-7.2	-7.2	-7.3	-7.0	-5.7	-3.5	-2.6	-1.6	1.4	2.9	3.8	2.1	2.0	1.2	1.0	0.7	0.4	-0.1	-0.8	-3.0	3.8
3-Mar	-3.4	-5.7	-7.2	-8.4	-9.0	-9.4	-9.7	-10.3	-10.9	-11.0	-11.1	-11.2	-10.8	-9.6	-9.4	-9.7	-10.0	-10.0	-10.7	-11.2	-12.3	-13.9	-14.7	-15.2	-10.2	-3.4
4-Mar	-15.6	-15.7	-15.8	-15.9	-16.0	-16.2	-17.1	-18.0	-18.1	-17.4	-16.4	-16.0	-15.3	-14.5	-14.0	-14.2	-14.7	-15.4	-16.9	-18.7	-20.0	-22.5	-24.2	-25.5	-17.3	-14.0
5-Mar	-27.3	-28.7	-29.2	-29.4	-30.0	-30.5	-31.2	-29.8	-25.3	-20.7	-17.6	-16.8	-16.5	-16.1	-15.5	-15.0	-15.4	-16.6	-19.7	-22.7	-25.0	-26.9	-27.7	DF	-23.2	-15.0
6-Mar	-29.7	-30.1	-31.0	-31.8	-32.4	-33.0	-33.4	-33.1	-29.7	-26.3	-20.3	-16.4	-13.2	-11.8	-11.6	-11.1	-10.5	-11.2	-11.8	-13.5	-15.6	-17.3	-18.2	-15.7	-21.2	-10.5
7-Mar	-13.2	-13.4	-13.1	-12.7	-12.8	-12.9	-13.6	-13.8	-13.4	-12.9	-12.4	-12.1	-11.6	-11.0	-9.8	-8.4	-7.1	-8.3	-9.1	-10.1	-10.0	-11.3	-10.0	-9.7	-11.4	-7.1
8-Mar	-9.6	-10.0	-11.5	-13.0	-14.6	-15.2	-15.3	-14.9	-13.9	-13.1	-11.2	-9.8	-8.7	-7.6	-6.5	-5.8	-5.9	-6.3	-8.4	-10.7	-11.2	-11.5	-12.1	-14.0	-10.9	-5.8
9-Mar	-14.8	-18.6	-21.0	-22.4	-20.4	-18.9	-22.2	-23.3	-19.1	-15.7	-13.2	-11.3	-10.1	-9.0	-8.6	-8.3	-7.7	-7.9	-8.5	-9.2	-9.6	-9.9	-9.9	-9.7	-13.7	-7.7
10-Mar	-9.7	-10.3	-10.5	-10.7	-10.8	-11.0	-11.0	-10.8	-10.6	-10.1	-9.6	-8.4	-8.0	-7.5	-6.8	-6.0	-6.2	-6.3	-6.9	-8.5	-8.1	-8.1	-8.4	-8.7	-8.9	-6.0
11-Mar	-8.2	-8.5	-9.6	-10.8	-11.1	-11.4	-11.4	-11.0	-9.8	-8.1	-6.3	-5.7	-4.9	-4.8	-4.6	-4.6	-5.0	-6.4	-7.8	-8.8	-9.8	-10.5	-11.0	-11.2	-8.4	-4.6
12-Mar	-11.5	-12.0	-12.5	-13.4	-14.2	-14.6	-15.2	-15.4	-15.0	-14.9	-14.9	-14.2	-13.3	-12.6	-11.6	-11.4	-11.8	-11.9	-12.4	-12.7	-13.2	-14.0	-14.8	-16.0	-13.5	-11.4
13-Mar	-16.4	-17.1	-18.1	-18.7	-18.6	-18.9	-18.8	-18.7	-17.3	-15.8	-14.4	-12.3	-10.3	-9.4	-9.0	-7.9	-7.1	-7.4	-8.2	-9.3	-9.9	-10.1	-10.4	-10.8	-13.1	-7.1
14-Mar	-11.1	-11.2	-11.4	-11.8	-12.3	-12.7	-12.9	-13.2	-13.4	-12.9	-12.5	-12.1	-11.9	-11.6	-11.3	-11.1	-11.5	-12.0	-12.5	-12.8	-13.1	-13.5	-14.0	-14.4	-12.4	-11.1
15-Mar	-14.8	-15.4	-16.5	-17.4	-18.6	-19.0	-17.5	-16.7	-16.0	-14.8	-12.4	-9.9	-9.1	-7.8	-8.2	-8.1	-8.7	-9.3	-11.2	-13.8	-15.4	-17.8	-18.5	-17.9	-13.9	-7.8
16-Mar	-17.0	-16.5	-14.4	-14.6	-14.1	-13.9	-13.9	-13.7	-13.1	-11.8	-10.8	-8.9	-7.4	-6.0	-4.6	-3.5	-3.8	-4.4	-5.1	-6.2	-6.8	-7.3	-8.0	-9.0	-9.8	-3.5
17-Mar	-9.4	-9.6	-9.6	-10.4	-11.4	-11.5	-12.4	-11.9	-9.6	-6.7	-3.9	-1.5	0.8	3.1	5.4	8.0	8.4	6.9	5.2	2.9	1.5	-1.6	-3.6	-4.3	-3.1	8.4
18-Mar	-2.7	-1.0	-1.7	-2.6	-2.7	-3.9	-6.2	-5.3	-3.0	-1.3	1.5	4.1	6.4	8.4	9.3	9.7	8.6	6.9	5.2	2.3	-0.6	-2.7	-2.8	-2.9	1.0	9.7
19-Mar	-2.5	-3.2	-5.2	-6.0	-7.3	-8.5	-8.9	-8.0	-6.0	-3.4	-2.3	-0.4	0.8	0.9	1.4	2.4	3.1	2.1	0.9	-1.2	-2.1	-2.5	-2.9	-3.4	-2.6	3.1
20-Mar	-4.1	-4.2	-4.6	-5.0	-5.9	-6.9	-7.1	-6.7	-6.3	-5.8	-5.6	-5.5	-4.5	-3.6	-2.5	-2.7	-3.1	-4.0	-5.4	-7.0	-8.6	-10.3	-11.6	-12.8	-6.0	-2.5
21-Mar	-13.3	-16.1	-17.5	-18.4	-20.5	-22.1	-22.5	-20.8	-15.7	-12.8	-9.7	-7.5	-5.0	-4.8	-2.8	-3.4	-4.0	-4.2	-5.2	-7.8	-8.5	-10.2	-11.4	-14.2	-11.6	-2.8
22-Mar	-17.0	-14.6	-17.5	-20.2	-20.9	-21.6	-22.0	-19.3	-12.3	-8.1	-6.0	-4.2	-2.5	-0.5	1.0	2.2	2.4	2.2	1.3	-1.1	-4.3	-5.7	-6.3	-8.3	-8.5	2.4
23-Mar	-8.7	-8.7	-8.6	-8.9	-7.1	-6.9	-5.5	-6.3	-4.1	-1.4	-0.9	-0.7	-1.6	-2.3	-1.2	-1.4	-2.8	-3.8	-5.4	-6.5	-7.1	-6.9	-6.3	-6.0	-5.0	-0.7
24-Mar	-6.6	-8.1	-10.5	-12.0	-14.5	-16.5	-18.0	-15.5	-11.6	-10.4	-7.7	-5.7	-2.9	-3.3	-2.6	-1.9	-1.5	-1.5	-2.5	-5.7	-8.0	-10.5	-12.8	-14.2	-8.5	-1.5
25-Mar	-15.6	-16.2	-17.3	-18.6	-20.1	-21.2	-21.4	-18.9	-13.0	-9.8	-6.8	-5.0	-3.8	-3.2	-3.3	-3.6	-4.3	-5.5	-7.6	-9.6	-11.0	-12.6	-14.1	-15.9	-11.6	-3.2
26-Mar	-17.7	-19.0	-19.3	-20.3	-20.9	-22.3	-22.7	-22.5	-20.1	-18.6	-16.8	-14.5	-12.6	-11.6	-11.1	-10.9	-11.0	-11.7	-12.9	-14.5	-16.1	-16.9	-19.2	-21.9	-16.9	-10.9
27-Mar	-23.6	-24.3	-25.5	-25.9	-26.8	-26.8	-26.8	-23.1	-18.6	-13.4	-10.8	-9.1	-8.0	-7.3	-6.4	-5.1	-4.5	-5.4	-8.0	-10.7	-11.4	-13.7	-16.9	-18.8	-15.5	-4.5
28-Mar	-20.1	-21.7	-22.8	-23.5	-24.4	-25.5	-25.4	-21.4	-16.8	-12.4	-9.4	-7.1	-5.1	-3.4	-2.5	-1.6	-1.8	-1.6	-1.8	-2.2	-2.4	-2.6	-3.5	-4.0	-11.0	-1.6
29-Mar	-4.2	-5.7	-7.0	-8.2	-9.0	-7.2	-6.1	-4.6	-2.5	-2.4	-1.5	-1.1	-1.1	-1.1	-1.2	-0.9	-1.1	-1.8	-2.8	-4.2	-5.5	-6.9	-9.6	-11.5	-4.5	-0.9
30-Mar	-11.5	-13.4	-14.4	-15.6	-16.4	-16.0	-15.8	-14.2	-10.8	-6.7	-5.0	-4.2	-3.7	-3.3	-2.8	-2.6	-2.3	-2.6	-3.0	-3.5	-4.6	-6.3	-6.4	-7.8	-8.0	-2.3
31-Mar	-9.1	-9.1	-9.5	-9.0	-8.8	-8.6	-8.3	-8.0	-7.5	-6.8	-6.0	-4.8	-3.4	-1.7	-0.5	0.3	0.9	1.0	0.4	-0.9	-1.9	-1.2	-2.2	-4.8	-4.6	1.0
	-13.2	-13.6	-14.4	-15.2	-15.7	-16.1	-16.4	-15.7	-13.5	-11.4	-9.5	-8.0	-6.8	-5.9	-5.1	-4.6	-4.7	-5.3	-6.5	-8.1	-9.1	-10.3	-11.2	-11.5	Diurnal Average	
	-2.5	-1.0	-1.7	-2.6	-2.7	-3.9	-5.5	-4.6	-2.5	-1.3	1.5	4.1	6.4	8.4	9.3	9.7	8.6	6.9	5.2	2.9	1.5	0.4	-0.1	-0.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Ells River - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	77	10.36	10.36
-20 - 0	622	83.71	94.08
0 - 10	44	5.92	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Ells River - March 2023

Maximum Value: 90.1 % on Mar 19 07:00

Maximum Daily Average: 80.5 % on Mar 14

Minimum Value: 27.8 % on Mar 18 16:00

Minimum Daily Average: 47.1 % on Mar 8

Maximum Diurnal Average: 74.4 % at hour 5

Minimum Diurnal Average: 52.9 % at hour 16

Monthly Average: 65.51 %

Percentiles: P_1 = 34.7 P_{10} = 46.1 Q_1 = 57.4 Median = 67.5 Q_3 = 75.7 P_{90} = 80.5 P_{99} = 86.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	72.6	74.6	75.2	72.5	72.1	71.4	70.7	70.1	70.4	70.5	66.6	66.5	64.2	62.9	61.7	62.7	64.4	68.4	76.4	84.7	83.2	79.9	81.3	81.4	71.8	84.7
2-Mar	83.2	86.2	85.9	86.6	87.0	87.4	86.8	85.2	84.5	80.5	71.5	68.1	67.4	62.6	63.5	64.2	79.3	79.8	74.1	71.0	71.9	72.5	66.3	63.9	76.2	87.4
3-Mar	77.5	79.1	78.5	76.3	75.1	73.9	74.7	71.5	70.8	70.7	71.0	69.0	66.2	62.3	62.7	64.3	70.3	73.3	81.7	82.3	77.6	72.6	71.0	71.2	72.7	82.3
4-Mar	71.9	73.1	76.0	77.8	77.7	72.1	71.7	72.0	70.4	63.2	55.3	55.4	52.6	49.7	50.4	54.5	57.9	61.6	61.7	65.1	68.1	72.4	73.3	73.0	65.7	77.8
5-Mar	71.7	70.8	70.5	70.4	69.8	69.5	69.1	69.5	69.3	62.0	50.9	48.4	48.6	48.7	47.4	46.3	47.6	50.3	59.1	65.3	68.9	69.6	69.7	DF	61.5	71.7
6-Mar	69.4	68.8	68.6	68.1	67.8	67.4	67.3	66.9	63.5	64.3	62.3	55.0	52.1	54.2	60.1	64.1	64.4	73.4	78.6	78.5	82.7	80.5	79.0	80.5	68.2	82.7
7-Mar	75.6	76.9	79.8	81.4	78.5	76.4	75.8	76.0	75.2	73.9	71.8	70.8	67.9	66.8	63.8	60.7	53.6	63.3	65.3	61.9	54.9	59.4	53.3	51.3	68.1	81.4
8-Mar	49.1	46.9	50.1	55.0	58.4	59.1	60.0	59.2	56.4	54.1	49.2	46.1	40.8	37.8	35.0	33.4	34.5	35.0	39.7	45.1	44.1	44.8	45.7	50.7	47.1	60.0
9-Mar	52.3	63.6	67.9	69.7	66.7	64.4	68.4	67.6	60.6	58.6	52.9	45.4	43.6	42.1	45.3	45.9	43.8	45.4	46.3	49.0	50.5	56.2	60.6	60.7	55.3	69.7
10-Mar	60.7	65.3	71.8	74.9	75.3	71.8	71.0	69.1	68.7	67.6	66.8	61.2	59.7	61.6	57.8	56.8	57.6	62.8	67.7	76.8	80.6	81.9	81.3	81.1	68.7	81.9
11-Mar	71.2	64.9	67.9	73.7	75.3	76.9	78.3	76.3	68.4	60.7	54.6	57.2	57.3	58.0	58.3	59.5	64.9	73.8	78.5	82.3	83.9	82.8	82.6	82.2	70.4	83.9
12-Mar	83.0	81.5	81.2	78.8	78.3	78.2	76.9	76.0	75.7	74.4	72.3	69.9	69.3	69.2	69.6	71.0	71.3	73.4	76.0	76.7	79.6	80.7	81.3	81.6	76.1	83.0
13-Mar	81.8	81.0	80.4	79.7	79.6	79.2	79.1	78.9	79.6	79.7	79.3	73.6	70.0	69.0	65.9	64.7	64.1	64.1	64.5	66.6	68.5	70.2	73.6	80.1	73.9	81.8
14-Mar	82.3	82.1	82.6	82.5	82.2	81.9	81.7	81.3	80.5	79.8	79.3	79.7	79.8	79.4	79.4	79.2	80.6	81.1	80.3	80.2	79.6	79.3	79.3	79.1	80.5	82.6
15-Mar	78.8	78.9	81.1	81.8	79.7	79.4	80.0	79.2	75.6	71.6	63.4	55.4	54.0	52.6	56.6	58.4	60.9	64.2	73.3	82.9	83.2	80.4	79.9	78.8	72.1	83.2
16-Mar	79.9	80.9	79.2	78.4	77.7	79.7	81.2	79.8	78.2	74.8	71.0	67.9	66.3	65.6	64.8	64.2	66.9	69.8	72.9	75.6	75.5	78.2	80.1	83.1	74.6	83.1
17-Mar	82.8	84.3	84.0	84.0	85.2	84.1	84.9	82.1	75.7	68.9	64.1	61.4	58.8	57.0	54.7	47.3	45.0	52.6	58.0	65.7	71.4	77.4	77.3	76.7	70.1	85.2
18-Mar	67.1	53.8	54.3	55.1	54.4	58.9	66.4	62.2	55.6	51.4	46.8	42.2	37.4	32.3	29.1	27.8	31.1	38.4	44.3	53.1	62.5	72.2	69.5	66.1	51.3	72.2
19-Mar	65.6	68.8	75.7	80.3	85.0	87.9	90.1	89.9	81.7	68.0	65.4	58.1	54.3	56.2	54.5	50.8	47.9	52.8	57.5	65.3	67.9	68.9	69.1	70.3	68.0	90.1
20-Mar	70.3	74.2	72.8	69.3	68.0	66.9	64.8	65.7	70.8	78.0	82.3	75.4	69.5	67.2	59.8	57.4	53.1	52.7	53.1	54.8	56.1	58.9	60.9	64.9	65.3	82.3
21-Mar	66.7	73.3	75.7	75.9	75.9	75.3	74.8	70.8	65.2	64.4	60.9	60.1	53.6	50.5	43.6	44.7	41.8	45.3	46.6	55.2	61.7	68.6	72.8	78.9	62.6	78.9
22-Mar	78.5	82.6	78.4	76.7	75.8	75.4	74.1	71.6	71.2	65.2	57.4	53.1	48.9	43.9	41.1	38.9	41.3	43.6	44.6	51.1	62.6	67.8	68.8	72.8	61.9	82.6
23-Mar	74.2	73.8	75.2	76.2	71.9	72.3	73.5	74.2	65.8	56.2	57.1	57.4	62.4	64.1	59.2	56.1	63.6	65.7	69.1	72.0	72.5	70.8	67.7	64.5	67.3	76.2
24-Mar	65.6	67.1	71.5	77.2	82.3	80.8	79.4	75.4	67.1	69.2	59.5	53.3	44.7	45.7	42.8	38.7	41.0	40.3	40.4	51.1	59.5	67.2	70.5	75.9	61.1	82.3
25-Mar	76.0	78.0	76.0	77.9	76.1	75.7	75.4	70.3	66.7	59.2	53.3	47.0	43.6	40.2	41.5	41.8	42.6	47.0	52.2	58.9	61.3	63.4	64.5	65.2	60.6	78.0
26-Mar	65.6	64.5	62.0	66.0	66.5	67.5	67.0	66.5	61.8	58.0	55.9	52.0	47.1	45.0	43.1	42.0	42.1	42.4	44.4	47.4	52.1	54.3	58.0	63.5	55.6	67.5
27-Mar	67.2	69.1	68.8	69.7	69.1	70.4	69.5	66.9	57.5	46.0	39.7	39.0	38.7	39.0	38.1	34.1	33.7	37.0	46.5	50.5	50.0	55.1	62.8	67.6	53.6	70.4
28-Mar	68.5	70.6	71.6	71.8	71.6	70.8	70.8	66.7	59.7	50.8	41.8	40.0	38.3	38.0	38.9	39.6	43.8	44.7	46.3	47.0	47.5	47.4	52.4	55.3	53.9	71.8
29-Mar	53.9	59.9	67.7	72.4	78.4	76.9	73.5	70.4	66.6	71.2	70.4	72.3	72.1	71.7	70.8	67.1	63.3	61.7	63.5	64.0	62.6	67.5	76.0	80.5	68.9	80.5
30-Mar	81.8	83.2	83.4	81.4	80.7	81.1	79.9	79.4	77.0	63.4	51.1	51.2	47.4	46.4	45.3	44.8	47.8	50.2	51.7	51.9	55.2	59.3	57.8	60.4	63.0	83.4
31-Mar	62.4	61.8	63.7	63.9	64.1	65.3	65.0	64.4	65.4	66.5	67.5	67.1	64.2	60.7	59.3	57.6	56.8	57.5	60.7	66.8	71.5	66.7	69.2	78.8	64.5	78.8
	71.2	72.2	73.5	74.4	74.4	74.1	74.3	72.7	69.5	65.9	61.7	58.7	56.2	54.9	53.7	52.9	54.1	57.1	60.5	64.5	66.7	68.6	69.5	71.3	Diurnal Average	
	83.2	86.2	85.9	86.6	87.0	87.9	90.1	89.9	84.5	80.5	82.3	79.7	79.8	79.4	79.4	79.2	80.6	81.1	81.7	84.7	83.9	82.8	82.6	83.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Ells River - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	26	3.50	3.50
40 - 60	199	26.78	30.28
60 - 80	431	58.01	88.29
80 - 100	87	11.71	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Ells River - March 2023

Maximum Value: 613.5 W/m2 on Mar 27 13:00

Maximum Daily Average: 193.8 W/m2 on Mar 27

Minimum Value: 0.0 W/m2 on Mar 1 02:00

Minimum Daily Average: 47.4 W/m2 on Mar 14

Maximum Diurnal Average: 468.0 W/m2 at hour 13

Minimum Diurnal Average: 0.1 W/m2 at hour 1

Monthly Average: 133.55 W/m2

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 5.3 Q_3 = 251.0 P_{90} = 455.6 P_{99} = 598.6

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.1	0.0	0.2	0.0	0.0	0.3	0.1	20.1	127.8	216.3	363.5	475.1	491.4	386.3	328.4	126.9	63.3	30.6	1.1	0.0	0.0	0.2	0.0	0.0	109.7	491.4
2-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	65.5	155.1	327.3	430.7	403.1	392.2	291.9	152.0	81.2	25.9	0.8	0.0	0.0	0.0	0.0	0.0	97.4	430.7
3-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	38.2	107.1	164.0	211.4	226.2	202.8	201.3	126.4	98.2	23.7	0.7	0.0	0.0	0.0	0.0	0.0	58.5	226.2
4-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	12.7	77.7	200.1	333.9	339.5	338.4	411.3	308.2	181.9	122.4	42.8	1.4	0.0	0.3	0.3	0.3	0.2	98.8	411.3
5-Mar	0.3	0.1	0.2	0.2	0.3	0.1	2.7	72.0	151.0	286.1	418.1	497.2	502.4	471.5	398.0	283.5	146.8	24.9	0.6	0.2	0.3	0.2	0.2	DF	141.6	502.4
6-Mar	0.1	0.2	0.2	0.2	0.1	0.1	0.7	33.2	134.6	161.7	373.6	458.3	469.3	382.3	276.6	202.2	125.7	27.3	1.8	0.2	0.1	0.1	0.0	0.0	110.4	469.3
7-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.4	16.2	96.4	159.1	182.5	223.8	288.3	303.0	236.3	235.6	166.8	69.1	5.3	0.2	0.0	0.0	0.0	0.0	82.6	303.0
8-Mar	0.0	0.0	0.1	0.0	0.0	0.0	0.6	32.0	99.4	178.9	374.4	440.6	433.8	445.7	429.6	325.1	192.1	68.0	4.2	0.1	0.0	0.0	0.1	0.0	126.0	445.7
9-Mar	0.2	0.3	0.2	0.1	0.2	0.4	1.4	39.5	135.8	237.9	388.7	473.6	505.0	501.5	421.0	297.1	201.7	35.6	3.6	0.0	0.0	0.0	0.0	0.0	135.2	505.0
10-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.6	18.8	84.1	157.2	227.2	470.0	341.0	417.1	362.8	301.6	125.0	51.2	3.5	0.0	0.0	0.0	0.0	0.0	106.7	470.0
11-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.9	25.1	87.5	256.4	343.8	398.1	477.8	399.1	351.8	225.9	118.8	29.9	2.3	0.0	0.0	0.0	0.0	0.0	113.2	477.8
12-Mar	0.0	0.0	0.0	0.0	0.0	0.0	1.5	32.5	81.8	151.3	224.2	266.8	276.6	357.5	343.3	227.1	124.6	53.9	4.1	0.0	0.0	0.0	0.0	0.0	89.4	357.5
13-Mar	0.0	0.0	0.0	0.0	0.0	0.0	2.7	35.5	86.3	219.6	317.3	358.4	444.8	327.8	339.6	194.9	154.1	48.3	4.3	0.0	0.0	0.0	0.0	0.0	105.6	444.8
14-Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.6	13.1	56.8	101.2	99.9	123.3	176.0	192.9	158.1	116.6	68.0	28.0	3.4	0.0	0.0	0.0	0.0	0.0	47.4	192.9
15-Mar	0.0	0.0	0.0	0.0	0.1	0.0	2.4	94.4	219.7	319.5	484.9	532.8	553.7	544.0	486.9	379.5	249.4	106.2	8.5	0.3	0.5	0.3	0.0	0.0	166.0	553.7
16-Mar	0.0	0.0	0.0	0.0	0.0	0.0	2.1	29.1	90.9	148.2	432.5	542.0	578.2	562.4	499.5	389.2	255.5	109.5	8.6	0.3	0.2	0.2	0.3	0.3	152.1	578.2
17-Mar	0.0	0.0	0.0	0.2	0.0	0.2	5.7	124.0	270.5	318.7	462.0	529.0	569.7	562.5	498.1	394.4	260.6	117.0	10.3	0.6	0.5	0.4	0.3	0.4	171.9	569.7
18-Mar	0.3	0.5	0.4	0.5	0.4	0.4	5.9	77.8	196.8	276.7	455.6	537.7	577.1	570.0	509.0	404.9	269.8	122.5	11.7	0.5	0.4	0.1	0.0	0.2	167.5	577.1
19-Mar	0.0	0.0	0.0	0.0	0.0	0.1	7.4	129.3	252.6	329.4	341.2	385.6	427.3	407.1	343.7	335.9	299.3	73.5	14.1	0.2	0.0	0.0	0.0	0.0	139.4	427.3
20-Mar	0.1	0.0	0.0	0.0	0.2	0.1	5.0	42.2	74.6	107.5	177.1	343.1	546.0	531.9	523.1	420.5	289.3	142.0	16.9	0.1	0.0	0.2	0.2	0.2	134.2	546.0
21-Mar	0.2	0.3	0.2	0.5	0.2	0.1	9.7	146.5	197.5	211.9	292.4	531.3	599.9	598.5	534.7	417.2	257.6	150.5	18.9	0.5	0.5	0.1	0.5	0.3	165.4	599.9
22-Mar	0.2	0.1	0.5	0.1	0.0	0.2	11.0	153.1	248.4	330.2	468.0	557.4	595.3	588.5	527.7	422.5	289.0	143.6	21.3	0.7	0.3	0.2	0.3	0.3	181.6	595.3
23-Mar	0.1	0.1	0.0	0.0	0.0	0.0	11.0	80.7	187.6	256.1	485.7	562.6	494.5	469.4	458.6	399.4	148.0	93.8	13.6	0.2	0.0	0.0	0.0	0.0	152.6	562.6
24-Mar	0.0	0.0	0.1	0.4	0.6	0.6	17.8	168.8	261.3	289.9	516.1	572.3	600.1	596.5	541.6	437.0	305.9	160.9	26.7	0.5	0.2	0.3	0.2	0.2	187.4	600.1
25-Mar	0.2	0.3	0.3	0.4	0.2	0.3	21.8	188.9	284.3	353.1	514.0	574.9	609.1	598.6	544.6	440.7	311.3	166.8	30.2	0.4	0.0	0.0	0.0	0.0	193.3	609.1
26-Mar	0.0	0.0	0.0	0.0	0.1	0.2	16.8	121.4	245.3	332.6	503.2	570.9	589.2	589.4	514.7	452.4	279.2	144.2	30.9	0.5	0.0	0.3	0.5	0.4	183.0	589.4
27-Mar	0.1	0.4	0.5	0.5	0.3	0.6	34.7	153.3	275.8	343.2	522.9	589.4	613.5	604.7	549.9	446.3	313.7	167.5	31.0	0.6	0.2	0.5	0.4	0.4	193.8	613.5
28-Mar	0.2	0.1	0.0	0.1	0.3	0.7	33.3	178.1	275.4	338.2	521.6	576.3	607.8	589.8	448.0	281.7	178.1	95.8	19.4	0.4	0.0	0.0	0.0	0.0	172.7	607.8
29-Mar	0.2	0.1	0.2	0.2	0.0	0.2	18.4	87.3	100.8	134.9	229.1	192.4	224.9	146.6	196.3	277.7	203.3	93.7	26.2	0.8	0.0	0.3	0.4	0.2	80.6	277.7
30-Mar	0.4	0.3	0.2	0.2	0.1	0.6	19.9	65.6	149.6	257.1	448.4	436.5	399.4	347.6	307.8	188.1	165.9	58.5	19.0	0.5	0.0	0.0	0.0	0.0	119.4	448.4
31-Mar	0.0	0.0	0.0	0.0	0.0	0.3	12.2	47.9	96.0	191.0	309.1	414.7	549.4	609.4	550.0	455.3	332.5	163.6	39.3	0.9	0.0	0.1	0.0	0.0	157.2	609.4
	0.1	0.1	0.1	0.1	0.1	0.2	8.0	72.7	153.2	229.9	364.6	439.2	468.0	455.1	402.6	307.7	199.9	86.1	12.4	0.3	0.1	0.1	0.1	0.1	Diurnal Average	
	0.4	0.5	0.5	0.5	0.6	0.7	34.7	188.9	284.3	353.1	522.9	589.4	613.5	609.4	550.0	455.3	332.5	167.5	39.3	0.9	0.5	0.5	0.5	0.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Global Radiation (GR) - W/m2

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Ells River - March 2023

Maximum Speed: 27 km/h on Mar 14 00:00

Maximum Daily Speed Average: 20.7 km/h on Mar 14

Minimum Speed Value: 0 km/h on Mar 27 17:00

Maximum Diurnal Speed Average: 6.9 km/h at hour 18

Monthly Average Velocity: 3.3 km/h 65.0 deg

Minimum Daily Speed Average: 0.7 km/h on Mar 5

Minimum Diurnal Speed Average: 0.5 km/h at hour 5

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 5$ Median = 10 $Q_3 = 14$ $P_{90} = 19$ $P_{99} = 26$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSW5	S7	SSW5	SSW3	SSW1	SSW2	UO	W2	S2	SSE3	SSE7	SSE9	S13	SSE11	SSE17	SSE14	SSE10	SSE7	SE4	SE3	SSE7	S2	WNW2	WNW4	SSE5.2	SSE17
2-Mar	SSW3	SSE16	SSE18	SSE17	S13	SSE11	S11	S14	S13	S10	S7	NNE3	N7	SE4	S9	WSW10	WSW11	W9	WNW11	W8	WSW9	W10	NW16	NW16	SSW5.7	SSE18
3-Mar	NNE14	NNE17	NE14	NE14	ENE11	ENE11	NE13	NE14	NE12	NE10	NE13	NE11	NE9	N2	NE5	NE8	NNE6	NE4	NE5	ENE6	NE15	NNE21	NE14	NE10	NE10.5	NNE21
4-Mar	ENE6	SE1	WSW3	WSW2	W2	NNE8	NE11	NE6	NNE9	N12	NNW18	NW17	NW15	NNW17	N15	NNE14	NE12	NE12	NE10	NNE7	NNW6	WNW3	WNW2	NNE3	N6.8	NNW18
5-Mar	W2	WNW4	SW2	W1	W2	W2	W4	WNW3	WNW4	WNW4	NNE3	ENE5	ESE8	ESE9	ESE8	ESE9	E10	ESE6	NNW2	WNW3	W3	WNW3	W2	DF	E0.7	E10
6-Mar	WNW3	WSW1	SW2	UO	SSW3	SW1	SSW3	SSW3	S2	E1	SSE10	SE7	SE6	SSE7	S9	SSE6	SSE12	SSE7	E5	E4	NE2	SE1	SSE6	SSE9	SSE3.8	SSE12
7-Mar	SSE13	SSE12	SSE12	SSE12	SSE14	SSE15	SSE13	SSE14	SSE17	SSE19	SSE19	SSE19	SSE20	SSE16	SSE13	SSE11	SE11	NNE7	NE4	E4	SE5	E2	SSE9	SSE11	SSE11.3	SSE20
8-Mar	SSE13	SSE13	SSE10	SSE9	SSE11	SSE11	SSE11	S9	S11	S10	S13	S12	SE11	SE14	SSE12	S10	S10	SSW8	S4	SE10	SSE12	SSE12	S13	SSE13	SSE10.7	SE14
9-Mar	SSE9	NNW2	WNW3	W1	SSW8	SSW9	SSW5	S5	S9	SSE11	SSE10	SSE17	SE19	SSE17	SE21	SE23	SSE20	SSE12	SE12	SE13	SE16	SSE20	SSE21	SSE22	SSE11.9	SE23
10-Mar	SSE24	SSE18	SSE18	SSE19	SSE20	SSE22	SSE22	SSE20	SSE21	SSE21	SSE22	SSE19	SSE17	SSE14	SSE13	ESE9	ESE5	E5	E7	NNE7	NNE9	NNE9	N5	NNE5	SSE12.0	SSE24
11-Mar	SE6	ESE5	ESE4	ENE2	ESE1	N1	NNW2	NNE2	NE2	N1	NNW5	NE6	NNE6	N9	NNE8	NE10	NNE15	NNE19	NNE17	NNE18	NNE17	NNE17	NNE15	NNE16	NNE7.6	NNE19
12-Mar	NNE16	NNE19	NNE14	NNE19	NNE15	NNE14	NNE15	NNE15	NNE15	NE15	NNE14	NNE11	NE12	NE14	NE14	NNE16	NE16	NE14	NE15	NNE14	NNE14	NNE13	NNE14	N12	NNE14.4	NNE19
13-Mar	N14	NNE12	N12	NNE10	N14	NNE11	NNE13	NNE12	NNE12	NNE15	NNE17	NNE17	NNE18	NNE22	NNE21	NNE23	NNE25	NNE26	NNE25	NNE27	NNE27	NNE26	NNE25	NNE27	NNE18.7	NNE27
14-Mar	NNE26	NNE27	NNE26	NNE25	NNE24	NNE24	NNE24	NNE23	NNE21	NNE22	NNE20	NNE19	NNE19	NNE19	NNE18	NNE15	NNE16	N17	N20	NNE21	NNE20	NNE17	NNE18	NNE17	NNE20.7	NNE27
15-Mar	NNE11	N8	N8	N7	NNW6	NW6	NNW5	N7	NNE8	N8	N5	N3	N4	N4	NNE5	NE6	NNE7	NE7	NE3	NW2	WSW2	NW3	W3	WNW2	N4.7	NNE11
16-Mar	SSE5	S8	SSE10	SSE7	ESE1	N2	SE3	S6	S7	S10	S13	S11	SSE12	SSE13	SSE13	S13	SSE16	SSE14	S12	S12	S13	S12	S8	SSW7	SSE9.1	SSE16
17-Mar	S8	S14	S13	S11	S10	S9	S10	S10	SSW12	S14	S15	S17	S18	SSE16	S14	SSW10	S8	SSE9	SSE7	S11	SSW10	WSW6	SSW5	SSW6	S10.6	S18
18-Mar	SW8	SW10	SW9	SW9	SW10	SW5	S9	S7	S8	SE9	SE8	SE8	SE8	SE7	SSE9	E10	ENE13	NE12	NE10	NNE5	NNW4	NNW5	NNW8	N8	SSE2.2	ENE13
19-Mar	NNE8	N8	NNE11	N9	N9	NNE7	N5	N4	NNE2	SE5	SSE7	SE3	N6	N8	NNE8	E5	E5	E7	S8	SSE11	SE15	SE14	SE11	ESE6	ENE3.2	SE15
20-Mar	E6	ESE7	E7	ESE9	ESE8	ESE7	SE6	SE5	NE4	NNE8	NNE16	NNE21	NE19	NE26	NNE24	NNE26	NNE25	NE22	NNE21	NNE21	NNE20	NE11	NE9	NNE6	NE12.1	NE26
21-Mar	N5	WNW5	N2	WNW2	WNW3	NW6	NW5	WNW5	NW4	NNW4	NNE2	ESE3	E4	SE5	ESE2	SE6	SSE9	S10	S8	SSE8	S9	SSE10	S6	S2	S1.7	S10
22-Mar	W2	S9	SSW5	W3	NW4	WSW3	SW1	SSW3	S9	S15	S14	S12	S14	S13	S12	S14	SSE14	SSE13	S8	S8	SSW2	WSW1	S4	SSW4	S7.0	S15
23-Mar	SSW7	SSW3	S7	S9	S9	SSW6	SW6	SE2	E5	NE19	NE20	NE20	NE25	NE23	NE19	NNE24	NE22	NE21	NNE21	NNE17	N12	N7	N10	N18	NE9.6	NE25
24-Mar	N18	NNE13	NNE7	NNW2	WSW2	W1	WSW2	SW1	NW2	N3	NNE4	NNE5	ENE4	SE8	SE10	SE12	SSE12	S10	S6	E2	NNE3	N3	WNW4	WNW4	ENE1.2	N18
25-Mar	WNW5	WNW3	W2	W2	WNW4	WNW4	WNW4	NW5	N6	NNE8	NNE10	NE15	NE12	ENE14	NE17	NE19	NE19	NE22	NE20	NNE18	NNE15	NNE16	NNE16	N11	NNE9.3	NE22
26-Mar	NNE11	N14	NNE12	NNW5	NNW8	N10	N13	N9	N7	NNE12	NNE15	NNE13	NE14	NNE15	NE19	NE20	NE19	NE20	NE16	NNE13	N15	NNE4	N4	W2	NNE11.5	NE20
27-Mar	WNW6	WSW2	SW2	WSW3	WSW3	SSW4	S3	S6	SSE8	SW8	SSE7	ESE8	SE8	SE11	SE11	SE6	ENE0	NE8	NE12	NNE9	NE6	NNW4	WNW4	WNW3	SE1.8	NE12
28-Mar	WNW2	WNW4	WNW3	W2	SW1	SSW3	S5	S6	SSE8	S12	SSW15	S14	S15	S16	S18	SSE17	SSE18	SSE14	SSE11	SSE10	SSE10	SSE6	SSE2	NNW3	S7.8	S18
29-Mar	SSW2	WNW4	WNW5	WNW5	W5	W5	SSW2	WNW6	NNW4	NNE8	NNE6	NE9	NE17	NE18	NE21	NE21	NNE22	NE20	NE18	NE14	NNE10	NNW4	W4	W4	NNE7.2	NNE22
30-Mar	W2	WNW5	WNW2	WSW2	SW2	SSW5	SSW3	SSW2	ESE1	E2	E8	ENE10	ENE10	NE10	NE10	NE9	NE11	NE12	NE12	NE11	NNE12	N11	NNE15	NNE12	NE5.3	NNE15
31-Mar	NNE11	NNE12	N11	N12	NNE13	N11	NNE13	NNE14	NNE16	NNE16	NNE15	N15	N16	NNE17	NNE18	NNE18	NNE19	NNE17	N17	NNE13	NE7	E9	NE7	NNE9	NNE13.2	NNE19
	NE1.9	ENE1.5	E1.2	E1.0	ESE0.5	E0.8	E1.2	E1.0	ESE1.8	E2.6	E3.3	E4.5	E5.1	E5.4	E5.7	ENE6.1	ENE6.7	ENE6.9	NE6.4	NE5.5	NE4.4	NE3.4	NNE3.1	NNE3.2	Diurnal Average	
	NNE26	NNE27	NNE26	NNE25	NNE24	NNE24	NNE24	NNE23	SSE21	NNE22	SSE22	NNE21	NE25	NE26	NNE24	NNE26	NNE25	NNE26	NNE25	NNE27	NNE27	NNE26	NNE25	NNE27	Diurnal Maximum	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Ells River - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Ells River - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	207	27.94	27.94
6 - 11	244	32.93	60.86
12 - 19	224	30.23	91.09
20 - 28	66	8.91	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Ells River - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	16	13	8	4	11	9	11	4	9	23	9	12	23	34	7	14	207
6 - 11	23	32	24	7	8	12	20	41	45	9	7	4	3	3	2	4	244
12 - 19	17	72	37	2	0	0	8	48	32	2	0	0	0	0	4	2	224
20 - 28	1	35	15	0	0	0	2	13	0	0	0	0	0	0	0	0	66
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	152	84	13	19	21	41	106	86	34	16	16	26	37	13	20	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Ells River

Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 20 22:00

Minimum Value: 0 km/h on Mar 24 22:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Ells River - March 2023

Direction of Maximum Speed: 25 deg on Mar 14 00:00
Direction of Maximum Daily Speed Average: 18.0 deg on Mar 14

Direction of Minimum Speed: 76 deg on Mar 27 17:00

Direction of Minimum Daily Speed Average: 0.7 deg on Mar 5

Monthly Average Direction: 65.0 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average
1-Mar	195	180	192	208	204	194	UO	277	181	150	163	163	182	157	157	160	154	149	126	145	154	173	288	296	168.3
2-Mar	197	166	167	166	172	161	172	181	185	178	171	22	9	126	174	243	239	266	294	263	256	267	311	312	207.1
3-Mar	26	30	46	53	67	65	53	44	43	46	39	56	38	8	46	41	25	35	43	63	42	30	36	50	43.0
4-Mar	63	146	241	258	280	30	51	38	17	359	332	320	321	330	349	25	40	38	44	21	345	286	297	14	1.1
5-Mar	281	283	235	262	263	260	271	283	286	301	21	65	109	112	117	105	100	105	334	300	275	296	272	DF	99.3
6-Mar	295	247	214	UO	206	236	198	208	177	95	164	143	130	148	182	156	160	153	100	85	42	140	156	158	157.8
7-Mar	162	155	152	151	154	151	157	155	155	155	153	149	149	153	152	148	144	20	55	90	130	92	164	159	149.8
8-Mar	160	165	156	159	164	162	166	182	178	183	186	174	146	146	155	178	189	195	181	144	157	168	169	159	166.4
9-Mar	168	328	298	266	192	198	192	186	175	161	162	157	145	168	146	146	161	149	132	143	145	149	149	153	156.4
10-Mar	156	154	160	158	157	159	160	162	161	158	148	152	152	149	148	123	113	96	92	20	26	25	4	23	147.4
11-Mar	130	113	117	58	109	350	342	19	49	359	341	52	14	5	18	34	33	30	29	26	22	22	30	27	30.0
12-Mar	22	24	22	21	21	21	26	29	30	34	25	31	42	39	44	29	37	36	34	26	19	18	15	8	27.1
13-Mar	11	13	11	14	9	16	15	19	18	19	20	23	25	27	23	29	24	22	21	21	21	24	24	25	21.0
14-Mar	21	20	18	21	22	21	19	18	16	17	20	20	23	23	17	22	15	1	11	17	15	15	16	16	18.0
15-Mar	13	4	8	3	329	314	343	10	18	3	357	3	355	349	30	43	28	52	37	313	258	313	275	283	3.0
16-Mar	168	169	164	157	123	5	128	169	181	177	171	176	165	157	166	171	147	156	169	176	177	183	183	193	168.4
17-Mar	169	171	177	186	182	187	187	190	192	184	174	174	174	168	174	207	183	155	164	185	195	246	203	210	181.6
18-Mar	221	224	226	218	230	236	191	187	181	143	136	135	135	140	153	88	60	39	48	19	340	344	343	354	151.6
19-Mar	13	7	18	10	1	14	358	7	26	137	150	135	356	4	19	87	93	87	182	160	145	144	132	119	76.1
20-Mar	87	103	93	112	112	106	134	129	48	29	19	26	40	34	30	33	31	35	24	25	24	40	45	32	41.1
21-Mar	353	302	353	291	292	310	304	293	306	345	14	106	90	143	114	142	147	171	181	161	181	161	182	186	180.1
22-Mar	265	175	204	273	305	250	223	201	176	176	181	177	171	179	177	189	163	157	169	175	206	243	170	205	181.0
23-Mar	211	199	185	188	186	203	226	135	79	46	43	46	34	40	43	26	40	36	29	28	7	355	355	8	35.5
24-Mar	11	15	12	333	240	276	250	229	307	3	17	28	64	133	129	136	158	178	189	92	25	356	296	289	69.0
25-Mar	287	292	267	264	294	300	290	315	350	12	19	44	44	61	37	44	52	47	40	29	18	14	20	9	26.7
26-Mar	20	0	13	343	348	10	2	5	355	18	18	18	43	23	34	35	36	34	36	26	7	28	350	265	19.8
27-Mar	286	248	227	245	238	201	187	176	156	214	158	120	145	139	142	125	76	38	40	31	35	344	289	286	139.0
28-Mar	287	293	288	270	228	201	191	183	168	190	192	175	183	176	169	164	152	157	161	163	163	166	160	339	175.1
29-Mar	192	294	288	286	278	279	201	285	343	21	32	40	35	38	36	34	32	43	45	38	24	346	272	276	22.3
30-Mar	263	282	303	258	235	203	192	203	106	101	87	71	72	49	56	41	55	40	40	42	27	9	13	16	40.0
31-Mar	17	12	6	10	13	8	13	15	20	17	18	9	6	12	14	16	15	12	7	16	44	95	50	29	16.5
Diurnal Average	45.2	57.7	80.7	86.6	104.3	85.3	88.0	91.7	104.2	85.6	85.3	82.8	80.9	80.9	83.7	72.3	72.0	56.5	46.5	45.0	40.8	36.5	29.1	22.9	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Ells River - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Ells River - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Mar 27 17:00

Minimum Value: 3 deg on Mar 10 21:00

Percentiles: $P_1 = 5$ $P_{10} = 7$ $Q_1 = 8$ Median = 13 $Q_3 = 22$ $P_{90} = 44$ $P_{99} = 79$

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	11	11	10	29	45	31	UO	25	51	42	17	22	16	22	11	10	9	11	20	12	10	81	54	23	81
2-Mar	69	10	10	11	11	11	14	10	11	12	22	70	19	60	37	23	18	25	17	23	17	20	13	12	70
3-Mar	21	11	15	10	11	11	11	11	12	14	10	18	16	58	29	13	21	27	9	26	8	7	9	13	58
4-Mar	15	55	23	26	50	20	10	8	7	21	15	13	12	16	19	12	11	8	9	10	21	23	46	39	55
5-Mar	33	22	42	81	28	41	34	44	18	31	19	26	25	23	22	17	13	10	49	21	12	21	19	DF	81
6-Mar	20	40	40	UO	23	44	48	19	30	59	15	20	17	23	24	26	11	12	17	14	46	94	8	7	94
7-Mar	8	7	7	6	7	8	7	7	8	8	8	10	8	13	14	14	13	57	53	27	15	45	7	7	57
8-Mar	7	7	9	4	5	6	6	9	9	14	15	22	12	11	19	29	18	12	46	12	8	8	7	6	46
9-Mar	57	74	20	35	7	6	11	8	10	18	19	15	10	20	10	7	13	17	9	7	7	7	8	8	74
10-Mar	8	8	9	8	8	9	8	9	9	10	6	13	11	13	16	22	53	58	25	15	3	14	16	18	58
11-Mar	19	13	15	50	53	62	20	37	43	83	15	48	41	17	22	21	12	8	9	7	8	8	6	7	83
12-Mar	8	7	8	6	7	8	6	7	7	8	11	15	14	11	11	11	9	9	6	6	5	5	5	6	15
13-Mar	5	4	5	5	4	5	4	5	6	6	6	8	10	7	7	7	7	6	8	6	6	6	6	6	10
14-Mar	7	7	7	6	6	7	6	7	8	7	7	8	8	7	8	9	11	12	10	7	8	8	6	6	12
15-Mar	6	14	12	11	15	15	14	11	6	9	12	21	18	22	32	23	17	14	43	46	28	57	19	60	60
16-Mar	47	11	7	13	44	34	30	14	19	17	17	20	16	15	15	16	5	6	7	8	7	7	10	13	47
17-Mar	8	7	8	11	7	8	6	10	13	13	11	12	11	10	12	36	38	9	12	5	7	38	41	29	41
18-Mar	13	15	22	12	15	52	8	15	16	9	7	7	7	9	10	25	15	8	7	14	28	13	8	16	52
19-Mar	9	16	5	11	12	6	16	22	82	14	17	70	29	10	18	51	37	22	17	14	8	9	10	18	82
20-Mar	23	16	12	12	14	12	13	18	30	13	8	11	13	9	16	10	10	8	8	6	6	31	14	45	45
21-Mar	37	18	65	36	13	9	14	10	13	18	32	51	38	26	73	43	12	15	12	10	9	7	28	70	73
22-Mar	46	15	23	24	11	38	41	40	15	12	20	27	17	24	22	15	14	8	6	14	66	77	15	31	77
23-Mar	27	84	16	21	14	39	45	66	33	11	10	14	9	13	15	11	10	8	7	8	7	18	16	10	84
24-Mar	8	6	10	51	36	49	43	41	72	22	24	22	43	30	19	14	18	16	23	46	24	15	15	9	72
25-Mar	11	21	48	54	25	23	12	22	12	11	17	17	35	22	17	14	13	11	8	9	7	9	7	8	54
26-Mar	6	10	9	13	13	9	10	7	9	11	9	16	15	18	13	12	13	9	7	4	6	46	28	37	46
27-Mar	11	48	47	22	19	12	51	12	12	39	45	31	35	24	43	51	95	22	9	8	10	23	14	13	95
28-Mar	17	14	8	48	68	24	18	22	14	15	15	16	21	19	15	13	7	7	6	6	7	52	85	65	85
29-Mar	58	17	18	17	9	21	49	13	38	10	21	17	13	11	11	11	12	8	8	8	8	20	10	19	58
30-Mar	40	24	52	38	36	14	28	69	38	50	23	20	20	20	24	20	21	14	7	6	7	10	5	7	69
31-Mar	8	5	6	6	5	7	6	6	8	8	10	10	11	14	11	11	8	9	8	5	23	10	20	4	23
Diurnal Maximum	69	84	65	81	68	62	51	69	82	83	45	70	43	60	73	51	95	58	53	46	66	94	85	70	

DF - DAS Failure UO - Unstable Operation

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS506
JACKFISH 1
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	34	35	99.87	26.6	0	6.2	0
H2S (ppb) Average	707	36	37	99.87	0.6	0	0.2	0
NO2 (ppb) Average	707	36	37	99.87	16.8	0	5.1	-
NO (ppb) Average	707	36	37	99.87	9	-	1.4	-
NOX (ppb) Average	707	36	37	99.87	23.8	-	6.3	-
Temperature 2 m (C) Average	743	0	1	99.87	8.8	-	-0.1	-
Relative Humidity (%) Average	743	0	1	99.87	91.6	-	84.9	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	15	-	10	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	1.09	2.7	-	0	0	0.1	0.3	0.9	2.7	26.6
H2S (ppb) Average	707	0.08	0.1	-	0	0	0	0.1	0.1	0.1	0.6
NO2 (ppb) Average	707	2.53	2.1	-	0.2	0.5	1	2	3.5	5	16.8
NO (ppb) Average	707	0.63	1	-	0	0	0	0.2	0.8	1.7	9
NOX (ppb) Average	707	3.16	2.9	-	0.2	0.6	1.2	2.4	4.3	6.3	23.8
Temperature 2 m (C) Average	743	-8.01	6.6	-	-24.7	-16.2	-12.7	-8	-3.9	0.5	8.8
Relative Humidity (%) Average	743	65.11	16.9	-	21.3	39.5	54.8	66.7	79.3	85.4	91.6
Wind Speed 10 m (km/h) Average	743	6.3	3	-	0	3	4	6	8	10	15
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Jackfish 1 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 26.6 ppb on Mar 14 16:00

Maximum Daily Average: 6.2 ppb on Mar 4

Minimum Value: 0.0 ppb on Mar 7 17:00

Maximum Diurnal Average: 2.3 ppb at hour 14

Monthly Average: 1.09 ppb

Minimum Daily Average: 0.0 ppb on Mar 8

Minimum Diurnal Average: 0.3 ppb at hour 23

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.3 Q_3 = 0.9 P_{90} = 2.7 P_{99} = 16.8

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.3	0.4	0.4	0.4	0.2	0.2	0.5	0.6	0.5	0.7	0.7	0.7	0.7	0.6	0.5	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.4	0.7
2-Mar	0.1	Z	0.3	0.2	0.2	0.3	0.2	0.2	1.2	1.2	1.1	0.8	0.6	0.5	0.7	0.8	0.8	0.8	11.9	0.9	0.9	1.0	1.1	0.4	1.1	11.9
3-Mar	0.6	0.9	Z	1.8	1.0	1.4	1.6	1.1	1.5	1.4	2.9	5.7	6.2	17.2	1.8	1.9	0.3	1.2	2.1	1.3	1.4	1.5	2.2	3.5	2.6	17.2
4-Mar	4.5	5.7	3.7	Z	2.8	8.9	17.7	19.7	17.2	8.8	1.0	8.9	3.4	18.9	10.6	3.1	3.1	0.1	0.2	0.3	0.5	0.7	1.2	1.1	6.2	19.7
5-Mar	0.4	0.3	0.2	0.8	Z	0.3	1.3	2.0	1.8	1.8	1.1	1.5	6.7	3.2	2.3	2.0	2.3	0.8	1.0	1.5	1.5	1.2	1.1	DF	1.6	6.7
6-Mar	0.8	0.7	0.6	0.6	0.7	1.0	1.1	0.7	1.2	1.1	0.7	0.8	0.5	0.5	Z	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.5	1.2
7-Mar	0.0	0.1	0.2	0.2	0.1	Z	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
8-Mar	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
9-Mar	0.0	Z	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.3	C	C	C	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3
10-Mar	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4
11-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.2
12-Mar	0.1	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.1	0.4	0.9	1.2	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.2
13-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.0	0.2	0.5
14-Mar	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.9	5.1	24.7	26.6	26.6	9.6	2.6	1.1	7.7	3.4	1.3	3.7	5.0	26.6
15-Mar	5.4	Z	3.9	3.8	3.3	2.8	2.5	2.5	2.3	3.6	0.7	2.4	5.2	3.3	2.7	5.3	4.8	2.1	0.8	0.6	0.5	0.5	0.1	0.1	2.6	5.4
16-Mar	0.2	0.1	Z	0.6	0.2	0.2	0.3	0.3	0.4	1.0	3.5	2.1	1.7	1.0	2.9	1.2	1.0	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.9	3.5
17-Mar	0.3	0.2	0.4	Z	0.3	0.3	0.4	0.5	1.3	1.8	1.3	0.7	0.4	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.8	0.9	0.8	0.4	0.5	1.8
18-Mar	0.4	0.3	0.4	0.1	Z	0.0	0.0	0.0	0.0	0.2	3.4	3.8	1.6	0.5	0.5	2.9	4.4	1.5	0.6	0.5	0.7	0.5	0.4	0.4	1.0	4.4
19-Mar	0.3	0.7	1.2	0.7	0.6	Z	0.8	0.4	0.5	0.3	0.3	0.2	0.4	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4	1.2
20-Mar	Z	0.2	0.2	0.4	0.3	0.1	0.0	0.2	0.8	0.8	1.2	1.2	1.1	0.8	1.0	0.5	0.7	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.5	1.2
21-Mar	0.3	Z	0.2	0.3	0.6	0.3	0.3	0.3	0.5	0.3	0.2	0.6	1.3	0.6	0.7	0.8	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.4	1.3
22-Mar	0.1	0.2	Z	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.7	0.5	0.5	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.7
23-Mar	0.3	0.4	2.1	Z	0.7	0.6	1.2	0.8	5.0	4.6	5.3	3.0	1.9	3.3	1.4	1.2	0.8	3.2	0.5	0.2	0.0	0.0	0.0	0.1	1.6	5.3
24-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.6	0.3	0.2	0.5	0.5	2.4	3.9	4.1	1.7	2.2	2.6	1.4	0.8	0.7	0.6	1.0	4.1
25-Mar	0.4	0.3	0.3	0.3	0.3	Z	0.5	0.9	2.9	3.7	2.1	2.4	7.7	2.4	2.3	2.9	2.5	1.8	0.6	0.3	0.4	0.3	0.2	0.1	1.5	7.7
26-Mar	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5
27-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	2.1	1.3	2.6	1.6	1.0	6.3	3.1	2.5	7.4	11.4	5.3	0.8	0.2	0.1	0.1	0.0	2.0	11.4
28-Mar	0.1	0.4	Z	0.6	0.1	0.1	0.1	0.2	0.5	0.9	3.9	13.0	7.3	2.3	2.5	1.9	0.9	1.0	0.4	0.4	0.0	0.0	0.0	0.0	1.6	13.0
29-Mar	0.0	0.1	0.4	Z	0.6	0.8	0.6	4.4	4.0	1.6	0.9	0.7	0.3	0.2	0.3	0.2	0.6	0.9	0.4	0.1	0.0	0.0	0.0	0.0	0.7	4.4
30-Mar	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
31-Mar	0.3	0.2	0.1	0.0	0.0	Z	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.1	1.2	3.1	3.9	2.4	0.9	0.1	0.1	0.0	0.0	0.0	0.6	3.9
	0.6	0.4	0.6	0.4	0.5	0.7	0.9	1.2	1.5	1.2	1.1	1.8	1.7	2.3	2.1	2.1	2.1	1.3	1.0	0.4	0.6	0.4	0.3	0.4	Diurnal Average	
	5.4	5.7	3.9	3.8	3.3	8.9	17.7	19.7	17.2	8.8	5.3	13.0	7.7	18.9	24.7	26.6	26.6	11.4	11.9	2.6	7.7	3.4	2.2	3.7	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Jackfish 1 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	697	98.31	98.31
11 - 20	9	1.27	99.58
21 - 60	3	0.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Jackfish 1 - March 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	70	35	21	14	17	14	53	94	144	50	24	12	13	23	40	73	697
11 - 20	0	0	0	0	1	0	0	0	0	0	0	0	0	1	7	0	9
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	35	21	14	18	14	53	94	144	50	24	12	13	24	50	73	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Jackfish 1

Total Number of Valid Hours: 709

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 0.6 ppb on Mar 19 03:00

Maximum Daily Average: 0.2 ppb on Mar 5

Minimum Value: 0.0 ppb on Mar 8 18:00

Minimum Daily Average: 0.0 ppb on Mar 8

Maximum Diurnal Average: 0.1 ppb at hour 8

Minimum Diurnal Average: 0.1 ppb at hour 24

Monthly Average: 0.08 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.1 P_{90} = 0.1 P_{99} = 0.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2-Mar	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
3-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
4-Mar	0.2	0.2	0.2	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.2
5-Mar	0.1	0.1	0.1	0.3	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	DF	0.2	0.3
6-Mar	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	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
7-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
8-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Mar	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
10-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
11-Mar	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
12-Mar	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
13-Mar	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
14-Mar	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	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.3
15-Mar	0.1	0.3	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
16-Mar	0.1	0.1	0.1	Z	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	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
17-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
18-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.3
19-Mar	Z	0.2	0.6	0.3	0.1	0.2	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
20-Mar	0.0	Z	0.0	0.0	0.0	0.0	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	0.0	0.1
21-Mar	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	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
22-Mar	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
23-Mar	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2
24-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
25-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
26-Mar	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
27-Mar	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
28-Mar	0.0	0.0	0.2	Z	0.2	0.2	0.2	0.3	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	0.3
29-Mar	0.0	0.0	0.0	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1
30-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
31-Mar	Z	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.2	0.3	0.6	0.3	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - March 2023

Concentration							**Wind Direction**										
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	67	35	19	15	18	14	52	98	148	49	22	13	13	23	48	73	707
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	35	19	15	18	14	52	98	148	49	22	13	13	23	48	73	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H2S) - ppb

Jackfish 1

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Jackfish 1 - March 2023

Maximum Value: 9.0 ppb on Mar 14 15:00

Maximum Daily Average: 1.4 ppb on Mar 14

Minimum Value: 0.0 ppb on Mar 3 03:00

Minimum Daily Average: 0.2 ppb on Mar 30

Maximum Diurnal Average: 1.5 ppb at hour 8

Minimum Diurnal Average: 0.0 ppb at hour 3

Monthly Average: 0.63 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.2 Q_3 = 0.8 P_{90} = 1.7 P_{99} = 4.8

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.1	0.1	0.1	0.0	Z	0.0	0.2	0.9	1.1	1.9	1.8	2.9	1.5	2.4	2.4	1.6	0.7	0.3	0.2	0.1	0.3	0.2	0.1	0.1	0.8	2.9
2-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.3	1.7	1.4	0.8	1.0	0.9	0.7	0.9	0.4	0.8	0.9	2.2	2.1	0.0	0.1	0.0	0.0	0.0	0.6	2.2
3-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.5	0.3	0.9	1.5	1.5	4.3	0.8	0.5	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.5	4.3
4-Mar	0.0	Z	0.0	0.0	0.2	1.3	3.2	4.7	3.6	2.2	0.5	2.6	0.9	5.0	2.6	1.5	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.0
5-Mar	0.0	0.0	Z	0.0	0.0	0.2	1.4	2.8	2.3	2.1	1.3	1.1	2.9	1.7	1.0	0.9	0.6	0.1	1.1	0.2	0.2	0.8	0.1	DF	0.9	2.9
6-Mar	0.1	0.9	0.1	0.1	0.2	0.1	2.4	7.0	2.6	2.0	1.2	1.9	Z	0.6	0.5	0.7	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.9	7.0
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.3	1.2	1.4	1.0	1.1	0.8	0.8	1.2	2.6	0.3	0.2	0.1	0.3	0.1	0.0	0.0	0.0	0.5	2.6
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.2	1.9	0.6	0.6	0.6	0.3	0.6	0.6	0.4	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.9
9-Mar	0.1	0.1	0.1	0.0	0.0	Z	0.3	1.8	1.6	0.1	1.1	0.2	1.2	0.3	0.5	0.5	0.4	0.6	0.0	0.0	0.9	0.0	0.0	0.0	0.4	1.8
10-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.3	1.5	0.5	0.6	0.6	0.7	0.5	0.2	0.2	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5
11-Mar	0.0	Z	0.0	0.1	0.0	0.0	0.2	0.8	0.7	0.9	0.0	0.6	0.5	0.3	0.7	0.2	0.7	0.1	0.1	0.2	0.2	0.6	0.5	0.1	0.3	0.9
12-Mar	0.1	0.1	Z	0.4	1.1	1.7	1.6	6.0	1.1	2.1	1.8	2.4	1.7	1.8	1.0	0.8	0.5	1.2	0.1	0.4	0.2	0.6	0.6	0.6	1.2	6.0
13-Mar	0.0	0.0	0.0	Z	0.0	1.2	2.1	0.7	0.7	1.4	0.6	0.4	0.3	0.9	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.1
14-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.8	0.2	0.3	0.2	1.1	2.1	9.0	8.4	6.8	1.7	0.3	0.0	1.5	0.4	0.0	0.0	1.4	9.0
15-Mar	0.0	0.0	0.0	0.1	0.0	Z	3.1	1.1	2.2	3.5	2.8	3.6	5.4	2.2	1.7	2.1	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.4
16-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.8	1.5	0.7	1.4	1.6	1.7	1.4	1.5	0.9	0.6	0.2	0.1	0.0	0.4	0.2	0.2	0.2	0.4	0.6	1.7
17-Mar	0.3	Z	0.1	0.1	0.2	0.7	0.7	3.9	3.8	4.2	1.4	1.1	0.7	0.4	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.8	4.2
18-Mar	0.0	0.0	Z	0.0	0.2	0.3	3.0	0.7	0.5	0.5	1.5	1.3	1.0	0.3	1.6	0.6	0.6	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.6	3.0
19-Mar	0.1	0.1	0.1	Z	0.0	0.0	2.3	0.8	1.1	0.5	1.5	0.1	4.3	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	4.3
20-Mar	0.1	0.1	0.1	0.0	Z	0.1	4.8	1.0	0.5	1.6	1.0	0.8	0.6	1.0	0.5	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.8
21-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.4	0.1	1.4	0.2	0.7	0.7	1.1	0.8	0.5	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4
22-Mar	Z	0.0	0.0	0.2	0.5	0.1	1.1	0.9	1.9	1.5	1.0	2.3	1.7	1.5	1.4	1.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	2.3
23-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	1.5	1.9	2.0	0.9	0.5	0.7	0.4	0.3	0.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.0
24-Mar	0.0	0.0	Z	0.5	0.0	0.8	2.3	1.3	0.6	1.1	0.3	0.3	1.2	0.6	0.9	1.1	0.8	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.5	2.3
25-Mar	0.1	0.1	0.0	Z	0.5	0.2	0.0	0.6	0.9	1.3	0.5	0.9	2.0	0.6	0.4	0.7	1.0	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.5	2.0
26-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.3	0.4	0.2	0.2	0.5	1.1	1.6	0.1	0.4	0.2	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6
27-Mar	0.0	0.0	0.0	0.0	1.2	Z	0.3	0.8	1.5	1.3	1.1	0.8	0.8	1.9	0.9	0.6	1.5	2.0	0.3	0.0	0.1	0.1	0.1	0.0	0.7	2.0
28-Mar	Z	0.0	0.0	0.5	0.0	2.1	0.4	1.4	0.7	0.6	1.5	3.7	2.2	0.8	0.7	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.7
29-Mar	0.0	Z	0.0	0.0	0.0	0.0	1.0	1.2	1.1	0.9	0.8	1.6	0.3	3.2	0.2	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.2
30-Mar	0.0	0.0	Z	0.0	0.1	0.1	2.4	0.9	C	C	C	C	C	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4
31-Mar	0.0	0.0	0.0	Z	0.0	0.1	0.6	0.6	0.8	1.7	0.8	0.6	0.6	0.5	0.3	0.8	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.7
	0.0	0.1	0.0	0.1	0.2	0.3	1.2	1.5	1.3	1.3	1.1	1.3	1.4	1.2	1.1	1.0	0.7	0.5	0.2	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.3	0.9	0.1	0.5	1.2	2.1	4.8	7.0	3.8	4.2	2.8	3.7	5.4	5.0	9.0	8.4	6.8	2.2	2.1	0.4	1.5	0.8	0.6	0.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Jackfish 1 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Jackfish 1 - March 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	69	35	21	14	17	14	51	98	145	48	23	12	13	25	49	73	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	35	21	14	17	14	51	98	145	48	23	12	13	25	49	73	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Jackfish 1

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 16.8 ppb on Mar 6 08:00

Maximum Daily Average: 5.1 ppb on Mar 12

Minimum Value: 0.2 ppb on Mar 9 00:00

Maximum Diurnal Average: 5.1 ppb at hour 8

Monthly Average: 2.53 ppb

Minimum Daily Average: 0.7 ppb on Mar 8

Minimum Diurnal Average: 1.7 ppb at hour 1

Percentiles: P_1 = 0.3 P_{10} = 0.5 Q_1 = 1.0 Median = 2.0 Q_3 = 3.5 P_{90} = 5.0 P_{99} = 9.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.5	2.7	2.9	3.4	Z	1.5	2.7	4.2	4.2	5.0	3.1	4.1	2.6	4.2	5.1	4.2	3.1	3.0	2.6	2.4	2.9	2.7	2.7	2.6	3.1	5.1
2-Mar	2.4	2.5	2.5	3.3	3.6	Z	3.8	5.5	5.7	4.1	4.0	3.7	3.0	2.6	2.5	2.8	1.9	4.8	6.3	1.4	1.5	1.7	2.2	1.0	3.2	6.3
3-Mar	Z	1.6	1.2	2.7	1.5	2.3	2.8	2.7	2.8	1.6	1.8	2.6	3.2	5.8	1.9	1.7	0.8	1.5	2.4	3.2	4.4	4.4	5.1	5.7	2.8	5.8
4-Mar	6.2	Z	5.2	4.1	3.6	4.9	8.4	8.9	7.7	4.1	1.1	3.6	1.7	6.3	4.0	1.8	1.9	0.9	0.4	0.4	1.4	2.1	3.5	5.5	3.8	8.9
5-Mar	3.3	1.9	Z	2.8	3.1	3.3	5.1	7.2	3.7	3.1	2.0	1.5	4.0	2.8	1.8	1.8	2.2	1.7	4.3	3.5	2.9	5.5	2.6	DF	3.2	7.2
6-Mar	2.1	6.1	1.6	1.3	2.6	3.5	8.9	16.8	6.3	3.8	1.9	1.9	Z	1.2	1.4	0.7	0.8	0.6	0.6	0.4	0.3	0.3	0.3	0.3	2.8	16.8
7-Mar	0.3	0.4	0.5	Z	1.0	0.8	1.0	1.4	1.8	2.3	2.1	1.8	1.5	1.5	2.1	2.3	1.0	1.0	0.9	1.7	0.5	0.4	0.4	0.4	1.2	2.3
8-Mar	0.4	0.4	0.4	0.4	Z	0.4	1.3	4.0	1.1	0.8	0.8	0.7	0.8	0.6	0.6	0.3	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.7	4.0
9-Mar	0.8	1.3	1.8	1.0	0.5	Z	1.7	2.7	1.5	0.5	1.3	0.5	1.0	0.8	0.9	1.1	1.3	1.5	0.5	0.6	1.9	0.6	0.4	0.6	1.1	2.7
10-Mar	Z	1.0	1.1	0.6	0.5	0.4	0.7	1.3	1.1	1.2	1.3	1.4	1.2	0.8	0.8	1.2	0.6	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.8	1.4
11-Mar	0.3	Z	0.5	0.3	0.4	0.5	3.8	4.6	2.3	1.3	0.5	0.5	0.9	0.8	0.9	0.9	1.7	0.8	0.9	0.8	1.9	4.6	5.3	2.0	1.6	5.3
12-Mar	0.9	2.0	Z	3.9	4.9	8.2	8.6	14.7	4.0	4.8	3.6	4.8	3.7	3.8	3.3	2.6	2.6	6.8	1.7	5.5	4.7	7.2	8.8	7.1	5.1	14.7
13-Mar	1.3	1.0	1.0	Z	1.6	4.8	8.2	4.2	3.0	1.6	1.6	1.5	1.1	1.5	0.8	0.8	0.8	0.6	0.5	0.6	0.5	0.5	0.5	0.5	1.7	8.2
14-Mar	0.5	0.5	0.5	0.6	Z	1.7	1.0	2.2	2.9	0.9	0.9	0.9	1.8	3.8	12.8	13.7	13.6	7.0	3.9	2.4	7.0	3.8	2.6	3.2	3.8	13.7
15-Mar	4.7	5.7	6.3	6.8	6.1	Z	7.4	6.4	5.4	5.2	3.5	4.1	4.2	3.3	2.9	4.8	5.1	3.6	2.3	2.2	2.4	2.1	1.4	2.3	4.3	7.4
16-Mar	Z	1.3	1.1	3.1	1.8	2.4	4.4	6.2	4.2	3.7	4.3	3.6	2.7	2.4	2.9	1.8	1.6	1.5	1.6	4.4	3.5	3.3	2.3	2.9	2.9	6.2
17-Mar	2.9	Z	2.5	2.1	1.9	4.5	4.9	9.4	7.6	7.9	3.5	3.0	1.4	1.2	0.8	1.1	0.8	0.6	0.9	1.1	3.1	3.6	3.6	3.4	3.1	9.4
18-Mar	3.3	3.0	Z	2.1	5.9	5.6	14.3	5.4	2.7	2.7	4.9	4.4	3.2	1.9	2.5	2.9	3.8	2.5	2.7	1.7	2.0	1.9	1.8	1.1	3.6	14.3
19-Mar	1.0	1.4	2.5	Z	2.7	3.3	10.3	6.3	3.7	1.8	3.3	1.0	2.8	0.8	0.7	0.7	0.7	0.6	0.4	0.6	0.5	0.5	0.5	0.5	2.0	10.3
20-Mar	0.8	1.1	1.1	1.4	Z	1.9	6.3	4.4	3.1	6.1	3.8	3.7	3.2	3.9	3.3	2.4	3.2	1.3	1.1	1.0	0.7	0.7	0.6	0.7	2.4	6.3
21-Mar	0.6	0.5	0.5	0.8	1.5	Z	2.0	1.6	3.3	1.2	1.3	1.6	2.4	1.7	1.6	2.0	1.8	0.7	0.5	0.4	0.4	0.3	0.3	0.9	1.2	3.3
22-Mar	Z	2.0	1.9	1.7	2.8	2.7	4.4	2.6	3.6	3.1	2.7	4.6	4.1	3.9	4.1	4.5	2.6	2.2	2.2	2.4	2.6	2.6	2.8	2.8	3.0	4.6
23-Mar	3.5	Z	5.9	5.4	4.5	4.4	5.8	4.6	6.9	6.1	5.6	3.0	2.4	2.9	2.2	1.9	1.8	4.9	4.1	2.5	1.5	1.1	1.1	1.6	3.6	6.9
24-Mar	1.2	0.8	Z	1.4	1.0	1.8	2.8	1.8	1.3	2.5	1.0	0.9	2.1	1.5	2.5	3.1	3.4	2.1	2.7	3.4	2.0	1.6	1.6	1.9	1.9	3.4
25-Mar	1.5	1.5	1.4	Z	3.3	2.2	1.8	3.5	3.4	3.7	1.8	2.2	4.0	1.6	1.7	2.8	3.4	4.3	4.4	3.1	3.0	3.5	4.5	2.7	2.8	4.5
26-Mar	1.2	1.8	0.7	0.9	Z	3.1	2.8	2.2	0.8	0.6	1.1	2.0	1.5	0.6	0.7	0.9	0.6	1.5	0.8	0.8	0.4	0.2	0.2	0.2	1.1	3.1
27-Mar	0.3	0.3	0.9	0.8	4.9	Z	3.9	4.0	3.3	1.9	1.9	1.3	1.1	3.4	2.3	1.9	4.6	7.8	4.9	1.6	1.2	2.3	1.7	1.0	2.5	7.8
28-Mar	Z	2.0	2.7	4.9	2.1	5.0	5.7	5.8	2.4	1.5	2.9	5.9	4.1	2.0	2.1	1.7	1.1	1.1	0.7	0.7	0.6	0.7	0.7	0.7	2.5	5.9
29-Mar	0.8	Z	1.3	1.4	1.5	2.0	5.4	5.2	3.9	2.6	2.0	1.2	1.4	1.6	1.5	0.9	2.1	4.3	2.8	1.3	1.3	0.8	0.7	0.9	2.0	5.4
30-Mar	1.2	2.3	Z	1.3	1.4	1.4	7.6	3.0	C	C	C	C	C	0.8	1.8	1.0	0.5	0.7	0.4	0.4	1.2	0.8	1.0	1.3	1.6	7.6
31-Mar	2.2	2.2	1.6	Z	1.5	2.7	4.2	4.6	3.5	4.1	2.8	2.4	2.6	2.7	2.5	4.1	4.9	4.3	3.0	2.0	2.0	1.1	1.0	1.4	2.8	4.9
	1.7	1.8	1.9	2.3	2.5	2.9	4.9	5.1	3.6	3.0	2.4	2.5	2.4	2.3	2.4	2.4	2.4	2.4	2.0	1.7	1.9	2.0	2.0	1.9	Diurnal Average	
	6.2	6.1	6.3	6.8	6.1	8.2	14.3	16.8	7.7	7.9	5.6	5.9	4.2	6.3	12.8	13.7	13.6	7.8	6.3	5.5	7.0	7.2	8.8	7.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1 - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 20	69	35	21	14	17	14	51	98	145	48	23	12	13	25	49	73	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	35	21	14	17	14	51	98	145	48	23	12	13	25	49	73	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Jackfish 1 - March 2023

Maximum Value: 23.8 ppb on Mar 6 08:00

Maximum Daily Average: 6.3 ppb on Mar 12

Minimum Value: 0.2 ppb on Mar 8 21:00

Minimum Daily Average: 0.9 ppb on Mar 8

Maximum Diurnal Average: 6.6 ppb at hour 8

Minimum Diurnal Average: 1.7 ppb at hour 1

Monthly Average: 3.16 ppb

Percentiles: P_1 = 0.3 P_{10} = 0.6 Q_1 = 1.2 Median = 2.4 Q_3 = 4.3 P_{90} = 6.3 P_{99} = 13.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	0.6	2.8	3.0	3.4	Z	1.5	2.9	5.1	5.3	6.9	4.9	7.0	4.1	6.6	7.5	5.8	3.8	3.3	2.8	2.5	3.2	2.9	2.8	2.7	4.0	7.5
2-Mar	2.5	2.6	2.6	3.4	3.7	Z	4.1	7.2	7.1	4.9	5.0	4.6	3.7	3.5	2.9	3.6	2.8	7.0	8.4	1.4	1.6	1.7	2.2	1.0	3.8	8.4
3-Mar	Z	1.6	1.2	2.7	1.5	2.3	3.0	2.8	3.3	1.9	2.7	4.1	4.7	10.1	2.7	2.2	1.4	2.1	2.6	3.2	4.4	4.4	5.1	5.7	3.3	10.1
4-Mar	6.2	Z	5.2	4.1	3.8	6.2	11.6	13.6	11.3	6.3	1.6	6.2	2.6	11.3	6.6	3.3	2.9	1.5	0.4	0.4	1.4	2.1	3.5	5.5	5.1	13.6
5-Mar	3.3	1.9	Z	2.8	3.1	3.5	6.5	10.0	6.0	5.2	3.3	2.6	6.9	4.5	2.8	2.7	2.8	1.8	5.4	3.7	3.1	6.3	2.7	DF	4.1	10.0
6-Mar	2.2	7.0	1.7	1.4	2.8	3.6	11.3	23.8	8.9	5.8	3.1	3.8	Z	1.8	1.9	1.4	1.0	0.7	0.8	0.4	0.3	0.3	0.3	0.3	3.7	23.8
7-Mar	0.3	0.4	0.5	Z	1.0	0.8	1.2	1.7	3.0	3.7	3.1	2.9	2.3	2.3	3.3	4.9	1.3	1.2	1.0	2.0	0.6	0.4	0.4	0.4	1.7	4.9
8-Mar	0.4	0.4	0.4	0.4	Z	0.4	1.5	5.9	1.7	1.4	1.4	1.0	1.4	1.2	1.0	0.4	0.7	0.6	0.3	0.3	0.2	0.2	0.2	0.3	0.9	5.9
9-Mar	0.9	1.4	1.9	1.0	0.5	Z	2.0	4.5	3.1	0.6	2.4	0.7	2.2	1.1	1.4	1.6	1.7	2.1	0.5	0.6	2.8	0.6	0.4	0.6	1.5	4.5
10-Mar	Z	1.0	1.1	0.6	0.5	0.4	1.0	2.8	1.6	1.8	1.9	2.1	1.7	1.0	1.0	1.9	0.7	0.8	0.6	0.5	0.5	0.5	0.4	0.4	1.1	2.8
11-Mar	0.3	Z	0.5	0.4	0.4	0.5	4.0	5.4	3.0	2.2	0.5	1.1	1.4	1.1	1.6	1.1	2.4	0.9	1.0	1.0	2.1	5.2	5.8	2.1	1.9	5.8
12-Mar	1.0	2.1	Z	4.3	6.0	9.9	10.2	20.7	5.1	6.9	5.4	7.2	5.4	5.6	4.3	3.4	3.1	8.0	1.8	5.9	4.9	7.8	9.4	7.7	6.3	20.7
13-Mar	1.3	1.0	1.0	Z	1.6	6.0	10.3	4.9	3.7	3.0	2.2	1.9	1.4	2.4	1.0	0.9	0.9	0.6	0.5	0.6	0.5	0.5	0.5	0.5	2.1	10.3
14-Mar	0.5	0.5	0.5	0.6	Z	1.7	1.1	2.3	3.7	1.1	1.2	1.1	2.9	5.9	21.8	22.1	20.4	8.7	4.2	2.4	8.5	4.2	2.6	3.2	5.3	22.1
15-Mar	4.7	5.7	6.3	6.9	6.1	Z	10.5	7.5	7.6	8.7	6.3	7.7	9.6	5.5	4.6	6.9	6.4	3.9	2.3	2.2	2.4	2.1	1.4	2.3	5.6	10.5
16-Mar	Z	1.3	1.1	3.1	1.8	2.4	5.2	7.7	4.9	5.1	5.9	5.3	4.1	3.9	3.8	2.4	1.8	1.6	1.6	4.8	3.7	3.5	2.5	3.3	3.5	7.7
17-Mar	3.2	Z	2.6	2.2	2.1	5.2	5.6	13.3	11.4	12.1	4.9	4.1	2.1	1.6	1.0	1.4	1.0	0.7	1.0	1.2	3.2	3.7	3.6	3.4	3.9	13.3
18-Mar	3.3	3.0	Z	2.1	6.1	5.9	17.3	6.1	3.2	3.2	6.4	5.7	4.2	2.2	4.1	3.5	4.4	2.7	2.8	1.7	2.0	1.9	1.9	1.2	4.1	17.3
19-Mar	1.1	1.5	2.6	Z	2.7	3.3	12.6	7.1	4.8	2.3	4.8	1.1	7.1	1.1	0.8	0.7	0.7	0.6	0.4	0.7	0.5	0.5	0.5	0.5	2.5	12.6
20-Mar	0.9	1.2	1.2	1.4	Z	2.0	11.1	5.4	3.6	7.7	4.8	4.5	3.8	4.9	3.8	2.7	3.6	1.3	1.1	1.0	0.7	0.7	0.6	0.7	3.0	11.1
21-Mar	0.6	0.5	0.5	0.8	1.5	Z	2.4	1.7	4.7	1.4	2.0	2.3	3.5	2.5	2.1	3.3	2.4	0.7	0.5	0.4	0.4	0.3	0.3	0.9	1.6	4.7
22-Mar	Z	2.0	1.9	1.9	3.3	2.8	5.5	3.5	5.5	4.6	3.7	6.9	5.8	5.4	5.5	5.7	2.9	2.3	2.2	2.4	2.6	2.6	2.8	2.9	3.7	6.9
23-Mar	3.5	Z	5.9	5.4	4.5	4.4	5.9	4.9	8.4	8.0	7.6	3.9	2.9	3.6	2.6	2.2	2.0	5.5	4.2	2.5	1.5	1.1	1.1	1.6	4.1	8.4
24-Mar	1.2	0.8	Z	1.9	1.0	2.6	5.1	3.1	1.9	3.6	1.3	1.2	3.3	2.1	3.4	4.2	4.2	2.3	2.8	3.5	2.1	1.6	1.6	1.9	2.5	5.1
25-Mar	1.6	1.6	1.4	Z	3.8	2.4	1.8	4.1	4.3	5.0	2.3	3.1	6.0	2.2	2.1	3.5	4.4	5.8	4.7	3.1	3.0	3.5	4.5	2.7	3.3	6.0
26-Mar	1.2	1.8	0.7	0.9	Z	3.2	3.1	2.6	1.0	0.8	1.6	3.1	3.1	0.7	1.1	1.1	0.7	2.1	0.8	0.8	0.4	0.2	0.2	0.2	1.4	3.2
27-Mar	0.3	0.3	0.9	0.8	6.1	Z	4.2	4.8	4.8	3.2	3.0	2.1	1.9	5.3	3.2	2.5	6.1	9.8	5.2	1.6	1.3	2.4	1.8	1.0	3.1	9.8
28-Mar	Z	2.0	2.7	5.4	2.1	7.1	6.1	7.2	3.1	2.1	4.4	9.6	6.3	2.8	2.8	2.1	1.3	1.2	0.7	0.7	0.6	0.7	0.7	0.7	3.1	9.6
29-Mar	0.8	Z	1.3	1.4	1.5	2.0	6.4	6.4	5.0	3.5	2.8	2.8	1.7	4.8	1.7	1.0	2.3	4.6	2.8	1.3	1.3	0.8	0.7	0.9	2.5	6.4
30-Mar	1.2	2.3	Z	1.3	1.5	1.5	10.0	3.9	C	C	C	C	C	0.9	2.5	1.0	0.5	0.7	0.4	0.4	1.2	0.8	1.0	1.3	1.8	10.0
31-Mar	2.2	2.2	1.6	Z	1.5	2.8	4.8	5.2	4.3	5.8	3.6	3.0	3.2	3.2	2.8	4.9	5.5	4.5	3.0	2.0	2.0	1.1	1.0	1.4	3.1	5.8
	1.7	1.9	1.9	2.3	2.7	3.3	6.1	6.6	4.8	4.3	3.5	3.8	3.8	3.6	3.5	3.4	3.1	2.9	2.1	1.8	2.0	2.1	2.0	1.9	Diurnal Average	
	6.2	7.0	6.3	6.9	6.1	9.9	17.3	23.8	11.4	12.1	7.6	9.6	9.6	11.3	21.8	22.1	20.4	9.8	8.4	5.9	8.5	7.8	9.4	7.7	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Jackfish 1 - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.43	99.43
21 - 40	4	0.57	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Jackfish 1 - March 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	69	35	21	14	17	14	51	98	143	48	23	12	13	25	47	73	703
21 - 40	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	4
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	35	21	14	17	14	51	98	145	48	23	12	13	25	49	73	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Jackfish 1

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 707

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Jackfish 1 - March 2023

Maximum Value: 8.8 C on Mar 18 16:00

Maximum Daily Average: -0.1 C on Mar 18

Minimum Value: -24.7 C on Mar 27 06:00

Minimum Daily Average: -19.3 C on Mar 5

Maximum Diurnal Average: -2.5 C at hour 15

Minimum Diurnal Average: -12.8 C at hour 7

Monthly Average: -8.01 C

Percentiles: P_1 = -23.1 P_{10} = -16.2 Q_1 = -12.7 Median = -8.0 Q_3 = -3.9 P_{90} = 0.5 P_{99} = 7.5

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-17.0	-16.1	-15.7	-15.2	-14.8	-14.7	-14.6	-14.8	-14.5	-13.0	-10.9	-8.4	-6.8	-6.6	-7.3	-7.8	-8.7	-9.5	-10.2	-10.3	-10.3	-10.3	-10.4	-10.4	-11.6	-6.6
2-Mar	-10.4	-10.4	-10.5	-10.2	-9.9	-9.5	-9.1	-8.5	-7.1	-4.8	-2.1	0.5	2.6	3.7	4.1	4.3	3.0	1.5	0.3	-1.4	-2.5	-3.0	-3.3	-3.7	-3.6	4.3
3-Mar	-4.3	-4.2	-4.8	-4.8	-4.7	-5.2	-4.3	-4.1	-3.5	-2.0	-1.5	-1.3	-1.3	-0.3	-2.0	-1.8	-2.3	-3.1	-3.9	-6.5	-8.2	-9.2	-10.0	-11.0	-4.3	-0.3
4-Mar	-11.6	-11.6	-11.7	-11.9	-12.0	-13.2	-14.6	-15.0	-14.8	-14.3	-13.9	-13.2	-13.1	-13.2	-13.2	-13.5	-13.8	-14.4	-15.1	-16.1	-17.7	-18.6	-19.5	-20.5	-14.4	-11.6
5-Mar	-21.6	-21.6	-21.6	-22.0	-22.7	-23.8	-24.6	-23.3	-21.2	-19.5	-18.5	-17.2	-16.0	-15.3	-14.5	-14.2	-14.6	-15.4	-16.5	-18.1	-19.6	-21.1	-21.7	DF	-19.3	-14.2
6-Mar	-22.8	-23.4	-23.7	-22.2	-21.5	-20.7	-20.9	-20.9	-19.0	-16.3	-14.9	-13.3	-11.0	-10.6	-10.5	-10.2	-10.7	-11.7	-13.0	-13.9	-14.7	-14.6	-14.4	-14.3	-16.2	-10.2
7-Mar	-14.3	-14.6	-14.9	-15.3	-15.7	-16.8	-17.3	-17.3	-15.6	-13.7	-11.6	-9.4	-7.6	-6.1	-4.8	-5.3	-6.5	-7.8	-9.7	-11.3	-12.3	-12.8	-13.7	-15.0	-12.1	-4.8
8-Mar	-16.0	-16.9	-17.9	-18.4	-18.8	-19.5	-20.1	-19.3	-17.3	-14.2	-11.5	-9.6	-8.5	-7.6	-7.2	-6.9	-7.4	-8.4	-10.6	-12.7	-14.4	-16.2	-16.9	-17.9	-13.9	-6.9
9-Mar	-18.7	-19.7	-20.0	-20.9	-21.8	-22.3	-22.5	-21.7	-18.3	-15.7	-13.0	-11.1	-9.6	-9.3	-9.0	-8.5	-9.1	-10.0	-11.2	-11.3	-11.7	-12.4	-12.7	-12.7	-14.7	-8.5
10-Mar	-13.2	-12.9	-13.0	-13.4	-13.4	-13.4	-13.6	-13.7	-12.5	-12.2	-10.3	-8.8	-7.5	-6.5	-6.3	-6.0	-6.1	-6.5	-7.5	-7.3	-7.6	-8.4	-9.9	-10.8	-10.0	-6.0
11-Mar	-12.0	-12.9	-13.1	-12.8	-12.8	-13.5	-14.4	-14.0	-12.7	-10.2	-8.8	-6.2	-4.1	-3.7	-3.5	-2.5	-3.1	-3.7	-4.7	-6.2	-7.4	-8.2	-8.7	-9.0	-8.7	-2.5
12-Mar	-9.7	-10.4	-11.1	-10.5	-11.0	-11.1	-11.7	-11.4	-10.1	-8.2	-6.2	-5.2	-4.4	-4.2	-3.9	-3.9	-4.3	-4.9	-6.2	-8.3	-10.3	-11.7	-13.0	-14.2	-8.6	-3.9
13-Mar	-15.2	-15.2	-15.9	-16.6	-17.1	-17.3	-17.1	-16.2	-13.6	-11.2	-9.7	-8.0	-5.8	-4.6	-3.9	-4.2	-5.4	-6.4	-7.3	-7.7	-8.3	-8.0	-8.0	-7.6	-10.4	-3.9
14-Mar	-7.6	-7.8	-7.8	-7.7	-7.7	-7.7	-7.8	-7.7	-7.7	-8.3	-8.1	-8.0	-7.0	-6.5	-6.8	-7.5	-8.1	-8.4	-8.8	-9.5	-9.9	-10.1	-10.9	-11.8	-8.3	-6.5
15-Mar	-13.3	-14.6	-15.6	-16.8	-18.0	-18.7	-18.7	-18.0	-16.9	-14.3	-12.6	-10.7	-9.1	-7.6	-6.7	-6.0	-5.9	-6.2	-8.1	-10.2	-11.1	-12.0	-12.7	-13.6	-12.4	-5.9
16-Mar	-14.9	-14.5	-13.3	-12.7	-14.0	-12.9	-11.7	-10.8	-9.9	-7.8	-7.0	-5.9	-3.9	-2.9	-2.3	-1.5	-1.5	-2.7	-3.9	-4.7	-6.9	-7.9	-9.9	-9.4	-8.0	-1.5
17-Mar	-10.1	-11.0	-10.6	-10.5	-10.9	-11.0	-10.7	-9.3	-5.9	-1.5	3.3	6.4	8.0	8.5	8.4	8.4	7.3	5.8	3.5	0.9	-0.6	-2.3	-3.3	-4.0	-1.7	8.5
18-Mar	-4.7	-5.6	-5.9	-6.8	-8.0	-8.4	-8.7	-7.6	-4.6	-1.5	2.2	4.7	6.7	7.6	8.7	8.8	8.2	5.8	3.4	4.1	2.4	0.3	-1.6	-1.9	-0.1	8.8
19-Mar	-3.9	-4.5	-4.0	-4.6	-5.4	-6.2	-7.3	-5.9	-3.9	-1.1	1.2	4.4	5.4	5.4	6.0	5.6	4.9	3.2	0.7	-0.8	-1.7	-2.5	-3.5	-3.8	-0.9	6.0
20-Mar	-4.1	-4.2	-4.4	-4.7	-5.8	-6.1	-6.3	-4.7	-3.1	-1.5	1.2	3.2	3.1	4.0	1.9	-1.0	-3.0	-5.3	-6.5	-7.0	-7.8	-8.1	-8.3	-8.4	-3.6	4.0
21-Mar	-8.5	-8.8	-9.0	-9.2	-9.3	-9.4	-9.7	-9.8	-9.3	-8.5	-8.2	-7.1	-5.9	-4.9	-4.3	-3.8	-3.8	-5.1	-6.6	-8.4	-10.0	-10.9	-11.9	-12.2	-8.1	-3.8
22-Mar	-12.6	-12.2	-12.7	-13.1	-13.2	-13.4	-13.2	-10.9	-7.6	-5.4	-3.3	-2.2	0.0	1.8	2.7	3.3	3.5	2.1	0.4	-1.8	-3.6	-4.7	-5.6	-6.5	-5.3	3.5
23-Mar	-6.8	-6.6	-5.6	-5.8	-4.4	-4.9	-4.8	-3.4	0.3	4.5	5.5	5.9	6.3	6.1	5.6	4.8	4.8	2.7	0.3	-2.0	-4.0	-5.8	-7.6	-8.2	-1.0	6.3
24-Mar	-8.1	-8.1	-8.2	-8.5	-8.8	-8.9	-9.1	-9.0	-7.9	-7.7	-6.2	-5.1	-4.0	-3.0	-2.4	-1.9	-1.8	-2.4	-3.3	-4.8	-6.1	-7.1	-8.1	-9.3	-6.2	-1.8
25-Mar	-11.1	-10.5	-9.0	-8.0	-7.5	-8.8	-8.5	-6.7	-2.8	-1.9	-0.5	0.2	0.9	1.3	1.4	0.5	0.3	-1.4	-3.3	-4.7	-5.6	-6.5	-7.7	-9.0	-4.5	1.4
26-Mar	-10.3	-11.5	-12.9	-13.8	-14.7	-15.6	-16.1	-15.8	-14.7	-12.6	-11.1	-9.4	-8.5	-8.1	-7.8	-8.1	-8.7	-9.6	-11.0	-12.7	-14.0	-15.2	-15.8	-17.1	-12.3	-7.8
27-Mar	-18.1	-19.8	-19.9	-21.9	-23.7	-24.7	-23.3	-18.5	-14.2	-12.4	-11.2	-9.9	-8.8	-7.3	-6.7	-6.3	-7.2	-7.8	-8.8	-9.8	-11.1	-12.4	-11.4	-11.6	-13.6	-6.3
28-Mar	-13.0	-14.4	-13.7	-13.5	-14.9	-15.7	-16.5	-14.7	-11.5	-8.0	-6.4	-5.5	-4.2	-2.7	-1.7	-1.2	-1.5	-1.7	-2.8	-3.9	-4.0	-5.2	-5.6	-4.3	-7.8	-1.2
29-Mar	-3.8	-4.2	-4.6	-4.5	-4.6	-5.3	-5.9	-3.4	-1.9	-1.1	-1.2	-1.1	-0.7	-0.5	-0.4	-0.3	0.0	-1.3	-2.3	-3.0	-4.3	-5.6	-6.1	-6.7	-3.0	0.0
30-Mar	-6.8	-7.4	-8.3	-9.2	-9.6	-9.4	-9.0	-7.8	-5.9	-4.1	-2.3	-0.6	0.7	1.9	2.6	2.1	2.2	1.5	0.6	-0.6	-1.2	-1.5	-1.7	-2.2	-3.2	2.6
31-Mar	-2.6	-3.4	-3.9	-4.2	-5.0	-5.7	-6.0	-4.6	-3.0	-2.1	-1.4	0.8	3.6	4.6	5.5	5.6	5.5	4.9	3.1	0.9	-0.2	-1.6	-2.5	-3.1	-0.6	5.6
	-11.2	-11.6	-11.7	-11.9	-12.3	-12.7	-12.8	-11.9	-10.0	-8.1	-6.4	-4.9	-3.6	-2.8	-2.5	-2.6	-3.0	-4.1	-5.4	-6.8	-7.9	-8.8	-9.6	-9.7	Diurnal Average	
	-2.6	-3.4	-3.9	-4.2	-4.4	-4.9	-4.3	-3.4	0.3	4.5	5.5	6.4	8.0	8.5	8.7	8.8	8.2	5.8	3.5	4.1	2.4	0.3	-1.6	-1.9	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Jackfish 1 - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	31	4.17	4.17
-20 - 0	628	84.52	88.69
0 - 10	84	11.31	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Jackfish 1 - March 2023

Maximum Value: 91.6 % on Mar 14 06:00

Maximum Daily Average: 84.9 % on Mar 14

Minimum Value: 21.3 % on Mar 28 16:00

Minimum Daily Average: 46.3 % on Mar 25

Maximum Diurnal Average: 80.1 % at hour 7

Minimum Diurnal Average: 48.2 % at hour 14

Monthly Average: 65.11 %

Percentiles: P_1 = 24.8 P_{10} = 39.5 Q_1 = 54.8 Median = 66.7 Q_3 = 79.3 P_{90} = 85.4 P_{99} = 89.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	82.5	83.3	83.9	84.7	85.2	85.2	85.1	84.9	83.4	80.8	74.0	66.5	62.5	62.7	67.6	70.5	74.9	79.3	82.6	83.6	82.9	81.9	81.5	81.7	78.8	85.2
2-Mar	83.6	83.6	84.0	82.7	82.3	81.6	81.1	79.7	73.3	64.6	58.0	51.8	47.9	44.9	44.6	42.8	49.1	49.3	57.2	77.7	84.0	83.7	85.4	87.6	69.2	87.6
3-Mar	84.8	73.5	71.9	73.3	77.4	82.8	84.2	81.9	74.3	64.3	63.2	64.2	63.7	57.7	61.7	57.4	57.2	59.8	65.5	72.1	77.7	81.8	80.0	82.7	71.4	84.8
4-Mar	84.2	80.9	78.3	78.7	80.1	76.1	78.9	78.1	76.8	70.6	62.5	61.1	59.3	61.2	59.6	59.2	59.9	59.5	62.1	65.6	70.7	73.7	75.4	77.8	70.4	84.2
5-Mar	79.1	79.4	80.2	80.0	80.3	78.9	79.3	78.2	73.4	69.1	65.0	56.5	51.6	48.7	46.5	45.6	47.5	49.8	53.6	59.3	63.3	68.6	71.1	DF	65.4	80.3
6-Mar	73.8	74.3	75.5	73.1	74.0	74.5	74.2	74.0	69.5	63.9	64.1	63.7	51.7	53.8	59.1	59.3	64.0	73.2	77.1	76.0	75.7	71.4	63.1	59.6	68.3	77.1
7-Mar	57.7	56.4	58.3	63.6	67.7	72.0	74.3	74.2	69.8	65.7	61.1	55.2	51.9	51.1	52.1	54.9	56.2	56.9	56.5	58.0	55.7	55.8	57.9	61.1	60.2	74.3
8-Mar	63.3	65.5	68.6	70.4	71.1	73.1	75.7	72.3	63.6	55.1	44.6	39.5	35.7	33.4	31.7	29.6	30.5	33.0	39.5	44.1	50.2	54.7	56.9	61.2	52.6	75.7
9-Mar	64.0	66.3	67.0	69.7	71.8	73.5	75.2	75.4	63.7	60.8	55.7	53.1	52.4	55.0	58.3	59.0	59.5	64.5	74.0	73.2	69.9	72.1	74.5	77.5	66.1	77.5
10-Mar	79.4	79.4	77.2	78.3	79.0	79.0	79.0	79.5	72.2	71.9	68.6	67.0	64.5	64.4	66.9	65.8	65.9	67.7	68.0	66.4	69.4	75.4	76.4	74.7	72.3	79.5
11-Mar	74.1	77.1	79.9	82.6	82.6	85.1	87.3	86.7	83.7	74.6	71.4	63.8	58.4	58.7	58.2	56.0	59.9	65.3	68.7	75.3	80.8	81.6	83.6	87.6	74.3	87.6
12-Mar	89.0	89.6	89.0	88.2	88.0	87.5	87.6	87.3	84.3	78.6	72.8	68.8	65.6	65.7	65.1	66.0	64.9	65.1	67.1	70.8	76.1	80.2	84.0	87.0	77.8	89.6
13-Mar	87.6	86.4	85.7	85.8	85.2	84.7	84.5	83.8	80.2	74.6	67.9	62.7	56.8	54.1	53.6	55.7	65.2	75.2	85.3	87.5	88.6	88.2	88.3	87.8	77.3	88.6
14-Mar	88.2	90.1	90.9	91.0	91.3	91.6	91.2	90.8	90.1	86.9	83.0	81.3	75.8	76.9	80.5	79.5	78.8	80.3	82.3	84.8	84.9	84.0	83.1	80.1	84.9	91.6
15-Mar	83.1	85.4	86.5	85.4	84.6	83.6	83.3	82.1	82.8	78.5	69.7	65.0	62.2	60.8	60.2	60.0	60.6	63.9	71.5	80.2	83.8	87.1	89.0	89.4	76.6	89.4
16-Mar	88.1	86.9	87.0	86.4	85.9	87.1	87.2	85.0	80.5	76.0	75.3	71.1	63.6	60.5	60.4	57.3	58.4	63.6	68.5	71.5	80.2	81.6	86.1	83.6	76.3	88.1
17-Mar	83.4	85.1	82.7	83.2	84.1	85.0	84.8	79.1	67.3	55.6	40.4	32.1	27.8	25.6	24.3	24.1	24.4	26.8	33.2	39.0	47.0	52.0	55.6	58.9	54.2	85.1
18-Mar	60.3	63.9	63.3	64.8	70.2	71.2	72.7	68.2	55.0	47.6	38.9	31.6	27.9	25.3	23.4	22.8	26.9	33.0	37.4	32.6	37.0	43.0	51.7	51.7	46.7	72.7
19-Mar	58.7	61.9	59.9	61.9	64.4	68.4	73.6	67.2	56.9	49.6	45.7	42.0	40.2	41.2	38.6	39.1	40.0	41.8	49.8	57.5	62.1	67.7	71.2	73.4	55.5	73.6
20-Mar	75.5	75.4	76.5	76.4	79.3	80.2	83.9	76.7	70.9	64.7	54.9	46.3	44.0	42.1	55.5	73.3	79.9	86.6	88.6	89.3	89.3	89.2	89.3	88.7	74.0	89.3
21-Mar	88.6	88.8	89.0	88.2	88.3	88.1	88.6	87.8	84.7	79.4	76.8	70.1	63.0	57.6	51.5	49.4	50.7	59.7	66.2	73.0	78.8	82.9	85.0	86.3	75.9	89.0
22-Mar	88.1	87.6	86.5	89.0	89.5	88.8	88.0	85.1	74.1	62.3	54.6	52.6	47.4	41.0	40.1	40.2	39.1	44.0	49.2	57.0	63.6	66.5	69.6	74.1	65.7	89.5
23-Mar	75.4	76.3	74.0	75.4	70.9	72.0	72.3	64.5	53.0	42.5	41.4	39.4	36.2	36.1	37.5	40.9	39.8	48.3	57.7	63.7	66.7	70.2	76.2	81.1	58.8	81.1
24-Mar	80.2	77.8	73.9	73.7	73.5	74.4	74.7	72.0	65.1	65.6	57.2	51.0	46.2	42.0	35.9	33.4	33.8	35.1	38.3	43.8	47.3	52.2	56.2	60.4	56.8	80.2
25-Mar	66.7	64.3	58.7	57.0	58.3	65.1	68.9	64.2	50.8	45.9	42.7	41.7	39.7	30.6	31.9	32.6	28.8	33.8	39.1	36.0	37.4	38.0	37.4	41.0	46.3	68.9
26-Mar	46.5	52.5	61.3	67.2	71.3	74.9	75.5	71.2	64.5	55.2	52.8	45.9	41.8	36.8	29.3	27.7	31.7	34.2	37.2	39.8	42.1	46.0	47.7	53.9	50.3	75.5
27-Mar	60.3	66.5	66.4	70.7	74.0	76.0	76.2	58.4	46.9	40.0	38.3	40.4	39.0	38.8	38.2	38.7	42.5	49.0	53.5	55.1	60.1	66.7	62.3	60.1	54.9	76.2
28-Mar	68.7	77.7	76.2	75.4	79.2	81.9	79.6	67.0	53.6	41.1	35.2	30.5	27.7	24.8	22.7	21.3	24.8	28.9	31.9	35.9	39.5	44.9	48.0	46.1	48.4	81.9
29-Mar	48.6	51.0	53.8	55.3	57.0	59.0	62.9	54.9	55.5	56.8	60.6	61.0	59.9	60.5	60.9	61.0	60.3	64.4	66.4	67.8	70.7	73.0	72.9	75.4	61.2	75.4
30-Mar	75.7	79.1	83.0	87.1	87.7	87.7	86.2	81.7	73.7	62.3	50.4	39.4	32.3	32.4	35.3	38.5	41.8	45.1	51.4	55.1	61.2	63.8	63.9	65.1	61.7	87.7
31-Mar	72.4	77.4	80.3	82.0	84.7	86.3	86.2	78.5	70.0	66.4	64.2	59.2	52.4	50.3	46.7	46.5	46.3	48.1	54.2	61.1	64.1	66.0	67.8	72.3	66.0	86.3
	74.6	75.6	75.8	76.8	78.0	79.2	80.1	76.5	69.8	63.6	58.4	54.0	50.0	48.2	48.3	48.7	50.4	54.4	59.1	63.0	66.5	69.2	70.7	72.3	Diurnal Average	
	89.0	90.1	90.9	91.0	91.3	91.6	91.2	90.8	90.1	86.9	83.0	81.3	75.8	76.9	80.5	79.5	79.9	86.6	88.6	89.3	89.3	89.2	89.3	89.4	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Jackfish 1 - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	80	10.77	10.77
40 - 60	182	24.50	35.26
60 - 80	307	41.32	76.58
80 - 100	174	23.42	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Jackfish 1 - March 2023

Maximum Speed: 15 km/h on Mar 23 16:00

Maximum Daily Speed Average: 10.3 km/h on Mar 10

Minimum Speed Value: 0 km/h on Mar 31 23:00

Minimum Daily Speed Average: 1.0 km/h on Mar 16

Maximum Diurnal Speed Average: 2.2 km/h at hour 6

Minimum Diurnal Speed Average: 0.4 km/h at hour 13

Monthly Average Velocity: 0.9 km/h 165.8 deg

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 4$ Median = 6 $Q_3 = 8$ $P_{90} = 10$ $P_{99} = 13$

Hours in Service: 744

Hours of Data: 743

Hours of Missing Data: 1

Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	S5	S4	SSE5	SSE4	SSE5	SSE6	SSE7	SSE7	S6	S7	S8	S8	S8	S8	S7	S7	S8	S7	S7	S8	S11	S11	S9	S7	S6.9	S11
2-Mar	S7	S7	S8	S7	S9	S9	S8	S10	SSW8	SSW8	SSW9	SSW9	WSW8	W7	WSW7	WNW7	WNW6	WNW3	WNW6	WNW6	WNW5	WNW2	W3	SW5	SW5.0	S10
3-Mar	WSW4	WNW4	WSW4	WNW4	WNW4	W2	WSW2	W3	WNW4	WNW5	NW6	WNW6	NW8	NW9	NW12	NW11	NNW13	NNW13	NNW9	NNE9	N7	N7	N7	N8	NW5.8	NNW13
4-Mar	N5	N4	N5	NNW4	NW6	NW8	NW7	NW9	NW7	NW8	NNW10	NW8	NW9	NW9	NW9	NW11	NW11	NNW14	NNW13	NNW10	N6	NNW6	N7	N6	NNW7.7	NNW14
5-Mar	N5	NNW5	NNW5	NNW6	NW2	WNW2	WSW1	NW1	NNE3	NNW6	NNW8	NNW9	NNW6	NNE4	N4	N4	NNW3	SE1	SSE4	S4	SSE3	SE2	SSE3	DF	NNW2.3	NNW9
6-Mar	S4	S4	S6	S5	S5	S4	SSW5	S4	S4	SSE7	SE9	SSE11	SSE10	SSE10	SSE8	SSE8	SSE7	SSE6	SE8	SE8	SE6	SE9	SE9	SE9	SSE6.6	SSE11
7-Mar	SE9	SSE9	SSE11	SSE10	SSE8	SSE7	SSE7	S7	SSE6	S6	S7	SSE8	SSE9	SSE9	S12	S11	SSE10	SSE9	S5	SSE6	SE6	SE9	SE9	SE6	SSE8.0	S12
8-Mar	SSE6	SSE6	SE5	SE6	E4	E4	SE4	SE5	SE6	SE9	SE12	SSE10	SE11	ESE9	E9	E9	ESE9	SE9	SE8	ESE7	SE8	SSE8	SSE5	S4	SE6.7	SE12
9-Mar	S4	S4	S5	S5	S5	S4	S4	S4	SSE6	SSE10	SSE11	SSE12	SSE12	SSE12	SSE13	SSE11	SSE11	SSE10	SSE12	SE14	SSE12	SE11	SSE10	SSE9	SSE8.7	SE14
10-Mar	SSE8	SSE9	SSE11	SSE10	SE11	SE11	SE9	SE10	SSE11	SSE10	SSE11	SE12	SE12	SSE12	SSE11	SSE10	SE13	SE11	SE9	SE11	SE12	SE9	SE6	SE8	SE10.3	SE13
11-Mar	SE7	SE4	SSE3	SSE1	NE1	SE1	SE2	ESE1	N2	E2	ENE5	ESE8	SSE8	ESE7	SE8	SSE6	SSE6	SSE7	S5	S5	S5	SSW5	SSW5	S5	SSE3.7	SE8
12-Mar	S5	S6	S6	S5	S6	SSW5	SSW5	S5	SSW5	SSW4	S5	S6	S7	SSW6	S7	S6	S5	S5	S5	SSW5	S4	SSW4	S4	S5	S5.3	S7
13-Mar	S6	S5	S4	S5	S4	S6	S4	SSE3	SSE5	E6	ESE8	ESE7	E10	E11	E11	E13	E12	ENE12	E10	E7	ENE7	E8	ENE6	NE6	ESE5.6	E13
14-Mar	ENE6	NE4	NE4	N3	NNW5	NNE5	NNE6	N3	NNW7	NNW8	N8	NNW8	NNW10	NW10	NW9	NW8	NW8	NW7	NW7	NNW9	NW8	NW9	NNW12	NNW11	NNW6.5	NNW12
15-Mar	NNW11	NNW9	NNW8	NW5	NW4	NW2	NW1	NW2	NNW3	N4	NNE6	NNE6	NNE6	NNE6	N6	NNE6	N3	NE2	ESE3	SSE4	S4	SE3	S3	S2	N2.6	NNW11
16-Mar	S4	S4	S4	SSE3	SSE3	SSE5	S4	S4	SSW4	W2	NW6	NNW6	NNW6	NNW9	N7	NNW7	NNW5	NNW5	NW1	S3	S4	S5	S5	S8	WSW1.0	NNW9
17-Mar	S8	S8	S8	S7	S7	S7	S8	S8	S8	S6	SSW5	SSW4	SW5	WSW6	W5	WSW5	SW7	SSW7	SSW4	S5	SSW6	S7	S7	S8	SSW5.9	S8
18-Mar	S7	S7	SSW6	SSW4	S3	S7	S5	S5	SSW4	SSW4	WNW2	NW5	NNW6	NNW8	N7	NNW9	NW6	NW4	NW5	N5	NW1	WSW2	S2	SSW1	W1.4	NNW9
19-Mar	SW1	W2	WNW2	W2	NW3	NNW3	NNW1	N1	NNW2	NNW4	N6	ENE6	ENE6	NNE10	ENE7	ESE10	ESE10	E9	E6	ESE7	SE9	SSE7	SSE6	SSE7	E2.5	ESE10
20-Mar	SSE5	SSE4	SSE5	SSE6	SE1	SSE3	SE2	SE3	S5	S5	S5	S5	SSE5	S5	NNW9	N13	NNE11	N11	N10	NNW11	N11	NNW9	NNW8	NNW8	N1.9	N13
21-Mar	NNW7	NNW7	NNW8	NNW9	NNW8	NNW7	NNW7	N6	N7	N8	N7	NNE6	NNE6	NNE5	NNE4	N5	NE4	SE7	SE7	SSE6	SSE6	SSE7	S6	S5	N2.9	NNW9
22-Mar	S6	S7	SSW6	S8	S8	S5	S5	S8	S9	S10	S9	S9	S8	SSW8	S7	S7	SW4	SW5	SSW4	S7	S7	S8	S9	S7	S7.0	S10
23-Mar	S8	SSW6	SW3	S5	SW8	SW6	SW4	WNW3	WNW3	S1	NNW8	NNW11	NNW12	NNW13	NW14	NW15	NW11	N11	N11	N12	N11	N9	N9	NNE9	NNW5.1	NW15
24-Mar	NE8	NNE8	NE7	NE7	NE7	NE5	ENE5	NNE5	E6	N8	NE7	NE5	NE5	N2	NNW6	NE3	NE4	NNE3	ESE2	SSE3	S4	SSW4	SSW4	SSW4	NE3.2	NNE8
25-Mar	SW2	SW3	SSW4	SW5	SW6	SW6	SW5	SSW3	NW2	NNW6	NNW8	NNW10	NW8	NNW12	NNW10	N9	N10	N10	N9	N5	N5	N6	N7	N6	NNW4.1	NNW12
26-Mar	N6	NNW5	NNW5	NNW5	NNW4	N4	N4	NE5	N5	NNE7	NE7	NE7	N9	N10	N10	N9	N9	N8	NNE8	NNE6	NE5	ENE3	SE3	SSW2	N5.3	N10
27-Mar	SW2	W2	W2	SW2	SSW2	SSW3	W2	W3	NNW5	NNW8	NNW10	NNW10	N9	NW6	WNW5	NW6	NW8	NW6	WNW3	SW1	SSW2	SSW2	SW5	SW6	WNW3.1	NNW10
28-Mar	SW2	ENE1	S1	NW3	WSW1	NW2	NNW4	NNW3	ENE3	SSE3	W2	E2	NNE1	SW1	WNW4	WNW4	W4	WSW3	SSW4	SSW5	SSW7	SSW6	SSW6	SSW8	SW1.7	SSW8
29-Mar	SSW8	SW5	SW7	SW7	SW5	WSW3	W1	NW6	N9	N10	N11	N9	N9	N8	N8	NNW8	N8	NNE11	N9	NNE6	NNE6	NE5	NE6	NE4	N4.2	NNE11
30-Mar	NNE3	N2	N2	SSE1	S2	SSW2	SSW2	S3	S5	S4	ENE1	SSE5	SSE7	SSE8	SSW3	SSW5	S5	SSW4	S5	S7	S5	S5	SSE6	SSE6	S3.2	SSE8
31-Mar	S6	S5	S6	S6	S6	S6	SSE6	SSE7	SSE5	SSE5	SE6	SSE5	SSE5	SSE4	N5	NNE8	N5	NNE5	N6	N5	NNE4	ENE2	SSE0	S3	SE2.1	NNE8
	S2.2	S1.9	S2.2	S2.2	SSW2.1	S2.2	S2.0	S1.8	S1.3	S0.6	NE0.4	ESE0.6	ENE0.4	NNW0.6	NNW1.5	N1.5	NNE1.2	NE1.2	ENE1.0	ESE1.3	SE1.9	SSE2.1	SSE1.8	S2.0	Diurnal Average	
	NNW11	SSE9	SSE11	SSE10	SE11	SE11	SE9	S10	SSE11	SSE10	SE12	SE12	NNW12	NNW13	NW14	NW15	NNW13	NNW14	NNW13	SE14	SSE12	S11	NNW12	NNW11	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

Jackfish 1 - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Jackfish 1 - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	314	42.26	42.26
6 - 11	399	53.70	95.96
12 - 19	30	4.04	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Jackfish 1 - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	24	12	14	7	4	3	13	31	77	35	18	10	13	20	14	19	314
6 - 11	45	23	8	7	12	11	34	66	77	16	8	3	1	5	33	50	399
12 - 19	2	0	0	1	2	0	6	7	1	0	0	0	0	0	3	8	30
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	71	35	22	15	18	14	53	104	155	51	26	13	14	25	50	77	743

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Jackfish 1

Total Number of Valid Hours: 743

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Jackfish 1 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 km/h on Mar 23 11:00

Minimum Value: 0 km/h on Mar 27 03:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 3$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

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

DF - DAS Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Jackfish 1 - March 2023

Direction of Maximum Speed: 326 deg on Mar 23 16:00
Direction of Maximum Daily Speed Average: 144.7 deg on Mar 10

Direction of Minimum Speed: 152 deg on Mar 31 23:00

Direction of Minimum Daily Speed Average: 1.0 deg on Mar 16

Monthly Average Direction: 165.8 deg

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Mar	174	172	161	157	162	163	163	162	172	181	182	183	182	184	186	188	184	185	179	182	189	187	184	180	178.5
2-Mar	178	176	171	180	180	183	182	189	195	200	203	210	238	260	247	289	299	302	294	301	296	291	277	215	217.2
3-Mar	252	293	241	301	293	281	251	271	301	296	304	302	319	314	326	325	334	330	328	13	8	4	0	4	323.8
4-Mar	2	5	353	328	321	311	307	314	307	314	327	322	316	312	319	319	323	333	333	335	358	342	355	352	327.7
5-Mar	350	333	334	334	304	287	239	313	13	346	342	341	347	14	7	359	340	137	159	177	163	146	159	DF	342.9
6-Mar	176	186	184	179	187	191	192	188	178	155	146	148	148	150	156	160	164	152	137	134	144	143	144	143	156.7
7-Mar	145	148	156	160	163	166	167	171	163	169	175	163	162	165	174	172	164	167	169	164	146	146	146	142	161.0
8-Mar	147	149	144	144	96	91	131	137	137	145	145	149	146	120	97	99	104	124	134	116	134	158	168	178	132.8
9-Mar	181	181	185	183	180	172	174	171	150	153	154	154	153	155	155	161	155	156	148	145	149	145	149	157	156.6
10-Mar	163	157	159	150	146	145	146	141	152	151	152	144	145	149	149	150	134	130	136	137	141	129	132	132	144.7
11-Mar	137	139	158	153	51	138	146	103	10	82	69	112	155	120	132	159	160	154	172	170	184	196	196	185	148.3
12-Mar	185	188	186	190	187	194	193	184	192	192	181	186	189	194	191	179	187	187	185	194	191	196	190	190	188.8
13-Mar	185	183	177	184	183	187	184	162	148	87	103	115	87	88	84	85	80	75	86	88	78	79	69	55	101.9
14-Mar	59	52	39	356	347	24	32	356	341	344	358	340	333	323	311	308	308	318	319	339	318	325	338	339	339.6
15-Mar	339	333	332	310	306	304	319	325	343	11	12	13	13	14	357	14	9	40	122	163	171	138	180	177	353.2
16-Mar	191	184	187	165	157	152	172	184	198	280	322	334	348	340	353	346	345	327	304	183	188	188	183	187	239.1
17-Mar	188	183	182	183	187	188	187	188	191	190	205	200	236	248	273	244	218	212	210	187	193	187	190	189	198.6
18-Mar	189	191	194	193	183	188	188	184	201	194	301	323	342	340	357	337	320	309	323	357	320	248	176	202	259.6
19-Mar	231	265	302	277	326	335	342	356	337	337	352	66	71	20	60	118	110	92	85	108	135	154	152	161	88.1
20-Mar	167	163	167	149	145	149	133	127	171	180	177	182	168	183	347	7	14	353	353	347	354	348	347	342	3.8
21-Mar	347	345	341	342	336	342	344	356	6	2	351	13	17	13	18	355	51	133	140	149	154	161	171	177	8.5
22-Mar	182	181	192	185	182	178	173	175	181	186	190	184	185	196	191	191	232	215	205	188	186	185	187	185	187.6
23-Mar	186	192	230	191	217	223	223	282	298	181	328	328	331	327	323	326	324	11	11	8	8	2	6	26	332.4
24-Mar	38	29	39	56	41	55	62	25	84	359	36	40	42	2	343	35	54	27	122	161	185	201	194	213	42.5
25-Mar	220	226	208	222	220	225	220	213	311	334	335	334	319	332	347	358	4	5	11	355	2	6	10	357	333.6
26-Mar	355	342	330	348	340	349	3	36	354	17	46	36	5	356	360	1	4	4	27	21	46	66	133	194	9.4
27-Mar	215	279	278	219	210	203	263	269	338	347	337	341	349	312	295	304	314	309	299	216	201	206	221	226	303.1
28-Mar	223	57	176	320	256	322	338	337	76	168	277	95	28	229	293	282	279	239	199	192	208	204	201	208	233.9
29-Mar	210	214	219	225	226	242	269	320	349	357	4	8	356	356	349	348	11	16	9	18	29	52	38	44	354.0
30-Mar	14	358	3	160	189	193	192	178	186	190	78	158	152	157	199	196	190	199	185	189	191	179	153	168	176.1
31-Mar	169	171	172	172	171	169	167	168	167	161	139	164	166	154	359	20	5	30	9	1	28	73	152	191	144.3
Diurnal Average	175.6	181.9	188.3	188.9	194.9	187.8	182.3	182.8	179.1	172.6	52.2	106.5	74.3	341.3	344.2	351.5	13.0	38.5	75.5	114.9	145.2	153.2	159.4	171.8	

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 1 - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Jackfish 1 - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 104 deg on Mar 28 14:00

Minimum Value: 6 deg on Mar 9 01:00

Percentiles: $P_1 = 9$ $P_{10} = 12$ $Q_1 = 16$ Median = 22 $Q_3 = 31$ $P_{90} = 54$ $P_{99} = 90$

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	12	14	14	14	12	13	12	15	16	22	24	26	28	26	24	24	20	22	22	22	24	20	23	21	28
2-Mar	19	20	17	21	20	20	20	21	30	31	30	33	60	68	61	71	55	93	61	44	34	101	75	47	101
3-Mar	69	79	75	63	41	65	71	67	61	58	42	34	30	30	15	16	15	15	29	26	26	25	23	26	79
4-Mar	26	25	19	20	19	12	17	12	16	14	17	19	27	18	18	15	15	13	11	11	20	10	16	14	27
5-Mar	16	9	11	10	40	38	41	68	51	26	17	20	33	59	69	74	41	87	18	9	12	60	16	DF	87
6-Mar	10	10	7	9	12	12	11	10	17	17	18	20	25	23	24	22	20	19	11	12	11	13	14	13	25
7-Mar	15	17	18	16	15	14	14	16	19	25	26	27	25	25	25	23	22	19	11	10	12	13	14	12	27
8-Mar	14	12	10	10	31	10	23	10	16	19	19	25	24	38	33	31	29	17	11	22	13	9	10	10	38
9-Mar	6	10	8	9	7	9	8	9	17	19	20	20	21	21	20	20	17	20	17	15	16	15	17	16	21
10-Mar	15	17	17	16	16	15	16	14	19	19	19	17	20	20	21	21	17	16	12	14	15	15	13	12	21
11-Mar	10	10	11	58	49	67	42	47	37	68	50	31	31	41	29	33	22	21	17	13	17	18	17	12	68
12-Mar	10	10	13	16	15	20	15	14	21	29	28	32	27	33	28	30	29	22	17	18	16	14	9	11	33
13-Mar	10	12	8	9	8	10	10	15	19	36	35	35	31	30	27	27	27	26	23	25	22	25	32	26	36
14-Mar	25	24	26	31	23	31	29	25	16	19	25	21	15	17	14	17	17	15	17	14	17	15	12	13	31
15-Mar	11	12	10	28	18	37	46	39	27	41	31	32	33	37	34	26	38	36	28	13	12	26	17	34	46
16-Mar	10	9	12	49	31	11	17	26	27	72	21	24	31	22	30	27	35	29	86	26	12	10	10	13	86
17-Mar	15	11	11	12	14	14	15	18	20	27	29	48	68	65	79	71	44	29	19	14	16	15	15	15	79
18-Mar	15	15	19	18	11	12	16	17	62	35	88	31	27	25	30	25	38	38	35	22	30	17	52	20	88
19-Mar	37	40	21	12	19	16	10	18	20	19	29	52	58	29	50	31	28	26	20	22	13	17	12	14	58
20-Mar	14	23	17	16	93	28	64	46	22	29	37	40	50	43	65	28	26	23	21	20	23	22	21	17	93
21-Mar	23	22	17	14	12	16	17	25	26	30	28	57	47	53	68	45	61	20	15	12	10	8	10	9	68
22-Mar	9	14	17	14	14	12	12	18	22	26	25	27	27	31	32	32	53	35	22	13	14	16	17	14	53
23-Mar	15	16	59	41	15	20	36	48	46	96	35	16	21	16	14	13	16	29	25	25	26	23	27	28	96
24-Mar	34	29	28	28	32	31	26	40	43	26	50	61	59	89	38	67	54	62	26	26	9	11	10	31	89
25-Mar	35	25	19	19	17	31	20	39	76	19	23	26	30	25	25	27	26	28	25	22	16	18	19	17	76
26-Mar	18	17	12	16	15	21	25	29	36	38	43	47	33	31	27	33	29	25	24	20	18	18	16	21	47
27-Mar	25	11	13	28	61	15	42	34	26	21	19	26	31	47	55	44	21	25	46	78	42	45	17	16	78
28-Mar	74	71	83	42	25	41	12	22	62	64	86	87	91	104	63	58	64	77	18	16	22	25	29	25	104
29-Mar	35	60	29	35	30	24	93	19	24	27	29	31	28	26	24	24	31	26	23	24	24	25	22	18	93
30-Mar	33	57	50	57	14	12	14	19	30	41	97	52	42	31	81	52	42	33	19	19	21	18	18	17	97
31-Mar	16	14	17	16	15	13	14	21	24	24	24	46	56	49	47	33	33	35	27	19	32	39	56	17	56
Diurnal Maximum	74	79	83	63	93	67	93	68	76	96	97	87	91	104	81	74	64	93	86	78	42	101	75	47	

DF - DAS Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS508
KIRBY NORTH
MARCH 2023

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

April 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS 508)
MARCH 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	706	37	38	99.87	20	0	2.9	0
H2S (ppb) Average	705	38	39	99.87	1	0	0.1	0
THC (ppm) Average	691	37	53	97.85	2.8	-	2.5	-
NO2 (ppb) Average	706	37	38	99.87	10.6	0	4	-
NO (ppb) Average	706	37	38	99.87	6.1	-	1.1	-
NOX (ppb) Average	706	37	38	99.87	15.4	-	5.1	-
Temperature 2 m (C) Average	743	0	1	99.87	7.9	-	-0.1	-
Relative Humidity (%) Average	743	0	1	99.87	91.8	-	83.5	-
Wind Speed 10 m (km/h) Average	737	0	7	99.06	27	-	16	-
Wind Direction 10 m (deg) Average	737	0	7	99.06	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)
MARCH 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	706	0.76	1.5	-	0	0	0.1	0.4	0.8	1.5	20
H2S (ppb) Average	705	0.07	0.1	-	0	0	0	0.1	0.1	0.1	1
THC (ppm) Average	691	2.34	0.1	-	2	2.2	2.3	2.3	2.4	2.5	2.8
NO2 (ppb) Average	706	2.03	1.6	-	0.2	0.6	1	1.5	2.7	3.9	10.6
NO (ppb) Average	706	0.27	0.5	-	0	0	0	0.1	0.3	0.7	6.1
NOX (ppb) Average	706	2.3	1.9	-	0.2	0.7	1	1.7	2.9	4.6	15.4
Temperature 2 m (C) Average	743	-8.12	6.4	-	-25.7	-15.9	-12.1	-8.3	-4.1	0.1	7.9
Relative Humidity (%) Average	743	64.39	16.7	-	23.5	40	52.7	66.4	78	84.7	91.8
Wind Speed 10 m (km/h) Average	737	10.2	4	-	1	5	7	10	13	15	27
Wind Direction 10 m (deg) Average	737	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)
MARCH 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	06 Mar 2023 00:00	06 Mar 2023 00:00	1	DAS Failure - data not recorded
THC	13 Mar 2023 10:00	14 Mar 2023 00:00	15	Unstable Operation - station temperature fluctuations
Wind Speed, Wind Direction	15 Mar 2023 07:00	15 Mar 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	19 Mar 2023 01:00	19 Mar 2023 01:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	24 Mar 2023 19:00	24 Mar 2023 22:00	4	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Kirby North - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 20.0 ppb on Mar 2 17:00 Maximum Daily Average: 2.9 ppb on Mar 2

Minimum Value: 0.0 ppb on Mar 2 23:00 Minimum Daily Average: 0.2 ppb on Mar 30

Maximum Diurnal Average: 1.4 ppb at hour 9 Minimum Diurnal Average: 0.4 ppb at hour 4

Monthly Average: 0.76 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.4 Q_3 = 0.8 P_{90} = 1.5 P_{99} = 6.8

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	Z	0.3	0.4	0.2	0.5	0.5	0.7	0.8	0.6	0.5	1.0	1.3	1.2	1.2	1.1	0.8	0.7	0.7	0.6	0.6	0.5	0.6	0.5	0.4	0.7	1.3
2-Mar	0.3	Z	0.4	0.4	0.3	0.4	0.4	0.5	0.7	1.1	1.0	0.8	0.4	0.4	4.1	14.1	20.0	0.9	2.1	14.4	3.4	0.4	0.0	0.0	2.9	20.0
3-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.1	3.8	4.5	1.6	0.0	1.9	1.5	0.0	0.0	0.0	0.0	0.0	0.3	1.4	1.9	3.0	0.9	4.5
4-Mar	8.3	8.0	5.7	Z	0.2	0.2	0.3	0.1	0.0	0.1	0.1	0.1	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.4	1.1	8.3
5-Mar	0.4	0.3	0.2	0.2	Z	0.6	1.0	1.5	2.0	1.1	0.2	0.2	0.1	0.2	0.5	0.4	0.1	0.0	0.0	0.3	1.9	1.7	1.0	DF	0.6	2.0
6-Mar	1.2	1.6	1.1	0.7	0.7	1.3	1.6	1.2	1.3	1.0	1.0	0.8	0.7	0.7	Z	0.5	0.4	0.7	0.5	0.5	0.4	0.8	1.0	0.9	0.9	1.6
7-Mar	0.6	0.8	0.8	0.8	0.6	Z	0.6	0.5	0.7	0.8	0.7	0.7	0.7	0.8	0.6	0.8	0.7	0.5	0.3	0.4	0.3	0.4	0.3	0.4	0.6	0.8
8-Mar	Z	0.3	0.5	0.3	0.4	0.1	0.6	0.6	1.3	0.8	0.5	1.2	0.8	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.1	1.0	0.6	0.4	0.4	1.3
9-Mar	0.6	Z	0.9	0.6	0.7	0.7	0.9	0.8	0.4	C	C	C	C	C	C	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.1	--	0.9
10-Mar	0.2	0.2	Z	0.3	0.4	0.6	0.4	0.8	0.9	0.5	0.4	0.4	0.4	0.4	0.7	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.3	0.9
11-Mar	0.0	0.1	0.3	Z	0.2	0.1	0.0	0.6	0.6	0.4	0.7	0.6	0.7	0.8	0.5	0.2	0.3	0.3	0.3	0.5	0.4	0.4	0.2	0.3	0.4	0.8
12-Mar	0.3	0.4	0.1	0.3	Z	0.4	0.5	0.3	0.1	0.6	0.5	0.3	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.6
13-Mar	0.0	0.1	0.0	0.0	0.0	Z	0.0	0.4	1.1	0.5	0.2	0.2	0.0	0.4	0.9	0.8	0.2	0.9	0.2	0.3	0.4	0.2	0.5	1.2	0.4	1.2
14-Mar	Z	0.7	0.6	0.4	0.5	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.4	1.1	1.1	1.1	1.1	0.9	0.9	1.1	1.1	1.0	0.9	0.7	0.7	1.1
15-Mar	0.7	Z	1.9	3.3	4.4	5.2	4.5	2.9	4.1	2.6	1.9	1.4	1.3	1.2	1.1	0.9	1.1	0.9	0.8	1.6	2.0	0.9	0.4	0.5	2.0	5.2
16-Mar	0.2	0.3	Z	0.3	0.3	0.3	0.3	0.5	3.7	0.7	0.9	1.8	0.9	0.7	0.5	1.6	0.4	0.5	0.4	0.3	0.4	0.5	0.3	0.3	0.7	3.7
17-Mar	0.3	0.2	0.5	Z	0.4	0.3	0.3	0.4	0.7	0.8	0.8	0.8	0.4	0.3	0.3	0.4	0.2	0.4	0.7	0.9	1.4	1.5	1.1	0.9	0.6	1.5
18-Mar	0.6	0.6	0.3	0.0	Z	0.0	0.0	0.0	0.0	0.1	2.6	6.0	0.6	1.2	0.7	0.6	0.4	0.8	0.6	0.4	0.3	0.7	0.8	0.3	0.8	6.0
19-Mar	0.2	0.4	0.1	0.2	0.4	Z	2.3	2.1	0.5	0.2	0.2	0.1	0.3	1.1	1.0	1.0	0.2	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.5	2.3
20-Mar	Z	0.8	0.9	1.0	1.1	1.0	1.0	1.1	0.8	0.6	0.6	0.6	0.9	1.0	1.3	0.9	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.6	1.3
21-Mar	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	0.6	2.1	1.8	0.0	0.0	0.1	0.0	0.0	0.2	2.1
22-Mar	0.2	0.2	Z	0.0	0.0	0.4	0.3	0.3	0.1	0.1	0.2	0.3	0.4	0.8	0.6	0.6	0.5	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.3	0.8
23-Mar	0.5	0.6	0.7	Z	0.5	0.3	0.2	0.3	1.8	1.6	0.8	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.8	0.7	0.4	0.4	0.1	0.0	0.5	1.8
24-Mar	0.0	0.0	0.0	0.0	Z	0.1	0.3	0.6	0.5	0.5	0.8	0.8	0.6	0.7	0.4	0.4	0.2	0.7	0.4	0.5	0.3	0.3	0.4	0.4	0.4	0.8
25-Mar	0.5	0.5	0.3	0.2	0.1	Z	0.1	0.1	1.1	1.2	0.3	4.0	5.4	0.4	0.4	1.1	1.6	1.0	0.7	0.4	0.4	0.4	0.3	0.2	0.9	5.4
26-Mar	Z	0.1	0.0	0.0	0.1	0.1	0.0	1.4	6.9	5.8	5.5	3.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.1	1.0	6.9
27-Mar	0.1	Z	0.0	0.0	0.0	0.1	0.3	0.6	1.0	2.7	5.4	6.0	1.8	2.7	2.0	5.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	6.0
28-Mar	1.0	0.1	Z	0.1	0.1	0.0	0.1	1.7	9.3	1.7	1.7	7.1	2.7	2.0	5.0	2.9	3.9	0.6	0.4	0.2	0.2	0.2	0.0	0.1	1.8	9.3
29-Mar	0.1	0.2	0.5	Z	0.6	0.6	1.1	1.4	1.7	1.3	1.0	0.4	0.4	0.4	0.4	0.8	0.4	0.5	1.0	0.5	0.5	0.3	0.7	1.8	0.7	1.8
30-Mar	1.0	0.6	0.4	0.3	Z	0.2	0.1	0.1	0.2	0.4	0.4	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0
31-Mar	0.1	0.1	0.0	0.0	0.0	Z	0.1	0.3	0.3	0.3	0.3	0.4	0.3	0.0	1.6	0.2	0.7	0.2	0.6	0.5	0.4	0.8	0.7	0.5	0.4	1.6
	0.7	0.7	0.6	0.4	0.5	0.5	0.6	0.7	1.4	1.1	1.1	1.4	0.8	0.7	0.9	1.2	1.1	0.5	0.5	0.8	0.5	0.5	0.4	0.4	Diurnal Average	
	8.3	8.0	5.7	3.3	4.4	5.2	4.5	2.9	9.3	5.8	5.5	7.1	5.4	2.7	5.0	14.1	20.0	2.1	2.1	14.4	3.4	1.7	1.9	3.0	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

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

Wood Buffalo Environmental Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Kirby North - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	703	99.58	99.58
11 - 20	3	0.42	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Kirby North - March 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	25	50	69	32	15	29	45	98	111	52	33	19	12	27	51	29	697
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	50	69	32	15	29	45	98	111	52	33	19	15	27	51	29	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Sulphur Dioxide (SO_2) - ppb

Kirby North

Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Span Responses

Sulphur Dioxide (SO_2) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Kirby North - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.0 ppb on Mar 18 20:00 Maximum Daily Average: 0.1 ppb on Mar 18

Minimum Value: 0.0 ppb on Mar 15 01:00 Minimum Daily Average: 0.0 ppb on Mar 24

Maximum Diurnal Average: 0.1 ppb at hour 20 Minimum Diurnal Average: 0.1 ppb at hour 16

Monthly Average: 0.07 ppb Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.1 P_{90} = 0.1 P_{99} = 0.2

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	38
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	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
2-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
3-Mar	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.4
4-Mar	0.2	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
5-Mar	0.1	0.1	0.1	0.1	0.1	Z	0.1	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	0.1	0.1	0.1	DF	0.1	0.2
6-Mar	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
7-Mar	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
8-Mar	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
9-Mar	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	C	C	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	--	0.2
10-Mar	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	0.0	0.1	0.1	0.1	0.1	0.1
11-Mar	0.1	0.1	0.1	0.0	Z	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
12-Mar	0.0	0.0	0.0	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	0.0	0.0	0.1
13-Mar	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1
14-Mar	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
15-Mar	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	0.1	0.1	0.1	0.1	0.1	0.1
16-Mar	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	0.1	0.1	0.1	0.1	0.2
17-Mar	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
18-Mar	0.1	0.1	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.2	0.1	1.0	0.1	0.1	0.1	0.0	0.1	1.0
19-Mar	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
20-Mar	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	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1
21-Mar	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
22-Mar	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
23-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
24-Mar	0.0	0.1	0.1	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	0.0	0.0	0.0	0.1
25-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
26-Mar	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.2
27-Mar	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
28-Mar	0.1	0.1	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
29-Mar	0.0	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2
30-Mar	0.2	0.2	0.2	0.2	0.2	Z	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	0.1	0.2
31-Mar	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	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.0	0.1	0.1	0.2	0.2	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

Wood Buffalo Environmental Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Kirby North - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	705	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: 705

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Kirby North - March 2023

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
	Wind Direction																
0 - 2	25	50	70	32	14	30	41	102	110	54	33	18	15	28	49	29	700
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	50	70	32	14	30	41	102	110	54	33	18	15	28	49	29	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Hydrogen Sulphide (H_2S) - ppb

Kirby North

Classes (ppb)

- 0 - 2
- 3 - 4
- 5 - 7
- 8 - 11
- > 11

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Kirby North - March 2023

Maximum Value: 2.8 ppm on Mar 26 19:00

Maximum Daily Average: 2.5 ppm on Mar 4

Minimum Value: 2.0 ppm on Mar 23 18:00

Minimum Daily Average: 2.2 ppm on Mar 30

Maximum Diurnal Average: 2.4 ppm at hour 3

Minimum Diurnal Average: 2.3 ppm at hour 13

Monthly Average: 2.34 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.3 Median = 2.3 Q_3 = 2.4 P_{90} = 2.5 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	691
Hours of Missing Data:	53
Hours of Calibration:	37
Percent Operational Time:	97.9

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

Z - zerospan C - Calibration DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

Kirby North - March 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	1	0.14	0.14
2.1 - 3.0	690	99.86	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 691

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Kirby North - March 2023

Concentration Ranges (ppm)	Wind Direction N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
2.1 - 3.0	25	50	67	20	14	29	45	98	111	52	33	19	15	27	51	28	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	25	50	67	20	14	29	45	98	111	52	33	19	15	27	51	29	685

Total Number of Valid Hours: 685

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Total Hydrocarbons (THC) - ppm

Kirby North

Classes (ppm)

- 0 - 2.0
- 2.1 - 3.0
- 3.1 - 10.0
- > 10.0

Total Number of Valid Hours: 685

Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Kirby North - March 2023

Wood Buffalo Environmental Association

Span Responses

Total Hydrocarbons (THC) - ppm

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Kirby North - March 2023

Maximum Value: 6.1 ppb on Mar 2 17:00

Maximum Daily Average: 1.1 ppb on Mar 2

Minimum Value: 0.0 ppb on Mar 1 01:00

Minimum Daily Average: 0.0 ppb on Mar 10

Maximum Diurnal Average: 0.9 ppb at hour 9

Minimum Diurnal Average: 0.0 ppb at hour 3

Monthly Average: 0.27 ppb

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.1 Q_3 = 0.3 P_{90} = 0.7 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.6	1.0	0.9	1.1	0.7	0.6	0.4	0.3	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.3	1.1
2-Mar	0.0	0.1	0.0	0.0	0.1	Z	0.2	0.2	0.5	0.9	0.9	1.1	1.3	1.0	2.0	3.6	6.1	1.1	0.8	3.6	0.7	0.3	0.4	0.1	1.1	6.1
3-Mar	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.4	1.8	2.3	1.5	0.8	1.2	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	2.3
4-Mar	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.6	0.8	1.8	0.4	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.3	1.8
5-Mar	0.0	0.1	Z	0.1	0.0	0.1	0.1	0.9	5.8	2.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	DF	0.5	5.8
6-Mar	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.4	0.5	0.6	0.4	Z	0.4	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6
7-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
8-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.6	0.7	0.4	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.7
9-Mar	0.0	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.7	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.7
10-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
11-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.1	0.8	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	1.1
12-Mar	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.2	0.6	0.4	0.3	0.4	0.7	0.4	0.4	0.6	0.2	0.1	0.1	0.0	0.3	0.3	0.2	0.1	0.3	0.7
13-Mar	0.0	0.1	0.0	Z	0.1	0.0	0.1	0.2	0.8	0.6	0.3	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.8
14-Mar	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.9	1.3	1.2	0.8	0.8	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.3	1.3
15-Mar	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.7	0.7	0.7	2.4	1.4	0.7	0.6	0.5	0.3	0.3	0.3	0.0	0.1	0.1	0.0	0.2	0.1	0.4	2.4
16-Mar	Z	0.0	0.1	0.0	0.1	0.0	0.2	0.2	1.6	0.7	1.2	0.8	0.5	0.3	0.1	0.7	0.3	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	1.6
17-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	1.9	1.5	1.2	1.0	0.8	0.4	0.3	0.3	0.3	0.4	0.1	0.2	0.1	0.1	0.1	0.2	0.4	1.9
18-Mar	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.7	0.7	0.5	1.5	2.2	0.5	0.5	0.5	0.4	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.2
19-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.2	1.2	0.8	0.1	0.3	0.1	0.2	0.3	0.9	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2
20-Mar	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
21-Mar	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
22-Mar	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.5	0.5	0.5	0.7	0.7	0.5	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7
23-Mar	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.8	0.5	0.1	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	1.0
24-Mar	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.3	0.2	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
25-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.7	0.2	0.7	0.8	0.4	0.0	0.1	0.5	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.8
26-Mar	0.1	0.1	0.0	0.1	Z	0.1	0.1	0.4	1.8	2.2	2.3	1.8	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	2.3
27-Mar	0.1	0.1	0.2	0.1	0.0	Z	0.2	0.7	2.1	1.4	2.0	2.0	0.8	1.0	0.7	1.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.6	2.1
28-Mar	Z	0.2	0.0	0.1	0.0	0.0	0.0	0.7	4.2	0.7	0.7	1.5	0.8	0.6	1.0	0.5	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.5	4.2
29-Mar	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.6	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6
30-Mar	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.3	0.1	0.2	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
31-Mar	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.4	0.5	0.3	0.1	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	0.7	0.7	0.7	0.5	0.4	0.4	0.4	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.0	Diurnal Average	
	0.1	0.2	0.2	0.1	0.2	0.2	0.2	1.2	5.8	2.2	2.4	2.2	1.8	1.3	2.0	3.6	6.1	1.1	0.8	3.6	0.7	0.3	0.4	0.2	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitric Oxide (NO) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb

Kirby North - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitric Oxide (NO) - ppb

Kirby North - March 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	24	48	71	31	15	26	42	106	110	52	32	19	14	28	53	29	700
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	24	48	71	31	15	26	42	106	110	52	32	19	14	28	53	29	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitric Oxide (NO) - ppb

Kirby North

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Nitric Oxide (NO) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitric Oxide (NO) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Kirby North - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 10.6 ppb on Mar 19 07:00

Maximum Daily Average: 4.0 ppb on Mar 2

Minimum Value: 0.2 ppb on Mar 11 00:00

Maximum Diurnal Average: 3.1 ppb at hour 9

Monthly Average: 2.03 ppb

Minimum Daily Average: 0.9 ppb on Mar 24

Minimum Diurnal Average: 1.6 ppb at hour 18

Percentiles: P_1 = 0.3 P_{10} = 0.6 Q_1 = 1.0 Median = 1.5 Q_3 = 2.7 P_{90} = 3.9 P_{99} = 8.1

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.0	1.0	1.0	0.7	Z	1.4	2.1	2.0	1.9	2.2	2.1	2.2	2.3	2.4	2.4	2.4	2.7	2.8	2.8	2.6	2.3	2.1	2.6	2.8	2.1	2.8
2-Mar	2.5	3.0	3.1	3.4	5.1	Z	5.1	4.7	5.1	5.0	4.7	4.2	3.9	3.1	3.6	5.0	9.3	3.0	3.1	7.5	2.9	1.8	1.9	1.2	4.0	9.3
3-Mar	Z	1.0	1.4	0.9	1.5	1.1	1.8	1.6	1.4	2.8	3.6	2.9	1.8	2.2	1.8	1.2	0.5	0.5	0.3	0.4	1.0	4.5	5.3	6.4	2.0	6.4
4-Mar	9.2	Z	6.5	1.1	0.5	0.6	0.4	0.7	0.8	0.6	1.0	1.1	1.9	0.9	0.5	0.6	0.6	0.5	0.8	0.6	0.6	1.1	0.3	0.9	1.4	9.2
5-Mar	1.7	2.6	Z	3.1	2.7	1.8	2.7	4.5	7.5	2.7	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	1.2	0.8	1.9	2.4	2.7	DF	1.9	7.5
6-Mar	1.8	2.6	3.7	3.1	3.1	3.6	2.8	2.4	2.1	1.5	1.3	1.0	Z	1.0	1.0	0.8	0.9	1.2	1.1	1.2	1.0	1.4	1.7	1.6	1.8	3.7
7-Mar	1.2	1.3	1.1	Z	1.2	1.2	1.3	1.4	1.3	1.2	1.2	1.1	1.1	1.2	1.0	1.3	1.2	0.9	1.1	1.4	1.4	1.2	0.9	1.1	1.2	1.4
8-Mar	1.0	0.9	1.3	1.4	Z	1.0	1.4	1.7	2.4	2.0	1.1	C	C	C	C	C	C	0.4	0.6	0.7	0.5	1.3	1.5	1.2	--	2.4
9-Mar	1.5	1.5	2.0	2.0	2.0	Z	2.7	2.5	2.7	0.9	0.6	0.7	0.7	0.8	0.7	1.1	1.2	1.2	1.3	1.2	0.8	0.8	0.9	1.0	1.3	2.7
10-Mar	Z	1.3	1.4	1.5	1.3	1.1	1.0	1.2	1.2	0.9	1.0	1.1	1.0	1.2	1.2	1.0	0.9	0.6	0.7	0.6	0.4	0.4	0.4	0.2	0.9	1.5
11-Mar	0.3	Z	0.8	0.6	1.0	0.5	0.4	0.8	2.9	2.2	1.8	0.8	1.0	1.2	1.0	0.7	0.6	0.9	0.9	1.2	2.0	2.2	1.4	2.3	1.2	2.9
12-Mar	1.3	1.1	Z	2.1	4.5	2.7	1.6	1.4	2.4	1.3	1.2	1.3	1.3	1.3	1.4	2.3	1.6	1.2	1.2	1.2	1.3	3.8	3.6	4.8	2.0	4.8
13-Mar	2.0	2.1	1.3	Z	2.5	2.3	1.5	2.1	3.3	2.2	1.4	1.6	1.4	1.8	1.9	1.9	3.2	4.4	0.9	0.6	4.0	1.7	3.8	1.8	2.2	4.4
14-Mar	1.3	1.3	1.2	1.5	Z	0.7	1.0	1.4	0.9	0.4	0.4	0.5	1.8	2.7	3.0	2.4	2.3	1.6	1.4	1.2	2.1	1.0	1.0	1.1	1.4	3.0
15-Mar	1.1	1.1	2.1	2.9	3.6	Z	6.8	4.1	2.1	1.6	3.4	2.1	1.4	1.4	1.5	1.3	1.8	3.4	2.6	2.6	3.1	1.9	3.7	2.5	2.5	6.8
16-Mar	Z	2.0	2.6	1.9	1.6	1.7	4.7	3.4	5.6	2.7	2.9	2.1	1.8	1.3	1.0	2.1	1.4	1.3	1.6	1.6	1.6	1.4	4.6	2.2	2.3	5.6
17-Mar	0.7	Z	2.3	2.4	2.1	2.0	1.7	2.0	6.3	4.3	3.5	2.8	2.5	1.9	1.6	1.7	1.7	2.2	1.9	4.5	7.6	3.8	6.1	8.1	3.2	8.1
18-Mar	4.7	6.4	Z	5.5	3.3	6.2	5.5	6.6	3.6	3.1	4.7	6.0	2.7	2.5	2.0	2.2	2.4	2.4	1.8	3.2	2.1	7.1	2.4	2.0	3.8	7.1
19-Mar	3.0	3.7	7.6	Z	4.3	9.1	10.6	9.5	3.1	1.3	1.6	1.1	1.5	1.5	2.7	1.7	1.1	1.7	0.5	0.5	0.5	0.7	1.9	1.0	3.1	10.6
20-Mar	1.4	1.5	2.1	2.1	Z	3.2	3.1	2.7	3.3	3.5	3.5	3.3	2.9	3.1	3.5	2.8	2.2	1.6	0.9	0.8	0.7	0.5	0.6	0.5	2.2	3.5
21-Mar	0.5	0.4	0.8	0.7	0.5	Z	0.8	0.7	0.8	0.7	0.6	0.6	0.6	0.7	0.8	0.9	1.4	2.5	2.8	0.7	0.6	2.6	0.9	0.9	1.0	2.8
22-Mar	Z	1.3	2.3	2.7	1.5	1.5	1.4	1.9	1.9	1.6	1.9	1.9	2.2	2.7	2.8	2.4	2.2	2.8	2.9	2.8	2.3	2.8	3.5	3.9	2.3	3.9
23-Mar	6.1	Z	6.4	5.7	4.4	5.6	5.2	4.5	5.6	4.1	2.9	1.8	1.5	1.4	1.2	1.0	0.8	0.8	3.7	3.9	2.1	1.5	0.9	0.7	3.1	6.4
24-Mar	0.5	0.6	Z	0.7	0.6	0.6	0.9	1.2	1.1	0.9	1.0	1.1	1.1	1.1	0.8	0.7	1.0	1.2	0.9	0.6	0.6	0.5	1.9	1.8	0.9	1.9
25-Mar	5.9	1.9	1.8	Z	3.1	2.8	2.8	2.0	2.1	2.6	1.4	2.2	2.3	1.5	1.0	1.0	2.4	2.8	1.9	2.0	5.3	2.2	2.1	1.3	2.4	5.9
26-Mar	1.1	0.7	1.1	0.8	Z	1.2	1.1	2.3	5.7	5.0	4.3	3.4	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.5	1.3	3.4	1.2	0.6	1.6	5.7
27-Mar	1.5	2.8	6.9	5.5	1.6	Z	2.4	2.5	4.3	3.0	3.2	3.0	1.5	2.1	1.7	2.2	1.0	0.8	0.7	0.8	1.0	0.8	0.9	1.4	2.2	6.9
28-Mar	Z	1.6	1.5	0.8	0.7	0.6	0.8	2.3	8.7	1.7	1.7	3.0	1.9	1.3	2.1	1.4	1.8	0.8	0.7	0.6	0.9	0.7	0.8	0.8	1.6	8.7
29-Mar	0.8	Z	1.2	1.4	1.4	1.6	2.1	3.2	1.5	1.3	1.2	0.9	1.2	1.3	1.0	1.4	1.1	1.6	5.4	4.2	4.3	4.2	3.2	3.1	2.1	5.4
30-Mar	2.3	1.7	Z	1.6	1.1	1.0	0.7	0.9	1.4	0.8	1.0	0.8	0.6	0.6	1.0	0.7	1.0	0.6	0.7	0.7	1.1	1.1	0.9	0.9	1.0	2.3
31-Mar	1.0	1.2	1.3	Z	2.1	2.3	2.7	3.6	3.3	3.2	3.3	3.2	2.9	2.7	3.3	2.7	3.2	2.3	2.6	2.3	8.9	2.9	1.4	2.1	2.8	8.9
	2.1	1.8	2.5	2.2	2.2	2.2	2.6	2.6	3.1	2.2	2.1	1.9	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.7	2.1	2.1	2.1	2.0	Diurnal Average	
	9.2	6.4	7.6	5.7	5.1	9.1	10.6	9.5	8.7	5.0	4.7	6.0	3.9	3.1	3.6	5.0	9.3	4.4	5.4	7.5	8.9	7.1	6.1	8.1	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Kirby North - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Kirby North - March 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	24	48	71	31	15	26	42	106	110	52	32	19	14	28	53	29	700
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	24	48	71	31	15	26	42	106	110	52	32	19	14	28	53	29	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Dioxide (NO_2) - ppb

Kirby North

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Kirby North - March 2023

Maximum Value: 15.4 ppb on Mar 2 17:00

Maximum Daily Average: 5.1 ppb on Mar 2

Minimum Value: 0.2 ppb on Mar 11 00:00

Minimum Daily Average: 1.0 ppb on Mar 10

Maximum Diurnal Average: 4.0 ppb at hour 9

Minimum Diurnal Average: 1.7 ppb at hour 19

Monthly Average: 2.30 ppb

Percentiles: P_1 = 0.4 P_{10} = 0.7 Q_1 = 1.0 Median = 1.7 Q_3 = 2.9 P_{90} = 4.6 P_{99} = 9.1

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	1.0	1.0	1.0	0.7	Z	1.4	2.1	2.1	2.1	2.8	3.1	3.1	3.4	3.1	3.0	2.8	3.0	2.9	2.8	2.7	2.3	2.2	2.7	2.8	2.3	3.4
2-Mar	2.5	3.1	3.1	3.4	5.2	Z	5.3	4.9	5.6	5.9	5.6	5.3	5.2	4.1	5.6	8.6	15.4	4.1	3.9	11.1	3.6	2.1	2.3	1.3	5.1	15.4
3-Mar	Z	1.0	1.4	0.9	1.6	1.2	1.9	2.1	1.8	4.6	5.9	4.4	2.6	3.4	2.9	1.7	0.5	0.5	0.3	0.4	1.0	4.5	5.3	6.5	2.5	6.5
4-Mar	9.3	Z	6.6	1.2	0.6	0.6	0.5	0.9	1.0	0.8	1.6	1.9	3.7	1.3	0.6	0.8	0.8	0.6	0.9	0.6	0.7	1.2	0.4	1.0	1.6	9.3
5-Mar	1.7	2.7	Z	3.2	2.7	1.9	2.8	5.4	13.3	4.8	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.3	1.2	0.9	2.0	2.4	2.7	DF	2.3	13.3
6-Mar	1.9	2.6	3.8	3.2	3.2	3.6	2.8	2.6	2.5	2.0	1.9	1.4	Z	1.4	1.2	1.0	1.0	1.3	1.2	1.2	1.0	1.4	1.7	1.6	2.0	3.8
7-Mar	1.2	1.3	1.1	Z	1.2	1.2	1.3	1.5	1.4	1.5	1.4	1.4	1.4	1.5	1.2	1.3	1.2	0.9	1.1	1.4	1.4	1.2	0.9	1.1	1.3	1.5
8-Mar	1.0	0.9	1.3	1.4	Z	1.0	1.4	1.8	3.0	2.7	1.5	C	C	C	C	C	C	0.4	0.6	0.7	0.5	1.3	1.5	1.2	--	3.0
9-Mar	1.5	1.6	2.1	2.1	2.1	Z	2.9	2.8	3.4	1.3	0.9	1.0	0.9	1.0	0.9	1.3	1.4	1.3	1.4	1.2	0.9	0.8	0.9	1.0	1.5	3.4
10-Mar	Z	1.3	1.4	1.5	1.3	1.1	1.0	1.3	1.3	1.0	1.2	1.2	1.2	1.3	1.3	1.0	0.9	0.6	0.7	0.6	0.4	0.4	0.4	0.2	1.0	1.5
11-Mar	0.3	Z	0.8	0.6	1.0	0.5	0.4	0.8	3.7	3.3	2.6	0.9	1.3	1.5	1.2	0.8	0.7	1.0	0.9	1.2	2.0	2.2	1.5	2.4	1.4	3.7
12-Mar	1.4	1.2	Z	2.2	4.7	2.8	1.7	1.6	3.0	1.7	1.5	1.7	2.0	1.7	1.8	2.9	1.8	1.3	1.3	1.2	1.6	4.1	3.8	4.9	2.3	4.9
13-Mar	2.0	2.2	1.3	Z	2.6	2.3	1.6	2.3	4.1	2.8	1.7	2.0	1.8	2.2	2.2	2.1	3.5	4.7	1.0	0.7	4.0	1.7	3.8	1.8	2.4	4.7
14-Mar	1.4	1.4	1.3	1.6	Z	0.8	1.1	1.5	1.0	0.4	0.5	0.6	2.7	4.0	4.2	3.2	3.1	1.8	1.5	1.2	2.2	1.0	1.0	1.1	1.7	4.2
15-Mar	1.1	1.1	2.1	2.9	3.6	Z	6.9	4.8	2.8	2.3	5.8	3.5	2.1	2.0	2.0	1.6	2.1	3.7	2.6	2.7	3.2	1.9	3.9	2.6	2.9	6.9
16-Mar	Z	2.0	2.7	1.9	1.7	1.7	4.9	3.6	7.2	3.4	4.1	2.9	2.3	1.6	1.1	2.8	1.7	1.3	1.7	1.6	1.6	1.4	4.7	2.2	2.6	7.2
17-Mar	0.7	Z	2.3	2.4	2.1	2.0	1.7	2.2	8.2	5.8	4.7	3.8	3.3	2.3	1.9	2.0	2.0	2.6	2.0	4.7	7.7	3.9	6.2	8.3	3.6	8.3
18-Mar	4.8	6.5	Z	5.6	3.4	6.4	5.6	7.3	4.3	3.6	6.2	8.2	3.2	3.0	2.5	2.6	2.8	2.5	1.9	3.2	2.1	7.1	2.4	2.0	4.2	8.2
19-Mar	3.0	3.7	7.6	Z	4.3	9.1	10.8	10.7	3.9	1.4	1.9	1.2	1.7	1.8	3.6	2.0	1.2	1.8	0.5	0.5	0.5	0.7	1.9	1.0	3.3	10.8
20-Mar	1.4	1.5	2.1	2.1	Z	3.2	3.1	2.7	3.6	3.8	3.8	3.6	3.1	3.3	3.7	3.0	2.3	1.6	0.9	0.8	0.7	0.5	0.6	0.5	2.3	3.8
21-Mar	0.5	0.4	0.8	0.7	0.6	Z	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.8	1.0	1.1	1.6	2.8	2.9	0.7	0.6	2.6	0.9	0.9	1.1	2.9
22-Mar	Z	1.3	2.3	2.7	1.5	1.5	1.4	2.1	2.3	2.0	2.4	2.4	2.7	3.4	3.5	2.9	2.5	3.1	3.0	2.8	2.3	2.8	3.5	3.9	2.5	3.9
23-Mar	6.1	Z	6.4	5.7	4.4	5.6	5.2	4.7	6.6	4.9	3.4	1.9	1.5	1.6	1.2	1.1	0.8	0.9	3.7	3.9	2.2	1.6	0.9	0.7	3.3	6.6
24-Mar	0.6	0.6	Z	0.7	0.6	0.6	0.9	1.3	1.2	1.0	1.4	1.4	1.3	1.4	1.0	0.7	1.1	1.2	0.9	0.6	0.6	0.5	1.9	1.8	1.0	1.9
25-Mar	5.9	1.9	1.8	Z	3.1	2.8	2.8	2.0	2.5	3.3	1.6	2.9	3.1	1.9	1.0	1.1	2.9	3.1	1.9	2.0	5.3	2.2	2.2	1.3	2.5	5.9
26-Mar	1.2	0.8	1.1	0.9	Z	1.3	1.2	2.7	7.5	7.2	6.6	5.2	0.7	0.6	0.7	0.7	0.7	0.5	0.5	0.6	1.4	3.5	1.3	0.7	2.1	7.5
27-Mar	1.6	2.9	7.1	5.6	1.6	Z	2.6	3.2	6.4	4.4	5.2	5.0	2.3	3.1	2.4	3.4	1.2	0.9	0.7	0.8	1.0	0.9	0.9	1.4	2.8	7.1
28-Mar	Z	1.8	1.5	0.9	0.7	0.6	0.8	3.0	12.9	2.4	2.4	4.5	2.7	1.9	3.1	1.9	2.5	1.0	0.8	0.7	1.0	0.8	0.9	0.9	2.2	12.9
29-Mar	0.9	Z	1.3	1.5	1.4	1.7	2.2	3.8	1.8	1.6	1.4	1.1	1.4	1.4	1.1	1.6	1.2	1.7	5.5	4.2	4.3	4.2	3.2	3.1	2.2	5.5
30-Mar	2.3	1.7	Z	1.6	1.1	1.0	0.7	0.9	1.6	0.9	1.3	0.9	0.8	0.7	1.2	0.7	1.2	0.6	0.7	0.7	1.1	1.1	0.9	0.9	1.1	2.3
31-Mar	1.0	1.2	1.3	Z	2.1	2.3	2.7	3.7	3.5	3.4	3.7	3.7	3.2	2.8	3.6	2.8	3.5	2.3	2.6	2.3	8.9	2.9	1.4	2.1	2.9	8.9
	2.2	1.8	2.5	2.2	2.3	2.2	2.6	2.9	4.0	2.8	2.8	2.6	2.2	2.0	2.0	2.0	2.2	1.7	1.7	1.9	2.2	2.1	2.1	2.0	Diurnal Average	
	9.3	6.5	7.6	5.7	5.2	9.1	10.8	10.7	13.3	7.2	6.6	8.2	5.2	4.1	5.6	8.6	15.4	4.7	5.5	11.1	8.9	7.1	6.2	8.3	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Kirby North - March 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Kirby North - March 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	24	48	71	31	15	26	42	106	110	52	32	19	14	28	53	29	700
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	24	48	71	31	15	26	42	106	110	52	32	19	14	28	53	29	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Nitrogen Oxides (NO_X) - ppb

Kirby North

Classes (ppb)

- 0 - 20
- 21 - 40
- 11 - 80
- 81 - 159
- > 159

Total Number of Valid Hours: 700

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Span Responses

Nitrogen Oxides (NO_X) - ppb

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Kirby North - March 2023

Maximum Value: 7.9 C on Mar 18 17:00

Maximum Daily Average: -0.1 C on Mar 19

Minimum Value: -25.7 C on Mar 5 04:00

Minimum Daily Average: -19.4 C on Mar 5

Maximum Diurnal Average: -2.7 C at hour 16

Minimum Diurnal Average: -12.8 C at hour 7

Monthly Average: -8.12 C

Percentiles: P_1 = -22.9 P_{10} = -15.9 Q_1 = -12.1 Median = -8.3 Q_3 = -4.1 P_{90} = 0.1 P_{99} = 6.7

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	-15.3	-15.3	-14.8	-14.6	-14.6	-14.5	-14.7	-15.4	-14.8	-13.5	-11.5	-10.1	-8.6	-8.2	-7.4	-8.1	-9.0	-9.5	-10.4	-10.7	-10.7	-10.8	-10.9	-10.9	-11.8	-7.4
2-Mar	-10.9	-10.9	-10.8	-10.7	-10.5	-10.2	-9.6	-9.1	-8.1	-6.3	-4.1	-1.7	0.8	2.9	3.9	4.3	4.0	2.4	0.6	-0.9	-1.8	-2.9	-4.0	-5.3	-4.1	4.3
3-Mar	-5.7	-5.6	-6.7	-5.9	-5.8	-5.6	-5.7	-4.9	-4.5	-3.6	-2.3	-1.9	-2.0	-1.8	-1.6	-2.0	-2.3	-3.7	-4.3	-5.4	-6.8	-8.4	-9.4	-10.4	-4.8	-1.6
4-Mar	-11.5	-11.9	-12.0	-12.5	-13.8	-15.2	-15.7	-15.7	-15.5	-15.0	-14.6	-14.3	-14.1	-14.4	-13.9	-13.9	-14.1	-15.0	-16.4	-17.4	-18.5	-19.8	-20.7	-22.3	-15.3	-11.5
5-Mar	-22.9	-23.1	-24.4	-25.7	-25.5	-24.1	-25.1	-23.7	-22.8	-19.6	-17.4	-16.1	-14.9	-13.9	-13.0	-12.7	-12.8	-14.2	-18.2	-18.7	-18.5	-19.3	-20.8	DF	-19.4	-12.7
6-Mar	-19.7	-19.8	-20.4	-19.9	-19.5	-19.4	-20.2	-19.7	-18.1	-16.0	-14.9	-12.8	-12.3	-12.1	-11.2	-11.1	-12.1	-12.7	-13.5	-13.7	-14.1	-14.4	-14.7	-14.9	-15.7	-11.1
7-Mar	-14.7	-14.8	-15.0	-15.5	-16.3	-17.1	-18.0	-18.3	-16.8	-15.3	-13.9	-11.8	-9.9	-8.0	-6.0	-6.3	-7.2	-8.1	-9.5	-10.8	-11.5	-12.4	-12.9	-13.7	-12.7	-6.0
8-Mar	-14.9	-15.9	-16.5	-17.5	-18.6	-19.1	-19.3	-18.9	-16.9	-14.4	-11.9	-9.8	-8.8	-7.8	-6.8	-6.7	-7.3	-8.4	-10.5	-12.1	-12.6	-14.3	-15.6	-15.9	-13.3	-6.7
9-Mar	-16.5	-17.2	-18.1	-19.3	-20.3	-20.5	-20.2	-19.8	-18.4	-16.0	-14.0	-11.9	-10.3	-10.6	-10.2	-9.6	-9.8	-10.8	-11.3	-11.5	-11.9	-12.2	-12.7	-13.0	-14.4	-9.6
10-Mar	-13.0	-13.2	-13.4	-13.6	-13.8	-13.7	-13.7	-13.4	-13.0	-11.8	-11.0	-9.5	-8.2	-7.3	-6.9	-6.6	-6.8	-7.4	-8.0	-8.1	-8.5	-9.3	-10.1	-10.6	-10.5	-6.6
11-Mar	-11.2	-11.7	-11.7	-11.8	-12.2	-13.4	-14.2	-12.8	-13.0	-10.1	-7.5	-5.3	-4.8	-3.9	-3.6	-3.2	-3.9	-4.4	-4.9	-6.2	-7.7	-8.5	-9.0	-9.8	-8.5	-3.2
12-Mar	-10.6	-10.8	-11.4	-11.6	-11.3	-11.4	-12.1	-11.9	-10.9	-9.5	-8.1	-6.9	-6.1	-5.6	-5.3	-5.0	-5.2	-5.6	-6.1	-7.6	-9.9	-12.1	-13.4	-13.8	-9.3	-5.0
13-Mar	-13.3	-12.7	-13.8	-15.2	-15.8	-15.5	-14.8	-14.1	-12.8	-11.9	-10.3	-8.4	-7.4	-6.1	-5.1	-4.6	-5.1	-6.3	-7.4	-7.8	-8.4	-8.9	-8.5	-8.3	-10.1	-4.6
14-Mar	-8.3	-8.2	-8.2	-8.3	-8.3	-8.3	-8.2	-8.2	-8.1	-8.3	-7.8	-7.5	-7.4	-7.6	-8.0	-8.3	-8.2	-8.4	-8.7	-9.2	-9.4	-10.0	-10.5	-11.1	-8.5	-7.4
15-Mar	-12.3	-14.4	-15.7	-17.0	-18.6	-19.8	-20.6	-19.0	-14.1	-13.3	-10.9	-9.1	-7.3	-5.5	-4.3	-4.2	-5.2	-5.8	-8.0	-9.7	-9.8	-10.1	-12.1	-13.6	-11.7	-4.2
16-Mar	-10.9	-10.5	-10.6	-10.7	-10.9	-10.8	-10.8	-10.1	-8.5	-7.0	-5.7	-3.5	-2.3	-1.9	-1.3	-0.9	-0.8	-1.3	-2.9	-6.3	-7.2	-7.0	-8.1	-8.4	-6.6	-0.8
17-Mar	-8.5	-9.2	-9.4	-10.1	-10.3	-10.3	-9.6	-9.4	-6.4	-3.1	0.0	3.1	5.5	6.7	7.0	7.1	6.8	5.5	2.8	1.1	-0.6	-2.4	-3.3	-4.2	-2.1	7.1
18-Mar	-5.2	-5.7	-6.6	-7.5	-8.0	-8.7	-9.2	-8.2	-6.9	-4.5	-1.0	2.9	6.6	7.1	7.6	7.7	7.9	7.4	5.6	3.8	-0.3	-0.8	-2.4	-4.0	-0.9	7.9
19-Mar	-4.3	-5.3	-6.7	-5.3	-4.0	-5.2	-5.6	-4.6	-0.8	2.5	4.0	5.5	5.7	5.7	5.8	6.0	5.6	4.5	2.1	0.4	-0.6	-1.6	-2.2	-2.8	-0.1	6.0
20-Mar	-3.5	-3.6	-3.7	-4.1	-4.2	-4.5	-5.6	-5.4	-3.7	-2.0	-0.2	0.6	1.8	2.4	3.1	1.2	-1.2	-4.1	-6.3	-7.2	-8.0	-8.6	-8.9	-9.0	-3.5	3.1
21-Mar	-9.0	-9.2	-9.5	-10.0	-10.3	-10.1	-10.2	-10.0	-9.5	-9.0	-7.9	-6.4	-5.2	-4.2	-3.0	-2.7	-2.7	-3.5	-5.4	-7.2	-8.5	-9.6	-9.6	-10.7	-7.6	-2.7
22-Mar	-11.6	-11.6	-11.3	-11.7	-11.8	-12.4	-12.7	-11.0	-9.0	-6.9	-4.9	-2.8	-0.8	0.5	1.0	2.1	2.1	1.6	-0.2	-2.0	-3.5	-4.9	-6.0	-6.7	-5.6	2.1
23-Mar	-6.8	-6.1	-5.9	-5.8	-6.8	-7.8	-8.6	-6.9	-3.5	0.2	4.1	5.9	6.4	6.5	5.7	4.6	4.8	4.2	1.2	-1.6	-3.8	-5.7	-7.7	-9.0	-1.8	6.5
24-Mar	-9.0	-8.9	-8.9	-9.1	-9.2	-9.4	-9.6	-9.6	-9.2	-7.7	-6.4	-4.7	-4.1	-2.7	-2.1	-1.3	-0.9	-1.1	-2.6	-6.8	-9.5	-9.7	-8.3	-8.7	-6.6	-0.9
25-Mar	-8.2	-9.4	-8.9	-8.7	-9.4	-10.0	-10.1	-8.7	-6.2	-3.8	-1.7	-0.6	0.1	0.8	1.5	1.7	1.0	-0.4	-2.6	-5.0	-6.4	-7.4	-8.9	-10.5	-5.1	1.7
26-Mar	-11.4	-12.4	-14.0	-14.4	-15.2	-15.2	-15.3	-15.1	-13.7	-11.9	-10.3	-9.5	-8.0	-8.0	-7.1	-7.1	-7.8	-8.8	-10.9	-13.3	-15.3	-16.2	-17.0	-17.4	-12.3	-7.1
27-Mar	-18.1	-20.3	-21.1	-21.2	-22.0	-21.6	-20.6	-18.9	-15.0	-12.8	-11.3	-10.2	-9.4	-8.3	-7.5	-7.1	-6.9	-7.0	-7.8	-8.8	-10.5	-11.0	-13.7	-14.7	-13.6	-6.9
28-Mar	-11.9	-10.0	-11.3	-11.9	-13.7	-16.3	-16.5	-13.7	-10.3	-8.7	-7.0	-5.8	-4.6	-3.9	-3.3	-2.3	-1.7	-1.7	-2.3	-3.9	-5.4	-6.4	-6.7	-6.3	-7.7	-1.7
29-Mar	-6.2	-6.2	-6.1	-5.8	-5.9	-6.2	-5.7	-4.2	-2.1	-1.1	-0.4	0.0	-0.1	-0.4	-0.5	-0.3	-0.2	-0.5	-2.2	-3.2	-4.7	-5.6	-6.5	-7.9	-3.4	0.0
30-Mar	-8.7	-8.8	-9.6	-9.1	-8.7	-8.8	-8.4	-7.4	-6.4	-4.5	-2.4	-1.2	-0.4	0.6	0.8	0.9	1.0	0.7	0.0	-0.8	-1.5	-1.6	-2.0	-2.7	-3.7	1.0
31-Mar	-3.1	-3.6	-4.2	-5.0	-5.5	-6.1	-6.4	-6.0	-4.8	-3.6	-1.9	0.1	2.1	3.3	4.6	6.0	6.2	6.1	3.0	0.3	-0.8	-1.5	-2.1	-2.1	-1.0	6.2
	-10.9	-11.2	-11.6	-11.9	-12.3	-12.6	-12.8	-12.1	-10.4	-8.7	-6.9	-5.3	-4.1	-3.4	-2.8	-2.7	-3.0	-3.7	-5.3	-6.8	-8.0	-8.8	-9.6	-9.9	Diurnal Average	
	-3.1	-3.6	-3.7	-4.1	-4.0	-4.5	-5.6	-4.2	-0.8	2.5	4.1	5.9	6.6	7.1	7.6	7.7	7.9	7.4	5.6	3.8	-0.3	-0.8	-2.0	-2.1	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Ambient Temperature (AT) - C

Kirby North - March 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	24	3.23	3.23
-20 - 0	642	86.41	89.64
0 - 10	77	10.36	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Kirby North - March 2023

Maximum Value: 91.8 % on Mar 3 00:00

Maximum Daily Average: 83.5 % on Mar 14

Minimum Value: 23.5 % on Mar 28 14:00

Minimum Daily Average: 47.4 % on Mar 18

Maximum Diurnal Average: 78.7 % at hour 7

Minimum Diurnal Average: 47.4 % at hour 15

Monthly Average: 64.39 %

Percentiles: P_1 = 26.8 P_{10} = 40.0 Q_1 = 52.7 Median = 66.4 Q_3 = 78.0 P_{90} = 84.7 P_{99} = 90.2

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	77.3	80.5	81.8	81.8	82.6	82.0	81.9	82.1	81.9	79.2	72.9	71.0	68.1	69.0	67.4	70.8	75.2	78.6	82.4	84.9	84.7	84.1	83.6	84.4	78.7	84.9
2-Mar	84.7	84.3	83.0	82.9	83.0	83.1	81.7	80.1	75.5	69.2	64.6	57.1	51.5	46.1	42.8	38.3	38.2	47.2	61.2	77.5	77.7	83.7	88.6	91.8	69.7	91.8
3-Mar	87.6	77.0	77.5	74.3	78.5	82.4	86.8	84.3	79.4	67.9	63.3	59.5	61.3	58.5	52.1	52.8	57.3	63.6	67.4	70.5	75.1	80.5	84.6	84.8	72.0	87.6
4-Mar	83.4	82.9	81.7	77.2	79.8	81.0	78.9	75.9	72.1	68.2	64.8	58.1	58.0	59.5	57.9	57.9	57.5	57.3	62.3	68.4	72.1	75.0	76.9	78.3	70.2	83.4
5-Mar	77.5	77.3	75.3	74.4	75.4	76.7	75.5	75.7	72.8	71.5	63.2	52.8	44.3	43.0	40.5	40.0	40.2	43.2	56.4	59.0	58.5	60.3	64.3	DF	61.6	77.5
6-Mar	63.0	62.0	65.0	67.8	72.7	72.6	72.4	74.5	73.7	67.8	64.0	58.6	59.3	59.1	56.2	59.7	68.2	78.7	80.2	81.8	80.4	77.6	72.8	72.5	69.2	81.8
7-Mar	64.8	60.9	61.3	66.4	71.0	73.7	76.2	76.6	72.5	69.2	67.2	61.9	57.6	53.1	49.7	51.9	54.0	56.2	52.9	47.4	47.6	49.7	51.1	52.8	60.2	76.6
8-Mar	56.5	59.1	60.6	63.5	67.0	69.0	69.3	67.6	59.9	53.5	49.9	36.9	33.7	30.1	28.2	27.6	27.4	27.8	32.9	37.9	40.4	45.3	49.9	51.2	47.7	69.3
9-Mar	53.5	56.0	58.9	63.1	66.4	67.2	68.1	67.4	64.7	61.8	58.0	53.4	52.2	56.2	61.2	58.8	59.8	64.0	65.7	65.6	69.2	73.1	75.9	78.2	63.3	78.2
10-Mar	78.1	77.6	76.8	78.2	78.3	77.8	78.0	77.4	74.2	66.8	65.6	64.0	63.1	63.6	65.8	65.3	71.4	75.9	76.9	72.3	75.3	77.3	78.1	78.3	73.2	78.3
11-Mar	76.1	76.9	79.8	82.1	83.6	85.6	86.3	84.4	81.0	73.3	67.8	61.1	61.9	59.4	58.3	57.1	65.7	65.2	72.5	81.9	84.1	86.3	88.4	89.8	75.4	89.8
12-Mar	89.7	89.3	88.6	88.3	88.3	87.9	87.5	87.1	86.6	84.1	79.2	73.1	71.2	73.8	74.9	71.9	70.4	67.6	65.8	71.9	74.4	81.6	85.4	86.3	80.2	89.7
13-Mar	86.1	85.5	84.7	84.7	84.9	84.9	85.2	82.8	80.6	77.3	71.0	65.0	61.9	58.9	56.6	57.0	59.9	70.3	82.5	80.2	79.5	88.9	88.9	89.1	76.9	89.1
14-Mar	90.6	90.1	90.3	90.5	91.0	91.1	90.8	90.8	89.8	86.4	80.4	77.7	75.5	72.7	72.8	73.2	75.6	76.0	81.4	80.2	82.7	85.7	84.6	84.5	83.5	91.1
15-Mar	83.9	86.1	87.5	85.9	84.7	83.2	81.5	79.7	77.1	72.7	64.2	57.3	53.1	50.4	49.5	50.1	55.5	57.8	66.9	77.5	77.3	77.9	80.0	88.4	72.0	88.4
16-Mar	83.0	81.0	82.0	83.2	81.4	80.5	81.4	80.4	79.3	77.2	71.3	61.5	58.3	57.9	54.4	52.6	50.8	52.2	57.2	69.7	76.9	74.4	76.7	79.3	70.9	83.2
17-Mar	78.0	77.6	76.8	79.0	80.3	81.1	78.0	75.3	65.8	56.5	46.4	38.2	30.7	27.0	25.6	25.3	25.7	27.8	32.7	36.1	41.3	46.4	48.7	52.6	52.2	81.1
18-Mar	56.1	58.3	61.8	64.0	65.9	69.4	71.0	66.7	62.1	55.5	45.6	36.4	28.0	26.6	25.7	26.0	27.2	28.8	32.0	34.9	45.3	44.9	50.0	55.4	47.4	71.0
19-Mar	56.6	60.7	67.1	62.5	59.3	65.6	68.5	63.5	52.0	45.2	41.9	38.9	39.0	39.9	39.4	38.9	39.2	42.2	47.0	53.2	56.5	60.6	64.0	65.9	52.8	68.5
20-Mar	68.6	70.0	72.2	72.9	73.1	76.7	78.8	76.3	67.3	60.9	53.4	50.9	46.4	45.3	43.0	56.1	68.1	81.8	85.9	87.4	86.9	88.2	89.4	89.1	70.4	89.4
21-Mar	88.6	88.7	88.2	89.4	89.6	88.2	88.1	87.3	84.6	79.4	72.5	64.0	56.7	51.5	47.4	45.2	44.2	45.3	51.9	61.0	66.2	72.0	72.5	77.6	70.8	89.6
22-Mar	81.4	82.1	82.9	84.3	84.4	86.0	87.0	82.2	73.8	65.0	60.5	53.4	47.8	46.0	43.9	42.4	43.0	44.4	49.2	54.7	58.9	63.5	67.1	70.5	64.8	87.0
23-Mar	72.4	72.6	73.2	73.8	76.8	81.8	83.9	77.7	66.0	54.8	45.8	39.4	33.6	32.0	36.6	41.1	38.1	37.3	52.9	63.0	68.5	69.4	74.3	82.0	60.3	83.9
24-Mar	84.0	82.9	80.5	78.0	78.4	78.3	77.2	73.5	71.1	63.3	55.3	49.2	45.9	40.8	36.1	33.1	32.3	30.0	32.7	45.7	61.5	62.9	51.6	51.1	58.1	84.0
25-Mar	48.5	54.1	55.1	58.1	64.2	70.9	73.6	70.3	64.5	54.4	46.9	47.6	46.7	38.6	30.2	30.8	29.6	30.5	37.3	36.8	41.2	43.4	48.4	50.2	48.8	73.6
26-Mar	52.4	56.9	63.3	68.4	73.1	74.2	75.2	73.9	67.1	60.3	54.1	48.6	39.8	39.6	36.8	36.5	33.0	30.8	34.8	41.6	47.8	49.5	51.1	51.6	52.5	75.2
27-Mar	55.3	64.0	69.0	67.7	70.2	68.9	65.7	60.1	51.8	44.8	41.7	43.9	43.1	40.7	39.4	39.5	39.9	41.7	45.8	50.5	55.4	55.8	62.8	68.8	53.6	70.2
28-Mar	66.7	62.8	66.8	71.5	75.3	83.2	79.6	65.1	51.4	42.9	38.0	31.6	27.2	23.5	26.7	27.7	27.8	27.9	30.1	37.6	43.2	45.1	45.2	45.1	47.6	83.2
29-Mar	49.0	53.2	55.4	56.3	58.3	60.2	59.3	55.6	54.1	57.4	55.9	54.6	56.7	59.6	60.0	58.6	58.0	60.2	66.9	69.2	73.6	75.8	78.0	82.1	61.2	82.1
30-Mar	84.0	85.3	87.8	87.5	87.1	87.2	86.3	81.3	75.3	59.6	45.9	38.7	40.1	40.0	42.9	43.7	44.6	44.9	47.7	52.7	59.0	60.7	62.9	71.6	63.2	87.8
31-Mar	71.9	77.8	81.6	85.3	87.7	89.1	87.3	83.2	77.3	73.0	68.3	61.2	56.2	53.5	48.4	43.4	42.4	41.7	53.7	63.5	66.1	67.5	68.0	72.6	67.5	89.1
	72.6	73.3	74.7	75.6	77.2	78.7	78.7	76.1	71.1	65.1	59.3	53.7	50.6	48.9	47.4	47.5	49.0	51.5	56.9	61.8	65.4	68.0	69.8	72.5	Diurnal Average	
	90.6	90.1	90.3	90.5	91.0	91.1	90.8	90.8	89.8	86.4	80.4	77.7	75.5	73.8	74.9	73.2	75.6	81.8	85.9	87.4	86.9	88.9	89.4	91.8	Diurnal Maximum	

DF - DAS Failure

Wood Buffalo Environmental Association

Hourly Averages

Relative Humidity (RH) - %

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Relative Humidity (RH) - %

Kirby North - March 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	75	10.09	10.09
40 - 60	212	28.53	38.63
60 - 80	298	40.11	78.73
80 - 100	158	21.27	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Kirby North - March 2023

Maximum Speed: 27 km/h on Mar 2 16:00

Maximum Daily Speed Average: 13.2 km/h on Mar 9

Minimum Speed Value: 1 km/h on Mar 19 03:00

Minimum Daily Speed Average: 2.5 km/h on Mar 25

Maximum Diurnal Speed Average: 5.0 km/h at hour 2

Minimum Diurnal Speed Average: 0.9 km/h at hour 11

Monthly Average Velocity: 2.1 km/h 155.6 deg

Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 7$ Median = 10 $Q_3 = 13$ $P_{90} = 15$ $P_{99} = 21$

Hours in Service: 744

Hours of Data: 737

Hours of Missing Data: 7

Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Mar	SSE11	S9	S9	S10	S10	SSE11	SSE11	SSE10	S9	S11	S13	SSW11	SSW13	S13	SSW15	SSW14	SSW14	SSW12	S14	S15	S14	S13	S14	S12	S11.7	S15
2-Mar	S13	S13	S13	S14	S14	S14	S13	S14	S15	SSW16	SSW15	SSW17	SW18	WSW22	WSW23	W27	W21	WSW19	WNW18	W20	W13	WSW14	SW11	SW11	SW13.1	W27
3-Mar	SW13	SW13	SSW10	SW12	WSW10	SW9	SW10	WSW14	WSW14	W14	WNW13	WNW15	WNW16	WNW17	WNW16	NW14	N11	NNW11	NNW9	NNW14	N11	NE12	NE9	NE11	WNW7.3	WNW17
4-Mar	NNE10	NNE7	NW5	NW11	NW10	NW12	NNW11	NW15	NW14	NW14	NW18	NW18	WNW18	NW15	NW14	NNW14	NNW14	NNW12	N8	NNW6	NNW7	NNW7	N8	NE8	NNW10.6	WNW18
5-Mar	NE8	NNE5	SSW4	SW3	NW4	NW5	NW5	NNW3	WSW2	WNW6	NNW9	N8	N7	NNE5	NNE5	NNE6	NNE7	NE4	ENE5	E7	ESE7	SE5	SE3	DF	NNE2.7	NNW9
6-Mar	SE7	SSE8	SSE8	SSE7	SSE7	SSE6	SSE7	SSE10	SSE11	SSE12	SSE11	SSE13	SSE12	SE13	SSE11	SE12	SSE12	SE7	ESE7	ESE9	SE9	SE10	SE10	SE9	SSE9.2	SSE13
7-Mar	SE11	SE13	SSE14	S14	S12	SSE12	S10	SSE10	S11	SSE14	SSE12	SSE13	SSE13	SSE15	SSE16	SSE17	SSE15	SSE15	SSE12	SSE10	SSE12	SSE13	SSE12	SSE11	SSE12.6	SSE17
8-Mar	SSE10	SSE11	SSE11	SE8	ESE7	ESE9	ESE8	SE12	SE11	SE9	SSE13	SSE14	SE13	SE12	ESE10	ESE11	ESE13	SE9	SE8	SE9	SE14	SE10	SSE9	SSE12	SE10.0	SSE14
9-Mar	SSE11	SSE9	SSE8	SSE8	SSE8	SSE8	SSE8	SSE11	SSE11	SSE15	SSE17	SSE17	SSE17	SSE17	SE15	SE14	SSE15	SE15	SE15	SE15	SSE18	SSE16	SSE15	SSE16	SSE13.2	SSE18
10-Mar	SSE16	SSE14	SSE15	SSE13	SE13	SE14	SE12	SE13	SSE15	SSE17	SSE14	SSE16	SSE14	SE14	SE14	ESE14	ESE12	ESE10	ESE9	ESE13	ESE12	ESE11	ESE12	ESE12	SE12.7	SSE17
11-Mar	ESE12	SE9	SE7	ESE6	E4	E4	ESE5	SE7	ENE2	NNE4	NNE5	ESE12	ESE10	SE10	SSE9	SSE9	SSE8	S9	SSE9	S6	S7	S7	S7	S6	SE5.8	ESE12
12-Mar	S7	S7	SSW6	S6	SSW6	S6	S7	S7	S6	SSW9	SSW8	SSW11	SW13	SW11	SW10	S8	SSE10	SSE9	S8	SW11	SSW11	SSW7	S7	S7	SSW7.7	SW13
13-Mar	S7	S6	SE7	SSE8	SSE9	SSE8	SE6	ESE4	ESE8	ENE13	ENE14	ENE15	ENE18	ENE17	NE17	ENE19	ENE20	ENE22	ENE20	E15	ENE12	ENE12	ENE11	NE10	E10.3	ENE22
14-Mar	NE10	NE9	NE8	NE6	NNE6	NNE9	NNE7	N7	N9	N11	N12	NNW11	WNW18	NW18	NW18	NW17	NW14	NW13	NNW11	NW9	NW8	NNW8	NNW9	NNW8	NNW8.8	WNW18
15-Mar	NNW8	N7	N7	N6	N4	N4	UO	NNE2	NNE3	NE7	ENE4	NNW5	N5	NNE6	N6	NNE8	NE7	ENE7	E5	SE6	SE9	SE9	SSE3	N2	NNE3.5	SE9
16-Mar	SSE7	SSE9	S7	SSE8	S9	S9	S7	S5	W5	NW10	NW9	NW8	NW10	NW11	NW11	NW11	NW10	NW9	NW6	SSE4	S5	SSE8	S10	S10	WSW3.0	NW11
17-Mar	S11	S14	S13	S13	S12	S12	S13	S12	S14	SSW12	SSW11	SSW12	SW12	SW15	SW16	SW15	SW15	SW13	SW10	SSW9	S8	S9	S10	S11	SSW11.5	SW16
18-Mar	S10	SSW11	S10	S11	SSW10	S9	S9	SSW10	SSW10	SSW8	W5	W5	NW7	WNW11	NW12	WNW12	WNW10	WNW11	WNW10	NW8	NE4	E5	SE1	SSW4	WSW4.3	WNW12
19-Mar	UO	S2	NNW1	NNE5	NE7	NE7	NE6	NNE5	NE4	E7	ENE11	ENE10	ENE13	NE17	NE16	ENE15	E12	E13	E15	E11	ESE11	SE11	SSE13	SSE14	E7.6	NE17
20-Mar	S11	S11	S13	S9	SSW4	SSE5	S5	SSE4	S7	S9	S8	WSW8	SSW7	SW4	WNW4	NNE17	NE22	NNE22	NNE21	NNE19	NNE18	NNE14	NNE13	NNE10	NE3.0	NNE22
21-Mar	NNE10	NNE12	NNE12	NNE13	NNE11	N9	NNW7	N7	NNE13	NNE11	NNE10	NE10	NNE7	NNE7	NE5	NE5	ENE5	E7	ESE8	SE10	SE10	SSE8	SSE11	SSE11	NE5.5	NNE13
22-Mar	SSE11	S12	S11	S10	S12	S12	S13	S15	S17	S18	S14	S15	S14	SW16	SW15	SW13	SW14	SW11	SSW8	S9	S9	S10	S11	S11	SSW11.9	S18
23-Mar	S11	S12	S12	SSW10	SSW8	SSW6	SSW4	SSW6	WSW6	WSW3	NW7	NNW12	NW14	NW14	NNW16	NNW17	NNW16	NNW10	NE16	NE17	NE17	NE15	NE14	NE16	N3.7	NE17
24-Mar	NE16	NE14	NE14	NE13	NE11	NE10	NE9	NE10	NE11	NNE11	NE9	NE7	ENE5	NNE4	N6	NNE6	NW5	W4	UO	UO	UO	UO	S7	SSW6	NE7.0	NE16
25-Mar	SSW7	SSW8	SSW9	S9	S10	S10	S9	SSE4	SW5	WNW6	NW4	WNW8	WNW8	NW12	NNW13	NNW15	N17	NNE19	NNE15	NE9	ENE10	NE11	NE9	NE9	N2.5	NNE19
26-Mar	NE11	NE9	NE11	NE10	NE9	NE10	NE10	NE12	NE9	NE11	NE10	NE10	NNE11	NE12	NE13	NNE14	NE16	NE16	NE12	NE10	NE8	ENE8	E7	ESE6	NE10.3	NE16
27-Mar	SSE3	S2	NW3	SW2	SW3	SSW4	SW4	SSW6	NW5	NW6	NW11	WNW12	NW14	WNW11	WNW13	NW16	NW15	NW14	NW9	WNW6	SSW2	SSE2	SE3	SSE2	WNW5.4	NW16
28-Mar	W10	WNW9	WNW3	NW3	N2	N2	NE8	NE7	NE7	E7	NW3	WNW5	WNW5	WSW6	W11	W11	WSW10	SW10	SSW9	SW11	SSW11	SSW9	SSW10	SSW10	WSW3.6	W11
29-Mar	SSW11	SSW11	SSW11	SSW11	SSW8	S4	WSW6	WNW7	N11	NNE14	NNE15	N14	NNE13	NNE13	N12	NNE14	NNE12	NE14	NE17	NE10	NE10	ENE10	ENE10	ENE7	NNE5.2	NE17
30-Mar	ENE9	E5	ENE6	ENE5	SSE3	SE1	SSE3	SSE6	S9	S7	S3	SSW6	SW6	WSW7	WSW12	WSW12	SW10	SSW9	SSW9	S9	SSE7	SSE9	SSE11	SSE10	S5.1	WSW12
31-Mar	SSE10	S10	S10	S10	S11	SSE12	SSE13	SSE12	SSE9	S9	SSW7	W5	W5	WSW9	W6	NW6	WNW4	NNE7	NNE10	NE11	ENE11	ENE10	ESE6	S7	SSE3.9	SSE13
	SSE4.9	SSE5.0	SSE4.8	SSE4.3	SSE3.9	SSE3.8	SSE3.9	SSE3.5	S3.0	S2.2	S0.9	SW1.2	WSW1.6	W2.2	WNW2.8	NNW2.4	N1.4	NNE1.4	ENE2.6	ESE2.7	ESE3.9	SE4.7	SE4.5	SE4.7	Diurnal Average	
	NE16	NE14	SSE15	S14	S14	S14	S13	NW15	S17	S18	NW18	NW18	WNW18	WSW22	WSW23	W27	NE22	ENE22	NNE21	W20	NNE18	SSE16	SSE15	NE16	Diurnal Maximum	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Speed (WS) - km/h

Kirby North - March 2023

Wood Buffalo Environmental Association

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

Kirby North - March 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	94	12.75	12.75
6 - 11	385	52.24	64.99
12 - 19	247	33.51	98.51
20 - 28	11	1.49	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744

Wood Buffalo Environmental Association

Frequency Distribution

Wind Speed (WS) - km/h

Kirby North - March 2023

Wind Speed							**Wind Direction**										
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	6	10	5	6	5	2	5	10	7	6	6	2	6	5	10	3	94
6 - 11	16	21	45	13	6	19	25	54	71	41	13	8	4	12	21	16	385
12 - 19	4	18	22	10	4	9	15	49	40	10	14	7	2	11	22	10	247
20 - 28	0	2	1	3	0	0	0	0	0	0	0	2	3	0	0	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	26	51	73	32	15	30	45	113	118	57	33	19	15	28	53	29	737

Total Number of Valid Hours: 737

Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Mar 2023

Wind Speed (WS) - km/h

Kirby North

Total Number of Valid Hours: 737

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Kirby North - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Mar 2 16:00

Minimum Value: 1 km/h on Mar 19 04:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Hours of Calibration:	0
Percent Operational Time:	99.1

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

DF - DAS Failure UO - Unstable Operation

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Kirby North - March 2023

Direction of Maximum Speed: 264 deg on Mar 2 16:00
Direction of Maximum Daily Speed Average: 150.5 deg on Mar 9

Direction of Minimum Speed: 345 deg on Mar 19 03:00

Direction of Minimum Daily Speed Average: 2.5 deg on Mar 25

Monthly Average Direction: 155.6 deg

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average
1-Mar	161	171	177	174	170	161	158	167	177	191	188	194	193	185	206	201	198	193	182	184	186	181	186	184	183.4
2-Mar	177	177	175	183	186	188	184	189	190	198	203	211	225	249	257	264	267	250	282	278	276	245	229	220	226.6
3-Mar	231	226	210	236	245	233	220	241	242	262	291	297	301	299	300	319	349	348	333	346	355	38	46	47	289.6
4-Mar	21	26	326	306	312	313	327	315	318	320	309	304	297	312	325	330	345	344	349	348	344	342	358	36	327.3
5-Mar	45	32	212	216	319	320	326	333	256	302	335	357	2	14	12	26	23	44	74	97	114	140	132	DF	16.5
6-Mar	139	156	153	153	155	152	151	162	165	165	155	151	157	144	154	144	163	143	121	115	129	129	132	137	147.9
7-Mar	144	145	158	169	170	167	170	168	174	167	163	153	153	159	163	153	161	164	148	150	154	155	152	153	158.9
8-Mar	154	157	155	141	119	119	120	129	145	144	157	148	132	143	110	103	107	139	135	124	129	141	164	162	137.1
9-Mar	161	157	154	151	150	147	151	150	150	155	155	150	152	149	146	143	154	146	143	144	147	149	153	159	150.5
10-Mar	164	161	159	148	146	144	143	140	147	152	148	148	148	145	144	117	115	111	114	121	123	120	114	119	139.0
11-Mar	114	124	126	120	94	96	121	145	61	14	21	114	108	124	153	158	168	174	167	177	182	185	186	179	139.8
12-Mar	176	179	194	189	196	187	177	172	180	206	201	213	221	218	215	183	164	160	174	216	209	198	191	182	194.2
13-Mar	181	171	146	148	154	156	145	120	102	68	69	67	70	67	53	61	70	65	74	84	73	68	57	46	80.0
14-Mar	48	54	51	39	24	33	20	358	2	0	351	327	303	307	311	313	316	315	328	321	311	331	343	334	338.9
15-Mar	332	0	350	351	4	7	UO	18	19	41	72	338	3	16	350	25	50	58	87	130	127	127	159	358	32.7
16-Mar	158	167	182	168	173	177	186	190	263	305	309	308	312	319	323	304	315	310	307	165	179	151	186	173	242.8
17-Mar	171	172	171	174	175	175	173	177	186	194	205	212	220	224	225	223	220	219	215	201	190	178	186	184	195.8
18-Mar	180	192	190	191	192	189	186	196	211	210	262	276	317	299	311	303	303	300	298	306	37	81	126	192	240.8
19-Mar	UO	183	345	30	48	47	35	17	35	100	73	77	57	47	54	58	85	79	82	92	121	140	156	166	79.2
20-Mar	170	173	185	180	198	161	176	168	182	184	170	243	211	217	286	31	35	31	28	26	25	23	21	24	54.9
21-Mar	20	22	16	18	21	8	343	2	32	21	24	49	31	21	56	46	66	87	120	131	140	151	163	165	47.6
22-Mar	167	173	184	180	178	179	181	185	185	187	184	188	188	228	214	219	233	231	211	191	190	185	177	179	192.6
23-Mar	181	182	184	192	195	197	192	211	249	246	318	328	314	312	328	330	327	336	46	41	48	39	40	38	349.4
24-Mar	45	52	47	42	36	38	41	49	37	29	56	54	58	16	352	18	321	275	UO	UO	UO	UO	180	192	40.8
25-Mar	200	201	193	185	188	185	178	162	227	299	309	296	300	315	332	347	9	18	24	44	60	52	45	49	357.5
26-Mar	46	39	35	47	39	38	37	40	37	44	51	54	23	46	36	32	43	38	45	52	51	67	85	107	44.3
27-Mar	157	185	309	235	220	211	222	211	304	311	305	300	309	298	301	306	307	308	305	303	212	164	140	148	292.7
28-Mar	259	298	286	311	2	351	39	37	56	80	323	296	295	255	264	261	249	219	210	215	210	193	194	197	243.7
29-Mar	194	203	201	200	199	187	244	303	7	13	16	10	12	22	6	13	23	35	43	56	54	64	72	77	29.0
30-Mar	75	99	75	75	162	127	159	159	175	177	190	206	223	237	239	237	232	211	192	180	163	156	162	168	183.0
31-Mar	167	174	172	170	172	167	162	164	158	171	192	272	266	252	268	324	284	12	33	56	63	78	109	171	160.8
Diurnal Average	152.3	159.7	163.7	165.9	166.8	160.5	161.3	167.2	172.0	172.0	178.0	215.4	257.4	268.5	286.7	328.1	351.9	31.0	73.2	107.3	119.5	123.9	139.7	146.1	

DF - DAS Failure UO - Unstable Operation

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

Wood Buffalo Environmental Association

Hourly Averages

Wind Direction (WD) - deg

Kirby North - March 2023

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Kirby North - March 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 93 deg on Mar 19 03:00

Minimum Value: 5 deg on Mar 19 05:00

Percentiles: $P_1 = 8$ $P_{10} = 12$ $Q_1 = 14$ Median = 17 $Q_3 = 22$ $P_{90} = 37$ $P_{99} = 71$

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Hours of Calibration:	0
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Mar	15	17	18	17	17	16	14	16	20	21	21	23	25	21	20	21	20	20	18	19	19	19	19	19	25
2-Mar	18	19	20	17	17	18	17	19	16	18	18	17	16	16	15	14	14	12	26	17	29	12	12	11	29
3-Mar	13	17	14	12	14	15	17	11	11	19	19	19	15	16	20	21	18	19	16	21	24	14	12	15	24
4-Mar	11	13	26	15	13	17	15	16	15	19	17	17	16	19	22	24	21	16	14	10	12	11	16	13	26
5-Mar	10	44	10	45	65	19	13	59	67	22	27	33	46	60	66	34	17	17	16	10	15	11	45	DF	67
6-Mar	16	15	10	8	10	13	13	15	17	18	19	22	23	20	26	19	19	17	14	14	13	14	14	15	26
7-Mar	16	17	17	18	19	17	17	17	21	17	20	20	23	22	21	19	19	18	17	16	17	15	16	15	23
8-Mar	16	16	16	14	19	13	16	16	18	21	18	22	23	26	32	24	21	16	10	8	12	18	13	14	32
9-Mar	13	15	14	11	11	15	18	16	18	17	18	19	23	19	18	18	20	17	17	19	16	17	17	16	23
10-Mar	17	17	17	17	17	16	17	16	18	18	19	18	20	19	18	20	19	15	15	14	14	13	13	12	20
11-Mar	13	15	18	20	37	24	15	18	66	22	63	26	27	27	31	31	27	21	18	18	18	18	16	14	66
12-Mar	12	13	14	15	16	15	12	13	20	20	24	22	18	19	27	27	20	19	24	16	15	13	14	12	27
13-Mar	12	14	9	7	7	9	12	51	22	16	16	19	17	16	13	13	14	13	13	16	16	12	14	13	51
14-Mar	12	12	12	15	21	19	24	18	16	17	18	21	15	18	16	17	17	15	14	16	17	15	15	14	24
15-Mar	13	15	12	12	13	8	UO	42	53	24	54	36	45	45	46	26	21	15	18	9	9	13	73	66	73
16-Mar	9	13	17	10	13	14	18	36	46	16	15	28	28	26	20	20	20	14	39	23	16	14	11	11	46
17-Mar	12	12	12	13	13	12	13	14	16	19	19	17	17	15	15	15	15	14	11	14	17	15	16	15	19
18-Mar	13	15	15	12	14	15	13	15	15	17	31	34	36	19	18	18	18	12	10	9	39	7	47	23	47
19-Mar	UO	72	93	18	5	10	15	20	28	29	22	25	19	15	17	19	17	16	14	14	18	18	17	15	93
20-Mar	17	16	17	19	79	44	17	50	26	22	27	36	38	66	66	19	13	12	11	11	12	12	13	11	79
21-Mar	12	11	11	15	16	16	15	19	13	15	20	24	46	44	57	71	54	28	12	13	13	15	15	14	71
22-Mar	14	16	18	18	17	17	17	17	17	18	21	20	23	22	20	22	14	14	16	16	17	15	15	14	23
23-Mar	14	14	14	16	17	31	46	30	34	20	33	24	21	23	21	16	19	21	20	11	11	12	15	12	46
24-Mar	15	16	15	14	12	14	14	19	21	16	32	41	69	73	55	69	37	49	UO	UO	UO	UO	22	12	73
25-Mar	10	11	14	13	13	12	10	50	35	19	65	34	40	32	28	26	18	14	12	13	8	9	8	8	65
26-Mar	8	10	7	8	8	9	10	12	13	17	22	26	22	25	21	16	17	15	13	8	7	9	9	15	26
27-Mar	37	47	27	28	39	15	19	15	49	29	23	25	26	28	23	26	19	17	17	12	61	64	50	56	64
28-Mar	23	15	47	51	80	29	9	10	20	33	67	56	55	48	27	29	30	17	15	15	15	14	15	15	80
29-Mar	17	15	16	16	20	48	28	28	23	21	23	23	24	20	20	19	22	19	13	14	12	10	10	11	48
30-Mar	9	18	15	16	23	52	61	17	20	35	89	44	58	44	19	19	22	21	21	21	18	19	18	18	89
31-Mar	16	18	18	16	17	16	16	14	16	23	38	48	49	25	37	35	47	27	10	9	8	10	27	14	49
Diurnal Maximum	37	72	93	51	80	52	61	59	67	35	89	56	69	73	66	71	54	49	39	23	61	64	73	66	

DF - DAS Failure UO - Unstable Operation

ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT

April 28, 2023
2:25:38 PM
Request # 4544750

Submitted by: EN6138_BAS
Submission Date: Apr 28, 2023 2:25:29 PM

File Type	File Name
Airshed Monitoring Report	WBEA-202302-V01.pdf

Total Number of Files: 1

*** End of Report ***

ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT

April 28, 2023
3:35:29 PM
Request # 4544794

Submitted by: EN6138_BAS
Submission Date: Apr 28, 2023 3:35:23 PM

File Type	File Name
Calibration Report	CAL-WBEA-202303.pdf

Total Number of Files: 1

*** End of Report ***

ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT

April 28, 2023
4:06:34 PM
Request # 4544807

Submitted by: EN6138_BAS
Submission Date: Apr 28, 2023 4:05:57 PM

File Type	File Name
Airshed Monitoring Report	WBEA-202303.pdf

Total Number of Files: 1

*** End of Report ***

ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT

April 28, 2023
4:07:11 PM
Request # 4544808

Submitted by: EN6138
Submission Date: Apr 28, 2023 4:06:48 PM

File Type	File Name
Ambient Data	AMB-WBEA-202303-V00.xml

Total Number of Files: 1

*** End of Report ***

End of Report