WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

JANUARY 2015 MONTHLY REPORT

CONTINUOUS MONITORING
February 27, 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc
Calgary, Alberta

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY
for AMD SECTION III.B.1(c)

JANUARY 2015

prepared 27Feb15:12:52

APPROVAL NUMBERS	REPORT DATE MONTH	YEAR
289664-00-00	1	2015
254465-00-00		
149968-00-01		
48522-01-00		
240008-00-03		
48263-00-00		
224816-00-03		
189942-00-02		
206355-00-00		
46586-00-00		
216466-00-04		
137467-00-00		
20809-01-00		
241311-00-00		
094-02-00		
305529-00-00		
026-02-00		
228044-00-00		
73203-01-00		

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
SO2(ppm)	1	100.00	0.023	0	0.003	0
SO2(ppm)	2	99.06	0.071	0	0.025	0
SO2(ppm)	4	99.06	0.011	0	0.002	0
SO2(ppm)	5	100.00	0.060	0	0.007	0
SO2(ppm)	6	99.87	0.029	0	0.006	0
SO2(ppm)	7	100.00	0.018	0	0.005	0
SO2(ppm)	8	100.00	0.009	0	0.002	0
SO2(ppm)	11	99.87	0.039	0	0.008	0
SO2(ppm)	12	99.87	0.020	0	0.004	0
SO2(ppm)	13	100.00	0.011	0	0.002	0
SO2(ppm)	14	96.77	0.018	0	0.004	0
SO2(ppm)	15	100.00	0.015	0	0.004	0
SO2(ppm)	16	99.87	0.065	0	0.011	0
SO2(ppm)	17	100.00	0.041	0	0.010	0
SO2(ppm)	19	100.00	0.036	0	0.012	0
SO2(ppm)	502	97.85	0.013	0	0.005	0
H2S(ppm)	2	98.52	0.009	0	0.002	0
H2S(ppm)	4	80.38	0.003	0	0.001	0
H2S(ppm)	5	100.00	0.004	0	0.001	0
H2S(ppm)	11	100.00	0.010	0	0.003	0
H2S(ppm)	17	99.46	0.007	0	0.002	0
H2S(ppm)	19	99.87	0.004	0	0.001	0
H2S(ppm)	502	99.19	0.006	0	0.002	0
TRS(ppm)	1	99.46	0.005	0	0.001	0
TRS(ppm)	6	100.00	0.002	0	0.001	0
TRS(ppm)	7	100.00	0.002	0	0.001	0
TRS(ppm)	9	100.00	0.003	0	0.001	0
TRS(ppm)	12	100.00	0.002	0	0.001	0
TRS(ppm)	13	100.00	0.016	2	0.002	0
TRS(ppm)	14	99.73	0.008	0	0.002	0
TRS(ppm)	15	100.00	0.001	0	0.001	0
THC(ppm)	1	99.87	3.9	-	2.3	-
THC(ppm)	2	98.79	4.9	-	2.9	-
THC(ppm)	4	99.06	4.0	-	2.8	-
THC(ppm)	5	99.87	4.5	-	2.9	-
THC(ppm)	6	99.06	3.0	-	2.3	-
THC(ppm)	7	98.66	2.4	-	2.1	-
THC(ppm)	9	100.00	5.0	-	3.3	-
THC(ppm)	11	92.07	5.0	-	2.9	-
THC(ppm)	12	100.00	6.8	-	3.1	-
THC(ppm)	13	100.00	6.2	-	3.2	-
THC(ppm)	14	99.73	3.0	-	2.1	-
THC(ppm)	15	100.00	9.0	-	3.2	-
THC(ppm)	16	100.00	6.2	-	4.1	-
THC(ppm)	17	100.00	2.8	-	2.3	-
THC(ppm)	19	100.00	2.8	-	2.3	-
O3(ppm)	1	99.87	0.039	0	0.035	-
O3(ppm)	6	100.00	0.038	0	0.034	-

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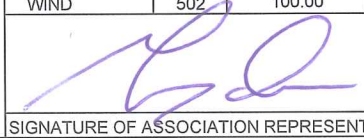
CONTINUOUS AMBIENT MONITORING

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
O3(ppm)	7	100.00	0.036	0	0.029	-
O3(ppm)	8	100.00	0.035	0	0.032	-
O3(ppm)	13	100.00	0.036	0	0.030	-
O3(ppm)	14	99.60	0.044	0	0.038	-
O3(ppm)	17	99.46	0.038	0	0.036	-
NO2(ppm)	1	99.87	0.039	0	0.029	-
NO2(ppm)	6	99.73	0.038	0	0.022	-
NO2(ppm)	7	100.00	0.040	0	0.023	-
NO2(ppm)	8	100.00	0.021	0	0.008	-
NO2(ppm)	12	100.00	0.049	0	0.030	-
NO2(ppm)	13	100.00	0.035	0	0.023	-
NO2(ppm)	14	99.73	0.028	0	0.014	-
NO2(ppm)	15	100.00	0.061	0	0.023	-
NO2(ppm)	16	96.37	0.052	0	0.026	-
NO2(ppm)	17	100.00	0.030	0	0.017	-
NO2(ppm)	19	100.00	0.054	0	0.015	-
NO2(ppm)	502	99.73	0.038	0	0.019	-
CO(ppm)	7	98.52	0.6	0	0.3	-
NH3(ppm)	1	94.62	0	0	0	-
NH3(ppm)	6	92.47	0	0	0	-
PM2.5(ug/m^3)	1	97.98	29.7	-	9.1	0
PM2.5(ug/m^3)	6	99.87	30.9	-	12.2	0
PM2.5(ug/m^3)	7	99.46	24.1	-	10.3	0
PM2.5(ug/m^3)	8	99.73	30.7	-	6.6	0
PM2.5(ug/m^3)	12	99.06	38.4	-	20.1	0
PM2.5(ug/m^3)	13	99.73	31	-	16.6	0
PM2.5(ug/m^3)	14	99.87	50.8	-	8.5	0
PM2.5(ug/m^3)	15	99.87	20.3	-	8	0
PM2.5(ug/m^3)	16	99.87	40.4	-	15.5	0
PM2.5(ug/m^3)	17	99.87	56.8	-	11.1	0
WIND	1	92.07	-	-	-	-
WIND	2	98.66	-	-	-	-
WIND	4	95.56	-	-	-	-
WIND	5	91.67	-	-	-	-
WIND	6	97.72	-	-	-	-
WIND	7	98.79	-	-	-	-
WIND	8	99.19	-	-	-	-
WIND	9	93.01	-	-	-	-
WIND	11	99.06	-	-	-	-
WIND	12	97.85	-	-	-	-
WIND	13	84.41	-	-	-	-
WIND	14	100.00	-	-	-	-
WIND	15	94.76	-	-	-	-
WIND	16	95.97	-	-	-	-
WIND	17	90.73	-	-	-	-
WIND	19	95.03	-	-	-	-
WIND	502	100.00	-	-	-	-



SIGNATURE OF ASSOCIATION REPRESENTATIVE

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AURORA
ATMOSPHERICS

February 26, 2015

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

RE: Monthly Ambient Air Quality Monitoring Report January 2015
Wood Buffalo Environmental Association

Enclosed is the January 2015 ambient air quality monitoring report for the continuous ambient air quality monitoring stations of the Wood Buffalo Environmental Association regional air quality monitoring network.

The continuous ambient air quality monitoring network stations are:

AMS 1 - Fort McKay – Bertha Ganter
AMS 2 - Mildred Lake
AMS 3 - Lower Camp B (meteorology)
AMS 4 - Buffalo Viewpoint
AMS 5 - Mannix
AMS 6 - Patricia McInnes
AMS 7 - Athabasca Valley
AMS 8 - Fort Chipewyan
AMS 9 - Barge Landing
AMS 11 - Lower Camp (air quality)
AMS 12 - Millennium Mine
AMS 13 - Fort McKay South
AMS 14 - Anzac
AMS 15 - CNRL Horizon
AMS 16 - Shell Muskeg River
AMS 17 - Wapasu
AMS 19 - Firebag
AMS 502 - ConocoPhillips Surmont

Aurora Atmospherics Inc.
15295 Sequoia Drive
Surrey, BC, V3S 8N4
Tel: 604.593.5501
Fax: 604.597.5015

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

1.0 Concentrations in Excess of Alberta Ambient Air Quality Objectives

There were no ambient concentrations in excess of the air quality objectives as indicated in the Air Monitoring Directive Section III.A.3 (a & b) for SO_2, CO, NO_2, NH_3, O_3 and $PM_{2.5}$.

There were 4 ambient ground level concentrations of H_2S and TRS in excess of the H_2S air quality objectives reported to Alberta Environment in real time. After data processing to account for analyzer drift with baseline correction, there were only 2 concentrations in excess of the 1-hour H_2S air quality objective. There was one 1-hour and daily objective exceedances reported in real-time that were found not to be in exceedance after data processing.

The reported and final concentrations and status after data processing are summarized as follows:

					concentration (ppb or ug/m^3 for $PM_{2.5}$)		
Site	parameter	date/time	reference	period	reported	final	status*
AMS 2 Mildred Lake	H_2S	22Jan15:14:00	294169	1-hour	10	9	nae
AMS 2 Mildred Lake	H_2S	22Jan15:24:00	294183	24-hour	3.0	2.0	nae
AMS 13 Fort McKay South	TRS	07Jan15:07:00	293636	1-hour	17	16	exc
AMS 13 Fort McKay South	TRS	07Jan15:08:00	293636	1-hour	11	11	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.

Concentrations reported in near real-time were raw values. The final values were determined after processing of data for reporting. For all parameters except $PM_{2.5}$, the final 5-minute data values were determined by subtracting from the raw 5-minute data values, the daily zero responses interpolated to the time of each raw 5-minute value. 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 the 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. In cases where the NO_X and/or NO values exceeded the operating range of the analyzer, values reported for NO_2 were determined as the largest of either the difference between baseline-corrected NO_X and NO values, or the NO_2 value reported by the data acquisition system with baseline correction applied.

2.0 Operational Status

2.1 Continuous Monitoring

In January 2015, there were two incidents resulting in compliance monitoring instruments operating less than 90 % of the time.

1. The wind speed and direction sensors at AMS 13 (Fort McKay South) operated less than 90% of the time in January 2015. Data was invalidated during periods of flat-line in the sensors output signal. These periods generally coincided with the freezing temperatures and ice buildup in the Wood Buffalo region. In January, the wind sensors at AMS 13 operated for only 84% of the time. Operation times less than 90% were reported to Alberta Environment Response Center, (AESRD Reference Number 295038) on February 18, 2015.

2. The hydrogen sulphide (H_2S) analyzer at AMS 4 (Buffalo Viewpoint) operated less than 90% of the time in January 2015. A maintenance check of the SO_X scrubber and subsequent calibration of the H_2S analyzer on January 6 did not meet the Air Monitoring Directive (AMD) calibration criteria for linearity and intercept. Calibration results indicate the analyzer response was beyond the 5% limit for linearity and the intercept was greater than 3% of the full scale (100 ppb). A follow-up calibration on January 12 was undertaken to establish analyzer conformance to AMD criteria. During the monthly reporting to AESRD, data from December 4 2014 to February 5 2015 was reviewed and processed as per the findings of the calibration and maintenance records. WBEA invalidated data for this parameter from January 6 to 12, 2015. In January, the H2S analyzer at AMS 4 operated for only 80% of the time. Operation times less than 90% were reported to Alberta Environment Response Center (AESRD Reference 295359) on February 27, 2015.

There were nine incidents of a monitoring instrument not required for air quality compliance operating less than 90 % of the time in January 2015.

- Communication issues and the effects of freezing temperatures in the region interrupted the normal operations of the 20 m elevation temperature and relative humidity sensors at the Lower Camp Meteorological Tower (AMS 3). This resulted in 348 hours of invalid data for this reporting period. After flagging and processing, data was available for 53% of the time.

- The effects of freezing temperatures and ice buildup affected the normal operations of the wind sensors at the 167 m elevation at AMS 3 (Lower Camp Meteorological tower). These sensors were operational for only 78 % of time.

- A new relative humidity sensor was installed at AMS 4, Buffalo Viewpoint and it commenced operation on January 8, 2015.

- The effects of freezing temperatures and ice buildup affected the normal operations of the temperature, relative humidity and wind sensors at all elevations on the Mannix Meteorological Tower (AMS 5). The operational times for these sensors ranged from 75 to 92 % of time for this reporting period.

- The precipitation collector and surface wetness sensors at Anzac air monitoring station (AMS 14) were out of service for an extended period of time. The precipitation collector and leaf wetness sensors were operational for only 54 and 57 % of the time this month, respectively.

2.2 Intermittent Monitoring

The December 2014 results for passive and integrated monitoring of PAH, VOC, RSC, $PM_{2.5}$ and PM_{10} samples are included with this report. The January 2015 results for passive and integrated monitoring of PAH, VOC, RSC, $PM_{2.5}$ and PM_{10} s were not available in time for submission with this report. These results will be submitted at a later date.

3.0 Monitoring Notes

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 5 ppb have been considered below detection levels and are reported as zero.

The effects of freezing temperatures and ice buildup affected the normal operations of all wind sensors at the air monitoring stations. The results for each station are provided in the site specific comments.

Monitoring notes for the continuous monitoring stations are provided on a station by station basis.

Station 1, Fort McKay- Bertha Ganter

Station operator activities in relation to station upgrades for the new standardized data collection program on January 24 interrupted the normal data collection of all parameters for 1 hour.

The implementation of the new data collection program at the station interrupted the routine data collection of the 10 m elevation temperature sensor data for 23 hours this reporting period. A revised program upload on January 24 resolved this data collection issue.

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 for stabilization after exposure to high concentrations of the NH_3 gas is an inherent behavior in the NH_3 analyzer operations resulting from the properties of the NH_3 gas. Data for 1 to 2 hours following the daily spans and 3 hours following the calibration periods have been reported as invalid for a total of 38 hours this month.

The TRS analyzer experienced two episodes of intermittent unstable operations on January 10 and 11 resulting in 3 hours of invalid data.

Maintenance to the sample inlet, flow audits and zero reference checks on January 13 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

A power spike at the station on January 24 affected the normal operations of the NH_3 and $PM_{2.5}$ analyzers for 1 hour. The $PM_{2.5}$ analyzed failed to respond following the power spike resulting in an additional 12 hours of downtime. A backup $PM_{2.5}$ analyzer was installed on January 24, 2015.

The effects of freezing temperatures and ice buildup affected the normal operations of the wind sensors at the station. Flat-line in the output signals of the wind sensor resulted in 58 hours of invalid data this reporting period.

The temperature sensors at 2 and 10 m are identical but independent sensors and are not an integrated delta-t system. Although reported values are representative of ambient temperatures, they may not be suitable as measurements of vertical temperature gradients.

Station 2, Mildred Lake

Station operator activities in relation to station setup upgrades for the new standardized data collection program from January 14 to 19 affected the normal operations of all parameters for 6 to 11 hours this reporting period.

A new relative humidity sensor was installed at the station and commenced operation on January 1, 2015.

Flat-line in the output signals of the wind sensor resulted in 4 hours of invalid data this reporting period.

Station 3, Lower Camp B - Meteorology

Communication issues and the effects of freezing temperatures and ice in the region interrupted the normal operations of the 20 m elevation temperature and relative humidity sensors at the Lower Camp Meteorological tower (AMS 3) resulting in 348 hours of invalid data this reporting period. After flagging and processing, data was available for 53% of the time for this reporting period.

A flat-line in the output signals of the 45 m elevation temperature and relative humidity sensor resulted in 1 hour of invalid data this reporting period.

The effects of freezing temperatures and ice buildup affected the normal operations of the wind sensors at all elevations of Air Monitoring Station 3 (Lower Camp Meteorological tower). The operational times for these sensors ranged from 78 to 99 % of time for this reporting period.

Station 4, Buffalo Viewpoint

Station operator activities in relation to the station upgrades for the new standardized data collection program on January 7 affected the normal operations of all parameters for 7 hours this reporting period. The implementation of the new data collection program at the station interrupted the routine data collection of the meteorological sensors for an additional 19 hours this reporting period.

A new relative humidity sensor was installed during the station upgrade and commenced operation on January 8, 2015.

Flat-lines in the output signals of the wind sensor resulted in 8 hours of invalid data this reporting period.

Station 5, Mannix

A power spike at the station on January 16 affected the normal operations of the THC analyzer for one hour.

The effects of freezing temperatures and ice buildup affected the normal operations of the temperature, relative humidity and wind sensors at all elevations on the Mannix Meteorological tower (AMS 5). The operational times for these sensors ranged from 75 to 92 % of time for this reporting period.

Station 6, Patricia McInnes

The NH_3 analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily span and routine monthly multipoint calibration periods. Additional time for stabilization after exposure to high concentrations of the NH_3 gas is an inherent behavior in the NH_3 analyzer operations resulting from the properties of the NH_3 gas. Data for one hour following the daily spans have been reported as invalid for a total of 30 hours this month.

Maintenance on the NH_3 analyzer at the station on January 8 and 9 to resolve the analyzer linearity issues resulted in 23 hours of downtime.

Maintenance to the sample inlet, flow audits and zero reference checks on January 8 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

Depletion and replacement of the carrier gas cylinder at the station on January 20 affected the normal operations of the THC analyzer for 2 hours.

The THC analyzer experienced a single episode of unstable operations on January 23 resulting in one hour of invalid data.

Maintenance on the daily zero and span systems and confirmation of SO_2, NO_2 and THC analyzer responses on January 29 interrupted the normal operations of these analyzers for 1, 2 and 4 hours, respectively.

A flat-line in the output signals of the wind sensor resulted in 17 hours of invalid data this reporting period.

Station 7, Athabasca Valley

A power spike at the station on January 1 affected the normal operations of the THC analyzer for one hour.

A data collection program update at the station on January 16 interrupted the routine data collection of the THC analyzer for 1 hour.

The THC analyzer experienced two episodes of excessive baseline drift on January 18 and 19 resulting in 8 hours of invalid data this reporting period.

Maintenance to the sample inlet, flow audits and zero reference checks on January 20 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

Maintenance and replacement of the sample pump and a follow-up calibration on January 27 affected the operation of the CO analyzer for 11 hours.

The $PM_{2.5}$ analyzer experienced two episodes of excessive baseline drift on January 31 resulting in 3 hours of invalid data.

A flat-line in the output signals of the wind sensor resulted in 9 hours of invalid data this reporting period.

Station 8, Fort Chipewyan

Maintenance to the sample inlet, flow audits and zero reference checks on January 12 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

Flat-line in the output signals of the wind sensor resulted in 6 hours of invalid data this reporting period.

Station 9, Barge Landing

A new relative humidity sensor was installed at the station and commenced operation on January 1, 2015.

Flat-line in the output signals of the wind sensor resulted in 52 hours of invalid data this reporting period.

Station 11, Lower Camp

Maintenance and replacement of the analyzer and a follow- up calibration from January 9 to 11 interrupted the normal operations of the THC analyzer for 56 hours.

Maintenance on the daily zero and span systems and confirmation of SO_2 and THC analyzer responses on January 27 interrupted the normal operations of these analyzers for 1 hour.

Depletion and replacement of the carrier gas cylinder at the station on January 30 affected the normal operations of the THC analyzer for 2 hours.

Flat-line in the output signals of the wind sensor resulted in 7 hours of invalid data this reporting period.

A new relative humidity sensor was installed at the station and commenced operation on January 1, 2015.

Station 12, Millennium Mine

Maintenance and cleaning of the sample manifold on January 29 affected the normal operations of the SO_2 analyzer for 1 hour.

The $PM_{2.5}$ analyzer experienced a single episode of excessive baseline drift on January 17 resulting in 6 hours of invalid data.

Maintenance to the sample inlet, flow audits and zero reference checks on January 21 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

A new relative humidity sensor was installed at the station and commenced operation on January 1, 2015. The relative humidity sensor experienced a single episode of values exceeding upper range limits on January 24 resulting in 3 hours of invalid data.

Flat-line in the output signals of the wind sensor resulted in 16 hours of invalid data this reporting period.

Station 13, Fort McKay South

A power spike at the station on January 22 affected the normal operations of the temperature and relative humidity sensors for 1 hour.

Maintenance to the sample inlet, flow audits and zero reference checks on January 22 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

The effects of freezing temperatures and ice buildup affected the normal operations of the wind sensors at the station. Flat-line in the output signals of the wind sensor resulted in 115 hours of invalid data this reporting period. An on-site maintenance to de-ice the wind sensors on January 27 resulted in 1 hour of downtime.

Station 14, Anzac

Data collection program updates at the station on January 7 and 8 interrupted the routine data collection of the NO_2 and O_3 analyzers for 1 hour.

Maintenance on the daily zero and span systems and confirmation of analyzer responses on January 12 interrupted the normal operations of all air quality analyzers for 12 hours.

Station operator activities on January 9 interrupted the normal operations of the THC analyzer for 1 hour.

The SO_2 analyzer experienced extended stabilization periods after the daily span checks this reporting month, resulting in 21 hours of invalid data.

The SO_2 analyzer experienced a single episode of excessive baseline drift on January 27 resulting in 2 hours of invalid data.

The precipitation collector and surface wetness sensors were out of service for an extended period of time this reporting period. The precipitation collector and leaf wetness sensor were operational for only 54 and 57 % of the time this month.

Station 15, CNRL Horizon

Maintenance to the sample inlet, flow audits and zero reference checks on January 13 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

Flat-lines in the output signals of the wind sensor resulted in 39 hours of invalid data this reporting period.

Station 16, Shell Muskeg River

Maintenance and replacement of the analyzer and a follow- up calibration on January 22 and 23 interrupted the normal operations of the NO_2 analyzer for 27 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on January 23 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

A data collection program update at the station on January 23 interrupted the routine data collection of the SO_2 analyzer for 1 hour.

Flat-lines in the output signals of the wind sensor resulted in 30 hours of invalid data this reporting period.

Station 17, Wapasu

Station operator activities on January 13 interrupted the normal operations of the Ozone analyzer for 4 hours.

Maintenance and cleaning of the sample manifold on January 13 affected the normal operations of the H_2S analyzer for 1 hour.

Maintenance to the sample inlet, flow audits and zero reference checks on January 14 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

A SO_2 scrubber test on the H_2S analyzer on January 14 interrupted the normal operations of the analyzer for 3 hours.

Flat-lines in the output signals of the wind sensor resulted in 69 hours of invalid data this reporting period.

Station 19, Firebag

The H_2S analyzer experienced a single episode of excessive baseline drift on January 28 resulting in 1 hour of invalid data.

The effects of freezing temperatures and ice buildup affected the normal operations of the wind sensors at station for 37 hours.

Station 502, ConocoPhillips Surmont

WBEA commissioned an ambient air quality survey at the ConocoPhillips facility to fulfill Alberta Environment's Environmental Protection and Enhancement Act (EPEA) facility approval number 48263-00-00. This station is equipped with ambient air quality analyzers for SO_2, H_2S, NO, NO_2, NO_X and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

The SO_2 analyzer experienced extended stabilization periods after the daily span checks this reporting month, resulting in 13 hours of invalid data.

Maintenance on the daily zero and span systems and confirmation of analyzer responses on January 2 and 3 interrupted the normal operations of all air quality analyzers for 2 to 3 hours.

The H_2S analyzer experienced two episodes of excessive baseline drifts on January 6 and 8 resulting in 5 hours of invalid data this reporting period.

If additional information is required, please contact either Sanjay Prasad at (403) 703 8931 or the Wood Buffalo Environmental Association at (780) 799 4420.

Yours sincerely,

Aurora Atmospherics Inc.

Sanjay Prasad
Air Quality Scientist

R00_1501_L01_V1.DOC

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 1
BERTHA GANTER FORT MCKAY
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY - BERTHA GANTER (AMS 1)
JANUARY 2015

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	100.00	23	0	3	0
TRS(ppb) Average	706	34	38	99.46	5	0	1	0
THC(ppm) Average	709	34	35	99.87	3.9	-	2.3	-
NMHC(ppm) Average	709	34	35	99.87	0.302	-	0.079	-
CH4(ppm) Average	709	34	35	99.87	3.8	-	2.3	-
O3 (ppb) Average	709	34	35	99.87	39	0	35	-
NO2 (ppb) Average	708	35	36	99.87	39	0	29	-
NO (ppb) Average	708	35	36	99.87	57	-	21	-
NOX (ppb) Average	708	35	36	99.87	91	-	46	-
NH3 (ppb) Average	668	36	76	94.62	0	0	0	-
PM2.5 (ug/m3) Average	729	0	15	97.98	29.7	-	9.1	0
Wind Speed 10 m (km/h) Average	685	0	59	92.07	14	-	-	-
Wind Direction 10 m (deg) Average	685	0	59	92.07	-	-	-	-
Temperature 2 m (C) Average	743	0	1	99.87	6.5	-	3.6	-
Temperature 10 m (C) Average	721	0	23	96.91	6.9	-	3.9	-
Relative Humidity (%) Average	743	0	1	99.87	99	-	-	-
Precipitation (mm) Total	743	0	1	99.87	2.8	-	-	-
Surface Wetness (% of range) Average	744	0	0	100.00	72	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	306	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT McKAY (AMS 1)
JANUARY 2015

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	1.3	2	-	0	0	0	1	1	3	23
TRS (ppb) Average	706	0.8	0	-	0	0	0	1	1	1	5
THC (ppm) Average	709	2.01	0.2	-	1.7	1.8	1.9	1.9	2.1	2.3	3.9
NMHC(ppm) Average	709	0.005	0.031	-	0	0	0	0	0	0	0.302
CH4(ppm) Average	709	2.01	0.2	-	1.7	1.8	1.9	1.9	2.1	2.3	3.8
O3 (ppb) Average	709	16.6	11	-	2	2	6	16	26	32	39
NO2 (ppb) Average	708	13.4	10	-	0	1	5	12	21	27	39
NO (ppb) Average	708	5.6	10	-	0	0	0	1	7	17	57
NOX (ppb) Average	708	19	17	-	0	1	6	14	28	42	91
NH3 (ppb) Average	668	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	729	4.92	3.7	-	0.1	1.6	2.6	3.8	6.2	9.3	29.7
Wind Speed 10 m (km/h) Average	685	5.3	3	-	0	2	3	5	7	9	14
Wind Direction 10 m (deg) Average	685	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	743	-15.23	9.8	-	-34	-27.2	-22.5	-16.3	-9	-0.3	6.5
Temperature 10 m (C) Average	721	-14.6	9.5	-	-33	-25.9	-21.5	-16.2	-8.7	0	6.9
Relative Humidity (%) Average	743	77.5	9	-	49	68	71	76	83	91	99
Precipitation (mm) Total	743	-	-	18.29	0	0	0	0	0	0	2.8
Surface Wetness (% of range) Average	744	1.4	7	-	0	0	0	0	0	3	72
Global Solar Radiation (W/m2) Average	744	18.9	41	-	0	0	0	0	12	77	306

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER Fort McKAY (AMS 1)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	24 Jan 2015 13:00	24 Jan 2015 13:00	1	Data logger program uploaded - data not recorded
TRS	10 Jan 2015 13:00	10 Jan 2015 13:00	1	Intermittent unstable operation
TRS	11 Jan 2015 01:00	11 Jan 2015 02:00	2	Intermittent unstable operation
NH3	01 Jan 2015 06:00	31 Jan 2015 06:00	35	Stabilization after daily span
NH3	13 Jan 2015 17:00	13 Jan 2015 19:00	3	Stabilization after calibration
NH3	24 Jan 2015 04:00	24 Jan 2015 04:00	1	Power spike
PM2.5	13 Jan 2015 15:00	13 Jan 2015 16:00	2	Maintenance - Flow and zero check, sample head cleaning
PM2.5	24 Jan 2015 04:00	24 Jan 2015 04:00	1	Power spike
PM2.5	24 Jan 2015 05:00	24 Jan 2015 16:00	12	Analyzer replaced - analyzer failed following power outage
Wind Speed, Wind Direction	20 Jan 2015 10:00	20 Jan 2015 10:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 04:00	24 Jan 2015 11:00	8	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 16:00	25 Jan 2015 05:00	14	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 01:00	26 Jan 2015 11:00	11	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 17:00	27 Jan 2015 16:00	24	Flat line in sensor output signal - Sensor frozen
Temperature 10 m	02 Jan 2015 17:00	02 Jan 2015 17:00	1	DAS collection error - data not recorded
Temperature 10 m	03 Jan 2015 03:00	03 Jan 2015 03:00	1	DAS collection error - data not recorded
Temperature 10 m	04 Jan 2015 01:00	04 Jan 2015 02:00	2	DAS collection error - data not recorded
Temperature 10 m	04 Jan 2015 21:00	04 Jan 2015 21:00	1	DAS collection error - data not recorded
Temperature 10 m	06 Jan 2015 05:00	06 Jan 2015 05:00	1	DAS collection error - data not recorded
Temperature 10 m	06 Jan 2015 21:00	06 Jan 2015 21:00	1	DAS collection error - data not recorded
Temperature 10 m	07 Jan 2015 06:00	07 Jan 2015 06:00	1	DAS collection error - data not recorded
Temperature 10 m	08 Jan 2015 07:00	08 Jan 2015 07:00	1	DAS collection error - data not recorded
Temperature 10 m	08 Jan 2015 10:00	08 Jan 2015 10:00	1	DAS collection error - data not recorded
Temperature 10 m	08 Jan 2015 23:00	08 Jan 2015 23:00	1	DAS collection error - data not recorded
Temperature 10 m	09 Jan 2015 22:00	09 Jan 2015 22:00	1	DAS collection error - data not recorded
Temperature 10 m	10 Jan 2015 06:00	10 Jan 2015 06:00	1	DAS collection error - data not recorded
Temperature 10 m	10 Jan 2015 14:00	10 Jan 2015 14:00	1	DAS collection error - data not recorded
Temperature 10 m	12 Jan 2015 03:00	12 Jan 2015 03:00	1	DAS collection error - data not recorded
Temperature 10 m	14 Jan 2015 11:00	14 Jan 2015 11:00	1	Unstable operation - spike in output signal
Temperature 10 m	14 Jan 2015 12:00	14 Jan 2015 12:00	1	DAS collection error - data not recorded
Temperature 10 m	14 Jan 2015 15:00	14 Jan 2015 15:00	1	DAS collection error - data not recorded
Temperature 10 m	14 Jan 2015 17:00	14 Jan 2015 17:00	1	DAS collection error - data not recorded
Temperature 10 m	16 Jan 2015 18:00	16 Jan 2015 19:00	2	DAS collection error - data not recorded

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER Fort McKAY (AMS 1)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Temperature 10 m	18 Jan 2015 03:00	18 Jan 2015 03:00	1	DAS collection error - data not recorded
Temperature 10 m	19 Jan 2015 23:00	19 Jan 2015 23:00	1	DAS collection error - data not recorded

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 23 ppb on Jan 31 15:00 Maximum Daily Average: 3.5 ppb on Jan 31

Minimum Value: 0 ppb on Jan 28 08:00 Minimum Daily Average: 0.3 ppb on Jan 27
Maximum Diurnal Average: 2.1 ppb at hour 15 Minimum Diurnal Average: 0.8 ppb at hour 10
Monthly Average: 1.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 10$

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-Jan	0	Z	1	0	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0	0	1	1	1	1	0.5	1
2-Jan	1	0	Z	0	0	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
3-Jan	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
5-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0.7	1
6-Jan	Z	0	0	0	0	0	1	0	0	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	0.8	2
7-Jan	1	Z	1	1	1	1	1	2	2	2	2	2	4	C	C	C	4	5	5	1	2	3	3	0	2.1	5
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0.4	1
9-Jan	1	1	1	Z	1	1	1	1	2	2	3	5	5	6	5	3	2	1	1	1	1	1	1	1	2.0	6
10-Jan	1	1	1	1	Z	1	1	1	1	1	1	2	3	4	5	5	6	5	3	2	2	2	1	1	2.2	6
11-Jan	2	2	1	2	2	Z	1	1	1	1	2	4	4	3	3	2	2	2	2	2	2	2	2	2	2.0	4
12-Jan	Z	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	1.5	3
13-Jan	3	Z	2	1	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	0	0	0	1	0.8	3
14-Jan	1	1	Z	1	1	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	10	8	7	1.6	10
16-Jan	15	3	1	1	Z	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.7	15
17-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	6	1.1	6
18-Jan	Z	2	3	2	2	2	2	2	2	2	2	2	3	4	3	3	2	1	1	1	1	1	1	1	1.9	4
19-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.6	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	2	3	5	6	6	5	7	8	8	11	12	3.4	12
21-Jan	13	7	3	Z	3	9	5	3	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	2.8	13
22-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
23-Jan	1	1	1	1	1	Z	1	0	1	1	1	1	1	1	1	1	1	1	1	5	6	4	8	6	1.9	8
24-Jan	Z	3	4	5	5	5	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.7	5
25-Jan	1	Z	9	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3	9
26-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.6	1
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.3	1
29-Jan	0	0	0	0	0	Z	0	1	3	2	1	1	2	3	4	3	4	3	3	3	3	7	3	2	2.1	7
30-Jan	Z	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
31-Jan	0	Z	0	0	0	0	0	0	1	1	1	2	4	8	23	19	5	2	2	1	2	3	3	4	3.5	23
	1.8	1.2	1.3	1.0	1.0	1.2	0.9	0.8	0.9	0.8	0.8	1.1	1.4	1.6	2.1	1.9	1.5	1.4	1.2	1.2	1.5	1.7	1.9	1.8	Diurnal Average	
	15	7	9	5	5	9	5	3	3	2	3	5	5	8	23	19	6	6	5	7	8	10	11	12	Diurnal Maximum	

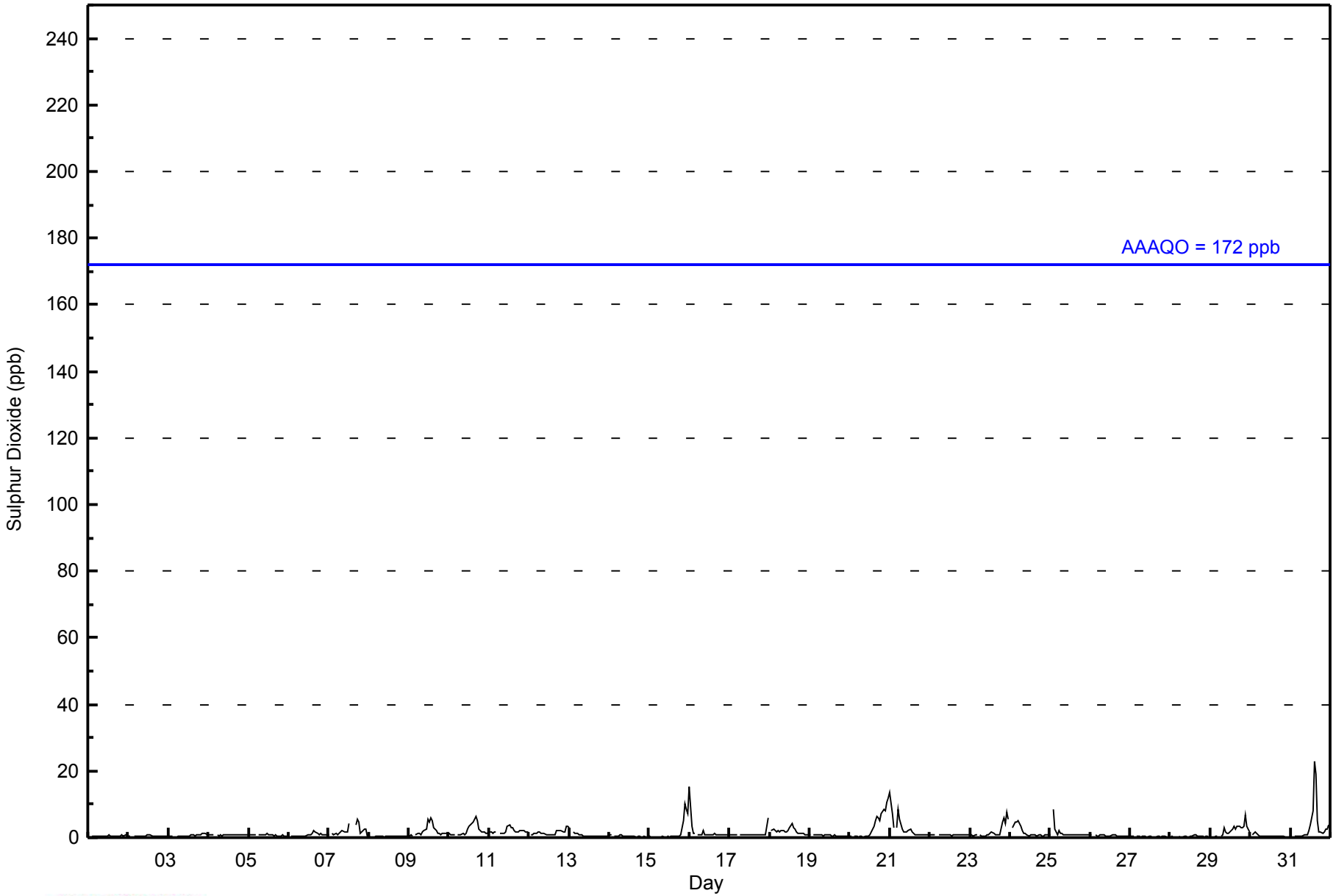
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2015



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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

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	91	61	30	17	9	3	3	17	111	96	31	44	31	39	33	32	648
11 - 20	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5
21 - 60	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	61	30	17	9	3	3	17	117	96	31	44	31	39	33	32	654

Total Number of Valid Hours: 654

Total Number of Hours: 744

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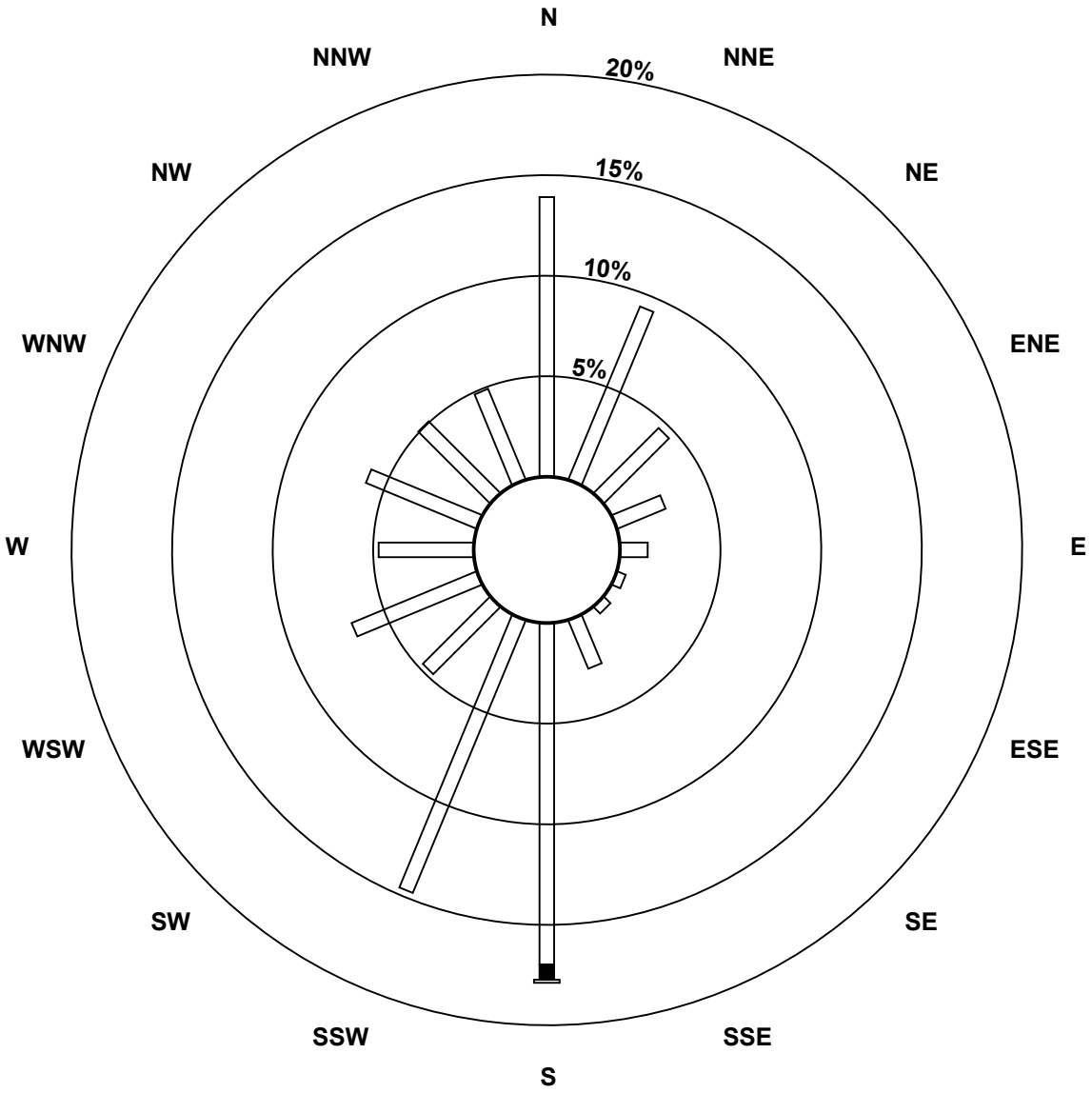
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

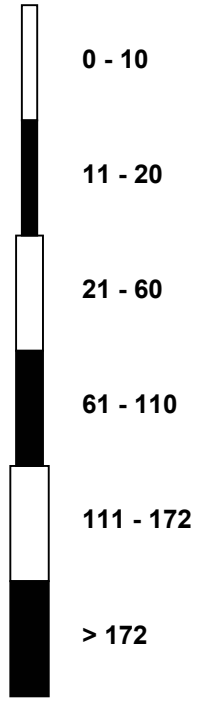
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



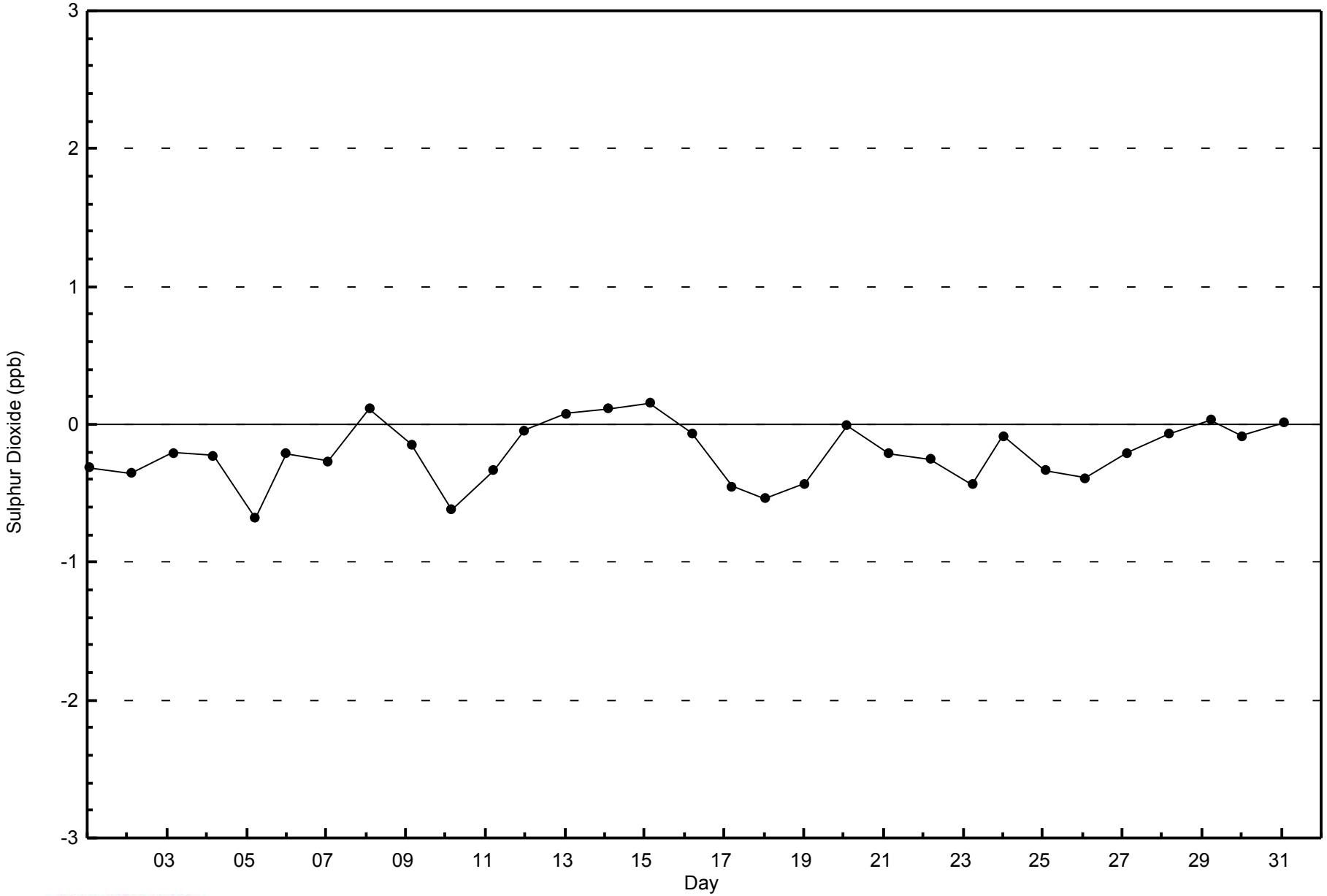
Total Number of Valid Hours: 654

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2015



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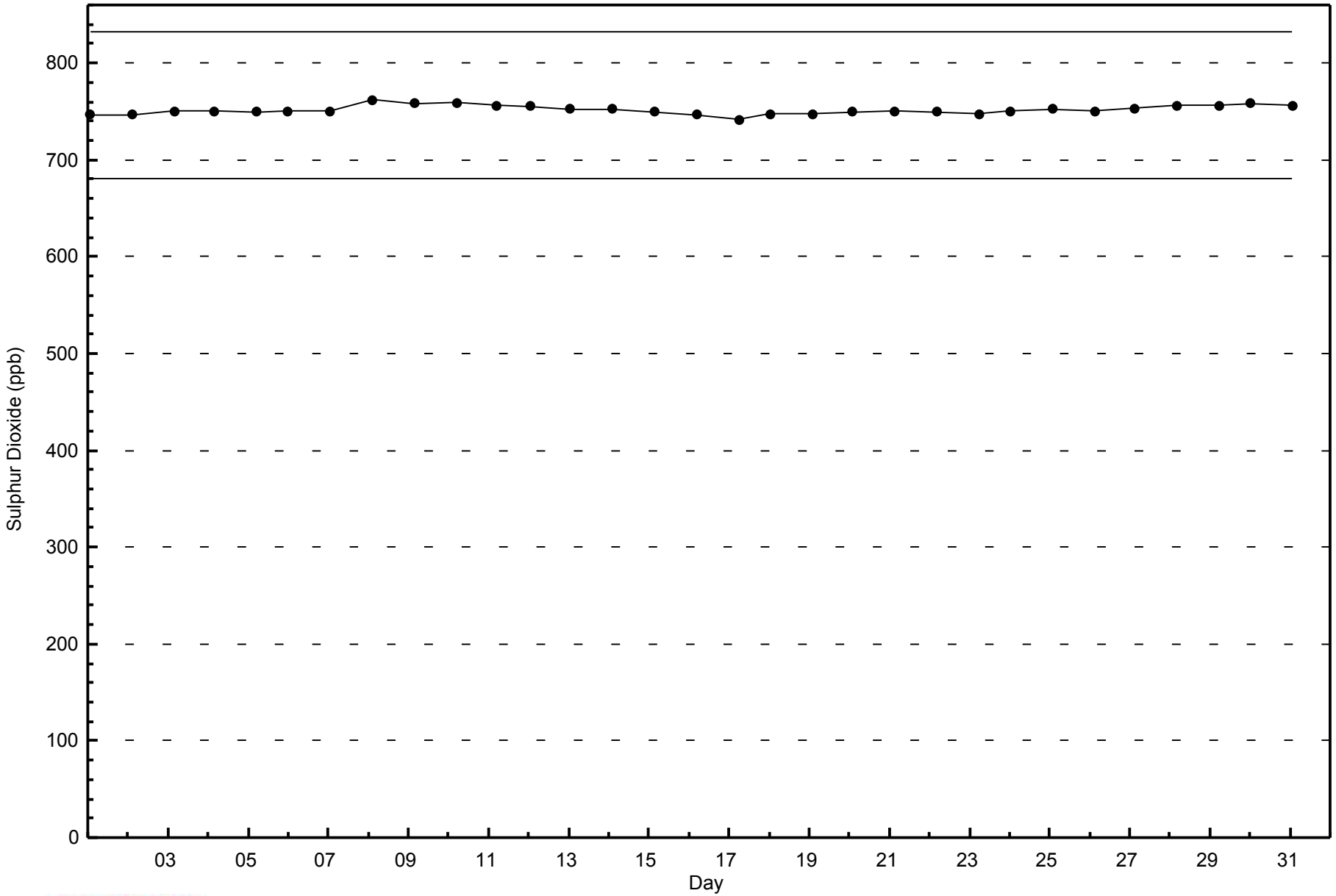
Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 ppb on Jan 7 07:00 Maximum Daily Average: 1.5 ppb on Jan 24

Minimum Value: 0 ppb on Jan 16 18:00 Minimum Daily Average: 0.5 ppb on Jan 22
Maximum Diurnal Average: 0.9 ppb at hour 7 Minimum Diurnal Average: 0.7 ppb at hour 2
Monthly Average: 0.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	34
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-Jan	0	0	Z	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
2-Jan	0	0	0	Z	1	1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0	1	0.5	1
3-Jan	1	1	0	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
4-Jan	0	0	0	0	0	Z	0	0	0	0	1	1	1	0	0	1	0	0	1	0	1	1	1	1	0.5	1
5-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1
6-Jan	0	Z	1	1	1	1	0	0	0	0	1	1	1	1	1	2	1	1	1	1	1	1	1	1	0.8	2
7-Jan	1	1	Z	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1.1	5
8-Jan	1	1	1	Z	1	0	0	0	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0.5	1
9-Jan	1	1	1	1	Z	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1.1	2
10-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	M	1	1	2	1	1	1	2	2	1	1	1	1.1	2
11-Jan	M	M	1	1	1	1	Z	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1.2	2
12-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1
13-Jan	2	2	Z	1	1	1	1	0	0	1	1	1	0	0	0	0	1	2	1	1	0	0	0	1	0.8	2
14-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
15-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
16-Jan	1	1	1	1	1	Z	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.5	1
17-Jan	0	0	0	0	0	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
18-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	2	1	1	1	1	1	1	1.3	3
19-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.6	1
20-Jan	1	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	0.9	2
21-Jan	2	1	1	1	Z	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.9	2
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.5	1
23-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	1.0	3
24-Jan	3	Z	3	3	3	2	2	2	2	2	1	1	MS	1	1	1	1	1	1	1	1	1	1	1	1.5	3
25-Jan	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.6	1
26-Jan	1	1	1	Z	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
27-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1
28-Jan	1	1	1	1	1	Z	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0.6	1
29-Jan	0	0	0	0	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
30-Jan	1	Z	1	1	1	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1	0	0	0	0	0.5	1
31-Jan	0	0	Z	0	1	0	0	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1.0	2
	0.8	0.7	0.7	0.8	0.8	0.8	0.9	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.8	0.8	Diurnal Average	
	3	2	3	3	3	2	5	2	2	2	1	2	2	2	3	2	2	2	1	2	2	2	3	3	Diurnal Maximum	

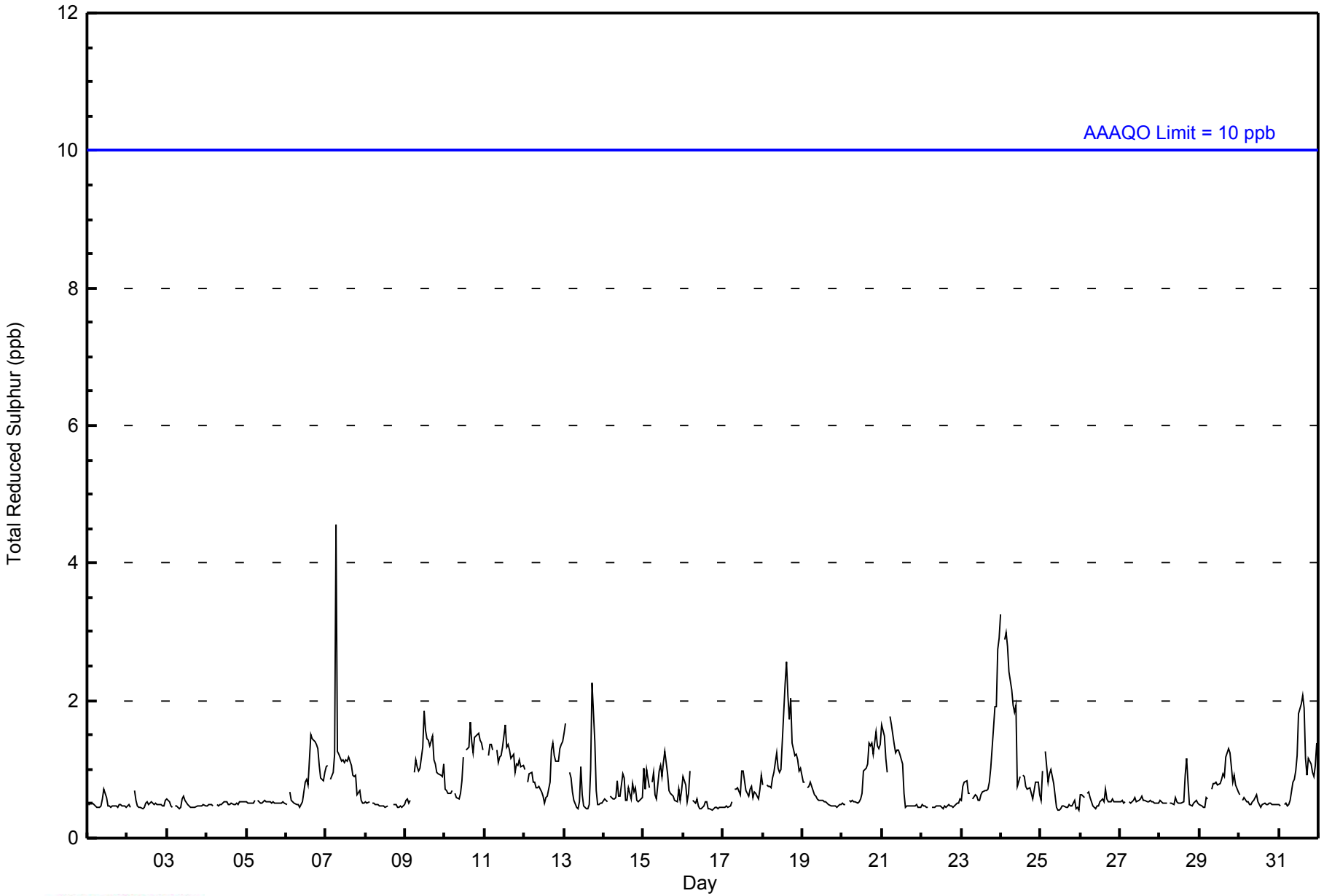
Z - zerospan C - Calibration M - Maintenance MS - Missing
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	698	98.87	98.87
3 - 4	7	0.99	99.86
5 - 7	1	0.14	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	87	60	33	18	8	3	3	17	112	96	30	41	32	38	32	35	645
3 - 4	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0	1	5
5 - 7	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	87	60	33	18	8	3	3	17	114	98	30	41	33	38	32	36	651

Total Number of Valid Hours: 651

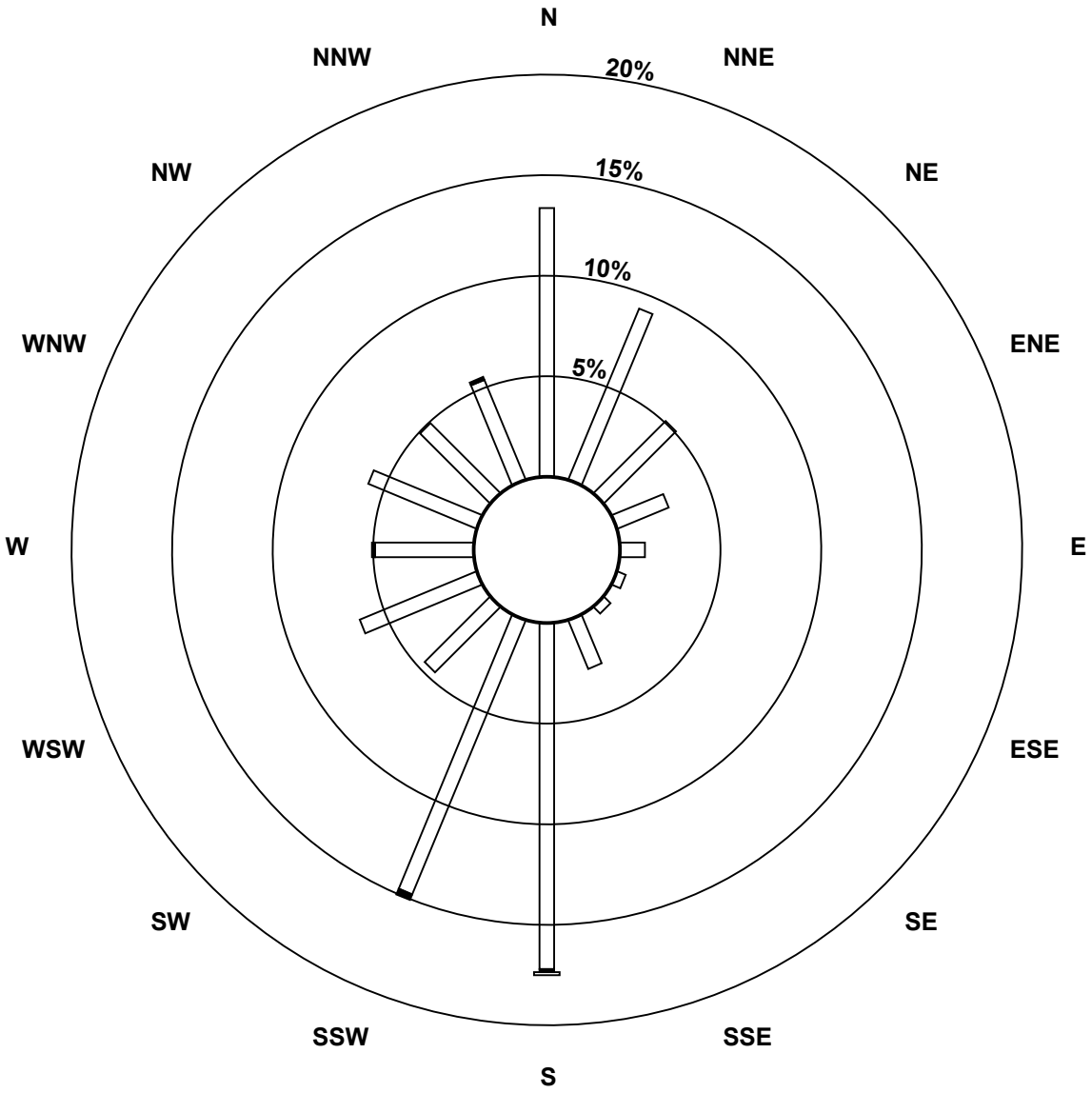
Total Number of Hours: 744

Wood Buffalo Environmental Association

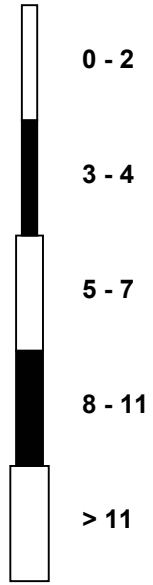
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



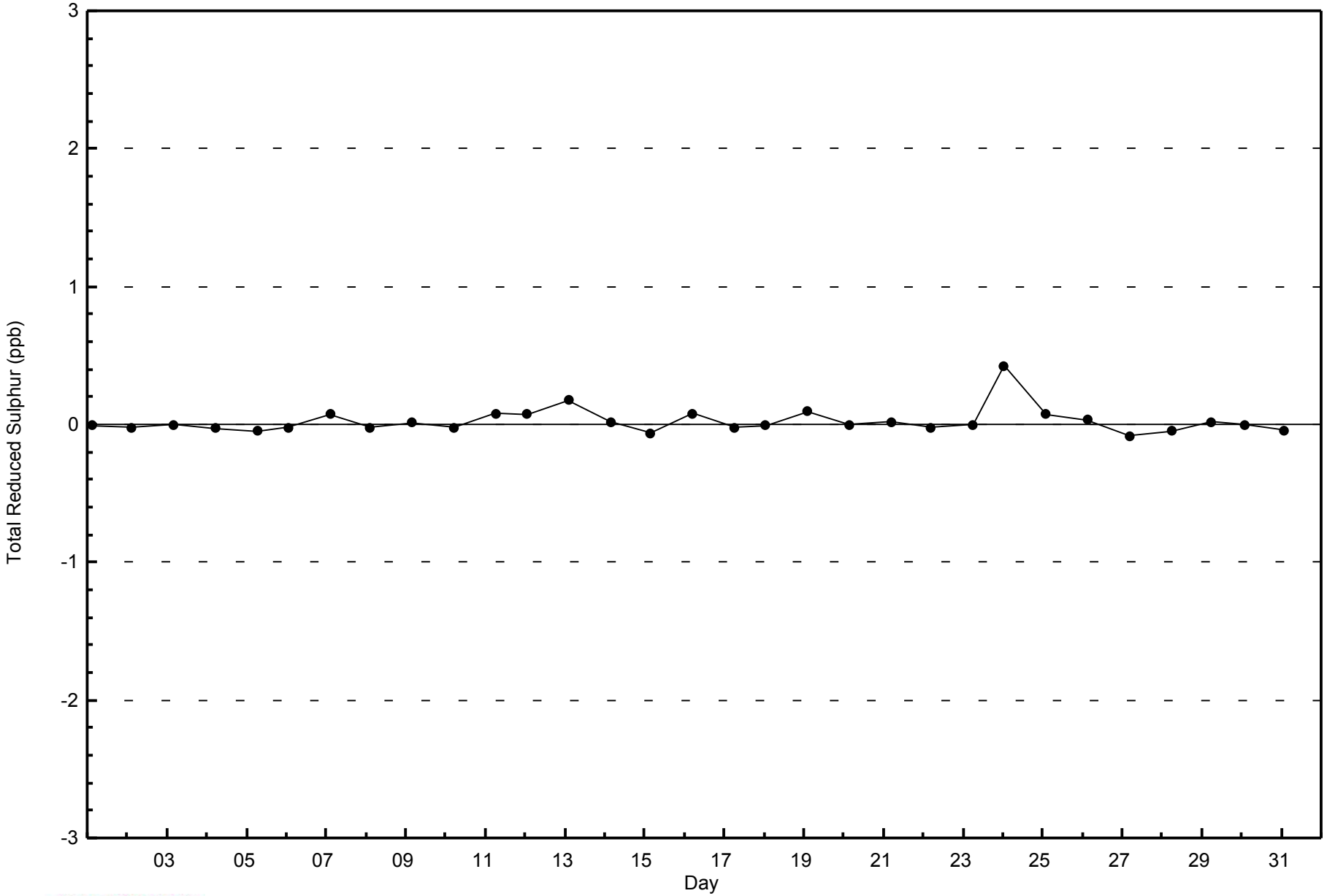
Total Number of Valid Hours: 651

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2015



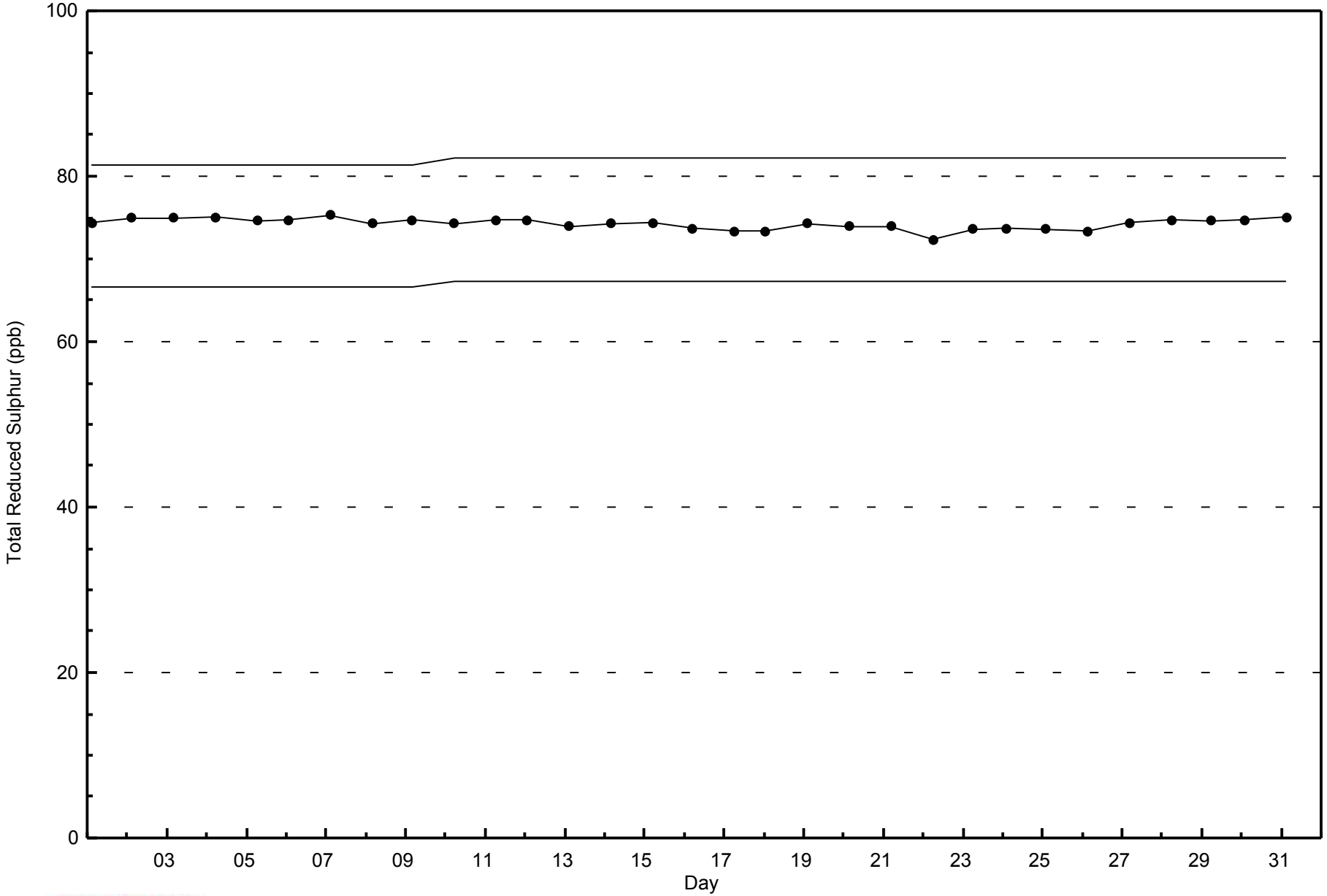
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2015

Maximum Value: 3.9 ppm on Jan 18 18:00

Maximum Daily Average: 2.3 ppm on Jan 24

Minimum Value: 1.7 ppm on Jan 22 13:00

Minimum Daily Average: 1.8 ppm on Jan 22

Maximum Diurnal Average: 2.1 ppm at hour 18

Minimum Diurnal Average: 2.0 ppm at hour 14

Monthly Average: 2.01 ppm

Percentiles: P_1 = 1.7 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.1 P_{90} = 2.3 P_{99} = 2.9

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-Jan	1.9	Z	2.0	2.0	2.0	1.9	1.8	1.8	1.9	2.1	2.1	2.2	1.9	1.8	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2
2-Jan	1.9	2.0	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	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
3-Jan	2.1	2.1	2.0	Z	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
4-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
5-Jan	1.9	1.9	1.9	1.9	1.9	Z	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	2.0	1.9	2.0
6-Jan	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.3
7-Jan	2.2	Z	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	C	C	C	2.1	2.2	2.4	1.9	2.0	1.9	1.8	1.8	2.1	2.4
8-Jan	1.8	1.9	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9
9-Jan	2.1	2.1	2.0	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.2	2.7
10-Jan	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	2.2	2.1	2.2	2.3	2.3	2.5	2.4	2.5	2.3	2.2	2.5
11-Jan	2.4	2.3	2.3	2.3	2.3	Z	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
12-Jan	Z	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.4	2.4	2.7	2.6	2.3	2.3	2.3	2.2	2.2	2.2	2.7
13-Jan	2.2	Z	2.3	2.2	2.2	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.1	1.9	1.9	1.9	1.9	2.1	2.1	2.3	1.9	1.9	1.9	2.1	2.0	2.3
14-Jan	2.1	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1
15-Jan	2.0	2.2	2.0	Z	2.1	1.9	1.9	1.9	1.9	2.0	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.1	1.9	1.8	1.8	1.8	2.0	2.2
16-Jan	1.8	1.8	1.9	2.0	Z	2.1	2.2	2.2	2.1	1.9	1.9	1.9	1.9	2.2	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.2
17-Jan	1.8	1.8	1.8	1.8	1.8	Z	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.1	1.9	2.1
18-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.5	2.1	2.1	2.1	2.2	2.2	2.3	2.6	2.9	3.9	2.6	2.3	2.3	2.3	2.3	2.2	2.3	3.9
19-Jan	2.3	Z	2.3	2.3	2.4	2.4	2.2	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4
20-Jan	2.0	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	2.4	3.1	2.5	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	3.1
21-Jan	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.1
22-Jan	1.8	1.7	1.7	1.7	Z	1.8	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9
23-Jan	1.9	1.9	1.9	1.9	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	2.2	2.2	2.5	2.6	3.0	3.6	3.4	2.2	3.6
24-Jan	Z	3.6	2.9	2.7	2.7	2.7	2.7	2.8	2.8	2.8	1.9	2.2	MS	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.3	3.6
25-Jan	2.1	Z	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.7	1.7	1.7	1.8	1.7	1.7	1.8	1.9	1.8	1.9	1.9	1.8	1.8	1.8	1.9	2.1
26-Jan	2.0	2.1	Z	2.2	2.1	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	2.0	1.9	2.1	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	2.2
27-Jan	1.8	1.8	1.8	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	1.8	1.9	1.9	1.9	1.9	1.9	1.9
28-Jan	1.8	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2
29-Jan	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0
30-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
31-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.4	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.4	3.6	2.9	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.3	2.2	2.4	2.3	2.4	3.1	2.9	3.9	2.6	2.5	2.6	3.0	3.6	3.4	Diurnal Maximum	

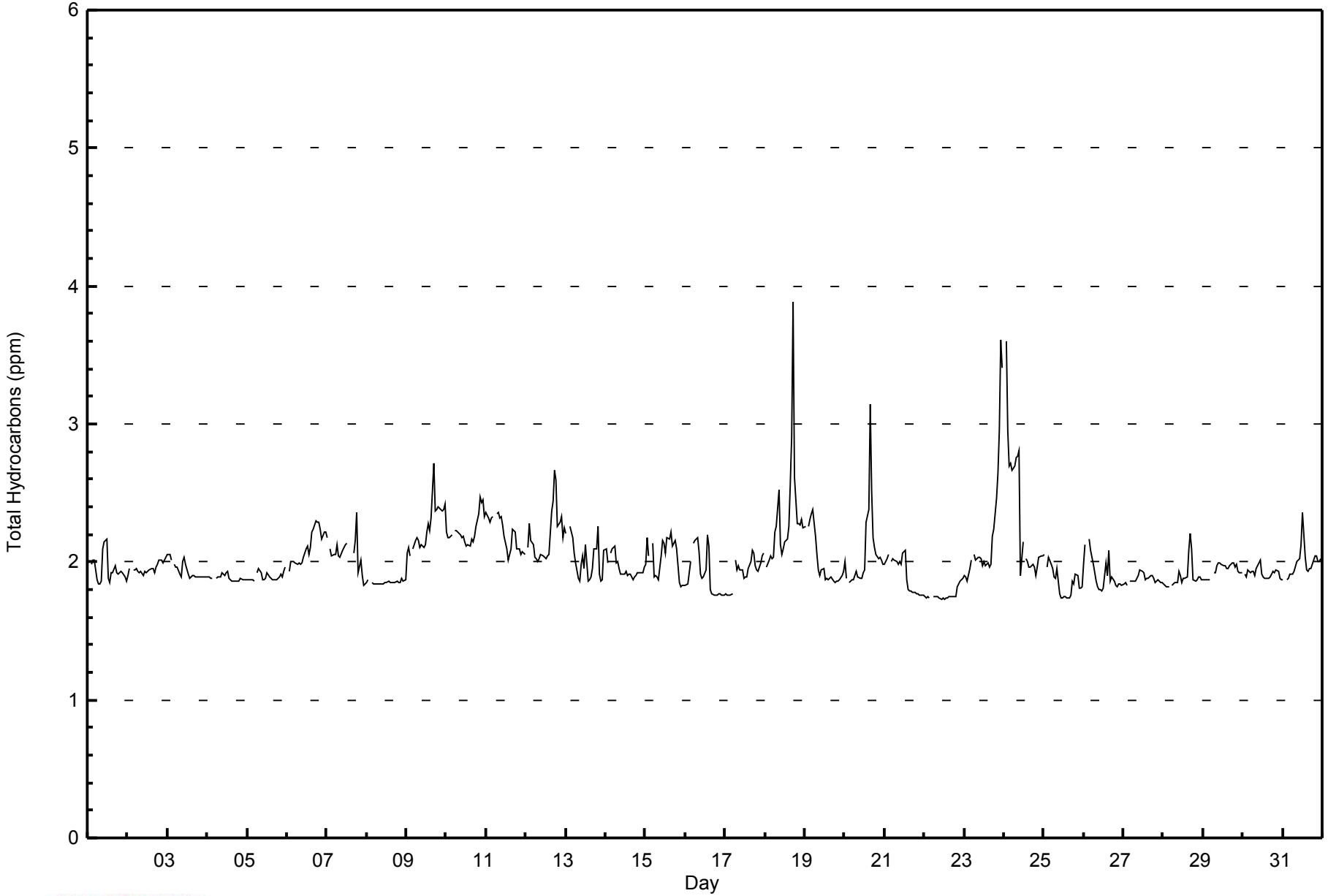
Z - zerospan C - Calibration MS - Missing

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	501	70.66	70.66
2.1 - 3.0	203	28.63	99.29
3.1 - 10.0	5	0.71	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2015

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	68	50	28	13	8	3	3	12	50	44	19	42	25	38	30	24	457
2.1 - 3.0	23	11	2	4	0	0	0	5	66	50	12	2	5	1	3	8	192
3.1 - 10.0	0	0	0	0	1	0	0	0	1	2	0	0	1	0	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	61	30	17	9	3	3	17	117	96	31	44	31	39	33	32	654

Total Number of Valid Hours: 654

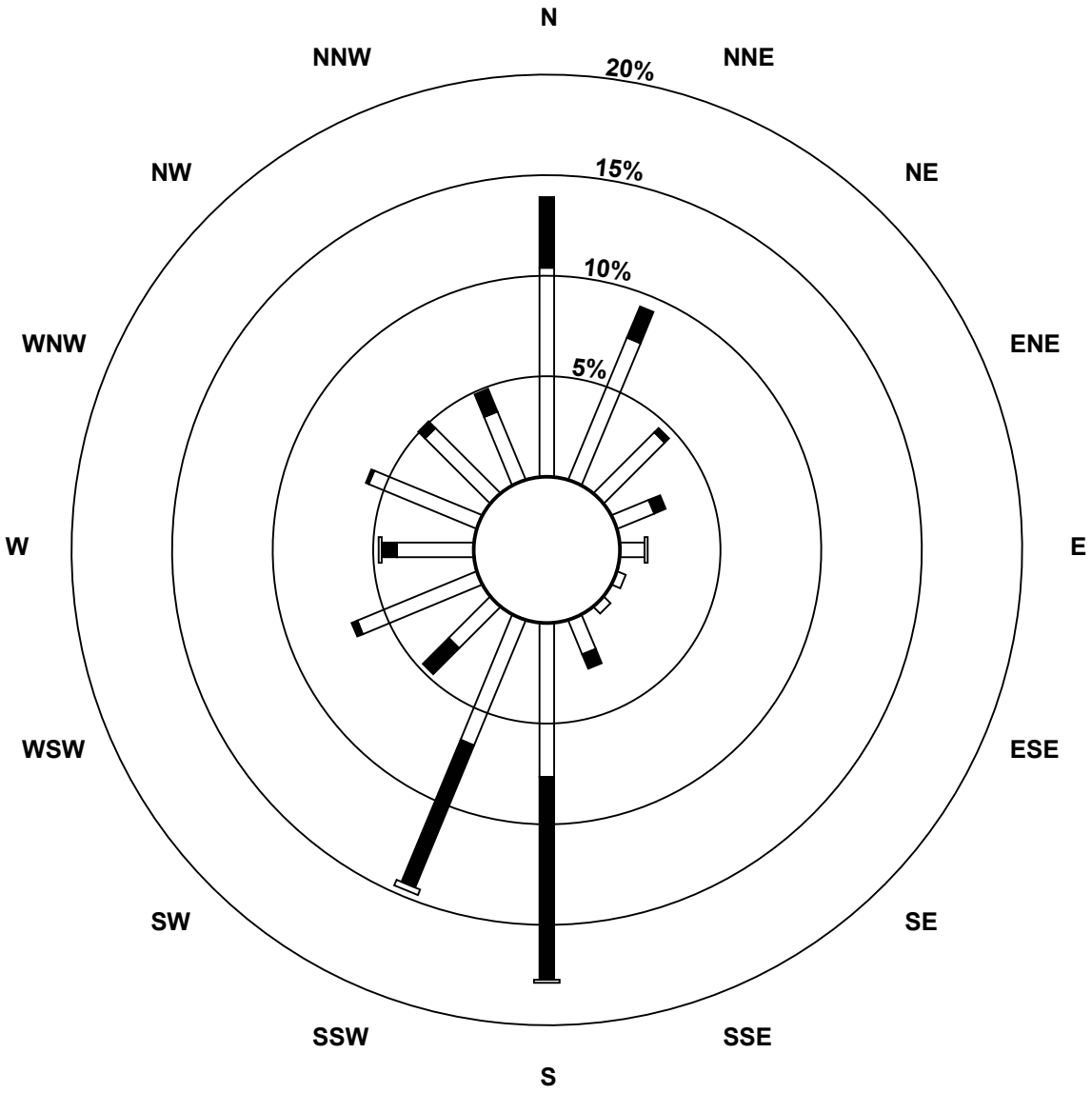
Total Number of Hours: 744

Wood Buffalo Environmental Association

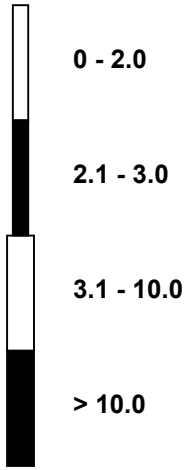
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)



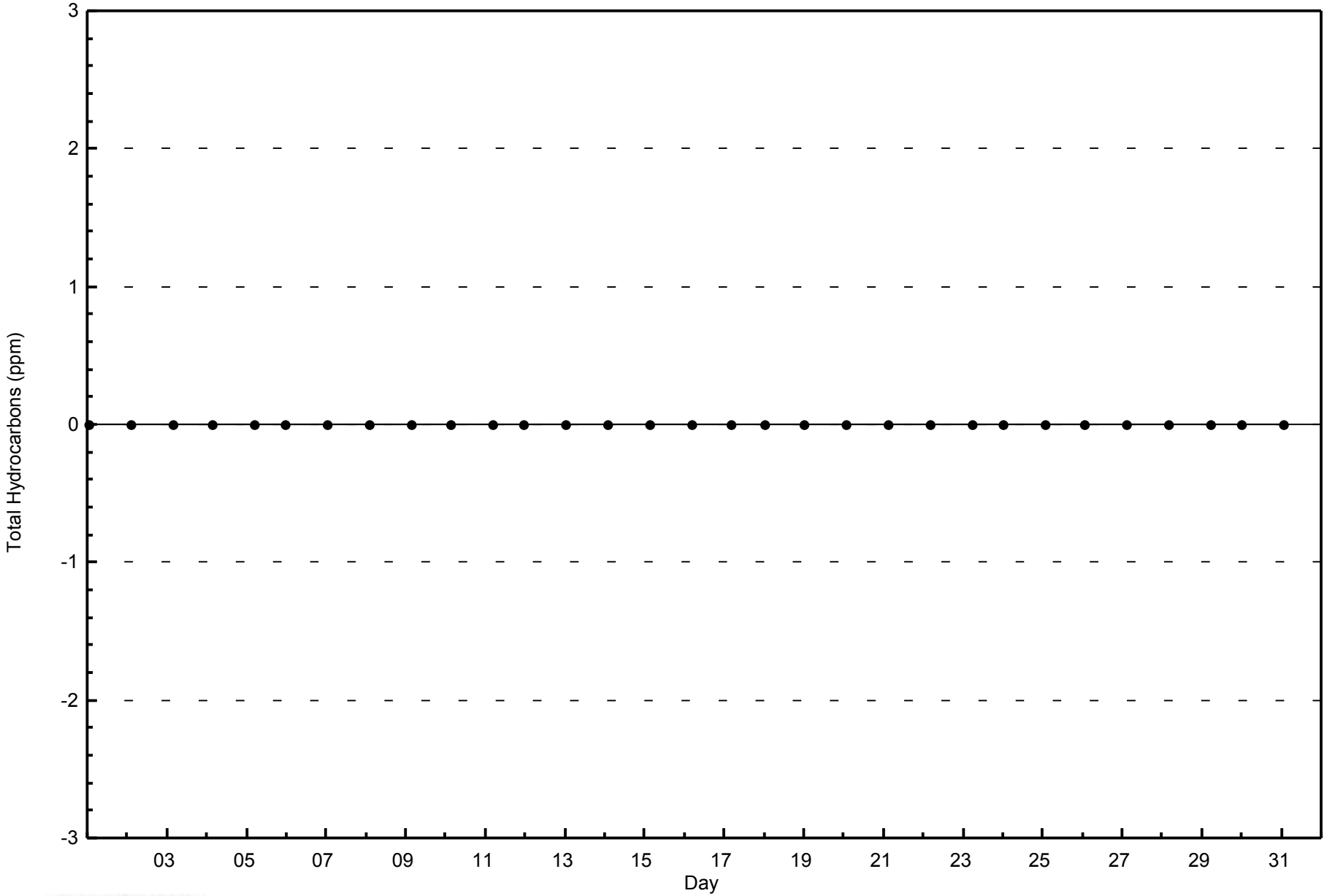
Total Number of Valid Hours: 654

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2015



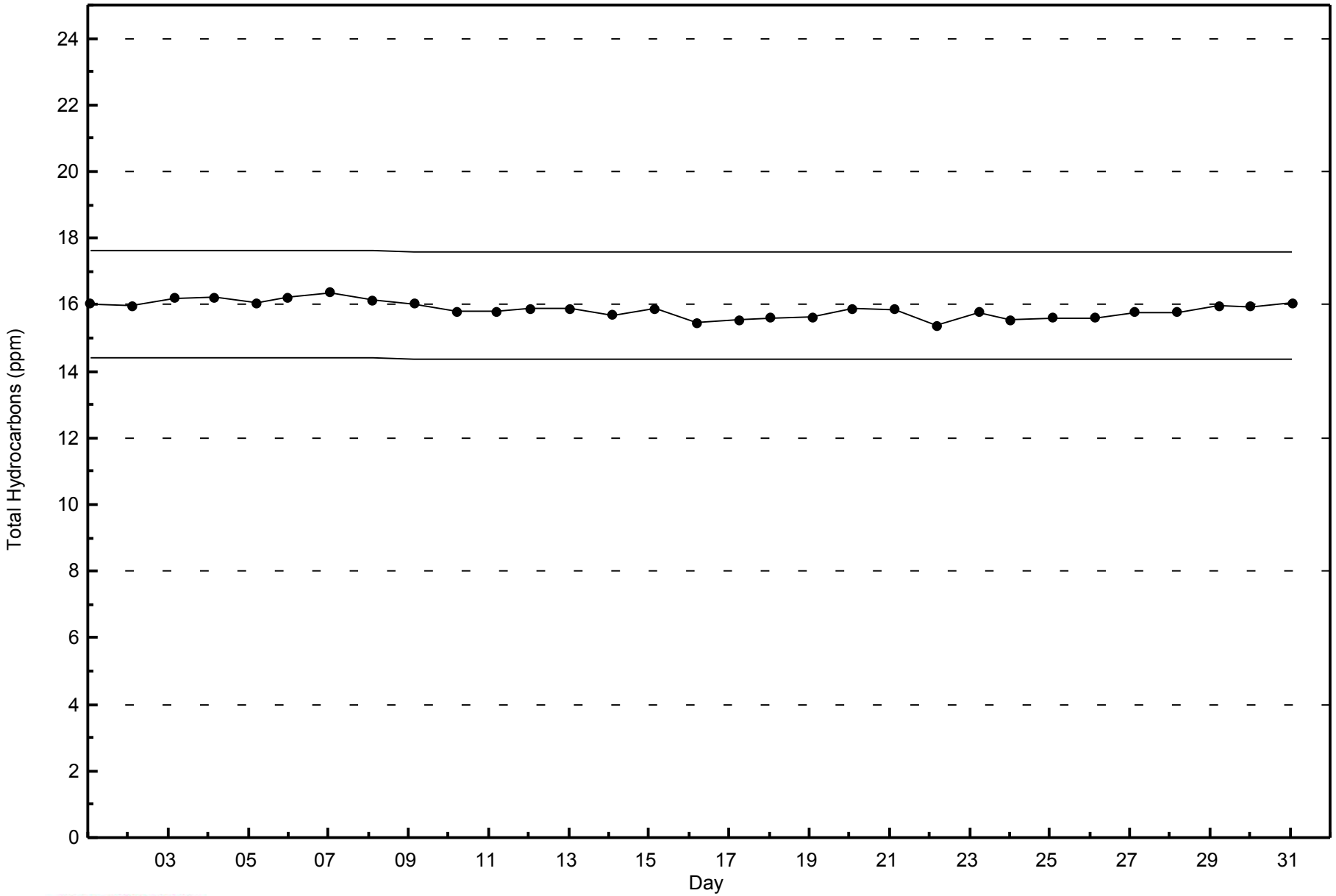
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2015



AURORA
ATMOSPHERICS INC.

Maximum Value: 0.302 ppm on Jan 24 02:00

Maximum Daily Average: 0.079 ppm on Jan 15

Minimum Value: 0.000 ppm on Jan 1 03:00

Minimum Daily Average: 0.000 ppm on Jan 2

Maximum Diurnal Average: 0.023 ppm at hour 2

Minimum Diurnal Average: 0.000 ppm at hour 6

Monthly Average: 0.005 ppm

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

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)																								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-Jan	0.032	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.002	0.032
2-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	0.000	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
4-Jan	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-Jan	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
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	Z	0.000	0.000	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
8-Jan	0.000	0.000	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
9-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	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-Jan	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-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.036	0.233	0.000	0.000	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.233
14-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.005	0.000	0.000	0.000	0.000	0.000	0.001	0.011
15-Jan	0.000	0.268	0.125	Z	0.253	0.000	0.000	0.000	0.003	0.133	0.226	0.220	0.123	0.208	0.156	0.107	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.268
16-Jan	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
17-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.107	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	0.005	0.107
18-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.056
19-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.125	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.125
21-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	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-Jan	0.000	0.006	0.002	0.013	0.000	Z	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	0.006	0.021	0.037	0.268	0.253	0.026	0.268
24-Jan	Z	0.302	0.074	0.003	0.006	0.000	0.007	0.017	0.006	0.000	0.000	0.002	MS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.302
25-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.054	0.051	0.000	0.000	0.000	0.006	0.054
26-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	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-Jan	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-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	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	0.000	0.000	0.002
	0.001	0.023	0.008	0.001	0.010	0.000	0.004	0.001	0.000	0.004	0.008	0.008	0.012	0.007	0.006	0.008	0.002	0.004	0.000	0.002	0.002	0.001	0.009	0.008	Diurnal Average	
	0.032	0.302	0.125	0.013	0.253	0.000	0.107	0.017	0.006	0.133	0.226	0.220	0.233	0.208	0.156	0.125	0.033	0.056	0.005	0.054	0.051	0.037	0.268	0.253	Diurnal Maximum	

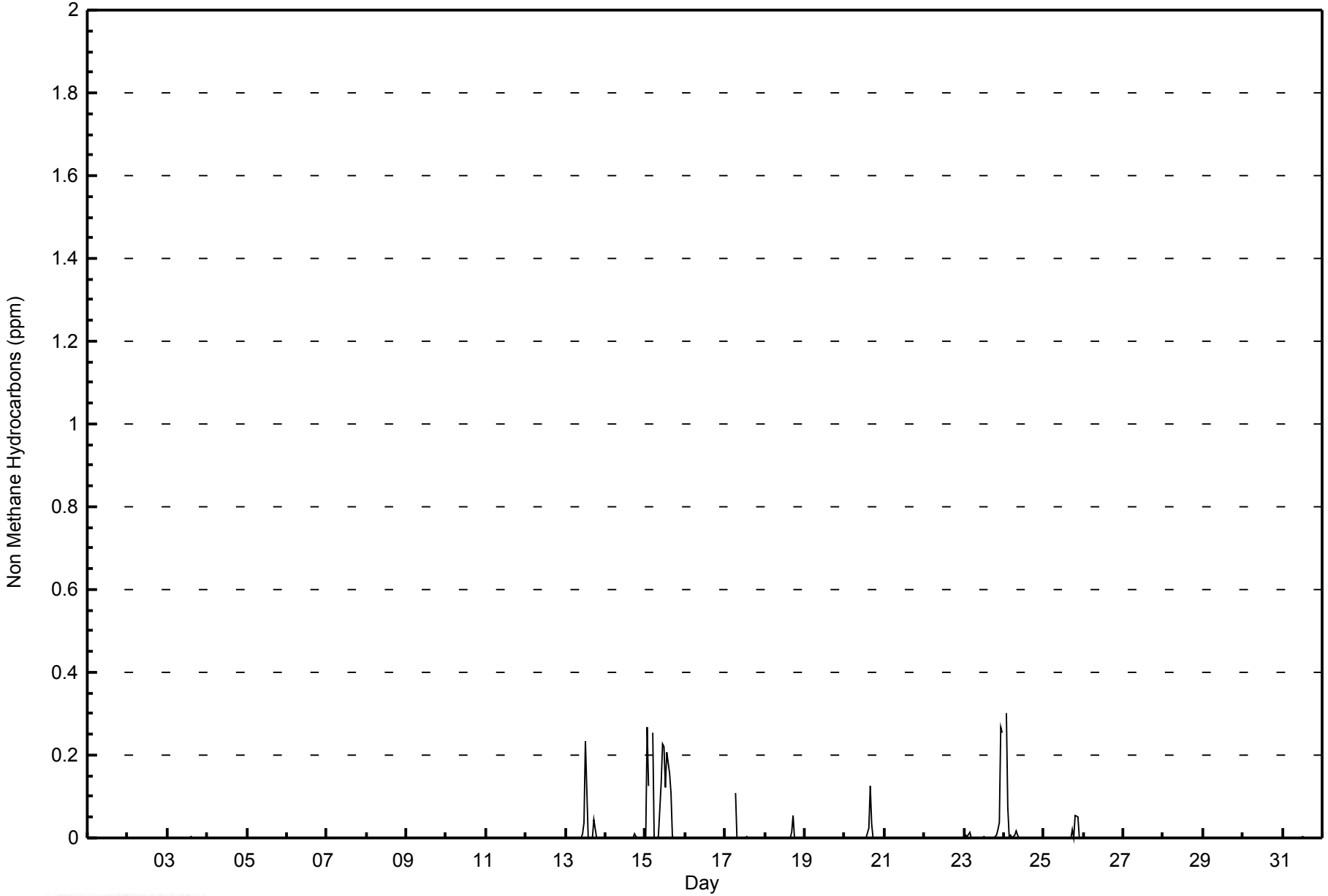
Z - zerospan C - Calibration MS - Missing

WBEA

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	672	94.78	94.78
0.006 - 0.05	19	2.68	97.46
0.06 - 0.1	8	1.13	98.59
> 0.1	10	1.41	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2015

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	89	55	24	10	7	3	3	17	112	92	31	44	30	39	33	32	621
0.006 - 0.05	1	1	2	5	1	0	0	0	4	1	0	0	0	0	0	0	15
0.06 - 0.1	0	2	2	1	0	0	0	0	1	2	0	0	0	0	0	0	8
> 0.1	1	3	2	1	1	0	0	0	0	1	0	0	1	0	0	0	10
Totals	91	61	30	17	9	3	3	17	117	96	31	44	31	39	33	32	654

Total Number of Valid Hours: 654

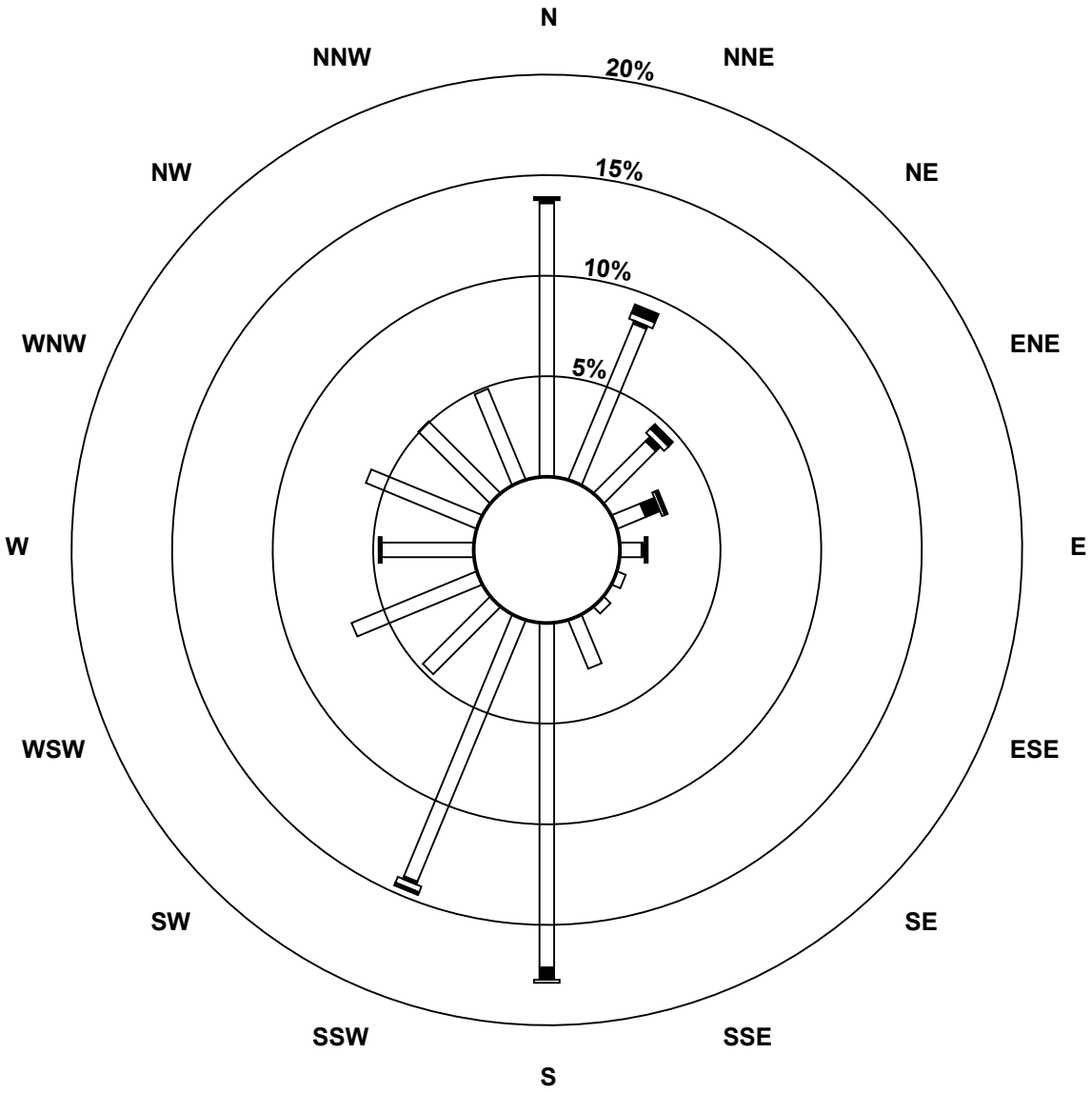
Total Number of Hours: 744

Wood Buffalo Environmental Association

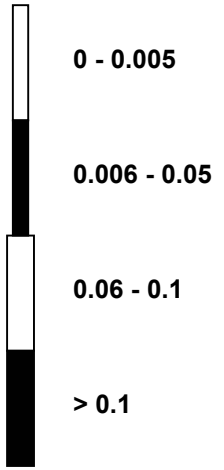
Wind Rose Jan 2015

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)



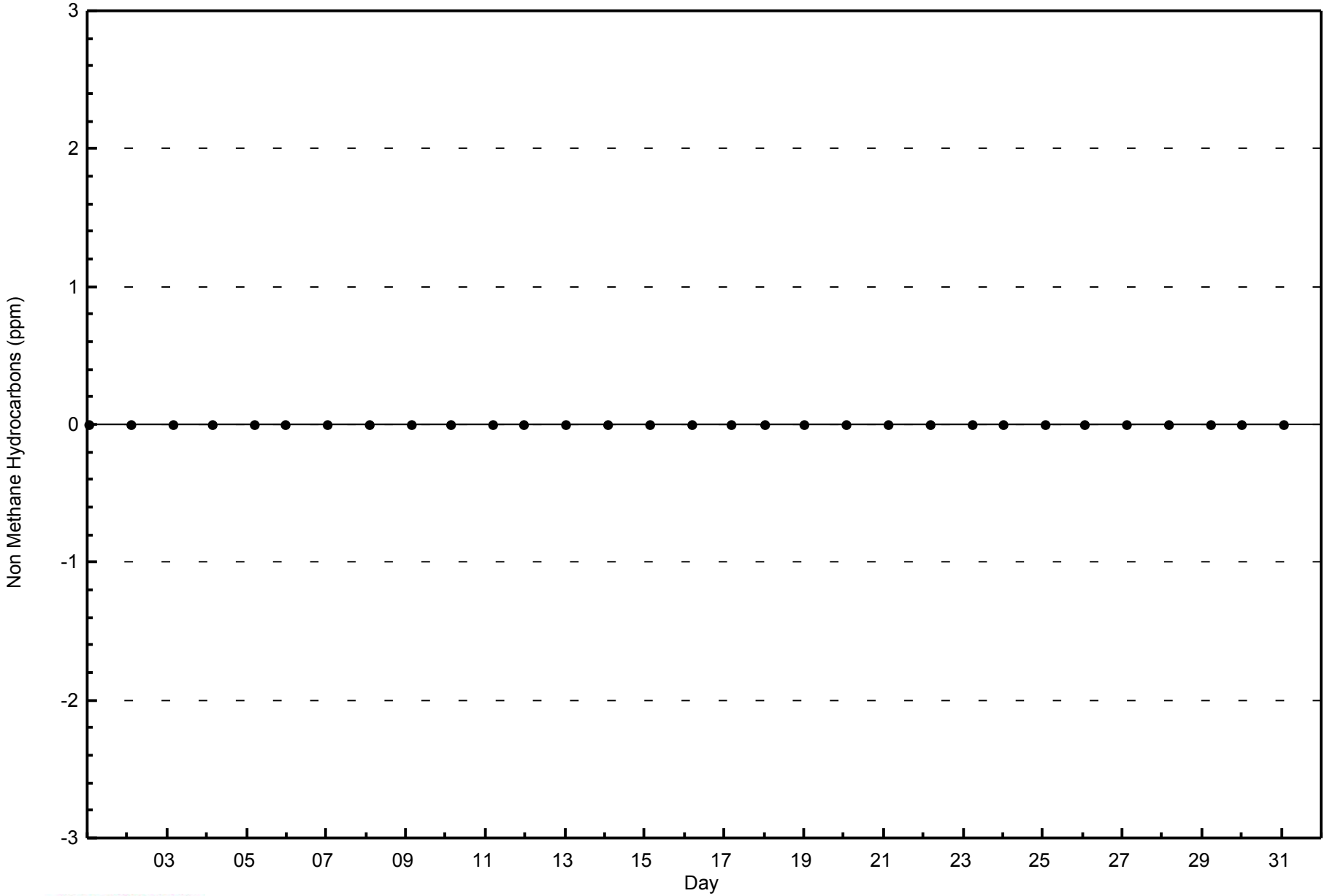
Total Number of Valid Hours: 654

WBEA

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2015



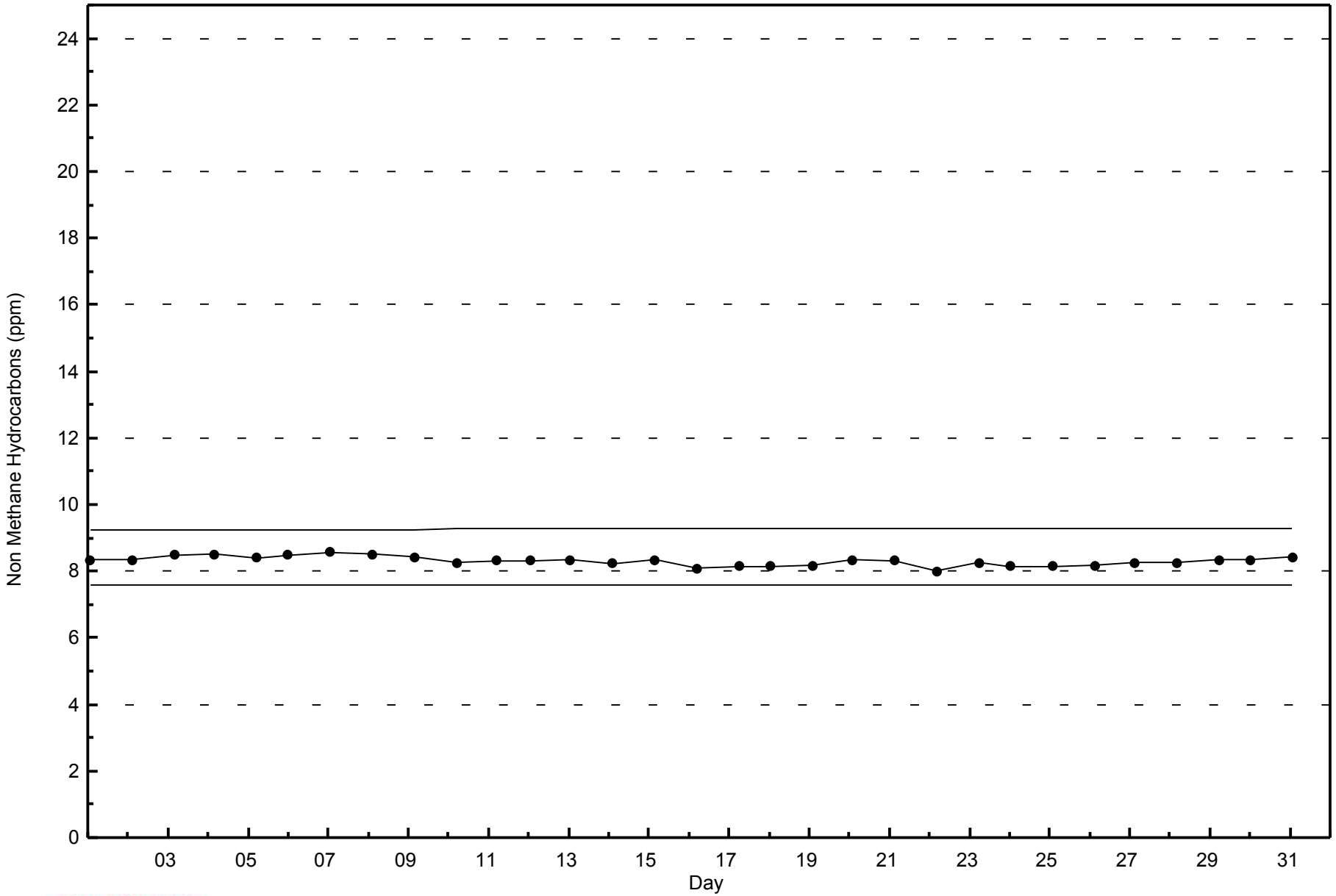
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.8 ppm on Jan 18 18:00 Maximum Daily Average: 2.3 ppm on Jan 24

Minimum Value: 1.7 ppm on Jan 22 13:00 Minimum Daily Average: 1.8 ppm on Jan 22
Maximum Diurnal Average: 2.1 ppm at hour 18 Minimum Diurnal Average: 2.0 ppm at hour 14
Monthly Average: 2.01 ppm Percentiles: P_1 = 1.7 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.1 P_{90} = 2.3 P_{99} = 2.9

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-Jan	1.9	Z	2.0	2.0	2.0	1.9	1.8	1.8	1.9	2.1	2.1	2.2	1.9	1.8	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2
2-Jan	1.9	2.0	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	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
3-Jan	2.1	2.1	2.0	Z	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
4-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
5-Jan	1.9	1.9	1.9	1.9	1.9	Z	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	2.0	1.9	2.0
6-Jan	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.3
7-Jan	2.2	Z	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	C	C	C	2.1	2.2	2.4	1.9	2.0	1.9	1.8	1.8	2.1	2.4
8-Jan	1.8	1.9	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9
9-Jan	2.1	2.1	2.0	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.2	2.7
10-Jan	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	2.2	2.1	2.2	2.3	2.3	2.5	2.4	2.5	2.3	2.2	2.5
11-Jan	2.4	2.3	2.3	2.3	2.3	Z	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
12-Jan	Z	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.4	2.4	2.7	2.6	2.3	2.3	2.3	2.2	2.2	2.2	2.7
13-Jan	2.2	Z	2.3	2.2	2.2	2.1	2.0	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.3	1.9	1.9	1.9	2.1	2.0	2.3
14-Jan	2.1	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1
15-Jan	2.0	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.1	1.9	1.8	1.8	1.8	2.0	2.2
16-Jan	1.8	1.8	1.9	2.0	Z	2.1	2.2	2.2	2.1	1.9	1.9	1.9	1.9	2.2	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.2
17-Jan	1.8	1.8	1.8	1.8	1.8	Z	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.1	1.9	2.1
18-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.5	2.1	2.1	2.1	2.2	2.2	2.3	2.6	2.9	3.8	2.6	2.3	2.3	2.3	2.3	2.2	2.3	3.8
19-Jan	2.3	Z	2.3	2.3	2.4	2.4	2.2	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4
20-Jan	2.0	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	2.4	3.0	2.5	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	3.0
21-Jan	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.1
22-Jan	1.8	1.7	1.7	1.7	Z	1.8	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9
23-Jan	1.9	1.9	1.9	1.9	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	2.2	2.2	2.5	2.6	2.9	3.3	3.2	2.2	3.3
24-Jan	Z	3.3	2.9	2.7	2.7	2.7	2.7	2.7	2.8	2.8	1.9	2.1	MS	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.3	3.3
25-Jan	2.1	Z	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.7	1.7	1.7	1.8	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	2.1
26-Jan	2.0	2.1	Z	2.2	2.1	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	2.0	1.9	2.1	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	2.2
27-Jan	1.8	1.8	1.8	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	1.8	1.9	1.9	1.9	1.9	1.9	1.9
28-Jan	1.8	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2
29-Jan	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0
30-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
31-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.4	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.4	3.3	2.9	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.3	2.2	2.4	2.3	2.4	3.0	2.9	3.8	2.6	2.5	2.6	2.9	3.3	3.2	Diurnal Maximum	

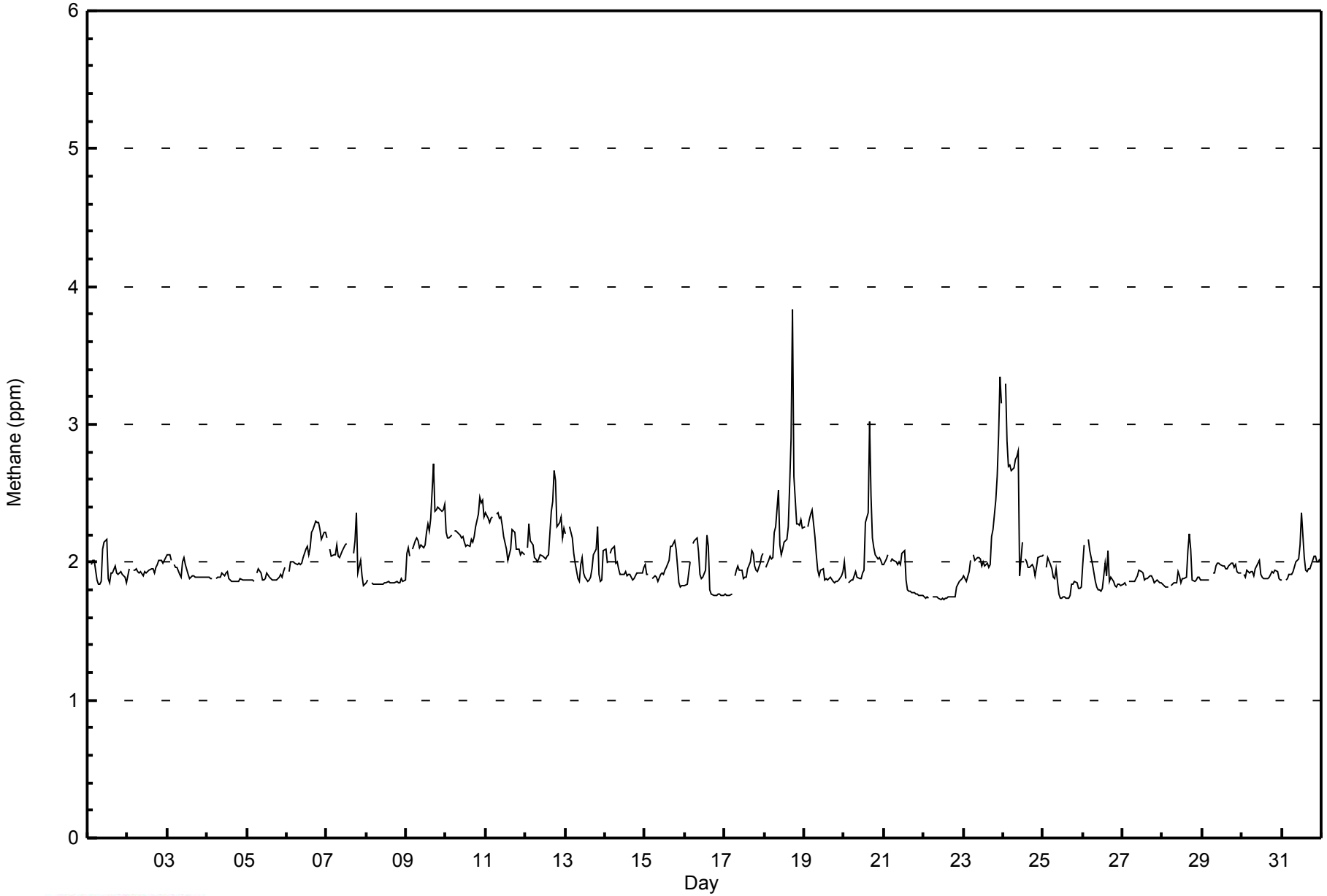
Z - zerospan C - Calibration MS - Missing

WBEA

Hourly Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	509	71.79	71.79
2.1 - 3.0	196	27.64	99.44
3.1 - 10.0	4	0.56	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

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	69	54	30	14	8	3	3	12	50	44	19	42	25	38	30	24	465
2.1 - 3.0	22	7	0	3	0	0	0	5	66	51	12	2	5	1	3	8	185
3.1 - 10.0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	61	30	17	9	3	3	17	117	96	31	44	31	39	33	32	654

Total Number of Valid Hours: 654

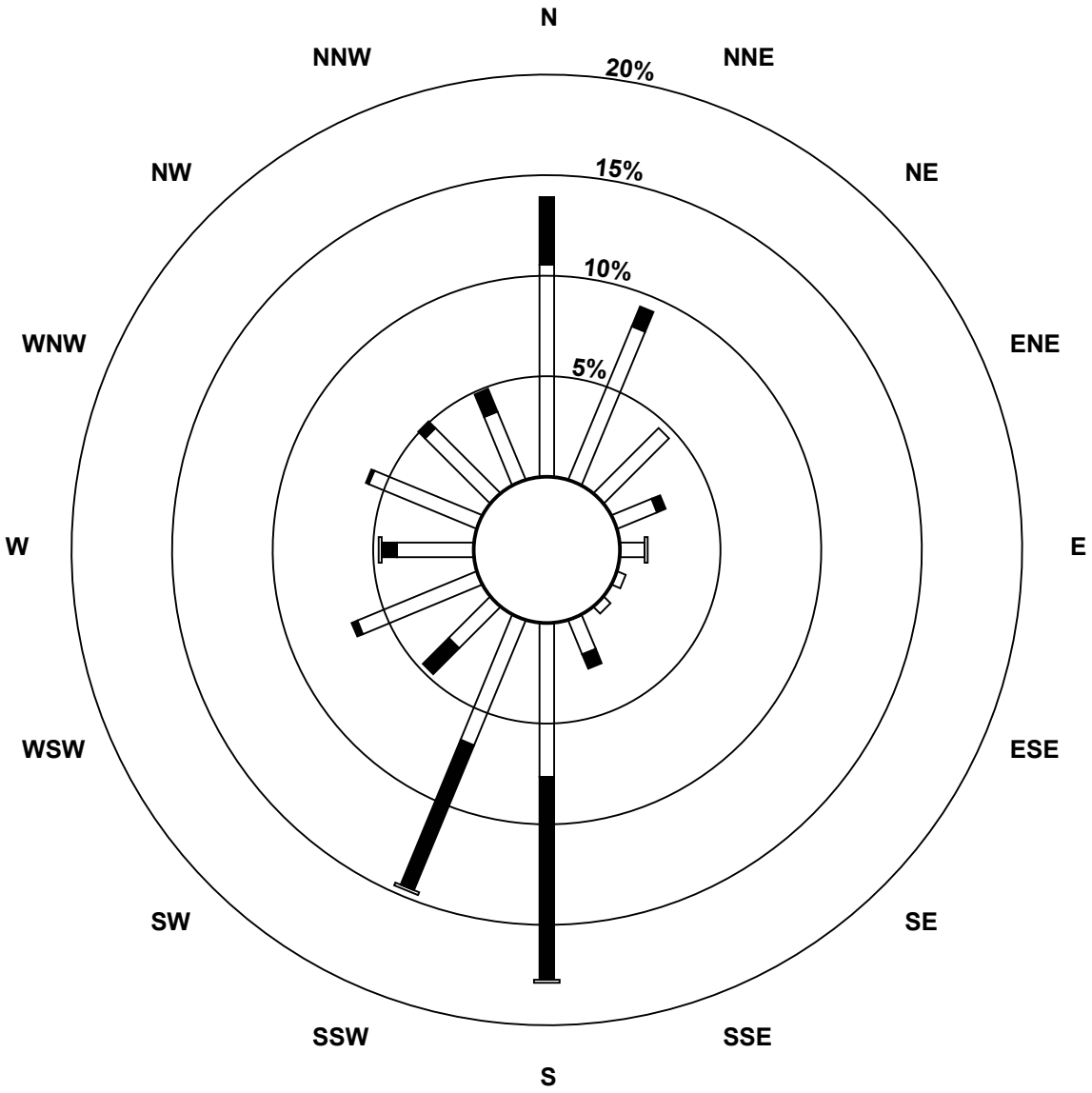
Total Number of Hours: 744

Wood Buffalo Environmental Association

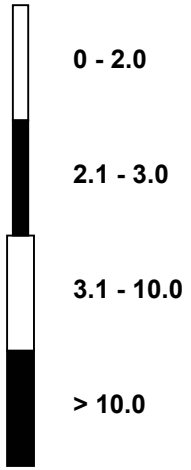
Wind Rose Jan 2015

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)



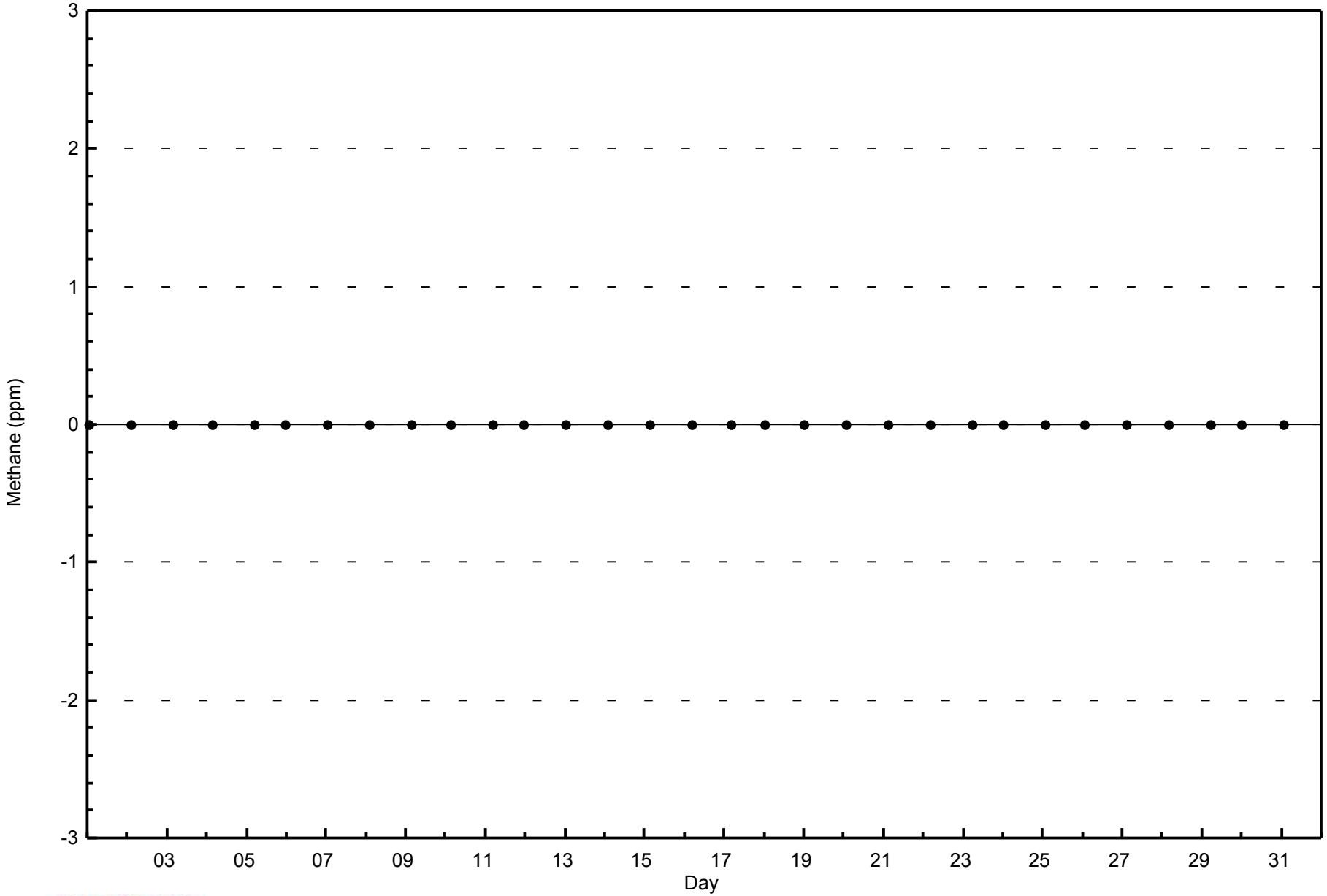
Total Number of Valid Hours: 654

WBEA

Zero Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2015



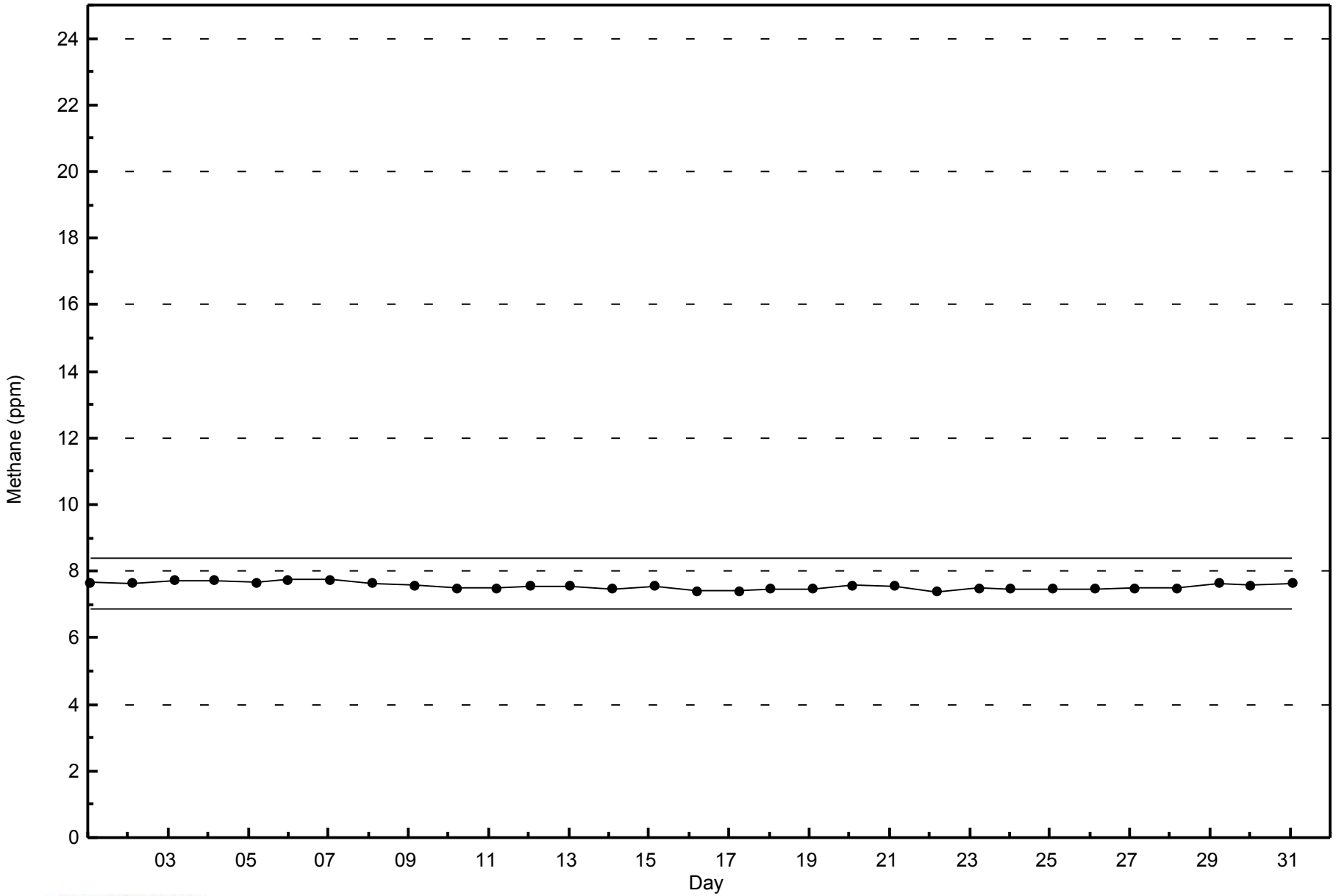
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

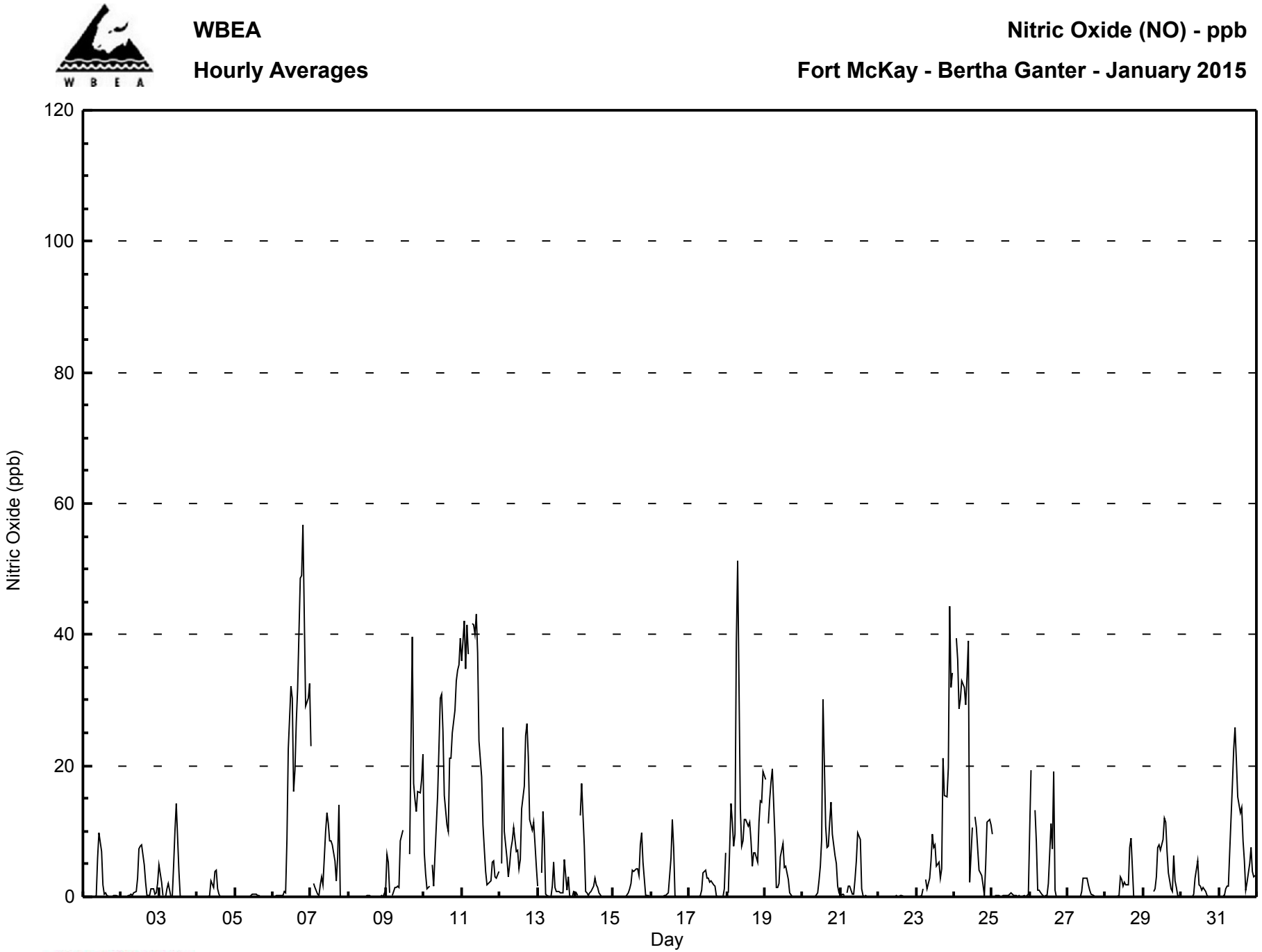
Maximum Value: 57 ppb on Jan 6 20:00
Maximum Daily Average: 21.1 ppb on Jan 11

Minimum Value: 0 ppb on Jan 2 00:00
Minimum Daily Average: 0.1 ppb on Jan 22
Maximum Diurnal Average: 7.8 ppb at hour 12
Minimum Diurnal Average: 3.3 ppb at hour 6
Monthly Average: 5.6 ppb
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 7$ $P_{90} = 17$ $P_{99} = 43$

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-Jan	0	Z	0	0	0	0	0	0	0	6	10	7	2	0	1	0	0	0	0	0	0	0	0	0	1.2	10
2-Jan	0	0	Z	0	0	0	0	0	1	1	3	7	8	8	5	2	0	0	0	1	1	0	1	2	1.8	8
3-Jan	5	2	0	Z	0	1	2	0	0	5	10	14	4	0	0	0	0	0	0	0	0	0	0	0	1.9	14
4-Jan	0	0	0	0	Z	0	0	0	0	3	1	4	4	1	0	0	0	0	0	0	0	0	0	0	0.6	4
5-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
6-Jan	Z	0	0	0	0	0	0	1	1	9	23	32	30	16	19	27	32	49	49	57	43	29	30	32	20.8	57
7-Jan	23	Z	2	1	0	0	2	3	2	10	13	11	9	9	8	5	2	6	14	0	0	0	0	0	5.3	23
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	1
9-Jan	7	5	1	Z	0	1	1	2	1	9	10	C	C	C	C	6	40	17	15	13	16	16	18	22	10.5	40
10-Jan	7	3	1	2	Z	5	2	6	15	23	30	31	25	15	11	10	21	21	25	28	33	35	35	39	18.5	39
11-Jan	36	42	35	41	37	Z	42	42	40	43	37	24	18	11	7	4	2	2	2	5	5	3	3	4	21.1	43
12-Jan	Z	5	26	10	6	3	5	7	9	11	7	7	4	6	14	17	25	26	21	12	10	11	8	5	11.0	26
13-Jan	2	Z	4	13	9	0	0	0	0	2	5	1	1	1	1	1	1	6	1	3	0	0	0	1	2.2	13
14-Jan	1	0	Z	12	17	8	1	1	0	1	1	2	3	2	2	1	0	0	0	0	0	0	0	0	2.2	17
15-Jan	0	0	0	Z	0	0	0	0	0	1	1	2	4	4	4	4	3	8	10	5	0	0	0	0	2.1	10
16-Jan	0	0	0	0	Z	0	0	0	0	0	0	1	6	12	8	0	0	0	0	0	0	0	0	0	1.2	12
17-Jan	0	0	0	0	0	Z	0	0	1	4	4	3	3	2	2	2	2	0	0	0	0	0	1	7	1.4	7
18-Jan	Z	1	14	11	8	10	39	51	13	8	9	12	12	11	11	9	5	7	7	5	11	15	14	19	13.1	51
19-Jan	18	Z	11	15	17	19	9	1	1	2	6	8	4	5	4	3	1	0	0	0	0	0	0	0	5.4	19
20-Jan	0	0	Z	0	0	0	0	0	0	1	2	5	9	30	11	8	8	11	14	10	6	5	2	1	5.3	30
21-Jan	0	0	0	Z	1	2	2	0	0	3	6	10	9	1	0	0	0	0	0	0	0	0	0	0	1.5	10
22-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Jan	0	0	0	0	1	Z	3	1	3	5	10	8	8	5	5	3	4	21	15	15	20	44	32	34	10.3	44
24-Jan	Z	40	36	29	30	33	32	29	34	39	2	11	MS	12	11	7	4	3	2	0	5	11	12	11	17.8	40
25-Jan	10	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.6	10
26-Jan	10	19	Z	13	8	1	1	0	0	0	0	0	2	11	7	19	1	0	0	0	0	0	0	0	4.1	19
27-Jan	0	0	0	Z	0	0	0	0	0	1	3	3	3	2	1	0	0	0	0	0	0	0	0	0	0.6	3
28-Jan	0	0	0	0	Z	0	0	0	0	3	3	2	2	2	2	7	9	4	0	0	0	0	0	0	1.5	9
29-Jan	0	0	0	0	0	Z	1	1	3	7	8	7	9	12	11	7	4	1	1	6	2	1	0	0	3.6	12
30-Jan	Z	0	0	0	0	0	0	0	0	3	6	2	2	1	1	1	0	0	0	0	0	0	0	0	0.7	6
31-Jan	0	Z	0	0	1	2	2	7	17	23	26	21	15	13	14	9	5	1	2	5	8	4	3	3	7.8	26
	4.5	4.7	5.0	5.7	5.3	3.3	4.6	5.0	4.6	7.1	7.6	7.8	6.8	6.4	5.3	4.9	5.4	6.0	5.8	5.4	5.2	5.7	5.2	5.9	Diurnal Average	
	36	42	36	41	37	33	42	51	40	43	37	32	30	30	19	27	40	49	49	57	43	44	35	39	Diurnal Maximum	

Z - zerospan C - Calibration MS - Missing


WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - January 2015
Nitric Oxide (ppb)
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	647	91.38	91.38
21 - 40	50	7.06	98.45
11 - 80	11	1.55	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

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	61	32	18	8	3	3	15	91	74	27	44	30	38	33	31	599
21 - 40	0	0	0	0	1	0	0	2	17	18	2	0	1	1	0	1	43
11 - 80	0	0	0	0	0	0	0	0	5	4	2	0	0	0	0	0	11
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	61	32	18	9	3	3	17	113	96	31	44	31	39	33	32	653

Total Number of Valid Hours: 653

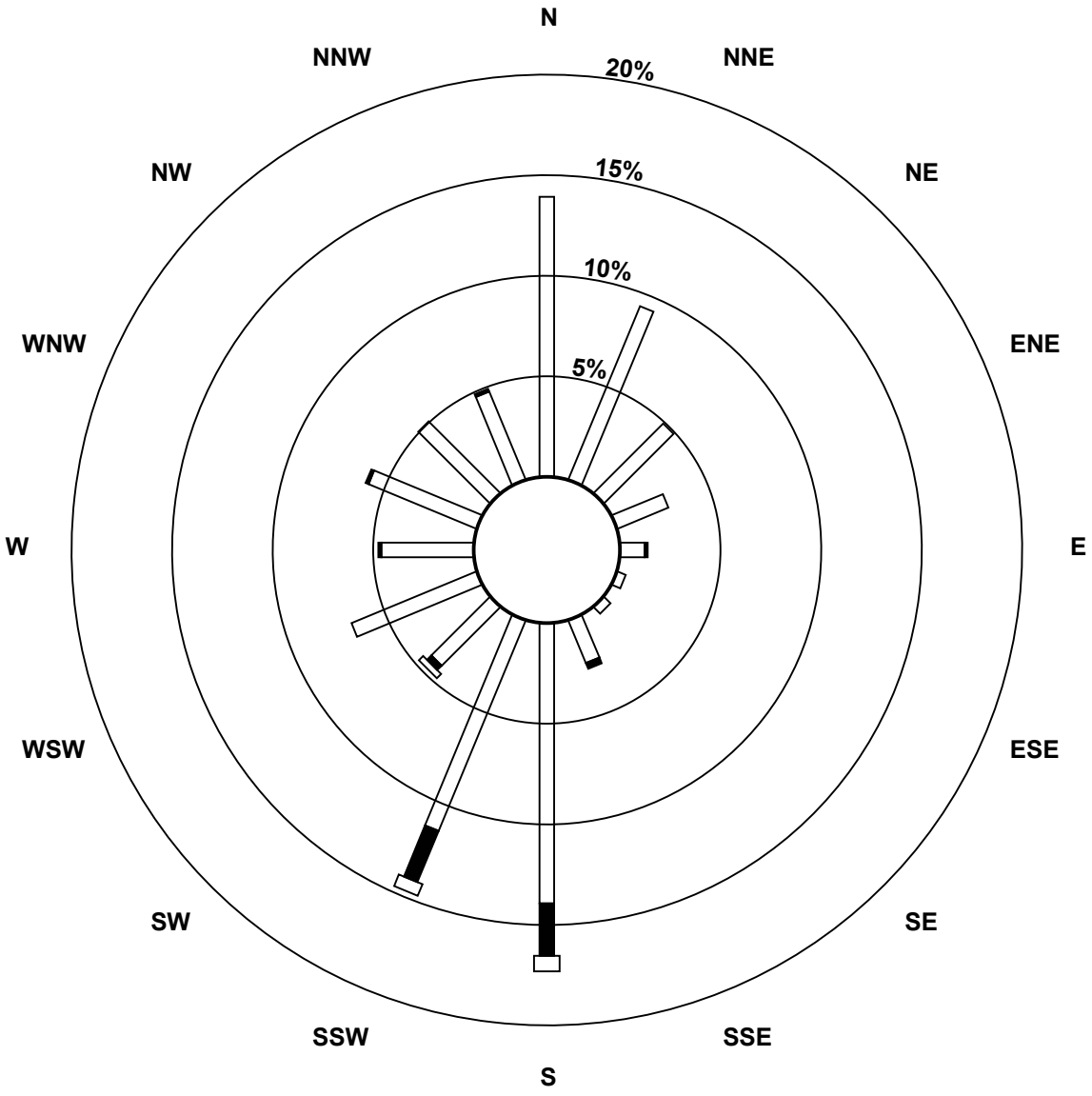
Total Number of Hours: 744

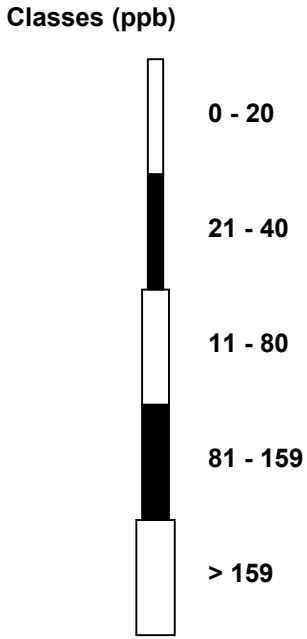
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter (AMS 1)





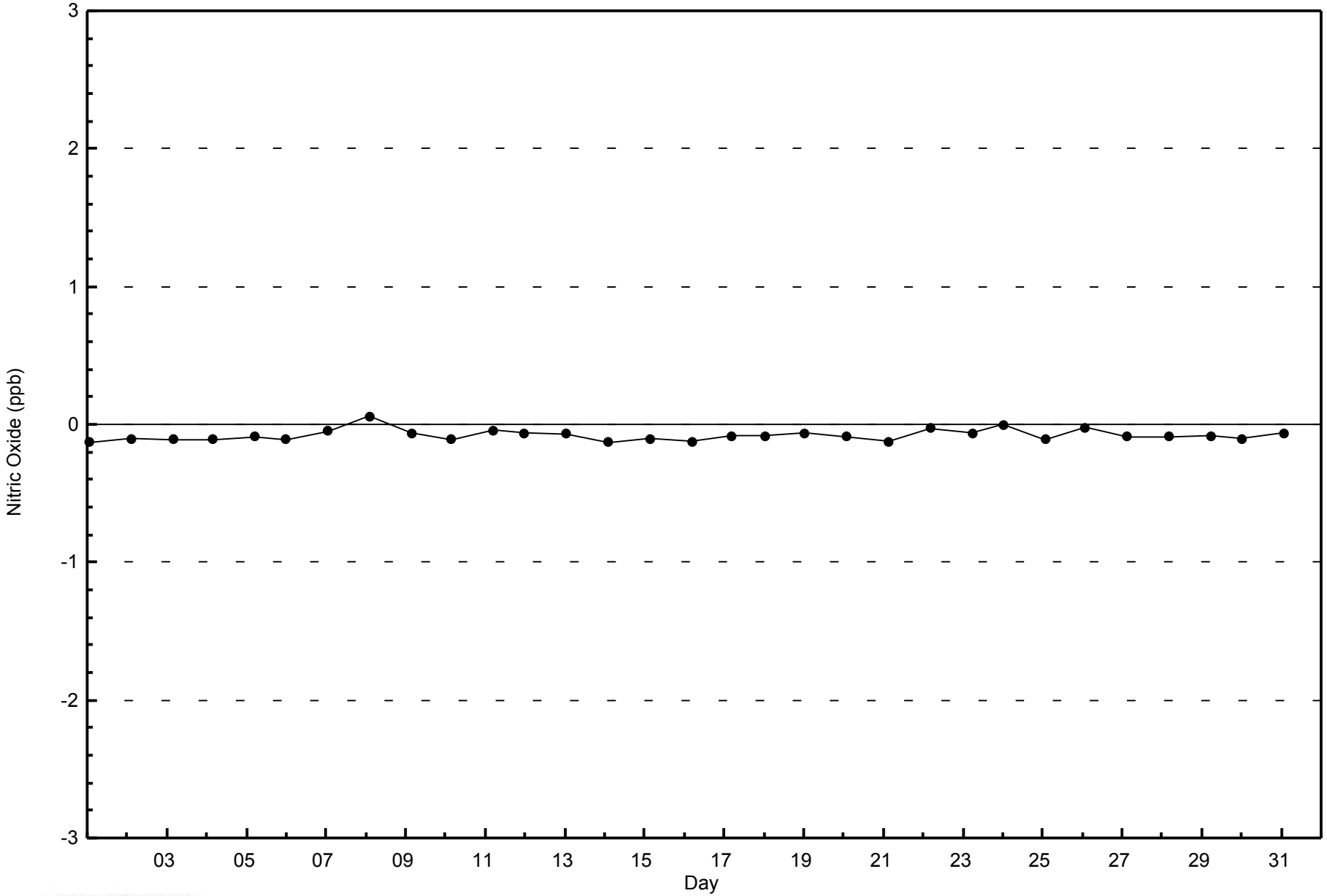
Total Number of Valid Hours: 653

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - January 2015



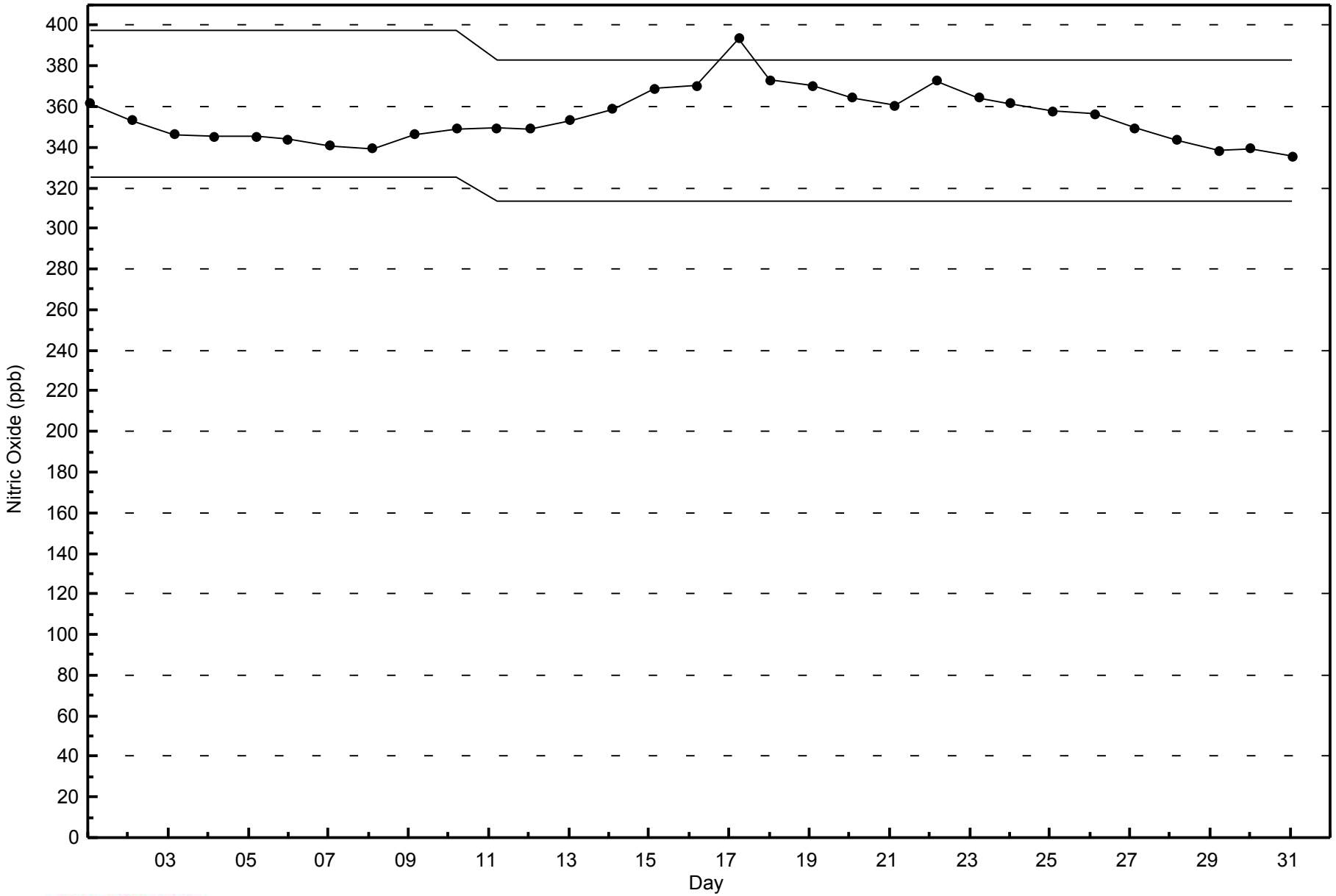
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 39 ppb on Jan 9 17:00 Maximum Daily Average: 28.9 ppb on Jan 9

Minimum Value: 0 ppb on Jan 3 14:00 Minimum Daily Average: 1.8 ppb on Jan 22
Maximum Diurnal Average: 17.1 ppb at hour 18 Minimum Diurnal Average: 10.4 ppb at hour 14
Monthly Average: 13.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 5$ Median = 12 $Q_3 = 21$ $P_{90} = 27$ $P_{99} = 34$

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-Jan	5	Z	16	14	15	9	4	3	10	25	27	22	9	3	5	6	9	6	8	11	13	8	4	1	10.1	27
2-Jan	4	10	Z	9	11	12	11	9	13	8	8	13	12	14	13	15	15	16	18	20	20	17	16	17	13.1	20
3-Jan	18	16	13	Z	9	9	10	4	1	9	13	14	4	0	0	1	1	0	0	0	0	0	0	0	5.4	18
4-Jan	0	0	0	0	Z	0	3	2	3	12	6	11	11	3	1	1	1	1	1	1	1	1	1	1	2.6	12
5-Jan	1	1	1	1	1	Z	12	14	7	1	2	3	4	2	1	1	1	1	1	3	3	2	6	8	3.2	14
6-Jan	Z	8	14	12	10	9	12	13	11	15	16	20	21	18	24	32	35	36	34	35	33	31	28	33	21.7	36
7-Jan	32	Z	27	25	19	19	22	27	26	27	25	23	24	23	24	24	27	30	29	8	17	7	2	2	21.3	32
8-Jan	6	8	Z	3	1	1	0	0	0	1	1	0	1	2	0	0	1	1	3	1	1	8	3	13	2.4	13
9-Jan	36	30	22	Z	19	31	29	23	27	27	21	C	C	C	C	26	39	36	34	33	32	30	27	27	28.9	39
10-Jan	25	26	22	22	Z	22	19	20	23	23	23	23	23	20	20	26	33	33	32	32	31	33	31	33	25.8	33
11-Jan	30	31	27	30	28	Z	29	29	28	26	25	21	18	14	14	16	21	25	25	28	28	27	26	27	24.9	31
12-Jan	Z	25	27	26	24	21	24	25	26	24	17	13	11	12	18	26	30	31	29	27	26	26	25	23	23.3	31
13-Jan	21	Z	21	24	25	22	17	6	4	13	18	7	4	4	6	12	20	32	27	30	18	14	11	21	16.4	32
14-Jan	23	13	Z	22	24	21	15	18	13	13	8	10	12	8	7	9	6	8	7	11	9	9	9	10	12.3	24
15-Jan	14	7	9	Z	6	9	11	11	12	15	12	14	19	21	24	30	33	36	35	30	12	10	12	12	17.1	36
16-Jan	14	8	3	4	Z	3	5	8	10	5	3	4	14	13	12	2	2	2	1	1	1	1	1	0	5.1	14
17-Jan	0	1	0	1	0	Z	12	17	23	23	17	12	12	11	15	18	27	24	17	16	15	17	23	30	14.3	30
18-Jan	Z	16	25	24	23	22	25	27	24	19	14	14	15	16	20	25	31	32	28	28	27	25	24	24	22.9	32
19-Jan	22	Z	18	17	16	20	20	19	21	14	14	15	10	11	12	15	11	11	10	7	7	7	9	9	13.7	22
20-Jan	12	7	Z	7	8	7	8	9	7	5	6	7	11	23	18	21	28	29	29	27	26	26	23	21	15.8	29
21-Jan	19	18	16	Z	16	19	20	14	13	13	14	17	17	6	3	2	3	2	2	2	1	1	1	1	9.4	20
22-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	0	1	2	1	1	1	0	0	3	4	9	10	1.8	10
23-Jan	9	9	14	20	26	Z	24	23	24	21	18	15	15	11	12	11	15	21	21	22	22	22	21	20	18.0	26
24-Jan	Z	17	17	16	15	15	14	12	10	12	4	7	MS	14	14	14	15	18	16	12	18	18	18	15	14.1	18
25-Jan	13	Z	19	11	11	6	5	7	10	2	1	1	2	2	1	1	1	7	4	3	5	3	6	6	5.6	19
26-Jan	13	15	Z	10	14	13	15	9	3	1	1	1	4	14	13	15	9	8	5	3	2	3	4	2	7.6	15
27-Jan	3	4	2	Z	4	4	5	5	6	9	10	9	8	7	7	6	6	7	6	4	6	7	5	7	5.8	10
28-Jan	6	4	3	2	Z	3	5	6	8	14	9	5	6	5	5	17	27	24	6	6	10	16	17	10	9.3	27
29-Jan	8	7	7	8	11	Z	22	24	25	21	17	16	17	18	19	19	21	23	24	27	25	24	18	14	18.0	27
30-Jan	Z	8	7	10	9	10	8	7	15	14	14	5	4	3	5	5	5	9	8	9	10	9	9	10	8.3	15
31-Jan	11	Z	9	10	15	15	17	20	22	21	20	17	16	14	17	18	23	24	27	29	29	29	28	28	19.9	29
	13.2	11.6	13.1	12.7	13.8	12.4	13.6	13.2	13.7	13.9	12.4	11.3	11.1	10.4	11.1	13.3	16.0	17.1	15.7	14.9	14.5	14.1	13.5	14.0	Diurnal Average	
	36	31	27	30	28	31	29	29	28	27	27	23	24	23	24	32	39	36	35	35	33	33	31	33	Diurnal Maximum	

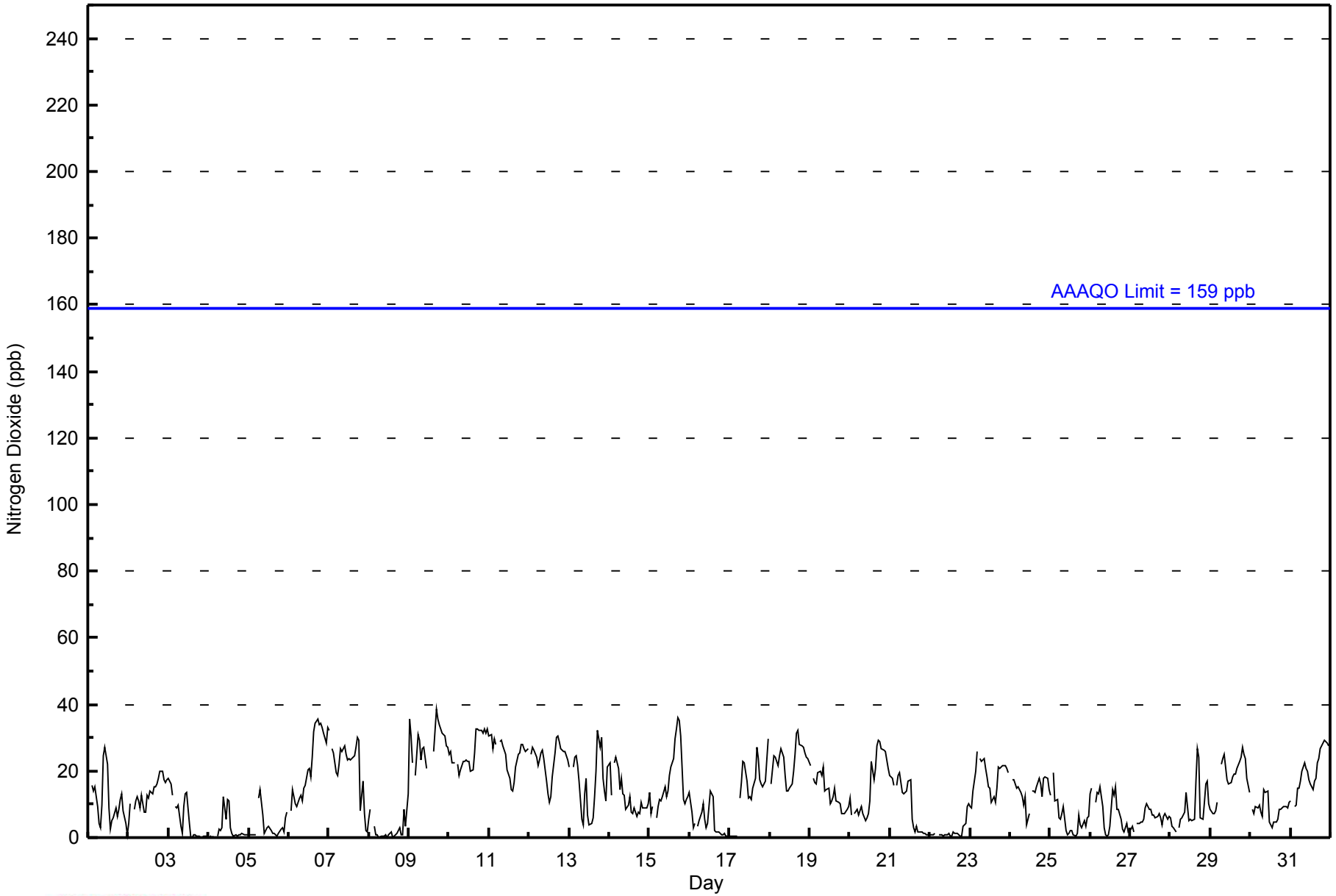
Z - zerospan C - Calibration MS - Missing
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	517	73.02	73.02
21 - 40	191	26.98	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	67	51	28	15	9	3	3	11	50	40	23	42	28	38	30	24	462
21 - 40	24	10	4	3	0	0	0	6	63	56	8	2	3	1	3	8	191
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	91	61	32	18	9	3	3	17	113	96	31	44	31	39	33	32	653

Total Number of Valid Hours: 653

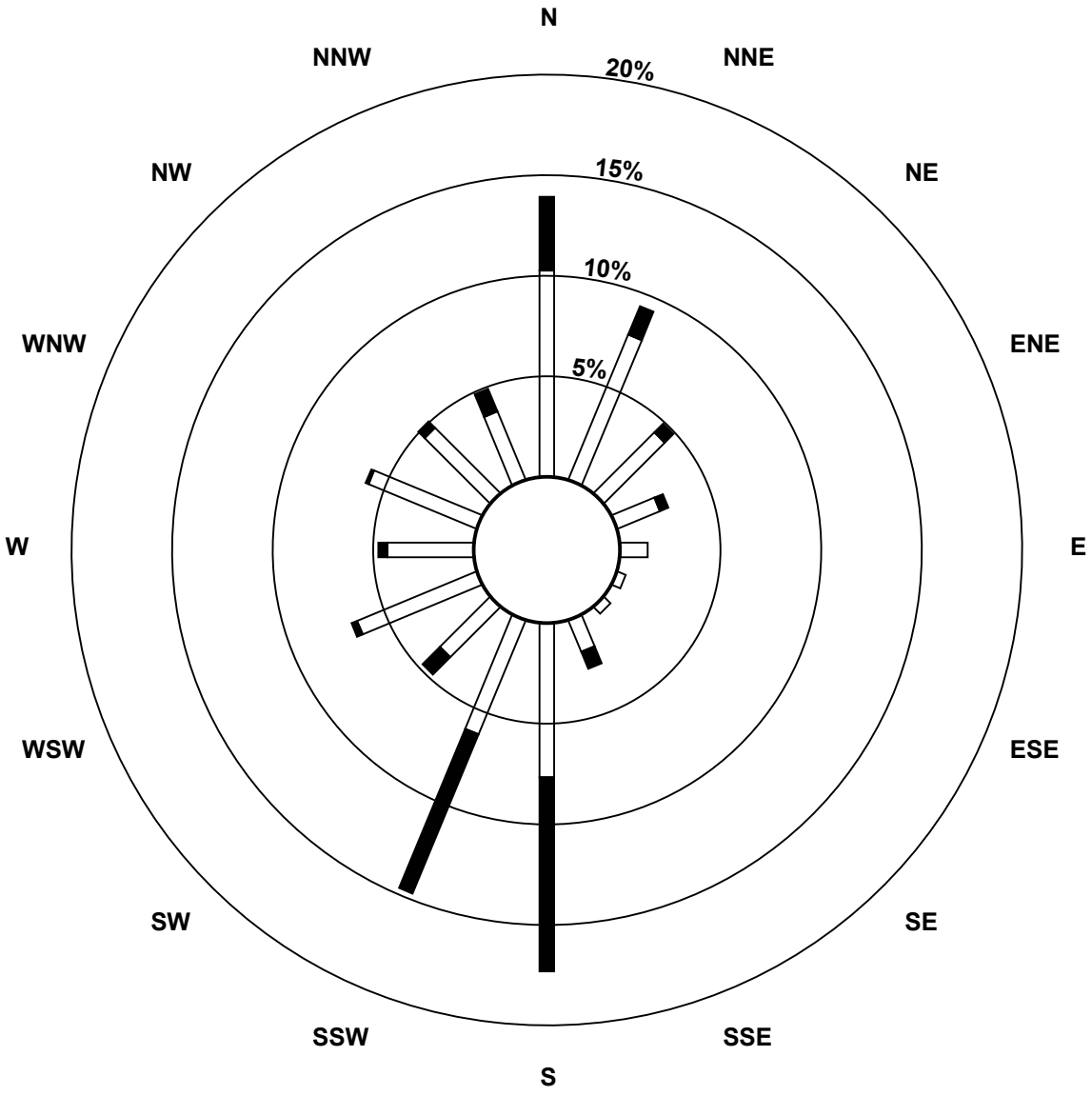
Total Number of Hours: 744

Wood Buffalo Environmental Association

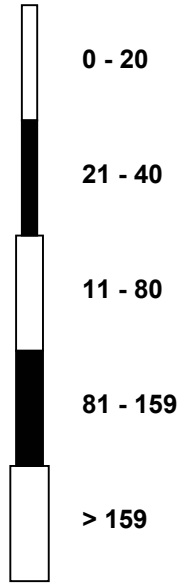
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



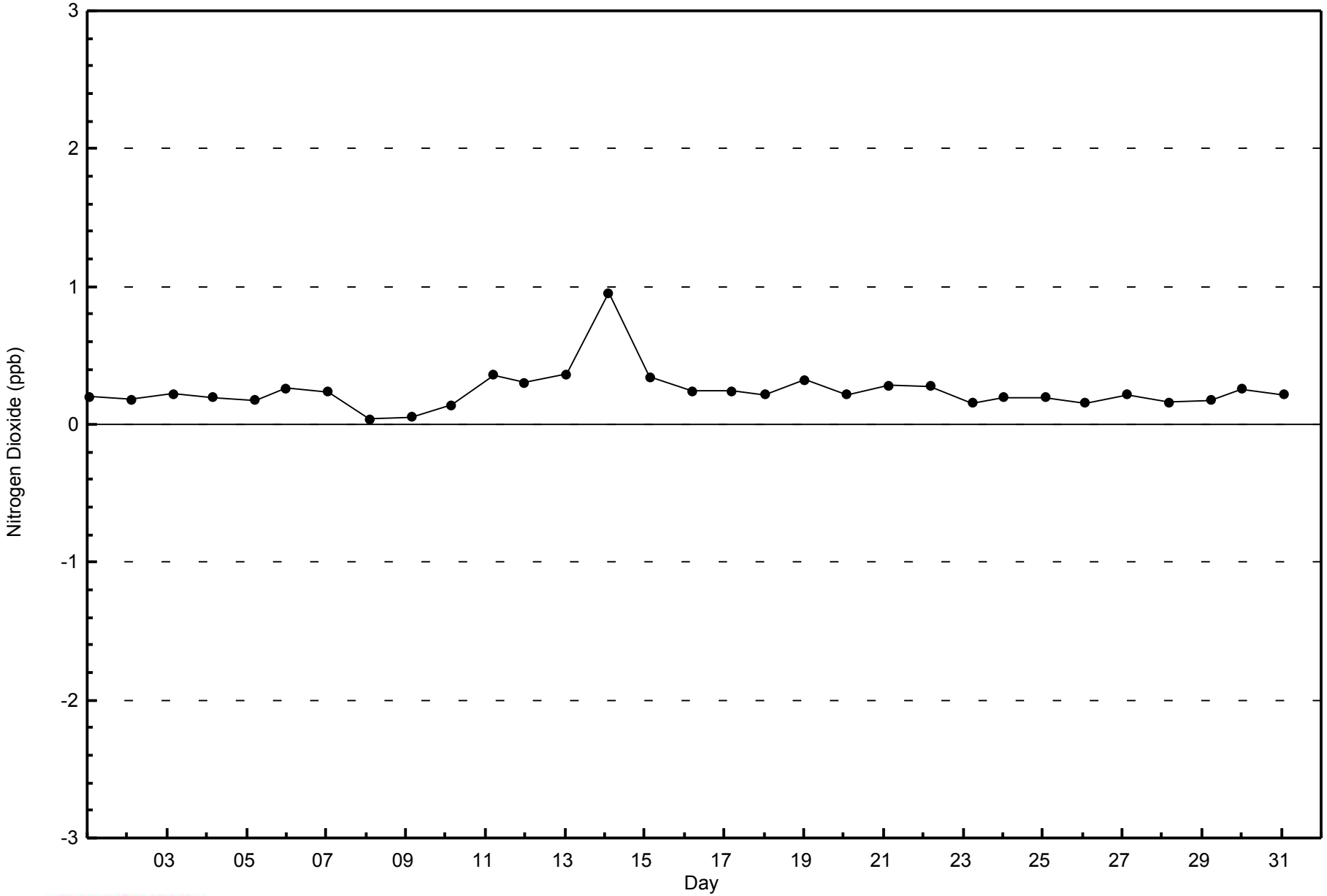
Total Number of Valid Hours: 653

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2015



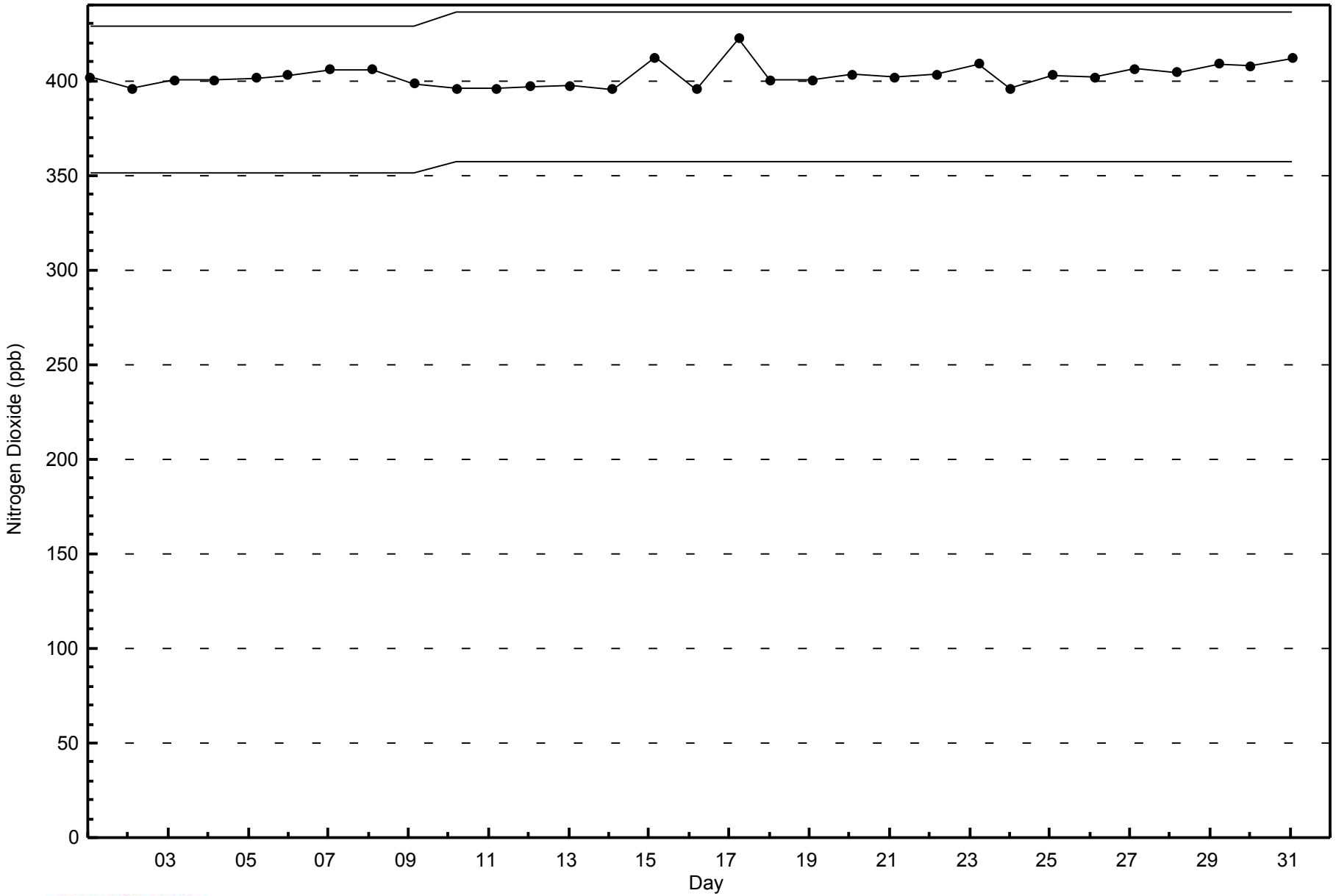
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2015

Maximum Value: 91 ppb on Jan 6 20:00

Maximum Daily Average: 46.0 ppb on Jan 11

Minimum Value: 0 ppb on Jan 3 21:00

Minimum Daily Average: 1.9 ppb on Jan 22

Maximum Diurnal Average: 23.1 ppb at hour 18

Minimum Diurnal Average: 15.7 ppb at hour 6

Monthly Average: 19.0 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 6$ Median = 14 $Q_3 = 28$ $P_{90} = 42$ $P_{99} = 71$

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-Jan	5	Z	16	14	15	9	4	3	10	30	37	29	11	3	6	6	9	6	8	12	13	8	4	1	11.3	37
2-Jan	4	10	Z	9	11	13	11	9	13	9	11	20	20	22	18	18	15	16	18	21	21	18	17	19	14.9	22
3-Jan	23	19	13	Z	9	10	12	4	1	14	23	28	8	0	0	1	1	0	0	0	0	0	0	0	7.3	28
4-Jan	0	0	0	0	Z	0	3	2	3	15	7	15	15	4	2	1	1	1	1	1	1	1	1	1	3.2	15
5-Jan	1	1	1	1	1	Z	12	14	7	1	2	3	4	2	2	1	1	1	1	2	3	2	6	8	3.3	14
6-Jan	Z	8	14	12	10	9	12	14	12	24	38	52	51	34	43	58	66	84	83	91	76	60	59	66	42.6	91
7-Jan	55	Z	29	27	20	19	24	30	28	37	38	34	32	32	31	30	29	36	43	8	17	7	2	2	26.5	55
8-Jan	6	8	Z	3	1	1	0	0	0	1	1	0	1	2	0	0	1	1	3	1	1	9	3	14	2.5	14
9-Jan	42	35	23	Z	19	32	31	25	28	36	31	C	C	C	C	33	78	53	48	46	48	46	45	49	39.4	78
10-Jan	32	29	24	24	Z	27	20	27	38	46	53	54	48	35	31	36	54	54	57	60	64	67	67	72	44.3	72
11-Jan	66	73	62	71	65	Z	71	71	68	70	62	44	36	25	21	20	23	27	28	33	33	30	29	31	46.0	73
12-Jan	Z	30	53	36	30	24	28	33	35	35	24	21	15	18	32	42	55	57	50	38	36	37	33	28	34.4	57
13-Jan	23	Z	25	37	33	22	17	6	4	15	23	8	5	5	7	13	21	38	28	33	18	14	11	22	18.5	38
14-Jan	23	13	Z	35	41	28	15	19	13	13	9	11	15	9	9	9	7	8	7	10	9	9	9	10	14.4	41
15-Jan	13	7	9	Z	6	9	11	11	13	16	13	16	23	25	28	34	36	44	45	36	12	10	12	13	19.2	45
16-Jan	14	8	3	4	Z	3	5	8	10	6	3	5	20	25	20	2	2	2	1	1	1	1	1	0	6.3	25
17-Jan	0	1	0	1	0	Z	12	17	24	26	21	14	15	14	17	20	29	24	17	16	15	17	25	36	15.7	36
18-Jan	Z	17	39	36	30	31	63	78	37	26	22	26	26	27	31	34	36	39	35	33	38	40	39	43	35.9	78
19-Jan	39	Z	29	31	34	39	29	20	22	16	20	23	15	16	16	18	12	11	10	7	7	7	9	9	19.1	39
20-Jan	12	7	Z	7	8	7	8	9	7	6	8	12	20	53	28	28	35	41	43	36	33	31	25	21	21.1	53
21-Jan	19	18	16	Z	16	20	21	14	13	16	20	27	26	7	3	2	4	2	2	1	1	1	1	1	10.9	27
22-Jan	1	1	1	1	Z	1	1	1	1	1	1	2	0	1	2	2	1	1	0	0	3	4	9	10	1.9	10
23-Jan	9	9	14	20	27	Z	26	24	27	26	28	23	23	15	17	14	19	43	36	37	41	66	53	54	28.3	66
24-Jan	Z	57	54	45	45	48	45	42	43	51	6	18	MS	26	25	21	19	21	18	12	23	29	29	25	32.0	57
25-Jan	22	Z	19	11	11	6	6	7	10	2	1	1	3	2	1	1	1	7	4	3	5	3	6	7	6.2	22
26-Jan	23	34	Z	24	22	14	16	10	3	1	1	1	6	26	20	34	10	8	5	3	1	3	4	2	11.8	34
27-Jan	3	4	2	Z	4	4	5	5	6	9	13	12	11	8	8	6	7	7	6	4	6	7	5	6	6.4	13
28-Jan	6	3	3	2	Z	3	5	6	8	17	12	7	8	7	7	24	36	29	6	6	10	16	17	10	10.8	36
29-Jan	8	7	7	8	11	Z	23	25	28	28	25	23	25	30	30	26	25	24	25	33	28	25	18	14	21.6	33
30-Jan	Z	8	7	10	9	10	8	6	15	17	19	7	5	4	6	6	6	9	8	9	9	9	9	10	8.9	19
31-Jan	11	Z	9	10	16	16	19	27	39	43	46	38	31	27	31	26	28	25	29	34	37	33	31	31	27.7	46
	17.7	16.3	18.1	18.4	19.1	15.7	18.2	18.2	18.3	21.0	20.0	19.2	17.9	16.8	16.4	18.2	21.4	23.1	21.5	20.3	19.7	19.8	18.6	19.8	Diurnal Average	
	66	73	62	71	65	48	71	78	68	70	62	54	51	53	43	58	78	84	83	91	76	67	67	72	Diurnal Maximum	

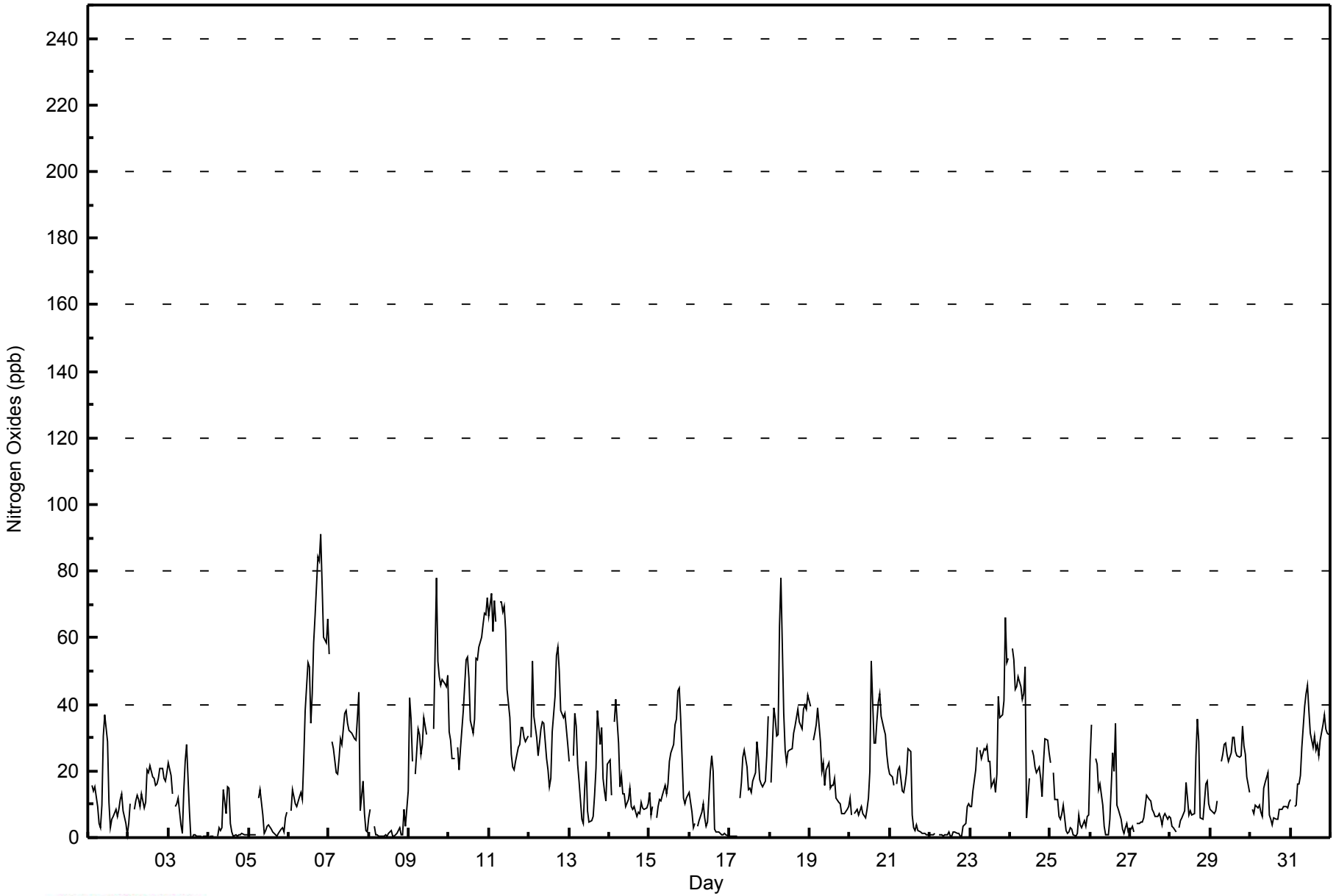
Z - zerospan C - Calibration MS - Missing

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	435	61.44	61.44
21 - 40	197	27.82	89.27
11 - 80	73	10.31	99.58
81 - 159	3	0.42	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	61	44	26	13	8	1	2	7	26	32	20	41	26	38	30	23	398
21 - 40	26	17	6	5	0	2	1	7	64	38	7	3	4	0	1	5	186
11 - 80	4	0	0	0	1	0	0	3	22	24	4	0	1	1	2	4	66
81 - 159	0	0	0	0	0	0	0	0	1	2	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	91	61	32	18	9	3	3	17	113	96	31	44	31	39	33	32	653

Total Number of Valid Hours: 653

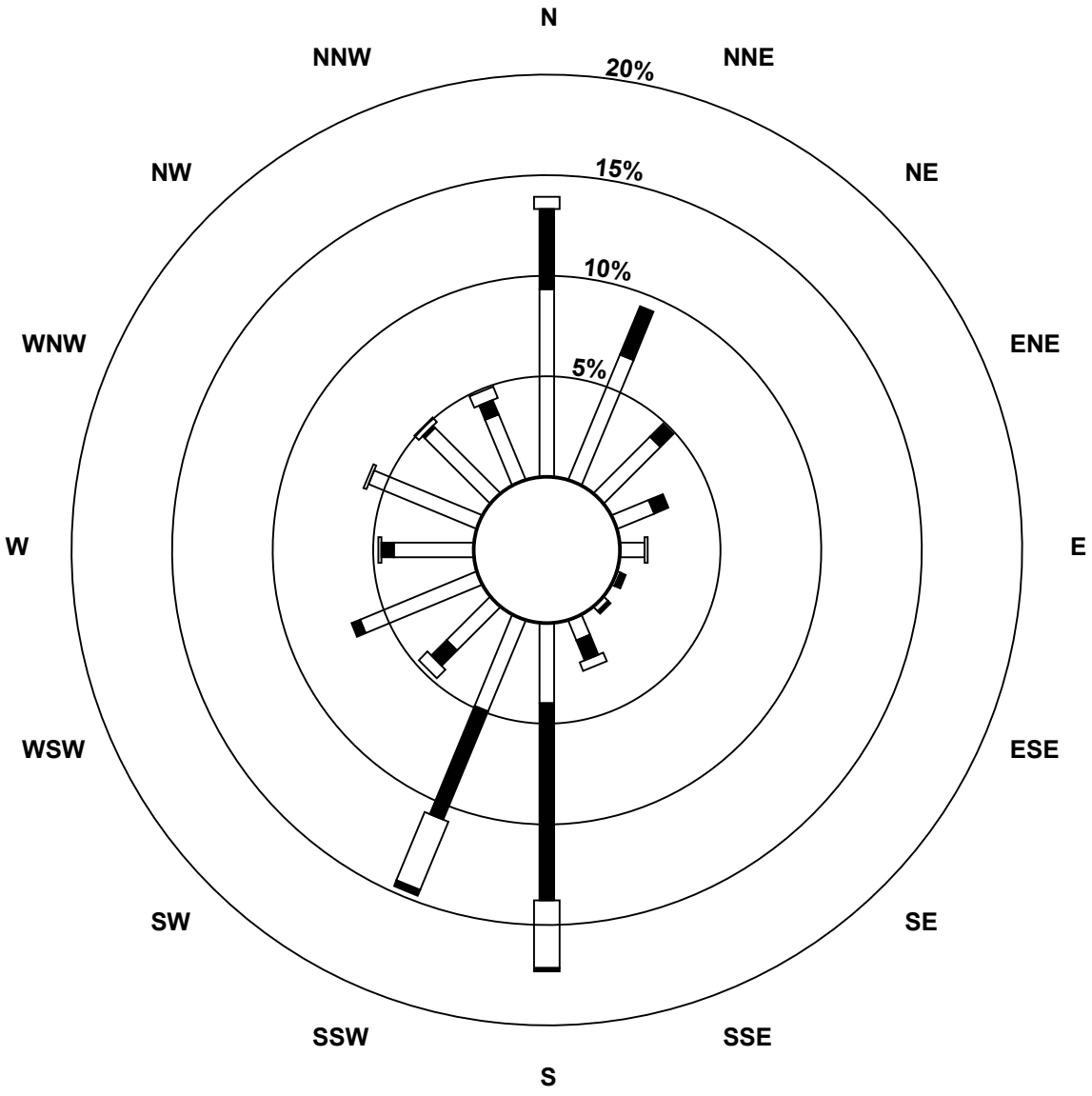
Total Number of Hours: 744

Wood Buffalo Environmental Association

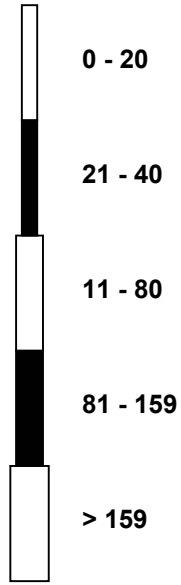
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



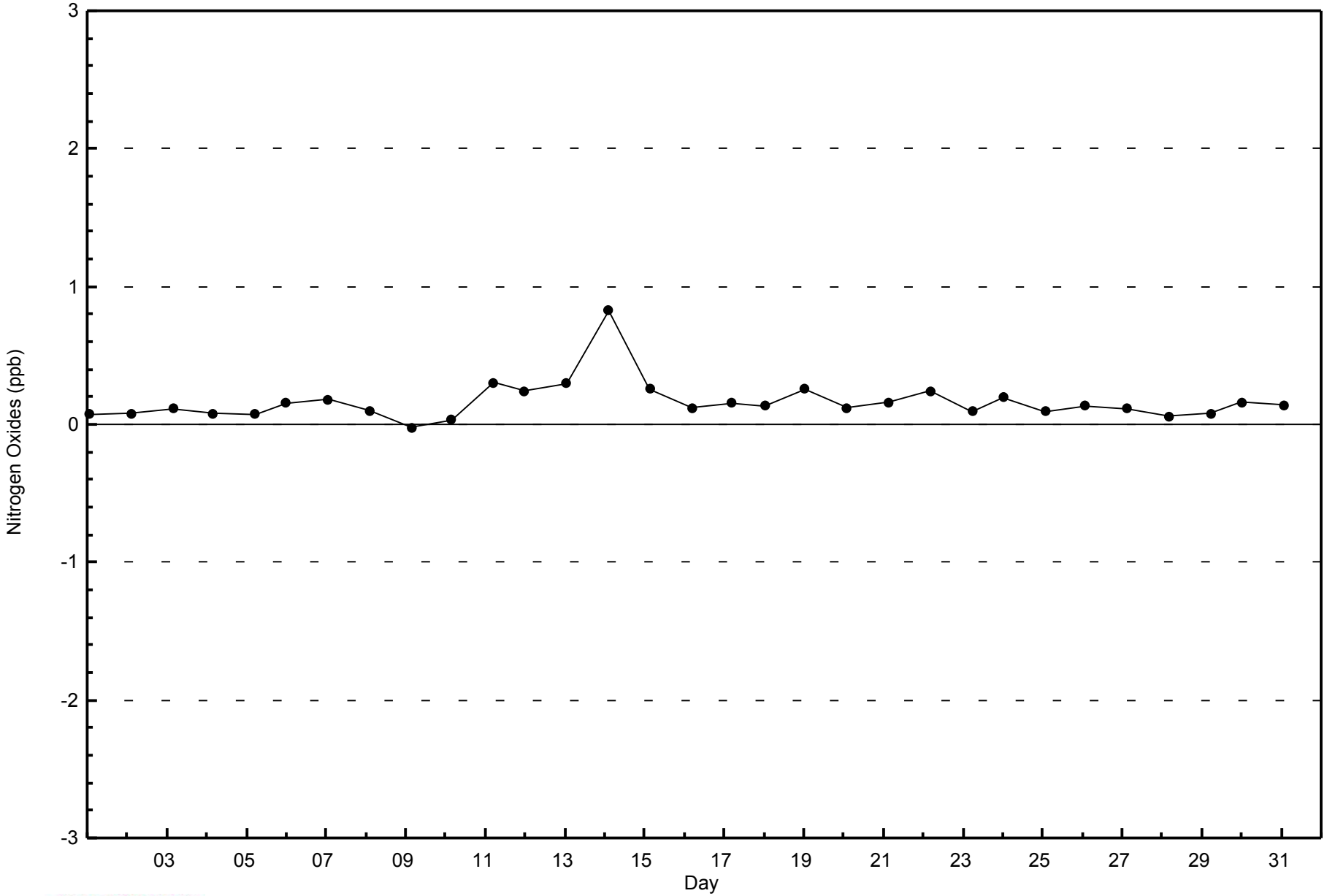
Total Number of Valid Hours: 653

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2015



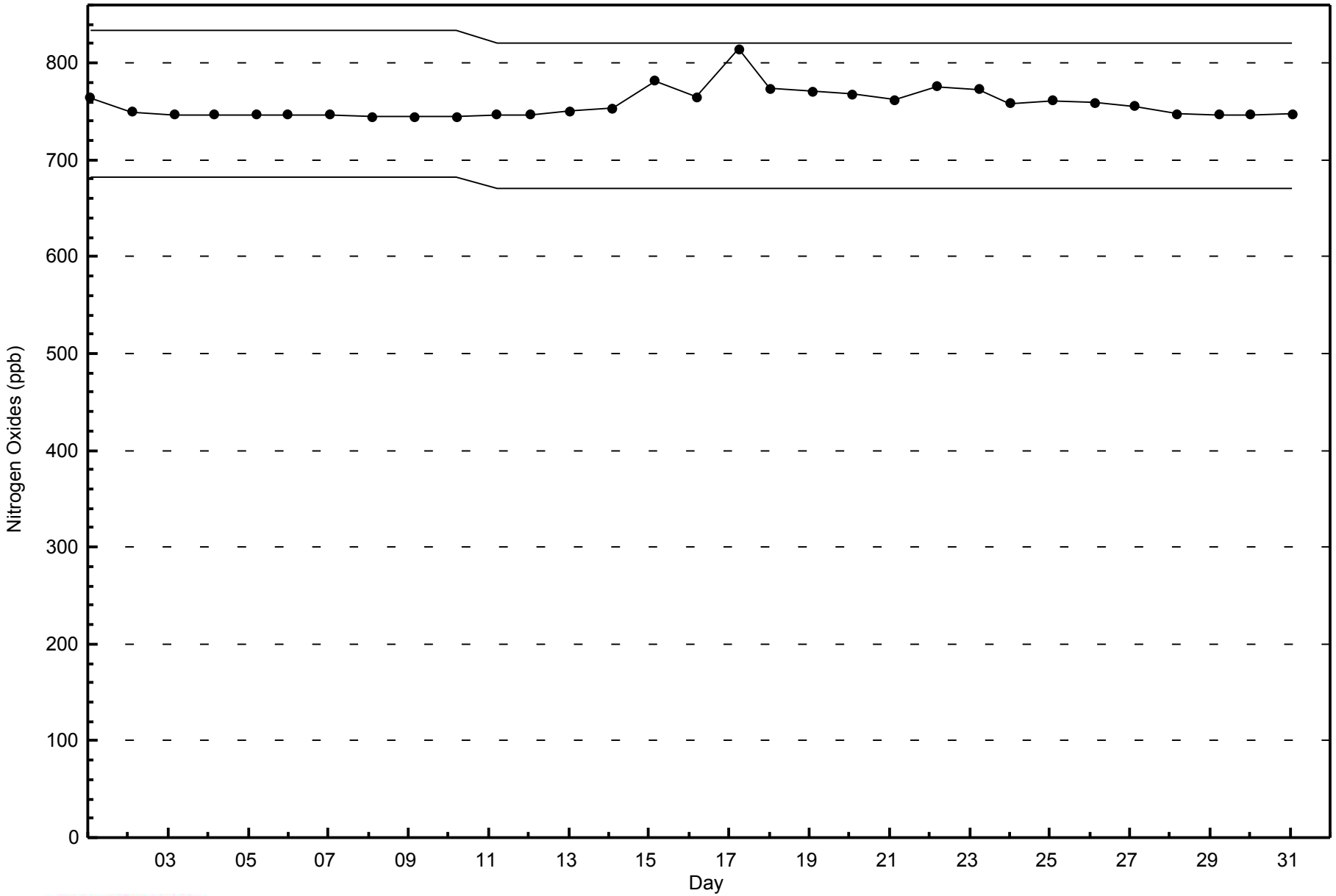
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2015

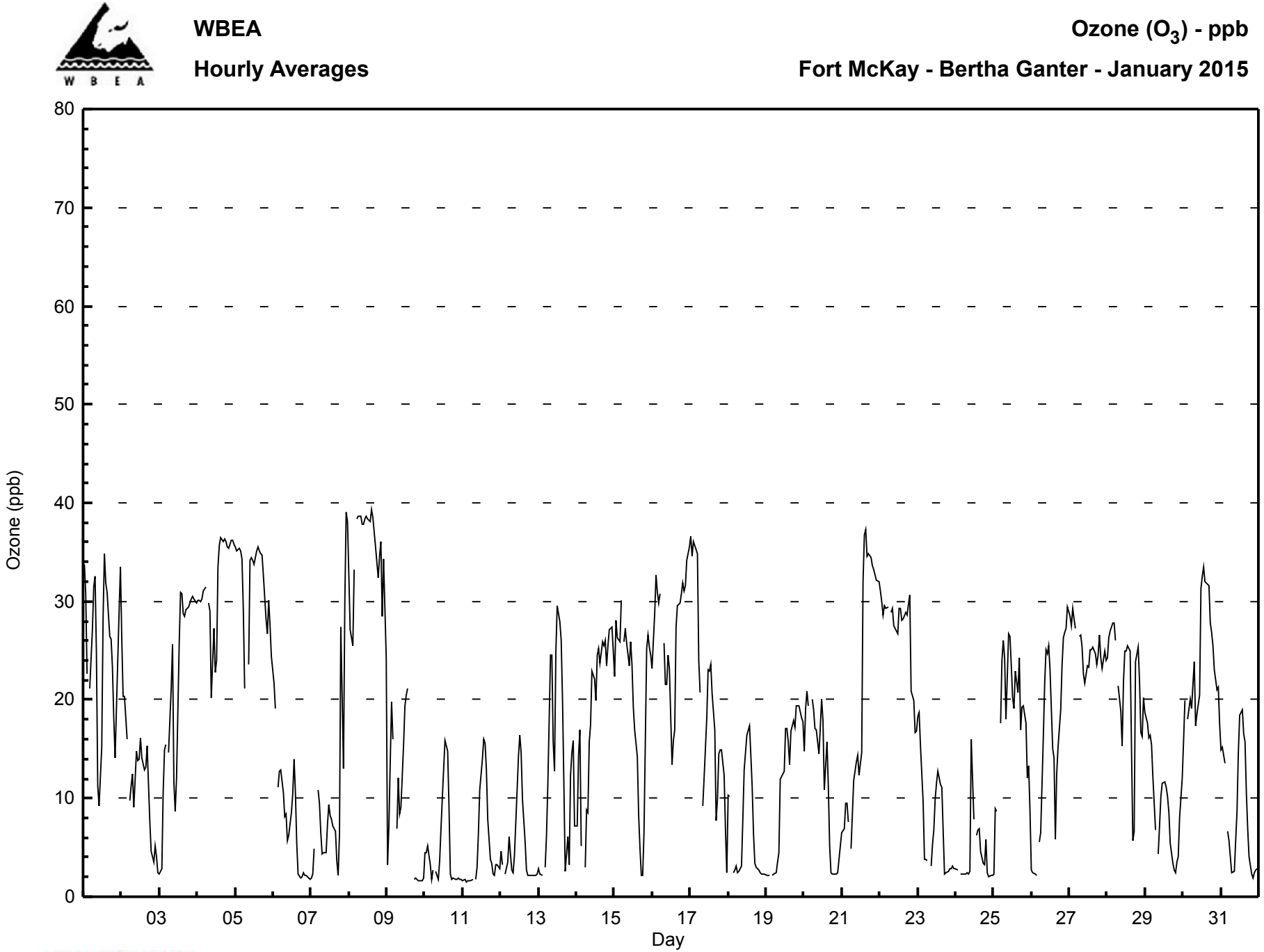
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 39 ppb on Jan 8 15:00 Maximum Daily Average: 34.9 ppb on Jan 8

Minimum Value: 2 ppb on Jan 11 03:00 Minimum Daily Average: 4.2 ppb on Jan 24
Maximum Diurnal Average: 21.3 ppb at hour 14 Minimum Diurnal Average: 13.1 ppb at hour 7
Monthly Average: 16.6 ppb Percentiles: $P_1 = 2$ $P_{10} = 2$ $Q_1 = 6$ Median = 16 $Q_3 = 26$ $P_{90} = 32$ $P_{99} = 38$

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-Jan	34	31	23	Z	21	27	31	32	25	11	9	15	28	35	32	31	27	26	23	18	14	19	29	33	25.0	35
2-Jan	26	20	20	16	Z	10	11	12	9	15	14	14	16	14	13	13	15	11	8	5	4	5	4	2	12.1	26
3-Jan	2	3	11	15	15	Z	15	21	26	12	9	12	26	31	31	29	29	29	29	30	30	30	30	30	21.5	31
4-Jan	30	30	30	30	31	31	Z	30	29	20	27	23	24	34	36	36	36	36	36	36	35	36	36	36	31.7	36
5-Jan	36	35	35	35	34	29	21	Z	24	34	34	34	34	35	36	35	35	35	33	28	27	30	28	24	31.8	36
6-Jan	22	19	Z	11	13	13	11	8	8	6	6	9	10	14	11	5	2	2	2	2	2	2	2	2	7.9	22
7-Jan	2	2	5	Z	11	10	6	4	5	4	7	9	8	8	7	7	4	2	6	27	13	30	39	38	11.1	39
8-Jan	33	27	26	33	Z	38	39	39	38	38	38	39	38	38	39	38	37	35	32	35	36	29	34	24	34.9	39
9-Jan	3	7	14	20	16	Z	7	12	8	9	15	19	20	21	C	C	C	2	2	2	2	2	2	2	9.2	21
10-Jan	4	4	5	3	2	3	Z	3	2	4	7	10	13	16	15	9	2	2	2	2	2	2	2	2	5.0	16
11-Jan	2	2	2	2	2	2	2	Z	2	3	6	11	14	16	16	13	8	4	3	2	2	3	3	3	5.2	16
12-Jan	5	3	Z	2	3	6	4	3	2	4	11	14	16	15	10	6	3	2	2	2	2	2	2	2	5.3	16
13-Jan	3	2	2	Z	3	6	11	25	25	16	13	25	30	28	26	20	12	3	6	3	12	15	16	7	13.4	30
14-Jan	7	14	17	5	Z	3	9	9	16	18	23	22	20	25	25	24	26	26	26	23	25	27	27	25	19.2	27
15-Jan	22	28	26	26	30	Z	26	27	26	23	26	24	19	17	14	8	5	2	2	6	25	27	25	25	20.0	30
16-Jan	23	29	33	31	30	31	Z	26	22	22	25	23	13	16	17	27	30	30	31	32	31	32	34	36	27.0	36
17-Jan	37	35	36	36	35	24	21	Z	9	12	18	23	23	24	21	17	8	10	15	15	15	12	7	2	19.7	37
18-Jan	10	10	Z	2	3	3	2	3	3	8	13	15	16	17	14	11	6	3	3	3	2	2	2	2	6.8	17
19-Jan	2	2	2	Z	2	2	2	4	5	12	12	13	17	17	16	13	17	18	17	19	19	19	18	18	11.6	19
20-Jan	15	19	21	19	Z	20	19	17	17	14	17	20	18	11	16	11	5	2	2	2	2	3	4	5	12.2	21
21-Jan	6	7	10	9	8	Z	5	12	13	14	14	12	15	32	37	37	35	35	34	34	33	33	32	32	21.7	37
22-Jan	31	30	29	30	29	29	Z	29	29	28	27	27	29	29	28	28	29	29	30	31	21	20	17	17	27.2	31
23-Jan	18	19	15	10	4	4	4	Z	3	5	7	10	11	13	11	11	7	2	2	3	3	3	3	3	7.4	19
24-Jan	3	3	Z	2	2	2	2	2	2	3	16	8	MS	6	7	7	5	3	3	6	2	2	2	2	4.2	16
25-Jan	2	9	9	Z	18	24	26	24	18	27	26	24	20	19	23	21	24	17	19	19	18	12	13	9	18.3	27
26-Jan	3	2	2	2	Z	6	7	16	22	25	25	26	23	15	14	6	12	15	19	23	26	27	27	29	16.2	29
27-Jan	29	28	29	28	27	Z	26	27	25	23	22	23	23	25	25	25	25	24	24	27	24	23	25	24	25.3	29
28-Jan	24	26	27	28	28	26	Z	21	19	15	22	25	25	25	25	15	6	7	24	25	22	17	16	20	21.3	28
29-Jan	19	18	16	16	15	12	7	Z	4	7	10	12	12	11	10	9	5	3	3	2	3	4	8	12	9.5	19
30-Jan	16	20	Z	18	20	19	22	24	17	19	20	31	33	33	32	32	32	28	27	25	23	21	21	17	23.9	33
31-Jan	15	15	14	Z	7	6	4	2	3	6	9	15	18	19	17	16	11	7	4	2	2	2	3	3	8.6	19
	15.6	16.1	17.6	17.2	15.7	14.9	13.1	16.6	14.7	14.7	17.1	18.9	20.5	21.3	20.7	18.7	16.5	14.5	15.2	15.8	15.5	15.8	16.6	15.7	Diurnal Average	
	37	35	36	36	35	38	39	39	38	38	38	39	38	38	39	38	37	36	36	36	36	36	39	38	Diurnal Maximum	

Z - zerospan C - Calibration MS - Missing
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb



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ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	435	61.35	61.35
21 - 50	274	38.65	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

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	64	32	13	10	6	2	2	14	104	79	18	16	13	8	9	13	403
21 - 50	24	30	20	8	3	1	1	2	16	13	14	27	19	32	23	18	251
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	88	62	33	18	9	3	3	16	120	92	32	43	32	40	32	31	654

Total Number of Valid Hours: 654

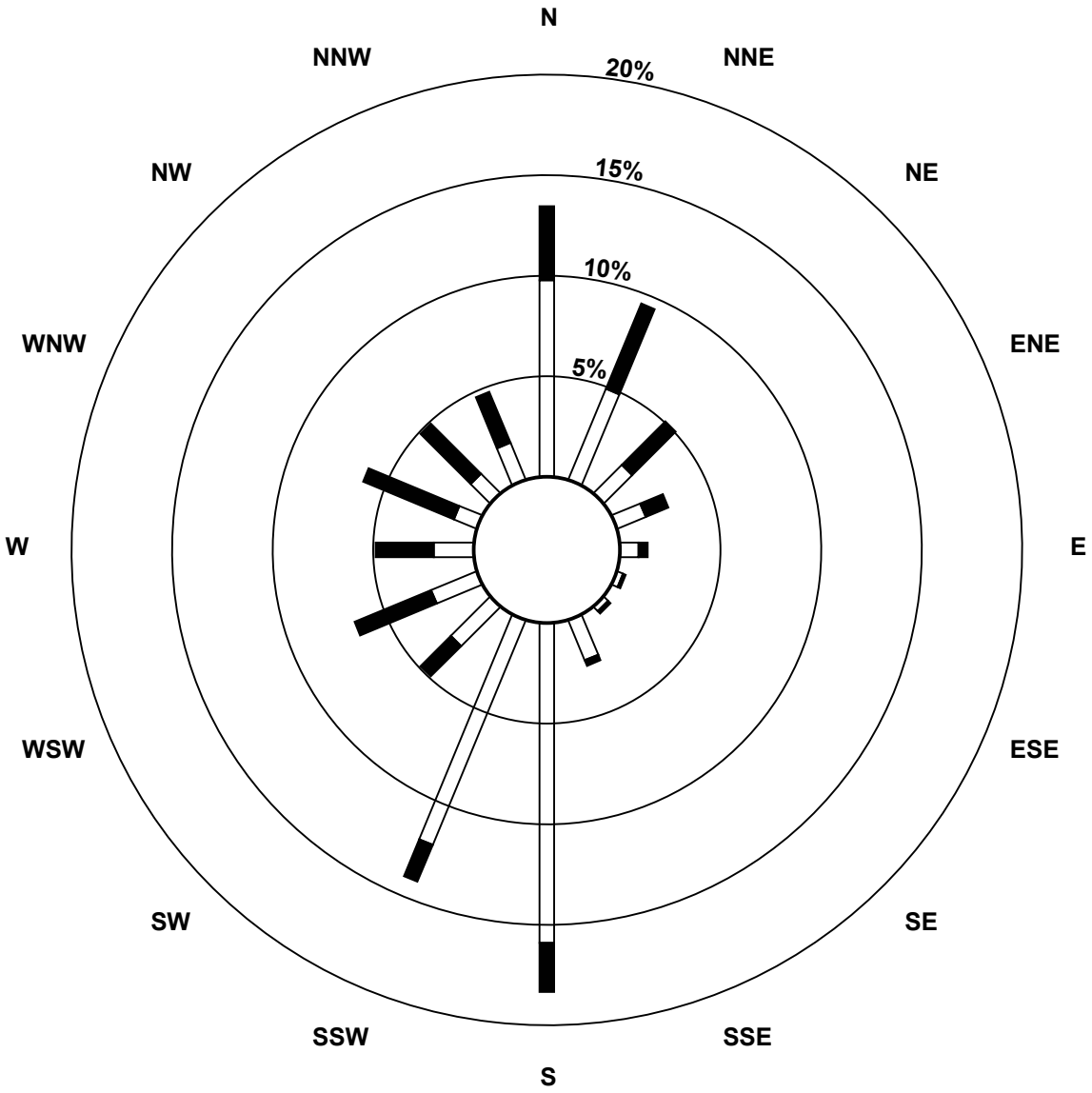
Total Number of Hours: 744

Wood Buffalo Environmental Association

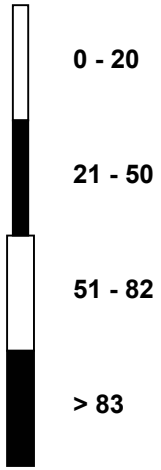
Wind Rose Jan 2015

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



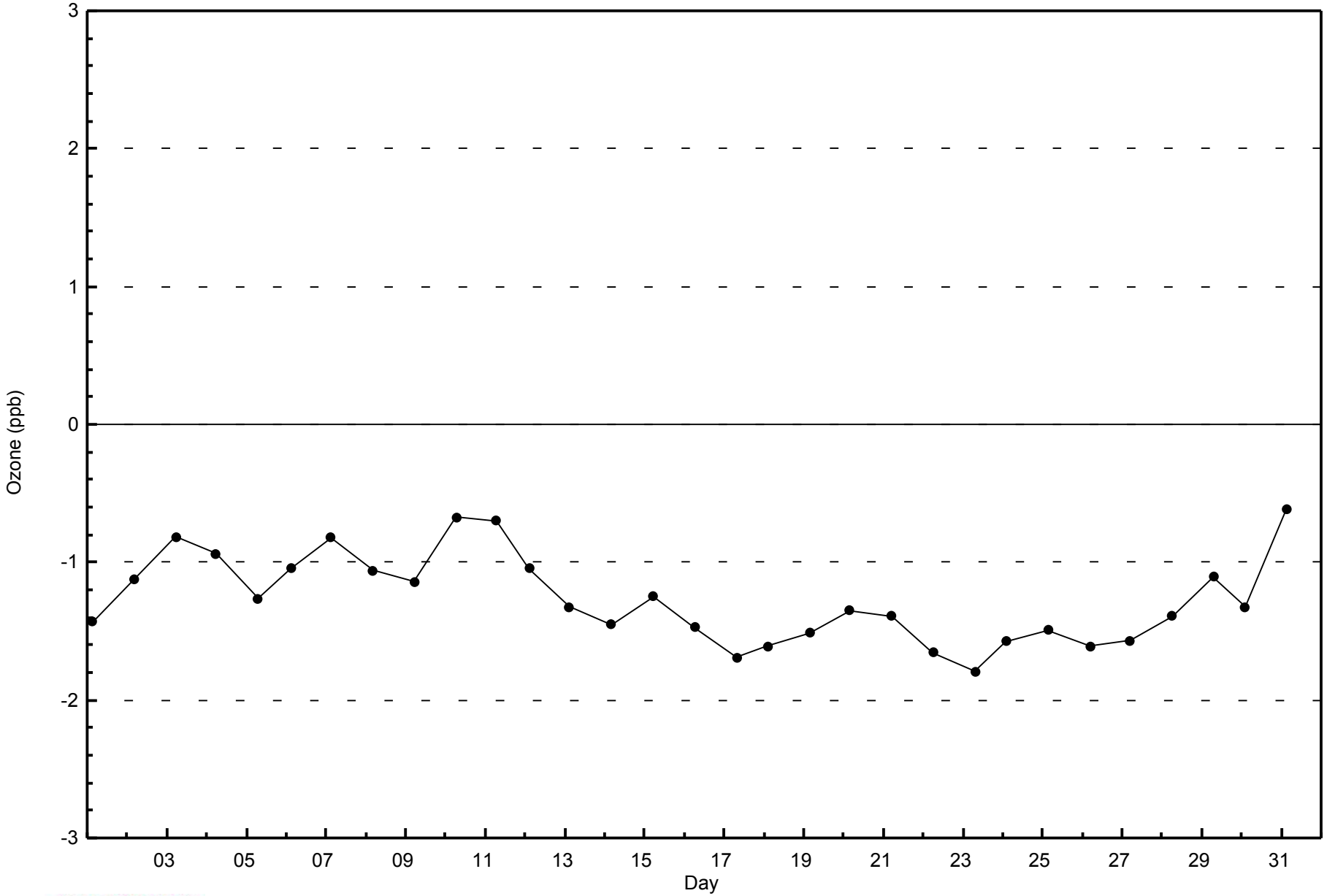
Total Number of Valid Hours: 654

WBEA

Zero Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2015



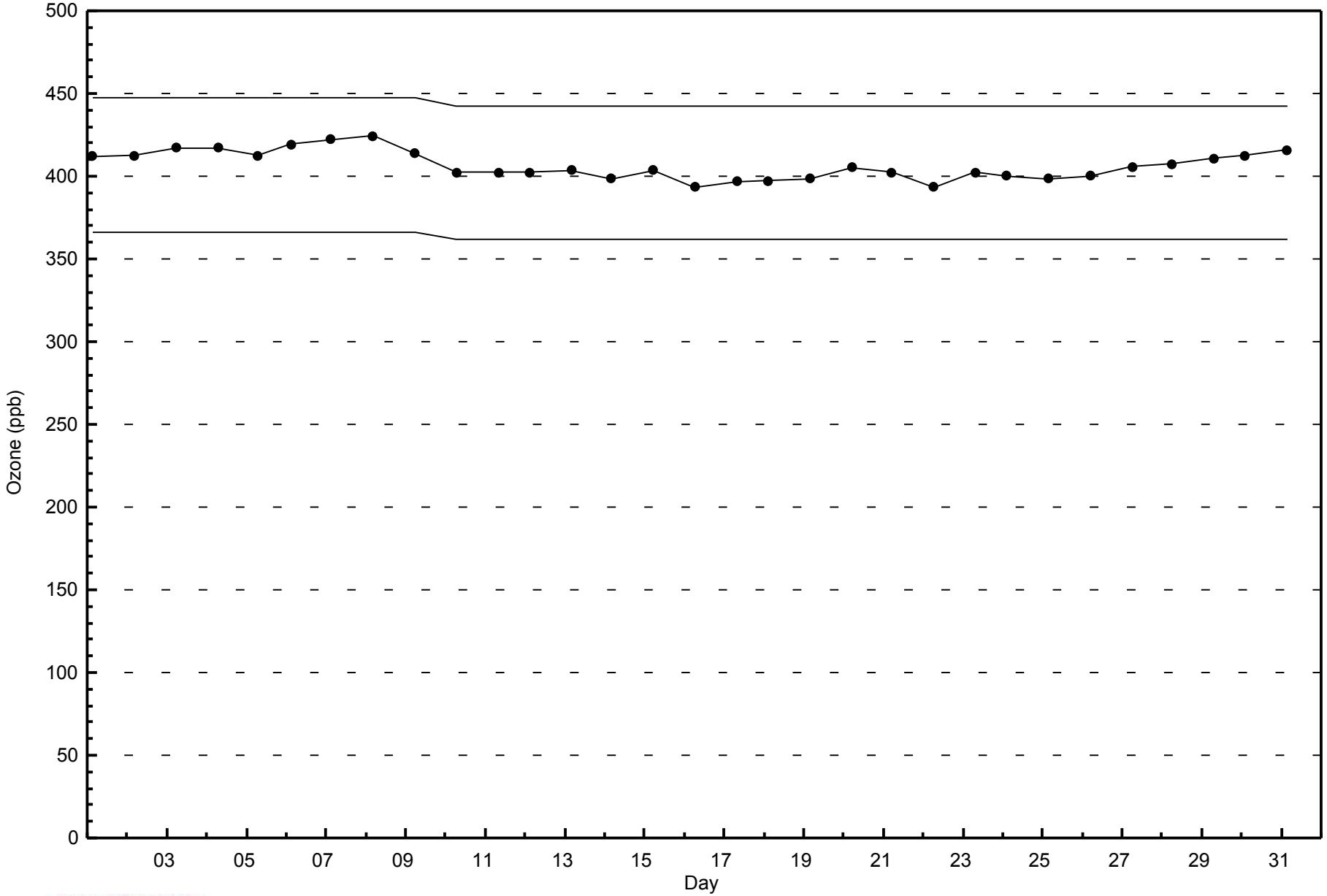
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay - Bertha Ganter - January 2015

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

Maximum Value: 29.7 $\mu g/m^3$ on Jan 24 01:00

Maximum Daily Average: 9.1 $\mu g/m^3$ on Jan 6

Minimum Value: 0.1 $\mu g/m^3$ on Jan 25 16:00

Minimum Daily Average: 1.7 $\mu g/m^3$ on Jan 5

Maximum Diurnal Average: 6.2 $\mu g/m^3$ at hour 17

Minimum Diurnal Average: 3.9 $\mu g/m^3$ at hour 12

Monthly Average: 4.92 $\mu g/m^3$

Percentiles: $P_1 = 0.7$ $P_{10} = 1.6$ $Q_1 = 2.6$ Median = 3.8 $Q_3 = 6.2$ $P_{90} = 9.3$ $P_{99} = 16.6$

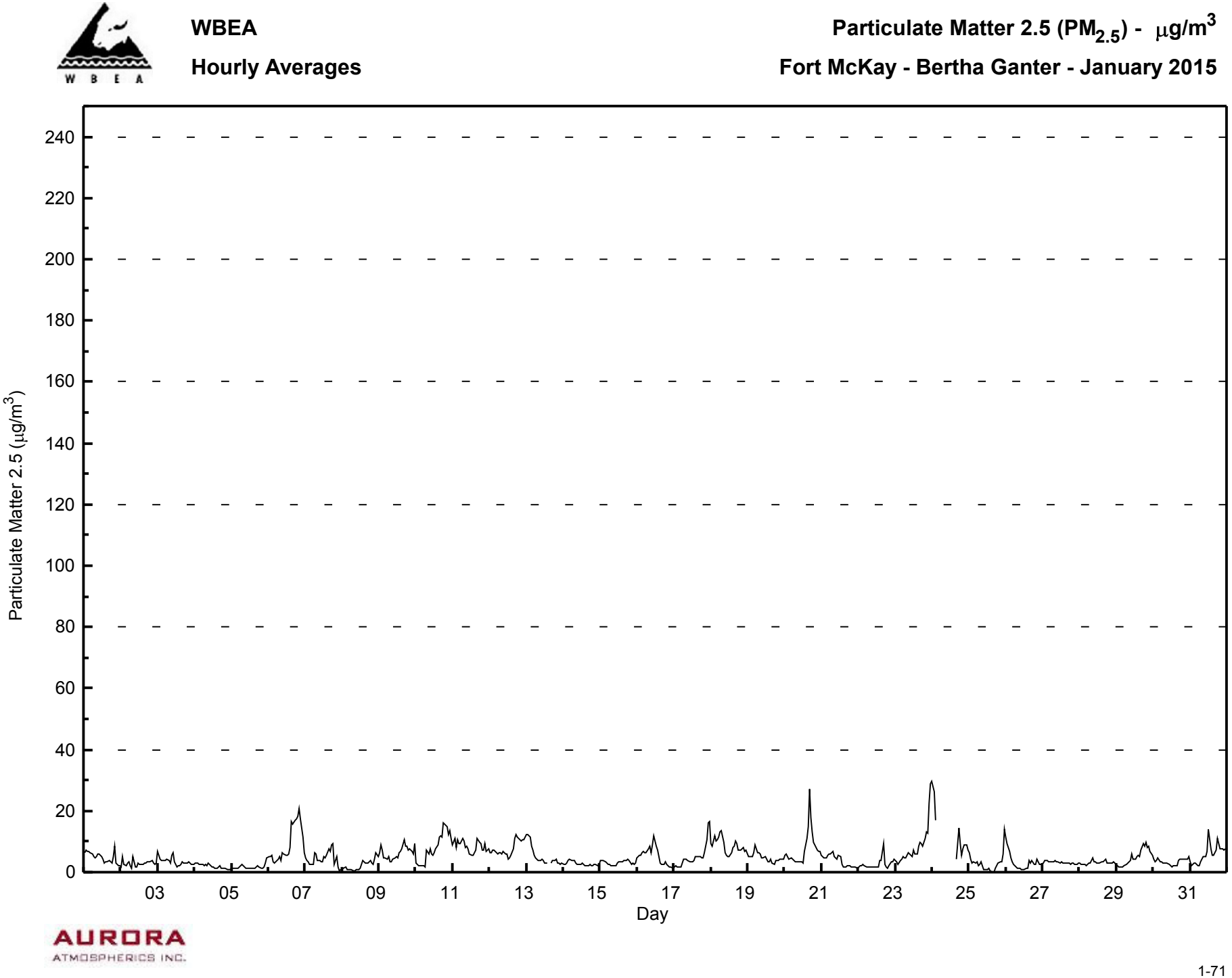
Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

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-Jan	6.2	7.3	6.8	6.6	6.3	5.8	5.0	4.6	5.0	5.7	6.1	5.3	4.2	2.8	3.2	3.4	3.6	3.3	3.0	4.9	8.4	3.2	2.3	2.0	4.8	8.4
2-Jan	1.9	5.0	2.6	2.0	2.9	3.3	2.1	1.3	5.2	1.6	1.6	2.9	2.5	2.5	2.6	3.0	3.1	3.2	3.3	3.3	3.9	2.9	2.6	2.9	2.8	5.2
3-Jan	6.8	4.4	4.0	3.8	3.6	3.8	4.1	3.9	3.0	5.5	6.2	3.5	1.8	2.0	2.2	2.6	3.2	3.0	3.0	3.1	3.4	3.1	2.6	2.5	3.5	6.8
4-Jan	2.8	2.9	2.9	2.4	2.4	2.6	2.3	2.4	2.2	2.8	2.3	1.9	1.9	1.4	1.2	1.2	2.0	1.2	1.3	1.3	1.1	1.0	1.0	1.0	1.9	2.9
5-Jan	1.1	1.3	1.3	1.3	1.3	1.5	2.0	2.3	1.6	1.2	1.3	1.4	1.3	1.4	1.5	1.3	1.5	2.0	1.5	1.3	1.3	1.5	2.9	4.9	1.7	4.9
6-Jan	4.9	5.0	5.7	3.4	3.1	3.4	4.4	5.3	3.8	6.5	5.9	5.5	5.4	6.1	8.2	16.5	15.6	17.0	17.4	18.4	20.7	17.4	11.4	6.2	9.1	20.7
7-Jan	4.5	3.7	3.3	2.6	2.5	2.5	6.2	6.0	3.7	3.6	3.3	3.4	4.9	4.8	5.6	7.4	7.0	8.9	9.5	2.5	5.1	1.9	0.6	0.7	4.3	9.5
8-Jan	0.8	1.2	1.6	1.0	0.8	0.8	0.7	0.6	0.6	0.7	0.8	0.9	1.4	3.9	3.2	2.8	2.8	3.0	3.7	3.0	2.5	4.3	6.3	5.2	2.2	6.3
9-Jan	6.5	8.9	7.3	4.8	4.6	4.3	5.0	3.4	3.4	4.3	4.7	5.0	4.9	6.4	7.0	7.5	10.8	8.4	8.5	7.1	7.8	6.6	5.9	9.3	6.3	10.8
10-Jan	2.9	2.5	2.0	2.0	2.1	2.1	1.8	7.1	6.0	7.8	5.9	5.5	6.4	7.7	9.1	11.6	12.0	11.6	16.3	15.3	14.8	12.2	13.6	11.1	7.9	16.3
11-Jan	9.0	11.2	8.2	10.7	9.3	9.3	11.2	10.1	8.3	8.6	7.6	5.9	5.5	5.5	6.4	7.2	11.0	9.9	9.4	7.4	7.3	9.2	6.8	7.6	8.4	11.2
12-Jan	6.2	6.2	7.4	7.3	6.4	6.0	6.4	6.3	6.0	6.8	5.9	5.9	4.4	4.8	5.4	7.8	11.2	12.5	11.5	10.9	10.3	10.6	10.5	11.2	7.8	12.5
13-Jan	12.2	12.2	11.3	8.6	7.2	5.6	4.7	3.8	3.7	4.0	4.4	4.0	3.1	2.8	M	M	2.9	3.8	3.9	4.1	3.2	2.9	2.7	2.9	5.2	12.2
14-Jan	2.6	2.6	2.8	3.7	4.1	3.7	4.0	3.9	2.9	2.5	2.4	2.6	2.8	2.4	2.1	2.2	2.2	2.4	2.2	2.3	2.5	2.7	2.3	2.4	2.8	4.1
15-Jan	3.6	3.6	3.7	3.3	2.8	2.4	2.3	2.0	1.9	2.3	2.2	2.8	3.4	3.3	3.5	3.7	3.8	4.0	4.1	3.8	2.5	3.1	2.6	2.8	3.1	4.1
16-Jan	4.5	5.7	5.6	6.5	6.9	6.5	6.5	7.4	8.6	6.1	9.0	11.9	8.6	7.0	4.9	3.1	2.6	2.5	3.4	2.4	2.1	1.7	1.5	1.3	5.3	11.9
17-Jan	1.6	2.0	1.8	1.7	1.8	2.9	4.2	4.4	4.3	3.9	3.6	3.4	3.5	3.7	4.9	5.2	5.2	5.2	4.6	4.6	6.6	10.5	15.9	16.5	5.1	16.5
18-Jan	9.5	8.3	11.8	10.1	10.5	11.4	13.2	13.3	9.8	6.2	5.4	5.2	5.2	6.2	8.2	8.4	10.1	9.5	7.2	7.1	7.6	8.2	6.7	7.1	8.6	13.3
19-Jan	5.1	4.9	5.1	4.9	6.2	9.0	6.5	6.5	5.9	4.6	4.8	5.2	4.2	3.6	3.4	4.1	3.1	2.5	3.8	4.0	3.9	4.2	4.3	4.4	4.8	9.0
20-Jan	5.5	6.0	5.2	4.2	4.5	4.3	4.0	3.5	3.6	3.5	3.5	3.3	2.9	6.9	10.9	14.6	27.0	17.7	13.1	9.7	8.2	7.1	6.8	6.6	7.6	27.0
21-Jan	5.3	4.7	4.9	4.7	5.5	5.9	5.9	6.7	5.2	4.5	4.4	5.4	5.2	2.5	1.7	1.6	1.8	1.9	1.9	1.8	1.6	1.7	1.6	1.2	3.7	6.7
22-Jan	1.6	2.0	2.1	2.6	2.2	1.9	1.7	1.7	1.6	1.7	1.7	1.7	1.6	1.7	3.8	3.9	9.2	2.6	1.5	1.5	2.3	3.2	3.6	4.0	2.6	9.2
23-Jan	3.9	3.5	2.7	4.0	4.4	5.2	4.6	4.5	6.2	6.1	5.5	5.2	7.0	5.8	6.0	8.3	9.7	9.3	8.4	10.9	13.2	12.8	22.3	28.8	8.3	28.8
24-Jan	29.7	26.3	16.9	PF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	4.3	14.4	9.3	5.3	7.8	8.7	8.8	7.0	--	29.7
25-Jan	6.3	4.1	2.9	3.5	3.1	3.5	2.3	2.6	3.6	0.8	0.7	0.8	0.9	1.2	0.3	0.1	0.1	1.2	2.2	3.0	3.3	3.4	6.1	14.0	2.9	14.0
26-Jan	11.6	9.3	6.7	4.5	3.6	2.5	2.1	1.3	1.2	1.1	0.8	0.8	0.6	1.4	1.2	4.0	3.1	4.0	2.5	2.6	4.1	3.5	2.4	2.7	3.2	11.6
27-Jan	2.8	3.9	3.7	3.7	3.4	3.5	3.5	3.5	3.9	3.6	3.3	3.0	3.2	3.0	3.1	2.8	2.9	2.9	2.6	2.8	2.8	2.5	2.6	2.9	3.2	3.9
28-Jan	2.8	2.6	2.4	2.4	2.3	2.4	2.8	2.8	4.5	3.5	3.2	3.1	3.1	3.1	3.2	3.5	3.8	4.1	3.1	2.8	3.0	3.1	3.5	3.2	3.1	4.5
29-Jan	2.4	1.9	1.8	1.9	1.9	2.1	2.6	2.9	3.3	4.0	6.0	4.2	4.4	5.2	5.3	5.1	7.4	9.2	8.6	9.7	7.9	8.4	6.9	5.4	4.9	9.7
30-Jan	4.3	3.3	3.9	4.5	3.5	3.5	3.0	2.8	2.9	3.0	2.6	2.0	1.8	1.9	2.1	2.2	3.9	4.2	4.1	4.2	4.4	4.2	4.2	5.3	3.4	5.3
31-Jan	3.5	2.0	3.1	2.8	2.7	2.3	2.3	3.4	5.2	4.9	5.3	6.7	13.8	7.6	5.4	5.5	6.5	7.1	11.2	7.6	7.5	7.6	7.4	7.7	5.8	13.8
	5.6	5.4	4.9	4.2	4.1	4.1	4.2	4.4	4.2	4.0	4.0	3.9	4.0	4.0	4.3	5.2	6.2	6.2	6.0	5.4	5.8	5.6	5.8	6.2	Diurnal Average	
	29.7	26.3	16.9	10.7	10.5	11.4	13.2	13.3	9.8	8.6	9.0	11.9	13.8	7.7	10.9	16.5	27.0	17.7	17.4	18.4	20.7	17.4	22.3	28.8	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure PF - Power Failure

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$
Fort McKay - Bertha Ganter - January 2015
Particulate Matter 2.5 ($\mu g/m^3$)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	483	66.26	66.26
6 - 15	207	28.40	94.65
16 - 25	13	1.78	96.43
26 - 80	4	0.55	96.98
> 81.0	0	0.00	96.98

Total Number of Valid Hours: 729

Total Number of Hours: 744

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**
1 - 5	70	58	29	15	8	1	3	9	46	38	15	41	29	36	25	22	445
6 - 15	21	4	3	2	0	1	0	6	73	52	15	3	4	1	2	10	197
16 - 25	0	0	0	0	0	0	0	0	3	10	0	0	0	0	0	0	13
26 - 80	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	4
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	62	32	17	9	2	3	15	123	100	30	44	34	37	27	33	659

Total Number of Valid Hours: 680

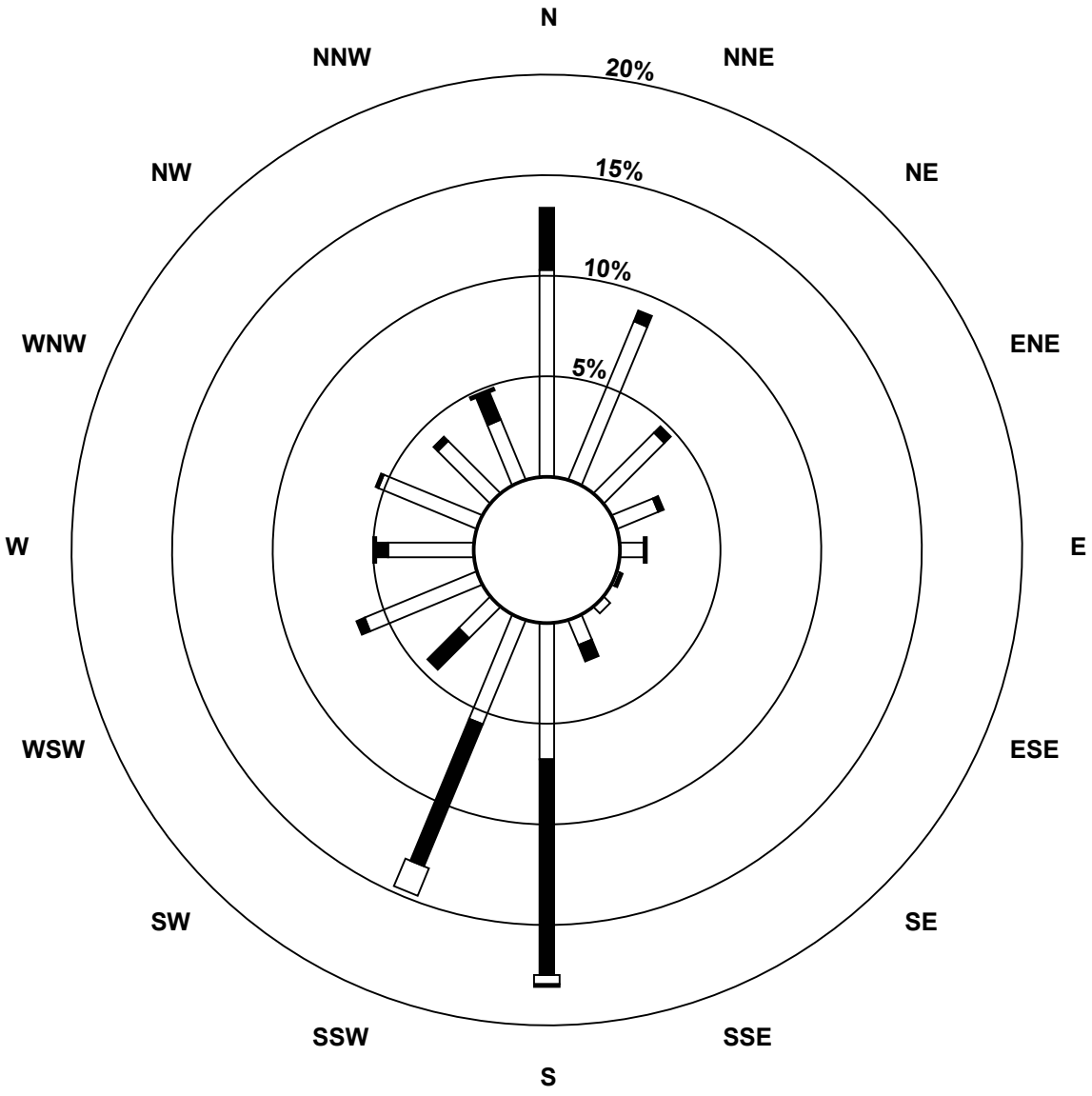
Total Number of Hours: 744

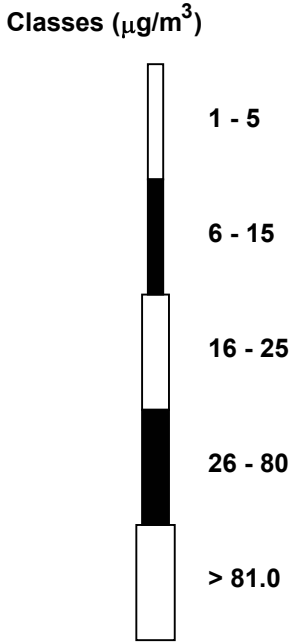
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Fort McKay - Bertha Ganter (AMS 1)





Total Number of Valid Hours: 680

Number of Exceedences (AAAQO): 1-hr: 0
Maximum Value: 0 ppb on Jan 1 01:00 Maximum Daily Average: 0.0 ppb on Jan 1

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 1
Maximum Diurnal Average: 0.0 ppb at hour 1 Minimum Diurnal Average: 0.0 ppb at hour 1
Monthly Average: 0.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 0$

Hours in Service:	744
Hours of Data:	668
Hours of Missing Data:	76
Hours of Calibration:	36
Percent Operational Time:	94.6

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-Jan	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
2-Jan	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
3-Jan	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
4-Jan	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
5-Jan	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
6-Jan	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
7-Jan	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
8-Jan	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
9-Jan	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
10-Jan	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
11-Jan	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
12-Jan	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
13-Jan	0	0	0	0	Z	RE	RE	0	0	0	C	C	C	C	C	C	RE	RE	RE	0	0	0	0	0	--	0
14-Jan	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
15-Jan	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
16-Jan	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
17-Jan	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
18-Jan	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
19-Jan	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
20-Jan	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
21-Jan	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
22-Jan	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
23-Jan	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
24-Jan	0	0	0	PF	RE	0	0	0	0	0	0	0	MS	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Jan	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
26-Jan	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
27-Jan	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
28-Jan	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
29-Jan	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
30-Jan	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
31-Jan	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Diurnal Maximum	

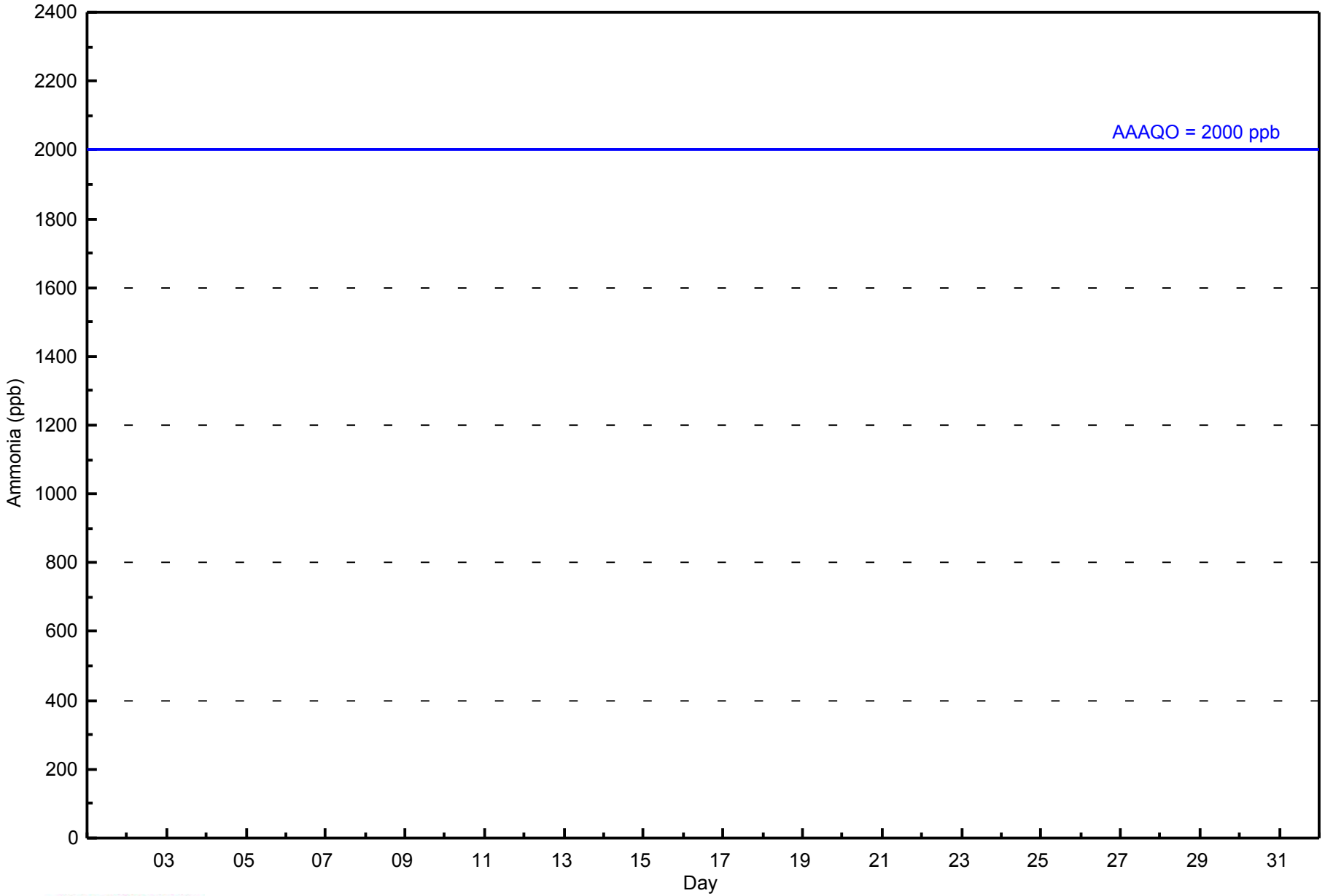
Z - zerospan C - Calibration PF - Power Failure MS - Missing RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb

WBEA

Hourly Averages

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	668	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: 668

Total Number of Hours: 744

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 5	79	57	28	14	9	3	3	17	115	90	27	44	31	36	31	33	617
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	79	57	28	14	9	3	3	17	115	90	27	44	31	36	31	33	617

Wind Direction

Total Number of Valid Hours: 617

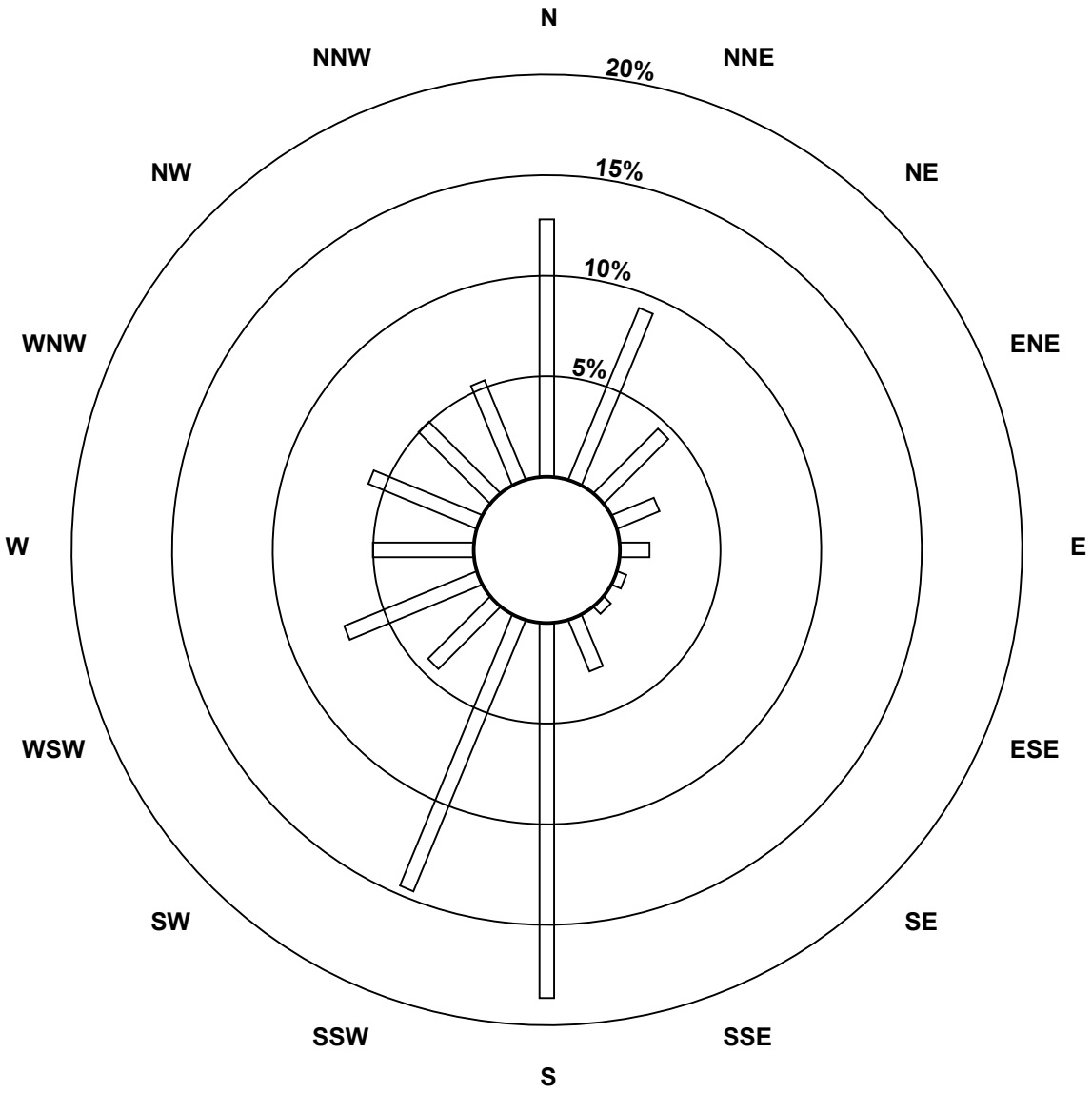
Total Number of Hours: 744

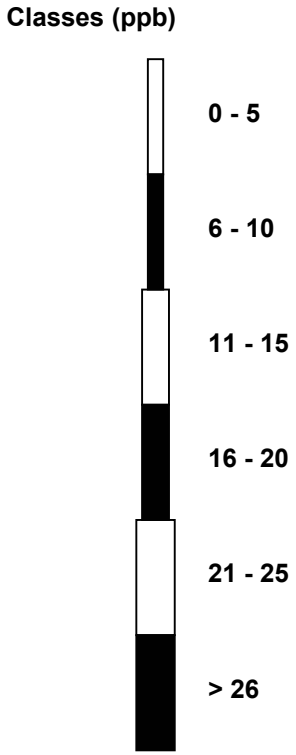
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter (AMS 1)





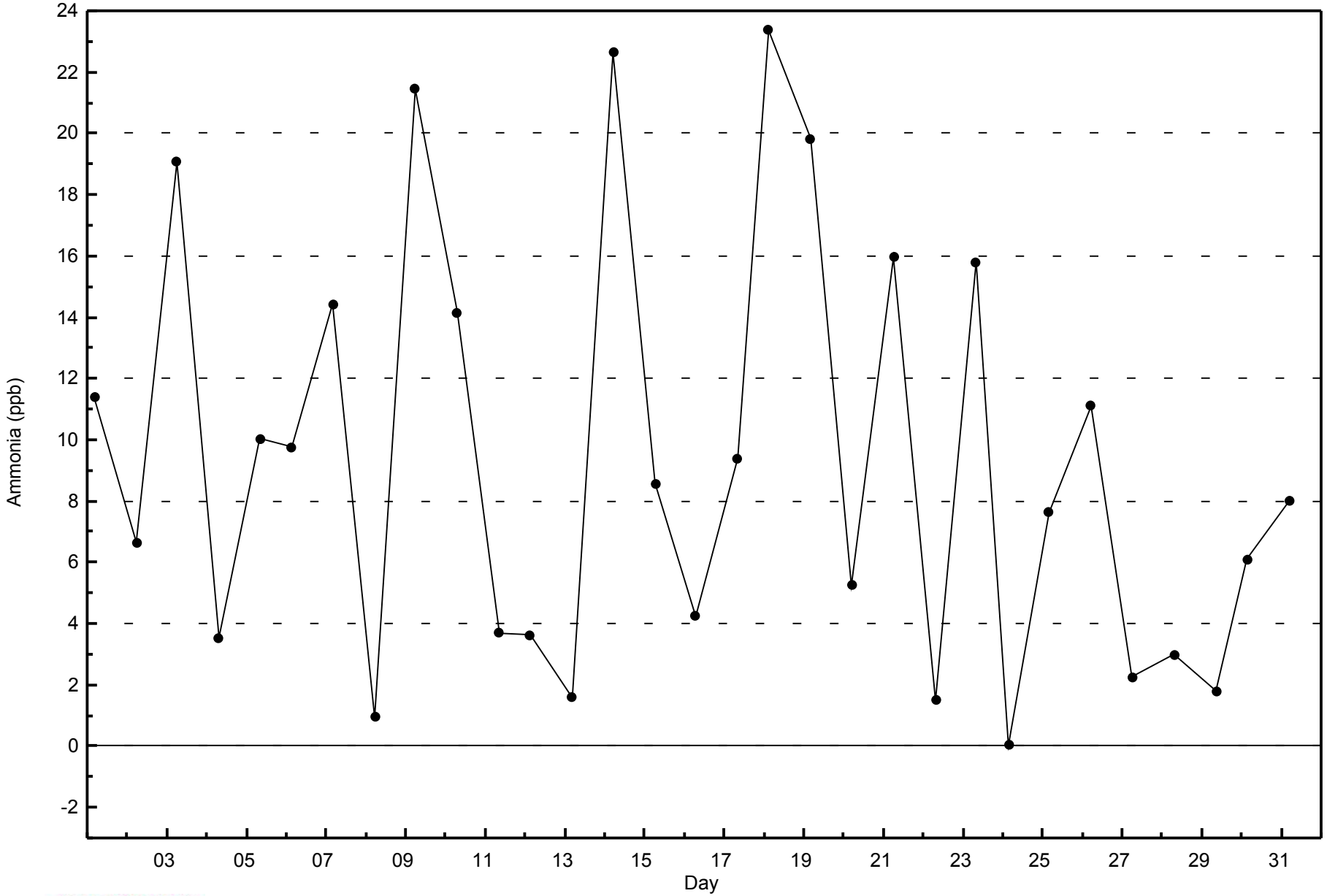
Total Number of Valid Hours: 617

WBEA

Zero Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2015



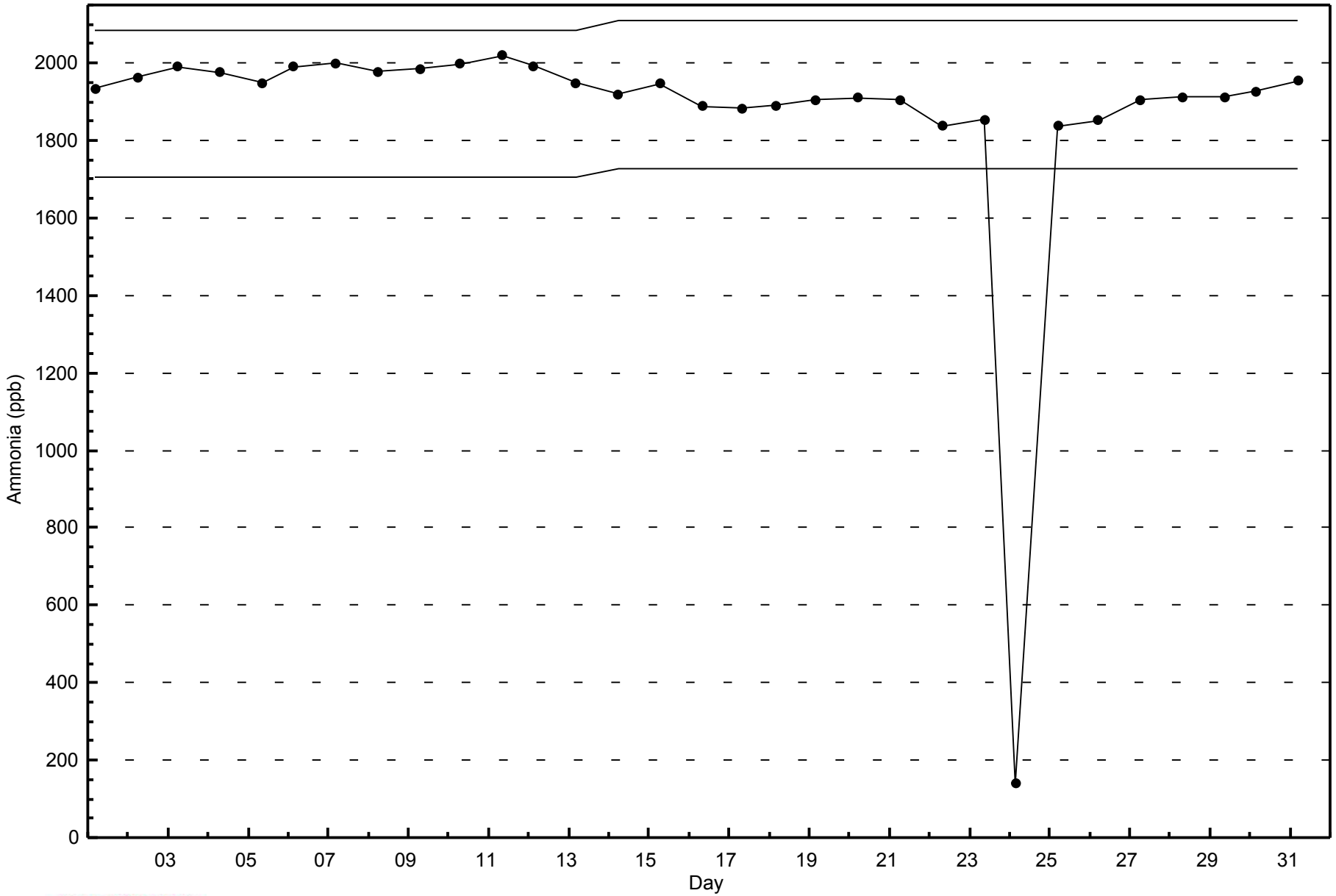
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - January 2015

Maximum Value: 6.9 C on Jan 25 16:00

Maximum Daily Average: 3.9 C on Jan 22

Minimum Value: -33.0 C on Jan 31 06:00

Minimum Daily Average: -27.2 C on Jan 31

Maximum Diurnal Average: -12.2 C at hour 14

Minimum Diurnal Average: -16.1 C at hour 8

Monthly Average: -14.60 C

Percentiles: P_1 = -31.6 P_{10} = -25.9 Q_1 = -21.5 Median = -16.2 Q_3 = -8.7 P_{90} = 0.0 P_{99} = 6.0

Hours in Service:	744
Hours of Data:	721
Hours of Missing Data:	23
Hours of Calibration:	0
Percent Operational Time:	96.9

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-Jan	-12.8	-13.7	-14.7	-15.2	-15.5	-15.9	-16.1	-16.3	-16.3	-16.2	-15.7	-15.1	-15.3	-16.2	-16.9	-17.5	-18.6	-19.4	-19.7	-20.4	-21.0	-20.5	-19.5	-19.7	-17.0	-12.8
2-Jan	-20.8	-21.7	-22.0	-23.1	-23.5	-23.3	-23.0	-23.3	-23.8	-24.0	-24.1	-23.0	-21.7	-21.5	-21.7	-22.9	MS	-25.9	-27.4	-28.3	-29.9	-29.4	-29.9	-30.0	-24.5	-20.8
3-Jan	-28.5	-27.9	MS	-27.2	-28.7	-28.8	-28.6	-28.8	-29.1	-32.2	-30.0	-28.4	-25.0	-24.0	-24.0	-24.4	-25.7	-25.8	-25.7	-25.6	-25.1	-25.0	-25.2	-25.6	-26.9	-24.0
4-Jan	MS	MS	-26.0	-25.6	-25.5	-25.5	-25.9	-25.7	-25.7	-25.3	-23.5	-21.6	-20.8	-17.6	-16.2	-16.4	-17.3	-17.4	-17.0	-17.8	MS	-17.6	-17.8	-18.7	-21.2	-16.2
5-Jan	-18.8	-18.8	-18.6	-18.4	-18.0	-17.8	-17.6	-17.5	-16.4	-15.5	-14.7	-13.8	-13.5	-13.6	-14.1	-14.9	-15.2	-15.4	-15.7	-17.0	-17.8	-18.7	-19.5	-20.6	-16.7	-13.5
6-Jan	-21.3	-22.3	-23.4	-25.8	MS	-27.2	-29.1	-30.1	-30.0	-30.9	-29.4	-26.8	-24.2	-21.5	-21.4	-21.7	-23.1	-24.4	-25.9	-26.5	MS	-25.6	-26.7	-26.0	-25.6	-21.3
7-Jan	-26.0	-25.9	-25.8	-25.9	-25.8	MS	-25.4	-24.6	-23.9	-23.4	-21.9	-20.6	-19.2	-19.0	-18.7	-18.4	-18.1	-17.9	-16.8	-15.5	-17.0	-15.2	-13.9	-15.3	-20.6	-13.9
8-Jan	-18.0	-19.2	-20.3	-18.4	-18.3	-18.5	MS	-18.6	-19.0	MS	-17.8	-17.0	-16.4	-15.8	-16.1	-16.8	-17.9	-19.0	-20.1	-19.8	-19.9	-20.7	MS	-21.9	-18.5	-15.8
9-Jan	-23.2	-23.5	-23.7	-24.1	-24.7	-25.0	-25.4	-25.6	-26.0	-25.7	-24.6	-22.8	-21.5	-19.8	-18.4	-18.7	-20.5	-21.9	-23.0	-23.7	-25.6	MS	-25.6	-24.1	-23.3	-18.4
10-Jan	-21.6	-23.1	-24.0	-27.3	-28.3	MS	-30.0	-31.7	-31.3	-30.0	-28.3	-26.6	-24.3	MS	-21.9	-21.9	-23.0	-23.5	-24.8	-25.3	-26.8	-26.9	-27.7	-28.1	-26.2	-21.6
11-Jan	-28.7	-28.6	-29.5	-29.3	-29.1	-30.1	-30.6	-29.8	-29.6	-29.7	-27.8	-25.7	-23.9	-22.8	-21.7	-20.8	-20.9	-21.2	-21.5	-21.3	-21.2	-20.5	-19.8	-20.4	-25.2	-19.8
12-Jan	-20.5	-20.8	MS	-21.4	-21.4	-20.2	-19.5	-18.5	-17.8	-17.1	-16.6	-15.8	-15.1	-14.5	-13.7	-14.1	-14.4	-13.6	-12.7	-12.0	-11.6	-11.1	-10.4	-9.9	-15.8	-9.9
13-Jan	-9.2	-8.9	-8.9	-9.1	-9.4	-9.8	-10.0	-10.1	-10.3	-10.4	-10.4	-11.0	-11.4	-11.5	-11.3	-11.4	-11.6	-11.9	-11.8	-11.8	-11.9	-11.9	-11.6	-11.1	-10.7	-8.9
14-Jan	-10.4	-9.7	-9.1	-9.3	-8.7	-8.2	-7.6	-7.4	-7.4	-7.3	UO	MS	-7.8	-8.0	MS	-9.7	MS	-12.6	-13.4	-13.8	-13.9	-14.5	-15.5	-16.4	-10.5	-7.3
15-Jan	-17.0	-17.2	-17.2	-17.3	-17.2	-17.4	-17.5	-17.8	-17.9	-18.0	-18.0	-17.9	-17.7	-17.7	-17.4	-17.3	-17.0	-16.9	-16.5	-15.6	-13.9	-13.0	-12.3	-11.7	-16.6	-11.7
16-Jan	-11.0	-10.4	-10.0	-9.5	-8.6	-8.0	-7.5	-7.1	-6.9	-9.4	-8.4	-7.6	-6.2	-3.5	-1.8	0.3	1.4	MS	MS	1.3	1.0	0.6	0.7	1.1	-5.0	1.4
17-Jan	0.9	0.1	1.0	0.9	0.5	-3.0	-5.9	-7.6	-8.6	-9.1	-9.3	-9.1	-9.0	-8.8	-9.0	-9.1	-9.2	-9.2	-9.2	-9.3	-9.3	-9.3	-9.1	-9.0	-6.6	1.0
18-Jan	-9.2	-9.6	MS	-10.8	-11.2	-11.3	-11.7	-11.7	-11.5	-10.9	-9.9	-8.5	-6.7	-4.9	-3.6	-3.3	-3.9	-4.9	-5.8	-5.9	-6.5	-7.7	-7.9	-9.2	-8.1	-3.3
19-Jan	-9.5	-10.9	-12.1	-13.0	-12.4	-12.3	-12.0	-12.2	-12.6	-13.2	-13.2	-12.7	-12.0	-11.9	-11.8	-11.9	-12.1	-12.7	-13.0	-13.1	-13.3	-13.3	MS	-13.4	-12.4	-9.5
20-Jan	-13.6	-13.6	-13.4	-13.2	-13.1	-13.0	-12.8	-12.8	-12.8	-13.1	-12.3	-11.7	-11.4	-10.9	-10.8	-10.4	-11.0	-11.0	-10.9	-10.4	-10.1	-9.9	-9.7	-9.2	-11.7	-9.2
21-Jan	-8.7	-8.2	-8.4	-9.7	-10.7	-10.0	-9.1	-8.3	-8.1	-7.5	-6.5	-5.5	-3.4	1.2	3.3	3.5	3.0	3.0	3.3	3.4	3.7	3.7	3.7	3.9	-2.9	3.9
22-Jan	3.8	3.6	3.3	3.7	3.9	4.0	4.1	4.2	4.7	4.1	3.9	4.1	5.6	6.8	6.6	6.8	6.6	6.2	6.3	6.3	0.9	-1.3	-2.0	-2.8	3.9	6.8
23-Jan	-3.2	-3.7	-4.4	-4.8	-5.1	-5.1	-5.2	-5.2	-5.2	-5.1	-4.8	-4.4	-3.9	-3.3	-3.1	-2.8	-2.9	-3.3	-3.6	-3.8	-4.2	-4.7	-4.8	-4.5	-4.2	-2.8
24-Jan	-4.5	-4.1	-2.8	-0.9	-0.3	-0.2	0.0	0.1	0.1	0.1	0.8	0.5	0.4	-0.3	-0.2	-0.5	-1.0	-1.5	-2.0	-3.2	-4.0	-4.3	-3.9	-3.3	-1.5	0.8
25-Jan	-2.9	-1.4	-0.6	-0.3	0.6	1.1	1.3	1.3	1.1	1.8	3.5	4.9	4.8	5.4	6.8	6.9	5.5	2.8	1.5	0.7	0.0	-0.6	-0.8	-1.1	1.7	6.9
26-Jan	-1.5	-1.7	-2.2	-2.1	-1.8	-1.7	-1.6	-1.8	-1.9	-1.0	-0.2	1.7	3.0	3.6	4.6	-0.4	-5.0	-5.9	-7.6	-8.8	-9.9	-11.6	-13.3	-14.1	-3.4	4.6
27-Jan	-15.1	-15.9	-16.5	-17.2	-18.0	-18.7	-19.5	-19.8	-19.8	-19.8	-19.5	-19.3	-19.0	-18.4	-18.8	-18.9	-19.2	-19.5	-19.7	-20.0	-20.0	-19.7	-19.9	-20.0	-18.9	-15.1
28-Jan	-20.1	-20.1	-20.4	-20.3	-19.9	-20.6	-21.7	-22.4	-23.1	-22.2	-21.2	-20.5	-19.9	-19.3	-18.9	-18.4	-19.3	-20.0	-19.6	-20.2	-20.7	-20.9	-21.0	-21.7	-20.5	-18.4
29-Jan	-22.2	-22.8	-22.7	-22.0	-21.7	-21.2	-20.5	-19.9	-19.3	-19.0	-18.5	-17.7	-17.0	-16.3	-15.5	-15.3	-15.4	-15.3	-15.3	-15.0	-14.6	-14.8	-15.7	-16.4	-18.1	-14.6
30-Jan	-17.3	-18.2	-18.7	-19.1	-18.9	-18.8	-19.0	-19.5	-20.3	-20.4	-20.0	-19.4	-19.5	-19.6	-19.9	-20.3	-21.4	-22.8	-23.8	-24.7	-25.6	-26.6	-26.9	-28.8	-21.2	-17.3
31-Jan	-30.1	-30.8	-31.1	-31.5	-32.4	-33.0	-32.8	-32.3	-31.7	-30.8	-29.6	-26.9	-24.9	-23.3	-21.8	-21.0	-21.1	-22.0	-22.8	-23.7	-24.5	-24.4	-24.7	-25.3	-27.2	-21.0
	-14.7	-15.0	-15.1	-15.7	-15.4	-15.2	-16.0	-16.1	-16.1	-16.0	-15.6	-14.6	-13.4	-12.2	-12.3	-12.3	-12.7	-14.1	-14.5	-14.2	-14.2	-14.5	-14.9	-15.3	Diurnal Average	
	3.8	3.6	3.3	3.7	3.9	4.0	4.1	4.2	4.7	4.1	3.9	4.9	5.6	6.8	6.8	6.9	6.6	6.2	6.3	6.3	3.7	3.7	3.7	3.9	Diurnal Maximum	

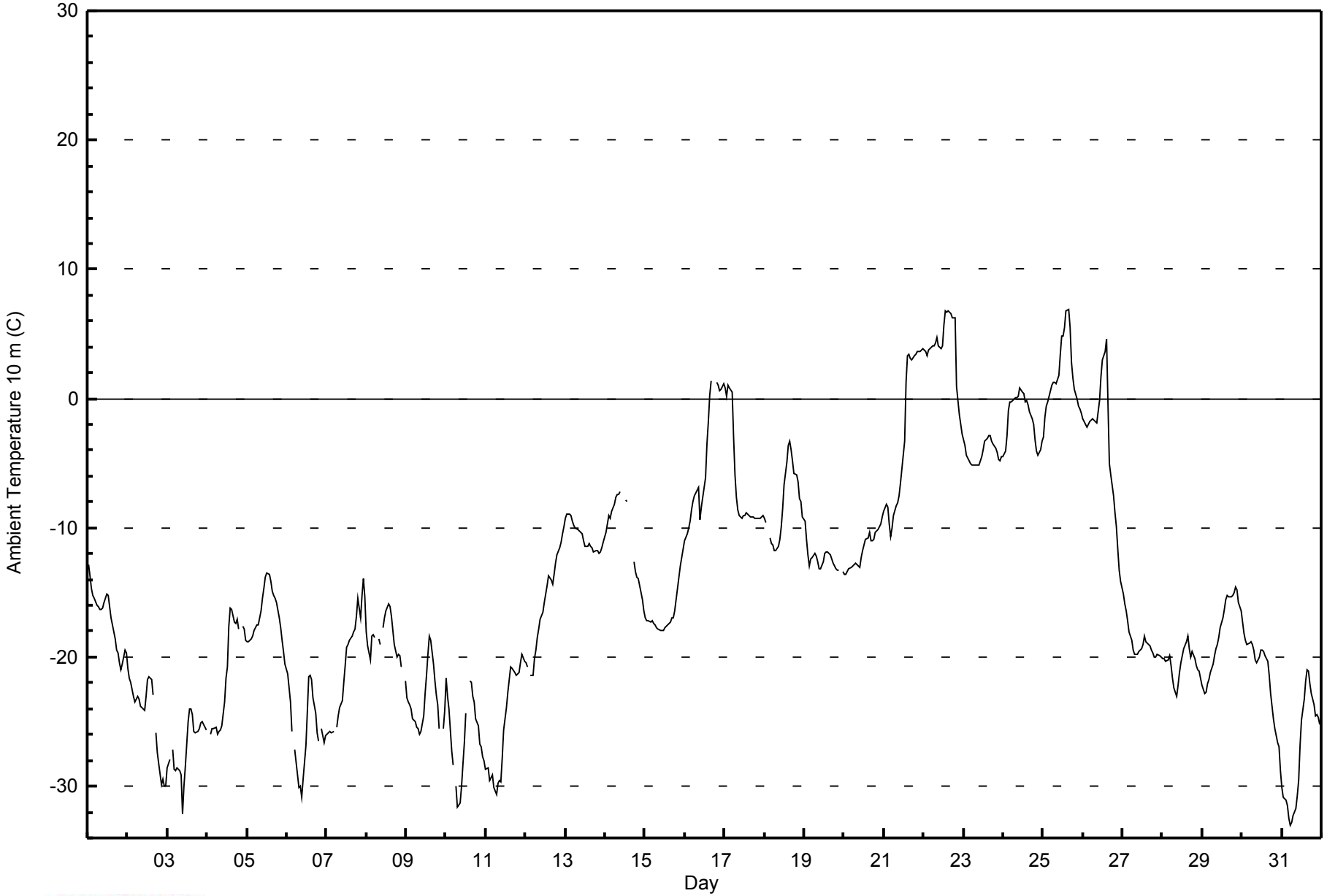
UO - Unstable Operation MS - Missing

WBEA

Hourly Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	228	31.62	31.62
-20 - 0	423	58.67	90.29
0 - 10	70	9.71	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 721

Total Number of Hours: 744

Maximum Value: 6.5 C on Jan 22 14:00

Maximum Daily Average: 3.6 C on Jan 22

Minimum Value: -34.0 C on Jan 31 06:00

Minimum Daily Average: -28.3 C on Jan 3

Maximum Diurnal Average: -12.0 C at hour 15

Minimum Diurnal Average: -16.9 C at hour 9

Monthly Average: -15.23 C

Percentiles: P_1 = -33.1 P_{10} = -27.2 Q_1 = -22.5 Median = -16.3 Q_3 = -9.0 P_{90} = -0.3 P_{99} = 5.6

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-Jan	-12.9	-13.9	-14.8	-15.3	-15.5	-16.0	-16.2	-16.3	-16.4	-16.3	-15.7	-15.0	-15.3	-16.2	-17.1	-17.7	-19.4	-21.5	-21.9	-21.6	-21.8	-22.0	-21.3	-20.5	-17.5	-12.9
2-Jan	-22.6	-24.1	-24.3	-23.9	-24.0	-23.9	-24.0	-24.5	-25.3	-25.6	-24.6	-22.9	-21.2	-21.4	-22.6	-25.0	-26.9	-28.6	-29.9	-30.9	-31.3	-31.4	-30.7	-30.7	-25.8	-21.2
3-Jan	-29.1	-28.9	-30.0	-31.0	-31.5	-31.8	-32.1	-32.5	-33.1	-33.7	-31.2	-27.7	-25.2	-23.7	-24.0	-25.7	-26.8	-26.5	-26.3	-26.3	-25.5	-25.4	-25.5	-26.0	-28.3	-23.7
4-Jan	-26.2	-26.3	-26.4	-25.8	-25.8	-25.7	-26.2	-26.1	-25.7	-25.3	-23.4	-21.5	-20.6	-17.3	-16.0	-16.7	-17.7	-17.6	-17.3	-18.1	-18.3	-17.8	-17.9	-19.0	-21.6	-16.0
5-Jan	-18.9	-18.9	-18.6	-18.4	-18.0	-17.6	-17.7	-17.9	-17.1	-15.9	-14.8	-13.9	-13.5	-13.6	-14.3	-15.0	-15.4	-15.6	-16.2	-19.0	-21.4	-21.8	-21.6	-23.9	-17.5	-13.5
6-Jan	-25.2	-26.3	-27.1	-28.4	-29.5	-30.3	-30.8	-31.9	-32.5	-32.4	-30.1	-25.7	-22.8	-20.4	-20.7	-22.5	-24.4	-26.1	-27.9	-28.6	-28.8	-28.4	-29.1	-26.5	-27.4	-20.4
7-Jan	-26.5	-26.2	-26.0	-26.1	-26.0	-26.3	-25.9	-24.4	-23.6	-23.2	-21.8	-20.1	-19.1	-18.9	-18.6	-18.2	-18.1	-17.9	-17.1	-15.8	-18.1	-15.8	-14.1	-15.3	-21.0	-14.1
8-Jan	-18.3	-21.2	-23.4	-22.4	-19.0	-19.1	-19.4	-19.6	-20.7	-20.4	-18.3	-17.0	-16.2	-15.5	-16.1	-17.6	-19.7	-21.2	-22.9	-22.3	-21.2	-22.3	-22.0	-22.7	-19.9	-15.5
9-Jan	-24.1	-25.3	-25.6	-25.6	-25.8	-25.4	-25.8	-25.9	-26.3	-26.1	-24.7	-22.4	-20.9	-19.1	-17.8	-20.1	-22.5	-24.2	-25.6	-26.5	-28.2	-28.3	-26.0	-25.2	-24.5	-17.8
10-Jan	-24.9	-25.9	-27.3	-29.3	-30.9	-31.7	-32.7	-33.3	-33.7	-33.0	-28.9	-25.7	-23.7	-22.0	-21.3	-22.4	-23.5	-24.3	-26.9	-28.3	-29.3	-29.6	-30.3	-30.3	-27.9	-21.3
11-Jan	-30.6	-30.1	-31.5	-31.5	-31.6	-32.2	-32.6	-31.9	-31.2	-31.1	-28.4	-25.1	-23.2	-22.1	-21.2	-21.0	-22.0	-21.6	-21.7	-21.3	-21.1	-20.5	-21.1	-21.9	-26.1	-20.5
12-Jan	-20.9	-23.1	-23.3	-23.3	-22.5	-20.5	-19.2	-18.1	-17.7	-16.9	-16.2	-15.2	-14.6	-14.0	-13.4	-14.4	-14.9	-13.6	-12.7	-12.1	-11.6	-11.1	-10.5	-9.8	-16.2	-9.8
13-Jan	-9.3	-9.0	-9.0	-9.1	-9.5	-9.9	-10.1	-10.2	-10.4	-10.4	-10.4	-10.9	-11.2	-11.2	-11.1	-11.3	-11.6	-11.9	-11.9	-11.8	-11.9	-11.9	-11.6	-11.1	-10.7	-9.0
14-Jan	-10.4	-9.7	-9.2	-9.5	-9.7	-9.1	-7.8	-7.5	-7.5	-7.3	-7.4	-7.7	-7.7	-7.9	-8.7	-9.7	-10.8	-12.6	-13.4	-13.8	-14.0	-14.7	-15.9	-16.6	-10.4	-7.3
15-Jan	-17.2	-17.2	-17.2	-17.4	-17.2	-17.4	-17.5	-17.8	-17.8	-17.9	-17.9	-17.8	-17.7	-17.6	-17.4	-17.3	-17.0	-16.9	-16.4	-15.9	-13.9	-13.0	-12.3	-11.7	-16.6	-11.7
16-Jan	-11.1	-10.5	-10.1	-9.6	-8.7	-8.1	-7.6	-7.2	-7.0	-9.4	-8.5	-7.5	-6.2	-3.6	-2.1	-0.3	0.8	1.3	1.2	0.6	-0.3	-0.9	0.2	0.6	-4.8	1.3
17-Jan	0.0	-0.5	0.4	0.1	-1.1	-2.9	-6.1	-8.2	-9.1	-9.2	-9.3	-9.0	-8.8	-8.7	-8.9	-9.1	-9.2	-9.3	-9.3	-9.4	-9.3	-9.3	-9.2	-9.1	-6.9	0.4
18-Jan	-9.2	-9.7	-10.4	-11.3	-12.3	-12.2	-12.9	-12.7	-11.9	-11.5	-9.8	-7.7	-6.2	-4.3	-3.1	-3.8	-4.7	-5.7	-7.3	-7.2	-7.8	-9.7	-10.7	-11.3	-8.9	-3.1
19-Jan	-12.1	-13.2	-14.0	-14.4	-13.1	-12.6	-12.1	-12.3	-12.7	-13.2	-13.1	-12.6	-12.0	-11.7	-11.8	-11.9	-12.2	-12.8	-13.1	-13.2	-13.3	-13.4	-13.4	-13.5	-12.8	-11.7
20-Jan	-13.7	-13.6	-13.4	-13.2	-13.1	-13.0	-12.9	-12.8	-13.1	-13.8	-12.7	-10.1	-10.2	-9.7	-10.0	-10.4	-11.0	-11.1	-10.9	-10.4	-10.1	-10.0	-9.7	-9.1	-11.6	-9.1
21-Jan	-8.7	-8.3	-8.4	-10.6	-11.3	-10.4	-9.8	-9.0	-8.5	-7.8	-6.5	-5.4	-3.4	1.0	3.1	3.3	2.7	2.7	2.9	3.1	3.3	3.4	3.4	3.6	-3.1	3.6
22-Jan	3.5	3.4	3.0	3.4	3.5	3.7	3.8	3.9	4.3	3.6	3.4	3.7	5.4	6.5	6.3	6.4	6.2	5.6	5.5	5.3	0.7	-1.3	-2.0	-2.7	3.6	6.5
23-Jan	-3.1	-3.7	-4.4	-4.8	-5.1	-5.2	-5.2	-5.2	-5.2	-5.1	-4.7	-4.3	-3.6	-3.0	-2.7	-2.6	-2.7	-3.2	-3.5	-3.8	-4.1	-4.7	-4.9	-4.6	-4.2	-2.6
24-Jan	-4.6	-4.0	-2.6	-0.9	-0.3	-0.2	-0.1	0.0	0.0	0.1	0.5	0.3	MS	-0.2	0.1	-0.3	-0.9	-1.5	-2.1	-3.2	-4.2	-4.7	-4.7	-4.5	-1.7	0.5
25-Jan	-4.2	-1.9	-0.7	-0.3	0.5	0.9	1.1	1.0	0.2	1.3	3.2	4.8	4.2	4.7	5.7	5.5	4.1	2.4	1.4	0.6	-0.1	-1.3	-1.3	-2.1	1.2	5.7
26-Jan	-2.3	-2.9	-3.6	-3.5	-3.6	-3.9	-3.7	-3.4	-3.3	-1.9	-0.6	1.9	4.5	5.8	5.4	-0.2	-4.9	-5.9	-7.5	-8.8	-9.9	-11.6	-13.3	-14.2	-3.8	5.8
27-Jan	-15.2	-16.0	-16.5	-17.3	-18.1	-18.7	-19.5	-19.8	-19.8	-19.7	-19.5	-19.2	-18.8	-18.2	-18.7	-18.9	-19.1	-19.5	-19.7	-20.0	-20.0	-19.8	-20.0	-20.0	-18.8	-15.2
28-Jan	-20.2	-20.1	-20.4	-20.3	-20.0	-21.0	-22.1	-23.5	-24.7	-22.6	-21.1	-20.1	-19.3	-18.7	-18.2	-18.4	-20.3	-21.1	-19.7	-20.0	-20.6	-20.8	-20.9	-22.6	-20.7	-18.2
29-Jan	-25.0	-24.4	-23.1	-22.1	-21.6	-21.2	-20.4	-19.7	-19.1	-18.8	-18.2	-17.6	-16.6	-15.7	-15.1	-15.1	-15.3	-15.2	-15.3	-15.0	-14.6	-14.8	-15.8	-16.5	-18.2	-14.6
30-Jan	-17.5	-18.2	-18.7	-19.1	-18.9	-18.9	-19.1	-19.7	-20.6	-20.9	-20.1	-19.2	-19.1	-19.2	-19.5	-20.3	-21.6	-23.3	-24.8	-26.2	-27.8	-29.2	-30.1	-31.0	-21.8	-17.5
31-Jan	-32.0	-32.3	-32.6	-33.0	-33.6	-34.0	-33.9	-33.5	-32.9	-30.9	-29.4	-26.1	-24.2	-22.5	-21.0	-20.7	-21.3	-24.1	-26.1	-26.0	-25.9	-25.2	-25.1	-25.8	-28.0	-20.7
	-15.9	-16.2	-16.4	-16.6	-16.6	-16.6	-16.7	-16.8	-16.9	-16.6	-15.5	-14.1	-13.6	-12.2	-12.0	-12.6	-13.6	-14.2	-14.7	-15.0	-15.5	-15.7	-15.7	-15.9	Diurnal Average	
	3.5	3.4	3.0	3.4	3.5	3.7	3.8	3.9	4.3	3.6	3.4	4.8	5.4	6.5	6.3	6.4	6.2	5.6	5.5	5.3	3.3	3.4	3.4	3.6	Diurnal Maximum	

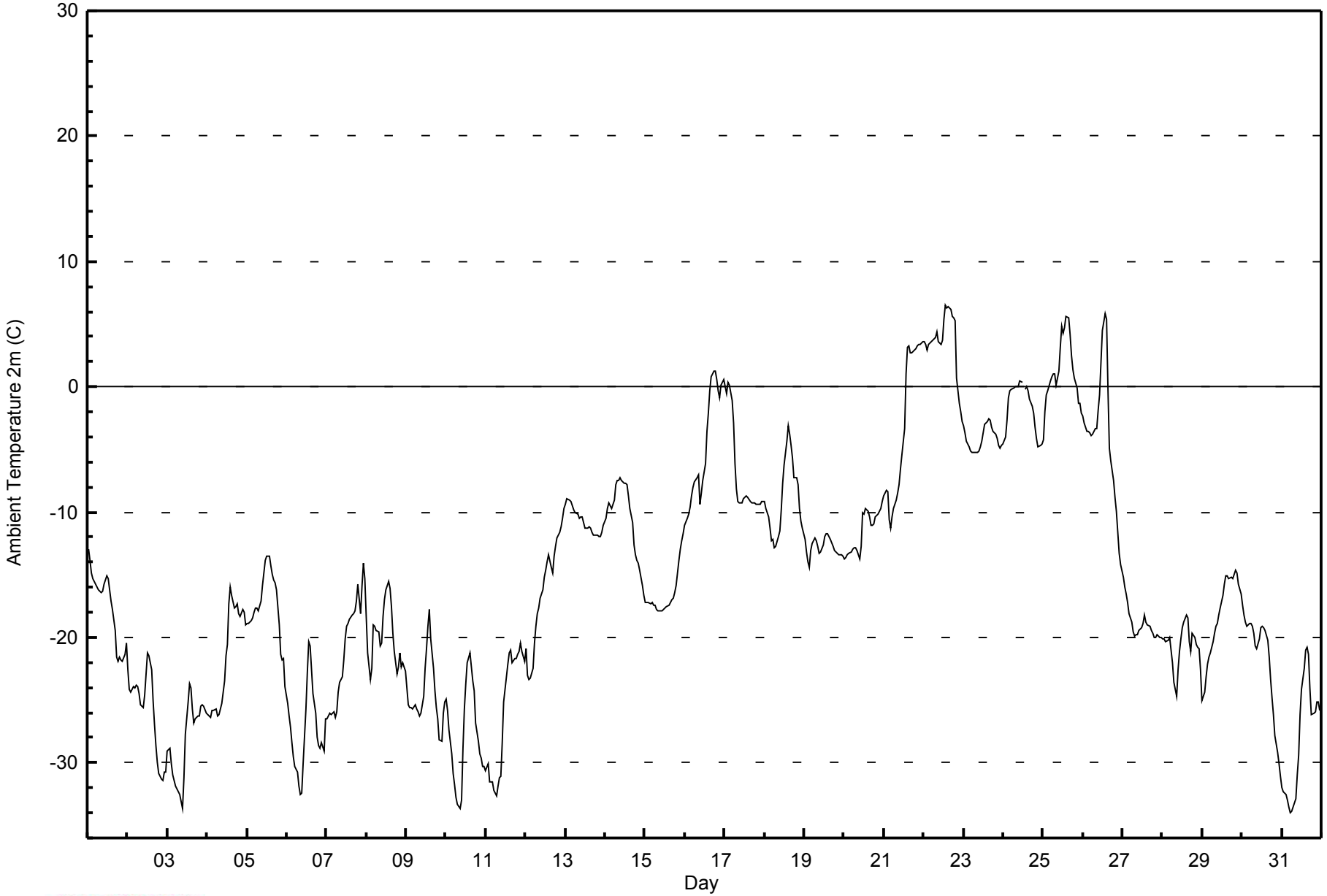
MS - Missing

WBEA

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	259	34.86	34.86
-20 - 0	417	56.12	90.98
0 - 10	67	9.02	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

Maximum Value: 99 % on Jan 24 11:00

Maximum Daily Average: 97.4 % on Jan 24

Minimum Value: 49 % on Jan 8 14:00

Minimum Daily Average: 66.6 % on Jan 8

Maximum Diurnal Average: 79.3 % at hour 10

Minimum Diurnal Average: 71.0 % at hour 14

Monthly Average: 77.5 %

Percentiles: P_1 = 59 P_{10} = 68 Q_1 = 71 Median = 76 Q_3 = 83 P_{90} = 91 P_{99} = 98

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-Jan	80	77	76	77	77	77	78	78	80	80	79	77	76	74	72	71	74	77	77	77	77	77	76	73	76.6	80
2-Jan	75	76	76	75	75	75	75	75	74	74	74	73	69	69	70	73	73	72	71	70	70	70	70	70	72.6	76
3-Jan	71	71	70	70	70	69	69	69	68	68	69	64	63	60	62	67	70	69	69	70	69	69	69	70	68.2	71
4-Jan	69	69	69	68	68	68	68	69	68	69	69	67	68	63	61	65	69	69	67	69	70	69	68	69	67.9	70
5-Jan	69	68	68	68	70	71	73	76	77	74	69	64	62	61	61	62	64	66	70	76	77	76	76	75	69.7	77
6-Jan	74	73	73	72	71	70	70	69	69	69	70	66	61	59	60	68	73	73	72	71	72	72	71	73	69.5	74
7-Jan	73	73	73	73	73	72	73	74	74	74	75	74	76	77	77	78	79	79	78	74	77	77	74	72	74.9	79
8-Jan	75	77	76	76	69	66	67	67	72	70	62	57	53	49	51	56	65	70	73	73	69	69	69	68	66.6	77
9-Jan	72	73	72	73	73	73	73	72	72	72	71	66	62	58	55	66	72	74	74	73	72	72	73	73	70.2	74
10-Jan	74	73	72	71	70	69	68	68	68	69	70	67	65	64	63	69	73	74	72	72	71	71	70	70	69.7	74
11-Jan	70	71	69	69	69	69	68	69	69	69	70	68	65	65	64	67	72	73	73	73	73	74	76	77	70.1	77
12-Jan	77	75	76	76	76	77	77	77	80	82	81	79	78	77	76	79	82	81	80	81	81	82	83	82	79.0	83
13-Jan	84	85	85	84	83	84	85	85	85	84	81	78	74	73	74	77	83	84	85	85	85	85	85	84	82.4	85
14-Jan	83	82	82	83	86	88	87	87	86	84	81	79	78	76	75	75	75	76	75	74	76	75	74	76	79.7	88
15-Jan	75	75	75	76	74	74	74	71	70	71	71	74	74	75	77	78	79	80	80	82	81	79	80	79	76.0	82
16-Jan	80	80	81	81	81	81	81	82	83	83	83	81	81	81	84	83	83	82	80	79	81	81	76	75	81.0	84
17-Jan	77	80	76	76	83	84	81	84	85	79	75	75	76	78	81	83	85	86	86	88	90	92	92	92	82.7	92
18-Jan	90	88	87	87	86	86	86	86	87	87	85	78	76	72	70	76	82	86	88	90	88	89	89	89	84.5	90
19-Jan	87	86	85	85	86	86	87	87	86	85	84	83	83	82	82	84	85	85	86	85	85	84	84	83	84.9	87
20-Jan	83	83	83	82	82	82	82	82	83	84	80	67	66	65	67	73	77	79	80	80	80	80	81	82	78.4	84
21-Jan	83	84	85	87	88	88	89	89	88	87	84	82	79	70	71	74	80	81	81	81	80	79	79	78	81.9	89
22-Jan	78	79	81	80	80	79	79	78	78	88	93	91	82	76	76	75	75	76	75	74	88	92	90	87	81.1	93
23-Jan	85	84	86	89	91	94	95	95	94	94	94	93	91	89	90	91	93	95	96	96	95	95	95	95	92.3	96
24-Jan	94	95	96	97	98	98	98	98	99	99	99	99	MS	98	99	98	99	98	98	97	96	95	95	95	97.4	99
25-Jan	95	97	95	94	95	96	97	98	98	98	92	86	90	91	90	91	91	93	94	94	93	95	97	97	94.0	98
26-Jan	97	97	97	96	96	96	95	95	94	93	89	79	68	63	66	83	90	93	90	89	86	83	78	79	87.2	97
27-Jan	79	77	77	74	72	72	72	73	75	76	72	69	71	69	70	70	71	74	76	76	76	76	77	77	73.7	79
28-Jan	76	76	76	76	75	76	76	75	75	76	73	70	68	67	66	66	72	77	73	71	71	71	71	73	72.8	77
29-Jan	74	76	76	77	76	77	77	77	76	75	74	74	75	75	75	77	79	79	80	80	80	79	79	79	76.9	80
30-Jan	78	76	75	75	74	75	75	75	75	75	73	65	62	61	61	62	65	68	71	72	72	72	71	70	70.7	78
31-Jan	70	69	69	69	69	68	68	69	69	70	69	67	65	62	63	65	69	72	74	74	74	74	74	74	69.3	74
	79.0	78.9	78.6	78.6	78.6	78.7	78.8	79.0	79.2	79.3	77.8	74.5	72.0	71.0	71.2	74.4	77.3	78.8	78.8	78.9	79.2	79.2	78.7	78.5	Diurnal Average	
	97	97	97	97	98	98	98	98	99	99	99	99	91	98	99	98	99	98	98	97	96	95	97	97	Diurnal Maximum	

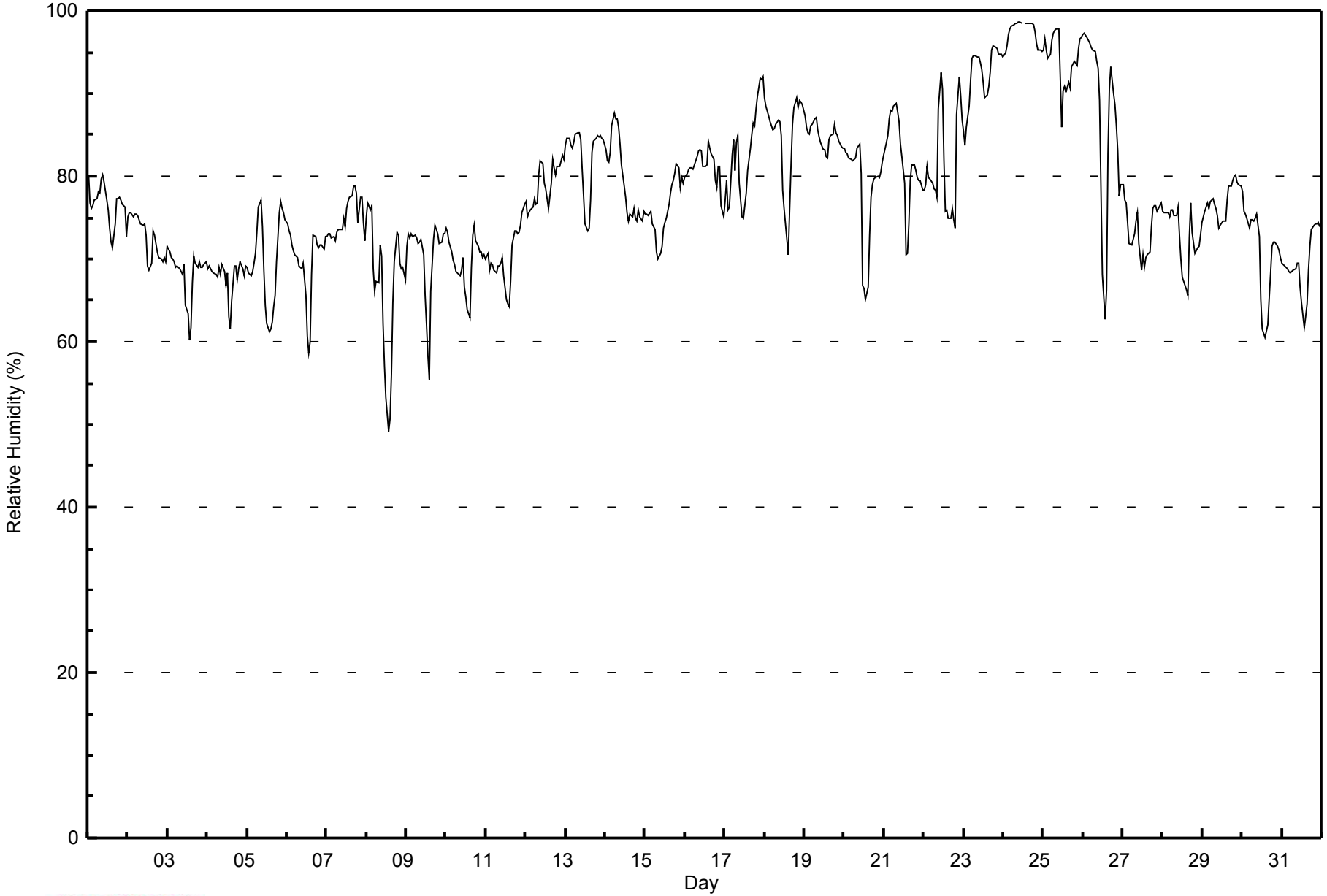
MS - Missing

WBEA

Hourly Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - January 2015



AURORA
ATMOSPHERICS INC.

Maximum Value: 2.8 mm on Jan 24 04:00

Maximum Daily Total: 10.7 mm on Jan 24

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 2.8 mm at hour 4

Minimum Diurnal Total: 0.0 mm at hour 1

Monthly Total: 18.29 mm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.8

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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.8	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.8
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	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	0.5	0.5	0.0	0.0	0.0	1.5	0.5
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.8	2.3	2.8	2.3	0.3	0.3	0.3	0.5	1.3	0.0	0.0	MS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	2.8
25-Jan	0.0	0.0	0.0	0.0	0.3	0.5	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	0.0	0.0	0.0	1.3	0.5
26-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.5	1.0	0.5
28-Jan	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.8	2.5	2.8	2.5	0.8	0.8	0.3	0.5	2.3	0.0	0.0	0.3	1.0	0.8	0.3	0.5	0.0	0.3	0.5	0.5	0.3	0.3	0.5	Diurnal Average	
	0.0	0.8	2.3	2.8	2.3	0.5	0.5	0.3	0.5	1.3	0.0	0.0	0.3	0.5	0.8	0.3	0.3	0.0	0.3	0.5	0.5	0.3	0.3	0.5	Diurnal Maximum	

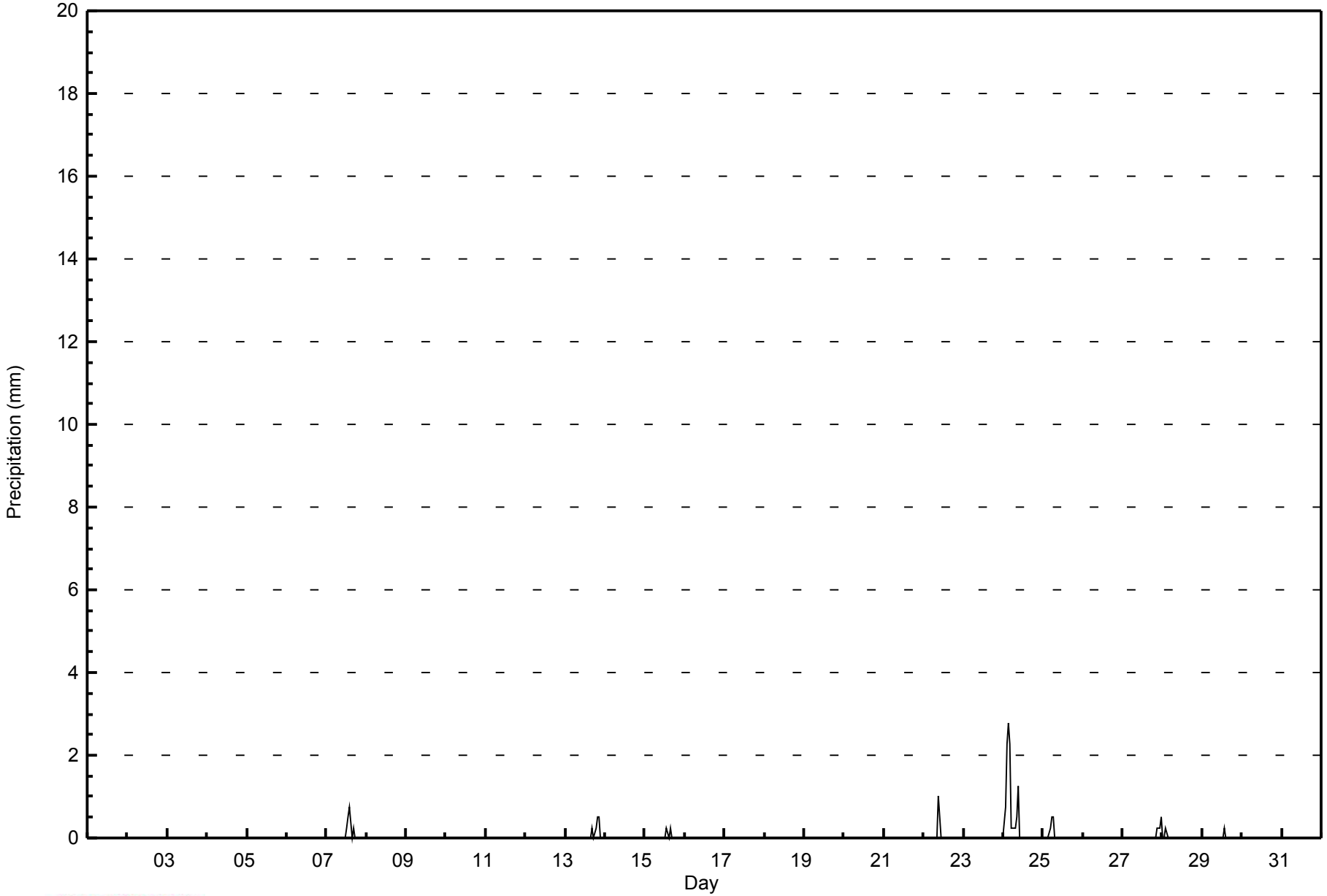
MS - Missing

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - January 201



AURORA ATMOSPHERICS INC.

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	0	0.00	99.06
0.8 - 1.4	4	0.54	99.60
1.5 - 10	3	0.40	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

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - January 2015

Maximum Value: 306 W/m2 on Jan 26 12:00

Maximum Daily Average: 50.7 W/m2 on Jan 26

Minimum Value: 0 W/m2 on Jan 1 01:00

Minimum Daily Average: 3.1 W/m2 on Jan 7

Maximum Diurnal Average: 98.0 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 24

Monthly Average: 18.9 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 12$ $P_{90} = 77$ $P_{99} = 177$

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

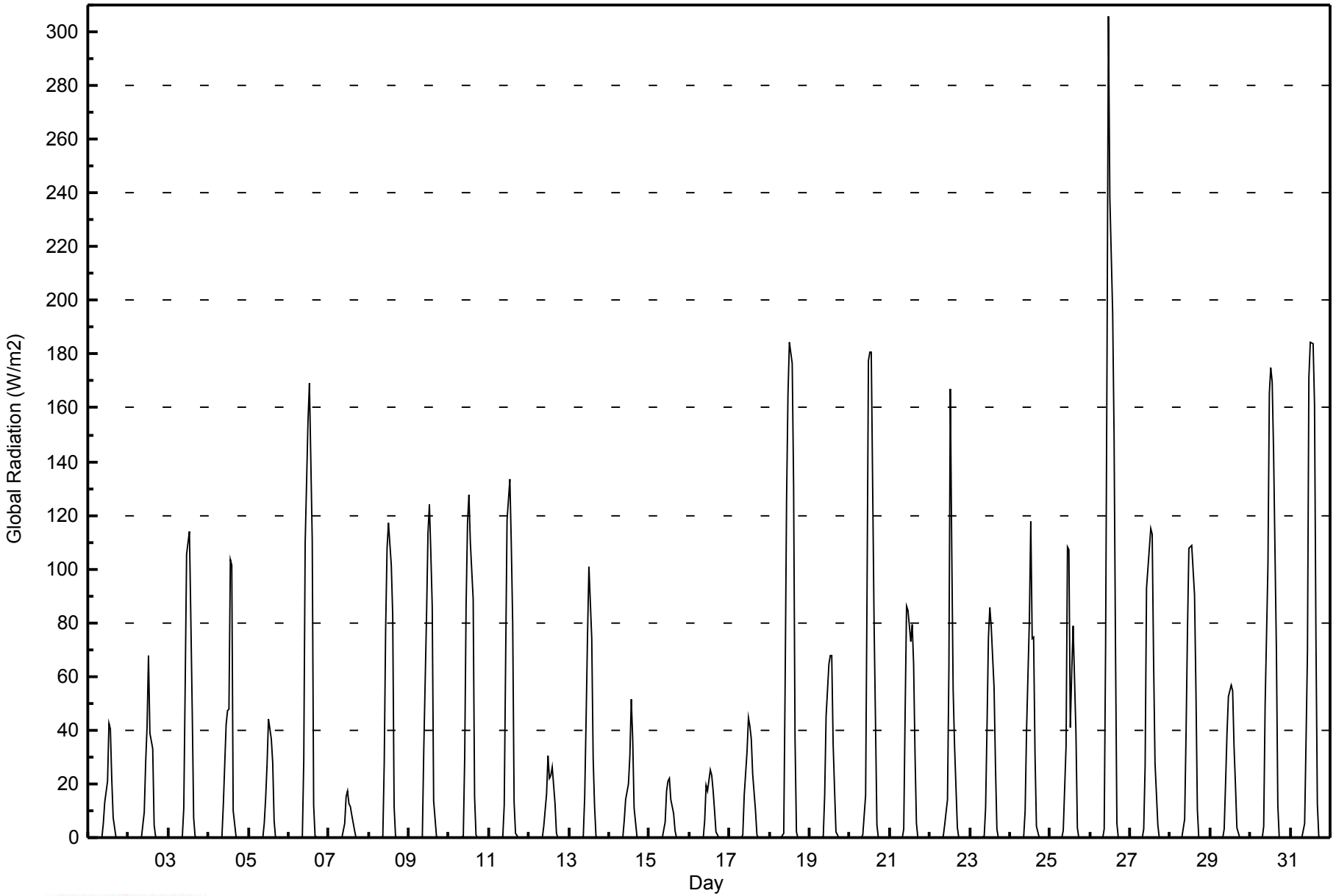
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	0	0	0	0	0	0	5	13	21	42	41	22	7	0	0	0	0	0	0	0	0	6.3	42
2-Jan	0	0	0	0	0	0	0	0	0	9	28	42	68	39	33	5	0	0	0	0	0	0	0	0	9.3	68
3-Jan	0	0	0	0	0	0	0	0	0	11	57	105	114	81	47	7	0	0	0	0	0	0	0	0	17.6	114
4-Jan	0	0	0	0	0	0	0	0	0	12	42	47	48	103	102	10	0	0	0	0	0	0	0	0	15.2	103
5-Jan	0	0	0	0	0	0	0	0	0	5	15	27	44	37	28	6	0	0	0	0	0	0	0	0	6.8	44
6-Jan	0	0	0	0	0	0	0	0	1	29	110	155	169	140	111	12	1	0	0	0	0	0	0	0	30.3	169
7-Jan	0	0	0	0	0	0	0	0	0	5	15	18	12	12	8	3	0	0	0	0	0	0	0	0	3.1	18
8-Jan	0	0	0	0	0	0	0	0	1	28	78	108	117	101	83	12	1	0	0	0	0	0	0	0	22.0	117
9-Jan	0	0	0	0	0	0	0	0	0	33	83	113	124	106	86	13	1	0	0	0	0	0	0	0	23.3	124
10-Jan	0	0	0	0	0	0	0	0	1	30	87	117	127	110	89	15	1	0	0	0	0	0	0	0	24.0	127
11-Jan	0	0	0	0	0	0	0	0	1	12	66	118	134	109	80	13	2	0	0	0	0	0	0	0	22.3	134
12-Jan	0	0	0	0	0	0	0	0	0	4	16	30	22	23	26	12	2	0	0	0	0	0	0	0	5.7	30
13-Jan	0	0	0	0	0	0	0	0	1	15	44	75	101	74	30	11	1	0	0	0	0	0	0	0	14.7	101
14-Jan	0	0	0	0	0	0	0	0	0	6	14	20	31	52	37	11	1	0	0	0	0	0	0	0	7.1	52
15-Jan	0	0	0	0	0	0	0	0	0	6	18	21	22	14	9	2	0	0	0	0	0	0	0	0	3.8	22
16-Jan	0	0	0	0	0	0	0	0	0	6	19	17	25	23	17	10	2	0	0	0	0	0	0	0	5.1	25
17-Jan	0	0	0	0	0	0	0	0	1	16	32	45	42	37	24	10	1	0	0	0	0	0	0	0	8.6	45
18-Jan	0	0	0	0	0	0	0	0	2	58	126	165	184	176	131	37	2	0	0	0	0	0	0	0	36.7	184
19-Jan	0	0	0	0	0	0	0	0	1	16	45	65	68	68	35	18	2	0	0	0	0	0	0	0	13.2	68
20-Jan	0	0	0	0	0	0	0	0	1	16	91	178	181	181	80	43	5	0	0	0	0	0	0	0	32.3	181
21-Jan	0	0	0	0	0	0	0	0	3	47	86	84	73	80	65	31	5	0	0	0	0	0	0	0	19.8	86
22-Jan	0	0	0	0	0	0	0	0	1	5	14	63	167	108	55	34	4	0	0	0	0	0	0	0	18.8	167
23-Jan	0	0	0	0	0	0	0	0	1	11	42	75	86	78	56	26	3	0	0	0	0	0	0	0	15.7	86
24-Jan	0	0	0	0	0	0	0	0	0	10	40	81	118	74	75	31	4	0	0	0	0	0	0	0	18.0	118
25-Jan	0	0	0	0	0	0	0	0	3	34	108	107	41	62	79	39	4	0	0	0	0	0	0	0	19.9	108
26-Jan	0	0	0	0	0	0	0	0	3	71	177	306	239	195	150	71	5	0	0	0	0	0	0	0	50.7	306
27-Jan	0	0	0	0	0	0	0	0	3	27	93	108	115	113	66	28	5	0	0	0	0	0	0	0	23.2	115
28-Jan	0	0	0	0	0	0	0	0	7	39	77	108	108	109	91	55	11	0	0	0	0	0	0	0	25.2	109
29-Jan	0	0	0	0	0	0	0	0	3	21	39	53	57	54	34	19	4	0	0	0	0	0	0	0	11.8	57
30-Jan	0	0	0	0	0	0	0	0	4	49	101	166	175	170	144	70	12	0	0	0	0	0	0	0	37.1	175
31-Jan	0	0	0	0	0	0	0	0	5	36	69	172	184	184	161	75	12	0	0	0	0	0	0	0	37.5	184
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	21.7	59.6	90.6	98.0	88.8	66.1	23.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0	0	0	0	0	0	0	0	7	71	177	306	239	195	161	75	12	0	0	0	0	0	0	0	Diurnal Maximum	

WBEA

Hourly Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	581	78.09	78.09
21 - 100	108	14.52	92.61
101 - 300	54	7.26	99.87
301 - 600	1	0.13	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - January 2015

Maximum Speed: 14 km/h on Jan 16 05:00

Maximum Daily Speed Average: 7.5 km/h on Jan 16

Minimum Speed Value: 0 km/h on Jan 2 05:00

Minimum Daily Speed Average: 0.7 km/h on Jan 2

Maximum Diurnal Speed Average: 1.8 km/h at hour 23

Minimum Diurnal Speed Average: 0.9 km/h at hour 11

Monthly Average Velocity: 1.2 km/h 251.0 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:	685
Hours of Missing Data:	59
Percent Operational Time:	92.1

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-Jan	ENE6	NE4	NNE5	N5	N4	N5	NNW4	NNE4	N4	NNW4	N5	N3	N8	NNE8	NNE9	NNE6	N3	NNW4	WNW3	WSW2	W2	NW2	NNW6	N4	N3.9	NNE9
2-Jan	ENE1	S2	NW3	WSW2	SW0	SSW1	W3	WSW2	WSW2	N3	SW1	SW1	SSE2	S1	NE2	NE2	NW1	WNW2	NNW2	WSW2	N2	NNW3	N3	WSW1	WNW0.7	W3
3-Jan	W1	N2	N1	W4	WSW2	NW4	NW3	WNW4	N1	SSW2	SSW1	SSE3	W5	WNW6	WNW6	W4	W5	WNW7	WNW8	WNW8	WNW8	WNW8	WNW7	WNW7	WNW3.9	WNW8
4-Jan	WNW7	W5	W5	WSW5	WSW6	WSW7	SSW7	SW7	S8	S9	S8	SSW11	S11	SSW11	SW10	SSW7	WSW7	W8	SW5	SW7	WSW9	WSW8	WNW8	WNW10	SW6.5	S11
5-Jan	WNW8	WSW6	WSW6	WSW6	SSW4	S3	S2	W0	WNW5	NW8	NW9	NW8	NNW9	NNW12	NNW10	NW10	NW8	NW8	NNW4	NW4	NNW3	NNW6	N4	NW3	NW4.9	NNW12
6-Jan	NW3	N2	NNW1	WSW3	W1	WNW2	WSW2	W1	W3	SW2	S2	S3	SSE4	S4	S6	SSW4	SSW5	SSW4	SSW3	S3	S4	SSW4	S5	S7	SSW2.4	S7
7-Jan	SSW7	SSW7	SSW7	S5	SSW6	SW2	S4	S5	S6	S5	SSW1	SSE3	ENE2	NE2	NE2	ENE1	N3	NNW4	N6	N6	WNW6	NW9	NNW13	N11	W0.9	NNW13
8-Jan	NE4	NW2	W2	NW7	NW11	NNW10	NW9	NW9	NW7	WNW8	NW9	NW8	NW9	NW8	NW11	WNW8	WNW6	WNW4	WSW3	W5	W6	WSW4	WSW6	SSW6	WNW6.0	NW11
9-Jan	SSW6	S5	S6	SSW6	S7	SSW8	SSW7	S8	S8	S7	S9	S11	S10	S9	S4	N6	NNW5	NW3	NNW4	N3	NW2	NNW1	NNW0	WNW2	SSW3.8	S11
10-Jan	NNE3	WSW3	W4	NW1	WNW3	W3	W2	SW3	SW4	SSW4	SSW5	S7	S9	S9	S7	SSW6	SSW6	SSW5	S3	SW2	SSW2	SW4	SSW4	SSW4	SSW3.4	S9
11-Jan	SSW4	SW5	S2	SW4	SSW4	SSW3	S3	SSW4	SSW4	S4	SSW6	S8	S10	S11	S10	SSW7	S5	S5	S6	S7	S5	S4	SSW4	S6	S5.3	S11
12-Jan	S6	SW1	SSW3	S3	S5	SSW4	S5	SSE3	S2	SSE2	SSE2	SSE2	S4	S5	S5	SSW5	S5	S5	S8	S8	S8	SSW5	SSW8	S6	S4.6	S8
13-Jan	SSW2	SW2	N5	N7	N7	N6	N5	N5	NNE1	NE3	NE5	ENE6	ENE6	ENE6	NE4	ENE4	NNE3	N4	N4	N3	N4	N4	WNW2	W4	NNE3.0	N7
14-Jan	WSW6	SSW7	SSW7	S7	SSE1	NNE2	N6	NNE6	NE5	NNE4	NE5	ENE5	NE5	NNE7	NNE7	NNE7	NNE8	NE8	NE6	NE5	NNE5	NNE5	NNE4	NNE3	NNE2.9	NNE8
15-Jan	NE4	NE3	ENE3	NE3	NNE5	NE4	NE5	NE5	NE4	NE4	NE4	NNE5	NNE4	N3	NNE3	NNE3	N3	N4	N2	SSW2	S7	S9	S12	S12	ENE1.7	S12
16-Jan	S12	SSW12	SSW14	S13	S14	S14	SSW13	SSW13	SW6	W6	SW6	S8	SSW6	SSW7	SW6	WSW5	WSW7	WSW8	WSW7	W7	WSW5	WSW6	W7	WNW10	SW7.5	S14
17-Jan	WNW8	W6	WNW7	W5	NW6	NNE6	NE5	NNE4	NNE4	NE5	NE5	NE5	NE4	NNE4	NNE5	NNE4	N4	N4	NNW2	NNW2	W2	WSW2	SSW3	SSW4	NNW2.5	WNW8
18-Jan	S6	S4	SSW6	SW5	SSW4	SSW5	S4	S5	SSW7	S6	SSW7	S8	S9	S9	S8	S8	S7	S7	S5	SSW7	SSW5	SSW3	SW4	SSW3	SSW5.7	S9
19-Jan	SSW2	NNE3	N3	NNW1	N3	N3	NNE3	N5	N6	N5	N6	N5	N5	N5	N5	N6	N7	N7	N6	N5	N5	N6	N5	N5	N4.5	N7
20-Jan	NNW4	NNW4	NNW3	N3	N4	N3	NNW4	WNW2	WNW1	AF	S1	SSE5	SSE7	S8	S9	SSW4	S9	SSW7	S8	S9	S9	S10	S7	S8	S3.1	S10
21-Jan	S9	S7	S7	S5	S6	SSW5	SSW6	SSW6	SSW9	SSW9	SSW6	SW4	SSW7	SSW13	SSW12	SW11	WSW9	WSW10	WSW10	WSW7	WSW6	WSW7	W7	WNW9	SW6.8	SSW13
22-Jan	W6	SW5	SSW6	SW6	SW5	WSW6	W7	WNW7	WNW9	WNW8	WNW6	W6	WNW14	WNW12	W7	W7	SW7	W6	WNW10	NW8	N11	N7	NNE6	NE6	WNW5.3	WNW14
23-Jan	NE5	ENE5	NE5	NNE5	NNE5	N5	NNE4	NNW4	N3	NNE2	NNE3	NNE2	ESE2	SW3	S6	S4	SSE5	SSE5	S5	S5	S3	SSW4	SSW1	W1	ENE0.8	S6
24-Jan	NNW1	E1	SSW4	AF	AF	AF	AF	AF	AF	AF	AF	NNE4	MS	NNE5	ESE2	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NNE5
25-Jan	AF	AF	AF	AF	AF	S6	SSW8	SSW7	SSW5	SW8	WSW5	SW4	SSE7	SSW3	WNW5	NW5	NNW6	ENE6	ENE4	ENE4	E3	WSW1	SSW3	SW3	SSW1.8	SSW8
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SW6	SSE4	SSE5	E1	N10	AF	AF	AF	AF	AF	AF	AF	AF	----	N10
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NNE9	NNE8	N8	N9	NNE8	N9	N8	N9	----	NNE9
28-Jan	N10	N8	N9	N7	NNW5	N5	N6	NNW4	N2	N2	N5	ENE2	SE2	SSE3	ESE3	ENE4	NNE2	ENE3	E5	E7	E5	E4	E3	E2	NNE3.0	N10
29-Jan	N2	NW1	NW2	N1	SE1	S1	S3	S5	S5	S6	S5	SSW4	S2	SE3	ENE1	NNE3	NNE4	NE3	N5	N6	N6	N8	N7	N7	NNE0.8	N8
30-Jan	NNE8	NNE9	NNE9	NNE7	NNE7	NNE6	NNE6	NNE5	NNE4	N5	NNE7	NNE9	NNE9	NNE9	NE8	NE7	NNE7	NNE5	NNE5	N4	NNW4	NW3	NNW4	WSW2	NNE5.8	NNE9
31-Jan	WSW2	W2	SW1	WSW2	SSW2	SSW2	SSW2	SSW4	SSW4	S5	S6	S9	S11	S10	S8	S7	S8	S3	SSW4	SSW5	SSW6	SSW7	SSW7	SSW7	SSW4.9	S11
	W1.2	WSW1.3	WSW1.4	WSW1.5	WSW1.1	W0.9	WSW1.0	WSW1.3	WSW1.3	WSW1.5	WSW0.9	S1.5	S1.6	SSW1.6	SW1.3	WNW1.0	W1.4	WNW1.5	WNW1.4	W1.3	W1.3	W1.6	W1.8	W1.8	Diurnal Average	
	S12	SSW12	SSW14	S13	S14	S14	SSW13	SSW13	WNW9	S9	NW9	S11	WNW14	SSW13	SSW12	SW11	NNE9	WSW10	WNW10	N9	N11	S10	NNW13	S12	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

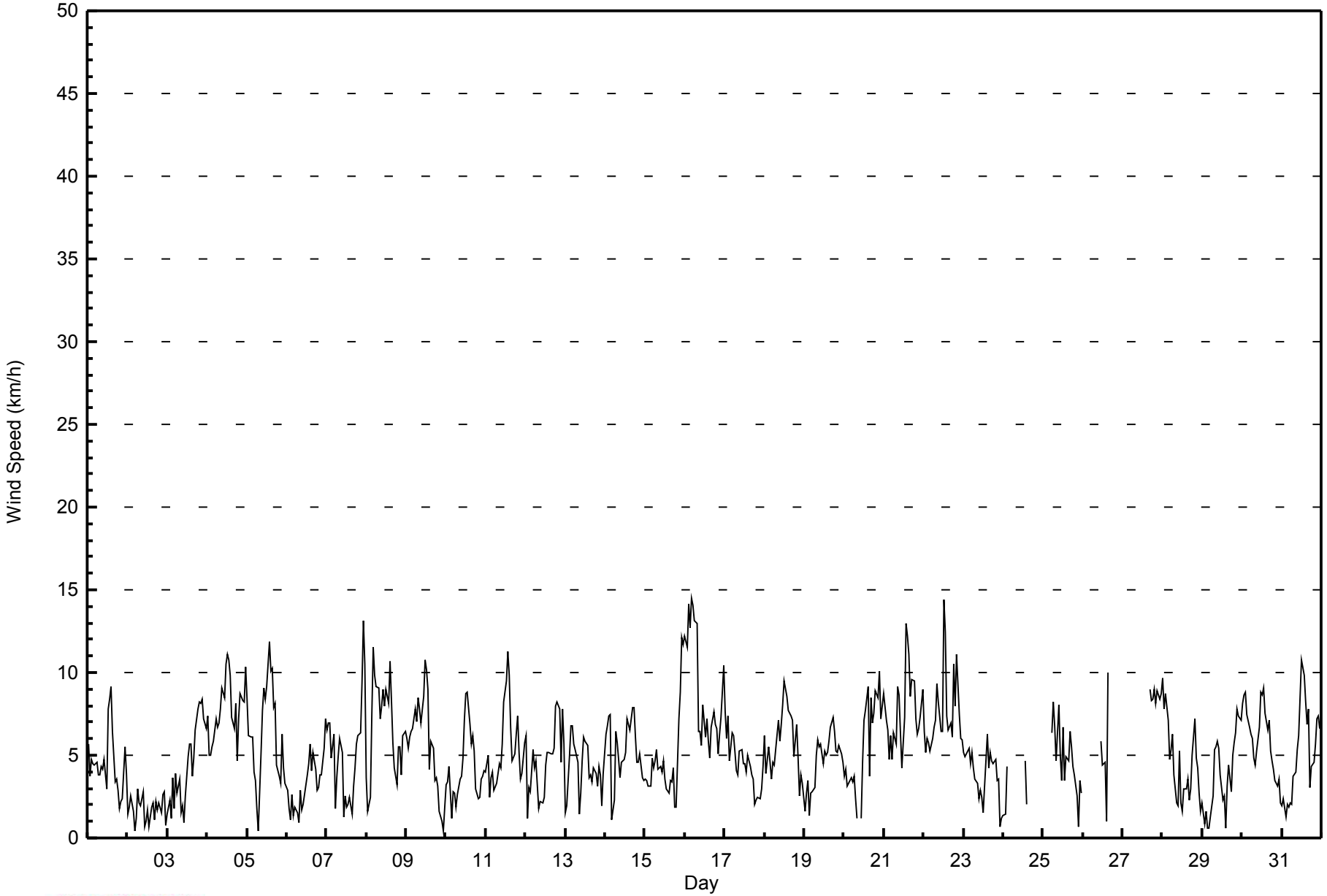
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	393	57.37	57.37
6 - 11	276	40.29	97.66
12 - 19	16	2.34	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: 685

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	59	39	29	13	8	3	3	15	50	53	22	24	21	12	15	27	393
6 - 11	33	25	5	5	1	0	0	2	67	41	11	21	13	26	19	7	276
12 - 19	0	0	0	0	0	0	0	0	6	6	0	0	0	2	0	2	16
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	92	64	34	18	9	3	3	17	123	100	33	45	34	40	34	36	685

Total Number of Valid Hours: 685

Total Number of Hours: 744

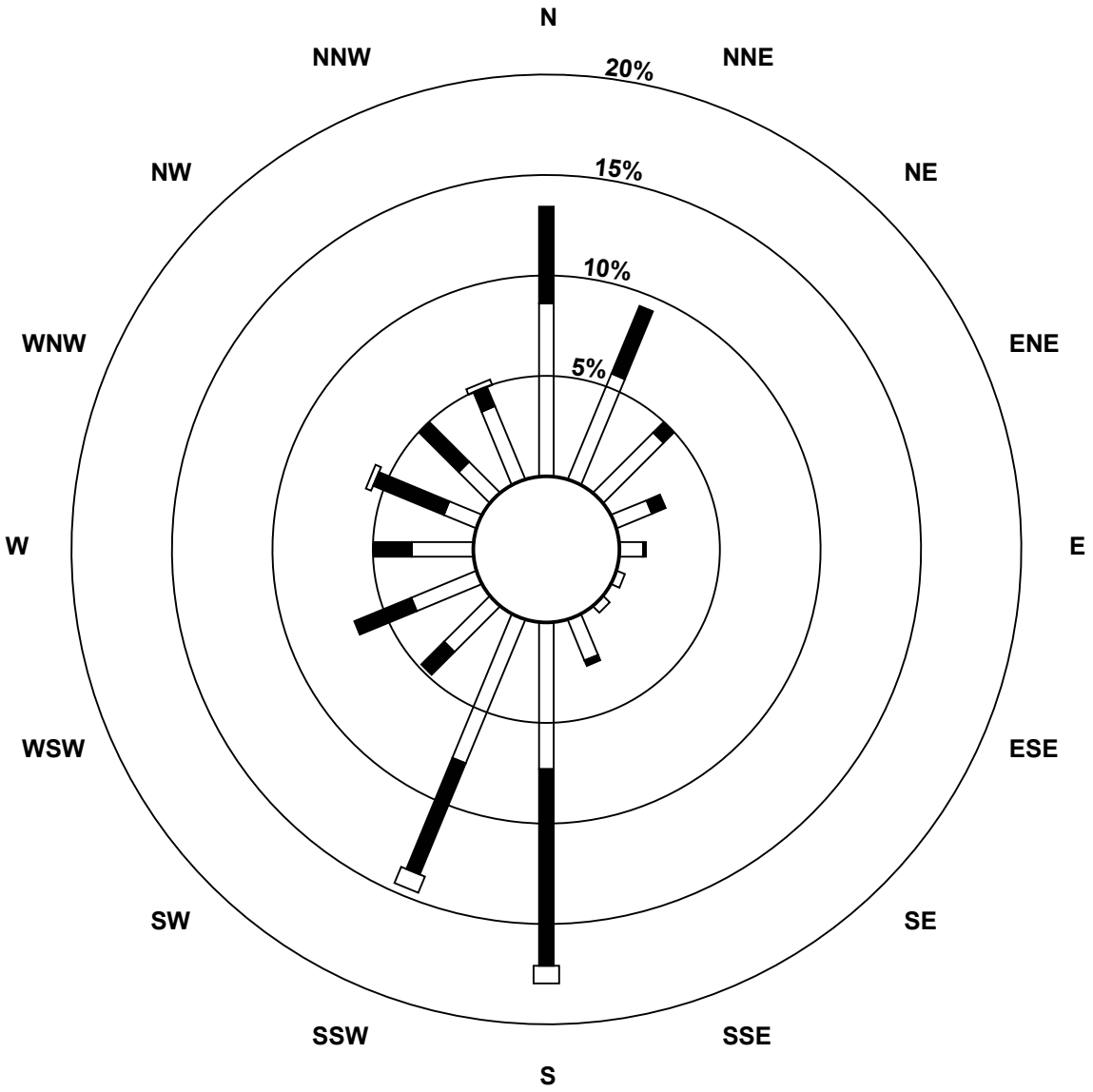
AURORA
ATMOSPHERICS INC.

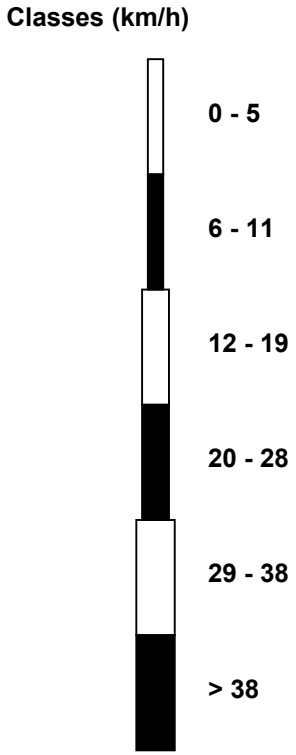
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter (AMS 1)





Total Number of Valid Hours: 685

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 km/h on Jan 8 00:00

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

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

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	0
Percent Operational Time:	92.1

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

AF - Analyzer Failure MS - Missing

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - January 2015

Direction of Maximum Speed: 184 deg on Jan 16 05:00
Direction of Maximum Daily Speed Average: 214.9 deg on Jan 16

Direction of Minimum Speed: 227 deg on Jan 2 05:00

Direction of Minimum Daily Speed Average: 0.7 deg on Jan 2

Monthly Average Direction: 255.0 deg

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Percent Operational Time:	92.1

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-Jan	74	43	12	2	4	0	347	17	358	345	351	357	5	17	20	23	0	328	303	241	268	320	337	8	3.2
2-Jan	57	188	309	243	227	209	259	252	246	360	218	217	164	170	41	47	319	283	328	253	360	338	10	245	295.6
3-Jan	263	353	356	278	256	315	310	300	359	210	198	153	278	287	286	275	272	285	289	293	289	289	282	284	286.4
4-Jan	286	270	273	257	251	239	207	219	189	183	191	198	186	204	224	212	240	261	224	229	251	257	282	290	231.1
5-Jan	285	250	240	248	202	169	183	259	300	305	315	322	329	331	329	311	320	312	333	319	335	344	1	321	308.3
6-Jan	326	2	348	250	269	283	243	277	271	221	176	172	167	183	180	193	201	202	197	191	182	194	190	190	201.3
7-Jan	194	194	192	184	195	219	190	187	177	184	212	165	60	51	50	61	355	346	352	354	298	320	333	10	271.7
8-Jan	36	305	276	315	318	328	313	314	305	303	308	306	320	309	305	301	289	283	258	279	274	249	254	200	301.3
9-Jan	193	181	190	195	191	192	194	188	190	191	187	183	176	181	187	2	327	313	331	349	317	328	346	292	196.1
10-Jan	20	248	272	308	288	273	278	219	226	208	194	178	179	179	185	193	195	200	185	231	213	215	209	208	206.1
11-Jan	196	221	188	223	197	201	190	202	198	191	197	186	177	177	182	192	191	182	178	176	178	179	192	191	188.4
12-Jan	187	221	194	170	184	196	172	166	171	163	155	168	172	171	183	193	182	191	182	188	188	200	199	179	183.9
13-Jan	192	225	8	349	355	5	352	11	16	38	48	68	70	78	50	60	14	6	353	359	10	352	285	262	16.9
14-Jan	241	194	205	191	158	12	1	13	34	12	46	67	41	18	20	30	29	45	43	36	27	21	24	31	30.9
15-Jan	49	46	64	43	32	52	47	44	41	36	40	17	27	4	14	14	359	2	7	205	174	169	182	182	65.4
16-Jan	190	194	193	188	184	189	194	193	223	266	228	191	212	208	219	242	242	240	253	267	253	244	268	292	214.9
17-Jan	291	273	298	259	313	22	42	20	24	43	39	43	54	22	13	13	352	356	346	327	277	240	206	208	347.1
18-Jan	182	180	203	220	208	204	182	187	193	190	194	177	180	186	187	190	189	191	191	197	195	206	221	197	191.8
19-Jan	213	16	5	346	356	1	20	357	1	354	0	3	11	360	9	0	358	357	355	358	359	1	2	2	0.6
20-Jan	338	329	337	350	353	0	339	303	301	AF	187	149	160	172	173	212	182	196	185	184	185	182	179	186	188.2
21-Jan	191	188	180	176	176	197	205	211	197	199	199	229	208	204	213	218	244	253	251	240	253	249	268	282	218.8
22-Jan	281	234	207	220	216	247	259	283	298	291	298	272	294	293	267	261	230	261	293	305	11	5	32	42	285.1
23-Jan	41	61	45	30	15	6	14	346	0	18	17	25	102	234	171	190	165	161	186	173	181	200	202	268	78.3
24-Jan	343	99	205	AF	AF	AF	AF	AF	AF	AF	AF	14	MS	19	102	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
25-Jan	AF	AF	AF	AF	AF	170	193	193	211	227	253	216	162	211	300	325	342	62	69	57	82	257	197	236	206.9
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	225	168	156	93	10	AF	AF	AF	AF	AF	AF	AF	AF	--
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	12	13	5	8	13	7	6	2	--
28-Jan	6	353	354	350	348	350	360	340	4	355	3	75	144	151	120	76	32	63	79	87	80	84	85	84	28.2
29-Jan	349	307	313	355	132	186	177	169	170	180	178	197	190	146	68	15	13	40	5	8	2	9	1	3	21.6
30-Jan	17	16	16	28	30	21	16	16	22	10	21	19	21	26	46	37	31	15	12	8	348	310	338	254	18.3
31-Jan	255	260	224	241	200	208	193	198	199	182	186	174	177	177	184	189	184	187	205	197	199	196	198	202	191.9
	258.8	236.3	246.0	252.1	253.1	262.1	248.2	241.2	239.5	242.2	244.1	189.6	185.1	205.4	218.8	285.9	281.1	287.2	286.9	269.4	272.0	277.3	273.3	261.8	
	Diurnal Average																								

AF - Analyzer Failure MS - Missing

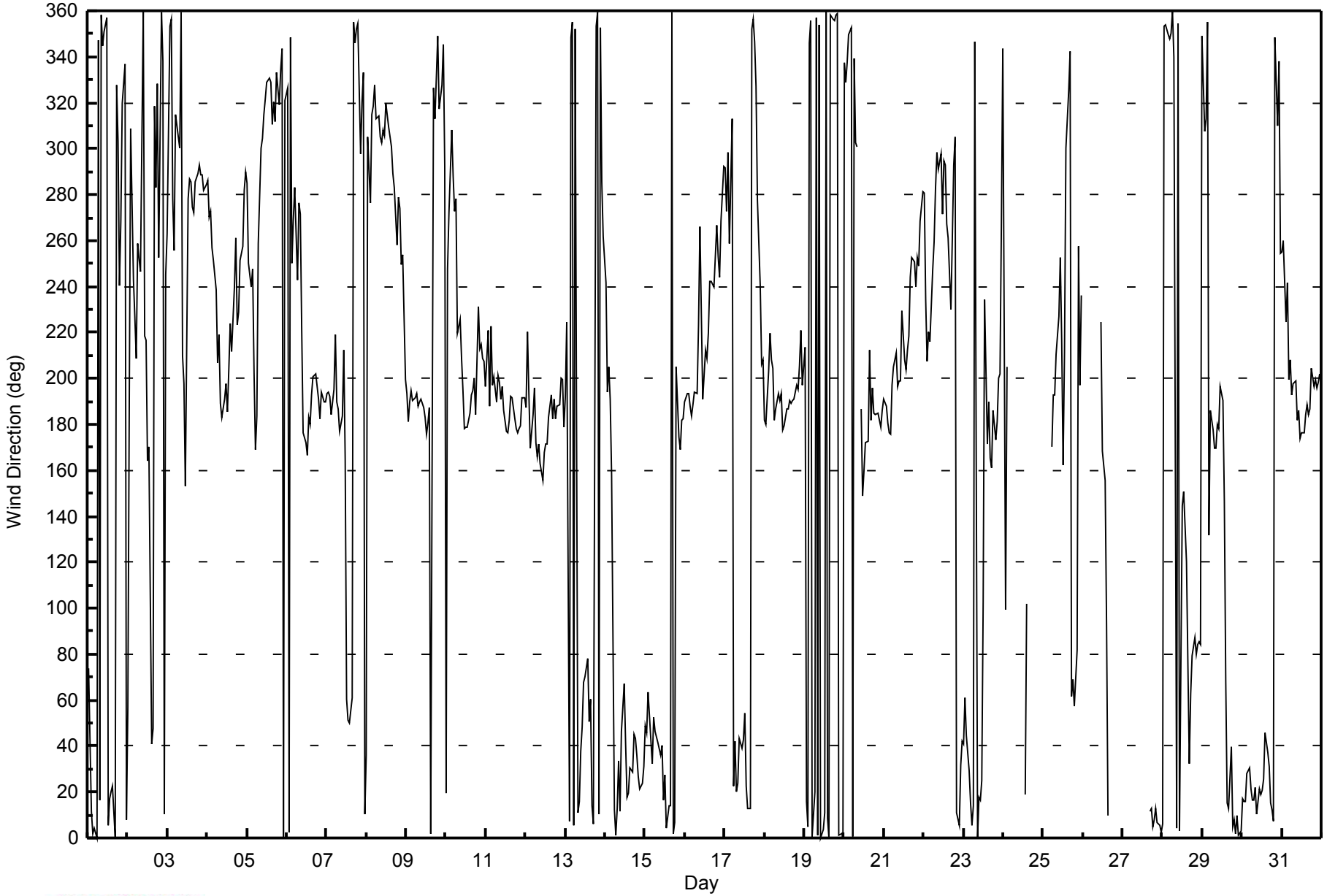
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - January 2015



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 99 deg on Jan 9 23:00

Minimum Value: 11 deg on Jan 18 17:00

Percentiles: P_1 = 12 P_{10} = 15 Q_1 = 20 Median = 29 Q_3 = 42 P_{90} = 54 P_{99} = 89

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	0
Percent Operational Time:	92.1

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-Jan	30	48	35	27	28	25	34	33	25	26	30	40	30	34	37	37	39	24	35	65	39	75	24	29	75
2-Jan	71	36	43	76	87	59	40	27	54	31	59	85	56	87	36	57	60	64	76	39	73	41	46	92	92
3-Jan	52	22	73	12	37	45	77	42	32	39	79	38	47	33	27	25	31	28	24	18	23	23	29	29	79
4-Jan	29	45	42	47	46	33	24	33	25	18	17	16	13	24	28	21	45	43	47	33	39	38	37	24	47
5-Jan	36	43	37	40	33	22	25	91	19	14	18	22	23	22	21	16	20	15	21	23	20	15	30	21	91
6-Jan	24	42	54	50	40	62	46	82	42	46	50	19	15	14	18	14	19	25	28	32	20	20	14	14	82
7-Jan	16	15	15	18	22	43	25	23	15	20	69	67	55	46	39	56	34	32	28	32	15	19	23	41	69
8-Jan	67	76	41	19	17	20	16	14	15	14	16	21	21	22	18	17	15	21	28	25	27	48	42	26	76
9-Jan	15	15	19	11	12	14	16	16	17	16	16	15	12	15	42	21	22	30	33	35	51	71	99	59	99
10-Jan	49	33	19	54	20	22	62	34	24	30	23	16	15	15	19	17	24	21	30	44	52	14	18	21	62
11-Jan	25	14	42	14	33	19	28	18	21	19	13	17	14	12	14	14	20	16	13	12	14	26	20	12	42
12-Jan	15	89	34	17	21	36	22	22	41	29	28	20	20	13	16	14	16	17	15	16	15	25	15	17	89
13-Jan	93	57	26	22	26	27	24	41	61	54	42	39	35	37	41	39	30	24	24	54	28	45	83	44	93
14-Jan	33	18	17	17	85	77	24	34	51	45	52	41	40	33	37	42	38	45	45	45	46	46	39	43	85
15-Jan	53	50	49	52	42	45	50	41	43	45	44	34	42	41	47	33	33	28	55	65	17	15	17	16	65
16-Jan	16	16	15	16	15	15	15	15	41	35	41	16	28	34	32	43	40	39	42	49	37	33	47	28	49
17-Jan	27	39	31	39	30	37	43	36	51	46	49	47	47	49	35	34	27	26	42	40	36	39	25	23	51
18-Jan	18	27	20	25	13	23	16	12	13	19	14	12	12	14	13	11	11	20	57	13	20	44	23	24	57
19-Jan	77	67	30	59	41	29	29	27	24	21	24	27	35	28	30	24	23	24	23	23	23	22	25	26	77
20-Jan	21	20	21	22	23	21	21	24	50	AF	41	11	11	16	13	66	21	15	16	15	14	16	18	18	66
21-Jan	17	15	15	18	16	21	14	15	13	14	21	28	27	18	21	20	36	38	42	47	50	46	50	41	50
22-Jan	48	44	22	30	35	42	47	45	30	32	30	44	26	25	41	44	35	44	25	27	31	30	44	39	48
23-Jan	43	46	38	35	37	29	40	37	40	50	40	56	75	49	19	40	18	19	33	26	30	37	93	82	93
24-Jan	72	70	29	AF	AF	AF	AF	AF	AF	AF	AF	24	MS	32	57	AF	AF	AF	AF	AF	AF	AF	AF	AF	72
25-Jan	AF	AF	AF	AF	AF	19	17	16	22	29	55	58	17	45	25	26	29	43	44	41	65	90	33	22	90
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	34	30	14	71	21	AF	AF	AF	AF	AF	AF	AF	AF	71
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	26	33	26	28	30	29	27	26	33
28-Jan	25	24	22	24	25	19	20	18	24	52	33	85	80	64	46	34	35	38	32	24	30	27	34	68	85
29-Jan	35	68	41	64	59	47	29	17	17	16	16	39	36	28	97	43	28	39	28	27	24	29	29	32	97
30-Jan	35	35	36	40	40	39	36	33	31	24	40	36	47	42	47	44	38	29	19	23	20	34	20	50	50
31-Jan	42	40	63	33	39	32	52	18	11	18	19	16	15	16	17	16	14	23	15	16	14	11	13	13	63
	93	89	73	76	87	77	77	91	61	54	79	85	80	87	97	66	60	64	76	65	73	90	99	92	
	Diurnal Maximum																								

AF - Analyzer Failure MS - Missing

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 2, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Other: Repair		
Start Time (MST)	13:14	End Time (MST)	15:50
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	1730512
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	May 29th 2014
Gas Cert Reference	LL107923		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403
DACS voltage range	0-5000 mv	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-689	-689
Analyzer Range (mv)	5000	5000	Lamp voltage	730	741
Calculated slope	0.993565	1.001082	Chamber temp.	42.0	43.0
Calculated intercept	1.122283	0.510899	Pressure (mmHg)	746.0	746.0
Analyzer Background	39.9	39.9	Flow (lpm)	0.500	0.500
Analyzer Coefficient	0.760	0.760	Intensity	359xx	356xx

Analyzer make	Thermo 43C	Analyzer serial #	509110888

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0.0	0.0	0.0	NA
as found span	5500	81.5	755.7	750.0	1.008
calibrator zero	5500	0.0	0.0	0.0	NA
high point	5500	81.5	755.7	755.2	1.001
second point	5500	45.7	423.8	421.2	1.006
third point	5500	22.8	211.4	211.0	1.002
as left zero	5500	0.0	0.0	0.0	NA
as left span	5500	81.5	755.7	760.4	0.994
				Average Correction Factor	1.003

Corrected As found	750.0	Previous response	759.5	% change	1.3%

Notes:

no adjustments required.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

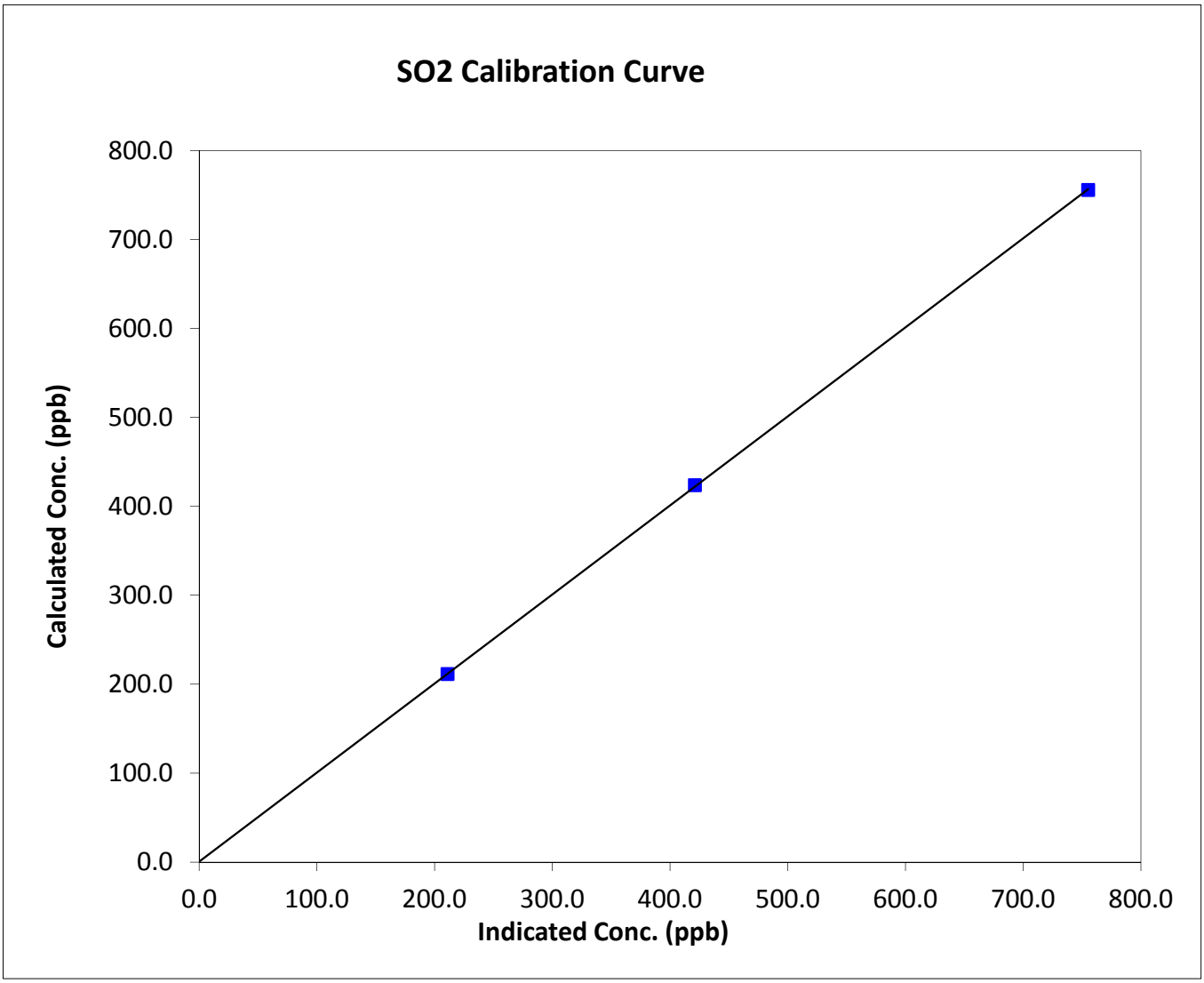
SO_2 Calibration Summary

Station Information

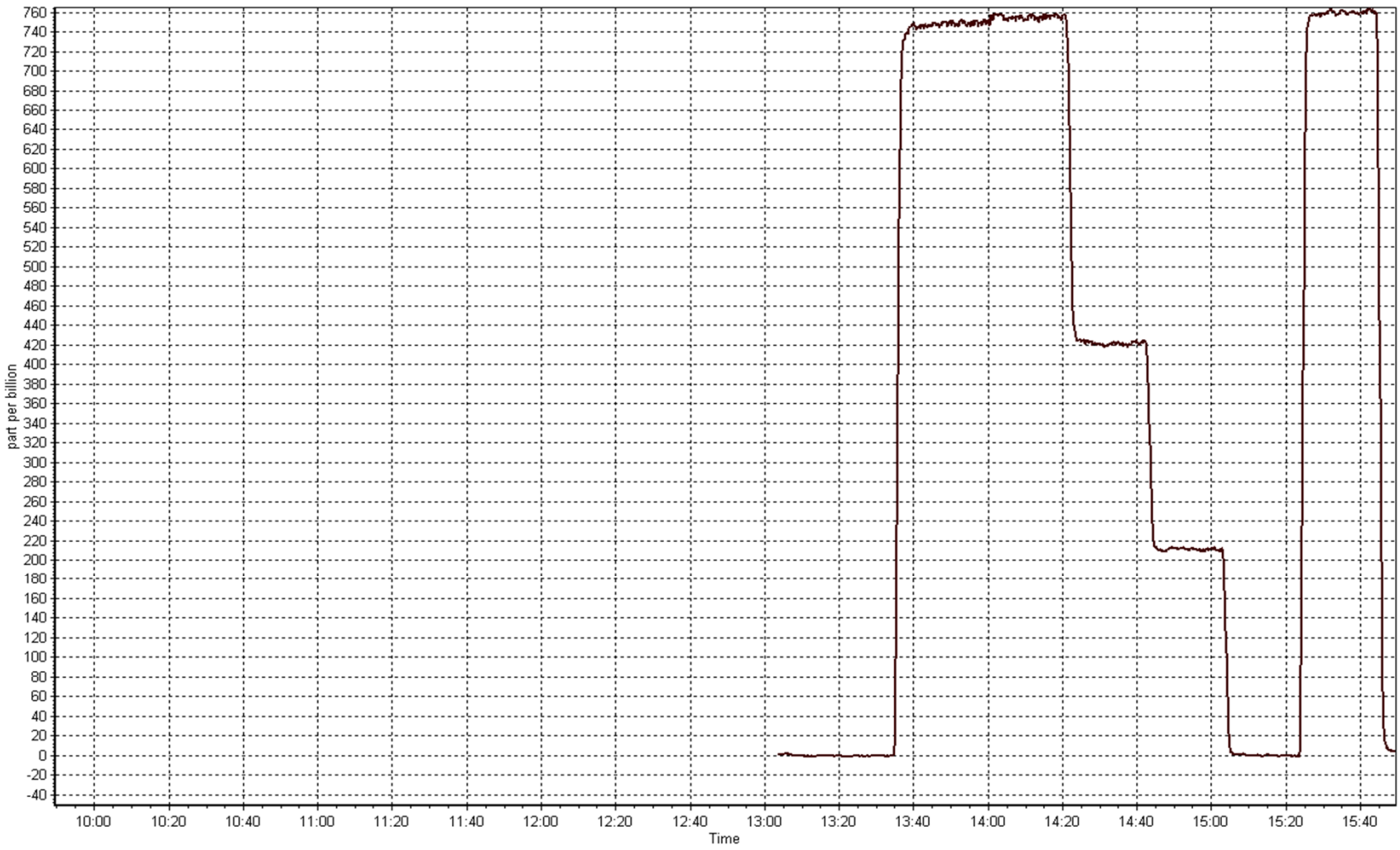
Calibration Date	January 7, 2015	Previous Calibration	December 2, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	13:14	End Time (MST)	15:50
Analyzer make	Thermo 43C	Analyzer serial #	509110888

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999989
755.7	755.2	1.0007		
423.8	421.2	1.0061	Slope	1.001082
211.4	211.0	1.0020		
			Intercept	0.510899



SO2 Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 3, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	14:05	End Time (MST)	16:45
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	1730512
Cal Gas Concentration	10.6 ppm H2S	Cal Gas Expiry Date	Dec 21 2012
Gas Cert Reference	LL27480	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403
DACS voltage range	5000	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-859	-859
Analyzer Range (input)	100	100	Lamp voltage	1148	1148
Calculated slope	1.004301	1.000977	Chamber temp.	45	45
Calculated intercept	0.050672	0.082284	Pressure	693.0	693.0
Analyzer Background	1.59	1.59	Flow	0.432	0.432
Analyzer Coefficient	0.976	0.976	Intensity	80	80
			Converter temp.	800	800

Analyzer make/model	Thermo 43i-TLE	Analyzer serial #	1218153461
Converter make/model	CDN-101	Converter serial #	305

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6500	0.0	0.00	-0.04	NA
as found span	6500	46.0	75.0	74.9	1.001
SO2 scrubber check	5500	22.8	211.4	0.52	NA
calibrator zero	6500	0.0	0.00	-0.04	NA
high point	6500	46.0	75.0	74.9	1.001
second point	6500	24.6	40.1	39.9	1.005
third point	6500	12.3	20.1	20.0	1.005
as left zero	6500	0.0	0.0	0.09	NA
as left span	6500	46.0	75.0	74.8	1.002
				Average Correction Factor	1.004

Corrected As found	75.0	Previous response	74.6	% change	-0.4%

Notes:

no adjustments necessary. No issues detected.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

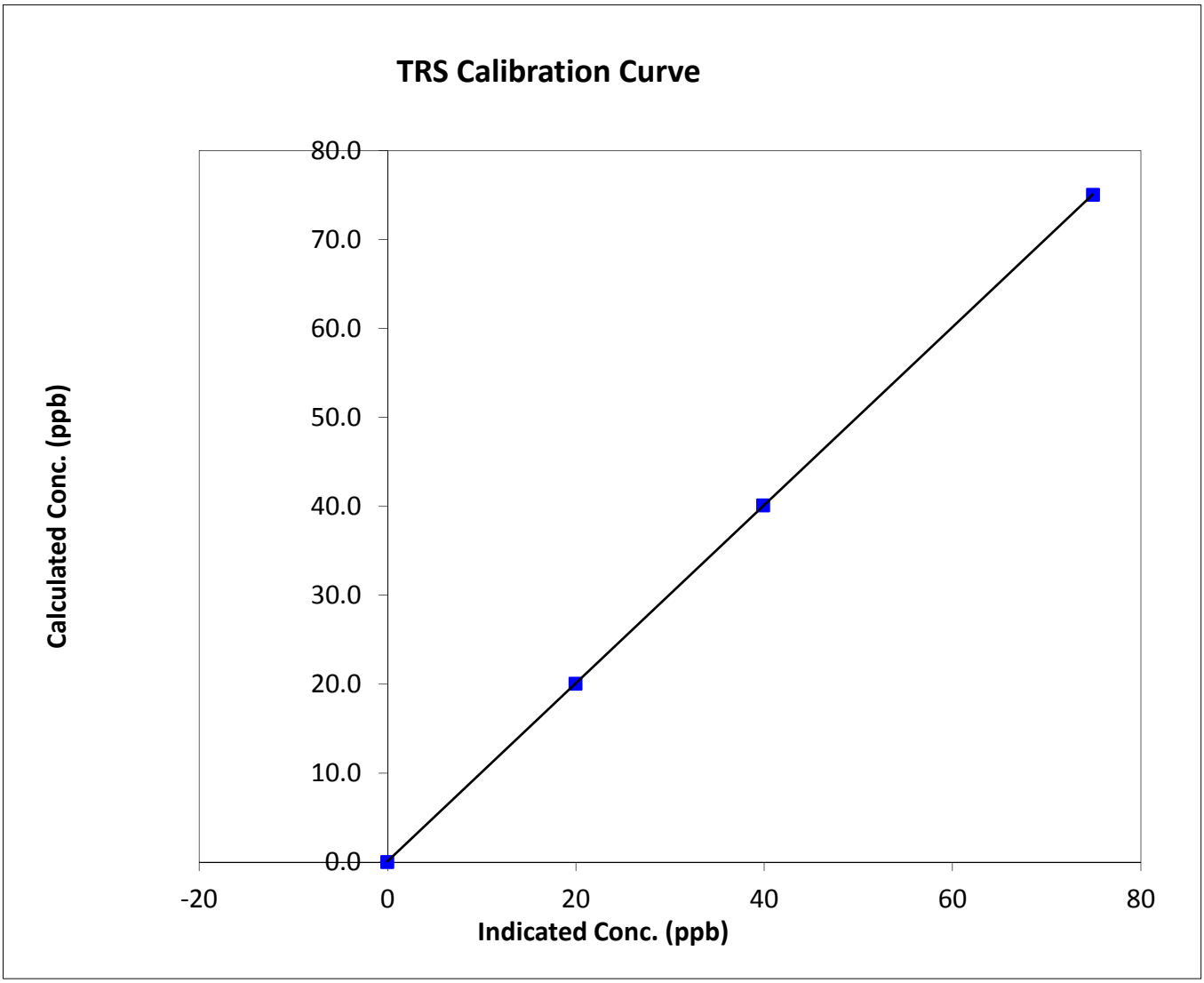
TRS Calibration Summary

Station Information

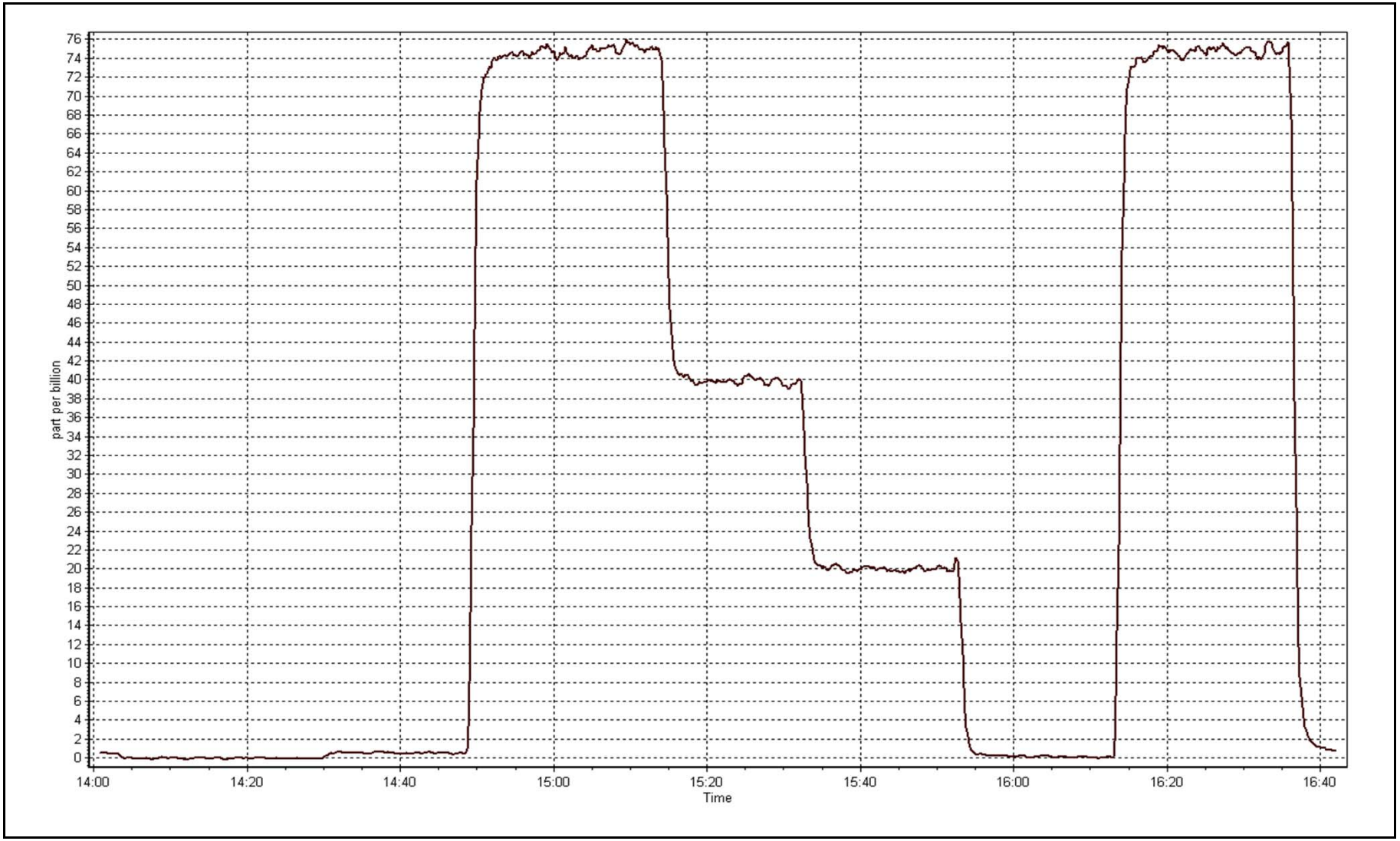
Calibration Date	January 8, 2015	Previous Calibration	December 3, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	14:05	End Time (MST)	16:45
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1218153461

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999996
75.0	74.9	1.0014		
40.1	39.9	1.0054	Slope	1.000977
20.1	20.0	1.0049		
			Intercept	0.082284



TRS Calibration Plot Date: January 8, 2015



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January-07-15	Prev Calibration	December-03-14
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	13:14	End Time (MST)	15:47
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	1730512
Gas Cert Reference	LL107923	Cal Gas Expiry Date	May 29th 2014
CH4 Cal Gas Conc.	510.0 ppm	CH4 Equiv Conc.	1076.5 ppm
C3H8 Cal Gas Conc.	206.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	35.0	35.0
THC Range (input)	50	50	Flame Temp	401.0	401.0
NMHC Range (ppm)	50	50	Carrier Pressure	40.0	40.0
NMHC Range (input)	50	50	Fuel Pressure	42.0	42.0
THC Calc slope	0.997553	1.001827	Air Pressure	32.0	32.0
THC Calc intercept	0.022721	0.021426	Det Temp	175.0	175.0
NMHC Calc slope	1.000572	1.003334	Filter Temp	175.0	175.0
NMHC Calc intercept	0.005297	-0.002846	Column Temp	74.0	74.0

Analyzer make	Thermo 55i	Analyzer serial #	1331259520

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0.0	0.00	0.00	N/A
as found span	5500	81.5	15.95	16.07	0.993
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	15.95	15.92	1.002
second point	5500	45.7	8.94	8.88	1.007
third point	5500	22.8	4.46	4.42	1.010
as left zero	5500	0.0	0.00	15.94	N/A
as left span	5500	81.5	15.95		
				Average Correction Factor	1.006

Corrected As found	16.07	Previous response	15.97	% change	-0.6%

Notes:

span adjusted slightly.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0	0.00	0.00	N/A
as found span	5500	81.5	8.39	8.39	1.001
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	8.39	8.37	1.003
second point	5500	45.7	4.71	4.69	1.004
third point	5500	22.8	2.35	2.35	0.999
calibrator zero					
as left zero	5500	0.0	0.00	8.38	N/A
as left span	5500	81.5	8.39		
				Average Correction Factor	1.002

Corrected As found	8.39	Previous response	8.38	% change	-0.1%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0	0.00	0.00	N/A
as found span	5500	81.5	7.56	7.68	0.984
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	7.56	7.55	1.001
second point	5500	45.7	4.24	4.19	1.011
third point	5500	22.8	2.11	2.07	1.021
calibrator zero					
as left zero	5500	0.0	0.00	7.56	N/A
as left span	5500	81.5	7.56		
				Average Correction Factor	

Corrected As found	7.68	Previous response	7.58	% change	-1.3%

Wood Buffalo Environmental Association

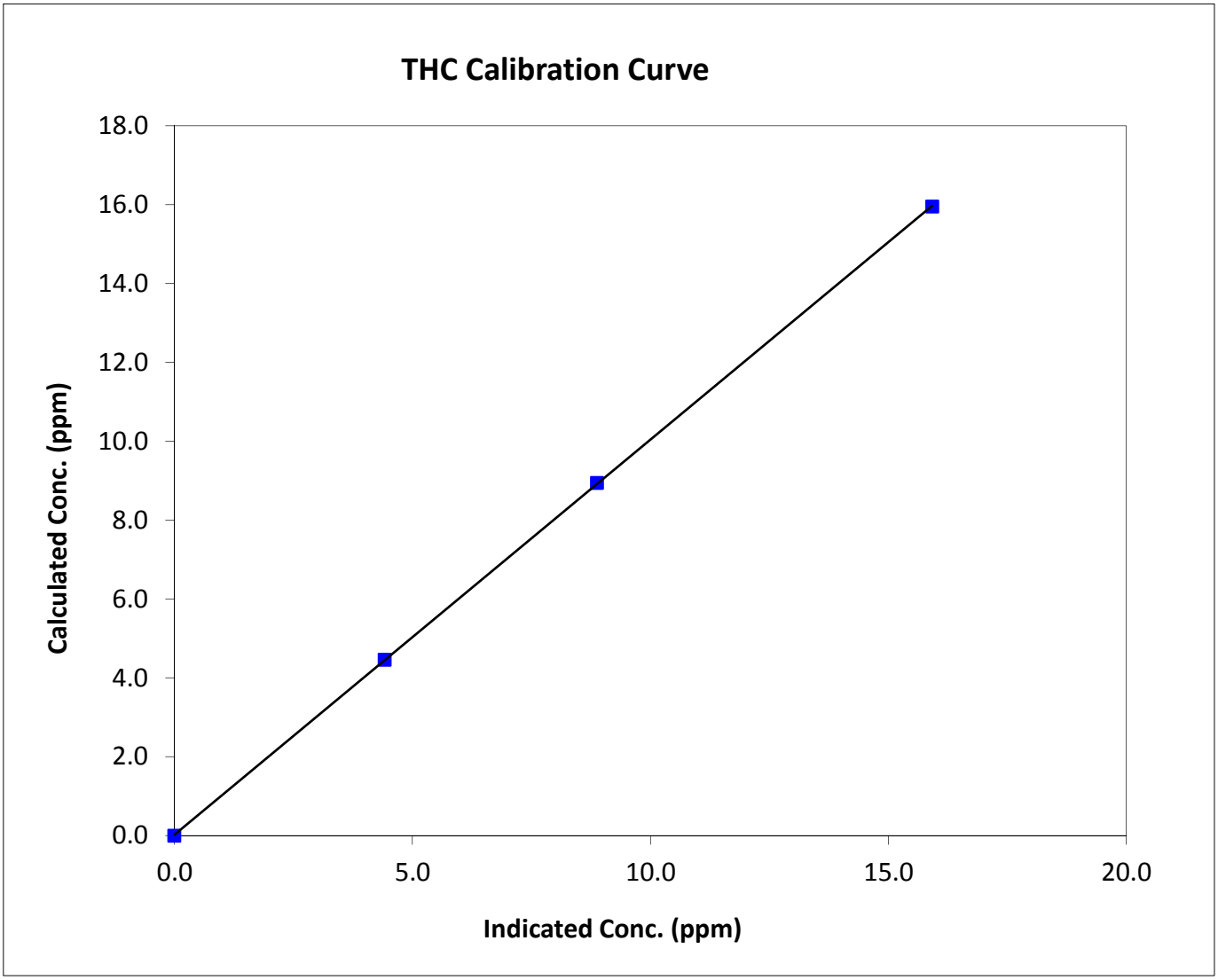
THC Calibration Summary

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 3, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	13:14	End Time (MST)	15:47
Analyzer make	Thermo 55i	Analyzer serial #	1331259520

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999988
15.95	15.92	1.0020		
8.94	8.88	1.0073	Slope	1.001827
4.46	4.42	1.0096		
			Intercept	0.021426



Wood Buffalo Environmental Association

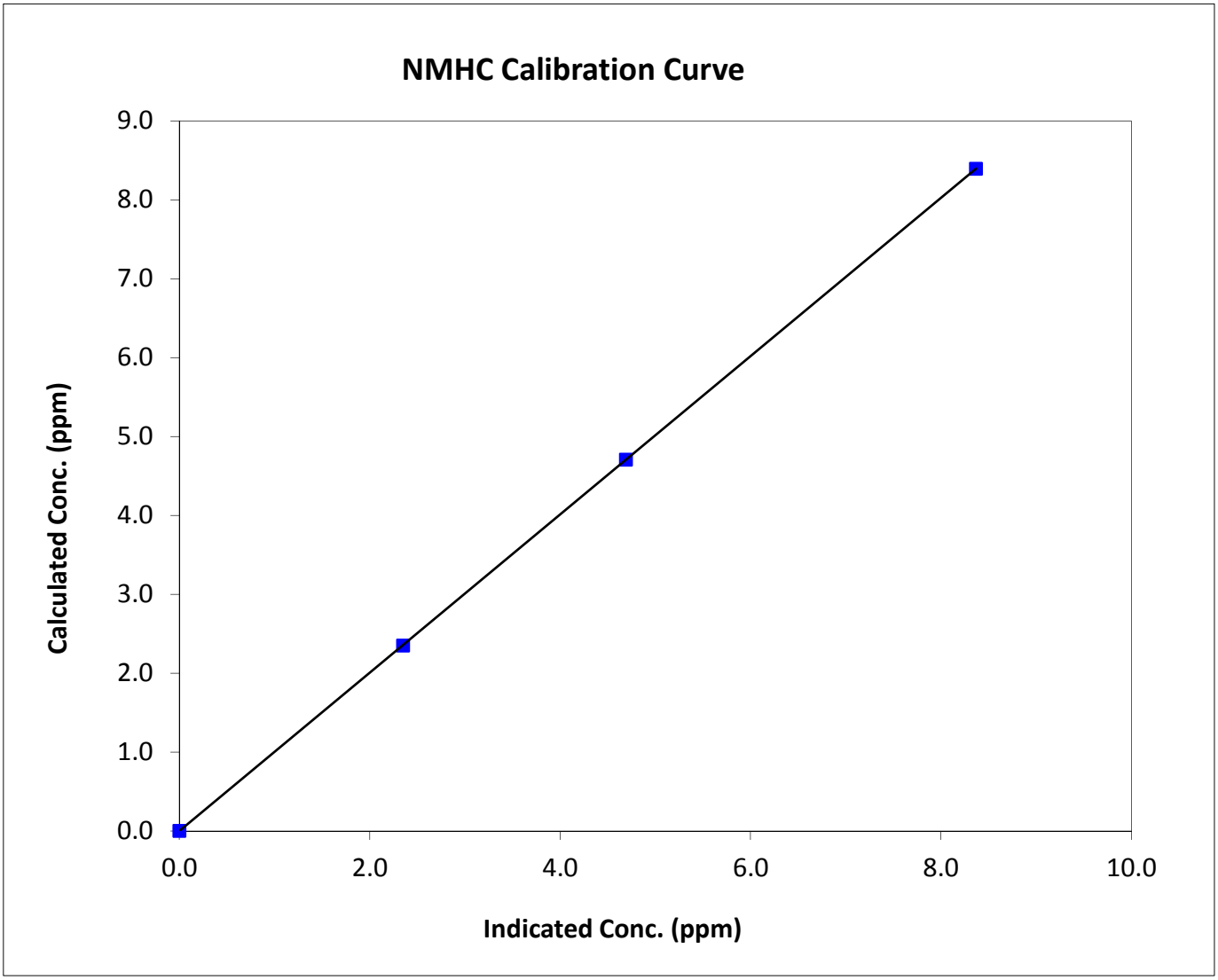
NMHC Calibration Summary

Station Information

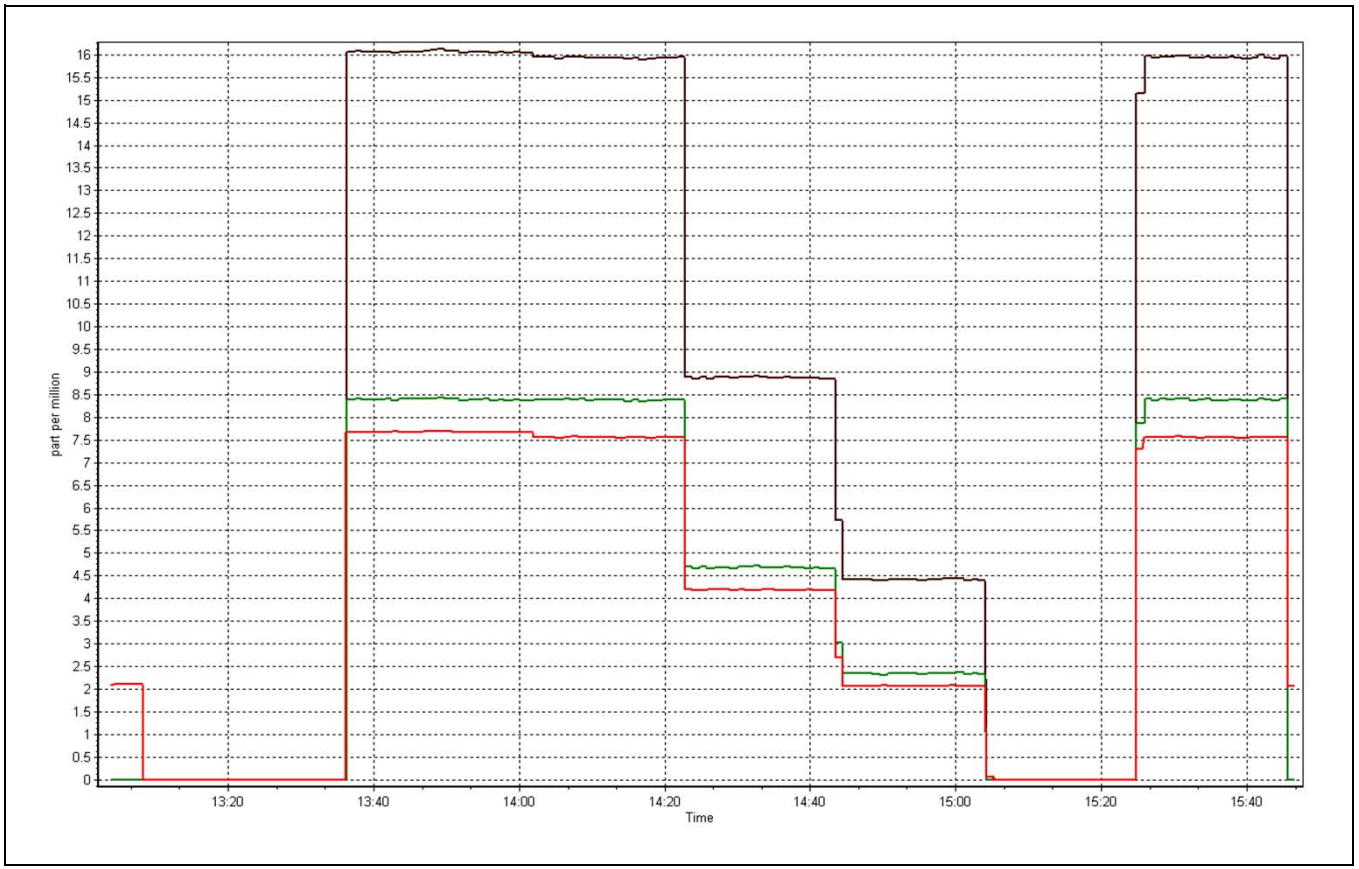
Calibration Date	January 7, 2015	Previous Calibration	December 3, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	13:14	End Time (MST)	15:47
Analyzer make	Thermo 55i	Analyzer serial #	1331259520

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999998
8.39	8.37	1.0029		
4.71	4.69	1.0036	Slope	1.003334
2.35	2.35	0.9993		
			Intercept	-0.002846



THC/NMHC Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	December 6, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	14:00	End Time (MST)	17:00
Barometric Pressure	N/A mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	1730512
NO2 calibration used	January-09-15	Transfer Standard	na
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	5000	DACS channel #	Digital

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	24.0	24.0
Analyzer Range (input)	500	500	Lamp temp.	53.0	53.0
Calculated slope	0.999147	0.994676	Pressure	684.0	684.0
Calculated intercept	0.371857	-0.018150	Flow cell A	0.734	0.734
Analyzer Background	-0.3	-0.3	Flow cell B	0.737	0.737
Analyzer Coefficient	1.036	1.010	Cell A Intensity	84xxx	84xxx
			Cell B Intensity	79xxx	79xxx

Analyzer make	Thermo 49i	Analyzer serial #	1300156233

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0.00	0.0	-0.7	N/A
as found span	5000	1.10	401.0	411.0	0.976
calibrator zero	5500	0.00	0.0	-0.7	N/A
high point	5000	1.10	401.0	402.6	0.996
second point	5000	0.60	207.0	209.0	0.990
third point	5000	0.35	107.0	108.0	0.991
calibrator zero					
as left zero	N/A	0.00	0.0	-0.1	NA
as left span	N/A	1.10	401.0	404.0	0.993
				Average Correction Factor	0.992

Corrected As found	411.7	Previous response	401.0	% change	-2.6%
				Average Correction	

Notes:

Span adjusted slightly.

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

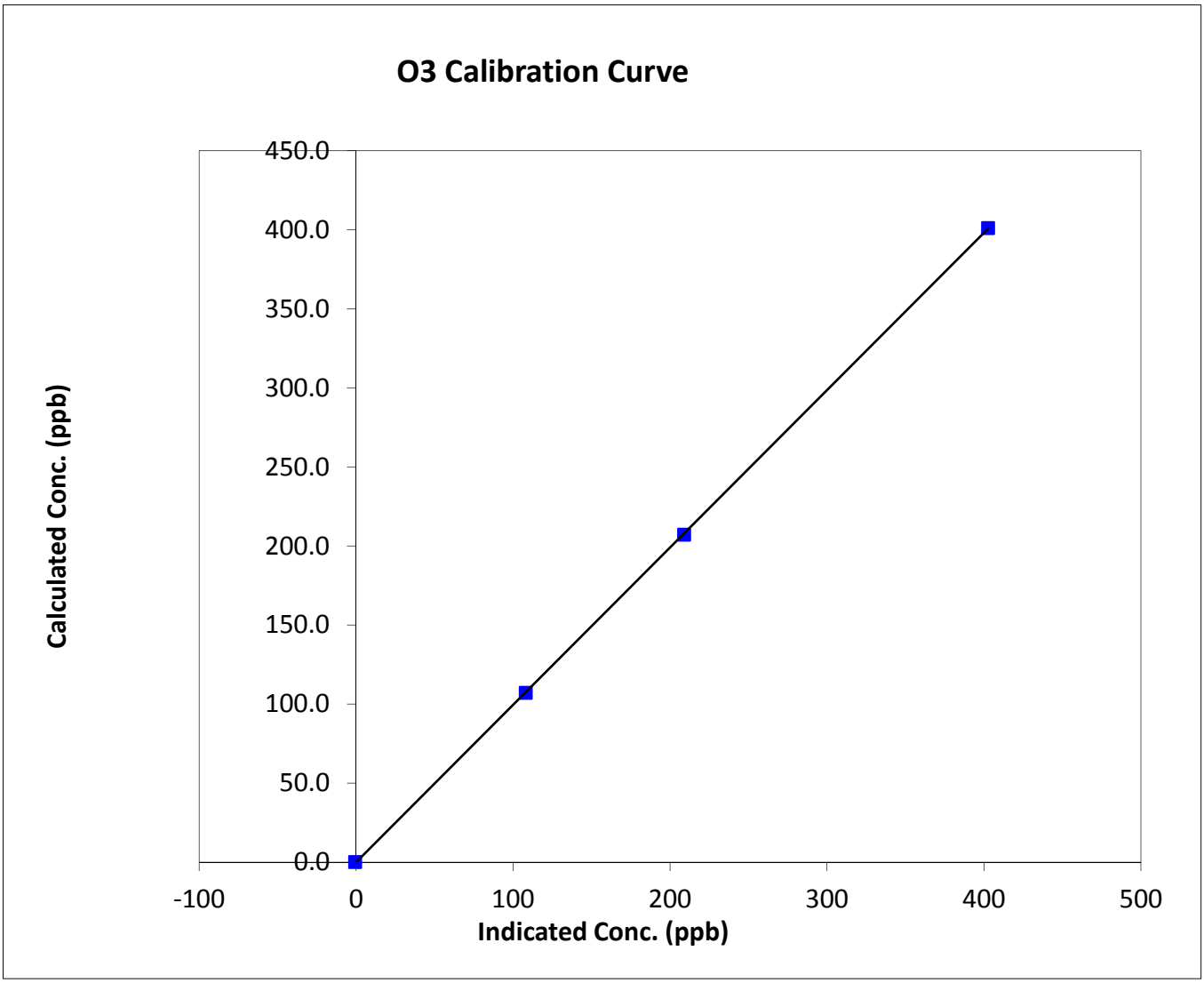
O_3 Calibration Summary

Station Information

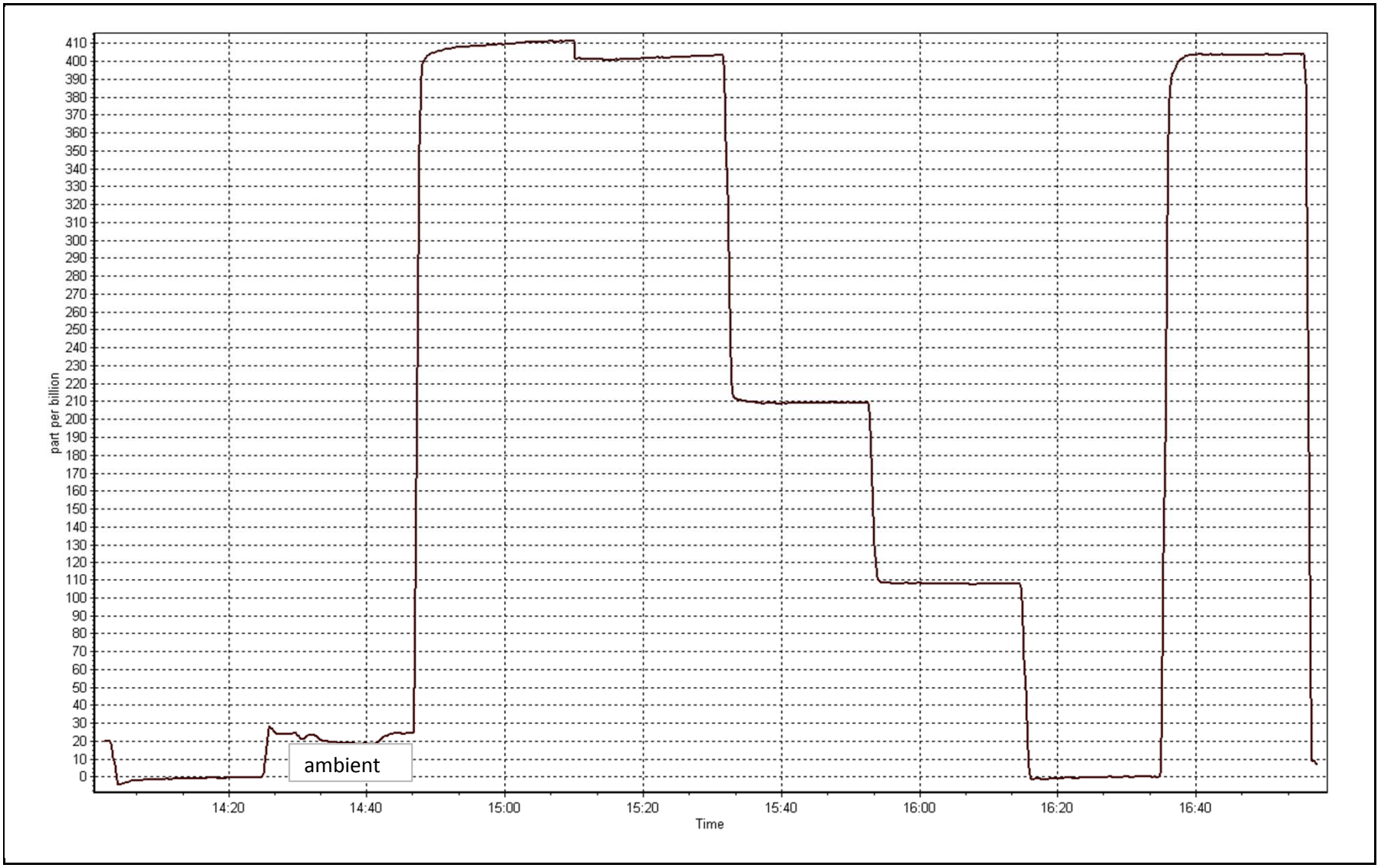
Calibration Date	January-09-15	Previous Calibration	December 6, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	14:00	End Time (MST)	17:00
Analyzer make	Thermo 49i	Analyzer serial #	1300156233

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.7	N/A	Correlation Coefficient	0.999980
401.0	402.6	0.9960		
207.0	209.0	0.9904	Slope	0.994676
107.0	108.0	0.9907		
			Intercept	-0.018150



O3 Calibration Plot Date: January 9, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	December 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	11:05	End Time (MST)	14:50
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	SABIO 4010	Serial Number	1730512
NO Cal Gas Conc	50.6 ppm	Cal Gas Expiry Date	May 29th 2014
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	LL107923

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.: 2582

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	5000	5000	5000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	1.000166	0.998217	1.002556
	Data Offset	0.355253	0.487704	0.666067
After	Data Slope	1.007002	1.004408	1.011969
	Data Offset	0.768919	1.090710	0.124862
Channel #		digital	digital	digital
Voltage Range		0-5000mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model: Thermo 42i NO/NO2/NOx Analyzer — Analyzer serial #: 1218153357

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	0.885	ppb	0.885	ppb
NOX coefficient	0.997	ppb	0.997	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	6.3		6.3	
NOX bkgrnd	6.4		6.4	
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	326.0	Deg C	326.0	Deg C
PMT Temp	-2.7	Deg C	-2.7	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	206.0	mmHg	206.0	mmHg
Sample Flow	503.0	ccm	503.0	ccm

Notes:

no adjustments required.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 9, 2015 Station Number: AMS 1

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5500	0.0	0.0	0.0	0.0	-0.05	-0.10	0.05	N/A	N/A
as found span	5500	81.5	749.8	749.8	0.0	744.0	746.0	-2.0	1.008	1.005
calibrator zero	5500	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
high point	5500	81.5	749.8	749.8	0.0	744.0	746.0	-2.0	1.008	1.005
second point	5500	45.7	420.4	420.4	0.0	417.0	417.0	-0.7	1.008	1.008
third point	5500	22.8	209.8	209.8	0.0	206.4	206.7	-0.3	1.016	1.015
as left zero	5500	0.0	0.0	0.0	0.0	0.2	0.0	0.2	N/A	N/A
as left span	5500	81.5	749.8	344.0	405.8	746.0	348.0	397.0	1.005	0.989
								Average Correction Factor	1.011	1.009

Corrcted As found NO_X= 744.1 NO= 746.1 Percent Change NO_X= 0.7% NO= 0.6%

Previous Response NO_X= 749.3 NO= 750.7

GPT Calibration Data

Dilution Flow 5500 ccm Source Gas Flow 81.50 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.1			N/A	
1st NO2 (300)	N/A	344.0	401.0	743.0	344.0	396.0	0.994	1.000	1.013	98.8%
2nd NO2 (200)	N/A	538.0	207.0	743.5	538.0	205.0	0.994	1.000	1.010	99.0%
3rd NO2 (100)	N/A	638.0	107.0	743.0	638.0	105.0	0.994	1.000	1.019	98.1%
4th NO2 (0)	745.0	N/A	-1.0	744.0	745.0	-1.0	0.993	1.000	N/A	N/A
					Average Correction Factor		0.994	1.000	1.014	98.6%

Calibration Performed By: Zack Eastman

Wood Buffalo Environmental Association

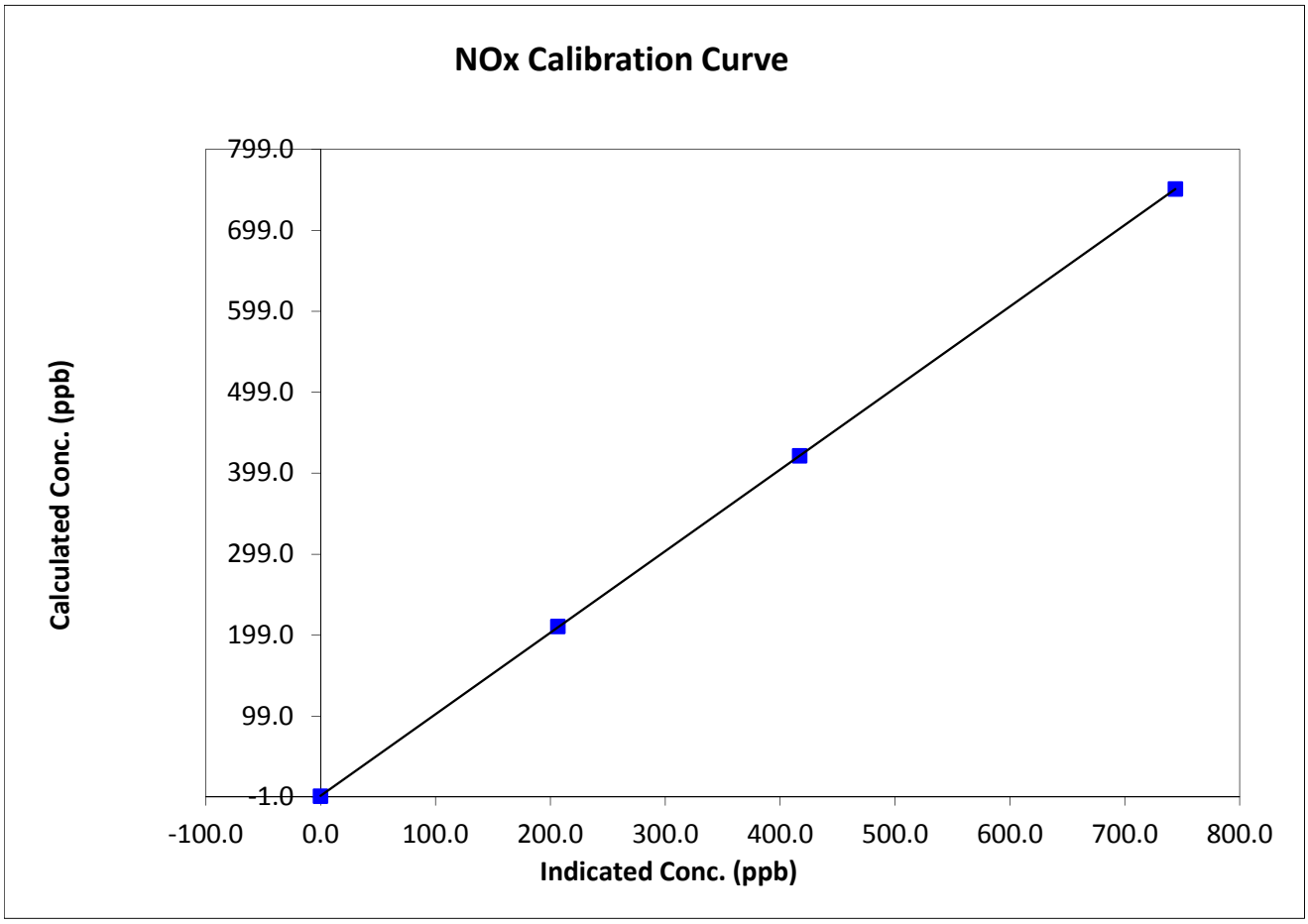
NO_X Calibration Summary

Station Information

Calibration Date	January 9, 2015	Previous Calibration	December 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:05	End Time (MST)	14:50
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999994
749.8	744.0	1.0078		
420.4	417.0	1.0082	Slope	1.007002
209.8	206.4	1.0163		
			Intercept	0.768919



Wood Buffalo Environmental Association

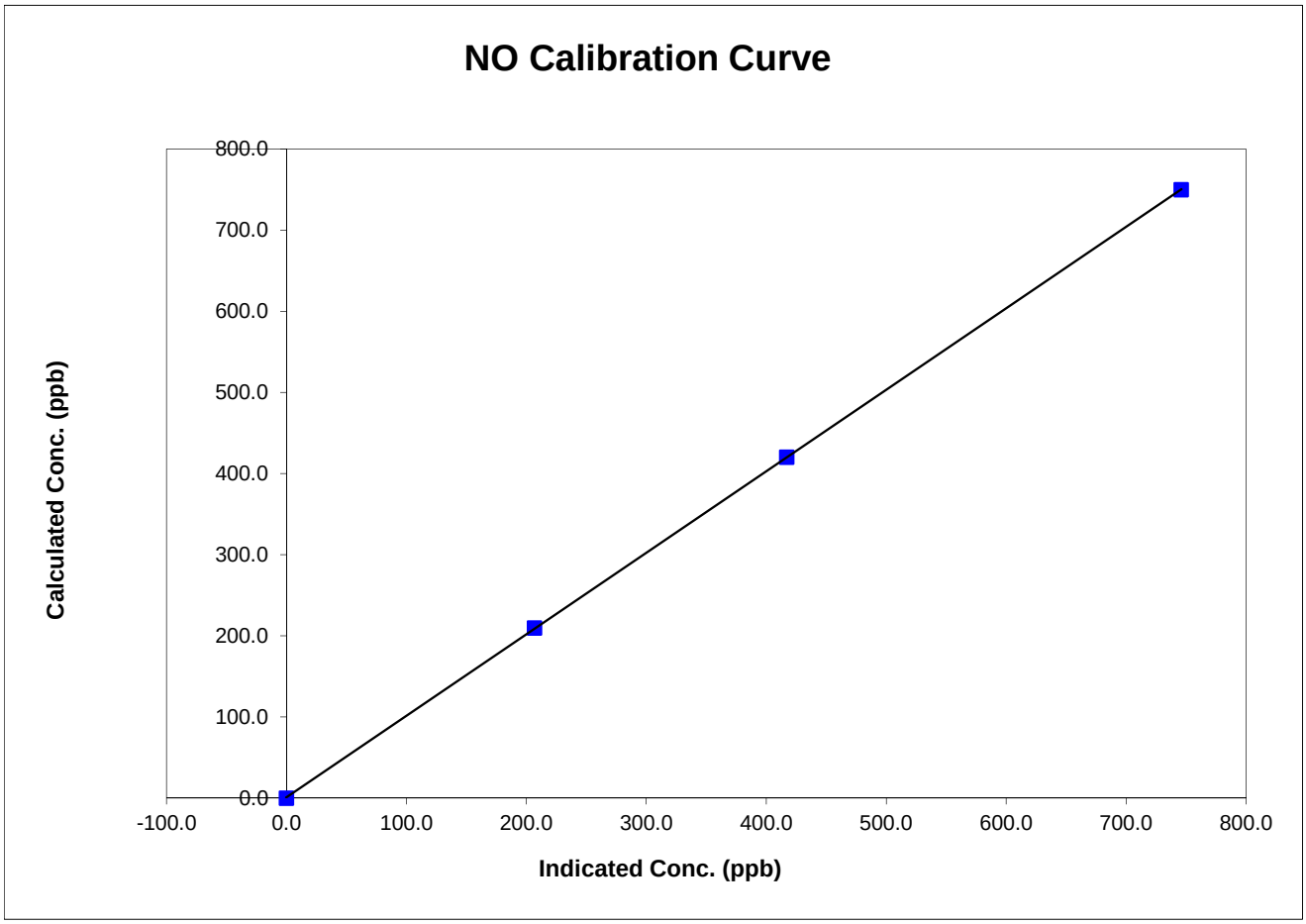
NO Calibration Summary

Station Information

Calibration Date	January 9, 2015	Previous Calibration	December 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:05	End Time (MST)	14:50
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999991
749.8	746.0	1.0051		
420.4	417.0	1.0082	Slope	1.004408
209.8	206.7	1.0148		
			Intercept	1.090710



Wood Buffalo Environmental Association

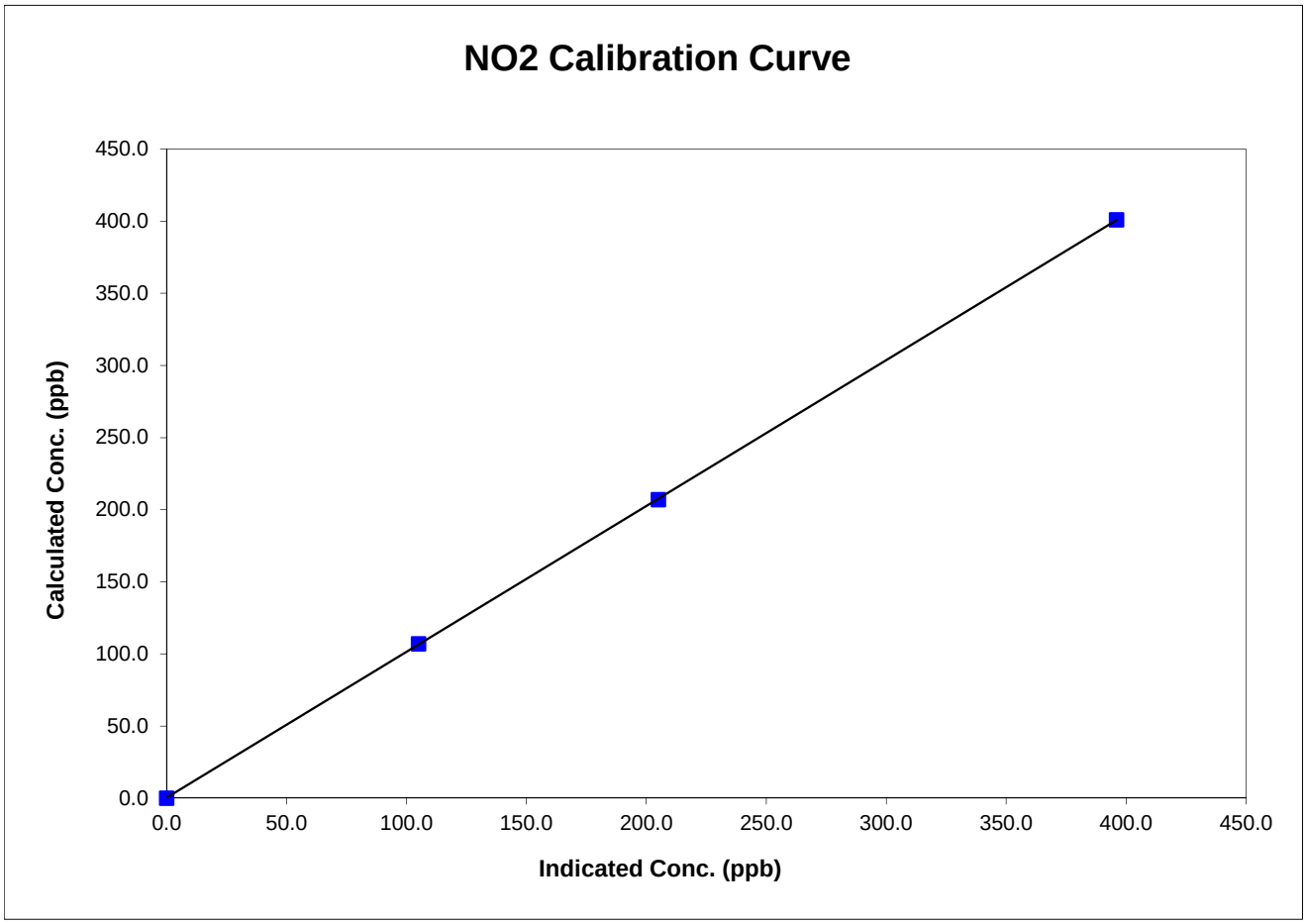
NO_2 Calibration Summary

Station Information

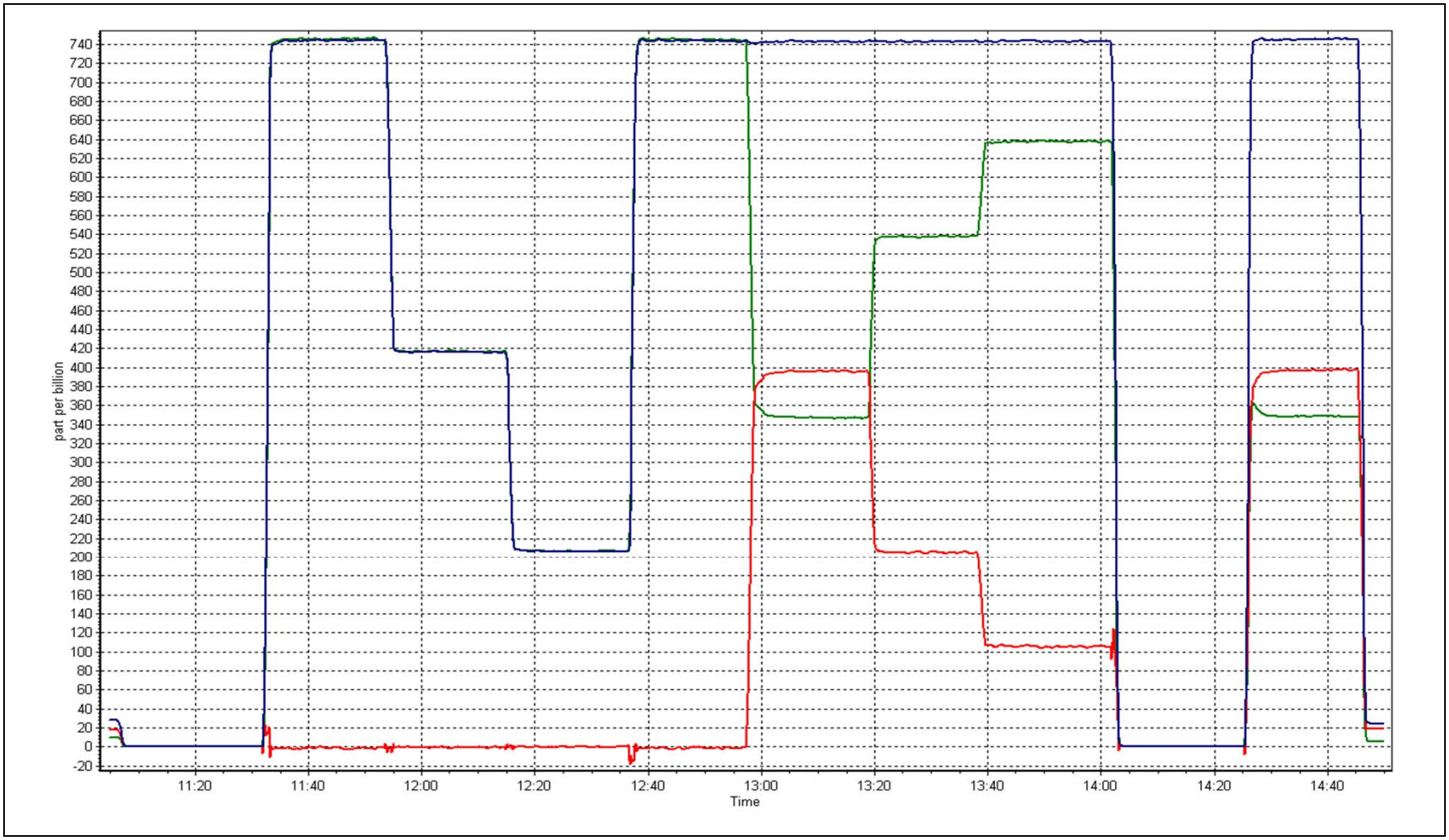
Calibration Date	January 9, 2015	Previous Calibration	December 9, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	11:05	End Time (MST)	14:50
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999991
401.0	396.0	1.0126		
207.0	205.0	1.0098	Slope	1.011969
107.0	105.0	1.0190		
			Intercept	0.124862



NOx, NO & NO_2 Calibration Plot Date: January 9, 2015



Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 9, 2014
Station Name	Bertha Ganter - Fort McKay	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	9:55	End Time (MST)	14:30
Barometric Pressure	N/A mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	1730512
NH3 Cal Gas Conc	192 ppm	Cal Gas Expiry Date	March 3rd 2012
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	LL156612

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2582

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	2500	1000	2500
Before	Data Slope	0.979625	1.000250	0.995962
	Data Offset	-5.860834	0.808846	-5.564780
After	Data Slope	0.990133	1.001801	0.997324
	Data Offset	-5.509857	0.001131	-4.994425
Channel #		Digital	Digital	Digital
Voltage Range		NA	NA	NA

Analyzer Information

Analyzer make/model	API T201	Analyzer serial #	152
		Converter serial #	147

Test Point	before		after	
Concentration range	0-2500	ppb	0-2500	ppb
Nt Slope	1.141		1.111	
NOX Slope			1.107	
NH3 Conv coeff	0.955		0.945	
NO slope	1.072		1.043	
No bkgrnd	0.1	mV	0.1	mV
Nt bkgrnd	0.1	mV	0.1	mV
NOX bkgrnd	0.0	mV	0.0	
NhH3 conv temp	825	DegC	825	Deg C
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	314.0	Deg C	314.0	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	85.0	ccm	85.0	ccm
R Cell Press	5.6	mmHg	5.6	mmHg
PMT Voltage	614.0	v	614.0	v
Sample Flow 1 NO	513.0	ccm	513.0	ccm
Sample Flow 2 Nox	514.0	ccm	514.0	ccm

Notes:

NO adjusted after as found, response stable. NH3 converter adjusted for span adjustment after as found.

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: January 13, 2015 Station Number: AMS 1

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero	5500	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	NA	NA
as found NO	5500	81.5	749.8	749.8	NA	771.6	771.2	0.4	0.972	NA
calibrator zero	5500	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	NA	NA
high NO point	5500	81.5	749.8	749.8	NA	751.3	749.1	2.2	0.998	NA
NO/O3 point	5500	81.5	749.8	749.8	NA	748.9	747.8	1.1	1.001	NA
as found NH3	6500	67.7	1999.8	NA	1999.8	1973.2	14.2	1959.0	1.013	1.021
first NH3	6500	67.7	1999.8	NA	1999.8	2021.7	14.7	2007.0	0.989	0.996
second NH3	6500	33.9	1001.4	NA	1001.4	1021.5	8.5	1013.0	0.980	0.989
third NH3	6500	16.9	499.2	NA	499.2	514.5	4.5	510.0	0.970	0.979
						0.0				
						0.0				
								Average Correction Factor	0.9996	0.9879

Corrected As found Nt = 771.9 ppb
NH3 = 1959.3 ppb

Previous response Nt = 771.3 ppb
NH3 = 2013.4 ppb

Nt percent change -0.1%
NH3 percent change 2.8%

Converter efficiency 94.5%

Calibration Performed By: Zach Eastman

Wood Buffalo Environmental Association

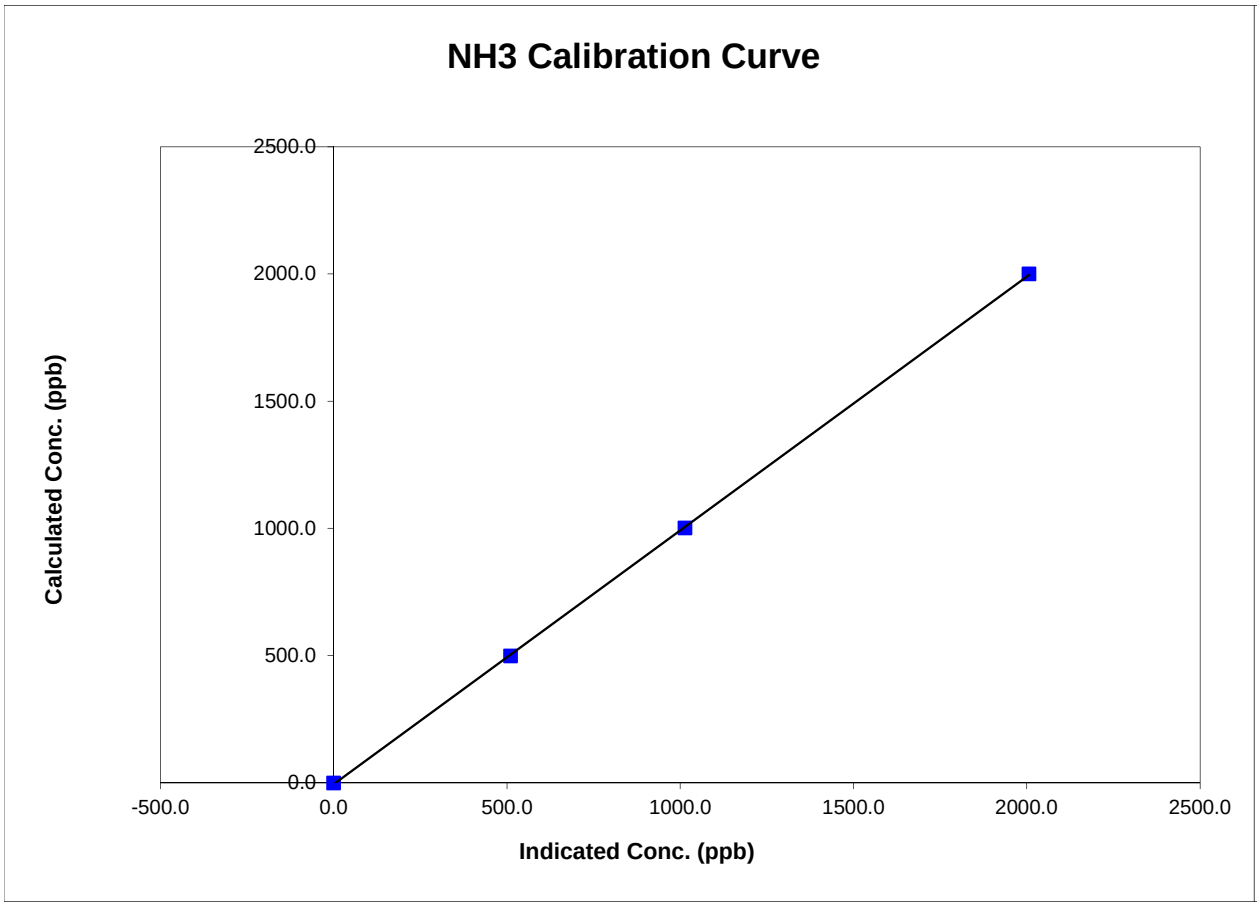
NH3 Calibration Summary

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 9, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	9:55	End Time (MST)	14:30
Analyzer make	API T201	Analyzer serial #	152

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999967
1999.8	2007.0	0.9964		
1001.4	1013.0	0.9885	Slope	0.997324
499.2	510.0	0.9788		
			Intercept	-4.994425



Wood Buffalo Environmental Association

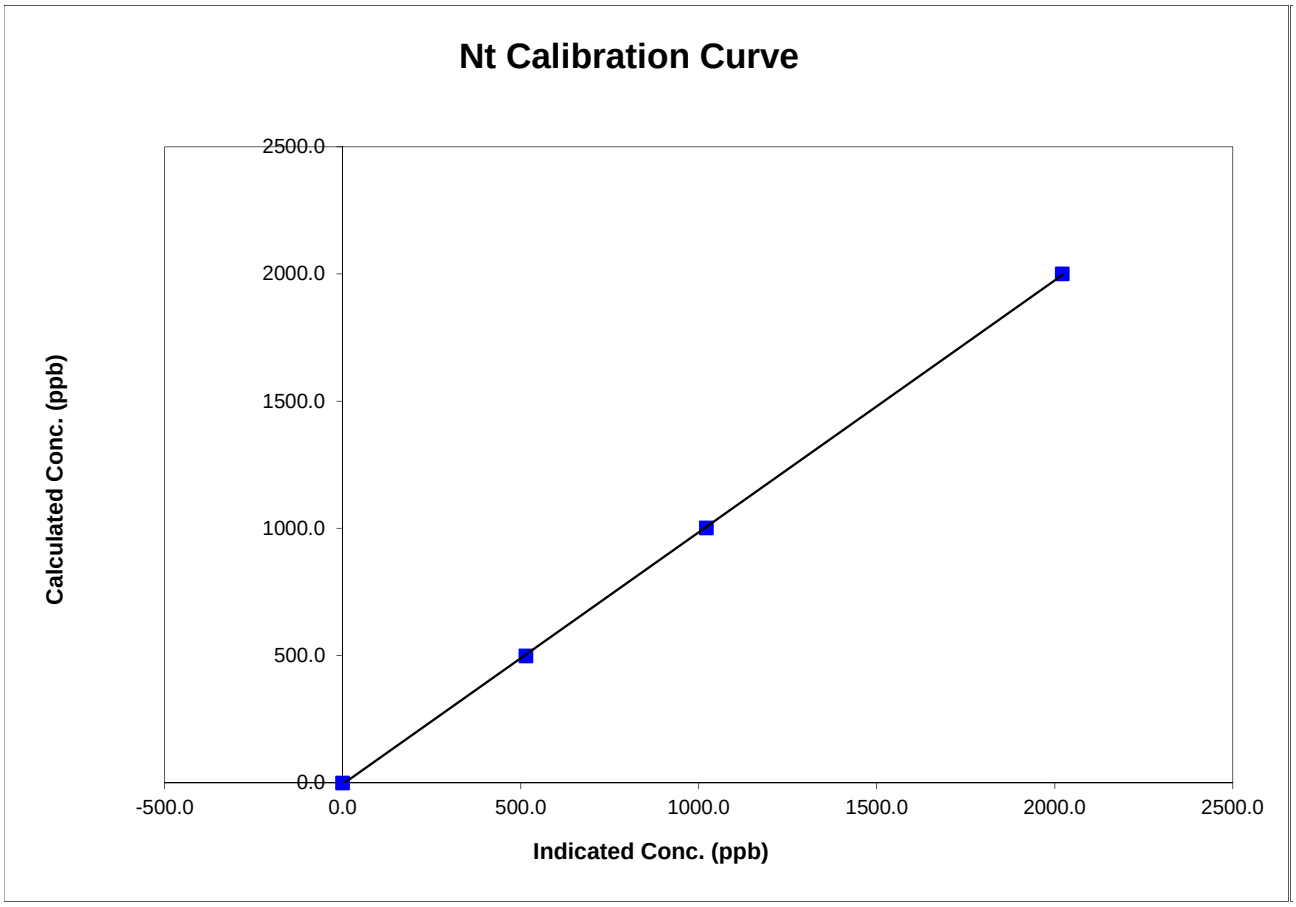
Nt Calibration Summary

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 9, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	9:55	End Time (MST)	14:30
Analyzer make	API T201	Analyzer serial #	152

Nt (NH_3) Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999959
1999.8	2021.7	0.9891		
1001.4	1021.5	0.9803	Slope	0.990133
499.2	514.5	0.9703		
	0.0		Intercept	-5.509857



Wood Buffalo Environmental Association

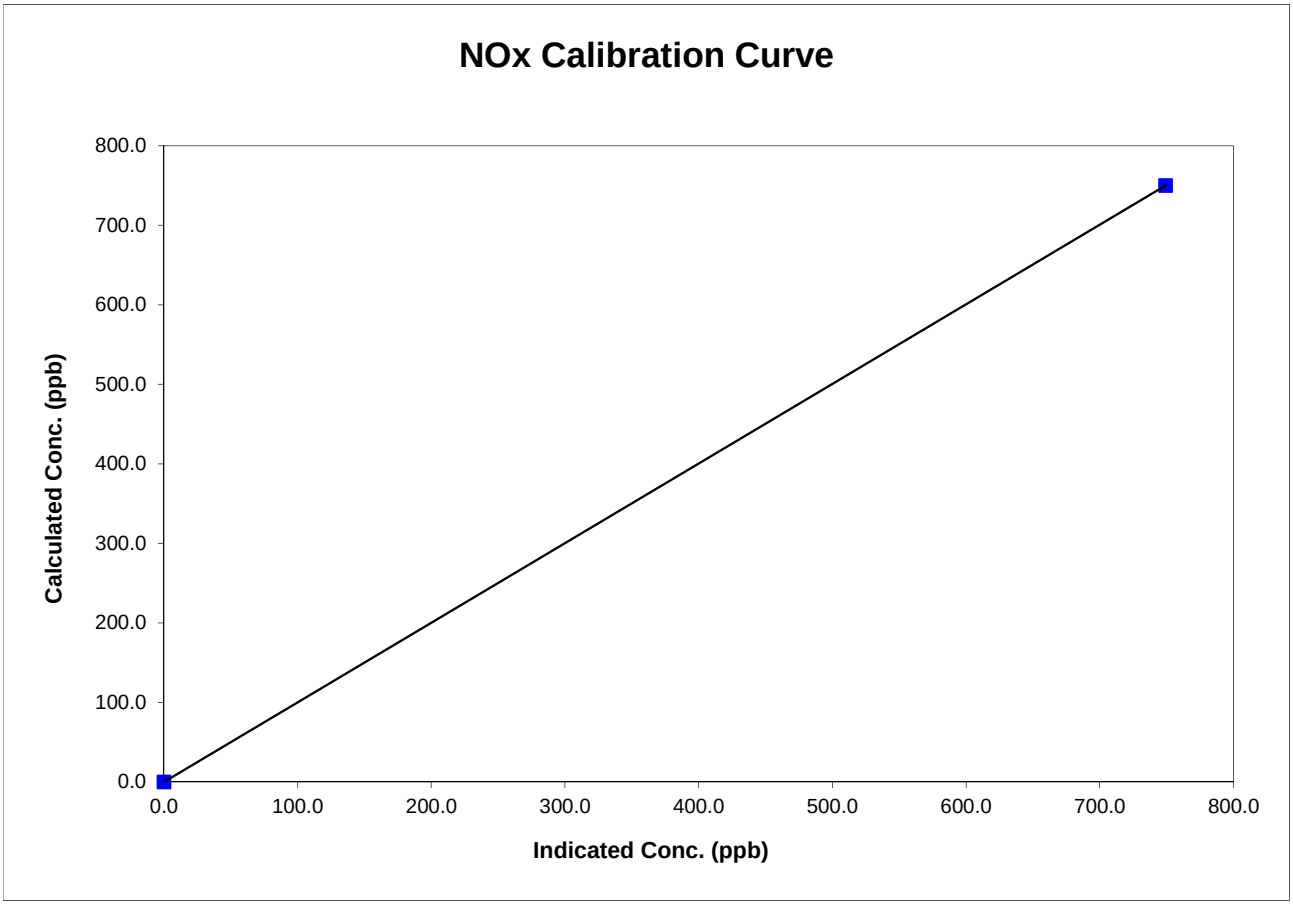
NOx Calibration Summary

Station Information

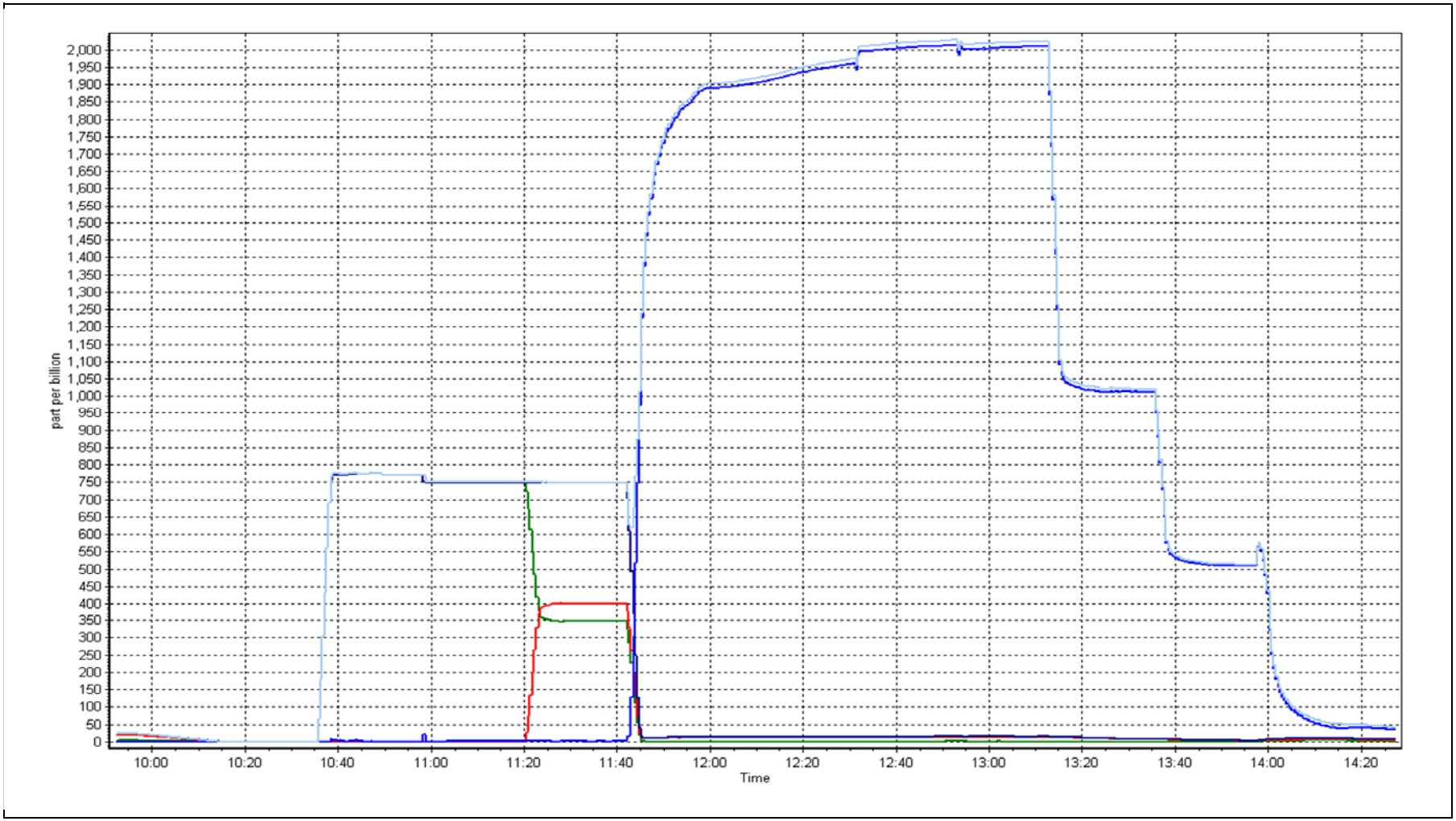
Calibration Date	January 13, 2015	Previous Calibration	December 9, 2014
Station Number	Bertha Ganter - Fort McKay	Station Number	AMS 1
Start Time (MST)	9:55	End Time (MST)	14:30
Analyzer make	API T201	Analyzer serial #	152

NO_X Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999998
749.8	749.1	1.0009		
749.8	747.8	1.0027	Slope	1.001801
			Intercept	0.001131



NH_3 Calibration Plot Date: January 13, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 2
MILDRED LAKE
January 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
JANUARY 2015

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	700	37	44	99.06	71	0	25	0
H2S (ppb) Average	699	34	45	98.52	9	0	2	0
THC (ppm) Average	701	34	43	98.79	4.9	-	2.9	-
Temperature (C) Average	737	0	7	99.06	6.9	-	4	-
Relative Humidity (%) Average	729	0	15	97.98	100	-	-	-
Wind Speed 10 m (km/h) Average	734	0	10	98.66	22	-	-	-
Wind Direction 10 m (deg) Average	734	0	10	98.66	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
JANUARY 2015

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	700	4	9	-	0	0	1	1	3	8	71
H2S (ppb) Average	699	0.7	1	-	0	0	0	0	1	1	9
THC (ppm) Average	701	2.48	0.4	-	2	2.1	2.2	2.3	2.7	3	4.9
Temperature 2 m (C) Average	737	-14.15	9.5	-	-30.4	-25.5	-21.3	-16	-8.1	1.5	6.9
Relative Humidity (%) Average	729	80.3	8	-	56	72	76	79	85	91	100
Wind Speed 10 m (km/h) Average	734	8.7	4	-	0	3	6	8	11	15	22
Wind Direction 10 m (deg) Average	734	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	15 Jan 2015 13:00	15 Jan 2015 17:00	5	Maintenance - station upgrade to digital polling
SO2	19 Jan 2015 07:00	19 Jan 2015 07:00	1	Maintenance on daily span system
SO2	19 Jan 2015 11:00	19 Jan 2015 11:00	1	Maintenance on daily span system
H2S	14 Jan 2015 13:00	14 Jan 2015 14:00	2	Maintenance - station upgrade to digital polling
H2S	15 Jan 2015 11:00	15 Jan 2015 18:00	8	Maintenance - station upgrade to digital polling
H2S	19 Jan 2015 11:00	19 Jan 2015 11:00	1	Maintenance on daily span system
THC	14 Jan 2015 13:00	14 Jan 2015 14:00	2	Maintenance - station upgrade to digital polling
THC	15 Jan 2015 13:00	15 Jan 2015 17:00	5	Maintenance - station upgrade to digital polling
THC	19 Jan 2015 07:00	19 Jan 2015 07:00	1	Maintenance on daily span system
THC	19 Jan 2015 11:00	19 Jan 2015 11:00	1	Maintenance on daily span system
Temperature	15 Jan 2015 11:00	15 Jan 2015 17:00	7	Maintenance - station upgrade to digital polling
Relative Humidity	15 Jan 2015 11:00	15 Jan 2015 17:00	7	Maintenance - station upgrade to digital polling
Relative Humidity	24 Jan 2015 04:00	24 Jan 2015 11:00	8	Unstable operation - exceed upper range
Wind Speed, Wind Direction	15 Jan 2015 11:00	15 Jan 2015 16:00	6	Maintenance - station upgrade to digital polling
Wind Speed, Wind Direction	24 Jan 2015 05:00	24 Jan 2015 08:00	4	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 71 ppb on Jan 22 08:00 Maximum Daily Average: 25.4 ppb on Jan 22

Minimum Value: 0 ppb on Jan 10 01:00 Minimum Daily Average: 0.2 ppb on Jan 1
Maximum Diurnal Average: 7.4 ppb at hour 2 Minimum Diurnal Average: 1.5 ppb at hour 7
Monthly Average: 4.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 3$ $P_{90} = 8$ $P_{99} = 48$

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	37
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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Jan	0	Z	0	0	0	0	0	0	0	0	1	7	1	0	0	0	0	0	0	1	1	0	0	0	0.6	7
3-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	1	2	1	1	1	2	3	0.8	3
4-Jan	1	Z	11	10	2	1	1	1	0	0	0	0	0	0	0	0	2	34	41	28	2	12	44	10	8.8	44
5-Jan	11	Z	27	20	8	7	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.5	27
6-Jan	0	Z	0	0	0	0	1	0	1	0	0	0	0	1	2	2	3	3	1	0	0	1	0	0	0.8	3
7-Jan	1	Z	0	0	2	0	1	0	1	0	1	1	3	1	1	2	4	5	5	1	1	2	1	0	1.5	5
8-Jan	0	Z	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	3	2	2	7	5	2	1	--	7
9-Jan	0	Z	2	1	1	1	1	1	1	1	1	3	5	6	6	2	2	2	1	1	1	1	0	0	1.7	6
10-Jan	0	Z	3	2	1	2	2	1	2	2	3	5	4	6	7	4	5	4	2	2	2	1	1	1	2.6	7
11-Jan	1	Z	2	1	2	1	1	2	2	1	3	6	5	4	4	2	1	1	1	1	1	1	1	1	1.9	6
12-Jan	1	Z	1	1	1	3	2	2	1	1	1	1	2	1	6	4	9	2	1	1	1	1	4	1	2.1	9
13-Jan	1	Z	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1.1	2
14-Jan	1	Z	1	1	3	5	1	1	1	1	1	1	1	1	0	0	1	1	1	0	0	0	0	1	1.0	5
15-Jan	1	Z	1	1	1	1	1	1	1	1	1	0	M	M	M	M	M	5	5	4	3	3	5	4	2.0	5
16-Jan	4	3	1	2	2	1	1	1	1	1	1	1	1	2	38	48	11	7	21	25	8	3	10	50	10.2	50
17-Jan	28	56	25	42	Z	14	0	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	2	8.1	56
18-Jan	Z	1	1	1	1	1	0	0	0	0	1	2	8	5	5	6	2	1	0	1	1	2	1	1	1.7	8
19-Jan	1	Z	1	1	1	1	M	1	1	0	M	0	0	0	1	1	1	0	0	1	1	1	1	1	0.7	1
20-Jan	1	0	Z	1	0	1	1	0	0	0	0	0	1	5	11	9	8	15	7	7	5	4	3	3	3.6	15
21-Jan	3	2	2	Z	5	3	2	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	12	47	4.1	47
22-Jan	57	26	2	2	Z	41	17	71	43	27	10	23	28	39	26	28	6	25	37	53	22	1	1	1	25.4	71
23-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	6	7	2	1	4	11	14	11	7	7	6	3.8	14
24-Jan	Z	2	4	3	2	2	2	3	1	1	28	47	61	23	10	19	2	39	27	27	29	24	4	2	15.7	61
25-Jan	5	Z	2	1	1	1	1	2	3	28	53	35	24	12	16	3	2	1	1	1	1	1	2	1	8.6	53
26-Jan	2	1	Z	1	2	5	2	1	5	4	3	4	1	3	2	1	1	1	1	0	0	1	1	0	1.8	5
27-Jan	1	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0.5	1
28-Jan	1	1	1	1	Z	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
29-Jan	1	1	2	2	2	Z	3	4	4	4	6	8	5	4	4	1	0	1	2	2	3	2	6	4	3.0	8
30-Jan	Z	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.9	2
31-Jan	1	Z	1	1	0	1	0	4	1	3	6	5	6	11	10	4	6	2	1	1	2	4	8	13	3.9	13
	4.3	7.4	3.2	3.3	1.5	3.3	1.5	3.3	2.4	2.7	4.4	5.2	5.6	4.7	5.6	5.1	2.5	5.2	5.6	5.8	3.5	2.8	3.9	5.0	Diurnal Average	
	57	56	27	42	8	41	17	71	43	28	53	47	61	39	38	48	11	39	41	53	29	24	44	50	Diurnal Maximum	

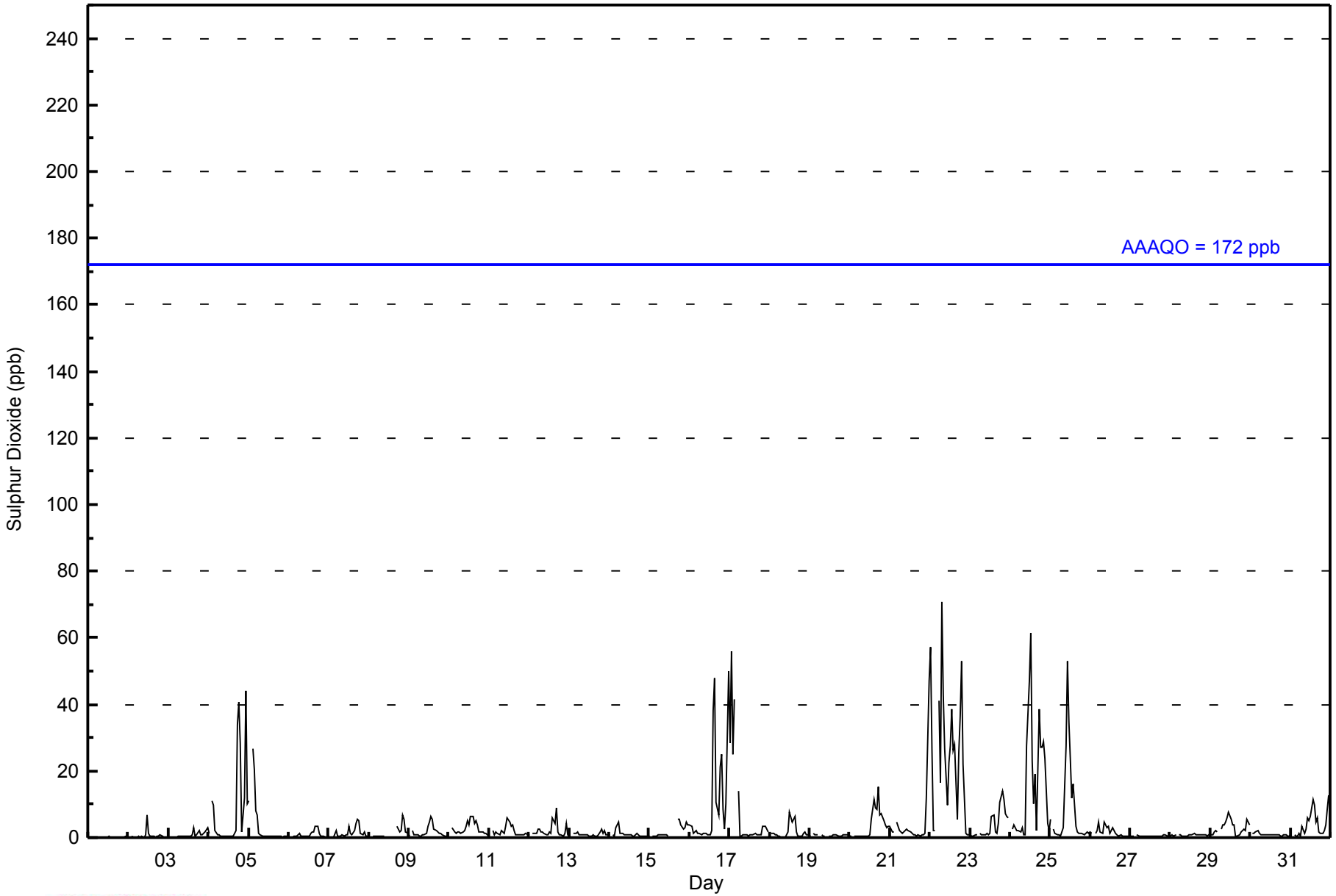
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	639	91.29	91.29
11 - 20	18	2.57	93.86
21 - 60	41	5.86	99.71
61 - 110	2	0.29	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	78	109	42	19	5	6	21	64	83	54	27	32	24	23	21	25	633
11 - 20	0	0	0	0	0	0	0	3	3	0	0	3	6	1	2	0	18
21 - 60	0	0	0	0	0	0	0	0	0	0	0	1	18	20	1	1	41
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	78	109	42	19	5	6	21	67	86	54	27	36	49	45	24	26	694

Total Number of Valid Hours: 694

Total Number of Hours: 744

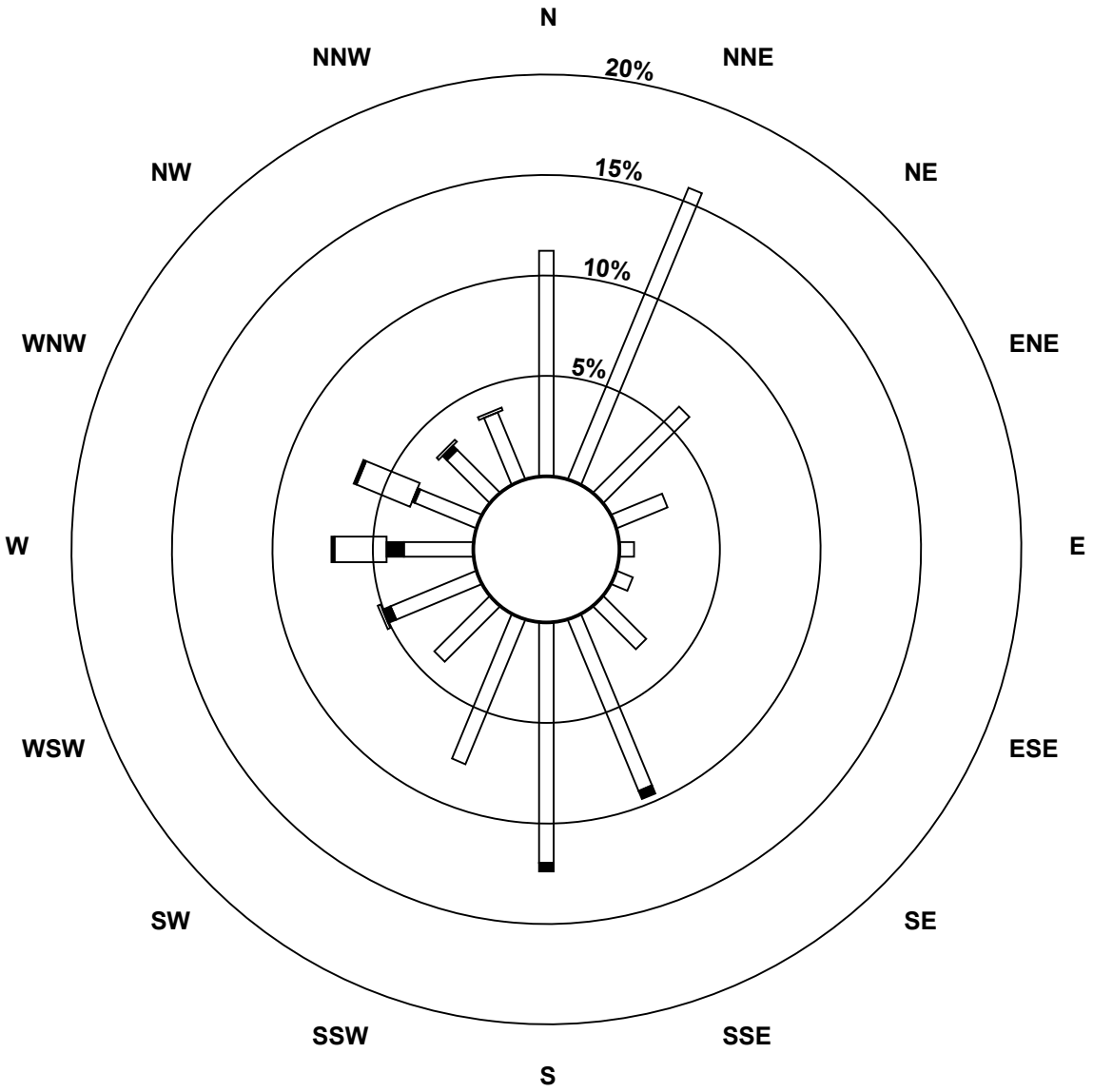
AURORA
ATMOSPHERICS INC.

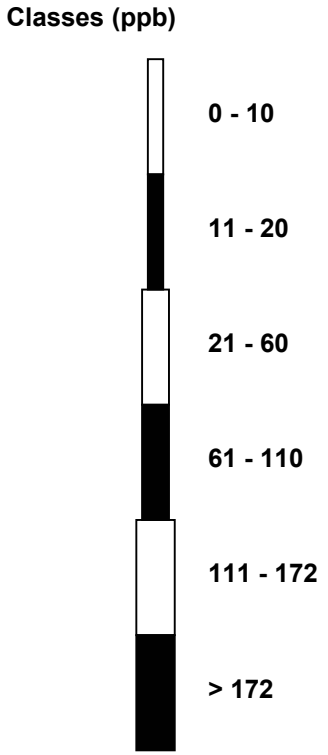
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Mildred Lake (AMS 2)





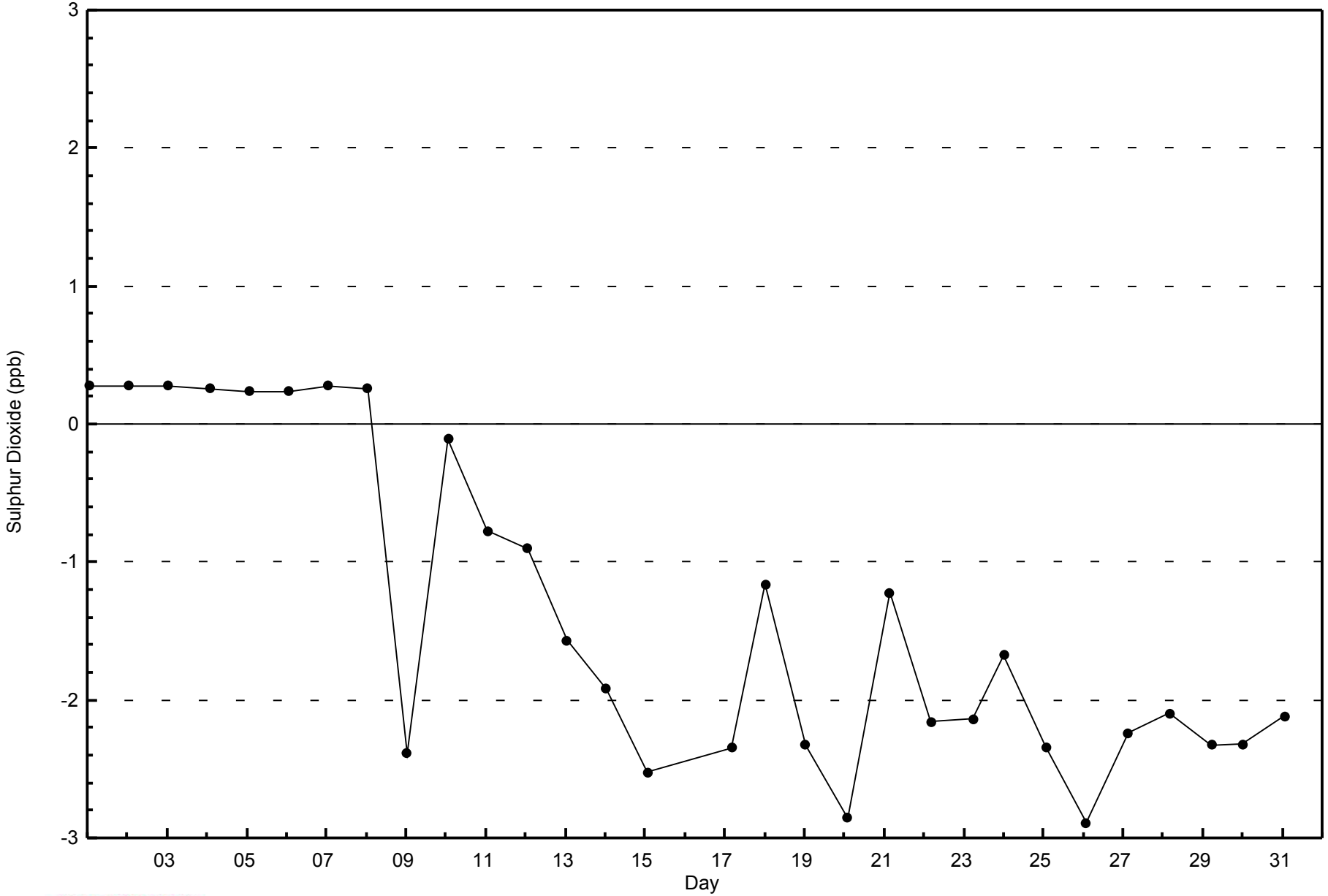
Total Number of Valid Hours: 694

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2015



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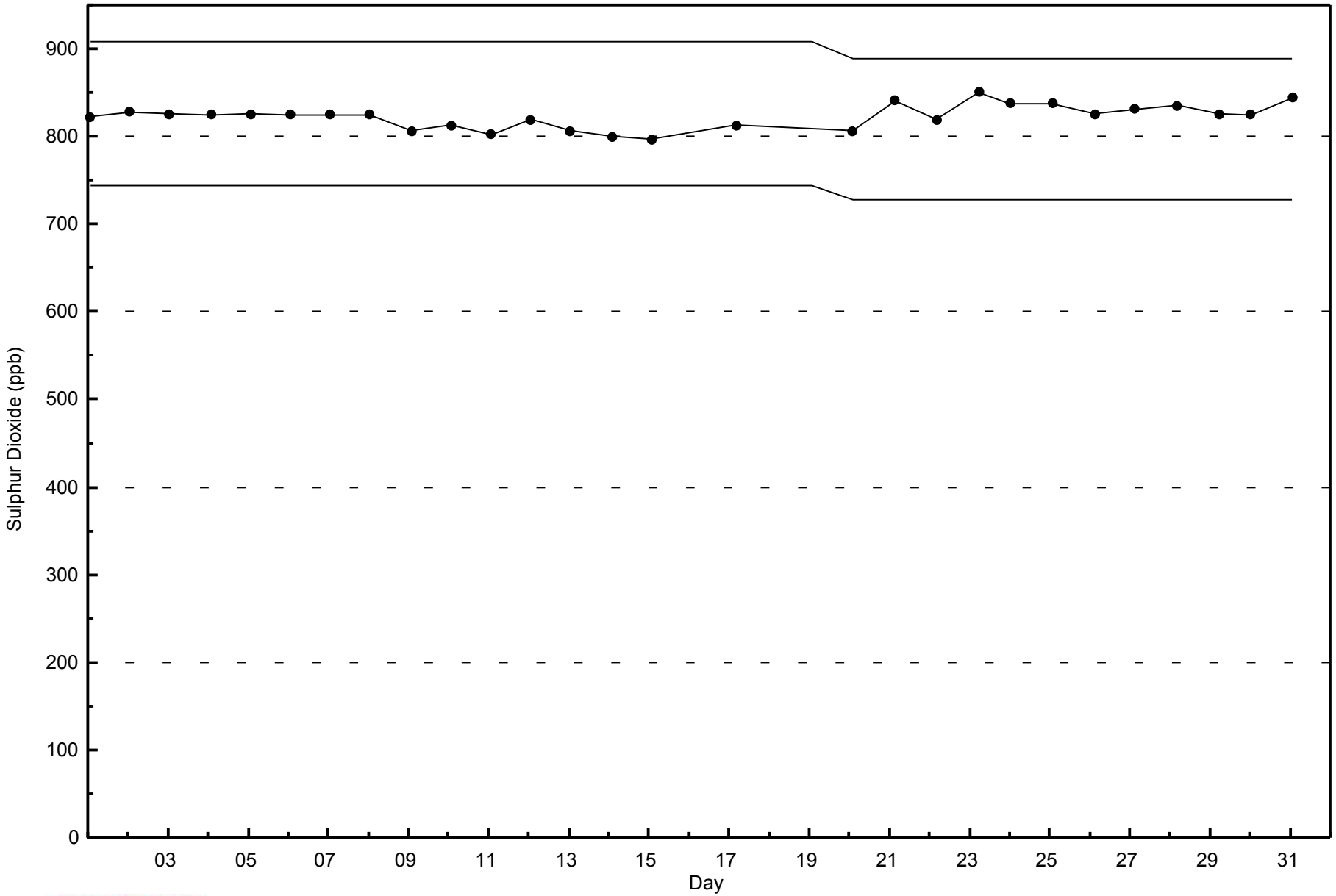
ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2015



AURORA
ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 ppb on Jan 22 14:00 Maximum Daily Average: 2.0 ppb on Jan 22

Minimum Value: 0 ppb on Jan 25 05:00 Minimum Daily Average: 0.2 ppb on Jan 1
Maximum Diurnal Average: 1.1 ppb at hour 14 Minimum Diurnal Average: 0.5 ppb at hour 3
Monthly Average: 0.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	699
Hours of Missing Data:	45
Hours of Calibration:	34
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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Jan	0	0	Z	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	1	1	1	0	0	0	0.5	2
3-Jan	1	1	Z	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	3	1	1	1	1	1	0.7	3
4-Jan	4	7	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0	1	1	1	1.0	7
5-Jan	1	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
6-Jan	0	0	Z	0	0	0	1	1	1	0	0	0	0	1	1	1	2	1	1	0	0	0	0	0	0.6	2
7-Jan	0	1	Z	0	1	0	0	1	1	1	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0.4	1
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0.3	1
9-Jan	0	0	Z	0	0	1	0	1	1	1	1	2	2	2	2	1	1	2	2	2	1	1	1	1	1.0	2
10-Jan	0	0	Z	0	1	1	1	1	1	1	1	2	1	2	2	2	2	2	1	1	1	1	1	1	1.0	2
11-Jan	1	1	Z	1	1	1	0	2	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0	1	0.8	2
12-Jan	0	0	Z	1	2	2	1	1	1	1	0	0	1	1	2	1	2	1	0	1	0	0	1	0	0.9	2
13-Jan	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
14-Jan	0	0	Z	0	1	2	0	0	0	0	0	0	M	M	0	0	0	0	0	0	0	0	0	0	0.3	2
15-Jan	0	0	Z	0	0	0	0	0	0	0	M	M	M	M	M	M	M	M	1	1	0	1	1	1	--	1
16-Jan	1	1	0	1	1	0	0	0	1	0	C	C	C	C	1	2	1	1	1	1	1	1	2	1	0.9	2
17-Jan	1	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0.5	1
18-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	3	3	3	2	1	0	0	1	1	2	1	2	1.1	3
19-Jan	1	2	Z	1	1	1	1	1	1	1	M	0	1	1	1	1	0	0	0	0	0	0	0	0	0.7	2
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	1	0	1	1	1	1	2	1	1	1	0	0	1	0.6	2
21-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0.6	1
22-Jan	2	1	0	0	1	Z	1	2	5	6	3	3	3	9	1	1	0	1	3	4	1	0	0	0	2.0	9
23-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	2	2	3	4	3	3	3	1.2	4
24-Jan	1	Z	1	1	1	1	1	1	1	0	5	2	3	1	0	0	0	3	3	1	1	1	0	0	1.3	5
25-Jan	2	2	Z	0	0	0	0	1	1	3	1	2	1	1	1	0	0	0	0	0	0	0	0	1	0.8	3
26-Jan	0	0	0	Z	1	3	1	0	0	1	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0.6	3
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	0	0	1	1	1	Z	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0.4	1
29-Jan	0	0	1	1	0	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
31-Jan	0	0	Z	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	2	3	0.9	3
	0.6	0.8	0.5	0.5	0.6	0.7	0.5	0.6	0.7	0.7	0.8	0.8	0.8	1.1	0.8	0.7	0.7	0.8	0.9	0.8	0.6	0.6	0.6	0.6	Diurnal Average	
	4	7	1	1	2	3	1	2	5	6	5	3	3	9	3	2	2	3	3	4	4	3	3	3	Diurnal Maximum	

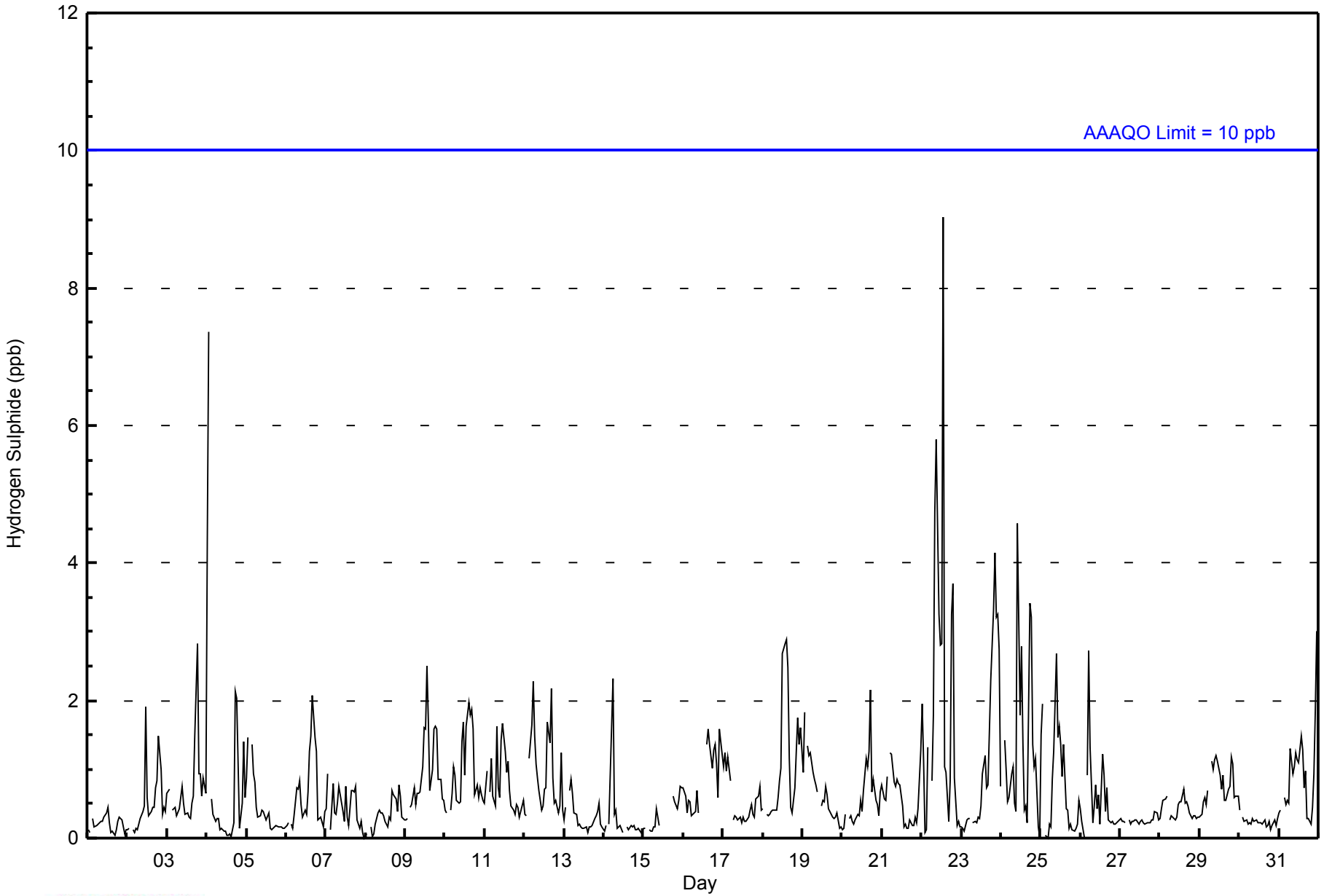
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	673	96.28	96.28
3 - 4	21	3.00	99.28
5 - 7	4	0.57	99.86
8 - 11	1	0.14	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2015

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	78	108	39	19	6	6	20	61	84	51	25	37	47	33	28	27	669
3 - 4	0	0	0	0	0	0	1	6	1	0	1	1	1	10	0	0	21
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	78	108	39	19	6	6	21	67	85	51	26	38	48	48	28	27	695

Total Number of Valid Hours: 695

Total Number of Hours: 744

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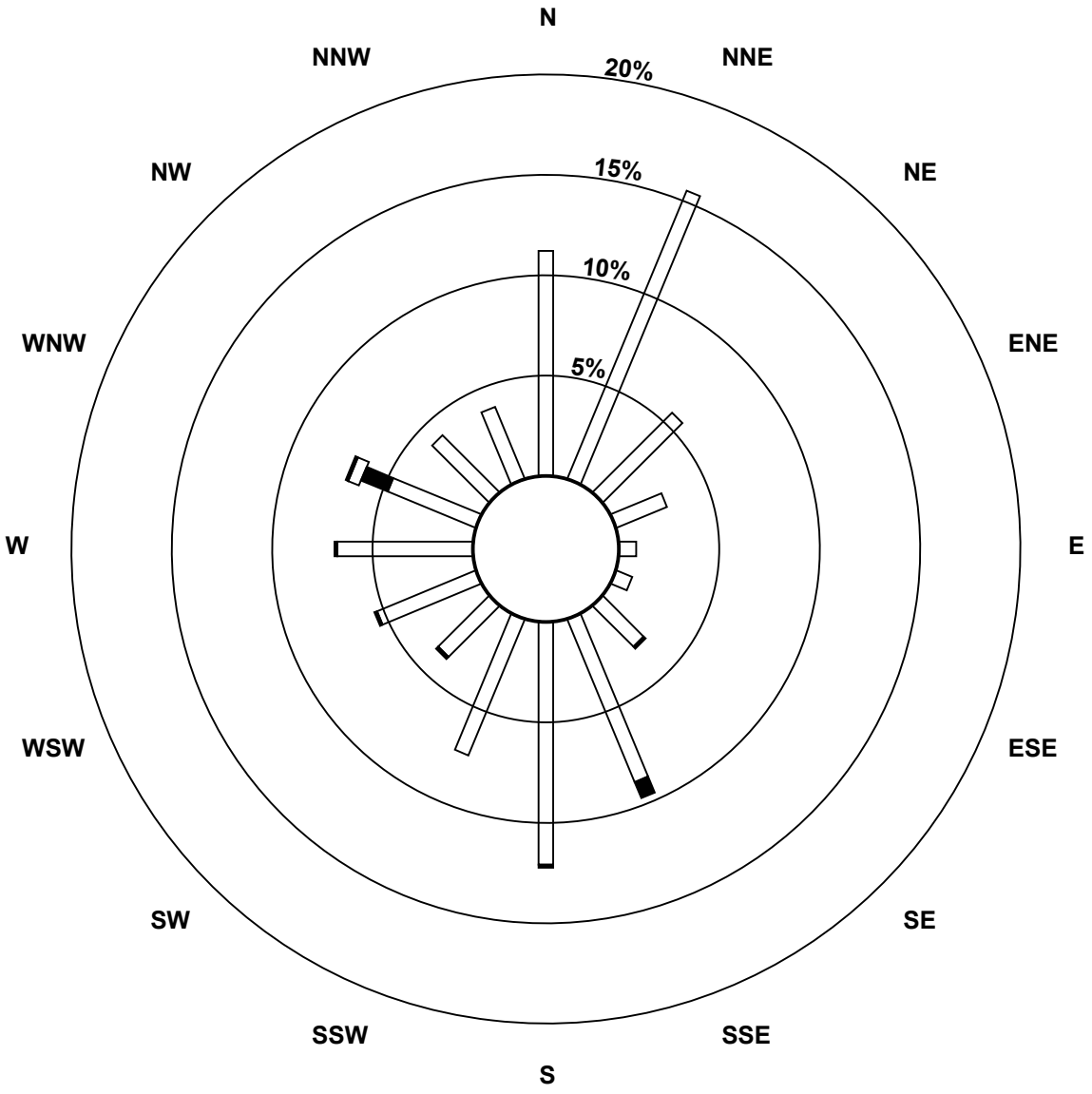
Wood Buffalo Environmental Association

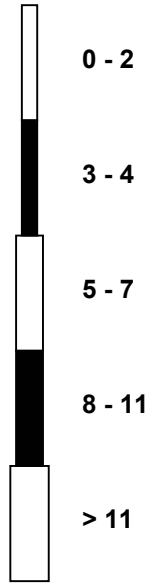
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake (AMS 2)



Classes (ppb)



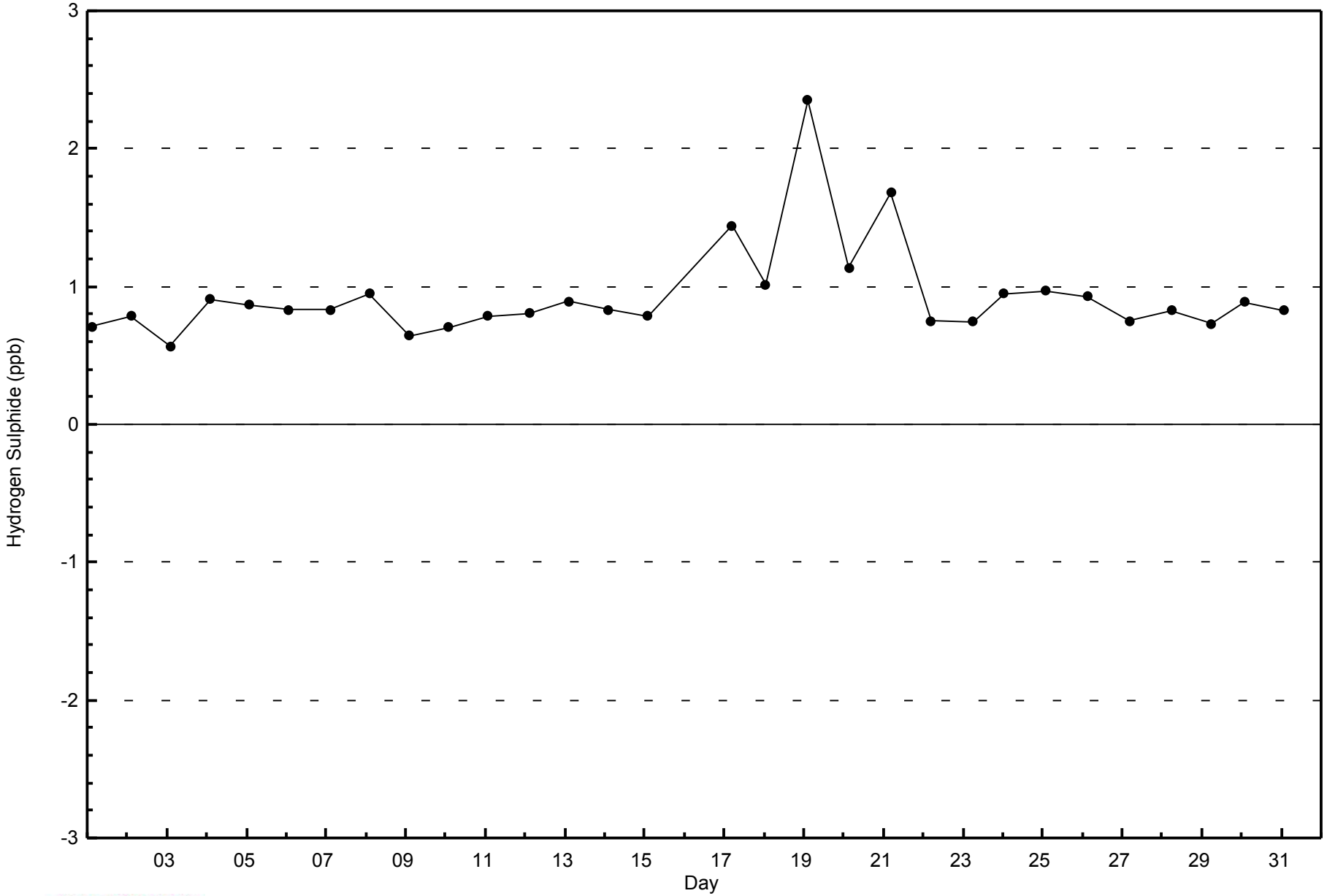
Total Number of Valid Hours: 695

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2015



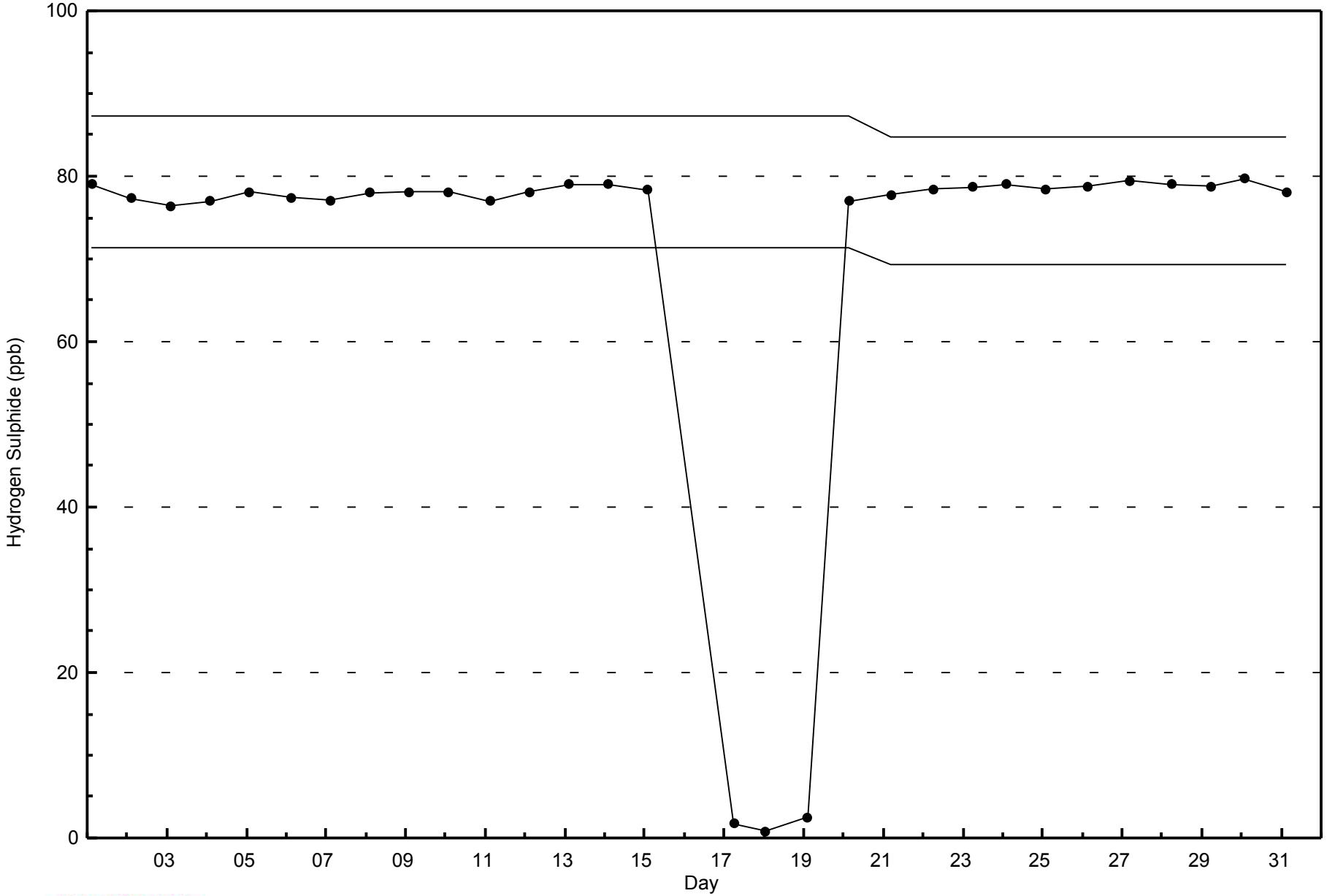
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2015

Maximum Value: 4.9 ppm on Jan 23 21:00

Maximum Daily Average: 2.9 ppm on Jan 23

Minimum Value: 2.0 ppm on Jan 22 04:00

Minimum Daily Average: 2.1 ppm on Jan 30

Maximum Diurnal Average: 2.6 ppm at hour 14

Minimum Diurnal Average: 2.4 ppm at hour 4

Monthly Average: 2.48 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.7 P_{90} = 3.0 P_{99} = 3.9

Hours in Service:	744
Hours of Data:	701
Hours of Missing Data:	43
Hours of Calibration:	34
Percent Operational Time:	98.8

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-Jan	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.6	2.5	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.1	2.1	2.2	2.6
2-Jan	2.1	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.4	2.3	2.2	2.3	2.3	2.2	2.2	2.5	2.4	2.4	2.2	2.3	2.2	2.2	2.5
3-Jan	2.7	Z	2.4	2.2	2.3	2.4	2.1	2.6	3.3	3.0	2.7	2.4	2.5	2.4	2.2	2.2	2.3	2.3	2.4	2.3	2.4	2.7	3.0	2.6	2.5	3.3
4-Jan	3.0	Z	3.2	2.8	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	2.7	2.7	2.4	2.2	2.3	2.7	2.5	2.4	3.2
5-Jan	2.5	Z	2.7	2.6	2.4	2.4	2.3	2.3	2.6	2.7	2.8	2.6	2.5	2.4	2.1	2.2	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.4	2.8
6-Jan	2.2	Z	2.2	2.2	2.1	2.2	2.4	2.4	2.5	2.4	2.5	2.5	2.3	2.5	2.8	3.0	3.2	2.6	2.4	2.2	2.2	2.3	2.3	2.3	2.4	3.2
7-Jan	2.4	Z	2.4	2.3	2.5	2.3	2.6	3.0	3.0	2.5	2.9	2.7	2.8	2.3	2.2	2.4	2.4	2.5	2.7	2.2	2.2	2.6	2.4	2.1	2.5	3.0
8-Jan	2.2	Z	2.4	2.6	2.3	2.4	2.8	2.8	2.3	3.0	2.9	2.7	C	C	C	C	2.6	2.3	2.4	2.2	2.7	2.5	2.2	2.1	2.5	3.0
9-Jan	2.2	Z	2.2	2.4	3.9	2.9	2.2	3.5	2.4	2.3	3.0	3.5	3.6	2.9	2.7	2.3	2.6	3.1	3.5	3.7	2.8	2.8	2.6	2.4	2.8	3.9
10-Jan	2.3	Z	2.1	2.2	2.2	2.2	2.5	3.1	2.3	2.3	2.6	3.1	2.8	3.0	3.3	3.7	3.1	3.8	2.6	2.6	2.5	2.5	2.5	2.5	2.7	3.8
11-Jan	2.4	Z	2.7	2.7	2.9	2.4	2.5	3.1	2.4	2.4	2.9	3.0	2.8	2.9	2.8	2.9	2.5	2.4	2.3	3.1	2.9	2.4	2.4	2.6	2.7	3.1
12-Jan	3.4	Z	2.4	2.8	2.7	2.8	2.8	2.7	2.8	2.7	2.4	2.4	2.6	2.8	3.0	3.6	3.3	3.6	2.4	2.7	2.3	3.0	3.2	3.0	2.9	3.6
13-Jan	2.4	Z	2.7	2.8	3.0	2.7	2.4	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.7	2.1	2.3	3.0
14-Jan	2.1	Z	2.5	2.7	3.7	3.0	2.6	2.6	2.2	2.1	2.1	2.1	M	M	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	3.7
15-Jan	2.2	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	M	M	M	M	M	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.2	2.4
16-Jan	2.2	2.5	2.9	2.7	2.7	2.9	3.3	3.4	3.3	2.3	2.4	2.8	3.2	2.7	2.4	2.4	3.4	3.1	3.0	2.5	2.9	2.5	3.2	2.2	2.8	3.4
17-Jan	2.2	2.2	2.2	2.2	Z	2.3	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	2.3	2.5	2.5	2.4	2.5	2.2	2.5
18-Jan	Z	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.5	2.7	2.9	3.6	4.7	3.7	3.7	2.9	2.3	2.3	2.5	2.8	3.4	3.3	3.7	2.8	4.7
19-Jan	2.8	Z	3.3	3.2	3.2	3.3	M	2.8	2.7	2.6	M	2.4	2.5	2.5	2.7	2.7	2.5	2.2	2.3	2.3	2.3	2.3	2.2	2.1	2.6	3.3
20-Jan	2.1	2.2	Z	2.4	2.4	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.3	4.6	3.6	2.9	2.7	2.9	2.5	2.7	2.6	2.7	2.8	2.7	2.6	4.6
21-Jan	2.8	2.9	2.4	Z	2.8	2.6	2.7	2.5	2.5	2.8	2.8	2.9	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.6	2.3	2.4	3.0	2.5	3.0
22-Jan	4.0	2.9	2.2	2.0	Z	4.3	2.8	3.3	2.1	2.1	2.1	2.1	2.0	2.1	2.6	2.8	2.1	2.5	2.1	2.1	2.4	2.1	2.1	2.1	2.5	4.3
23-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.1	2.1	2.2	2.5	3.4	3.7	3.0	3.0	3.2	3.2	3.7	4.9	4.3	4.1	3.9	2.9	4.9
24-Jan	Z	2.7	2.5	2.4	2.5	2.6	3.0	3.1	3.6	3.2	2.3	2.3	2.2	2.4	3.1	2.8	2.4	2.5	3.2	3.0	2.7	3.7	2.2	2.2	2.7	3.7
25-Jan	3.0	Z	2.6	2.1	2.1	2.4	2.1	2.9	3.3	3.5	2.5	2.2	2.4	2.4	2.2	3.0	3.9	2.1	2.1	2.1	2.1	2.1	2.1	2.5	2.5	3.9
26-Jan	2.7	2.8	Z	2.2	3.3	2.8	2.7	2.4	2.5	2.4	2.3	2.3	2.2	2.4	2.2	2.2	2.5	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.4	3.3
27-Jan	2.1	2.1	2.1	Z	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	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2
28-Jan	2.1	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.8	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.8
29-Jan	2.2	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.8	2.7	2.4	2.3	2.3	2.3	2.8
30-Jan	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2
31-Jan	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.4	2.3	2.6	2.6	2.7	2.7	2.5	2.5	2.6	2.4	2.2	2.7	2.3	2.8	2.7	2.7	2.6	2.5	2.8
	2.5	2.4	2.4	2.4	2.5	2.5	2.4	2.6	2.5	2.4	2.4	2.5	2.5	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.4	Diurnal Average	
	4.0	2.9	3.3	3.2	3.9	4.3	3.3	3.5	3.6	3.5	3.0	3.5	3.6	4.7	3.7	3.7	3.9	3.8	3.5	3.7	4.9	4.3	4.1	3.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

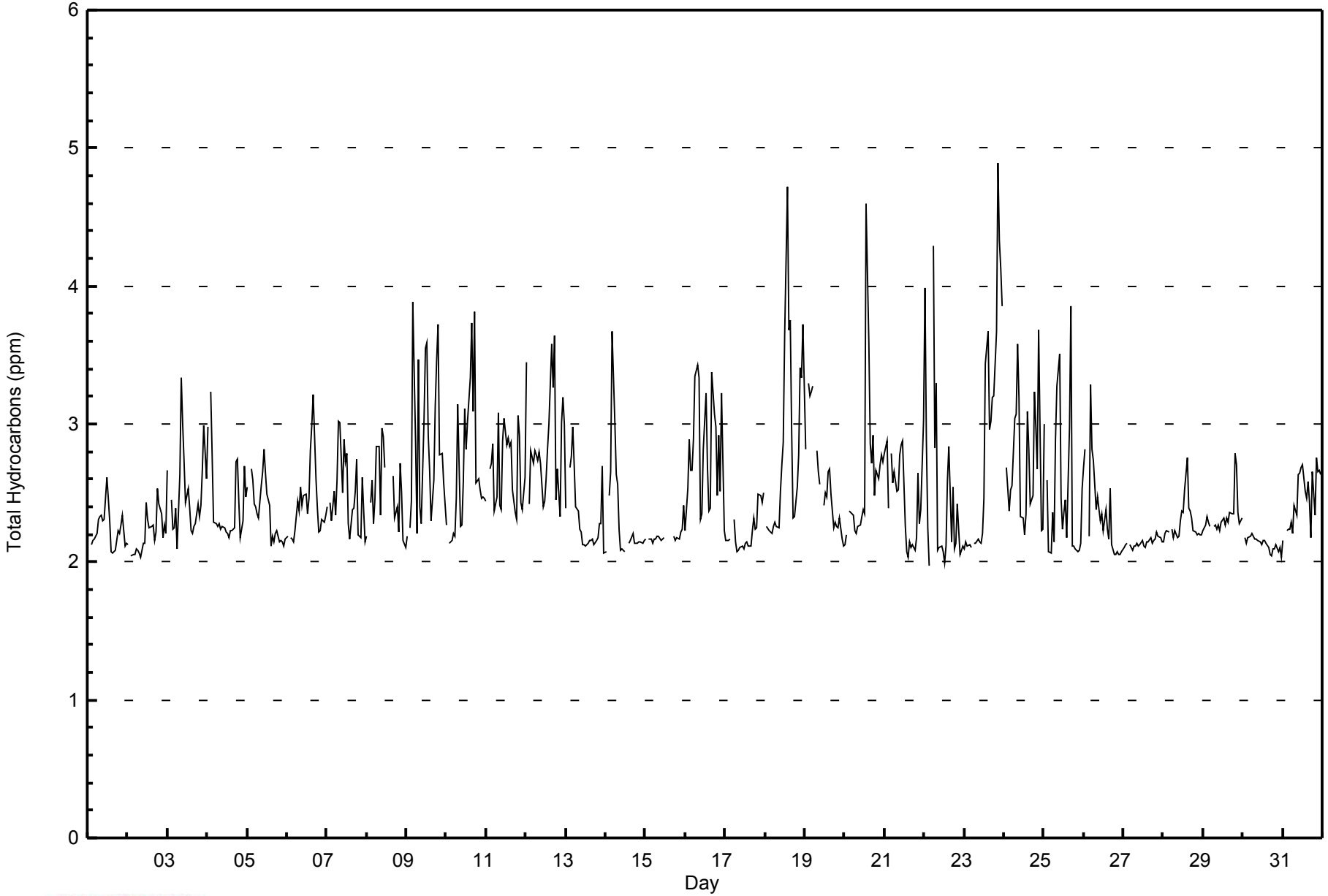
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	10	1.43	1.43
2.1 - 3.0	625	89.16	90.58
3.1 - 10.0	66	9.42	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2015

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	1	4	0	0	1	0	0	0	0	0	2	1	0	1	0	0	10
2.1 - 3.0	74	104	40	18	4	5	18	53	69	51	24	32	41	40	25	22	620
3.1 - 10.0	3	1	0	1	0	1	3	14	17	3	1	3	9	4	1	4	65
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	78	109	40	19	5	6	21	67	86	54	27	36	50	45	26	26	695

Total Number of Valid Hours: 695

Total Number of Hours: 744

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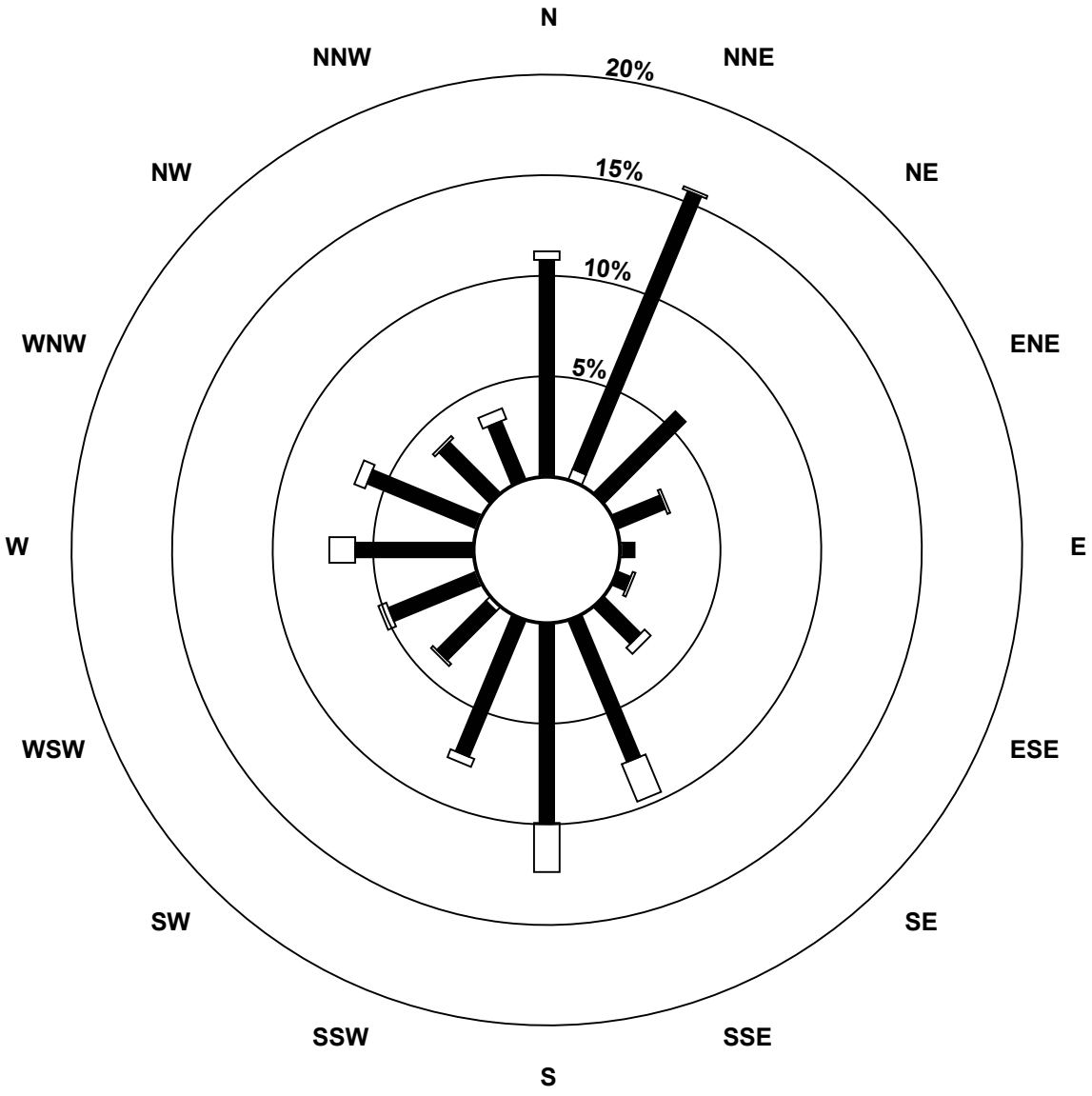
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

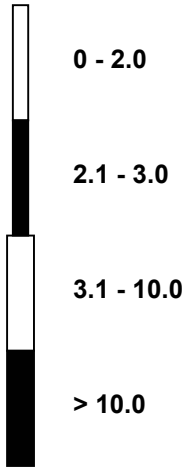
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Mildred Lake (AMS 2)



Classes (ppm)



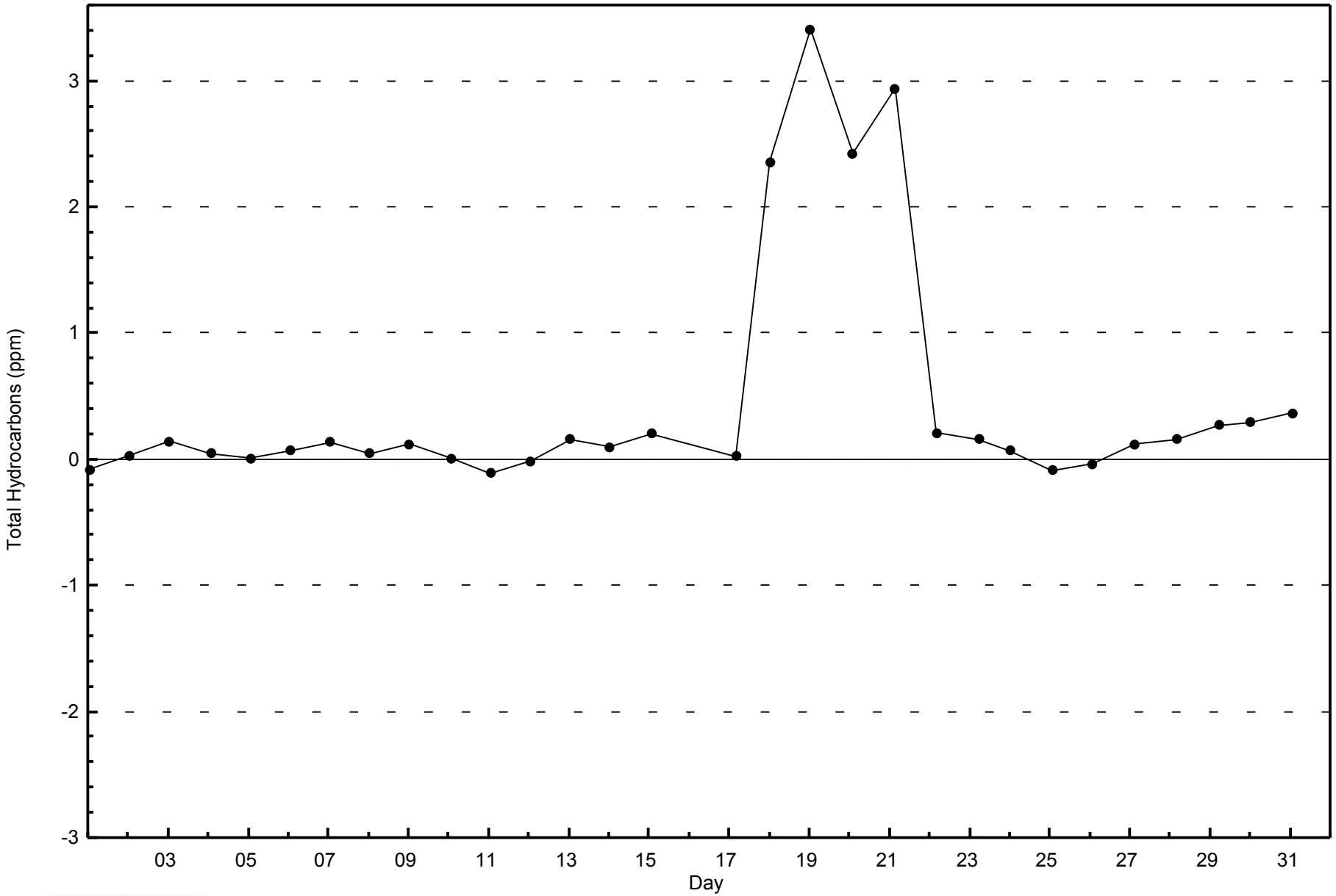
Total Number of Valid Hours: 695

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2015



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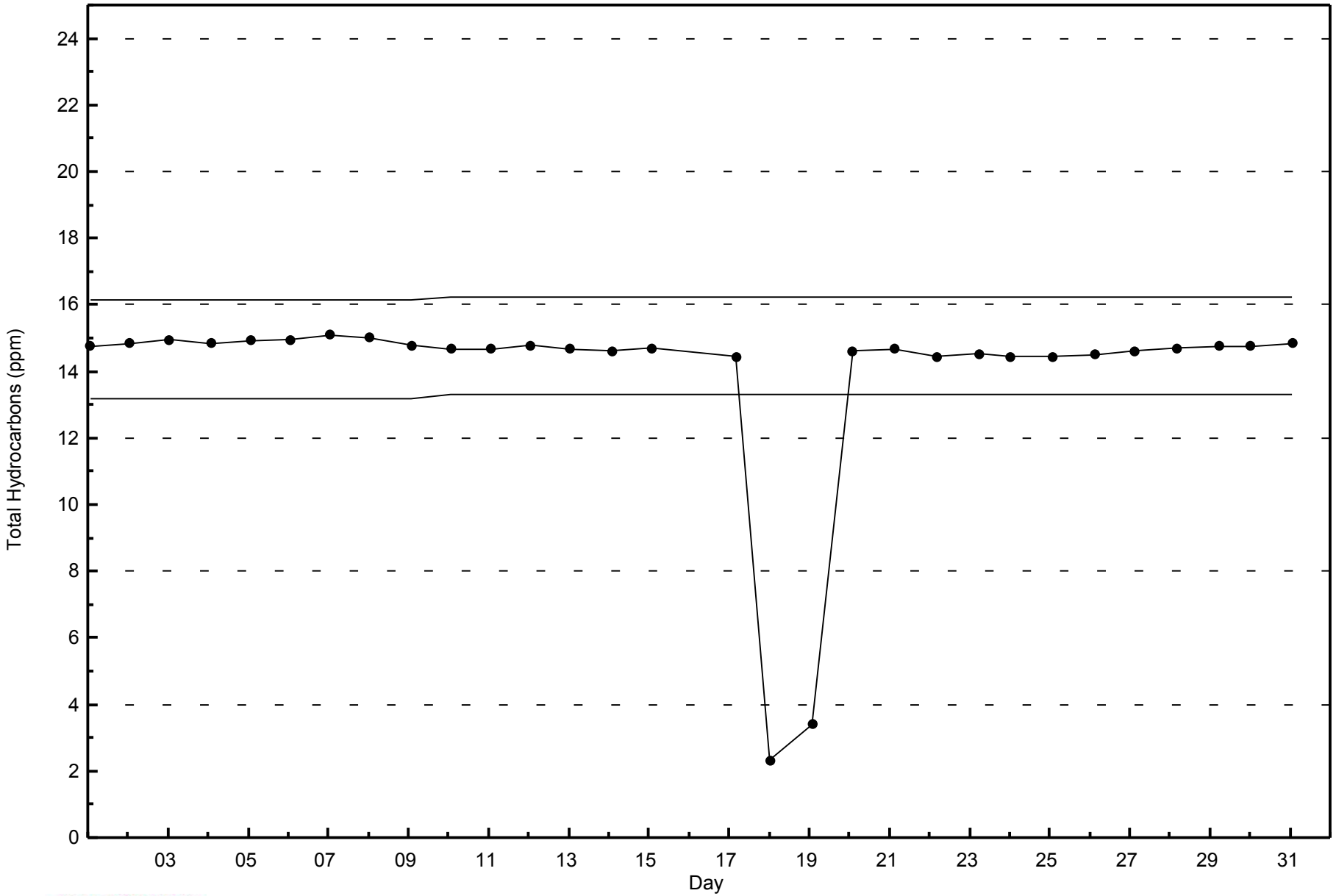
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 6.9 C on Jan 25 12:00

Maximum Daily Average: 4.0 C on Jan 22

Minimum Value: -30.4 C on Jan 31 04:00

Minimum Daily Average: -26.1 C on Jan 3

Maximum Diurnal Average: -12.0 C at hour 15

Minimum Diurnal Average: -15.6 C at hour 9

Monthly Average: -14.15 C

Percentiles: P_1 = -29.0 P_{10} = -25.5 Q_1 = -21.3 Median = -16.0 Q_3 = -8.1 P_{90} = 1.5 P_{99} = 6.0

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Hours of Calibration:	0
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST)																								Daily	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-Jan	-13.1	-13.8	-14.5	-14.9	-15.4	-15.8	-16.0	-16.1	-16.2	-16.2	-16.2	-15.7	-15.5	-16.2	-16.9	-17.8	-19.1	-20.6	-21.0	-20.8	-21.0	-20.1	-19.7	-20.8	-17.2	-13.1
2-Jan	-22.3	-22.1	-22.0	-22.0	-21.9	-22.0	-22.3	-22.5	-22.8	-23.3	-23.1	-22.0	-21.5	-21.3	-21.4	-22.8	-24.8	-26.6	-27.6	-28.2	-26.4	-24.9	-25.0	-25.1	-23.5	-21.3
3-Jan	-25.0	-24.9	-25.6	-26.4	-27.1	-26.5	-26.5	-27.3	-29.1	-30.0	-27.6	-26.8	-26.0	-25.5	-25.1	-24.9	-25.3	-25.3	-25.2	-25.5	-25.1	-25.1	-25.0	-25.3	-26.1	-24.9
4-Jan	-25.0	-24.5	-24.8	-24.6	-25.0	-25.8	-26.0	-25.5	-25.3	-24.4	-22.9	-21.6	-20.7	-19.3	-17.8	-17.6	-18.0	-16.9	-16.8	-18.0	-18.9	-18.8	-18.8	-19.5	-21.5	-16.8
5-Jan	-19.6	-18.8	-18.3	-18.2	-17.5	-16.8	-16.5	-15.8	-15.4	-15.4	-15.1	-14.6	-14.4	-14.4	-14.5	-15.2	-15.4	-15.6	-15.8	-16.8	-18.7	-19.1	-19.7	-21.1	-16.8	-14.4
6-Jan	-22.8	-24.2	-24.6	-25.7	-25.2	-26.5	-27.0	-27.8	-28.5	-28.2	-26.5	-25.5	-24.1	-23.2	-23.0	-22.8	-24.1	-22.2	-21.3	-21.2	-21.3	-22.2	-23.5	-24.9	-24.4	-21.2
7-Jan	-26.5	-26.3	-25.3	-26.0	-25.1	-24.5	-23.4	-23.5	-23.1	-22.4	-20.8	-19.5	-18.7	-18.0	-17.8	-17.8	-18.0	-18.0	-17.3	-16.1	-16.2	-15.8	-14.6	-14.9	-20.4	-14.6
8-Jan	-17.8	-19.8	-19.8	-17.6	-18.4	-18.9	-19.1	-19.5	-19.5	-19.3	-18.8	-18.2	-17.5	-17.1	-17.0	-17.6	-18.4	-18.4	-19.4	-20.3	-20.4	-20.5	-20.9	-21.8	-19.0	-17.0
9-Jan	-22.3	-21.9	-22.6	-22.9	-24.6	-26.4	-27.1	-26.3	-27.7	-27.1	-24.5	-22.4	-21.1	-19.9	-19.2	-18.8	-20.5	-21.7	-23.5	-23.6	-22.5	-23.5	-21.0	-20.4	-23.0	-18.8
10-Jan	-20.8	-21.5	-23.3	-25.7	-27.2	-26.9	-26.2	-26.1	-27.9	-27.5	-25.6	-24.8	-24.3	-23.2	-22.4	-22.3	-23.2	-23.4	-23.9	-24.9	-25.9	-26.8	-27.1	-27.8	-24.9	-20.8
11-Jan	-28.4	-27.8	-28.4	-28.5	-28.8	-28.9	-28.4	-28.4	-28.1	-28.8	-26.0	-24.4	-23.3	-22.1	-20.8	-19.5	-18.9	-19.6	-19.9	-19.9	-19.0	-18.3	-18.6	-19.7	-23.9	-18.3
12-Jan	-19.6	-18.9	-20.3	-20.8	-21.1	-19.7	-18.5	-17.1	-16.5	-16.0	-15.5	-14.8	-14.8	-14.1	-13.6	-13.6	-13.6	-12.6	-11.8	-11.2	-10.3	-9.9	-9.8	-9.0	-15.1	-9.0
13-Jan	-8.4	-7.6	-8.0	-8.2	-9.0	-9.5	-9.9	-10.1	-10.2	-10.4	-10.6	-10.8	-11.1	-11.0	-10.7	-10.9	-11.0	-11.1	-10.6	-9.3	-8.9	-8.4	-7.9	-7.7	-9.6	-7.6
14-Jan	-7.7	-8.0	-8.8	-8.3	-4.3	-3.1	-5.4	-6.7	-7.4	-7.6	-7.7	-8.1	-8.3	-8.4	-8.8	-9.3	-10.8	-12.4	-13.7	-14.3	-14.5	-14.8	-15.6	-16.2	-9.6	-3.1
15-Jan	-17.0	-17.4	-17.4	-17.4	-17.4	-17.5	-17.8	-18.0	-17.9	-18.0	M	M	M	M	M	M	M	-14.5	-14.3	-14.1	-13.5	-13.1	-12.6	-11.9	--	-11.9
16-Jan	-11.3	-10.8	-10.4	-9.8	-9.0	-8.6	-7.8	-7.5	-7.0	-6.4	-6.5	-6.3	-3.6	-1.1	1.0	2.0	2.0	2.0	2.2	2.1	1.4	0.9	1.6	2.2	-3.7	2.2
17-Jan	1.0	1.1	1.2	1.4	0.9	0.1	-3.7	-6.8	-8.5	-9.4	-9.5	-9.1	-8.8	-8.6	-8.6	-8.7	-9.0	-9.4	-9.4	-9.4	-9.1	-8.9	-10.0	-11.4	-6.4	1.4
18-Jan	-11.2	-11.1	-10.8	-11.0	-11.0	-10.5	-10.1	-11.1	-11.9	-11.2	-9.2	-7.8	-6.2	-4.9	-3.6	-3.0	-5.2	-6.3	-7.1	-7.6	-7.8	-8.3	-8.6	-9.1	-8.5	-3.0
19-Jan	-9.2	-9.6	-10.8	-11.8	-12.8	-11.5	-11.0	-11.1	-11.3	-12.2	-12.5	-12.9	-12.6	-12.5	-12.3	-12.3	-12.0	-12.2	-12.8	-13.2	-13.4	-13.5	-13.5	-13.8	-12.1	-9.2
20-Jan	-14.0	-13.9	-13.7	-13.6	-13.5	-13.4	-13.3	-13.2	-13.2	-13.1	-13.1	-12.4	-11.9	-10.8	-11.1	-11.3	-11.5	-11.3	-10.7	-10.3	-10.1	-9.9	-9.6	-8.9	-12.0	-8.9
21-Jan	-8.3	-8.3	-9.5	-9.1	-8.9	-7.8	-7.8	-7.9	-7.2	-6.4	-4.4	-3.2	-0.3	2.1	2.7	3.0	3.0	2.9	2.8	3.2	3.2	3.2	3.0	3.6	-2.3	3.6
22-Jan	3.7	3.4	2.5	3.2	3.6	4.5	4.4	5.0	6.0	4.8	3.6	4.2	5.5	6.1	6.0	6.1	5.6	5.7	6.4	6.5	4.3	-0.8	-1.8	-2.5	4.0	6.5
23-Jan	-3.0	-3.6	-4.1	-4.4	-4.8	-4.9	-5.0	-5.0	-5.0	-4.9	-4.6	-4.4	-3.9	-3.6	-3.4	-3.4	-3.6	-4.0	-4.2	-4.6	-4.9	-5.6	-5.2	-5.1	-4.4	-3.0
24-Jan	-4.4	-3.0	-1.0	-0.3	-0.1	-0.1	0.0	0.0	0.4	1.0	2.1	2.4	3.2	3.2	3.1	4.1	4.2	4.0	3.4	3.4	2.9	2.4	1.9	1.7	1.4	4.2
25-Jan	0.7	0.3	0.5	1.1	2.0	1.7	1.5	1.3	1.9	4.3	5.8	6.9	6.4	5.9	6.7	6.2	6.0	5.1	3.2	1.7	0.3	-1.2	-2.0	-1.8	2.7	6.9
26-Jan	-1.6	-1.4	1.7	1.3	0.3	-0.9	-2.2	-2.3	-0.8	0.0	0.9	1.9	3.1	3.4	3.7	3.1	-0.9	-5.9	-7.0	-8.4	-9.2	-10.6	-12.4	-13.8	-2.4	3.7
27-Jan	-15.0	-15.8	-16.5	-17.1	-17.9	-18.8	-19.5	-19.9	-20.1	-20.0	-19.8	-19.5	-19.0	-18.7	-18.6	-18.7	-18.8	-19.3	-19.6	-19.8	-19.7	-19.5	-19.6	-19.7	-18.8	-15.0
28-Jan	-19.7	-19.8	-20.2	-20.5	-20.3	-20.3	-21.4	-22.5	-23.3	-22.8	-21.7	-20.9	-20.2	-19.5	-19.1	-19.5	-20.2	-21.1	-20.7	-20.4	-20.7	-21.0	-21.1	-21.2	-20.8	-19.1
29-Jan	-21.4	-21.1	-20.5	-20.3	-20.2	-20.0	-19.9	-19.8	-19.6	-19.0	-18.2	-17.4	-16.3	-15.3	-14.8	-14.3	-14.4	-15.2	-15.2	-15.3	-15.0	-14.8	-15.0	-16.0	-17.5	-14.3
30-Jan	-17.3	-18.1	-18.6	-19.4	-19.9	-19.6	-19.5	-19.5	-20.4	-20.7	-20.6	-19.8	-19.7	-19.8	-20.3	-21.0	-21.7	-22.9	-23.9	-25.0	-25.8	-26.6	-26.9	-27.9	-21.5	-17.3
31-Jan	-28.8	-29.3	-30.1	-30.4	-30.1	-28.7	-28.9	-29.2	-29.0	-28.7	-27.8	-25.8	-23.9	-22.6	-21.7	-21.3	-21.2	-22.4	-22.6	-22.4	-22.9	-24.7	-25.3	-25.8	-26.0	-21.2
	-14.7	-14.8	-15.0	-15.1	-15.2	-15.1	-15.3	-15.5	-15.6	-15.5	-14.5	-13.8	-13.0	-12.3	-12.0	-12.0	-12.6	-13.2	-13.5	-13.7	-13.8	-14.2	-14.3	-14.7	Diurnal Average	
	3.7	3.4	2.5	3.2	3.6	4.5	4.4	5.0	6.0	4.8	5.8	6.9	6.4	6.1	6.7	6.2	6.0	5.7	6.4	6.5	4.3	3.2	3.0	3.6	Diurnal Maximum	

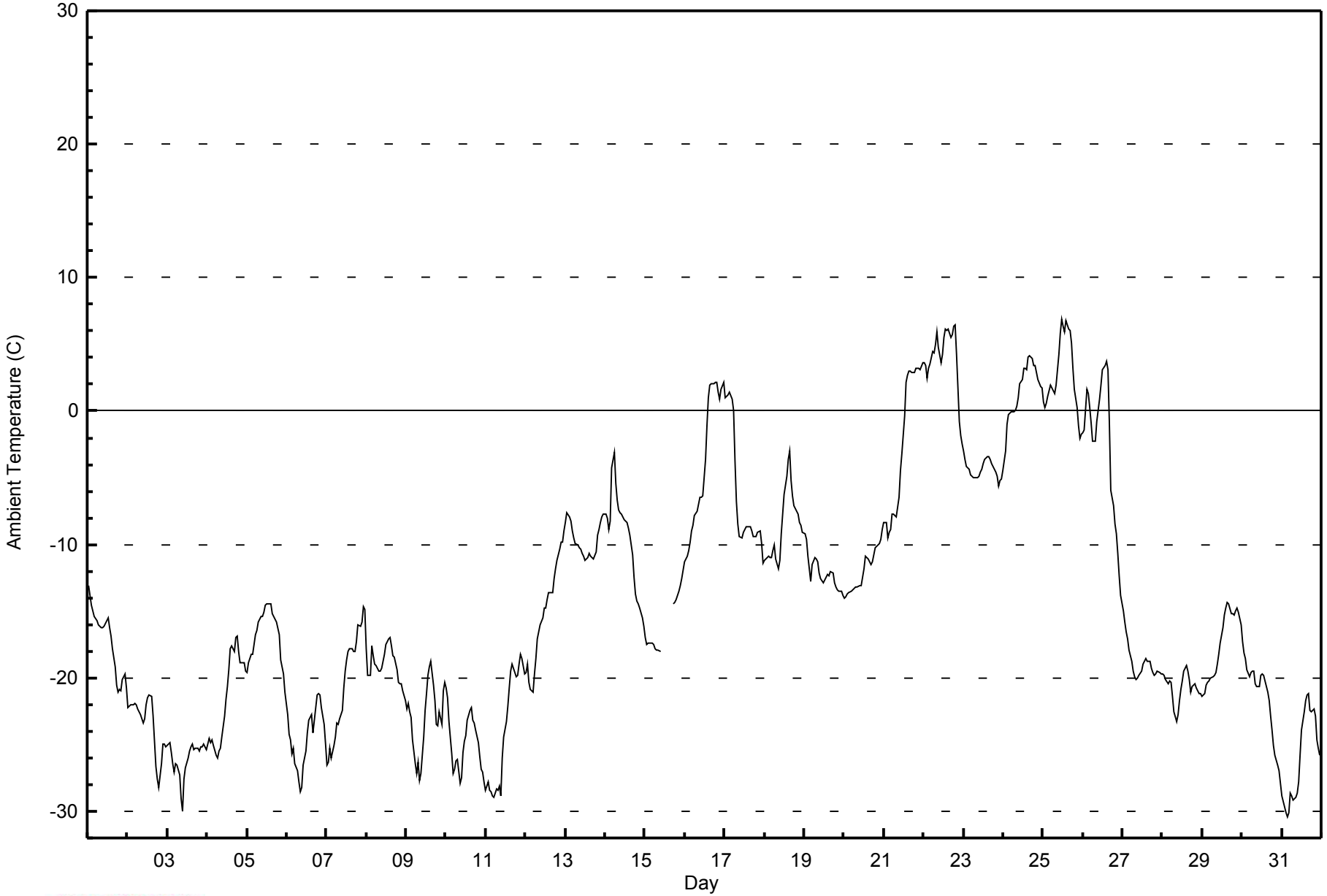
M - Maintenance

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	233	31.61	31.61
-20 - 0	408	55.36	86.97
0 - 10	96	13.03	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mildred Lake - January 2015

Maximum Value: 100 % on Jan 26 01:00

Maximum Daily Average: 95.6 % on Jan 23

Minimum Value: 56 % on Jan 8 15:00

Minimum Daily Average: 67.8 % on Jan 8

Maximum Diurnal Average: 82.7 % at hour 1

Minimum Diurnal Average: 76.4 % at hour 14

Monthly Average: 80.3 %

Percentiles: P_1 = 65 P_{10} = 72 Q_1 = 76 Median = 79 Q_3 = 85 P_{90} = 91 P_{99} = 98

Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

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-Jan	86	84	81	81	83	82	83	84	84	84	83	83	82	81	79	77	78	81	81	80	81	75	70	77	80.9	86
2-Jan	80	77	76	76	77	75	76	78	79	80	80	77	74	71	72	78	79	80	79	79	78	76	76	76	77.1	80
3-Jan	77	76	76	75	77	75	71	71	75	76	74	71	69	66	66	68	71	74	77	74	73	75	77	76	73.3	77
4-Jan	77	78	78	77	74	73	73	73	73	74	73	70	72	71	69	69	70	73	74	73	72	73	74	73	73.2	78
5-Jan	73	76	75	73	73	73	74	73	72	74	72	70	70	69	65	64	66	68	71	74	78	76	74	78	72.2	78
6-Jan	80	80	80	79	79	78	78	77	77	76	76	75	76	78	78	79	79	79	77	77	77	78	78	78	77.8	80
7-Jan	78	78	78	77	78	78	79	78	78	79	78	78	78	80	80	81	82	82	81	76	75	75	76	78	78.4	82
8-Jan	78	79	80	71	66	66	68	69	68	68	66	63	60	58	56	59	63	68	67	71	70	69	71	73	67.8	80
9-Jan	74	72	72	72	76	77	77	76	76	76	71	67	66	65	66	68	72	76	78	77	73	77	74	75	73.0	78
10-Jan	78	78	79	79	78	79	78	79	76	77	76	73	71	72	73	74	77	77	78	78	78	77	78	77	76.7	79
11-Jan	76	76	76	76	76	75	76	76	76	75	75	73	71	71	71	72	73	74	75	76	76	76	78	81	75.1	81
12-Jan	82	82	82	82	82	83	83	83	83	86	86	85	84	82	83	84	84	84	84	85	85	85	85	86	83.8	86
13-Jan	87	87	88	88	88	89	90	90	88	87	85	82	79	79	79	82	87	88	89	90	90	90	89	88	86.6	90
14-Jan	89	86	86	90	88	88	88	89	88	86	85	83	84	80	81	81	81	80	79	79	80	80	79	79	83.7	90
15-Jan	79	79	79	78	76	76	77	76	74	74	M	M	M	M	M	M	M	75	76	79	79	79	80	81	--	81
16-Jan	82	83	84	85	85	85	85	85	86	86	86	86	85	84	83	80	79	78	75	73	72	71	69	70	80.7	86
17-Jan	75	74	74	75	75	76	85	85	85	83	80	80	82	84	87	87	88	90	92	95	95	95	93	91	84.5	95
18-Jan	92	91	91	91	91	91	91	91	90	91	90	88	84	83	81	81	87	91	92	93	93	93	95	94	89.7	95
19-Jan	94	93	92	92	91	94	92	91	91	90	89	89	89	89	89	89	90	90	89	89	89	89	89	88	90.4	94
20-Jan	88	88	88	88	88	88	88	87	87	86	86	84	82	79	81	82	83	84	84	83	83	84	85	87	85.2	88
21-Jan	89	89	91	92	92	91	90	89	88	86	81	79	74	70	75	76	77	79	80	78	78	77	79	78	82.4	92
22-Jan	79	80	84	81	81	77	77	76	74	82	91	88	83	78	77	74	75	74	72	69	77	96	98	95	80.7	98
23-Jan	93	89	87	89	96	97	97	97	97	97	97	97	97	97	98	98	98	98	97	97	97	96	96	97	95.6	98
24-Jan	97	98	99	UO	UO	UO	UO	UO	UO	UO	UO	92	88	89	91	84	79	79	79	75	74	73	72	73	--	99
25-Jan	80	84	83	85	93	95	98	97	96	87	80	75	77	79	78	77	76	78	89	93	94	97	99	100	87.0	100
26-Jan	100	98	79	78	82	88	93	93	87	83	79	75	72	71	70	73	86	96	96	95	93	90	86	85	85.3	100
27-Jan	82	81	80	79	77	76	78	80	79	77	76	75	74	73	72	74	75	77	80	80	80	80	81	81	77.8	82
28-Jan	81	81	81	81	80	80	81	80	80	79	76	73	73	73	74	76	79	80	78	77	76	76	75	75	77.6	81
29-Jan	77	80	79	77	77	78	79	79	79	79	79	81	81	81	82	82	83	85	85	86	86	85	84	84	81.2	86
30-Jan	82	80	79	80	78	78	78	77	78	78	77	73	68	68	68	69	71	71	72	73	74	75	76	78	75.0	82
31-Jan	77	77	77	76	76	76	76	76	76	76	76	74	71	70	71	71	72	75	77	76	77	79	80	79	75.5	80
	82.7	82.5	81.8	80.7	81.0	81.3	81.9	81.8	81.3	81.0	80.1	78.7	77.2	76.4	76.5	77.0	78.6	80.2	80.8	80.7	80.8	81.2	81.2	81.6	Diurnal Average	
	100	98	99	92	96	97	98	97	97	97	97	97	97	97	98	98	98	98	97	97	97	97	99	100	Diurnal Maximum	

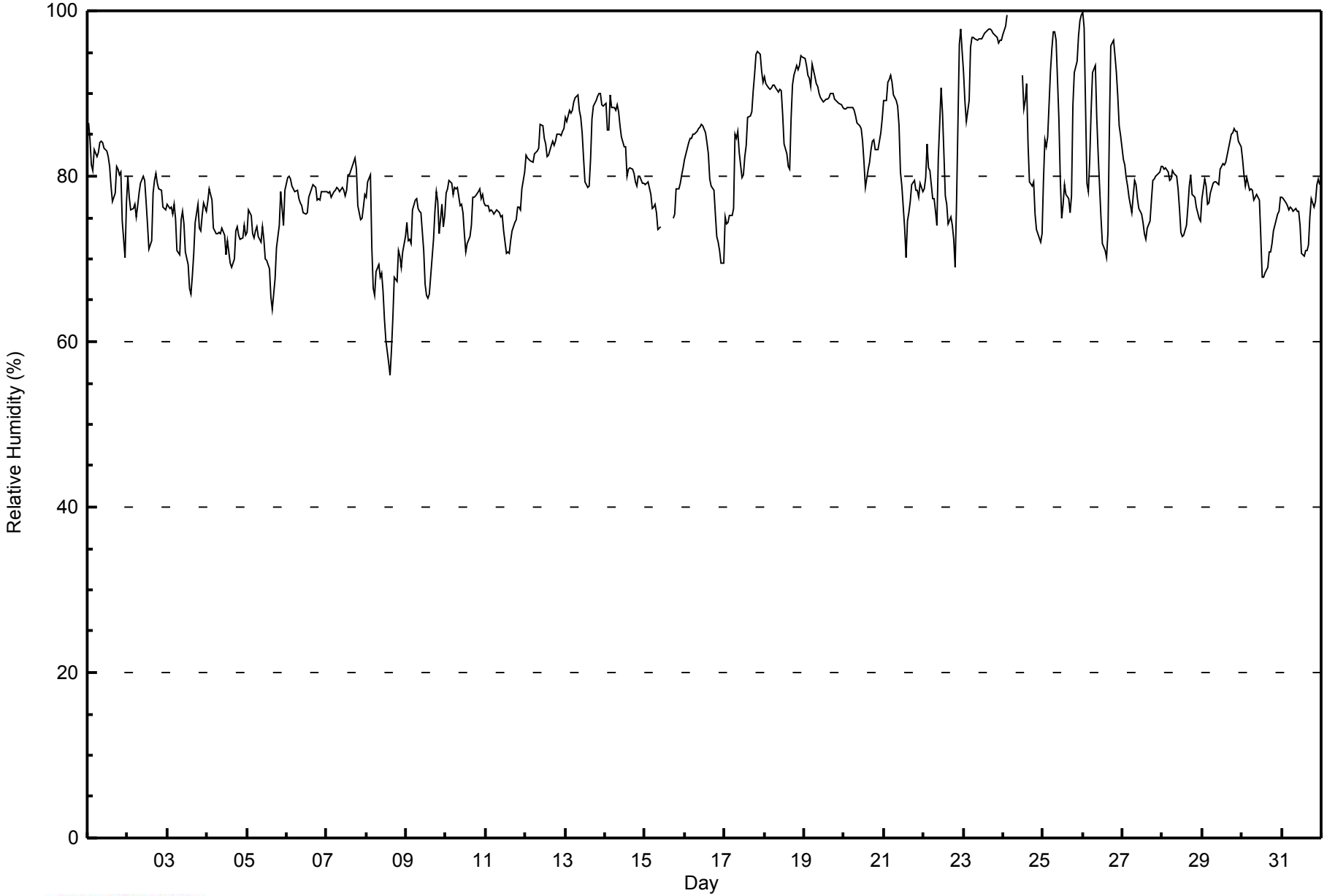
M - Maintenance UO - Unstable Operation

WBEA

Hourly Averages

Relative Humidity (RH) - %

Mildred Lake - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Mildred Lake - January 2015

Maximum Speed: 22 km/h on Jan 22 14:00

Maximum Daily Speed Average: 12.8 km/h on Jan 27

Minimum Speed Value: 0 km/h on Jan 10 05:00

Minimum Daily Speed Average: 0.9 km/h on Jan 7

Maximum Diurnal Speed Average: 3.4 km/h at hour 18

Minimum Diurnal Speed Average: 0.5 km/h at hour 2

Monthly Average Velocity: 1.5 km/h 301.2 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 6 Median = 8 Q_3 = 11 P_{90} = 15 P_{99} = 20

Hours in Service: 744

Hours of Data: 734

Hours of Missing Data: 10

Percent Operational Time: 98.7

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-Jan	NNE6	NE8	NE7	NNE6	N8	NNE8	N8	NNE6	NNE7	N9	N9	N9	N8	N15	NNE12	NNE13	N10	N6	N6	N2	NNW4	N9	N7	NNE2	NNE7.5	N15
2-Jan	ENE3	ENE5	NNE5	NNE2	E2	NE6	NNE2	S0	SW5	SSW3	SSE4	SSW3	NW4	N5	N3	NE5	ENE4	WSW1	WSW3	NNE2	N5	N8	NNW6	N7	NNE2.0	N8
3-Jan	N7	N7	N6	N5	NNW5	NNW7	NNW10	NW8	WNW3	E1	NW6	NW11	NW10	WNW10	WNW11	WNW10	WNW11	WNW12	WNW11	WNW12	WNW11	W9	W7	W7	NW7.2	WNW12
4-Jan	WNW9	WNW9	W8	W10	W13	WSW11	WSW12	W14	WSW14	WSW12	WSW14	SW13	SW14	SW13	WSW12	SW11	WSW12	W15	W10	W12	WSW13	WSW15	W17	WSW13	WSW11.7	W17
5-Jan	W10	W10	W7	W10	W8	W6	NW8	WNW12	WNW10	NW10	NW11	NW11	NW11	NW12	NNW15	NNW15	NNW14	NNW12	NNW8	NNW7	N7	N9	N9	N4	NW8.6	NNW15
6-Jan	NE3	NE3	ENE3	ENE6	ENE8	SSW2	SW4	SW3	SSW4	SW5	SW4	SSW4	S3	SE5	SE4	SE4	SSE4	W5	WSW5	WSW8	W7	WSW6	SSW6	SSW7	SSW2.0	WSW8
7-Jan	SE5	S5	S7	S5	S9	S7	S11	S11	S9	S7	SSW12	S8	S2	SW3	WNW3	NNE4	N7	N9	N12	NNE15	N12	NNW13	NNW18	N21	WNW0.9	N21
8-Jan	NNE14	N9	NNW8	NW16	NW16	NW14	NW13	WNW10	NW13	NW11	NW13	NW12	NW13	NW13	NW11	WNW11	W8	WNW11	WNW9	W9	W7	W9	W11	WSW8	NW10.0	NW16
9-Jan	SW10	WSW13	SW11	SSW8	S9	SSW7	S8	S10	SSW9	SSW8	S6	SSE9	S10	SSE9	SE7	ENE5	N7	NNW8	NNW6	NNW7	NNW6	NW6	NNW6	N6	SSW3.0	WSW13
10-Jan	ENE5	ENE8	NE2	WNW1	SSW0	SSE1	SSW4	SSW6	SSW6	SSW5	SSE7	S9	S9	SSE8	SSE9	SE6	SE5	S3	SW4	S3	SSW6	SSW3	SSW5	SSW5	S3.8	S9
11-Jan	SSW5	SSE4	SSW6	SE5	SSW5	SW6	S4	S5	SSW6	SSW6	SSE6	SSE10	SSE9	SSE10	SSE9	S10	S11	S8	S9	S8	S13	S11	S6	S7	S7.1	S13
12-Jan	S10	S10	S4	ESE2	E3	ESE3	ESE3	NE2	NE1	NNE2	NNE2	SE1	S3	SSE2	SSE5	SSE6	SSE8	S7	S7	S8	S8	SSE8	SSE7	SSW8	SSE4.2	S10
13-Jan	SW8	E3	NE3	N11	N12	NNE12	NNE12	NNE9	NNE9	NE7	ENE6	ENE10	ENE8	ENE8	NE5	NE5	NNE5	NNE4	E3	SE9	SE9	SSE9	S10	SSW9	NE3.9	NNE12
14-Jan	SSW11	SW9	SW8	SW9	WSW5	WNW8	N14	NNE14	NE11	NE9	NE8	NE8	NE7	NE9	NE9	NNE9	NE11	NE14	NE11	NNE10	NNE10	NNE10	NNE9	NE11	NNE5.9	NE14
15-Jan	NE11	NE12	NE10	NE7	NE6	NE7	NE8	NE7	NE7	ENE6	M	M	M	M	M	M	SSE13	SSE14	SSE19	SSE18	SSE18	SSE19	SSE21	SSE17	SE7.0	SSE21
16-Jan	SSE19	S16	S15	SSE15	S14	S13	S17	S18	S16	S11	SSW7	S5	SSW8	WSW8	WNW14	WNW15	W16	W16	W18	WNW22	W17	W15	W20	WNW20	SW9.4	WNW22
17-Jan	WNW14	WNW17	WNW15	WNW14	WNW16	NW12	NNE12	NNE10	NNE9	NE11	NNE9	NNE8	NNE8	NNE8	NNE7	NNE5	N7	N8	NNE4	WNW1	WSW3	SSW5	S6	S8	NNW5.0	WNW17
18-Jan	SSW9	SSW9	SSW10	SSW10	SSW8	SSW9	SSW8	SSW8	SSW7	SSW7	S6	S7	SSE9	SSE10	SSE4	SSE5	S8	SSW8	SSW8	SE4	SE4	SSE3	S4	S4	S6.4	SSW10
19-Jan	SSE3	SE2	ENE3	NNW4	NNE2	N4	N7	N6	N5	N7	N7	NNW7	N7	NNW6	N6	N6	N7	N6	N8	N7	N6	NNE7	NNE7	NNE8	N5.3	NNE8
20-Jan	N7	N6	N6	N6	N6	N5	N5	N5	N4	N3	NNW2	WSW1	SSW2	S7	SSE9	S6	SSE6	S8	S9	S11	S10	S11	S12	SSE10	SSE2.0	S12
21-Jan	SSE10	S12	S8	S11	SSE11	SSE16	SSE16	S10	S9	SSE10	SSE15	SSE12	SSW12	SW20	SW16	WSW12	W16	W17	W18	WSW14	WSW15	WSW17	WSW15	W12	SSW9.9	SW20
22-Jan	W9	WSW7	SW9	WSW12	WSW8	W11	W12	W15	WNW18	WNW20	WNW17	WNW16	WNW21	WNW22	W15	W14	WSW12	W14	WNW16	WNW15	NNW9	NNE14	NNE10	NNE9	WNW10.9	WNW22
23-Jan	NNE10	NNE9	NNE7	NE8	NNE7	NNE7	NNE6	NNE5	N4	NNE4	N6	NNE6	NNW4	N4	SSW4	SW5	SSE3	ESE4	S2	S2	WSW1	SSE2	SE2	SW3	NNE2.7	NNE10
24-Jan	SW3	SE4	SSE8	SE6	AF	AF	AF	AF	NW7	WNW8	WNW14	W9	WNW13	NW5	N4	NW12	NW12	WNW11	WNW8	W8	WNW7	W7	WSW8	SW8	W6.0	WNW14
25-Jan	SSE8	SSE10	S9	SSW7	SSW13	S13	S13	SSE7	WSW7	W14	W18	WNW15	W10	W9	WNW12	NW11	NW12	N10	NNE8	NNE8	NE7	ESE2	S5	SW5	WSW4.1	W18
26-Jan	SSW5	SSW6	WSW10	SW8	SSE7	SSE6	SSW7	SW8	WSW7	WSW8	WSW7	W10	WSW9	W9	W6	WSW1	N16	NNE21	NNE18	NNE18	NNE18	NNE16	NNE18	NNE16	NNW3.2	NNE21
27-Jan	NNE16	NNE15	NNE16	NNE15	NNE13	NNE14	NNE12	NNE13	NNE11	NE10	NNE11	NNE10	NNE12	NNE13	NNE12	NE13	NNE13	NNE14	NNE14	NNE14	NNE11	NNE13	NNE15	NNE13	NNE12.8	NNE16
28-Jan	NNE15	NNE14	N13	N12	NNW11	N8	N9	NNE6	NE3	N3	N6	NNW6	NW4	SW3	SSE2	ENE4	NNE5	NE6	NE7	ENE6	ENE7	ENE7	ENE5	E4	NNE5.4	NNE15
29-Jan	ENE3	SE3	SSE6	S9	S8	SSE7	SSE7	SSE10	SE9	SSE9	SSE9	SSE5	SE5	SSW4	SE5	ESE3	NNE6	N10	N10	NNE11	N10	NNE11	N12	NNE11	E2.5	N12
30-Jan	NNE15	NNE13	NNE15	NNE12	NE12	NNE10	NNE12	NNE12	NNE11	NNE9	NNE11	NNE13	NNE13	NNE13	NE11	NE10	NE10	NNE10	NNE9	NNE7	NNE7	N8	N7	N5	NNE10.5	NNE15
31-Jan	NNE3	NNW2	N3	SE1	S4	SSW4	S4	S5	SSW6	S5	SSE7	S7	SSE9	SSE10	SSE8	SSE8	SSE10	S6	S7	S8	S6	S7	S6	SSE7	S5.3	SSE10
	N0.5	N0.5	W0.6	W1.1	WNW0.9	WNW0.9	NW0.7	WNW0.8	W1.5	WNW1.6	WNW2.0	W1.7	W2.1	WNW2.0	WNW1.5	NW2.0	NW2.4	NW3.4	NW2.7	NW2.1	NW1.6	NW1.5	WNW2.0	WNW1.4	Diurnal Average	
	SSE19	WNW17	NNE16	NW16	WNW16	SSE16	S17	S18	WNW18	WNW20	W18	WNW16	WNW21	WNW22	SW16	NNW15	N16	NNE21	SSE19	WNW22	SSE18	SSE19	SSE21	N21	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Jan 16 20:00

Minimum Value: 1 km/h on Jan 2 11:00

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:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

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

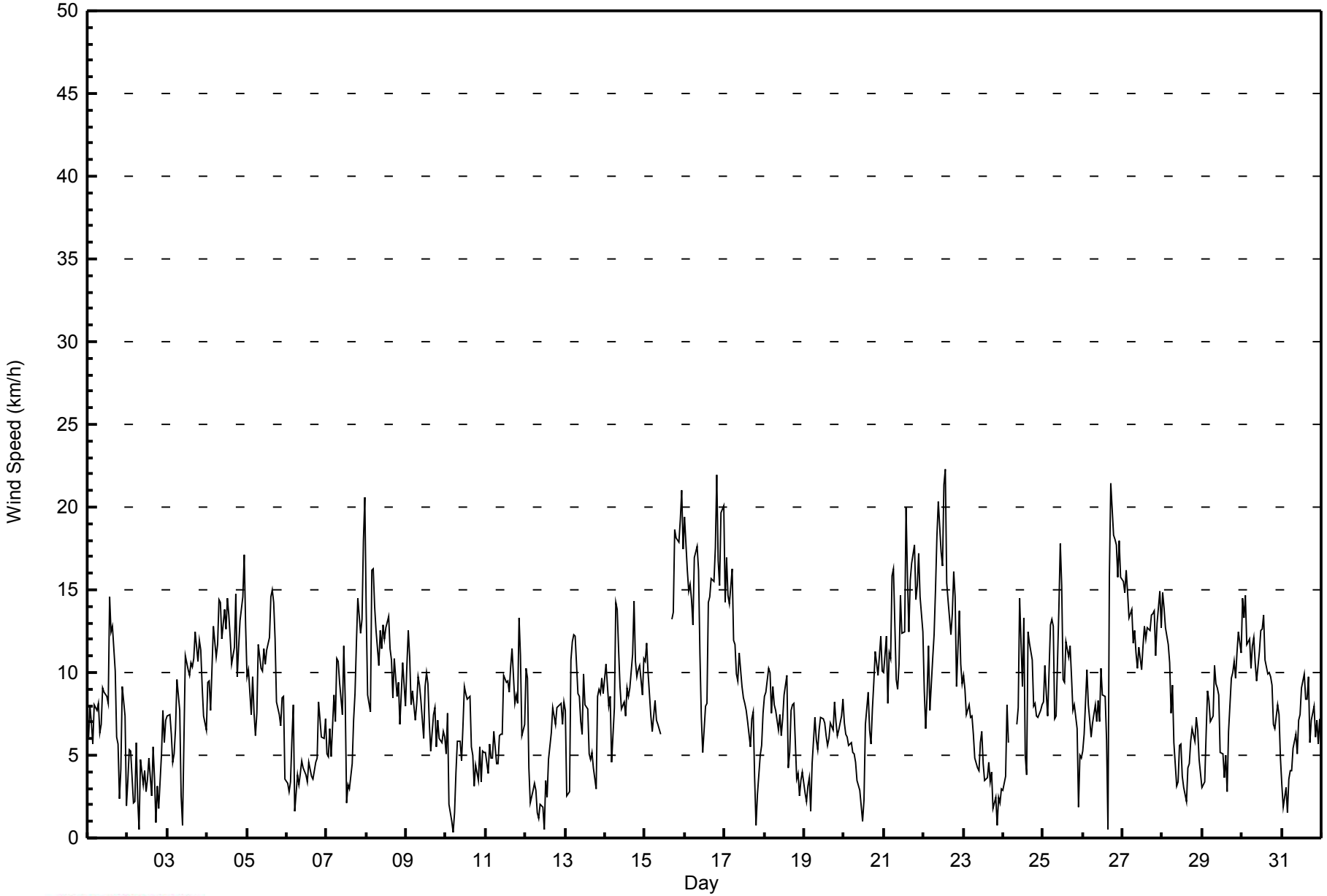
M - Maintenance AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Mildred Lake - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	172	23.43	23.43
6 - 11	386	52.59	76.02
12 - 19	166	22.62	98.64
20 - 28	10	1.36	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Mildred Lake - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	19	17	10	10	6	6	16	14	21	19	12	8	1	4	3	6	172
6 - 11	54	50	31	11	0	0	6	43	56	33	12	14	28	20	12	16	386
12 - 19	9	44	4	0	0	0	0	13	12	3	4	17	21	19	14	6	166
20 - 28	1	1	0	0	0	0	0	1	0	0	1	0	1	5	0	0	10
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	83	112	45	21	6	6	22	71	89	55	29	39	51	48	29	28	734

Total Number of Valid Hours: 734

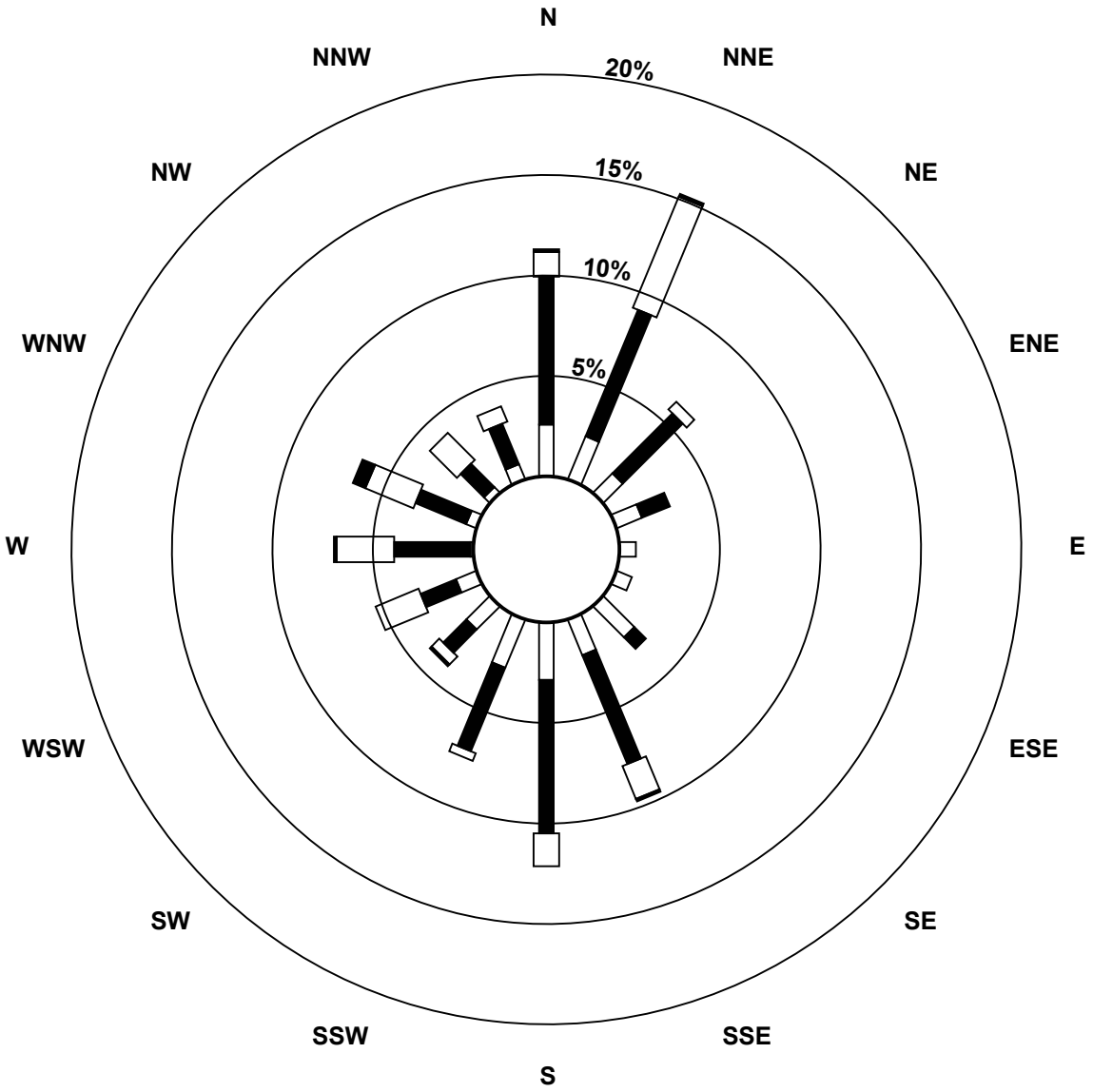
Total Number of Hours: 744

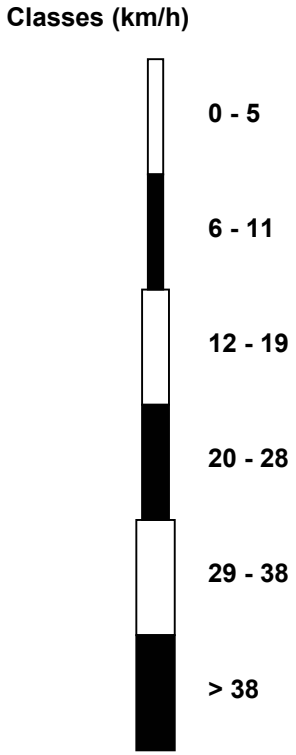
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Mildred Lake (AMS 2)





Total Number of Valid Hours: 734

Direction of Maximum Speed: 293 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 25.6 deg on Jan 27

Direction of Minimum Speed: 198 deg on Jan 10 05:00

Direction of Minimum Daily Speed Average: 0.9 deg on Jan 7

Monthly Average Direction: 255.1 deg

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Percent Operational Time:	98.7

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-Jan	32	34	35	22	10	18	8	18	20	8	4	4	4	8	22	21	7	351	4	5	344	354	358	20	11.6
2-Jan	66	57	30	28	93	38	26	175	217	201	157	195	319	357	2	38	60	246	246	29	349	6	336	8	18.0
3-Jan	3	10	8	0	342	336	344	325	292	80	305	309	304	300	301	298	297	299	295	294	290	273	272	261	308.9
4-Jan	296	296	273	262	265	258	257	261	248	238	247	234	225	221	237	236	247	272	264	262	243	256	271	254	254.0
5-Jan	259	274	270	270	269	279	307	302	303	305	306	308	310	314	333	328	336	329	346	348	355	2	359	356	313.7
6-Jan	38	55	75	65	72	201	219	215	210	216	224	200	183	143	131	124	152	265	258	255	260	246	197	195	199.5
7-Jan	142	174	176	184	174	186	182	189	178	189	197	191	170	227	287	20	7	3	359	16	355	332	332	355	295.0
8-Jan	14	2	340	315	319	317	307	302	306	305	308	307	310	311	309	303	280	286	284	264	274	268	271	241	305.0
9-Jan	229	245	219	205	177	195	184	184	201	200	175	164	173	159	132	57	355	347	336	345	346	326	336	3	208.7
10-Jan	63	67	41	285	198	161	195	209	206	198	164	185	177	164	165	140	135	182	216	182	199	203	199	208	175.4
11-Jan	207	147	212	130	196	216	184	173	206	200	168	163	161	158	159	171	176	190	185	189	179	181	191	183	179.3
12-Jan	178	182	182	114	82	105	109	41	47	33	24	139	181	150	151	159	167	181	174	170	174	160	168	207	165.2
13-Jan	223	93	54	7	6	14	22	24	30	38	57	58	63	62	45	40	18	30	82	137	132	156	183	211	52.2
14-Jan	213	226	217	214	250	297	10	27	35	36	41	54	46	41	35	33	43	48	34	28	29	32	26	45	30.0
15-Jan	45	43	44	40	49	46	42	43	38	57	M	M	M	M	M	M	152	152	160	162	164	164	162	165	125.1
16-Jan	165	170	175	168	173	178	170	172	172	190	208	172	213	246	282	283	273	268	275	282	270	266	276	287	226.5
17-Jan	294	286	294	288	290	311	14	27	27	35	30	31	25	29	33	27	359	9	26	299	251	210	186	186	338.4
18-Jan	196	199	201	207	205	207	201	204	210	195	191	172	157	162	166	157	190	207	213	124	125	163	177	181	189.3
19-Jan	149	134	66	348	16	10	7	10	3	354	3	343	352	346	353	3	9	2	351	0	2	12	12	12	3.7
20-Jan	6	359	352	356	356	9	8	1	350	8	348	240	205	173	168	170	152	184	172	169	171	170	170	167	162.0
21-Jan	164	171	184	175	164	161	168	177	172	163	162	157	195	220	223	241	259	271	272	257	257	254	252	267	212.7
22-Jan	268	245	218	239	252	264	260	270	290	296	302	294	290	293	277	271	256	267	289	292	341	27	30	29	286.1
23-Jan	21	17	21	37	32	27	21	18	8	28	10	12	332	349	209	219	151	102	189	183	245	165	146	229	23.2
24-Jan	219	126	163	141	AF	AF	AF	AF	304	302	295	272	295	308	353	305	305	293	284	272	284	260	244	228	280.9
25-Jan	166	162	173	212	198	175	187	165	247	271	281	290	280	278	288	307	315	350	27	25	44	103	191	220	251.4
26-Jan	199	208	247	228	168	156	204	214	257	254	256	259	249	271	264	247	6	23	24	21	27	24	26	21	340.3
27-Jan	30	25	31	27	23	23	23	22	22	35	29	27	33	33	33	34	21	23	24	23	25	19	14	17	25.6
28-Jan	13	12	4	353	347	353	357	15	56	5	355	348	318	233	152	63	27	35	56	69	73	73	71	94	19.2
29-Jan	68	127	167	169	171	161	148	157	145	149	152	168	130	196	145	109	19	8	8	15	7	15	8	19	96.6
30-Jan	23	23	26	23	35	26	18	21	26	17	27	17	20	13	47	36	37	32	29	19	20	10	9	7	23.9
31-Jan	26	333	354	129	178	200	183	178	194	188	166	179	163	158	161	164	165	181	179	179	185	174	172	159	172.0
	349.4	355.4	276.2	280.5	282.2	294.6	325.5	283.4	278.0	286.2	289.5	281.2	276.6	282.0	291.7	323.1	323.6	322.2	315.0	312.6	310.1	306.5	296.7	286.9	
	Diurnal Average																								

M - Maintenance AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 93 deg on Jan 2 08:00

Minimum Value: 7 deg on Feb 1 00:00

Percentiles: P_1 = 9 P_{10} = 12 Q_1 = 14 Median = 18 Q_3 = 22 P_{90} = 39 P_{99} = 77

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	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-Jan	15	16	16	18	10	15	11	12	15	9	9	9	11	11	15	15	11	12	13	73	19	10	36	71	73
2-Jan	25	16	15	72	56	18	46	93	12	33	18	24	32	19	47	13	14	92	26	58	53	13	15	14	93
3-Jan	9	10	11	20	13	14	14	14	39	93	51	14	16	16	15	17	16	16	19	16	17	17	20	30	93
4-Jan	21	21	29	25	20	22	23	19	18	19	18	20	15	16	22	25	23	27	37	26	24	21	18	22	37
5-Jan	25	25	29	24	26	25	18	15	16	17	16	15	15	19	10	12	12	12	16	11	11	8	15	32	32
6-Jan	16	27	14	12	8	63	8	22	20	11	14	18	22	17	18	16	40	35	32	18	21	20	29	16	63
7-Jan	36	38	20	32	23	19	15	15	17	21	14	33	71	31	42	19	10	12	10	14	16	14	14	21	71
8-Jan	13	8	29	15	14	14	14	13	14	15	15	15	16	14	16	16	26	23	21	21	19	20	17	25	29
9-Jan	21	21	17	21	11	11	12	14	19	16	20	16	15	16	30	41	14	14	15	15	21	20	17	16	41
10-Jan	24	16	72	59	90	75	20	18	15	22	16	16	14	16	14	24	19	42	67	32	21	54	13	14	90
11-Jan	15	29	21	25	36	12	17	28	16	13	14	13	15	15	14	12	13	12	14	16	14	15	13	11	36
12-Jan	13	19	38	61	47	31	33	70	64	38	59	78	21	46	18	14	13	14	15	14	13	25	53	21	78
13-Jan	20	66	64	10	9	12	13	14	17	23	19	18	21	19	22	18	14	18	48	18	15	18	16	19	66
14-Jan	14	20	19	24	73	47	12	17	18	19	21	20	20	20	19	18	19	17	18	17	18	14	15	14	73
15-Jan	16	15	15	19	22	18	17	17	18	19	M	M	M	M	M	M	20	18	13	13	13	12	12	13	22
16-Jan	11	13	13	11	15	16	11	12	11	14	18	46	25	27	21	19	19	19	20	17	20	20	19	17	46
17-Jan	17	19	18	18	16	34	19	20	17	17	17	20	20	22	23	21	13	12	25	63	44	20	14	12	63
18-Jan	11	15	12	11	16	16	10	10	14	12	14	20	12	10	34	21	11	13	26	45	47	71	31	33	71
19-Jan	40	30	25	18	82	54	11	12	13	10	13	9	13	13	14	12	13	16	11	13	12	15	14	13	82
20-Jan	13	12	11	13	12	13	12	15	19	19	22	67	53	17	11	49	62	20	14	11	12	12	13	15	67
21-Jan	15	12	16	13	19	14	11	16	11	15	12	14	27	17	18	24	20	16	17	21	22	22	23	24	27
22-Jan	30	42	22	23	31	22	22	19	18	16	18	19	17	17	20	18	21	22	18	17	48	16	19	18	48
23-Jan	15	16	21	18	17	19	31	22	27	33	13	15	22	42	70	25	23	28	49	35	80	71	56	46	80
24-Jan	54	40	22	34	AF	AF	AF	AF	17	22	17	21	18	56	64	21	15	22	21	31	32	30	27	20	64
25-Jan	21	11	17	25	16	15	16	14	40	21	18	20	24	21	19	15	15	18	14	14	21	55	32	25	55
26-Jan	16	24	24	27	18	55	12	14	30	20	22	18	23	17	26	77	12	15	16	17	18	18	17	17	77
27-Jan	18	19	18	18	18	17	16	17	16	17	17	19	22	19	20	19	15	16	16	16	17	18	13	14	22
28-Jan	13	13	13	14	11	13	12	30	24	30	24	23	42	51	57	22	12	16	14	17	18	16	18	20	57
29-Jan	24	31	20	13	19	19	19	15	17	17	16	27	32	30	26	34	36	11	12	13	11	13	14	15	36
30-Jan	17	18	17	17	18	18	17	17	17	16	18	20	23	19	22	18	17	16	14	14	14	11	10	13	23
31-Jan	52	39	18	73	38	18	34	20	15	18	16	18	16	14	16	14	15	13	13	13	16	12	13	7	73
	54	66	72	73	90	75	46	93	64	93	59	78	71	56	70	77	62	92	67	73	80	71	56	71	
	Diurnal Maximum																								

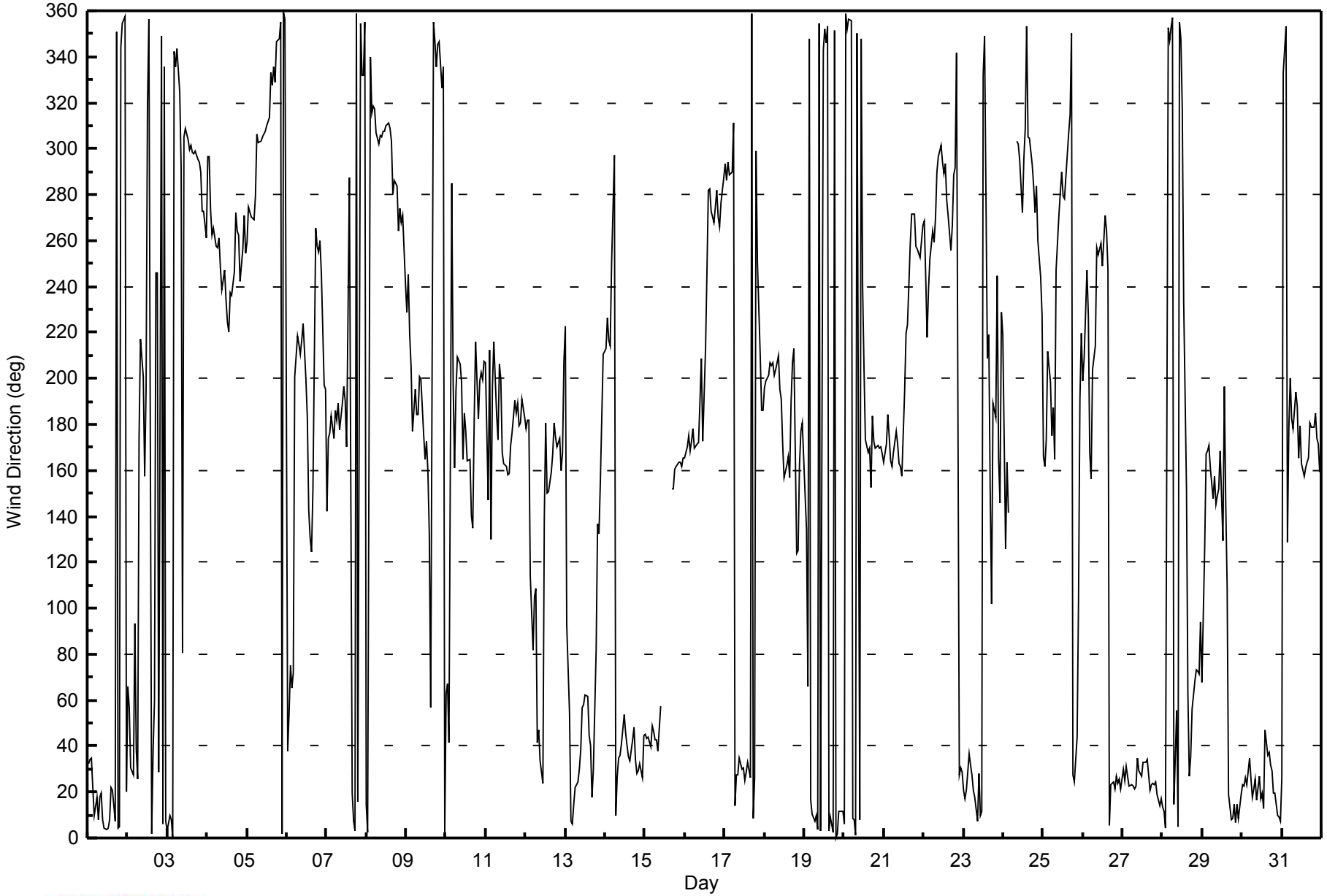
M - Maintenance AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Mildred Lake - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2

Reason: Removal

Start Time (MST)	10:45	End Time (MST)	12:35
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11541008
Cal Gas Concentration	59.4 ppm	Cal Gas Expiry Date	3/26/2012
Gas Cert Reference	cc307191		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5v	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-616	NA
Analyzer Range (mv)	5000	5000	Lamp voltage	908	NA
Calculated slope	0.998878	0.997905	Chamber temp.	44.4	NA
Calculated intercept	0.976628	0.678624	Pressure (mmHg)	713.0	NA
Analyzer Background	27.4	NA	Flow (lpm)	0.521	NA
Analyzer Coefficient	0.897	NA	Intensity	29000	NA

Analyzer make	TEI 43c	Analyzer serial #	43c-77879-387

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.3	NA
as found span	5000	69.9	830.4	832.1	0.998
calibrator zero	5000	0.0	0.0	0.3	0.000
high point	5000	69.9	830.4	832.1	0.998
second point	5000	35.4	420.6	419.8	1.002
third point	5000	17.7	210.3	209.4	1.004
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.001

Corrected As found	831.8	Previous response	830.4	% change	-0.2%

Notes:

Removal Cal.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

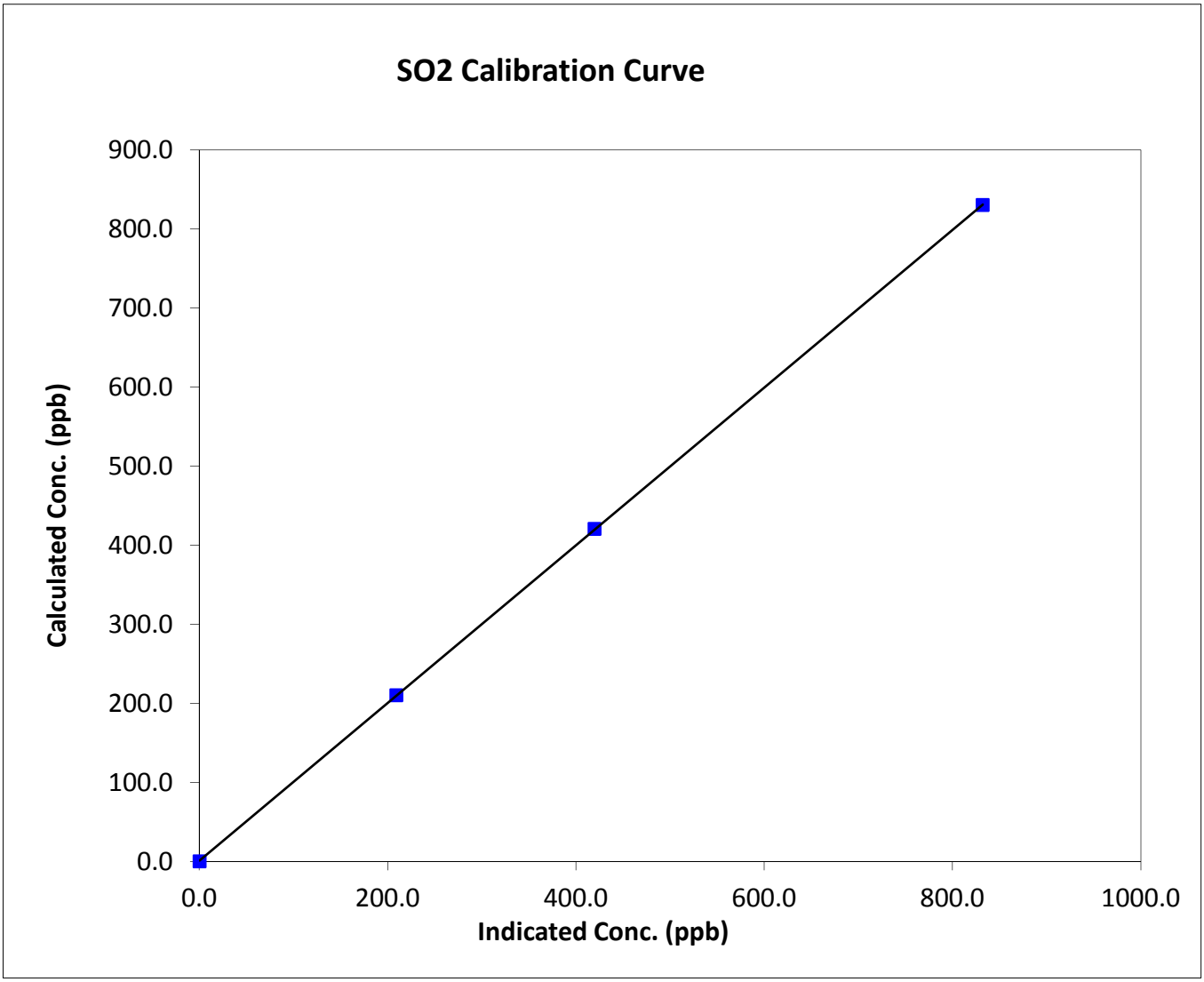
SO_2 Calibration Summary

Station Information

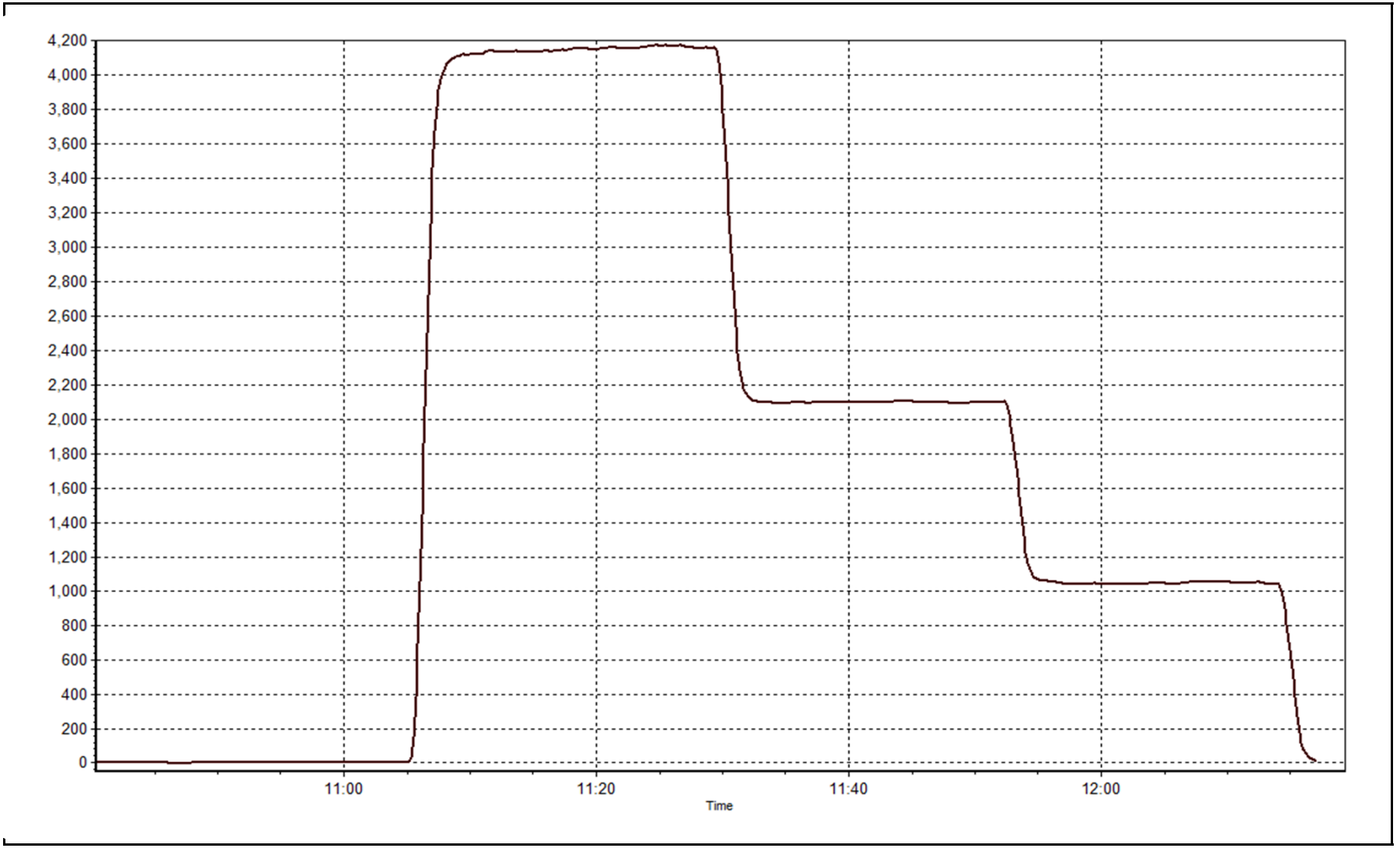
Calibration Date	January 8, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:45	End Time (MST)	12:35
Analyzer make	TEI 43c	Analyzer serial #	43c-77879-387

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999993
830.4	832.1	0.9979		
420.6	419.8	1.0018	Slope	0.997905
210.3	209.4	1.0042		
			Intercept	0.678624



SO2 Calibration Plot Date: January 8, 2015



Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 8, 2015	Previous Calibration	NA
Station Name	Mildred Lake	Station Number	AMS 2

Reason: Install

Start Time (MST)	12:40	End Time (MST)	15:40
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11541008
Cal Gas Concentration	59.4 ppm	Cal Gas Expiry Date	3/26/2012
Gas Cert Reference	cc307191		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5v	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	NA	-652
Analyzer Range (mv)	5000	5000	Lamp voltage	NA	780
Calculated slope	NA	1.006009	Chamber temp.	NA	45.0
Calculated intercept	NA	1.013991	Pressure (mmHg)	NA	713.9
Analyzer Background	NA	28.6	Flow (lpm)	NA	0.459
Analyzer Coefficient	NA	1.111	Intensity	NA	90

Analyzer make	TEI 43i	Analyzer serial #	JC1404901075

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.0	-0.9	NA
high point	5000	69.9	830.4	824.7	1.007
second point	5000	35.4	420.6	416.2	1.010
third point	5000	17.7	210.3	208.5	1.009
calibrator zero	5000	0.0	0.0	-0.9	NA
as left zero	5000	0.0	0.0	-1.4	NA
as left span	5000	69.9	830.4	809.2	1.026
				Average Correction Factor	1.009

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Installation calibration. Zero and span adjusted.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

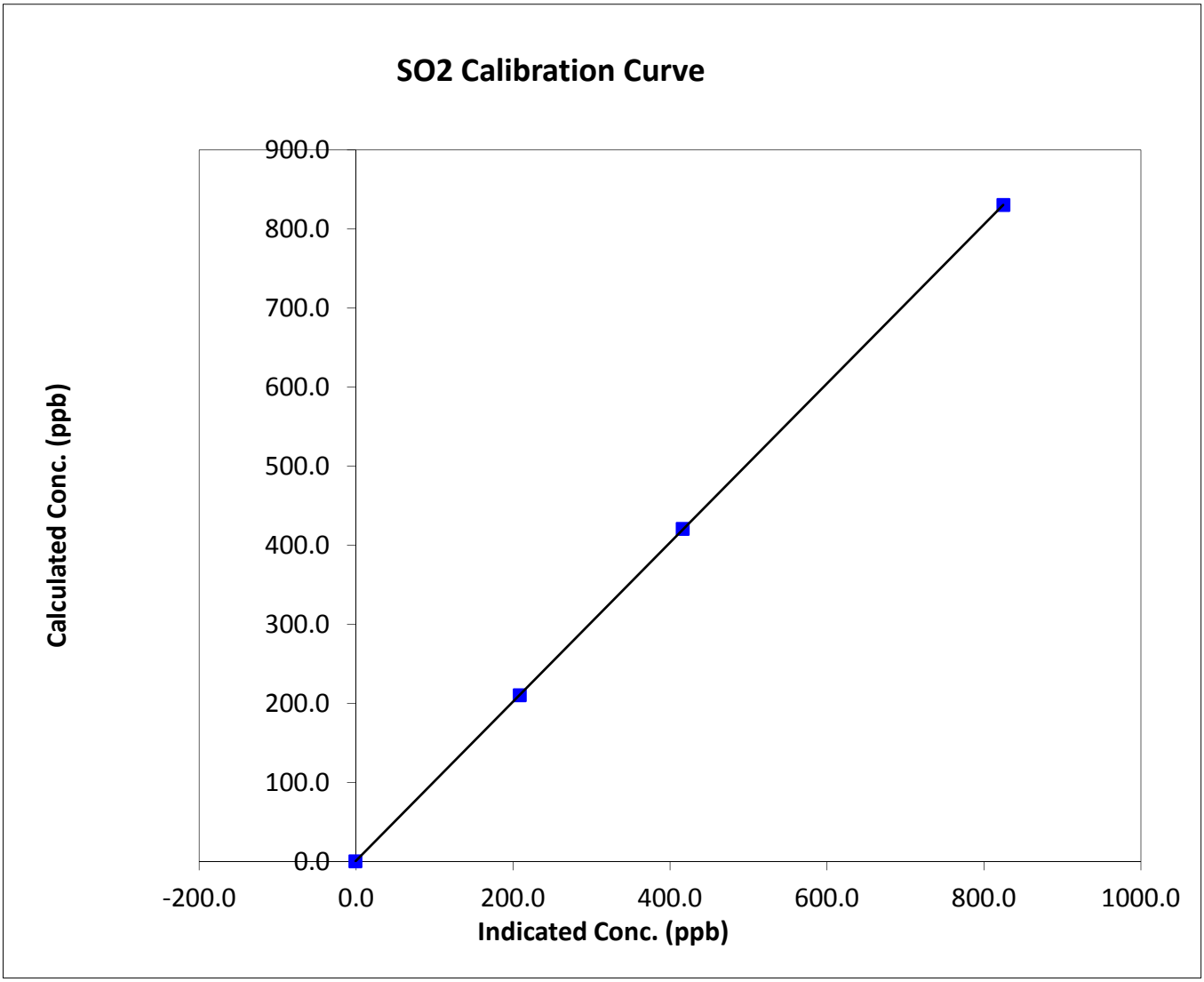
SO_2 Calibration Summary

Station Information

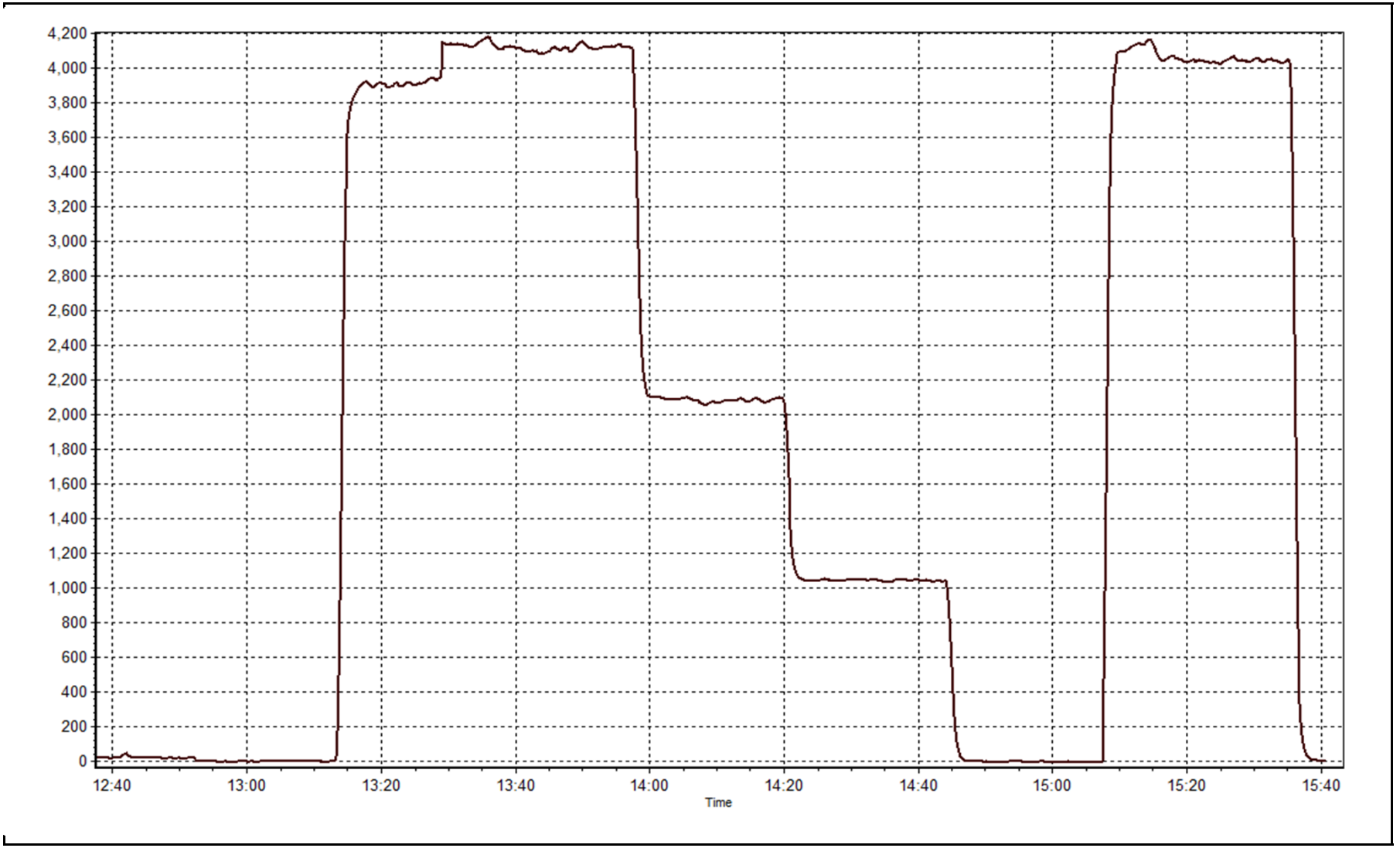
Calibration Date	January 8, 2015	Previous Calibration	NA
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	12:40	End Time (MST)	15:40
Analyzer make	TEI 43i	Analyzer serial #	JC1404901075

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.9	N/A	Correlation Coefficient	0.999997
830.4	824.7	1.0069		
420.6	416.2	1.0104	Slope	1.006009
210.3	208.5	1.0087		
			Intercept	1.013991



SO2 Calibration Plot Date: January 8, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	10:20	End Time (MST)	12:30
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11541008
Cal Gas Concentration	5.04 ppm H2S	Cal Gas Expiry Date	09/09/2017
Gas Cert Reference		SO2 gas conc.	59.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5v	DACS channel #	SE2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-600	-600
Analyzer Range (mv)	5000	5000	Lamp voltage	775	775
Calculated slope	1.016952	0.949796	Chamber temp.	45	45
Calculated intercept	-0.663245	-0.771045	Pressure	535.0	535.0
Analyzer Background	12.7	12.7	Flow	0.990	0.990
Analyzer Coefficient	0.873	0.873	Intensity	87	87
			Converter temp.	328	328

Analyzer make/model	TEI 450i	Analyzer serial #	815129107
Converter make/model	n/a	Converter serial #	n/a

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.8	NA
as found span	4000	63.5	80.0	76.8	1.041
SO2 scrubber check					
calibrator zero	4000	0.0	0.0	0.8	NA
high point	4000	57.3	72.2	76.8	0.940
second point					
third point					
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	0.940

Corrected As found	76.0	Previous response	79.3	% change	4.4%

Notes:

As founds after H2S calibration gas cylinder change.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

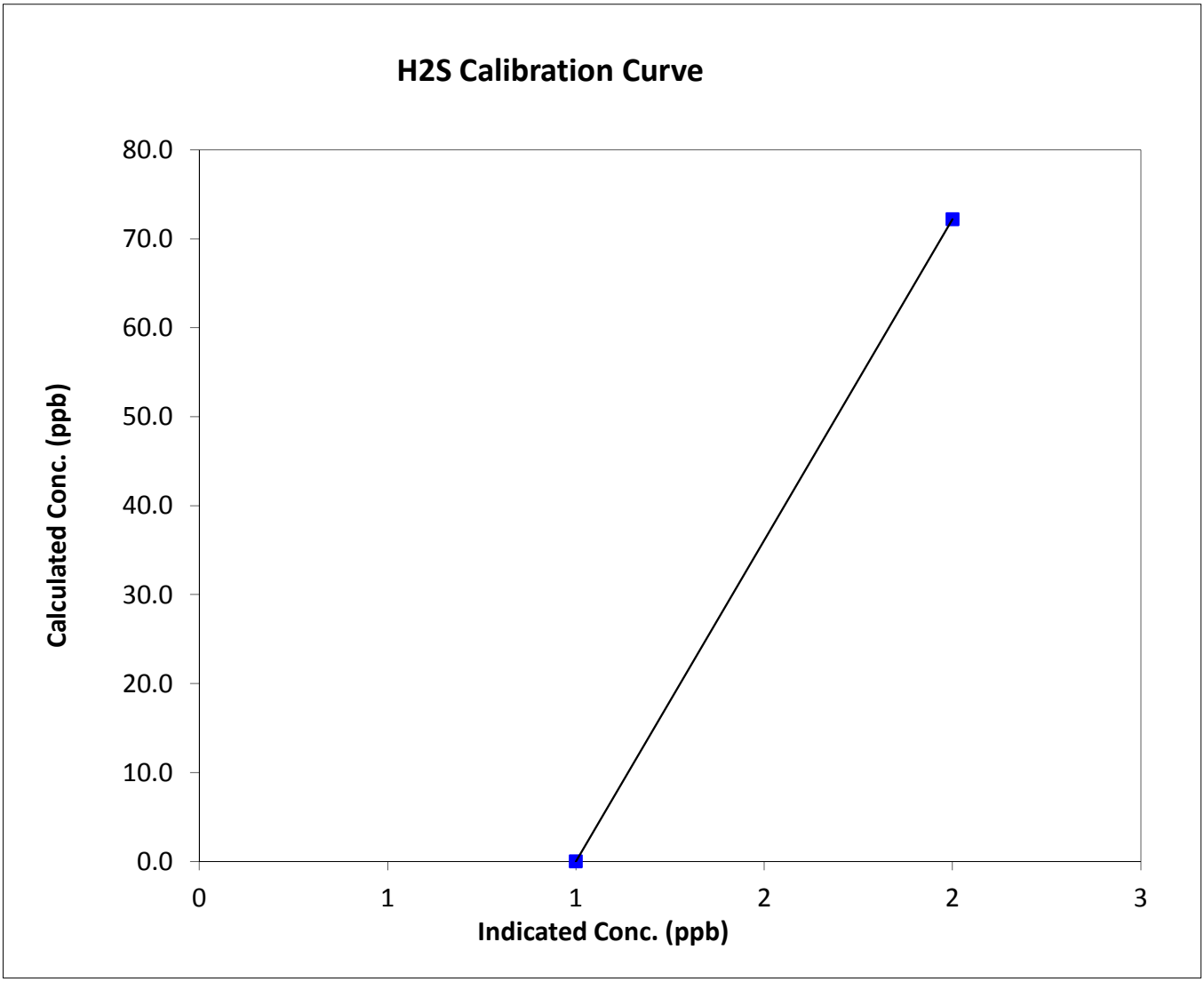
H2S Calibration Summary

Station Information

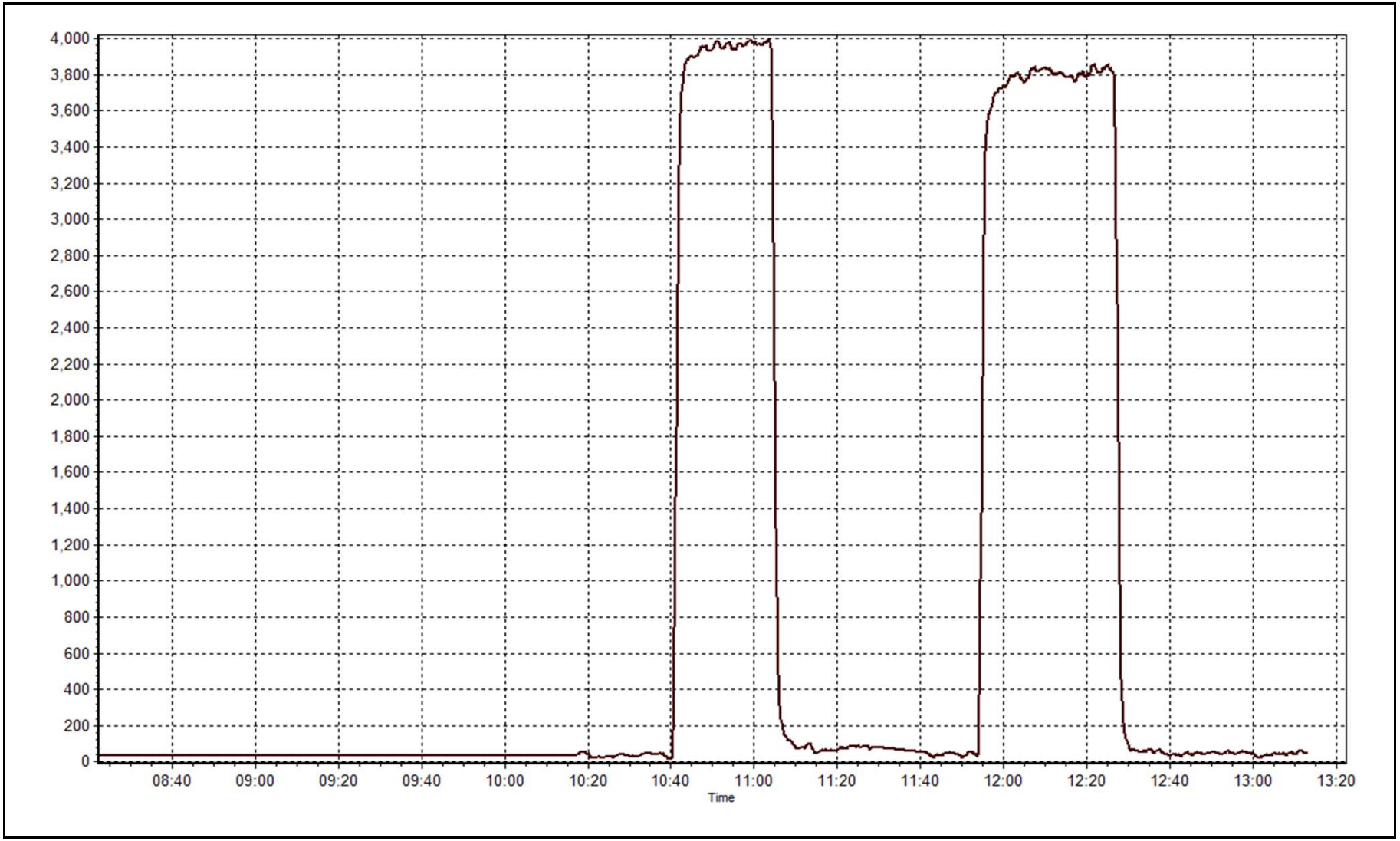
Calibration Date	January 15, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:20	End Time (MST)	12:30
Analyzer make	TEI 450i	Analyzer serial #	815129107

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.8	N/A	Correlation Coefficient	1.000000
72.2	76.8	0.9398		
			Slope	0.949796
			Intercept	-0.771045



H2S Calibration Plot Date: January-15-15



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine	installation of new calibration cylinder	
Start Time (MST)	10:20	End Time (MST)	
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11541008
Cal Gas Concentration	5.59 ppm H2S	Cal Gas Expiry Date	11/03/2009
Gas Cert Reference	cc243460	SO2 gas conc.	59.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5v	DACS channel #	SE2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-600	-600
Analyzer Range (mv)	5000	5000	Lamp voltage	775	775
Calculated slope	1.016952	1.019123	Chamber temp.	45	45
Calculated intercept	-0.663245	-0.779017	Pressure	535.0	535.0
Analyzer Background	12.7	12.7	Flow	0.990	0.990
Analyzer Coefficient	0.873	0.873	Intensity	87	87
			Converter temp.	328	328

Analyzer make/model	TEI 450i	Analyzer serial #	815129107
Converter make/model	n/a	Converter serial #	n/a

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.8	NA
as found span	4000	57.3	80.1	79.3	1.009
SO2 scrubber check					
calibrator zero	5000	0.0	0.0	0.8	NA
high point	4000	57.3	80.1	79.3	1.009
second point					
third point					
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.009

Corrected As found	78.6	Previous response	79.4	% change	1.1%

Notes:

As founds before H2S cylinder change.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

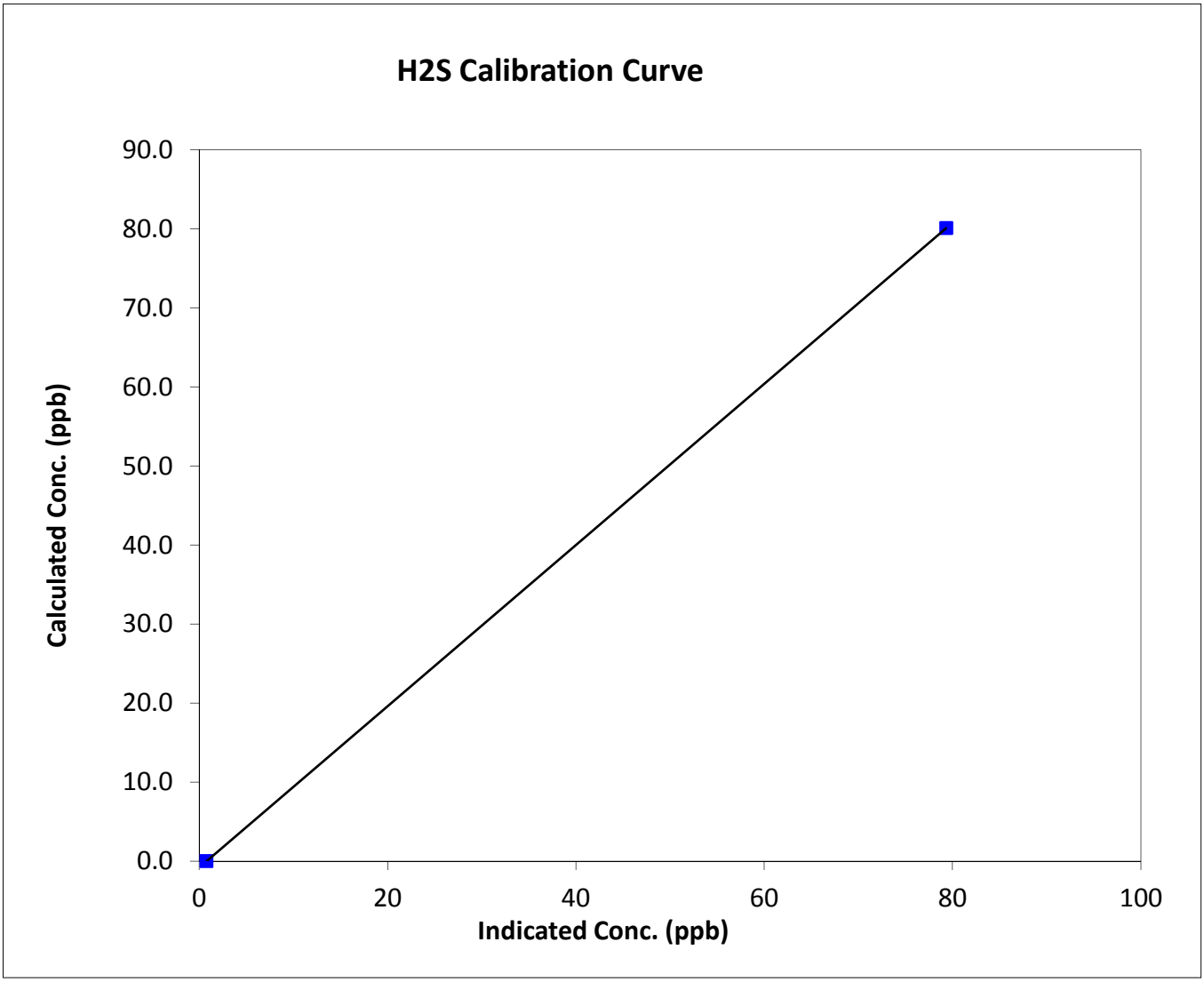
H2S Calibration Summary

Station Information

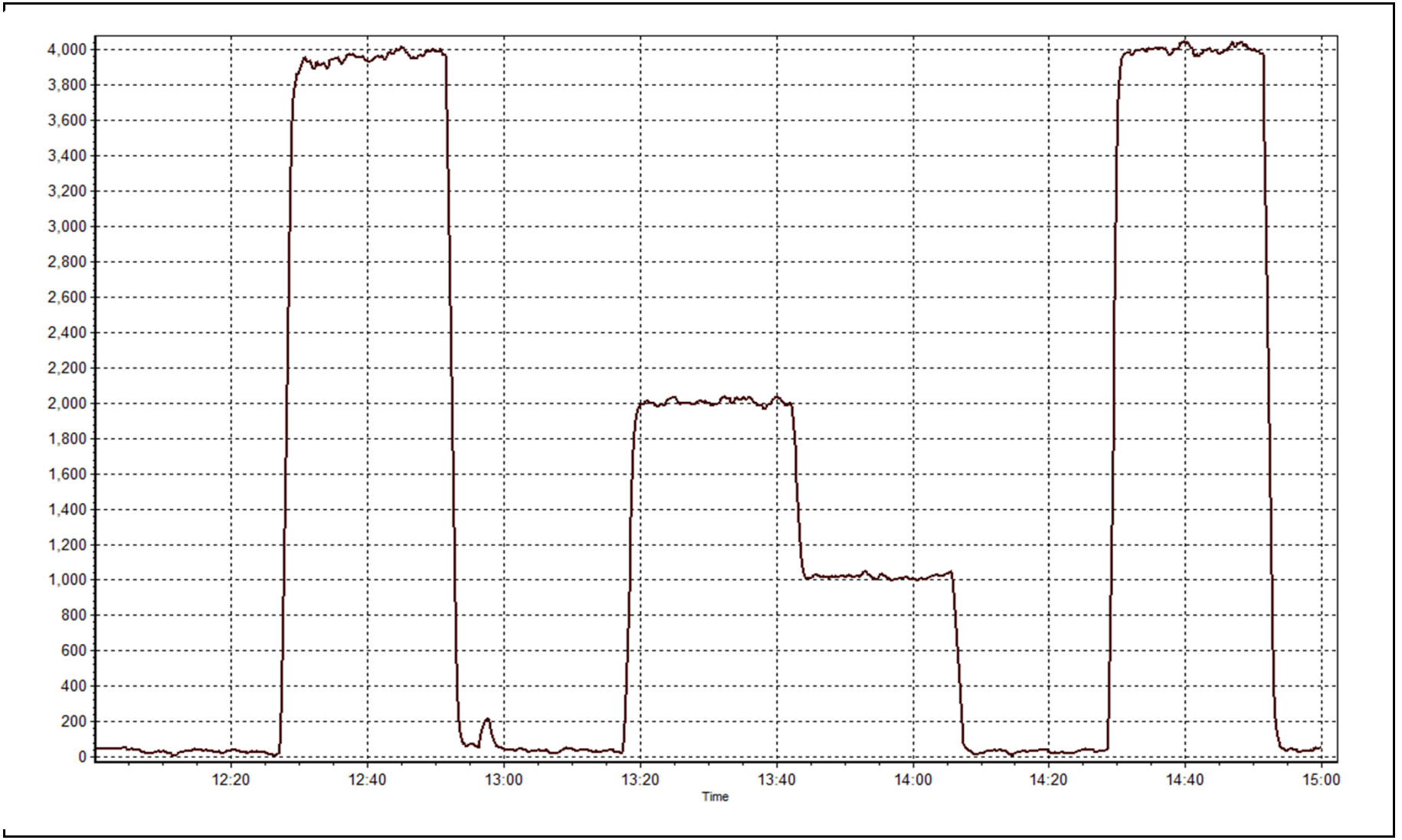
Calibration Date	January 15, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:20	End Time (MST)	
Analyzer make	TEI 450i	Analyzer serial #	815129107

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.8	N/A	Correlation Coefficient	1.000000
80.1	79.3	1.0093		
			Slope	1.019123
			Intercept	-0.779017



H2S Calibration Plot Date: January-15-15



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H2S Calibration Report

Station Information

Calibration Date	January 16, 2015	Previous Calibration	January 15, 2015
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	10:10	End Time (MST)	13:30
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11541008
Cal Gas Concentration	5.04 ppm H2S	Cal Gas Expiry Date	09/09/2017
Gas Cert Reference		SO2 gas conc.	59.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5v	DACS channel #	SE2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-600	-601
Analyzer Range (mv)	100	100	Lamp voltage	775	775
Calculated slope	1.016952	1.002259	Chamber temp.	45	45
Calculated intercept	-0.663245	-0.625935	Pressure	535.0	532.3
Analyzer Background	12.7	13.5	Flow	0.990	0.986
Analyzer Coefficient	0.873	0.917	Intensity	87	87
			Converter temp.	328	328

Analyzer make/model	TEI 450i	Analyzer serial #	815129107
Converter make/model	n/a	Converter serial #	n/a

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.7	NA
as found span	4000	63.5	80.0	76.4	1.048
SO2 scrubber check					
calibrator zero	4000	0.0	0.0	0.7	NA
high point	4000	63.5	80.0	80.5	0.994
second point	4000	31.8	40.1	40.6	0.988
third point	4000	16.0	20.2	20.6	0.977
calibrator zero	4000	0.0	0.0	0.7	NA
as left zero	5000	0.0	0.0	1.2	NA
as left span	4000	63.5	80.0	80.6	0.993
				Average Correction Factor	0.986

Corrected As found	75.6	Previous response	79.3	% change	4.9%

Notes:

Purged cal line after first span. Adjusted span.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

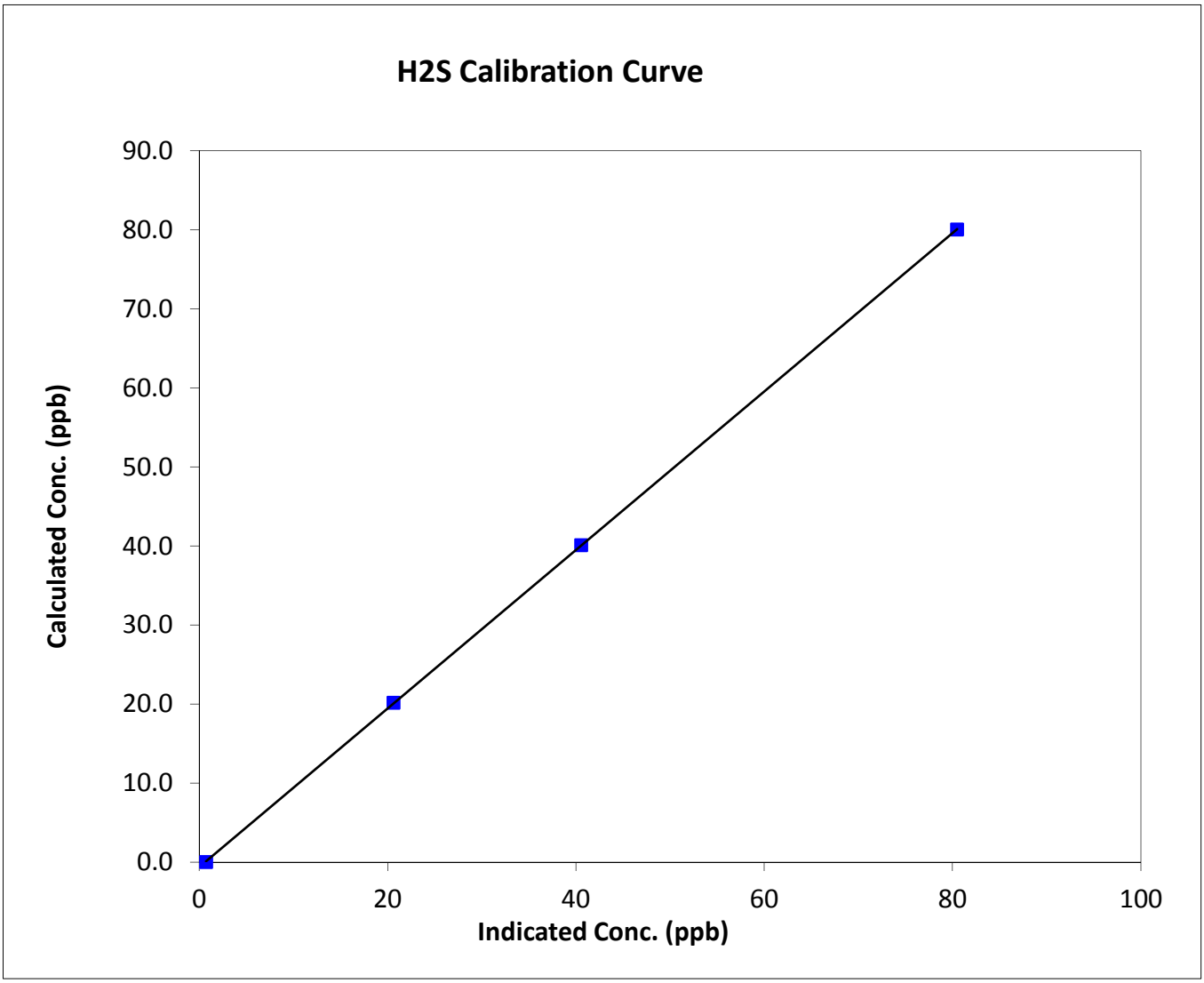
H2S Calibration Summary

Station Information

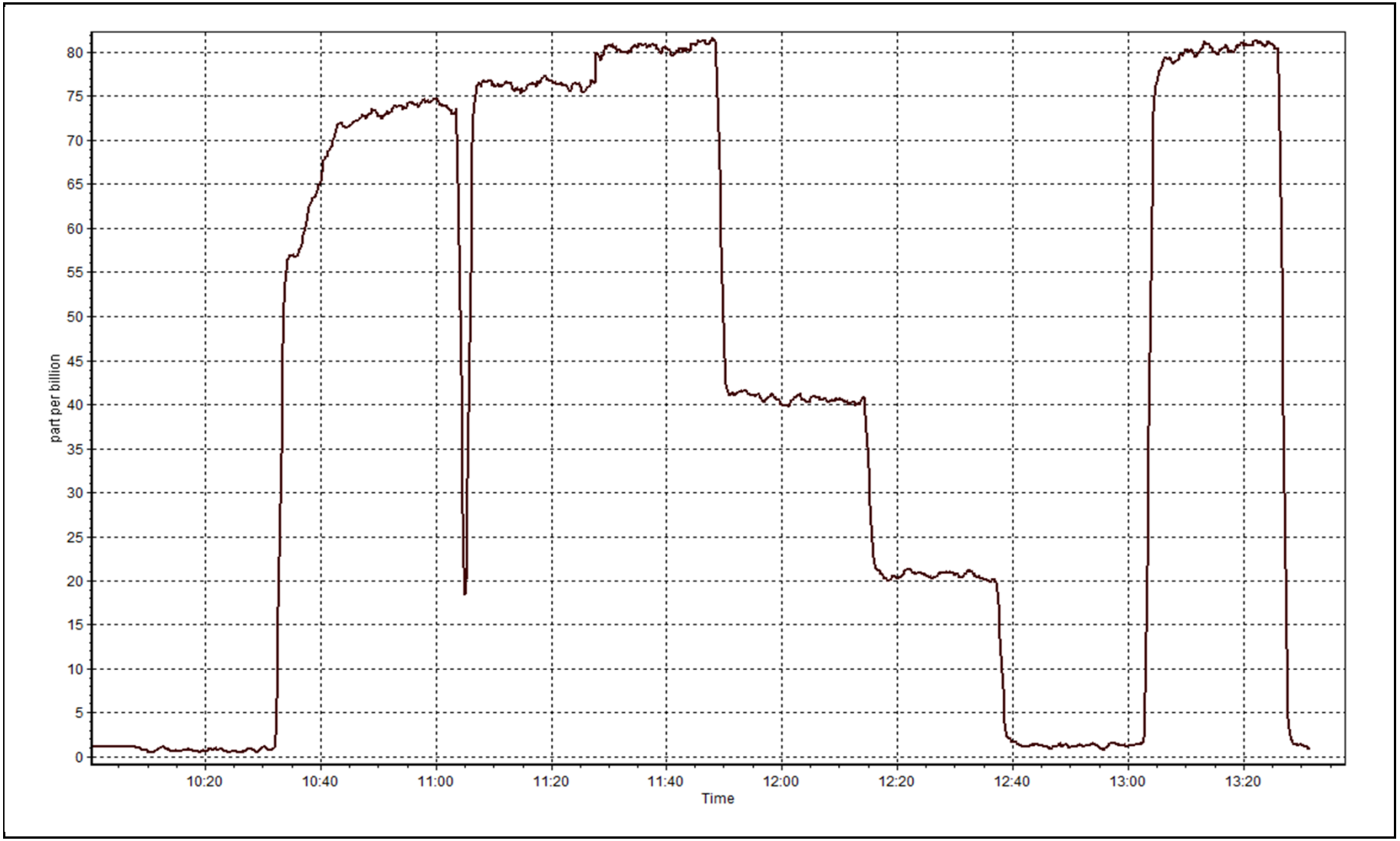
Calibration Date	January 16, 2015	Previous Calibration	January 15, 2015
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:10	End Time (MST)	13:30
Analyzer make	TEI 450i	Analyzer serial #	815129107

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.7	N/A	Correlation Coefficient	0.999993
80.0	80.5	0.9939		
40.1	40.6	0.9879	Slope	1.002259
20.2	20.6	0.9767		
			Intercept	-0.625935



H2S Calibration Plot Date: January-16-15



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	12:40	End Time (MST)	15:40
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11541008
Gas Cert Reference	cc307191	Cal Gas Expiry Date	3/26/2012
CH4 Cal Gas Conc.	505 ppm	CH4 Equiv Conc.	1060.5 ppm
C3H8 Cal Gas Conc.	202 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5v	DACS channel #	SE3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.2	8.2
Analyzer Range (mv)	5000	5000	Air or Bypass press	39.8	39.8
Calculated slope	0.996804	0.999560	Fuel Pressure	25.7	25.6
Calculated intercept	0.028458	-0.038050			
BKG	2.41	2.38			
COEF	4.877	4.812			

Analyzer make	51i-LT	Analyzer serial #	1300156231

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.02	N/A
as found span	5000	69.9	14.83	15.06	0.984
calibrator zero	5000	0.0	0.00	0.02	N/A
high point	5000	69.9	14.83	14.85	0.998
second point	5000	35.4	7.51	7.60	0.988
third point	5000	17.7	3.75	3.78	0.993
calibrator zero	5000	0.0	0.00	0.02	N/A
as left zero	5000	0.0	0.00	0.08	N/A
as left span	5000	69.9	14.83	14.75	1.005
				Average Correction Factor	0.993

Corrected As found	15.04	Previous response	14.84	% change	-1.3%

Notes:

Span adjusted.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

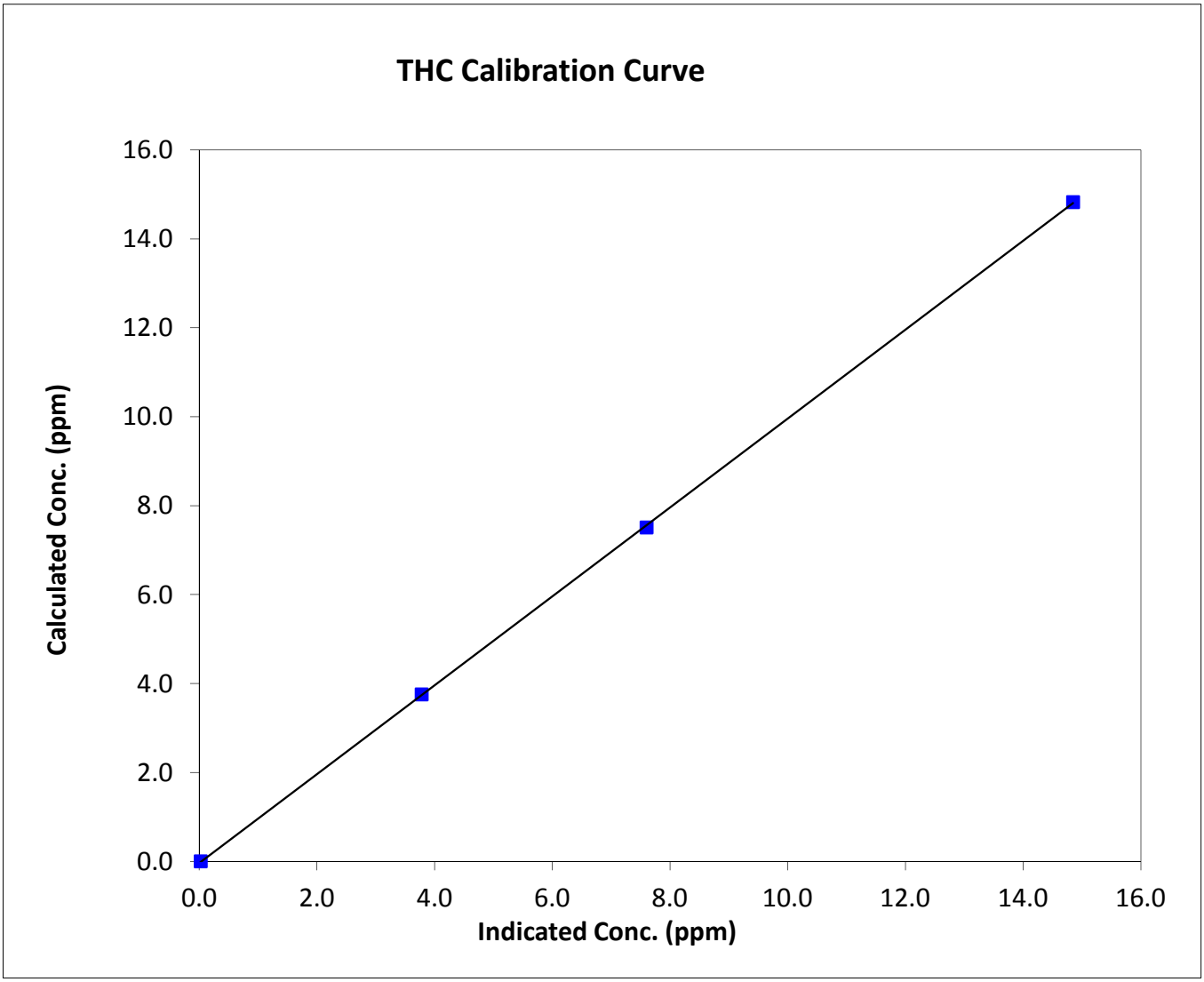
THC Calibration Summary

Station Information

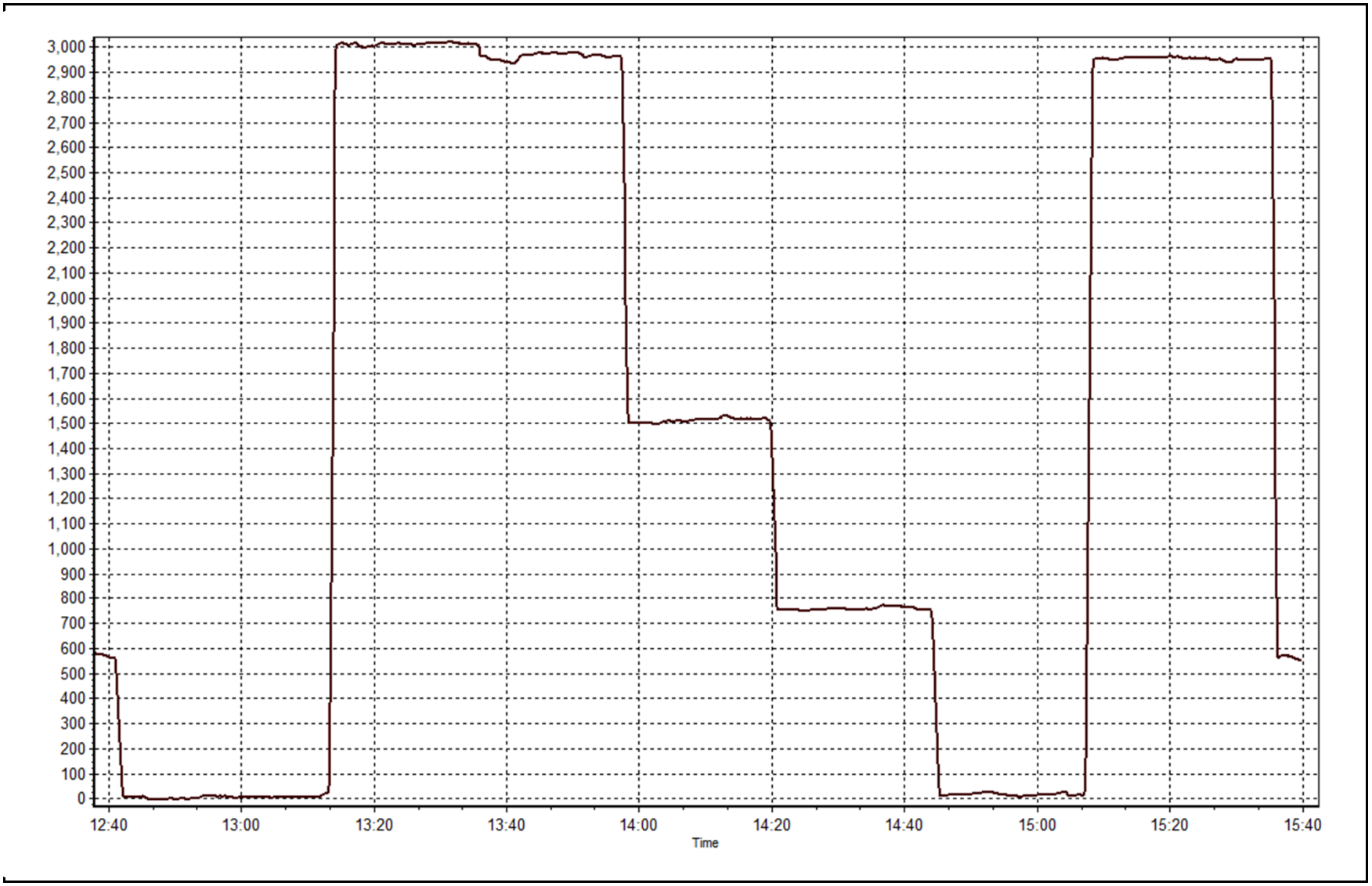
Calibration Date	January 8, 2015	Previous Calibration	December 19, 2014
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	12:40	End Time (MST)	15:40
Analyzer make	51i-LT	Analyzer serial #	1300156231

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.02	N/A	Correlation Coefficient	0.999972
14.83	14.85	0.9985		
7.51	7.60	0.9879	Slope	0.999560
3.75	3.78	0.9931		
			Intercept	-0.038050



THC Calibration Plot Date: January 8, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 3
LOWER CAMP METEOROLOGY
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
JANUARY 2015

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	396	0	348	53.23	6.8	-	3.9	-
Temperature 45 m (C) Average	743	0	1	99.87	7	-	4.1	-
Temperature 100 m (C) Average	744	0	0	100.00	7.8	-	4.5	-
Temperature 167 m (C) Average	744	0	0	100.00	8.2	-	4.5	-
Relative Humidity 20 m (%) Average	396	0	348	53.23	99	-	94.0	-
Relative Humidity 45 m (%) Average	743	0	1	99.87	98	-	93.0	-
Relative Humidity 100 m (%) Average	744	0	0	100.00	99	-	95.0	-
Relative Humidity 167 m (%) Average	744	0	0	100.00	99	-	95.0	-
Wind Speed 20 m (km/h) Average	733	0	11	98.52	25	-	16.0	-
Wind Speed 45 m (km/h) Average	734	0	10	98.66	33	-	21.0	-
Wind Speed 100 m (km/h) Average	677	0	67	90.99	49	-	30.0	-
Wind Speed 167 m (km/h) Average	582	0	162	78.23	59	-	35.0	-
Wind Direction 20 m (deg) Average	733	0	11	98.52	-	-	-	-
Wind Direction 45 m (deg) Average	734	0	10	98.66	-	-	-	-
Wind Direction 100 m (deg) Average	677	0	67	90.99	-	-	-	-
Wind Direction 167 m (deg) Average	582	0	162	78.23	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	733	0	11	98.52	0.5	-	0.1	-
Vertical Wind Speed 45 m (km/h) Average	734	0	10	98.66	1.7	-	0.8	-
Vertical Wind Speed 100 m (km/h) Average	677	0	67	90.99	4.1	-	1.0	-
Vertical Wind Speed 167 m (km/h) Average	582	0	162	78.23	6.8	-	2.2	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
JANUARY 2015

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	396	-9.26	9.4	-	-32.4	-20.6	-18.3	-8.8	-1.1	3.2	6.8
Temperature 45 m (C) Average	743	-14.35	9.7	-	-31.4	-26.4	-21.7	-15.9	-8.2	1.2	7
Temperature 100 m (C) Average	744	-13.71	9.4	-	-29.2	-24.5	-21	-16.2	-7.7	2.1	7.8
Temperature 167 m (C) Average	744	-13.51	9.4	-	-28.2	-23.6	-20.9	-16.2	-7.1	2.2	8.2
Relative Humidity 20 m (%) Average	396	81.6	8	-	62	72	75	81	88	94	99
Relative Humidity 45 m (%) Average	743	77.6	8	-	50	69	73	76	82	89	98
Relative Humidity 100 m (%) Average	744	78.2	8	-	50	68	73	77	84	90	99
Relative Humidity 167 m (%) Average	744	78.3	9	-	51	67	72	78	85	90	99
Wind Speed 20 m (km/h) Average	733	7.5	5	-	0	2	4	7	11	14	25
Wind Speed 45 m (km/h) Average	734	10	6	-	0	2	5	9	13	18	33
Wind Speed 100 m (km/h) Average	677	14.2	9	-	0	4	7	13	18	27	49
Wind Speed 167 m (km/h) Average	582	19	11	-	0	7	11	16	26	34	59
Wind Direction 20 m (deg) Average	733	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	734	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	677	-	-	-	-	-	-	-	-	-	-
Wind Direction 167 m (deg) Average	582	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	733	-0.03	0.2	-	-0.8	-0.3	-0.1	0	0.1	0.2	0.5
Vertical Wind Speed 45 m (km/h) Average	734	0.12	0.6	-	-2.2	-0.4	-0.2	0	0.5	0.9	1.7
Vertical Wind Speed 100 m (km/h) Average	677	0.32	0.8	-	-1.4	-0.3	-0.1	0.1	0.5	1.1	4.1
Vertical Wind Speed 167 m (km/h) Average	582	0.68	1	-	-0.9	-0.2	0.1	0.4	0.9	2.1	6.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Temperature, Relative Humidity 20 m	01 Jan 2015 01:00	13 Jan 2015 21:00	309	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	14 Jan 2015 20:00	16 Jan 2015 00:00	29	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	18 Jan 2015 02:00	18 Jan 2015 09:00	8	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	22 Jan 2015 11:00	22 Jan 2015 12:00	2	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 45 m	25 Jan 2015 19:00	25 Jan 2015 19:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	22 Jan 2015 12:00	22 Jan 2015 12:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	24 Jan 2015 02:00	24 Jan 2015 11:00	10	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	24 Jan 2015 02:00	24 Jan 2015 11:00	10	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 100 m	19 Jan 2015 07:00	20 Jan 2015 13:00	31	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 100 m	23 Jan 2015 10:00	23 Jan 2015 13:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 100 m	23 Jan 2015 20:00	24 Jan 2015 11:00	16	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 100 m	26 Jan 2015 19:00	27 Jan 2015 10:00	16	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	19 Jan 2015 07:00	20 Jan 2015 16:00	34	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	23 Jan 2015 00:00	24 Jan 2015 08:00	33	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	26 Jan 2015 19:00	30 Jan 2015 16:00	94	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	31 Jan 2015 08:00	31 Jan 2015 08:00	1	Flat line in sensor output signal - Sensor frozen

Maximum Value: 6.8 C on Jan 25 17:00

Maximum Daily Average: 3.9 C on Jan 22

Minimum Value: -32.4 C on Jan 31 05:00

Minimum Daily Average: -27.0 C on Jan 31

Maximum Diurnal Average: -6.9 C at hour 15

Minimum Diurnal Average: -10.7 C at hour 11

Monthly Average: -9.26 C

Percentiles: P_1 = -31.9 P_{10} = -20.6 Q_1 = -18.3 Median = -8.8 Q_3 = -1.1 P_{90} = 3.2 P_{99} = 6.0

Hours in Service:	744
Hours of Data:	396
Hours of Missing Data:	348
Hours of Calibration:	0
Percent Operational Time:	53.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
2-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
3-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
4-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
5-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
6-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
7-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
8-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
9-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
13-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-8.1	-7.4	-7.1	--	-7.1
14-Jan	-7.1	-6.8	-7.1	-7.7	-7.8	-6.3	-6.9	-6.3	-7.1	-7.3	-7.5	-7.9	-7.9	-7.9	-8.6	-9.1	-10.5	-12.2	-13.4	AF	AF	AF	AF	AF	-8.2	-6.3
15-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
16-Jan	-10.7	-10.1	-9.3	-8.8	-8.2	-7.4	-7.0	-7.0	-6.8	-6.6	-6.7	-6.0	-4.8	-3.4	0.7	1.5	1.9	2.2	2.1	1.9	1.3	1.2	1.1	1.8	-3.6	2.2
17-Jan	1.5	0.7	0.8	1.3	0.6	0.2	-2.8	-6.2	-8.0	-8.7	-8.8	-8.3	-7.9	-7.8	-7.8	-7.9	-8.2	-8.7	-8.7	-8.9	-8.8	-8.9	-9.3	-10.6	-5.9	1.5
18-Jan	-11.3	AF	AF	AF	AF	AF	AF	AF	AF	-10.8	-10.1	-9.3	-7.9	-6.3	-4.7	-4.2	-5.3	-6.0	-6.6	-7.2	-7.5	-8.2	-8.7	-9.6	--	-4.2
19-Jan	-9.7	-10.0	-11.2	-12.7	-13.0	-13.0	-13.0	-12.8	-12.3	-12.3	-12.1	-11.9	-11.9	-11.8	-11.7	-11.8	-11.8	-11.9	-12.1	-12.7	-12.9	-13.0	-13.1	-13.2	-12.2	-9.7
20-Jan	-13.4	-13.5	-13.3	-13.2	-13.0	-12.9	-12.8	-12.7	-12.7	-12.6	-12.5	-12.4	-11.8	-11.2	-11.0	-11.1	-11.1	-10.8	-10.6	-10.4	-10.1	-10.1	-9.6	-9.5	-11.8	-9.5
21-Jan	-9.3	-9.6	-10.2	-10.9	-11.2	-10.8	-10.9	-10.4	-9.7	-8.8	-7.4	-5.4	-2.5	3.1	3.8	4.1	4.0	4.0	4.0	4.1	3.9	3.6	3.3	3.4	-3.2	4.1
22-Jan	3.6	3.2	2.6	2.0	2.9	3.4	4.0	4.9	5.5	5.4	AF	AF	5.1	6.1	5.8	5.8	5.9	6.1	6.1	5.7	5.1	-0.2	-1.2	-1.7	3.9	6.1
23-Jan	-2.2	-2.9	-3.4	-3.9	-4.2	-4.5	-4.6	-4.7	-4.7	-4.6	-4.3	-3.9	-3.1	-2.9	-3.2	-3.3	-3.3	-3.4	-3.4	-3.7	-3.8	-4.7	-4.8	-4.7	-3.8	-2.2
24-Jan	-4.5	-3.6	-1.4	-0.4	-0.1	-0.1	0.1	0.0	0.1	0.1	1.0	2.2	2.9	3.9	3.8	1.4	-0.7	-0.7	0.9	0.4	-0.6	-0.3	1.0	0.0	0.2	3.9
25-Jan	0.1	0.3	0.7	1.8	1.6	2.0	2.5	2.0	1.7	2.3	5.2	5.9	5.7	5.4	5.4	6.3	6.8	5.7	3.5	2.2	0.9	0.1	-0.7	-1.1	2.8	6.8
26-Jan	-1.0	-1.1	-1.1	-1.2	-1.1	-1.3	-1.3	-1.7	-2.2	-1.9	0.1	1.2	2.8	3.3	3.7	3.9	1.0	-5.2	-6.5	-7.8	-8.6	-9.9	-11.5	-13.0	-2.5	3.9
27-Jan	-14.5	-15.3	-16.0	-16.5	-17.5	-18.2	-18.9	-19.3	-19.5	-19.5	-19.2	-19.1	-18.6	-18.2	-18.1	-18.1	-18.2	-18.5	-18.8	-19.0	-19.0	-18.7	-18.8	-18.8	-18.2	-14.5
28-Jan	-18.9	-19.0	-19.3	-19.8	-19.9	-19.8	-20.7	-21.8	-22.5	-22.1	-21.4	-20.6	-19.9	-19.6	-18.8	-18.6	-19.4	-20.7	-20.5	-20.1	-20.3	-20.5	-20.6	-20.5	-20.2	-18.6
29-Jan	-20.8	-21.0	-20.2	-20.0	-19.8	-19.8	-20.0	-20.0	-19.6	-19.3	-18.4	-17.3	-16.2	-15.3	-14.7	-14.4	-14.2	-14.6	-14.7	-14.6	-14.4	-14.3	-14.5	-15.6	-17.2	-14.2
30-Jan	-16.7	-17.6	-18.1	-18.9	-19.5	-19.1	-19.0	-19.1	-20.0	-20.1	-20.1	-19.4	-19.3	-19.2	-19.8	-20.2	-21.2	-22.5	-23.5	-24.6	-25.6	-26.9	-28.1	-28.9	-21.2	-16.7
31-Jan	-29.6	-31.0	-31.6	-31.9	-32.4	-32.2	-32.0	-30.9	-30.3	-29.9	-29.0	-27.9	-25.8	-23.7	-22.2	-21.6	-21.3	-21.7	-22.3	-22.7	-23.3	-24.2	-25.0	-25.4	-27.0	-21.3
	-9.7	-9.8	-9.9	-10.1	-10.2	-10.0	-10.2	-10.4	-10.5	-10.4	-10.7	-10.0	-8.3	-7.4	-6.9	-6.9	-7.4	-8.2	-8.5	-8.6	-9.0	-9.6	-9.9	-10.3	Diurnal Average	
	3.6	3.2	2.6	2.0	2.9	3.4	4.0	4.9	5.5	5.4	5.2	5.9	5.7	6.1	5.8	6.3	6.8	6.1	6.1	5.7	5.1	3.6	3.3	3.4	Diurnal Maximum	

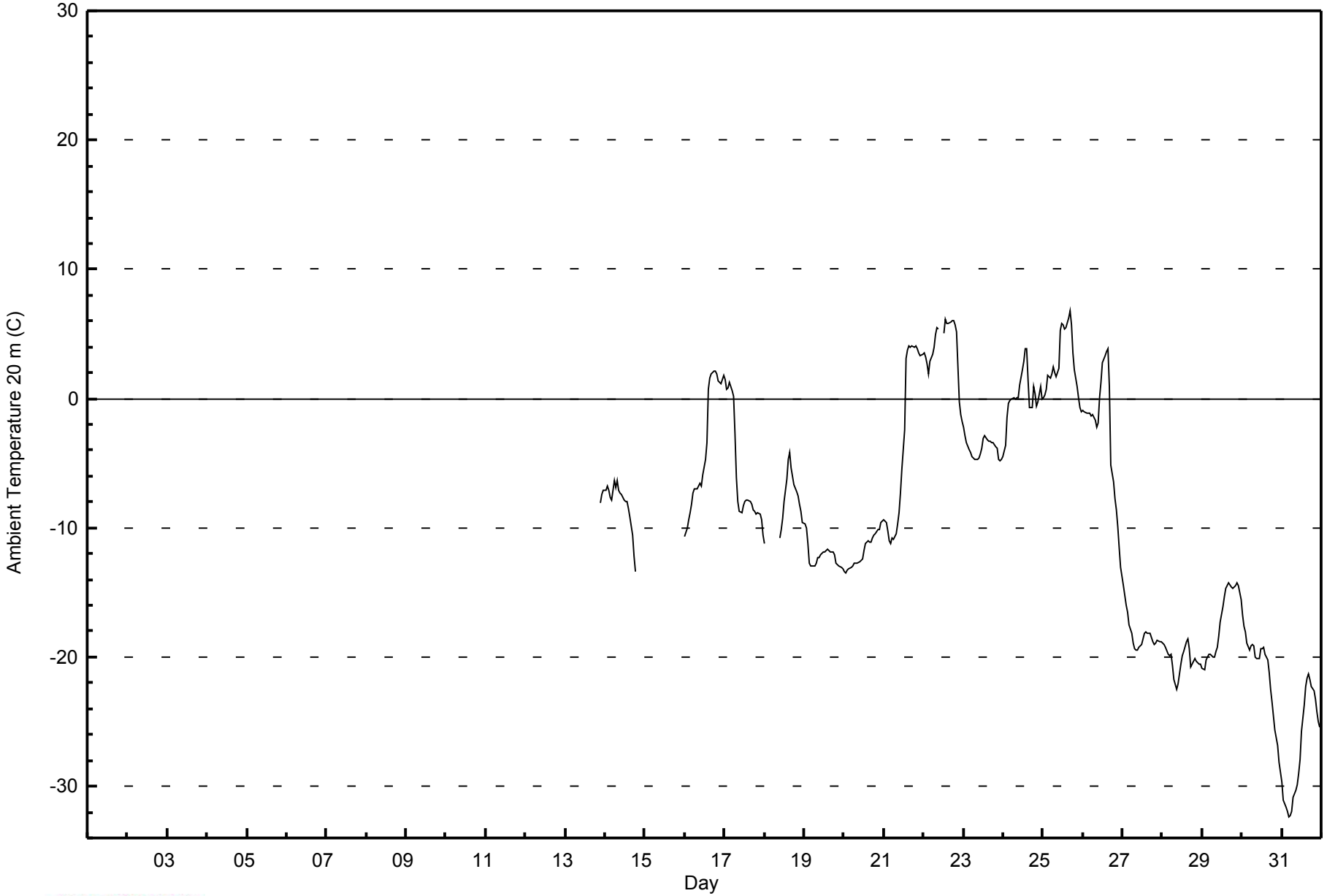
AF - Analyzer Failure

WBEA

Hourly Averages

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	54	13.64	13.64
-20 - 0	254	64.14	77.78
0 - 10	88	22.22	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 396

Total Number of Hours: 744

Maximum Value: 7.0 C on Jan 25 17:00

Maximum Daily Average: 4.1 C on Jan 22

Minimum Value: -31.4 C on Jan 31 05:00

Minimum Daily Average: -27.2 C on Jan 3

Maximum Diurnal Average: -12.1 C at hour 16

Minimum Diurnal Average: -15.8 C at hour 9

Monthly Average: -14.35 C

Percentiles: P_1 = -30.0 P_{10} = -26.4 Q_1 = -21.7 Median = -15.9 Q_3 = -8.2 P_{90} = 1.2 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-Jan	-12.8	-13.5	-14.2	-14.6	-14.9	-15.4	-15.7	-15.9	-15.9	-15.9	-15.9	-15.6	-15.2	-15.5	-16.5	-17.5	-18.4	-19.1	-19.6	-20.1	-20.3	-21.1	-20.7	-20.7	-16.9	-12.8
2-Jan	-21.2	-21.4	-21.6	-22.0	-21.8	-21.8	-22.1	-22.5	-22.6	-23.2	-23.3	-22.7	-22.4	-22.2	-22.2	-22.6	-23.1	-24.8	-26.4	-27.7	-28.5	-28.7	-28.7	-29.3	-23.9	-21.2
3-Jan	-28.9	-28.0	-27.0	-26.5	-27.7	-28.0	-28.7	-28.5	-28.8	-28.9	-28.7	-28.5	-27.2	-25.8	-25.6	-26.0	-26.3	-26.2	-26.4	-26.6	-26.4	-26.1	-26.3	-26.7	-27.2	-25.6
4-Jan	-26.9	-26.5	-25.9	-27.5	-28.2	-28.3	-27.9	-27.4	-26.7	-25.7	-25.4	-23.3	-20.8	-20.3	-18.5	-17.7	-17.5	-17.3	-16.9	-17.6	-18.1	-18.6	-19.1	-19.3	-22.6	-16.9
5-Jan	-20.1	-20.0	-19.8	-19.4	-18.6	-18.4	-17.4	-16.1	-15.7	-15.3	-14.8	-14.3	-14.2	-14.1	-13.9	-14.7	-15.0	-15.2	-15.4	-15.9	-17.0	-18.2	-19.0	-19.7	-16.8	-13.9
6-Jan	-20.3	-21.0	-22.5	-23.7	-24.8	-26.2	-26.7	-27.9	-27.9	-28.1	-28.0	-27.3	-25.7	-24.1	-23.0	-23.1	-23.4	-23.5	-23.1	-23.0	-24.4	-25.3	-25.8	-26.1	-24.8	-20.3
7-Jan	-25.8	-25.5	-26.2	-26.1	-26.9	-27.2	-27.3	-27.0	-25.9	-25.1	-23.8	-22.2	-20.7	-19.5	-19.1	-18.5	-18.1	-17.9	-17.1	-16.0	-15.7	-15.7	-15.3	-14.7	-21.6	-14.7
8-Jan	-17.4	-18.8	-19.6	-18.7	-17.9	-18.3	-18.4	-18.2	-18.1	-19.0	-18.4	-17.7	-17.3	-16.8	-16.5	-16.7	-18.1	-19.4	-19.9	-20.3	-20.4	-20.6	-20.7	-21.6	-18.7	-16.5
9-Jan	-21.7	-22.8	-23.8	-24.3	-24.6	-25.0	-25.3	-25.6	-25.6	-25.6	-24.8	-23.5	-22.0	-20.5	-19.3	-18.8	-19.4	-21.4	-22.0	-23.5	-23.3	-23.7	-24.1	-23.6	-23.1	-18.8
10-Jan	-21.7	-21.5	-22.1	-23.9	-25.7	-27.5	-27.8	-27.6	-28.2	-28.8	-28.5	-27.7	-26.5	-25.2	-23.8	-23.3	-23.1	-23.1	-24.0	-24.5	-25.3	-26.1	-26.5	-27.2	-25.4	-21.5
11-Jan	-27.6	-27.8	-28.4	-28.7	-28.9	-29.0	-28.7	-29.1	-29.2	-29.3	-28.3	-27.3	-25.5	-23.5	-21.9	-21.2	-21.1	-22.3	-22.4	-22.3	-21.0	-21.1	-20.9	-20.4	-25.2	-20.4
12-Jan	-21.0	-21.7	-21.3	-20.8	-21.5	-21.4	-21.0	-19.9	-19.4	-18.7	-17.9	-16.6	-15.6	-15.0	-14.2	-13.4	-13.2	-13.4	-12.9	-12.7	-12.0	-11.2	-10.0	-9.7	-16.4	-9.7
13-Jan	-9.6	-9.1	-8.7	-8.5	-8.5	-9.0	-9.5	-9.7	-9.9	-10.2	-10.4	-10.7	-10.8	-10.5	-10.1	-10.5	-10.8	-10.9	-10.8	-9.4	-8.5	-8.1	-7.5	-7.1	-9.5	-7.1
14-Jan	-7.1	-6.9	-7.0	-7.5	-7.2	-5.5	-6.6	-6.4	-7.2	-7.3	-7.6	-8.0	-8.1	-8.1	-8.7	-9.2	-10.6	-12.3	-13.5	-14.2	-14.2	-14.5	-15.1	-15.9	-9.5	-5.5
15-Jan	-16.7	-17.2	-17.0	-17.0	-17.1	-17.3	-17.6	-17.6	-17.6	-17.6	-17.5	-17.4	-17.0	-16.6	-16.3	-15.0	-14.2	-14.1	-13.9	-13.6	-13.0	-12.5	-11.9	-11.3	-15.7	-11.3
16-Jan	-10.7	-10.1	-9.4	-8.8	-8.2	-7.4	-6.9	-6.9	-6.7	-6.3	-6.4	-5.9	-4.7	-2.4	0.7	1.6	2.0	2.3	2.2	2.0	1.5	1.4	1.2	1.9	-3.5	2.3
17-Jan	1.5	0.8	0.9	1.3	0.7	0.3	-2.8	-6.1	-7.8	-8.9	-9.1	-8.6	-8.3	-8.2	-8.1	-8.1	-8.3	-8.7	-8.8	-9.0	-8.9	-8.9	-9.2	-10.3	-5.9	1.5
18-Jan	-11.1	-10.8	-10.7	-10.9	-10.9	-10.7	-10.2	-10.3	-10.7	-10.7	-10.2	-9.4	-7.9	-6.1	-4.3	-3.4	-4.7	-5.2	-6.1	-6.8	-7.0	-7.6	-8.2	-8.6	-8.4	-3.4
19-Jan	-9.0	-9.5	-10.6	-11.8	-12.6	-12.6	-12.9	-12.3	-12.0	-11.9	-12.2	-12.2	-12.1	-12.0	-11.8	-11.9	-11.9	-11.9	-12.2	-12.8	-12.9	-13.1	-13.2	-13.3	-12.0	-9.0
20-Jan	-13.5	-13.6	-13.4	-13.3	-13.1	-13.0	-12.9	-12.8	-12.8	-12.8	-12.7	-12.5	-11.9	-11.3	-11.1	-11.0	-10.9	-10.7	-10.6	-10.4	-9.9	-10.1	-9.4	-9.5	-11.8	-9.4
21-Jan	-9.4	-9.6	-10.0	-10.5	-10.9	-10.7	-10.8	-10.3	-9.6	-8.5	-7.3	-5.4	-1.8	3.1	3.8	4.1	4.1	4.1	4.1	4.2	4.0	3.7	3.4	3.4	-3.0	4.2
22-Jan	3.6	3.5	3.5	2.4	3.4	4.0	4.3	5.0	5.6	5.5	4.6	4.4	5.1	6.1	5.9	6.0	6.2	6.3	6.2	6.0	5.2	-0.4	-1.3	-1.9	4.1	6.3
23-Jan	-2.4	-3.1	-3.6	-4.1	-4.4	-4.6	-4.7	-4.8	-4.8	-4.7	-4.5	-4.1	-3.5	-3.2	-3.3	-3.4	-3.4	-3.5	-3.4	-3.7	-3.8	-4.6	-4.8	-4.6	-4.0	-2.4
24-Jan	-4.3	-3.5	-1.5	-0.4	-0.1	0.0	0.2	0.0	0.2	0.3	1.2	2.5	2.9	3.7	3.4	1.5	-0.3	1.1	2.2	2.1	1.4	1.3	1.6	1.2	0.7	3.7
25-Jan	0.7	0.6	0.8	2.0	2.0	2.1	2.6	2.1	2.2	3.0	5.3	5.9	5.9	5.8	5.6	6.5	7.0	6.2	AF	2.2	0.8	0.1	-0.3	-0.4	3.0	7.0
26-Jan	-0.5	-0.5	-0.1	-0.3	-0.7	-1.0	-0.8	-1.0	-1.6	-1.2	0.5	1.3	2.7	3.2	3.5	3.8	1.0	-5.5	-6.6	-7.9	-8.8	-10.0	-11.7	-13.2	-2.3	3.8
27-Jan	-14.6	-15.4	-16.1	-16.7	-17.6	-18.3	-19.0	-19.5	-19.6	-19.7	-19.5	-19.4	-18.9	-18.4	-18.3	-18.3	-18.3	-18.6	-18.9	-19.1	-19.1	-18.8	-18.9	-19.0	-18.3	-14.6
28-Jan	-19.0	-19.1	-19.4	-19.9	-20.0	-19.9	-20.6	-21.6	-22.3	-22.4	-21.6	-20.9	-20.1	-19.7	-19.0	-18.9	-19.3	-20.2	-20.4	-20.1	-20.4	-20.5	-20.6	-20.6	-20.3	-18.9
29-Jan	-20.8	-20.9	-20.2	-20.1	-19.9	-19.9	-20.0	-20.1	-19.6	-19.3	-18.5	-17.4	-16.3	-15.4	-14.8	-14.6	-14.4	-14.8	-14.8	-14.7	-14.6	-14.4	-14.6	-15.7	-17.3	-14.4
30-Jan	-16.7	-17.7	-18.1	-19.0	-19.6	-19.2	-19.1	-19.2	-20.0	-20.4	-20.4	-19.9	-19.8	-19.7	-20.1	-20.5	-21.2	-22.4	-23.3	-24.3	-25.1	-26.0	-27.4	-27.8	-21.1	-16.7
31-Jan	-28.4	-29.8	-30.2	-30.9	-31.4	-31.0	-30.7	-30.4	-30.3	-29.9	-29.1	-27.9	-25.9	-23.7	-22.3	-21.6	-21.1	-21.4	-22.0	-22.4	-23.1	-24.1	-24.9	-25.3	-26.6	-21.1
	-14.6	-14.9	-14.9	-15.2	-15.4	-15.5	-15.7	-15.7	-15.8	-15.7	-15.3	-14.6	-13.7	-12.8	-12.2	-12.1	-12.5	-13.0	-13.9	-13.6	-13.8	-14.3	-14.5	-14.7	Diurnal Average	
	3.6	3.5	3.5	2.4	3.4	4.0	4.3	5.0	5.6	5.5	5.3	5.9	5.9	6.1	5.9	6.5	7.0	6.3	6.2	6.0	5.2	3.7	3.4	3.4	Diurnal Maximum	

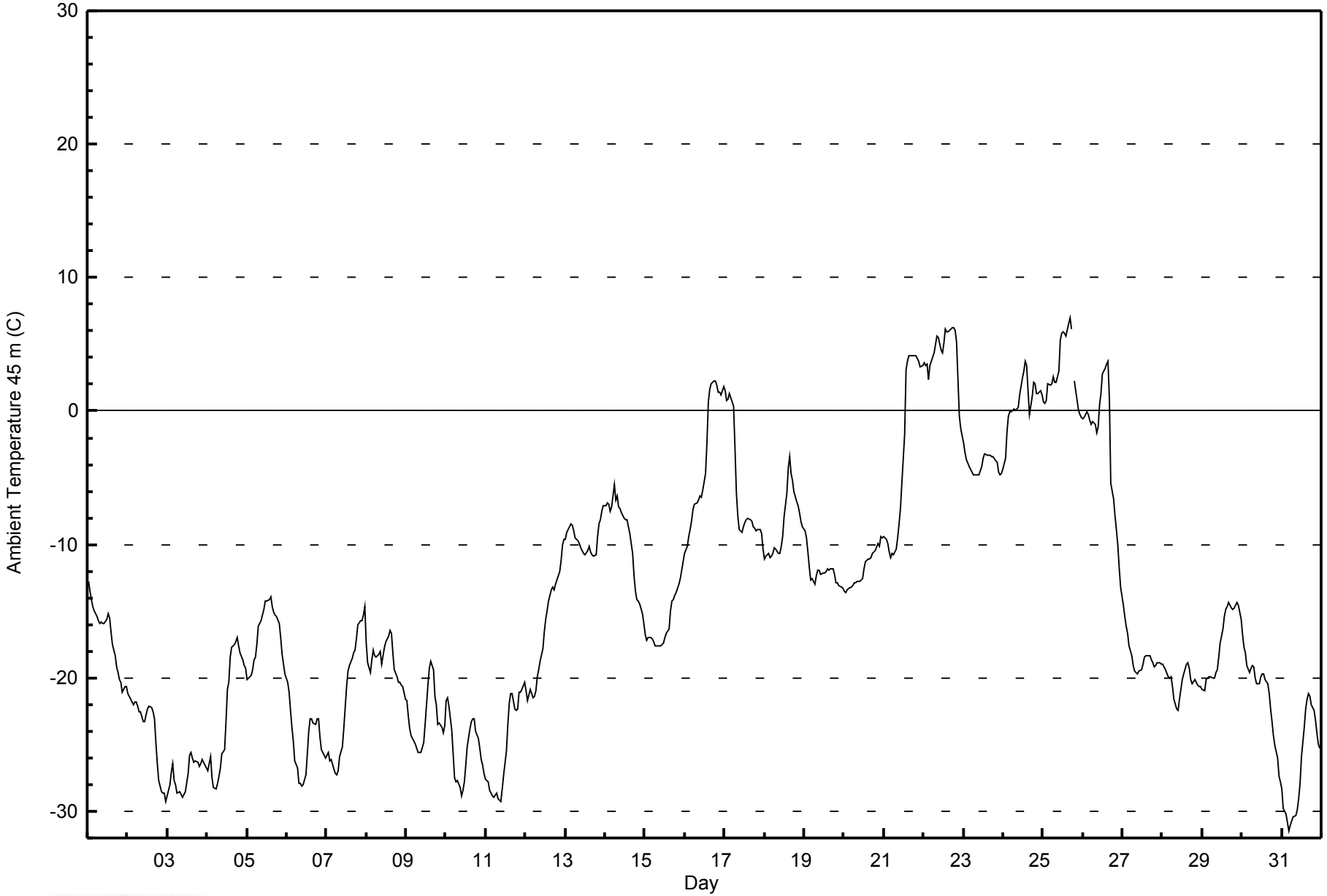
AF - Analyzer Failure

WBEA

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Lower Camp Met Tower - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	244	32.84	32.84
-20 - 0	406	54.64	87.48
0 - 10	93	12.52	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

Maximum Value: 7.8 C on Jan 22 20:00

Maximum Daily Average: 4.5 C on Jan 22

Minimum Value: -29.2 C on Jan 31 10:00

Minimum Daily Average: -26.3 C on Jan 3

Maximum Diurnal Average: -11.9 C at hour 16

Minimum Diurnal Average: -15.1 C at hour 9

Monthly Average: -13.71 C

Percentiles: P_1 = -28.0 P_{10} = -24.5 Q_1 = -21.0 Median = -16.2 Q_3 = -7.7 P_{90} = 2.1 P_{99} = 7.2

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

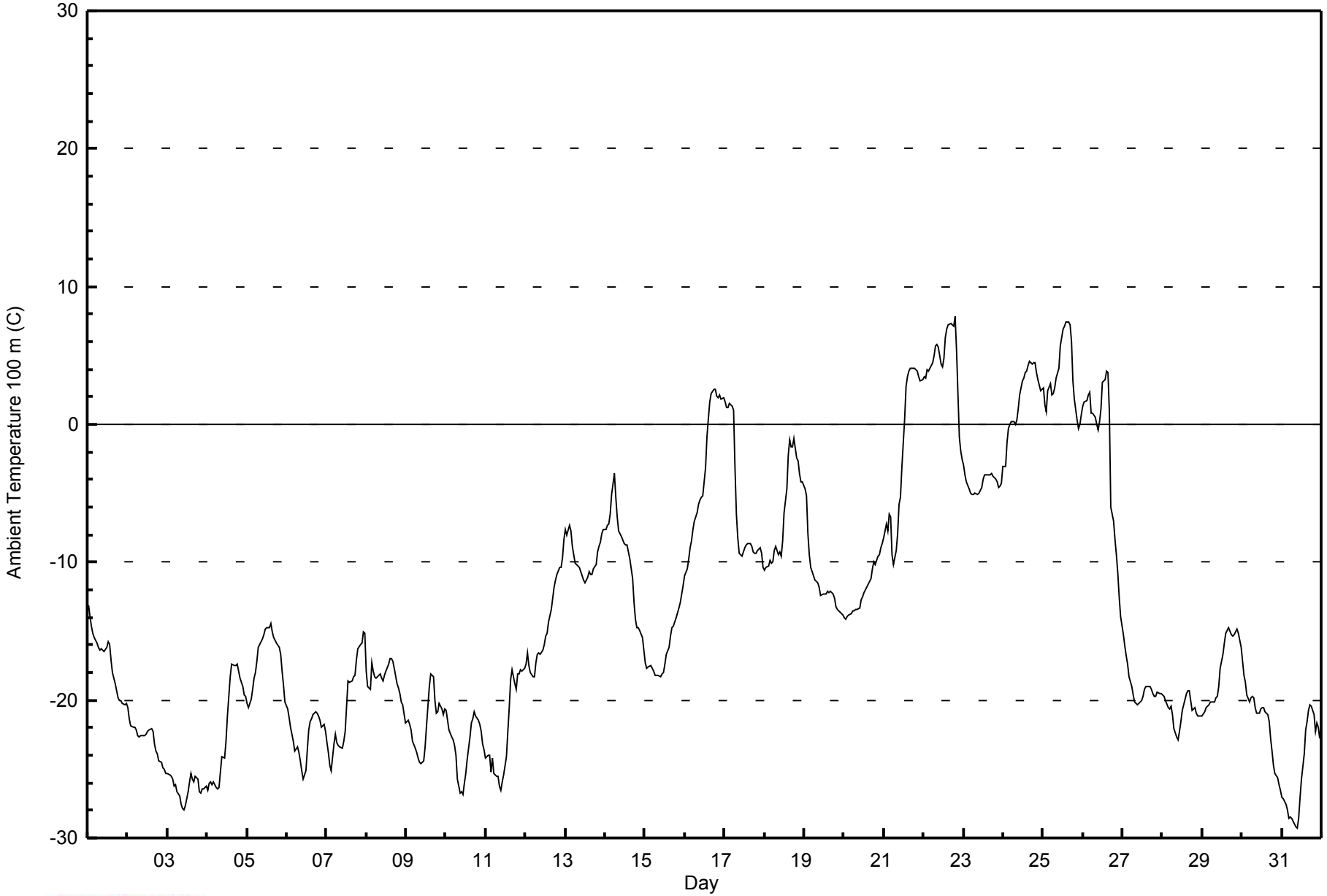
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-13.1	-13.9	-14.7	-15.2	-15.5	-15.9	-16.2	-16.4	-16.3	-16.4	-16.5	-16.2	-15.7	-16.0	-17.1	-18.0	-18.8	-19.3	-19.8	-20.0	-20.0	-20.2	-20.3	-20.2	-17.2	-13.1
2-Jan	-20.5	-21.4	-21.8	-21.9	-21.9	-22.1	-22.5	-22.7	-22.5	-22.6	-22.6	-22.4	-22.3	-22.2	-22.1	-22.2	-23.2	-23.6	-23.9	-24.4	-24.5	-24.9	-25.0	-25.4	-22.9	-20.5
3-Jan	-25.4	-25.4	-25.5	-25.8	-26.2	-26.2	-26.7	-27.0	-27.5	-27.8	-27.9	-27.7	-26.6	-25.9	-25.3	-25.7	-26.0	-25.5	-25.7	-26.7	-26.7	-26.4	-26.4	-26.2	-26.3	-25.3
4-Jan	-26.5	-26.0	-25.9	-26.1	-25.9	-26.4	-26.5	-26.3	-25.2	-24.1	-24.2	-22.9	-21.1	-19.7	-18.3	-17.4	-17.5	-17.5	-17.4	-17.9	-18.4	-19.0	-19.6	-19.7	-22.1	-17.4
5-Jan	-20.2	-20.6	-20.0	-19.2	-18.4	-18.0	-17.2	-16.2	-15.8	-15.6	-15.3	-14.8	-14.8	-14.7	-14.5	-15.1	-15.5	-15.6	-15.8	-16.2	-16.7	-17.9	-18.9	-20.1	-17.0	-14.5
6-Jan	-20.7	-21.3	-22.0	-22.4	-23.0	-23.7	-23.4	-23.8	-24.4	-25.1	-25.7	-25.2	-23.6	-22.2	-21.6	-21.3	-21.1	-20.8	-21.0	-21.2	-21.5	-22.0	-21.7	-22.3	-22.5	-20.7
7-Jan	-23.1	-23.8	-24.7	-25.1	-23.2	-22.5	-23.1	-23.3	-23.4	-23.5	-23.0	-22.3	-20.4	-18.6	-18.8	-18.6	-18.3	-18.2	-17.1	-16.3	-15.9	-15.9	-15.0	-15.1	-20.4	-15.0
8-Jan	-17.9	-19.1	-19.2	-17.3	-17.9	-18.3	-18.4	-18.2	-18.1	-18.4	-18.6	-18.2	-17.9	-17.4	-17.0	-17.0	-17.2	-17.7	-18.9	-19.2	-19.6	-20.1	-20.4	-21.6	-18.5	-17.0
9-Jan	-21.6	-21.5	-21.7	-22.2	-23.0	-23.5	-23.8	-24.3	-24.5	-24.6	-24.4	-23.4	-21.9	-20.4	-19.0	-18.1	-18.3	-20.0	-21.0	-20.9	-20.3	-20.7	-21.1	-20.6	-21.7	-18.1
10-Jan	-20.8	-21.4	-22.2	-22.7	-22.9	-23.3	-24.0	-25.7	-26.7	-26.7	-26.8	-26.1	-25.3	-24.3	-22.6	-21.6	-21.3	-20.8	-21.1	-21.4	-21.7	-22.2	-23.2	-23.6	-23.3	-20.8
11-Jan	-24.2	-24.0	-24.0	-25.2	-24.2	-25.3	-25.5	-25.5	-26.3	-26.5	-25.9	-25.4	-24.1	-22.3	-20.5	-18.5	-17.8	-18.8	-19.2	-18.1	-18.1	-17.8	-17.9	-17.7	-22.2	-17.7
12-Jan	-17.4	-16.6	-17.4	-18.0	-18.3	-18.3	-17.3	-16.6	-16.6	-16.7	-16.4	-16.0	-15.4	-15.2	-14.3	-13.4	-12.6	-11.8	-11.3	-10.9	-10.4	-10.4	-9.7	-8.3	-14.6	-8.3
13-Jan	-7.6	-8.0	-7.4	-7.8	-8.9	-9.5	-10.0	-10.2	-10.4	-10.7	-11.0	-11.3	-11.4	-11.1	-10.7	-10.9	-10.8	-10.5	-10.2	-9.3	-8.9	-8.5	-7.9	-7.6	-9.6	-7.4
14-Jan	-7.6	-7.3	-7.2	-6.5	-5.1	-3.6	-5.2	-6.7	-7.7	-7.9	-8.2	-8.6	-8.8	-8.8	-9.2	-9.8	-11.2	-12.9	-14.1	-14.8	-14.7	-15.0	-15.5	-16.4	-9.7	-3.6
15-Jan	-17.3	-17.7	-17.6	-17.5	-17.7	-17.9	-18.2	-18.2	-18.2	-18.3	-18.2	-18.0	-17.4	-16.7	-16.2	-15.3	-14.7	-14.6	-14.4	-14.0	-13.4	-13.0	-12.3	-11.7	-16.2	-11.7
16-Jan	-11.0	-10.5	-9.8	-9.0	-8.4	-7.6	-7.0	-6.5	-5.8	-5.5	-5.3	-5.2	-3.1	-1.0	0.4	1.7	2.2	2.6	2.6	2.1	2.0	2.1	1.8	1.9	-3.2	2.6
17-Jan	1.7	1.2	1.2	1.5	1.4	1.0	-3.1	-6.5	-8.2	-9.4	-9.6	-9.3	-8.9	-8.8	-8.7	-8.7	-8.8	-9.2	-9.3	-9.4	-9.1	-9.0	-9.3	-10.3	-6.2	1.7
18-Jan	-10.6	-10.3	-10.2	-9.9	-10.1	-10.0	-9.1	-8.8	-9.5	-9.2	-9.5	-8.4	-6.4	-4.6	-2.2	-1.1	-1.6	-1.6	-1.1	-2.4	-2.6	-3.6	-4.1	-4.2	-6.3	-1.1
19-Jan	-4.7	-5.2	-7.9	-9.5	-10.3	-10.6	-11.2	-11.4	-11.5	-11.8	-12.4	-12.3	-12.3	-12.3	-12.1	-12.2	-12.1	-12.3	-12.6	-13.3	-13.4	-13.5	-13.7	-13.8	-11.4	-4.7
20-Jan	-14.0	-14.1	-14.0	-13.9	-13.7	-13.6	-13.5	-13.5	-13.4	-13.3	-12.8	-12.5	-12.2	-12.0	-11.6	-11.4	-11.2	-10.5	-10.0	-10.1	-9.6	-9.5	-8.9	-8.7	-12.0	-8.7
21-Jan	-8.2	-7.2	-7.7	-6.5	-6.7	-9.4	-10.1	-9.2	-8.0	-5.8	-5.3	-3.2	0.4	2.8	3.5	3.8	4.0	4.1	4.1	4.0	3.8	3.5	3.2	3.3	-2.0	4.1
22-Jan	3.4	3.4	4.0	3.8	4.1	4.5	5.0	5.7	5.8	5.6	4.4	4.2	4.8	6.3	6.9	7.2	7.3	7.2	7.1	7.8	5.4	-0.9	-1.9	-2.5	4.5	7.8
23-Jan	-3.0	-3.7	-4.2	-4.7	-5.0	-5.1	-5.1	-5.0	-5.1	-5.0	-4.8	-4.5	-4.0	-3.7	-3.7	-3.7	-3.6	-3.5	-3.7	-4.0	-4.2	-4.6	-4.5	-4.3	-4.3	-3.0
24-Jan	-3.1	-3.1	-1.4	-0.3	0.0	0.2	0.2	0.0	0.3	1.1	2.1	3.1	3.3	3.8	3.9	4.3	4.6	4.4	4.5	4.5	3.8	3.2	2.5	2.5	1.9	4.6
25-Jan	2.7	1.4	0.9	2.5	3.0	2.1	2.3	2.6	3.3	4.1	5.7	6.3	6.9	7.1	7.4	7.5	7.3	6.0	3.1	1.8	0.3	-0.3	0.0	0.7	3.5	7.5
26-Jan	1.3	1.7	1.8	2.2	2.3	0.9	0.9	0.5	0.0	-0.4	0.2	1.1	3.0	3.2	3.9	3.8	1.0	-6.0	-7.0	-8.3	-9.4	-10.8	-12.5	-13.9	-1.7	3.9
27-Jan	-15.3	-16.1	-16.8	-17.4	-18.3	-19.0	-19.7	-20.1	-20.3	-20.3	-20.2	-20.1	-19.7	-19.2	-19.0	-19.0	-19.0	-19.2	-19.5	-19.8	-19.7	-19.4	-19.5	-19.5	-19.0	-15.3
28-Jan	-19.6	-19.7	-20.0	-20.5	-20.6	-20.4	-21.0	-22.1	-22.7	-22.9	-22.3	-21.6	-20.8	-20.3	-19.5	-19.3	-19.3	-20.0	-20.7	-20.6	-20.9	-21.1	-21.2	-21.1	-20.8	-19.3
29-Jan	-21.1	-20.9	-20.5	-20.5	-20.3	-20.2	-20.2	-20.2	-19.8	-19.7	-19.0	-17.7	-16.7	-15.9	-15.2	-14.9	-14.8	-15.3	-15.4	-15.3	-15.1	-14.9	-15.2	-16.2	-17.7	-14.8
30-Jan	-17.2	-18.2	-18.7	-19.6	-20.2	-19.8	-19.7	-19.8	-20.5	-21.0	-21.0	-20.6	-20.5	-20.5	-20.8	-21.1	-21.6	-22.8	-23.7	-24.7	-25.3	-25.6	-26.1	-26.5	-21.5	-17.2
31-Jan	-27.1	-27.2	-27.6	-28.0	-28.5	-28.4	-28.6	-28.7	-29.2	-29.2	-28.5	-27.0	-25.7	-23.9	-22.2	-21.6	-20.8	-20.4	-20.4	-21.1	-22.2	-21.6	-21.9	-22.8	-25.1	-20.4
	-13.9	-14.1	-14.3	-14.3	-14.3	-14.5	-14.8	-15.0	-15.1	-15.1	-14.9	-14.4	-13.5	-12.7	-12.1	-11.9	-12.0	-12.4	-12.7	-12.9	-13.1	-13.6	-13.8	-13.9	Diurnal Average	
	3.4	3.4	4.0	3.8	4.1	4.5	5.0	5.7	5.8	5.6	5.7	6.3	6.9	7.1	7.4	7.5	7.3	7.2	7.1	7.8	5.4	3.5	3.2	3.3	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 100 m (AT100m) - C

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	240	32.26	32.26
-20 - 0	398	53.49	85.75
0 - 10	106	14.25	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

Maximum Value: 8.2 C on Jan 22 20:00

Maximum Daily Average: 4.5 C on Jan 22

Minimum Value: -28.2 C on Jan 31 09:00

Minimum Daily Average: -26.2 C on Jan 3

Maximum Diurnal Average: -11.9 C at hour 16

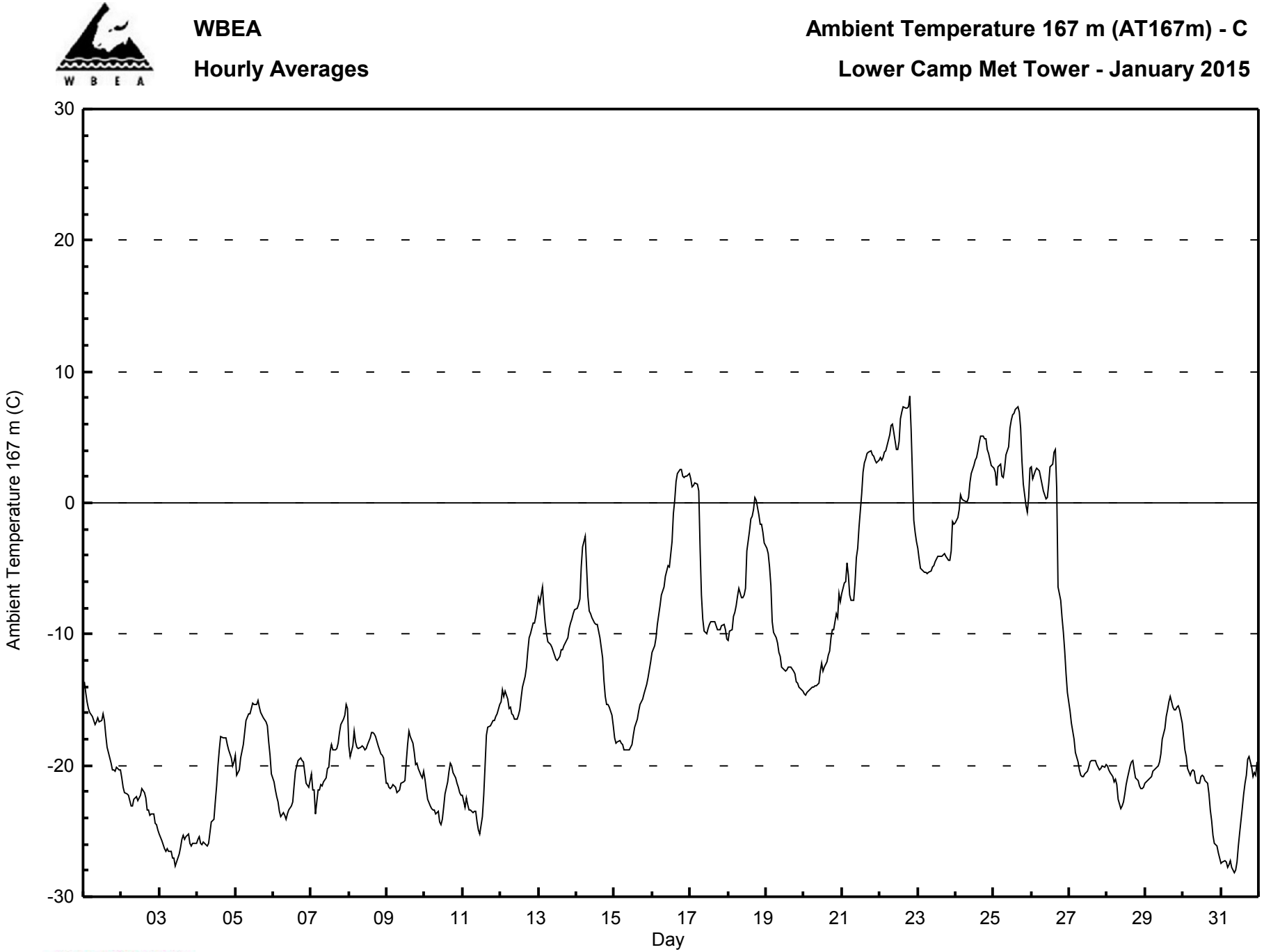
Minimum Diurnal Average: -14.7 C at hour 9

Monthly Average: -13.51 C

Percentiles: P_1 = -27.4 P_{10} = -23.6 Q_1 = -20.9 Median = -16.2 Q_3 = -7.1 P_{90} = 2.2 P_{99} = 7.0

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-Jan	-13.6	-14.4	-15.1	-15.6	-16.0	-16.2	-16.6	-16.8	-16.7	-16.4	-16.7	-16.5	-16.1	-16.6	-17.7	-18.6	-19.4	-19.8	-20.4	-20.3	-20.4	-20.1	-20.3	-20.3	-17.5	-13.6
2-Jan	-20.9	-21.6	-22.1	-22.1	-22.3	-22.7	-23.1	-23.1	-22.6	-22.4	-22.7	-22.4	-22.3	-21.8	-22.1	-22.5	-23.3	-23.4	-23.8	-23.7	-23.7	-24.4	-24.5	-24.9	-22.8	-20.9
3-Jan	-25.2	-25.7	-26.1	-26.4	-26.5	-26.3	-26.5	-26.6	-27.1	-27.1	-27.7	-27.4	-26.7	-26.2	-25.6	-25.4	-25.6	-25.4	-25.2	-26.0	-26.2	-25.9	-25.9	-25.9	-26.2	-25.2
4-Jan	-25.7	-25.4	-26.0	-26.0	-25.8	-26.0	-26.1	-25.9	-25.1	-24.3	-24.1	-22.8	-21.6	-20.1	-18.8	-17.8	-17.9	-17.9	-17.9	-18.4	-18.8	-19.5	-20.0	-19.7	-22.2	-17.8
5-Jan	-19.2	-20.8	-20.3	-19.5	-18.9	-18.4	-17.4	-16.6	-16.1	-16.0	-15.7	-15.3	-15.3	-15.3	-15.1	-15.6	-16.0	-16.1	-16.3	-16.6	-17.0	-18.2	-19.2	-20.6	-17.3	-15.1
6-Jan	-21.3	-21.9	-22.4	-22.8	-23.5	-23.9	-23.6	-23.7	-24.1	-23.7	-23.4	-23.1	-22.8	-21.5	-20.4	-20.0	-19.6	-19.4	-19.7	-19.7	-20.5	-21.3	-21.6	-21.1	-21.9	-19.4
7-Jan	-20.6	-21.9	-21.8	-23.7	-21.9	-21.9	-21.4	-21.6	-21.3	-21.0	-20.2	-20.1	-18.9	-18.4	-18.8	-18.8	-18.8	-18.3	-17.5	-16.8	-16.5	-16.2	-15.4	-15.7	-19.5	-15.4
8-Jan	-18.6	-19.3	-18.5	-17.3	-18.2	-18.6	-18.7	-18.6	-18.5	-18.6	-18.8	-18.7	-18.4	-17.9	-17.5	-17.5	-17.6	-17.8	-18.5	-18.8	-19.1	-19.2	-19.5	-21.4	-18.6	-17.3
9-Jan	-21.3	-21.6	-21.8	-21.7	-21.4	-21.7	-22.1	-22.0	-21.9	-21.4	-21.3	-21.2	-19.8	-18.4	-17.4	-17.8	-18.3	-19.0	-19.9	-19.8	-20.3	-20.8	-21.0	-20.4	-20.5	-17.4
10-Jan	-21.1	-21.9	-22.6	-23.0	-23.3	-23.4	-23.4	-23.7	-23.5	-24.3	-24.5	-24.1	-23.2	-22.1	-21.2	-20.4	-19.8	-20.0	-20.5	-20.9	-21.4	-21.7	-22.1	-22.3	-22.3	-19.8
11-Jan	-22.3	-23.2	-22.5	-23.0	-23.3	-23.4	-23.6	-23.5	-23.5	-24.3	-24.9	-25.2	-23.9	-22.3	-20.0	-17.7	-17.0	-17.0	-16.8	-16.5	-16.6	-16.2	-16.1	-15.3	-20.8	-15.3
12-Jan	-15.1	-14.3	-14.8	-14.3	-14.9	-15.7	-15.6	-16.1	-16.2	-16.5	-16.5	-16.2	-15.7	-14.9	-14.0	-13.3	-12.5	-11.2	-10.3	-9.9	-9.1	-9.2	-8.6	-7.9	-13.5	-7.9
13-Jan	-7.3	-7.6	-6.4	-7.9	-9.1	-10.0	-10.6	-10.8	-11.0	-11.3	-11.6	-11.9	-12.0	-11.7	-11.2	-11.2	-10.9	-10.7	-10.3	-9.6	-9.1	-8.8	-8.4	-8.2	-9.9	-6.4
14-Jan	-8.1	-7.7	-7.3	-4.9	-3.4	-2.5	-4.9	-7.1	-8.3	-8.5	-8.7	-9.1	-9.3	-9.2	-9.7	-10.3	-11.8	-13.5	-14.8	-15.3	-15.3	-15.6	-16.1	-17.0	-9.9	-2.5
15-Jan	-17.9	-18.3	-18.2	-18.1	-18.3	-18.5	-18.8	-18.8	-18.8	-18.8	-18.6	-18.4	-17.7	-17.1	-16.5	-15.8	-15.3	-15.2	-14.9	-14.5	-13.8	-13.4	-12.8	-12.1	-16.7	-12.1
16-Jan	-11.3	-10.9	-10.3	-9.2	-8.6	-7.8	-7.0	-6.4	-5.6	-5.2	-4.8	-4.8	-2.9	-0.8	0.2	1.7	2.2	2.5	2.5	2.1	2.0	2.0	2.1	2.2	-3.2	2.5
17-Jan	1.8	1.2	1.3	1.5	1.5	0.9	-3.5	-7.1	-8.8	-9.7	-10.0	-9.6	-9.2	-9.1	-9.0	-9.1	-9.4	-9.6	-9.7	-9.6	-9.3	-9.3	-9.6	-10.3	-6.4	1.8
18-Jan	-10.5	-9.8	-9.6	-8.6	-8.3	-7.8	-7.1	-6.5	-7.3	-7.2	-7.1	-6.5	-3.6	-2.1	-1.2	-1.1	-0.5	0.4	0.2	-0.9	-1.6	-1.6	-2.2	-3.1	-4.7	0.4
19-Jan	-3.4	-3.9	-4.9	-6.3	-9.0	-9.8	-10.2	-10.6	-11.4	-11.7	-12.5	-12.7	-12.8	-12.7	-12.5	-12.5	-12.5	-12.8	-13.1	-13.6	-13.8	-14.0	-14.2	-14.3	-11.1	-3.4
20-Jan	-14.5	-14.6	-14.5	-14.4	-14.2	-14.1	-14.0	-13.9	-13.9	-13.8	-12.8	-12.2	-12.8	-12.5	-12.1	-11.6	-11.3	-10.3	-9.7	-9.7	-8.5	-8.8	-6.9	-7.5	-12.0	-6.9
21-Jan	-6.9	-6.1	-6.0	-4.6	-5.4	-7.0	-7.4	-7.4	-6.1	-4.2	-3.4	-1.8	0.7	2.4	3.1	3.4	3.7	3.9	3.9	3.7	3.5	3.3	3.1	3.3	-1.2	3.9
22-Jan	3.4	3.2	3.5	3.9	3.9	4.8	5.2	5.9	6.0	5.4	4.0	4.1	4.6	6.4	6.9	7.3	7.2	7.3	7.3	8.2	5.6	-1.3	-2.2	-2.9	4.5	8.2
23-Jan	-3.4	-4.2	-5.0	-5.2	-5.3	-5.3	-5.3	-5.3	-5.2	-4.9	-4.8	-4.5	-4.3	-4.0	-4.1	-4.0	-4.0	-3.9	-4.1	-4.4	-4.3	-3.7	-1.5	-1.6	-4.3	-1.5
24-Jan	-1.5	-1.1	-0.5	0.6	0.3	0.2	0.1	0.1	0.4	1.5	2.3	2.9	3.2	3.5	3.9	4.6	5.1	5.0	4.9	4.8	4.1	3.7	2.8	2.7	2.2	5.1
25-Jan	2.7	2.4	1.4	2.7	2.9	2.1	1.9	2.7	3.7	4.3	5.6	6.3	6.7	6.8	7.1	7.3	6.9	5.7	3.2	1.4	-0.2	-0.7	0.5	2.7	3.6	7.3
26-Jan	2.8	1.9	2.5	2.6	2.5	2.4	1.9	0.9	0.6	0.3	0.4	1.4	2.8	3.0	3.8	4.1	1.1	-6.4	-7.4	-8.8	-9.9	-11.3	-13.0	-14.4	-1.5	4.1
27-Jan	-15.9	-16.7	-17.4	-18.0	-19.0	-19.7	-20.3	-20.7	-20.9	-20.9	-20.7	-20.5	-20.1	-19.7	-19.6	-19.7	-19.6	-19.9	-20.1	-20.3	-20.3	-20.0	-20.1	-20.0	-19.6	-15.9
28-Jan	-20.1	-20.3	-20.6	-20.9	-21.2	-21.0	-21.5	-22.6	-23.3	-23.1	-22.8	-22.2	-21.4	-20.9	-20.1	-19.8	-19.6	-20.3	-21.0	-21.2	-21.6	-21.7	-21.8	-21.7	-21.3	-19.6
29-Jan	-21.4	-21.2	-21.1	-20.9	-20.8	-20.4	-20.3	-20.2	-20.1	-19.7	-19.1	-18.0	-17.2	-16.3	-15.7	-15.1	-14.8	-15.5	-15.7	-15.8	-15.6	-15.4	-15.8	-16.8	-18.0	-14.8
30-Jan	-17.8	-18.8	-19.3	-20.2	-20.8	-20.4	-20.3	-20.4	-21.1	-21.3	-21.4	-20.8	-20.7	-20.8	-21.2	-21.4	-22.1	-23.4	-24.2	-25.3	-25.9	-26.1	-26.6	-27.0	-22.0	-17.8
31-Jan	-27.5	-27.3	-27.3	-27.4	-27.7	-27.6	-27.2	-27.8	-28.2	-28.0	-27.3	-26.1	-25.1	-23.2	-22.2	-21.4	-20.7	-19.5	-19.4	-20.2	-20.9	-20.5	-20.7	-19.8	-24.3	-19.4
	-13.6	-13.9	-14.0	-13.9	-14.1	-14.2	-14.4	-14.7	-14.7	-14.6	-14.5	-14.1	-13.4	-12.7	-12.2	-11.9	-12.0	-12.3	-12.6	-12.8	-13.0	-13.4	-13.5	-13.6	Diurnal Average	
	3.4	3.2	3.5	3.9	3.9	4.8	5.2	5.9	6.0	5.4	5.6	6.3	6.7	6.8	7.1	7.3	7.2	7.3	7.3	8.2	5.6	3.7	3.1	3.3	Diurnal Maximum	


WBEA
Hourly Averages
Ambient Temperature 167 m (AT167m) - C
Lower Camp Met Tower - January 2015
Ambient Temperature 167 m (C)
30
20
10
0
-10
-20
-30
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	243	32.66	32.66
-20 - 0	390	52.42	85.08
0 - 10	111	14.92	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 20m (RH20m) - %

Lower Camp Met Tower - January 2015

Maximum Value: 99 % on Jan 24 10:00

Maximum Daily Average: 94.0 % on Jan 23

Minimum Value: 62 % on Jan 30 14:00

Minimum Daily Average: 71.5 % on Jan 30

Maximum Diurnal Average: 83.9 % at hour 9

Minimum Diurnal Average: 77.0 % at hour 14

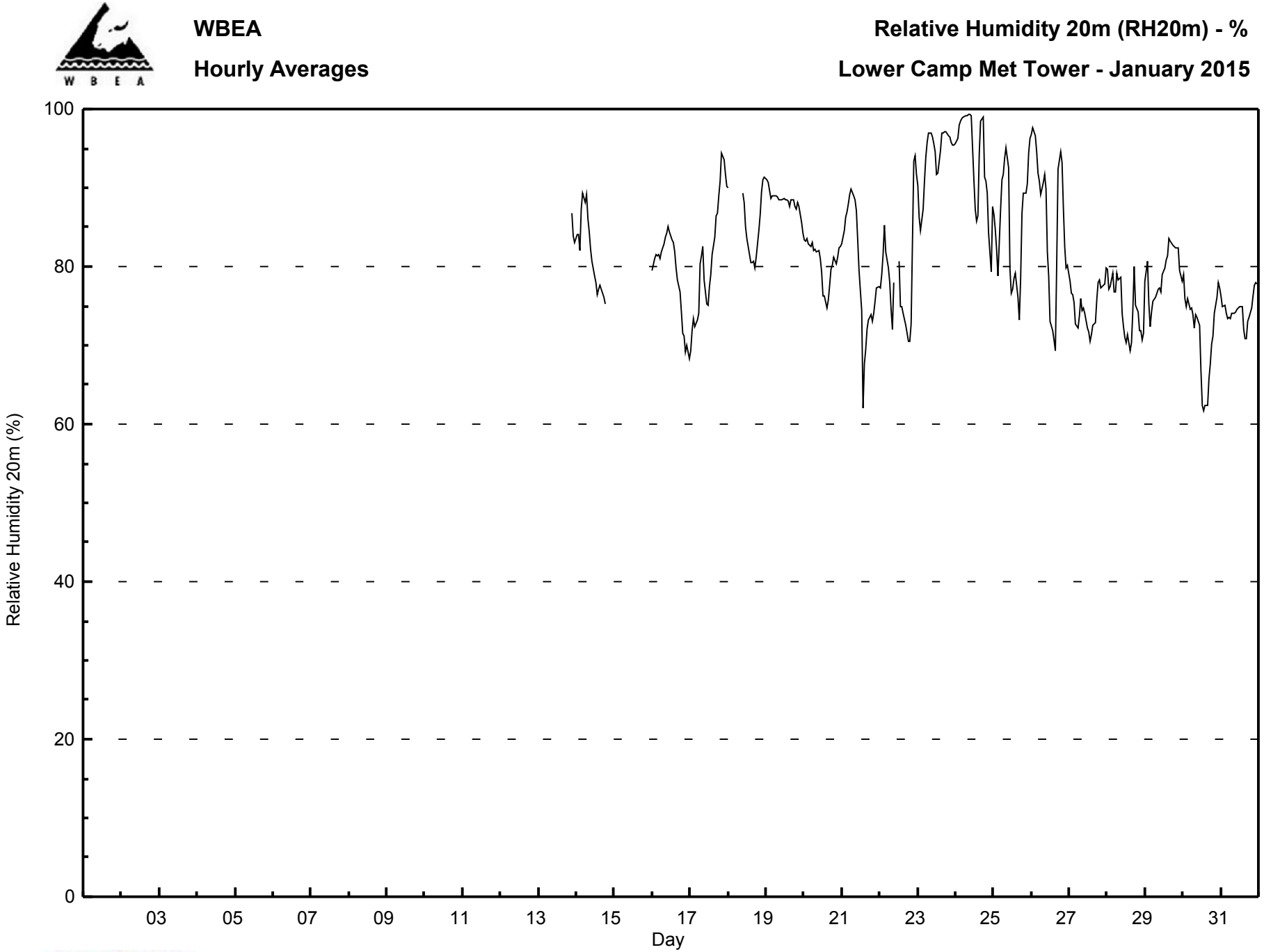
Monthly Average: 81.6 %

Percentiles: P_1 = 61 P_{10} = 72 Q_1 = 75 Median = 81 Q_3 = 88 P_{90} = 94 P_{99} = 99

Hours in Service:	744
Hours of Data:	396
Hours of Missing Data:	348
Hours of Calibration:	0
Percent Operational Time:	53.2

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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
2-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
3-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
4-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
5-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
6-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
7-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
8-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
9-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
13-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	87	84	83	--	87
14-Jan	84	84	82	87	89	88	89	86	84	82	81	79	78	76	77	78	77	76	75	AF	AF	AF	AF	AF	81.8	89
15-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
16-Jan	80	81	81	81	82	81	82	83	84	84	85	84	83	83	82	80	78	77	74	72	71	69	70	68	79.0	85
17-Jan	69	72	73	72	73	74	80	81	82	78	75	75	77	79	81	84	86	87	89	91	94	94	92	90	81.3	94
18-Jan	90	AF	AF	AF	AF	AF	AF	AF	AF	89	88	85	84	81	80	81	81	80	81	85	87	90	91	91	--	91
19-Jan	91	91	90	89	89	89	89	89	88	88	88	89	88	88	88	88	88	88	88	87	88	88	86	84	88.3	91
20-Jan	83	83	84	83	83	83	82	82	82	82	81	79	76	76	75	76	78	80	80	81	80	81	82	83	80.7	84
21-Jan	83	85	86	87	88	89	90	89	88	87	83	79	74	62	68	70	72	73	74	73	74	76	77	77	79.4	90
22-Jan	77	79	82	85	82	80	78	75	72	78	AF	AF	81	75	75	74	73	72	71	71	73	93	94	92	78.6	94
23-Jan	90	86	85	87	91	94	96	97	97	96	96	95	92	92	95	97	97	97	97	97	96	96	95	95	94.0	97
24-Jan	96	96	98	99	99	99	99	99	99	99	99	91	87	86	87	94	98	99	91	91	89	84	79	88	93.6	99
25-Jan	87	85	82	79	87	91	92	94	95	92	80	77	77	78	79	76	73	78	87	89	89	90	94	96	85.4	96
26-Jan	97	98	97	95	92	91	89	91	92	90	82	79	73	72	71	69	80	92	95	93	87	82	80	80	86.1	98
27-Jan	78	77	76	75	73	72	74	76	74	75	74	72	72	70	71	73	73	76	78	78	77	77	78	80	75.0	80
28-Jan	80	77	77	79	77	77	79	78	79	74	72	71	70	71	69	70	74	80	75	74	72	72	71	72	74.7	80
29-Jan	78	81	75	72	74	76	76	77	77	77	77	79	80	81	81	84	83	83	83	82	82	82	79	78	79.1	84
30-Jan	79	76	75	76	75	75	74	72	74	74	73	67	62	62	62	62	66	68	70	71	74	76	78	77	71.5	79
31-Jan	76	75	75	74	73	74	73	74	74	74	75	75	75	75	72	71	71	73	73	75	76	78	78	78	74.5	78
	83.4	82.8	82.4	82.6	82.9	83.3	83.9	83.9	83.9	83.6	81.8	79.7	78.3	77.0	77.3	78.0	79.4	81.1	81.2	81.9	82.0	83.3	82.9	83.1	Diurnal Average	
	97	98	98	99	99	99	99	99	99	99	99	95	92	92	95	97	98	99	97	97	96	96	95	96	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - January 2015
Relative Humidity 20m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	190	47.98	47.98
80 - 100	206	52.02	100.00

Total Number of Valid Hours: 396

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 45m (RH45m) - %

Lower Camp Met Tower - January 2015

Maximum Value: 98 % on Jan 24 10:00

Maximum Daily Average: 93.4 % on Jan 23

Minimum Value: 50 % on Jan 8 15:00

Minimum Daily Average: 63.2 % on Jan 8

Maximum Diurnal Average: 79.2 % at hour 7

Minimum Diurnal Average: 74.2 % at hour 15

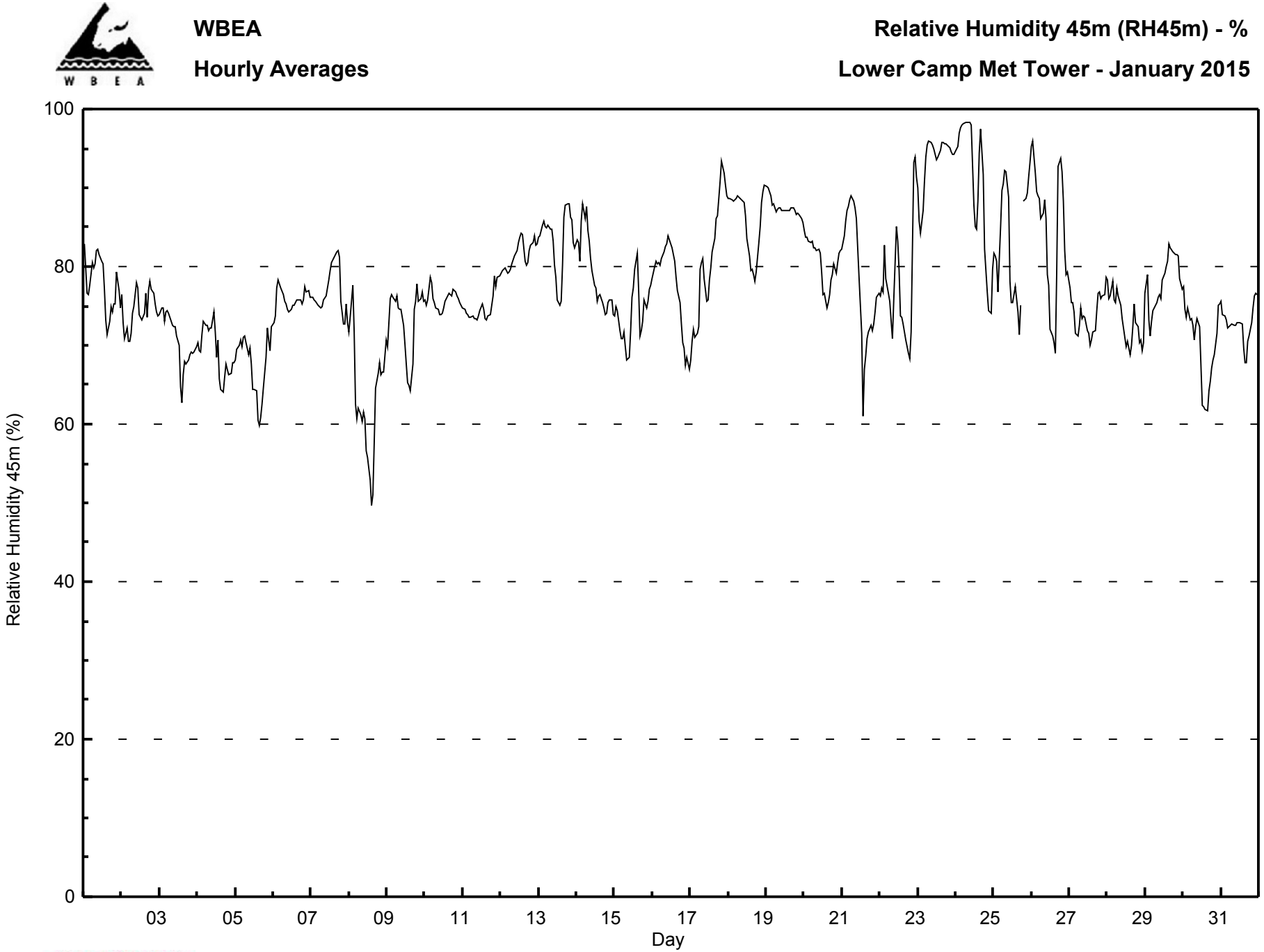
Monthly Average: 77.6 %

Percentiles: P_1 = 60 P_{10} = 69 Q_1 = 73 Median = 76 Q_3 = 82 P_{90} = 89 P_{99} = 98

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-Jan	83	80	77	76	78	80	80	80	82	82	82	81	80	77	73	71	73	75	74	75	75	79	77	75	77.8	83
2-Jan	77	73	71	72	71	71	72	74	75	78	77	74	74	73	74	77	74	77	78	77	77	75	74	74	74.4	78
3-Jan	74	75	75	73	74	74	74	73	73	72	72	71	70	65	63	66	68	68	68	69	69	69	69	70	70.6	75
4-Jan	70	69	69	71	73	73	73	72	72	72	74	72	69	71	66	64	64	66	68	67	66	66	68	68	69.3	74
5-Jan	68	70	70	71	70	71	71	70	69	70	68	64	64	64	61	60	61	63	65	68	72	71	69	72	67.6	72
6-Jan	73	74	77	78	78	77	76	76	75	75	74	75	75	75	75	76	76	76	75	76	77	77	77	76	75.8	78
7-Jan	76	76	76	76	75	75	75	75	76	76	77	78	80	80	81	82	82	82	81	76	73	73	75	73	77.0	82
8-Jan	72	73	78	72	63	61	62	61	60	61	61	57	56	53	50	51	58	65	66	68	66	67	67	71	63.2	78
9-Jan	70	73	76	76	76	76	76	75	75	75	72	70	68	65	65	64	68	75	76	78	76	76	77	76	73.0	78
10-Jan	76	75	76	79	78	76	75	75	75	74	74	74	75	76	76	77	76	76	77	77	76	76	75	75	75.8	79
11-Jan	75	75	74	74	74	74	74	73	73	73	74	74	75	75	73	73	74	74	75	76	79	77	79	79	74.8	79
12-Jan	79	79	80	80	79	79	80	80	81	81	82	83	84	84	84	81	80	80	82	83	83	84	83	83	81.4	84
13-Jan	84	84	85	86	85	85	85	85	85	83	80	79	76	75	76	80	86	88	88	88	86	86	83	82	83.3	88
14-Jan	83	83	81	86	88	86	88	85	83	81	79	78	77	76	76	76	75	75	74	74	75	76	76	74	79.4	88
15-Jan	74	75	74	72	71	71	72	70	68	69	72	76	77	80	82	77	71	72	73	76	75	76	77	78	74.0	82
16-Jan	78	80	81	80	81	80	81	82	83	83	84	83	82	82	81	79	77	75	73	70	70	67	68	67	77.8	84
17-Jan	68	70	72	71	72	72	80	80	81	79	76	76	78	80	82	84	86	86	89	91	93	92	90	89	80.7	93
18-Jan	89	89	88	88	88	89	89	89	89	88	88	87	84	81	79	80	79	78	79	83	85	88	90	90	85.7	90
19-Jan	90	90	89	89	88	88	87	87	87	87	87	87	87	87	87	87	88	87	87	87	87	87	86	86	87.5	90
20-Jan	85	84	84	83	83	83	82	82	82	82	82	79	76	77	75	75	77	78	79	80	79	81	82	82	80.5	85
21-Jan	82	84	86	87	88	88	89	88	87	86	82	79	71	61	67	69	71	72	73	72	73	74	76	77	78.4	89
22-Jan	76	77	77	83	78	77	76	73	71	76	85	83	80	74	74	73	71	70	69	68	72	93	94	91	77.5	94
23-Jan	90	86	84	87	91	94	95	96	96	95	95	94	94	94	95	96	96	96	96	95	95	94	94	94	93.4	96
24-Jan	95	95	97	98	98	98	98	98	98	98	98	88	85	85	88	94	97	92	82	80	77	74	74	80	90.3	98
25-Jan	82	81	81	77	85	90	91	92	92	89	78	75	75	76	78	74	71	75	AF	88	89	89	91	93	83.2	93
26-Jan	95	96	92	90	89	89	86	87	89	86	79	78	72	71	70	69	79	93	94	92	88	82	79	79	84.3	96
27-Jan	77	75	75	74	72	71	73	75	73	74	73	72	71	70	71	72	72	74	77	77	76	76	76	79	74.0	79
28-Jan	78	76	76	78	76	75	77	76	75	73	72	71	70	70	69	70	72	75	73	72	70	71	69	70	73.3	78
29-Jan	77	79	73	71	73	74	75	75	76	76	76	78	79	80	81	83	82	82	82	82	82	81	78	77	78.1	83
30-Jan	78	75	73	75	73	73	73	71	72	73	72	67	62	62	62	62	64	65	67	68	69	72	75	75	70.0	78
31-Jan	76	74	74	73	72	72	72	73	73	73	73	73	73	73	70	68	68	70	71	73	75	76	77	76	72.8	77
	79.0	78.9	78.7	78.9	78.6	78.8	79.2	79.0	78.9	78.8	78.1	76.6	75.5	74.6	74.2	74.5	75.3	76.8	77.0	77.6	77.6	78.3	78.3	78.4	Diurnal Average	
	95	96	97	98	98	98	98	98	98	98	98	94	94	94	95	96	97	96	96	95	95	94	94	94	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - January 2015
Relative Humidity 45m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	7	0.94	0.94
60 - 80	493	66.35	67.29
80 - 100	243	32.71	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Maximum Value: 99 % on Jan 24 08:00

Maximum Daily Average: 94.5 % on Jan 23

Minimum Value: 50 % on Jan 8 15:00

Minimum Daily Average: 62.2 % on Jan 8

Maximum Diurnal Average: 80.2 % at hour 7

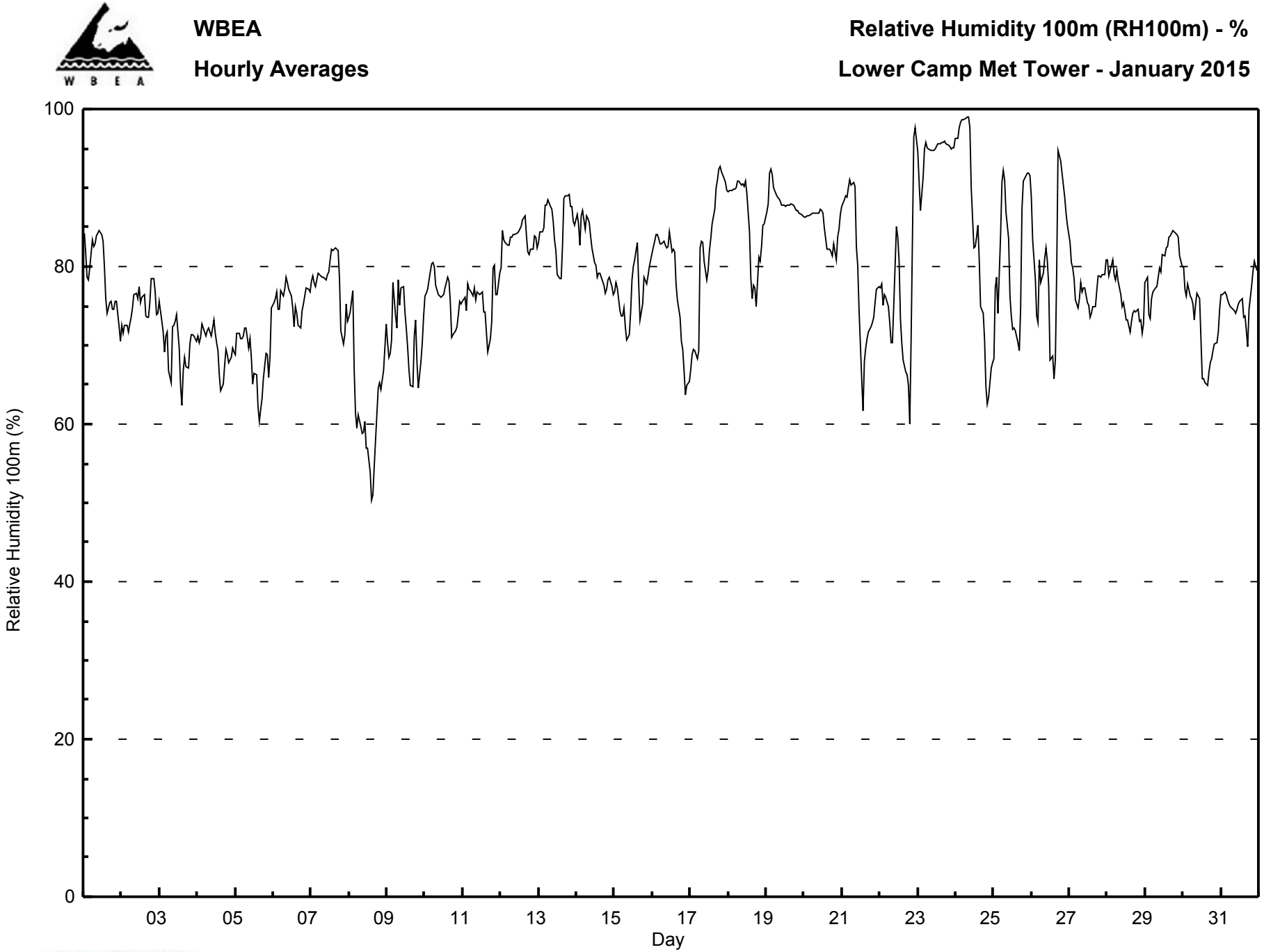
Minimum Diurnal Average: 74.9 % at hour 16

Monthly Average: 78.2 %

Percentiles: P_1 = 59 P_{10} = 68 Q_1 = 73 Median = 77 Q_3 = 84 P_{90} = 90 P_{99} = 97

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-Jan	84	82	79	78	80	83	83	83	84	84	85	84	83	80	76	74	75	76	74	75	76	76	72	71	79.0	85
2-Jan	72	72	73	73	72	73	74	75	77	77	76	77	75	76	76	74	74	74	75	78	78	77	74	74	74.8	78
3-Jan	76	73	72	69	71	72	67	65	72	73	73	74	70	65	62	67	68	67	67	70	71	71	71	70	69.9	76
4-Jan	71	70	71	73	72	71	72	72	72	71	73	72	70	69	66	64	65	67	70	69	68	68	70	69	69.9	73
5-Jan	69	71	72	71	71	71	72	72	70	71	68	65	66	66	62	60	62	63	66	69	69	66	69	75	68.2	75
6-Jan	75	76	77	75	75	77	76	77	79	78	77	76	75	72	75	74	72	72	74	75	76	77	77	77	75.7	79
7-Jan	78	79	78	77	79	79	79	79	79	78	79	79	81	82	82	82	82	82	79	72	70	71	75	73	78.1	82
8-Jan	74	74	77	67	61	60	61	60	59	59	60	57	57	54	50	51	55	58	65	65	64	66	67	73	62.2	77
9-Jan	70	69	69	71	78	74	72	78	75	77	78	74	72	70	67	65	65	71	73	68	65	68	70	74	71.4	78
10-Jan	76	77	77	79	80	81	80	78	76	76	76	76	77	77	79	78	75	71	71	72	72	74	76	75	76.3	81
11-Jan	76	76	74	78	77	77	76	77	76	77	77	76	77	74	74	72	69	71	73	80	80	77	76	79	75.8	80
12-Jan	80	85	83	83	83	83	84	84	84	84	84	84	85	85	86	86	84	82	82	82	82	84	84	82	83.5	86
13-Jan	83	84	84	85	88	88	89	88	87	86	83	82	79	78	78	83	89	89	89	89	88	88	86	85	85.3	89
14-Jan	87	85	83	86	87	85	86	86	86	84	82	81	80	79	79	79	78	78	77	77	78	79	78	76	81.5	87
15-Jan	77	78	77	74	74	74	75	72	71	71	74	78	80	81	83	78	73	74	75	79	78	79	80	81	76.5	83
16-Jan	82	83	84	84	84	83	83	83	83	82	82	84	82	82	82	78	76	74	70	69	67	64	65	65	78.0	84
17-Jan	67	69	70	69	68	69	82	83	83	81	78	79	82	83	85	87	90	91	92	93	92	91	91	90	82.0	93
18-Jan	89	90	90	90	90	90	91	91	90	90	90	91	89	84	79	76	78	77	75	81	81	83	85	85	85.6	91
19-Jan	87	88	92	92	92	90	89	89	89	88	88	88	88	88	88	88	88	88	88	87	87	87	87	87	88.3	92
20-Jan	86	86	86	86	87	87	87	87	87	87	87	87	87	85	82	82	82	82	81	83	81	84	85	87	85.0	87
21-Jan	88	88	89	89	90	91	90	91	90	83	80	75	66	62	68	70	71	72	72	73	74	75	77	77	79.2	91
22-Jan	77	78	75	76	76	75	73	70	70	75	85	84	81	73	70	68	67	66	65	60	71	96	98	96	76.1	98
23-Jan	95	91	87	91	95	96	95	95	95	95	95	95	95	96	96	96	96	96	96	95	95	95	95	95	94.5	96
24-Jan	96	96	98	98	99	99	99	99	99	98	90	82	83	84	85	81	75	74	71	65	62	63	67	68	84.6	99
25-Jan	68	77	79	74	84	91	92	91	87	84	76	74	72	72	72	70	69	75	87	91	92	92	92	91	81.3	92
26-Jan	89	83	78	74	73	81	78	79	81	82	81	78	68	69	66	68	79	95	93	92	90	89	87	85	80.8	95
27-Jan	83	81	80	79	76	75	76	78	77	77	77	75	75	74	74	75	75	77	79	79	79	79	79	81	77.4	83
28-Jan	81	79	79	81	79	78	80	78	77	75	75	74	73	73	72	73	74	74	74	75	73	73	72	73	75.6	81
29-Jan	78	79	74	73	76	77	77	77	79	80	79	82	81	82	83	84	84	84	84	84	84	84	81	80	80.3	84
30-Jan	80	77	76	78	76	76	75	73	75	77	76	71	66	66	65	65	67	68	68	69	70	70	72	75	72.1	80
31-Jan	76	76	77	77	76	75	75	75	74	74	75	75	76	76	74	74	72	70	75	78	79	81	80	80	75.7	81
	79.7	79.7	79.3	79.1	79.6	79.9	80.2	80.2	80.0	79.8	79.4	78.4	77.1	76.1	75.4	74.9	75.1	76.1	76.8	77.2	77.2	78.2	78.6	79.0	Diurnal Average	
	96	96	98	98	99	99	99	99	99	98	95	95	95	96	96	96	96	96	96	95	95	96	98	96	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - January 2015
Relative Humidity 100m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	11	1.48	1.48
60 - 80	450	60.48	61.96
80 - 100	283	38.04	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 99 % on Jan 24 09:00

Maximum Daily Average: 95.3 % on Jan 23

Minimum Value: 51 % on Jan 8 15:00

Minimum Daily Average: 60.7 % on Jan 8

Maximum Diurnal Average: 80.4 % at hour 7

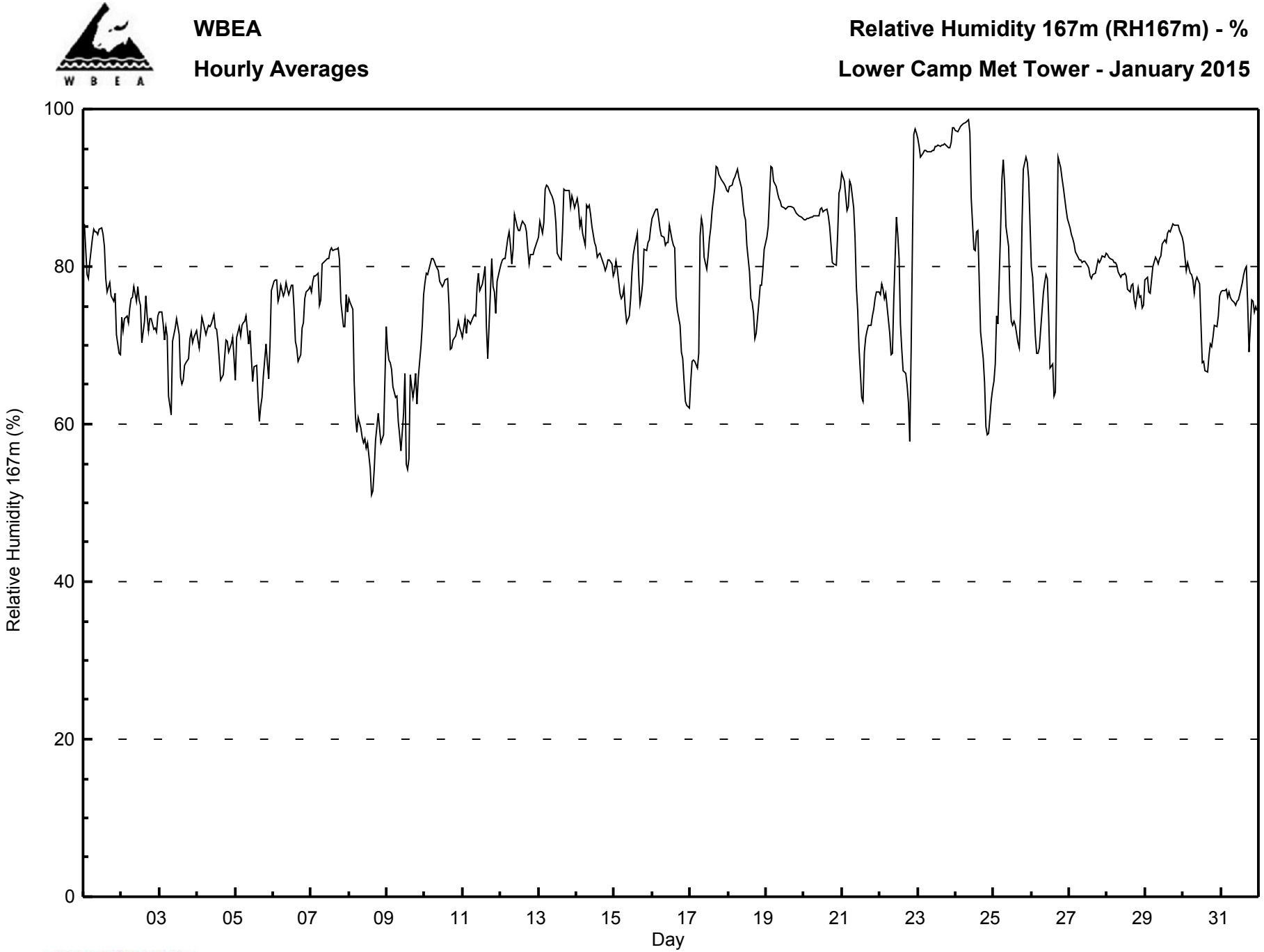
Minimum Diurnal Average: 75.5 % at hour 17

Monthly Average: 78.3 %

Percentiles: P_1 = 57 P_{10} = 67 Q_1 = 72 Median = 78 Q_3 = 85 P_{90} = 90 P_{99} = 97

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-Jan	85	82	79	79	81	84	85	84	84	84	85	85	84	83	79	77	78	76	76	76	77	71	69	69	79.6	85
2-Jan	74	72	73	74	73	75	76	76	77	76	77	76	75	70	73	76	74	72	73	73	72	72	72	74	74.0	77
3-Jan	74	74	73	71	72	71	64	61	71	71	72	73	71	66	65	66	67	68	68	71	72	70	71	72	69.8	74
4-Jan	71	70	71	74	73	71	72	73	72	73	74	72	72	71	68	66	66	68	71	70	69	70	71	68	70.7	74
5-Jan	66	71	72	71	73	73	73	74	70	72	68	65	67	67	64	60	62	63	66	70	68	66	70	77	68.7	77
6-Jan	78	78	78	76	76	78	76	77	78	77	76	78	78	75	70	70	68	69	72	73	76	77	77	77	75.3	78
7-Jan	77	78	79	79	79	75	76	80	80	81	81	81	82	82	82	82	82	82	81	76	72	72	77	74	78.8	82
8-Jan	76	76	74	65	61	59	61	60	58	58	58	57	58	54	51	52	54	58	61	59	58	58	59	72	60.7	76
9-Jan	69	68	68	67	65	63	64	60	59	57	61	66	55	54	56	66	63	65	66	63	66	70	73	76	64.2	76
10-Jan	78	79	79	80	81	81	81	80	79	78	78	78	78	78	78	75	70	70	71	71	72	73	72	72	76.3	81
11-Jan	71	73	72	73	73	73	74	74	74	77	79	77	78	79	80	72	68	77	81	78	77	74	78	80	75.5	81
12-Jan	80	81	81	81	84	84	83	80	82	87	85	85	85	85	86	85	84	82	80	81	82	82	83	83	83.0	87
13-Jan	84	86	84	86	90	90	90	89	89	88	88	86	82	81	81	85	90	90	90	90	88	89	88	88	87.1	90
14-Jan	89	87	85	86	84	83	88	88	88	87	85	83	83	81	81	82	81	80	79	80	81	81	80	79	83.3	89
15-Jan	79	81	80	77	76	76	77	75	73	74	76	79	81	83	84	79	75	76	78	82	82	83	83	85	78.9	85
16-Jan	86	87	87	87	86	85	84	84	83	83	83	85	83	83	82	76	74	72	69	68	65	63	62	62	78.4	87
17-Jan	65	68	68	68	67	69	84	86	85	81	80	81	84	85	87	90	93	93	92	91	91	91	90	90	82.4	93
18-Jan	89	90	90	91	91	92	92	91	90	88	87	86	83	79	76	75	74	71	71	75	78	78	80	82	83.4	92
19-Jan	84	85	89	93	93	91	90	89	89	88	88	87	87	87	88	88	88	87	87	87	87	86	86	86	87.9	93
20-Jan	86	86	86	86	86	86	86	86	86	87	87	87	87	87	87	87	85	83	81	80	80	84	89	90	85.7	90
21-Jan	92	91	89	87	88	91	90	87	84	77	74	70	63	63	69	71	72	73	73	74	74	76	77	77	78.4	92
22-Jan	76	78	77	76	77	73	71	69	69	76	86	84	81	73	69	67	66	65	63	58	69	97	97	97	75.6	97
23-Jan	96	95	94	94	95	95	95	95	95	95	95	95	95	95	95	95	95	96	95	95	95	96	98	98	95.3	98
24-Jan	97	97	98	98	98	98	98	99	99	97	89	82	82	84	85	78	72	68	65	60	59	59	63	64	82.8	99
25-Jan	65	68	74	73	85	91	94	91	85	83	76	73	73	73	73	70	70	75	85	92	94	93	91	86	80.4	94
26-Jan	80	79	71	69	69	70	72	77	78	79	79	74	67	68	64	64	78	94	93	91	90	89	87	86	77.7	94
27-Jan	85	84	83	83	82	81	81	81	81	81	81	80	80	79	78	79	79	80	81	81	81	81	81	82	81.0	85
28-Jan	82	81	81	81	81	81	80	79	79	79	79	79	79	77	77	78	78	76	75	77	76	76	75	75	78.3	82
29-Jan	78	79	77	77	78	80	81	81	80	81	81	83	83	83	84	85	84	85	85	85	85	85	85	84	82.1	85
30-Jan	83	81	79	81	79	79	78	77	78	79	78	73	68	68	67	67	69	70	70	71	72	72	74	76	74.5	83
31-Jan	77	77	77	77	76	77	76	76	75	75	76	76	76	78	79	80	80	75	69	76	76	74	75	74	76.1	80
	79.8	80.1	79.7	79.3	79.7	79.8	80.4	79.9	79.7	79.6	79.4	78.6	77.4	76.5	76.1	75.5	75.5	76.1	76.4	76.6	76.9	77.7	78.5	79.2	Diurnal Average	
	97	97	98	98	98	98	98	99	99	97	95	95	95	95	95	95	95	96	95	95	95	97	98	98	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity 167m (RH167m) - %
Lower Camp Met Tower - January 2015
Relative Humidity 167m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	25	3.36	3.36
60 - 80	397	53.36	56.72
80 - 100	322	43.28	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - January 2015

Maximum Speed: 25 km/h on Jan 22 14:00

Maximum Daily Speed Average: 11.1 km/h on Jan 11

Minimum Speed Value: 0 km/h on Jan 6 09:00

Minimum Daily Speed Average: 0.5 km/h on Jan 29

Maximum Diurnal Speed Average: 2.1 km/h at hour 5

Minimum Diurnal Speed Average: 0.5 km/h at hour 11

Monthly Average Velocity: 0.9 km/h 192.6 deg

Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 11$ $P_{90} = 14$ $P_{99} = 20$

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	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-Jan	N5	N5	N4	NNW3	N4	N4	NNW4	N4	NNW4	NNW5	NNW4	NNW5	NNW5	N11	N10	N10	NNW6	NW5	NNW5	WNW2	NW1	NNW0	SE1	WNW2	NNW4.3	N11
2-Jan	NW1	WNW2	NNW3	WNW2	WNW2	NW3	NNW2	NE0	WSW3	E0	W2	WSW1	W2	W2	NW1	NNW2	NW2	NW2	NW1	NW2	NNW3	NW2	N2	NNW3	NW1.5	NW3
3-Jan	NNW2	WNW2	NNW3	NNW3	NNW3	NNW3	NW2	WSW1	NNW2	NNW3	WNW3	SW1	W1	W4	WNW5	NW2	NW2	W11	W10	NNW2	NNE1	W0	SSE4	S5	WNW2.2	W11
4-Jan	SE3	SW4	SW7	SSE9	SE13	SSE7	SSE8	SSE9	SE12	SSE14	SSE16	SSE12	S10	SSE14	S9	SW9	WSW9	WSW10	W9	W11	WSW13	WSW16	W13	W13	SSW6.8	WSW16
5-Jan	W18	W12	SW7	SSW6	SSE8	SE9	SE5	WSW1	NNW4	NNW6	NW7	NW10	WNW12	WNW14	NW11	NW12	NNW10	NW10	NNW8	NW5	NNW4	NNW6	NNW6	NW5	WNW5.2	W18
6-Jan	NNE3	N3	NW2	NW3	NNW2	NNW2	NNW1	S0	S0	SSE1	SSW2	SSE7	SSE9	SSE12	SSE9	SSE7	SSE4	SSE5	SSE11	SE11	SE12	SSE13	SSE15	SSE14	SSE4.9	SSE15
7-Jan	SSE13	SSE15	SE10	SSE12	SSE13	SSE13	SE11	SSE10	SSE12	SSE7	ENE1	N2	NNW2	NNW2	N4	NNW3	NNW3	NNW7	NNW8	N11	NNW9	NW6	NNW7	NNW14	SE1.7	SSE15
8-Jan	N9	NNW7	N4	NW8	NW12	NW12	WNW13	WNW12	WNW13	WNW8	NW11	WNW14	WNW12	WNW11	NW12	WNW14	W11	W12	WNW7	W10	W9	NW3	WSW6	SSE7	WNW8.9	WNW14
9-Jan	SSE10	SE11	SSE12	SSE12	SSE12	SSE13	SSE13	SSE12	SSE13	SSE11	SSE13	SSE10	SSE10	SSE9	SSE8	N2	NNW4	NW1	NW4	NW3	W2	NNW3	N1	SW1	SSE6.4	SSE13
10-Jan	SE2	NE3	NW3	NW0	NNW1	NNW1	NW0	SSE3	SSE10	SSE11	SSE12	SSE10	SSE10	SSE9	SSE10	SSE10	SSE10	SSE9	SSE5	SSE8	SSE11	SSE8	SSE6	SSE9	SSE6.1	SSE12
11-Jan	SSE8	SSE7	SSE9	SSE9	SSE8	SSE10	SSE10	SSE13	SSE12	SSE11	SSE11	SSE10	SSE10	SSE11	SSE8	SSE11	SSE16	SSE13	SSE13	SSE16	SSE17	SSE12	SSE11	SSE10	SSE11.1	SSE17
12-Jan	SSE12	SSE12	SSE10	SSE7	SSE1	SSE1	SSE4	SE2	ESE1	ENE0	SSE1	S1	SSE2	SSE1	SSE4	SSE8	SSE9	SSE12	SE11	SE11	SSE11	SE5	SSE7	SSE10	SSE5.9	SSE12
13-Jan	SE13	SSE6	SE1	NNW5	N7	N9	N8	N6	N2	NNE4	NNE4	NE6	NE4	NE4	N2	NNW4	NNW4	N4	N4	SSE1	SE9	SSE9	S7	SSW7	NE1.5	SE13
14-Jan	SSW7	S6	SW4	SSE9	SSE11	NW3	NNW7	N9	N8	NNE6	NNE6	NNE7	N7	NNE6	NNE6	NNE6	NNE8	NNE9	NNE8	N8	NNE7	NNE6	N6	NNE7	NNE4.0	SSE11
15-Jan	NNE5	NNE6	NNE6	N4	NE4	NNE5	NNE6	NNE4	N4	NNE3	N4	N4	NNW4	N3	NNW3	ESE5	SE15	SE15	SE18	SSE20	SSE18	SSE21	SSE22	SSE20	ESE4.9	SSE22
16-Jan	SSE21	SSE20	SSE20	SSE19	SSE16	SSE13	SSE14	SSE16	SSE18	SSE18	SSE15	SSE11	SSE11	SSE9	WSW10	W12	W15	W16	W17	W18	W18	W20	W20	WNW20	SSW8.5	SSE21
17-Jan	WNW18	W14	W16	W18	W20	W14	N10	N7	N7	N6	N6	NNW4	N6	N7	NNW6	N5	NNW4	NNW4	NW2	WNW2	NW2	NNE2	SSE4	SSE7	NW5.6	W20
18-Jan	SSE8	SSE9	SSE7	SSE5	SSE4	SE4	SE5	SSE6	SSE5	SSE8	SSE8	SSE9	SSE12	SSE12	SSE9	SSE9	SSE11	SSE10	SE17	SSE9	SSE9	SSE9	SSE7	SSE7	SSE8.3	SE17
19-Jan	SSE10	SSE6	SSE0	NNW3	WNW3	NW2	NW1	N1	NNW1	N5	NNW4	NNW5	NNW7	NNW6	NNW6	NNW6	NNW5	NNW5	NNW6	NNW7	NNW6	N7	NNW5	NNW6	NNW3.4	SSE10
20-Jan	NNW6	NNW6	NNW5	NNW5	NW5	NNW4	NNW4	NW4	NW4	NNW3	N2	WSW3	SW3	SSE3	SSE10	SSE7	SSE4	SSE11	SSE10	SSE7	SSE15	SSE14	SSE18	SSE13	SSE2.7	SSE18
21-Jan	SSE7	SE8	SE12	SSE15	SE15	ESE4	NNE2	ESE4	SE5	SSE6	SE7	ESE6	SSE15	SSW14	SSW13	SW14	WSW18	WSW19	W14	S7	SSW6	SW4	SW6	SW5	S6.5	WSW19
22-Jan	SSW3	SSE6	SE12	SE9	SSE3	SW4	WSW6	W13	W13	WNW16	WNW10	AF	NW12	WNW25	W20	W16	W14	W18	W19	W19	NW11	NNE8	N8	N6	W8.3	WNW25
23-Jan	N8	N8	N6	N5	NNW4	N5	NNW4	NNW4	NNW4	NNW4	N4	N4	NW3	W4	SW4	W2	E2	N3	WNW2	WSW2	WNW2	WSW3	SSE1	WSW1	NNW2.7	N8
24-Jan	E1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	W16	W13	W7	NNW4	NNW4	NNW1	NNW2	WNW1	SSE1	NW3	W4	SSE6	SSE13	----	W16
25-Jan	SSE17	SSE15	SE12	SSE7	SSE16	SSE21	SSE16	SSE12	SE5	WSW3	W16	W12	W12	W15	W11	WNW11	NW7	N6	N5	N4	NE4	NNE1	SW1	ESE2	SSW3.6	SSE21
26-Jan	S3	SSE10	SSE10	SSE10	SE10	SE8	SE10	SSE12	SSE11	SSE7	SSE5	S5	WSW8	W7	WNW6	WNW1	NNW10	NNE13	N16	N14	NNE15	NNE13	N14	N14	ENE1.9	N16
27-Jan	N13	NNE12	N11	N12	N11	NNE10	N9	N9	N7	NNE8	N8	N7	NNE8	N10	N9	N9	N10	N10	N8	N9	N7	N7	N8	N7	N9.1	N13
28-Jan	NNW7	NNW7	NNW8	NNW8	NW9	NNW6	NNW6	NNW4	N2	NNW3	NNW4	NW5	WNW4	WSW5	NNE1	N2	NW2	NNW3	NW2	NE2	NE4	NE2	NNE2	ENE0	NNW3.5	NW9
29-Jan	NNE2	WNW1	SSE6	SSE7	SSE5	SE5	SSE6	SSE10	SSE8	SSE7	SSE3	SSW1	N1	SSE1	N2	NNW3	N5	NNW6	NNW5	N6	NNW5	N7	N10	N10	NE0.5	N10
30-Jan	N10	N9	N11	NNE9	NNE7	NNE6	N9	N8	NNE7	N6	N9	N9	NNE10	NNE9	NNE9	N8	NNE7	N6	NNW5	NNW4	N3	N4	WNW2	NNW1	N6.8	N11
31-Jan	NW2	NNW2	NNW2	NW1	SW1	NW0	SE4	SSE6	SSE7	SSE8	SSE9	SSE11	SSE11	SSE7	SSE7	SE5	SSE7	SSE8	SSE11	SSE10	SSE7	SSE10	SSE11	SSE12	SSE5.9	SSE12
	SSE1.6	SSE1.8	SSE1.8	SSE1.9	SSE2.1	SSE1.1	SE1.1	SE1.5	SSE1.6	SSE1.3	SSE0.5	SW0.8	SW1.3	WSW1.9	W1.4	WNW1.8	W1.5	WNW1.9	W1.5	WSW0.9	S1.0	S0.8	S1.6	S1.6	Diurnal Average	
	SSE21	SSE20	SSE20	SSE19	W20	SSE21	SSE16	SSE16	SSE18	SSE18	SSE16	W16	SSE15	WNW25	W20	W16	WSW18	WSW19	W19	SSE20	SSE18	SSE21	SSE22	WNW20	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 22 14:00

Minimum Value: 0 km/h on Jan 19 08:00

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

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Hours of Calibration:	0
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	Maximum
1-Jan	2	2	2	1	2	2	2	2	2	2	2	2	2	4	4	4	2	2	2	1	1	1	1	1	4
2-Jan	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	3	2	2	3	4	5	3	2	2	2	3	5
4-Jan	1	4	3	4	4	3	3	3	5	3	3	4	4	4	3	5	3	5	5	5	4	5	7	7	7
5-Jan	7	6	5	4	3	2	3	2	3	3	4	4	4	5	4	4	3	3	3	1	2	2	2	2	7
6-Jan	1	2	1	1	1	1	1	1	1	0	1	1	2	2	1	1	1	2	2	2	2	2	2	2	2
7-Jan	3	2	3	3	6	3	3	2	2	3	2	1	1	1	1	1	1	3	3	5	3	2	3	6	6
8-Jan	4	2	2	5	3	4	4	4	4	4	4	5	4	4	4	4	4	4	4	5	6	3	4	2	6
9-Jan	3	2	2	3	2	3	2	2	3	3	3	3	3	3	2	2	1	1	1	1	2	1	1	1	3
10-Jan	2	2	1	1	1	1	1	2	3	2	2	2	3	3	3	2	2	2	2	2	2	2	1	1	3
11-Jan	1	1	2	2	2	2	2	2	2	2	2	2	2	4	3	3	3	2	2	2	2	3	5	2	5
12-Jan	2	5	4	3	1	1	1	2	2	1	1	1	1	1	2	2	2	3	3	3	3	3	3	4	5
13-Jan	4	2	1	2	2	3	3	2	1	2	2	3	2	2	1	1	2	1	1	3	5	4	3	3	5
14-Jan	3	3	2	3	3	4	2	3	3	3	3	3	3	3	3	3	3	4	4	3	3	2	2	3	4
15-Jan	3	3	3	2	2	3	2	2	2	2	1	2	2	2	2	4	5	4	6	6	6	7	7	6	7
16-Jan	7	6	5	5	5	4	4	4	3	5	4	3	3	4	3	4	5	5	6	6	6	6	6	7	7
17-Jan	6	5	4	6	5	6	3	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	3	2	6
18-Jan	2	2	2	3	1	2	2	2	2	4	3	4	3	3	3	5	5	3	4	4	4	4	2	2	5
19-Jan	2	1	2	1	1	1	1	0	1	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	3
20-Jan	2	2	2	2	2	2	1	2	1	2	1	1	1	1	3	5	2	3	4	4	5	5	4	5	5
21-Jan	4	4	4	5	4	4	1	2	3	2	2	3	5	5	5	6	5	5	5	4	4	3	3	3	6
22-Jan	2	3	2	4	2	2	2	5	6	5	5	AF	6	8	6	6	4	5	5	5	6	3	3	3	8
23-Jan	3	2	3	2	2	2	2	1	2	2	2	2	1	2	2	1	1	1	1	1	1	2	2	2	3
24-Jan	1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	4	4	3	2	2	1	1	1	1	2	3	2	3	4
25-Jan	3	4	3	2	5	5	5	3	4	4	5	4	3	3	4	3	3	2	2	2	2	1	1	1	5
26-Jan	1	3	2	2	3	3	3	3	3	2	2	3	4	3	3	1	6	5	5	5	6	5	5	5	6
27-Jan	4	5	4	5	5	4	3	3	3	3	3	3	3	4	3	3	4	4	3	3	3	3	3	2	5
28-Jan	3	3	3	3	3	2	2	2	1	1	2	2	2	2	1	1	1	1	1	2	2	1	1	1	3
29-Jan	1	1	3	2	2	3	4	4	2	2	2	2	1	1	1	1	2	3	2	2	2	3	4	3	4
30-Jan	4	4	4	4	4	3	4	4	3	2	3	4	4	4	4	3	3	2	2	1	1	1	1	1	4
31-Jan	1	1	1	1	1	1	2	1	2	2	3	3	2	2	3	1	2	3	2	3	2	3	3	3	3
	7	6	5	6	6	6	5	5	6	5	5	5	6	8	6	6	6	5	6	6	6	7	7	7	
	Diurnal Maximum																								

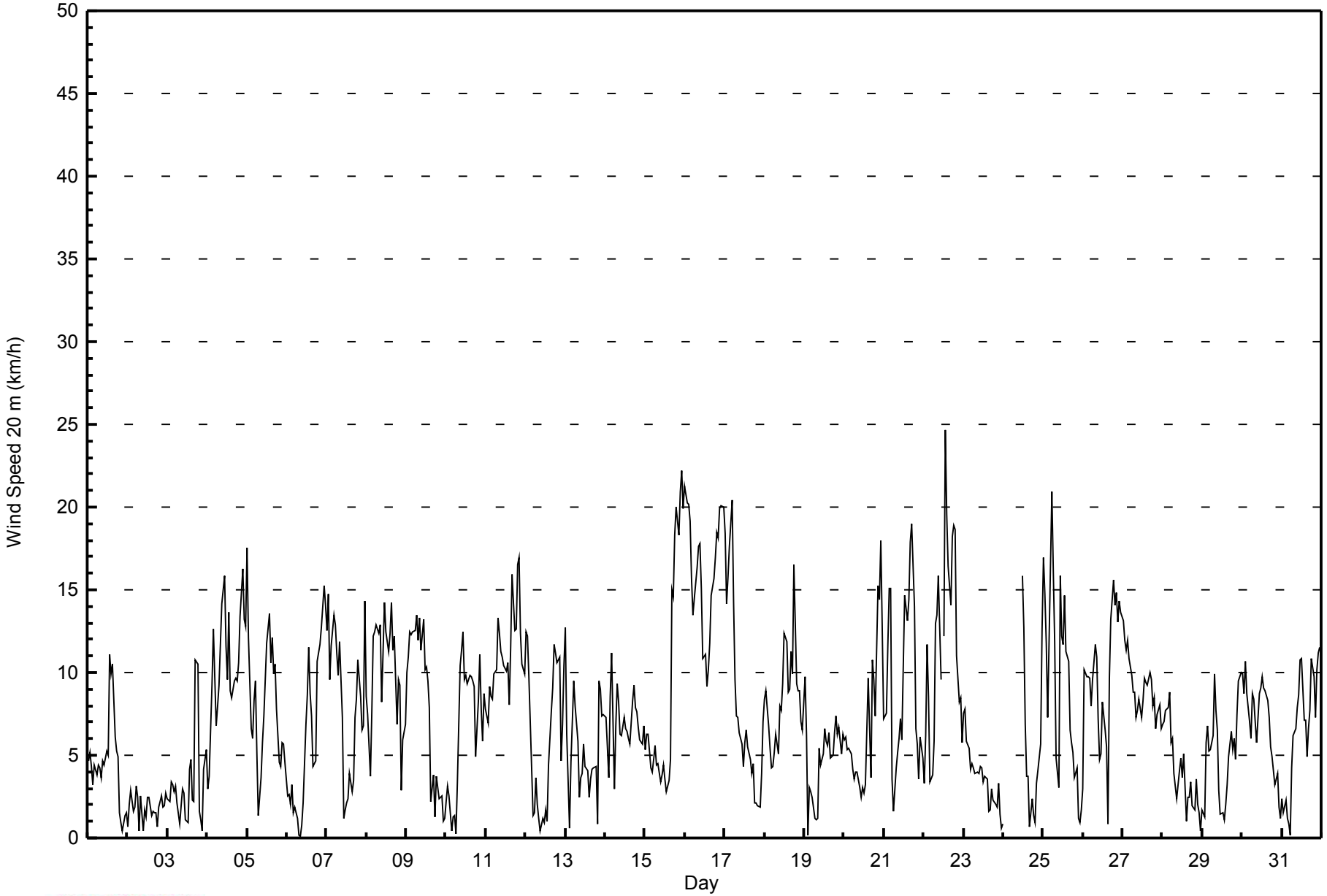
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	289	39.43	39.43
6 - 11	297	40.52	79.95
12 - 19	133	18.14	98.09
20 - 28	14	1.91	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 733

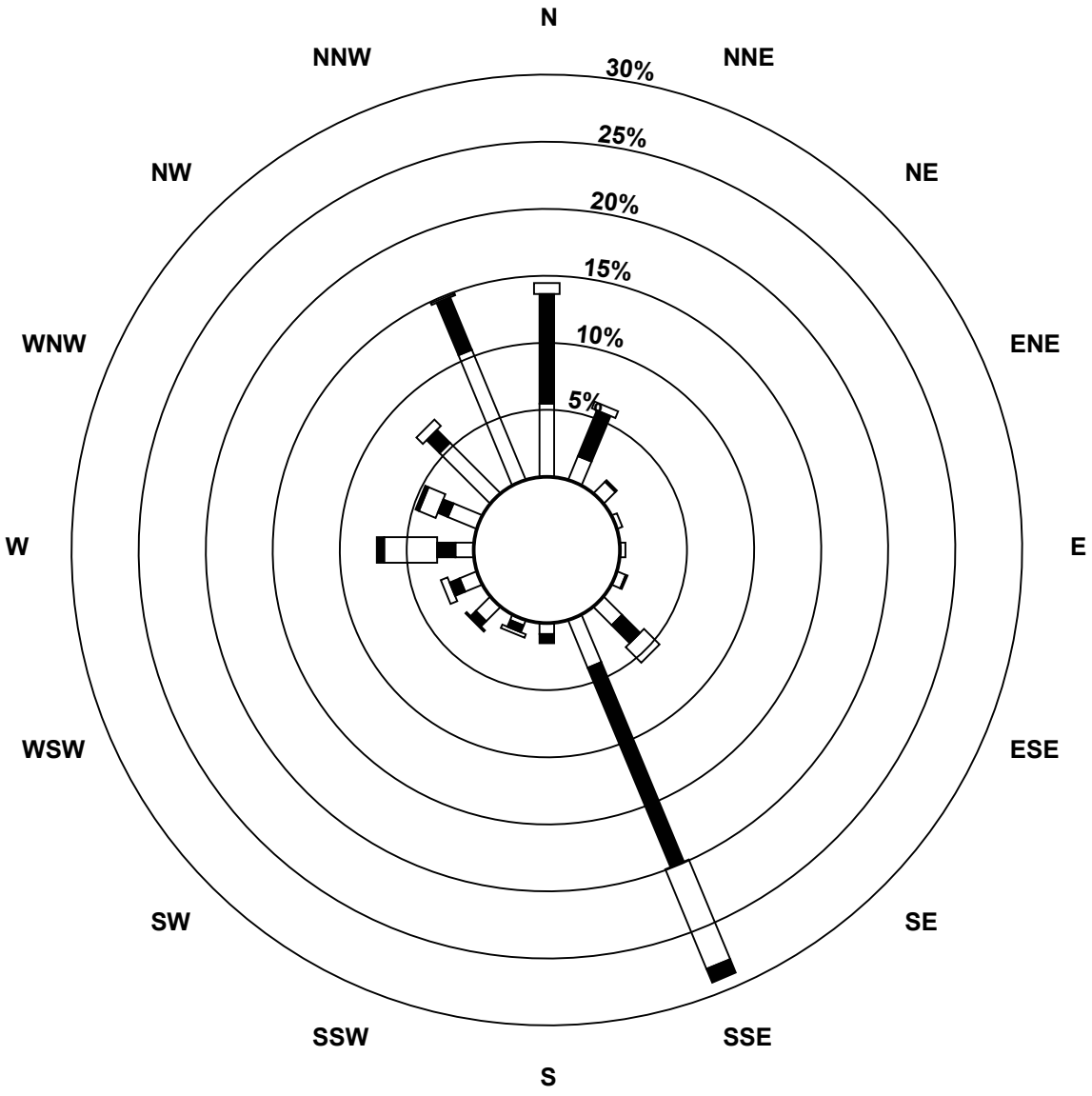
Total Number of Hours: 744

Wood Buffalo Environmental Association

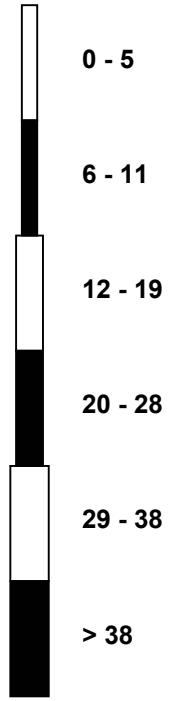
Wind Rose Jan 2015

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower (AMS 3)



Classes (km/h)



Total Number of Valid Hours: 733

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - January 2015

Maximum Speed: 33 km/h on Jan 22 14:00

Maximum Daily Speed Average: 13.2 km/h on Jan 11

Minimum Speed Value: 0 km/h on Jan 1 22:00

Minimum Daily Speed Average: 0.9 km/h on Jan 29

Maximum Diurnal Speed Average: 3.0 km/h at hour 18

Minimum Diurnal Speed Average: 0.1 km/h at hour 11

Monthly Average Velocity: 0.8 km/h 218.6 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 5 Median = 9 Q_3 = 13 P_{90} = 18 P_{99} = 27

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Percent Operational Time:	98.7

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-Jan	N7	N8	N7	NNW5	N6	N6	NNW7	N6	NNW6	NNW7	NNW6	NNW7	NNW7	N16	N14	N15	NNW9	NW8	NNW7	WNW3	NW1	NNW0	SE1	WNW2	NNW6.4	N16
2-Jan	NW1	WNW2	NNW4	WNW2	WNW2	NW5	NNW4	NE0	WSW3	E1	W1	WSW1	W2	W2	NW3	NNW4	NW1	NW2	NW1	NW3	NNW2	NW3	N2	NNW5	NW1.9	NW5
3-Jan	NNW4	WNW3	NNW6	NNW6	NNW3	NNW5	NW2	WSW1	NNW1	NNW3	WNW5	SW4	W3	W6	WNW8	NW4	NW6	W17	W17	NNW3	NNE2	W2	SSE4	S6	WNW3.7	W17
4-Jan	SE2	SW8	SW10	SSE10	SE12	SSE7	SSE8	SSE9	SE10	SSE11	SSE18	SSE11	S10	SSE13	S9	SW13	WSW14	WSW14	W13	W14	WSW18	WSW24	W20	W19	SSW8.2	WSW24
5-Jan	W25	W18	SW10	SSW8	SSE7	SE8	SE3	WSW3	NNW6	NNW8	NW10	NW12	WNW15	WNW17	NW13	NW15	NNW13	NW13	NNW11	NW7	NNW8	NNW10	NNW9	NW6	WNW7.7	W25
6-Jan	NNE4	N5	NW2	NW2	NNW2	NNW2	NNW1	S2	S2	SSE2	SSW4	SSE9	SSE10	SSE13	SSE10	SSE9	SSE8	SSE8	SSE10	SE7	SE12	SSE14	SSE17	SSE16	SSE5.7	SSE17
7-Jan	SSE16	SSE17	SE12	SSE12	SSE17	SSE16	SE14	SSE11	SSE12	SSE8	ENE2	N2	NNW2	NNW3	N6	NNW4	NNW5	NNW9	NNW11	N16	NNW12	NW9	NNW10	NNW20	ESE1.5	NNW20
8-Jan	N12	NNW11	N7	NW12	NW17	NW17	WNW18	WNW17	WNW18	WNW13	NW15	WNW18	WNW16	WNW14	NW16	WNW19	W17	W18	WNW11	W16	W15	NW6	WSW12	SSE7	WNW12.7	WNW19
9-Jan	SSE9	SE10	SSE14	SSE16	SSE16	SSE17	SSE16	SSE16	SSE17	SSE15	SSE16	SSE13	SSE14	SSE13	SSE10	N4	NNW7	NW2	NW5	NW5	W3	NNW2	N1	SW1	SSE7.8	SSE17
10-Jan	SE3	NE8	NW4	NW2	NNW2	NNW2	NW1	SSE7	SSE13	SSE13	SSE14	SSE12	SSE12	SSE12	SSE12	SSE11	SSE11	SSE12	SSE9	SSE12	SSE14	SSE9	SSE9	SSE11	SSE7.7	SSE14
11-Jan	SSE11	SSE10	SSE11	SSE11	SSE11	SSE13	SSE13	SSE15	SSE13	SSE13	SSE12	SSE12	SSE12	SSE13	SSE11	SSE14	SSE17	SSE15	SSE14	SSE18	SSE18	SSE16	SSE14	SSE9	SSE13.2	SSE18
12-Jan	SSE12	SSE19	SSE12	SSE8	SSE4	SSE4	SSE5	SE3	ESE2	ENE0	SSE1	S1	SSE1	SSE1	SSE6	SSE9	SSE12	SSE16	SE14	SE13	SSE15	SE8	SSE9	SSE13	SSE7.8	SSE19
13-Jan	SE15	SSE7	SE2	NNW7	N10	N14	N12	N10	N4	NNE6	NNE6	NE8	NE7	NE6	N4	NNW5	NNW5	N6	N5	SSE4	SE13	SSE12	S9	SSW9	NE2.4	SE15
14-Jan	SSW9	S6	SW5	SSE11	SSE11	NW6	NNW10	N14	N12	NNE9	NNE10	NNE11	N10	NNE10	NNE9	NNE10	NNE12	NNE15	NNE12	N12	NNE10	NNE10	N9	NNE11	NNE6.7	NNE15
15-Jan	NNE9	NNE10	NNE10	N6	NE6	NNE7	NNE8	NNE7	N6	NNE5	N5	N6	NNW4	N3	NNW4	ESE7	SE20	SE18	SE24	SSE27	SSE24	SSE28	SSE31	SSE27	ESE6.7	SSE31
16-Jan	SSE30	SSE26	SSE25	SSE25	SSE20	SSE16	SSE17	SSE20	SSE22	SSE22	SSE19	SSE14	SSE15	SSE7	WSW13	W17	W20	W21	W23	W24	W24	W28	W27	WNW26	SSW10.8	SSE30
17-Jan	WNW25	W20	W21	W23	W28	W19	N13	N10	N10	N9	N8	NNW6	N7	N8	NNW8	N7	NNW6	NNW7	NW3	WNW3	NW2	NNE3	SSE5	SSE7	NW7.7	W28
18-Jan	SSE10	SSE10	SSE8	SSE7	SSE5	SE6	SE7	SSE8	SSE7	SSE11	SSE10	SSE12	SSE16	SSE15	SSE11	SSE12	SSE14	SSE12	SE19	SSE11	SSE11	SSE9	SSE10	SSE10	SSE10.5	SE19
19-Jan	SSE12	SSE9	SSE2	NNW4	WNW4	NW4	NW2	N2	NNW3	N7	NNW7	NNW7	NNW8	NNW7	NNW7	NNW8	NNW7	NNW7	NNW8	NNW9	NNW8	N9	NNW7	NNW9	NNW4.6	SSE12
20-Jan	NNW8	NNW8	NNW7	NNW7	NW6	NNW6	NNW5	NW5	NW5	NNW4	N4	WSW3	SW3	SSE4	SSE11	SSE9	SSE5	SSE14	SSE14	SSE11	SSE17	SSE17	SSE20	SSE15	SSE3.2	SSE20
21-Jan	SSE12	SE12	SE14	SSE21	SE20	ESE6	NNE2	ESE6	SE8	SSE9	SE11	ESE9	SSE16	SSW19	SSW18	SW19	WSW23	WSW26	W19	S8	SSW7	SW5	SW8	SW7	S8.7	WSW26
22-Jan	SSW4	SSE5	SE10	SE9	SSE3	SW6	WSW9	W18	W18	WNW21	WNW12	AF11	NW15	WNW33	W27	W22	W20	W25	W25	W26	NW15	NNE12	N12	N8	W11.6	WNW33
23-Jan	N10	N11	N8	N7	NNW6	N6	NNW6	NNW5	NNW5	NNW5	N6	N5	NW4	W4	SW4	W2	E2	N4	WNW3	WSW2	WNW2	WSW3	SSE2	WSW1	NNW3.6	N11
24-Jan	E2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	W23	W18	W10	NNW5	NNW4	NNW2	NNW4	WNW6	SSE6	NW9	W11	SSE5	SSE15	----	W23
25-Jan	SSE22	SSE19	SE14	SSE8	SSE18	SSE24	SSE18	SSE16	SE6	WSW4	W22	W17	W16	W21	W17	WNW15	NW10	N9	N8	N6	NE6	NNE2	SW2	ESE2	SSW4.3	SSE24
26-Jan	S6	SSE13	SSE12	SSE13	SE15	SE12	SE12	SSE15	SSE13	SSE8	SSE5	S5	WSW13	W10	WNW8	WNW2	NNW14	NNE20	N22	N20	NNE22	NNE18	N20	N20	NE2.7	N22
27-Jan	N19	NNE18	N17	N18	N16	NNE14	N13	N12	N10	NNE11	N12	N11	NNE12	N13	N13	N13	N14	N14	N12	N13	N9	N10	N12	N9	N13.1	N19
28-Jan	NNW10	NNW10	NNW11	NNW10	NW10	NNW8	NNW9	NNW6	N4	NNW5	NNW5	NW5	WNW4	WSW6	NNE1	N3	NW3	NNW6	NW2	NE3	NE5	NE3	NNE2	ENE1	NNW4.8	NNW11
29-Jan	NNE3	WNW0	SSE8	SSE8	SSE7	SE8	SSE9	SSE13	SSE10	SSE7	SSE3	SSW2	N1	SSE1	N2	NNW4	N7	NNW9	NNW8	N9	NNW7	N10	N13	N14	NE0.9	N14
30-Jan	N15	N13	N16	NNE13	NNE10	NNE9	N12	N13	NNE11	N8	N12	N13	NNE14	NNE13	NNE14	N12	NNE11	N8	NNW7	NNW6	N6	N7	WNW4	NNW3	N10.2	N16
31-Jan	NW3	NNW2	NNW2	NW1	SW1	NW2	SE8	SSE10	SSE9	SSE9	SSE11	SSE13	SSE13	SSE9	SSE10	SE7	SSE9	SSE10	SSE13	SSE13	SSE9	SSE14	SSE16	SSE15	SSE7.8	SSE16
	SSE1.6	SSE1.8	SSE1.7	SSE1.9	SSE2.1	SSE0.8	ESE0.9	SE1.7	SE1.5	SSE1.0	SSE0.1	WSW0.9	WSW1.6	W2.5	W2.0	WNW2.6	WNW2.4	WNW3.0	WNW2.5	W1.3	SW0.7	SSW0.8	S1.7	S1.4	Diurnal Average	
	SSE30	SSE26	SSE25	SSE25	W28	SSE24	SSE18	SSE20	SSE22	SSE22	W22	W23	W18	WNW33	W27	W22	WSW23	WSW26	W25	SSE27	SSE24	SSE28	SSE31	SSE27	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 5 00:00

Minimum Value: 1 km/h on Jan 3 09:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 7

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

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

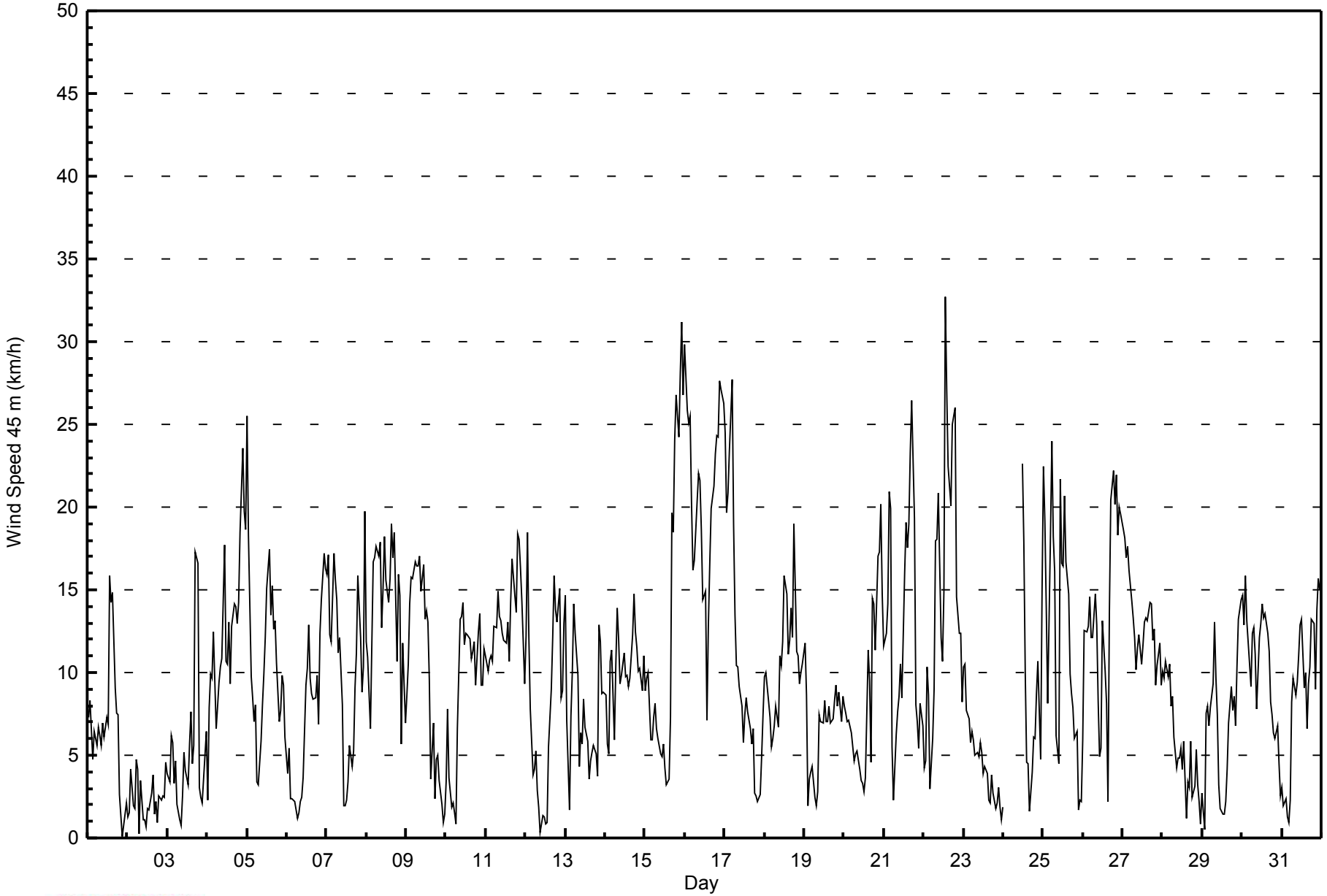
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	189	25.75	25.75
6 - 11	273	37.19	62.94
12 - 19	216	29.43	92.37
20 - 28	53	7.22	99.59
29 - 38	3	0.41	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 734

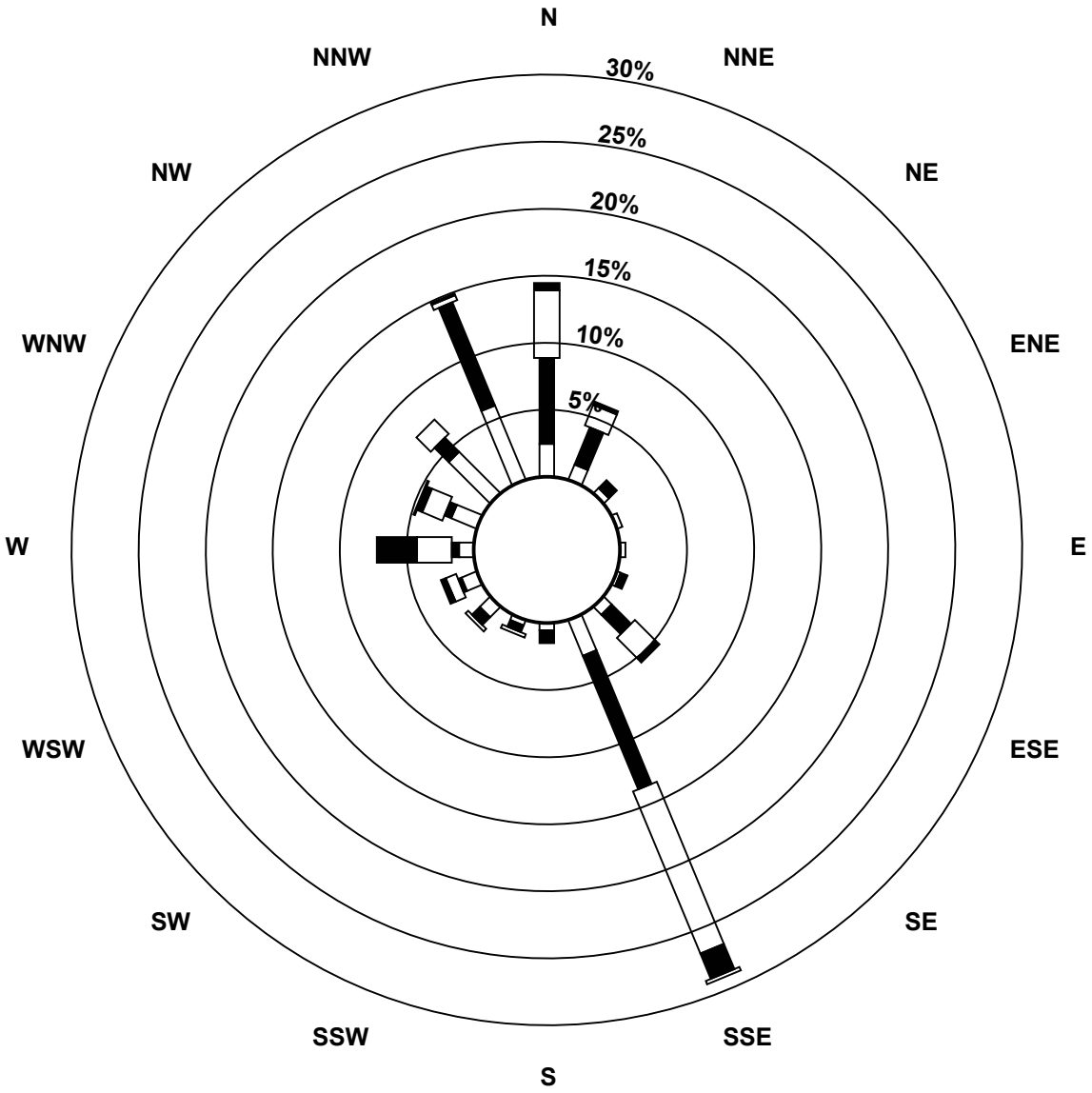
Total Number of Hours: 744

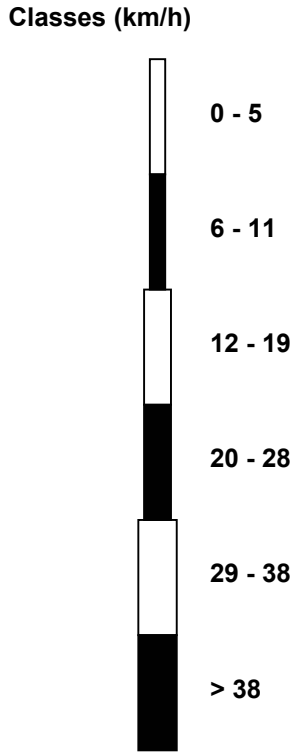
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 733

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - January 2015

Maximum Speed: 49 km/h on Jan 22 14:00

Maximum Daily Speed Average: 22.4 km/h on Jan 8

Minimum Speed Value: 0 km/h on Jan 10 06:00

Maximum Diurnal Speed Average: 6.2 km/h at hour 19

Monthly Average Velocity: 3.1 km/h 246.9 deg

Minimum Daily Speed Average: 0.9 km/h on Jan 7

Minimum Diurnal Speed Average: 0.9 km/h at hour 7

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 7 Median = 13 Q_3 = 18 P_{90} = 27 P_{99} = 41

Hours in Service:	744
Hours of Data:	677
Hours of Missing Data:	67
Percent Operational Time:	91.0

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-Jan	NNE11	NNE12	NNE9	N6	N9	N9	NNW10	N9	N8	N12	NNW9	NNW10	NNW10	N22	N21	N20	N14	NNW13	NNW12	NNW7	NNW4	NNW4	N5	N5	N10.3	N22
2-Jan	NE5	NE7	NNE6	NNE6	NNE6	NNE7	N7	N2	W3	S2	SE5	SSE3	W2	NE2	N2	NNE7	ENE6	ENE2	SSW1	NW2	NW4	N5	NW6	NNW12	NNE3.0	NNW12
3-Jan	NNW11	N13	N11	N9	NW6	NW9	NNW13	WNW9	W7	WNW5	WNW6	WNW7	W13	WNW10	W16	WSW16	WSW19	WSW28	W30	W15	W11	WSW11	WSW14	WSW20	W10.5	W30
4-Jan	WSW15	WSW22	WSW20	SW15	SW12	WSW21	WSW16	SW13	WSW16	SW15	SSW13	SW16	SSW14	SW16	SW18	WSW22	WSW22	WSW22	WSW20	WSW20	WSW26	WSW28	WSW25	WSW28	WSW18.5	WSW28
5-Jan	WSW35	WSW27	WSW18	WSW18	SW12	SW8	WSW12	WNW9	WNW15	WNW18	WNW19	NW18	WNW20	WNW24	NW19	NW23	NW21	NW22	NW18	NNW12	NNW16	NNW20	NNW17	N7	WNW14.6	WSW35
6-Jan	NNE6	NNE9	NNE6	NE10	NE6	NE1	WSW2	SSW2	SSE4	S4	SSW4	SSW3	SSW4	SSE4	SSE9	SSE6	S4	WSW8	WSW11	WSW13	SW11	SW9	S7	S12	SSW2.5	WSW13
7-Jan	SSE14	SSE19	SSE18	SSE13	SSE23	SSE14	SSE18	SSE9	SSE9	SSE8	SE9	ESE3	SE4	WSW2	WNW7	NNW8	N9	NNW14	N19	N25	N21	NW16	NW19	NNW30	NE0.9	NNW30
8-Jan	N18	NNW18	NNW11	WNW27	WNW28	WNW29	WNW30	WNW30	WNW30	WNW28	WNW26	WNW28	WNW22	WNW21	WNW23	WNW30	W29	W33	WSW26	WSW29	WSW27	WSW22	WSW24	SW10	WNW22.4	W33
9-Jan	SW9	SSW8	S7	SSE10	SSE16	SSE13	SSE13	SSE18	SSE17	SE18	SE18	SE19	SE17	SE18	SE16	ENE7	N12	NNW11	NW7	NW10	NNW11	NW8	WNW6	NNW9	SSE5.6	SE19
10-Jan	NE13	NE16	NNE9	N3	WNW1	N0	SE6	S6	SSE5	SSE5	SE14	SSE9	SSE8	SE15	SSE13	SSE12	SSE12	S8	SSW6	SW7	SSW6	SSW4	SW5	SW5	SSE4.5	NE16
11-Jan	SSW6	SSE5	SSW5	SE11	S6	S6	SSE9	SSE13	SSE10	SSE11	SSE17	SSE16	SSE16	SSE16	SSE17	SSE15	S17	S12	S11	SSE17	SSE21	SSE20	SSE12	SSE11	SSE12.2	SSE21
12-Jan	S14	SSE24	SSE15	SSE12	SSE5	SE4	SE3	S4	SW4	WNW3	N2	N3	SSE0	ESE2	SE9	SSE11	SSE16	SSE18	SSE13	SSE14	SSE17	SSE17	SSE12	S9	SSE8.8	SSE24
13-Jan	SSW9	ESE4	ESE1	N15	N16	N21	N17	N15	NNE8	NNE9	NNE7	NE10	NE8	NE8	NNE4	N5	NNE4	E3	SE6	SE16	SE23	SE21	SSE13	S9	ENE4.4	SE23
14-Jan	S10	SSW8	SW11	SSW8	WSW12	W20	N18	N21	NNE18	NNE13	NNE13	NNE14	NNE14	NNE14	NNE12	NNE13	NNE17	NNE20	NNE18	N17	NNE14	NNE14	N13	NNE14	N9.6	N21
15-Jan	NNE14	NNE14	NNE14	NNE9	NNE9	NNE10	NNE10	NNE9	NNE7	NNE6	NNE6	NNE6	NNE3	S3	ESE6	SE15	SE28	SE27	SE34	SE38	SE37	SE41	SE43	SE39	ESE11.4	SE43
16-Jan	SE42	SE36	SSE32	SE34	SE29	SSE23	SSE22	SSE26	SSE29	SSE25	SSE16	SSE8	S6	WSW16	WSW20	W29	WSW34	WSW36	W39	W39	WSW39	WSW43	WSW45	W41	SSW17.7	WSW45
17-Jan	W38	W34	W33	W37	W41	W29	N15	N12	N13	N13	N11	N8	N9	N10	N9	N8	N8	N9	N4	WNW2	W4	WSW2	SSE8	S7	WNW9.8	W41
18-Jan	S10	SSE8	SSE8	S9	SSE8	SSE10	SSE13	SSE12	SSE12	SSE18	SE18	SE12	SSE15	SSE14	SSE9	SSE8	S13	S10	SSW10	S7	SSE6	SSE8	SSE7	S6	SSE10.1	SE18
19-Jan	S6	SSE8	SE6	NNE1	NNW8	NNW7	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	SSE8
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSE6	SSE11	SE13	SSE8	SSE15	SSE18	SSE18	SSE20	SSE21	SSE24	SSE20	----	SSE24
21-Jan	SSE22	SSE24	SSE18	SSE25	SSE26	SE16	SE11	SE11	SE14	SSE19	SE19	SSE21	S19	SSW28	SSW27	SW29	SW32	WSW34	WSW28	SW14	SW15	SW15	WSW16	WSW16	SSW16.0	WSW34
22-Jan	WSW13	WSW10	SSW9	SW8	WSW13	WSW15	WSW21	W35	W31	W33	WNW19	W20	W25	W49	W43	WSW38	WSW33	WSW39	W39	W40	WNW23	NNE16	N15	N11	W22.1	W49
23-Jan	N13	N12	N8	N9	N7	N8	N7	NNW6	NNW5	AF	AF	AF	AF	WNW4	SSW3	SW3	E3	ENE4	SW2	AF	AF	AF	AF	AF	----	N13
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	W32	W28	W18	W7	W9	WNW15	W19	WSW22	WSW22	W24	W26	SW8	S7	----	W32
25-Jan	SSE13	SSE21	SSE17	SSW17	S19	SSE29	SSE23	SSE17	SSW6	WSW14	W36	W29	W27	W32	W31	WNW25	NW20	NNW14	NNE10	N8	NE7	ENE3	S4	SSE5	SW8.5	W36
26-Jan	S6	S6	S4	S6	SSE13	SSE17	S7	S6	SSW7	SW9	SW12	WSW18	WSW21	WSW18	WSW20	W10	NNW18	N27	AF	AF	AF	AF	AF	AF	SW6.2	N27
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	N15	NNE14	NNE15	N16	N17	N17	N18	N19	N17	N18	N13	N16	N16	N14	----	N19
28-Jan	N16	N15	NNW15	NNW14	NW14	NNW12	NNW16	N10	N6	N9	NNW5	NW6	WNW5	WSW5	NE2	NNE4	N6	NE12	NE8	ENE7	NE7	NE4	NE3	ESE2	N7.0	N16
29-Jan	E4	SE5	SSE11	SSE12	SE12	SE16	SE19	SE20	SE15	SE12	SE7	SE5	SSE3	SSE5	SE2	NNW3	N8	NNW13	N12	N13	N11	N16	N17	N17	E3.4	SE20
30-Jan	N21	N17	N22	NNE17	NNE15	N14	N18	N19	NNE16	N12	N17	N17	NNE19	N18	NNE17	N16	NNE16	N12	N13	N10	N8	N10	NNW11	NNW6	N14.9	N22
31-Jan	N6	NW3	WNW3	WSW1	SSE4	SSW3	SSE5	SSE7	SSE7	SSE8	SE16	SSE15	SE17	SE17	SE14	SSE13	SSE16	SSE15	SSE16	SSE18	SSE14	SSE15	SSE15	SE18	SSE10.0	SE18
	SW2.0	S2.1	SSW1.9	SSW2.6	SW3.1	SW2.6	WSW0.9	SSW1.2	SW1.9	SW2.3	SW1.5	WSW3.3	WSW3.9	WSW4.9	WSW4.0	W4.8	W4.8	W5.9	W6.2	WSW4.7	WSW4.3	SW3.7	SW3.8	WSW3.0	Diurnal Average	
	SE42	SE36	W33	W37	W41	W29	WNW30	W35	W31	W33	W36	W32	W28	W49	W43	WSW38	WSW34	WSW39	W39	W40	WSW39	WSW43	WSW45	W41	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 km/h on Jan 22 21:00

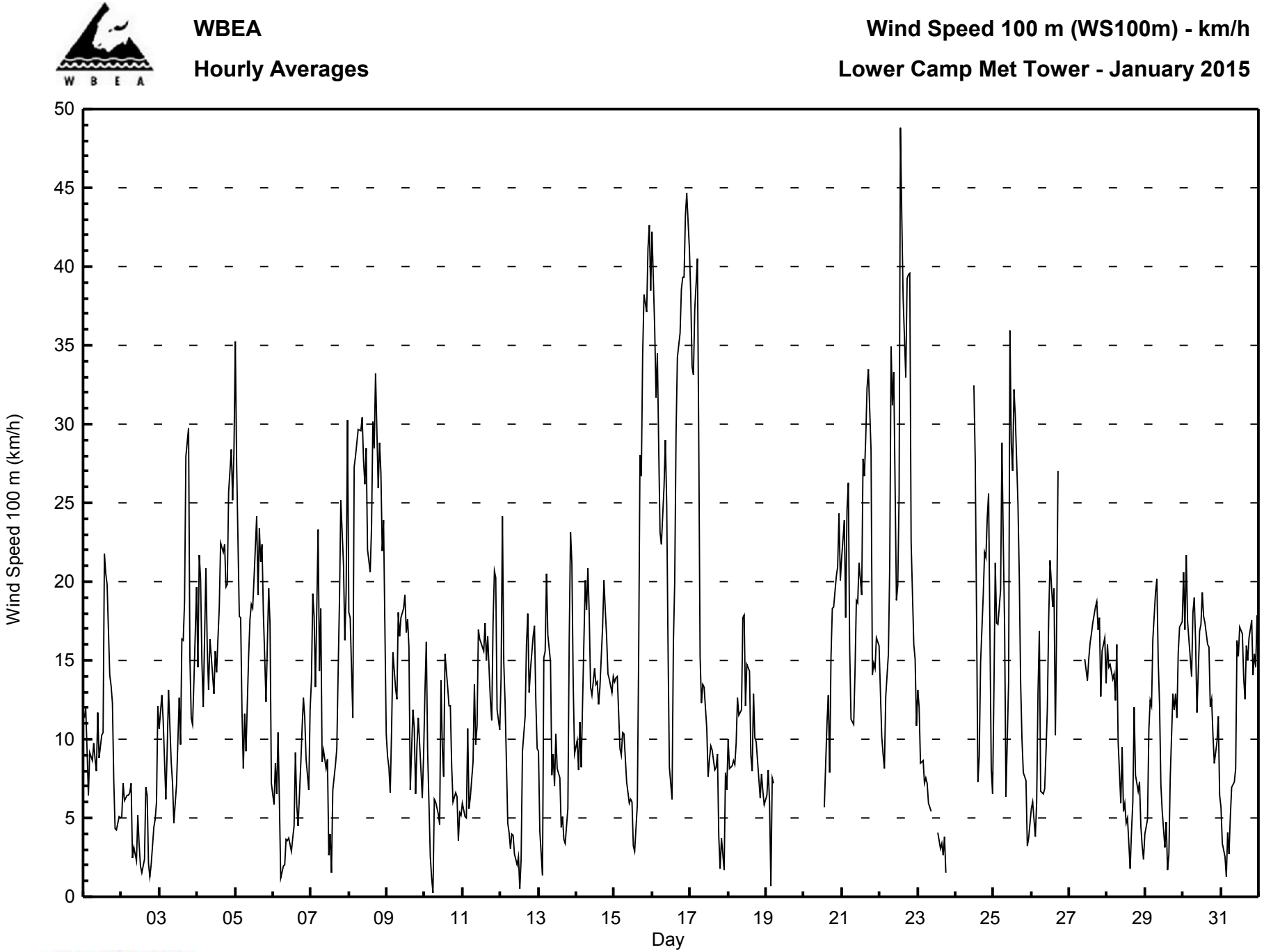
Minimum Value: 1 km/h on Jan 10 05:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 8

Hours in Service:	744
Hours of Data:	677
Hours of Missing Data:	67
Hours of Calibration:	0
Percent Operational Time:	91.0

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

AF - Analyzer Failure


WBEA
Hourly Averages
Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - January 2015
Wind Speed 100 m (km/h)
0
5
10
15
20
25
30
35
40
45
50
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	97	14.33	14.33
6 - 11	197	29.10	43.43
12 - 19	239	35.30	78.73
20 - 28	87	12.85	91.58
29 - 38	41	6.06	97.64
> 38	16	2.36	100.00

Total Number of Valid Hours: 677

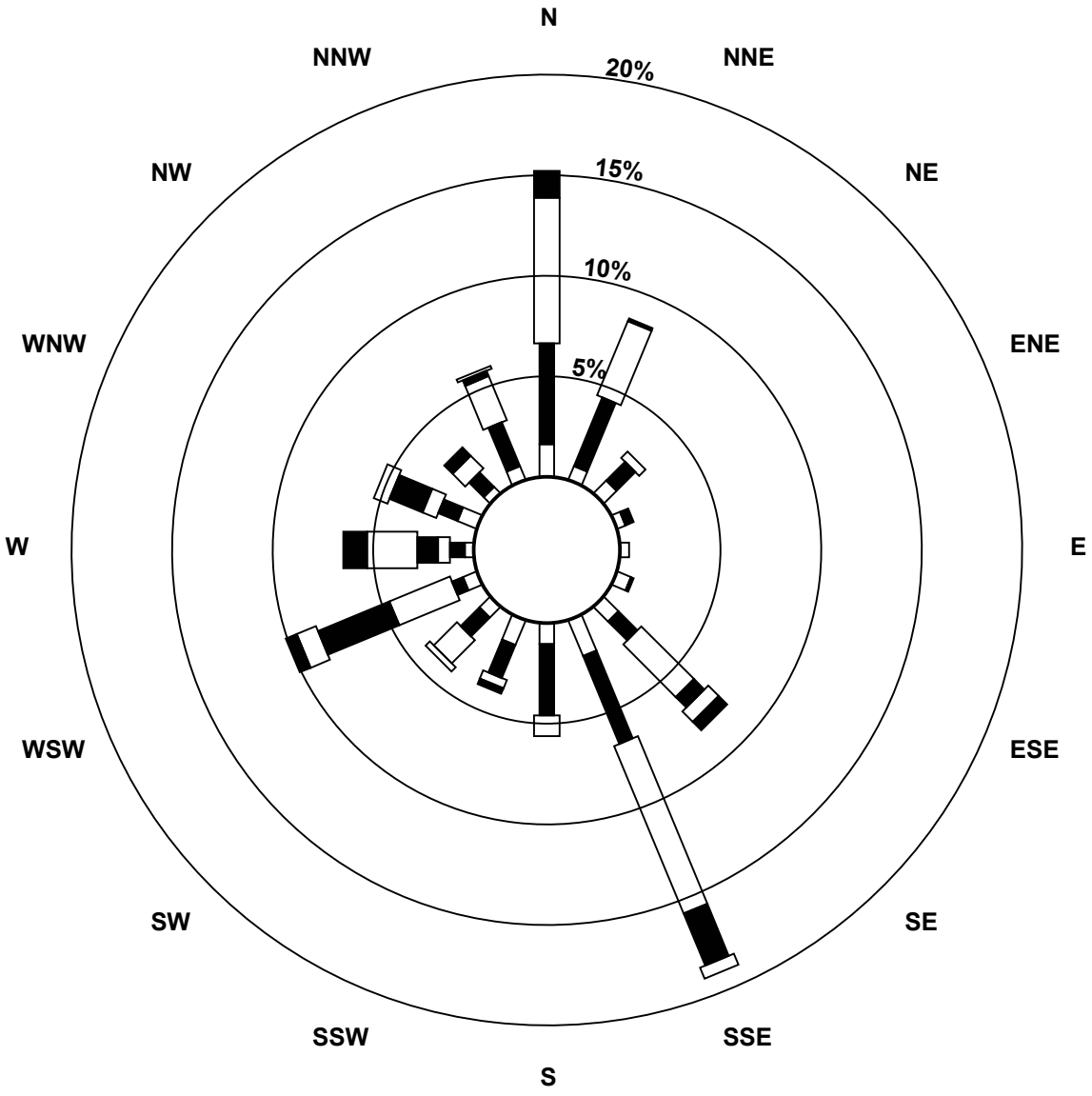
Total Number of Hours: 744

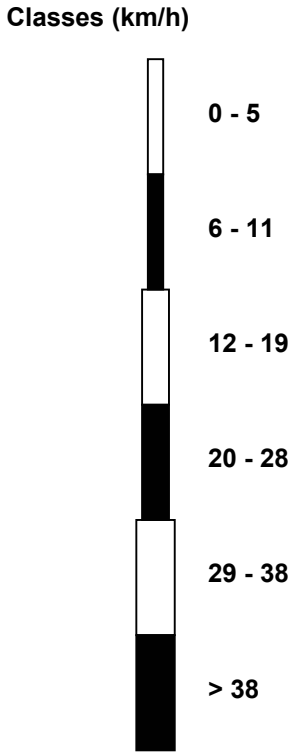
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 677

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower - January 2015

Maximum Speed: 59 km/h on Jan 22 14:00

Maximum Daily Speed Average: 32.0 km/h on Jan 22

Minimum Speed Value: 0 km/h on Jan 6 09:00

Minimum Daily Speed Average: 2.1 km/h on Jan 7

Maximum Diurnal Speed Average: 11.1 km/h at hour 19

Minimum Diurnal Speed Average: 5.2 km/h at hour 7

Monthly Average Velocity: 8.1 km/h 253.3 deg

Percentiles: P_1 = 3 P_{10} = 7 Q_1 = 11 Median = 16 Q_3 = 26 P_{90} = 34 P_{99} = 50

Hours in Service:	744
Hours of Data:	582
Hours of Missing Data:	162
Percent Operational Time:	78.2

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-Jan	NNE15	NE16	NE13	NNE8	NNE9	NNE9	N8	NNE9	NE9	NNE11	N9	N11	N13	N25	NNE22	N21	N17	N18	N15	N11	NNW7	NNW15	NNW14	N11	N12.6	N25
2-Jan	NE10	NE16	NE13	NNE13	NNE14	NE11	NNE10	NNE7	WNW4	WSW6	S4	SW6	NW6	N5	NNW5	NE9	ENE13	ENE8	ESE4	ESE3	NW8	NNW14	NW15	N17	NNE6.1	N17
3-Jan	N17	NNE16	NNE14	N12	NNW10	NW14	NNW21	NW16	WNW13	WNW12	WNW12	WNW14	WNW18	WNW13	W18	W25	W26	W32	W34	W26	W25	W26	WSW24	WSW27	WNW15.6	W34
4-Jan	W26	W27	WSW27	WSW27	WSW26	WSW35	WSW31	WSW30	WSW27	WSW22	SW20	WSW24	SW21	SW23	SW24	WSW30	WSW31	WSW32	WSW27	WSW25	WSW33	WSW34	WSW32	W37	WSW27.5	W37
5-Jan	W38	WSW36	WSW27	WSW25	WSW17	WSW16	W16	WNW14	WNW23	WNW22	NW24	NW23	NW22	WNW27	NW22	NW29	NW27	NW28	NW23	NNW16	NNW21	N27	N22	NNE12	WNW18.7	W38
6-Jan	NNE7	NNE11	NE12	NE12	NE10	NNE6	N5	N3	N0	SW6	SW10	WNW10	WNW9	WSW7	SW9	WSW10	W16	W22	W23	WSW28	WSW23	WSW21	SW14	SW15	W7.1	WSW28
7-Jan	SSW13	S16	S19	S17	S27	S25	S24	SSE13	SE19	SSE20	SSE20	SSE15	SE15	S6	W5	NW5	NNW11	N20	N24	N30	N26	NNW22	NW26	NNW35	S2.1	NNW35
8-Jan	N20	N22	NW21	WNW37	NW36	NW37	NW35	NW34	WNW35	WNW34	NW34	WNW33	WNW27	WNW26	WNW28	WNW33	W30	W33	W31	W32	W30	W28	W28	WSW27	WNW27.9	NW37
9-Jan	WSW25	SW16	SW12	SSW10	SSW9	SSW14	SSW13	SSW12	SSW14	SSW12	S10	S10	SSW9	S8	S8	E5	NNE14	NNE13	NNW12	NNW15	N18	N14	NNW11	N18	WSW3.6	WSW25
10-Jan	NE20	NE21	NNE14	NE7	NE3	ENE3	SE2	SSW12	SSW15	SSW15	S7	SSW8	SSW8	SSW8	SSW10	SSW10	SSW10	SW13	WSW17	WSW17	WSW14	WSW12	WSW11	WSW12	SW4.9	NE21
11-Jan	WSW16	WSW10	SW15	SW7	SW10	SW12	SW10	SSW8	S10	S12	SSE12	SSE13	SSE16	SSE17	SSE21	S26	S25	SSE21	SSE19	SSE22	SSE25	S28	SSW16	SSW11	S14.2	S28
12-Jan	S20	S22	S16	S9	S7	S5	W4	WSW13	WSW10	NW5	NNW4	WNW2	SW3	SW3	S5	S8	SSE13	S15	SSW16	S16	S14	S14	S11	SW12	SSW8.7	S22
13-Jan	WSW19	W7	NW11	N20	N18	N21	NNE18	N17	NNE9	NNE10	NE7	NE10	NE8	ENE8	NE4	ENE5	ESE8	ESE10	SE15	SE24	SE29	SSE25	SSE16	S12	ENE4.5	SE29
14-Jan	SSW14	SW13	WSW21	WSW24	WSW31	W33	NNW19	NNE24	NNE20	NNE15	NNE14	NNE15	NNE14	NNE14	NNE13	NNE15	NNE20	NNE22	NNE19	NNE18	NNE16	NNE15	NNE13	NNE16	N9.8	W33
15-Jan	NNE16	NNE17	NNE17	NNE12	NE12	NNE11	NNE12	NNE9	NNE8	NE6	NE6	NE6	E7	SSE5	SE14	SE20	SE31	SE29	SE38	SSE40	SSE38	SSE42	SSE43	SSE38	ESE13.1	SSE43
16-Jan	SSE40	SSE35	SSE29	SSE30	SSE26	SSE25	SSE26	SSE29	S34	S26	SSW15	SSW10	WSW15	WSW28	WSW29	W36	W45	W46	W48	W51	W49	W52	W57	W53	SW23.2	W57
17-Jan	W44	W42	W40	W44	W43	WNW31	N15	NNE12	NNE16	NNE17	NNE13	NNE9	N8	NNE9	NNE9	NNE8	N8	NNE9	NNE4	SSE0	SW4	S4	SSE9	S13	WNW10.0	W44
18-Jan	S16	SSE12	SSE13	SSE13	SSE14	SSE16	SSE16	SSE18	S18	S22	S15	S9	SSW12	SSW9	SW8	SW9	SSW13	SSW16	SW21	SW15	SW9	SW10	WSW9	SW14	S12.1	S22
19-Jan	SW13	WSW7	WNW3	W4	NW3	NNW11	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	SW13
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	S10	S17	S17	S23	S21	S20	S21	S22	----	S23
21-Jan	S20	S26	S26	S20	S26	SSE29	SSE25	SSE21	S24	S26	S24	S25	SSW31	SSW40	SSW40	SW34	WSW41	WSW45	WSW41	WSW25	WSW26	WSW27	WSW31	WSW30	SSW24.6	WSW45
22-Jan	W27	WSW22	SW15	WSW21	WSW22	WSW30	WSW33	W47	W45	W42	WNW25	W31	W40	W59	W50	W46	WSW42	W49	W46	W44	WNW27	NNE16	NNE15	AF	W32.0	W59
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	WNW11	WNW17	W27	W35	W30	W20	W14	W21	WNW25	W29	W30	WSW32	W34	W36	WSW18	SW15	----	W36
25-Jan	SSW12	S17	S18	SW27	SSW27	S34	S26	S17	WSW15	W28	W44	W36	W30	W34	W31	WNW29	NW25	NNW17	N14	NNE9	NE8	E7	S9	SSW15	WSW13.3	W44
26-Jan	WSW18	WSW11	WSW16	WSW13	SSW12	S11	SW14	SW17	WSW22	WSW26	WSW26	WSW27	WSW26	WSW23	W20	W17	N17	NNE26	AF	AF	AF	AF	AF	AF	WSW14.8	WSW27
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NNE16	NNE16	NNE17	NNE15	NNE11	NNE12	N10	NNE5	----	NNE17
31-Jan	NE4	NNE2	WNW4	NNW4	WSW1	SSW5	SSW5	AF	S13	S14	SSE14	SSE12	SSE11	SSE12	SE15	SSE13	SSE18	S18	S19	S21	S20	SSW13	SSW12	SSW14	S10.1	S21
	WSW7.5	SW5.3	WSW6.2	WSW7.4	WSW7.0	WSW7.1	WSW5.2	WSW5.9	WSW7.1	WSW7.7	WSW7.5	W8.2	WSW9.1	W10.4	WSW9.4	W10.2	W8.7	W10.2	W11.1	WSW9.5	WSW9.1	WSW8.8	WSW9.0	WSW9.2	Diurnal Average	
	W44	W42	W40	W44	W43	NW37	NW35	W47	W45	W42	W44	W36	W40	W59	W50	W46	W45	W49	W48	W51	W49	W52	W57	W53	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 14 km/h on Jan 22 21:00

Minimum Value: 1 km/h on Jan 2 12:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 9

Hours in Service:	744
Hours of Data:	582
Hours of Missing Data:	162
Hours of Calibration:	0
Percent Operational Time:	78.2

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

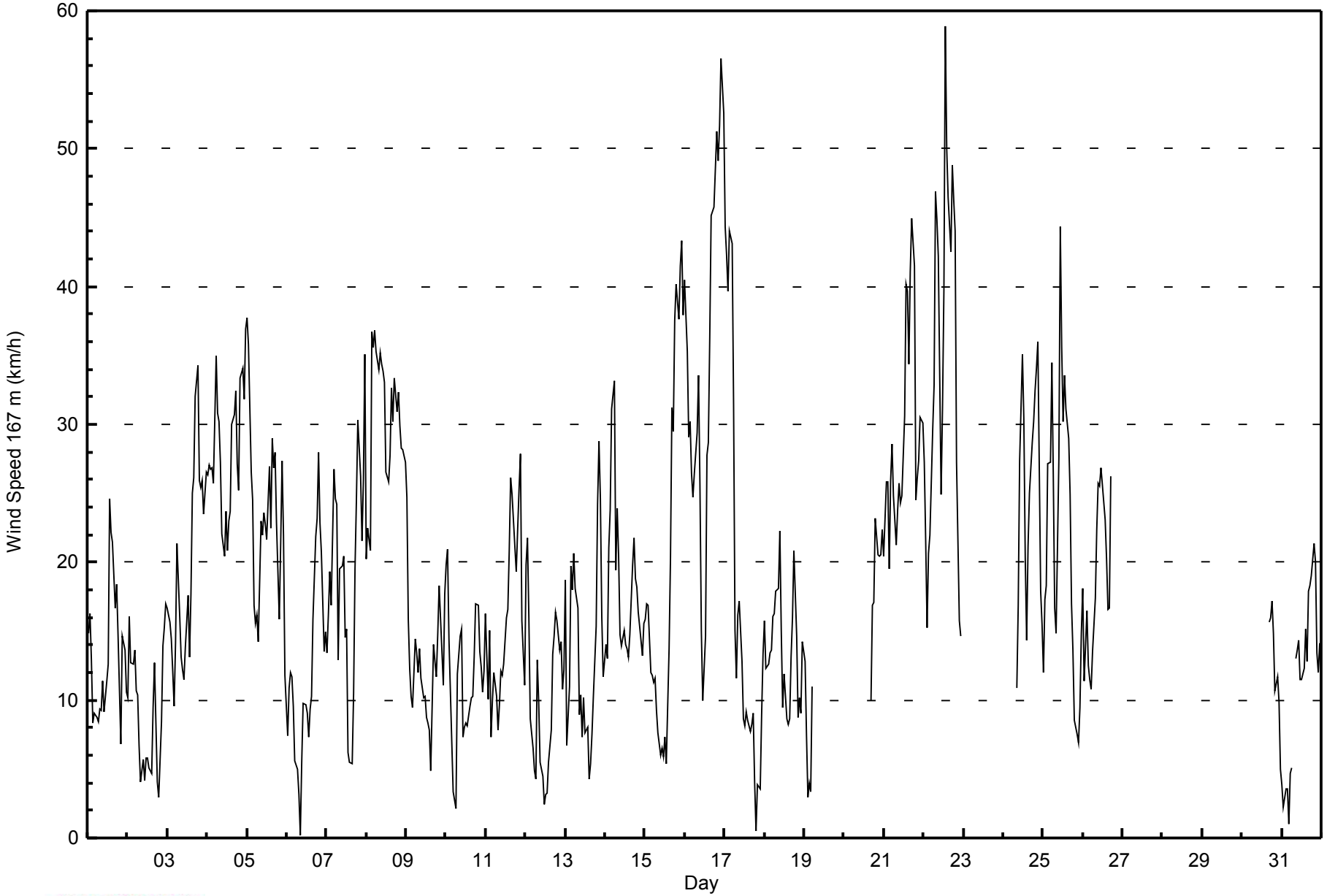
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	41	7.04	7.04
6 - 11	111	19.07	26.12
12 - 19	189	32.47	58.59
20 - 28	138	23.71	82.30
29 - 38	69	11.86	94.16
> 38	34	5.84	100.00

Total Number of Valid Hours: 582

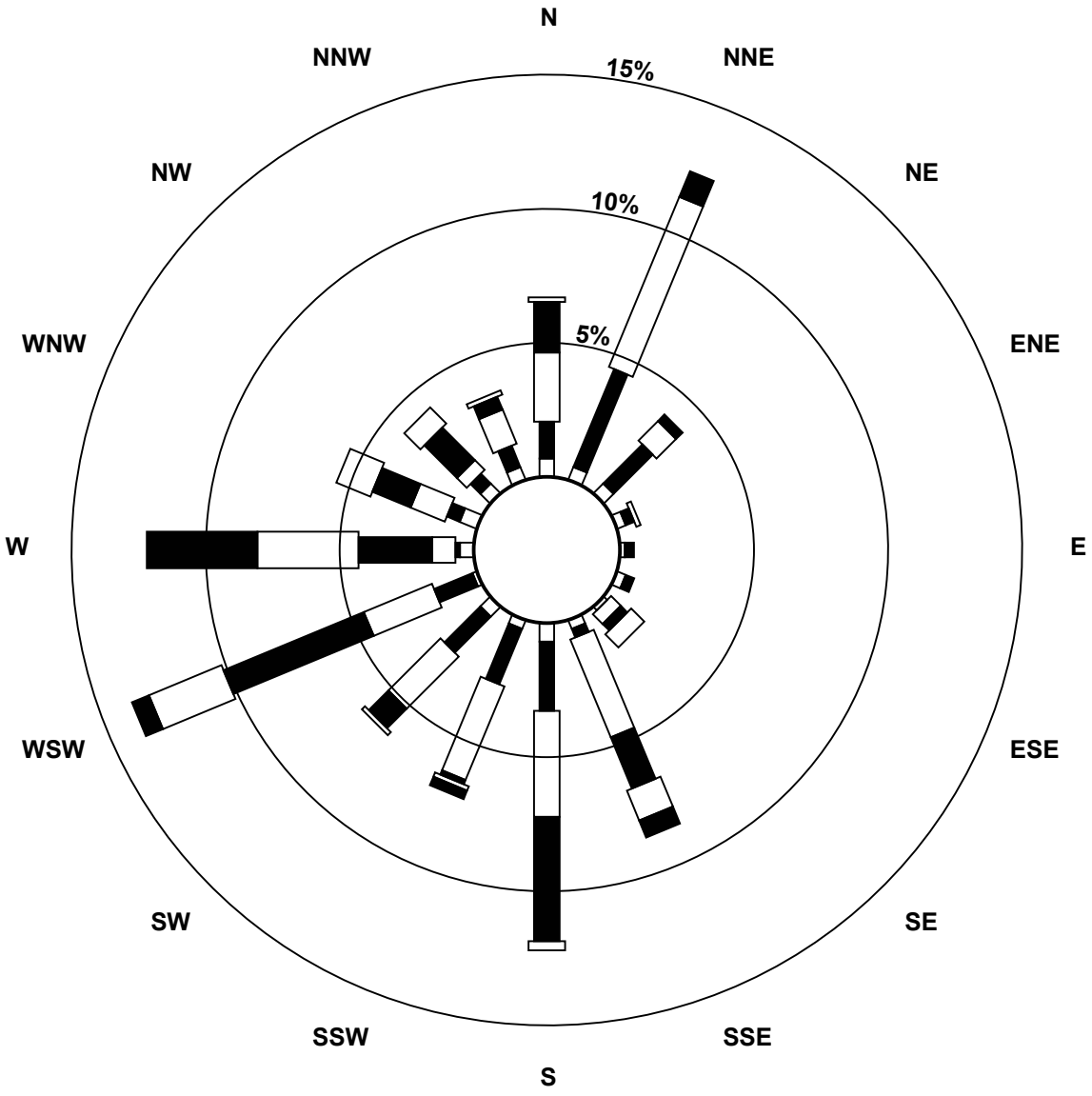
Total Number of Hours: 744

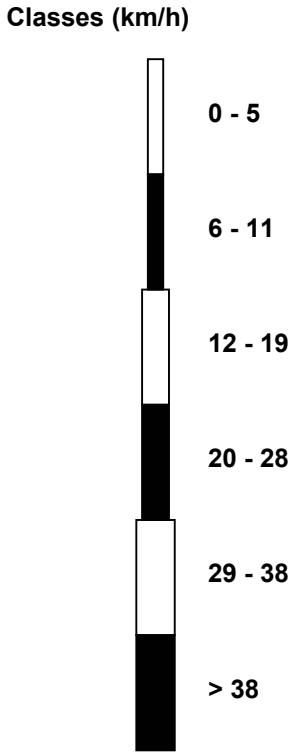
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 582

Direction of Maximum Speed: 284 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 153.1 deg on Jan 11

Direction of Minimum Speed: 178 deg on Jan 6 09:00
Direction of Minimum Daily Speed Average: 0.5 deg on Jan 29

Monthly Average Direction: 304.6 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-Jan	355	5	2	342	351	349	336	353	346	343	342	334	333	352	7	355	340	322	331	291	310	334	139	295	346.5
2-Jan	323	291	333	295	289	321	347	52	241	85	267	257	261	263	312	339	305	311	310	314	344	312	354	337	308.3
3-Jan	334	302	334	336	343	344	321	254	330	332	282	229	260	274	292	307	305	275	279	344	25	275	152	184	293.8
4-Jan	130	235	232	160	143	159	152	147	146	153	153	165	179	158	180	222	251	258	266	263	248	249	259	268	198.9
5-Jan	267	270	231	208	161	145	145	239	345	328	322	307	298	301	323	318	327	323	328	323	338	336	333	307	300.1
6-Jan	27	11	314	308	328	339	327	188	178	162	205	160	155	152	153	155	155	153	148	142	146	152	149	151	150.7
7-Jan	147	156	146	149	155	148	144	154	155	152	78	358	332	347	350	331	332	327	327	359	341	322	345	348	130.6
8-Jan	352	334	349	321	309	307	299	300	299	295	311	301	302	301	309	300	275	272	287	274	281	313	247	159	298.9
9-Jan	150	146	147	150	154	156	153	156	154	152	156	154	156	151	149	351	345	310	310	313	280	342	354	221	153.8
10-Jan	137	41	307	324	332	347	310	154	157	157	159	157	152	147	153	148	148	151	153	154	149	157	153	156	152.4
11-Jan	156	159	156	156	159	157	154	155	155	158	155	154	150	151	147	149	149	149	151	156	154	151	149	149	153.1
12-Jan	148	148	153	150	149	159	162	139	123	57	147	190	157	168	153	152	148	153	144	146	147	137	149	147	148.9
13-Jan	144	152	142	348	351	359	10	8	8	27	13	56	53	44	7	341	327	350	351	165	140	160	176	211	47.7
14-Jan	207	182	232	158	149	315	347	4	10	14	30	23	11	16	32	25	20	27	20	4	16	14	8	20	20.4
15-Jan	18	21	23	2	36	33	31	19	9	31	3	355	334	349	343	112	141	138	145	150	152	149	151	150	123.5
16-Jan	147	154	160	151	151	167	161	155	153	155	154	152	150	154	244	267	274	272	272	281	272	271	275	284	199.5
17-Jan	285	278	276	279	271	280	355	1	358	359	358	346	352	353	348	349	339	347	322	287	324	13	150	166	306.6
18-Jan	152	155	153	147	148	146	145	150	150	147	150	152	153	156	158	154	147	147	144	151	158	154	162	158	151.6
19-Jan	155	162	165	335	296	325	316	356	346	357	346	338	332	328	328	331	345	340	334	329	335	354	337	348	336.8
20-Jan	338	329	330	330	326	329	329	324	324	339	355	253	224	148	158	160	154	152	147	148	160	159	162	157	165.7
21-Jan	147	141	146	154	145	121	33	116	138	156	124	120	154	208	207	220	242	253	260	179	193	220	215	228	186.8
22-Jan	201	156	146	142	157	221	251	274	280	283	303	AF	306	284	276	277	266	268	274	274	305	14	8	2	277.8
23-Jan	355	1	359	357	345	350	344	335	332	337	356	351	322	279	221	274	79	352	287	252	303	239	158	242	335.9
24-Jan	101	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	264	267	274	329	336	339	332	298	160	325	279	151	150	--
25-Jan	152	151	146	163	159	161	164	153	140	241	276	281	270	262	276	291	321	353	1	6	38	13	227	116	199.5
26-Jan	171	153	157	152	141	140	142	150	148	159	161	174	247	259	283	296	345	12	7	8	22	15	5	6	68.6
27-Jan	4	12	8	8	9	13	9	2	8	12	8	10	12	9	9	8	4	9	4	2	359	358	1	351	6.7
28-Jan	347	346	342	329	326	334	335	345	353	335	329	314	292	252	31	351	310	344	324	47	49	53	18	65	336.5
29-Jan	24	302	161	166	163	141	154	157	160	166	166	209	1	163	6	342	349	337	343	352	337	355	355	2	52.5
30-Jan	3	7	6	18	16	13	2	11	12	349	2	1	18	13	30	10	18	2	347	342	349	1	300	331	6.9
31-Jan	316	345	345	325	231	314	146	150	149	153	150	157	156	156	160	145	155	149	152	154	150	149	151	151	152.5
	154.6	154.1	157.7	158.5	158.6	155.0	129.7	140.7	146.6	154.2	163.4	222.9	233.7	249.2	264.0	286.5	279.3	284.7	275.0	239.9	185.4	183.6	175.3	171.2	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 114 deg on Jan 3 22:00

Minimum Value: 5 deg on Jan 11 19:00

Percentiles: P_1 = 6 P_{10} = 9 Q_1 = 15 Median = 20 Q_3 = 31 P_{90} = 57 P_{99} = 99

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
	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-Jan	15	18	21	21	20	24	21	19	33	17	22	20	21	16	23	19	18	15	16	63	65	82	59	55	82
2-Jan	99	42	29	48	52	28	38	96	54	93	58	48	26	30	36	40	57	65	97	51	37	38	26	31	99
3-Jan	34	28	31	26	29	31	53	65	36	34	43	81	84	25	25	75	92	22	33	96	106	114	39	36	114
4-Jan	41	70	40	32	11	24	16	17	14	9	8	27	25	16	24	46	14	22	25	20	14	13	25	38	70
5-Jan	22	30	52	49	16	11	37	91	46	31	30	18	15	16	17	14	16	13	15	21	26	16	16	23	91
6-Jan	30	67	41	20	49	36	61	98	97	44	22	7	9	7	6	7	16	16	7	8	7	5	6	7	98
7-Jan	10	7	13	9	16	7	13	9	7	16	73	42	49	37	17	19	16	17	17	21	19	26	26	23	73
8-Jan	24	16	22	26	14	14	14	14	15	23	17	17	15	15	14	15	22	18	41	35	36	77	55	19	77
9-Jan	17	13	7	7	7	9	8	10	8	10	8	10	10	15	10	89	22	74	38	27	60	31	99	75	99
10-Jan	48	57	50	102	52	48	90	30	9	8	6	11	11	13	12	8	9	8	17	12	8	6	9	7	102
11-Jan	8	9	10	10	9	9	9	7	7	7	10	8	9	9	14	8	5	7	5	5	5	13	16	6	16
12-Jan	6	17	17	15	65	43	17	85	83	87	80	47	39	60	15	8	8	11	11	12	15	52	25	12	87
13-Jan	10	15	85	15	14	17	18	20	33	31	23	27	34	29	44	21	17	18	21	96	26	23	19	22	96
14-Jan	18	64	39	13	12	90	16	20	24	25	25	25	24	25	24	24	24	25	28	22	23	21	17	20	90
15-Jan	32	24	23	29	36	29	24	25	26	31	23	22	40	39	37	60	17	16	15	15	16	15	14	15	60
16-Jan	15	15	11	13	13	17	9	9	8	10	8	11	15	24	14	18	16	15	17	17	15	14	16	17	24
17-Jan	15	16	14	16	13	26	15	16	14	16	19	20	17	16	18	17	20	16	31	33	50	29	65	15	65
18-Jan	11	10	10	20	19	27	18	13	17	20	14	11	11	11	18	8	22	12	9	31	10	10	10	11	31
19-Jan	7	10	86	32	27	18	50	45	28	13	19	17	17	15	16	13	18	18	14	13	16	15	17	19	86
20-Jan	19	16	16	16	14	18	19	16	16	22	31	15	17	28	9	55	78	11	17	29	19	12	7	13	78
21-Jan	27	26	15	13	12	75	71	29	48	23	13	36	18	12	12	10	13	12	17	45	39	62	28	29	75
22-Jan	33	23	9	18	37	47	13	18	18	16	23	AF	24	16	15	15	14	13	13	11	48	24	21	27	48
23-Jan	17	17	28	20	20	25	31	28	27	32	25	25	30	53	52	72	50	20	34	38	38	34	51	87	87
24-Jan	83	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	12	15	25	36	41	93	47	91	90	57	59	15	7	93
25-Jan	9	10	13	31	18	9	11	14	95	83	16	19	14	10	15	16	21	21	21	31	27	63	52	58	95
26-Jan	36	8	7	9	14	18	10	9	12	16	25	37	34	38	41	90	20	21	19	21	24	24	19	21	90
27-Jan	18	22	22	22	22	22	21	18	28	24	23	22	24	22	22	20	23	22	24	24	23	22	24	20	28
28-Jan	21	20	20	15	15	16	18	25	24	26	25	29	44	19	91	29	38	21	42	64	35	44	55	99	99
29-Jan	45	45	37	15	25	30	34	15	15	16	35	89	64	81	40	23	23	16	18	18	22	18	18	16	89
30-Jan	19	21	21	26	28	29	21	26	21	24	21	23	25	26	23	21	25	17	18	19	28	23	35	72	72
31-Jan	39	38	34	56	70	101	20	10	14	12	15	8	10	16	18	15	13	11	7	11	14	10	11	9	101
	99	70	86	102	70	101	90	98	97	93	80	89	84	81	91	90	93	74	97	96	106	114	99	99	
	Diurnal Maximum																								

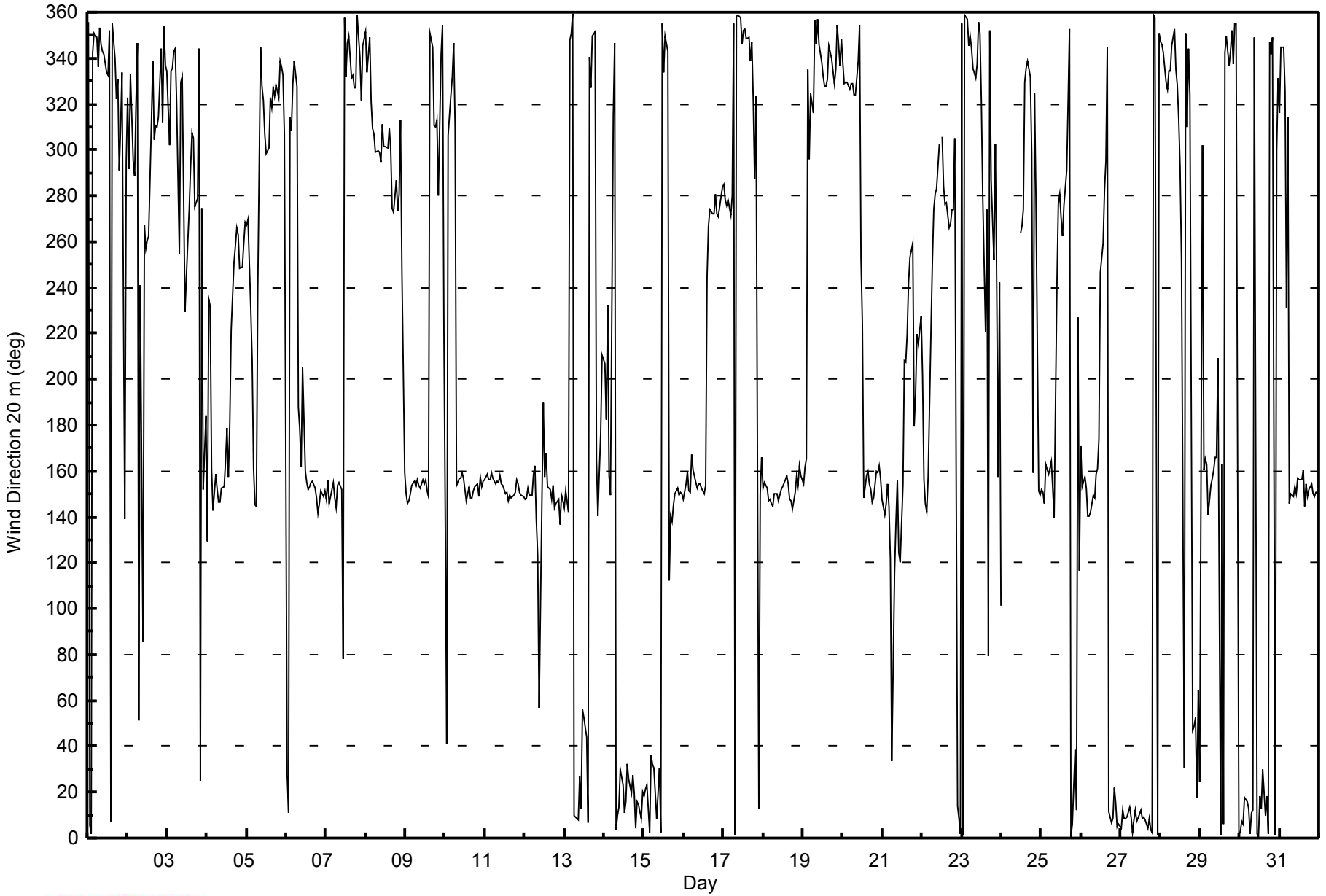
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - January 2015

Direction of Maximum Speed: 274 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 140.6 deg on Jan 11

Direction of Minimum Speed: 352 deg on Jan 1 22:00

Direction of Minimum Daily Speed Average: 1.2 deg on Jan 29

Monthly Average Direction: 306.6 deg

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Percent Operational Time:	98.7

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-Jan	353	4	2	340	345	343	333	346	341	338	337	330	328	345	5	351	337	323	326	307	294	352	114	301	343.1
2-Jan	314	339	339	308	309	326	348	233	228	99	228	180	270	251	311	11	20	302	293	300	318	295	353	325	317.7
3-Jan	335	326	345	337	327	328	313	302	319	324	248	237	272	274	282	280	278	261	264	299	312	281	177	211	281.1
4-Jan	173	241	238	160	135	167	156	147	151	159	147	170	176	158	190	227	242	251	257	254	241	241	250	257	209.2
5-Jan	255	258	231	214	173	147	177	266	321	311	309	299	290	292	316	310	319	314	321	325	334	330	331	313	292.4
6-Jan	18	20	307	302	330	297	328	264	226	190	168	142	140	136	135	139	148	148	142	149	137	136	134	136	139.3
7-Jan	136	141	134	133	144	137	135	138	138	138	87	5	323	335	342	328	329	325	326	356	338	317	336	344	91.2
8-Jan	349	331	346	306	299	298	290	291	290	288	300	292	293	293	300	291	264	261	271	260	264	280	244	159	288.1
9-Jan	155	134	135	139	140	143	140	142	141	140	143	141	143	139	133	350	338	325	311	322	286	320	45	174	139.9
10-Jan	69	42	339	268	323	303	242	150	143	143	145	143	139	136	141	134	136	142	149	145	137	142	152	144	139.1
11-Jan	145	147	143	144	146	145	140	140	138	142	140	140	138	138	135	138	141	137	138	144	145	140	139	130	140.6
12-Jan	133	139	138	133	151	157	156	133	126	69	140	169	132	119	137	138	140	143	136	136	137	134	140	140	138.8
13-Jan	135	134	129	338	344	355	8	7	8	17	8	50	49	41	1	337	324	345	346	109	128	144	164	199	39.5
14-Jan	195	180	227	147	140	292	340	0	5	10	23	18	8	12	29	22	16	22	15	2	12	11	2	13	14.1
15-Jan	16	15	19	358	31	27	22	16	7	25	358	353	330	339	337	113	133	130	137	139	140	139	141	140	111.3
16-Jan	139	143	147	141	140	154	150	144	143	146	144	142	141	163	239	260	262	262	262	270	261	259	263	273	192.7
17-Jan	275	269	267	268	262	271	348	356	352	353	351	341	349	348	344	343	336	342	327	287	312	360	141	159	300.1
18-Jan	144	144	142	140	137	136	136	139	139	137	138	139	141	142	142	146	135	132	133	135	143	137	148	150	139.7
19-Jan	139	153	153	331	316	332	332	333	342	346	338	330	326	319	321	326	338	335	328	325	331	350	333	342	333.6
20-Jan	333	324	326	324	320	327	327	320	320	334	345	255	215	138	146	144	136	142	139	140	151	148	152	145	148.7
21-Jan	139	136	139	145	137	120	75	114	125	136	118	115	150	197	197	213	234	245	250	186	204	220	218	230	179.5
22-Jan	214	166	144	133	187	236	248	264	270	273	296	286	295	274	265	265	254	258	265	264	298	7	5	358	270.8
23-Jan	351	356	355	351	341	345	340	332	327	334	352	344	315	279	213	258	65	352	280	239	302	222	131	214	334.9
24-Jan	138	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	253	257	262	322	336	338	268	255	261	277	267	152	143	--
25-Jan	141	140	136	163	153	153	157	142	135	241	266	270	260	253	262	283	311	345	359	3	32	37	233	144	199.6
26-Jan	152	141	145	139	135	136	138	140	135	146	155	193	244	253	267	306	339	7	3	4	16	10	0	2	50.4
27-Jan	360	6	4	4	5	8	6	358	4	9	5	7	9	3	3	4	2	5	359	360	356	354	358	345	2.6
28-Jan	342	340	337	323	319	330	330	342	353	339	323	310	288	247	24	349	323	2	354	46	44	42	21	68	337.1
29-Jan	33	315	148	153	149	133	141	145	147	154	152	179	0	162	353	334	343	331	338	348	334	348	350	359	46.0
30-Jan	358	4	2	11	11	9	359	7	11	346	359	356	14	8	24	6	13	355	341	336	335	352	343	310	2.2
31-Jan	302	344	317	267	144	145	142	140	136	140	139	144	144	142	148	134	143	140	140	143	139	139	139	139	141.2
	134.3	126.3	131.8	144.4	145.0	141.7	97.0	117.2	121.7	127.5	112.0	247.4	236.5	253.0	268.6	289.0	281.3	282.3	276.0	264.9	202.0	179.5	167.0	159.2	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 99 deg on Jan 28 15:00

Minimum Value: 3 deg on Jan 25 01:00

Percentiles: P_1 = 4 P_{10} = 6 Q_1 = 10 Median = 15 Q_3 = 23 P_{90} = 49 P_{99} = 85

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	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-Jan	12	14	17	18	14	18	16	14	15	12	18	15	16	12	17	14	13	12	9	51	42	94	69	43	94
2-Jan	79	69	24	46	58	17	28	94	29	72	68	69	33	31	24	11	62	41	72	35	44	39	21	21	94
3-Jan	25	21	16	18	31	15	69	41	50	41	13	17	59	16	18	58	60	12	20	97	84	93	51	29	97
4-Jan	66	59	29	39	11	38	18	17	18	13	7	26	23	20	22	36	9	15	16	15	9	7	13	23	66
5-Jan	12	18	47	46	21	16	49	44	41	24	20	13	11	12	14	12	15	12	12	14	14	10	11	18	49
6-Jan	24	16	44	35	38	29	45	46	23	25	21	6	7	4	5	5	6	6	10	17	7	3	3	4	46
7-Jan	6	4	9	8	10	5	8	5	6	13	71	36	50	25	13	13	11	15	15	17	15	21	20	22	71
8-Jan	19	12	8	15	11	10	9	10	10	13	13	12	11	11	12	10	19	10	26	19	22	65	49	20	65
9-Jan	22	19	6	4	3	4	5	6	5	7	5	7	7	8	6	76	15	44	27	13	28	37	79	68	79
10-Jan	49	15	50	46	25	40	73	17	6	5	5	9	6	8	7	6	7	8	8	8	6	7	4	3	73
11-Jan	4	5	9	7	6	7	5	4	4	4	7	4	6	6	7	6	9	5	4	4	4	8	11	5	11
12-Jan	5	9	9	9	21	11	10	65	79	85	73	34	63	69	12	6	4	5	6	8	7	28	19	8	85
13-Jan	9	14	75	10	11	12	13	13	23	20	18	20	24	22	36	19	12	13	24	82	20	19	16	21	82
14-Jan	16	68	31	15	13	78	9	18	18	17	17	18	19	18	17	15	17	16	19	15	17	14	13	14	78
15-Jan	18	16	15	22	26	20	17	19	21	24	17	15	39	36	49	40	12	11	10	10	12	10	9	10	49
16-Jan	10	12	10	9	10	15	9	7	6	7	3	5	8	36	11	13	11	10	11	13	10	8	11	13	36
17-Jan	10	10	9	11	7	28	10	12	10	12	13	16	12	11	11	12	16	12	26	29	48	22	57	17	57
18-Jan	9	7	9	12	15	13	14	11	12	13	10	8	7	6	12	6	5	6	5	12	7	11	7	6	15
19-Jan	5	6	71	22	15	13	28	17	10	8	12	12	13	13	13	11	15	13	12	11	15	12	14	14	71
20-Jan	15	13	13	13	11	14	13	14	12	18	18	20	23	26	7	50	79	6	9	18	11	8	6	10	79
21-Jan	17	14	11	7	8	50	66	13	21	13	8	17	22	13	13	9	9	6	11	41	36	50	26	24	66
22-Jan	34	38	15	20	46	36	10	14	14	12	22	20	22	12	10	10	9	8	8	7	49	18	14	21	49
23-Jan	12	14	20	14	14	16	26	22	22	27	20	19	23	53	48	72	41	14	36	56	41	52	65	82	82
24-Jan	52	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	7	7	16	36	32	73	68	48	55	16	30	28	6	73
25-Jan	3	7	10	33	19	8	9	8	80	76	11	13	10	5	10	13	18	19	14	22	20	72	24	48	80
26-Jan	9	7	4	5	7	10	6	5	7	15	31	42	19	30	25	53	16	15	14	15	18	18	14	15	53
27-Jan	14	15	15	15	17	17	16	14	19	17	15	17	18	16	15	16	16	16	18	18	16	18	17	15	19
28-Jan	14	15	16	13	12	12	14	15	18	20	22	25	40	15	99	19	32	14	52	44	25	34	43	82	99
29-Jan	28	84	17	14	21	22	22	10	12	13	37	69	66	84	52	17	18	12	13	15	15	14	14	12	84
30-Jan	13	15	14	21	19	21	19	18	14	19	16	17	19	19	16	16	19	14	14	13	11	14	20	18	21
31-Jan	28	42	22	86	56	23	7	7	8	7	11	6	6	12	11	10	10	7	6	8	11	7	6	6	86
	79	84	75	86	58	78	73	94	80	85	73	69	66	84	99	76	79	68	72	97	84	94	79	82	
	Diurnal Maximum																								

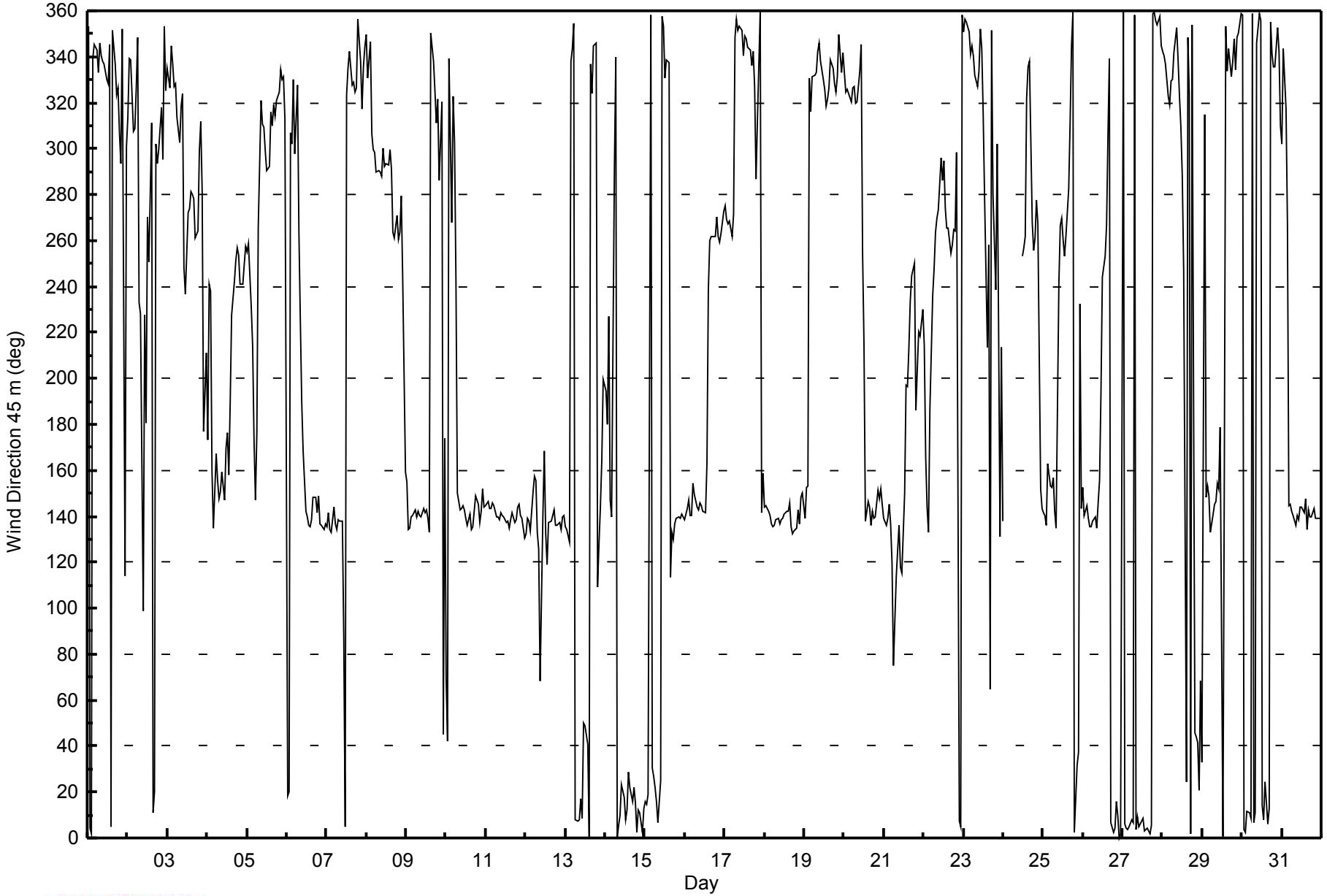
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Direction of Maximum Speed: 270 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 286.1 deg on Jan 8

Direction of Minimum Speed: 358 deg on Jan 10 06:00

Direction of Minimum Daily Speed Average: 0.9 deg on Jan 7

Monthly Average Direction: 261.6 deg

Hours in Service:	744
Hours of Data:	677
Hours of Missing Data:	67
Percent Operational Time:	91.0

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-Jan	17	20	18	3	354	1	345	359	7	355	344	342	343	350	9	2	354	343	342	343	332	339	358	7	356.3
2-Jan	52	52	16	16	25	18	9	5	259	182	126	150	276	48	3	29	65	61	210	313	312	5	311	346	15.7
3-Jan	348	353	359	357	317	315	327	300	280	282	284	282	281	286	272	252	253	256	259	262	262	258	241	243	278.2
4-Jan	245	251	248	235	234	247	241	234	237	223	210	223	210	216	226	241	248	252	253	251	242	241	250	254	240.2
5-Jan	254	253	244	241	230	226	247	286	296	294	303	306	296	296	320	311	319	312	322	336	342	346	348	353	295.3
6-Jan	18	21	31	54	45	52	249	203	168	183	212	213	196	168	148	159	189	240	239	242	229	229	187	169	198.1
7-Jan	157	151	151	149	155	167	158	168	164	156	146	106	134	238	302	347	354	346	349	2	349	323	320	345	56.1
8-Jan	358	344	336	297	302	303	296	295	293	294	298	292	295	295	296	291	270	265	258	251	254	250	246	229	286.1
9-Jan	214	197	184	164	151	162	159	151	154	146	145	143	144	141	132	64	353	334	316	321	340	309	298	346	152.1
10-Jan	47	43	21	350	303	358	141	173	163	163	142	159	155	138	150	157	158	183	211	217	212	203	215	214	150.9
11-Jan	211	156	193	144	176	174	160	152	164	156	153	154	156	151	156	166	173	173	171	157	158	163	168	167	161.8
12-Jan	172	159	158	153	153	140	126	180	229	286	9	8	157	102	129	147	149	157	167	166	163	150	159	186	158.0
13-Jan	209	115	106	353	352	360	9	7	13	21	20	54	52	52	28	10	21	95	124	129	133	140	154	189	57.7
14-Jan	188	202	234	197	245	271	354	8	12	15	24	21	13	12	27	22	22	25	18	7	16	15	6	21	6.1
15-Jan	20	24	25	13	32	27	23	22	18	33	15	12	32	181	116	127	137	134	140	143	143	143	144	143	118.3
16-Jan	143	146	148	146	146	153	155	154	156	161	168	164	184	250	249	260	256	258	260	264	258	255	257	267	211.0
17-Jan	272	261	267	265	265	277	358	8	9	11	8	355	357	358	355	358	352	359	353	287	280	241	151	180	296.5
18-Jan	173	166	167	170	163	158	155	162	156	151	145	146	147	147	154	160	174	182	201	170	167	165	159	183	161.1
19-Jan	171	153	130	24	329	335	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	152	148	143	149	157	154	149	161	157	160	155	--
21-Jan	152	159	162	160	154	139	134	139	146	153	145	153	183	207	207	218	233	240	243	223	231	236	242	249	192.0
22-Jan	250	241	205	230	246	251	253	260	267	274	293	279	279	270	262	257	251	255	264	268	288	12	11	6	267.5
23-Jan	359	360	359	3	357	355	351	345	344	AF	AF	AF	AF	298	209	232	93	78	235	AF	AF	AF	AF	AF	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	261	264	260	272	280	284	259	257	256	259	259	231	189	--
25-Jan	162	149	152	210	185	162	164	158	197	257	264	268	267	262	266	288	305	338	15	10	38	76	174	167	234.4
26-Jan	184	169	191	170	160	154	186	191	203	223	234	240	243	251	257	271	344	8	AF	AF	AF	AF	AF	AF	233.4
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	8	15	13	11	8	8	7	8	7	5	9	3	5	357	--
28-Jan	353	350	346	330	323	332	336	1	10	2	336	310	299	246	38	12	11	40	52	57	45	49	39	107	355.1
29-Jan	88	134	149	147	143	141	143	141	137	141	133	138	149	153	143	341	352	343	349	358	351	358	355	1	94.2
30-Jan	2	10	6	15	12	10	1	8	16	0	5	357	16	10	26	10	16	8	359	357	1	358	346	346	7.1
31-Jan	354	317	290	255	148	193	158	162	156	150	145	149	146	138	139	147	150	162	156	151	149	152	147	146	149.9
	226.7	178.8	198.8	213.1	214.9	232.6	243.7	213.2	226.5	227.4	229.8	257.7	257.8	257.0	254.1	271.9	273.7	276.0	261.5	253.2	242.6	233.5	234.7	241.4	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 90 deg on Jan 10 06:00

Minimum Value: 2 deg on Jan 17 05:00

Percentiles: P_1 = 3 P_{10} = 5 Q_1 = 7 Median = 10 Q_3 = 16 P_{90} = 28 P_{99} = 71

Hours in Service:	744
Hours of Data:	677
Hours of Missing Data:	67
Hours of Calibration:	0
Percent Operational Time:	91.0

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	Maximum
1-Jan	8	10	10	14	10	9	6	10	10	5	9	9	11	7	10	9	11	9	7	11	16	20	25	20	25
2-Jan	27	19	24	13	18	18	20	37	27	48	17	17	50	35	45	27	17	72	58	36	20	28	16	8	72
3-Jan	8	11	10	16	20	7	9	11	9	22	12	8	8	14	10	11	12	3	6	32	24	24	12	5	32
4-Jan	11	6	8	17	14	11	15	18	10	5	13	8	13	10	7	7	6	9	10	8	5	4	6	7	18
5-Jan	4	6	16	10	13	17	12	13	14	10	10	8	7	8	10	7	10	6	8	5	7	5	14	21	21
6-Jan	16	12	13	6	8	84	28	46	19	19	16	23	21	22	6	11	27	8	10	8	4	10	17	7	84
7-Jan	8	8	9	16	10	6	7	8	11	17	16	30	77	58	14	9	5	9	9	10	10	11	8	19	77
8-Jan	13	6	11	7	7	5	4	3	4	5	6	5	7	8	7	4	13	3	6	4	3	10	19	26	26
9-Jan	20	30	19	8	5	8	12	4	6	4	4	3	4	6	11	46	17	11	10	9	11	12	16	19	46
10-Jan	15	7	13	28	31	90	20	31	15	22	7	14	18	5	7	10	11	22	15	17	14	20	15	18	90
11-Jan	16	14	23	11	18	9	9	7	9	7	5	5	6	8	6	8	6	6	6	6	4	6	9	7	23
12-Jan	6	3	6	8	11	15	34	29	21	36	49	19	85	33	7	5	5	8	7	7	6	8	11	19	85
13-Jan	15	30	60	5	6	5	6	6	11	14	14	15	17	15	29	20	70	56	38	14	6	9	16	21	70
14-Jan	14	30	13	26	23	27	8	10	10	12	13	10	11	12	9	9	10	11	10	10	10	9	8	10	30
15-Jan	11	11	10	14	15	13	11	13	16	13	12	10	51	50	60	11	6	6	4	4	4	3	3	4	60
16-Jan	3	6	6	4	5	8	7	6	6	8	7	10	28	10	7	5	6	4	5	7	5	3	4	8	28
17-Jan	6	3	3	6	2	30	10	10	9	11	12	14	10	10	7	8	9	7	15	43	30	50	18	15	50
18-Jan	9	13	15	11	13	14	10	11	11	9	5	9	6	5	10	11	7	9	11	13	20	14	8	26	26
19-Jan	13	11	28	87	15	15	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	87
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	8	6	29	64	11	7	9	8	6	5	7	64
21-Jan	7	3	7	4	5	12	11	13	10	5	7	8	20	10	9	5	5	4	7	24	16	16	13	12	24
22-Jan	14	22	19	42	12	12	4	6	8	8	17	16	15	6	6	4	3	3	3	2	49	10	8	14	49
23-Jan	7	8	11	10	9	10	19	16	24	AF	AF	AF	AF	38	70	58	31	17	59	AF	AF	AF	AF	AF	70
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	4	4	10	22	27	9	10	4	6	3	4	38	17	38
25-Jan	12	7	10	23	19	9	10	12	53	53	6	8	5	2	4	11	11	21	9	11	14	43	20	25	53
26-Jan	19	15	30	18	11	10	12	17	27	36	25	10	4	4	5	16	24	7	AF	AF	AF	AF	AF	AF	36
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	9	9	11	11	10	9	9	8	11	12	12	11	10	8	12
28-Jan	8	10	11	11	6	8	7	10	13	12	18	17	32	20	73	11	21	11	17	16	19	21	38	31	73
29-Jan	31	28	10	9	11	6	4	3	5	6	12	22	46	21	81	25	24	6	6	8	9	7	9	5	81
30-Jan	8	11	9	10	11	12	12	11	9	15	12	12	12	12	11	11	14	10	10	11	13	13	5	7	15
31-Jan	14	17	19	55	23	18	15	10	15	9	5	5	4	5	8	6	7	6	6	8	11	4	5	5	55
	31	30	60	87	31	90	34	46	53	53	49	30	85	58	81	58	70	72	59	43	49	50	38	31	
	Diurnal Maximum																								

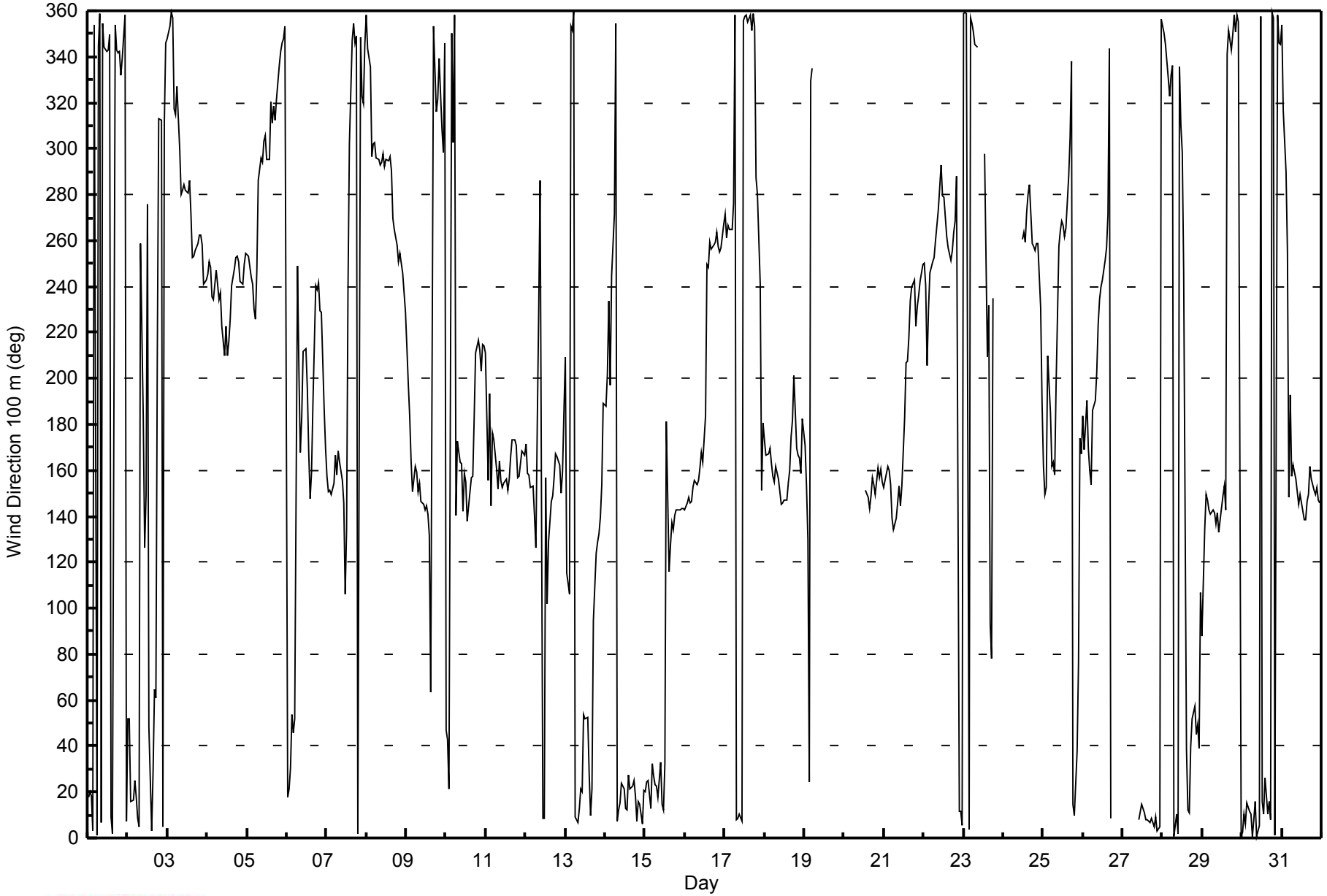
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 0.5 km/h on Jan 9 01:00

Maximum Daily Average: 0.1 km/h on Jan 6

Minimum Value: -0.8 km/h on Jan 22 14:00

Minimum Daily Average: -0.3 km/h on Jan 22

Maximum Diurnal Average: 0.0 km/h at hour 4

Minimum Diurnal Average: -0.1 km/h at hour 15

Monthly Average: -0.03 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.3 Q_1 = -0.1 Median = 0.0 Q_3 = 0.1 P_{90} = 0.2 P_{99} = 0.4

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	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-Jan	-0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.2	0.1	-0.2	-0.3	-0.2	0.0	-0.2	-0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2
2-Jan	0.0	0.1	-0.1	0.1	0.0	-0.1	-0.1	0.1	0.0	0.1	0.1	0.1	-0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1
3-Jan	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	-0.2	-0.1	0.0	0.1	-0.2	0.0	0.0	0.1	0.0	0.3	0.4	0.0	0.4
4-Jan	0.2	0.0	0.1	0.4	0.2	0.1	0.3	0.4	0.4	0.5	0.3	0.4	0.2	0.4	0.4	0.2	-0.1	-0.3	-0.4	-0.4	-0.2	-0.1	-0.2	-0.2	0.1	0.5
5-Jan	-0.3	-0.1	0.1	0.1	0.3	0.2	0.0	0.0	0.0	0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.3
6-Jan	0.0	-0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.1	0.3	0.4	0.0	0.1	0.4
7-Jan	-0.1	-0.1	0.0	0.0	0.0	0.2	-0.2	0.3	0.1	0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.1	0.2	0.0	0.0	-0.2	0.1	-0.1	0.0	-0.1	0.0	0.3
8-Jan	-0.2	0.0	-0.1	-0.1	-0.3	-0.2	-0.2	-0.3	-0.3	0.0	-0.2	-0.2	-0.3	-0.3	-0.4	-0.3	-0.1	-0.2	-0.2	-0.1	-0.2	0.0	0.1	0.2	-0.2	0.2
9-Jan	0.5	0.3	0.4	0.2	-0.1	-0.1	-0.1	-0.3	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.5
10-Jan	0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.3
11-Jan	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.0	-0.3	-0.1	0.2	0.3	0.2	0.2	0.2	0.1	-0.1	0.1	0.3	0.1	0.3
12-Jan	0.1	-0.3	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	-0.1	0.0	-0.1	-0.2	0.1	-0.1	-0.4	-0.1	-0.2	0.0	0.0	0.2
13-Jan	0.4	0.3	0.0	0.0	0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	-0.3	-0.1	0.0	0.1	-0.1	-0.1	-0.2	-0.2	0.0	-0.1	0.0	0.1	-0.1	0.0	0.4
14-Jan	0.0	0.2	0.0	0.3	0.3	-0.1	0.0	0.0	-0.2	-0.1	-0.1	0.1	-0.1	0.0	-0.1	0.1	-0.1	-0.1	0.1	0.0	-0.1	0.1	0.0	-0.2	0.0	0.3
15-Jan	-0.1	0.0	0.1	-0.1	0.0	0.0	-0.2	-0.1	-0.1	0.0	0.0	-0.3	-0.1	0.0	-0.3	0.1	0.0	-0.4	-0.1	-0.1	0.2	0.2	-0.2	0.0	-0.1	0.2
16-Jan	0.0	0.2	-0.3	0.0	-0.1	0.2	-0.1	-0.1	-0.1	-0.4	0.1	0.0	0.2	0.4	-0.3	-0.3	-0.6	-0.6	-0.5	-0.7	-0.6	-0.6	-0.6	-0.7	-0.2	0.4
17-Jan	-0.7	-0.4	-0.6	-0.5	-0.7	-0.4	-0.1	-0.1	-0.2	-0.2	-0.2	0.0	-0.3	-0.4	-0.1	-0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.2	0.3	-0.2	0.3
18-Jan	0.2	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	0.2	0.2	0.1	0.4	0.1	0.2	0.3	0.2	0.1	0.1	0.4
19-Jan	0.3	0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.2	0.2	0.1	-0.2	0.0	-0.1	0.1	0.1	0.1	0.1	0.0	-0.1	-0.2	0.1	0.1	0.0	0.3
20-Jan	0.0	0.1	0.0	0.1	-0.1	0.2	0.1	-0.1	0.1	0.0	0.0	0.0	-0.3	0.0	-0.1	-0.1	0.0	-0.1	-0.2	-0.3	0.1	0.0	0.0	0.0	0.0	0.2
21-Jan	-0.1	0.0	-0.5	0.2	-0.1	-0.1	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	0.3	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	0.1	0.1	0.1	0.0	-0.2	-0.1	0.3
22-Jan	0.2	0.2	0.3	0.1	0.1	0.0	-0.1	-0.4	-0.4	-0.6	-0.3	AF	-0.3	-0.8	-0.6	-0.7	-0.5	-0.6	-0.7	-0.6	-0.3	-0.1	-0.3	0.0	-0.3	0.3
23-Jan	-0.3	-0.4	-0.2	-0.3	0.1	0.0	0.0	0.1	0.0	-0.2	-0.1	-0.1	0.0	0.2	0.0	0.1	0.0	-0.2	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	0.2
24-Jan	0.1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.4	--	0.4
25-Jan	-0.1	-0.2	-0.2	0.2	0.1	-0.1	0.1	0.0	0.2	-0.1	-0.5	-0.4	-0.4	-0.4	-0.3	-0.4	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.1	-0.1	0.2
26-Jan	0.1	0.2	0.2	0.3	0.0	-0.2	0.3	0.4	0.4	0.2	0.0	0.4	-0.1	-0.2	-0.1	0.1	-0.1	0.0	-0.3	-0.3	-0.2	-0.5	-0.5	-0.3	0.0	0.4
27-Jan	-0.4	-0.2	-0.1	-0.2	0.0	0.0	0.1	-0.2	0.0	-0.2	0.0	0.0	-0.1	-0.5	-0.2	0.0	-0.2	-0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.1
28-Jan	0.1	-0.1	-0.1	-0.1	-0.3	0.1	0.1	0.0	-0.1	0.1	0.1	-0.1	-0.2	-0.3	-0.2	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1
29-Jan	-0.1	-0.1	0.1	0.2	0.1	-0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	-0.1	0.1	0.1	0.1	-0.2	0.1	-0.1	-0.3	-0.3	0.0	0.2
30-Jan	-0.2	-0.1	-0.2	-0.1	0.0	0.0	-0.3	0.0	-0.1	-0.1	-0.3	-0.2	0.1	0.0	0.0	0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	0.0	0.1	-0.1	0.1
31-Jan	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	0.0	-0.2	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	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	Diurnal Average	
	0.5	0.3	0.4	0.4	0.3	0.2	0.3	0.4	0.4	0.5	0.3	0.4	0.3	0.4	0.4	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4.4 km/h on Jan 22 14:00

Minimum Value: 0.1 km/h on Jan 31 05:00

Percentiles: P_1 = 0.1 P_{10} = 0.3 Q_1 = 0.7 Median = 1.2 Q_3 = 1.7 P_{90} = 2.3 P_{99} = 3.6

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
	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-Jan	0.8	1.1	0.9	0.7	0.9	0.9	1.0	0.9	0.7	0.9	1.0	1.2	1.1	2.1	2.3	2.3	1.2	0.6	0.7	0.3	0.1	0.2	0.3	0.2	2.3
2-Jan	0.5	0.5	0.4	0.3	0.5	0.4	0.5	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.2	0.1	0.3	0.2	0.2	0.4	0.5
3-Jan	0.5	0.3	0.4	0.5	0.3	0.3	0.2	0.1	0.2	0.3	0.3	0.4	0.5	0.7	1.0	1.3	1.4	2.3	2.4	1.5	1.3	1.2	1.1	1.1	2.4
4-Jan	0.8	1.5	1.6	1.5	1.3	1.6	1.4	1.6	1.6	1.7	1.6	1.5	1.4	1.8	1.5	1.8	1.4	1.9	1.9	1.9	1.8	2.5	2.4	2.8	2.8
5-Jan	3.3	2.9	2.0	1.7	1.2	1.2	0.9	0.6	1.0	1.6	1.7	1.8	2.0	2.5	1.9	2.0	1.9	1.8	1.4	0.5	0.6	0.8	0.8	0.6	3.3
6-Jan	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.8	1.0	0.7	0.5	0.3	0.3	0.8	1.2	1.0	0.8	1.2	1.3	1.3
7-Jan	1.4	1.3	1.5	1.4	1.9	1.3	1.6	1.1	1.1	1.1	0.8	0.6	0.6	0.6	0.7	0.6	0.7	1.2	1.6	2.4	1.9	1.1	1.3	3.2	3.2
8-Jan	1.9	1.3	0.4	1.4	1.9	2.1	2.1	2.0	2.2	1.7	2.2	2.7	2.1	1.9	2.2	2.4	1.9	2.1	1.9	2.1	2.3	1.6	1.7	1.1	2.7
9-Jan	1.5	0.9	0.9	1.2	1.2	1.4	1.3	1.6	1.4	1.2	1.4	1.3	1.4	1.6	0.8	0.4	0.4	0.4	0.2	0.2	0.4	0.3	0.3	0.4	1.6
10-Jan	0.4	0.8	0.5	0.1	0.1	0.1	0.2	0.4	1.1	1.1	1.1	1.2	1.3	1.5	1.1	0.9	0.6	0.6	0.4	0.7	0.7	0.4	0.3	0.5	1.5
11-Jan	0.6	0.6	0.8	0.8	0.8	1.0	1.2	1.4	1.3	1.1	1.2	1.2	1.2	1.3	1.3	1.1	1.1	1.0	0.8	1.1	1.1	1.8	1.8	0.8	1.8
12-Jan	0.9	2.3	1.2	0.9	0.3	0.2	0.5	0.6	0.6	0.5	0.5	0.4	0.3	0.5	0.8	0.7	0.8	1.5	1.4	1.3	1.8	1.8	1.0	1.4	2.3
13-Jan	1.5	0.8	0.4	0.7	1.3	1.8	1.7	1.4	0.7	1.0	0.9	1.4	1.2	1.1	0.8	0.7	0.7	0.6	0.8	1.4	2.2	2.1	1.3	1.1	2.2
14-Jan	1.1	1.1	0.8	0.9	1.1	1.2	1.0	2.1	2.1	1.6	1.7	2.0	1.7	1.7	1.5	1.4	2.1	2.5	2.2	1.8	1.7	1.5	1.1	1.5	2.5
15-Jan	1.6	1.7	1.6	1.1	1.1	1.3	1.3	1.2	1.1	0.9	1.0	1.1	1.0	0.8	1.0	1.5	2.9	2.6	3.4	3.8	3.7	3.8	4.1	3.8	4.1
16-Jan	3.9	3.3	2.9	3.3	2.7	2.0	1.6	1.9	1.9	2.0	1.6	1.4	1.7	1.3	1.4	2.0	2.4	2.5	2.9	3.4	2.9	3.0	3.4	3.5	3.9
17-Jan	3.1	2.5	2.4	3.0	2.9	2.4	1.6	1.3	1.2	1.2	1.2	1.1	1.2	1.2	1.2	0.9	0.8	0.8	0.5	0.4	0.5	0.5	0.7	0.8	3.1
18-Jan	0.8	0.8	0.7	0.8	0.5	0.6	0.9	0.8	0.7	1.3	1.4	1.3	1.7	1.5	1.0	0.7	1.0	1.4	1.2	0.8	0.8	0.8	0.6	0.5	1.7
19-Jan	0.8	0.4	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.8	0.9	1.1	1.2	1.1	1.0	1.2	0.9	1.2	1.2	1.4	1.2	1.2	1.1	1.4	1.4
20-Jan	1.2	1.1	1.0	1.1	0.9	0.8	0.7	0.8	0.7	0.6	0.5	0.5	0.5	0.8	1.1	1.3	0.5	1.3	1.9	2.0	1.6	1.7	1.6	1.8	2.0
21-Jan	2.1	1.8	1.6	2.3	1.9	1.3	0.6	0.9	0.8	0.6	1.2	1.1	1.9	2.5	2.2	1.9	2.1	2.6	2.4	1.5	1.5	1.3	1.5	1.3	2.6
22-Jan	1.0	0.8	0.9	1.3	0.9	0.8	0.8	2.4	2.6	2.7	2.0	AF	2.9	4.4	3.3	2.6	2.0	2.6	2.8	2.6	2.6	2.0	2.0	1.4	4.4
23-Jan	1.5	1.5	1.2	1.1	0.9	1.1	1.1	0.9	0.8	0.9	1.1	1.1	1.0	1.1	0.9	0.7	0.6	0.6	0.6	0.4	0.5	0.5	0.5	0.4	1.5
24-Jan	0.3	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.2	1.9	1.4	0.9	0.8	0.4	0.6	0.5	0.6	0.7	1.3	0.7	1.1	2.2
25-Jan	1.7	1.6	1.3	1.2	1.7	2.3	2.1	1.5	0.9	1.1	2.8	2.2	1.5	1.7	1.7	1.5	1.2	0.9	1.0	0.8	1.0	0.3	0.2	0.3	2.8
26-Jan	0.3	0.9	0.8	0.8	1.4	1.3	0.8	1.3	1.3	1.2	0.9	1.4	1.6	1.4	1.5	0.7	2.0	3.2	3.5	3.3	3.7	3.0	3.2	2.9	3.7
27-Jan	2.8	2.9	2.7	2.8	2.7	2.5	2.2	1.9	1.8	2.0	2.1	1.9	2.1	2.3	2.1	2.3	2.3	2.3	2.1	2.1	1.5	1.8	1.9	1.4	2.9
28-Jan	1.6	1.6	1.7	1.5	1.6	1.1	1.1	0.8	0.3	0.8	1.1	1.3	1.1	1.0	0.8	0.6	0.2	0.5	0.6	0.8	1.0	0.7	0.6	0.4	1.7
29-Jan	0.3	0.2	0.9	1.0	1.1	1.6	1.7	1.7	1.3	0.9	0.8	0.6	0.8	0.7	0.9	0.7	1.1	1.4	1.1	1.3	1.0	1.5	1.9	2.0	2.0
30-Jan	2.0	2.1	2.5	2.3	2.0	1.7	2.0	2.2	1.8	1.3	2.0	2.2	2.7	2.3	2.3	1.9	1.7	1.1	0.9	0.7	0.4	0.5	0.3	0.1	2.7
31-Jan	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.5	1.1	1.1	1.5	1.2	1.4	1.4	1.2	0.7	0.9	0.9	0.9	1.4	0.9	1.4	1.7	1.5	1.7
	3.9	3.3	2.9	3.3	2.9	2.5	2.2	2.4	2.6	2.7	2.8	2.7	2.9	4.4	3.3	2.6	2.9	3.2	3.5	3.8	3.7	3.8	4.1	3.8	
	Diurnal Maximum																								

AF - Analyzer Failure

Maximum Value: 1.7 km/h on Jan 26 08:00

Maximum Daily Average: 0.8 km/h on Jan 11

Minimum Value: -2.2 km/h on Jan 22 14:00

Minimum Daily Average: -0.6 km/h on Jan 22

Maximum Diurnal Average: 0.3 km/h at hour 4

Minimum Diurnal Average: -0.1 km/h at hour 16

Monthly Average: 0.12 km/h

Percentiles: P_1 = -1.3 P_{10} = -0.4 Q_1 = -0.2 Median = 0.0 Q_3 = 0.5 P_{90} = 0.9 P_{99} = 1.5

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily	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-Jan	-0.2	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.5	-0.3	-0.4	-0.2	-0.4	-0.4	-0.1	0.0	0.1	0.1	0.0	-0.1	0.1
2-Jan	0.0	0.1	-0.2	0.0	0.0	-0.3	-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	-0.2	0.0	0.1
3-Jan	-0.2	-0.1	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.3	-0.4	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.4	0.4	0.0	0.4
4-Jan	0.3	0.3	0.3	1.0	0.9	0.5	0.6	1.0	1.0	0.8	1.2	0.8	0.2	1.0	0.4	0.2	-0.1	-0.5	-0.4	-0.5	-0.1	-0.1	-0.1	-0.3	0.4	1.2
5-Jan	-0.3	0.1	0.2	0.6	0.4	0.7	0.0	-0.1	-0.3	-0.1	-0.2	-0.7	-0.7	-0.9	-0.8	-0.8	-0.5	-0.5	-0.4	-0.3	-0.3	-0.5	-0.5	-0.3	-0.3	0.7
6-Jan	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.8	1.0	1.2	0.9	0.8	0.6	0.6	0.8	0.5	1.0	1.3	1.5	1.1	0.5	1.5
7-Jan	0.8	0.8	0.6	0.4	0.9	1.0	0.5	1.1	0.7	0.4	0.0	-0.2	-0.2	-0.2	-0.3	-0.1	0.0	-0.2	-0.4	-0.2	-0.2	-0.4	-0.2	-0.4	0.2	1.1
8-Jan	-0.3	-0.3	-0.2	-0.5	-1.0	-0.9	-0.8	-0.8	-0.8	-0.1	-0.8	-0.7	-0.8	-0.7	-1.1	-1.1	-0.3	-0.4	-0.2	0.0	0.0	0.2	0.6	0.5	-0.4	0.6
9-Jan	0.8	0.9	1.3	1.3	0.9	0.9	0.9	0.5	1.0	0.7	0.7	0.6	0.7	0.7	0.6	-0.2	-0.3	0.0	-0.2	-0.2	0.0	0.0	0.1	0.1	0.5	1.3
10-Jan	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.4	1.0	1.1	0.9	0.7	0.9	0.7	0.8	0.8	0.8	0.9	0.6	0.8	1.3	0.8	0.5	1.0	0.6	1.3
11-Jan	0.8	0.7	0.7	0.8	0.7	1.1	1.0	1.1	1.1	1.1	0.8	0.9	0.4	0.1	0.4	1.0	1.2	1.1	0.9	1.2	0.8	0.6	1.0	0.7	0.8	1.2
12-Jan	0.6	0.9	0.7	0.6	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.6	0.8	0.8	0.5	0.3	-0.1	0.2	0.9	0.4	0.9
13-Jan	1.4	0.8	0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.2	-0.1	-0.1	0.2	0.2	0.2	0.1	-0.2	-0.4	-0.5	-0.4	0.3	0.8	0.6	0.2	-0.2	0.1	1.4
14-Jan	-0.1	0.3	0.0	1.1	1.1	-0.3	-0.4	-0.1	0.0	0.0	0.1	-0.1	-0.1	0.1	0.1	0.2	-0.1	0.0	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	0.1	1.1
15-Jan	0.1	0.1	0.1	-0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.0	-0.2	-0.2	-0.1	-0.3	0.6	0.9	0.6	1.0	1.3	1.5	1.5	1.5	1.4	0.4	1.5
16-Jan	1.3	1.4	1.0	1.2	0.9	0.9	0.8	1.0	1.0	0.9	1.2	0.9	1.3	0.8	-0.3	-0.8	-1.0	-1.2	-1.2	-1.4	-1.1	-1.3	-1.1	-2.0	0.1	1.4
17-Jan	-1.5	-1.0	-1.3	-1.1	-1.2	-0.9	-0.3	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	0.1	-0.1	0.3	0.0	0.0	0.0	0.4	0.5	-0.3	0.5
18-Jan	0.8	0.6	0.6	0.7	0.3	0.4	0.2	0.3	0.4	0.5	0.5	0.7	0.9	0.9	0.7	0.9	1.2	1.1	1.6	1.0	0.9	0.8	0.8	0.8	0.7	1.6
19-Jan	1.2	0.5	0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	-0.2	0.0	-0.2	-0.4	-0.3	-0.3	-0.2	-0.1	-0.1	-0.1	-0.4	-0.3	-0.3	0.0	-0.1	-0.1	1.2
20-Jan	-0.1	0.1	-0.1	-0.2	-0.3	0.0	0.0	-0.2	-0.1	0.0	0.0	-0.1	-0.2	0.2	0.5	0.4	0.2	0.7	0.4	-0.1	0.8	0.8	0.8	0.3	0.2	0.8
21-Jan	0.4	0.7	0.0	1.6	1.1	0.1	0.1	-0.3	0.2	0.3	0.4	0.4	1.1	-0.2	-0.3	-0.6	0.0	-0.5	-0.7	0.3	0.1	0.1	0.0	-0.2	0.2	1.6
22-Jan	0.1	0.3	0.8	0.6	0.1	-0.3	-0.2	-0.9	-0.9	-1.1	-0.7	-0.6	-0.9	-2.2	-1.3	-1.3	-0.9	-1.2	-1.4	-1.2	-0.8	-0.2	-0.2	-0.1	-0.6	0.8
23-Jan	-0.3	-0.4	-0.2	-0.2	0.0	-0.2	-0.1	0.0	0.0	-0.2	-0.2	-0.1	0.0	0.2	0.0	0.1	0.1	-0.2	-0.1	0.0	0.0	-0.1	0.1	-0.1	-0.1	0.2
24-Jan	0.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-0.6	-0.5	-0.3	-0.2	-0.2	0.0	-0.1	-0.1	0.0	-0.2	0.1	0.3	1.4	--	1.4
25-Jan	1.5	1.0	0.2	0.3	0.9	0.9	0.8	1.0	0.8	-0.3	-1.1	-0.7	-0.7	-0.8	-0.5	-0.9	-0.4	-0.4	-0.2	-0.1	0.0	0.0	0.0	0.2	0.1	1.5
26-Jan	0.3	1.2	1.2	1.3	1.0	0.5	1.1	1.7	1.5	0.8	0.3	0.7	0.3	0.1	0.0	0.0	-0.5	-0.2	-0.4	-0.3	-0.1	-0.3	-0.6	-0.2	0.4	1.7
27-Jan	-0.5	-0.3	-0.2	-0.5	-0.1	0.1	-0.1	-0.2	0.1	-0.1	-0.1	0.2	-0.1	-0.3	-0.2	-0.1	-0.2	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.3	-0.1	0.2
28-Jan	-0.1	-0.3	-0.3	-0.3	-0.7	-0.2	-0.2	0.0	-0.2	0.0	0.1	0.0	-0.3	-0.3	0.0	0.0	-0.2	-0.1	0.0	0.1	0.2	0.2	0.1	0.1	-0.1	0.2
29-Jan	-0.1	0.0	0.5	0.4	0.3	0.4	0.5	0.6	0.5	0.3	0.2	0.1	0.1	0.2	0.1	-0.1	-0.3	-0.1	0.0	-0.2	-0.1	-0.1	-0.3	-0.3	0.1	0.6
30-Jan	-0.3	-0.3	-0.3	0.1	0.2	0.1	-0.4	0.1	-0.1	-0.2	-0.3	-0.3	0.1	0.0	0.2	0.0	0.0	-0.2	-0.2	-0.3	-0.4	-0.3	-0.1	0.0	-0.1	0.2
31-Jan	-0.1	0.0	0.0	0.0	0.1	0.1	0.7	0.7	0.6	0.6	0.4	0.5	0.4	0.3	0.2	0.2	0.4	0.5	0.8	0.4	0.4	1.0	0.7	1.0	0.4	1.0
	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.2	Diurnal Average	
	1.5	1.4	1.3	1.6	1.1	1.1	1.1	1.7	1.5	1.1	1.2	0.9	1.3	1.2	0.9	1.0	1.2	1.1	1.6	1.3	1.5	1.5	1.5	1.4	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4.7 km/h on Jan 22 14:00

Minimum Value: 0.1 km/h on Jan 10 05:00

Percentiles: P_1 = 0.1 P_{10} = 0.4 Q_1 = 0.7 Median = 1.1 Q_3 = 1.8 P_{90} = 2.4 P_{99} = 3.6

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	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-Jan	0.8	1.1	1.0	0.8	1.0	1.0	1.1	0.9	0.8	1.1	1.1	1.4	1.2	2.4	2.4	2.3	1.5	0.8	0.8	0.4	0.2	0.2	0.3	0.1	2.4
2-Jan	0.7	0.6	0.5	0.5	0.6	0.5	0.7	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.1	0.3	0.6	0.2	0.2	0.2	0.4	0.3	0.2	0.4	0.7
3-Jan	0.6	0.5	0.6	0.7	0.4	0.4	0.3	0.3	0.2	0.3	0.4	0.5	0.7	0.9	1.2	1.7	1.9	2.4	2.6	1.9	1.7	1.6	1.4	1.4	2.6
4-Jan	1.2	1.8	1.9	1.7	1.4	1.9	1.6	1.8	1.8	1.5	1.4	1.7	1.7	2.2	1.7	1.8	1.4	2.2	2.2	1.9	2.0	2.3	2.3	2.9	2.9
5-Jan	3.3	3.1	2.2	1.9	1.5	1.4	1.1	0.9	1.4	2.0	2.0	1.9	2.2	2.5	2.1	2.4	2.1	2.2	1.7	0.6	0.7	1.0	1.0	0.8	3.3
6-Jan	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.3	0.5	0.5	0.4	0.4	0.4	0.5	0.9	1.1	0.9	0.5	0.6	0.8	1.1
7-Jan	1.1	0.9	1.3	1.2	1.6	1.1	1.3	0.8	0.8	0.9	0.8	0.5	0.6	0.4	0.7	0.6	0.8	1.3	1.9	2.6	2.2	1.3	1.5	3.6	3.6
8-Jan	2.1	1.4	0.3	1.8	2.2	2.2	2.2	2.2	2.5	2.0	2.5	2.8	2.3	2.1	2.2	2.5	1.9	2.1	2.3	2.3	2.6	2.0	1.9	1.4	2.8
9-Jan	1.9	1.2	0.7	0.9	0.8	1.1	0.9	1.2	0.9	1.1	1.2	1.1	1.1	1.4	0.6	0.5	0.4	0.4	0.3	0.3	0.6	0.3	0.3	0.5	1.9
10-Jan	0.6	0.9	0.6	0.2	0.1	0.1	0.2	0.5	0.8	0.8	0.7	0.9	0.9	1.2	0.8	0.7	0.6	0.6	0.5	0.6	0.5	0.4	0.3	0.4	1.2
11-Jan	0.6	0.5	0.7	0.6	0.6	0.7	0.8	1.0	0.8	0.7	0.8	0.9	1.1	1.0	1.1	1.0	0.9	0.8	0.7	0.8	0.9	1.5	1.4	0.6	1.5
12-Jan	0.8	1.8	1.1	0.8	0.4	0.3	0.5	0.6	0.6	0.4	0.5	0.4	0.3	0.4	0.6	0.5	0.6	1.1	1.3	1.0	1.4	2.0	1.0	1.2	2.0
13-Jan	1.2	0.7	0.5	0.9	1.4	1.9	1.8	1.4	0.8	1.0	1.0	1.4	1.1	1.1	0.8	0.7	0.7	0.5	0.8	1.8	2.3	2.2	1.4	1.2	2.3
14-Jan	1.3	1.3	1.1	1.0	1.3	1.6	0.8	2.2	2.2	1.7	1.7	1.9	1.8	1.7	1.4	1.5	2.2	2.5	2.3	1.9	1.6	1.4	1.1	1.3	2.5
15-Jan	1.6	1.7	1.7	1.2	1.3	1.3	1.3	1.2	1.1	1.0	1.0	1.0	1.1	0.8	1.1	1.6	2.6	2.4	3.2	3.5	3.6	3.7	3.6	3.4	3.7
16-Jan	3.5	3.1	2.6	2.9	2.4	2.1	1.6	1.6	1.6	1.7	1.2	1.1	1.3	1.5	1.6	2.5	2.7	2.8	3.2	3.8	3.1	3.2	3.7	4.1	4.1
17-Jan	3.4	2.8	2.4	3.4	2.9	2.5	1.5	1.3	1.2	1.2	1.2	1.1	1.1	1.2	1.1	0.9	1.0	0.9	0.6	0.4	0.6	0.4	0.8	1.0	3.4
18-Jan	0.8	0.8	0.8	0.9	0.7	0.8	1.2	1.0	0.9	1.3	1.4	1.0	1.3	1.1	1.0	0.7	0.7	1.1	0.9	0.7	0.7	0.6	0.6	0.5	1.4
19-Jan	0.5	0.4	0.3	0.2	0.2	0.2	0.4	0.3	0.3	0.7	1.0	1.1	1.4	1.2	1.2	1.3	1.0	1.3	1.4	1.5	1.3	1.2	1.3	1.5	1.5
20-Jan	1.4	1.3	1.2	1.2	1.0	1.0	0.8	0.9	0.8	0.7	0.5	0.4	0.5	0.8	0.9	1.2	0.6	1.0	1.7	2.1	1.7	1.6	1.7	1.9	2.1
21-Jan	2.0	1.8	1.6	1.9	1.4	1.2	0.8	0.8	0.8	0.7	1.0	1.1	1.9	3.0	2.7	2.3	2.3	2.2	2.5	1.9	1.9	1.7	1.9	1.7	3.0
22-Jan	1.3	1.0	1.2	1.3	1.1	1.1	1.0	2.8	3.2	3.4	2.3	2.4	3.4	4.7	3.6	2.7	2.0	2.5	2.8	2.4	2.7	1.9	1.8	1.4	4.7
23-Jan	1.4	1.4	1.1	1.0	0.9	1.0	1.2	0.9	0.9	0.8	1.0	1.1	1.1	1.2	1.0	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4	1.4
24-Jan	0.4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.1	1.8	1.5	0.9	1.0	0.5	0.8	0.8	0.9	1.0	1.7	0.8	1.1	2.1
25-Jan	1.0	1.2	1.2	1.4	1.6	2.2	2.2	1.2	1.0	1.4	3.1	2.5	1.4	1.4	1.7	1.6	1.4	1.0	1.0	0.8	0.9	0.3	0.2	0.4	3.1
26-Jan	0.4	0.7	0.7	0.6	1.1	1.3	0.7	1.0	1.3	1.5	1.3	1.7	1.5	1.5	1.7	0.9	2.1	3.2	3.4	3.3	3.6	3.0	3.0	3.1	3.6
27-Jan	2.8	3.0	2.7	2.9	2.7	2.5	2.4	1.9	1.9	2.0	2.1	1.9	2.1	2.1	2.1	2.2	2.4	2.4	2.1	2.1	1.7	1.9	2.1	1.5	3.0
28-Jan	1.8	1.8	1.9	1.7	1.8	1.3	1.4	1.0	0.4	1.0	1.2	1.5	1.2	0.9	0.9	0.6	0.3	0.6	0.8	0.9	1.2	0.8	0.6	0.4	1.9
29-Jan	0.4	0.2	0.9	1.1	1.2	1.6	1.8	1.5	1.2	0.9	0.9	0.7	0.8	0.8	0.8	0.7	1.1	1.6	1.3	1.3	1.3	1.6	2.0	1.9	2.0
30-Jan	2.1	2.0	2.6	2.4	2.0	1.8	2.2	2.4	1.9	1.5	2.0	2.2	2.6	2.3	2.2	1.9	1.7	1.1	1.2	0.9	0.5	0.5	0.3	0.1	2.6
31-Jan	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.8	0.9	1.4	1.0	1.2	1.4	1.2	0.7	0.9	0.8	1.0	1.2	1.0	1.2	1.3	1.2	1.4
	3.5	3.1	2.7	3.4	2.9	2.5	2.4	2.8	3.2	3.4	3.1	2.8	3.4	4.7	3.6	2.7	2.7	3.2	3.4	3.8	3.6	3.7	3.7	4.1	
	Diurnal Maximum																								

AF - Analyzer Failure

Maximum Value: 4.1 km/h on Jan 15 21:00

Maximum Daily Average: 1.0 km/h on Jan 4

Minimum Value: -1.4 km/h on Jan 22 10:00

Minimum Daily Average: -0.3 km/h on Jan 22

Maximum Diurnal Average: 0.6 km/h at hour 22

Minimum Diurnal Average: 0.2 km/h at hour 13

Monthly Average: 0.32 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.3 Q_1 = -0.1 Median = 0.1 Q_3 = 0.5 P_{90} = 1.1 P_{99} = 3.6

Hours in Service:	744
Hours of Data:	677
Hours of Missing Data:	67
Hours of Calibration:	0
Percent Operational Time:	91.0

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-Jan	0.2	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	-0.1	0.1	-0.2	0.5	-0.1	-0.1	-0.2	-0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.5
2-Jan	0.0	0.3	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	0.0	0.3
3-Jan	-0.2	0.0	-0.2	-0.3	-0.1	-0.3	-0.3	-0.3	-0.2	-0.1	-0.1	-0.1	-0.3	-0.3	0.2	2.2	3.3	2.7	2.8	1.2	0.2	1.0	2.0	2.6	0.6	3.3
4-Jan	1.0	2.1	1.9	0.8	0.0	3.8	1.5	0.8	0.8	0.7	0.5	0.7	0.2	1.2	1.5	1.2	0.7	0.2	0.5	0.0	0.7	0.8	1.3	1.6	1.0	3.8
5-Jan	2.5	2.6	1.6	2.3	0.6	-0.2	-0.3	-0.5	-0.2	0.3	0.2	-0.4	-0.6	-0.8	-0.4	-0.4	-0.5	-0.6	-0.3	-0.2	-0.2	-0.2	-0.1	-0.2	0.2	2.6
6-Jan	-0.2	-0.2	0.1	0.2	-0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.0	0.4	0.1	-0.3	-0.2	-0.3	0.2	0.1	-0.2	0.1	0.0	1.0
7-Jan	0.4	0.6	1.6	0.4	1.4	-0.2	0.7	-0.1	0.0	0.0	0.7	0.0	0.1	-0.1	-0.3	0.0	0.0	0.0	0.0	0.5	-0.1	-0.5	-0.3	-0.1	0.2	1.6
8-Jan	0.4	-0.2	-0.3	-0.5	-1.0	-0.9	-0.8	-0.8	-0.6	0.3	-0.5	-0.8	-1.0	-0.7	-0.8	-1.1	0.6	1.2	3.3	3.6	3.8	3.9	3.6	1.4	0.5	3.9
9-Jan	-0.2	0.1	0.0	0.4	1.1	0.8	0.7	1.2	1.0	0.9	0.7	0.8	1.0	1.1	0.6	0.2	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	-0.2	0.4	1.2
10-Jan	0.0	0.1	0.0	0.1	0.0	0.0	0.4	0.3	0.2	0.2	0.7	0.3	0.1	0.7	0.9	0.4	0.7	0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	0.2	0.9
11-Jan	-0.1	0.3	0.0	1.0	0.1	-0.1	0.4	0.8	0.1	0.6	0.9	0.9	0.2	0.1	0.7	0.6	-0.3	-0.1	-0.2	0.6	0.0	0.2	0.7	0.2	0.3	1.0
12-Jan	0.1	1.8	0.6	0.4	0.2	0.3	0.2	0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.6	0.9	0.4	0.0	0.8	1.2	0.2	0.3	0.4	1.8
13-Jan	0.1	0.5	0.1	0.1	0.0	0.5	0.3	0.3	0.4	0.0	0.0	0.2	0.4	0.3	0.3	-0.1	-0.2	-0.1	0.3	2.2	2.3	2.1	0.3	0.2	0.4	2.3
14-Jan	0.0	0.3	0.4	0.3	0.3	0.3	-0.4	0.3	0.4	0.4	0.0	-0.2	-0.1	0.4	0.5	0.4	0.4	0.3	0.4	0.3	-0.2	0.0	0.1	0.1	0.2	0.5
15-Jan	-0.1	0.2	-0.2	0.1	0.3	0.1	0.0	0.1	0.2	0.2	0.0	0.2	0.1	-0.1	0.9	1.5	0.9	0.9	1.5	2.8	4.1	3.0	2.3	2.8	0.9	4.1
16-Jan	2.5	3.0	3.7	2.1	2.0	2.2	1.5	1.2	0.8	0.8	0.4	0.3	0.1	0.5	0.0	-0.4	0.0	-0.2	0.0	-0.5	-0.3	-0.4	0.0	-1.1	0.8	3.7
17-Jan	-1.0	-0.1	-0.9	-0.8	-0.1	-0.2	0.1	0.1	0.0	0.1	0.0	-0.2	0.0	-0.1	0.0	0.0	0.3	0.1	0.2	0.0	-0.1	0.0	0.3	0.0	-0.1	0.3
18-Jan	0.0	0.0	0.1	0.2	0.0	0.3	0.1	0.1	0.6	0.8	1.6	0.7	1.1	0.9	0.6	0.3	0.2	0.1	-0.1	0.2	0.3	0.2	0.3	0.2	0.4	1.6
19-Jan	0.1	0.5	0.4	0.1	-0.2	-0.1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.5
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.4	0.5	1.1	0.5	0.5	0.8	0.6	0.3	1.4	-0.2	-0.2	--	1.4
21-Jan	1.5	2.1	-0.1	2.0	1.0	0.7	0.3	-0.4	0.1	0.1	0.2	1.1	0.7	0.4	-0.1	0.8	1.0	0.2	-0.1	0.3	0.9	0.3	0.4	-0.1	0.5	2.1
22-Jan	-0.6	0.4	-0.3	0.5	0.0	-0.2	0.0	-0.3	-0.8	-1.4	-0.3	-0.9	-1.2	-1.3	-0.3	-0.2	0.2	-0.2	-0.6	-0.8	-0.1	0.4	-0.1	0.5	-0.3	0.5
23-Jan	0.1	-0.2	-0.2	0.0	0.1	-0.1	0.0	0.1	0.1	AF	AF	AF	AF	0.3	0.1	0.5	-0.1	-0.1	0.1	AF	AF	AF	AF	AF	--	0.5
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.5	0.4	0.8	-0.1	-0.3	-0.5	0.2	0.4	0.5	0.3	1.4	0.6	-0.1	--	1.4
25-Jan	0.2	0.4	-0.6	0.9	0.1	0.9	0.7	0.8	0.2	-0.2	-0.5	-0.5	-0.2	-0.1	0.2	-0.8	-0.3	-0.4	0.1	0.1	-0.2	-0.1	0.0	0.1	0.0	0.9
26-Jan	-0.1	0.1	0.0	0.2	0.5	0.9	0.0	0.0	0.2	0.7	1.9	4.0	2.5	2.1	2.3	-0.5	-0.4	0.7	AF	AF	AF	AF	AF	AF	0.8	4.0
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.0	0.5	0.5	0.7	0.4	0.6	0.4	0.3	0.4	0.2	0.5	0.5	0.2	0.1	--	0.7
28-Jan	0.4	0.1	-0.2	-0.4	-0.5	-0.4	-0.1	0.2	-0.2	0.1	0.4	0.3	-0.3	-0.4	0.2	-0.1	0.0	0.1	0.0	0.1	0.3	0.5	0.1	0.1	0.0	0.5
29-Jan	-0.1	0.2	0.5	0.7	0.9	1.9	2.3	1.4	1.1	0.9	0.7	0.3	0.2	0.3	0.1	-0.2	-0.2	-0.2	0.0	0.2	0.1	0.2	0.1	-0.1	0.5	2.3
30-Jan	0.3	0.2	0.0	0.7	0.5	0.4	0.2	0.6	0.1	0.0	0.0	0.0	0.4	0.0	0.5	0.3	0.3	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	0.0	0.1	0.7
31-Jan	0.1	0.0	-0.1	0.0	0.2	0.0	0.3	0.2	0.4	0.5	0.6	0.5	0.2	0.6	0.5	0.1	0.7	0.3	0.6	0.7	0.2	1.0	0.7	1.0	0.4	1.0
	0.3	0.5	0.3	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.2	0.3	0.2	0.3	0.4	0.5	0.6	0.4	0.3	Diurnal Average	
	2.5	3.0	3.7	2.3	2.0	3.8	2.3	1.4	1.1	0.9	1.9	4.0	2.5	2.1	2.3	2.2	3.3	2.7	3.3	3.6	4.1	3.9	3.6	2.8	Diurnal Maximum	

AF - Analyzer Failure

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

Maximum Value: 4.4 km/h on Jan 22 13:00

Minimum Value: 0.1 km/h on Jan 10 05:00

Percentiles: P_1 = 0.2 P_{10} = 0.5 Q_1 = 0.8 Median = 1.2 Q_3 = 1.8 P_{90} = 2.3 P_{99} = 3.2

Hours in Service:	744
Hours of Data:	677
Hours of Missing Data:	67
Hours of Calibration:	0
Percent Operational Time:	91.0

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	Maximum
1-Jan	0.9	1.3	1.1	0.8	0.8	0.7	0.7	0.6	0.5	0.7	0.9	1.1	1.2	2.0	2.6	2.4	1.6	1.1	1.0	0.4	0.3	0.6	0.8	0.3	2.6
2-Jan	1.2	1.6	1.1	0.9	1.2	1.0	1.1	0.3	0.3	0.3	0.5	0.4	0.2	0.1	0.2	0.8	1.1	0.4	0.3	0.3	0.7	0.7	0.4	0.5	1.6
3-Jan	0.8	0.9	1.1	1.2	0.5	0.6	0.6	0.6	0.5	0.7	0.5	0.6	1.1	1.1	1.1	2.3	2.2	0.9	1.6	3.2	3.0	2.5	2.2	1.5	3.2
4-Jan	1.9	1.8	2.1	2.4	2.2	3.0	2.3	2.4	2.3	1.2	1.4	1.7	1.8	2.1	1.9	1.9	1.6	2.5	2.5	1.6	1.9	2.0	2.0	2.5	3.0
5-Jan	2.2	2.5	2.4	2.2	2.0	1.7	1.3	1.3	1.7	1.9	1.9	1.8	1.5	1.8	2.1	2.0	1.8	1.7	1.4	0.4	0.7	1.0	1.1	1.3	2.5
6-Jan	1.2	1.0	0.7	0.3	0.4	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.8	1.3	1.3	0.7	0.7	0.8	0.8	1.3
7-Jan	0.9	1.0	1.5	1.5	1.8	1.0	1.2	0.7	0.7	0.9	1.3	0.4	0.7	0.4	0.5	0.3	0.2	0.8	1.9	2.7	2.4	1.2	1.7	3.6	3.6
8-Jan	2.3	1.0	0.7	2.0	2.0	1.8	1.6	1.3	1.5	1.7	1.8	2.1	1.9	2.0	1.9	1.5	1.5	0.8	1.6	1.6	1.8	2.3	1.9	2.5	2.5
9-Jan	2.1	1.5	0.9	1.0	0.8	1.1	1.1	1.0	1.1	1.0	1.0	1.1	1.0	1.2	0.8	0.4	0.4	0.6	0.4	0.8	1.4	0.7	0.6	1.2	2.1
10-Jan	1.1	1.1	0.7	0.3	0.1	0.2	0.4	0.6	0.8	0.6	0.7	0.8	0.6	0.9	0.8	1.0	0.8	0.8	0.6	0.9	0.7	0.4	0.5	0.4	1.1
11-Jan	0.7	0.5	0.7	0.7	0.7	0.5	0.7	0.7	0.7	0.8	0.9	1.0	1.1	0.9	1.4	1.2	1.1	0.8	0.8	1.0	1.0	1.7	1.3	0.8	1.7
12-Jan	0.9	1.2	1.0	0.9	0.4	0.5	0.7	0.9	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.6	0.8	1.1	1.3	1.1	1.2	2.3	1.1	1.2	2.3
13-Jan	1.2	1.1	0.4	0.5	1.0	1.3	1.5	1.1	0.6	1.1	1.0	1.6	1.5	1.4	0.9	0.4	0.9	0.8	1.7	2.6	1.9	2.3	1.7	1.5	2.6
14-Jan	1.4	1.5	1.8	1.4	1.8	2.2	0.8	2.2	2.2	2.0	1.8	2.0	1.7	1.6	1.7	1.5	2.3	2.8	2.4	1.9	1.6	1.4	1.2	1.6	2.8
15-Jan	2.0	2.1	2.0	1.7	1.9	1.4	1.7	1.4	1.0	1.0	0.8	0.5	1.0	1.0	1.7	2.0	2.3	2.2	2.4	2.8	2.8	2.8	2.6	2.7	2.8
16-Jan	2.6	2.7	2.6	2.5	2.4	2.6	2.0	2.1	2.3	2.3	1.4	0.9	1.3	1.7	1.8	1.7	2.2	1.9	2.4	3.5	2.1	1.8	2.4	3.8	3.8
17-Jan	2.2	1.6	1.3	2.7	0.8	1.5	1.0	1.2	1.5	1.5	1.2	1.2	1.0	1.0	0.9	0.6	0.8	0.6	0.6	0.4	0.6	0.4	1.1	1.2	2.7
18-Jan	1.1	1.0	1.0	1.2	0.9	1.1	1.2	1.2	1.1	1.4	1.2	0.8	0.8	1.1	1.5	0.7	1.1	1.1	1.1	0.8	0.7	0.6	0.8	0.6	1.5
19-Jan	0.6	0.6	0.4	0.2	0.3	0.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.6
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.6	0.8	1.2	0.8	1.3	1.3	2.0	2.2	1.6	1.6	1.8	2.2
21-Jan	1.9	1.4	1.6	1.6	1.8	1.7	1.5	1.7	1.8	1.5	1.4	1.8	2.1	3.2	2.9	2.7	2.5	2.0	2.7	2.6	2.9	2.8	2.9	2.5	3.2
22-Jan	2.2	1.4	1.6	1.8	1.8	1.8	1.2	1.9	3.4	3.2	3.1	2.9	4.4	3.7	2.5	1.7	1.3	1.5	1.4	0.7	2.0	1.7	1.3	1.2	4.4
23-Jan	1.0	1.2	0.7	0.8	0.7	0.6	0.7	0.6	1.4	AF	AF	AF	AF	1.2	1.2	0.9	0.6	0.4	0.5	AF	AF	AF	AF	AF	1.4
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.9	1.0	1.2	1.0	1.7	1.4	0.9	0.8	1.2	1.0	1.4	1.2	1.1	1.7
25-Jan	1.1	1.4	1.7	1.7	1.7	2.7	2.5	1.7	1.3	1.9	2.6	2.2	1.2	0.7	1.2	1.2	1.3	1.5	0.8	0.7	1.0	0.5	0.5	0.6	2.7
26-Jan	0.8	1.0	0.9	0.8	1.2	1.2	0.8	1.0	1.7	2.4	2.5	2.2	1.5	1.0	1.2	1.6	1.4	2.8	AF	AF	AF	AF	AF	AF	2.8
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.5	1.7	1.9	2.1	2.0	2.1	1.8	2.2	1.9	1.7	1.6	1.6	1.7	1.2	2.2
28-Jan	1.5	1.6	1.7	1.4	1.5	1.0	1.1	0.8	0.6	1.0	1.4	1.7	1.3	1.0	1.0	0.3	0.3	0.9	1.3	1.3	1.4	1.2	1.0	0.5	1.7
29-Jan	0.4	0.7	1.1	1.1	1.4	1.2	1.2	1.0	0.9	1.0	1.0	0.7	0.9	0.9	0.5	0.3	0.5	1.0	0.9	1.1	0.9	1.2	1.5	1.2	1.5
30-Jan	1.7	2.0	2.4	2.6	2.3	2.0	2.2	2.4	2.1	1.7	2.2	2.3	2.8	2.3	2.7	2.0	1.9	1.5	1.6	1.2	1.1	1.1	0.4	0.3	2.8
31-Jan	0.4	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.7	0.8	1.1	0.9	0.9	1.0	0.9	0.9	1.4	1.3	1.0	1.3	1.4	0.8	1.0	0.9	1.4
	2.6	2.7	2.6	2.7	2.4	3.0	2.5	2.4	3.4	3.2	3.1	2.9	4.4	3.7	2.9	2.7	2.5	2.8	2.7	3.5	3.0	2.8	2.9	3.8	
	Diurnal Maximum																								

AF - Analyzer Failure

Maximum Value: 6.8 km/h on Jan 26 12:00

Maximum Daily Average: 2.2 km/h on Jan 4

Minimum Value: -0.9 km/h on Jan 8 06:00

Minimum Daily Average: 0.1 km/h on Jan 17

Maximum Diurnal Average: 1.1 km/h at hour 22

Minimum Diurnal Average: 0.4 km/h at hour 9

Monthly Average: 0.68 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.2 Q_1 = 0.1 Median = 0.4 Q_3 = 0.9 P_{90} = 2.1 P_{99} = 4.8

Hours in Service:	744
Hours of Data:	582
Hours of Missing Data:	162
Hours of Calibration:	0
Percent Operational Time:	78.2

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-Jan	0.4	0.2	0.4	0.1	-0.1	0.0	0.1	0.1	0.0	-0.1	0.1	0.0	0.2	0.0	0.7	-0.3	0.1	0.2	-0.3	0.3	0.0	-0.1	-0.1	0.0	0.1	0.7
2-Jan	0.2	0.6	0.0	0.2	0.1	0.1	-0.2	0.2	0.0	0.4	0.3	0.3	0.0	0.1	0.0	0.3	0.3	0.1	0.3	0.1	-0.1	0.1	-0.3	-0.1	0.1	0.6
3-Jan	0.0	0.1	-0.2	-0.3	0.1	-0.2	-0.3	-0.2	-0.1	-0.2	-0.1	0.1	0.2	0.3	1.1	3.4	4.5	2.7	3.1	1.5	1.2	3.9	3.5	3.6	1.2	4.5
4-Jan	1.9	2.6	3.2	1.9	0.9	6.1	3.4	2.8	2.2	1.4	2.0	2.0	1.8	2.8	2.2	2.1	1.6	1.4	1.5	0.7	1.9	1.8	2.2	3.3	2.2	6.1
5-Jan	3.0	4.8	3.2	3.4	1.2	0.4	0.1	-0.1	0.3	1.0	0.4	-0.1	-0.2	-0.6	-0.4	-0.3	-0.3	-0.5	-0.2	-0.2	0.0	0.0	0.2	-0.1	0.6	4.8
6-Jan	-0.1	-0.1	0.1	0.2	0.0	0.2	0.0	0.1	0.1	0.4	0.6	-0.1	-0.1	0.2	0.4	0.4	0.2	0.0	0.1	0.2	0.7	0.5	0.5	1.0	0.2	1.0
7-Jan	0.8	0.5	0.9	0.3	0.6	-0.5	0.7	0.2	0.6	0.7	1.1	0.5	0.8	0.2	0.1	-0.1	-0.1	-0.1	0.0	0.6	0.3	-0.5	-0.4	0.2	0.3	1.1
8-Jan	0.6	-0.1	-0.5	0.0	-0.6	-0.9	-0.5	-0.4	-0.3	0.7	0.1	-0.6	-0.8	-0.4	-0.6	-0.8	1.0	1.5	3.8	3.6	3.3	4.8	4.3	5.0	0.9	5.0
9-Jan	0.6	0.7	0.7	0.7	0.6	1.4	1.2	0.9	1.4	0.9	0.2	0.4	0.4	0.5	0.4	0.4	0.3	0.3	-0.1	-0.2	0.0	0.0	0.0	0.0	0.5	1.4
10-Jan	0.1	0.2	0.3	0.1	0.1	0.1	0.2	1.0	1.1	0.7	0.2	0.5	0.5	0.4	0.7	0.5	0.9	0.7	0.4	0.6	0.5	0.6	0.4	0.5	0.5	1.1
11-Jan	0.3	0.5	0.7	0.6	0.6	0.7	0.7	0.6	0.3	0.2	0.4	0.7	0.5	0.7	1.2	0.8	0.1	0.6	0.1	0.4	0.1	0.0	1.3	0.7	0.5	1.3
12-Jan	-0.1	0.6	0.4	0.3	0.2	0.3	0.0	0.4	0.1	0.0	0.0	0.0	0.2	0.2	0.2	0.4	0.4	0.8	1.3	0.7	0.9	0.4	0.4	1.1	0.4	1.3
13-Jan	1.1	0.2	-0.1	0.0	0.0	0.6	0.3	0.4	0.4	0.3	0.0	0.3	0.5	0.2	0.3	0.3	0.3	0.5	1.5	3.5	3.3	2.7	0.5	0.6	0.7	3.5
14-Jan	0.9	1.1	1.6	2.2	1.9	1.5	-0.6	0.1	0.3	0.4	0.0	0.0	0.0	0.5	0.6	0.6	0.5	0.6	0.8	0.4	-0.2	0.0	0.2	0.1	0.6	2.2
15-Jan	0.2	0.1	-0.2	0.0	0.1	0.3	0.0	0.2	0.1	0.2	0.0	0.6	0.7	0.0	2.5	2.0	1.0	1.1	1.7	3.0	4.4	3.1	2.3	2.8	1.1	4.4
16-Jan	2.5	3.0	3.4	1.8	1.5	1.8	1.1	0.6	-0.1	0.6	1.2	0.8	0.6	1.3	0.6	0.4	1.1	0.9	0.8	0.4	0.7	1.0	1.7	-0.3	1.1	3.4
17-Jan	-0.2	0.2	-0.7	-0.4	0.0	-0.2	0.1	0.2	0.0	0.3	0.1	0.0	-0.1	0.0	0.0	0.1	0.4	0.1	0.1	0.1	0.5	0.4	0.4	0.0	0.1	0.5
18-Jan	0.0	0.5	0.6	0.8	0.2	0.4	0.1	0.3	0.4	0.4	0.6	0.6	0.8	0.3	0.3	0.6	1.0	1.3	1.3	0.9	0.4	0.7	0.5	0.8	0.6	1.3
19-Jan	0.7	0.4	0.1	0.2	0.0	0.0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.7
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.1	0.5	0.3	0.1	0.6	0.9	0.5	-0.6	--	0.9
21-Jan	0.6	1.1	-0.3	0.9	-0.2	1.3	1.2	-0.6	-0.5	-0.5	-0.5	0.3	2.6	3.9	3.5	2.4	2.3	1.5	1.4	2.0	2.4	2.2	2.1	1.2	1.3	3.9
22-Jan	0.2	1.5	0.2	1.6	0.4	0.5	0.9	0.7	-0.2	-0.5	0.5	-0.4	-0.2	0.1	0.3	0.5	0.9	0.9	-0.5	-0.5	0.3	0.4	-0.1	AF	0.3	1.6
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	-0.2	-0.2	2.3	0.7	0.6	0.7	0.2	0.1	0.0	0.5	0.9	1.3	1.2	2.5	1.5	0.9	--	2.5
25-Jan	0.7	-0.1	-0.3	2.5	1.7	0.8	0.7	0.5	0.6	0.5	-0.1	0.0	0.0	0.0	0.2	-0.5	0.0	-0.5	0.3	0.3	-0.1	0.3	0.3	1.2	0.4	2.5
26-Jan	0.9	0.5	0.4	0.6	0.6	0.6	0.8	1.1	1.2	3.7	5.2	6.8	3.4	2.9	2.4	0.3	-0.1	0.6	AF	AF	AF	AF	AF	AF	1.8	6.8
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.0	-0.1	-0.1	0.2	0.4	0.3	0.2	0.8	--	0.8
31-Jan	1.0	1.5	0.9	1.0	0.3	1.7	1.4	AF	0.9	0.5	0.8	0.6	0.4	1.2	1.6	0.4	0.6	0.7	0.3	0.7	0.2	1.0	1.0	0.7	0.8	1.7
	0.7	0.9	0.6	0.8	0.4	0.7	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.7	0.8	0.6	0.7	0.6	0.8	0.8	0.9	1.1	0.9	1.0	Diurnal Average	
	3.0	4.8	3.4	3.4	1.9	6.1	3.4	2.8	2.2	3.7	5.2	6.8	3.4	3.9	3.5	3.4	4.5	2.7	3.8	3.6	4.4	4.8	4.3	5.0	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4.1 km/h on Jan 22 13:00

Minimum Value: 0.1 km/h on Jan 12 11:00

Percentiles: P_1 = 0.2 P_{10} = 0.5 Q_1 = 0.8 Median = 1.1 Q_3 = 1.6 P_{90} = 2.1 P_{99} = 3.2

Hours in Service:	744
Hours of Data:	582
Hours of Missing Data:	162
Hours of Calibration:	0
Percent Operational Time:	78.2

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	Maximum
1-Jan	0.7	1.2	1.0	0.9	0.6	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.8	1.7	3.1	2.6	1.8	1.3	1.1	0.6	0.5	0.8	0.9	0.5	3.1
2-Jan	1.5	1.7	1.4	1.1	1.4	1.2	1.0	0.4	0.5	0.3	0.5	0.3	0.2	0.2	0.2	0.9	1.2	0.6	0.6	0.4	1.0	0.6	0.7	0.7	1.7
3-Jan	1.0	1.3	1.2	1.4	0.5	0.7	0.7	0.8	0.5	0.8	0.7	0.9	1.3	1.5	1.4	1.3	1.1	0.9	1.5	3.1	3.6	1.5	1.4	0.8	3.6
4-Jan	1.2	0.9	1.2	2.2	1.5	2.2	1.3	1.7	1.6	1.4	1.3	1.5	1.8	2.1	2.0	1.8	1.5	1.9	2.0	1.2	1.3	1.6	1.6	2.2	2.2
5-Jan	1.9	1.3	1.6	1.5	2.0	1.6	0.8	1.3	1.5	1.5	1.8	1.9	1.7	1.5	1.9	1.6	1.6	1.4	1.0	0.7	0.8	1.3	1.3	1.6	2.0
6-Jan	1.2	1.2	0.8	0.4	0.4	0.7	0.5	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.5	0.6	0.8	0.7	0.8	0.5	0.5	1.0	1.0	1.2
7-Jan	0.8	0.8	1.1	1.0	1.6	0.9	0.7	0.6	0.6	1.3	1.4	0.7	1.1	0.7	0.4	0.2	0.3	1.1	2.4	3.0	2.4	1.3	1.8	3.3	3.3
8-Jan	2.6	1.1	0.9	1.9	1.7	1.3	1.6	1.4	1.4	1.2	1.3	1.1	1.7	1.7	1.5	0.9	1.3	1.1	1.4	1.7	1.1	1.0	1.1	2.6	2.6
9-Jan	1.4	1.5	1.2	0.9	0.7	1.0	1.1	1.1	1.0	0.9	0.8	0.7	1.0	0.7	0.8	0.5	0.5	0.6	0.4	1.0	1.9	0.9	1.0	1.6	1.9
10-Jan	1.1	1.0	0.6	0.4	0.3	0.3	0.3	0.7	0.7	0.5	0.5	0.6	0.4	0.6	0.8	0.9	0.7	0.8	0.7	0.6	0.5	0.4	0.3	0.3	1.1
11-Jan	0.3	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.7	0.5	0.8	0.7	0.8	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.3	1.6	1.0	0.7	1.6
12-Jan	0.9	0.9	0.7	0.6	0.4	0.4	0.9	1.1	0.3	0.2	0.1	0.2	0.2	0.2	0.4	0.5	0.7	0.9	1.2	0.8	0.8	1.2	1.0	1.2	1.2
13-Jan	1.0	1.4	0.6	0.5	1.0	1.3	1.7	1.0	0.7	1.1	0.9	1.7	1.5	1.3	0.9	0.4	1.0	1.2	2.4	2.5	1.8	2.4	1.9	1.2	2.5
14-Jan	1.1	1.9	1.9	1.5	1.1	1.8	1.1	2.6	2.6	2.3	1.8	1.8	1.7	1.8	1.5	1.4	2.3	2.7	2.6	2.3	1.6	1.4	1.4	1.8	2.7
15-Jan	2.0	2.2	2.1	1.8	2.1	1.4	1.8	1.4	0.9	0.9	0.8	0.6	1.2	1.5	2.0	2.0	2.3	2.0	2.6	3.3	3.2	3.2	3.0	3.2	3.3
16-Jan	3.2	3.0	2.9	2.7	2.8	2.5	1.9	2.0	1.9	1.8	1.3	1.1	1.5	1.4	1.1	1.1	1.6	1.8	1.9	2.2	1.5	1.3	2.1	2.3	3.2
17-Jan	1.0	0.9	1.0	1.2	1.2	1.7	1.0	1.4	1.9	1.8	1.5	1.1	1.0	1.0	0.9	0.6	0.6	0.4	0.4	0.3	0.8	0.5	0.9	1.1	1.9
18-Jan	0.9	1.3	1.5	1.2	0.8	1.0	0.9	0.8	0.6	0.9	0.8	0.7	0.9	1.1	1.6	0.8	0.9	1.0	1.2	1.0	0.9	0.9	1.1	0.6	1.6
19-Jan	0.6	0.5	0.3	0.2	0.2	0.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.6
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.7	1.0	0.9	1.5	1.6	1.1	1.2	1.6	1.6
21-Jan	1.2	1.0	1.3	0.9	1.2	1.8	1.6	1.8	1.4	0.9	1.0	1.2	2.5	3.2	2.8	2.6	2.3	1.8	2.2	2.6	2.8	2.3	2.0	1.4	3.2
22-Jan	1.5	1.3	2.1	2.4	2.1	2.0	1.0	1.4	2.0	2.5	3.1	2.3	4.1	1.8	1.4	1.7	1.3	1.7	1.1	1.3	1.7	1.7	1.3	AF	4.1
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	0.5	1.1	1.2	1.0	1.2	1.3	1.3	2.6	2.1	1.1	0.8	1.2	0.9	1.3	1.3	1.0	2.6
25-Jan	1.0	1.0	1.4	1.6	1.5	1.6	1.6	1.3	1.7	2.3	2.0	1.7	1.7	1.0	1.8	1.4	1.3	2.1	0.7	0.7	0.9	0.6	0.6	0.9	2.3
26-Jan	0.9	1.1	1.3	1.4	0.8	1.0	1.0	1.1	1.7	2.3	1.7	1.0	1.2	0.8	0.9	0.9	0.8	2.9	AF	AF	AF	AF	AF	AF	2.9
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.8	1.8	2.0	1.8	1.9	2.0	0.8	1.6	2.8
31-Jan	1.8	1.8	1.5	1.7	0.5	2.0	1.6	AF	1.5	0.9	1.1	0.9	0.7	0.9	1.1	0.8	1.0	1.2	0.7	1.0	1.2	0.8	0.7	0.9	2.0
	3.2	3.0	2.9	2.7	2.8	2.5	1.9	2.6	2.6	2.5	3.1	2.3	4.1	3.2	3.1	2.6	2.8	2.9	2.6	3.3	3.6	3.2	3.0	3.3	
	Diurnal Maximum																								

AF - Analyzer Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 4
BUFFALO VIEWPOINT
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
JANUARY 2015

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	702	35	42	99.06	11	0	2	0
H2S (ppb) Average	571	27	173	80.38	3	0	1	0
THC (ppm) Average	703	34	41	99.06	4	-	2.8	-
Temperature (C) Average	718	0	26	96.51	6.7	-	4.5	-
Relative Humidity (%) Average	565	0	179	75.94	100	-	-	-
Wind Speed 10 m (km/h) Average	711	0	33	95.56	32	-	-	-
Wind Direction 10 m (deg) Average	711	0	33	95.56	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
JANUARY 2015

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	702	0.5	1	-	0	0	0	0	0	1	11
H2S (ppb) Average	571	0.2	0	-	0	0	0	0	0	1	3
THC (ppm) Average	703	2.35	0.3	-	2.1	2.1	2.2	2.3	2.4	2.7	4
Temperature 2 m (C) Average	718	-14.15	9.9	-	-32.7	-26.2	-21.4	-15.7	-8	1.7	6.7
Relative Humidity (%) Average	565	80.9	9	-	53	70	75	80	88	93	100
Wind Speed 10 m (km/h) Average	711	10.9	6	-	1	4	7	10	14	19	32
Wind Direction 10 m (deg) Average	711	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	07 Jan 2015 10:00	07 Jan 2015 16:00	7	Maintenance - station upgrade to digital polling
H2S	06 Jan 2015 10:00	06 Jan 2015 14:00	5	Maintenance - SOX scrubber test
H2S	06 Jan 2015 15:00	12 Jan 2015 11:00	141	Invalid data due to calibration error
THC	07 Jan 2015 10:00	07 Jan 2015 16:00	7	Maintenance - station upgrade to digital polling
ET	07 Jan 2015 10:00	08 Jan 2015 11:00	26	Maintenance - station upgrade to digital polling
Relative Humidity	01 Jan 2015 01:00	08 Jan 2015 11:00	179	Sensor not in service
Wind Speed, Wind Direction	07 Jan 2015 10:00	08 Jan 2015 10:00	25	Maintenance - station upgrade to digital polling
Wind Speed, Wind Direction	24 Jan 2015 03:00	24 Jan 2015 10:00	8	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 ppb on Jan 20 15:00 Maximum Daily Average: 1.9 ppb on Jan 20

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 22
Maximum Diurnal Average: 0.9 ppb at hour 15 Minimum Diurnal Average: 0.2 ppb at hour 9
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	35
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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	2	1	0.3	2
2-Jan	1	Z	2	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	1	1	0	0	0	0	0.6	2
3-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0.5	1
4-Jan	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
5-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0.1	0
6-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
7-Jan	0	Z	0	0	0	0	0	0	0	M	M	M	M	M	M	M	1	3	5	1	6	3	0	3	--	6
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	3	2	1	1	1	2	6	2	1.0	6
10-Jan	1	1	1	0	Z	0	0	0	0	0	1	1	2	3	2	1	1	1	1	1	1	1	1	0	0.8	3
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Jan	Z	0	1	2	6	5	3	1	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0	0	1.2	6
13-Jan	0	Z	0	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0.5	2
14-Jan	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
15-Jan	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
16-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	2	1	1	0.3	3
18-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Jan	0	Z	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
20-Jan	0	0	Z	1	0	0	0	0	0	0	0	0	0	4	11	5	3	4	5	4	3	2	2	1	1.9	11
21-Jan	1	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Jan	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
23-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0.3	1
24-Jan	Z	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	3
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Jan	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
28-Jan	0	0	0	0	Z	2	0	0	0	0	0	0	1	5	5	4	3	1	0	1	1	2	3	3	1.4	5
29-Jan	1	0	0	0	0	Z	0	0	1	1	1	1	1	1	0	0	1	1	1	1	2	1	4	4	1.0	4
30-Jan	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0.4	2
	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.7	0.9	0.6	0.6	0.6	0.6	0.5	0.7	0.6	0.7	0.6	Diurnal Average	
	1	1	2	2	6	5	3	3	1	1	1	2	2	5	11	5	3	4	5	4	6	3	6	4	Diurnal Maximum	

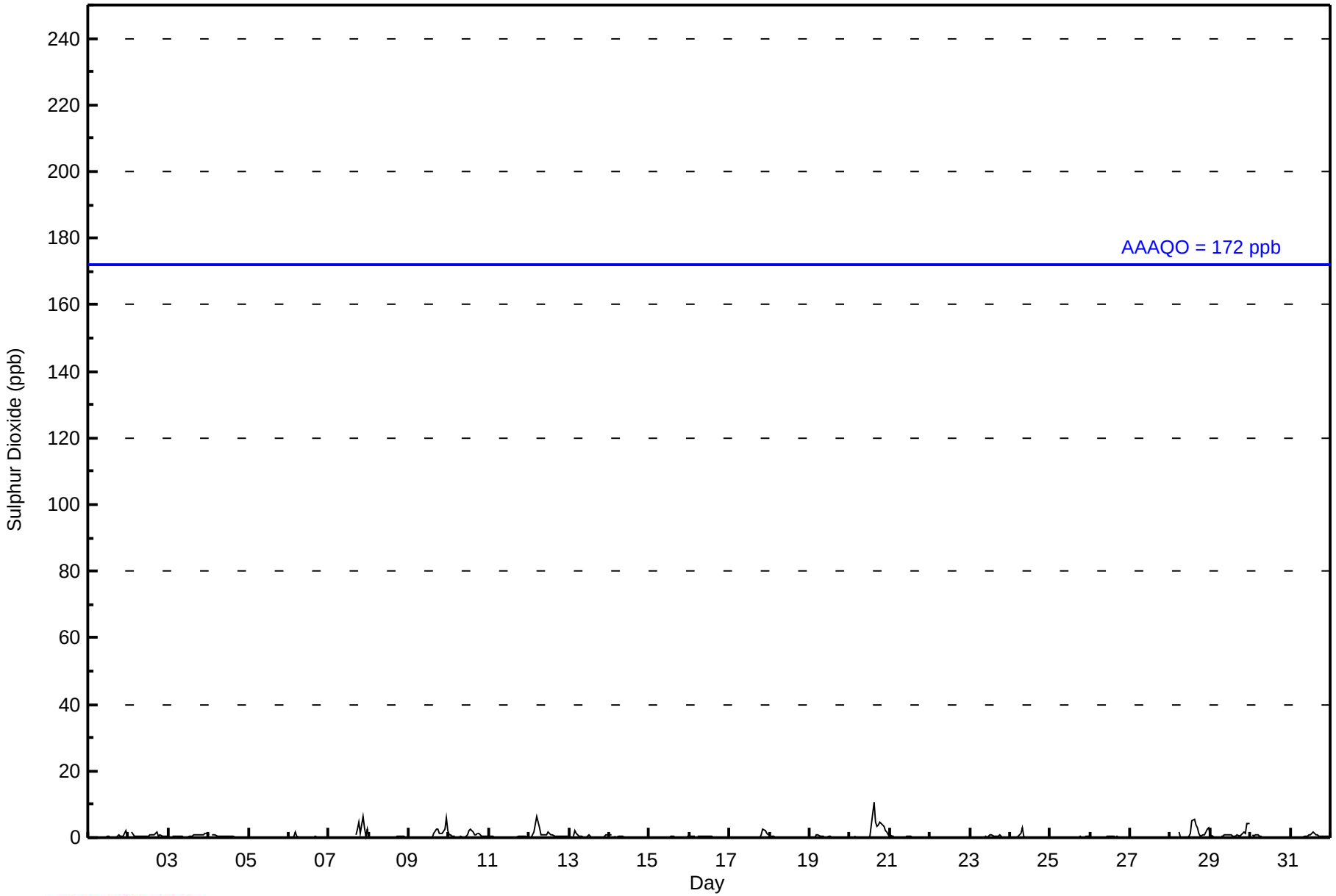
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	701	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: 702

Total Number of Hours: 744

Sulphur Dioxide (SO_2) - ppb
Buffalo Viewpoint - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	114	76	16	7	3	6	74	143	22	14	19	74	39	22	23	24	676
11 - 20	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	114	76	16	7	3	6	75	143	22	14	19	74	39	22	23	24	677

Total Number of Valid Hours: 677

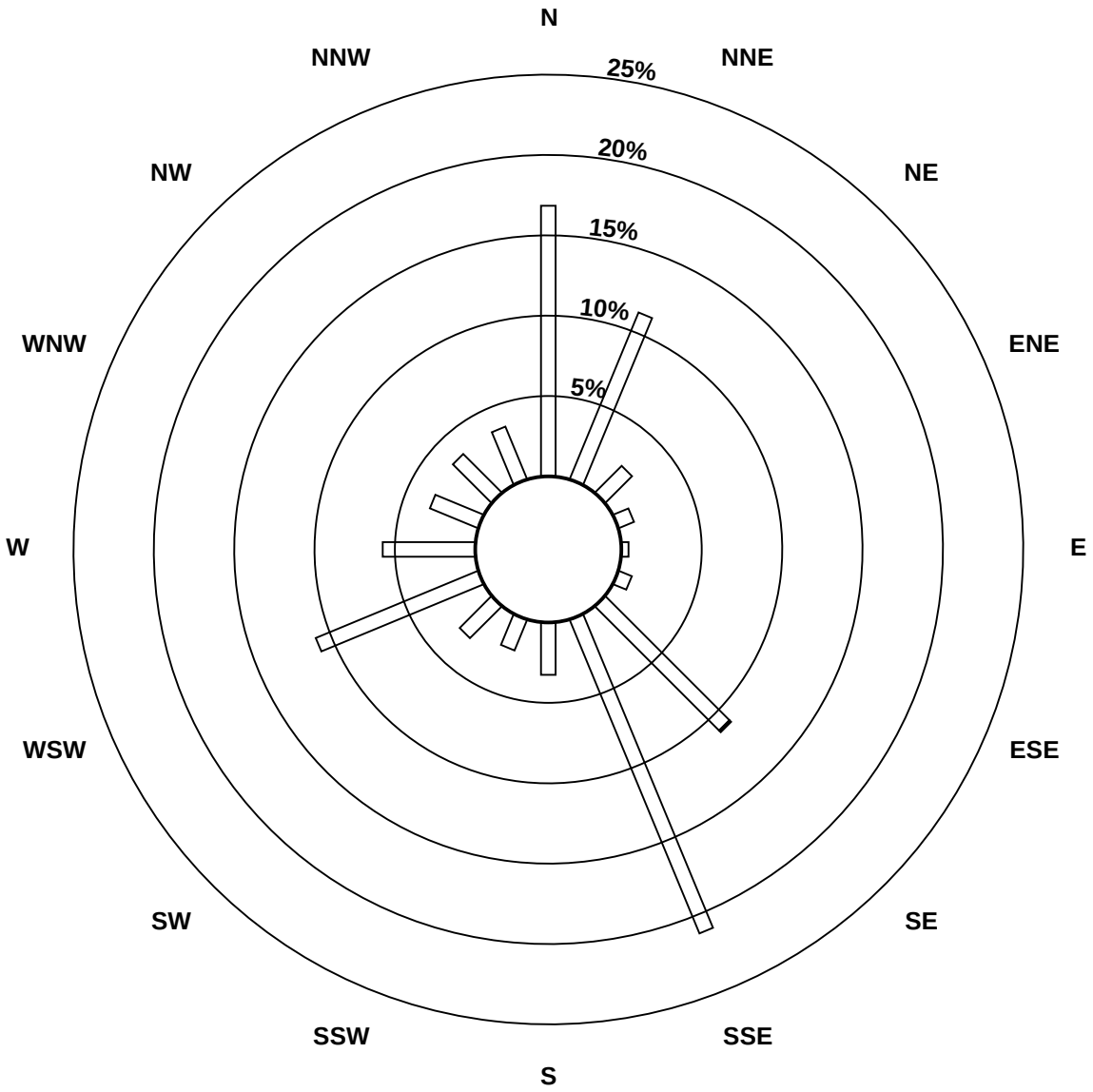
Total Number of Hours: 744

Wood Buffalo Environmental Association

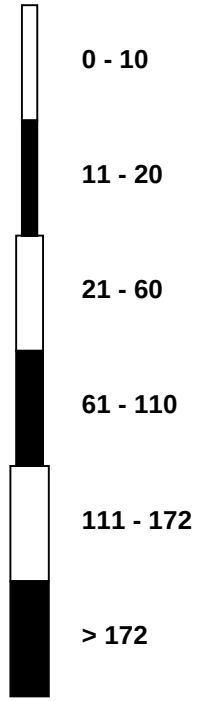
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint (AMS 4)



Classes (ppb)



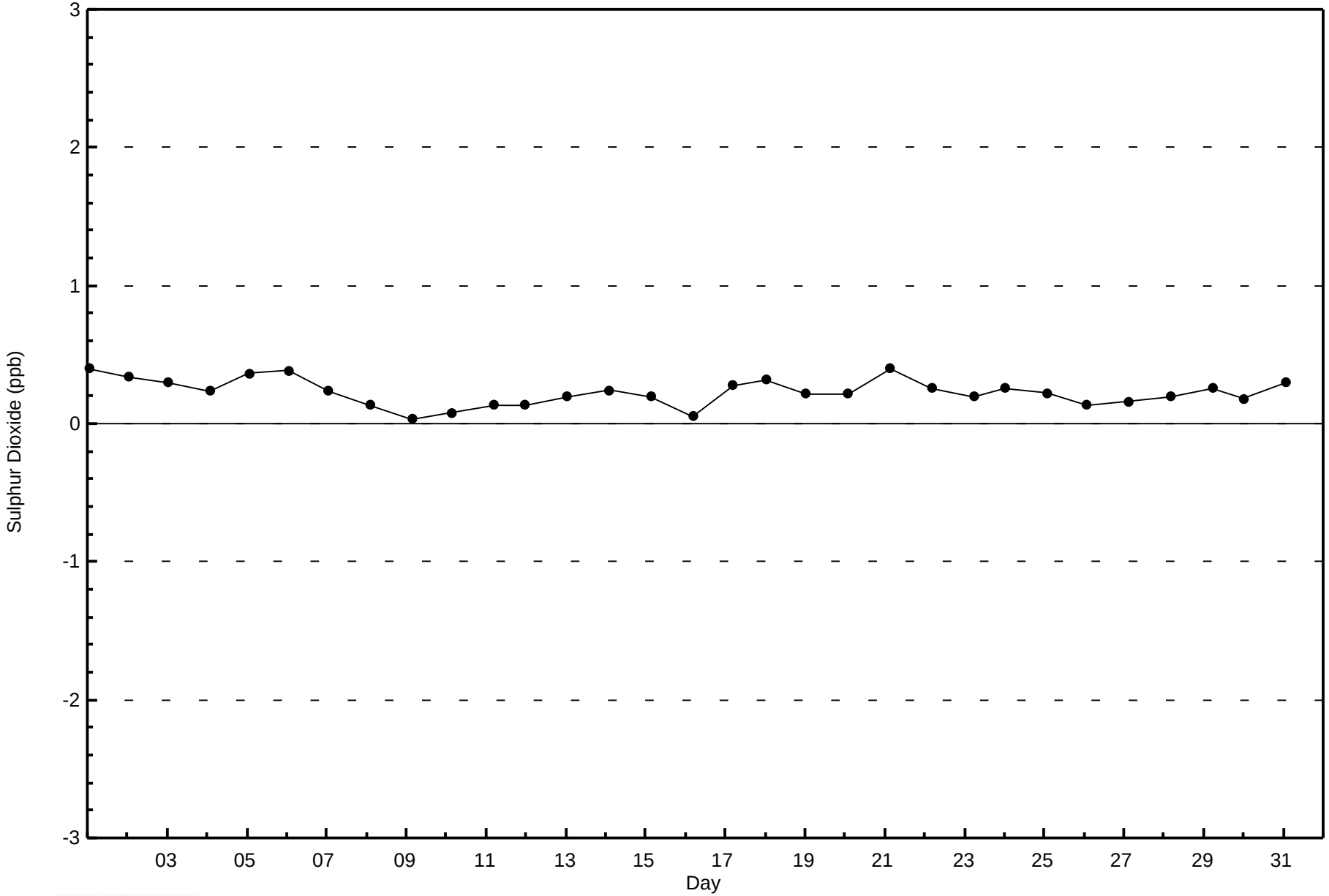
Total Number of Valid Hours: 677

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2015



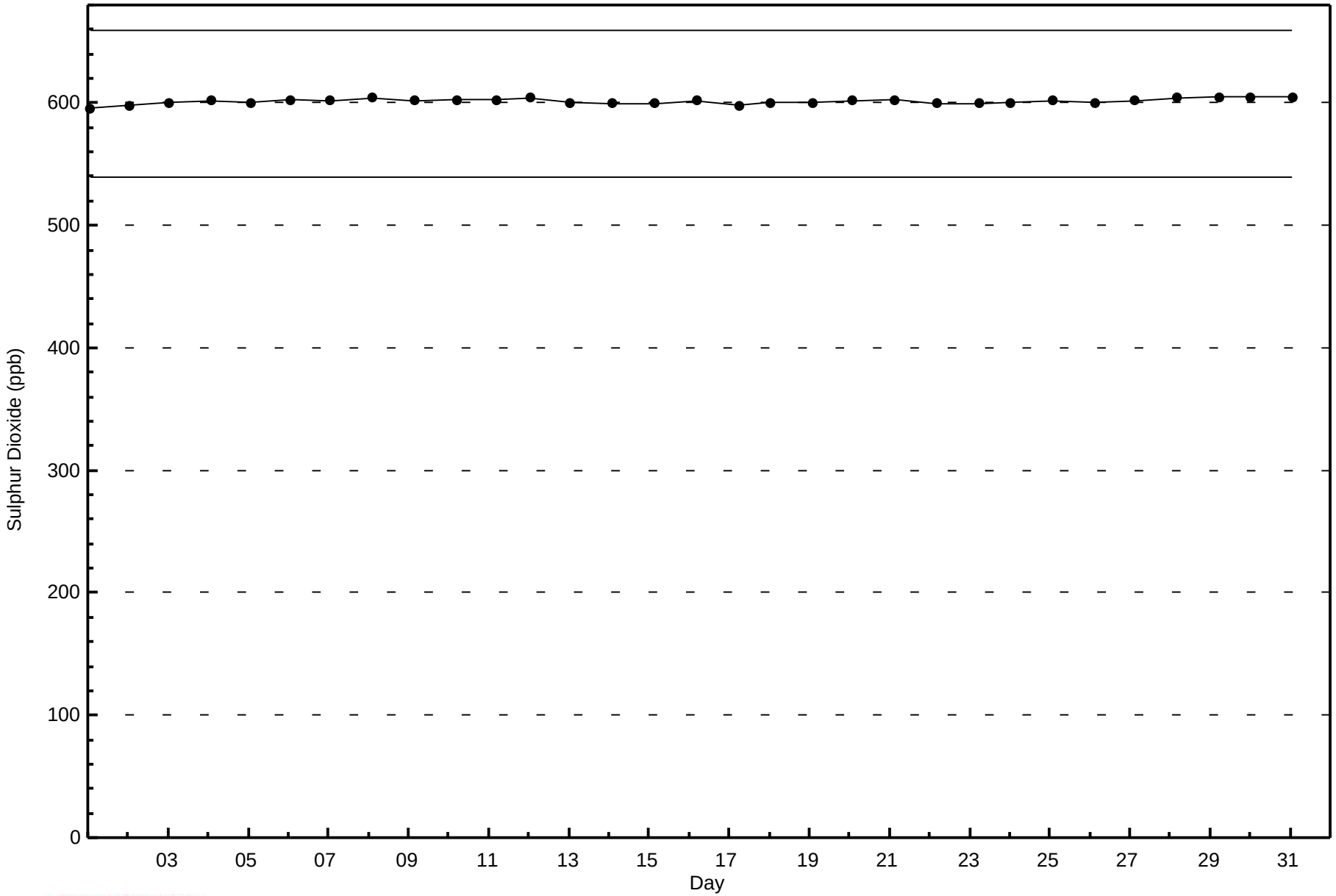
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 2 15:00 Maximum Daily Average: 0.7 ppb on Jan 19

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 22
Maximum Diurnal Average: 0.3 ppb at hour 14 Minimum Diurnal Average: 0.2 ppb at hour 1
Monthly Average: 0.2 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	571
Hours of Missing Data:	173
Hours of Calibration:	27
Percent Operational Time:	80.4

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-Jan	0	0	Z	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	1	2	1	0	0	0	0.4	2
2-Jan	0	1	Z	0	0	0	0	0	0	0	0	0	1	2	3	1	1	1	1	1	1	1	1	0	0.6	3
3-Jan	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
4-Jan	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
5-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Jan	0	0	Z	0	0	0	0	0	0	M	M	M	M	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0
7-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
8-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
9-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	0	0	0	0	0	0	0	0	0	0	0	--	0
13-Jan	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Jan	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
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.1	1
18-Jan	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
19-Jan	0	0	Z	0	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.7	2
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0.4	1
21-Jan	0	0	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Jan	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
23-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	2	1	1	1	1	1	0.5	2
24-Jan	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
25-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Jan	0	0	0	0	1	Z	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	1	0.5	1
29-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0.4	1
30-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	Diurnal Average	
	1	1	1	1	2	2	2	1	1	1	1	2	1	2	3	1	1	1	2	2	1	1	1	1	Diurnal Maximum	

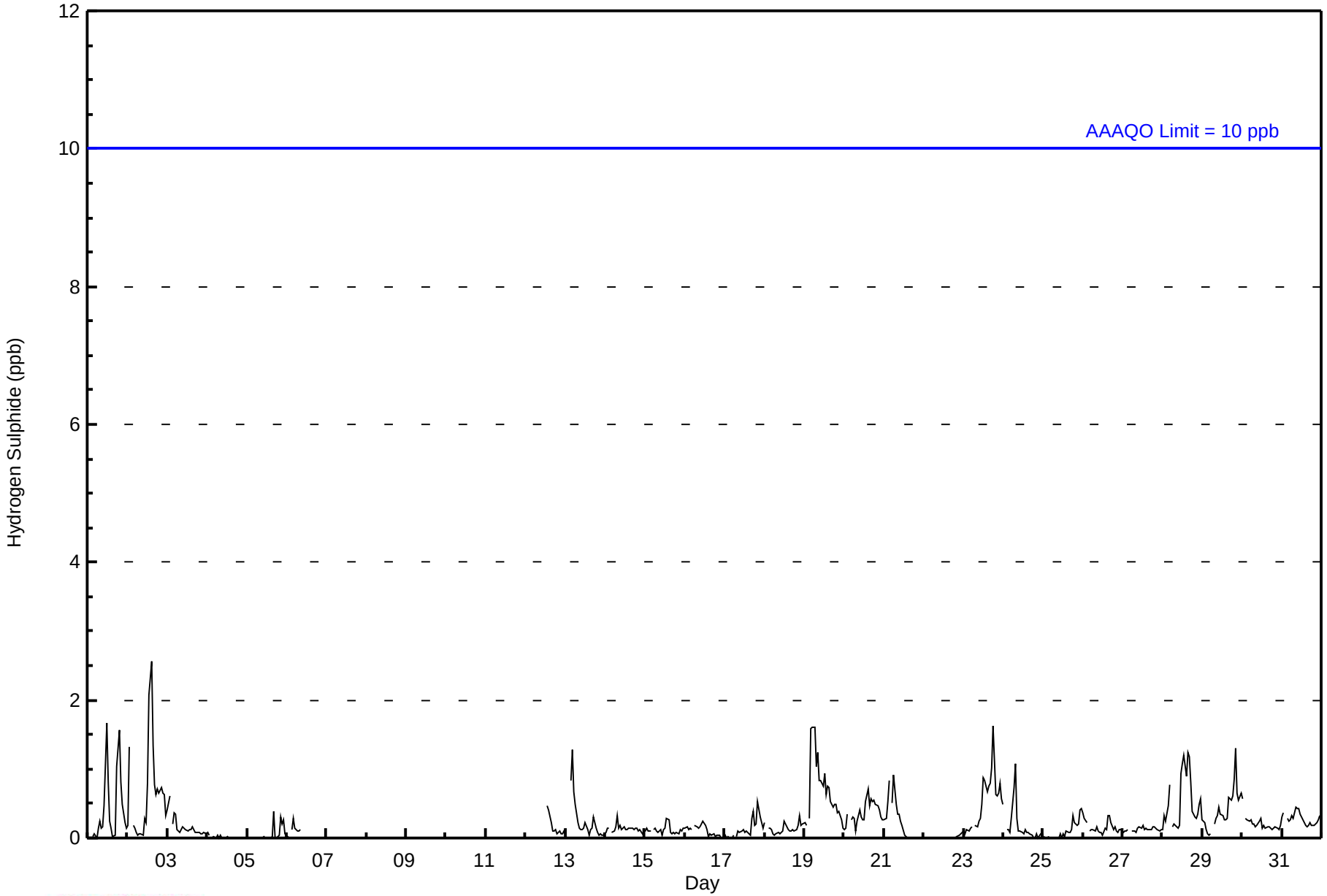
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	570	99.82	99.82
3 - 4	1	0.18	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: 571

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	108	74	13	5	3	4	51	95	16	8	17	65	41	19	21	22	562
3 - 4	1	0	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	109	74	13	5	3	4	51	95	16	8	17	65	41	19	21	22	563

Total Number of Valid Hours: 563

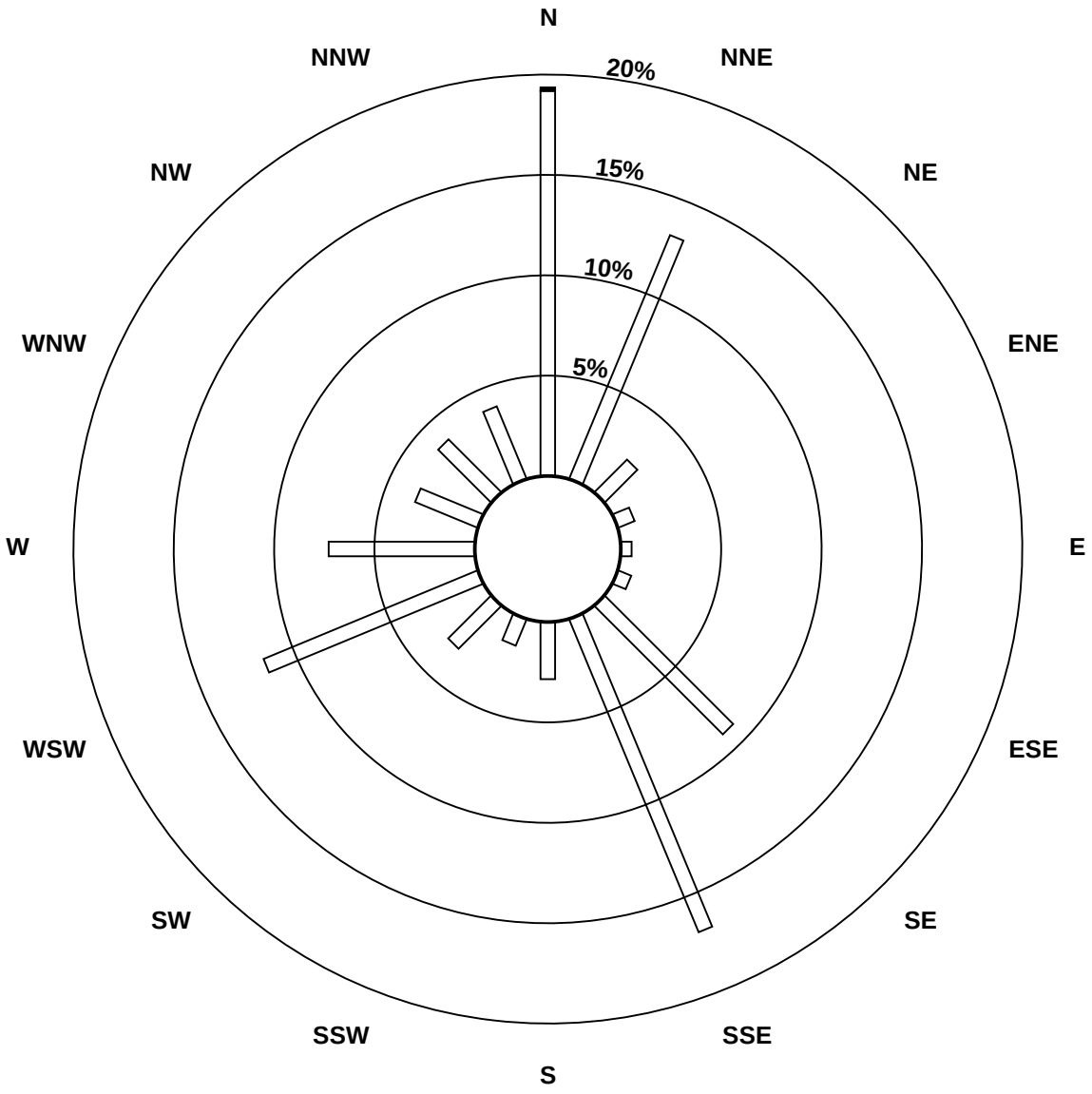
Total Number of Hours: 744

Wood Buffalo Environmental Association

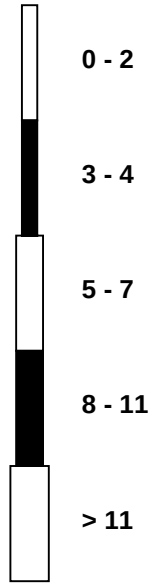
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint (AMS 4)



Classes (ppb)



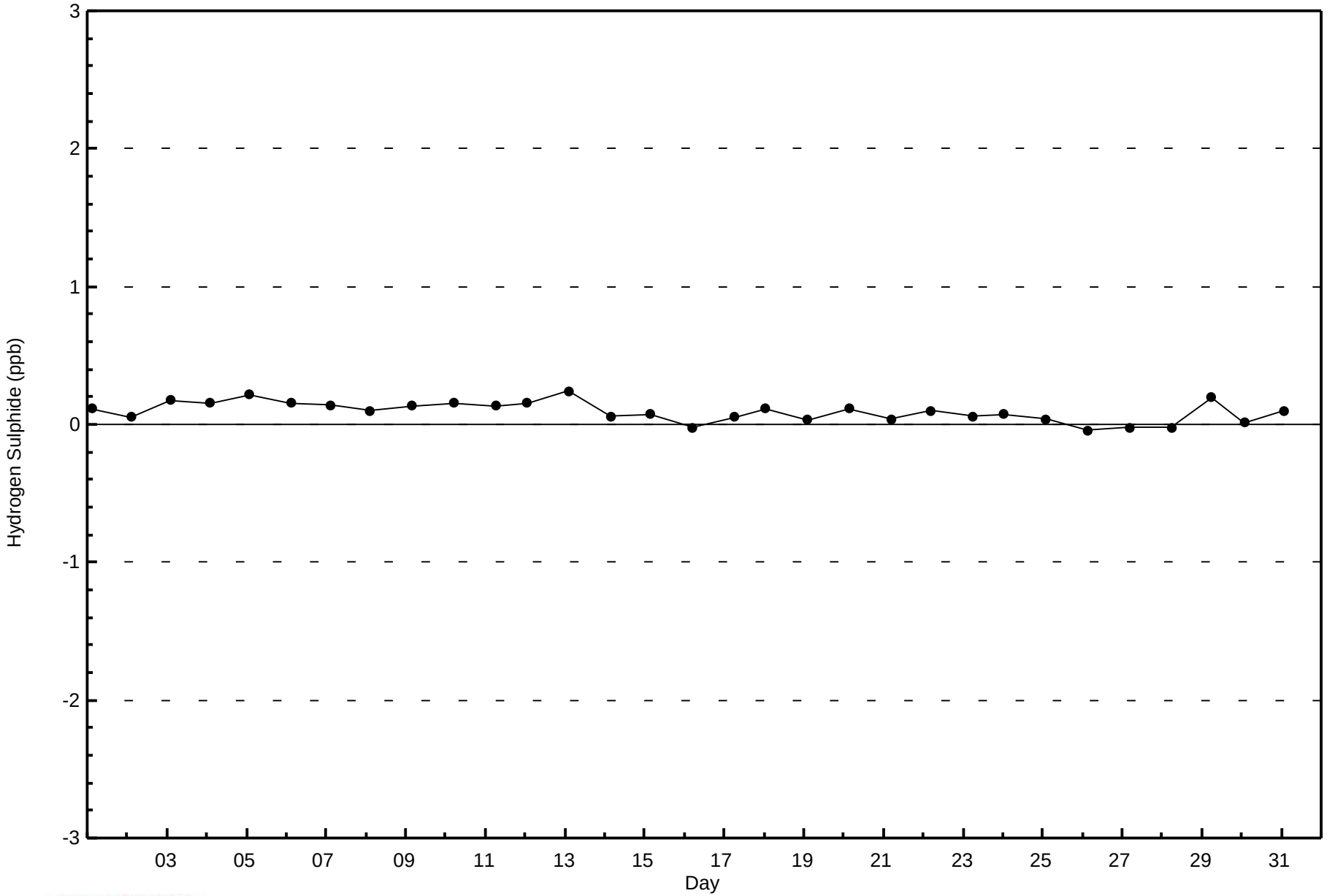
Total Number of Valid Hours: 563

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2015



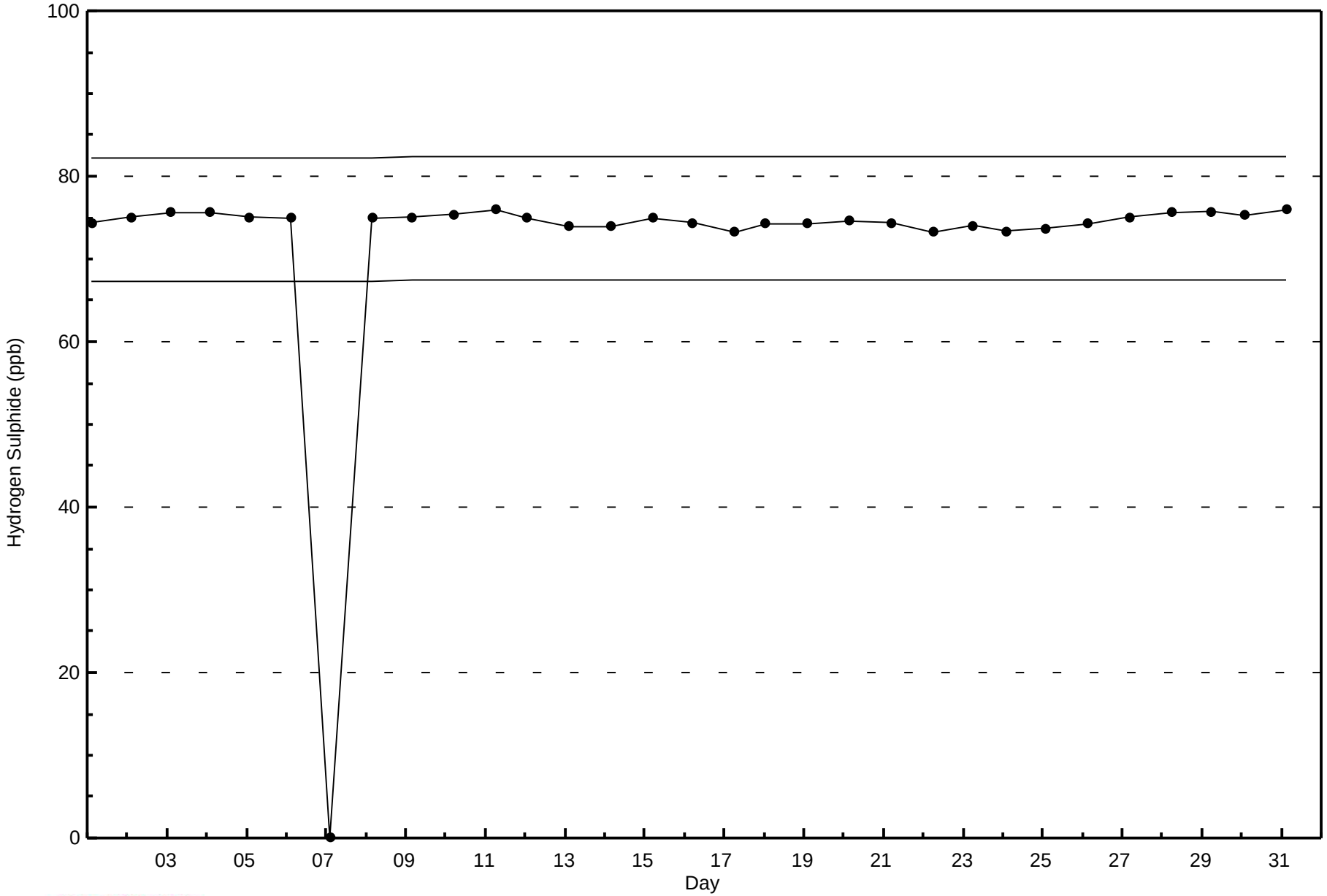
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2015

Maximum Value: 4.0 ppm on Jan 19 06:00

Maximum Daily Average: 2.8 ppm on Jan 19

Minimum Value: 2.1 ppm on Jan 25 07:00

Minimum Daily Average: 2.1 ppm on Jan 22

Maximum Diurnal Average: 2.4 ppm at hour 13

Minimum Diurnal Average: 2.3 ppm at hour 1

Monthly Average: 2.35 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.4 P_{90} = 2.7 P_{99} = 3.6

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)																								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-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.6	2.4	2.4	2.4	2.8	3.1	2.7	2.4	2.2	2.2	2.2	2.5	2.8	2.7	2.6	2.6	2.4	2.2	2.4	3.1
2-Jan	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.6	2.6	2.7	2.8	2.5	2.4	2.5	2.6	2.8	2.9	2.8	2.5	2.5	2.9
3-Jan	2.7	Z	2.5	2.4	2.6	2.9	2.3	2.4	2.3	2.4	2.4	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.4	2.9
4-Jan	2.3	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
5-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	C	C	C	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.4
6-Jan	2.2	Z	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
7-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	M	M	M	M	M	M	M	2.5	2.6	2.8	2.4	2.6	2.5	2.2	2.2	--	2.8
8-Jan	2.2	2.4	Z	2.3	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4
9-Jan	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	3.0	2.8	3.7	3.3	3.2	3.7	3.1	3.1	2.7	2.6	3.7
10-Jan	2.4	2.3	2.3	2.2	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.5	2.4	2.5
11-Jan	2.5	2.5	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.5
12-Jan	Z	2.4	2.4	2.4	3.4	3.1	3.1	2.8	2.6	2.5	2.6	2.9	2.8	2.7	2.6	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.6	3.4
13-Jan	2.5	Z	2.8	3.0	3.3	2.9	2.8	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.4	3.3
14-Jan	2.2	2.2	Z	2.3	2.2	2.2	2.4	2.7	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	2.7
15-Jan	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	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.1	2.2	2.3
16-Jan	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.3	3.0	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	3.0
17-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.9	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.6	2.4	2.3	2.3	2.3	2.9
18-Jan	Z	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	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
19-Jan	2.3	Z	2.4	2.6	4.0	4.0	3.7	3.0	3.0	2.8	2.6	2.7	2.8	2.7	2.8	2.8	2.7	2.5	2.5	2.5	2.5	2.5	2.3	2.2	2.8	4.0
20-Jan	2.2	2.2	Z	2.5	2.4	2.4	2.3	2.2	2.3	2.5	2.4	2.3	3.6	3.3	2.6	2.4	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.5	3.6
21-Jan	2.3	2.3	2.3	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3
22-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2
23-Jan	2.1	2.1	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.5	2.6	3.4	3.1	3.0	3.0	3.1	3.4	3.8	2.7	2.9	2.9	3.0	2.7	2.7	3.8
24-Jan	Z	2.4	2.2	2.2	2.2	2.5	3.3	3.4	2.7	2.3	2.3	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.2	2.3	3.4
25-Jan	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	2.2	2.2	2.2	2.7	2.3	2.2	2.2	2.3	2.6	2.2	2.7
26-Jan	2.6	2.4	Z	3.6	2.4	2.4	2.2	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.6
27-Jan	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
28-Jan	2.2	2.3	2.3	2.3	Z	2.4	2.2	2.3	2.2	2.2	2.4	2.7	3.1	3.0	2.8	3.1	2.8	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.5	3.1
29-Jan	2.3	2.4	2.3	2.2	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.4	2.6	2.9	2.5	2.5	2.5	2.4	2.9
30-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.5
31-Jan	2.3	Z	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	Diurnal Average	
	2.7	2.5	2.8	3.6	4.0	4.0	3.7	3.4	3.0	2.8	2.8	3.1	3.6	3.3	3.0	3.1	3.1	3.7	3.8	3.2	3.7	3.1	3.1	2.7	Diurnal Maximum	

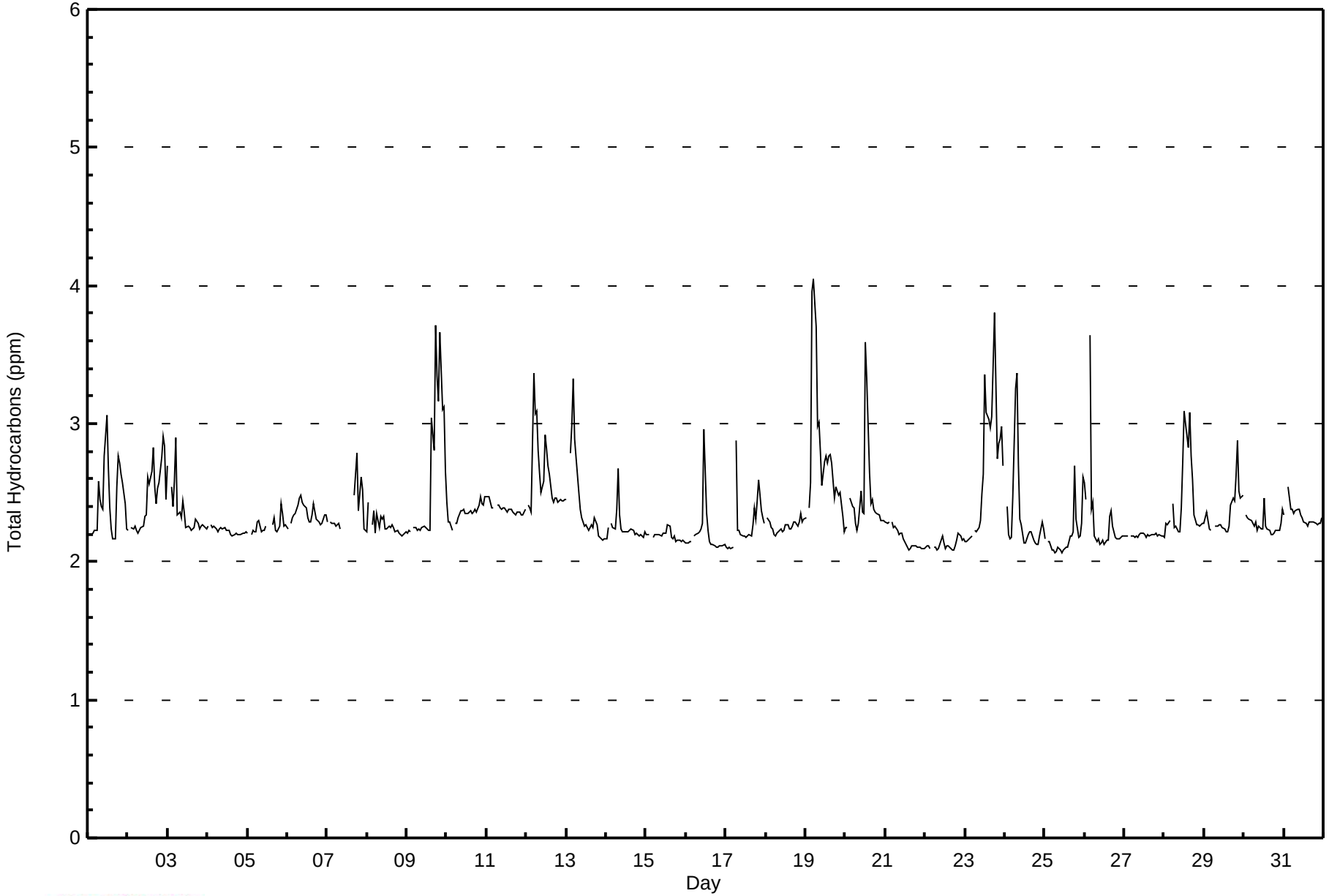
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	677	96.30	96.30
3.1 - 10.0	26	3.70	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2015

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	111	76	12	7	3	4	73	141	22	14	19	74	39	20	18	21	654
3.1 - 10.0	3	0	4	0	0	2	2	2	0	0	0	0	0	2	6	3	24
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	114	76	16	7	3	6	75	143	22	14	19	74	39	22	24	24	678

Total Number of Valid Hours: 678

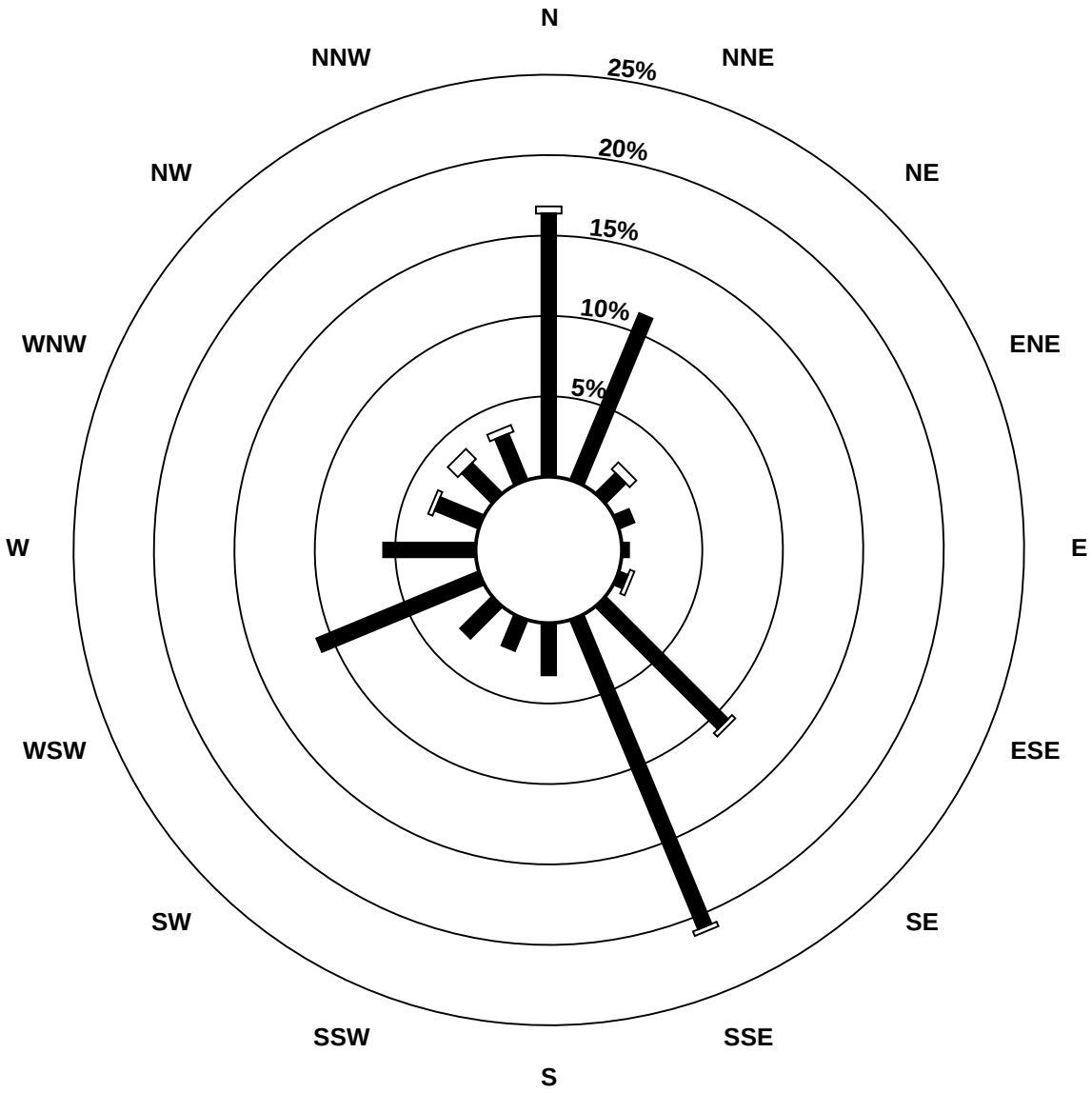
Total Number of Hours: 744

Wood Buffalo Environmental Association

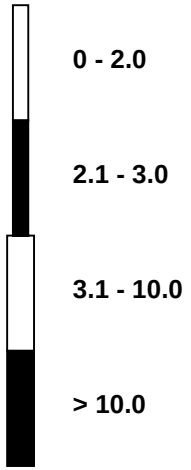
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint (AMS 4)



Classes (ppm)



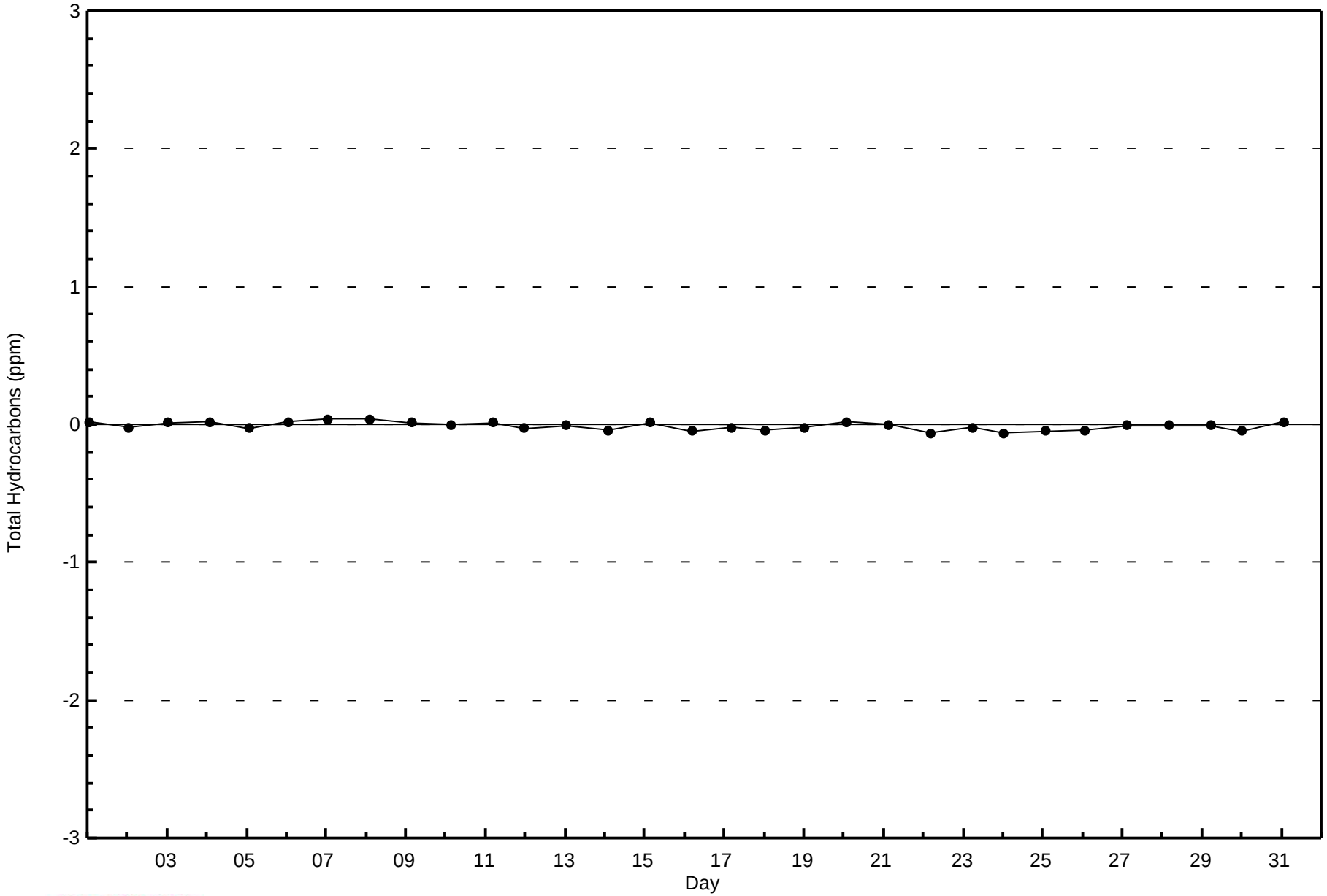
Total Number of Valid Hours: 678

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2015



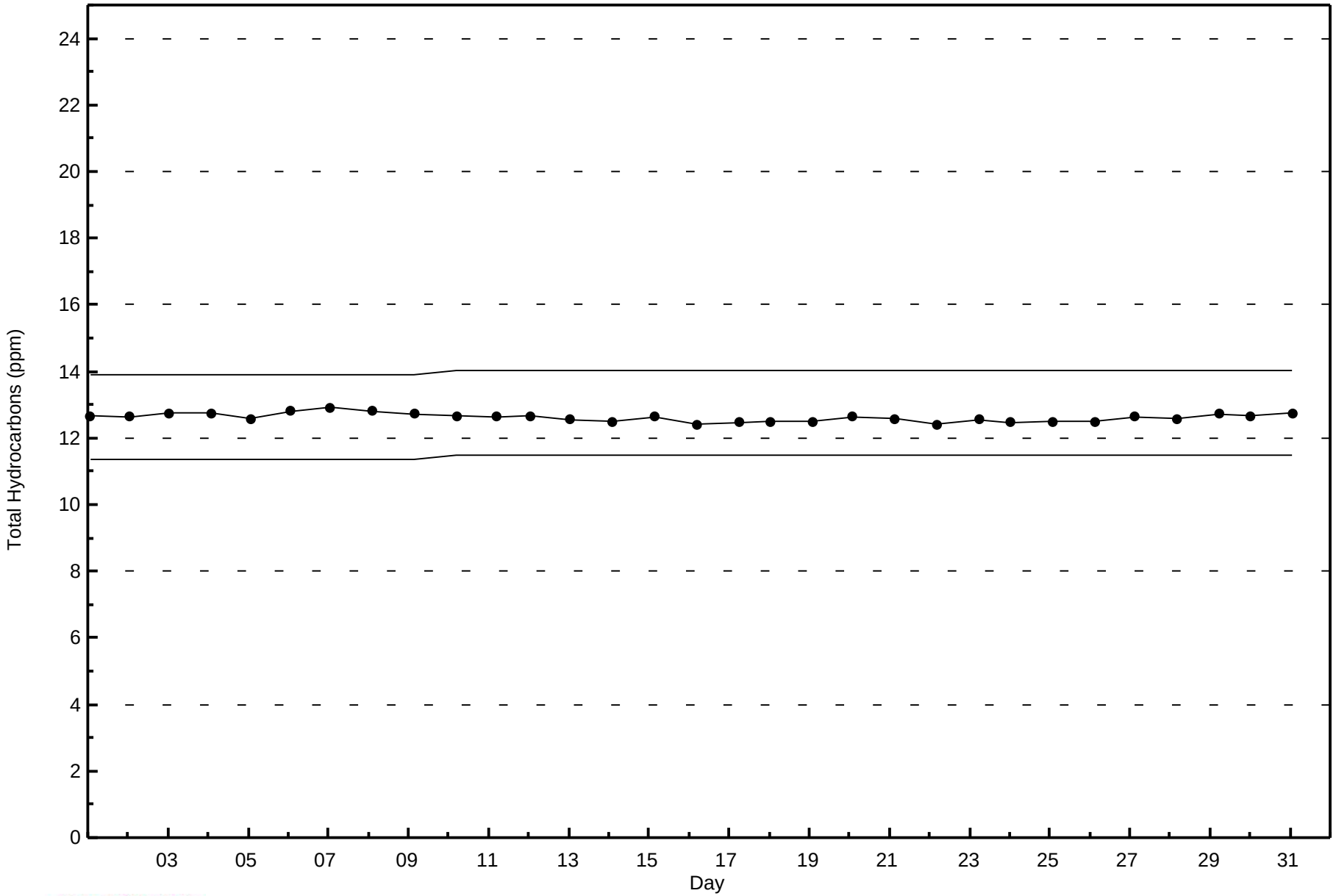
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 6.7 C on Jan 22 18:00

Maximum Daily Average: 4.5 C on Jan 22

Minimum Value: -32.7 C on Jan 31 08:00

Minimum Daily Average: -27.1 C on Jan 31

Maximum Diurnal Average: -11.6 C at hour 15

Minimum Diurnal Average: -15.9 C at hour 9

Monthly Average: -14.15 C

Percentiles: P_1 = -31.4 P_{10} = -26.2 Q_1 = -21.4 Median = -15.7 Q_3 = -8.0 P_{90} = 1.7 P_{99} = 6.3

Hours in Service:	744
Hours of Data:	718
Hours of Missing Data:	26
Hours of Calibration:	0
Percent Operational Time:	96.5

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-Jan	-13.3	-14.0	-14.6	-15.0	-15.3	-15.8	-16.0	-16.1	-16.2	-16.2	-15.9	-15.2	-14.7	-16.0	-17.4	-18.4	-19.9	-20.8	-20.9	-20.9	-21.0	-20.9	-19.3	-19.9	-17.2	-13.3
2-Jan	-21.2	-21.8	-22.3	-22.2	-22.0	-22.2	-22.4	-22.5	-23.0	-23.9	-23.9	-22.9	-21.8	-20.9	-21.7	-23.5	-25.0	-24.5	-26.6	-26.6	-27.9	-27.8	-26.7	-24.8	-23.7	-20.9
3-Jan	-24.8	-24.8	-25.5	-26.1	-26.3	-27.1	-26.8	-27.3	-27.8	-28.4	-28.4	-27.2	-25.7	-25.2	-25.0	-25.6	-25.8	-25.7	-25.7	-26.5	-26.4	-26.2	-26.2	-25.9	-26.3	-24.8
4-Jan	-26.3	-25.6	-25.5	-25.1	-25.3	-25.7	-25.6	-25.0	-24.3	-24.9	-25.5	-23.8	-20.4	-19.2	-17.8	-17.3	-17.5	-17.2	-17.1	-17.9	-18.3	-19.0	-19.5	-19.9	-21.8	-17.1
5-Jan	-20.1	-19.8	-19.0	-18.5	-17.8	-17.4	-16.8	-16.5	-15.9	-15.8	-15.7	-15.0	-14.8	-14.8	-14.9	-15.4	-15.6	-15.8	-15.8	-16.3	-17.3	-18.5	-19.4	-21.0	-17.0	-14.8
6-Jan	-22.3	-22.5	-22.2	-23.9	-24.6	-25.4	-27.7	-28.9	-29.8	-30.3	-27.9	-25.8	-21.4	-19.4	-18.9	-21.6	-23.4	-22.7	-23.4	-23.1	-24.4	-25.1	-27.1	-28.2	-24.6	-18.9
7-Jan	-27.3	-27.1	-27.5	-26.9	-26.4	-25.2	-24.8	-24.8	-23.9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	-23.9
8-Jan	M	M	M	M	M	M	M	M	M	M	M	-18.5	-17.7	-17.2	-17.1	-17.8	-18.8	-18.9	-19.4	-19.8	-19.9	-20.1	-20.8	-21.4	--	-17.1
9-Jan	-22.3	-22.4	-24.0	-25.7	-26.8	-27.5	-27.6	-27.6	-28.1	-27.7	-25.5	-23.1	-20.9	-19.4	-18.5	-19.2	-22.2	-22.2	-22.5	-23.1	-23.3	-22.3	-21.1	-20.0	-23.4	-18.5
10-Jan	-20.8	-22.3	-22.9	-22.8	-23.1	-25.2	-28.2	-29.9	-30.8	-30.5	-27.7	-25.8	-23.6	-23.0	-22.8	-22.8	-23.7	-24.0	-24.4	-27.3	-28.3	-27.1	-27.8	-30.1	-25.6	-20.8
11-Jan	-30.0	-30.5	-31.2	-29.3	-30.5	-30.5	-31.4	-32.4	-31.4	-30.5	-28.2	-25.3	-22.8	-21.3	-20.2	-19.3	-19.4	-20.3	-20.7	-20.6	-20.0	-19.4	-19.2	-19.7	-25.2	-19.2
12-Jan	-20.9	-21.6	-20.5	-20.0	-20.6	-20.7	-19.1	-19.2	-18.9	-17.4	-16.2	-15.0	-14.5	-13.5	-13.1	-13.6	-14.6	-14.1	-13.0	-11.7	-10.9	-10.4	-9.9	-9.7	-15.8	-9.7
13-Jan	-9.3	-6.2	-6.0	-7.6	-8.6	-9.4	-10.0	-10.2	-10.3	-10.4	-10.4	-10.4	-10.7	-10.6	-10.6	-10.8	-11.0	-10.4	-9.7	-9.3	-8.9	-8.5	-8.2	-8.1	-9.4	-6.0
14-Jan	-8.0	-7.7	-8.3	-8.8	-3.9	-2.5	-2.9	-6.6	-7.6	-7.9	-7.8	-8.1	-8.3	-8.2	-8.9	-9.5	-10.7	-12.4	-13.7	-14.4	-14.7	-15.0	-15.7	-16.4	-9.5	-2.5
15-Jan	-17.0	-17.5	-17.6	-17.6	-17.5	-17.6	-17.9	-18.0	-18.0	-18.0	-17.8	-17.5	-17.1	-17.1	-16.2	-15.2	-14.9	-14.7	-14.5	-14.2	-13.7	-13.3	-12.8	-12.2	-16.2	-12.2
16-Jan	-11.7	-11.2	-10.8	-10.3	-9.5	-8.9	-8.2	-7.9	-7.4	-7.0	-6.6	-6.3	-4.0	-0.6	1.1	1.9	2.1	2.3	2.2	1.8	1.6	1.7	1.7	1.9	-3.8	2.3
17-Jan	0.9	0.9	0.9	1.2	0.7	-0.1	-2.6	-6.9	-10.1	-10.1	-9.4	-8.8	-8.3	-8.2	-8.5	-8.6	-9.0	-9.4	-9.5	-9.6	-9.4	-9.2	-9.4	-10.2	-6.4	1.2
18-Jan	-10.5	-11.5	-11.2	-11.4	-11.4	-10.9	-10.3	-10.9	-11.5	-11.3	-9.4	-7.1	-6.3	-4.8	-3.5	-3.2	-4.3	-5.5	-6.9	-6.0	-7.1	-7.6	-7.1	-8.7	-8.3	-3.2
19-Jan	-9.4	-9.7	-10.2	-9.5	-10.0	-10.2	-10.2	-10.5	-10.8	-11.0	-11.8	-11.8	-11.9	-12.0	-12.0	-12.2	-12.3	-12.2	-12.4	-12.9	-13.2	-13.5	-13.5	-13.8	-11.5	-9.4
20-Jan	-14.0	-13.8	-13.6	-13.5	-13.5	-13.6	-13.4	-13.4	-13.3	-12.9	-12.7	-11.3	-10.5	-10.8	-10.7	-10.9	-12.1	-12.1	-11.5	-11.1	-10.8	-10.6	-10.4	-9.7	-12.1	-9.7
21-Jan	-9.1	-9.0	-9.8	-10.7	-10.9	-8.5	-9.0	-8.7	-7.7	-6.3	-4.5	-2.5	0.7	2.5	3.1	3.3	3.4	3.4	3.6	3.7	3.7	3.9	4.1	4.2	-2.4	4.2
22-Jan	4.0	3.7	4.1	4.6	4.9	5.5	5.5	6.0	5.8	4.7	3.6	3.9	5.2	6.0	6.3	6.6	6.6	6.7	6.5	6.2	5.6	0.0	-1.6	-2.2	4.5	6.7
23-Jan	-2.6	-3.1	-3.5	-3.9	-4.5	-4.7	-4.7	-4.6	-4.6	-4.5	-4.1	-3.8	-3.7	-3.6	-3.6	-3.5	-3.8	-4.1	-4.3	-4.9	-5.6	-6.2	-6.2	-5.6	-4.3	-2.6
24-Jan	-4.8	-2.7	-0.7	-0.3	-0.1	-0.1	-0.1	-0.1	0.3	0.9	1.5	2.3	3.4	4.3	5.1	5.0	4.0	3.8	3.7	4.0	3.7	2.6	1.5	0.1	1.5	5.1
25-Jan	-0.6	-0.5	0.0	1.8	2.4	1.7	1.8	1.5	3.1	5.0	5.8	6.1	6.1	6.2	6.4	6.4	6.1	5.5	4.0	1.8	0.3	-0.7	-1.4	-1.8	2.8	6.4
26-Jan	-1.9	-2.2	-0.9	-1.7	-2.4	-2.1	-2.3	-2.8	-1.2	0.6	1.4	2.5	4.0	4.1	4.5	4.6	1.3	-5.2	-6.6	-8.0	-8.9	-10.2	-12.0	-13.4	-2.4	4.6
27-Jan	-14.8	-15.6	-16.3	-16.8	-17.4	-18.3	-19.2	-19.6	-19.8	-19.7	-19.3	-19.1	-18.7	-18.3	-18.2	-18.5	-18.5	-18.9	-19.2	-19.5	-19.5	-19.4	-19.4	-19.4	-18.5	-14.8
28-Jan	-19.5	-19.8	-20.0	-20.0	-20.1	-19.8	-20.4	-21.5	-22.2	-21.6	-21.2	-20.3	-20.1	-19.5	-18.9	-19.1	-19.8	-21.6	-20.9	-20.4	-20.5	-20.8	-21.0	-21.2	-20.4	-18.9
29-Jan	-21.2	-20.9	-20.9	-20.8	-20.9	-20.7	-20.7	-20.7	-20.4	-19.8	-18.7	-17.5	-16.5	-15.6	-14.7	-14.6	-14.3	-14.7	-14.9	-15.2	-15.1	-14.9	-15.0	-15.8	-17.7	-14.3
30-Jan	-17.4	-18.1	-18.5	-19.1	-19.7	-19.6	-19.5	-19.5	-20.4	-20.3	-20.3	-20.0	-19.4	-20.7	-20.6	-21.1	-22.7	-23.5	-24.6	-25.2	-26.4	-27.2	-27.7	-27.8	-21.6	-17.4
31-Jan	-28.1	-28.1	-29.0	-30.7	-31.9	-32.4	-32.6	-32.7	-32.1	-31.2	-28.8	-26.5	-24.0	-22.0	-21.2	-21.4	-22.0	-23.1	-24.1	-24.8	-25.3	-25.5	-26.0	-26.7	-27.1	-21.2
	-14.8	-14.9	-14.9	-15.0	-15.1	-15.2	-15.4	-15.9	-15.9	-15.4	-14.7	-13.8	-12.6	-12.0	-11.6	-11.8	-12.6	-13.1	-13.4	-13.7	-14.1	-14.4	-14.6	-14.9	Diurnal Average	
	4.0	3.7	4.1	4.6	4.9	5.5	5.5	6.0	5.8	5.0	5.8	6.1	6.1	6.2	6.4	6.6	6.6	6.7	6.5	6.2	5.6	3.9	4.1	4.2	Diurnal Maximum	

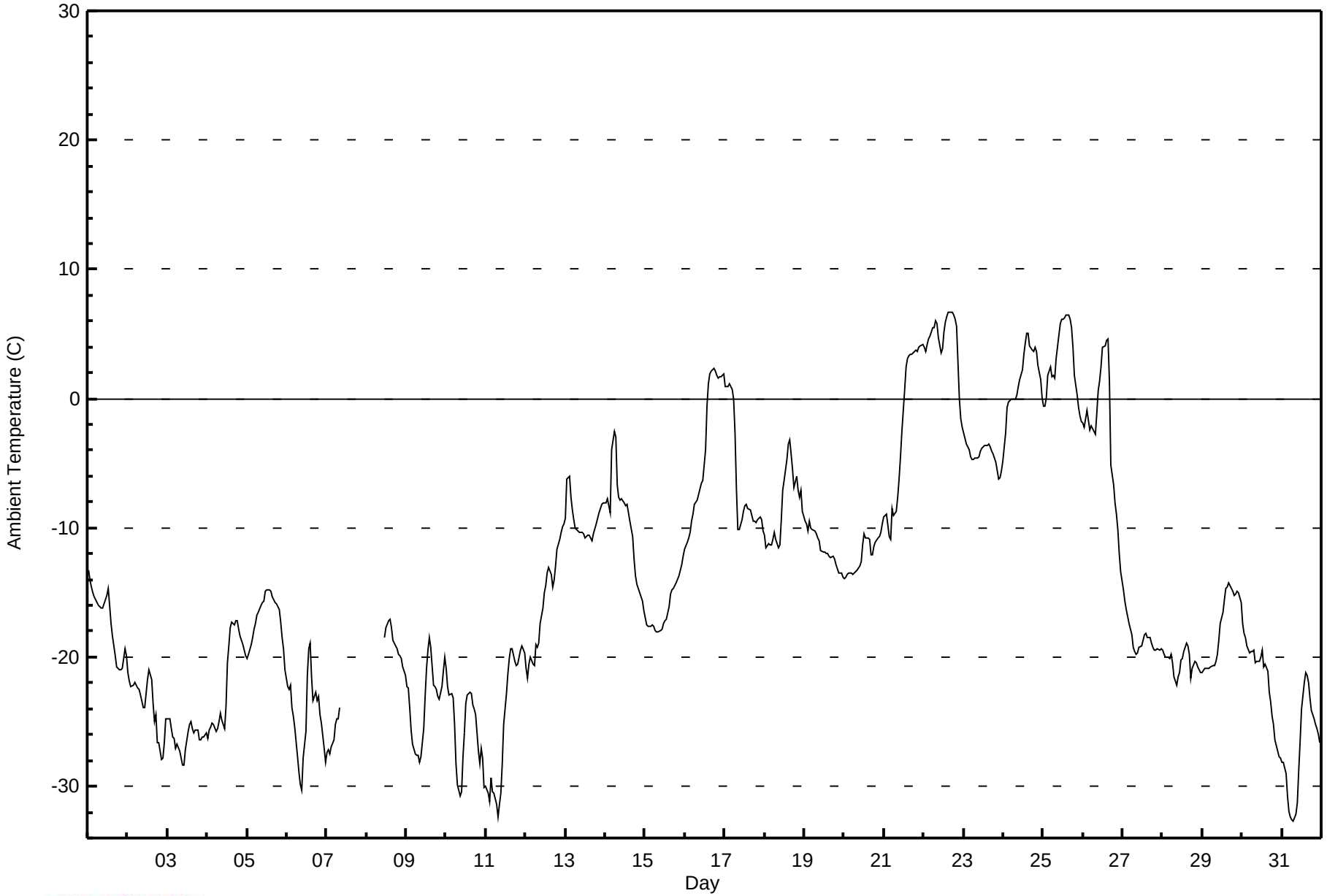
M - Maintenance

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	233	32.45	32.45
-20 - 0	394	54.87	87.33
0 - 10	91	12.67	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Buffalo Viewpoint - January 2015

Maximum Value: 100 % on Jan 24 09:00

Maximum Daily Average: 95.4 % on Jan 23

Minimum Value: 53 % on Jan 8 15:00

Minimum Daily Average: 70.5 % on Jan 9

Maximum Diurnal Average: 83.9 % at hour 8

Minimum Diurnal Average: 75.1 % at hour 14

Monthly Average: 80.9 %

Percentiles: $P_1 = 59$ $P_{10} = 70$ $Q_1 = 75$ Median = 80 $Q_3 = 88$ $P_{90} = 93$ $P_{99} = 99$

Hours in Service:	744
Hours of Data:	565
Hours of Missing Data:	179
Hours of Calibration:	0
Percent Operational Time:	75.9

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-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
2-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
3-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
4-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
5-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
6-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
7-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
8-Jan	M	M	M	M	M	M	M	M	M	M	M	58	55	54	53	54	61	60	63	64	62	62	65	68	--	68
9-Jan	69	67	70	73	75	74	74	74	73	72	70	67	63	61	60	60	73	75	75	75	74	73	73	75	70.5	75
10-Jan	76	77	77	77	77	75	73	73	73	72	71	70	68	67	67	69	74	75	76	75	75	76	75	73	73.4	77
11-Jan	73	73	72	74	72	72	72	71	72	71	70	71	70	67	66	69	72	73	74	75	75	75	77	79	72.3	79
12-Jan	81	81	82	82	81	81	82	80	81	83	83	83	82	80	79	81	85	84	85	85	84	85	85	85	82.6	85
13-Jan	86	84	86	87	88	88	89	89	89	87	85	83	81	78	80	84	88	89	89	90	90	90	89	88	86.5	90
14-Jan	89	86	87	91	88	85	86	90	89	88	86	85	85	83	83	84	83	82	81	80	81	82	81	80	84.8	91
15-Jan	80	80	80	79	77	77	77	77	75	75	77	78	79	81	82	80	78	78	80	82	81	82	83	83	79.2	83
16-Jan	84	85	85	86	86	86	86	87	87	87	87	86	86	83	81	77	77	75	72	71	68	65	66	66	80.0	87
17-Jan	70	70	72	71	72	75	81	86	89	85	80	77	80	82	86	89	88	90	92	95	95	93	92	91	83.4	95
18-Jan	91	89	89	89	89	90	90	90	89	88	88	88	85	78	78	79	85	89	93	93	94	94	94	94	88.5	94
19-Jan	94	93	93	94	92	93	92	91	90	90	89	88	88	88	88	88	89	89	89	88	88	88	87	87	89.8	94
20-Jan	87	87	87	87	87	87	87	87	87	87	86	84	80	78	79	79	84	86	86	85	85	86	87	88	85.2	88
21-Jan	89	90	90	91	92	92	91	90	89	87	83	79	69	66	71	73	74	75	74	74	74	73	73	73	80.5	92
22-Jan	74	76	74	73	73	70	70	68	70	81	90	87	80	75	72	69	69	67	67	67	68	93	98	97	76.1	98
23-Jan	94	93	88	89	94	97	98	98	98	97	96	95	95	96	97	98	98	97	97	96	95	95	95	95	95.4	98
24-Jan	96	97	99	99	100	100	100	100	100	99	97	91	86	84	82	77	79	78	74	65	62	66	72	81	86.8	100
25-Jan	86	89	86	81	92	96	97	97	90	82	76	75	75	76	75	74	74	75	82	92	95	97	98	99	85.8	99
26-Jan	99	98	92	93	94	93	94	94	87	80	77	72	65	65	64	63	74	93	95	93	92	89	87	86	84.9	99
27-Jan	83	81	80	78	78	77	77	79	79	77	76	74	73	72	72	74	75	78	79	80	80	80	81	81	77.7	83
28-Jan	81	81	81	81	80	80	81	80	79	75	76	75	75	73	75	76	76	80	80	79	78	77	76	76	77.8	81
29-Jan	78	79	79	78	78	78	79	79	79	79	79	79	80	80	80	83	85	85	85	85	85	85	85	84	81.0	85
30-Jan	83	81	80	80	80	80	79	79	78	75	76	75	68	72	73	72	74	74	75	74	75	75	76	76	76.3	83
31-Jan	76	76	75	74	73	73	73	73	73	73	73	73	68	65	67	69	71	76	78	78	77	78	78	78	73.7	78
	83.5	83.2	82.9	82.9	83.4	83.4	83.8	83.9	83.3	82.2	81.4	78.9	76.5	75.1	75.3	75.9	78.5	80.2	80.8	80.9	80.5	81.7	82.1	82.6	Diurnal Average	
	99	98	99	99	100	100	100	100	100	99	97	95	95	96	97	98	98	97	97	96	95	97	98	99	Diurnal Maximum	

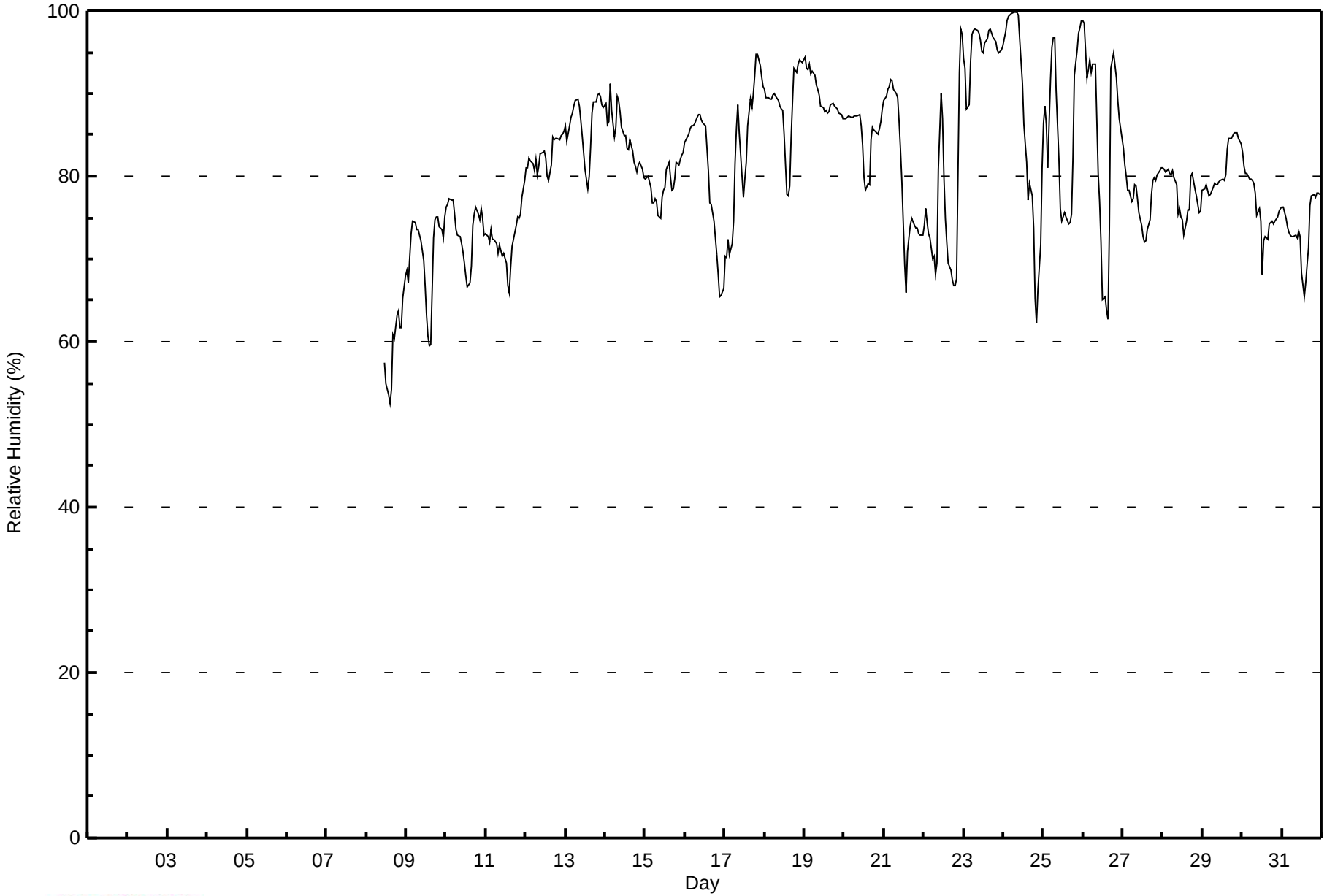
M - Maintenance MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Buffalo Viewpoint - January 2015



AURORA
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Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - January 2015

Maximum Speed: 32 km/h on Jan 16 20:00

Maximum Daily Speed Average: 19.1 km/h on Jan 27

Minimum Speed Value: 1 km/h on Jan 10 04:00

Minimum Daily Speed Average: 1.0 km/h on Jan 2

Maximum Diurnal Speed Average: 3.8 km/h at hour 18

Minimum Diurnal Speed Average: 0.5 km/h at hour 8

Monthly Average Velocity: 1.5 km/h 278.4 deg

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 7$ Median = 10 $Q_3 = 14$ $P_{90} = 19$ $P_{99} = 27$

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Percent Operational Time:	95.6

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-Jan	NNE10	NNE11	NNE8	NNE8	N9	N7	N6	NNE8	NNE10	N9	NNW7	NNW8	NNW8	N20	N20	N17	N16	NW7	NNW6	NW2	WNW2	NW5	N19	N14	N9.4	N20
2-Jan	NE6	NE9	NNE4	WNW2	SE3	N5	N3	S3	S4	SSW6	SE7	S3	NW7	NW5	N3	NNE6	ENE5	S2	SSW5	NNW3	SW2	N3	NW4	NNW12	N1.0	NNW12
3-Jan	N8	N10	N6	NW5	WNW5	WNW8	NW12	WNW8	SW4	W6	W8	W10	W10	W11	W10	W11	WSW15	WSW18	WSW19	W12	W10	W8	W9	WSW12	W8.6	WSW19
4-Jan	W11	WSW17	WSW19	WSW18	WSW15	WSW9	WSW11	SW12	SW12	S6	SSE8	SSE7	SW13	SW13	SW12	WSW13	WSW17	WSW30	WSW23	WSW10	WSW11	WSW18	W14	W19	WSW12.8	WSW30
5-Jan	WSW23	WSW22	WSW21	WSW19	WSW15	WSW12	W13	W14	WNW15	WNW15	W11	WNW13	WNW15	WNW17	WNW17	NW17	NW17	NW15	NW15	NW14	NW15	NNW10	N17	N10	WNW13.4	WSW23
6-Jan	NNE9	NW2	ENE4	ESE4	SSE4	S5	S6	SSE6	SE7	SE7	SSW5	S5	W6	WSW4	SSE4	SSE5	SSE6	SW6	SSW8	SSW8	S8	SSE7	SE11	SSE12	S4.2	SSE12
7-Jan	SE12	SSE10	SSE11	SSE10	SSE10	SSE9	SSE13	SSE8	SSE8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	----	SSE13
8-Jan	M	M	M	M	M	M	M	M	M	M	WNW17	WNW17	WNW16	WNW15	WNW17	WNW14	WSW14	WSW17	WSW15	WSW13	WSW16	WSW14	WSW13	SW8	----	WNW17
9-Jan	SSW8	SSW9	SSE8	SE10	SE9	SSE9	SSE10	SSE9	SSE9	SSE9	SE8	SE8	SSE8	SE10	SE9	NE3	N11	NW7	WNW10	NW10	N12	NNW10	NW10	N13	SSE1.9	N13
10-Jan	NNE8	NE8	N4	ENE1	E1	SSE3	SSE6	SSE8	SSE8	SE8	SE6	SSE5	SSE5	SE8	SE9	SE10	SE10	SSE9	SSE7	SSE7	SSE9	SSE8	SSE7	SSE11	SE5.6	SSE11
11-Jan	SE9	SE9	SSE11	SE9	SSE9	SSE10	SE10	SSE10	SSE10	SSE9	SSE7	SE8	SE7	SE8	SE10	SSE11	SSE14	SSE11	SSE12	SSE12	SSE16	SSE13	SSE8	SSE9	SSE10.0	SSE16
12-Jan	SSE8	SSE8	SSE6	SE7	NE3	SSE3	NE4	S1	S2	SSW2	ESE1	NNE1	S2	SSE3	SE6	SE7	SSE8	SSE8	SSE9	SSE9	SSE9	SE8	SE8	SSE8	SSE5.0	SSE9
13-Jan	S8	W9	NW6	N14	NNW14	N13	N12	N9	NNE5	N7	NNE5	NE7	NE9	NE7	NNE5	NE6	NE6	E5	SE7	SE8	SE9	SSE9	SSE9	S8	NNE3.1	N14
14-Jan	S8	SW7	WNW3	S7	WSW15	W19	NW13	N19	NNE20	NNE14	NNE10	NE11	NE10	NNE10	N13	NNE11	NNE18	NNE18	NNE16	NNE12	N13	N13	N11	NNE11	N8.3	NNE20
15-Jan	NNE11	NNE12	NNE11	NNE10	NNE12	NNE10	NNE12	NNE9	NNE8	NNE7	NNE7	NNE7	NNE5	N3	ESE4	SE10	SE12	SE13	SE17	SSE17	SSE17	SSE18	SSE17	SSE16	E5.9	SSE18
16-Jan	SSE14	SSE14	SSE14	SSE14	SSE12	SSE11	SSE14	SSE15	SSE16	SSE11	S6	SSE5	SE3	WSW12	WSW22	WSW25	WSW25	WSW26	WSW29	WSW32	WSW25	WSW25	WSW30	W27	SW12.5	WSW32
17-Jan	W19	WSW23	W23	WSW23	W20	W19	NNW14	NNE15	N13	NNE12	N11	N7	N10	N10	N10	N7	NNW7	N7	NNW4	WSW3	SSW3	SSE6	SE5	SSE7	NW6.2	WSW23
18-Jan	SSE8	SSE8	SSE9	SSE11	SSE11	SSE10	SSE11	SSE12	SSE10	SSE11	SSE10	SE6	SE9	SE9	SE9	SE9	SSE10	SE10	SSE11	SE8	SSE7	SE9	SE8	SSE9	SSE9.2	SSE12
19-Jan	SE9	SE7	ESE3	WNW4	NW6	N6	N8	N5	N6	N7	N8	N6	NNW7	N7	N6	N7	N9	N8	NNW7	N8	N9	N9	N9	N12	N5.5	N12
20-Jan	NNW10	N12	NNW8	NNW7	N8	N8	N8	NNW6	NNW4	NNW4	NNW2	N1	NE2	SE7	SE8	SSE7	SE4	SSE8	SSE10	SE13	SSE13	SSE13	SSE14	SSE11	ESE1.8	SSE14
21-Jan	SSE10	SSE11	SSE9	SSE10	SE11	SE15	SSE16	SSE16	SSE14	SSE14	SSE15	SSE14	S17	SSW21	SSW20	SSW19	SW19	SW20	SW23	SW19	SW19	WSW21	WSW25	WSW24	SSW12.8	WSW25
22-Jan	W18	W12	SW7	WSW17	WSW21	WSW20	WSW18	WSW25	WSW26	W21	W22	W20	W29	W27	WSW24	WSW21	WSW16	WSW24	WSW26	W21	W20	N21	N15	NNE12	W17.0	W29
23-Jan	N12	N10	N8	NNE7	NNE8	NNE8	N7	NNE6	N3	NNE3	N5	N6	NW4	NW5	S2	SSE3	ESE3	ESE3	SSE3	SSE3	NNE2	SE2	SSE5	SSE5	NNE2.9	N12
24-Jan	SSE7	SE8	AF	AF	AF	AF	AF	AF	AF	AF	WSW12	WSW12	WSW11	WSW12	W13	W15	W11	WSW9	SW8	WSW12	WSW18	W11	SSW4	SSE8	----	WSW18
25-Jan	SE12	SE12	SSE12	SSW9	S14	SSE17	SSE13	SSE7	WSW9	WSW21	W25	W21	W14	WSW17	WSW17	WNW14	WNW15	WNW15	NNW8	NNE9	NNE10	E2	S7	SE9	SW6.2	W25
26-Jan	S8	SE8	SSE6	SE9	SE9	SE10	SSE9	SSE7	SW7	WSW9	WSW8	WSW11	WSW10	W9	W9	W7	N9	N27	N24	N23	N23	N22	N25	N24	N4.4	N27
27-Jan	NNE24	N23	NNE23	N24	N19	N19	N21	NNE18	NNE17	NNE15	NNE16	NNE15	NNE16	NNE17	NNE18	NNE19	NNE20	NNE21	NNE20	NNE20	NNE19	NNE20	NNE20	NNE18	NNE19.1	NNE24
28-Jan	N18	N17	N18	NNW15	NW12	NW9	N15	N13	NNE9	NNE7	N4	N4	WNW4	WSW2	NNE5	NE6	NE5	N7	NE8	NE8	ENE6	ENE6	ENE4	ENE3	N7.3	N18
29-Jan	E2	SSE4	SSE7	SSE8	SSE8	SSE9	SSE9	SSE8	SSE10	SSE9	SSE8	SSE6	SSE5	SSE5	SE2	NW3	N6	N10	N9	N12	N11	N15	N18	N17	ENE1.9	N18
30-Jan	N20	N18	N20	N19	NNE18	N14	N19	N18	NNE17	N13	N15	N17	N16	N17	NNE14	NNE12	NNE11	NNE13	N11	NNE12	N7	NNW6	NNW7	N7	N14.0	N20
31-Jan	N3	W4	WSW3	SW4	SSE6	SSE7	SE9	SSE8	SSE9	SSE8	SE9	SE8	SE8	SE9	SE8	SE9	SE10	SSE10	SE11	SE13	SE15	SSE12	SSE10	SSE9	SSE7.4	SE15
	N0.8	WNW0.7	WNW0.6	WSW1.0	WSW1.6	SW1.2	N0.6	ENE0.5	SSW0.5	W0.7	WNW1.6	WNW1.9	W2.9	W3.2	W2.5	WNW2.3	WNW2.5	W3.8	W3.6	W2.1	W2.0	WNW1.2	NW1.6	WNW0.9	Diurnal Average	
	NNE24	WSW23	NNE23	N24	WSW21	WSW20	N21	WSW25	WSW26	W21	W25	W21	W29	W27	WSW24	WSW25	WSW25	WSW30	WSW29	WSW32	WSW25	WSW25	WSW30	W27	Diurnal Maximum	

M - Maintenance AF - Analyzer 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

Buffalo Viewpoint - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Jan 26 17:00

Minimum Value: 1 km/h on Jan 31 04:00

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

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	0
Percent Operational Time:	95.6

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

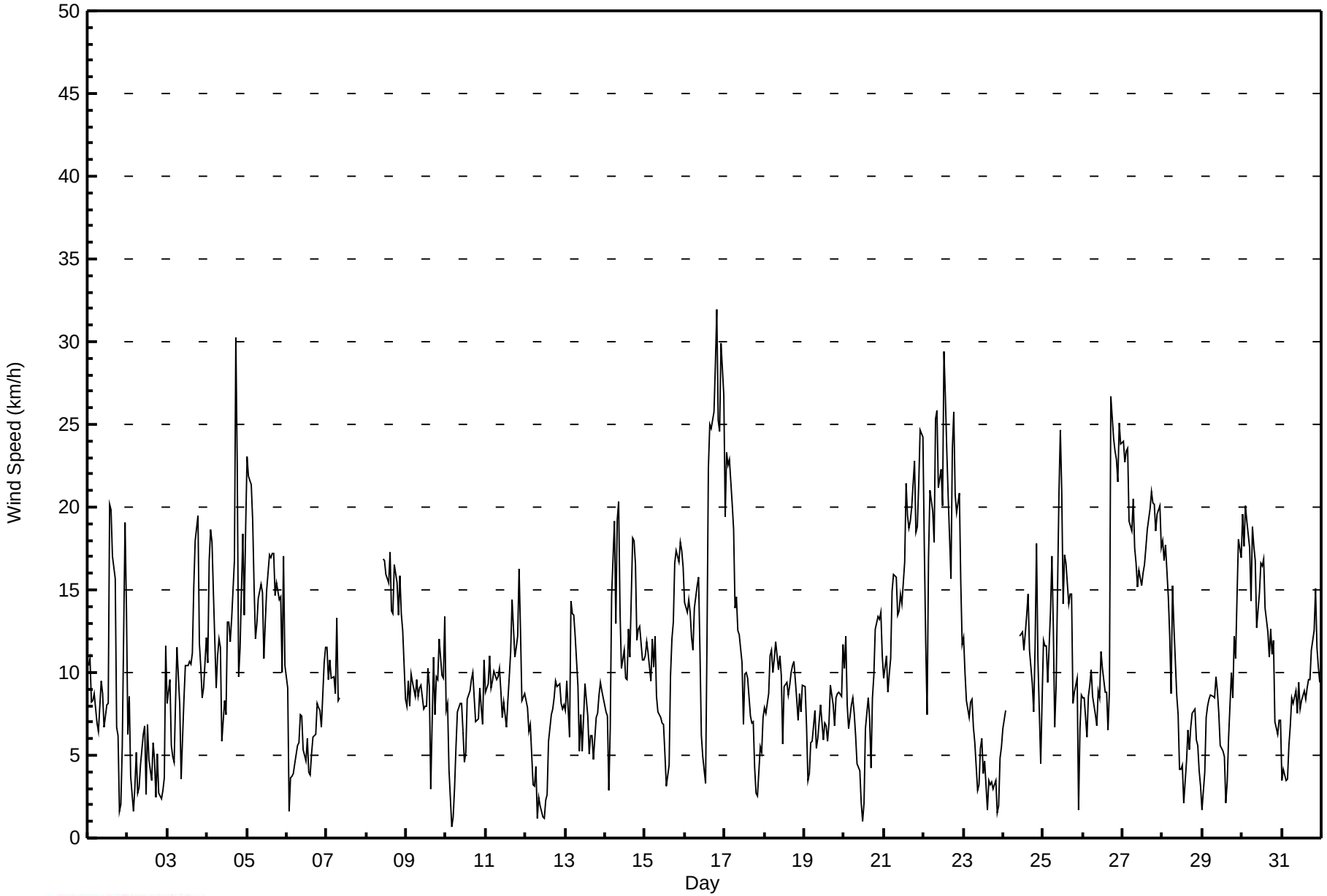
M - Maintenance AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	108	15.19	15.19
6 - 11	338	47.54	62.73
12 - 19	197	27.71	90.44
20 - 28	63	8.86	99.30
29 - 38	5	0.70	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Buffalo Viewpoint - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	13	9	5	5	4	6	6	17	10	5	3	4	1	6	9	5	108
6 - 11	50	32	12	2	0	0	62	101	10	6	6	12	16	5	8	16	338
12 - 19	39	29	0	0	0	0	10	34	2	1	8	33	13	15	9	4	197
20 - 28	15	9	0	0	0	0	0	0	0	2	2	24	11	0	0	0	63
29 - 38	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	5
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	117	79	17	7	4	6	78	152	22	14	19	77	42	26	26	25	711

Total Number of Valid Hours: 711

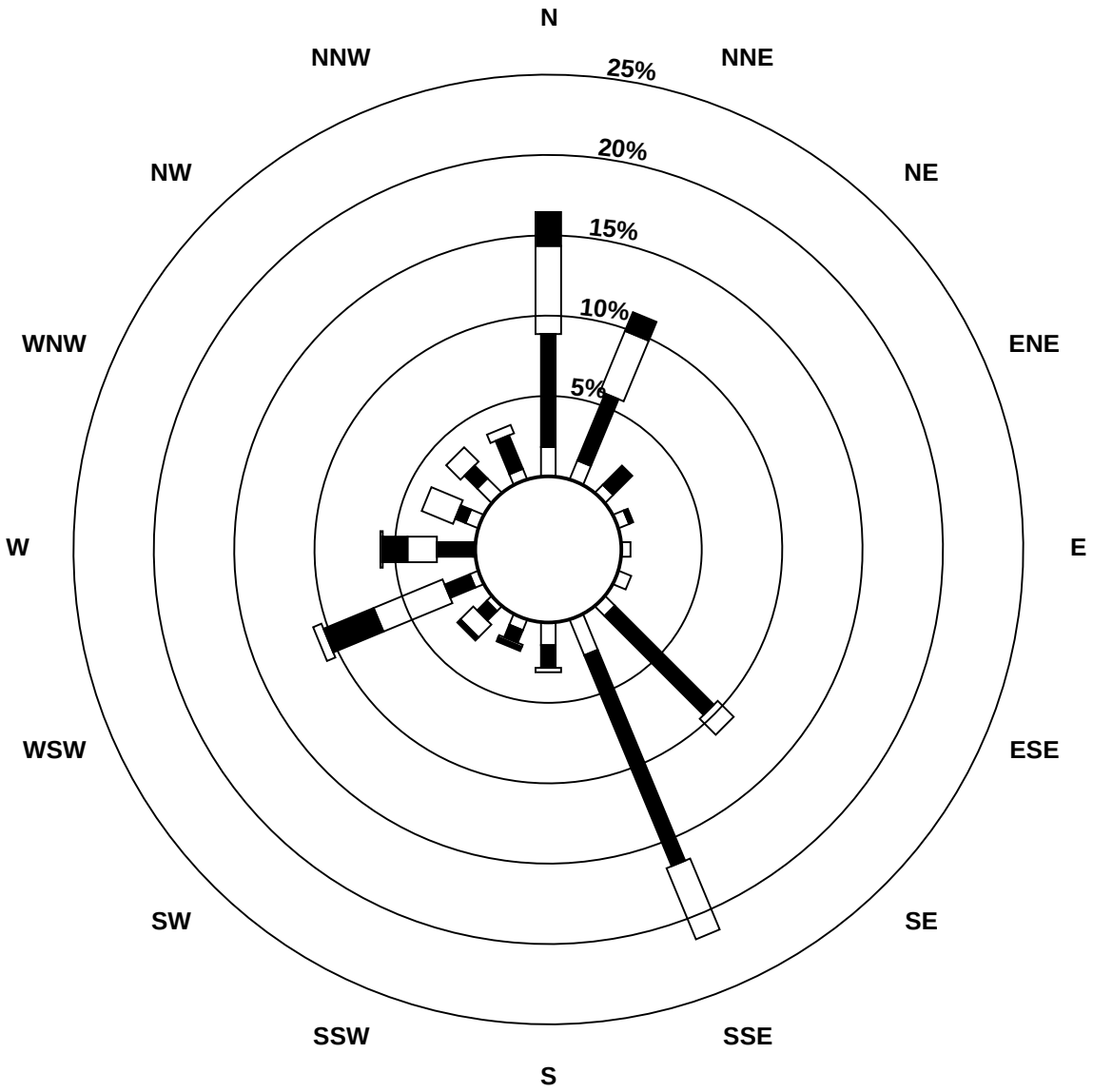
Total Number of Hours: 744

Wood Buffalo Environmental Association

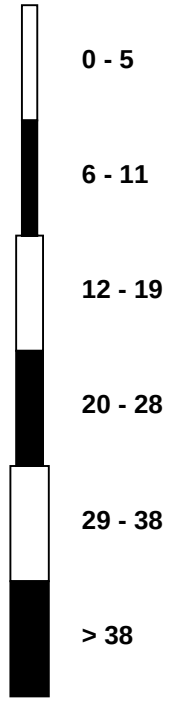
Wind Rose Jan 2015

Wind Speed (WS) - km/h

Buffalo Viewpoint (AMS 4)



Classes (km/h)



Total Number of Valid Hours: 711

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - January 2015

Direction of Maximum Speed: 254 deg on Jan 16 20:00
Direction of Maximum Daily Speed Average: 12.7 deg on Jan 27

Direction of Minimum Speed: 73 deg on Jan 10 04:00

Direction of Minimum Daily Speed Average: 1.0 deg on Jan 2

Monthly Average Direction: 254.9 deg

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Percent Operational Time:	95.6

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-Jan	15	21	23	14	359	3	349	12	13	358	327	338	348	354	9	9	3	326	331	313	303	320	352	6	358.9
2-Jan	40	55	26	284	142	9	355	177	188	195	140	170	304	311	353	29	59	179	210	329	228	10	318	330	0.6
3-Jan	351	2	357	318	295	297	312	285	232	265	278	281	274	273	268	260	256	253	258	279	276	281	271	251	278.2
4-Jan	280	257	255	247	239	238	243	229	227	171	147	164	219	216	230	241	248	256	254	240	239	250	261	262	242.2
5-Jan	257	255	253	254	250	250	275	277	284	290	278	297	289	287	301	310	315	306	308	310	320	343	356	5	289.0
6-Jan	18	314	68	113	161	175	178	163	143	146	209	176	262	240	168	150	167	218	199	205	183	152	138	155	169.4
7-Jan	135	154	151	154	160	167	158	158	154	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--
8-Jan	M	M	M	M	M	M	M	M	M	M	292	291	294	293	299	287	253	254	251	243	255	241	246	224	--
9-Jan	206	204	150	136	142	166	156	147	162	165	141	139	149	140	137	34	357	306	300	313	352	336	323	355	155.2
10-Jan	24	52	3	73	98	162	160	149	153	146	129	166	153	138	138	141	141	150	161	151	153	152	165	155	141.7
11-Jan	145	137	165	130	162	153	142	151	160	163	155	139	142	138	137	152	157	158	153	156	154	157	156	158	151.6
12-Jan	151	159	159	134	39	147	54	176	189	198	120	20	191	157	135	139	152	160	150	159	157	146	143	160	149.2
13-Jan	177	269	319	1	346	353	353	354	13	4	31	41	41	34	18	35	44	100	130	135	135	154	165	185	28.6
14-Jan	183	219	294	175	258	263	307	11	12	13	19	37	36	18	11	22	22	29	12	20	8	11	9	24	5.3
15-Jan	27	28	24	24	32	31	29	29	31	28	30	33	30	7	102	130	138	134	145	148	150	148	151	153	91.6
16-Jan	152	157	157	156	159	161	152	151	158	160	175	165	141	250	256	255	252	250	254	254	249	249	252	261	223.4
17-Jan	266	256	261	258	267	274	334	16	2	14	10	359	356	0	3	3	347	356	338	250	201	163	133	158	306.3
18-Jan	162	155	159	160	157	153	159	158	163	154	152	139	140	136	138	143	162	146	158	138	147	141	138	162	151.5
19-Jan	142	145	114	294	306	354	2	1	358	354	357	350	345	354	355	356	354	356	340	355	356	358	352	353	355.9
20-Jan	345	354	339	333	350	355	355	345	332	340	327	7	36	134	135	149	132	159	149	142	151	155	153	148	108.3
21-Jan	147	154	154	158	142	146	149	153	156	150	148	154	186	197	200	211	224	231	232	231	235	243	249	254	197.4
22-Jan	264	269	219	238	249	249	246	253	256	270	281	274	262	265	255	252	247	251	254	259	276	8	7	22	264.1
23-Jan	4	8	2	18	16	13	7	14	1	31	360	359	325	311	191	167	121	118	159	155	19	132	159	154	18.5
24-Jan	154	145	AF	AF	AF	AF	AF	AF	AF	AF	251	244	240	251	263	278	278	250	235	246	251	267	200	149	--
25-Jan	134	143	150	196	178	157	163	152	245	255	260	262	261	254	257	282	284	296	335	14	13	95	170	146	234.2
26-Jan	169	130	152	134	144	129	153	154	225	255	254	255	241	269	269	259	354	4	6	2	5	7	7	5	352.6
27-Jan	12	8	12	9	9	8	8	13	13	14	12	17	16	15	17	14	12	12	13	13	23	14	12	16	12.7
28-Jan	5	350	356	347	320	319	356	2	18	16	2	355	296	250	25	46	48	8	41	42	57	61	73	77	5.7
29-Jan	90	150	153	158	158	154	148	154	154	154	147	157	158	162	134	320	352	358	1	10	355	359	1	2	73.7
30-Jan	1	6	8	6	14	8	4	2	13	5	10	4	4	357	15	26	14	13	10	16	354	334	336	356	6.3
31-Jan	357	269	252	227	161	149	143	155	153	159	144	144	131	128	128	132	137	148	145	144	140	148	155	162	147.5
	0.5	290.8	292.5	248.9	244.4	232.9	354.8	70.4	197.9	275.0	286.5	294.6	280.0	277.6	280.7	282.6	291.1	276.9	263.4	268.3	262.9	287.1	306.0	292.2	
	Diurnal Average																								

M - Maintenance AF - Analyzer 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

Buffalo Viewpoint - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 91 deg on Jan 20 12:00

Minimum Value: 3 deg on Jan 11 00:00

Percentiles: P_1 = 6 P_{10} = 10 Q_1 = 12 Median = 14 Q_3 = 18 P_{90} = 33 P_{99} = 73

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	0
Percent Operational Time:	95.6

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	Maximum
1-Jan	11	11	15	9	10	12	17	11	10	12	22	16	14	9	10	10	9	25	17	71	69	73	14	9	73
2-Jan	48	11	44	66	28	48	36	34	12	14	10	41	9	16	20	15	52	35	15	57	62	89	61	28	89
3-Jan	11	10	11	17	12	16	11	16	38	12	14	13	15	14	15	12	11	10	12	13	13	17	18	20	38
4-Jan	20	13	12	15	15	22	18	18	23	37	22	31	14	17	17	15	14	11	14	27	19	16	21	13	37
5-Jan	15	12	12	14	15	16	16	14	15	13	14	12	13	13	12	12	10	11	10	9	17	15	11	10	17
6-Jan	6	66	38	33	25	20	12	22	7	9	23	29	22	45	32	26	21	19	16	15	16	21	14	9	66
7-Jan	8	12	7	16	17	16	16	15	16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	17
8-Jan	M	M	M	M	M	M	M	M	M	M	12	13	12	13	12	16	13	10	12	16	13	14	14	17	17
9-Jan	20	17	23	12	15	12	8	18	22	19	14	14	20	12	11	77	13	15	11	17	12	17	18	18	77
10-Jan	20	14	38	78	64	63	16	6	7	7	11	27	20	12	11	10	12	14	18	12	7	14	13	3	78
11-Jan	10	11	7	12	13	7	9	10	5	5	10	13	17	14	13	13	13	13	14	14	12	14	14	14	17
12-Jan	14	9	12	25	63	58	28	89	64	51	71	74	42	38	14	10	7	14	9	15	14	17	15	11	89
13-Jan	27	23	31	15	12	12	13	13	22	16	24	19	16	17	16	14	12	36	16	16	16	20	19	19	36
14-Jan	19	33	63	39	16	15	51	13	13	13	14	13	14	16	12	14	12	13	13	15	12	11	10	13	63
15-Jan	15	15	13	14	14	14	13	15	14	16	14	12	18	26	49	17	16	16	17	17	18	17	17	17	49
16-Jan	18	17	16	17	16	19	15	15	16	16	23	46	70	42	12	11	12	11	11	10	11	11	10	14	70
17-Jan	14	11	13	11	14	14	39	12	11	12	14	14	11	13	13	13	11	14	16	35	36	20	17	16	39
18-Jan	14	14	12	12	11	12	12	9	11	10	12	21	9	10	12	13	7	8	9	25	19	10	17	14	25
19-Jan	6	14	61	76	13	18	12	10	13	12	13	18	15	13	13	13	14	15	14	13	12	14	12	15	76
20-Jan	10	13	15	18	11	11	12	15	18	16	51	91	49	17	14	37	71	17	13	11	12	12	12	15	91
21-Jan	14	14	16	12	11	14	14	14	13	14	14	15	25	17	16	14	14	13	12	13	15	14	12	12	25
22-Jan	16	21	25	18	11	12	12	12	11	16	15	16	14	15	12	12	16	13	10	12	32	12	15	13	32
23-Jan	13	13	12	18	14	13	18	20	59	40	13	13	33	33	63	40	26	36	20	23	46	72	28	24	72
24-Jan	10	13	AF	AF	AF	AF	AF	AF	AF	AF	13	14	17	14	18	14	15	13	19	15	10	30	55	15	55
25-Jan	7	13	10	24	19	16	19	34	26	18	13	14	14	10	11	16	14	12	36	13	11	56	25	5	56
26-Jan	17	6	23	14	18	10	21	18	44	24	15	15	22	25	16	19	67	17	15	17	16	15	17	16	67
27-Jan	14	17	15	15	16	15	14	15	14	13	14	15	14	15	13	13	14	13	13	13	12	14	12	11	17
28-Jan	13	13	15	20	12	12	13	20	14	15	21	32	29	67	25	16	9	16	13	17	21	22	19	19	67
29-Jan	31	23	15	16	18	17	17	16	16	17	20	28	25	25	69	31	16	13	13	13	14	15	14	15	69
30-Jan	14	14	13	15	13	14	16	16	11	12	14	14	15	14	21	14	13	12	10	13	25	10	10	17	25
31-Jan	65	15	20	34	16	16	6	14	8	14	12	17	17	15	15	10	10	7	8	7	5	8	4	10	65
	65	66	63	78	64	63	51	89	64	51	71	91	70	67	69	77	71	36	36	71	69	89	61	28	
	Diurnal Maximum																								

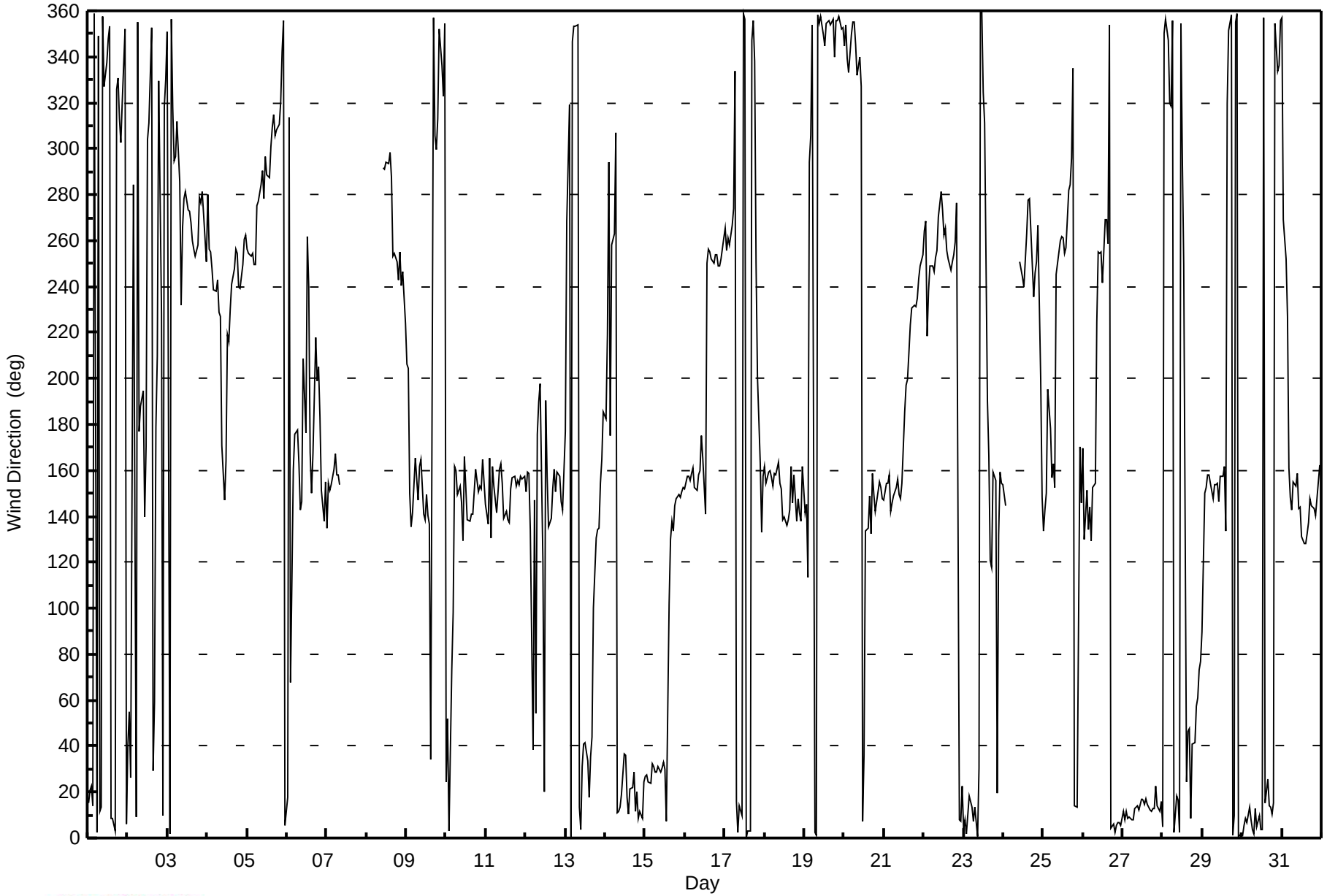
M - Maintenance AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 5, 2015	Previous Calibration	December 4, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	12:10	End Time (MST)	15:00
Barometric Pressure	747 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Cal Gas Concentration	51.00 ppm	Cal Gas Expiry Date	5/29/2014
Gas Cert Reference	LL107926		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	11

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-593	-592
Analyzer Range (mv)	5000	5000	Lamp voltage	841	840
Calculated slope	0.999675	0.990742	Chamber temp.	45.0	45.2
Calculated intercept	-0.442518	-0.379581	Pressure (mmHg)	695.8	701.8
Analyzer Background	9.4	9.4	Flow (lpm)	0.498	0.502
Analyzer Coefficient	0.885	0.885	Intensity	85	85

Analyzer make	TEI 43i	Analyzer serial #	JC1327300932

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.4	NA
as found span	5000	58.8	599.8	605.1	0.991
calibrator zero	5000	0.0	0.0	0.4	NA
high point	5000	58.8	599.8	605.1	0.991
second point	5000	29.4	299.9	304.9	0.984
third point	5000	14.7	149.9	150.6	0.996
calibrator zero	5000	0.0	0.0	0.4	0.000
as left zero	5000	0.0	0.0	0.4	NA
as left span	5000	58.8	599.8	607.0	0.988
				Average Correction Factor	0.990

Corrected As found	604.8	Previous response	600.4	% change	-0.7%

Notes:

Filter changed after as founds. No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

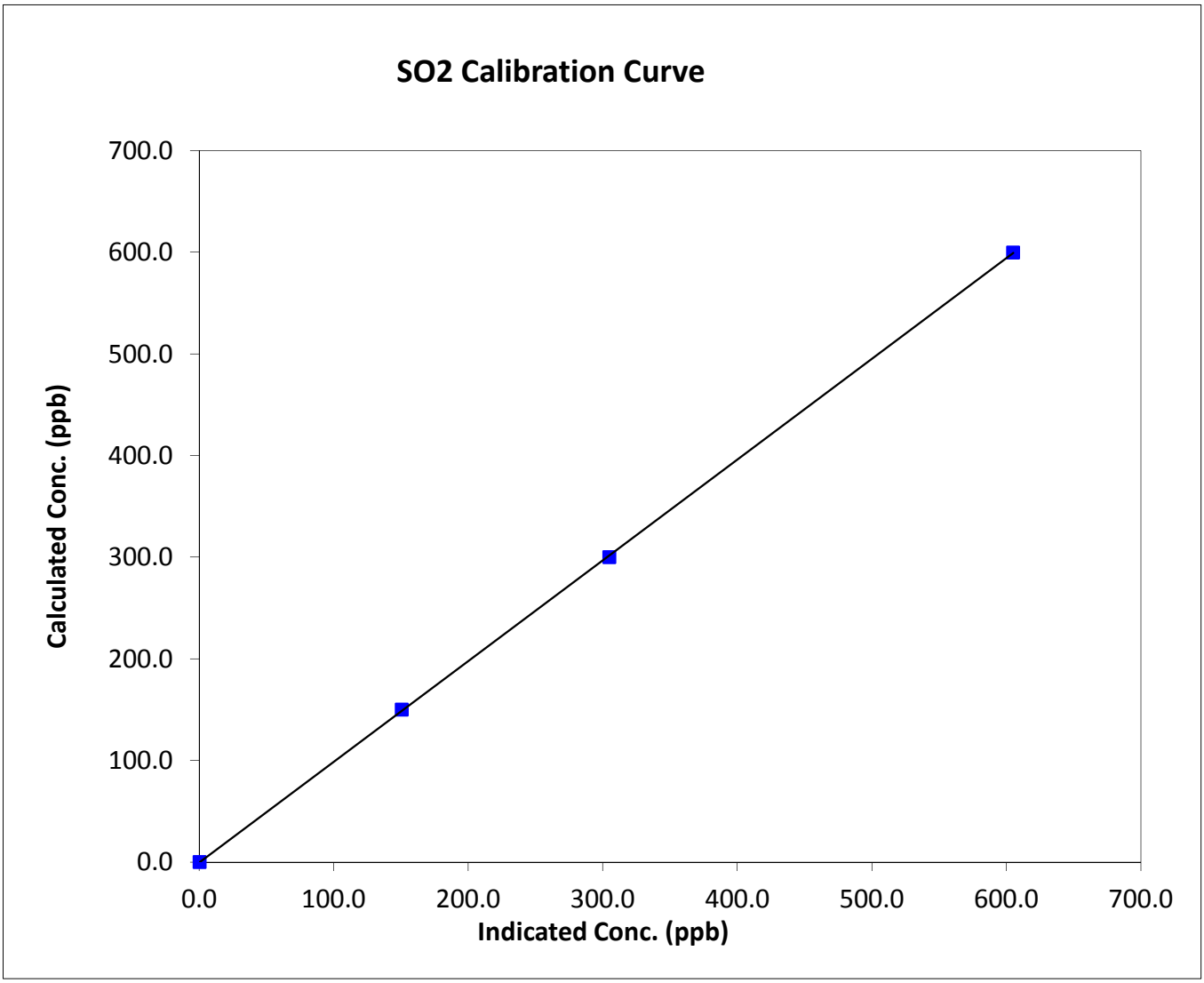
SO_2 Calibration Summary

Station Information

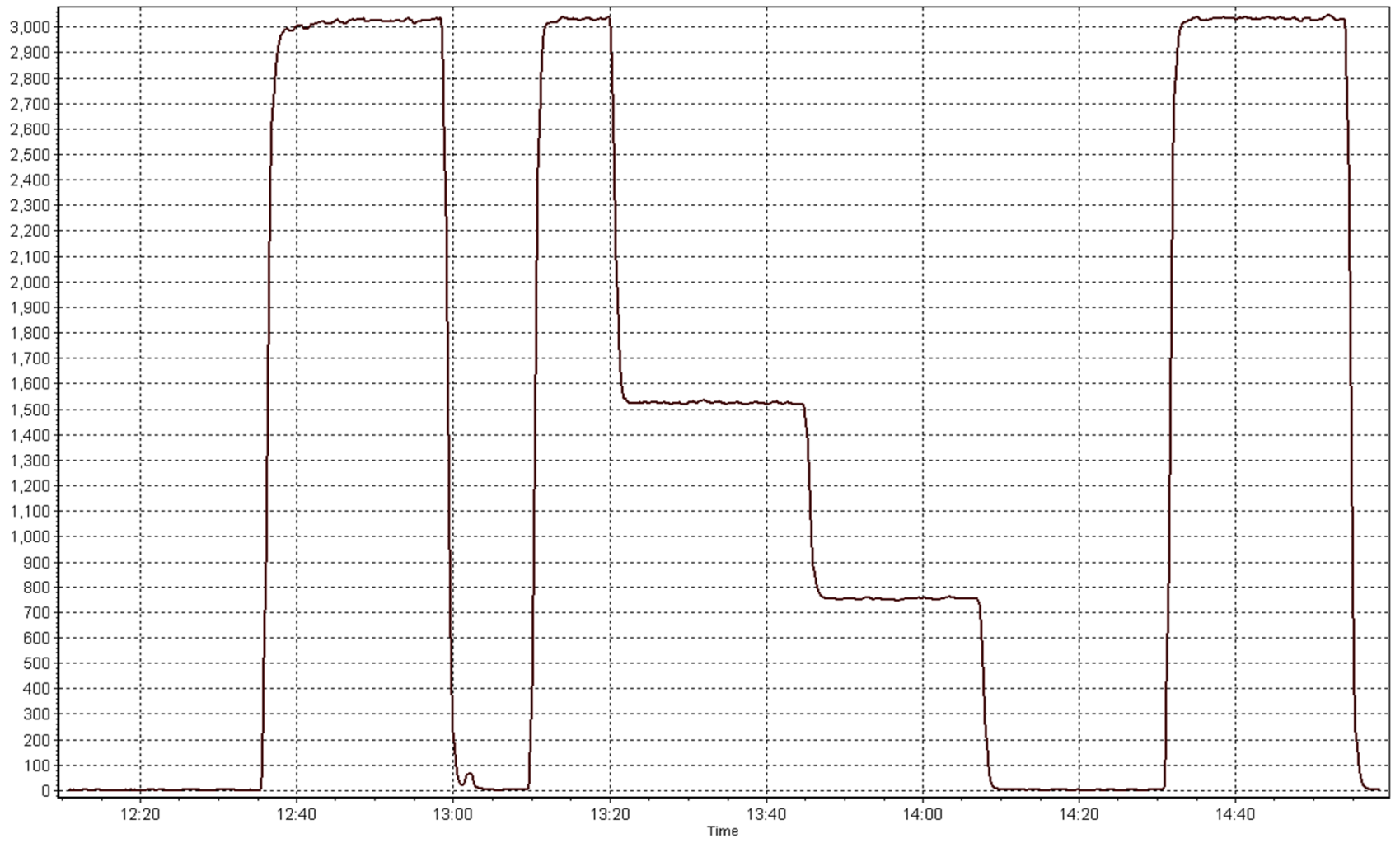
Calibration Date	January 5, 2015	Previous Calibration	December 4, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	12:10	End Time (MST)	15:00
Analyzer make	TEI 43i	Analyzer serial #	JC1327300932

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.4	N/A	Correlation Coefficient	0.999976
599.8	605.1	0.9911		
299.9	304.9	0.9837	Slope	0.990742
149.9	150.6	0.9958		
			Intercept	-0.379581



SO2 Calibration Plot Date: January 5, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 6, 2014	Previous Calibration	December 4, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Other:	Maintenance	
Start Time (MST)	9:35	End Time (MST)	13:35
Barometric Pressure	NA mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11551008
Cal Gas Concentration	9.75 ppm H2S	Cal Gas Expiry Date	2/22/2016
Gas Cert Reference	LL101590	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	dig

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-617	-617
Analyzer Range (mv)	5000	5000	Lamp voltage	871	872
Calculated slope	1.002361	0.994787	Chamber temp.	45	45
Calculated intercept	-0.149808	-2.419963	Pressure	532.8	575.1
Analyzer Background	14.5	13.8	Flow	1.025	1.086
Analyzer Coefficient	0.868	0.868	Intensity	94	94
			Converter temp.	332	329

Analyzer make/model	TEI 450i	Analyzer serial #	1336160094
Converter make/model	NA	Converter serial #	NA

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	6000	46.2	75.1	76.3	0.984
SO2 scrubber check	5000	14.7	149.9	3.2	NA
calibrator zero	6000	0.0	0.0	3.1	NA
high point	6000	46.1	74.9	78.2	0.958
second point	6000	25.8	41.9	44.2	0.948
third point	6000	15.3	24.9	26.7	0.932
calibrator zero	6000	0.0	0.0	1.2	NA
as left zero	5000	0.0	0.0	1.2	NA
as left span	6000	46.2	75.1	77.0	0.975
				Average Correction Factor	0.946

Corrected As found	76.3	Previous response	75.0	% change	-1.6%

Notes:

Filter changed after as founds. Scrubber check after as founds. Scrubber check showed slow rise in H2S possibly due to unusually dry conditions. No adjustments were made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

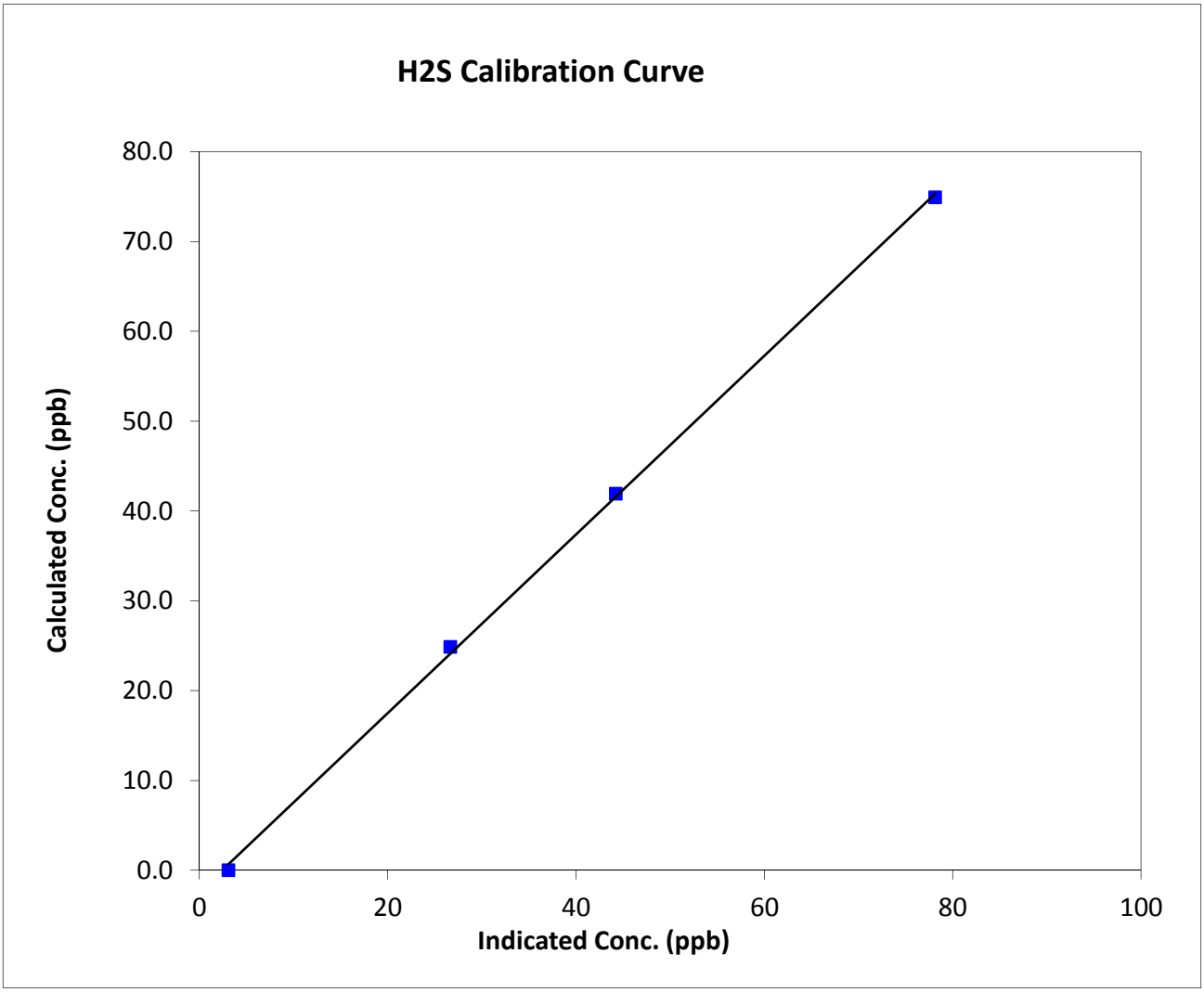
H2S Calibration Summary

Station Information

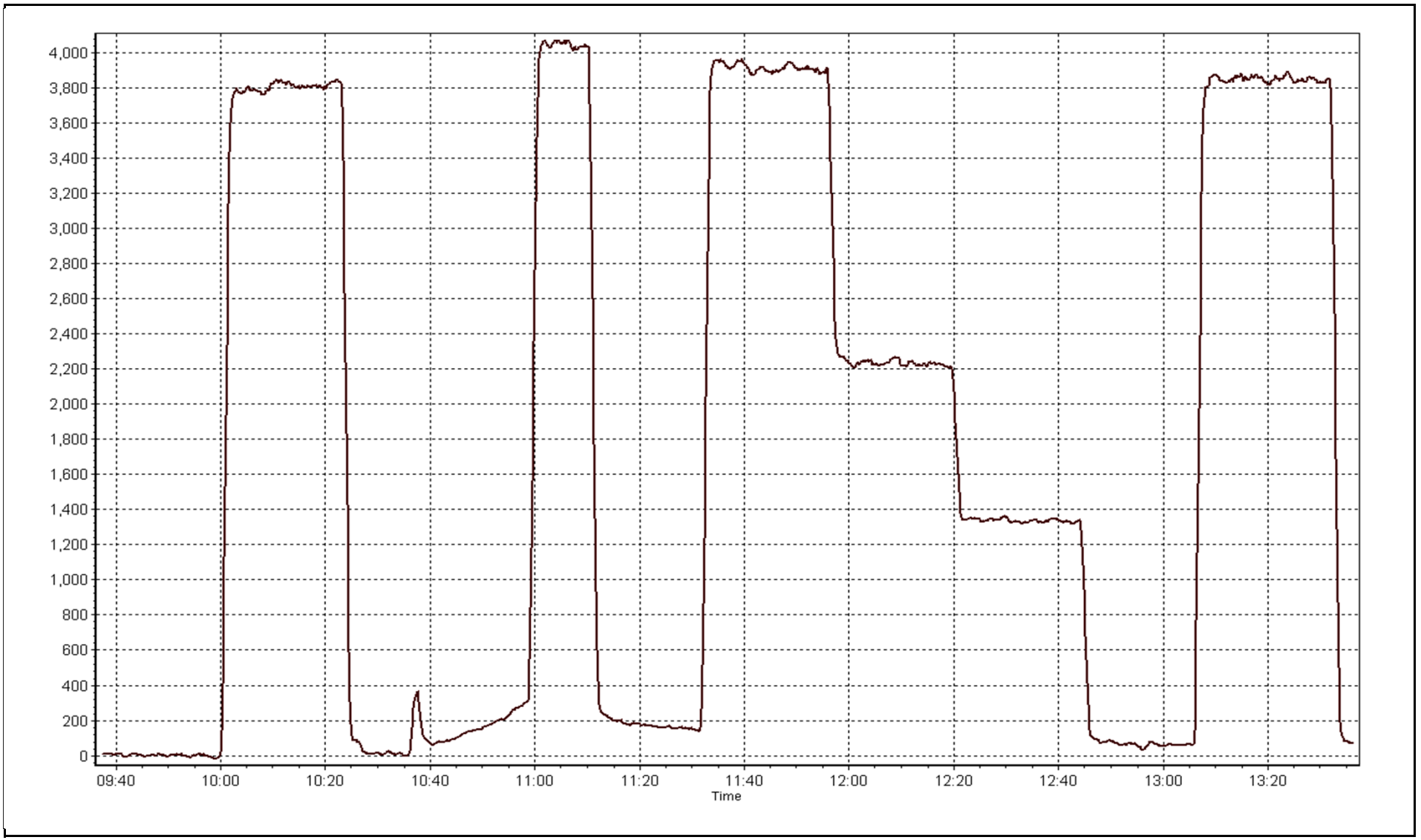
Calibration Date	January 6, 2014	Previous Calibration	December 4, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	9:35	End Time (MST)	13:35
Analyzer make	TEI 450i	Analyzer serial #	1336160094

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	3.1	N/A	Correlation Coefficient	0.999567
74.9	78.2	0.9585		
41.9	44.2	0.9478	Slope	0.994787
24.9	26.7	0.9320		
			Intercept	-2.419963



H2S Calibration Plot Date: January-06-14



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 12, 2014	Previous Calibration	January 6, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	10:10	End Time (MST)	12:35
Barometric Pressure	NA mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11551008
Cal Gas Concentration	9.75 ppm H2S	Cal Gas Expiry Date	2/22/2016
Gas Cert Reference	LL101590	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	dig

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-617	-617
Analyzer Range (mv)	5000	5000	Lamp voltage	872	871
Calculated slope	0.959802	0.999893	Chamber temp.	45	45
Calculated intercept	-0.346235	-0.198681	Pressure	575.1	551.1
Analyzer Background	13.8	14.2	Flow	1.086	1.054
Analyzer Coefficient	0.868	0.868	Intensity	94	94
			Converter temp.	329	330

Analyzer make/model	TEI 450i	Analyzer serial #	1336160094
Converter make/model	NA	Converter serial #	NA

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	6000	46.2	75.1	75.0	1.001
SO2 scrubber check	5000	14.7	149.9	0.0	NA
calibrator zero	6000	0.0	0.0	0.1	NA
high point	6000	46.1	74.9	75.0	0.999
second point	6000	25.8	41.9	42.3	0.990
third point	6000	15.3	24.9	25.1	0.990
calibrator zero	6000	0.0	0.0	0.1	NA
as left zero	5000	0.0	0.0	0.2	NA
as left span	6000	46.2	75.1	75.3	0.998
				Average Correction Factor	0.993

Corrected As found	75.0	Previous response	78.6	% change	4.8%

Notes:

No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

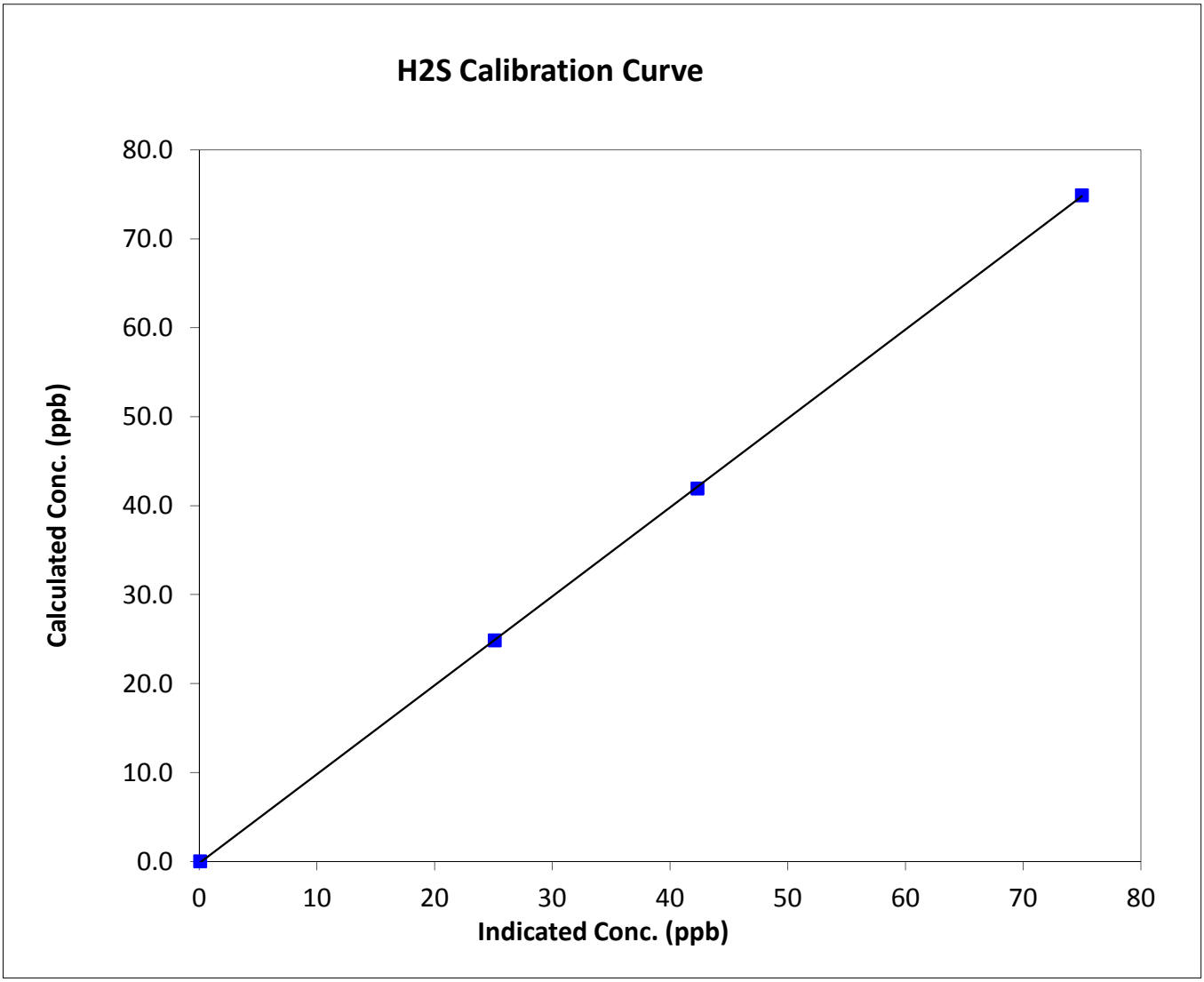
H2S Calibration Summary

Station Information

Calibration Date	January 12, 2014	Previous Calibration	January 6, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	10:10	End Time (MST)	12:35
Analyzer make	TEI 450i	Analyzer serial #	1336160094

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999975
74.9	75.0	0.9990		
41.9	42.3	0.9904	Slope	0.999893
24.9	25.1	0.9901		
			Intercept	-0.198681



H2S Calibration Plot Date: 41651

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-05-15	Previous Calibration	December-04-14
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	12:15	End Time (MST)	15:00
Barometric Pressure	747 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Gas Cert Reference	LL107926	Cal Gas Expiry Date	5/29/2014
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1067.8 ppm
C3H8 Cal Gas Conc.	201 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	19

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.5	8.5
Analyzer Range (mv)	5000	5000	Air or Bypass press	30.4	30.4
Calculated slope	1.005012	1.000654	Fuel Pressure	19.8	19.8
Calculated intercept	-0.054965	-0.033347			
BKG	1.3	1.3			
COEF	4.066	4.066			

Analyzer make	TEI 51i-LT	Analyzer serial #	1201650671

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.02	N/A
as found span	5000	58.8	12.56	12.55	1.000
calibrator zero	5000	0.0	0.00	0.02	N/A
high point	5000	58.8	12.56	12.55	1.000
second point	5000	29.4	6.28	6.37	0.985
third point	5005	14.7	3.14	3.15	0.996
calibrator zero	5000	0.0	0.00	0.02	N/A
as left zero	5000	0.0	0.00	-0.01	N/A
as left span	5000	58.8	12.56	12.75	0.985
				Average Correction Factor	0.994

Corrected As found	12.54	Previous response	12.55	% change	0.1%

Notes:

Filters were changed after as founds. No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

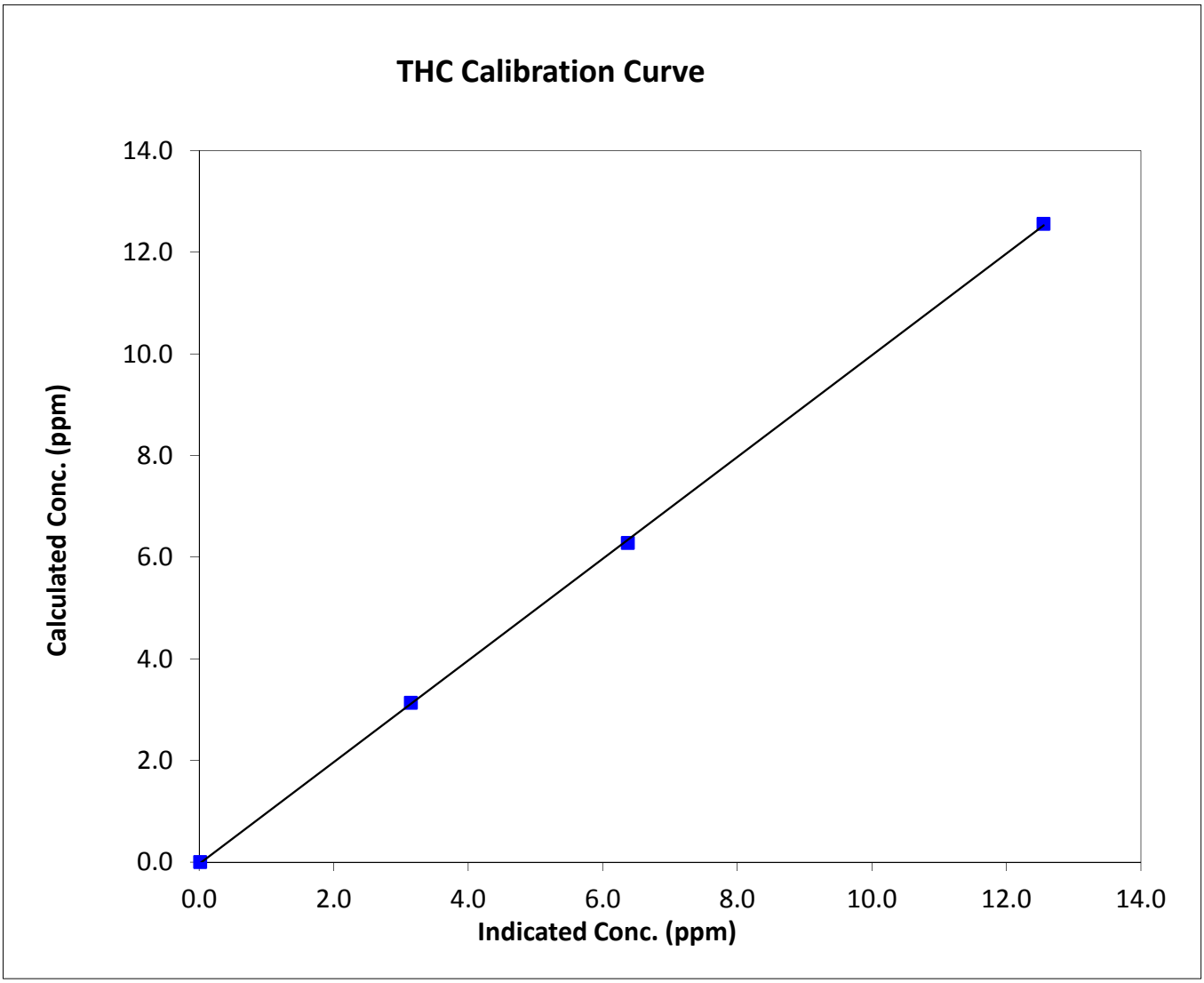
THC Calibration Summary

Station Information

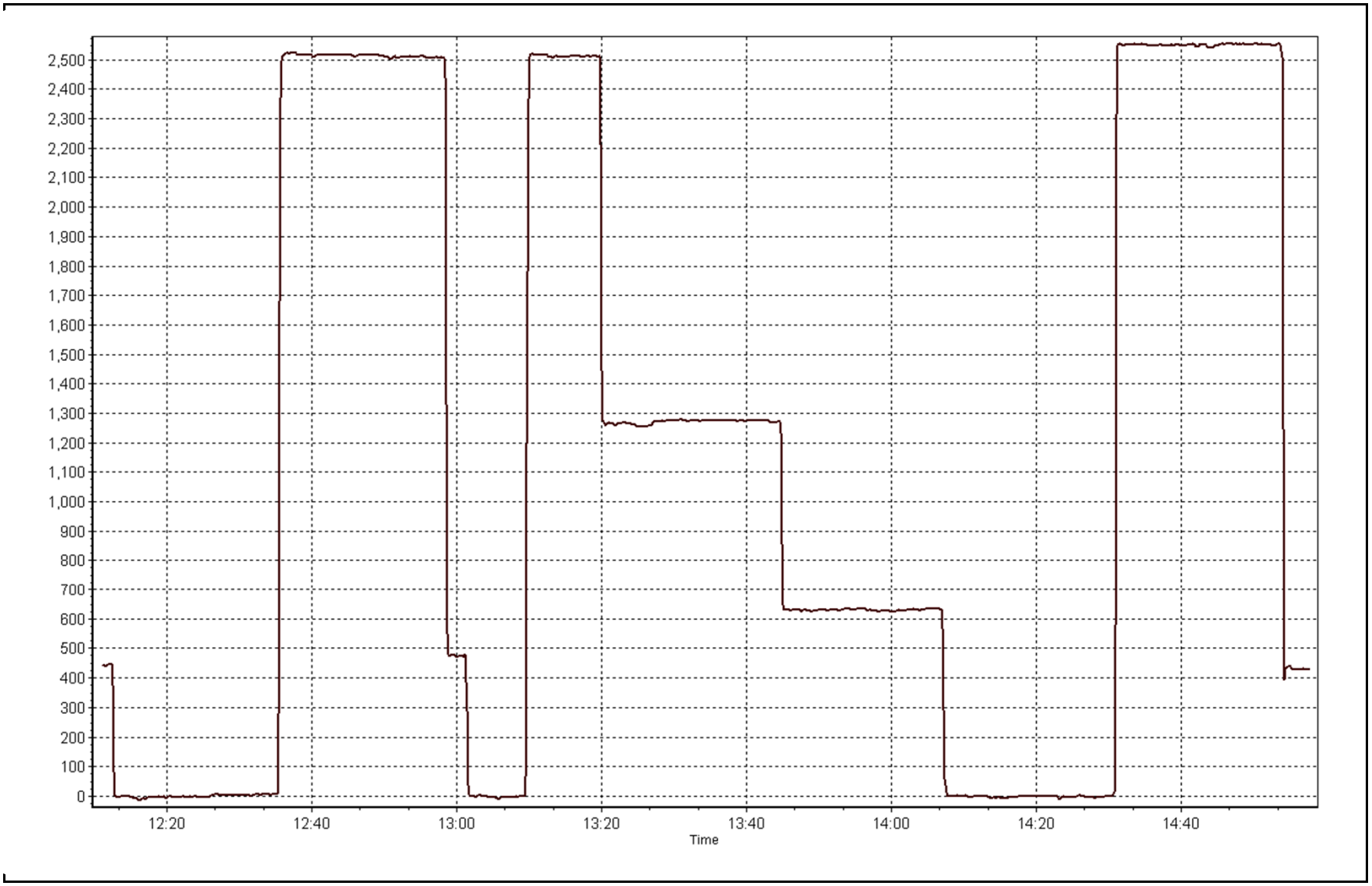
Calibration Date	January 5, 2015	Previous Calibration	December 4, 2014
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	12:15	End Time (MST)	15:00
Analyzer make	TEI 51i-LT	Analyzer serial #	1201650671

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.02	N/A	Correlation Coefficient	0.999934
12.56	12.55	1.0003		
6.28	6.37	0.9852	Slope	1.000654
3.14	3.15	0.9961		
			Intercept	-0.033347



THC Calibration Plot Date: January 5, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 5
MANNIX
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2015

MONTHLY SUMMARY for
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100.00	60	0	7	0
H2S (ppb) Average	708	36	36	100.00	4	0	1	0
THC (ppm) Average	708	35	36	99.87	4.5	-	2.9	-
Temperature 2 m (C) Average	685	0	59	92.07	6.3	-	3.9	-
Temperature 20 m (C) Average	674	0	70	90.59	7.2	-	4.7	-
Temperature 45 m (C) Average	649	0	95	87.23	7.4	-	4.9	-
Temperature 75 m (C) Average	654	0	90	87.90	7.4	-	4.9	-
Temperature 90 m (C) Average	656	0	88	88.17	7.4	-	4.9	-
Relative Humidity 2 m (%) Average	685	0	59	92.07	98	-	-	-
Relative Humidity 20 m (%) Average	674	0	70	90.59	97	-	-	-
Relative Humidity 45 m (%) Average	649	0	95	87.23	97	-	-	-
Relative Humidity 75 m (%) Average	654	0	90	87.90	97	-	-	-
Relative Humidity 90 m (%) Average	656	0	88	88.17	97	-	-	-
Wind Speed 20 m (km/h) Average	682	0	62	91.67	35	-	-	-
Wind Speed 45 m (km/h) Average	588	0	156	79.03	40	-	-	-
Wind Speed 75 m (km/h) Average	557	0	187	74.87	45	-	-	-
Wind Speed 90 m (km/h) Average	560	0	184	75.27	45	-	-	-
Wind Direction 20 m (deg) Average	682	0	62	91.67	-	-	-	-
Wind Direction 45 m (deg) Average	588	0	156	79.03	-	-	-	-
Wind Direction 75 m (deg) Average	557	0	187	74.87	-	-	-	-
Wind Direction 90 m (deg) Average	560	0	184	75.27	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	682	0	62	91.67	0.7	-	-	-
Vertical Wind Speed 45 m (km/h) Average	588	0	156	79.03	2.4	-	-	-
Vertical Wind Speed 75 m (km/h) Average	557	0	187	74.87	4.3	-	-	-
Vertical Wind Speed 90 m (km/h) Average	560	0	184	75.27	4.6	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2015

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	1.8	5	-	0	0	0	0	1	4	60
H2S (ppb) Average	708	0.6	0	-	0	0	0	0	1	1	4
THC (ppm) Average	708	2.41	0.3	-	2.1	2.2	2.3	2.3	2.5	2.7	4.5
Temperature 2 m (C) Average	685	-14.35	9.8	-	-30.5	-26.2	-21.8	-16.7	-7.8	1.5	6.3
Temperature 20 m (C) Average	674	-14.07	9.8	-	-30.4	-25.4	-21.6	-17.1	-7.7	2	7.2
Temperature 45 m (C) Average	649	-14.15	9.8	-	-30.2	-24.8	-21.3	-17.4	-8.1	2.2	7.4
Temperature 75 m (C) Average	654	-13.87	9.7	-	-28.2	-23.8	-21.3	-17.6	-7.8	2.4	7.4
Temperature 90 m (C) Average	656	-13.75	9.7	-	-28.1	-23.7	-21.2	-17.1	-7	2.4	7.4
Relative Humidity 2 m (%) Average	685	79.9	7	-	56	72	75	78	84	91	98
Relative Humidity 20 m (%) Average	674	78.8	8	-	53	69	74	78	84	90	97
Relative Humidity 45 m (%) Average	649	77.4	8	-	52	68	72	77	83	88	97
Relative Humidity 75 m (%) Average	654	77.3	8	-	52	67	72	77	83	87	97
Relative Humidity 90 m (%) Average	656	77.8	8	-	52	68	73	78	84	88	97
Wind Speed 20 m (km/h) Average	682	10.3	6	-	0	4	6	9	14	17	35
Wind Speed 45 m (km/h) Average	588	14.9	8	-	1	5	9	15	20	25	40
Wind Speed 75 m (km/h) Average	557	18	9	-	1	6	11	18	24	31	45
Wind Speed 90 m (km/h) Average	560	19	10	-	1	7	12	19	26	33	45
Wind Direction 20 m (deg) Average	682	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	588	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	557	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	560	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	682	-0.03	0.3	-	-0.9	-0.4	-0.2	0	0.2	0.4	0.7
Vertical Wind Speed 45 m (km/h) Average	588	0.08	0.5	-	-1.1	-0.5	-0.3	0	0.4	0.7	2.4
Vertical Wind Speed 75 m (km/h) Average	557	0.07	0.5	-	-0.8	-0.4	-0.2	0	0.2	0.5	4.3
Vertical Wind Speed 90 m (km/h) Average	560	1.06	1	-	-1	0	0.3	0.8	1.7	2.6	4.6

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC	16 Jan 2015 14:00	16 Jan 2015 14:00	1	Power spike
Temperature, Relative Humidity 2 m	18 Jan 2015 00:00	18 Jan 2015 06:00	7	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 2 m	19 Jan 2015 08:00	20 Jan 2015 10:00	27	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 2 m	23 Jan 2015 07:00	23 Jan 2015 07:00	1	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 2 m	26 Jan 2015 19:00	27 Jan 2015 17:00	23	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 2 m	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	18 Jan 2015 00:00	18 Jan 2015 06:00	7	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	19 Jan 2015 07:00	20 Jan 2015 11:00	29	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	23 Jan 2015 07:00	23 Jan 2015 07:00	1	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	24 Jan 2015 03:00	24 Jan 2015 11:00	9	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	26 Jan 2015 19:00	27 Jan 2015 17:00	23	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 20 m	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 45 m	18 Jan 2015 00:00	18 Jan 2015 11:00	12	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 45 m	19 Jan 2015 07:00	20 Jan 2015 11:00	29	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 45 m	23 Jan 2015 07:00	24 Jan 2015 11:00	29	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 45 m	26 Jan 2015 19:00	27 Jan 2015 18:00	24	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 45 m	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 75 m	18 Jan 2015 00:00	18 Jan 2015 06:00	7	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 75 m	19 Jan 2015 08:00	20 Jan 2015 10:00	27	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 75 m	23 Jan 2015 04:00	24 Jan 2015 10:00	31	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 75 m	26 Jan 2015 19:00	27 Jan 2015 18:00	24	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 75 m	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 90 m	18 Jan 2015 00:00	18 Jan 2015 06:00	7	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 90 m	19 Jan 2015 07:00	20 Jan 2015 10:00	28	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 90 m	23 Jan 2015 07:00	24 Jan 2015 09:00	27	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 90 m	26 Jan 2015 18:00	27 Jan 2015 18:00	25	Flat line in sensor output signal - Sensor frozen
Temperature, Relative Humidity 90 m	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	18 Jan 2015 00:00	18 Jan 2015 06:00	7	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	19 Jan 2015 08:00	20 Jan 2015 02:00	19	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	20 Jan 2015 07:00	20 Jan 2015 09:00	3	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	23 Jan 2015 07:00	23 Jan 2015 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	24 Jan 2015 03:00	24 Jan 2015 10:00	8	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	26 Jan 2015 19:00	27 Jan 2015 17:00	23	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	18 Jan 2015 00:00	18 Jan 2015 12:00	13	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	19 Jan 2015 08:00	20 Jan 2015 02:00	19	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	20 Jan 2015 07:00	20 Jan 2015 09:00	3	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	23 Jan 2015 07:00	23 Jan 2015 12:00	6	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	23 Jan 2015 18:00	24 Jan 2015 11:00	18	Flat line in sensor output signal - Sensor frozen

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	26 Jan 2015 19:00	30 Jan 2015 19:00	97	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	18 Jan 2015 00:00	18 Jan 2015 07:00	8	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	19 Jan 2015 07:00	20 Jan 2015 02:00	20	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	20 Jan 2015 07:00	20 Jan 2015 10:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	23 Jan 2015 06:00	24 Jan 2015 10:00	29	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	26 Jan 2015 19:00	01 Feb 2015 00:00	126	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	18 Jan 2015 00:00	18 Jan 2015 07:00	8	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	19 Jan 2015 07:00	20 Jan 2015 10:00	28	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	23 Jan 2015 07:00	23 Jan 2015 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	23 Jan 2015 13:00	24 Jan 2015 09:00	21	Flat line in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	26 Jan 2015 19:00	01 Feb 2015 00:00	126	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 60 ppb on Jan 9 21:00 Maximum Daily Average: 7.0 ppb on Jan 27

Minimum Value: 0 ppb on Jan 15 06:00 Minimum Daily Average: 0.1 ppb on Jan 25
Maximum Diurnal Average: 3.7 ppb at hour 21 Minimum Diurnal Average: 0.7 ppb at hour 4
Monthly Average: 1.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 19$

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)																								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-Jan	0	Z	0	0	1	0	1	3	0	2	2	1	2	2	5	11	13	2	3	2	1	1	1	3	2.4	13
2-Jan	1	0	Z	2	1	1	1	3	1	1	1	1	1	1	2	1	1	0	1	1	1	1	1	1	1.1	3
3-Jan	8	9	1	Z	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1.4	9
4-Jan	1	1	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
5-Jan	0	0	0	0	0	Z	0	0	0	0	0	1	1	0	1	1	5	4	5	3	0	2	3	4	1.4	5
6-Jan	Z	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0.3	1
7-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4	8	8	17	5	4	5	5	2.7	17
8-Jan	7	2	Z	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	7
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	2	5	3	2	60	20	1	4	4.4	60
10-Jan	5	0	0	0	Z	0	0	0	1	1	2	4	4	2	1	1	1	1	1	1	1	1	1	1	1.3	5
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0.3	1
12-Jan	Z	1	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1	0	0	1	0	1.2	2
13-Jan	1	Z	1	5	5	3	2	4	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1.1	5
14-Jan	1	1	Z	1	1	0	1	7	4	0	0	0	1	2	0	0	0	0	0	6	10	0	0	0	1.5	10
15-Jan	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
16-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.4	1
17-Jan	0	0	0	0	0	Z	1	1	5	2	1	7	2	2	2	4	4	5	2	0	1	2	1	1	1.9	7
18-Jan	Z	1	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	0	0	0	0	0	0.4	1
19-Jan	0	Z	0	0	1	1	2	3	3	4	C	C	C	C	0	0	2	2	1	1	0	2	2	3	1.4	4
20-Jan	2	1	Z	0	1	2	9	6	1	3	5	1	2	9	7	8	9	7	6	5	3	2	2	1	4.0	9
21-Jan	1	1	0	Z	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
22-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0.3	3
23-Jan	0	1	2	1	1	Z	3	4	4	2	3	5	3	1	1	0	0	1	0	0	0	0	0	0	1.5	5
24-Jan	Z	0	0	0	0	0	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	1
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	12	35	21	4	33	17	6.5	35
27-Jan	39	41	12	Z	2	0	0	0	0	0	1	0	0	0	2	5	7	5	8	17	0	2	6	14	7.0	41
28-Jan	16	4	2	1	Z	0	1	1	4	21	3	5	4	1	3	4	3	1	0	0	0	0	0	0	3.4	21
29-Jan	0	0	0	0	0	Z	0	1	1	1	1	1	1	1	0	1	0	3	5	3	4	5	4	9	1.8	9
30-Jan	Z	2	14	2	3	16	9	6	1	14	7	3	11	6	0	0	0	0	1	0	0	0	0	0	4.3	16
31-Jan	0	Z	0	0	0	0	0	1	0	0	1	1	2	1	1	1	1	1	1	1	0	0	0	0	0.7	2
	3.2	2.7	1.5	0.7	0.8	1.2	1.2	1.5	1.1	1.8	1.1	1.3	1.3	1.2	1.1	1.5	1.9	2.4	2.0	3.1	3.7	1.7	2.1	2.2	Diurnal Average	
	39	41	14	5	5	16	9	7	5	21	7	7	11	9	7	11	13	26	12	35	60	20	33	17	Diurnal Maximum	

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

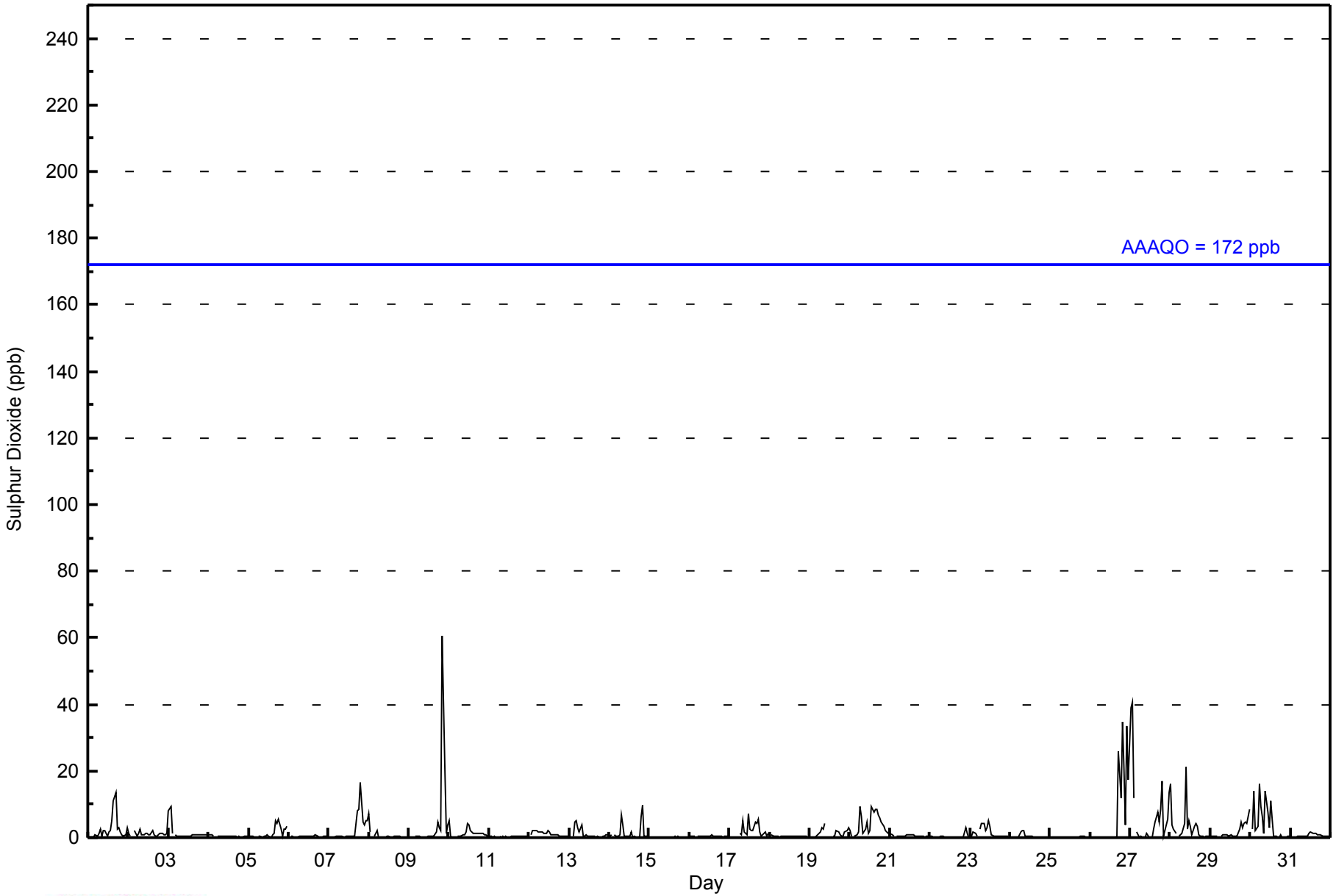
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	687	96.90	96.90
11 - 20	14	1.97	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: 709

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	54	60	15	2	6	5	45	163	28	19	31	62	65	24	23	37	639
11 - 20	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	11
21 - 60	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	66	15	2	6	5	45	163	28	19	31	62	65	24	23	39	653

Total Number of Valid Hours: 653

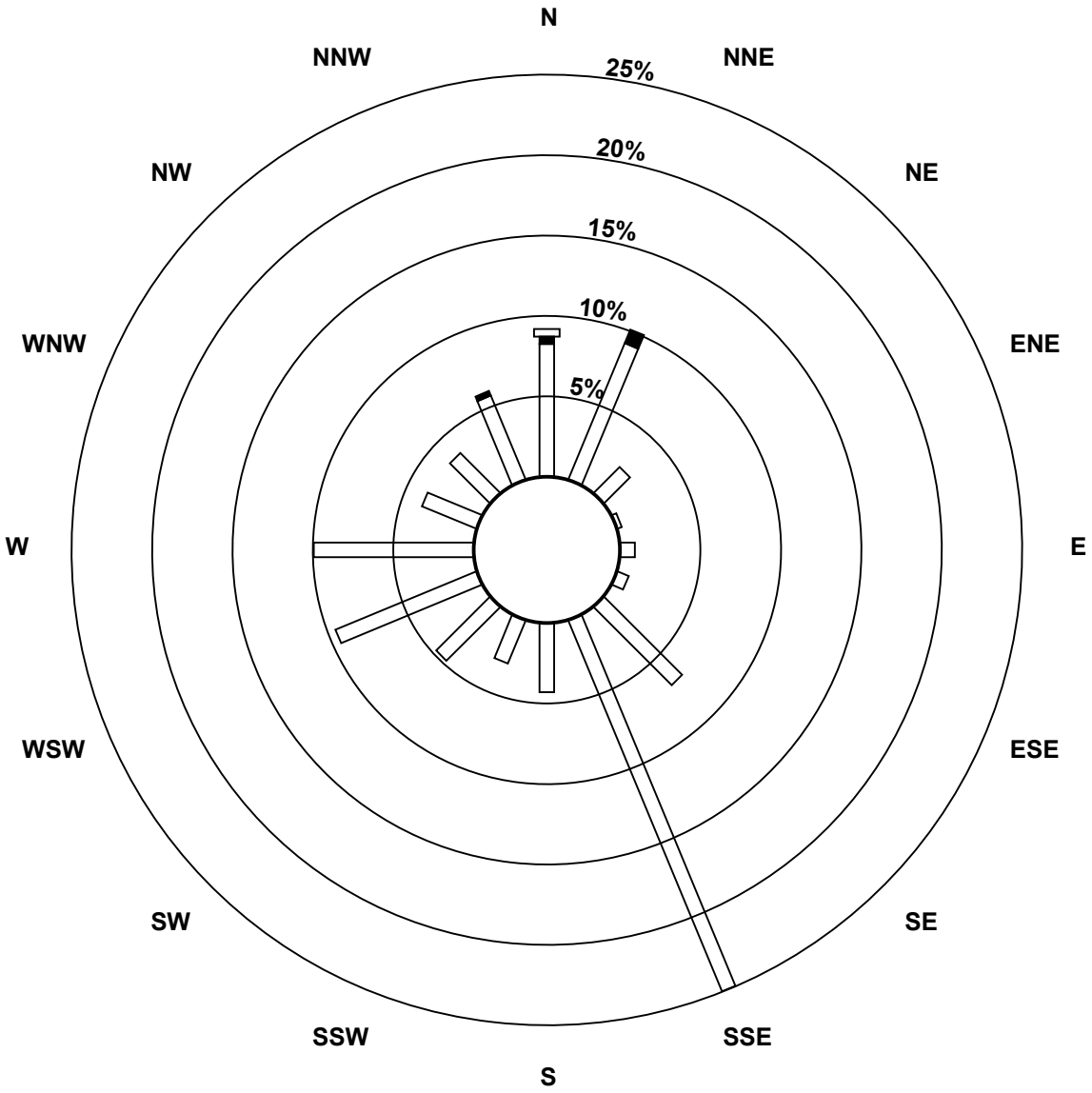
Total Number of Hours: 744

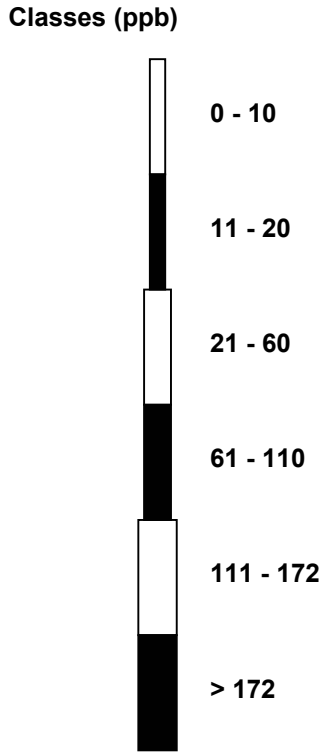
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Mannix (AMS 5)





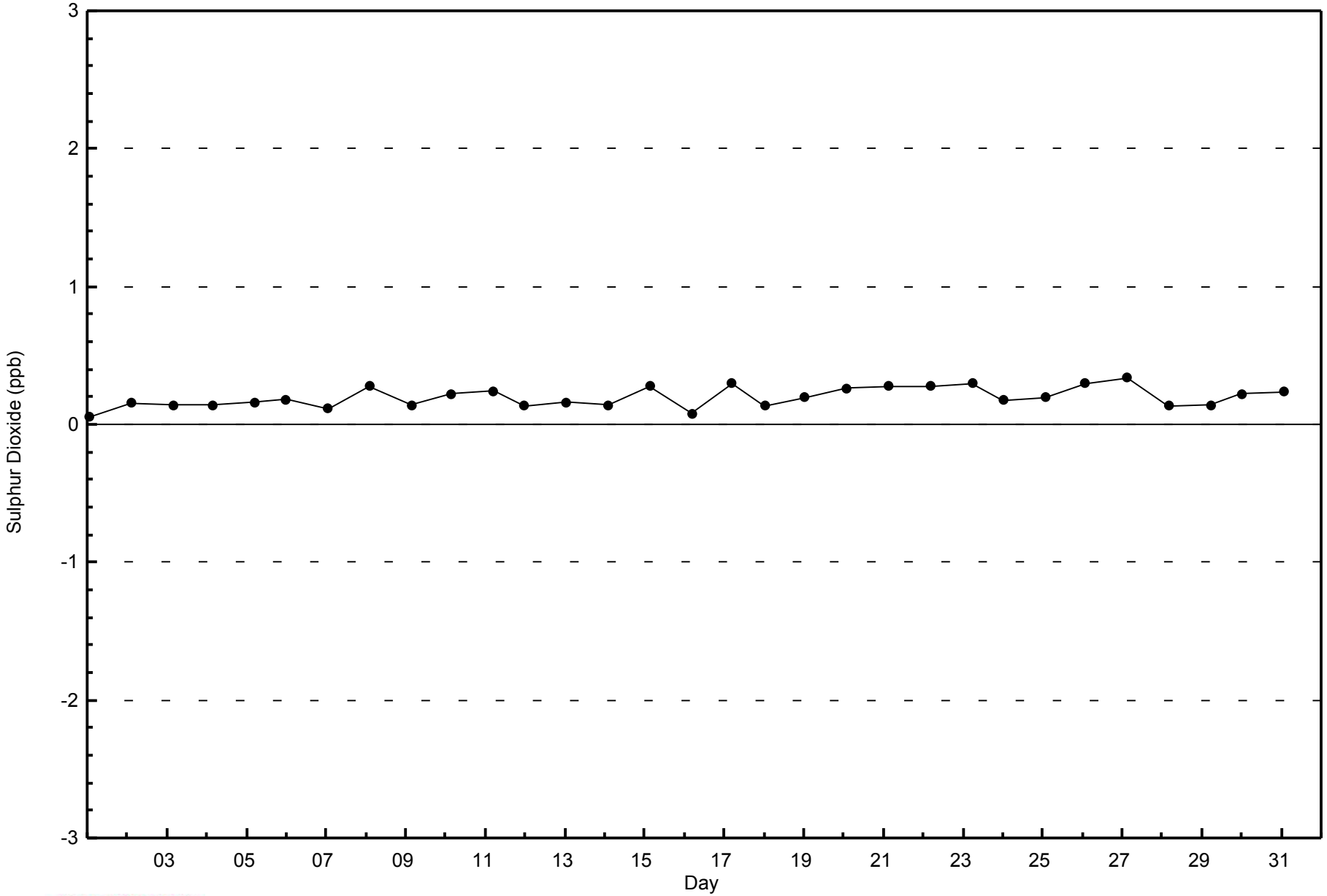
Total Number of Valid Hours: 653

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2015



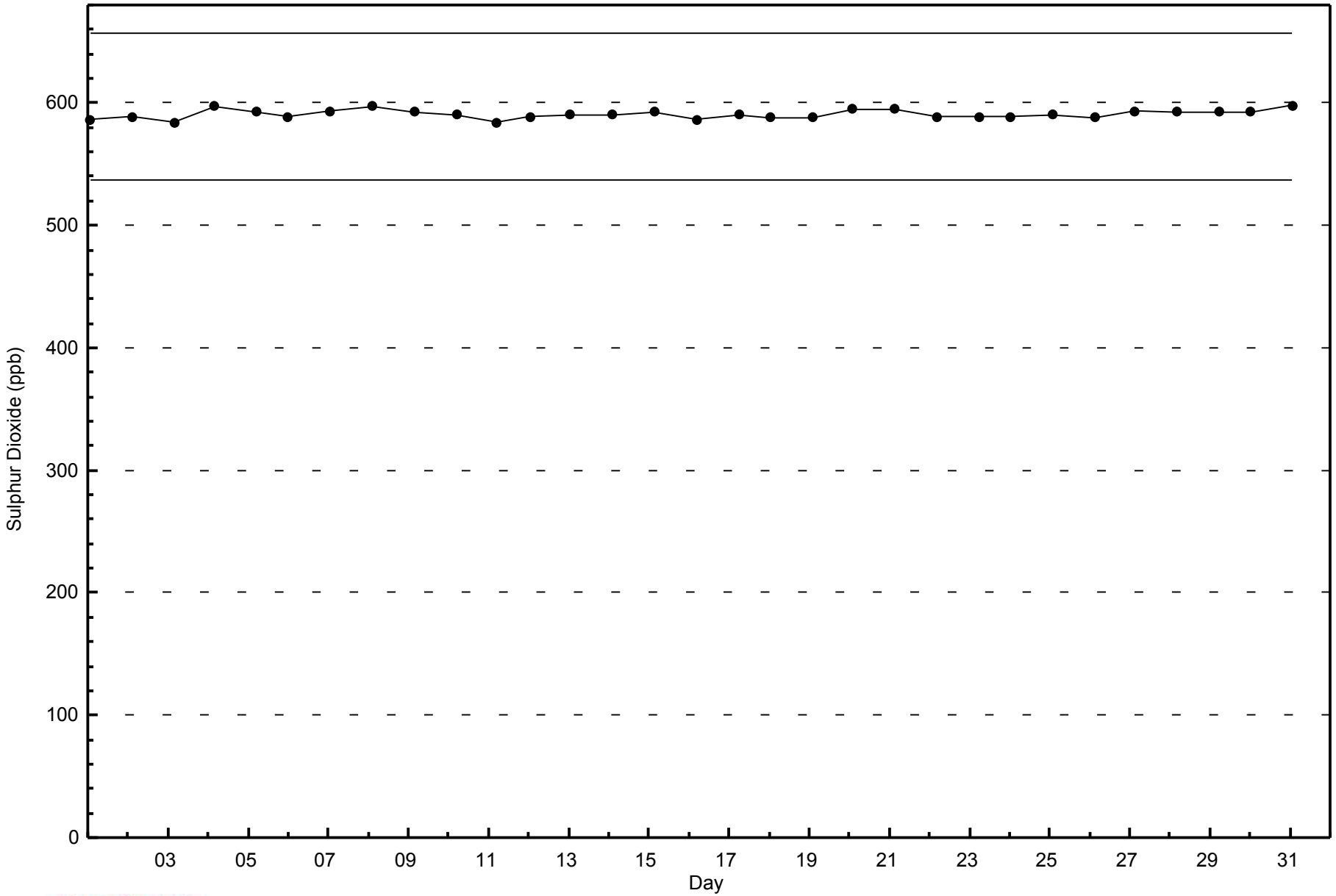
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 ppb on Jan 9 21:00 Maximum Daily Average: 1.0 ppb on Jan 19

Minimum Value: 0 ppb on Jan 17 06:00 Minimum Daily Average: 0.1 ppb on Jan 22
Maximum Diurnal Average: 0.7 ppb at hour 21 Minimum Diurnal Average: 0.4 ppb at hour 14
Monthly Average: 0.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

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-Jan	0	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
2-Jan	1	1	1	Z	1	0	0	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	1	1	1.0	2
3-Jan	1	1	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
4-Jan	0	0	1	1	1	Z	1	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0.5	1
5-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0.5	1
6-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
7-Jan	0	0	Z	0	1	1	1	1	1	1	1	0	0	0	0	0	2	2	1	1	1	1	1	1	0.8	2
8-Jan	1	1	1	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
9-Jan	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	1	1	1	2	2	2	4	2	1	1	0.9	4
10-Jan	1	1	1	0	1	Z	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	0.9	2
11-Jan	1	1	0	1	0	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
12-Jan	1	Z	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	0	1	1	0	0	0	0	0.8	2
13-Jan	0	1	Z	2	2	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0.7	2
14-Jan	0	0	0	Z	1	0	1	1	1	1	1	1	1	0	0	0	0	1	0	0	1	1	0	1	0.5	1
15-Jan	1	0	0	1	Z	1	1	1	1	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0.5	1
16-Jan	0	0	0	0	0	Z	0	0	0	0	C	C	C	C	C	1	1	1	0	0	0	0	0	0	0.4	1
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0.3	1
18-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	0	0.4	1
19-Jan	1	1	Z	1	2	3	2	2	2	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1.0	3
20-Jan	1	0	1	Z	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0.6	1
21-Jan	0	0	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Jan	0	0	0	0	0	1	Z	2	2	1	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1.0	2
24-Jan	0	Z	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
25-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0.2	1
26-Jan	0	1	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	1	0	1	1	0.4	1
27-Jan	1	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.4	1
28-Jan	1	1	0	0	0	Z	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0.6	1
29-Jan	0	0	0	0	0	0	Z	0	1	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0.6	1
30-Jan	0	Z	1	0	0	1	1	0	0	1	1	0	0	0	1	0	0	0	1	1	1	0	0	0	0.5	1
31-Jan	0	0	Z	1	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.4	1
	0.5	0.5	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.5	0.5	0.5	Diurnal Average	
	1	1	1	2	2	3	2	2	2	1	2	2	1	1	1	1	2	2	2	2	4	2	1	1	Diurnal Maximum	

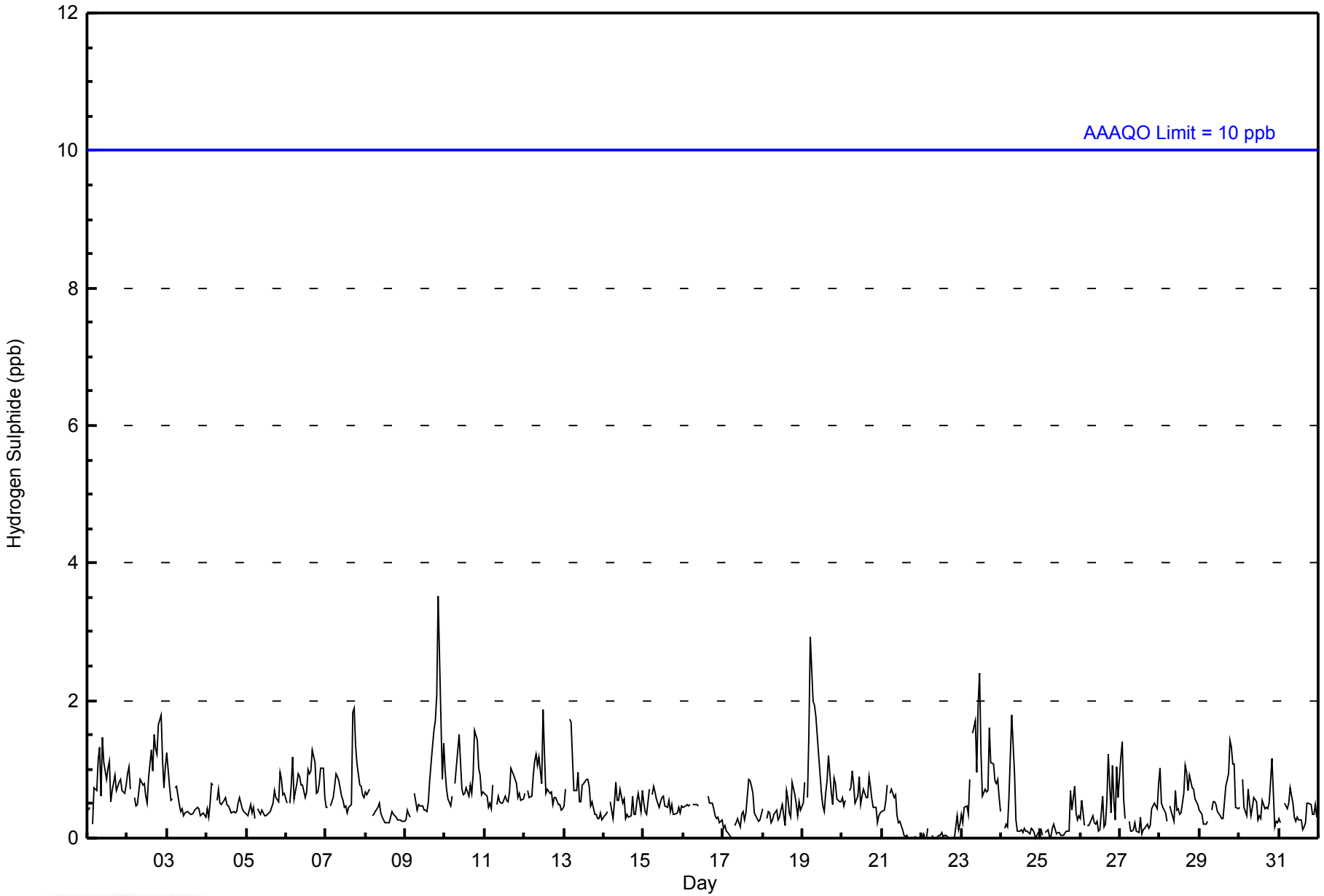
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2015



AURORA ATMOSPHERICS INC.

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

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	57	68	16	2	6	6	45	158	30	19	32	57	67	22	21	41	647
3 - 4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	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	59	68	16	2	6	6	45	158	30	19	32	57	67	22	21	41	649

Total Number of Valid Hours: 649

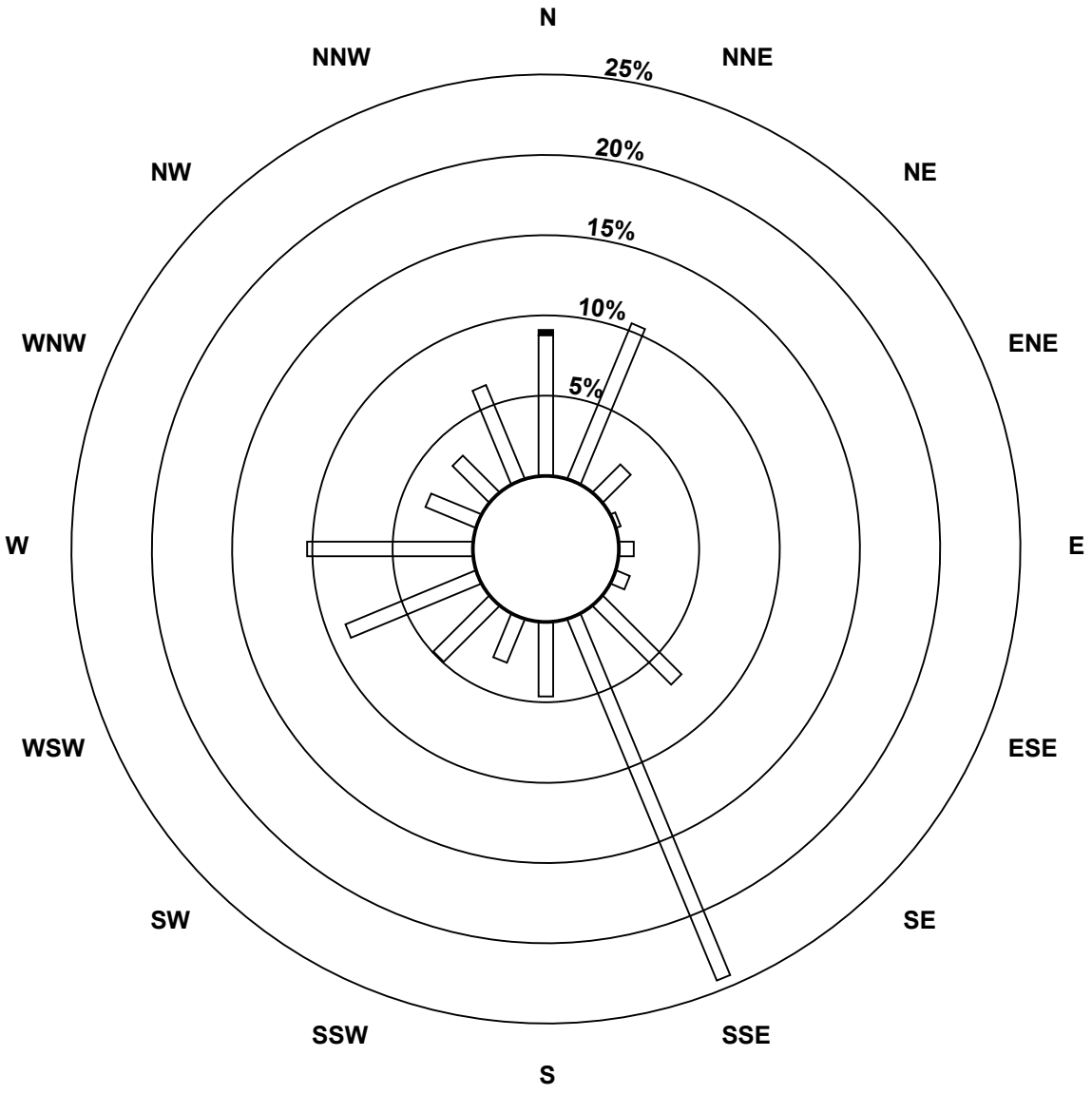
Total Number of Hours: 744

Wood Buffalo Environmental Association

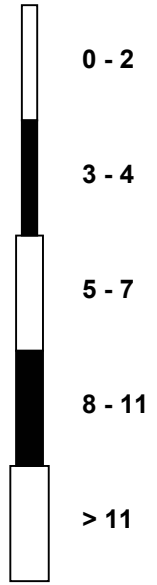
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

Mannix (AMS 5)



Classes (ppb)



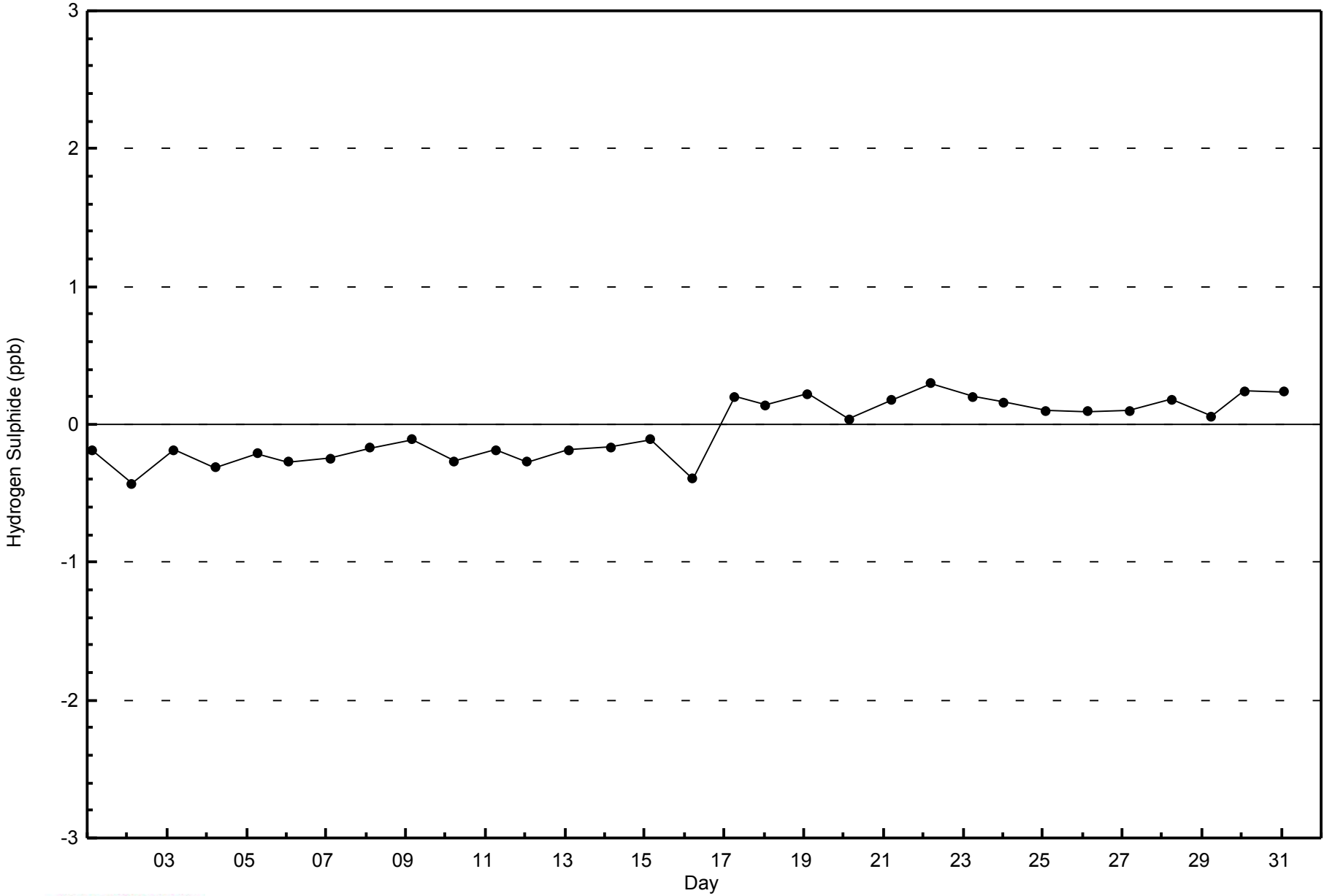
Total Number of Valid Hours: 649

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2015



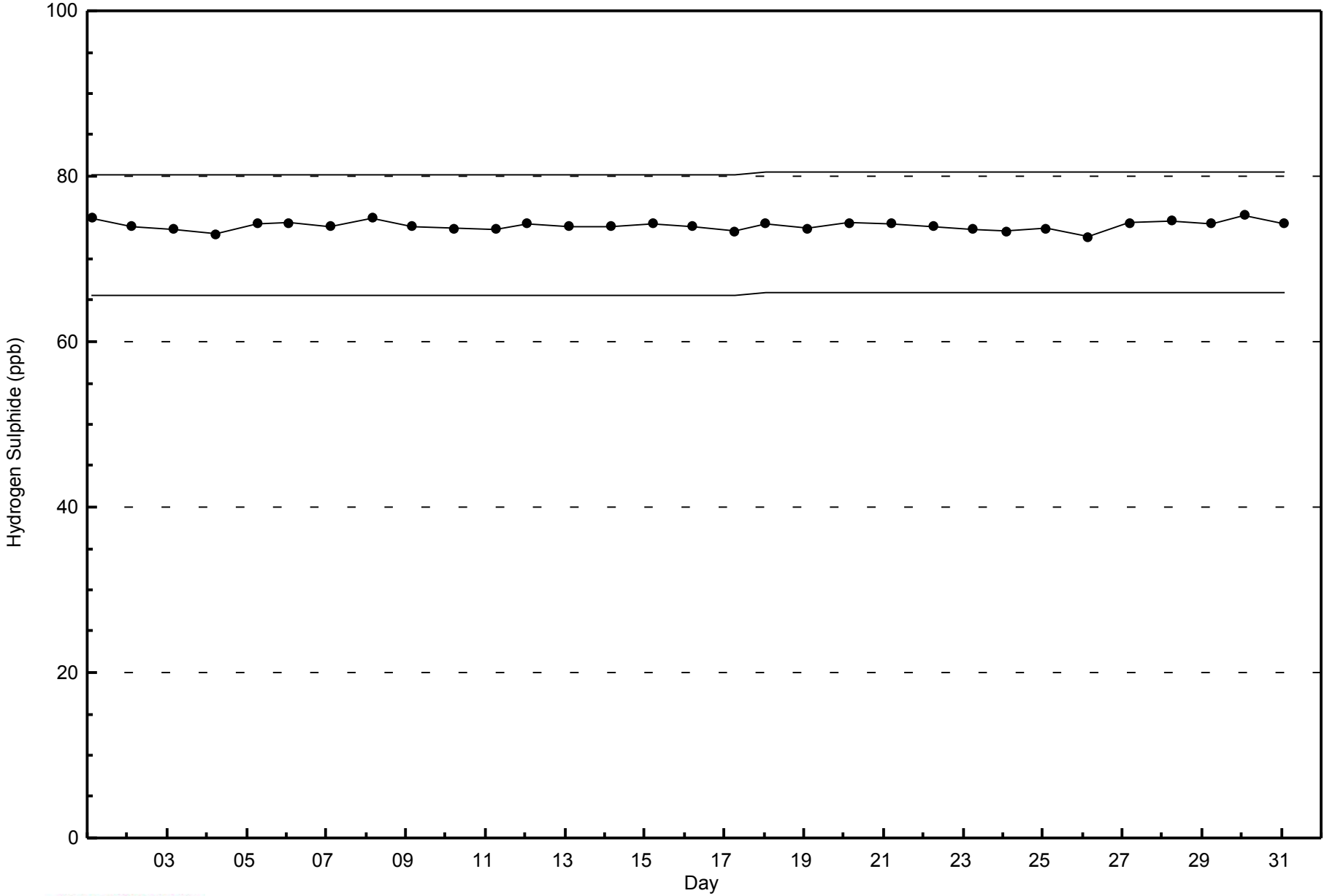
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - January 2015

Maximum Value: 4.5 ppm on Jan 7 17:00

Maximum Daily Average: 2.9 ppm on Jan 23

Minimum Value: 2.1 ppm on Jan 25 10:00

Minimum Daily Average: 2.2 ppm on Jan 22

Maximum Diurnal Average: 2.5 ppm at hour 17

Minimum Diurnal Average: 2.3 ppm at hour 3

Monthly Average: 2.41 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.3 Median = 2.3 Q_3 = 2.5 P_{90} = 2.7 P_{99} = 3.7

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)																								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-Jan	2.3	Z	2.2	2.2	2.4	2.4	3.6	2.9	2.4	2.5	3.5	3.6	3.2	3.1	2.3	2.4	2.3	2.3	2.3	2.5	2.5	2.4	2.4	2.3	2.6	3.6
2-Jan	2.5	2.7	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.3	2.4	2.7	2.9	2.9	2.8	2.5	2.7	2.7	2.7	2.8	2.7	2.8	2.6	2.9
3-Jan	2.6	2.4	2.4	Z	2.5	2.6	2.7	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	2.4	2.7
4-Jan	2.3	2.3	2.3	2.4	Z	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4
5-Jan	2.2	2.2	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.6	2.4	2.4	2.7	3.0	2.3	2.3	2.3	2.3	3.0
6-Jan	Z	2.3	2.3	2.4	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.5	2.9	2.5	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.9
7-Jan	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	3.7	4.5	3.2	2.7	2.3	2.3	3.0	2.7	2.4	2.5	4.5
8-Jan	2.2	2.3	Z	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
9-Jan	2.2	2.3	2.3	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.8	2.8	3.5	3.3	4.2	3.2	2.6	2.9	2.6	2.6	4.2
10-Jan	2.5	2.3	2.3	2.2	Z	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.7	2.8	2.4	2.4	2.4	2.4	2.4	2.8
11-Jan	2.4	2.5	2.4	2.5	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5
12-Jan	Z	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	3.0	2.9	2.6	2.5	2.5	2.6	2.5	2.5	2.5	2.4	2.5	2.5	2.5	2.5	3.0
13-Jan	2.5	Z	2.7	2.9	3.0	2.8	2.5	2.4	2.4	2.3	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.5	3.0
14-Jan	2.2	2.2	Z	2.2	2.2	2.2	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
15-Jan	2.3	2.3	2.3	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.4	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	2.3	2.5
16-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.5	PF	2.7	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.7
17-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.9	2.6	2.4	2.3	2.2	2.3	2.3	2.9
18-Jan	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.6	2.8	2.3	2.3	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.8
19-Jan	2.5	Z	2.3	2.5	3.0	3.8	3.6	3.4	3.4	3.0	C	C	C	C	3.2	3.2	2.8	2.4	2.6	2.8	2.8	2.4	2.3	2.3	2.9	3.8
20-Jan	2.4	2.6	Z	2.5	2.6	2.5	2.4	2.3	2.4	2.3	2.3	2.5	2.5	3.0	2.7	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.5	3.0
21-Jan	2.4	2.3	2.3	Z	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
22-Jan	2.1	2.7	2.2	2.1	Z	3.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.2	3.0
23-Jan	2.3	2.2	2.3	2.3	2.3	Z	2.4	2.9	2.7	2.8	4.1	3.3	3.1	2.8	3.1	3.0	3.0	3.7	3.3	3.0	2.7	2.8	2.9	2.8	2.9	4.1
24-Jan	Z	2.4	2.3	2.4	2.3	2.6	4.0	4.1	3.2	2.5	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	4.1
25-Jan	2.3	Z	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.7	2.3	2.3	2.4	2.4	2.5	2.2	2.7
26-Jan	2.5	2.7	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.4	2.2	2.6	2.2	2.2	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.7
27-Jan	2.3	2.4	2.4	Z	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.4
28-Jan	2.4	2.3	2.3	2.5	Z	2.5	2.5	2.4	2.3	2.3	2.3	2.4	2.5	2.5	2.6	2.9	2.8	2.6	2.6	2.5	2.5	2.4	2.5	2.8	2.5	2.9
29-Jan	2.4	2.4	2.3	2.3	2.3	Z	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.5	2.5	2.6	2.9	2.7	2.9	2.7	2.4	2.4	2.4	2.9
30-Jan	Z	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.5
31-Jan	2.5	Z	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5
	2.3	2.4	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	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	Diurnal Average	
	2.6	2.7	2.7	2.9	3.0	3.8	4.0	4.1	3.4	3.0	4.1	3.6	3.2	3.1	3.2	3.7	4.5	3.7	3.3	4.2	3.2	3.0	2.9	2.8	Diurnal Maximum	

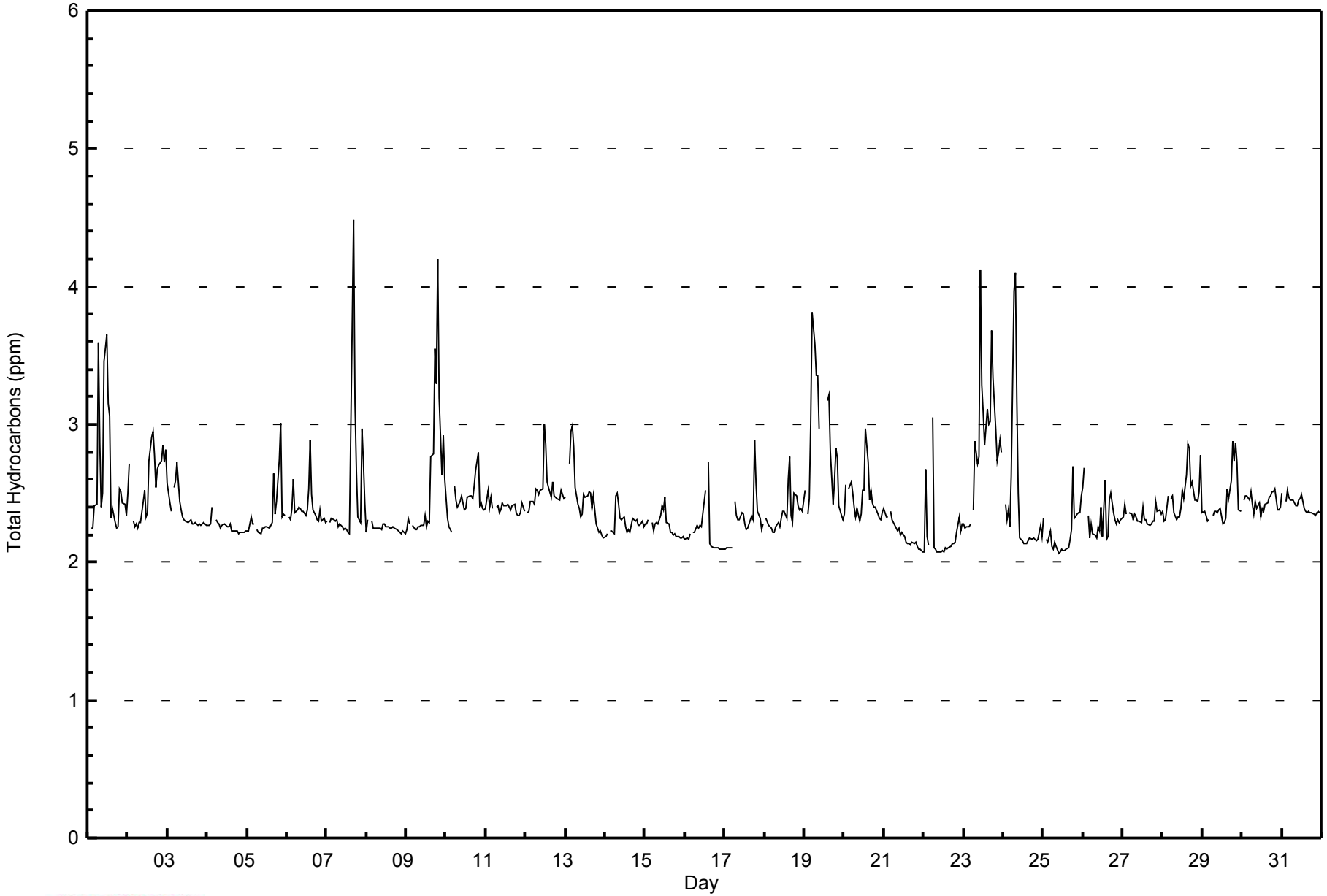
Z - zerospan C - Calibration PF - Power Failure

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	681	96.19	96.19
3.1 - 10.0	27	3.81	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mannix - January 2015

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	56	66	15	2	5	5	45	162	28	19	29	62	65	20	16	37	632
3.1 - 10.0	4	0	0	0	1	0	0	0	0	0	2	0	0	4	7	2	20
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	60	66	15	2	6	5	45	162	28	19	31	62	65	24	23	39	652

Total Number of Valid Hours: 652

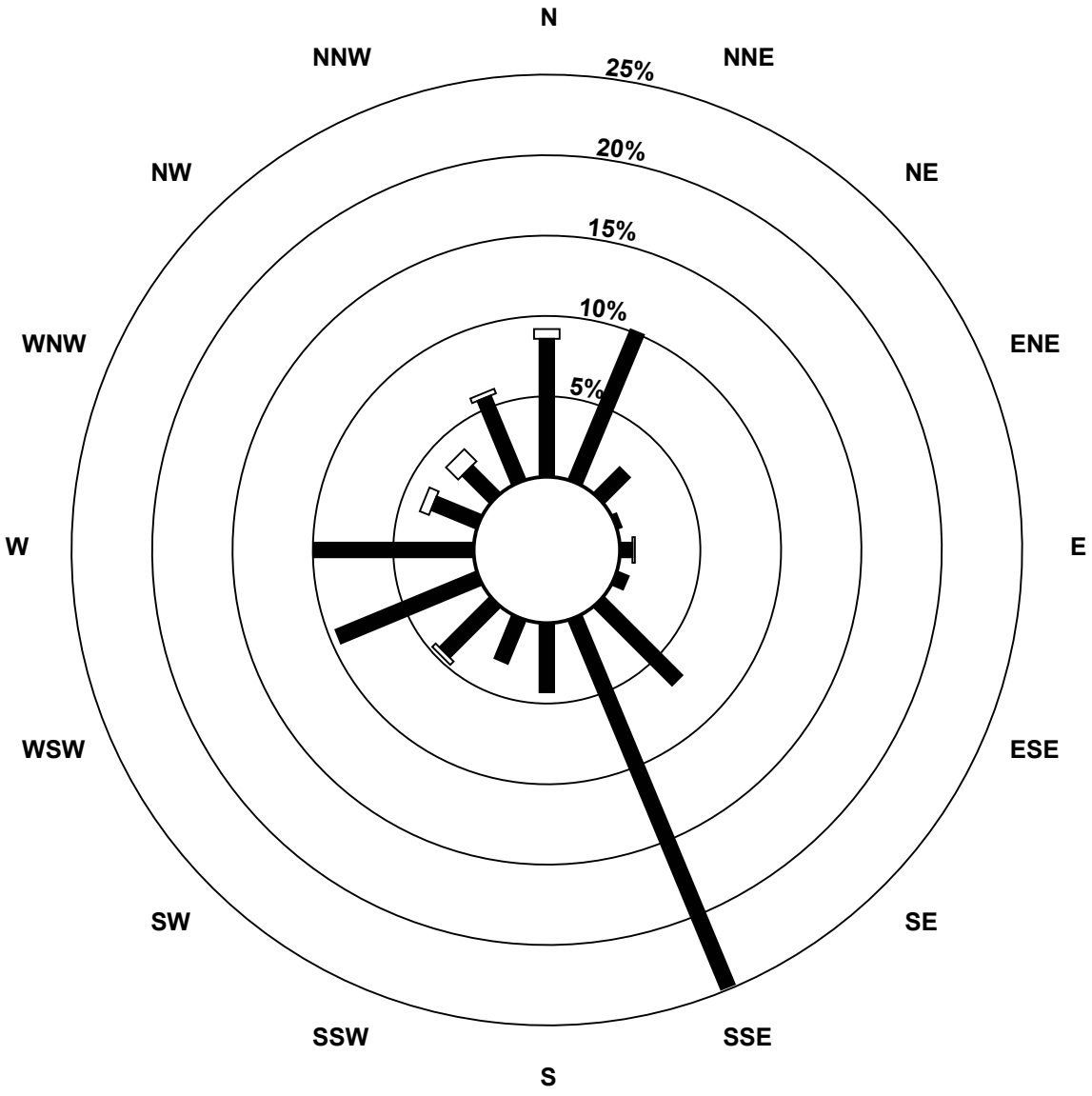
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Mannix (AMS 5)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

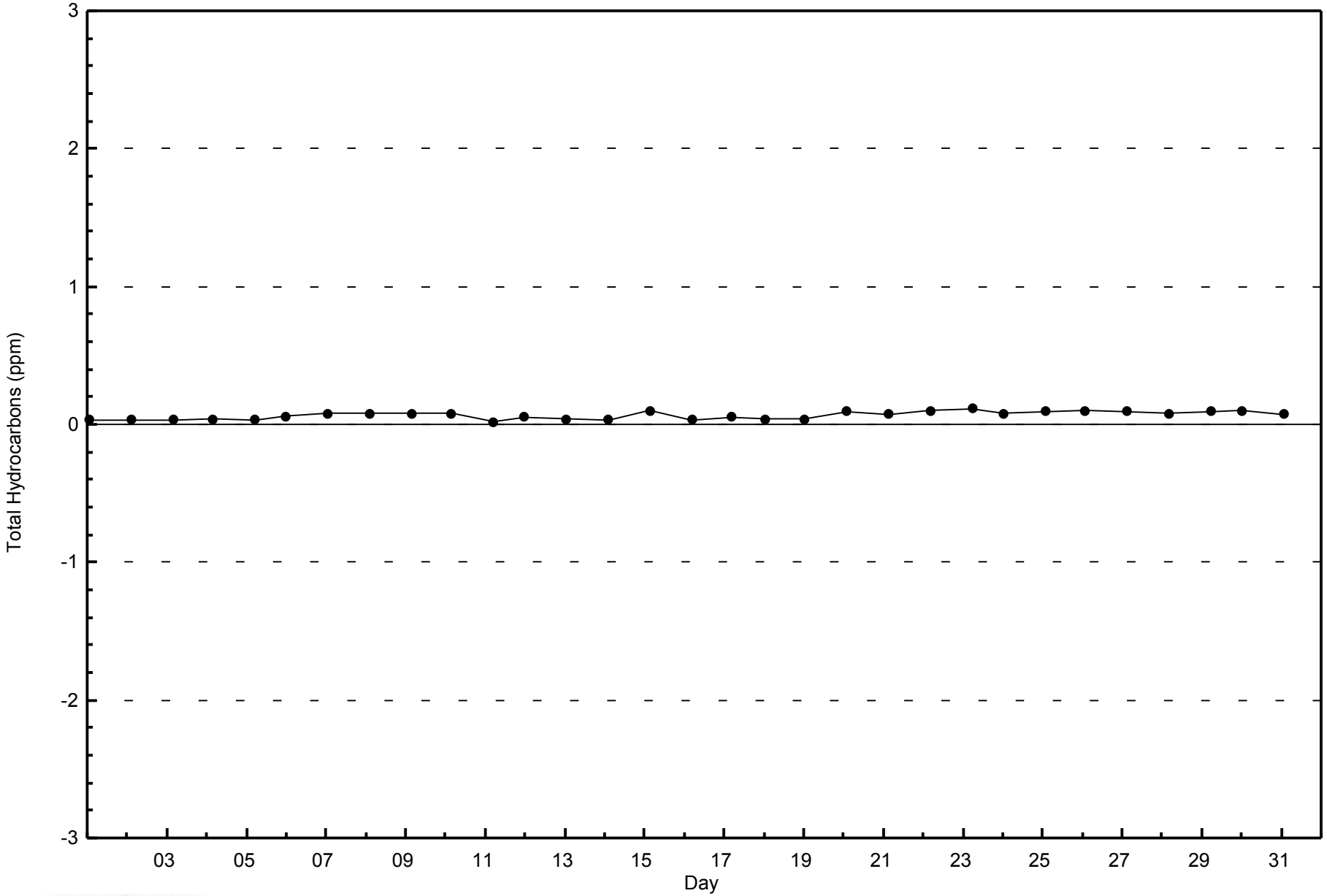
Total Number of Valid Hours: 652

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Mannix - January 2015



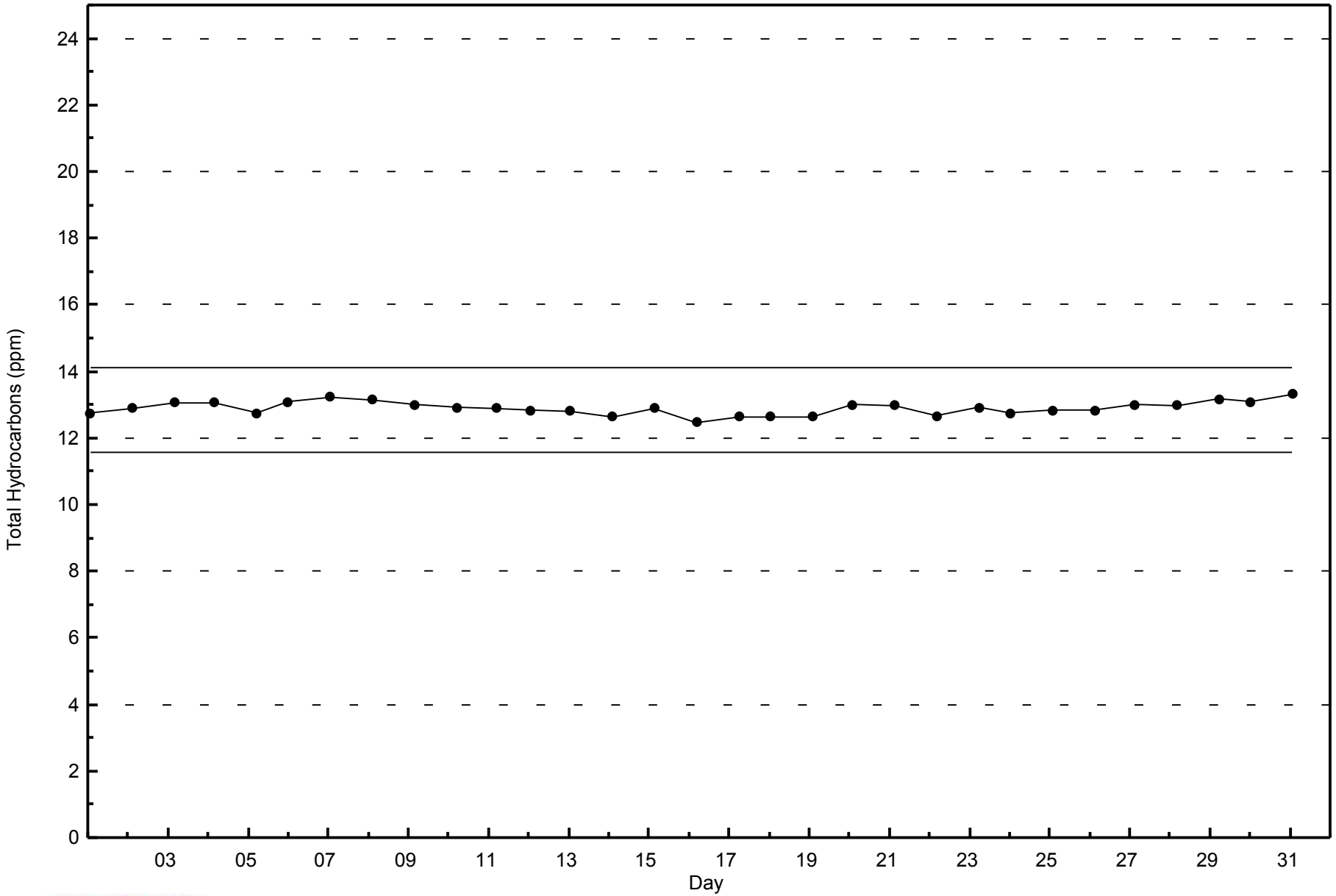
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 6.3 C on Jan 22 19:00

Maximum Daily Average: 3.9 C on Jan 22

Minimum Value: -30.5 C on Jan 31 08:00

Minimum Daily Average: -26.9 C on Jan 3

Maximum Diurnal Average: -12.0 C at hour 16

Minimum Diurnal Average: -15.7 C at hour 8

Monthly Average: -14.35 C

Percentiles: P_1 = -29.8 P_{10} = -26.2 Q_1 = -21.8 Median = -16.7 Q_3 = -7.8 P_{90} = 1.5 P_{99} = 6.0

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	0
Percent Operational Time:	92.1

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-Jan	-12.9	-13.5	-14.3	-14.7	-14.7	-15.1	-15.4	-15.7	-15.7	-15.5	-15.8	-15.6	-15.2	-15.7	-16.8	-17.8	-18.9	-20.1	-20.2	-20.9	-21.1	-21.3	-21.6	-20.2	-17.0	-12.9
2-Jan	-20.3	-21.6	-21.6	-21.5	-21.5	-21.8	-22.2	-22.6	-23.4	-24.0	-22.7	-22.2	-22.2	-21.8	-21.8	-23.1	-23.5	-25.1	-26.2	-26.9	-27.2	-26.4	-25.3	-25.4	-23.3	-20.3
3-Jan	-24.7	-25.0	-25.8	-26.3	-26.9	-26.1	-27.0	-28.0	-28.7	-29.0	-28.0	-28.0	-26.9	-25.9	-25.7	-26.0	-26.8	-27.5	-27.4	-26.8	-26.5	-26.4	-27.0	-27.9	-26.9	-24.7
4-Jan	-28.0	-27.3	-27.9	-29.6	-29.9	-28.1	-28.0	-27.7	-26.3	-27.3	-25.7	-24.4	-22.3	-21.1	-19.6	-18.0	-18.8	-18.0	-17.1	-17.5	-19.2	-18.8	-18.7	-19.4	-23.3	-17.1
5-Jan	-20.3	-19.8	-20.4	-20.7	-19.7	-18.1	-17.4	-16.7	-16.3	-16.1	-15.7	-15.5	-15.2	-15.2	-15.1	-15.5	-15.5	-15.8	-15.9	-16.4	-18.1	-18.6	-19.4	-20.3	-17.4	-15.1
6-Jan	-20.9	-21.6	-22.8	-23.0	-23.2	-24.1	-25.3	-26.9	-27.5	-28.4	-27.4	-24.5	-23.6	-23.9	-22.8	-22.9	-24.1	-23.7	-23.4	-23.4	-24.5	-25.0	-25.6	-25.8	-24.3	-20.9
7-Jan	-25.3	-25.8	-25.5	-25.2	-24.8	-24.7	-26.2	-25.1	-24.0	-23.3	-21.8	-19.9	-18.4	-18.0	-18.3	-17.8	-17.7	-17.7	-16.8	-16.2	-16.3	-16.1	-15.0	-14.7	-20.6	-14.7
8-Jan	-17.5	-19.8	-19.8	-18.1	-18.7	-19.4	-20.1	-21.4	-22.0	-21.7	-20.8	-19.2	-18.3	-17.9	-17.5	-18.2	-19.3	-20.1	-20.5	-21.1	-21.4	-21.4	-22.7	-22.3	-20.0	-17.5
9-Jan	-23.8	-24.9	-25.6	-24.9	-25.5	-26.1	-25.8	-26.0	-26.3	-25.8	-23.9	-22.7	-21.1	-20.0	-19.4	-19.3	-20.4	-21.2	-22.5	-23.4	-21.3	-21.1	-20.3	-19.9	-23.0	-19.3
10-Jan	-20.6	-21.4	-22.6	-22.9	-23.7	-23.4	-24.8	-27.4	-28.4	-28.5	-26.9	-26.1	-25.4	-24.8	-23.4	-23.2	-23.9	-24.3	-25.3	-25.4	-25.7	-26.4	-26.8	-27.3	-24.9	-20.6
11-Jan	-27.8	-28.1	-27.9	-27.8	-28.2	-28.4	-28.1	-27.9	-28.4	-27.9	-26.2	-25.1	-23.9	-22.2	-20.6	-20.3	-22.2	-22.3	-22.1	-21.2	-20.8	-19.7	-19.7	-20.1	-24.4	-19.7
12-Jan	-20.8	-20.5	-19.4	-19.9	-20.1	-19.8	-18.7	-17.0	-16.4	-15.9	-15.1	-14.8	-14.3	-13.8	-13.4	-13.4	-14.1	-12.9	-12.1	-11.5	-10.8	-10.4	-9.9	-9.6	-15.2	-9.6
13-Jan	-9.0	-9.3	-9.2	-7.7	-8.1	-8.9	-9.7	-10.0	-10.3	-10.4	-10.6	-10.9	-11.1	-10.6	-10.2	-10.0	-9.8	-9.7	-9.3	-9.0	-8.7	-8.3	-8.1	-7.8	-9.4	-7.7
14-Jan	-7.8	-7.4	-8.1	-8.7	-9.0	-3.8	-2.5	-5.8	-7.5	-7.7	-7.9	-8.2	-8.4	-8.2	-8.9	-9.4	-10.6	-12.4	-13.7	-14.4	-14.5	-14.9	-15.6	-16.2	-9.7	-2.5
15-Jan	-17.0	-17.4	-17.3	-17.3	-17.4	-17.6	-17.7	-17.7	-17.7	-17.6	-17.5	-17.1	-16.5	-15.8	-15.5	-14.9	-14.6	-14.5	-14.3	-14.1	-13.5	-13.1	-12.5	-12.0	-15.9	-12.0
16-Jan	-11.3	-10.8	-10.5	-10.0	-9.4	-8.7	-8.0	-7.7	-7.3	-6.7	-6.3	-5.6	-4.6	-3.3	-1.3	1.6	1.8	2.1	2.0	1.6	1.6	1.6	1.5	2.0	-4.0	2.1
17-Jan	1.3	1.1	1.3	1.6	1.1	0.4	-1.6	-6.1	-8.1	-9.1	-9.0	-8.6	-8.0	-7.9	-7.9	-8.1	-8.4	-8.7	-8.8	-9.0	-9.0	-9.7	-11.4	AF	-5.8	1.6
18-Jan	AF	AF	AF	AF	AF	AF	-10.2	-10.8	-11.3	-10.6	-9.1	-8.5	-7.4	-4.9	-4.1	-3.8	-5.8	-5.9	-7.0	-6.9	-6.9	-7.6	-8.7	-8.7	-7.7	-3.8
19-Jan	-8.9	-9.4	-9.8	-10.7	-11.2	-11.1	-10.7	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-8.9
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-12.7	-12.4	-12.0	-12.0	-11.9	-11.7	-12.2	-11.5	-11.0	-11.1	-10.5	-10.2	-10.3	-9.5	--	-9.5
21-Jan	-9.5	-9.5	-10.6	-11.6	-9.8	-10.0	-10.1	-8.5	-7.1	-5.8	-4.3	-2.6	-0.2	1.6	2.3	2.7	2.8	2.7	2.6	1.9	2.6	2.8	3.2	4.0	-2.9	4.0
22-Jan	4.5	2.5	1.5	1.5	1.5	2.6	4.7	6.0	6.2	5.0	3.7	4.0	5.0	5.9	6.0	6.2	6.0	6.2	6.3	5.7	5.4	0.3	-1.2	-1.9	3.9	6.3
23-Jan	-2.4	-2.7	-3.3	-3.7	-4.0	-4.1	AF	-3.9	-4.0	-3.9	-3.4	-3.0	-3.3	-3.4	-3.3	-3.1	-3.2	-3.2	-4.0	-4.8	-5.7	-6.1	-5.0	-4.6	-3.8	-2.4
24-Jan	-3.8	-2.4	-1.3	-0.4	-0.1	0.1	0.1	0.1	0.2	0.6	1.0	1.5	2.6	3.4	4.2	4.2	3.3	2.9	1.8	1.9	1.7	0.6	-0.3	-0.7	0.9	4.2
25-Jan	-0.2	0.0	-0.1	0.3	0.8	1.1	1.5	1.3	1.6	4.1	5.3	5.5	5.4	5.8	5.4	5.3	5.3	5.1	3.9	2.2	0.9	-0.5	-1.5	-1.7	2.4	5.8
26-Jan	-1.9	-2.2	-2.6	-2.4	-2.2	-1.5	-2.3	-2.5	-2.8	-2.5	-0.2	2.3	3.5	3.2	3.6	3.9	1.8	-3.9	AF	AF	AF	AF	AF	AF	-0.5	3.9
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-18.4	-18.6	-18.8	-18.8	-18.5	-18.6	-18.6	--	-18.4
28-Jan	-18.5	-18.9	-19.3	-19.5	-19.9	-19.6	-20.4	-21.5	AF	-21.9	-21.2	-20.6	-20.0	-19.5	-18.9	-19.0	-19.6	-20.1	-20.2	-20.1	-20.4	-20.6	-20.7	-20.6	-20.0	-18.5
29-Jan	-20.6	-20.6	-20.8	-20.8	-20.8	-20.6	-20.7	-20.6	-20.1	-19.5	-18.5	-17.0	-16.0	-15.1	-14.6	-14.2	-13.8	-13.8	-14.3	-14.8	-14.6	-14.6	-14.7	-15.5	-17.4	-13.8
30-Jan	-16.8	-17.9	-18.2	-19.0	-19.9	-19.6	-19.4	-19.4	-20.3	-20.4	-20.4	-19.9	-20.0	-19.9	-20.4	-20.8	-21.5	-22.6	-23.5	-24.6	-25.5	-26.3	-26.8	-27.5	-21.3	-16.8
31-Jan	-27.4	-27.8	-28.2	-29.2	-30.3	-30.1	-30.3	-30.5	-30.4	-30.1	-28.9	-26.8	-25.3	-23.2	-22.0	-21.4	-21.7	-23.0	-23.5	-23.9	-24.2	-24.4	-25.4	-25.0	-26.4	-21.4
	-14.7	-15.1	-15.4	-15.4	-15.6	-15.2	-15.6	-15.7	-15.6	-15.7	-14.8	-14.0	-13.2	-12.6	-12.1	-12.0	-12.6	-13.2	-13.8	-14.1	-14.2	-14.5	-14.8	-14.9	Diurnal Average	
	4.5	2.5	1.5	1.6	1.5	2.6	4.7	6.0	6.2	5.0	5.3	5.5	5.4	5.9	6.0	6.2	6.0	6.2	6.3	5.7	5.4	2.8	3.2	4.0	Diurnal Maximum	

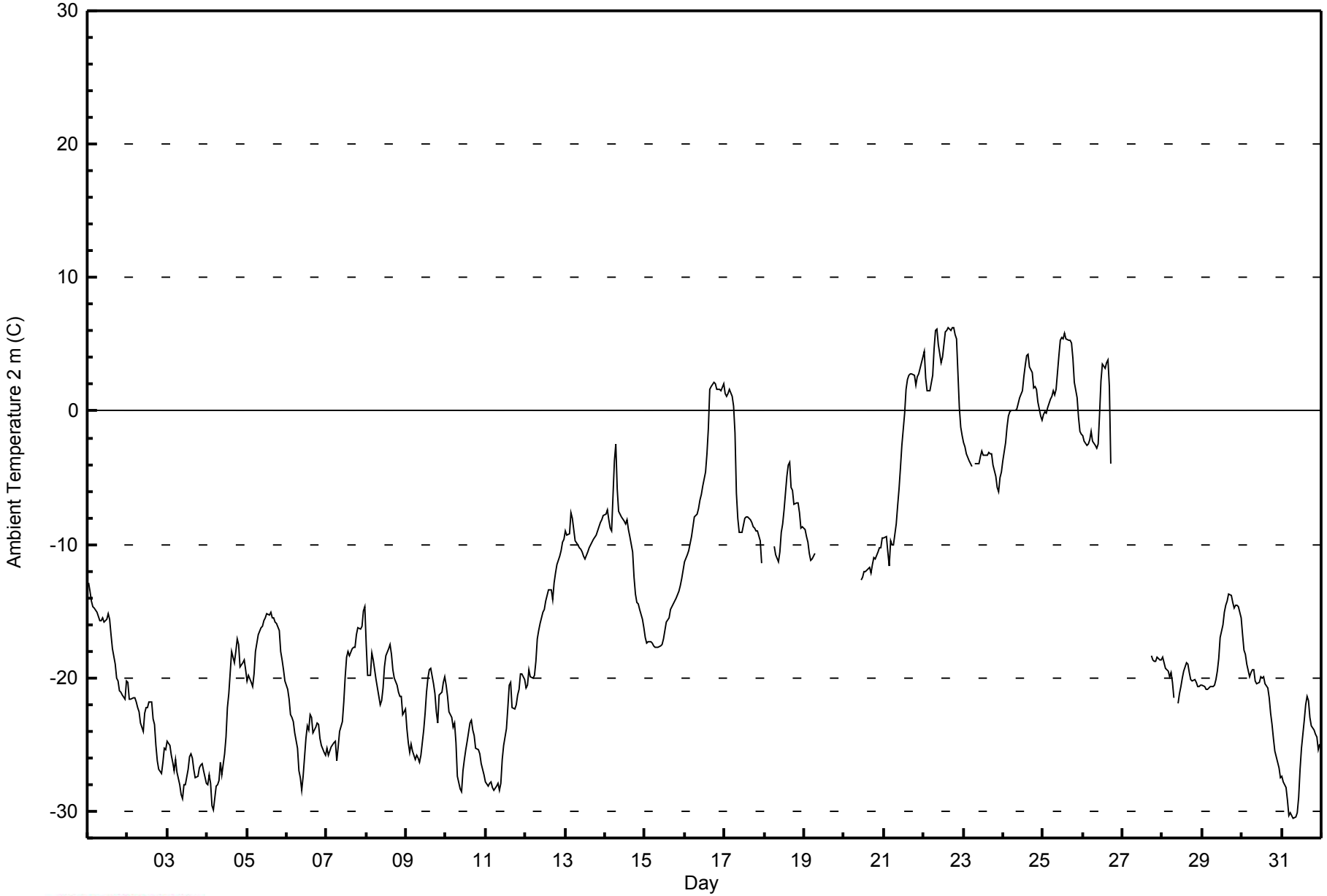
AF - Analyzer Failure

WBEA

Hourly Averages

Ambient Temperature 2 m (AT2m) - C

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	248	36.20	36.20
-20 - 0	348	50.80	87.01
0 - 10	89	12.99	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 744

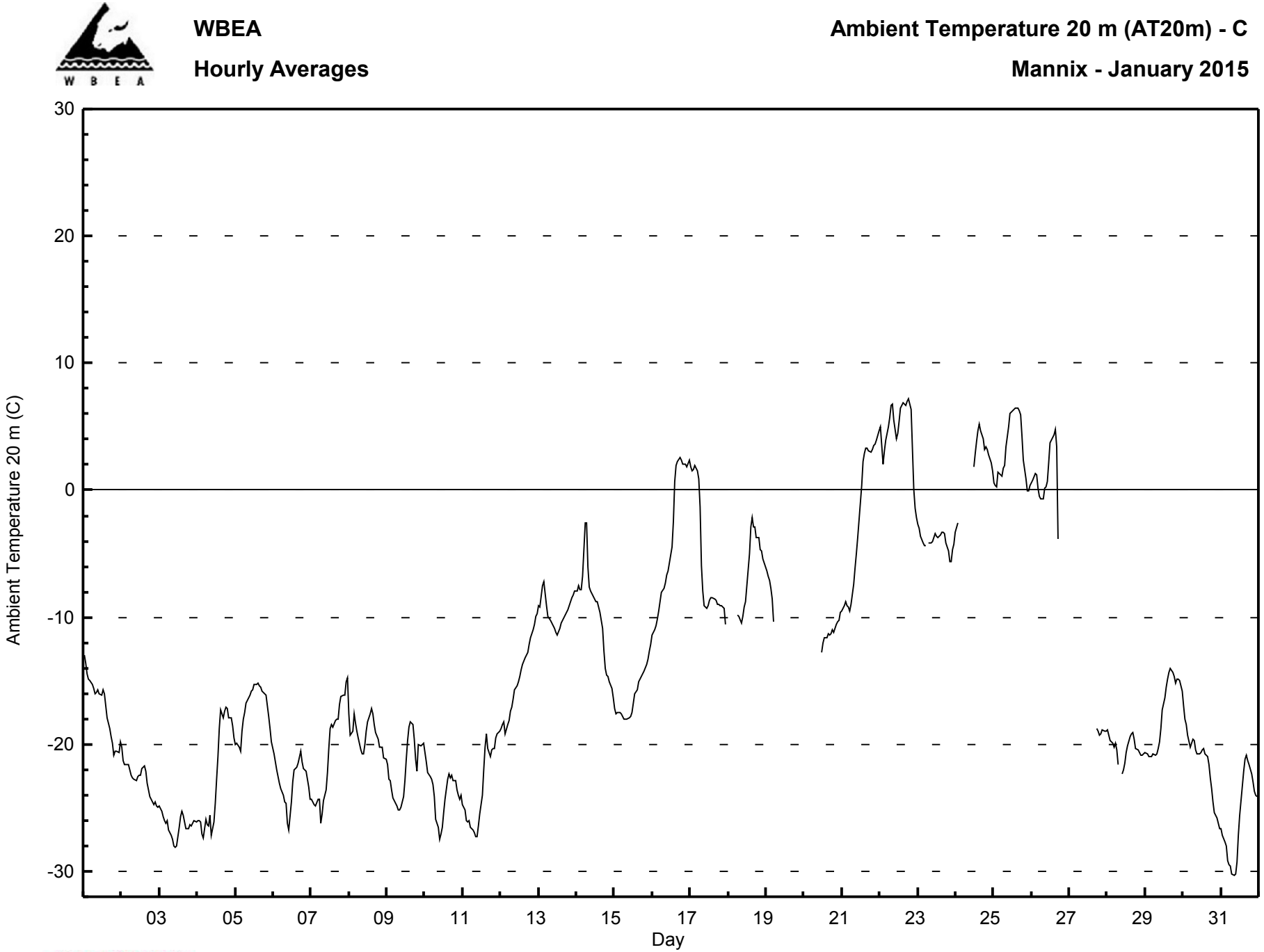
Maximum Value: 7.2 C on Jan 22 19:00
Maximum Daily Average: 4.7 C on Jan 22

Minimum Value: -30.4 C on Jan 31 09:00
Minimum Daily Average: -26.4 C on Jan 3
Maximum Diurnal Average: -11.6 C at hour 16
Minimum Diurnal Average: -15.9 C at hour 7
Monthly Average: -14.07 C
Percentiles: P_1 = -28.2 P_{10} = -25.4 Q_1 = -21.6 Median = -17.1 Q_3 = -7.7 P_{90} = 2.0 P_{99} = 6.7

Hours in Service:	744
Hours of Data:	674
Hours of Missing Data:	70
Hours of Calibration:	0
Percent Operational Time:	90.6

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-Jan	-12.9	-13.6	-14.4	-14.9	-15.0	-15.3	-15.6	-16.0	-15.9	-15.8	-16.0	-16.1	-15.7	-16.0	-16.9	-17.9	-18.8	-19.3	-19.9	-20.8	-20.5	-20.5	-20.6	-19.8	-17.0	-12.9
2-Jan	-20.3	-21.3	-21.6	-21.6	-21.6	-22.0	-22.4	-22.6	-22.7	-22.8	-22.6	-22.5	-22.4	-21.9	-21.7	-22.1	-23.1	-23.6	-24.2	-24.3	-24.8	-24.6	-24.8	-25.0	-22.8	-20.3
3-Jan	-24.9	-25.2	-25.7	-26.0	-26.2	-26.0	-26.7	-27.2	-27.5	-28.0	-28.1	-28.0	-26.5	-25.7	-25.2	-25.5	-26.1	-26.7	-26.6	-26.3	-26.4	-26.2	-26.0	-26.1	-26.4	-24.9
4-Jan	-26.0	-26.0	-26.1	-27.1	-27.4	-25.9	-26.4	-26.4	-25.6	-27.1	-26.1	-24.7	-22.7	-21.0	-18.7	-17.3	-17.9	-17.4	-17.1	-17.2	-17.9	-18.0	-18.5	-19.4	-22.4	-17.1
5-Jan	-20.1	-19.9	-20.3	-20.6	-18.9	-18.0	-17.5	-16.8	-16.4	-16.1	-15.8	-15.7	-15.3	-15.3	-15.2	-15.4	-15.5	-15.8	-16.0	-16.1	-17.0	-17.8	-18.8	-19.8	-17.2	-15.2
6-Jan	-20.7	-21.4	-22.0	-22.5	-23.1	-23.5	-24.0	-24.6	-24.7	-26.2	-26.8	-24.6	-23.0	-22.0	-21.9	-21.8	-21.5	-20.5	-21.4	-21.9	-22.0	-22.1	-23.3	-24.4	-22.9	-20.5
7-Jan	-24.3	-24.5	-24.8	-24.9	-24.3	-24.3	-26.2	-25.5	-24.4	-23.6	-22.2	-20.3	-18.7	-18.4	-18.6	-18.1	-18.0	-18.0	-16.9	-16.3	-16.2	-16.1	-15.0	-14.7	-20.6	-14.7
8-Jan	-17.6	-19.3	-19.0	-17.6	-18.3	-19.0	-19.5	-20.4	-20.8	-20.8	-20.1	-18.9	-18.2	-17.6	-17.2	-17.6	-18.4	-19.1	-19.6	-20.2	-20.2	-20.2	-21.1	-21.2	-19.2	-17.2
9-Jan	-21.6	-22.8	-22.9	-23.6	-24.2	-24.6	-24.8	-25.2	-25.2	-25.0	-24.1	-22.9	-21.1	-19.7	-18.6	-18.2	-18.4	-19.6	-21.2	-22.2	-20.0	-20.2	-20.0	-19.9	-21.9	-18.2
10-Jan	-20.6	-21.4	-22.3	-22.5	-22.7	-23.1	-24.1	-25.9	-26.5	-27.5	-27.1	-26.5	-25.4	-24.3	-22.7	-22.3	-22.7	-22.4	-22.8	-22.9	-23.6	-24.0	-24.3	-24.0	-23.8	-20.6
11-Jan	-24.7	-25.2	-26.0	-26.1	-26.1	-26.6	-26.7	-26.9	-27.3	-27.3	-26.4	-25.5	-24.0	-22.1	-20.2	-19.2	-20.4	-21.0	-20.5	-20.4	-20.4	-19.5	-19.1	-19.0	-23.4	-19.0
12-Jan	-18.8	-18.4	-18.3	-19.2	-18.4	-18.2	-17.4	-17.1	-16.5	-15.7	-15.4	-15.1	-14.7	-14.1	-13.8	-13.2	-13.0	-12.8	-12.1	-11.6	-11.0	-10.6	-10.0	-9.7	-14.8	-9.7
13-Jan	-9.1	-9.2	-7.5	-7.2	-8.2	-9.1	-10.0	-10.2	-10.5	-10.6	-10.9	-11.2	-11.4	-10.9	-10.5	-10.3	-10.0	-9.8	-9.4	-9.1	-8.8	-8.5	-8.3	-8.0	-9.5	-7.2
14-Jan	-7.9	-7.5	-7.8	-7.8	-6.8	-2.6	-2.6	-6.0	-7.6	-7.9	-8.2	-8.5	-8.8	-8.8	-9.2	-9.6	-10.8	-12.7	-14.0	-14.6	-14.7	-15.1	-15.6	-16.3	-9.6	-2.6
15-Jan	-17.1	-17.6	-17.5	-17.5	-17.6	-17.8	-18.0	-18.0	-18.0	-17.9	-17.8	-17.5	-16.7	-16.1	-15.7	-15.1	-14.8	-14.7	-14.5	-14.3	-13.7	-13.2	-12.7	-12.1	-16.1	-12.1
16-Jan	-11.5	-11.0	-10.6	-10.1	-9.5	-8.8	-8.1	-7.7	-7.3	-6.7	-6.3	-5.8	-4.5	-2.4	0.6	2.0	2.2	2.5	2.4	2.0	2.0	2.1	1.9	2.4	-3.8	2.5
17-Jan	1.8	1.5	1.6	2.0	1.5	0.9	-1.3	-6.0	-7.9	-9.1	-9.3	-9.1	-8.7	-8.5	-8.5	-8.6	-8.7	-8.9	-8.9	-9.1	-9.0	-9.3	-10.5	AF	-5.7	2.0
18-Jan	AF	AF	AF	AF	AF	AF	-9.8	-10.0	-10.5	-10.0	-9.2	-8.7	-7.5	-5.0	-2.9	-2.2	-2.9	-2.9	-3.8	-3.8	-4.7	-4.8	-5.4	-5.7	-6.1	-2.2
19-Jan	-6.4	-6.7	-7.1	-7.7	-8.5	-10.4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-6.4
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-12.8	-12.1	-11.6	-11.6	-11.3	-11.4	-11.3	-11.0	-11.2	-10.6	-10.3	-10.3	-9.6	--	-9.6
21-Jan	-9.6	-9.1	-8.8	-9.1	-9.2	-9.5	-9.0	-7.4	-6.1	-5.0	-3.7	-2.4	0.4	2.3	2.9	3.3	3.3	3.1	3.0	3.2	3.5	3.6	4.0	4.7	-2.1	4.7
22-Jan	5.0	3.5	2.0	3.1	4.0	5.0	5.7	6.7	6.8	5.5	4.0	4.4	5.4	6.5	6.6	6.9	6.7	7.0	7.2	6.8	6.4	0.0	-1.5	-2.1	4.7	7.2
23-Jan	-2.6	-3.0	-3.7	-4.2	-4.3	-4.4	AF	-4.1	-4.1	-4.1	-3.7	-3.4	-3.6	-3.7	-3.5	-3.3	-3.3	-3.4	-4.1	-4.8	-5.6	-5.7	-4.7	-4.2	-4.0	-2.6
24-Jan	-3.3	-2.5	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.9	2.9	3.9	4.6	5.2	4.7	4.0	3.3	3.5	3.2	2.8	2.2	1.5	--	5.2
25-Jan	0.5	0.3	0.2	1.4	1.2	1.1	1.7	1.9	3.4	5.0	6.0	6.2	6.2	6.4	6.4	6.5	6.2	5.9	4.2	2.4	0.8	-0.1	0.0	0.3	3.1	6.5
26-Jan	0.6	0.8	1.3	1.2	0.1	-0.5	-0.7	-0.7	0.2	0.3	0.6	2.1	3.8	4.2	4.4	4.7	3.4	-3.8	AF	AF	AF	AF	AF	AF	1.2	4.7
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-18.8	-19.0	-19.2	-19.1	-18.8	-19.0	-19.0	--	-18.8
28-Jan	-18.9	-19.3	-19.7	-19.9	-20.2	-20.0	-20.5	-21.6	AF	-22.3	-22.1	-21.5	-20.6	-20.1	-19.4	-19.2	-19.1	-19.6	-20.4	-20.4	-20.6	-20.9	-20.9	-20.8	-20.3	-18.9
29-Jan	-20.7	-20.8	-21.0	-21.0	-21.0	-20.8	-20.9	-20.8	-20.4	-19.8	-18.8	-17.3	-16.3	-15.5	-14.9	-14.4	-14.0	-14.3	-14.7	-15.1	-14.9	-14.8	-15.0	-15.8	-17.6	-14.0
30-Jan	-17.0	-18.1	-18.5	-19.3	-20.2	-19.9	-19.6	-19.7	-20.4	-20.7	-20.8	-20.6	-20.4	-20.3	-20.7	-20.9	-21.6	-22.6	-23.5	-24.6	-25.3	-25.9	-26.2	-26.7	-21.4	-17.0
31-Jan	-26.7	-27.2	-27.7	-28.0	-29.2	-29.5	-29.5	-30.2	-30.4	-30.3	-29.3	-27.2	-25.6	-23.2	-22.1	-21.2	-20.9	-21.3	-21.6	-22.4	-23.0	-23.7	-24.0	-24.2	-25.8	-20.9
	-14.1	-14.5	-15.1	-15.2	-15.3	-15.3	-15.9	-15.9	-15.6	-15.9	-15.6	-14.2	-13.3	-12.4	-11.9	-11.6	-11.9	-12.6	-13.2	-13.5	-13.6	-13.9	-14.1	-14.2	Diurnal Average	
	5.0	3.5	2.0	3.1	4.0	5.0	5.7	6.7	6.8	5.5	6.0	6.2	6.2	6.5	6.6	6.9	6.7	7.0	7.2	6.8	6.4	3.6	4.0	4.7	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Ambient Temperature 20 m (AT20m) - C
Mannix - January 2015
Ambient Temperature 20 m (C)
30
20
10
0
-10
-20
-30
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	240	35.61	35.61
-20 - 0	335	49.70	85.31
0 - 10	99	14.69	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 744

Maximum Value: 7.4 C on Jan 22 19:00

Maximum Daily Average: 4.9 C on Jan 22

Minimum Value: -30.2 C on Jan 31 10:00

Minimum Daily Average: -26.3 C on Jan 3

Maximum Diurnal Average: -11.9 C at hour 16

Minimum Diurnal Average: -16.3 C at hour 10

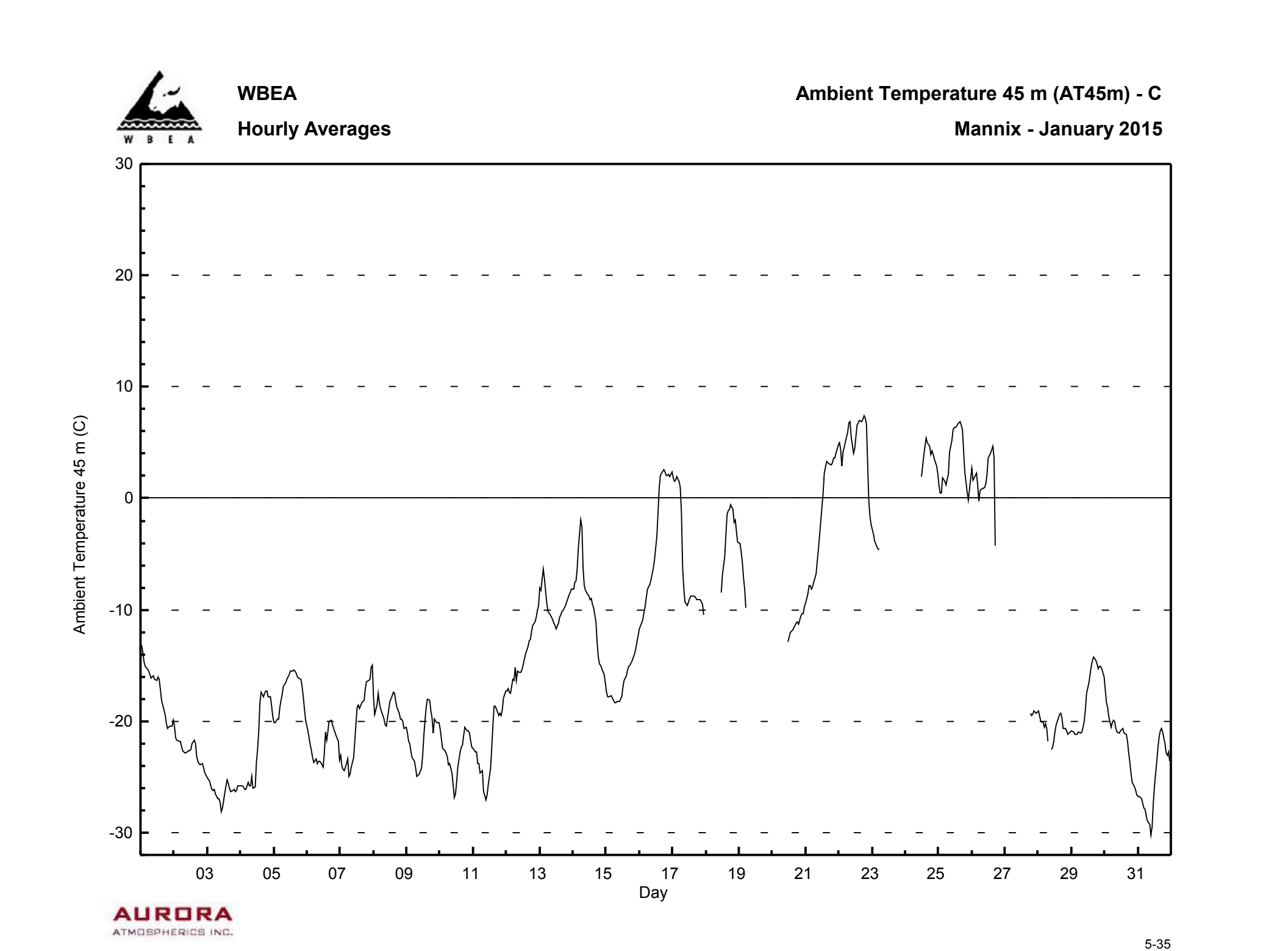
Monthly Average: -14.15 C

Percentiles: P_1 = -27.9 P_{10} = -24.8 Q_1 = -21.3 Median = -17.4 Q_3 = -8.1 P_{90} = 2.2 P_{99} = 6.8

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Hours of Calibration:	0
Percent Operational Time:	87.2

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-Jan	-13.1	-13.8	-14.7	-15.1	-15.2	-15.5	-15.8	-16.2	-16.0	-15.9	-16.2	-16.3	-16.0	-16.3	-17.2	-18.1	-19.0	-19.4	-20.1	-20.7	-20.5	-20.4	-20.4	-19.9	-17.2	-13.1
2-Jan	-20.5	-21.5	-21.7	-21.8	-21.8	-22.2	-22.6	-22.8	-22.8	-22.7	-22.6	-22.6	-22.5	-22.0	-21.7	-22.1	-23.2	-23.6	-23.8	-23.9	-23.8	-24.3	-24.7	-24.9	-22.7	-20.5
3-Jan	-25.0	-25.4	-25.8	-26.1	-26.2	-26.1	-26.5	-26.9	-27.0	-27.2	-28.1	-27.8	-26.5	-25.8	-25.3	-25.5	-26.0	-26.3	-26.2	-26.1	-26.4	-26.2	-25.8	-25.8	-26.3	-25.0
4-Jan	-25.8	-25.8	-25.9	-26.1	-26.1	-25.4	-25.9	-25.8	-25.0	-26.0	-25.9	-23.7	-22.5	-20.8	-18.4	-17.4	-17.8	-17.5	-17.3	-17.3	-17.8	-17.8	-18.6	-19.6	-22.1	-17.3
5-Jan	-20.1	-20.1	-19.8	-19.8	-18.7	-18.2	-17.6	-16.9	-16.6	-16.2	-16.0	-15.8	-15.5	-15.5	-15.4	-15.5	-15.7	-16.0	-16.2	-16.3	-16.9	-17.9	-18.8	-19.9	-17.3	-15.4
6-Jan	-20.9	-21.5	-22.1	-22.7	-23.3	-23.7	-23.3	-23.8	-23.6	-23.6	-23.6	-24.1	-22.9	-20.9	-21.7	-21.0	-20.0	-19.9	-20.4	-20.6	-21.0	-21.3	-21.8	-23.5	-22.1	-19.9
7-Jan	-23.1	-24.1	-24.4	-24.5	-23.8	-23.3	-24.9	-24.7	-24.1	-23.3	-21.8	-20.3	-18.8	-18.6	-18.9	-18.4	-18.2	-18.1	-17.0	-16.5	-16.3	-16.2	-15.2	-15.0	-20.4	-15.0
8-Jan	-17.8	-19.4	-18.6	-17.5	-18.3	-18.9	-19.1	-19.8	-20.3	-20.4	-19.7	-18.9	-18.3	-17.7	-17.3	-17.5	-18.3	-18.8	-19.3	-19.8	-19.9	-20.0	-20.7	-20.5	-19.0	-17.3
9-Jan	-21.1	-21.8	-22.0	-22.7	-23.3	-23.6	-24.2	-24.9	-24.9	-24.7	-24.2	-23.0	-21.3	-19.9	-18.7	-18.0	-18.1	-19.1	-19.7	-21.1	-19.8	-20.1	-20.1	-20.1	-21.5	-18.0
10-Jan	-20.8	-21.6	-22.4	-22.7	-22.8	-23.2	-23.9	-23.8	-24.6	-25.7	-26.9	-26.5	-25.4	-24.1	-22.7	-22.3	-22.1	-21.3	-20.5	-20.8	-20.8	-21.1	-21.9	-22.3	-22.9	-20.5
11-Jan	-22.5	-22.8	-22.7	-23.8	-23.8	-24.7	-24.4	-26.4	-26.7	-27.0	-26.6	-25.7	-24.3	-22.4	-20.3	-18.7	-18.6	-19.2	-19.5	-19.3	-19.5	-19.0	-18.0	-17.3	-22.2	-17.3
12-Jan	-17.3	-17.1	-17.4	-17.5	-16.3	-16.3	-15.2	-16.4	-15.5	-15.6	-15.6	-15.3	-14.9	-14.4	-14.0	-13.3	-12.8	-12.7	-11.9	-11.4	-11.0	-10.7	-10.1	-9.7	-14.3	-9.7
13-Jan	-8.1	-8.2	-6.4	-7.2	-8.4	-9.4	-10.2	-10.4	-10.7	-10.9	-11.2	-11.4	-11.7	-11.2	-10.7	-10.5	-10.2	-10.0	-9.6	-9.3	-9.0	-8.7	-8.4	-8.2	-9.6	-6.4
14-Jan	-8.1	-7.6	-7.5	-6.2	-4.4	-2.0	-2.6	-6.2	-7.9	-8.2	-8.5	-8.8	-9.1	-9.0	-9.5	-9.9	-11.1	-12.9	-14.3	-14.9	-14.9	-15.3	-15.8	-16.6	-9.6	-2.0
15-Jan	-17.4	-17.9	-17.8	-17.7	-17.9	-18.1	-18.3	-18.3	-18.3	-18.2	-18.1	-17.8	-17.0	-16.3	-16.0	-15.4	-15.1	-15.0	-14.8	-14.5	-13.9	-13.5	-12.9	-12.4	-16.4	-12.4
16-Jan	-11.7	-11.2	-10.8	-10.3	-9.7	-8.9	-8.1	-7.7	-7.3	-6.8	-6.2	-5.6	-3.4	-1.3	0.9	2.0	2.2	2.5	2.4	2.0	2.1	2.1	1.9	2.3	-3.7	2.5
17-Jan	1.8	1.5	1.6	1.9	1.5	1.0	-1.3	-6.1	-8.1	-9.3	-9.6	-9.3	-9.0	-8.8	-8.7	-8.8	-8.9	-9.1	-9.1	-9.1	-9.1	-9.5	-10.4	AF	-5.9	1.9
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-8.5	-6.9	-5.2	-3.2	-1.4	-1.1	-1.0	-0.6	-1.0	-2.2	-2.0	-3.0	-3.9	--	-0.6
19-Jan	-4.0	-4.8	-5.7	-7.1	-8.1	-9.8	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-4.0
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-12.9	-12.5	-12.1	-11.8	-11.6	-11.4	-11.2	-11.1	-11.3	-10.6	-10.4	-10.3	-9.7	--	-9.7
21-Jan	-9.4	-8.5	-7.8	-7.8	-8.2	-8.0	-7.5	-6.8	-5.6	-4.5	-3.3	-2.1	0.5	2.2	2.8	3.3	3.2	3.1	3.0	3.2	3.6	3.7	4.0	4.7	-1.8	4.7
22-Jan	5.0	4.3	2.9	4.2	4.6	5.5	5.9	6.8	6.9	5.5	4.0	4.5	5.5	6.6	6.8	7.0	6.9	7.1	7.4	7.2	6.7	-0.1	-1.6	-2.3	4.9	7.4
23-Jan	-2.8	-3.2	-3.8	-4.3	-4.5	-4.5	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-2.8
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.0	2.9	3.8	4.7	5.4	5.0	4.7	4.0	4.3	4.0	3.5	2.8	2.1	--	5.4
25-Jan	1.1	0.5	0.5	1.8	1.5	1.2	1.7	2.2	4.1	5.2	6.1	6.3	6.4	6.5	6.7	6.8	6.5	6.2	4.2	2.4	0.6	-0.1	0.8	1.8	3.4	6.8
26-Jan	2.7	1.6	2.0	2.3	1.2	-0.3	0.7	0.9	0.9	1.0	1.3	2.2	3.6	4.1	4.4	4.6	3.7	-4.3	AF	AF	AF	AF	AF	AF	1.8	4.6
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-19.3	-19.5	-19.4	-19.1	-19.2	-19.1	--	-19.1
28-Jan	-19.1	-19.6	-20.0	-20.1	-20.5	-20.2	-20.7	-21.8	AF	-22.6	-22.3	-21.8	-20.9	-20.3	-19.7	-19.4	-19.3	-19.7	-20.6	-20.7	-20.9	-21.1	-21.1	-21.0	-20.6	-19.1
29-Jan	-20.9	-21.0	-21.2	-21.2	-21.2	-21.0	-21.1	-21.0	-20.6	-20.0	-19.0	-17.5	-16.6	-15.8	-15.1	-14.6	-14.2	-14.6	-14.9	-15.3	-15.1	-15.1	-15.3	-16.1	-17.8	-14.2
30-Jan	-17.2	-18.3	-18.7	-19.6	-20.5	-20.1	-19.9	-20.0	-20.7	-21.0	-21.1	-20.9	-20.7	-20.7	-21.0	-21.2	-21.8	-22.9	-23.7	-24.8	-25.5	-25.9	-26.2	-26.6	-21.6	-17.2
31-Jan	-26.7	-26.8	-27.0	-27.4	-27.8	-27.9	-28.6	-29.0	-29.3	-30.2	-29.4	-27.4	-25.8	-23.6	-22.4	-21.4	-20.9	-20.7	-21.0	-22.0	-22.9	-23.1	-22.8	-23.5	-25.3	-20.7
	-14.2	-14.6	-14.7	-14.8	-14.9	-14.9	-15.7	-16.2	-16.0	-16.3	-16.2	-14.6	-13.7	-12.8	-12.3	-11.9	-12.0	-12.5	-13.2	-13.5	-13.6	-13.9	-14.1	-14.3	Diurnal Average	
	5.0	4.3	2.9	4.2	4.6	5.5	5.9	6.8	6.9	5.5	6.1	6.3	6.4	6.6	6.8	7.0	6.9	7.1	7.4	7.2	6.7	3.7	4.0	4.7	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Ambient Temperature 45 m (AT45m) - C
Mannix - January 2015
Ambient Temperature 45 m (C)
30
20
10
0
-10
-20
-30
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	232	35.75	35.75
-20 - 0	316	48.69	84.44
0 - 10	101	15.56	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 649

Total Number of Hours: 744

Maximum Value: 7.4 C on Jan 22 19:00

Maximum Daily Average: 4.9 C on Jan 22

Minimum Value: -28.2 C on Jan 31 08:00

Minimum Daily Average: -26.3 C on Jan 3

Maximum Diurnal Average: -11.9 C at hour 16

Minimum Diurnal Average: -15.6 C at hour 8

Monthly Average: -13.87 C

Percentiles: P_1 = -27.6 P_{10} = -23.8 Q_1 = -21.3 Median = -17.6 Q_3 = -7.8 P_{90} = 2.4 P_{99} = 6.8

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

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-Jan	-13.4	-14.0	-14.9	-15.2	-15.4	-15.6	-15.9	-16.4	-15.9	-15.8	-16.1	-16.5	-16.2	-16.5	-17.5	-18.4	-19.2	-19.4	-20.3	-20.7	-20.7	-20.6	-20.5	-20.1	-17.3	-13.4
2-Jan	-20.8	-21.7	-21.9	-22.0	-22.1	-22.5	-22.9	-23.0	-22.9	-22.7	-22.6	-22.5	-22.4	-22.0	-21.8	-22.1	-23.2	-23.6	-23.6	-23.8	-23.7	-24.3	-24.7	-24.9	-22.8	-20.8
3-Jan	-25.2	-25.5	-26.0	-26.3	-26.4	-26.3	-26.6	-26.7	-26.9	-27.1	-28.2	-27.6	-26.6	-26.0	-25.5	-25.7	-26.1	-26.3	-26.1	-26.1	-26.2	-26.2	-25.9	-25.8	-26.3	-25.2
4-Jan	-25.8	-25.9	-26.0	-25.8	-25.6	-25.4	-25.7	-25.4	-24.9	-24.5	-24.1	-22.4	-21.6	-20.2	-18.3	-17.6	-17.9	-17.6	-17.5	-17.5	-17.9	-17.9	-18.8	-19.8	-21.8	-17.5
5-Jan	-20.2	-20.2	-19.7	-19.4	-18.9	-18.4	-17.8	-17.0	-16.8	-16.4	-16.3	-16.0	-15.8	-15.7	-15.7	-15.8	-16.0	-16.3	-16.4	-16.5	-16.8	-17.9	-18.8	-20.1	-17.4	-15.7
6-Jan	-21.0	-21.7	-22.4	-23.0	-23.5	-23.8	-23.4	-23.7	-23.9	-23.6	-23.4	-23.5	-22.5	-21.3	-20.6	-20.2	-19.6	-19.7	-19.8	-19.8	-20.4	-20.9	-21.4	-21.2	-21.9	-19.6
7-Jan	-20.0	-21.9	-21.0	-22.8	-22.2	-21.9	-22.6	-23.6	-22.6	-21.7	-20.7	-20.0	-18.6	-18.6	-18.8	-18.6	-18.5	-18.2	-17.2	-16.7	-16.5	-16.3	-15.4	-15.2	-19.6	-15.2
8-Jan	-18.0	-19.3	-17.8	-17.6	-18.3	-18.9	-19.0	-19.6	-19.9	-20.2	-19.7	-19.1	-18.5	-18.0	-17.6	-17.7	-18.3	-18.7	-19.3	-19.7	-19.8	-20.0	-20.4	-20.2	-19.0	-17.6
9-Jan	-20.6	-21.3	-21.6	-21.6	-21.6	-22.3	-22.6	-22.8	-22.2	-21.3	-21.5	-21.9	-20.7	-18.9	-18.0	-17.1	-17.9	-18.8	-19.1	-20.3	-19.7	-20.1	-20.2	-20.3	-20.5	-17.1
10-Jan	-21.0	-21.9	-22.7	-22.8	-23.0	-23.3	-23.6	-23.8	-23.4	-24.0	-24.3	-24.1	-23.7	-21.7	-21.3	-20.6	-20.5	-20.1	-19.9	-20.4	-20.7	-20.8	-21.8	-21.9	-22.1	-19.9
11-Jan	-22.3	-22.3	-22.1	-22.1	-22.8	-22.9	-23.0	-23.7	-23.6	-23.7	-26.1	-25.7	-24.0	-22.1	-19.7	-18.0	-17.5	-17.9	-17.8	-18.3	-18.2	-17.8	-16.3	-15.2	-21.0	-15.2
12-Jan	-15.0	-14.9	-15.6	-15.0	-14.2	-14.5	-14.9	-15.3	-15.5	-15.8	-15.8	-15.4	-15.1	-14.5	-14.2	-13.4	-12.7	-11.9	-11.1	-10.7	-10.8	-10.5	-9.9	-8.5	-13.5	-8.5
13-Jan	-7.1	-7.1	-6.0	-7.3	-8.6	-9.6	-10.4	-10.7	-10.9	-11.2	-11.5	-11.8	-12.0	-11.5	-11.0	-10.7	-10.4	-10.2	-9.9	-9.6	-9.2	-8.9	-8.6	-8.4	-9.7	-6.0
14-Jan	-8.3	-7.3	-6.5	-4.9	-3.0	-1.5	-2.5	-6.4	-8.1	-8.5	-8.8	-9.1	-9.4	-9.4	-9.8	-10.1	-11.4	-13.3	-14.6	-15.1	-15.2	-15.7	-16.1	-16.9	-9.7	-1.5
15-Jan	-17.7	-18.2	-18.1	-18.1	-18.2	-18.5	-18.6	-18.6	-18.6	-18.5	-18.3	-18.1	-17.3	-16.6	-16.3	-15.7	-15.4	-15.3	-15.1	-14.8	-14.2	-13.8	-13.2	-12.6	-16.7	-12.6
16-Jan	-12.0	-11.5	-11.1	-10.4	-9.8	-8.9	-8.1	-7.5	-7.0	-6.7	-5.8	-3.9	-2.2	-0.7	0.8	1.9	2.2	2.4	2.3	1.9	2.0	2.1	1.9	2.2	-3.6	2.4
17-Jan	1.7	1.4	1.5	1.8	1.4	0.9	-1.3	-6.1	-8.1	-9.5	-9.9	-9.6	-9.3	-9.1	-9.0	-9.1	-8.9	-9.2	-9.3	-9.2	-9.1	-9.6	-10.2	AF	-6.0	1.8
18-Jan	AF	AF	AF	AF	AF	AF	-8.1	-7.5	-7.2	-7.8	-7.7	-6.2	-2.5	-2.6	-1.4	-0.6	-0.6	0.3	0.2	-0.4	-1.4	-1.4	-1.7	-2.2	-3.3	0.3
19-Jan	-2.3	-3.2	-4.3	-6.0	-7.3	-9.0	-10.4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-2.3
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-13.2	-12.9	-12.7	-12.1	-11.9	-11.7	-11.4	-10.4	-10.6	-11.1	-9.8	-10.1	-10.0	-9.3	--	-9.3
21-Jan	-7.8	-7.0	-5.9	-5.9	-6.4	-6.6	-5.8	-5.9	-4.9	-3.7	-2.4	-1.5	0.5	2.1	2.7	3.2	3.2	3.0	3.0	3.1	3.6	3.6	4.0	4.7	-1.1	4.7
22-Jan	5.0	4.5	3.9	4.4	4.9	5.6	5.9	6.8	6.8	5.4	3.9	4.4	5.4	6.5	6.7	6.9	6.9	7.1	7.4	7.2	6.7	0.0	-1.8	-2.5	4.9	7.4
23-Jan	-3.0	-3.3	-4.0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-3.0
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.6	2.0	2.8	3.6	4.5	5.3	5.1	4.9	4.5	4.6	4.2	3.7	3.0	2.2	--	5.3
25-Jan	2.1	1.0	0.9	2.3	2.0	1.2	1.6	2.4	4.4	5.2	6.0	6.2	6.2	6.4	6.6	6.8	6.6	6.2	4.3	2.5	0.5	-0.1	1.1	3.6	3.6	6.8
26-Jan	3.1	2.3	2.6	2.6	2.3	1.3	1.6	1.2	1.2	1.4	1.5	2.2	3.3	3.9	4.1	4.4	3.7	-4.6	AF	AF	AF	AF	AF	AF	2.1	4.4
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-19.6	-19.8	-19.7	-19.1	-19.4	-19.2	--	-19.1
28-Jan	-19.1	-19.7	-20.3	-20.4	-20.8	-20.5	-20.9	-22.0	AF	-22.8	-22.7	-22.1	-21.3	-20.8	-20.1	-19.8	-19.7	-20.0	-21.0	-21.0	-21.3	-21.5	-21.4	-21.3	-20.9	-19.1
29-Jan	-21.2	-21.3	-21.5	-21.5	-21.3	-21.2	-21.3	-21.2	-20.7	-20.2	-19.2	-17.8	-16.9	-16.0	-15.4	-14.9	-14.5	-14.7	-15.0	-15.5	-15.3	-15.3	-15.5	-16.4	-18.1	-14.5
30-Jan	-17.5	-18.6	-19.0	-19.9	-20.8	-20.4	-20.2	-20.3	-21.0	-21.3	-21.4	-21.3	-21.1	-21.1	-21.4	-21.6	-22.2	-23.2	-23.9	-25.1	-25.8	-26.1	-26.3	-26.7	-21.9	-17.5
31-Jan	-26.8	-26.9	-26.8	-27.1	-27.5	-27.5	-28.0	-28.2	-27.8	-27.8	-28.1	-27.3	-25.8	-23.6	-22.3	-21.3	-20.6	-19.9	-20.4	-21.3	-22.1	-20.6	-19.9	-20.1	-24.5	-19.9
	-13.9	-14.3	-14.3	-14.8	-14.9	-15.0	-15.0	-15.6	-15.2	-15.5	-14.8	-14.3	-13.5	-12.7	-12.2	-11.9	-12.0	-12.3	-13.1	-13.4	-13.5	-13.8	-13.9	-13.9	Diurnal Average	
	5.0	4.5	3.9	4.4	4.9	5.6	5.9	6.8	6.8	5.4	6.0	6.2	6.2	6.5	6.7	6.9	6.9	7.1	7.4	7.2	6.7	3.7	4.0	4.7	Diurnal Maximum	

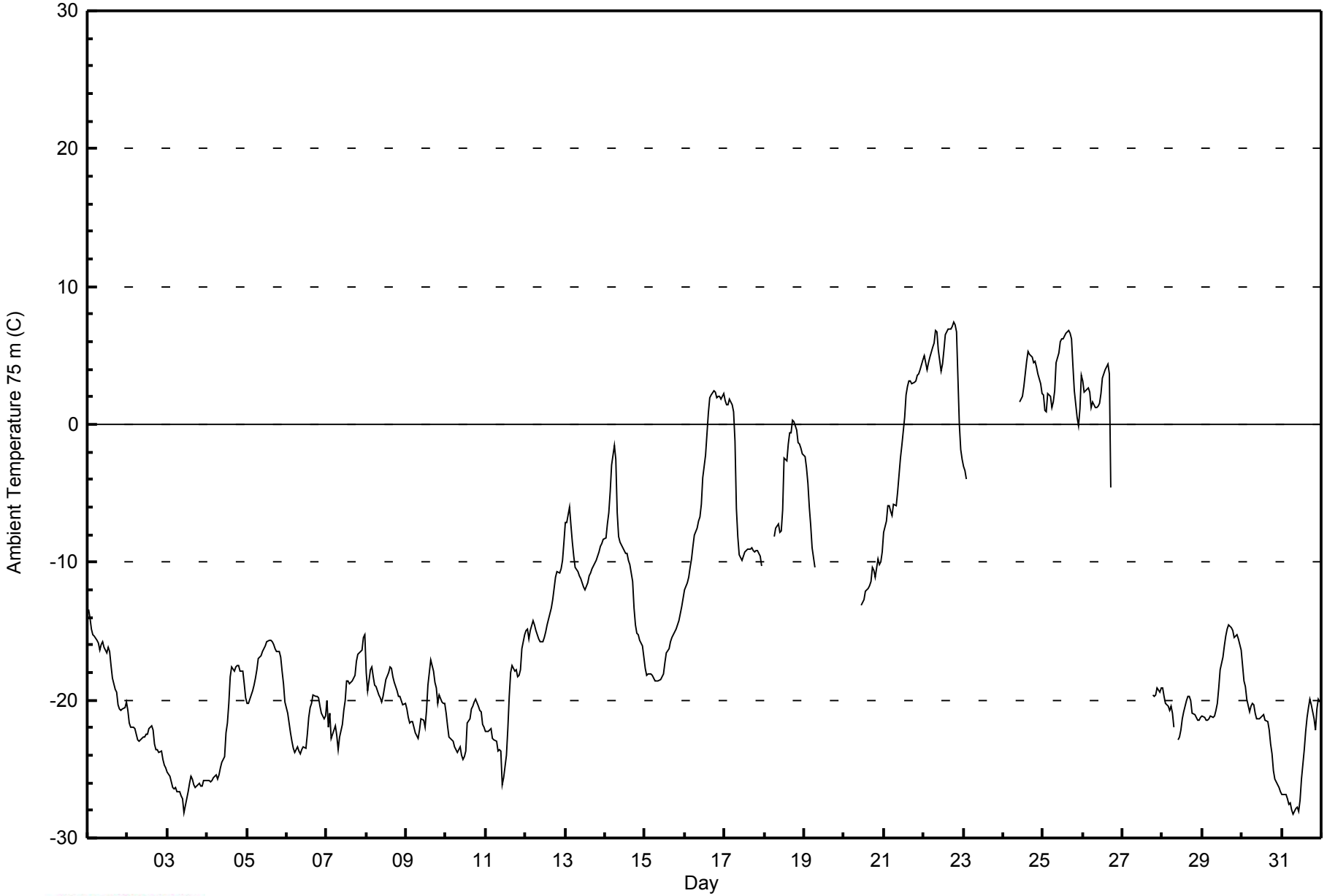
AF - Analyzer Failure

WBEA

Hourly Averages

Ambient Temperature 75 m (AT75m) - C

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	231	35.32	35.32
-20 - 0	318	48.62	83.95
0 - 10	105	16.06	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 654

Total Number of Hours: 744

Maximum Value: 7.4 C on Jan 22 19:00
Maximum Daily Average: 4.9 C on Jan 22

Minimum Value: -28.1 C on Jan 3 11:00
Minimum Daily Average: -26.3 C on Jan 3
Maximum Diurnal Average: -11.9 C at hour 16
Minimum Diurnal Average: -15.4 C at hour 8
Monthly Average: -13.75 C
Percentiles: P_1 = -27.7 P_{10} = -23.7 Q_1 = -21.2 Median = -17.1 Q_3 = -7.0 P_{90} = 2.4 P_{99} = 6.8

Hours in Service:	744
Hours of Data:	656
Hours of Missing Data:	88
Hours of Calibration:	0
Percent Operational Time:	88.2

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-Jan	-13.5	-14.1	-14.9	-15.2	-15.4	-15.6	-15.9	-16.3	-15.9	-15.7	-16.0	-16.6	-16.3	-16.5	-17.6	-18.5	-19.3	-19.4	-20.4	-20.7	-20.8	-20.7	-20.6	-20.2	-17.3	-13.5
2-Jan	-20.9	-21.8	-22.0	-22.1	-22.2	-22.6	-23.0	-23.1	-22.9	-22.7	-22.6	-22.5	-22.4	-22.1	-21.9	-22.2	-23.2	-23.5	-23.6	-23.8	-23.7	-24.3	-24.7	-25.0	-22.9	-20.9
3-Jan	-25.3	-25.6	-26.1	-26.4	-26.5	-26.4	-26.7	-26.7	-26.9	-27.1	-28.1	-27.5	-26.7	-26.1	-25.6	-25.8	-26.2	-26.3	-26.1	-26.0	-26.1	-26.2	-25.9	-25.8	-26.3	-25.3
4-Jan	-25.8	-25.8	-26.0	-25.7	-25.6	-25.4	-25.7	-25.3	-24.9	-24.3	-23.9	-22.2	-21.4	-20.0	-18.3	-17.7	-17.9	-17.7	-17.6	-17.6	-17.9	-18.0	-18.9	-19.9	-21.8	-17.6
5-Jan	-20.2	-20.2	-19.7	-19.3	-19.0	-18.4	-17.8	-17.1	-16.9	-16.5	-16.4	-16.1	-15.9	-15.8	-15.8	-15.9	-16.1	-16.4	-16.5	-16.6	-16.8	-17.9	-18.8	-20.2	-17.5	-15.8
6-Jan	-21.0	-21.7	-22.5	-23.1	-23.6	-23.8	-23.5	-23.8	-23.9	-23.7	-23.3	-23.0	-22.4	-21.2	-20.4	-20.0	-19.6	-19.5	-19.6	-19.5	-20.1	-20.8	-21.3	-21.0	-21.8	-19.5
7-Jan	-20.0	-21.0	-19.9	-21.9	-22.0	-21.9	-22.1	-23.0	-21.9	-21.2	-20.4	-19.8	-18.5	-18.5	-18.5	-18.6	-18.5	-18.2	-17.2	-16.8	-16.6	-16.4	-15.5	-15.3	-19.3	-15.3
8-Jan	-18.1	-19.2	-17.6	-17.6	-18.4	-19.0	-19.0	-19.5	-19.6	-19.9	-19.7	-19.2	-18.6	-18.1	-17.7	-17.7	-18.4	-18.7	-19.3	-19.7	-19.7	-20.0	-20.3	-20.2	-19.0	-17.6
9-Jan	-20.6	-21.1	-21.6	-21.4	-21.3	-21.9	-22.2	-22.2	-21.4	-20.5	-20.1	-20.9	-19.6	-18.2	-17.3	-16.6	-17.9	-18.6	-19.1	-20.0	-19.6	-20.1	-20.3	-20.3	-20.1	-16.6
10-Jan	-21.0	-22.0	-22.8	-22.9	-23.1	-23.4	-23.6	-23.8	-23.3	-23.9	-23.5	-23.3	-22.5	-21.4	-20.8	-20.1	-19.9	-19.8	-19.9	-20.4	-20.7	-20.9	-21.7	-21.5	-21.9	-19.8
11-Jan	-22.1	-22.1	-21.9	-22.1	-22.7	-22.9	-22.9	-23.2	-22.8	-22.3	-25.2	-25.5	-23.8	-21.9	-19.6	-18.0	-17.5	-17.3	-16.9	-17.5	-17.1	-16.9	-15.8	-14.7	-20.5	-14.7
12-Jan	-14.8	-14.7	-14.7	-13.9	-13.8	-14.3	-14.8	-15.3	-15.6	-15.7	-15.8	-15.5	-15.1	-14.4	-14.2	-13.4	-12.7	-11.5	-10.4	-10.5	-10.5	-10.3	-9.6	-8.3	-13.3	-8.3
13-Jan	-6.8	-6.8	-6.0	-7.3	-8.6	-9.7	-10.4	-10.7	-11.0	-11.3	-11.6	-12.0	-12.2	-11.6	-11.1	-10.8	-10.5	-10.3	-10.0	-9.6	-9.3	-8.9	-8.7	-8.5	-9.7	-6.0
14-Jan	-8.3	-7.1	-6.2	-4.4	-2.4	-1.2	-2.4	-6.4	-8.3	-8.6	-8.9	-9.2	-9.5	-9.5	-9.9	-10.3	-11.5	-13.4	-14.7	-15.3	-15.4	-15.8	-16.2	-17.0	-9.7	-1.2
15-Jan	-17.8	-18.3	-18.2	-18.2	-18.4	-18.6	-18.8	-18.8	-18.7	-18.6	-18.5	-18.2	-17.4	-16.7	-16.4	-15.9	-15.6	-15.4	-15.2	-14.9	-14.4	-13.9	-13.3	-12.7	-16.8	-12.7
16-Jan	-12.1	-11.6	-11.2	-10.4	-9.8	-8.8	-8.0	-7.5	-7.0	-6.6	-5.4	-3.4	-1.9	-0.6	0.8	1.9	2.1	2.4	2.2	1.9	1.9	2.0	1.8	2.2	-3.5	2.4
17-Jan	1.6	1.3	1.4	1.8	1.3	0.8	-1.2	-6.0	-8.1	-9.5	-10.0	-9.7	-9.4	-9.2	-9.1	-9.1	-9.0	-9.2	-9.4	-9.2	-9.2	-9.6	-10.1	AF	-6.0	1.8
18-Jan	AF	AF	AF	AF	AF	AF	-7.4	-6.5	-6.5	-6.8	-6.2	-4.7	-2.1	-2.3	-1.2	-0.8	-0.6	0.4	0.2	-0.4	-1.3	-1.3	-1.6	-2.0	-2.8	0.4
19-Jan	-2.1	-3.1	-4.2	-5.5	-7.0	-8.6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-2.1
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-13.3	-13.1	-12.8	-12.4	-11.9	-11.7	-11.3	-10.0	-10.1	-10.6	-9.3	-9.7	-9.6	-8.7	--	-8.7
21-Jan	-6.8	-6.6	-5.5	-5.8	-6.1	-6.2	-5.2	-5.3	-4.2	-3.0	-2.1	-1.3	0.6	2.0	2.6	3.1	3.1	2.9	3.0	3.1	3.6	3.6	3.9	4.7	-0.9	4.7
22-Jan	4.9	4.5	4.1	4.4	4.9	5.6	5.9	6.8	6.7	5.3	3.8	4.3	5.3	6.4	6.6	6.9	6.8	7.0	7.4	7.2	6.7	0.1	-1.9	-2.6	4.9	7.4
23-Jan	-3.1	-3.4	-4.1	-4.6	-4.8	-4.4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-3.1
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.8	1.6	2.0	2.7	3.5	4.4	5.2	5.0	4.9	4.6	4.8	4.3	3.7	3.0	2.2	--	5.2
25-Jan	2.3	1.1	1.1	2.4	2.1	1.3	1.6	2.5	4.5	5.1	6.0	6.1	6.1	6.3	6.5	6.8	6.6	6.2	4.3	2.5	0.5	0.0	1.2	4.1	3.6	6.8
26-Jan	3.3	2.6	2.8	2.7	2.4	1.6	1.8	1.2	1.3	1.4	1.6	2.3	3.3	3.8	4.0	4.3	3.7	AF	AF	AF	AF	AF	AF	AF	--	4.3
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-19.7	-19.9	-19.7	-19.0	-19.4	-19.0	--	-19.0
28-Jan	-19.0	-19.8	-20.3	-20.5	-20.9	-20.6	-21.0	-22.0	AF	-22.9	-22.8	-22.2	-21.4	-20.9	-20.2	-19.9	-19.8	-20.1	-21.1	-21.2	-21.5	-21.7	-21.6	-21.5	-21.0	-19.0
29-Jan	-21.4	-21.4	-21.6	-21.6	-21.3	-21.2	-21.2	-21.1	-20.6	-20.2	-19.2	-17.9	-17.0	-16.1	-15.5	-15.0	-14.6	-14.8	-14.9	-15.5	-15.4	-15.3	-15.6	-16.5	-18.1	-14.6
30-Jan	-17.6	-18.7	-19.1	-20.0	-20.9	-20.6	-20.4	-20.5	-21.1	-21.4	-21.5	-21.4	-21.3	-21.3	-21.6	-21.8	-22.3	-23.3	-24.1	-25.2	-25.9	-26.2	-26.3	-26.7	-22.1	-17.6
31-Jan	-26.9	-26.9	-26.9	-27.1	-27.4	-27.5	-27.6	-28.0	-27.7	-27.4	-26.6	-26.8	-25.6	-23.4	-22.0	-21.3	-20.5	-19.5	-20.0	-20.6	-20.9	-19.9	-19.6	-19.2	-24.1	-19.2
	-13.8	-14.2	-14.2	-14.3	-14.5	-14.6	-15.1	-15.4	-15.1	-14.7	-14.6	-14.2	-13.4	-12.7	-12.2	-11.9	-12.0	-12.6	-13.0	-13.3	-13.4	-13.7	-13.8	-13.8	Diurnal Average	
	4.9	4.5	4.1	4.4	4.9	5.6	5.9	6.8	6.7	5.3	6.0	6.1	6.1	6.4	6.6	6.9	6.8	7.0	7.4	7.2	6.7	3.7	3.9	4.7	Diurnal Maximum	

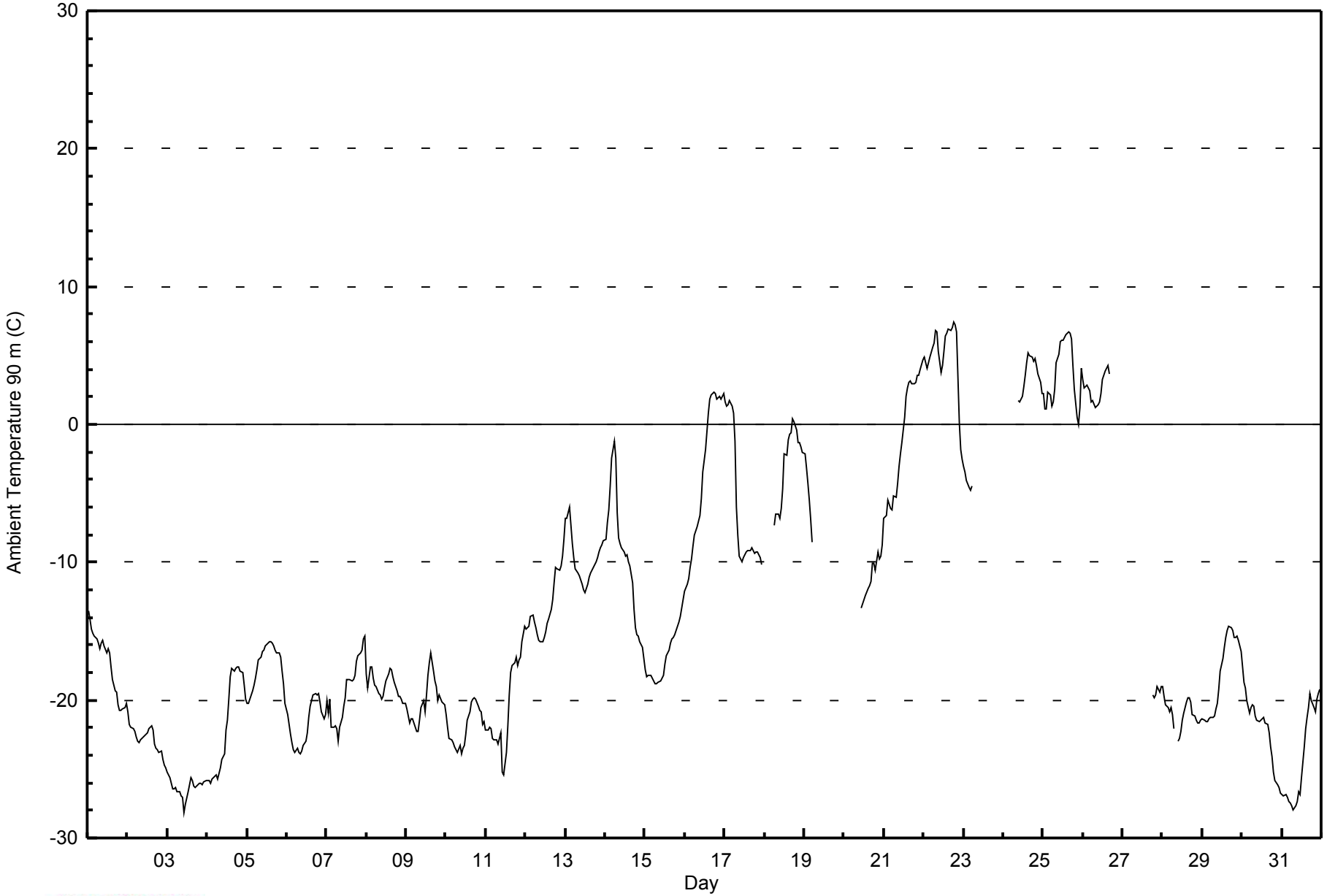
AF - Analyzer Failure

WBEA

Hourly Averages

Ambient Temperature 90 m (AT90m) - C

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	221	33.69	33.69
-20 - 0	327	49.85	83.54
0 - 10	108	16.46	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 656

Total Number of Hours: 744

Maximum Value: 98 % on Jan 24 08:00

Maximum Daily Average: 95.2 % on Jan 23

Minimum Value: 56 % on Jan 8 15:00

Minimum Daily Average: 69.4 % on Jan 8

Maximum Diurnal Average: 82.0 % at hour 3

Minimum Diurnal Average: 76.2 % at hour 16

Monthly Average: 79.9 %

Percentiles: P_1 = 66 P_{10} = 72 Q_1 = 75 Median = 78 Q_3 = 84 P_{90} = 91 P_{99} = 98

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	0
Percent Operational Time:	92.1

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-Jan	83	84	83	81	81	83	84	84	85	85	83	83	81	82	78	76	76	78	77	79	81	81	81	76	81.1	85
2-Jan	74	74	74	74	73	73	75	78	79	80	79	77	76	76	76	77	77	77	79	78	78	78	78	77	76.5	80
3-Jan	78	77	76	76	75	76	76	76	76	75	75	74	73	70	69	70	72	74	74	73	73	73	75	75	74.2	78
4-Jan	76	75	75	75	75	76	76	76	76	76	76	76	76	76	75	71	73	72	70	71	74	73	70	71	74.2	76
5-Jan	72	72	74	77	77	75	74	74	73	74	73	74	72	71	71	68	67	70	74	73	75	71	71	76	72.8	77
6-Jan	77	77	79	78	76	78	77	77	77	76	76	76	75	73	74	76	78	79	80	79	79	79	78	78	77.2	80
7-Jan	78	78	78	78	78	78	77	78	78	78	79	79	79	81	82	82	82	82	79	76	74	75	77	76	78.5	82
8-Jan	77	77	78	73	69	67	68	73	75	74	71	65	61	59	56	58	64	68	71	73	71	70	74	75	69.4	78
9-Jan	77	78	79	78	77	77	77	76	76	76	73	70	68	66	66	67	73	74	78	79	77	75	74	76	74.3	79
10-Jan	77	77	78	79	79	79	78	77	76	76	77	77	77	77	77	76	77	78	78	79	78	78	78	77	77.6	79
11-Jan	77	76	77	77	76	76	76	76	76	76	76	75	74	73	72	74	76	77	78	79	78	78	78	80	76.2	80
12-Jan	82	82	83	82	82	82	83	84	84	85	85	84	83	82	81	82	84	84	84	84	85	85	84	85	83.4	85
13-Jan	87	86	88	87	87	88	88	88	86	85	82	82	80	79	78	82	87	88	87	89	90	90	89	89	85.9	90
14-Jan	89	89	90	91	91	90	85	86	86	85	83	82	82	80	80	80	80	79	78	78	80	79	79	78	83.3	91
15-Jan	77	78	78	75	73	73	75	73	70	71	74	77	79	80	82	78	77	77	78	80	80	80	81	82	77.0	82
16-Jan	83	84	85	85	85	85	85	86	86	85	86	86	85	83	84	78	77	75	73	71	69	67	67	66	79.8	86
17-Jan	69	71	72	70	71	72	78	84	85	80	78	79	79	81	83	85	88	91	92	92	91	91	89	AF	81.3	92
18-Jan	AF	AF	AF	AF	AF	AF	90	90	89	90	90	89	87	84	82	83	87	90	91	92	91	92	92	92	89.0	92
19-Jan	92	92	91	90	90	90	90	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	92
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	87	86	85	85	82	83	85	85	85	84	84	84	85	85	--	87
21-Jan	85	87	89	89	91	90	90	90	88	85	81	77	75	73	76	78	78	79	79	82	80	78	77	74	82.2	91
22-Jan	72	81	86	87	87	84	75	69	68	77	88	85	79	74	73	71	71	69	67	68	68	90	96	96	78.4	96
23-Jan	96	95	94	92	93	95	AF	96	96	96	96	96	96	96	96	96	96	96	96	95	94	94	95	95	95.2	96
24-Jan	96	97	97	98	98	98	98	98	98	98	98	98	94	88	87	83	84	83	85	82	76	79	85	87	91.0	98
25-Jan	86	84	86	88	92	94	96	96	96	87	78	77	78	77	78	78	77	77	83	89	91	92	94	96	86.3	96
26-Jan	96	96	97	97	96	91	92	92	93	93	89	77	72	71	69	67	74	90	AF	AF	AF	AF	AF	AF	86.1	97
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	79	80	80	80	80	81	81	--	81
28-Jan	82	81	81	81	80	80	80	80	AF	78	76	75	74	72	72	74	78	80	78	75	74	73	72	72	76.8	82
29-Jan	74	77	77	75	76	77	78	79	79	79	78	80	80	81	81	83	83	83	84	84	85	85	84	82	80.3	85
30-Jan	81	79	78	79	78	78	77	76	75	76	76	73	67	67	67	67	68	69	69	70	72	74	77	76	73.7	81
31-Jan	77	76	76	75	75	75	75	75	74	74	75	75	73	69	69	69	70	76	78	77	78	78	78	79	74.8	79
	81.0	81.5	82.0	81.7	81.5	81.4	81.2	81.6	81.6	81.1	80.6	79.3	77.9	76.7	76.4	76.2	77.9	79.3	79.4	79.7	79.6	80.1	80.7	80.5	Diurnal Average	
	96	97	97	98	98	98	98	98	98	98	98	98	96	96	96	96	96	96	96	95	94	94	96	96	Diurnal Maximum	

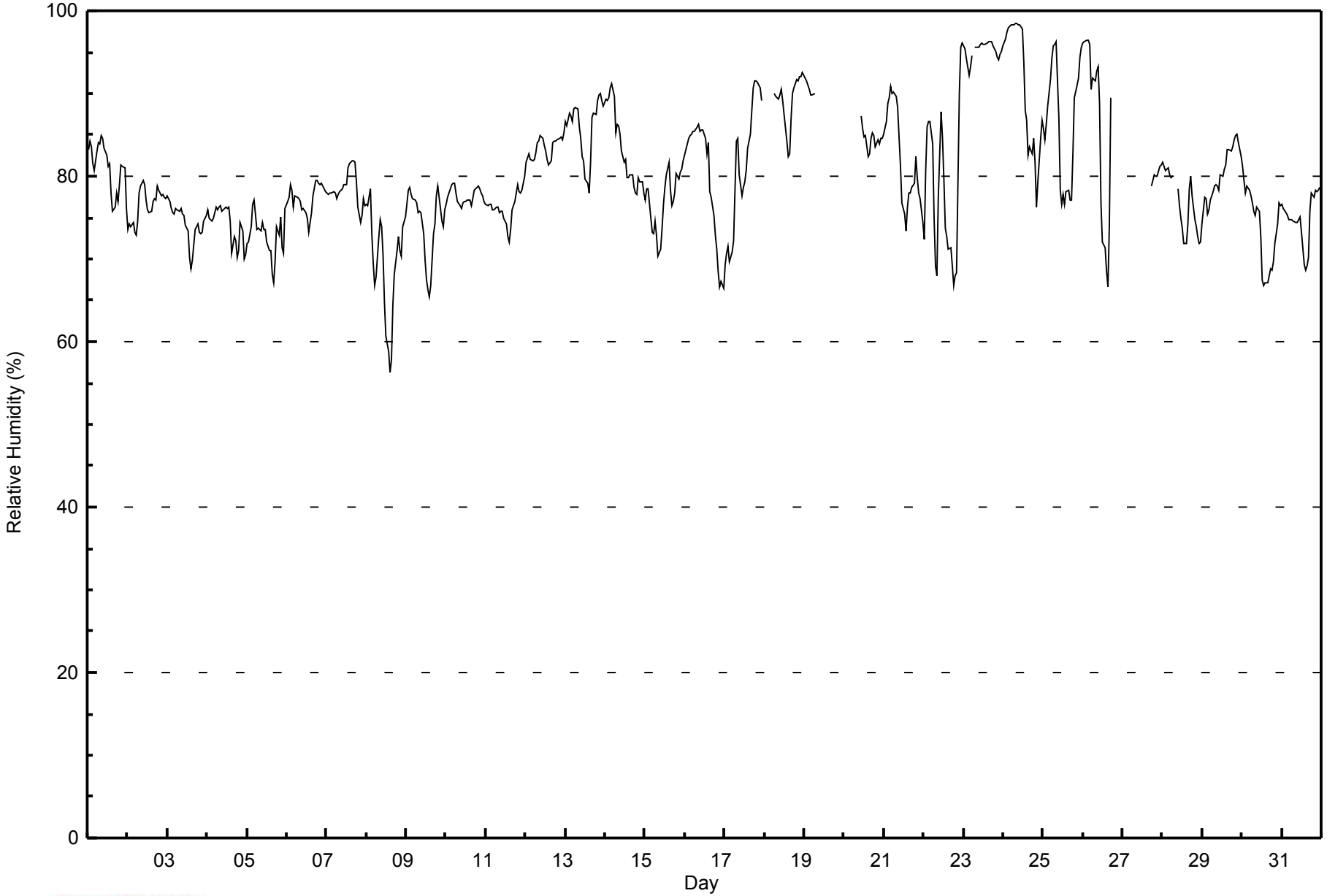
AF - Analyzer Failure

WBEA

Hourly Averages

Relative Humidity (RH) - %

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	3	0.44	0.44
60 - 80	407	59.42	59.85
80 - 100	275	40.15	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 20m (RH20m) - %

Mannix - January 2015

Maximum Value: 97 % on Jan 23 00:00

Maximum Daily Average: 95.8 % on Jan 23

Minimum Value: 53 % on Jan 8 15:00

Minimum Daily Average: 66.9 % on Jan 8

Maximum Diurnal Average: 80.9 % at hour 2

Minimum Diurnal Average: 74.9 % at hour 16

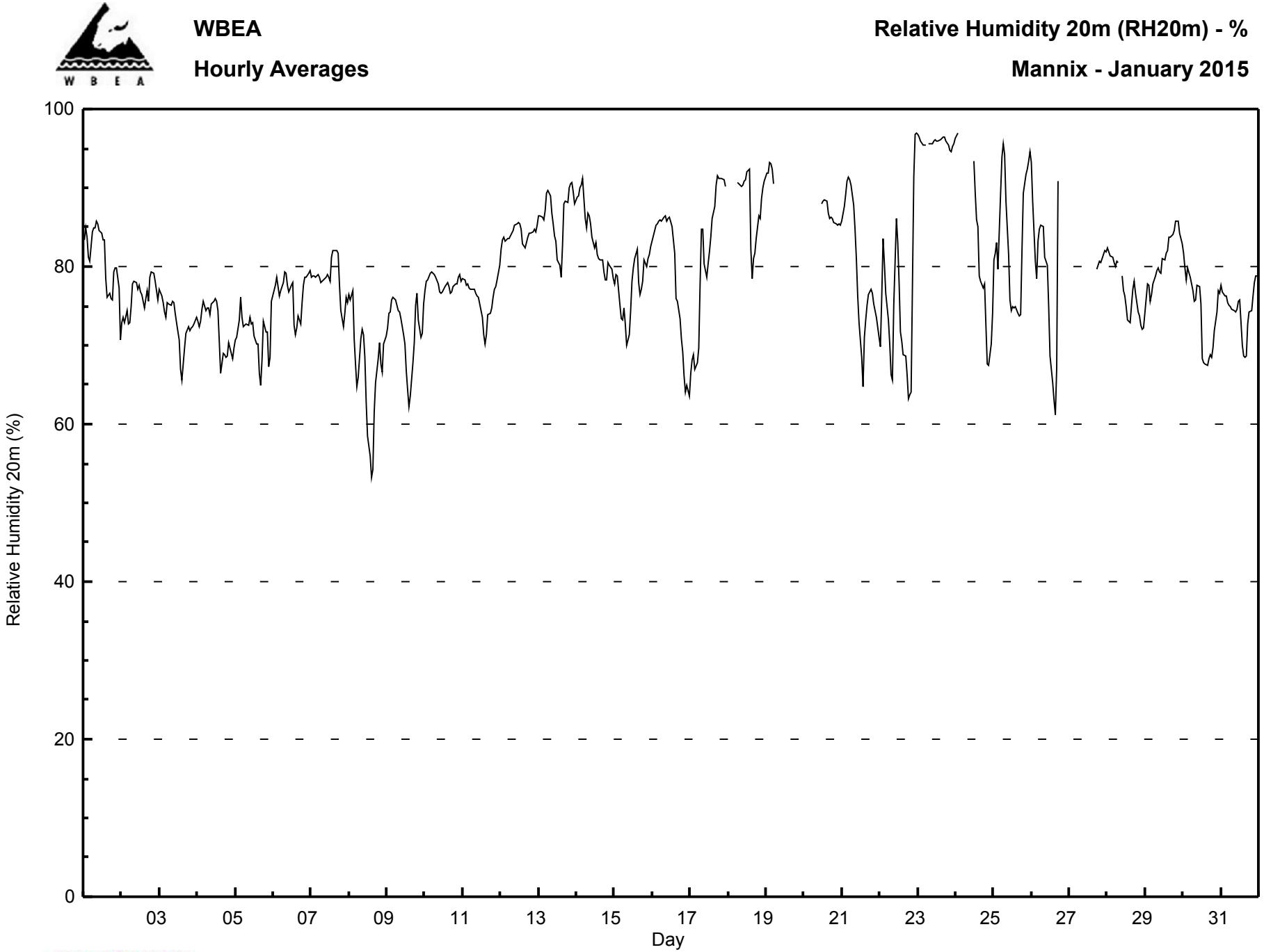
Monthly Average: 78.8 %

Percentiles: $P_1 = 63$ $P_{10} = 69$ $Q_1 = 74$ Median = 78 $Q_3 = 84$ $P_{90} = 90$ $P_{99} = 96$

Hours in Service:	744
Hours of Data:	674
Hours of Missing Data:	70
Hours of Calibration:	0
Percent Operational Time:	90.6

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-Jan	83	85	84	81	81	84	85	85	86	86	85	84	83	83	78	76	77	76	76	79	80	80	77	71	81.0	86
2-Jan	73	74	73	74	73	73	75	78	78	78	77	78	77	76	75	76	77	76	79	79	79	78	77	76	76.1	79
3-Jan	77	76	75	74	74	75	75	75	76	75	74	73	71	67	66	68	70	71	72	72	72	72	73	74	72.8	77
4-Jan	73	72	73	75	76	74	75	75	74	75	76	76	76	74	71	66	69	69	68	69	70	69	68	70	72.2	76
5-Jan	71	71	73	76	74	72	72	73	73	74	73	73	71	70	70	66	65	68	73	72	72	67	68	76	71.4	76
6-Jan	77	78	79	77	76	77	78	79	79	78	77	78	78	72	71	72	74	73	75	78	79	79	79	79	76.7	79
7-Jan	79	79	79	79	79	79	78	78	78	79	79	79	78	81	82	82	82	82	78	74	72	74	76	75	78.4	82
8-Jan	76	76	77	71	68	65	66	71	72	71	68	63	58	56	53	54	61	65	68	70	68	67	70	71	66.9	77
9-Jan	72	74	74	76	76	76	75	74	74	73	71	70	67	64	62	64	68	70	75	77	73	71	71	75	71.8	77
10-Jan	77	78	78	79	79	79	79	79	78	77	77	77	77	77	78	77	77	77	77	78	78	79	79	78	77.9	79
11-Jan	79	78	78	78	77	77	77	77	77	76	76	75	74	71	70	71	74	74	75	76	77	77	78	80	76.0	80
12-Jan	82	83	84	83	84	84	84	84	85	85	85	86	85	85	83	82	83	84	84	84	84	85	84	85	84.1	86
13-Jan	87	87	86	86	87	89	90	89	87	85	84	83	81	80	79	83	88	88	88	90	90	91	90	88	86.5	91
14-Jan	89	89	90	90	91	86	85	87	86	85	84	82	83	82	81	81	81	79	78	78	80	80	80	79	83.6	91
15-Jan	78	79	79	75	73	73	75	73	70	71	74	78	80	81	82	78	77	77	78	81	80	81	81	82	77.4	82
16-Jan	83	85	85	85	86	86	86	86	86	86	86	86	85	83	82	76	76	73	71	69	66	64	65	64	79.2	86
17-Jan	66	68	69	67	68	70	78	85	85	80	79	80	82	84	86	88	90	91	91	91	91	91	90	AF	81.3	91
18-Jan	AF	AF	AF	AF	AF	AF	91	91	90	90	91	91	92	92	82	78	81	82	84	86	86	89	90	91	87.6	92
19-Jan	92	92	93	93	92	90	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	93
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	88	88	88	88	87	86	86	86	86	85	85	85	85	--	88
21-Jan	86	88	89	91	91	91	90	88	85	81	76	73	68	65	71	73	75	76	77	77	75	74	73	71	79.4	91
22-Jan	70	76	84	80	77	73	70	66	66	75	86	83	78	72	71	69	69	66	63	64	64	91	97	97	75.2	97
23-Jan	97	96	96	95	95	95	AF	96	96	96	96	96	96	96	96	96	96	96	96	95	95	95	95	96	95.8	97
24-Jan	96	97	AF	AF	AF	AF	AF	AF	AF	AF	AF	93	89	86	85	79	78	77	78	73	68	67	70	74	--	97
25-Jan	81	82	83	80	89	94	96	94	88	81	76	74	75	75	75	74	74	74	82	89	92	92	93	95	83.7	96
26-Jan	93	88	81	78	83	85	85	85	81	81	80	75	69	65	63	61	67	91	AF	AF	AF	AF	AF	AF	78.4	93
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	80	80	81	81	81	82	82	--	82
28-Jan	82	82	81	81	80	80	81	81	AF	79	77	76	75	73	73	75	77	78	77	74	74	72	72	72	77.1	82
29-Jan	74	78	78	76	76	78	79	80	80	79	79	81	81	82	82	84	84	84	85	86	86	86	84	83	80.9	86
30-Jan	82	80	78	80	79	78	77	76	76	78	78	75	68	68	68	67	68	69	69	70	72	74	77	77	74.2	82
31-Jan	78	77	76	76	75	75	75	75	74	74	75	76	76	70	69	69	69	73	74	74	76	78	79	79	74.6	79
	80.4	80.9	80.5	79.9	80.0	80.0	79.8	80.6	79.9	79.6	79.2	79.4	78.0	76.6	75.6	74.9	76.2	77.6	77.9	78.3	78.1	79.0	79.5	79.4	Diurnal Average	
	97	97	96	95	95	95	96	96	96	96	96	96	96	96	96	96	96	96	96	95	95	95	97	97	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Relative Humidity 20m (RH20m) - %
Mannix - January 2015
Relative Humidity 20m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	4	0.59	0.59
60 - 80	411	60.98	61.57
80 - 100	259	38.43	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 744

Maximum Value: 97 % on Jan 22 23:00

Maximum Daily Average: 86.8 % on Jan 13

Minimum Value: 52 % on Jan 8 15:00

Minimum Daily Average: 65.5 % on Jan 8

Maximum Diurnal Average: 79.6 % at hour 3

Minimum Diurnal Average: 74.1 % at hour 16

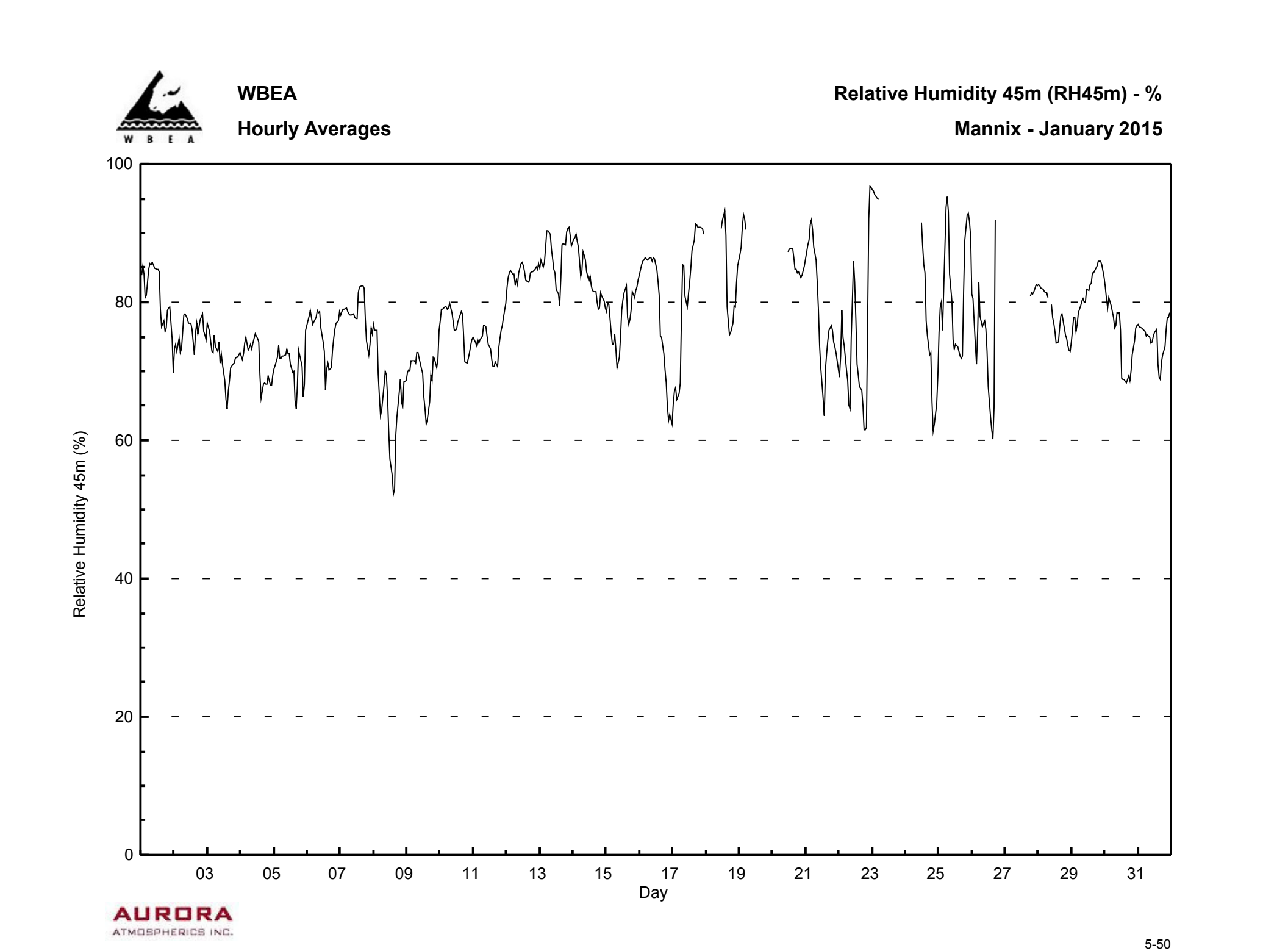
Monthly Average: 77.4 %

Percentiles: P_1 = 61 P_{10} = 68 Q_1 = 72 Median = 77 Q_3 = 83 P_{90} = 88 P_{99} = 95

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Hours of Calibration:	0
Percent Operational Time:	87.2

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-Jan	84	85	84	81	81	85	86	85	86	85	85	85	85	84	79	76	77	76	76	79	79	79	75	70	81.1	86
2-Jan	73	74	73	75	73	73	76	78	78	78	77	77	77	76	72	76	77	75	76	77	78	76	75	75	75.6	78
3-Jan	77	76	74	73	73	75	74	73	74	71	73	71	69	66	65	67	69	70	71	71	72	72	72	73	71.6	77
4-Jan	72	72	73	74	75	73	73	74	73	74	75	75	75	74	69	66	68	68	68	68	69	68	68	69	71.5	75
5-Jan	70	71	72	74	72	72	72	72	72	73	73	73	71	70	70	66	65	68	73	71	71	66	68	76	70.9	76
6-Jan	77	78	79	78	77	77	78	79	79	79	76	74	73	67	70	71	70	70	73	75	76	77	77	79	75.4	79
7-Jan	78	79	79	79	79	79	78	78	78	78	78	78	78	81	82	82	82	82	78	74	72	74	76	75	78.3	82
8-Jan	77	76	76	70	66	64	64	68	70	69	66	61	57	55	52	53	61	63	67	69	65	65	68	69	65.5	77
9-Jan	70	70	70	71	71	72	71	73	73	72	70	70	66	65	62	63	66	69	69	72	72	71	72	76	69.8	76
10-Jan	77	79	79	79	79	79	79	80	78	77	76	76	76	77	78	79	78	75	71	71	72	73	74	74	76.6	80
11-Jan	75	74	74	75	74	75	75	77	77	76	75	74	73	72	71	71	71	71	73	75	76	77	78	80	74.4	80
12-Jan	82	84	84	85	84	84	83	83	82	84	86	86	85	84	83	83	83	84	84	84	85	85	85	86	84.1	86
13-Jan	85	86	85	86	88	90	90	90	88	86	85	84	82	81	79	83	88	89	88	90	91	91	90	88	86.8	91
14-Jan	89	89	90	89	88	84	85	87	87	86	84	83	84	82	82	82	81	80	79	79	81	81	80	79	83.8	90
15-Jan	79	80	80	76	74	74	75	73	71	72	75	79	80	81	82	78	77	78	79	82	81	82	82	83	77.9	83
16-Jan	84	85	86	86	86	86	86	86	86	86	86	86	85	83	81	75	75	73	70	68	65	63	64	62	79.0	86
17-Jan	65	67	68	66	67	68	78	86	85	81	79	81	83	85	87	89	91	91	91	91	91	91	90	AF	81.3	91
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	91	92	93	90	79	77	75	76	77	79	79	83	85	--	93
19-Jan	87	88	91	93	92	90	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	93
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	87	88	88	88	86	85	85	84	84	84	84	85	85	--	88
21-Jan	86	88	89	91	92	91	88	86	83	79	74	70	66	64	70	73	74	76	77	76	74	73	73	70	78.5	92
22-Jan	69	72	79	75	74	70	69	65	65	75	86	83	77	71	69	68	67	65	61	62	62	92	97	97	73.7	97
23-Jan	96	96	96	95	95	95	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	96
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	92	88	85	84	77	75	72	73	66	61	62	65	69	--	92
25-Jan	76	79	80	76	88	94	95	93	84	80	75	73	74	74	74	72	72	72	82	89	93	93	92	89	82.0	95
26-Jan	81	81	74	71	76	83	78	76	77	77	76	73	68	63	62	60	65	92	AF	AF	AF	AF	AF	AF	74.0	92
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	81	81	81	82	82	82	--	82
28-Jan	83	82	82	82	81	81	81	81	AF	80	78	77	76	74	74	76	78	78	77	75	75	74	73	73	77.9	83
29-Jan	74	78	78	76	77	79	80	80	80	80	80	82	82	83	83	84	84	85	85	86	86	86	85	84	81.5	86
30-Jan	82	80	79	81	79	79	78	76	77	79	78	76	69	69	69	68	69	69	69	70	72	74	76	77	74.8	82
31-Jan	77	76	76	76	76	76	75	75	75	74	74	75	76	76	71	69	69	71	72	74	76	78	78	78	74.7	78
	78.7	79.5	79.6	78.9	79.2	79.5	78.7	79.0	78.2	78.1	77.6	78.3	76.9	75.9	75.0	74.1	74.8	75.9	75.9	76.3	76.4	77.4	78.0	77.9	Diurnal Average	
	96	96	96	95	95	95	95	93	88	86	86	92	92	93	90	89	91	92	91	91	93	93	97	97	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Relative Humidity 45m (RH45m) - %
Mannix - January 2015
Relative Humidity 45m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	4	0.62	0.62
60 - 80	422	65.02	65.64
80 - 100	223	34.36	100.00

Total Number of Valid Hours: 649

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 75m (RH75m) - %

Mannix - January 2015

Maximum Value: 97 % on Jan 22 23:00

Maximum Daily Average: 87.7 % on Jan 13

Minimum Value: 52 % on Jan 8 15:00

Minimum Daily Average: 64.8 % on Jan 8

Maximum Diurnal Average: 79.1 % at hour 7

Minimum Diurnal Average: 74.2 % at hour 16

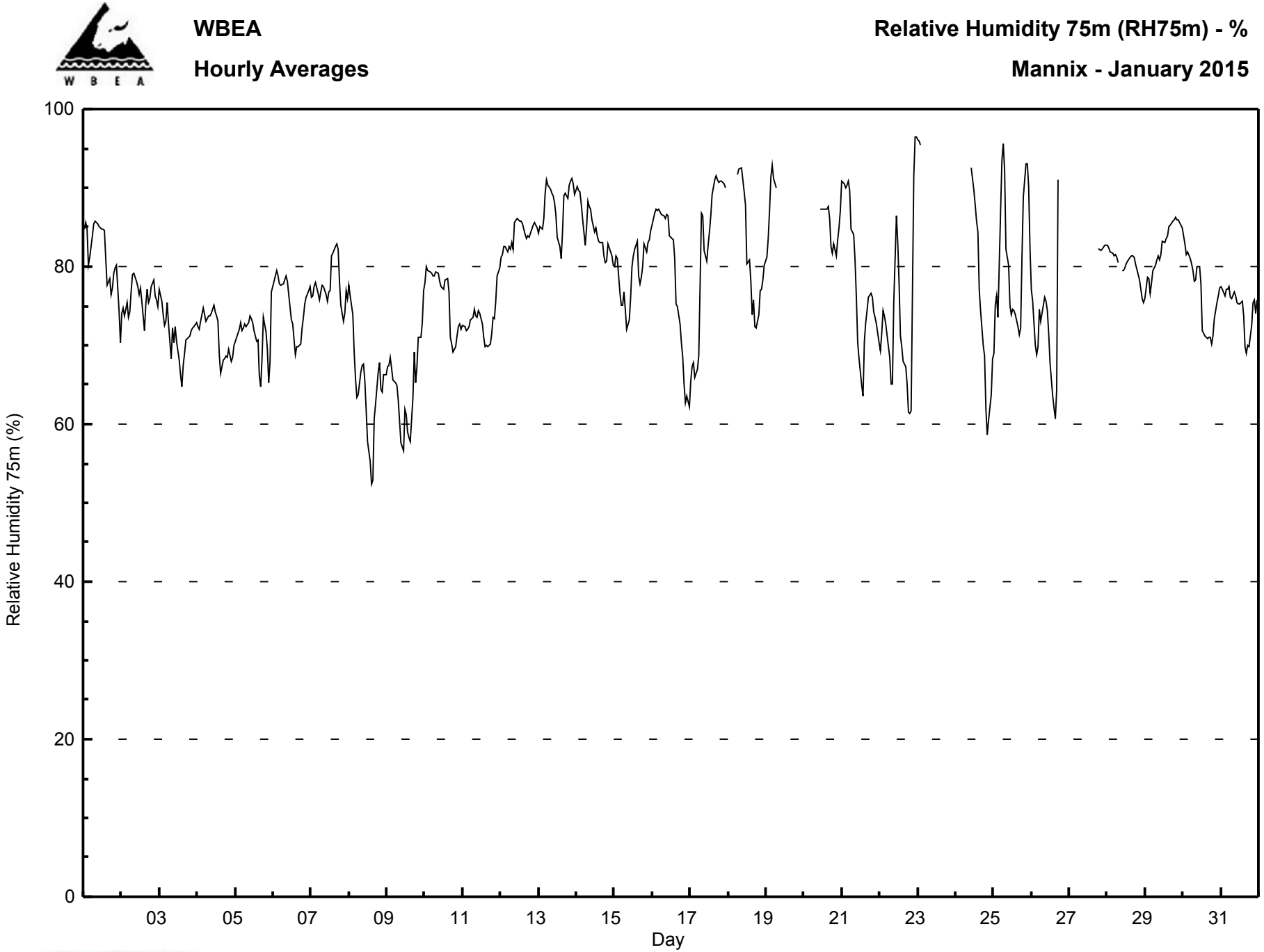
Monthly Average: 77.3 %

Percentiles: P_1 = 58 P_{10} = 67 Q_1 = 72 Median = 77 Q_3 = 83 P_{90} = 87 P_{99} = 94

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

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-Jan	85	86	85	80	81	84	86	86	86	85	85	85	85	85	81	78	78	76	77	79	80	80	74	70	81.5	86
2-Jan	74	75	74	76	74	74	77	79	79	78	77	76	77	76	72	75	77	76	76	78	78	76	76	75	76.0	79
3-Jan	77	76	74	73	73	75	73	68	72	70	72	71	68	66	65	68	69	71	71	71	72	72	72	73	71.3	77
4-Jan	72	72	73	74	75	73	73	74	74	74	75	74	74	73	69	66	68	68	69	68	69	68	68	70	71.4	75
5-Jan	70	71	72	73	72	72	73	72	73	74	73	73	72	71	71	66	65	68	74	72	70	65	68	77	71.1	77
6-Jan	78	79	80	79	78	78	78	78	79	78	76	73	73	71	69	70	70	70	72	74	75	76	77	77	75.3	80
7-Jan	76	76	77	78	77	76	77	78	77	76	76	77	77	81	82	83	83	82	78	75	73	74	77	76	77.6	83
8-Jan	78	76	74	69	66	63	64	67	67	68	65	62	58	55	52	53	61	62	67	68	64	64	66	66	64.8	78
9-Jan	67	67	68	67	66	65	65	63	60	58	57	62	61	59	58	58	63	69	65	67	71	71	73	77	64.9	77
10-Jan	78	80	79	79	79	79	79	79	79	78	77	77	77	78	78	77	71	70	69	70	71	72	73	72	76.0	80
11-Jan	73	72	72	72	72	73	74	75	74	74	74	74	73	71	70	70	70	70	72	74	73	76	79	80	73.1	80
12-Jan	81	82	83	83	82	83	82	83	82	86	86	86	86	86	85	84	84	84	84	84	85	86	85	85	83.9	86
13-Jan	84	85	85	86	89	91	90	90	89	89	88	87	84	83	81	84	89	89	89	90	91	91	90	89	87.7	91
14-Jan	90	90	90	88	86	83	85	88	88	87	86	84	85	84	83	83	83	81	80	81	83	82	81	80	84.7	90
15-Jan	80	81	81	77	75	75	77	75	72	73	76	80	81	82	83	79	78	79	80	83	82	83	83	85	79.2	85
16-Jan	85	87	87	87	87	87	87	87	86	87	87	84	84	83	81	75	75	73	70	69	65	63	64	62	79.2	87
17-Jan	65	67	68	66	67	69	78	87	86	82	81	83	84	86	89	91	91	91	91	91	91	91	90	AF	82.0	91
18-Jan	AF	AF	AF	AF	AF	AF	92	92	93	91	89	88	80	81	78	74	76	72	72	74	77	77	78	80	81.4	93
19-Jan	81	83	87	91	93	91	90	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	93
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	87	87	87	87	87	88	86	83	82	83	81	83	85	87	--	88
21-Jan	91	91	90	90	91	90	85	84	81	76	70	68	65	64	71	73	74	76	77	76	74	74	73	70	78.0	91
22-Jan	69	72	74	74	73	70	69	65	65	75	86	83	78	71	70	68	67	65	61	61	62	92	97	96	73.5	97
23-Jan	96	96	95	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	96
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	93	90	88	86	84	77	74	70	69	62	59	60	64	68	--	93
25-Jan	69	75	76	74	87	94	96	92	82	80	75	74	75	74	74	72	71	72	81	89	93	93	90	82	80.9	96
26-Jan	77	76	70	69	70	75	73	75	76	76	74	71	68	64	62	61	64	91	AF	AF	AF	AF	AF	AF	71.7	91
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	82	82	82	82	83	83	--	83
28-Jan	83	82	82	82	81	82	81	80	AF	80	80	80	80	81	81	81	81	81	80	79	78	77	76	75	80.2	83
29-Jan	76	79	78	77	78	80	80	81	81	81	82	83	83	84	84	85	85	86	86	86	86	86	86	85	82.3	86
30-Jan	84	83	81	82	81	80	80	78	78	80	80	78	72	71	71	71	71	71	70	71	73	75	76	77	76.5	84
31-Jan	78	77	76	77	77	77	76	76	77	76	75	75	75	76	74	70	69	70	70	72	75	76	74	76	74.8	78
	78.5	79.1	79.0	77.7	78.0	78.4	79.1	78.9	78.3	78.2	78.7	78.0	76.7	76.0	75.2	74.2	74.8	75.6	75.5	76.0	76.3	77.4	77.8	77.6	Diurnal Average	
	96	96	95	91	93	94	96	92	93	91	93	90	88	87	89	91	91	91	91	91	93	93	97	96	Diurnal Maximum	

AF - Analyzer Failure


WBEA
Hourly Averages
Relative Humidity 75m (RH75m) - %
Mannix - January 2015
Relative Humidity 75m (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	10	1.53	1.53
60 - 80	397	60.70	62.23
80 - 100	247	37.77	100.00

Total Number of Valid Hours: 654

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 90m (RH90m) - %

Mannix - January 2015

Maximum Value: 97 % on Jan 22 23:00

Maximum Daily Average: 88.5 % on Jan 13

Minimum Value: 52 % on Jan 9 11:00

Minimum Daily Average: 63.7 % on Jan 9

Maximum Diurnal Average: 79.6 % at hour 2

Minimum Diurnal Average: 75.0 % at hour 16

Monthly Average: 77.8 %

Percentiles: P_1 = 56 P_{10} = 68 Q_1 = 73 Median = 78 Q_3 = 84 P_{90} = 88 P_{99} = 95

Hours in Service:	744
Hours of Data:	656
Hours of Missing Data:	88
Hours of Calibration:	0
Percent Operational Time:	88.2

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-Jan	86	86	85	80	81	84	85	86	86	86	86	86	85	85	82	79	80	77	78	80	81	81	74	71	82.1	86
2-Jan	75	75	74	76	75	75	78	80	80	78	78	77	78	76	73	76	78	76	77	78	79	77	77	76	76.8	80
3-Jan	78	76	75	73	74	76	73	68	72	71	73	71	69	67	66	68	70	71	72	72	72	73	73	74	71.9	78
4-Jan	73	73	74	75	75	74	74	74	75	75	76	75	74	73	70	67	69	69	69	69	70	69	69	71	72.2	76
5-Jan	71	72	73	73	73	73	73	73	74	75	74	73	73	72	72	67	65	69	74	72	69	65	68	78	71.7	78
6-Jan	79	80	80	80	79	79	79	79	79	79	77	73	73	72	70	71	70	71	73	74	75	77	78	78	75.9	80
7-Jan	77	77	77	78	77	76	77	77	77	76	76	77	77	82	82	83	83	83	79	76	74	75	78	77	78.0	83
8-Jan	79	77	74	69	66	64	64	67	67	67	66	62	59	56	53	53	61	63	67	68	64	64	66	66	65.0	79
9-Jan	67	67	69	67	65	64	64	61	58	55	52	56	55	56	56	56	64	68	65	66	71	72	74	78	63.7	78
10-Jan	79	81	80	80	80	79	79	80	80	79	79	78	79	79	79	76	70	70	70	70	72	73	73	71	76.5	81
11-Jan	72	72	72	72	73	74	74	75	74	73	74	75	74	72	70	71	70	69	70	71	70	75	80	80	73.0	80
12-Jan	82	82	82	82	82	83	83	84	83	87	87	86	86	86	86	86	85	84	83	85	86	86	86	86	84.5	87
13-Jan	85	85	85	87	90	92	91	90	90	90	89	89	87	84	82	85	90	90	89	91	91	92	91	90	88.5	92
14-Jan	91	90	90	88	86	82	85	89	89	88	87	86	86	85	84	84	84	83	82	82	84	84	82	81	85.5	91
15-Jan	81	82	82	78	76	76	78	76	73	74	77	81	82	83	84	80	79	80	81	84	83	84	85	86	80.2	86
16-Jan	86	88	88	88	88	88	87	87	87	87	87	84	84	84	82	76	75	73	71	69	66	63	64	62	79.7	88
17-Jan	66	68	68	66	68	69	78	88	87	83	82	84	86	88	90	92	92	91	91	91	91	91	91	AF	82.7	92
18-Jan	AF	AF	AF	AF	AF	AF	93	93	88	87	87	85	80	81	78	75	76	73	73	74	77	77	79	80	80.8	93
19-Jan	81	84	88	91	94	92	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	94
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	88	88	88	88	88	87	85	82	81	82	80	84	86	89	--	89
21-Jan	93	93	92	91	91	90	84	83	79	74	70	68	65	64	71	73	75	77	77	77	75	74	73	71	78.3	93
22-Jan	70	72	74	74	73	70	69	65	66	76	87	84	78	72	70	68	68	65	62	62	62	91	97	97	73.8	97
23-Jan	96	96	96	95	95	95	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	96
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	95	92	90	88	87	85	78	74	70	68	61	58	60	63	68	--	95
25-Jan	68	74	75	73	87	94	96	92	82	81	76	74	75	75	74	73	72	72	81	89	93	93	90	80	80.9	96
26-Jan	76	74	69	69	70	73	73	75	76	76	74	71	68	64	63	61	65	AF	AF	AF	AF	AF	AF	AF	--	76
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	83	83	83	83	83	83	--	83
28-Jan	83	83	82	82	82	82	82	81	AF	80	80	80	81	81	82	82	82	82	82	81	81	81	81	81	81.5	83
29-Jan	81	81	81	80	80	81	81	81	82	82	83	84	84	85	85	86	86	87	86	87	87	86	86	85	83.6	87
30-Jan	85	84	83	83	82	82	82	81	81	81	81	80	77	76	76	75	75	75	74	74	75	77	77	78	78.8	85
31-Jan	78	78	77	78	78	79	77	77	78	78	77	76	76	75	74	72	71	72	71	73	76	75	74	76	75.5	79
	79.2	79.6	79.4	78.8	79.2	79.5	79.2	79.3	78.4	79.0	79.0	78.3	77.3	76.7	76.0	75.0	75.5	75.6	75.9	76.4	76.7	77.9	78.5	78.3	Diurnal Average	
	96	96	96	95	95	95	96	93	90	95	92	90	88	88	90	92	92	91	91	91	93	93	97	97	Diurnal Maximum	

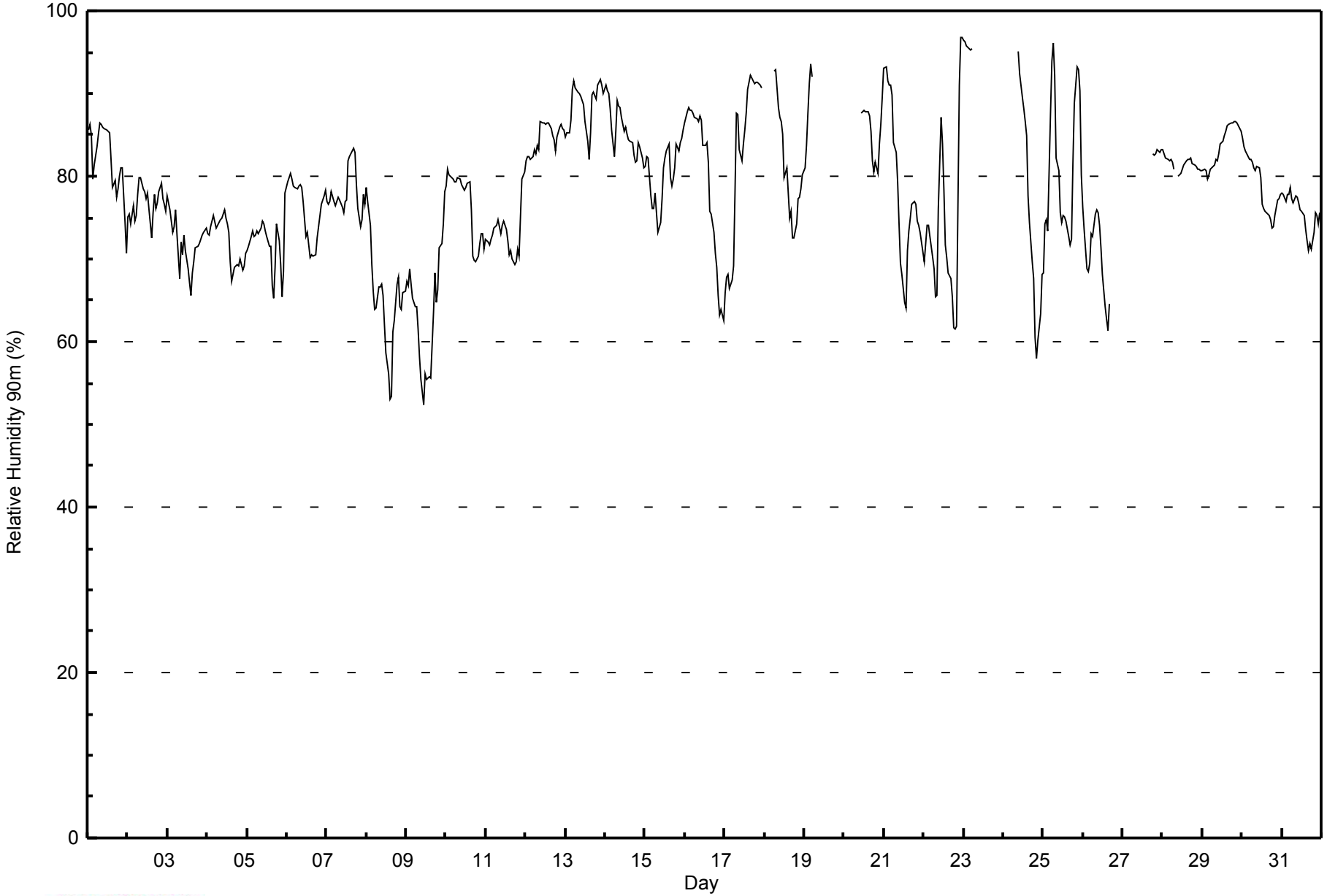
AF - Analyzer Failure

WBEA

Hourly Averages

Relative Humidity 90m (RH90m) - %

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	13	1.98	1.98
60 - 80	373	56.86	58.84
80 - 100	270	41.16	100.00

Total Number of Valid Hours: 656

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - January 2015

Maximum Speed: 35 km/h on Jan 22 14:00

Maximum Daily Speed Average: 15.3 km/h on Jan 22

Minimum Speed Value: 0 km/h on Jan 13 03:00

Minimum Daily Speed Average: 1.3 km/h on Jan 23

Maximum Diurnal Speed Average: 3.7 km/h at hour 14

Minimum Diurnal Speed Average: 0.0 km/h at hour 1

Monthly Average Velocity: 1.9 km/h 239.4 deg

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 6 Median = 9 Q_3 = 14 P_{90} = 17 P_{99} = 28

Hours in Service: 744

Hours of Data: 682

Hours of Missing Data: 62

Percent Operational Time: 91.7

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-Jan	NNE9	NNE9	N7	N6	N5	N7	WNW5	N6	NNE9	N6	WNW6	NW8	NW7	NNW13	NNE21	NNE22	NNE15	NNW13	N7	SW4	WSW5	SW3	NW2	N8	N7.0	NNE22
2-Jan	NNE7	NNE6	NNE9	N5	N8	N8	N6	N4	SW3	SSW5	SSE3	S4	WSW5	WSW4	WNW3	NNE7	NE8	NNE3	WSW4	NW2	W4	NNW6	W4	NW9	NNW2.7	NNE9
3-Jan	N8	N11	N10	NNW6	NW7	WNW8	W10	W12	W11	W6	WSW5	W7	W12	W14	W13	WSW12	WSW11	WSW12	WSW13	W15	WSW13	WSW9	SW9	SW8	W8.2	W15
4-Jan	WSW8	W10	WSW7	S5	S6	WSW11	SW8	SW9	SSW11	SSE13	SSE12	S9	SSE11	S9	S8	WSW11	SW11	WSW13	WSW14	SW10	S7	WSW12	WSW12	WSW17	SW8.5	WSW17
5-Jan	WSW14	WSW10	SSE4	S3	SSW4	SW8	WSW9	W13	W16	W15	W15	W14	W17	WNW19	WNW17	WNW15	NW17	WNW14	WNW13	NW12	NNW12	NNW15	NNW14	N14	WNW10.2	WNW19
6-Jan	NNE13	N9	N5	NE5	NE6	NNE3	W2	WSW6	SW7	SW7	SW4	SW3	W3	ESE2	SE3	SSE5	S4	SW6	SW8	WSW9	SSW7	S7	SSE8	SSE12	SSW1.8	NNE13
7-Jan	SSE11	SSE15	SSE16	SSE14	SSE15	SSE11	SSE12	S9	SSE8	SSE10	SSE14	SSE10	SSE11	SSW5	W8	NW6	NW7	NNW11	NNW19	NNW21	NNW18	NW15	NW21	NW25	SW1.7	NW25
8-Jan	N20	NNW14	NNW16	WNW25	WNW24	WNW21	W18	WSW15	W16	W14	W17	W20	W20	W20	WNW18	W17	W14	WSW13	WSW11	WSW13	W15	WSW13	SW11	SW14	W14.7	WNW25
9-Jan	SW9	S5	SSE7	SSE11	SSE12	SSE13	SSE14	SSE12	SSE12	SSE13	SSE9	SE10	SSE9	SSE8	SE5	ENE5	N9	NW8	WNW9	NW5	N13	NNW8	NNW7	N7	SSE3.4	SSE14
10-Jan	NNE16	NNE14	N7	NNE5	NNE3	SSW2	S3	S5	SSE7	SSE8	SSE8	SSE10	SSE5	SE6	SE6	SSE5	SE7	SE5	ESE3	SE4	SSE7	SSE6	SSE7	SSE7	SE3.5	NNE16
11-Jan	S8	SE5	S9	SE6	SSE8	SSE9	SSE8	SE8	SSE10	SSE9	SSE8	SSE11	SSE13	SSE13	SSE12	SSE11	SSE11	SSE12	SSE11	SSE13	SSE13	SSE11	SSE12	SSE11	SSE9.9	SSE13
12-Jan	SSE12	SSE15	SSE12	SSE8	SSE7	SSE7	SE4	SSE2	SSE4	SSW1	WSW2	WNW2	WSW2	S2	SSE6	SE7	SE7	SSE10	SSE11	SSE16	SSE15	SSE13	SSE9	SSE9	SSE7.3	SSE16
13-Jan	S8	ESE2	WSW0	N9	NNW10	N10	N10	N8	NNE10	NNE7	NNE4	NE10	NE9	NE10	NE5	ENE6	E9	ESE8	SE10	SE10	SE10	SE12	SSE9	S9	ENE3.8	SE12
14-Jan	S9	S9	SE6	SSE9	SSW5	W18	NW12	N18	NNE19	NNE13	NNE10	NNE12	NNE9	N9	N10	N11	NNE16	NNE16	NNE15	NNE13	NNE9	NNE11	NNE11	NNE14	NNE7.6	NNE19
15-Jan	NNE13	NNE14	NNE15	NE13	NNE12	NE11	NNE9	NNE9	NNE7	NNE6	NNE5	NNE5	E4	SE6	SE9	SE11	SE14	SE12	SE17	SE20	SE19	SE22	SE22	SE17	E7.2	SE22
16-Jan	SE21	SE16	SE14	SE15	SE14	SSE13	SSE11	SSE12	SSE15	SSE14	SSE15	SSE9	SE4	SSE2	WSW8	WSW13	WSW17	WSW20	WSW24	WSW24	W25	WSW25	WSW27	W32	SSW9.6	W32
17-Jan	W25	W23	W26	W29	W26	W22	NW14	N13	NNE14	NNE14	NNE11	NNW6	N5	N6	NNW6	NNW6	NNW7	NNW6	WNW4	WSW4	WSW2	SSE8	SSE9	AF	WNW7.7	W29
18-Jan	AF	AF	AF	AF	AF	AF	SSE11	SSE11	SSE9	SSE11	SSE9	SE7	SSE8	SSE9	SE3	SSE6	SSE12	SSE10	SSE9	SSE7	SSE7	SSE9	SSE6	SSE6	SSE8.3	SSE12
19-Jan	SSE6	SSE4	SSE4	WNW1	NW4	N4	N4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	SSE6
20-Jan	AF	AF	NNW6	NNW6	NNW5	NNW6	AF	AF	AF	NNW5	NNW2	W2	SSW2	SSE5	SE7	SSE9	SSE5	SSE10	SSE11	SSE13	SSE15	SSE15	SSE15	SSE12	SSE4.6	SSE15
21-Jan	SE10	SSE14	SSE15	SSE12	SSE14	SSE15	SSE15	SSE16	SSE21	SSE15	SSE22	SSE17	S17	SSW20	SSW19	SSW17	SW20	SW22	SW19	SSW10	SW14	SW11	SW11	WSW12	S13.4	SW22
22-Jan	WSW12	SSE3	SSE8	S7	SSW2	WSW6	WSW10	WSW22	W34	W31	W26	W22	W28	W35	W29	WSW23	WSW17	W19	W25	W23	WNW20	N17	N10	N7	W15.3	W35
23-Jan	NNE8	N6	NNW5	N4	N5	N6	AF	NNW3	W3	NW1	NW3	N4	WNW6	WNW4	SW2	S3	E3	E3	SW3	SSE3	SW2	SE3	ESE4	S4	NNW1.3	NNE8
24-Jan	SSE5	SE7	AF	AF	AF	AF	AF	AF	AF	AF	WSW11	WSW13	WSW12	W12	WSW11	W15	W13	W13	WSW7	WSW11	WSW11	WSW9	SSW7	SSE7	----	W15
25-Jan	SSE10	SSE14	SSE12	SSW10	SSE11	SSE16	SSE18	SSE10	SW10	W14	W28	W24	W14	WSW14	W15	W16	WNW16	WNW16	N7	N7	NE8	NNE1	SSW5	S5	SW6.5	W28
26-Jan	S5	SSE6	S5	SSE7	SSE9	SSE11	S12	S10	SSW9	SSW8	SSW7	SW6	SW7	W5	W10	W6	NNW5	N19	AF	AF	AF	AF	AF	AF	SSW3.9	N19
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	N17	N16	N15	NNE14	N14	N14	N13	----	N17
28-Jan	N12	NNW11	NNW11	NW12	NW15	NW10	NNW12	N8	AF	N6	NNW10	NNW8	WNW5	WSW3	N2	NE4	NNE3	NNE7	NE7	NE10	NE9	NE7	E3	ESE4	N5.9	NW15
29-Jan	S4	SSE7	SSE7	SSE9	SSE8	SSE6	SSE8	SE7	SE7	SSE8	SE8	SE8	SSE6	SSE6	SE5	E3	NE5	NNW7	NNW7	N10	NNW8	N10	N12	N13	ESE2.2	N13
30-Jan	N16	NNE17	NNE20	NNE19	NNE18	NNE13	N15	N14	NNE16	NNE16	NNE15	NNW12	NNE15	NNE13	NNE13	NNE14	NNE16	NNE17	NNE19	NNE16	NNE11	N5	NNW3	W2	NNE13.6	NNE20
31-Jan	NW2	W5	WNW6	W4	WSW3	SW4	SSE5	SSE9	SSE9	SSE8	SSE10	SSE8	SSE10	SSE9	SSE10	SSE12	SSE11	SSE8	SSE11	SSE10	SSE9	SSE9	SSE9	SSE12	SSE6.6	SSE12
	SE0.0	SE0.7	SSE0.4	SSW0.6	SW0.9	WSW2.0	SSW2.0	SSW1.7	SW2.7	SW2.1	SW2.9	WSW2.8	WSW3.3	WSW3.7	WSW3.1	W2.6	W2.2	WNW3.3	W3.3	WSW2.5	WSW2.1	SW1.5	SW2.2	SW1.8	Diurnal Average	
	W25	W23	W26	W29	W26	W22	W18	WSW22	W34	W31	W28	W24	W28	W35	W29	WSW23	SW20	SW22	W25	WSW24	W25	WSW25	WSW27	W32	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 22 13:00

Minimum Value: 1 km/h on Jan 31 01:00

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

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	0
Percent Operational Time:	91.7

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

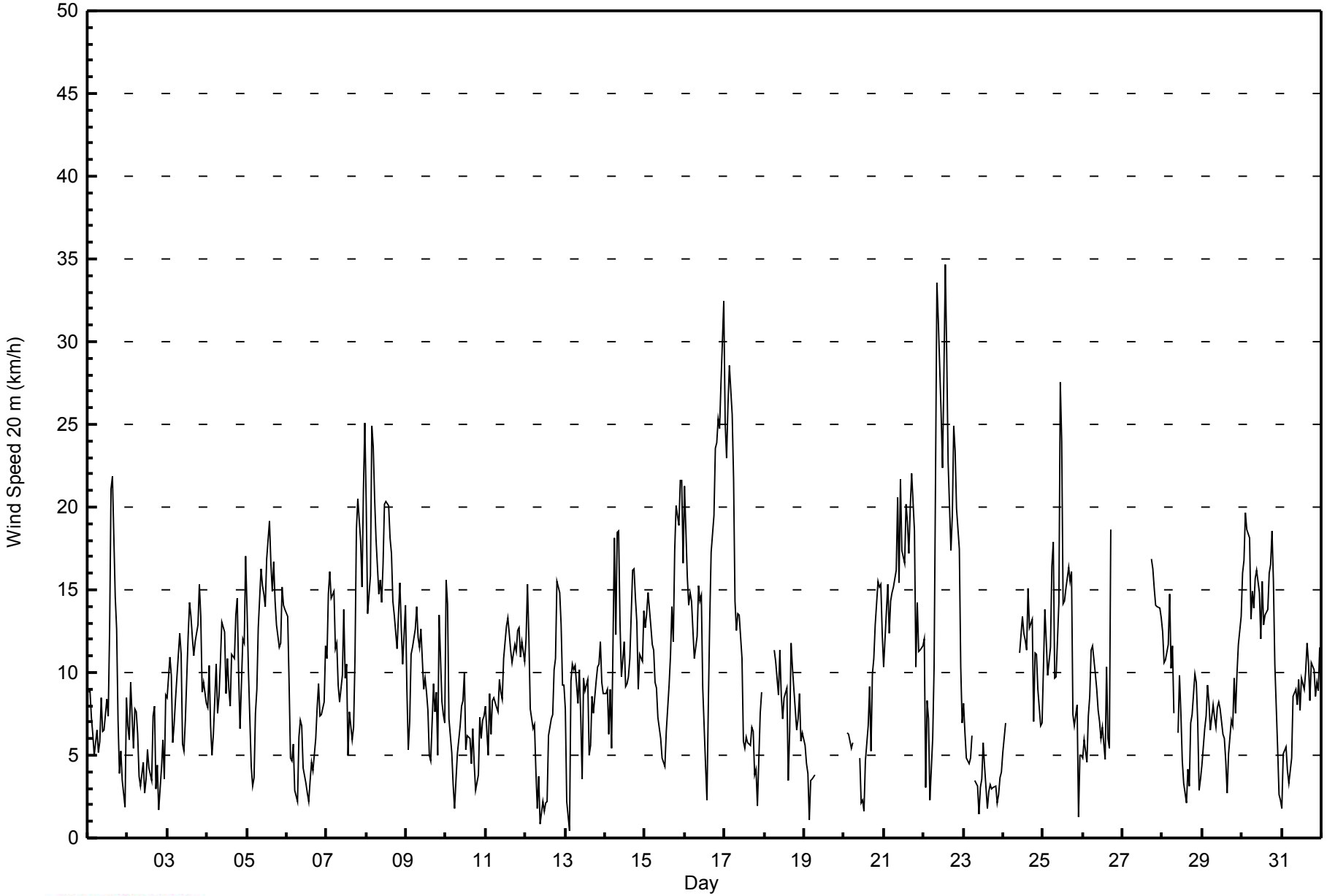
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	137	20.09	20.09
6 - 11	296	43.40	63.49
12 - 19	200	29.33	92.82
20 - 28	43	6.30	99.12
29 - 38	6	0.88	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Mannix - January 2015

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	11	9	4	1	5	5	10	17	13	9	9	13	9	7	7	8	137
6 - 11	32	24	11	1	1	1	23	99	15	8	18	20	8	5	8	22	296
12 - 19	18	34	1	0	0	0	10	54	2	2	3	22	28	8	7	11	200
20 - 28	1	3	0	0	0	0	4	2	0	1	2	7	16	4	2	1	43
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	70	16	2	6	6	47	172	30	20	32	62	67	24	24	42	682

Total Number of Valid Hours: 682

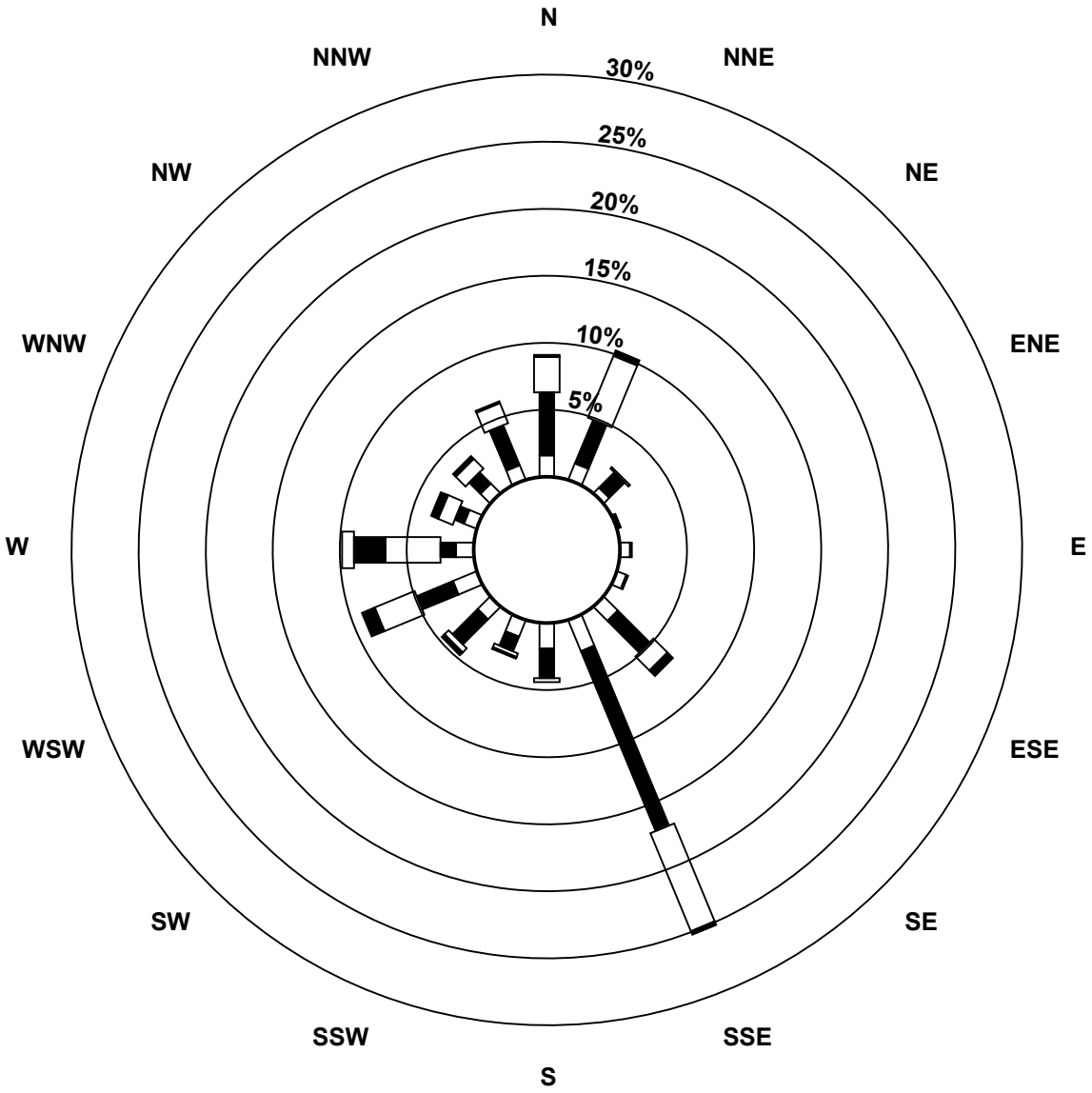
Total Number of Hours: 744

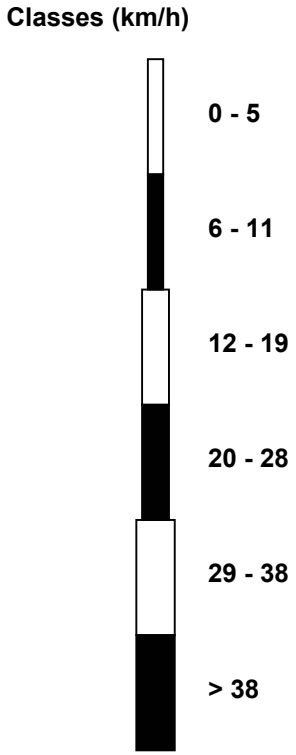
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 20 m (WS20m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 682

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2015

Maximum Speed: 40 km/h on Jan 22 09:00

Maximum Daily Speed Average: 20.7 km/h on Jan 21

Minimum Speed Value: 1 km/h on Jan 2 20:00

Minimum Daily Speed Average: 2.8 km/h on Jan 7

Maximum Diurnal Speed Average: 7.1 km/h at hour 19

Minimum Diurnal Speed Average: 2.4 km/h at hour 1

Monthly Average Velocity: 4.4 km/h 227.0 deg

Percentiles: P_1 = 2 P_{10} = 5 Q_1 = 9 Median = 15 Q_3 = 20 P_{90} = 25 P_{99} = 35

Hours in Service:	744
Hours of Data:	588
Hours of Missing Data:	156
Percent Operational Time:	79.0

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-Jan	NNE12	NNE12	N10	NNE8	N7	NNE8	NW6	N7	NNE10	N10	NW7	NW9	NW9	NNW18	NNE27	NNE29	NNE19	N19	N10	W4	WSW3	WSW5	N5	N11	N9.8	NNE29
2-Jan	NNE8	NNE8	NNE13	N8	NNE10	NNE10	N8	N5	SW3	SSW5	S4	SSW4	W7	W5	NW5	NNE9	NE11	NE5	SW1	N1	WNW3	N11	WNW6	NW12	N4.0	NNE13
3-Jan	N12	N16	N15	N9	NW10	NW11	WNW13	WNW16	W15	WNW10	W8	W12	W16	W17	W16	W16	WSW16	WSW16	WSW19	W21	W19	WSW14	WSW14	WSW11	W11.6	W21
4-Jan	W13	W16	WSW13	SW9	WSW11	WSW16	SW13	SW16	SW15	S17	S15	S15	S14	SSW15	SSW12	WSW15	WSW17	WSW19	WSW19	WSW13	SSW9	WSW18	WSW15	WSW22	SW13.3	WSW22
5-Jan	WSW20	WSW15	SSW6	SSW6	WSW8	WSW11	W12	W17	W19	W19	W17	WNW17	WNW20	WNW23	WNW20	WNW20	NW22	WNW19	NW17	NW16	NNW18	NNW23	NNW20	NNE18	WNW13.7	NNW23
6-Jan	NNE18	N14	NNE7	NE6	NE8	NNE4	NNE3	W3	SW5	SSW9	WSW9	W8	W7	SSE2	SE5	S5	SW6	WSW11	WSW14	WSW18	SW15	SW12	S12	SSE19	WSW3.2	SSE19
7-Jan	SSE19	SSE23	SSE24	SSE22	SSE24	SSE20	SSE19	SSE12	SSE13	SSE16	SSE21	SE14	SE15	S6	W8	NW7	NW8	NNW15	NNW26	N28	NNW24	NW21	NW27	NW32	S2.8	NW32
8-Jan	N27	NNW20	NW25	WNW35	WNW32	WNW27	WNW25	W20	W21	W20	W21	WNW25	WNW24	WNW23	WNW23	WNW21	W20	W20	WSW17	WSW20	W21	WSW17	SW16	SW22	WNW20.0	WNW35
9-Jan	SW16	SW12	S9	SSE16	SSE18	SSE20	SSE20	SSE20	SSE20	SSE20	SSE14	SSE13	SSE11	SSE10	SE8	E7	N13	NNW9	NW12	NNW11	N21	NNW13	NNW12	N10	SSE4.6	N21
10-Jan	NNE21	NNE19	NNE10	NNE7	NE5	SE1	S3	SSW12	S15	S14	SSE12	SSE13	SSE6	SE10	SSE11	SSE10	SSE15	SSE10	SSW5	SSE4	S7	S7	WSW6	SW5	SSE4.5	NNE21
11-Jan	SW6	S5	S11	SSE11	S11	S15	S12	SSE16	SSE18	SSE15	SSE13	SSE15	SSE16	SSE18	SSE19	S20	S21	SSE21	SSE19	SSE20	SSE22	SSE20	SSE23	SSE23	SSE16.0	SSE23
12-Jan	SSE23	SSE26	SSE22	SSE18	SSE18	SSE15	S7	SSE6	S1	W3	W3	WNW2	WSW2	SSW2	SSE7	SSE10	SE13	SSE16	SSE17	SSE22	SSE20	SSE19	SSE15	SSE13	SSE11.9	SSE26
13-Jan	SSW13	WSW3	WNW7	N15	NNW14	N14	N13	N10	NNE12	NNE10	NNE4	NE11	NE11	NE12	NE6	ENE6	ESE10	ESE10	SE14	SE15	SE15	SE16	SSE14	S13	ENE4.4	SE16
14-Jan	S15	S13	SSE9	S12	WSW14	W25	NW17	N25	NNE25	NNE17	NNE12	NNE16	NNE12	N12	N13	N14	NNE20	NNE21	NNE18	NNE18	NNE12	NNE14	NNE15	NNE18	N9.6	W25
15-Jan	NNE17	NNE17	NNE18	NNE16	NNE14	NE13	NNE11	NNE11	NNE8	NE6	NNE5	NNE5	E6	SE8	SE12	SE15	SE18	SE16	SE23	SE25	SE23	SE28	SE28	SE22	E9.4	SE28
16-Jan	SE28	SE21	SE18	SE20	SE19	SSE18	SSE16	SSE18	SSE22	SSE21	SSE21	SSE13	S7	WSW7	WSW13	W18	WSW23	WSW26	WSW30	WSW31	WSW32	WSW33	WSW37	W38	SSW13.1	W38
17-Jan	W30	W28	W31	W34	W30	W26	NW19	NNE17	NNE19	NNE18	NNE14	N7	N7	N7	NNW7	NNW6	NNW8	NNW8	NW4	SW3	S3	SE10	SSE14	AF	WNW8.8	W34
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSE14	SSE14	SE9	SSE9	SSE20	S19	S18	SSW12	SSE12	S12	SSE14	SSE14	----	SSE20
19-Jan	S10	SSE11	SSE12	SSW3	NW8	NNW5	N7	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	SSE12
20-Jan	AF	AF	NNW8	NNW9	NNW7	NNW8	AF	AF	AF	NNW6	NNW4	WSW2	S3	SSE5	SE8	SSE13	SSE10	SSE17	SSE16	SSE18	SSE22	SSE21	SSE22	SSE18	SSE7.0	SSE22
21-Jan	SSE17	SSE22	SSE24	SSE23	SSE26	SSE26	SSE26	SSE24	SSE28	SSE25	SSE31	SSE26	S28	SSW32	SSW30	SSW26	SW28	SW30	SW26	SW17	SW21	WSW18	WSW18	WSW17	S20.7	SSW32
22-Jan	WSW17	SW6	S13	SW13	WSW8	WSW13	WSW17	WSW29	W40	W36	W31	W28	W33	W40	W35	WSW30	WSW25	W25	W31	W29	WNW26	N23	N14	NNE9	W20.3	W40
23-Jan	NNE11	N7	NNW6	N5	N6	N8	AF	AF	AF	AF	AF	AF	WNW6	WNW5	SW2	S4	E4	AF	AF	AF	AF	AF	AF	AF	----	NNE11
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	WSW20	WSW17	W15	W16	W19	W18	W22	WSW16	WSW19	WSW19	WSW17	SW13	SSW11	----	W22
25-Jan	SSE17	SSE21	S19	SSW19	S19	SSE23	SSE25	S15	SW17	W19	W33	W29	W19	W20	W20	W22	WNW23	WNW24	N10	N10	NE9	ENE3	S10	S13	SW9.8	W33
26-Jan	SW15	SSW12	SW11	SSW10	SSE15	SSE18	S16	SSW16	SW14	SW12	SW11	WSW10	WSW9	W7	W13	W8	NW8	N25	AF	AF	AF	AF	AF	AF	SW7.6	N25
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NNE20	NNE14	NNE8	N5	N2	----	NNE20
31-Jan	N2	W5	WNW7	NW4	WNW4	WSW8	SSW6	SSE13	SSE15	SSE12	SSE11	SSE10	SSE11	SE9	SSE12	SSE16	SSE17	S19	SSE19	SSE18	SSE15	SSE18	SSE18	SSE20	SSE10.1	SSE20
	SSW2.4	S2.6	SSW2.5	SSW3.2	SSW2.9	SW4.1	SW4.1	SSW3.9	SW5.2	SW4.6	SW5.2	SW5.3	SW5.4	WSW5.8	WSW5.1	WSW4.7	WSW4.8	WSW6.3	WSW7.1	WSW5.3	SW4.9	SW4.3	SSW5.3	SW4.7	Diurnal Average	
	W30	W28	W31	WNW35	WNW32	WNW27	SSE26	WSW29	W40	W36	W33	W29	W33	W40	W35	WSW30	SW28	SW30	W31	WSW31	WSW32	WSW33	WSW37	W38	Diurnal Maximum	

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Maximum Value: 8 km/h on Jan 22 13:00

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Percent Operational Time:	79.0

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

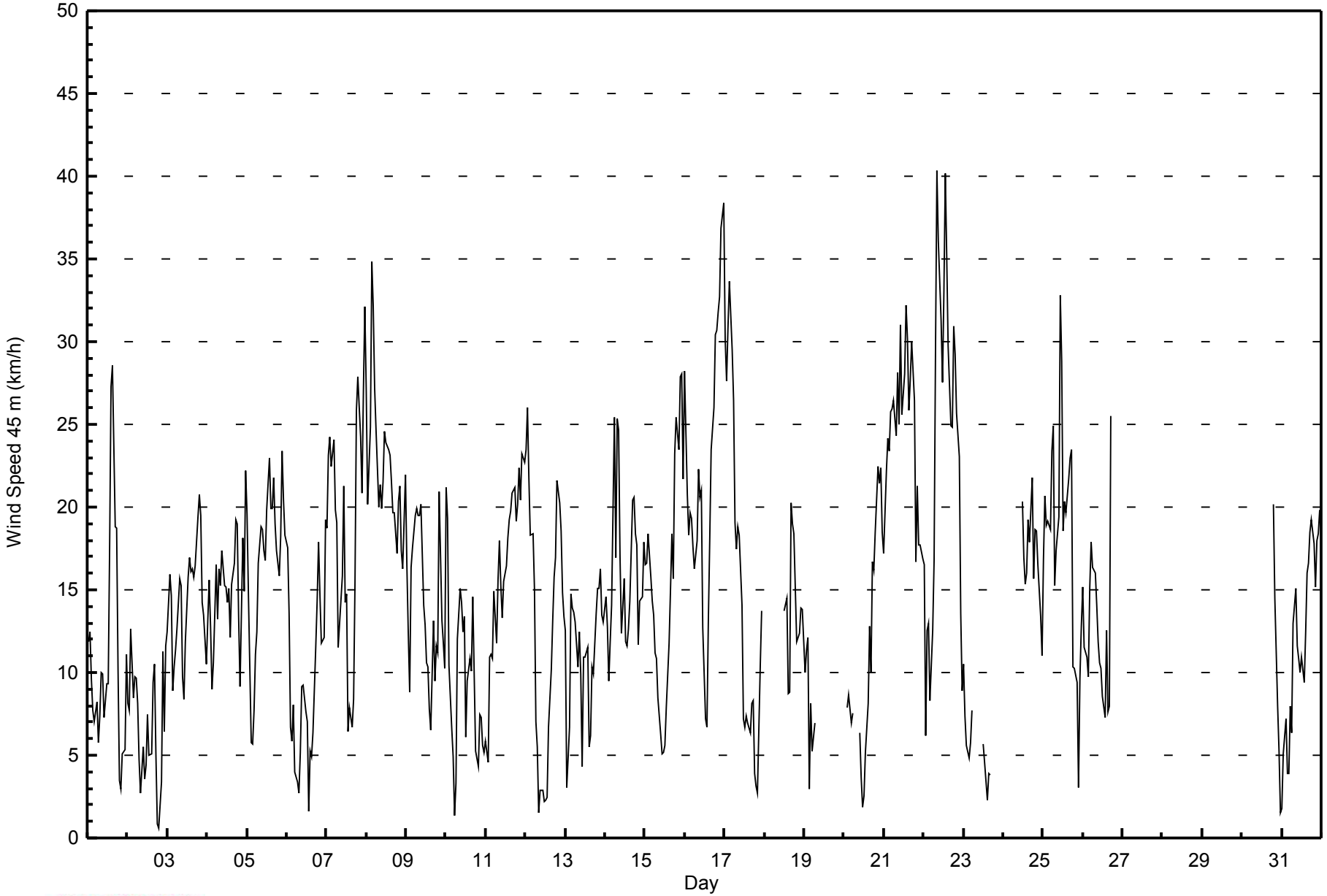
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2015



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Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	60	10.20	10.20
6 - 11	145	24.66	34.86
12 - 19	234	39.80	74.66
20 - 28	119	20.24	94.90
29 - 38	28	4.76	99.66
> 38	2	0.34	100.00

Total Number of Valid Hours: 588

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	7	5	2	1	1	0	2	3	8	5	6	5	6	4	3	2	60
6 - 11	21	18	8	1	2	2	7	17	10	7	6	13	5	6	10	12	145
12 - 19	13	28	2	0	0	0	13	62	23	8	15	32	20	6	6	6	234
20 - 28	6	6	0	0	0	0	9	44	2	1	4	8	16	14	4	5	119
29 - 38	0	1	0	0	0	0	0	1	0	2	1	7	13	2	1	0	28
> 38	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Totals	47	58	12	2	3	2	31	127	43	23	32	65	62	32	24	25	588

Total Number of Valid Hours: 588

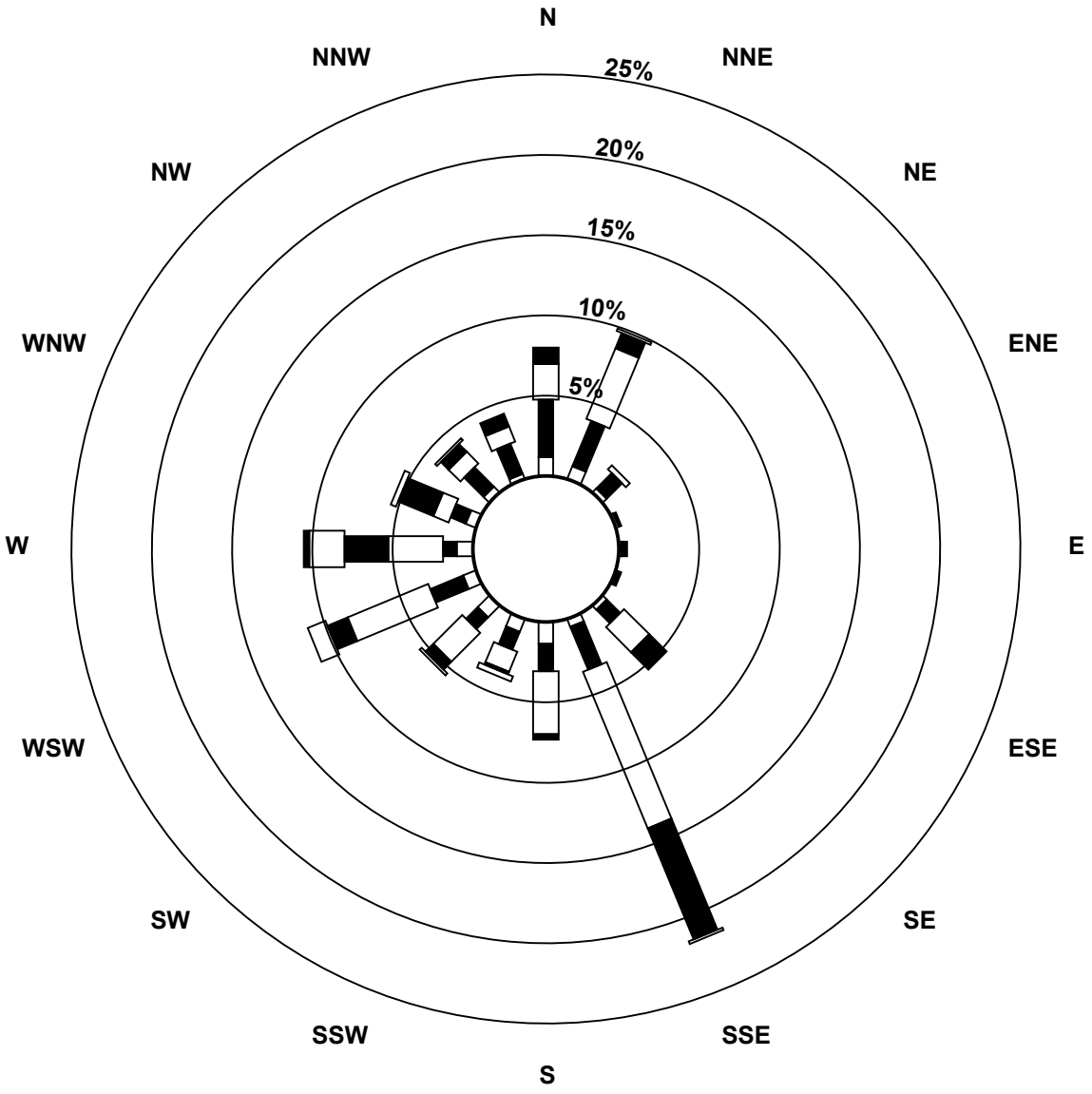
Total Number of Hours: 744

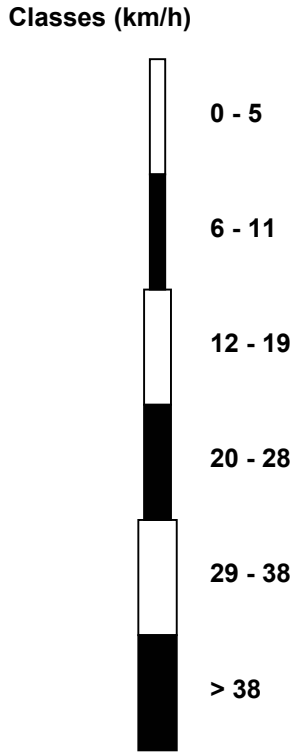
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 45 m (WS45m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 588

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2015

Maximum Speed: 45 km/h on Jan 22 09:00

Maximum Daily Speed Average: 26.4 km/h on Jan 21

Minimum Speed Value: 1 km/h on Jan 2 20:00

Minimum Daily Speed Average: 2.8 km/h on Jan 7

Maximum Diurnal Speed Average: 8.9 km/h at hour 19

Minimum Diurnal Speed Average: 3.9 km/h at hour 2

Monthly Average Velocity: 6.2 km/h 239.4 deg

Percentiles: P_1 = 2 P_{10} = 6 Q_1 = 11 Median = 18 Q_3 = 24 P_{90} = 31 P_{99} = 39

Hours in Service:	744
Hours of Data:	557
Hours of Missing Data:	187
Percent Operational Time:	74.9

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-Jan	NNE15	NNE15	NNE11	NNE9	NNE8	NNE8	NNW5	NNE9	NE11	NNE10	NNW6	NNW9	NNW10	NNW22	NNE31	NNE33	N22	N24	N12	NW4	WSW1	WSW5	N9	N12	N11.6	NNE33
2-Jan	NE10	NE10	NNE16	NNE11	NNE11	NNE11	N9	NNE5	WSW2	S4	S4	SW5	WNW9	WNW5	NW6	NNE9	NE12	NE7	ESE2	SE1	NW4	N13	NW10	NNW14	N5.2	NNE16
3-Jan	N15	NNE20	N18	N11	NNW12	NW12	NW15	WNW18	WNW18	WNW13	W13	W17	W18	W18	W18	W19	WSW19	WSW21	W24	W25	W25	W19	WSW17	WSW14	WNW14.0	W25
4-Jan	W18	W21	WSW18	WSW15	WSW18	WSW21	WSW18	WSW22	SW19	SSW16	SSW15	SW17	SSW17	SW20	SW15	WSW18	WSW21	WSW24	WSW23	WSW16	SW11	WSW22	WSW18	WSW26	WSW17.9	WSW26
5-Jan	WSW23	WSW20	SW9	WSW10	WSW10	WSW14	W16	W20	W21	WNW21	W19	WNW18	WNW21	WNW25	WNW21	WNW22	NW25	NW21	NW19	NW19	NNW23	N30	NNW26	NNE20	WNW16.3	N30
6-Jan	NNE20	NNE17	NNE9	NE7	NE11	NNE6	N5	NNE2	SSW3	SSW8	WSW9	W13	WNW13	WSW5	SW4	WSW7	W10	W18	WSW20	WSW24	WSW20	WSW17	SSW12	S16	W5.6	WSW24
7-Jan	S14	SSE23	S24	S29	SSE32	SSE27	SSE20	SE12	SE13	SE20	SE30	SE18	SE19	SSE10	WSW7	NW7	NW9	NNW20	N31	N32	NNW29	NW25	NW31	NNW37	SSE2.8	NNW37
8-Jan	N31	NNW26	NW33	WNW40	WNW37	WNW32	WNW30	W23	W27	W25	WNW25	WNW27	WNW25	WNW25	WNW26	WNW24	W24	W25	WSW22	WSW26	W26	WSW22	WSW20	WSW21	WNW23.9	WNW40
9-Jan	WSW20	SW19	SW11	S11	S11	S16	S16	SSE19	S18	S18	SSE17	SSE15	SSE14	SSE14	SSE13	ENE4	NNE14	N11	N13	NNW18	N27	N17	N15	N13	S3.2	N27
10-Jan	NNE27	NNE24	NNE13	NNE8	NE7	ENE2	SSE3	SSW13	SSW19	SSW18	S15	S12	SSW9	S9	SSE14	S15	SSE15	SSW8	WSW8	WSW5	SW7	WSW6	W10	WSW11	S3.8	NNE27
11-Jan	WSW10	WSW5	SW10	SW6	SW6	SSW6	SSW7	SSE10	SSE14	SSE16	SSE20	SSE22	SSE21	SSE24	SSE27	SSE24	SSE26	SSE25	SE23	SSE22	SSE28	SSE31	S28	S26	SSE16.6	SSE31
12-Jan	S29	S33	S29	S20	S15	S11	SSW7	SSW2	WSW3	W6	WNW4	WNW3	WSW3	SW3	SSE7	SSE13	SSE16	S21	S24	S26	S24	SSE23	SSE20	S14	S13.5	S33
13-Jan	SW15	W11	WNW12	N18	N15	N15	N14	N11	NNE15	NNE11	NE5	NE12	NE12	ENE13	ENE6	E6	ESE8	ESE8	SE14	SE17	SE18	SE20	SSE18	S16	ENE4.1	SE20
14-Jan	S18	S15	S6	SW11	W25	W32	NW20	N30	NNE28	NNE20	NNE14	NNE18	NNE14	N12	N14	N14	NNE22	NNE24	NNE21	NNE21	NNE13	NNE17	NNE18	NNE21	N11.1	W32
15-Jan	NNE19	NNE19	NNE21	NNE19	NNE16	NE15	NNE12	NNE12	NE9	NE6	NE5	NE5	ESE5	SE8	SE10	SE14	SE18	SE14	SE24	SE28	SE26	SE31	SE31	SE24	E10.1	SE31
16-Jan	SE30	SE24	SE22	SE25	SE26	SSE24	SSE22	SSE25	SSE29	SSE27	S25	SSW14	SW12	WSW14	W18	W22	WSW29	WSW31	WSW36	WSW36	WSW37	WSW39	WSW44	W43	SSW16.5	WSW44
17-Jan	W34	W31	W35	W38	W33	W30	NW21	N19	NNE23	NNE22	NNE17	N7	N7	N8	N7	N7	N7	N8	NW3	S3	SSE5	SE13	SSE17	AF	WNW9.0	W38
18-Jan	AF	AF	AF	AF	AF	AF	AF	SSE24	SSE27	SSE30	S24	S15	S14	SSE19	SSE7	S5	SSE18	S18	SSW17	SW13	SSW9	SSW9	SSW10	SSW9	----	SSE30
19-Jan	SSW9	SSW6	S5	SSW4	WNW9	NNW9	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	WNW9
20-Jan	AF	AF	NNW9	NNW10	NNW7	NNW11	AF	AF	AF	AF	NNW4	SW1	SSE3	SSE5	SE9	SSE16	S13	S22	SSE21	SSE25	SSE28	SSE27	SSE29	SSE24	SSE10.0	SSE29
21-Jan	SSE26	SSE32	SSE29	S30	SSE30	SSE30	SSE31	SSE31	SSE39	SSE37	SSE39	S31	S34	SSW38	SSW35	SSW31	SW33	SW35	SW33	SW21	SW26	WSW22	WSW23	WSW22	S26.4	SSE39
22-Jan	WSW20	WSW10	SSW13	SW18	WSW15	WSW18	WSW22	WSW35	W45	W39	W34	W31	W37	W44	W39	WSW35	WSW30	WSW30	W35	W34	W30	N24	N15	NNE10	W24.4	W45
23-Jan	NNE12	N8	N5	N5	N6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NNE12
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	W22	WSW25	W21	W17	W19	W22	W23	W27	WSW23	WSW25	W24	WSW21	SW18	SSW13	----	W27
25-Jan	S16	S26	S24	SSW26	S25	SSE30	SSE30	S20	SW23	WSW24	W37	W32	W21	W24	W23	W25	WNW28	WNW28	NNW12	N11	NNE11	E5	S11	SSW17	SW13.1	W37
26-Jan	SW18	SW18	WSW19	SW13	S14	SSE19	SSW14	SW19	WSW17	WSW15	WSW15	WSW15	WSW11	W8	W14	W9	NW9	N31	AF	AF	AF	AF	AF	AF	WSW10.7	N31
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
	WSW3.9	SW3.9	WSW4.1	SW5.1	SW4.6	SW5.3	SW5.0	SW4.3	SW6.1	SW6.5	SW7.2	WSW7.3	WSW7.6	WSW7.8	WSW7.0	WSW6.7	WSW6.8	W8.4	WSW8.9	WSW7.9	WSW7.2	SW6.1	SW6.8	WSW6.7	Diurnal Average	
	W34	S33	W35	WNW40	WNW37	W32	SSE31	WSW35	W45	W39	SSE39	W32	W37	W44	W39	WSW35	SW33	SW35	WSW36	WSW36	WSW37	WSW39	WSW44	W43	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 22 13:00

Minimum Value: 1 km/h on Jan 12 01:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 7

Hours in Service:	744
Hours of Data:	557
Hours of Missing Data:	187
Hours of Calibration:	0
Percent Operational Time:	74.9

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

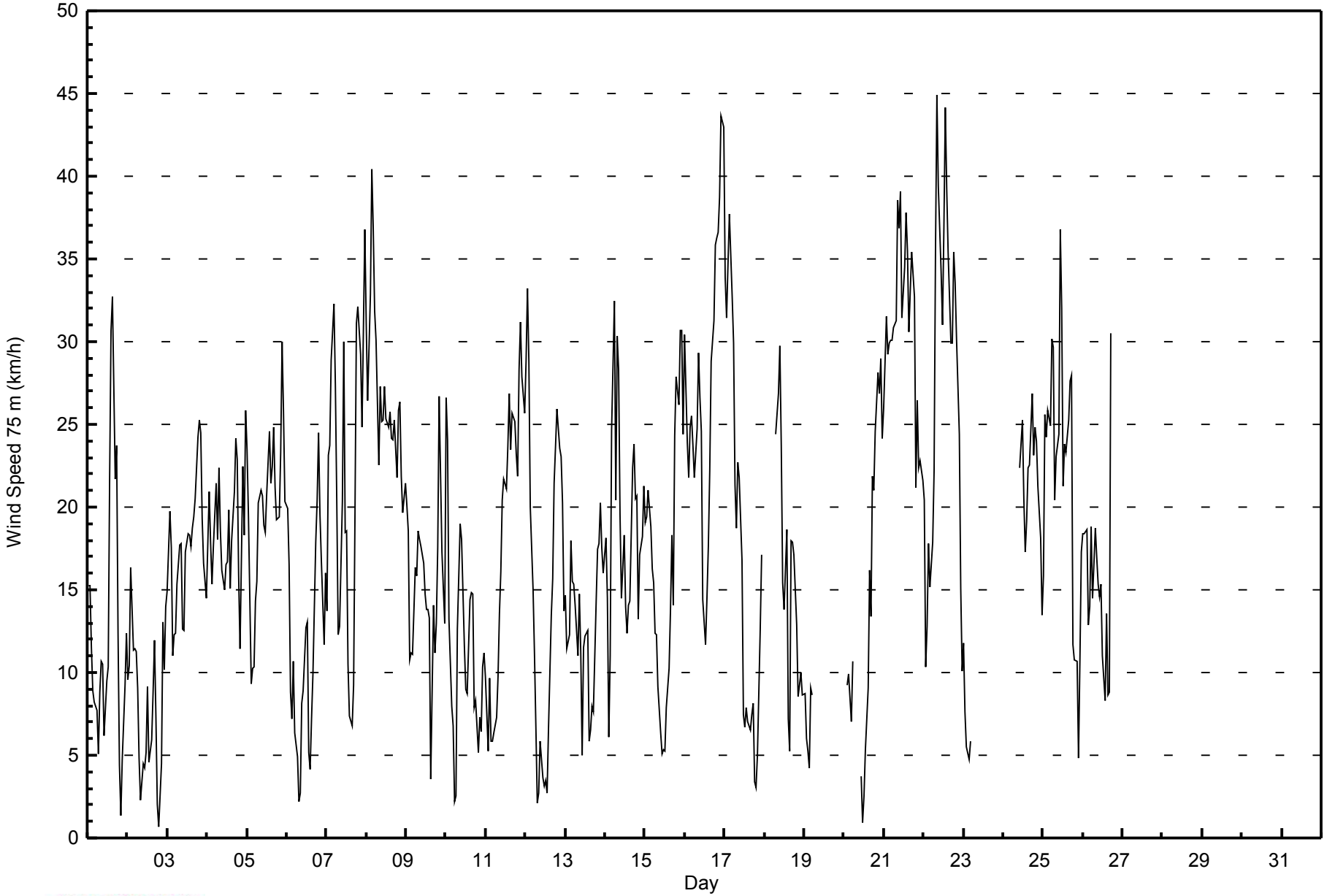
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	46	8.26	8.26
6 - 11	109	19.57	27.83
12 - 19	169	30.34	58.17
20 - 28	153	27.47	85.64
29 - 38	70	12.57	98.20
> 38	10	1.80	100.00

Total Number of Valid Hours: 557

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2015

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	3	2	3	2	1	2	1	4	5	3	4	8	0	3	3	2	46
6 - 11	14	19	7	1	1	2	3	4	6	12	8	11	6	2	5	8	109
12 - 19	17	22	4	1	0	0	11	18	20	13	13	20	16	6	4	4	169
20 - 28	4	15	0	0	0	0	11	27	15	1	4	30	23	14	4	5	153
29 - 38	6	2	0	0	0	0	4	14	7	3	3	9	15	3	2	2	70
> 38	0	0	0	0	0	0	0	2	0	0	0	2	5	1	0	0	10
Totals	44	60	14	4	2	4	30	69	53	32	32	80	65	29	18	21	557

Total Number of Valid Hours: 557

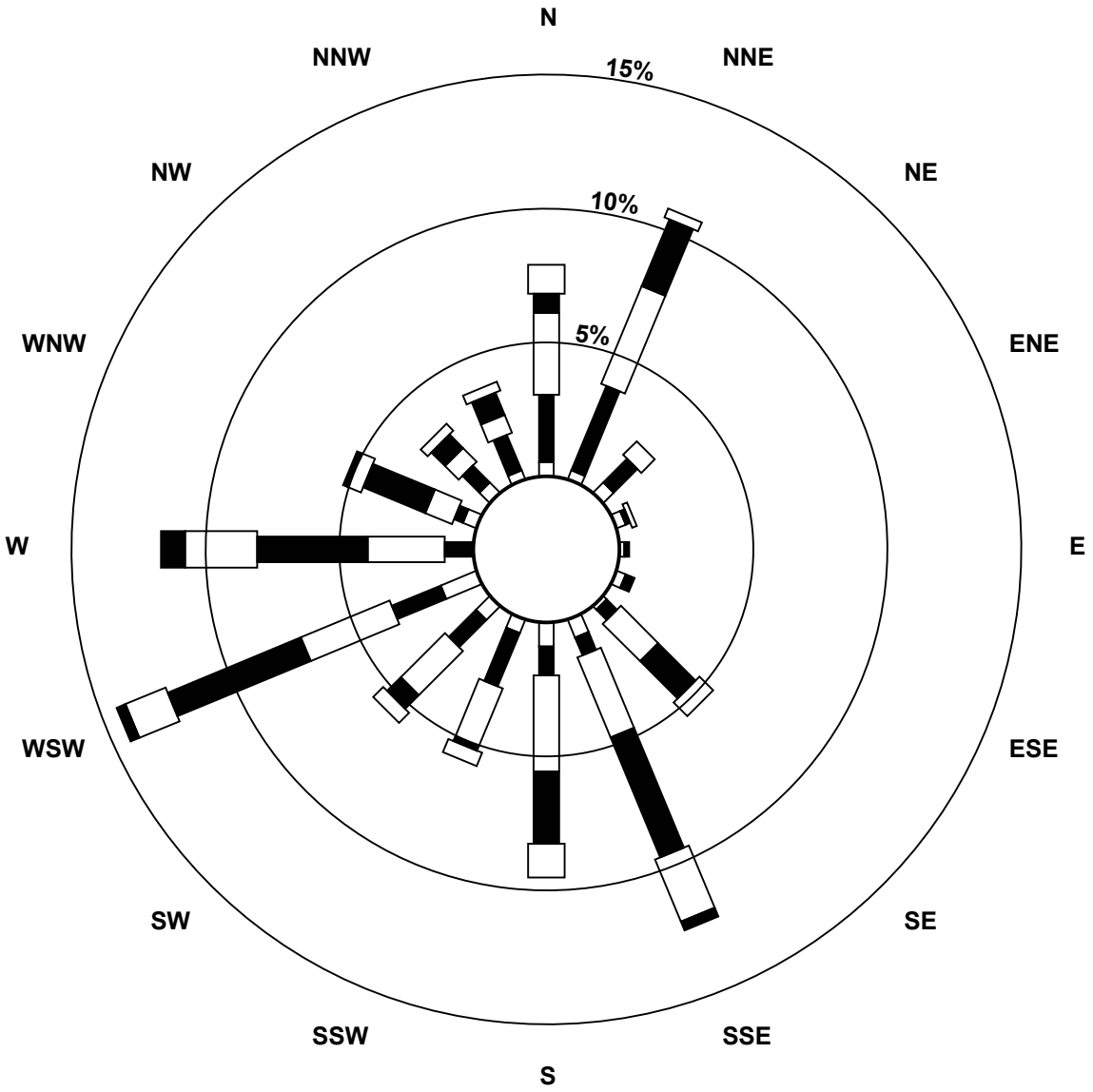
Total Number of Hours: 744

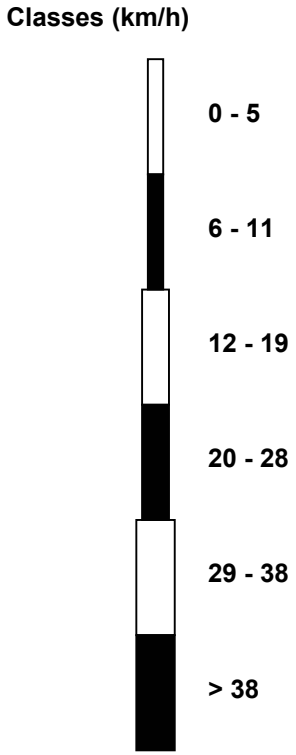
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 75 m (WS75m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 557

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - January 2015

Maximum Speed: 45 km/h on Jan 22 09:00

Maximum Daily Speed Average: 29.7 km/h on Jan 21

Minimum Speed Value: 1 km/h on Jan 20 12:00

Minimum Daily Speed Average: 2.5 km/h on Jan 7

Maximum Diurnal Speed Average: 9.7 km/h at hour 19

Minimum Diurnal Speed Average: 4.6 km/h at hour 2

Monthly Average Velocity: 6.9 km/h 239.2 deg

Percentiles: P_1 = 1 P_{10} = 7 Q_1 = 12 Median = 19 Q_3 = 26 P_{90} = 33 P_{99} = 42

Hours in Service:	744
Hours of Data:	560
Hours of Missing Data:	184
Percent Operational Time:	75.3

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-Jan	NNE17	NNE16	NNE13	NNE10	NNE9	NE8	NNW4	N9	NE11	NNE10	N6	NW10	NNW11	NNW23	N32	N34	N23	N25	NNW14	NNW5	WSW1	W5	NNW11	N13	N12.4	N34
2-Jan	NNE10	NNE12	NNE19	N13	NNE13	NNE12	N10	N5	W3	SSW4	S4	WSW5	WNW10	WNW5	WNW6	NNE9	NE12	NE8	E2	ENE1	NW5	NNW13	WNW12	NW15	N6.0	NNE19
3-Jan	N16	N21	N19	N12	NW13	NW13	NW17	WNW18	WNW18	W14	W14	W19	W19	W19	W18	WSW19	WSW21	WSW22	WSW26	W26	W26	WSW21	WSW18	WSW17	WNW15.0	W26
4-Jan	WSW19	WSW23	WSW20	WSW18	WSW20	WSW24	WSW20	WSW25	SW20	SSW17	SSW16	SW18	SSW18	SW22	SW16	WSW19	WSW22	WSW26	WSW24	WSW17	SW13	WSW24	WSW19	WSW27	WSW19.7	WSW27
5-Jan	WSW25	WSW21	SW11	WSW12	WSW11	WSW16	W17	W21	W22	W21	W19	WNW19	W21	W25	WNW22	WNW23	NW26	WNW22	WNW20	NW21	NNW25	NNW33	NNW28	N21	WNW17.4	NNW33
6-Jan	N20	N18	NNE10	NE8	NE12	NNE8	N6	N3	SSW1	S8	WSW9	W13	W14	WSW8	WSW7	WSW10	W12	W21	WSW23	WSW27	WSW22	WSW19	SW13	SSW15	W6.9	WSW27
7-Jan	SSW13	SSE18	S22	S30	SSE32	SSE27	SSE25	SE16	ESE13	SE20	SE33	SE20	SE20	SE13	SW7	WNW7	NW10	NNW21	NNW34	N34	NNW31	NW26	NW32	NW38	SSE2.5	NW38
8-Jan	N33	NNW29	NW35	WNW41	WNW37	WNW33	WNW31	W24	W29	W27	W27	W28	W26	W25	WNW26	W25	W25	WSW27	WSW23	WSW28	WSW28	WSW24	WSW21	WSW22	W25.3	WNW41
9-Jan	WSW20	SW20	SW13	S10	S9	SSW16	S15	S15	S14	S14	S14	SSE13	SSE13	SSE12	SSE13	NNE2	N14	N13	N14	NNW20	N29	NNW19	NNW17	NNW14	SW2.8	N29
10-Jan	NNE28	NNE26	NNE15	N9	NNE8	NE3	ESE3	S13	S20	SSW18	S12	S9	SW10	S10	S12	S12	S10	SSW7	WSW10	WSW7	WSW9	WSW8	WSW13	WSW15	SW3.4	NNE28
11-Jan	WSW13	WSW8	WSW12	SW6	WSW7	SW7	SW7	S7	S10	S11	SSE21	SSE25	SSE21	SSE24	SSE28	SSE25	SSE27	SE30	SE28	SE26	SE34	SSE36	S27	S22	SSE16.8	SSE36
12-Jan	SSE27	SSE31	S28	S18	S11	SSW10	SW7	SW1	WSW4	W8	W5	WNW4	W5	WSW4	SSE6	SSE14	SE17	S21	S25	S27	S25	SSE24	SSE20	S12	S13.1	SSE31
13-Jan	WSW17	W15	WNW13	NNW19	N16	N16	N15	N11	NNE16	NNE12	NNE5	NE12	NE12	NE13	ENE6	E8	ESE12	ESE13	SE18	SE21	SE21	SE23	SE20	SSE18	ENE4.5	SE23
14-Jan	S20	SSW15	SSW6	WSW14	W29	W35	WNW22	N32	N30	NNE21	NNE15	NNE19	N15	N13	N14	N14	N23	NNE25	N21	N22	N14	NNE18	NNE20	NNE23	N11.9	W35
15-Jan	NNE20	NNE21	NNE22	NNE20	NNE17	NNE16	NNE13	NNE13	NNE9	NE7	NE5	NE5	ESE7	SE10	ESE14	ESE18	SE21	ESE19	SE27	SE31	SE29	SE34	SE34	SE28	E11.5	SE34
16-Jan	SE34	SE27	SE24	SE28	SE29	SE27	SE24	SE28	SSE33	SSE29	S25	SSW15	SW15	WSW17	WSW19	WSW23	WSW30	WSW32	WSW37	WSW38	WSW38	WSW40	WSW45	W44	SSW17.4	WSW45
17-Jan	W35	WSW32	W35	W39	W33	W31	NW22	N19	N24	N23	NNE18	N8	N7	N8	N7	N7	NNW7	N8	NW3	SSE4	SE6	SE14	SE18	AF	WNW9.2	W39
18-Jan	AF	AF	AF	AF	AF	AF	AF	SSE28	SSE28	SSE31	S24	SSW18	S13	SSE16	SSE4	SSW5	SSE16	S18	SSW17	SW14	SSW8	SSW10	SW10	SW8	----	SSE31
19-Jan	SSW8	SW6	SSW3	WSW4	WNW7	NNW8	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	SSW8
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NNW4	SW1	SSE2	SE6	SE5	SSE19	S15	S23	SSE24	SSE28	SSE30	SSE29	SSE31	SSE27	----	SSE31
21-Jan	SSE30	SSE34	SSE31	SSE33	SSE35	SSE39	SSE42	SSE42	SSE44	SSE42	SSE41	SSE34	S37	SSW40	SSW38	SSW33	SW35	SW38	SW35	SW23	SW28	WSW24	WSW24	WSW23	S29.7	SSE44
22-Jan	WSW22	WSW12	SW14	SW20	WSW18	WSW20	WSW24	WSW37	WSW45	W40	W35	W32	W37	W45	W40	WSW37	WSW31	WSW31	W37	W35	W31	N24	N15	N11	W25.9	WSW45
23-Jan	N13	N8	NNW6	N6	N7	N7	AF	NNW3	W3	ENE1	NW3	NW3	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NNE13
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	W23	W24	WSW27	WSW22	W18	WSW20	W23	W24	W28	WSW25	WSW27	WSW26	WSW23	SW20	SW15	----	W28
25-Jan	S15	S27	S27	SSW29	S28	SSE34	SSE32	S23	SW26	WSW26	W38	W33	W22	WSW25	W24	W26	WNW29	WNW29	NNW12	N11	NNE11	ENE5	SSE11	SSW18	SW14.5	W38
26-Jan	SW20	SW22	WSW23	SW15	S14	SSE16	SW15	SW20	WSW19	WSW17	WSW17	WSW17	SW12	WSW9	W14	W9	WNW9	N32	AF	AF	AF	AF	AF	AF	WSW12.4	N32
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
	WSW4.6	WSW4.6	WSW5.5	WSW6.4	SW5.5	SW5.9	SW5.8	SW4.7	SW6.4	SW7.0	SW7.4	WSW7.8	WSW8.4	WSW8.4	WSW7.6	WSW7.5	WSW7.5	W8.9	WSW9.7	WSW8.6	WSW7.9	SW6.8	SW7.5	WSW7.7	Diurnal Average	
	W35	SSE34	W35	WNW41	WNW37	SSE39	SSE42	SSE42	WSW45	SSE42	SSE41	SSE34	S37	W45	W40	WSW37	SW35	SW38	WSW37	WSW38	WSW38	WSW40	WSW45	W44	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Jan 7 18:00

Minimum Value: 1 km/h on Jan 2 09:00

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:	560
Hours of Missing Data:	184
Hours of Calibration:	0
Percent Operational Time:	75.3

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

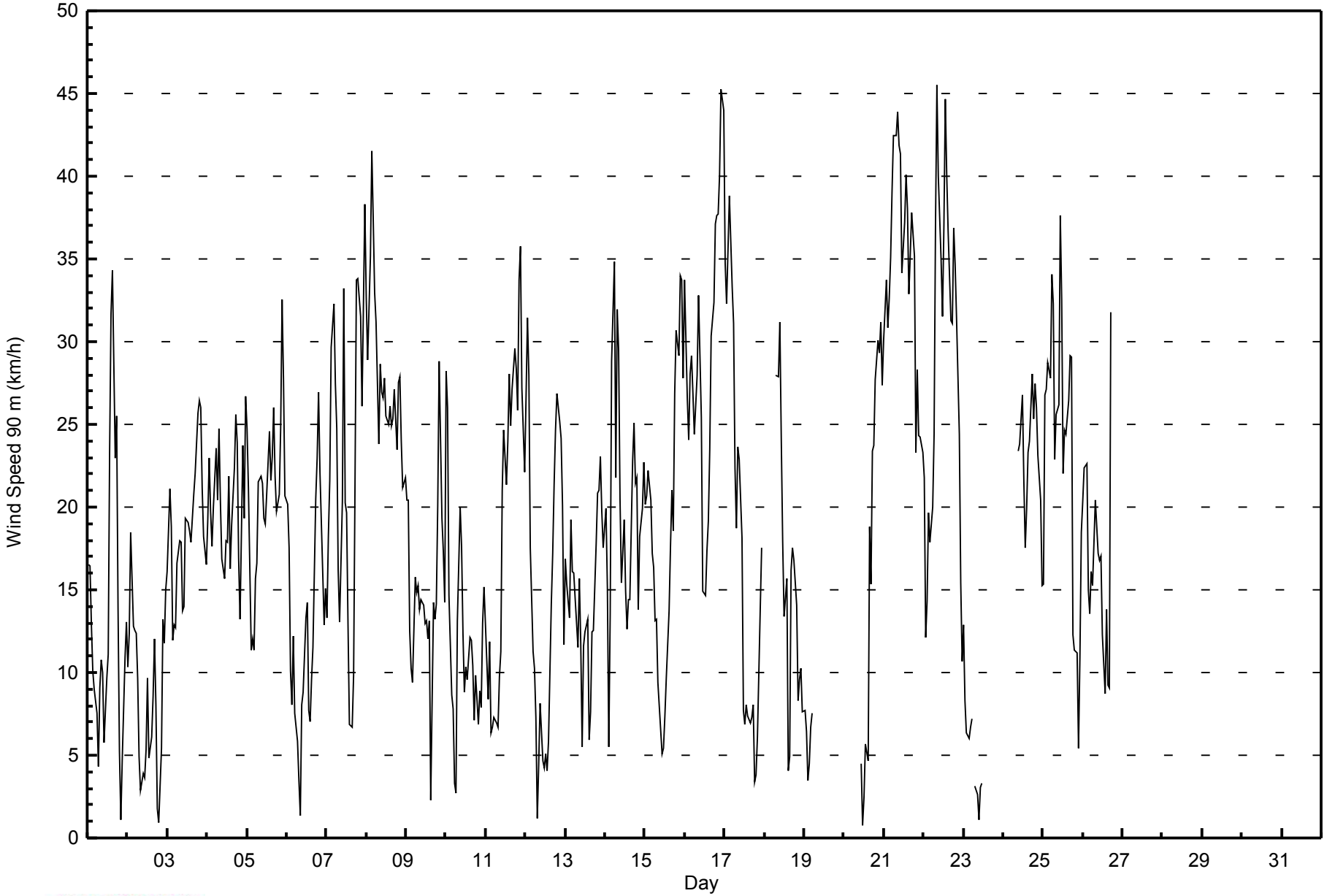
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	43	7.68	7.68
6 - 11	93	16.61	24.29
12 - 19	161	28.75	53.04
20 - 28	168	30.00	83.04
29 - 38	79	14.11	97.14
> 38	16	2.86	100.00

Total Number of Valid Hours: 560

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed 90 m (WS90m) - km/h

Mannix - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	2	2	3	3	1	1	1	3	1	4	2	5	5	2	4	4	43
6 - 11	18	10	5	1	1	1	3	2	8	8	10	12	2	5	2	5	93
12 - 19	19	19	5	0	0	6	5	12	16	12	11	26	14	5	4	7	161
20 - 28	11	10	0	0	0	0	18	17	17	0	11	46	23	6	4	5	168
29 - 38	8	0	0	0	0	0	9	17	2	3	3	10	15	5	3	4	79
> 38	0	0	0	0	0	0	0	6	0	1	0	3	5	1	0	0	16
Totals	58	41	13	4	2	8	36	57	44	28	37	102	64	24	17	25	560

Total Number of Valid Hours: 560

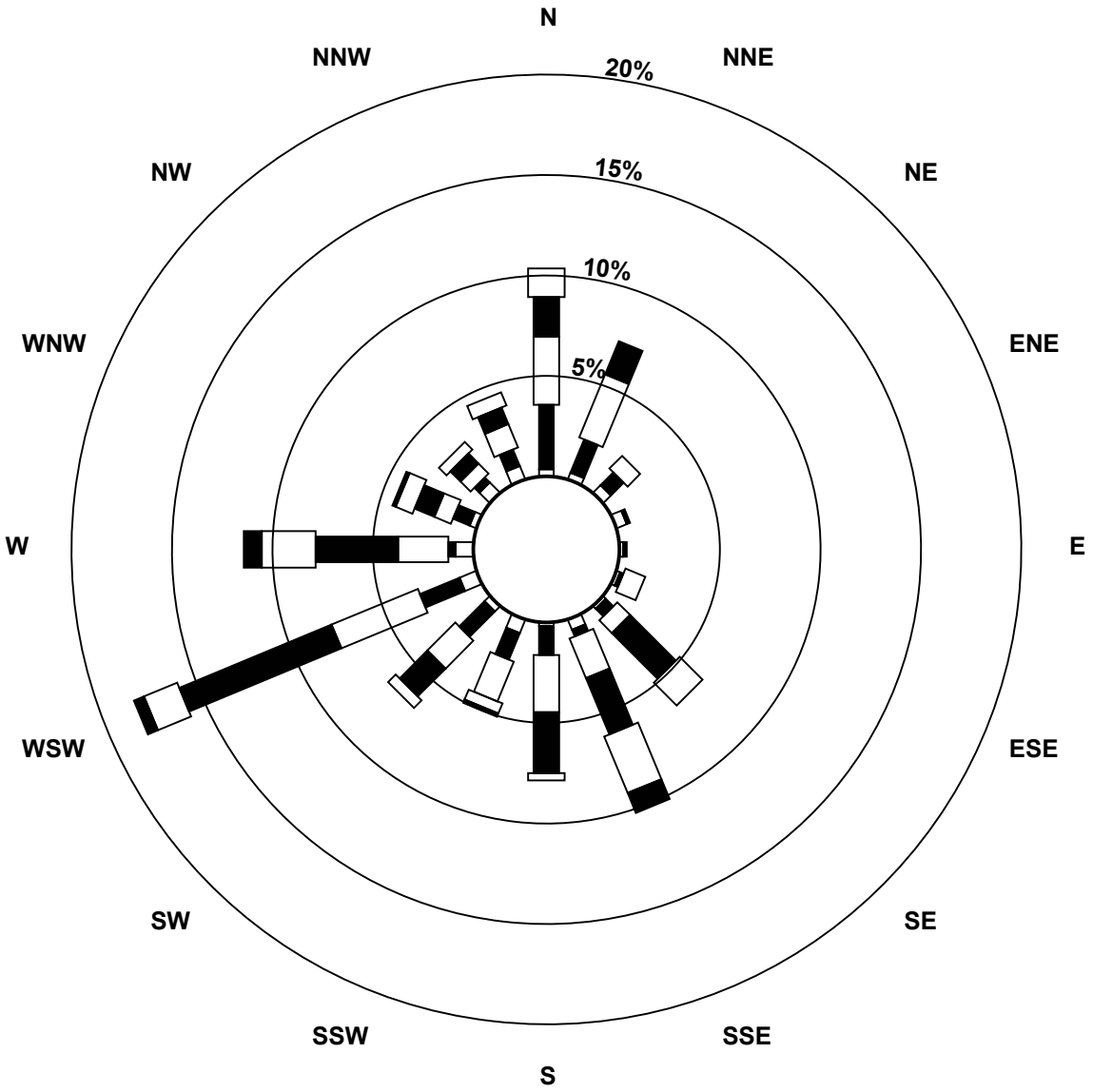
Total Number of Hours: 744

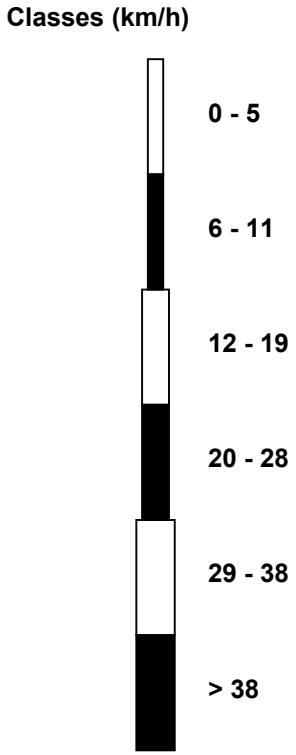
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed 90 m (WS90m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 560

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Mannix - January 2015

Direction of Maximum Speed: 266 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 265.1 deg on Jan 22

Direction of Minimum Speed: 256 deg on Jan 13 03:00

Direction of Minimum Daily Speed Average: 1.3 deg on Jan 23

Monthly Average Direction: 246.4 deg

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Percent Operational Time:	91.7

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-Jan	20	17	2	10	356	7	300	3	12	354	302	314	316	335	16	21	13	344	354	236	238	235	318	2	354.4
2-Jan	28	18	19	4	11	10	2	6	233	204	167	182	253	250	292	21	54	33	250	323	277	343	277	318	347.7
3-Jan	355	8	3	346	307	295	278	276	275	263	253	263	272	276	270	257	252	241	248	261	257	249	234	222	272.2
4-Jan	251	260	245	184	184	244	216	217	204	168	166	176	166	186	189	237	229	245	246	233	179	242	257	254	219.6
5-Jan	251	249	161	169	211	235	253	271	271	277	272	279	280	283	285	298	311	299	300	319	336	340	339	11	289.8
6-Jan	15	9	6	41	49	24	279	237	221	223	215	230	272	117	134	157	182	235	224	239	213	190	152	158	206.7
7-Jan	156	160	160	156	155	157	161	170	167	160	159	152	152	197	276	319	323	335	341	348	337	308	309	322	219.2
8-Jan	355	335	327	295	293	286	281	258	268	263	274	280	280	279	285	280	261	257	255	254	261	250	231	224	278.7
9-Jan	214	182	149	150	152	159	155	154	156	156	150	145	155	147	129	73	359	310	283	312	0	339	335	349	154.0
10-Jan	26	25	9	16	32	194	184	188	163	153	147	161	152	144	146	152	145	139	118	128	155	157	164	167	131.9
11-Jan	170	143	173	141	162	164	154	145	158	154	147	156	156	155	156	167	162	160	160	163	161	156	153	160	157.9
12-Jan	152	157	155	147	154	163	141	153	159	200	249	285	246	171	156	146	139	154	161	162	160	153	153	165	157.3
13-Jan	178	115	256	351	342	353	6	10	29	19	17	51	43	49	50	64	98	113	130	134	132	145	153	174	70.0
14-Jan	185	172	144	160	206	272	312	9	16	20	26	23	18	2	8	2	14	26	15	14	16	26	17	33	12.7
15-Jan	24	21	19	34	28	36	29	29	28	30	24	19	94	138	129	130	135	129	136	141	142	138	138	140	96.1
16-Jan	139	144	146	142	144	150	150	147	155	154	158	156	141	156	256	258	253	255	253	256	259	254	255	264	210.6
17-Jan	266	262	266	264	267	272	319	11	12	15	15	346	352	360	342	334	331	335	298	246	238	149	158	AF	294.5
18-Jan	AF	AF	AF	AF	AF	AF	153	152	150	152	152	143	147	150	132	150	168	167	168	161	151	154	156	163	154.9
19-Jan	148	149	166	301	317	8	358	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
20-Jan	AF	AF	335	335	329	330	AF	AF	AF	334	330	259	195	166	142	154	162	160	155	152	161	156	158	149	159.0
21-Jan	146	157	159	152	149	154	156	159	161	159	165	163	183	197	196	208	224	232	231	212	231	234	232	243	187.1
22-Jan	237	156	157	188	198	242	237	249	261	269	273	269	265	266	264	254	249	262	269	271	284	7	4	11	265.1
23-Jan	21	350	344	354	349	1	AF	330	279	323	314	354	282	290	233	176	97	81	222	168	227	145	116	170	338.5
24-Jan	164	141	AF	AF	AF	AF	AF	AF	AF	AF	253	255	256	260	257	272	273	259	255	246	253	239	204	166	--
25-Jan	150	158	165	194	157	156	164	160	226	260	265	269	262	256	262	274	289	291	349	360	43	33	192	169	234.2
26-Jan	178	166	184	160	151	150	169	177	201	209	211	236	232	276	273	274	339	1	AF	AF	AF	AF	AF	AF	202.8
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	8	7	2	21	10	360	3	--
28-Jan	354	335	330	322	307	311	331	353	AF	351	340	345	295	247	350	50	26	23	41	48	49	49	90	109	351.5
29-Jan	169	167	147	154	153	153	151	143	146	147	137	141	150	153	137	101	51	341	333	352	341	353	351	6	115.5
30-Jan	1	17	18	21	17	19	7	1	19	14	19	343	15	13	25	21	21	23	21	26	28	5	328	280	15.1
31-Jan	324	267	285	281	245	220	164	161	159	151	150	150	149	151	151	152	156	166	156	155	152	151	149	151	160.8
	135.4	139.7	150.1	210.5	231.5	239.0	211.4	208.2	213.9	215.1	222.6	239.7	239.0	244.7	253.7	259.5	266.6	284.0	262.8	251.5	243.5	220.7	217.3	232.9	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 91 deg on Jan 25 22:00

Minimum Value: 5 deg on Jan 8 21:00

Percentiles: P_1 = 6 P_{10} = 8 Q_1 = 10 Median = 13 Q_3 = 18 P_{90} = 31 P_{99} = 76

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	0
Percent Operational Time:	91.7

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-Jan	11	15	11	11	20	11	16	18	10	17	16	18	16	14	13	10	16	12	16	36	10	18	77	12	77
2-Jan	17	23	15	57	20	13	21	28	13	15	31	29	14	20	34	17	18	43	34	56	30	20	66	26	66
3-Jan	12	12	12	39	16	14	16	6	6	13	18	13	11	8	9	8	9	5	10	7	9	18	11	12	39
4-Jan	9	9	14	22	22	7	15	15	18	8	8	14	10	18	26	11	12	13	13	19	24	21	14	10	26
5-Jan	10	14	32	40	61	15	11	9	7	7	8	7	8	7	10	10	10	9	13	15	14	11	17	9	61
6-Jan	8	30	32	17	25	22	57	10	12	9	18	24	46	19	19	14	28	15	9	8	11	13	10	8	57
7-Jan	9	7	7	11	9	8	9	12	13	14	10	14	13	42	14	15	15	15	13	14	13	14	11	18	42
8-Jan	13	12	14	8	8	11	6	12	6	10	10	6	6	7	8	6	9	6	7	7	5	9	7	7	14
9-Jan	14	34	10	8	9	5	7	8	8	8	12	9	13	13	34	31	11	19	8	39	13	20	19	15	39
10-Jan	12	15	17	11	24	51	38	30	19	11	12	12	12	15	19	48	14	20	27	13	9	14	9	11	51
11-Jan	8	13	16	14	16	12	13	12	10	10	13	11	10	10	9	7	11	9	7	6	7	10	8	8	16
12-Jan	7	8	12	15	19	13	33	41	34	84	57	89	32	29	25	11	9	10	8	7	8	10	11	10	89
13-Jan	15	47	83	27	13	14	13	15	11	21	31	13	10	10	22	20	14	16	12	11	11	13	15	18	83
14-Jan	14	21	26	11	46	7	34	16	12	13	13	15	20	17	16	12	11	12	12	15	19	15	13	10	46
15-Jan	13	11	11	10	12	12	12	13	13	14	15	19	35	16	16	14	12	14	11	11	10	10	10	11	35
16-Jan	10	12	11	10	10	11	10	10	10	11	9	13	19	31	21	11	11	12	11	10	9	10	10	9	31
17-Jan	8	8	8	7	6	8	24	13	10	12	11	31	21	18	19	11	11	14	22	15	76	12	14	AF	76
18-Jan	AF	AF	AF	AF	AF	AF	9	9	13	11	13	12	12	11	24	15	6	10	12	28	20	10	24	17	28
19-Jan	13	20	18	80	57	52	21	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	80
20-Jan	AF	AF	13	14	15	14	AF	AF	AF	13	39	52	55	15	13	19	42	16	9	11	9	9	9	11	55
21-Jan	11	9	6	7	9	9	7	8	7	9	6	8	14	13	12	12	12	9	11	14	14	13	16	16	16
22-Jan	18	62	12	32	67	41	14	12	8	7	10	10	9	8	9	12	9	12	9	6	23	11	15	15	67
23-Jan	15	25	15	20	15	20	AF	45	57	63	29	29	14	26	66	41	23	61	24	28	20	56	46	38	66
24-Jan	29	15	AF	AF	AF	AF	AF	AF	AF	AF	28	9	10	9	12	10	6	9	12	8	6	12	24	15	29
25-Jan	9	9	10	13	16	9	10	18	26	11	8	9	10	10	6	9	9	8	26	16	12	91	21	27	91
26-Jan	12	11	20	13	16	14	8	9	12	24	22	18	16	41	6	18	45	14	AF	AF	AF	AF	AF	AF	45
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	12	12	14	13	15	12	11	15
28-Jan	12	16	13	14	8	25	11	18	AF	21	13	16	28	31	49	27	73	15	14	10	11	14	47	36	73
29-Jan	14	13	13	13	12	13	15	13	15	13	13	14	14	19	17	21	34	17	15	12	17	15	15	11	34
30-Jan	15	11	12	10	10	16	21	21	11	12	13	18	16	17	14	12	11	10	10	10	11	18	50	25	50
31-Jan	37	10	12	30	30	26	22	8	10	10	11	13	12	11	10	9	9	5	7	8	10	9	9	9	37
	37	62	83	80	67	52	57	45	57	84	57	89	55	42	66	48	73	61	34	56	76	91	77	38	
	Diurnal Maximum																								

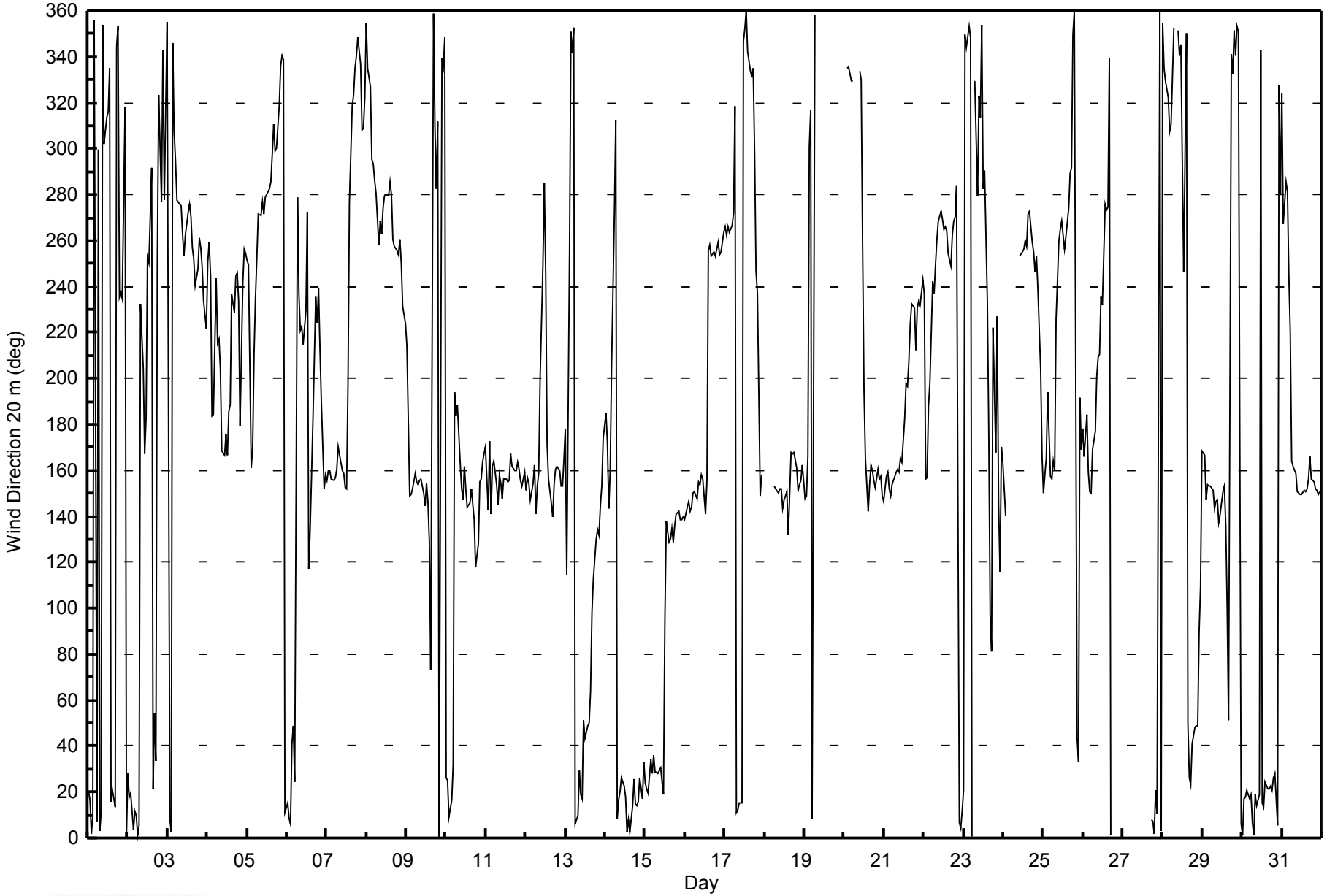
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - January 2015

Direction of Maximum Speed: 261 deg on Jan 22 09:00
Direction of Maximum Daily Speed Average: 187.2 deg on Jan 21

Direction of Minimum Speed: 355 deg on Jan 2 20:00
Direction of Minimum Daily Speed Average: 2.8 deg on Jan 7

Monthly Average Direction: 246.1 deg

Hours in Service:	744
Hours of Data:	588
Hours of Missing Data:	156
Percent Operational Time:	79.0

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-Jan	23	21	8	19	3	14	315	8	22	2	315	321	324	339	14	20	12	349	353	278	249	247	350	4	359.4
2-Jan	30	28	22	11	16	18	5	11	227	196	177	197	272	266	306	25	52	51	217	355	285	352	301	326	359.3
3-Jan	0	10	7	356	320	305	302	289	281	286	269	273	273	277	273	260	257	252	258	264	263	256	244	244	281.1
4-Jan	260	262	252	235	242	248	233	234	222	177	174	190	179	198	209	241	237	249	249	240	204	245	258	256	230.9
5-Jan	254	252	200	212	239	244	260	276	274	281	275	283	282	285	288	299	315	302	304	321	339	345	343	12	293.5
6-Jan	16	11	15	45	48	29	12	266	218	205	245	259	281	155	137	176	235	258	245	246	234	225	178	163	238.3
7-Jan	166	162	163	160	154	164	159	155	156	154	149	145	143	179	273	318	322	338	345	352	342	312	312	326	180.0
8-Jan	357	339	326	296	296	292	287	267	271	270	280	283	283	283	287	283	262	260	257	254	261	253	235	231	281.7
9-Jan	229	219	181	156	155	165	160	156	158	159	151	147	154	148	141	87	7	336	320	338	2	345	342	352	158.1
10-Jan	25	25	15	18	42	126	174	195	183	173	152	161	156	146	150	157	150	159	194	165	190	187	244	226	151.8
11-Jan	225	170	191	160	171	170	169	148	159	157	147	156	155	155	156	169	169	163	157	159	165	164	161	162	162.4
12-Jan	155	158	159	159	157	166	176	165	173	280	269	294	245	192	158	147	142	160	168	165	162	156	153	167	161.5
13-Jan	197	244	303	352	348	356	6	9	28	19	27	52	43	52	54	72	103	114	129	133	131	144	153	173	71.8
14-Jan	183	176	149	175	255	270	312	9	17	20	26	22	17	4	10	4	16	25	17	14	18	26	20	30	9.3
15-Jan	23	23	22	30	28	35	30	30	31	38	32	26	99	133	127	129	134	127	135	140	141	138	137	139	98.0
16-Jan	138	142	146	141	143	149	151	149	154	157	163	163	183	243	258	260	254	256	254	256	258	254	256	264	210.6
17-Jan	267	262	267	265	268	273	322	12	13	16	17	353	356	3	348	345	337	341	308	225	178	144	157	AF	299.0
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	150	154	143	154	168	174	189	193	164	170	167	168	--
19-Jan	180	156	161	197	309	340	352	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
20-Jan	AF	AF	336	340	332	337	AF	AF	AF	337	340	257	183	165	142	154	166	162	158	154	162	158	158	152	159.1
21-Jan	153	160	160	157	151	155	157	158	159	161	164	167	186	198	197	209	226	232	232	218	232	237	239	247	187.2
22-Jan	242	216	170	222	238	250	240	252	261	269	273	271	265	267	264	255	251	260	268	270	282	7	7	14	264.6
23-Jan	20	353	348	355	353	5	AF	AF	AF	AF	AF	AF	287	289	220	180	93	AF	AF	AF	AF	AF	AF	AF	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	256	258	262	261	272	273	263	255	253	258	245	224	194	--
25-Jan	157	163	173	202	171	158	166	174	232	259	265	270	265	259	264	276	289	294	351	7	36	69	170	183	230.3
26-Jan	216	205	229	195	158	151	183	204	222	236	235	249	237	269	270	271	318	3	AF	AF	AF	AF	AF	AF	222.9
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	24	27	18	8	349	--
31-Jan	352	269	297	317	290	246	195	151	163	160	149	150	148	144	147	151	162	172	164	160	160	160	160	156	163.5
	207.9	190.0	198.3	208.2	213.1	219.6	215.5	207.1	214.7	216.0	216.2	234.4	233.9	241.0	243.3	245.2	243.2	253.7	240.5	237.6	232.7	220.5	211.7	217.2	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 84 deg on Jan 2 19:00

Minimum Value: 3 deg on Jan 9 00:00

Percentiles: P_1 = 3 P_{10} = 5 Q_1 = 7 Median = 9 Q_3 = 13 P_{90} = 22 P_{99} = 63

Hours in Service:	744
Hours of Data:	588
Hours of Missing Data:	156
Hours of Calibration:	0
Percent Operational Time:	79.0

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	Maximum
1-Jan	9	11	8	9	15	9	16	18	6	10	15	16	13	10	10	7	13	8	11	41	24	17	55	9	55
2-Jan	16	18	10	38	14	10	15	21	21	18	18	28	12	12	32	14	13	13	84	75	26	8	37	22	84
3-Jan	7	7	7	29	13	10	12	4	4	8	11	7	7	7	8	4	5	3	5	3	4	9	4	13	29
4-Jan	7	6	7	10	10	4	8	6	9	14	7	16	11	17	17	9	8	10	10	15	23	10	11	7	23
5-Jan	7	10	30	36	11	11	8	7	6	6	7	5	6	6	8	7	9	6	10	12	11	7	13	6	36
6-Jan	5	25	25	14	17	15	21	27	10	5	19	15	27	49	9	32	10	6	4	3	3	7	16	4	49
7-Jan	6	4	3	8	6	4	8	14	10	9	6	9	9	37	14	13	10	12	10	11	11	13	10	16	37
8-Jan	8	9	13	5	5	8	5	10	4	6	9	5	5	6	7	5	7	3	4	5	4	7	5	3	13
9-Jan	7	16	18	5	6	5	6	5	4	5	9	8	12	9	21	23	9	17	12	20	8	15	12	12	23
10-Jan	9	10	11	9	14	50	36	9	9	10	7	10	12	9	10	12	8	20	22	30	14	20	11	15	50
11-Jan	11	21	14	13	18	7	13	7	7	7	8	9	7	7	6	5	6	4	5	4	3	6	4	3	21
12-Jan	4	4	5	5	5	5	19	13	69	22	48	80	35	33	16	10	7	8	4	4	4	7	7	11	80
13-Jan	11	76	16	21	9	11	10	13	8	15	23	11	7	8	16	17	10	10	8	7	6	10	11	14	76
14-Jan	7	17	22	16	21	5	35	12	8	9	11	10	16	15	12	8	8	9	9	11	15	11	10	8	35
15-Jan	9	9	8	9	9	9	10	11	10	11	13	19	31	11	12	9	9	10	8	8	8	7	8	9	31
16-Jan	7	9	8	7	8	8	7	8	8	7	6	10	34	17	12	9	8	9	9	8	7	7	7	8	34
17-Jan	6	6	7	6	5	7	26	7	6	9	9	24	16	14	15	10	6	11	21	37	50	8	12	AF	50
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	5	6	11	28	4	9	9	13	20	11	6	8	28
19-Jan	21	13	4	64	13	23	12	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	64
20-Jan	AF	AF	9	13	11	10	AF	AF	AF	9	28	64	35	11	9	11	24	12	6	8	6	7	6	7	64
21-Jan	7	6	3	4	6	5	4	6	6	7	4	7	9	8	7	8	8	6	7	10	10	9	12	11	12
22-Jan	13	43	16	19	22	11	9	9	6	7	9	9	8	7	7	8	6	10	7	5	22	7	11	11	43
23-Jan	11	20	12	15	10	14	AF	AF	AF	AF	AF	AF	13	24	49	32	17	AF	AF	AF	AF	AF	AF	AF	49
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	6	8	7	10	8	4	5	5	5	4	7	12	13	13
25-Jan	5	7	9	7	16	8	8	12	17	9	8	8	8	7	5	8	7	5	23	10	10	52	21	9	52
26-Jan	4	8	7	18	12	9	10	8	8	15	9	13	14	14	5	14	36	10	AF	AF	AF	AF	AF	AF	36
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	7	8	11	14	41	41
31-Jan	28	13	7	26	28	10	33	5	6	13	9	11	9	9	8	6	9	6	8	8	8	6	4	4	33
	28	76	30	64	28	50	36	27	69	22	48	80	35	49	49	32	36	20	84	75	50	52	55	41	
	Diurnal Maximum																								

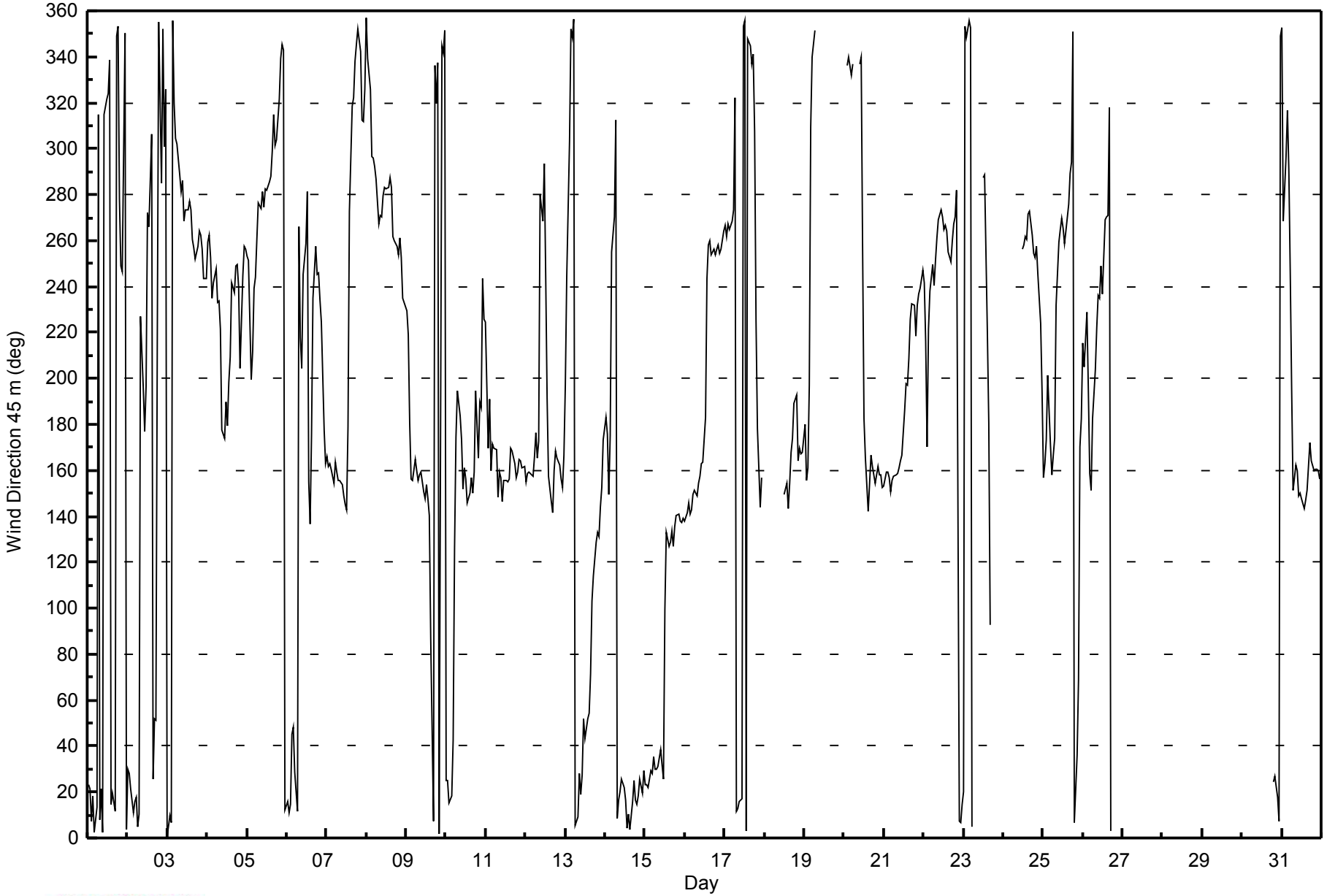
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - January 2015

Direction of Maximum Speed: 261 deg on Jan 22 09:00
Direction of Maximum Daily Speed Average: 189.9 deg on Jan 21

Direction of Minimum Speed: 135 deg on Jan 2 20:00

Direction of Minimum Daily Speed Average: 2.8 deg on Jan 7

Monthly Average Direction: 251.3 deg

Hours in Service:	744
Hours of Data:	557
Hours of Missing Data:	187
Percent Operational Time:	74.9

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-Jan	26	26	18	30	14	31	334	13	37	20	343	329	332	344	16	19	11	354	354	323	257	256	355	3	6.2
2-Jan	34	35	23	13	19	24	8	15	258	191	177	236	291	292	307	29	54	53	120	135	308	352	308	328	3.5
3-Jan	3	12	10	2	328	312	313	303	291	285	280	278	275	278	274	261	257	257	260	267	268	259	249	256	285.4
4-Jan	261	261	255	248	250	248	241	241	231	208	206	218	203	215	221	243	241	250	250	243	227	245	256	258	240.2
5-Jan	254	253	232	245	247	249	266	279	276	285	277	287	283	286	290	300	318	304	307	323	339	350	347	13	295.6
6-Jan	15	12	19	46	46	29	8	12	209	200	246	278	283	257	219	238	262	262	253	254	247	241	210	185	267.1
7-Jan	191	167	181	173	162	163	150	137	136	136	139	138	136	155	247	313	318	342	352	356	346	317	315	328	163.7
8-Jan	359	342	320	297	299	297	292	280	275	277	285	286	284	285	288	285	263	260	258	254	261	254	245	241	284.7
9-Jan	239	232	221	178	173	187	178	166	171	178	168	154	162	155	154	71	15	2	350	347	5	351	350	354	185.6
10-Jan	26	24	20	18	41	69	156	192	192	195	179	183	203	179	163	170	163	193	247	244	231	243	261	255	189.3
11-Jan	254	248	232	218	223	211	213	163	165	168	151	155	159	156	156	158	158	150	143	147	152	165	173	173	164.8
12-Jan	169	169	172	172	176	191	212	195	256	277	286	295	256	221	162	152	147	172	181	176	171	163	157	181	174.2
13-Jan	231	265	300	352	357	359	7	11	25	20	35	53	47	58	65	86	107	121	133	136	135	145	151	169	70.5
14-Jan	180	190	171	225	263	269	308	10	18	21	26	24	18	6	11	3	18	25	18	15	19	26	21	29	4.0
15-Jan	24	26	24	29	29	36	32	32	34	43	46	43	105	134	129	131	135	130	137	141	142	139	138	140	97.5
16-Jan	139	143	145	141	142	148	150	149	154	161	172	198	227	258	259	261	255	257	255	256	258	254	256	265	212.7
17-Jan	267	262	267	265	268	273	320	10	12	17	20	357	2	8	358	359	349	356	322	171	148	143	153	AF	300.1
18-Jan	AF	AF	AF	AF	AF	AF	AF	150	164	163	172	188	181	162	149	182	167	187	200	218	197	201	203	198	--
19-Jan	207	209	185	206	298	338	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
20-Jan	AF	AF	339	335	331	343	AF	AF	AF	AF	348	229	162	157	145	156	172	172	167	159	168	163	163	162	164.8
21-Jan	165	165	168	169	161	158	155	160	161	165	167	172	190	198	198	209	226	231	233	223	233	239	242	249	189.9
22-Jan	246	237	207	233	244	249	242	253	261	269	273	271	265	267	264	255	251	258	267	269	279	6	9	15	264.3
23-Jan	20	357	353	360	357	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	271	258	260	263	263	272	273	265	256	255	259	249	232	211	--
25-Jan	175	173	186	209	183	161	168	184	235	256	265	270	266	260	265	278	289	295	345	10	31	83	169	203	232.5
26-Jan	232	227	239	221	179	159	211	220	238	257	253	255	239	261	268	270	308	5	AF	AF	AF	AF	AF	AF	240.6
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	239.5	223.2	237.2	234.3	234.9	229.2	233.7	215.8	220.8	217.2	222.5	241.8	241.2	243.5	246.3	254.2	254.1	264.5	250.4	246.8	245.2	235.7	229.9	243.1	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 87 deg on Jan 20 12:00

Minimum Value: 2 deg on Jan 12 02:00

Percentiles: P_1 = 3 P_{10} = 4 Q_1 = 6 Median = 8 Q_3 = 12 P_{90} = 21 P_{99} = 57

Hours in Service:	744
Hours of Data:	557
Hours of Missing Data:	187
Hours of Calibration:	0
Percent Operational Time:	74.9

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-Jan	5	9	7	10	13	8	18	14	9	10	16	12	13	8	9	5	11	6	9	35	74	24	24	11	74
2-Jan	15	12	7	21	12	9	14	18	37	25	14	24	6	10	25	19	11	10	43	78	27	8	18	21	78
3-Jan	7	5	6	23	10	8	10	7	4	11	5	4	5	6	8	4	4	3	3	3	3	6	4	10	23
4-Jan	4	5	5	6	5	4	4	3	5	10	8	12	10	11	12	8	7	8	8	12	21	8	10	5	21
5-Jan	5	5	14	13	9	8	8	6	5	6	7	6	6	5	8	6	8	6	9	11	11	4	11	4	14
6-Jan	4	18	16	13	9	17	14	45	21	9	24	9	11	21	24	14	7	4	2	2	3	4	18	6	45
7-Jan	7	6	6	7	4	3	10	5	6	4	3	6	5	20	20	16	8	9	8	10	9	13	9	15	20
8-Jan	6	6	11	4	5	7	5	8	4	4	7	5	5	6	6	5	5	3	4	4	3	6	3	4	11
9-Jan	6	5	13	13	10	8	6	3	4	7	10	5	9	7	12	57	11	7	11	14	7	12	10	11	57
10-Jan	7	7	9	9	11	40	40	8	11	5	8	13	13	17	7	6	8	28	12	20	15	23	7	5	40
11-Jan	6	14	13	22	22	14	13	9	9	6	5	6	4	3	3	3	3	2	4	6	3	3	3	3	22
12-Jan	2	2	3	5	8	12	24	66	53	9	34	47	30	38	12	6	6	9	3	3	4	7	4	19	66
13-Jan	12	18	5	18	7	9	9	11	7	13	17	9	6	7	16	14	13	13	8	6	6	8	9	11	18
14-Jan	4	17	39	18	7	4	34	10	6	7	8	7	14	12	11	6	6	7	7	9	13	8	8	6	39
15-Jan	7	7	6	7	7	7	9	9	9	11	15	19	26	10	11	9	8	10	6	7	7	6	6	7	26
16-Jan	5	7	6	4	5	6	5	6	7	5	10	8	25	9	10	8	7	7	8	7	6	5	6	7	25
17-Jan	6	6	6	6	5	7	29	5	5	7	8	19	14	13	13	9	6	11	21	65	24	7	11	AF	65
18-Jan	AF	AF	AF	AF	AF	AF	AF	5	3	4	6	10	13	5	28	57	3	18	6	11	25	17	11	20	57
19-Jan	24	35	18	53	6	22	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	53
20-Jan	AF	AF	16	12	23	15	AF	AF	AF	AF	26	87	33	10	7	8	19	10	7	5	5	5	3	4	87
21-Jan	4	4	4	4	4	3	3	5	4	4	3	6	8	7	6	7	7	6	6	8	8	7	9	10	10
22-Jan	10	28	16	12	9	8	8	7	5	6	8	9	7	6	7	6	5	8	7	5	21	8	8	10	28
23-Jan	9	17	14	13	11	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	17
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	6	5	7	7	9	8	4	4	4	4	4	5	8	11	11
25-Jan	9	6	9	6	13	8	7	10	12	8	7	8	8	6	5	7	6	5	22	7	11	38	21	15	38
26-Jan	5	6	3	15	15	8	12	6	9	10	7	5	10	13	5	13	38	7	AF	AF	AF	AF	AF	AF	38
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	24	35	39	53	23	40	40	66	53	25	34	87	33	38	28	57	38	28	43	78	74	38	24	21	
	Diurnal Maximum																								

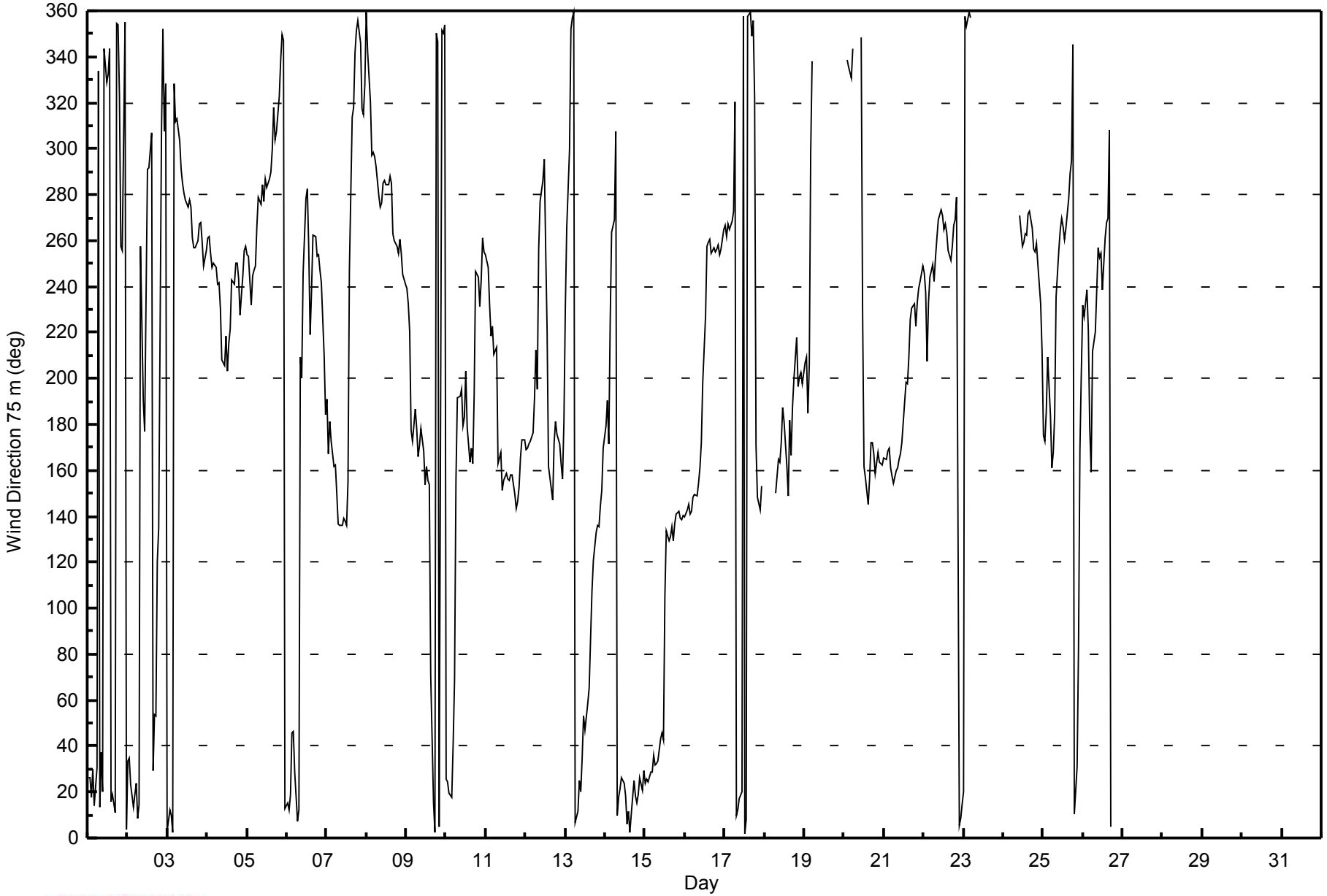
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 75 m (WD75m) - deg

Mannix - January 2015



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Jan 23 10:00

Minimum Value: 2 deg on Jan 12 01:00

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 5 Median = 7 Q_3 = 11 P_{90} = 21 P_{99} = 80

Hours in Service:	744
Hours of Data:	560
Hours of Missing Data:	184
Hours of Calibration:	0
Percent Operational Time:	75.3

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	Maximum
1-Jan	4	9	7	9	13	10	22	11	12	9	18	10	12	7	8	5	10	6	9	30	84	26	20	12	84
2-Jan	16	10	6	13	12	9	14	18	28	29	25	21	6	12	21	23	10	10	53	81	23	10	16	21	81
3-Jan	7	4	5	21	8	8	9	8	4	9	5	4	5	5	7	4	4	3	3	3	2	5	3	8	21
4-Jan	4	4	4	4	3	3	3	3	4	7	7	10	9	8	11	7	7	7	7	10	17	8	9	5	17
5-Jan	4	5	9	9	8	6	7	5	4	5	6	6	6	6	8	6	7	6	8	10	12	4	10	4	12
6-Jan	4	15	14	14	8	17	15	17	65	9	26	8	9	7	15	10	7	3	2	2	3	3	16	6	65
7-Jan	8	9	7	7	3	4	10	6	3	3	2	5	3	14	21	21	7	9	8	9	9	13	8	15	21
8-Jan	5	7	10	4	4	6	5	7	4	4	6	4	4	5	6	5	5	2	3	3	3	5	3	4	10
9-Jan	6	5	11	13	11	8	7	6	8	7	10	8	11	11	13	91	11	5	10	11	7	10	9	10	91
10-Jan	7	6	7	9	9	36	45	7	10	3	10	13	8	16	11	7	12	29	10	12	12	15	5	3	45
11-Jan	5	7	10	19	14	8	10	15	13	11	7	5	2	2	2	2	3	2	2	2	3	5	5	2	19
12-Jan	2	2	6	9	11	12	16	70	34	7	19	34	16	41	17	6	6	8	5	4	3	7	5	23	70
13-Jan	10	11	5	18	6	9	8	9	8	12	15	8	7	7	19	15	9	9	5	5	4	7	8	11	19
14-Jan	5	20	55	14	5	4	32	9	6	7	8	6	13	11	10	6	6	6	6	8	12	8	7	6	55
15-Jan	6	7	6	6	7	6	9	8	9	10	18	19	22	8	8	7	7	7	6	7	6	6	6	7	22
16-Jan	5	8	6	4	5	5	4	5	5	5	13	8	18	7	9	8	6	7	7	6	6	5	5	6	18
17-Jan	6	5	6	5	5	6	27	5	4	6	8	18	13	11	12	9	6	12	20	60	19	7	10	AF	60
18-Jan	AF	AF	AF	AF	AF	AF	AF	5	4	4	7	12	15	5	86	49	5	21	7	13	22	16	12	24	86
19-Jan	22	31	31	42	6	26	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	42
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	27	90	36	42	78	7	16	10	8	5	5	6	3	4	90
21-Jan	4	4	5	4	3	2	2	3	3	3	2	6	7	7	6	7	7	6	6	8	8	7	8	9	9
22-Jan	10	23	14	10	8	7	7	7	5	6	8	8	7	6	7	5	5	7	6	5	19	10	8	10	23
23-Jan	9	16	13	13	11	12	AF	52	60	94	31	26	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	94
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	5	6	5	6	6	9	7	4	4	3	4	3	4	7	11	11
25-Jan	10	5	8	6	13	8	7	12	10	8	7	7	7	5	5	7	5	4	22	7	12	40	23	13	40
26-Jan	5	4	3	13	15	10	11	6	8	7	5	4	8	10	5	11	38	5	AF	AF	AF	AF	AF	AF	38
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	22	31	55	42	15	36	45	70	65	94	31	90	36	42	86	91	38	29	53	81	84	40	23	24	
	Diurnal Maximum																								

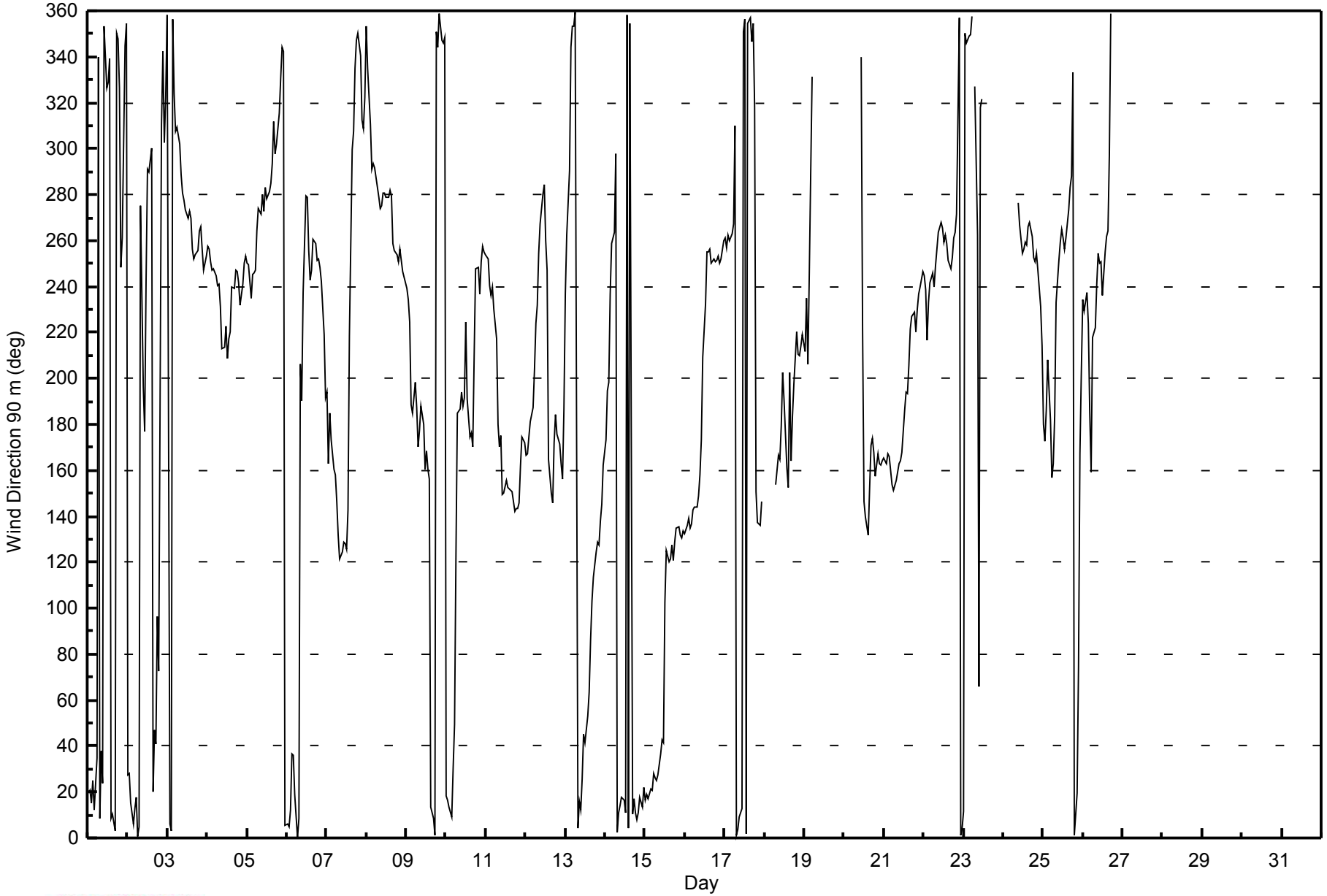
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction 90 m (WD90m) - deg

Mannix - January 2015



AURORA
ATMOSPHERICS INC.

Maximum Value: 0.7 km/h on Jan 21 09:00

Maximum Daily Average: 0.3 km/h on Jan 12

Minimum Value: -0.9 km/h on Jan 8 01:00

Minimum Daily Average: -0.4 km/h on Jan 8

Maximum Diurnal Average: 0.0 km/h at hour 11

Minimum Diurnal Average: -0.1 km/h at hour 18

Monthly Average: -0.03 km/h

Percentiles: P_1 = -0.6 P_{10} = -0.4 Q_1 = -0.2 Median = 0.0 Q_3 = 0.2 P_{90} = 0.4 P_{99} = 0.7

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	0
Percent Operational Time:	91.7

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-Jan	-0.1	-0.2	-0.4	-0.2	-0.2	-0.2	0.0	-0.2	-0.2	-0.1	0.0	-0.2	0.1	-0.3	-0.5	-0.1	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.3	-0.4	-0.2	0.1
2-Jan	0.0	0.0	-0.2	0.0	-0.2	-0.2	-0.2	-0.1	0.0	-0.2	0.1	0.0	-0.2	0.0	0.0	-0.1	0.2	0.0	-0.2	0.0	-0.1	-0.2	-0.1	-0.4	-0.1	0.2
3-Jan	-0.3	-0.3	-0.4	-0.2	0.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	-0.4	-0.4	-0.4	-0.6	-0.3	-0.4	-0.3	-0.3	-0.2	-0.3	0.0
4-Jan	-0.2	-0.2	-0.2	-0.1	-0.1	-0.4	-0.3	-0.2	-0.3	0.1	0.1	0.0	0.2	0.0	0.1	-0.3	-0.3	-0.1	-0.3	-0.3	0.0	-0.1	-0.1	-0.3	-0.1	0.2
5-Jan	-0.4	-0.2	0.0	0.0	-0.1	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.3	-0.4	-0.3	-0.4	-0.5	-0.5	-0.6	-0.4	-0.3	0.0
6-Jan	-0.4	-0.3	-0.1	0.1	0.2	-0.1	-0.1	-0.2	-0.4	-0.5	-0.2	-0.1	-0.2	0.2	0.3	0.1	0.0	-0.2	-0.2	-0.3	-0.2	-0.1	0.2	0.3	-0.1	0.3
7-Jan	0.2	0.6	0.7	0.6	0.6	0.4	0.4	0.1	0.1	0.2	0.4	0.2	0.3	0.0	0.0	-0.2	-0.2	-0.3	-0.5	-0.6	-0.5	-0.3	-0.5	-0.8	0.0	0.7
8-Jan	-0.9	-0.4	-0.5	-0.5	-0.6	-0.4	-0.4	-0.3	-0.2	-0.4	-0.3	-0.4	-0.3	-0.2	-0.3	-0.2	-0.3	-0.4	-0.4	-0.4	-0.3	-0.4	-0.3	-0.4	-0.4	-0.2
9-Jan	-0.2	0.0	0.2	0.5	0.4	0.5	0.5	0.6	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.1	-0.3	-0.2	-0.1	-0.2	-0.4	-0.3	0.1	-0.3	0.1	0.6
10-Jan	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	-0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3
11-Jan	-0.1	0.1	-0.1	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.3	0.5	0.4	0.3	0.2	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.2	0.5
12-Jan	0.5	0.7	0.5	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.5	0.4	0.2	0.3	0.7
13-Jan	0.0	0.1	0.0	-0.4	-0.3	-0.4	-0.5	-0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.1	0.2	0.0	0.3	0.3	0.1	0.0	0.3
14-Jan	0.1	0.1	0.1	0.1	-0.2	-0.4	-0.3	-0.6	-0.2	0.0	0.1	0.0	0.1	-0.2	-0.2	-0.3	-0.4	0.1	-0.3	-0.1	0.0	0.0	0.0	0.2	-0.1	0.2
15-Jan	-0.1	-0.2	-0.2	0.0	0.1	0.0	0.2	0.2	-0.1	0.1	0.0	0.1	0.3	0.4	0.2	0.4	0.2	0.4	0.5	0.4	0.4	0.4	0.5	0.6	0.2	0.6
16-Jan	0.6	0.5	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.6	0.6	0.2	0.1	0.1	0.3	-0.2	-0.5	-0.3	-0.7	-0.5	-0.5	-0.6	-0.6	-0.6	0.0	0.6
17-Jan	-0.4	-0.4	-0.2	-0.5	-0.3	-0.3	-0.4	-0.3	-0.2	-0.3	-0.2	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	0.1	0.0	0.1	0.2	0.2	AF	-0.2	0.2
18-Jan	AF	AF	AF	AF	AF	AF	0.2	0.2	0.1	0.3	0.3	0.1	0.1	0.3	0.2	0.3	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3
19-Jan	0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.1
20-Jan	AF	AF	-0.2	-0.3	-0.2	-0.3	AF	AF	AF	-0.3	0.0	-0.1	0.3	0.0	0.3	0.3	0.3	0.4	0.4	0.4	0.7	0.7	0.6	0.5	0.2	0.7
21-Jan	0.4	0.6	0.7	0.6	0.6	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.1	0.0	-0.1	-0.3	-0.5	-0.5	-0.3	-0.1	-0.2	-0.1	0.0	-0.2	0.2	0.7
22-Jan	-0.4	0.1	0.2	-0.1	0.1	-0.1	-0.3	-0.5	-0.9	-0.3	-0.1	-0.2	-0.4	-0.4	-0.5	-0.5	-0.5	-0.4	-0.3	-0.3	-0.3	-0.5	-0.2	0.1	-0.3	0.2
23-Jan	0.1	-0.2	-0.2	-0.2	-0.2	-0.2	AF	-0.1	0.0	0.0	0.1	0.0	-0.1	0.0	0.2	0.1	0.0	0.2	-0.1	-0.1	-0.1	0.1	0.0	-0.1	0.0	0.2
24-Jan	0.0	0.1	AF	AF	AF	AF	AF	AF	AF	AF	-0.3	-0.4	-0.2	-0.1	-0.3	-0.2	-0.1	-0.3	-0.2	-0.4	-0.4	-0.3	-0.1	0.0	--	0.1
25-Jan	0.5	0.7	0.5	-0.1	0.5	0.6	0.7	0.4	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.2	-0.1	0.1	0.0	-0.1	0.1	0.0	0.7
26-Jan	0.0	0.0	-0.1	0.0	0.3	0.4	0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	-0.1	-0.1	-0.1	-0.5	AF	AF	AF	AF	AF	AF	-0.1	0.4
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-0.5	-0.7	-0.3	0.0	-0.3	-0.4	-0.3	--	0.0
28-Jan	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2	-0.5	-0.2	AF	0.0	-0.3	-0.2	0.2	-0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.1	-0.1	0.2
29-Jan	0.1	0.2	0.1	0.2	0.1	0.1	0.3	0.1	0.1	0.4	0.2	0.3	0.2	0.0	0.2	0.1	0.1	-0.1	-0.2	-0.4	-0.2	-0.2	-0.3	-0.4	0.0	0.4
30-Jan	-0.4	-0.4	-0.4	-0.1	-0.3	0.2	0.0	-0.4	0.0	-0.3	0.0	-0.4	-0.3	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	0.1	0.0	-0.2	-0.2	-0.1	-0.2	0.2
31-Jan	-0.1	0.0	0.0	-0.2	-0.1	-0.2	0.0	0.2	0.4	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.3	0.2	0.4	0.3	0.3	0.1	0.1	0.2	0.1	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	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.1	Diurnal Average	
	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.3	0.5	0.4	0.4	0.3	0.4	0.5	0.6	0.7	0.7	0.6	0.6	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.6 km/h on Jan 16 23:00

Minimum Value: 0.2 km/h on Jan 19 04:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.6 Median = 1.0 Q_3 = 1.5 P_{90} = 2.1 P_{99} = 3.0

Hours in Service:	744
Hours of Data:	682
Hours of Missing Data:	62
Hours of Calibration:	0
Percent Operational Time:	91.7

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-Jan	1.2	1.1	0.8	0.7	0.7	0.7	0.5	0.7	0.9	0.9	0.5	0.9	0.9	1.8	2.7	2.7	2.0	1.8	1.1	0.5	0.3	0.3	0.7	0.8	2.7
2-Jan	1.0	0.8	1.2	1.1	1.2	1.1	1.0	0.5	0.2	0.2	0.3	0.4	0.7	0.5	0.3	0.5	0.8	0.4	0.2	0.2	0.3	0.7	0.5	0.8	1.2
3-Jan	1.2	1.5	1.3	0.9	0.6	0.7	0.8	0.3	0.3	0.2	0.6	0.5	0.7	0.9	0.8	1.1	0.8	0.6	1.0	1.0	1.4	1.1	0.5	0.6	1.5
4-Jan	0.6	0.9	0.8	0.5	0.4	0.7	0.5	0.9	0.8	1.0	1.0	1.1	1.1	1.3	1.1	1.3	1.4	2.0	2.1	1.4	0.8	1.8	1.4	2.1	2.1
5-Jan	1.7	1.5	0.6	0.6	0.7	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.3	1.6	1.4	1.4	1.8	1.5	1.3	1.4	1.5	2.1	1.7	1.5	2.1
6-Jan	1.3	1.2	0.7	0.7	1.0	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.3	0.6	0.4	0.2	0.3	0.4	0.5	0.4	0.3	0.5	0.9	1.3
7-Jan	0.9	1.1	1.4	1.5	1.5	1.0	1.0	0.9	0.8	1.2	1.5	1.3	1.4	0.9	0.5	0.6	0.7	1.6	2.6	3.2	2.5	1.7	2.2	3.0	3.2
8-Jan	2.9	1.8	1.7	2.4	2.1	1.8	1.1	0.8	0.6	0.9	0.9	1.3	1.4	1.4	1.7	1.1	1.0	0.9	0.7	1.0	0.8	0.6	0.5	1.1	2.9
9-Jan	0.9	0.6	0.4	1.0	0.9	0.7	1.0	1.1	1.1	1.1	1.2	1.3	1.0	1.0	0.8	0.5	0.6	0.5	0.4	0.5	1.7	1.3	1.2	1.1	1.7
10-Jan	2.0	2.0	1.1	0.4	0.4	0.3	0.4	0.4	0.5	0.7	1.1	1.1	0.8	0.9	0.9	0.7	0.8	0.4	0.3	0.4	0.4	0.4	0.3	0.3	2.0
11-Jan	0.3	0.3	0.5	0.6	0.6	0.6	0.5	0.8	0.8	0.8	1.3	1.5	1.6	1.6	1.4	0.7	0.6	0.7	0.6	0.7	1.0	1.2	1.1	0.8	1.6
12-Jan	1.1	1.1	1.1	0.9	0.6	0.6	0.3	0.4	0.5	0.3	0.6	0.5	0.6	0.6	0.6	0.8	0.9	1.0	1.0	1.3	1.4	1.5	1.2	0.9	1.5
13-Jan	0.7	0.4	0.4	1.3	1.3	1.4	1.3	1.0	1.2	1.1	0.9	1.2	1.3	1.3	0.9	0.8	1.2	1.4	1.7	1.7	1.6	1.6	1.3	1.1	1.7
14-Jan	1.3	1.1	0.9	0.6	0.5	1.1	1.8	2.5	2.4	1.9	1.5	1.7	1.5	1.3	1.3	1.4	2.0	2.3	1.9	2.0	1.4	1.7	1.5	1.9	2.5
15-Jan	1.8	1.8	1.9	1.7	1.6	1.5	1.3	1.4	1.0	0.9	0.8	0.8	1.0	1.1	1.6	2.1	2.1	2.3	2.6	2.6	2.4	2.8	2.9	2.2	2.9
16-Jan	2.7	2.2	1.7	1.8	1.8	1.5	1.3	1.4	1.6	1.7	1.5	0.8	0.7	0.4	1.3	1.7	2.2	2.6	3.0	3.0	2.8	3.2	3.6	3.0	3.6
17-Jan	2.1	2.1	2.2	2.4	1.8	1.7	1.7	1.4	1.6	1.8	1.5	0.9	1.0	1.1	0.8	0.6	0.7	0.8	0.5	0.4	0.5	0.8	0.9	AF	2.4
18-Jan	AF	AF	AF	AF	AF	AF	1.2	1.0	1.0	1.4	1.1	0.9	1.1	1.2	0.6	0.6	0.4	0.6	0.6	0.6	0.5	0.5	0.4	0.5	1.4
19-Jan	0.4	0.5	0.4	0.2	0.4	0.3	0.6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.6
20-Jan	AF	AF	0.8	0.9	0.7	0.8	AF	AF	AF	0.6	0.4	0.4	0.6	0.6	0.9	1.1	0.7	1.1	1.2	1.5	1.5	1.7	1.7	1.6	1.7
21-Jan	1.3	1.3	1.1	1.0	1.7	1.4	1.2	1.4	1.7	1.7	1.6	1.7	2.5	2.8	2.6	2.3	2.4	2.4	2.3	1.6	1.9	1.6	1.9	1.8	2.8
22-Jan	1.8	1.1	0.8	0.8	0.9	1.1	1.4	2.9	3.2	2.4	2.3	2.1	2.7	2.8	2.4	2.5	2.1	2.1	2.0	1.5	1.7	2.1	1.5	1.1	3.2
23-Jan	1.2	0.8	0.7	0.7	0.7	0.9	AF	0.6	0.6	0.5	0.6	0.6	0.7	0.8	0.6	0.8	0.7	0.6	0.5	0.3	0.2	0.4	0.5	0.6	1.2
24-Jan	0.5	1.0	AF	AF	AF	AF	AF	AF	AF	AF	1.1	1.5	1.5	1.1	1.2	1.1	0.6	1.2	0.8	0.7	0.8	0.6	0.5	0.4	1.5
25-Jan	1.1	1.4	1.1	1.2	1.3	1.9	1.9	1.2	1.1	1.8	2.4	2.0	1.4	1.6	1.1	1.0	1.4	1.4	0.9	0.7	0.9	0.4	0.4	0.3	2.4
26-Jan	0.4	0.4	0.3	0.4	0.7	1.2	0.8	0.7	0.7	0.6	0.7	0.8	0.8	0.5	0.5	0.3	0.9	2.8	AF	AF	AF	AF	AF	AF	2.8
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.1	2.0	1.9	1.9	1.8	1.9	1.8	2.1
28-Jan	1.6	1.5	1.6	1.4	1.3	1.3	1.4	1.3	AF	1.3	1.3	1.2	1.0	0.9	0.8	0.8	0.5	0.9	1.2	1.4	1.4	1.3	0.8	0.7	1.6
29-Jan	0.6	0.8	0.9	1.2	1.0	0.9	1.1	1.1	1.0	1.3	1.4	1.3	1.0	1.0	0.9	0.6	0.9	0.9	0.8	1.3	1.2	1.5	1.6	1.7	1.7
30-Jan	2.3	2.2	2.7	2.3	2.2	2.0	2.2	2.3	2.1	2.2	2.1	1.8	2.2	1.8	1.9	1.8	2.1	2.0	2.2	1.8	1.3	0.7	0.4	0.3	2.7
31-Jan	0.2	0.2	0.3	0.3	0.2	0.4	0.4	0.6	0.9	0.9	1.2	1.3	1.4	1.2	1.2	1.4	0.9	0.4	0.6	0.8	0.9	0.9	0.9	1.1	1.4
	2.9	2.2	2.7	2.4	2.2	2.0	2.2	2.9	3.2	2.4	2.4	2.1	2.7	2.8	2.7	2.7	2.4	2.8	3.0	3.2	2.8	3.2	3.6	3.0	
	Diurnal Maximum																								

AF - Analyzer Failure

Maximum Value: 2.4 km/h on Jan 31 19:00

Maximum Daily Average: 0.6 km/h on Jan 31

Minimum Value: -1.1 km/h on Jan 22 09:00

Minimum Daily Average: -0.6 km/h on Jan 8

Maximum Diurnal Average: 0.2 km/h at hour 5

Minimum Diurnal Average: 0.0 km/h at hour 17

Monthly Average: 0.08 km/h

Percentiles: P_1 = -0.8 P_{10} = -0.5 Q_1 = -0.3 Median = 0.0 Q_3 = 0.4 P_{90} = 0.7 P_{99} = 1.2

Hours in Service:	744
Hours of Data:	588
Hours of Missing Data:	156
Hours of Calibration:	0
Percent Operational Time:	79.0

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-Jan	0.1	0.1	-0.2	0.0	0.0	-0.1	0.1	0.0	0.1	0.0	0.1	-0.1	0.3	-0.3	-0.3	0.1	-0.1	-0.2	-0.1	-0.1	0.1	0.0	-0.2	-0.4	-0.1	0.3
2-Jan	-0.1	0.1	-0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.1	-0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.0	-0.2	-0.2	-0.4	0.0	0.2
3-Jan	-0.2	-0.3	-0.6	-0.3	-0.1	-0.1	-0.3	-0.5	-0.3	-0.1	-0.3	-0.3	-0.3	-0.2	-0.1	-0.4	-0.5	-0.5	-0.6	-0.4	-0.4	-0.2	-0.5	-0.2	-0.3	-0.1
4-Jan	-0.2	-0.3	-0.5	-0.2	-0.2	-0.5	-0.4	-0.3	-0.5	0.1	0.0	-0.1	0.2	0.1	0.0	-0.4	-0.3	-0.2	-0.5	-0.3	0.0	-0.2	0.0	-0.5	-0.2	0.2
5-Jan	-0.5	-0.2	0.0	0.1	0.0	-0.1	-0.1	-0.3	-0.3	-0.3	-0.1	-0.3	-0.4	-0.5	-0.4	-0.4	-0.5	-0.4	-0.4	-0.4	-0.7	-1.0	-0.8	-0.2	-0.3	0.1
6-Jan	-0.2	-0.3	0.0	0.4	0.4	0.1	0.1	0.1	-0.1	-0.1	-0.1	-0.2	-0.2	0.2	0.2	0.2	0.0	-0.2	-0.4	-0.5	-0.4	-0.3	0.2	0.5	0.0	0.5
7-Jan	0.2	0.8	0.9	0.9	1.0	0.4	0.7	0.4	0.5	0.4	0.8	0.5	0.7	0.2	0.1	0.0	0.0	-0.5	-0.7	-0.7	-0.6	-0.5	-0.5	-0.8	0.2	1.0
8-Jan	-0.8	-0.7	-0.9	-0.8	-0.8	-0.8	-0.7	-0.5	-0.5	-0.5	-0.5	-0.7	-0.5	-0.5	-0.5	-0.4	-0.5	-0.6	-0.5	-0.7	-0.6	-0.6	-0.5	-0.5	-0.6	-0.4
9-Jan	-0.2	-0.1	0.3	0.9	1.0	0.7	0.7	0.8	1.1	0.7	0.4	0.6	0.4	0.5	0.4	0.2	-0.1	-0.2	-0.2	-0.3	-0.4	-0.1	0.1	-0.2	0.3	1.1
10-Jan	-0.1	0.2	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.5	0.2	0.2	0.4	0.5	0.4	0.6	0.2	0.1	0.3	0.2	0.2	0.0	0.0	0.2	0.6
11-Jan	-0.1	0.2	0.0	0.2	0.2	0.1	0.2	0.5	0.5	0.4	0.5	0.6	0.6	0.8	0.7	0.3	0.3	0.6	0.9	0.8	0.4	0.5	0.7	1.0	0.5	1.0
12-Jan	1.1	0.9	0.7	0.4	0.7	0.4	0.2	0.3	0.0	0.0	0.3	0.3	0.1	0.3	0.2	0.4	0.7	0.6	0.3	0.7	0.8	0.8	0.7	0.2	0.5	1.1
13-Jan	-0.1	0.0	-0.2	-0.5	-0.2	-0.4	-0.4	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.5	0.7	0.3	0.5	0.4	0.5	0.3	0.5	0.6	0.4	0.2	0.7
14-Jan	0.3	0.2	0.4	0.1	-0.4	-0.7	-0.4	-0.4	-0.2	0.1	0.4	0.4	0.3	-0.1	-0.1	-0.2	0.0	0.4	-0.2	0.0	0.2	0.2	0.4	0.4	0.0	0.4
15-Jan	0.1	0.1	0.2	0.2	0.3	0.2	0.6	0.5	0.1	0.3	0.0	0.3	0.4	0.7	0.6	0.6	0.6	0.8	0.9	0.7	1.0	1.0	1.0	1.0	0.5	1.0
16-Jan	1.1	0.8	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.9	0.7	0.3	0.1	0.0	0.1	-0.2	-0.7	-0.5	-0.7	-0.6	-0.6	-1.0	-0.9	-0.7	0.1	1.1
17-Jan	-0.6	-0.5	-0.5	-0.7	-0.5	-0.5	-0.4	0.0	0.0	0.1	0.0	-0.1	0.1	0.0	-0.1	0.0	-0.1	0.0	0.3	0.2	0.2	0.3	0.3	AF	-0.1	0.3
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.4	0.5	0.3	0.5	0.4	0.0	0.0	0.0	0.4	0.3	0.3	0.3	--	0.5
19-Jan	0.1	0.4	0.4	0.1	-0.2	-0.1	-0.1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.4
20-Jan	AF	AF	-0.1	-0.6	-0.1	-0.1	AF	AF	AF	-0.2	0.0	0.2	0.5	0.1	0.6	0.7	0.5	0.7	0.8	0.8	1.2	1.3	1.4	1.1	0.5	1.4
21-Jan	1.0	1.0	1.2	1.1	1.3	1.0	0.8	1.0	1.1	1.0	0.8	0.8	0.3	0.1	-0.1	-0.3	-0.6	-0.6	-0.4	-0.2	-0.4	-0.3	0.0	-0.1	0.4	1.3
22-Jan	-0.3	0.3	0.3	-0.1	0.1	-0.3	-0.4	-0.8	-1.1	-0.4	-0.3	-0.3	-0.4	-0.8	-0.6	-0.8	-0.8	-0.6	-0.5	-0.5	-0.5	-0.5	-0.2	0.4	-0.4	0.4
23-Jan	0.3	-0.1	-0.1	-0.1	-0.1	0.1	AF	AF	AF	AF	AF	AF	0.1	0.4	0.3	0.3	-0.2	AF	AF	AF	AF	AF	AF	AF	--	0.4
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-0.5	-0.2	-0.1	-0.3	-0.3	-0.2	-0.4	-0.3	-0.5	-0.5	-0.5	-0.2	0.0	--	0.0
25-Jan	1.0	0.9	0.5	-0.3	0.6	0.8	0.9	0.6	-0.5	-0.4	-0.5	-0.5	-0.3	-0.5	-0.3	-0.3	-0.7	-0.6	-0.2	0.1	0.1	0.2	0.2	0.2	0.0	1.0
26-Jan	-0.1	-0.1	-0.2	0.0	0.6	0.7	0.2	-0.3	-0.2	-0.1	-0.2	-0.1	0.0	0.2	-0.1	-0.1	0.0	-0.1	AF	AF	AF	AF	AF	AF	0.0	0.7
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.4	0.3	0.0	0.0	0.0	--	0.4
31-Jan	0.2	0.0	0.0	0.0	0.0	-0.3	-0.1	0.7	1.1	1.1	0.5	0.3	0.4	0.7	0.6	0.8	0.9	1.5	2.4	1.6	1.0	0.4	0.3	0.6	0.6	2.4
	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	Diurnal Average	
	1.1	1.0	1.2	1.1	1.3	1.0	0.9	1.0	1.1	1.1	0.8	0.8	0.7	0.8	0.7	0.8	0.9	1.5	2.4	1.6	1.2	1.3	1.4	1.1	Diurnal Maximum	

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.7 km/h on Jan 7 20:00

Minimum Value: 0.1 km/h on Jan 31 02:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.6 Median = 1.0 Q_3 = 1.5 P_{90} = 2.2 P_{99} = 3.2

Hours in Service:	744
Hours of Data:	588
Hours of Missing Data:	156
Hours of Calibration:	0
Percent Operational Time:	79.0

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

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - January 2015

Maximum Value: 4.3 km/h on Jan 21 07:00

Maximum Daily Average: 0.8 km/h on Jan 21

Minimum Value: -0.8 km/h on Jan 21 17:00

Minimum Daily Average: -0.3 km/h on Jan 8

Maximum Diurnal Average: 0.2 km/h at hour 7

Minimum Diurnal Average: -0.1 km/h at hour 19

Monthly Average: 0.07 km/h

Percentiles: P_1 = -0.7 P_{10} = -0.4 Q_1 = -0.2 Median = 0.0 Q_3 = 0.2 P_{90} = 0.5 P_{99} = 1.7

Hours in Service:	744
Hours of Data:	557
Hours of Missing Data:	187
Hours of Calibration:	0
Percent Operational Time:	74.9

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-Jan	0.2	0.2	-0.1	0.0	0.1	0.0	0.2	0.1	0.1	0.3	0.2	0.1	0.6	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	-0.3	-0.3	0.1	0.6
2-Jan	-0.1	0.0	-0.1	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.2	0.0	0.1	0.3	0.0	0.1	0.2	0.0	0.1	0.1	0.0	0.0	-0.1	-0.3	0.1	0.3
3-Jan	0.0	-0.1	-0.4	-0.1	0.1	0.1	0.0	-0.2	-0.1	0.0	-0.2	-0.2	-0.1	0.0	0.1	-0.3	-0.5	-0.5	-0.5	-0.3	-0.1	-0.1	-0.6	-0.3	-0.2	0.1
4-Jan	-0.2	-0.3	-0.4	-0.2	-0.1	-0.5	-0.5	-0.3	-0.7	-0.3	-0.5	-0.4	-0.3	-0.2	-0.1	-0.3	-0.3	0.0	-0.3	-0.2	-0.3	-0.1	0.0	-0.3	-0.3	0.0
5-Jan	-0.5	0.0	-0.1	0.0	0.2	-0.1	0.1	-0.2	-0.2	0.0	0.1	-0.1	-0.1	-0.1	-0.1	0.1	0.1	0.1	0.1	0.0	-0.4	-0.7	-0.3	0.1	-0.1	0.2
6-Jan	0.0	0.1	0.0	0.3	0.2	-0.1	0.0	0.1	0.0	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.3	-0.3	-0.5	-0.4	-0.4	-0.1	0.1	-0.1	0.3
7-Jan	-0.1	0.5	0.4	0.6	0.9	0.5	0.2	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.1	0.0	0.1	0.2	-0.2	-0.1	-0.2	-0.2	-0.2	0.2	0.1	0.1	0.9
8-Jan	-0.3	-0.4	-0.4	0.0	0.0	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.5	-0.5	-0.5	-0.7	-0.6	-0.8	-0.6	-0.5	-0.3	0.0
9-Jan	0.0	-0.1	0.0	0.3	0.4	0.0	0.1	0.4	0.6	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.1	-0.1	-0.1	0.2	0.3	-0.2	0.1	0.6
10-Jan	0.1	0.5	0.3	0.0	0.1	0.1	0.1	0.0	0.0	-0.2	0.4	0.0	-0.2	0.0	0.5	0.6	0.4	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.1	0.6
11-Jan	-0.2	-0.1	-0.2	0.0	-0.1	-0.1	0.0	0.2	0.4	0.4	0.4	0.6	0.5	0.6	0.7	0.6	0.6	0.2	0.0	0.1	0.3	0.7	0.4	0.8	0.3	0.8
12-Jan	0.7	0.5	0.4	0.1	0.4	0.1	0.0	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.3	0.4	0.0	0.4	0.4	0.6	0.7	0.0	0.2	0.7
13-Jan	-0.4	0.0	0.0	-0.3	0.0	-0.3	-0.3	0.2	0.2	0.3	0.2	0.3	0.0	0.3	0.6	0.7	0.0	0.2	-0.3	-0.2	-0.3	0.0	0.3	0.3	0.1	0.7
14-Jan	0.3	-0.2	0.1	-0.2	-0.2	-0.7	0.0	0.1	0.0	0.1	0.6	0.7	0.4	0.0	0.0	-0.1	0.3	0.7	0.2	0.3	0.6	0.3	0.5	0.4	0.2	0.7
15-Jan	0.1	0.1	0.4	0.1	0.3	0.3	0.6	0.4	0.0	0.3	0.0	0.3	0.1	0.2	0.0	0.0	-0.1	0.0	-0.2	-0.2	0.1	-0.3	-0.1	0.0	0.1	0.6
16-Jan	0.0	0.0	-0.1	-0.3	-0.3	0.0	0.1	0.1	0.4	0.7	0.3	-0.2	-0.2	0.1	0.1	-0.2	-0.6	-0.3	-0.4	-0.4	-0.5	-0.7	-0.6	-0.4	-0.1	0.7
17-Jan	-0.2	-0.2	-0.1	-0.4	-0.1	-0.3	0.3	0.3	0.5	0.5	0.2	-0.1	0.1	-0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.2	0.0	0.1	AF	0.1	0.5
18-Jan	AF	AF	AF	AF	AF	AF	AF	0.4	0.3	0.7	0.4	-0.2	0.0	0.4	0.2	0.2	0.3	0.0	-0.2	-0.2	0.1	-0.1	-0.1	0.0	--	0.7
19-Jan	0.0	0.1	0.1	0.1	0.2	0.0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.2
20-Jan	AF	AF	0.3	0.3	-0.3	1.0	AF	AF	AF	AF	0.0	0.1	0.4	0.1	0.4	0.7	0.6	0.9	0.9	1.1	1.4	1.5	1.7	1.2	0.7	1.7
21-Jan	1.2	1.5	1.7	2.5	3.4	3.9	4.3	3.0	1.0	0.9	0.8	0.6	-0.1	-0.5	-0.5	-0.5	-0.8	-0.8	-0.4	-0.2	-0.4	-0.3	0.0	-0.2	0.8	4.3
22-Jan	0.1	0.3	-0.2	-0.3	0.0	-0.3	-0.5	-0.4	-0.8	-0.1	0.5	0.0	0.0	-0.3	-0.3	-0.6	-0.7	-0.3	-0.4	-0.3	-0.2	-0.4	0.0	0.6	-0.2	0.6
23-Jan	0.3	0.1	-0.1	-0.2	0.0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.3
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.1	-0.1	0.1	0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.4	-0.4	-0.4	-0.3	-0.2	--	0.1
25-Jan	0.4	0.7	0.1	-0.7	0.3	0.8	0.6	0.3	-0.6	-0.3	-0.2	-0.2	-0.1	-0.2	-0.1	0.0	-0.1	-0.1	0.1	0.2	0.0	0.1	0.1	-0.1	0.0	0.8
26-Jan	-0.2	-0.2	-0.4	-0.3	0.2	0.4	-0.3	-0.5	-0.2	-0.1	-0.2	-0.1	0.1	0.2	-0.1	-0.1	0.2	0.5	AF	AF	AF	AF	AF	AF	-0.1	0.5
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.1	0.0	Diurnal Average	
	1.2	1.5	1.7	2.5	3.4	3.9	4.3	3.0	1.0	0.9	0.8	0.7	0.6	0.6	0.7	0.7	0.6	0.9	0.9	1.1	1.4	1.5	1.7	1.2	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.7 km/h on Jan 7 20:00

Minimum Value: 0.2 km/h on Jan 6 10:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.6 Median = 1.0 Q_3 = 1.5 P_{90} = 2.3 P_{99} = 3.3

Hours in Service:	744
Hours of Data:	557
Hours of Missing Data:	187
Hours of Calibration:	0
Percent Operational Time:	74.9

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-Jan	1.1	0.9	0.7	0.8	0.6	0.4	0.3	0.5	0.6	0.4	0.4	1.0	1.2	1.8	2.3	2.5	2.2	1.8	1.5	0.8	0.2	0.5	1.1	1.2	2.5
2-Jan	1.5	1.3	1.5	1.2	1.6	1.4	1.1	0.5	0.3	0.2	0.3	0.2	0.4	0.4	0.3	0.3	0.5	0.4	0.2	0.3	0.4	0.7	0.9	1.0	1.6
3-Jan	1.0	1.0	1.1	1.0	1.0	0.6	1.2	0.6	0.4	0.3	0.5	0.4	1.0	1.2	1.1	0.8	0.8	0.7	0.8	0.7	0.6	0.8	0.8	0.9	1.2
4-Jan	0.8	1.2	1.1	0.9	0.9	0.8	0.6	0.6	0.7	0.7	0.7	0.7	0.9	1.4	1.5	1.7	1.8	2.5	2.3	1.6	1.4	2.3	1.7	1.7	2.5
5-Jan	1.2	1.2	0.9	0.9	1.1	1.0	0.8	1.1	1.2	1.1	1.3	1.0	1.2	1.5	1.3	1.4	1.9	1.4	1.2	1.5	0.9	1.4	1.4	1.1	1.9
6-Jan	0.9	1.2	1.0	1.2	1.0	0.8	0.6	0.3	0.2	0.2	0.4	0.4	0.3	0.2	0.5	0.3	0.3	0.4	0.3	0.2	0.2	0.4	0.5	0.5	1.2
7-Jan	0.5	0.6	0.4	0.6	0.8	0.4	0.6	0.6	0.9	1.1	1.2	1.3	1.3	0.9	0.6	0.5	0.8	1.5	3.2	3.7	3.1	1.7	2.4	3.6	3.7
8-Jan	2.5	1.5	1.3	1.9	1.9	1.9	1.3	0.9	0.7	0.6	1.0	1.3	1.4	1.5	1.6	1.1	0.8	0.7	0.7	0.7	0.7	0.8	0.5	0.4	2.5
9-Jan	0.5	0.5	0.9	0.7	0.6	0.6	0.4	0.7	0.6	0.5	0.7	0.8	0.8	0.8	0.9	0.8	0.6	0.7	1.1	0.8	2.5	2.0	1.7	1.5	2.5
10-Jan	1.4	1.6	1.3	0.8	0.5	0.6	0.3	0.2	0.5	0.3	0.5	0.6	0.4	0.4	0.7	0.7	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.4	1.6
11-Jan	0.6	0.6	0.4	0.4	0.4	0.4	0.2	0.3	0.5	0.5	0.8	1.1	1.2	1.3	0.9	0.3	0.3	0.3	0.6	0.4	0.4	0.8	0.5	0.4	1.3
12-Jan	0.6	0.7	0.7	0.8	0.9	0.9	0.4	0.5	0.6	0.5	0.4	0.5	0.3	0.5	0.5	0.3	0.3	0.5	0.7	0.5	0.7	0.9	1.0	0.7	1.0
13-Jan	0.6	0.8	0.4	1.1	1.1	1.4	1.3	1.1	1.0	1.1	1.1	1.0	0.7	1.1	1.1	1.1	1.9	1.8	1.5	1.5	1.5	1.6	1.2	1.0	1.9
14-Jan	0.8	1.7	1.4	1.1	1.0	1.2	1.7	2.1	1.9	1.9	1.6	1.7	1.6	1.2	1.1	1.1	1.4	2.0	1.8	1.9	1.8	1.7	1.7	1.5	2.1
15-Jan	1.7	2.0	2.0	1.7	1.9	1.6	1.6	1.5	1.1	1.3	0.9	0.9	1.4	1.3	1.7	2.0	2.1	2.2	2.3	2.8	2.7	2.5	2.6	2.4	2.8
16-Jan	2.6	2.4	1.7	1.5	1.7	1.2	0.9	1.0	1.2	1.4	1.0	0.8	0.9	1.2	2.1	1.9	2.4	3.1	3.3	3.2	2.8	2.7	3.1	3.2	3.3
17-Jan	2.3	2.4	2.6	2.6	2.4	2.3	2.0	0.8	1.2	1.4	1.3	1.0	1.3	1.1	0.9	0.6	0.4	0.4	0.8	0.4	0.8	0.7	0.6	AF	2.6
18-Jan	AF	AF	AF	AF	AF	AF	AF	0.7	0.5	0.9	0.9	0.6	0.7	0.9	0.5	0.8	0.5	0.4	0.4	0.5	0.6	0.4	0.4	0.9	0.9
19-Jan	0.3	0.7	0.6	0.3	0.3	0.3	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.7
20-Jan	AF	AF	2.0	2.3	1.7	2.7	AF	AF	AF	AF	0.8	0.3	0.5	0.5	0.8	0.8	0.5	0.6	0.7	0.9	0.8	1.0	1.0	1.0	2.7
21-Jan	0.8	0.8	1.2	1.6	1.8	1.7	1.0	2.2	1.7	1.8	1.1	1.4	2.3	3.0	2.6	2.4	2.5	2.3	2.4	2.0	2.2	2.1	2.3	2.4	3.0
22-Jan	2.7	2.0	1.5	1.5	1.6	1.8	1.9	3.1	3.3	3.2	3.0	2.7	3.4	3.4	2.6	2.2	1.7	2.5	2.7	2.1	2.1	1.5	1.2	1.1	3.4
23-Jan	1.1	1.1	0.6	0.7	0.6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.1
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.9	1.0	1.6	1.2	1.4	1.5	1.1	0.8	0.6	0.8	1.0	0.8	0.6	0.6	1.6
25-Jan	0.8	0.8	0.9	1.1	1.3	1.6	1.8	1.7	1.6	2.5	3.2	2.8	1.7	1.6	1.3	1.4	1.6	1.3	1.0	0.8	0.9	0.3	0.5	0.4	3.2
26-Jan	0.5	0.5	0.6	0.8	0.7	0.8	0.9	0.9	0.7	0.6	0.4	0.5	0.9	0.8	0.7	0.4	0.8	2.3	AF	AF	AF	AF	AF	AF	2.3
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	2.7	2.4	2.6	2.6	2.4	2.7	2.0	3.1	3.3	3.2	3.2	2.8	3.4	3.4	2.6	2.5	2.5	3.1	3.3	3.7	3.1	2.7	3.1	3.6	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - January 2015

Maximum Value: 4.6 km/h on Jan 22 14:00

Maximum Daily Average: 2.5 km/h on Jan 22

Minimum Value: -1.0 km/h on Jan 7 10:00

Minimum Daily Average: -0.1 km/h on Jan 15

Maximum Diurnal Average: 1.3 km/h at hour 18

Minimum Diurnal Average: 0.8 km/h at hour 4

Monthly Average: 1.06 km/h

Percentiles: P_1 = -0.6 P_{10} = 0.0 Q_1 = 0.3 Median = 0.8 Q_3 = 1.7 P_{90} = 2.6 P_{99} = 4.1

Hours in Service:	744
Hours of Data:	560
Hours of Missing Data:	184
Hours of Calibration:	0
Percent Operational Time:	75.3

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-Jan	0.0	0.0	-0.2	-0.3	0.1	-0.2	0.3	0.1	-0.2	0.1	0.4	0.8	1.4	1.4	0.3	0.3	0.9	1.3	0.7	0.4	0.1	0.5	0.1	0.1	0.3	1.4
2-Jan	-0.5	-0.4	-0.2	0.3	0.1	0.0	0.3	0.1	0.2	0.1	0.2	0.3	1.1	0.8	0.6	-0.1	-0.1	-0.2	0.0	0.1	0.4	0.6	0.9	0.9	0.2	1.1
3-Jan	0.3	0.0	-0.3	0.3	1.0	1.3	1.5	1.7	1.9	1.5	1.2	1.8	1.9	2.0	1.9	1.5	1.3	1.6	2.0	2.4	2.7	1.9	0.9	1.3	1.4	2.7
4-Jan	1.6	1.9	1.4	1.4	1.7	1.5	1.1	2.0	0.5	0.4	0.1	0.5	0.5	1.1	0.9	1.3	1.7	2.3	2.0	1.2	0.8	2.0	1.9	2.3	1.3	2.3
5-Jan	1.8	2.1	0.7	1.0	1.2	1.3	2.0	2.1	1.9	2.2	2.1	2.0	2.1	2.6	2.2	2.6	2.6	2.4	2.2	2.0	1.3	0.8	1.0	0.2	1.8	2.6
6-Jan	0.0	0.2	0.0	-0.2	-0.1	-0.4	0.1	0.0	0.0	0.3	0.6	1.5	1.7	0.6	0.5	0.8	1.1	1.8	1.9	2.2	1.7	1.2	0.6	0.5	0.7	2.2
7-Jan	0.3	0.9	1.1	1.8	1.8	1.3	0.9	-0.1	-0.9	-1.0	-0.4	-0.5	-0.6	0.3	0.3	0.8	1.1	1.1	1.3	1.2	1.3	2.4	3.4	3.1	0.9	3.4
8-Jan	0.8	1.4	3.2	4.5	4.1	3.5	3.3	2.4	2.9	2.8	2.7	2.9	2.6	2.5	2.7	2.6	2.1	2.1	1.7	1.8	2.1	1.3	1.2	1.3	2.4	4.5
9-Jan	1.7	1.5	0.7	0.5	0.4	0.3	0.4	0.6	0.7	0.5	0.6	0.5	0.5	0.3	0.5	0.1	0.1	0.0	0.6	0.9	0.6	1.0	1.0	0.3	0.6	1.7
10-Jan	-0.2	0.5	0.3	-0.1	-0.1	-0.1	0.0	0.7	0.8	0.6	0.7	0.3	0.4	0.2	0.8	0.7	0.5	0.4	0.8	0.5	0.5	0.6	1.2	1.4	0.5	1.4
11-Jan	1.0	0.5	0.6	0.3	0.3	0.3	0.3	0.2	0.5	0.6	1.1	1.4	1.1	1.2	1.5	1.1	1.1	0.8	0.8	0.7	1.0	2.0	1.3	1.3	0.9	2.0
12-Jan	1.6	1.6	1.5	0.7	0.6	0.3	0.3	0.3	0.3	0.7	0.5	0.4	0.5	0.2	0.3	0.6	0.7	1.1	0.9	1.4	1.2	1.4	1.3	0.3	0.8	1.6
13-Jan	0.9	1.6	1.5	0.6	0.5	0.2	-0.1	0.2	0.0	0.3	0.0	-0.2	-0.4	-0.2	0.3	0.2	-0.5	-0.4	-0.9	-0.4	-0.5	0.2	0.6	0.8	0.2	1.6
14-Jan	0.9	0.4	0.2	0.8	2.7	2.9	2.2	0.7	-0.1	-0.1	0.6	0.6	0.4	0.1	0.1	0.2	0.3	0.6	0.3	0.5	0.8	0.2	0.5	-0.1	0.6	2.9
15-Jan	-0.1	-0.1	0.1	-0.4	-0.2	-0.2	0.3	0.1	-0.3	0.0	-0.2	0.1	-0.2	-0.1	-0.5	-0.6	-0.3	-0.6	-0.4	0.1	0.4	-0.1	-0.2	0.1	-0.1	0.4
16-Jan	0.2	0.1	0.3	0.1	0.2	0.6	0.7	0.8	1.3	1.7	1.1	0.4	0.8	1.9	1.9	2.0	2.4	3.1	3.3	3.3	3.2	3.4	3.9	4.2	1.7	4.2
17-Jan	3.5	3.1	3.6	3.6	3.3	2.8	2.4	0.5	0.8	0.6	0.2	0.1	0.3	-0.1	0.3	0.1	0.2	0.3	0.4	0.1	0.1	0.1	0.5	AF	1.2	3.6
18-Jan	AF	AF	AF	AF	AF	AF	AF	1.4	1.0	1.8	1.2	0.4	0.4	0.8	0.2	0.4	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.5	--	1.8
19-Jan	0.3	0.5	0.2	0.5	0.9	0.5	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.9
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.4	0.3	0.4	0.2	1.7	0.2	0.6	1.4	1.2	1.3	1.8	2.0	2.2	1.6	--	2.2
21-Jan	1.8	1.9	1.8	1.8	2.1	1.6	1.6	1.9	2.4	2.6	2.6	2.0	1.6	1.4	1.4	0.9	1.2	1.7	2.1	1.2	1.6	1.7	2.2	2.2	1.8	2.6
22-Jan	2.1	1.3	0.6	1.1	1.7	1.5	1.6	3.3	3.9	3.8	4.2	3.7	4.3	4.6	3.9	3.1	2.2	2.9	3.3	3.4	3.2	0.0	0.2	0.8	2.5	4.6
23-Jan	0.4	0.5	0.5	0.4	0.3	0.6	AF	0.2	0.3	0.0	0.5	0.6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.6
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.7	2.6	2.6	2.3	1.9	1.8	2.2	2.4	2.8	2.3	2.2	2.1	1.7	1.1	0.4	--	2.8
25-Jan	0.7	1.7	1.3	0.5	1.2	1.7	1.6	1.1	1.2	2.3	3.8	3.2	2.1	2.3	2.3	2.8	3.1	3.1	0.9	0.3	-0.2	-0.1	0.4	0.6	1.6	3.8
26-Jan	1.3	1.2	1.4	0.6	0.6	0.8	0.5	0.6	1.3	1.6	1.3	1.5	0.9	1.1	1.2	0.8	1.2	1.4	AF	AF	AF	AF	AF	AF	1.1	1.6
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
	0.9	1.0	0.9	0.8	1.1	1.0	1.0	0.9	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.3	1.2	1.2	1.2	1.1	1.2	1.1	Diurnal Average	
	3.5	3.1	3.6	4.5	4.1	3.5	3.3	3.3	3.9	3.8	4.2	3.7	4.3	4.6	3.9	3.1	3.1	3.1	3.3	3.4	3.2	3.4	3.9	4.2	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3.9 km/h on Jan 7 20:00

Minimum Value: 0.2 km/h on Jan 11 16:00

Percentiles: P_1 = 0.3 P_{10} = 0.5 Q_1 = 0.7 Median = 1.0 Q_3 = 1.5 P_{90} = 2.4 P_{99} = 3.6

Hours in Service:	744
Hours of Data:	560
Hours of Missing Data:	184
Hours of Calibration:	0
Percent Operational Time:	75.3

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	Maximum
1-Jan	0.8	0.8	0.7	0.7	0.5	0.5	0.4	0.4	0.5	0.4	0.6	1.0	1.2	1.7	2.3	2.5	2.4	1.8	1.5	0.8	0.3	0.8	1.3	1.5	2.5
2-Jan	1.6	1.5	1.5	1.2	1.8	1.4	1.1	0.5	0.3	0.3	0.3	0.3	0.7	0.6	0.4	0.3	0.4	0.3	0.3	0.4	0.6	0.8	1.2	1.3	1.8
3-Jan	1.2	1.0	1.2	1.2	1.1	0.7	1.2	0.8	0.4	0.4	0.5	0.5	1.1	1.3	1.2	0.9	0.9	0.9	0.9	0.7	0.6	1.0	1.0	1.2	1.3
4-Jan	0.9	1.2	1.3	1.2	1.1	0.9	0.9	0.9	0.7	0.8	0.7	0.9	1.1	1.5	1.8	1.8	2.0	2.7	2.5	1.9	1.8	2.6	1.9	1.8	2.7
5-Jan	1.4	1.4	1.0	1.1	1.1	1.1	0.9	1.1	1.3	1.1	1.3	1.1	1.3	1.5	1.4	1.3	1.8	1.4	1.2	1.6	1.0	1.2	1.2	1.2	1.8
6-Jan	1.0	1.3	1.1	1.3	1.0	0.9	0.7	0.3	0.3	0.2	0.6	0.5	0.4	0.3	0.6	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.7	0.6	1.3
7-Jan	0.5	0.6	0.4	0.6	0.7	0.4	0.6	0.6	0.8	0.9	0.7	1.2	0.9	0.9	0.7	0.6	0.8	1.5	3.2	3.9	3.2	1.8	2.3	3.4	3.9
8-Jan	2.5	1.4	1.3	1.7	1.9	1.9	1.3	1.2	0.7	0.8	1.1	1.3	1.4	1.5	1.6	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.6	0.6	2.5
9-Jan	0.5	0.8	1.0	0.8	0.6	0.6	0.5	0.7	0.6	0.5	0.6	0.6	0.8	0.7	0.9	0.8	0.6	0.8	1.4	1.0	2.8	2.2	1.8	1.8	2.8
10-Jan	1.3	1.4	1.3	0.8	0.5	0.6	0.3	0.4	0.5	0.3	0.6	0.6	0.4	0.5	0.7	0.7	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.5	1.4
11-Jan	0.7	0.7	0.5	0.5	0.5	0.4	0.3	0.3	0.5	0.4	0.6	0.9	0.9	1.0	0.7	0.2	0.2	0.3	0.6	0.5	0.5	0.9	0.6	0.5	1.0
12-Jan	0.5	0.7	0.7	0.9	0.9	0.9	0.3	0.5	0.7	0.5	0.4	0.5	0.3	0.4	0.4	0.3	0.3	0.5	0.7	0.5	0.7	0.7	0.9	0.8	0.9
13-Jan	0.8	0.9	0.4	1.2	1.1	1.4	1.4	1.1	1.1	1.0	1.0	1.0	0.6	1.0	1.1	0.8	1.3	1.5	1.3	1.2	1.2	1.5	1.2	1.0	1.5
14-Jan	0.8	1.9	1.5	1.4	1.1	1.3	1.8	2.0	1.8	1.9	1.7	1.6	1.5	1.2	1.1	1.2	1.3	1.9	1.8	2.0	1.9	1.6	1.7	1.5	2.0
15-Jan	1.8	2.1	2.0	1.8	1.9	1.6	1.6	1.6	1.1	1.3	0.9	1.0	1.1	1.2	1.5	1.8	2.1	2.1	2.3	2.8	2.6	2.5	2.5	2.3	2.8
16-Jan	2.4	2.3	1.6	1.3	1.5	1.1	0.8	1.0	1.1	1.2	1.1	0.9	1.2	1.6	2.4	2.1	2.6	3.3	3.6	3.4	3.1	2.9	3.4	3.3	3.6
17-Jan	2.6	2.6	2.8	2.8	2.6	2.5	2.2	1.0	1.1	1.5	1.2	1.0	1.3	1.2	0.9	0.6	0.3	0.4	0.7	0.5	0.9	0.7	0.4	AF	2.8
18-Jan	AF	AF	AF	AF	AF	AF	AF	0.7	0.6	0.9	0.7	0.6	0.7	0.8	0.6	1.0	0.6	0.6	0.5	0.5	0.7	0.4	0.5	1.1	1.1
19-Jan	0.3	0.9	0.6	0.5	0.5	0.3	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.9
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.9	0.4	0.5	0.7	1.2	1.1	0.5	0.4	0.5	0.8	0.7	0.8	0.8	0.9	1.2
21-Jan	0.8	0.7	0.7	0.6	0.8	0.9	1.0	1.7	1.3	1.4	1.0	1.5	2.4	3.1	2.6	2.4	2.7	2.7	2.6	2.2	2.5	2.4	2.5	2.8	3.1
22-Jan	3.0	2.3	1.7	1.9	1.9	2.0	2.1	3.6	3.6	3.4	3.1	2.9	3.7	3.6	2.7	2.4	2.0	2.8	2.9	2.2	2.4	1.8	1.2	1.2	3.7
23-Jan	1.5	1.4	1.4	1.6	1.1	0.9	AF	0.8	0.8	0.8	0.5	0.8	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.6
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.7	1.0	1.1	1.7	1.4	1.5	1.7	1.2	0.9	0.7	1.0	1.2	1.0	0.8	0.7	1.7
25-Jan	0.8	0.7	0.9	1.2	1.5	1.5	1.9	1.8	1.9	2.8	3.4	2.9	1.9	1.7	1.5	1.6	1.6	1.1	1.3	1.0	0.9	0.3	0.7	0.6	3.4
26-Jan	0.6	0.6	0.7	0.9	0.9	0.7	0.9	0.9	0.9	0.9	0.6	0.6	1.0	1.1	0.9	0.5	0.8	2.2	AF	AF	AF	AF	AF	AF	2.2
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
28-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
30-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	3.0	2.6	2.8	2.8	2.6	2.5	2.2	3.6	3.6	3.4	3.4	2.9	3.7	3.6	2.7	2.5	2.7	3.3	3.6	3.9	3.2	2.9	3.4	3.4	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 19, 2015	Previous Calibration	December 5, 2014
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	10:20	End Time (MST)	13:18
Barometric Pressure	730 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	29-May-14
Gas Cert Reference	LL107934		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2633
DACS voltage range		DACS channel #	N/A

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-634	-634
Analyzer Range (mv)	1000	1000	Lamp voltage	879	879
Calculated slope	0.997414	1.002447	Chamber temp.	44.9	44.9
Calculated intercept	-0.301403	0.009385	Pressure (mmHg)	701.6	693.1
Analyzer Background	6.9	6.9	Flow (lpm)	0.477	0.470
Analyzer Coefficient	0.976	0.976	Intensity	90	90

Analyzer make	TEI 43i	Analyzer serial #	1008841399

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.2	NA
as found span	5000	58.8	599.8	598.1	1.003
calibrator zero	5000	0.0	0.0	0.2	0.000
high point	5000	58.8	599.8	598.1	1.003
second point	5000	29.4	299.9	299.8	1.000
third point	5000	14.7	149.9	148.8	1.007
calibrator zero					
as left zero	5000	0.0	0.0	0.3	0.000
as left span	5000	58.8	599.8		
				Average Correction Factor	1.003

Corrected As found	597.9	Previous response	601.6	% change	0.6%

Notes:

No adjustments, as founds used as calibrator zero and high point. Filter changed after third point.

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

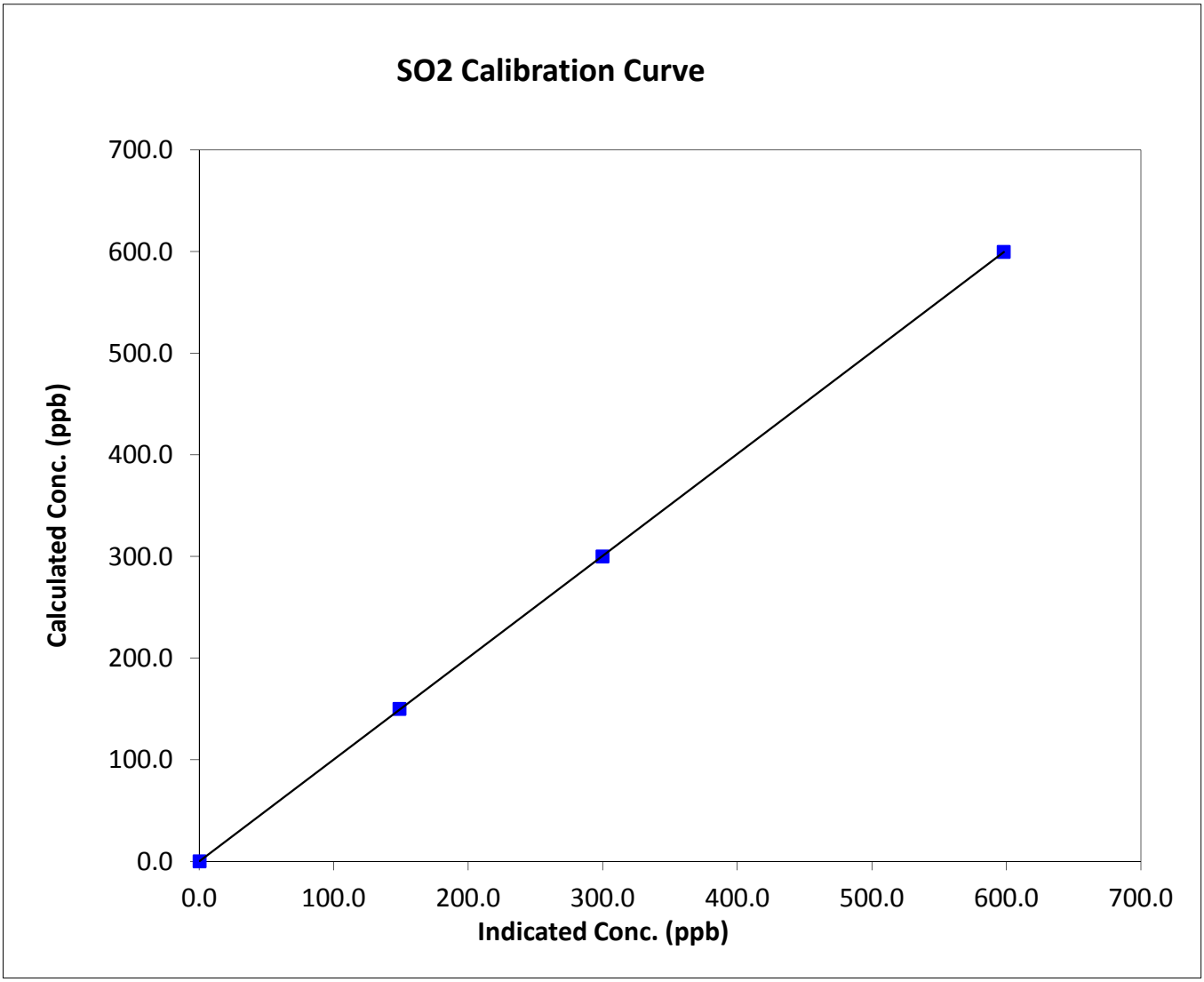
SO_2 Calibration Summary

Station Information

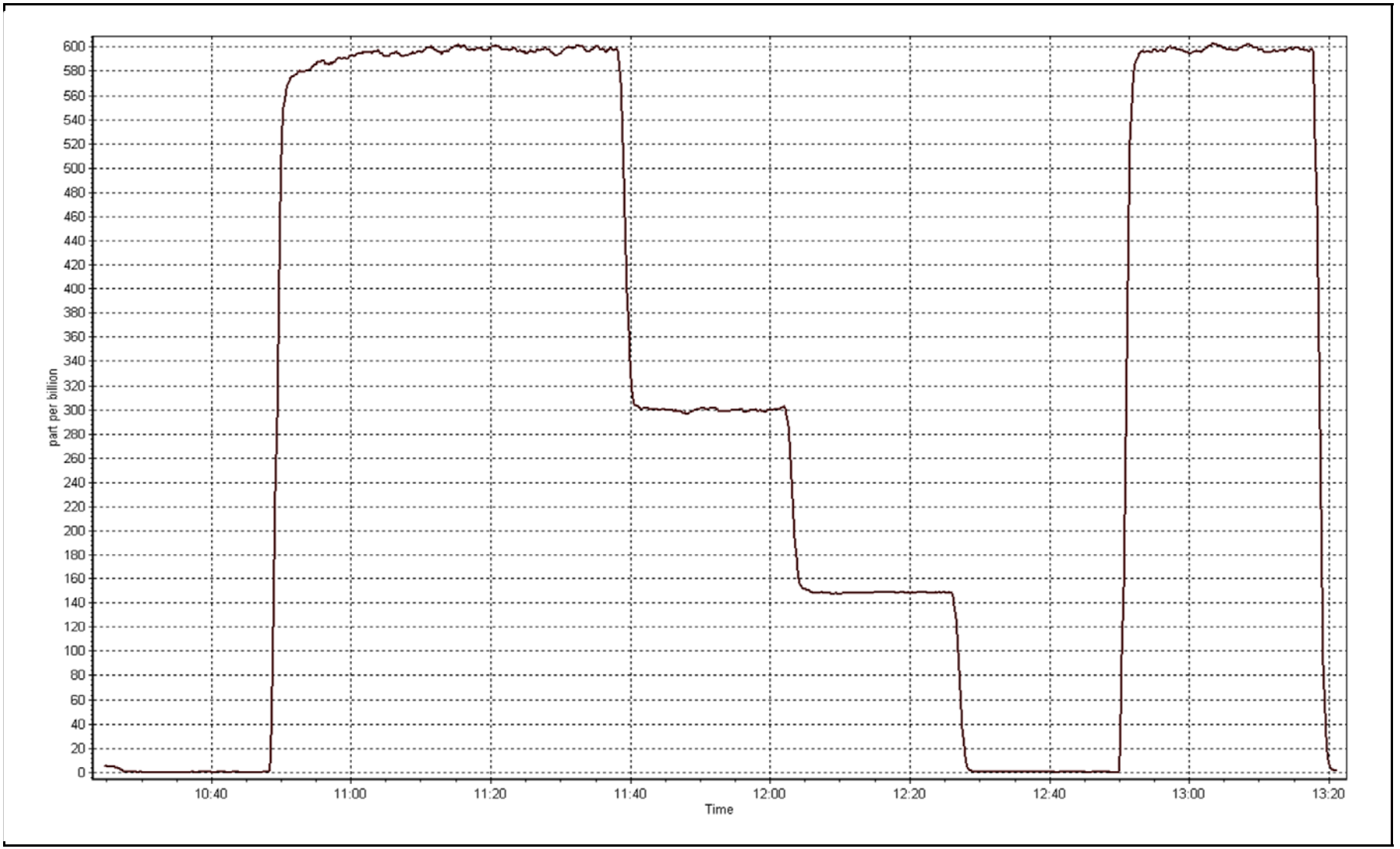
Calibration Date	January 19, 2015	Previous Calibration	December 5, 2014
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	10:20	End Time (MST)	13:18
Analyzer make	TEI 43i	Analyzer serial #	1008841399

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999995
599.8	598.1	1.0027		
299.9	299.8	1.0003	Slope	1.002447
149.9	148.8	1.0074		
			Intercept	0.009385



SO2 Calibration Plot Date: January 19, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 16, 2015	Previous Calibration	December 5, 2014
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	10:05	End Time (MST)	13:50
Barometric Pressure	725 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11061107
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	30-May-13
Gas Cert Reference	LL155272	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2633
DACS voltage range	0-5v	DACS channel #	28

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-623	-624
Analyzer Range (pbb)	100	100	Lamp voltage	890	893
Calculated slope	1.000047	0.996100	Chamber temp.	45	45
Calculated intercept	-0.064673	-0.003816	Pressure	516.2	498.9
Analyzer Background	14.8	14.6	Flow	1.062	1.039
Analyzer Coefficient	1.140	1.144	Intensity (%)	115	115
			Converter temp.	324	323

Analyzer make/model	TEI 450i	Analyzer serial #	815129108
Converter make/model	N/A	Converter serial #	N/A

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.16	NA
as found span	5000	36.8	75.1	74.1	1.014
SO2 scrubber check	5000	29.4	299.9	1.9	NA
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5000	36.8	75.1	75.2	0.998
second point	5000	20.6	42.0	42.6	0.986
third point	5000	12.3	25.1	25.0	1.003
calibrator zero					
as left zero	5000	0.0	0.0	0.3	NA
as left span	5000	36.8	75.1	75.2	0.999
				Average Correction Factor	0.996

Corrected As found	74.2	Previous response	75.1	% change	1.2%

Notes:

Small adjustments to zero and span. Filter changed after As Founds. Data logger accidently reset after third point, missing a couple minutes of data

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

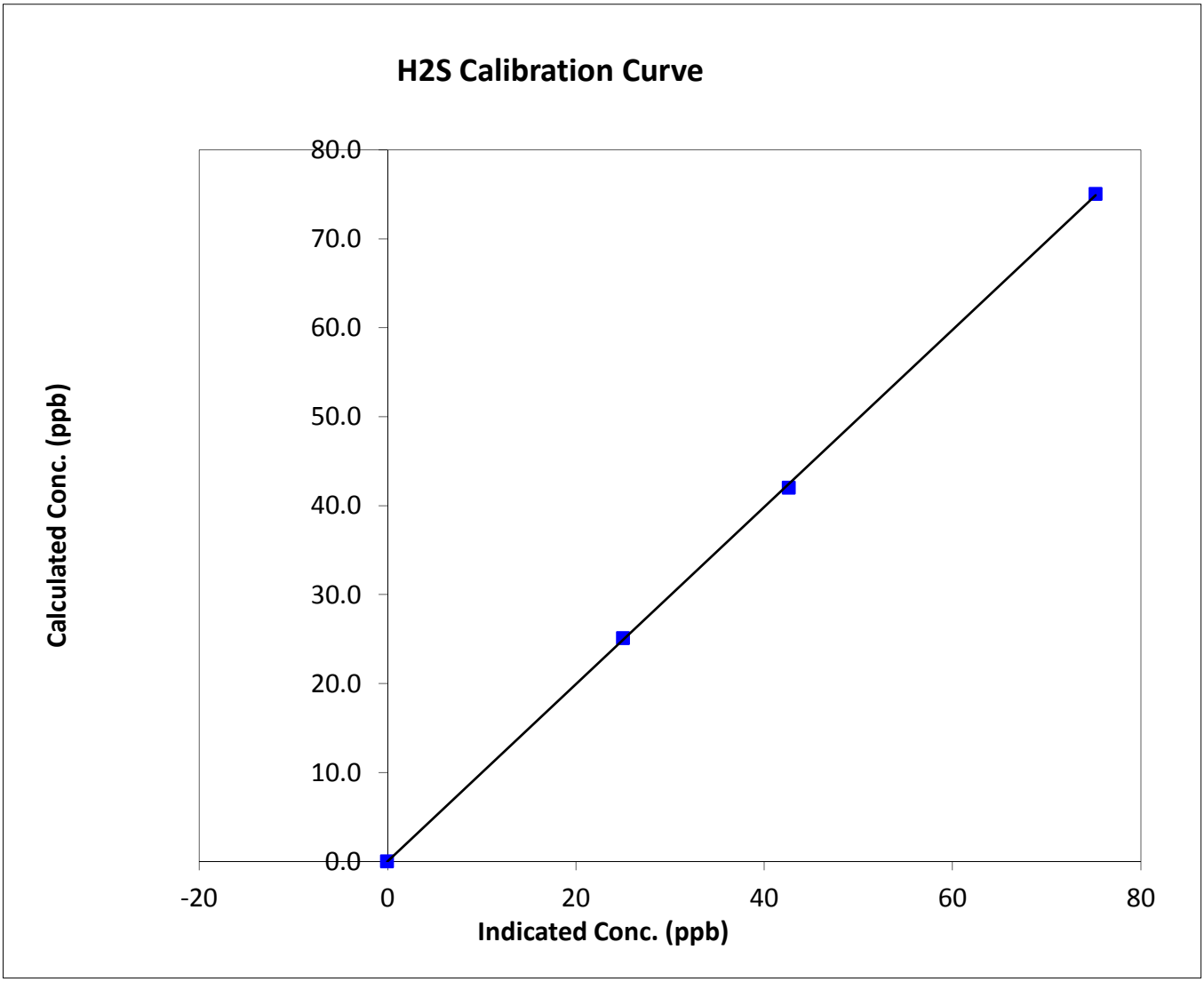
H2S Calibration Summary

Station Information

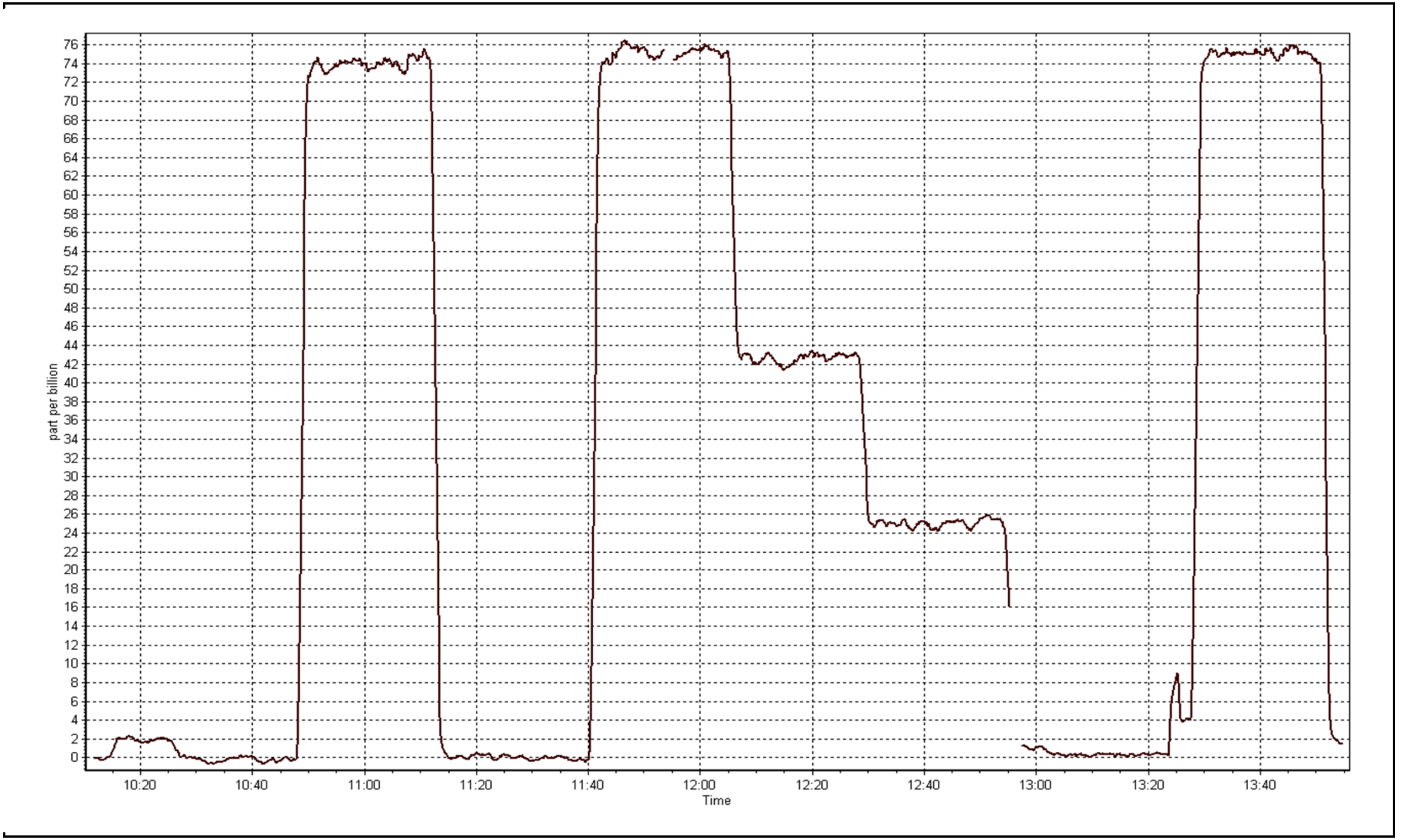
Calibration Date	January 16, 2015	Previous Calibration	December 5, 2014
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	10:05	End Time (MST)	13:50
Analyzer make	TEI 450i	Analyzer serial #	815129108

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999923
75.1	75.2	0.9983		
42.0	42.6	0.9865	Slope	0.996100
25.1	25.0	1.0033		
			Intercept	-0.003816



H2S Calibration Plot Date: February-05-14



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-19-14	Previous Calibration	December-05-14
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	10:20	End Time (MST)	13:18
Barometric Pressure	740 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Gas Cert Reference	LL107934	Cal Gas Expiry Date	29-May-14
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1081.5 ppm
C3H8 Cal Gas Conc.	206 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2633
DACS voltage range	0-5v	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	11.6	11.6
Analyzer Range (ppm)	25	25	Air	42.3	42.3
Calculated slope	1.004023	1.004916	Fuel Pressure	20.2	20.2
Calculated intercept	-0.008008	-0.038088	Detector Temp	125.1	125.1
Bkg	1.89	1.91	Flame Temp	165.1	164.3
Slope	1.798	1.810			

Analyzer make	TEI 51i-LT	Analyzer serial #	1317958295

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.06	N/A
as found span	5000	58.8	12.72	12.60	1.009
calibrator zero	5000	0.0	0.00	0.06	N/A
high point	5000	58.8	12.72	12.70	1.001
2nd point	5000	29.4	6.36	6.37	0.998
3rd point	5000	14.7	3.18	3.17	1.003
calibrator zero					
as left zero	5000	0.0	0.00	0.07	N/A
as left span	5000	58.8	12.72	12.75	0.998
				Average Correction Factor	1.001

Corrected As found	12.54	Previous response	12.68	% change	1.1%

Notes:

Span adjusted, as found zero used as calibrator zero. Filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

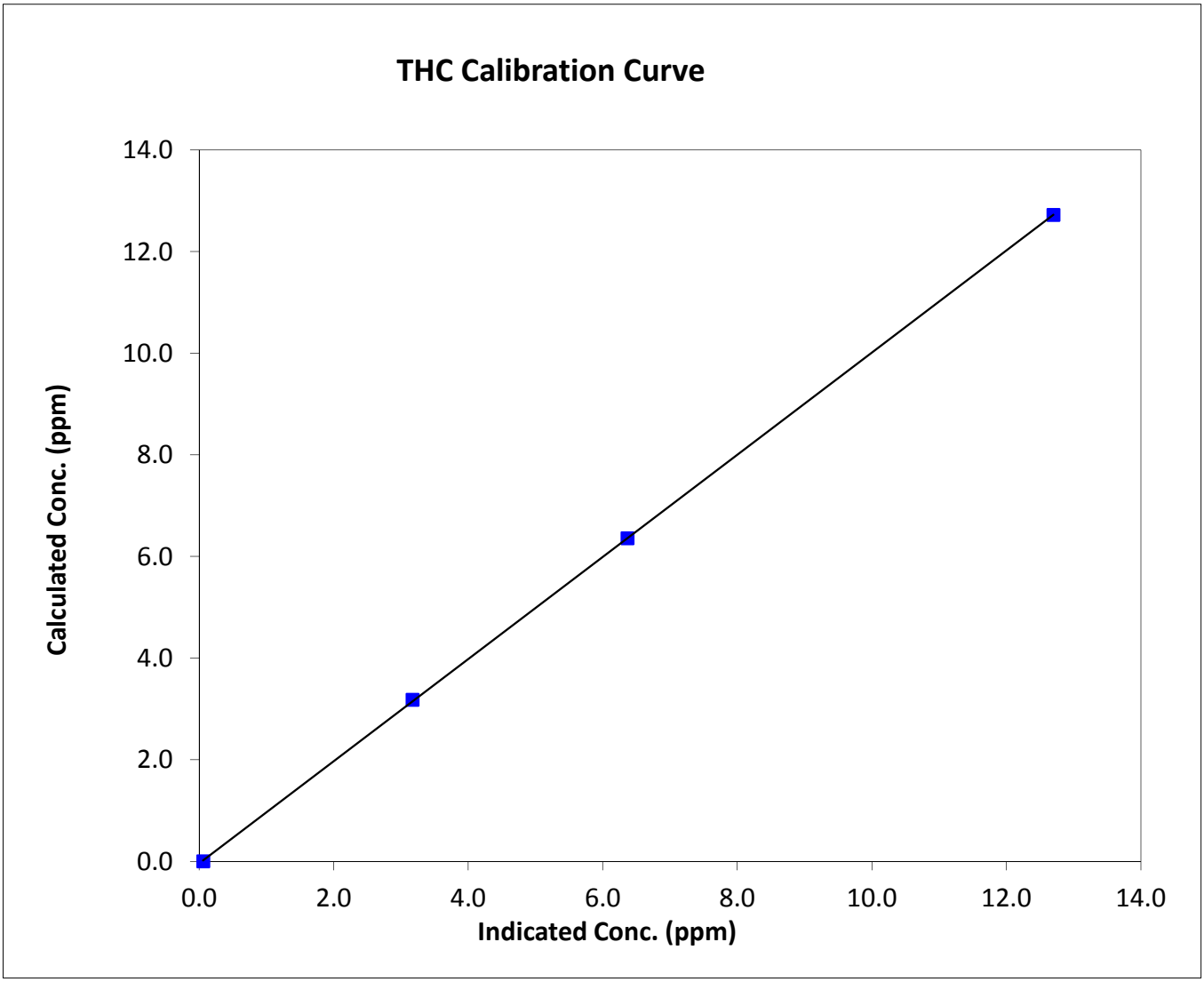
THC Calibration Summary

Station Information

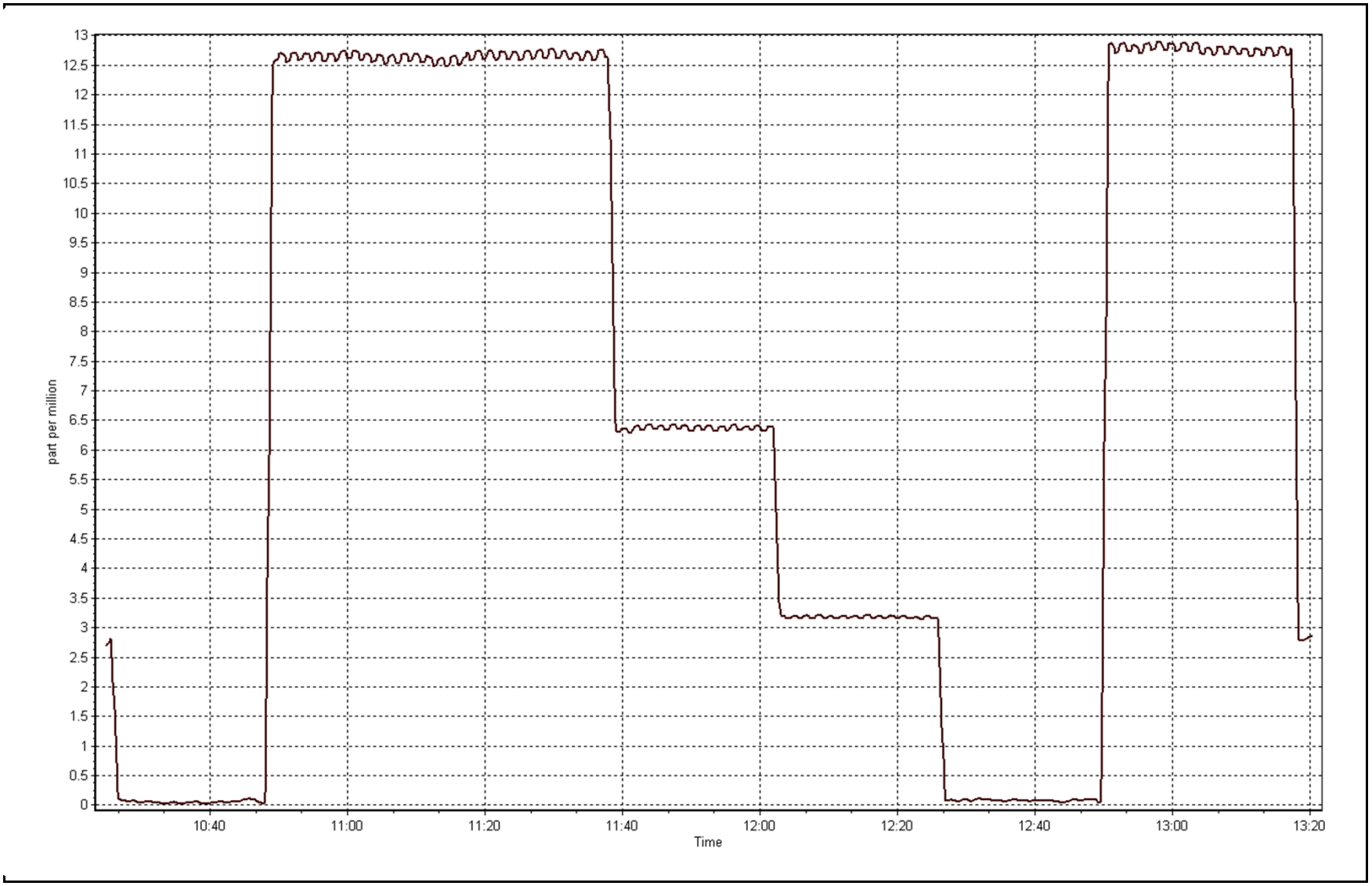
Calibration Date	January 19, 2014	Previous Calibration	December 5, 2014
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	10:20	End Time (MST)	13:18
Analyzer make	TEI 51i-LT	Analyzer serial #	1317958295

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.06	N/A	Correlation Coefficient	0.999982
12.72	12.70	1.0015		
6.36	6.37	0.9983	Slope	1.004916
3.18	3.17	1.0030		
			Intercept	-0.038088



THC Calibration Plot Date: January 19, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 6
PATRICIA MCINNES
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
JANUARY 2015

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	706	37	38	99.87	29	0	6	0
TRS (ppb) Average	707	37	37	100.00	2	0	1	0
THC (ppm) Average	700	37	44	99.06	3	-	2.3	-
NMHC(ppm) Average	700	37	44	99.06	0.544	-	0.056	-
CH4(ppm) Average	700	37	44	99.06	2.9	-	2.3	-
O3 (ppb) Average	709	35	35	100.00	38	0	34	-
NO2 (ppb) Average	705	37	39	99.73	38	0	22	-
NO (ppb) Average	705	37	39	99.73	74	-	23	-
NOX (ppb) Average	705	37	39	99.73	110	-	42	-
NH3 (ppb) Average	651	37	93	92.47	0	0	0	-
PM2.5 (ug/m3) Average	743	0	1	99.87	30.9	-	12.2	0
Temperature 2 m (C) Average	744	0	0	100.00	7.2	-	4	-
Relative Humidity (%) Average	744	0	0	100.00	98	-	-	-
Wind Speed 10 m (km/h) Average	727	0	17	97.72	27	-	-	-
Wind Direction 10 m (deg) Average	727	0	17	97.72	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
JANUARY 2015

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	1.5	3	-	0	0	0	0	1	4	29
TRS (ppb) Average	707	0.7	0	-	0	0	1	1	1	1	2
THC (ppm) Average	700	2.02	0.1	-	1.9	1.9	2	2	2	2.1	3
NMHC(ppm) Average	700	0.003	0.028	-	0	0	0	0	0	0	0.544
CH4(ppm) Average	700	2.02	0.1	-	1.9	1.9	2	2	2	2.1	2.9
O3 (ppb) Average	709	20.6	10	-	1	6	14	22	29	32	38
NO2 (ppb) Average	705	9.3	8	-	0	1	2	7	14	22	38
NO (ppb) Average	705	4.4	10	-	0	0	0	1	4	11	74
NOX (ppb) Average	705	13.7	16	-	0	1	3	9	18	32	110
NH3 (ppb) Average	651	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	743	4.78	4.5	-	0	0.6	1.4	3.7	6.2	10.8	30.9
Temperature 2 m (C) Average	744	-13.92	9.9	-	-32.7	-26.3	-21.4	-15.6	-7.6	1.6	7.2
Relative Humidity (%) Average	744	79.3	8	-	56	71	74	79	84	89	98
Wind Speed 10 m (km/h) Average	727	9.8	5	-	1	4	6	9	13	17	27
Wind Direction 10 m (deg) Average	727	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	29 Jan 2015 14:00	29 Jan 2015 14:00	1	Maintenance on daily span system
NMHC, CH4, THC	20 Jan 2015 10:00	20 Jan 2015 11:00	2	Maintenance - replace carrier gas cylinder
NMHC, CH4, THC	23 Jan 2015 21:00	23 Jan 2015 21:00	1	Unstable operation - unknown spike in output signal
NMHC, CH4, THC	29 Jan 2015 12:00	29 Jan 2015 12:00	1	Maintenance on daily span system
NMHC, CH4, THC	29 Jan 2015 14:00	29 Jan 2015 16:00	3	Maintenance on daily span system
NO2, NO, NOX	29 Jan 2015 14:00	29 Jan 2015 15:00	2	Maintenance on daily span system
NH3	01 Jan 2015 06:00	31 Jan 2015 06:00	30	Stabilization after daily span
NH3	08 Jan 2015 13:00	09 Jan 2015 11:00	23	Maintenance - resolve analyzer linearity issue - O3 switch on high
PM2.5	08 Jan 2015 16:00	08 Jan 2015 16:00	1	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	23 Jan 2015 17:00	24 Jan 2015 09:00	17	Flat line in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 29 ppb on Jan 19 16:00 Maximum Daily Average: 6.2 ppb on Jan 19

Minimum Value: 0 ppb on Jan 31 21:00 Minimum Daily Average: 0.2 ppb on Jan 6
Maximum Diurnal Average: 2.7 ppb at hour 13 Minimum Diurnal Average: 0.9 ppb at hour 7
Monthly Average: 1.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 14$

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-Jan	0	Z	0	0	0	0	0	0	1	0	1	1	2	5	2	1	1	2	3	2	1	1	0	0	1.0	5
2-Jan	1	1	Z	1	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.5	1
3-Jan	0	2	1	Z	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	0.6	1
5-Jan	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	1
6-Jan	Z	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
7-Jan	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	1	0	0	5	4	1	5	1	0	--	5
8-Jan	1	2	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5	4	1	4	1.0	5
10-Jan	3	1	0	0	Z	0	0	0	1	2	3	2	2	2	2	2	2	1	1	1	1	1	0	0	1.2	3
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
12-Jan	Z	0	1	2	4	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	4
13-Jan	1	Z	1	0	1	5	2	2	2	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1.0	5
14-Jan	1	1	Z	0	0	0	0	2	4	1	0	0	0	2	12	3	1	1	0	2	1	1	1	1	1.6	12
15-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
16-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
17-Jan	0	0	0	0	0	Z	0	0	1	5	12	3	16	13	10	6	8	10	12	8	5	4	4	3	5.3	16
18-Jan	Z	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.6	1
19-Jan	0	Z	0	0	0	0	0	0	1	1	3	13	19	13	9	29	15	8	8	5	6	4	3	6	6.2	29
20-Jan	7	6	Z	11	5	3	3	3	3	8	7	5	4	7	9	7	5	4	5	5	4	3	2	2	5.2	11
21-Jan	2	2	1	Z	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	0	0	1.1	2
22-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	0.6	6
23-Jan	9	10	11	9	8	Z	6	4	3	2	1	1	1	1	0	0	0	0	0	1	1	1	1	1	3.1	11
24-Jan	Z	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
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	21	7	1	0	0	1.5	21
27-Jan	0	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	3	7	1	4	4	1	0	2	1.1	7
28-Jan	3	4	3	5	Z	6	3	2	1	1	7	27	21	8	7	12	9	5	3	3	2	0	0	1	5.7	27
29-Jan	1	0	0	0	0	Z	1	2	2	1	1	1	1	M	1	1	1	1	1	1	2	4	6	4	1.5	6
30-Jan	Z	7	2	2	2	3	1	4	2	1	5	9	6	11	3	6	1	0	0	0	0	0	1	0	2.9	11
31-Jan	0	Z	0	0	0	0	0	1	0	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0.4	1
	1.3	1.7	1.1	1.4	1.0	1.0	0.9	0.9	0.9	1.0	1.7	2.4	2.7	2.5	2.2	2.5	1.7	1.5	1.6	2.1	1.5	1.2	0.9	1.2	Diurnal Average	
	9	10	11	11	8	6	6	4	4	8	12	27	21	13	12	29	15	10	12	21	7	5	6	6	Diurnal Maximum	

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

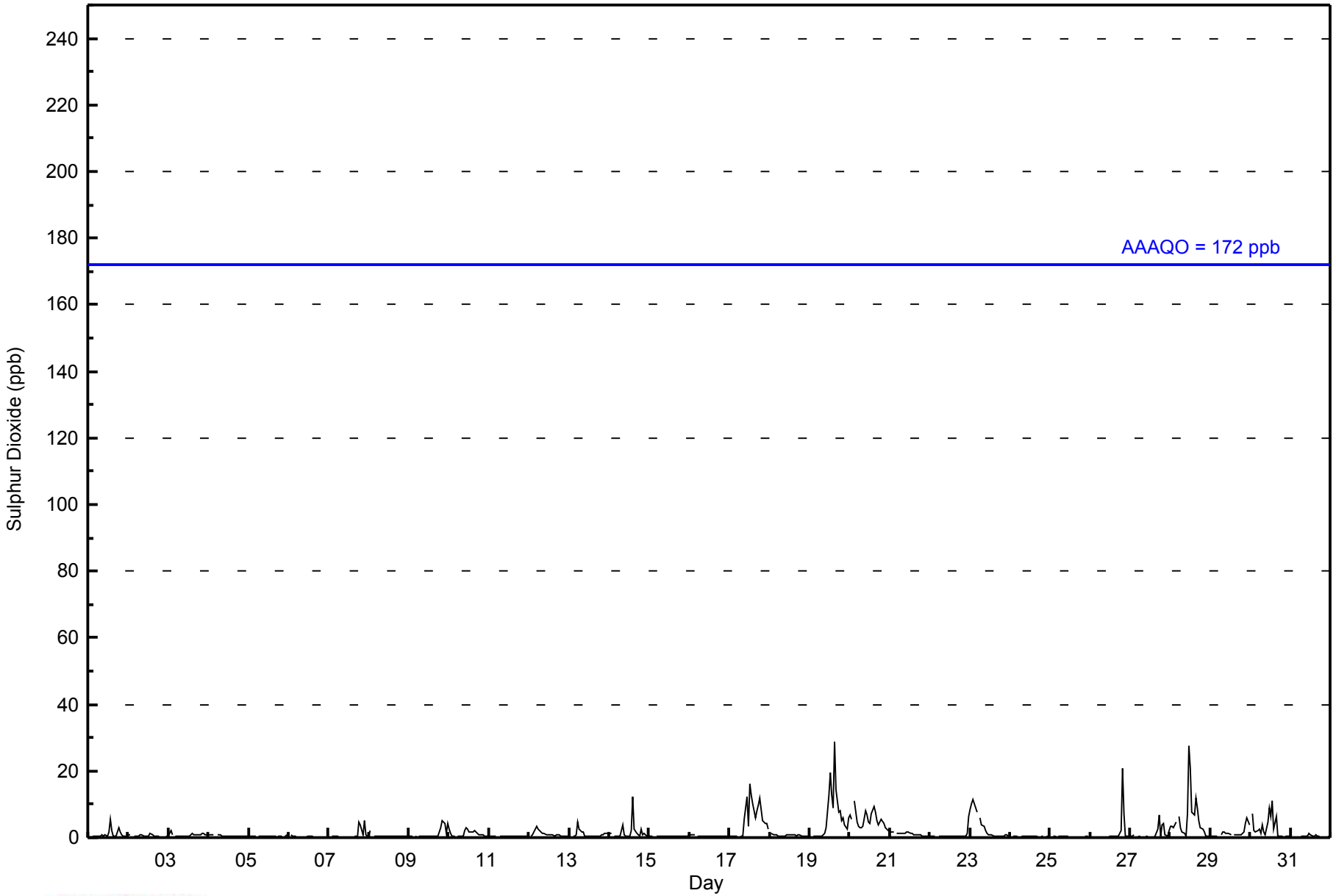
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	689	97.59	97.59
11 - 20	13	1.84	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: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	84	21	3	7	6	30	41	34	36	53	108	74	39	30	30	77	673
11 - 20	7	2	0	0	1	0	0	0	0	0	0	0	0	0	0	3	13
21 - 60	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	93	23	3	7	7	30	41	34	36	53	108	74	39	30	30	82	690

Total Number of Valid Hours: 690

Total Number of Hours: 744

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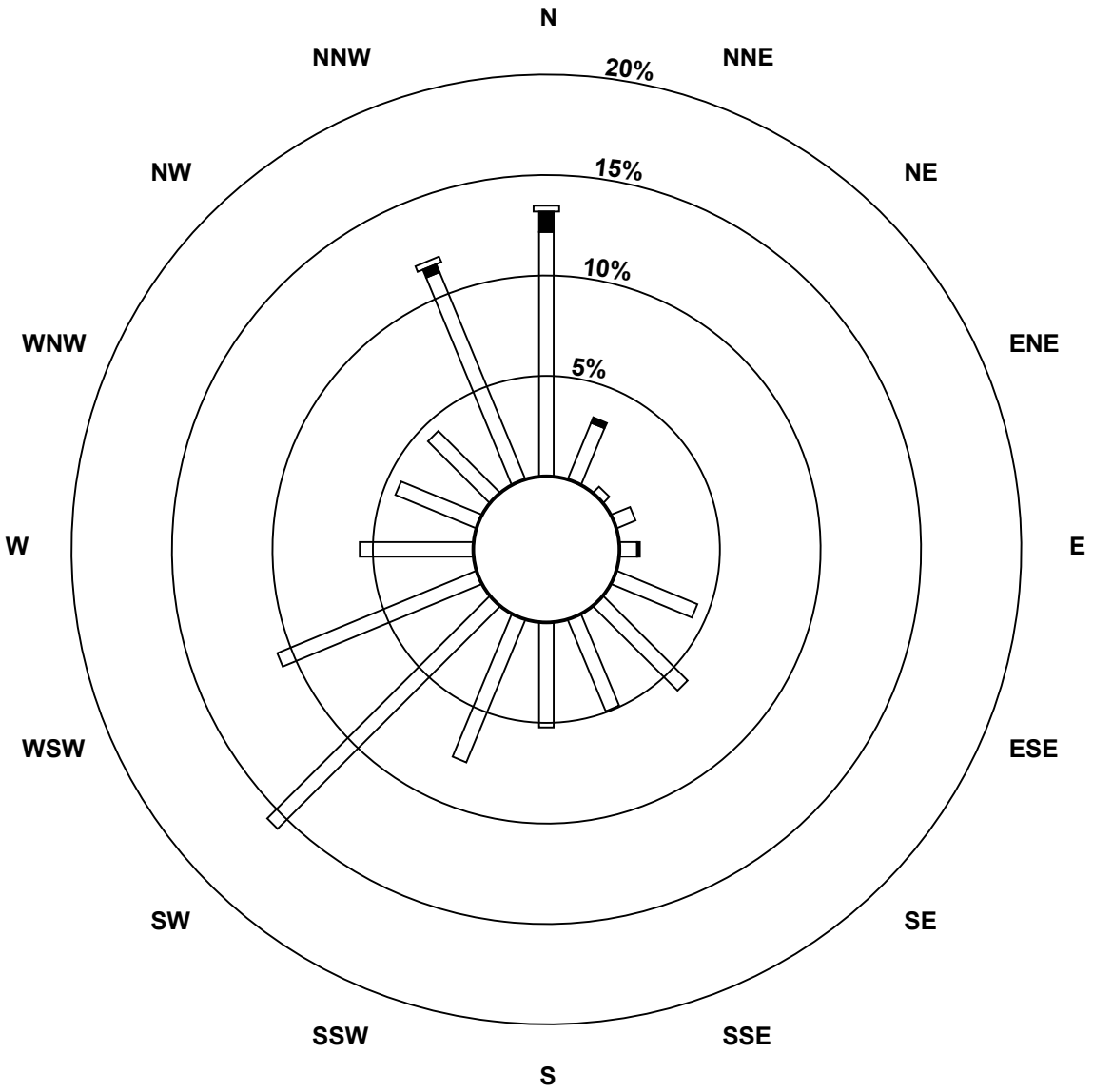
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

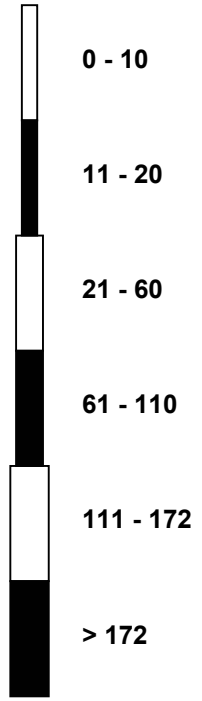
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



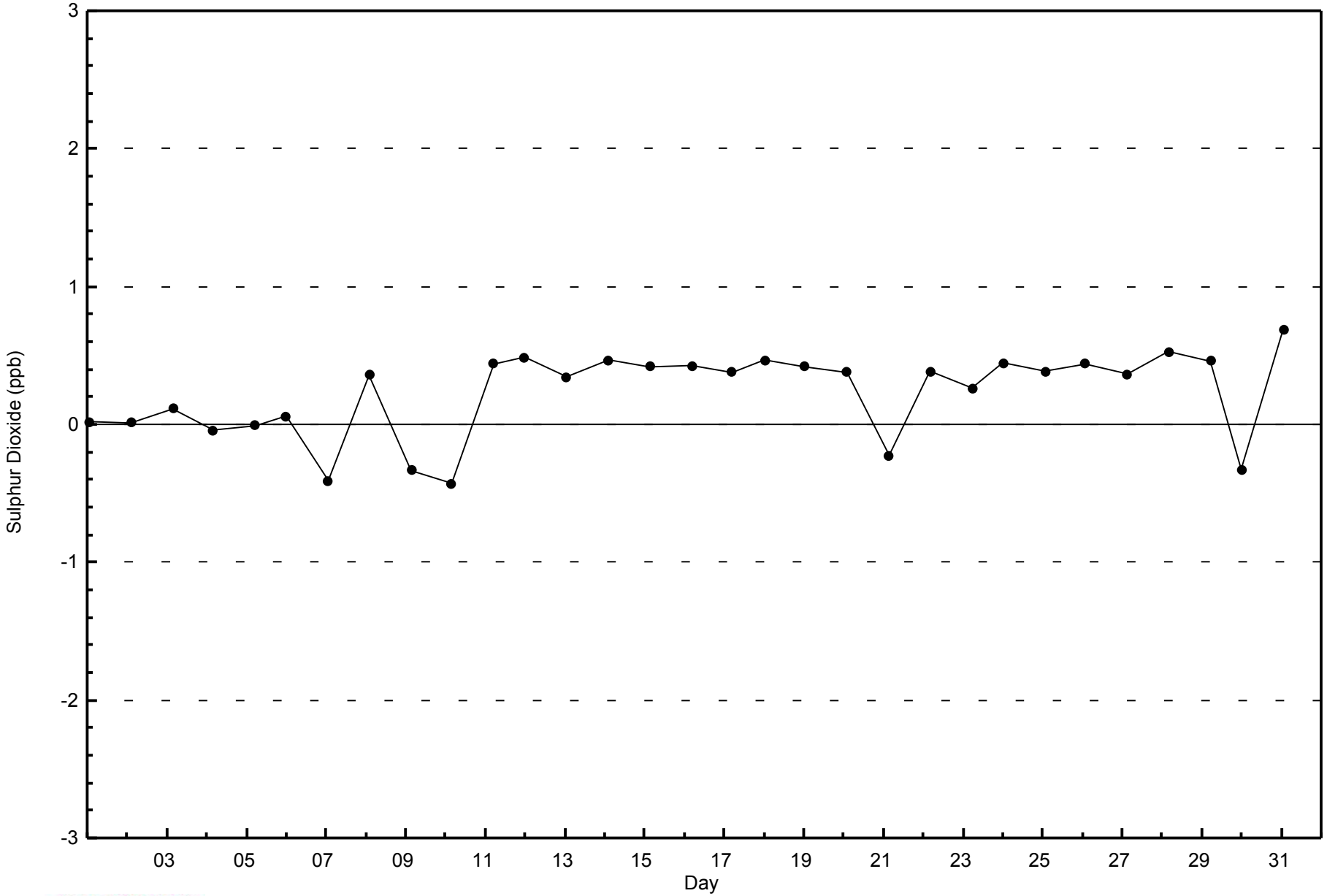
Total Number of Valid Hours: 690

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2015



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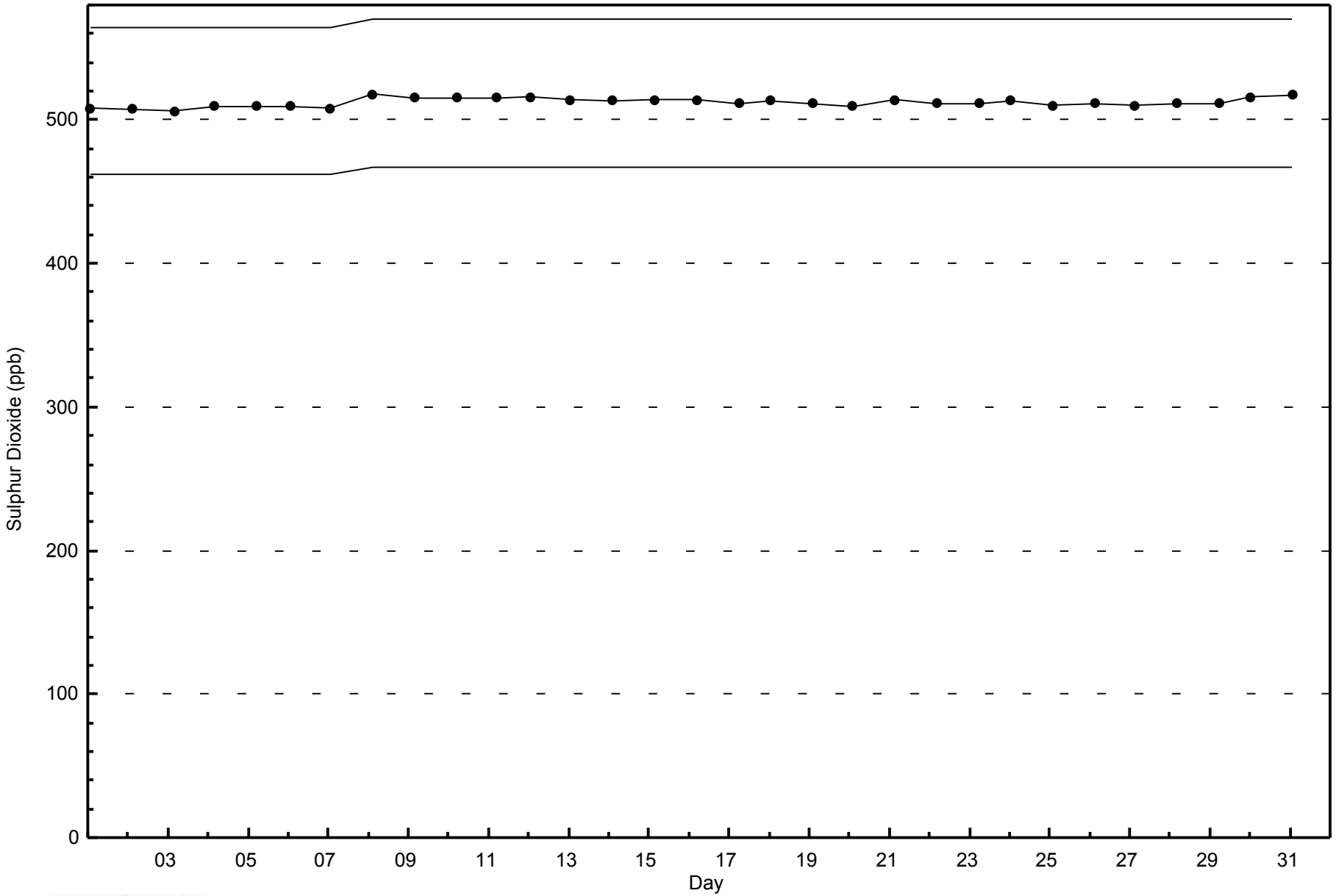
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2 ppb on Jan 19 16:00 Maximum Daily Average: 1.1 ppb on Jan 19

Minimum Value: 0 ppb on Jan 30 19:00 Minimum Daily Average: 0.5 ppb on Jan 31
Maximum Diurnal Average: 0.7 ppb at hour 10 Minimum Diurnal Average: 0.6 ppb at hour 5
Monthly Average: 0.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

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-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0.7	1
2-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
3-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	0.6	1
4-Jan	1	0	0	0	0	Z	1	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0.5	1
5-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
6-Jan	1	Z	1	1	1	1	1	1	1	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	--	1
7-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
8-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
9-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
10-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
11-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
12-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
13-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
14-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
15-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
16-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	1
17-Jan	0	0	0	0	0	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
18-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
19-Jan	1	1	Z	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1.1	2
20-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
21-Jan	1	1	1	1	Z	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.8	2
22-Jan	0	0	0	0	0	Z	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.5	1
23-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
24-Jan	1	Z	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0	0	1	0	1	0	0	0.5	1
25-Jan	1	0	Z	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0.5	1
26-Jan	0	0	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
27-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
28-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1
29-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0.7	1
30-Jan	1	Z	1	1	1	0	0	1	1	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0.5	1
31-Jan	0	0	Z	0	0	0	0	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	1	0.5	1
	0.6	0.6	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	Diurnal Average	
	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Diurnal Maximum	

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

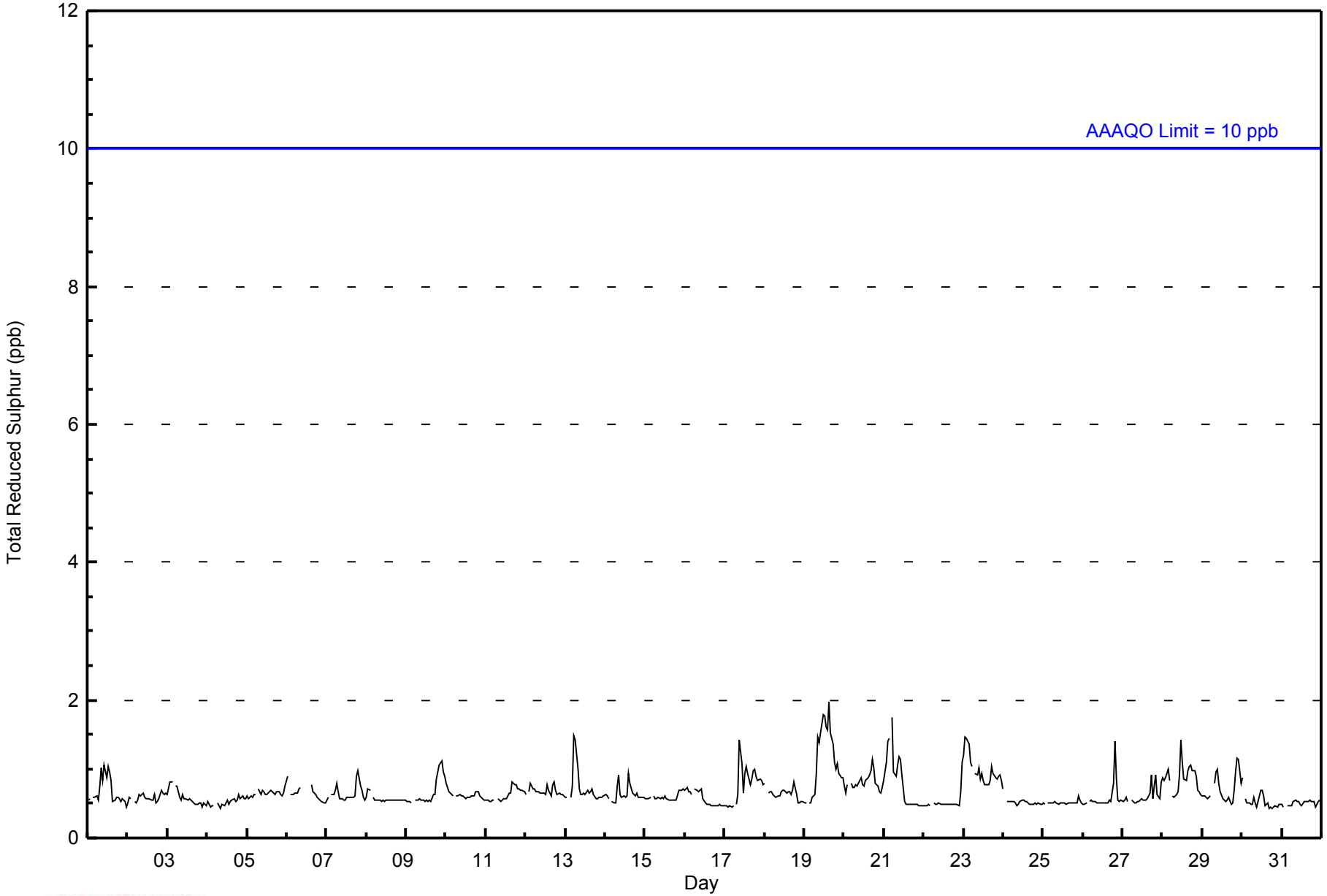
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2015



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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

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	94	20	4	7	8	31	43	32	37	54	104	73	40	28	30	86	691
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	94	20	4	7	8	31	43	32	37	54	104	73	40	28	30	86	691

Total Number of Valid Hours: 691

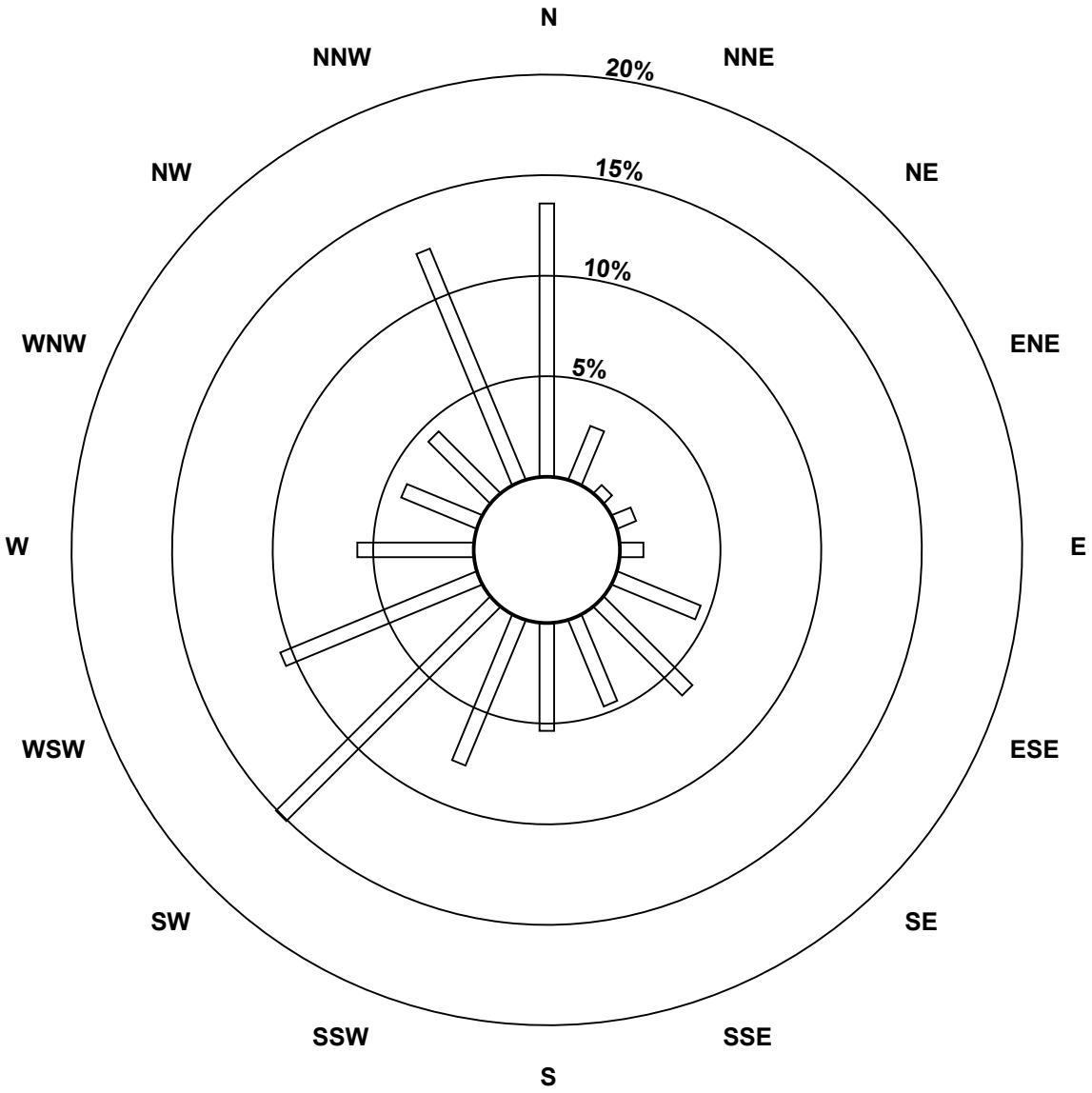
Total Number of Hours: 744

Wood Buffalo Environmental Association

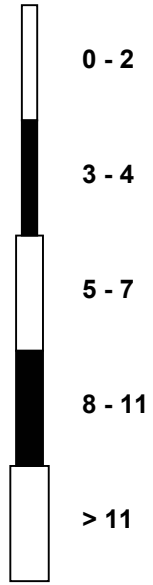
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



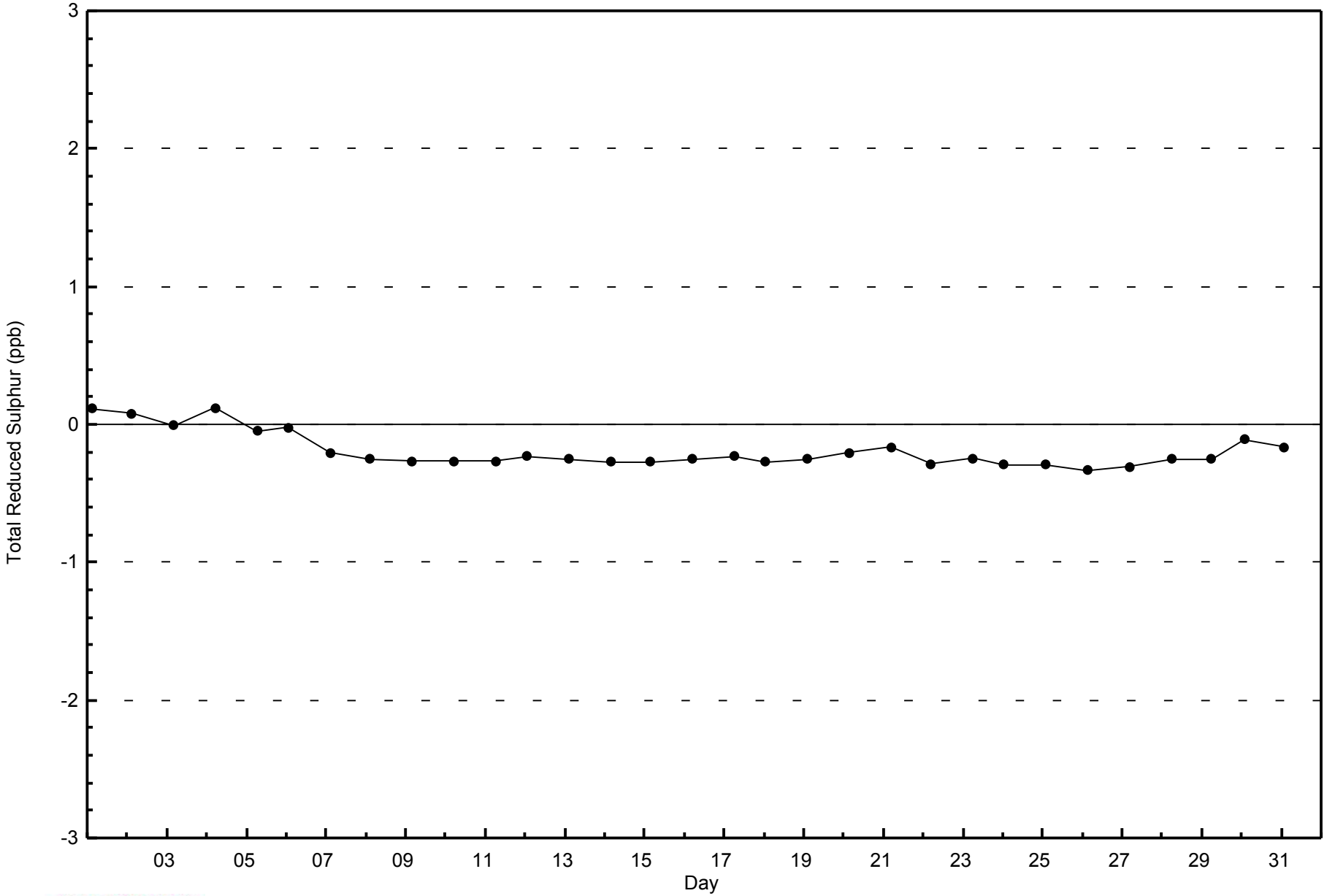
Total Number of Valid Hours: 691

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2015



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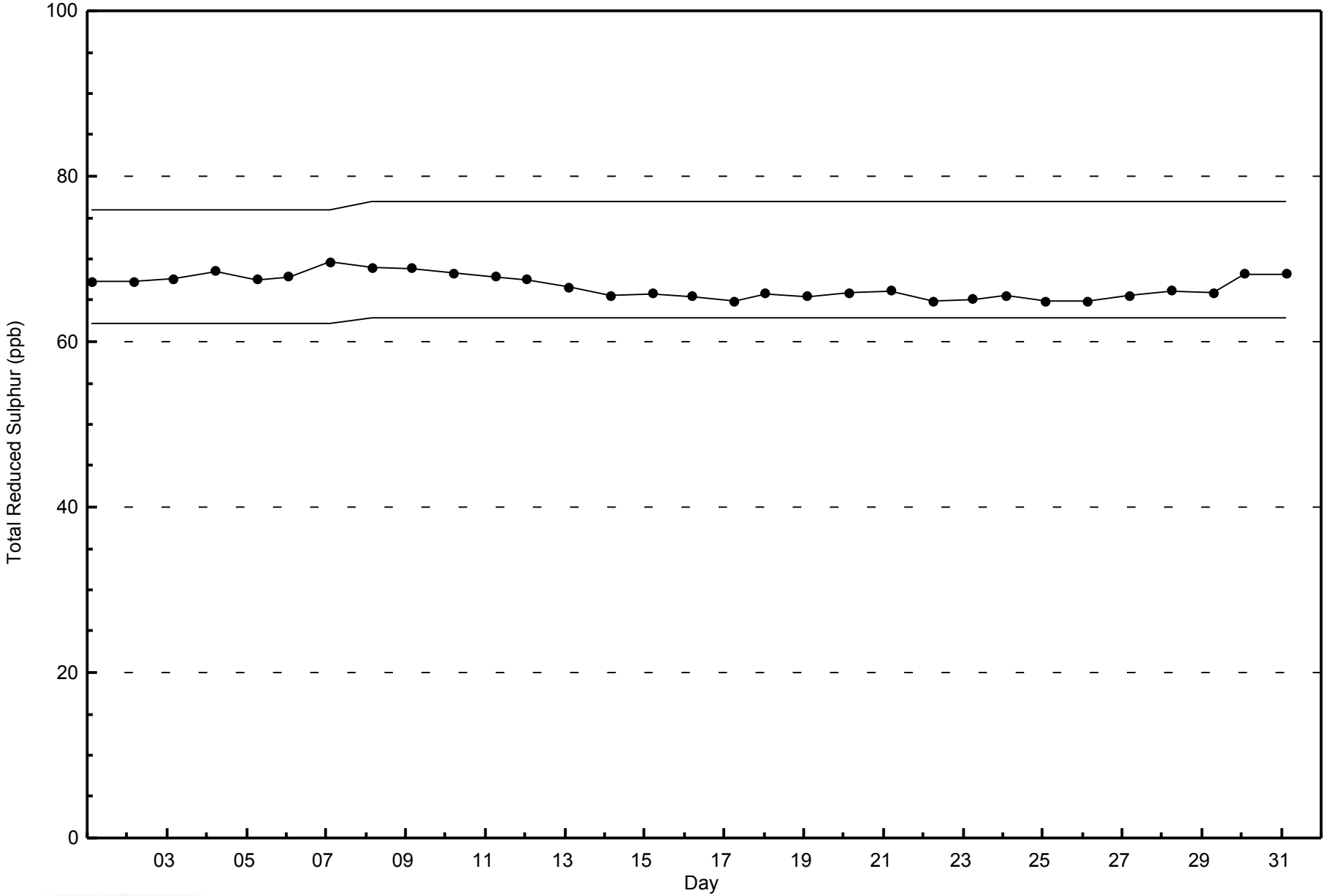
ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2015

Maximum Value: 3.0 ppm on Jan 19 09:00

Maximum Daily Average: 2.3 ppm on Jan 19

Minimum Value: 1.9 ppm on Jan 22 11:00

Minimum Daily Average: 1.9 ppm on Jan 22

Maximum Diurnal Average: 2.0 ppm at hour 9

Minimum Diurnal Average: 2.0 ppm at hour 1

Monthly Average: 2.02 ppm

Percentiles: P_1 = 1.9 P_{10} = 1.9 Q_1 = 2.0 Median = 2.0 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.5

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	37
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-Jan	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	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	2.1	2.3
2-Jan	2.0	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
3-Jan	2.0	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
4-Jan	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-Jan	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-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	C	C	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	1.9	--	2.1
8-Jan	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0
9-Jan	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	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.3
10-Jan	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11-Jan	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	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
12-Jan	Z	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
13-Jan	2.1	Z	2.1	2.1	2.2	2.3	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.4
14-Jan	2.0	2.0	Z	2.0	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
15-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
16-Jan	1.9	1.9	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1
17-Jan	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	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	2.1
18-Jan	Z	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	2.3	2.7	2.6	2.3	1.9	1.9	2.0	2.0	2.1	2.7
19-Jan	2.0	Z	2.0	2.0	2.0	2.1	2.2	2.5	3.0	2.9	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.3	3.0
20-Jan	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	M	M	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2
21-Jan	2.0	2.0	2.1	Z	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
22-Jan	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	2.0	2.0	1.9	2.0
23-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	UO	2.3	2.3	2.3	2.1	2.3
24-Jan	Z	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
25-Jan	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	2.0	1.9	1.9	1.9	2.0
26-Jan	1.9	1.9	Z	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	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.1
27-Jan	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
28-Jan	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1
29-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	M	2.0	M	M	M	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.1	2.0	2.3
30-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
31-Jan	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.1	2.1	2.2	2.3	2.2	2.3	2.4	2.5	3.0	2.9	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.7	2.6	2.3	2.3	2.3	2.3	2.3	Diurnal Maximum	

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

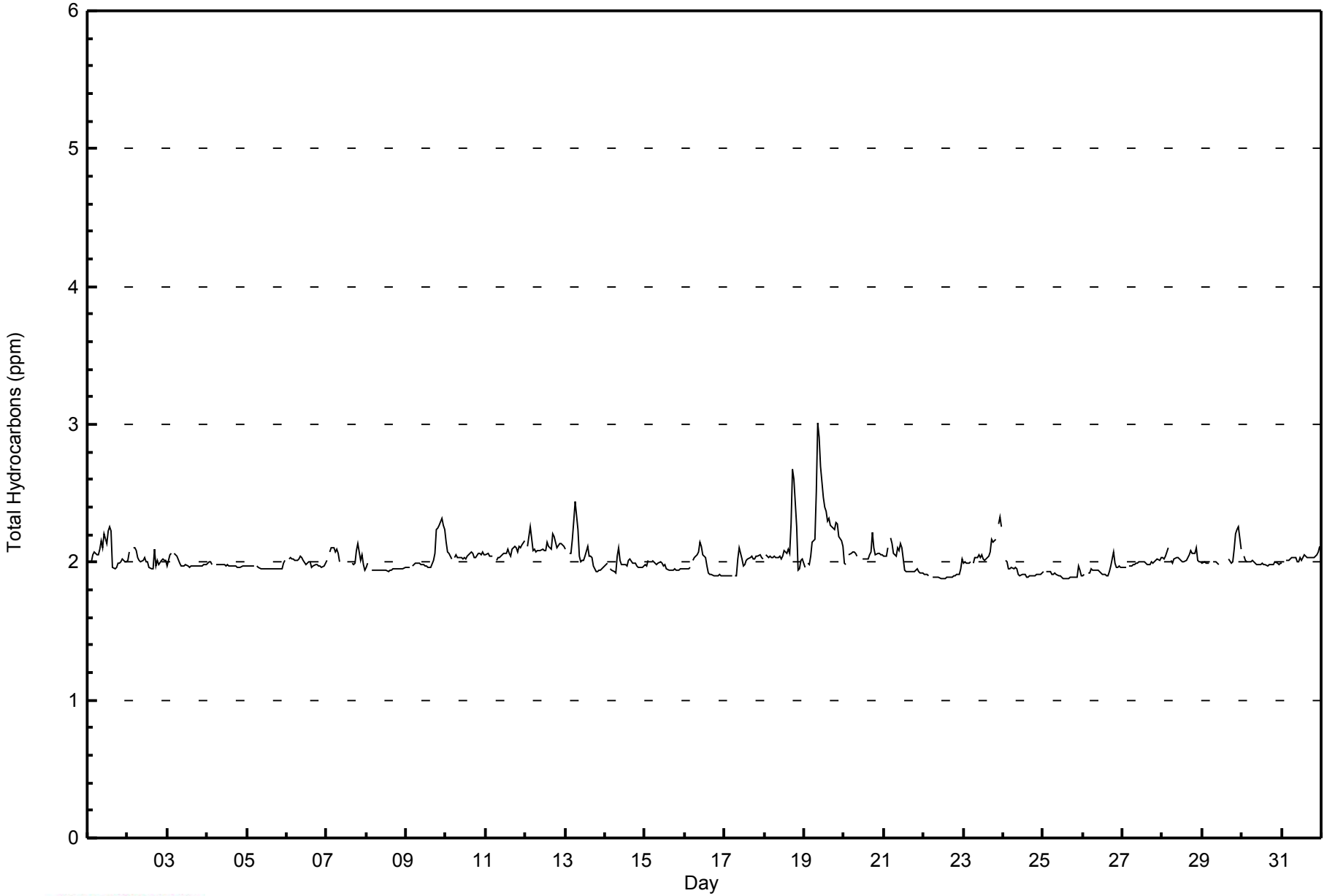
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	526	75.14	75.14
2.1 - 3.0	174	24.86	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2015

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	75	16	2	6	4	28	24	13	16	40	95	72	35	27	20	45	518
2.1 - 3.0	18	7	1	1	1	1	17	21	20	13	13	2	4	3	9	36	167
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	93	23	3	7	5	29	41	34	36	53	108	74	39	30	29	81	685

Total Number of Valid Hours: 685

Total Number of Hours: 744

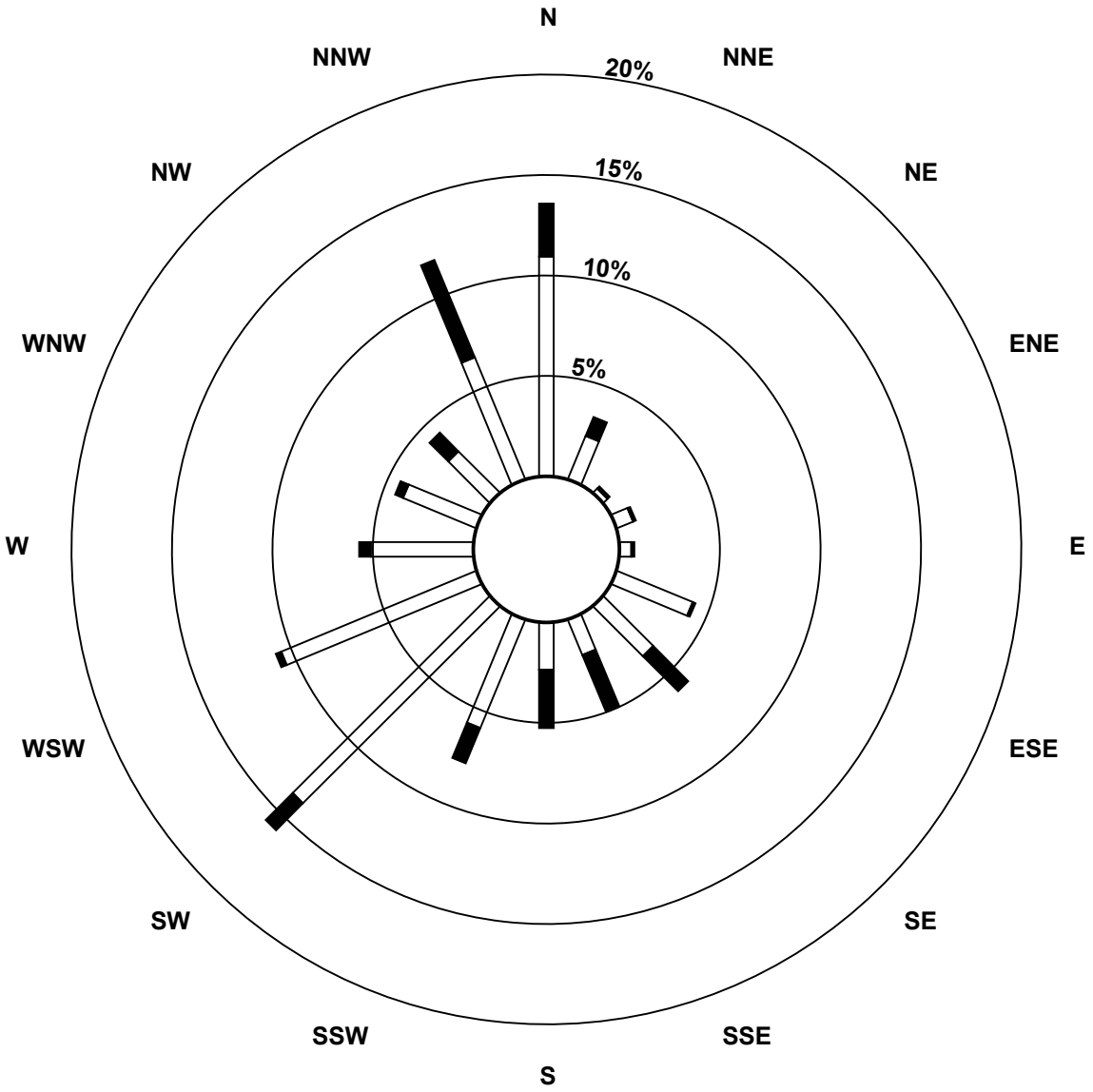
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

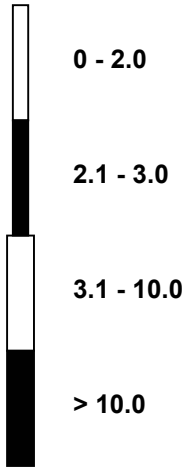
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Patricia McInnes (AMS 6)



Classes (ppm)



0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

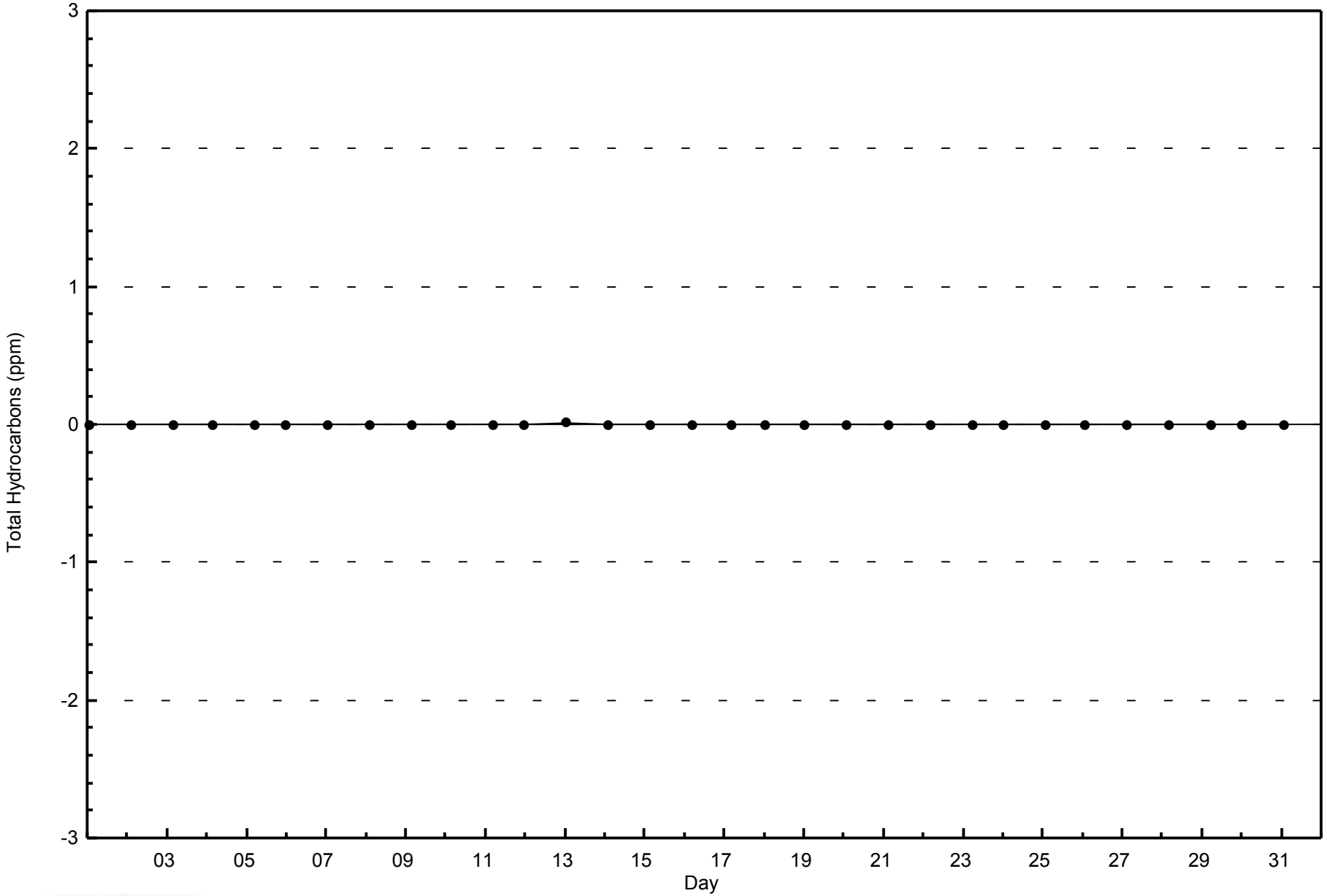
Total Number of Valid Hours: 685

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2015



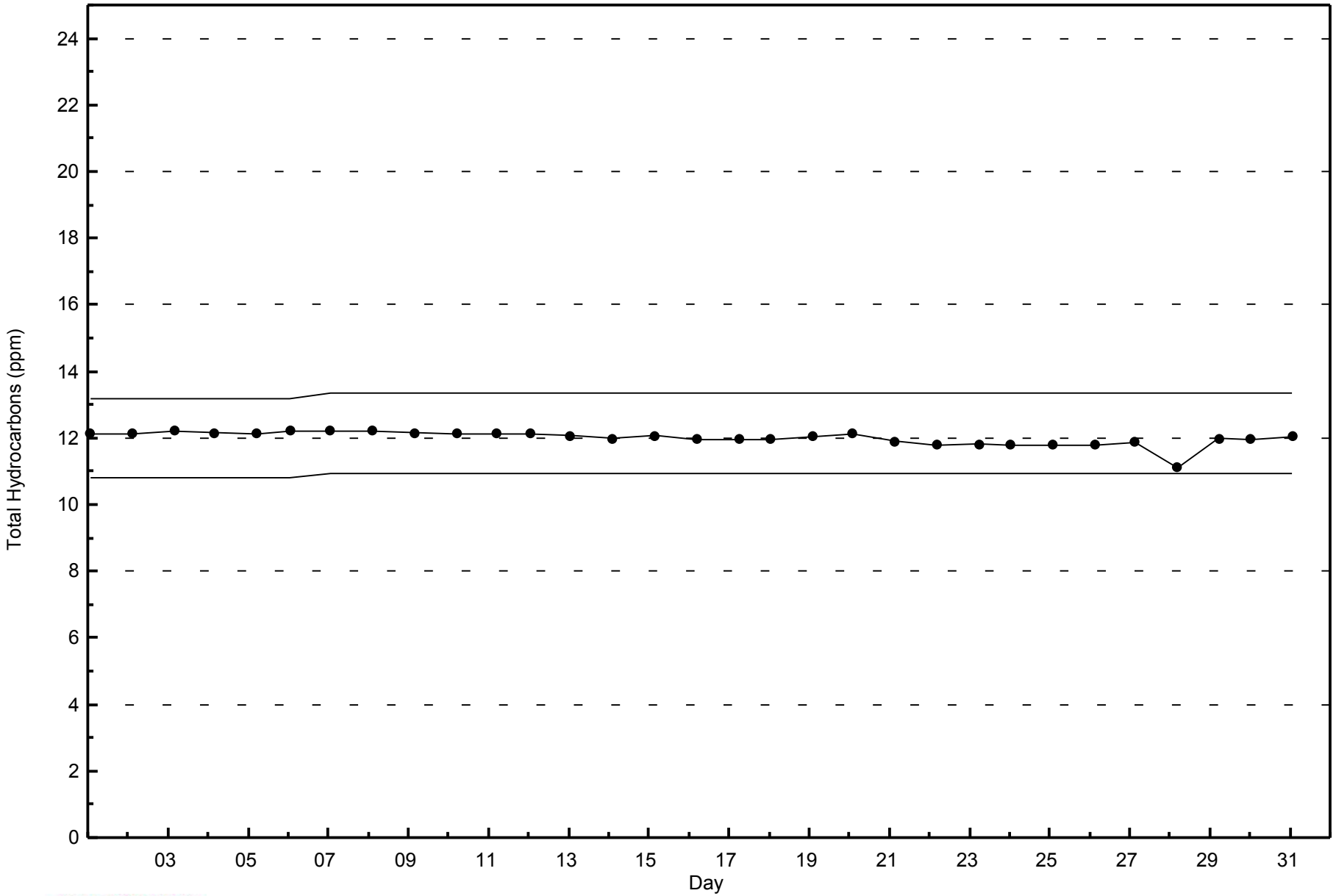
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 0.544 ppm on Jan 18 18:00

Maximum Daily Average: 0.056 ppm on Jan 18

Minimum Value: 0.000 ppm on Jan 1 01:00

Minimum Daily Average: 0.000 ppm on Jan 8

Maximum Diurnal Average: 0.020 ppm at hour 18

Minimum Diurnal Average: 0.000 ppm at hour 4

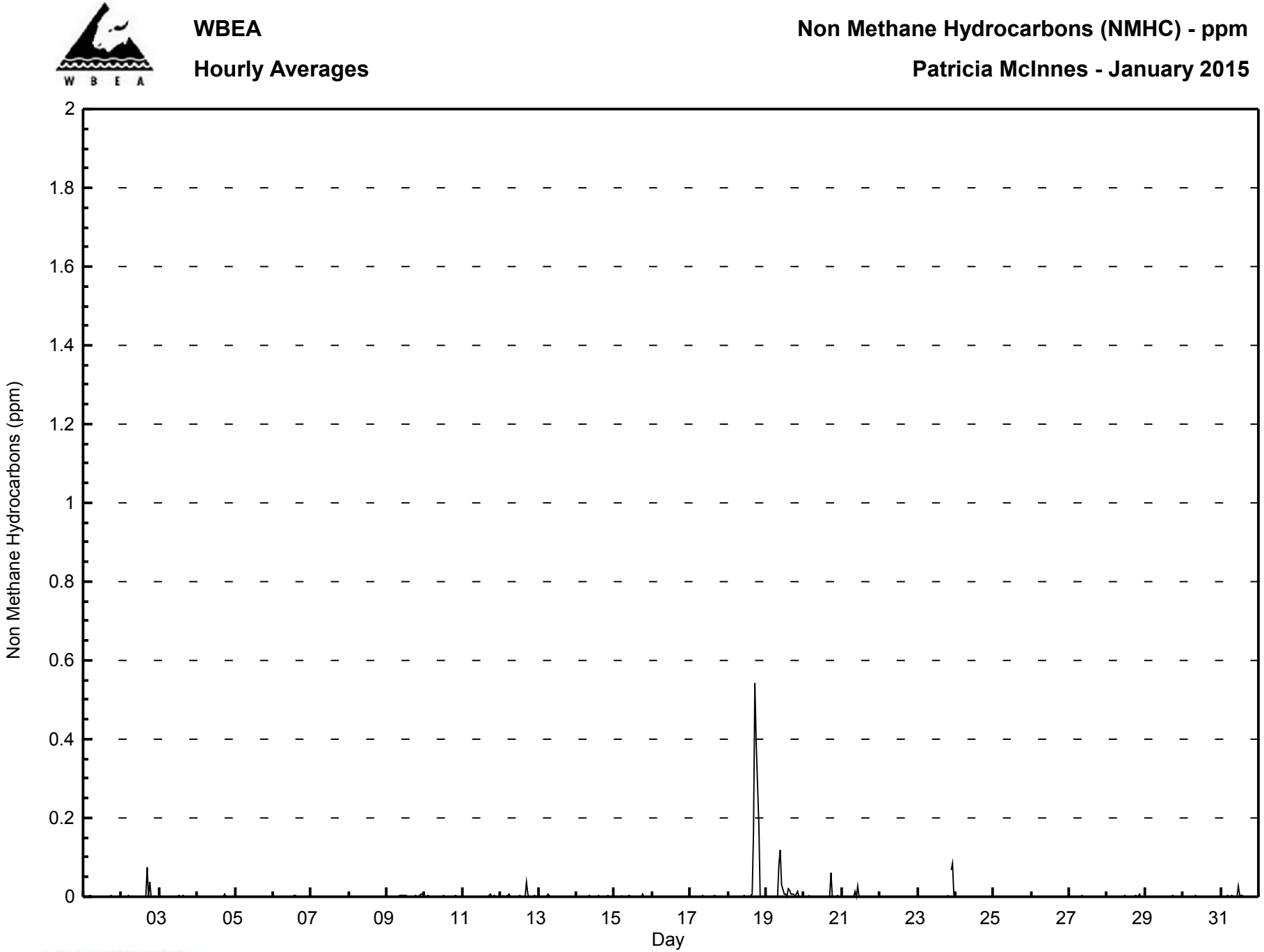
Monthly Average: 0.003 ppm

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:	700
Hours of Missing Data:	44
Hours of Calibration:	37
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-Jan	0.000	Z	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
2-Jan	0.000	0.000	Z	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	0.074	0.000	0.037	0.000	0.000	0.000	0.000	0.000	0.005	0.074
3-Jan	0.004	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004
4-Jan	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	0.000	0.005
5-Jan	0.004	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	0.004
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
7-Jan	0.004	Z	0.000	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	--	0.004
8-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.004	0.004	0.002	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.007	0.007	0.000	0.001	0.007
10-Jan	0.000	0.000	0.004	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.004
11-Jan	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	0.006	0.000	0.000	0.003	0.000	0.000	0.004	0.001	0.006
12-Jan	Z	0.004	0.000	0.000	0.004	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.038	0.008	0.000	0.000	0.000	0.004	0.000	0.000	0.003	0.038
13-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
14-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.004
15-Jan	0.000	0.000	0.000	Z	0.003	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	0.008	0.000	0.000	0.000	0.000	0.000	0.001	0.008
16-Jan	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
17-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
18-Jan	Z	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	0.007	0.165	0.544	0.392	0.183	0.000	0.000	0.000	0.000	0.056	0.544
19-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.118	0.031	0.007	0.006	0.000	0.021	0.015	0.006	0.005	0.000	0.006	0.012	0.000	0.000	0.000	0.013	0.118
20-Jan	0.000	0.000	Z	0.003	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.001	0.000	0.000	0.000	0.000	0.060	0.000	0.000	0.001	0.004	0.000	0.000	0.003	0.060
21-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.012	0.000	0.027	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	0.027
22-Jan	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-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	UO	0.068	0.085	0.005	0.007	0.085
24-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
26-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002
27-Jan	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
28-Jan	0.000	0.000	0.000	0.000	Z	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	0.003	0.000	0.006	0.000	0.000	0.002	0.001	0.006
29-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	M	0.000	M	M	M	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002
30-Jan	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	0.000	0.003
31-Jan	0.000	Z	0.000	0.000	0.002	0.000	0.000	0.004	0.000	0.000	0.000	0.028	0.005	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.028
	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.004	0.002	0.001	0.001	0.000	0.001	0.001	0.009	0.020	0.014	0.006	0.001	0.003	0.003	0.000	Diurnal Average	
	0.004	0.004	0.004	0.003	0.004	0.008	0.006	0.004	0.082	0.118	0.031	0.028	0.006	0.004	0.021	0.015	0.165	0.544	0.392	0.183	0.012	0.068	0.085	0.005	Diurnal Maximum	

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


WBEA
Hourly Averages
Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - January 2015
Non Methane Hydrocarbons (ppm)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	670	95.71	95.71
0.006 - 0.05	20	2.86	98.57
0.06 - 0.1	6	0.86	99.43
> 0.1	4	0.57	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2015

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	86	22	3	7	5	28	38	30	35	49	107	74	37	30	28	78	657
0.006 - 0.05	5	1	0	0	0	1	2	4	1	0	1	0	2	0	1	2	20
0.06 - 0.1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	4
> 0.1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
Totals	93	23	3	7	5	29	41	34	36	53	108	74	39	30	29	81	685

Total Number of Valid Hours: 685

Total Number of Hours: 744

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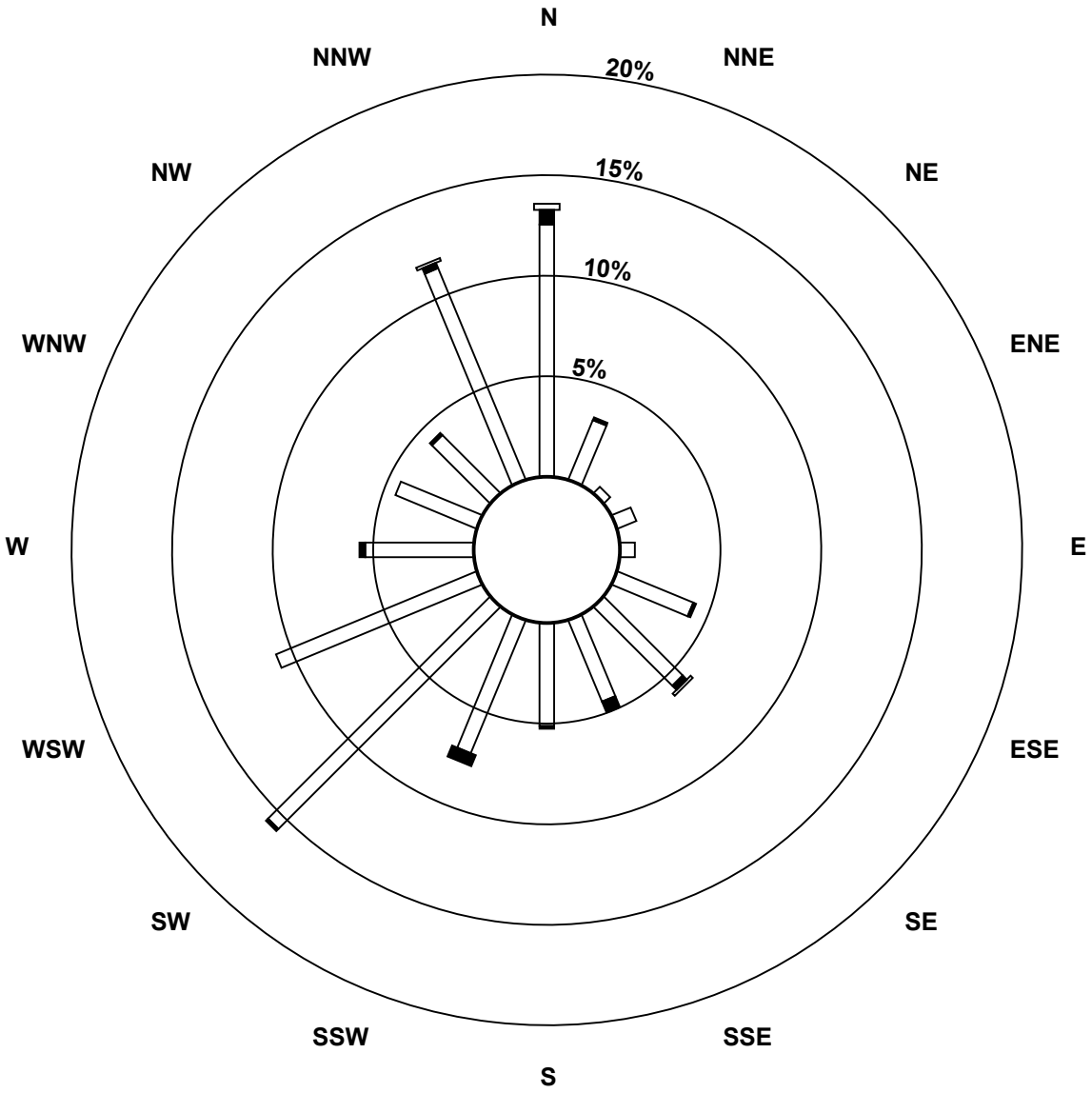
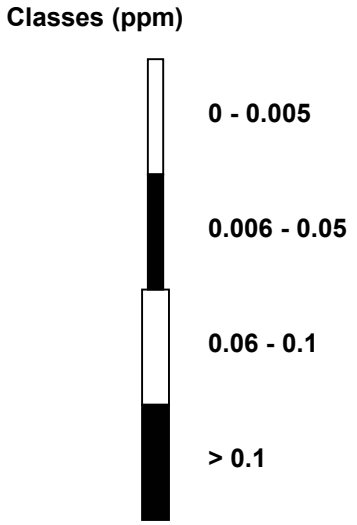
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes (AMS 6)





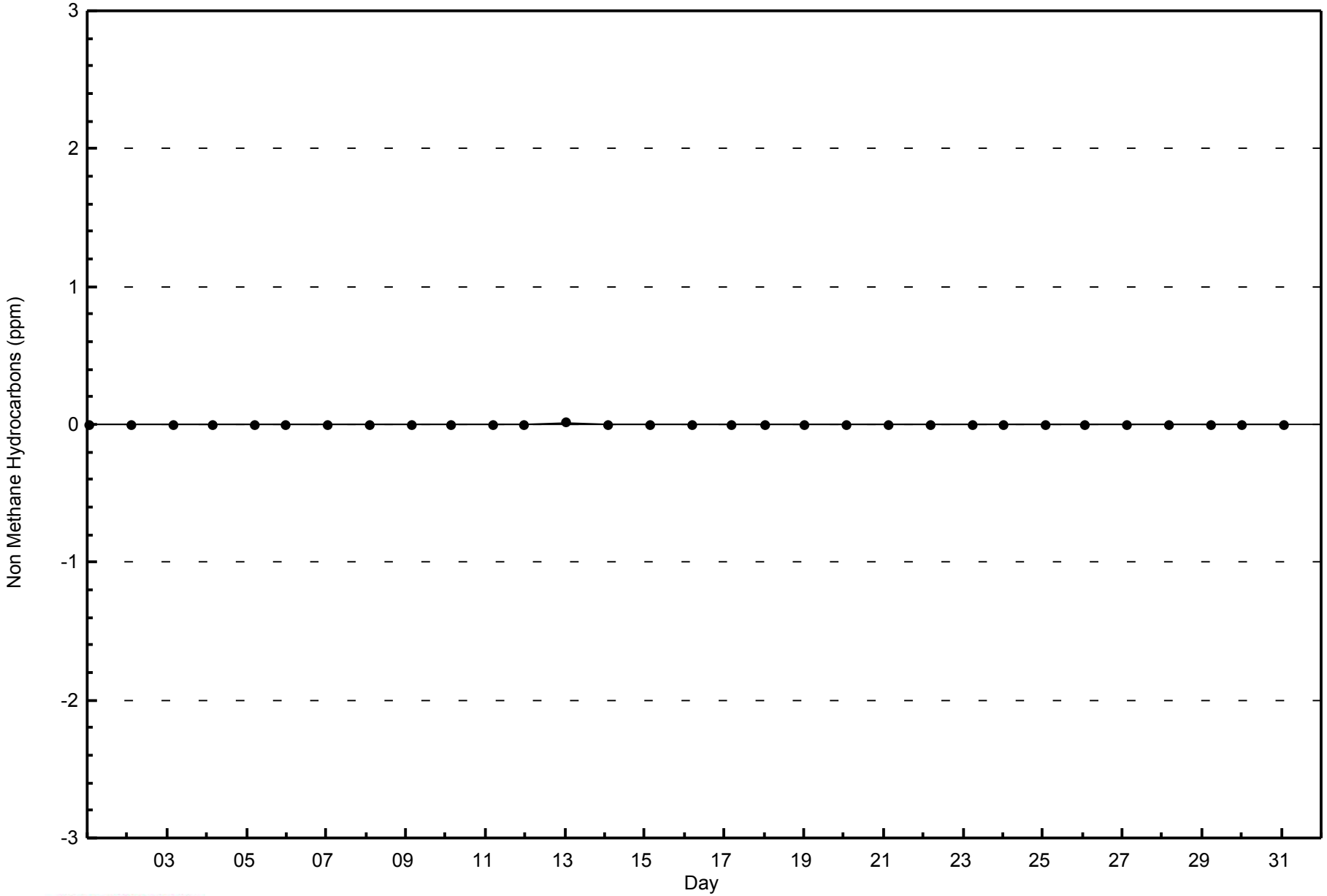
Total Number of Valid Hours: 685

WBEA

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2015



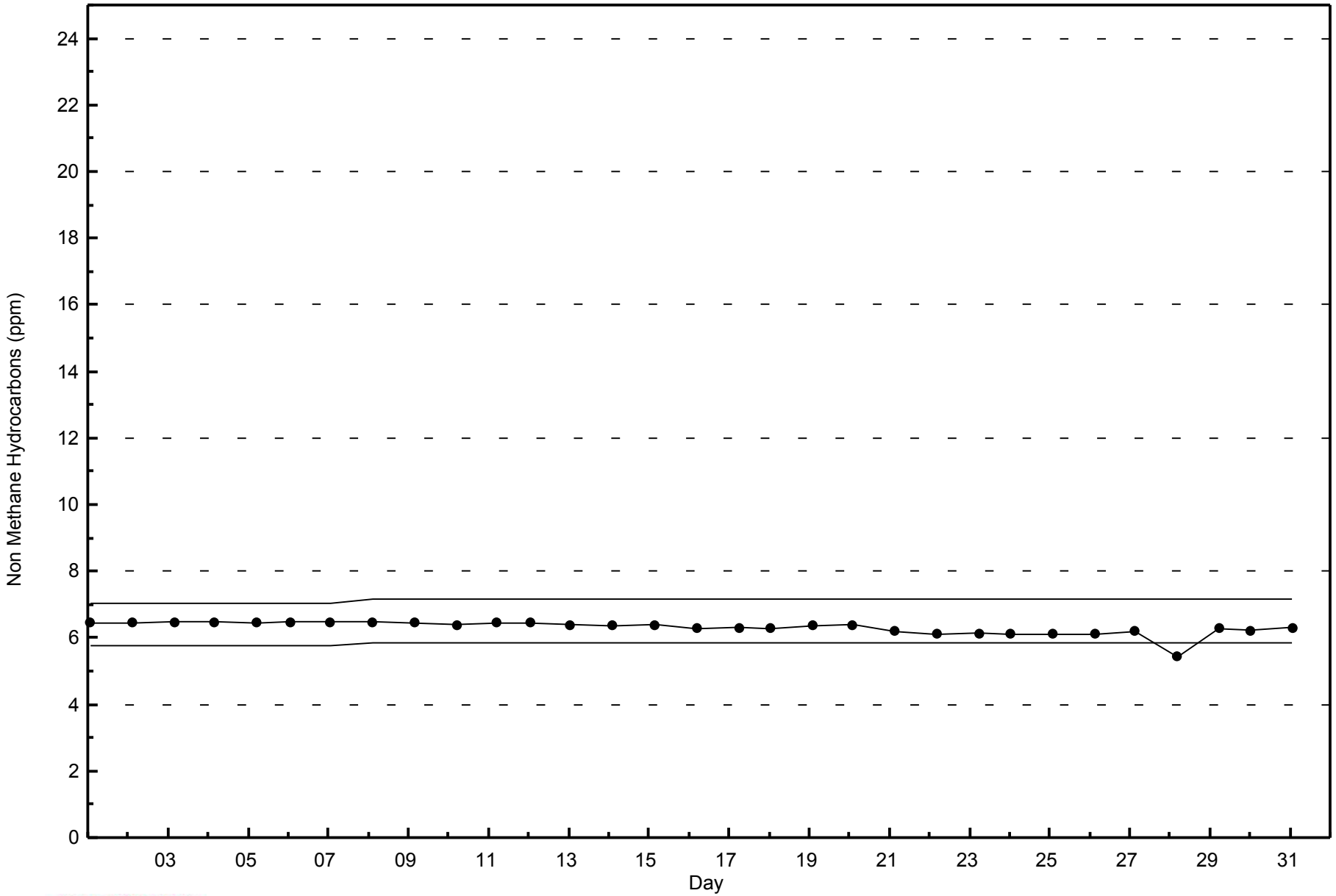
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Patricia McInnes - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.9 ppm on Jan 19 09:00 Maximum Daily Average: 2.3 ppm on Jan 19

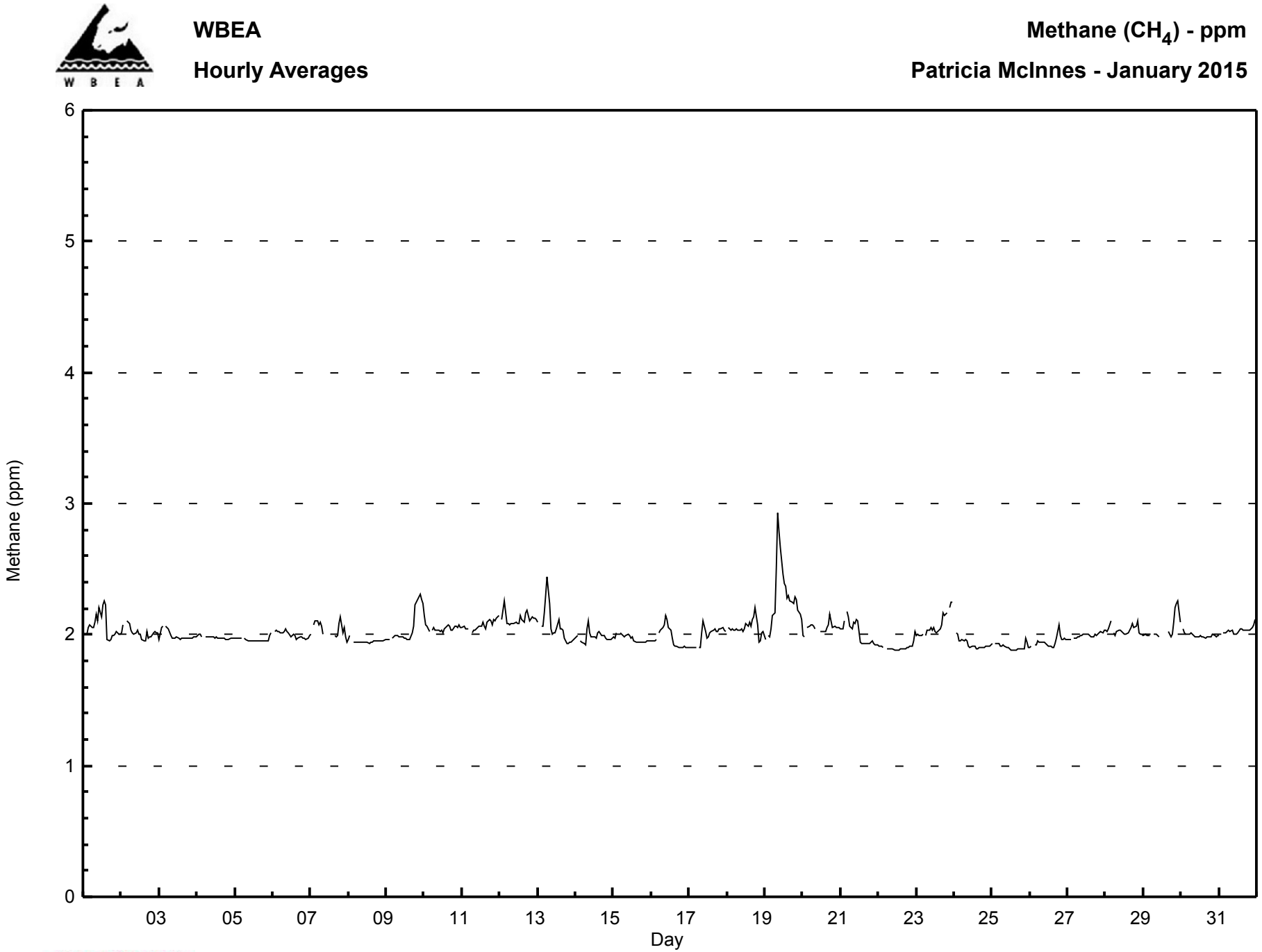
Minimum Value: 1.9 ppm on Jan 22 11:00
Maximum Diurnal Average: 2.0 ppm at hour 9
Monthly Average: 2.02 ppm

Minimum Daily Average: 1.9 ppm on Jan 22
Minimum Diurnal Average: 2.0 ppm at hour 1
Percentiles: P_1 = 1.9 P_{10} = 1.9 Q_1 = 2.0 Median = 2.0 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	700
Hours of Missing Data:	44
Hours of Calibration:	37
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-Jan	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	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	2.1	2.3
2-Jan	2.0	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
3-Jan	2.0	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
4-Jan	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-Jan	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-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	C	C	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	1.9	--	2.1
8-Jan	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0
9-Jan	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	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.3
10-Jan	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11-Jan	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	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12-Jan	Z	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
13-Jan	2.1	Z	2.1	2.1	2.2	2.3	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.4
14-Jan	2.0	2.0	Z	2.0	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
15-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
16-Jan	1.9	1.9	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1
17-Jan	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	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	2.1
18-Jan	Z	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	2.2	2.1	1.9	1.9	2.0	2.0	2.1	2.2
19-Jan	2.0	Z	2.0	2.0	2.0	2.1	2.2	2.5	2.9	2.8	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.3	2.9
20-Jan	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	M	M	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2
21-Jan	2.0	2.0	2.1	Z	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
22-Jan	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	2.0	2.0	1.9	2.0
23-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	UO	2.2	2.2	2.2	2.1	2.2
24-Jan	Z	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
25-Jan	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	2.0	1.9	1.9	1.9	2.0
26-Jan	1.9	1.9	Z	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	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.1
27-Jan	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
28-Jan	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1
29-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	M	2.0	M	M	M	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.1	2.0	2.3
30-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
31-Jan	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.1	2.1	2.2	2.3	2.2	2.3	2.4	2.5	2.9	2.8	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	Diurnal Maximum	

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


WBEA
Hourly Averages
Methane (CH_4) - ppm
Patricia McInnes - January 2015
Methane (ppm)
0
1
2
3
4
5
6
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	527	75.29	75.29
2.1 - 3.0	173	24.71	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744

WBEA

Frequency Distribution

Methane (CH_4) - ppm

Patricia McInnes - January 2015

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	76	16	2	6	4	28	24	13	16	40	95	72	35	27	20	45	519
2.1 - 3.0	17	7	1	1	1	1	17	21	20	13	13	2	4	3	9	36	166
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	93	23	3	7	5	29	41	34	36	53	108	74	39	30	29	81	685

Total Number of Valid Hours: 685

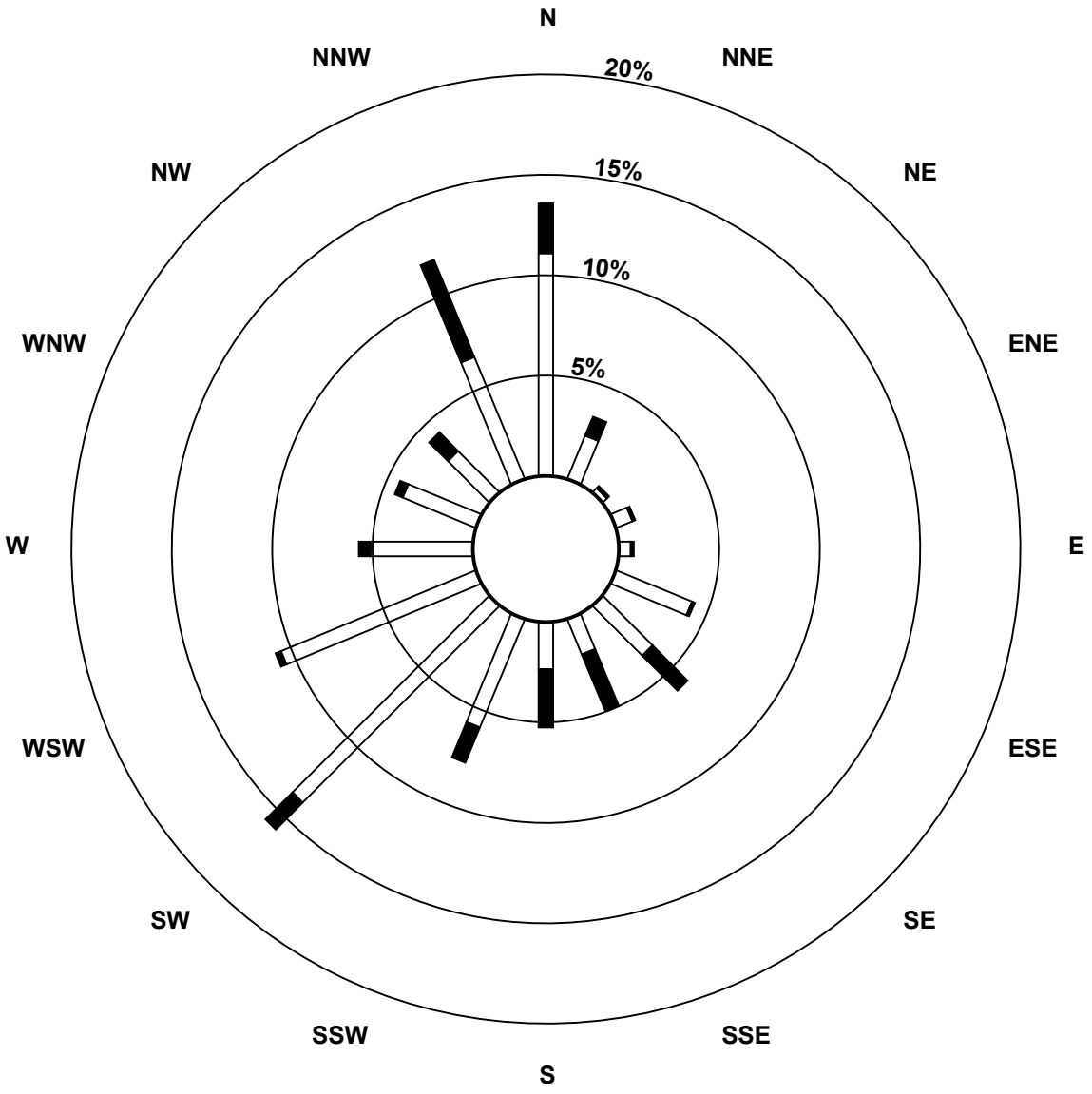
Total Number of Hours: 744

Wood Buffalo Environmental Association

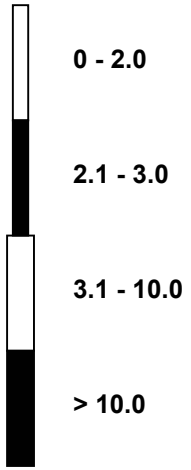
Wind Rose Jan 2015

Methane (CH_4) - ppm

Patricia McInnes (AMS 6)



Classes (ppm)



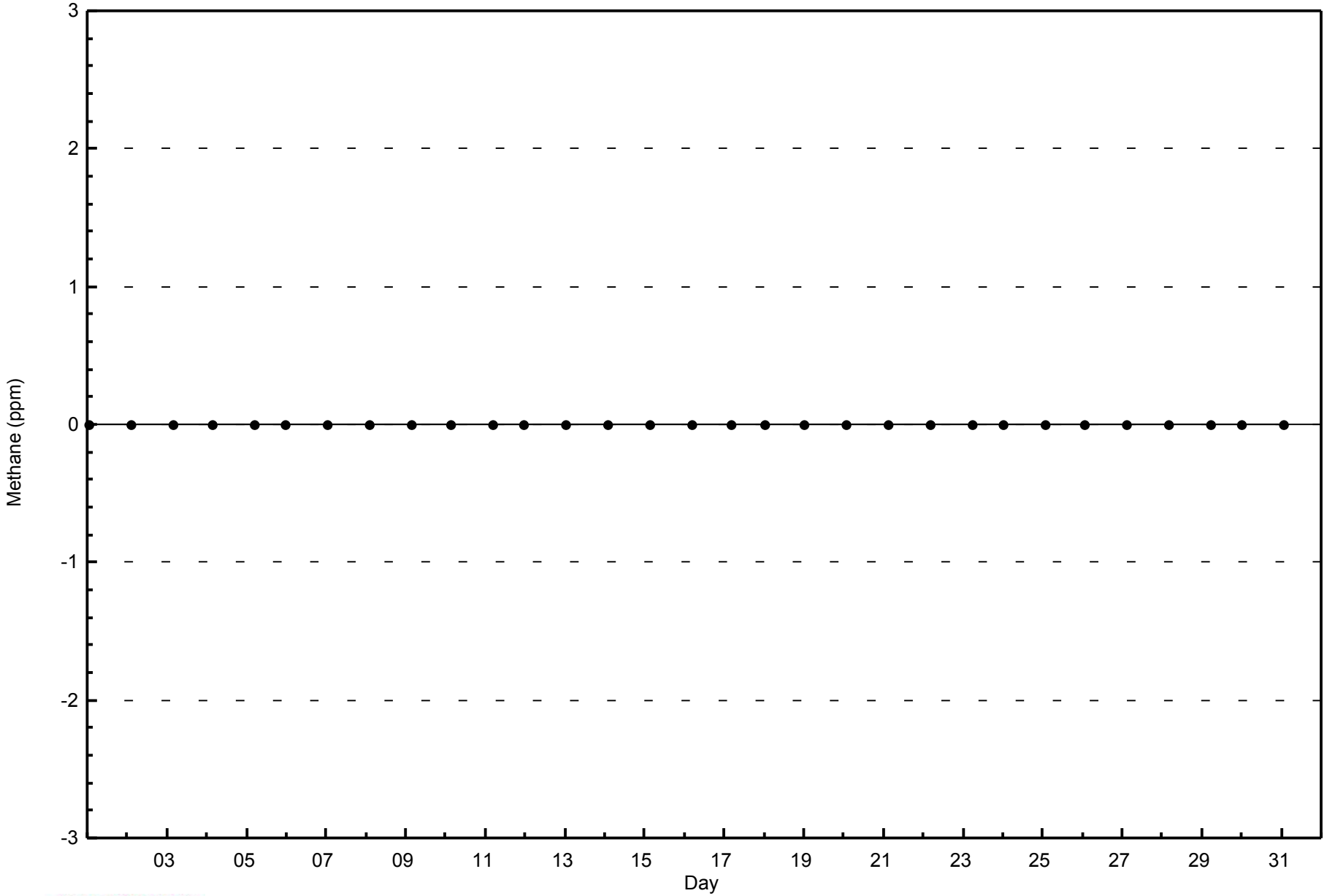
Total Number of Valid Hours: 685

WBEA

Zero Responses

Methane (CH_4) - ppm

Patricia McInnes - January 2015



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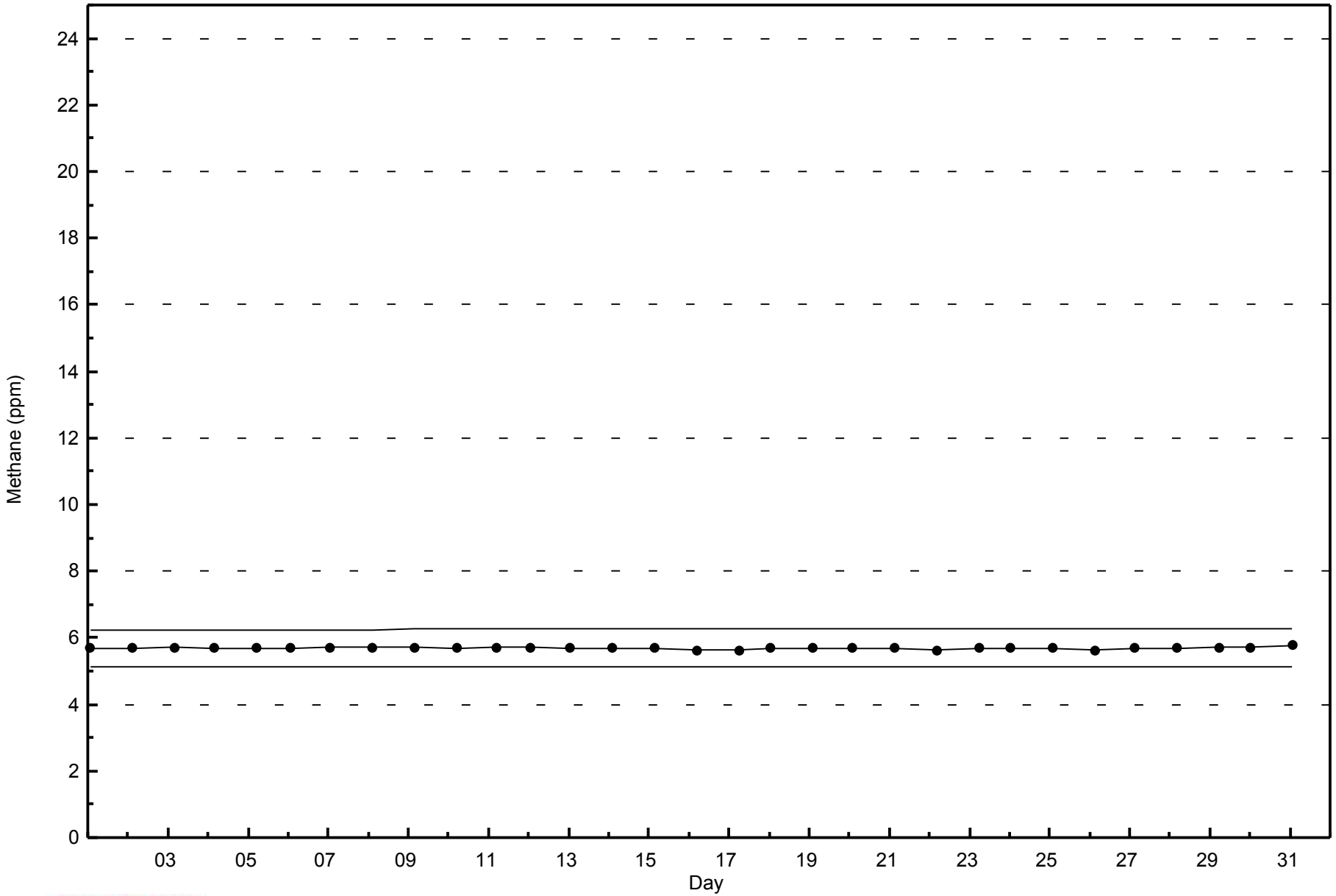
WBEA

Span Responses

Methane (CH_4) - ppm

Patricia McInnes - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Patricia McInnes - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 38 ppb on Jan 17 03:00 Maximum Daily Average: 34.3 ppb on Jan 8

Minimum Value: 1 ppb on Jan 29 23:00 Minimum Daily Average: 6.6 ppb on Jan 19
Maximum Diurnal Average: 23.6 ppb at hour 15 Minimum Diurnal Average: 18.3 ppb at hour 8
Monthly Average: 20.6 ppb Percentiles: $P_1 = 1$ $P_{10} = 6$ $Q_1 = 14$ Median = 22 $Q_3 = 29$ $P_{90} = 32$ $P_{99} = 37$

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)																								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-Jan	28	27	22	Z	14	11	12	15	18	17	15	17	17	16	15	33	31	30	30	26	22	15	18	21	20.4	33
2-Jan	22	16	13	15	Z	12	20	22	21	19	16	23	26	31	33	32	18	23	21	18	16	14	16	17	20.1	33
3-Jan	30	20	19	16	16	Z	17	26	28	27	26	24	29	30	30	29	28	28	28	28	27	27	24	26	25.3	30
4-Jan	25	24	24	26	26	26	Z	27	27	28	29	30	30	31	31	32	31	32	32	32	32	32	31	30	29.0	32
5-Jan	31	31	31	31	31	31	28	Z	34	34	34	34	34	33	33	33	33	33	33	33	33	31	28	26	31.8	34
6-Jan	23	22	Z	16	15	16	15	10	8	12	14	18	15	14	19	31	22	25	23	27	27	28	29	25	19.6	31
7-Jan	17	12	8	Z	5	3	9	16	21	22	24	23	22	22	21	23	24	23	17	15	28	24	33	37	19.6	37
8-Jan	36	32	24	37	Z	37	36	36	34	C	C	C	C	36	36	36	35	35	35	34	32	32	33	32	34.3	37
9-Jan	32	32	32	32	31	Z	29	29	29	30	31	32	32	32	32	32	14	18	10	7	8	6	8	9	23.8	32
10-Jan	17	24	22	25	20	20	Z	16	17	19	20	23	27	23	21	19	17	19	15	12	13	15	15	21	19.1	27
11-Jan	22	21	23	25	24	23	25	Z	22	23	23	21	23	18	18	16	3	3	4	5	4	10	13	11	16.6	25
12-Jan	9	9	Z	2	12	14	17	16	16	18	18	19	20	11	12	14	5	2	3	8	7	13	14	15	11.9	20
13-Jan	17	17	17	Z	13	3	1	4	19	24	24	20	21	14	18	12	9	22	32	31	31	31	28	26	18.9	32
14-Jan	21	25	25	24	Z	24	25	16	13	22	25	24	25	26	22	24	21	23	25	25	30	29	29	30	24.0	30
15-Jan	27	29	25	27	26	Z	26	26	23	22	22	25	24	30	30	31	31	30	31	31	30	30	31	31	27.8	31
16-Jan	31	31	29	28	26	22	Z	13	11	15	17	23	26	27	29	31	32	30	31	31	32	34	35	37	27.1	37
17-Jan	35	37	38	38	37	37	37	Z	21	16	22	27	22	21	21	16	13	14	10	6	8	6	6	7	21.6	38
18-Jan	7	9	Z	9	9	12	9	11	8	11	10	11	12	15	11	8	4	2	3	13	28	24	13	21	11.3	28
19-Jan	23	24	22	Z	15	3	2	1	2	3	4	6	8	7	6	4	2	2	3	2	1	1	4	8	6.6	24
20-Jan	19	20	17	16	Z	12	13	15	16	16	18	19	20	18	15	9	3	2	2	4	3	4	3	6	11.8	20
21-Jan	9	8	3	3	2	Z	8	6	3	4	5	12	35	36	37	36	35	34	34	33	33	32	31	31	20.4	37
22-Jan	31	30	29	30	31	31	Z	31	30	32	33	32	31	31	30	31	29	30	31	31	31	31	21	11	29.5	33
23-Jan	13	14	15	15	11	11	13	Z	3	4	6	6	8	9	7	6	3	2	2	2	2	2	2	2	6.8	15
24-Jan	2	7	Z	11	10	10	10	10	17	27	29	32	28	27	32	32	28	25	29	31	29	30	29	28	22.3	32
25-Jan	28	29	32	Z	30	37	33	33	32	29	27	25	29	30	31	32	31	31	30	32	34	16	21	27	29.5	37
26-Jan	28	29	31	30	Z	18	25	27	27	26	29	30	31	31	36	36	20	20	8	9	18	23	24	26	25.3	36
27-Jan	26	27	28	28	27	Z	26	24	23	23	22	21	21	22	22	22	20	17	20	19	17	17	20	19	22.2	28
28-Jan	18	19	17	11	12	20	Z	19	16	19	21	18	18	20	17	10	9	5	7	5	5	16	18	19	14.7	21
29-Jan	20	19	22	23	22	19	15	Z	13	17	19	19	19	20	18	15	8	18	10	1	1	1	1	7	14.3	23
30-Jan	9	14	Z	23	23	21	21	21	26	27	27	25	28	29	31	29	28	25	30	30	26	26	21	19	24.4	31
31-Jan	19	16	12	Z	14	11	8	9	6	14	16	19	20	17	15	14	11	9	5	4	4	3	2	2	11.0	20
	21.8	21.7	22.4	21.6	19.3	18.7	18.4	18.3	18.9	20.0	20.8	22.0	23.4	23.5	23.6	23.4	19.4	19.8	19.1	18.9	19.7	19.4	19.3	20.4	Diurnal Average	
	36	37	38	38	37	37	37	36	34	34	34	34	35	36	37	36	35	35	35	34	34	34	35	37	Diurnal Maximum	

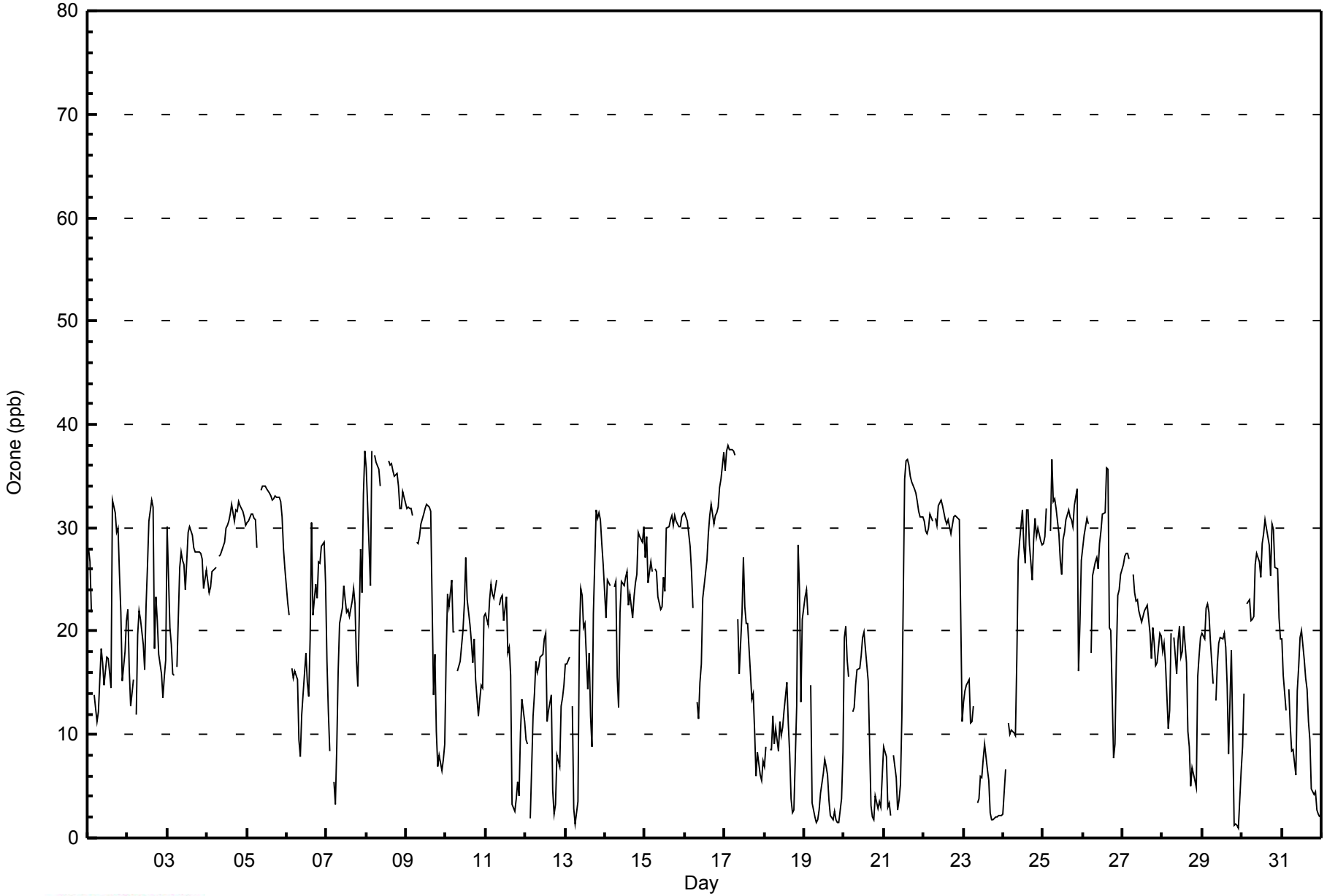
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA

Hourly Averages

Ozone (O_3) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	327	46.12	46.12
21 - 50	382	53.88	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

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Patricia McInnes - January 2015

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	11	3	6	7	15	28	29	31	22	19	10	5	6	18	64	311
21 - 50	57	11	0	1	1	17	15	4	7	30	90	59	33	24	10	23	382
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	94	22	3	7	8	32	43	33	38	52	109	69	38	30	28	87	693

Total Number of Valid Hours: 693

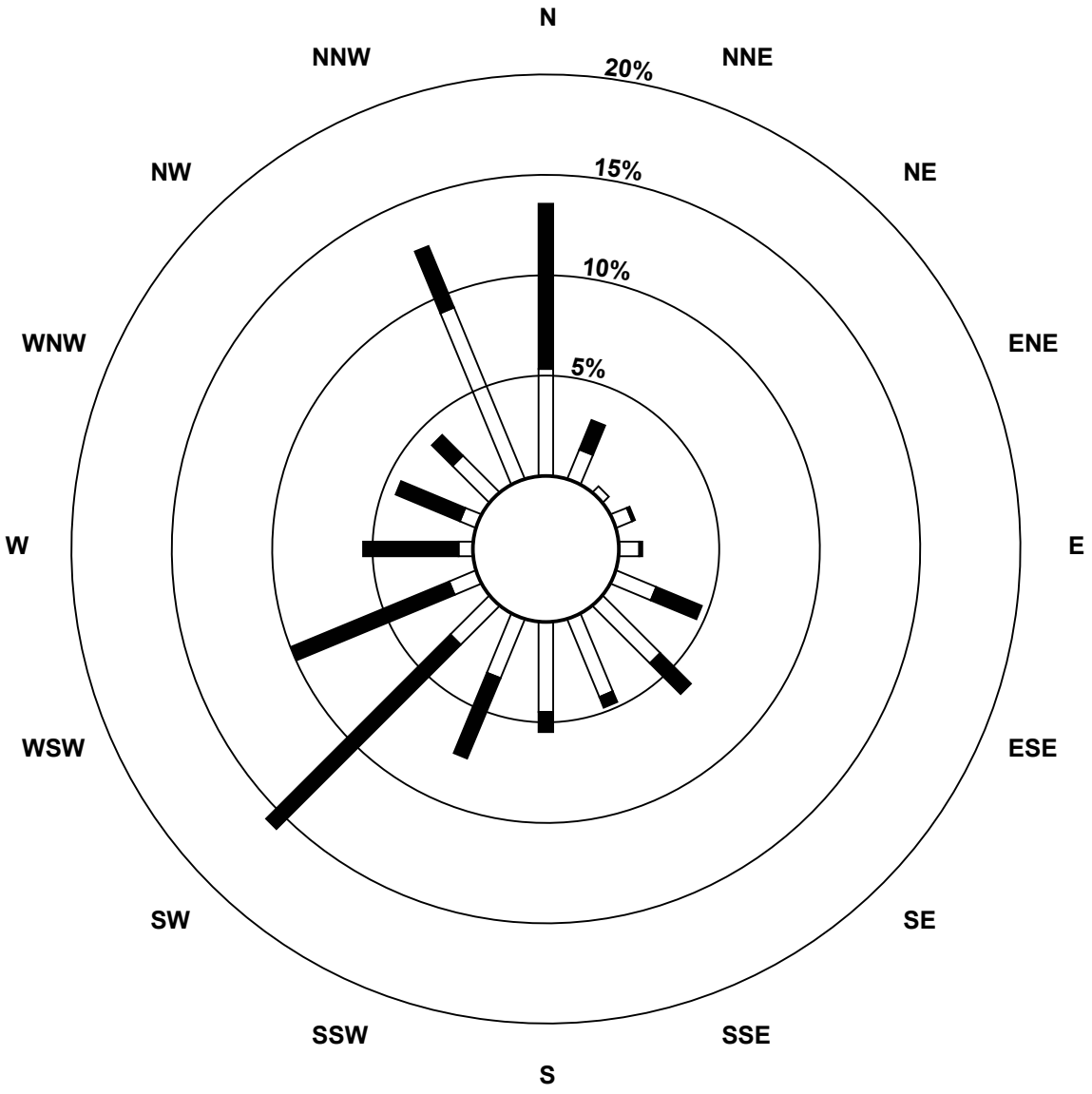
Total Number of Hours: 744

Wood Buffalo Environmental Association

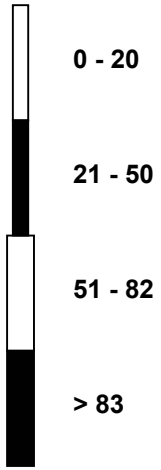
Wind Rose Jan 2015

Ozone (O_3) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



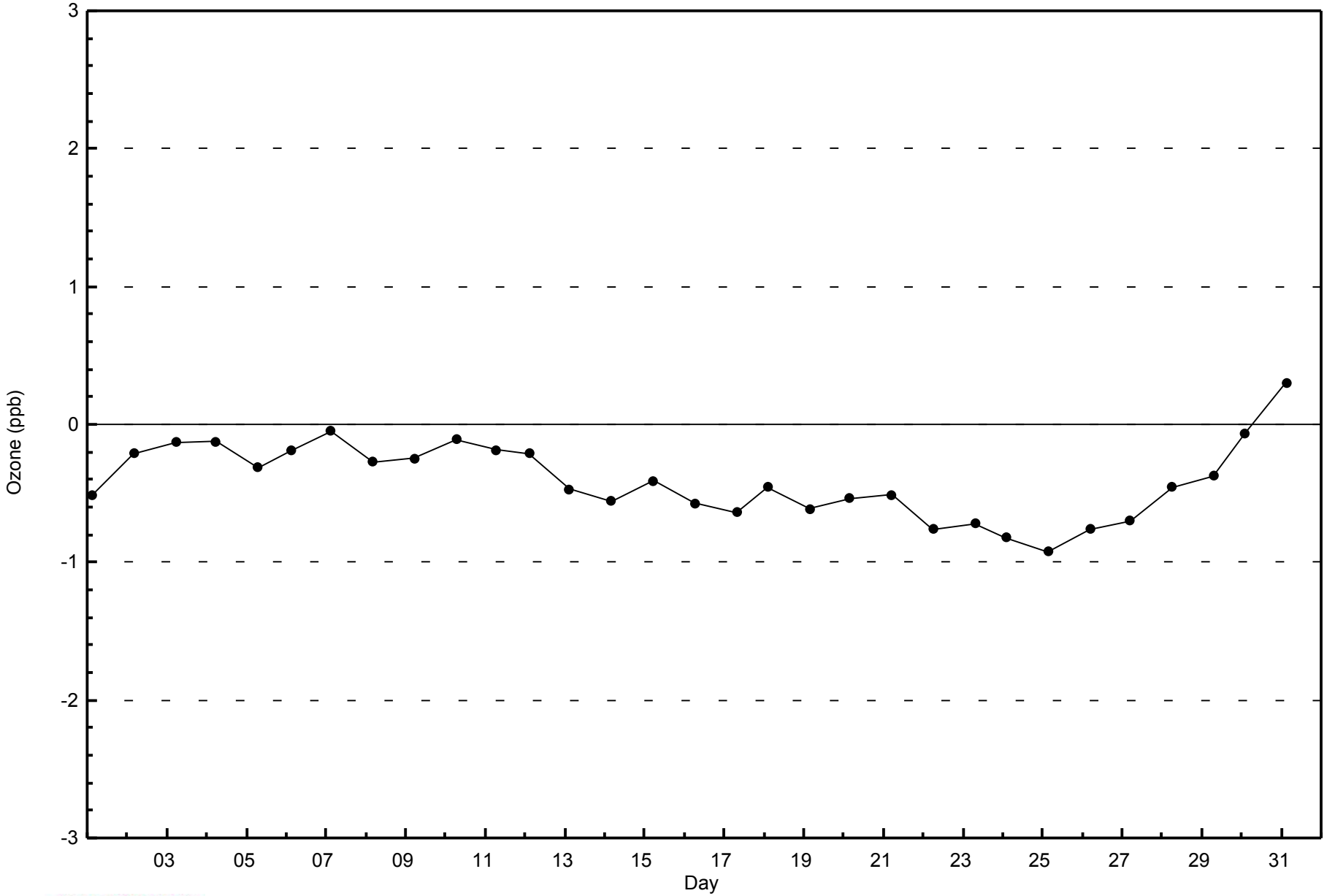
Total Number of Valid Hours: 693

WBEA

Zero Responses

Ozone (O_3) - ppb

Patricia McInnes - January 2015



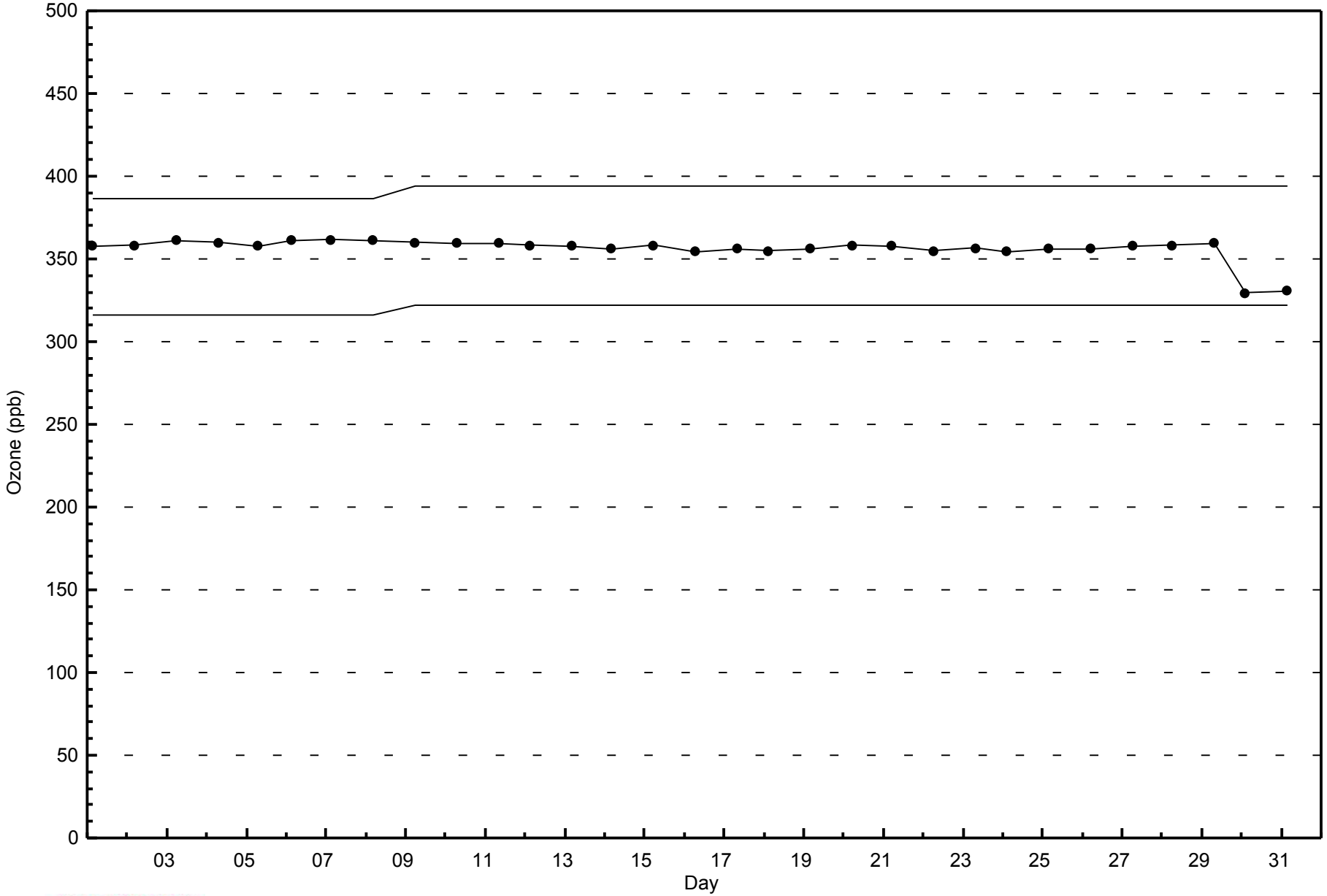
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 74 ppb on Jan 23 22:00

Maximum Daily Average: 22.7 ppb on Jan 23

Minimum Value: 0 ppb on Jan 1 20:00

Minimum Daily Average: 0.1 ppb on Jan 22

Maximum Diurnal Average: 8.7 ppb at hour 18

Minimum Diurnal Average: 0.5 ppb at hour 1

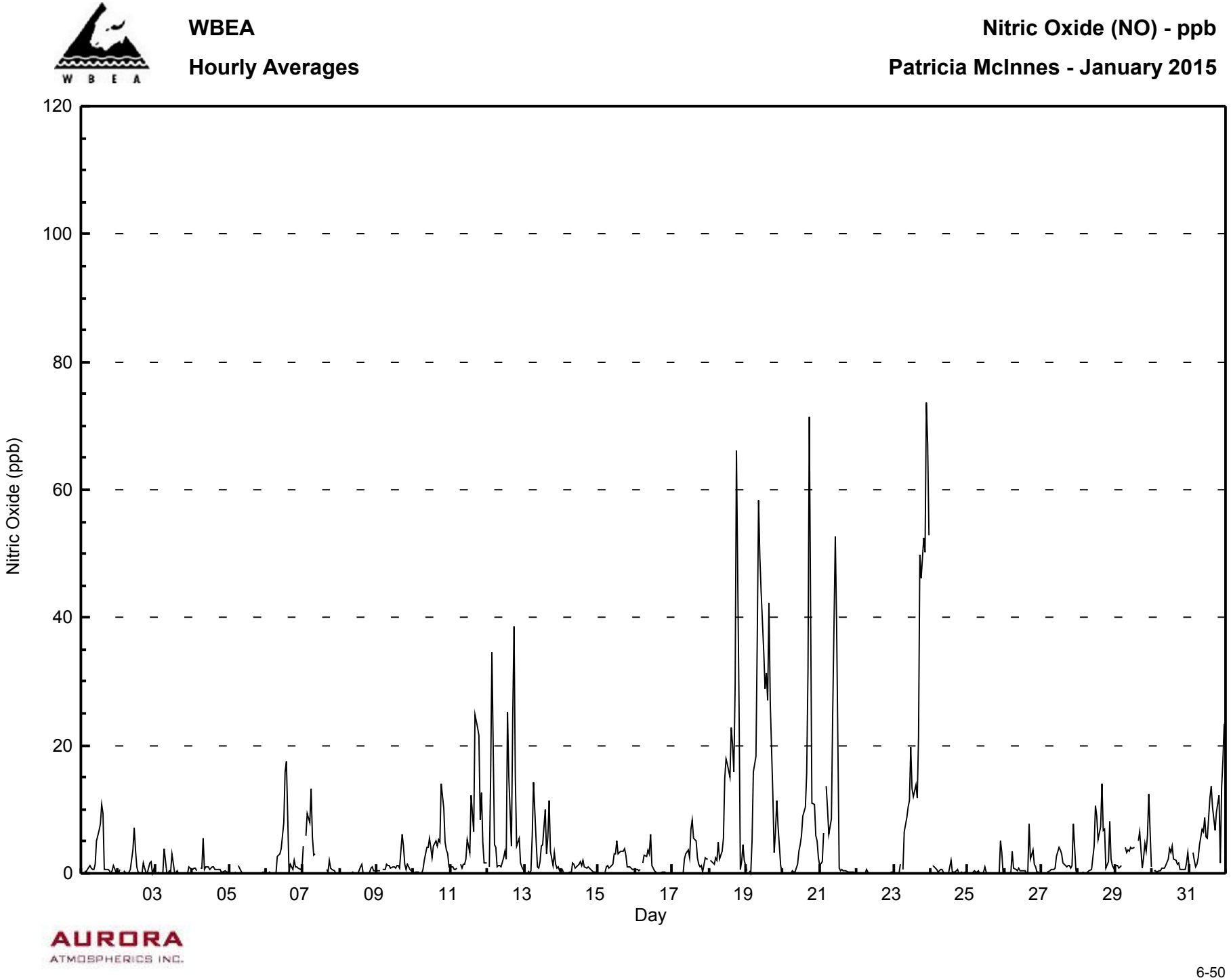
Monthly Average: 4.4 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 4$ $P_{90} = 11$ $P_{99} = 53$

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-Jan	0	Z	0	0	1	1	1	1	1	1	5	7	8	11	9	1	1	1	0	0	0	1	0	0	2.2	11
2-Jan	0	1	Z	0	0	0	0	0	1	4	7	4	1	0	0	0	2	1	0	0	2	2	0	1	1.1	7
3-Jan	0	0	0	Z	0	0	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	1	0.5	4
4-Jan	1	1	1	0	Z	1	1	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.8	5
5-Jan	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
6-Jan	Z	0	0	0	0	0	0	3	3	3	4	8	16	17	9	0	1	1	2	1	1	1	1	1	3.1	17
7-Jan	4	Z	6	9	8	13	6	3	3	C	C	C	C	C	C	1	0	2	1	1	0	0	0	0	--	13
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0.2	1
9-Jan	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	6	4	1	1	1	1	0	0	1.3	6
10-Jan	0	0	0	0	Z	0	1	2	4	4	5	4	2	4	5	4	5	5	14	10	5	4	3	1	3.7	14
11-Jan	1	1	1	1	1	Z	1	1	1	1	2	5	3	12	9	6	25	23	21	8	13	5	2	2	6.4	25
12-Jan	Z	1	15	35	4	4	1	1	1	1	2	3	2	25	15	4	24	39	15	4	5	2	1	1	9.0	39
13-Jan	0	Z	0	0	0	6	14	5	1	1	2	4	4	10	3	6	11	3	1	3	1	1	1	0	3.5	14
14-Jan	1	0	Z	0	0	0	0	2	1	1	1	2	2	1	2	1	1	1	1	1	1	0	0	0	0.8	2
15-Jan	0	0	0	Z	0	1	1	1	1	1	3	3	5	3	3	3	4	4	3	1	1	1	1	1	1.8	5
16-Jan	1	1	0	1	Z	2	3	3	4	3	6	1	0	0	0	0	0	0	0	0	0	0	0	0	1.1	6
17-Jan	0	0	0	0	0	Z	0	0	2	3	4	2	7	8	6	5	2	1	1	1	0	2	2	2	2.2	8
18-Jan	Z	2	2	1	2	2	5	2	3	5	15	18	17	15	23	20	16	30	66	26	1	2	5	2	12.2	66
19-Jan	0	Z	0	0	5	16	18	37	58	49	44	35	29	31	27	42	27	12	3	6	11	7	1	0	20.1	58
20-Jan	0	0	Z	0	0	0	0	0	0	1	3	5	6	9	10	16	32	71	42	11	11	6	5	2	10.1	71
21-Jan	1	2	6	Z	14	10	6	9	25	39	53	39	1	0	1	0	0	0	0	0	0	0	0	0	9.0	53
22-Jan	0	0	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
23-Jan	0	0	0	0	1	Z	1	6	9	10	11	20	13	12	14	12	21	50	46	52	50	74	67	53	22.7	74
24-Jan	Z	1	1	1	1	0	1	1	0	0	0	0	1	2	0	0	0	1	0	0	0	0	0	0	0.4	2
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5	3	0	0.5	5
26-Jan	0	0	Z	0	0	4	1	1	0	1	0	0	0	0	0	0	8	2	4	1	1	0	0	0	1.1	8
27-Jan	0	0	0	Z	0	0	1	1	1	1	3	4	4	3	2	1	1	1	1	1	1	8	0	0	1.4	8
28-Jan	0	0	0	0	Z	0	0	0	1	2	4	11	9	5	7	14	7	7	1	2	8	2	1	1	3.6	14
29-Jan	1	1	1	1	1	Z	4	3	4	4	4	4	4	M	M	5	7	1	2	5	3	6	12	1	3.6	12
30-Jan	Z	0	0	0	0	0	1	1	1	1	2	4	3	4	2	2	1	2	1	1	1	1	2	3	1.5	4
31-Jan	1	Z	3	2	1	2	2	5	7	7	9	6	6	12	14	10	8	7	9	12	2	14	18	23	7.7	23
	0.5	0.5	1.5	2.0	1.6	2.4	2.4	3.0	4.3	4.9	6.4	6.4	4.9	6.6	5.7	5.1	6.8	8.7	7.7	4.8	3.9	4.7	4.1	3.1	Diurnal Average	
	4	2	15	35	14	16	18	37	58	49	53	39	29	31	27	42	32	71	66	52	50	74	67	53	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance


WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Patricia McInnes - January 2015
Nitric Oxide (ppb)
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	668	94.75	94.75
21 - 40	22	3.12	97.87
11 - 80	15	2.13	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

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	87	21	3	6	5	30	38	27	33	50	108	74	38	30	30	80	660
21 - 40	3	2	0	1	1	0	1	7	2	2	0	0	1	0	0	1	21
11 - 80	3	0	0	0	0	0	2	0	1	1	0	0	0	0	0	1	8
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	93	23	3	7	6	30	41	34	36	53	108	74	39	30	30	82	689

Total Number of Valid Hours: 689

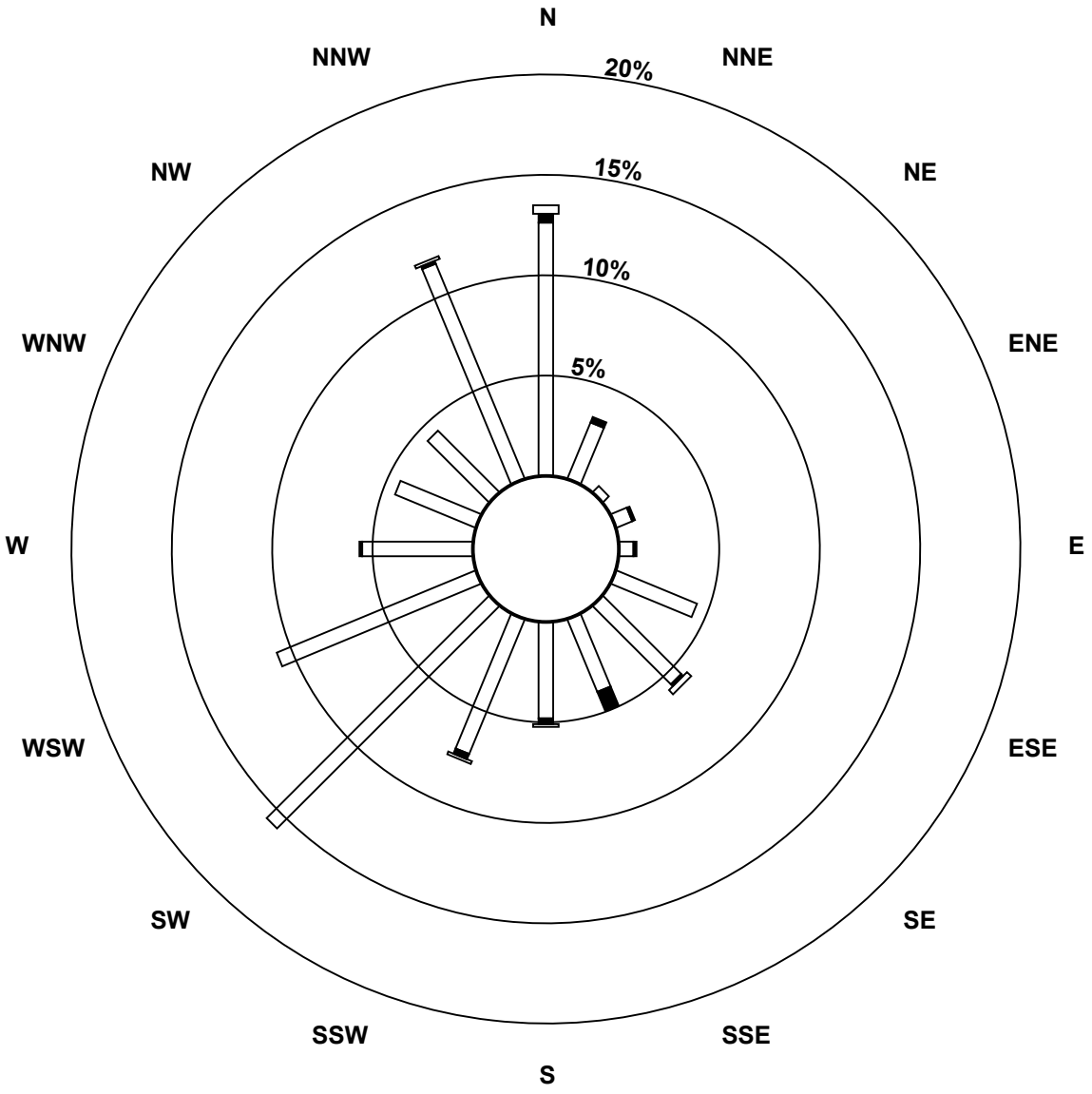
Total Number of Hours: 744

Wood Buffalo Environmental Association

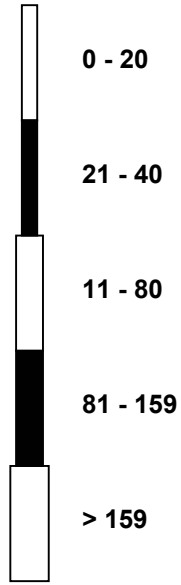
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



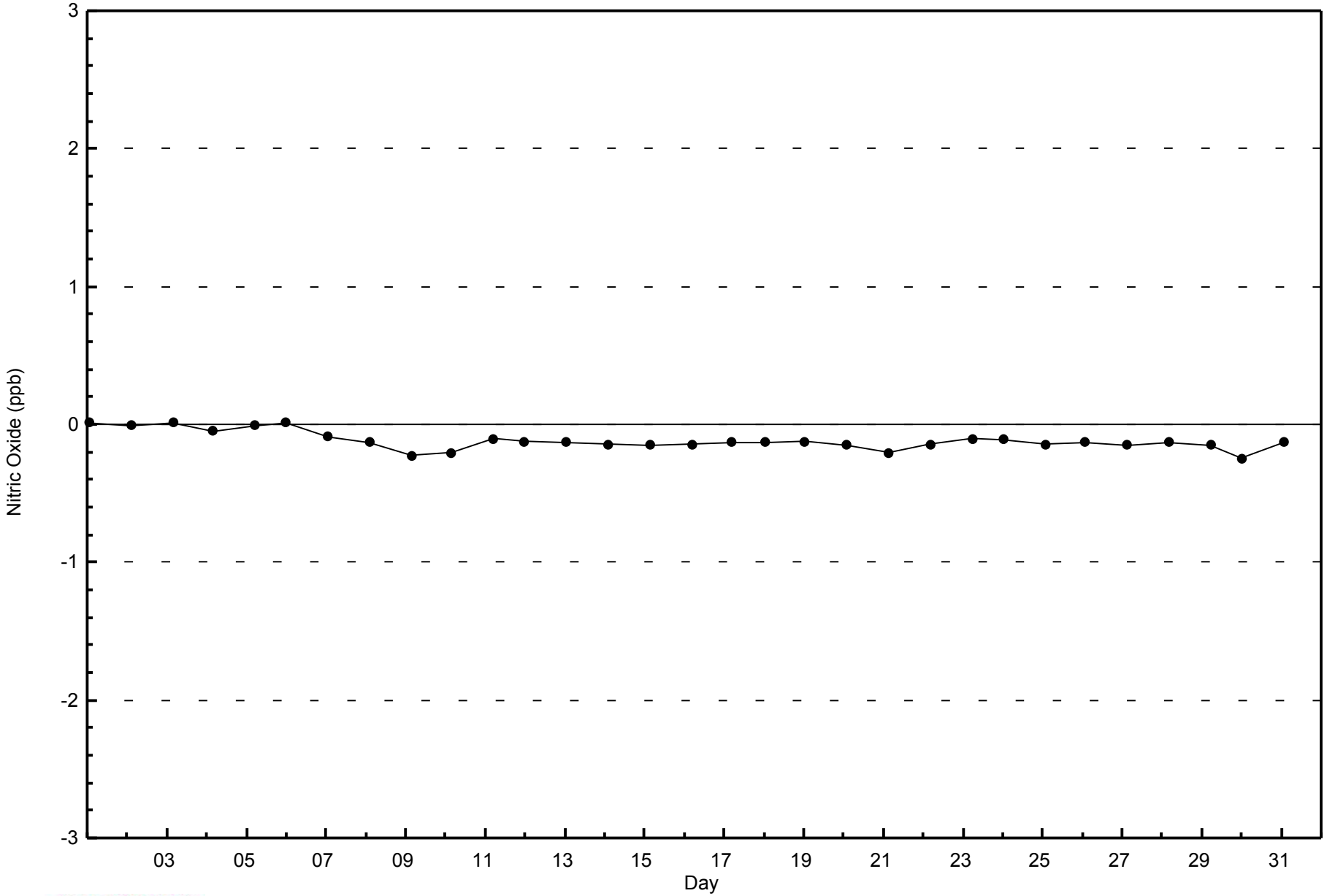
Total Number of Valid Hours: 689

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2015



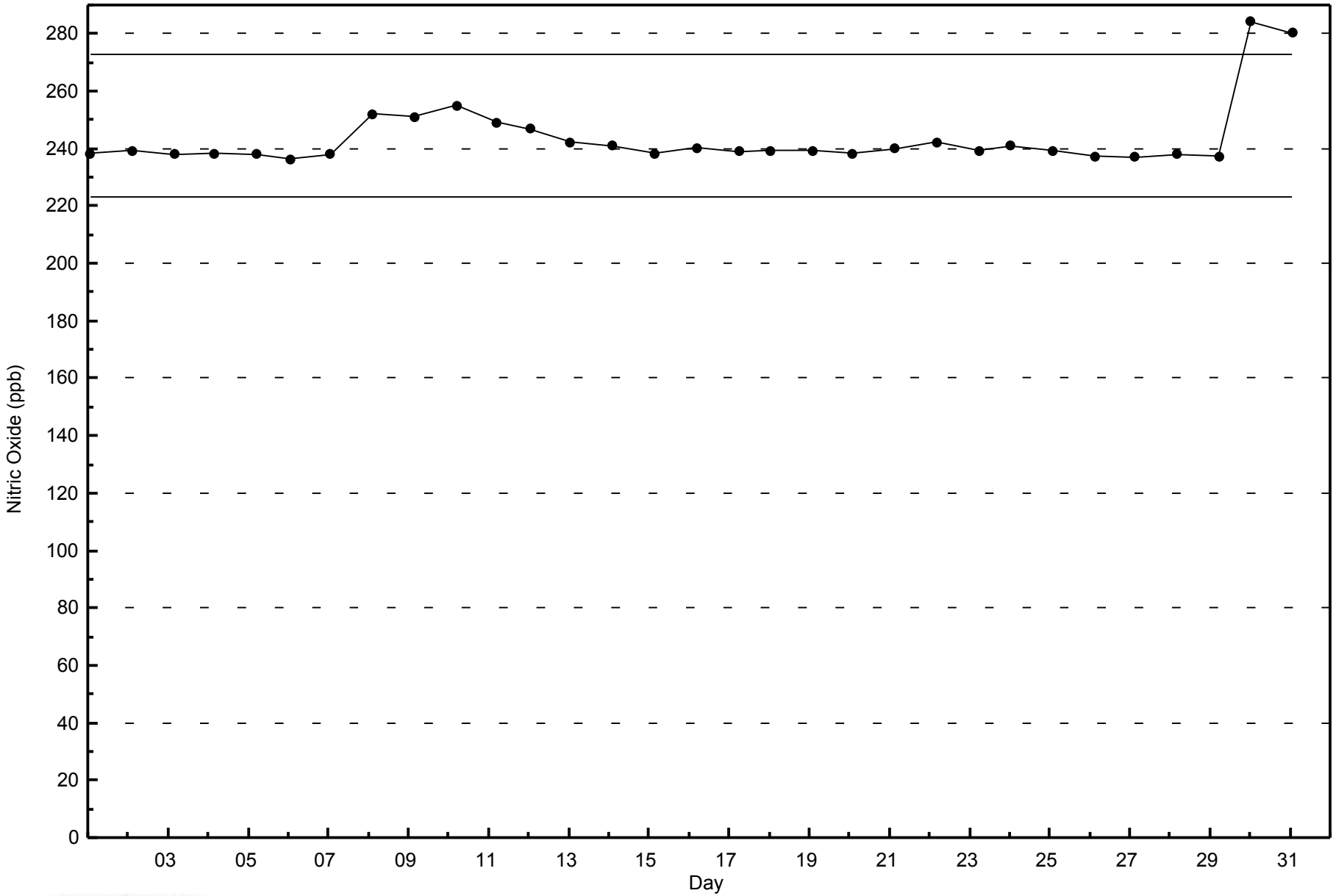
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 38 ppb on Jan 20 18:00 Maximum Daily Average: 22.1 ppb on Jan 19

Minimum Value: 0 ppb on Jan 22 09:00
Maximum Diurnal Average: 13.0 ppb at hour 17
Monthly Average: 9.3 ppb

Minimum Daily Average: 0.8 ppb on Jan 22
Minimum Diurnal Average: 6.0 ppb at hour 1
Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 7 $Q_3 = 14$ $P_{90} = 22$ $P_{99} = 31$

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-Jan	8	Z	13	21	22	24	22	17	13	14	17	14	16	20	23	4	4	5	4	7	10	15	10	4	13.2	24
2-Jan	6	17	Z	22	18	16	11	9	12	13	14	8	3	1	1	1	13	4	4	5	8	9	7	10	9.3	22
3-Jan	1	11	13	Z	11	8	10	3	1	2	1	5	1	0	1	1	1	1	0	1	1	2	4	2	3.4	13
4-Jan	3	4	3	2	Z	2	2	10	2	2	2	2	2	2	3	2	4	3	4	2	2	2	2	3	2.8	10
5-Jan	2	1	1	1	2	Z	6	6	2	1	1	1	1	1	1	1	1	0	1	0	1	2	5	7	1.8	7
6-Jan	Z	7	8	6	7	5	7	12	15	8	6	9	16	19	13	2	9	5	8	5	5	4	3	7	8.1	19
7-Jan	16	Z	23	27	27	30	22	14	9	C	C	C	C	C	C	9	7	8	15	20	6	11	3	1	--	30
8-Jan	2	4	Z	1	0	0	1	1	2	0	0	1	1	1	2	1	1	1	1	2	4	4	2	2	1.4	4
9-Jan	3	2	2	Z	3	3	5	5	4	3	3	2	2	3	4	4	22	18	23	25	27	31	25	24	10.4	31
10-Jan	18	12	13	10	Z	7	7	9	12	11	9	6	4	7	9	11	15	12	21	23	18	17	15	8	11.9	23
11-Jan	7	8	5	4	6	Z	4	5	6	4	4	6	4	10	13	16	32	31	31	26	28	19	13	14	12.8	32
12-Jan	Z	10	20	29	18	15	10	11	10	8	8	7	5	19	16	13	27	31	26	18	18	10	9	8	15.1	31
13-Jan	6	Z	5	4	10	22	25	24	13	9	10	14	14	20	15	23	29	16	6	7	5	4	5	6	12.7	29
14-Jan	10	4	Z	2	1	1	1	10	14	6	5	6	5	5	8	7	10	9	8	7	4	5	5	5	6.0	14
15-Jan	7	6	11	Z	11	12	12	12	14	16	15	12	13	7	8	7	8	8	5	5	5	5	4	4	9.0	16
16-Jan	4	4	5	5	Z	10	15	20	22	16	13	5	3	2	1	1	1	2	2	2	1	1	1	0	5.9	22
17-Jan	1	0	0	0	0	Z	1	0	13	14	10	5	11	13	13	18	20	18	21	25	22	24	24	21	11.9	25
18-Jan	Z	17	14	15	14	11	14	11	13	11	13	13	13	16	21	27	29	30	34	20	3	7	19	9	16.2	34
19-Jan	5	Z	6	2	15	26	24	27	30	28	25	22	21	23	24	27	27	27	26	27	27	27	24	19	22.1	30
20-Jan	8	7	Z	11	14	14	13	11	9	9	9	7	8	11	13	21	29	38	33	23	24	21	22	19	16.2	38
21-Jan	15	16	21	Z	20	19	16	20	26	25	30	28	3	2	2	3	3	2	2	1	1	1	1	0	11.2	30
22-Jan	0	1	0	0	Z	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	0.8	10
23-Jan	8	7	6	5	11	Z	9	17	19	17	13	13	10	9	12	12	16	22	19	17	14	16	17	15	13.1	22
24-Jan	Z	6	3	2	4	4	3	2	1	0	0	0	1	3	0	0	2	2	0	0	1	1	1	1	1.5	6
25-Jan	1	Z	1	1	4	2	5	3	1	0	0	1	0	0	0	0	0	0	1	0	0	13	8	2	1.9	13
26-Jan	0	0	Z	0	2	11	3	2	1	2	1	0	0	0	0	1	17	8	13	14	5	2	3	2	3.8	17
27-Jan	2	2	2	Z	2	3	4	6	6	6	7	8	8	7	6	6	9	11	8	9	11	11	8	7	6.5	11
28-Jan	9	8	10	17	Z	8	6	7	11	9	8	13	13	10	14	22	23	25	18	18	26	14	11	9	13.3	26
29-Jan	8	10	7	5	6	Z	12	12	12	8	7	6	7	M	M	11	19	6	14	25	25	25	27	18	12.9	27
30-Jan	Z	11	7	4	4	5	6	7	5	4	4	6	5	6	5	6	7	10	5	5	8	7	12	8	6.3	12
31-Jan	7	Z	11	6	7	9	10	13	20	13	11	6	5	9	14	16	20	23	23	23	15	21	22	24	14.2	24
	6.0	7.0	8.1	7.8	9.1	10.2	9.2	9.9	10.2	8.7	8.1	7.6	6.4	7.8	8.3	8.7	13.0	12.1	11.9	11.7	10.6	10.6	10.1	8.6	Diurnal Average	
	18	17	23	29	27	30	25	27	30	28	30	28	21	23	24	27	32	38	34	27	28	31	27	24	Diurnal Maximum	

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

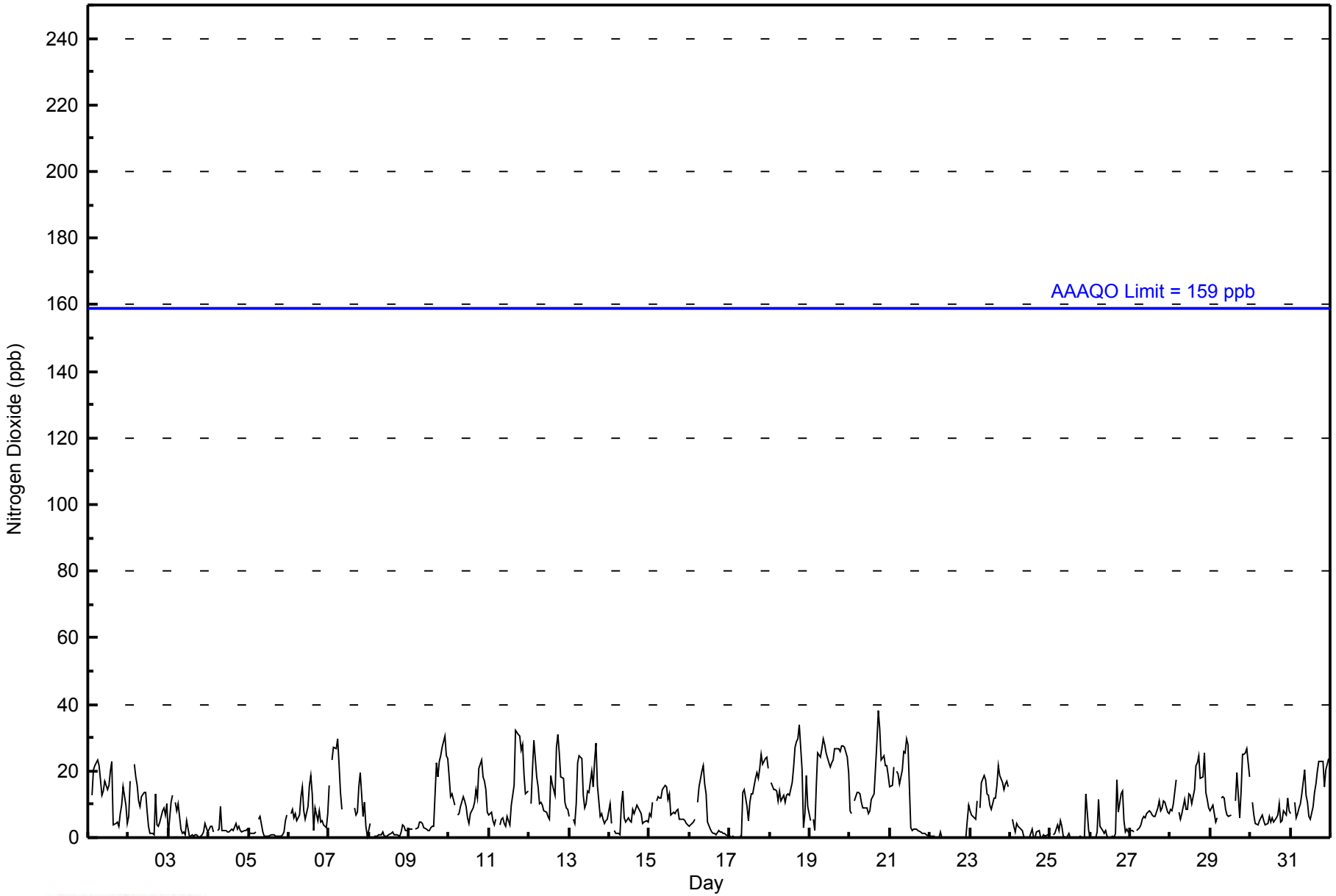
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2015

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	613	86.95	86.95
21 - 40	92	13.05	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

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2015

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	17	1	6	4	29	29	18	28	49	107	74	37	28	27	64	598
21 - 40	13	6	2	1	2	1	12	16	8	4	1	0	2	2	3	18	91
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	93	23	3	7	6	30	41	34	36	53	108	74	39	30	30	82	689

Total Number of Valid Hours: 689

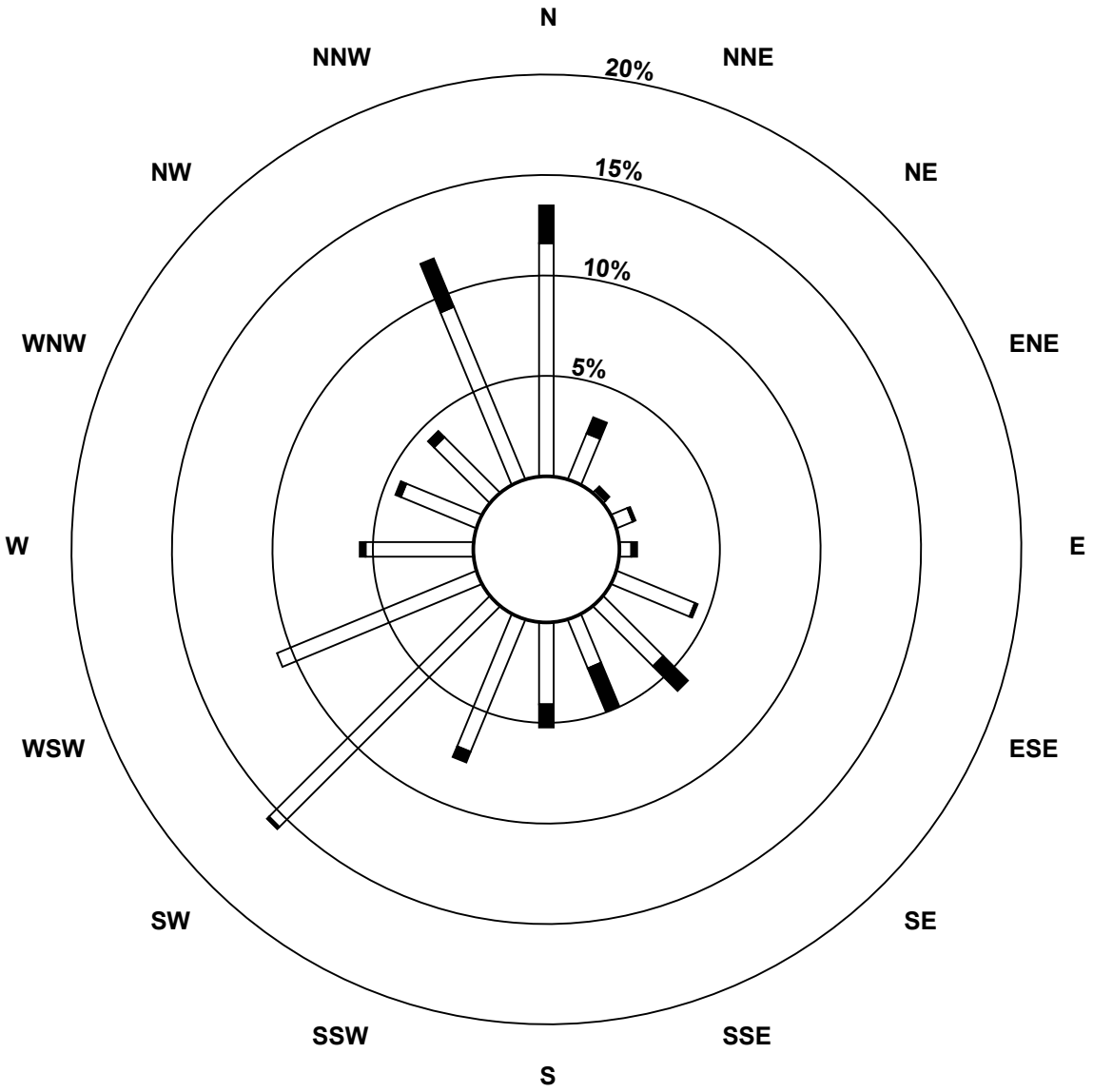
Total Number of Hours: 744

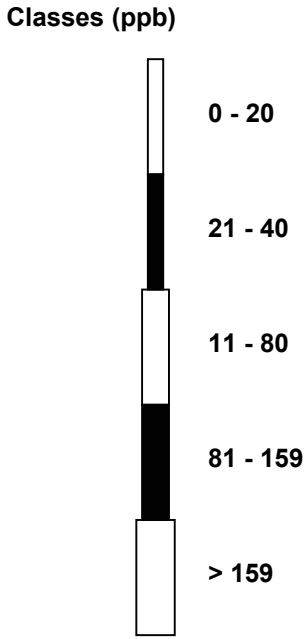
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes (AMS 6)





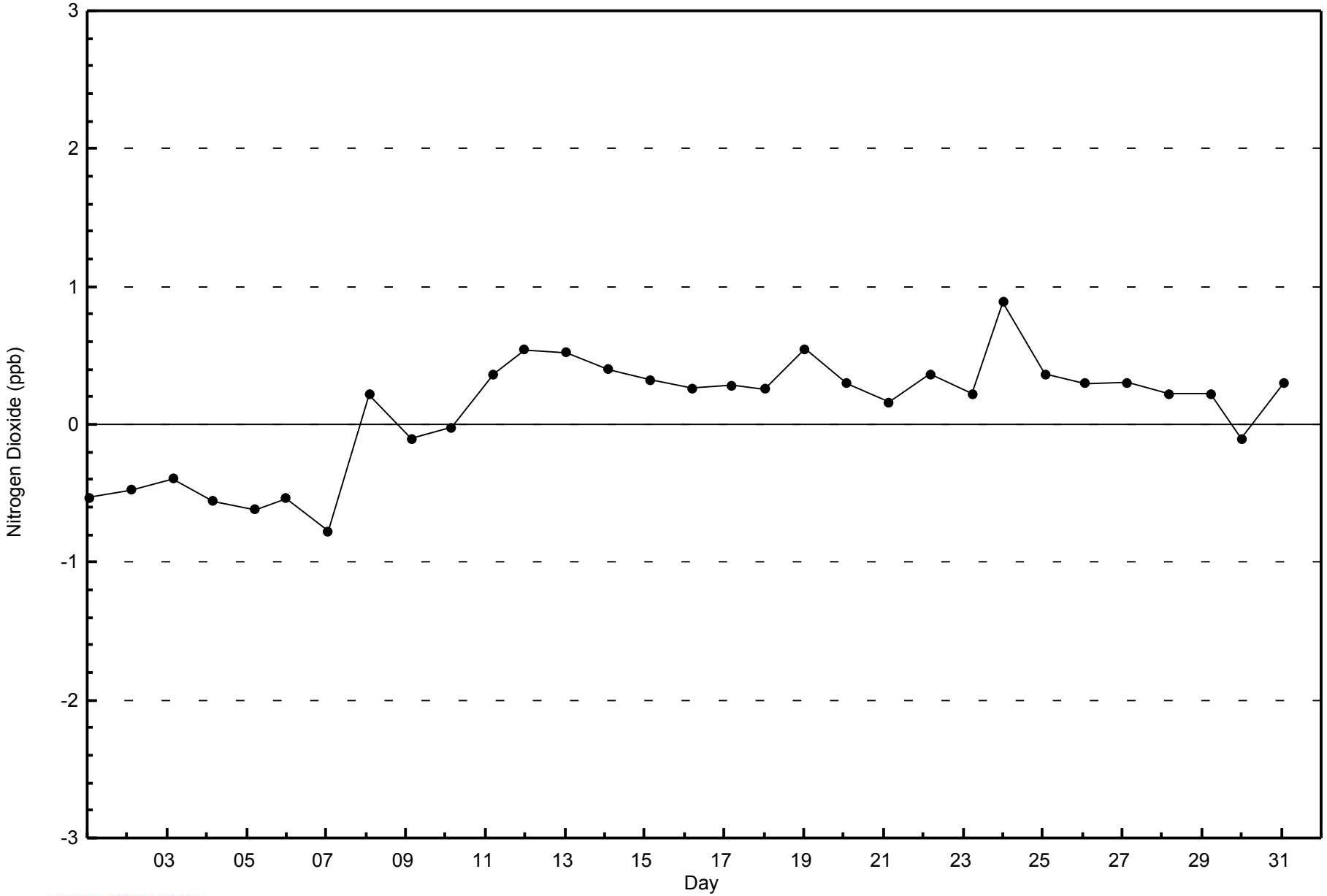
Total Number of Valid Hours: 689

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2015



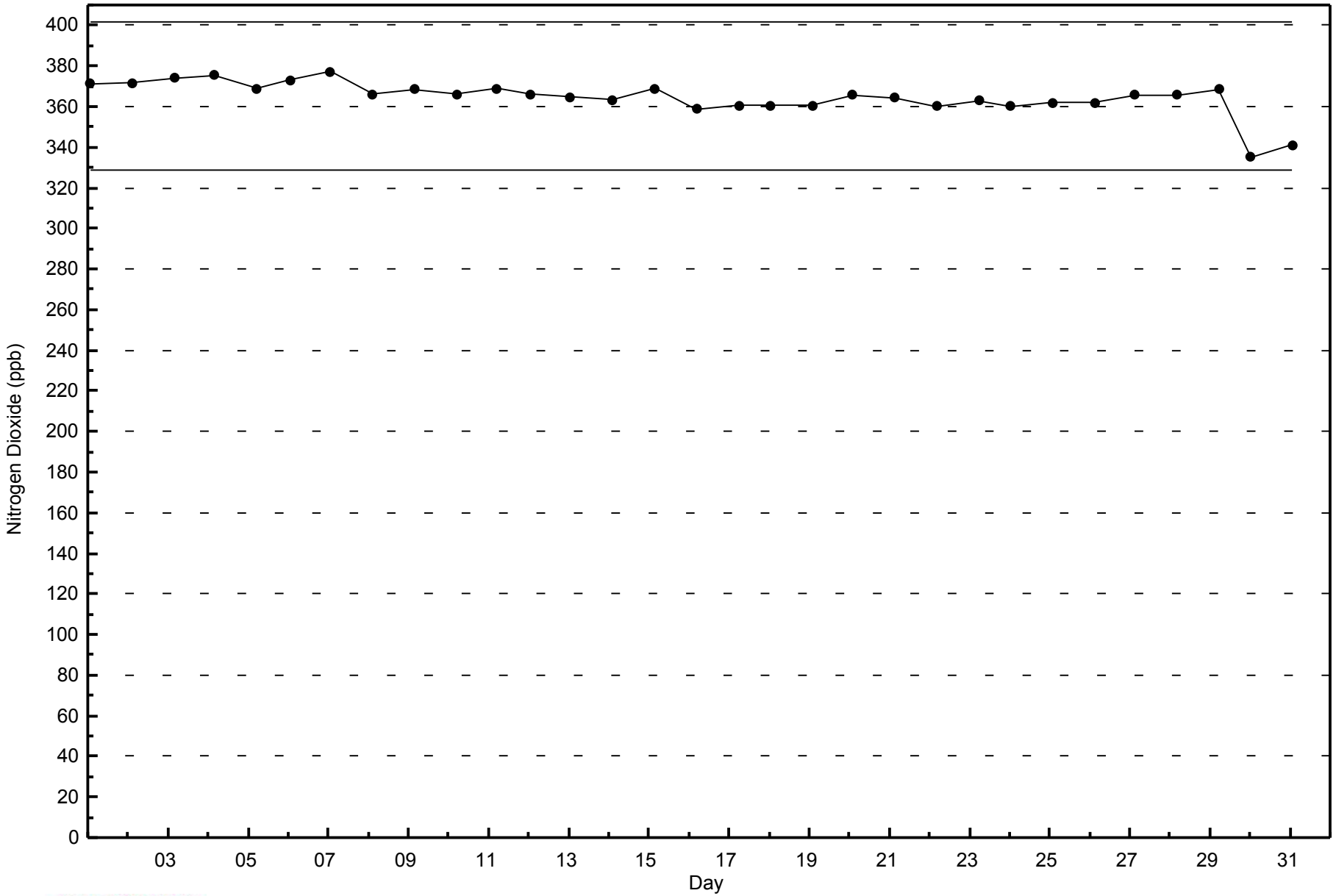
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2015

Maximum Value: 110 ppb on Jan 20 18:00

Maximum Daily Average: 42.1 ppb on Jan 19

Minimum Value: 0 ppb on Jan 22 10:00

Minimum Daily Average: 0.9 ppb on Jan 22

Maximum Diurnal Average: 20.7 ppb at hour 18

Minimum Diurnal Average: 6.5 ppb at hour 1

Monthly Average: 13.7 ppb

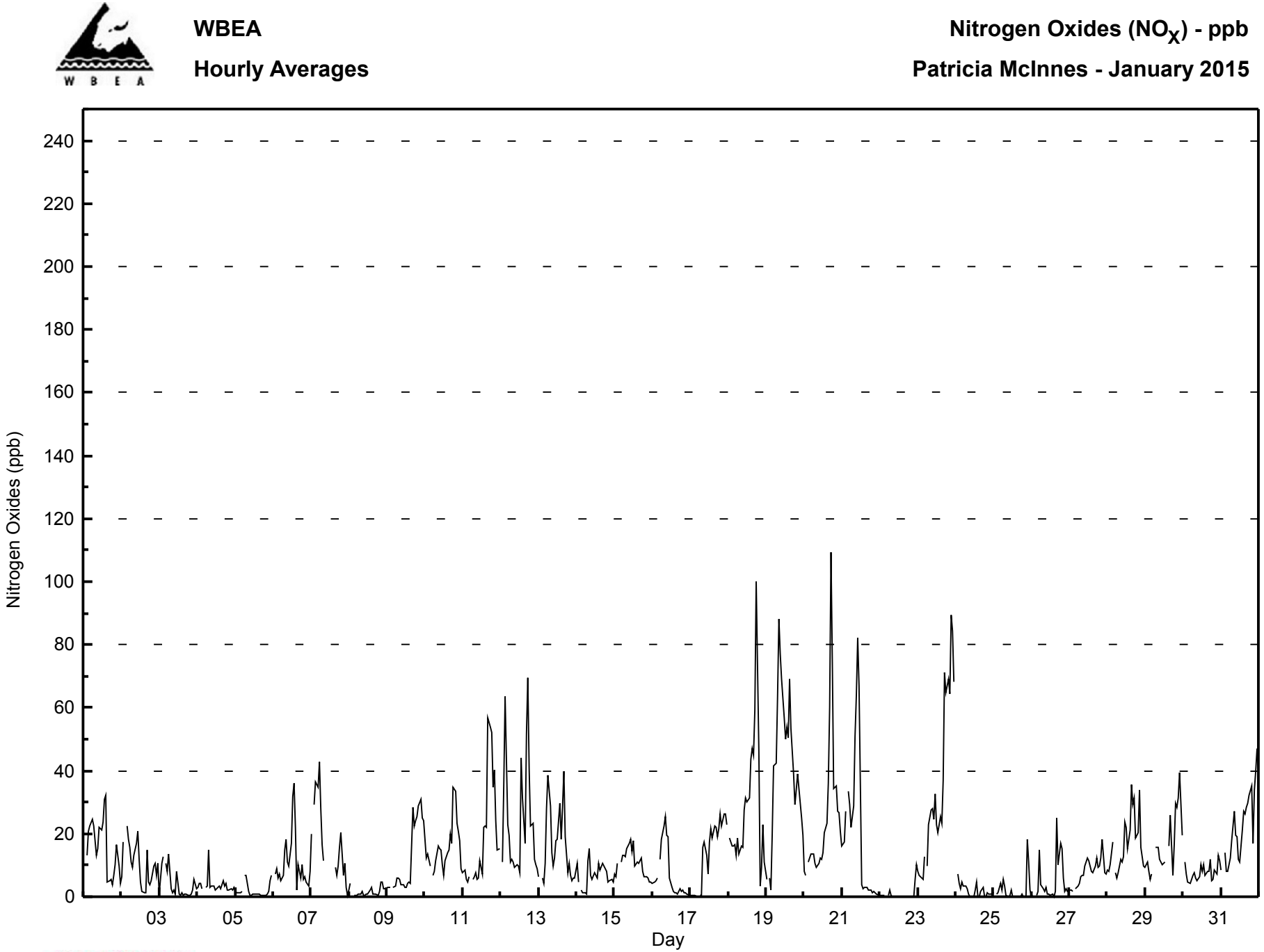
Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 9 $Q_3 = 18$ $P_{90} = 32$ $P_{99} = 74$

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-Jan	8	Z	13	21	22	25	22	18	13	15	22	21	24	31	32	4	5	5	4	7	10	16	10	4	15.4	32
2-Jan	6	17	Z	23	18	16	11	9	13	17	21	12	4	2	1	1	15	5	4	5	10	10	7	11	10.3	23
3-Jan	1	11	13	Z	11	8	14	3	1	2	1	8	1	0	1	0	1	1	0	0	1	2	5	3	3.8	14
4-Jan	3	4	4	2	Z	3	3	15	3	3	3	2	3	3	4	3	5	3	4	2	2	3	2	3	3.6	15
5-Jan	2	1	1	1	2	Z	7	7	2	1	1	1	1	1	1	1	1	0	0	0	1	2	5	7	1.9	7
6-Jan	Z	7	9	6	7	5	7	15	18	11	10	17	32	36	22	2	10	6	10	6	6	5	4	8	11.2	36
7-Jan	20	Z	29	37	35	43	28	17	12	C	C	C	C	C	C	9	7	10	16	20	7	11	3	0	--	43
8-Jan	2	4	Z	1	0	0	1	1	2	0	0	1	1	2	3	1	1	1	1	2	5	5	2	3	1.6	5
9-Jan	3	3	3	Z	3	3	6	6	6	4	4	3	3	4	5	4	29	23	24	25	29	31	25	24	11.7	31
10-Jan	18	12	13	10	Z	7	8	11	16	15	15	10	7	11	14	15	20	17	35	33	23	21	18	9	15.6	35
11-Jan	8	9	5	5	7	Z	5	6	8	6	6	11	7	22	22	22	57	54	52	35	40	24	15	15	19.2	57
12-Jan	Z	11	35	64	23	20	11	12	11	9	10	10	7	44	31	17	52	70	41	23	23	12	10	9	24.1	70
13-Jan	7	Z	6	4	10	28	39	29	14	10	12	18	18	30	18	28	40	19	8	10	7	5	6	6	16.2	40
14-Jan	11	5	Z	2	1	1	1	12	15	7	5	7	7	6	10	8	11	10	9	8	5	5	5	5	6.8	15
15-Jan	7	6	11	Z	11	13	13	13	15	17	18	15	18	10	11	11	11	12	8	6	7	6	5	5	10.8	18
16-Jan	4	5	5	6	Z	12	18	23	26	19	19	6	3	2	1	1	1	2	2	2	1	1	1	0	7.0	26
17-Jan	1	0	0	0	0	Z	0	0	16	17	13	7	18	22	19	23	22	19	22	26	22	26	26	23	14.0	26
18-Jan	Z	19	16	16	16	13	19	14	16	16	28	31	30	31	44	47	45	59	100	46	3	9	23	11	28.4	100
19-Jan	5	Z	6	2	20	42	42	63	88	77	69	57	50	54	51	69	53	39	29	34	39	34	25	20	42.1	88
20-Jan	8	7	Z	11	14	14	13	11	9	10	12	12	14	20	23	36	60	110	75	34	35	27	27	21	26.3	110
21-Jan	16	18	27	Z	33	29	22	29	51	64	82	67	4	3	3	3	3	2	2	1	2	1	1	0	20.2	82
22-Jan	0	1	0	0	Z	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	10	0.9	10
23-Jan	8	7	6	5	13	Z	10	23	27	28	24	32	23	20	26	23	37	71	65	69	64	90	84	68	35.9	90
24-Jan	Z	7	4	3	5	4	3	3	1	0	0	0	2	5	0	0	2	3	0	0	1	1	1	1	2.0	7
25-Jan	1	Z	1	1	4	2	5	4	1	0	1	2	0	0	0	0	0	0	1	0	0	18	11	2	2.4	18
26-Jan	0	0	Z	0	2	15	4	3	2	3	1	1	1	1	0	2	25	10	17	15	6	2	3	2	4.9	25
27-Jan	2	2	2	Z	3	3	4	6	7	7	10	12	11	10	8	8	10	12	9	10	12	18	8	7	7.9	18
28-Jan	9	8	10	17	Z	8	6	8	12	11	13	24	22	15	21	36	29	31	19	20	34	16	13	10	17.0	36
29-Jan	9	11	8	5	7	Z	16	16	16	12	11	10	11	M	M	16	26	7	16	30	28	31	39	19	16.4	39
30-Jan	Z	11	7	4	4	5	7	8	6	5	7	10	8	10	7	8	8	12	5	6	9	7	13	11	7.8	13
31-Jan	8	Z	14	8	8	10	12	18	27	19	19	12	11	21	27	26	28	29	32	35	17	34	40	47	22.0	47
	6.5	7.4	9.6	9.8	10.7	12.7	11.6	12.9	14.6	13.5	14.5	14.0	11.3	14.4	14.0	13.7	19.8	20.7	19.6	16.5	14.5	15.3	14.3	11.7	Diurnal Average	
	20	19	35	64	35	43	42	63	88	77	82	67	50	54	51	69	60	110	100	69	64	90	84	68	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Nitrogen Oxides (NO_X) - ppb
Patricia McInnes - January 2015
Nitrogen Oxides (ppb)
0
20
40
60
80
100
120
140
160
180
200
220
240
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	550	78.01	78.01
21 - 40	113	16.03	94.04
11 - 80	36	5.11	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	77	14	0	3	2	25	17	9	23	46	106	72	37	28	26	57	542
21 - 40	9	6	3	3	3	5	19	17	10	3	2	2	1	2	4	23	112
11 - 80	7	3	0	1	1	0	3	8	3	3	0	0	1	0	0	1	31
81 - 159	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	1	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	93	23	3	7	6	30	41	34	36	53	108	74	39	30	30	82	689

Total Number of Valid Hours: 689

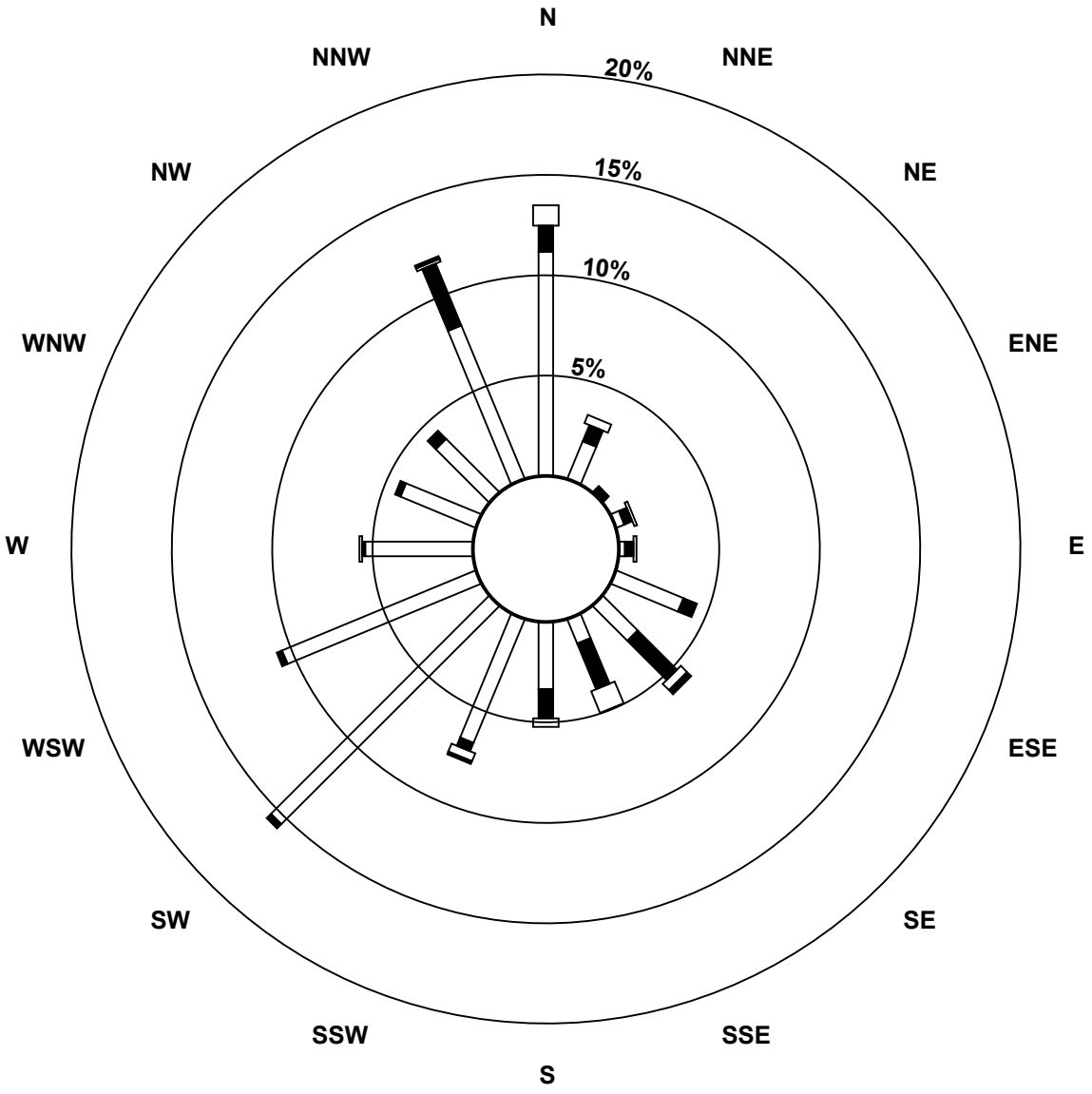
Total Number of Hours: 744

Wood Buffalo Environmental Association

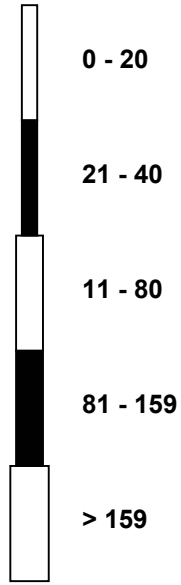
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes (AMS 6)



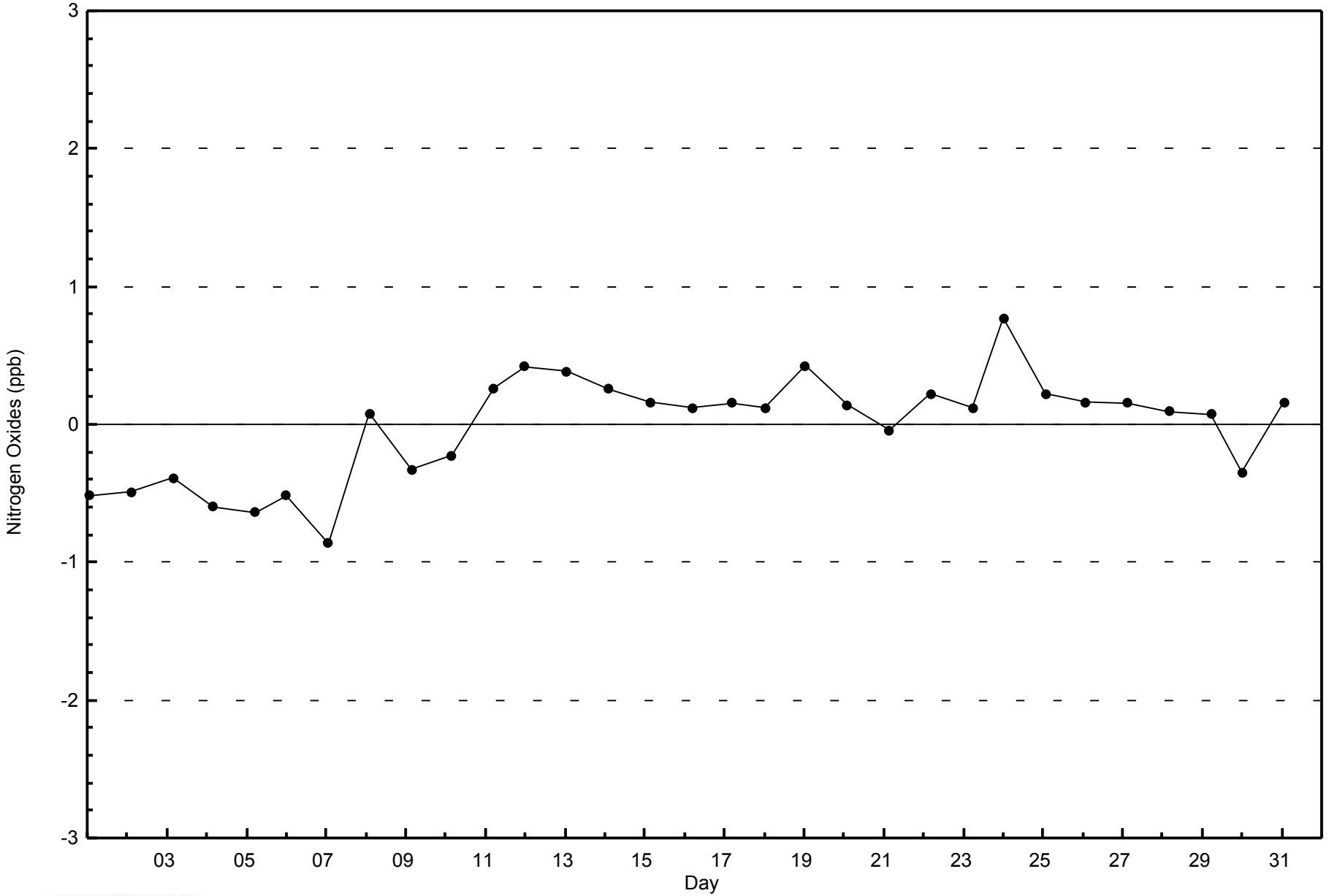
Classes (ppb)



Total Number of Valid Hours: 689

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Patricia McInnes - January 2015



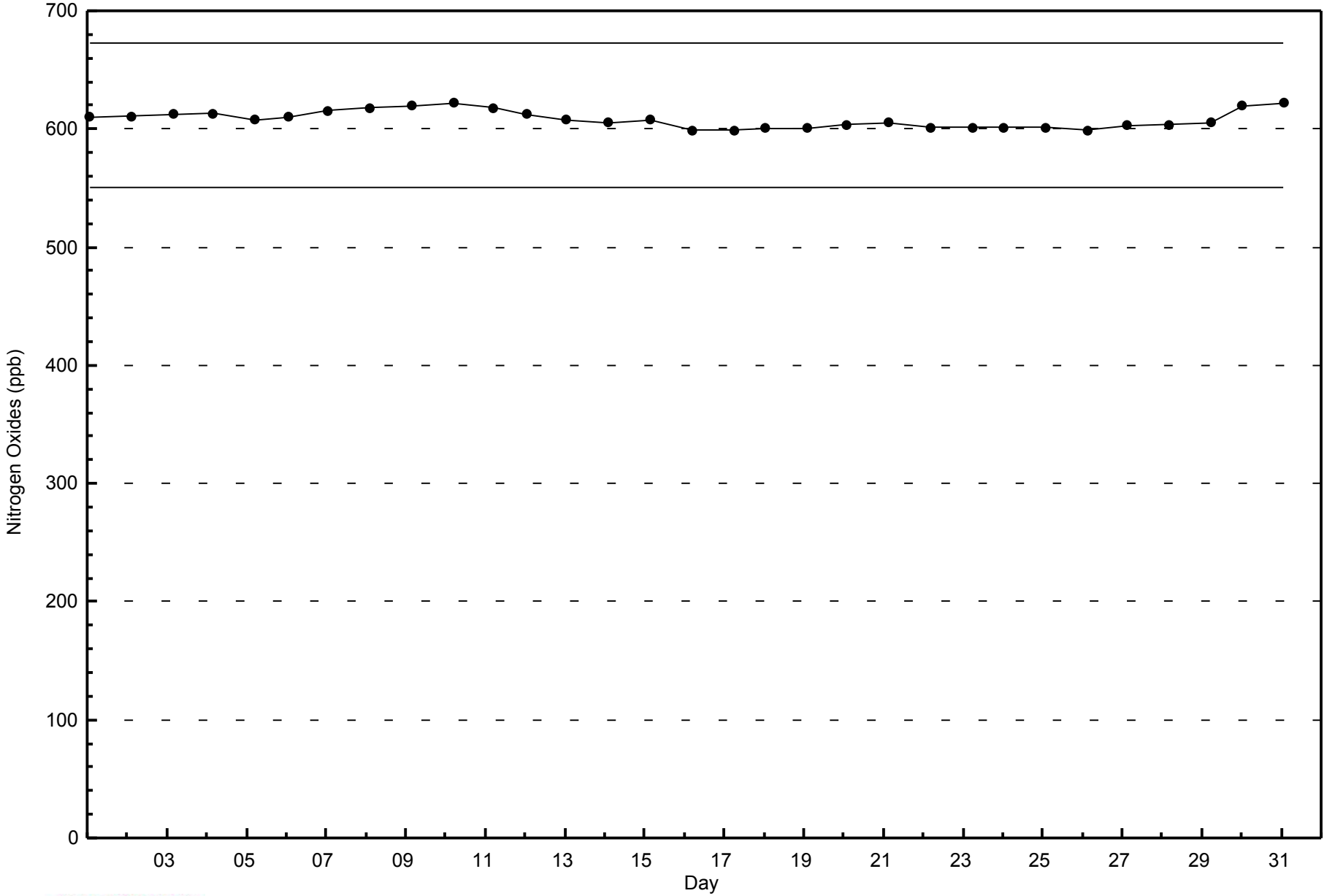
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0
Maximum Value: 0 ppb on Jan 1 01:00 Maximum Daily Average: 0.0 ppb on Jan 1

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 1
Maximum Diurnal Average: 0.0 ppb at hour 1 Minimum Diurnal Average: 0.0 ppb at hour 1
Monthly Average: 0.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 0$

Hours in Service:	744
Hours of Data:	651
Hours of Missing Data:	93
Hours of Calibration:	37
Percent Operational Time:	92.5

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-Jan	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
2-Jan	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
3-Jan	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
4-Jan	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
5-Jan	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
6-Jan	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
7-Jan	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
8-Jan	0	0	0	0	0	Z	RE	0	0	0	0	0	M	M	M	M	M	M	M	M	M	M	M	M	--	0
9-Jan	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	C	C	RE	RE	RE	0	0	0	--	0
10-Jan	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
11-Jan	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
12-Jan	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
13-Jan	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
14-Jan	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
15-Jan	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
16-Jan	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
17-Jan	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
18-Jan	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
19-Jan	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
20-Jan	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
21-Jan	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
22-Jan	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
23-Jan	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
24-Jan	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
25-Jan	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
26-Jan	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
27-Jan	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
28-Jan	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
29-Jan	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
30-Jan	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
31-Jan	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Diurnal Maximum	

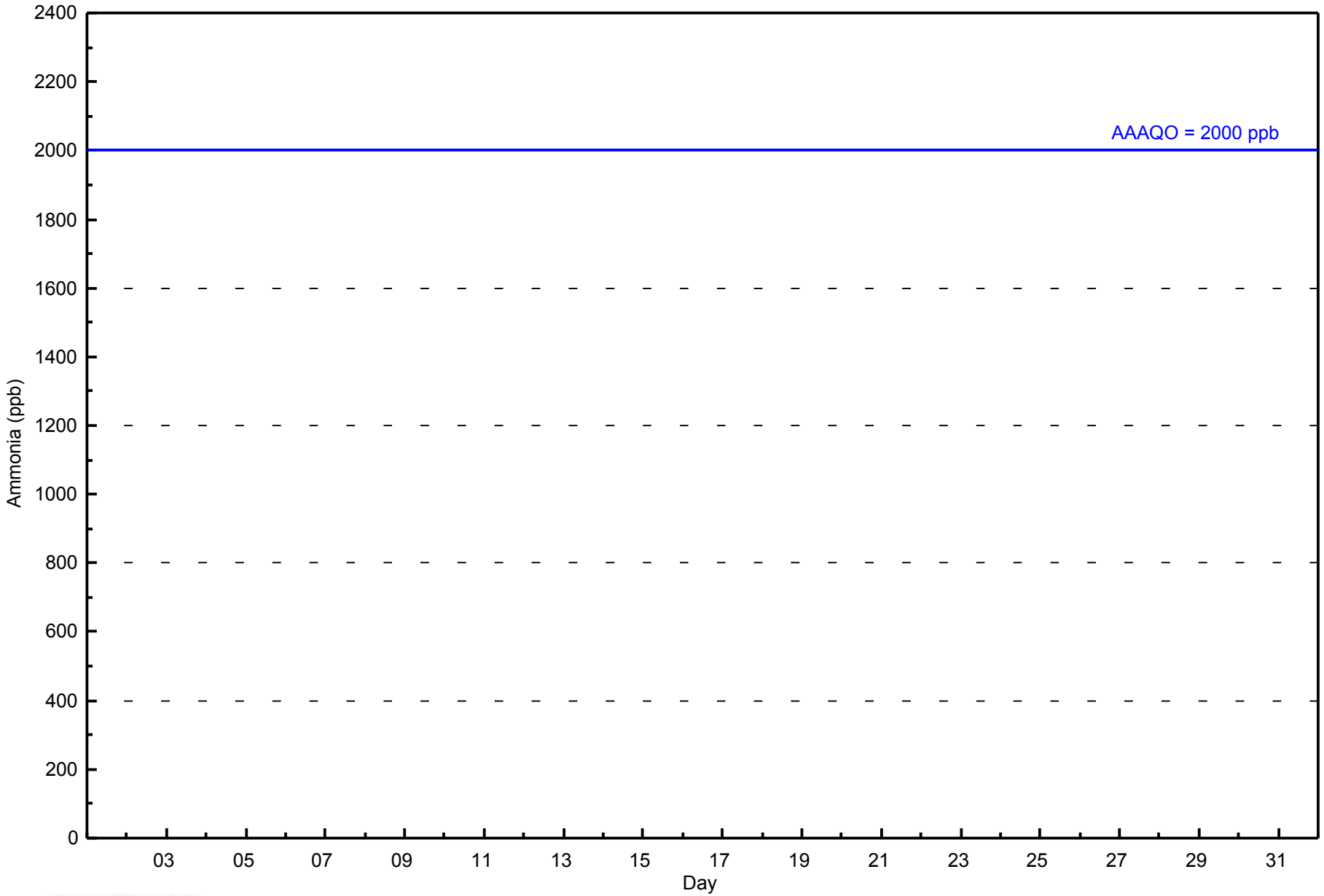
Z - zerospan C - Calibration M - Maintenance RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb

WBEA

Hourly Averages

Ammonia (NH_3) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	651	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: 651

Total Number of Hours: 744

WBEA

Frequency Distribution

Ammonia (NH_3) - ppb

Patricia McInnes - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	88	19	4	7	7	30	42	28	40	44	93	71	33	23	27	80	636
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	88	19	4	7	7	30	42	28	40	44	93	71	33	23	27	80	636

Total Number of Valid Hours: 636

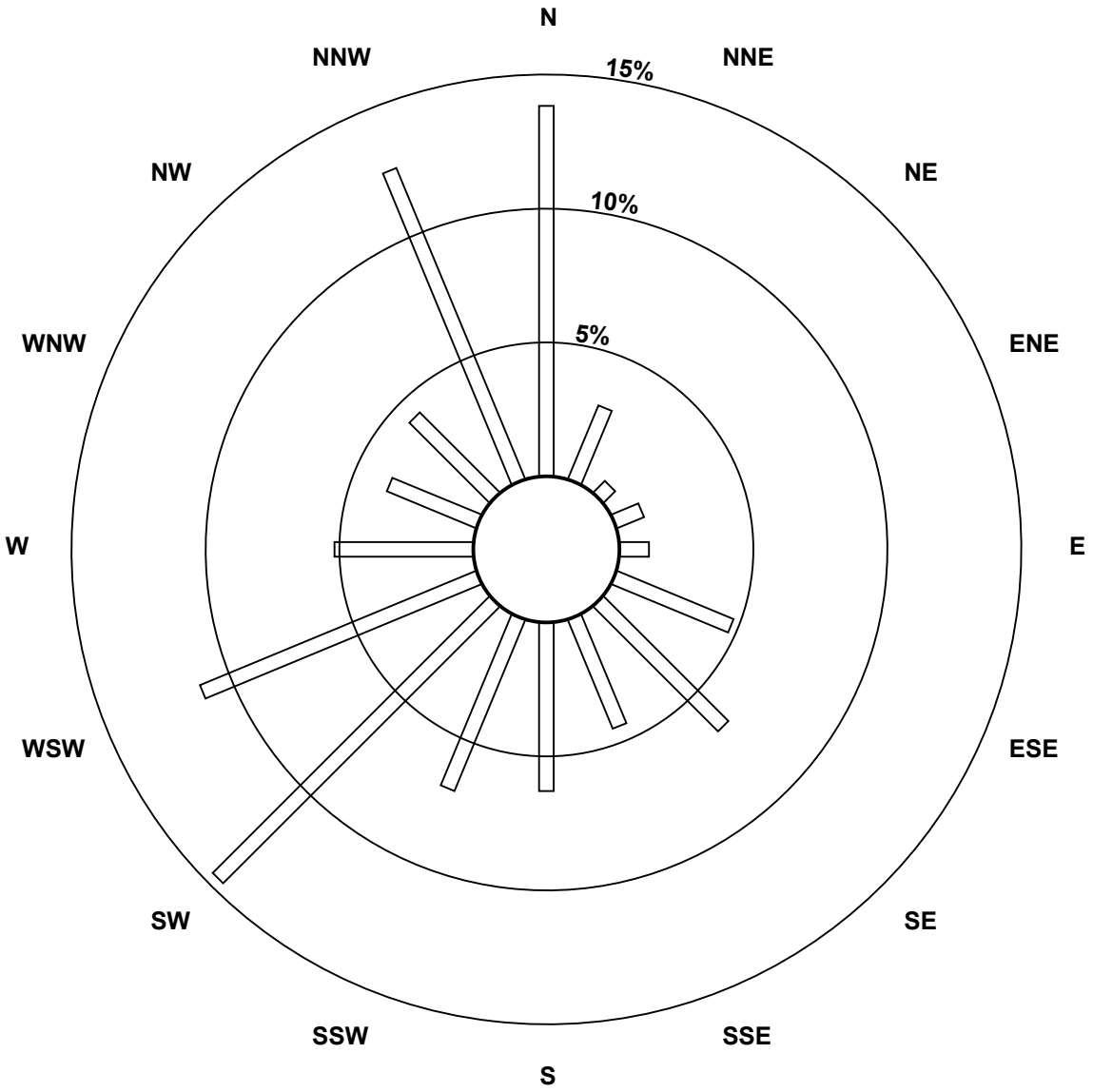
Total Number of Hours: 744

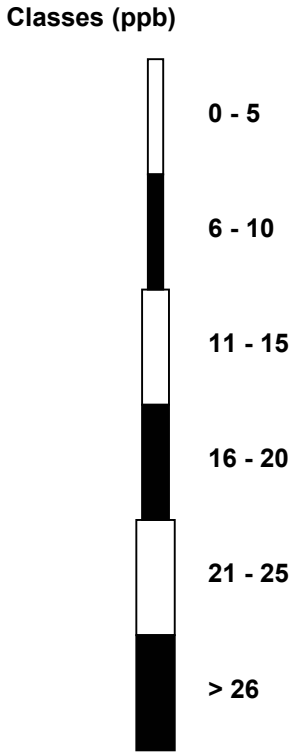
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Ammonia (NH_3) - ppb

Patricia McInnes (AMS 6)





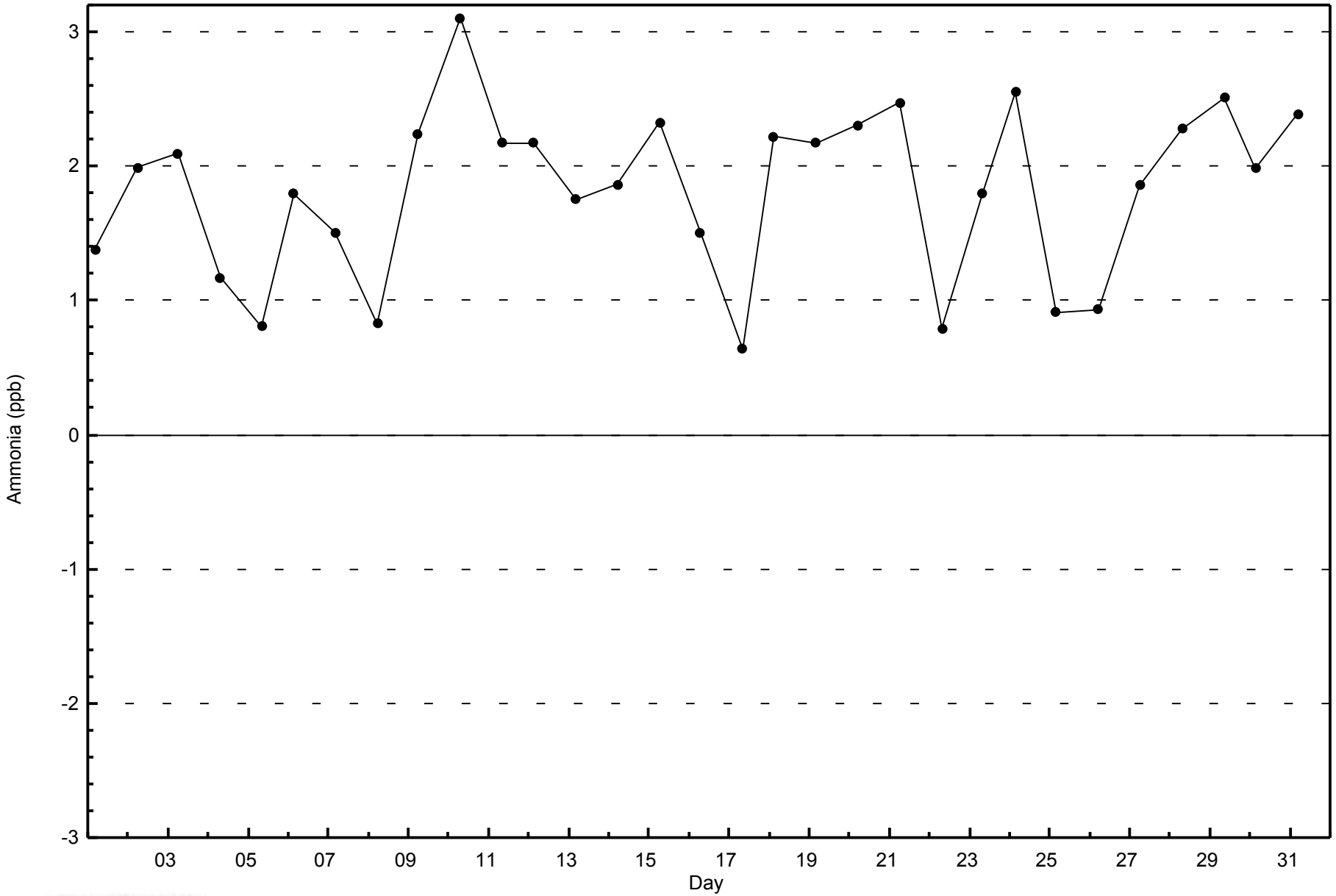
Total Number of Valid Hours: 636

WBEA

Zero Responses

Ammonia (NH_3) - ppb

Patricia McInnes - January 2015



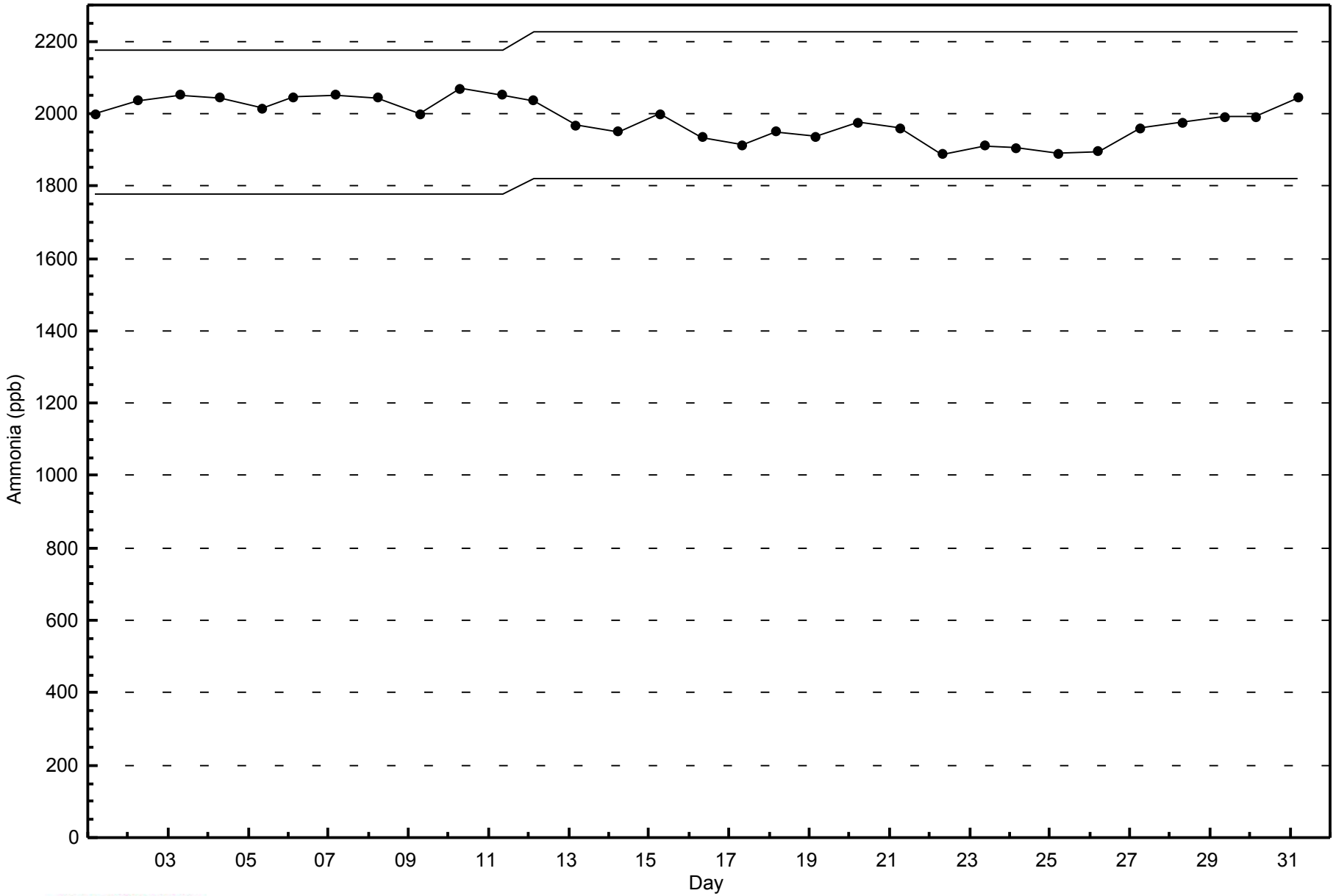
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Ammonia (NH_3) - ppb

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

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

Maximum Value: 30.9 $\mu g/m^3$ on Jan 11 19:00

Maximum Daily Average: 12.2 $\mu g/m^3$ on Jan 23

Minimum Value: 0.0 $\mu g/m^3$ on Jan 8 10:00

Minimum Daily Average: 1.0 $\mu g/m^3$ on Jan 25

Maximum Diurnal Average: 6.8 $\mu g/m^3$ at hour 20

Minimum Diurnal Average: 3.5 $\mu g/m^3$ at hour 13

Monthly Average: 4.78 $\mu g/m^3$

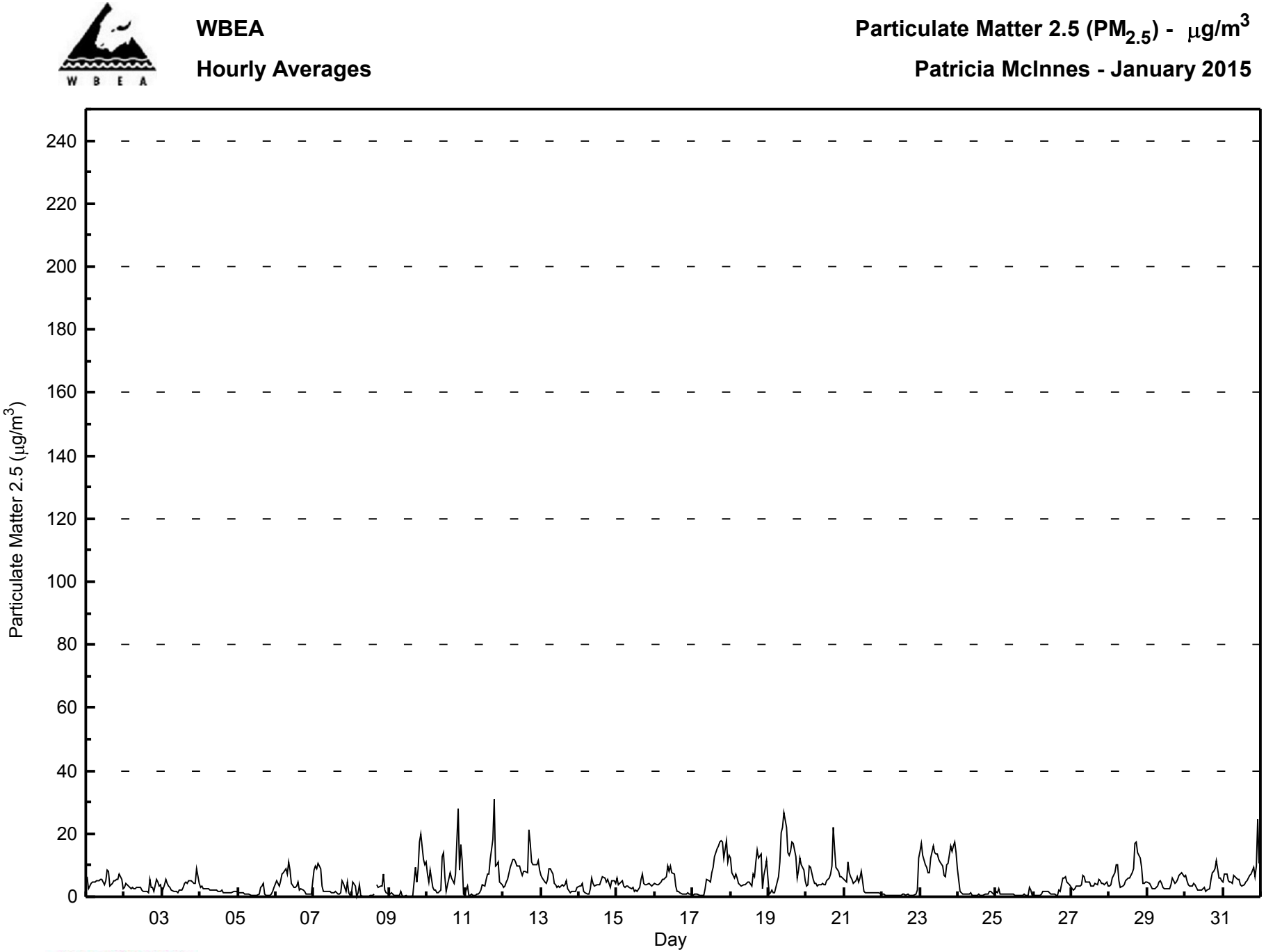
Percentiles: P_1 = 0.0 P_{10} = 0.6 Q_1 = 1.4 Median = 3.7 Q_3 = 6.2 P_{90} = 10.8 P_{99} = 21.9

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-Jan	6.4	2.6	3.3	4.3	4.6	4.6	5.0	4.9	5.1	5.6	5.7	3.7	4.9	8.7	7.9	3.4	4.4	4.9	5.2	5.6	5.7	7.2	5.4	2.4	5.1	8.7
2-Jan	3.0	4.1	3.6	2.8	2.6	3.1	2.7	2.5	3.1	3.1	3.0	2.1	1.6	1.5	1.5	1.4	5.6	3.1	2.9	1.8	5.4	4.9	3.3	4.0	3.0	5.6
3-Jan	1.5	3.7	5.5	4.4	3.5	2.9	2.3	1.9	1.9	1.7	1.2	2.1	1.9	3.2	4.3	4.6	4.4	5.0	4.9	4.6	4.4	4.3	8.7	4.4	3.6	8.7
4-Jan	3.1	3.2	2.7	2.5	2.6	2.3	2.2	2.3	2.3	2.3	2.1	1.5	1.7	1.5	2.1	1.2	1.2	1.3	1.3	1.1	1.3	1.5	1.6	1.6	1.9	3.2
5-Jan	1.4	1.4	1.2	1.1	0.9	0.8	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.7	2.9	3.4	4.4	0.8	0.5	0.5	0.5	0.9	1.9	2.9	1.2	4.4
6-Jan	5.3	4.2	3.3	5.1	7.2	7.8	9.1	7.3	11.0	8.7	4.4	2.9	3.0	3.4	4.7	2.2	2.4	2.0	1.7	1.0	0.9	0.7	0.7	4.8	4.3	11.0
7-Jan	8.6	9.6	8.7	10.5	8.8	3.5	1.9	1.9	1.9	1.9	1.5	1.2	1.2	1.1	1.6	0.7	0.8	1.3	5.3	4.4	1.6	4.8	1.1	0.3	3.5	10.5
8-Jan	0.8	4.5	3.5	0.2	1.1	3.8	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.5	0.7	M	3.7	3.0	3.4	3.3	7.3	2.2	1.3	1.0	1.8	7.3
9-Jan	1.0	1.1	0.7	0.5	0.3	0.2	0.5	1.6	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.3	9.4	4.7	8.9	17.2	19.7	12.0	10.1	10.9	4.2	19.7
10-Jan	7.3	4.6	8.4	2.9	2.3	2.3	1.2	1.3	2.1	12.6	13.8	6.3	1.8	3.8	7.7	5.9	5.2	4.3	7.4	28.1	8.3	16.4	11.6	0.9	6.9	28.1
11-Jan	0.8	3.5	0.5	0.6	0.9	0.6	0.5	1.0	0.8	1.1	2.1	3.8	3.6	5.5	7.3	7.1	11.9	18.4	30.9	9.5	10.0	11.2	4.6	4.0	5.8	30.9
12-Jan	3.0	3.3	4.5	5.6	9.3	10.7	11.8	11.7	11.1	9.9	9.7	8.2	6.7	8.2	8.0	7.5	21.3	16.9	11.0	10.0	10.0	10.2	11.2	8.4	9.5	21.3
13-Jan	6.8	6.1	4.6	4.3	5.5	8.8	9.0	7.3	4.3	3.7	3.1	3.4	2.8	3.8	3.4	4.0	5.1	2.7	1.3	1.6	1.7	1.5	1.8	2.8	4.1	9.0
14-Jan	3.2	3.5	4.3	1.8	1.2	0.9	0.7	2.5	6.0	4.1	3.4	3.6	4.0	3.9	4.9	6.3	6.1	4.9	5.4	4.3	3.1	5.0	5.3	4.1	3.9	6.3
15-Jan	6.1	3.9	4.4	5.3	3.6	2.9	3.3	3.4	3.0	2.4	3.1	1.8	2.1	1.9	2.8	5.4	7.1	4.2	3.7	3.9	4.1	3.6	3.2	3.7	3.7	7.1
16-Jan	4.0	3.8	4.0	4.1	4.8	5.7	5.5	6.5	9.9	8.0	9.9	7.6	7.0	3.4	1.6	1.5	1.3	1.0	0.9	0.9	0.7	1.1	0.8	0.6	4.0	9.9
17-Jan	0.6	0.7	0.7	0.6	0.6	0.5	0.5	0.5	2.7	5.6	4.9	4.5	7.5	9.3	12.9	15.1	16.3	17.6	17.9	17.3	12.4	17.6	11.2	13.0	7.9	17.9
18-Jan	12.5	7.6	6.0	7.1	6.1	4.3	3.8	3.5	3.8	4.0	4.2	4.6	4.5	3.3	7.1	6.2	11.1	14.9	12.5	13.7	2.7	6.9	9.1	11.6	7.1	14.9
19-Jan	1.0	1.4	2.0	1.3	1.4	2.8	6.5	11.1	20.5	22.0	26.7	22.0	14.2	13.3	14.4	17.5	17.1	12.9	5.9	8.7	12.4	10.0	8.6	4.9	10.8	26.7
20-Jan	3.3	3.7	9.9	9.3	5.4	4.4	4.1	3.6	3.6	3.9	4.2	3.9	3.8	5.1	6.1	7.2	9.9	22.2	15.1	9.1	8.0	6.4	6.2	6.1	6.9	22.2
21-Jan	5.6	4.8	10.8	7.6	6.3	5.4	4.4	5.3	6.3	4.8	6.0	8.0	1.7	1.4	1.2	1.1	1.2	1.4	1.5	1.4	1.3	1.3	1.1	0.9	3.8	10.8
22-Jan	0.8	0.7	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	2.3	12.3	1.2	12.3
23-Jan	14.5	17.2	13.1	10.2	9.5	7.8	7.7	12.2	16.3	14.0	13.7	13.5	12.0	10.8	9.6	6.8	6.3	10.1	10.6	15.9	14.3	16.3	17.4	14.0	12.2	17.4
24-Jan	9.0	1.8	1.3	0.9	0.9	1.0	0.8	0.9	1.2	0.5	0.5	0.4	0.5	0.8	0.5	0.5	0.6	0.7	0.7	0.7	1.9	1.8	0.7	0.6	1.2	9.0
25-Jan	1.7	1.3	2.7	0.9	0.9	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	2.9	2.0	0.6	1.0	2.9
26-Jan	0.5	0.5	0.5	0.5	0.6	0.8	1.6	1.9	1.8	1.6	1.2	0.9	0.8	0.7	0.6	0.6	2.2	1.8	6.1	6.0	6.3	4.5	4.3	3.9	2.1	6.3
27-Jan	2.6	2.3	2.7	3.3	3.5	3.4	3.8	6.9	6.5	4.7	4.5	4.5	3.5	3.4	3.5	4.3	3.6	5.7	5.0	4.1	4.2	4.0	4.7	3.6	4.1	6.9
28-Jan	3.3	3.7	6.1	7.7	10.0	10.1	5.0	3.1	3.5	3.7	5.0	5.5	5.8	5.8	7.7	9.0	17.2	17.4	13.9	12.3	9.2	4.4	4.4	4.8	7.4	17.4
29-Jan	4.8	4.4	3.6	2.6	2.4	2.7	3.3	4.5	4.9	4.1	3.0	2.5	2.4	2.4	2.4	3.7	5.8	4.2	4.6	5.6	6.7	7.4	7.4	6.1	4.2	7.4
30-Jan	6.9	5.2	4.0	3.3	3.4	4.3	3.6	2.9	2.3	2.2	2.1	2.4	3.1	1.7	2.0	2.7	5.4	7.5	7.9	8.7	11.3	5.7	6.0	5.1	4.6	11.3
31-Jan	4.9	7.3	7.1	5.0	4.5	4.6	4.4	6.8	5.9	5.3	5.6	3.9	3.5	3.9	4.7	5.1	5.9	6.6	7.2	9.2	6.2	9.7	24.6	10.6	6.8	24.6
	4.3	4.1	4.3	3.8	3.7	3.7	3.5	3.9	4.7	4.6	4.7	4.1	3.5	3.7	4.4	4.5	6.4	6.5	6.6	6.8	5.9	6.0	5.9	5.0	Diurnal Average	
	14.5	17.2	13.1	10.5	10.0	10.7	11.8	12.2	20.5	22.0	26.7	22.0	14.2	13.3	14.4	17.5	21.3	22.2	30.9	28.1	19.7	17.6	24.6	14.0	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$


WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - μg/m^3
Patricia McInnes - January 2015
Particulate Matter 2.5 (μg/m^3)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	377	50.74	50.74
6 - 15	197	26.51	77.25
16 - 25	25	3.36	80.62
26 - 80	3	0.40	81.02
> 81.0	0	0.00	81.02

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Patricia McInnes - January 2015

Concentration	**Wind Direction**																
Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	69	14	1	3	4	29	27	7	13	30	57	28	13	16	19	44	374
6 - 15	20	9	2	4	4	3	16	20	26	14	14	7	4	2	9	37	191
16 - 25	7	0	1	0	0	1	2	3	1	1	0	0	0	1	0	5	22
26 - 80	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	97	23	4	7	8	33	45	31	40	46	71	35	17	19	28	86	590

Total Number of Valid Hours: 726

Total Number of Hours: 744

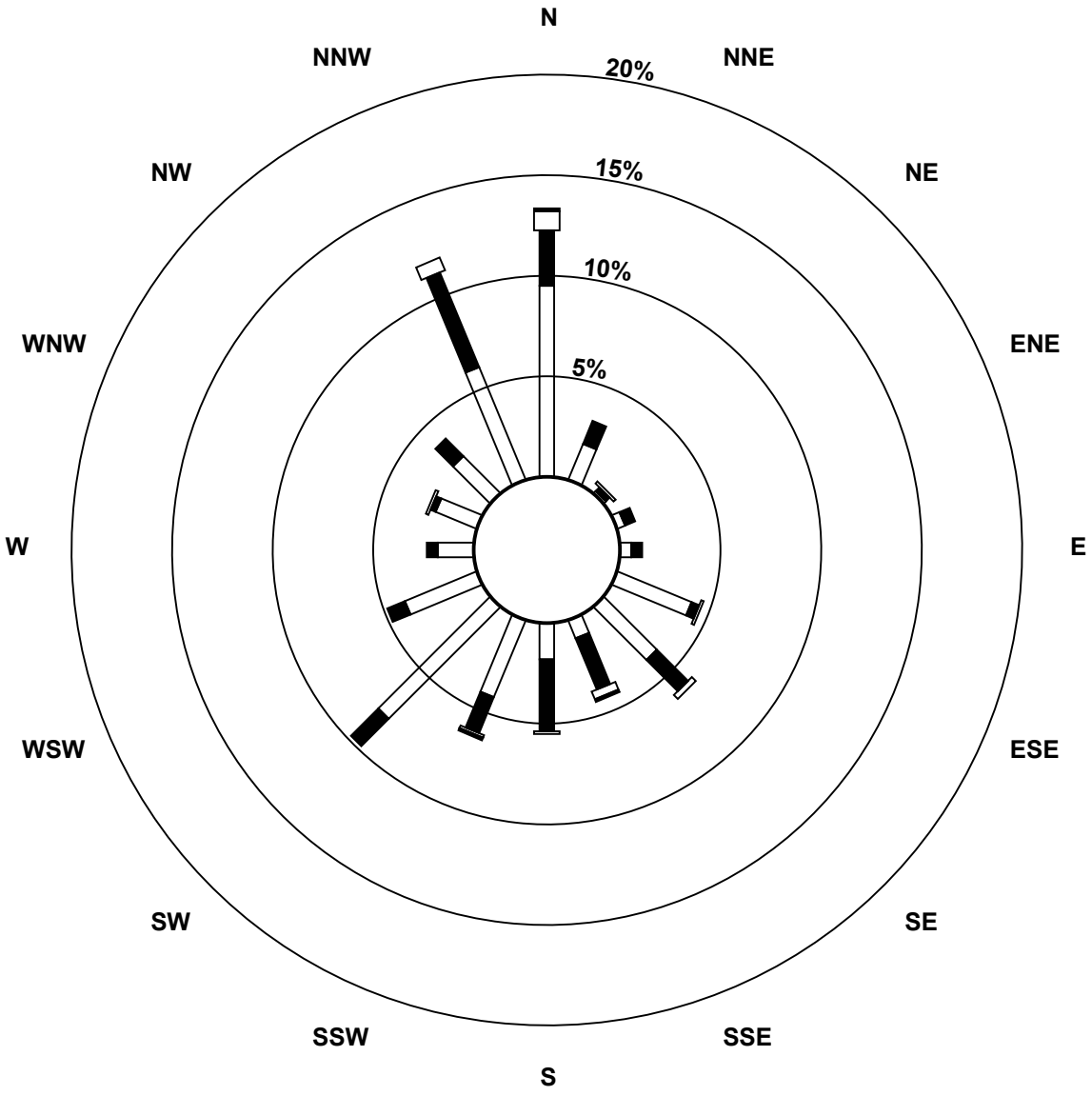
AURORA
ATMOSPHERICS INC.

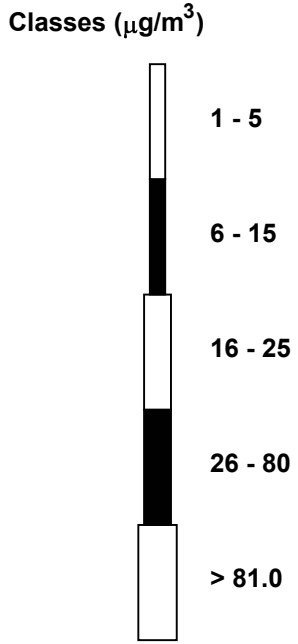
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Patricia McInnes (AMS 6)





Total Number of Valid Hours: 726

Maximum Value: 7.2 C on Jan 25 16:00

Maximum Daily Average: 4.0 C on Jan 22

Minimum Value: -32.7 C on Jan 31 05:00

Minimum Daily Average: -27.7 C on Jan 31

Maximum Diurnal Average: -10.9 C at hour 15

Minimum Diurnal Average: -15.4 C at hour 9

Monthly Average: -13.92 C

Percentiles: P_1 = -31.3 P_{10} = -26.3 Q_1 = -21.4 Median = -15.6 Q_3 = -7.6 P_{90} = 1.6 P_{99} = 6.2

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

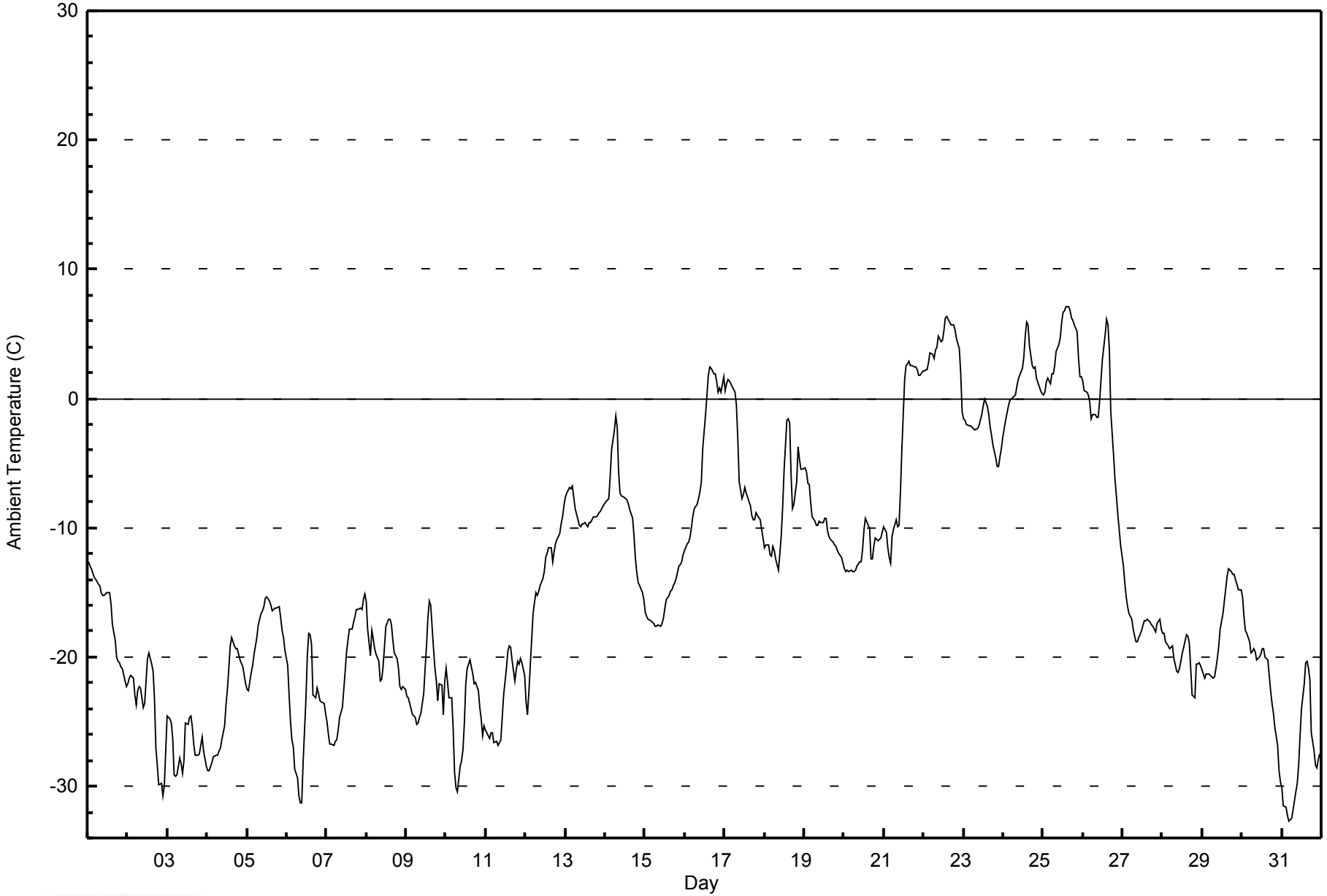
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-12.6	-12.9	-13.1	-13.5	-13.8	-14.1	-14.4	-14.5	-15.0	-15.2	-15.2	-15.0	-15.0	-15.0	-15.8	-17.5	-18.7	-20.0	-20.4	-20.4	-20.7	-20.9	-21.8	-22.3	-16.6	-12.6
2-Jan	-22.1	-21.7	-21.5	-21.6	-23.0	-23.7	-22.6	-22.2	-22.4	-24.0	-23.6	-21.9	-20.1	-19.7	-20.6	-21.1	-23.2	-27.1	-28.4	-29.9	-29.8	-30.8	-30.0	-27.3	-24.1	-19.7
3-Jan	-24.5	-24.7	-25.1	-26.3	-29.1	-29.3	-29.1	-27.8	-28.2	-29.0	-28.1	-25.2	-25.2	-24.7	-24.5	-25.4	-26.8	-27.6	-27.6	-27.5	-26.8	-26.2	-27.3	-28.5	-26.9	-24.5
4-Jan	-28.8	-28.8	-28.5	-28.2	-27.7	-27.6	-27.6	-27.3	-27.1	-26.4	-25.3	-23.7	-22.5	-20.8	-19.1	-18.5	-19.1	-19.4	-19.4	-19.8	-20.2	-20.8	-21.4	-22.1	-23.8	-18.5
5-Jan	-22.5	-22.6	-21.2	-20.6	-19.8	-19.2	-18.4	-17.5	-16.7	-16.4	-16.1	-15.4	-15.3	-15.7	-16.0	-16.5	-16.3	-16.3	-16.2	-16.1	-17.0	-18.0	-18.5	-19.5	-17.8	-15.3
6-Jan	-20.7	-23.0	-25.0	-26.4	-27.0	-28.7	-29.3	-30.7	-31.3	-31.3	-28.1	-23.3	-19.9	-18.2	-18.3	-19.0	-22.9	-23.1	-22.4	-22.8	-23.3	-23.5	-23.6	-24.3	-24.4	-18.2
7-Jan	-24.9	-26.0	-26.7	-26.7	-26.9	-26.6	-26.4	-25.6	-24.7	-24.0	-22.5	-21.1	-19.6	-18.7	-17.9	-17.8	-17.3	-16.9	-16.3	-16.4	-16.2	-16.3	-15.5	-15.1	-21.1	-15.1
8-Jan	-15.7	-17.9	-19.8	-17.9	-18.6	-19.3	-19.8	-20.3	-21.8	-21.7	-20.7	-19.2	-17.6	-17.1	-17.0	-17.5	-18.7	-19.7	-20.1	-20.9	-22.3	-22.6	-22.3	-22.6	-19.6	-15.7
9-Jan	-23.0	-23.1	-23.6	-24.1	-24.4	-24.7	-25.2	-25.1	-24.7	-24.3	-22.8	-20.9	-19.1	-17.0	-15.7	-16.0	-19.3	-20.8	-21.8	-23.4	-22.1	-22.1	-24.4	-21.9	-22.1	-15.7
10-Jan	-20.9	-22.0	-23.1	-23.2	-25.5	-28.9	-30.1	-30.4	-28.4	-28.0	-27.1	-25.1	-22.1	-20.8	-20.3	-20.7	-21.4	-22.0	-21.9	-22.6	-23.9	-24.8	-26.1	-25.4	-24.4	-20.3
11-Jan	-25.7	-26.1	-26.3	-25.9	-25.9	-26.6	-26.5	-26.8	-26.6	-26.4	-24.7	-22.9	-20.9	-19.5	-19.1	-19.3	-20.2	-21.8	-21.0	-20.4	-20.6	-20.1	-20.4	-21.4	-23.1	-19.1
12-Jan	-23.5	-24.4	-22.8	-20.7	-16.7	-15.8	-15.0	-15.2	-14.9	-14.5	-14.0	-13.4	-12.4	-12.0	-11.5	-11.5	-12.6	-11.9	-11.2	-10.9	-10.5	-9.7	-9.1	-8.3	-14.3	-8.3
13-Jan	-7.6	-7.4	-6.9	-7.0	-6.7	-7.6	-8.6	-9.3	-9.8	-9.9	-9.7	-9.7	-9.6	-9.9	-9.6	-9.6	-9.4	-9.2	-9.1	-9.0	-8.9	-8.7	-8.5	-8.3	-8.7	-6.7
14-Jan	-7.9	-7.8	-7.7	-6.0	-4.0	-2.5	-1.4	-2.2	-5.6	-7.3	-7.6	-7.6	-7.8	-7.9	-8.2	-8.6	-9.3	-10.6	-12.4	-13.5	-14.3	-14.5	-15.0	-15.6	-8.6	-1.4
15-Jan	-16.5	-16.9	-17.1	-17.2	-17.3	-17.4	-17.6	-17.6	-17.5	-17.6	-17.4	-17.0	-16.2	-15.6	-15.2	-14.9	-14.8	-14.5	-14.3	-14.0	-12.9	-12.8	-12.7	-12.1	-15.7	-12.1
16-Jan	-11.8	-11.3	-11.1	-10.7	-10.0	-9.1	-8.5	-8.2	-7.7	-7.2	-6.5	-3.8	-1.3	0.3	1.7	2.4	2.3	1.9	1.9	1.3	0.5	0.9	0.5	1.7	-3.8	2.4
17-Jan	0.6	1.1	1.4	1.3	1.0	0.7	0.5	-0.5	-3.0	-6.4	-7.8	-7.4	-6.9	-7.3	-7.6	-8.3	-9.1	-9.4	-9.4	-8.8	-9.1	-9.4	-10.1	-10.8	-5.2	1.4
18-Jan	-11.5	-11.3	-11.3	-12.1	-12.2	-11.4	-11.7	-12.4	-13.3	-12.0	-10.6	-8.4	-5.6	-1.7	-1.6	-1.9	-5.9	-8.5	-8.2	-6.4	-3.8	-4.7	-5.5	-5.5	-8.2	-1.6
19-Jan	-5.4	-5.7	-6.5	-6.7	-8.1	-9.1	-9.4	-9.8	-9.8	-9.4	-9.6	-9.6	-9.3	-9.3	-10.2	-10.7	-10.9	-11.1	-11.4	-11.5	-11.7	-12.0	-12.3	-12.7	-9.7	-5.4
20-Jan	-13.2	-13.3	-13.3	-13.3	-13.3	-13.4	-13.4	-13.3	-13.0	-12.6	-12.6	-11.6	-10.1	-9.3	-9.8	-10.0	-12.4	-12.4	-11.5	-10.8	-11.0	-10.9	-10.7	-10.4	-11.9	-9.3
21-Jan	-9.9	-10.3	-11.6	-12.4	-12.7	-10.7	-10.1	-9.4	-9.9	-9.8	-7.2	-3.9	1.5	2.5	2.7	2.9	2.6	2.5	2.5	2.4	2.2	1.8	1.8	2.1	-3.8	2.9
22-Jan	2.2	2.2	2.2	2.8	3.6	3.4	3.1	3.8	4.0	4.9	4.4	4.5	5.3	6.2	6.4	6.2	5.7	5.7	5.7	5.2	4.6	3.8	2.0	-1.0	4.0	6.4
23-Jan	-1.6	-1.7	-2.0	-2.1	-2.1	-2.3	-2.4	-2.4	-2.3	-2.1	-1.7	-1.3	-0.6	0.0	-0.6	-1.3	-2.2	-2.8	-3.7	-4.6	-5.3	-5.3	-4.4	-3.9	-2.4	0.0
24-Jan	-3.0	-1.7	-1.1	-0.6	-0.2	0.0	0.1	0.3	0.9	1.5	1.8	2.3	3.2	4.8	5.9	5.7	4.1	2.6	2.3	2.4	1.5	1.2	0.6	0.4	1.5	5.9
25-Jan	0.3	0.5	1.3	1.5	1.2	1.9	1.9	2.6	3.7	4.2	4.7	5.9	6.7	6.8	7.1	7.2	6.8	6.3	6.0	5.7	5.2	3.1	1.7	1.7	3.9	7.2
26-Jan	1.4	0.6	0.5	0.2	-0.2	-1.5	-1.2	-1.2	-1.5	-1.5	-0.3	1.3	3.0	4.9	6.1	5.7	3.7	-1.1	-4.4	-6.2	-7.5	-8.9	-10.1	-11.4	-1.2	6.1
27-Jan	-12.9	-14.3	-15.3	-16.1	-16.6	-17.1	-17.8	-18.4	-18.8	-18.8	-18.5	-18.0	-17.5	-17.2	-17.2	-17.1	-17.3	-17.5	-17.6	-17.8	-18.0	-17.4	-17.1	-17.9	-17.2	-12.9
28-Jan	-18.1	-18.1	-18.8	-19.2	-19.4	-19.3	-19.2	-20.1	-21.0	-21.2	-20.9	-20.3	-19.7	-19.2	-18.3	-18.4	-18.9	-20.9	-22.9	-23.2	-20.6	-20.5	-20.4	-20.6	-20.0	-18.1
29-Jan	-21.0	-21.6	-21.3	-21.3	-21.3	-21.5	-21.6	-21.5	-20.9	-20.1	-19.1	-17.8	-16.7	-15.7	-14.7	-13.8	-13.2	-13.4	-13.6	-13.6	-14.0	-14.4	-14.7	-14.8	-17.6	-13.2
30-Jan	-15.3	-16.9	-18.0	-18.2	-18.8	-19.6	-19.6	-19.4	-19.6	-20.2	-20.0	-19.8	-19.3	-19.4	-20.0	-20.3	-21.5	-22.6	-23.6	-24.3	-25.4	-26.8	-28.8	-29.7	-21.1	-15.3
31-Jan	-30.1	-31.5	-31.6	-32.3	-32.7	-32.6	-32.5	-31.8	-30.4	-29.8	-28.3	-26.0	-24.0	-22.0	-20.4	-20.4	-20.8	-21.8	-25.8	-27.3	-28.4	-28.5	-27.9	-27.5	-27.7	-20.4
	-14.4	-14.8	-15.0	-15.0	-15.1	-15.3	-15.3	-15.3	-15.4	-15.4	-14.7	-13.4	-12.1	-11.2	-10.9	-11.2	-12.2	-13.0	-13.4	-13.7	-13.9	-14.2	-14.6	-14.7	Diurnal Average	
	2.2	2.2	2.2	2.8	3.6	3.4	3.1	3.8	4.0	4.9	4.7	5.9	6.7	6.8	7.1	7.2	6.8	6.3	6.0	5.7	5.2	3.8	2.0	2.1	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Patricia McInnes - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	242	32.53	32.53
-20 - 0	397	53.36	85.89
0 - 10	105	14.11	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

Maximum Value: 98 % on Jan 24 07:00

Maximum Daily Average: 96.4 % on Jan 23

Minimum Value: 56 % on Jan 26 15:00

Minimum Daily Average: 69.8 % on Jan 8

Maximum Diurnal Average: 81.3 % at hour 1

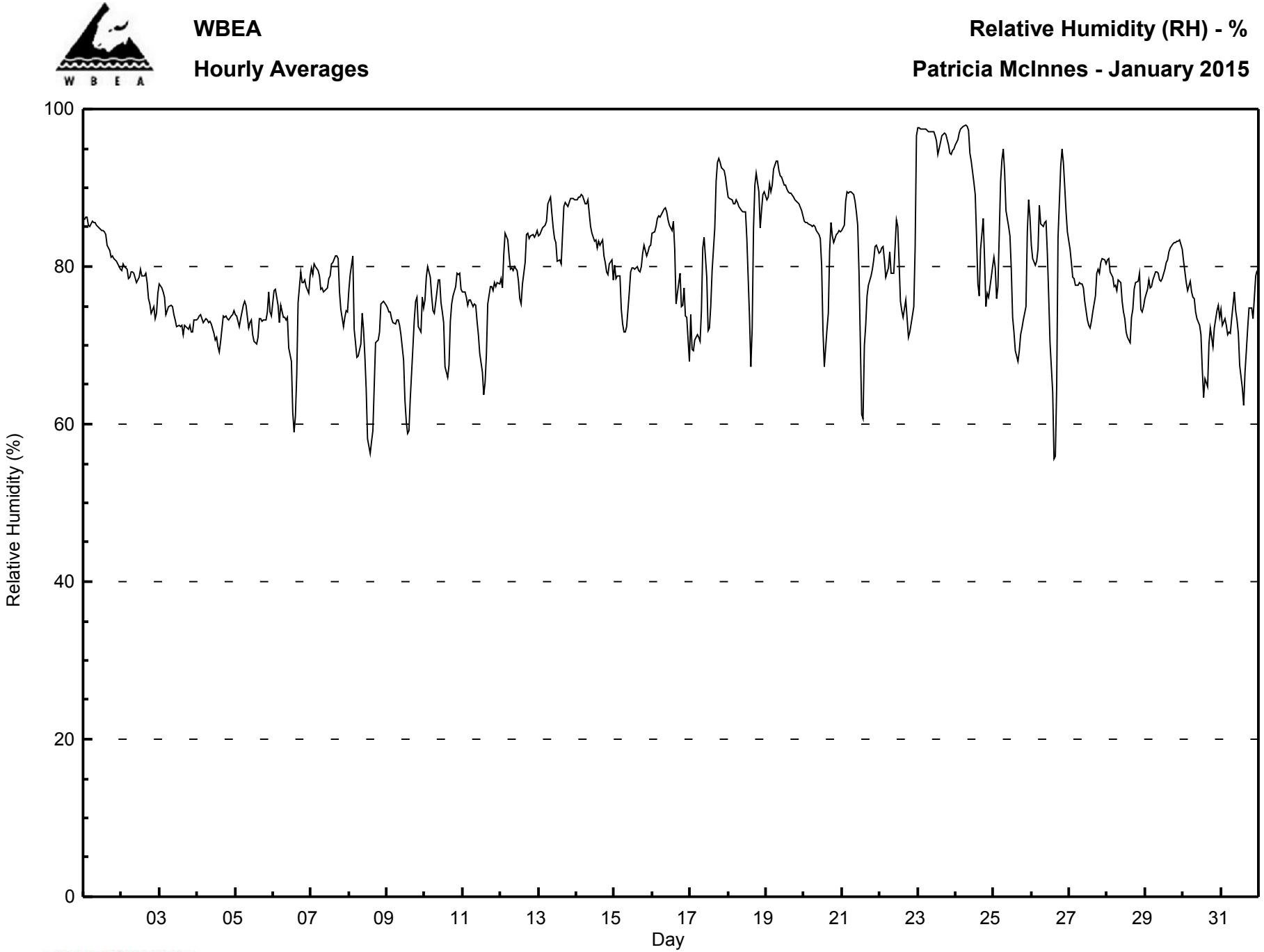
Minimum Diurnal Average: 73.3 % at hour 15

Monthly Average: 79.3 %

Percentiles: P_1 = 59 P_{10} = 71 Q_1 = 74 Median = 79 Q_3 = 84 P_{90} = 89 P_{99} = 97

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-Jan	86	86	86	85	85	86	86	86	85	85	85	85	85	84	84	83	82	81	81	81	81	81	80	80	83.7	86
2-Jan	80	80	80	80	78	79	79	79	79	78	78	79	80	79	79	79	78	76	75	74	75	73	74	77	77.8	80
3-Jan	78	77	77	76	74	74	75	75	75	74	73	72	73	72	73	71	72	72	72	73	72	72	73	73	73.7	78
4-Jan	73	74	74	73	73	73	73	73	73	73	71	71	71	70	69	71	74	74	74	73	73	74	74	74	72.7	74
5-Jan	74	74	72	73	74	75	76	75	72	73	73	71	70	70	71	73	73	73	73	73	74	77	74	74	73.3	77
6-Jan	77	77	76	75	73	75	74	74	73	74	70	68	62	59	61	66	76	79	78	78	78	77	77	79	73.1	79
7-Jan	80	79	80	80	80	79	77	77	77	77	77	79	79	80	81	81	81	81	77	75	72	74	74	74	78.0	81
8-Jan	77	79	81	72	70	68	69	70	74	72	69	64	58	56	58	59	65	70	71	72	75	75	76	75	69.8	81
9-Jan	75	74	74	73	73	73	73	73	73	71	68	63	60	59	59	63	70	73	76	76	72	72	76	75	70.6	76
10-Jan	76	79	80	79	76	74	74	76	78	78	75	74	73	67	66	68	73	75	76	77	79	79	79	77	75.4	80
11-Jan	77	77	76	75	76	76	75	75	75	73	71	69	67	64	65	69	75	78	77	77	78	77	78	78	74.1	78
12-Jan	78	77	81	84	83	81	80	80	79	80	79	78	76	75	78	81	84	84	83	84	84	84	84	85	81.0	85
13-Jan	84	84	85	85	85	86	88	89	87	85	83	83	81	81	80	84	88	88	88	88	89	89	89	88	85.7	89
14-Jan	89	89	89	89	89	88	88	89	87	85	84	83	83	82	83	83	83	81	80	79	79	80	81	78	84.3	89
15-Jan	80	79	79	79	75	73	72	72	72	77	79	80	80	80	80	79	79	80	82	83	81	82	82	83	78.6	83
16-Jan	84	84	85	86	86	86	87	87	88	87	86	85	84	86	82	75	77	79	75	75	77	74	74	68	81.6	88
17-Jan	74	70	69	71	71	71	71	74	82	84	79	72	72	75	80	85	91	93	94	93	93	92	91	90	80.7	94
18-Jan	89	89	89	88	88	88	88	88	87	87	87	87	84	73	67	72	85	90	92	89	85	87	89	90	85.8	92
19-Jan	88	89	91	90	90	92	93	93	92	92	91	90	90	90	89	89	89	89	88	88	88	88	87	86	89.8	93
20-Jan	86	86	86	85	85	85	85	85	85	84	84	80	72	67	72	74	82	86	84	83	84	84	85	84	82.2	86
21-Jan	84	85	88	90	89	89	89	89	88	87	85	79	61	61	70	73	76	78	79	80	81	82	83	82	81.2	90
22-Jan	82	82	83	81	79	80	82	79	79	79	86	85	81	76	74	73	76	73	71	72	73	75	82	97	79.1	97
23-Jan	98	98	98	97	97	97	97	97	97	97	97	97	96	94	96	97	97	97	97	95	94	94	95	95	96.4	98
24-Jan	95	96	97	97	98	98	98	98	97	94	93	91	89	84	78	76	82	86	81	75	77	76	79	80	88.1	98
25-Jan	81	80	76	77	91	94	95	92	87	85	84	80	74	72	69	68	69	71	72	73	75	84	89	86	80.2	95
26-Jan	83	81	80	81	82	88	85	85	86	86	82	76	70	64	56	56	65	84	93	95	93	90	87	84	80.5	95
27-Jan	82	80	79	78	78	78	78	78	78	77	76	73	73	72	73	74	76	79	80	79	80	81	81	80	77.7	82
28-Jan	81	81	79	79	77	78	77	78	78	76	74	73	72	71	70	73	75	77	78	78	79	75	74	75	76.2	81
29-Jan	76	77	78	77	77	78	79	79	79	78	78	78	80	80	81	82	82	83	83	83	83	83	83	82	80.1	83
30-Jan	81	79	78	77	78	77	76	76	74	73	72	71	67	63	66	65	70	72	71	70	72	74	75	74	73.0	81
31-Jan	75	72	73	73	71	72	72	73	77	74	73	72	68	65	62	67	69	72	75	75	73	76	79	79	72.4	79
	81.3	81.1	81.3	80.8	80.8	81.0	81.0	81.1	81.1	80.5	79.5	77.7	75.1	73.3	73.3	74.5	77.9	79.9	79.8	79.6	79.7	80.1	80.7	80.7	Diurnal Average	
	98	98	98	97	98	98	98	98	97	97	97	97	96	94	96	97	97	97	97	95	94	94	95	97	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity (RH) - %
Patricia McInnes - January 2015
100
80
60
40
20
0
Relative Humidity (%)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - January 2015

Maximum Speed: 27 km/h on Jan 22 13:00

Maximum Daily Speed Average: 16.7 km/h on Jan 22

Minimum Speed Value: 1 km/h on Jan 20 13:00

Minimum Daily Speed Average: 1.2 km/h on Jan 20

Maximum Diurnal Speed Average: 4.6 km/h at hour 20

Minimum Diurnal Speed Average: 2.6 km/h at hour 14

Monthly Average Velocity: 3.6 km/h 266.0 deg

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 6 Median = 9 Q_3 = 13 P_{90} = 17 P_{99} = 23

Hours in Service:	744
Hours of Data:	727
Hours of Missing Data:	17
Percent Operational Time:	97.7

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-Jan	N8	N7	N8	N8	N8	NNE7	NNW5	N7	N9	NNW9	NNW9	NNW9	NNW10	NNW14	NNW17	N17	NNW13	NW7	NW8	W5	WSW2	S3	S1	NNW3	NNW7.3	N17
2-Jan	NNW5	NNE6	N6	NNE5	NW4	W5	NW5	NW4	N4	SW3	SW6	WSW7	WNW3	WNW5	WNW6	WNW5	N4	W4	W3	WNW5	NNW3	WSW2	NNW1	WNW4	NW3.1	WSW7
3-Jan	NW8	NNW10	NNW8	NNW4	WNW4	W4	WNW7	WNW8	WNW9	W7	WSW5	S2	WNW10	WNW10	W10	WSW10	WSW12	WSW12	WSW14	WSW12	WSW13	WSW9	SSW9	SW12	W7.3	WSW14
4-Jan	SW9	SW9	SW10	SW13	SW16	SW14	SW16	SW16	SW15	SSW13	SW15	SW16	SSW16	SSW17	SW13	SW15	SW10	SW14	SW10	SW14	SW17	SW16	SW15	SW13	SW13.8	SW17
5-Jan	SW20	WSW20	WSW19	WSW15	SW11	SW11	SW8	WSW8	W10	WNW13	WNW12	WNW11	W12	W14	W15	W12	W12	WNW13	WNW11	WNW10	WNW9	NW9	NNW11	NW9	W10.5	WSW20
6-Jan	NNW6	NW3	SSW1	N4	N4	WSW4	W4	WSW4	WSW3	SW5	SW5	S3	SE3	ESE4	WSW1	WSW7	SW6	WSW9	SW9	WSW10	SW10	SW11	SSW12	SSW6	WSW4.0	SSW12
7-Jan	SSE5	S4	SSE4	SSE5	SSE5	SE4	SE7	SE9	SE11	SE12	SE15	ESE9	ESE7	SE5	SW3	W4	NW6	NNW7	NNW20	NNW24	NNW22	NW17	NW20	NW21	N1.6	NNW24
8-Jan	NNW20	NNW11	WNW2	WNW17	WNW18	WNW16	WNW13	W13	WSW15	WSW17	WSW18	WSW15	W16	WNW18	W16	W15	W12	WSW14	W12	WSW12	SW12	SW12	SW15	SW14	W12.6	NNW20
9-Jan	SW14	SW15	SW15	SW15	SW15	SW16	SSW13	SSW11	SSW12	SSW13	SW12	SW12	SW13	SSW10	SW11	SW11	NNW7	NW8	WNW8	WNW8	NNW12	NW8	W5	NW5	SW8.7	SW16
10-Jan	NW7	NNW9	NNW8	NNW5	NNW2	WSW3	SW4	SW5	SSW7	SSW7	S6	S7	SSW10	S8	S9	S8	SSW7	SW5	SW5	SSW6	S7	SSW5	SSW6	SW7	SSW4.0	SSW10
11-Jan	SW8	SSW6	SW8	SW8	SW7	SW7	SW11	SSW7	SSW8	SSW9	SSW9	S9	S9	SE7	SE7	SSE6	SE5	SSE4	SSE6	SSE6	SSE7	S7	S5	S4	S6.2	SW11
12-Jan	S5	S4	S5	SSE6	SSW7	SW7	SW11	SW9	SW12	SW12	SW10	SW8	WSW3	ENE4	S3	SSW6	S4	SSE4	SSE6	SSE6	SSE6	S7	S5	SSW7	SSW5.6	SW12
13-Jan	SW11	SW12	SW12	WSW11	NNW9	NNW13	NNW11	N10	N9	N6	NNE5	N5	NNE7	N7	NNW5	NE6	ENE7	ESE10	ESE15	ESE12	ESE13	ESE12	ESE8	SE6	NE1.9	ESE15
14-Jan	SSE4	S8	SSW12	SW14	WSW18	WSW18	WSW14	NNW6	N19	N16	N13	N12	N12	N11	N11	NNW11	N10	N15	N14	N15	N12	N12	N12	N14	NNW7.1	N19
15-Jan	N8	N11	N11	N9	NNE12	NNE13	NNE12	NNE10	N8	NNE7	NNE7	NNE7	ENE8	E10	ESE13	ESE14	ESE14	ESE14	ESE16	SE15	SE17	ESE15	ESE15	SE16	ENE7.3	SE17
16-Jan	SE15	SE15	SE11	SE12	SE13	SE10	SE10	SE8	SSE9	SSE8	S8	SW9	SW14	WSW14	WSW16	W17	WSW19	SW14	WSW17	SW17	WSW17	WSW19	WSW21	WSW20	SSW8.6	WSW21
17-Jan	WSW15	WSW18	WSW19	WSW16	WSW16	W18	WSW19	WSW15	N8	N10	NNW12	NNW10	N9	NNE9	NNE9	NNE7	N7	NNW7	NNW6	N3	NW2	SE2	SE7	S5	WNW5.8	WSW19
18-Jan	S5	S4	S5	SSW4	SSW4	SSW5	SSW5	SSW5	SSW5	SSW6	SSE5	SSE5	SSE6	SE4	E5	SE4	SW2	SSW5	SSW5	SSW9	SW13	SSW7	S8	SSW12	S5.0	SW13
19-Jan	SSW7	SSW7	SSW6	SW7	NW4	NNE3	N4	NNW7	NNW6	N5	N6	N5	N5	NNE6	NNE7	N6	N6	NNW7	NNW6	NNW7	NNW7	NNW7	NNW7	NNW9	NNW4.3	NNW9
20-Jan	NNW11	NNW9	NNW8	NNW9	NW7	NNW7	NNW7	NW5	NW6	NW4	NNW6	NNW2	N1	SE2	SE5	SE7	W2	SE5	S4	SE6	SE6	SSE7	ESE5	SE6	NNW1.2	NNW11
21-Jan	SSE5	SE6	S5	S6	SSE6	SE7	SE7	SSE7	SSE6	SSE6	SE8	SSE9	SSW18	SSW20	SSW16	SSW19	SW21	SW20	SW21	SW23	SW20	SW17	SW15	SW16	SSW10.9	SW23
22-Jan	SW12	SW9	SW13	SW13	SW15	SW18	SW16	WSW21	WSW21	W22	W26	W22	W27	W25	WSW21	WSW20	WSW17	WSW17	WSW18	WSW21	WSW21	WSW18	NNW8	N12	WSW16.7	W27
23-Jan	N10	NNW7	N3	NW1	ENE3	NE5	NNE5	NE3	ESE3	E4	ESE3	E5	ENE2	N3	N3	NNW3	AF	AF	AF	AF	AF	AF	AF	AF	----	N10
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	WNW11	W8	WSW10	SW8	WSW5	W14	W14	WSW12	SW11	WSW15	WSW13	WSW12	SW14	SW12	SW12	----	WSW15
25-Jan	SSW10	SSW9	SSW10	SSW8	SSE9	SSE12	SSE10	S9	SW18	WSW22	SW15	WSW9	W11	W12	W14	W14	W11	W9	W8	WNW12	W11	W1	SW7	SW9	WSW8.4	WSW22
26-Jan	SW13	SW13	SW15	SW15	SSW11	SSW6	SW10	SW13	SW14	SW10	SW12	SW13	SW11	SW6	WSW8	WSW9	WSW3	NW6	NNW23	N23	NNW23	N21	N19	N19	W6.8	NNW23
27-Jan	N18	N19	N18	N19	N18	N17	N18	N17	N15	N15	N16	N14	N15	N16	N15	N15	N15	N14	N14	NNW15	N13	N11	N11	NNW14	N15.5	N19
28-Jan	NNW12	NNW14	NNW14	NNW13	NW13	NW9	NW7	NNW9	NW6	NNW10	N12	NNW10	NNW8	NNE5	ENE2	E5	NE3	N4	NW4	NNW5	NNE7	ENE6	ESE5	ESE6	NNW6.3	NNW14
29-Jan	ESE6	ESE5	SE6	ESE8	SE8	SE8	ESE7	ESE9	ESE10	ESE9	ESE9	ESE7	ESE7	E6	E6	E3	NNE3	NNW9	NNW10	N10	NNW10	NNW13	NNW13	NNW13	ENE3.2	NNW13
30-Jan	NNW17	N15	N15	N16	N18	N16	N14	NNW15	N17	N16	N15	N13	NNW14	N14	NNE14	N14	N10	NNW8	NNW10	NNW11	NNW8	NW6	WNW4	NW5	N12.5	N18
31-Jan	NW4	WSW3	WSW2	WSW3	SW2	SW3	S2	S3	SSE4	S5	SSE5	SSE5	SE7	SE8	ESE7	SE7	SE6	SE5	S3	S3	S3	S5	SSE6	S5	SSE3.4	SE8
	W3.6	W3.2	WSW3.6	W4.0	W3.7	W3.6	WSW3.5	WSW3.3	W3.2	W3.8	W3.2	WSW2.8	W3.6	W2.6	W3.3	W3.9	W3.5	W4.0	WNW4.6	W4.6	W4.2	WSW3.7	WSW3.1	W3.7	Diurnal Average	
	NNW20	WSW20	WSW19	N19	WNW18	WSW18	WSW19	WSW21	WSW21	W22	W26	W22	W27	W25	WSW21	WSW20	SW21	SW20	NNW23	NNW24	NNW23	N21	WSW21	NW21	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Jan 7 19:00

Minimum Value: 0 km/h on Jan 31 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:	727
Hours of Missing Data:	17
Hours of Calibration:	0
Percent Operational Time:	97.7

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

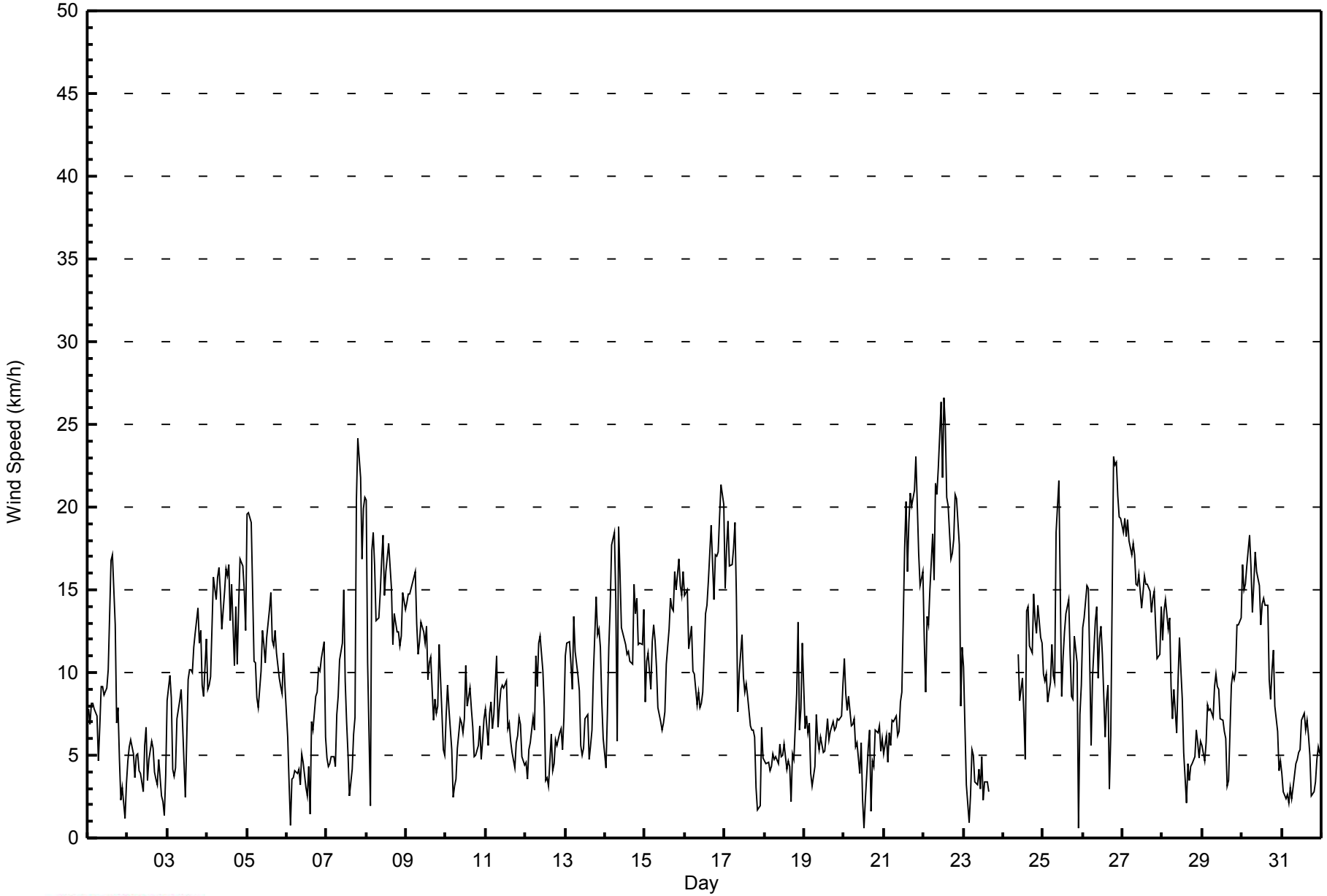
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Patricia McInnes - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	168	23.11	23.11
6 - 11	296	40.72	63.82
12 - 19	231	31.77	95.60
20 - 28	32	4.40	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 727

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Patricia McInnes - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	15	6	3	4	5	6	11	13	26	12	10	14	10	9	12	12	168
6 - 11	32	13	1	3	3	15	26	20	14	31	38	14	8	13	15	50	296
12 - 19	48	4	0	0	0	12	8	1	0	12	60	39	17	9	2	19	231
20 - 28	2	0	0	0	0	0	0	0	0	1	6	10	5	0	2	6	32
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	97	23	4	7	8	33	45	34	40	56	114	77	40	31	31	87	727

Total Number of Valid Hours: 727

Total Number of Hours: 744

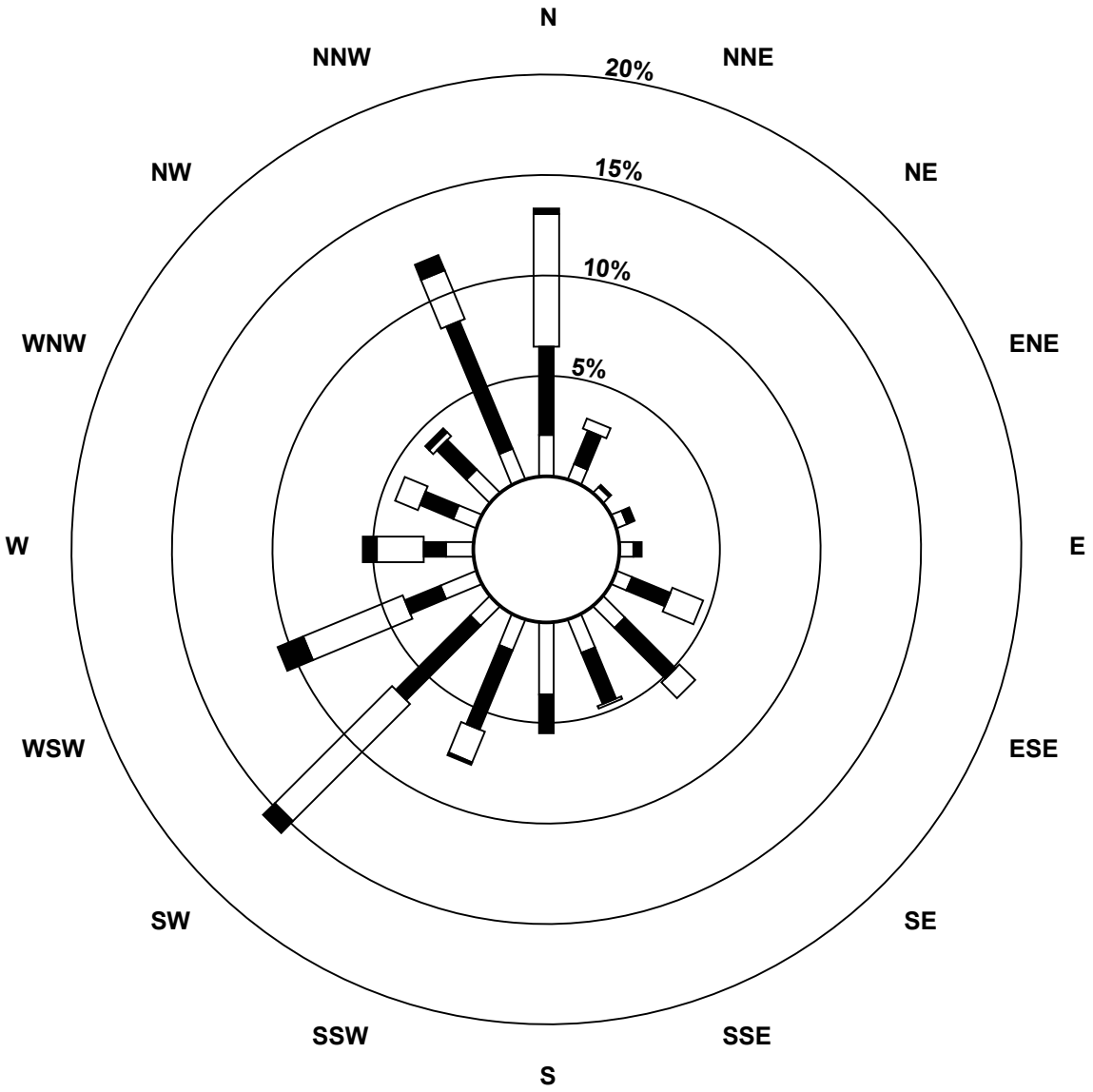
AURORA ATMOSPHERICS INC.

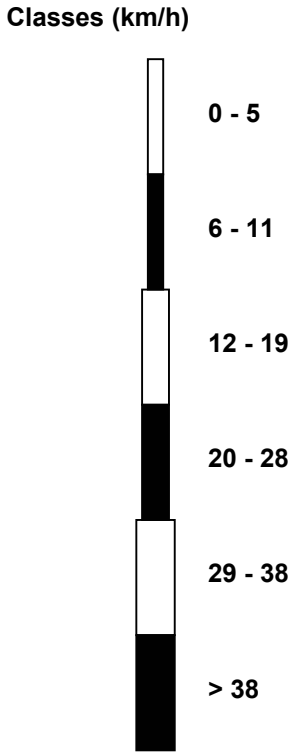
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Patricia McInnes (AMS 6)





Total Number of Valid Hours: 727

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Patricia McInnes - January 2015

Direction of Maximum Speed: 259 deg on Jan 22 13:00
Direction of Maximum Daily Speed Average: 249.6 deg on Jan 22

Direction of Minimum Speed: 350 deg on Jan 20 13:00

Direction of Minimum Daily Speed Average: 1.2 deg on Jan 20

Monthly Average Direction: 277.5 deg

Hours in Service:	744
Hours of Data:	727
Hours of Missing Data:	17
Percent Operational Time:	97.7

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-Jan	355	356	353	0	354	16	337	6	2	340	336	337	344	339	339	357	347	320	317	267	257	189	191	336	344.0
2-Jan	334	12	6	26	310	280	309	309	356	236	226	242	301	296	289	288	360	276	267	283	340	257	337	290	303.9
3-Jan	324	332	341	343	289	270	286	292	282	267	248	191	287	285	280	257	247	246	249	252	256	253	210	231	269.0
4-Jan	228	221	220	227	228	223	221	219	215	212	218	220	213	212	220	227	221	227	226	235	233	224	222	223	222.2
5-Jan	228	237	241	241	235	236	226	237	277	289	286	285	274	269	274	265	277	295	296	294	292	313	341	326	268.4
6-Jan	332	304	201	353	5	258	278	256	251	232	221	190	124	105	248	252	234	239	234	238	229	225	210	194	236.8
7-Jan	167	179	158	155	148	146	125	139	128	130	124	117	122	132	218	261	316	327	342	345	346	318	307	306	351.7
8-Jan	334	340	294	290	291	291	283	259	239	249	250	252	278	283	278	270	263	255	263	246	236	230	231	218	267.4
9-Jan	217	223	222	231	227	218	208	199	213	212	214	215	215	202	214	233	332	312	301	301	332	306	280	307	233.4
10-Jan	322	339	336	342	340	253	218	217	209	204	175	176	209	182	174	181	206	223	229	193	184	199	207	216	213.0
11-Jan	214	198	224	215	218	220	223	206	212	210	204	172	187	137	140	154	135	157	161	151	164	184	190	186	190.0
12-Jan	190	186	170	167	209	225	225	223	220	223	228	234	238	63	185	196	173	164	158	157	158	178	170	213	200.3
13-Jan	223	227	229	244	330	341	341	3	5	2	16	8	13	5	341	44	77	105	114	114	116	119	121	138	50.5
14-Jan	164	177	205	235	246	243	246	328	1	352	2	7	360	5	349	340	3	3	6	7	353	358	358	6	337.8
15-Jan	354	358	1	0	12	16	23	17	10	16	13	25	78	101	107	109	110	107	113	126	131	120	119	126	75.5
16-Jan	124	130	127	126	132	133	140	135	148	159	175	220	234	252	257	265	252	235	241	235	238	239	246	251	212.4
17-Jan	241	256	254	251	254	259	257	256	352	354	344	347	353	17	19	16	359	331	339	357	311	141	139	174	288.2
18-Jan	175	173	171	194	205	200	203	211	207	194	166	164	148	145	98	142	214	202	209	212	218	205	172	205	189.6
19-Jan	213	210	208	231	325	33	357	346	333	353	357	352	351	20	19	359	359	335	336	346	343	338	335	333	337.9
20-Jan	329	327	327	329	324	327	331	317	316	323	348	335	350	133	134	139	276	139	169	145	139	150	116	127	340.7
21-Jan	159	143	182	181	163	139	141	147	156	166	139	165	206	204	200	213	221	229	232	235	231	227	226	231	206.3
22-Jan	228	215	221	223	236	236	229	237	240	262	265	261	259	265	258	250	242	245	249	250	245	247	332	349	249.6
23-Jan	1	338	354	312	74	39	16	39	122	96	113	97	59	352	2	342	AF	AF	AF	AF	AF	AF	AF	AF	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	295	279	250	220	244	271	259	242	232	243	247	239	235	229	222	--
25-Jan	205	194	196	202	157	160	154	191	231	239	235	240	259	266	276	272	277	280	274	290	279	273	229	234	236.8
26-Jan	233	234	236	227	210	202	222	229	231	225	232	233	234	228	254	238	252	321	343	353	348	353	357	355	275.8
27-Jan	356	354	354	353	354	355	355	353	351	355	354	357	2	358	352	354	354	355	357	347	3	5	352	341	354.6
28-Jan	336	336	334	334	325	319	318	330	320	331	349	347	347	12	70	91	34	355	313	334	27	74	103	123	345.0
29-Jan	116	114	125	122	127	135	116	120	123	122	110	111	112	99	96	80	21	341	341	349	335	332	332	340	70.6
30-Jan	338	351	354	352	354	352	358	343	358	359	360	356	343	9	18	7	355	348	340	344	340	317	288	313	351.7
31-Jan	312	255	243	251	214	221	184	178	163	178	155	147	134	136	117	124	133	140	174	172	190	172	167	169	161.3
	274.2	269.1	257.0	260.6	267.0	261.6	256.2	257.8	262.1	264.9	263.8	257.4	262.2	276.1	276.6	264.0	274.5	271.3	281.4	278.0	268.9	254.7	253.5	263.2	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Patricia McInnes - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 93 deg on Jan 25 22:00

Minimum Value: 0 deg on Jan 23 16:00

Percentiles: P_1 = 7 P_{10} = 9 Q_1 = 11 Median = 13 Q_3 = 17 P_{90} = 28 P_{99} = 83

Hours in Service:	744
Hours of Data:	727
Hours of Missing Data:	17
Hours of Calibration:	0
Percent Operational Time:	97.7

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-Jan	13	15	15	16	14	13	14	17	12	9	12	11	10	11	10	16	12	20	9	20	48	21	87	26	87
2-Jan	19	28	19	13	37	17	14	16	22	50	19	13	23	12	7	12	24	22	17	25	81	55	57	36	81
3-Jan	13	10	12	18	14	18	10	9	6	13	13	38	15	14	13	11	6	7	8	8	11	25	12	10	38
4-Jan	11	9	11	10	9	8	9	10	10	12	13	11	11	12	11	11	13	12	14	11	11	10	12	9	14
5-Jan	11	9	8	10	12	9	10	16	14	10	9	15	11	11	11	10	12	11	10	13	10	31	13	16	31
6-Jan	16	34	91	20	24	11	22	10	22	17	16	41	30	12	79	11	6	7	6	7	8	10	14	13	91
7-Jan	28	22	13	22	27	19	14	14	14	15	15	15	19	22	51	15	23	11	11	13	12	19	12	11	51
8-Jan	21	16	85	11	10	9	14	14	9	7	8	11	12	13	12	11	11	10	8	10	8	8	8	11	85
9-Jan	8	10	9	9	10	11	13	13	12	11	12	11	12	13	11	15	20	11	12	8	12	22	16	10	22
10-Jan	18	9	12	23	51	21	17	11	12	13	16	14	13	18	10	13	25	44	62	21	9	19	21	9	62
11-Jan	12	16	11	36	13	11	9	15	14	16	16	12	15	26	19	13	11	26	13	13	13	13	13	12	36
12-Jan	8	14	9	21	25	25	14	13	13	11	12	13	45	47	64	15	15	14	15	16	15	17	59	33	64
13-Jan	11	10	8	15	37	10	11	16	13	16	15	15	14	19	15	26	14	13	13	12	12	13	15	27	37
14-Jan	34	15	30	10	11	11	8	59	15	13	14	14	14	14	14	13	13	15	14	14	13	14	13	13	59
15-Jan	14	15	12	15	14	12	12	13	16	14	14	14	16	13	13	13	13	12	13	14	13	13	14	13	16
16-Jan	13	13	13	12	12	13	14	14	15	11	16	19	18	14	15	12	12	15	14	12	10	10	11	13	19
17-Jan	9	10	11	11	11	10	10	13	31	18	11	12	14	16	11	12	23	13	17	32	52	91	16	20	91
18-Jan	15	17	24	13	12	12	10	13	10	12	12	10	14	40	26	23	78	18	14	11	12	38	13	13	78
19-Jan	12	12	23	16	38	55	57	13	15	23	15	16	14	19	17	17	13	13	12	11	12	11	12	10	57
20-Jan	9	10	10	9	10	10	9	12	10	13	13	74	79	66	17	12	88	35	47	16	18	12	49	27	88
21-Jan	40	15	18	8	15	10	12	8	10	11	15	25	12	13	13	12	10	11	10	10	10	10	11	12	40
22-Jan	13	16	10	11	11	10	9	9	8	16	12	11	11	13	12	9	9	10	10	9	9	25	53	18	53
23-Jan	13	19	76	90	65	36	15	50	38	37	46	19	61	22	28	0	AF	AF	AF	AF	AF	AF	AF	AF	90
24-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	13	12	14	20	59	13	10	11	8	10	9	8	9	8	8	59
25-Jan	12	12	12	13	12	15	12	28	12	9	11	22	17	12	12	11	12	15	20	10	17	93	24	7	93
26-Jan	8	9	9	9	14	24	14	10	10	11	11	12	10	48	22	9	52	23	11	15	14	15	15	14	52
27-Jan	13	15	14	14	14	13	14	13	12	14	14	15	14	15	14	15	14	13	14	14	13	19	14	10	19
28-Jan	9	9	9	11	12	12	17	9	9	13	13	12	14	55	65	28	29	13	17	21	23	28	20	18	65
29-Jan	14	14	15	16	13	14	16	14	15	16	15	18	21	16	18	28	33	11	10	13	10	11	8	11	33
30-Jan	11	13	13	13	14	13	14	13	15	15	14	15	13	15	12	12	13	12	11	12	17	8	18	15	18
31-Jan	41	19	52	35	32	27	59	28	17	12	15	20	13	17	17	14	12	14	27	37	15	11	13	10	59
	41	34	91	90	65	55	59	59	38	50	46	74	79	66	79	28	88	44	62	37	81	93	87	36	
	Diurnal Maximum																								

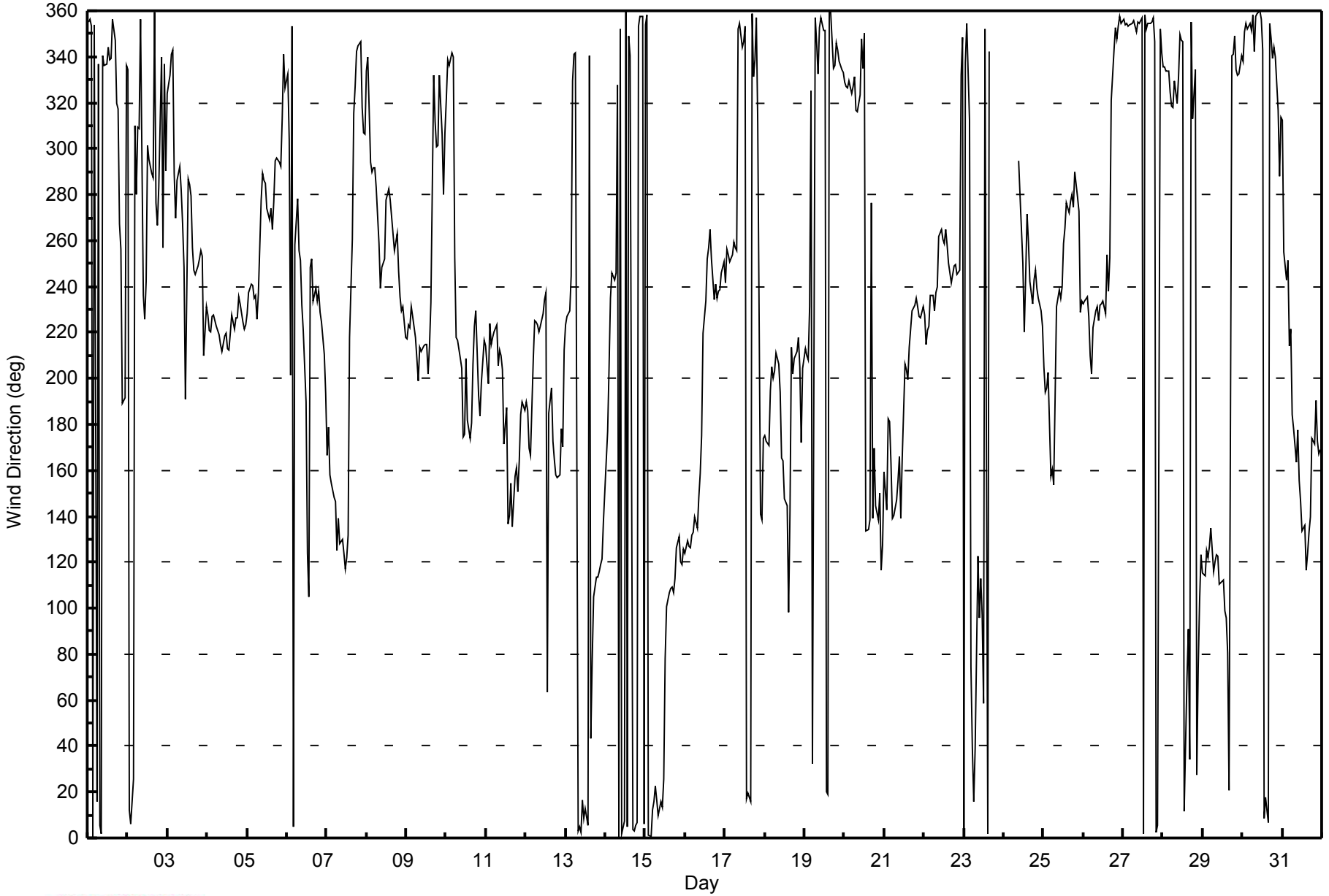
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Patricia McInnes - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	9:35	End Time (MST)	14:35
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	1220
Cal Gas Concentration	47.0 ppm	Cal Gas Expiry Date	12/12/2016
Gas Cert Reference	SA130110A		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE 1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-677	-677
Analyzer Range (mv)	1000	1000	Lamp voltage	773	773
Calculated slope	1.010507	1.003623	Chamber temp.	45.0	45.0
Calculated intercept	0.780406	0.394339	Pressure (mmHg)	679.0	696.7
Analyzer Background	5.6	5.5	Flow (lpm)	0.435	0.443
Analyzer Coefficient	1.022	1.031	Intensity	91	91

Analyzer make	Thermo 43i	Analyzer serial #	1008841397

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.3	NA
as found span	5000	55.3	519.8	511.8	1.016
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5000	55.3	519.8	517.6	1.004
second point	5000	27.7	260.4	259.3	1.004
third point	5000	13.9	130.7	129.3	1.011
calibrator zero					
as left zero	5000	0.0	0.0	0.1	NA
as left span	5000	55.3	519.8	519.8	1.000
				Average Correction Factor	1.006

Corrected As found	512.1	Previous response	513.6	% change	0.3%

Notes:

replaced inlet filter. Adjusted span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

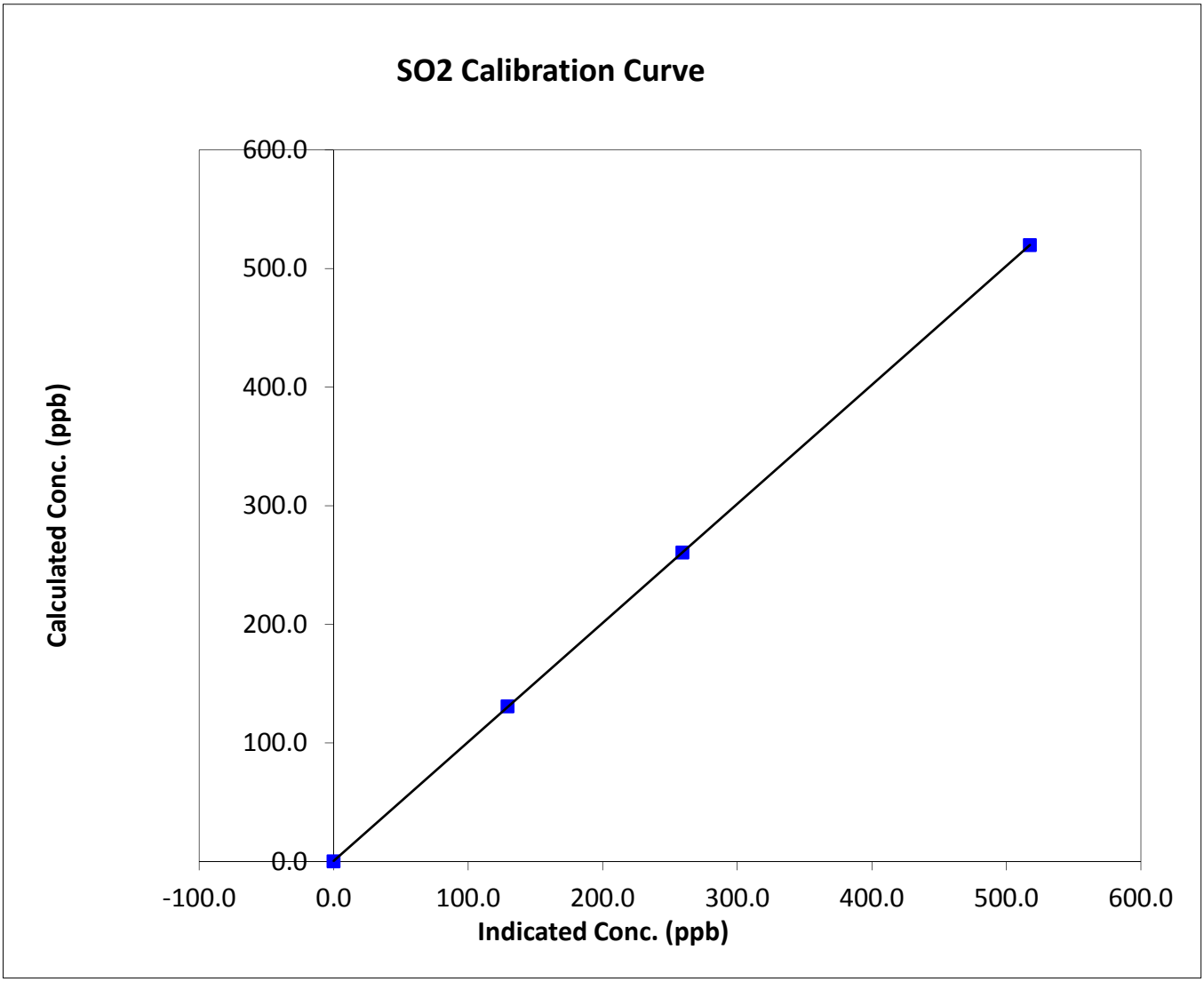
SO_2 Calibration Summary

Station Information

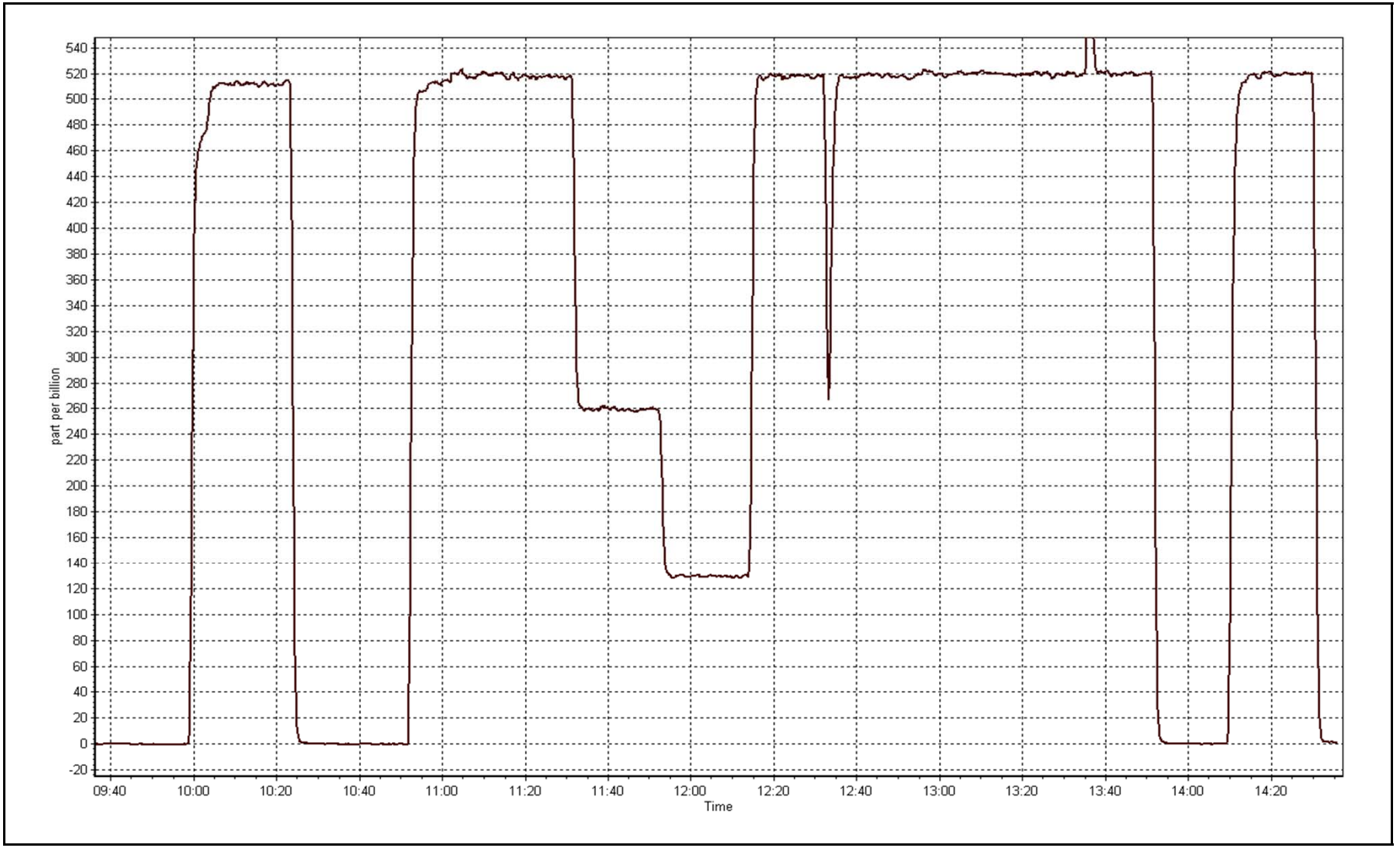
Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:35	End Time (MST)	14:35
Analyzer make	Thermo 43i	Analyzer serial #	1008841397

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999997
519.8	517.6	1.0044		
260.4	259.3	1.0042	Slope	1.003623
130.7	129.3	1.0109		
			Intercept	0.394339



SO2 Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 6, 2015	Previous Calibration	December 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Removal		
Start Time (MST)	9:45	End Time (MST)	11:35
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial number	1220
Cal Gas Concentration	4.84 ppm H2S	Cal Gas Expiry Date	June 10 2014
Gas Cert Reference	ALM009562	SO2 gas conc.	47.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE 2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-675	-675
Analyzer Range (input)	100	100	Lamp voltage	805	805
Calculated slope	1.002381	1.000840	Chamber temp.	45	45
Calculated intercept	-0.086792	-0.171904	Pressure	695.4	720.0
Analyzer Background	13.8	13.8	Flow	0.465	0.490
Analyzer Coefficient	1.198	1.198	Intensity	90	90
			Converter temp.	850	850

Analyzer make/model	TEI 43i	Analyzer serial #	1008841398
Converter make/model	JC Andelle model 26	Converter serial #	20101-07

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	5000	72.3	70.0	70.0	1.000
SO2 scrubber check	5000	21.3	200.2	0.7	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	72.3	70.0	70.0	1.000
second point	5000	36.3	35.1	35.4	0.992
third point	5000	18.7	18.1	18.4	0.986
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	0.993

Corrected As found	70.0	Previous response	69.9	% change	-0.1%

Notes:

Removal cal to upgrade to 43i-TLE.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

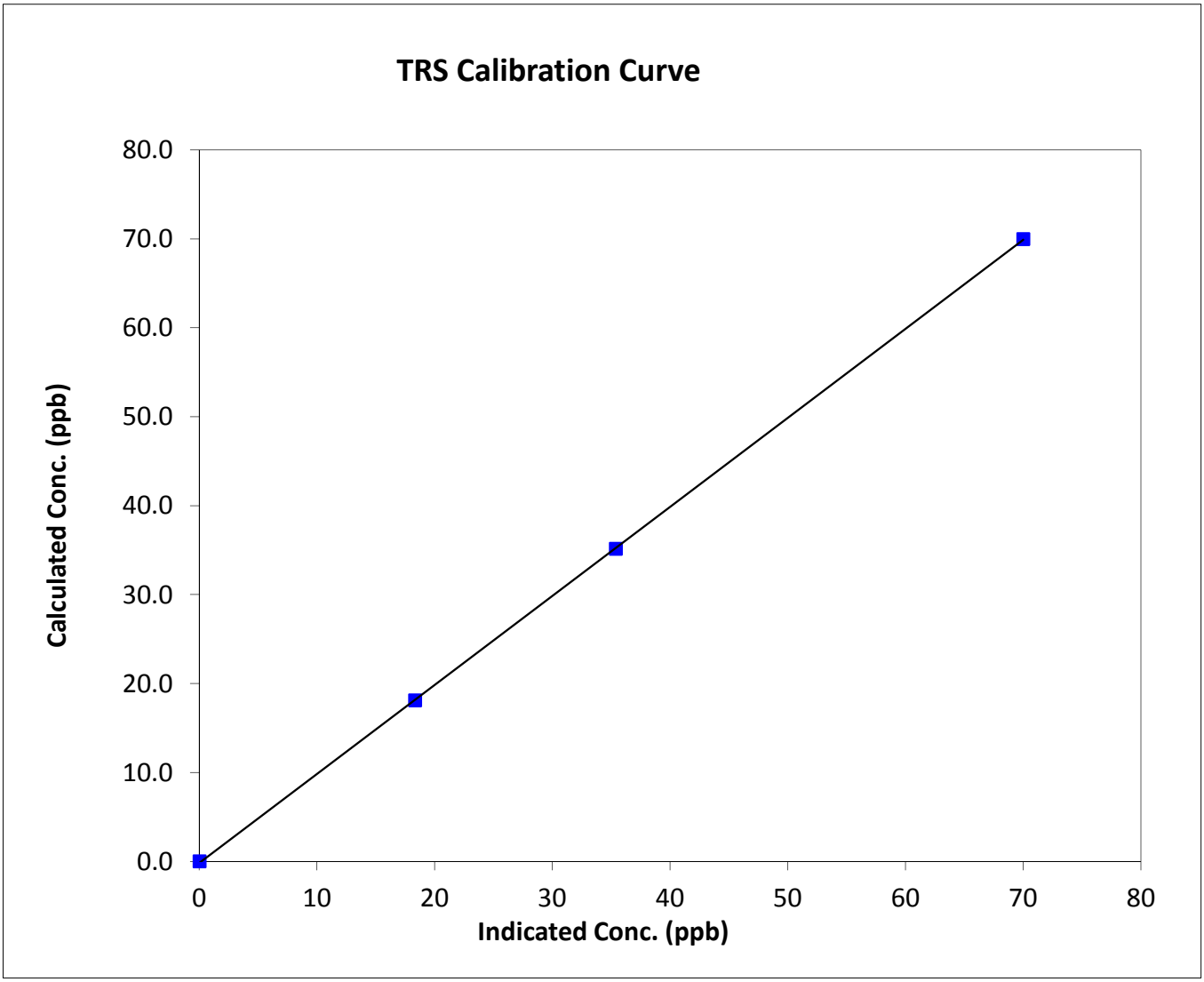
TRS Calibration Summary

Station Information

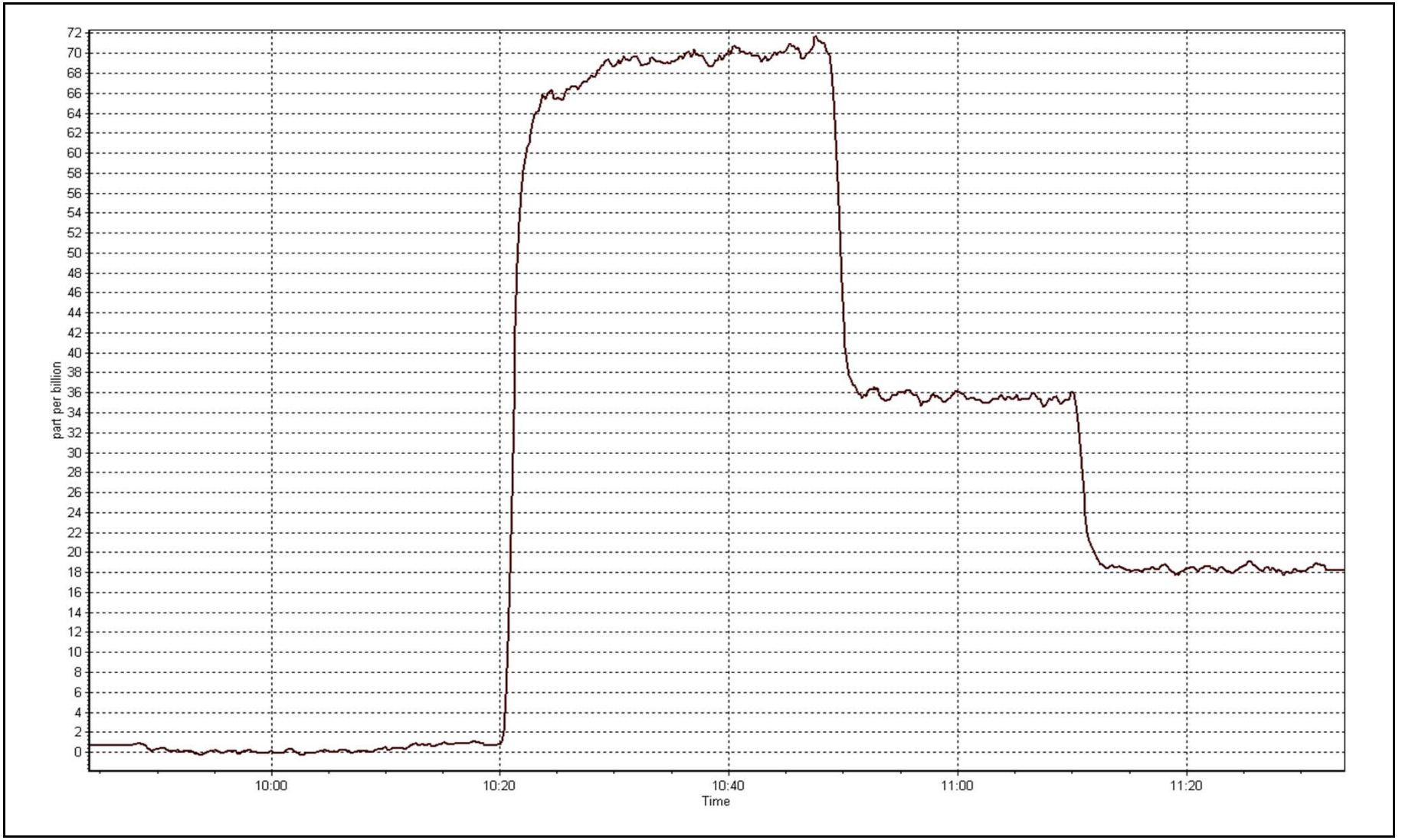
Calibration Date	January 6, 2015	Previous Calibration	December 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:45	End Time (MST)	11:35
Analyzer make	TEI 43i	Analyzer serial #	1008841398

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999981
70.0	70.0	0.9997		
35.1	35.4	0.9923	Slope	1.000840
18.1	18.4	0.9865		
			Intercept	-0.171904



TRS Calibration Plot Date: January 6, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 6, 2015	Previous Calibration	December 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Install		
Start Time (MST)	11:45	End Time (MST)	14:30
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial number	1220
Cal Gas Concentration	4.84 ppm H2S	Cal Gas Expiry Date	June 10 2014
Gas Cert Reference	ALM009562	SO2 gas conc.	47.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	Ethernet connection	DACS channel #	192.168.1.44

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	NA	-720
Analyzer Range (input)	100	100	Lamp voltage	NA	1002
Calculated slope	NA	0.995119	Chamber temp.	NA	45
Calculated intercept	NA	-0.159029	Pressure	NA	722.5
Analyzer Background	NA	2.48	Flow	NA	0.454
Analyzer Coefficient	NA	1.206	Intensity	NA	91
			Converter temp.	NA	850

Analyzer make/model	Thermo 43i-TLE	Analyzer serial #	1218153358
Converter make/model	JC Andelle model 26	Converter serial #	20101-07

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
SO2 scrubber check	5000	21.3	200.2	0.8	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	72.3	70.0	70.4	0.994
second point	5000	36.3	35.1	35.6	0.988
third point	5000	18.7	18.1	18.5	0.978
calibrator zero					
as left zero	5000	0.0	0.0	0.3	NA
as left span	5000	72.3	70.0	71.1	0.984
				Average Correction Factor	0.987

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Installed to upgrade from 43i to 43i-TLE. Adjusted zero and span. SO2 scrubber check performed after zero.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

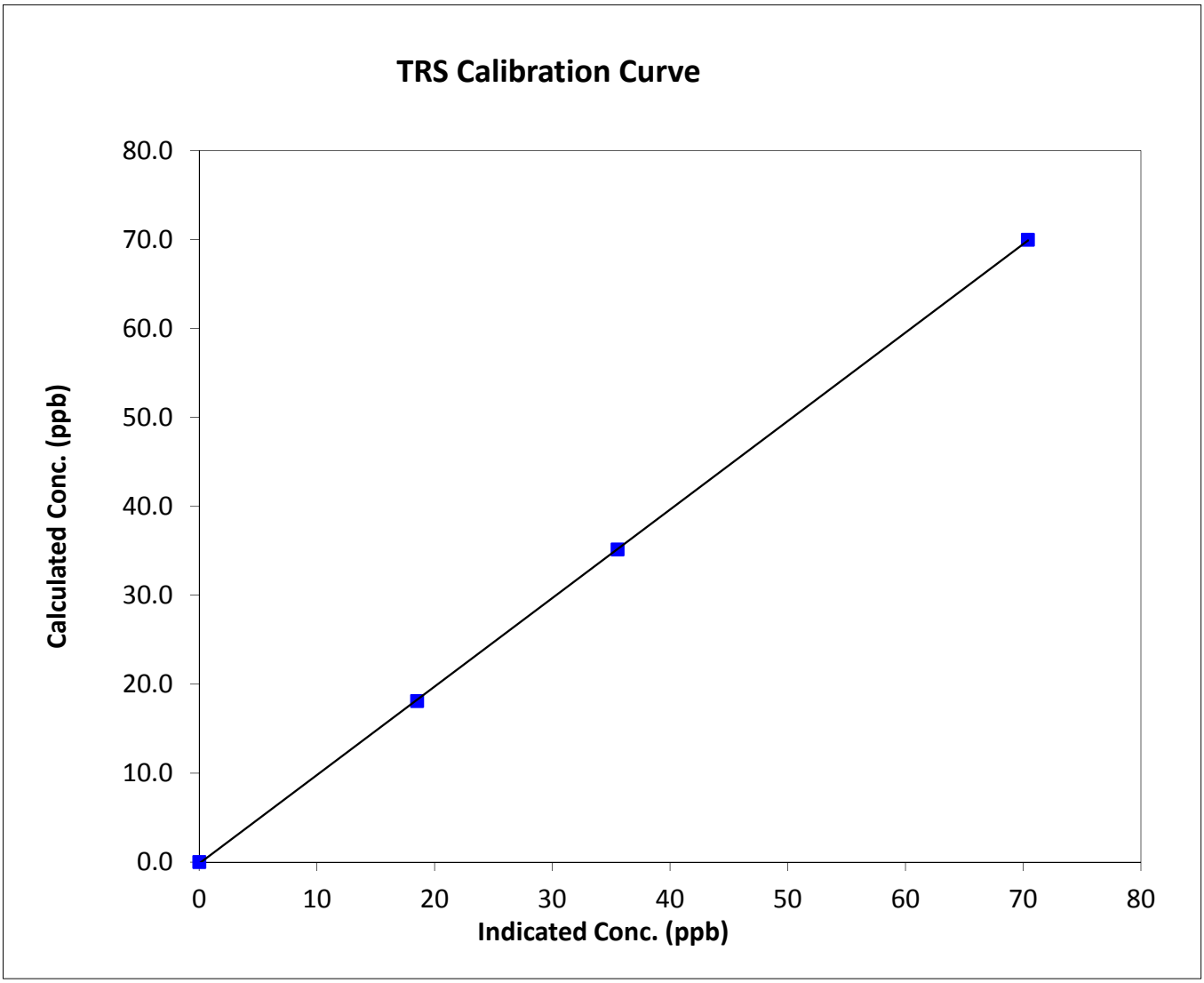
TRS Calibration Summary

Station Information

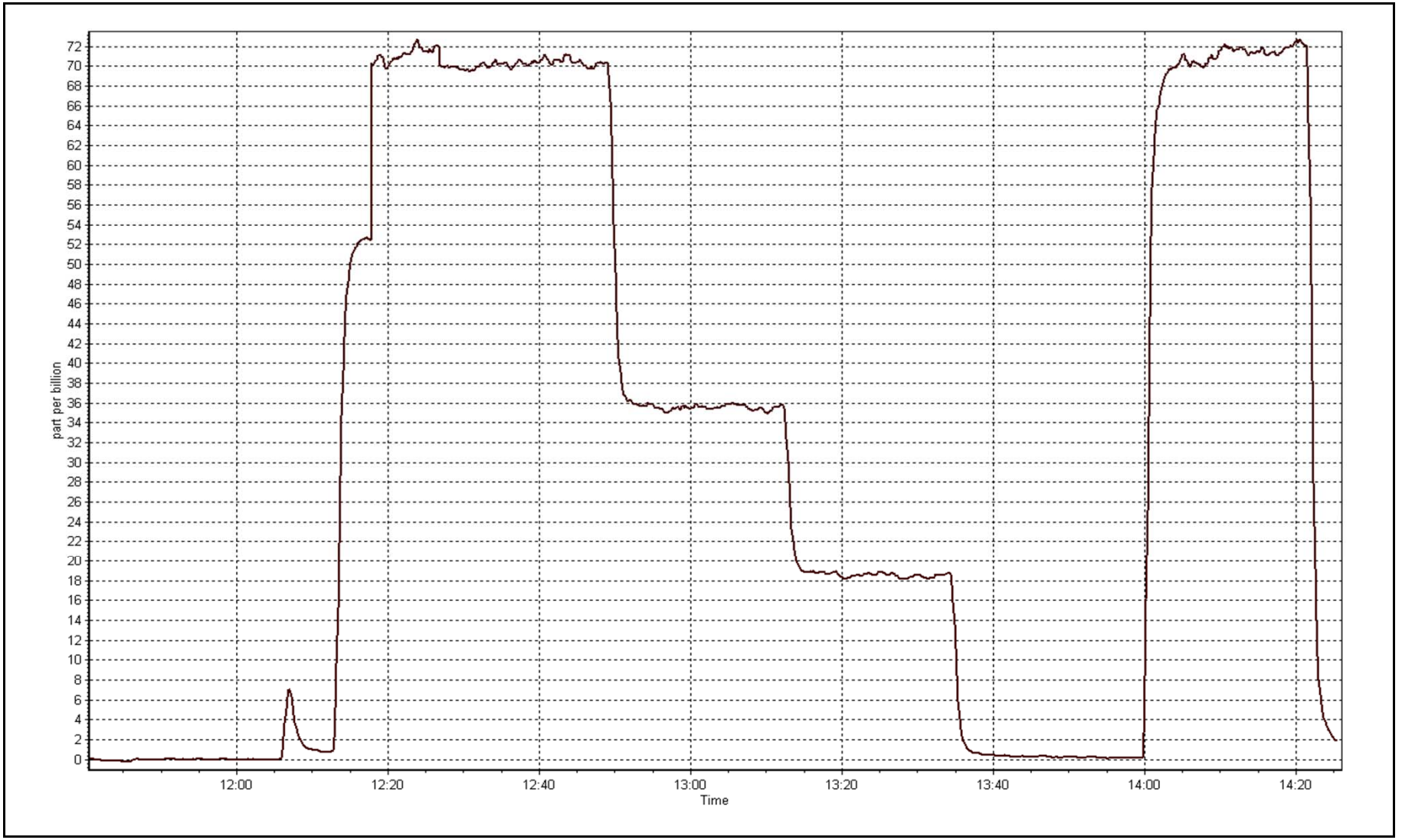
Calibration Date	January 6, 2015	Previous Calibration	December 2, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	11:45	End Time (MST)	14:30
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1218153358

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999979
70.0	70.4	0.9940		
35.1	35.6	0.9884	Slope	0.995119
18.1	18.5	0.9785		
			Intercept	-0.159029



TRS Calibration Plot Date: January 6, 2015



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January-07-15	Prev Calibration	December-09-14
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	9:35	End Time (MST)	14:35
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Model	API T700	Serial Number	1220
Gas Cert Reference	SA130110A	Cal Gas Expiry Date	December-12-16
CH4 Cal Gas Conc.	512.0 ppm	CH4 Equiv Conc.	1092.3 ppm
C3H8 Cal Gas Conc.	211.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582

Analyzer Information

	Before	*After*		*Before*	*After*
CH4 Range (ppm)	50	50	Internal Temp	37.4	38.9
CH4 Range (input)	50	50	Flame Temp	401.4	402.4
NMHC Range (ppm)	50	50	Carrier Pressure	34.5	34.5
NMHC Range (input)	50	50	Fuel Pressure	42.3	42.3
THC Calc slope	1.001493	0.993689	Air Pressure	32.4	32.4
THC Calc intercept	-0.023924	-0.019808	Detector Temp	175.0	175.0
NMHC Calc slope	1.002197	0.995286	Filter Temp	175.0	175.0
NMHC Calc intercept	-0.027808	-0.025667			

Analyzer make	Thermo 55i	Analyzer serial #	1331259521

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.00	N/A
as found span	5000	55.3	12.08	12.17	0.993
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	55.3	12.08	12.17	0.993
second point	5000	27.7	6.05	6.11	0.990
third point	5000	13.8	3.01	3.08	0.979
calibrator zero					
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	55.3	12.08	12.13	0.996
				Average Correction Factor	0.987

Corrected As found	12.17	Previous response	12.09	% change	-0.7%

Notes:

replaced inlet filter after as founds.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	55.3	6.42	6.46	0.993
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	55.3	6.42	6.46	0.993
second point	5000	27.7	3.21	3.27	0.983
third point	5000	13.8	1.60	1.66	0.965
calibrator zero					
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	55.3	6.42	6.44	0.997
				Average Correction Factor	0.980

Corrected As found	6.46	Previous response	6.43	% change	-0.4%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	55.3	5.66	5.71	0.992
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	55.3	5.66	5.71	0.992
second point	5000	27.7	2.84	2.84	0.999
third point	5000	13.8	1.41	1.42	0.995
calibrator zero					
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	55.3	5.66	5.69	0.995
				Average Correction Factor	

Corrected As found	5.71	Previous response	5.65	% change	-1.0%

Wood Buffalo Environmental Association

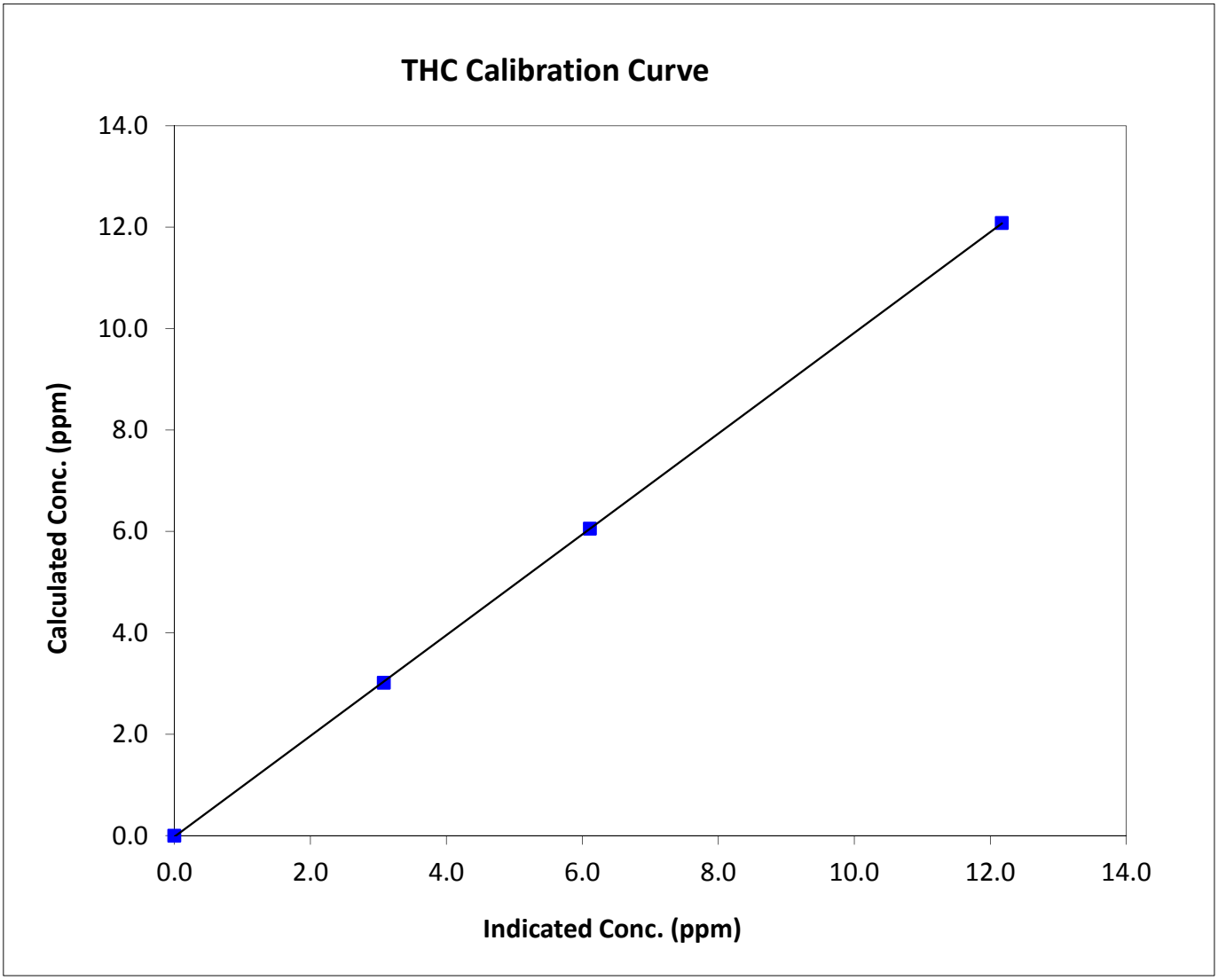
THC Calibration Summary

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:35	End Time (MST)	14:35
Analyzer make	Thermo 55i	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999986
12.08	12.17	0.9926		
6.05	6.11	0.9904	Slope	0.993689
3.01	3.08	0.9788		
			Intercept	-0.019808



Wood Buffalo Environmental Association

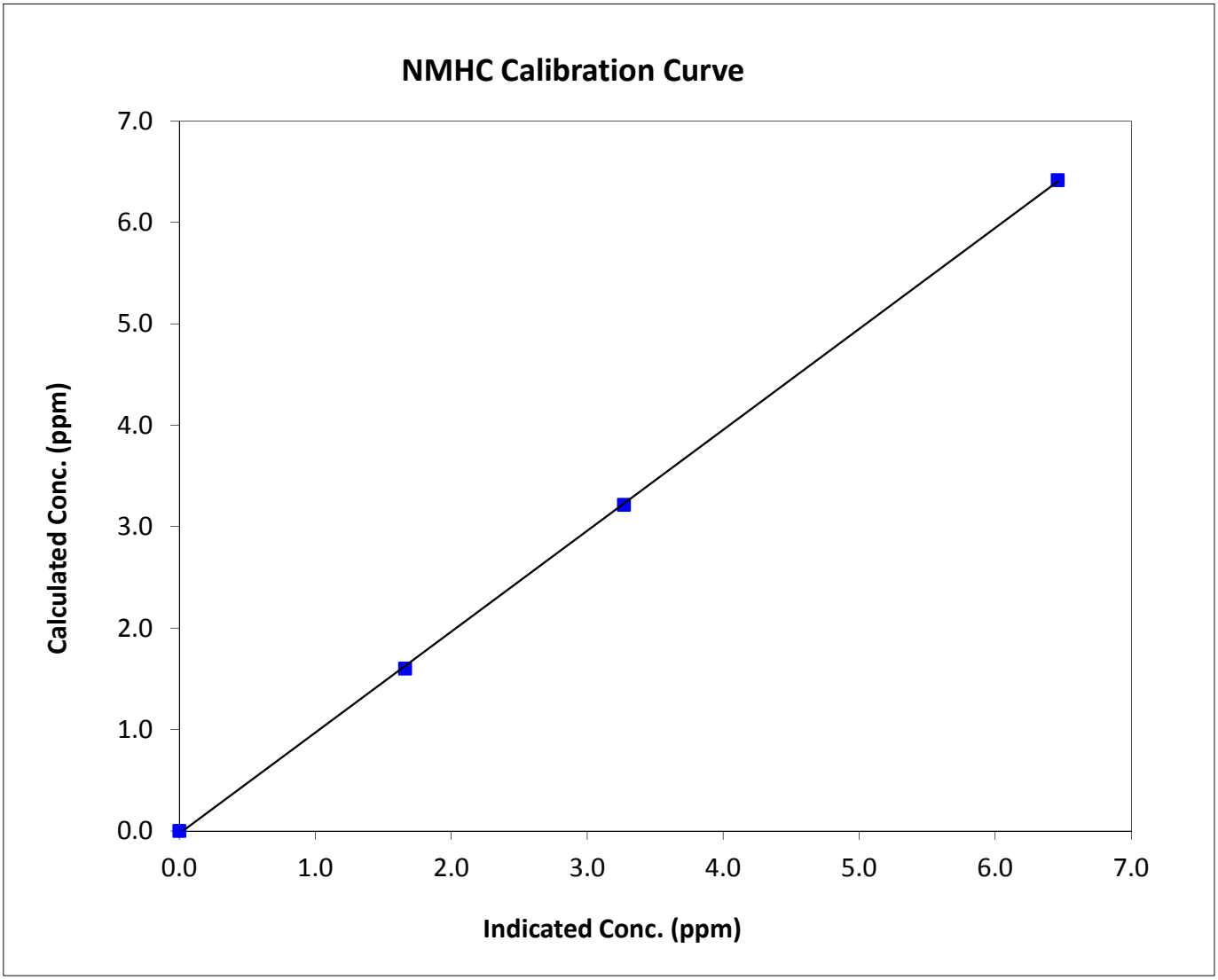
NMHC Calibration Summary

Station Information

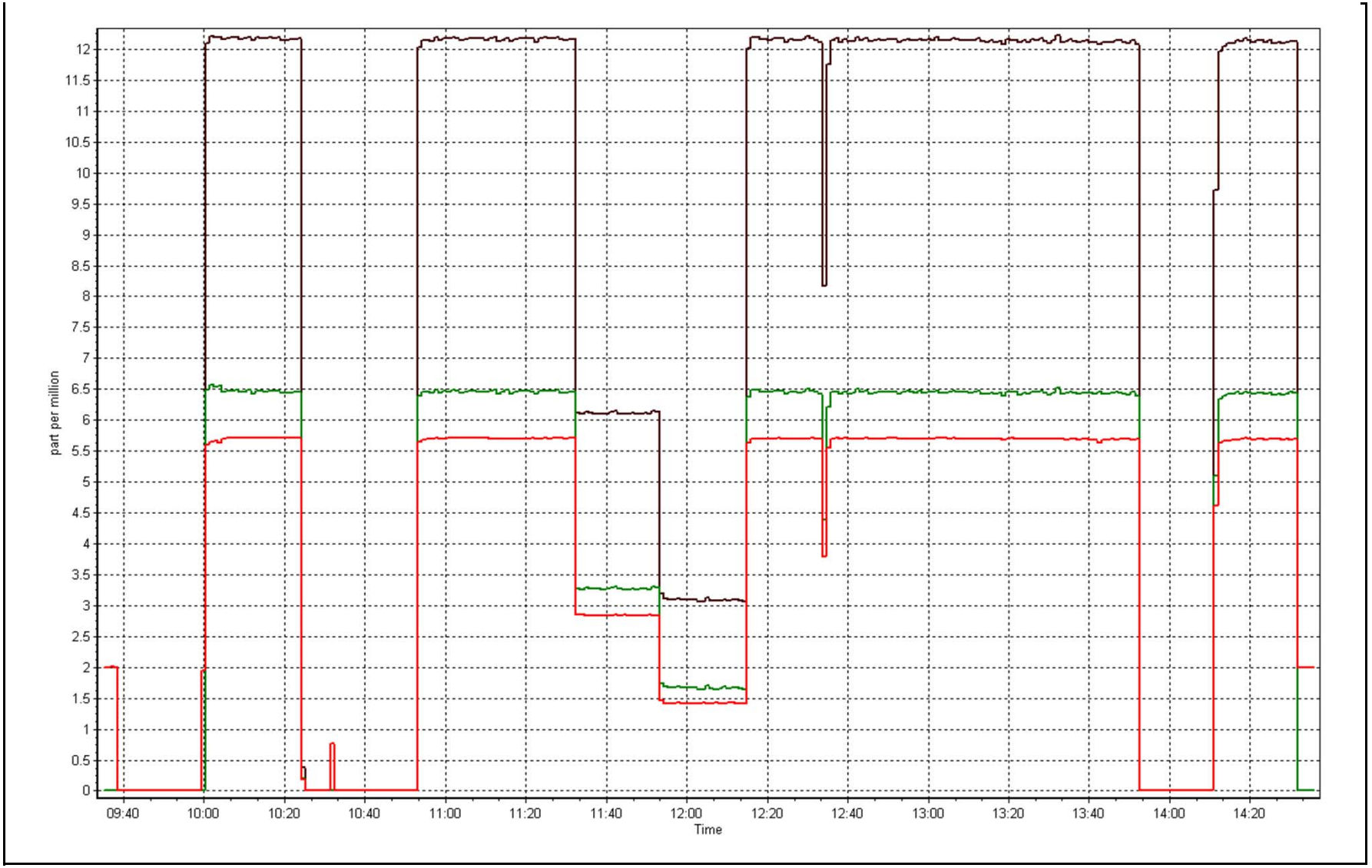
Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:35	End Time (MST)	14:35
Analyzer make	Thermo 55i	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999926
6.42	6.46	0.9934		
3.21	3.27	0.9831	Slope	0.995286
1.60	1.66	0.9648		
			Intercept	-0.025667



THC/NMHC Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 10, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	9:30	End Time (MST)	12:05
Barometric Pressure	743.5 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	1220
NO2 calibration used	January-07-15	Transfer Standard	SA130110A
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	27.7	29.7
Analyzer Range (input)	500	500	Lamp temp.	53.5	53.5
Calculated slope	1.016462	0.992785	Pressure	654.0	681.6
Calculated intercept	-0.137017	-2.177731	Flow cell A	0.694	0.712
Analyzer Background	-0.4	-0.4	Flow cell B	0.720	0.737
Analyzer Coefficient	0.982	0.982	Cell A Intensity	86400	85200
			Cell B Intensity	80900	79800

Analyzer make	Thermo 49i	Analyzer serial #	1300156234

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Gen Drive Vs. Ref (mv)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.000	0.0	0.2	N/A
as found span	5000	1053 / 621	355.6	359.1	0.990
calibrator zero	5000	0.000	0.0	0.2	N/A
high point	5000	1053 / 621	355.6	358.7	0.991
second point	5000	964 / 430	239.9	245.0	0.979
third point	5000	838 / 220	119.4	125.0	0.955
calibrator zero					
as left zero	5000	0.000	0.0	0.5	N/A
as left span	5000	1060 / 615	355.6	361.0	0.985
				Average Correction Factor	0.975

Corrected As found	358.9	Previous response	350.0	% change	-2.5%

Notes:

No adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

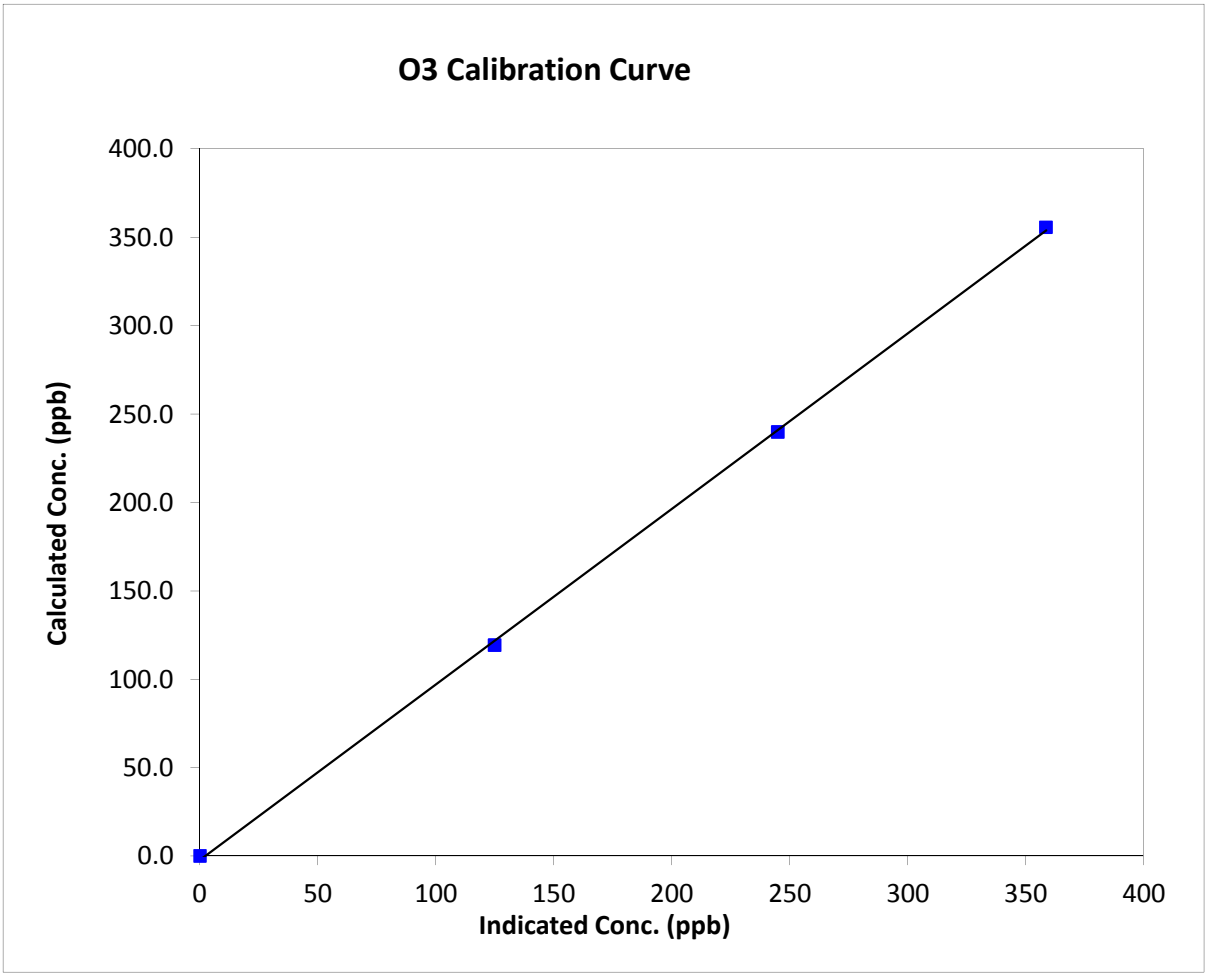
O_3 Calibration Summary

Station Information

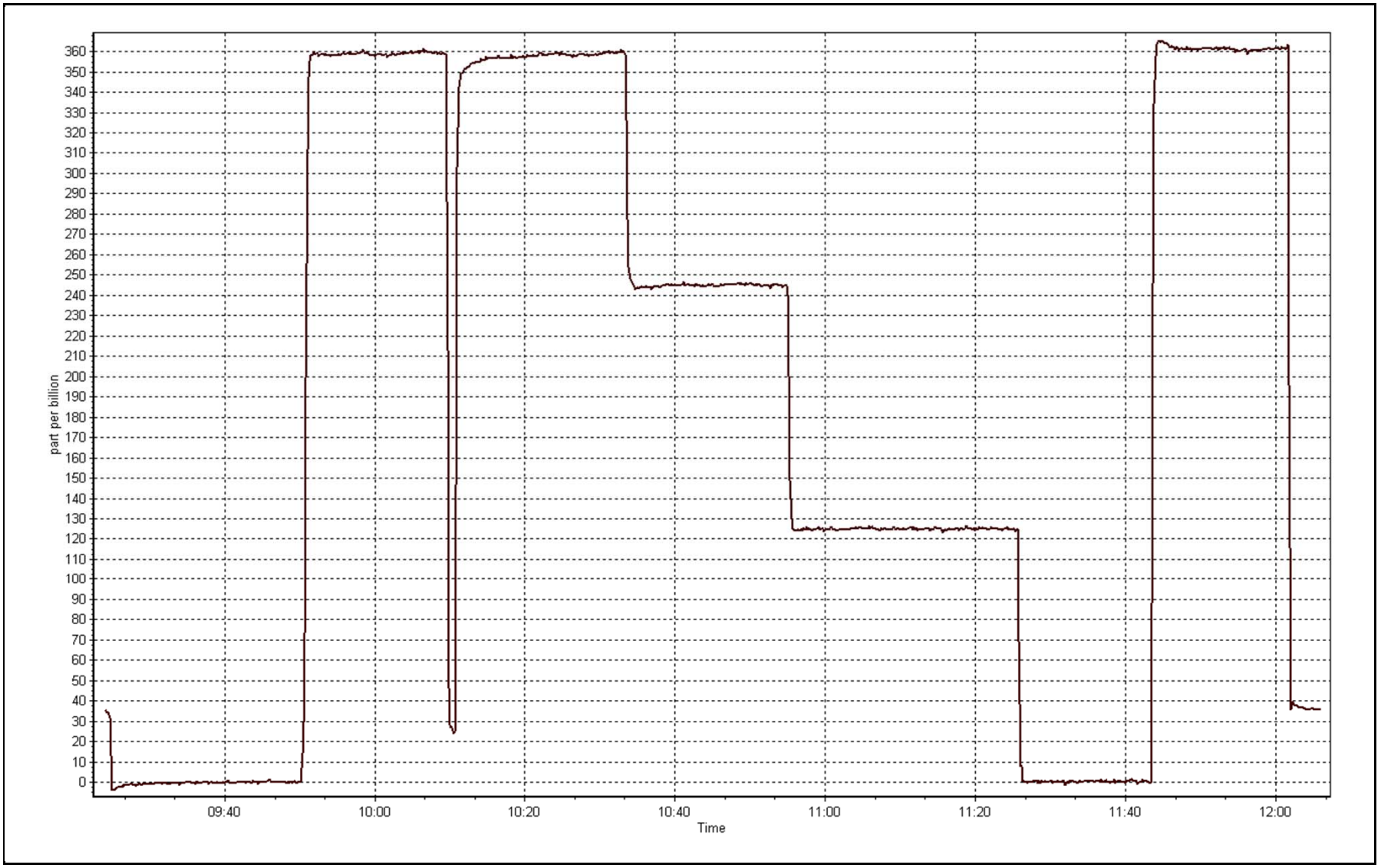
Calibration Date	January-08-15	Previous Calibration	December 10, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:30	End Time (MST)	12:05
Analyzer make	Thermo 49i	Analyzer serial #	1300156234

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999794
355.6	358.7	0.9914		
239.9	245.0	0.9792	Slope	0.992785
119.4	125.0	0.9552		
			Intercept	-2.177731



O3 Calibration Plot Date: January 8, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	9:35	End Time (MST)	14:35
Barometric Pressure	n/a mmHg	Station Temperature	22.0 Deg C
Calibrator	API T700	Serial Number	1220
NO Cal Gas Conc	54.4 ppm	Cal Gas Expiry Date	December 12, 2016
NOx Cal Gas Conc	54.4 ppm	Cal Gas Serial #	SA130110A

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2582

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.998045	0.998720	1.018196
	Data Offset	0.119038	0.175489	-0.029177
After	Data Slope	0.995893	0.993777	0.998558
	Data Offset	-0.520403	0.249298	-1.679439
IP address:		192.168.1.42		
Voltage Range		N/A		

Analyzer Information

Analyzer make/model	Thermo Scientific 42i	Analyzer serial #	1218153460

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	1.086		0.991	
NOX coefficient	0.997		0.997	
NO2 coefficient	1.000		1.000	
NO bkgrnd	2.8		2.7	
NOX bkgrnd	4.2		3.3	
Chamber Temp	50.6	Deg C	50.6	Deg C
Moly Temp	325	Deg C	327	Deg C
PMT voltage	-761	V	-761	V
PMT Temp	-2.9	Deg C	-3	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell press NO	174.4	mmHg	167.3	mmHg
R Cell Press Nox	173.8	mmHg	167	mmHg
NO sample flow	0.782	ccm	0.868	ccm
Nox sample Flow	0.782	ccm	0.865	ccm

Notes:

replaced pump for preventative maintenance. Replaced inlet filter. Adjusted zero and span.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 7, 2015 Station Number: AMS 6

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-1.0	0.0	-1.0	N/A	N/A
as found span	5000	55.3	601.7	601.7	0.0	611.1	609.1	2.1	0.9845	0.9878
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	N/A	N/A
high point	5000	55.3	601.7	601.7	0.0	604.0	605.0	-0.7	0.9961	0.9945
second point	5000	27.7	301.4	301.4	0.0	304.4	303.7	0.7	0.9901	0.9924
third point	5000	13.9	151.2	151.2	0.0	152.5	151.3	1.2	0.9916	0.9994
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	N/A	N/A
as left span	5000	55.3	601.7	254.8	346.8	614.3	258.4	355.8	0.9795	0.9861
							Average Correction Factor		0.9926	0.9954

Corrcted As found NO_X= 612.1 NO= 609.1 Percent Change NO_X= -1.5% NO= -1.1%

Previous Response NO_X= 602.7 NO= 602.3

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 55.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.1			N/A	
1st NO2 (300)	N/A	254.8	355.6	611.3	254.8	356.4	0.9735	1.0000	0.9976	100.2%
2nd NO2 (200)	N/A	370.5	239.9	613.3	370.5	242.8	0.9703	1.0000	0.9882	101.2%
3rd NO2 (100)	N/A	491.0	119.4	614.5	491.0	123.5	0.9684	1.0000	0.9667	103.4%
4th NO2 (0)	610.4	N/A	-1.0	609.4	610.4	-0.9	0.9764	1.0000	N/A	N/A
					Average Correction Factor		0.9722	1.0000	0.9842	101.6%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

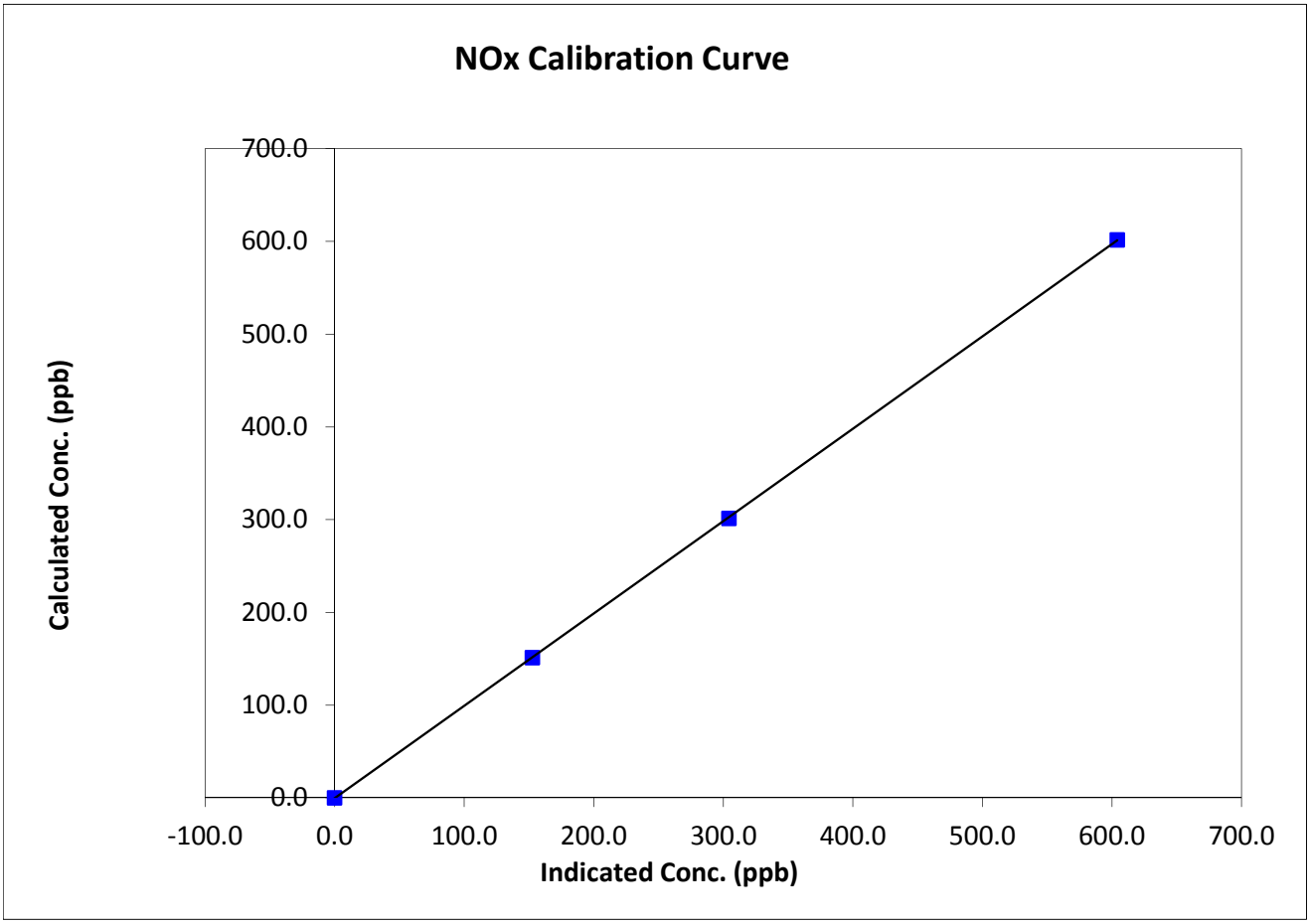
NO_X Calibration Summary

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:35	End Time (MST)	14:35
Analyzer make	Thermo Scientific 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999987
601.7	604.0	0.9961		
301.4	304.4	0.9901	Slope	0.995893
151.2	152.5	0.9916		
			Intercept	-0.520403



Wood Buffalo Environmental Association

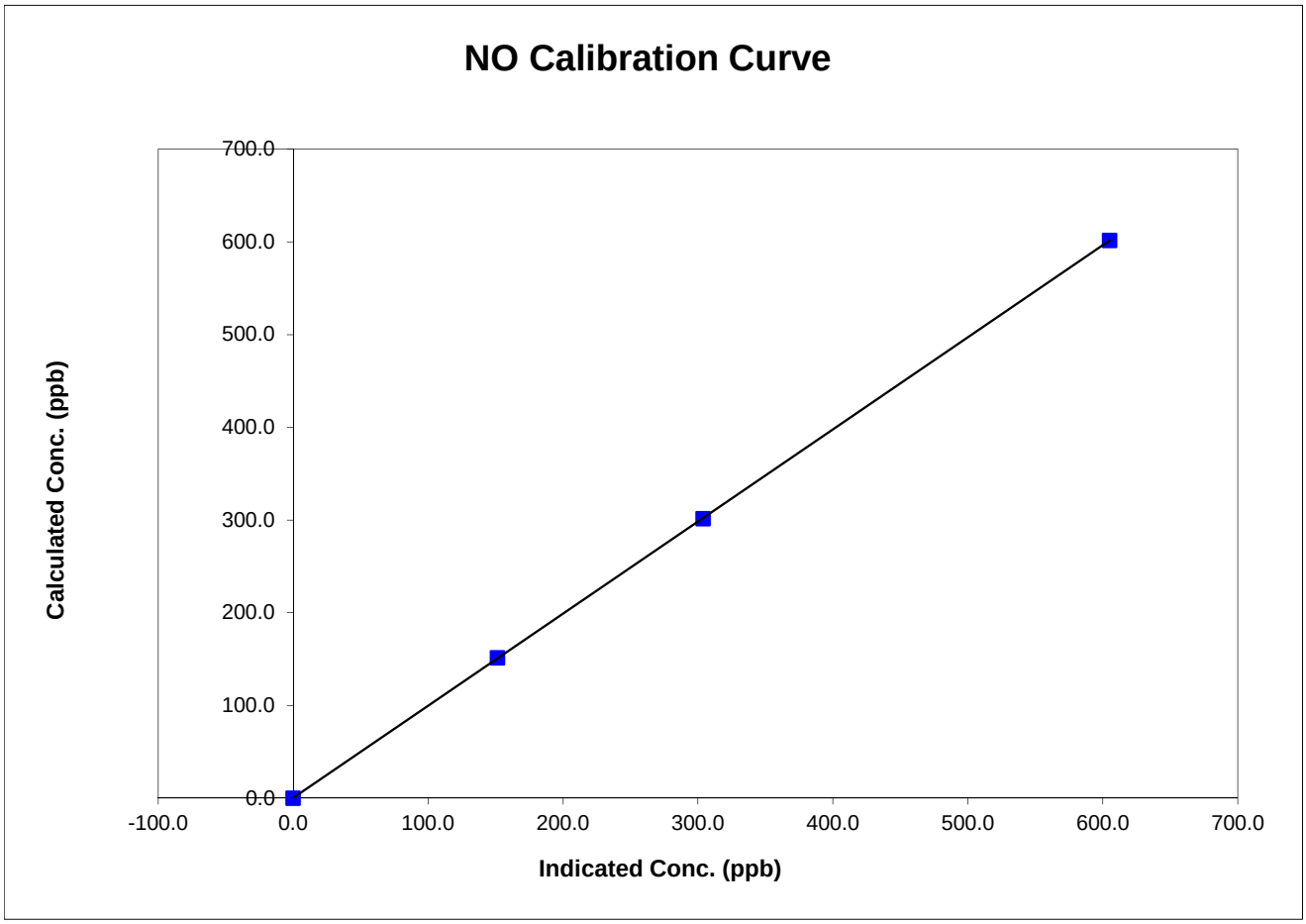
NO Calibration Summary

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:35	End Time (MST)	14:35
Analyzer make	Thermo Scientific 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999996
601.7	605.0	0.9945		
301.4	303.7	0.9924	Slope	0.993777
151.2	151.3	0.9994		
			Intercept	0.249298



Wood Buffalo Environmental Association

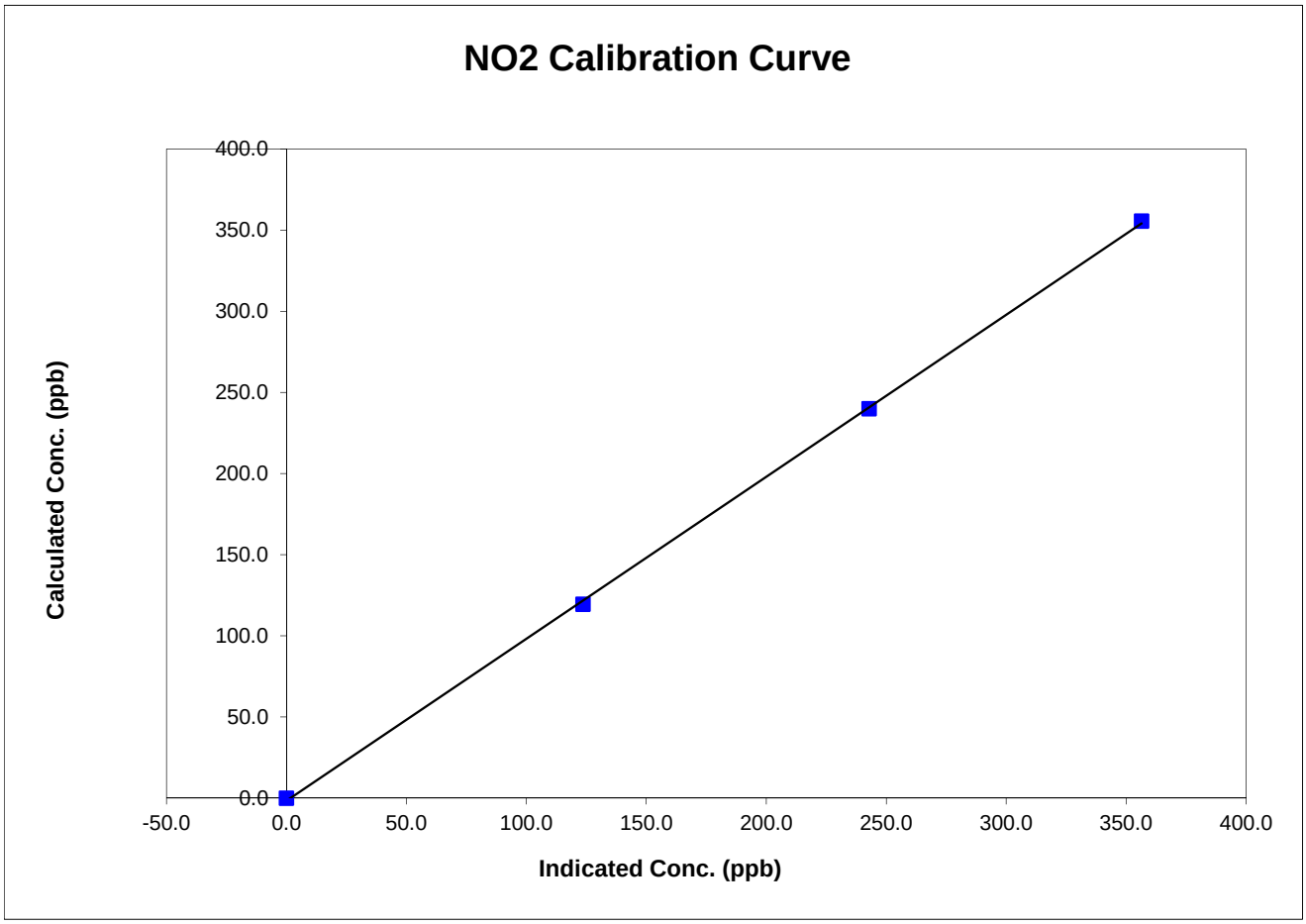
NO_2 Calibration Summary

Station Information

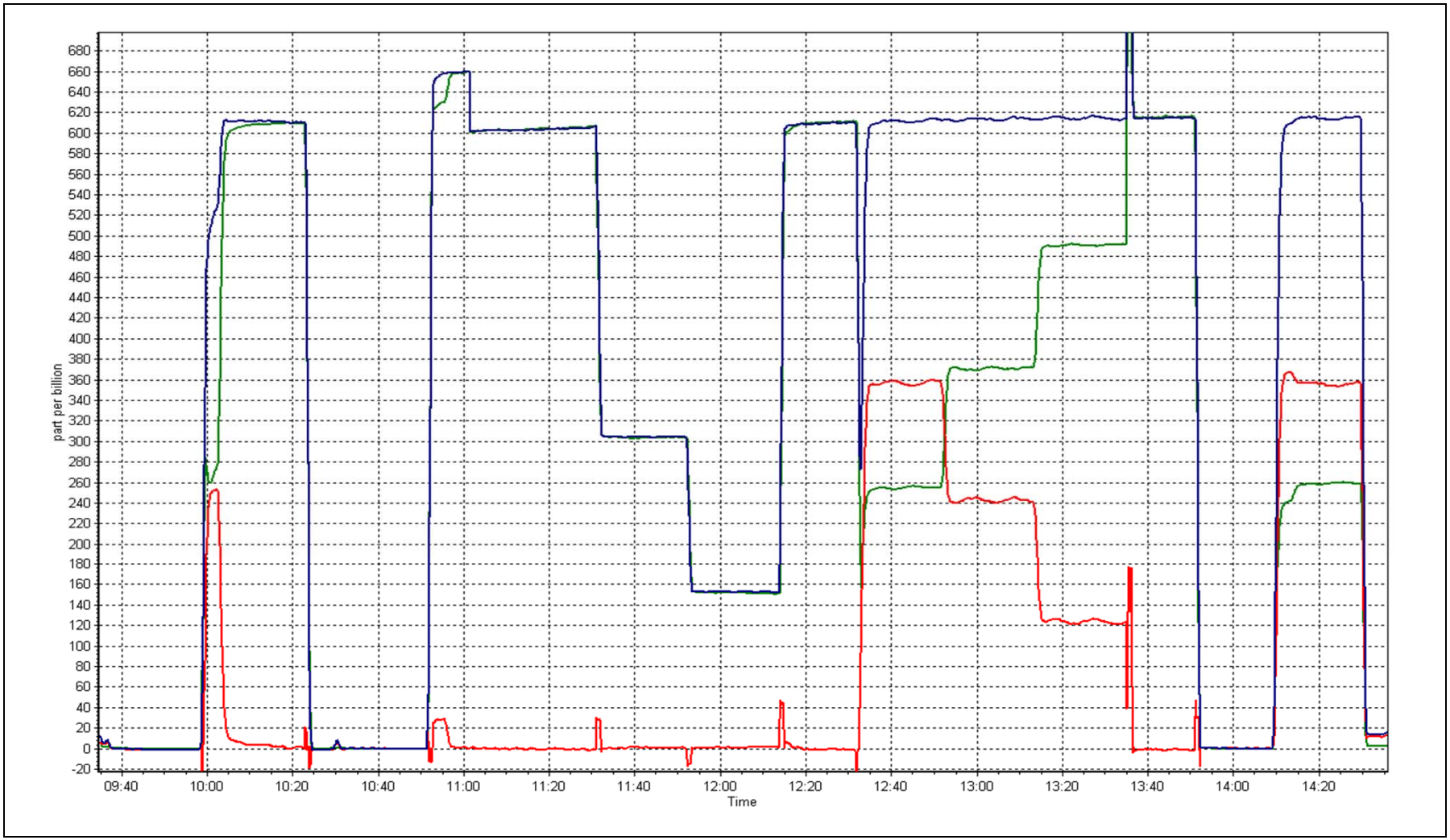
Calibration Date	January 7, 2015	Previous Calibration	December 9, 2014
Station Number	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	9:35	End Time (MST)	14:35
Analyzer make	Thermo Scientific 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999849
355.6	356.4	0.9976		
239.9	242.8	0.9882	Slope	0.998558
119.4	123.5	0.9667		
			Intercept	-1.679439



NOx, NO & NO_2 Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 10, 2014
Station Name	Patricia McInnis	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	12:10	End Time (MST)	16:00
Barometric Pressure	744 mmHg	Station Temperature	21.0 Deg C
Calibrator	API T700	Serial Number	1220
NH3 Cal Gas Conc	190 ppm	Cal Gas Expiry Date	April 3, 2012
NOx Cal Gas Conc	54.4 ppm	Cal Gas Serial #	LL86349

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2582

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	2500	1000	2500
Before	Data Slope	0.998334	0.999859	0.998757
	Data Offset	12.499223	0.572406	11.877696
After	Data Slope	0.992500	0.999990	0.992983
	Data Offset	16.283051	0.033357	16.166095
IP address		192.168.1.17		

Analyzer Information

Analyzer make/model	Thermo 17i	Analyzer serial #	1426262596
		Converter serial #	1426262596

Test Point	before		after	
Concentration range	0-2500	ppb	0-2500	ppb
NO BKG	9.9	ppb	9.0	ppb
NOx BKG	9.2	ppb	8.3	ppb
Nt BKG	12.8		11.0	
NO coefficient	1.214		1.160	
NO2 coefficient	1.000	ppb	1.000	ppb
NOx coefficient	0.922		0.924	
NH3 coefficient	0.879		0.870	
Nt coefficient	0.984		0.985	
NH3 conv temp	753	DegC	761	Deg C
Chamber Temp	50.4	Deg C	50.7	Deg C
Moly Temp	326.0	Deg C	326.6	Deg C
PMT Temp	-8.7	Deg C	-9.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	100.5	mmHg	104.8	mmHg
PMT Voltage	-838.1	v	-838.0	v
Sample Flow 1 NO	510.0	ccm	555.0	ccm
Sample Flow 2 Nox	492.0	ccm	533.0	ccm
Sample Flow 3 Nt	463.0	ccm	502.0	ccm

Notes:

Replaced inlet filter. Adjusted zero, NO/Nox/Nt span; adjusted NH3 span.

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: January 8, 2015 Station Number: AMS 6

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-2.6	-1.0	-1.6	NA	NA
as found NO	5000	55.3	601.7	601.7	NA	633.0	632.1	0.9	0.950	NA
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	NA	NA
high NO point	5000	55.3	601.7	601.7	NA	604.3	602.6	1.7	0.996	NA
NO/O3 point	5000	55.3	601.7	601.7	NA	603.7	600.6	3.1	0.997	NA
as found NH3	5000	52.8	2006.4	NA	2006.4	1973.0	1.0	1972.0	1.017	1.017
first NH3	5000	52.8	2006.4	NA	2006.4	2012.5	0.8	2011.7	0.997	0.997
second NH3	5000	26.3	999.4	NA	999.4	983.5	0.4	983.1	1.016	1.017
third NH3	5000	13.3	505.4	NA	505.4	476.3	0.1	476.1	1.061	1.061
as left zero						0.0				
as left span						0.0				
								Average Correction Factor	0.9961	1.0251

Corrected As found Nt = 635.6 ppb
NH3 = 1973.6 ppb

Previous response Nt = 590.2 ppb
NH3 = 1997.0 ppb

Nt percent change -7.2%
NH3 percent change 1.2%

Converter efficiency 87.0%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

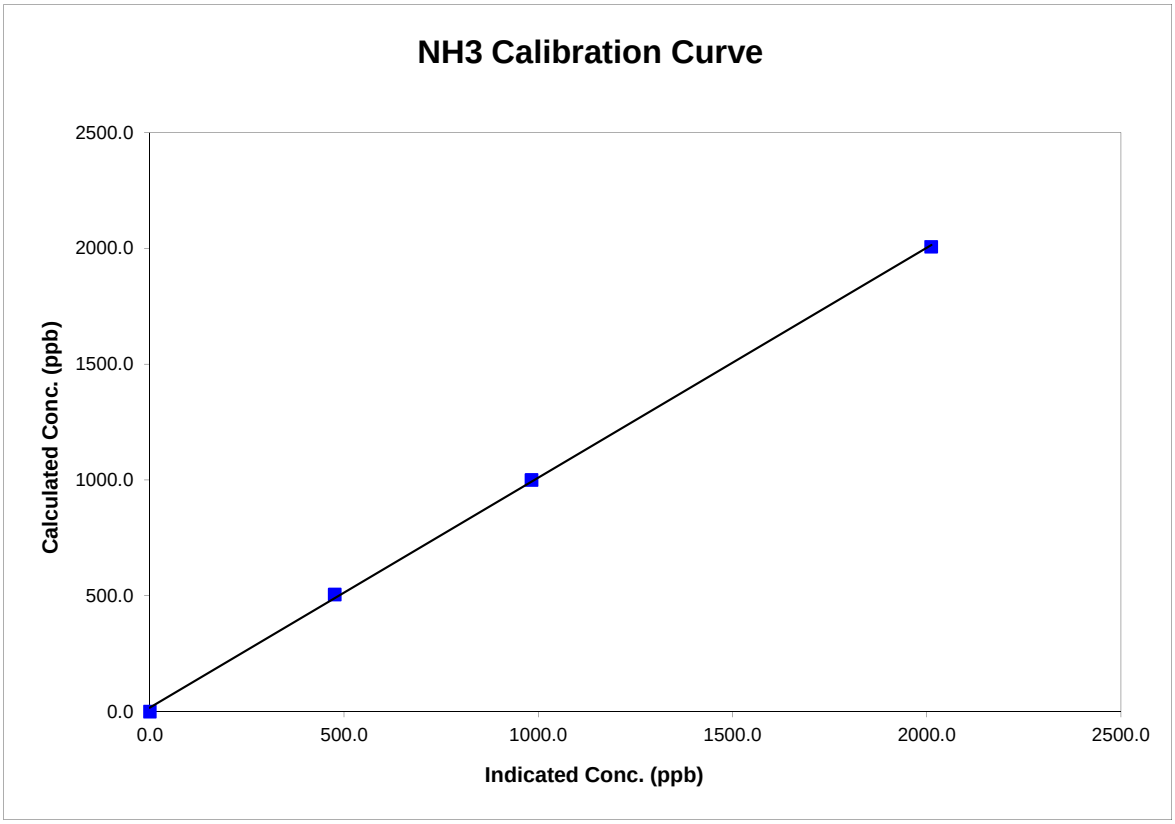
NH3 Calibration Summary

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 10, 2014
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	12:10	End Time (MST)	16:00
Analyzer make	Thermo 17i	Analyzer serial #	1426262596

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999711
2006.4	2011.7	0.9974		
999.4	983.1	1.0166	Slope	0.992983
505.4	476.1	1.0615		
			Intercept	16.166095



Wood Buffalo Environmental Association

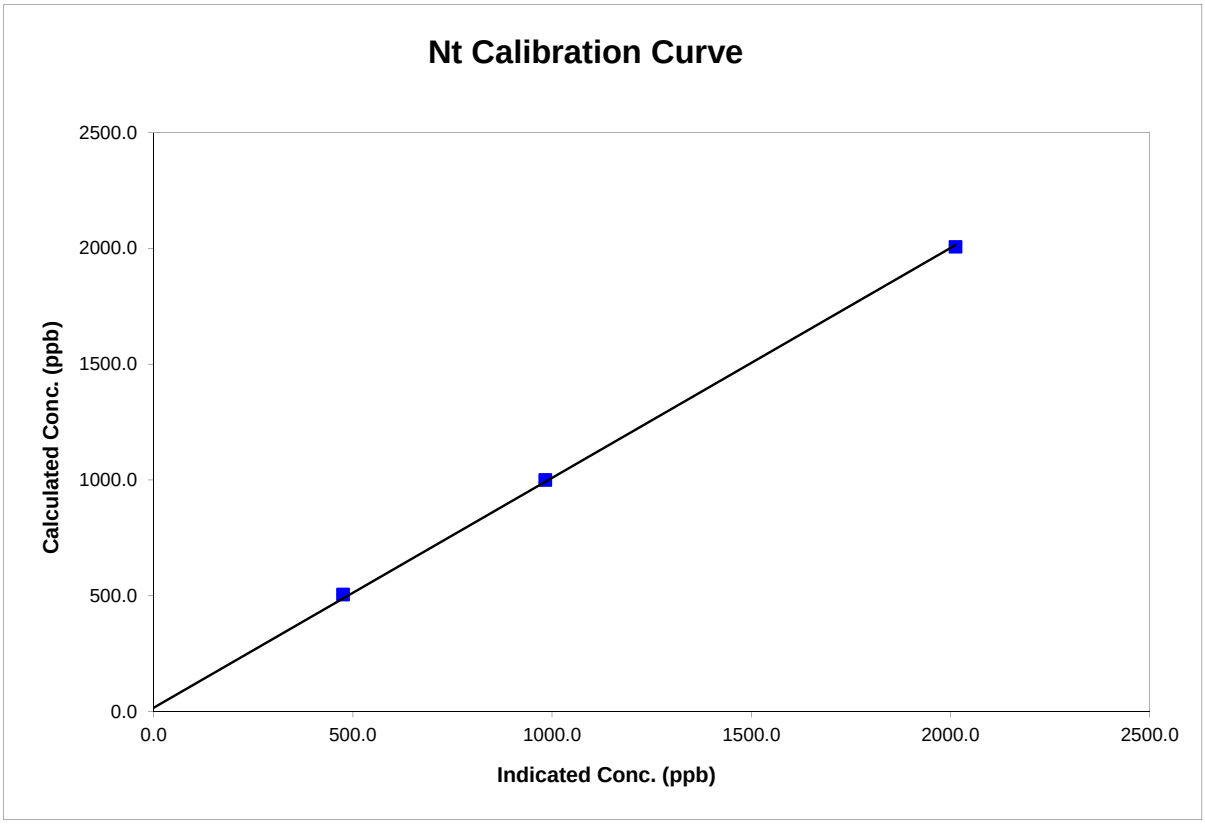
Nt Calibration Summary

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 10, 2014
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	12:10	End Time (MST)	16:00
Analyzer make	Thermo 17i	Analyzer serial #	1426262596

Nt (NH_3) Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999712
2006.4	2012.5	0.9969		
999.4	983.5	1.0162	Slope	0.992500
505.4	476.3	1.0612		
	0.0		Intercept	16.283051



Wood Buffalo Environmental Association

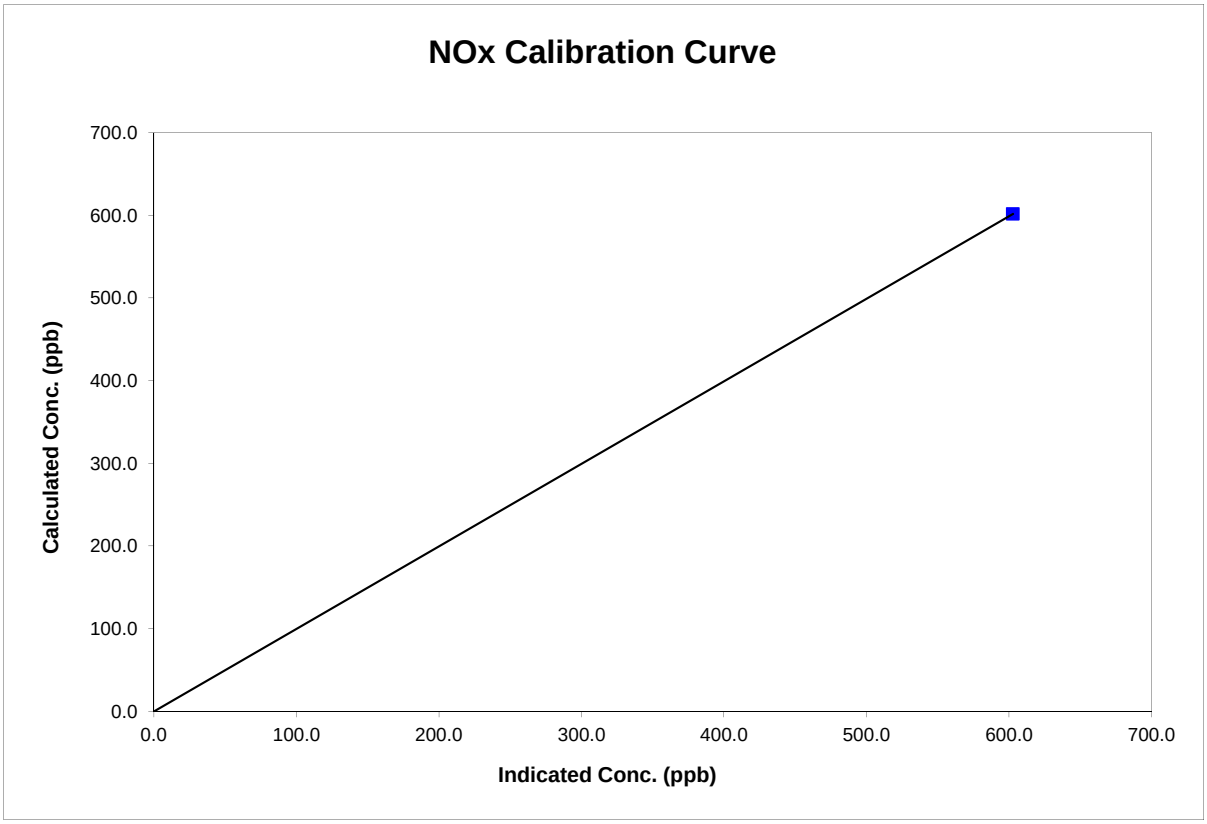
NOx Calibration Summary

Station Information

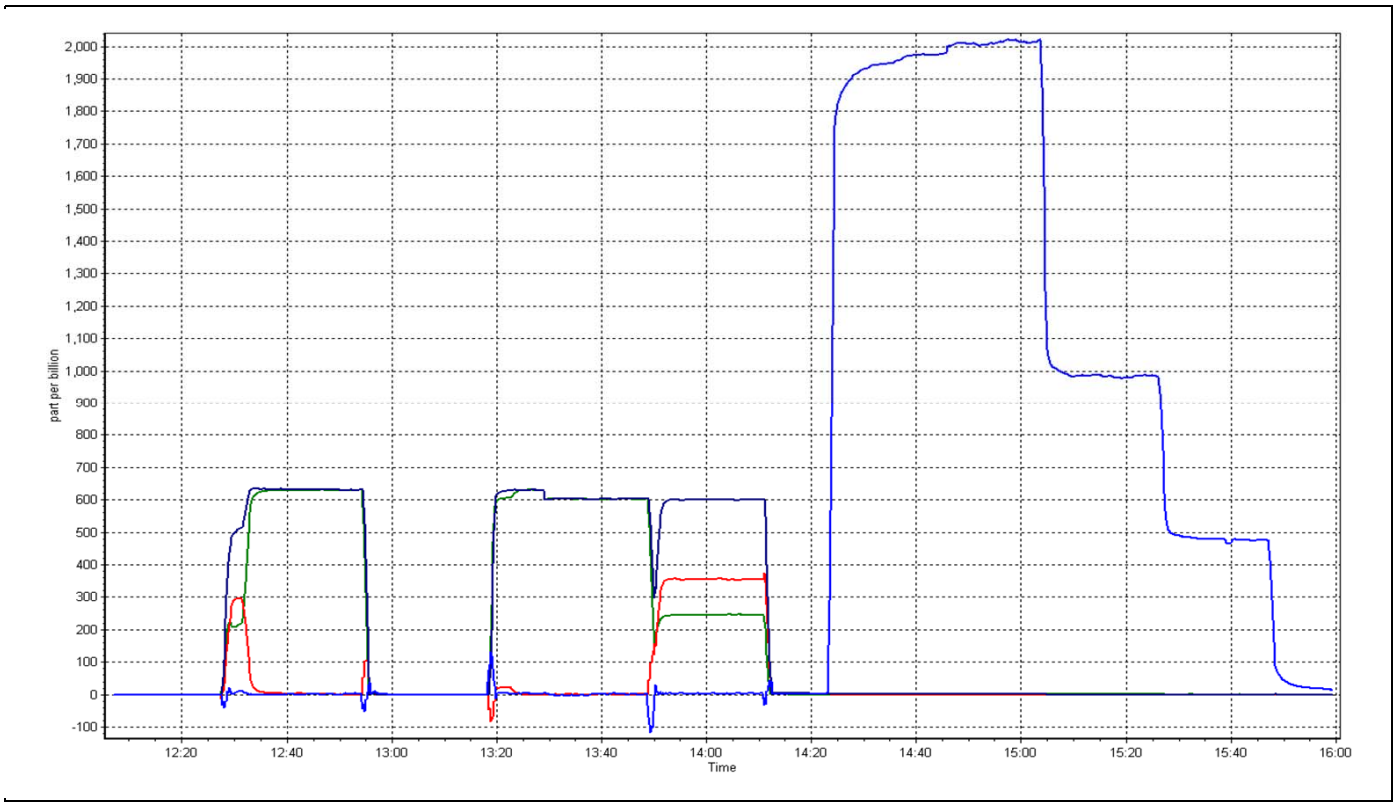
Calibration Date	January 8, 2015	Previous Calibration	December 10, 2014
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	12:10	End Time (MST)	16:00
Analyzer make	Thermo 17i	Analyzer serial #	1426262596

NO_X Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999992
601.7	602.6	0.9984		
601.7	600.6	1.0017	Slope	0.999990
			Intercept	0.033357



NH_3 Calibration Plot Date: January 8, 2015



Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Name	Patricia McInnis	Station Number	AMS 6
Reason:	Other: repair		
Start Time (MST)	10:00	End Time (MST)	16:30
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	API T700	Serial Number	1220
NH3 Cal Gas Conc	190 ppm	NH3 Cal Gas Exp Date	April 3, 2012
		NH3 Cal Gas Serial #	LL86349
NO Cal Gas Conc	54.4 ppm	NO Cal Gas Exp Date	January-12-16
		NO Cal Gas Serial #	SA130110A

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2582

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	2500	1000	2500
Before	Data Slope	0.992500	0.999990	0.992983
	Data Offset	16.283051	0.033357	16.166095
After	Data Slope	0.980690	0.998059	0.981266
	Data Offset	11.147256	0.409227	10.488799
IP address		192.168.1.17		

Analyzer Information

Analyzer make/model	Thermo 17i	Analyzer serial #	1426262596
		Converter serial #	1426262596

Test Point	before		after	
Concentration range	0-2500	ppb	0-2500	ppb
NO BKG	9.0	ppb	11.1	ppb
NOx BKG	8.3	ppb	10.2	ppb
Nt BKG	11.0		13.9	
NO coefficient	1.160		1.197	
NO2 coefficient	1.000	ppb	1.000	ppb
NOx coefficient	0.924		0.926	
NH3 coefficient	0.870		0.870	
Nt coefficient	0.985		0.981	
NH3 conv temp	761	DegC	757	Deg C
Chamber Temp	50.7	Deg C	50.7	Deg C
Moly Temp	326.6	Deg C	325.0	Deg C
PMT Temp	-9.0	Deg C	-9.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	104.8	mmHg	101.4	mmHg
PMT Voltage	-838.0	v	-838.0	v
Sample Flow 1 NO	555.0	ccm	546.0	ccm
Sample Flow 2 Nox	533.0	ccm	525.0	ccm
Sample Flow 3 Nt	502.0	ccm	494.0	ccm

Notes:

NO high point changed to 800 ppb. Adjusted zero, NO/Nox/Nt. Ozonator switch changed from low to high.

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: January 9, 2015 Station Number: AMS 6

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.0	-0.3	0.3	NA	NA
as found NO	5000	55.3	601.7	601.7	NA	612.3	606.3	6.0	0.983	NA
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.4	-0.2	NA	NA
high NO point	5000	73.6	800.8	800.8	NA	801.9	802.0	-0.1	0.999	NA
NO/O3 point	5000	73.6	800.8	800.8	NA	803.2	801.8	1.4	0.997	NA
as found NH3										
first NH3	5000	52.8	2006.4	NA	2006.4	2039.6	0.6	2039.0	0.984	0.984
second NH3	5000	26.3	999.4	NA	999.4	1002.9	-0.1	1003.0	0.996	0.996
third NH3	5000	13.3	505.4	NA	505.4	493.0	-0.5	493.5	1.025	1.024
as left zero						0.0				
as left span						0.0				
								Average Correction Factor	0.9978	1.0015

Corrected As found Nt = 612.3 ppb
NH3 = NA ppb

Previous response Nt = 600.6 ppb
NH3 = NA ppb

Nt percent change -1.9%
NH3 percent change NA

Converter efficiency 87.0%

Wood Buffalo Environmental Association

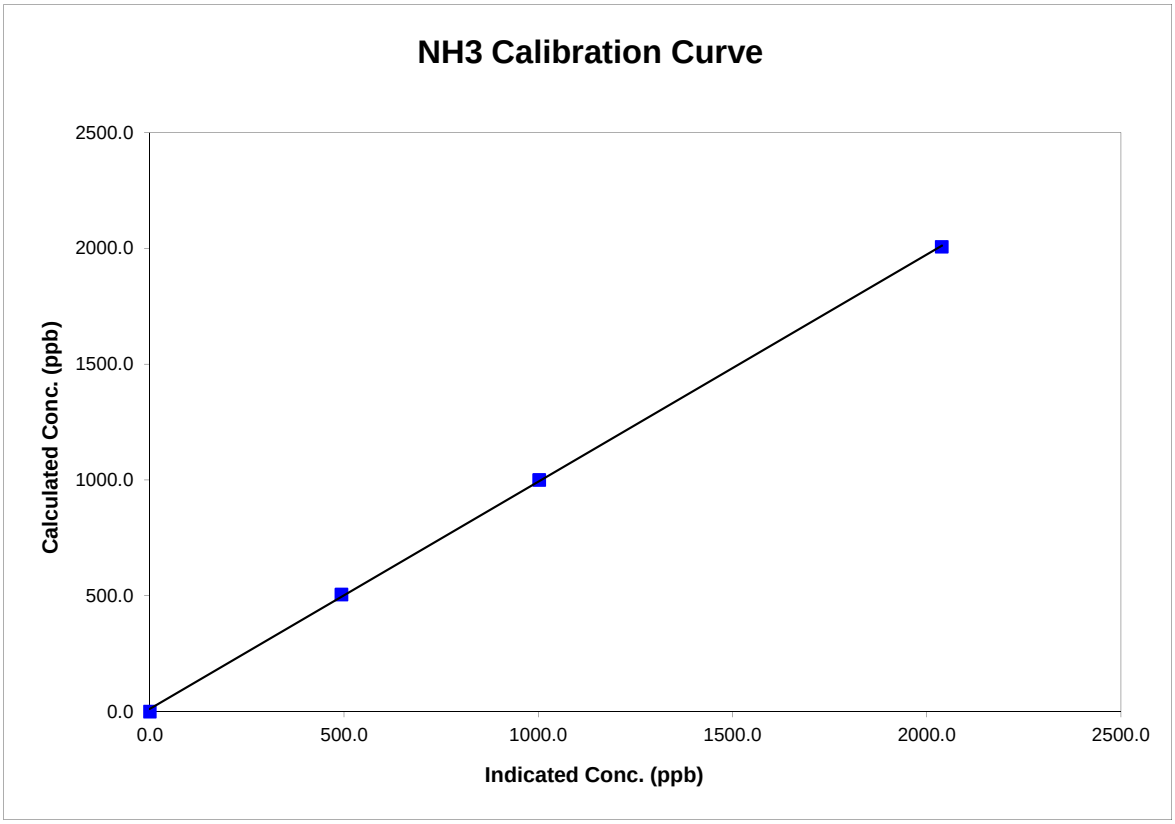
NH3 Calibration Summary

Station Information

Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	10:00	End Time (MST)	16:30
Analyzer make	Thermo 17i	Analyzer serial #	1426262596

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999877
2006.4	2039.0	0.9840		
999.4	1003.0	0.9964	Slope	0.981266
505.4	493.5	1.0242		
			Intercept	10.488799



Wood Buffalo Environmental Association

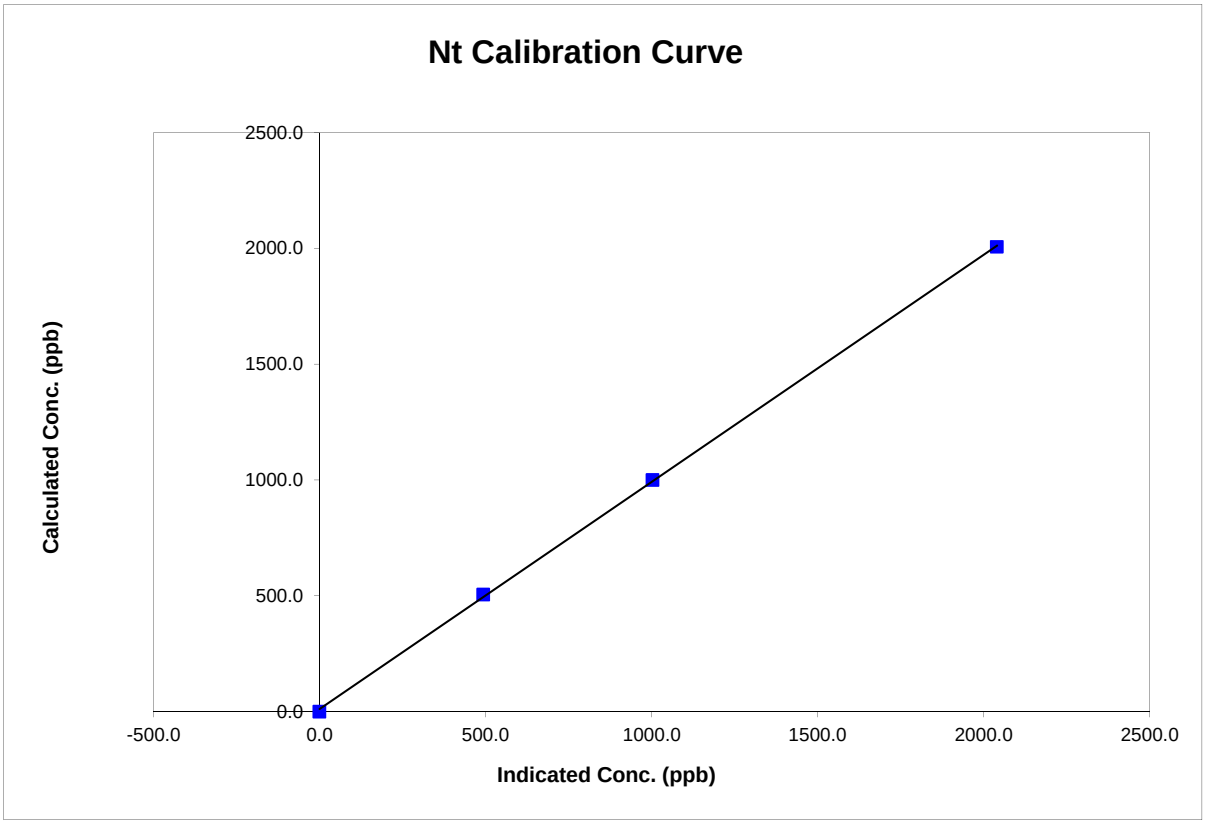
Nt Calibration Summary

Station Information

Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	10:00	End Time (MST)	16:30
Analyzer make	Thermo 17i	Analyzer serial #	1426262596

Nt (NH_3) Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999876
2006.4	2039.6	0.9837		
999.4	1002.9	0.9965	Slope	0.980690
505.4	493.0	1.0252		
	0.0		Intercept	11.147256



Wood Buffalo Environmental Association

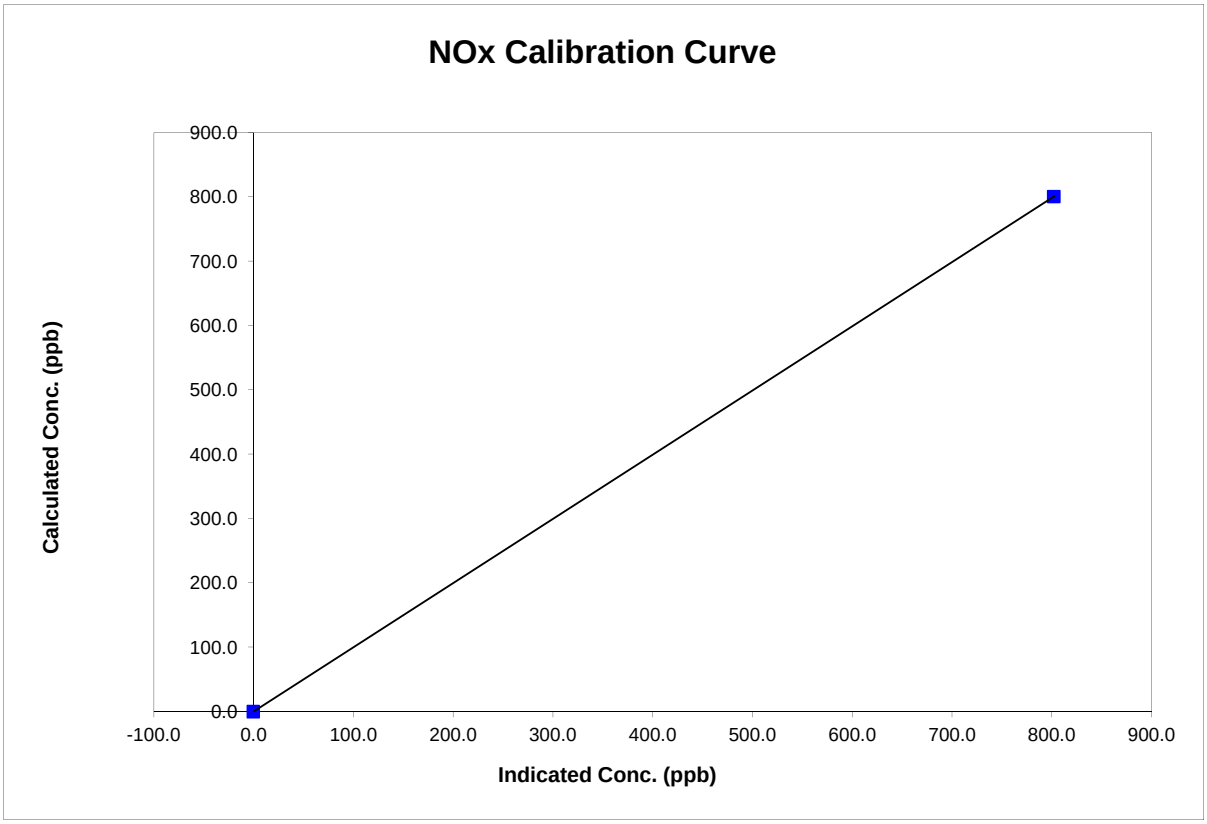
NOx Calibration Summary

Station Information

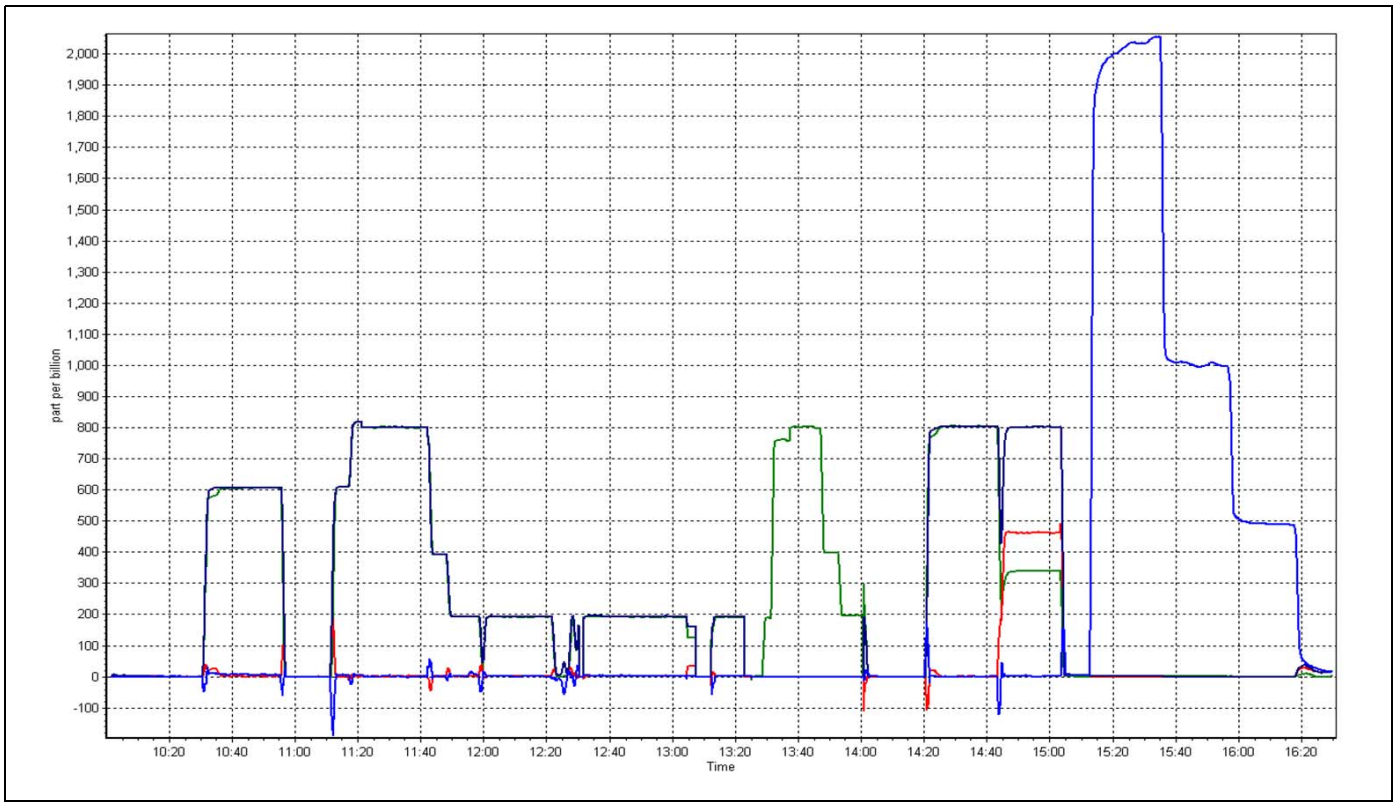
Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Number	Patricia McInnis	Station Number	AMS 6
Start Time (MST)	10:00	End Time (MST)	16:30
Analyzer make	Thermo 17i	Analyzer serial #	1426262596

NO_X Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	1.000000
800.8	802.0	0.9985		
800.8	801.8	0.9987	Slope	0.998059
			Intercept	0.409227



NH_3 Calibration Plot Date: January 9, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Name	Patricia McInnes	Station Number	AMS 6
Reason:	Routine		
Start Time (MST)	10:00	End Time (MST)	
Barometric Pressure	n/a mmHg	Station Temperature	22.0 Deg C
Calibrator	API T700	Serial Number	1220
NO Cal Gas Conc	54.4 ppm	Cal Gas Expiry Date	December 12, 2016
NOx Cal Gas Conc	54.4 ppm	Cal Gas Serial #	SA130110A

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2582

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope			
	Data Offset			
After	Data Slope	1.000902	1.001200	1.004113
	Data Offset	2.631428	2.684792	-0.100411
IP address:		192.168.1.42		
Voltage Range		N/A		

Analyzer Information

Analyzer make/model	Thermo Scientific 17i	Analyzer serial #	1426262596

Test Point	before		after	
Concentration range		ppb	0-1000	ppb
NO coefficient			0.991	
NOX coefficient			0.997	
NO2 coefficient			1.000	
NO bkgrnd			2.7	
NOX bkgrnd			3.3	
Chamber Temp		Deg C	50.6	Deg C
Moly Temp		Deg C	327	Deg C
PMT voltage		V	-761	V
PMT Temp		Deg C	-3	Deg C
O3 flow		ccm	ok	ccm
R Cell press NO		mmHg	167.3	mmHg
R Cell Press Nox		mmHg	167	mmHg
NO sample flow		ccm	0.868	ccm
Nox sample Flow		ccm	0.865	ccm

Notes:

Investigation on linearity issues.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 9, 2015 Station Number: AMS 6

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero										
as found span										
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.4	0.1	N/A	N/A
high point	5000	73.6	800.8	800.8	0.0	800.9	800.5	0.4	0.9998	1.0003
second point	5000	36.9	401.5	401.5	0.0	392.4	392.4	-0.1	1.0231	1.0231
third point	5000	18.5	201.3	201.3	0.0	196.3	196.3	1.0	1.0254	1.0254
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.4	0.1	N/A	N/A
as left zero										
as left span										
								Average Correction Factor	1.0161	1.0163

Corrcted As found NO_X= NA NO= NA Percent Change NO_X= N/A NO= N/A

Previous Response NO_X= NA NO= NA

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 73.60 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.1			N/A	
1st NO2 (300)	N/A	339.1	463.9	801.2	339.1	462.1	0.9850	1.0000	1.0039	99.6%
2nd NO2 (200)										
3rd NO2 (100)										
4th NO2 (0)	803.0	N/A	0.5	803.5	803.0	0.5	0.9821	1.0000	N/A	N/A
					Average Correction Factor		0.9836	1.0000	1.0039	99.6%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

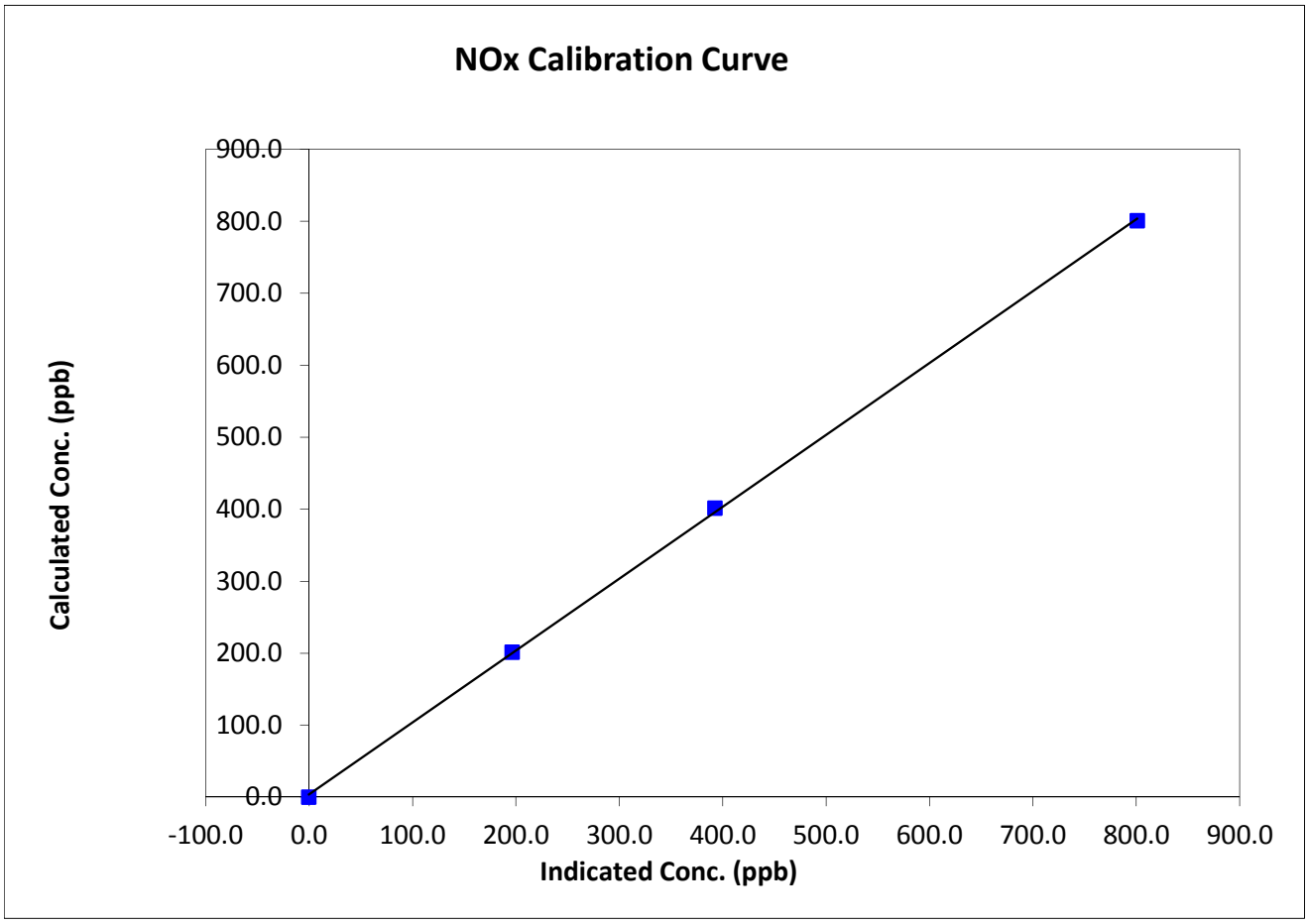
NO_X Calibration Summary

Station Information

Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	10:00	End Time (MST)	
Analyzer make	Thermo Scientific 17i	Analyzer serial #	1426262596

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999854
800.8	800.9	0.9998		
401.5	392.4	1.0231	Slope	1.000902
201.3	196.3	1.0254		
0.0	-0.3	0.0000	Intercept	2.631428



Wood Buffalo Environmental Association

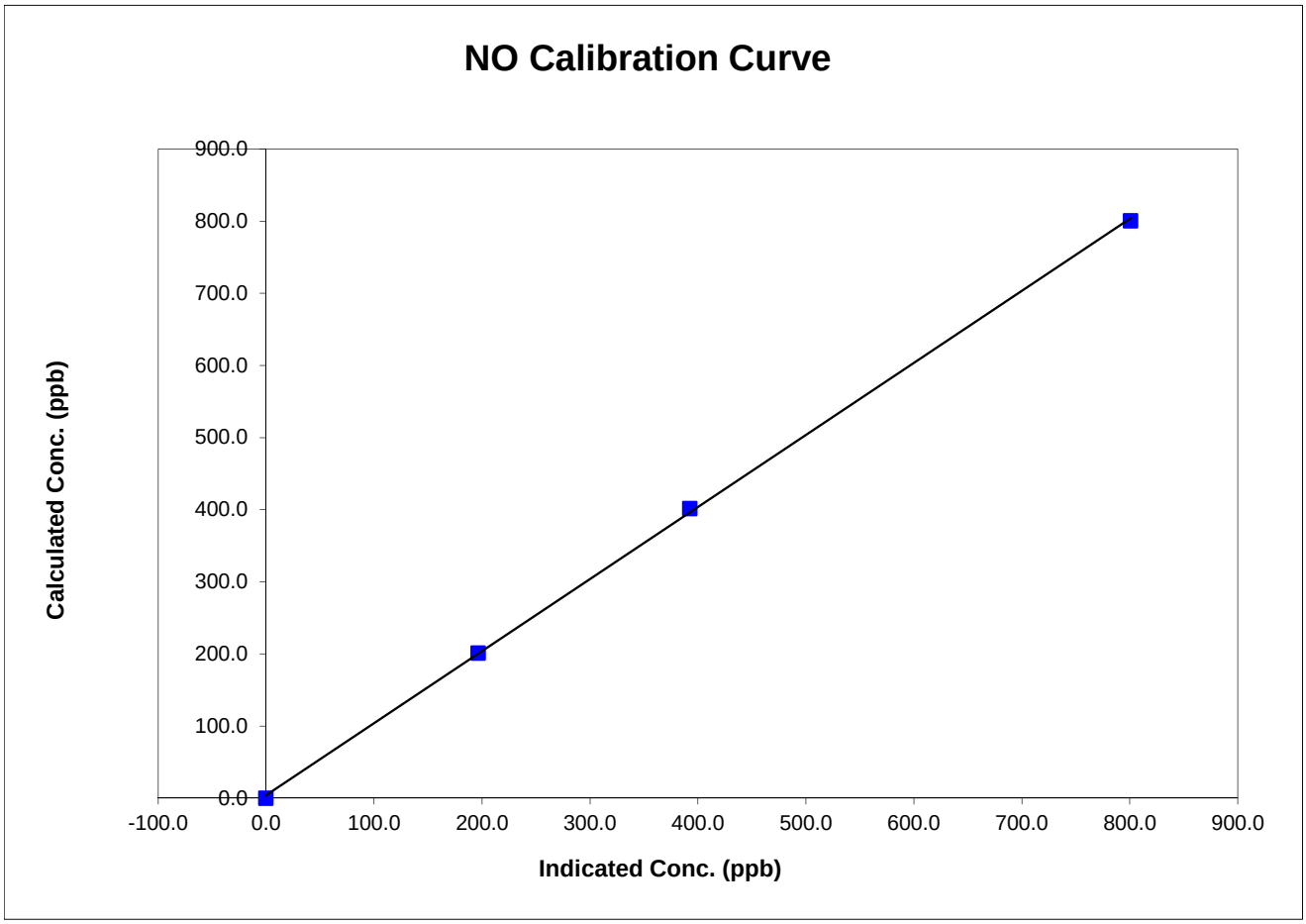
NO Calibration Summary

Station Information

Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Name	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	10:00	End Time (MST)	
Analyzer make	Thermo Scientific 17i	Analyzer serial #	1426262596

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	0.999863
800.8	800.5	1.0003		
401.5	392.4	1.0231	Slope	1.001200
201.3	196.3	1.0254		
0.0	-0.4	0.0000	Intercept	2.684792



Wood Buffalo Environmental Association

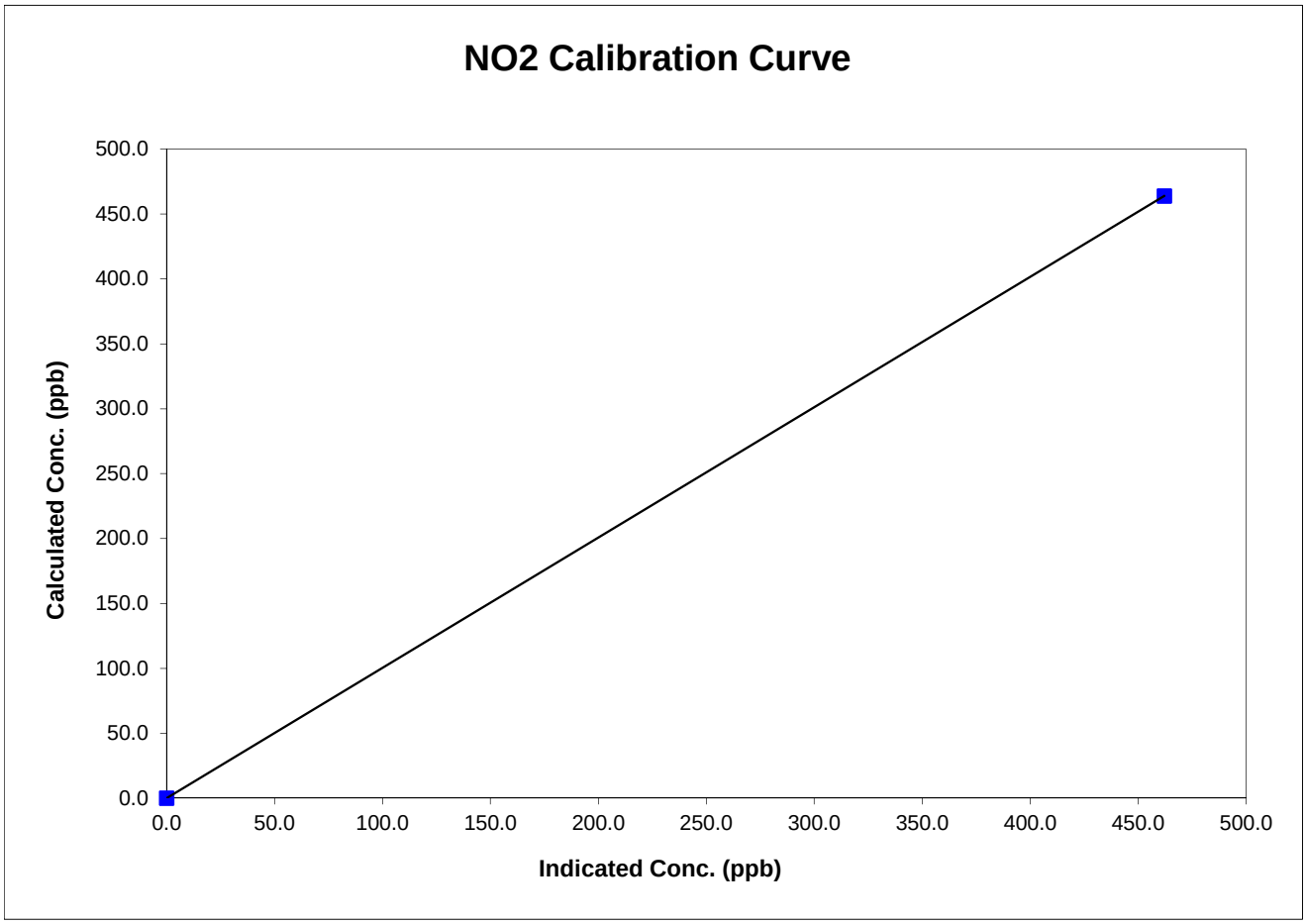
NO_2 Calibration Summary

Station Information

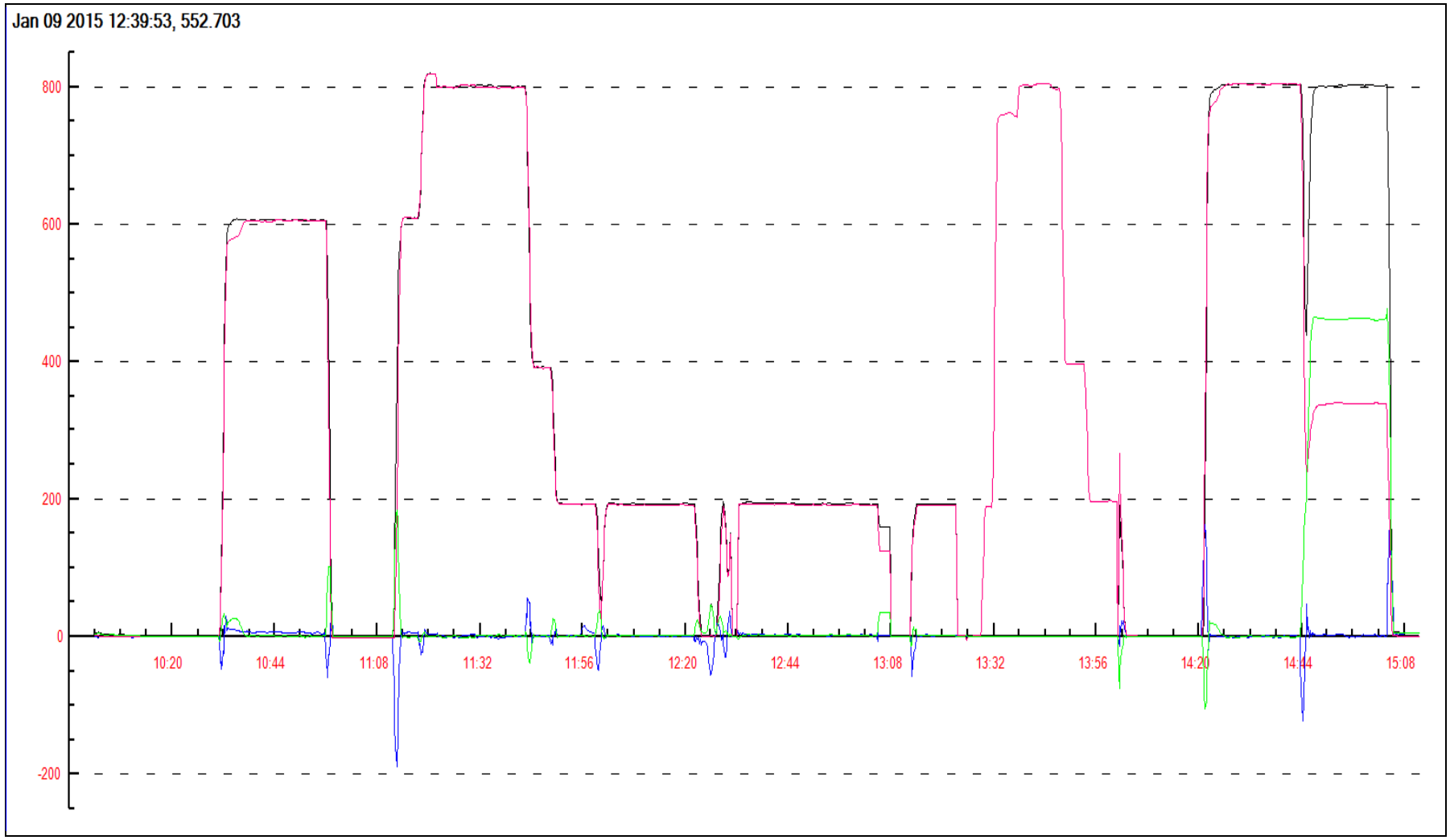
Calibration Date	January 9, 2015	Previous Calibration	January 8, 2015
Station Number	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	10:00	End Time (MST)	
Analyzer make	Thermo Scientific 17i	Analyzer serial #	1426262596

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	1.000000
463.9	462.1	1.0039		
			Slope	1.004113
			Intercept	-0.100411



NOx, NO & NO_2 Calibration Plot Date: January 9, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 7
ATHABASCA VALLEY
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
JANUARY 2015

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	37	37	100.00	18	0	5	0
TRS (ppb) Average	710	34	34	100.00	2	0	1	0
THC (ppm) Average	692	42	52	98.66	2.4	-	2.1	-
NMHC (ppm) Average	692	42	52	98.66	0.311	-	0.08	-
CH4(ppm) Average	692	42	52	98.66	2.2	-	2	-
O3 (ppb) Average	705	39	39	100.00	36	0	29	-
NO2 (ppb) Average	707	37	37	100.00	40	0	23	-
NO (ppb) Average	707	37	37	100.00	102	-	22	-
NOX (ppb) Average	707	37	37	100.00	129	-	44	-
PM2.5 (ug/m3) Average	740	0	4	99.46	24.1	-	10.3	0
CO(ppm) Average	699	34	45	98.52	0.6	0	0.3	-
Temperature 2 m (C) Average	744	0	0	100.00	6.8	-	3.7	-
Barometric Pressure (inHg) Average	744	0	0	100.00	30	-	-	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	735	0	9	98.79	31	-	-	-
Wind Direction 10 m (deg) Average	735	0	9	98.79	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
JANUARY 2015

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	2	-	0	0	0	1	1	2	18
TRS (ppb) Average	710	0.4	0	-	0	0	0	0	0	1	2
THC (ppm) Average	692	1.95	0.1	-	1.7	1.8	1.9	1.9	2	2.1	2.4
NMHC (ppm) Average	692	0.017	0.041	-	0	0	0	0	0	0.1	0.311
CH4(ppm) Average	692	1.93	0.1	-	1.7	1.8	1.9	1.9	2	2	2.2
O3 (ppb) Average	705	14.2	10	-	0	2	6	13	22	28	36
NO2 (ppb) Average	707	12.8	8	-	1	4	6	12	18	23	40
NO (ppb) Average	707	7.5	11	-	0	0	1	3	10	22	102
NOX (ppb) Average	707	20.3	17	-	1	4	8	15	28	42	129
PM2.5 (ug/m3) Average	740	5.55	3.3	-	0.3	2.7	3.6	4.8	6.6	9.8	24.1
CO(ppm) Average	699	0.12	0.1	-	0	0	0.1	0.1	0.1	0.2	0.6
Temperature 2 m (C) Average	744	-14.8	10.2	-	-32.8	-28.4	-22.8	-15.3	-8.2	0.3	6.8
Barometric Pressure (inHg) Average	744	29.14	0.4	-	28.3	28.6	28.8	29.2	29.4	29.7	30
Relative Humidity (%) Average	744	79.4	8	-	56	70	74	78	84	91	99
Wind Speed 10 m (km/h) Average	735	8	6	-	0	2	3	7	11	17	31
Wind Direction 10 m (deg) Average	735	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NMHC, CH4, THC	01 Jan 2015 13:00	01 Jan 2015 13:00	1	Power spike
NMHC, CH4, THC	16 Jan 2015 15:00	16 Jan 2015 15:00	1	Maintenance - uploaded new data collection program
NMHC, CH4, THC	18 Jan 2015 15:00	18 Jan 2015 15:00	1	Intermittent unstable operation - excessive baseline drift
NMHC, CH4, THC	18 Jan 2015 19:00	19 Jan 2015 01:00	7	Intermittent unstable operation - excessive baseline drift
PM2.5	20 Jan 2015 14:00	20 Jan 2015 14:00	1	Maintenance - Flow and zero check, sample head cleaning
PM2.5	31 Jan 2015 03:00	31 Jan 2015 04:00	2	Intermittent unstable operation - excessive baseline drift
PM2.5	31 Jan 2015 06:00	31 Jan 2015 06:00	1	Intermittent unstable operation - excessive baseline drift
CO	27 Jan 2015 03:00	27 Jan 2015 13:00	11	Maintenance - sample pump replaced
Wind Speed, Wind Direction	24 Jan 2015 03:00	24 Jan 2015 11:00	9	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 18 ppb on Jan 19 15:00 Maximum Daily Average: 5.3 ppb on Jan 28

Minimum Value: 0 ppb on Jan 6 05:00 Minimum Daily Average: 0.3 ppb on Jan 27
Maximum Diurnal Average: 2.1 ppb at hour 15 Minimum Diurnal Average: 0.6 ppb at hour 10
Monthly Average: 1.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 10$

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-Jan	0	Z	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	0.6	1
2-Jan	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.4	1
3-Jan	0	0	0	Z	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0.6	1
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	0.6	1
5-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0.4	1
6-Jan	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	0	0	0	0.4	1
7-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	3	1	2	3	1	0.8	3
8-Jan	2	5	Z	1	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.7	5
9-Jan	0	0	0	Z	0	0	1	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	1	0	0.5	1
10-Jan	1	0	0	0	Z	0	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	0.9	2
11-Jan	1	1	0	1	1	Z	0	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.5	1
12-Jan	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
13-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0.6	1
14-Jan	1	1	Z	1	1	1	1	2	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0.6	2
15-Jan	0	0	0	Z	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	1	0	0	--	1
16-Jan	1	1	1	0	Z	0	1	0	0	0	1	0	1	1	1	1	1	1	0	0	1	1	1	1	0.6	1
17-Jan	1	0	1	1	1	Z	0	0	2	1	0	0	7	9	4	2	2	4	4	4	2	1	3	3	2.3	9
18-Jan	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
19-Jan	0	Z	0	0	0	0	0	1	1	1	1	1	2	3	18	9	3	2	3	1	1	1	2	3	2.4	18
20-Jan	6	4	Z	3	2	2	1	1	2	2	2	2	2	2	4	4	3	2	2	2	1	1	1	1	2.3	6
21-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
22-Jan	1	1	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	2	9		1.0	9
23-Jan	7	4	5	5	5	Z	2	2	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1.9	7
24-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	0	1	0.4	1
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0.4	1
26-Jan	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	1	1	1	11	1	0	0	0	0	0.9	11
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	1	2	3	5	Z	7	9	4	3	1	1	11	10	12	18	11	9	6	4	3	2	1	1	1	5.3	18
29-Jan	1	1	1	1	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	0.9	3
30-Jan	Z	2	1	1	1	2	1	1	1	1	1	1	6	1	1	1	1	0	0	0	0	0	0	0	1.1	6
31-Jan	0	Z	0	0	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0.6	1
	1.0	1.1	0.8	1.0	0.7	0.8	0.9	0.8	0.7	0.6	0.6	1.0	1.5	1.4	2.1	1.5	1.1	0.9	1.2	0.8	0.6	0.7	0.8	1.0	Diurnal Average	
	7	5	5	5	5	7	9	4	3	2	2	11	10	12	18	11	9	6	11	4	2	2	3	9	Diurnal Maximum	

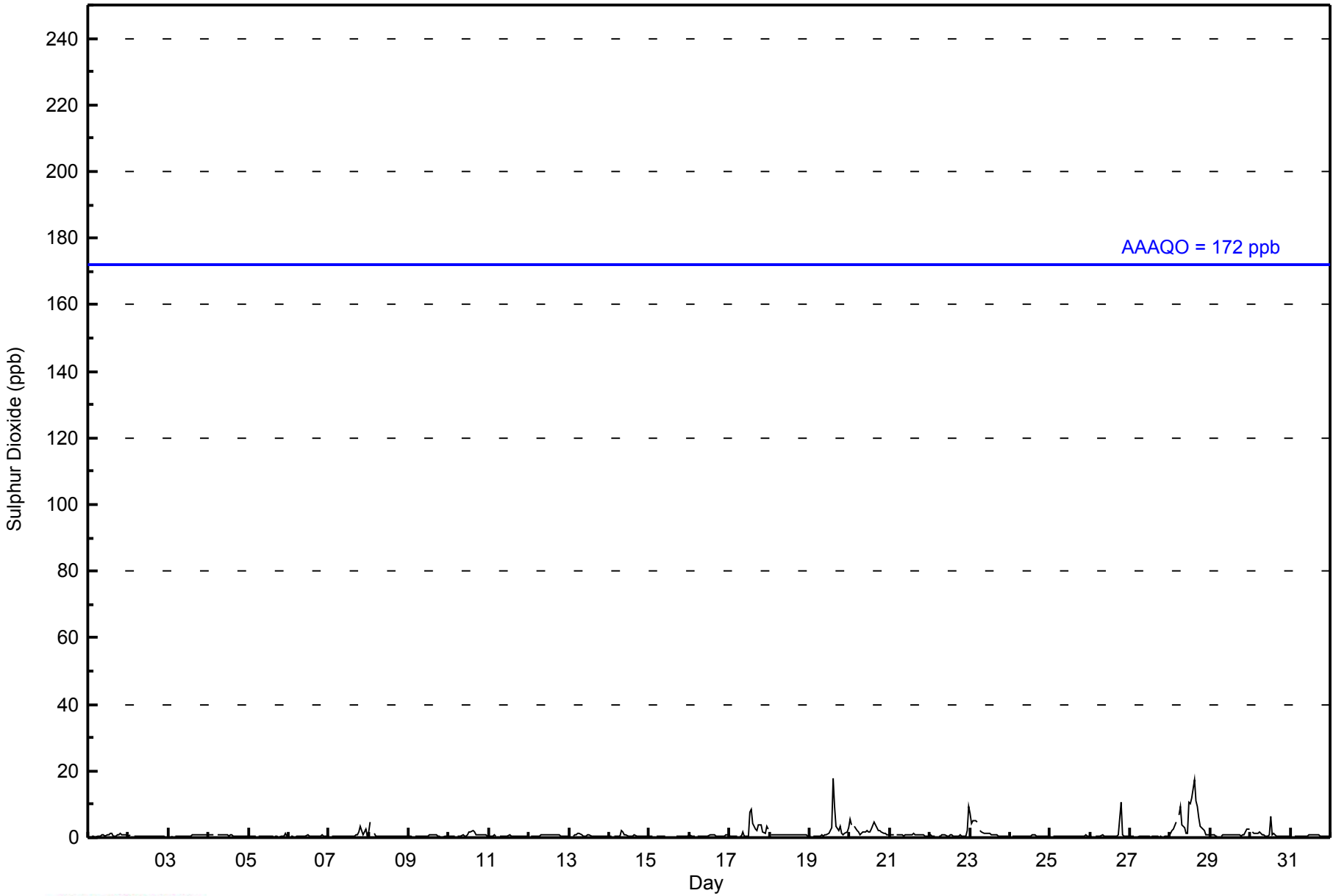
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	701	99.15	99.15
11 - 20	6	0.85	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

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	68	8	6	12	3	19	102	62	43	40	65	51	39	29	20	125	692
11 - 20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	8	6	12	3	19	102	62	43	40	65	51	39	29	20	129	698

Total Number of Valid Hours: 698

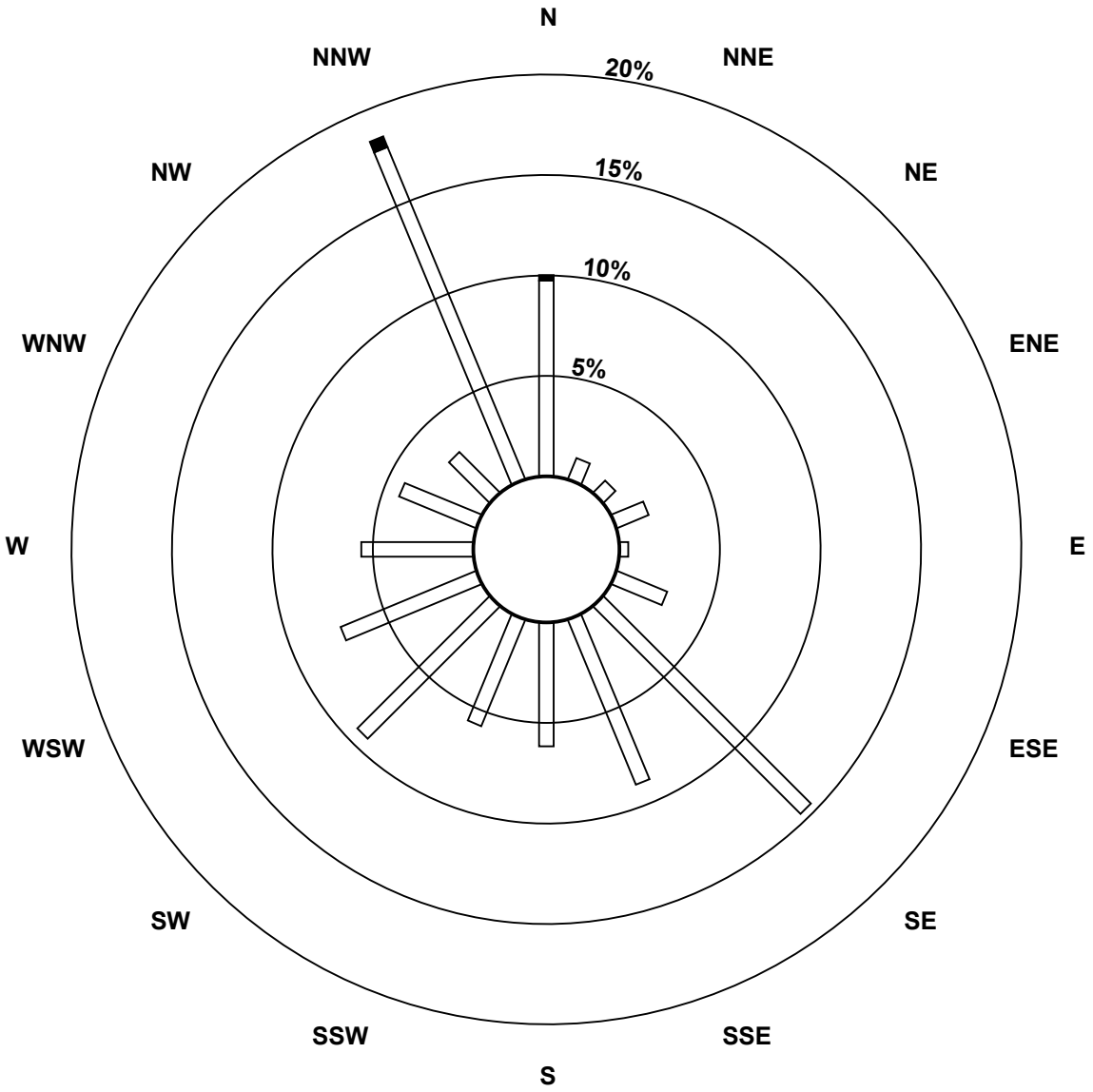
Total Number of Hours: 744

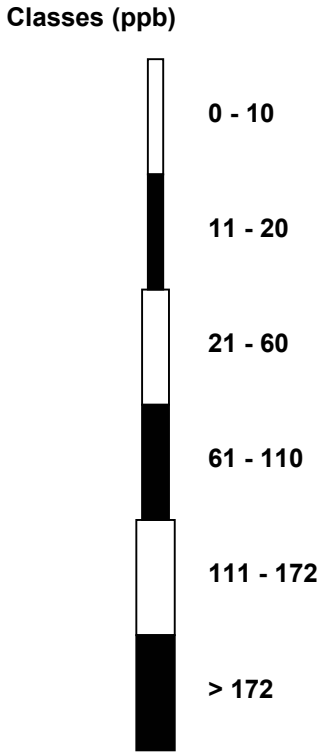
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley (AMS 7)





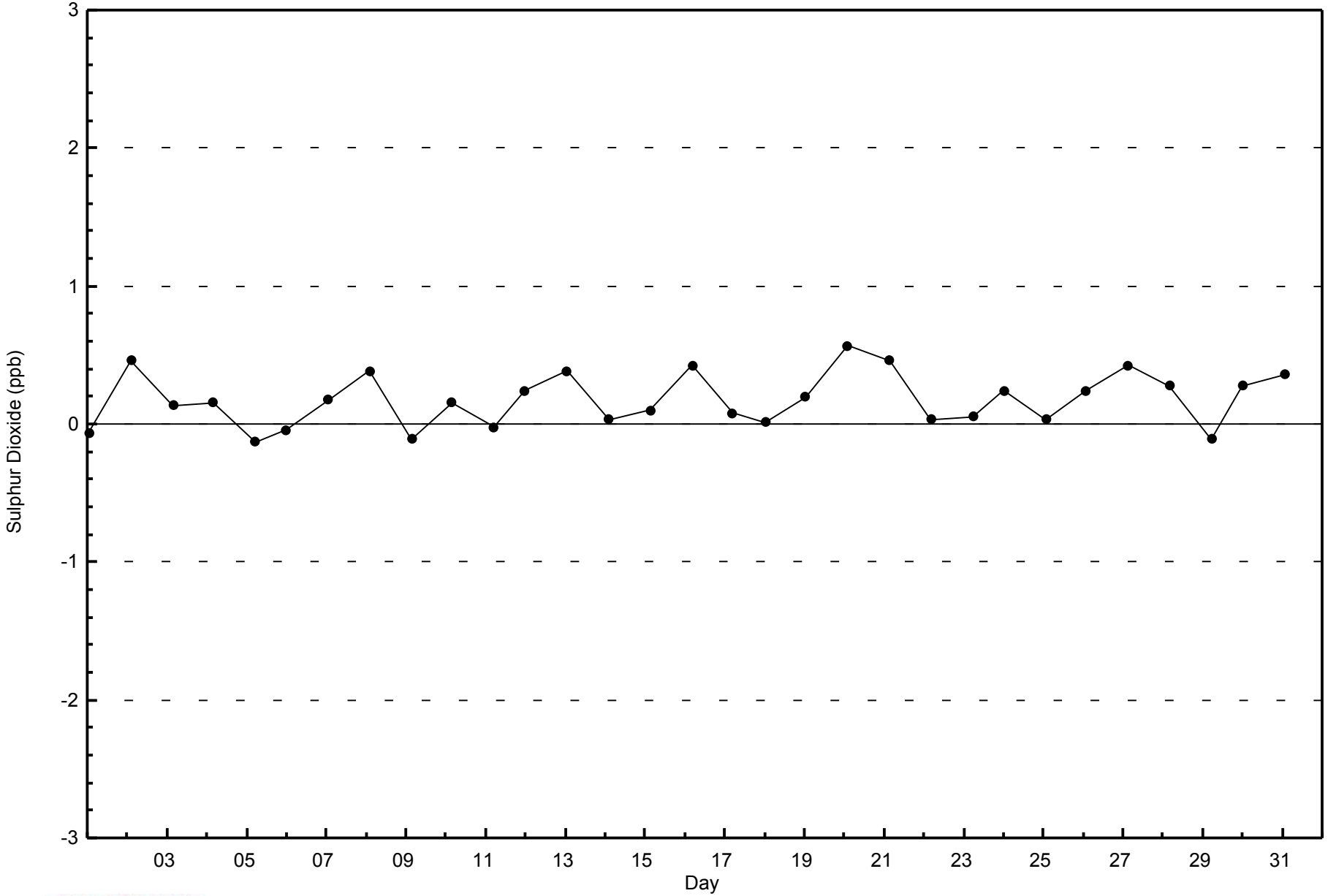
Total Number of Valid Hours: 698

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2015



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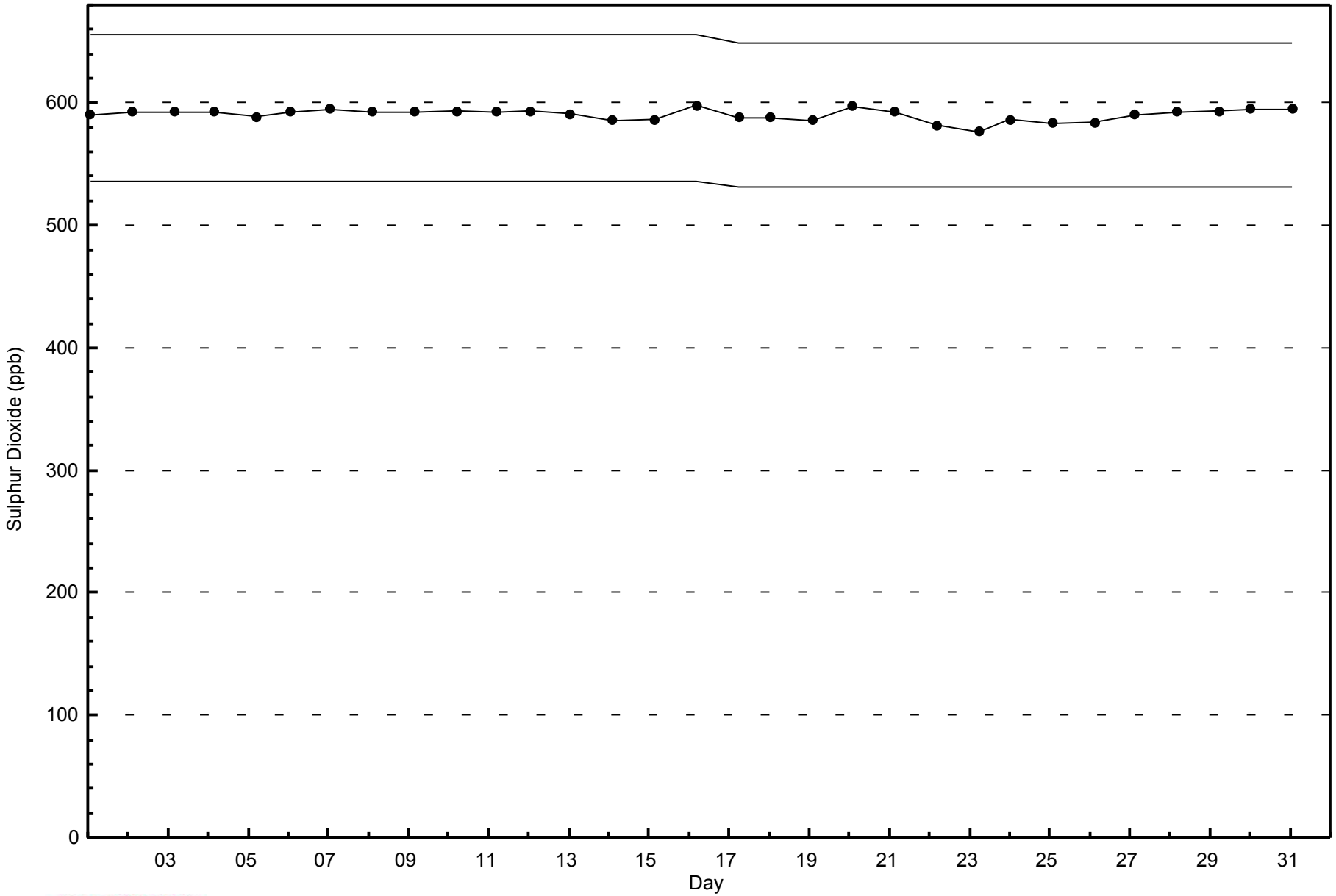
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2 ppb on Jan 19 08:00 Maximum Daily Average: 0.7 ppb on Jan 23

Minimum Value: 0 ppb on Jan 25 10:00 Minimum Daily Average: 0.2 ppb on Jan 25
Maximum Diurnal Average: 0.4 ppb at hour 8 Minimum Diurnal Average: 0.3 ppb at hour 2
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

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-Jan	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.4	1
2-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
6-Jan	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
7-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0.4	1
8-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
9-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0.4	1
10-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0.4	1
11-Jan	0	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.4	1
13-Jan	0	0	Z	0	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.4	1
14-Jan	0	0	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0.4	1
15-Jan	0	0	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
16-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	C	C	C	1	0	0	0	0	0	0	0	0	0.3	1
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
19-Jan	0	0	Z	0	0	0	0	2	1	1	1	1	1	1	2	1	1	1	1	0	0	1	1	1	0.7	2
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0.4	1
21-Jan	1	0	0	0	Z	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
23-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.7	1
24-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
25-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.3	1
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	1	1	0	1	1	Z	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0.5	1
29-Jan	0	0	0	0	0	0	Z	0	1	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	0.4	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
31-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
	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	0.3	0.4	0.4	0.3	0.3	Diurnal Average	
	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

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

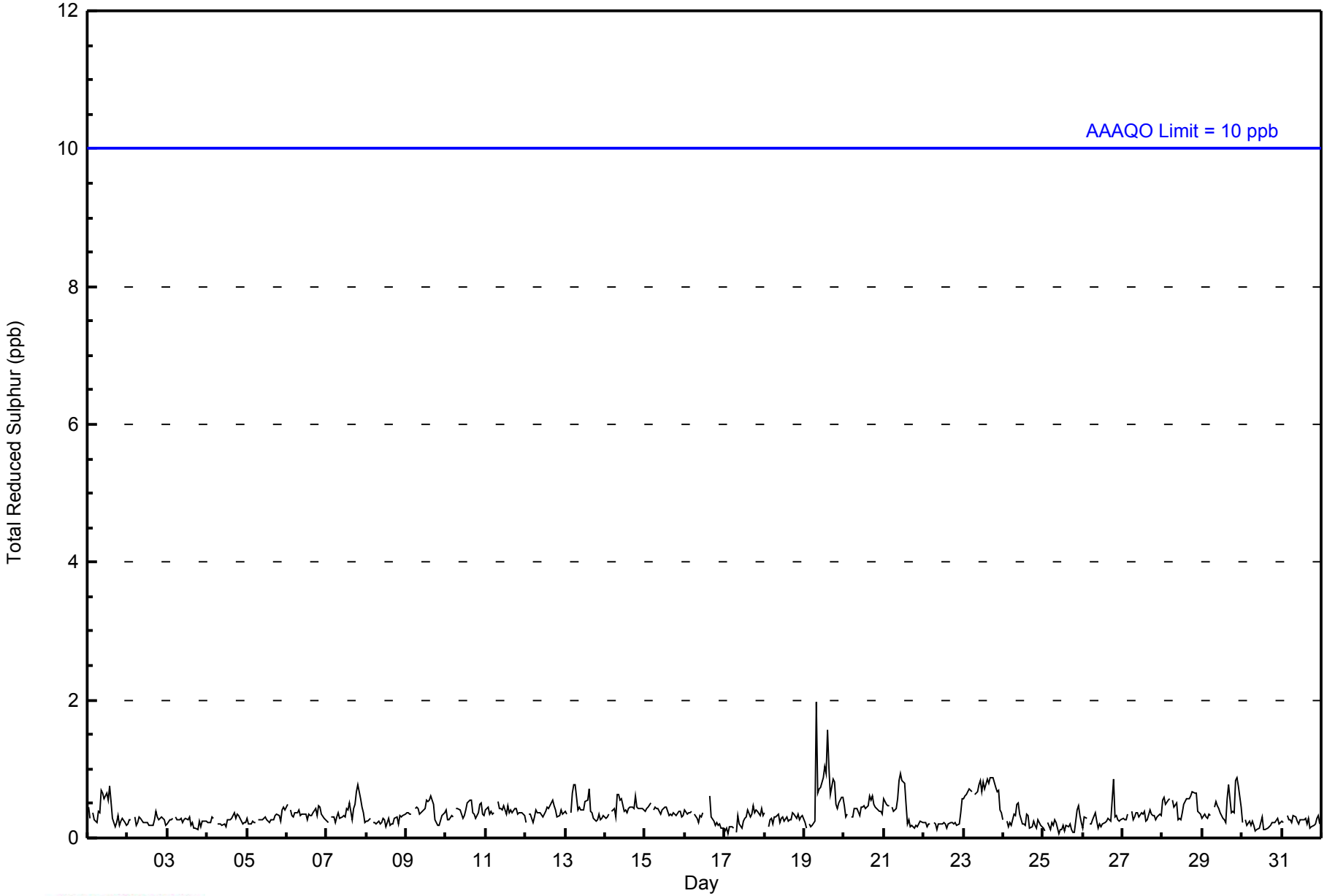
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	710	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: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	70	8	6	12	4	20	100	64	41	42	64	51	39	29	20	131	701
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	70	8	6	12	4	20	100	64	41	42	64	51	39	29	20	131	701

Total Number of Valid Hours: 701

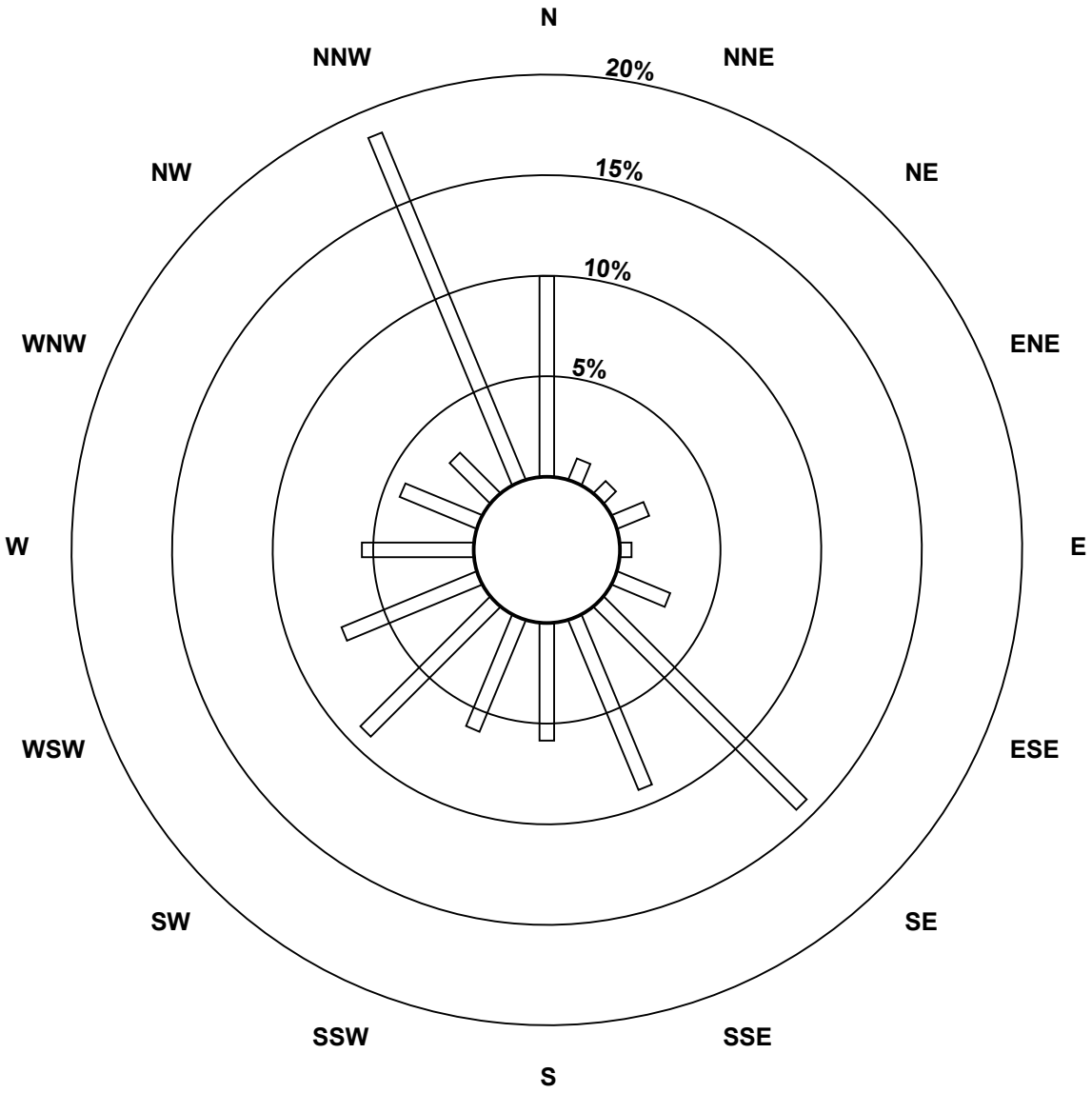
Total Number of Hours: 744

Wood Buffalo Environmental Association

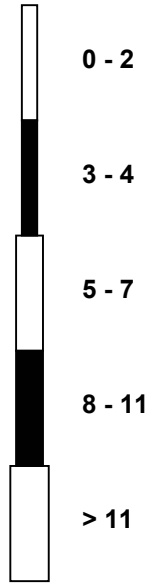
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley (AMS 7)



Classes (ppb)



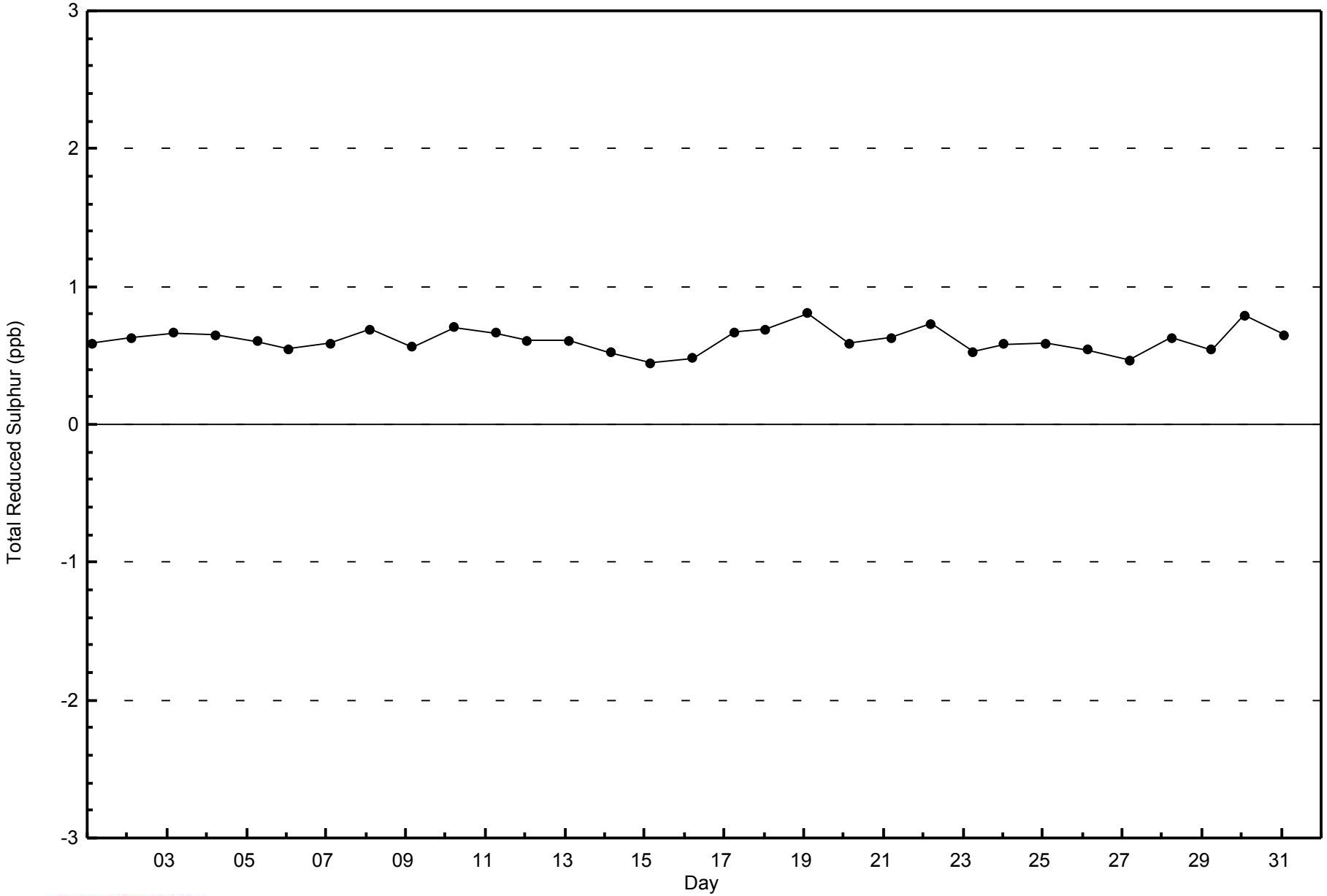
Total Number of Valid Hours: 701

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2015



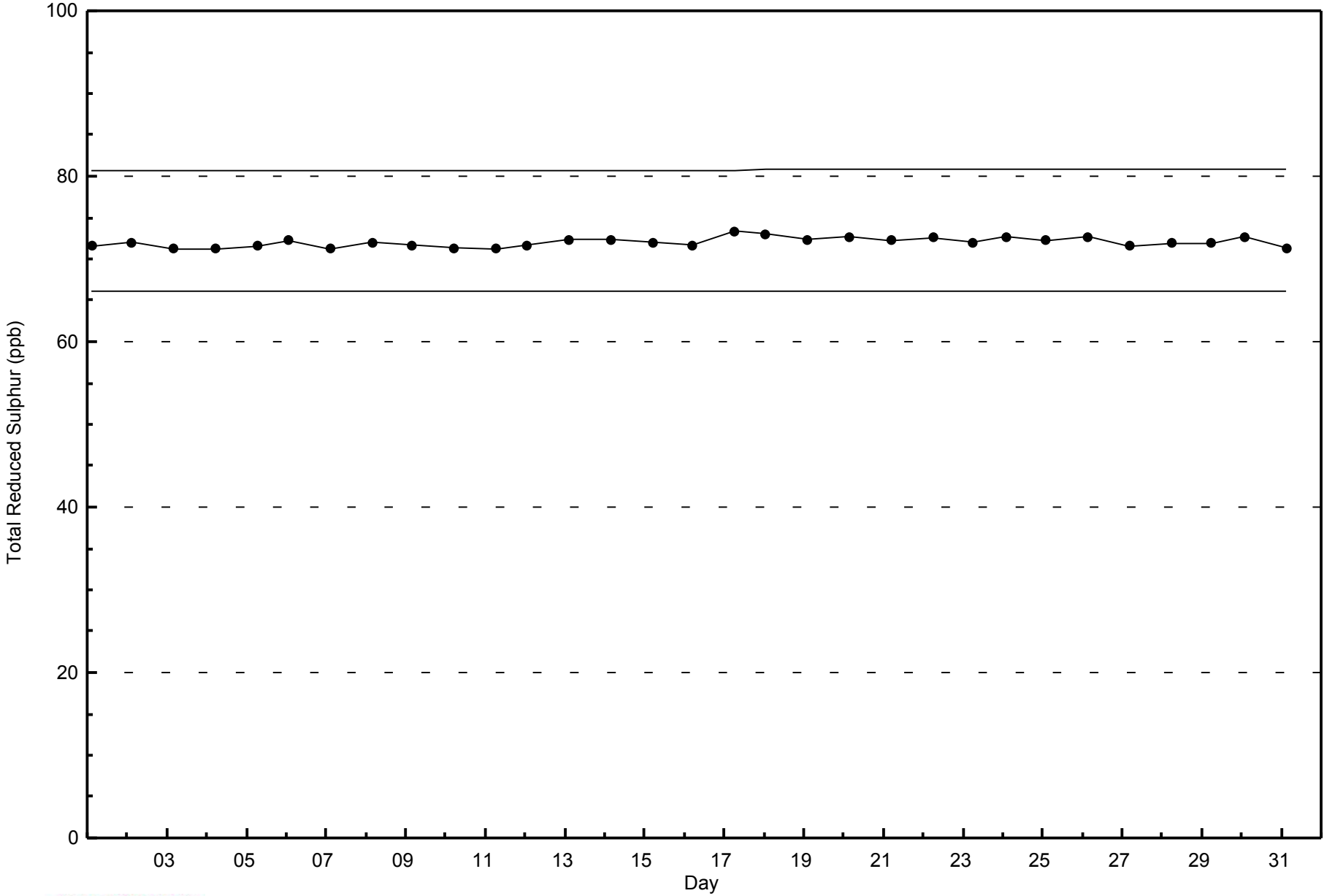
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2015

Maximum Value: 2.4 ppm on Jan 19 18:00

Maximum Daily Average: 2.1 ppm on Jan 12

Minimum Value: 1.7 ppm on Jan 15 08:00

Minimum Daily Average: 1.8 ppm on Jan 14

Maximum Diurnal Average: 2.0 ppm at hour 16

Minimum Diurnal Average: 1.9 ppm at hour 1

Monthly Average: 1.95 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Hours of Calibration:	42
Percent Operational Time:	98.7

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-Jan	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	PF	2.3	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3
2-Jan	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	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0
3-Jan	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
4-Jan	1.9	1.9	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
5-Jan	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
6-Jan	Z	1.9	1.9	1.9	2.0	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	2.0	2.0	1.9	1.9	1.9	1.9	2.0
7-Jan	1.9	Z	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	2.1	2.0	1.9	1.9	1.9	1.8	1.9	2.1
8-Jan	1.8	1.8	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0
9-Jan	1.9	1.9	1.9	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
10-Jan	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.2	2.1	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	2.2
11-Jan	2.0	2.1	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
12-Jan	Z	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.3	2.1	2.1	2.1	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.3
13-Jan	2.0	Z	2.2	2.2	2.1	2.2	2.2	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.2
14-Jan	1.8	1.8	Z	1.9	1.9	2.0	1.8	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
15-Jan	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.7	1.8	1.8	C	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	--	1.9
16-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.2	2.1	M	2.4	2.1	1.9	1.9	1.8	1.8	1.8	1.8	1.8	2.0	2.4
17-Jan	1.8	1.8	1.8	1.8	1.8	Z	1.8	1.8	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	1.9	2.1
18-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	UO	2.1	2.1	2.2	UO	UO	UO	UO	UO	UO	--	2.2
19-Jan	UO	Z	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.2	C	C	C	C	C	2.4	2.4	2.4	2.3	2.1	2.0	2.2	2.2	2.1	--	2.4
20-Jan	1.9	1.9	Z	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	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9	2.0	2.1
21-Jan	1.9	1.9	1.9	Z	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.2	1.9	2.2
22-Jan	2.0	2.0	2.1	2.1	Z	2.1	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.1
23-Jan	1.9	1.9	1.9	1.9	1.9	Z	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	1.9	1.9	2.0	2.2
24-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	2.0	2.2	1.8	1.8	1.8	1.8	1.8	2.1	2.0	2.0	1.9	2.2
25-Jan	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	2.1	1.9	1.9	1.9	2.1
26-Jan	1.9	2.1	Z	2.1	1.9	1.9	1.9	2.0	2.1	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.1
27-Jan	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
28-Jan	2.0	2.0	1.9	1.9	Z	2.1	2.1	2.0	2.1	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.1	2.1	1.9	1.9	1.9	2.0	2.1
29-Jan	1.9	1.9	1.9	1.9	1.9	Z	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	2.0	2.3	2.3	2.4	2.1	2.0	2.4
30-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
31-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.1	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.9	2.0	2.0	1.9	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	Diurnal Average	
	2.0	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.1	2.1	2.2	2.3	2.1	2.4	2.4	2.4	2.3	2.2	2.3	2.3	2.4	2.2	Diurnal Maximum	

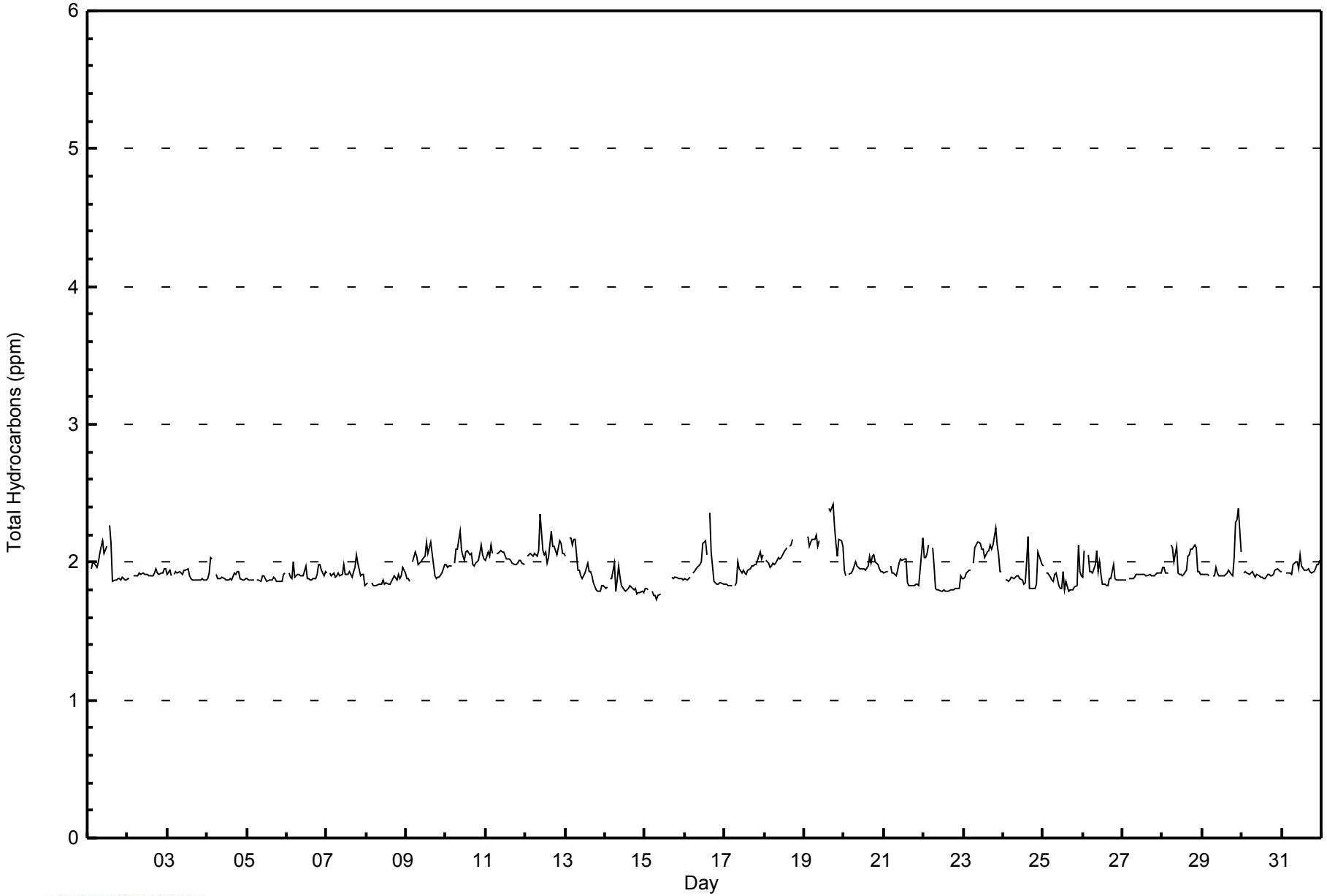
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	569	82.23	82.23
2.1 - 3.0	123	17.77	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 692

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2015

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	50	8	4	10	1	12	78	42	34	33	54	50	39	27	18	100	560
2.1 - 3.0	20	0	2	1	2	7	23	18	8	5	8	1	0	2	2	24	123
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	70	8	6	11	3	19	101	60	42	38	62	51	39	29	20	124	683

Total Number of Valid Hours: 683

Total Number of Hours: 744

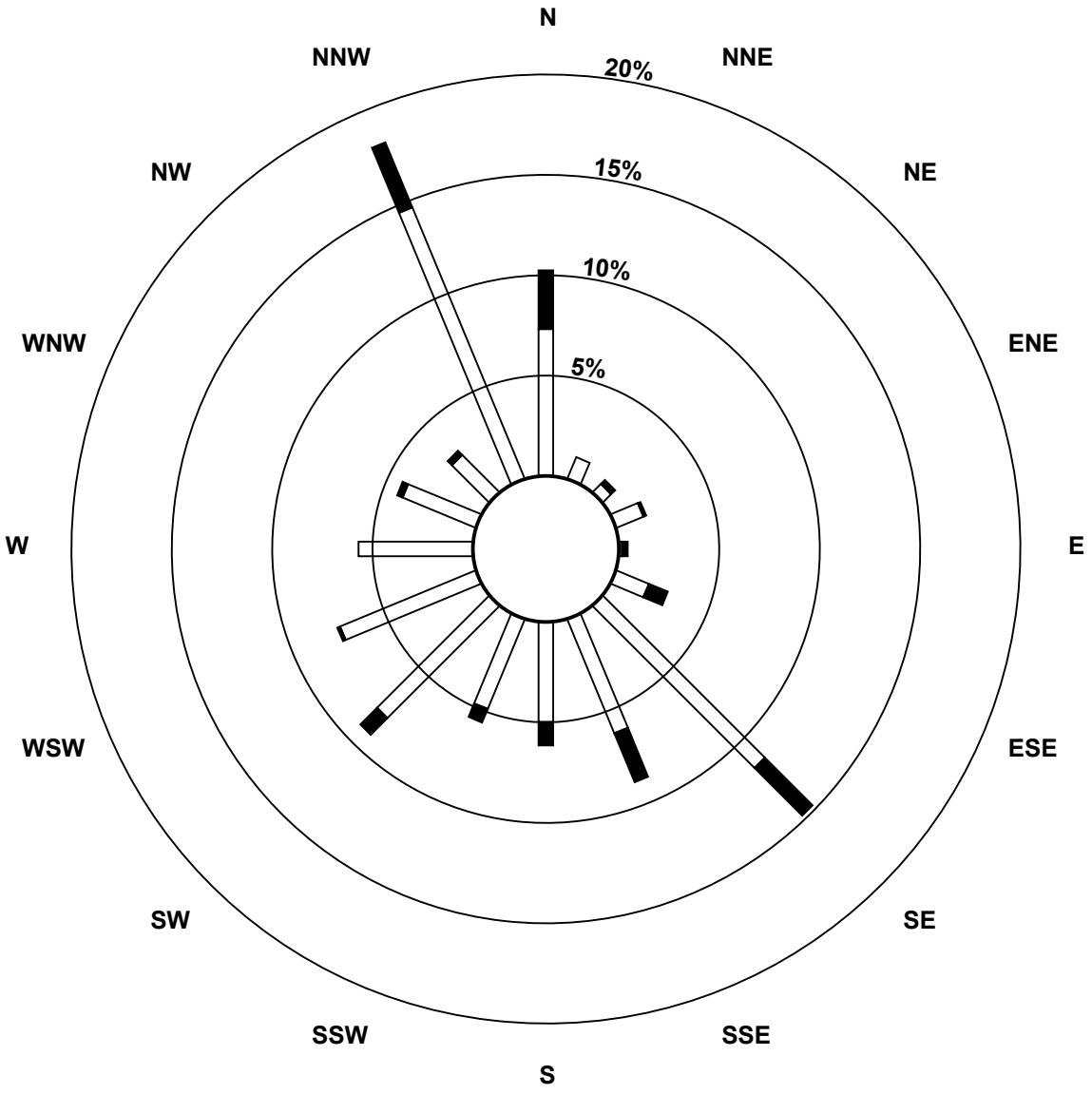
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

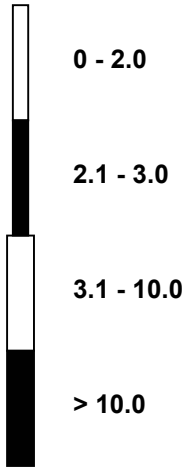
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)



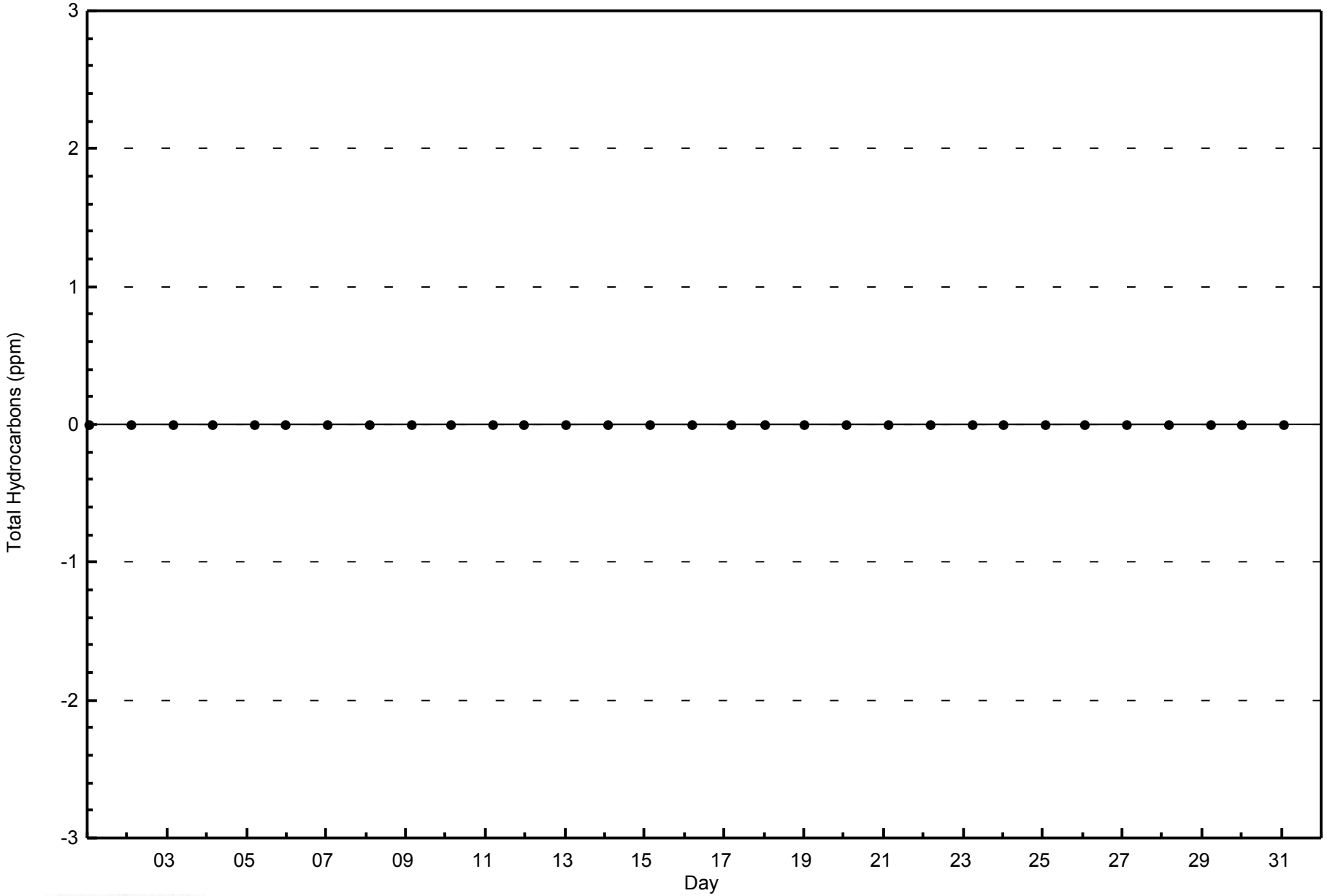
Total Number of Valid Hours: 683

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2015



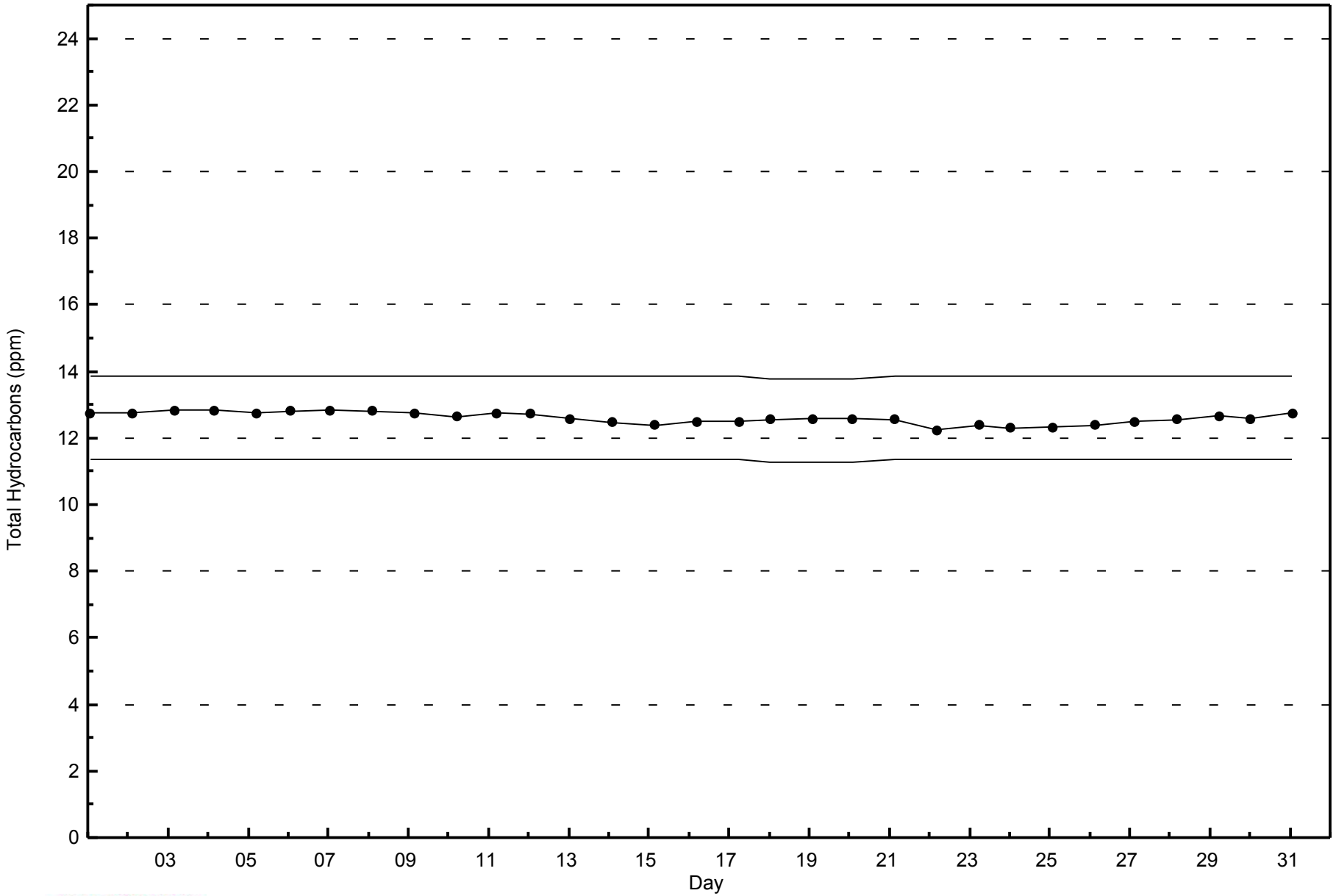
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2015

Maximum Value: 0.311 ppm on Jan 24 16:00

Maximum Daily Average: 0.080 ppm on Jan 23

Minimum Value: 0.000 ppm on Jan 1 01:00

Minimum Daily Average: 0.000 ppm on Jan 2

Maximum Diurnal Average: 0.044 ppm at hour 16

Minimum Diurnal Average: 0.004 ppm at hour 2

Monthly Average: 0.017 ppm

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

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Hours of Calibration:	42
Percent Operational Time:	98.7

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-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	0.079	0.076	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.079
2-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
4-Jan	0.000	0.004	0.031	0.033	Z	0.004	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.000	0.007	0.006	0.007	0.021	0.000	0.000	0.001	0.001	0.005	0.033
5-Jan	0.002	0.000	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	0.004
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.027	0.027	0.014	0.004	0.010	0.004	0.027
7-Jan	0.006	Z	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.003	0.075	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.075
8-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.006	0.001	0.002	0.020
9-Jan	0.001	0.002	0.000	Z	0.025	0.032	0.031	0.015	0.020	0.018	0.036	0.028	0.099	0.039	0.057	0.056	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.099
10-Jan	0.000	0.000	0.000	0.000	Z	0.001	0.018	0.010	0.027	0.004	0.006	0.001	0.059	0.032	0.020	0.027	0.003	0.001	0.002	0.004	0.003	0.012	0.001	0.000	0.010	0.059
11-Jan	0.002	0.006	0.006	0.020	0.010	Z	0.008	0.012	0.008	0.006	0.005	0.013	0.011	0.002	0.003	0.009	0.007	0.006	0.002	0.004	0.007	0.008	0.007	0.005	0.007	0.020
12-Jan	Z	0.007	0.008	0.011	0.008	0.010	0.011	0.013	0.013	0.244	0.035	0.035	0.066	0.041	0.053	0.205	0.090	0.077	0.065	0.058	0.156	0.118	0.064	0.055	0.063	0.244
13-Jan	0.052	Z	0.070	0.070	0.060	0.070	0.074	0.014	0.007	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	0.018	0.074
14-Jan	0.000	0.000	Z	0.005	0.005	0.022	0.000	0.000	0.047	0.011	0.000	0.001	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.047
15-Jan	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	0.005	0.000	0.000	0.006	0.000	0.000	0.000	0.000	--	0.006
16-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.003	0.002	0.000	0.001	0.101	0.092	0.024	M	0.153	0.082	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.153
17-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.006	0.004	0.000	0.015	0.033	0.003	0.002	0.003	0.033
18-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	UO	0.000	0.001	0.045	UO	UO	UO	UO	UO	UO	--	0.045
19-Jan	UO	Z	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	C	C	C	C	C	0.307	0.287	0.269	0.175	0.106	0.060	0.134	0.132	0.103	--	0.307
20-Jan	0.003	0.001	Z	0.000	0.002	0.000	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.000	0.012	0.031	0.018	0.067	0.081	0.028	0.001	0.000	0.000	0.000	0.011	0.081
21-Jan	0.001	0.000	0.000	Z	0.022	0.001	0.000	0.000	0.007	0.000	0.000	0.001	0.008	0.058	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.176	0.013	0.176
22-Jan	0.025	0.002	0.002	0.001	Z	0.018	0.003	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.009	0.000	0.003	0.025
23-Jan	0.003	0.009	0.028	0.055	0.047	Z	0.039	0.100	0.125	0.127	0.125	0.103	0.112	0.076	0.094	0.090	0.104	0.096	0.111	0.188	0.112	0.071	0.007	0.014	0.080	0.188
24-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.001	0.000	0.103	0.311	0.000	0.000	0.000	0.001	0.005	0.077	0.039	0.010	0.024	0.311
25-Jan	0.000	Z	0.000	0.003	0.000	0.000	0.000	0.002	0.002	0.001	0.000	0.007	0.098	0.002	0.066	0.000	0.000	0.005	0.000	0.000	0.004	0.137	0.039	0.012	0.016	0.137
26-Jan	0.001	0.062	Z	0.015	0.000	0.005	0.007	0.051	0.070	0.010	0.023	0.005	0.001	0.000	0.002	0.000	0.030	0.025	0.049	0.000	0.001	0.000	0.000	0.000	0.016	0.070
27-Jan	0.000	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	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001
28-Jan	0.019	0.018	0.000	0.000	Z	0.149	0.162	0.056	0.147	0.001	0.000	0.000	0.000	0.000	0.026	0.113	0.125	0.142	0.149	0.155	0.120	0.000	0.000	0.000	0.060	0.162
29-Jan	0.000	0.001	0.000	0.000	0.000	Z	0.000	0.000	0.070	0.023	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.007	0.130	0.182	0.193	0.055	0.029	0.193
30-Jan	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
31-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.004	0.008	0.041	0.001	0.095	0.001	0.003	0.005	0.002	0.012	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.008	0.095
	0.005	0.004	0.006	0.008	0.007	0.012	0.011	0.010	0.018	0.016	0.012	0.014	0.020	0.012	0.019	0.044	0.025	0.024	0.022	0.021	0.021	0.026	0.018	0.015	Diurnal Average	
	0.052	0.062	0.070	0.070	0.060	0.149	0.162	0.100	0.147	0.244	0.125	0.103	0.112	0.079	0.103	0.311	0.287	0.269	0.175	0.188	0.156	0.182	0.193	0.176	Diurnal Maximum	

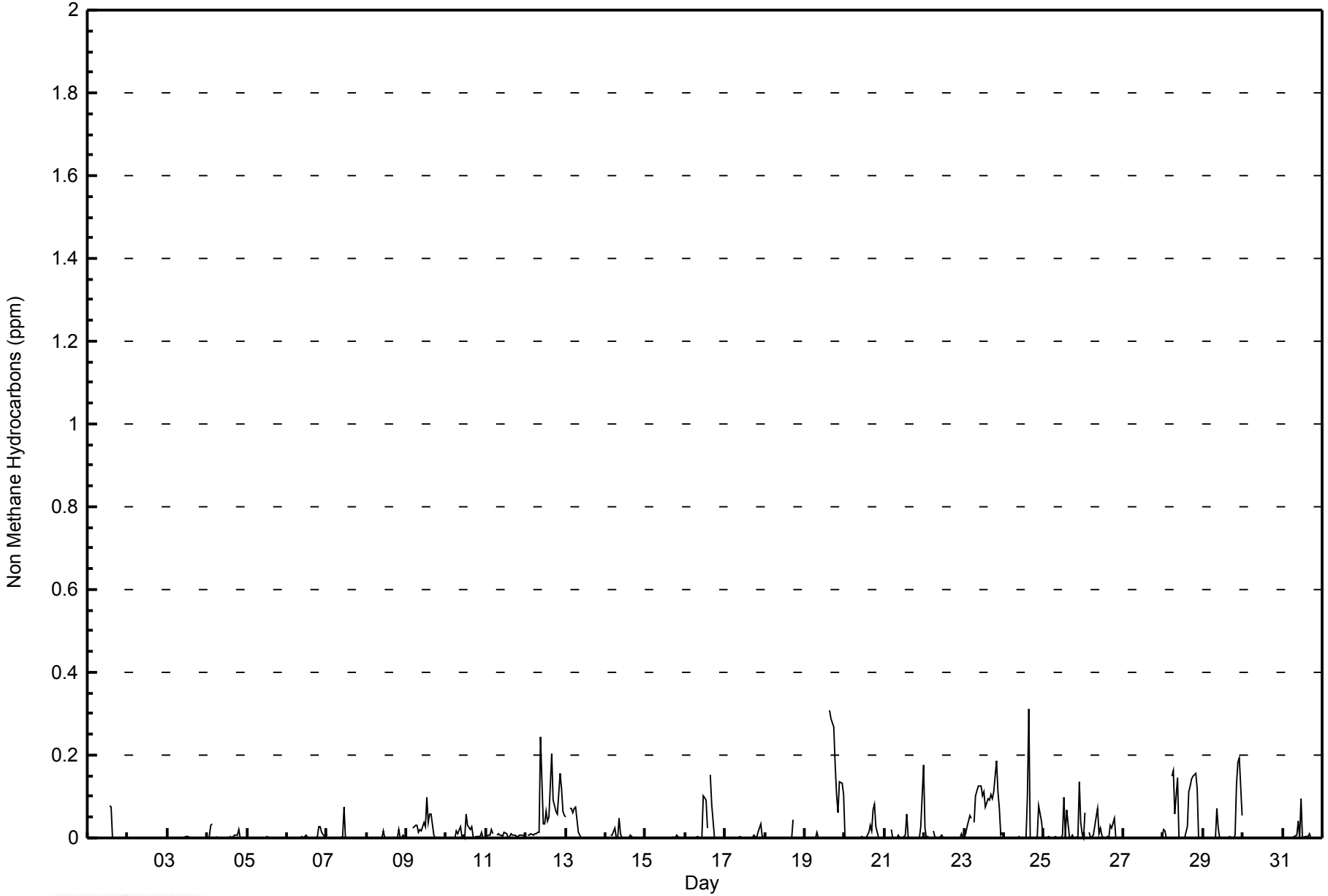
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure

WBEA

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2015

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	501	72.40	72.40
0.006 - 0.05	114	16.47	88.87
0.06 - 0.1	62	8.96	97.83
> 0.1	15	2.17	100.00

Total Number of Valid Hours: 692

Total Number of Hours: 744

WBEA

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2015

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	44	6	4	8	2	8	63	27	24	28	53	49	37	26	19	94	492
0.006 - 0.05	8	2	0	3	0	8	23	25	15	8	7	1	1	2	1	10	114
0.06 - 0.1	15	0	2	0	0	1	13	7	3	2	1	1	1	1	0	15	62
> 0.1	3	0	0	0	1	2	2	1	0	0	1	0	0	0	0	5	15
Totals	70	8	6	11	3	19	101	60	42	38	62	51	39	29	20	124	683

Total Number of Valid Hours: 683

Total Number of Hours: 744

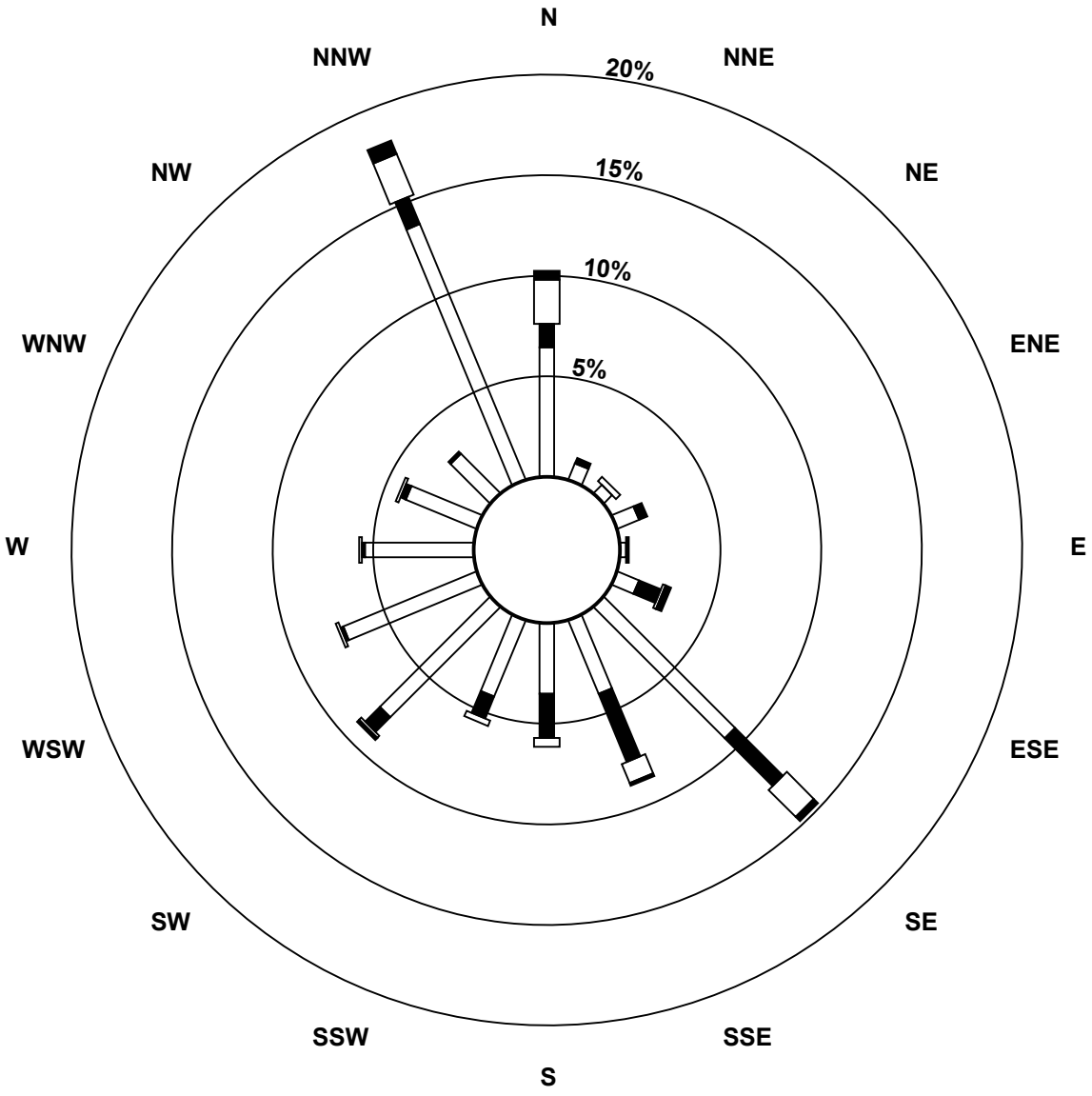
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

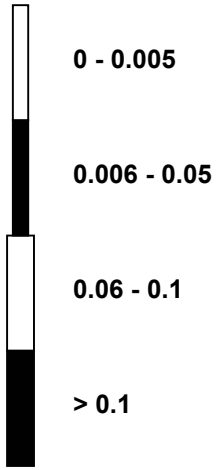
Wind Rose Jan 2015

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)



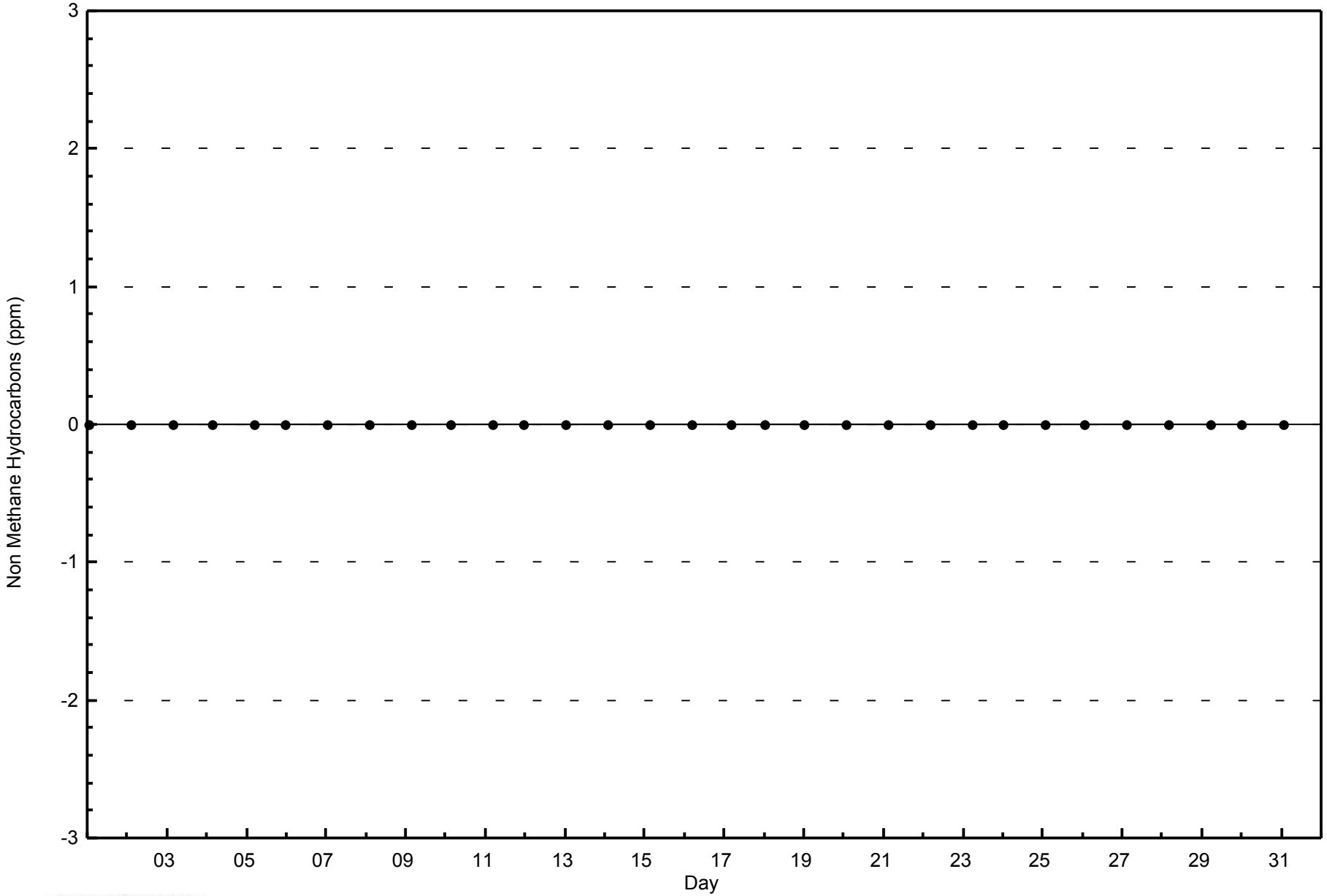
Total Number of Valid Hours: 683

WBEA

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2015



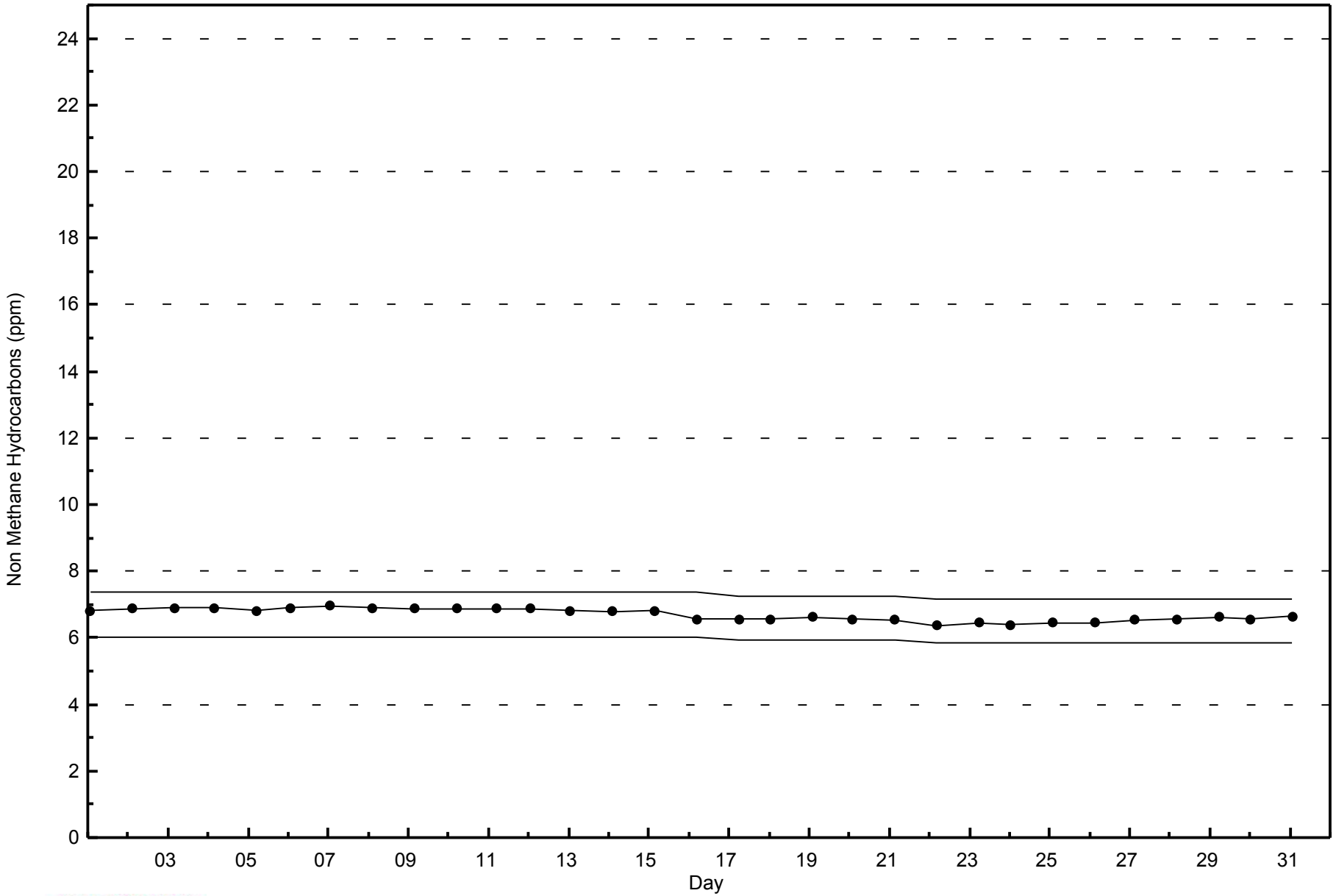
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Athabasca Valley - January 2015

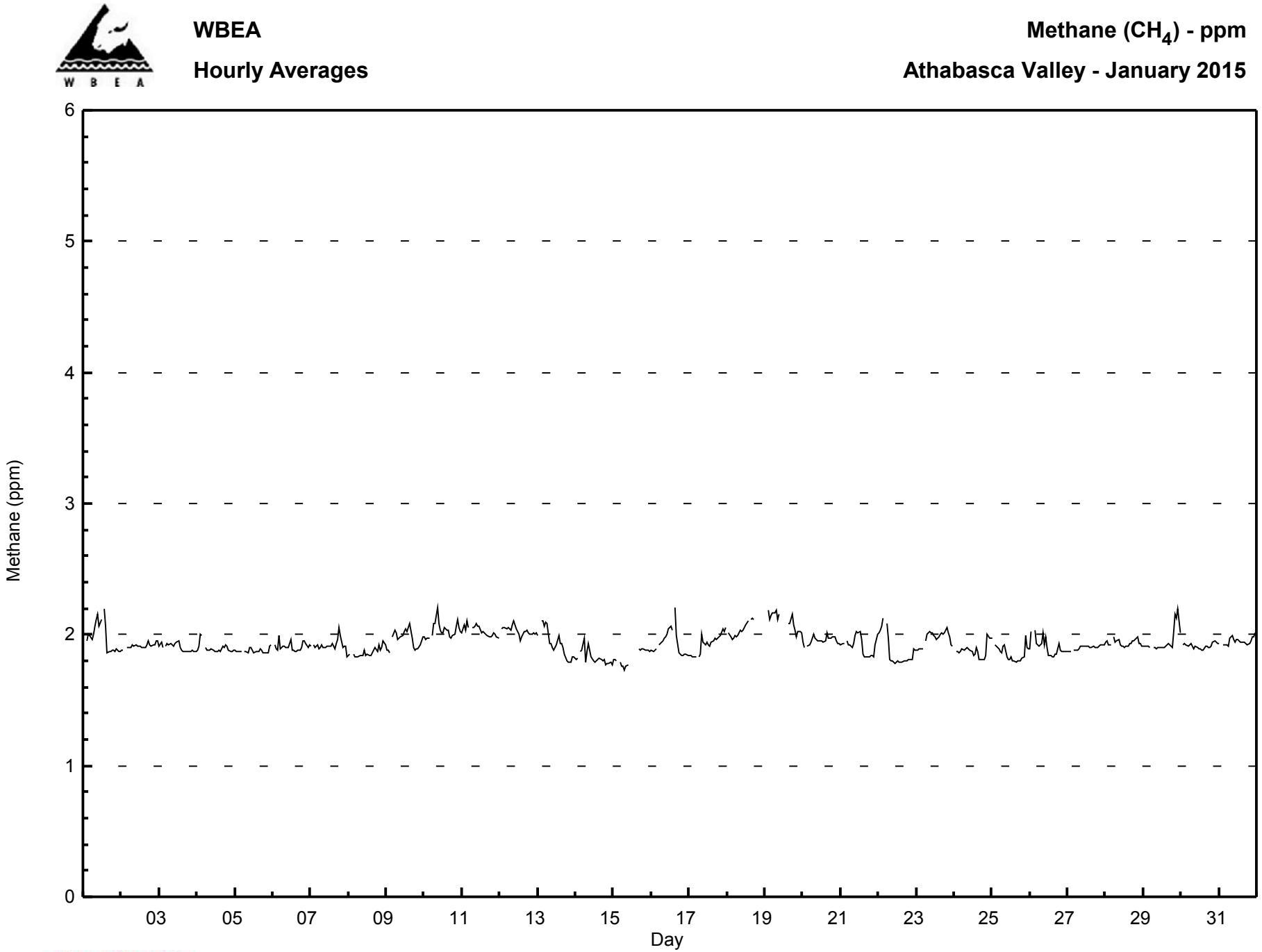
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.2 ppm on Jan 16 16:00 Maximum Daily Average: 2.0 ppm on Jan 10

Minimum Value: 1.7 ppm on Jan 15 08:00 Minimum Daily Average: 1.8 ppm on Jan 14
Maximum Diurnal Average: 2.0 ppm at hour 9 Minimum Diurnal Average: 1.9 ppm at hour 1
Monthly Average: 1.93 ppm Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.0 P_{90} = 2.0 P_{99} = 2.2

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Hours of Calibration:	42
Percent Operational Time:	98.7

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-Jan	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	PF	2.2	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
2-Jan	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	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0
3-Jan	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
4-Jan	1.9	1.9	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
5-Jan	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
6-Jan	Z	1.9	1.9	1.9	2.0	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	2.0	2.0	1.9	1.9	1.9	1.9	2.0
7-Jan	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	2.0	2.1	2.0	1.9	1.9	1.9	1.8	1.9	2.1
8-Jan	1.8	1.8	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0
9-Jan	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1
10-Jan	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2
11-Jan	2.0	2.1	2.0	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
12-Jan	Z	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
13-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.1
14-Jan	1.8	1.8	Z	1.9	1.9	2.0	1.8	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
15-Jan	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.7	1.8	1.8	C	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	--	1.9
16-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	M	2.2	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	2.2
17-Jan	1.8	1.8	1.8	1.8	1.8	Z	1.8	1.8	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	1.9	2.1
18-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	UO	2.1	2.1	2.1	UO	UO	UO	UO	UO	UO	--	2.1
19-Jan	UO	Z	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.2	C	C	C	C	C	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	--	2.2
20-Jan	1.9	1.9	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0
21-Jan	1.9	1.9	1.9	Z	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	2.0
22-Jan	2.0	2.0	2.1	2.1	Z	2.1	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.1
23-Jan	1.9	1.9	1.9	1.9	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	2.1	2.0	2.0	1.9	1.9	2.0	2.1
24-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	2.0	2.0	2.0	1.9	2.0
25-Jan	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0	1.9	1.9	1.9	2.0
26-Jan	1.9	2.0	Z	2.0	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
27-Jan	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
28-Jan	1.9	1.9	1.9	1.9	Z	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.0
29-Jan	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	2.0	2.2	2.1	2.2	2.0	1.9	2.2
30-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
31-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0
	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.0	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.1	Diurnal Maximum	

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


WBEA
Hourly Averages
Methane (CH_4) - ppm
Athabasca Valley - January 2015
Methane (ppm)
0
1
2
3
4
5
6
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	632	91.33	91.33
2.1 - 3.0	60	8.67	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 692

Total Number of Hours: 744

WBEA

Frequency Distribution

Methane (CH_4) - ppm

Athabasca Valley - January 2015

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	63	8	6	11	2	15	92	53	37	34	56	51	39	28	18	110	623
2.1 - 3.0	7	0	0	0	1	4	9	7	5	4	6	0	0	1	2	14	60
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	70	8	6	11	3	19	101	60	42	38	62	51	39	29	20	124	683

Total Number of Valid Hours: 683

Total Number of Hours: 744

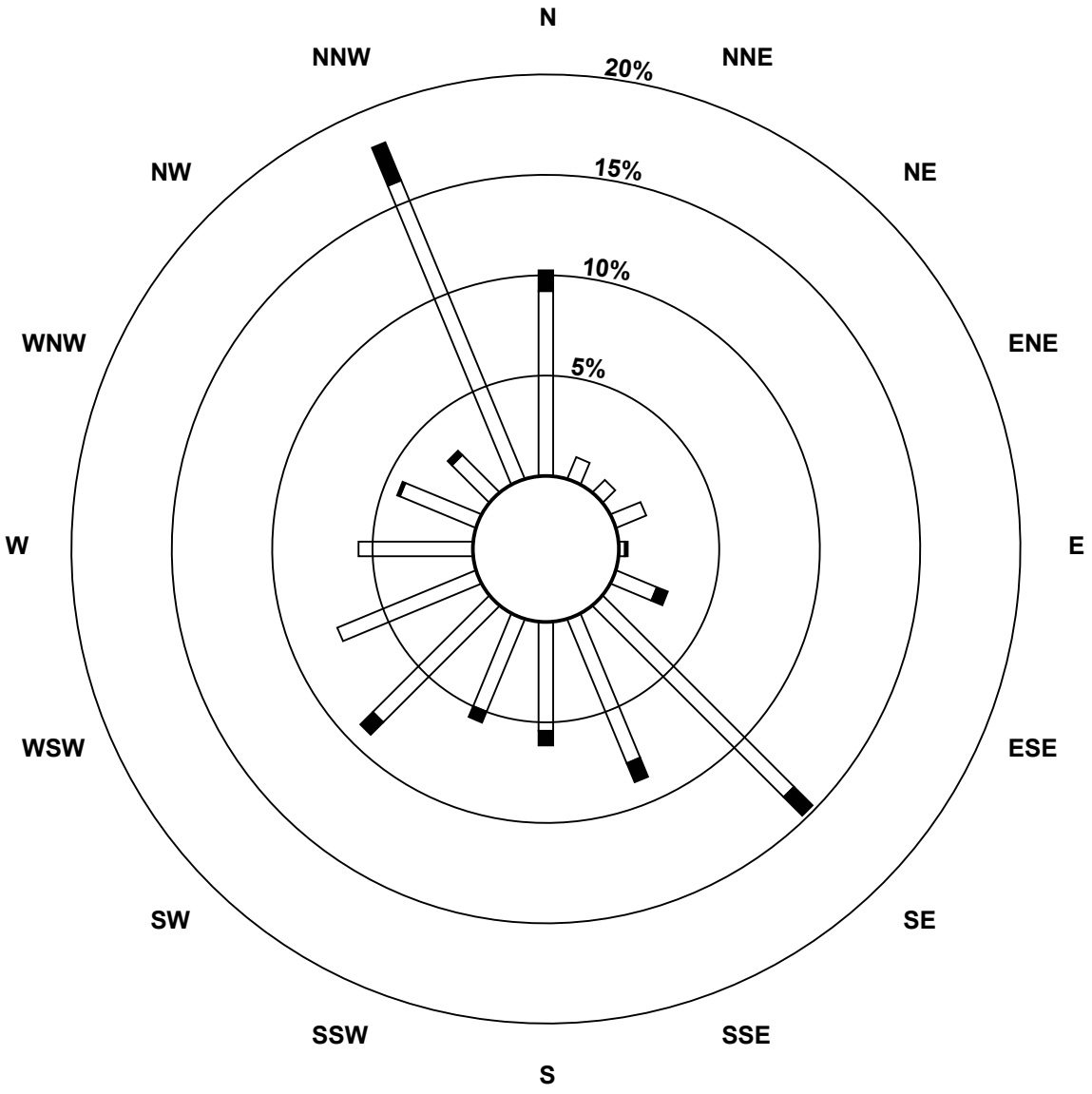
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

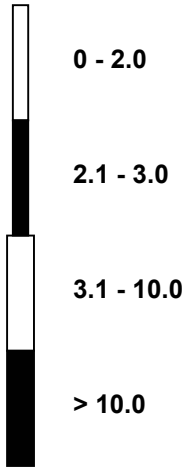
Wind Rose Jan 2015

Methane (CH_4) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)



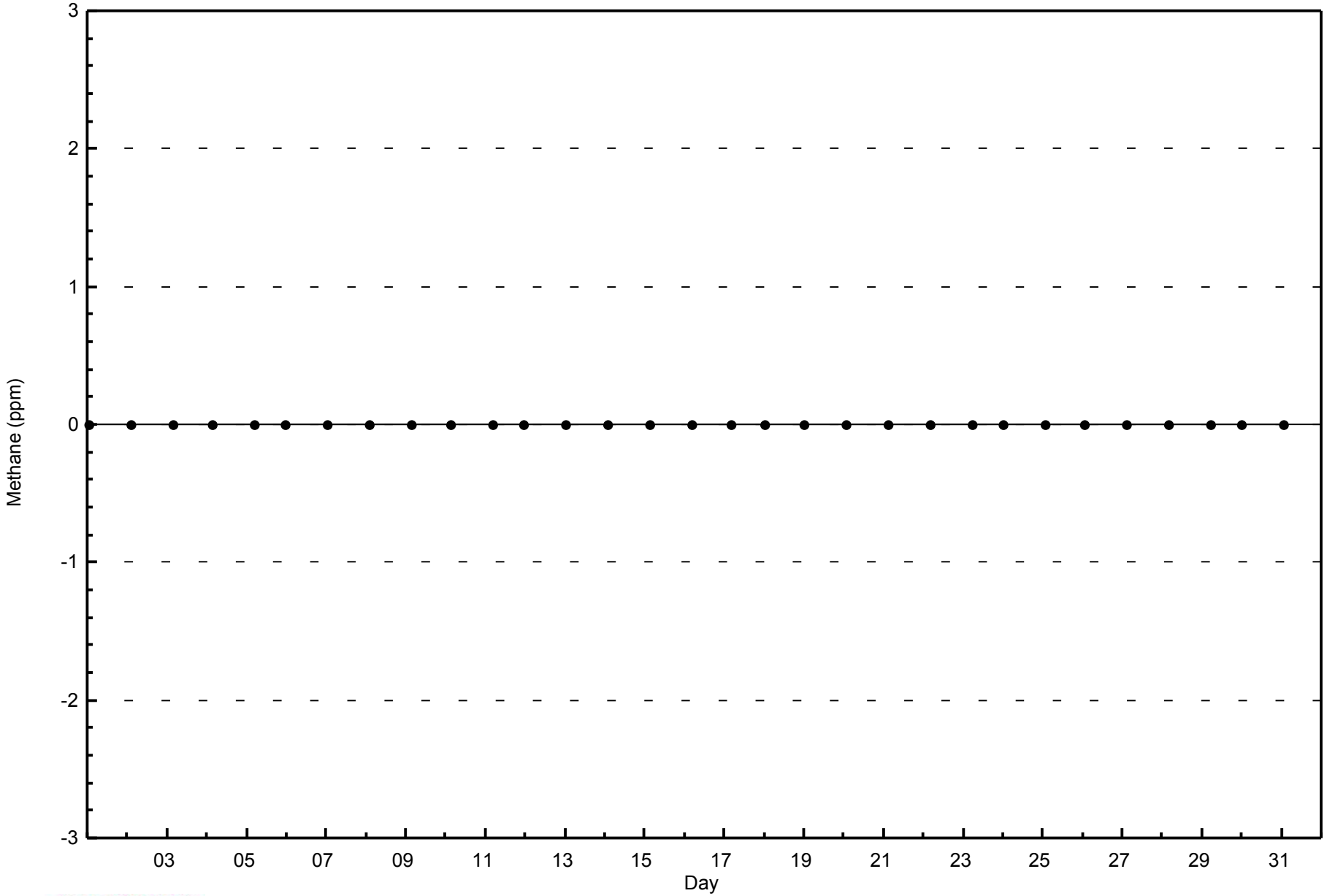
Total Number of Valid Hours: 683

WBEA

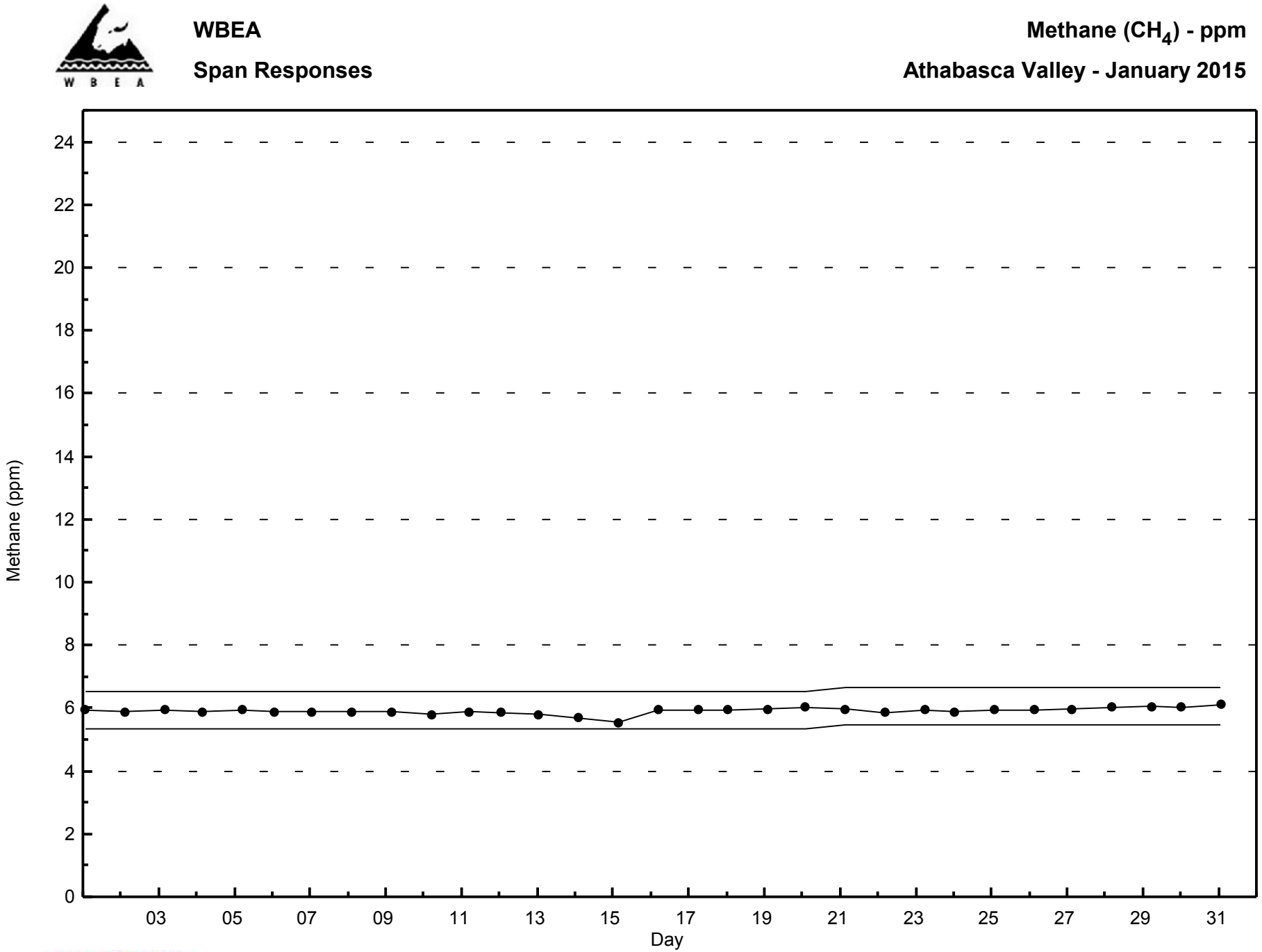
Zero Responses

Methane (CH_4) - ppm

Athabasca Valley - January 2015



AURORA
ATMOSPHERICS INC.


WBEA
Span Responses
Methane (CH_4) - ppm
Athabasca Valley - January 2015
Methane (ppm)
0
2
4
6
8
10
12
14
16
18
20
22
24
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 36 ppb on Jan 17 03:00 Maximum Daily Average: 28.6 ppb on Jan 8

Minimum Value: 0 ppb on Jan 23 18:00 Minimum Daily Average: 4.4 ppb on Jan 19
Maximum Diurnal Average: 17.2 ppb at hour 14 Minimum Diurnal Average: 11.0 ppb at hour 8
Monthly Average: 14.2 ppb Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 6$ Median = 13 $Q_3 = 22$ $P_{90} = 28$ $P_{99} = 34$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
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-Jan	18	21	17	Z	7	12	3	2	10	8	9	12	16	12	15	29	27	23	20	17	20	20	21	19	15.6	29
2-Jan	19	15	13	11	Z	14	13	5	9	9	13	17	17	16	14	12	10	2	3	5	2	2	1	5	9.9	19
3-Jan	8	5	11	6	5	Z	6	6	8	8	8	11	12	13	19	22	24	24	24	23	19	19	22	25	14.3	25
4-Jan	24	16	2	2	13	15	Z	22	23	21	25	28	28	28	25	24	16	16	15	14	23	29	29	27	20.3	29
5-Jan	28	29	29	30	29	28	26	Z	27	27	27	27	27	28	27	26	24	25	27	27	27	25	21	23	26.7	30
6-Jan	20	17	Z	19	15	12	12	9	4	8	10	9	14	14	15	12	8	2	2	1	3	4	4	3	9.5	20
7-Jan	4	8	9	Z	10	10	8	8	12	14	14	15	13	13	9	13	3	0	1	16	25	21	25	34	12.4	34
8-Jan	32	30	22	28	Z	32	30	28	30	31	31	31	31	33	32	29	27	30	28	28	26	25	18	24	28.6	33
9-Jan	26	18	22	8	6	Z	1	4	3	6	8	11	8	7	4	3	1	8	15	15	19	9	9	9	9.6	26
10-Jan	10	14	10	8	8	6	Z	3	1	4	8	9	10	7	6	3	4	5	5	2	2	1	3	3	5.8	14
11-Jan	5	4	4	2	2	2	2	Z	2	4	8	10	10	9	8	7	5	4	7	7	10	11	11	11	6.4	11
12-Jan	13	10	Z	11	11	9	6	6	4	2	5	6	7	8	6	2	1	0	3	5	5	5	7	6	6.0	13
13-Jan	5	3	2	Z	1	0	3	15	11	8	18	16	14	9	8	8	9	11	24	25	25	24	22	22	12.4	25
14-Jan	23	21	16	10	Z	1	20	10	6	13	16	21	21	21	23	24	22	21	21	25	26	25	26	28	19.1	28
15-Jan	23	23	22	13	23	Z	28	28	28	25	23	24	27	27	28	27	27	28	28	26	26	25	28	28	25.5	28
16-Jan	28	28	27	27	25	21	Z	16	17	C	C	C	C	C	C	C	C	26	26	28	31	33	34	35	--	35
17-Jan	34	34	36	35	35	35	34	Z	13	23	25	23	23	23	21	15	2	1	1	1	1	2	2	1	18.3	36
18-Jan	1	4	Z	15	11	10	9	8	4	8	10	10	11	10	9	7	6	3	4	3	2	4	3	1	6.7	15
19-Jan	2	7	8	Z	7	7	2	0	0	1	2	4	4	7	5	5	2	0	1	4	8	5	9	10	4.4	10
20-Jan	15	20	20	20	Z	16	10	6	9	13	17	19	17	18	14	4	1	0	1	2	4	7	9	9	11.0	20
21-Jan	10	11	7	5	4	Z	8	9	5	4	5	6	5	17	29	30	34	33	33	30	28	27	10	4	15.4	34
22-Jan	4	8	8	3	3	2	Z	30	29	29	29	27	21	28	27	28	27	28	29	29	30	30	15	5	20.5	30
23-Jan	8	14	13	14	14	13	5	Z	0	2	3	5	7	8	5	3	1	0	0	0	0	1	4	5	5.5	14
24-Jan	6	8	Z	9	9	8	5	0	0	1	6	15	20	14	6	7	23	16	25	25	18	3	1	1	9.7	25
25-Jan	7	13	12	Z	13	14	16	14	14	28	26	19	7	15	17	23	22	21	19	20	19	1	5	5	15.3	28
26-Jan	5	0	1	2	Z	4	2	1	2	5	7	16	26	25	20	19	8	8	6	16	18	21	22	24	11.2	26
27-Jan	24	25	26	25	22	Z	24	22	17	16	20	20	20	20	20	22	20	21	17	18	18	15	14	17	20.1	26
28-Jan	16	16	17	10	9	11	Z	11	10	20	24	25	23	20	19	17	16	10	5	3	4	15	14	18	14.5	25
29-Jan	19	16	17	19	21	19	17	Z	14	15	15	18	17	16	14	7	1	2	2	1	0	0	0	7	11.1	21
30-Jan	13	16	Z	11	15	17	18	21	27	27	27	28	29	33	32	30	28	27	19	21	20	16	13	13	21.8	33
31-Jan	10	13	13	Z	9	9	7	3	4	10	14	16	15	15	13	13	10	13	7	5	4	4	7	9	9.7	16
	14.9	15.1	14.8	13.7	12.5	12.6	12.2	11.0	11.1	13.0	15.1	16.6	16.8	17.2	16.3	15.7	13.7	13.2	13.4	14.2	15.0	13.9	13.2	13.9	Diurnal Average	
	34	34	36	35	35	35	34	30	30	31	31	31	31	33	32	30	34	33	33	30	31	33	34	35	Diurnal Maximum	

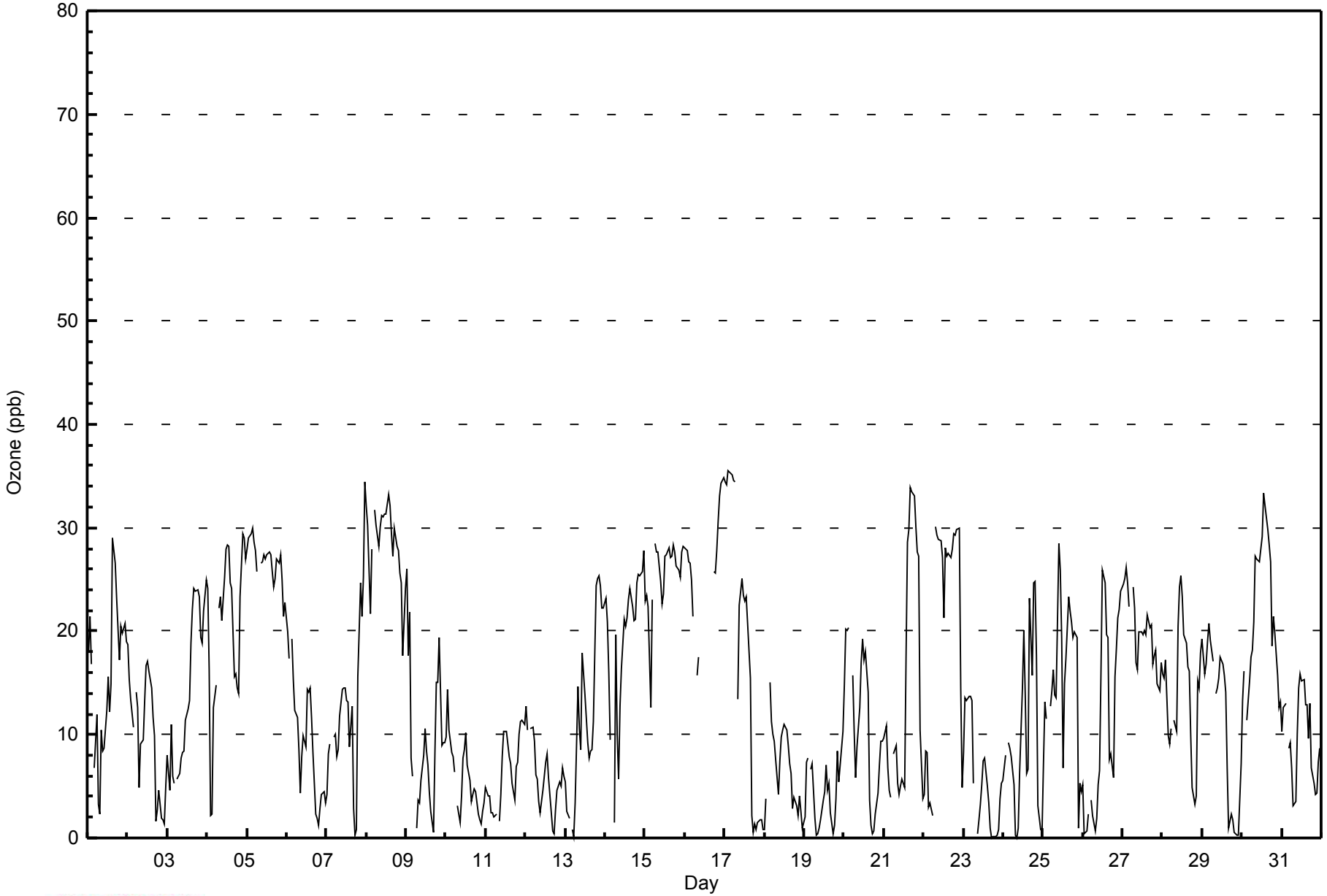
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA

Hourly Averages

Ozone (O_3) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	498	70.64	70.64
21 - 50	207	29.36	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

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Athabasca Valley - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	50	6	6	11	3	18	82	52	37	32	35	13	18	23	15	89	490
21 - 50	19	2	0	0	1	3	19	6	6	11	26	37	20	8	6	43	207
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	69	8	6	11	4	21	101	58	43	43	61	50	38	31	21	132	697

Total Number of Valid Hours: 697

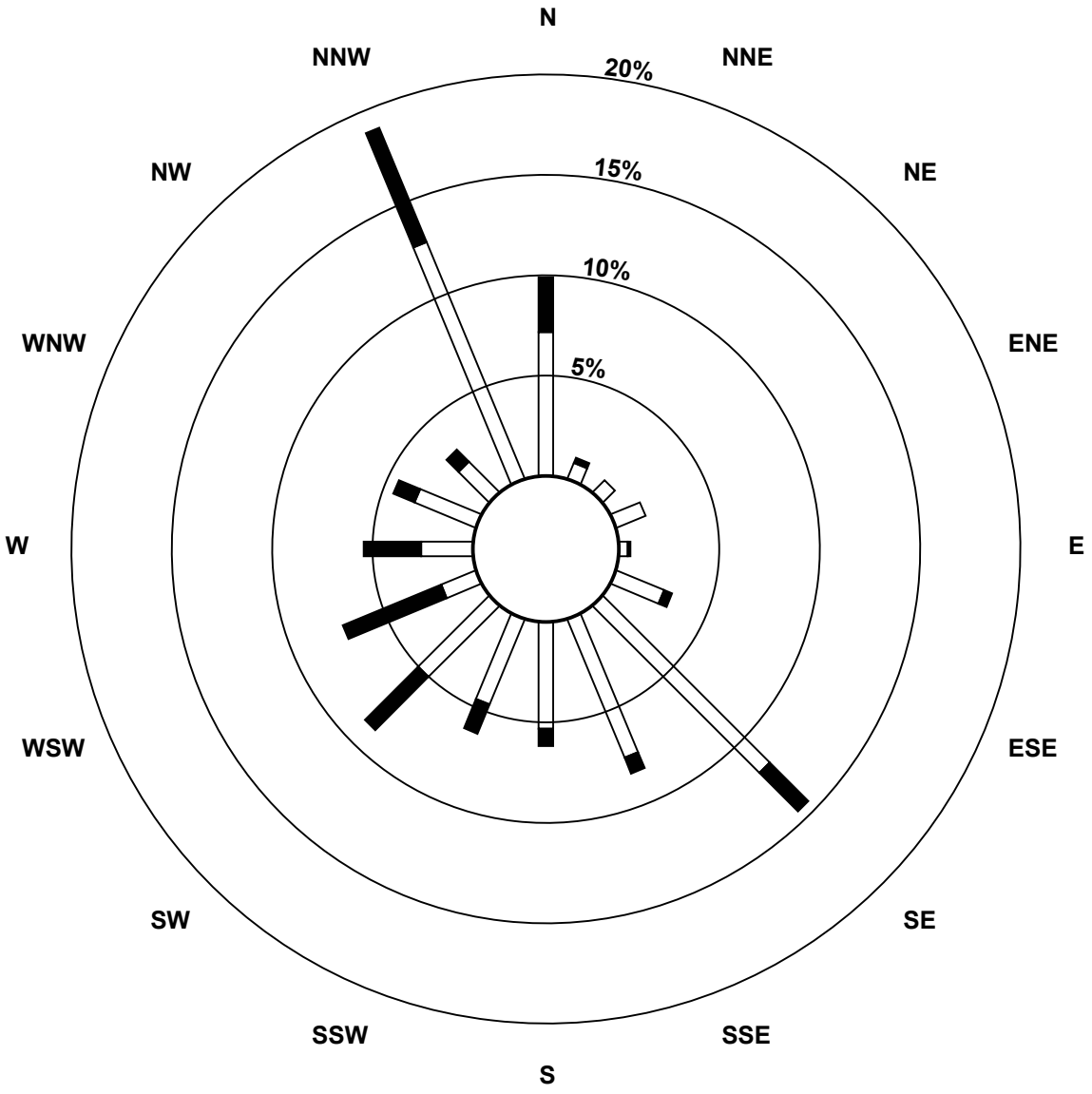
Total Number of Hours: 744

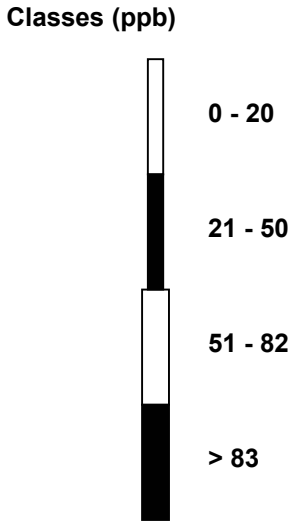
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Ozone (O_3) - ppb

Athabasca Valley (AMS 7)





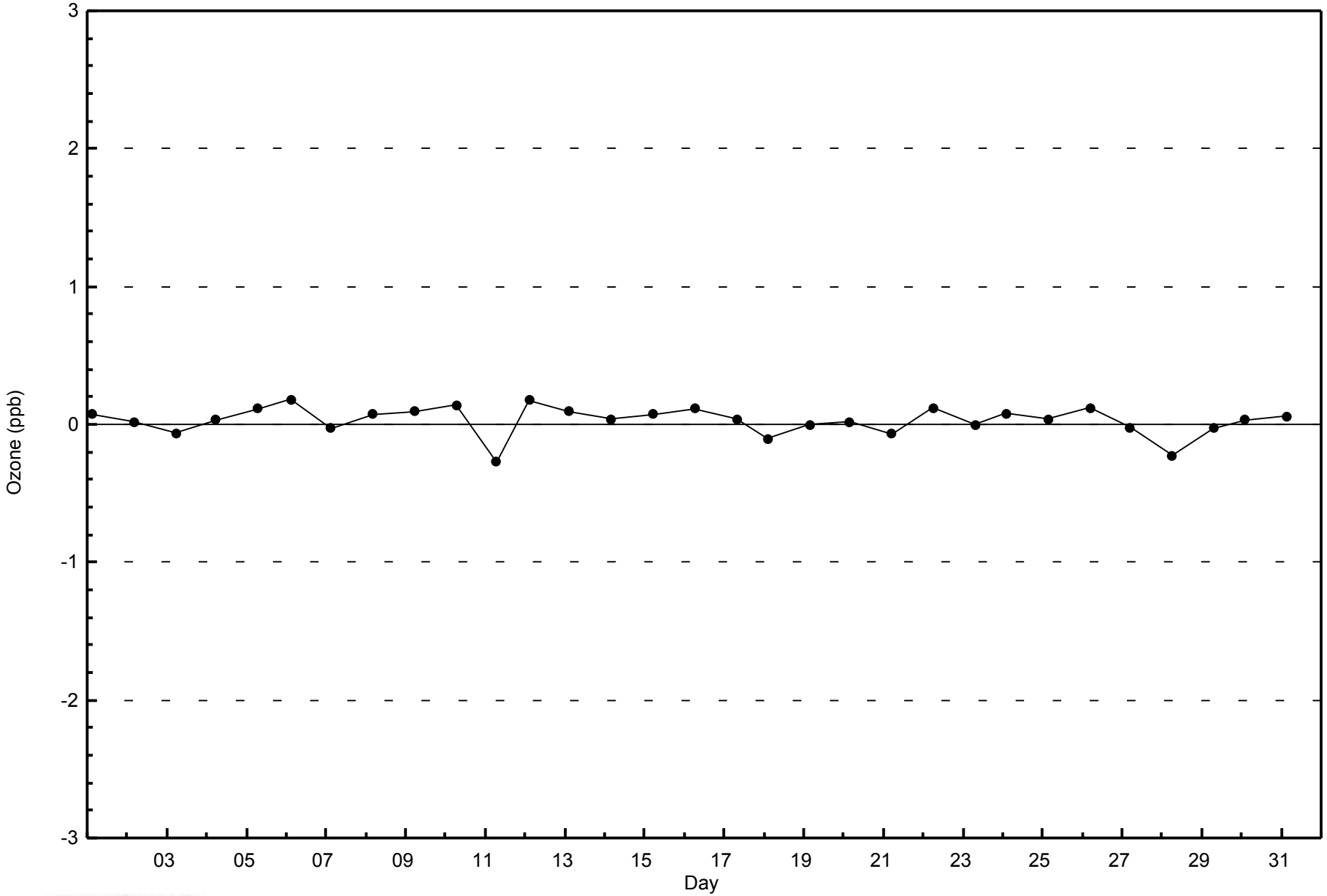
Total Number of Valid Hours: 697

WBEA

Zero Responses

Ozone (O_3) - ppb

Athabasca Valley - January 2015



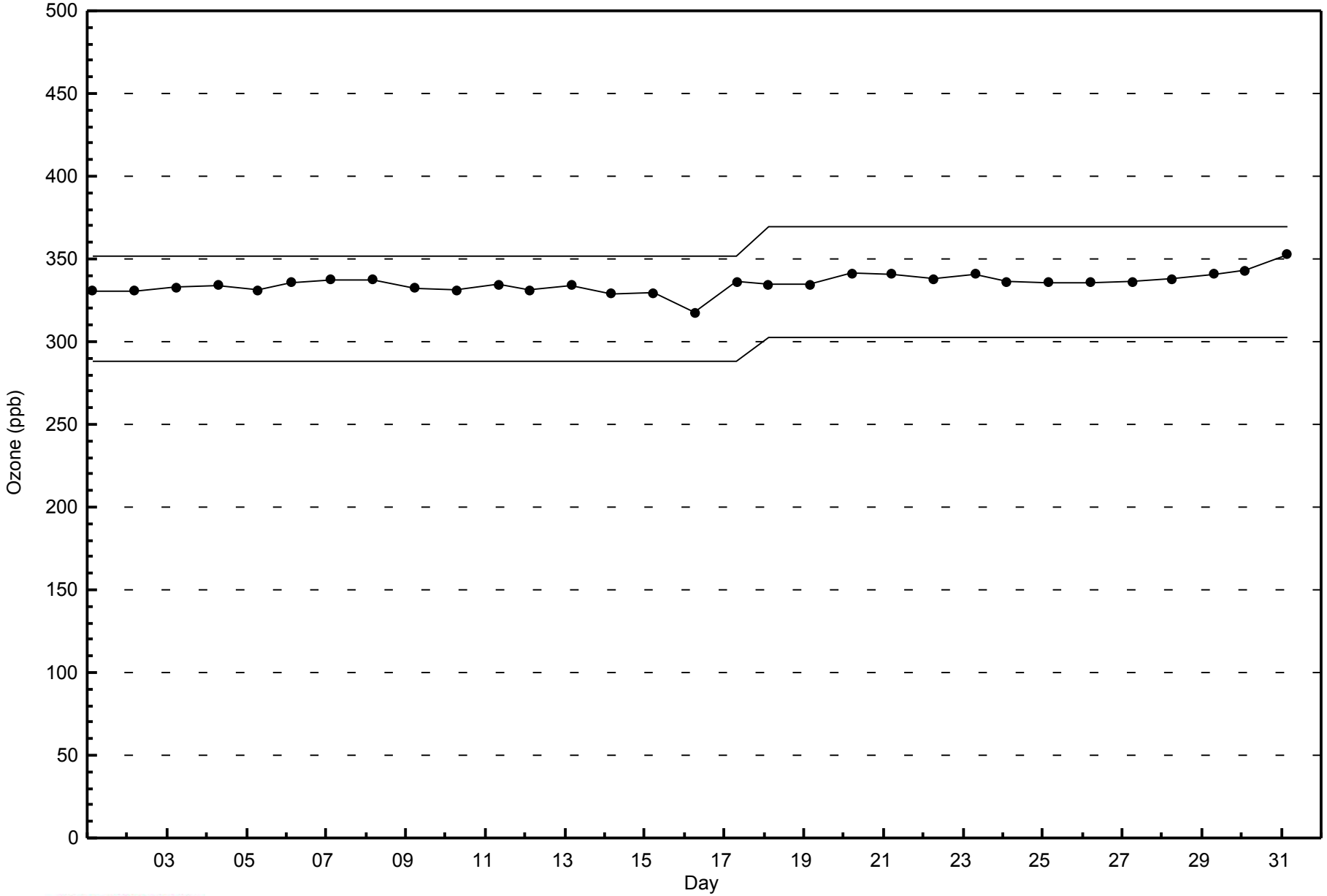
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2015

Maximum Value: 102 ppb on Jan 19 08:00

Maximum Daily Average: 22.0 ppb on Jan 10

Minimum Value: 0 ppb on Jan 5 19:00

Minimum Daily Average: 0.6 ppb on Jan 5

Maximum Diurnal Average: 12.4 ppb at hour 16

Minimum Diurnal Average: 1.8 ppb at hour 3

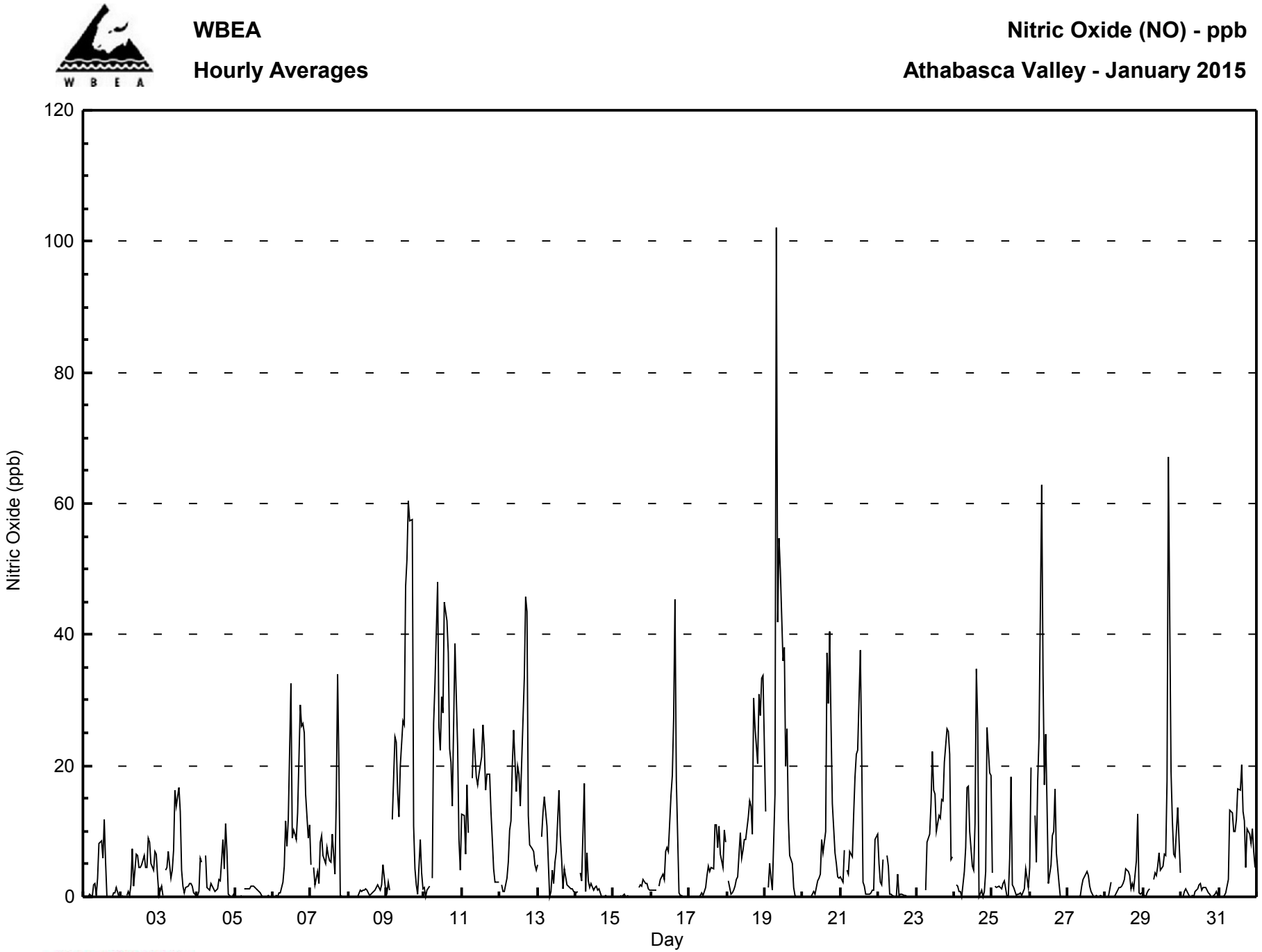
Monthly Average: 7.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 3 $Q_3 = 10$ $P_{90} = 22$ $P_{99} = 53$

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-Jan	0	Z	0	0	1	0	2	2	0	3	8	8	6	12	5	0	0	0	0	1	1	1	0	0	2.2	12
2-Jan	0	0	Z	0	1	0	2	7	2	7	6	4	5	5	6	4	5	9	8	5	4	7	6	3	4.2	9
3-Jan	0	2	0	Z	4	5	7	3	4	7	16	14	17	13	4	2	1	1	2	2	2	2	1	0	4.6	17
4-Jan	0	1	6	5	Z	6	1	1	1	2	1	1	1	1	3	2	9	4	11	7	0	0	0	0	2.9	11
5-Jan	0	0	0	0	0	Z	1	1	1	1	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0.6	2
6-Jan	Z	0	0	0	1	1	2	5	12	8	12	32	9	10	10	9	13	29	26	26	25	16	9	11	11.5	32
7-Jan	5	Z	4	2	4	2	8	9	6	5	7	6	5	5	10	3	15	34	20	0	0	0	0	0	6.6	34
8-Jan	0	0	Z	0	0	0	0	1	1	1	1	1	1	0	1	1	1	1	2	2	1	2	5	1	0.9	5
9-Jan	1	2	1	Z	12	24	24	16	12	20	27	26	47	51	60	57	58	11	4	2	0	9	4	1	20.4	60
10-Jan	1	0	1	2	Z	3	26	33	48	26	22	31	28	45	42	37	23	21	14	39	30	23	9	4	22.0	48
11-Jan	13	12	6	17	10	Z	18	26	22	18	17	19	21	26	22	16	19	19	13	9	4	2	2	2	14.5	26
12-Jan	Z	2	1	1	3	5	10	12	20	25	16	20	19	14	20	33	46	44	12	8	7	7	5	4	14.5	46
13-Jan	5	Z	9	13	15	13	11	0	1	4	2	5	7	16	9	6	1	4	2	2	1	1	1	1	5.6	16
14-Jan	1	1	Z	4	2	17	1	7	2	2	2	1	1	2	1	1	0	0	0	0	0	0	0	0	2.0	17
15-Jan	0	0	0	Z	0	0	0	0	0	0	C	C	C	C	C	C	1	2	2	3	2	2	1	1	--	3
16-Jan	1	1	1	1	Z	2	3	3	3	7	8	7	16	19	27	45	18	1	0	0	0	0	0	0	7.0	45
17-Jan	0	0	0	0	0	Z	0	0	1	0	1	3	5	4	4	4	11	11	8	11	6	5	10	8	4.0	11
18-Jan	Z	3	0	1	1	2	3	3	10	6	7	9	9	12	15	14	9	30	26	20	31	28	33	34	13.3	34
19-Jan	13	Z	1	5	3	1	16	102	42	55	50	36	38	20	26	12	6	5	2	0	0	0	0	0	18.8	102
20-Jan	0	0	Z	0	0	0	0	1	0	2	3	3	9	7	10	37	30	40	27	14	7	5	3	3	8.8	40
21-Jan	3	2	7	Z	4	3	7	6	13	18	22	22	38	22	2	2	0	0	0	1	1	1	9	10	8.4	38
22-Jan	5	2	2	6	Z	6	5	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1.4	6
23-Jan	0	0	0	0	0	Z	1	8	10	14	22	16	16	10	12	12	15	15	21	26	25	22	6	6	11.1	26
24-Jan	Z	2	2	1	1	0	4	7	17	17	10	5	4	11	35	26	0	1	0	1	4	26	19	19	9.1	35
25-Jan	4	Z	2	1	2	1	1	2	3	0	0	6	18	2	1	0	0	0	1	0	1	4	3	1	2.4	18
26-Jan	5	20	Z	12	5	18	24	63	34	17	25	14	2	5	9	10	16	7	2	0	0	0	0	0	12.6	63
27-Jan	0	0	0	Z	0	0	0	0	0	2	3	3	4	3	2	1	0	0	0	0	0	0	0	0	0.8	4
28-Jan	0	0	0	2	Z	0	0	1	1	1	2	2	3	4	4	3	1	2	1	5	13	1	0	1	2.1	13
29-Jan	0	0	1	1	1	Z	3	4	3	5	7	4	5	6	6	18	67	19	12	6	6	10	14	4	8.7	67
30-Jan	Z	0	1	1	0	0	0	0	0	1	1	2	2	1	1	1	1	1	0	0	0	0	1	0	0.7	2
31-Jan	1	Z	0	0	1	2	3	13	13	10	10	12	16	16	20	13	12	4	10	10	8	10	7	4	8.5	20
	2.2	2.0	1.8	2.9	2.7	4.3	5.9	10.9	9.1	9.2	10.3	10.5	11.9	11.5	12.3	12.4	12.2	10.2	7.2	6.4	5.9	5.9	4.8	3.8	Diurnal Average	
	13	20	9	17	15	24	26	102	48	55	50	36	47	51	60	57	67	44	27	39	31	28	33	34	Diurnal Maximum	

Z - zerospan C - Calibration


WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Athabasca Valley - January 2015
Nitric Oxide (ppb)
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	632	89.39	89.39
21 - 40	58	8.20	97.60
11 - 80	16	2.26	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

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	66	8	5	11	2	14	92	39	31	33	60	51	39	29	17	126	623
21 - 40	1	0	1	0	1	3	6	19	11	7	5	0	0	0	1	3	58
11 - 80	2	0	0	1	0	2	4	4	1	0	0	0	0	0	2	0	16
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	70	8	6	12	3	19	102	62	43	40	65	51	39	29	20	129	698

Total Number of Valid Hours: 698

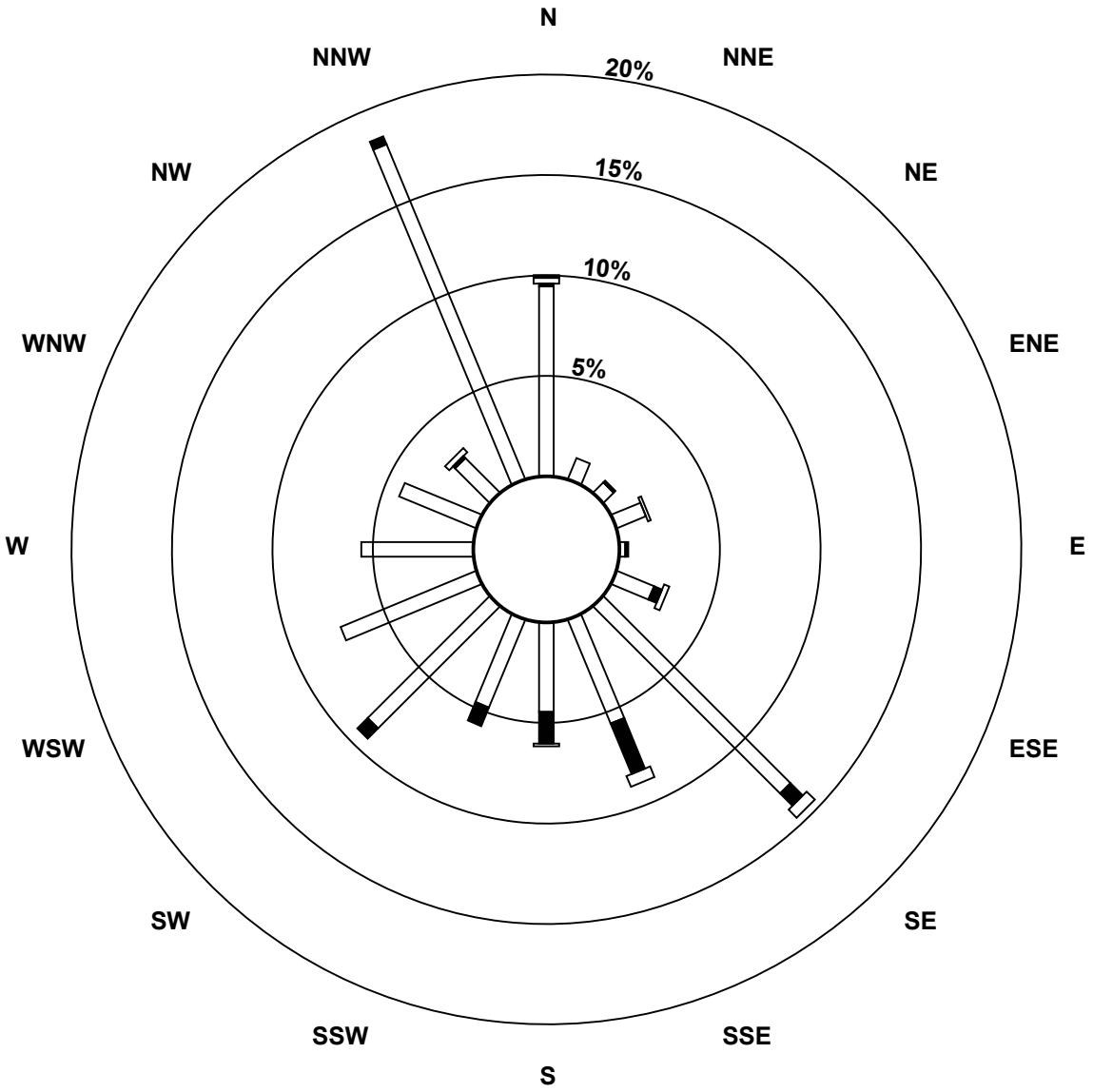
Total Number of Hours: 744

Wood Buffalo Environmental Association

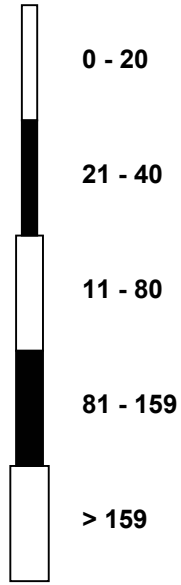
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Athabasca Valley (AMS 7)



Classes (ppb)



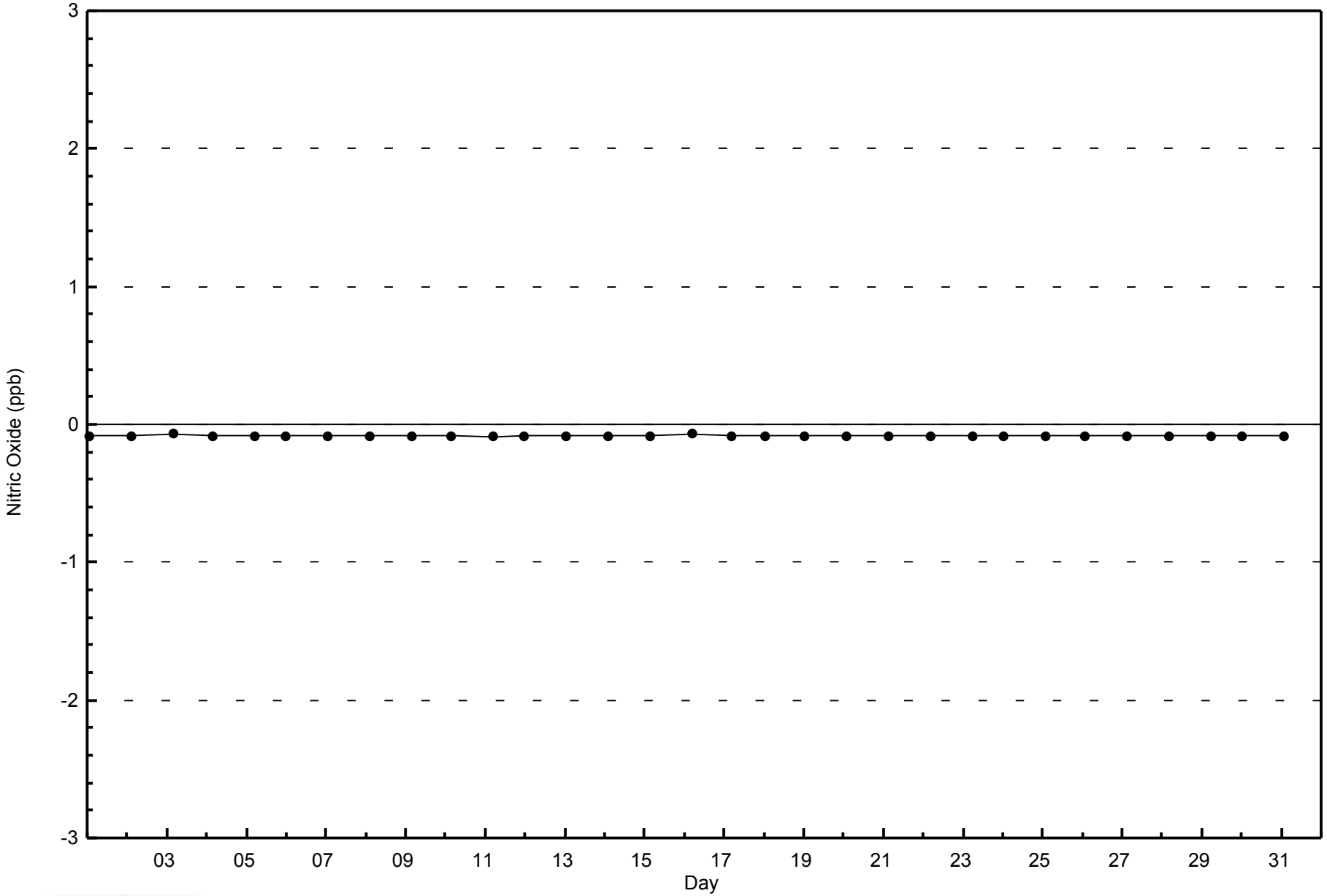
Total Number of Valid Hours: 698

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2015



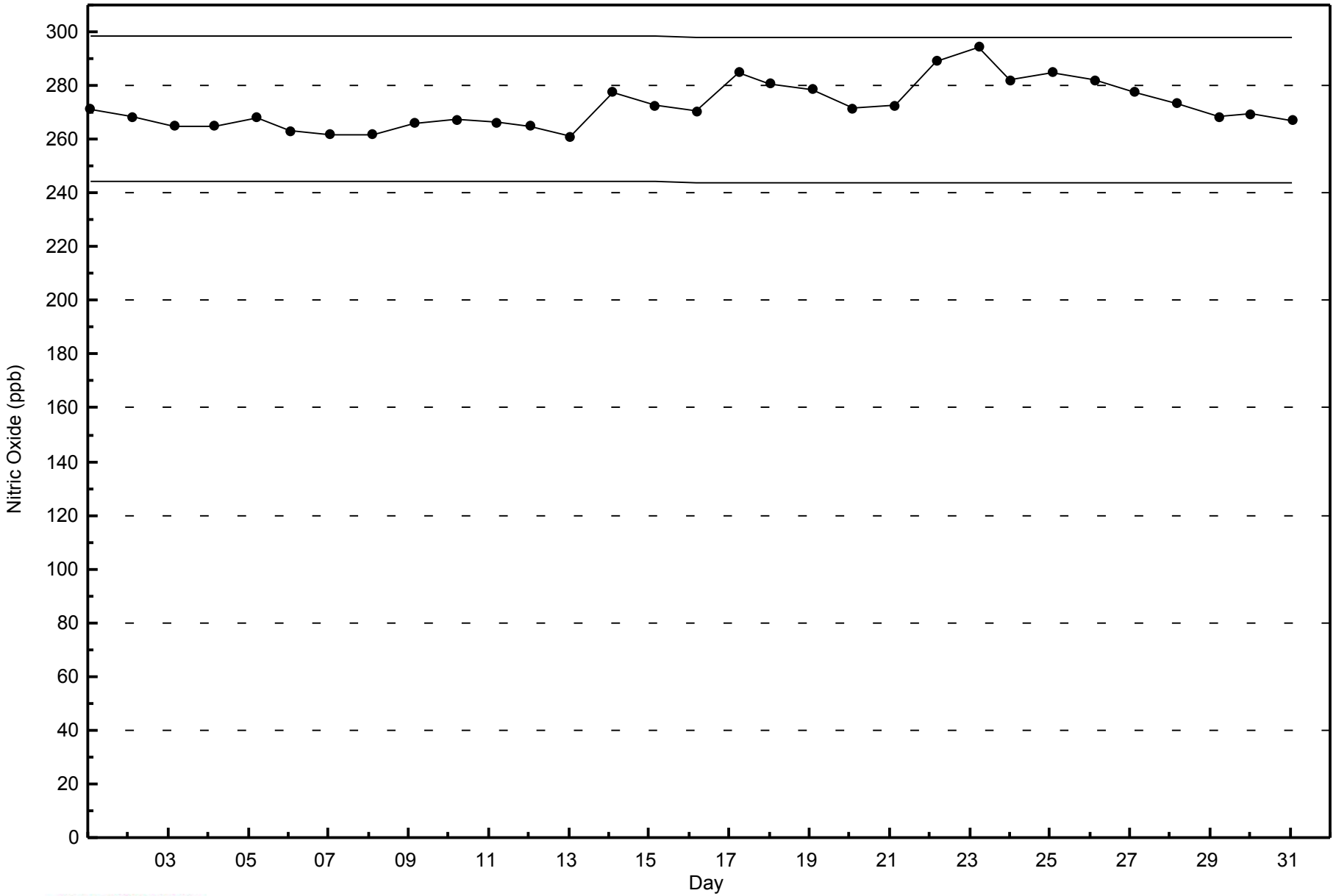
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 40 ppb on Jan 9 17:00 Maximum Daily Average: 22.8 ppb on Jan 9

Minimum Value: 1 ppb on Jan 17 03:00 Minimum Daily Average: 4.7 ppb on Jan 5
Maximum Diurnal Average: 16.1 ppb at hour 17 Minimum Diurnal Average: 9.4 ppb at hour 2
Monthly Average: 12.8 ppb Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 6$ Median = 12 $Q_3 = 18$ $P_{90} = 23$ $P_{99} = 32$

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-Jan	14	Z	14	23	26	20	30	30	19	21	20	16	13	21	18	5	6	9	12	14	8	8	4	4	15.5	30
2-Jan	5	7	Z	11	10	8	12	24	18	19	13	9	9	9	12	16	17	25	22	17	19	19	19	14	14.5	25
3-Jan	11	16	8	Z	14	14	15	15	13	13	14	11	14	13	10	6	4	3	3	3	8	8	5	1	9.6	16
4-Jan	2	9	24	23	Z	14	6	6	4	8	4	2	2	3	7	9	18	18	20	20	9	2	2	4	9.4	24
5-Jan	2	1	1	1	3	Z	6	5	5	5	5	5	5	4	5	6	8	7	5	5	4	5	8	7	4.7	8
6-Jan	Z	11	6	4	7	10	8	11	17	12	12	18	8	9	9	11	16	23	25	25	25	21	18	20	14.1	25
7-Jan	18	Z	14	12	13	11	15	17	14	12	13	13	15	15	20	14	27	32	31	15	6	11	8	1	15.0	32
8-Jan	3	4	Z	6	2	4	5	7	4	3	3	3	4	2	3	6	8	4	5	5	8	9	16	9	5.2	16
9-Jan	6	15	10	Z	28	31	32	29	29	25	24	22	29	31	35	37	40	24	13	11	6	18	16	14	22.8	40
10-Jan	15	10	14	16	Z	16	25	26	29	23	18	19	19	26	28	30	24	22	22	26	26	26	20	18	21.6	30
11-Jan	19	18	16	20	18	Z	19	21	20	17	14	14	14	18	20	20	20	21	17	18	13	10	11	10	16.9	21
12-Jan	Z	9	8	8	7	8	15	16	18	23	19	18	19	18	21	26	29	28	22	19	18	17	15	15	17.1	29
13-Jan	16	Z	21	21	21	22	21	11	17	22	12	16	17	23	24	22	22	23	12	11	9	9	9	8	16.8	24
14-Jan	7	9	Z	19	14	28	4	15	19	13	11	7	8	7	6	5	6	8	9	5	5	5	5	4	9.5	28
15-Jan	9	9	10	Z	11	3	5	6	6	9	C	C	C	C	C	C	8	7	6	8	7	9	6	5	--	11
16-Jan	5	5	5	5	Z	10	12	16	13	20	18	17	24	25	28	32	18	4	4	3	2	1	1	1	11.6	32
17-Jan	1	1	1	1	1	Z	2	3	17	7	5	7	9	8	11	16	30	31	28	28	23	20	27	27	13.1	31
18-Jan	Z	20	13	9	10	10	10	10	13	8	6	6	6	8	10	12	13	18	17	17	19	15	18	20	12.5	20
19-Jan	15	Z	7	10	6	5	12	27	20	21	21	21	23	18	23	20	22	25	25	21	16	21	16	15	17.8	27
20-Jan	11	6	Z	5	6	9	14	18	16	13	8	7	10	10	15	29	29	30	27	25	21	17	14	13	15.4	30
21-Jan	13	11	16	Z	14	10	13	12	14	14	13	13	20	16	11	9	4	3	3	6	8	7	22	27	12.0	27
22-Jan	23	16	15	18	Z	17	13	2	2	3	3	4	9	2	3	2	2	3	2	1	1	1	10	16	7.2	23
23-Jan	12	7	7	6	6	Z	14	22	21	19	18	14	11	9	12	13	15	16	16	16	15	12	7	6	12.7	22
24-Jan	Z	4	5	4	5	5	8	11	13	12	9	7	5	13	22	21	3	9	3	4	9	24	21	21	10.3	24
25-Jan	15	Z	9	8	7	6	6	9	12	1	2	7	18	4	5	5	6	6	6	5	10	22	12	9	8.2	22
26-Jan	8	16	Z	14	15	22	19	28	20	15	14	11	5	8	14	15	22	12	14	6	3	3	4	3	12.5	28
27-Jan	3	4	3	Z	6	5	4	6	12	13	9	9	9	8	8	7	8	7	11	10	9	13	13	10	8.0	13
28-Jan	10	10	9	18	Z	17	17	16	17	7	5	4	6	10	11	13	13	17	20	21	22	11	11	9	12.8	22
29-Jan	8	10	10	8	7	Z	10	11	12	12	12	10	11	12	13	22	33	25	24	25	25	26	27	17	16.1	33
30-Jan	Z	8	13	15	12	9	8	8	3	4	4	4	4	2	3	5	7	9	17	13	14	16	18	15	9.1	18
31-Jan	16	Z	10	9	13	12	14	22	22	16	11	12	13	14	18	18	22	16	20	22	22	22	19	16	16.4	22
	10.3	9.4	10.3	11.2	10.8	12.5	12.7	14.7	14.8	13.1	11.3	10.8	11.9	12.2	14.1	15.0	16.1	15.6	14.7	13.7	12.5	13.1	12.9	11.6	Diurnal Average	
	23	20	24	23	28	31	32	30	29	25	24	22	29	31	35	37	40	32	31	28	26	26	27	27	Diurnal Maximum	

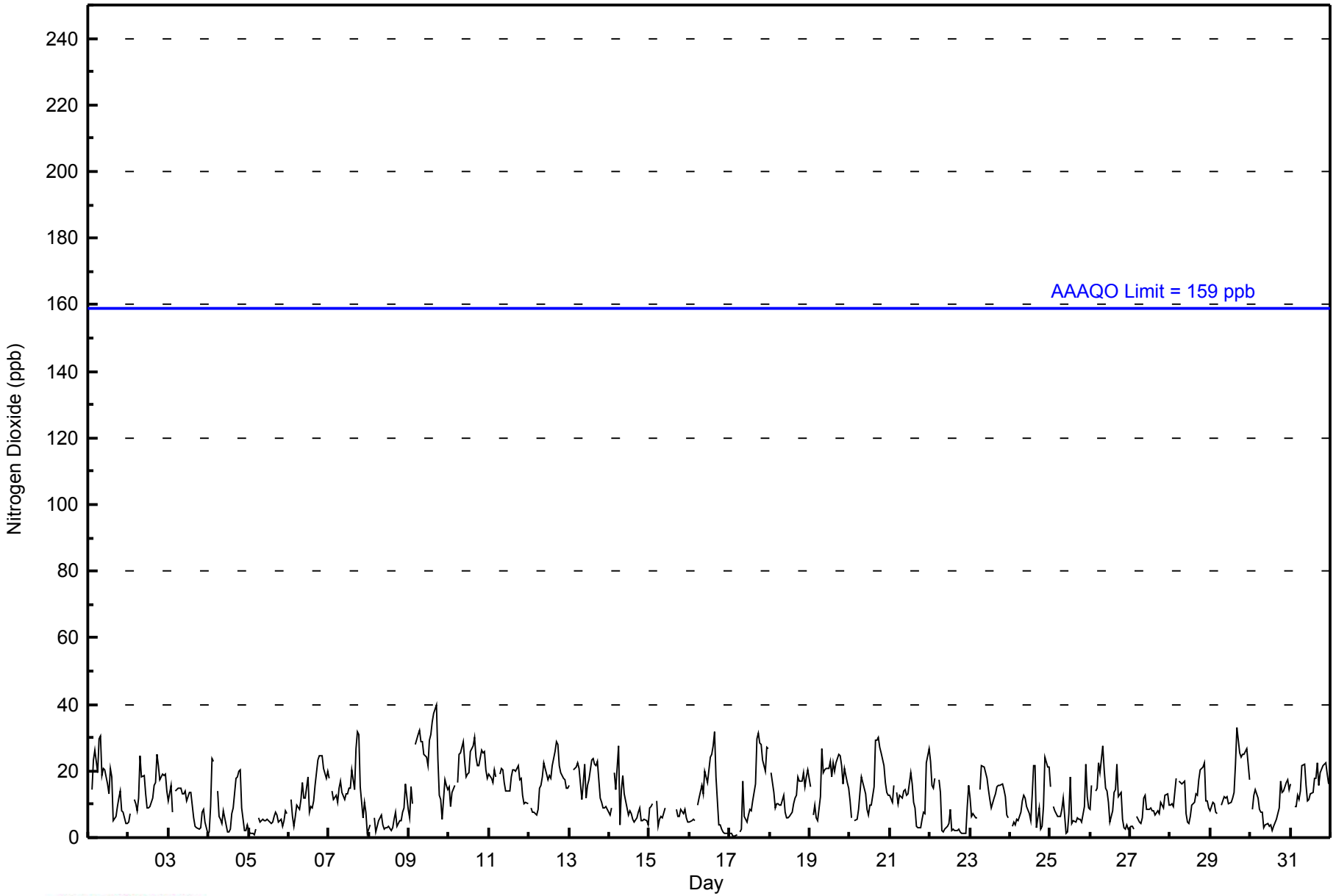
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2015



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	583	82.46	82.46
21 - 40	124	17.54	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

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2015

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	6	5	10	3	11	77	41	32	35	63	51	36	26	16	108	574
21 - 40	16	2	1	2	0	8	25	21	11	5	2	0	3	3	4	21	124
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	8	6	12	3	19	102	62	43	40	65	51	39	29	20	129	698

Total Number of Valid Hours: 698

Total Number of Hours: 744

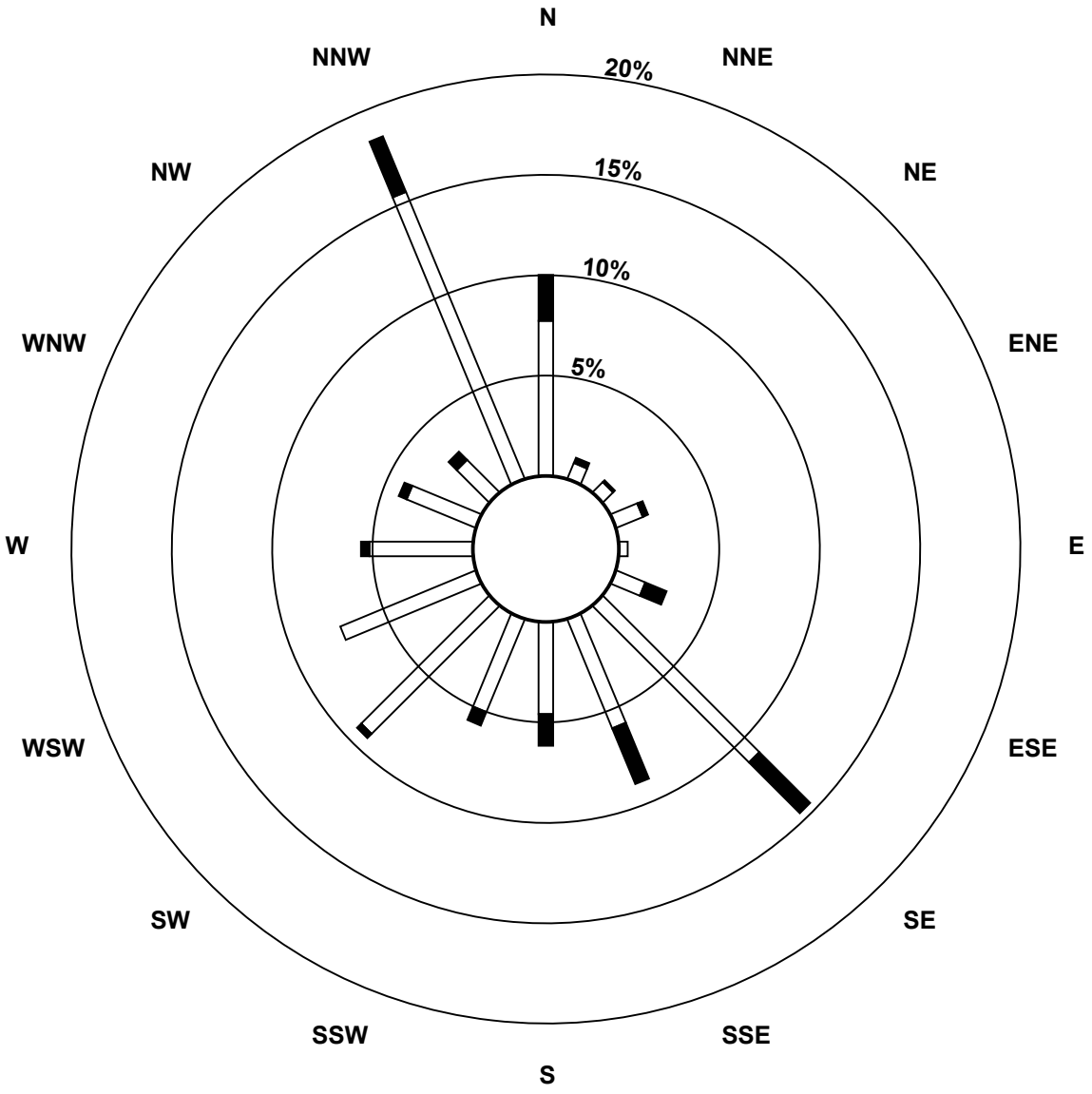
AURORA
ATMOSPHERICS INC.

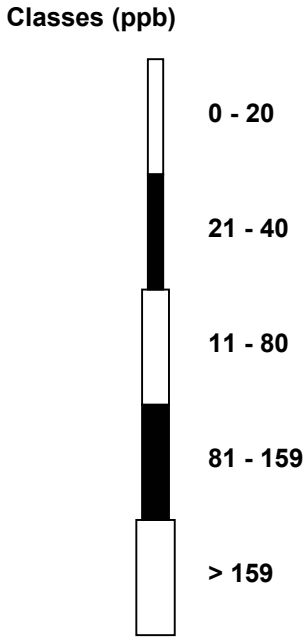
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley (AMS 7)





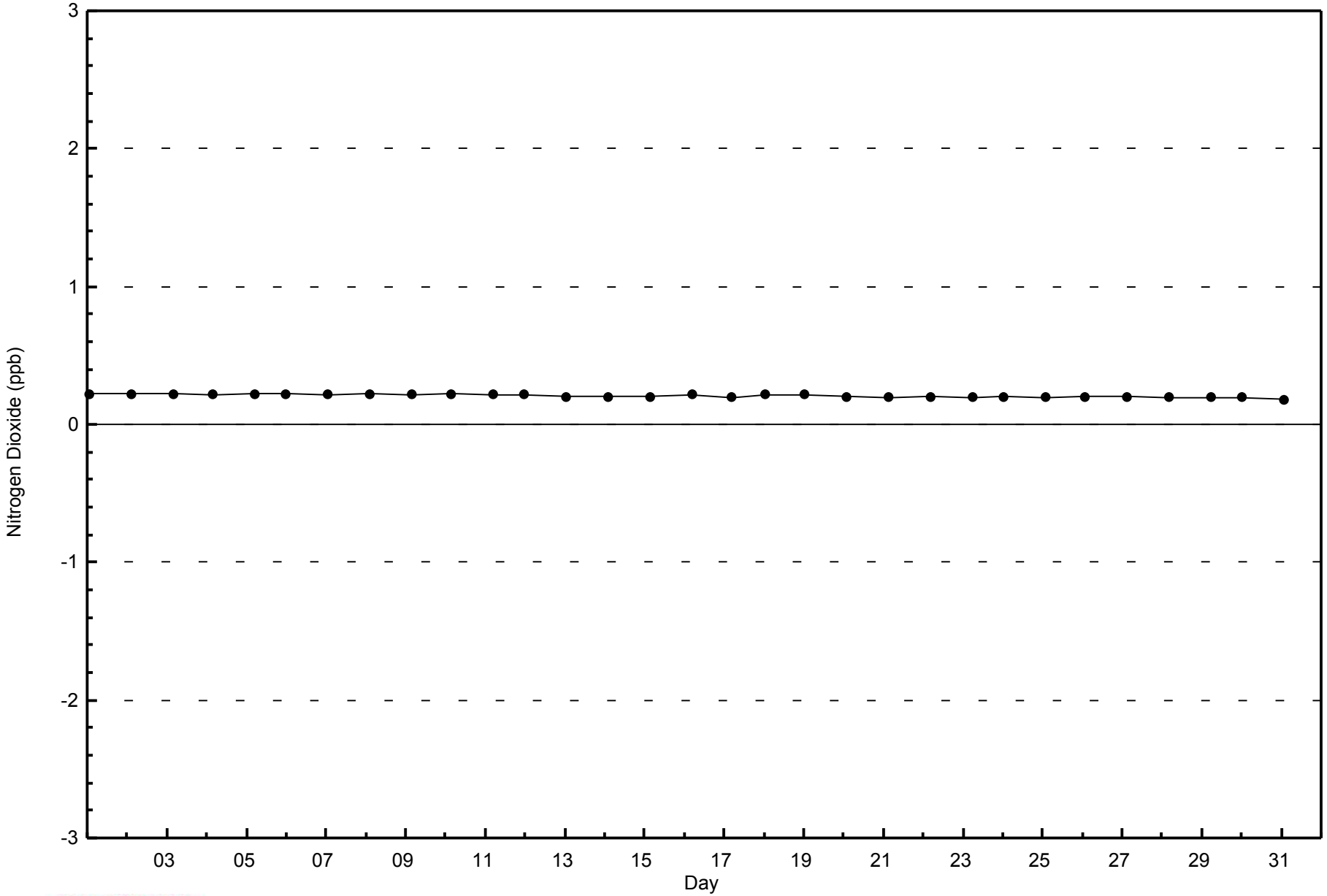
Total Number of Valid Hours: 698

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2015



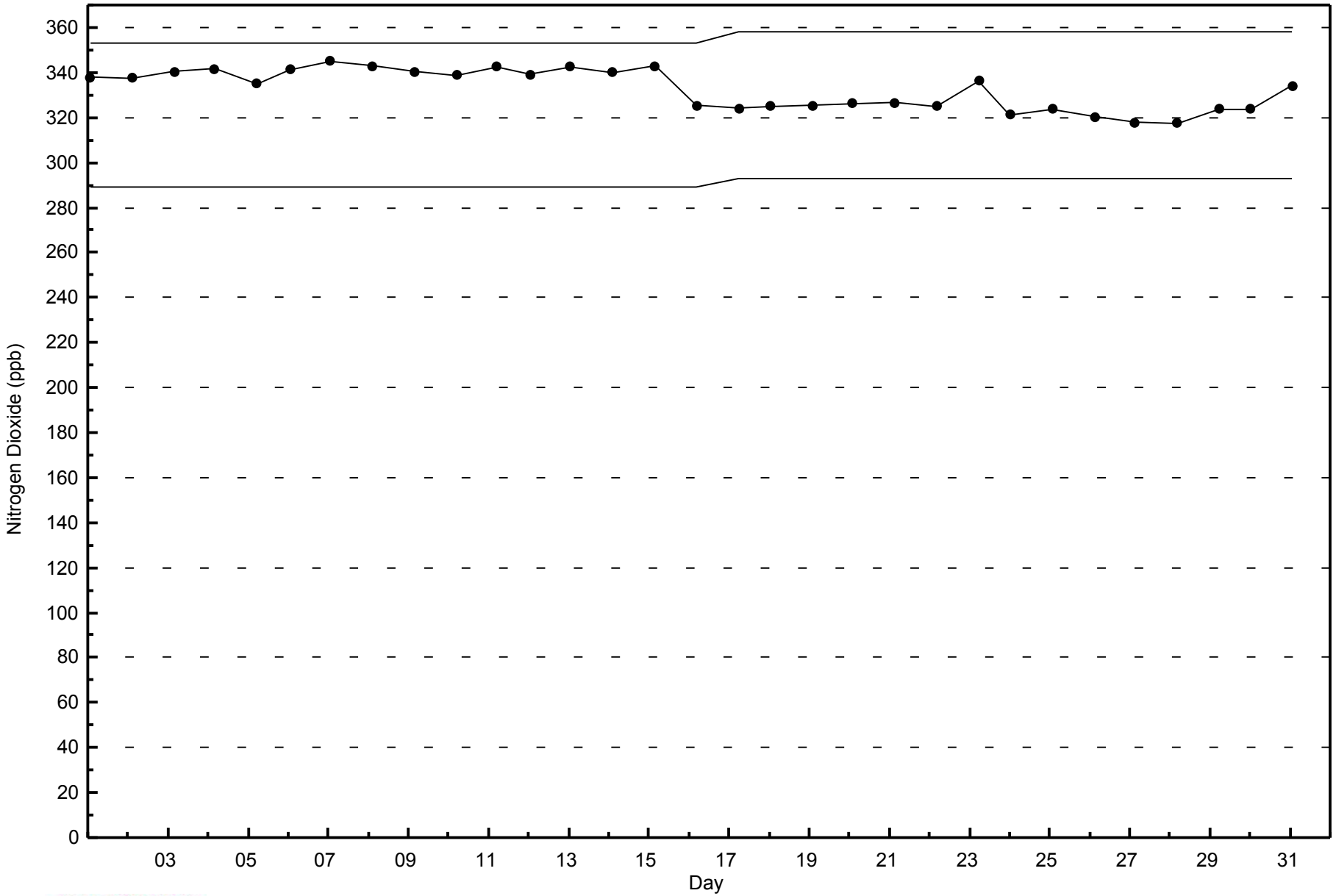
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2015

Maximum Value: 129 ppb on Jan 19 08:00

Maximum Daily Average: 43.6 ppb on Jan 10

Minimum Value: 1 ppb on Jan 17 03:00

Minimum Daily Average: 5.3 ppb on Jan 5

Maximum Diurnal Average: 28.3 ppb at hour 17

Minimum Diurnal Average: 11.4 ppb at hour 2

Monthly Average: 20.3 ppb

Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 8$ Median = 15 $Q_3 = 28$ $P_{90} = 42$ $P_{99} = 78$

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-Jan	14	Z	14	23	27	20	32	32	19	23	29	25	19	33	24	5	6	10	12	15	9	9	4	4	17.7	33
2-Jan	4	7	Z	11	11	9	14	32	20	25	19	13	13	14	18	20	21	34	30	22	23	26	25	17	18.7	34
3-Jan	11	17	8	Z	18	19	22	18	17	20	30	25	30	26	14	8	4	5	4	5	10	10	5	1	14.3	30
4-Jan	2	10	30	28	Z	20	8	7	5	10	5	3	3	4	10	11	27	22	31	27	10	2	2	4	12.2	31
5-Jan	2	1	1	1	3	Z	7	6	7	7	6	7	7	6	6	7	8	7	5	5	4	5	8	7	5.3	8
6-Jan	Z	12	6	4	7	10	11	16	28	20	23	50	17	20	18	20	28	52	51	51	50	36	27	31	25.6	52
7-Jan	23	Z	18	13	16	13	23	26	20	17	21	20	20	20	30	18	42	66	51	15	6	11	8	1	21.6	66
8-Jan	3	4	Z	6	2	4	5	8	5	4	4	4	5	2	3	6	8	5	7	7	9	11	21	9	6.1	21
9-Jan	7	17	11	Z	40	55	56	45	41	45	51	48	77	82	95	95	97	35	17	13	6	26	19	16	43.2	97
10-Jan	17	10	15	17	Z	19	52	58	77	49	41	50	47	71	70	67	47	42	35	65	56	49	29	22	43.6	77
11-Jan	32	30	23	37	28	Z	37	46	42	35	31	33	35	45	43	36	39	40	30	26	17	12	13	12	31.5	46
12-Jan	Z	11	8	8	9	14	25	27	38	48	35	37	37	32	42	59	75	71	34	27	25	24	19	19	31.6	75
13-Jan	20	Z	30	33	36	35	32	11	17	26	14	21	24	39	33	28	23	27	14	12	10	10	11	9	22.5	39
14-Jan	7	10	Z	23	17	45	5	21	21	15	13	8	9	9	7	6	6	8	9	5	5	5	5	4	11.4	45
15-Jan	9	9	10	Z	11	3	6	7	6	9	C	C	C	C	C	C	10	8	8	11	9	11	7	6	--	11
16-Jan	6	6	7	6	Z	11	15	19	16	27	26	24	40	43	55	77	36	4	4	3	2	1	1	1	18.6	77
17-Jan	1	1	1	1	1	Z	2	3	17	7	6	10	13	12	15	20	41	42	36	39	30	25	37	35	17.1	42
18-Jan	Z	22	14	10	11	12	12	13	23	14	13	15	15	20	25	26	22	49	43	37	50	43	52	54	25.8	54
19-Jan	28	Z	8	15	9	6	28	129	61	75	70	57	61	38	48	32	29	30	26	22	16	21	16	15	36.6	129
20-Jan	11	6	Z	5	6	8	14	19	17	15	11	10	19	17	25	66	59	71	54	40	28	22	17	16	24.1	71
21-Jan	16	13	23	Z	18	13	19	18	27	33	35	35	57	38	13	10	4	3	3	6	9	8	31	36	20.4	57
22-Jan	28	18	17	23	Z	23	18	2	2	3	3	4	12	2	3	2	2	3	2	2	1	1	9	16	8.6	28
23-Jan	12	6	7	6	6	Z	15	30	31	34	40	31	27	19	24	25	30	30	36	42	40	34	13	12	23.9	42
24-Jan	Z	6	6	5	6	5	11	19	30	29	19	12	9	24	56	48	3	10	3	4	13	50	40	40	19.5	56
25-Jan	19	Z	11	9	8	8	7	11	14	1	2	13	36	6	6	5	6	6	6	5	11	26	15	10	10.6	36
26-Jan	13	35	Z	26	20	40	44	90	54	32	39	25	7	13	23	24	39	19	16	6	3	2	4	3	25.1	90
27-Jan	3	3	3	Z	6	5	4	6	12	14	11	12	13	11	10	8	8	7	11	10	9	13	13	10	8.8	14
28-Jan	10	10	9	20	Z	17	17	17	19	9	6	6	9	14	14	16	14	19	22	27	35	12	12	10	14.9	35
29-Jan	8	10	11	9	8	Z	12	15	15	17	19	14	15	18	20	40	100	45	36	31	31	36	40	21	24.9	100
30-Jan	Z	8	13	16	12	8	8	8	3	5	5	5	6	3	5	7	8	10	17	13	14	17	18	15	9.8	18
31-Jan	17	Z	10	10	13	13	17	35	35	25	21	23	30	30	38	31	34	20	30	31	30	33	26	21	24.9	38
	12.5	11.4	12.0	14.1	13.5	16.8	18.6	25.6	23.8	22.3	21.6	21.3	23.8	23.7	26.4	27.4	28.3	25.8	22.0	20.2	18.4	19.1	17.7	15.4	Diurnal Average	
	32	35	30	37	40	55	56	129	77	75	70	57	77	82	95	95	100	71	54	65	56	50	52	54	Diurnal Maximum	

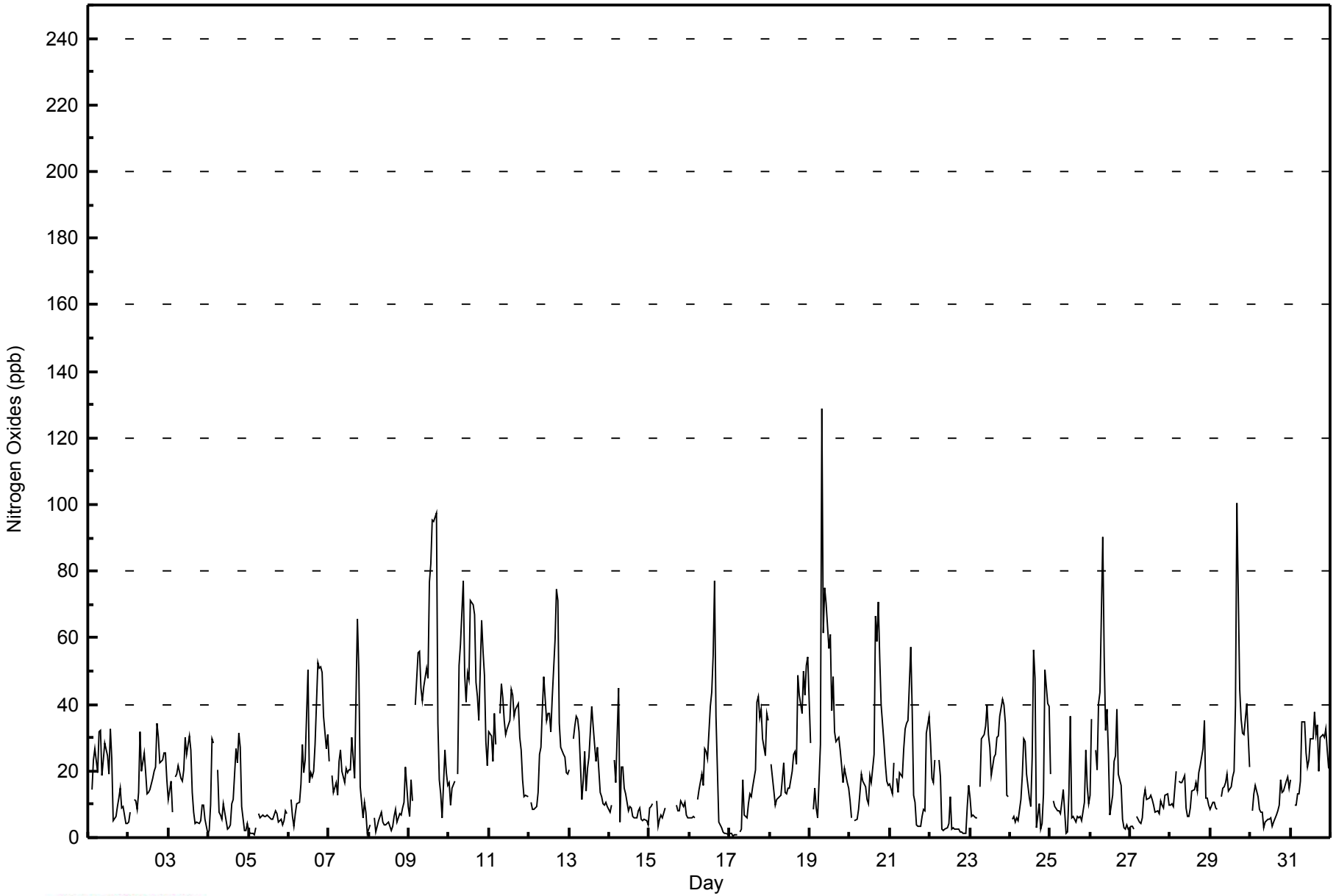
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Nitrogen Oxides (NO_X) - ppb
Athabasca Valley - January 2015

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	445	62.94	62.94
21 - 40	185	26.17	89.11
11 - 80	70	9.90	99.01
81 - 159	7	0.99	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	46	4	4	5	1	4	51	17	17	22	53	50	33	24	12	95	438
21 - 40	20	4	2	5	1	11	38	21	16	14	7	1	5	5	4	29	183
11 - 80	2	0	0	2	1	3	11	24	9	4	5	0	1	0	3	5	70
81 - 159	2	0	0	0	0	1	2	0	1	0	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	70	8	6	12	3	19	102	62	43	40	65	51	39	29	20	129	698

Total Number of Valid Hours: 698

Total Number of Hours: 744

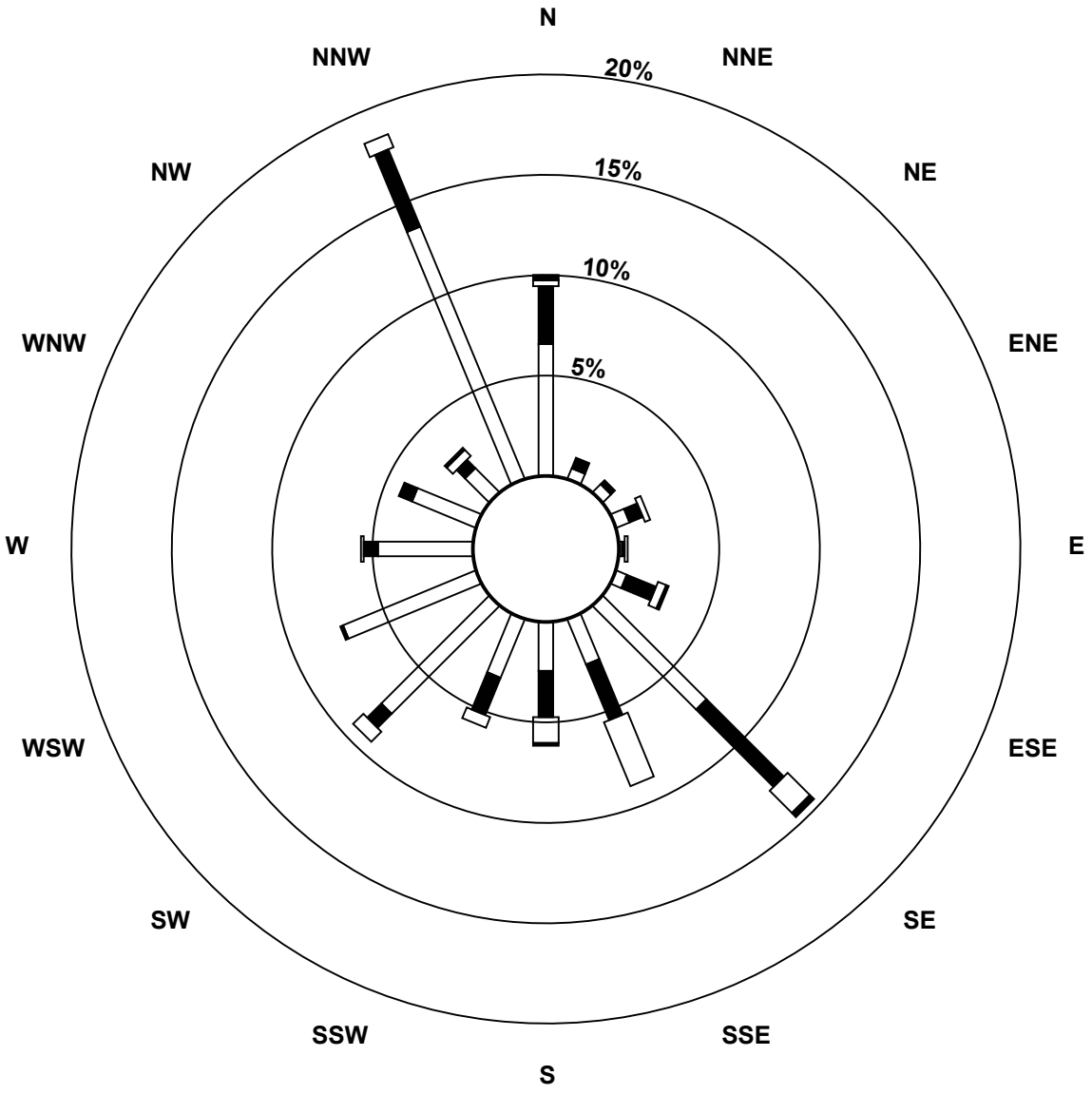
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

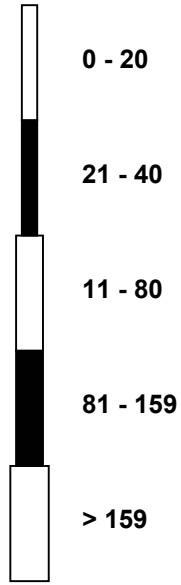
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley (AMS 7)



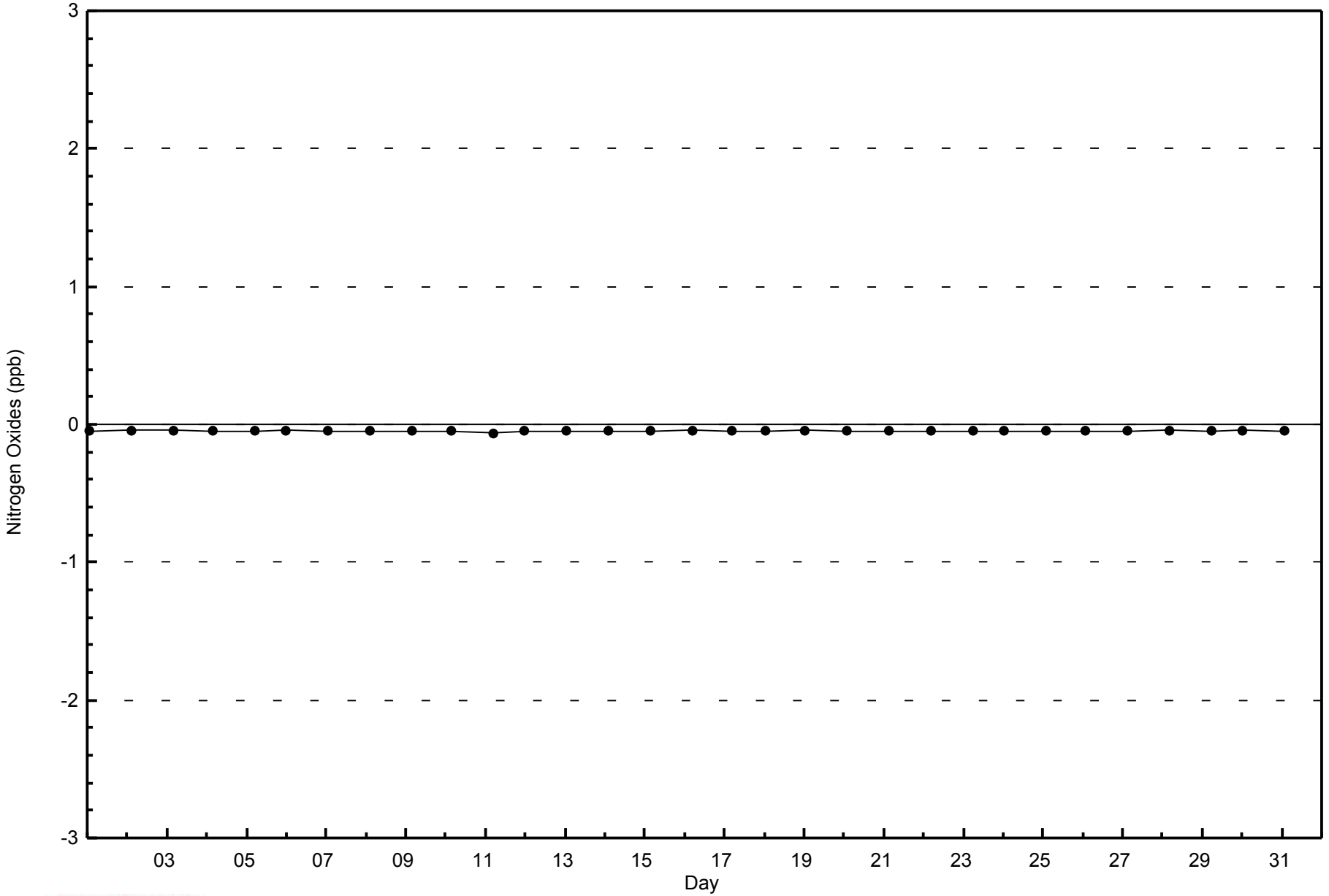
Classes (ppb)



Total Number of Valid Hours: 698

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Athabasca Valley - January 2015



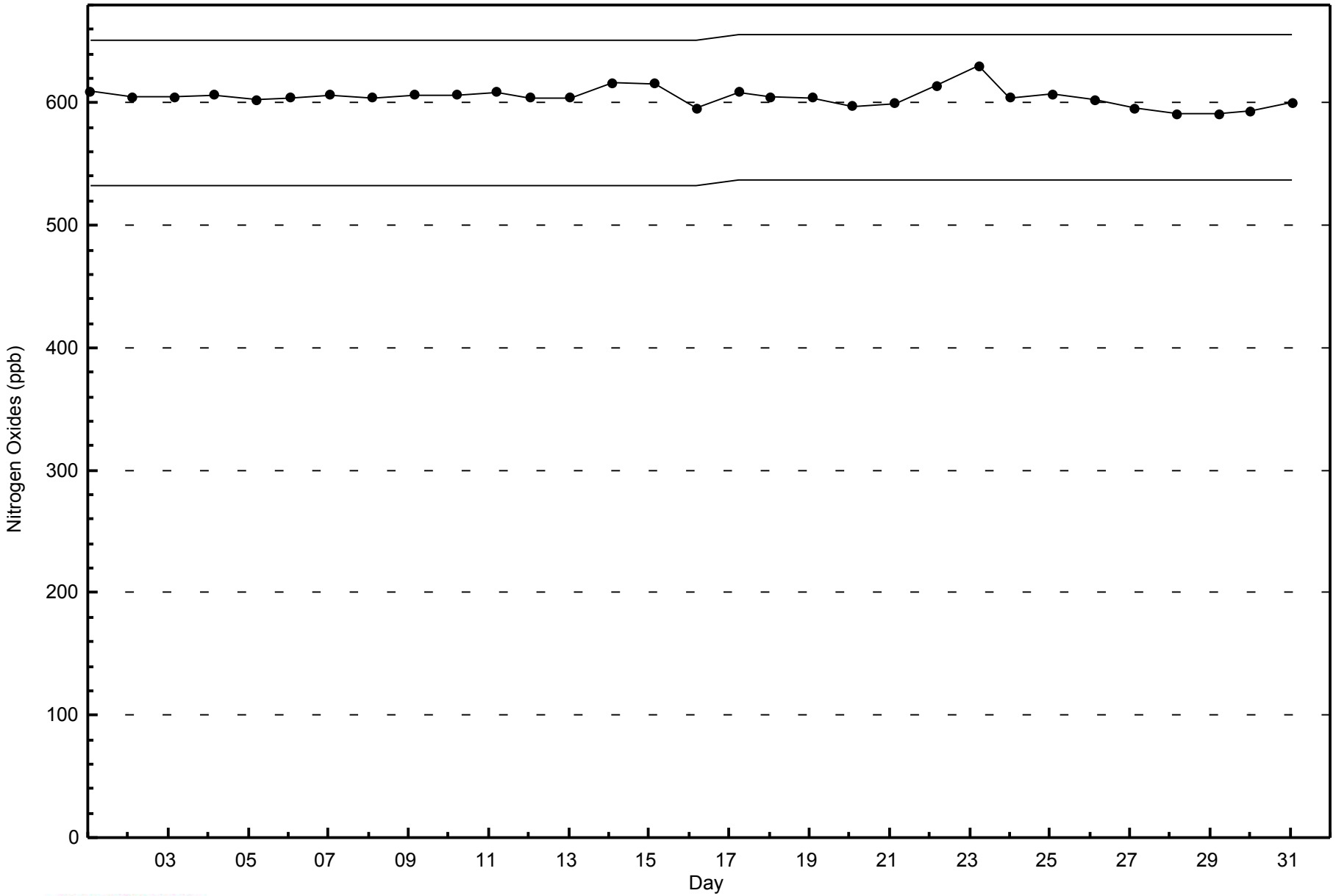
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - January 2015

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

Maximum Value: 24.1 $\mu g/m^3$ on Jan 31 16:00

Maximum Daily Average: 10.3 $\mu g/m^3$ on Jan 31

Minimum Value: 0.3 $\mu g/m^3$ on Jan 22 22:00

Minimum Daily Average: 2.0 $\mu g/m^3$ on Jan 25

Maximum Diurnal Average: 6.7 $\mu g/m^3$ at hour 16

Minimum Diurnal Average: 4.8 $\mu g/m^3$ at hour 5

Monthly Average: 5.55 $\mu g/m^3$

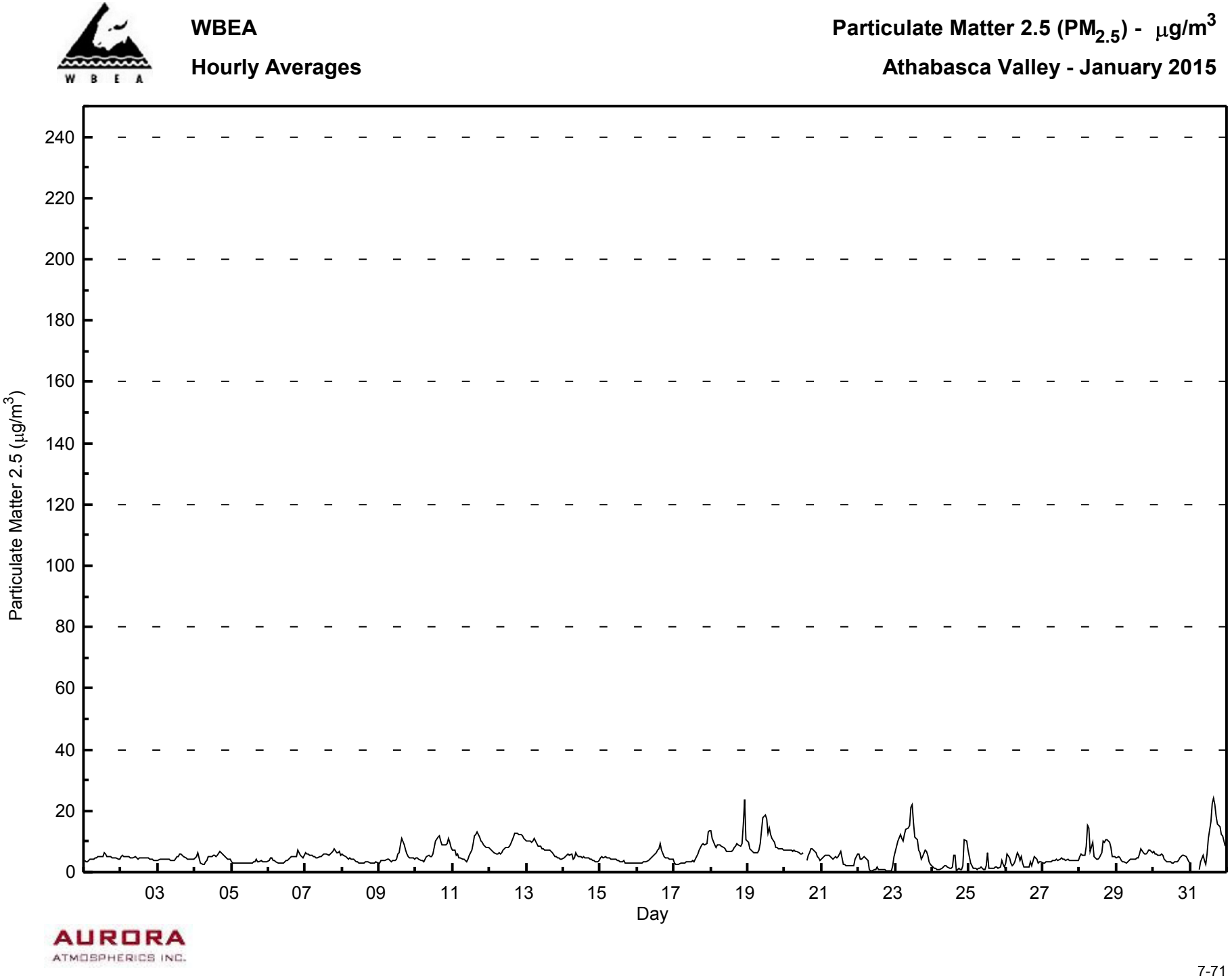
Percentiles: P_1 = 0.7 P_{10} = 2.7 Q_1 = 3.6 Median = 4.8 Q_3 = 6.6 P_{90} = 9.8 P_{99} = 16.5

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	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-Jan	3.6	3.4	3.4	3.8	4.1	4.2	4.3	4.6	4.6	5.0	5.1	5.1	5.1	6.4	5.9	5.2	5.3	5.0	4.8	4.8	4.7	4.6	4.4	4.1	4.6	6.4
2-Jan	5.1	5.5	5.2	5.2	5.3	5.0	4.8	4.6	4.8	4.9	4.7	4.4	4.5	4.6	4.5	4.6	4.8	4.8	4.6	4.3	4.2	3.9	3.7	3.7	4.7	5.5
3-Jan	3.9	4.2	4.1	4.3	4.1	4.1	4.1	4.1	3.8	3.7	3.8	3.9	5.0	5.1	5.7	6.0	5.7	5.3	4.8	4.4	4.3	4.4	4.3	4.1	4.5	6.0
4-Jan	4.6	4.9	6.2	4.6	3.1	2.7	2.7	3.4	3.9	4.9	5.0	5.1	5.6	5.4	5.2	5.5	6.7	6.3	5.9	5.6	4.9	4.4	4.3	4.3	4.8	6.7
5-Jan	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.9	2.9	3.0	2.9	3.2	3.4	4.4	3.6	3.3	3.6	3.4	3.4	3.5	3.6	3.2	4.4
6-Jan	4.0	4.6	4.5	3.9	3.6	3.4	3.2	3.2	2.9	2.8	3.0	3.6	3.7	4.4	4.8	5.2	5.2	5.2	5.2	7.0	6.4	5.7	4.7	5.4	4.4	7.0
7-Jan	6.3	5.9	6.0	5.7	5.5	5.2	5.1	4.7	4.9	5.1	5.3	5.5	5.8	5.9	5.9	5.4	5.9	6.6	6.9	7.5	6.3	6.3	6.6	5.4	5.8	7.5
8-Jan	5.8	5.7	5.3	4.8	4.3	4.6	4.4	4.1	3.7	3.6	3.3	3.2	3.1	3.1	3.1	3.2	3.4	3.3	3.1	3.0	3.0	3.0	3.3	2.9	3.8	5.8
9-Jan	3.1	3.9	3.7	3.8	4.0	4.2	4.4	3.9	3.4	3.9	3.9	4.3	5.8	6.5	8.7	11.0	9.1	7.2	5.9	5.2	4.7	4.7	4.7	4.3	5.2	11.0
10-Jan	4.7	4.5	4.2	3.8	3.7	3.4	4.4	5.0	5.4	5.0	5.3	5.9	8.1	10.0	11.5	12.0	10.2	9.1	9.0	8.9	9.5	10.9	9.7	8.3	7.2	12.0
11-Jan	7.0	7.1	5.5	5.9	4.8	4.7	4.2	4.2	3.8	3.6	4.4	5.7	7.0	9.4	11.7	12.3	13.0	11.3	10.2	9.7	8.9	8.4	8.3	8.2	7.5	13.0
12-Jan	7.4	7.2	6.7	6.5	6.1	5.9	6.2	6.0	6.2	7.3	7.9	8.0	8.2	8.4	9.5	11.4	12.6	12.7	12.7	12.5	12.1	11.8	11.0	10.7	9.0	12.7
13-Jan	10.0	10.4	10.2	9.7	10.2	10.8	10.1	8.4	8.4	8.3	7.8	7.5	7.0	7.3	7.2	7.3	6.8	6.4	5.2	5.1	4.8	4.6	4.3	4.2	7.6	10.8
14-Jan	4.7	5.3	5.6	6.0	5.7	5.8	4.2	4.7	6.2	5.6	5.3	4.9	4.7	4.9	4.8	4.6	4.5	4.2	4.1	4.0	3.7	3.6	3.5	3.7	4.8	6.2
15-Jan	4.7	5.0	4.8	5.0	4.7	4.5	4.8	4.4	4.2	4.2	4.2	3.8	3.7	3.4	3.3	3.6	3.2	3.1	3.2	3.1	3.1	3.1	2.9	3.0	3.9	5.0
16-Jan	3.0	3.0	3.1	3.1	3.2	3.3	3.5	3.8	4.1	4.5	5.1	5.6	6.4	7.1	7.5	9.3	7.1	5.0	4.8	4.7	4.5	4.2	4.1	4.1	4.8	9.3
17-Jan	3.1	2.7	2.7	2.7	2.8	2.8	2.8	2.8	3.3	3.4	3.4	3.5	3.8	3.5	4.1	5.9	7.4	8.2	9.0	9.3	8.9	9.1	13.1	13.4	5.5	13.4
18-Jan	13.7	10.9	8.8	8.2	9.0	8.9	8.9	8.6	8.2	7.6	6.9	6.6	6.8	6.9	7.4	7.9	8.4	9.3	8.7	8.5	9.3	15.8	23.8	10.7	9.6	23.8
19-Jan	9.6	7.5	7.1	6.9	6.6	6.3	6.3	7.2	9.5	13.6	18.0	18.6	17.3	12.9	14.3	12.1	11.1	9.6	8.2	7.9	7.5	7.7	7.7	7.4	10.0	18.6
20-Jan	7.2	7.3	7.1	7.1	7.2	6.9	7.0	7.0	6.7	6.4	6.1	6.1	6.2	M	3.8	5.5	6.2	7.6	7.5	7.3	6.3	5.0	4.6	4.0	6.3	7.6
21-Jan	4.3	5.1	5.4	5.5	5.4	5.3	5.0	4.4	4.6	5.0	4.7	4.9	6.6	4.9	2.5	2.4	2.0	2.0	2.0	2.1	2.2	2.0	4.1	6.1	4.1	6.6
22-Jan	5.7	4.2	4.2	4.5	4.9	4.1	3.8	0.7	0.5	0.5	0.7	0.8	1.7	0.9	0.9	0.8	0.8	0.7	0.5	0.4	0.3	0.3	2.0	5.2	2.0	5.7
23-Jan	7.0	8.6	10.0	12.2	11.2	10.1	12.2	13.9	14.4	15.2	21.0	22.2	16.3	11.3	10.5	7.2	6.3	4.2	5.2	7.2	7.0	5.5	3.4	2.7	10.2	22.2
24-Jan	2.0	1.2	1.2	1.0	1.0	1.0	1.2	1.7	2.1	2.1	1.9	1.2	1.1	1.8	5.5	5.5	0.5	1.3	0.8	1.0	2.1	10.6	10.0	7.0	2.7	10.6
25-Jan	5.0	3.1	2.3	1.4	1.1	1.0	1.1	1.4	1.7	0.9	0.9	2.0	6.3	1.3	1.4	1.3	1.4	1.5	1.5	1.2	1.8	4.0	2.5	1.7	2.0	6.3
26-Jan	3.0	6.1	4.6	3.1	2.2	2.6	3.4	6.4	5.7	4.0	5.0	3.1	1.6	1.7	1.8	1.6	3.4	2.1	5.1	4.7	4.4	3.0	3.3	3.2	3.5	6.4
27-Jan	3.0	3.0	3.4	3.6	3.5	3.5	4.0	3.8	4.0	4.1	4.0	4.4	4.7	4.3	4.3	3.9	4.0	3.9	3.9	3.7	3.9	4.0	3.8	3.8	3.9	4.7
28-Jan	5.0	5.9	5.6	5.4	8.3	15.1	14.4	7.0	9.8	5.0	4.7	4.3	4.4	4.8	6.6	10.3	9.9	10.7	10.7	9.6	8.1	5.2	5.3	5.3	7.6	15.1
29-Jan	4.7	5.0	4.5	4.0	3.4	3.2	3.1	3.6	3.8	4.1	4.2	4.0	4.4	4.7	4.8	5.8	7.7	6.5	5.8	5.7	6.6	7.0	7.1	6.2	5.0	7.7
30-Jan	6.8	5.9	5.8	5.5	5.4	6.0	5.5	4.2	3.8	3.5	3.4	3.5	3.1	3.0	3.4	3.5	3.8	4.5	5.2	5.4	5.5	5.1	4.4	3.4	4.6	6.8
31-Jan	3.0	3.1	UO	UO	0.7	UO	0.8	3.3	5.4	4.0	2.5	5.8	11.0	16.4	22.4	24.1	22.0	18.3	15.6	14.8	12.4	11.7	10.0	8.6	10.3	24.1
	5.3	5.3	5.1	5.0	4.8	5.1	4.9	4.8	5.1	5.0	5.3	5.5	5.9	5.8	6.3	6.7	6.5	6.1	5.9	5.9	5.6	5.9	6.1	5.4	Diurnal Average	
	13.7	10.9	10.2	12.2	11.2	15.1	14.4	13.9	14.4	15.2	21.0	22.2	17.3	16.4	22.4	24.1	22.0	18.3	15.6	14.8	12.4	15.8	23.8	13.4	Diurnal Maximum	

M - Maintenance UO - Unstable Operation

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$


WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - μg/m³
Athabasca Valley - January 2015
Particulate Matter 2.5 (μg/m³)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	453	61.22	61.22
6 - 15	252	34.05	95.27
16 - 25	14	1.89	97.16
26 - 80	0	0.00	97.16
> 81.0	0	0.00	97.16

Total Number of Valid Hours: 740

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Athabasca Valley - January 2015

Concentration	**Wind Direction**																
Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	33	5	3	8	2	11	71	31	23	30	45	37	30	27	11	77	444
6 - 15	35	3	2	2	2	10	34	35	21	14	19	3	2	5	8	57	252
16 - 25	3	0	0	1	0	1	5	0	1	0	1	0	0	0	0	2	14
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	71	8	5	11	4	22	110	66	45	44	65	40	32	32	19	136	710

Total Number of Valid Hours: 731

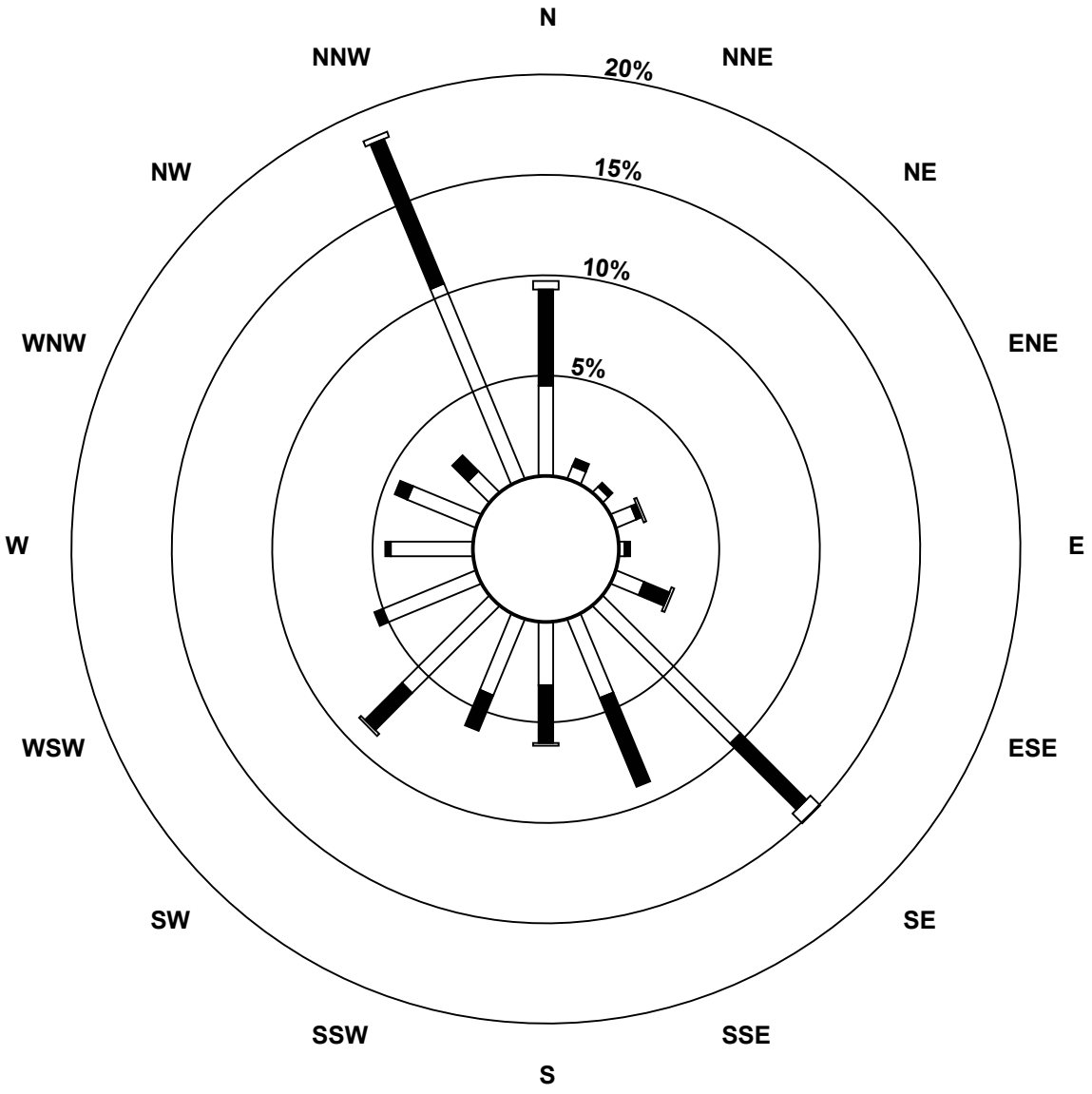
Total Number of Hours: 744

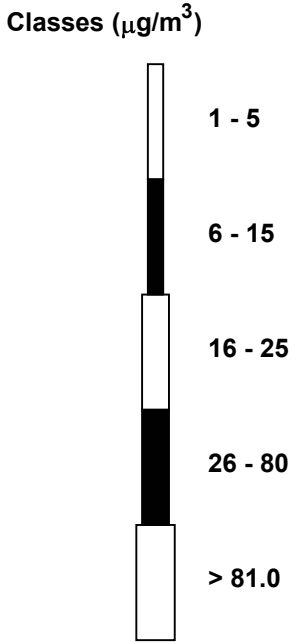
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Athabasca Valley (AMS 7)





Total Number of Valid Hours: 731

Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 0.6 ppm on Jan 16 16:00 Maximum Daily Average: 0.3 ppm on Jan 9

Minimum Value: 0.0 ppm on Jan 30 15:00 Minimum Daily Average: 0.0 ppm on Jan 30
Maximum Diurnal Average: 0.2 ppm at hour 16 Minimum Diurnal Average: 0.1 ppm at hour 2
Monthly Average: 0.12 ppm Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.1 Q_3 = 0.1 P_{90} = 0.2 P_{99} = 0.4

Hours in Service:	744
Hours of Data:	699
Hours of Missing Data:	45
Hours of Calibration:	34
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-Jan	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
2-Jan	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3-Jan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
4-Jan	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3
5-Jan	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	0.1	0.1	0.1	0.1
6-Jan	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.3
7-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
8-Jan	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
9-Jan	0.1	0.1	0.1	0.2	0.2	0.3	0.4	Z	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.4	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.6
10-Jan	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.4
11-Jan	0.1	0.2	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
12-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5
13-Jan	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	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
14-Jan	0.1	0.1	0.1	0.1	0.1	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	0.1	0.1	0.3
15-Jan	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	0.1	0.1	0.1	0.1	0.1	0.1
16-Jan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
17-Jan	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	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
18-Jan	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.2	0.4
19-Jan	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
20-Jan	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	C	C	C	C	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3
21-Jan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3
22-Jan	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
23-Jan	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	0.2	0.2	0.2	0.1	0.1	0.1	0.2
24-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.3	0.1	0.4
25-Jan	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
26-Jan	0.1	0.2	0.2	0.2	0.1	0.2	Z	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
27-Jan	0.0	0.0	AF	AF	AF	AF	AF	AF	AF	AF	M	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
28-Jan	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	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1
29-Jan	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
30-Jan	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
31-Jan	0.1	0.0	0.0	0.0	0.1	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	0.1	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	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.3	Diurnal Maximum	

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

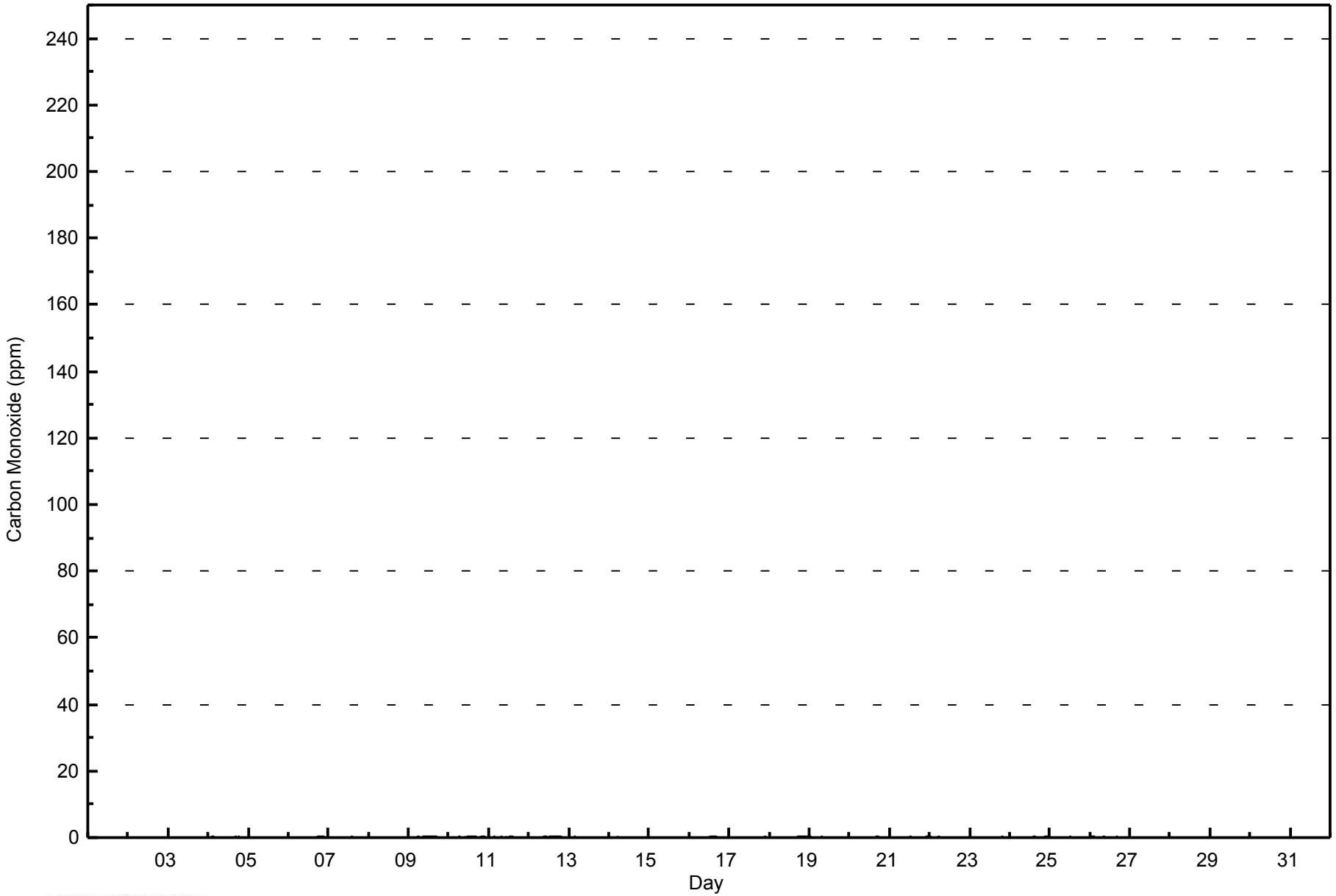
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	681	97.42	97.42
0.4 - 0.5	15	2.15	99.57
0.6 - 0.7	3	0.43	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: 699

Total Number of Hours: 744

WBEA

Frequency Distribution

Carbon Monoxide (CO) - ppm

Athabasca Valley - January 2015

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	68	7	6	10	3	19	99	59	43	44	60	49	38	31	18	119	673
0.4 - 0.5	0	0	0	0	0	1	5	4	1	0	2	1	0	0	1	0	15
0.6 - 0.7	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3
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	68	7	6	10	3	22	105	63	44	44	62	50	38	31	19	119	691

Total Number of Valid Hours: 691

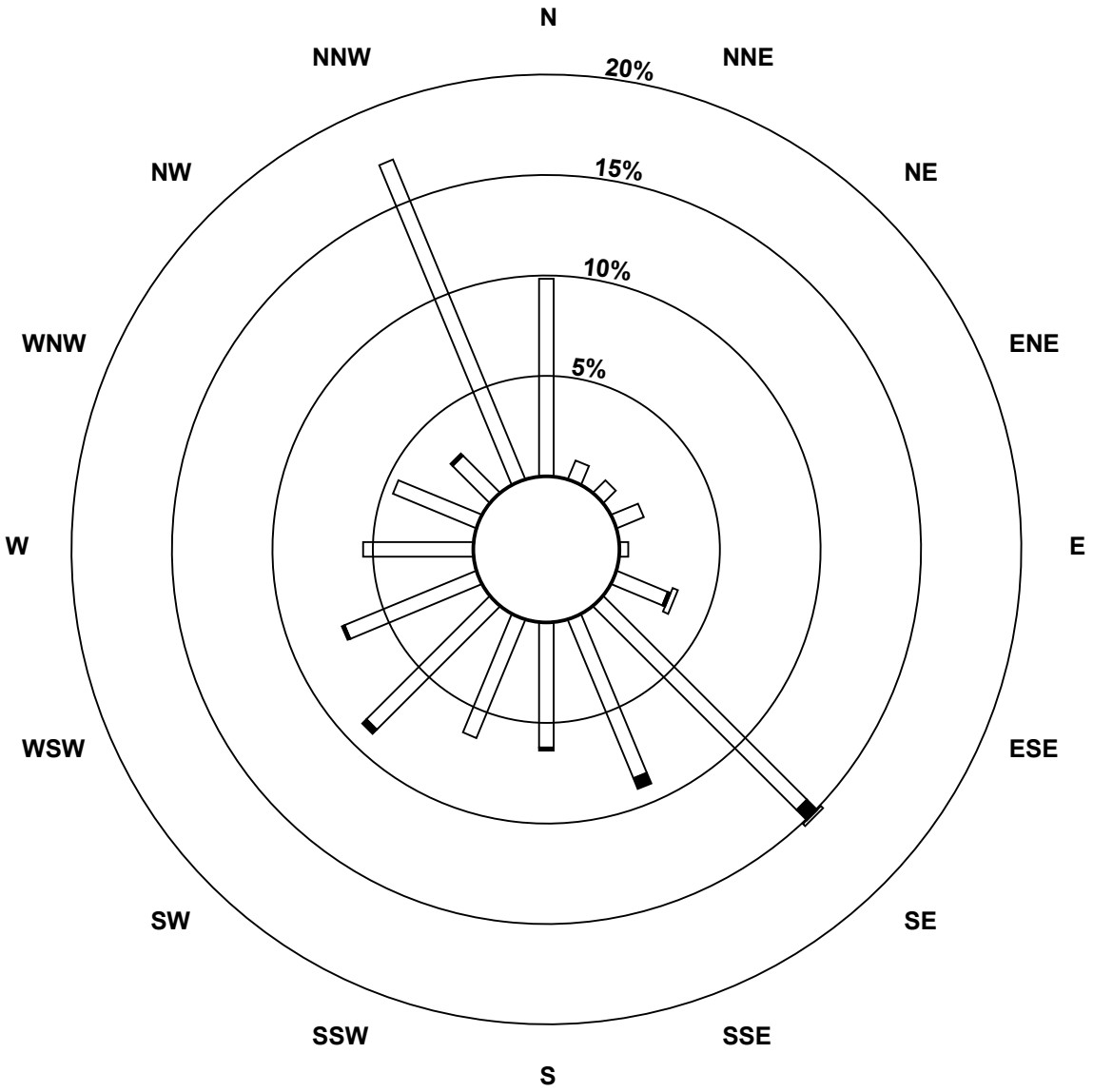
Total Number of Hours: 744

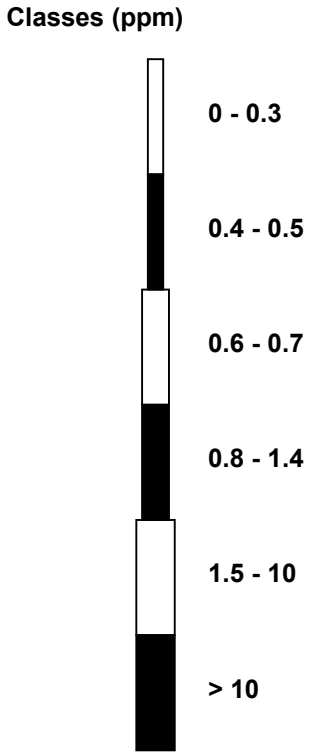
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Carbon Monoxide (CO) - ppm

Athabasca Valley (AMS 7)





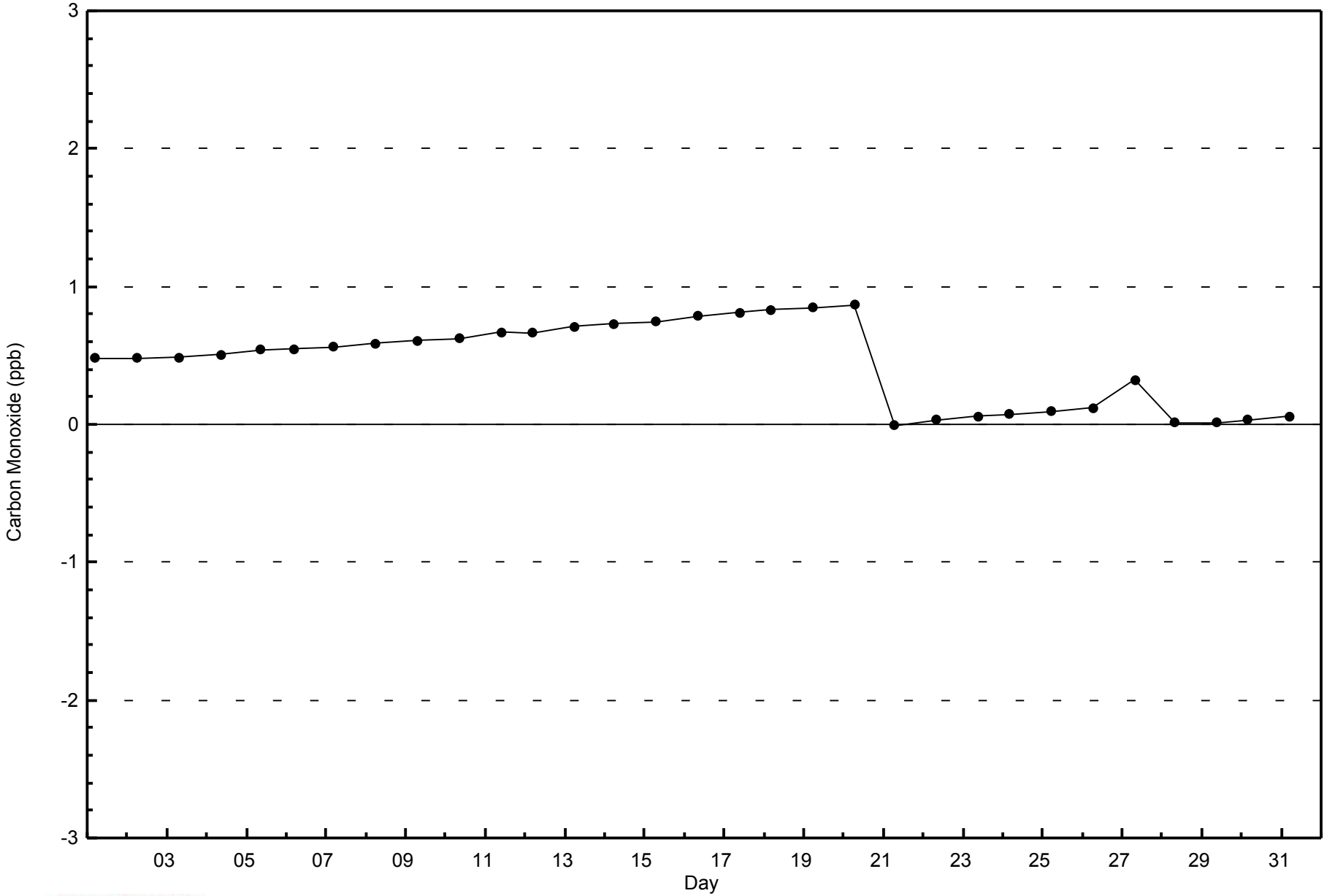
Total Number of Valid Hours: 691

WBEA

Zero Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - January 2015



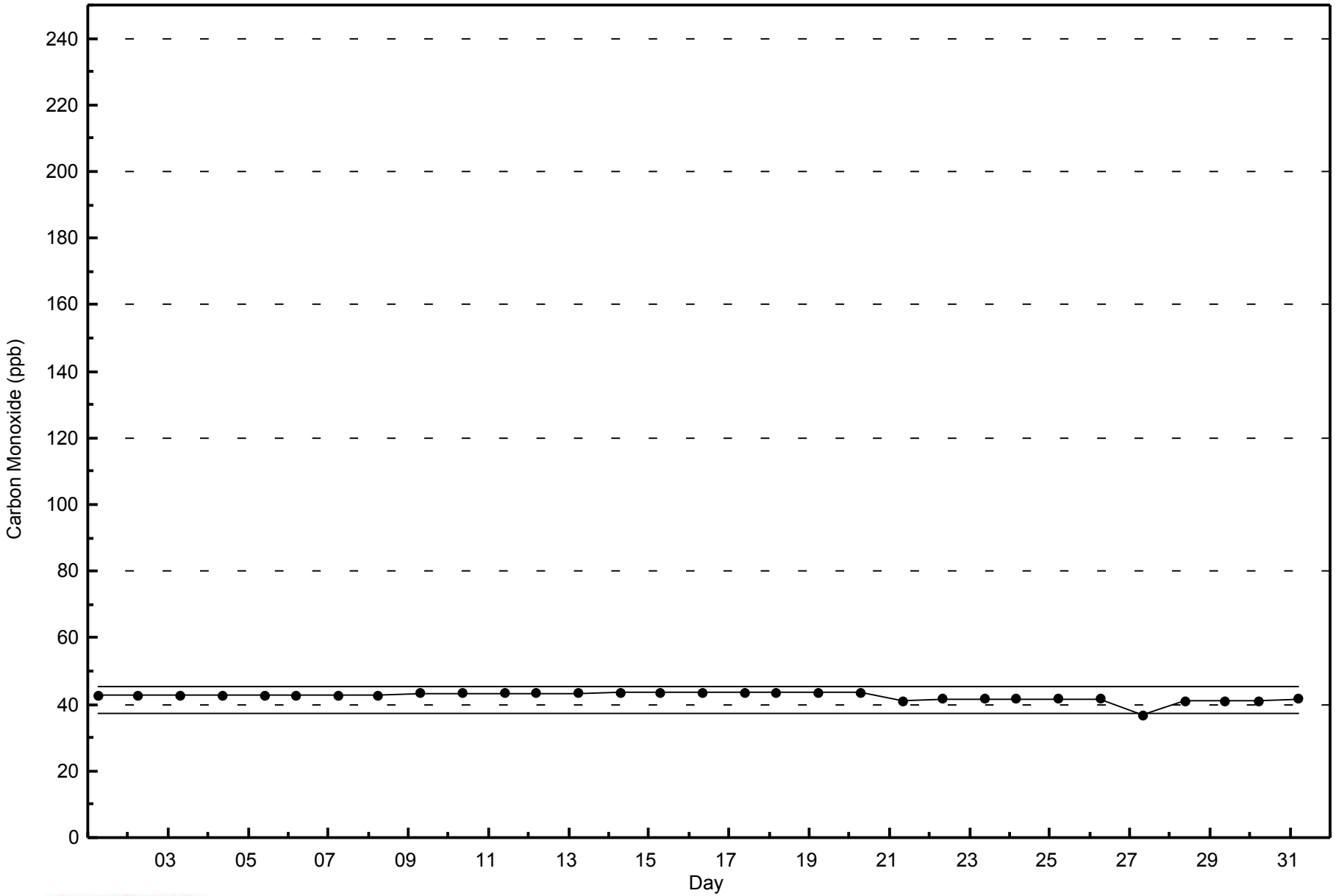
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 6.8 C on Jan 22 15:00

Maximum Daily Average: 3.7 C on Jan 22

Minimum Value: -32.8 C on Jan 11 09:00

Minimum Daily Average: -28.3 C on Jan 3

Maximum Diurnal Average: -12.1 C at hour 16

Minimum Diurnal Average: -16.4 C at hour 6

Monthly Average: -14.80 C

Percentiles: P_1 = -32.0 P_{10} = -28.4 Q_1 = -22.8 Median = -15.3 Q_3 = -8.2 P_{90} = 0.3 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

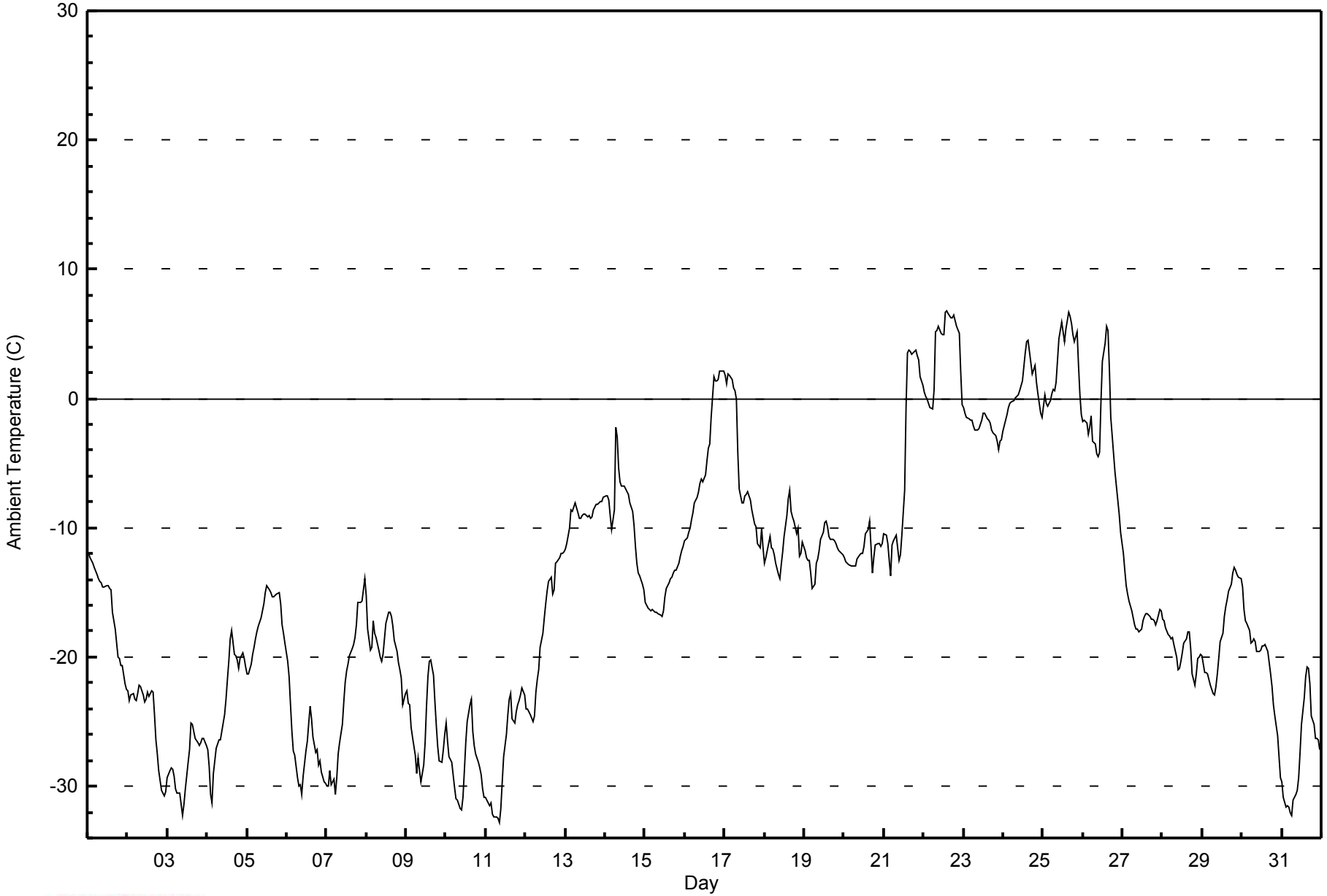
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-12.0	-12.3	-12.5	-12.7	-13.1	-13.6	-13.9	-14.1	-14.3	-14.6	-14.6	-14.5	-14.4	-14.7	-14.8	-16.5	-17.8	-19.0	-20.0	-20.2	-20.7	-20.7	-22.0	-22.5	-16.1	-12.0
2-Jan	-22.6	-23.4	-23.0	-22.8	-23.3	-23.3	-22.9	-22.1	-22.3	-23.0	-23.5	-23.3	-22.7	-23.0	-22.6	-22.8	-24.5	-26.5	-27.5	-28.8	-30.3	-30.5	-30.8	-30.5	-24.8	-22.1
3-Jan	-29.3	-28.8	-28.5	-28.7	-29.2	-30.2	-30.6	-30.5	-31.4	-32.3	-31.4	-30.2	-28.1	-27.2	-25.1	-25.2	-25.7	-26.3	-26.6	-26.9	-26.6	-26.3	-26.3	-26.9	-28.3	-25.1
4-Jan	-27.2	-28.5	-30.6	-31.3	-29.0	-27.1	-26.7	-26.4	-26.4	-25.7	-24.5	-23.3	-21.7	-20.3	-18.6	-18.0	-19.8	-20.0	-20.2	-20.9	-20.1	-19.7	-20.1	-20.8	-23.6	-18.0
5-Jan	-21.3	-21.3	-20.6	-19.8	-19.2	-18.5	-18.1	-17.6	-16.9	-16.4	-15.9	-15.1	-14.4	-14.8	-15.0	-15.3	-15.4	-15.2	-15.1	-15.0	-15.9	-17.6	-18.2	-18.9	-17.1	-14.4
6-Jan	-20.3	-21.5	-23.7	-25.7	-27.3	-27.6	-29.4	-30.0	-29.8	-30.7	-29.2	-27.3	-26.6	-25.2	-23.8	-24.8	-26.2	-27.4	-27.2	-28.3	-28.0	-28.9	-29.7	-29.8	-27.0	-20.3
7-Jan	-30.0	-30.0	-28.8	-29.9	-29.4	-30.6	-29.3	-27.5	-26.6	-25.2	-23.5	-21.9	-21.1	-20.6	-19.9	-19.4	-19.1	-18.5	-17.5	-15.8	-15.8	-15.7	-14.8	-13.9	-22.7	-13.9
8-Jan	-15.3	-17.8	-19.5	-19.3	-17.1	-18.2	-18.5	-19.5	-20.0	-20.3	-19.7	-18.6	-17.4	-16.6	-16.5	-16.8	-17.6	-18.7	-19.6	-20.4	-20.9	-21.6	-23.7	-22.8	-19.0	-15.3
9-Jan	-22.6	-23.6	-23.7	-25.4	-26.2	-27.6	-29.0	-27.8	-28.8	-29.6	-28.4	-26.6	-23.8	-21.5	-20.3	-20.3	-21.4	-23.5	-25.3	-27.0	-28.0	-28.2	-27.1	-26.0	-25.5	-20.3
10-Jan	-25.1	-26.5	-27.7	-28.1	-29.1	-30.1	-31.0	-31.1	-31.7	-31.8	-30.8	-28.8	-26.6	-25.0	-23.7	-23.3	-25.7	-26.8	-27.5	-28.2	-28.5	-29.1	-30.2	-30.9	-28.2	-23.3
11-Jan	-30.8	-31.3	-31.5	-31.3	-32.2	-32.4	-32.4	-32.5	-32.8	-31.7	-29.7	-27.7	-26.0	-24.5	-23.3	-22.8	-24.8	-25.1	-24.2	-23.7	-23.3	-22.9	-22.4	-23.0	-27.6	-22.4
12-Jan	-24.0	-24.1	-24.3	-24.4	-25.0	-24.6	-22.7	-21.8	-20.9	-19.2	-18.2	-17.0	-15.9	-14.9	-14.1	-13.9	-15.1	-14.8	-12.8	-12.6	-12.3	-12.0	-12.0	-11.8	-17.8	-11.8
13-Jan	-11.7	-11.2	-10.1	-8.6	-8.7	-8.4	-8.0	-8.8	-9.2	-9.2	-9.1	-9.0	-8.9	-9.1	-9.0	-9.2	-9.2	-8.6	-8.2	-8.2	-8.1	-8.0	-8.0	-7.6	-8.9	-7.6
14-Jan	-7.5	-7.5	-7.9	-9.1	-10.1	-8.7	-2.2	-3.0	-5.4	-6.5	-6.7	-6.8	-7.0	-7.3	-7.5	-8.0	-8.7	-9.8	-11.4	-12.7	-13.5	-13.7	-14.3	-14.8	-8.8	-2.2
15-Jan	-15.7	-16.0	-16.3	-16.4	-16.3	-16.4	-16.6	-16.6	-16.6	-16.8	-16.8	-16.4	-15.3	-14.7	-14.3	-13.9	-13.8	-13.5	-13.3	-13.2	-12.7	-12.2	-11.8	-11.5	-14.9	-11.5
16-Jan	-11.0	-10.7	-10.4	-10.1	-9.4	-8.8	-8.1	-7.7	-7.2	-6.6	-6.2	-6.4	-5.9	-4.8	-3.9	-3.6	-1.4	1.7	1.3	1.3	1.5	2.1	2.1	2.1	-4.6	2.1
17-Jan	1.8	1.1	1.9	1.8	1.5	0.8	0.6	-0.1	-4.2	-7.0	-8.1	-8.0	-7.6	-7.4	-7.2	-7.9	-8.7	-9.1	-9.7	-9.9	-11.2	-11.5	-10.0	-11.6	-5.4	1.9
18-Jan	-12.8	-12.3	-11.2	-10.7	-11.6	-11.7	-12.0	-12.7	-13.6	-14.0	-12.9	-11.9	-10.6	-9.1	-7.7	-7.1	-8.7	-9.2	-9.5	-10.4	-10.1	-12.1	-12.0	-11.1	-11.0	-7.1
19-Jan	-11.8	-12.3	-12.6	-12.6	-13.5	-14.7	-14.3	-12.7	-12.4	-11.8	-10.9	-10.3	-9.6	-9.5	-9.9	-10.6	-10.9	-10.9	-11.0	-11.2	-11.5	-11.8	-12.0	-12.1	-11.7	-9.5
20-Jan	-12.3	-12.6	-12.7	-12.9	-13.0	-12.9	-12.9	-13.0	-12.4	-12.1	-12.0	-12.0	-11.4	-10.4	-10.1	-9.5	-11.5	-13.5	-12.3	-11.3	-11.2	-11.3	-11.4	-11.2	-11.9	-9.5
21-Jan	-10.5	-10.5	-11.2	-12.5	-13.7	-11.3	-11.0	-10.6	-11.6	-12.5	-12.1	-10.5	-7.1	-0.7	3.5	3.8	3.6	3.5	3.7	3.7	3.3	3.0	1.7	1.1	-4.8	3.8
22-Jan	0.4	0.2	0.0	-0.3	-0.7	-0.8	0.7	5.2	5.3	5.5	5.1	5.0	4.9	6.7	6.8	6.5	6.2	6.2	6.5	6.0	5.5	5.1	2.0	-0.5	3.7	6.8
23-Jan	-0.7	-1.2	-1.4	-1.6	-1.7	-1.7	-2.1	-2.4	-2.4	-2.3	-2.0	-1.7	-1.2	-1.1	-1.6	-1.7	-1.9	-2.4	-2.6	-2.9	-3.3	-3.9	-3.3	-3.2	-2.1	-0.7
24-Jan	-2.6	-1.7	-1.2	-0.7	-0.3	-0.2	-0.2	0.1	0.2	0.3	0.7	1.4	2.4	3.5	4.4	4.6	3.6	1.9	2.3	2.6	1.3	0.4	-1.1	-1.4	0.8	4.6
25-Jan	-0.6	0.3	-0.4	-0.6	-0.1	0.4	0.7	0.6	1.2	4.6	5.3	5.9	5.2	4.4	5.3	6.7	6.4	5.8	4.9	4.4	5.2	2.5	0.2	-1.2	2.8	6.7
26-Jan	-1.8	-1.6	-1.9	-2.8	-2.2	-1.4	-3.3	-3.5	-4.3	-4.5	-4.2	-0.2	2.9	4.3	5.6	5.3	2.3	-1.5	-4.2	-5.7	-6.8	-7.8	-8.9	-10.4	-2.4	5.6
27-Jan	-11.9	-13.2	-14.4	-15.1	-15.7	-16.4	-17.0	-17.5	-17.9	-17.9	-18.0	-17.8	-17.2	-16.8	-16.6	-16.6	-16.8	-17.1	-17.1	-17.2	-17.5	-17.2	-16.3	-16.4	-16.5	-11.9
28-Jan	-17.1	-17.2	-17.7	-18.3	-18.4	-18.6	-18.5	-19.1	-20.0	-21.0	-20.9	-20.4	-19.7	-19.0	-18.6	-18.1	-18.1	-19.4	-21.3	-22.2	-21.3	-20.1	-20.0	-19.7	-19.4	-17.1
29-Jan	-19.9	-21.2	-21.2	-21.3	-21.7	-22.2	-22.8	-22.9	-22.3	-21.3	-20.1	-18.8	-18.1	-16.9	-16.1	-15.5	-14.9	-14.3	-13.5	-13.0	-13.3	-13.6	-13.8	-14.0	-18.0	-13.0
30-Jan	-14.6	-16.3	-17.1	-17.4	-18.0	-18.9	-18.8	-18.6	-18.8	-19.5	-19.6	-19.5	-19.1	-19.1	-19.0	-19.6	-20.4	-21.3	-22.3	-23.7	-24.5	-26.0	-27.8	-29.3	-20.4	-14.6
31-Jan	-29.7	-30.8	-31.6	-31.5	-31.6	-32.0	-32.3	-31.1	-30.6	-30.4	-29.4	-27.4	-25.3	-23.1	-21.5	-20.8	-20.9	-22.1	-24.6	-25.3	-26.3	-26.3	-26.4	-27.1	-27.4	-20.8
	-15.2	-15.6	-15.9	-16.1	-16.3	-16.4	-16.2	-16.0	-16.3	-16.2	-15.7	-14.8	-13.8	-12.9	-12.1	-12.1	-12.8	-13.4	-13.7	-14.1	-14.4	-14.7	-15.1	-15.4	Diurnal Average	
	1.8	1.1	1.9	1.8	1.5	0.8	0.7	5.2	5.3	5.5	5.3	5.9	5.2	6.7	6.8	6.7	6.4	6.2	6.5	6.0	5.5	5.1	2.1	2.1	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	252	33.87	33.87
-20 - 0	410	55.11	88.98
0 - 10	82	11.02	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

Maximum Value: 30.0 % on Jan 6 18:00

Maximum Daily Average: 29.9 % on Jan 6

Minimum Value: 28.3 % on Jan 16 14:00

Minimum Daily Average: 28.4 % on Jan 16

Maximum Diurnal Average: 29.2 % at hour 24

Minimum Diurnal Average: 29.1 % at hour 15

Monthly Average: 29.14 %

Percentiles: P_1 = 28.3 P_{10} = 28.6 Q_1 = 28.8 Median = 29.2 Q_3 = 29.4 P_{90} = 29.7 P_{99} = 30.0

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

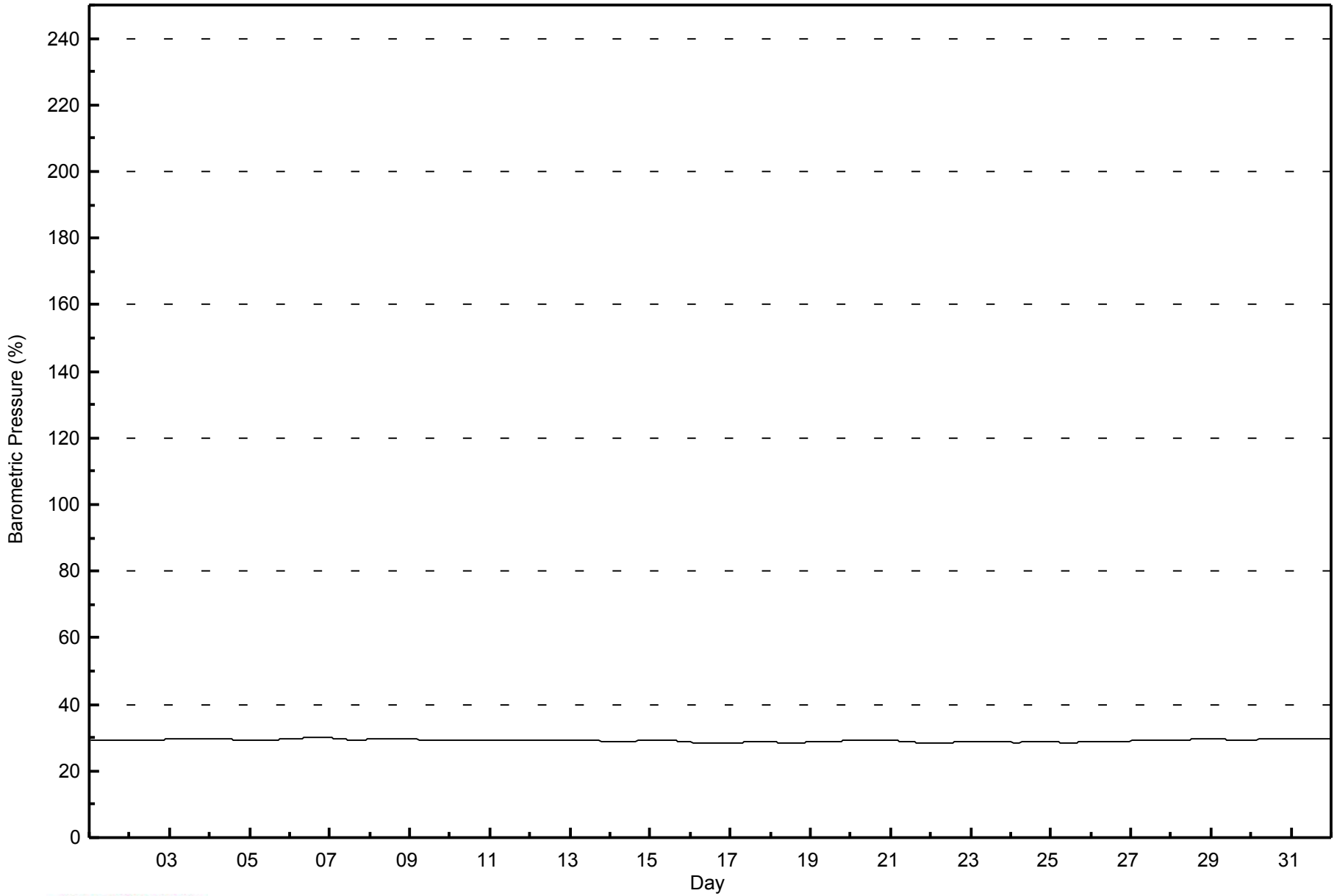
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.2	29.3	29.3	29.1	29.3
2-Jan	29.2	29.2	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	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.3	29.5
3-Jan	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	29.7	29.7
4-Jan	29.7	29.7	29.7	29.7	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	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.5	29.7
5-Jan	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	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.6	29.3	29.6
6-Jan	29.6	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.9	29.9	29.9	29.9	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	30.0
7-Jan	29.9	29.9	29.9	29.8	29.8	29.7	29.7	29.6	29.6	29.5	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.3	29.3	29.4	29.4	29.4	29.5	29.5	29.5	29.9
8-Jan	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.7	29.8
9-Jan	29.6	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.6
10-Jan	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3
11-Jan	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	29.3	29.3	29.3	29.3	29.3	29.3	29.4
12-Jan	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3
13-Jan	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	28.9	28.9	28.9	28.8	29.1	29.2
14-Jan	28.8	28.8	28.8	28.8	28.7	28.7	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.2	29.2	28.9	29.2
15-Jan	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	29.0	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.7	29.1	29.2
16-Jan	28.7	28.6	28.6	28.5	28.5	28.4	28.4	28.4	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.7
17-Jan	28.4	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.7
18-Jan	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.6	28.7
19-Jan	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	28.9	29.1
20-Jan	29.1	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	29.2	29.2	29.2	29.2	29.2	29.3
21-Jan	29.2	29.2	29.1	29.1	29.1	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.8	29.2
22-Jan	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.4	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	28.8	28.8	28.8	28.6	28.8
23-Jan	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.8	28.9
24-Jan	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.8
25-Jan	28.8	28.7	28.7	28.7	28.6	28.5	28.5	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.8
26-Jan	28.7	28.7	28.8	28.8	28.8	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	28.8	29.0
27-Jan	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	29.2	29.2	29.1	29.2	29.1	29.1	29.1	29.1	29.1	29.2
28-Jan	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.4	29.6
29-Jan	29.6	29.6	29.6	29.6	29.6	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	29.3	29.4	29.6
30-Jan	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.6	29.8
31-Jan	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	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.7	29.8
	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	Diurnal Average	
	29.9	29.9	29.9	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.9	29.9	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	Diurnal Maximum	

WBEA

Hourly Averages

Barometric Pressure (BP) - %

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 99 inHg on Jan 24 10:00

Maximum Daily Average: 97.6 inHg on Jan 23

Minimum Value: 56 inHg on Jan 8 14:00

Minimum Daily Average: 68.1 inHg on Jan 8

Maximum Diurnal Average: 81.6 inHg at hour 4

Minimum Diurnal Average: 75.1 inHg at hour 16

Monthly Average: 79.4 inHg

Percentiles: P_1 = 63 P_{10} = 70 Q_1 = 74 Median = 78 Q_3 = 84 P_{90} = 91 P_{99} = 98

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

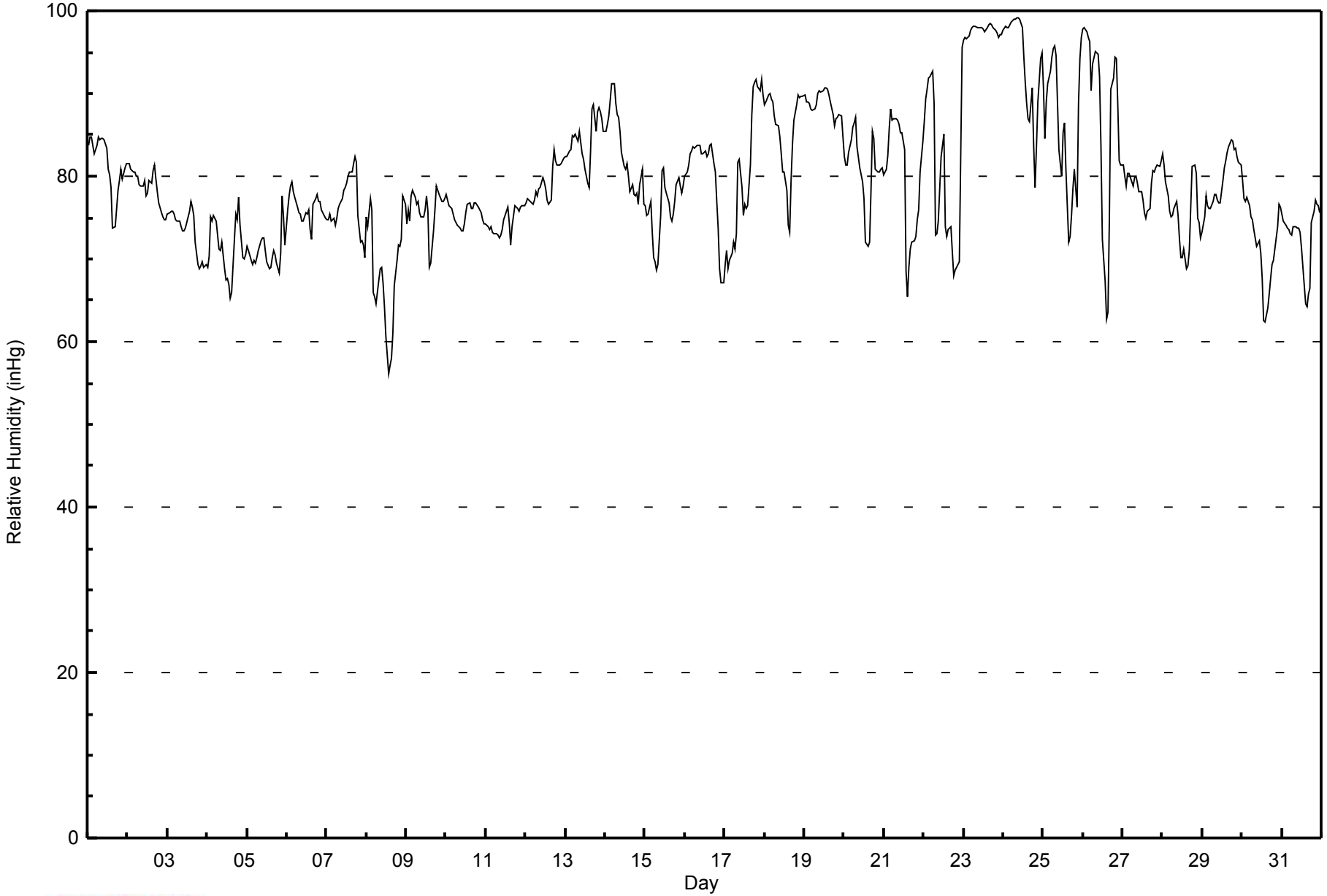
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	84	85	85	84	83	84	85	84	85	85	84	83	81	80	79	74	74	76	78	80	81	80	81	82	81.4	85
2-Jan	81	82	81	81	81	80	80	79	79	79	79	78	78	79	79	81	81	80	78	77	76	75	75	75	78.8	82
3-Jan	75	76	76	76	75	75	74	75	74	73	73	74	75	76	77	76	75	72	69	69	69	70	69	69	73.5	77
4-Jan	69	70	75	75	75	75	73	71	71	72	69	67	68	67	65	66	72	75	75	77	74	70	70	71	71.4	77
5-Jan	72	71	70	69	70	69	70	71	72	73	72	71	70	69	69	70	71	71	70	68	71	78	75	72	70.9	78
6-Jan	76	78	79	79	78	78	76	76	75	75	75	76	75	76	74	72	77	77	78	77	77	76	75	75	76.2	79
7-Jan	75	75	75	75	75	74	75	76	77	77	78	79	79	80	80	81	81	82	82	75	72	72	72	70	76.5	82
8-Jan	75	74	77	76	66	65	65	67	69	69	67	64	61	56	57	58	61	67	70	72	72	72	78	77	68.1	78
9-Jan	74	76	75	78	78	78	77	77	76	75	75	76	78	76	69	70	73	76	79	78	78	77	77	77	75.9	79
10-Jan	78	77	76	76	75	75	74	74	74	73	73	74	76	77	77	76	76	77	77	76	76	76	75	74	75.5	78
11-Jan	74	74	74	74	73	73	73	73	73	73	74	75	76	76	74	72	74	76	76	76	76	76	76	77	74.5	77
12-Jan	77	77	77	77	77	77	78	78	78	79	80	79	78	77	77	77	81	83	82	81	81	82	82	82	79.1	83
13-Jan	82	82	83	83	85	85	85	84	85	84	83	82	81	79	79	83	88	89	85	88	88	88	87	86	84.4	89
14-Jan	85	86	87	89	91	91	89	87	87	86	83	81	81	81	80	78	79	78	78	78	77	79	81	77	82.9	91
15-Jan	77	75	75	77	73	70	70	69	69	75	81	81	79	78	77	75	75	75	77	79	80	79	78	79	75.9	81
16-Jan	80	81	81	83	83	84	83	84	84	84	83	83	83	82	83	84	84	81	81	77	74	69	67	67	80.1	84
17-Jan	69	71	69	70	71	72	71	73	82	82	79	75	77	76	76	81	87	91	91	92	91	90	92	90	79.9	92
18-Jan	89	89	90	90	89	89	87	86	86	85	83	81	80	78	74	73	79	84	87	89	90	90	90	90	85.3	90
19-Jan	90	89	89	89	88	88	88	89	90	90	90	90	91	91	90	90	89	87	86	87	87	87	87	85	88.7	91
20-Jan	82	81	81	83	84	86	87	87	84	81	80	79	77	72	72	72	78	86	85	81	81	81	81	81	80.9	87
21-Jan	80	81	82	86	88	87	87	87	87	86	85	85	83	68	65	69	71	72	72	73	75	76	80	84	79.6	88
22-Jan	87	89	91	92	92	93	89	73	73	75	82	84	85	74	73	74	74	71	68	69	69	70	83	96	80.1	96
23-Jan	97	97	97	97	98	98	98	98	98	98	98	98	98	97	98	98	98	98	98	98	97	97	97	97	97.6	98
24-Jan	98	98	98	98	98	99	99	99	99	99	99	98	94	91	89	87	87	91	84	79	84	89	94	95	93.5	99
25-Jan	91	85	89	91	93	94	95	96	95	83	81	80	85	86	81	72	73	75	78	81	76	89	94	97	85.9	97
26-Jan	98	98	97	97	96	90	94	95	95	95	92	84	72	67	63	63	75	91	92	94	94	89	82	81	87.3	98
27-Jan	81	80	79	80	80	79	79	80	80	79	78	78	77	76	75	76	76	79	81	81	81	81	81	82	79.1	82
28-Jan	83	81	79	78	76	75	75	76	77	75	72	70	70	71	69	69	71	76	81	81	80	75	74	73	75.4	83
29-Jan	73	75	78	76	76	76	77	78	78	77	77	77	79	81	82	83	84	84	84	83	83	82	82	81	79.5	84
30-Jan	79	77	77	77	77	75	75	74	72	72	72	71	68	63	62	64	66	68	69	70	71	74	77	76	71.9	79
31-Jan	75	75	74	74	74	73	73	74	74	74	74	73	71	67	64	64	66	66	74	76	77	77	76	76	72.5	77
	80.8	80.8	81.2	81.6	81.3	80.8	80.7	80.3	80.5	80.1	79.8	78.9	78.3	76.4	75.1	75.1	77.3	79.2	79.5	79.4	79.2	79.5	80.2	80.4	Diurnal Average	
	98	98	98	98	98	99	99	99	99	99	99	98	98	97	98	98	98	98	98	98	97	97	97	97	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - inHg

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Athabasca Valley - January 2015

Maximum Speed: 31 km/h on Jan 22 14:00

Maximum Daily Speed Average: 16.0 km/h on Jan 27

Minimum Speed Value: 0 km/h on Jan 6 11:00

Minimum Daily Speed Average: 1.0 km/h on Jan 20

Maximum Diurnal Speed Average: 3.4 km/h at hour 19

Minimum Diurnal Speed Average: 0.7 km/h at hour 1

Monthly Average Velocity: 1.8 km/h 279.2 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 3 Median = 7 Q_3 = 11 P_{90} = 17 P_{99} = 24

Hours in Service: 744

Hours of Data: 735

Hours of Missing Data: 9

Percent Operational Time: 98.8

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-Jan	NNW5	N6	NNW6	NNW7	N8	NNW10	N5	NNW9	NNW10	NNW9	NNW8	N9	NNW11	NNW11	NNW17	NNW16	N9	NNW6	WNW4	W2	SW4	SSW2	WSW3	WSW2	NNW6.7	NNW17
2-Jan	WNW2	W3	WNW2	NW1	WSW4	WNW2	W4	W3	NW2	SW4	SSW2	SW2	WNW2	WNW2	WSW3	NW3	NNW3	NW3	WNW3	W5	NW3	W2	WNW2	W2	W2.3	W5
3-Jan	WNW3	WNW2	W2	WNW2	WNW2	SW1	W1	ENE1	WSW1	S1	ENE1	ENE1	ENE3	NNW1	WNW2	WSW6	SW5	SW9	SW12	SW10	SSW5	S5	SSW7	SW8	SW2.9	SW12
4-Jan	SW7	S4	ESE4	ESE5	SSW5	S7	SSW9	SSW9	SW9	SSE4	SSW11	SW15	SW12	SSW11	S6	S4	ESE4	SSE3	SE4	S4	S4	SW9	SW8	SW6	SSW5.9	SW15
5-Jan	SW14	SW13	WSW11	SW11	SW8	SSW7	SW7	SW9	SW9	SW10	SW10	WSW8	W12	W19	W20	W21	W17	W16	WNW15	NW12	NW7	NW5	NNW8	NW6	WSW9.8	W21
6-Jan	NW4	WNW3	W3	WSW4	W5	SW2	WSW5	SW4	SSW2	SW1	NNE0	S1	SW6	SW4	SW7	SW4	SW3	S1	SSW1	SSE2	S2	SE1	S1	S2	SW2.3	SW7
7-Jan	S2	S2	SSE6	SE4	SE6	E3	SE6	SE9	SE11	SE12	SE13	SE8	NE3	N4	NW2	W2	NNW5	NW4	NW10	NNW22	NNW19	NW12	NW13	NW28	N1.7	NW28
8-Jan	NNW18	NNW14	WNW5	WNW16	WNW21	W20	WNW20	WSW20	WSW20	WSW20	WSW17	W19	W18	WNW21	WNW19	W18	W14	WSW13	SW9	SW9	SW6	SSW6	S4	SSW8	W12.6	WNW21
9-Jan	SSW6	S5	S4	S3	S3	SSE4	SSE5	SE10	SE5	SE5	SE5	ESE5	SE7	SE7	ESE5	SE5	NW4	W6	WSW5	SW3	WSW5	S1	WSW2	NNE0	SSE3.1	SE10
10-Jan	ENE1	NW3	WSW1	SW3	SSE1	ESE1	SSE2	S2	SSE4	SE2	ESE1	S3	SSE6	SSE7	SSE7	SSE6	S2	S2	S2	SSW3	SSW2	SSE2	E1	ESE1	SSE2.1	SSE7
11-Jan	SSE1	SSE1	SE1	S3	SSE2	SE4	SE4	SSE2	SE3	SE5	SE7	SSE7	SE7	SSE5	SSE8	SSE7	SSW1	SSE2	SSE4	SSE2	S4	SW5	S3	SSW5	SSE3.6	SSE8
12-Jan	SSW7	SSW6	SW8	SW4	SW6	SSW6	S5	S5	SSW5	SSE4	SE2	ENE1	N2	NNE3	ENE1	SE4	SSE2	SE3	SE9	SE10	SE11	SE10	SE11	SE8	SSE4.1	SE11
13-Jan	SE7	SE6	SE5	S2	N6	NNW10	NNW12	N12	NNW8	NNW4	N4	NNW6	N7	NNW8	N5	NNE4	NNW2	ESE5	SE11	SE11	SE12	SSE12	SSE9	SSE8	ENE1.4	NNW12
14-Jan	SSE9	SE9	SE9	SSE5	SE2	SSE2	WSW11	NW13	NNW23	NNW18	NNW13	NNW11	NNW10	NNW12	NNW12	NNW11	N10	N13	NNW16	N13	NNW11	NNW9	NNW10	N10	NNW7.4	NNW23
15-Jan	NNW8	NNW10	NNW11	NNW8	NNW9	N7	N7	NNE6	NNW7	N6	NNW7	N7	E5	ESE7	ESE10	SE11	SE14	ESE11	SE14	SE16	SE14	SE15	SE18	SE18	E4.2	SE18
16-Jan	SE20	SE20	SE18	SE19	SE21	SE17	SE18	SE15	SE17	SSE10	SSE9	SE8	SE6	SE9	SE8	ESE5	WSW6	WSW11	WSW10	WSW11	WSW16	WSW18	WSW21	WSW13	SSE8.7	WSW21
17-Jan	WSW13	W13	WSW18	WSW17	WSW14	WSW17	WSW20	W15	NNW19	NNW11	N11	N11	NNW11	NNW11	NNW9	NNW8	NNW4	W2	WNW2	WNW1	NNE2	ESE5	SE6	ESE5	WNW6.3	WSW20
18-Jan	ESE4	SE2	SE2	SSE4	S4	SSW7	SW10	SW11	SSW6	SW8	SW8	SW8	SW9	SSW8	SSW7	SW6	SW6	SW5	SW6	SSW3	SW2	SW3	S3	SSE3	SSW5.2	SW11
19-Jan	SSE3	SSE2	S2	S2	WNW1	N2	NNW3	N3	NW3	N1	ENE1	NNW6	NNW7	NNW10	NNW10	NNW10	NNW8	NNW8	N7	N6	N8	N9	N8	NNW11	NNW4.6	NNW11
20-Jan	NNW12	NNW12	NNW9	N7	N4	N3	N5	NNW2	NW6	NNW5	N6	N4	NNW2	NW1	ENE3	SSE6	SSW1	S2	SSE4	SE10	SE10	SE11	SE13	SE12	NE1.0	SE13
21-Jan	SE11	SE11	SE7	SSW2	SSW3	SSE13	SSE10	SSE12	SSE9	S7	SSW6	S6	SSE5	SSW6	S7	SW10	WSW22	WSW24	SW22	SSW11	S6	SSW7	SE4	ESE5	S7.3	WSW24
22-Jan	SE7	SE7	ESE6	SE7	SE7	ESE4	SW3	WSW20	WSW21	W20	W26	W13	SSE2	W31	W23	WSW21	WSW16	WSW14	WSW20	WSW22	WSW25	WSW21	NNW15	N12	WSW11.1	W31
23-Jan	N9	NNW8	N4	N3	N4	NNW4	N7	NNW5	NE3	N4	N5	N6	N7	N9	NNW9	NNW7	NNW5	N2	NE2	E3	S4	SSW6	SSE8	SSE9	N3.2	N9
24-Jan	SSE9	SE13	AF	AF	AF	AF	AF	AF	AF	AF	AF	SW8	SW9	SSE2	SSE2	SW3	W6	WNW5	W9	WSW10	SSW3	SSE6	SE5	SSE4	----	SE13
25-Jan	SE6	SE9	SE10	SSE9	SE13	SE13	SE15	SE14	SSW5	WSW17	WSW11	SSE2	SW3	WSW9	W10	W11	WSW10	W11	WSW9	WSW8	WNW10	N6	WNW2	SW2	SSW4.4	WSW17
26-Jan	S3	SSE4	SSE3	S2	SSE4	SSE6	SSE2	S3	SSE2	SSW2	ESE2	SSW4	SW5	SSW5	SSW6	SW8	SSW3	WNW5	N24	NNW26	NNW24	NNW22	NNW19	NNW21	NNW3.7	NNW26
27-Jan	NNW19	NNW19	N17	NNW17	NNW17	NNW18	NNW19	NNW18	NNW15	NNW15	NNW18	NNW16	NNW16	NNW17	N15	NNW16	NNW17	NNW17	NNW16	N15	NNW16	NNW11	NNW11	N10	NNW16.0	NNW19
28-Jan	NNW13	NNW16	NNW16	NNW16	NNW16	NNW13	N8	NNW11	NNW9	N12	NNW14	NNW16	N10	N5	NNW5	NNW4	NNW3	N3	WNW4	N3	NNW5	NE4	ENE3	ESE6	NNW8.2	NNW16
29-Jan	SE4	SSE1	SE5	SE7	SE9	SE10	SE10	SE11	SE9	SE9	SE6	ENE3	NE2	NNE2	N3	N3	N1	N5	NNW7	N8	N10	NNW12	NNW12	NNW14	ENE2.0	NNW14
30-Jan	NNW18	NNW18	NNW14	NNW15	NNW19	NNW18	NNW13	NNW17	N14	N13	NNW13	NNW17	NNW15	N16	N13	N11	N10	N7	NNW5	NNW8	NNW6	NNW4	W3	W4	NNW11.9	NNW19
31-Jan	W3	W2	W2	ENE1	N1	NW1	NE2	SE7	SE8	SE8	SE9	SE9	SE7	SE6	SE6	SE8	SE9	SE8	ESE1	SSE3	SW2	S4	SSE7	SSE8	SE4.3	SE9
	WNW0.7	WNW0.7	WSW0.7	W1.1	WNW1.3	W0.9	WSW1.6	WSW2.0	WNW1.9	W2.0	WNW2.1	WNW2.2	WNW2.0	WNW3.3	WNW2.8	W2.7	W3.2	W3.3	W3.4	W2.4	WNW2.2	WSW1.6	WSW0.8	W0.7	Diurnal Average	
	SE20	SE20	SE18	SE19	WNW21	WNW20	WNW20	WSW20	NNW23	W20	W26	W19	W18	W31	W23	W21	WSW22	WSW24	N24	NNW26	WSW25	NNW22	WSW21	NW28	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 22 12:00

Minimum Value: 1 km/h on Jan 29 16:00

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:	735
Hours of Missing Data:	9
Hours of Calibration:	0
Percent Operational Time:	98.8

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

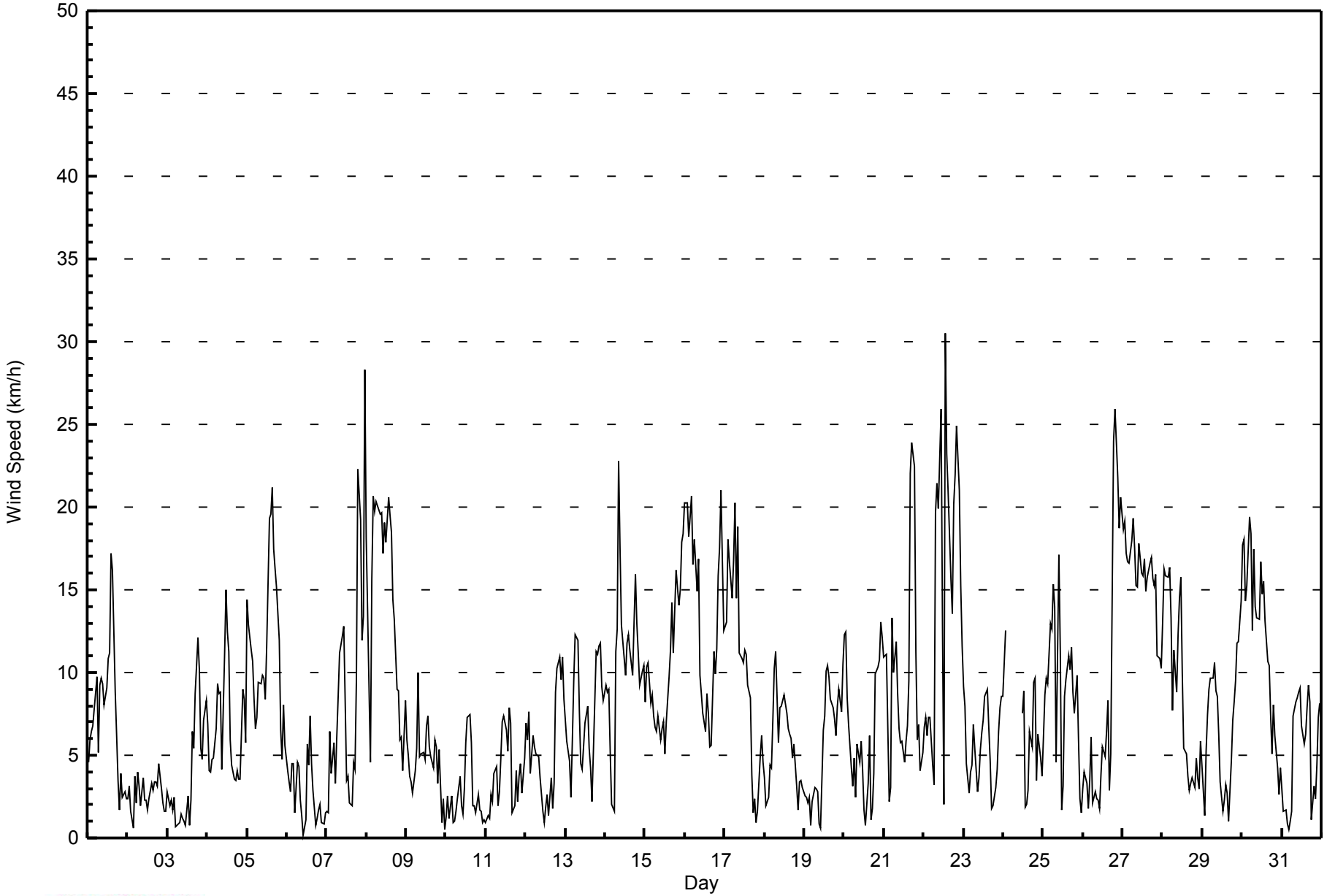
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	304	41.36	41.36
6 - 11	265	36.05	77.41
12 - 19	130	17.69	95.10
20 - 28	35	4.76	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 735

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Athabasca Valley - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	25	6	6	12	4	17	24	39	40	21	24	11	17	23	13	22	304
6 - 11	34	2	0	0	0	5	60	24	5	23	35	14	6	1	4	52	265
12 - 19	12	0	0	0	0	0	23	3	0	0	5	13	11	4	3	56	130
20 - 28	1	0	0	0	0	0	3	0	0	0	1	14	5	4	1	6	35
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	8	6	12	4	22	110	66	45	44	65	52	40	32	21	136	735

Total Number of Valid Hours: 735

Total Number of Hours: 744

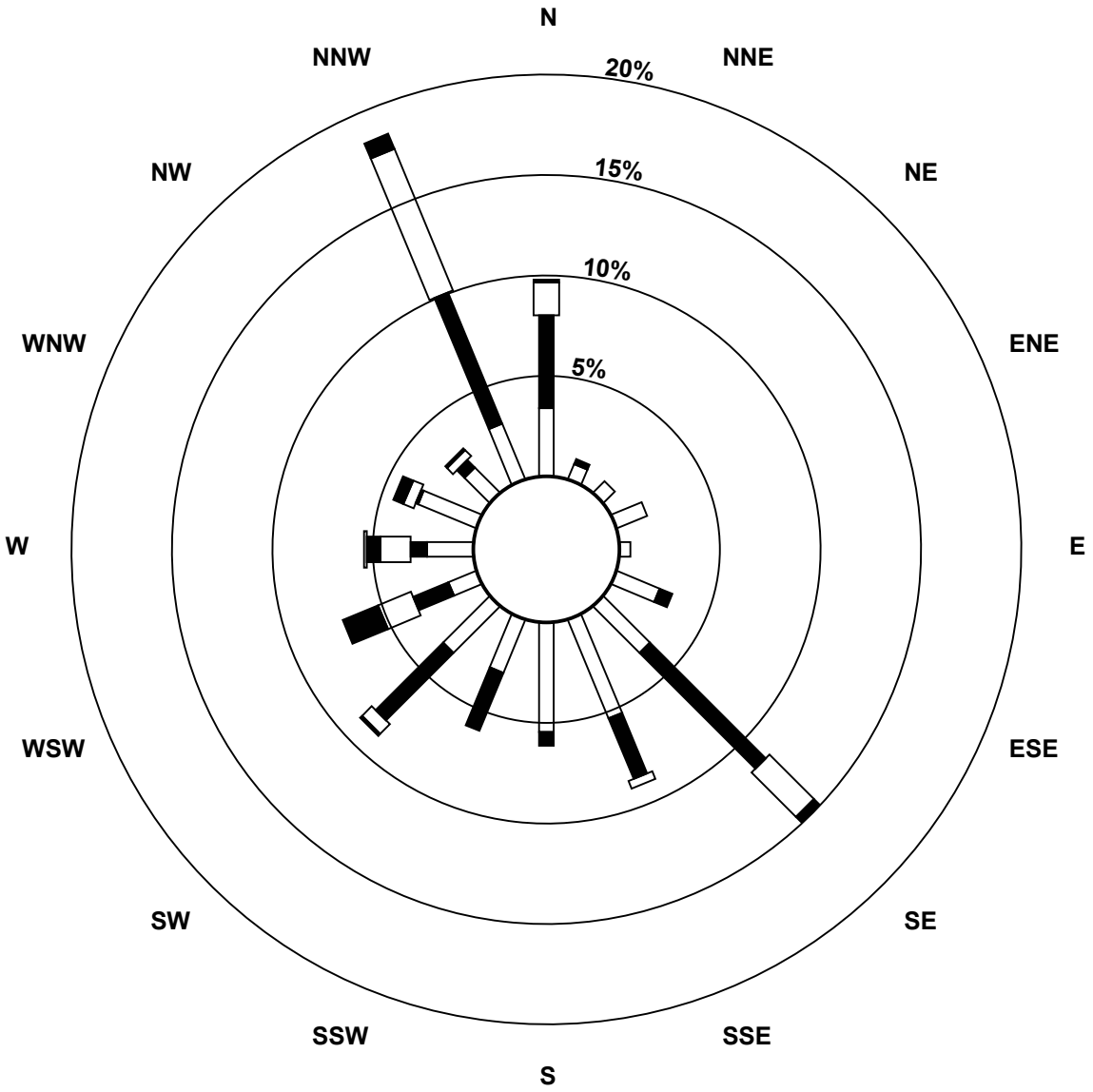
AURORA
ATMOSPHERICS INC.

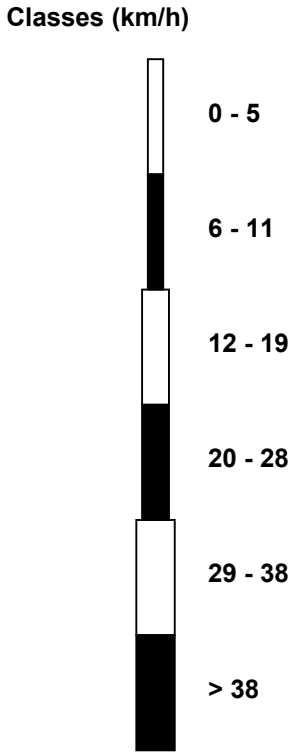
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Athabasca Valley (AMS 7)





Total Number of Valid Hours: 735

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Athabasca Valley - January 2015

Direction of Maximum Speed: 269 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 344.3 deg on Jan 27

Direction of Minimum Speed: 27 deg on Jan 6 11:00

Direction of Minimum Daily Speed Average: 1.0 deg on Jan 20

Monthly Average Direction: 291.4 deg

Hours in Service:	744
Hours of Data:	735
Hours of Missing Data:	9
Percent Operational Time:	98.8

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-Jan	338	351	347	345	350	348	349	348	346	348	347	350	348	348	343	341	352	331	293	262	233	212	244	237	340.8
2-Jan	287	281	287	319	258	288	270	274	326	235	207	218	292	297	258	310	345	309	282	280	312	275	284	266	280.7
3-Jan	285	289	280	297	298	217	261	57	242	185	71	65	70	333	298	238	232	225	218	218	196	184	206	217	225.9
4-Jan	216	190	122	111	193	187	201	203	219	147	204	220	223	211	173	181	117	156	134	175	186	229	222	228	199.0
5-Jan	217	235	237	227	215	213	221	230	229	229	229	237	260	267	270	271	267	280	286	304	322	321	330	324	257.9
6-Jan	321	285	261	254	262	231	239	229	197	229	27	185	236	231	227	224	219	179	199	164	169	145	169	182	233.1
7-Jan	170	172	147	136	139	100	137	135	130	133	143	125	56	6	306	263	327	321	321	343	344	323	324	307	353.1
8-Jan	340	342	293	291	297	281	283	258	256	249	258	261	275	286	283	277	263	246	222	222	218	200	182	204	270.9
9-Jan	200	182	189	185	173	149	149	145	135	134	133	116	133	145	123	131	321	262	237	229	253	170	246	32	165.9
10-Jan	77	312	254	223	156	115	153	171	149	134	114	185	163	156	154	157	170	189	172	194	199	165	99	102	163.3
11-Jan	165	168	146	172	148	142	143	165	137	146	146	153	142	155	151	156	194	163	166	167	172	229	181	201	159.6
12-Jan	212	212	217	217	223	209	189	181	199	164	128	58	8	26	67	124	150	132	140	143	142	140	141	128	163.8
13-Jan	140	138	139	176	352	337	347	350	333	339	351	331	349	334	1	23	345	122	133	142	141	149	157	159	65.8
14-Jan	148	136	145	152	142	152	247	315	338	338	339	347	347	343	342	346	350	352	340	349	342	341	345	354	342.1
15-Jan	346	344	340	336	346	11	11	12	341	349	348	353	88	120	118	124	129	116	125	138	138	141	138	136	93.8
16-Jan	137	139	141	141	142	142	141	139	142	152	147	138	139	135	131	111	248	244	242	243	249	250	253	253	168.0
17-Jan	253	262	249	254	253	250	257	262	336	345	352	349	337	342	343	336	341	271	294	295	33	112	140	115	289.8
18-Jan	105	139	144	165	186	213	219	216	209	218	221	222	220	212	208	219	222	218	222	213	223	226	185	163	209.2
19-Jan	168	168	169	174	293	349	340	1	316	10	67	335	334	337	345	340	339	347	356	355	352	352	351	348	344.6
20-Jan	328	328	335	349	355	352	349	328	322	344	5	0	346	313	78	151	195	186	159	141	136	140	140	137	46.8
21-Jan	141	138	146	196	207	147	147	151	158	191	192	190	168	205	183	221	237	239	236	206	190	201	139	119	190.8
22-Jan	125	129	123	139	125	113	220	244	243	266	275	278	155	269	261	247	251	254	254	249	249	258	330	351	255.5
23-Jan	349	348	355	6	356	346	356	348	47	352	3	350	357	354	345	348	340	352	34	79	191	192	155	150	357.7
24-Jan	152	145	AF	AF	AF	AF	AF	AF	AF	AF	AF	219	229	161	166	217	266	285	268	241	211	159	140	160	--
25-Jan	145	143	139	151	143	140	136	136	193	248	253	147	219	246	262	263	257	259	258	252	297	350	284	223	209.2
26-Jan	180	151	151	186	152	153	152	179	159	206	122	203	217	193	211	214	197	299	350	339	340	344	347	344	327.6
27-Jan	344	345	349	343	342	343	344	340	339	342	340	340	342	344	349	348	348	343	342	352	345	346	344	353	344.3
28-Jan	343	343	339	341	332	332	350	333	329	350	346	344	353	1	339	334	340	358	293	352	341	50	78	117	344.1
29-Jan	125	164	133	142	136	138	136	137	126	128	131	76	43	33	352	1	356	351	340	349	351	341	335	342	66.4
30-Jan	346	340	337	336	338	341	342	341	355	354	344	339	345	350	354	1	3	358	345	347	345	345	270	272	344.3
31-Jan	276	273	262	75	2	321	37	140	139	140	140	142	139	129	144	134	142	126	105	151	221	173	148	157	144.0
	283.0	303.1	247.8	261.1	283.8	269.0	251.2	248.4	282.5	279.3	290.4	298.8	303.7	295.3	295.3	278.3	279.3	274.4	273.2	275.9	284.3	254.5	252.8	279.7	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Athabasca Valley - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 101 deg on Jan 10 00:00

Minimum Value: 7 deg on Jan 17 09:00

Percentiles: P_1 = 8 P_{10} = 11 Q_1 = 14 Median = 21 Q_3 = 44 P_{90} = 72 P_{99} = 97

Hours in Service:	744
Hours of Data:	735
Hours of Missing Data:	9
Hours of Calibration:	0
Percent Operational Time:	98.8

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-Jan	17	16	17	13	14	11	21	13	12	13	13	13	14	13	14	12	19	26	35	78	52	83	61	72	83
2-Jan	59	33	79	90	35	67	24	26	41	20	68	64	71	40	17	18	27	29	36	23	35	44	60	73	90
3-Jan	22	49	19	49	30	90	94	88	85	85	88	88	50	98	43	19	25	12	7	11	29	25	23	19	98
4-Jan	16	48	21	30	70	50	39	42	40	52	19	12	15	27	38	54	31	62	38	53	45	17	19	48	70
5-Jan	31	20	16	12	17	20	16	12	9	7	9	12	16	9	10	8	10	11	13	16	24	26	25	31	31
6-Jan	25	32	69	18	23	94	24	47	73	91	98	75	11	13	8	42	54	81	82	86	59	89	96	65	98
7-Jan	88	85	26	70	38	77	41	19	15	15	14	27	44	18	60	77	36	23	21	13	14	17	20	9	88
8-Jan	29	13	31	21	14	9	8	14	10	9	11	11	13	12	9	9	11	11	22	18	17	27	34	43	43
9-Jan	33	37	45	38	46	35	20	12	31	26	20	22	20	18	24	32	43	26	24	71	22	86	55	101	101
10-Jan	98	65	92	63	82	95	84	72	47	77	99	82	41	21	22	22	71	78	92	35	76	55	81	92	99
11-Jan	79	80	91	59	61	42	39	76	48	40	20	21	21	24	15	28	77	68	42	88	62	47	71	52	91
12-Jan	18	21	15	64	24	27	41	38	33	44	75	88	49	30	72	30	61	50	14	15	15	17	26	18	88
13-Jan	17	26	45	83	28	11	18	16	13	24	27	12	13	12	19	23	47	38	16	17	15	15	16	18	83
14-Jan	20	12	15	34	68	95	16	48	7	8	10	15	16	13	11	16	16	16	9	17	11	13	13	18	95
15-Jan	14	15	8	11	15	18	18	16	12	13	13	14	52	22	19	19	15	19	17	16	16	15	15	14	52
16-Jan	13	12	12	11	10	11	11	12	12	17	17	23	39	16	23	27	95	13	19	14	13	12	12	14	95
17-Jan	12	11	10	10	10	9	9	40	7	19	18	13	7	11	12	11	28	49	47	72	52	20	25	24	72
18-Jan	34	69	85	39	47	34	10	10	30	13	14	10	12	14	14	10	10	13	11	44	79	34	31	60	85
19-Jan	57	49	66	51	95	42	43	54	27	69	95	23	14	10	13	8	9	14	17	17	17	16	15	15	95
20-Jan	9	9	14	15	18	22	14	26	21	22	16	34	63	64	35	17	97	80	54	17	15	17	15	16	97
21-Jan	17	16	29	79	53	13	16	17	22	27	33	35	36	37	36	25	10	9	12	32	58	54	48	24	79
22-Jan	22	19	22	18	15	45	92	11	11	16	11	22	70	9	11	9	12	11	10	10	10	34	19	17	92
23-Jan	15	17	27	37	25	29	19	44	37	35	18	15	17	15	10	14	26	47	49	53	67	34	26	34	67
24-Jan	28	14	AF	AF	AF	AF	AF	AF	AF	AF	AF	32	17	67	48	73	33	33	29	21	84	38	27	25	84
25-Jan	31	18	13	15	11	13	12	11	71	13	13	75	41	11	9	9	10	11	21	17	26	28	53	76	76
26-Jan	47	33	30	61	45	26	67	48	65	60	68	58	35	46	12	15	72	62	15	8	9	13	14	11	72
27-Jan	12	13	15	11	11	10	12	9	9	11	8	10	11	12	16	15	13	12	10	16	12	22	14	18	22
28-Jan	10	11	9	10	10	9	15	16	17	15	12	12	18	24	12	21	16	27	19	31	23	34	67	34	67
29-Jan	44	76	42	21	14	15	13	12	20	16	24	51	73	64	40	32	86	25	16	15	15	16	10	14	86
30-Jan	14	11	10	8	9	10	13	12	18	18	11	9	14	17	18	17	18	18	19	17	17	23	53	21	53
31-Jan	49	84	86	90	71	67	65	22	17	16	17	17	23	26	24	14	13	22	98	57	45	43	24	29	98
	98	85	92	90	95	95	94	88	85	91	99	88	73	98	72	77	97	81	98	88	84	89	96	101	
	Diurnal Maximum																								

AF - Analyzer Failure

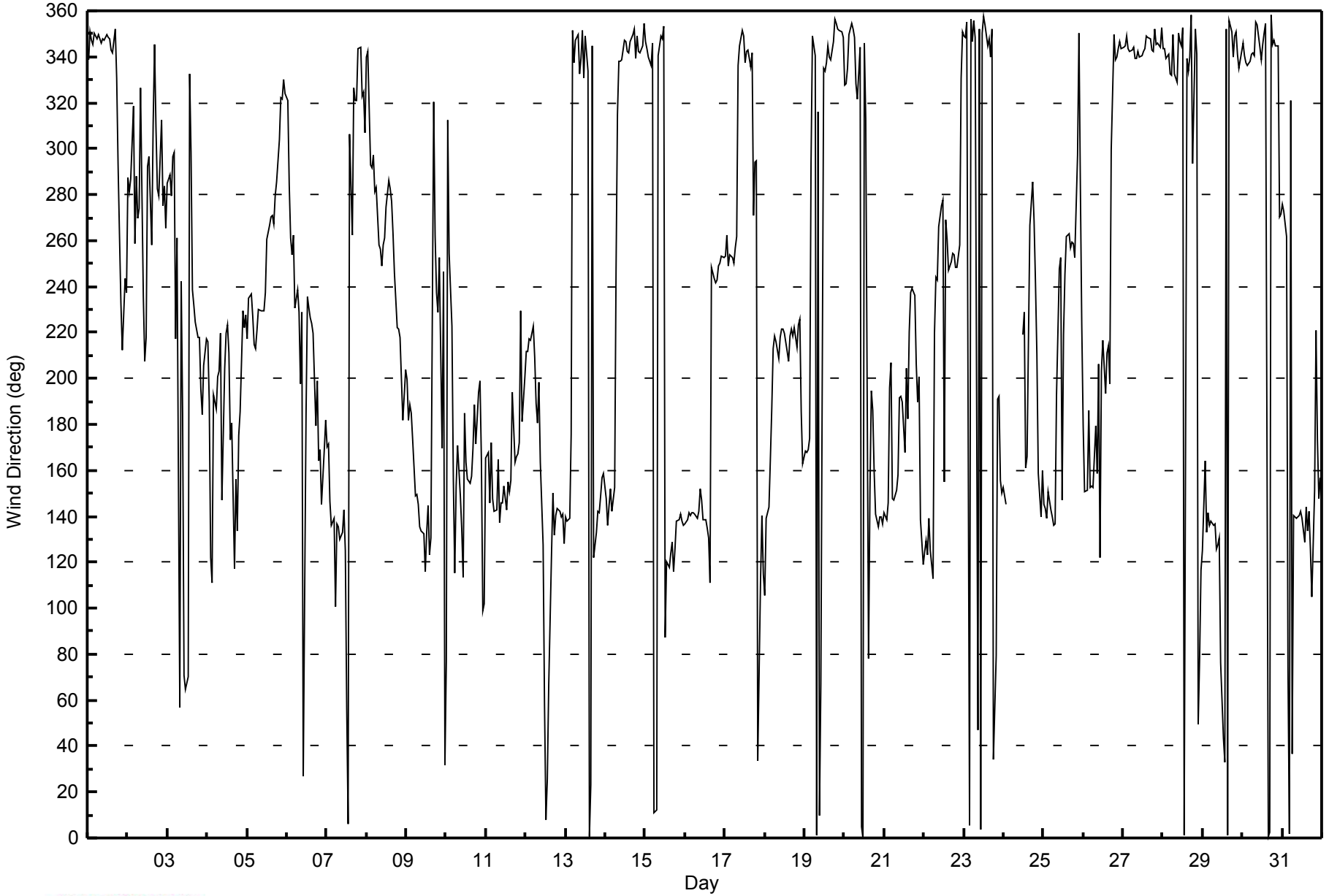
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Direction (WD) - deg

Athabasca Valley - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	10:15	End Time (MST)	15:40
Barometric Pressure	737 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Cal Gas Concentration	50 ppm	Cal Gas Expiry Date	26-Sep-17
Gas Cert Reference	S970259A		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5564
DACS voltage range	0-5V	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-681	-681
Analyzer Range (mv)	1000	1000	Lamp voltage	809	816
Calculated slope	1.004274	1.004138	Chamber temp.	43.6	43.7
Calculated intercept	1.410099	0.803278	Pressure (mmHg)	695.0	713.0
Analyzer Background	10.5	10.5	Flow (lpm)	0.554	0.555
Analyzer Coefficient	0.829	0.829	Intensity	49000	48500

Analyzer make	Thermo 43c	Analyzer serial #	607415781

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.2	NA
as found span	5000	60.7	607.0	600.9	1.010
calibrator zero	5000	0.0	0.0	0.2	NA
high point	5000	60.7	607.0	604.6	1.004
second point	5000	30.4	304.0	300.3	1.012
third point	5000	15.2	152.0	150.3	1.011
calibrator zero					
as left zero	6000	0.0	0.0	0.6	NA
as left span	5000	60.7	607.0	604.8	1.004
				Average Correction Factor	1.009

Corrected As found	600.7	Previous response	603.0	% change	0.4%

Notes:

no adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

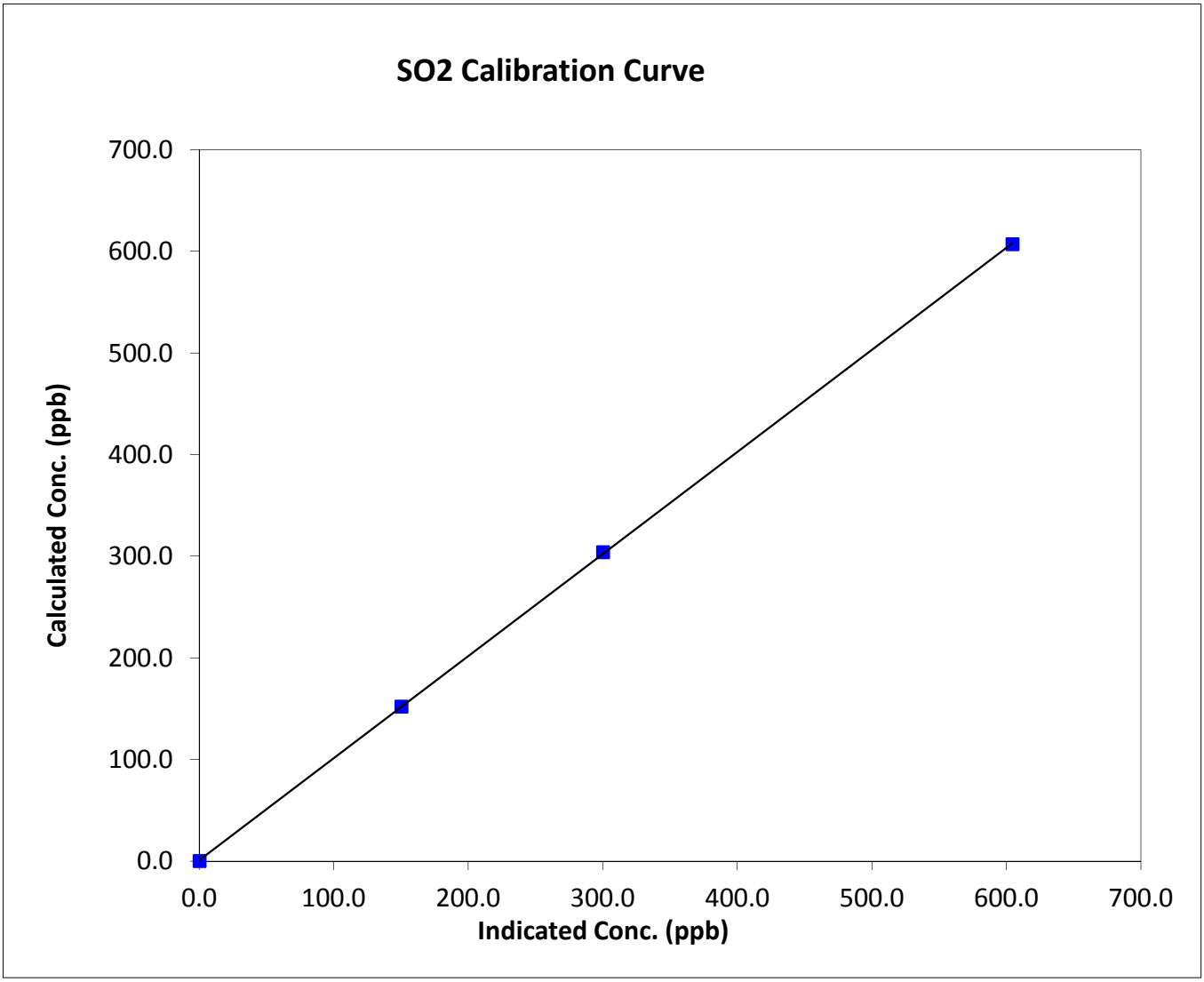
SO_2 Calibration Summary

Station Information

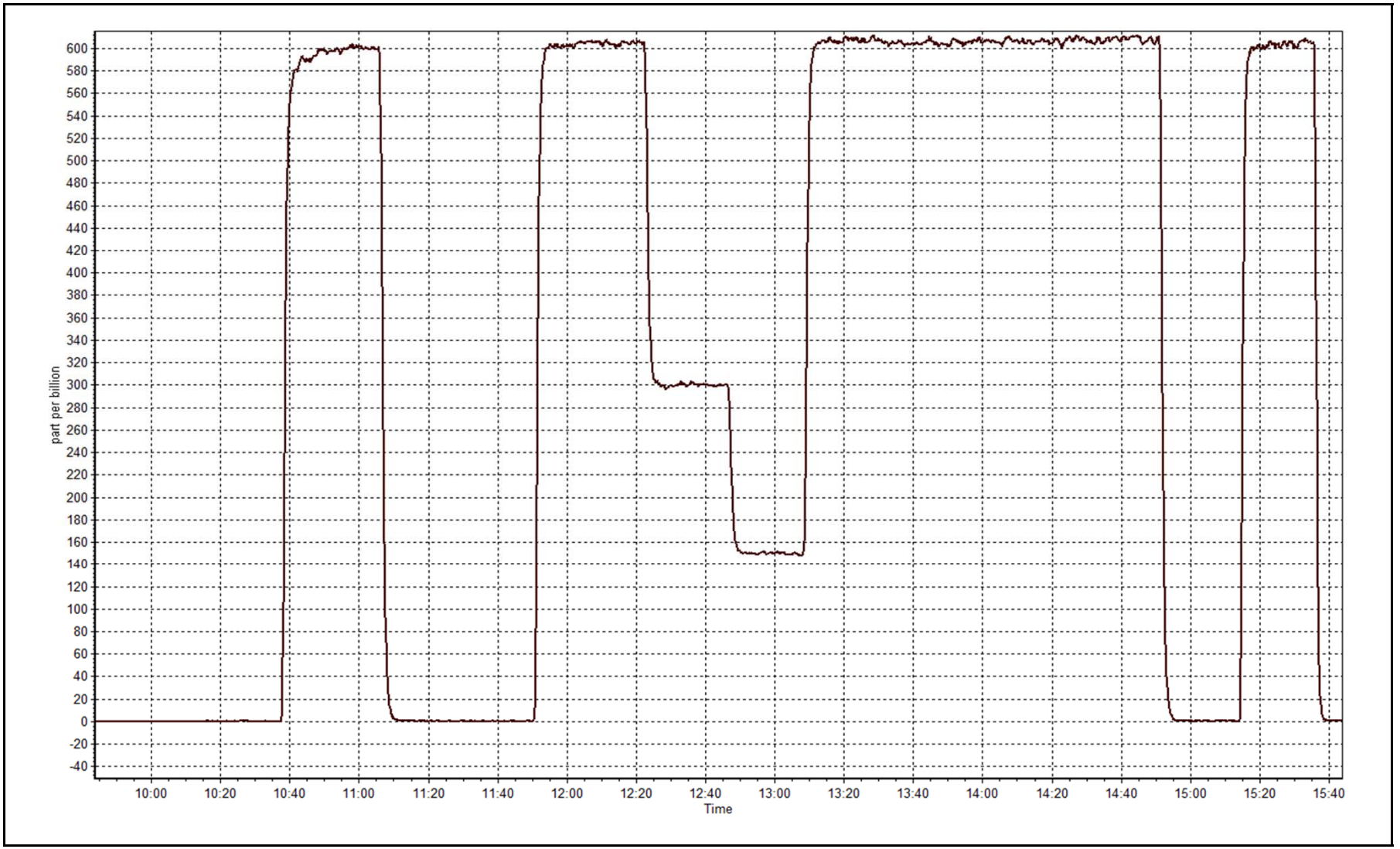
Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	10:15	End Time (MST)	15:40
Analyzer make	Thermo 43c	Analyzer serial #	607415781

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999978
607.0	604.6	1.0040		
304.0	300.3	1.0123	Slope	1.004138
152.0	150.3	1.0110		
			Intercept	0.803278



SO2 Calibration Plot Date: January 15, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 16, 2015	Previous Calibration	December 15, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	12:25	End Time (MST)	14:55
Barometric Pressure	719 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	8400311
Cal Gas Concentration	5.02 ppm H2S	Cal Gas Expiry Date	09/09/2017
Gas Cert Reference	ALMO52589	SO2 gas conc.	50.8 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2575
DACS voltage range	0-5V	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-619	-619
Analyzer Range (input)	100	100	Lamp voltage	805	805
Calculated slope	1.006382	1.013900	Chamber temp.	44	44
Calculated intercept	-0.537939	-0.563783	Pressure	697.0	665.8
Analyzer Background	17	17	Flow	0.480	0.466
Analyzer Coefficient	1.040	1.040	Intensity	43500	43500
			Converter temp.	800	800

Analyzer make/model	TEI 45C	Analyzer serial #	630718530
Converter make/model	Model 26 Thermal Oxidizer	Converter serial #	20101-14

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.0	0.5	NA
as found span	6000	79.8	75.0	74.4	1.008
SO2 scrubber check	5000	14.7	149.4	0.6	NA
calibrator zero	6000	0.0	0.0	0.5	NA
high point	6000	89.6	75.0	74.4	1.007
second point	6000	50.2	42.0	42.1	0.998
third point	6000	29.9	25.0	25.2	0.991
calibrator zero					
as left zero	5000	0.0	0.0	0.5	NA
as left span	6000	89.6	75.0	74.0	1.013
				Average Correction Factor	0.999

Corrected As found	73.9	Previous response	75.1	% change	1.5%

Notes:

Sox scrubber check done after as found zero. No adjustments required; cal within specifications

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

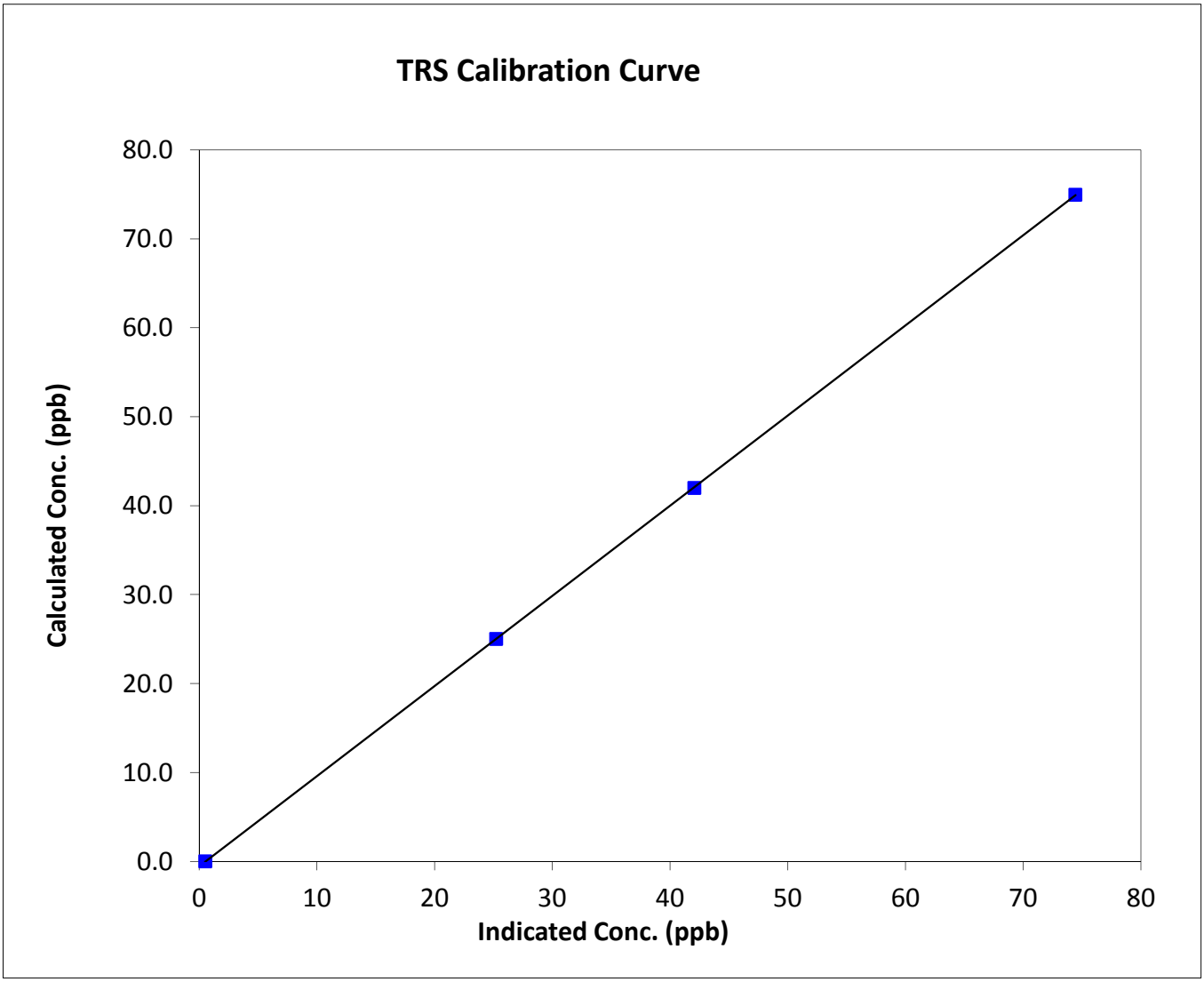
TRS Calibration Summary

Station Information

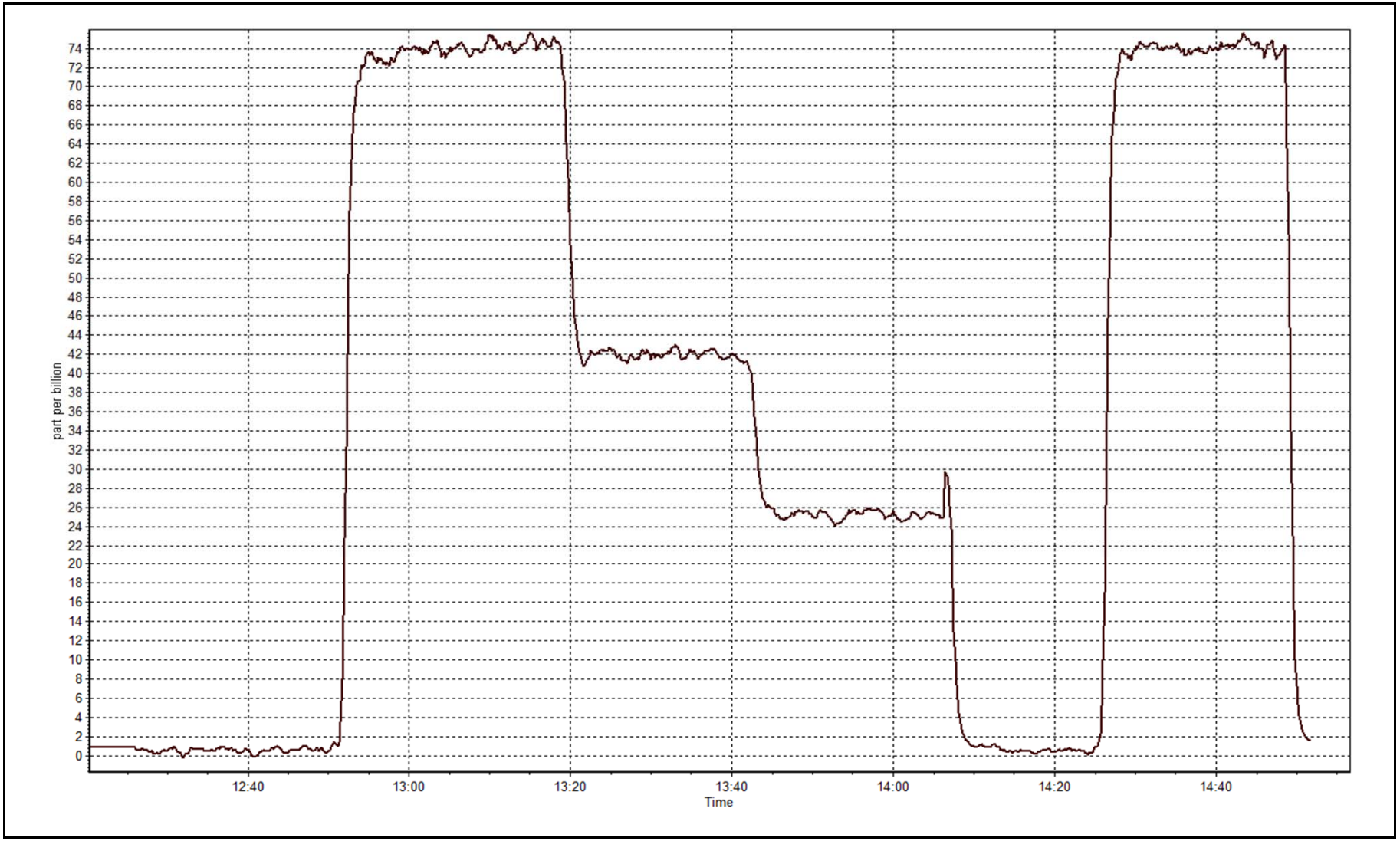
Calibration Date	January 16, 2015	Previous Calibration	December 15, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	12:25	End Time (MST)	14:55
Analyzer make	TEI 45C	Analyzer serial #	630718530

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.5	N/A	Correlation Coefficient	0.999995
75.0	74.4	1.0071		
42.0	42.1	0.9984	Slope	1.013900
25.0	25.2	0.9911		
			Intercept	-0.563783



TRS Calibration Plot Date: January 16, 2015



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January-15-15	Prev Calibration	December-11-14
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	10:15	End Time (MST)	15:40
Barometric Pressure	737 mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	S970259A	Cal Gas Expiry Date	September-26-17
CH4 Cal Gas Conc.	490.0 ppm	CH4 Equiv Conc.	1040.0 ppm
C3H8 Cal Gas Conc.	200.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5564

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	33.7	35.8
THC Range (input)	50	50	Flame Temp	383.8	379.0
NMHC Range (ppm)	50	50	Carrier Pressure	32.1	32.1
NMHC Range (input)	50	50	Fuel Pressure	41.4	41.4
THC Calc slope	0.999054	0.999027	Air Pressure	32.5	32.5
THC Calc intercept	0.030304	0.030705			
NMHC Calc slope	0.998592	0.997857			
NMHC Calc intercept	0.022341	0.027969			

Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.00	N/A
as found span	5000	60.7	12.63	12.46	1.013
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	12.63	12.63	1.000
second point	5000	30.4	6.32	6.26	1.010
third point	5000	15.2	3.16	3.12	1.014
calibrator zero					
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	60.7	12.63	12.56	1.005
				Average Correction Factor	1.008

Corrected As found	12.46	Previous response	12.61	% change	1.2%

Notes:

Replaced sample pump, increased actuator pressure from ZAG.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	60.7	6.68	6.82	0.979
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	6.68	6.68	1.000
second point	5000	30.4	3.34	3.30	1.013
third point	5000	15.2	1.67	1.63	1.028
calibrator zero					
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	60.7	6.68	6.62	1.009
				Average Correction Factor	1.014

Corrected As found	6.82	Previous response	6.66	% change	-2.3%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	60.7	5.95	5.64	1.055
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	5.95	5.96	0.998
second point	5000	30.4	2.98	2.97	1.003
third point	5000	15.2	1.49	1.49	0.998
calibrator zero					
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	60.7	5.95	5.94	1.001
				Average Correction Factor	

Corrected As found	5.64	Previous response	5.94	% change	5.4%

Wood Buffalo Environmental Association

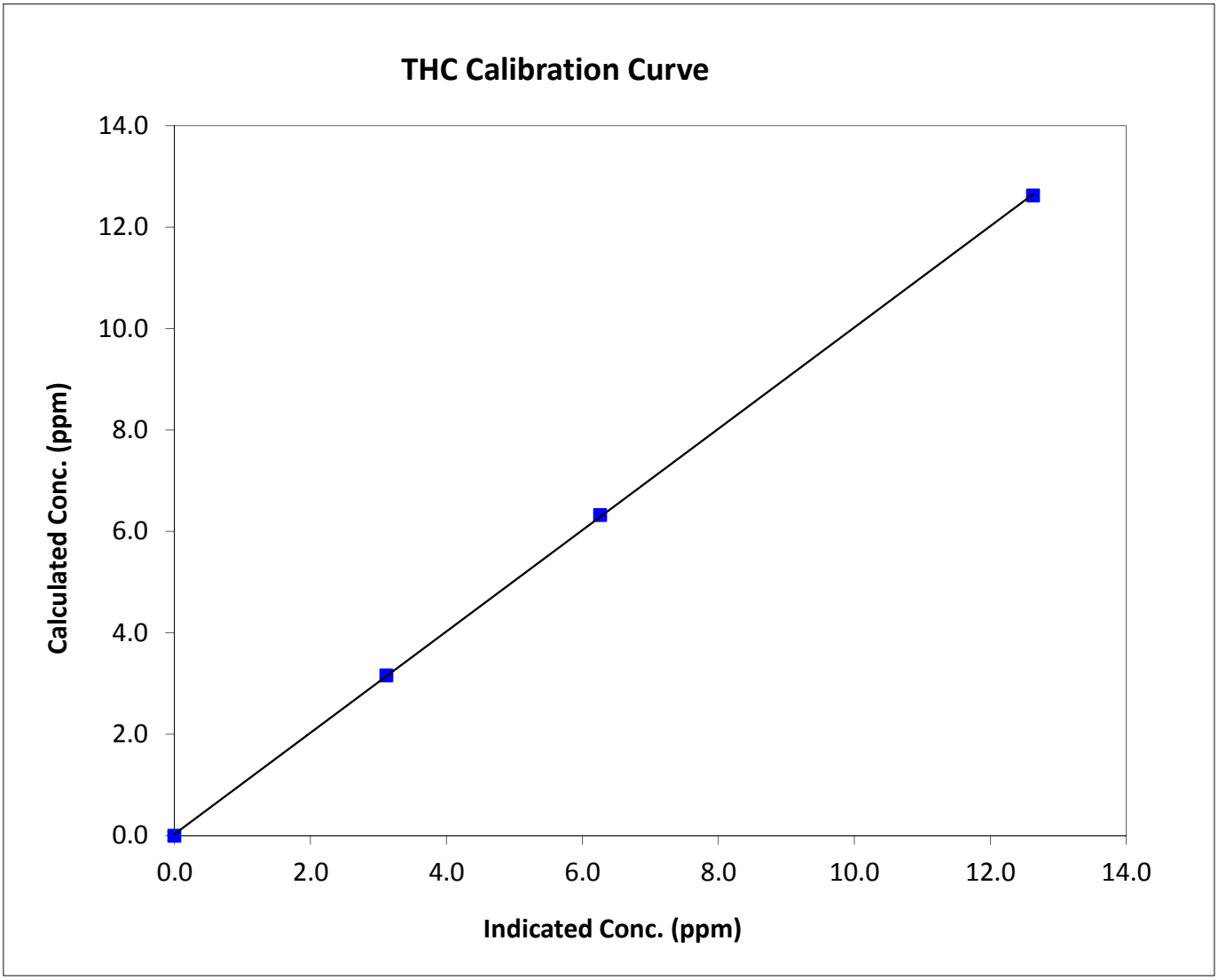
THC Calibration Summary

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	10:15	End Time (MST)	15:40
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999964
12.63	12.63	0.9997		
6.32	6.26	1.0101	Slope	0.999027
3.16	3.12	1.0137		
			Intercept	0.030705



Wood Buffalo Environmental Association

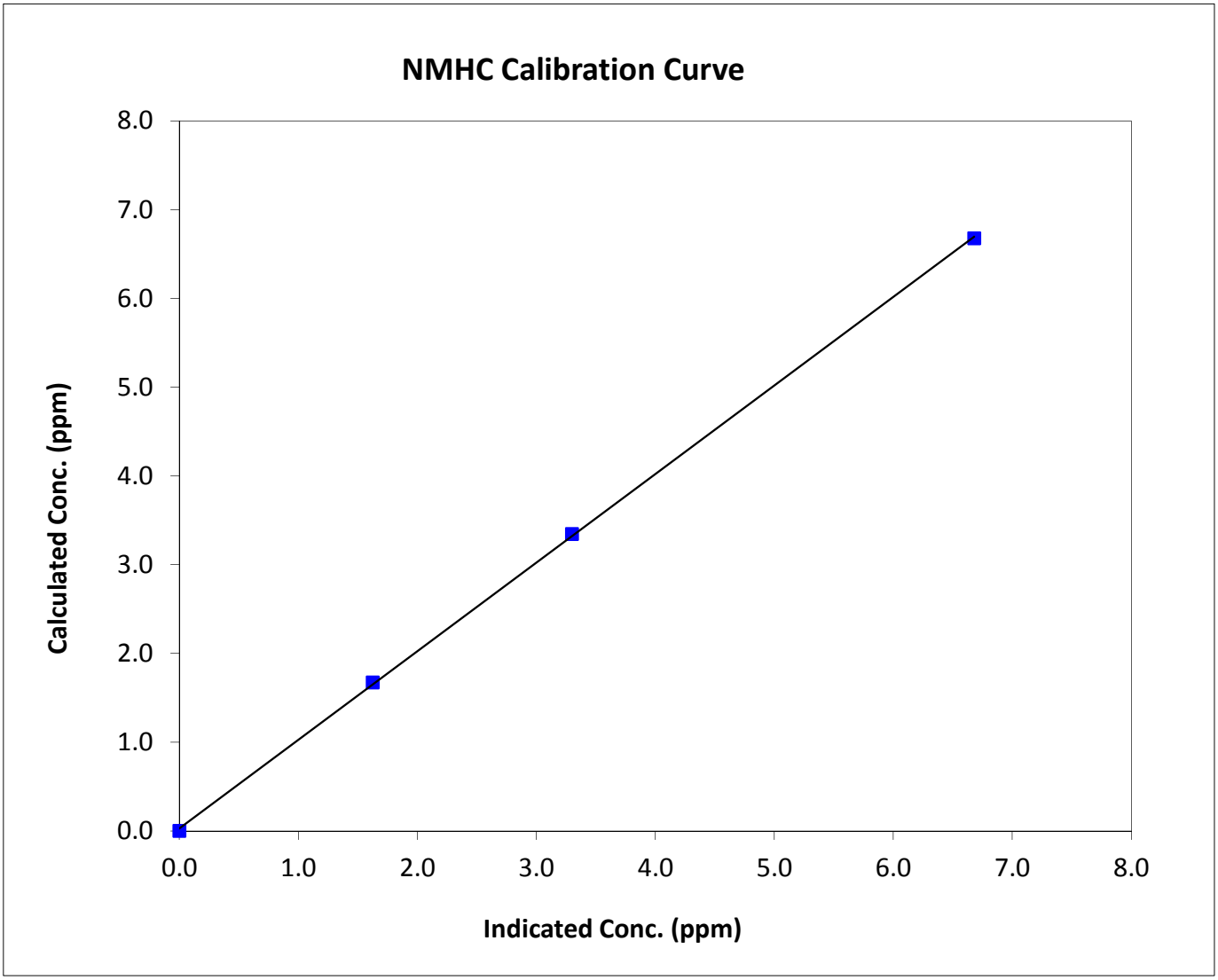
NMHC Calibration Summary

Station Information

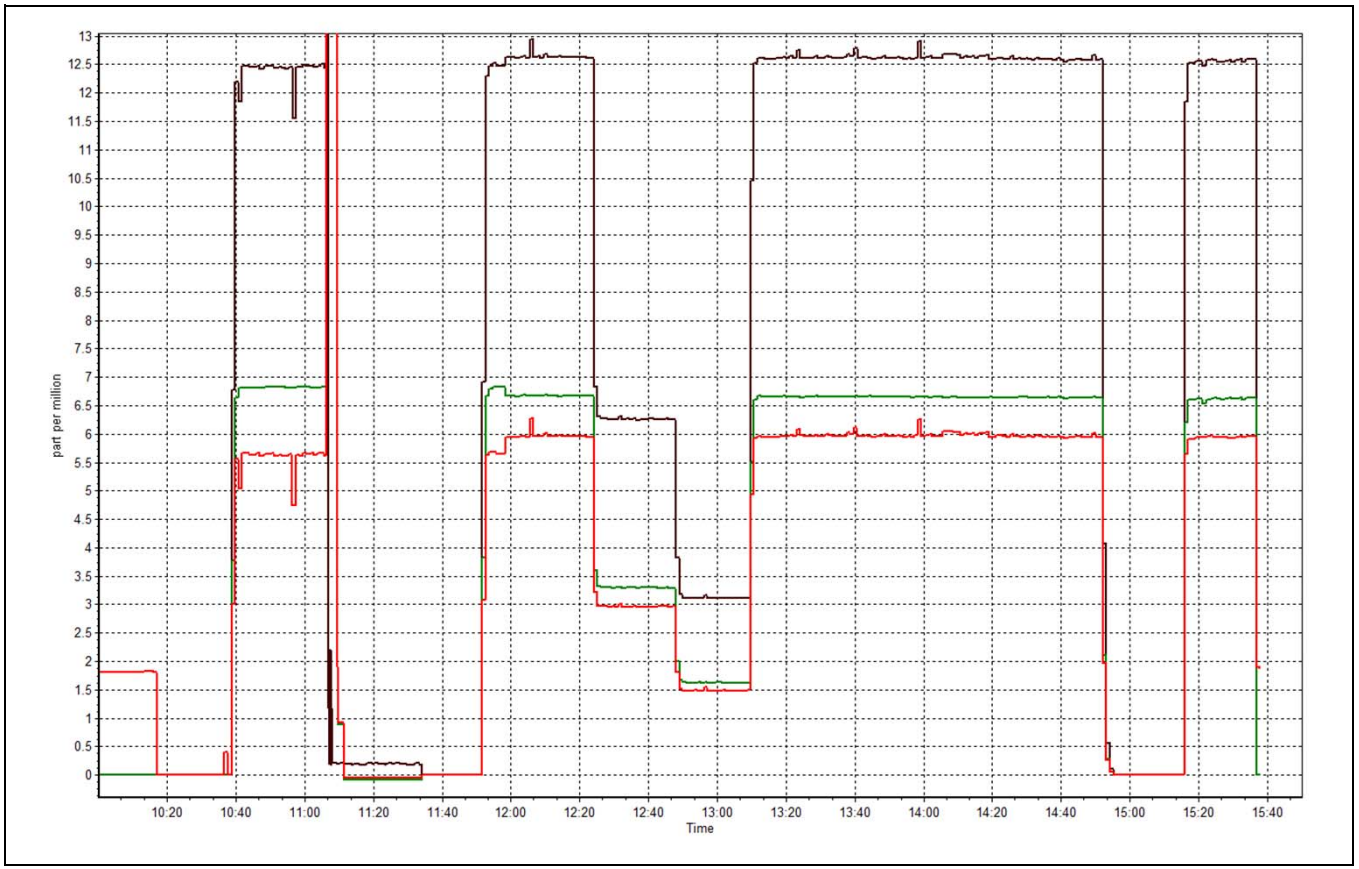
Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	10:15	End Time (MST)	15:40
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999916
6.68	6.68	0.9996		
3.34	3.30	1.0133	Slope	0.997857
1.67	1.63	1.0283		
			Intercept	0.027969



THC/NMHC Calibration Plot Date: January 15, 2015



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January-19-15	Prev Calibration	January-15-15
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Removal		
Start Time (MST)	9:45	End Time (MST)	11:30
Barometric Pressure	734 mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	S970259A	Cal Gas Expiry Date	September-26-17
CH4 Cal Gas Conc.	490.0 ppm	CH4 Equiv Conc.	1040.0 ppm
C3H8 Cal Gas Conc.	200.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5564

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	35.8	36.1
THC Range (input)	50	50	Flame Temp	379.0	376.6
NMHC Range (ppm)	50	50	Carrier Pressure	32.1	32.1
NMHC Range (input)	50	50	Fuel Pressure	41.4	41.4
THC Calc slope	0.999027	0.999404	Air Pressure	32.5	32.5
THC Calc intercept	0.030705	0.038374			
NMHC Calc slope	0.997857	1.005102			
NMHC Calc intercept	0.027969	0.028556			

Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.00	N/A
as found span	5000	60.7	12.63	12.62	1.000
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	12.63	12.62	1.000
second point	5000	30.4	6.32	6.25	1.012
third point	5000	15.2	3.16	3.10	1.020
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.011

Corrected As found	12.62	Previous response	12.61	% change	-0.1%

Notes:

Removal for actuator replacement and FID rebuild.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	60.7	6.68	6.63	1.007
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	6.68	6.63	1.007
second point	5000	30.4	3.34	3.28	1.020
third point	5000	15.2	1.67	1.61	1.039
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.022

Corrected As found	6.63	Previous response	6.66	% change	0.5%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	60.7	5.95	5.98	0.995
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	5.95	5.98	0.995
second point	5000	30.4	2.98	2.97	1.003
third point	5000	15.2	1.49	1.49	1.000
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	

Corrected As found	5.98	Previous response	5.94	% change	-0.6%

Wood Buffalo Environmental Association

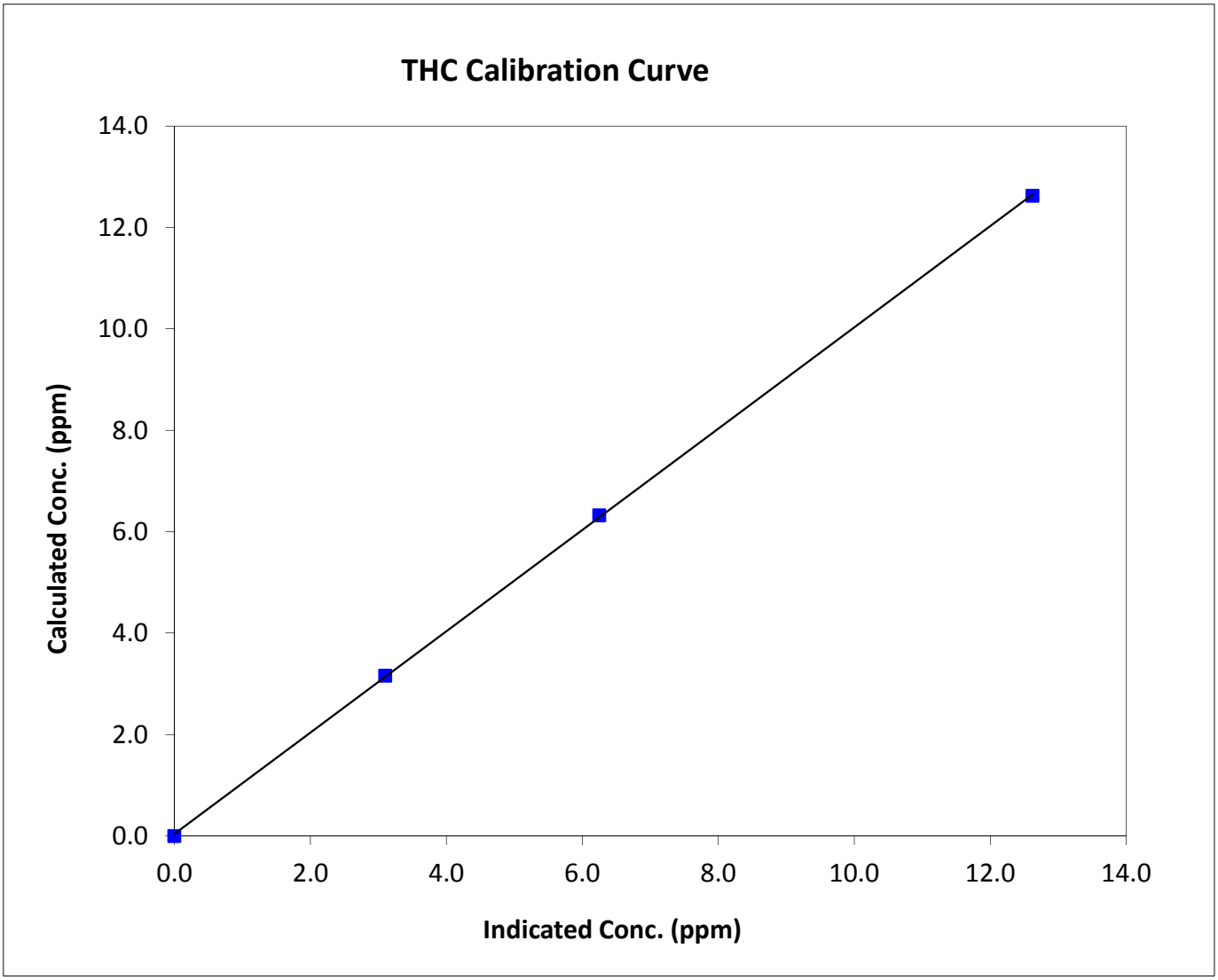
THC Calibration Summary

Station Information

Calibration Date	January 19, 2015	Previous Calibration	January 15, 2015
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:45	End Time (MST)	11:30
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999952
12.63	12.62	1.0004		
6.32	6.25	1.0117	Slope	0.999404
3.16	3.10	1.0199		
			Intercept	0.038374



Wood Buffalo Environmental Association

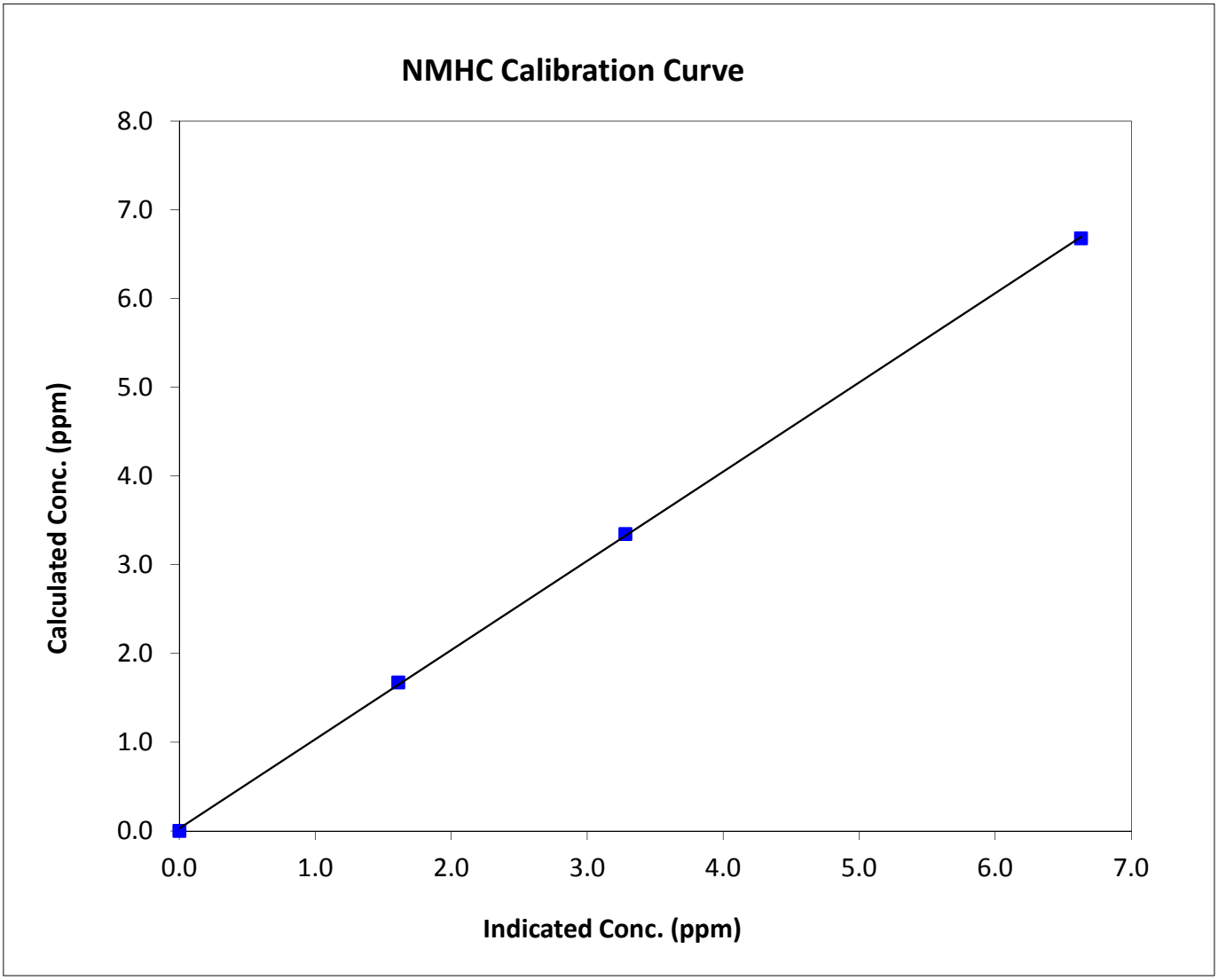
NMHC Calibration Summary

Station Information

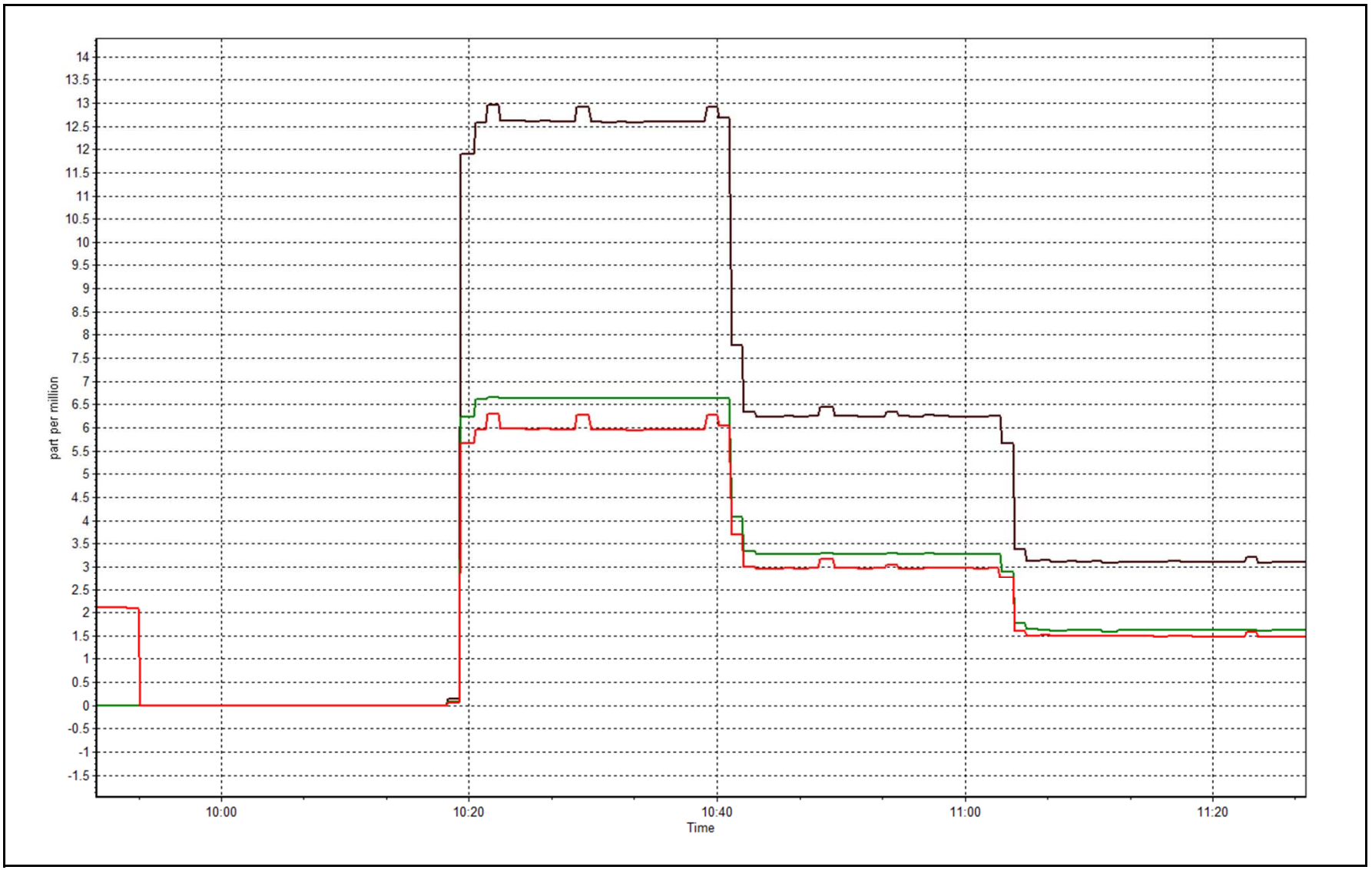
Calibration Date	January 19, 2015	Previous Calibration	January 15, 2015
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:45	End Time (MST)	11:30
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999916
6.68	6.63	1.0071		
3.34	3.28	1.0195	Slope	1.005102
1.67	1.61	1.0385		
			Intercept	0.028556



THC/NMHC Calibration Plot Date: January 19, 2015



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January-19-15	Prev Calibration	n/a
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Install		
Start Time (MST)	11:40	End Time (MST)	14:00
Barometric Pressure	734 mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	S970259A	Cal Gas Expiry Date	September-26-17
CH4 Cal Gas Conc.	490.0 ppm	CH4 Equiv Conc.	1040.0 ppm
C3H8 Cal Gas Conc.	200.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5564

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	n/a	34.2
THC Range (input)	50	50	Flame Temp	n/a	336.7
NMHC Range (ppm)	50	50	Carrier Pressure	n/a	36.8
NMHC Range (input)	50	50	Fuel Pressure	n/a	42.1
THC Calc slope	n/a	1.003039	Air Pressure	n/a	32.2
THC Calc intercept	n/a	-0.021712			
NMHC Calc slope	n/a	1.007935			
NMHC Calc intercept	n/a	-0.037561			

Analyzer make	Thermo Scientific 55i	Analyzer serial #	1426262594

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	12.63	12.61	1.001
second point	5000	30.4	6.32	6.30	1.004
third point	5000	15.2	3.16	3.22	0.982
calibrator zero					
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	60.7	12.63	12.48	1.012
				Average Correction Factor	0.996

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Installed to replace previous unit going in for repairs.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	6.68	6.65	1.004
second point	5000	30.4	3.34	3.35	0.998
third point	5000	15.2	1.67	1.75	0.955
calibrator zero					
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	60.7	6.68	6.53	1.023
				Average Correction Factor	0.986

Corrected As found	NA	Previous response	NA	% change	NA

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	60.7	5.95	5.96	0.998
second point	5000	30.4	2.98	2.95	1.010
third point	5000	15.2	1.49	1.47	1.013
calibrator zero					
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	60.7	5.95	5.95	1.000
				Average Correction Factor	

Corrected As found	NA	Previous response	NA	% change	NA

Wood Buffalo Environmental Association

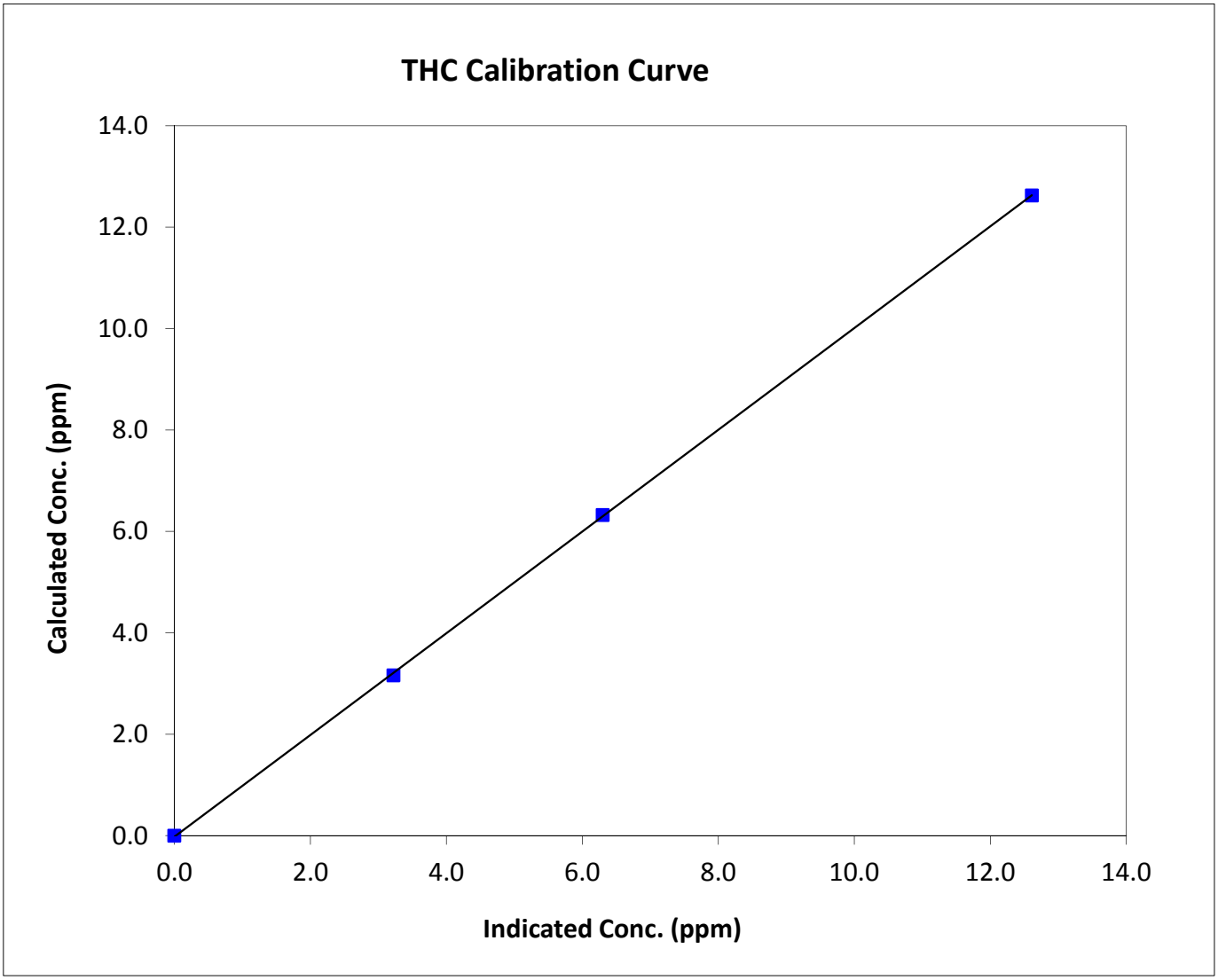
THC Calibration Summary

Station Information

Calibration Date	January 19, 2015	Previous Calibration	n/a
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	11:40	End Time (MST)	14:00
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999962
12.63	12.61	1.0012		
6.32	6.30	1.0037	Slope	1.003039
3.16	3.22	0.9819		
			Intercept	-0.021712



Wood Buffalo Environmental Association

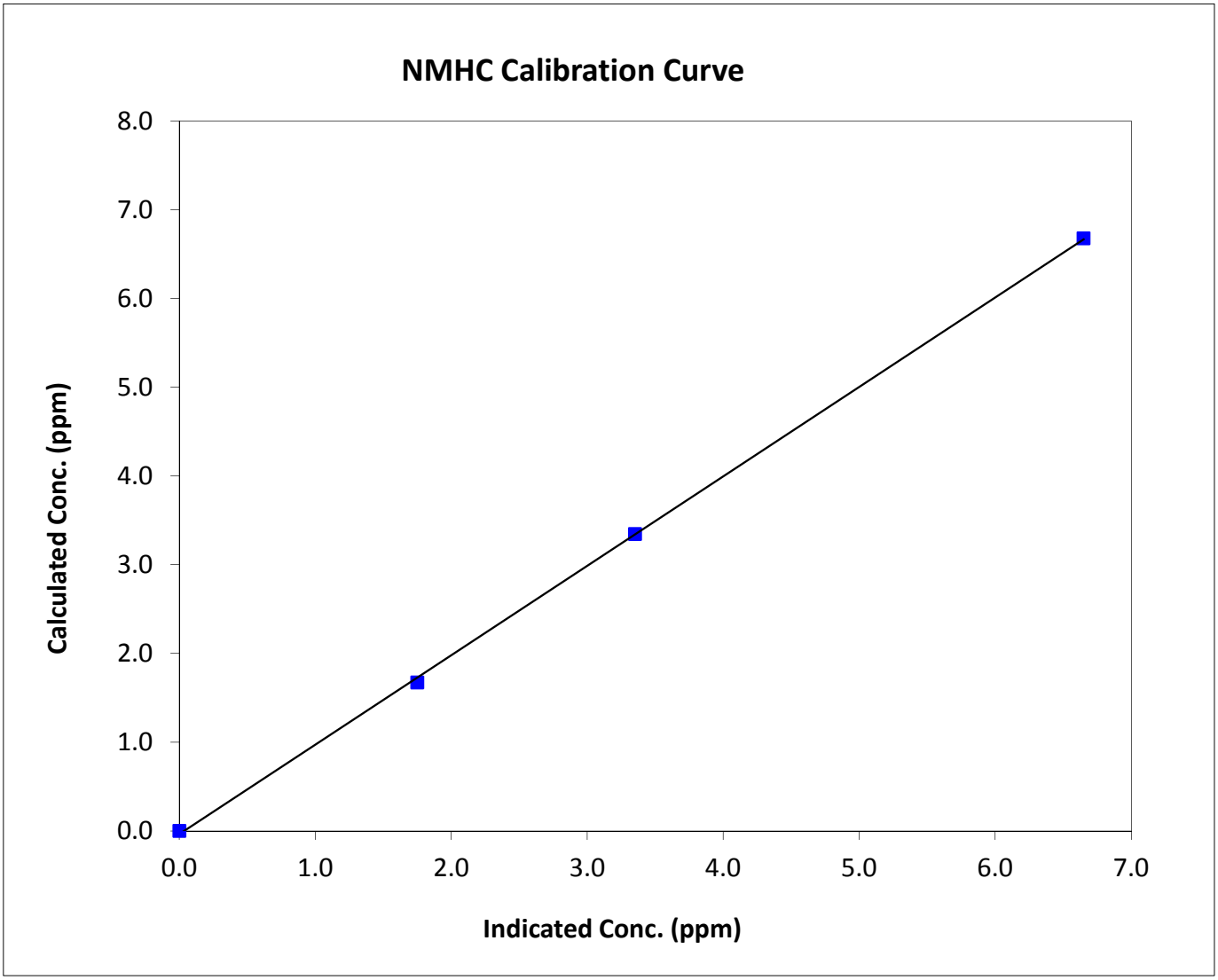
NMHC Calibration Summary

Station Information

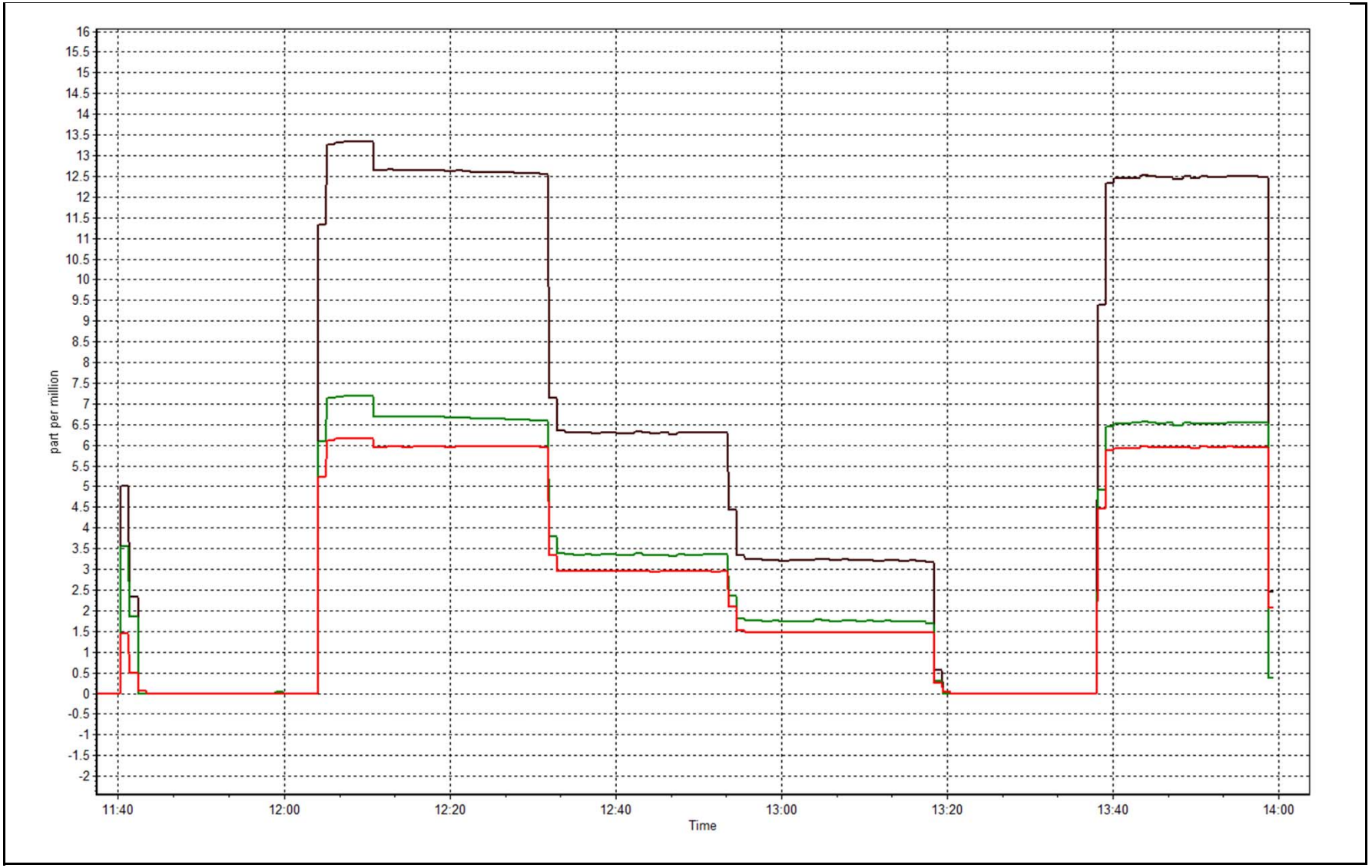
Calibration Date	January 19, 2015	Previous Calibration	n/a
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	11:40	End Time (MST)	14:00
Analyzer make	Thermo Scientific 55i	Analyzer serial #	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999814
6.68	6.65	1.0041		
3.34	3.35	0.9982	Slope	1.007935
1.67	1.75	0.9554		
			Intercept	-0.037561



THC/NMHC Calibration Plot Date: January 19, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 16, 2015	Previous Calibration	December 12, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	9:35	End Time (MST)	12:30
Barometric Pressure	719 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11021107
NO2 calibration used	January-15-15	Transfer Standard	N/A
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563
DACS voltage range	0-5V	DACS channel #	5

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	29.2	29.0
Analyzer Range (input)	500	500	Lamp temp.	70.8	70.9
Calculated slope	1.011654	1.001780	Pressure	719.0	702.7
Calculated intercept	-0.326714	0.599520	Flow cell A	0.678	0.669
Analyzer Background	-0.2	-0.2	Flow cell B	0.743	0.733
Analyzer Coefficient	0.972	1.033	Cell A Intensity	105000	104850
			Cell B Intensity	88500	88150

Analyzer make	TEI 49C	Analyzer serial #	607415760

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	0.0	N/A
as found span	5000	N/A	338.1	319.1	1.059
calibrator zero	5000	0.00	0.0	0.0	N/A
high point	5000	N/A	338.1	337.8	1.001
second point	5000	N/A	174.8	172.0	1.016
third point	5000	N/A	87.3	87.0	1.004
calibrator zero					
as left zero	5000	0.00	0.0	0.0	N/A
as left span	5000	N/A	338.1	331.7	1.019
				Average Correction Factor	1.007

Corrected As found	319.1	Previous response	334.5	% change	4.8%

Notes:

adjusted span after as founds. Diagnostics OK.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

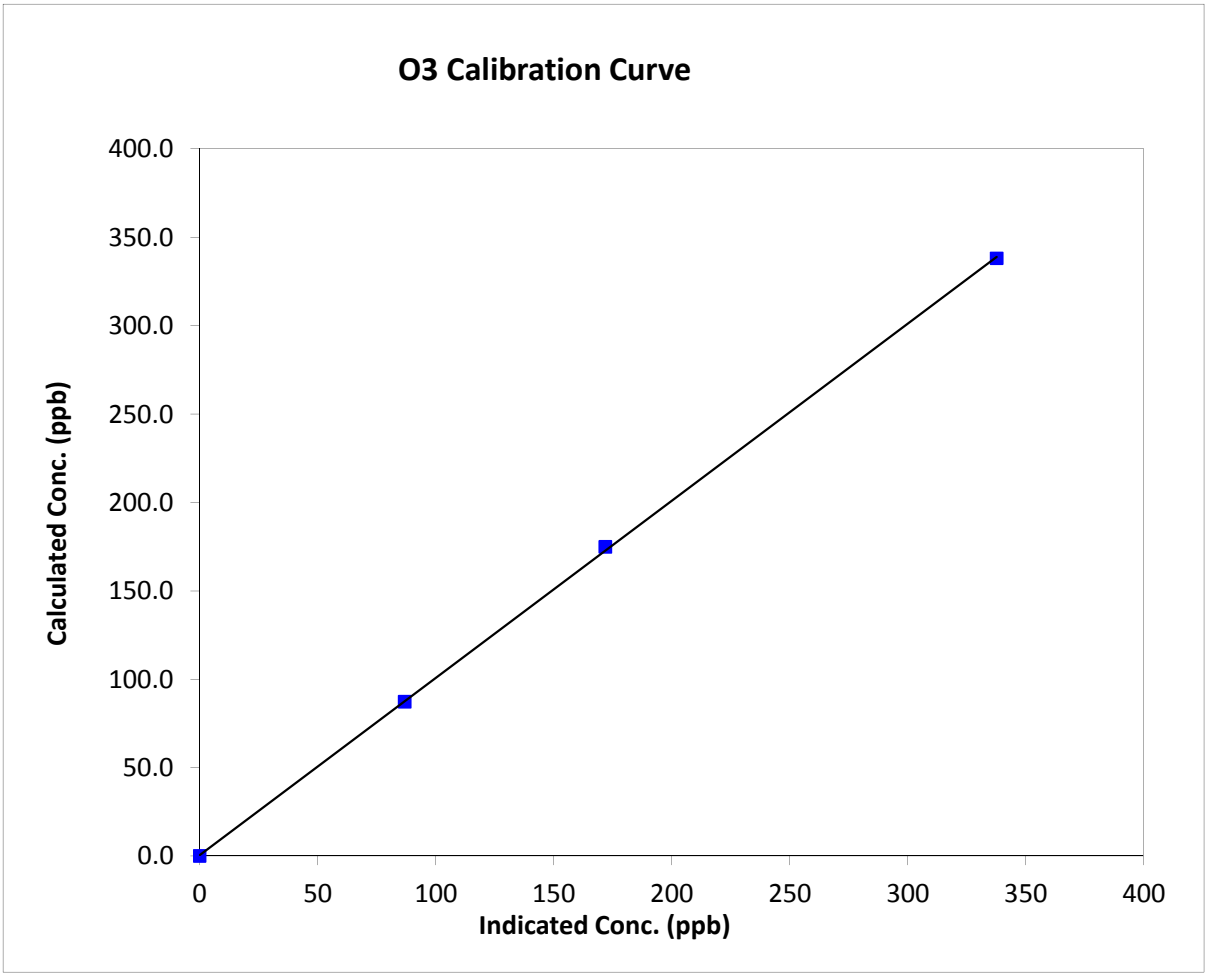
O_3 Calibration Summary

Station Information

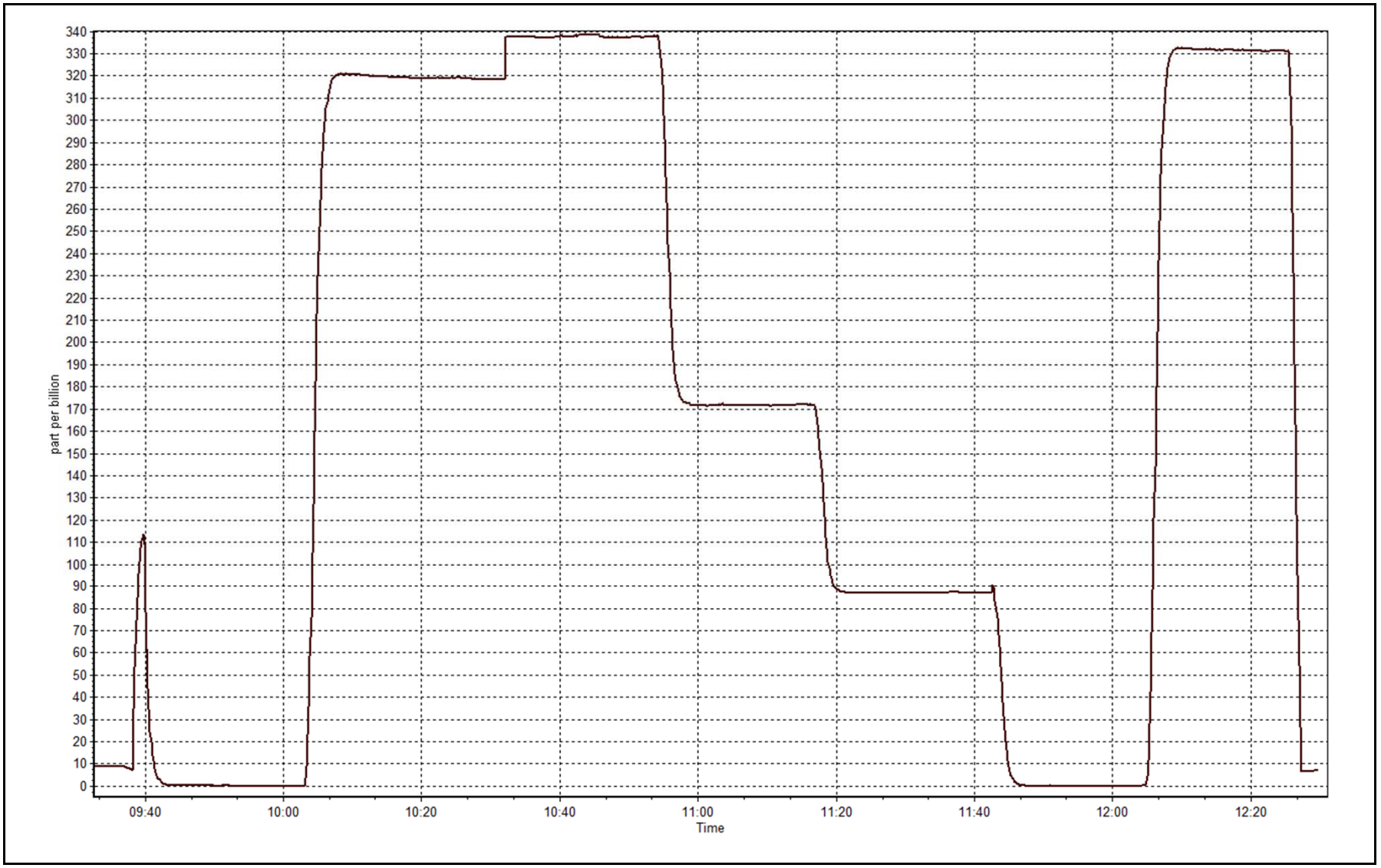
Calibration Date	January-16-15	Previous Calibration	December 12, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:35	End Time (MST)	12:30
Analyzer make	TEI 49C	Analyzer serial #	607415760

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999922
338.1	337.8	1.0010		
174.8	172.0	1.0163	Slope	1.001780
87.3	87.0	1.0040		
			Intercept	0.599520



O3 Calibration Plot Date: January 16, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	10:15	End Time (MST)	15:40
Barometric Pressure	737 mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	11021107
NO Cal Gas Conc	49.4 ppm	Cal Gas Expiry Date	September 26, 2017
NOx Cal Gas Conc	49.4 ppm	Cal Gas Serial #	S970259A

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2575

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.996922	0.997678	1.001037
	Data Offset	1.818590	2.047438	-0.493276
After	Data Slope	0.983012	0.983696	1.000255
	Data Offset	2.166012	2.112832	-0.015773
Channel #		1	2	3
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	Thermo 42c	Analyzer serial #	601114773

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.768	ppb	0.768	ppb
NOX coefficient	1.000	ppb	1.000	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	3.3		3.3	
NOX bkgrnd	3.5		3.5	
Nt coefficient	n/a		n/a	
Chamber Temp	49.7	Deg C	49.5	Deg C
Moly Temp	323.0	Deg C	323.0	Deg C
PMT Temp	-3.6	Deg C	-3.6	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	165.0	mmHg	168.8	mmHg
Sample Flow	0.784	ccm	0.794	ccm

Notes:

no adjustments required.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 15, 2015 Station Number: AMS 7

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.2	N/A	N/A
as found span	5000	60.7	599.7	599.7	0.0	610.9	610.7	0.4	0.9817	0.9820
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.2	N/A	N/A
high point	5000	60.7	599.7	599.7	0.0	609.2	608.7	0.6	0.9845	0.9852
second point	5000	30.4	300.4	300.4	0.0	301.5	301.6	0.4	0.9962	0.9960
third point	5000	15.2	150.2	150.2	0.0	148.9	148.9	0.2	1.0083	1.0088
calibrator zero										
as left zero	6000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.2	N/A	N/A
as left span	5000	60.7	599.7	269.5	330.2	598.1	271.7	326.5	1.0026	0.9917
								Average Correction Factor	0.9963	0.9967

Corrcted As found NO_X= 610.9 NO= 610.8 Percent Change NO_X= -1.8% NO= -1.9%

Previous Response NO_X= 599.7 NO= 599.1

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 60.70 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.2			N/A	
1st NO2 (300)	N/A	269.5	338.1	607.5	269.5	338.2	0.9754	1.0000	0.9998	100.0%
2nd NO2 (200)	N/A	432.8	174.8	607.2	432.8	174.6	0.9759	1.0000	1.0013	99.9%
3rd NO2 (100)	N/A	520.3	87.3	607.2	520.3	87.2	0.9758	1.0000	1.0013	99.9%
4th NO2 (0)	607.6	N/A	-0.1	607.5	607.6	0.1	0.9754	1.0000	N/A	N/A
					Average Correction Factor		0.9756	1.0000	1.0008	99.9%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

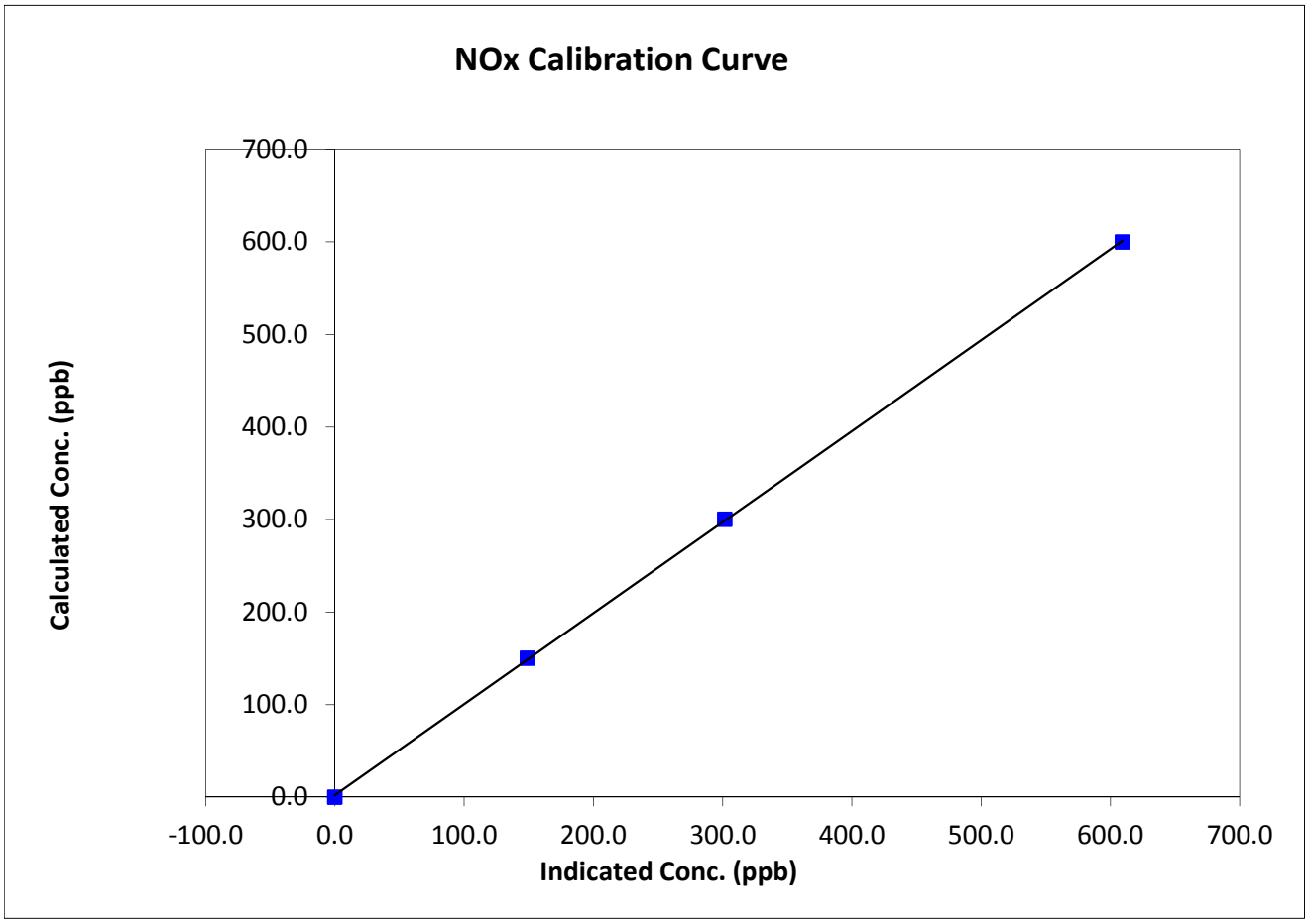
NO_X Calibration Summary

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	10:15	End Time (MST)	15:40
Analyzer make	Thermo 42c	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999939
599.7	609.2	0.9845		
300.4	301.5	0.9962	Slope	0.983012
150.2	148.9	1.0083		
			Intercept	2.166012



Wood Buffalo Environmental Association

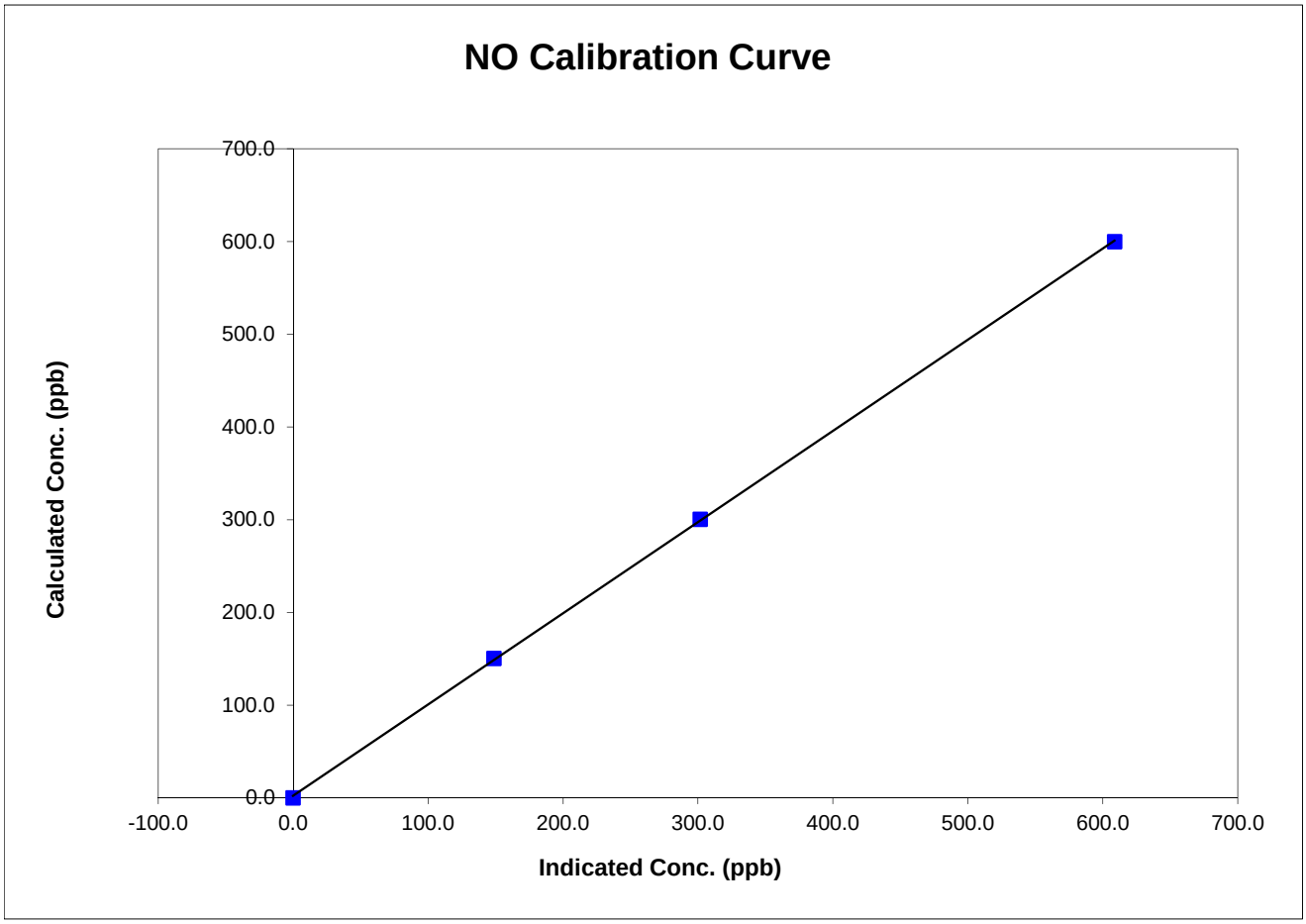
NO Calibration Summary

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	10:15	End Time (MST)	15:40
Analyzer make	Thermo 42c	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999945
599.7	608.7	0.9852		
300.4	301.6	0.9960	Slope	0.983696
150.2	148.9	1.0088		
			Intercept	2.112832



Wood Buffalo Environmental Association

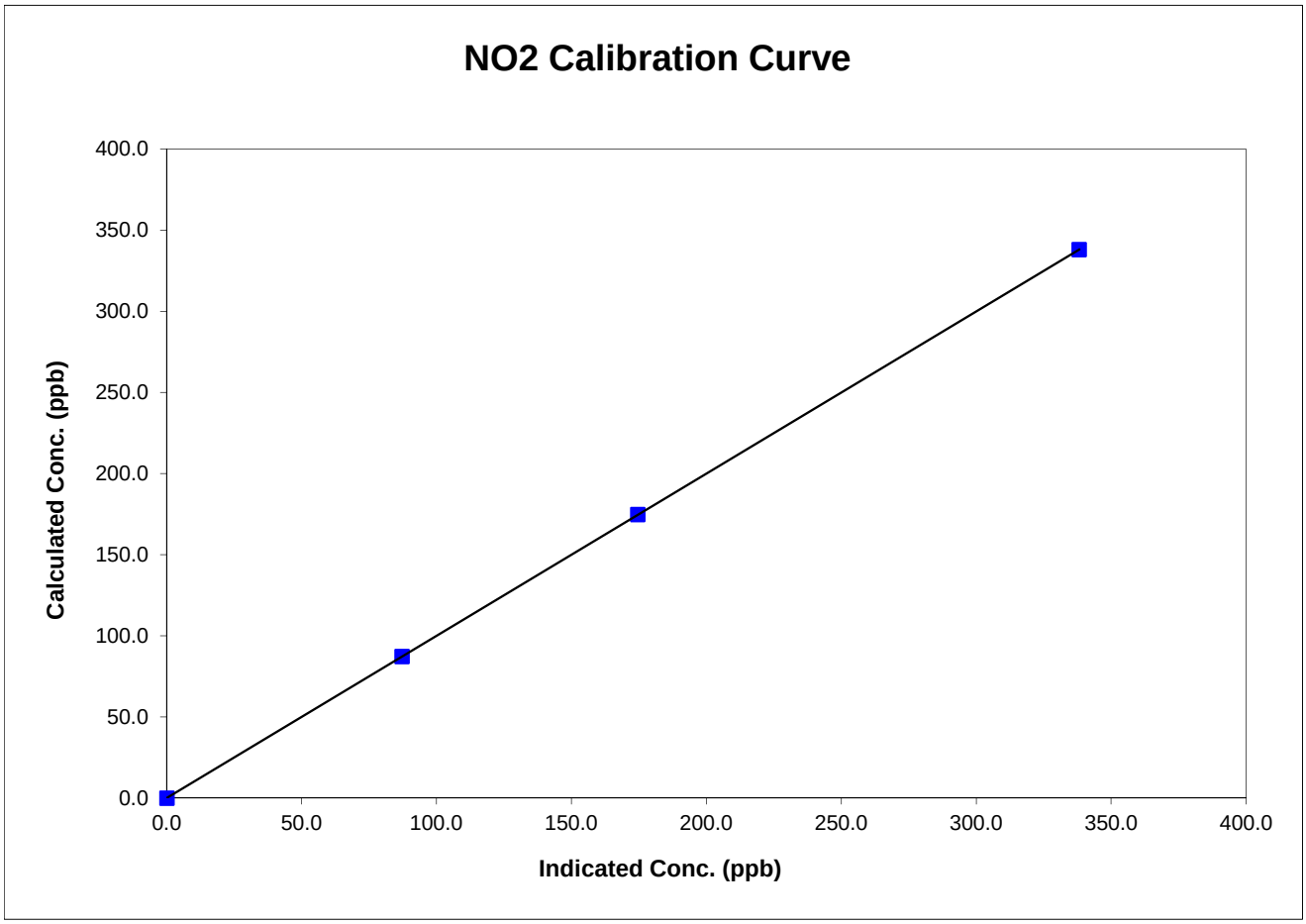
NO_2 Calibration Summary

Station Information

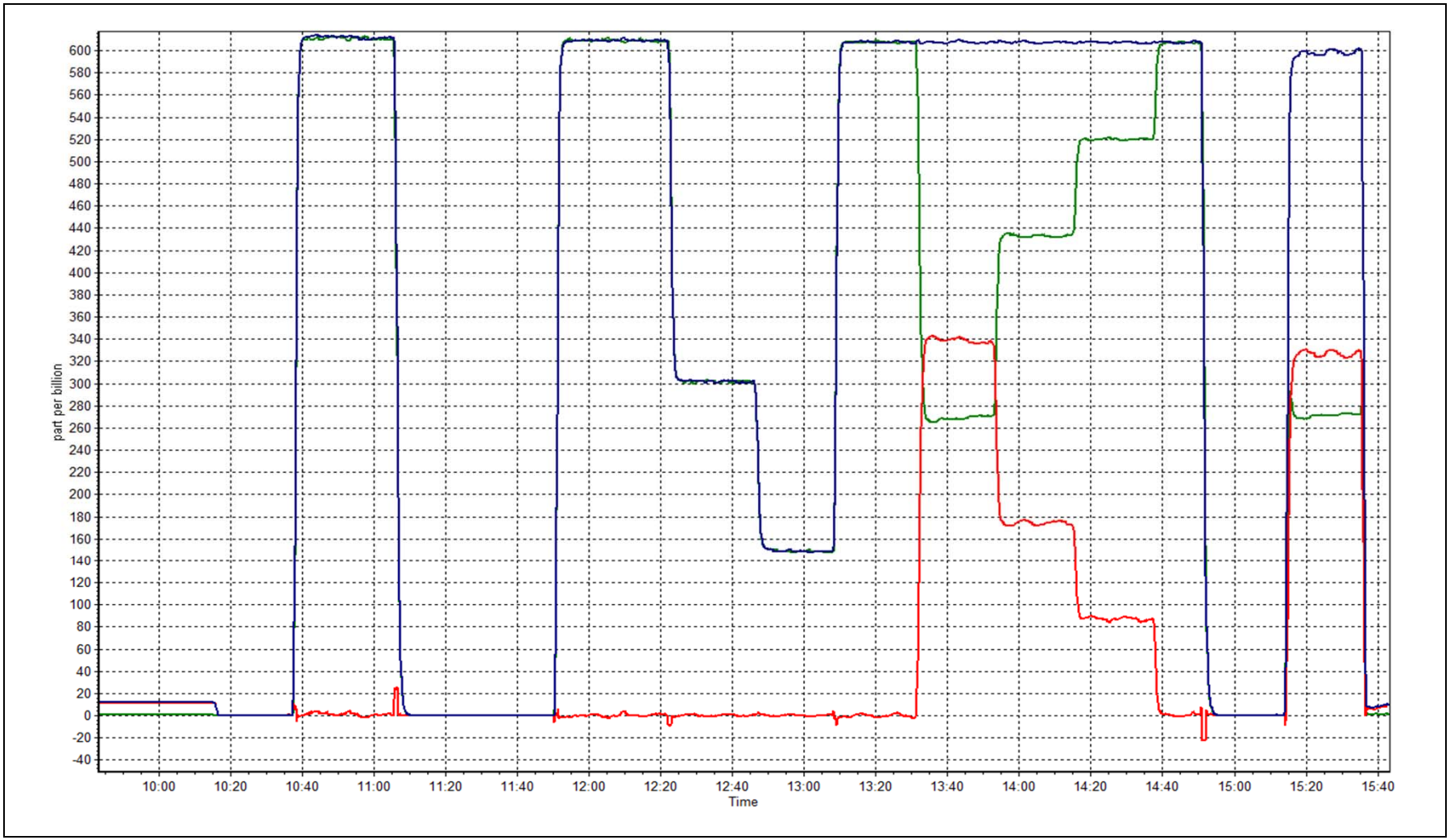
Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Number	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	10:15	End Time (MST)	15:40
Analyzer make	Thermo 42c	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999998
338.1	338.2	0.9998		
174.8	174.6	1.0013	Slope	1.000255
87.3	87.2	1.0013		
			Intercept	-0.015773



NOx, NO & NO_2 Calibration Plot Date: January 15, 2015



Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 15, 2014
Station Name	Athabasca Valley	Station Number	7

Reason:	Routine	Install	Removal	Other:

Start Time (MST)	11:25	End Time (MST)	14:40
Barometric Pressure	745 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11021107
Cal Gas Concentration	3060 ppm	Cal Gas Expiry Date	27/04/2015
Gas Cert Reference	LL 85940		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5564
DACS input	ethernet connection	IP address	192.168.1.48

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	50	50	Chamber temp.	47.9	48.0
Analyzer Range (mv)	50	50	Pressure	747.4	740.3
Calculated slope	0.990566	1.000217	Flow	0.473	0.468
Calculated intercept	-0.074584	0.093447	Intensity	199698	199463
Analyzer Background	-0.105	0.771	S/R ratio	1.183300	1.181232
Analyzer Coefficient	1.006	1.009			

Analyzer make	Thermo 48i-TLE	Analyzer serial #	1408761381

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	0.9	N/A
as found span	5000	67.70	41.4	43.9	0.944
calibrator zero	5000	0.00	0.0	0.0	N/A
high point	5000	67.70	41.4	41.4	1.001
second point	5000	34.20	20.9	20.7	1.011
third point	5000	14.70	9.0	8.9	1.015
calibrator zero					
as left zero	5000	0.00	0.0	0.0	N/A
as left span	5000	67.70	41.4	41.3	1.003
				Average Correction Factor	1.009

Corrected As found	43.0	Previous response	41.1	% change	-4.4%

Notes:

Installed zero air @ 15 psi to PURGE port on back to improve baseline drift. Adjusted zero and made slight adjustment to span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

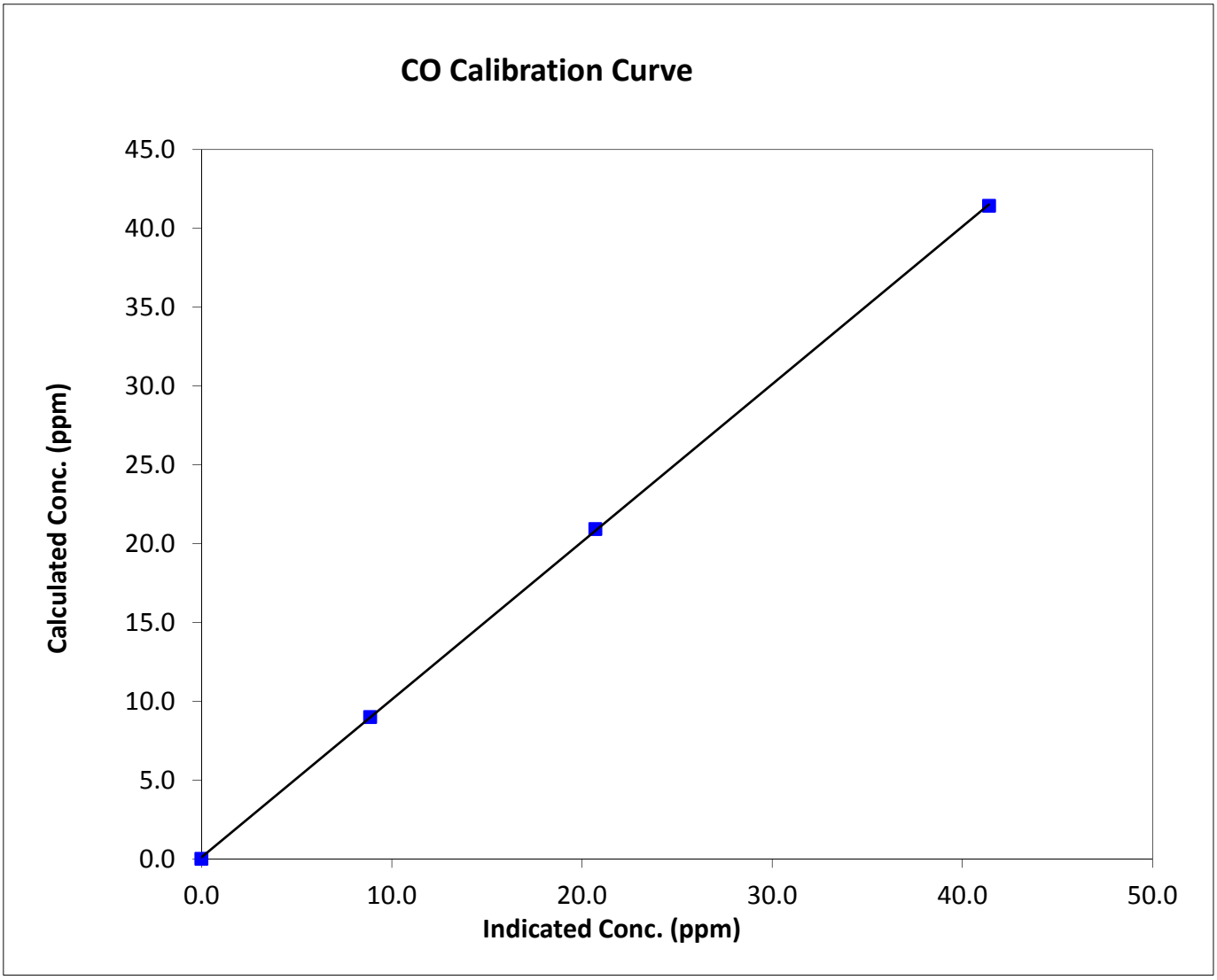
CO Calibration Summary

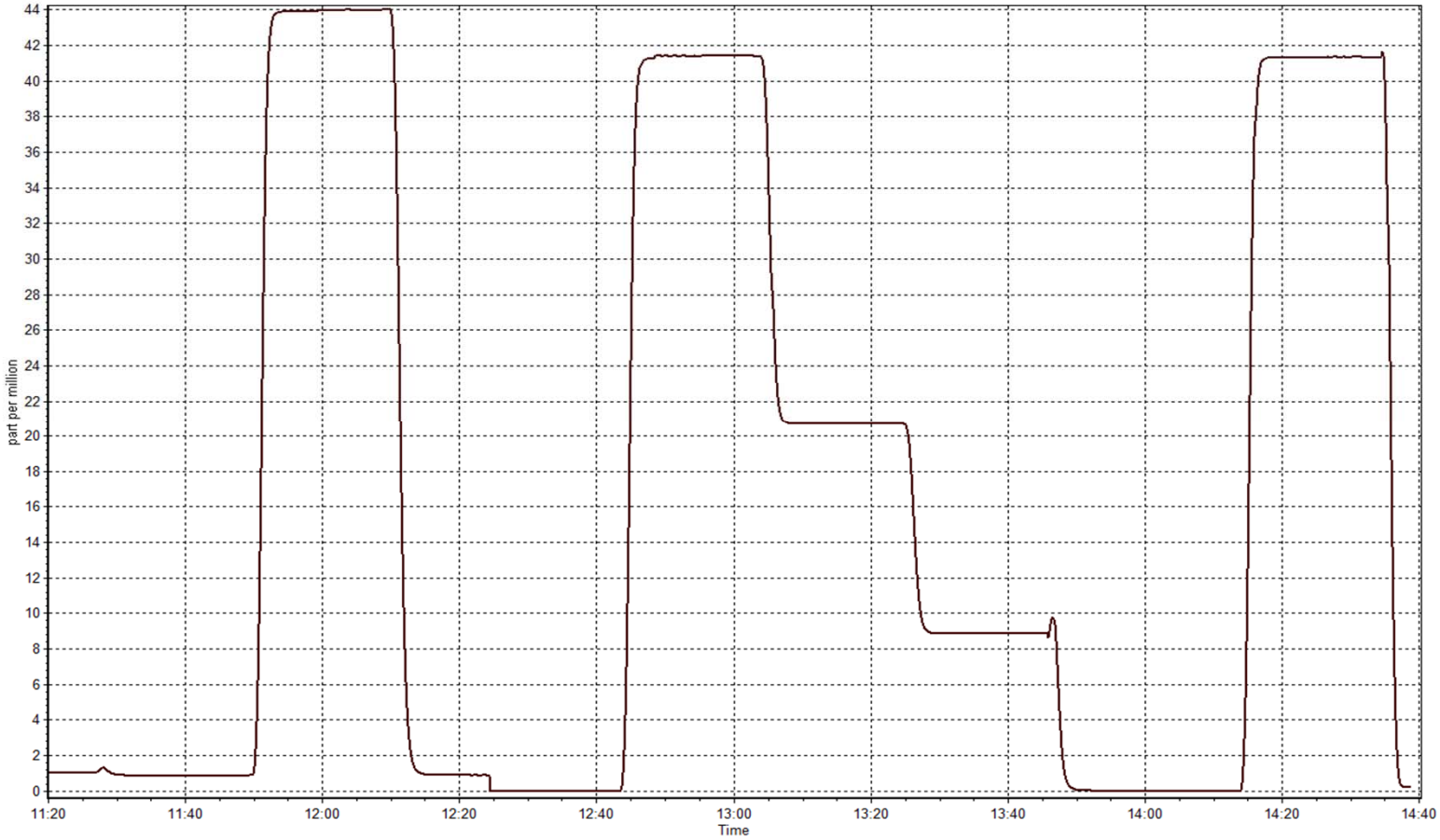
Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 15, 2014
Station Name	Athabasca Valley	Station Number	7
Start Time (MST)	11:25	End Time (MST)	14:40
Analyzer make	Thermo 48i-TLE	Analyzer serial #	1408761381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999969
41.4	41.4	1.0008		
20.9	20.7	1.0106	Slope	1.000217
9.0	8.9	1.0154		
			Intercept	0.093447

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Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Calibration Date	January 27, 2015	Previous Calibration	January 20, 2015
Station Name	Athabasca Valley	Station Number	7

Reason:	Routine	Install	Removal	Other:	REPAIR

Start Time (MST)	9:45	End Time (MST)	12:05
Barometric Pressure	741 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11021107
Cal Gas Concentration	3060 ppm	Cal Gas Expiry Date	27/04/2015
Gas Cert Reference	LL 85940		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5564
DACS input	ethernet connection	IP address	192.168.1.48

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	50	50	Chamber temp.	48.0	48.1
Analyzer Range (mv)	50	50	Pressure	740.3	746.2
Calculated slope	1.000217	1.000803	Flow	0.468	0.492
Calculated intercept	0.093447	0.095555	Intensity	199463	199755
Analyzer Background	0.771	0.892	S/R ratio	1.181232	1.181130
Analyzer Coefficient	1.009	1.009			

Analyzer make	Thermo 48i-TLE	Analyzer serial #	1408761381

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.00	0.0	0.0	N/A
high point	5000	67.70	41.4	41.4	1.002
second point	5000	34.20	20.9	20.7	1.011
third point	5000	14.70	9.0	8.9	1.015
calibrator zero					
as left zero	5000	0.00	0.0	0.0	N/A
as left span	5000	67.70	41.4	41.2	1.005
				Average Correction Factor	1.009

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Pump had low flow on arrival. Replaced pump. Adjusted zero.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

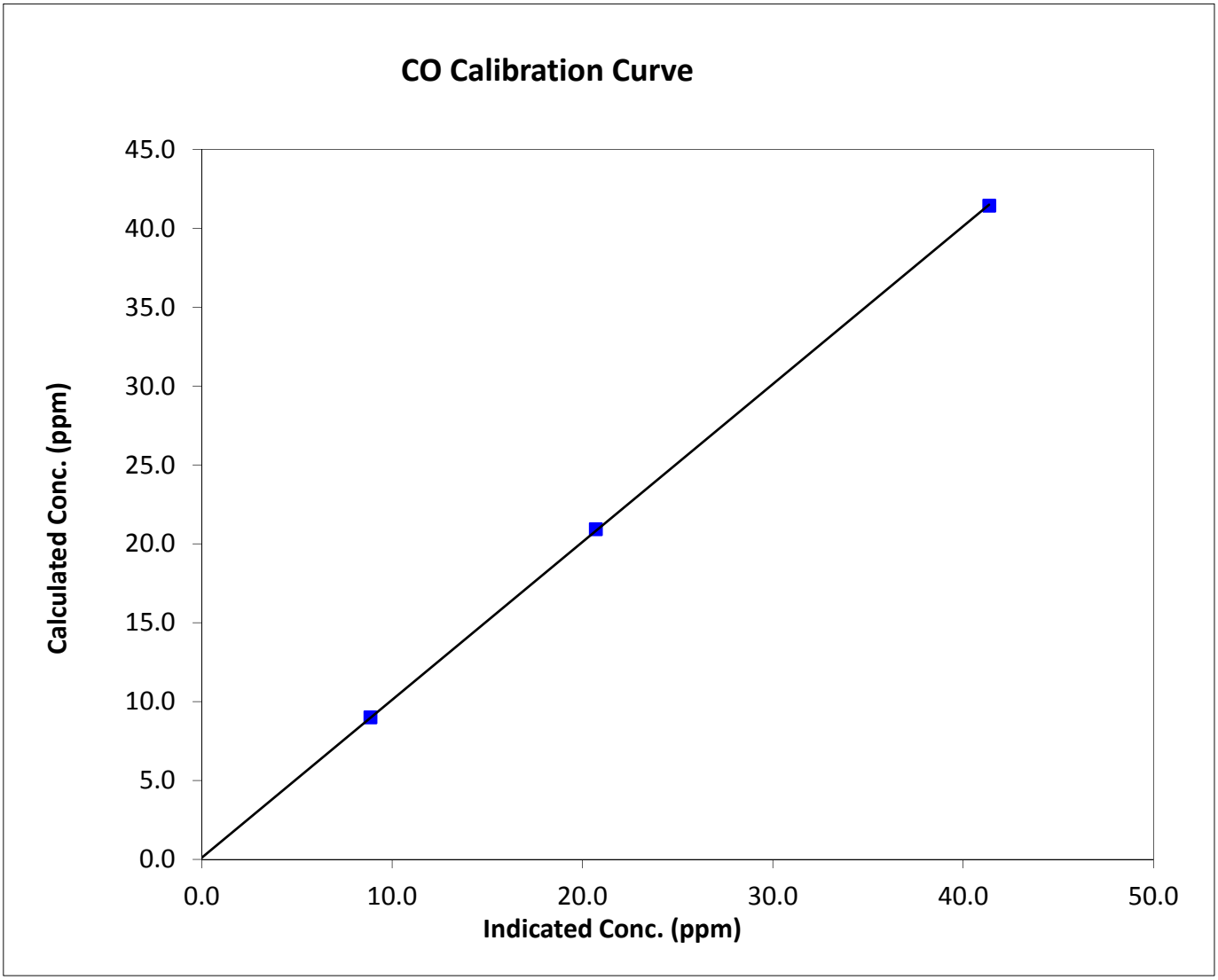
CO Calibration Summary

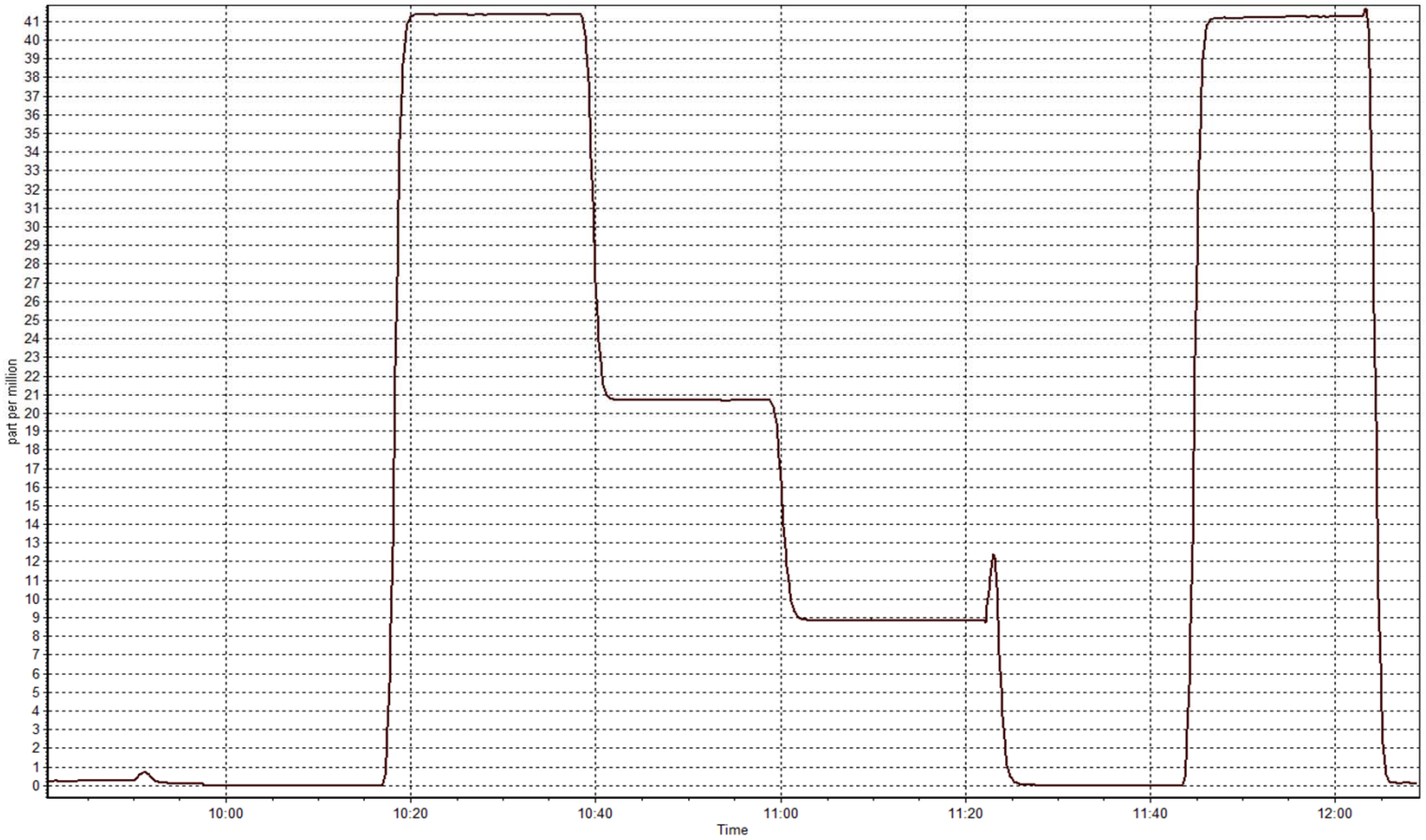
Station Information

Calibration Date	January 27, 2015	Previous Calibration	January 20, 2015
Station Name	Athabasca Valley	Station Number	7
Start Time (MST)	9:45	End Time (MST)	12:05
Analyzer make	Thermo 48i-TLE	Analyzer serial #	1408761381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999972
41.4	41.4	1.0015		
20.9	20.7	1.0111	Slope	1.000803
9.0	8.9	1.0154		
			Intercept	0.095555




part per million
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
10:00
10:20
10:40
11:00
11:20
11:40
12:00
Time

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 8
FORT CHIPEWYAN
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
JANUARY 2015

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	37	37	100.00	9	0	2	0
O3(ppb) Average	709	35	35	100.00	35	0	32	0
NO2(ppb) Average	705	39	39	100.00	21	0	8	0
NO(ppb) Average	705	39	39	100.00	4	-	1	-
NOX(ppb) Average	705	39	39	100.00	22	-	8	-
PM2.5(ug/m3) Average	742	0	2	99.73	30.7	-	6.6	0
Wind Speed 10 m (km/h) Average	738	0	6	99.19	37	-	21	-
Wind Direction 10 m (deg) Average	738	0	6	99.19	-	-	-	-
Temperature 2 m (C) Average	744	0	0	100.00	1.7	-	-4.6	-
Relative Humidity (%) Average	744	0	0	100.00	96	-	-	-
Precipitation (mm) Total	744	0	0	100.00	0.5	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	391	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
JANUARY 2015

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	0.3	1	-	0	0	0	0	0	1	9
O3(ppb) Average	709	25.5	5	-	10	19	22	26	29	31	35
NO2(ppb) Average	705	2.9	3	-	0	1	1	2	4	6	21
NO(ppb) Average	705	0.4	1	-	0	0	0	0	0	1	4
NOX(ppb) Average	705	3.3	3	-	0	1	1	2	5	7	22
PM2.5(ug/m3) Average	742	3.67	2.4	-	1.1	1.7	2.2	3.1	4.6	6	30.7
Wind Speed 10 m (km/h) Average	738	11.9	7	-	1	4	7	11	15	22	37
Wind Direction 10 m (deg) Average	738	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	744	-18.31	7.3	-	-35.3	-27.2	-24.2	-18.4	-13.3	-8.6	1.7
Relative Humidity (%) Average	744	80.6	6	-	63	73	76	79	86	90	96
Precipitation (mm) Total	744	-	-	1.52	0	0	0	0	0	0	0.5
Global Solar Radiation (W/m2) Average	744	29.8	67	-	0	0	0	0	21	98	391

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	12 Jan 2015 16:00	12 Jan 2015 17:00	2	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	26 Jan 2015 06:00	26 Jan 2015 08:00	3	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	29 Jan 2015 01:00	29 Jan 2015 01:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	31 Jan 2015 08:00	31 Jan 2015 09:00	2	Flat line in sensor output signal -sensor frozen

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 ppb on Jan 11 21:00 Maximum Daily Average: 1.7 ppb on Jan 11

Minimum Value: 0 ppb on Jan 14 14:00 Minimum Daily Average: 0.0 ppb on Jan 15
Maximum Diurnal Average: 0.4 ppb at hour 21 Minimum Diurnal Average: 0.1 ppb at hour 4
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 3$

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-Jan	0	Z	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
2-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Jan	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1
4-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Jan	Z	0	0	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-Jan	0	Z	0	0	0	0	1	1	1	1	1	2	3	3	2	1	1	0	0	0	0	0	0	0	0.8	3
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Jan	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
10-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	3	7	9	6	5	3	1.7	9
12-Jan	Z	1	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	--	1
13-Jan	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
14-Jan	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
15-Jan	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
16-Jan	0	0	0	0	Z	0	1	1	2	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0.7	3
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.3	1
19-Jan	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
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
21-Jan	0	0	0	Z	1	1	2	3	2	2	3	3	2	3	2	1	1	0	0	0	0	0	0	0	1.2	3
22-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Jan	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
24-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
26-Jan	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
27-Jan	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
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0.4	1
30-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
31-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.2	2
	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	Diurnal Average	
	0	1	0	1	1	1	2	3	2	3	3	3	3	3	2	1	1	1	3	7	9	6	5	3	Diurnal Maximum	

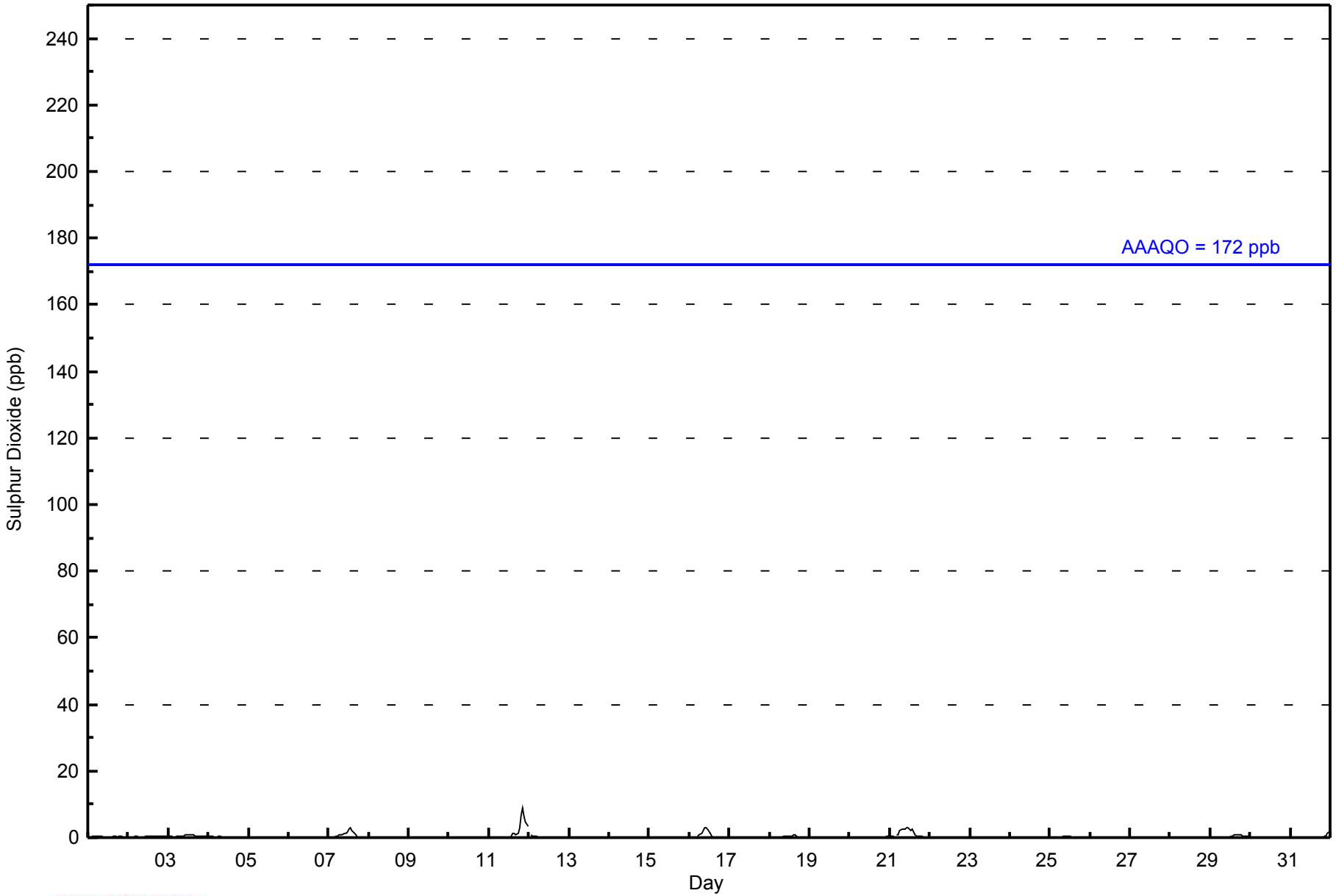
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

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

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - January 2015

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	23	12	7	37	108	38	10	8	11	8	11	13	82	108	155	70	701
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	23	12	7	37	108	38	10	8	11	8	11	13	82	108	155	70	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

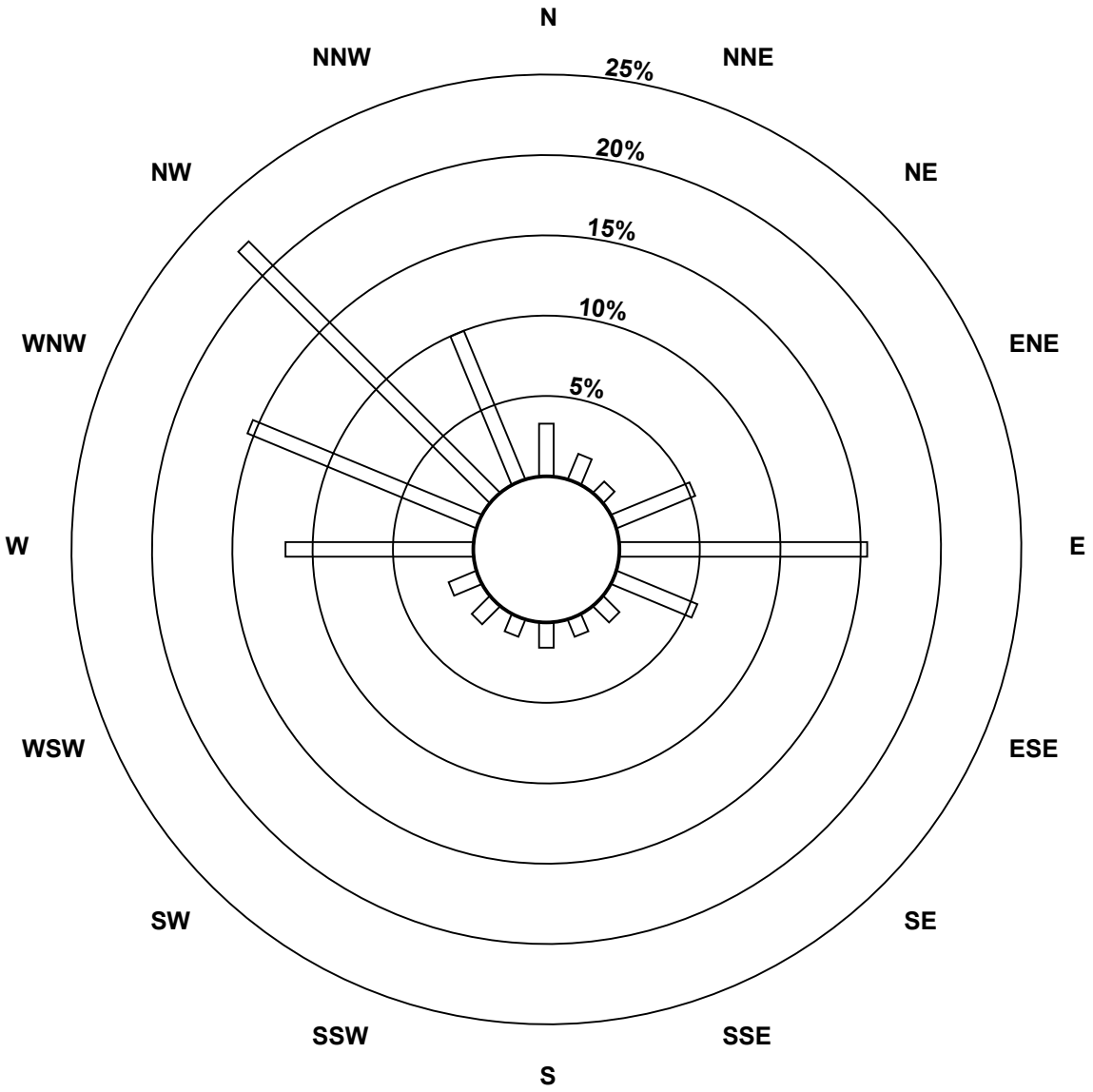
AURORA ATMOSPHERICS INC.

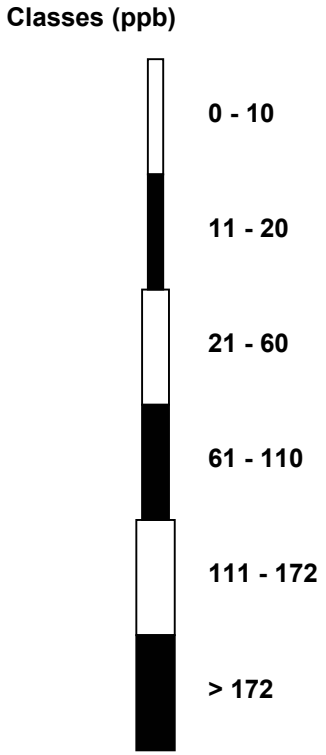
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan (AMS 8)





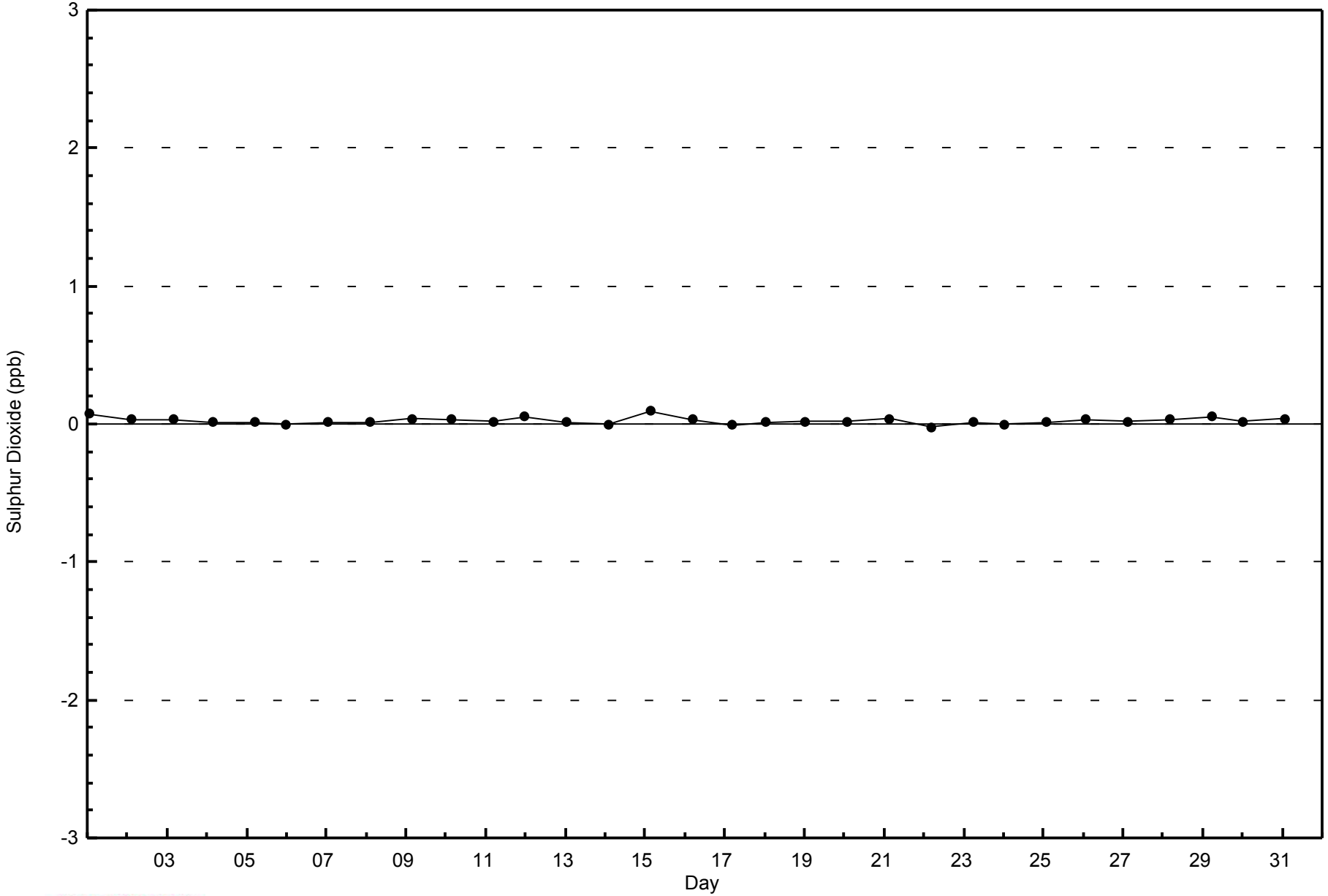
Total Number of Valid Hours: 701

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - January 2015



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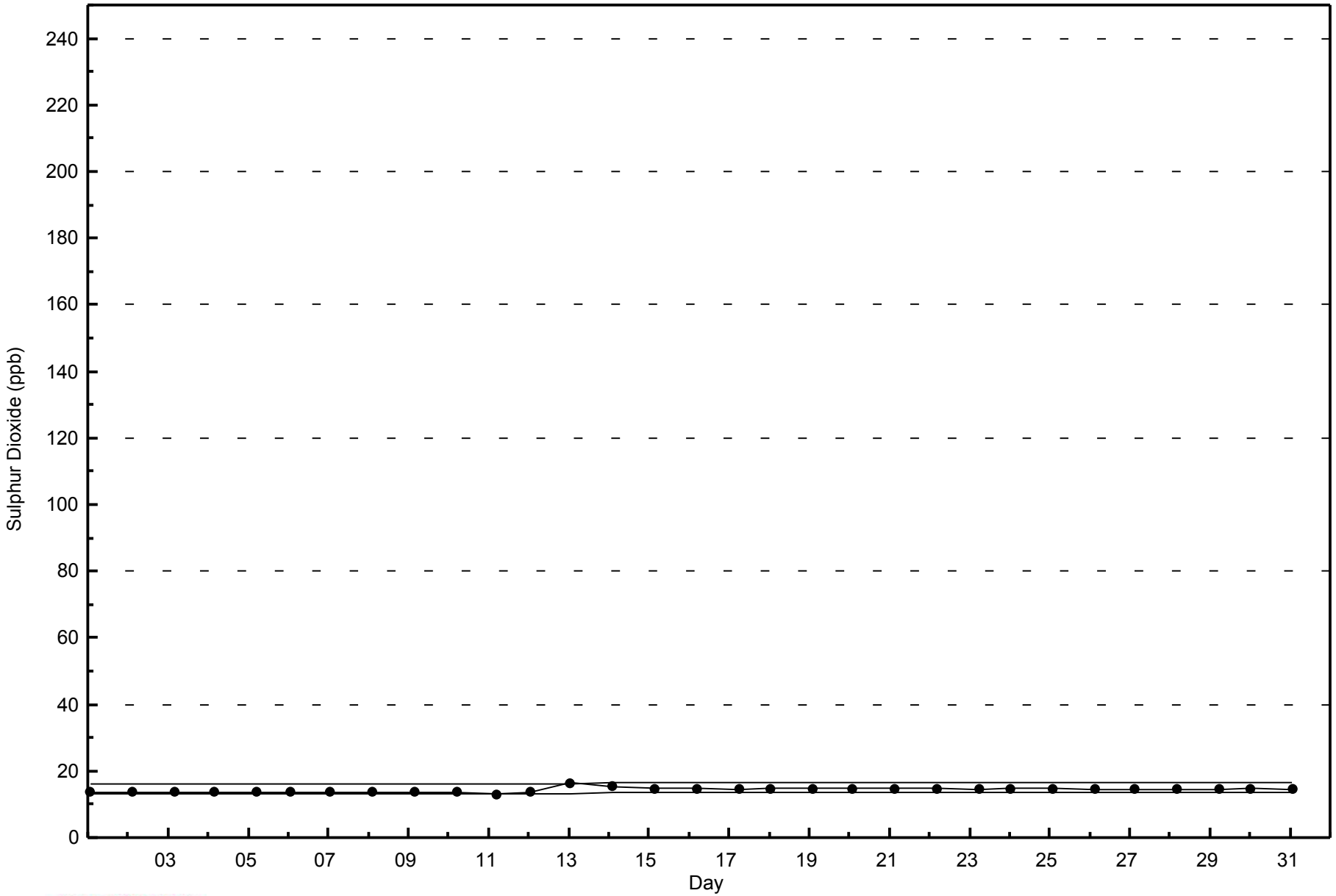
ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Chipewyan - January 2015

Maximum Value: 4 ppb on Jan 18 23:00

Maximum Daily Average: 1.5 ppb on Jan 18

Minimum Value: 0 ppb on Jan 28 00:00

Minimum Daily Average: 0.1 ppb on Jan 15

Maximum Diurnal Average: 0.6 ppb at hour 14

Minimum Diurnal Average: 0.3 ppb at hour 7

Monthly Average: 0.4 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Jan	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
4-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Jan	Z	0	0	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-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.3	1
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.2	1
10-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0.4	1
12-Jan	Z	0	0	0	0	0	1	1	0	0	0	1	C	C	C	C	C	C	C	C	1	0	0	0	--	1
13-Jan	0	Z	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
14-Jan	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
15-Jan	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
16-Jan	0	0	0	0	Z	1	1	1	1	1	2	2	2	1	1	1	1	1	2	1	1	1	2	2	1.0	2
17-Jan	0	0	0	0	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
18-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	2	3	3	3	3	3	4	3	1.5	4
19-Jan	2	Z	2	2	1	1	0	1	0	1	1	1	1	2	1	2	2	2	2	2	2	1	1	1	1.3	2
20-Jan	1	1	Z	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
21-Jan	0	0	0	Z	0	0	0	0	0	0	1	1	2	1	1	1	0	0	0	0	0	1	1	1	0.5	2
22-Jan	1	1	1	1	Z	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	2	2	1.3	2
23-Jan	2	2	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
24-Jan	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
25-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	0.9	2
26-Jan	1	1	Z	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	1.2	2
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
30-Jan	Z	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
31-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	Diurnal Average	
	2	2	2	2	1	1	1	2	2	2	2	2	2	2	3	2	2	3	3	3	3	3	4	3	Diurnal Maximum	

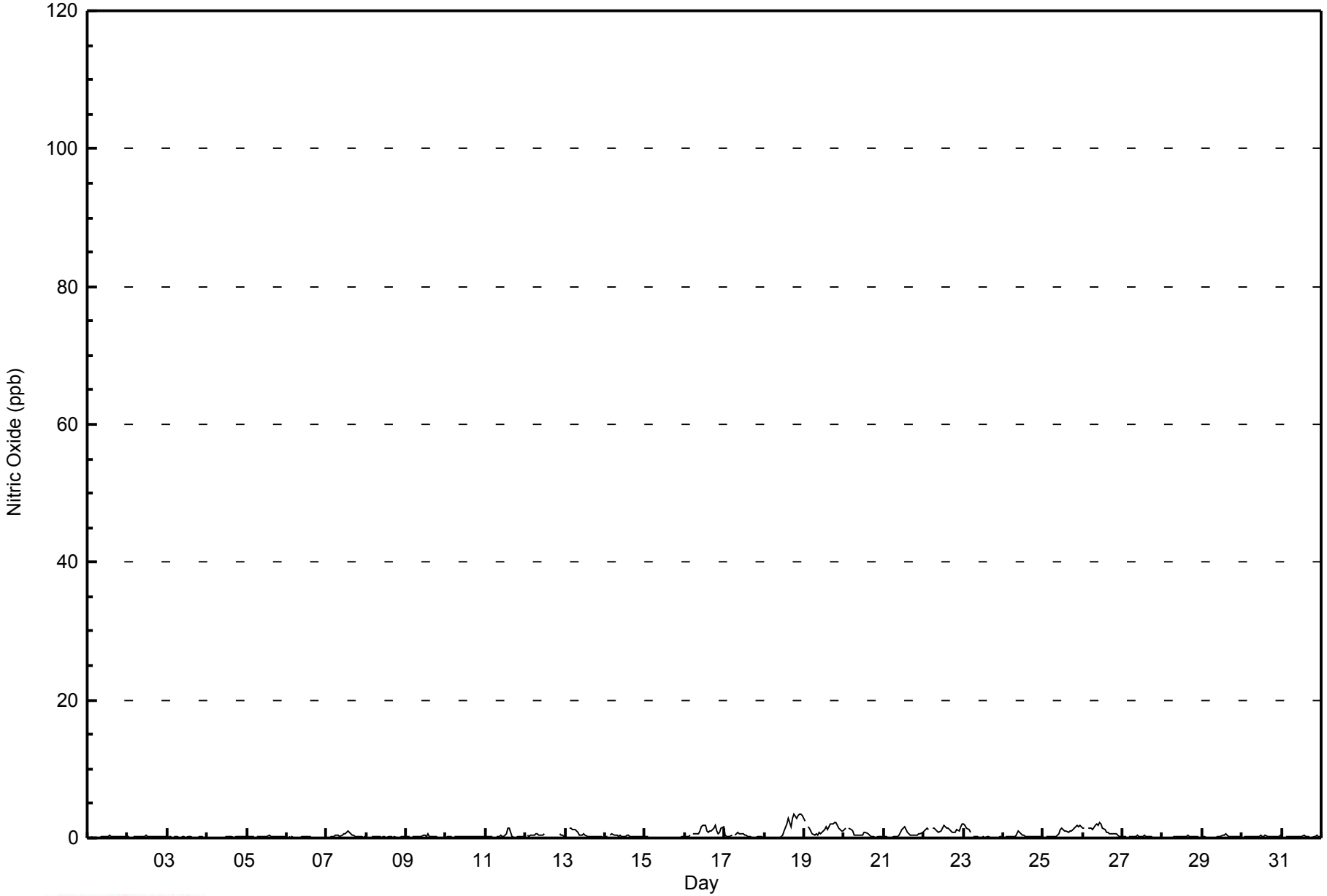
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Fort Chipewyan - January 2015



AURORA
ATMOSPHERICS INC.

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

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort Chipewyan - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	23	12	7	37	108	38	10	8	9	8	11	13	82	108	155	70	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	23	12	7	37	108	38	10	8	9	8	11	13	82	108	155	70	699

Total Number of Valid Hours: 699

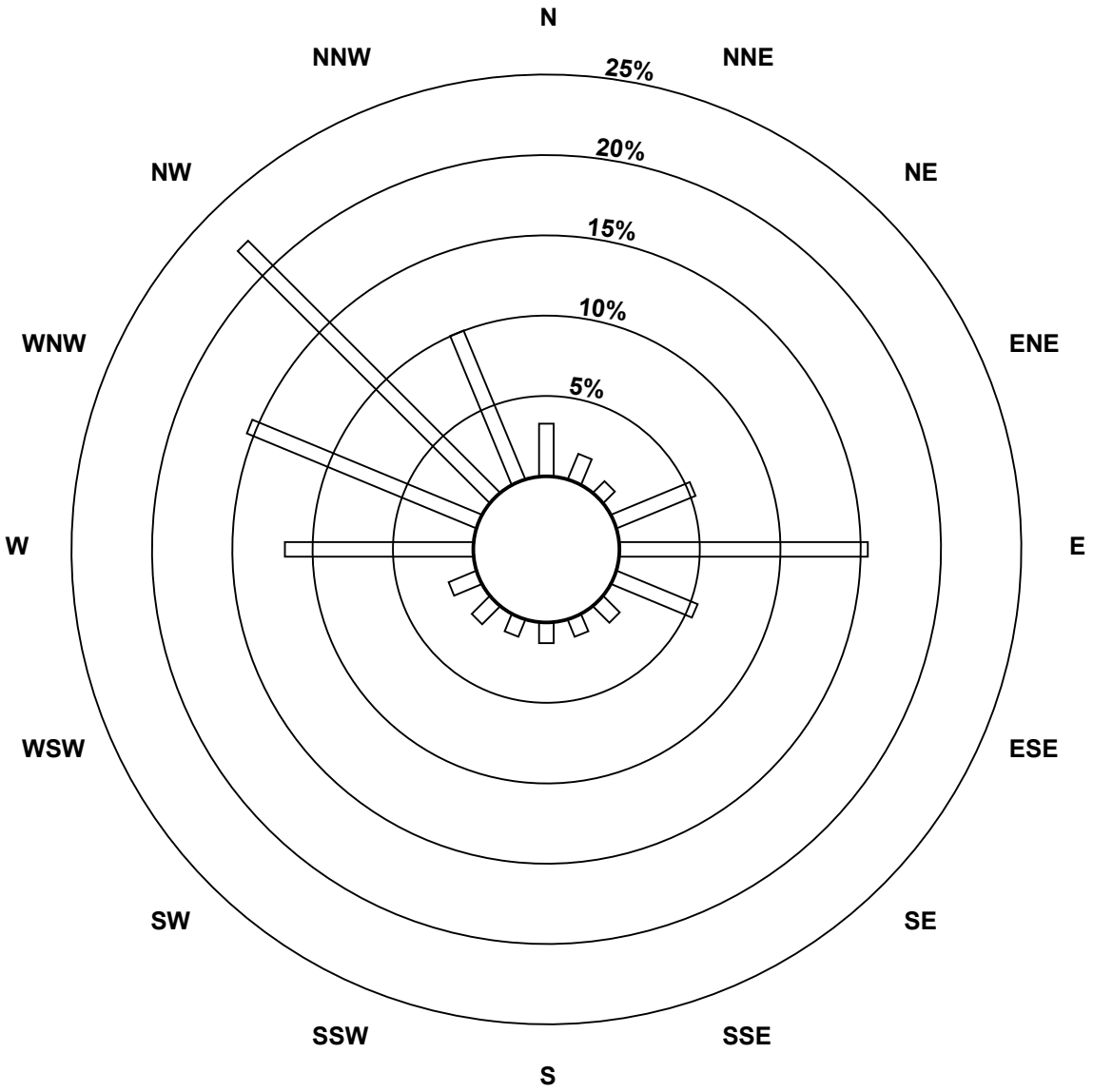
Total Number of Hours: 744

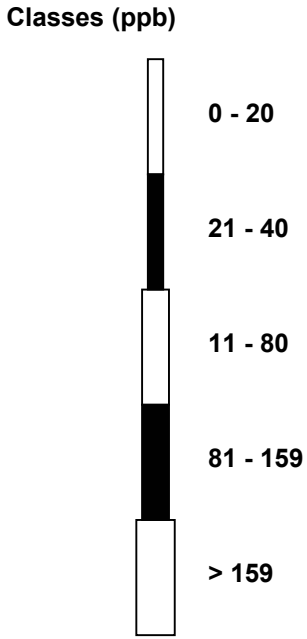
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Fort Chipewyan (AMS 8)





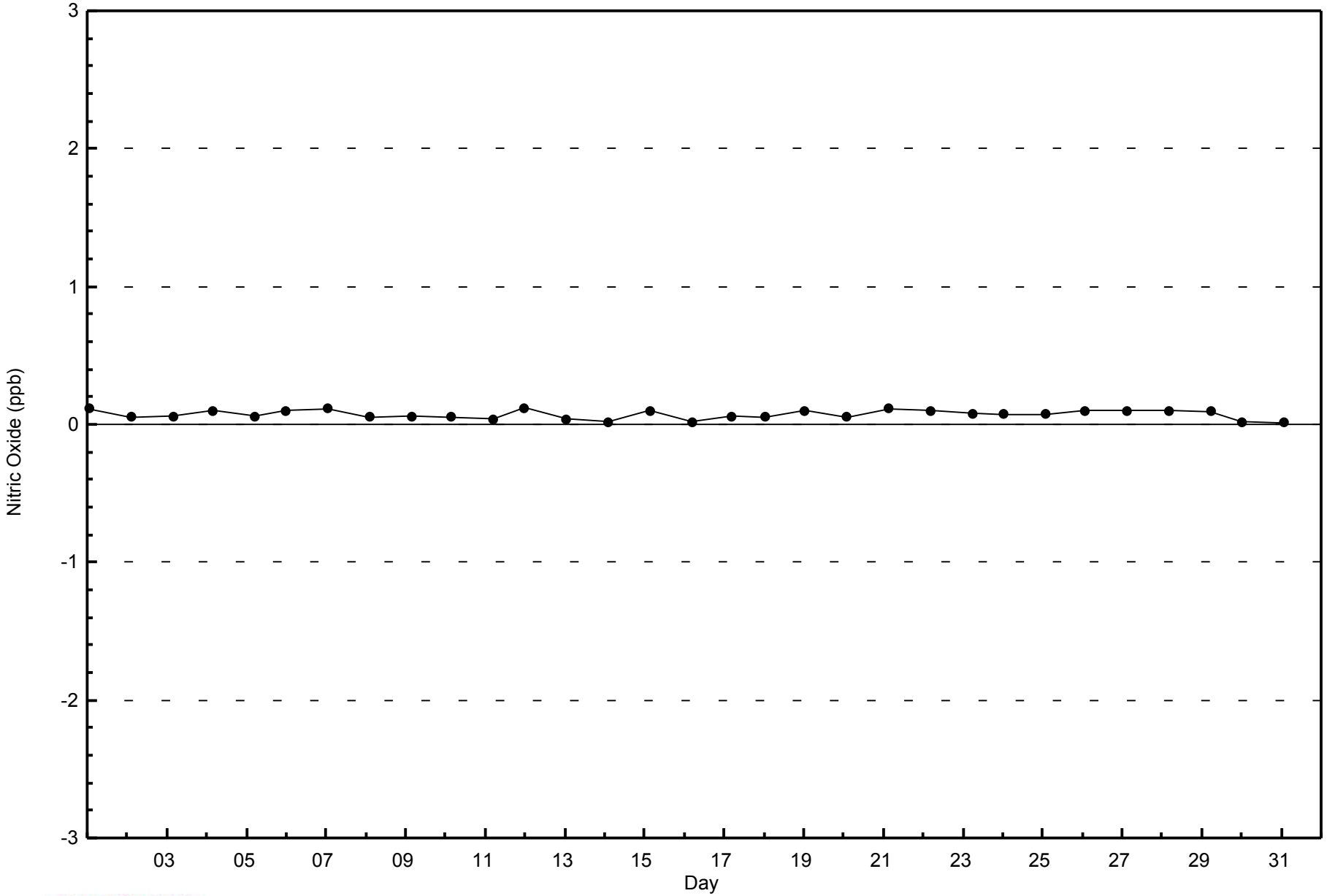
Total Number of Valid Hours: 699

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Fort Chipewyan - January 2015



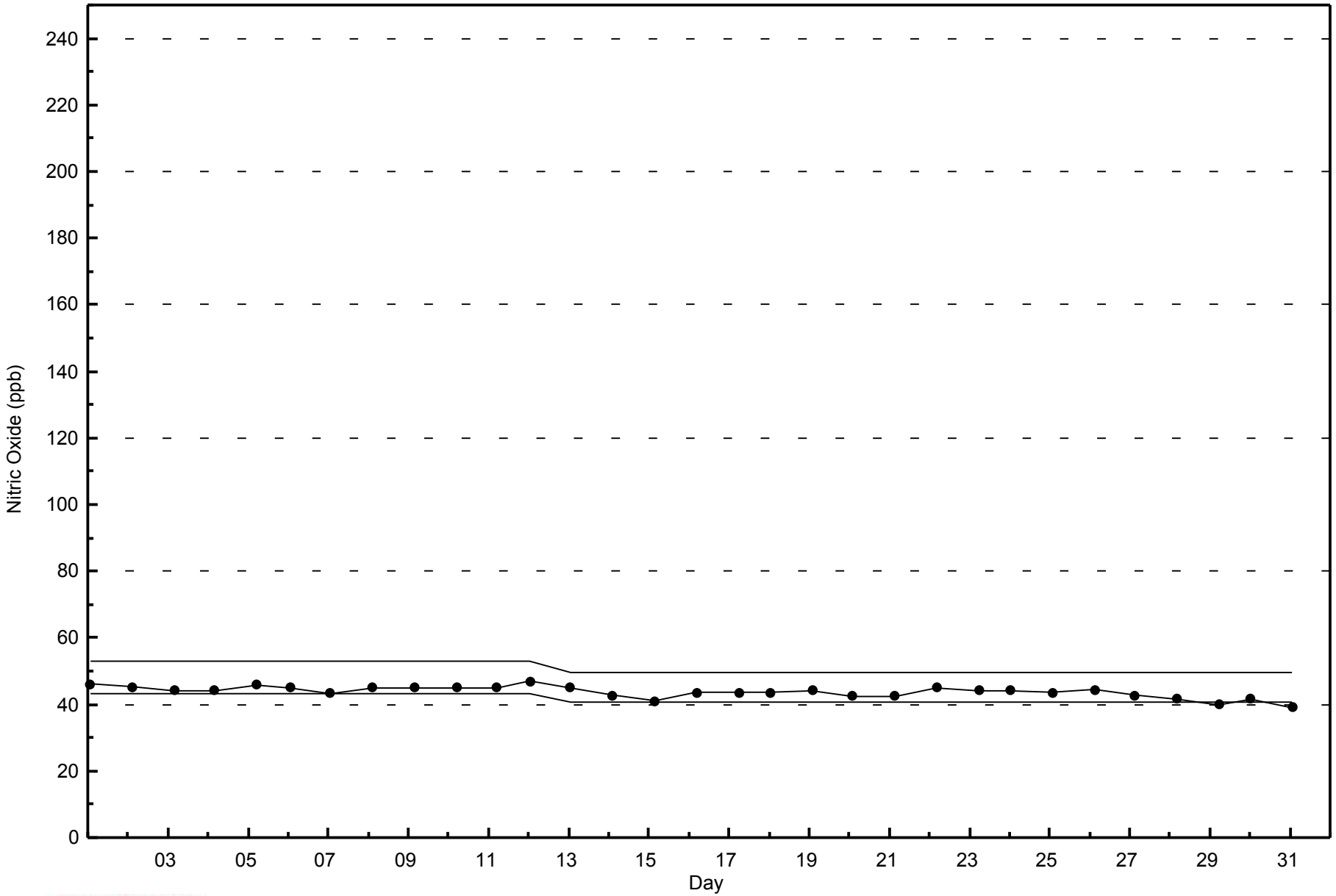
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 21 ppb on Jan 7 07:00 Maximum Daily Average: 7.6 ppb on Jan 7

Minimum Value: 0 ppb on Jan 15 21:00 Minimum Daily Average: 0.8 ppb on Jan 3
Maximum Diurnal Average: 3.4 ppb at hour 14 Minimum Diurnal Average: 2.4 ppb at hour 19
Monthly Average: 2.9 ppb Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 4$ $P_{90} = 6$ $P_{99} = 14$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
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-Jan	7	Z	2	2	1	1	1	1	2	2	2	2	3	2	2	2	2	1	1	1	1	1	1	1	1.8	7
2-Jan	1	1	Z	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1.3	2
3-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2	1.3	2
5-Jan	2	2	2	2	2	Z	2	2	2	2	2	2	1	2	2	2	2	2	1	1	2	2	1	1	1.7	2
6-Jan	Z	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1.1	2
7-Jan	2	Z	5	8	15	20	21	18	15	11	7	5	6	7	8	7	8	6	2	1	1	1	1	1	7.6	21
8-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
9-Jan	1	1	1	Z	2	2	2	2	1	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1.6	3
10-Jan	1	2	1	1	Z	1	1	1	1	1	1	1	2	2	2	2	1	2	1	2	1	1	2	1	1.4	2
11-Jan	2	1	2	2	2	Z	2	3	2	3	2	1	3	6	8	9	7	4	5	11	15	12	11	10	5.3	15
12-Jan	Z	7	6	7	7	7	6	5	4	4	3	3	C	C	C	C	C	C	C	C	2	2	3	2	--	7
13-Jan	2	Z	4	4	4	4	4	5	3	2	2	4	3	2	1	2	2	1	1	1	1	1	1	1	2.3	5
14-Jan	1	1	Z	2	3	4	3	3	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2.0	4
15-Jan	2	2	2	Z	1	1	1	2	3	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	0.9	3
16-Jan	2	2	2	3	Z	4	5	6	9	11	11	10	8	6	5	5	5	5	5	5	4	5	5	5	5.5	11
17-Jan	3	2	2	2	3	Z	4	4	5	5	4	4	3	3	1	1	1	1	1	1	1	1	1	1	2.3	5
18-Jan	Z	1	1	1	1	1	1	1	1	1	2	4	6	9	12	11	8	6	6	6	6	6	6	6	4.3	12
19-Jan	6	Z	5	5	5	4	3	4	4	5	4	4	5	6	5	5	6	6	5	6	5	5	5	5	4.8	6
20-Jan	5	5	Z	5	5	5	4	4	3	3	3	3	6	5	4	4	3	2	1	1	1	1	2	2	3.3	6
21-Jan	3	2	1	Z	2	2	3	4	4	4	5	7	9	9	8	7	7	5	4	5	4	5	5	6	4.7	9
22-Jan	6	7	7	7	Z	7	6	6	6	6	6	6	6	6	6	6	5	5	5	5	6	6	6	6	6.0	7
23-Jan	6	6	6	6	7	Z	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.1	7
24-Jan	Z	1	1	2	2	2	2	3	4	5	5	4	4	3	2	2	2	2	2	2	2	2	2	2	2.5	5
25-Jan	1	Z	1	1	2	3	2	2	3	4	7	6	6	5	5	5	5	5	5	5	6	6	6	6	4.2	7
26-Jan	5	5	Z	5	6	6	5	5	5	5	5	6	5	5	5	5	5	5	4	4	4	4	3	2	4.8	6
27-Jan	2	2	2	Z	2	2	1	2	2	3	2	2	3	4	3	2	3	4	2	2	1	1	1	1	2.1	4
28-Jan	1	1	1	2	Z	1	1	2	2	2	2	2	2	3	2	2	2	2	1	3	3	2	1	2	1.7	3
29-Jan	4	3	2	3	1	Z	1	1	1	1	1	1	2	1	2	3	2	4	4	3	2	2	2	2	2.0	4
30-Jan	Z	3	2	2	2	1	1	1	1	1	2	2	2	3	2	2	2	2	1	1	1	2	2	3	1.8	3
31-Jan	2	Z	2	1	1	2	2	4	3	1	0	1	1	1	1	1	2	1	4	6	9	13	14	13	3.7	14
	2.6	2.4	2.4	3.0	3.0	3.2	3.0	3.1	3.0	2.9	2.8	3.0	3.2	3.4	3.3	3.2	2.9	2.6	2.4	2.7	2.8	2.9	2.9	2.9	Diurnal Average	
	7	7	7	8	15	20	21	18	15	11	11	10	9	9	12	11	8	6	6	11	15	13	14	13	Diurnal Maximum	

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

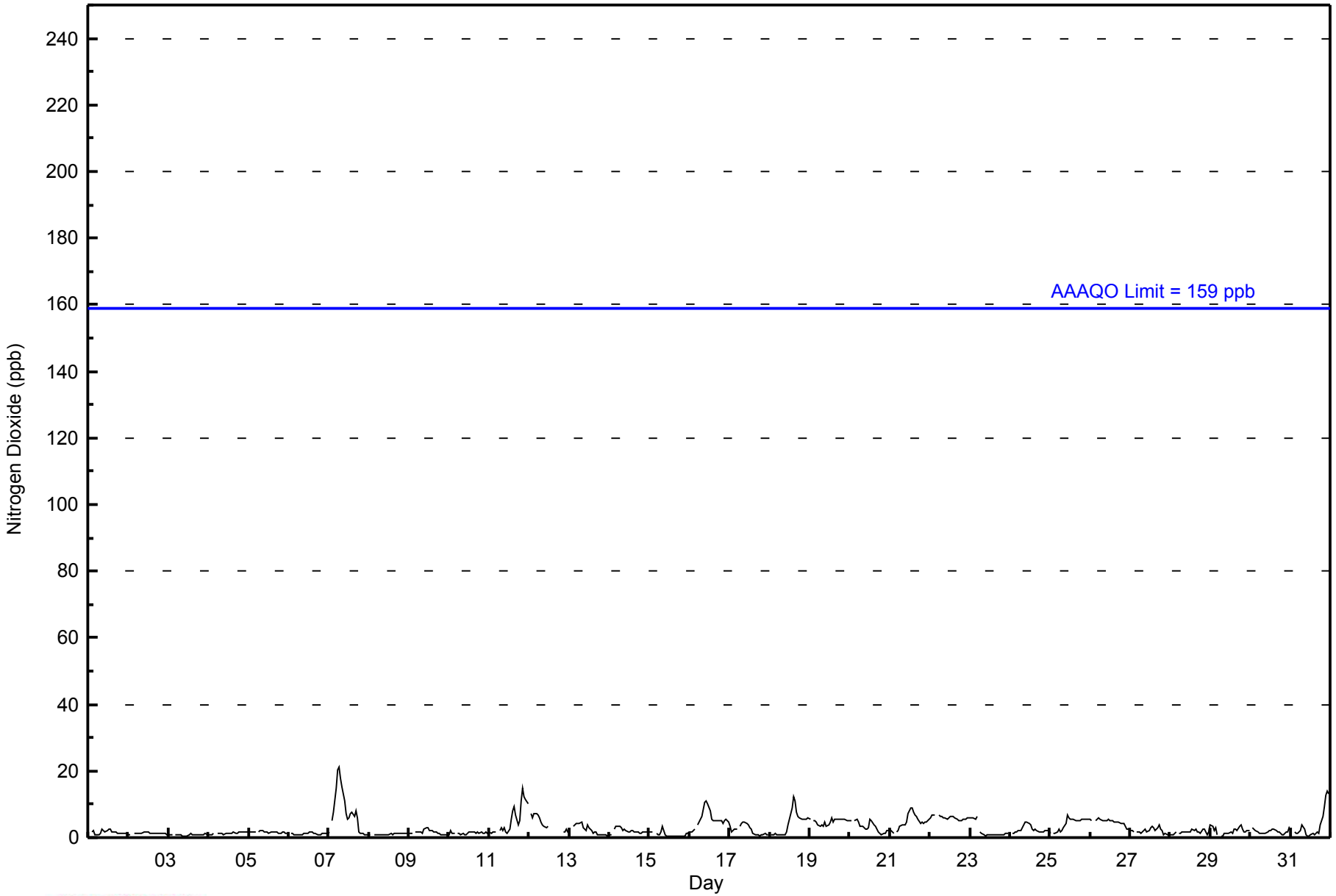
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 705

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	23	12	7	37	108	38	9	8	9	8	11	13	82	108	155	70	698
21 - 40	0	0	0	0	0	0	1	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	23	12	7	37	108	38	10	8	9	8	11	13	82	108	155	70	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

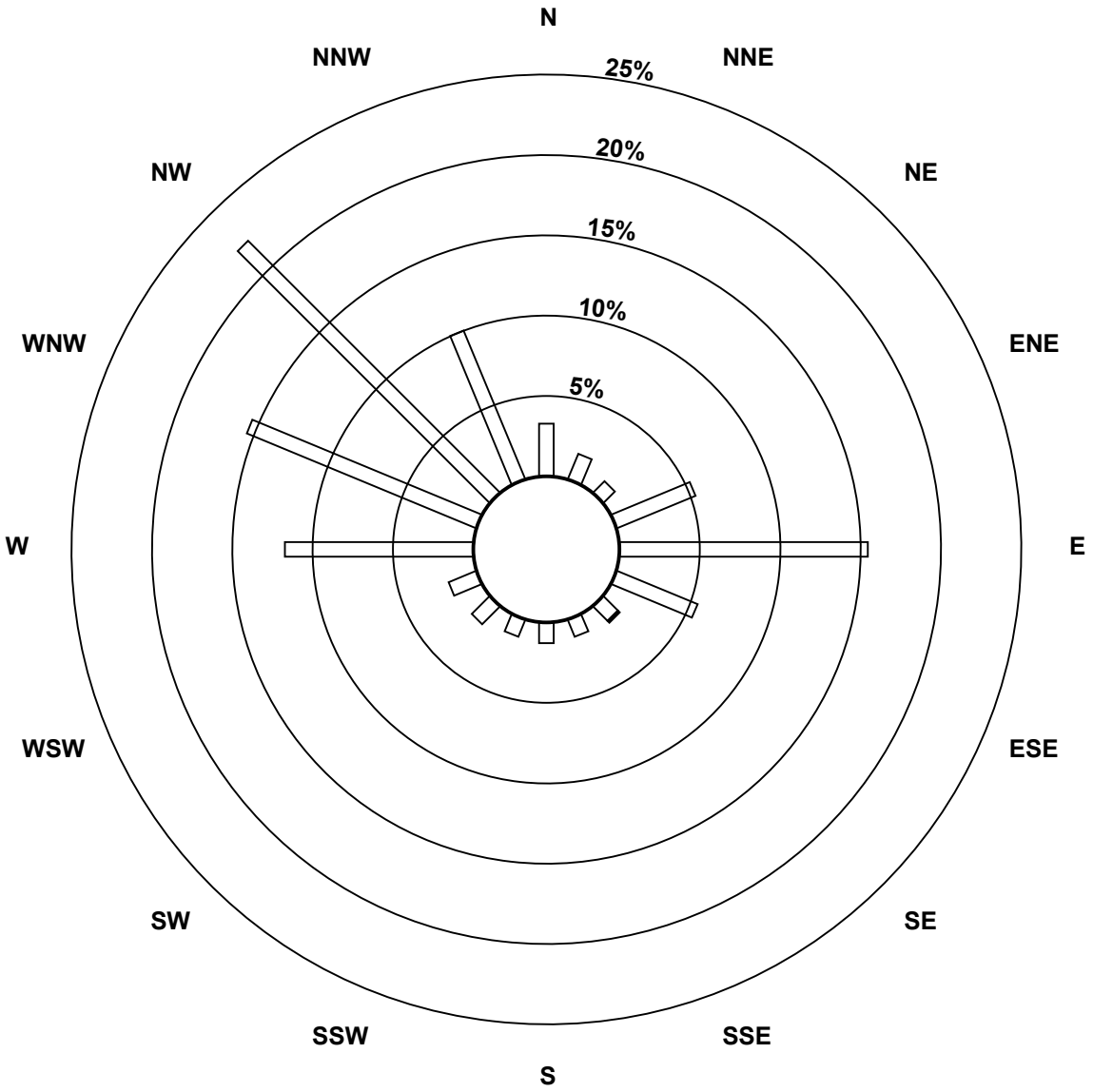
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

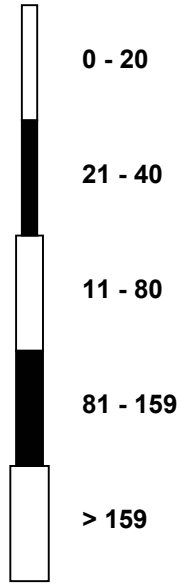
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan (AMS 8)



Classes (ppb)



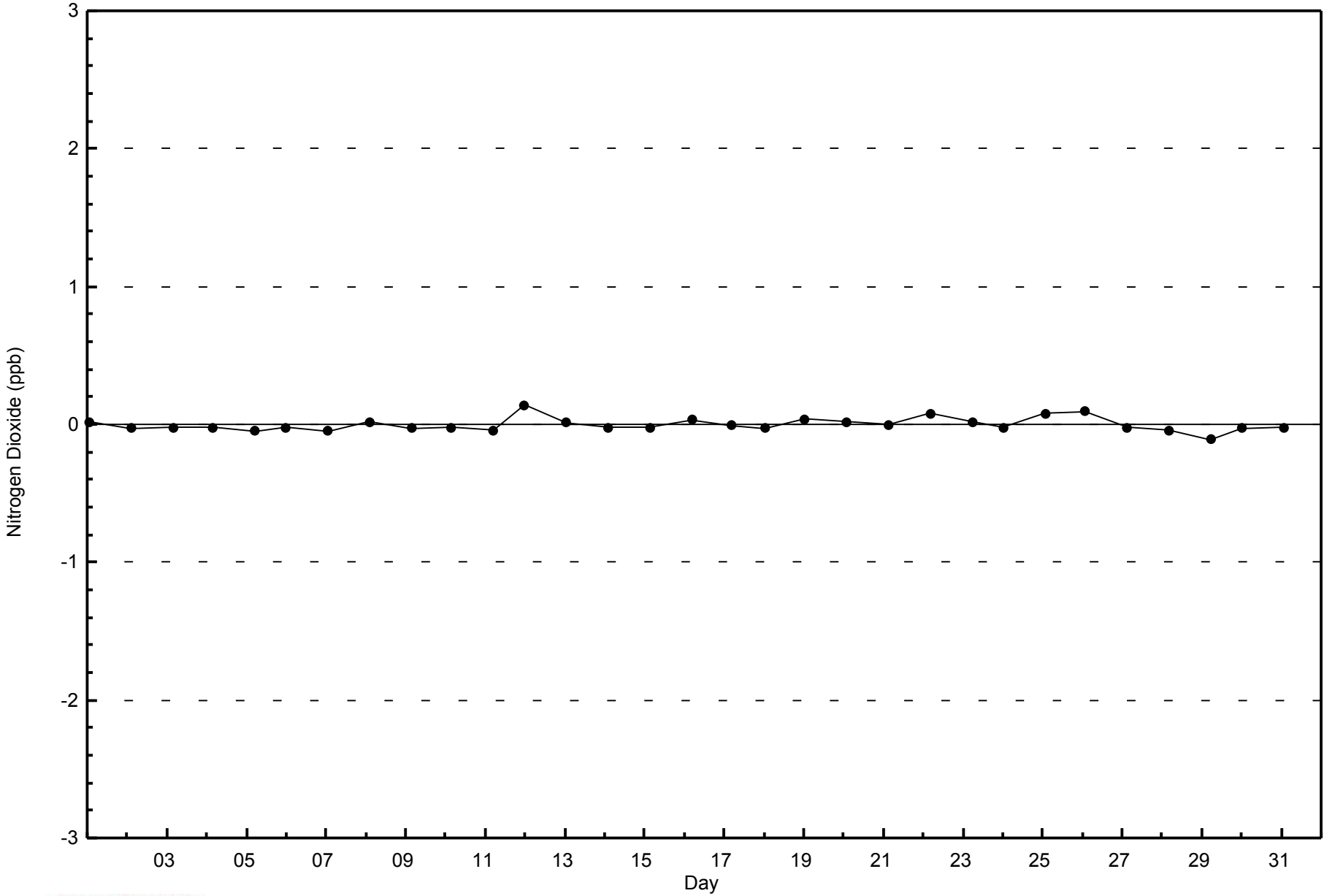
Total Number of Valid Hours: 699

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - January 2015



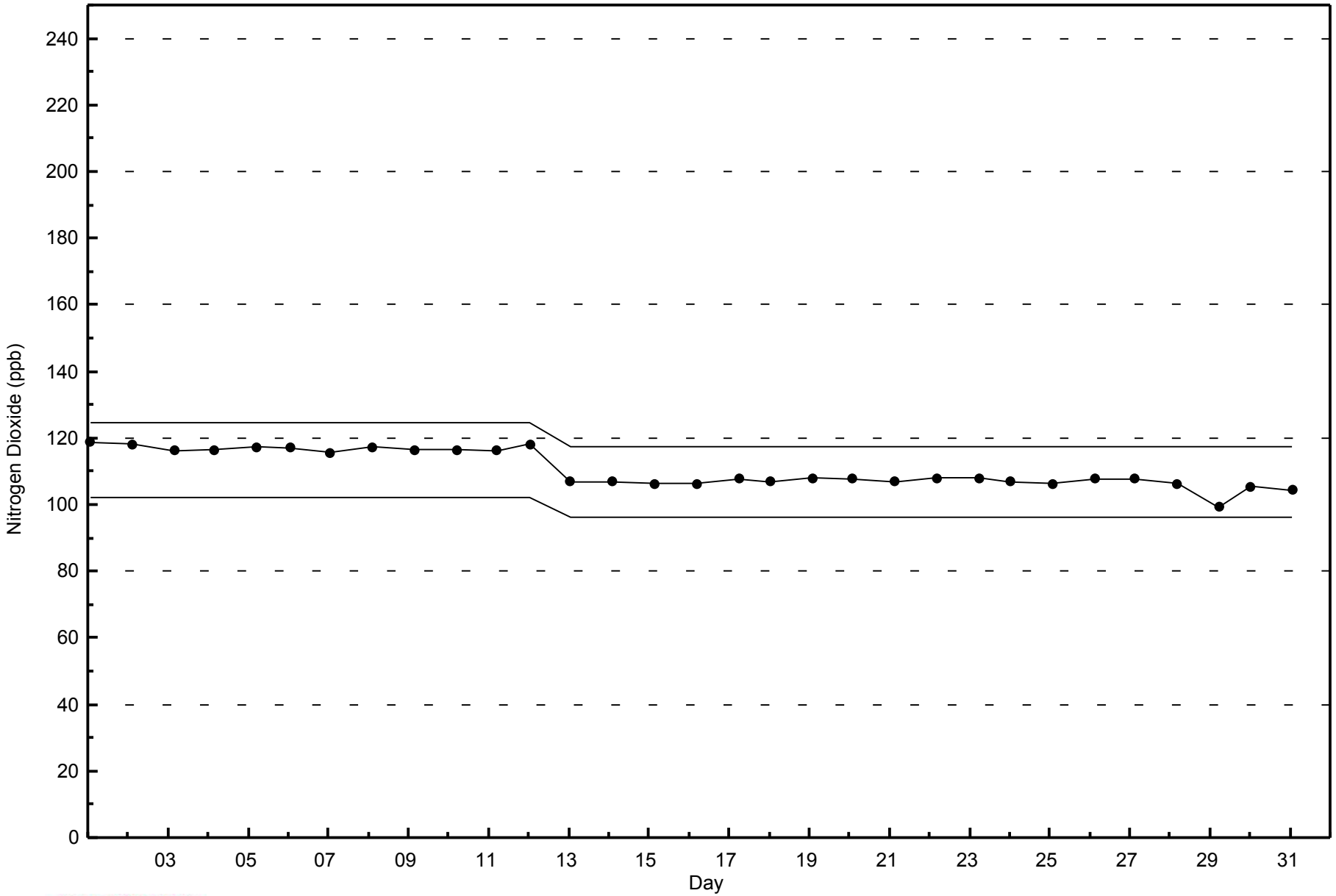
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - January 2015

Maximum Value: 22 ppb on Jan 7 07:00

Maximum Daily Average: 8.0 ppb on Jan 7

Minimum Value: 0 ppb on Jan 15 21:00

Minimum Daily Average: 0.9 ppb on Jan 3

Maximum Diurnal Average: 4.0 ppb at hour 14

Minimum Diurnal Average: 2.8 ppb at hour 3

Monthly Average: 3.3 ppb

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 5$ $P_{90} = 7$ $P_{99} = 15$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
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-Jan	7	Z	2	2	1	1	1	2	3	2	2	3	3	3	2	2	2	2	2	2	2	1	1	1	2.0	7
2-Jan	1	1	Z	2	2	2	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1.5	2
3-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	2	1	1	2	1	2	2	2	2	2	2	2	1.4	2
5-Jan	2	2	2	2	2	Z	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1.8	2
6-Jan	Z	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1.3	2
7-Jan	2	Z	5	8	15	21	22	18	16	11	8	6	7	8	8	7	9	6	2	1	1	1	1	1	8.0	22
8-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	1
9-Jan	1	1	1	Z	2	2	2	2	2	3	3	3	2	3	3	2	2	2	1	1	1	1	1	1	1.8	3
10-Jan	1	2	1	1	Z	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	2	1.5	2
11-Jan	2	2	2	2	2	Z	2	3	2	3	2	2	3	7	9	10	7	4	5	11	15	12	12	11	5.6	15
12-Jan	Z	8	6	7	8	7	6	5	4	4	4	4	C	C	C	C	C	C	C	C	3	2	3	2	--	8
13-Jan	3	Z	5	5	5	5	6	5	3	3	3	4	4	2	1	2	2	1	1	1	1	1	1	1	2.8	6
14-Jan	1	1	Z	3	4	4	4	3	2	3	3	2	2	2	2	2	2	2	1	2	2	2	2	2	2.2	4
15-Jan	2	2	2	Z	1	1	1	2	4	1	1	1	1	1	1	1	1	1	1	0	0	1	1	2	1.1	4
16-Jan	2	2	2	3	Z	4	5	7	9	12	13	12	10	7	6	6	6	6	7	6	5	6	7	6	6.5	13
17-Jan	4	2	2	3	3	Z	4	5	6	5	5	5	3	3	1	1	1	1	1	1	1	1	1	1	2.6	6
18-Jan	Z	1	1	1	1	1	1	1	1	1	2	4	7	11	15	13	9	9	9	8	9	9	9	9	5.8	15
19-Jan	8	Z	7	6	6	5	4	4	4	5	4	5	6	7	6	7	7	7	8	8	7	7	6	6	6.1	8
20-Jan	6	6	Z	7	7	6	4	4	4	3	3	3	6	6	4	4	3	2	1	1	1	2	2	2	3.8	7
21-Jan	3	2	1	Z	2	2	3	4	4	4	6	8	11	10	9	7	7	6	5	5	5	5	5	6	5.2	11
22-Jan	7	8	8	8	Z	8	8	8	7	7	7	7	8	8	8	8	6	6	6	6	7	6	8	8	7.2	8
23-Jan	8	8	7	7	7	Z	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.4	8
24-Jan	Z	2	2	2	2	2	2	3	5	6	6	5	4	3	2	3	2	2	2	2	2	2	3	2	2.8	6
25-Jan	2	Z	2	1	2	3	2	3	3	5	8	7	7	6	6	6	6	6	6	7	7	7	7	7	5.1	8
26-Jan	7	7	Z	6	7	8	7	7	7	7	7	8	7	7	6	6	5	5	5	5	5	4	3	3	5.9	8
27-Jan	2	2	2	Z	2	2	2	2	2	3	2	3	3	4	3	2	3	4	2	2	1	1	1	1	2.2	4
28-Jan	1	1	1	2	Z	1	1	2	2	2	2	2	2	3	2	3	2	2	1	3	3	2	1	2	1.9	3
29-Jan	4	3	2	3	1	Z	1	1	1	1	2	2	2	2	3	3	2	4	4	3	2	2	2	2	2.2	4
30-Jan	Z	3	3	2	2	2	1	1	1	2	2	3	3	3	3	2	2	2	1	1	1	2	2	3	2.0	3
31-Jan	2	Z	2	1	1	2	2	4	3	1	1	1	1	2	1	2	2	2	4	7	9	13	14	13	3.9	14
	3.0	2.8	2.8	3.4	3.4	3.6	3.3	3.4	3.4	3.3	3.3	3.5	3.7	4.0	3.8	3.6	3.3	3.0	2.8	3.1	3.3	3.3	3.4	3.3	Diurnal Average	
	8	8	8	8	15	21	22	18	16	12	13	12	11	11	15	13	9	9	9	11	15	13	14	13	Diurnal Maximum	

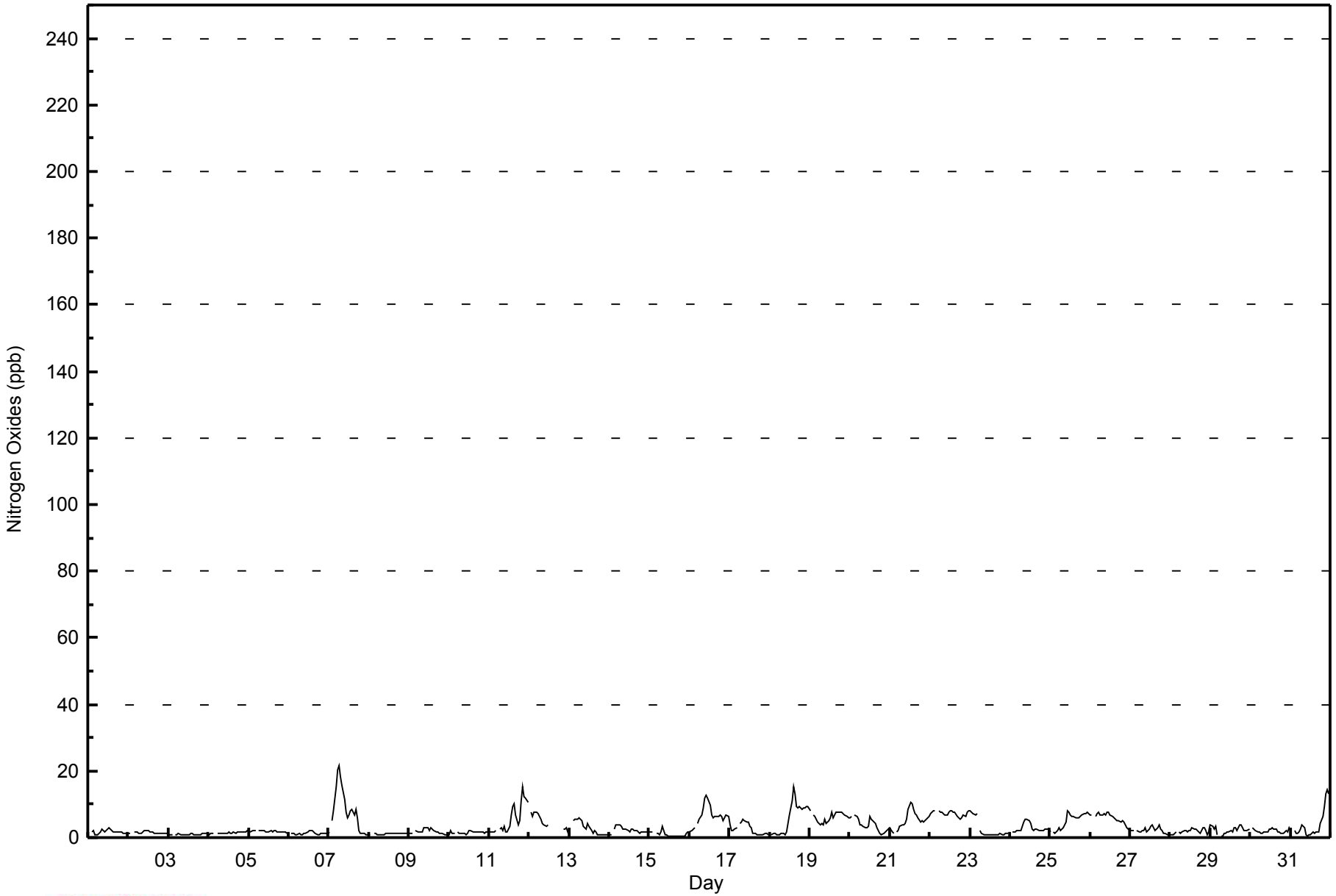
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.72	99.72
21 - 40	2	0.28	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

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	23	12	7	37	108	38	9	8	8	8	11	13	82	108	155	70	697
21 - 40	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	23	12	7	37	108	38	10	8	9	8	11	13	82	108	155	70	699

Total Number of Valid Hours: 699

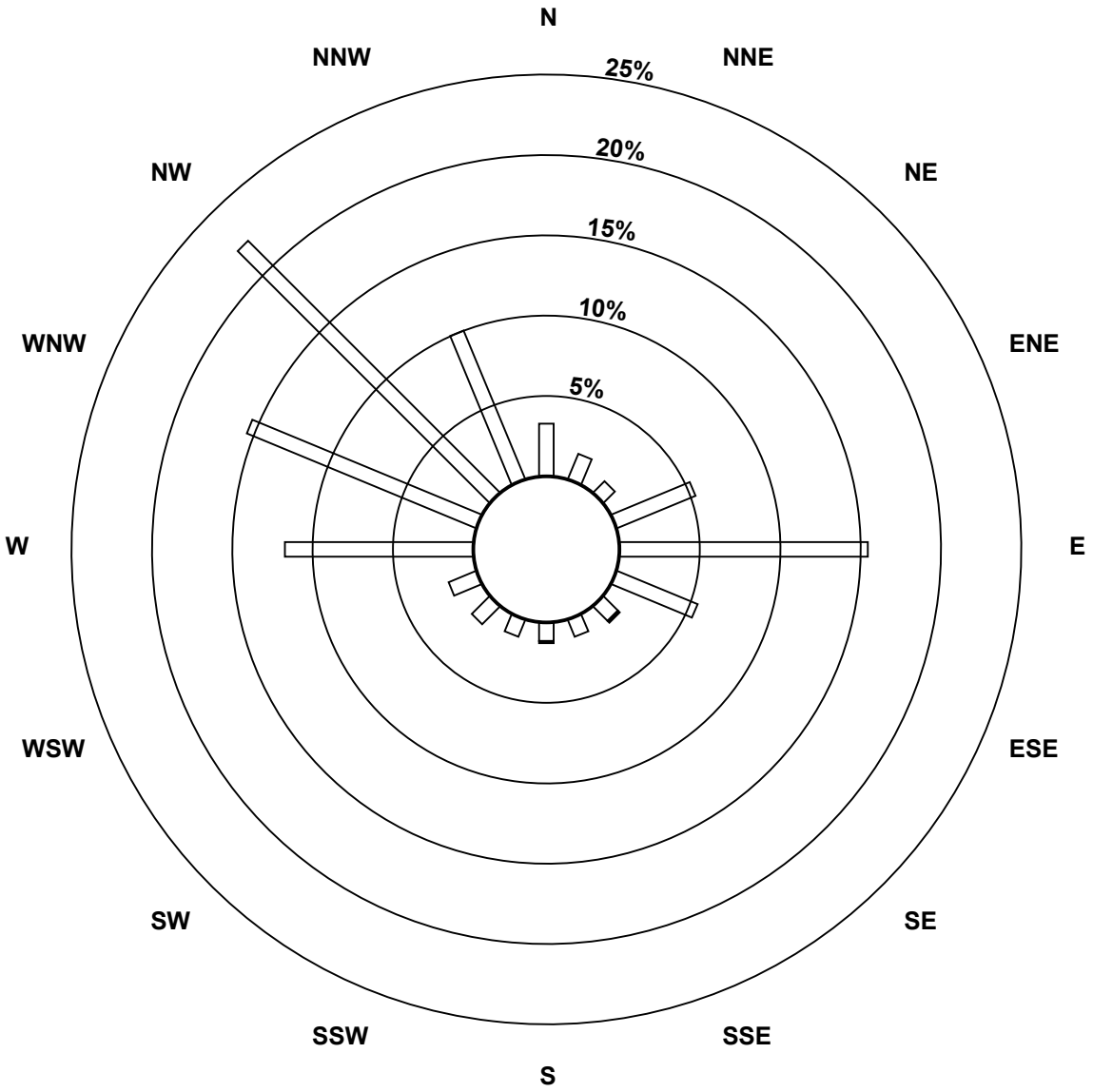
Total Number of Hours: 744

Wood Buffalo Environmental Association

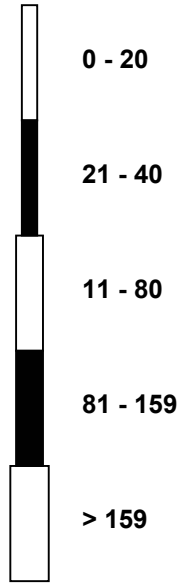
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan (AMS 8)



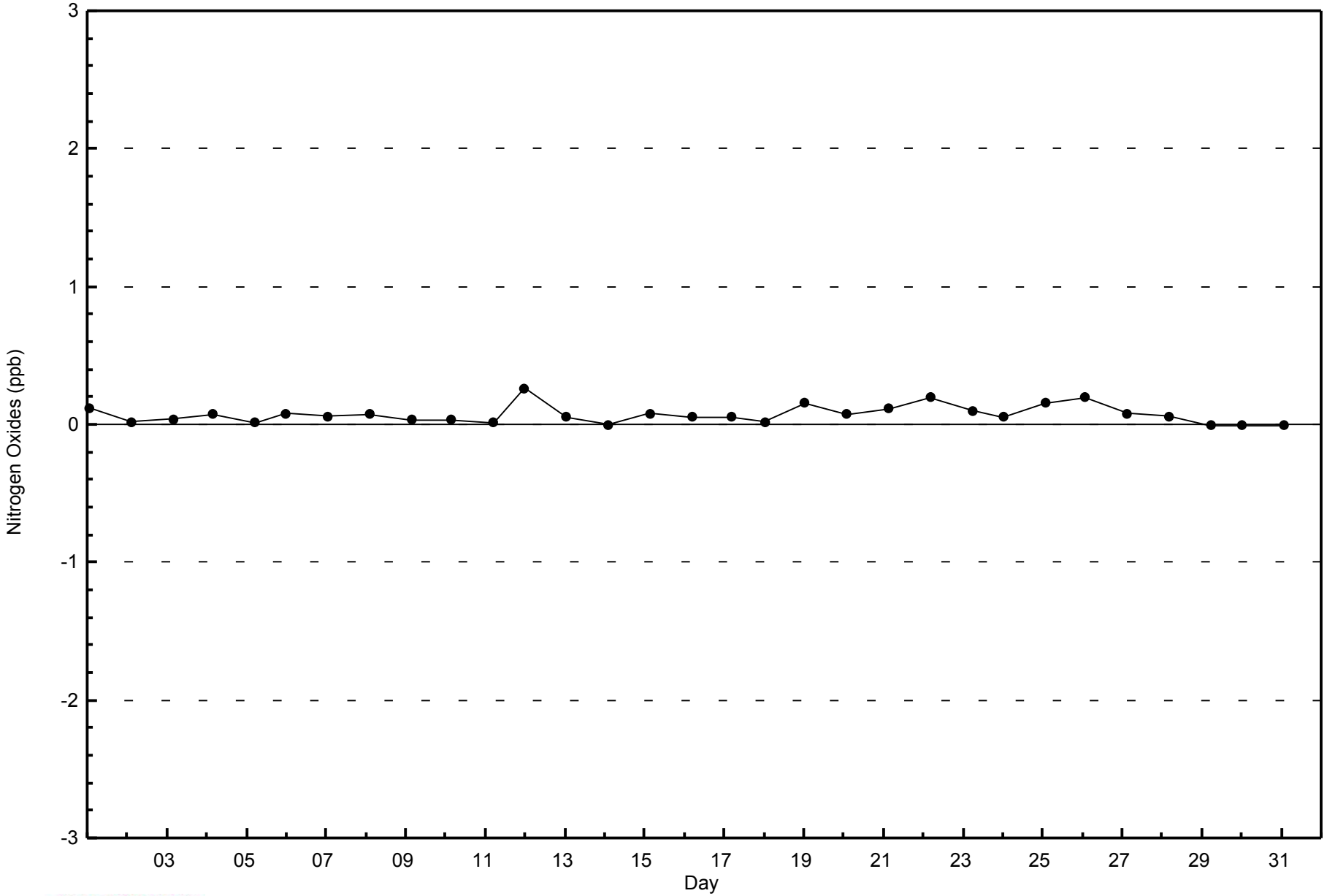
Classes (ppb)



Total Number of Valid Hours: 699

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Fort Chipewyan - January 2015



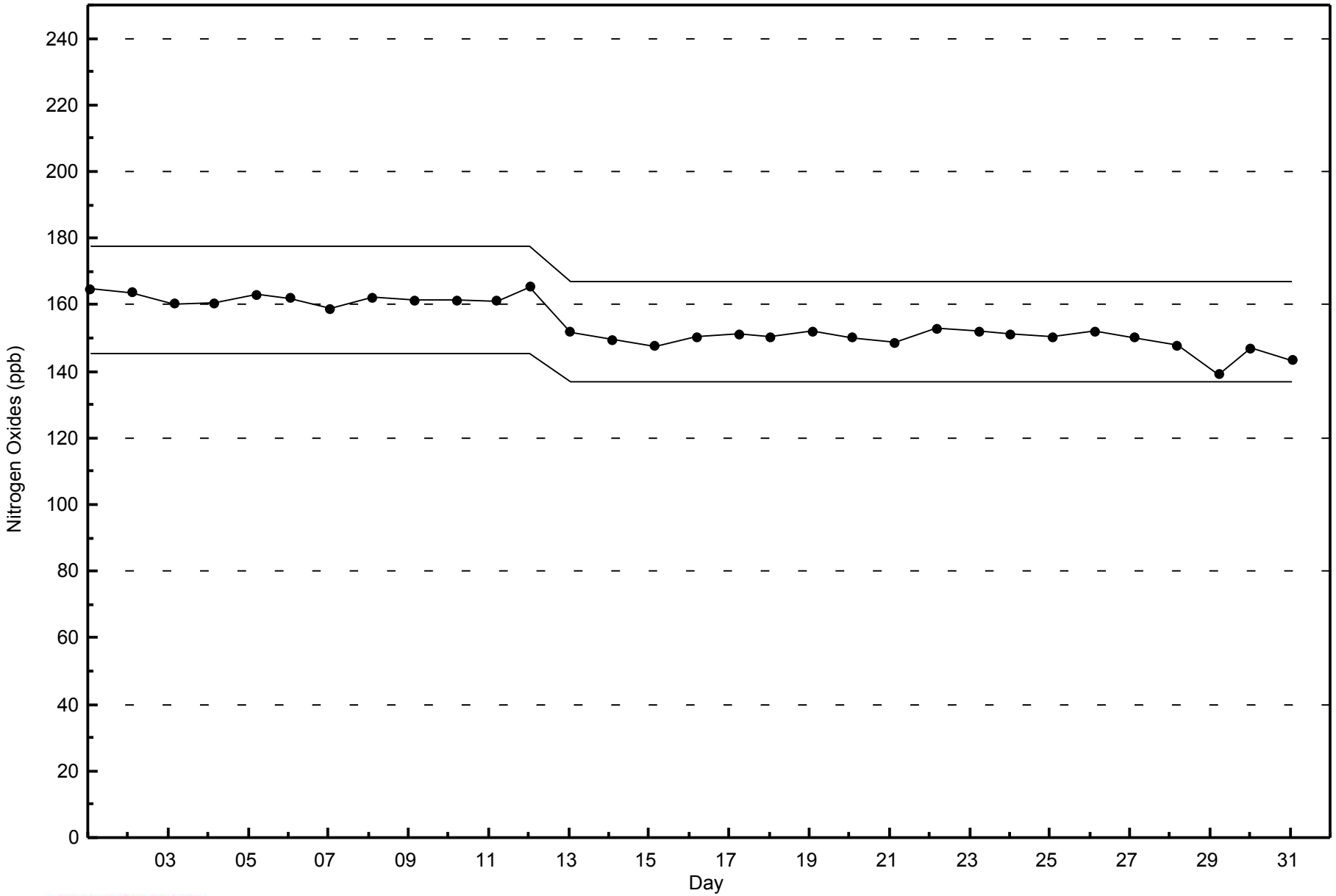
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort Chipewyan - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 35 ppb on Jan 15 22:00 Maximum Daily Average: 31.7 ppb on Jan 8

Minimum Value: 10 ppb on Jan 7 07:00 Minimum Daily Average: 18.0 ppb on Jan 22
Maximum Diurnal Average: 26.8 ppb at hour 19 Minimum Diurnal Average: 24.2 ppb at hour 8
Monthly Average: 25.5 ppb Percentiles: P_1 = 14 P_{10} = 19 Q_1 = 22 Median = 26 Q_3 = 29 P_{90} = 31 P_{99} = 34

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)																								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-Jan	26	29	30	Z	32	32	31	30	28	26	26	24	25	24	28	28	29	28	29	30	30	29	28	29	28.4	32
2-Jan	29	28	28	29	Z	29	28	29	29	28	29	29	29	30	30	29	29	29	29	29	28	28	28	28	28.7	30
3-Jan	26	26	26	26	26	Z	25	24	24	24	26	26	26	25	25	24	24	24	24	24	24	25	25	25	25.1	26
4-Jan	25	25	26	26	26	27	Z	28	28	29	29	29	29	29	30	30	30	30	30	30	30	30	29	29	28.5	30
5-Jan	29	28	28	28	28	28	28	Z	29	30	30	30	31	31	30	30	29	30	30	29	29	28	28	28	29.2	31
6-Jan	28	28	Z	26	26	26	27	26	26	26	26	25	26	27	27	26	26	26	26	26	25	26	28	27	26.3	28
7-Jan	26	24	23	Z	14	10	10	13	14	19	22	25	24	23	22	22	20	23	29	29	31	34	34	34	22.8	34
8-Jan	33	33	33	33	Z	32	33	33	32	32	32	32	32	32	32	31	31	30	30	30	31	31	31	31	31.7	33
9-Jan	30	30	30	30	29	Z	30	29	30	29	28	27	28	28	27	27	27	29	30	31	31	31	30	30	29.1	31
10-Jan	30	28	27	27	26	26	Z	25	26	25	25	24	26	27	27	26	26	25	25	24	24	24	23	23	25.6	30
11-Jan	23	23	23	23	22	22	22	Z	21	19	20	21	21	22	22	22	24	26	25	20	16	17	17	17	21.3	26
12-Jan	16	19	Z	19	19	19	20	22	24	25	26	25	22	24	24	24	24	C	C	C	C	26	25	27	22.6	27
13-Jan	24	22	23	Z	23	24	23	24	26	25	26	25	26	27	28	29	29	30	30	30	30	30	31	32	26.9	32
14-Jan	33	33	31	28	Z	26	26	26	27	26	27	28	29	29	29	29	28	29	30	30	29	29	29	29	28.6	33
15-Jan	29	29	30	30	30	Z	31	30	29	31	32	32	32	32	32	32	32	32	33	33	34	35	34	34	31.6	35
16-Jan	33	31	31	30	29	28	Z	23	20	17	16	17	19	21	22	22	22	21	21	24	25	22	20	22	23.3	33
17-Jan	26	28	28	29	29	29	28	Z	27	27	28	28	29	30	32	32	32	32	33	32	32	31	31	31	29.8	33
18-Jan	31	30	Z	30	30	30	30	29	29	29	27	21	18	14	10	14	19	20	21	21	21	20	18	18	23.1	31
19-Jan	20	21	21	Z	22	22	22	22	22	21	21	21	21	19	22	20	19	19	19	20	20	21	21	21	20.8	22
20-Jan	21	21	20	20	Z	21	21	20	21	21	22	22	17	20	22	22	23	24	26	26	25	24	23	23	21.9	26
21-Jan	23	24	25	24	24	Z	20	18	19	19	19	18	18	20	22	22	23	24	26	25	25	24	23	20	21.9	26
22-Jan	19	18	18	17	16	16	Z	14	15	17	15	15	14	14	15	16	18	22	23	22	22	23	22	21	18.0	23
23-Jan	21	22	22	23	22	22	28	Z	29	29	30	31	31	31	31	31	31	31	30	31	31	30	30	30	28.0	31
24-Jan	30	29	Z	28	27	27	28	25	24	23	23	25	27	29	29	28	29	30	30	30	29	28	28	28	27.6	30
25-Jan	30	30	28	Z	25	24	26	25	23	20	18	20	20	20	20	20	19	19	19	19	19	19	19	19	21.8	30
26-Jan	18	19	18	17	Z	15	15	16	17	17	17	17	18	19	20	21	22	22	23	23	23	24	26	26	19.7	26
27-Jan	26	26	26	25	25	Z	24	24	24	22	25	23	22	21	23	25	25	24	25	26	27	27	28	29	24.9	29
28-Jan	29	29	28	28	28	27	Z	26	25	24	24	24	24	24	25	27	29	29	29	25	24	23	25	26	26.2	29
29-Jan	23	22	23	22	24	25	27	Z	28	28	27	27	27	27	26	25	25	24	24	24	25	25	25	24	25.1	28
30-Jan	21	22	Z	25	28	30	31	30	30	30	29	28	28	27	28	29	30	30	31	31	30	28	29	28	28.3	31
31-Jan	29	28	25	Z	27	28	27	20	20	20	22	22	24	24	25	27	26	26	25	22	18	15	13	13	22.8	29
	26.0	26.0	25.8	25.6	25.3	24.8	25.4	24.2	24.7	24.5	24.8	24.6	24.6	24.8	25.3	25.5	25.8	26.4	26.8	26.6	26.3	26.0	25.9	25.8	Diurnal Average	
	33	33	33	33	32	32	33	33	32	32	32	32	32	32	32	32	32	32	33	33	34	35	34	34	Diurnal Maximum	

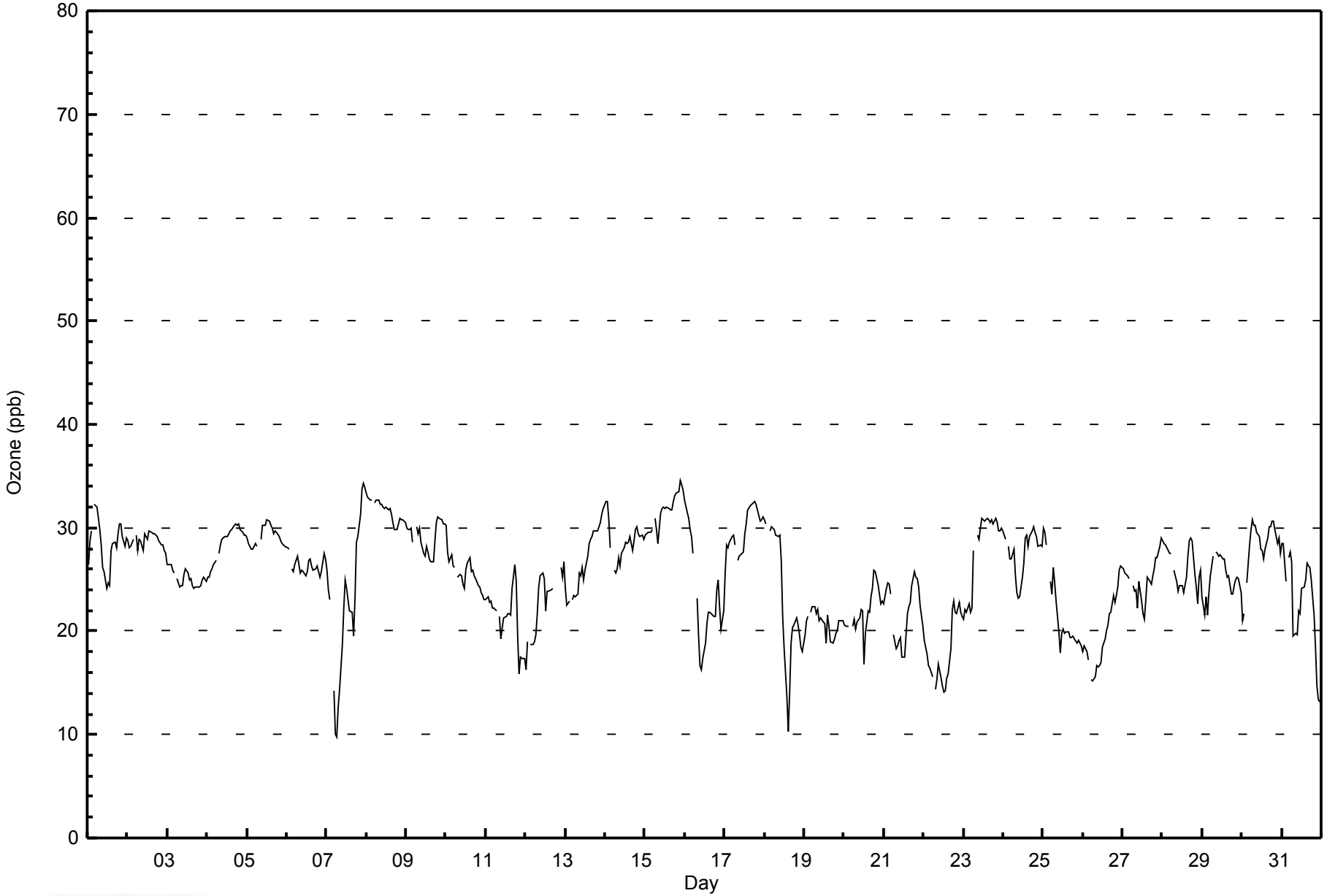
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA

Hourly Averages

Ozone (O_3) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	109	15.37	15.37
21 - 50	600	84.63	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

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Fort Chipewyan - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	2	4	2	0	12	3	4	1	5	5	3	4	8	15	16	20	104
21 - 50	20	7	5	37	96	33	6	8	2	3	10	9	76	95	140	52	599
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	22	11	7	37	108	36	10	9	7	8	13	13	84	110	156	72	703

Total Number of Valid Hours: 703

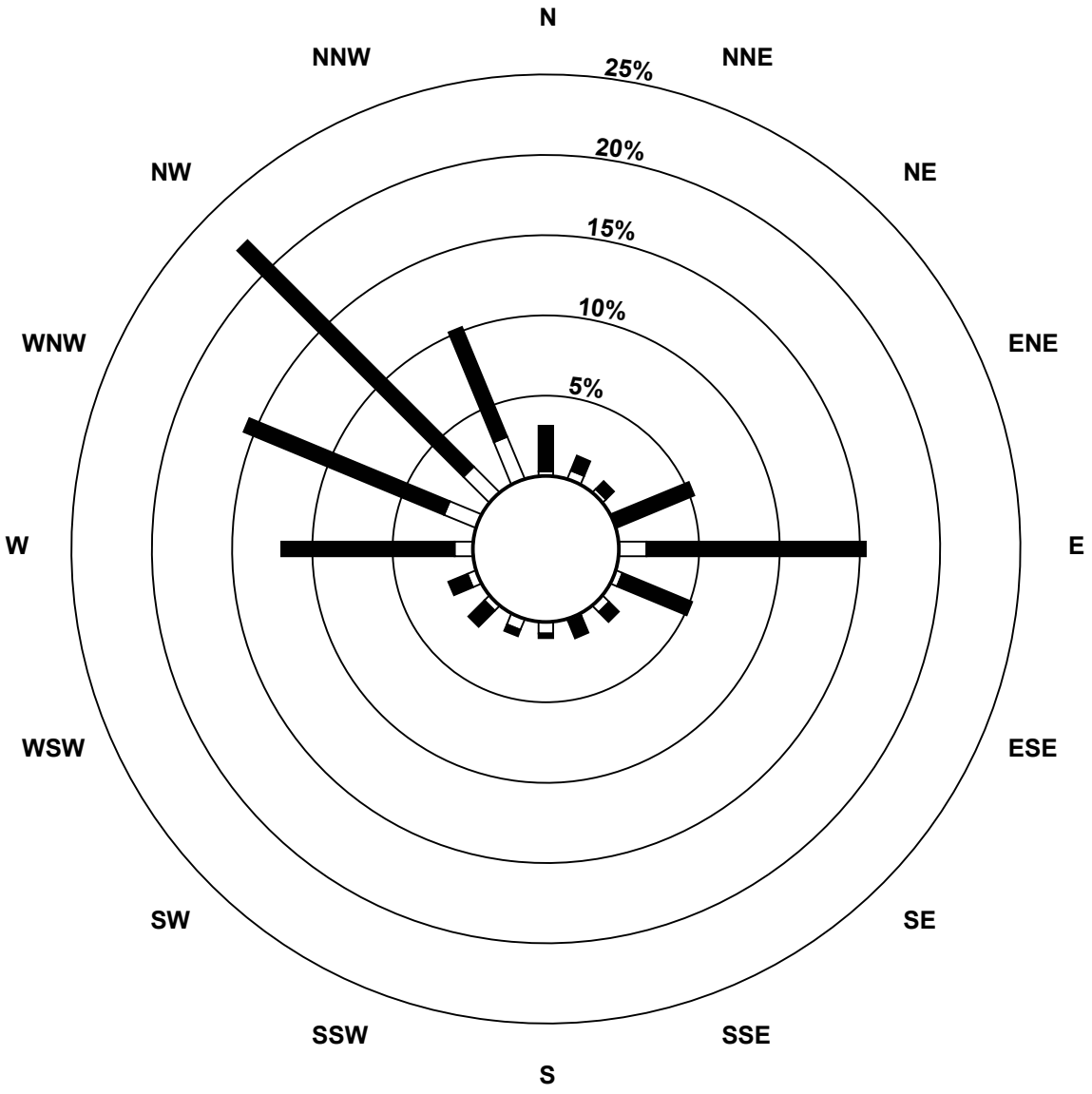
Total Number of Hours: 744

Wood Buffalo Environmental Association

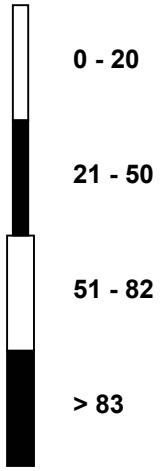
Wind Rose Jan 2015

Ozone (O_3) - ppb

Fort Chipewyan (AMS 8)



Classes (ppb)



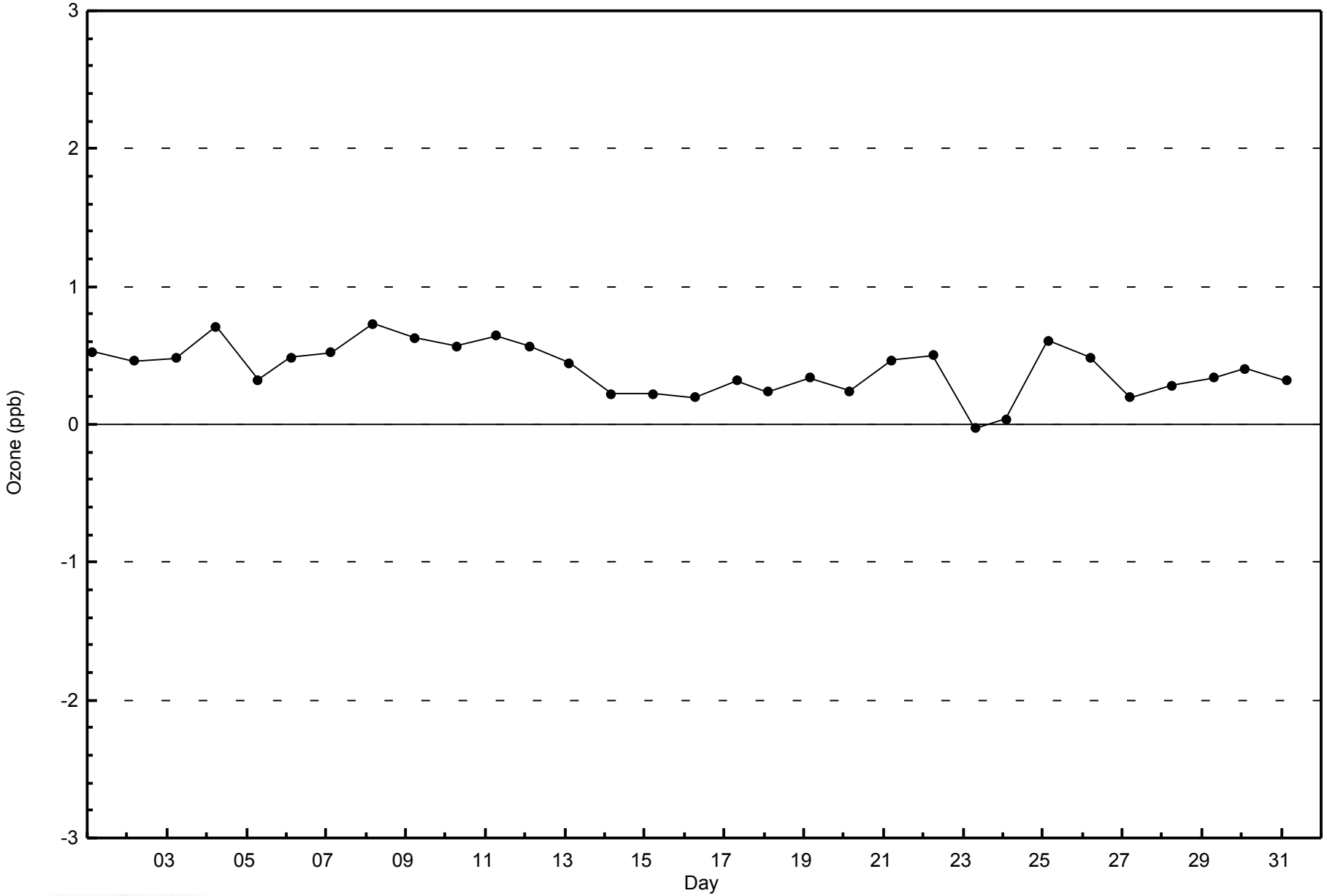
Total Number of Valid Hours: 703

WBEA

Zero Responses

Ozone (O_3) - ppb

Fort Chipewyan - January 2015



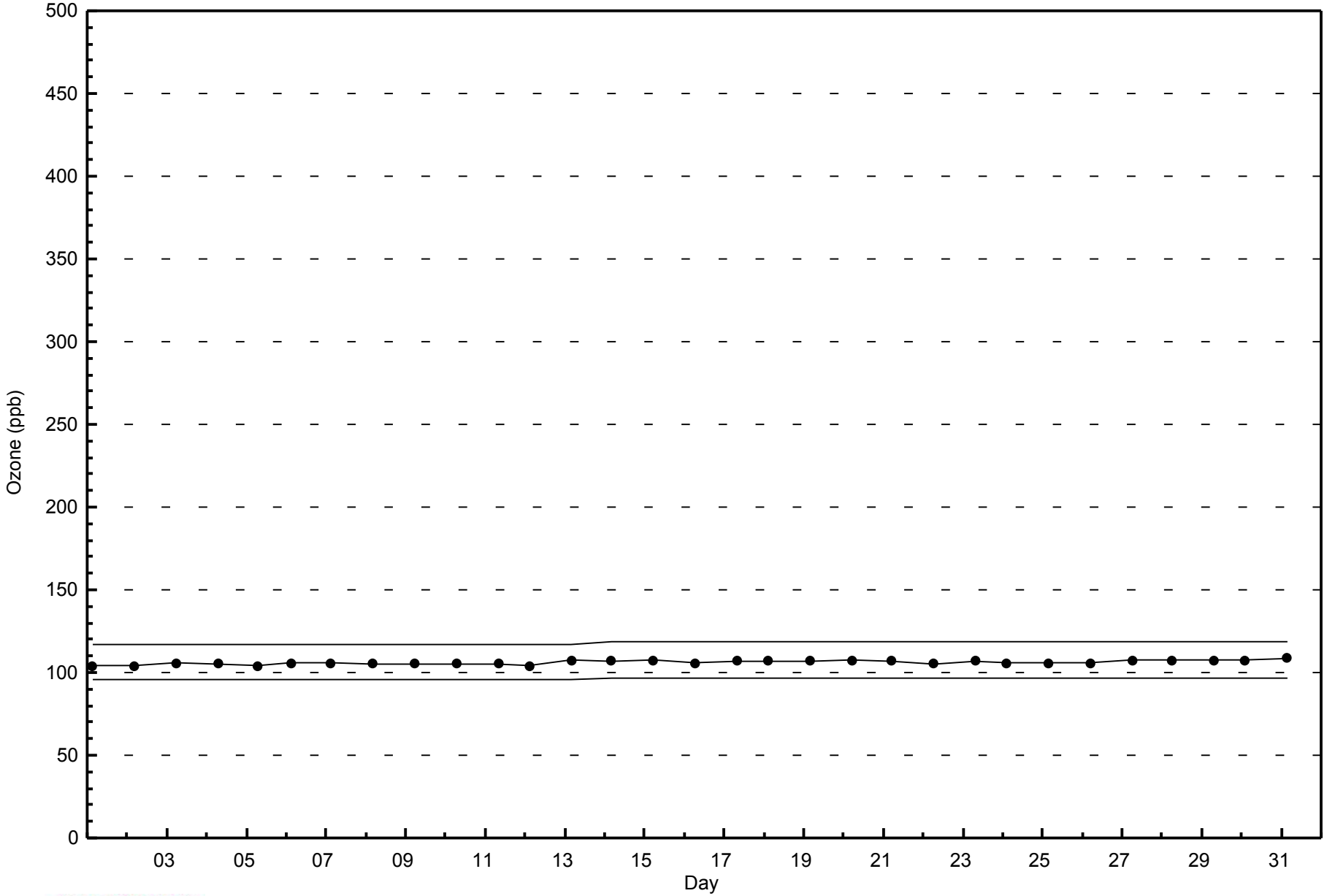
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Chipewyan - January 2015

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

Maximum Value: 30.7 $\mu g/m^3$ on Jan 19 08:00

Maximum Daily Average: 6.6 $\mu g/m^3$ on Jan 24

Minimum Value: 1.1 $\mu g/m^3$ on Jan 23 19:00

Minimum Daily Average: 1.8 $\mu g/m^3$ on Jan 23

Maximum Diurnal Average: 4.7 $\mu g/m^3$ at hour 8

Minimum Diurnal Average: 3.1 $\mu g/m^3$ at hour 16

Monthly Average: 3.67 $\mu g/m^3$

Percentiles: P_1 = 1.2 P_{10} = 1.7 Q_1 = 2.2 Median = 3.1 Q_3 = 4.6 P_{90} = 6.0 P_{99} = 12.8

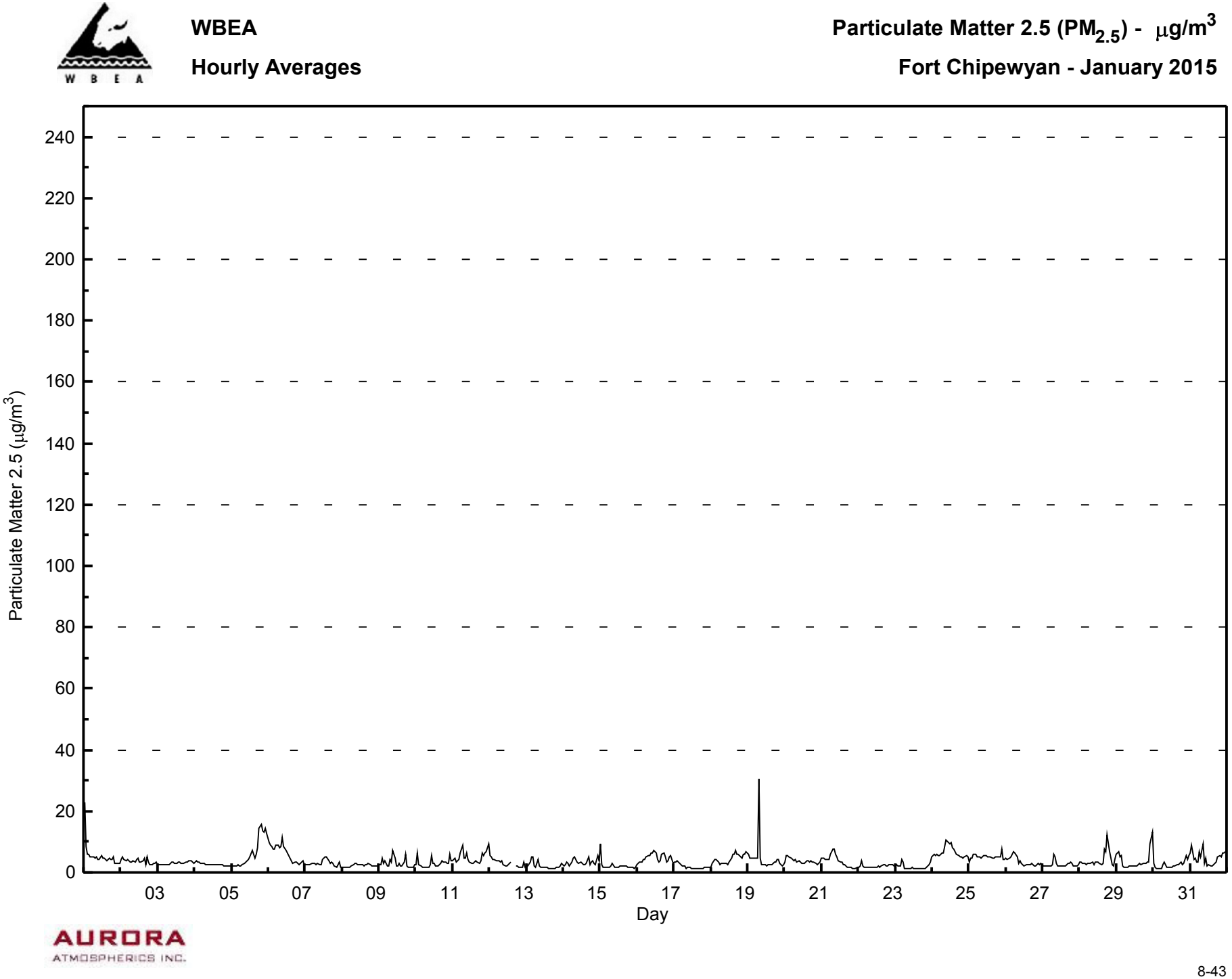
Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	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-Jan	22.7	8.6	6.1	5.8	5.0	5.0	5.0	4.8	4.9	4.1	4.1	5.5	4.7	4.5	4.1	3.8	4.5	4.3	4.1	5.2	3.1	2.9	2.8	3.1	5.4	22.7
2-Jan	4.3	5.0	4.4	3.8	4.1	3.8	3.3	3.3	3.6	3.4	4.1	4.6	3.3	3.2	3.8	4.5	2.7	5.0	3.3	2.4	2.5	2.8	2.9	3.4	3.6	5.0
3-Jan	2.4	2.6	2.5	2.6	2.4	2.4	2.5	2.6	2.9	3.4	3.6	3.1	3.0	3.4	3.2	3.0	2.9	3.1	3.3	3.3	3.9	3.7	3.9	3.1	3.0	3.9
4-Jan	3.6	3.7	3.5	3.3	3.2	3.1	2.9	2.6	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.2	2.1	2.1	2.1	2.2	2.6	3.7
5-Jan	2.2	2.1	2.0	1.9	2.3	2.3	2.2	2.4	2.9	3.5	3.8	4.4	5.2	7.2	6.0	4.6	5.8	8.0	14.3	15.7	13.5	13.0	14.5	12.6	6.3	15.7
6-Jan	10.0	8.8	8.5	7.8	7.6	9.0	9.0	8.2	8.4	11.4	8.4	7.4	6.5	5.4	4.8	3.8	3.2	3.5	3.3	2.9	2.7	2.9	4.0	2.5	6.2	11.4
7-Jan	2.5	2.5	2.4	2.5	2.9	3.0	2.9	2.7	2.8	2.5	2.4	4.1	4.7	5.2	5.0	3.7	3.0	3.3	3.0	1.9	1.6	2.5	3.3	1.5	3.0	5.2
8-Jan	1.5	1.6	1.7	1.7	1.8	1.8	2.0	2.7	3.0	3.0	2.5	2.5	2.4	2.4	2.3	2.7	2.7	3.0	2.5	2.2	2.0	2.0	2.0	2.0	2.3	3.0
9-Jan	2.6	2.4	4.5	2.9	3.7	2.2	2.1	4.3	3.3	7.4	4.6	2.2	2.0	2.8	2.3	2.1	3.5	6.1	2.2	1.7	1.7	1.8	1.8	2.4	3.0	7.4
10-Jan	2.6	6.4	2.5	2.2	1.7	1.6	1.8	1.7	1.8	2.7	5.4	3.1	3.1	2.3	2.1	2.6	3.0	3.8	3.4	3.2	3.1	2.8	5.9	3.9	3.0	6.4
11-Jan	3.9	4.5	3.6	3.9	4.1	6.2	9.0	4.7	4.7	6.2	4.2	3.6	2.9	3.1	3.4	3.7	3.3	3.1	3.8	6.5	5.6	6.4	6.6	9.4	4.8	9.4
12-Jan	5.7	5.1	4.3	4.1	4.0	3.8	3.7	3.5	3.9	2.4	2.0	2.1	2.6	3.1	3.4	M	M	1.9	2.1	1.7	1.8	1.9	3.3	1.9	3.1	5.7
13-Jan	2.2	2.0	3.5	5.1	5.1	2.3	1.9	4.1	2.0	1.7	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.5	1.6	1.8	1.9	2.8	2.2	5.1
14-Jan	2.2	2.3	3.2	2.9	2.3	3.4	4.8	5.1	4.3	3.3	3.0	3.3	3.1	2.4	2.5	2.8	5.0	2.7	3.4	3.7	3.0	2.7	5.6	3.7	3.4	5.6
15-Jan	9.5	2.4	1.8	1.7	1.7	1.8	1.9	2.0	3.0	1.5	1.5	1.7	1.8	2.0	2.2	2.1	2.0	2.0	1.9	1.7	1.6	1.6	1.5	1.6	2.2	9.5
16-Jan	2.3	3.5	3.5	3.5	4.3	4.3	5.0	5.4	5.3	6.3	6.3	7.0	6.4	4.1	3.5	4.0	5.9	6.4	5.2	3.5	3.9	5.1	5.4	3.2	4.7	7.0
17-Jan	3.2	3.5	3.6	3.3	2.6	2.2	2.0	1.9	1.4	1.5	1.7	1.2	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.8	1.5	1.6	1.6	1.9	3.6
18-Jan	1.7	3.1	4.3	4.1	4.0	3.2	2.7	3.1	3.0	3.0	2.9	2.6	3.3	4.6	5.8	6.0	7.3	6.0	5.8	5.2	4.5	5.8	6.1	6.7	4.4	7.3
19-Jan	6.1	4.8	4.8	4.7	4.5	4.7	4.8	30.7	4.6	2.7	2.5	2.4	2.1	2.4	2.4	2.6	2.7	3.4	3.6	4.2	4.2	2.9	2.2	2.3	4.7	30.7
20-Jan	3.6	5.4	5.4	5.2	4.6	4.2	4.0	4.2	3.5	3.6	3.3	3.1	2.8	3.0	3.7	3.8	3.6	3.8	3.3	3.3	3.0	2.7	3.0	3.3	3.7	5.4
21-Jan	4.5	4.6	4.3	4.3	4.3	4.3	6.0	7.8	7.5	6.0	4.9	3.7	3.3	3.2	2.6	2.4	2.2	1.8	1.6	1.5	1.3	1.3	1.4	1.6	3.6	7.8
22-Jan	1.7	2.2	3.7	2.2	1.6	1.6	1.7	1.9	1.7	1.8	1.6	1.5	1.8	2.0	1.8	2.3	2.5	2.5	2.2	2.3	2.4	2.4	2.4	2.2	2.1	3.7
23-Jan	2.1	2.6	2.0	2.2	4.3	3.3	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.4	1.4	1.2	1.1	1.1	1.1	1.3	1.6	2.0	2.6	3.2	1.8	4.3
24-Jan	5.1	6.0	5.4	5.7	5.7	5.7	6.4	6.5	8.7	10.7	10.0	9.5	9.6	8.1	7.7	6.9	6.0	5.3	5.1	5.0	4.8	5.2	5.5	4.9	6.6	10.7
25-Jan	3.3	4.6	4.6	6.0	6.0	5.3	5.1	5.0	4.7	5.3	5.6	5.4	5.0	5.1	5.2	4.7	4.5	5.1	5.2	4.9	5.0	7.7	4.4	4.1	5.1	7.7
26-Jan	4.7	4.1	4.7	5.2	5.8	6.6	6.5	5.0	3.1	3.8	2.8	2.5	1.9	2.4	2.5	2.5	2.7	3.0	2.0	2.2	2.5	2.8	2.5	2.8	3.5	6.6
27-Jan	1.9	2.0	1.9	2.0	2.1	2.2	2.5	6.0	5.0	2.8	2.1	1.9	2.0	2.1	2.0	2.1	2.8	2.8	3.5	2.8	2.3	2.3	2.2	2.3	2.6	6.0
28-Jan	3.2	3.3	3.1	2.9	2.7	3.0	2.9	2.9	3.5	2.5	3.2	3.4	3.4	2.9	2.5	2.9	7.6	6.6	12.4	6.9	4.6	2.6	1.9	4.0	4.0	12.4
29-Jan	5.8	6.7	5.0	5.4	2.2	1.8	1.8	1.9	2.0	2.2	2.1	2.0	2.1	2.3	2.7	2.9	2.7	2.9	2.9	2.9	3.2	3.5	9.5	13.1	3.7	13.1
30-Jan	3.0	1.7	1.4	1.4	1.4	1.4	2.5	3.3	2.6	1.6	1.5	1.8	1.9	2.0	2.2	2.3	2.5	2.9	3.2	2.7	2.8	5.5	4.4	5.4	2.6	5.5
31-Jan	6.3	8.7	4.2	4.7	3.4	3.3	6.6	5.0	9.2	3.1	4.9	2.1	2.7	2.2	2.0	2.6	2.8	3.3	5.2	5.6	5.2	6.3	6.3	6.7	4.7	9.2
	4.4	4.1	3.8	3.7	3.6	3.5	3.8	4.7	3.9	3.8	3.6	3.3	3.2	3.2	3.2	3.1	3.4	3.6	3.8	3.6	3.3	3.6	4.0	4.0	Diurnal Average	
	22.7	8.8	8.5	7.8	7.6	9.0	9.0	30.7	9.2	11.4	10.0	9.5	9.6	8.1	7.7	6.9	7.6	8.0	14.3	15.7	13.5	13.0	14.5	13.1	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$
Fort Chipewyan - January 2015
Particulate Matter 2.5 ($\mu g/m^3$)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	640	86.25	86.25
6 - 15	99	13.34	99.60
16 - 25	2	0.27	99.87
26 - 80	1	0.13	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Fort Chipewyan - January 2015

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**
1 - 5	24	11	6	32	102	31	9	8	10	5	10	11	81	97	134	67	638
6 - 15	1	1	1	6	12	7	1	1	2	3	2	2	5	19	26	6	95
16 - 25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	12	7	39	114	38	10	9	12	8	12	13	86	116	162	73	736

Total Number of Valid Hours: 736

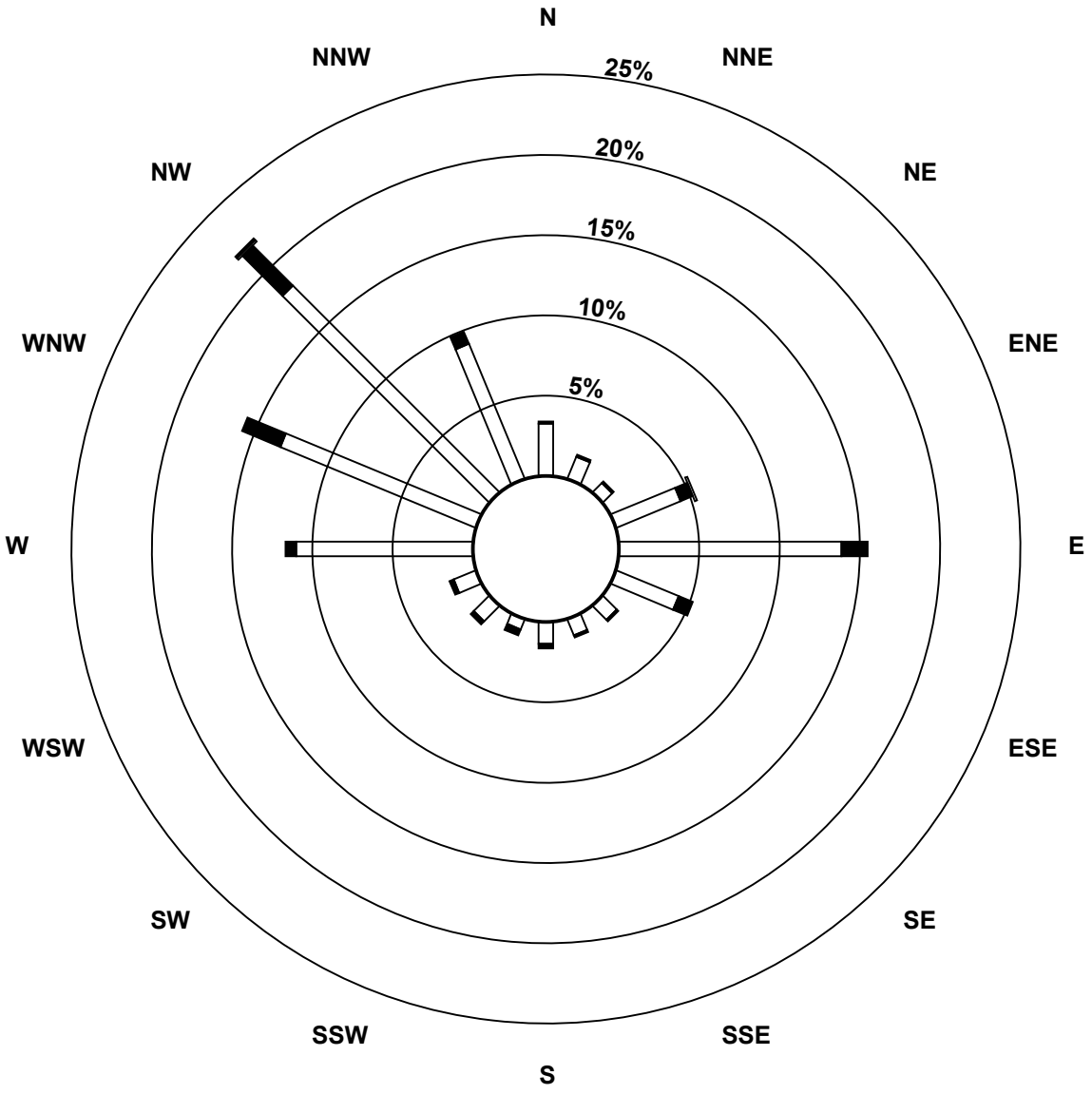
Total Number of Hours: 744

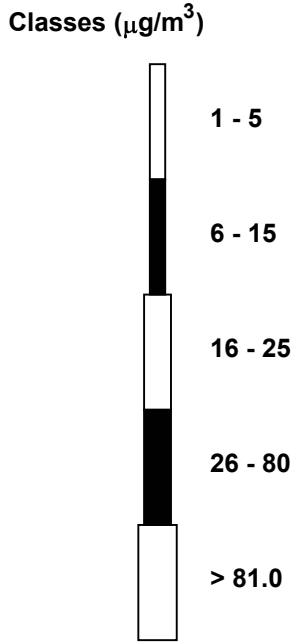
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Fort Chipewyan (AMS 8)





Total Number of Valid Hours: 736

Maximum Value: 1.7 C on Jan 21 19:00

Maximum Daily Average: -4.6 C on Jan 21

Minimum Value: -35.3 C on Jan 31 10:00

Minimum Daily Average: -30.8 C on Jan 31

Maximum Diurnal Average: -17.0 C at hour 15

Minimum Diurnal Average: -19.3 C at hour 10

Monthly Average: -18.31 C

Percentiles: P_1 = -32.0 P_{10} = -27.2 Q_1 = -24.2 Median = -18.4 Q_3 = -13.3 P_{90} = -8.6 P_{99} = -0.1

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

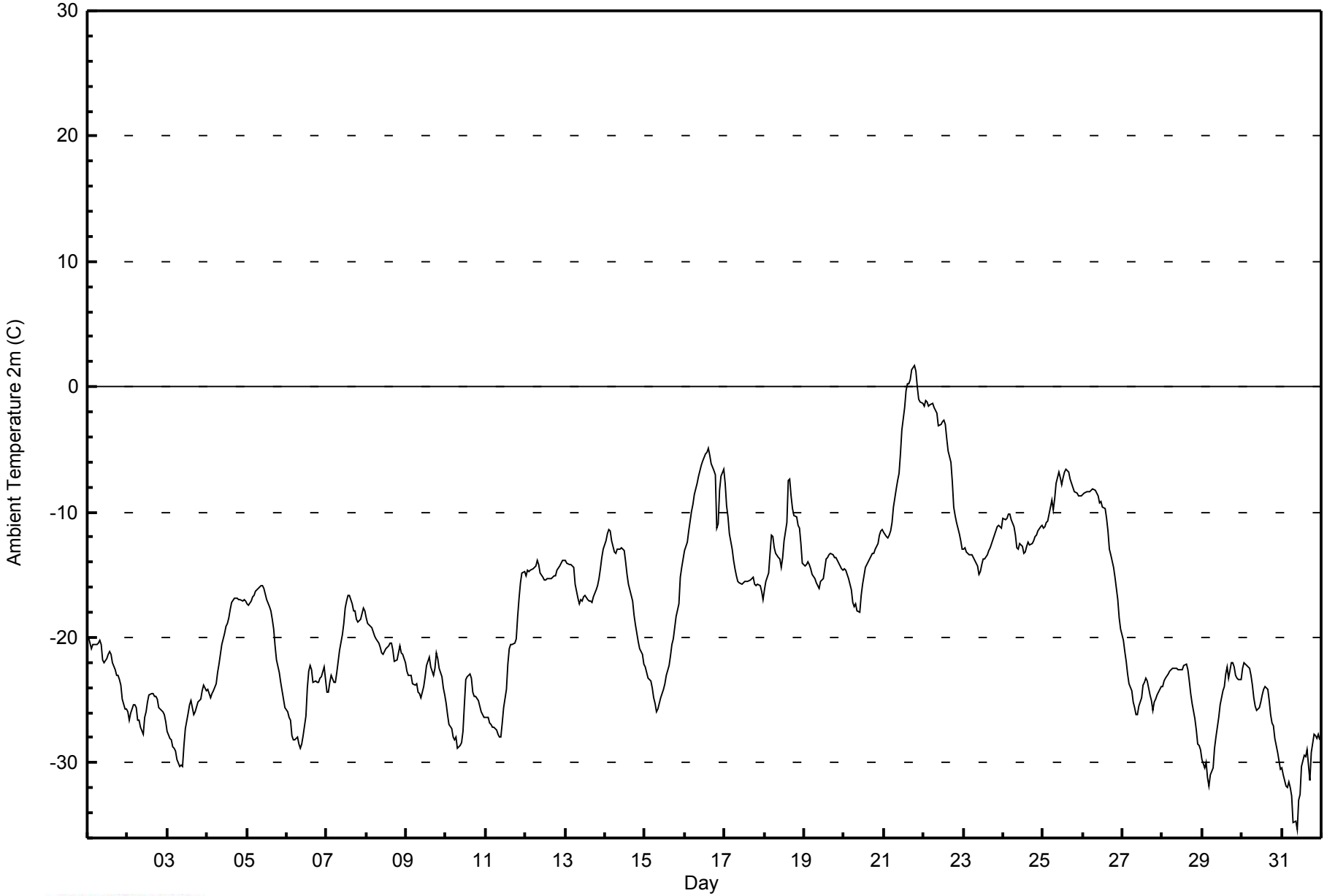
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-20.0	-20.5	-20.9	-20.5	-20.5	-20.6	-20.5	-20.2	-20.5	-21.8	-22.0	-21.7	-21.4	-21.1	-21.3	-22.1	-22.6	-23.0	-23.1	-23.4	-23.9	-24.9	-25.7	-25.7	-22.0	-20.0
2-Jan	-25.9	-26.6	-26.0	-25.4	-25.3	-25.6	-26.6	-26.6	-27.1	-27.7	-26.4	-26.0	-25.2	-24.6	-24.5	-24.5	-24.7	-24.7	-24.9	-25.5	-25.8	-25.9	-26.2	-26.7	-25.8	-24.5
3-Jan	-27.5	-28.0	-28.2	-28.7	-28.9	-29.1	-29.7	-30.3	-30.2	-30.3	-28.6	-27.2	-26.1	-25.3	-25.0	-25.6	-26.1	-25.9	-25.1	-25.1	-25.0	-24.2	-23.8	-24.3	-27.0	-23.8
4-Jan	-24.2	-24.5	-24.8	-24.5	-24.2	-23.7	-22.8	-22.1	-21.4	-20.5	-19.7	-19.1	-18.9	-18.5	-17.8	-17.2	-16.9	-16.9	-16.9	-17.0	-17.0	-17.0	-17.0	-17.1	-20.0	-16.9
5-Jan	-17.3	-17.4	-17.1	-16.8	-16.7	-16.4	-16.2	-16.1	-15.8	-15.9	-16.1	-16.5	-17.0	-17.6	-17.9	-18.5	-19.3	-20.7	-21.8	-22.8	-23.5	-24.3	-24.9	-25.6	-18.8	-15.8
6-Jan	-26.0	-26.3	-26.6	-27.8	-28.2	-28.2	-27.9	-28.5	-28.8	-28.5	-27.8	-26.3	-24.0	-22.7	-22.3	-22.6	-23.6	-23.4	-23.6	-23.6	-23.3	-23.1	-22.4	-23.4	-25.4	-22.3
7-Jan	-24.4	-24.4	-23.6	-23.0	-23.6	-23.5	-22.8	-21.9	-21.0	-19.8	-18.8	-17.7	-17.1	-16.6	-16.7	-17.4	-17.9	-17.8	-18.5	-18.8	-18.5	-18.1	-17.7	-17.9	-19.9	-16.6
8-Jan	-18.5	-18.9	-19.1	-19.2	-19.5	-19.9	-20.1	-20.4	-20.8	-21.2	-21.4	-21.2	-20.9	-20.7	-20.5	-20.5	-21.0	-22.0	-21.8	-21.2	-20.7	-21.2	-21.4	-22.1	-20.6	-18.5
9-Jan	-22.7	-23.0	-23.1	-23.0	-23.7	-23.8	-23.7	-24.4	-24.4	-24.8	-23.9	-23.1	-22.3	-21.9	-21.6	-22.4	-23.0	-22.5	-21.2	-21.7	-22.4	-23.2	-24.0	-24.6	-23.1	-21.2
10-Jan	-25.3	-26.2	-27.0	-27.3	-27.9	-28.1	-28.0	-28.8	-28.6	-28.4	-27.5	-25.4	-23.3	-23.1	-22.9	-23.2	-24.4	-24.7	-24.8	-25.0	-25.5	-25.9	-26.1	-26.4	-26.0	-22.9
11-Jan	-26.4	-26.3	-26.8	-27.0	-27.1	-27.1	-27.4	-27.7	-27.9	-27.9	-26.8	-25.6	-24.1	-22.1	-20.9	-20.6	-20.6	-20.5	-20.1	-18.4	-16.9	-15.6	-14.9	-14.7	-23.1	-14.7
12-Jan	-15.1	-14.7	-14.7	-14.6	-14.5	-14.4	-14.3	-13.9	-14.2	-14.8	-15.2	-15.4	-15.5	-15.4	-15.4	-15.3	-15.1	-15.1	-15.0	-14.7	-14.3	-14.1	-13.9	-13.9	-14.7	-13.9
13-Jan	-13.8	-14.1	-14.2	-14.2	-14.2	-14.4	-15.7	-16.9	-17.4	-17.0	-17.1	-16.7	-16.7	-17.0	-17.1	-17.1	-17.2	-16.8	-16.2	-15.8	-15.3	-14.5	-13.6	-12.9	-15.7	-12.9
14-Jan	-12.3	-11.7	-11.4	-11.5	-12.3	-13.2	-13.3	-12.9	-13.0	-13.0	-12.8	-13.1	-14.0	-15.0	-15.8	-16.3	-17.0	-18.2	-19.0	-19.7	-20.3	-20.9	-21.4	-22.1	-15.4	-11.4
15-Jan	-22.4	-22.8	-23.2	-23.4	-24.0	-24.8	-25.3	-26.0	-25.7	-24.9	-24.5	-24.1	-23.7	-23.0	-22.2	-21.4	-20.6	-20.1	-19.3	-18.3	-17.4	-15.2	-14.5	-13.7	-21.7	-13.7
16-Jan	-13.1	-12.4	-11.5	-10.8	-9.9	-9.3	-8.6	-7.7	-7.1	-6.6	-6.3	-6.0	-5.3	-5.2	-4.9	-5.4	-6.1	-6.7	-7.0	-11.3	-10.9	-8.2	-7.1	-6.6	-8.1	-4.9
17-Jan	-7.7	-9.5	-10.4	-11.8	-13.0	-13.8	-14.5	-15.1	-15.5	-15.7	-15.8	-15.6	-15.6	-15.5	-15.5	-15.4	-15.3	-15.2	-15.7	-15.9	-15.8	-15.9	-16.3	-17.0	-14.5	-7.7
18-Jan	-16.2	-15.6	-14.8	-13.3	-11.9	-11.9	-12.8	-13.3	-13.6	-13.7	-14.4	-13.7	-12.3	-10.8	-7.5	-7.3	-8.7	-9.7	-10.3	-10.4	-11.0	-11.3	-12.5	-14.1	-12.1	-7.3
19-Jan	-14.3	-14.2	-14.0	-14.2	-14.6	-15.0	-15.3	-15.6	-15.8	-16.0	-15.6	-15.4	-14.5	-13.8	-13.6	-13.4	-13.3	-13.4	-13.6	-13.7	-13.8	-14.1	-14.5	-14.6	-14.4	-13.3
20-Jan	-14.5	-14.6	-14.9	-15.4	-16.2	-17.2	-17.6	-17.3	-17.8	-18.0	-16.7	-15.7	-15.1	-14.4	-14.0	-13.7	-13.5	-13.3	-13.3	-13.0	-12.5	-11.9	-11.5	-11.4	-14.7	-11.4
21-Jan	-11.6	-11.9	-12.0	-11.9	-11.5	-10.9	-9.6	-8.1	-7.5	-6.9	-5.4	-3.4	-1.7	-0.4	0.2	0.2	0.6	1.3	1.7	1.2	0.1	-1.0	-1.2	-1.3	-4.6	1.7
22-Jan	-1.5	-1.1	-1.2	-1.5	-1.4	-1.3	-1.6	-1.8	-2.2	-3.1	-3.0	-2.8	-2.7	-3.0	-4.1	-5.1	-6.0	-7.6	-9.6	-10.3	-10.8	-11.7	-12.3	-13.0	-4.9	-1.1
23-Jan	-12.9	-12.8	-13.2	-13.4	-13.4	-13.4	-13.7	-13.9	-14.3	-15.0	-14.8	-14.2	-13.8	-13.8	-13.4	-13.1	-12.9	-12.5	-12.1	-11.5	-11.1	-11.1	-11.2	-11.2	-13.0	-11.1
24-Jan	-10.5	-10.6	-10.5	-10.2	-10.1	-10.6	-11.2	-11.9	-12.8	-12.9	-12.5	-12.7	-13.3	-13.2	-12.8	-12.4	-12.6	-12.5	-12.2	-11.9	-11.8	-11.5	-11.1	-11.1	-11.8	-10.1
25-Jan	-11.3	-11.2	-10.8	-10.7	-9.6	-9.0	-9.8	-8.9	-7.7	-6.8	-7.3	-7.8	-7.3	-6.8	-6.6	-6.9	-7.4	-7.7	-8.0	-8.4	-8.5	-8.7	-8.7	-8.7	-8.5	-6.6
26-Jan	-8.6	-8.4	-8.4	-8.4	-8.3	-8.3	-8.2	-8.2	-8.4	-8.7	-9.3	-9.2	-9.6	-9.7	-10.4	-11.5	-12.9	-13.4	-14.5	-15.2	-16.0	-17.0	-18.5	-19.3	-11.3	-8.2
27-Jan	-20.2	-21.2	-21.9	-22.9	-23.7	-24.3	-25.2	-25.6	-26.1	-26.1	-25.5	-24.9	-23.8	-23.6	-23.2	-23.5	-24.6	-25.1	-25.8	-25.1	-24.9	-24.6	-24.1	-23.9	-24.2	-20.2
28-Jan	-23.9	-23.5	-23.2	-22.9	-22.7	-22.6	-22.5	-22.4	-22.5	-22.6	-22.6	-22.6	-22.6	-22.2	-22.2	-22.5	-23.5	-24.4	-25.3	-26.5	-27.4	-28.5	-28.7	-29.0	-24.0	-22.2
29-Jan	-29.8	-30.4	-30.0	-31.2	-31.9	-31.0	-30.4	-28.9	-27.9	-27.1	-26.4	-25.4	-24.2	-23.9	-22.9	-22.4	-23.2	-22.0	-22.1	-22.3	-23.1	-23.3	-23.3	-23.4	-26.1	-22.0
30-Jan	-22.4	-22.0	-22.1	-22.2	-22.5	-23.0	-23.8	-24.8	-25.5	-25.8	-25.6	-25.2	-24.6	-24.2	-24.0	-24.2	-25.1	-26.1	-26.8	-27.1	-28.1	-29.2	-29.8	-30.5	-25.2	-22.0
31-Jan	-30.4	-30.9	-31.8	-32.0	-31.5	-32.0	-32.7	-34.8	-34.7	-35.3	-33.0	-32.5	-30.3	-29.4	-29.6	-29.0	-30.2	-31.4	-29.1	-27.7	-27.8	-28.1	-27.8	-28.2	-30.8	-27.7
	-18.4	-18.6	-18.6	-18.7	-18.8	-18.9	-19.1	-19.2	-19.2	-19.3	-18.8	-18.3	-17.6	-17.2	-17.0	-17.1	-17.6	-17.8	-17.9	-18.1	-18.2	-18.2	-18.3	-18.5	Diurnal Average	
	-1.5	-1.1	-1.2	-1.5	-1.4	-1.3	-1.6	-1.8	-2.2	-3.1	-3.0	-2.8	-1.7	-0.4	0.2	0.2	0.6	1.3	1.7	1.2	0.1	-1.0	-1.2	-1.3	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	348	46.77	46.77
-20 - 0	389	52.28	99.06
0 - 10	7	0.94	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

Maximum Value: 96 % on Jan 22 10:00

Maximum Daily Average: 91.8 % on Jan 25

Minimum Value: 63 % on Jan 8 15:00

Minimum Daily Average: 70.0 % on Jan 8

Maximum Diurnal Average: 81.7 % at hour 1

Minimum Diurnal Average: 78.0 % at hour 14

Monthly Average: 80.6 %

Percentiles: P_1 = 67 P_{10} = 73 Q_1 = 76 Median = 79 Q_3 = 86 P_{90} = 90 P_{99} = 93

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

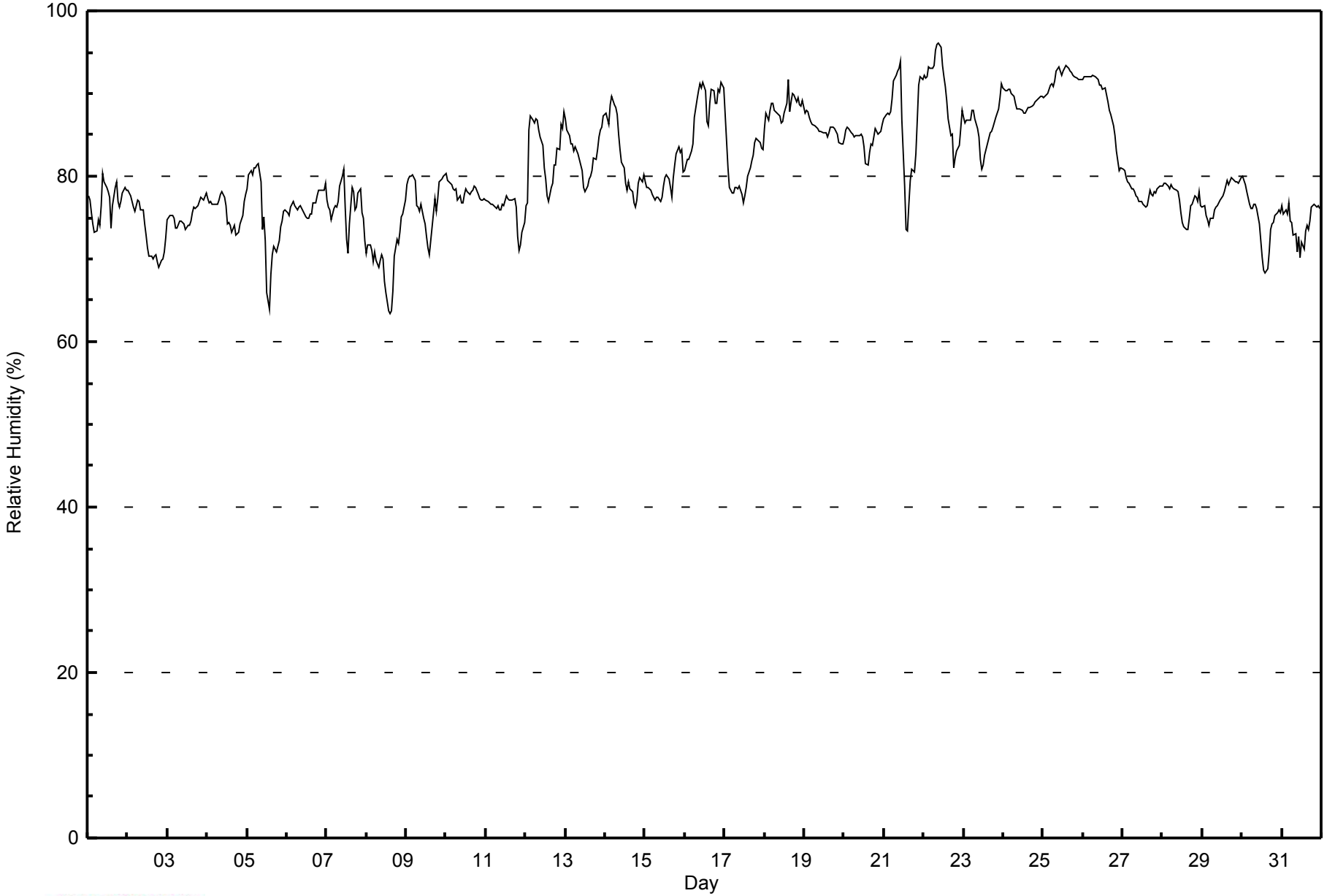
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	78	77	76	74	73	73	75	74	76	80	79	79	78	78	74	76	79	79	77	76	77	78	79	78	76.8	80
2-Jan	78	78	78	76	76	76	77	77	76	76	74	73	71	70	70	70	70	71	70	69	70	70	71	73	73.3	78
3-Jan	75	75	75	75	75	74	74	75	75	74	74	73	74	74	74	76	76	76	76	77	77	77	77	78	75.3	78
4-Jan	77	77	77	77	77	77	77	77	78	78	77	76	74	74	74	73	74	73	73	73	74	75	77	78	75.7	78
5-Jan	78	80	81	80	81	81	81	82	79	74	75	72	66	64	68	71	71	71	71	72	74	75	76	76	75.0	82
6-Jan	76	75	76	77	77	76	76	76	76	76	76	75	75	75	75	75	77	77	78	78	78	78	78	79	76.6	79
7-Jan	77	76	76	75	76	76	76	77	79	80	81	76	72	71	74	79	78	76	76	78	78	76	75	72	76.3	81
8-Jan	71	72	72	71	70	71	70	69	70	71	70	67	66	64	63	64	66	70	72	72	73	75	75	77	70.0	77
9-Jan	79	80	80	80	80	80	76	76	76	77	75	74	73	71	71	72	76	77	76	77	79	80	80	80	76.9	80
10-Jan	80	80	79	79	79	78	79	77	78	77	77	78	78	78	78	78	78	79	79	78	77	77	77	77	78.1	80
11-Jan	77	77	77	77	77	76	76	76	76	76	77	76	78	77	77	77	77	77	76	73	71	72	73	74	75.9	78
12-Jan	76	77	86	87	87	86	87	87	86	85	84	81	80	78	77	79	79	81	81	83	83	86	86	88	82.9	88
13-Jan	87	86	85	84	84	83	84	83	82	81	81	79	78	79	80	80	81	82	82	83	85	86	86	87	82.7	87
14-Jan	88	87	86	89	90	89	88	87	85	83	82	81	79	78	79	78	78	77	76	77	79	80	79	80	82.4	90
15-Jan	79	79	79	78	78	77	77	77	77	77	77	79	80	80	80	79	77	80	81	83	83	83	83	80	79.4	83
16-Jan	81	82	82	83	83	84	87	89	90	91	91	91	90	87	86	89	91	90	89	89	90	90	91	91	87.8	91
17-Jan	87	84	81	79	78	78	79	79	79	79	78	77	78	79	80	81	82	82	84	84	84	84	83	83	80.9	87
18-Jan	86	88	87	88	89	89	88	88	87	87	86	87	88	89	92	88	89	90	90	89	89	89	89	89	88.3	92
19-Jan	88	88	88	87	87	86	86	86	86	86	85	85	85	85	85	85	86	86	86	85	85	84	84	84	85.7	88
20-Jan	84	86	86	86	85	85	85	85	85	85	85	85	83	81	81	83	84	84	85	86	85	85	85	86	84.6	86
21-Jan	87	87	88	87	88	89	92	92	93	93	94	87	79	74	73	77	80	81	81	83	87	91	92	92	86.0	94
22-Jan	92	92	92	93	93	93	93	95	96	96	96	93	92	91	89	87	85	85	81	82	83	84	86	88	89.9	96
23-Jan	87	86	87	87	87	88	88	87	86	85	82	81	81	83	84	85	85	85	86	87	88	88	90	91	86.0	91
24-Jan	91	90	90	91	90	90	90	89	88	88	88	88	88	88	88	88	88	88	89	89	89	89	90	90	89.0	91
25-Jan	89	90	90	90	91	91	91	92	93	93	93	92	93	93	93	93	93	93	92	92	92	92	92	92	91.8	93
26-Jan	92	92	92	92	92	92	92	92	92	92	91	91	91	91	90	89	88	87	86	85	83	82	81	81	88.9	92
27-Jan	81	81	80	79	79	79	78	78	78	77	77	77	77	76	76	76	78	78	78	78	78	78	79	79	78.2	81
28-Jan	79	79	79	79	78	79	79	78	78	78	77	76	74	74	74	74	75	76	77	78	77	77	78	76	77.1	79
29-Jan	76	76	75	75	74	75	75	76	76	77	77	77	78	78	79	79	79	80	80	79	79	79	79	80	77.5	80
30-Jan	80	79	79	78	77	76	76	77	77	76	74	72	70	69	68	69	71	74	74	74	75	76	76	76	74.7	80
31-Jan	76	75	76	75	77	75	74	73	73	71	73	70	72	71	73	74	74	75	76	77	76	76	76	76	74.4	77
	81.7	81.6	81.7	81.5	81.5	81.4	81.5	81.5	81.4	81.2	80.8	79.6	78.7	78.0	78.3	78.8	79.5	80.0	79.9	80.2	80.7	81.0	81.4	81.7	Diurnal Average	
	92	92	92	93	93	93	93	95	96	96	96	93	93	93	93	93	93	93	92	92	92	92	92	92	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	426	57.26	57.26
80 - 100	318	42.74	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 0.5 mm on Jan 16 13:00

Maximum Daily Total: 1.0 mm on Jan 16

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 0.5 mm at hour 1

Minimum Diurnal Total: 0.0 mm at hour 2

Monthly Total: 1.52 mm

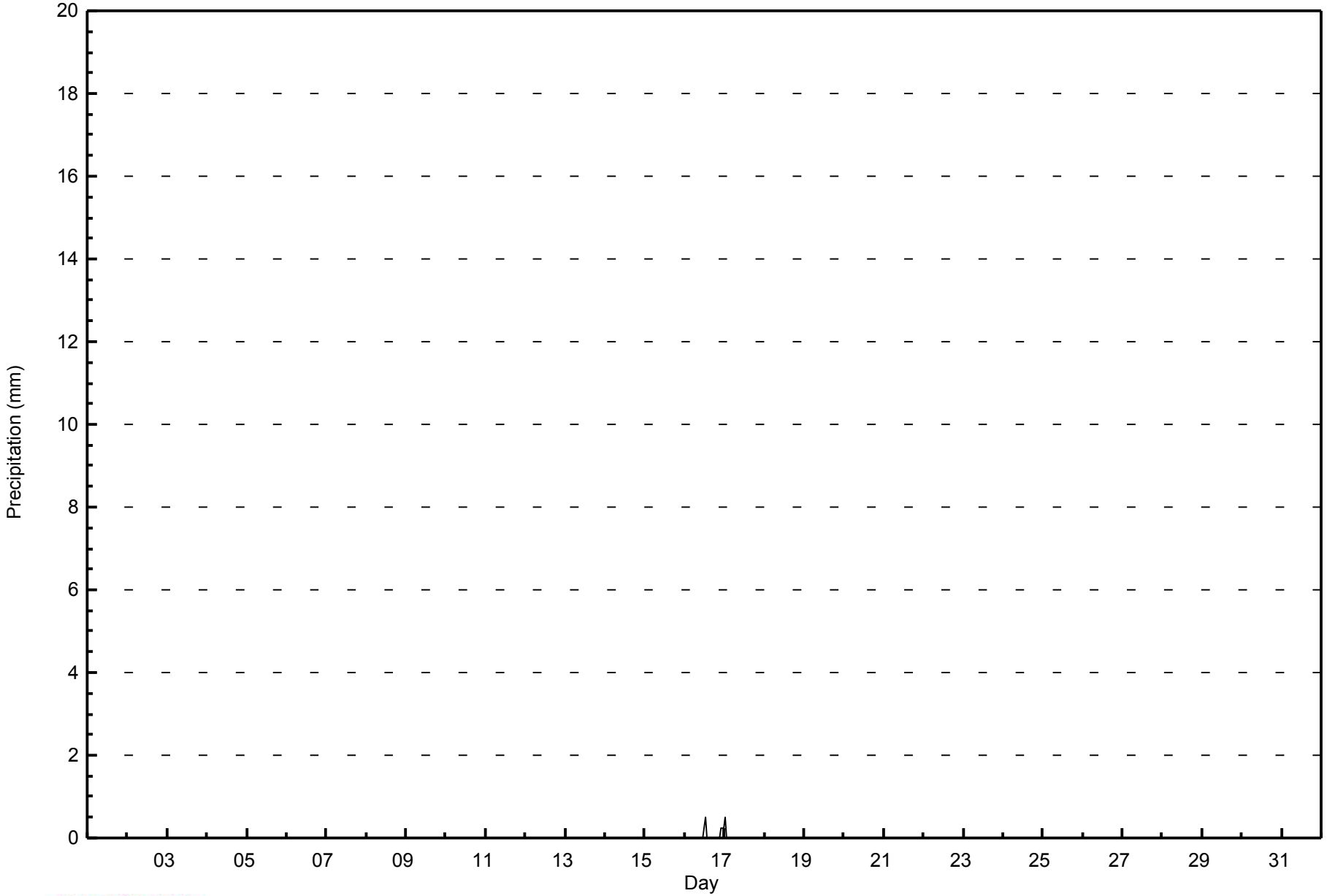
Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.0

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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.0	0.5
17-Jan	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.3	Diurnal Average	
	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	Diurnal Maximum	

Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort Chipewyan - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	742	99.73	99.73
0.4 - 0.5	2	0.27	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: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Fort Chipewyan - January 2015

Maximum Value: 391 W/m2 on Jan 31 14:00

Maximum Daily Average: 80.5 W/m2 on Jan 31

Minimum Value: 0 W/m2 on Jan 9 07:00

Minimum Daily Average: 7.7 W/m2 on Jan 7

Maximum Diurnal Average: 171.8 W/m2 at hour 13

Minimum Diurnal Average: 0.1 W/m2 at hour 21

Monthly Average: 29.8 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 21$ $P_{90} = 98$ $P_{99} = 333$

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

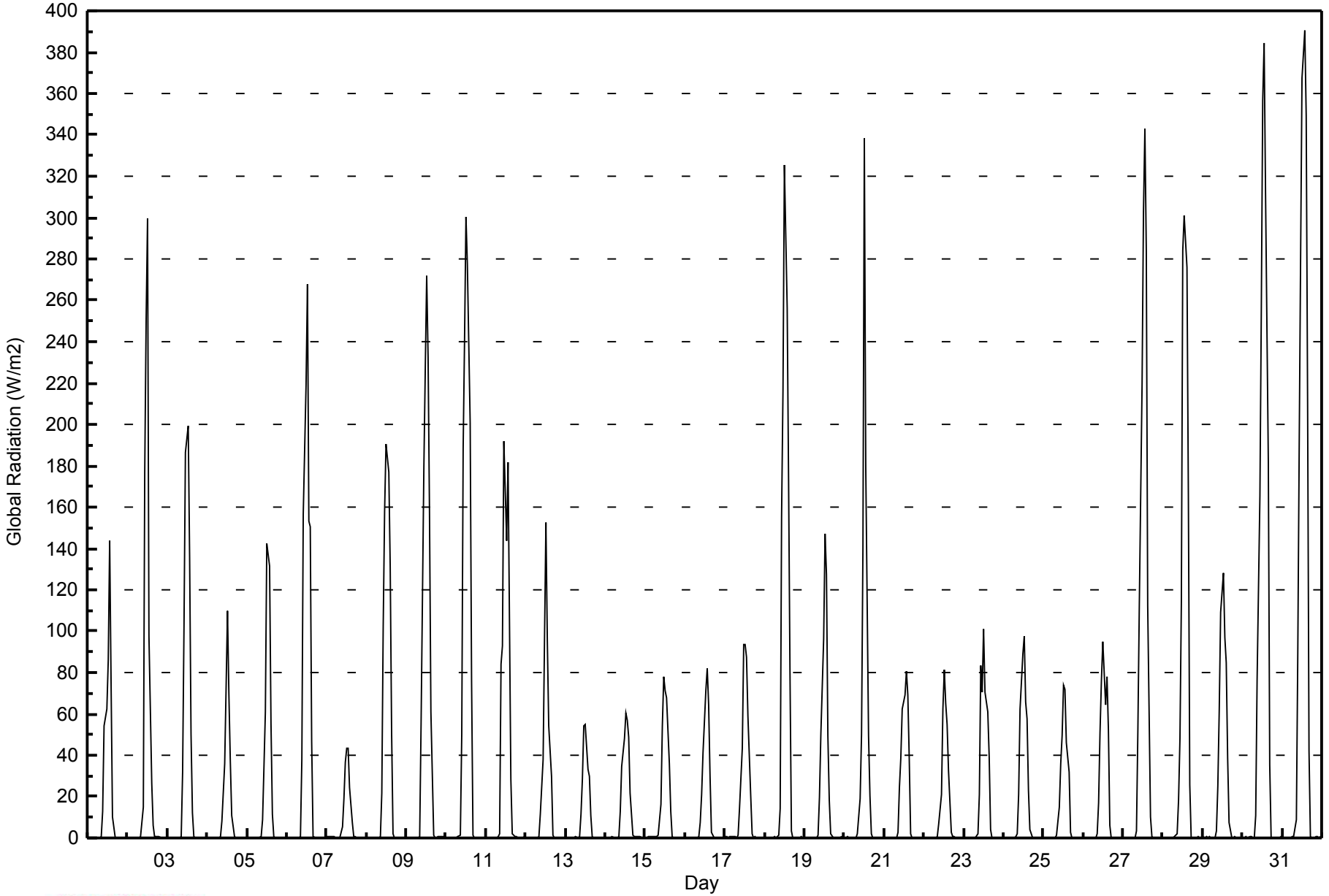
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	0	0	0	0	0	1	13	54	63	86	144	75	10	0	0	0	0	0	0	0	0	18.7	144
2-Jan	0	0	0	0	0	0	0	0	1	15	177	251	300	98	26	6	1	0	1	0	0	0	0	0	36.6	300
3-Jan	0	0	0	0	0	0	0	0	1	32	103	186	199	136	50	12	1	0	0	0	0	0	0	0	30.0	199
4-Jan	0	0	0	0	0	0	0	0	0	8	36	72	110	69	38	11	0	0	0	0	0	0	0	0	14.4	110
5-Jan	0	0	0	0	0	0	0	0	0	9	35	61	142	132	56	12	1	0	0	0	0	0	0	0	18.7	142
6-Jan	0	0	0	0	0	0	0	0	1	38	156	219	268	153	151	47	1	0	0	0	0	0	0	1	43.1	268
7-Jan	1	0	0	0	1	0	0	0	0	6	19	36	43	44	25	7	1	0	0	0	0	0	0	0	7.7	44
8-Jan	0	0	0	0	0	0	0	0	1	22	102	158	190	177	131	51	2	0	0	0	0	0	0	0	34.8	190
9-Jan	0	0	0	0	0	0	0	0	1	55	179	227	272	233	157	61	1	0	0	1	1	1	1	1	49.6	272
10-Jan	0	0	0	0	0	0	0	0	1	50	188	241	300	277	200	76	2	0	0	0	0	0	0	0	55.7	300
11-Jan	0	0	0	0	0	0	0	0	2	84	93	192	144	182	106	29	2	0	0	0	0	0	0	0	34.8	192
12-Jan	0	0	0	0	0	0	0	0	1	12	38	96	153	95	54	30	1	0	0	0	0	0	0	0	20.0	153
13-Jan	0	0	0	0	0	0	1	0	1	12	29	54	55	33	30	11	1	0	0	0	0	0	0	0	9.5	55
14-Jan	0	0	0	0	1	0	0	0	1	13	34	48	60	57	49	22	1	0	1	0	0	0	0	0	12.1	60
15-Jan	0	0	0	1	1	1	1	1	1	16	55	78	71	68	36	13	1	0	0	0	0	0	0	0	14.3	78
16-Jan	0	0	0	0	0	0	0	0	1	7	21	42	71	82	65	30	3	0	0	0	0	0	0	0	13.4	82
17-Jan	0	0	0	1	0	0	0	0	1	14	44	94	94	87	59	20	2	0	0	0	0	0	0	0	17.5	94
18-Jan	0	0	0	0	0	0	0	0	1	14	155	216	325	256	172	79	3	0	0	0	0	0	0	0	51.0	325
19-Jan	0	0	0	0	0	0	0	0	2	20	50	96	147	127	50	19	2	0	0	0	0	0	0	0	21.5	147
20-Jan	0	0	0	0	0	0	0	0	2	19	50	140	338	180	50	21	2	0	0	0	0	0	0	0	33.5	338
21-Jan	0	0	0	0	0	0	0	0	3	25	39	62	69	81	69	38	2	0	0	0	0	0	0	0	16.2	81
22-Jan	0	0	0	0	0	0	0	0	1	7	21	62	81	65	55	33	2	1	0	0	0	0	0	0	13.7	81
23-Jan	0	0	0	0	0	0	0	0	2	21	83	71	101	71	61	40	4	0	0	0	0	0	0	0	18.9	101
24-Jan	0	0	0	0	0	0	0	0	2	21	62	89	98	66	58	23	4	0	0	0	0	0	0	0	17.7	98
25-Jan	0	0	0	0	0	0	0	0	1	15	36	49	74	72	46	32	3	0	0	0	0	0	0	0	13.7	74
26-Jan	0	0	0	0	0	0	0	0	2	17	51	76	95	65	78	52	6	0	0	0	0	0	0	0	18.4	95
27-Jan	0	0	0	0	0	0	0	0	3	52	111	220	303	343	284	113	10	1	0	0	0	0	0	0	60.0	343
28-Jan	0	0	0	0	0	0	0	0	2	18	48	114	284	301	276	165	26	0	0	0	0	0	0	0	51.5	301
29-Jan	0	0	0	0	0	0	0	0	4	25	62	109	128	97	85	39	7	0	0	0	0	0	0	0	23.3	128
30-Jan	0	0	0	0	0	0	0	0	11	77	166	256	357	385	312	182	35	0	0	0	0	0	0	1	74.3	385
31-Jan	0	0	0	0	0	0	0	1	9	89	189	280	367	391	349	210	42	1	0	0	0	0	0	0	80.5	391
	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	1.9	26.6	80.2	127.7	171.8	147.3	104.9	48.1	5.5	0.2	0.2	0.1	0.1	0.1	0.1	0.2	Diurnal Average	
	1	0	0	1	1	1	1	1	11	89	189	280	367	391	349	210	42	1	1	1	1	1	1	1	Diurnal Maximum	

WBEA

Hourly Averages

Global Radiation (GR) - W/m2

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	553	74.33	74.33
21 - 100	119	15.99	90.32
101 - 300	61	8.20	98.52
301 - 600	11	1.48	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort Chipewyan - January 2015

Maximum Speed: 37 km/h on Jan 15 20:00

Maximum Daily Speed Average: 21.4 km/h on Jan 4

Minimum Speed Value: 1 km/h on Jan 31 11:00

Minimum Daily Speed Average: 1.2 km/h on Jan 20

Maximum Diurnal Speed Average: 4.4 km/h at hour 5

Minimum Diurnal Speed Average: 2.6 km/h at hour 24

Monthly Average Velocity: 3.2 km/h 328.3 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 7 Median = 11 Q_3 = 15 P_{90} = 22 P_{99} = 31

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-Jan	ENE7	E9	E11	E14	E18	ESE14	ESE9	E6	ENE3	NNW7	NNW9	NW10	WNW9	WNW14	NW16	NW12	WNW14	WNW14	NW15	NW14	WNW10	W10	W12	W11	NNW4.1	E18
2-Jan	WNW14	WNW13	WNW14	WNW14	NW13	WNW11	WNW12	WNW13	WNW13	WNW15	WNW15	NW17	NW16	NW17	NW17	NW16	NW16	NW16	NW16	NW15	NW12	NW12	WNW11	WNW11	NW14.0	NW17
3-Jan	W10	WNW11	WNW12	WNW11	WNW12	WNW11	WNW8	WNW10	WNW12	WNW12	WNW14	WNW12	W13	W14	W13	W12	W15	W17	W17	W16	WNW16	WNW15	WNW15	W13	WNW12.8	W17
4-Jan	W15	W18	W18	W21	W23	W24	W23	W23	W20	W22	W22	W25	W27	W26	W24	W24	W23	W21	W24	W20	W18	W16	W17	W21	W21.4	W27
5-Jan	W21	W19	W16	W15	WNW17	WNW17	WNW15	WNW13	NW12	NNW13	NW15	NW16	NW18	NW17	NW16	NW15	NW15	NW13	NW13	NW12	NW13	NW14	NW14	NW14	NW14.5	W21
6-Jan	NW12	WNW13	WNW11	WNW13	WNW14	WNW14	NW13	WNW12	WNW14	WNW12	WNW10	W12	WNW11	WNW14	W14	W13	W12	W12	W10	W11	W12	W10	WSW10	SW11	WNW11.6	WNW14
7-Jan	SW13	SW14	SSW5	S7	SW11	S8	SE9	SE9	ESE13	E18	ESE18	SE11	SSE6	WNW1	N7	N7	NW13	NNW17	NW15	NW20	NW21	NW20	NW24	NW24	NW3.1	NW24
8-Jan	NW23	NW23	NW25	NW24	NW27	NW32	NW30	NW28	NW26	NW23	NW22	NW22	NW22	NW22	NW20	NW18	WNW15	WNW15	W15	W15	W17	W17	W16	WNW16	WNW20.7	NW32
9-Jan	WNW14	WNW17	WNW14	WNW13	WNW11	WNW12	WNW11	W8	W8	WNW9	WNW11	WNW16	WNW15	WNW13	WNW11	WNW13	WNW12	NW12	NNW12	NNW14	N11	N12	N14	NW5	WNW10.9	WNW17
10-Jan	NNW7	WNW9	WNW10	WNW9	WNW10	WNW9	WNW10	W6	W7	W6	WSW6	WSW9	W12	W16	W12	W8	W9	W9	W12	WNW15	WNW14	WNW14	WNW12	WNW12	WNW9.7	W16
11-Jan	WNW11	WNW11	WNW11	WNW10	WNW12	WNW11	NW4	ESE1	SW4	SE4	ESE5	SE4	ESE7	SE10	ESE15	ESE18	E20	ESE17	ESE13	S13	S12	SSW14	SSW13	WSW7	SSE3.0	E20
12-Jan	W9	WSW12	W10	WNW9	WNW10	WNW9	W9	WNW9	NW10	NW9	NW9	NW8	NW7	WNW8	W5	W5	SW2	S7	S8	S6	E4	E8	ENE6	E7	WNW4.2	WSW12
13-Jan	N4	NNW6	NW7	NW9	NW8	NNW8	NNW6	NW8	NW8	NNW7	NE8	E1	ESE4	ESE10	ESE14	E16	E19	E24	E27	E28	E29	E31	E32	E32	E9.6	E32
14-Jan	E28	E20	ENE10	NNW4	NW9	NW11	NW12	NW14	NW14	NW11	NW14	NW16	NW17	NW17	NW17	NW17	NW15	NW17	NW19	NW17	NW14	NW14	NW13	WNW11	NW10.6	E28
15-Jan	NW12	NW12	NW12	NNW13	N11	NNE8	N5	ENE6	ESE4	ESE14	E19	ESE20	ESE19	E23	E28	E31	ESE30	E30	E31	E37	E35	SE28	SE26	SSE24	E14.5	E37
16-Jan	SSE22	SSE21	SSE20	SSE21	SSE17	S17	S15	S15	SSW14	SSW12	SW11	SW11	WSW13	W15	W11	WSW7	WNW8	NW7	NW8	E8	E5	NNE3	WNW7	NW12	SSW7.0	SSE22
17-Jan	NW18	NW18	NNW17	NNW15	NNW13	NNW13	NNW12	NNW9	NW10	NNW7	NNW7	NNW7	NE5	E9	ESE13	E13	E17	E22	E19	E19	E18	E19	E21	E24	NE7.4	E24
18-Jan	E25	E26	E18	E19	E21	E21	E18	E16	E17	E15	ESE9	ESE6	E5	S2	W5	WNW9	WNW7	NW9	NW10	WNW9	NW8	NNW8	NNW9	NNW13	ENE6.9	E26
19-Jan	NNW8	N9	N6	N6	N3	N4	NNW3	NW4	WNW3	NW5	NNW6	NNW6	NNW5	NNW7	NW7	NW5	NNW5	NNW5	NW6	NW8	NNW8	NNW10	NNW9	NNW8	NNW5.9	NNW10
20-Jan	NNW7	NNW8	NW6	NW10	NW8	WNW6	WNW6	WNW6	WNW6	WNW7	WSW6	W7	W9	W7	SW8	SE7	E10	E11	E17	ESE17	ESE12	E11	E12	E15	NE1.2	ESE17
21-Jan	ENE16	E20	E22	E21	E26	E31	E30	E30	E29	E22	SE13	S19	S28	SSW28	SSW23	SW17	SW19	SW17	SW15	WSW14	WSW13	WSW12	W12	W10	SE8.0	E31
22-Jan	WNW9	WNW7	WNW5	W5	WNW4	NNW3	N8	NNE6	E7	E8	NNE3	N5	NNW6	NNW7	NNW10	NNW10	NNW11	NNW12	NNW15	NNW11	NNW10	NNW8	NNW6	NNW5	NNW6.0	NNW15
23-Jan	NNW4	NNE4	NNE5	NE7	NE6	E11	ESE17	ESE23	E29	E31	E31	E32	E28	E30	ENE27	ENE29	ENE26	ENE27	ENE22	E25	ENE20	ENE19	ENE23	ENE24	ENE19.9	E32
24-Jan	ENE22	ENE21	ENE20	ENE17	NE11	ENE13	ENE10	N6	NW6	NNW5	E4	ESE10	ESE10	ESE9	ESE9	ESE8	ESE10	E10	E10	E9	ESE8	ESE7	ENE9	E11	ENE9.2	ENE22
25-Jan	E15	E15	E17	E17	ENE11	E13	ENE13	E12	ENE7	NE5	NNE4	NNE5	N3	NW3	NW6	NNW6	NNW5	NW4	NW4	WNW5	WNW5	NW4	WNW3	W2	NE4.6	E17
26-Jan	WNW1	W2	NW1	NE1	ENE3	AF	AF	AF	NNW3	NNW4	NNW4	NW5	NNW5	NW6	NW7	NW8	NW7	NW7	NW8	NW6	NW8	NW8	NW7	NW7	NW4.8	NW8
27-Jan	NW6	NW6	NW7	NW6	NW5	WNW4	W4	NW4	NW3	WNW4	NNW5	N3	WNW3	N3	N3	ESE1	ENE4	ENE5	ENE5	ENE6	E9	E10	E14	E15	NNE2.6	E15
28-Jan	ENE13	ENE11	NE9	N5	N6	NNE6	N4	NW5	NW7	NW7	NW9	NW10	NW11	NW9	NW9	NW8	NW7	NW6	NW5	WNW5	WNW6	W3	WSW3	S1	NNW4.6	ENE13
29-Jan	AF	SSE1	ESE1	E5	E7	E7	E7	E9	E9	E10	E10	E13	E10	E11	ENE8	NE5	ENE5	ENE4	NNE3	N3	NNW2	NNE2	NW2	NW6	ENE5.1	E13
30-Jan	NW8	NNW7	NW6	NW7	NW9	NNW8	NW6	NW8	NW7	NW8	NW8	NW10	NW8	NW7	NW7	NNW6	NNW4	NNW5	NNW6	NNW5	NNW4	NNW4	NNW3	N1	NW6.3	NW10
31-Jan	N1	W1	W3	W4	WNW6	WNW4	W2	AF	AF	E5	ENE1	E4	E5	E5	E6	E6	E6	E6	E5	ESE4	ESE4	E5	E5	E6	E2.5	E6
	NNW3.3	NW3.3	NNW3.9	NNW4.0	NNW4.4	NNW3.9	NNW3.1	NNW2.8	NNW2.9	NNW2.7	NNW3.0	NW3.1	WNW3.6	WNW4.1	NW3.6	NW2.9	NNW2.7	NNW3.3	NNW3.8	NNW3.0	NNW3.0	NNW2.8	NNW2.9	NNW2.6	Diurnal Average	
	E28	E26	NW25	NW24	NW27	NW32	E30	E30	E29	E31	E31	E32	S28	ENE30	E28	E31	ESE30	E30	E31	E37	E35	E31	E32	E32	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 8 06:00

Minimum Value: 0 km/h on Jan 31 21:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 7

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

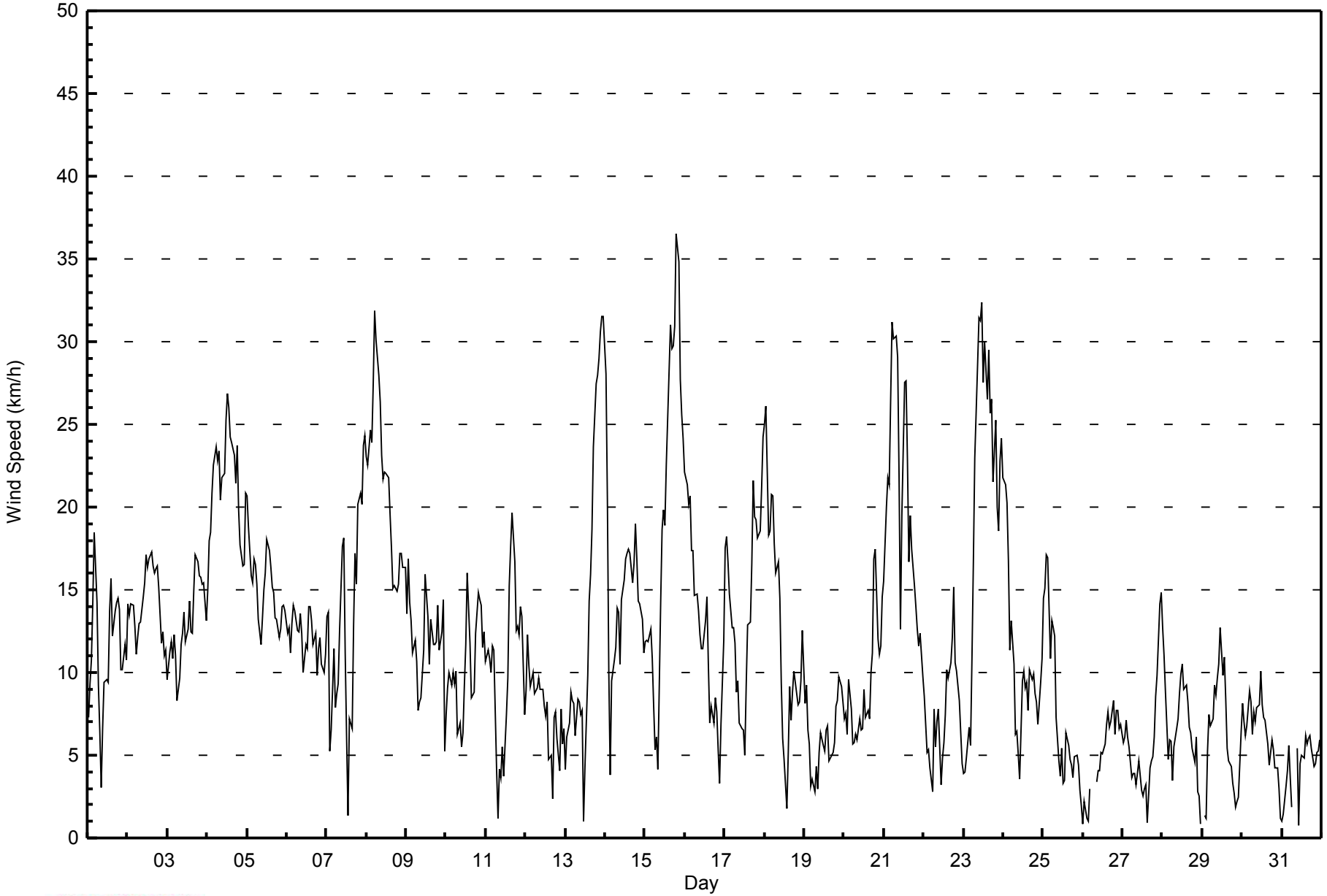
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	128	17.34	17.34
6 - 11	273	36.99	54.34
12 - 19	234	31.71	86.04
20 - 28	81	10.98	97.02
29 - 38	22	2.98	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 738

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Fort Chipewyan - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	14	8	4	8	13	8	2	2	1	1	2	1	12	13	17	22	128
6 - 11	9	4	3	12	33	13	5	1	5	0	5	7	21	50	67	38	273
12 - 19	2	0	0	6	30	14	1	1	5	5	6	5	35	53	58	13	234
20 - 28	0	0	0	11	21	2	2	5	1	2	0	0	19	0	18	0	81
29 - 38	0	0	0	2	17	1	0	0	0	0	0	0	0	0	2	0	22
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	12	7	39	114	38	10	9	12	8	13	13	87	116	162	73	738

Total Number of Valid Hours: 738

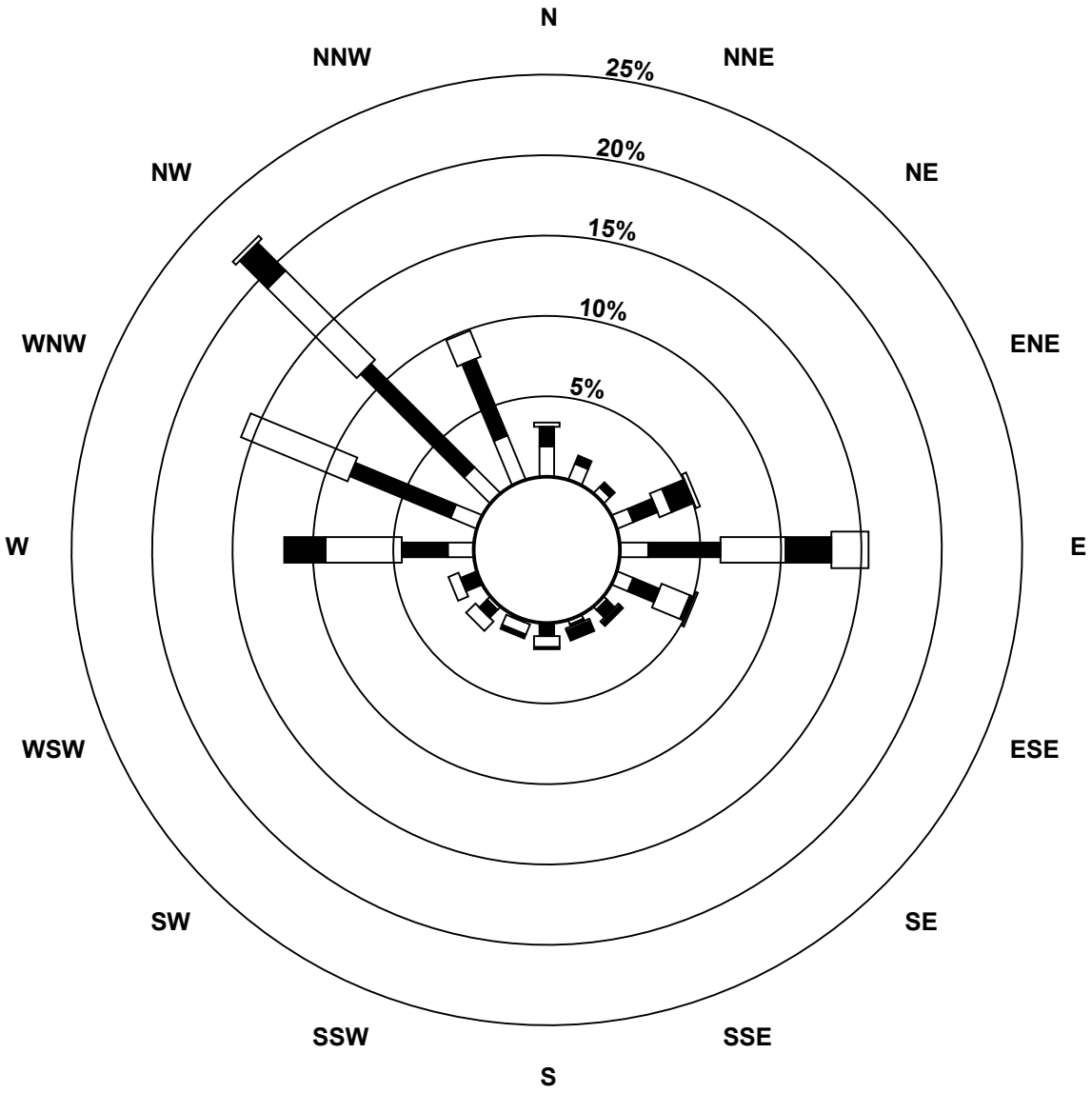
Total Number of Hours: 744

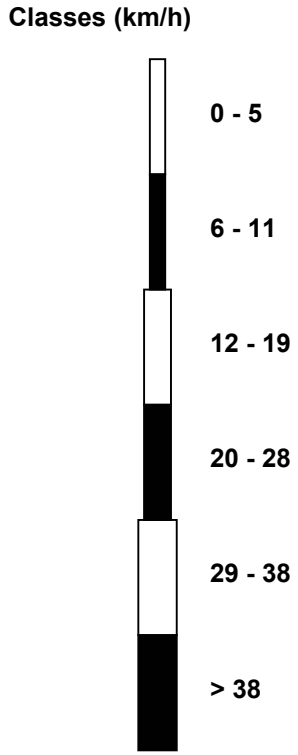
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Fort Chipewyan (AMS 8)





Total Number of Valid Hours: 738

Direction of Maximum Speed: 93 deg on Jan 15 20:00
Direction of Maximum Daily Speed Average: 270.3 deg on Jan 4

Direction of Minimum Speed: 71 deg on Jan 31 11:00

Direction of Minimum Daily Speed Average: 1.2 deg on Jan 20

Monthly Average Direction: 307.4 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-Jan	71	84	85	83	95	105	115	92	60	340	331	313	293	294	312	306	294	291	317	317	292	276	277	270	327.8
2-Jan	291	283	294	296	316	300	288	299	294	290	302	310	311	309	309	313	316	316	320	319	309	311	300	285	304.3
3-Jan	279	285	288	286	293	295	291	287	284	287	290	292	279	280	275	263	265	279	278	275	282	282	282	277	281.8
4-Jan	271	271	271	271	270	269	269	269	263	261	265	266	269	270	272	272	272	275	274	273	274	276	273	274	270.3
5-Jan	275	277	279	281	291	300	293	300	321	328	321	323	320	315	312	317	318	318	320	312	316	319	315	304	306.3
6-Jan	309	299	300	286	288	299	304	291	292	296	287	281	282	283	281	274	268	270	262	276	278	270	252	226	282.5
7-Jan	225	218	194	178	214	187	136	124	105	100	104	129	155	284	360	350	323	328	324	319	320	321	315	310	309.4
8-Jan	306	306	306	312	314	317	317	314	309	308	311	306	305	305	307	305	289	285	278	269	271	271	276	282	301.9
9-Jan	287	287	294	294	298	299	290	270	281	284	286	288	296	288	286	286	294	307	336	341	350	351	353	324	302.6
10-Jan	334	292	292	289	291	296	293	277	267	264	245	241	267	267	276	266	264	279	280	289	291	287	297	290	281.6
11-Jan	295	293	294	297	300	301	319	109	225	137	123	134	123	137	120	105	99	103	121	169	188	195	203	246	163.1
12-Jan	262	239	270	298	292	287	279	291	317	322	316	310	312	294	278	280	228	178	191	187	101	96	71	99	281.7
13-Jan	9	335	307	310	310	333	338	320	321	344	44	99	120	118	104	95	99	98	99	96	96	96	91	94	82.6
14-Jan	95	94	69	348	322	314	306	309	325	322	317	313	316	318	314	316	309	309	314	315	320	318	311	298	323.9
15-Jan	315	315	320	336	1	23	7	69	102	109	98	102	105	95	96	100	102	95	92	93	97	126	137	151	96.0
16-Jan	152	156	158	163	166	172	184	191	206	202	217	228	245	274	268	252	291	324	316	82	81	24	288	309	198.4
17-Jan	314	319	332	335	330	328	336	334	317	333	334	340	54	98	107	100	86	85	88	89	85	82	82	80	42.9
18-Jan	80	83	84	88	93	88	90	86	91	93	102	109	86	169	272	291	288	304	316	302	310	327	343	347	68.7
19-Jan	347	353	356	9	8	352	344	322	296	322	339	344	341	336	326	317	329	327	326	320	334	334	333	330	336.3
20-Jan	334	335	317	319	316	285	292	291	293	282	257	266	270	259	216	125	98	87	95	108	105	100	85	81	53.6
21-Jan	75	79	83	81	84	86	86	90	88	92	137	173	186	197	208	214	219	231	236	248	253	251	267	280	137.4
22-Jan	291	283	289	262	282	329	355	31	81	83	25	356	345	337	346	340	333	327	337	335	329	341	336	343	337.0
23-Jan	347	23	12	34	56	83	110	106	95	87	83	82	79	79	76	78	73	77	72	79	72	67	71	68	78.5
24-Jan	71	65	68	64	47	61	60	349	324	347	87	119	117	104	110	118	102	90	81	85	105	105	78	86	77.5
25-Jan	91	86	85	88	68	83	77	82	66	45	17	27	3	322	314	331	333	319	318	297	297	314	300	275	55.7
26-Jan	282	261	323	51	76	AF	AF	AF	342	336	334	323	336	322	322	311	314	315	325	324	324	321	325	321	323.9
27-Jan	319	314	321	316	312	302	275	311	306	296	331	10	286	6	7	120	70	72	63	70	86	83	81	80	24.1
28-Jan	77	72	56	8	3	22	3	317	320	313	316	315	319	306	305	312	318	320	315	303	293	269	248	177	334.2
29-Jan	AF	155	111	83	92	84	94	99	91	92	86	83	84	82	69	48	74	60	14	358	348	14	316	317	76.1
30-Jan	323	329	324	318	325	330	323	313	304	304	317	315	321	320	316	333	328	333	336	328	333	343	334	1	322.8
31-Jan	4	277	280	271	292	293	281	AF	AF	79	71	81	79	85	83	87	91	91	100	107	102	93	101	96	85.0
	335.3	324.4	329.4	327.1	326.6	335.0	331.6	330.3	329.8	344.5	333.3	312.4	300.9	299.8	311.4	322.5	328.5	339.7	341.6	343.5	340.4	337.2	337.2	333.2	
	Diurnal Average																								

AF - Analyzer 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 - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 89 deg on Jan 27 16:00

Minimum Value: 4 deg on Jan 29 05:00

Percentiles: P_1 = 4 P_{10} = 7 Q_1 = 10 Median = 14 Q_3 = 19 P_{90} = 29 P_{99} = 74

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
	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-Jan	13	9	6	7	7	5	11	22	61	16	17	13	17	16	16	16	13	13	19	18	17	13	12	14	61
2-Jan	13	11	14	13	17	15	12	13	15	11	14	15	16	16	14	15	16	16	17	17	17	15	16	13	17
3-Jan	13	12	12	12	13	13	14	14	12	12	13	16	13	13	14	13	12	12	12	12	12	12	12	13	16
4-Jan	13	13	12	13	13	13	13	13	13	13	14	14	14	13	14	14	13	13	13	13	13	13	13	12	14
5-Jan	12	12	13	13	13	13	13	14	20	20	19	20	18	17	16	17	17	18	17	15	16	14	13	14	20
6-Jan	17	15	13	10	11	12	11	12	10	11	14	15	15	14	13	13	13	16	15	12	11	16	15	9	17
7-Jan	8	7	37	34	10	27	13	9	11	9	7	9	44	76	27	26	18	19	21	19	20	20	16	15	76
8-Jan	15	15	14	17	15	15	15	15	15	14	15	15	15	14	16	14	13	12	13	14	13	12	12	12	17
9-Jan	13	11	12	10	11	11	11	15	19	12	15	14	15	13	14	13	13	12	23	18	20	18	18	67	67
10-Jan	19	21	16	13	15	7	12	30	12	39	15	14	21	14	15	16	21	14	12	12	12	12	12	12	39
11-Jan	11	10	10	10	11	11	62	78	17	51	12	35	23	16	9	8	4	5	15	20	9	9	10	41	78
12-Jan	20	12	19	15	12	14	13	15	17	18	17	16	25	19	37	20	35	15	9	12	34	13	13	13	37
13-Jan	34	29	17	15	17	23	17	12	21	26	18	84	36	10	6	5	6	5	5	4	4	4	4	4	84
14-Jan	5	6	14	43	20	15	15	18	23	23	18	17	19	17	16	15	15	14	15	15	15	13	13	12	43
15-Jan	13	13	14	18	28	31	77	26	49	10	7	6	8	5	5	4	5	5	4	4	5	8	6	8	77
16-Jan	8	10	12	11	12	12	10	8	9	9	8	8	19	15	15	22	19	17	19	30	12	60	18	22	60
17-Jan	18	19	23	23	22	22	21	24	19	24	23	35	37	8	6	5	6	5	5	4	6	5	5	6	37
18-Jan	6	6	6	7	4	5	5	11	5	6	8	9	17	60	24	14	11	10	13	19	13	19	17	27	60
19-Jan	49	27	28	26	30	26	14	15	21	22	22	23	31	31	26	27	23	19	19	17	20	20	20	19	49
20-Jan	20	21	18	14	12	10	12	11	16	18	20	21	17	20	13	21	15	9	7	6	6	7	8	6	21
21-Jan	7	6	6	6	6	6	6	5	5	6	26	10	7	6	7	7	7	9	9	10	11	10	13	16	26
22-Jan	13	14	18	17	18	46	39	41	15	20	54	23	29	26	24	24	24	22	23	22	24	25	22	25	54
23-Jan	25	34	33	24	30	13	9	5	8	5	6	6	8	8	9	7	8	7	8	10	10	8	8	7	34
24-Jan	8	8	8	9	15	12	17	27	20	34	53	10	12	8	8	15	8	8	7	9	11	9	11	8	53
25-Jan	4	5	5	7	10	8	9	8	14	19	32	18	36	33	18	24	23	25	25	15	14	17	39	34	39
26-Jan	61	33	33	69	16	AF	AF	AF	30	26	29	25	26	24	20	16	16	18	23	22	21	16	18	19	69
27-Jan	19	17	15	15	12	34	21	16	16	14	25	39	64	41	26	89	11	18	7	13	7	7	7	7	89
28-Jan	7	11	16	30	27	23	28	17	16	17	18	18	16	18	16	16	13	10	18	23	13	53	26	68	68
29-Jan	AF	55	64	10	4	7	12	8	6	8	7	7	9	9	10	27	52	44	38	26	15	32	41	10	64
30-Jan	12	19	19	19	20	21	20	14	16	17	19	17	22	25	24	27	17	13	13	21	19	17	29	78	78
31-Jan	71	62	20	11	6	9	70	AF	AF	10	79	10	11	11	9	6	8	6	13	17	8	7	8	5	79
	71	62	64	69	30	46	77	78	61	51	79	84	64	76	37	89	52	44	38	30	34	60	41	78	
	Diurnal Maximum																								

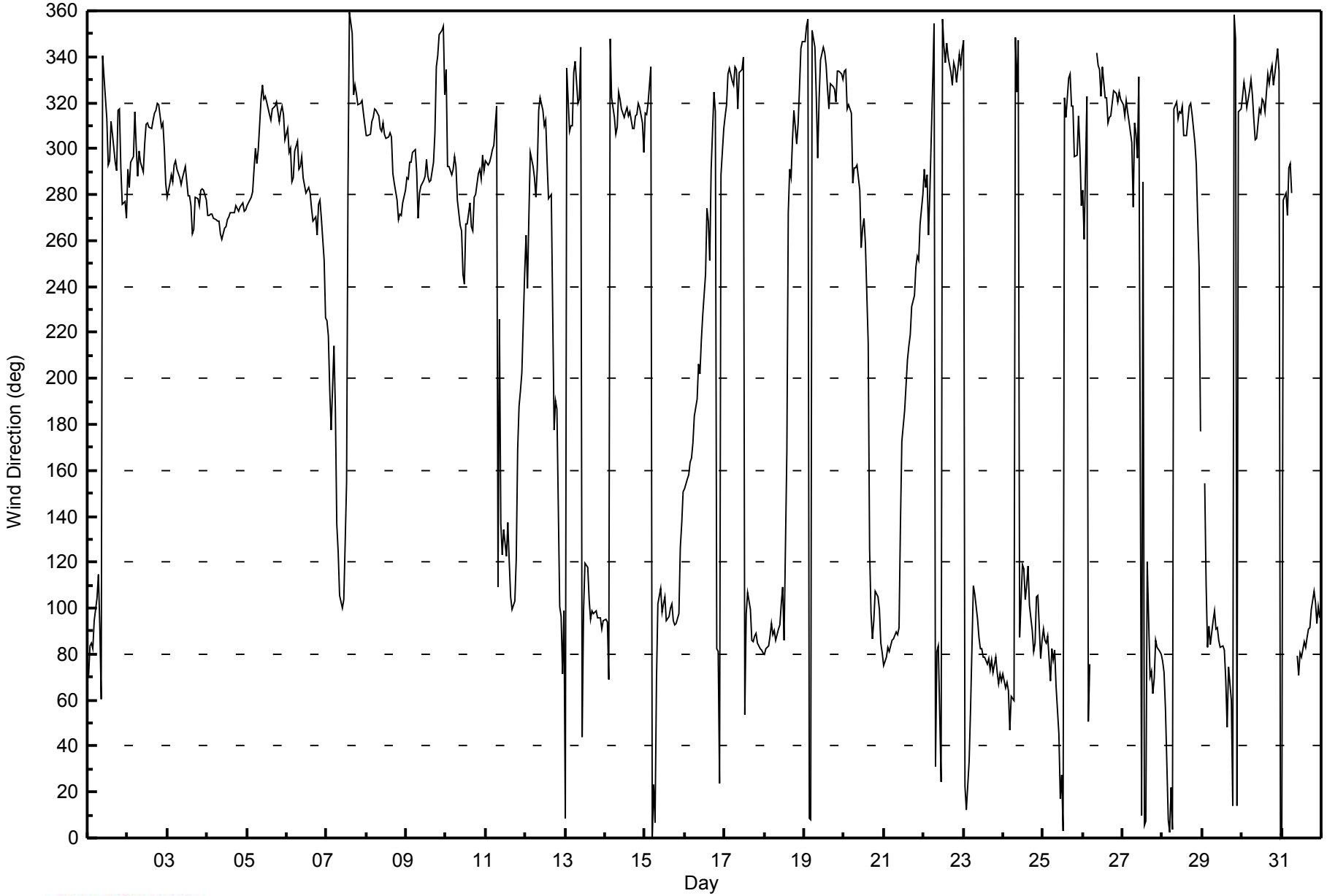
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Fort Chipewyan - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 12, 2015	Previous Calibration	December 19, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Reason:	Routine		
Start Time (MST)	12:45	End Time (MST)	15:10
Barometric Pressure	740 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	747
Cal Gas Concentration	2.45 ppm	Cal Gas Expiry Date	16/09/2016
Gas Cert Reference	LL103809		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8205
DACS voltage range	0-5v	DACS channel #	DIFF 1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	20	20	PMT voltage (mV)	-826	-826
Analyzer Range (mv)	20	20	Flash power supply (V)	975	1008
Calculated slope	1.008763	0.995684	Chamber temp.	44.9	45.2
Calculated intercept	-0.048504	-0.028903	Pressure (mm Hg)	704.6	711.6
Analyzer Background	1.1	1.20	Flow (l/m)	0.430	0.431
Analyzer Coefficient	0.966	1.043	UV Lamp (%)	94	90

Analyzer make	Thermo 43i-TLE	Analyzer serial #	1136451241

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.01	NA
as found span	5000	37.1	18.18	16.64	1.092
calibrator zero	5000	0.0	0.0	0.01	NA
high point	5000	37.1	18.18	18.27	0.995
second point	5000	19.8	9.70	9.80	0.990
third point	5000	9.9	4.85	4.91	0.988
calibrator zero					
as left zero	5000	0.0	0.0	0.1	NA
as left span	5000	37.1	18.2	18.0	1.010
				Average Correction Factor	0.991

Corrected As found	16.6	Previous response	18.1	% change	8.7%

Notes:

Analyzer settling in after installation last month. Diagnostics seem fine, good cal. Span adjusted, filter changed during As Lefts. As found zero used as calibrator zero

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

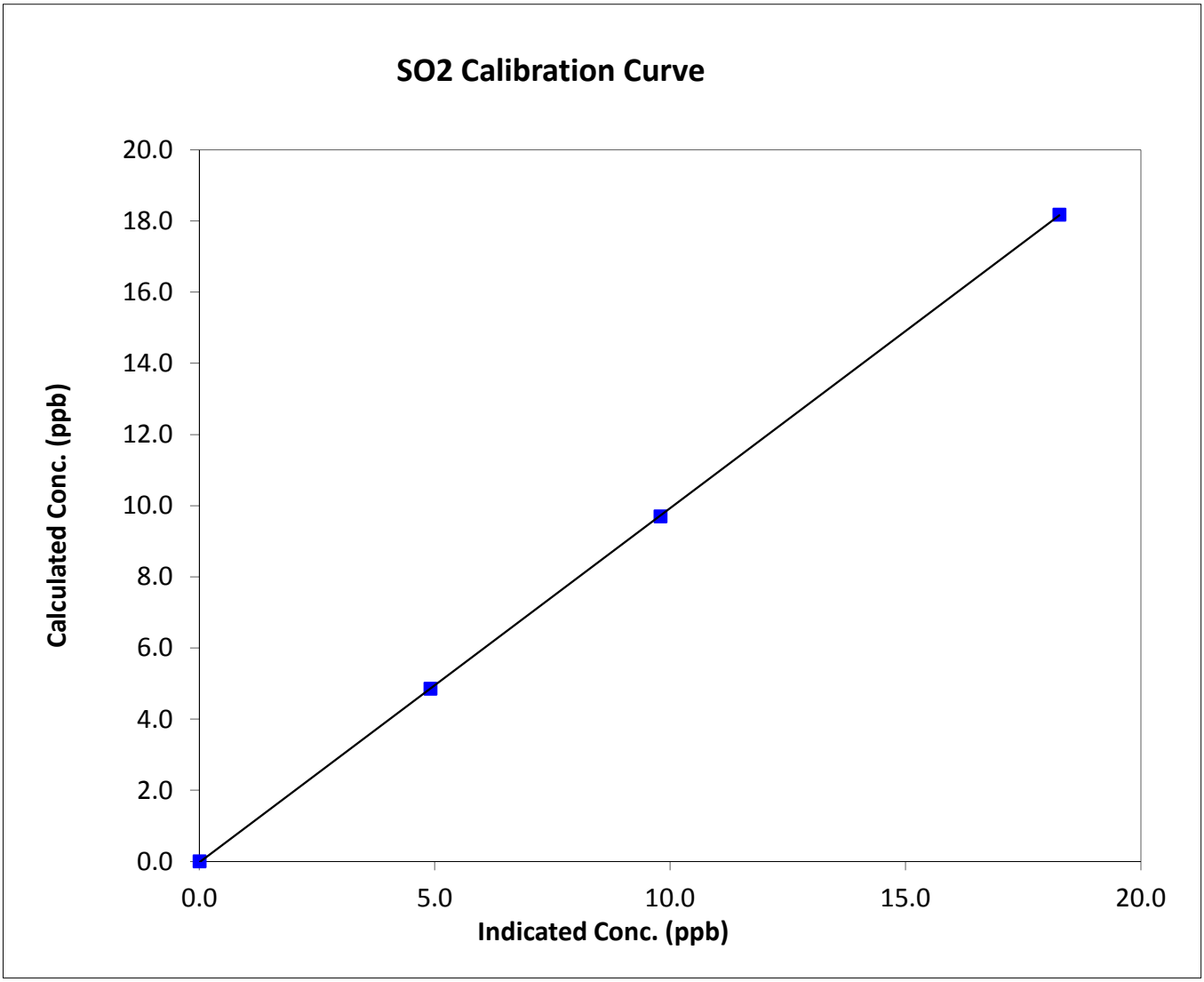
SO_2 Calibration Summary

Station Information

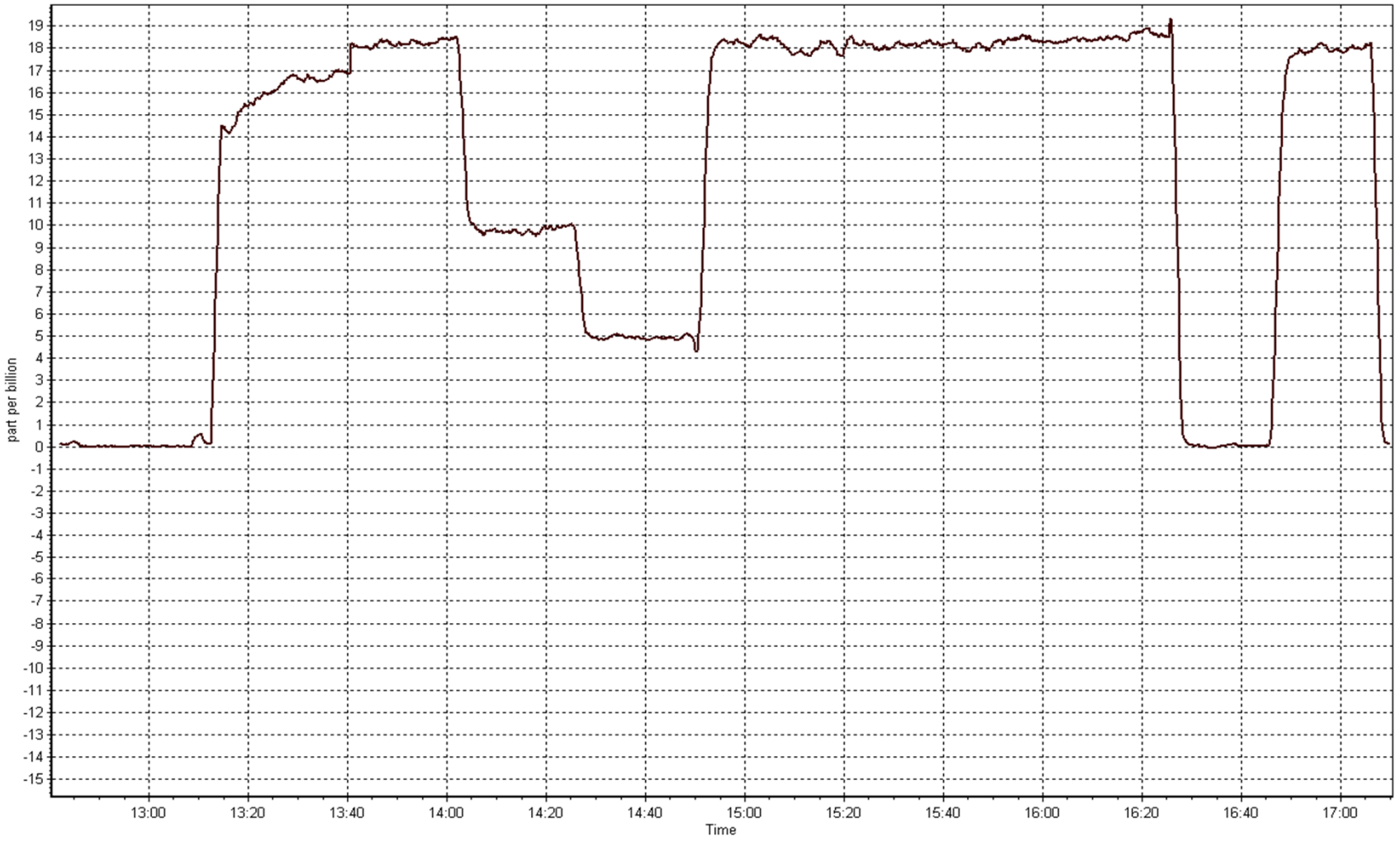
Calibration Date	January 12, 2015	Previous Calibration	December 19, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	12:45	End Time (MST)	15:10
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1136451241

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999992
18.2	18.3	0.9950		
9.7	9.8	0.9900	Slope	0.995684
4.9	4.9	0.9880		
			Intercept	-0.028903



SO2 Calibration Plot Date: January 12, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 12, 2015	Previous Calibration	December 4, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Reason:	Routine		
Start Time (MST)	17:10	End Time (MST)	20:40
Barometric Pressure	740 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	735
NO2 calibration used	December-03-14	Transfer Standard	NA
DACS make/model	Campeblls CR3000	DACS serial No.	8205
DACS voltage range	0-5V	DACS channel #	Digital

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	200	200	Bench temp. (Deg C)	31.0	28.5
Analyzer Range (input)	200	200	Lamp temp. (Deg C)	58.0	58.0
Calculated slope	0.999303	0.985466	Pressure (in Hg)	27.0	27.4
Calculated intercept	-0.265857	-0.048058	Flow cell (LPM)	0.717	0.766
Analyzer Background	-0.50	-0.6			
Analyzer Coefficient	1.001	1.015	Cell A Intensity	NA	NA
			Cell B Intensity	NA	NA

Analyzer make	API T400	Analyzer serial #	1020

Calibration Data

Set Point	Dilution air flow rate (cc/min)	O3 Ref -- O3 Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	0.8	N/A
as found span	5000	197.5 -- 810.1	102.4	101.9	1.005
calibrator zero	5000	0.00	0.0	-0.1	N/A
high point	5000	197.5 -- 810.1	102.4	103.6	0.989
second point	5000	148 -- 772	78.2	79.8	0.980
third point	5000	93 -- 715	52.3	53.3	0.982
calibrator zero					
as left zero	5000	0.00	0.0	0.5	N/A
as left span	5000	197.5 -- 810.1	102.4	107.0	0.957
				Average Correction Factor	0.984

Corrected As found	101.1	Previous response	102.7	% change	1.7%

Notes:

Internal pump bypassed and external pump plumbed in. Changed after As Founds. Filter changed after As Founds

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

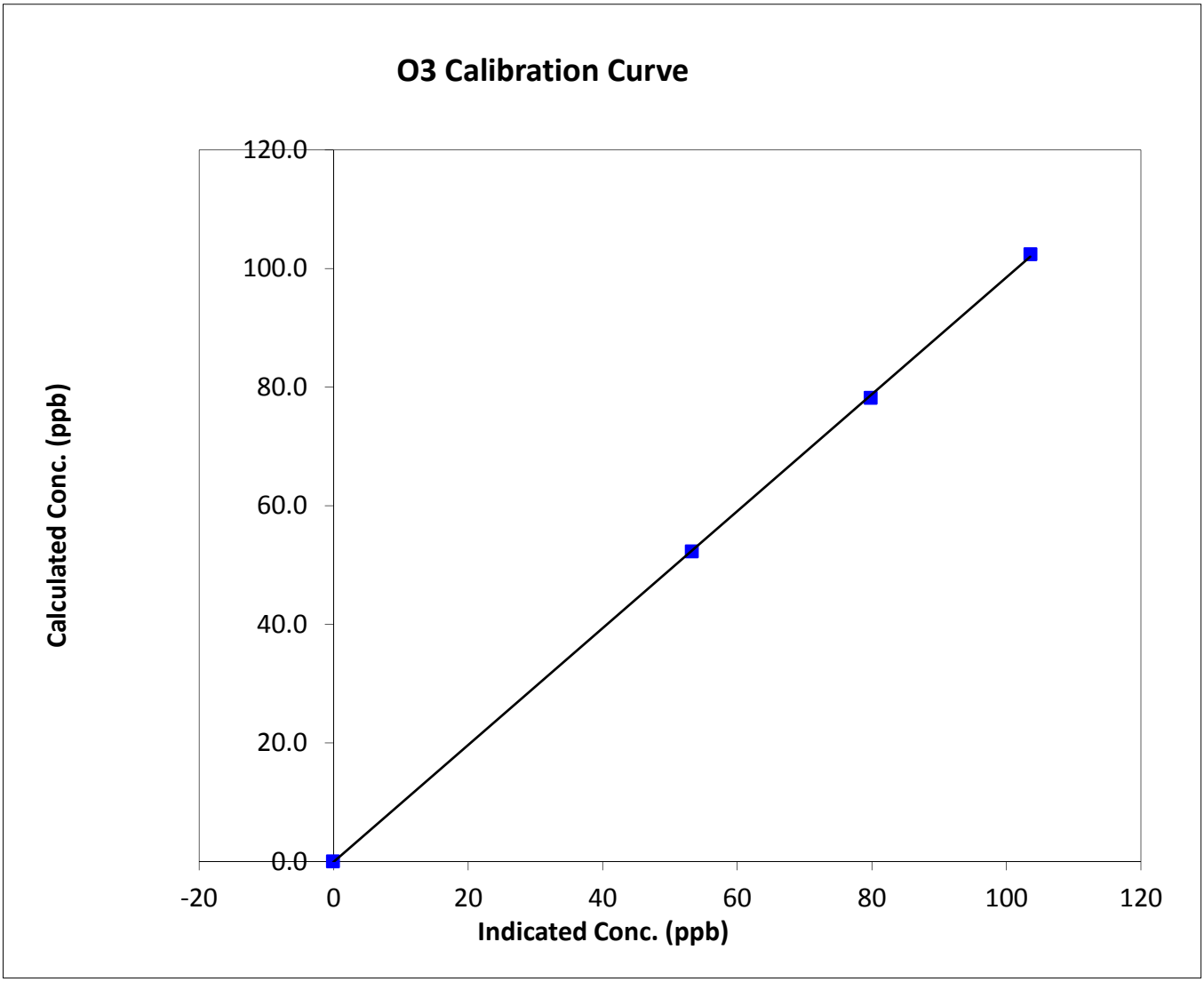
O_3 Calibration Summary

Station Information

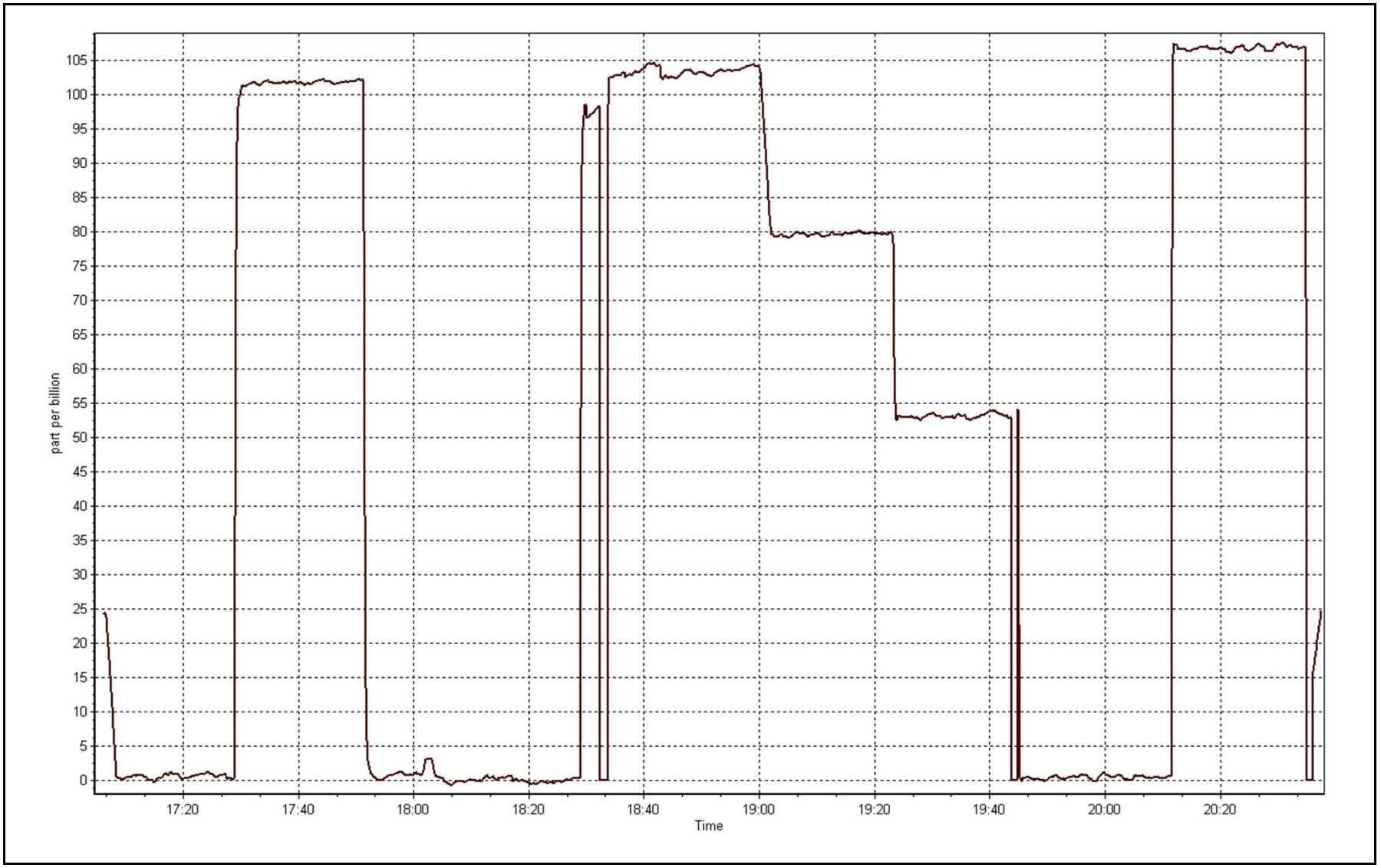
Calibration Date	January-12-15	Previous Calibration	December 4, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	17:10	End Time (MST)	20:40
Analyzer make	API T400	Analyzer serial #	1020

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999938
102.4	103.6	0.9887		
78.2	79.8	0.9797	Slope	0.985466
52.3	53.3	0.9822		
			Intercept	-0.048058



O3 Calibration Plot Date: January 12, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 12, 2015	Previous Calibration	December 3, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Reason:	Routine		
Start Time (MST)	12:45	End Time (MST)	17:08
Barometric Pressure	740 mmHg	Station Temperature	21.0 Deg C
Calibrator	API T700	Serial Number	747
NO Cal Gas Conc	20.2 ppm	Cal Gas Expiry Date	September 16, 2016
NOx Cal Gas Conc	20.3 ppm	Cal Gas Serial #	LL103809

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	172

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	200	200	200
	Analyzer Range (mv)	200	200	200
Before	Data Slope	0.992382	0.993314	0.987373
	Data Offset	0.905350	0.888480	-0.170217
After	Data Slope	1.001936	1.001021	0.993139
	Data Offset	0.048583	0.156814	0.098998
Channel #		DIFF 3	DIFF 1	DIFF 2
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	Thermo 42C	Analyzer serial #	2185

Test Point	before		after	
Concentration range	200	ppb	200	ppb
NO coefficient	1.349	ppb	1.208	ppb
NOX coefficient	1.360	ppb	1.221	ppb
NO bkgrnd	-0.1		-0.1	
NOX bkgrnd	0.1		0.1	
HVPS	502.0		502.0	
Chamber Temp	40.0	Deg C	40.0	Deg C
Moly Temp	314.0	Deg C	316.0	Deg C
PMT Temp	5.1	Deg C	5.1	Deg C
O3 flow	89.0	ccm	89.0	ccm
R Cell Press	2.6	"Hg	2.6	"Hg
Sample Flow	1114	ccm	1131	ccm

Notes:

NO and Nox both out 10%; cause was due to station environmental control repairs.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 12, 2015 Station Number: AMS 8

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	0.0	N/A	N/A
as found span	5000	37.1	150.6	149.9	0.7	167.7	166.9	0.9	0.8980	0.8982
calibrator zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	0.0	N/A	N/A
high point	5000	37.1	150.6	149.9	0.7	150.5	149.8	0.7	1.0011	1.0007
second point	5000	19.8	80.4	80.0	0.4	79.8	79.4	0.4	1.0077	1.0076
third point	5000	9.9	40.2	40.0	0.2	40.2	39.8	0.5	0.9989	1.0062
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	N/A	N/A
as left span	5000	37.1	150.6	46.0	104.6	147.9	45.8	102.1	1.0183	1.0041
								Average Correction Factor	1.0026	1.0048

Corrcted As found NO_X= 167.7 NO= 166.8 Percent Change NO_X= -10.0% NO= -10.1%

Previous Response NO_X= 150.9 NO= 150.0

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 37.10 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.0			N/A	
1st NO2 (100)	N/A	46.0	102.4	149.0	46.0	103.1	1.0033	1.0000	0.9934	100.7%
2nd NO2 (75)	N/A	70.2	78.2	148.8	70.2	78.6	1.0049	1.0000	0.9944	100.6%
3rd NO2 (50)	N/A	96.1	52.3	148.5	96.1	52.4	1.0070	1.0000	0.9977	100.2%
4th NO2 (0)	148.4	N/A	1.0	149.3	148.4	1.0	1.0015	1.0000	N/A	N/A
					Average Correction Factor		1.0042	1.0000	0.9952	100.5%

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

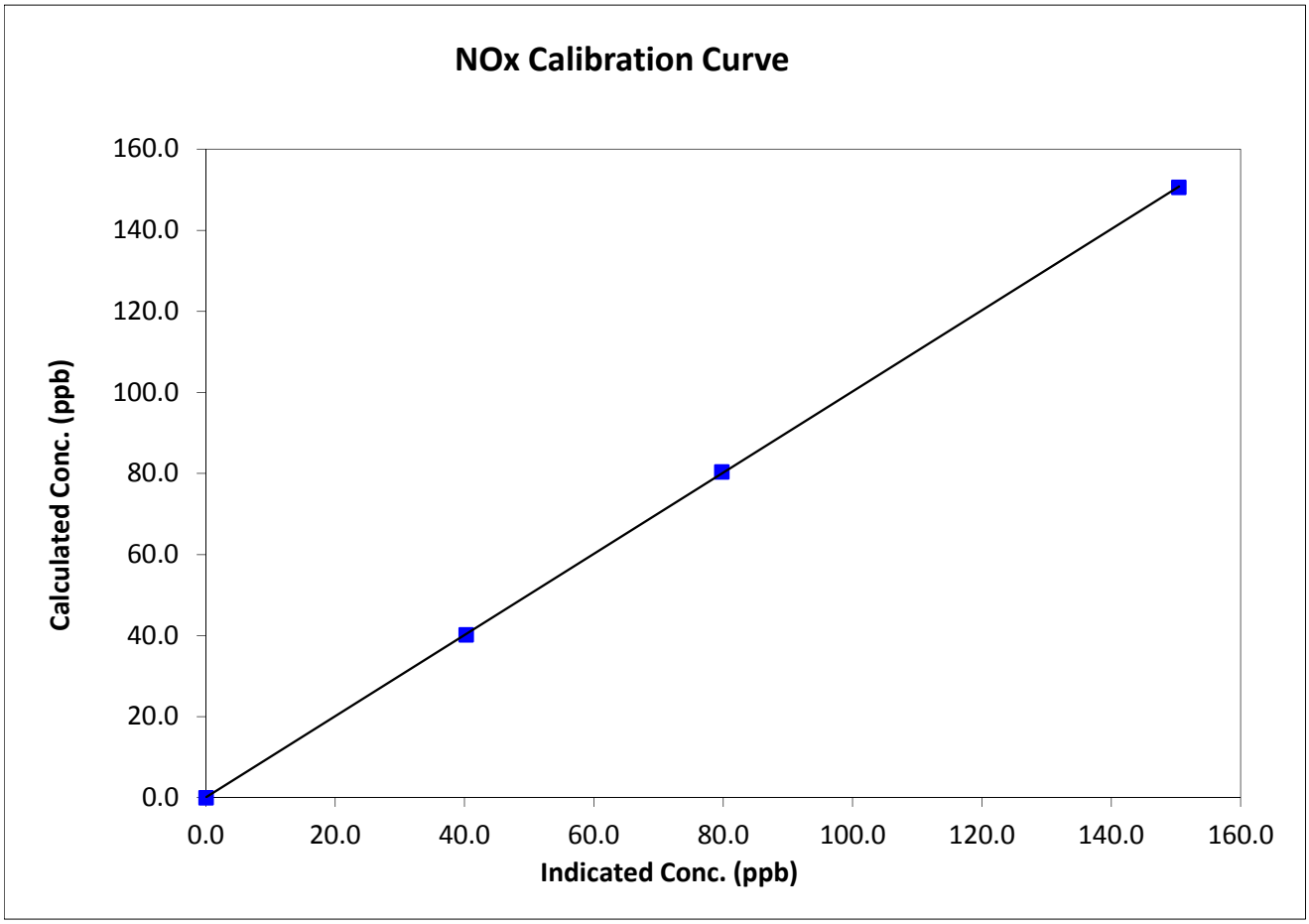
NO_X Calibration Summary

Station Information

Calibration Date	January 12, 2015	Previous Calibration	December 3, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	12:45	End Time (MST)	17:08
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999981
150.6	150.5	1.0011		
80.4	79.8	1.0077	Slope	1.001936
40.2	40.2	0.9989		
			Intercept	0.048583



Wood Buffalo Environmental Association

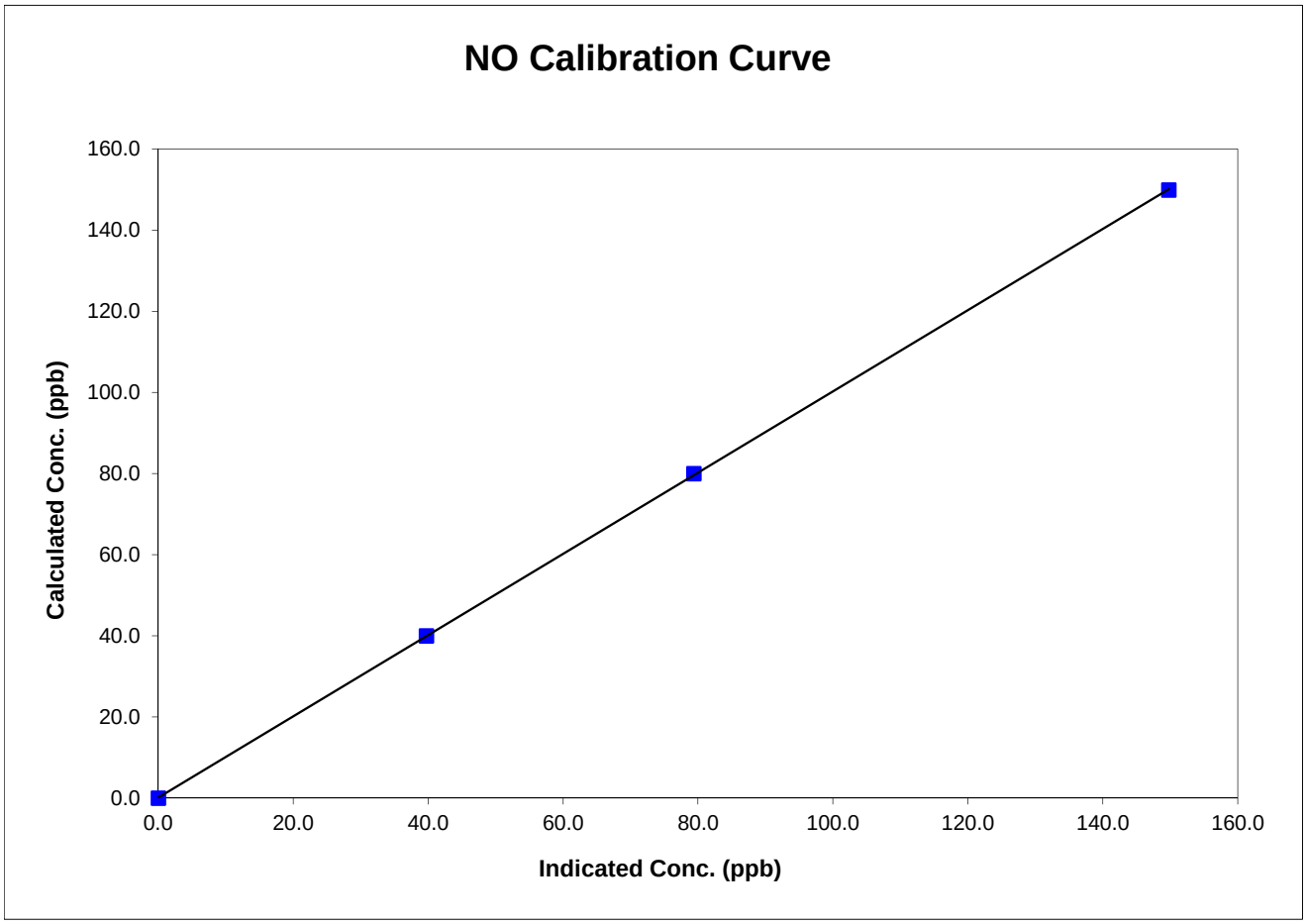
NO Calibration Summary

Station Information

Calibration Date	January 12, 2015	Previous Calibration	December 3, 2014
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	12:45	End Time (MST)	17:08
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999982
149.9	149.8	1.0007		
80.0	79.4	1.0076	Slope	1.001021
40.0	39.8	1.0062		
			Intercept	0.156814



Wood Buffalo Environmental Association

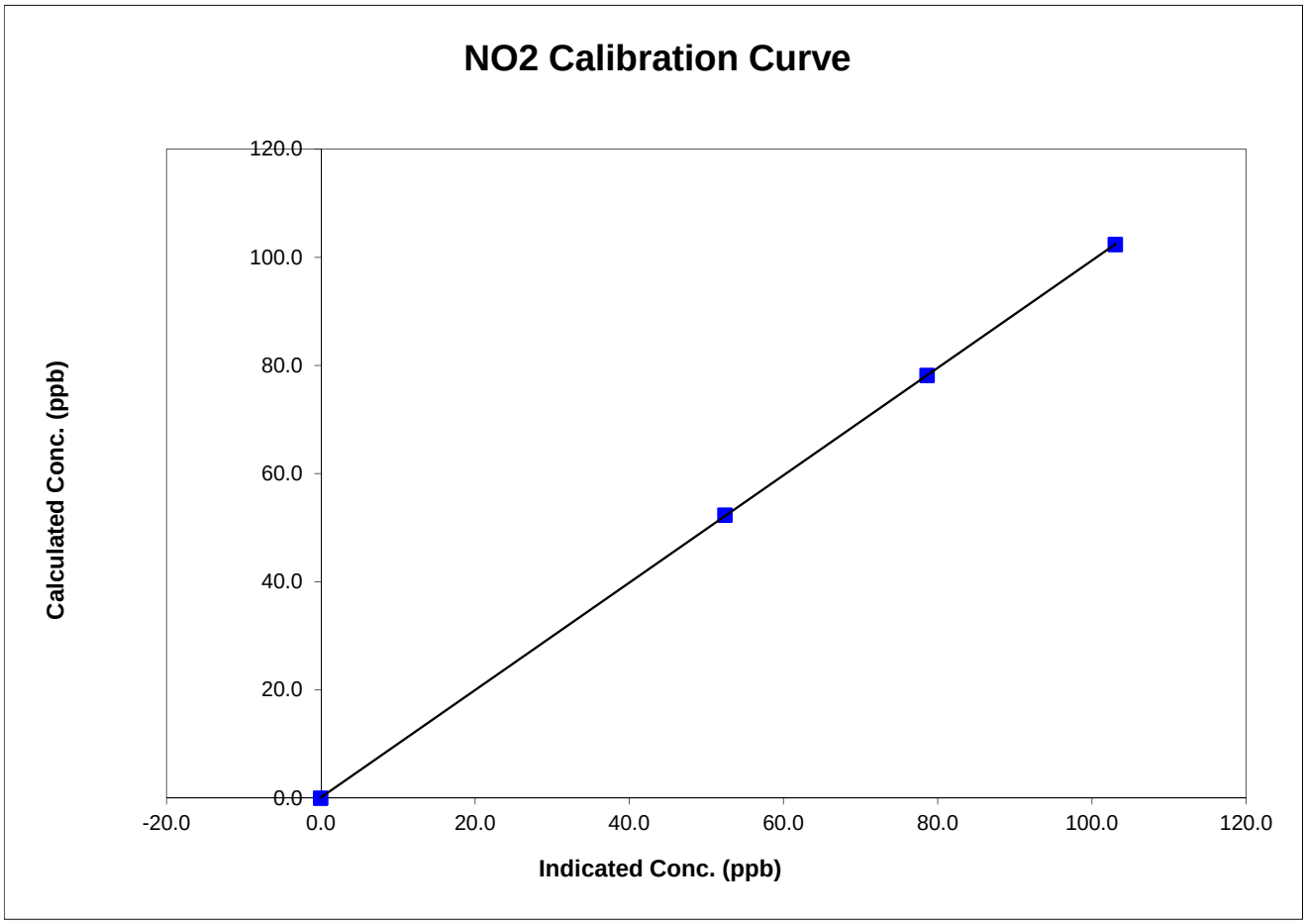
NO_2 Calibration Summary

Station Information

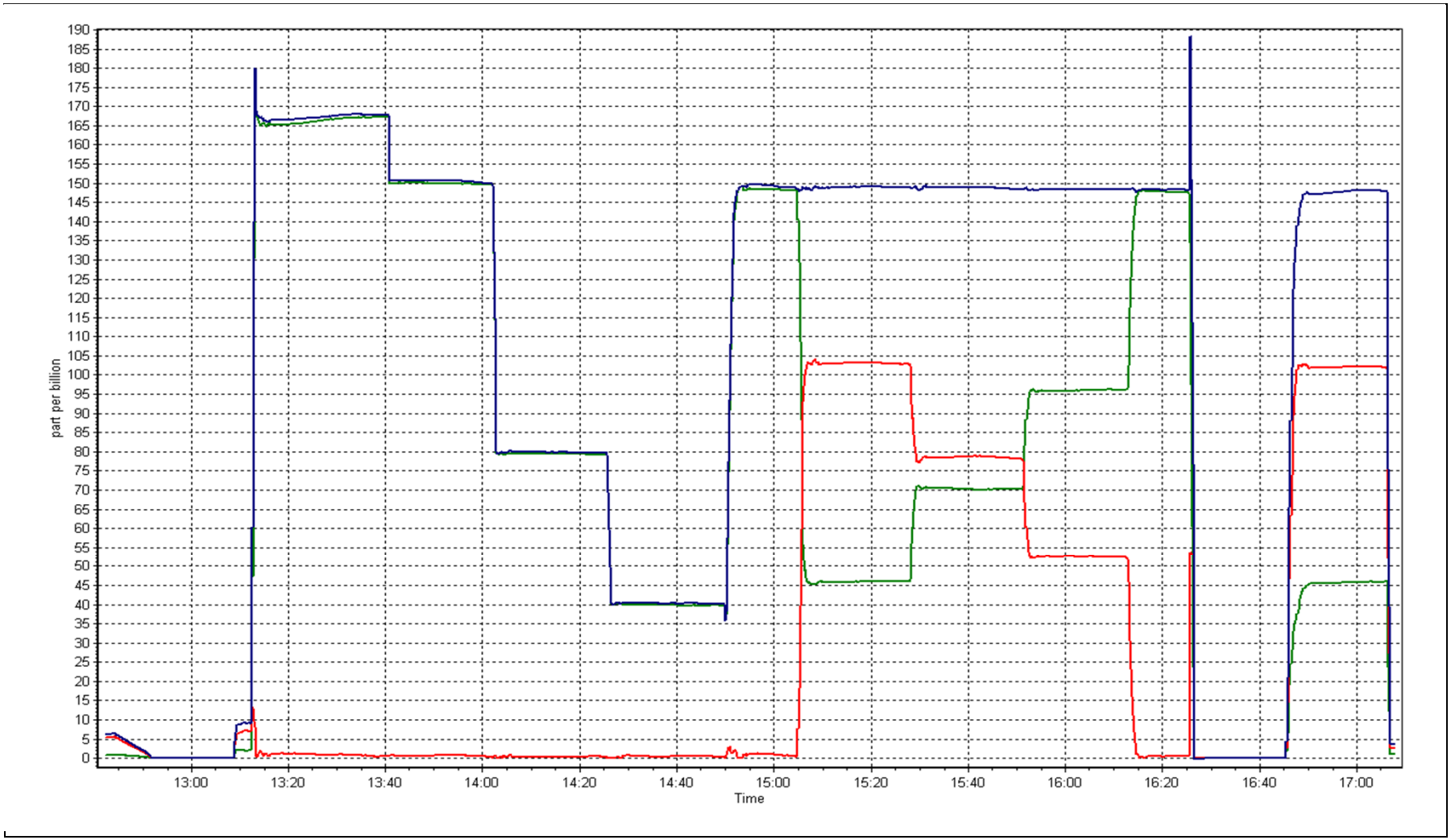
Calibration Date	January 12, 2015	Previous Calibration	December 3, 2014
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	12:45	End Time (MST)	17:08
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999995
102.4	103.1	0.9934		
78.2	78.6	0.9944	Slope	0.993139
52.3	52.4	0.9977		
			Intercept	0.098998



NOx, NO & NO_2 Calibration Plot Date: January 12, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 9
BARGE LANDING
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
JANUARY 2015

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
TRS(ppb) Average	708	36	36	100.00	3	0	1	0
THC(ppm) Average	710	34	34	100.00	5	-	3.3	-
Temperature (C) Average	744	0	0	100.00	6.3	-	3.4	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	692	0	52	93.01	17	-	-	-
Wind Direction 10 m (deg) Average	692	0	52	93.01	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
JANUARY 2015

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
TRS(ppb) Average	708	0.4	0	-	0	0	0	0	1	1	3
THC(ppm) Average	710	2.41	0.3	-	1.9	2.1	2.2	2.3	2.5	2.8	5
Temperature (C) Average	744	-14.86	9.4	-	-32.7	-26.4	-21.7	-16.6	-8.6	-0.4	6.3
Relative Humidity (%) Average	744	80.4	8	-	49	72	75	79	86	93	99
Wind Speed 10 m (km/h) Average	692	5.2	3	-	0	2	3	5	7	8	17
Wind Direction 10 m (deg) Average	692	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	24 Jan 2015 04:00	24 Jan 2015 11:00	8	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 17:00	25 Jan 2015 04:00	12	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 01:00	26 Jan 2015 11:00	11	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 17:00	27 Jan 2015 13:00	21	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 9 16:00 Maximum Daily Average: 1.1 ppb on Jan 24

Minimum Value: 0 ppb on Jan 22 09:00 Minimum Daily Average: 0.1 ppb on Jan 22
Maximum Diurnal Average: 0.5 ppb at hour 16 Minimum Diurnal Average: 0.3 ppb at hour 12
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
2-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Jan	0	Z	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	1	1	0	0	0	0	0.4	1
7-Jan	1	1	Z	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0.6	1
8-Jan	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
9-Jan	0	0	0	0	Z	0	1	1	1	1	C	C	C	C	C	3	1	1	1	1	1	1	1	0	0.7	3
10-Jan	0	0	0	0	0	Z	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
11-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0.8	1
12-Jan	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0.5	1
13-Jan	1	1	Z	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0.3	1
14-Jan	0	0	0	Z	0	0	0	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0.4	1
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.3	1
16-Jan	0	0	0	0	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0.3	1
18-Jan	0	Z	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
19-Jan	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0.6	1
21-Jan	2	1	1	1	Z	1	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.7	2
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Jan	0	0	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	0.7	2
24-Jan	2	Z	2	2	2	2	2	2	1	1	1	0	1	1	0	0	0	1	0	0	1	1	1	1	1.1	2
25-Jan	0	1	Z	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
26-Jan	0	0	1	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0.3	2
29-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0.4	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
31-Jan	0	1	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0.6	1
	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	3	2	1	1	1	2	2	2	2	Diurnal Maximum	

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

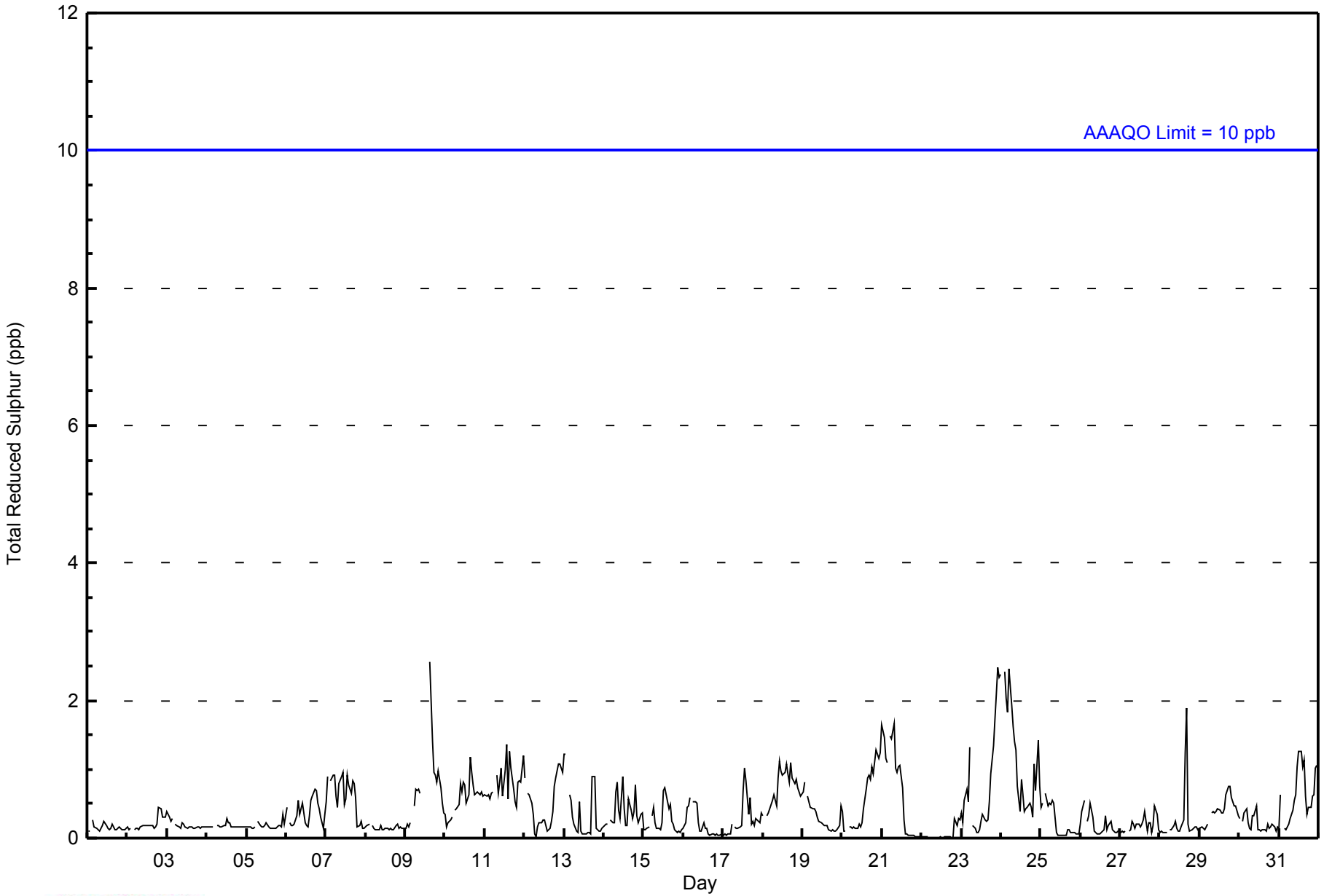
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	99.86	99.86
3 - 4	1	0.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	48	64	24	28	9	8	24	64	110	48	45	48	19	20	25	74	658
3 - 4	1	0	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	49	64	24	28	9	8	24	64	110	48	45	48	19	20	25	74	659

Total Number of Valid Hours: 659

Total Number of Hours: 744

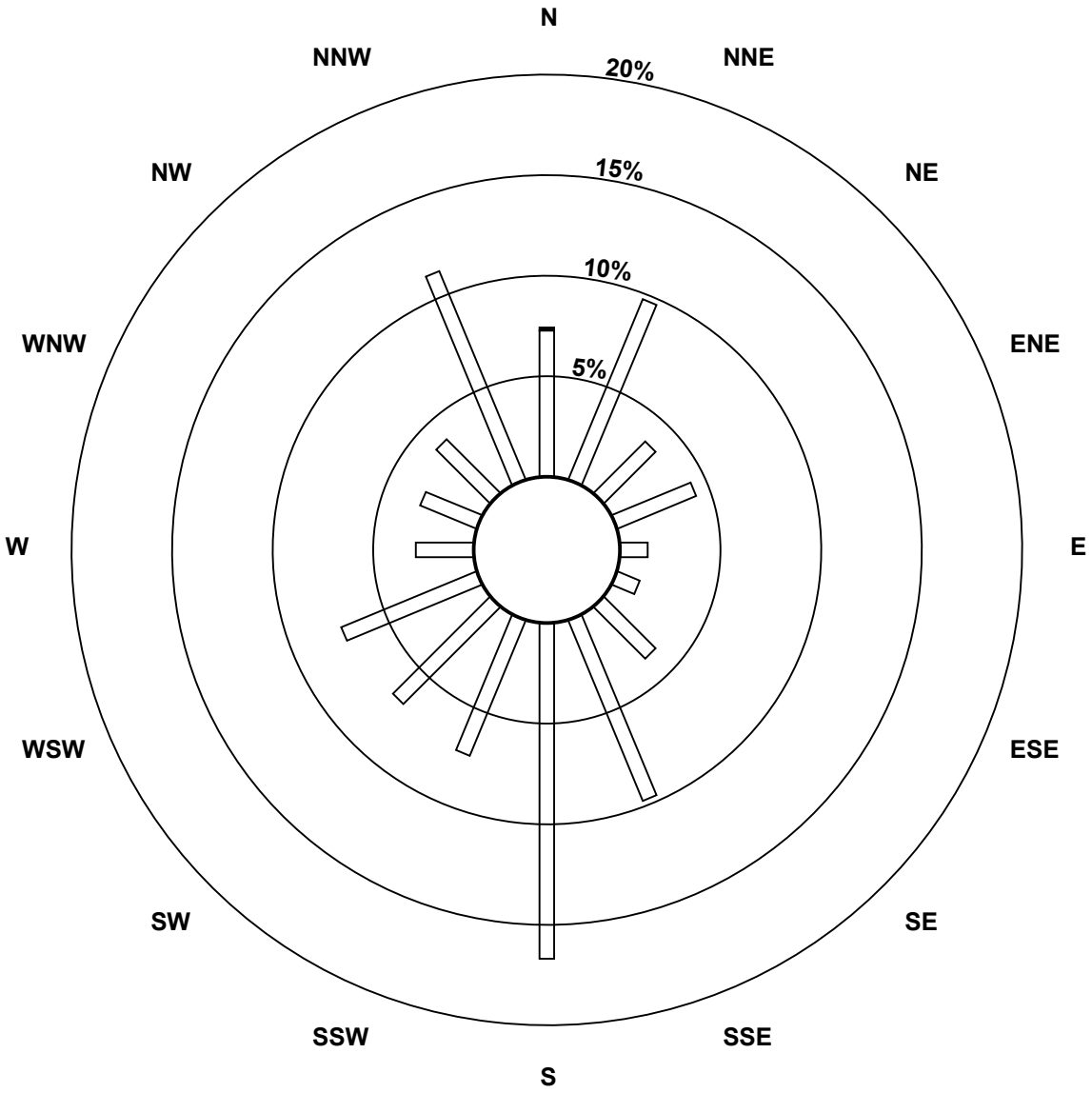
AURORA
ATMOSPHERICS INC.

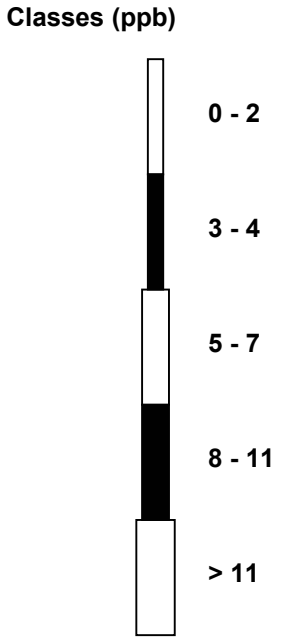
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Barge Landing (AMS 9)





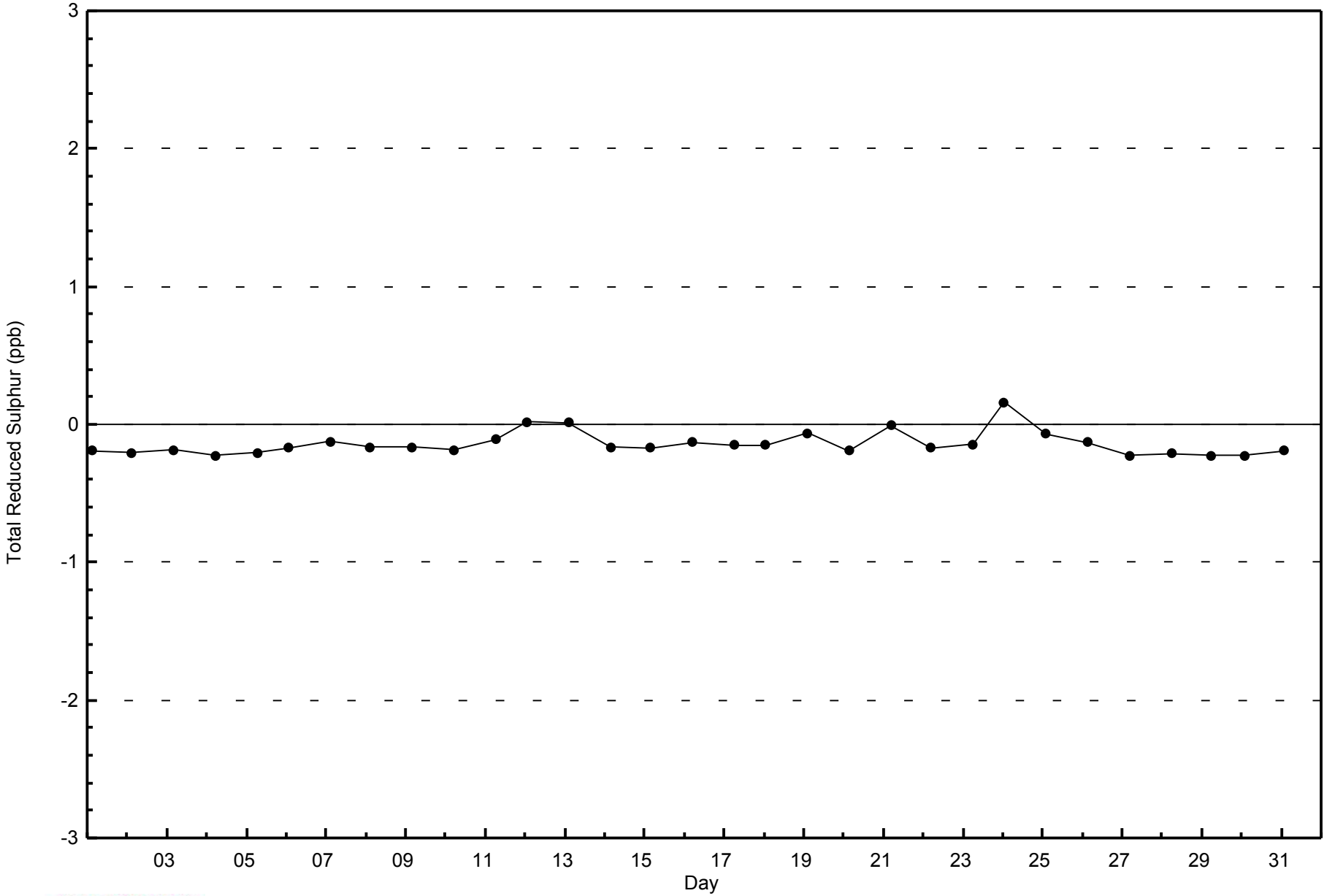
Total Number of Valid Hours: 659

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2015



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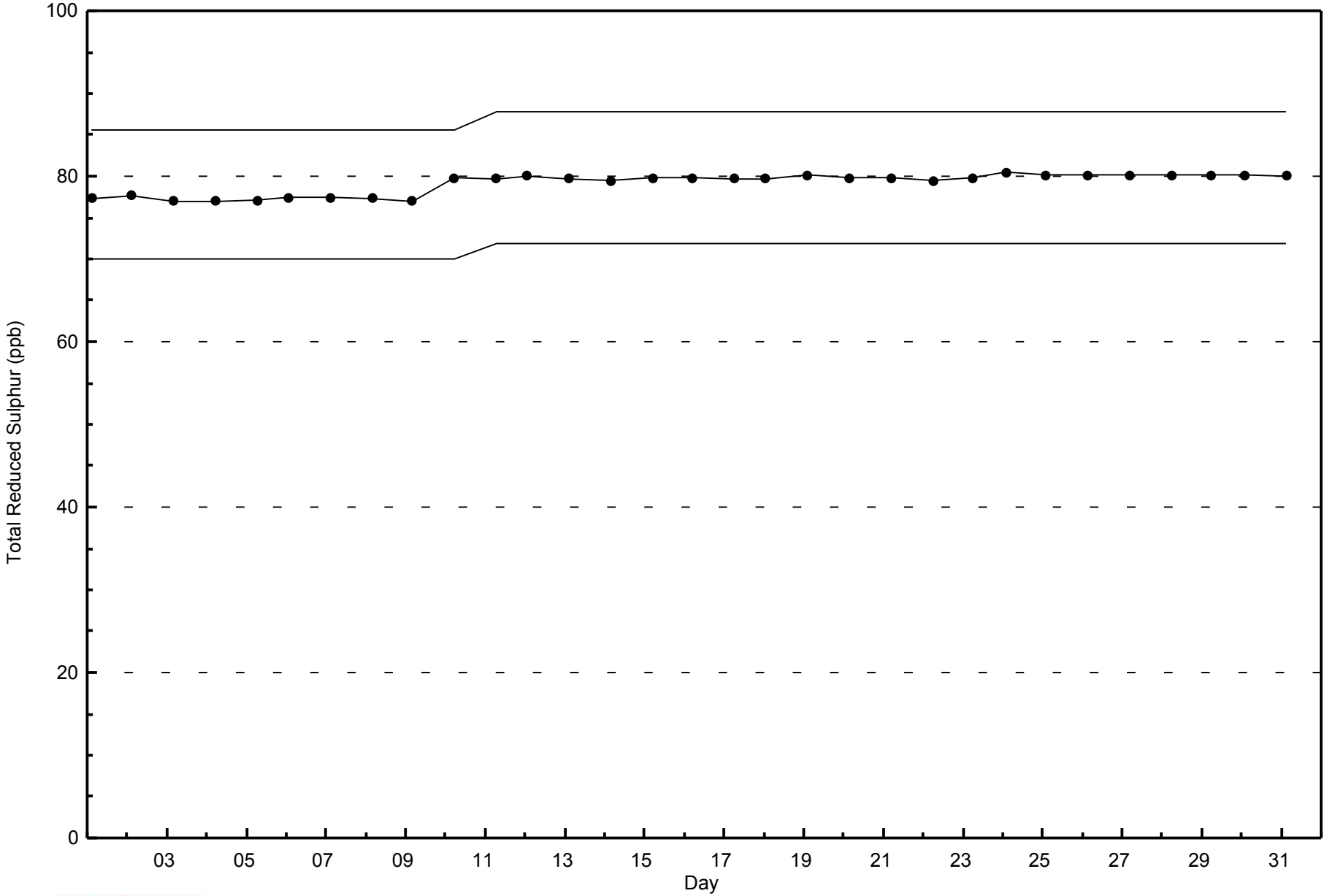
WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2015

Maximum Value: 5.0 ppm on Jan 24 06:00

Maximum Daily Average: 3.3 ppm on Jan 24

Minimum Value: 1.9 ppm on Jan 25 11:00

Minimum Daily Average: 2.1 ppm on Jan 22

Maximum Diurnal Average: 2.5 ppm at hour 17

Minimum Diurnal Average: 2.3 ppm at hour 12

Monthly Average: 2.41 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.5 P_{90} = 2.8 P_{99} = 3.9

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-Jan	2.0	Z	2.4	2.4	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.5	2.1	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.5
2-Jan	2.4	2.3	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.3	2.5
3-Jan	2.6	2.6	2.5	Z	2.4	2.3	2.3	2.2	2.2	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	2.3	2.6
4-Jan	2.1	2.2	2.2	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
5-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.1	2.6	2.6	2.2	2.6
6-Jan	Z	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.2	2.4	2.5	2.6	2.7	2.8	2.6	2.6	2.5	2.2	2.5	2.4	2.8
7-Jan	2.5	Z	2.6	2.5	2.5	2.4	2.4	2.3	2.5	2.4	2.5	2.3	2.3	2.5	2.4	2.5	2.9	2.7	2.5	2.2	2.2	2.3	2.1	2.1	2.4	2.9
8-Jan	2.3	2.5	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.1	2.2	2.5
9-Jan	2.3	2.4	2.4	Z	2.5	2.5	2.6	2.5	2.4	2.3	2.5	2.6	2.7	2.8	2.8	3.2	3.3	2.8	2.8	3.0	3.0	2.8	2.7	2.4	2.7	3.3
10-Jan	2.3	2.1	2.2	2.3	Z	2.5	2.5	2.5	2.5	2.7	2.7	2.7	2.7	2.5	2.6	2.7	2.5	2.5	2.5	2.5	2.7	2.6	2.7	2.8	2.5	2.8
11-Jan	2.8	2.7	2.8	2.7	2.9	Z	2.9	3.0	3.0	3.0	2.8	2.6	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.5	2.7	2.7	2.5	2.6	2.7	3.0
12-Jan	Z	2.9	2.8	2.7	2.5	2.4	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.5	2.4	2.6	2.7	2.8	2.9	2.9	2.9	2.8	2.6	2.7	2.6	2.9
13-Jan	2.9	Z	2.9	2.9	2.9	2.6	2.5	2.4	2.4	2.5	2.3	2.2	C	C	C	2.3	2.3	2.7	2.6	2.6	2.2	2.2	2.2	2.3	2.5	2.9
14-Jan	2.5	2.4	Z	2.5	2.6	2.5	2.4	2.6	2.7	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.7
15-Jan	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.5	2.8	2.6	2.8	2.7	2.8	2.6	2.6	2.3	2.1	2.1	2.2	2.2	2.4	2.8
16-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.4	2.2	2.2	2.7	2.3	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.7
17-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.9	2.7	2.5	2.6	2.7	2.3	2.6	2.5	2.5	2.4	2.6	2.4	2.3	2.3	2.4	2.3	2.4	2.5	2.4	2.9
18-Jan	Z	2.2	2.3	2.4	2.5	2.7	2.9	2.7	2.4	2.4	2.5	2.7	3.0	3.0	3.0	2.9	2.6	3.0	2.8	2.8	2.7	2.8	2.8	2.8	2.7	3.0
19-Jan	2.9	Z	3.1	3.1	2.9	2.7	2.6	2.5	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.2	2.2	2.3	2.4	2.3	2.4	3.1
20-Jan	2.4	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.7	3.3	3.9	3.1	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.5	3.9
21-Jan	2.4	2.4	2.5	Z	2.5	2.4	2.3	2.4	2.4	2.4	2.4	2.4	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	2.5
22-Jan	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	2.4	2.3	2.3	2.2	2.1	2.4
23-Jan	2.3	2.2	2.3	2.5	2.4	Z	2.6	2.3	2.3	2.3	2.3	2.5	2.7	2.5	2.4	2.3	2.4	3.2	3.3	3.2	3.4	4.4	3.6	4.0	2.7	4.4
24-Jan	Z	4.7	4.2	3.3	3.6	5.0	4.1	4.2	4.0	3.9	3.0	2.5	3.4	2.9	2.5	2.6	2.7	2.7	2.6	2.4	2.9	2.9	3.5	3.1	3.3	5.0
25-Jan	2.8	Z	2.4	2.4	2.4	2.2	2.1	2.2	2.3	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.8
26-Jan	2.2	2.4	Z	2.5	2.4	2.5	2.5	2.4	2.1	2.0	2.1	2.1	2.0	2.2	2.3	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6
27-Jan	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.2	2.3
28-Jan	2.2	2.1	2.1	2.1	Z	2.1	2.2	2.5	2.4	2.4	2.3	2.2	2.2	2.2	2.4	2.9	3.3	2.4	2.2	2.2	2.3	2.3	2.3	2.2	2.3	3.3
29-Jan	2.3	2.5	2.3	2.3	2.2	Z	2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.7	2.5	2.4	2.4	2.4	2.7
30-Jan	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.5	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.5
31-Jan	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.4	2.5	2.5	2.5	2.5	2.6	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.6
	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Diurnal Average	
	2.9	4.7	4.2	3.3	3.6	5.0	4.1	4.2	4.0	3.9	3.0	2.7	3.4	3.0	3.3	3.9	3.3	3.2	3.3	3.2	3.4	4.4	3.6	4.0	Diurnal Maximum	

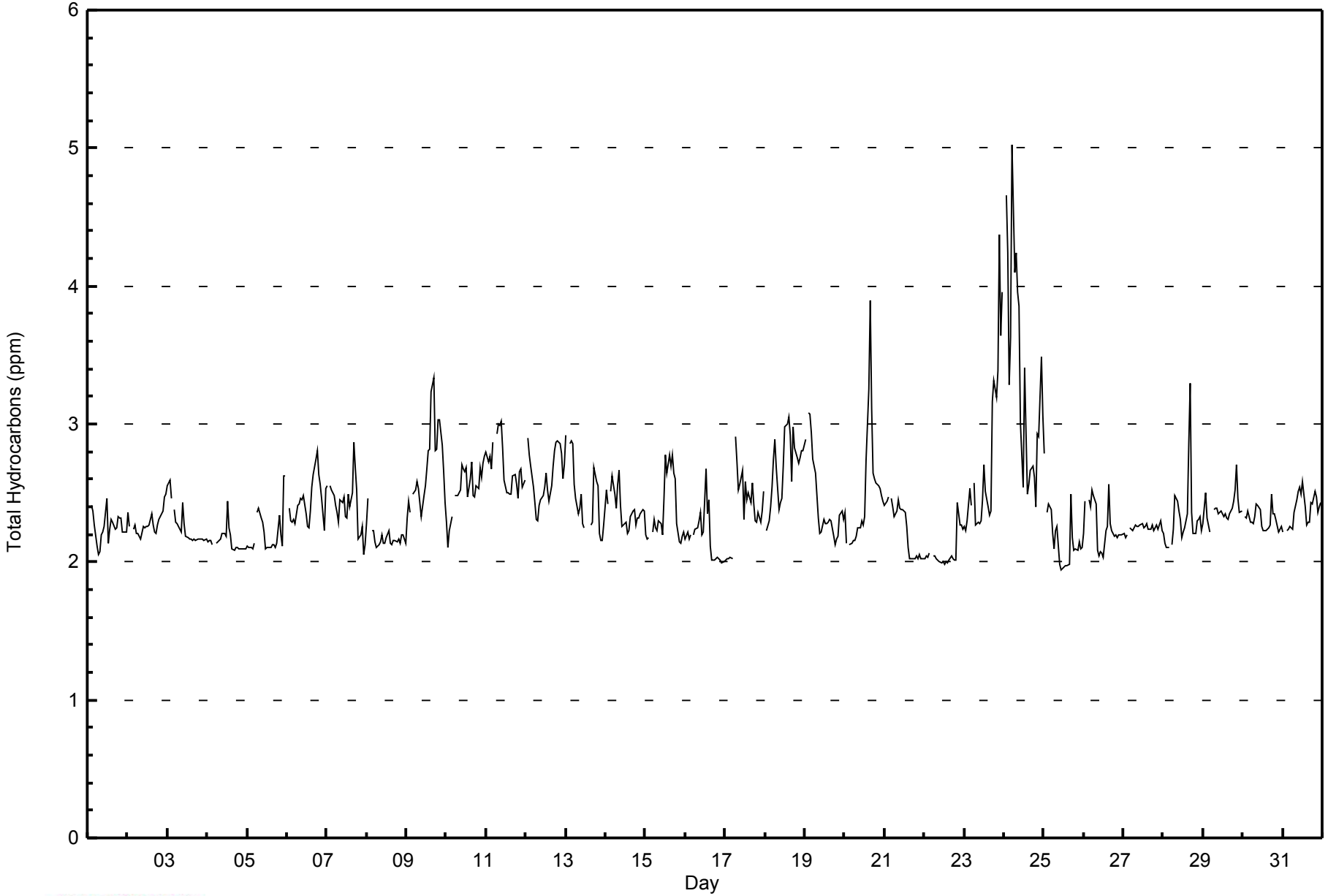
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	50	7.04	7.04
2.1 - 3.0	633	89.15	96.20
3.1 - 10.0	27	3.80	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2015

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	1	0	0	0	0	2	3	13	19	9	1	1	0	49
2.1 - 3.0	46	66	22	23	10	7	22	63	109	46	30	27	11	18	21	73	594
3.1 - 10.0	2	0	2	0	0	1	2	2	1	1	3	1	0	0	1	2	18
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	66	24	24	10	8	24	65	112	50	46	47	20	19	23	75	661

Total Number of Valid Hours: 661

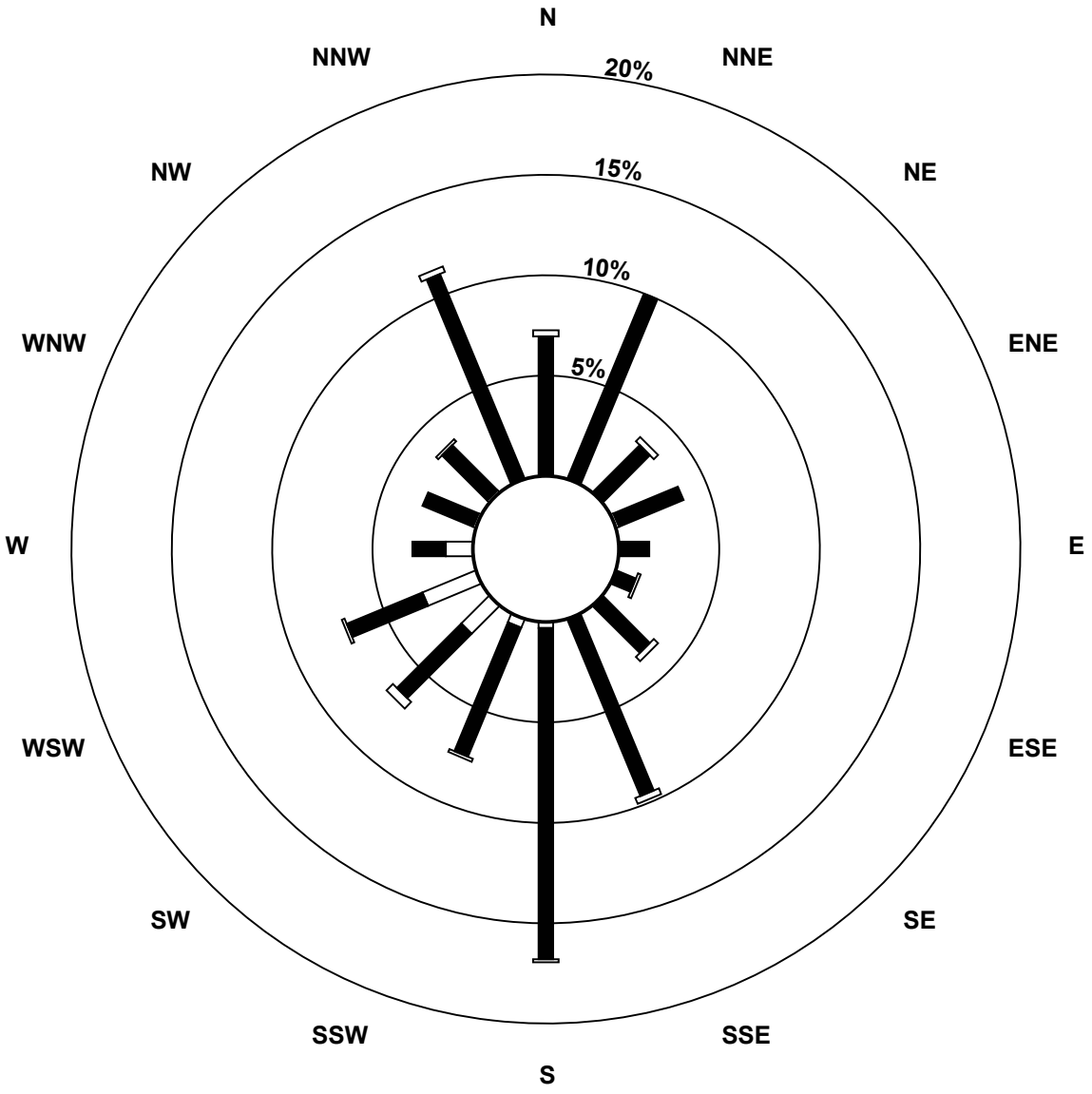
Total Number of Hours: 744

Wood Buffalo Environmental Association

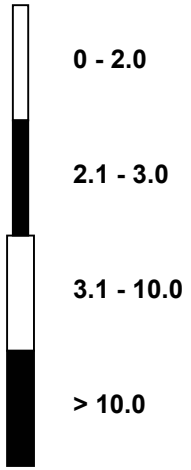
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Barge Landing (AMS 9)



Classes (ppm)



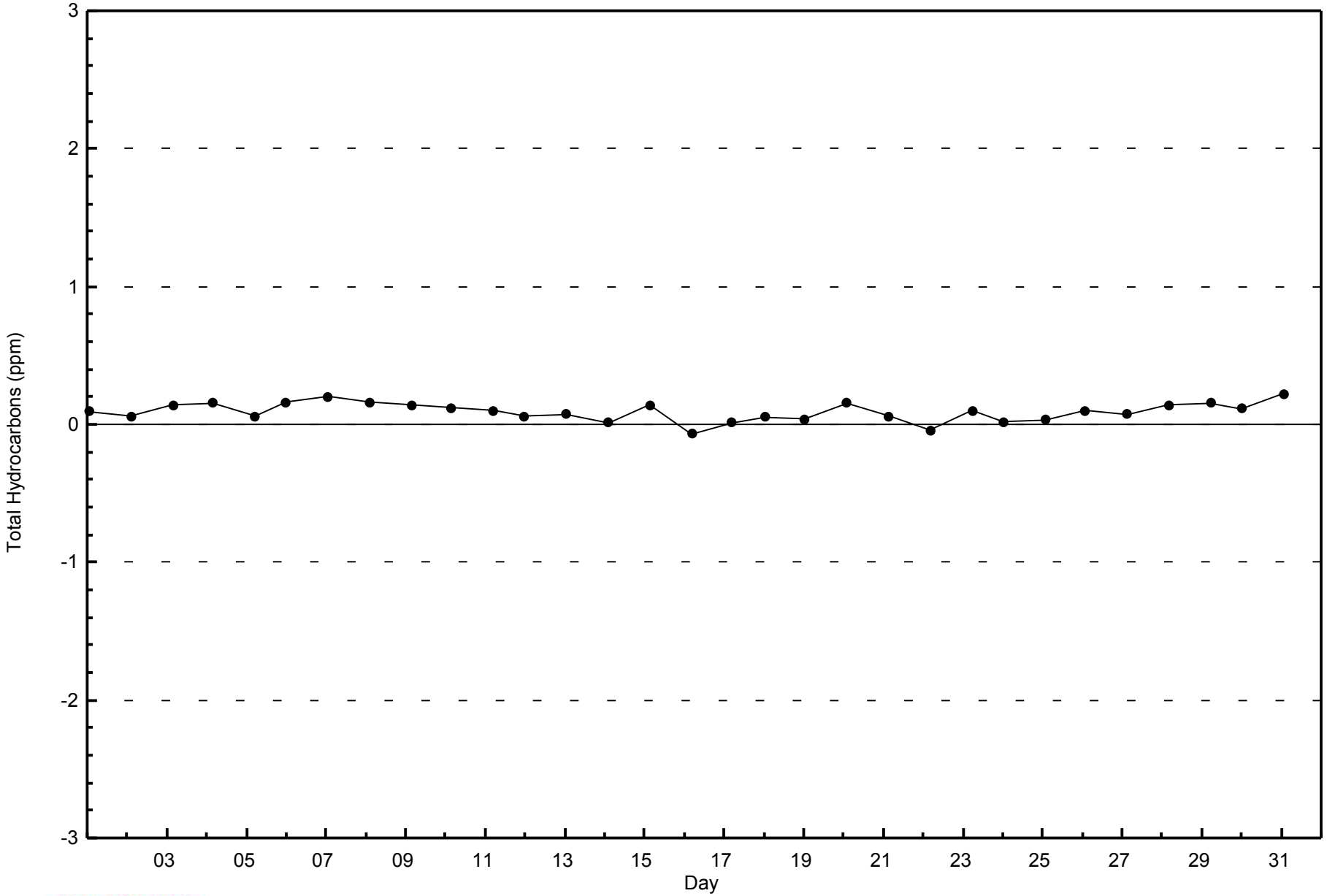
Total Number of Valid Hours: 661

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2015



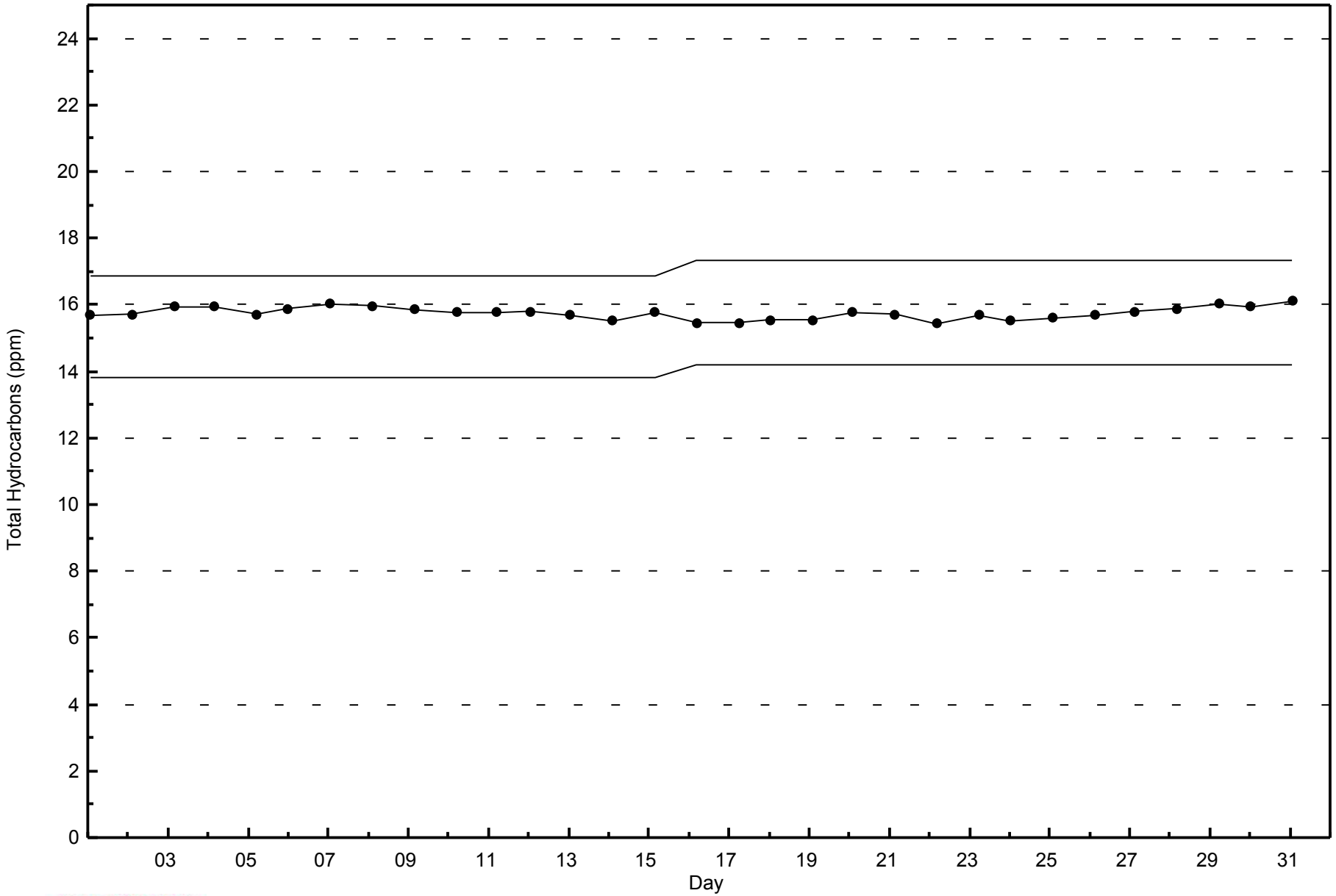
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 6.3 C on Jan 22 14:00

Maximum Daily Average: 3.4 C on Jan 22

Minimum Value: -32.7 C on Jan 31 06:00

Minimum Daily Average: -27.3 C on Jan 3

Maximum Diurnal Average: -12.1 C at hour 15

Minimum Diurnal Average: -16.4 C at hour 9

Monthly Average: -14.86 C

Percentiles: P_1 = -31.3 P_{10} = -26.4 Q_1 = -21.7 Median = -16.6 Q_3 = -8.6 P_{90} = -0.4 P_{99} = 5.4

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

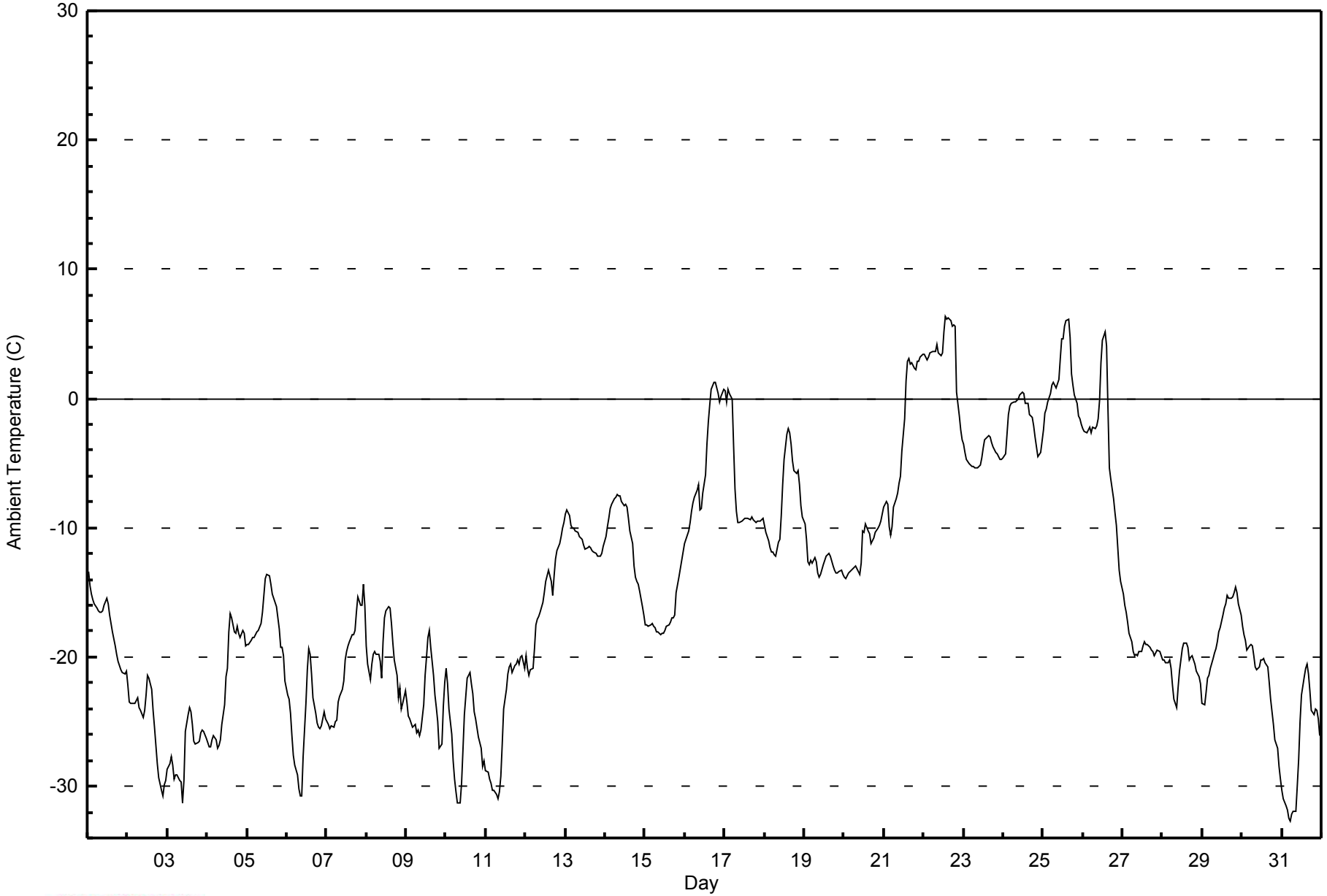
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-13.4	-14.4	-15.1	-15.6	-15.9	-16.2	-16.4	-16.6	-16.5	-16.5	-16.0	-15.4	-15.8	-16.7	-17.4	-18.1	-19.2	-19.8	-20.4	-20.6	-20.9	-21.2	-21.3	-21.1	-17.5	-13.4
2-Jan	-22.2	-23.5	-23.6	-23.5	-23.6	-23.4	-23.2	-23.9	-24.2	-24.7	-24.1	-23.0	-21.4	-21.6	-22.5	-24.1	-25.4	-26.8	-28.3	-29.4	-30.3	-30.8	-29.9	-29.6	-25.1	-21.4
3-Jan	-28.7	-28.2	-27.7	-28.4	-29.5	-29.1	-29.2	-29.5	-29.6	-31.3	-29.6	-25.8	-24.4	-24.0	-24.2	-25.2	-26.5	-26.8	-26.6	-26.5	-25.8	-25.7	-25.7	-26.3	-27.3	-24.0
4-Jan	-26.6	-27.0	-26.9	-26.4	-26.1	-26.4	-27.0	-26.8	-26.4	-25.2	-23.7	-21.5	-20.8	-18.0	-16.7	-17.0	-18.0	-18.2	-17.7	-18.2	-18.5	-17.9	-18.1	-19.2	-22.0	-16.7
5-Jan	-19.1	-19.0	-18.7	-18.4	-18.4	-18.3	-18.1	-17.9	-17.4	-16.5	-15.2	-13.9	-13.6	-13.7	-14.4	-15.2	-15.5	-15.8	-16.1	-17.8	-19.3	-19.2	-19.9	-21.9	-17.2	-13.6
6-Jan	-22.9	-23.3	-24.4	-26.0	-27.6	-28.3	-29.1	-30.3	-30.7	-30.8	-27.8	-23.6	-21.0	-19.4	-19.8	-21.3	-23.1	-24.3	-25.1	-25.4	-25.5	-25.4	-24.2	-24.8	-25.2	-19.4
7-Jan	-25.0	-25.3	-25.6	-25.3	-25.4	-25.0	-24.9	-23.5	-23.0	-22.5	-21.8	-20.2	-19.6	-19.1	-18.8	-18.3	-18.2	-17.9	-16.5	-15.4	-16.0	-16.0	-14.4	-16.0	-20.6	-14.4
8-Jan	-19.1	-20.5	-21.7	-20.5	-19.8	-19.6	-19.7	-19.8	-20.4	-21.6	-18.8	-17.0	-16.4	-16.1	-16.2	-17.4	-19.0	-20.3	-21.5	-23.1	-22.4	-24.0	-23.6	-22.6	-20.0	-16.1
9-Jan	-23.5	-24.5	-24.8	-25.1	-25.5	-25.3	-25.8	-25.6	-26.0	-25.6	-23.7	-21.4	-20.0	-18.5	-18.0	-19.3	-21.4	-22.9	-23.9	-25.0	-27.1	-26.7	-23.8	-21.9	-23.6	-18.0
10-Jan	-20.8	-22.0	-24.0	-26.0	-28.0	-29.5	-30.4	-31.3	-31.2	-29.7	-27.1	-24.5	-23.0	-21.7	-21.3	-22.0	-22.8	-24.2	-24.8	-26.1	-26.6	-27.1	-28.5	-28.0	-25.9	-20.8
11-Jan	-28.8	-28.9	-29.4	-29.7	-30.3	-30.3	-30.7	-31.0	-30.4	-29.3	-26.8	-24.0	-22.5	-21.3	-20.7	-20.6	-21.2	-20.7	-20.6	-20.2	-20.5	-20.0	-19.9	-20.9	-24.9	-19.9
12-Jan	-19.9	-20.8	-21.4	-21.0	-20.9	-19.3	-17.5	-17.1	-16.9	-16.6	-15.8	-15.1	-14.2	-13.7	-13.3	-14.1	-15.3	-13.8	-12.4	-11.7	-11.2	-10.7	-10.1	-9.6	-15.5	-9.6
13-Jan	-9.0	-8.6	-9.1	-9.8	-10.1	-10.1	-10.2	-10.4	-10.7	-10.7	-10.9	-11.3	-11.7	-11.6	-11.4	-11.6	-11.8	-11.9	-12.0	-12.2	-12.2	-12.2	-11.9	-11.4	-10.9	-8.6
14-Jan	-10.7	-9.9	-9.2	-8.5	-8.2	-7.7	-7.7	-7.4	-7.5	-7.5	-7.9	-8.3	-8.2	-8.5	-9.3	-10.3	-11.2	-13.0	-13.8	-14.2	-14.3	-15.0	-16.2	-16.8	-10.5	-7.4
15-Jan	-17.5	-17.5	-17.6	-17.5	-17.4	-17.7	-17.8	-18.0	-18.1	-18.2	-18.1	-18.2	-18.0	-17.6	-17.5	-17.3	-17.0	-17.0	-16.8	-15.0	-13.8	-13.2	-12.6	-11.9	-16.7	-11.9
16-Jan	-11.3	-10.6	-10.2	-9.6	-8.8	-8.1	-7.6	-7.1	-6.7	-8.6	-8.5	-7.3	-5.9	-3.5	-1.8	-0.5	0.8	1.3	1.3	0.8	0.4	-0.3	0.1	0.8	-4.6	1.3
17-Jan	0.6	-0.2	0.7	0.4	-0.1	-3.6	-6.9	-8.7	-9.6	-9.6	-9.5	-9.4	-9.3	-9.3	-9.2	-9.4	-9.2	-9.4	-9.5	-9.6	-9.5	-9.5	-9.3	-9.3	-7.0	0.7
18-Jan	-9.8	-10.3	-11.0	-11.5	-11.9	-11.9	-12.1	-12.2	-11.1	-10.9	-9.1	-6.7	-4.7	-2.7	-2.3	-2.6	-3.6	-4.8	-5.6	-5.8	-5.6	-6.7	-8.3	-9.2	-7.9	-2.3
19-Jan	-9.7	-10.9	-12.6	-12.8	-12.5	-12.7	-12.3	-12.6	-13.5	-13.9	-13.6	-12.9	-12.5	-12.2	-12.1	-12.0	-12.2	-13.0	-13.2	-13.5	-13.5	-13.4	-13.3	-13.6	-12.7	-9.7
20-Jan	-13.8	-13.9	-13.7	-13.5	-13.3	-13.2	-13.0	-12.9	-13.2	-13.6	-12.7	-10.2	-10.4	-9.7	-10.3	-10.5	-11.2	-11.0	-10.8	-10.3	-10.0	-9.8	-9.5	-8.9	-11.6	-8.9
21-Jan	-8.4	-7.9	-8.1	-9.9	-10.5	-10.0	-8.4	-7.8	-7.4	-6.6	-6.0	-4.1	-1.5	1.4	2.8	3.1	2.6	2.7	2.3	2.2	2.8	2.9	3.2	3.4	-2.8	3.4
22-Jan	3.4	3.2	3.0	3.2	3.5	3.6	3.7	3.7	4.1	3.5	3.3	3.6	5.2	6.3	6.1	6.3	6.1	5.6	5.7	5.6	0.5	-1.4	-2.5	-3.2	3.4	6.3
23-Jan	-3.5	-4.2	-4.7	-5.0	-5.2	-5.3	-5.3	-5.3	-5.3	-5.3	-5.2	-4.6	-3.8	-3.2	-3.0	-2.9	-3.0	-3.4	-3.7	-4.1	-4.3	-4.5	-4.7	-4.7	-4.4	-2.9
24-Jan	-4.6	-4.2	-2.7	-1.2	-0.6	-0.4	-0.3	-0.3	-0.2	0.0	0.2	0.5	0.4	-0.4	-0.3	-0.4	-1.3	-1.4	-2.1	-3.0	-3.7	-4.4	-4.2	-3.2	-1.6	0.5
25-Jan	-2.5	-1.1	-0.8	-0.3	0.3	1.0	1.2	1.1	0.8	1.5	3.1	4.7	4.7	5.6	6.0	6.1	4.8	1.9	1.0	0.3	-0.4	-1.3	-1.5	-2.0	1.4	6.1
26-Jan	-2.3	-2.6	-2.7	-2.4	-2.2	-2.6	-2.2	-2.4	-2.1	-1.6	-0.1	2.7	4.5	5.2	4.1	-0.8	-5.3	-6.2	-7.8	-8.8	-9.9	-11.6	-13.3	-14.1	-3.5	5.2
27-Jan	-15.2	-16.0	-16.6	-17.3	-18.1	-18.8	-19.6	-19.9	-19.8	-19.9	-19.6	-19.6	-19.1	-18.8	-19.0	-19.0	-19.3	-19.4	-19.5	-19.9	-19.7	-19.5	-19.6	-19.9	-18.9	-15.2
28-Jan	-20.2	-20.2	-20.4	-20.4	-20.2	-20.9	-22.2	-23.2	-23.9	-22.4	-21.1	-20.3	-19.4	-18.9	-18.9	-19.2	-20.2	-20.0	-19.8	-20.5	-21.0	-21.3	-21.5	-22.1	-20.8	-18.9
29-Jan	-23.6	-23.7	-22.7	-21.6	-21.4	-20.9	-20.1	-19.7	-19.3	-18.8	-18.1	-17.7	-16.8	-16.2	-15.9	-15.3	-15.5	-15.4	-15.3	-15.0	-14.6	-15.0	-15.9	-16.7	-18.1	-14.6
30-Jan	-17.6	-18.3	-18.8	-19.4	-19.1	-19.0	-19.2	-19.9	-20.7	-20.9	-20.8	-20.2	-20.2	-20.2	-20.4	-20.8	-22.0	-23.2	-24.2	-25.2	-26.4	-27.0	-28.4	-29.4	-21.7	-17.6
31-Jan	-30.3	-31.0	-31.5	-31.9	-32.5	-32.7	-32.1	-31.9	-32.0	-30.0	-27.9	-25.0	-22.9	-21.6	-20.9	-20.6	-21.3	-22.6	-24.2	-24.5	-24.1	-24.1	-24.7	-26.1	-26.9	-20.6
	-15.4	-15.7	-15.9	-16.0	-16.1	-16.2	-16.3	-16.4	-16.4	-16.3	-15.2	-13.9	-13.0	-12.2	-12.1	-12.6	-13.4	-13.9	-14.3	-14.6	-15.0	-15.2	-15.3	-15.5	Diurnal Average	
	3.4	3.2	3.0	3.2	3.5	3.6	3.7	3.7	4.1	3.5	3.3	4.7	5.2	6.3	6.1	6.3	6.1	5.6	5.7	5.6	2.8	2.9	3.2	3.4	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Barge Landing - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	251	33.74	33.74
-20 - 0	428	57.53	91.26
0 - 10	65	8.74	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

Maximum Value: 99 % on Jan 24 10:00

Maximum Daily Average: 98.3 % on Jan 24

Minimum Value: 49 % on Jan 8 14:00

Minimum Daily Average: 67.6 % on Jan 8

Maximum Diurnal Average: 82.2 % at hour 6

Minimum Diurnal Average: 74.1 % at hour 14

Monthly Average: 80.4 %

Percentiles: P_1 = 62 P_{10} = 72 Q_1 = 75 Median = 79 Q_3 = 86 P_{90} = 93 P_{99} = 99

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

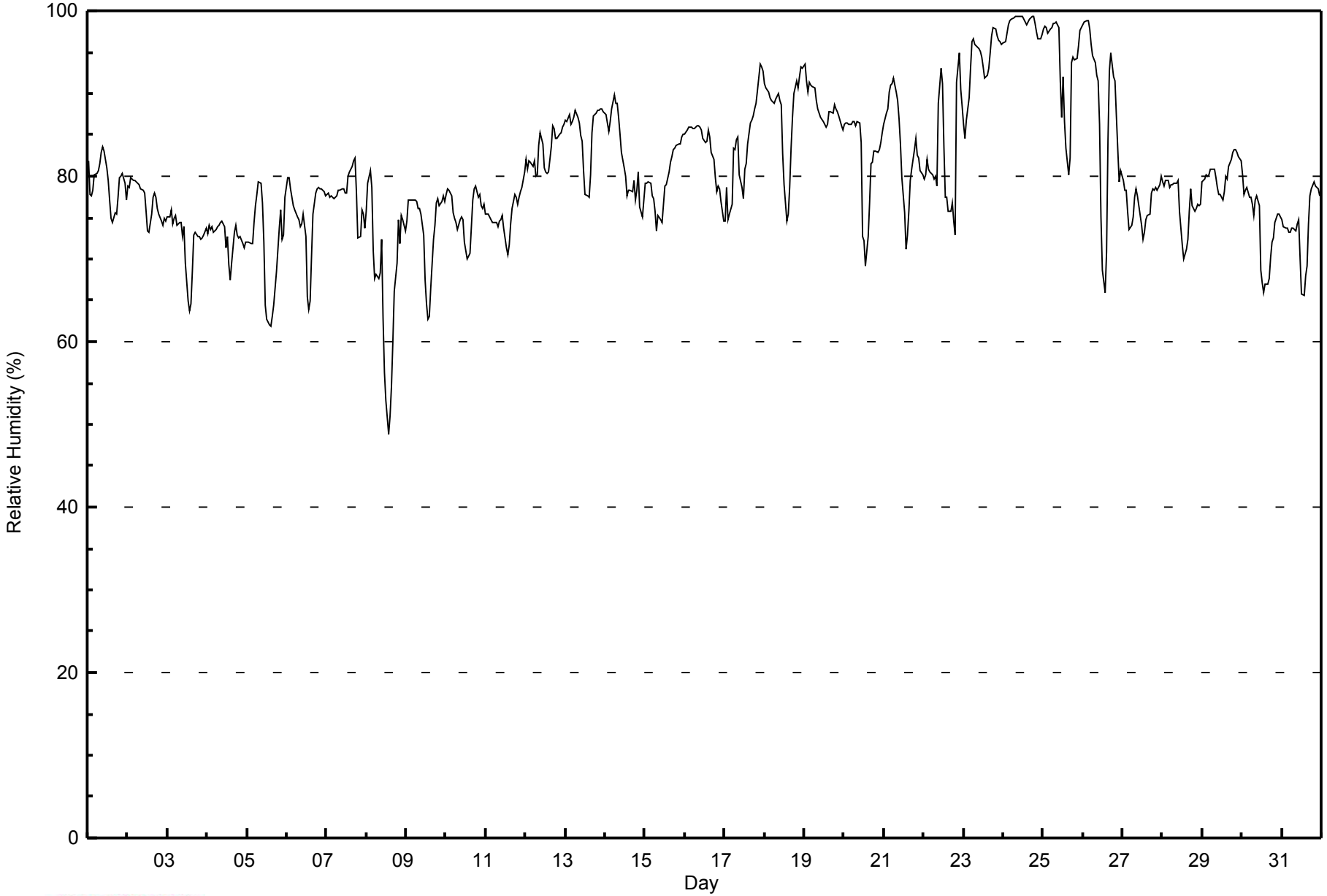
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	82	78	78	78	80	80	81	82	83	84	83	81	80	77	75	74	76	75	78	80	80	80	79	77	79.2	84
2-Jan	79	79	80	79	79	79	79	79	79	78	78	76	73	73	75	77	78	78	76	75	75	74	75	75	77.0	80
3-Jan	75	75	76	74	75	75	74	74	74	73	74	69	65	64	65	69	73	73	73	73	72	72	73	74	72.2	76
4-Jan	73	74	74	74	73	73	74	74	74	75	74	71	73	69	67	69	73	74	73	73	73	72	71	72	72.6	75
5-Jan	72	72	72	72	74	76	78	79	79	77	72	64	63	62	62	63	64	66	68	74	76	72	73	77	71.2	79
6-Jan	80	80	79	77	76	76	75	75	74	74	75	73	65	64	65	70	75	78	78	79	78	79	78	78	75.1	80
7-Jan	78	78	77	78	77	77	78	78	78	78	78	78	78	80	81	81	82	82	78	73	73	76	75	74	77.8	82
8-Jan	76	79	81	79	71	68	68	68	68	72	63	56	53	49	51	55	60	66	69	75	72	75	75	73	67.6	81
9-Jan	75	77	77	77	77	77	77	76	76	75	73	67	65	63	63	67	72	74	77	77	77	77	78	77	73.8	78
10-Jan	78	78	78	78	76	75	74	74	75	75	75	72	71	70	71	74	77	79	79	78	78	76	76	77	75.5	79
11-Jan	76	75	75	75	74	74	74	74	75	75	75	74	71	70	72	74	76	78	77	77	77	78	79	81	75.3	81
12-Jan	82	81	82	82	81	82	80	80	84	85	84	81	80	80	80	84	86	86	85	85	85	85	86	86	83.0	86
13-Jan	87	87	87	86	87	87	88	87	86	85	84	81	78	78	77	80	85	87	88	88	88	88	88	88	85.2	88
14-Jan	87	86	85	87	88	90	89	89	87	85	83	81	80	78	78	78	78	79	77	78	80	76	75	77	82.2	90
15-Jan	79	79	79	79	78	77	76	73	75	75	74	77	79	79	81	82	82	83	83	84	84	84	85	85	79.7	85
16-Jan	85	86	86	86	86	86	86	86	86	86	86	85	84	84	86	85	83	82	80	78	79	79	77	75	83.3	86
17-Jan	75	79	75	75	77	83	83	84	85	80	79	77	81	81	84	86	87	87	88	89	90	94	93	93	83.6	94
18-Jan	91	91	90	90	89	89	89	89	90	89	89	83	79	75	75	79	83	87	90	91	91	92	93	93	87.4	93
19-Jan	94	91	90	91	91	91	91	89	88	88	87	87	86	86	86	88	88	88	89	88	88	87	86	86	88.5	94
20-Jan	86	87	87	86	86	87	87	86	87	86	84	73	72	69	73	77	81	82	83	83	83	83	84	85	82.3	87
21-Jan	86	88	88	90	91	91	92	90	89	87	84	80	76	71	73	76	79	81	83	85	82	82	81	80	83.6	92
22-Jan	80	80	82	81	80	80	80	80	79	89	93	91	84	77	77	76	76	77	75	73	91	95	91	88	82.3	95
23-Jan	86	85	87	89	93	96	97	96	96	95	95	94	93	92	92	93	95	97	98	98	97	96	96	96	93.9	98
24-Jan	96	96	97	98	99	99	99	99	99	99	99	99	99	99	98	99	99	99	99	98	97	97	97	97	98.3	99
25-Jan	98	98	98	97	98	98	98	99	99	98	92	87	92	87	83	80	82	94	94	94	94	96	98	98	93.8	99
26-Jan	98	99	99	99	98	96	95	94	92	92	86	75	69	66	71	84	93	95	92	92	87	83	79	81	88.1	99
27-Jan	80	78	78	76	74	74	75	77	78	78	76	74	72	73	75	75	75	78	79	78	79	78	79	80	76.7	80
28-Jan	79	79	79	79	79	79	79	79	79	80	76	74	72	70	71	72	76	78	76	76	76	77	76	77	76.6	80
29-Jan	79	80	80	80	80	81	81	81	80	79	78	78	77	78	80	80	81	82	83	83	83	83	82	82	80.4	83
30-Jan	80	78	78	79	78	77	77	75	77	78	76	69	67	66	67	67	68	70	72	72	74	75	75	75	73.8	80
31-Jan	75	74	74	74	73	73	74	74	73	74	75	70	66	66	68	69	74	78	78	79	79	79	78	78	73.9	79
	82.1	82.1	82.2	82.1	81.9	82.2	82.1	82.0	82.1	82.0	80.7	77.3	75.5	74.1	74.9	76.9	79.3	81.1	81.3	81.4	81.9	82.0	81.7	81.7	Diurnal Average	
	98	99	99	99	99	99	99	99	99	99	99	99	99	99	98	99	99	99	99	98	97	97	98	98	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Barge Landing - January 2015



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Summary of Hour Averages

Wind Speed (WS) - km/h

Barge Landing - January 2015

Maximum Speed: 17 km/h on Jan 22 14:00

Maximum Daily Speed Average: 8.3 km/h on Jan 16

Minimum Speed Value: 0 km/h on Jan 2 18:00

Minimum Daily Speed Average: 0.6 km/h on Jan 2

Maximum Diurnal Speed Average: 1.7 km/h at hour 12

Minimum Diurnal Speed Average: 0.6 km/h at hour 19

Monthly Average Velocity: 1.0 km/h 214.7 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 3$ Median = 5 $Q_3 = 7$ $P_{90} = 8$ $P_{99} = 13$

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Percent Operational Time:	93.0

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-Jan	ENE6	NE5	NNE5	NNW3	NNW4	NNW4	NNW4	N3	N3	NNW2	NNW4	NNW3	N8	NNE9	NNE8	NNE7	N5	N4	WNW2	SSE3	SW2	NW2	NNW3	N2	N3.5	NNE9
2-Jan	E3	SE3	WNW1	SSW1	SE1	SSE2	S1	SSW2	SSW3	NE1	SE3	WSW1	S1	W1	ENE2	E5	ENE2	S0	WNW1	SSW1	ESE1	N1	N2	NW1	SE0.6	E5
3-Jan	WSW2	NNW3	N3	WNW2	W3	NNW3	NNW2	NW2	NNW3	W1	SW3	SW3	WSW5	WSW6	WSW6	SW3	SSW4	SW5	WSW5	W6	WSW6	WSW7	WSW8	WSW6	WSW3.2	WSW8
4-Jan	WSW6	WSW5	SW5	SW7	SW6	SSW7	S7	S7	S7	S8	SSW9	SSW12	S10	SSW10	SW9	SSW8	SSW8	SSW8	SSW6	SW12	WSW12	WSW11	SW6	SW7	SSW7.5	SW12
5-Jan	WSW8	SW8	SW7	SW6	S3	SE4	SE2	SSE1	WNW2	WNW3	NNW6	NNW9	NW8	NW8	NNW7	NW7	NW7	NW6	NNW4	NNW2	N3	NNW6	N5	NNE2	NW3.2	NNW9
6-Jan	ENE2	E1	E3	SE1	SE2	SE2	WSW2	ESE2	SSW2	SSE2	SSE3	SSW3	SW3	SSW3	S4	S4	SSE4	S5	SSE4	SSE5	SE5	S5	S6	S7	SSE2.9	S7
7-Jan	S6	SSE5	S7	SSE6	S6	SSW5	S5	S6	S5	SSW5	WSW5	SSW5	W3	NNW2	NNE2	E3	NNE2	NNW3	N8	NNE9	NNW4	NW3	NNW9	N11	SW0.8	N11
8-Jan	NNE5	NNE1	NW2	WNW5	NW7	NW8	WNW6	WNW6	W4	WNW2	NW5	WNW6	NW7	NW7	WNW6	WNW6	WSW3	SW4	S4	S3	SSW4	S5	S6	S6	W3.1	NW8
9-Jan	S6	SE6	SSE6	SSE6	SSE6	SSE7	SSE8	SSE8	SE8	SE7	SSE7	SSE8	S8	S6	SSE3	N5	NNW4	NW4	NW3	NNW2	NW3	NNW5	NNW4	N4	SSE2.6	SSE8
10-Jan	NE6	E5	SW2	W1	WSW0	SW1	WSW2	S3	S5	SSE4	S5	S8	S9	S7	SSE6	SSE6	SSE5	SSE3	SE5	SE2	SSE4	SE3	S4	SSE4	SSE3.4	S9
11-Jan	SE5	SSE3	SE4	SE4	SSE4	SE3	SE5	S3	S4	S3	S4	S6	S7	S8	S7	S7	S6	S6	S8	S8	S6	SSE5	S4	SSW7	S5.0	S8
12-Jan	S7	SW3	SW5	SSW2	SSE5	SSW4	SSW6	SSW3	S1	WSW2	W1	WSW2	SSW2	SSE3	SSE4	SSE4	SE4	S6	SSE7	SSE7	SSE5	SSE5	S6	SSE5	S3.7	S7
13-Jan	SE3	SSE1	NNW4	NNW6	NNW6	N6	NNW4	N4	NNE3	NNE4	ENE5	ENE7	ENE4	ENE5	ENE4	ENE4	NE3	N3	NNW4	NNW5	NNW4	NNW4	WNW2	WSW4	NNE2.7	ENE7
14-Jan	SW6	SSW7	SSW8	SSW7	SSE3	ENE2	NNW5	NNE6	NE7	NE6	NE6	NE6	NE6	NNE7	NNE7	NNE7	NNE8	NE9	NE7	NNE5	NNE5	NNE6	NNE5	NE5	NNE3.6	NE9
15-Jan	ENE4	ENE5	ENE4	NE5	NE6	NNE5	NNE6	NNE5	NE4	NE5	ENE4	NNE4	NNE3	NNW3	N3	N2	NNW3	NNW3	NNW1	S5	S8	SSE9	SSE8	S8	ENE2.0	SSE9
16-Jan	S9	S9	S10	S10	S10	S10	S10	S11	SSW7	WSW7	WSW7	S6	SW9	SW9	SSW7	SW6	WSW13	WSW13	WSW13	WSW12	WSW10	WSW11	WSW12	WSW15	SW8.3	WSW15
17-Jan	W10	WSW9	WSW10	WSW8	WNW7	NNE7	NNE5	NNE4	NE5	NE7	NE6	NE5	NNE5	NNE5	N5	N5	NNW3	NNW3	WNW2	NW2	W2	WSW3	SSW2	SSW3	NNW2.0	WSW10
18-Jan	S6	S5	S5	SSW5	S5	SSW5	S5	S6	SSE7	S6	S7	S7	S7	S7	S6	S6	S9	S8	SSE5	SSE5	SSE5	SE4	S4	S2	S5.5	S9
19-Jan	S3	NNW2	NNW5	NW4	NNW3	NNW5	NNW4	NNW5	NNW5	NNW4	NNW5	NNW4	N5	NNW4	N4	N4	N5	NNW5	NNW5	N5	NNW4	N4	NNE5	NNE5	NNW3.9	NNW5
20-Jan	NNW3	NNW4	NNW4	NNW3	NNW3	NNW3	NNW2	WNW1	W0	NW1	ESE2	SSW2	SSE5	SSW6	S7	SW4	SSE7	S6	SSE7	SSE7	S7	S7	S7	S7	S2.4	SSE7
21-Jan	S8	S7	S8	S6	S7	SSW5	S8	S9	S9	S7	SSW7	SSW8	S9	SSW12	SSW13	SW13	SW12	SW11	S5	S7	SSW6	SW6	SW7	SSW6	SSW7.8	SW13
22-Jan	WSW6	SW7	SW7	SW6	SW7	SW8	SW8	WSW6	W8	W9	W5	WSW7	W14	W17	WSW13	WSW12	SW8	WSW10	W14	W9	NNE9	NNE8	NNE8	NNE7	WSW6.3	W17
23-Jan	NE6	NE6	NNE5	NNE5	NE4	N5	NNE4	ENE2	NNW3	NNW2	NNW4	NNW3	WNW2	SW3	S4	SSW4	S3	SE3	SSE3	SE4	SW3	SSW3	ESE3	WSW2	NE0.7	NE6
24-Jan	NW1	NE1	SW3	AF	AF	AF	AF	AF	AF	AF	AF	N1	N3	NNE3	NW1	ENE0	AF	AF	AF	AF	AF	AF	AF	AF	----	NNE3
25-Jan	AF	AF	AF	AF	SSE8	SSE9	S9	S8	SW6	SW9	WSW10	SW5	SSW5	WSW7	W6	NW7	N5	E7	ENE4	NE5	ENE5	ESE2	S3	S4	SSW2.6	WSW10
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSW6	SW3	SSW3	N1	NNW9	AF	AF	AF	AF	AF	AF	AF	AF	----	NNW9
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NNE8	NNE8	NNE8	N8	NNE8	NNE9	N8	NNE8	NNE8	N7	N7	----	NNE9
28-Jan	N8	NNW8	NNW7	NNW7	NNW5	NNW5	N5	N2	ENE1	NE2	NW4	NNW2	W3	ENE1	ENE3	NE3	NE3	ENE5	ENE6	E6	E4	E4	ESE3	ESE2	NNE2.7	N8
29-Jan	ENE1	ENE2	ENE1	ENE0	ESE2	SSE3	SSE4	SSE5	SE5	SSE4	SSW2	WSW4	WSW2	NW2	NNW2	NW3	NNW4	NNW3	N5	N5	N5	N6	N6	N6	N0.9	N6
30-Jan	NNE8	NNE9	NNE8	NNE8	NNE8	NNE7	N7	NNE6	NNE5	N5	NNE7	NNE9	NNE9	NNE9	NNE8	NNE6	NNE8	NNE5	NNE5	NNE5	N4	NNW3	NNW3	WNW1	NNE6.2	NNE9
31-Jan	SW2	SW1	SW2	SW2	SSE3	S3	SSE3	SE4	SSE4	SSE3	SSE5	S8	S7	S7	S6	SSW5	S5	SSE4	SE5	SSE5	SSE6	SSE6	SSE4	S3	S4.0	S8
	S1.0	S0.9	SW1.3	SW1.3	S1.1	S0.6	SSW1.0	S1.3	S1.1	SSW1.0	SW1.0	SW1.7	SW1.7	WSW1.6	SW1.0	W0.9	SW0.9	SW1.1	WSW0.6	SSW0.9	SSW1.0	SW0.9	SW1.0	SW1.2	Diurnal Average	
	W10	WSW9	WSW10	S10	S10	S10	S10	S11	S9	W9	WSW10	SSW12	W14	W17	SSW13	SW13	WSW13	WSW13	W14	SW12	WSW12	WSW11	WSW12	WSW15	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Jan 22 13:00

Minimum Value: 1 km/h on Jan 9 21:00

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

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Hours of Calibration:	0
Percent Operational Time:	93.0

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

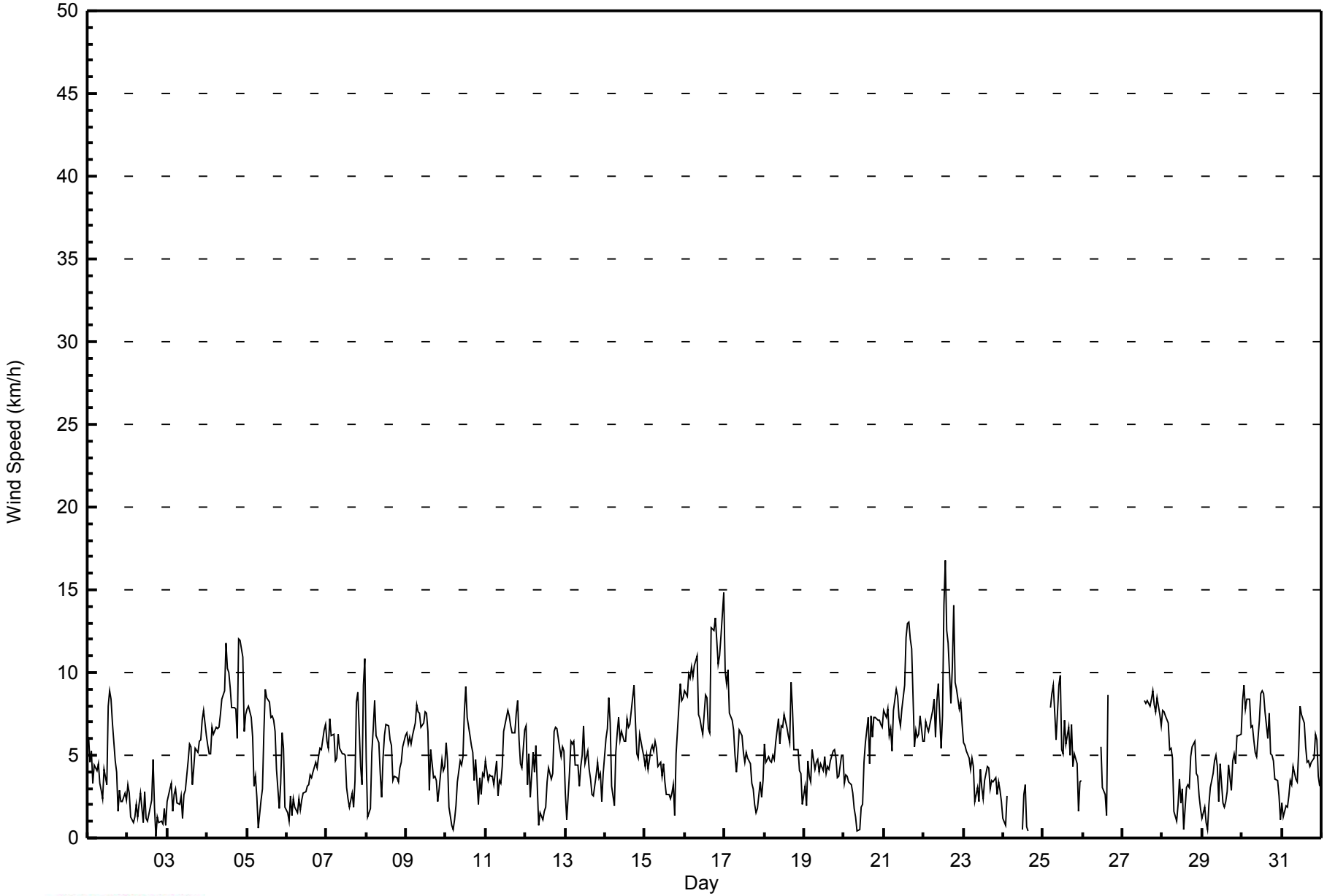
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Barge Landing - January 2015



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Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	404	58.38	58.38
6 - 11	270	39.02	97.40
12 - 19	18	2.60	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: 692

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Barge Landing - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	36	29	15	25	8	8	23	46	39	28	22	17	11	13	17	67	404
6 - 11	13	39	11	3	2	0	3	23	77	20	24	22	6	8	8	11	270
12 - 19	0	0	0	0	0	0	0	0	0	3	3	9	3	0	0	0	18
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	49	68	26	28	10	8	26	69	116	51	49	48	20	21	25	78	692

Total Number of Valid Hours: 692

Total Number of Hours: 744

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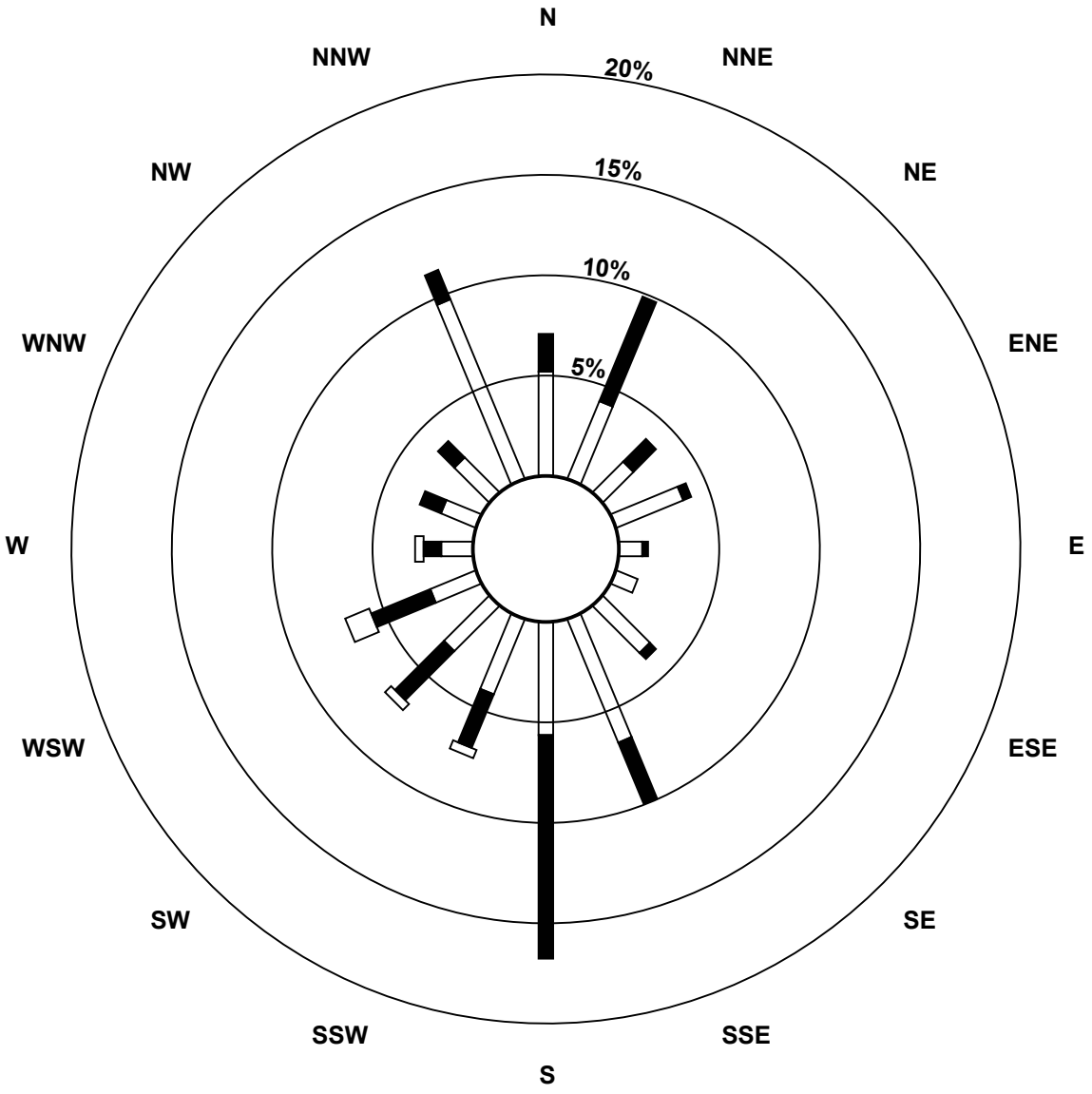
ATMOSPHERICS INC.

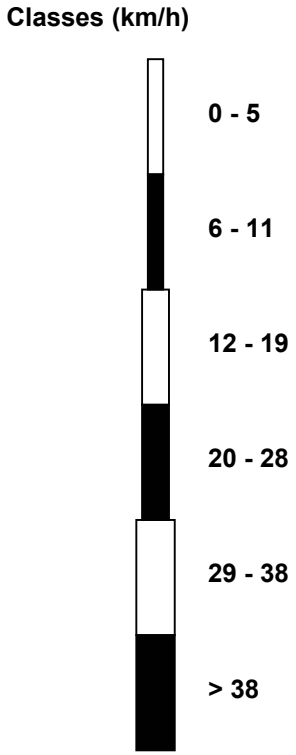
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Barge Landing (AMS 9)





Total Number of Valid Hours: 692

Direction of Maximum Speed: 263 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 215.2 deg on Jan 16

Direction of Minimum Speed: 173 deg on Jan 2 18:00
Direction of Minimum Daily Speed Average: 0.6 deg on Jan 2

Monthly Average Direction: 251.7 deg

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Percent Operational Time:	93.0

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-Jan	72	53	13	344	347	343	336	357	349	339	336	338	360	16	13	16	359	359	299	168	224	314	339	8	2.0
2-Jan	86	126	293	192	134	163	191	200	198	46	132	245	170	262	77	88	75	173	298	198	121	353	3	320	128.9
3-Jan	256	339	4	298	272	340	334	325	341	277	226	233	243	247	252	214	206	232	249	261	254	250	241	243	256.7
4-Jan	244	237	233	235	217	203	190	187	181	185	195	212	184	195	215	209	197	202	213	228	238	239	233	235	212.5
5-Jan	240	233	229	225	177	137	134	163	303	300	329	330	323	325	330	304	318	309	331	346	0	342	9	12	305.6
6-Jan	60	90	98	142	128	133	239	117	202	147	162	213	216	201	186	175	160	171	162	158	146	175	186	172	167.0
7-Jan	174	163	174	167	186	195	181	184	187	197	239	205	266	332	13	82	23	334	5	13	335	309	328	8	225.9
8-Jan	14	14	304	291	304	315	294	303	274	289	310	290	310	310	284	283	244	233	189	182	210	178	175	184	278.4
9-Jan	173	144	155	150	154	163	153	154	146	146	159	168	173	170	152	358	330	319	325	332	316	334	340	351	158.7
10-Jan	53	91	233	281	237	226	239	171	172	168	184	180	180	177	166	155	159	167	126	146	168	146	169	160	164.2
11-Jan	146	152	131	137	160	145	127	169	173	171	169	184	184	183	177	186	186	181	176	174	176	163	179	192	171.4
12-Jan	177	215	220	198	154	196	203	197	170	242	272	237	199	168	155	156	141	176	158	163	161	166	182	159	177.2
13-Jan	143	157	347	329	344	360	340	10	14	27	73	63	68	69	67	71	37	6	333	336	345	330	288	252	13.9
14-Jan	223	196	208	199	148	57	346	23	37	34	37	34	35	22	22	32	32	46	35	31	30	21	20	38	33.0
15-Jan	60	59	74	44	47	31	33	31	50	49	66	16	30	347	359	3	344	328	342	178	170	166	168	170	68.5
16-Jan	177	183	180	172	169	170	174	174	203	247	237	181	220	215	197	231	238	238	245	247	248	240	246	258	215.2
17-Jan	260	244	257	239	283	32	31	25	35	46	44	36	24	14	9	8	348	338	292	315	276	238	206	201	326.3
18-Jan	177	180	184	204	191	194	187	171	165	175	176	183	180	189	180	182	178	176	147	149	168	146	186	182	176.9
19-Jan	189	331	337	325	334	332	335	335	339	339	340	334	4	348	1	350	354	347	343	353	348	6	19	27	347.0
20-Jan	340	333	339	336	335	335	330	284	273	305	121	209	156	192	191	218	163	177	168	168	174	177	176	179	186.6
21-Jan	179	174	171	181	176	192	188	186	180	190	197	194	182	200	207	214	230	231	182	183	196	214	231	212	197.6
22-Jan	246	236	215	215	215	229	235	238	276	260	264	240	260	263	247	244	223	244	262	273	26	29	28	22	255.2
23-Jan	39	46	20	27	40	10	18	73	337	341	339	336	284	227	183	204	171	134	159	145	216	201	111	254	40.0
24-Jan	325	52	228	AF	AF	AF	AF	AF	AF	AF	AF	353	358	12	307	60	AF	AF	AF	AF	AF	AF	AF	AF	--
25-Jan	AF	AF	AF	AF	166	153	175	177	217	226	238	222	192	240	275	311	355	82	57	56	72	120	174	187	194.3
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	208	218	202	350	341	AF	AF	AF	AF	AF	AF	AF	AF	--
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	21	22	18	10	16	14	7	17	15	11	355	--
28-Jan	356	346	340	337	335	345	355	6	58	45	321	328	268	59	58	38	35	74	72	84	85	90	103	109	17.1
29-Jan	73	74	74	74	112	156	160	157	145	164	210	252	248	322	346	325	337	338	350	359	355	4	355	3	0.3
30-Jan	15	14	20	29	32	18	10	15	24	7	17	20	19	24	32	23	24	18	12	12	1	340	344	288	17.6
31-Jan	235	230	223	221	152	170	161	141	151	167	163	181	177	182	188	198	176	148	142	162	167	164	165	181	172.2
	188.0	186.5	221.2	225.1	185.6	181.2	196.1	169.2	182.2	204.5	220.4	219.8	221.3	238.3	227.3	272.2	236.1	228.8	240.6	202.7	205.2	226.1	231.9	224.0	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Jan 28 14:00

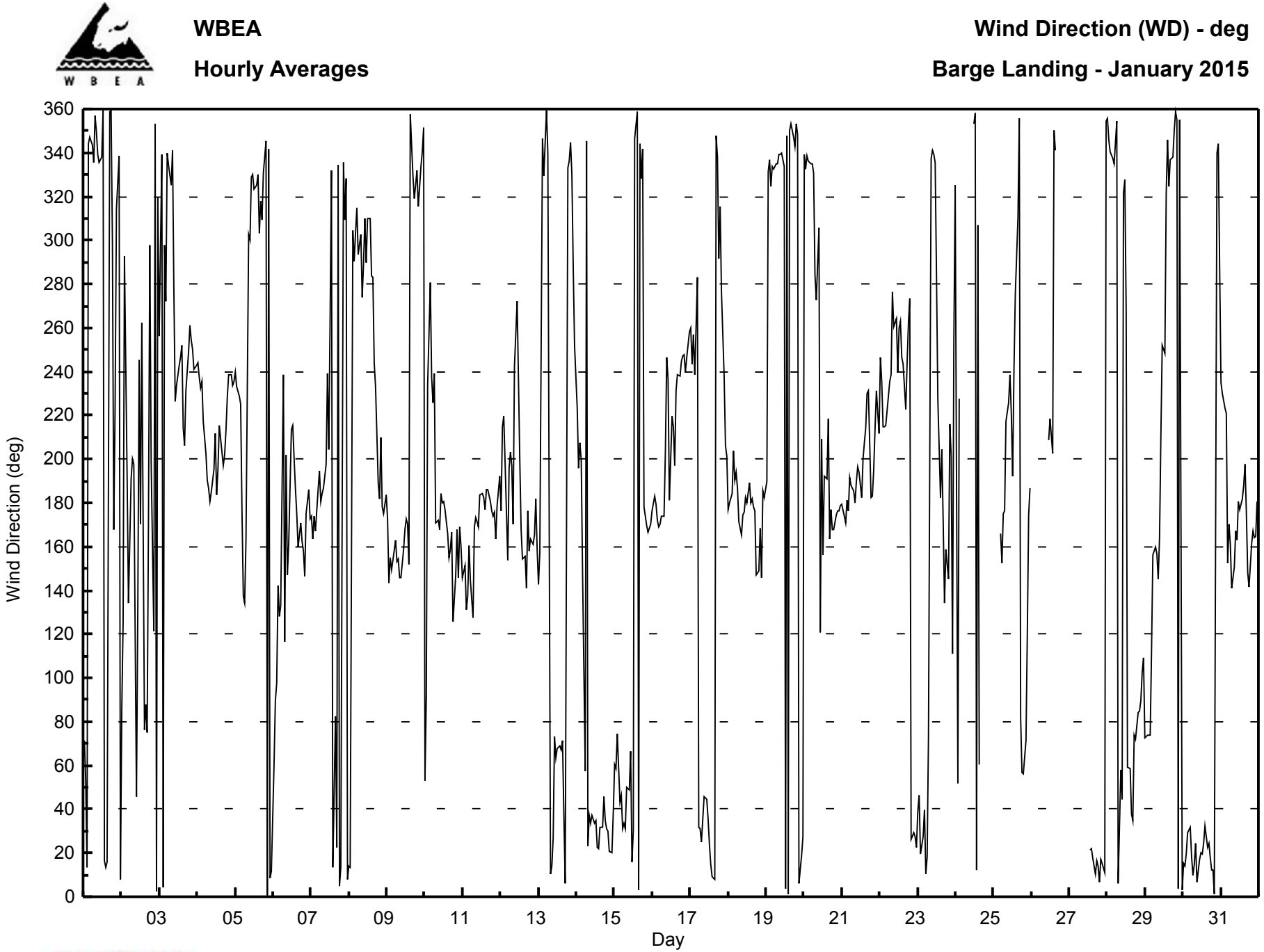
Minimum Value: 0 deg on Jan 29 02:00

Percentiles: P_1 = 13 P_{10} = 17 Q_1 = 19 Median = 23 Q_3 = 30 P_{90} = 49 P_{99} = 86

Hours in Service:	744
Hours of Data:	692
Hours of Missing Data:	52
Hours of Calibration:	0
Percent Operational Time:	93.0

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	Maximum
1-Jan	20	24	17	28	20	19	22	28	21	37	21	27	21	20	20	19	23	37	53	38	50	36	20	47	53
2-Jan	16	51	39	70	50	40	62	17	46	35	15	74	77	57	46	15	29	91	69	66	66	71	51	71	91
3-Jan	31	19	14	56	26	23	23	15	20	47	31	28	27	19	20	25	19	18	24	21	18	17	15	19	56
4-Jan	20	17	16	15	23	24	21	25	22	25	25	22	23	23	23	22	28	25	24	17	18	21	54	29	54
5-Jan	18	16	18	27	32	16	18	91	25	32	20	21	22	20	20	23	25	24	23	41	20	17	22	51	91
6-Jan	37	60	14	70	40	62	58	27	47	49	36	32	27	35	30	17	27	21	21	29	14	14	21	18	70
7-Jan	24	18	23	25	29	24	22	23	25	25	29	33	52	26	35	25	72	33	22	23	51	41	22	25	72
8-Jan	21	61	80	26	30	21	24	25	38	55	25	30	25	27	30	31	32	20	28	42	32	28	17	17	80
9-Jan	25	11	16	13	14	19	15	16	13	17	23	23	25	25	56	19	17	19	24	46	17	11	18	19	56
10-Jan	37	18	39	52	90	54	48	42	25	22	24	26	24	27	24	20	23	27	12	52	19	20	20	27	90
11-Jan	30	31	35	26	25	18	11	17	22	27	30	25	28	26	25	23	19	18	18	21	25	21	25	19	35
12-Jan	24	39	26	58	29	42	28	29	73	50	55	39	58	42	22	20	16	22	21	24	22	25	25	23	73
13-Jan	73	76	26	17	20	21	21	27	21	15	21	24	28	22	22	20	25	23	19	20	21	21	60	33	76
14-Jan	19	32	26	34	38	58	24	18	17	19	17	18	20	20	16	16	17	19	16	19	16	16	17	19	58
15-Jan	20	21	24	21	24	19	18	20	24	21	30	19	35	33	35	39	39	30	77	43	27	24	25	25	77
16-Jan	25	27	23	25	24	24	22	23	30	16	22	28	21	24	29	32	14	15	16	16	17	13	16	20	32
17-Jan	23	16	21	17	45	23	20	16	23	17	20	22	20	18	22	19	25	18	38	49	35	24	23	26	49
18-Jan	24	23	22	20	20	21	18	20	23	26	23	23	24	23	26	21	18	24	33	21	25	19	36	34	36
19-Jan	21	63	12	21	20	17	17	16	16	18	18	20	22	26	21	21	19	21	21	21	21	20	18	19	63
20-Jan	22	15	18	17	17	19	32	39	62	70	12	56	35	33	26	48	22	23	21	25	25	25	25	26	70
21-Jan	22	22	23	19	23	26	21	22	22	19	28	26	22	22	22	20	18	21	45	28	29	36	24	27	45
22-Jan	33	23	22	25	23	21	20	31	32	24	34	23	28	22	16	16	27	19	21	47	24	18	16	19	47
23-Jan	20	30	23	19	21	17	20	55	39	50	24	35	45	40	44	30	43	27	35	32	43	41	32	80	80
24-Jan	84	72	60	AF	AF	AF	AF	AF	AF	AF	AF	61	30	35	87	100	AF	AF	AF	AF	AF	AF	AF	AF	100
25-Jan	AF	AF	AF	AF	21	19	23	19	33	20	17	24	23	27	25	28	43	36	50	23	21	56	29	17	56
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	24	54	50	86	18	AF	AF	AF	AF	AF	AF	AF	AF	86
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	19	17	19	19	17	20	20	20	18	21	21	21
28-Jan	20	20	19	19	18	17	18	37	27	34	27	69	41	100	31	18	20	19	20	22	24	24	29	34	100
29-Jan	32	0	22	23	41	24	27	20	22	25	58	24	43	38	32	25	18	26	23	21	21	23	26	19	58
30-Jan	19	21	22	18	19	19	21	18	16	19	18	17	17	18	18	20	16	20	17	19	16	13	17	58	58
31-Jan	33	42	28	48	41	25	23	15	17	26	27	24	28	28	28	28	17	18	13	18	19	18	16	24	48
	84	76	80	70	90	62	62	91	73	70	58	74	77	100	87	100	72	91	77	66	66	71	60	80	
	Diurnal Maximum																								

AF - Analyzer Failure


WBEA
Hourly Averages
Wind Direction (WD) - deg
Barge Landing - January 2015
Wind Direction (deg)
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	December 5, 2014
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Routine		
Start Time (MST)	10:15	End Time (MST)	13:55
Barometric Pressure	NA mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11071107
Cal Gas Concentration	4.77 ppm H2S	Cal Gas Expiry Date	05/30/13
Gas Cert Reference	LL86129	SO2 gas conc.	59.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2638
DACS voltage range		DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-690	-690
Analyzer Range (input)	5000	5000	Lamp voltage	1024	1023
Calculated slope	1.014656	0.991922	Chamber temp.	45	45
Calculated intercept	-0.241924	0.055314	Pressure	697.3	690.9
Analyzer Background	2.01	2.07	Flow	0.441	0.438
Analyzer Coefficient	0.956	0.984	Intensity	91	91
			Converter temp.	800	800

Analyzer make/model	Thermo 43i-TLE	Analyzer serial #	1331259320
Converter make/model	CDN-101	Converter serial #	519

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.0	0.0	NA
as found span	5000	83.7	79.8	77.7	1.028
SO2 scrubber check	5000	10.1	119.2	0.6	NA
calibrator zero	5000	0.0	0.0	-0.2	NA
high point	5000	83.7	79.8	80.4	0.993
second point	5000	41.9	40.0	40.3	0.991
third point	5000	20.8	19.8	20.0	0.991
calibrator zero	6000	0.0	0.0	0.0	NA
as left zero	6000	0.0	0.0	0.0	NA
as left span	5000	83.7	79.8	80.1	0.996
				Average Correction Factor	0.992

Corrected As found	77.7	Previous response	78.9	% change	1.6%

Notes:

Filter was changed after as founds. Scrubber check after as founds. Span was adjusted.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

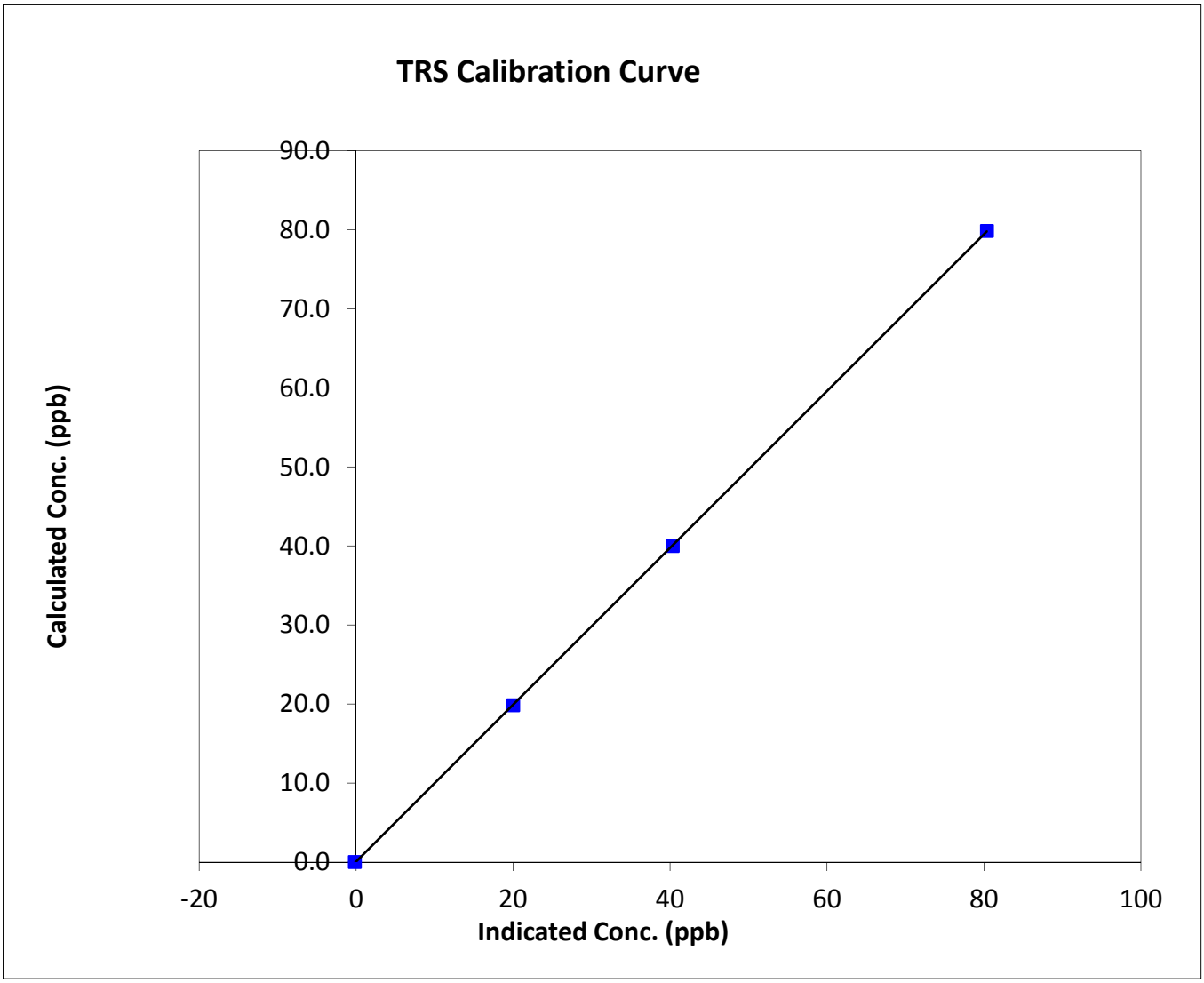
TRS Calibration Summary

Station Information

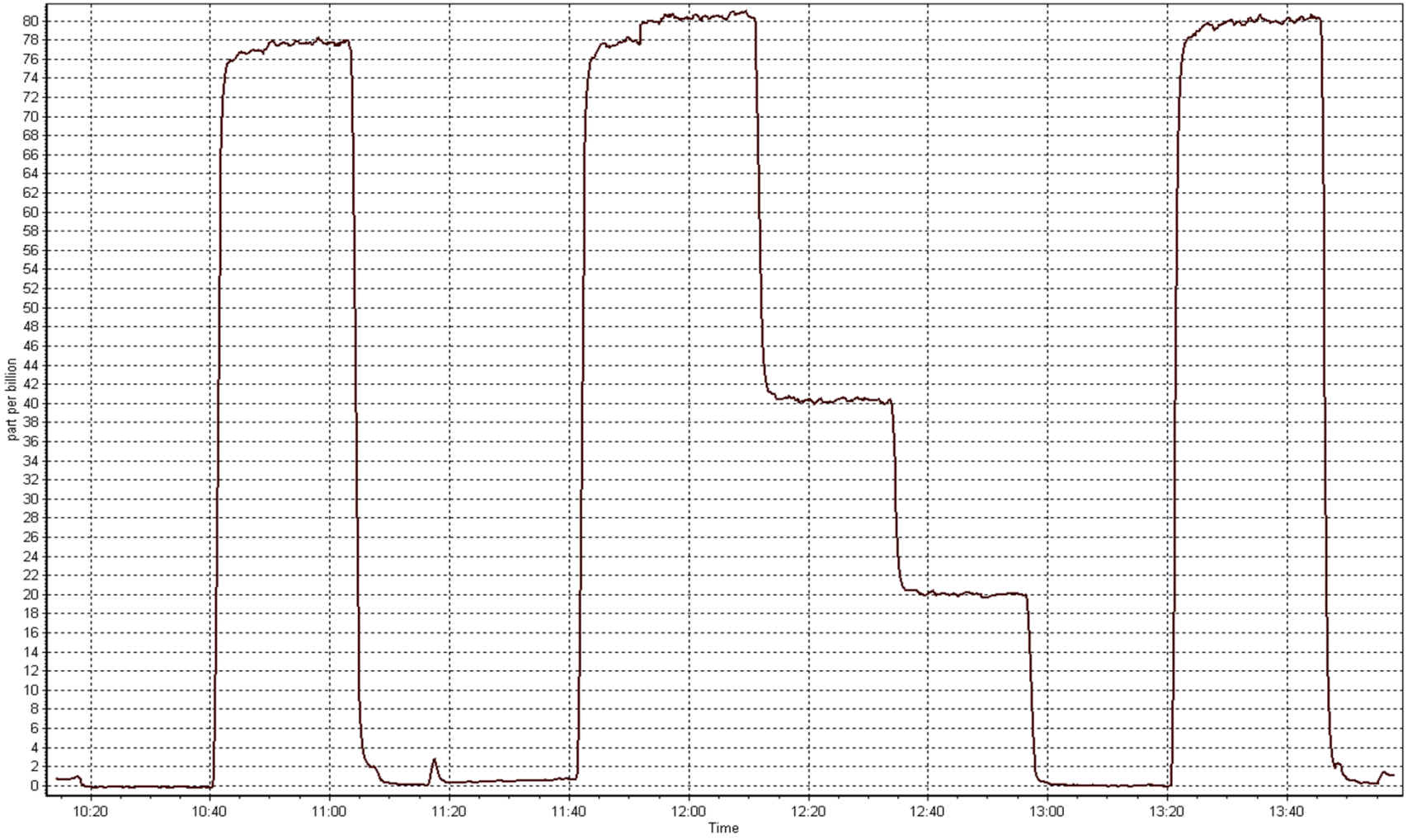
Calibration Date	January 9, 2015	Previous Calibration	December 5, 2014
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	10:15	End Time (MST)	13:55
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1331259320

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999992
79.8	80.4	0.9934		
40.0	40.3	0.9911	Slope	0.991922
19.8	20.0	0.9907		
			Intercept	0.055314



TRS Calibration Plot Date: January 9, 2015



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-13-15	Previous Calibration	December-05-14
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Routine		
Start Time (MST)	12:00	End Time (MST)	14:40
Barometric Pressure	730 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11071107
Gas Cert Reference	139843	Cal Gas Expiry Date	11/24/2012
CH4 Cal Gas Conc.	494 ppm	CH4 Equiv Conc.	1049.5 ppm
C3H8 Cal Gas Conc.	202 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2638
DACS voltage range		DACS channel #	5

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	9.1	9.1
Analyzer Range (mv)	5000	5000	Air or Bypass press	34.7	34.7
Calculated slope	1.001052	1.003828	Fuel Pressure	24.1	24.1
Calculated intercept	0.030260	-0.095196	BKG	5.75	5.75
			COEF	4.334	4.334

Analyzer make	Thermo 51i-LT	Analyzer serial #	1327059296

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.00	0.10	N/A
as found span	6000	89.7	15.69	15.73	0.997
calibrator zero	6000	0.0	0.00	0.10	N/A
high point	6000	89.7	15.69	15.73	0.997
second point	6000	48.0	8.40	8.45	0.994
third point	6000	18.0	3.15	3.23	0.975
calibrator zero	6000	0.0	0.00	0.10	N/A
as left zero	6000	0.5	0.09	0.12	N/A
as left span	6000	89.7	15.69	15.66	1.002
				0.00	
				Average Correction Factor	0.989

Corrected As found	15.63	Previous response	15.64	% change	0.1%

Notes:

Changed filter after as founds. No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

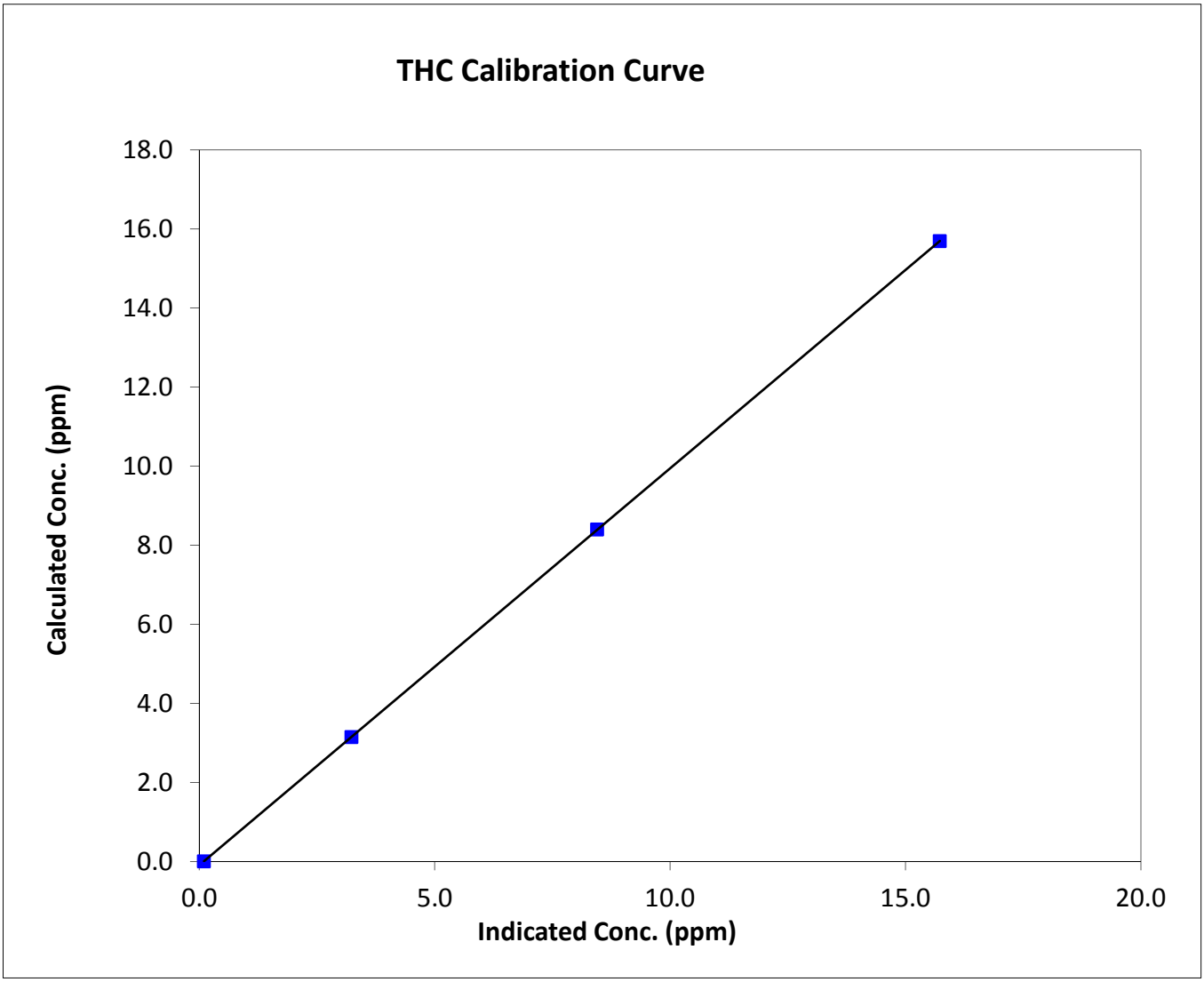
THC Calibration Summary

Station Information

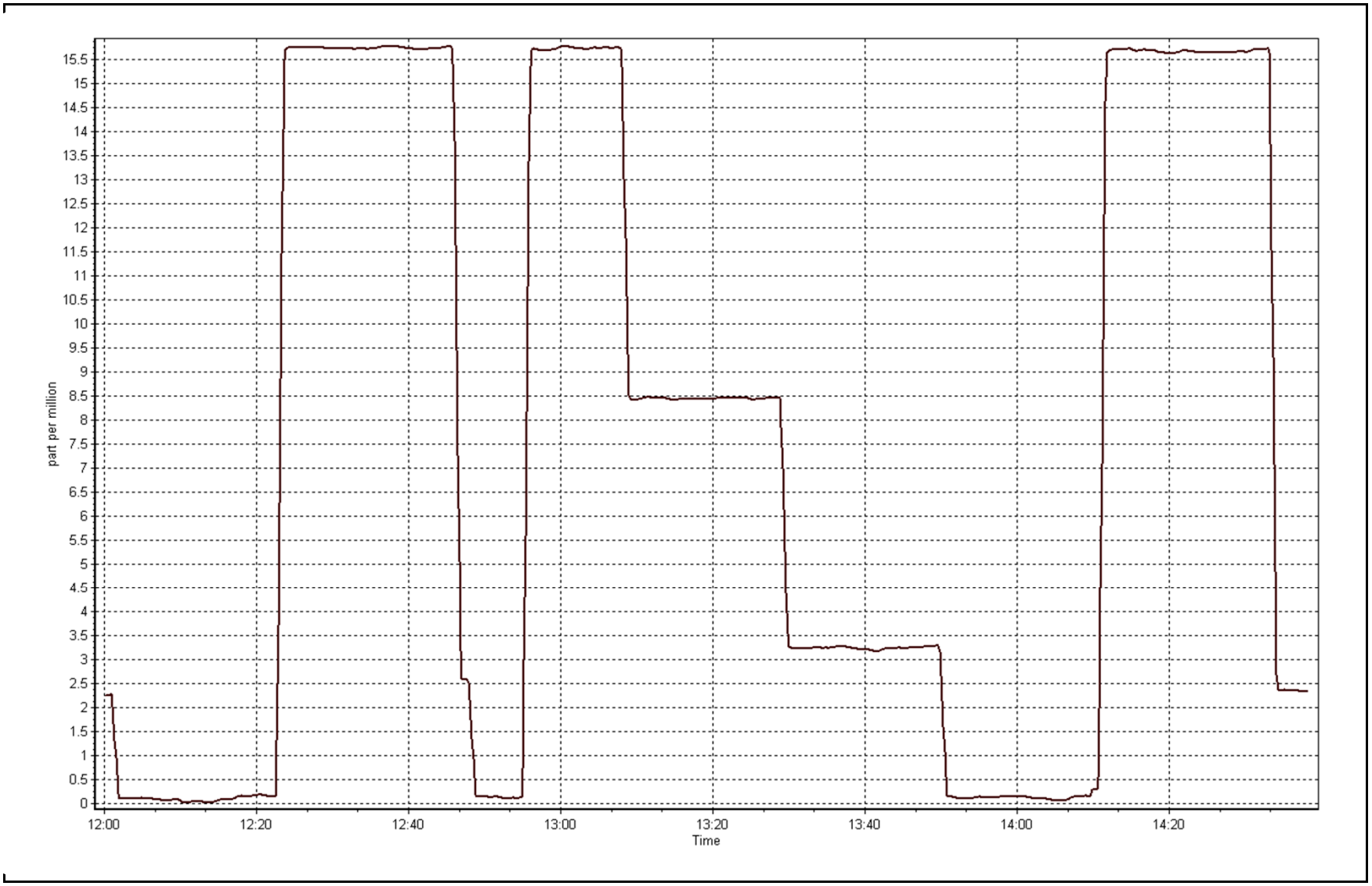
Calibration Date	January 13, 2015	Previous Calibration	December 5, 2014
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	12:00	End Time (MST)	14:40
Analyzer make	Thermo 51i-LT	Analyzer serial #	1327059296

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.10	N/A	Correlation Coefficient	0.999999
15.69	15.73	0.9975		
8.40	8.45	0.9936	Slope	1.003828
3.15	3.23	0.9748		
			Intercept	-0.095196



THC Calibration Plot Date: January 13, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 11
LOWER CAMP
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
JANUARY 2015

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	706	37	38	99.87	39	0	8	0
H2S (ppb) Average	708	36	36	100.00	10	0	3	0
THC (ppm) Average	656	29	88	92.07	5	-	2.9	-
Temperature (C) Average	744	0	0	100.00	6.2	-	3.3	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	737	0	7	99.06	28	-	-	-
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 - LOWER CAMP (AMS 11)
JANUARY 2015

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	1.9	4	-	0	0	0	1	2	5	39
H2S (ppb) Average	708	0.8	1	-	0	0	0	1	1	1	10
THC (ppm) Average	656	2.43	0.4	-	2	2.1	2.2	2.3	2.6	2.9	5
Temperature 2 m (C) Average	744	-14.96	10	-	-33.7	-28.3	-22.9	-15.6	-8.2	0.4	6.2
Relative Humidity (%) Average	744	79.3	8	-	51	70	74	78	85	91	99
Wind Speed 10 m (km/h) Average	737	8.8	5	-	0	2	5	8	12	16	28
Wind Direction 10 m (deg) Average	737	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	27 Jan 2015 11:00	27 Jan 2015 11:00	1	Maintenance on daily span system
THC	09 Jan 2015 05:00	11 Jan 2015 12:00	56	Analyzer replaced - FID detector failed
THC	27 Jan 2015 11:00	27 Jan 2015 11:00	1	Maintenance on daily span system
THC	30 Jan 2015 15:00	30 Jan 2015 16:00	2	Maintenance - replace fuel cylinder
Wind Speed, Wind Direction	24 Jan 2015 04:00	24 Jan 2015 10:00	7	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 39 ppb on Jan 2 13:00 Maximum Daily Average: 7.9 ppb on Jan 2

Minimum Value: 0 ppb on Jan 7 06:00 Minimum Daily Average: 0.2 ppb on Jan 27
Maximum Diurnal Average: 3.4 ppb at hour 18 Minimum Diurnal Average: 0.8 ppb at hour 8
Monthly Average: 1.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 2$ $P_{90} = 5$ $P_{99} = 18$

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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
2-Jan	2	2	Z	1	1	1	0	0	0	1	2	11	39	13	19	16	9	38	13	6	3	2	1	1	7.9	39
3-Jan	1	1	2	Z	1	1	0	1	0	1	1	0	1	1	1	3	9	5	2	3	5	7	5	6	2.3	9
4-Jan	3	4	6	2	1	Z	2	2	2	1	1	2	2	1	2	2	3	4	3	2	3	2	3	5	2.5	6
5-Jan	4	2	2	2	3	Z	2	3	6	6	3	1	5	16	1	1	1	1	1	1	1	1	1	1	2.7	16
6-Jan	Z	1	0	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
7-Jan	0	Z	0	0	0	0	0	0	0	0	2	5	5	9	9	7	5	6	7	2	1	2	2	1	2.7	9
8-Jan	1	1	Z	1	1	1	1	1	8	4	1	3	1	1	2	3	7	6	6	7	6	5	3	3	3.2	8
9-Jan	2	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	2	5	9	2	1	2	2	1	1	1.5	9
10-Jan	1	1	2	1	Z	1	0	0	1	1	1	1	3	3	2	2	2	2	1	1	1	1	1	1	1.3	3
11-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0	0.6	1
12-Jan	Z	0	0	0	0	5	0	0	0	1	0	1	0	0	1	0	1	1	1	1	2	1	1	1	0.8	5
13-Jan	1	Z	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4	1.4	4
14-Jan	3	3	Z	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	1.4	3
15-Jan	1	1	1	Z	1	0	0	1	1	0	1	0	0	0	0	0	1	0	1	5	7	3	8	12	1.9	12
16-Jan	7	15	30	14	Z	7	2	1	1	2	1	1	1	1	3	2	3	1	2	1	2	3	2	1	4.5	30
17-Jan	0	1	0	0	2	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.6	2
18-Jan	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	5	3	1	1	1	1	1	1	1	1	1.1	5
19-Jan	1	Z	1	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1.0	3
20-Jan	0	0	Z	0	0	0	0	0	0	0	1	6	4	3	6	5	9	9	6	11	7	7	5	4	3.7	11
21-Jan	3	1	3	Z	1	1	1	1	1	1	1	1	1	2	2	5	8	2	2	7	5	3	2	3	2.4	8
22-Jan	4	3	2	1	Z	1	1	2	1	1	21	7	1	1	2	2	3	3	2	2	2	1	0	0	2.8	21
23-Jan	1	0	0	1	1	Z	1	0	0	0	1	1	1	2	9	6	6	6	20	17	5	34	2	1	4.9	34
24-Jan	Z	2	2	2	3	3	2	2	2	1	3	2	3	4	1	1	1	1	1	0	0	0	1	0	1.5	4
25-Jan	0	Z	1	0	0	1	2	0	0	1	1	1	2	2	4	1	1	1	1	0	0	0	0	0	1.0	4
26-Jan	0	0	Z	0	0	0	0	0	0	1	C	C	C	C	C	C	1	0	0	0	0	0	0	0	--	1
27-Jan	0	0	0	Z	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	18	4	0	0	0	0	0	0	1.4	18
29-Jan	0	0	0	0	0	Z	0	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	5	4	0.9	5
30-Jan	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
31-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0.5	1
	1.5	1.7	2.2	1.5	1.0	1.3	0.8	0.8	1.1	1.0	1.6	1.8	2.6	2.3	2.6	2.3	3.1	3.4	2.5	2.4	1.9	2.6	1.6	1.7	Diurnal Average	
	7	15	30	14	3	7	2	3	8	6	21	11	39	16	19	16	18	38	20	17	7	34	8	12	Diurnal Maximum	

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

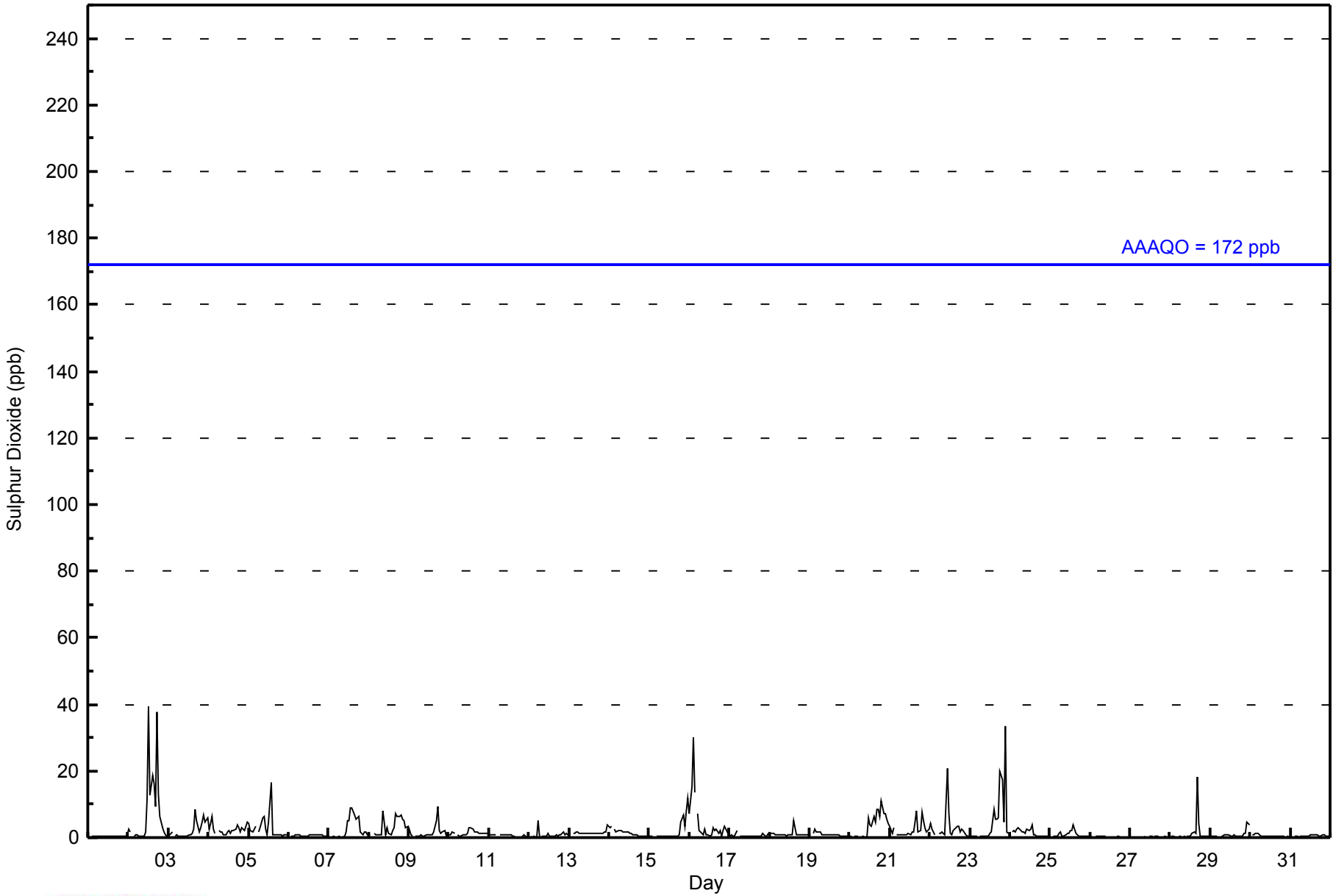
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	688	97.45	97.45
11 - 20	13	1.84	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: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2015

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	73	25	10	3	11	23	214	14	5	5	7	29	35	57	104	66	681
11 - 20	0	0	0	0	0	0	4	0	0	0	1	2	3	2	1	0	13
21 - 60	0	0	0	0	0	0	1	0	0	0	1	1	0	1	1	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	73	25	10	3	11	23	219	14	5	5	9	32	38	60	106	66	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

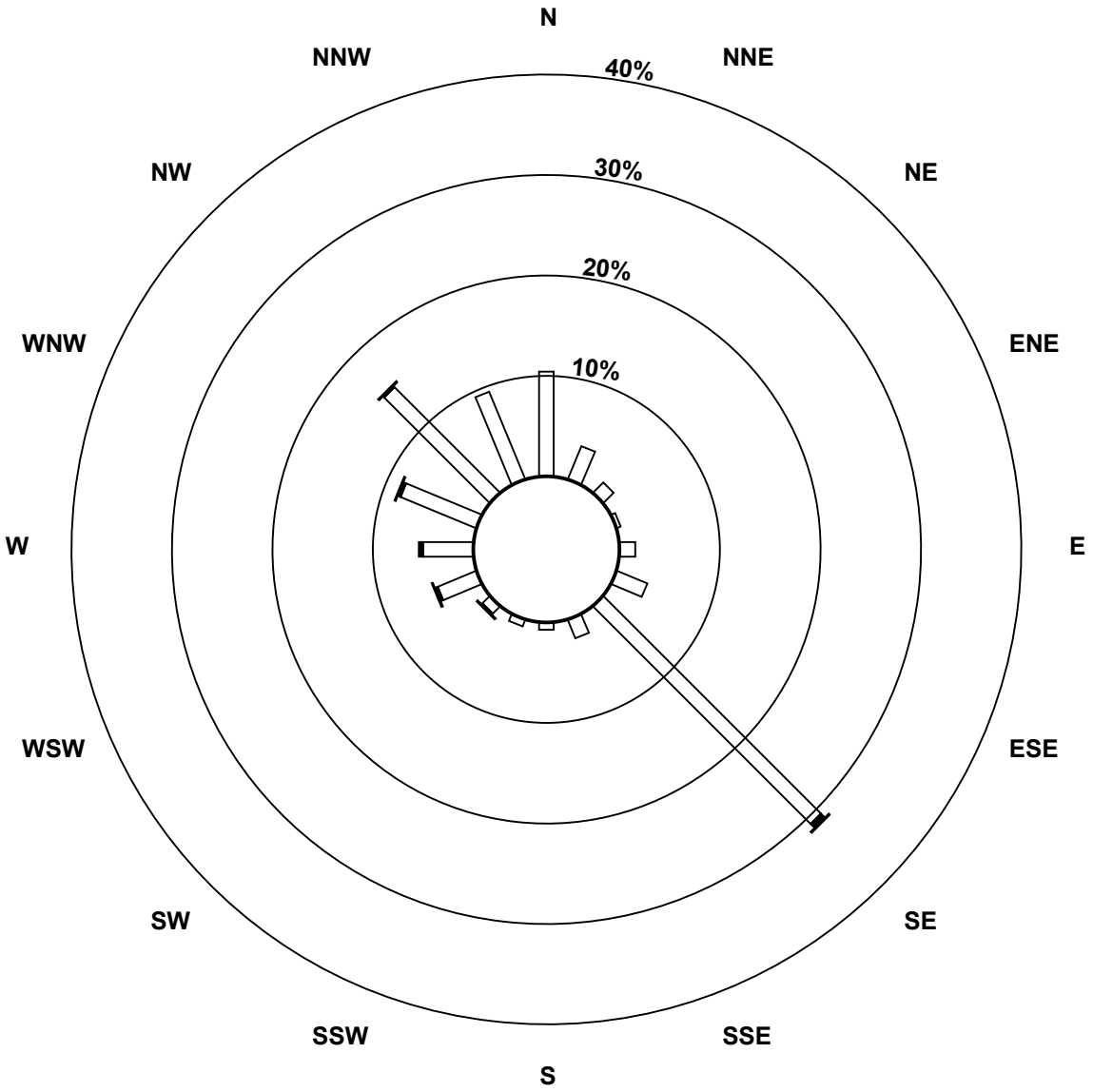
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

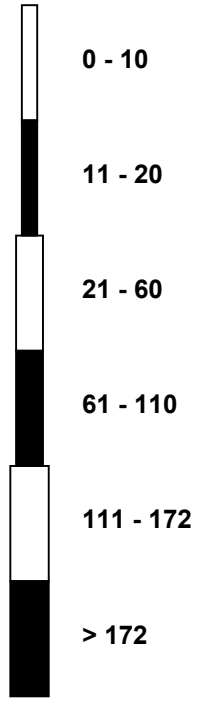
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Lower Camp (AMS 11)



Classes (ppb)



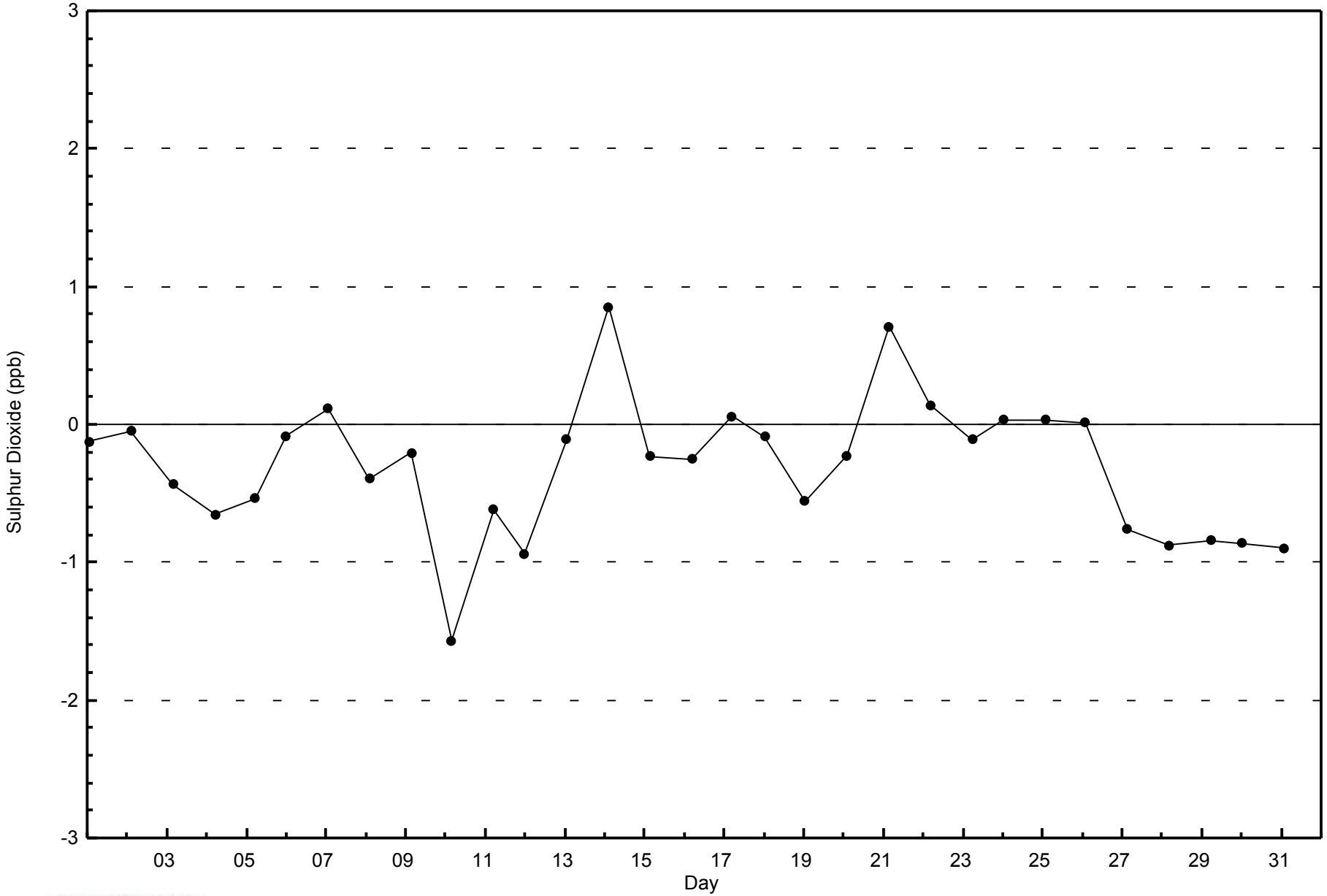
Total Number of Valid Hours: 699

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2015



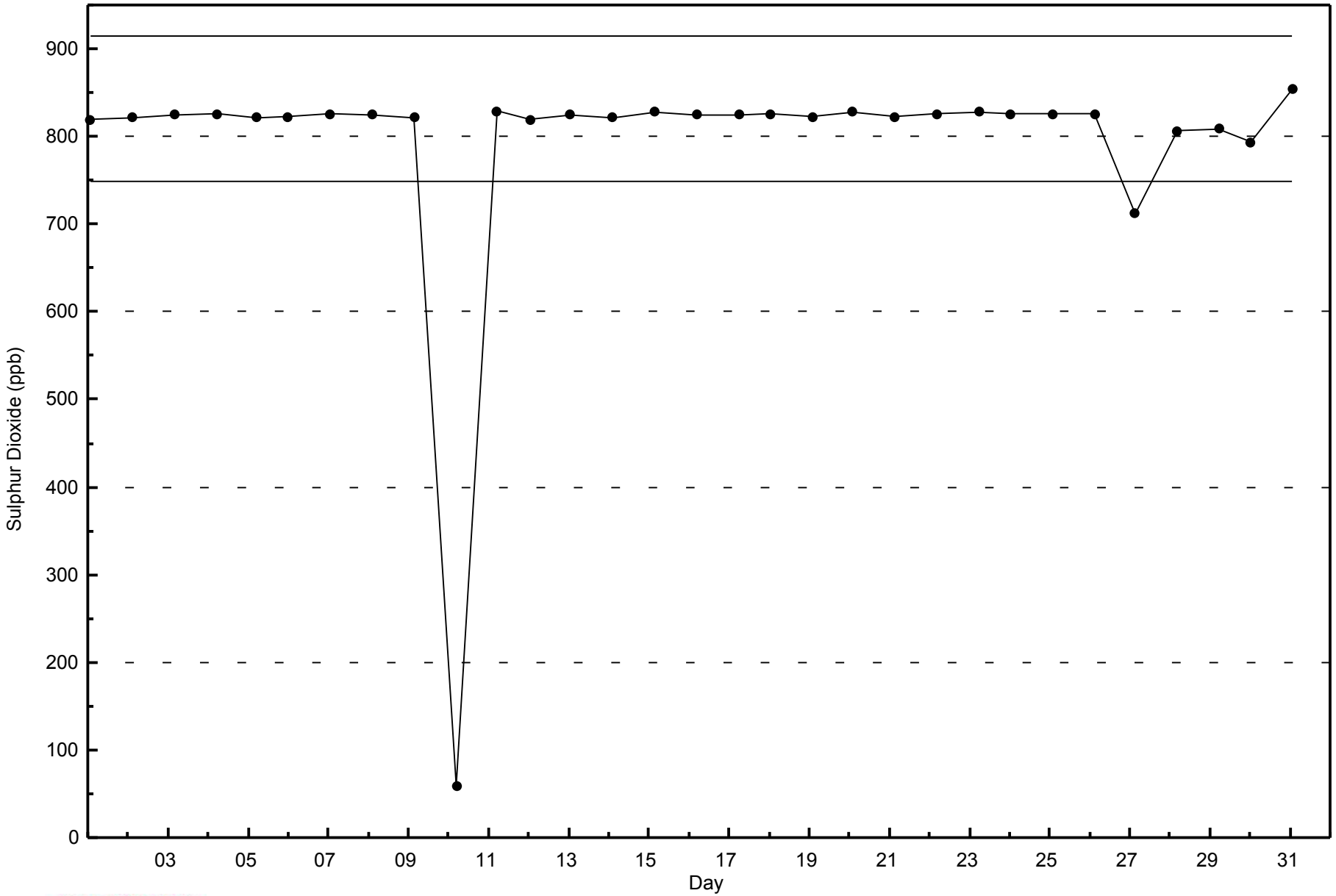
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 10 ppb on Jan 2 18:00 Maximum Daily Average: 2.8 ppb on Jan 2

Minimum Value: 0 ppb on Jan 13 13:00 Minimum Daily Average: 0.3 ppb on Jan 27
Maximum Diurnal Average: 1.1 ppb at hour 18 Minimum Diurnal Average: 0.6 ppb at hour 2
Monthly Average: 0.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 4$

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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0.4	1
2-Jan	2	1	2	Z	1	1	1	1	1	1	1	3	8	3	4	5	4	10	5	4	2	2	2	1	2.8	10
3-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	1	1	0	0	1	1	1	1	0.7	1
4-Jan	1	1	5	1	0	1	Z	1	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0.8	5
5-Jan	1	0	0	0	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
6-Jan	0	Z	1	1	1	2	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1.2	2
7-Jan	1	1	Z	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.7	1
8-Jan	0	0	1	Z	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0.6	1
9-Jan	1	1	0	0	Z	0	0	0	0	1	0	0	0	0	0	1	2	4	3	2	2	3	2	2	1.3	4
10-Jan	2	2	1	2	3	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	3
11-Jan	1	1	1	1	1	1	Z	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	0.7	1
12-Jan	1	Z	1	1	1	6	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1.4	6
13-Jan	0	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
14-Jan	1	1	1	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
16-Jan	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	0.7	1
17-Jan	0	0	0	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0.4	1
18-Jan	1	Z	1	1	1	0	0	0	1	1	1	0	0	0	3	3	1	1	1	1	1	1	1	1	0.9	3
19-Jan	1	1	Z	4	2	3	2	2	2	1	1	C	C	C	C	C	1	0	0	0	0	0	0	0	1.2	4
20-Jan	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	3	1	1	1	1	0	1	1	0.7	3
21-Jan	1	0	2	1	Z	1	1	1	1	1	1	1	0	0	1	1	2	0	0	1	1	1	1	1	0.8	2
22-Jan	1	1	0	0	1	Z	2	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0.5	2
23-Jan	0	0	0	0	1	1	Z	1	0	0	0	0	0	1	2	2	2	2	4	5	3	9	2	2	1.7	9
24-Jan	2	Z	0	0	1	1	1	1	2	2	2	1	0	1	0	1	1	1	1	1	2	1	1	1	1.1	2
25-Jan	1	1	Z	1	1	1	1	0	1	1	0	0	1	1	1	0	0	1	0	0	0	0	0	1	0.6	1
26-Jan	0	0	1	Z	0	0	0	1	1	1	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0.6	2
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	4	2	0	0	0	0	0	0	0.6	4
29-Jan	0	0	0	0	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0.6	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	1
31-Jan	1	0	Z	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0.7	1
	0.7	0.6	0.9	0.8	0.8	0.9	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.6	0.9	0.8	1.0	1.1	0.9	0.9	0.8	1.0	0.7	0.7	Diurnal Average	
	2	2	5	4	3	6	2	2	2	2	2	3	8	3	4	5	4	10	5	5	3	9	2	2	Diurnal Maximum	

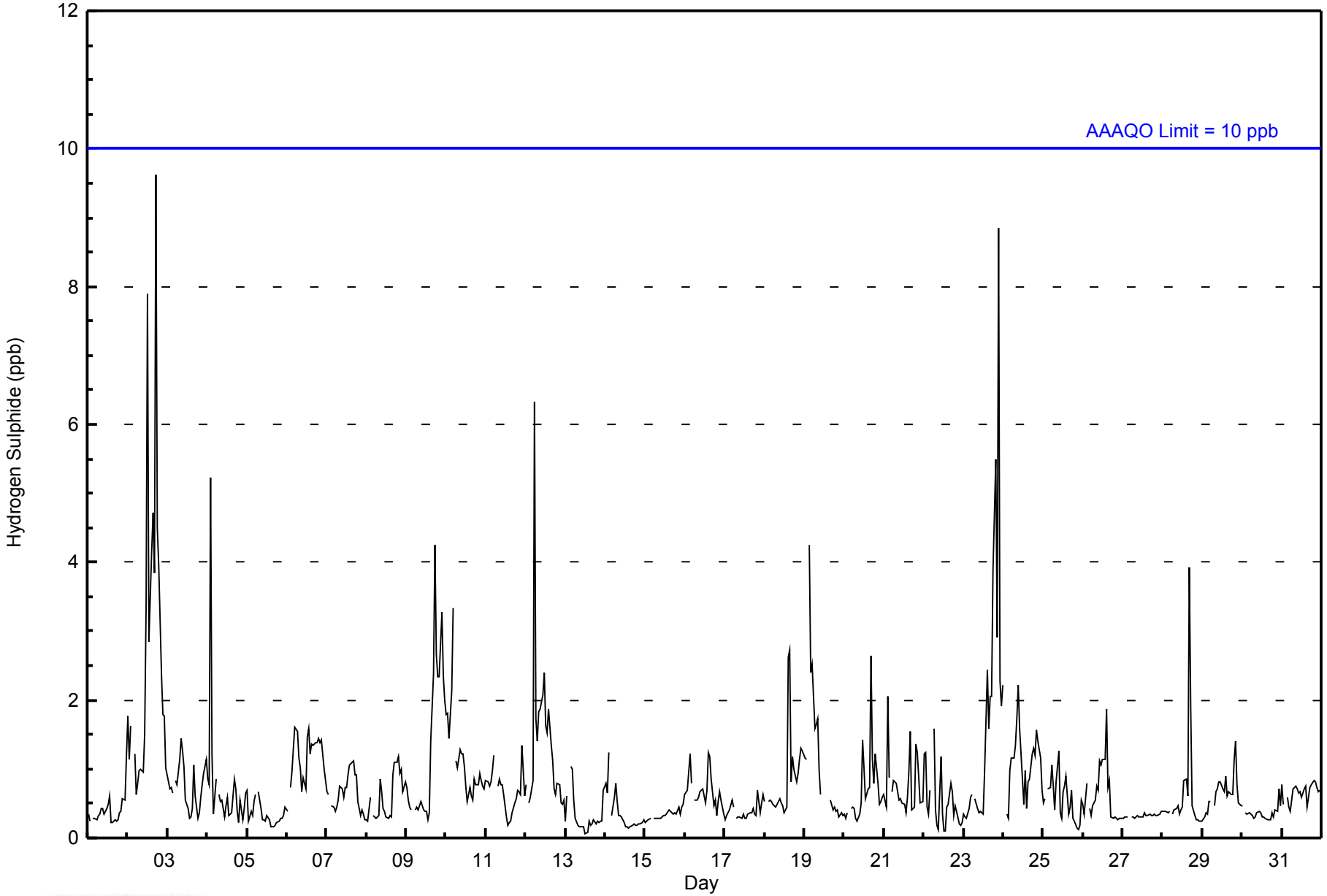
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	683	96.47	96.47
3 - 4	17	2.40	98.87
5 - 7	5	0.71	99.58
8 - 11	3	0.42	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	76	25	10	3	10	21	219	15	5	5	7	29	35	59	92	65	676
3 - 4	0	0	0	0	0	0	2	1	0	0	0	4	3	4	3	0	17
5 - 7	0	0	0	0	0	1	1	0	0	0	1	0	1	0	1	0	5
8 - 11	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	3
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	76	25	10	3	10	22	222	16	5	5	9	34	39	63	97	65	701

Total Number of Valid Hours: 701

Total Number of Hours: 744

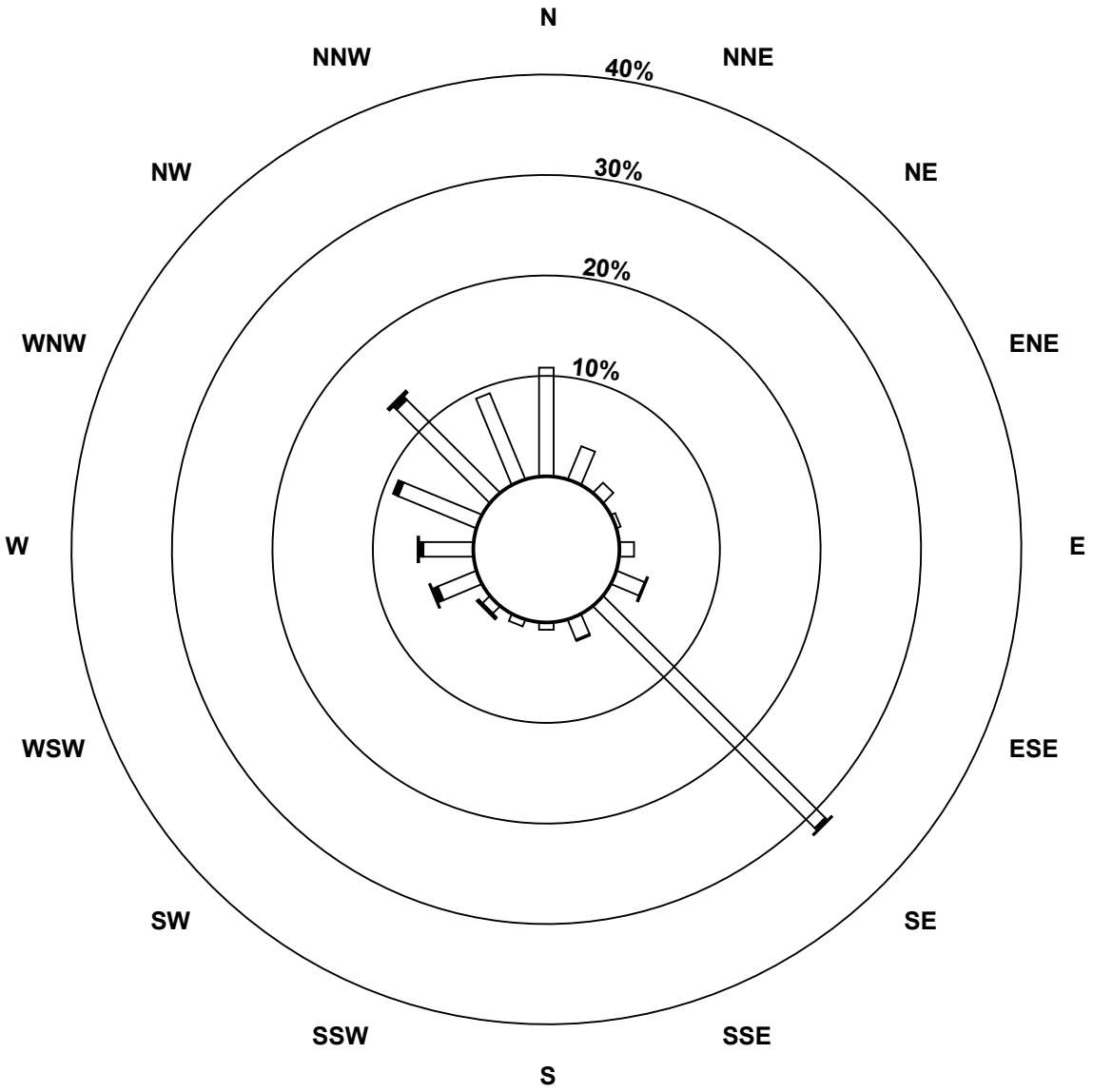
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

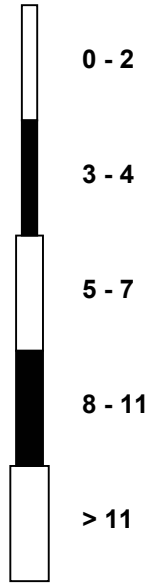
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

Lower Camp (AMS 11)



Classes (ppb)



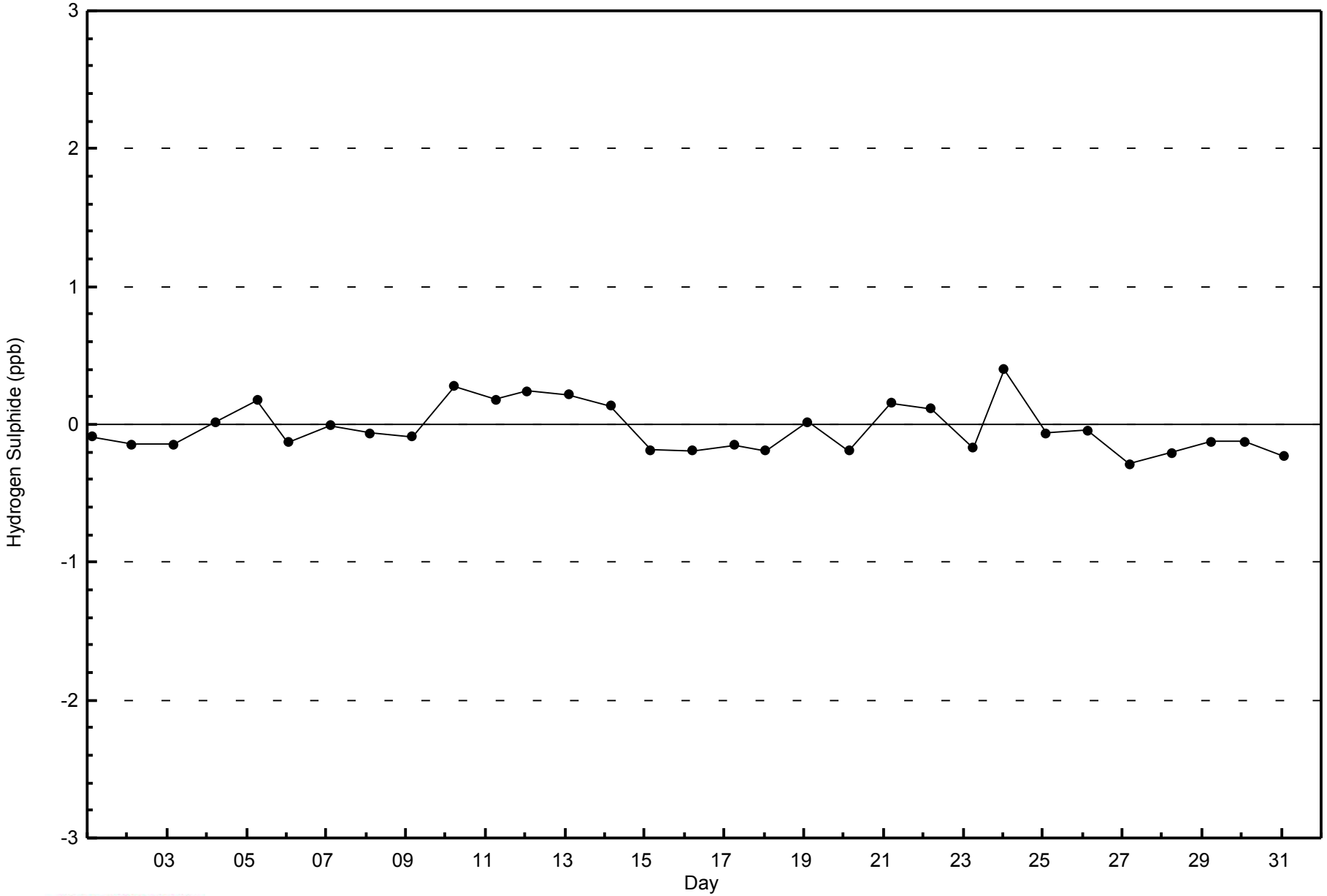
Total Number of Valid Hours: 701

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2015



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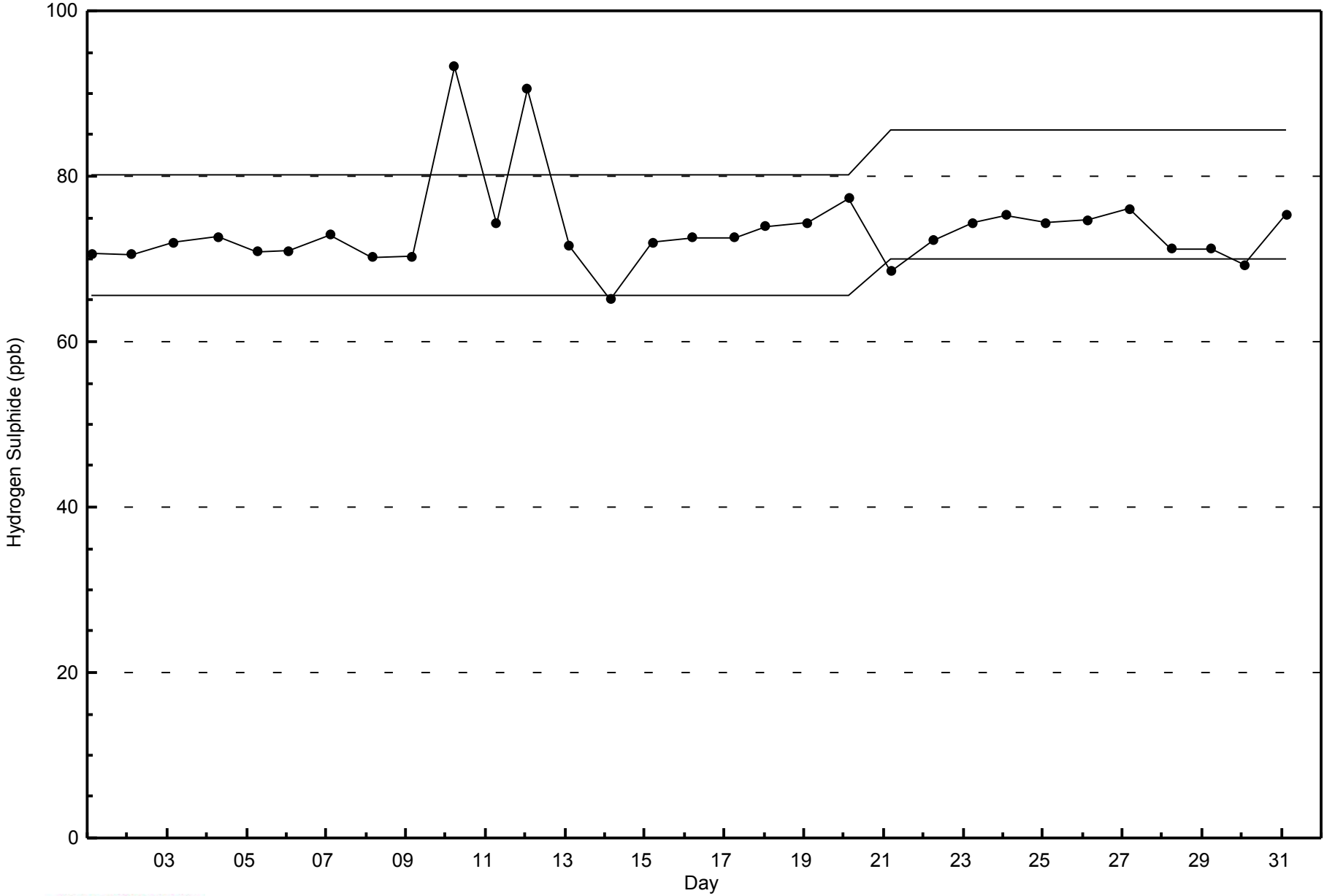
Span Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2015

Maximum Value: 5.0 ppm on Jan 23 20:00

Maximum Daily Average: 2.9 ppm on Jan 23

Minimum Value: 2.0 ppm on Jan 7 21:00

Minimum Daily Average: 2.1 ppm on Jan 15

Maximum Diurnal Average: 2.6 ppm at hour 15

Minimum Diurnal Average: 2.3 ppm at hour 2

Monthly Average: 2.43 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.6 P_{90} = 2.9 P_{99} = 3.6

Hours in Service:	744
Hours of Data:	656
Hours of Missing Data:	88
Hours of Calibration:	29
Percent Operational Time:	92.1

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-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.6
2-Jan	2.4	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.9	2.6	2.8	2.9	2.7	3.0	2.7	2.6	2.5	2.5	2.4	2.3	2.5	3.0
3-Jan	2.2	2.3	2.4	Z	2.4	2.4	2.5	2.5	2.5	2.6	2.5	2.3	2.4	2.3	2.4	2.3	2.2	2.2	2.3	2.3	2.2	2.3	2.6	2.6	2.4	2.6
4-Jan	2.6	2.4	2.7	2.7	2.3	Z	2.8	2.5	2.4	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	2.3	2.8
5-Jan	2.2	2.2	2.6	2.4	2.7	Z	3.0	2.6	2.4	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	2.3	3.0
6-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.3	3.1	3.4	2.8	2.9	2.9	2.9	2.8	2.8	2.6	2.8	2.4	2.4	2.5	3.4
7-Jan	2.5	Z	2.5	2.4	2.3	2.2	2.2	2.4	2.6	2.3	2.2	2.3	2.5	2.5	2.3	2.3	2.4	2.4	2.7	2.1	2.0	2.6	2.1	2.0	2.3	2.7
8-Jan	2.0	2.0	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.5	2.2	2.5
9-Jan	2.4	2.4	2.2	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	2.4
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	2.4	2.4	2.5	2.4	2.4	2.6	2.5	2.5	2.4	2.4	2.3	2.4	--	2.6
12-Jan	Z	2.2	2.2	2.3	2.3	2.8	2.9	2.8	3.2	3.1	3.3	3.6	2.9	3.0	3.4	3.3	2.9	2.6	2.5	2.6	2.5	2.4	2.7	3.0	2.8	3.6
13-Jan	2.5	Z	3.6	3.3	3.1	2.8	2.5	2.4	2.4	2.5	2.5	2.4	2.2	2.3	2.5	2.4	2.4	2.4	2.4	2.6	2.7	2.6	2.5	3.0	2.6	3.6
14-Jan	3.5	2.6	Z	2.7	2.6	3.0	3.0	2.9	2.7	2.6	2.5	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	2.4	3.5
15-Jan	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	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2
16-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.4	2.5	2.5	2.5	2.3	2.4	2.8	2.8	2.2	2.2	2.3	2.4	2.3	2.1	2.1	2.3	2.3	2.8
17-Jan	2.1	2.7	2.6	2.5	2.5	Z	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.7
18-Jan	Z	2.3	2.3	2.4	2.4	2.3	2.2	2.3	2.3	2.4	2.7	2.4	2.3	2.5	2.7	2.9	2.8	3.1	2.8	2.9	2.8	3.0	3.3	3.1	2.6	3.3
19-Jan	3.3	Z	3.2	3.5	3.4	3.4	3.3	3.1	3.0	2.7	2.5	2.4	2.6	2.8	2.9	2.8	2.5	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.7	3.5
20-Jan	2.2	2.2	Z	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.9	2.7	2.8	2.8	2.5	2.5	2.5	2.4	2.4	2.5	2.4	2.9
21-Jan	2.4	2.3	2.4	Z	2.7	2.6	2.7	2.6	2.5	2.6	2.7	2.5	2.3	2.6	2.9	2.1	2.1	2.0	2.0	2.2	2.4	2.4	2.5	2.6	2.4	2.9
22-Jan	2.9	3.0	2.6	2.5	Z	3.2	3.2	2.8	2.4	2.2	2.4	2.5	2.3	2.1	2.3	2.5	2.2	2.3	2.6	2.7	2.6	2.1	2.1	2.1	2.5	3.2
23-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	3.1	3.4	3.0	3.7	3.3	3.4	5.0	4.1	4.8	3.8	3.9	2.9	5.0
24-Jan	Z	3.6	2.6	2.8	3.0	2.8	2.8	3.1	3.2	3.4	3.0	2.2	2.2	2.2	2.5	2.9	3.2	3.2	3.1	2.9	2.8	2.8	2.5	2.5	2.8	3.6
25-Jan	2.4	Z	2.5	2.6	2.2	2.1	2.1	2.1	2.2	2.4	2.2	2.3	2.3	2.1	2.1	2.8	3.1	2.5	2.2	2.2	2.1	2.1	2.1	2.2	2.3	3.1
26-Jan	2.2	2.4	Z	2.7	2.3	2.3	2.4	2.4	2.6	2.5	2.9	2.8	3.1	2.4	2.3	2.8	2.8	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4	3.1
27-Jan	2.1	2.2	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.2	M	2.1	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
28-Jan	2.2	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.8	3.0	2.5	2.8	2.5	2.3	2.2	2.2	2.2	2.2	2.1	2.3	3.0
29-Jan	2.1	2.2	2.3	2.2	2.3	Z	2.2	2.2	2.3	2.3	2.5	2.6	2.4	2.5	2.9	2.4	2.4	2.3	2.4	2.7	3.0	2.5	2.3	2.2	2.4	3.0
30-Jan	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	M	M	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
31-Jan	2.2	Z	2.3	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.6	2.5	2.7	2.6	2.2	2.4	2.5	2.4	2.5	2.6	2.5	2.5	2.5	2.4	2.7
	2.4	2.3	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.5	2.5	2.4	2.4	2.5	2.4	2.4	2.4	2.4	Diurnal Average	
	3.5	3.6	3.6	3.5	3.4	3.4	3.3	3.1	3.2	3.4	3.3	3.6	3.1	3.4	3.4	3.3	3.7	3.3	3.4	5.0	4.1	4.8	3.8	3.9	Diurnal Maximum	

Z - zerospan M - Maintenance AF - Analyzer Failure

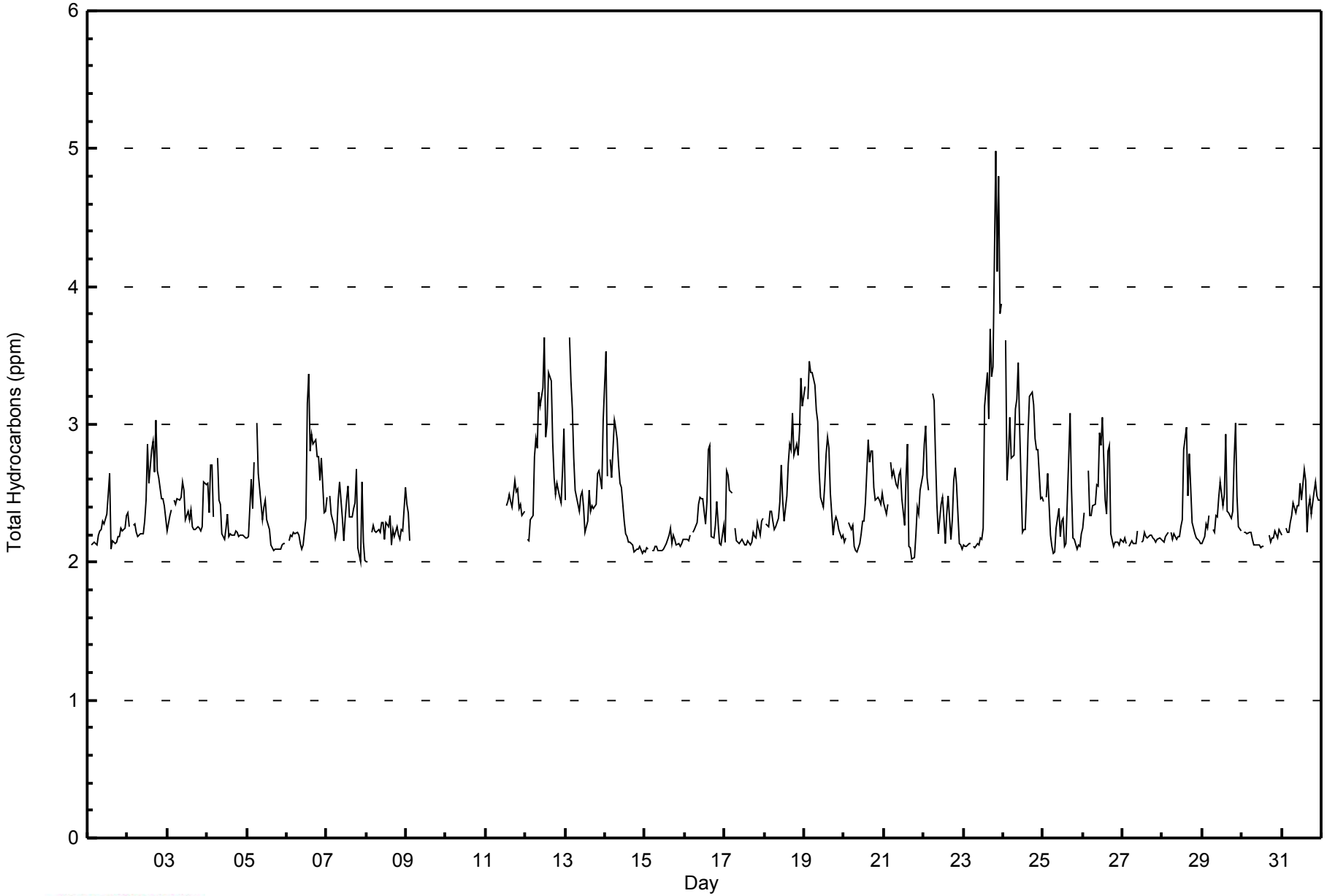
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	6	0.91	0.91
2.1 - 3.0	607	92.53	93.45
3.1 - 10.0	43	6.55	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 656

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2015

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	1	1	0	2	2	6
2.1 - 3.0	71	22	8	3	7	18	173	13	4	5	6	32	35	51	96	59	603
3.1 - 10.0	0	0	2	0	2	3	12	1	1	0	3	1	2	6	3	4	40
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	22	10	3	9	21	185	14	5	5	9	34	38	57	101	65	649

Total Number of Valid Hours: 649

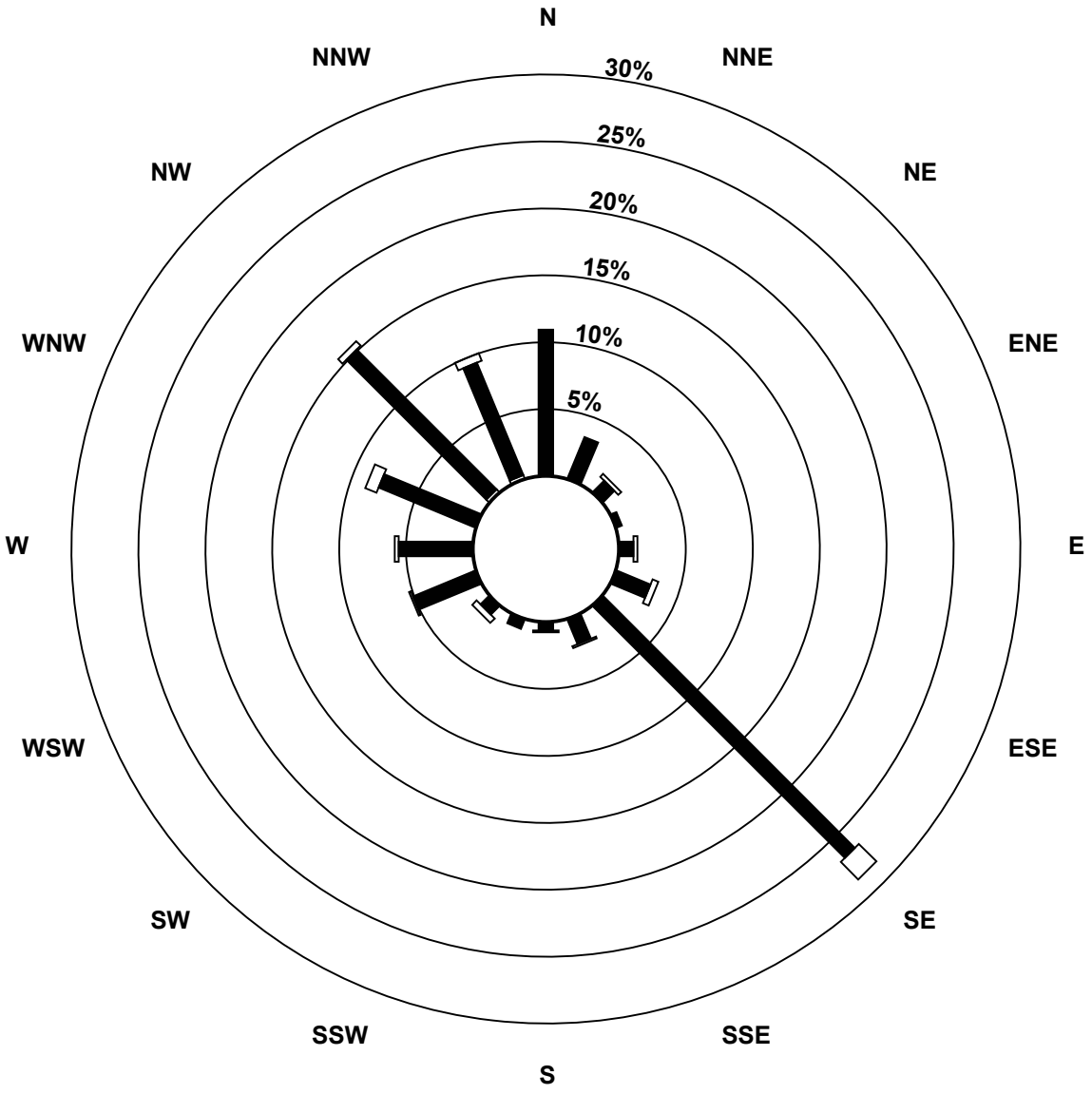
Total Number of Hours: 744

Wood Buffalo Environmental Association

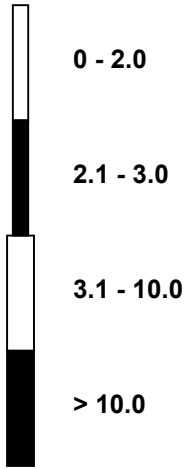
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Lower Camp (AMS 11)



Classes (ppm)



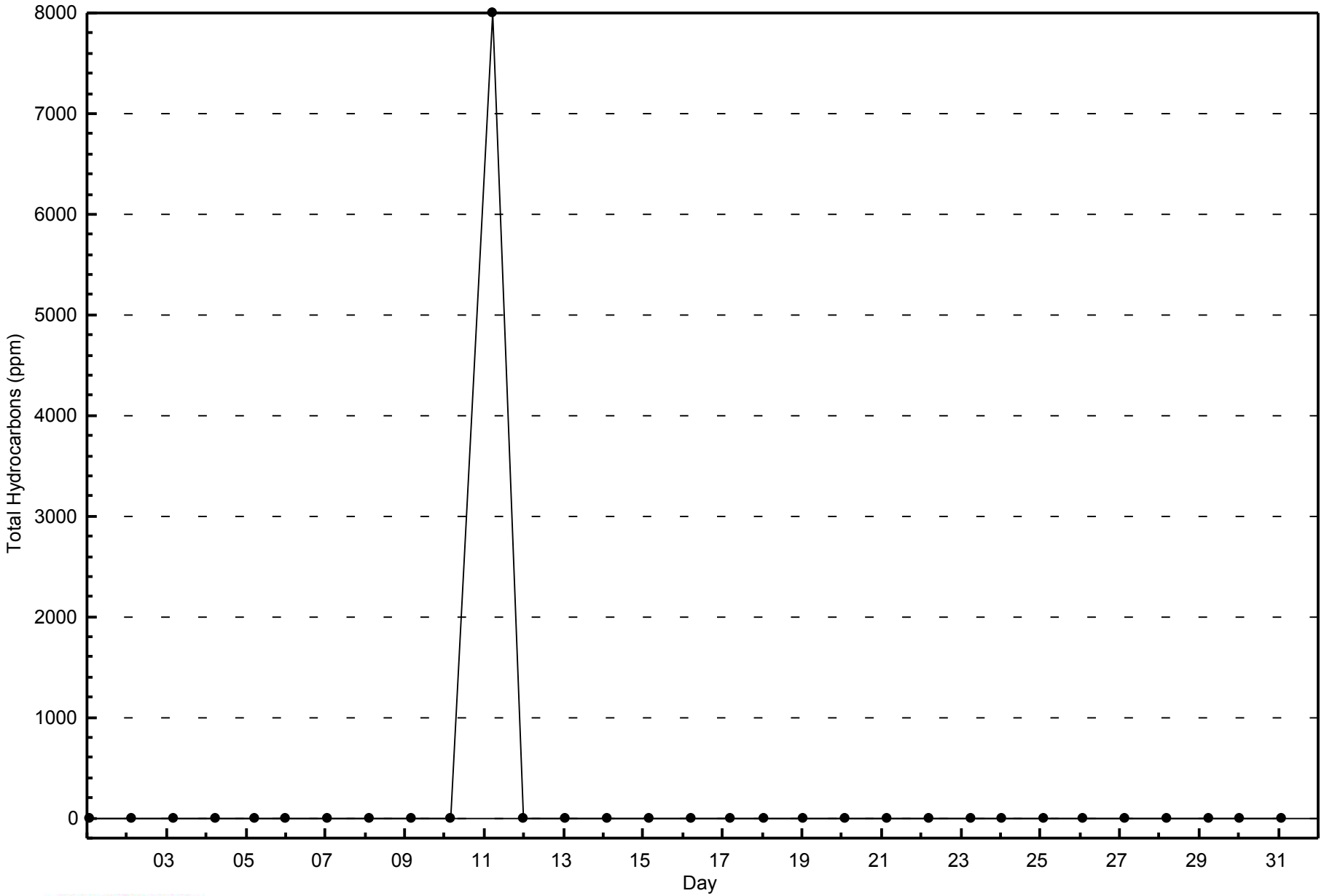
Total Number of Valid Hours: 649

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2015



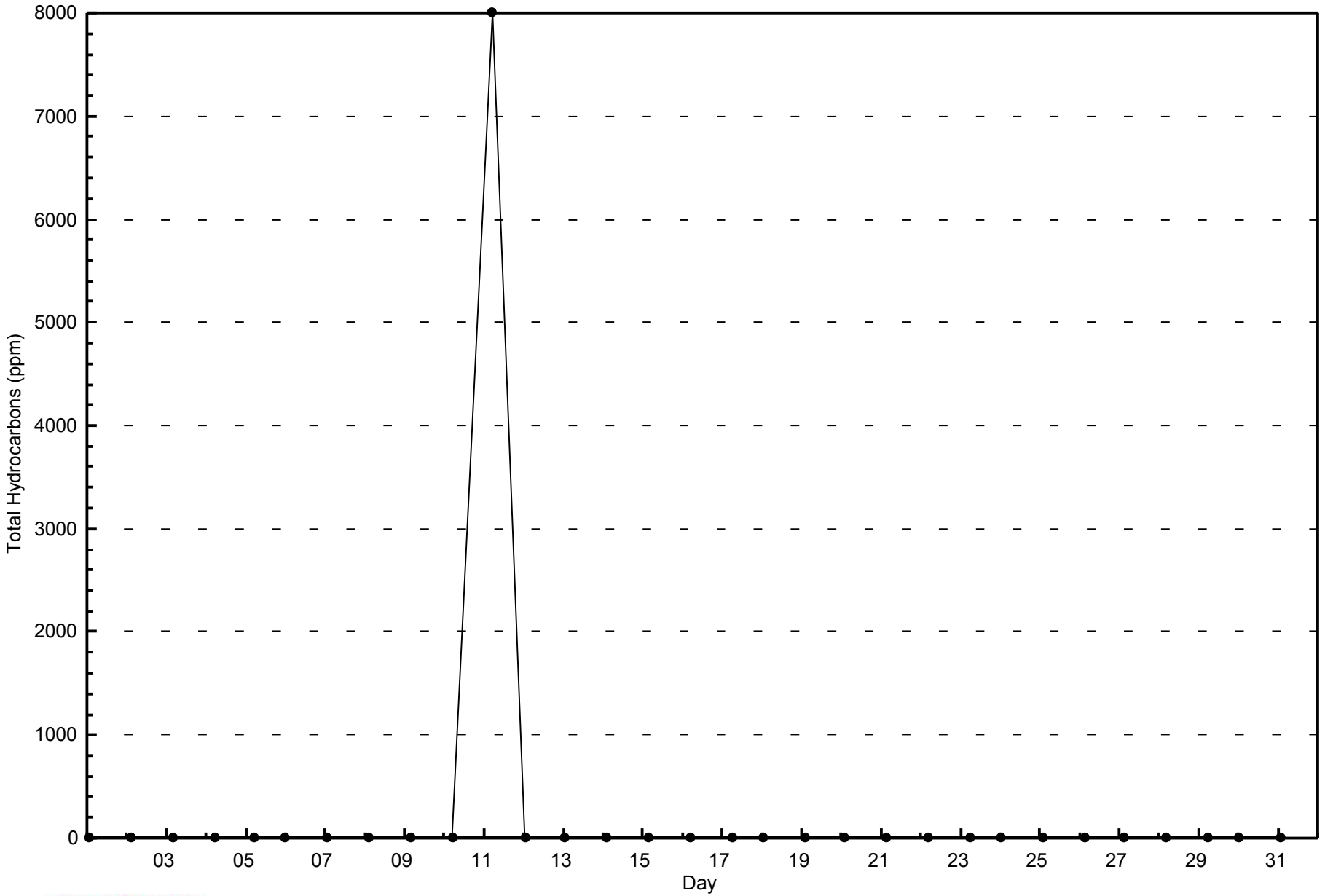
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 6.2 C on Jan 22 17:00

Maximum Daily Average: 3.3 C on Jan 22

Minimum Value: -33.7 C on Jan 3 11:00

Minimum Daily Average: -29.0 C on Jan 3

Maximum Diurnal Average: -12.3 C at hour 15

Minimum Diurnal Average: -16.4 C at hour 5

Monthly Average: -14.96 C

Percentiles: P_1 = -32.6 P_{10} = -28.3 Q_1 = -22.9 Median = -15.6 Q_3 = -8.2 P_{90} = 0.4 P_{99} = 5.6

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

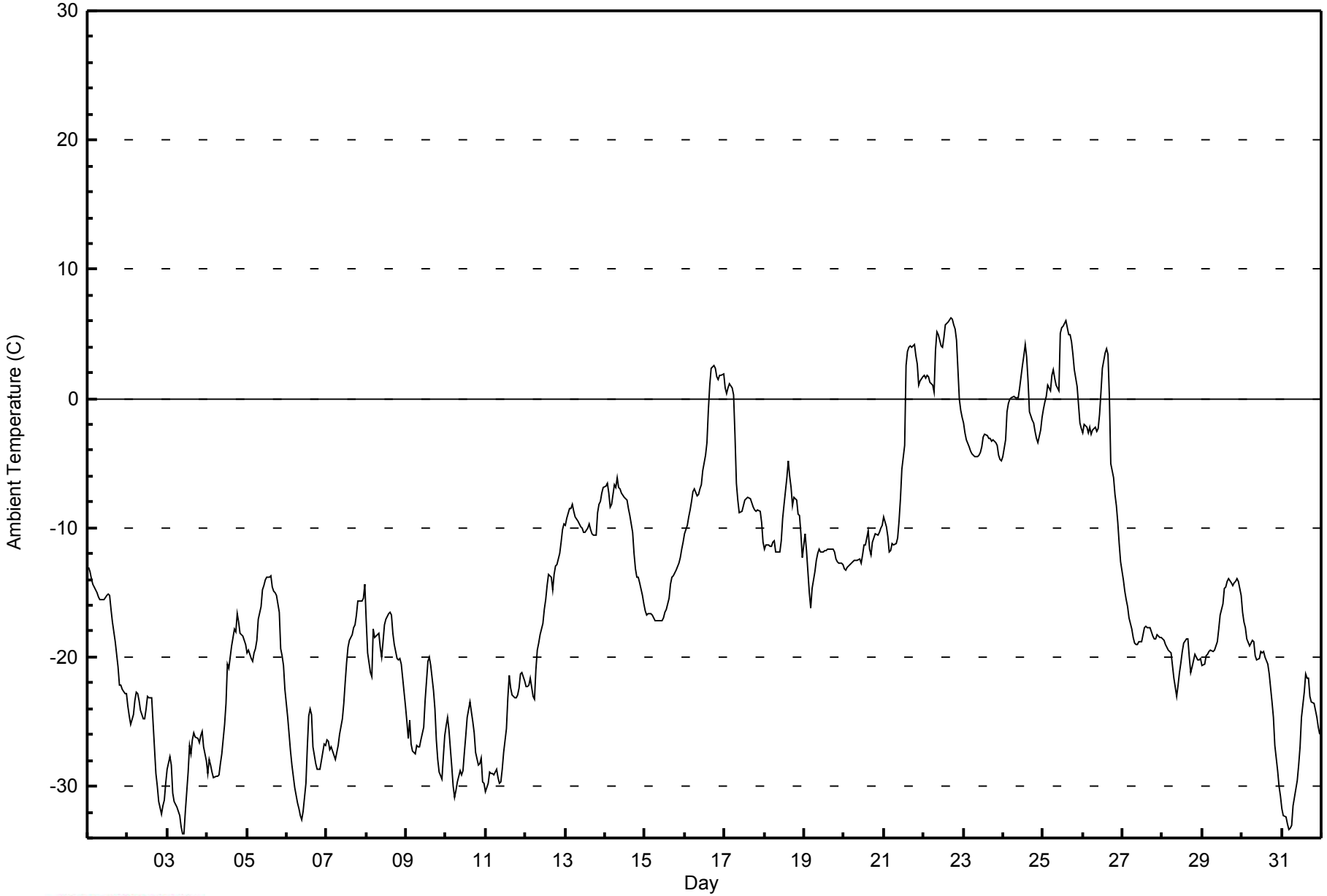
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-13.1	-13.4	-13.9	-14.4	-14.6	-15.0	-15.4	-15.6	-15.5	-15.5	-15.6	-15.2	-15.1	-15.2	-16.3	-17.3	-18.8	-19.8	-20.7	-22.2	-22.2	-22.5	-22.8	-22.8	-17.2	-13.1
2-Jan	-23.8	-24.6	-25.2	-24.4	-23.4	-22.7	-22.9	-23.3	-24.1	-24.8	-24.8	-24.0	-23.0	-23.2	-23.1	-25.1	-27.0	-29.0	-30.0	-31.2	-32.2	-31.5	-31.0	-29.8	-26.0	-22.7
3-Jan	-28.7	-27.7	-28.4	-30.5	-31.2	-31.4	-31.7	-32.3	-33.1	-33.7	-33.7	-31.9	-28.9	-26.9	-27.4	-26.4	-25.8	-26.2	-26.4	-26.6	-26.1	-25.8	-26.9	-28.0	-29.0	-25.8
4-Jan	-29.0	-27.9	-28.3	-28.9	-29.4	-29.2	-29.2	-29.2	-28.2	-27.5	-25.2	-23.6	-20.6	-20.9	-20.0	-19.1	-17.9	-18.0	-16.6	-17.3	-18.2	-18.3	-18.8	-19.1	-23.4	-16.6
5-Jan	-19.7	-19.4	-20.2	-20.4	-19.7	-19.3	-18.7	-17.1	-16.1	-14.8	-14.5	-14.0	-13.8	-13.8	-13.7	-14.6	-14.9	-15.1	-15.3	-16.6	-19.4	-19.8	-20.7	-22.5	-17.2	-13.7
6-Jan	-24.7	-26.0	-27.3	-28.3	-29.2	-30.1	-31.3	-31.7	-32.2	-32.6	-32.0	-29.8	-26.9	-24.6	-24.0	-24.4	-27.0	-28.3	-28.7	-28.7	-28.6	-28.0	-26.8	-26.8	-28.2	-24.0
7-Jan	-26.4	-26.5	-27.2	-26.9	-27.6	-28.0	-27.4	-26.8	-26.0	-24.7	-23.6	-21.9	-20.4	-19.3	-18.7	-18.2	-17.8	-17.5	-16.8	-15.7	-15.7	-15.6	-15.4	-14.3	-21.6	-14.3
8-Jan	-17.2	-19.7	-21.3	-21.5	-17.9	-18.5	-18.4	-18.2	-19.2	-20.1	-18.8	-17.5	-17.1	-16.7	-16.5	-16.7	-18.2	-19.1	-20.1	-20.2	-20.1	-20.6	-21.7	-23.8	-19.1	-16.5
9-Jan	-25.0	-26.3	-24.8	-26.8	-27.3	-27.5	-26.9	-26.9	-27.0	-26.4	-25.4	-23.4	-21.9	-20.3	-20.0	-20.6	-22.6	-24.0	-26.4	-27.9	-28.9	-29.5	-27.7	-26.1	-25.4	-20.0
10-Jan	-25.3	-24.7	-25.7	-28.4	-30.0	-30.9	-30.4	-29.7	-28.8	-29.2	-28.8	-27.4	-26.1	-24.7	-23.5	-24.2	-25.0	-25.9	-27.4	-28.3	-28.2	-27.8	-29.7	-29.7	-27.5	-23.5
11-Jan	-30.5	-29.7	-28.9	-29.0	-29.0	-29.1	-28.7	-29.4	-29.7	-29.7	-28.7	-27.4	-25.5	-23.1	-21.4	-22.4	-22.9	-23.1	-23.2	-22.9	-22.4	-21.3	-21.2	-21.8	-25.9	-21.2
12-Jan	-22.3	-22.3	-22.2	-21.6	-23.1	-23.2	-21.0	-19.5	-18.9	-18.3	-17.4	-16.3	-15.6	-14.5	-13.6	-13.8	-14.9	-13.6	-13.0	-12.9	-12.0	-11.1	-10.2	-9.7	-16.7	-9.7
13-Jan	-9.9	-9.2	-8.6	-8.6	-8.2	-8.7	-9.2	-9.5	-9.7	-9.9	-10.1	-10.3	-10.4	-10.0	-9.7	-10.2	-10.5	-10.6	-10.6	-8.8	-8.2	-7.9	-7.3	-6.9	-9.3	-6.9
14-Jan	-6.8	-6.6	-7.4	-8.4	-8.1	-6.7	-6.9	-6.1	-6.8	-7.0	-7.3	-7.7	-7.8	-7.8	-8.5	-9.0	-10.3	-11.9	-13.2	-13.8	-13.8	-14.3	-15.2	-15.9	-9.5	-6.1
15-Jan	-16.5	-16.8	-16.6	-16.6	-16.7	-16.9	-17.2	-17.2	-17.2	-17.2	-17.1	-17.0	-16.5	-16.3	-15.4	-14.4	-13.9	-13.7	-13.5	-13.2	-12.7	-12.3	-11.7	-11.1	-15.3	-11.1
16-Jan	-10.5	-9.8	-9.1	-8.6	-7.9	-7.2	-7.0	-7.5	-7.4	-7.0	-6.7	-5.5	-4.3	-3.4	-0.9	1.0	2.3	2.5	2.4	1.7	1.4	1.8	1.8	1.9	-3.6	2.5
17-Jan	0.8	0.4	0.8	1.2	0.8	0.3	-2.9	-6.5	-7.9	-8.8	-8.7	-8.2	-7.8	-7.7	-7.7	-7.8	-8.1	-8.4	-8.6	-8.7	-8.6	-8.7	-9.6	-11.1	-5.9	1.2
18-Jan	-11.7	-11.3	-11.3	-11.5	-11.5	-11.1	-11.0	-11.9	-11.8	-11.9	-11.0	-9.2	-8.2	-6.1	-4.8	-6.1	-6.9	-8.3	-7.7	-7.8	-9.0	-9.1	-10.4	-12.3	-9.7	-4.8
19-Jan	-10.4	-11.8	-13.4	-15.0	-16.2	-14.7	-13.4	-12.6	-12.0	-11.7	-11.8	-11.9	-11.8	-11.7	-11.6	-11.6	-11.7	-11.6	-11.8	-12.5	-12.6	-12.7	-12.8	-12.9	-12.5	-10.4
20-Jan	-13.1	-13.2	-13.1	-12.9	-12.7	-12.7	-12.5	-12.5	-12.5	-12.5	-12.7	-12.1	-11.3	-11.4	-10.2	-11.7	-12.1	-11.1	-10.7	-10.4	-10.6	-10.4	-10.1	-9.8	-11.8	-9.8
21-Jan	-9.2	-9.9	-10.6	-11.9	-11.8	-11.2	-11.3	-11.3	-10.8	-9.5	-7.8	-5.5	-3.6	2.6	3.6	4.0	4.0	4.0	4.2	3.3	2.7	1.1	1.3	1.7	-3.8	4.2
22-Jan	1.8	1.5	1.8	1.7	1.3	1.1	0.5	3.8	5.2	4.9	4.1	4.0	4.7	5.7	5.8	5.9	6.2	6.2	5.7	5.4	4.5	-0.1	-0.9	-1.5	3.3	6.2
23-Jan	-1.9	-2.7	-3.2	-3.7	-4.0	-4.3	-4.4	-4.5	-4.5	-4.4	-4.2	-3.8	-3.0	-2.8	-2.8	-3.1	-3.1	-3.3	-3.2	-3.4	-3.6	-4.3	-4.7	-4.8	-3.7	-1.9
24-Jan	-4.5	-3.2	-1.1	-0.3	-0.1	0.0	0.2	0.1	0.1	0.1	0.8	2.5	3.3	4.2	3.2	1.4	-1.0	-1.7	-1.9	-2.5	-3.1	-3.4	-2.4	-1.5	-0.4	4.2
25-Jan	-0.8	-0.2	0.1	1.0	0.6	1.8	2.3	1.6	1.0	0.6	5.1	5.5	5.5	5.8	6.0	4.9	5.0	4.4	3.4	2.2	0.9	-0.5	-1.8	-2.3	2.2	6.0
26-Jan	-2.6	-2.0	-2.2	-2.6	-2.2	-2.8	-2.4	-2.2	-2.5	-2.3	-1.2	0.5	2.3	3.5	3.9	3.4	0.2	-5.0	-6.1	-7.4	-8.3	-9.5	-11.2	-12.6	-3.0	3.9
27-Jan	-14.1	-14.9	-15.5	-16.1	-17.0	-17.8	-18.5	-18.9	-19.0	-19.0	-18.8	-18.8	-18.3	-17.7	-17.6	-17.7	-17.7	-18.0	-18.4	-18.6	-18.6	-18.3	-18.4	-18.5	-17.8	-14.1
28-Jan	-18.6	-18.7	-19.0	-19.5	-19.6	-19.6	-20.7	-21.6	-23.1	-22.2	-21.2	-20.4	-19.5	-19.0	-18.6	-18.6	-20.0	-21.3	-20.8	-19.8	-20.0	-20.2	-20.2	-20.1	-20.1	-18.6
29-Jan	-20.6	-20.5	-19.9	-19.7	-19.5	-19.4	-19.6	-19.5	-19.1	-18.8	-17.9	-16.8	-15.8	-14.7	-14.6	-14.2	-14.0	-14.3	-14.4	-14.3	-14.2	-14.0	-14.2	-15.3	-16.9	-14.0
30-Jan	-16.5	-17.3	-17.7	-18.6	-19.2	-18.9	-18.7	-18.9	-19.8	-20.2	-20.1	-19.6	-19.6	-19.5	-20.0	-20.5	-21.3	-22.3	-23.5	-24.7	-26.8	-28.8	-30.0	-30.8	-21.4	-16.5
31-Jan	-31.7	-32.3	-32.4	-32.9	-33.4	-33.2	-33.0	-31.5	-30.2	-29.6	-28.3	-26.9	-24.7	-22.7	-21.4	-21.6	-21.6	-23.1	-23.5	-23.6	-24.1	-24.7	-25.4	-25.9	-27.4	-21.4
	-15.6	-15.7	-15.9	-16.3	-16.4	-16.4	-16.4	-16.3	-16.4	-16.2	-15.6	-14.6	-13.6	-12.7	-12.3	-12.5	-13.1	-13.8	-14.1	-14.4	-14.8	-15.1	-15.4	-15.6	Diurnal Average	
	1.8	1.5	1.8	1.7	1.3	1.8	2.3	3.8	5.2	4.9	5.1	5.5	5.5	5.8	6.0	5.9	6.2	6.2	5.7	5.4	4.5	1.8	1.8	1.9	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Lower Camp - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	246	33.06	33.06
-20 - 0	415	55.78	88.84
0 - 10	83	11.16	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

Maximum Value: 99 % on Jan 24 07:00

Maximum Daily Average: 96.3 % on Jan 24

Minimum Value: 51 % on Jan 8 15:00

Minimum Daily Average: 64.9 % on Jan 8

Maximum Diurnal Average: 81.3 % at hour 1

Minimum Diurnal Average: 74.8 % at hour 15

Monthly Average: 79.3 %

Percentiles: P_1 = 62 P_{10} = 70 Q_1 = 74 Median = 78 Q_3 = 85 P_{90} = 91 P_{99} = 99

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

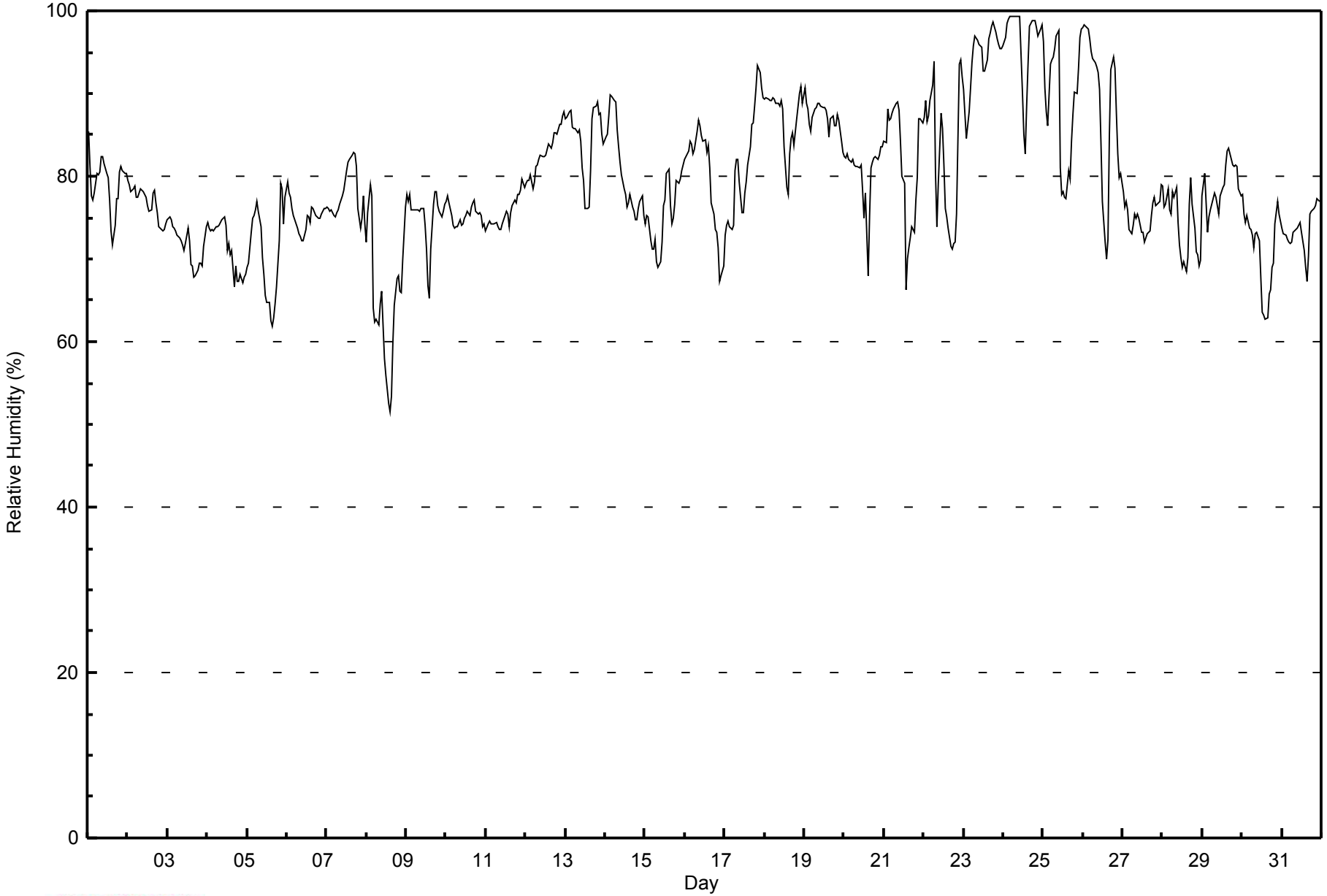
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	85	81	78	77	78	80	80	80	82	82	82	80	80	77	73	72	74	77	77	81	81	81	80	80	79.2	85
2-Jan	80	79	78	78	79	77	78	78	78	78	78	78	76	76	76	78	78	77	76	74	73	73	74	74	76.8	80
3-Jan	75	75	75	74	74	73	73	72	72	72	71	72	74	72	69	69	68	68	69	69	69	69	72	74	71.7	75
4-Jan	74	74	73	74	73	74	74	74	74	75	75	74	71	72	70	71	67	69	67	67	68	67	68	68	71.4	75
5-Jan	69	69	73	75	75	76	77	76	74	70	68	66	65	65	63	62	63	65	67	72	79	78	74	78	70.7	79
6-Jan	79	78	77	76	75	75	74	73	73	72	72	74	75	75	74	76	76	75	75	75	75	75	76	76	75.1	79
7-Jan	76	76	76	76	75	75	76	76	77	78	78	79	81	82	82	83	83	83	81	76	74	75	78	74	77.9	83
8-Jan	72	76	79	78	64	62	63	62	65	66	62	58	56	52	51	53	60	64	68	68	66	66	70	76	64.9	79
9-Jan	78	77	78	76	76	76	76	76	76	76	76	74	71	67	65	71	77	78	78	77	76	75	76	77	75.0	78
10-Jan	77	78	77	75	74	74	74	74	75	74	74	75	75	76	75	76	77	77	76	75	76	75	74	74	75.3	78
11-Jan	73	74	75	74	74	74	74	74	74	74	74	75	76	75	74	76	77	77	77	78	78	78	80	79	75.5	80
12-Jan	79	80	80	80	78	79	81	81	82	83	82	82	83	83	84	83	84	85	85	85	86	86	87	88	82.8	88
13-Jan	87	87	88	88	86	86	86	85	86	84	81	79	76	76	76	81	87	88	88	89	88	88	85	84	84.5	89
14-Jan	85	85	87	90	90	89	89	86	84	82	80	78	78	76	77	78	76	76	75	75	76	77	78	75	80.8	90
15-Jan	74	75	75	72	71	71	72	70	69	70	72	76	77	80	81	76	74	75	77	79	79	80	81	81	75.4	81
16-Jan	82	83	83	84	84	83	83	85	87	86	85	84	84	83	84	81	77	75	74	73	71	67	68	69	79.8	87
17-Jan	73	74	75	74	74	74	81	82	82	79	76	76	78	79	81	84	86	86	89	91	93	92	91	89	81.6	93
18-Jan	89	89	89	89	89	90	89	89	89	89	89	88	84	79	78	83	85	85	84	87	89	90	91	89	87.1	91
19-Jan	91	89	88	86	86	87	88	88	89	89	88	88	88	88	87	85	87	87	86	86	87	87	84	83	87.2	91
20-Jan	82	82	83	82	82	82	81	81	81	81	81	78	75	78	68	75	81	82	82	82	82	82	84	84	80.5	84
21-Jan	84	84	88	87	87	88	88	89	89	88	84	80	79	66	70	71	73	74	73	77	80	87	87	86	81.7	89
22-Jan	87	89	87	87	89	91	94	80	74	79	88	86	81	76	75	74	72	71	72	72	75	94	94	92	82.4	94
23-Jan	91	87	85	88	91	94	96	97	96	96	96	96	93	93	94	97	97	98	99	97	97	96	95	95	94.3	99
24-Jan	96	97	99	99	99	99	99	99	99	99	99	90	85	83	88	94	98	99	99	99	98	97	98	98	96.3	99
25-Jan	96	91	88	86	94	94	94	95	97	98	81	78	78	77	77	81	80	84	87	90	90	93	97	98	88.5	98
26-Jan	98	98	98	98	97	95	94	94	93	93	91	84	77	72	70	72	85	93	94	93	88	83	80	80	88.3	98
27-Jan	78	76	77	76	74	73	74	75	75	75	75	73	73	72	73	73	73	75	77	78	76	77	77	79	75.2	79
28-Jan	79	76	77	79	76	75	78	78	79	74	72	70	69	70	69	70	77	80	77	74	71	70	69	70	74.0	80
29-Jan	78	80	77	73	75	76	77	78	77	76	75	78	79	79	81	83	83	82	81	81	81	81	79	78	78.7	83
30-Jan	78	75	74	75	74	73	73	71	73	73	72	68	64	63	63	63	66	66	69	70	74	77	75	75	71.0	78
31-Jan	74	73	73	72	72	72	72	73	74	74	74	74	73	71	69	67	70	75	76	76	76	77	77	77	73.4	77
	81.3	80.9	80.9	80.6	80.1	80.3	80.9	80.4	80.4	80.1	79.1	77.8	76.6	75.3	74.8	76.0	77.7	79.0	79.1	79.6	79.8	80.5	80.5	80.7	Diurnal Average	
	98	98	99	99	99	99	99	99	99	99	99	96	93	93	94	97	98	99	99	99	98	97	98	98	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Lower Camp - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Lower Camp - January 2015

Maximum Speed: 28 km/h on Jan 22 14:00

Maximum Daily Speed Average: 13.1 km/h on Jan 27

Minimum Speed Value: 0 km/h on Jan 3 12:00

Minimum Daily Speed Average: 1.7 km/h on Jan 2

Maximum Diurnal Speed Average: 3.0 km/h at hour 18

Minimum Diurnal Speed Average: 0.2 km/h at hour 11

Monthly Average Velocity: 0.2 km/h 155.5 deg

Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 5$ Median = 8 $Q_3 = 12$ $P_{90} = 16$ $P_{99} = 24$

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 Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	NW5	N7	N6	NW5	NNW6	NNW5	NW7	NNW5	NW5	NW5	NW6	NW7	NW8	NNW12	N15	NNW11	NW8	WNW7	NW6	NW2	NNE0	NE0	E1	NNW2	NNW5.5	N15
2-Jan	WNW1	W2	NW2	NW1	WNW2	WNW4	NW3	NW1	SE1	N1	WNW1	WSW1	WSW4	WSW1	W2	W3	WSW2	NW3	NW1	WNW1	NW2	NW2	WNW2	NW3	WNW1.7	WNW4
3-Jan	NW2	W4	WNW4	WNW3	NW2	WNW3	NNW2	NNW1	NW1	NW3	NW1	ENE0	N1	WNW5	WNW6	NW3	WSW10	WSW14	WSW15	WNW7	WNW6	WNW6	SSE5	SE6	W3.5	WSW15
4-Jan	SE5	SSW3	SE7	SE10	SE11	SE11	SE9	SE10	SE10	SE11	SE12	SSE9	SSE8	SE14	SE12	S7	SW7	WSW8	WSW14	W11	WSW9	WSW16	WSW15	WSW15	S6.3	WSW16
5-Jan	WSW17	WSW12	SSE8	SE9	SE8	SE9	SE8	W3	NW7	WNW11	WNW13	WNW13	WNW14	WNW16	NW13	WNW15	NW14	NW14	NW11	NW6	WNW5	WNW7	WNW8	WNW5	WNW6.5	WSW17
6-Jan	N2	NW2	NW2	NW2	NW2	NW2	NNW1	N1	NNW1	NNE1	E1	SE5	SE8	SE10	SE10	SE6	E2	ESE2	SE7	ESE8	SE9	SE10	SE14	SE14	SE3.8	SE14
7-Jan	SE14	SE13	SE13	SE14	SE16	SE18	SE17	SE10	SE11	SE12	ESE9	NNW2	NW2	NW3	NNW5	NW5	NW5	NW8	WNW10	N14	NW10	WNW8	NW8	NNW18	ESE2.3	SE18
8-Jan	NNW10	NW10	WNW5	NW9	WNW18	WNW16	WNW18	WNW17	W16	W14	WNW16	WNW17	WNW16	WNW16	WNW15	WNW18	WSW14	WSW15	W10	WSW9	WSW15	WSW8	S6	SSE8	W11.6	WNW18
9-Jan	SE9	SE9	SE11	SE12	SE11	SE11	SE12	SE14	SE12	SE14	SE11	SE12	SE12	SE14	SE10	WNW2	WNW5	WNW4	NW5	NW4	NW3	NW2	SSE1	E0	SE6.4	SE14
10-Jan	NNW0	N2	WNW2	N2	NW1	NW1	NNE1	E2	SE9	SE10	SE10	SE9	SE11	SE13	SE9	SE9	SE8	SE5	ESE4	SE7	SE9	SE6	ESE3	SE7	SE5.2	SE13
11-Jan	SE6	SE6	SE9	SE8	SE8	SE10	SE10	SE12	SE11	SE9	SE10	SE9	SE12	SE12	SE11	SE12	SE13	SE13	SE12	SE14	ESE12	ESE17	SE11	SE10	SE10.7	ESE17
12-Jan	SE13	SE18	SE12	SE9	ESE1	ESE1	SE3	ESE7	ESE5	E2	SE3	ESE2	SE4	SE2	SE7	SE8	SE8	SE12	SE13	SE14	SE13	SE14	SE9	SE11	SE7.8	SE18
13-Jan	SE13	SE7	ESE3	NW5	NNW8	N12	N14	N9	NNE4	NNE5	NNE6	NE9	NE8	NE7	N5	NW5	NW5	NW4	NW5	ESE9	ESE14	SE12	SSE6	SSW6	NE2.9	ESE14
14-Jan	S7	SSE4	SSE3	SE8	SE9	NW3	NW7	N12	N11	N10	NNE11	N13	N10	N11	NNE10	NNE10	NNE12	NNE15	NNE13	N10	N9	N10	N8	NNE9	NNE6.8	NNE15
15-Jan	N9	N10	NNE11	N6	NNE7	NNE8	NNE9	N8	N6	NNE6	N6	NNW5	NW4	NNW5	ENE5	ESE13	ESE21	ESE20	SE25	SE23	SE20	SE25	SE26	SE23	E7.1	SE26
16-Jan	SE25	SE21	SE18	SE19	SE16	SE11	SE11	SE13	SE14	SE15	SE14	SE10	SE12	SE10	SW5	W11	W18	W20	W22	W22	W21	W24	W27	W26	SSW7.4	W27
17-Jan	W19	W15	W18	W21	WSW24	W18	NNW10	N9	NNW8	NNW7	NNW6	NNW6	NNW7	NNW8	NNW7	NNW6	NW7	NW6	WNW5	WNW3	NW3	N3	SE3	SE7	WNW7.1	WSW24
18-Jan	SE7	SE6	SE7	SSE6	SE5	SE6	SE10	SE9	SE7	SE11	SE10	SE11	SE13	SE13	SE7	SE7	SE11	SE8	SE15	SE11	SE7	SE8	SE6	SE5	SE8.6	SE15
19-Jan	SE8	SE5	NW1	W2	WNW2	WNW3	WNW3	NW1	NW2	NNW5	NNW5	NW6	NW8	NW7	NW7	NW9	NW7	NW7	NW9	NW10	NW9	NNW8	NW7	NNW8	NW4.6	NW10
20-Jan	NW8	NW9	NW8	NW8	NW7	NW6	NW6	NW6	NW6	NW5	NW3	WSW4	SSW2	ESE3	SE10	SE9	SSE3	SE11	SE14	SE15	ESE13	SE14	SE16	SE16	SE2.1	SE16
21-Jan	SE15	SE14	SE10	SE18	SE18	SE16	SE12	SW1	SW1	SSE6	SE9	SE13	SE17	S13	S12	SSW10	SW16	WSW18	W13	SSE5	SE4	ESE5	SE4	SE4	SSE7.8	SE18
22-Jan	SE5	SE7	SE9	SE11	SE5	SE4	SE4	W13	W17	W19	WNW14	WNW10	WNW14	W28	W23	W18	WSW16	W20	W21	W19	NW12	N12	N10	N9	W8.6	W28
23-Jan	NNW9	NNW9	NNW7	NNW7	NNW6	NNW6	NW7	NW6	NW6	NNW5	NNW6	NNW6	WNW5	W6	SW5	N2	NE3	NNW4	WNW3	SW1	WSW2	SW3	SE4	WNW1	NW3.8	NNW9
24-Jan	NNE1	E3	SE11	AF	AF	AF	AF	AF	AF	AF	WSW5	WSW18	WSW14	W8	NW6	WNW5	NNW0	NNW3	NE1	ESE4	N3	E2	SE5	SE10	----	WSW18
25-Jan	SE14	SE13	SE14	SSE7	SE13	SE14	SSE12	SE12	SE5	SW1	W19	W14	WSW12	WSW16	WSW16	W13	WNW7	NNW7	NNW6	NNW5	NE7	NNW1	ESE1	E0	SSW3.2	W19
26-Jan	SSW1	SE9	SE7	SE9	SE12	SE11	SE7	SE11	SE11	SE9	SE8	SE9	SSE7	WSW5	WSW8	WNW4	NNW10	N21	N20	N20	N23	N18	N19	N18	NE3.5	N23
27-Jan	N17	N18	N16	N17	N17	N16	N14	N12	N11	N11	N13	N13	N14	N14	N14	N14	N14	N14	N12	N11	N8	NNW10	NNW10	NNW8	N13.1	N18
28-Jan	NNW8	NNW9	NW10	NW12	NW12	NW9	NW7	NW5	NNW3	NW4	NW6	WNW7	WNW5	WSW6	NNW2	NW3	W3	WNW5	WNW3	NE4	NE6	NE5	NNE3	ENE2	NW4.7	NW12
29-Jan	N3	WNW2	SE5	SE7	SE8	SE12	SE13	SE12	SE9	SE7	SE6	E2	NNW3	SE3	N5	NNW5	NNW7	NW9	NW7	NNW7	NW7	NNW10	N12	N12	NE1.8	SE13
30-Jan	N13	N12	N13	N15	N13	N10	N12	N13	N10	NNW7	N11	N12	NNE16	N13	NNE16	NNE12	NNE11	NNW7	NW7	NW6	NW3	NW2	NW1	NW1	N9.5	NNE16
31-Jan	NW2	NW1	NNW2	NNW1	NNE0	NNW1	E2	SE5	SE8	SE8	SE13	SE11	SE12	SE12	SE12	SE9	SE8	SE8	SE11	SE12	SE11	SE13	SE14	SE14	SE7.3	SE14
	SE1.4	SE1.4	ESE2.0	SE1.8	SE1.5	ESE1.3	E1.4	E1.1	ESE0.8	SE0.7	ENE0.2	W0.7	SW0.5	WSW1.2	WNW0.9	WNW2.0	WNW2.3	WNW3.0	WNW2.4	WNW0.4	NE0.5	ESE0.9	SE1.1	ESE1.2	Diurnal Average	
	SE25	SE21	SE18	W21	WSW24	SE18	WNW18	WNW17	W17	W19	W19	WSW18	SE17	W28	W23	W18	ESE21	N21	SE25	SE23	N23	SE25	W27	W26	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Jan 26 17:00

Minimum Value: 1 km/h on Jan 20 12:00

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:	737
Hours of Missing Data:	7
Hours of Calibration:	0
Percent Operational Time:	99.1

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

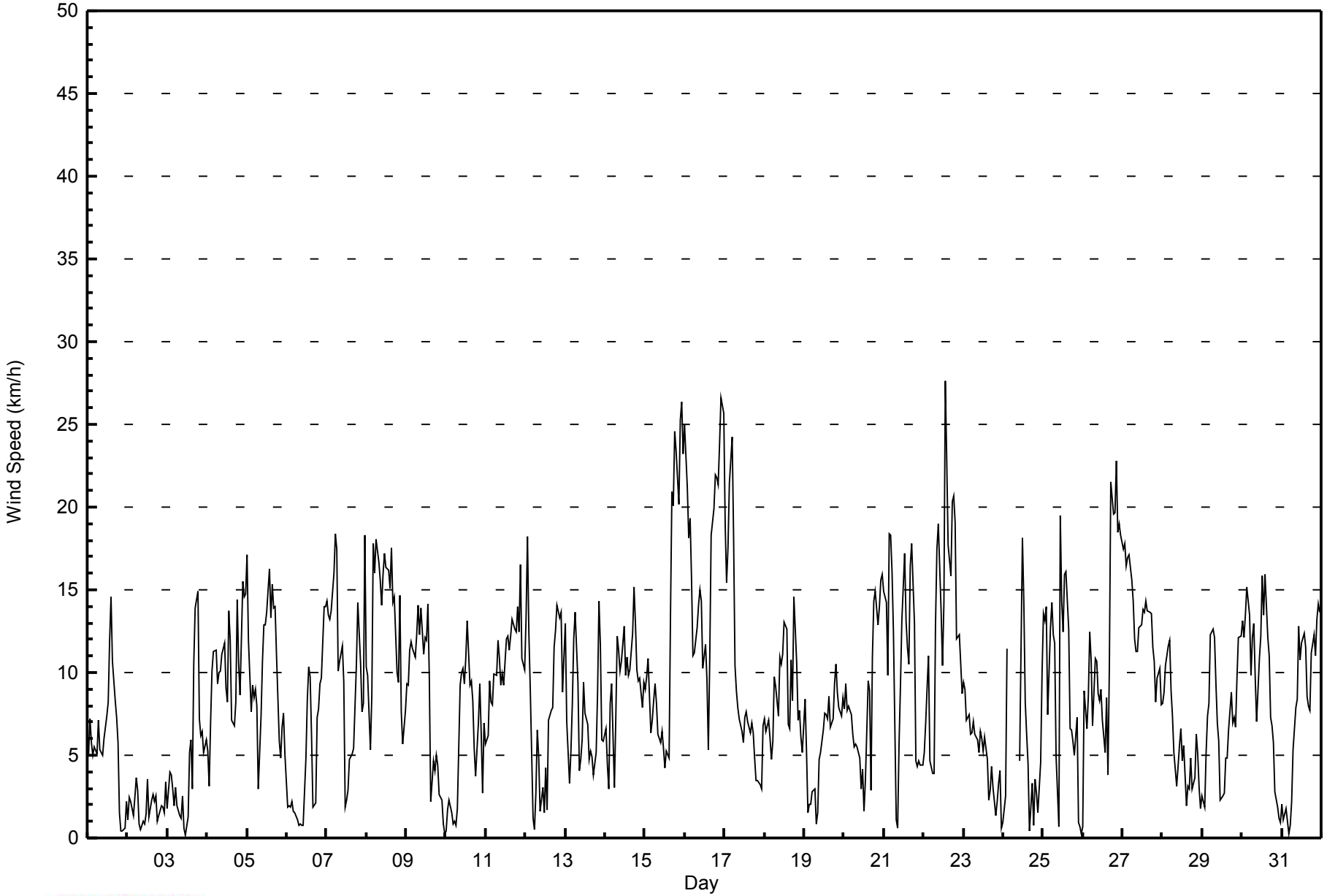
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Lower Camp - January 2015



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	222	30.12	30.12
6 - 11	294	39.89	70.01
12 - 19	194	26.32	96.34
20 - 28	27	3.66	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

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Lower Camp - January 2015

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	11	8	5	3	11	12	25	6	0	3	7	8	6	33	55	29	222
6 - 11	27	11	5	0	0	4	121	9	3	2	1	7	5	13	50	36	294
12 - 19	37	7	0	0	0	5	82	1	2	0	1	18	16	17	6	2	194
20 - 28	4	0	0	0	0	2	8	0	0	0	0	1	12	0	0	0	27
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	79	26	10	3	11	23	236	16	5	5	9	34	39	63	111	67	737

Total Number of Valid Hours: 737

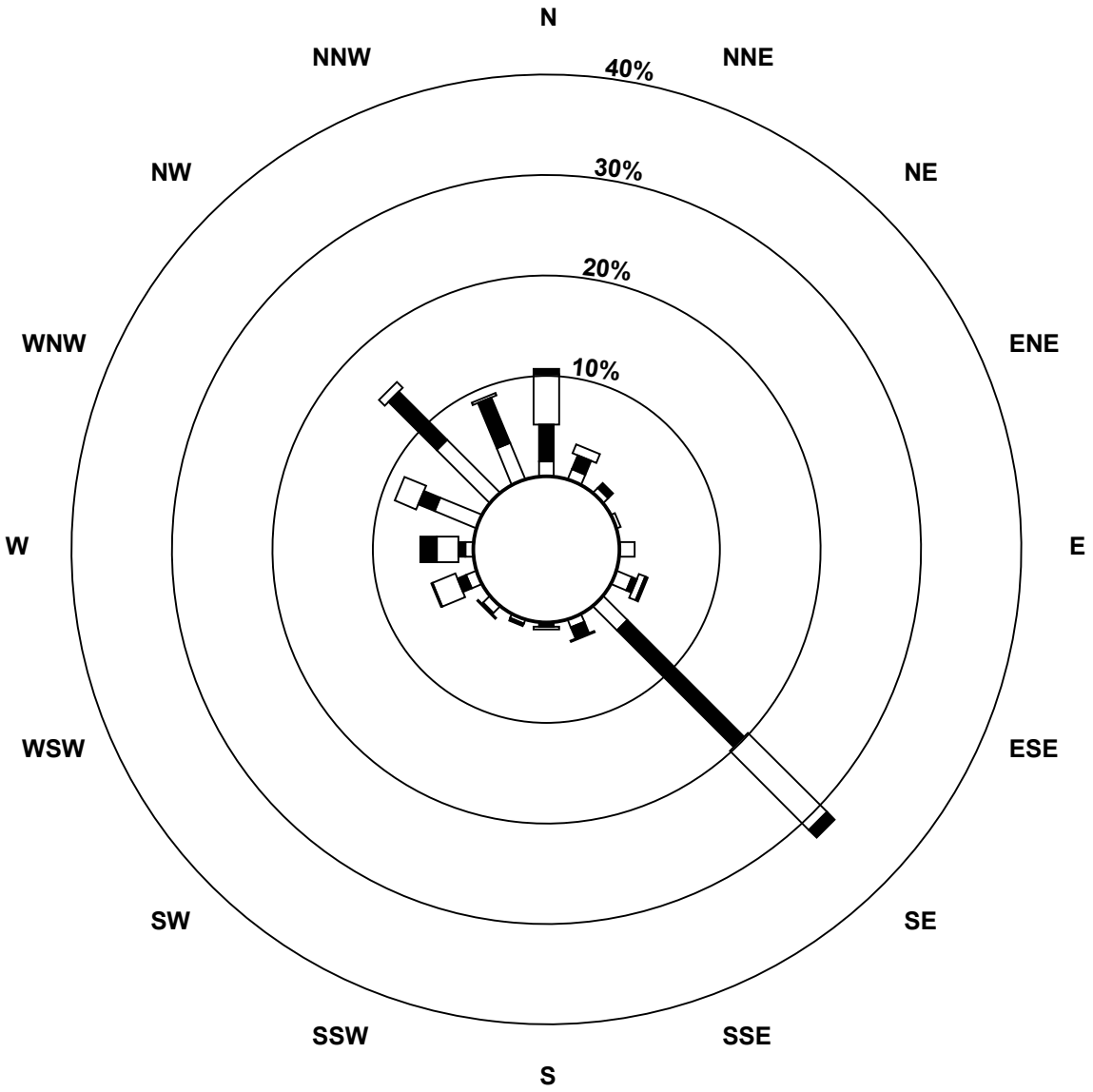
Total Number of Hours: 744

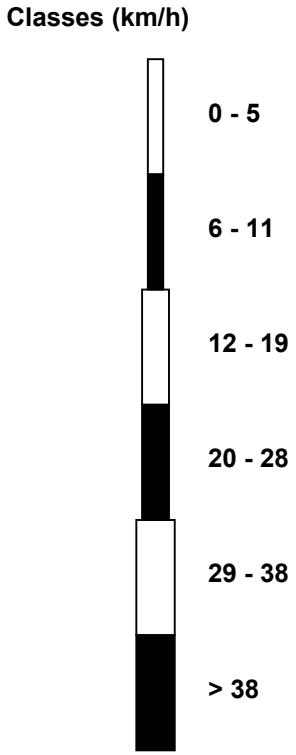
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Lower Camp (AMS 11)





Total Number of Valid Hours: 737

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Lower Camp - January 2015

Direction of Maximum Speed: 271 deg on Jan 22 14:00
Direction of Maximum Daily Speed Average: 0.9 deg on Jan 27

Direction of Minimum Speed: 67 deg on Jan 3 12:00

Direction of Minimum Daily Speed Average: 1.7 deg on Jan 2

Monthly Average Direction: 305.4 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)																								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-Jan	322	356	353	325	335	335	316	334	324	319	319	317	310	339	360	342	319	288	306	307	25	39	89	333	330.1
2-Jan	290	273	305	317	292	289	318	314	126	8	303	256	250	258	276	275	255	306	309	303	320	315	286	308	291.5
3-Jan	309	281	285	294	309	295	327	346	307	305	311	67	356	295	299	310	257	255	257	283	289	282	154	146	274.3
4-Jan	141	202	145	141	139	142	143	139	141	140	136	147	150	139	146	190	230	252	258	263	240	243	252	257	181.1
5-Jan	249	244	148	140	144	140	137	280	317	303	298	287	288	286	304	299	310	307	312	305	299	295	298	290	284.8
6-Jan	2	307	315	313	315	313	339	350	344	12	96	137	139	139	134	137	92	122	125	123	130	138	141	140	132.4
7-Jan	139	139	135	138	135	126	128	140	140	133	112	343	311	321	328	309	315	308	303	351	324	292	325	336	116.1
8-Jan	340	311	301	304	292	288	284	284	269	263	288	287	292	292	290	291	257	256	263	254	254	254	187	147	279.6
9-Jan	140	139	141	137	137	139	139	137	137	139	140	138	138	135	133	290	288	299	310	308	315	304	154	79	140.6
10-Jan	337	8	292	5	321	308	21	95	141	141	141	142	137	135	134	139	138	136	122	127	136	135	106	130	134.2
11-Jan	126	128	143	140	144	145	144	141	144	145	140	139	136	137	137	133	136	134	136	134	123	123	130	136	136.1
12-Jan	136	138	138	139	115	109	132	122	122	88	128	107	137	126	135	137	132	137	132	133	137	136	125	134	133.6
13-Jan	138	146	115	320	335	355	5	4	15	22	12	55	53	48	1	323	306	323	325	113	117	129	157	200	45.8
14-Jan	175	159	161	142	143	313	314	355	359	9	25	9	360	8	26	17	18	15	13	355	2	9	1	18	12.9
15-Jan	8	9	15	354	20	25	19	11	5	16	358	344	312	335	75	109	122	120	128	131	133	131	133	131	97.0
16-Jan	131	135	139	132	130	143	140	136	135	137	140	135	133	137	214	260	263	266	261	270	264	261	261	269	194.8
17-Jan	277	271	267	267	258	267	341	354	341	337	341	327	340	343	339	334	317	325	294	282	310	349	138	144	296.1
18-Jan	142	143	141	147	140	143	136	136	140	139	137	135	136	137	142	146	135	133	138	139	135	140	139	129	138.3
19-Jan	140	132	325	279	303	292	301	320	305	331	334	325	318	312	309	315	324	324	320	316	318	346	321	333	320.5
20-Jan	318	312	312	317	310	310	313	306	309	321	304	251	197	108	138	137	159	129	134	137	118	130	127	127	133.2
21-Jan	135	136	133	132	126	139	135	230	227	150	133	138	142	182	183	205	233	254	263	154	130	118	136	143	158.1
22-Jan	139	140	142	142	136	130	133	268	270	271	289	290	291	271	263	265	258	260	266	262	305	6	357	10	270.9
23-Jan	346	347	345	343	342	340	324	318	311	327	342	327	299	266	230	1	53	348	289	231	258	219	124	302	326.0
24-Jan	30	93	132	AF	AF	AF	AF	AF	AF	AF	252	248	254	268	314	303	330	330	41	111	2	90	140	141	--
25-Jan	136	135	134	148	140	144	148	138	138	220	266	271	254	249	253	274	285	333	339	339	35	328	102	101	203.9
26-Jan	193	139	139	136	136	126	135	141	142	145	145	141	149	254	254	298	327	2	360	358	9	10	359	3	41.6
27-Jan	357	1	2	2	7	3	2	0	8	9	8	4	7	10	9	1	357	1	359	353	349	348	347	330	0.9
28-Jan	327	330	323	311	312	320	306	310	328	307	321	296	290	248	330	326	272	294	293	36	36	52	16	70	320.1
29-Jan	1	298	136	141	132	126	130	132	128	134	136	88	339	132	355	327	338	323	325	340	318	348	353	357	55.5
30-Jan	355	3	356	5	6	2	353	5	4	330	351	351	14	11	18	12	18	348	326	313	323	321	314	326	359.6
31-Jan	318	309	335	338	32	348	98	126	138	137	133	136	137	134	135	135	139	133	136	137	134	136	137	136	134.5
	124.3	126.1	123.4	128.8	127.5	118.0	89.6	83.7	118.3	134.1	59.0	278.8	232.7	250.3	286.5	296.2	281.3	296.4	281.9	285.2	42.3	114.7	130.5	119.1	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 99 deg on Jan 26 00:00

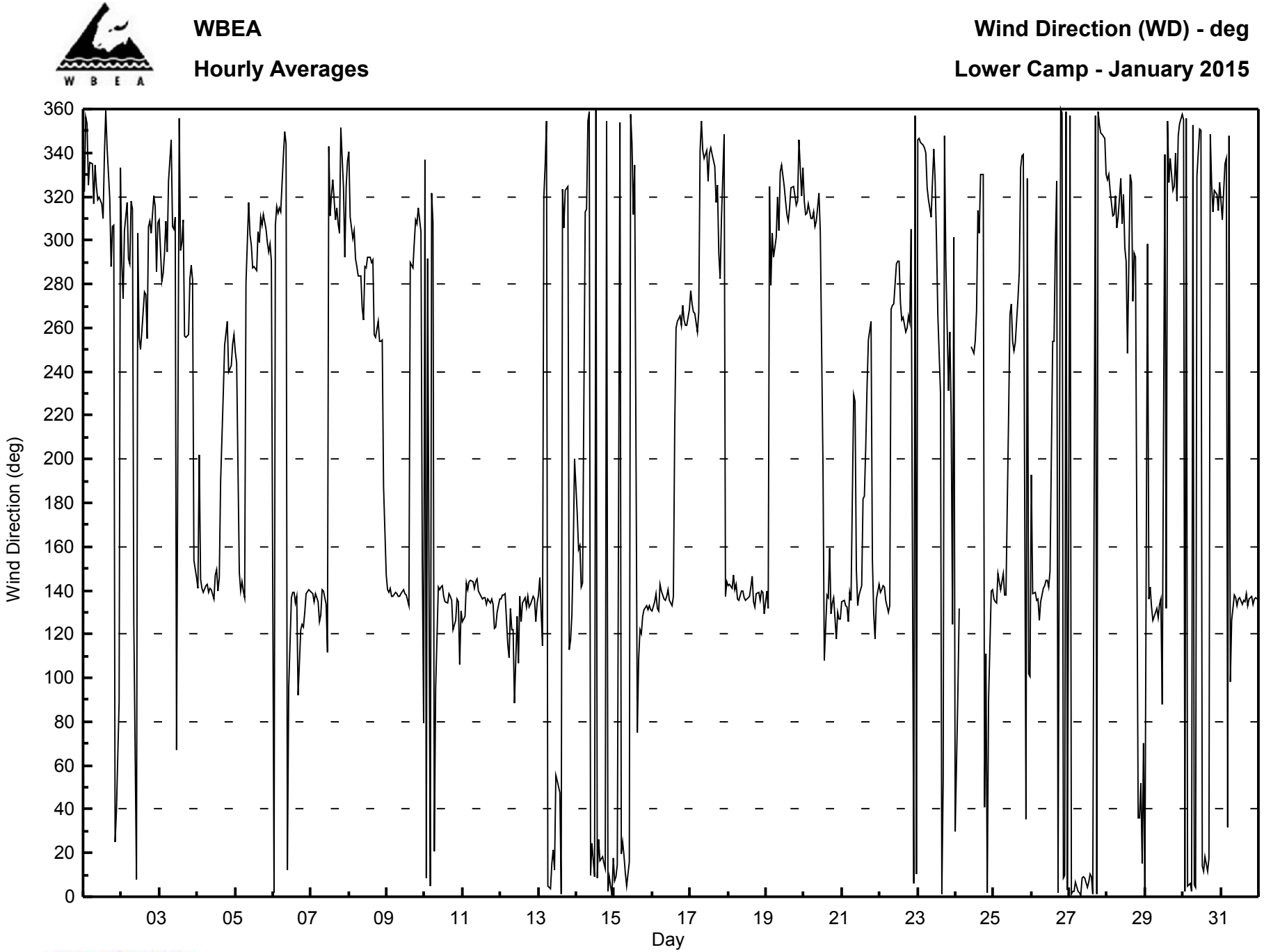
Minimum Value: 5 deg on Jan 6 15:00

Percentiles: P_1 = 7 P_{10} = 10 Q_1 = 12 Median = 17 Q_3 = 29 P_{90} = 56 P_{99} = 96

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
	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-Jan	23	15	19	17	17	26	16	17	14	21	23	16	12	17	18	18	15	13	19	46	92	79	91	35	92
2-Jan	97	56	47	72	46	32	39	61	98	68	73	79	13	52	30	43	50	50	60	56	39	44	42	35	98
3-Jan	51	17	23	31	45	34	46	56	38	42	91	89	68	14	19	61	19	12	13	38	44	54	56	19	91
4-Jan	25	67	41	11	9	14	10	12	11	10	16	31	29	12	16	53	38	62	14	28	23	14	16	18	67
5-Jan	27	31	39	11	17	10	11	75	24	19	13	10	10	10	15	10	13	9	11	23	26	11	14	31	75
6-Jan	54	67	43	41	50	50	40	65	48	26	77	13	7	5	5	11	49	42	7	12	10	12	9	9	77
7-Jan	9	11	11	9	9	8	10	9	9	12	47	65	70	32	15	12	11	20	16	21	16	20	24	23	70
8-Jan	24	14	26	45	10	9	9	9	17	10	16	11	10	10	12	9	17	12	21	20	12	49	55	16	55
9-Jan	9	10	9	7	8	13	11	8	10	10	15	10	9	7	9	83	29	27	26	29	54	46	95	98	98
10-Jan	94	83	52	37	83	65	92	49	13	10	12	12	9	9	10	19	20	30	19	16	11	15	31	16	94
11-Jan	15	21	13	17	15	14	13	11	12	14	11	12	8	6	8	6	7	6	7	7	12	11	21	9	21
12-Jan	6	7	10	11	77	64	44	13	18	67	25	43	14	38	11	9	9	10	9	8	8	9	18	10	77
13-Jan	8	19	64	20	14	19	12	11	26	21	21	17	20	18	29	22	18	40	23	58	13	24	37	41	64
14-Jan	31	77	45	16	18	88	26	21	16	16	16	15	16	21	14	12	17	16	16	18	16	11	16	19	88
15-Jan	16	15	12	26	26	16	19	13	16	15	11	20	38	27	69	12	11	10	10	13	16	12	12	13	69
16-Jan	12	16	16	14	15	24	16	12	11	11	9	21	11	9	52	43	12	12	11	11	11	11	11	12	52
17-Jan	11	11	10	12	10	19	20	15	17	18	19	21	17	17	18	15	13	17	10	22	42	19	77	16	77
18-Jan	17	19	16	17	25	21	14	13	18	15	12	8	9	8	23	24	15	15	8	11	23	16	19	14	25
19-Jan	14	12	71	20	52	24	38	33	21	15	16	16	18	10	12	8	16	12	9	10	12	16	13	16	71
20-Jan	16	9	10	10	10	11	13	13	11	15	35	11	77	23	8	54	75	13	11	13	15	12	11	11	77
21-Jan	10	9	20	10	9	9	10	81	99	33	17	9	10	28	26	26	17	14	29	51	54	44	48	38	99
22-Jan	19	15	11	10	52	42	29	46	12	10	14	15	15	11	11	14	13	11	11	10	45	16	15	24	52
23-Jan	17	16	16	16	17	23	28	23	23	29	23	22	20	19	24	66	39	17	31	78	64	59	56	92	92
24-Jan	73	62	12	AF	AF	AF	AF	AF	AF	AF	80	10	11	21	27	40	96	39	81	43	56	89	23	11	96
25-Jan	9	14	12	24	14	17	20	16	69	96	12	14	12	9	11	10	28	27	20	23	23	75	73	99	99
26-Jan	92	18	12	10	9	16	16	10	10	15	18	22	19	73	14	31	36	15	17	15	17	19	18	18	92
27-Jan	17	16	14	17	14	16	14	18	14	17	16	12	12	16	16	16	15	15	19	20	19	22	21	17	22
28-Jan	19	17	17	9	11	10	19	24	29	24	27	15	24	33	51	26	35	16	42	56	21	22	34	44	56
29-Jan	43	39	46	18	23	12	12	10	13	16	24	67	59	54	25	22	20	13	14	19	14	21	17	17	67
30-Jan	16	17	18	17	16	20	20	18	16	25	19	19	20	20	12	18	23	18	19	15	43	47	44	65	65
31-Jan	46	64	36	74	88	69	35	29	14	11	10	10	10	8	8	10	13	30	11	12	13	10	9	12	88
	97	83	71	74	88	88	92	81	99	96	91	89	77	73	69	83	96	62	81	78	92	89	95	99	
	Diurnal Maximum																								

AF - Analyzer Failure


WBEA
Hourly Averages
Wind Direction (WD) - deg
Lower Camp - January 2015
Wind Direction (deg)
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 26, 2015	Previous Calibration	December 16, 2014
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Install		
Start Time (MST)	10:45	End Time (MST)	12:30
Barometric Pressure	760 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Cal Gas Concentration	51.3 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL107920		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5v	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-626	NA
Analyzer Range (mv)	1000	1000	Lamp voltage	861	NA
Calculated slope	1.001166	NA	Chamber temp.	43.6	NA
Calculated intercept	0.458380	NA	Pressure (mmHg)	722.9	NA
Analyzer Background	28.0	NA	Flow (lpm)	0.484	NA
Analyzer Coefficient	1.009	NA	Intensity	35xxx	NA

Analyzer make	TEI 43C	Analyzer serial #	613516794

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	5000	80.9	830.0	830.0	1.000
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	80.9	830.0	830.0	1.000
second point	5000	40.9	419.6	417.9	1.004
third point	5002	20.4	209.2	208.0	1.006
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.003

Corrected As found	830.0	Previous response	828.6	% change	-0.2%

Notes:

Removal Calibration. Replacing with 43I.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

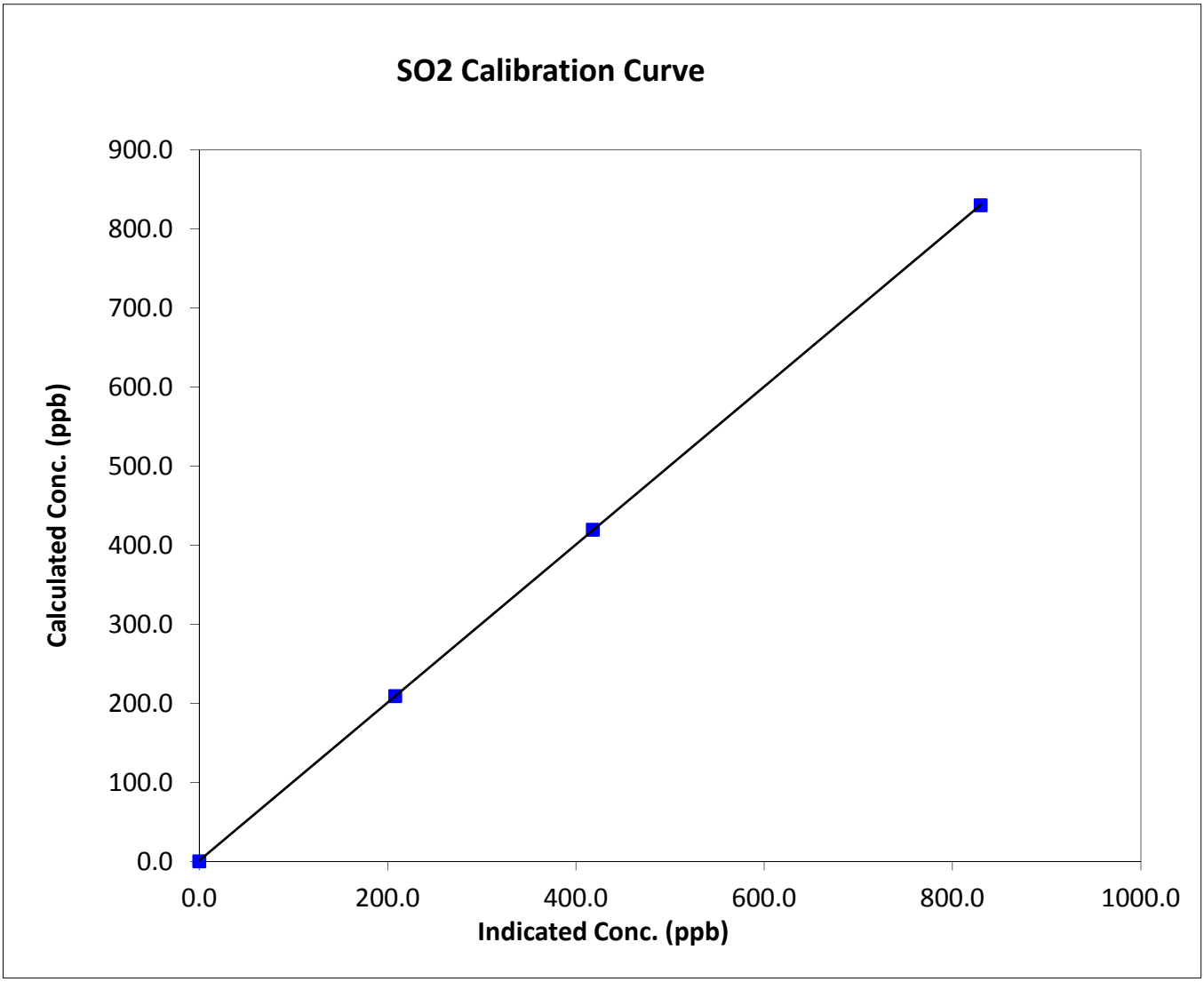
SO_2 Calibration Summary

Station Information

Calibration Date	January 26, 2015	Previous Calibration	December 16, 2014
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	10:45	End Time (MST)	12:30
Analyzer make	TEI 43C	Analyzer serial #	613516794

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999994
830.0	830.0	1.0000		
419.6	417.9	1.0042	Slope	0.999741
209.2	208.0	1.0058		
			Intercept	0.831293



SO2 Calibration Plot Date: January 26, 2015

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 26, 2015	Previous Calibration	NA
Station Name	Lower Camp	Station Number	AMS 11

Reason: Install

Start Time (MST)	12:50	End Time (MST)	15:20
Barometric Pressure	760 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Cal Gas Concentration	51.3 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL107920		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	3492
DACS voltage range	0-5v	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	NA	-675
Analyzer Range (mv)	1000	1000	Lamp voltage	NA	805
Calculated slope	NA	0.999939	Chamber temp.	NA	44.9
Calculated intercept	NA	1.889049	Pressure (mmHg)	NA	715.6
Analyzer Background	NA	11.5	Flow (lpm)	NA	0.502
Analyzer Coefficient	NA	1.006	Intensity	NA	91

Analyzer make	TEI 43I	Analyzer serial #	100841398

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.0	0.2	NA
high point	5000	80.9	830.0	829.8	1.000
second point	5000	40.9	419.6	415.1	1.011
third point	5002	20.4	209.2	206.4	1.014
calibrator zero					
as left zero	5000	0.0	0.0	-0.6	NA
as left span	5000	80.9	830.0	824.5	1.007
				Average Correction Factor	1.008

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Installation Calibration.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

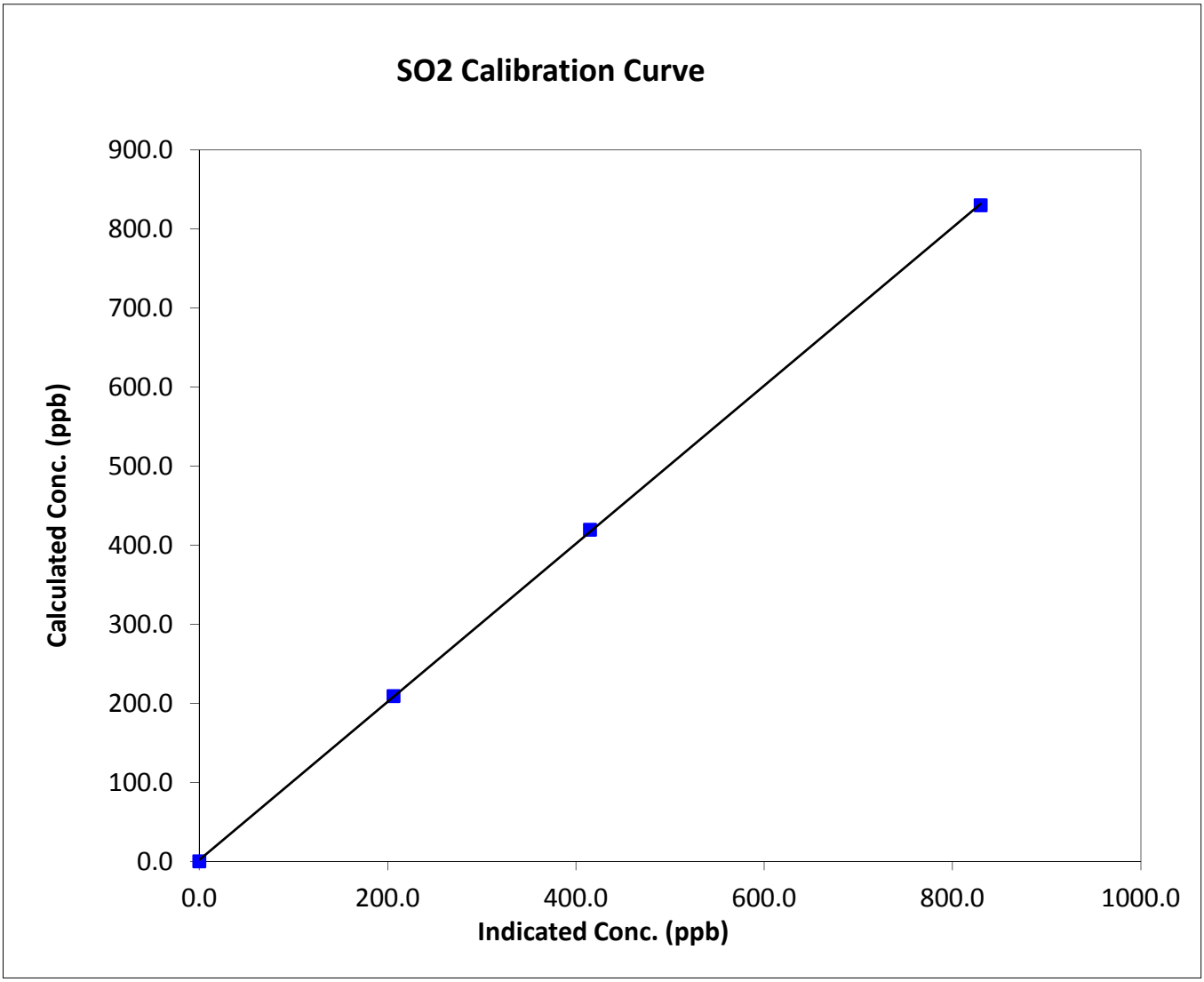
SO_2 Calibration Summary

Station Information

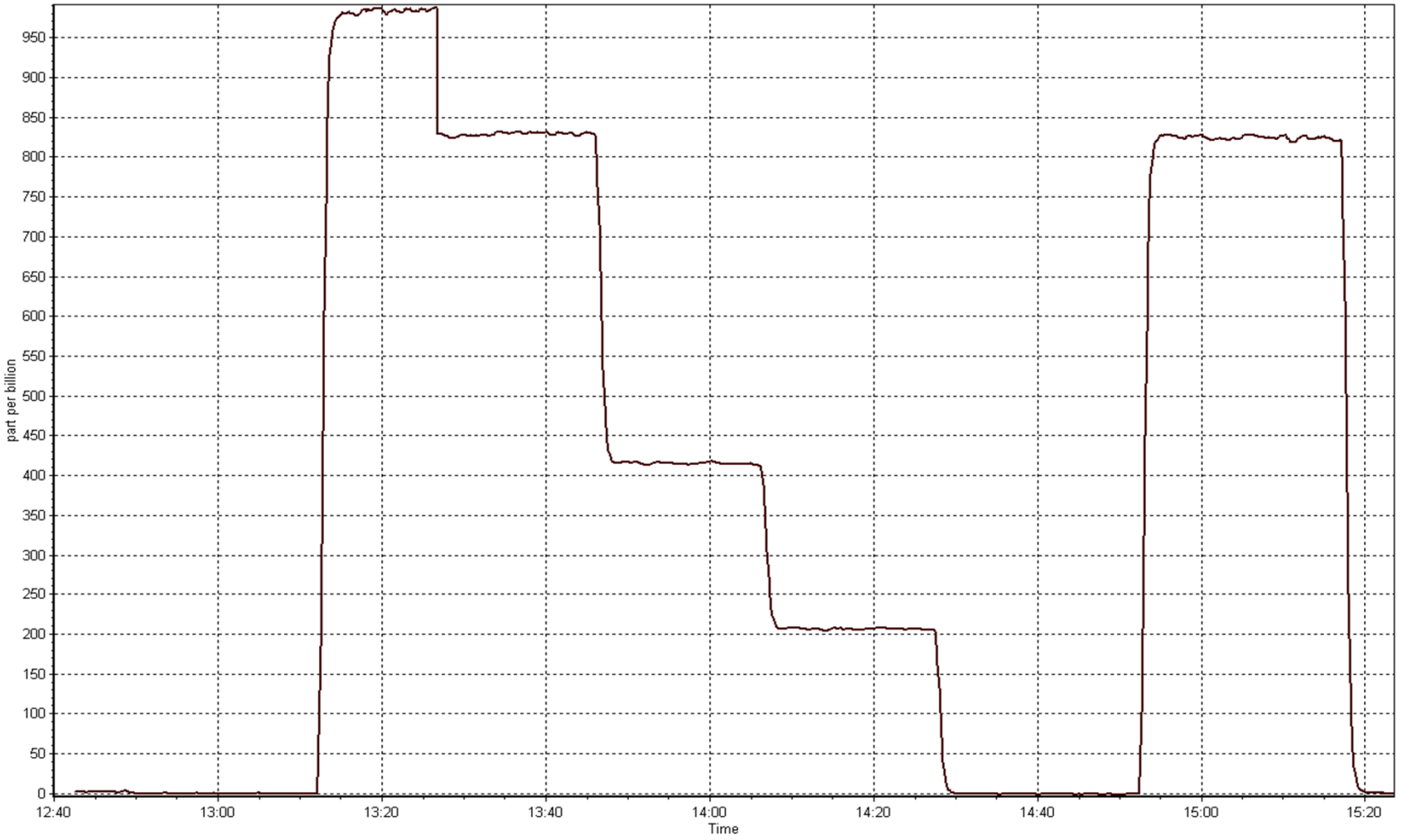
Calibration Date	January 26, 2015	Previous Calibration	NA
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	12:50	End Time (MST)	15:20
Analyzer make	TEI 43I	Analyzer serial #	100841398

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999960
830.0	829.8	1.0003		
419.6	415.1	1.0110	Slope	0.999939
209.2	206.4	1.0138		
			Intercept	1.889049



SO2 Calibration Plot Date: January 26, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 19, 2015	Previous Calibration	December 12, 2014
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	11:30	End Time (MST)	15:25
Barometric Pressure	760 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11051107
Cal Gas Concentration	5.15 ppm H2S	Cal Gas Expiry Date	09/09/2017
Gas Cert Reference	LL20284	SO2 gas conc.	51.3 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5v	DACS channel #	SE2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage (v)	-680	-680
Analyzer Range (mv)	100	100	Lamp voltage (v)	980	984
Calculated slope	0.988264	0.996260	Chamber temp. (deg C)	45	45
Calculated intercept	0.283917	0.271671	Pressure (mmHg)	477.3	477.0
Analyzer Background	1.9	1.97	Flow(LPM)	0.330	0.318
Analyzer Coefficient	0.921	0.938	Intensity(%)	89	92
			Converter temp.(deg C)	370	370

Analyzer make/model	Thermo 43i	Analyzer serial #	1008841400
Converter make/model	TEI 340	Converter serial #	328702539

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.1	NA
as found span	5000	72.9	75.1	75.0	1.002
SO2 scrubber check	5000	20.5	210.3	1.8	NA
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5001	72.9	75.1	75.2	0.999
second point	5002	38.8	39.9	39.7	1.006
third point	5002	19.4	20.0	19.7	1.016
calibrator zero	5000	0.0	0.0	-0.1	NA
as left zero	5000	0.0	0.0	-0.1	NA
as left span	4999	72.9	75.1	75.4	0.996
				Average Correction Factor	1.007

Corrected As found	75.1	Previous response	75.7	% change	0.8%

Notes:

Filter was changed after as founds. Scrubber check was completed after as founds. Adjusted the span slightly.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

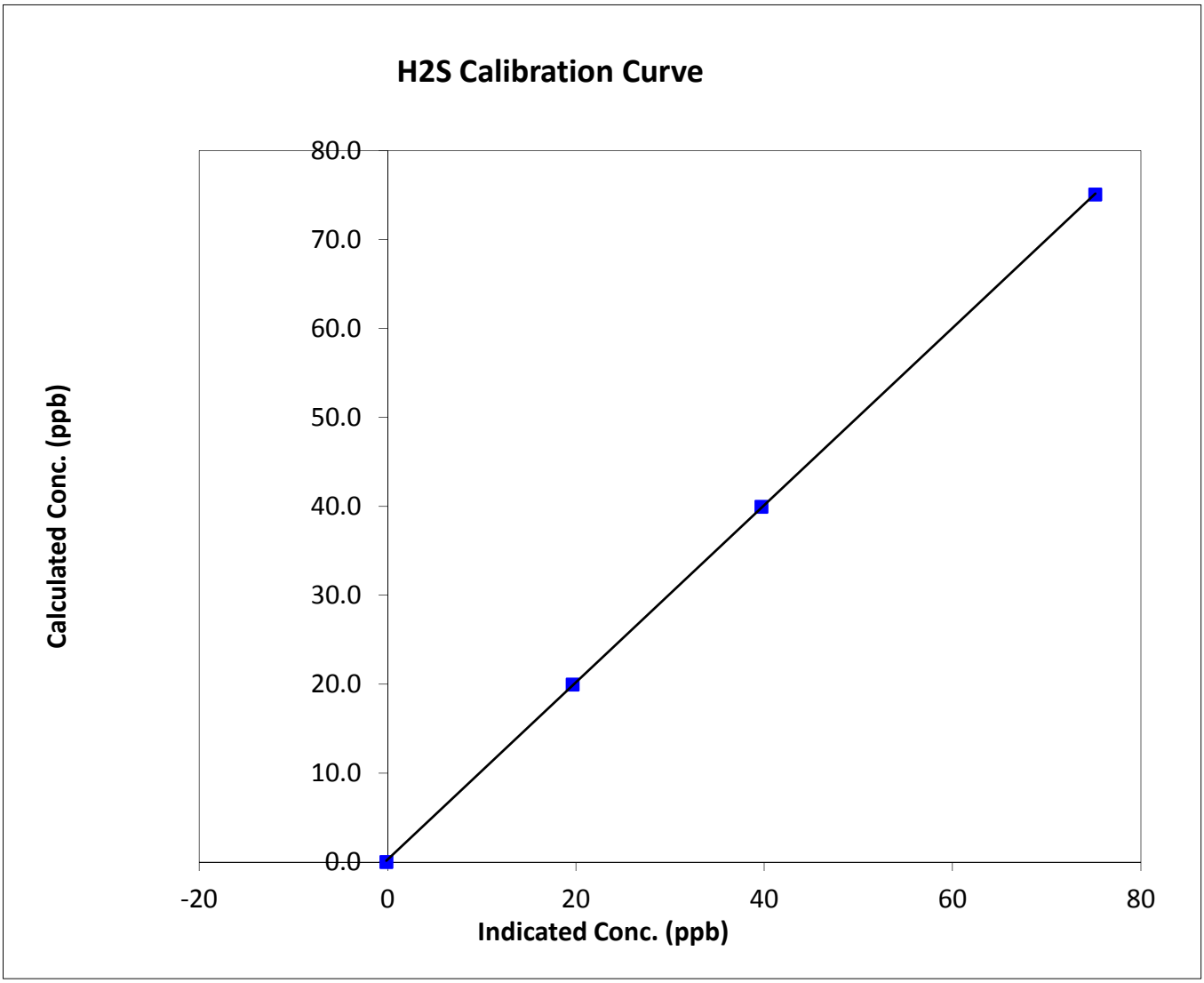
H2S Calibration Summary

Station Information

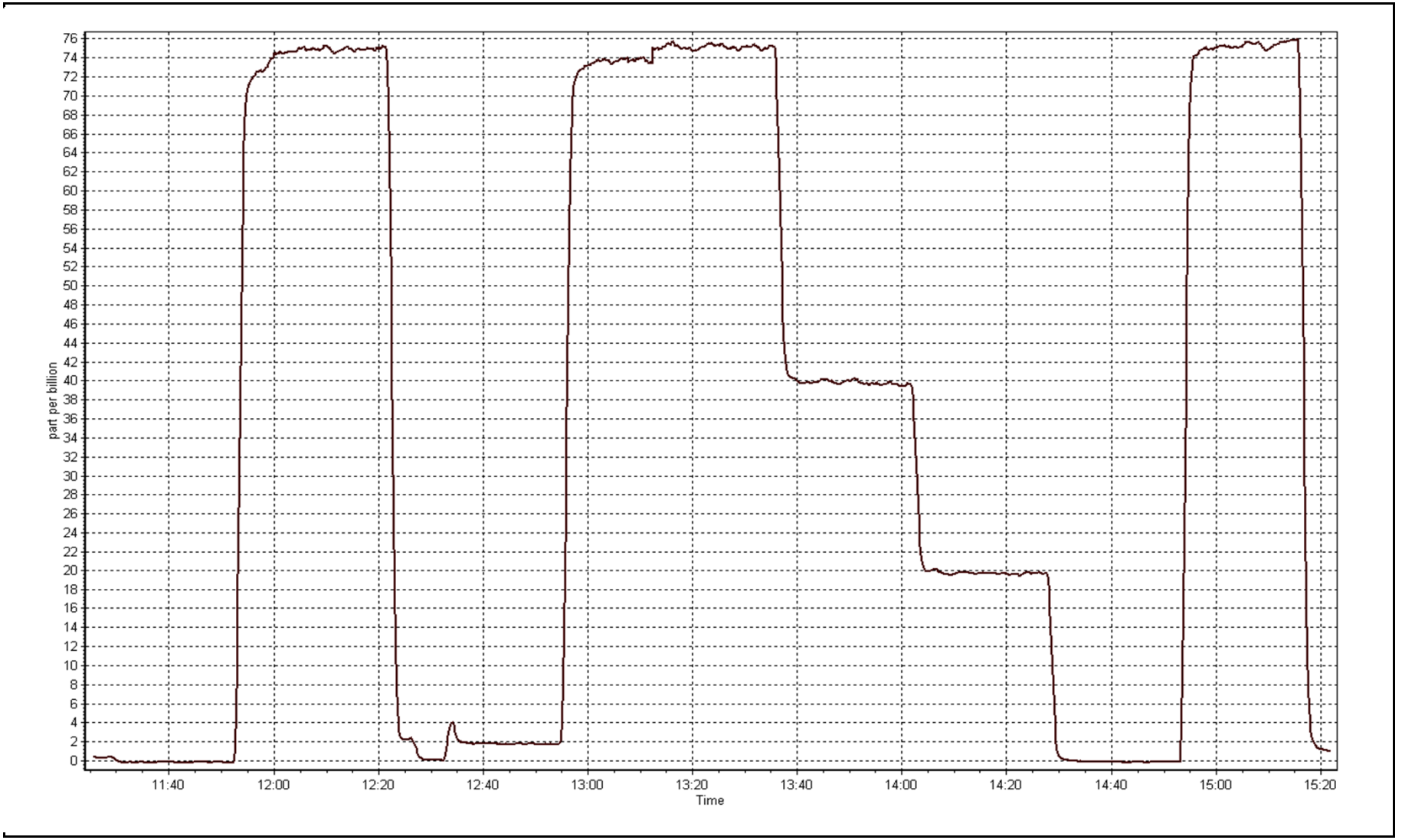
Calibration Date	January 19, 2015	Previous Calibration	December 12, 2014
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	11:30	End Time (MST)	15:25
Analyzer make	Thermo 43i	Analyzer serial #	1008841400

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999982
75.1	75.2	0.9987		
39.9	39.7	1.0057	Slope	0.996260
20.0	19.7	1.0165		
			Intercept	0.271671



H2S Calibration Plot Date: January-19-15



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-11-15	Previous Calibration	NA
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Install		
Start Time (MST)	9:55	End Time (MST)	11:40
Barometric Pressure	760 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Gas Cert Reference	CC 302056	Cal Gas Expiry Date	
CH4 Cal Gas Conc.	510 ppm	CH4 Equiv Conc.	1073.8 ppm
C3H8 Cal Gas Conc.	205 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5v	DACS channel #	SE3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	NA	8.5
Analyzer Range (mv)	25	25	Air or Bypass press	NA	37.3
Calculated slope	NA	1.002207	Fuel Pressure	NA	24.0
Calculated intercept	NA	0.026302			

Analyzer make	51i-LT	Analyzer serial #	1410661326

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	-0.02	N/A
high point	5001	80.9	17.37	17.31	1.003
second point	5000	40.9	8.78	8.73	1.006
third point	5002	20.4	4.38	4.34	1.009
calibrator zero	5000	0.0	0.00	0.01	N/A
as left zero	5000	0.0	0.00	0.01	N/A
as left span	5000	80.9	17.37	17.25	1.007
				Average Correction Factor	1.006

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Replaced analyzer.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

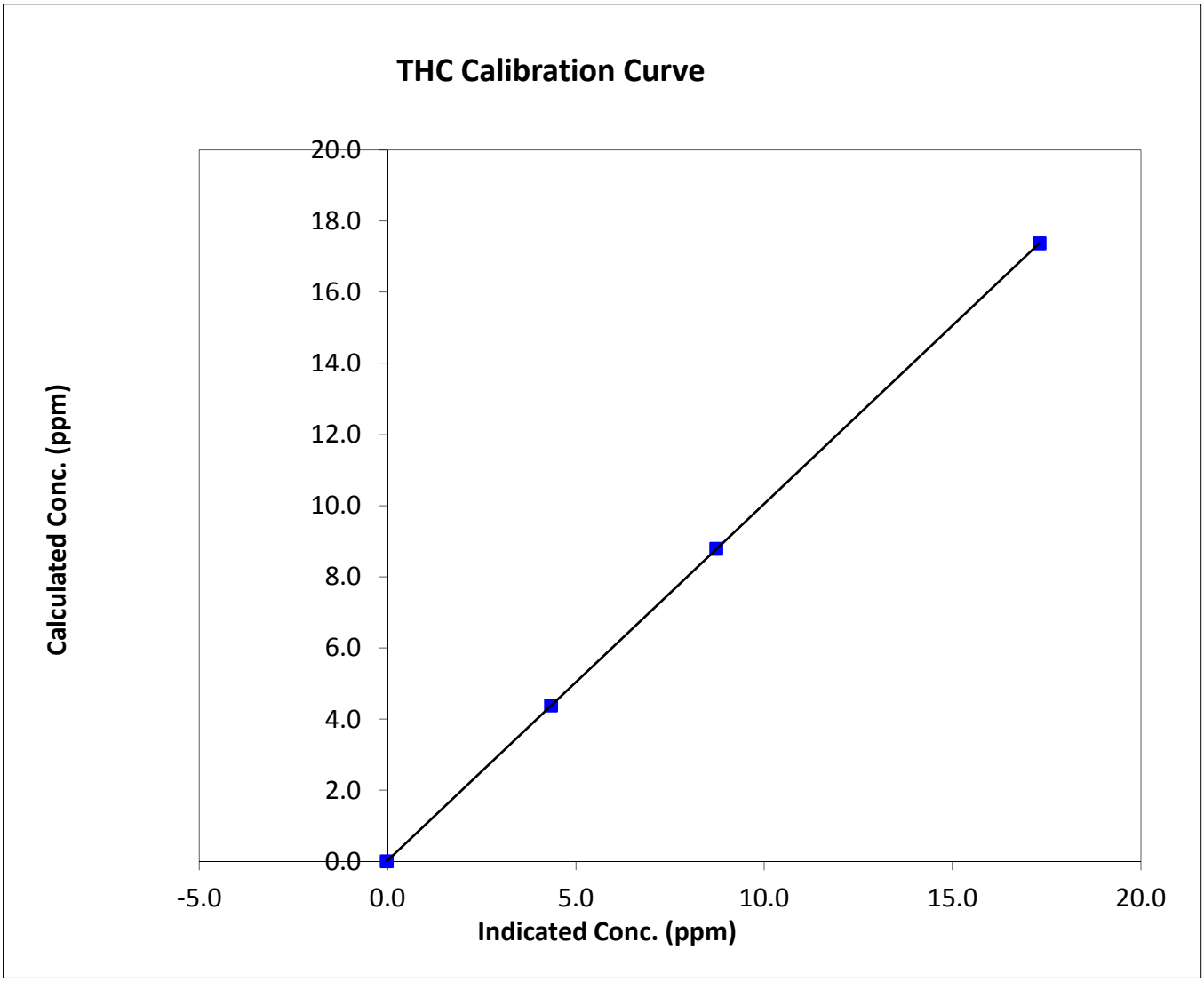
THC Calibration Summary

Station Information

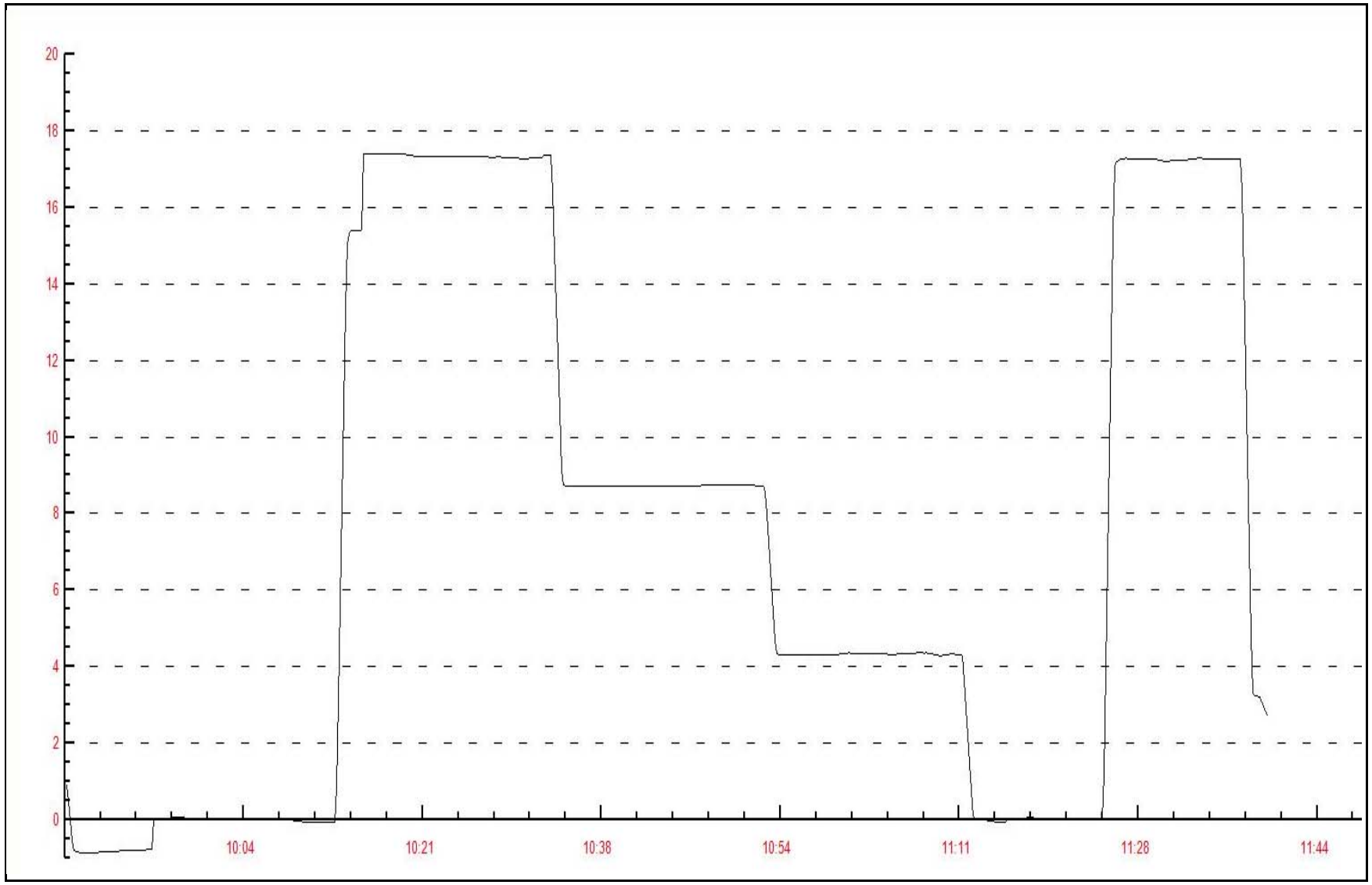
Calibration Date	January 11, 2015	Previous Calibration	NA
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	9:55	End Time (MST)	11:40
Analyzer make	51i-LT	Analyzer serial #	1410661326

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.02	N/A	Correlation Coefficient	0.999999
17.37	17.31	1.0035		
8.78	8.73	1.0061	Slope	1.002207
4.38	4.34	1.0090		
			Intercept	0.026302



THC Calibration Plot Date: January 11, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 12
MILLENNIUM MINE
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILLENNIUM MINE (AMS 12)
JANUARY 2015

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	36	37	99.87	20	0	4	0
TRS(ppb) Average	709	35	35	100.00	2	0	1	0
THC(ppm) Average	707	37	37	100.00	6.8	-	3.1	-
NO2(ppb) Average	707	37	37	100.00	49	0	30	-
NO(ppb) Average	707	37	37	100.00	189	-	49	-
NOX(ppb) Average	707	37	37	100.00	223	-	78	-
PM2.5(ug/m3) Average	737	0	7	99.06	38.4	-	20.1	0
Temperature 2 m (C) Average	744	0	0	100.00	7.2	-	3.7	-
Relative Humidity (%) Average	741	0	3	99.60	100	-	-	-
Wind Speed 10 m (km/h) Average	728	0	16	97.85	23	-	-	-
Wind Direction 10 m (deg) Average	728	0	16	97.85	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILLENNIUM MINE (AMS 12)
JANUARY 2015

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	0.7	1	-	0	0	0	0	1	1	20
TRS(ppb) Average	709	0.4	0	-	0	0	0	0	0	1	2
THC(ppm) Average	707	2.48	0.5	-	2	2.1	2.2	2.3	2.6	3.1	6.8
NO2(ppb) Average	707	17.2	11	-	0	3	8	16	26	32	49
NO(ppb) Average	707	14.6	27	-	0	0	0	3	17	42	189
NOX(ppb) Average	707	31.8	35	-	0	4	8	20	43	73	223
PM2.5(ug/m3) Average	737	6.49	4.9	-	0.1	2.3	3.6	5.2	8.2	12.2	38.4
Temperature 2 m (C) Average	744	-14.26	9.6	-	-31.7	-26.2	-21.6	-16	-7.7	0.8	7.2
Relative Humidity (%) Average	741	81.9	8	-	58	73	77	80	87	93	100
Wind Speed 10 m (km/h) Average	728	7.4	4	-	1	3	4	6	9	14	23
Wind Direction 10 m (deg) Average	728	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MILLENNIUM MINE (AMS 12)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	29 Jan 2015 09:00	29 Jan 2015 09:00	1	Maintenance - manifold cleaning
PM2.5	16 Jan 2015 20:00	17 Jan 2015 01:00	6	Unstable operation - excessive baseline drift and noise
PM2.5	21 Jan 2015 11:00	21 Jan 2015 11:00	1	Maintenance - Flow and zero check, sample head cleaning
Relative Humidity	24 Jan 2015 09:00	24 Jan 2015 11:00	3	Unstable operation - exceed upper range
Wind Speed, Wind Direction	01 Jan 2015 22:00	01 Jan 2015 22:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	10 Jan 2015 00:00	10 Jan 2015 00:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	10 Jan 2015 06:00	10 Jan 2015 06:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	10 Jan 2015 22:00	10 Jan 2015 22:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	23 Jan 2015 10:00	23 Jan 2015 10:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	23 Jan 2015 20:00	23 Jan 2015 22:00	3	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 03:00	24 Jan 2015 10:00	8	Flat line in sensor output signal -sensor frozen

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 20 ppb on Jan 8 06:00 Maximum Daily Average: 3.6 ppb on Jan 8

Minimum Value: 0 ppb on Jan 14 19:00 Minimum Daily Average: 0.1 ppb on Jan 15
Maximum Diurnal Average: 1.2 ppb at hour 6 Minimum Diurnal Average: 0.4 ppb at hour 1
Monthly Average: 0.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 6$

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)																								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-Jan	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
2-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	1	1	1	1	0.5	1
3-Jan	1	1	0	Z	0	1	1	2	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0.8	2
4-Jan	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
5-Jan	0	0	0	0	0	Z	0	0	0	2	3	6	7	5	5	1	0	0	0	0	0	0	0	0	1.4	7
6-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0.5	1
7-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	1	0	1	2	3	4	1	0	0	1	1	0.7	4
8-Jan	0	0	Z	8	13	20	16	6	2	1	3	8	1	1	1	0	0	0	0	0	0	0	0	0	3.6	20
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	2	1	1	1	1	0.6	3
10-Jan	1	0	0	0	Z	1	1	1	1	0	2	5	4	2	1	1	1	1	1	1	1	1	1	1	1.1	5
11-Jan	1	1	1	0	1	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	Z	1	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	3
13-Jan	1	Z	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
14-Jan	0	0	Z	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	5
15-Jan	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
16-Jan	0	0	0	0	Z	0	0	0	C	C	C	C	C	0	1	0	0	0	0	0	0	0	0	0	0.2	1
17-Jan	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	2	2	0	1	1	1	1	1	0	1	0.6	2
18-Jan	Z	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
19-Jan	0	Z	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	2	4	3	3	2	2	1	1	1.1	4
21-Jan	1	1	1	Z	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
22-Jan	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.3	1
23-Jan	0	0	0	0	0	Z	1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1	1	1	0.9	3
24-Jan	Z	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0.4	2
26-Jan	1	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.3	1
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	3	4	3	1	1	0	0	0	0	0	0	0.7	4
29-Jan	0	0	0	0	0	Z	0	1	M	1	1	0	0	0	0	0	0	0	0	0	0	0	2	4	0.7	4
30-Jan	Z	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
31-Jan	0	Z	0	0	0	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0.5	1
	0.4	0.4	0.4	0.7	1.0	1.2	1.1	0.7	0.5	0.5	0.6	1.0	0.7	0.8	0.8	0.6	0.6	0.7	0.7	0.5	0.5	0.4	0.5	0.5	Diurnal Average	
	1	1	3	8	13	20	16	6	2	2	3	8	7	5	5	3	2	4	4	3	2	2	2	4	Diurnal Maximum	

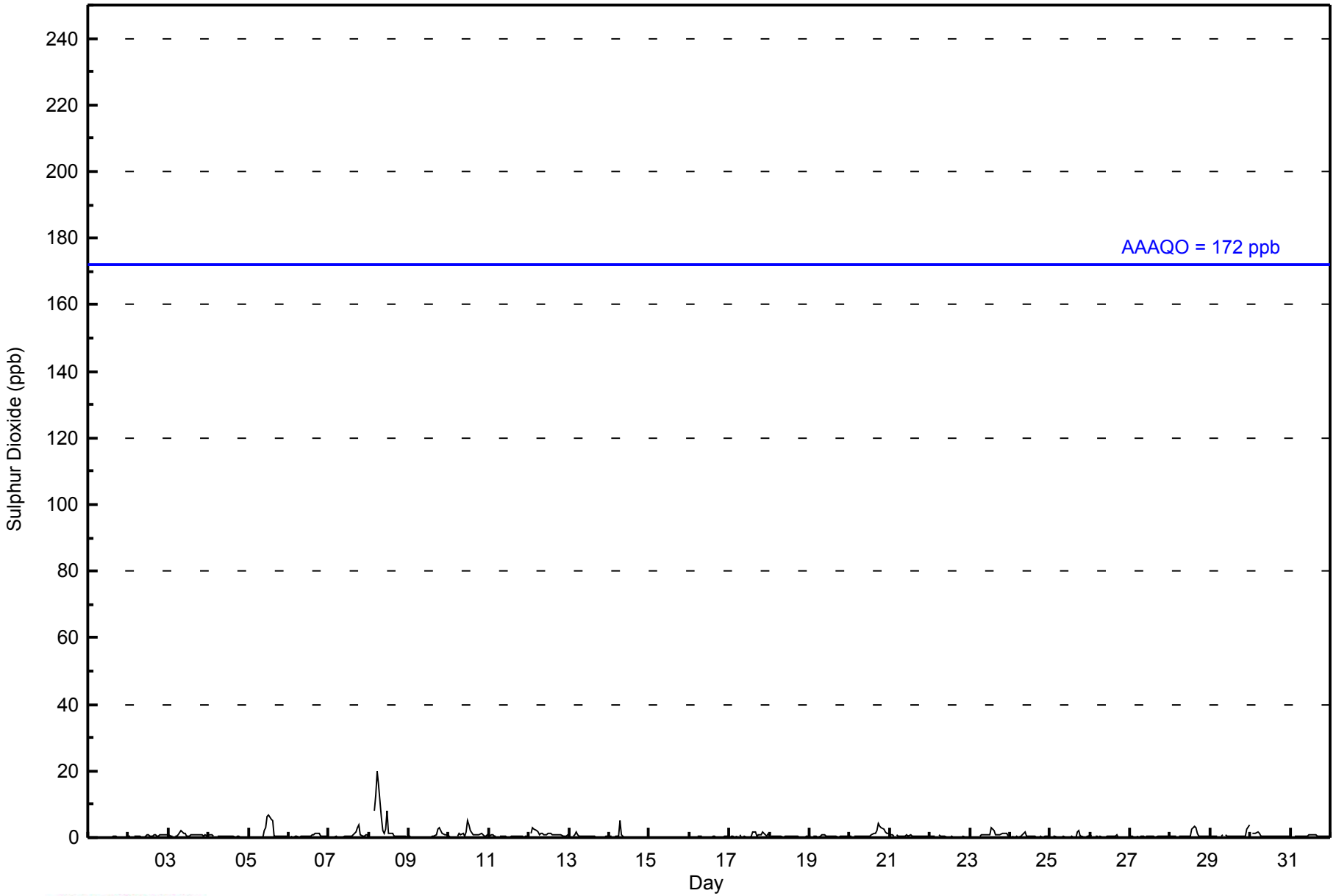
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2015



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	704	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: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	119	48	13	4	4	8	99	95	59	47	23	23	32	28	43	43	688
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	48	13	4	4	8	99	95	59	47	23	23	32	30	44	43	691

Total Number of Valid Hours: 691

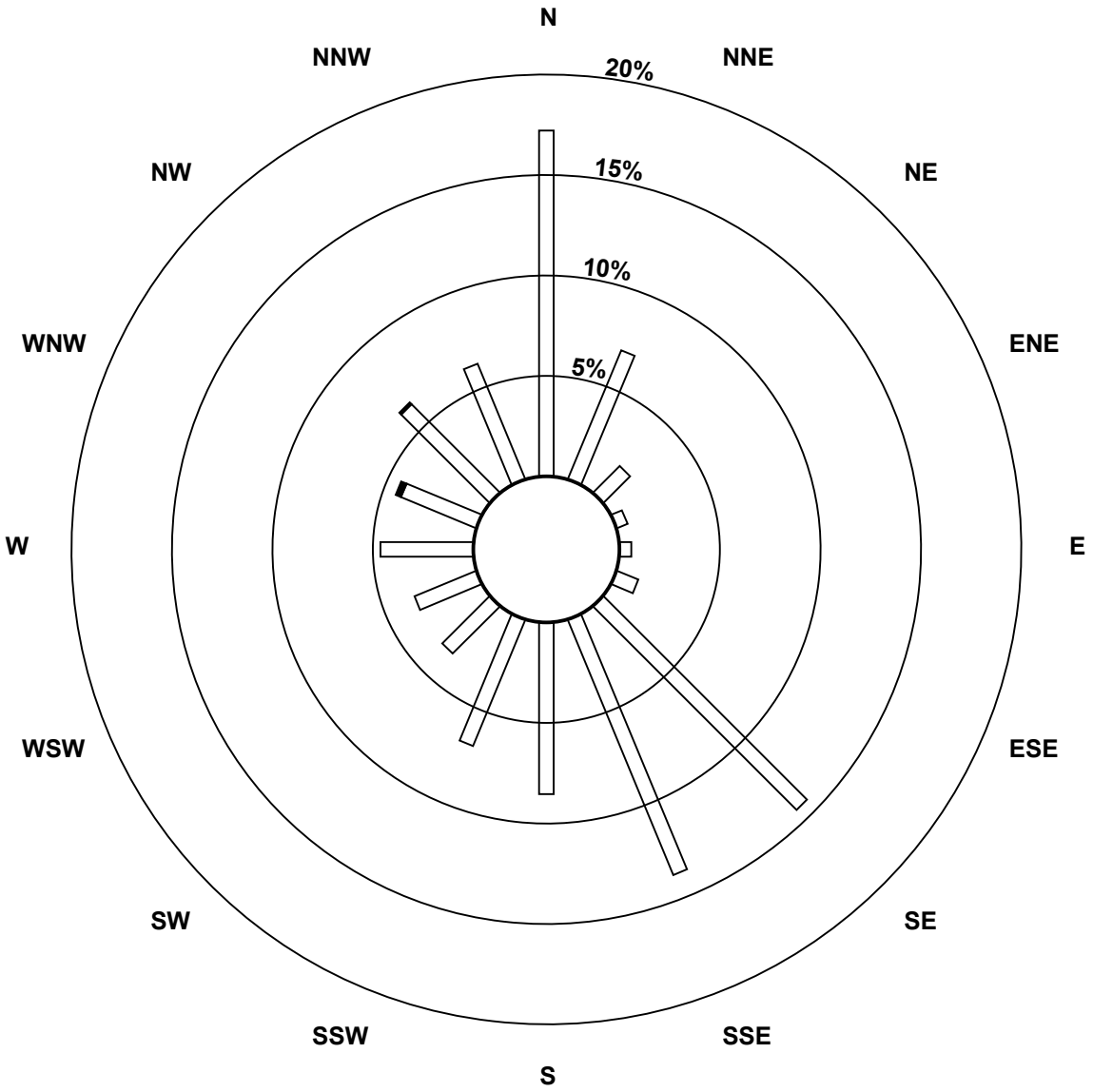
Total Number of Hours: 744

Wood Buffalo Environmental Association

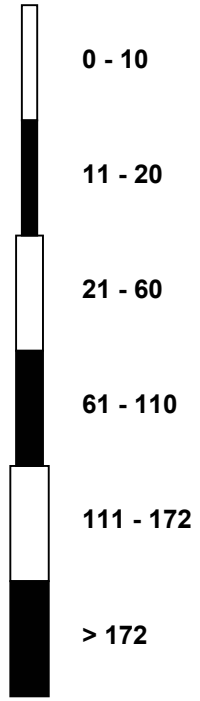
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Millennium (AMS 12)



Classes (ppb)



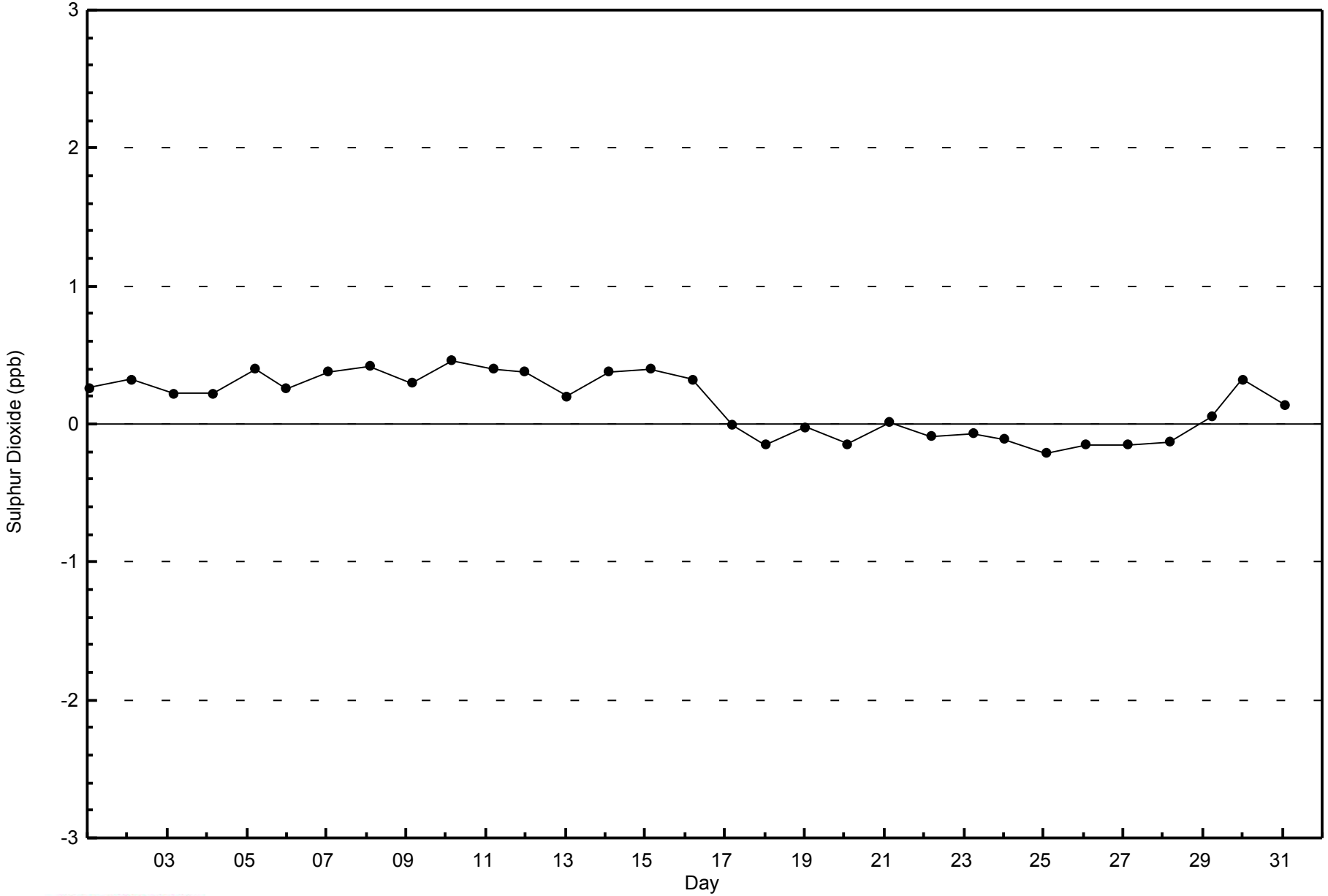
Total Number of Valid Hours: 691

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2015



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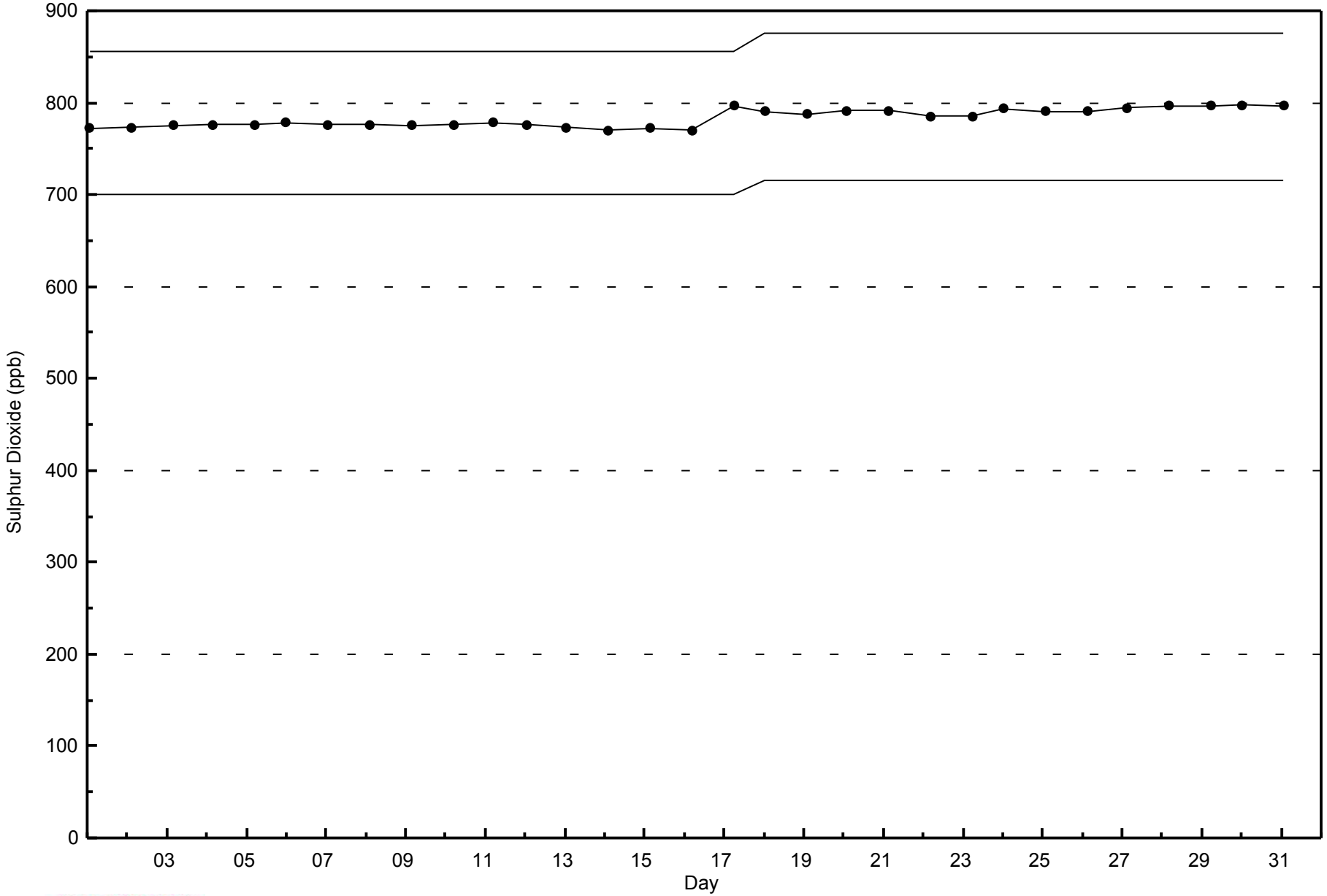
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2 ppb on Jan 24 10:00 Maximum Daily Average: 0.8 ppb on Jan 23

Minimum Value: 0 ppb on Jan 18 22:00 Minimum Daily Average: 0.1 ppb on Jan 27
Maximum Diurnal Average: 0.4 ppb at hour 7 Minimum Diurnal Average: 0.3 ppb at hour 2
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

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)																								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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.3	1
2-Jan	1	0	0	Z	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	1	1	1	0	1	0.5	1
3-Jan	1	0	0	0	Z	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Jan	0	0	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
5-Jan	0	0	0	0	1	1	Z	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
6-Jan	0	Z	0	0	0	0	0	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	1	0	0.6	1
7-Jan	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0.4	1
8-Jan	0	0	0	Z	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
9-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	1	1	1	1	0.6	2
10-Jan	1	0	0	0	0	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0.6	1
11-Jan	1	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	1	Z	0	0	0	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
13-Jan	0	0	Z	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Jan	0	0	0	Z	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Jan	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
19-Jan	0	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.2	1
21-Jan	0	0	0	1	Z	1	1	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
23-Jan	0	0	0	0	0	0	Z	0	0	1	1	1	1	2	2	1	1	1	1	1	1	2	1	1	0.8	2
24-Jan	1	Z	0	0	0	0	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
25-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.2	1
26-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.2	1
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Jan	0	0	0	0	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.4	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
31-Jan	0	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
	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	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	Diurnal Average	
	1	1	1	1	1	1	1	1	2	2	1	1	1	2	2	1	1	1	2	2	1	2	1	1	Diurnal Maximum	

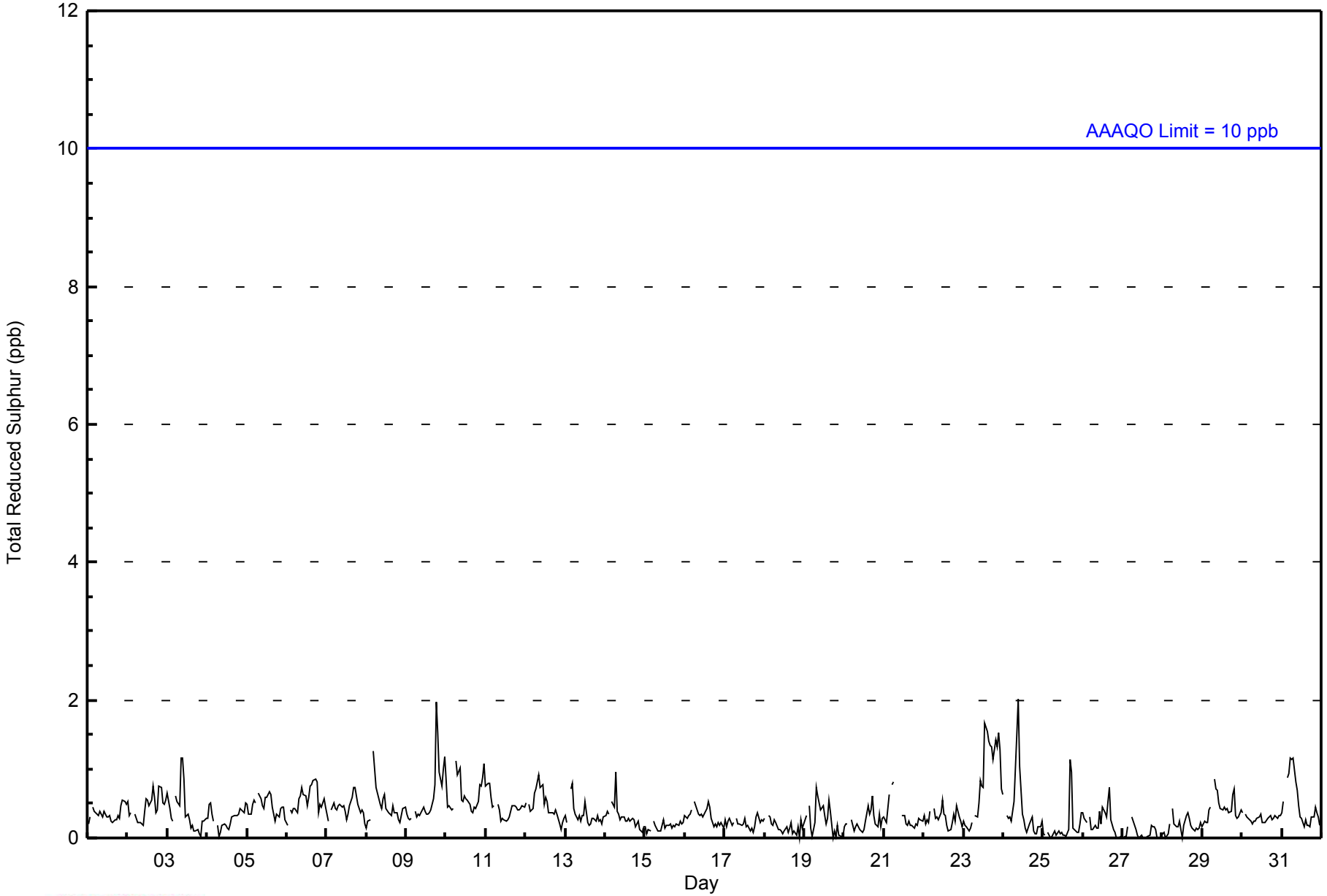
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2015



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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

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	120	47	14	4	4	9	98	92	66	46	23	23	33	29	43	43	694
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	120	47	14	4	4	9	98	92	66	46	23	23	33	29	43	43	694

Total Number of Valid Hours: 694

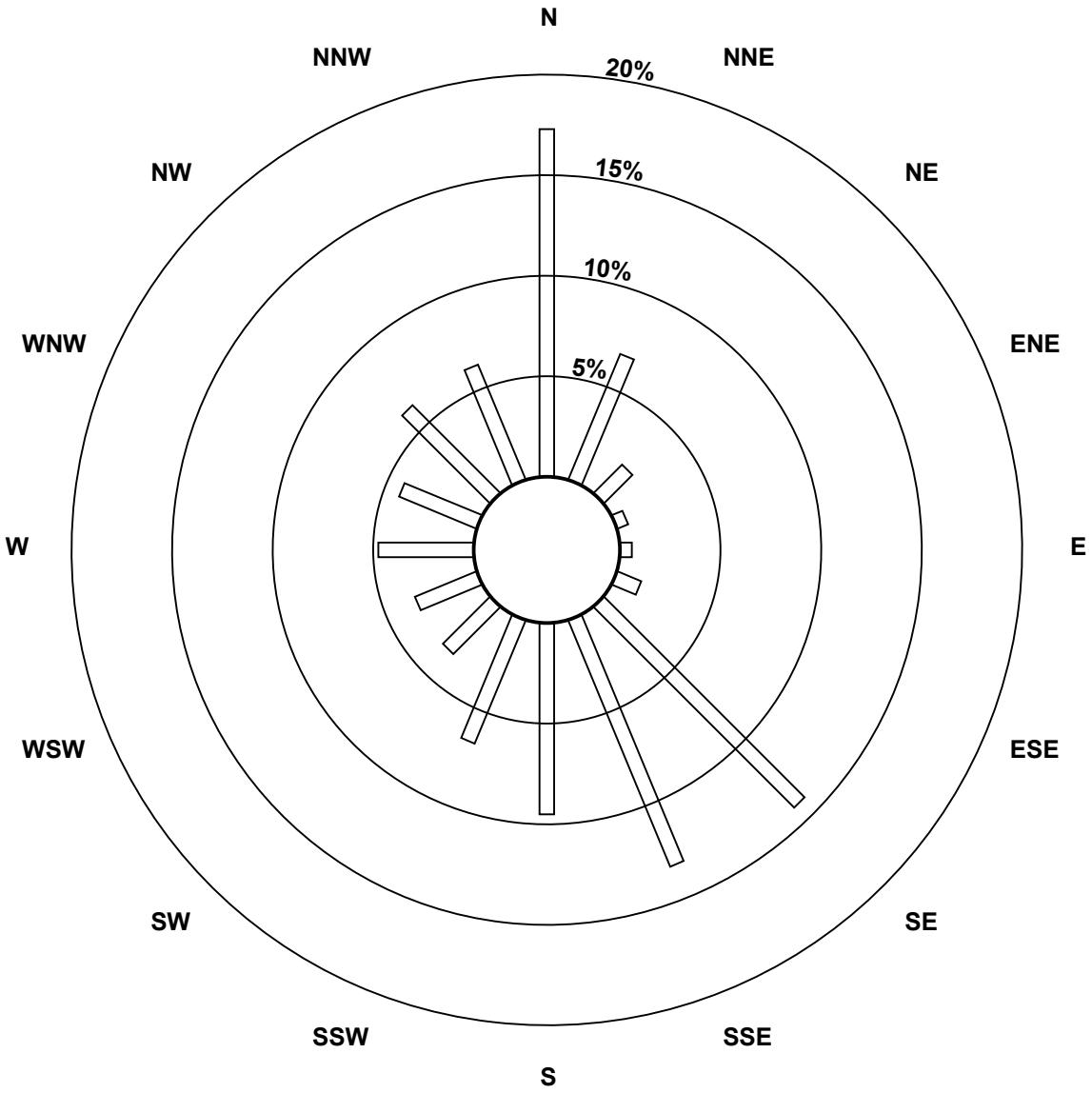
Total Number of Hours: 744

Wood Buffalo Environmental Association

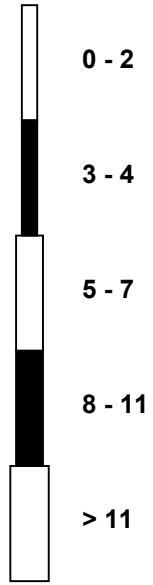
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Millennium (AMS 12)



Classes (ppb)



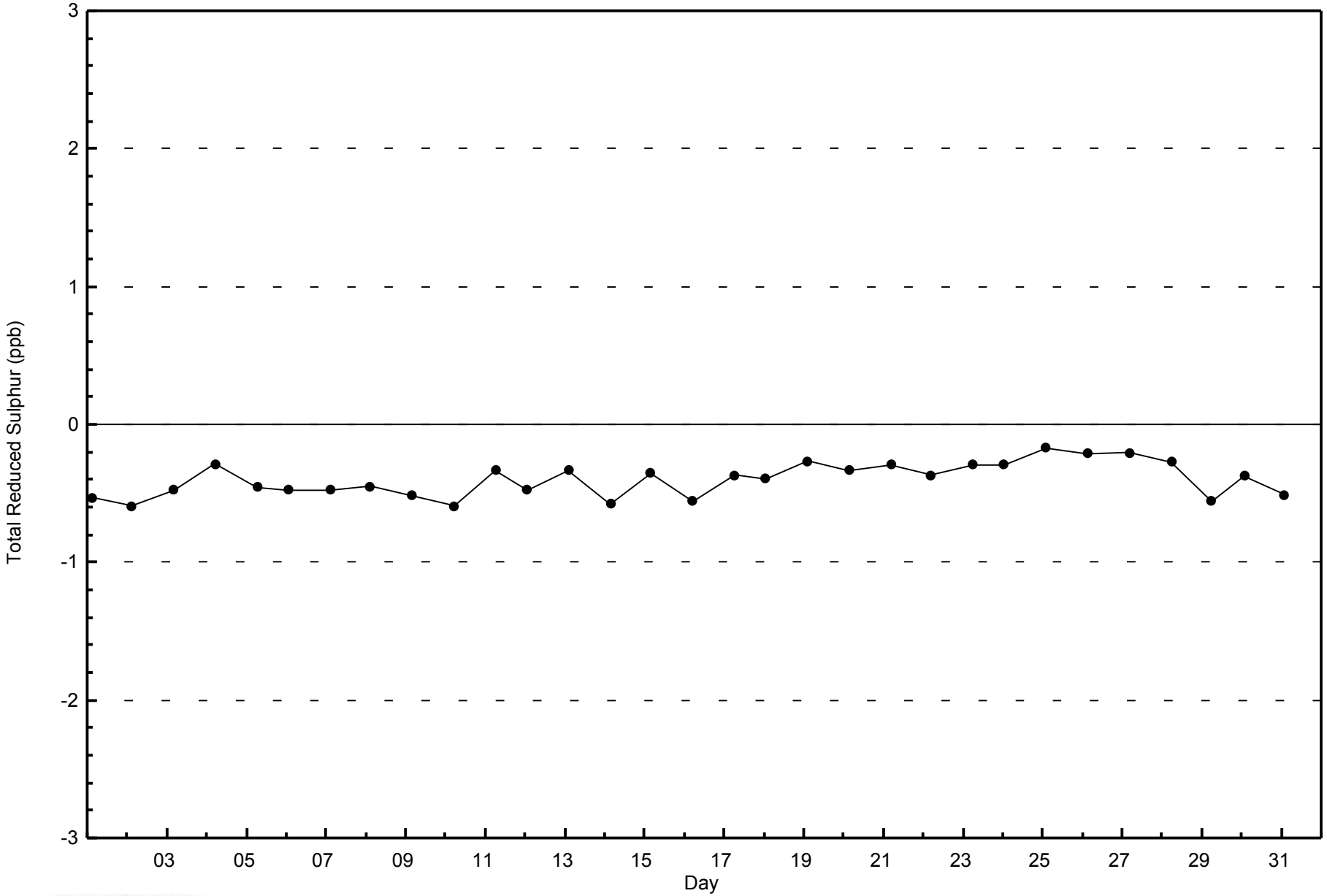
Total Number of Valid Hours: 694

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2015



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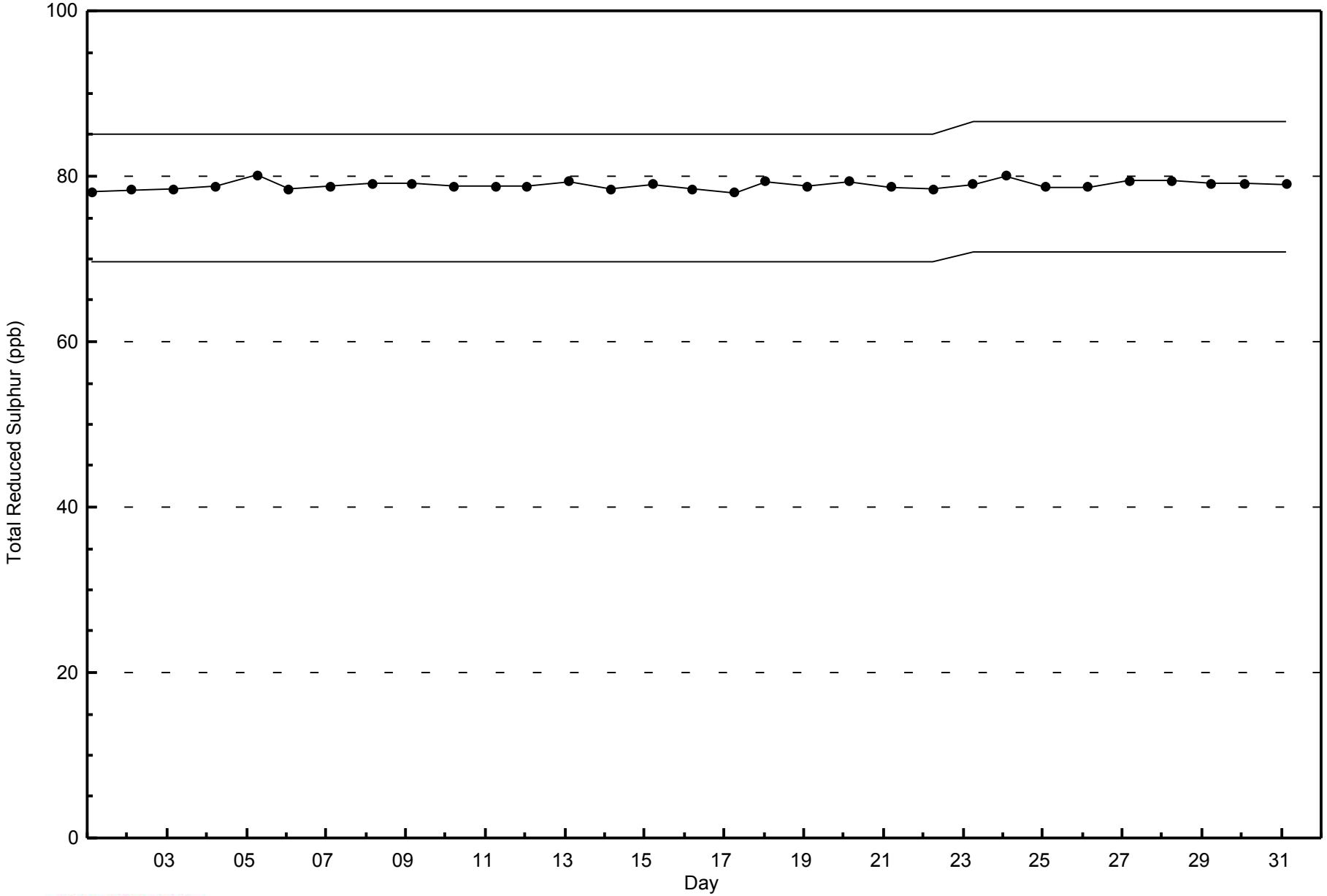
WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Millennium - January 2015

Maximum Value: 6.8 ppm on Jan 23 23:00

Maximum Daily Average: 3.1 ppm on Jan 23

Minimum Value: 2.0 ppm on Jan 25 14:00

Minimum Daily Average: 2.2 ppm on Jan 27

Maximum Diurnal Average: 2.7 ppm at hour 23

Minimum Diurnal Average: 2.4 ppm at hour 2

Monthly Average: 2.48 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.6 P_{90} = 3.1 P_{99} = 4.2

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-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.4	2.8	2.5	2.6	2.4	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.4	2.6	2.3	2.8
2-Jan	2.7	2.6	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.9	2.9	2.8	2.6	2.6	2.8	3.2	2.4	2.5	3.3	3.2	3.2	3.2	3.3	2.7	3.3
3-Jan	3.0	2.8	2.5	Z	2.5	3.0	2.8	2.5	3.0	3.0	2.7	2.5	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	3.0	3.3	3.1	2.6	3.3
4-Jan	2.5	2.5	2.5	2.5	Z	2.5	2.4	2.5	2.5	2.6	2.3	2.5	2.4	2.3	2.3	2.7	2.9	2.7	2.6	3.0	3.0	2.8	2.5	2.6	2.6	3.0
5-Jan	2.6	2.6	2.4	2.4	2.6	Z	2.9	3.1	2.9	2.6	2.5	2.4	2.4	2.6	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.5	3.1
6-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	3.4	3.4	3.5	3.3	2.9	2.5	2.6	2.9	2.6	2.6	2.9	2.7	2.7	2.8	2.5	2.4	2.5	2.7	3.5
7-Jan	2.4	Z	2.3	2.4	2.3	2.8	3.2	3.2	3.2	3.2	2.2	2.2	2.2	2.6	2.5	2.6	2.4	2.6	2.4	2.2	2.2	2.4	2.3	2.2	2.5	3.2
8-Jan	2.1	2.2	Z	2.4	2.5	2.5	2.5	2.3	2.3	2.3	2.4	2.5	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	3.2	3.0	2.4	3.2
9-Jan	2.7	2.4	2.3	Z	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.8	2.6	4.0	3.3	2.8	2.7	3.4	3.6	2.6	4.0
10-Jan	2.8	2.2	2.2	2.2	Z	3.4	3.4	3.2	3.1	2.5	2.4	2.4	2.8	2.5	2.4	2.4	2.4	2.4	2.5	2.9	4.4	3.6	3.5	3.6	2.8	4.4
11-Jan	3.6	3.1	5.2	3.2	3.3	Z	2.7	2.6	3.6	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.6	3.1	2.8	2.4	2.5	2.4	2.4	2.3	2.8	5.2
12-Jan	Z	2.3	2.3	2.3	2.5	3.7	3.3	3.1	2.9	3.0	3.4	2.9	3.2	3.1	2.5	2.5	2.5	2.5	2.6	2.5	2.4	2.5	2.5	2.7	2.8	3.7
13-Jan	3.1	Z	2.6	3.2	2.8	2.4	2.3	2.2	2.2	2.2	2.3	2.2	2.4	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	3.2
14-Jan	2.2	2.2	Z	2.5	2.4	2.5	2.8	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.8
15-Jan	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
16-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.2	2.3	2.6	2.5	2.8	2.9	2.6	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.9
17-Jan	2.0	2.0	2.0	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.2	2.3
18-Jan	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.9	2.5	2.4	2.6	2.5	2.4	2.4	3.9	3.3	2.5	3.9
19-Jan	3.5	Z	4.9	4.0	3.1	2.7	2.9	3.4	3.1	2.7	2.5	2.7	2.6	2.6	3.0	3.0	2.7	2.3	2.3	2.3	2.5	2.3	2.3	2.3	2.8	4.9
20-Jan	2.3	2.3	Z	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.5	2.4	2.4	2.6	2.4	2.3	2.4	2.3	2.4	2.4	2.3	2.6
21-Jan	2.7	2.4	2.7	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.6	2.3	2.3	2.6	2.2	2.2	2.2	2.5	2.2	2.4	2.3	2.3	2.3	2.7
22-Jan	2.4	2.4	2.9	2.2	Z	3.9	3.8	2.8	2.1	2.0	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.4	3.9
23-Jan	2.1	2.2	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.4	2.7	2.6	2.5	2.9	3.1	3.5	3.4	4.0	4.0	4.2	4.3	4.4	6.8	3.5	3.1	6.8
24-Jan	Z	2.8	2.3	2.8	2.6	2.2	2.6	2.6	3.1	3.3	2.6	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.4	2.4	3.3
25-Jan	2.3	Z	2.2	2.5	2.1	2.1	2.0	2.0	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.9	2.9	2.2	2.1	2.1	2.4	2.8	3.0	2.3	3.0
26-Jan	3.5	2.7	Z	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.8	2.6	2.9	2.7	2.5	3.0	3.7	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.5	3.7
27-Jan	2.1	2.1	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
28-Jan	2.2	2.2	2.2	2.2	Z	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.4	2.4	2.4	2.5	2.5	2.3	2.3	2.2	2.3	2.3	2.5
29-Jan	2.3	2.3	2.2	2.3	2.3	Z	2.2	C	C	C	C	C	C	2.2	2.2	2.2	2.3	2.3	2.6	2.6	2.3	2.2	2.2	2.2	--	2.6
30-Jan	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	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
31-Jan	2.2	Z	3.3	3.2	3.6	4.2	3.6	4.1	4.2	3.7	2.4	2.5	2.4	2.2	2.7	2.3	2.2	2.3	2.3	2.3	2.3	3.0	2.7	2.2	2.9	4.2
	2.5	2.4	2.6	2.5	2.4	2.6	2.5	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.7	2.6	Diurnal Average	
	3.6	3.1	5.2	4.0	3.6	4.2	3.8	4.1	4.2	3.7	3.4	2.9	3.2	3.1	3.1	3.5	3.7	4.0	4.0	4.2	4.4	4.4	6.8	3.6	Diurnal Maximum	

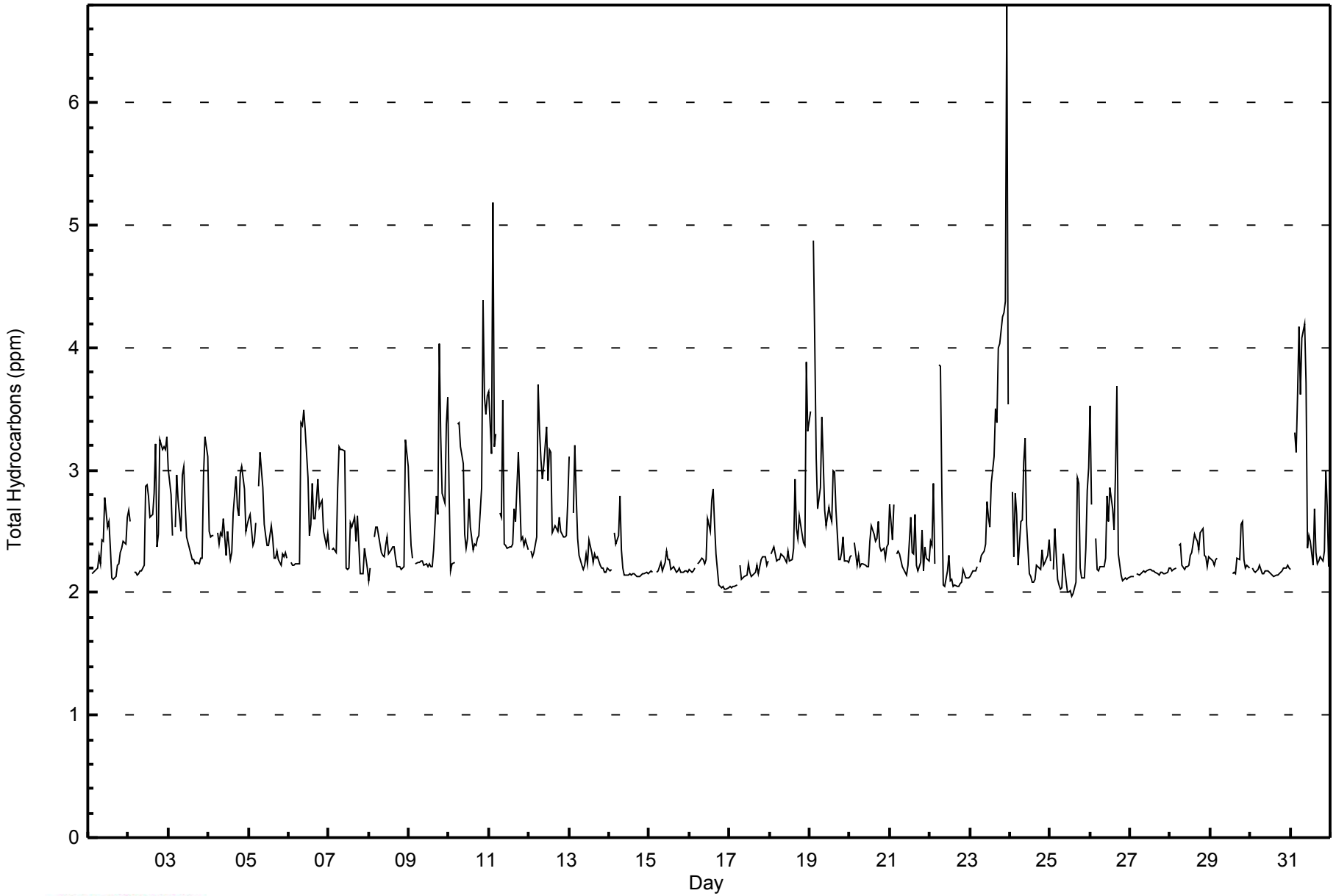
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Millennium - January 2015



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	18	2.55	2.55
2.1 - 3.0	612	86.56	89.11
3.1 - 10.0	77	10.89	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Millennium - January 2015

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	0	0	0	0	0	0	0	2	0	0	0	8	8	0	0	0	18
2.1 - 3.0	115	47	11	4	2	7	91	87	48	33	14	14	24	27	39	41	604
3.1 - 10.0	4	1	2	0	2	1	4	8	13	14	9	1	0	3	5	2	69
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	48	13	4	4	8	95	97	61	47	23	23	32	30	44	43	691

Total Number of Valid Hours: 691

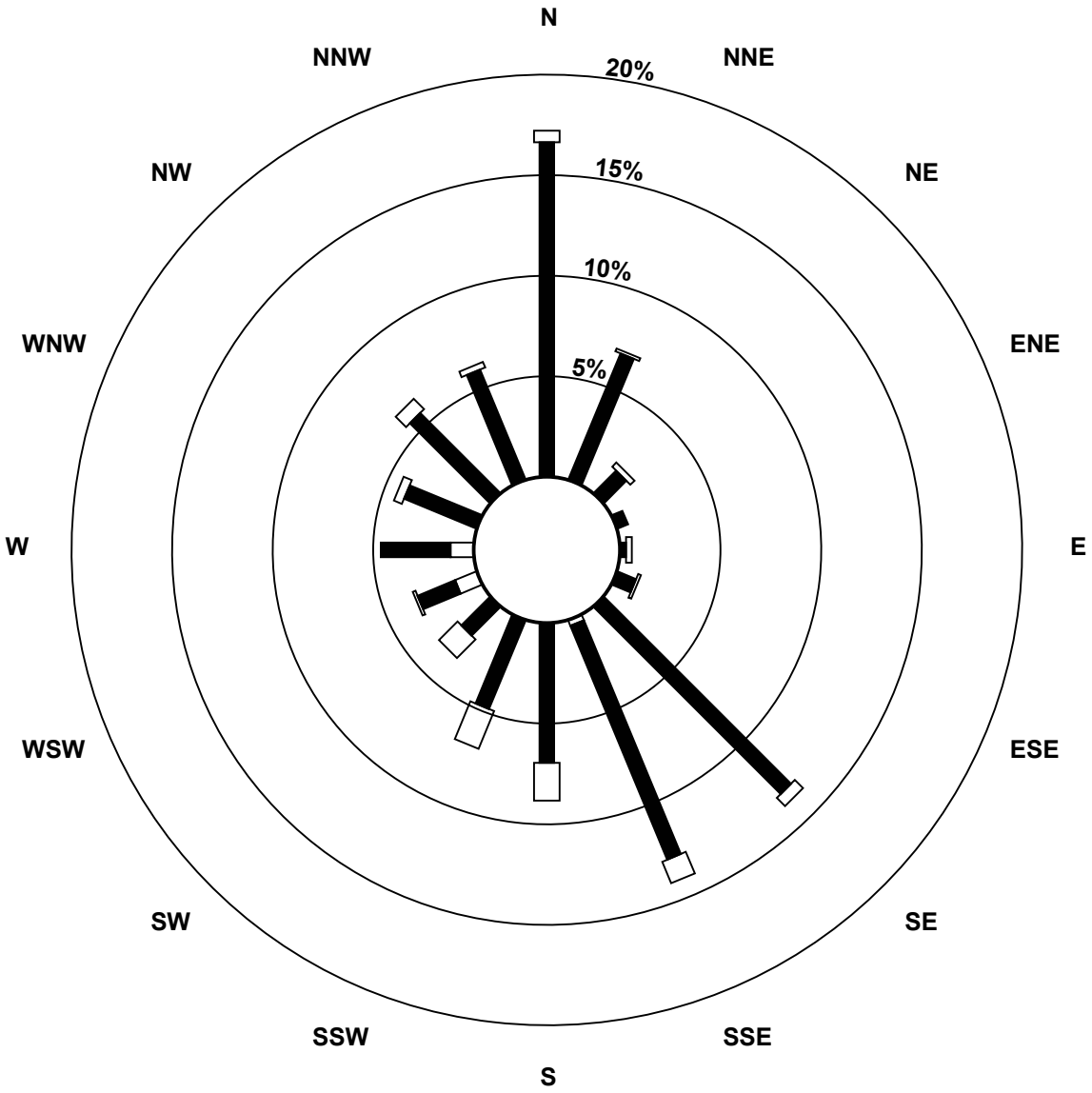
Total Number of Hours: 744

Wood Buffalo Environmental Association

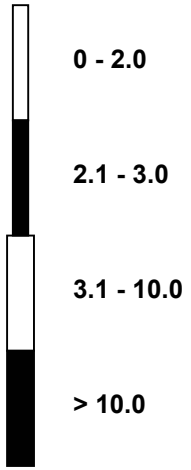
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Millennium (AMS 12)



Classes (ppm)



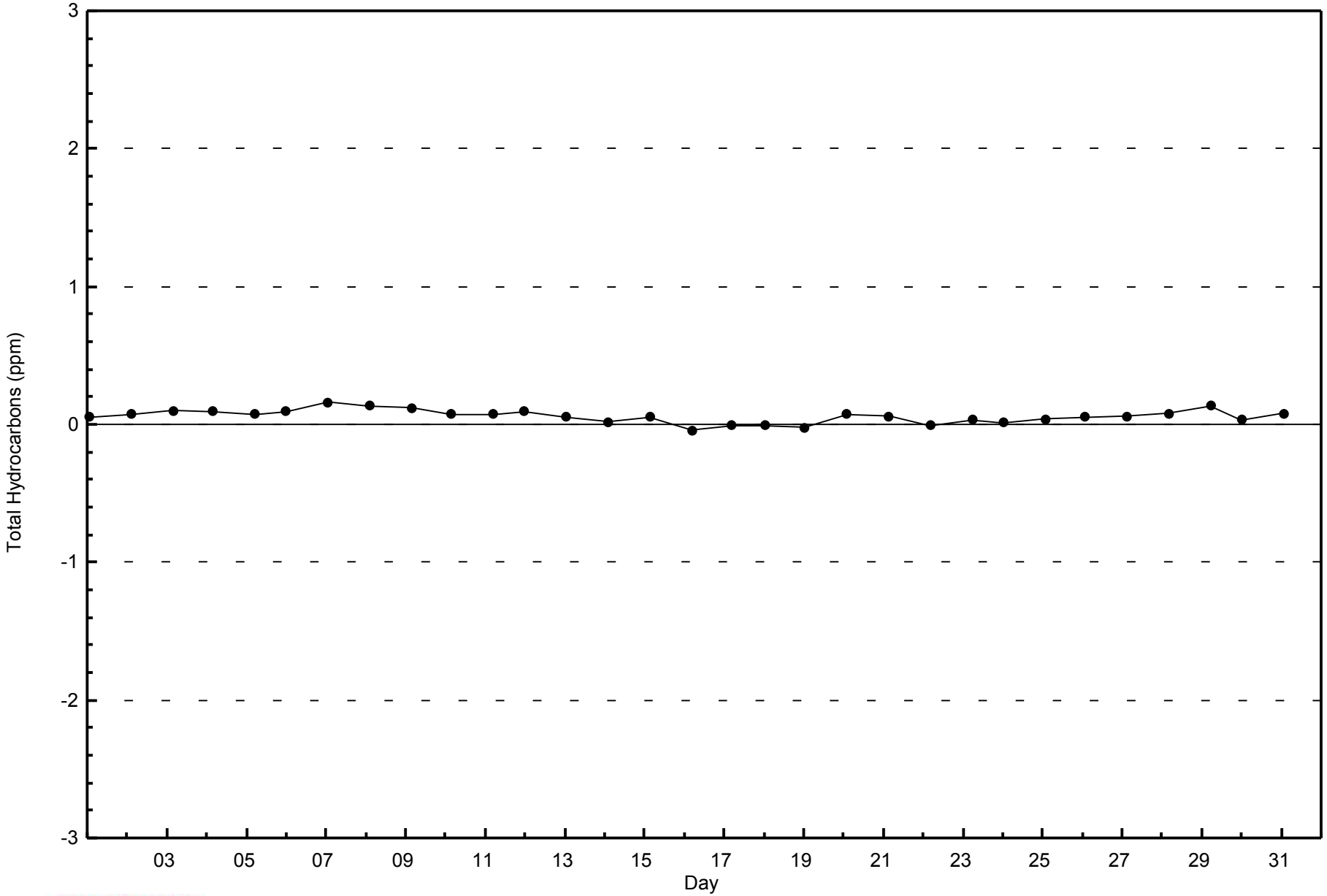
Total Number of Valid Hours: 691

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Millennium - January 2015



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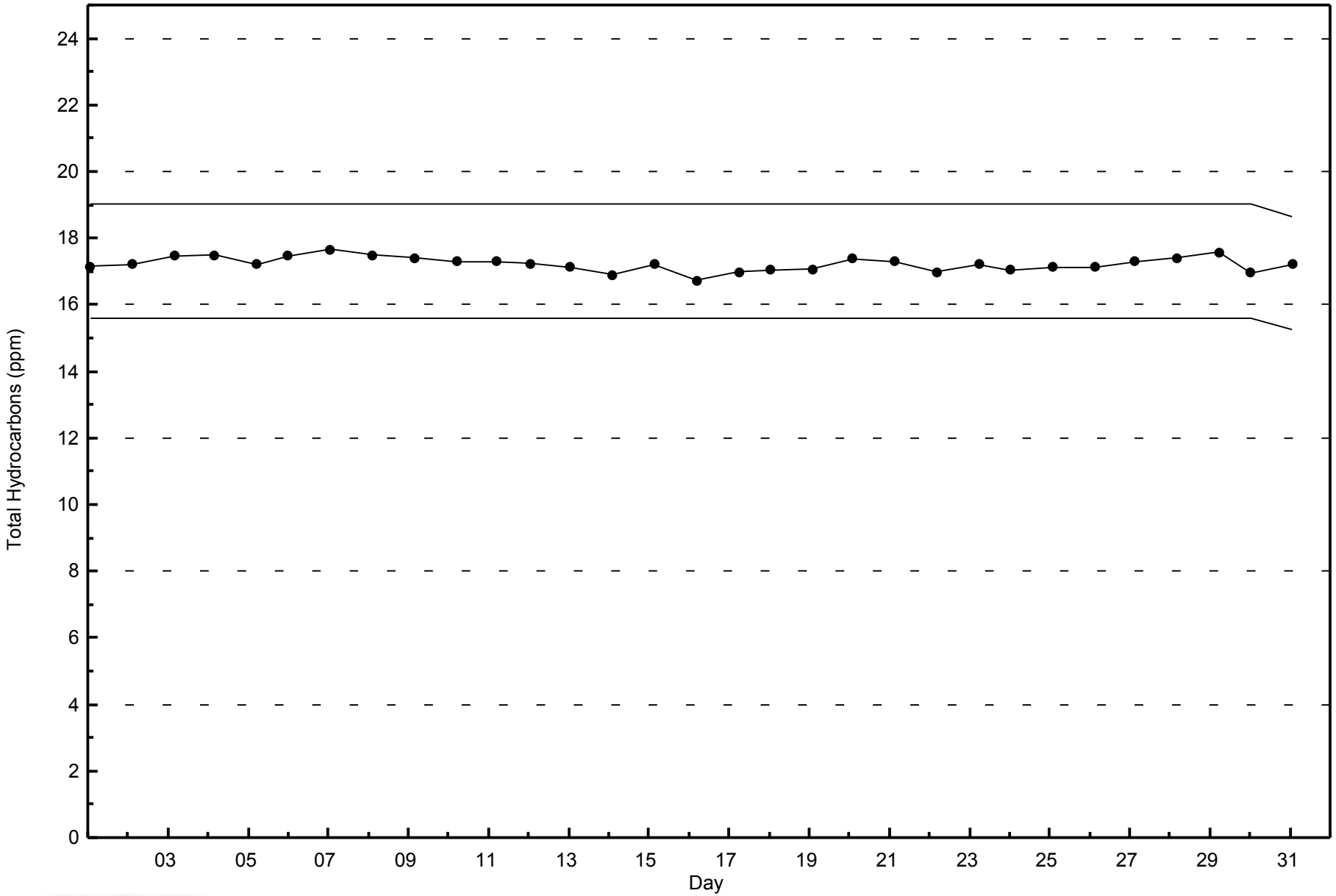
Span Responses

Total Hydrocarbons (THC) - ppm

Millennium - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Millennium - January 2015

Maximum Value: 189 ppb on Jan 23 23:00

Maximum Daily Average: 48.9 ppb on Jan 6

Minimum Value: 0 ppb on Jan 1 01:00

Minimum Daily Average: 0.3 ppb on Jan 30

Maximum Diurnal Average: 19.7 ppb at hour 17

Minimum Diurnal Average: 9.6 ppb at hour 13

Monthly Average: 14.6 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 3 $Q_3 = 17$ $P_{90} = 42$ $P_{99} = 134$

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-Jan	0	Z	1	1	6	5	6	4	15	10	15	12	12	9	1	0	0	0	1	0	0	0	0	16	4.9	16
2-Jan	37	11	Z	0	0	0	0	0	0	2	31	67	49	15	18	35	60	15	27	104	120	87	84	84	36.8	120
3-Jan	87	45	16	Z	6	3	1	2	18	20	25	7	5	6	4	1	0	0	0	0	0	2	12	5	11.6	87
4-Jan	33	87	90	48	Z	20	21	7	2	4	4	6	3	4	4	6	2	1	1	1	1	4	0	1	15.2	90
5-Jan	11	5	9	16	21	Z	7	10	1	1	2	3	2	2	1	1	0	0	0	0	0	0	0	0	4.0	21
6-Jan	Z	0	0	0	0	0	0	26	18	31	42	39	14	62	96	104	135	165	148	29	59	52	77	26	48.9	165
7-Jan	6	Z	1	3	16	5	11	9	7	26	5	4	4	18	8	30	15	8	3	0	0	0	0	0	7.7	30
8-Jan	0	0	Z	1	0	0	1	0	0	2	4	3	2	2	2	1	0	0	0	0	0	0	2	2	1.0	4
9-Jan	9	8	6	Z	2	1	1	1	0	1	4	8	11	11	8	11	52	22	46	50	22	15	27	38	15.5	52
10-Jan	19	0	0	0	Z	79	169	128	163	34	17	18	24	33	19	16	17	27	29	71	72	46	50	49	46.9	169
11-Jan	51	93	88	48	69	Z	46	57	57	12	18	7	6	10	12	22	27	35	20	17	4	3	8	13	31.5	93
12-Jan	Z	14	2	2	8	29	22	47	83	54	35	28	24	31	12	21	28	38	29	25	6	2	2	17	24.3	83
13-Jan	23	Z	8	34	10	1	0	0	0	1	7	2	7	6	1	2	1	0	0	0	0	0	1	2	4.7	34
14-Jan	0	1	Z	7	26	17	7	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	2.8	26
15-Jan	0	0	0	Z	0	0	0	0	0	1	4	4	2	2	2	1	0	0	0	0	0	0	0	0	0.9	4
16-Jan	1	1	0	1	Z	1	1	1	1	1	5	9	13	8	57	30	0	0	0	0	0	0	0	0	5.6	57
17-Jan	0	0	0	0	0	Z	0	0	0	1	4	1	1	1	1	1	0	0	0	0	10	23	25	2	3.1	25
18-Jan	Z	10	12	14	11	13	20	41	11	22	17	13	22	15	15	33	39	17	16	6	11	2	42	30	18.8	42
19-Jan	33	Z	69	49	31	9	35	84	83	49	21	15	10	8	19	22	16	0	0	0	1	0	1	0	24.1	84
20-Jan	0	1	Z	0	0	0	0	0	0	1	2	3	7	36	71	39	40	85	21	22	4	2	3	8	15.0	85
21-Jan	9	5	13	Z	33	15	14	5	0	1	2	3	6	2	1	1	0	0	0	0	0	32	17	2	7.0	33
22-Jan	19	12	10	5	Z	93	60	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	9.0	93
23-Jan	0	0	0	0	0	Z	2	4	6	9	18	29	14	11	9	17	52	109	107	139	183	135	189	61	47.7	189
24-Jan	Z	46	8	3	11	5	7	15	31	28	5	1	1	1	1	1	1	0	0	0	0	0	4	36	9.0	46
25-Jan	6	Z	4	1	0	0	0	0	0	0	0	0	1	0	0	0	2	1	2	3	1	0	11	26	2.6	26
26-Jan	75	31	Z	59	19	3	7	4	0	3	10	18	22	37	8	56	104	5	0	0	0	0	0	0	20.1	104
27-Jan	0	0	0	Z	0	0	0	0	0	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0.4	2
28-Jan	0	0	0	0	Z	0	2	1	0	2	2	2	2	4	5	6	3	1	6	4	0	0	0	2	1.9	6
29-Jan	6	4	4	6	11	Z	5	C	C	C	C	C	C	13	9	5	4	2	10	17	3	0	0	0	--	17
30-Jan	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
31-Jan	0	Z	12	13	27	32	28	42	40	51	24	20	20	12	24	15	11	14	38	35	16	14	19	4	22.1	51
	16.4	14.9	13.5	11.9	11.9	12.8	15.3	16.5	18.0	12.3	10.7	10.9	9.6	11.6	13.2	15.4	19.7	17.7	16.3	17.0	16.6	13.7	18.7	13.7	Diurnal Average	
	87	93	90	59	69	93	169	128	163	54	42	67	49	62	96	104	135	165	148	139	183	135	189	84	Diurnal Maximum	

Z - zerospan C - Calibration

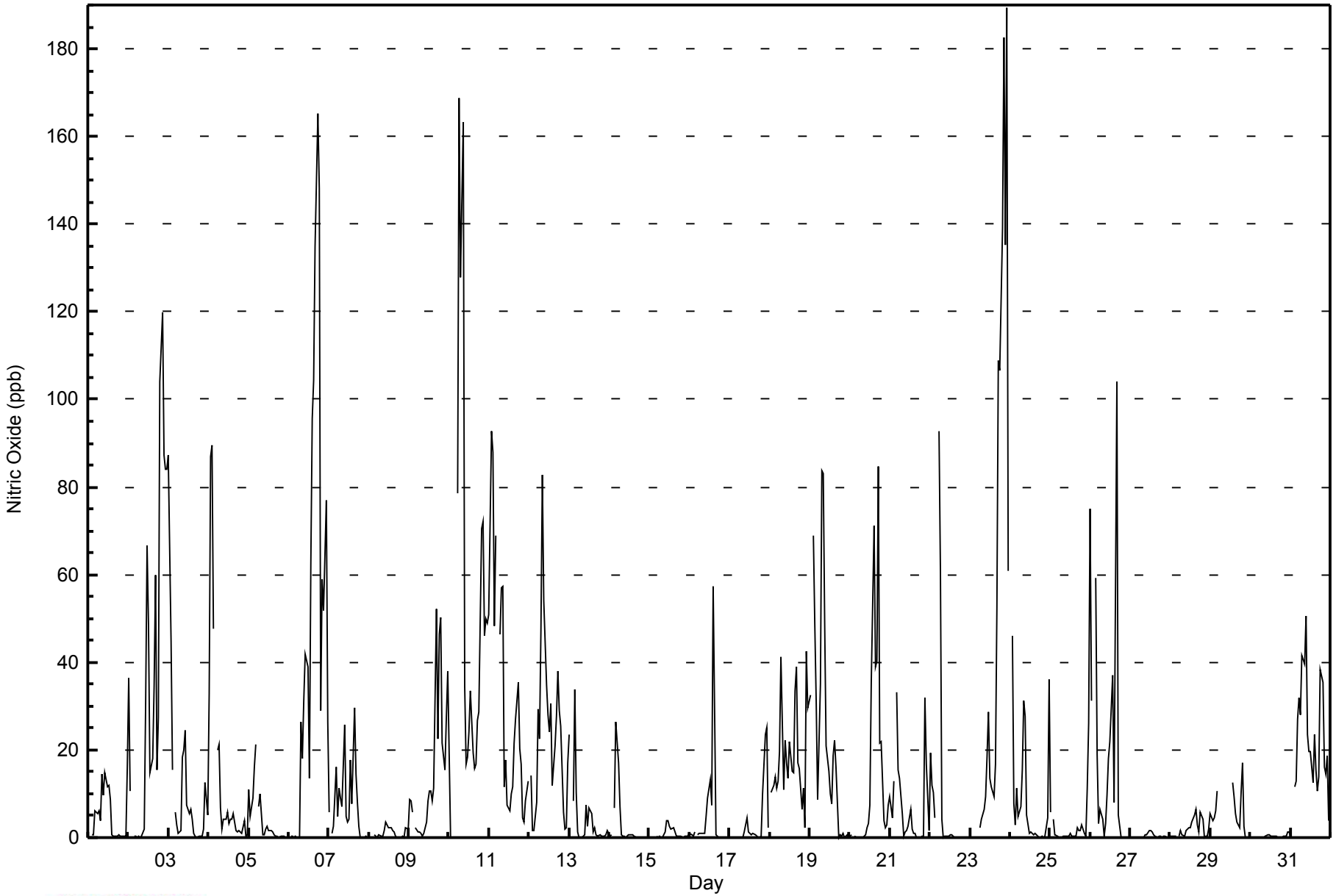
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Millennium - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	557	78.78	78.78
21 - 40	77	10.89	89.67
11 - 80	43	6.08	95.76
81 - 159	25	3.54	99.29
> 159	5	0.71	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Millennium - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	111	46	10	4	1	7	61	68	40	32	15	23	32	26	36	37	549
21 - 40	4	1	1	0	1	1	15	18	13	7	7	0	0	1	2	3	74
11 - 80	3	0	1	0	1	0	11	7	6	7	0	0	0	0	4	1	41
81 - 159	1	1	1	0	1	0	7	1	2	1	1	0	0	3	2	2	23
> 159	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
Totals	119	48	13	4	4	8	95	97	61	47	23	23	32	30	44	43	691

Total Number of Valid Hours: 691

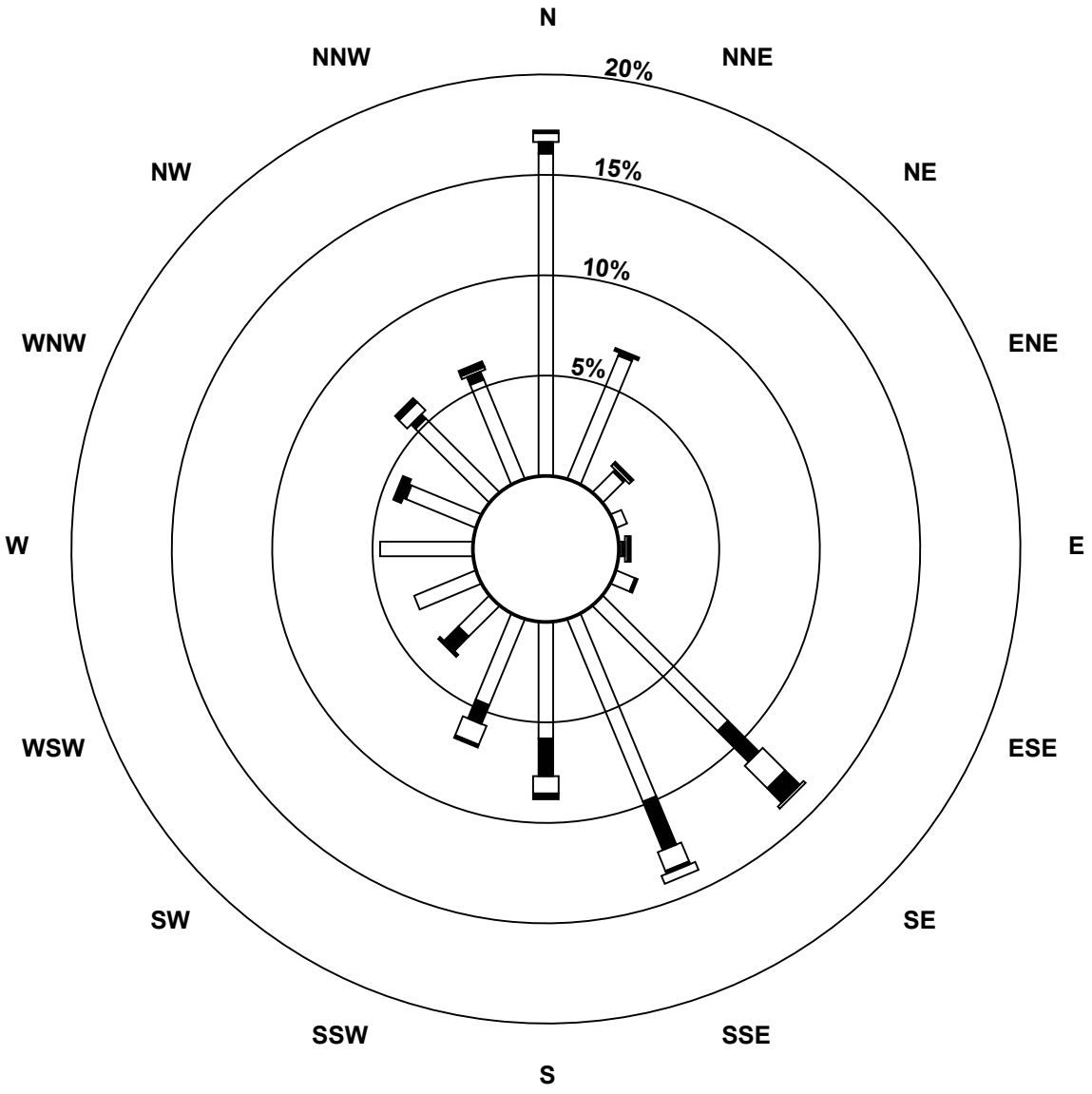
Total Number of Hours: 744

Wood Buffalo Environmental Association

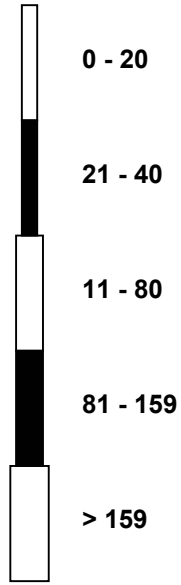
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Millennium (AMS 12)



Classes (ppb)



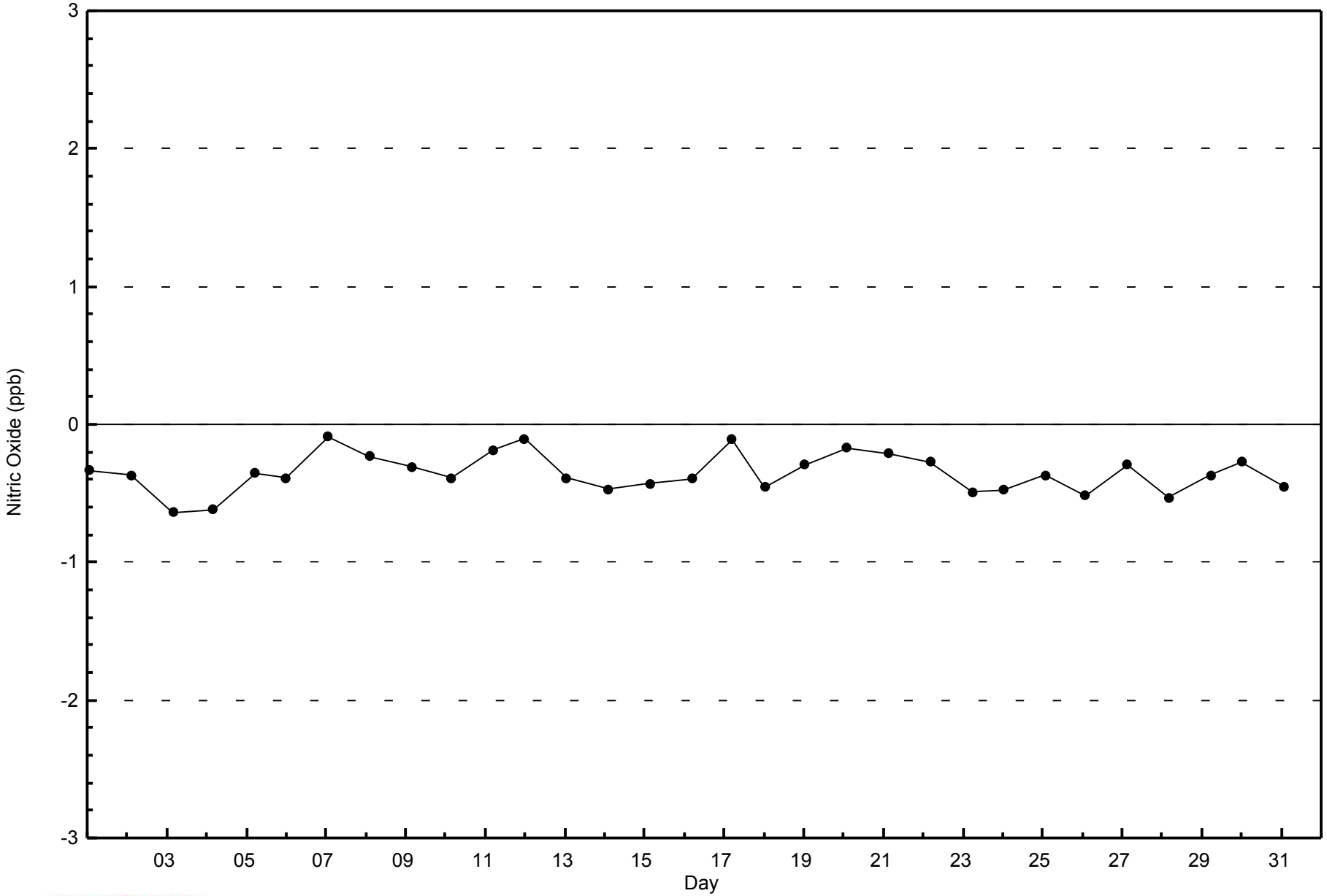
Total Number of Valid Hours: 691

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Millennium - January 2015



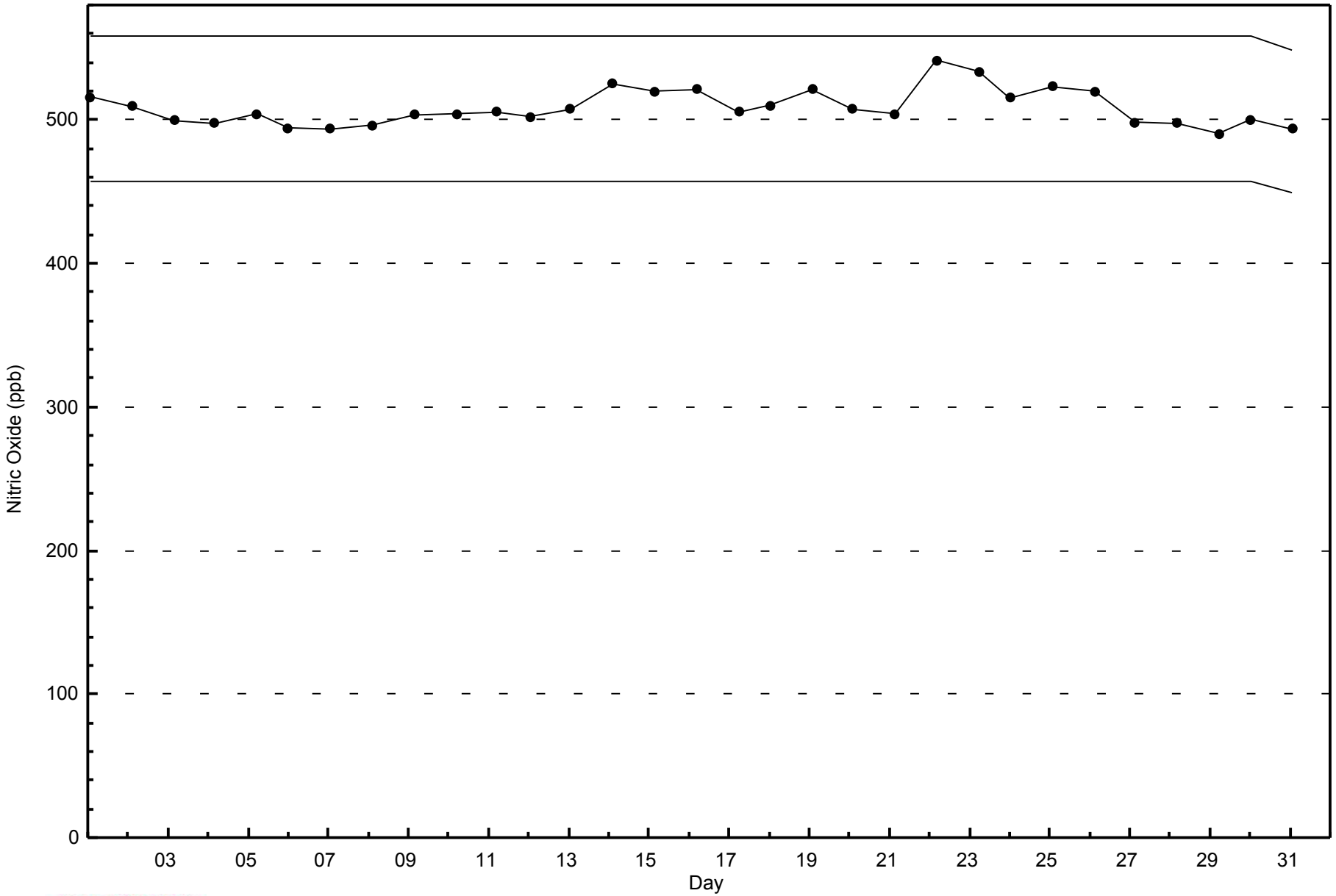
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Millennium - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 49 ppb on Jan 10 09:00 Maximum Daily Average: 29.5 ppb on Jan 10

Minimum Value: 0 ppb on Jan 30 14:00 Minimum Daily Average: 3.4 ppb on Jan 27
Maximum Diurnal Average: 20.3 ppb at hour 1 Minimum Diurnal Average: 12.8 ppb at hour 13
Monthly Average: 17.2 ppb Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 8$ Median = 16 $Q_3 = 26$ $P_{90} = 32$ $P_{99} = 43$

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-Jan	8	Z	17	22	32	30	27	22	27	24	23	19	20	15	3	4	4	8	13	19	19	19	16	23	18.1	32
2-Jan	33	29	Z	17	12	7	8	6	10	16	30	36	34	21	26	35	39	36	36	44	45	42	40	40	27.9	45
3-Jan	42	34	25	Z	24	22	18	17	32	31	26	14	10	12	12	7	6	5	4	5	8	20	27	23	18.4	42
4-Jan	30	36	37	33	Z	29	28	22	17	19	12	11	8	9	12	22	19	16	16	20	20	24	12	15	20.2	37
5-Jan	27	26	31	35	33	Z	27	28	19	11	12	12	8	8	9	7	7	9	6	12	13	11	10	10	16.1	35
6-Jan	Z	12	13	13	18	18	7	31	33	33	31	28	18	30	38	40	41	44	43	33	36	36	36	33	28.8	44
7-Jan	28	Z	17	22	32	23	26	26	26	28	18	15	16	26	20	33	30	29	20	5	6	9	14	10	20.9	33
8-Jan	2	11	Z	19	14	11	16	15	16	18	16	10	8	8	8	12	12	9	11	11	11	8	24	23	12.7	24
9-Jan	29	31	33	Z	27	19	21	17	12	11	13	17	19	19	20	27	40	37	40	40	36	36	38	39	26.9	40
10-Jan	31	5	8	11	Z	34	49	49	49	31	24	21	22	26	23	25	31	32	33	36	38	34	34	35	29.5	49
11-Jan	33	39	38	31	35	Z	33	34	35	24	22	13	10	15	20	25	29	33	28	29	23	18	26	31	27.0	39
12-Jan	Z	32	24	24	28	31	28	32	39	32	27	25	25	26	21	25	26	26	27	24	20	17	17	20	25.8	39
13-Jan	25	Z	22	26	23	15	8	5	8	7	16	6	13	12	8	17	13	16	17	15	8	10	17	20	14.1	26
14-Jan	10	15	Z	24	28	19	23	14	5	3	2	3	2	2	2	4	3	3	2	2	1	1	3	6	7.7	28
15-Jan	7	7	4	Z	6	5	9	10	5	14	18	16	10	11	12	11	10	10	13	7	3	9	14	10	9.6	18
16-Jan	17	17	15	21	Z	17	21	20	20	13	17	21	23	20	29	22	12	7	4	3	4	4	3	2	14.4	29
17-Jan	3	2	2	2	1	Z	7	5	3	7	12	5	4	3	5	6	10	8	9	15	29	28	26	21	9.1	29
18-Jan	Z	23	23	25	26	26	26	29	25	25	20	17	21	19	22	30	32	30	31	23	30	25	32	31	25.6	32
19-Jan	31	Z	29	27	22	17	19	29	30	25	18	16	14	13	20	24	21	10	16	11	17	12	15	11	19.3	31
20-Jan	13	16	Z	12	8	10	8	12	8	7	7	7	11	23	31	29	29	31	26	25	19	17	16	21	16.8	31
21-Jan	23	19	22	Z	27	27	28	18	12	11	9	11	16	11	9	10	5	4	5	14	13	28	31	24	16.3	31
22-Jan	31	29	24	27	Z	34	34	21	4	4	6	3	3	4	3	4	3	3	1	1	6	3	1	0	10.8	34
23-Jan	1	2	4	4	8	Z	12	15	16	16	16	15	11	13	14	19	23	27	25	27	27	26	34	18	16.3	34
24-Jan	Z	18	11	16	13	8	13	13	15	16	13	6	5	3	3	6	10	7	5	9	6	11	19	28	11.0	28
25-Jan	25	Z	18	13	7	5	4	5	9	4	2	2	4	3	2	4	17	16	13	17	9	9	16	21	9.7	25
26-Jan	26	25	Z	30	27	20	19	20	12	15	16	20	21	25	16	25	37	9	3	1	1	3	1	1	16.2	37
27-Jan	2	1	1	Z	1	0	1	3	2	5	2	3	4	4	3	3	2	4	5	4	7	9	4	7	3.4	9
28-Jan	8	7	6	7	Z	9	17	7	5	6	5	5	5	8	11	16	17	21	27	23	7	10	10	21	11.2	27
29-Jan	29	27	24	25	27	Z	23	C	C	C	C	C	C	17	15	14	17	14	25	27	17	8	10	8	--	29
30-Jan	Z	5	4	3	3	4	3	1	2	3	1	1	1	0	0	1	1	2	2	9	12	12	22	19	4.9	22
31-Jan	16	Z	31	30	31	30	29	29	28	27	23	18	17	15	22	22	26	29	34	34	33	30	30	24	26.4	34
	20.3	18.5	18.5	19.9	19.6	18.1	19.1	18.4	17.4	16.2	15.2	13.1	12.8	13.6	14.1	17.0	18.4	17.2	17.4	17.6	16.9	17.0	19.2	19.1	Diurnal Average	
	42	39	38	35	35	34	49	49	49	33	31	36	34	30	38	40	41	44	43	44	45	42	40	40	Diurnal Maximum	

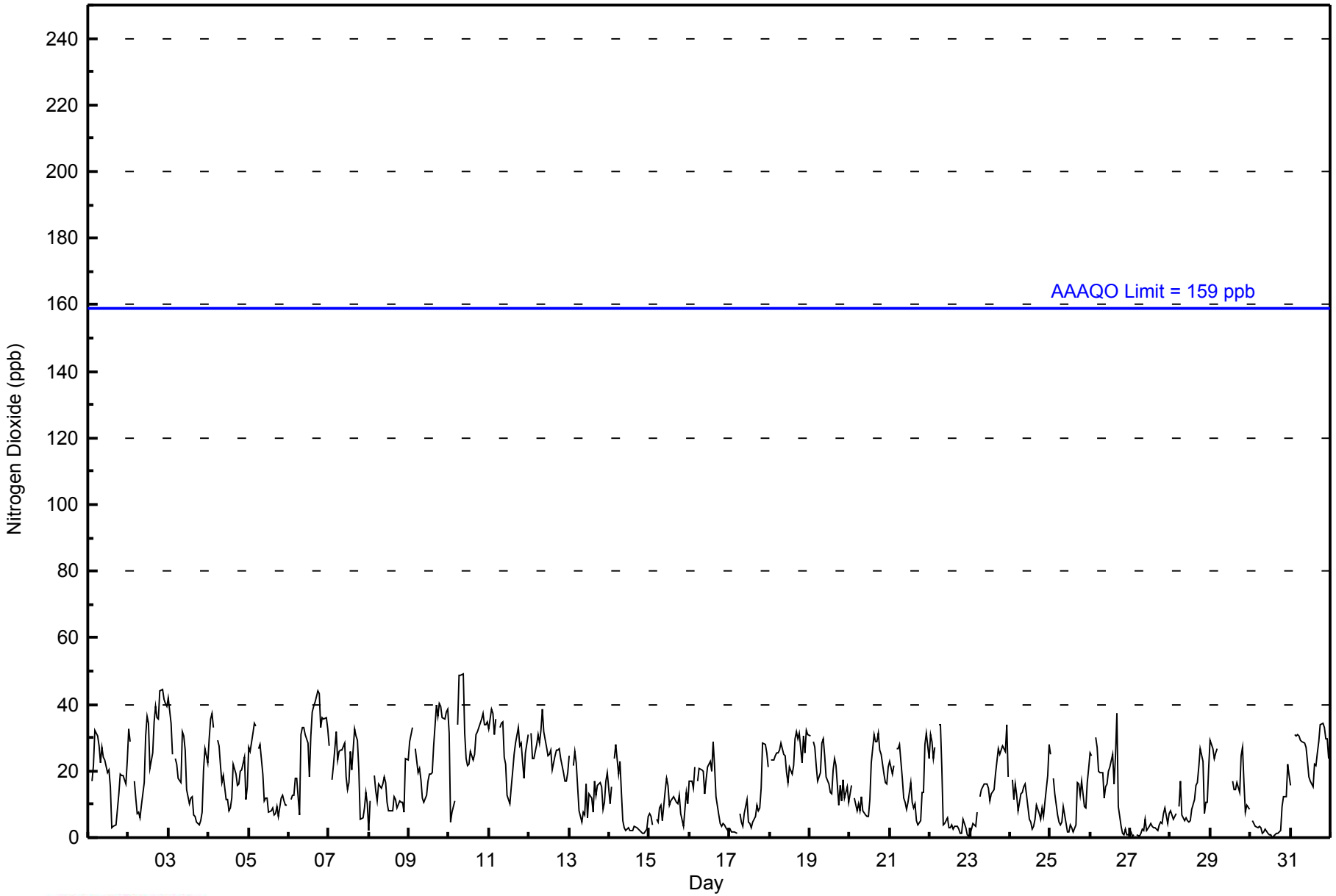
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	436	61.67	61.67
21 - 40	261	36.92	98.59
11 - 80	10	1.41	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

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	105	43	6	3	0	6	35	42	15	21	11	21	31	24	32	31	426
21 - 40	13	5	7	1	3	2	59	52	44	26	12	2	1	5	11	12	255
11 - 80	1	0	0	0	1	0	1	3	2	0	0	0	0	1	1	0	10
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	48	13	4	4	8	95	97	61	47	23	23	32	30	44	43	691

Total Number of Valid Hours: 691

Total Number of Hours: 744

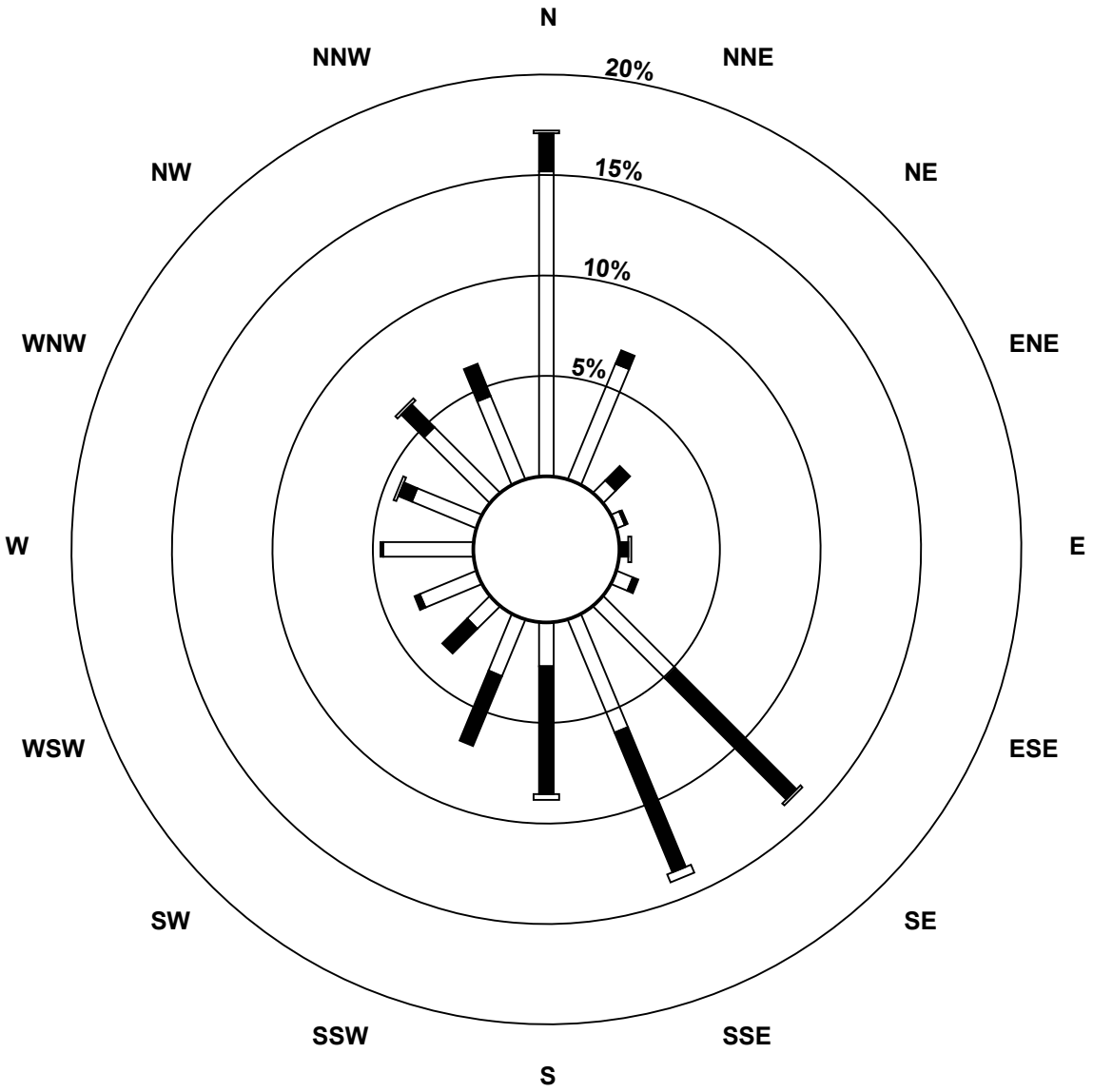
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

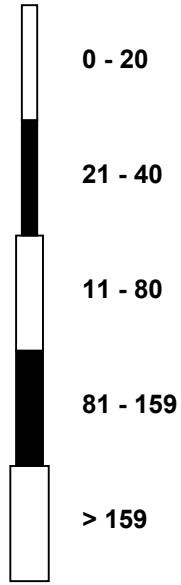
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Millennium (AMS 12)



Classes (ppb)



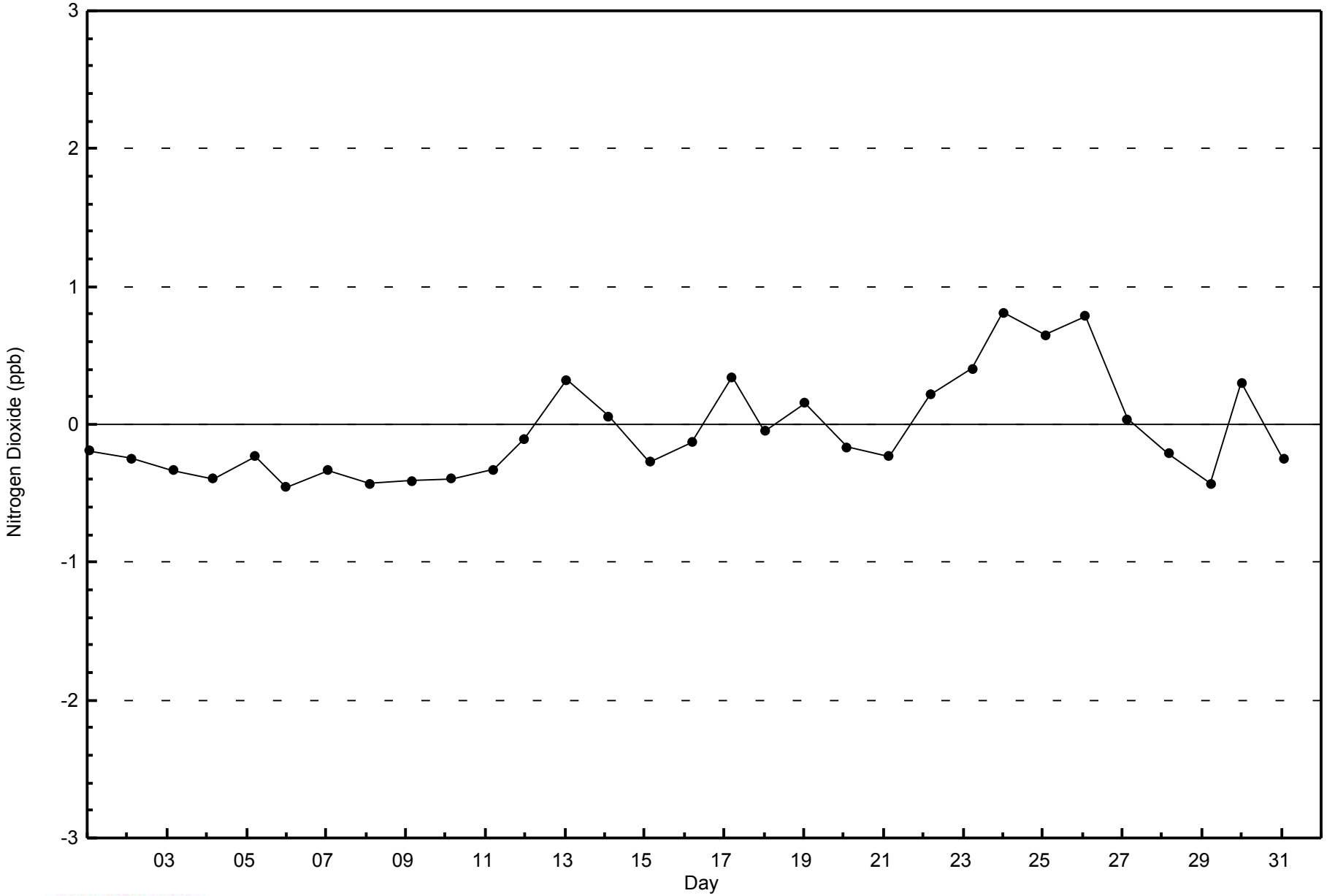
Total Number of Valid Hours: 691

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2015



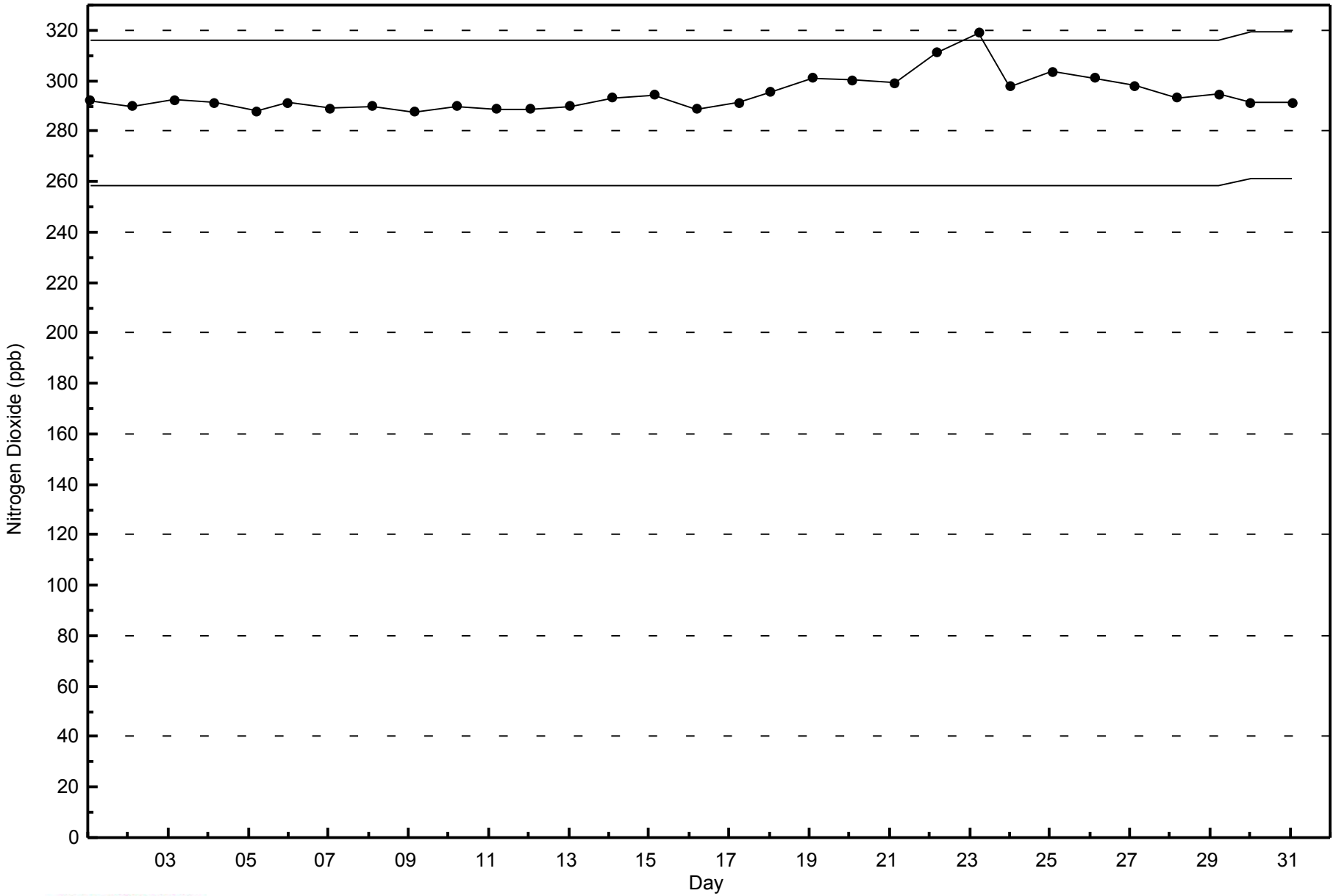
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2015

Maximum Value: 223 ppb on Jan 23 23:00

Maximum Daily Average: 77.7 ppb on Jan 6

Minimum Value: 0 ppb on Jan 23 00:00

Minimum Daily Average: 3.7 ppb on Jan 27

Maximum Diurnal Average: 38.1 ppb at hour 17

Minimum Diurnal Average: 22.5 ppb at hour 13

Monthly Average: 31.8 ppb

Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 8$ Median = 20 $Q_3 = 43$ $P_{90} = 73$ $P_{99} = 168$

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-Jan	8	Z	17	22	38	36	34	26	42	34	38	31	32	24	4	4	4	9	14	19	19	19	17	40	23.0	42
2-Jan	69	40	Z	17	12	7	8	6	10	18	61	103	83	35	44	70	99	51	63	148	164	129	124	124	64.7	164
3-Jan	129	79	41	Z	29	25	19	18	50	50	51	22	15	19	16	8	7	5	4	5	8	23	39	28	30.0	129
4-Jan	62	123	127	81	Z	49	49	29	19	23	16	17	11	13	16	28	21	17	18	21	21	28	12	16	35.4	127
5-Jan	38	30	40	50	55	Z	34	38	20	12	14	15	10	10	10	7	8	10	7	12	13	11	10	10	20.1	55
6-Jan	Z	12	13	13	18	18	7	57	51	64	73	67	32	93	133	144	176	209	191	62	95	87	113	59	77.7	209
7-Jan	33	Z	18	24	48	28	37	35	33	54	23	18	21	43	28	62	45	37	23	5	6	9	14	10	28.6	62
8-Jan	2	11	Z	19	14	11	17	15	16	20	20	13	10	10	10	14	12	9	11	11	11	7	26	25	13.7	26
9-Jan	38	39	39	Z	29	21	22	18	12	12	16	25	30	30	28	39	92	59	87	90	58	51	65	77	42.4	92
10-Jan	50	5	8	11	Z	113	218	176	212	66	40	40	46	59	43	41	48	58	62	106	110	80	84	84	76.5	218
11-Jan	84	131	125	80	104	Z	80	91	92	36	40	20	16	25	32	46	56	68	48	46	27	21	34	44	58.5	131
12-Jan	Z	46	25	26	36	60	51	80	122	86	62	53	49	57	32	46	54	64	56	49	26	19	19	37	50.1	122
13-Jan	48	Z	30	60	33	16	8	5	8	7	24	8	20	18	9	19	13	16	17	16	8	11	18	21	18.8	60
14-Jan	11	16	Z	30	54	36	30	14	5	4	2	3	3	3	3	4	3	2	2	2	1	1	3	6	10.4	54
15-Jan	7	7	4	Z	6	5	9	10	5	15	22	20	12	13	15	12	11	10	13	8	3	9	14	10	10.5	22
16-Jan	18	18	15	22	Z	18	22	21	21	14	22	30	36	28	86	51	13	7	4	3	4	4	3	2	20.0	86
17-Jan	2	2	2	2	1	Z	7	5	3	8	16	6	5	4	5	7	10	8	9	15	38	52	51	24	12.2	52
18-Jan	Z	33	35	38	37	38	46	70	36	47	36	30	43	34	36	63	71	47	47	29	42	28	74	61	44.4	74
19-Jan	63	Z	98	75	53	26	54	112	113	73	39	31	23	21	39	46	37	10	16	11	18	12	16	11	43.4	113
20-Jan	14	16	Z	12	8	10	8	12	8	7	9	10	19	58	102	68	69	116	48	47	23	19	19	29	31.8	116
21-Jan	32	24	34	Z	60	42	41	23	12	12	10	14	23	13	10	11	5	4	5	14	14	60	48	25	23.3	60
22-Jan	50	41	34	32	Z	127	94	25	4	5	6	3	4	5	3	4	3	3	1	1	6	3	1	0	19.7	127
23-Jan	1	3	4	3	8	Z	15	19	23	26	35	44	25	25	24	36	76	136	131	167	209	161	223	79	63.9	223
24-Jan	Z	64	19	19	24	13	20	29	46	44	18	6	6	4	4	6	10	7	5	9	6	11	23	64	19.9	64
25-Jan	30	Z	22	14	7	5	4	5	10	5	2	2	5	3	2	4	19	18	14	20	10	9	28	47	12.3	47
26-Jan	100	56	Z	89	46	23	26	24	12	18	26	38	43	62	24	80	141	14	3	1	1	3	1	1	36.3	141
27-Jan	2	1	1	Z	1	0	1	3	2	6	3	5	6	5	4	3	2	4	5	4	8	9	4	7	3.7	9
28-Jan	8	7	6	8	Z	9	19	7	5	7	7	7	7	12	17	22	20	23	33	27	7	11	11	23	13.2	33
29-Jan	35	31	28	31	37	Z	28	C	C	C	C	C	C	29	24	20	20	16	35	44	19	8	10	9	--	44
30-Jan	Z	5	4	3	3	4	3	1	2	3	2	1	1	1	1	1	1	2	2	9	12	12	23	20	5.1	23
31-Jan	16	Z	43	43	58	62	57	71	68	78	46	38	37	28	45	37	36	43	72	70	50	44	48	27	48.6	78
	36.6	33.4	32.0	31.8	31.5	30.8	34.4	34.9	35.4	28.4	25.9	24.0	22.5	25.2	27.4	32.4	38.1	34.9	33.8	34.6	33.5	30.7	37.9	32.8	Diurnal Average	
	129	131	127	89	104	127	218	176	212	86	73	103	83	93	133	144	176	209	191	167	209	161	223	124	Diurnal Maximum	

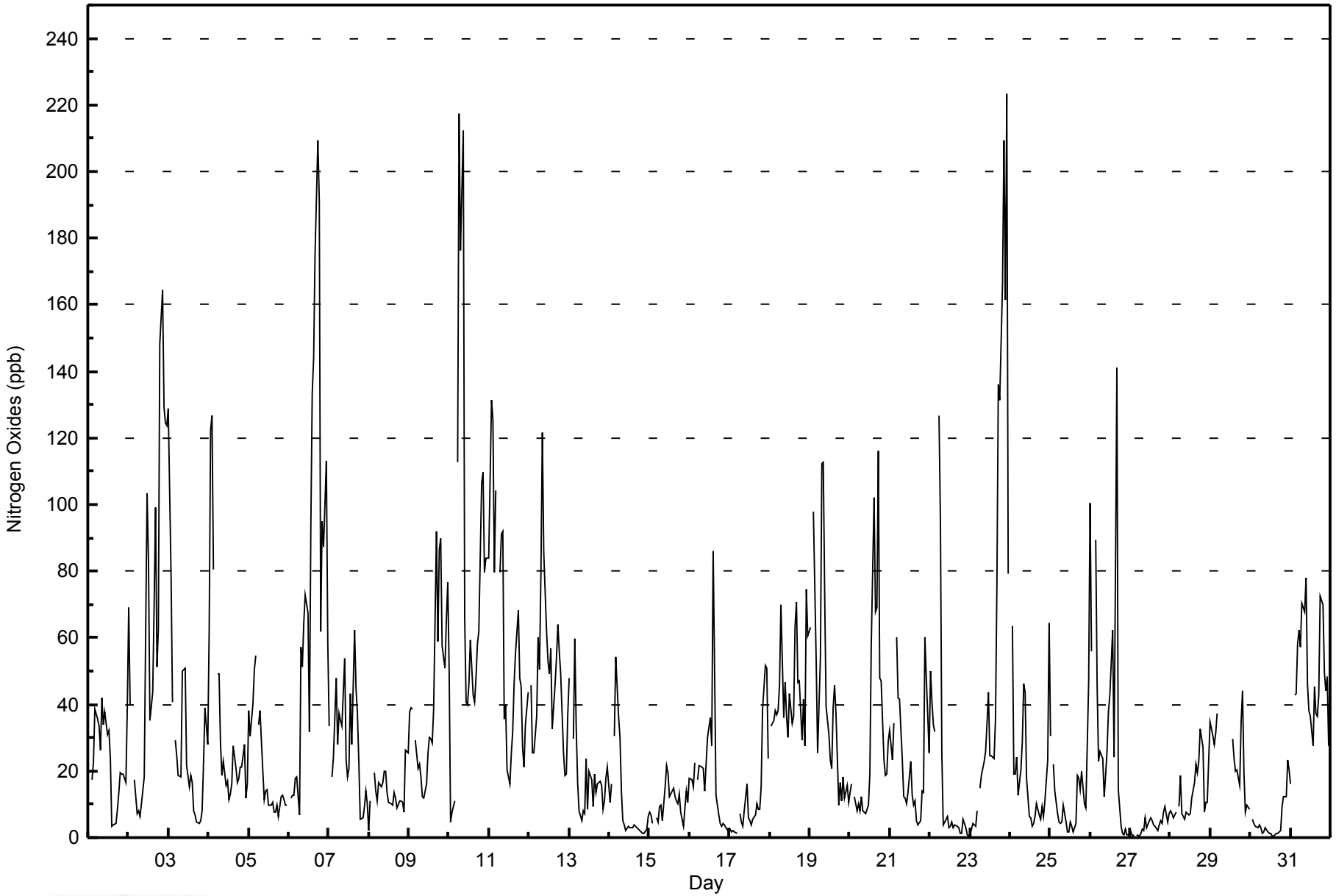
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	361	51.06	51.06
21 - 40	159	22.49	73.55
11 - 80	130	18.39	91.94
81 - 159	45	6.36	98.30
> 159	11	1.56	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	100	41	6	3	0	5	25	21	6	15	11	21	29	22	22	29	356
21 - 40	10	4	4	0	1	2	26	39	27	17	2	1	2	3	12	6	156
11 - 80	5	2	1	1	2	1	29	28	22	9	9	1	1	2	7	6	126
81 - 159	4	1	2	0	1	0	12	6	4	6	1	0	0	3	2	2	44
> 159	0	0	0	0	0	0	2	3	2	0	0	0	0	0	1	0	8
Totals	119	48	13	4	4	8	94	97	61	47	23	23	32	30	44	43	690

Total Number of Valid Hours: 691

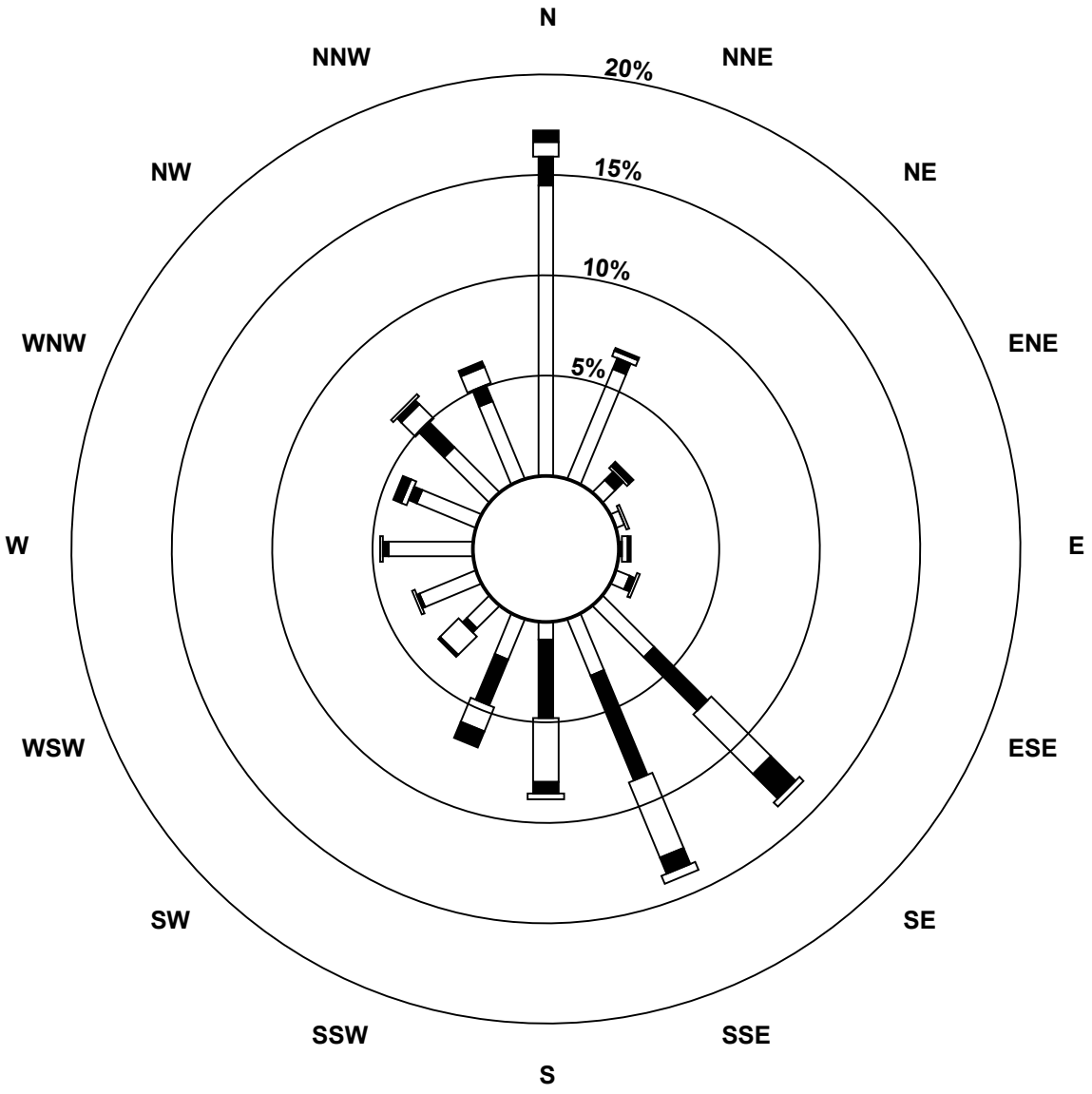
Total Number of Hours: 744

Wood Buffalo Environmental Association

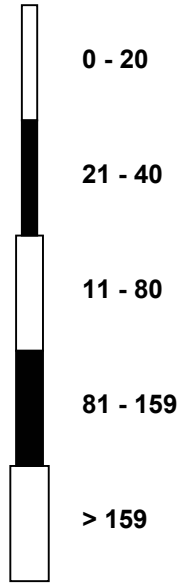
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Millennium (AMS 12)



Classes (ppb)



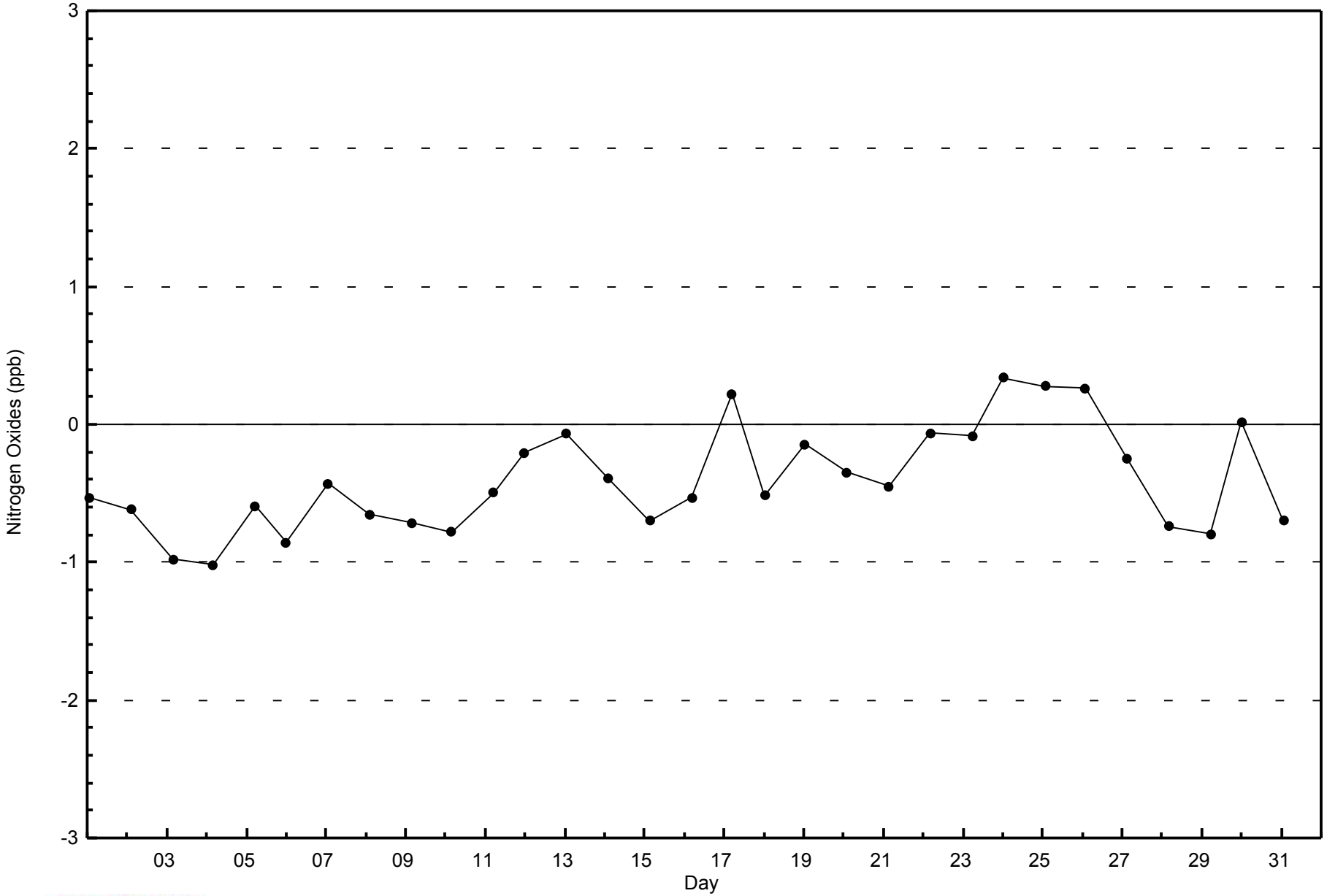
Total Number of Valid Hours: 691

Wood Buffalo Environmental Association

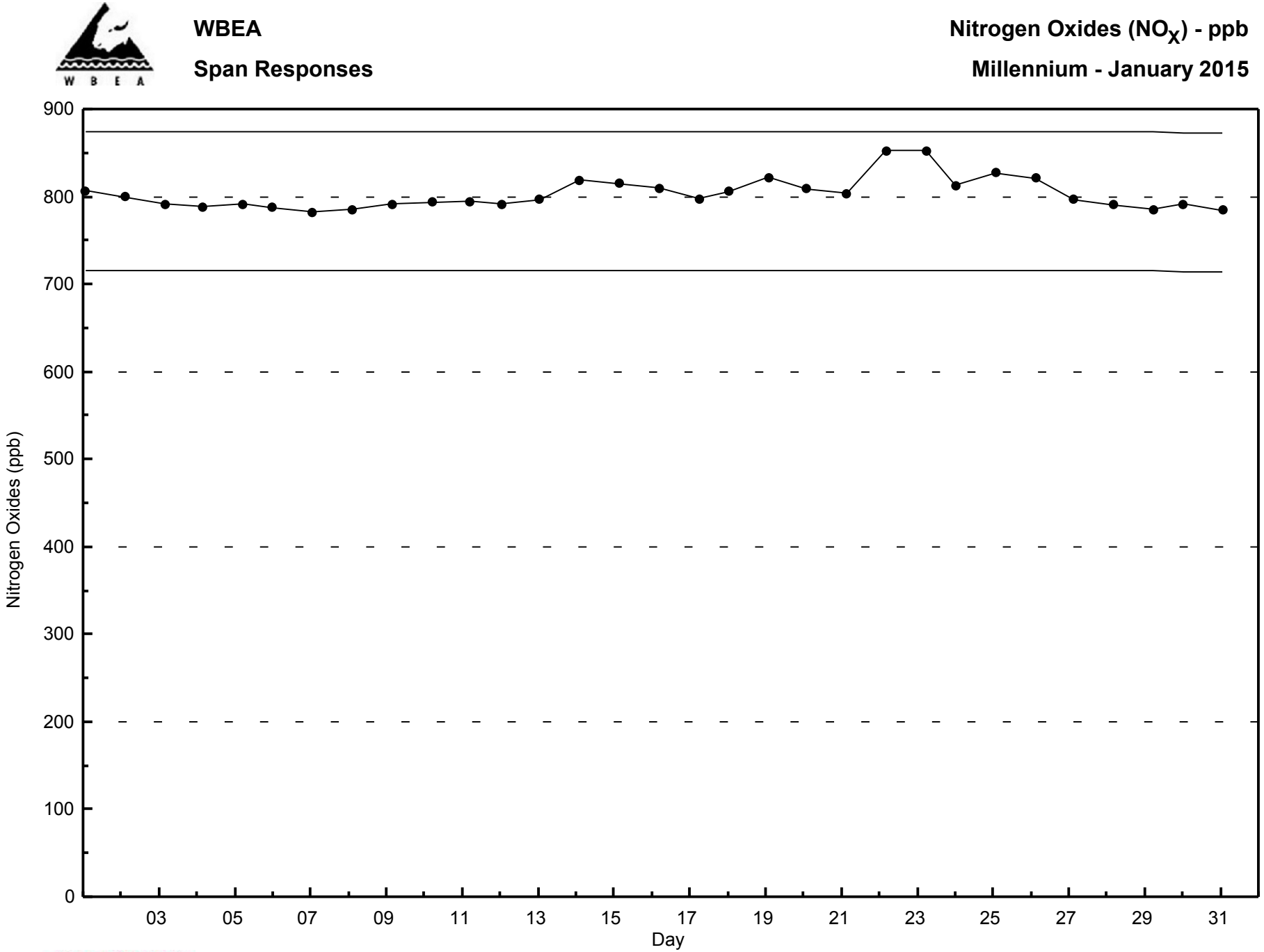
Zero Responses

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2015



AURORA ATMOSPHERICS INC.


WBEA
Span Responses
Nitrogen Oxides (NO_X) - ppb
Millennium - January 2015
Nitrogen Oxides (ppb)
900
800
700
600
500
400
300
200
100
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Millennium - January 2015

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

Maximum Value: 38.4 $\mu g/m^3$ on Jan 23 12:00

Maximum Daily Average: 20.1 $\mu g/m^3$ on Jan 23

Minimum Value: 0.1 $\mu g/m^3$ on Jan 22 09:00

Minimum Daily Average: 1.1 $\mu g/m^3$ on Jan 22

Maximum Diurnal Average: 7.3 $\mu g/m^3$ at hour 23

Minimum Diurnal Average: 5.8 $\mu g/m^3$ at hour 2

Monthly Average: 6.49 $\mu g/m^3$

Percentiles: $P_1 = 0.2$ $P_{10} = 2.3$ $Q_1 = 3.6$ Median = 5.2 $Q_3 = 8.2$ $P_{90} = 12.2$ $P_{99} = 30.2$

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	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-Jan	2.6	3.7	4.1	4.3	4.0	3.9	4.2	5.0	4.2	3.8	4.6	5.2	5.7	4.6	3.8	5.5	5.2	5.3	5.0	5.1	5.6	5.7	5.4	5.9	4.7	5.9
2-Jan	5.8	5.9	7.6	6.4	7.1	9.6	9.9	5.8	4.3	5.2	7.1	9.3	9.3	5.8	7.1	9.7	9.1	6.0	8.2	13.9	13.7	10.5	15.3	13.7	8.6	15.3
3-Jan	13.8	10.6	8.5	7.2	8.8	9.4	9.0	8.0	13.4	12.8	10.8	6.0	6.1	6.3	8.5	19.1	10.2	8.9	8.3	7.6	7.0	8.9	9.6	8.4	9.5	19.1
4-Jan	10.1	12.7	13.3	9.8	7.9	7.5	6.5	5.7	4.9	5.5	4.9	4.7	4.1	4.1	3.7	3.7	3.5	3.0	2.9	3.3	3.5	3.9	3.5	3.7	5.7	13.3
5-Jan	4.4	4.4	4.4	4.7	4.9	3.6	4.2	4.6	3.1	3.6	4.1	4.2	4.1	5.0	4.4	3.8	2.5	2.8	2.6	2.6	3.1	3.8	3.9	6.8	4.0	6.8
6-Jan	9.0	9.7	13.6	10.9	10.6	10.9	10.3	14.7	16.4	14.1	14.4	12.2	8.3	10.4	12.4	13.4	12.1	13.3	12.1	7.7	7.4	9.2	9.0	6.6	11.2	16.4
7-Jan	5.4	4.9	4.4	16.4	11.2	7.9	7.9	7.6	7.3	6.6	4.5	3.1	2.7	3.7	3.7	5.3	5.4	6.4	7.2	4.5	3.2	4.3	5.6	6.1	6.0	16.4
8-Jan	12.5	8.6	6.0	8.6	8.0	6.7	18.7	14.7	8.3	5.7	7.0	9.7	6.9	5.8	6.0	9.5	4.6	3.4	3.9	3.9	4.4	4.1	4.9	5.0	7.4	18.7
9-Jan	4.9	4.0	3.7	3.8	3.7	3.3	3.4	2.9	2.7	2.8	2.8	2.6	2.6	2.6	2.6	2.6	5.7	11.7	21.3	13.3	9.1	7.1	13.2	11.9	6.0	21.3
10-Jan	8.3	4.7	5.9	6.4	5.3	12.3	15.8	14.6	15.8	8.2	12.9	16.6	18.2	14.6	6.9	11.9	9.7	9.6	9.1	10.2	17.9	13.1	21.3	15.5	11.9	21.3
11-Jan	12.2	12.2	17.2	11.3	11.8	9.2	9.2	8.2	10.2	5.6	5.3	5.4	5.8	6.1	6.9	22.3	16.0	12.3	10.7	8.1	7.7	7.4	8.7	12.3	10.1	22.3
12-Jan	12.6	9.5	7.1	7.9	9.7	11.1	9.5	9.8	11.4	11.7	13.0	11.3	11.1	10.6	8.3	8.9	10.7	12.4	11.5	10.9	10.4	10.8	10.4	11.0	10.5	13.0
13-Jan	10.9	8.3	8.3	10.8	9.6	6.2	4.9	4.0	3.6	3.7	4.3	5.1	5.4	4.8	3.8	3.2	3.5	3.4	2.8	2.6	2.5	2.8	2.5	2.4	5.0	10.9
14-Jan	2.5	2.9	4.2	4.7	5.9	4.2	5.3	4.9	3.3	2.4	2.5	2.9	2.7	2.7	3.0	3.5	3.3	4.9	7.8	5.2	3.1	3.9	4.2	4.7	3.9	7.8
15-Jan	5.2	4.6	5.9	7.7	6.9	7.6	7.5	8.2	7.8	6.3	5.6	4.4	3.6	2.7	2.8	2.6	2.8	3.2	3.6	3.7	3.2	3.2	3.9	3.7	4.9	8.2
16-Jan	4.5	5.1	4.9	4.9	4.8	4.2	4.8	5.0	5.3	5.5	6.4	7.4	7.8	7.0	8.9	5.0	2.8	1.7	2.3	UO	UO	UO	UO	UO	5.2	8.9
17-Jan	UO	1.2	1.2	1.2	1.1	1.1	1.5	1.9	2.1	2.4	2.7	2.6	2.5	2.9	3.6	3.8	3.3	4.3	4.4	5.0	5.3	3.5	3.9	5.5	2.9	5.5
18-Jan	5.4	4.5	4.9	4.5	4.0	4.0	4.1	4.4	4.0	4.0	3.8	3.8	3.4	3.3	2.7	3.9	5.4	6.1	6.1	6.6	4.8	4.1	7.2	6.2	4.6	7.2
19-Jan	5.8	6.7	8.9	7.2	6.5	5.6	10.5	18.5	20.9	28.6	15.4	5.4	5.4	6.3	7.6	7.0	5.8	4.5	4.3	4.0	4.8	8.8	8.1	7.3	8.9	28.6
20-Jan	7.0	6.3	5.1	4.9	4.4	4.5	3.9	4.1	3.9	3.8	3.8	4.1	5.0	7.8	10.2	7.1	11.0	15.2	10.7	8.7	7.2	5.9	5.6	5.1	6.5	15.2
21-Jan	5.0	4.1	5.4	6.1	5.9	4.5	4.1	3.3	2.9	2.9	M	3.5	3.9	2.3	1.9	1.8	1.3	1.1	1.1	1.5	1.4	2.9	2.2	1.5	3.1	6.1
22-Jan	2.1	1.6	2.0	1.3	2.7	4.2	3.4	1.0	0.1	0.3	0.4	0.1	0.8	0.5	0.3	0.2	0.2	0.2	0.1	0.2	1.0	1.2	1.2	1.9	1.1	4.2
23-Jan	2.2	4.2	5.4	6.0	9.1	10.7	11.6	13.7	16.2	20.8	30.5	38.4	30.3	35.2	32.8	31.7	33.5	28.0	23.5	20.8	23.2	19.6	25.8	9.3	20.1	38.4
24-Jan	7.3	4.4	2.1	1.6	2.2	1.9	3.8	3.7	7.3	9.5	3.3	1.1	0.5	0.1	0.2	0.4	0.7	0.8	0.8	1.1	1.1	1.4	2.5	3.6	2.6	9.5
25-Jan	1.9	1.6	2.0	2.0	1.1	0.8	0.7	0.8	1.1	1.0	0.7	0.5	0.5	0.3	0.4	0.6	3.3	2.7	1.5	2.4	2.4	3.2	5.9	7.5	1.9	7.5
26-Jan	8.4	4.9	3.6	4.0	2.6	2.0	2.6	3.2	3.5	3.9	4.0	4.2	3.9	4.1	2.3	5.5	9.5	3.0	3.5	3.6	3.4	3.6	3.8	3.2	4.0	9.5
27-Jan	3.2	3.7	4.2	4.7	4.7	4.9	5.2	5.4	5.2	6.0	5.8	6.0	5.8	5.7	5.1	5.1	5.2	5.6	5.1	5.6	5.4	5.3	5.0	5.2	5.1	6.0
28-Jan	5.3	4.9	4.8	4.9	5.8	5.9	5.6	4.7	4.7	4.8	4.8	5.0	5.2	5.4	7.0	8.2	7.4	5.5	5.6	5.4	4.4	4.3	4.1	5.0	5.4	8.2
29-Jan	5.6	5.5	5.1	5.4	6.2	6.1	6.1	7.2	9.2	7.5	5.9	5.5	5.0	4.8	4.2	4.6	4.5	4.9	5.9	6.1	5.1	5.1	5.6	6.1	5.7	9.2
30-Jan	5.3	4.6	4.3	4.9	5.3	5.0	3.9	3.6	3.2	3.4	3.4	3.2	3.3	3.2	3.0	3.1	3.8	4.8	5.2	5.7	5.5	6.2	9.0	6.7	4.6	9.0
31-Jan	7.4	9.6	12.5	14.4	18.9	15.3	10.9	12.1	16.1	10.1	8.4	7.1	6.8	6.3	7.0	6.7	7.8	7.7	9.6	8.3	7.7	9.5	8.6	8.1	9.9	18.9
	6.5	5.8	6.1	6.4	6.5	6.3	6.7	6.8	7.2	6.9	6.8	6.5	6.0	6.0	5.8	7.1	6.8	6.5	6.7	6.3	6.1	6.1	7.3	6.7	Diurnal Average	
	13.8	12.7	17.2	16.4	18.9	15.3	18.7	18.5	20.9	28.6	30.5	38.4	30.3	35.2	32.8	31.7	33.5	28.0	23.5	20.8	23.2	19.6	25.8	15.5	Diurnal Maximum	

M - Maintenance UO - Unstable Operation

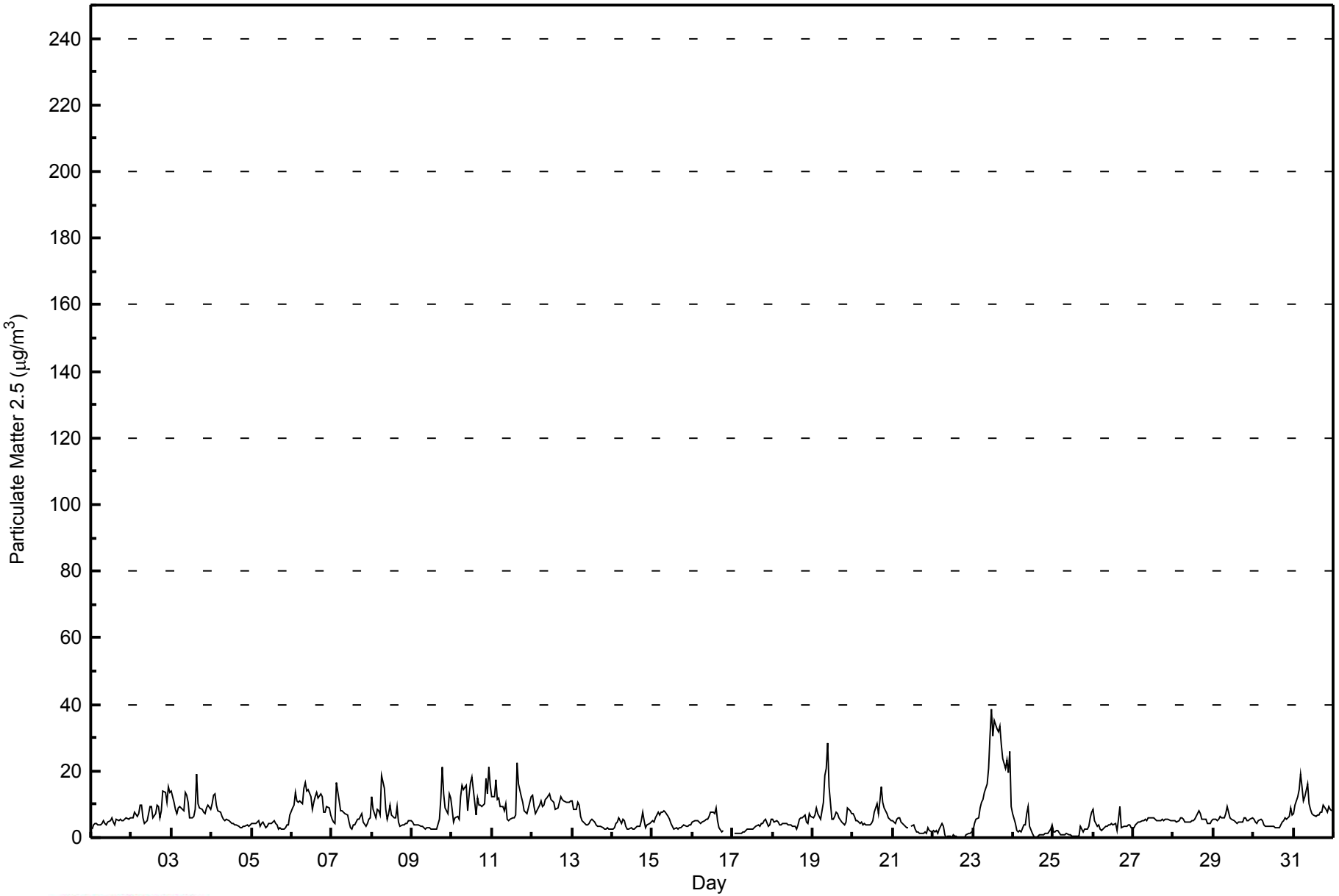
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Millennium - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	374	50.75	50.75
6 - 15	298	40.43	91.18
16 - 25	25	3.39	94.57
26 - 80	10	1.36	95.93
> 81.0	0	0.00	95.93

Total Number of Valid Hours: 737

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Millennium - January 2015

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**
1 - 5	91	25	8	3	1	8	63	45	26	24	10	6	11	7	17	23	368
6 - 15	31	25	6	1	2	1	42	47	39	17	9	6	6	16	24	20	292
16 - 25	0	0	0	0	0	0	0	4	2	6	3	0	1	2	2	1	21
26 - 80	1	1	0	0	1	0	1	1	1	0	0	0	0	1	2	1	10
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	123	51	14	4	4	9	106	97	68	47	22	12	18	26	45	45	691

Total Number of Valid Hours: 721

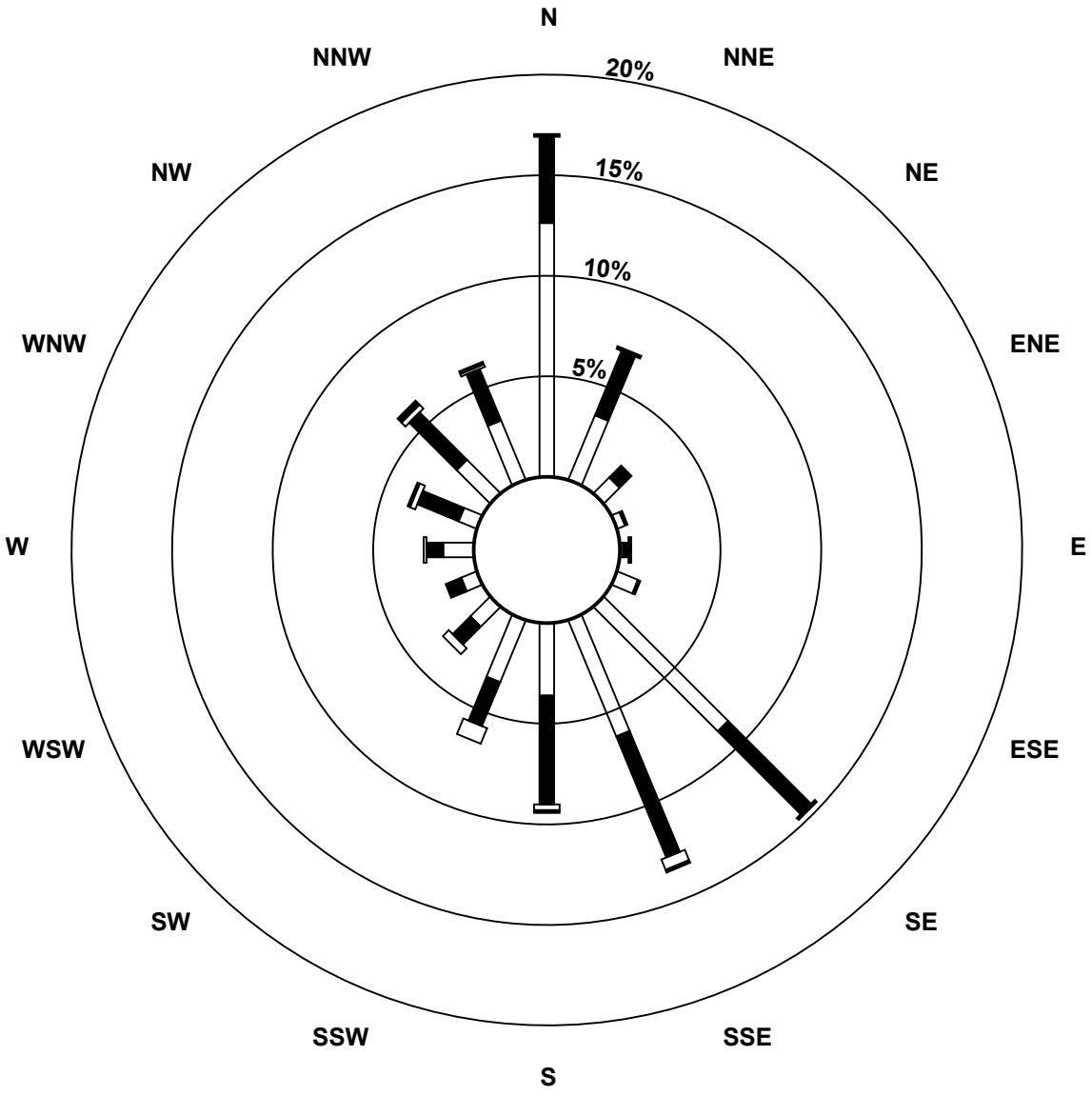
Total Number of Hours: 744

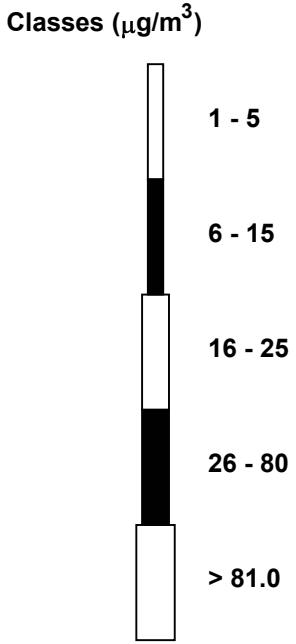
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Millennium (AMS 12)





Total Number of Valid Hours: 721

Maximum Value: 7.2 C on Jan 22 19:00

Maximum Daily Average: 3.7 C on Jan 22

Minimum Value: -31.7 C on Jan 31 09:00

Minimum Daily Average: -26.9 C on Jan 3

Maximum Diurnal Average: -11.8 C at hour 15

Minimum Diurnal Average: -15.8 C at hour 9

Monthly Average: -14.26 C

Percentiles: P_1 = -30.0 P_{10} = -26.2 Q_1 = -21.6 Median = -16.0 Q_3 = -7.7 P_{90} = 0.8 P_{99} = 6.2

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

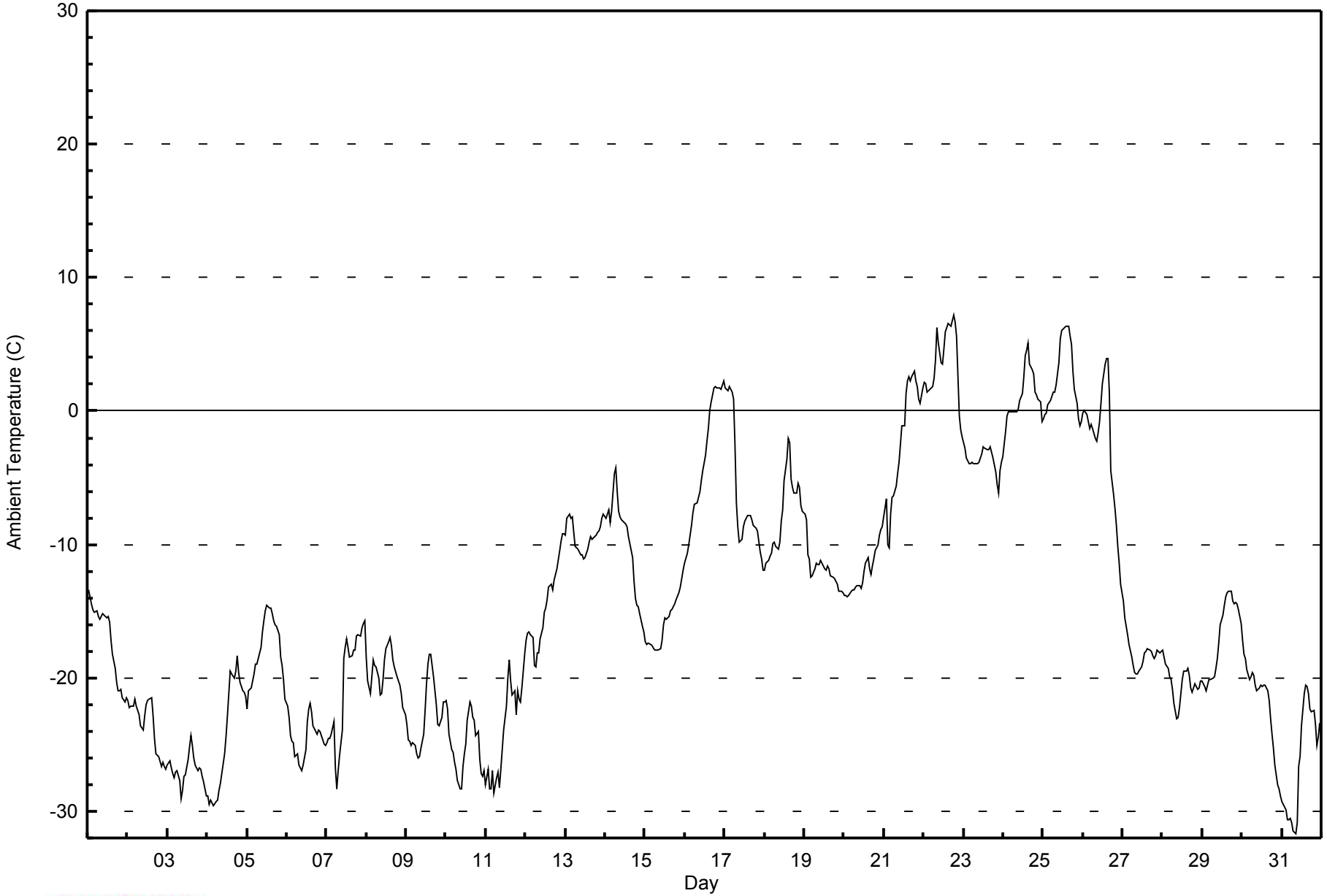
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-13.4	-13.9	-14.5	-14.9	-15.1	-15.0	-15.4	-15.6	-15.4	-15.2	-15.3	-15.5	-15.4	-15.8	-17.2	-18.2	-19.2	-20.4	-21.0	-20.9	-20.8	-21.5	-21.8	-21.5	-17.2	-13.4
2-Jan	-21.7	-22.2	-22.1	-22.1	-21.6	-22.1	-22.5	-22.7	-23.6	-23.9	-22.9	-22.1	-21.8	-21.6	-21.5	-22.8	-24.5	-25.7	-25.8	-25.9	-26.6	-26.3	-26.6	-26.9	-23.6	-21.5
3-Jan	-26.6	-26.2	-26.7	-27.1	-27.5	-27.1	-26.9	-27.7	-29.1	-28.4	-27.4	-27.3	-26.2	-25.2	-24.3	-25.0	-26.0	-26.6	-26.9	-26.7	-26.8	-27.3	-27.8	-28.9	-26.9	-24.3
4-Jan	-28.9	-29.5	-29.2	-29.4	-29.6	-29.2	-29.2	-28.4	-27.9	-27.2	-25.7	-24.4	-22.8	-21.2	-19.5	-19.8	-20.0	-19.5	-18.3	-19.6	-20.4	-21.0	-21.1	-21.4	-24.3	-18.3
5-Jan	-22.3	-20.9	-20.8	-20.3	-19.7	-19.0	-19.0	-18.5	-17.7	-16.6	-15.7	-15.0	-14.5	-14.8	-14.7	-15.2	-15.7	-16.0	-16.1	-16.7	-18.5	-19.0	-20.1	-21.6	-17.9	-14.5
6-Jan	-22.2	-23.0	-24.4	-24.8	-24.9	-25.9	-25.7	-26.5	-26.7	-27.0	-26.5	-25.4	-23.3	-22.4	-21.9	-22.5	-23.6	-24.0	-24.2	-23.9	-24.1	-24.3	-24.9	-25.0	-24.5	-21.9
7-Jan	-24.9	-24.6	-24.5	-24.3	-23.3	-26.7	-28.3	-27.0	-25.8	-23.9	-18.5	-17.7	-17.1	-17.7	-18.4	-18.4	-17.9	-17.9	-16.9	-16.8	-16.8	-16.2	-15.9	-15.7	-20.6	-15.7
8-Jan	-18.4	-20.2	-21.2	-19.9	-18.6	-19.1	-19.1	-20.0	-21.2	-21.2	-20.1	-18.6	-17.8	-17.3	-17.0	-17.6	-18.6	-19.2	-19.9	-20.2	-20.5	-21.2	-22.2	-22.8	-19.7	-17.0
9-Jan	-23.5	-24.6	-24.7	-25.1	-24.8	-25.1	-25.7	-26.0	-25.9	-25.3	-24.2	-22.5	-20.4	-19.0	-18.3	-18.3	-20.0	-21.0	-22.0	-23.5	-23.5	-23.0	-21.9	-21.8	-22.9	-18.3
10-Jan	-21.7	-22.3	-24.2	-25.4	-25.6	-26.4	-26.8	-27.7	-28.3	-28.3	-26.7	-25.7	-25.0	-23.2	-21.8	-22.2	-23.0	-23.2	-24.3	-24.0	-26.1	-27.2	-27.4	-27.0	-25.1	-21.7
11-Jan	-28.0	-26.8	-28.4	-28.4	-26.9	-28.6	-27.5	-27.1	-28.2	-26.8	-25.3	-24.0	-22.2	-20.0	-18.7	-20.2	-21.3	-21.0	-22.7	-21.0	-21.6	-21.8	-20.8	-18.2	-24.0	-18.2
12-Jan	-17.1	-16.7	-16.5	-16.7	-17.0	-19.1	-19.2	-18.2	-18.2	-17.1	-16.3	-15.1	-14.7	-14.1	-13.2	-13.0	-13.4	-12.7	-12.3	-11.8	-10.5	-9.8	-9.2	-9.2	-14.6	-9.2
13-Jan	-9.3	-8.1	-7.7	-8.1	-7.9	-9.1	-10.1	-10.3	-10.5	-10.8	-10.8	-11.1	-10.9	-10.3	-9.9	-9.4	-9.6	-9.6	-9.3	-9.1	-9.0	-8.6	-8.1	-7.7	-9.4	-7.7
14-Jan	-8.0	-7.7	-7.4	-8.4	-7.5	-4.7	-4.3	-6.0	-7.5	-7.9	-8.1	-8.4	-8.5	-8.6	-9.4	-10.0	-11.0	-12.8	-14.0	-14.6	-14.7	-15.2	-16.1	-16.6	-9.9	-4.3
15-Jan	-17.3	-17.5	-17.4	-17.5	-17.7	-17.8	-17.9	-17.9	-17.9	-17.8	-17.2	-16.0	-15.5	-15.6	-15.4	-15.0	-14.8	-14.7	-14.5	-14.2	-13.6	-13.1	-12.5	-11.9	-15.9	-11.9
16-Jan	-11.4	-10.7	-10.0	-9.3	-8.6	-7.6	-7.0	-6.9	-6.5	-6.0	-5.2	-4.5	-3.3	-2.3	-1.3	0.1	0.7	1.7	1.9	1.7	1.7	1.8	1.7	2.2	-3.6	2.2
17-Jan	1.8	1.6	1.5	1.8	1.4	0.8	-2.6	-6.9	-8.6	-9.8	-9.7	-8.7	-8.2	-8.1	-7.8	-7.8	-8.1	-8.6	-8.7	-8.8	-9.0	-10.5	-11.1	-11.9	-6.1	1.8
18-Jan	-11.9	-11.4	-11.2	-10.9	-10.7	-9.9	-9.8	-10.1	-10.3	-9.8	-8.2	-7.4	-5.2	-3.6	-2.0	-2.3	-5.1	-5.7	-6.1	-6.2	-5.4	-5.8	-7.1	-7.6	-7.7	-2.0
19-Jan	-7.7	-8.2	-10.8	-11.1	-12.4	-12.4	-11.8	-11.5	-11.5	-11.5	-11.2	-11.6	-11.8	-11.9	-11.6	-11.8	-12.3	-12.5	-12.6	-12.8	-13.0	-13.5	-13.5	-13.6	-11.8	-7.7
20-Jan	-13.8	-13.8	-13.9	-13.8	-13.6	-13.4	-13.4	-13.2	-13.1	-13.1	-13.2	-12.9	-12.0	-11.4	-11.0	-11.8	-12.3	-11.6	-11.1	-10.5	-10.0	-9.3	-8.9	-8.7	-12.1	-8.7
21-Jan	-7.9	-6.6	-10.0	-10.3	-7.7	-6.5	-6.3	-5.7	-4.7	-3.8	-2.5	-1.1	-1.2	1.3	2.2	2.6	2.3	2.6	2.9	2.2	1.8	0.9	0.6	1.8	-2.2	2.9
22-Jan	2.2	2.1	1.4	1.5	1.7	1.8	2.5	3.9	6.3	5.1	3.6	3.5	4.7	6.0	6.2	6.6	6.4	6.8	7.2	6.7	5.6	-0.3	-1.4	-2.0	3.7	7.2
23-Jan	-2.4	-2.8	-3.5	-3.9	-4.0	-3.8	-3.9	-3.9	-3.9	-3.9	-3.6	-3.2	-2.7	-2.8	-2.9	-2.9	-2.6	-3.1	-3.5	-4.6	-5.5	-6.2	-4.4	-3.9	-3.7	-2.4
24-Jan	-3.4	-1.5	-0.4	-0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.8	1.4	2.6	4.1	4.6	5.1	3.5	3.1	2.8	1.4	1.2	0.9	0.7	-0.8	1.1	5.1
25-Jan	-0.6	-0.3	-0.2	0.5	0.8	1.1	1.4	1.4	2.0	3.6	5.4	6.0	6.1	6.2	6.4	6.3	5.6	5.0	3.0	1.7	0.6	-0.6	-1.1	-0.8	2.5	6.4
26-Jan	-0.1	0.0	-0.3	-0.7	-1.3	-1.0	-1.3	-2.0	-2.3	-1.6	-0.8	0.5	2.1	3.5	3.9	4.0	1.3	-4.5	-6.2	-7.3	-8.5	-10.2	-11.4	-13.0	-2.4	4.0
27-Jan	-14.3	-15.5	-16.1	-16.8	-17.5	-18.4	-19.1	-19.6	-19.7	-19.7	-19.5	-19.2	-18.8	-18.1	-18.0	-17.8	-18.0	-18.0	-18.3	-18.6	-18.3	-17.9	-18.1	-18.0	-18.1	-14.3
28-Jan	-17.9	-18.5	-19.0	-19.3	-19.9	-20.1	-20.8	-21.9	-23.1	-23.0	-22.2	-21.2	-20.1	-19.5	-19.5	-19.3	-19.8	-20.8	-21.1	-20.4	-20.7	-20.9	-20.7	-20.3	-20.4	-17.9
29-Jan	-20.2	-20.6	-21.0	-20.5	-20.1	-20.1	-20.1	-20.0	-19.3	-18.6	-17.3	-16.1	-15.3	-14.6	-13.9	-13.6	-13.5	-13.5	-14.3	-14.5	-14.4	-14.5	-14.9	-15.9	-16.9	-13.5
30-Jan	-17.2	-18.3	-18.6	-19.4	-20.1	-19.9	-19.6	-19.8	-20.6	-21.0	-20.8	-20.5	-20.6	-20.5	-20.6	-21.0	-21.7	-23.0	-24.2	-25.3	-26.5	-28.0	-28.3	-28.9	-21.9	-17.2
31-Jan	-29.3	-29.5	-29.9	-30.6	-30.7	-30.6	-30.8	-31.5	-31.7	-30.8	-26.7	-25.9	-23.6	-21.2	-20.6	-20.7	-21.2	-22.3	-22.6	-22.4	-23.4	-25.1	-24.4	-23.3	-26.2	-20.6
	-14.8	-14.8	-15.2	-15.3	-15.2	-15.3	-15.5	-15.7	-15.8	-15.5	-14.6	-13.8	-13.0	-12.2	-11.8	-12.0	-12.7	-13.2	-13.5	-13.8	-14.1	-14.7	-14.8	-14.9	Diurnal Average	
	2.2	2.1	1.5	1.8	1.7	1.8	2.5	3.9	6.3	5.1	5.4	6.0	6.1	6.2	6.4	6.6	6.4	6.8	7.2	6.7	5.6	1.8	1.7	2.2	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Millennium - January 2015



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ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	254	34.14	34.14
-20 - 0	404	54.30	88.44
0 - 10	86	11.56	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) - %

Millennium - January 2015

Maximum Value: 100 % on Jan 24 08:00

Maximum Daily Average: 97.2 % on Jan 23

Minimum Value: 58 % on Jan 8 15:00

Minimum Daily Average: 71.0 % on Jan 8

Maximum Diurnal Average: 83.8 % at hour 1

Minimum Diurnal Average: 77.4 % at hour 15

Monthly Average: 81.9 %

Percentiles: P_1 = 66 P_{10} = 73 Q_1 = 77 Median = 80 Q_3 = 87 P_{90} = 93 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	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-Jan	86	85	83	82	83	83	85	86	86	86	86	85	85	83	79	78	77	79	79	81	80	81	81	81	82.4	86
2-Jan	78	77	76	76	73	74	75	76	78	79	78	77	76	76	77	80	79	78	78	78	77	78	76	78	76.9	80
3-Jan	78	77	76	75	76	77	76	75	75	76	76	75	74	71	68	69	72	73	74	74	74	76	76	76	74.5	78
4-Jan	76	75	75	75	76	76	76	77	77	77	77	77	77	75	73	74	77	77	75	78	79	79	79	78	76.4	79
5-Jan	80	78	80	79	80	78	79	79	79	79	77	75	72	73	73	70	69	71	71	73	75	71	73	78	75.5	80
6-Jan	78	79	79	78	77	77	78	76	76	77	78	79	76	74	73	74	79	80	80	80	80	80	79	79	77.7	80
7-Jan	79	79	79	80	80	78	77	78	79	80	83	81	80	82	83	84	84	84	81	76	76	78	81	83	80.2	84
8-Jan	77	78	80	80	74	72	70	72	75	76	72	67	64	61	58	59	64	68	71	72	71	72	76	77	71.0	80
9-Jan	78	79	79	79	79	79	78	78	78	78	77	76	72	69	68	69	72	74	79	79	77	76	77	78	76.1	79
10-Jan	79	79	79	78	78	77	78	77	77	77	78	78	78	77	75	75	78	80	79	79	78	77	77	77	77.7	80
11-Jan	74	76	76	77	78	76	77	77	77	77	78	78	77	74	72	74	77	79	78	80	80	80	81	84	77.4	84
12-Jan	85	85	85	85	84	83	83	83	84	84	84	84	84	83	82	83	86	86	86	87	87	87	87	87	84.8	87
13-Jan	88	88	88	88	88	89	90	89	88	86	84	82	80	80	80	83	88	89	89	90	90	90	89	89	86.9	90
14-Jan	91	91	92	93	93	92	90	88	87	86	84	83	83	81	81	82	81	80	79	79	81	81	81	80	84.9	93
15-Jan	79	80	79	75	75	75	75	72	71	73	75	75	77	81	83	83	82	82	82	83	82	83	84	85	78.9	85
16-Jan	86	86	87	86	86	86	86	87	87	87	86	85	86	85	88	84	82	78	75	72	70	67	68	66	81.6	88
17-Jan	68	70	71	69	70	71	81	86	88	84	82	80	80	84	87	89	90	92	93	93	94	93	92	93	83.4	94
18-Jan	91	91	91	91	91	92	91	91	91	92	92	91	88	82	79	80	87	90	92	91	93	94	94	94	89.9	94
19-Jan	94	93	92	92	91	91	92	93	92	92	91	90	90	90	90	89	90	90	89	89	89	89	89	88	90.6	94
20-Jan	88	88	88	88	88	88	88	88	88	88	87	86	85	82	78	82	87	88	87	87	87	87	87	88	86.6	88
21-Jan	89	91	91	93	94	93	90	88	86	83	79	75	71	67	71	76	80	80	79	82	84	88	91	87	83.7	94
22-Jan	86	87	89	89	91	90	88	81	70	80	93	92	87	79	75	72	72	69	65	65	69	96	99	98	82.6	99
23-Jan	97	98	98	97	98	98	98	97	97	97	97	97	97	97	98	98	98	98	97	97	96	95	97	97	97.2	98
24-Jan	97	99	99	100	100	100	100	100	UO	UO	UO	100	97	90	88	84	85	86	85	91	86	84	84	96	92.9	100
25-Jan	94	91	91	86	95	98	99	99	97	92	82	78	78	77	77	77	78	80	89	92	94	96	98	99	89.0	99
26-Jan	99	96	93	93	94	91	91	93	94	91	87	83	78	74	68	69	83	93	95	94	93	91	88	86	88.2	99
27-Jan	84	83	82	82	82	81	81	81	82	81	81	79	78	77	77	78	79	80	81	81	81	82	83	83	80.9	84
28-Jan	84	82	82	82	83	83	82	80	80	79	78	76	76	76	77	77	78	79	79	78	76	75	75	76	78.8	84
29-Jan	77	78	78	79	79	80	80	80	81	80	81	82	81	83	83	84	83	82	87	86	86	85	84	83	81.8	87
30-Jan	82	80	80	81	79	79	77	77	77	78	77	74	70	67	67	67	68	69	70	72	74	76	77	76	74.8	82
31-Jan	76	76	75	75	75	75	75	74	74	75	77	77	78	75	72	72	76	79	80	79	80	79	80	80	76.5	80
	83.8	83.8	83.7	83.3	83.5	83.2	83.4	83.2	82.4	82.3	81.9	81.3	79.8	78.2	77.4	77.8	80.0	81.1	81.4	82.0	81.9	82.8	83.3	83.8	Diurnal Average	
	99	99	99	100	100	100	100	100	97	97	97	100	97	97	98	98	98	98	97	97	96	96	99	99	Diurnal Maximum	

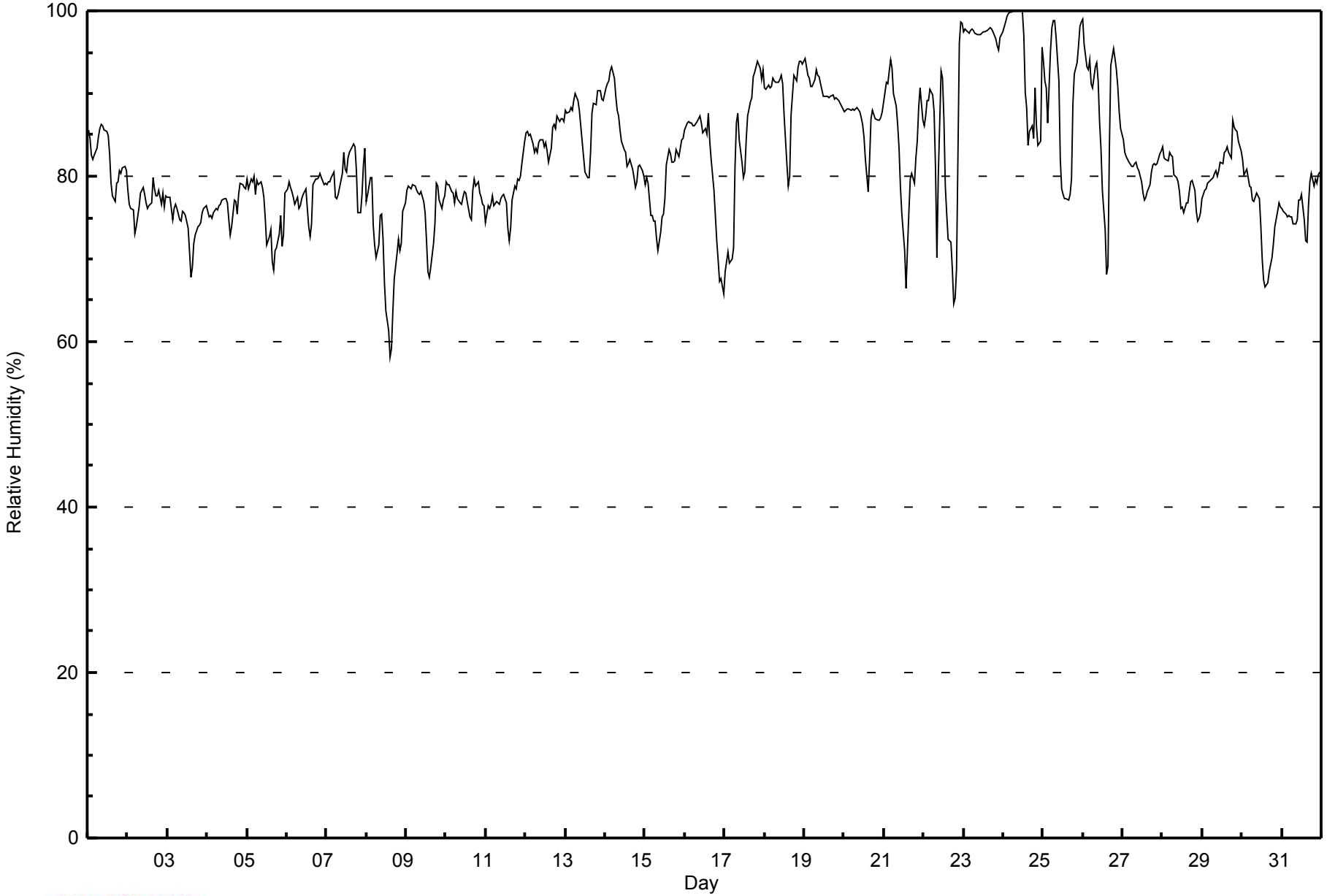
UO - Unstable Operation

WBEA

Hourly Averages

Relative Humidity (RH) - %

Millennium - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Millennium - January 2015

Maximum Speed: 23 km/h on Jan 7 20:00

Maximum Daily Speed Average: 15.6 km/h on Jan 27

Minimum Speed Value: 1 km/h on Jan 23 15:00

Minimum Daily Speed Average: 0.4 km/h on Jan 20

Maximum Diurnal Speed Average: 2.2 km/h at hour 1

Minimum Diurnal Speed Average: 0.4 km/h at hour 23

Monthly Average Velocity: 0.9 km/h 2.7 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 4 Median = 6 Q_3 = 9 P_{90} = 14 P_{99} = 20

Hours in Service: 744

Hours of Data: 728

Hours of Missing Data: 16

Percent Operational Time: 97.9

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-Jan	NNE8	NNE8	NNE9	N7	N6	N5	NNW4	N7	NNE6	N6	NNW4	NW5	NW6	N12	N21	NNE19	NNE15	NNW6	NNW5	W3	SW3	AF	NE1	NE3	N6.6	N21
2-Jan	NE7	NE9	NNE9	NNE6	NNE11	NNE10	N7	NNW3	NW2	SE1	E1	SSE2	SSW3	WSW3	WNW3	NNE6	NE6	ENE2	S2	E1	NW1	N3	WNW3	NNW3	NNE3.0	NNE11
3-Jan	WNW3	NW3	NW4	NNW5	WNW4	NNW5	NW5	WNW6	W3	NNW1	SW3	W4	WNW5	WNW6	WNW6	W6	WSW6	WSW6	WSW6	W6	SW5	SSW4	SSW5	S5	W3.6	WSW6
4-Jan	SE3	SE3	SE4	SE6	SE5	SSE4	S4	S6	S6	S7	S7	SSW9	SSW11	SSW10	S8	SSW7	SSW9	SW9	SW7	SSW8	SSW9	SSW8	SW7	SSW6	SSW6.2	SSW11
5-Jan	SSE4	S3	SSE4	SSE3	SSE3	S4	S3	SW4	W5	WNW6	W8	WNW8	WNW10	WNW10	WNW9	NW10	NNW10	NW9	NW9	NNW7	N7	N12	N8	NNE11	NW4.1	N12
6-Jan	N11	NNE7	N2	N2	NNE5	NNW1	NNW3	SW4	SW5	SW6	SSW5	SSW5	S3	SE4	SE4	SE4	SE4	SSE4	S4	SSW6	S5	SSE4	SE6	SSE5	SSE1.6	N11
7-Jan	SE6	SSE6	SSE5	SSE6	SSE7	SSW6	SSW5	SW3	SSW4	S6	SSE8	SSE8	SE9	S5	W4	NNW5	NNW5	NNW7	N20	N23	N17	NNW10	NW8	N18	N1.5	N23
8-Jan	N22	NNW7	NNW8	NW11	NW14	WNW13	WNW12	W7	W4	W9	W9	WNW11	WNW11	WNW11	WNW12	WNW10	W7	W7	WSW6	WSW8	WSW7	SW5	SSW8	SSW7	WNW7.4	N22
9-Jan	S6	SSE5	SE6	SE6	SSE6	SSE6	SSE6	SSE6	SSE6	SSE6	SE8	SE6	SSE5	SE6	SE7	E4	N7	NNW6	NW6	N5	N9	NW4	WNW3	AF	SE2.4	N9
10-Jan	N11	N13	N2	NW2	NE3	AF	SSE3	S5	SSE4	SE5	SE6	SSE5	S3	SE4	SE6	SSE4	SE5	SE5	SE2	SE4	SSW4	AF	SSW2	SSW4	SE1.8	N13
11-Jan	S2	SE3	SSW6	SE4	S4	S4	SE4	SE5	SSE4	SSE4	SE6	SSE5	SSE5	SSE5	SSE5	SSW6	S7	S5	S6	S5	S6	SSW7	S6	SSE6	SSE4.7	S7
12-Jan	SE8	SE8	SE7	SE7	SSE4	S3	ESE2	NW2	NW1	SSW3	SSW4	SW3	SSW3	S3	S3	SE5	SE7	SSE6	S4	SSE5	SSE6	SSE5	SSE5	S4	SSE3.8	SE8
13-Jan	S3	SSE3	SSW3	N6	N11	N14	N13	N6	N5	NNE8	N5	NNE9	NE8	NE8	NE4	SE5	ESE7	ESE8	SE11	SE11	SE13	SE11	SE10	SSE7	ENE3.4	N14
14-Jan	SSW8	S6	S4	SSE4	SSE3	WNW3	N10	N20	NNE16	N14	N11	N12	N10	N11	N10	N10	NNE18	NNE20	N16	N12	N11	N12	N13	NNE12	N8.9	N20
15-Jan	NNE11	NNE13	NNE16	NNE15	NNE13	NNE10	NNE10	NNE9	NNE8	NNE6	NNE2	SE4	ESE8	SE9	SE9	SE11	SE13	SE13	SE17	SE19	SE18	SE19	SE20	SE18	E7.2	SE20
16-Jan	SE19	SE17	SE15	SE15	SE17	SE15	SE11	SE12	SSE10	SSE7	S8	SSE5	S5	S3	SE4	SW4	SW6	WSW10	WSW11	WSW12	WSW15	WSW16	WSW15	W15	S6.8	SE19
17-Jan	W11	W13	W14	W14	W14	W12	NNW11	N12	N12	N12	N9	NW4	N6	N9	N7	NNW4	NNW5	N7	NW3	SW2	S3	SE6	SSE5	SSW8	NW4.7	W14
18-Jan	S5	S5	S5	S6	S6	S5	S5	S5	SSE5	SSE5	SSE5	SSE4	SE5	SE5	ESE5	SSE4	S5	S4	S5	S5	SE5	SE5	SSE4	S4	SSE4.6	S6
19-Jan	SSE4	S4	N2	NW2	NW3	NW2	NNW3	WNW3	NNW4	NNW5	N6	NW5	NW5	NW5	NW4	NW5	NNW5	N6	NNW4	NNW5	NNW6	N7	NNW5	N8	NNW3.6	NNW8
20-Jan	NNW6	NW5	NW6	NW4	NNW5	NNW5	N5	NNW4	NW4	N4	NNW3	NW2	ESE2	S4	SSE3	SE5	SE3	SSE7	SSE6	SSE5	SSE6	SSE7	SSE7	SSE6	SSE0.4	SSE7
21-Jan	SSE7	SSE6	S5	S6	SE8	SE9	SE11	SSE9	SSE8	SSE9	SSE9	SSE9	S14	SSW15	SSW14	SSW12	SSW8	SSW9	SW12	S5	SSW6	SE5	SE6	SE5	S7.7	SSW15
22-Jan	SE5	SE4	S6	SE4	ESE5	SE5	SSE5	SSW7	W13	W15	WNW12	WNW8	W6	WNW12	W14	W11	WSW7	WSW11	W15	W14	NW10	NNE15	N13	N9	W5.1	W15
23-Jan	N9	N8	N6	N6	N5	N6	NNW5	NNW4	NW3	AF	NW4	N5	WNW4	NW3	SSE1	S2	E1	NNE2	SW4	AF	AF	AF	SE4	SSE5	NNW2.6	N9
24-Jan	S4	SE6	AF	AF	AF	AF	AF	AF	AF	AF	WSW4	SW6	WSW5	W7	WSW5	W6	WNW8	WSW6	SW5	SSW5	SW4	SSW4	SSE4	SE6	----	WNW8
25-Jan	SE8	SSE7	SSE6	SSW9	SSE7	SSE9	SSE8	SSE6	S6	WSW5	W12	W10	WSW7	WSW8	W8	W7	NW7	NW6	N6	NNE9	NNE7	ENE2	SSW5	SSE4	SW2.4	W12
26-Jan	S5	SSE4	SE5	SE6	SE7	SSE8	SSE5	SE5	SE5	SSE4	S6	SSE4	SSE4	SE2	NNW3	SE2	NE3	N23	N22	N19	N19	NNE20	N20	N20	NNE4.1	N23
27-Jan	N20	N19	N18	N19	N18	N17	N17	NNE16	NNE16	NNE15	N15	NNE14	NNE13	N14	N16	N15	N15	N16	N15	N16	NNE14	N13	N12	N12	N15.6	N20
28-Jan	N11	N13	N11	NNW10	NW10	NW8	NW6	N11	NNW4	NW4	N8	N9	NW5	WNW4	N4	NNE3	NNE3	NNE6	NE5	NE7	NE8	NE7	ENE3	SE2	N5.5	N13
29-Jan	SE4	SSE4	SE5	SE6	SE8	SE7	SE7	SSE7	SE8	SE8	SE8	SE7	SE8	SE7	ESE6	ESE4	ENE4	N6	NW5	N11	N9	N12	N13	N14	E3.0	N14
30-Jan	N17	N16	NNE16	N21	N19	N12	N16	N19	NNE16	N13	N14	N16	N15	N17	N15	N14	N15	N12	N10	NNE10	N6	NNW3	NW3	NNW2	N13.1	NNE21
31-Jan	N2	WSW2	WSW2	SW1	SW5	SW6	SSW6	SSW5	SSW6	S4	SSE5	S5	SSE5	SE5	SSE4	SSE4	SSE6	SSE4	SSE5	SSE7	SSE5	S5	SSE5	SSE5	S3.8	SSE7
	NE2.2	NE1.6	NE1.1	NNE1.4	NNE1.4	N0.8	NNE1.4	N1.3	N0.8	NNW0.7	WNW0.6	WNW0.9	WSW0.9	WNW0.9	NW1.1	NW0.9	N1.2	NNW1.7	NW1.6	N1.3	N1.0	NE1.3	E0.4	NE0.9	Diurnal Average	
	N22	N19	N18	NNE21	N19	N17	N17	N20	NNE16	W15	N15	N16	N15	N17	N21	NNE19	NNE18	N23	N22	N23	N19	NNE20	N20	N20	Diurnal Maximum	

AF - Analyzer 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

Millennium - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Jan 8 00:00

Minimum Value: 0 km/h on Jan 31 00:00

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

Hours in Service:	744
Hours of Data:	728
Hours of Missing Data:	16
Hours of Calibration:	0
Percent Operational Time:	97.9

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

AF - Analyzer Failure

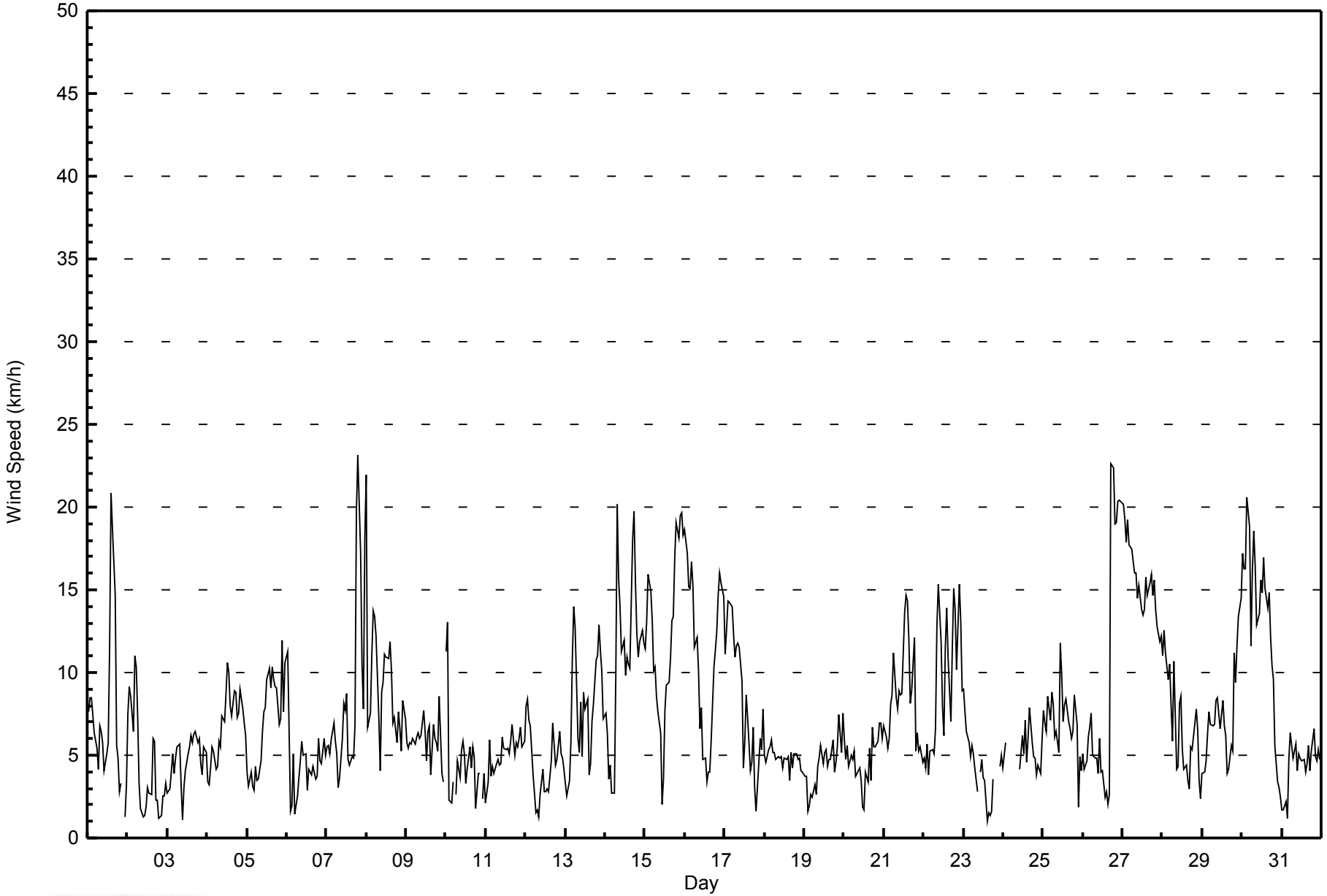
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Millennium - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	311	42.72	42.72
6 - 11	288	39.56	82.28
12 - 19	115	15.80	98.08
20 - 28	14	1.92	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 728

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Millennium - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	14	5	6	4	4	5	44	61	48	19	15	7	6	10	31	32	311
6 - 11	45	24	8	0	0	4	46	40	19	25	7	13	15	15	14	13	288
12 - 19	54	19	0	0	0	0	15	0	1	3	1	4	12	5	1	0	115
20 - 28	10	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	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	123	51	14	4	4	9	106	101	68	47	23	24	33	30	46	45	728

Total Number of Valid Hours: 728

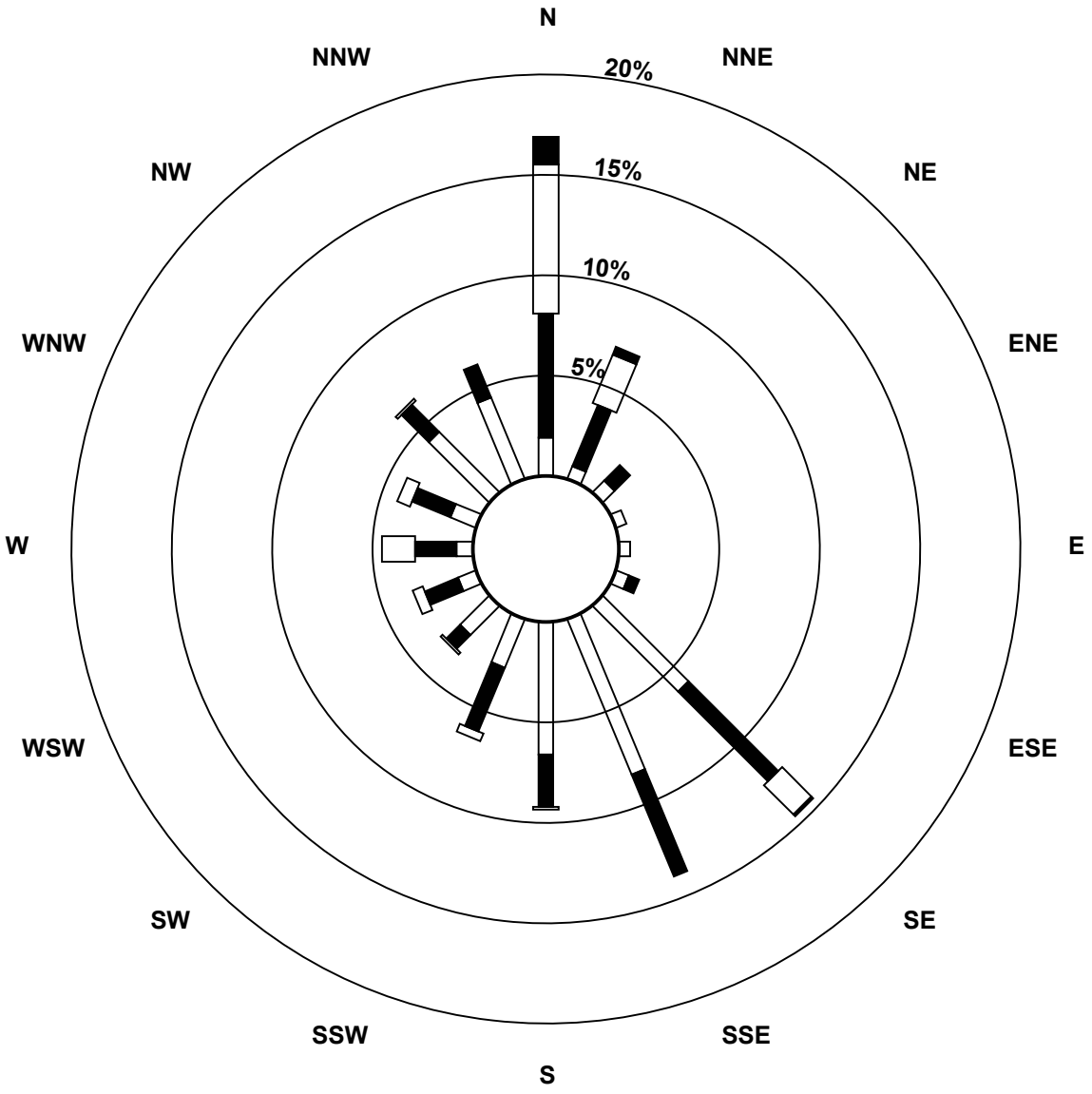
Total Number of Hours: 744

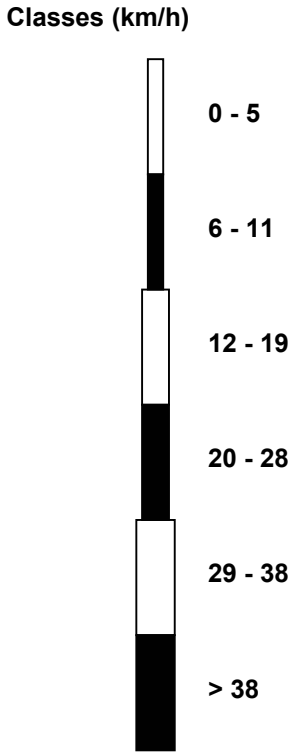
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Millennium (AMS 12)





Total Number of Valid Hours: 728

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Millennium - January 2015

Direction of Maximum Speed: 1 deg on Jan 7 20:00
Direction of Maximum Daily Speed Average: 9.1 deg on Jan 27

Direction of Minimum Speed: 155 deg on Jan 23 15:00
Direction of Minimum Daily Speed Average: 0.4 deg on Jan 20

Monthly Average Direction: 247.4 deg

Hours in Service:	744
Hours of Data:	728
Hours of Missing Data:	16
Percent Operational Time:	97.9

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-Jan	23	26	13	11	9	9	335	5	13	6	335	310	312	356	8	16	12	338	345	269	233	AF	42	47	2.8
2-Jan	40	37	28	19	17	19	1	340	308	145	83	165	197	244	289	22	46	77	186	101	312	2	289	345	18.5
3-Jan	300	309	325	346	292	331	307	290	266	339	224	259	282	282	288	261	251	245	249	266	232	200	194	188	269.6
4-Jan	144	140	130	137	141	154	169	190	176	189	182	195	200	193	189	204	212	221	219	206	204	206	214	213	191.7
5-Jan	167	174	147	164	153	190	180	220	265	282	275	294	303	294	298	314	329	323	324	341	353	357	354	12	311.5
6-Jan	7	19	4	11	22	330	329	224	222	217	205	199	170	129	141	144	134	147	174	193	171	147	129	154	158.6
7-Jan	141	153	152	149	153	202	208	219	207	175	150	149	142	181	265	330	340	337	359	1	360	332	319	2	359.6
8-Jan	8	330	327	318	310	300	299	281	276	274	276	294	291	287	291	286	268	262	251	250	254	225	209	197	289.6
9-Jan	188	153	142	146	148	166	155	148	148	163	143	145	148	143	135	98	1	335	305	355	358	316	282	AF	143.9
10-Jan	10	6	1	320	39	AF	167	183	154	143	144	167	188	138	144	151	142	140	140	135	205	AF	210	207	137.5
11-Jan	182	140	205	125	176	181	137	145	157	149	141	153	152	151	150	195	190	179	184	172	187	203	172	154	167.7
12-Jan	146	146	145	144	153	185	117	320	308	211	212	235	197	188	172	137	136	149	170	154	166	158	155	174	160.4
13-Jan	176	168	210	351	357	3	3	353	9	19	6	27	41	48	54	125	122	123	133	134	130	139	145	167	74.1
14-Jan	197	176	179	168	153	291	359	9	14	10	8	6	1	359	1	5	16	23	9	4	8	9	6	19	9.6
15-Jan	16	18	24	28	26	23	26	28	19	14	21	127	123	134	129	129	138	128	136	139	138	135	134	137	96.6
16-Jan	135	140	141	139	139	139	142	140	148	156	173	158	184	171	140	224	226	241	243	245	255	255	257	272	181.2
17-Jan	275	267	276	274	275	277	343	9	10	11	8	325	350	0	2	344	340	354	312	229	171	144	168	193	314.7
18-Jan	170	175	171	182	183	169	169	171	165	161	157	152	144	140	120	162	175	169	174	173	141	145	168	187	163.9
19-Jan	149	172	9	313	313	319	333	302	339	347	351	312	305	309	311	308	342	353	327	341	342	358	342	349	332.8
20-Jan	335	326	312	320	343	343	349	329	309	349	346	318	119	181	168	144	146	149	148	156	154	151	162	158	165.6
21-Jan	153	163	172	169	141	141	131	148	152	148	155	166	186	192	193	199	200	206	217	188	193	133	129	144	171.4
22-Jan	128	134	191	146	115	131	165	210	269	279	292	297	267	290	276	260	249	251	269	274	310	12	7	6	279.5
23-Jan	3	359	358	360	355	359	345	336	311	AF	324	354	288	310	155	180	98	29	227	AF	AF	AF	126	165	348.7
24-Jan	174	138	AF	AF	AF	AF	AF	AF	AF	AF	246	234	252	261	253	281	291	257	231	196	214	199	159	133	--
25-Jan	137	147	154	195	168	153	159	166	180	244	267	277	255	250	265	278	320	317	10	13	18	69	200	161	221.7
26-Jan	185	166	135	134	136	153	166	146	139	167	191	165	156	145	346	127	54	1	6	4	5	18	6	8	28.8
27-Jan	11	6	4	7	6	9	10	13	14	14	11	12	13	7	4	4	3	11	10	8	17	10	8	10	9.1
28-Jan	3	358	353	346	313	318	317	1	340	324	353	357	316	283	3	17	22	32	41	52	50	53	66	134	358.6
29-Jan	142	154	146	144	134	133	144	147	134	137	129	136	139	133	123	114	68	358	326	6	360	2	2	1	92.0
30-Jan	1	9	12	11	9	10	5	3	12	6	8	2	4	6	8	7	7	7	5	18	7	329	324	330	6.4
31-Jan	357	240	245	233	214	221	206	213	206	182	149	170	154	146	166	157	150	155	154	150	154	174	150	159	174.4
	41.9	53.3	35.1	31.6	31.1	10.6	13.5	8.9	3.8	338.3	296.8	292.8	246.7	281.7	321.1	321.6	1.9	341.8	317.0	354.3	0.3	37.3	82.0	53.8	
	Diurnal Average																								

AF - Analyzer 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

Millennium - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 87 deg on Jan 14 06:00

Minimum Value: 10 deg on Jan 1 04:00

Percentiles: P_1 = 10 P_{10} = 13 Q_1 = 15 Median = 20 Q_3 = 28 P_{90} = 36 P_{99} = 75

Hours in Service:	744
Hours of Data:	728
Hours of Missing Data:	16
Hours of Calibration:	0
Percent Operational Time:	97.9

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-Jan	14	12	10	10	13	11	27	12	11	14	24	28	22	23	14	13	14	26	39	38	17	AF	61	23	61
2-Jan	13	10	12	18	15	14	25	33	45	63	60	36	23	31	23	26	25	28	30	58	55	40	33	29	63
3-Jan	35	43	37	38	30	25	23	22	26	61	36	28	29	32	28	29	19	18	20	20	23	15	14	25	61
4-Jan	22	29	13	12	12	22	23	22	18	17	16	18	17	17	15	14	13	17	23	18	12	17	25	26	29
5-Jan	30	27	16	20	32	18	16	26	31	22	21	30	30	30	29	30	29	31	36	32	26	24	31	12	36
6-Jan	11	16	60	56	16	42	37	16	11	16	14	17	28	19	28	17	14	17	23	11	16	24	13	17	60
7-Jan	16	16	14	14	17	20	22	22	47	29	20	19	16	33	35	19	29	32	22	17	19	30	33	26	47
8-Jan	17	33	32	27	25	23	29	25	27	22	20	28	28	25	25	25	27	25	19	23	21	23	10	15	33
9-Jan	17	25	14	11	13	15	16	12	13	15	14	15	19	18	15	44	13	22	24	27	20	34	24	AF	44
10-Jan	15	13	84	22	28	AF	38	34	17	14	16	18	27	26	20	15	13	13	63	21	20	AF	58	17	84
11-Jan	46	20	20	45	25	21	12	20	20	14	17	17	17	16	14	21	18	19	20	18	15	14	17	10	46
12-Jan	13	12	13	11	12	26	42	55	84	37	24	30	23	23	22	15	14	16	14	12	17	18	17	22	84
13-Jan	42	48	33	32	17	16	18	28	36	24	29	17	14	14	33	23	20	19	17	17	17	18	17	24	48
14-Jan	19	24	48	47	76	87	24	16	12	12	13	13	14	15	15	13	13	13	15	15	14	11	15	14	87
15-Jan	14	14	14	13	13	14	14	15	13	13	78	31	23	18	18	17	17	17	17	17	17	17	17	17	78
16-Jan	17	17	17	17	17	16	16	15	17	15	19	27	37	26	32	43	29	27	29	29	28	26	28	28	43
17-Jan	30	27	26	26	27	27	32	10	12	11	12	34	28	14	15	23	27	16	31	43	31	23	20	17	43
18-Jan	15	22	25	16	12	17	16	14	15	13	14	19	20	17	14	47	22	23	22	37	16	17	25	35	47
19-Jan	19	36	71	44	29	30	30	22	25	21	23	24	27	28	29	22	31	25	30	31	32	17	27	23	71
20-Jan	30	37	27	32	30	29	23	36	31	31	32	60	66	16	16	20	67	23	14	16	15	14	18	16	67
21-Jan	21	16	21	17	13	15	15	17	15	14	16	19	18	18	18	18	31	21	18	30	20	20	17	24	31
22-Jan	26	21	24	20	29	17	34	31	33	27	30	32	36	38	28	30	38	31	27	26	43	12	14	18	43
23-Jan	15	17	14	13	16	28	29	33	47	AF	33	22	38	40	82	74	38	67	25	AF	AF	AF	23	33	82
24-Jan	32	18	AF	AF	AF	AF	AF	AF	AF	AF	28	24	31	24	26	28	20	24	23	14	20	29	27	11	32
25-Jan	13	15	21	18	19	18	17	25	25	59	30	31	32	28	25	28	28	31	14	12	13	64	17	30	64
26-Jan	21	28	22	14	12	21	24	15	20	18	26	41	30	41	47	59	53	19	16	16	15	16	16	14	59
27-Jan	15	15	17	15	13	14	11	12	14	13	12	13	14	14	14	14	15	13	14	13	13	12	14	12	17
28-Jan	14	15	19	23	21	22	29	15	29	38	22	20	40	41	20	16	23	15	18	15	11	18	24	45	45
29-Jan	22	26	17	17	17	17	18	18	19	18	22	22	18	18	23	32	43	31	23	13	16	15	18	15	43
30-Jan	17	12	14	13	14	14	18	18	15	14	14	15	14	14	16	14	15	14	15	12	14	27	22	16	27
31-Jan	64	29	43	79	10	13	13	12	13	23	18	17	25	26	25	20	12	10	13	13	14	14	11	10	79
	64	48	84	79	76	87	42	55	84	63	78	60	66	41	82	74	67	67	63	58	55	64	61	45	
	Diurnal Maximum																								

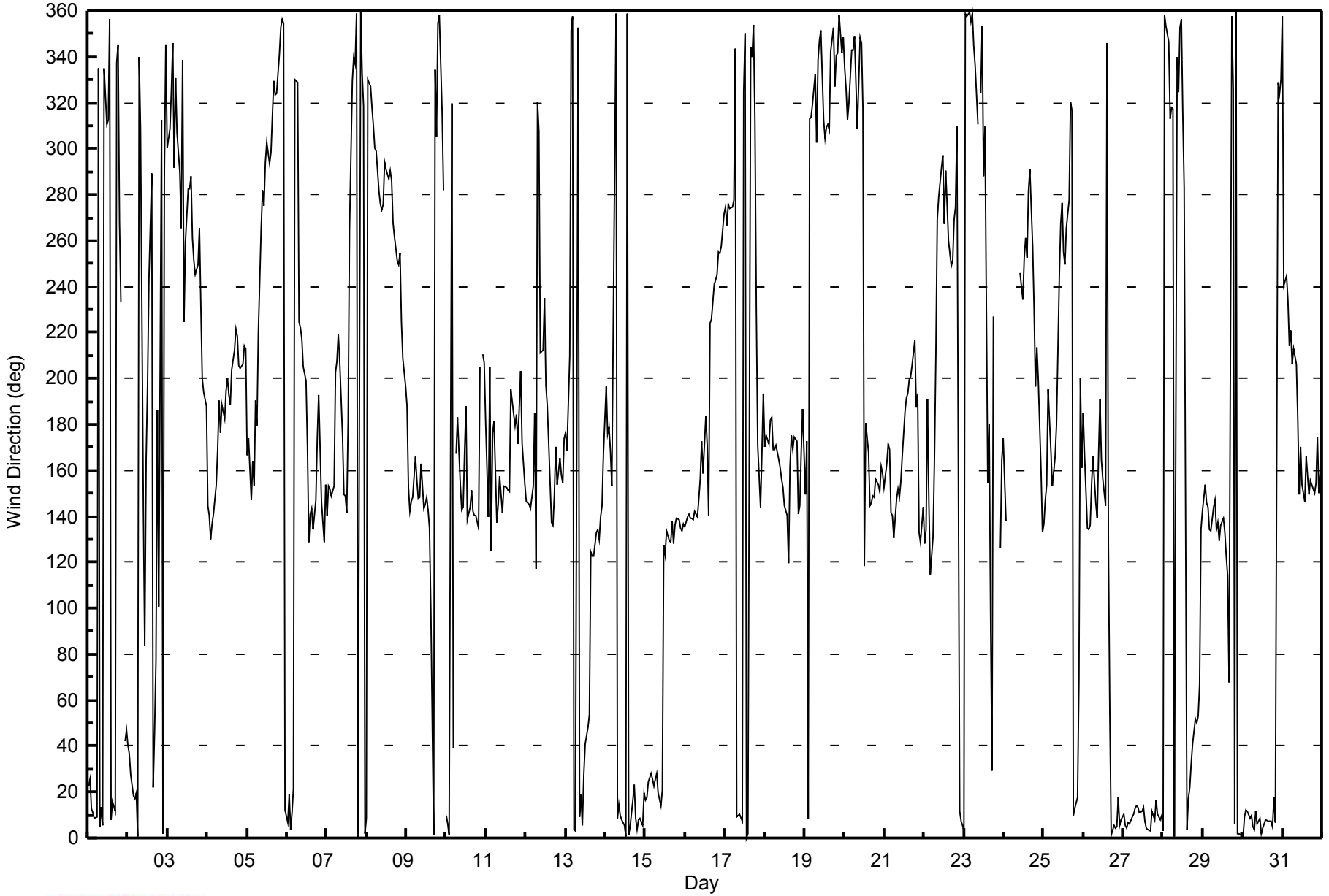
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Millennium - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 16, 2015	Previous Calibration	December 12, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Reason:	Routine		
Start Time (MST)	8:35	End Time (MST)	11:59
Barometric Pressure	724 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11091107
Cal Gas Concentration	51.1 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL107924		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2374
DACS voltage range	0-5 volts	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-665	-665
Analyzer Range (mv)	1000	1000	Lamp voltage	796	796
Calculated slope	1.017313	1.001503	Chamber temp.	44.9	44.9
Calculated intercept	-1.022630	0.252846	Pressure (mmHg)	691.4	686.2
Analyzer Background	8.4	9.3	Flow (lpm)	0.000	0.420
	1.199	1.217	Intensity	89	89

Analyzer make	43i Thermo	Analyzer serial #	1118148499

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.0	0.1	NA
as found span	6000	94.1	801.4	778.9	1.029
calibrator zero	6000	0.0	0.0	0.2	NA
high point	6000	94.1	801.4	800.3	1.001
second point	6000	47.1	401.1	399.7	1.004
third point	6000	23.5	200.1	199.4	1.004
calibrator zero	6000	0.0	0.0	0.1	NA
as left zero	6000	0.0	0.0	0.1	NA
as left span	6000	94.1	801.4	799.4	1.003
				Average Correction Factor	1.003

Corrected As found	778.8	Previous response	788.8	% change	1.3%

Notes:

Filter changed, span adjusted, Flow sensor replaced and calibrated

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

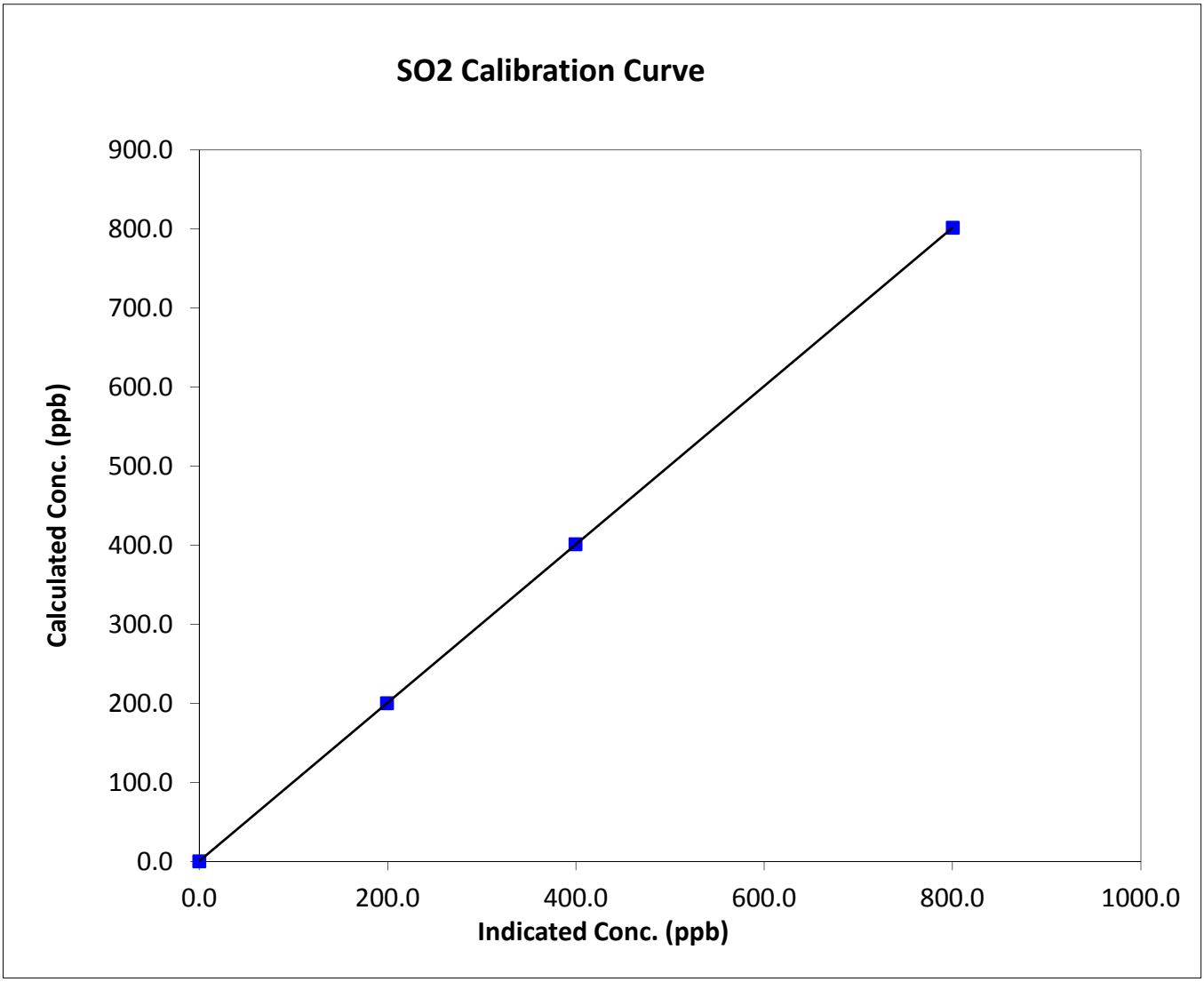
SO_2 Calibration Summary

Station Information

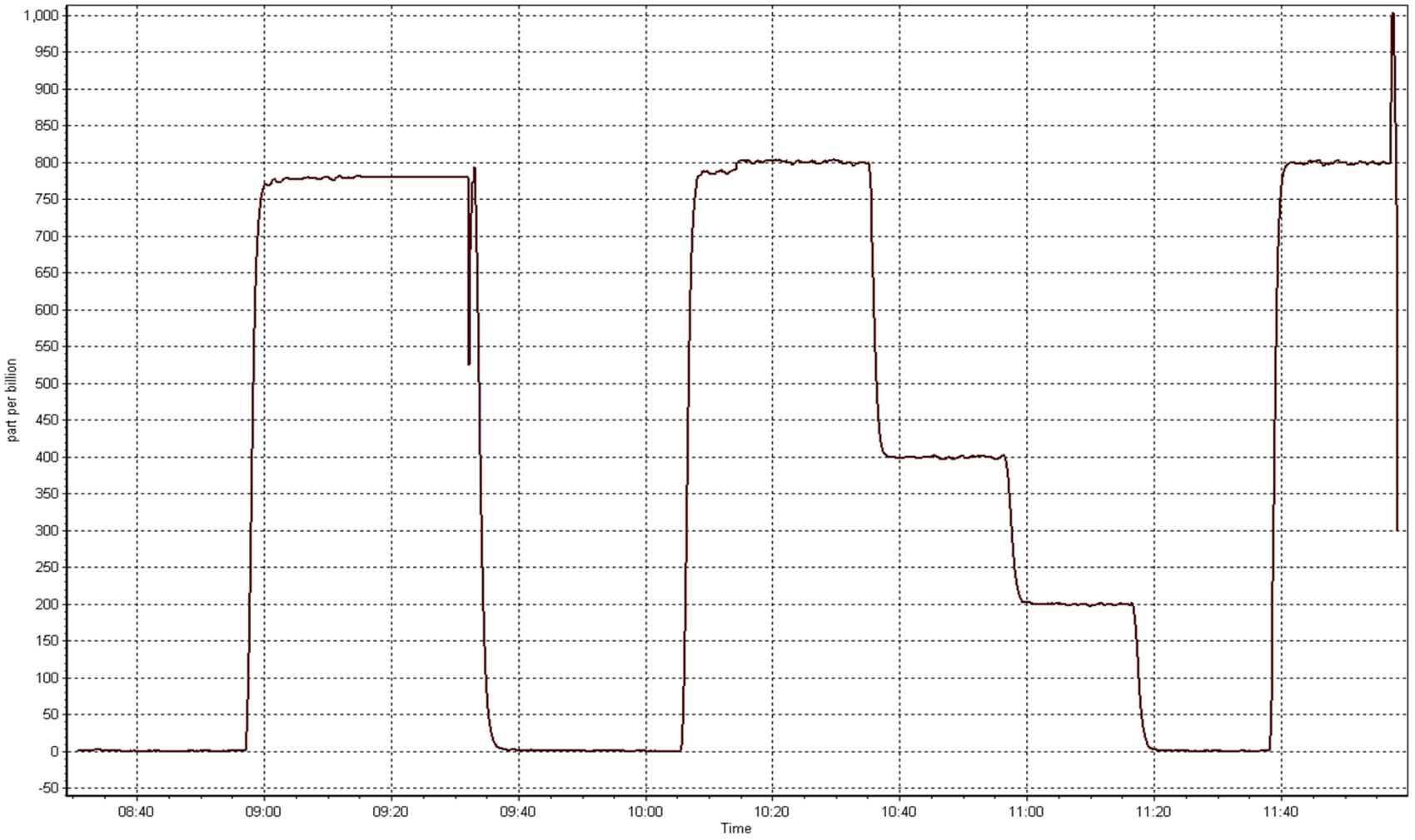
Calibration Date	January 16, 2015	Previous Calibration	December 12, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Start Time (MST)	8:35	End Time (MST)	11:59
Analyzer make	43i Thermo	Analyzer serial #	1118148499

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999998
801.4	800.3	1.0014		
401.1	399.7	1.0036	Slope	1.001503
200.1	199.4	1.0037		
			Intercept	0.252846



SO2 Calibration Plot Date: January 16, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 21, 2015	Previous Calibration	December 17, 2014
Station Name	Millenium Mine	Station Number	Ams 12
Reason:	Routine		
Start Time (MST)	7:40	End Time (MST)	10:10
Barometric Pressure	727 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11091107
Cal Gas Concentration	10.4 ppm H2S	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL84557	SO2 gas conc.	51.1 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2374
DACS voltage range	0-5 volts	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-597	-597
Analyzer Range (input)	100	100	Lamp voltage	882	882
Calculated slope	0.979923	0.983947	Chamber temp.	44	44
Calculated intercept	0.625202	0.001926	Pressure	683.6	683.6
Analyzer Background	18.9	18.9	Flow	0.602	0.602
Analyzer Coefficient	0.640	0.64	Intensity	46600	46600
			Converter temp.	817	817

Analyzer make/model	TEI 43C	Analyzer serial #	0509110887
Converter make/model	CDN-101	Converter serial #	375

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	5000	38.5	80.1	81.4	0.984
SO2 scrubber check	6000	47.1	401.1	1.2	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	38.5	80.1	81.4	0.984
second point	5000	19.2	39.9	40.5	0.986
third point	5000	9.6	20.0	20.4	0.979
calibrator zero	6000	0.0	0.0	0.2	NA
as left zero	6000	0.0	0.0	0.2	NA
as left span	5000	38.5	80.1	80.5	0.995
				Average Correction Factor	0.983

Corrected As found	81.4	Previous response	81.1	% change	-0.4%

Notes:

Filter changed out,Scrubber checked before as founds, No adjustments or maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

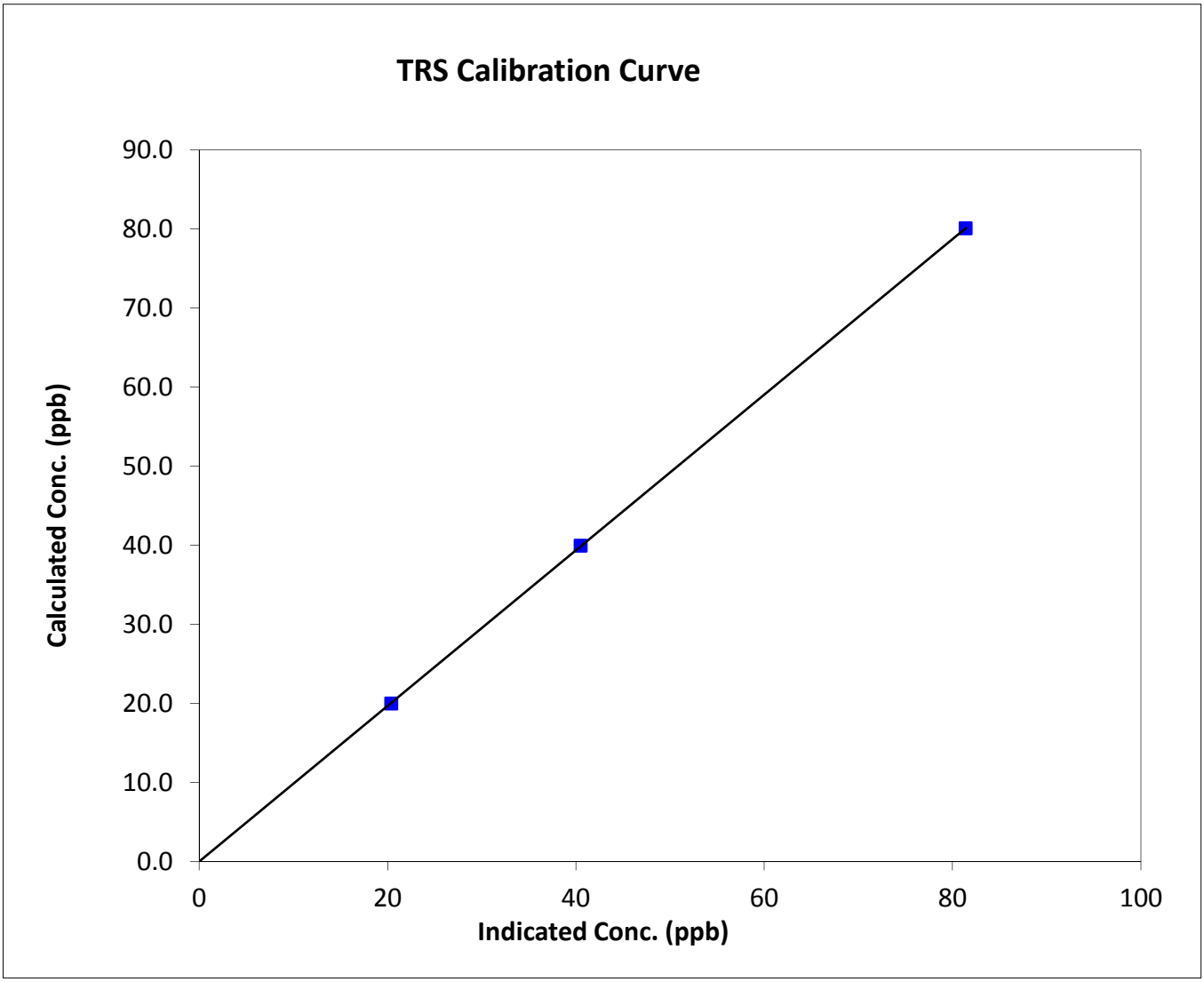
TRS Calibration Summary

Station Information

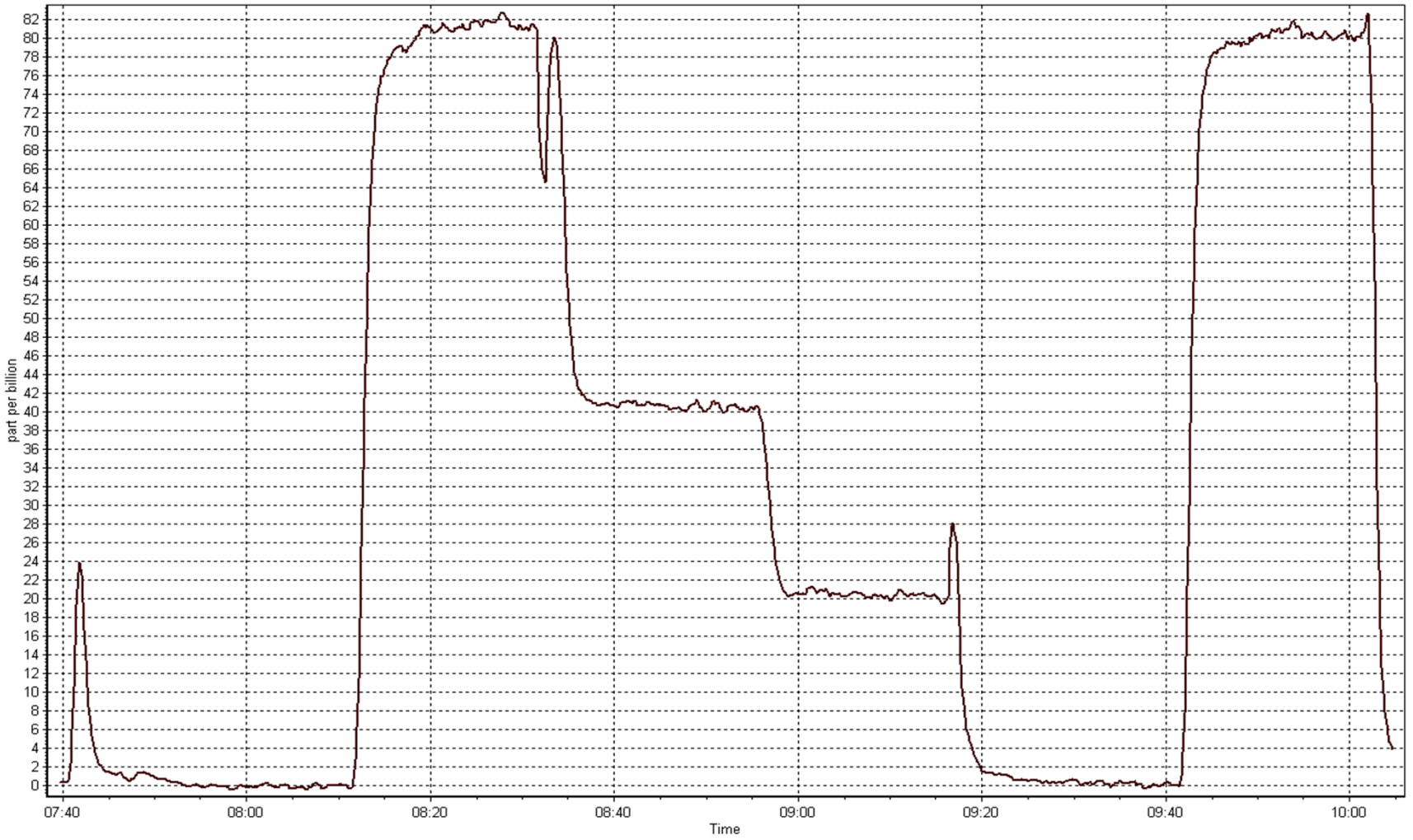
Calibration Date	January 21, 2015	Previous Calibration	December 17, 2014
Station Name	Millenium Mine	Station Number	Ams 12
Start Time (MST)	7:40	End Time (MST)	10:10
Analyzer make	TEI 43C	Analyzer serial #	0509110887

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999994
80.1	81.4	0.9838		
39.9	40.5	0.9861	Slope	0.983947
20.0	20.4	0.9788		
			Intercept	0.001926



TRS Calibration Plot Date: January 21, 2015



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-29-15	Previous Calibration	December-12-14
Station Name	Millennium	Station Number	AMS 12
Reason:	Routine		
Start Time (MST)	7:40	End Time (MST)	12:25
Barometric Pressure	na mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11091107
Gas Cert Reference	LL107924	Cal Gas Expiry Date	29/05/2014
CH4 Cal Gas Conc.	510.0 ppm	CH4 Equiv Conc.	1079.3 ppm
C3H8 Cal Gas Conc.	207.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2374
DACS voltage range	0 - 5 volts	DACS channel #	3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	11.8	11.8
Analyzer Range (mv)	25	25	Air or Bypass press	42.9	42.9
Calculated slope	1.003226	0.997343	Fuel Pressure	19.3	19.3
Calculated intercept	-0.020238	0.016045		3.75	3.76
				2.25	2.08

Analyzer make	Thermo 51i-LT	Analyzer serial #	1317958296

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.00	0.08	N/A
as found span	6000	94.1	16.93	17.32	0.977
calibrator zero	6000	0.0	0.00	-0.04	N/A
high point	6000	94.1	16.93	16.95	0.999
second point	6000	47.1	8.47	8.47	1.000
third point	6000	23.5	4.23	4.26	0.992
calibrator zero	6000	0.0	0.00	-0.04	N/A
as left zero	6000	0.0	0.00	-0.04	N/A
as left span	6000	94.1	16.93	16.87	1.003
				Average Correction Factor	0.997

Corrected As found	17.24	Previous response	16.89	% change	-2.0%

Notes:

Filter changed out, zero and span adjusted, No maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

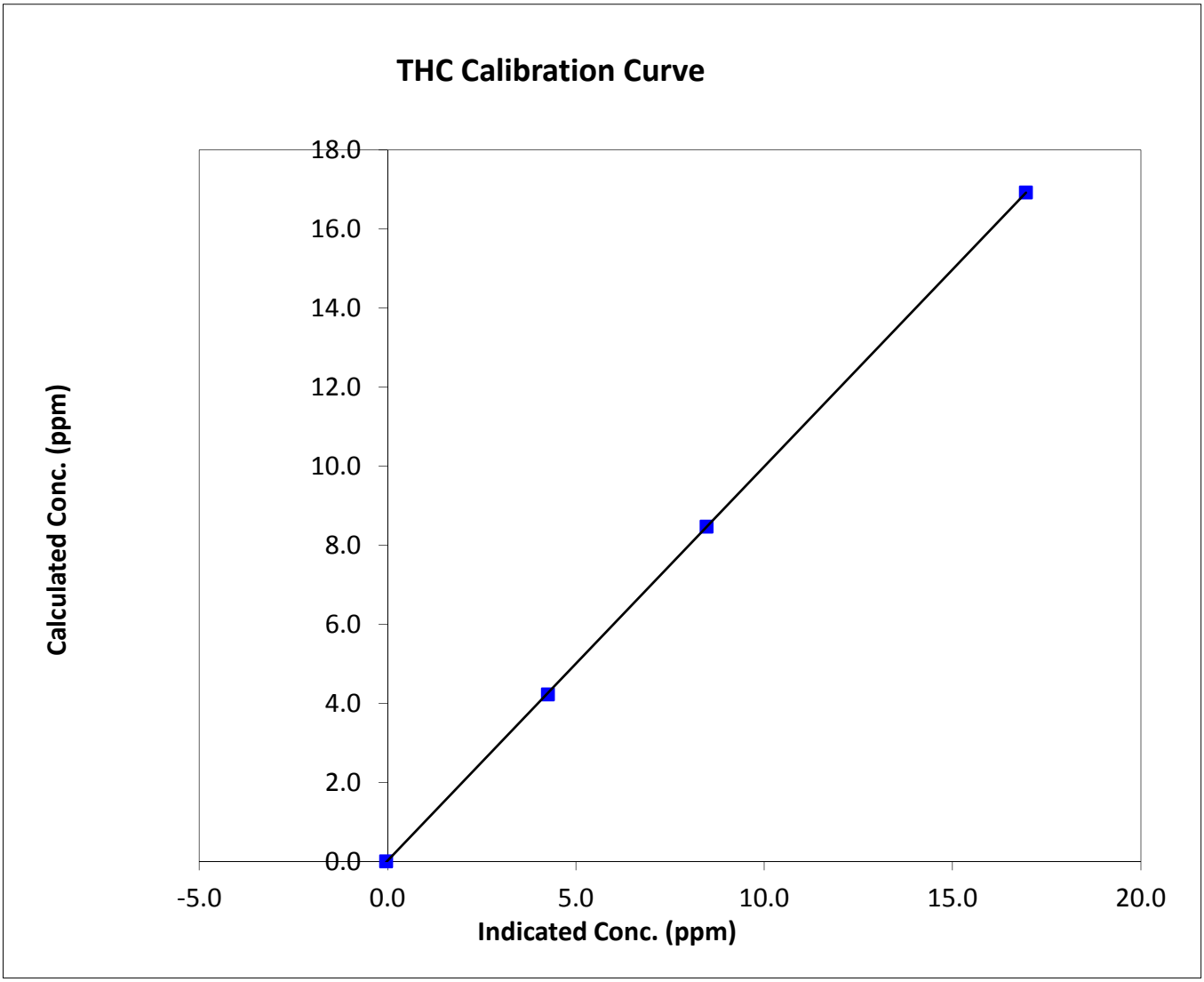
THC Calibration Summary

Station Information

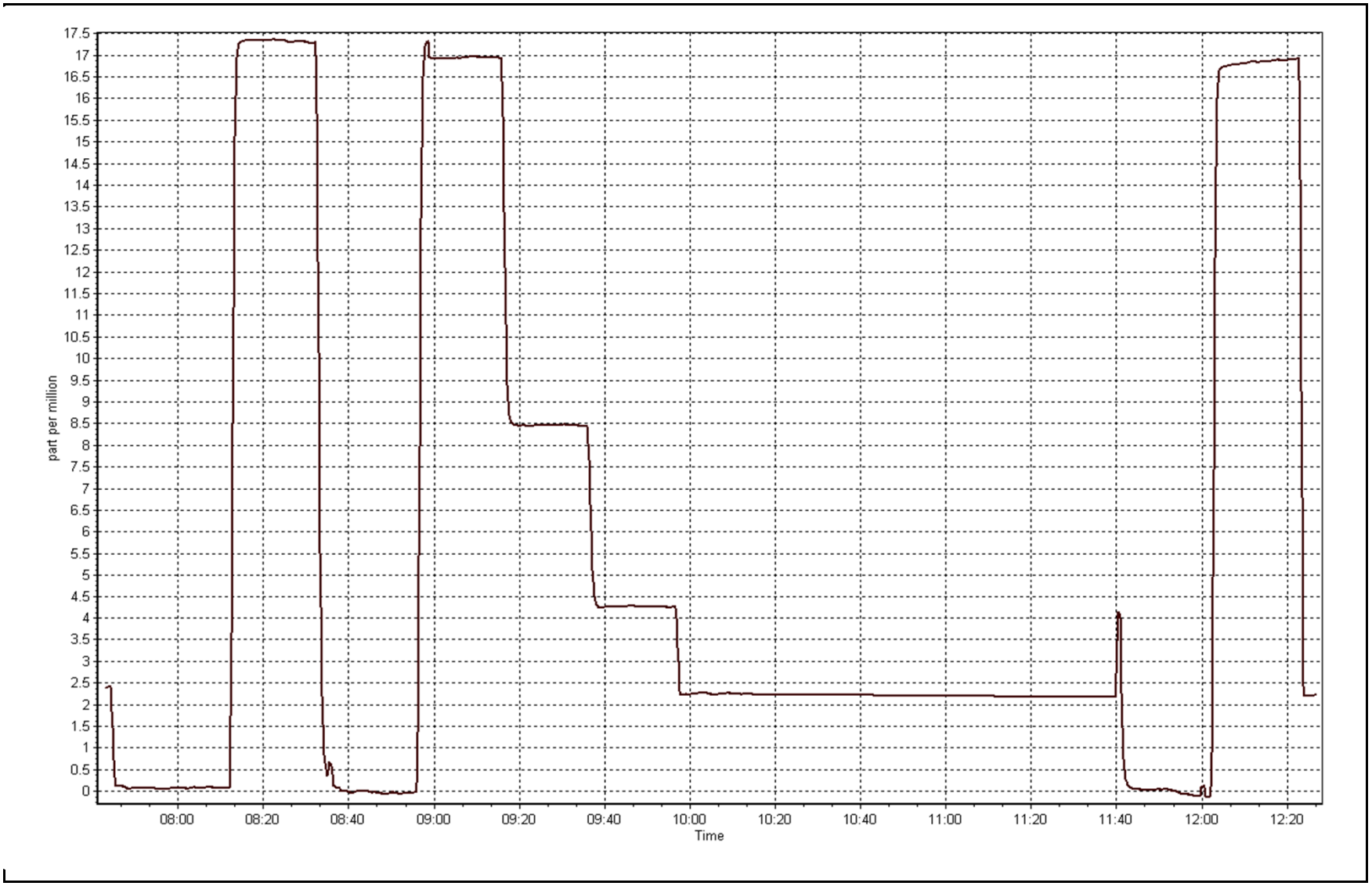
Calibration Date	January 29, 2015	Previous Calibration	December 12, 2014
Station Name	Millennium	Station Number	AMS 12
Start Time (MST)	7:40	End Time (MST)	12:25
Analyzer make	Thermo 51i-LT	Analyzer serial #	1317958296

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.04	N/A	Correlation Coefficient	0.999987
16.93	16.95	0.9986		
8.47	8.47	1.0002	Slope	0.997343
4.23	4.26	0.9923		
			Intercept	0.016045



THC Calibration Plot Date: January 29, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 29, 2015	Previous Calibration	December 12, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Reason:	Routine		
Start Time (MST)	7:40	End Time (MST)	12:25
Barometric Pressure	724 mmHg	Station Temperature	22.0 Deg C
Calibrator	Sabio 4010	Serial Number	11091107
NO Cal Gas Conc	51 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	51 ppm	Cal Gas Serial #	LL107924

DACS Information

DACS make & model: Campbell Scientific CR3000 DACS serial No.:

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.988367	0.988594	1.004132
	Data Offset	1.826083	1.195525	-0.435683
After	Data Slope	1.006256	1.006337	1.003330
	Data Offset	0.504364	0.300834	0.147277
Channel #		7	6	5
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model: API T200 Analyzer serial #: 723

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	1.148	ppb	1.148	ppb
NOX coefficient	1.141	ppb	1.141	ppb
NO2 coefficient		ppb		ppb
NO bkgrnd	0.5		0.5	
NOX bkgrnd	1.6		1.6	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	314.4	Deg C	314.4	Deg C
PMT Temp	6.9	Deg C	6.9	Deg C
O3 flow	88.0	ccm	88.0	ccm
R Cell Press	2.9	mmHg	2.9	mmHg
Sample Flow	504	ccm	504	ccm

Notes:

Filter changed, No maintanence or adjustments made

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 29, 2015 Station Number: AMS 12

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	6000	0.0	0.0	0.0	0.0	-0.6	-0.3	-0.2	N/A	N/A
as found span	6000	94.1	799.9	799.9	0.0	794.4	794.8	-0.4	1.0069	1.0064
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.6	-0.3	-0.2	N/A	N/A
high point	6000	94.1	799.9	799.9	0.0	794.4	794.8	-0.4	1.0069	1.0064
second point	6000	47.1	400.4	400.4	0.0	397.2	397.0	0.2	1.0079	1.0084
third point	6000	23.5	199.8	199.8	0.0	198.2	198.1	0.1	1.0077	1.0083
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.5	0.1	-0.6	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	-0.5	0.1	-0.6	N/A	N/A
as left span	6000	94.1	799.9	486.7	313.2	789.6	495.8	293.8	1.0130	0.9816
								Average Correction Factor	1.0075	1.0077

Corrcted As found NO_X= 795.0 NO= 795.1 Percent Change NO_X= 1.6% NO= 1.6%

Previous Response NO_X= 807.4 NO= 807.9

GPT Calibration Data

Dilution Flow 6000 ccm Source Gas Flow 94.10 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.2			N/A	
1st NO2 (300)	N/A	486.7	307.8	792.9	486.7	306.2	0.9932	1.0000	1.0052	99.5%
2nd NO2 (200)	N/A	593.2	201.3	794.3	593.2	201.3	0.9914	1.0000	1.0000	100.0%
3rd NO2 (100)	N/A	694.1	100.4	793.7	694.1	99.6	0.9922	1.0000	1.0080	99.2%
4th NO2 (0)	794.5	N/A	0.1	794.6	794.5	0.1	0.9911	1.0000	N/A	N/A
					Average Correction Factor		0.9920	1.0000	1.0044	99.6%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

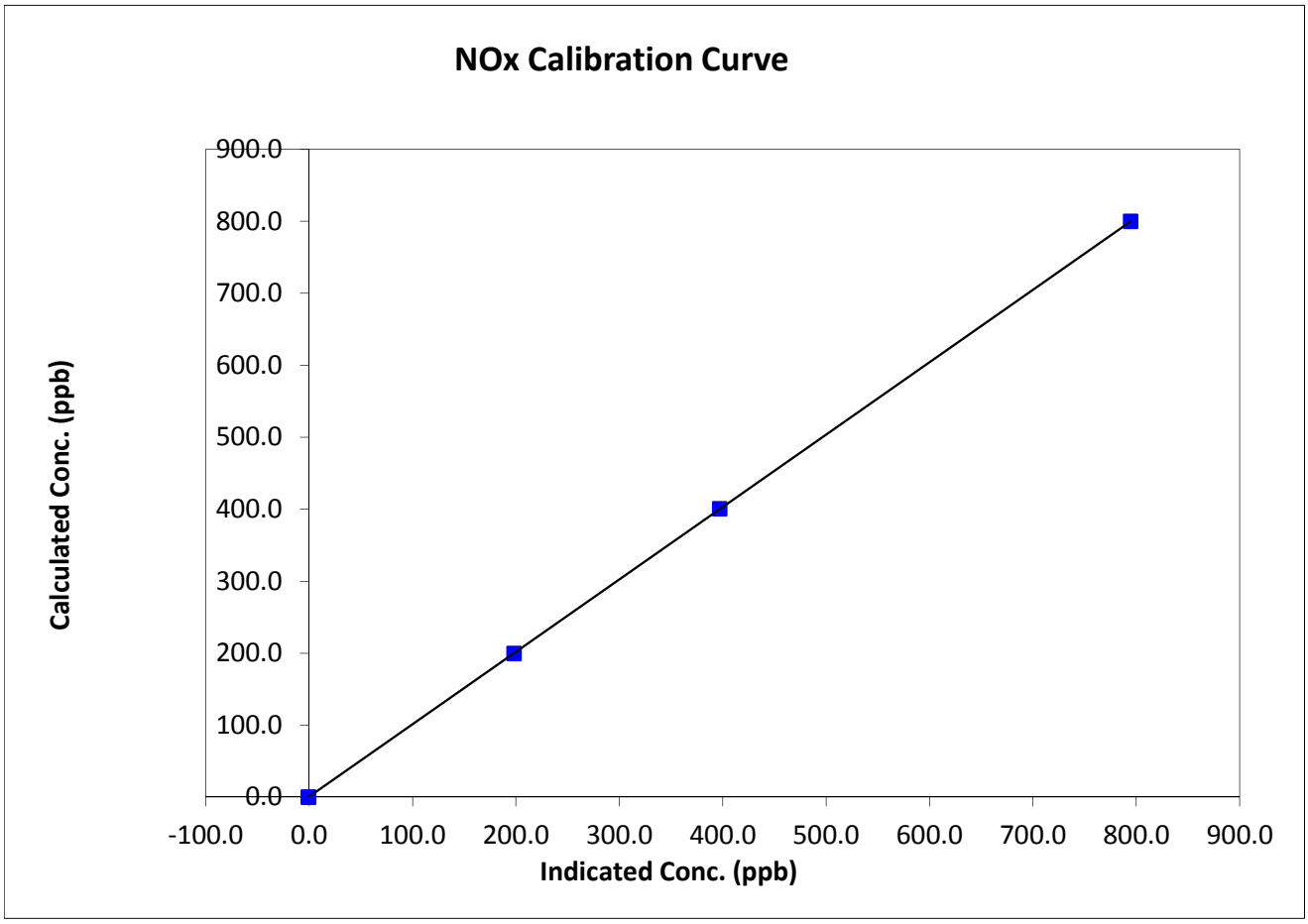
NO_X Calibration Summary

Station Information

Calibration Date	January 29, 2015	Previous Calibration	December 12, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Start Time (MST)	7:40	End Time (MST)	12:25
Analyzer make	API T200	Analyzer serial #	723

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	1.000000
799.9	794.4	1.0069		
400.4	397.2	1.0079	Slope	1.006256
199.8	198.2	1.0077		
0.0	-0.5	0.0000	Intercept	0.504364



Wood Buffalo Environmental Association

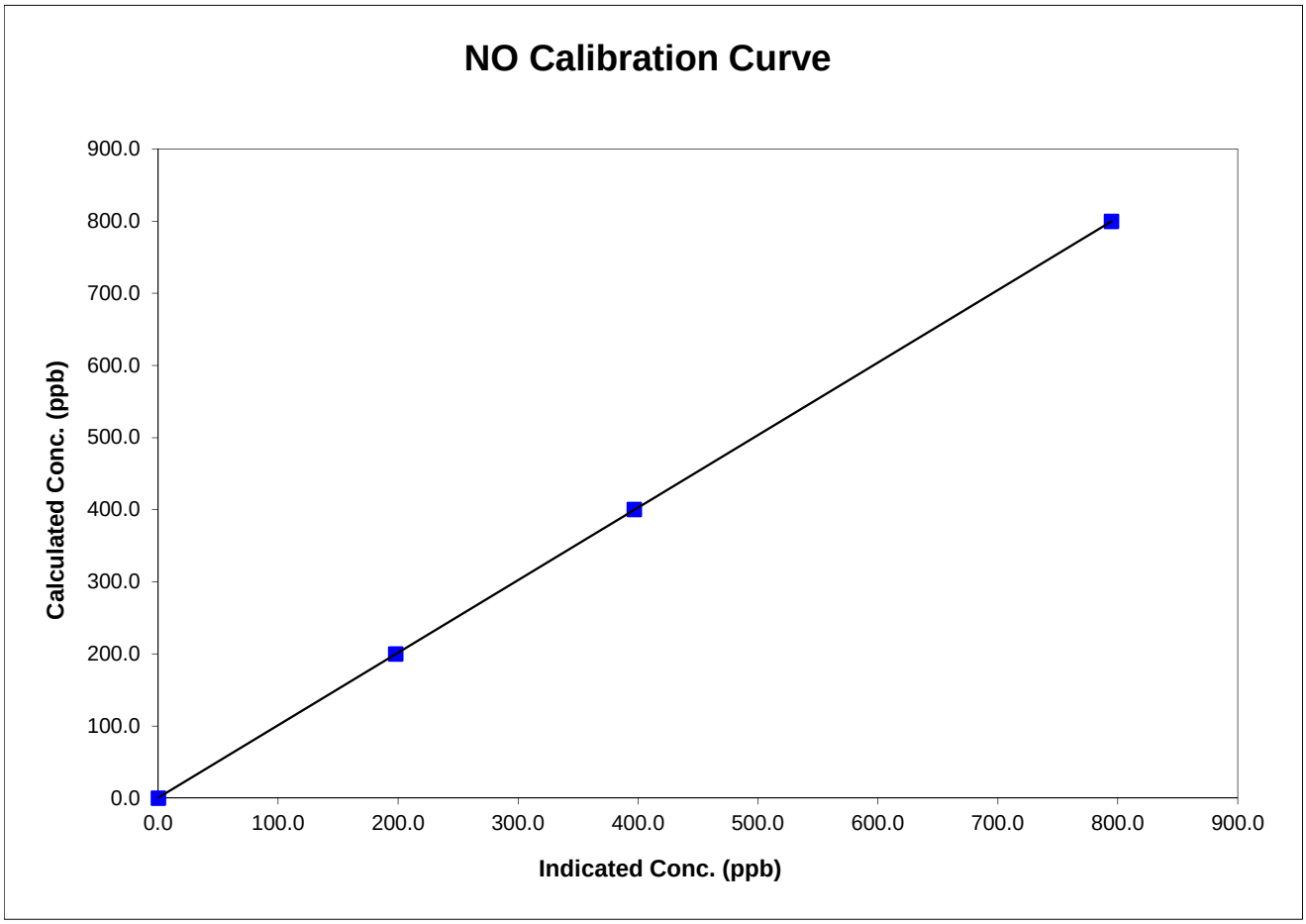
NO Calibration Summary

Station Information

Calibration Date	January 29, 2015	Previous Calibration	December 12, 2014
Station Name	Millenium Mine	Station Number	AMS 12
Start Time (MST)	7:40	End Time (MST)	12:25
Analyzer make	API T200	Analyzer serial #	723

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999999
799.9	794.8	1.0064		
400.4	397.0	1.0084	Slope	1.006337
199.8	198.1	1.0083		
0.0	0.1	0.0000	Intercept	0.300834



Wood Buffalo Environmental Association

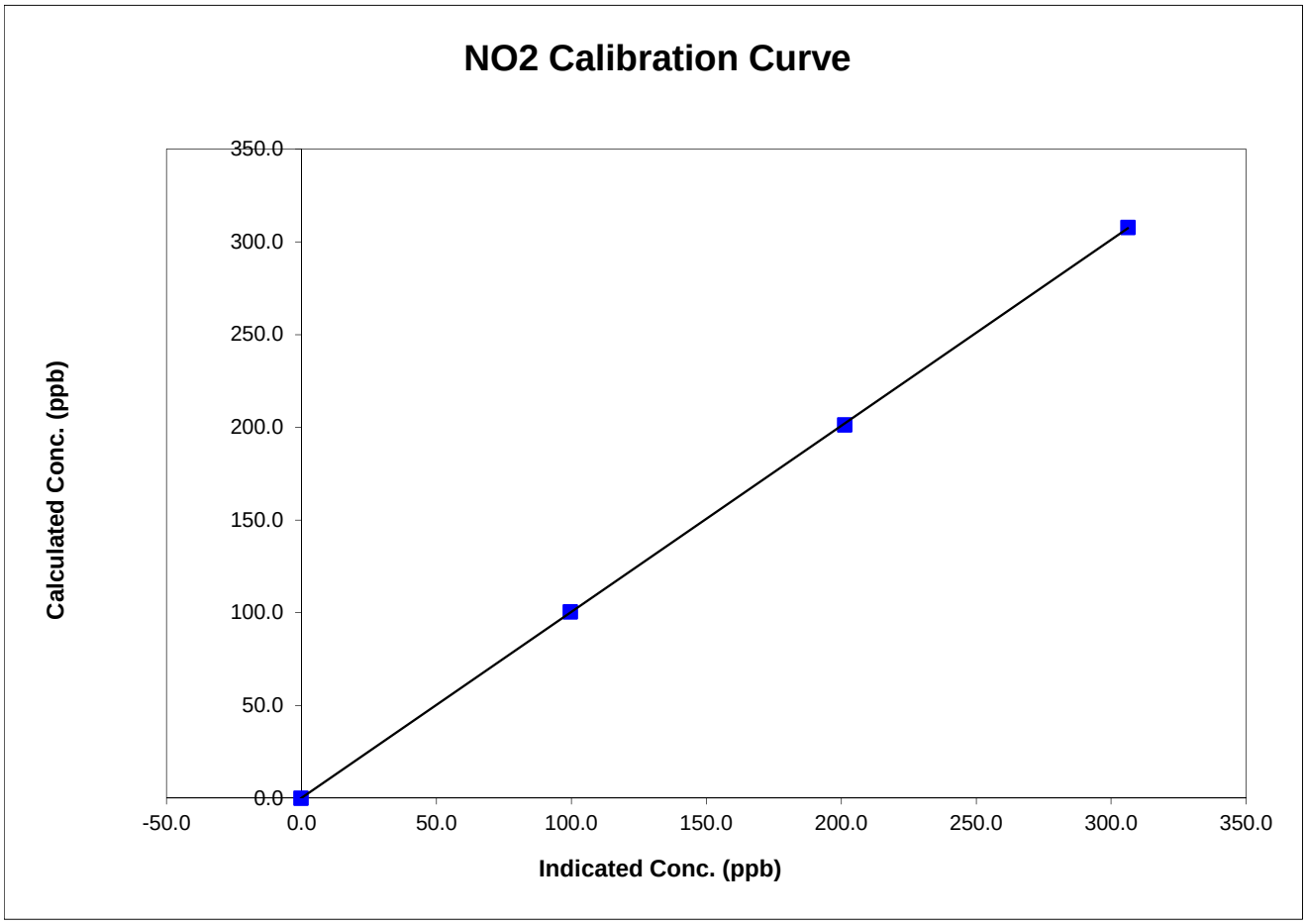
NO_2 Calibration Summary

Station Information

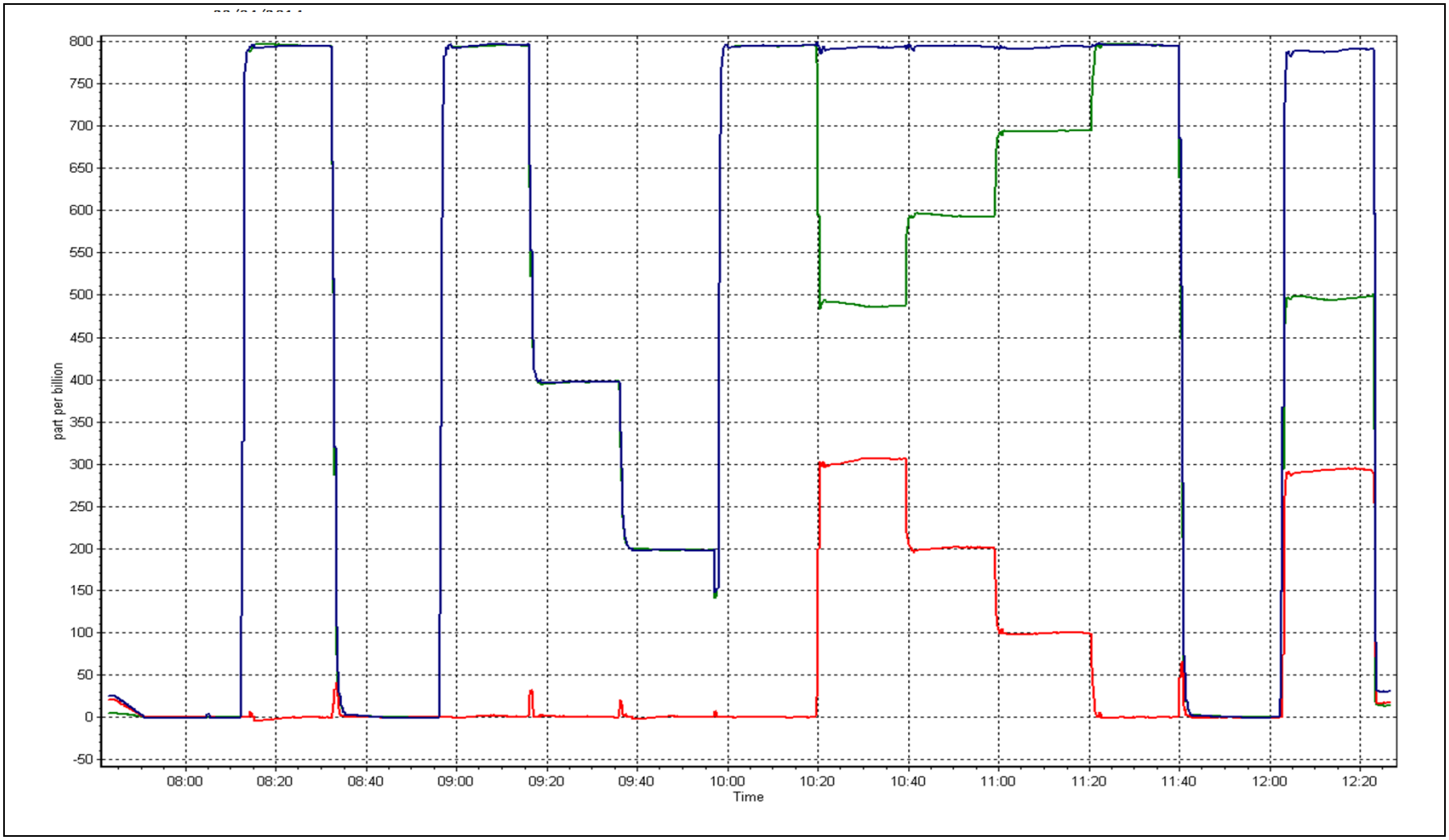
Calibration Date	January 29, 2015	Previous Calibration	December 12, 2014
Station Number	Millenium Mine	Station Number	AMS 12
Start Time (MST)	7:40	End Time (MST)	12:25
Analyzer make	API T200	Analyzer serial #	723

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999982
307.8	306.2	1.0052		
201.3	201.3	1.0000	Slope	1.003330
100.4	99.6	1.0080		
			Intercept	0.147277



NOx, NO & NO_2 Calibration Plot Date: January 29, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 13
FORT MCKAY SOUTH
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS 13)
JANUARY 2015

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	37	37	100.00	11	0	2	0
TRS(ppb) Average	709	35	35	100.00	16	2	2	0
THC(ppm) Average	707	37	37	100.00	6.2	-	3.2	-
O3(ppb) Average	710	34	34	100.00	36	0	30	-
NO2(ppb) Average	707	37	37	100.00	35	0	23	-
NO(ppb) Average	707	37	37	100.00	61	-	28	-
NOX(ppb) Average	707	37	37	100.00	75	-	48	-
PM2.5(ug/m3) Average	742	0	2	99.73	31	-	16.6	0
Temperature 2 m (C) Average	743	0	1	99.87	6.8	-	3.4	-
Relative Humidity (%) Average	743	0	1	99.87	99	-	-	-
Wind Speed 10 m (km/h) Average	628	0	116	84.41	14	-	-	-
Wind Direction 10 m (deg) Average	628	0	116	84.41	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS 13)
JANUARY 2015

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	1	-	0	0	0	1	1	2	11
TRS(ppb) Average	709	0.5	1	-	0	0	0	0	1	1	16
THC(ppm) Average	707	2.37	0.4	-	1.9	2	2.1	2.3	2.5	2.8	6.2
O3(ppb) Average	710	13.9	11	-	0	1	3	12	24	30	36
NO2(ppb) Average	707	11.9	9	-	0	1	4	11	19	24	35
NO(ppb) Average	707	5.4	10	-	0	0	0	1	7	17	61
NOX(ppb) Average	707	17.3	16	-	0	1	4	13	28	39	75
PM2.5(ug/m3) Average	742	4.56	4	-	0	1.1	2.1	3.5	5.8	8.9	31
Temperature 2 m (C) Average	743	-15.93	10.3	-	-35.3	-30.4	-23.7	-16.4	-9.2	-0.3	6.8
Relative Humidity (%) Average	743	80.6	8	-	57	72	74	79	86	93	99
Wind Speed 10 m (km/h) Average	628	4.4	3	-	0	1	2	4	6	8	14
Wind Direction 10 m (deg) Average	628	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -FORT McKAY SOUTH (AMS 13)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	22 Jan 2015 12:00	22 Jan 2015 13:00	2	Maintenance - Flow and zero check, sample head cleaning
Temperature/ Relative Humidity	22 Jan 2015 14:00	22 Jan 2015 14:00	1	Power spike
Wind Speed, Wind Direction	24 Jan 2015 04:00	24 Jan 2015 10:00	7	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 17:00	25 Jan 2015 04:00	12	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 00:00	26 Jan 2015 11:00	12	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 17:00	27 Jan 2015 13:00	21	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	27 Jan 2015 14:00	27 Jan 2015 14:00	1	Maintenance - De-ice sensors
Wind Speed, Wind Direction	28 Jan 2015 08:00	29 Jan 2015 15:00	32	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	30 Jan 2015 18:00	01 Feb 2015 00:00	31	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 ppb on Jan 31 15:00 Maximum Daily Average: 2.2 ppb on Jan 29

Minimum Value: 0 ppb on Jan 2 05:00 Minimum Daily Average: 0.3 ppb on Jan 27
Maximum Diurnal Average: 1.6 ppb at hour 23 Minimum Diurnal Average: 0.5 ppb at hour 7
Monthly Average: 1.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 6$

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-Jan	1	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	0.7	2
2-Jan	2	1	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	2
3-Jan	1	1	1	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
4-Jan	1	1	1	1	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
5-Jan	1	1	1	1	1	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
6-Jan	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0.8	1
7-Jan	1	Z	0	1	1	1	1	1	1	1	2	2	2	3	4	4	3	5	5	2	2	2	1	1	1.9	5
8-Jan	1	1	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.5	1
9-Jan	1	1	1	Z	0	0	0	0	1	1	1	2	2	4	3	1	1	1	1	1	1	1	1	1	1.1	4
10-Jan	1	1	1	1	Z	0	0	0	0	0	1	1	1	2	4	3	1	1	1	1	1	1	0	0	0.8	4
11-Jan	0	0	0	0	1	Z	0	0	1	1	1	1	3	2	2	1	1	1	1	1	1	1	1	1	0.9	3
12-Jan	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.0	2
13-Jan	2	Z	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2
14-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0.7	1
15-Jan	1	1	1	Z	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	7	2	1.0	7
16-Jan	2	2	1	1	Z	0	0	1	2	1	0	1	1	1	1	1	1	0	0	0	0	1	1	1	0.8	2
17-Jan	1	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	6	3	0.8	6
18-Jan	Z	2	2	2	1	2	2	2	1	1	1	1	2	3	2	2	1	1	1	1	2	2	2	1	1.5	3
19-Jan	1	Z	0	1	1	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.5	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	3	2	1	2	2	2	3	3	--	3
21-Jan	3	1	1	Z	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	3
22-Jan	1	1	1	1	Z	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
23-Jan	1	1	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	2	5	7	8	7	5	1.9	8
24-Jan	Z	4	5	6	5	4	3	2	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1.7	6
25-Jan	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
26-Jan	1	1	Z	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
27-Jan	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0.4	1
29-Jan	0	1	1	1	1	Z	0	1	3	2	2	3	3	3	2	3	3	3	3	3	2	6	4	2	2.2	6
30-Jan	Z	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.8	2
31-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	4	7	11	5	1	1	1	1	1	1	1	1	1.5	11
	0.9	1.0	0.8	0.9	0.7	0.6	0.5	0.5	0.7	0.7	0.7	0.9	1.1	1.4	1.5	1.2	0.9	1.0	0.9	1.0	1.0	1.3	1.6	1.1	Diurnal Average	
	3	4	5	6	5	4	3	2	3	2	2	3	4	7	11	5	3	5	5	5	7	8	7	5	Diurnal Maximum	

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

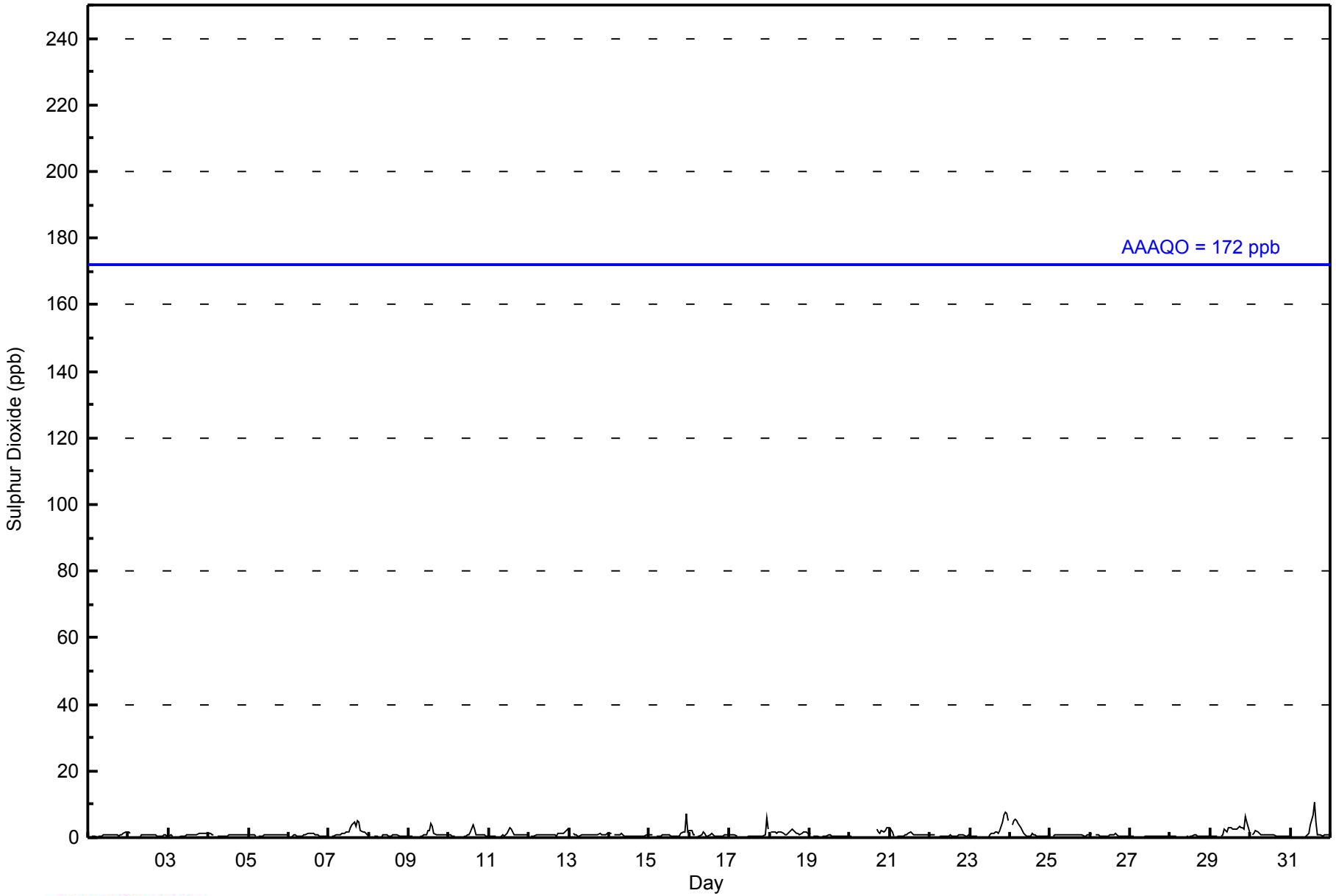
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	706	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: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	100	59	10	2	3	3	15	44	80	68	74	51	24	17	14	32	596
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	100	59	10	2	3	3	15	44	80	68	74	51	24	17	14	32	596

Total Number of Valid Hours: 596

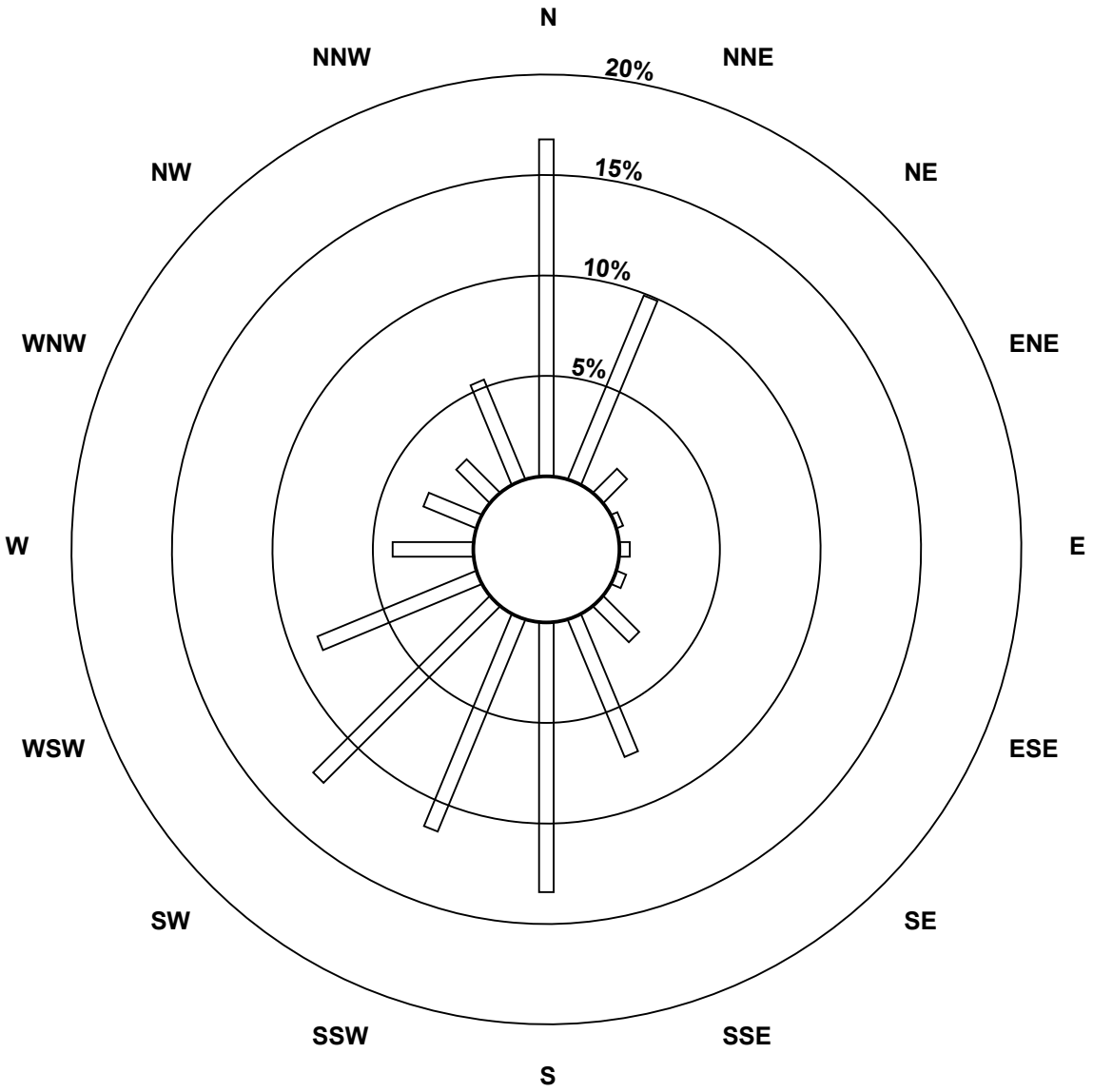
Total Number of Hours: 744

Wood Buffalo Environmental Association

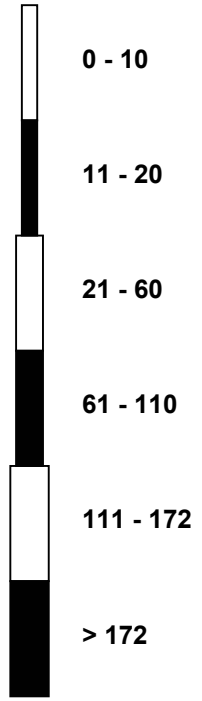
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



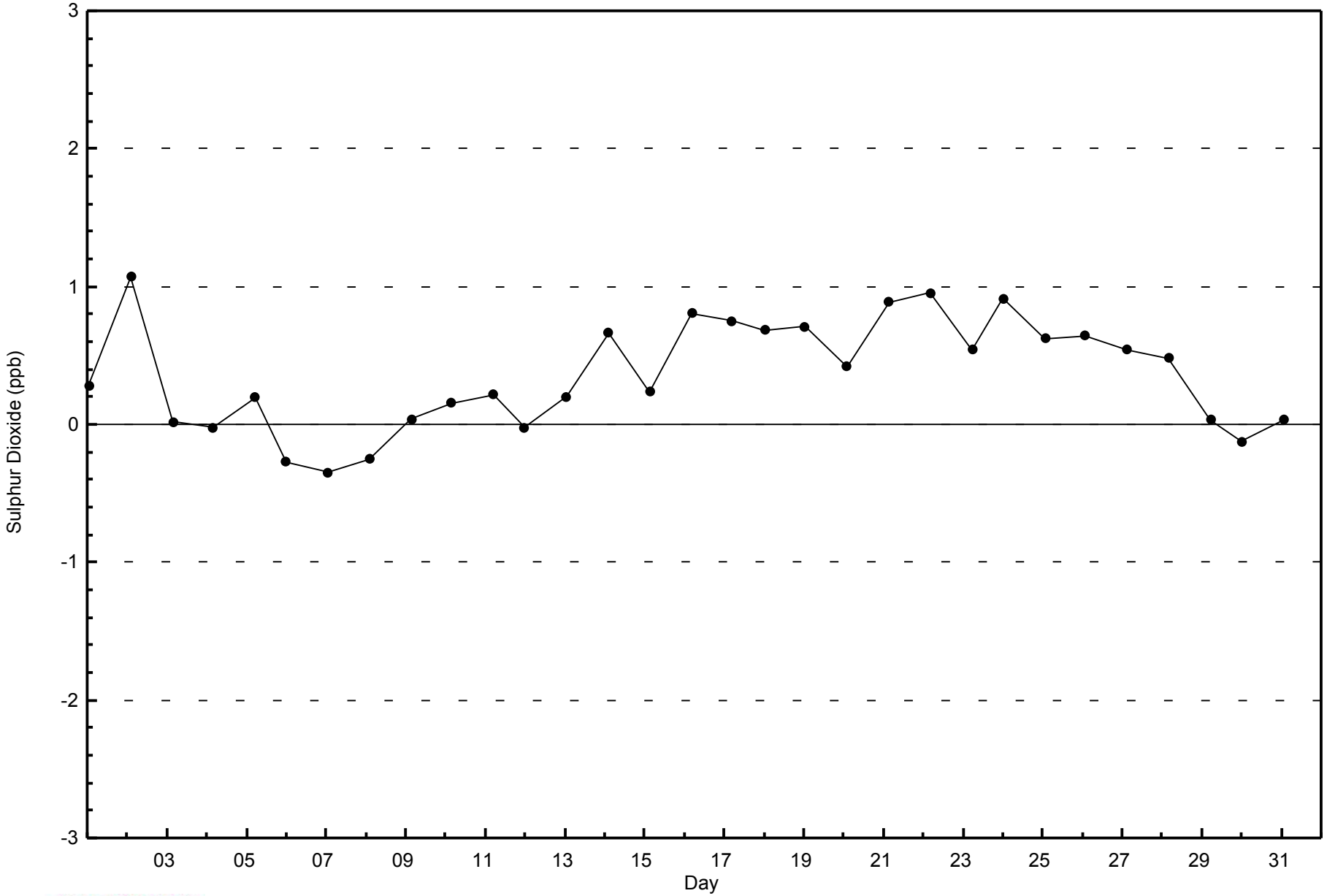
Total Number of Valid Hours: 596

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2015



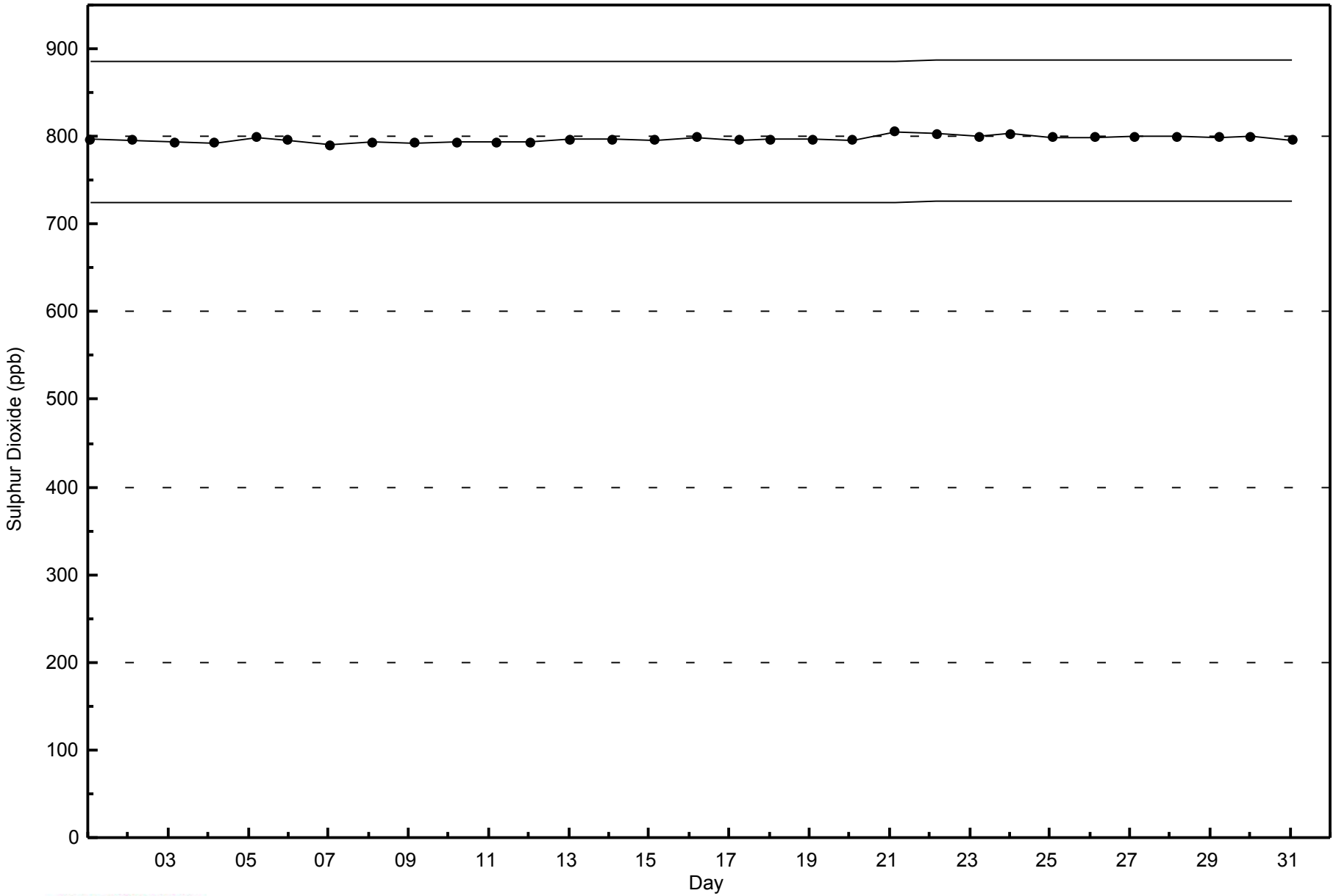
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2015

Number of Exceedences (AAAQO): 1-hr: 2 24-hr: 0
Maximum Value: 16 ppb on Jan 7 07:00 Maximum Daily Average: 1.9 ppb on Jan 7

Minimum Value: 0 ppb on Jan 26 11:00 Minimum Daily Average: 0.1 ppb on Jan 8
Maximum Diurnal Average: 1.0 ppb at hour 7 Minimum Diurnal Average: 0.3 ppb at hour 2
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 3$

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)																								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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0.3	1
7-Jan	0	0	Z	1	1	5	16	11	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1.9	16
8-Jan	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
9-Jan	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0.6	1
10-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0.6	1
11-Jan	0	0	0	0	0	0	Z	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0.5	1
12-Jan	0	Z	0	0	0	0	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	0.6	1
13-Jan	1	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0.5	1
14-Jan	0	0	0	Z	0	0	0	0	1	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0.4	1
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.4	1
16-Jan	1	1	0	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0.3	1
18-Jan	0	Z	0	0	0	0	0	1	1	1	1	1	1	2	2	1	1	1	1	0	0	0	0	0	0.7	2
19-Jan	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0.5	1
21-Jan	1	1	0	1	Z	1	1	1	1	1	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Jan	0	0	0	0	1	1	Z	1	0	1	1	0	0	0	0	0	1	1	1	2	2	3	3	4	1.0	4
24-Jan	4	Z	3	3	2	2	2	2	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1.1	4
25-Jan	0	0	Z	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
26-Jan	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0.3	1
29-Jan	0	0	0	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.5	1
30-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Jan	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	2	1	1	1	1	1	1	1	1	1	0.6	2
	0.4	0.3	0.4	0.4	0.4	0.6	1.0	0.7	0.4	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
	4	1	3	3	2	5	16	11	2	1	1	1	1	2	2	1	1	1	1	2	2	3	3	4	Diurnal Maximum	

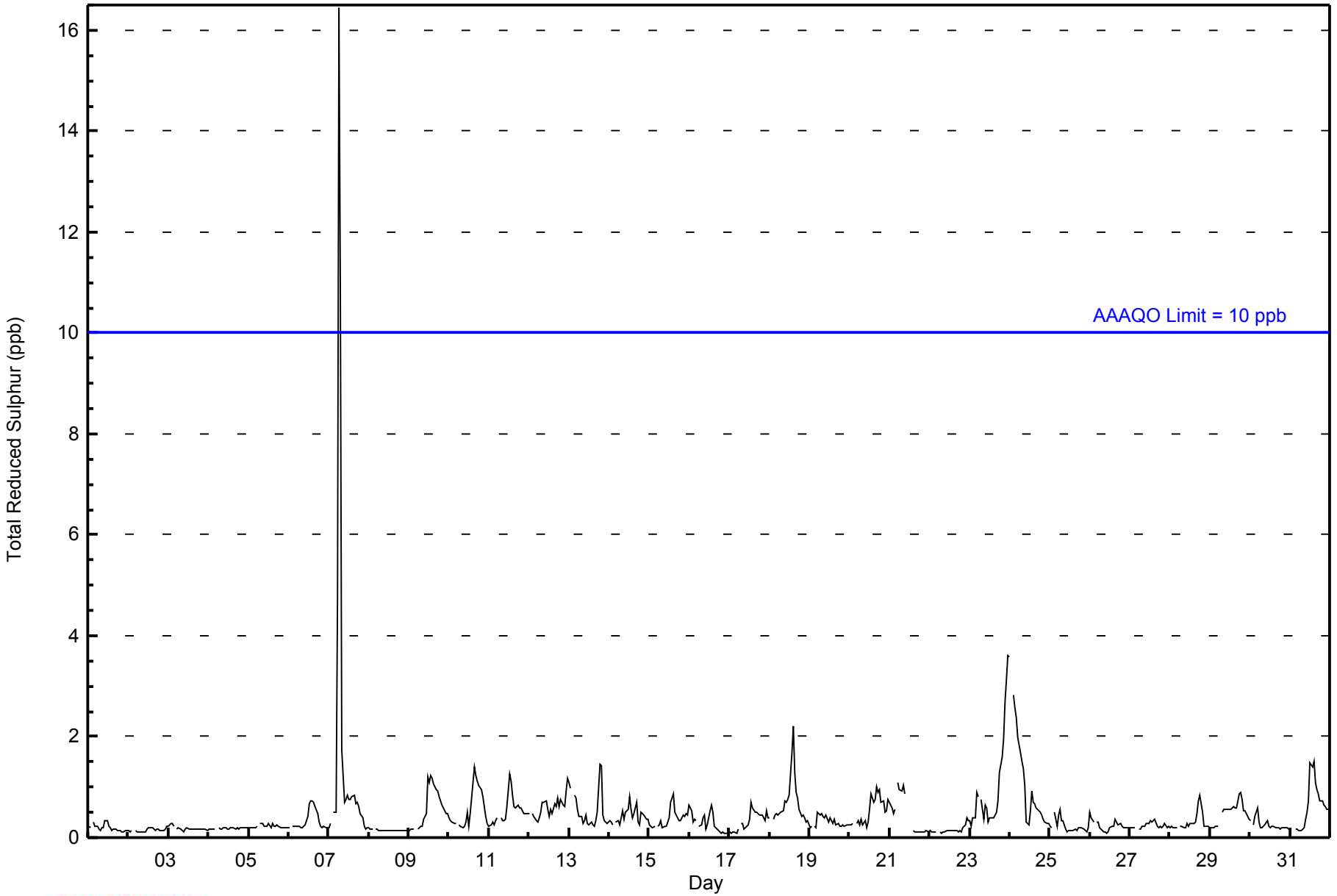
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	700	98.73	98.73
3 - 4	6	0.85	99.58
5 - 7	1	0.14	99.72
8 - 11	0	0.00	99.72
> 11	2	0.28	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	100	57	10	2	4	3	15	43	80	66	71	53	24	16	14	32	590
3 - 4	0	0	1	0	0	0	0	2	1	0	1	0	0	0	0	0	5
5 - 7	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Totals	100	57	11	2	4	3	15	47	81	67	72	53	24	16	14	32	598

Total Number of Valid Hours: 598

Total Number of Hours: 744

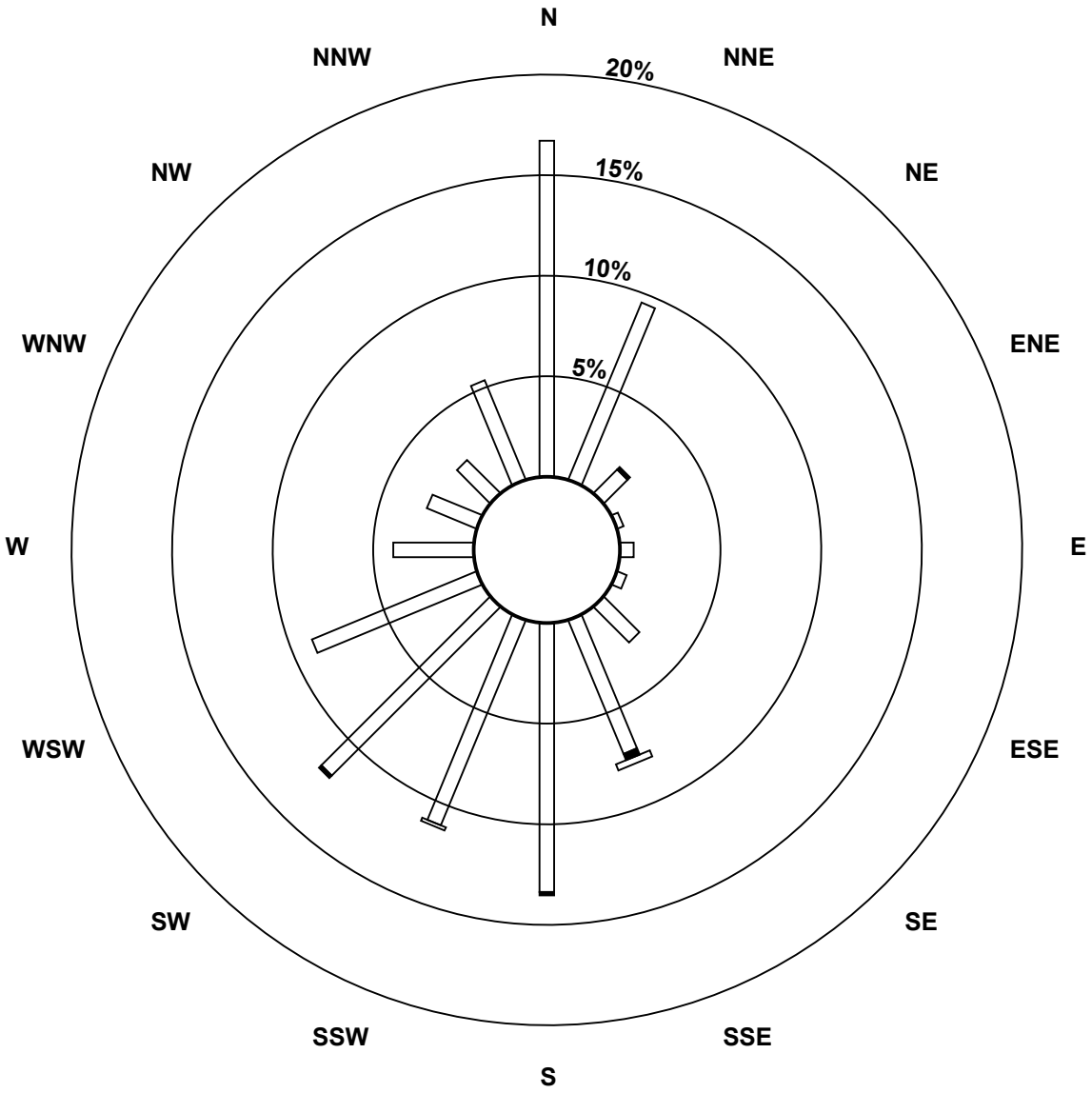
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

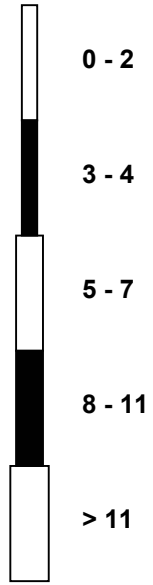
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



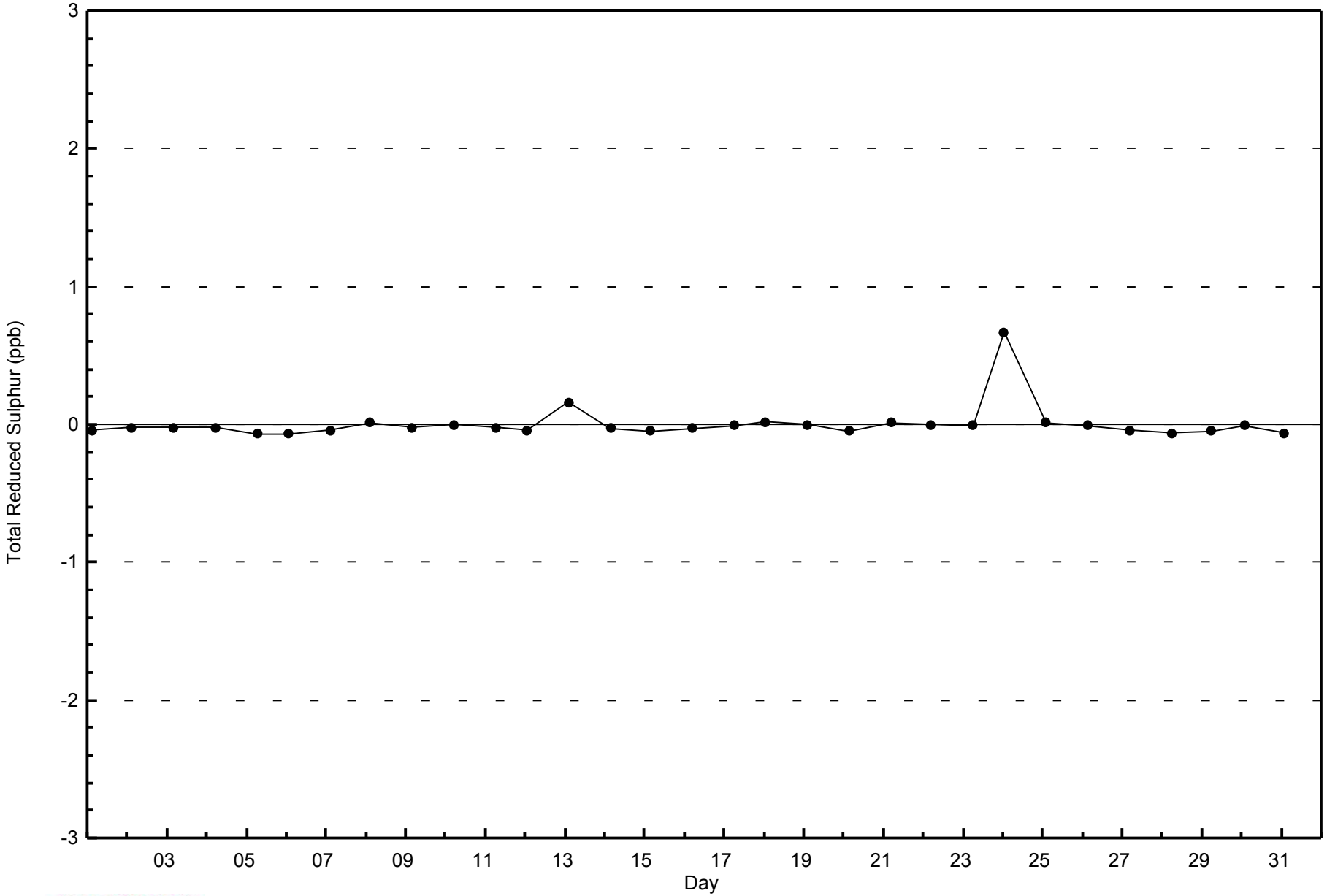
Total Number of Valid Hours: 598

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2015



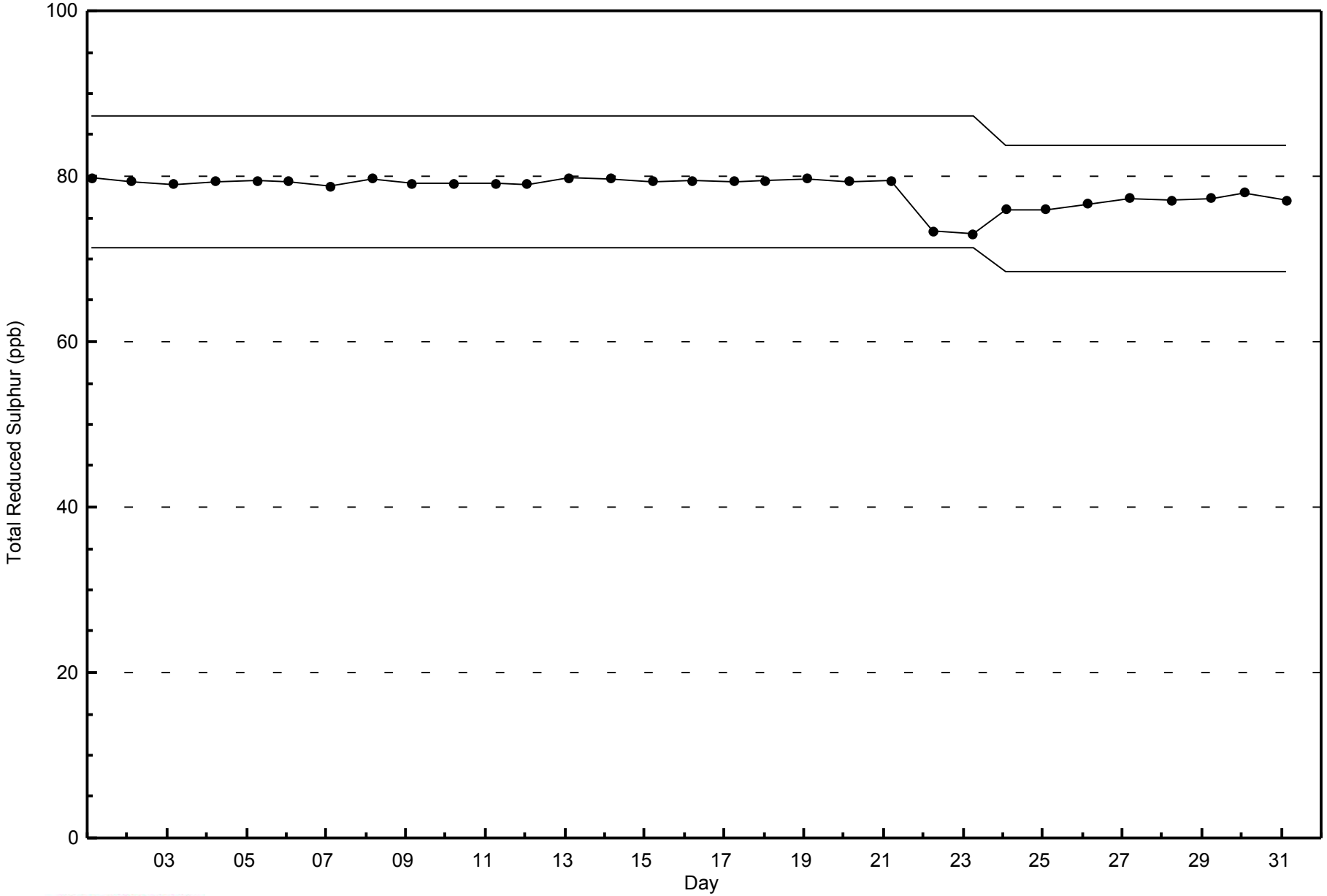
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2015

Maximum Value: 6.2 ppm on Jan 23 22:00

Maximum Daily Average: 3.2 ppm on Jan 23

Minimum Value: 1.9 ppm on Jan 16 21:00

Minimum Daily Average: 2.0 ppm on Jan 8

Maximum Diurnal Average: 2.4 ppm at hour 19

Minimum Diurnal Average: 2.3 ppm at hour 1

Monthly Average: 2.37 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.1 Median = 2.3 Q_3 = 2.5 P_{90} = 2.8 P_{99} = 4.3

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-Jan	2.0	Z	2.2	2.3	2.5	2.3	2.1	2.1	2.1	2.4	2.5	2.5	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.5
2-Jan	2.1	2.1	Z	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2
3-Jan	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	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.3
4-Jan	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1
5-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.4
6-Jan	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.5	2.5	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.1	2.2	2.3	2.5
7-Jan	2.1	Z	2.3	2.5	2.5	2.5	2.6	2.5	2.3	2.3	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.4	2.5	2.2	2.2	2.1	2.0	2.0	2.3	2.6
8-Jan	2.0	2.1	Z	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1
9-Jan	2.1	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.5	3.1	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.6	3.1
10-Jan	2.8	2.5	2.4	2.4	Z	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.2	2.3	2.5	2.6	2.5	2.6	2.7	3.0	3.0	2.9	2.7	2.4	2.6	3.0
11-Jan	2.3	2.3	2.3	2.3	2.5	Z	2.5	2.5	2.5	2.5	2.6	2.7	2.7	2.5	2.6	2.6	2.7	2.8	2.7	2.6	2.5	2.4	2.4	2.4	2.5	2.8
12-Jan	Z	2.5	2.6	2.6	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.7	2.7	3.0	3.0	2.8	2.6	2.8	2.8	2.9	2.6	3.0
13-Jan	2.9	Z	2.9	2.7	2.8	2.5	2.4	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.5	2.6	2.5	2.2	2.2	2.3	2.4	2.9
14-Jan	2.4	2.3	Z	2.3	2.3	2.4	2.3	2.4	2.3	2.2	2.1	2.2	2.3	2.1	2.2	2.3	2.3	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.3	2.4
15-Jan	2.1	2.1	2.1	Z	2.1	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.5	2.5	2.5	2.6	2.6	2.6	2.5	2.3	2.1	2.1	2.1	2.2	2.3	2.6
16-Jan	2.1	2.2	2.1	2.3	Z	2.2	2.2	2.1	2.2	2.3	2.1	2.2	4.0	4.4	3.6	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	4.4
17-Jan	1.9	2.0	1.9	1.9	1.9	Z	2.2	2.4	2.3	2.1	2.0	2.0	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.6	2.4	2.2	2.6
18-Jan	Z	2.4	2.6	2.6	2.6	2.7	2.7	2.7	3.1	3.1	2.8	3.1	3.0	2.8	3.0	3.8	3.9	4.1	3.2	3.0	2.9	2.9	2.9	2.8	3.0	4.1
19-Jan	2.7	Z	2.5	2.4	2.6	2.8	2.8	2.5	2.4	2.3	2.3	2.4	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.8
20-Jan	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	C	C	C	C	C	C	3.4	2.9	2.7	2.5	2.5	2.4	2.3	2.4	--	3.4
21-Jan	2.4	2.4	2.3	Z	3.6	3.6	3.2	2.9	2.9	2.5	2.3	2.3	2.5	2.2	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.5	3.6
22-Jan	2.2	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.3	2.1	2.3
23-Jan	2.3	2.2	2.4	2.4	2.5	Z	2.6	2.6	2.5	2.5	2.5	2.4	2.6	2.4	2.4	2.5	2.8	3.0	3.8	4.4	5.6	6.2	5.2	5.3	3.2	6.2
24-Jan	Z	5.1	3.9	3.4	3.5	3.5	3.5	3.8	3.8	3.3	2.1	2.1	2.8	3.3	2.8	2.8	2.8	2.8	2.7	2.6	2.4	2.3	2.4	2.4	3.0	5.1
25-Jan	2.4	Z	2.4	2.5	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.5
26-Jan	2.5	2.7	Z	3.0	2.9	2.7	2.5	2.4	2.3	2.2	2.0	2.0	2.2	2.3	2.4	2.6	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.3	3.0
27-Jan	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3
28-Jan	2.2	2.2	2.1	2.2	Z	2.2	2.3	2.4	2.4	2.4	2.4	2.3	2.2	2.3	2.3	2.3	2.4	2.5	2.6	2.4	2.2	2.2	2.2	2.2	2.3	2.6
29-Jan	2.1	2.1	2.1	2.2	2.2	Z	2.2	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.3	2.3	2.3	2.3	2.5
30-Jan	Z	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4
31-Jan	2.3	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.4	2.5	2.4	2.8	2.9	2.6	2.3	2.3	2.4	2.5	2.6	2.7	2.8	2.8	2.6	2.6	2.5	2.9
	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Diurnal Average	
	2.9	5.1	3.9	3.4	3.6	3.6	3.5	3.8	3.8	3.3	2.8	3.1	4.0	4.4	3.6	3.8	3.9	4.1	3.8	4.4	5.6	6.2	5.2	5.3	Diurnal Maximum	

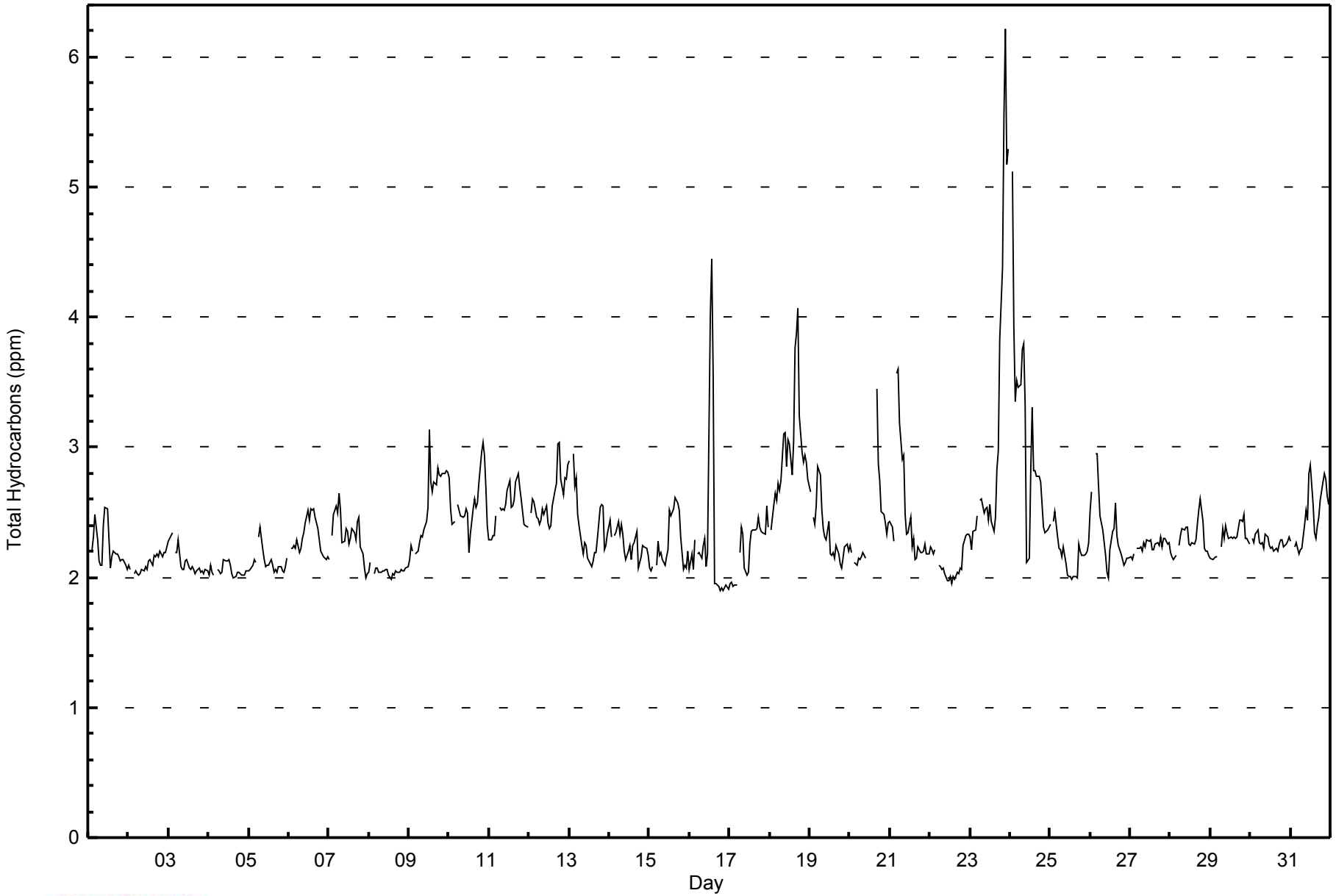
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	74	10.47	10.47
2.1 - 3.0	602	85.15	95.62
3.1 - 10.0	31	4.38	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2015

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	2	4	0	0	0	0	0	2	0	8	21	23	3	7	3	0	73
2.1 - 3.0	97	54	10	2	3	3	15	38	67	57	51	28	21	10	11	32	499
3.1 - 10.0	1	1	0	0	0	0	0	4	13	3	2	0	0	0	0	0	24
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	100	59	10	2	3	3	15	44	80	68	74	51	24	17	14	32	596

Total Number of Valid Hours: 596

Total Number of Hours: 744

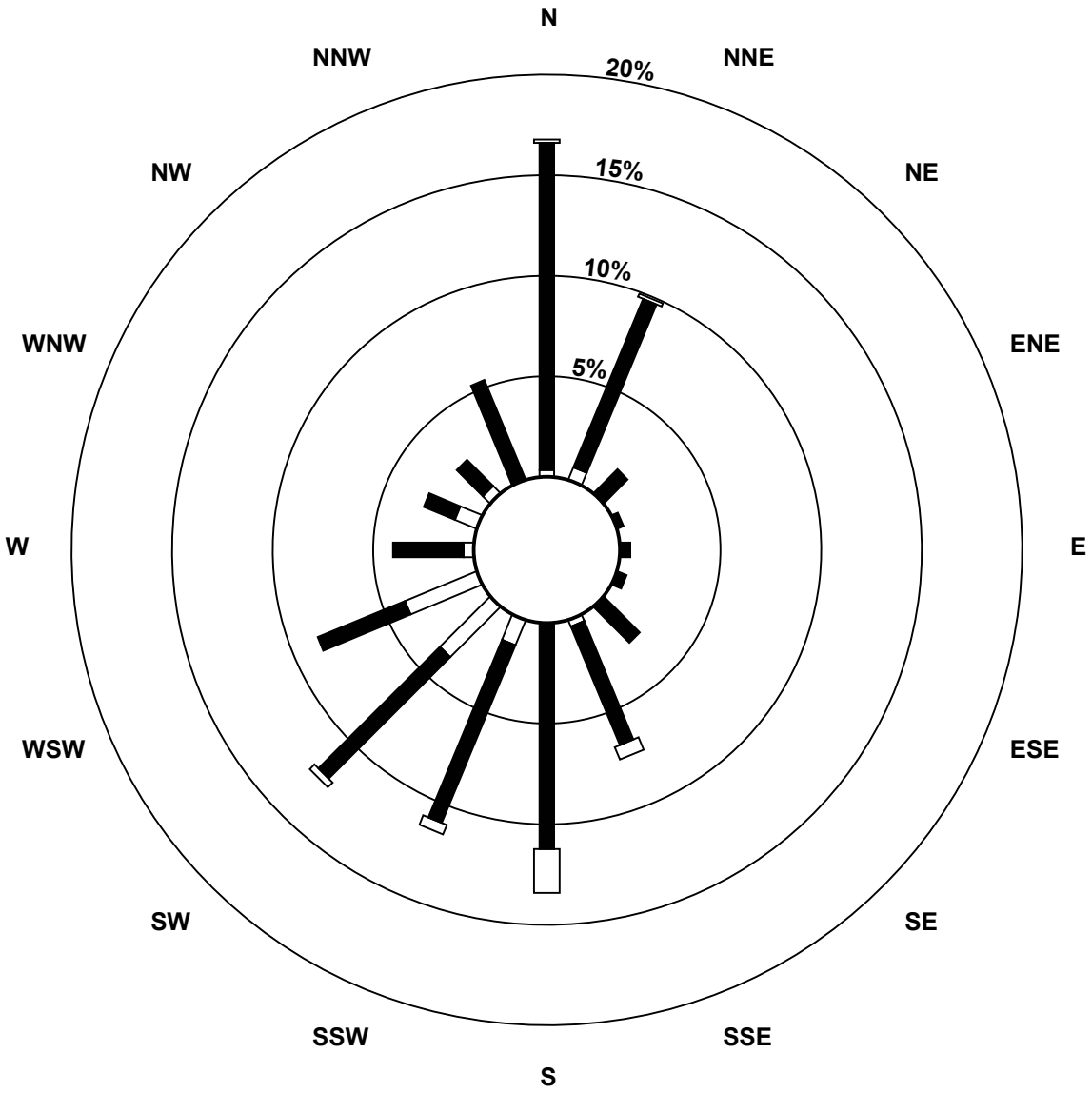
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

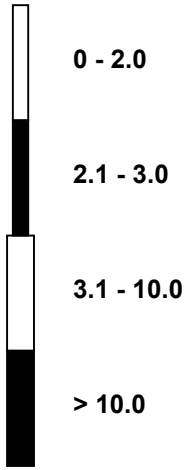
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Fort McKay South (AMS 13)



Classes (ppm)



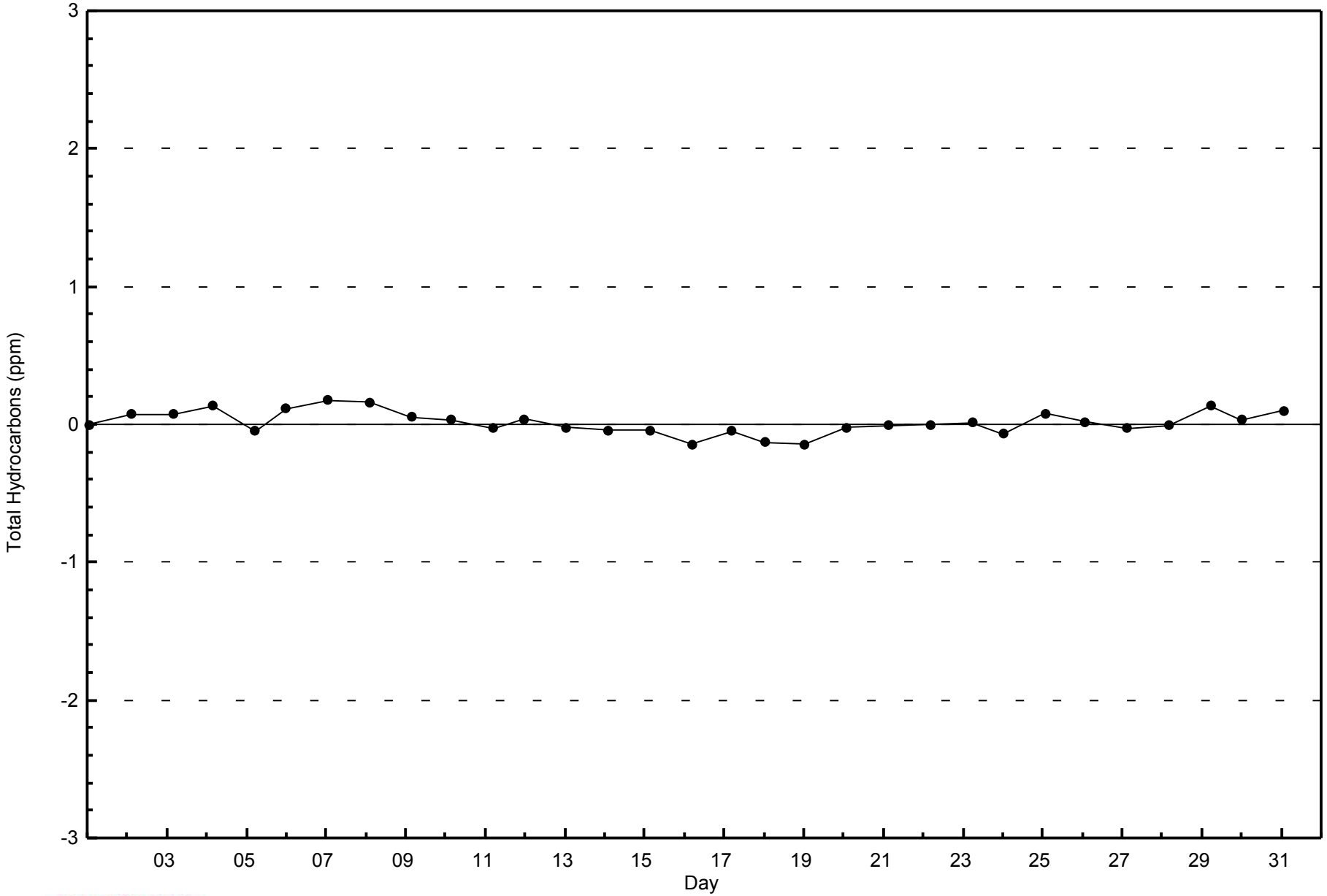
Total Number of Valid Hours: 596

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2015



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ATMOSPHERICS INC.

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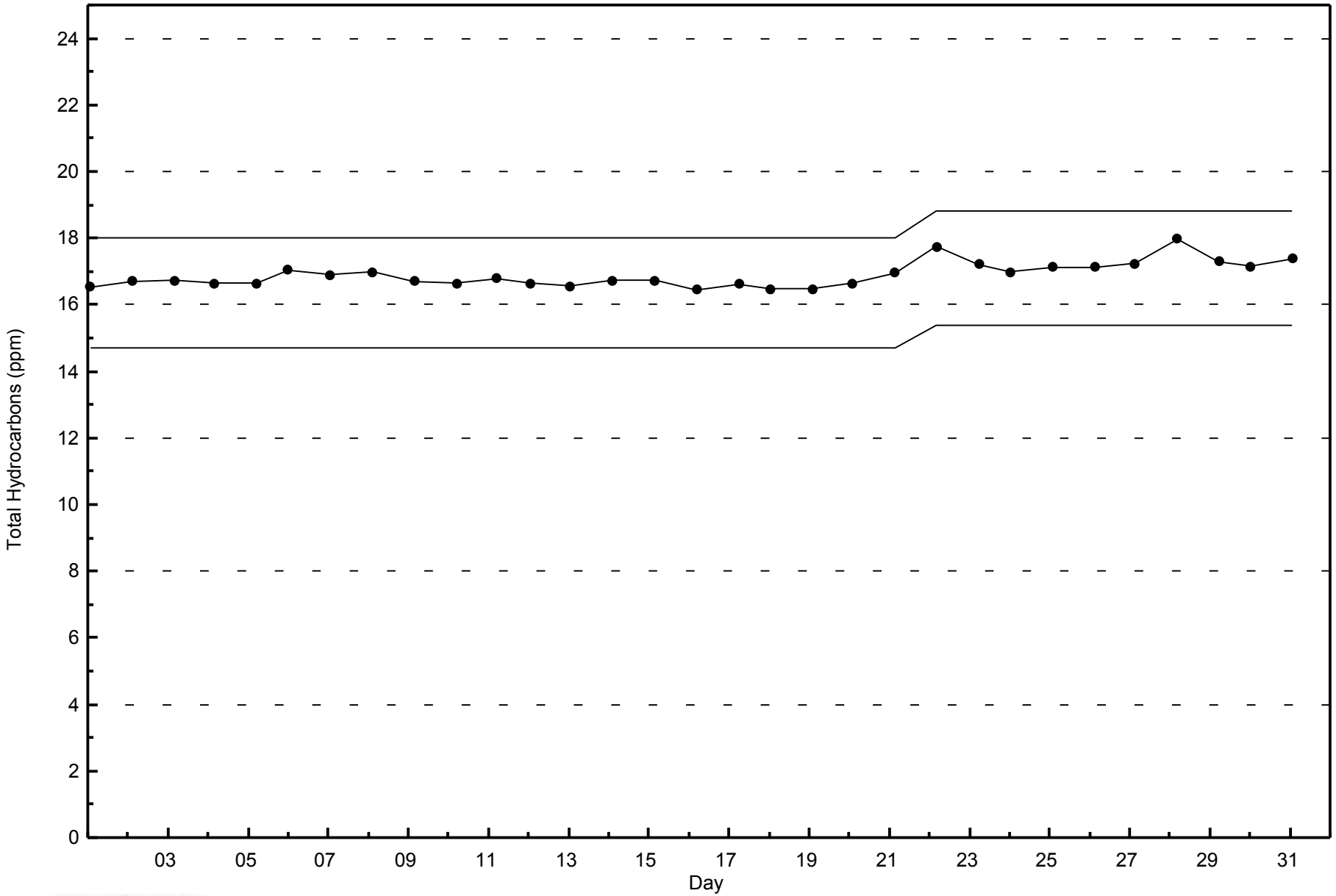
Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay South - January 2015

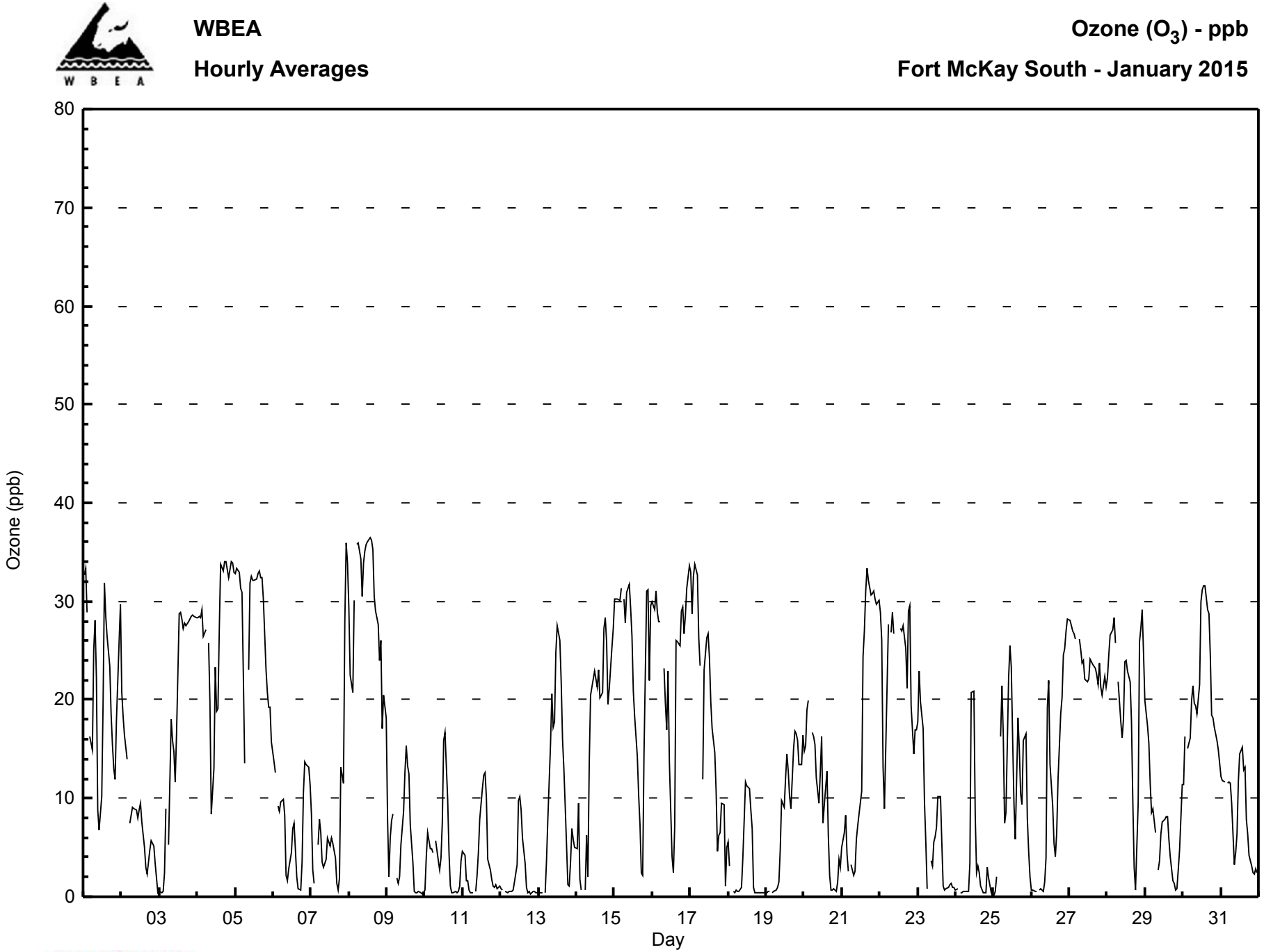
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 36 ppb on Jan 8 14:00 Maximum Daily Average: 29.6 ppb on Jan 8

Minimum Value: 0 ppb on Jan 25 01:00 Minimum Daily Average: 2.3 ppb on Jan 12
Maximum Diurnal Average: 17.0 ppb at hour 14 Minimum Diurnal Average: 10.8 ppb at hour 7
Monthly Average: 13.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 12 $Q_3 = 24$ $P_{90} = 30$ $P_{99} = 36$

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-Jan	33	33	29	Z	16	15	25	28	22	9	7	10	20	32	28	26	24	19	15	13	12	18	26	30	21.3	33
2-Jan	21	18	16	14	Z	7	8	9	9	9	8	9	10	8	5	3	2	4	5	6	5	3	2	0	7.9	21
3-Jan	1	0	0	2	9	Z	5	18	16	15	12	17	29	29	28	27	28	28	28	28	29	29	29	28	18.8	29
4-Jan	28	28	28	29	26	27	Z	26	20	8	13	23	19	19	27	34	33	34	34	33	32	34	34	33	27.2	34
5-Jan	33	33	33	31	31	23	13	Z	23	32	33	32	32	32	33	33	32	32	30	23	21	19	19	16	27.8	33
6-Jan	14	13	Z	9	9	10	10	8	2	2	3	4	7	8	5	2	1	1	3	11	14	13	13	11	7.5	14
7-Jan	8	3	1	Z	5	8	6	4	3	4	6	6	5	6	5	4	1	1	2	13	11	28	36	34	8.7	36
8-Jan	29	23	21	30	Z	36	36	34	31	34	35	36	36	36	36	35	31	29	28	24	26	17	20	18	29.6	36
9-Jan	8	2	6	8	8	Z	2	1	2	5	9	13	15	13	12	7	3	1	0	0	0	0	0	0	5.2	15
10-Jan	1	4	6	5	5	4	Z	6	4	3	4	8	16	17	10	4	1	0	0	1	0	1	1	4	4.5	17
11-Jan	5	4	2	2	1	0	0	Z	1	2	4	8	11	12	13	10	4	3	2	1	1	1	1	1	3.8	13
12-Jan	1	1	Z	1	0	1	1	1	1	2	3	10	10	9	6	3	1	0	1	0	1	1	0	0	2.3	10
13-Jan	1	0	0	Z	0	4	8	15	21	17	18	25	28	26	22	16	13	9	1	1	4	7	6	5	10.7	28
14-Jan	5	10	2	1	Z	1	6	2	14	20	21	23	22	21	23	20	21	27	28	26	20	21	25	27	16.8	28
15-Jan	30	30	30	30	31	Z	30	28	31	32	29	26	21	18	14	10	7	2	2	14	31	31	22	30	23.1	32
16-Jan	30	29	31	29	28	28	Z	23	20	17	23	14	4	2	7	26	26	26	29	29	27	29	31	34	23.5	34
17-Jan	33	29	33	34	33	26	24	Z	12	23	26	27	24	20	17	15	11	5	6	6	9	9	1	5	18.6	34
18-Jan	6	3	Z	1	0	1	1	0	1	4	8	12	11	11	9	7	1	0	0	0	0	0	0	0	3.4	12
19-Jan	0	1	1	Z	0	1	1	1	1	5	10	9	12	15	13	10	9	15	17	17	16	13	13	16	8.5	17
20-Jan	15	15	19	20	Z	17	16	15	12	9	13	16	7	9	13	6	2	1	1	1	1	2	4	3	9.4	20
21-Jan	5	7	8	4	3	Z	3	2	3	6	7	8	11	24	27	31	33	32	31	31	31	30	30	30	17.3	33
22-Jan	29	26	13	9	15	28	Z	27	29	27	C	C	C	27	27	28	25	21	29	29	19	14	17	17	22.8	29
23-Jan	18	23	20	17	10	6	1	Z	4	3	6	6	7	10	10	5	1	1	1	1	1	1	1	1	6.7	23
24-Jan	1	1	Z	0	0	0	1	1	1	3	21	21	8	2	3	2	1	0	0	0	3	2	0	0	3.2	21
25-Jan	0	1	2	Z	16	21	16	7	9	22	25	23	16	9	6	18	15	10	9	16	17	8	5	2	12.0	25
26-Jan	1	1	1	1	Z	1	1	1	2	4	19	22	13	9	5	4	6	12	19	20	25	25	27	28	10.7	28
27-Jan	28	27	27	27	26	Z	26	25	24	24	22	22	22	24	24	24	23	22	22	24	21	20	22	21	23.8	28
28-Jan	22	25	27	27	28	26	Z	22	18	16	18	24	24	23	22	18	10	3	1	9	26	27	29	25	20.4	29
29-Jan	20	17	16	11	9	9	6	Z	3	4	6	8	8	8	8	6	4	2	1	1	1	3	5	11	7.2	20
30-Jan	11	16	Z	15	16	20	21	20	19	19	22	30	31	32	32	29	29	24	18	18	17	16	15	14	21.1	32
31-Jan	12	12	12	Z	12	12	12	10	3	4	6	12	15	15	13	13	8	6	4	3	2	2	3	2	8.4	15
	14.4	14.0	14.7	14.3	13.0	12.7	10.8	12.8	11.5	12.4	14.5	16.7	16.5	17.0	16.2	15.4	13.1	11.9	11.9	12.9	13.6	13.8	14.1	14.5	Diurnal Average	
	33	33	33	34	33	36	36	34	31	34	35	36	36	36	36	35	33	34	34	33	32	34	36	34	Diurnal Maximum	

Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb


WBEA
Hourly Averages
Ozone (O_3) - ppb
Fort McKay South - January 2015
Ozone (ppb)
0
10
20
30
40
50
60
70
80
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	482	67.89	67.89
21 - 50	228	32.11	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Fort McKay South - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	68	30	8	2	3	3	14	38	79	53	40	13	11	6	9	21	398
21 - 50	30	30	2	0	1	0	1	10	4	11	35	39	12	11	5	10	201
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	98	60	10	2	4	3	15	48	83	64	75	52	23	17	14	31	599

Total Number of Valid Hours: 599

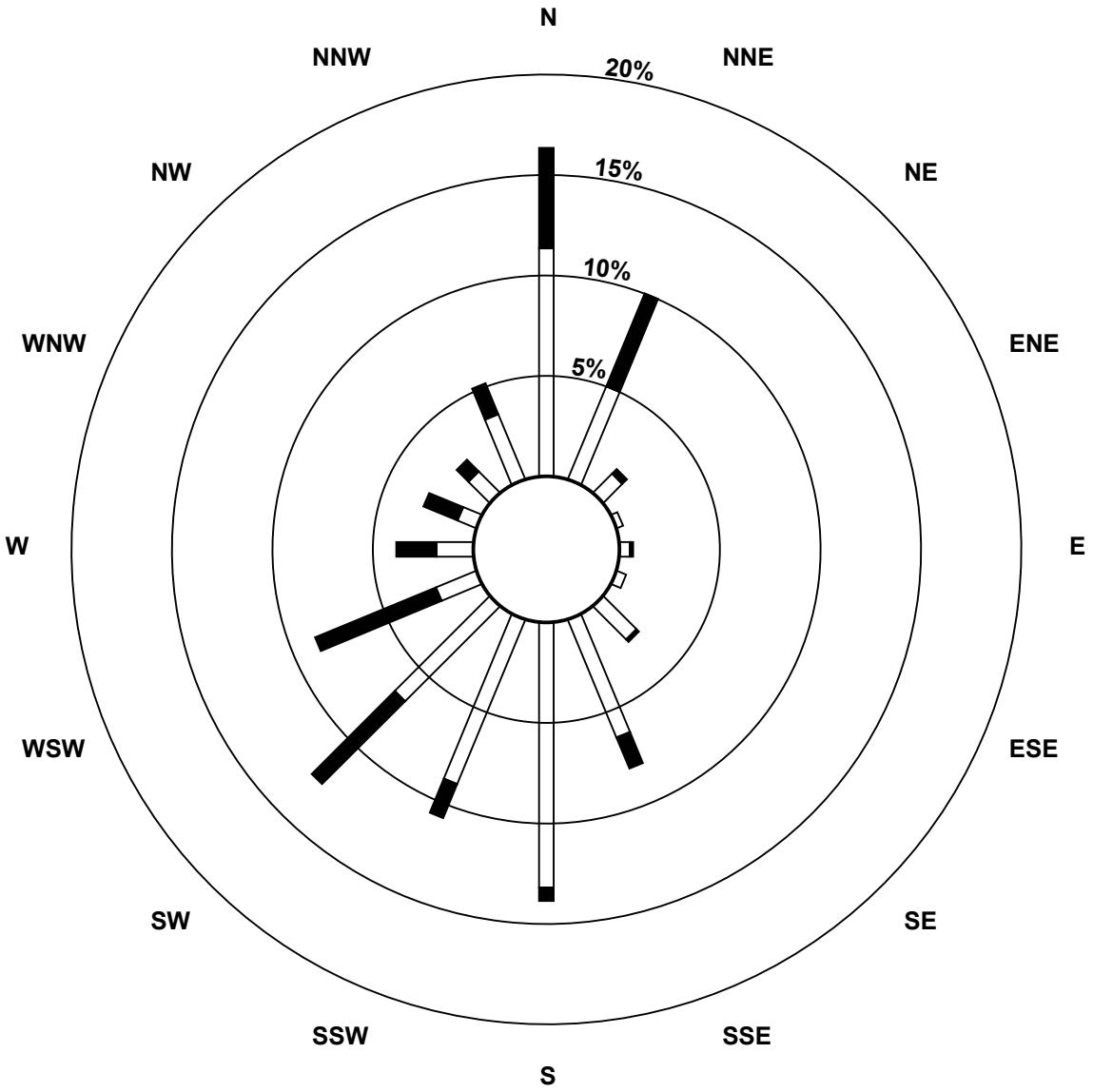
Total Number of Hours: 744

Wood Buffalo Environmental Association

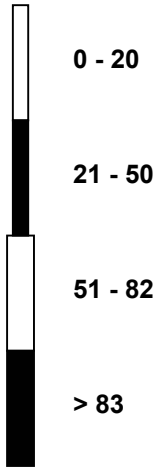
Wind Rose Jan 2015

Ozone (O_3) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



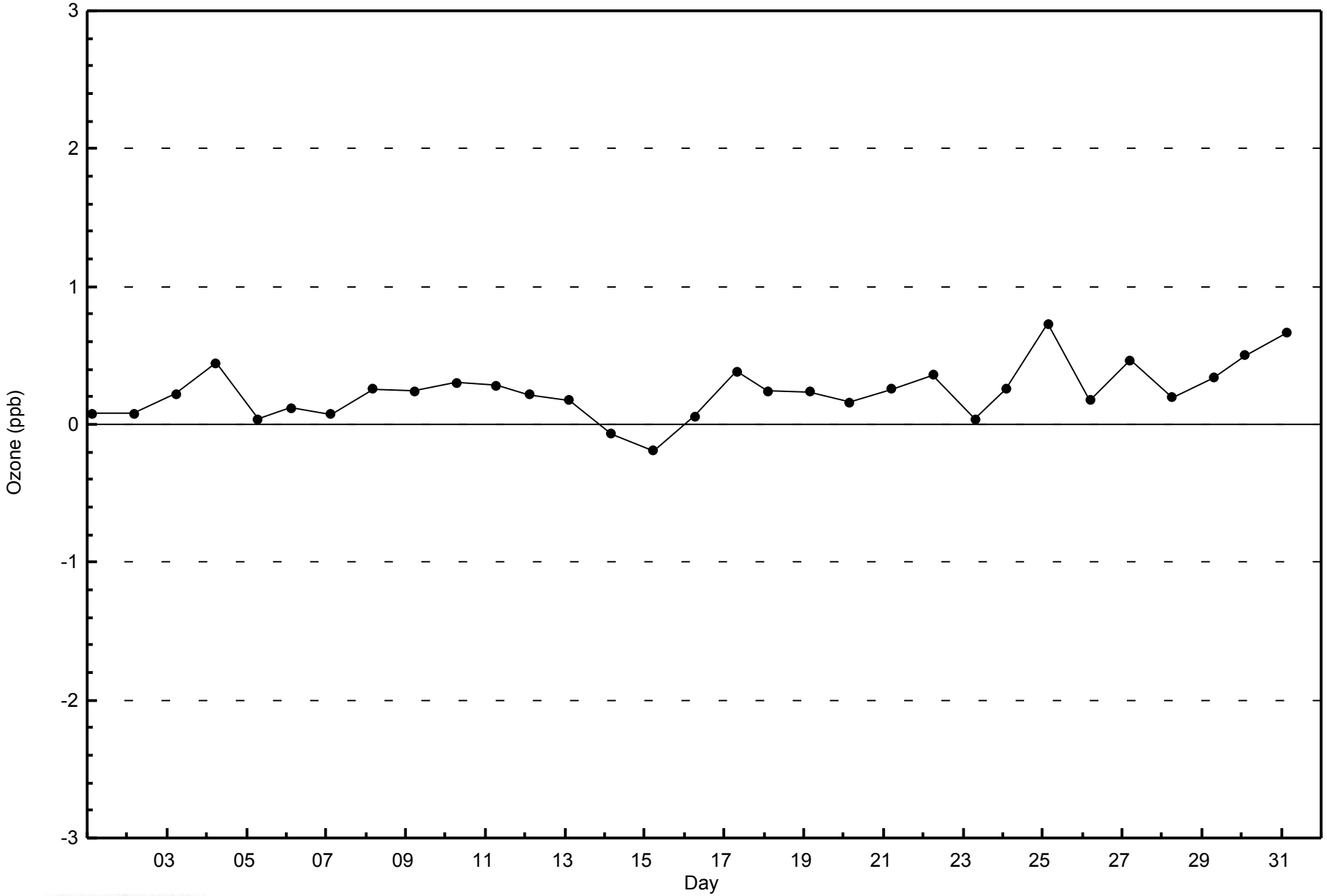
Total Number of Valid Hours: 599

WBEA

Zero Responses

Ozone (O_3) - ppb

Fort McKay South - January 2015



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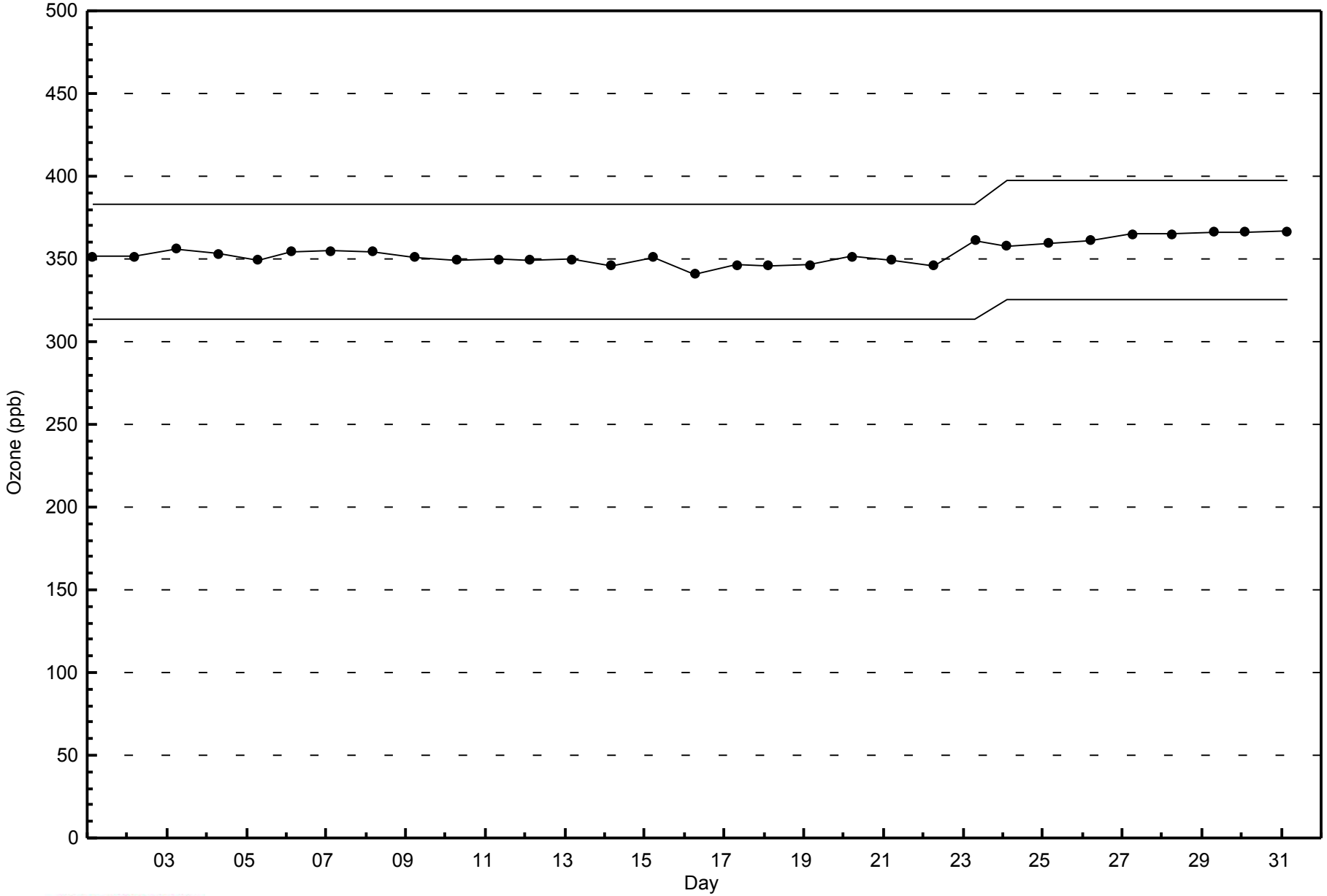
WBEA

Span Responses

Ozone (O_3) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort McKay South - January 2015

Maximum Value: 61 ppb on Jan 18 22:00

Maximum Daily Average: 28.4 ppb on Jan 18

Minimum Value: 0 ppb on Jan 1 01:00

Minimum Daily Average: 0.0 ppb on Jan 8

Maximum Diurnal Average: 8.3 ppb at hour 14

Minimum Diurnal Average: 3.1 ppb at hour 1

Monthly Average: 5.4 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 7$ $P_{90} = 17$ $P_{99} = 40$

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-Jan	0	Z	0	0	0	0	0	0	0	4	11	10	5	1	1	0	0	0	0	0	0	0	0	0	1.4	11
2-Jan	0	0	Z	0	0	0	0	0	0	1	2	8	9	14	12	7	2	1	0	0	0	0	2	6	2.8	14
3-Jan	5	10	10	Z	0	0	2	0	0	0	3	7	0	0	0	0	0	0	0	0	0	0	0	0	1.6	10
4-Jan	0	0	0	0	Z	0	0	0	1	7	8	2	4	6	4	0	0	0	0	0	0	0	0	0	1.4	8
5-Jan	0	0	0	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
6-Jan	Z	0	0	0	0	0	0	0	3	16	29	47	32	27	30	31	26	17	4	0	0	0	0	0	11.5	47
7-Jan	1	Z	2	1	0	0	0	1	5	9	11	15	13	10	9	8	5	7	8	1	0	0	0	0	4.6	15
8-Jan	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
9-Jan	2	3	1	Z	0	0	1	2	1	5	10	13	11	15	10	5	3	5	6	7	8	8	8	8	5.8	15
10-Jan	6	2	0	0	Z	0	0	0	3	10	23	26	11	10	13	14	9	11	14	16	17	13	5	1	8.9	26
11-Jan	0	1	3	3	8	Z	15	21	19	14	19	23	18	12	7	3	2	1	1	3	4	3	4	2	8.1	23
12-Jan	Z	12	10	17	30	25	23	24	16	15	26	12	9	10	16	13	13	19	17	15	10	16	10	7	15.8	30
13-Jan	9	Z	8	6	12	1	0	0	0	1	2	1	1	1	1	1	0	1	6	4	2	0	0	0	2.5	12
14-Jan	1	1	Z	10	17	22	4	3	0	0	1	1	2	2	2	1	0	0	0	0	0	0	0	0	3.0	22
15-Jan	0	0	0	Z	0	0	0	0	0	0	1	1	3	3	3	3	1	2	2	2	0	0	0	0	1.0	3
16-Jan	0	0	0	0	Z	0	0	0	0	0	0	4	22	36	22	0	0	0	0	0	0	0	0	0	3.7	36
17-Jan	0	0	0	0	0	Z	0	0	0	0	1	1	2	3	3	2	1	1	0	0	0	0	5	2	0.9	5
18-Jan	Z	6	34	41	36	36	40	51	19	9	8	9	13	13	12	8	21	23	23	31	53	61	59	46	28.4	61
19-Jan	33	Z	16	33	34	23	15	6	3	6	7	11	8	5	5	4	2	0	0	0	0	0	0	0	9.1	34
20-Jan	0	0	Z	0	0	0	0	0	0	1	C	C	C	C	C	C	9	14	17	9	8	4	2	3	--	17
21-Jan	1	0	0	Z	0	0	0	1	1	3	4	5	4	2	1	0	0	0	0	0	0	0	0	0	1.0	5
22-Jan	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
23-Jan	0	0	0	0	0	Z	5	4	1	6	9	11	10	5	3	9	24	20	15	19	23	38	39	43	12.2	43
24-Jan	Z	42	42	34	31	36	33	28	28	19	0	0	11	29	18	16	12	10	10	5	1	1	2	6	17.9	42
25-Jan	5	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.4	5
26-Jan	16	27	Z	32	25	12	4	2	1	1	0	0	7	13	13	19	3	0	0	0	0	0	0	0	7.6	32
27-Jan	0	0	0	Z	0	0	0	0	0	1	2	3	3	2	1	1	0	0	0	0	0	0	0	0	0.6	3
28-Jan	0	0	0	0	Z	0	0	0	0	2	4	2	2	3	3	4	2	3	5	2	0	0	0	0	1.3	5
29-Jan	0	0	0	0	0	Z	1	1	6	12	10	9	12	12	12	10	5	3	1	7	7	1	1	0	4.8	12
30-Jan	Z	0	0	0	0	0	0	0	0	2	4	2	2	2	2	1	0	0	0	0	0	0	0	0	0.8	4
31-Jan	0	Z	0	0	0	0	0	0	3	14	27	21	17	14	14	7	3	0	0	0	0	0	0	1	5.3	27
	3.1	4.2	4.9	6.9	7.5	6.1	4.6	4.7	3.6	5.1	7.4	8.2	7.7	8.3	7.2	5.6	4.6	4.4	4.2	4.0	4.3	4.7	4.5	4.1	Diurnal Average	
	33	42	42	41	36	36	40	51	28	19	29	47	32	36	30	31	26	23	23	31	53	61	59	46	Diurnal Maximum	

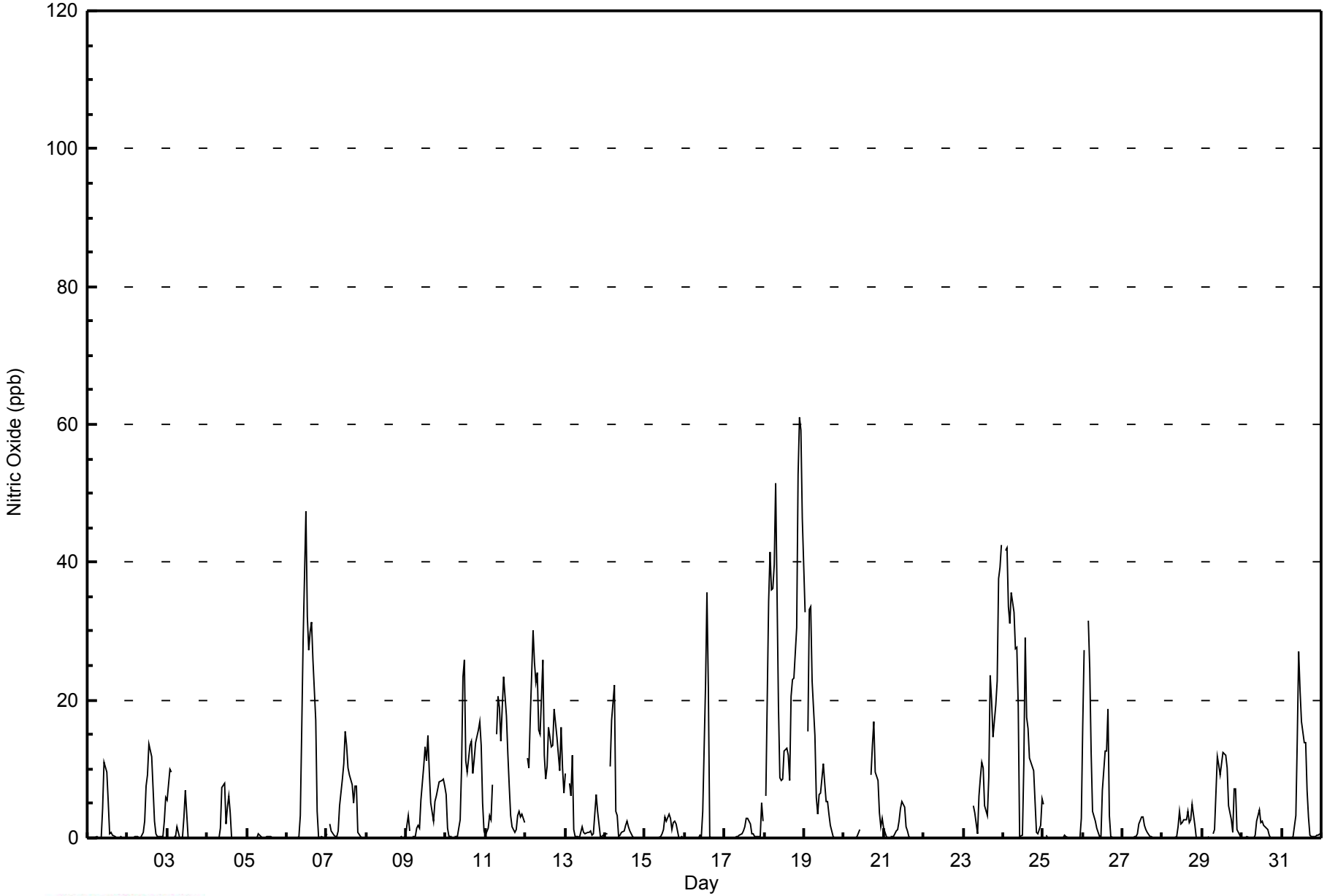
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	650	91.94	91.94
21 - 40	47	6.65	98.59
11 - 80	10	1.41	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

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay South - January 2015

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	56	10	0	2	2	15	37	66	57	69	51	24	17	14	31	550
21 - 40	1	2	0	2	0	1	0	6	12	7	4	0	0	0	0	1	36
11 - 80	0	1	0	0	1	0	0	1	2	4	1	0	0	0	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	100	59	10	2	3	3	15	44	80	68	74	51	24	17	14	32	596

Total Number of Valid Hours: 596

Total Number of Hours: 744

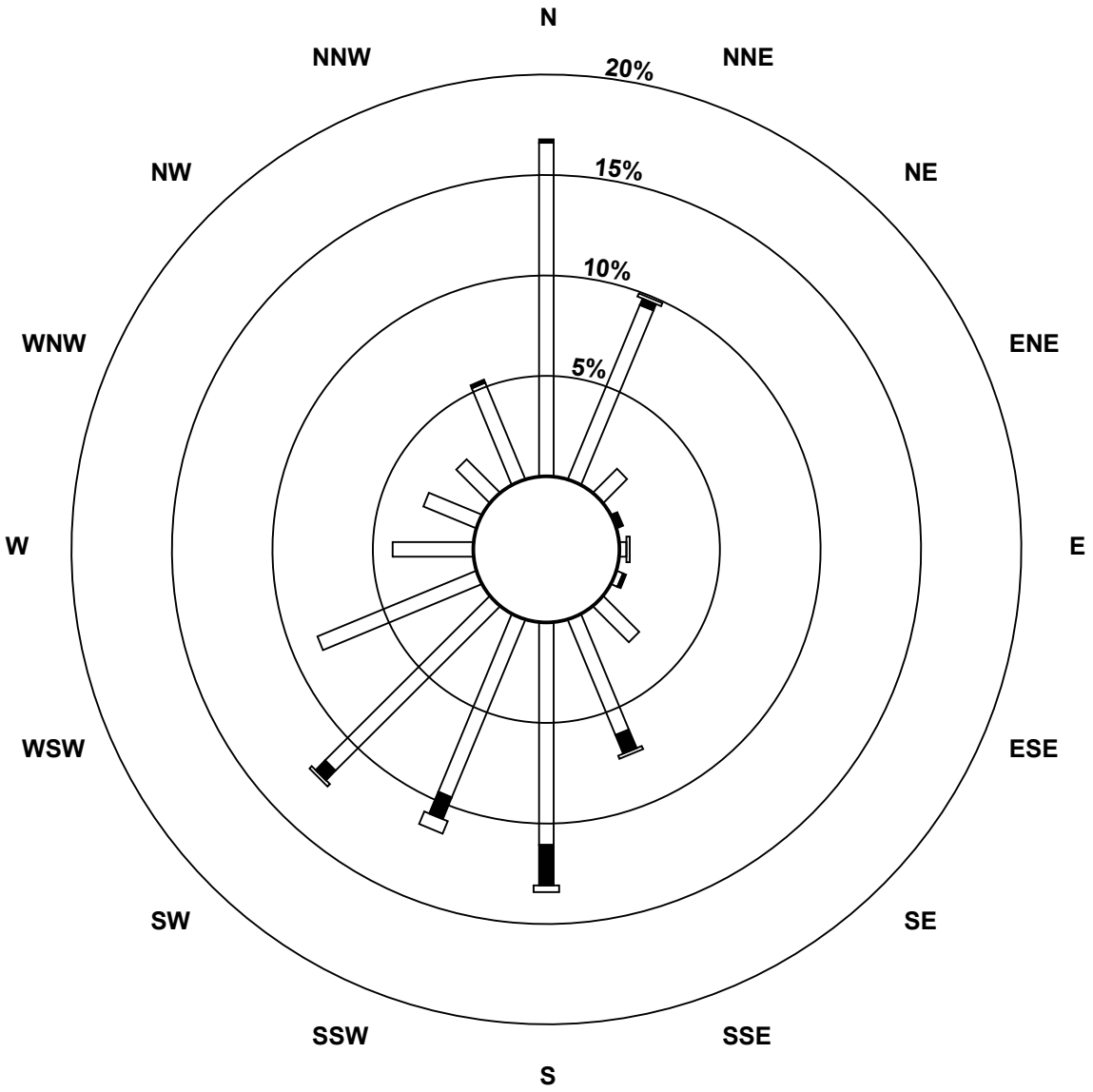
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

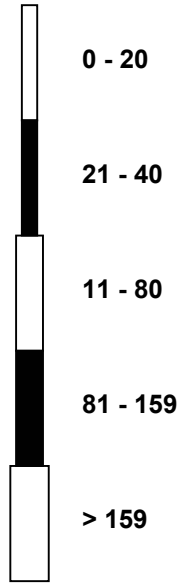
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



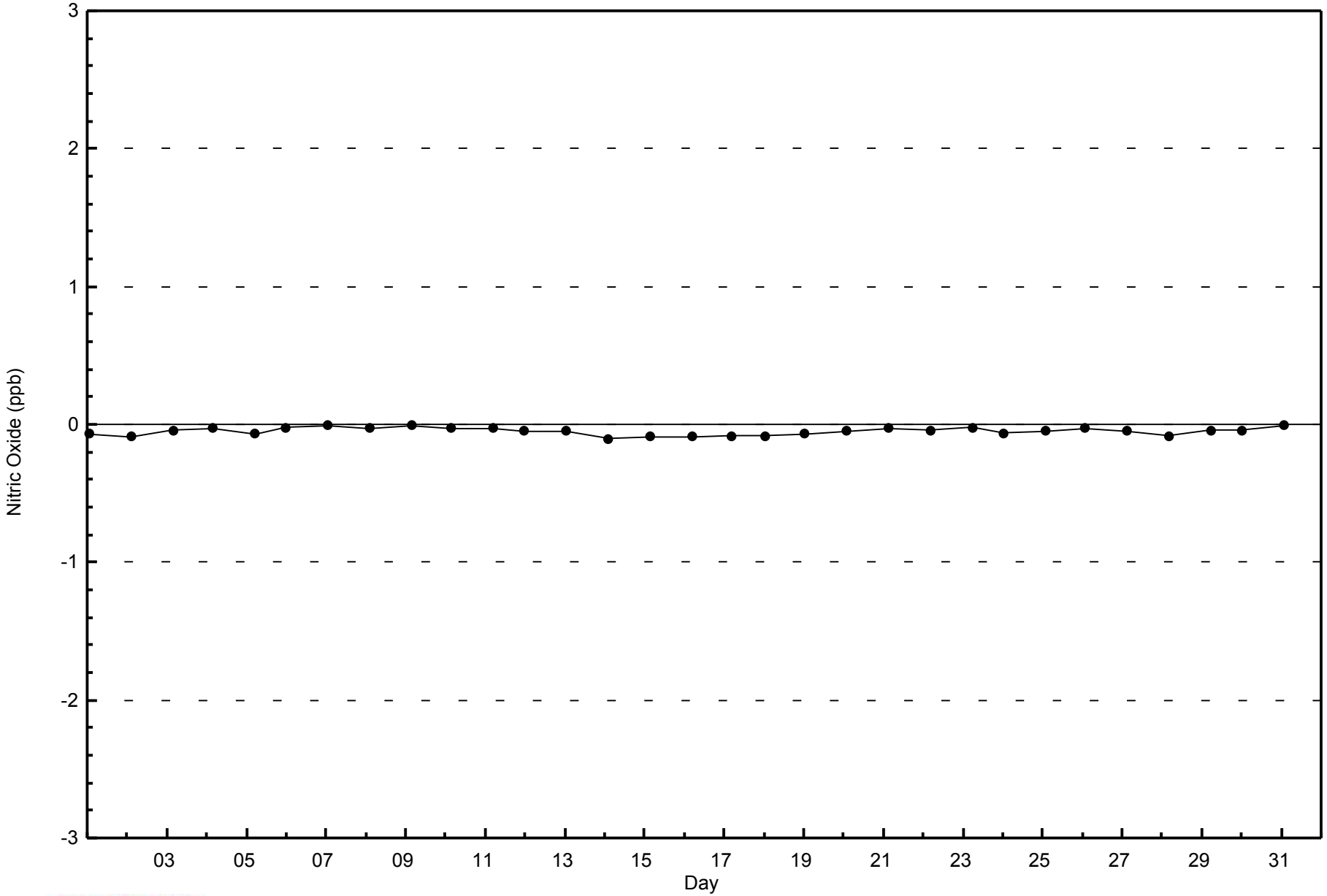
Total Number of Valid Hours: 596

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay South - January 2015



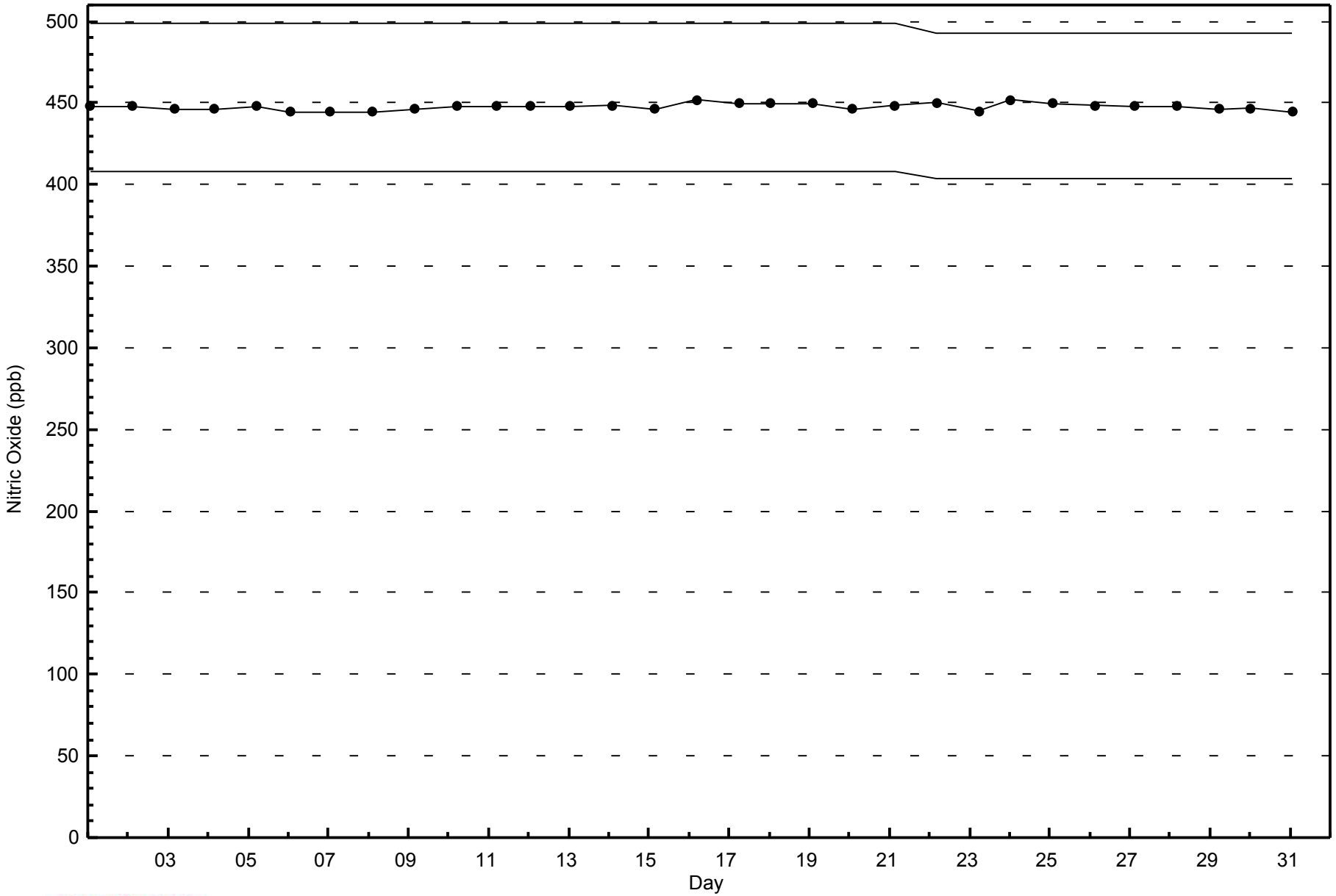
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 35 ppb on Jan 15 18:00 Maximum Daily Average: 23.2 ppb on Jan 9

Minimum Value: 0 ppb on Jan 3 20:00 Minimum Daily Average: 2.0 ppb on Jan 22
Maximum Diurnal Average: 15.0 ppb at hour 18 Minimum Diurnal Average: 8.6 ppb at hour 1
Monthly Average: 11.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 4$ Median = 11 $Q_3 = 19$ $P_{90} = 24$ $P_{99} = 29$

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-Jan	2	Z	6	16	19	20	8	5	10	25	29	26	16	3	6	9	9	7	6	5	4	3	2	1	10.2	29
2-Jan	2	2	Z	3	4	7	4	3	3	5	6	11	11	16	15	14	16	15	13	11	11	12	16	20	9.5	20
3-Jan	19	19	19	Z	8	7	13	3	2	1	5	7	1	0	0	0	0	0	0	0	0	0	0	0	4.6	19
4-Jan	0	0	0	0	Z	2	5	4	10	24	20	9	14	16	8	1	1	1	1	1	1	1	1	1	5.2	24
5-Jan	1	1	1	1	1	Z	15	17	7	1	1	1	1	3	2	1	0	0	1	1	0	1	3	6	2.8	17
6-Jan	Z	6	7	7	7	6	5	7	12	14	14	22	22	23	26	25	24	21	14	5	3	5	5	5	12.3	26
7-Jan	7	Z	21	20	16	13	12	18	27	28	26	26	27	25	25	27	29	31	32	19	15	6	3	4	19.8	32
8-Jan	7	7	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	11	10	2.3	11
9-Jan	18	29	23	Z	15	18	23	24	25	23	20	23	23	26	24	24	25	28	27	27	24	23	22	22	23.2	29
10-Jan	20	19	15	13	Z	10	9	8	10	14	18	24	19	18	24	28	26	26	24	25	24	22	19	14	18.5	28
11-Jan	12	13	17	16	18	Z	19	20	20	18	17	23	21	18	17	17	17	18	19	22	23	22	19	18	18.5	23
12-Jan	Z	21	20	21	20	19	24	27	27	24	25	18	17	19	23	24	22	24	22	21	20	21	23	21	21.8	27
13-Jan	19	Z	20	23	26	24	20	13	7	11	11	5	4	5	9	16	18	23	34	32	29	23	22	22	17.9	34
14-Jan	24	16	Z	22	20	19	16	24	14	8	9	8	9	10	9	12	11	5	4	7	14	14	10	8	12.7	24
15-Jan	5	4	4	Z	4	5	5	9	6	5	7	10	16	19	23	28	30	35	34	21	4	3	13	5	12.8	35
16-Jan	4	5	2	4	Z	4	6	7	10	10	3	12	26	27	19	2	2	1	1	1	1	1	1	1	6.4	27
17-Jan	1	1	0	0	0	Z	6	15	15	7	5	5	8	14	17	19	22	29	25	23	19	18	30	22	13.1	30
18-Jan	Z	22	27	27	24	24	24	22	19	15	14	16	19	20	23	25	19	17	18	19	16	14	14	14	19.6	27
19-Jan	10	Z	10	12	12	18	19	21	23	20	15	17	14	12	14	17	19	13	10	9	10	13	13	10	14.4	23
20-Jan	11	10	Z	5	8	9	10	10	10	8	C	C	C	C	C	C	28	29	27	26	21	23	21	21	--	29
21-Jan	18	15	11	Z	10	9	8	10	12	10	9	10	12	11	10	5	2	2	2	2	1	1	1	1	7.4	18
22-Jan	1	1	3	4	Z	1	1	1	1	1	1	1	0	0	1	1	0	1	0	0	5	8	8	9	2.0	9
23-Jan	10	4	8	11	18	Z	27	26	22	23	20	18	18	12	11	16	22	22	22	22	22	23	21	19	18.0	27
24-Jan	Z	19	17	16	15	16	13	9	8	6	1	2	9	17	16	16	17	17	17	18	13	13	11	11	12.9	19
25-Jan	9	Z	8	7	8	6	7	4	3	1	1	0	0	1	0	0	1	8	12	4	2	2	2	4	3.9	12
26-Jan	7	6	Z	5	5	7	9	9	8	2	1	1	11	16	12	16	14	11	6	5	3	4	4	3	7.1	16
27-Jan	3	4	4	Z	5	5	5	6	7	7	9	10	10	8	8	8	8	8	9	7	9	10	8	9	7.2	10
28-Jan	8	5	3	2	Z	2	6	5	4	8	13	7	7	8	9	13	17	22	23	18	5	5	3	3	8.5	23
29-Jan	2	2	4	11	15	Z	18	21	26	25	22	21	21	21	21	23	23	25	25	28	29	25	21	14	19.2	29
30-Jan	Z	11	9	13	12	9	8	10	12	13	13	6	6	5	5	8	8	11	13	11	10	7	7	7	9.3	13
31-Jan	6	Z	4	3	2	2	2	4	13	18	23	21	20	18	20	18	18	18	18	17	16	17	18	18	13.6	23
	8.6	9.6	10.1	10.1	11.3	10.0	11.1	11.7	12.0	12.1	11.8	11.9	12.7	13.1	13.2	13.6	14.4	15.0	14.7	13.1	11.5	11.3	11.3	10.4	Diurnal Average	
	24	29	27	27	26	24	27	27	27	28	29	26	27	27	26	28	30	35	34	32	29	25	30	22	Diurnal Maximum	

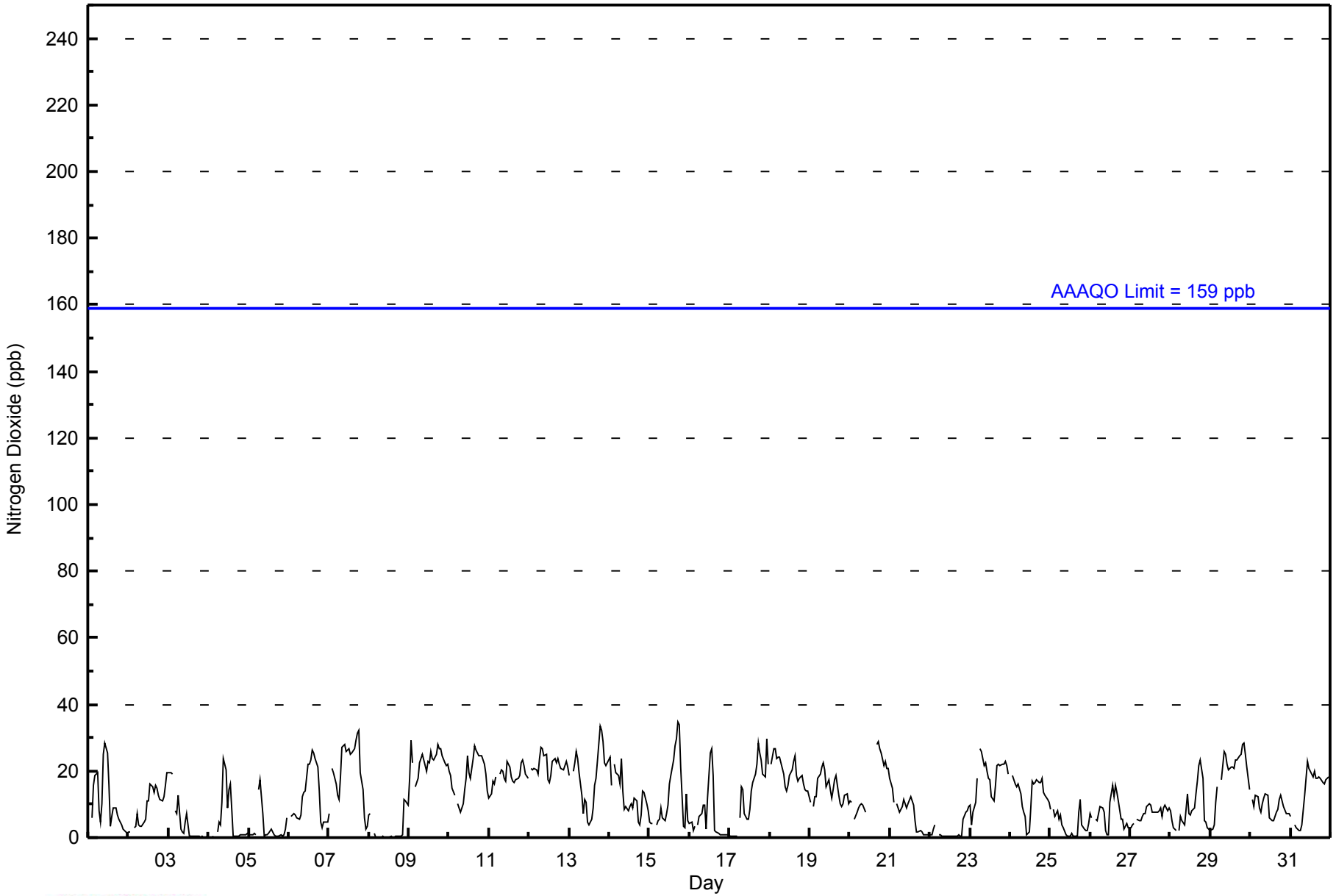
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Nitrogen Dioxide (NO_2) - ppb
Fort McKay South - January 2015

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	558	78.93	78.93
21 - 40	149	21.07	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

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
	Wind Direction																
0 - 20	78	52	9	0	2	1	6	25	52	50	67	49	22	16	12	18	459
21 - 40	22	7	1	2	1	2	9	19	28	18	7	2	2	1	2	14	137
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	100	59	10	2	3	3	15	44	80	68	74	51	24	17	14	32	596

Total Number of Valid Hours: 596

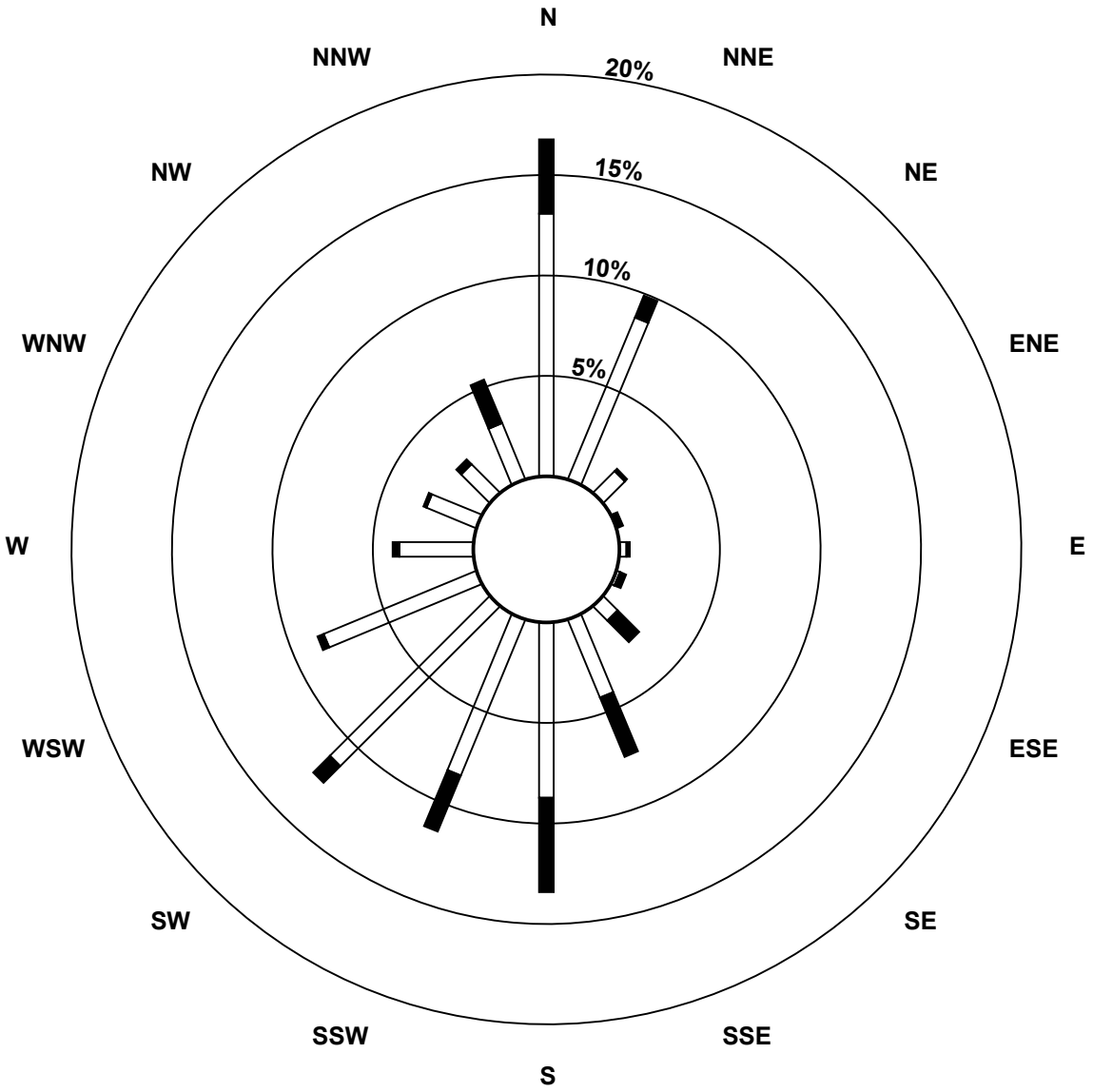
Total Number of Hours: 744

Wood Buffalo Environmental Association

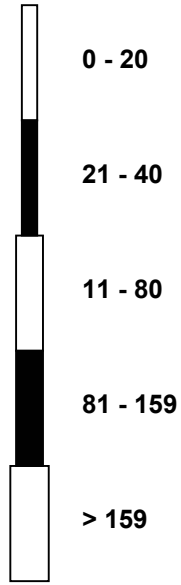
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



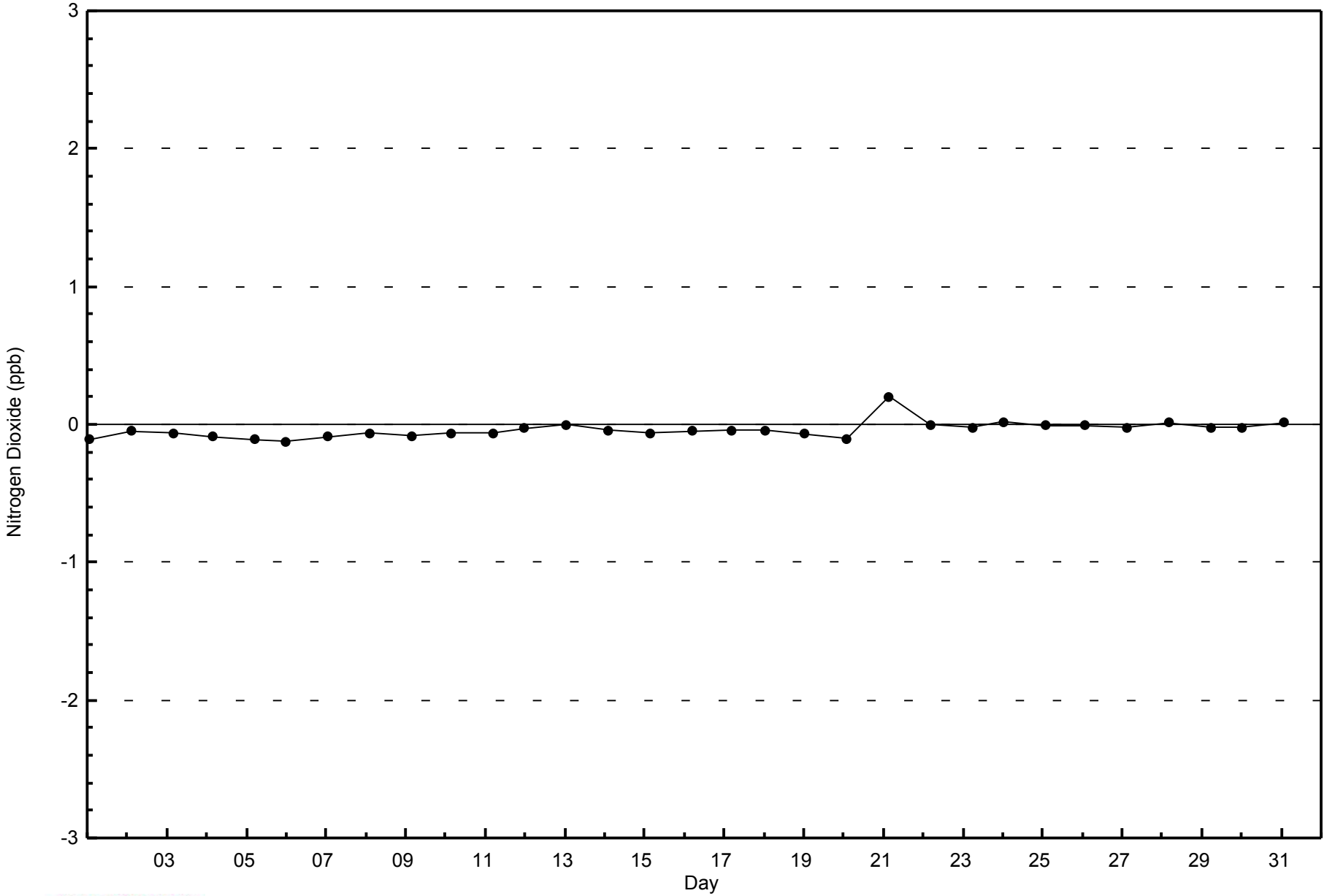
Total Number of Valid Hours: 596

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2015



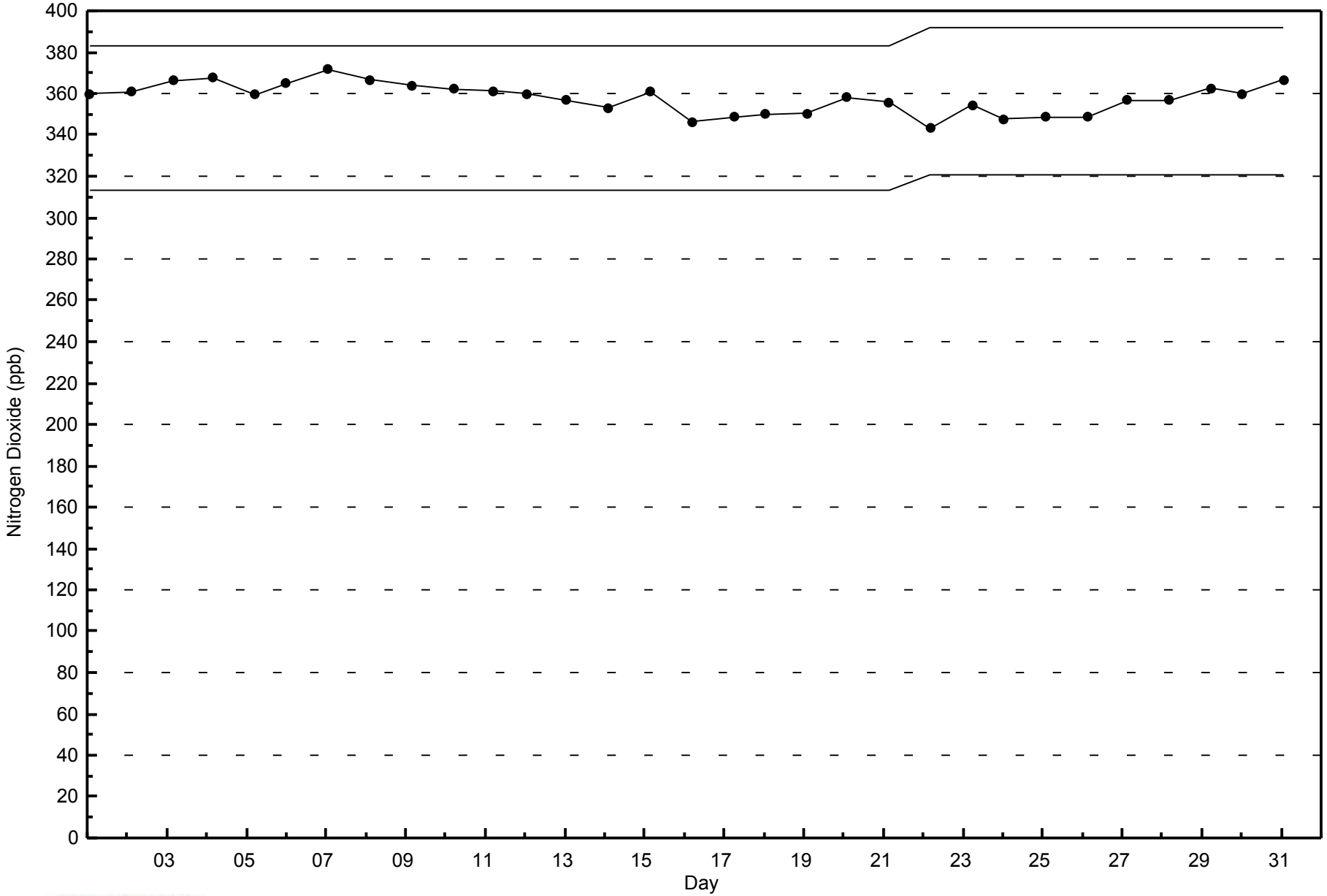
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2015

Maximum Value: 75 ppb on Jan 18 22:00

Maximum Daily Average: 48.0 ppb on Jan 18

Minimum Value: 0 ppb on Jan 8 06:00

Minimum Daily Average: 2.0 ppb on Jan 22

Maximum Diurnal Average: 21.3 ppb at hour 14

Minimum Diurnal Average: 11.7 ppb at hour 1

Monthly Average: 17.3 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 4$ Median = 13 $Q_3 = 28$ $P_{90} = 39$ $P_{99} = 61$

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-Jan	2	Z	6	16	19	20	8	5	10	29	40	35	21	4	7	9	9	7	6	5	4	3	2	1	11.6	40
2-Jan	2	2	Z	3	4	7	4	3	3	5	8	19	20	30	27	21	18	15	13	12	11	13	18	26	12.3	30
3-Jan	25	29	29	Z	8	7	14	3	2	1	8	14	1	0	0	0	0	0	0	0	0	0	0	0	6.3	29
4-Jan	0	0	0	0	Z	2	5	4	12	31	28	11	19	22	12	1	1	1	1	1	1	1	1	1	6.7	31
5-Jan	1	1	1	1	1	Z	15	18	7	1	1	1	2	3	2	1	0	0	0	1	0	1	3	6	2.8	18
6-Jan	Z	6	7	7	7	6	5	7	16	29	43	69	54	51	56	57	50	38	18	5	3	5	5	5	23.8	69
7-Jan	8	Z	22	21	17	13	12	19	32	37	37	42	40	35	35	35	34	39	40	20	15	6	3	4	24.5	42
8-Jan	7	7	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	11	10	2.3	11
9-Jan	20	32	24	Z	15	18	24	26	26	29	30	36	34	41	34	29	28	33	33	34	32	31	30	30	29.0	41
10-Jan	26	20	15	13	Z	10	9	8	13	24	41	50	30	27	37	42	36	37	38	40	40	35	24	15	27.5	50
11-Jan	12	14	20	19	26	Z	34	41	39	32	36	46	39	31	24	20	19	18	20	26	27	25	23	20	26.5	46
12-Jan	Z	32	31	38	50	44	46	51	42	40	51	30	25	29	39	37	36	43	39	35	30	37	33	28	37.6	51
13-Jan	28	Z	28	29	38	25	20	13	7	12	12	5	5	6	10	16	18	23	40	36	31	23	22	23	20.4	40
14-Jan	25	16	Z	33	37	41	20	27	14	9	10	9	11	13	11	13	11	5	4	7	14	14	10	8	15.7	41
15-Jan	4	4	4	Z	4	5	5	9	6	5	8	11	19	21	27	30	31	37	36	23	4	3	13	5	13.8	37
16-Jan	4	5	2	4	Z	4	6	7	10	10	3	16	48	62	41	2	2	1	1	1	1	1	1	1	10.1	62
17-Jan	0	0	0	0	0	Z	6	15	15	7	6	6	10	17	20	21	23	29	26	24	19	19	35	25	14.1	35
18-Jan	Z	28	61	68	60	60	64	74	38	24	22	24	31	33	35	33	39	40	41	49	69	75	73	60	48.0	75
19-Jan	43	Z	25	45	46	40	34	27	26	27	22	28	22	17	20	21	21	13	10	9	10	13	13	10	23.6	46
20-Jan	11	10	Z	5	8	9	10	10	10	9	C	C	C	C	C	C	37	43	44	35	30	26	23	24	--	44
21-Jan	19	15	11	Z	10	9	8	11	13	13	13	15	17	13	11	5	2	2	2	2	1	1	1	1	8.4	19
22-Jan	1	1	3	4	Z	1	1	1	0	1	1	1	0	0	1	1	0	1	0	0	5	8	8	9	2.0	9
23-Jan	10	4	8	11	18	Z	32	29	22	29	29	29	28	17	14	24	45	42	36	41	45	61	61	62	30.2	62
24-Jan	Z	60	59	49	47	52	46	37	35	25	1	2	20	46	34	32	29	27	26	23	14	13	13	16	30.8	60
25-Jan	13	Z	9	7	8	5	7	4	3	1	1	1	1	1	0	0	1	8	12	4	2	2	2	7	4.3	13
26-Jan	23	33	Z	37	30	20	13	11	9	3	1	1	17	28	25	34	17	12	5	5	3	4	4	3	14.7	37
27-Jan	3	4	4	Z	5	5	5	6	7	8	11	13	13	10	9	8	8	8	9	7	9	10	8	9	7.8	13
28-Jan	8	5	3	2	Z	2	6	5	4	10	17	9	9	10	12	17	19	25	28	20	5	5	3	3	9.8	28
29-Jan	2	2	4	11	15	Z	18	23	32	37	32	30	34	33	33	33	28	27	26	35	36	26	22	14	24.1	37
30-Jan	Z	11	9	13	12	9	8	10	12	16	17	8	8	7	7	9	9	11	13	11	9	7	7	7	10.1	17
31-Jan	6	Z	4	3	2	2	2	4	16	32	50	42	37	32	34	24	21	18	18	17	16	18	18	19	18.9	50
	11.7	13.8	15.0	16.9	18.7	16.0	15.7	16.4	15.6	17.3	19.3	20.1	20.4	21.3	20.4	19.2	19.1	19.5	18.8	17.0	15.8	16.0	15.8	14.5	Diurnal Average	
	43	60	61	68	60	60	64	74	42	40	51	69	54	62	56	57	50	43	44	49	69	75	73	62	Diurnal Maximum	

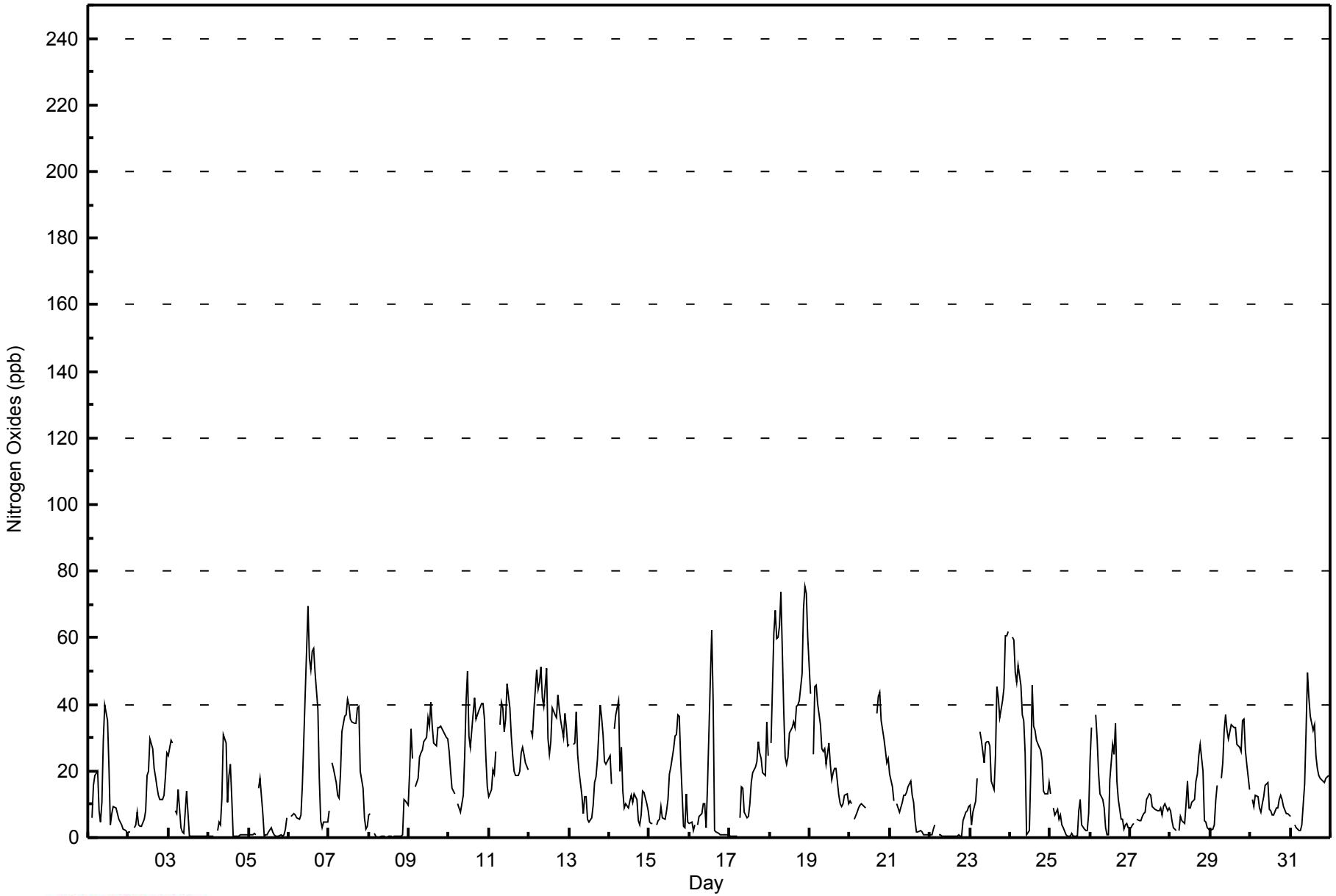
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	455	64.36	64.36
21 - 40	194	27.44	91.80
11 - 80	58	8.20	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

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	67	44	4	0	1	0	2	18	36	34	61	49	20	14	11	16	377
21 - 40	32	12	5	0	1	2	12	17	28	23	8	2	4	3	3	15	167
11 - 80	1	3	1	2	1	1	1	9	16	11	5	0	0	0	0	1	52
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	100	59	10	2	3	3	15	44	80	68	74	51	24	17	14	32	596

Total Number of Valid Hours: 596

Total Number of Hours: 744

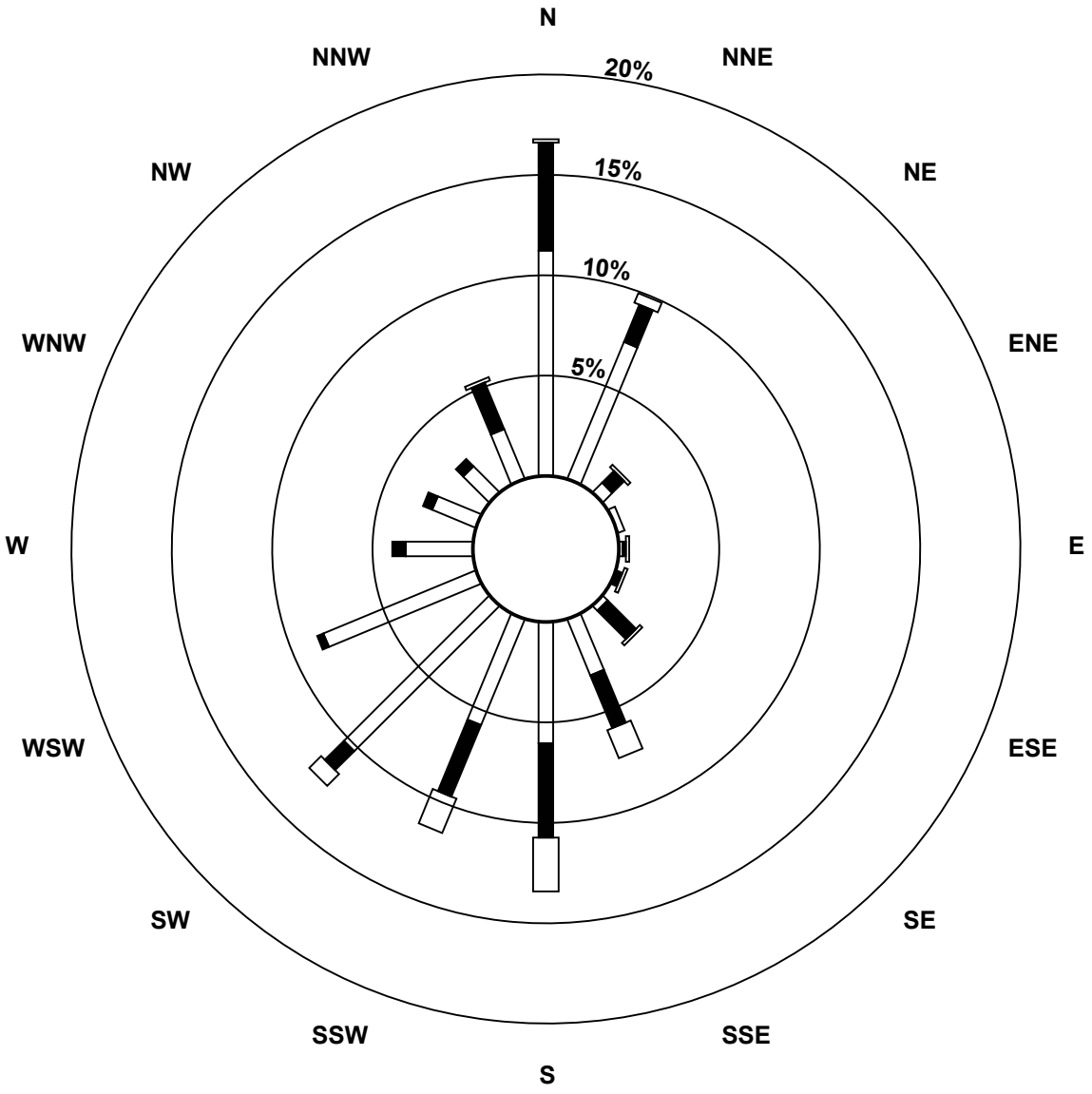
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

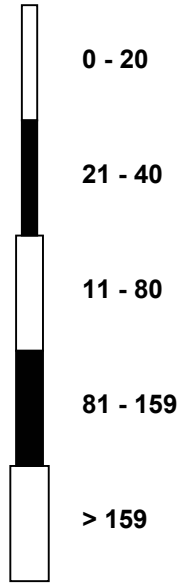
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Fort McKay South (AMS 13)



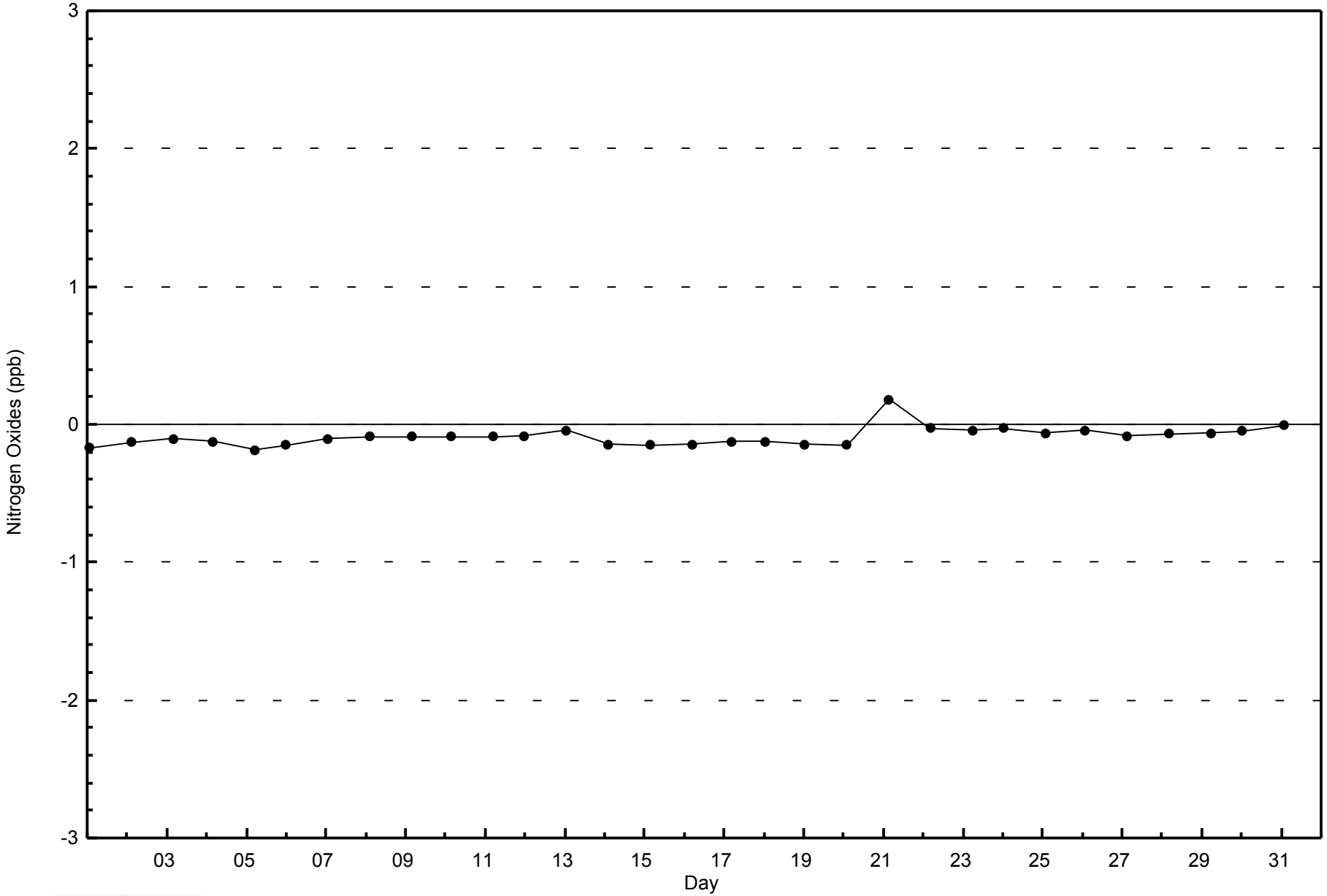
Classes (ppb)



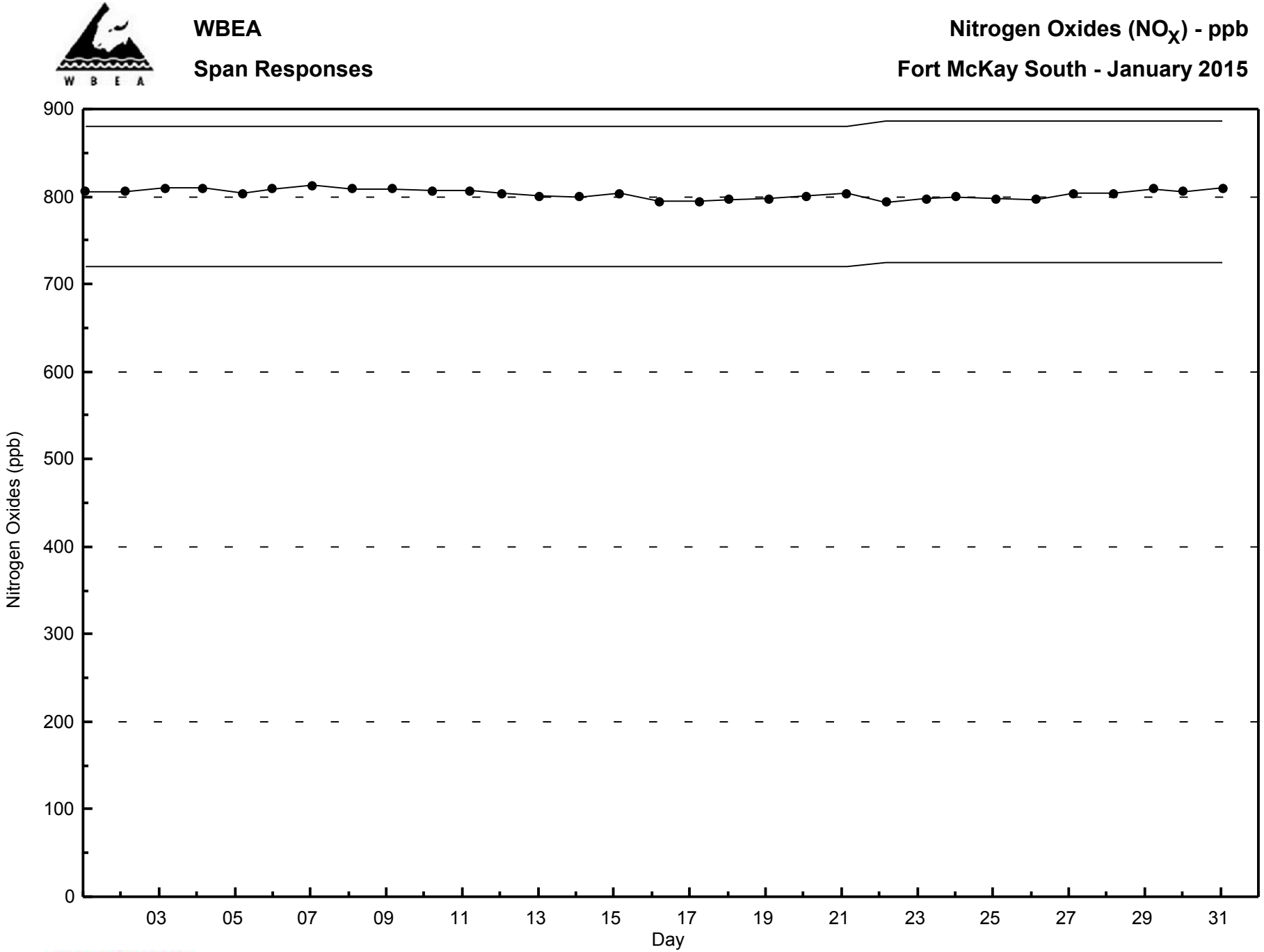
Total Number of Valid Hours: 596

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.


WBEA
Span Responses
Nitrogen Oxides (NO_X) - ppb
Fort McKay South - January 2015
Nitrogen Oxides (ppb)
900
800
700
600
500
400
300
200
100
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay South - January 2015

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

Maximum Value: 31.0 $\mu g/m^3$ on Jan 23 22:00

Maximum Daily Average: 16.6 $\mu g/m^3$ on Jan 23

Minimum Value: 0.0 $\mu g/m^3$ on Jan 22 20:00

Minimum Daily Average: 0.8 $\mu g/m^3$ on Jan 5

Maximum Diurnal Average: 5.3 $\mu g/m^3$ at hour 17

Minimum Diurnal Average: 3.7 $\mu g/m^3$ at hour 10

Monthly Average: 4.56 $\mu g/m^3$

Percentiles: P_1 = 0.5 P_{10} = 1.1 Q_1 = 2.1 Median = 3.5 Q_3 = 5.8 P_{90} = 8.9 P_{99} = 22.1

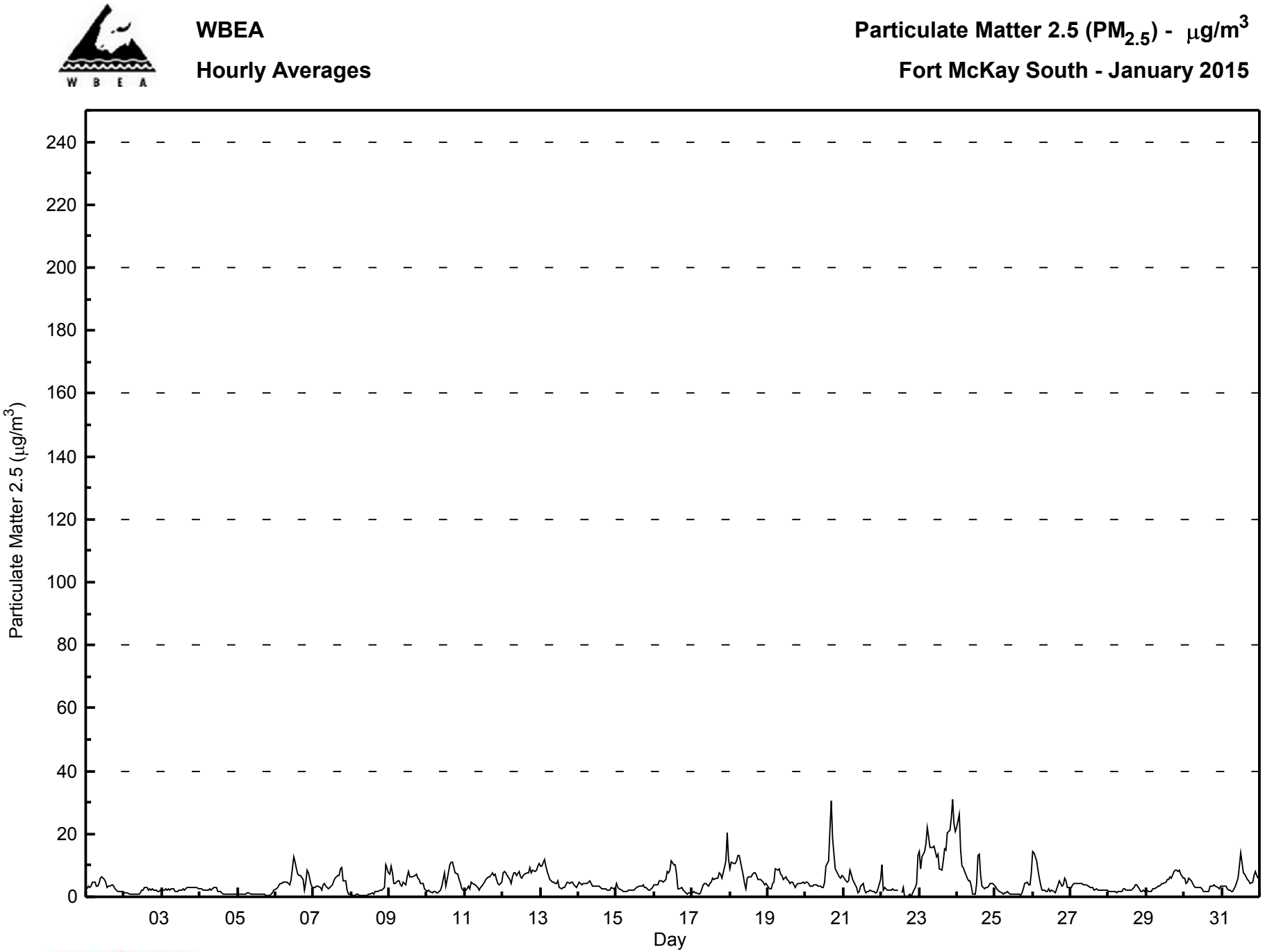
Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								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-Jan	2.6	3.5	3.2	3.6	4.8	4.5	3.4	3.4	4.3	5.8	6.2	5.6	4.8	3.0	3.3	3.4	3.8	3.2	2.7	2.1	1.9	1.7	1.7	1.5	3.5	6.2
2-Jan	1.3	1.2	1.1	1.0	1.0	1.0	0.8	0.9	0.9	1.0	1.1	2.1	2.1	2.8	2.8	2.2	2.7	2.3	2.5	2.3	2.0	1.7	1.7	2.2	1.7	2.8
3-Jan	2.2	2.2	2.5	2.0	2.3	2.2	2.4	2.5	1.8	1.6	1.7	2.2	2.3	2.6	2.2	2.5	3.1	3.0	3.1	2.9	2.9	3.0	2.8	2.7	2.4	3.1
4-Jan	2.3	2.5	2.2	2.1	2.1	2.1	2.3	2.2	2.4	3.1	2.9	1.8	1.7	1.6	1.3	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	1.7	3.1
5-Jan	0.8	0.7	0.7	0.8	0.7	0.9	1.2	1.3	0.9	0.7	0.7	0.7	0.8	0.8	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.7	1.1	2.1	0.8	2.1
6-Jan	2.4	3.2	3.6	4.1	4.1	4.7	4.8	4.6	4.2	3.8	5.5	12.7	10.9	8.8	7.2	6.9	6.8	5.4	2.2	4.6	8.3	7.8	3.6	2.8	5.5	12.7
7-Jan	2.8	3.0	3.4	3.6	2.8	2.3	3.8	4.1	3.3	2.7	2.8	3.5	3.8	5.3	5.9	6.6	6.9	8.9	9.2	5.3	5.1	2.0	0.7	0.8	4.1	9.2
8-Jan	0.9	0.5	0.4	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.5	0.7	1.0	1.1	1.0	1.6	1.5	1.7	1.9	2.0	2.4	2.9	10.2	7.7	1.7	10.2
9-Jan	7.3	9.9	7.6	4.3	4.1	5.1	4.9	3.8	3.5	4.4	3.8	6.5	8.2	6.5	6.5	6.3	6.9	7.0	5.9	5.3	4.3	4.3	2.7	2.2	5.5	9.9
10-Jan	1.7	2.0	1.7	1.3	1.6	1.5	1.4	1.2	2.0	3.6	5.4	7.7	3.5	5.4	10.0	11.0	11.2	9.3	7.7	7.3	5.6	4.1	2.4	2.1	4.6	11.2
11-Jan	1.7	2.6	3.3	2.7	4.8	4.1	3.7	3.5	2.8	2.2	2.9	3.4	4.5	5.3	6.0	6.4	6.5	7.7	7.0	7.1	5.4	4.4	3.8	4.8	4.4	7.7
12-Jan	7.8	8.2	7.5	6.6	5.4	4.4	6.3	7.4	7.5	6.6	7.9	6.4	6.0	6.6	7.1	7.5	7.8	9.2	7.8	8.3	8.0	8.5	9.6	10.5	7.4	10.5
13-Jan	9.9	9.9	12.0	9.9	8.1	6.6	5.3	4.5	4.5	4.4	4.3	5.0	2.8	2.4	3.2	3.0	3.6	4.8	4.4	4.5	4.6	3.8	3.6	3.0	5.3	12.0
14-Jan	4.8	4.3	3.9	4.0	4.1	4.2	4.6	5.2	4.4	3.5	3.5	3.6	3.6	3.2	2.8	2.6	2.7	2.4	2.1	2.1	2.2	2.8	2.5	2.5	3.4	5.2
15-Jan	4.1	2.8	2.4	2.1	1.7	1.6	1.7	1.7	1.9	2.0	1.9	2.2	2.7	3.1	3.2	3.3	3.6	3.7	3.1	2.9	2.0	2.2	2.5	2.9	2.6	4.1
16-Jan	3.8	4.0	3.9	5.0	5.1	4.9	4.7	5.4	7.9	7.6	8.4	11.5	10.2	10.1	7.2	2.8	2.5	2.8	2.2	1.9	1.3	1.0	1.1	1.2	4.8	11.5
17-Jan	1.2	1.6	1.3	1.1	1.0	1.4	2.4	3.9	4.4	4.3	3.5	4.1	4.8	5.8	5.3	5.9	6.1	7.4	7.4	6.0	7.6	11.6	20.5	12.0	5.4	20.5
18-Jan	8.9	11.1	10.6	10.7	11.6	13.2	13.1	11.0	6.6	4.4	2.5	5.8	6.4	6.4	7.3	7.4	7.5	6.6	5.6	5.6	5.0	4.5	3.8	4.3	7.5	13.2
19-Jan	3.0	2.5	2.7	4.1	4.7	8.7	8.7	8.8	7.1	6.7	5.7	6.4	5.6	5.0	4.1	4.8	4.5	3.0	3.6	4.4	4.1	4.4	4.8	4.2	5.1	8.8
20-Jan	4.8	4.5	4.3	3.4	3.6	4.0	3.8	3.6	3.3	3.3	3.1	3.0	4.7	9.7	11.4	21.2	30.5	18.5	13.5	8.9	7.4	6.4	5.8	6.6	7.9	30.5
21-Jan	6.4	5.1	4.5	5.3	8.5	7.1	5.3	3.9	3.0	1.2	1.5	3.6	4.1	2.0	1.4	1.7	1.9	1.9	1.9	1.6	1.1	1.1	2.7	5.5	3.4	8.5
22-Jan	10.4	2.1	2.9	2.5	2.3	2.0	2.2	2.6	2.2	2.0	2.0	M	M	1.1	2.9	0.2	0.1	0.6	0.7	0.0	1.2	3.0	4.2	13.1	2.7	13.1
23-Jan	14.6	9.0	12.6	14.4	16.9	22.1	19.2	15.7	15.5	16.0	14.5	12.7	13.7	8.9	8.7	11.4	15.3	14.8	20.5	21.2	25.2	31.0	23.2	20.6	16.6	31.0
24-Jan	22.2	26.5	15.0	9.6	9.3	8.1	5.9	5.2	5.0	3.6	0.7	0.8	4.3	13.2	13.8	7.0	3.3	2.6	3.0	3.1	3.6	4.3	4.2	3.8	7.4	26.5
25-Jan	3.4	2.6	1.9	1.9	1.1	1.0	1.2	1.1	1.8	0.8	1.0	0.8	0.7	0.7	0.8	0.7	0.6	1.4	2.7	4.2	4.4	3.8	3.9	7.6	2.1	7.6
26-Jan	14.4	13.9	11.5	8.6	6.0	3.7	2.2	2.3	1.8	1.5	2.5	1.8	2.0	1.6	1.4	2.4	3.9	5.2	3.6	3.9	5.9	5.1	3.0	3.0	4.6	14.4
27-Jan	3.1	3.6	4.2	4.3	4.4	4.2	4.1	4.1	3.7	3.9	3.6	3.3	3.1	3.0	2.9	2.2	2.4	2.2	2.2	1.9	2.0	2.0	2.2	2.0	3.1	4.4
28-Jan	1.8	1.7	1.7	1.7	1.7	1.5	1.7	1.9	1.8	2.4	2.6	2.2	2.0	1.9	1.9	2.6	2.9	3.8	3.9	2.6	1.8	1.8	2.0	1.6	2.1	3.9
29-Jan	2.0	1.9	1.7	1.9	2.7	2.4	2.8	3.4	3.4	3.9	4.3	4.3	4.8	5.4	5.7	6.3	5.9	8.1	8.5	8.3	8.1	8.3	7.1	5.8	4.9	8.5
30-Jan	6.0	4.3	4.5	6.0	4.9	4.3	3.4	2.9	2.8	3.2	3.0	2.4	1.9	1.6	1.5	1.7	3.5	3.5	3.5	3.8	3.2	2.9	2.7	3.5	3.4	6.0
31-Jan	3.4	3.3	3.2	2.6	2.3	2.2	1.9	1.9	3.2	4.7	5.8	9.7	13.9	7.7	7.0	6.5	5.3	4.9	4.3	4.8	6.8	8.2	6.6	6.1	5.3	13.9
	5.2	5.0	4.6	4.3	4.3	4.4	4.2	4.0	3.8	3.7	3.7	4.6	4.7	4.6	4.7	4.8	5.3	5.1	4.8	4.5	4.7	4.8	4.8	4.8	Diurnal Average	
	22.2	26.5	15.0	14.4	16.9	22.1	19.2	15.7	15.5	16.0	14.5	12.7	13.9	13.2	13.8	21.2	30.5	18.5	20.5	21.2	25.2	31.0	23.2	20.6	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$
Fort McKay South - January 2015
Particulate Matter 2.5 ($\mu g/m^3$)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	485	65.36	65.36
6 - 15	176	23.72	89.08
16 - 25	15	2.02	91.11
26 - 80	3	0.40	91.51
> 81.0	0	0.00	91.51

Total Number of Valid Hours: 742

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Fort McKay South - January 2015

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**
1 - 5	77	45	6	0	1	1	6	23	43	52	53	39	12	8	5	20	391
6 - 15	19	13	4	2	2	2	9	22	37	14	10	1	2	0	3	14	154
16 - 25	6	0	1	0	0	0	0	2	5	0	1	0	0	0	0	0	15
26 - 80	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	102	59	11	2	3	3	15	47	86	66	65	40	14	8	8	34	563

Total Number of Valid Hours: 626

Total Number of Hours: 744

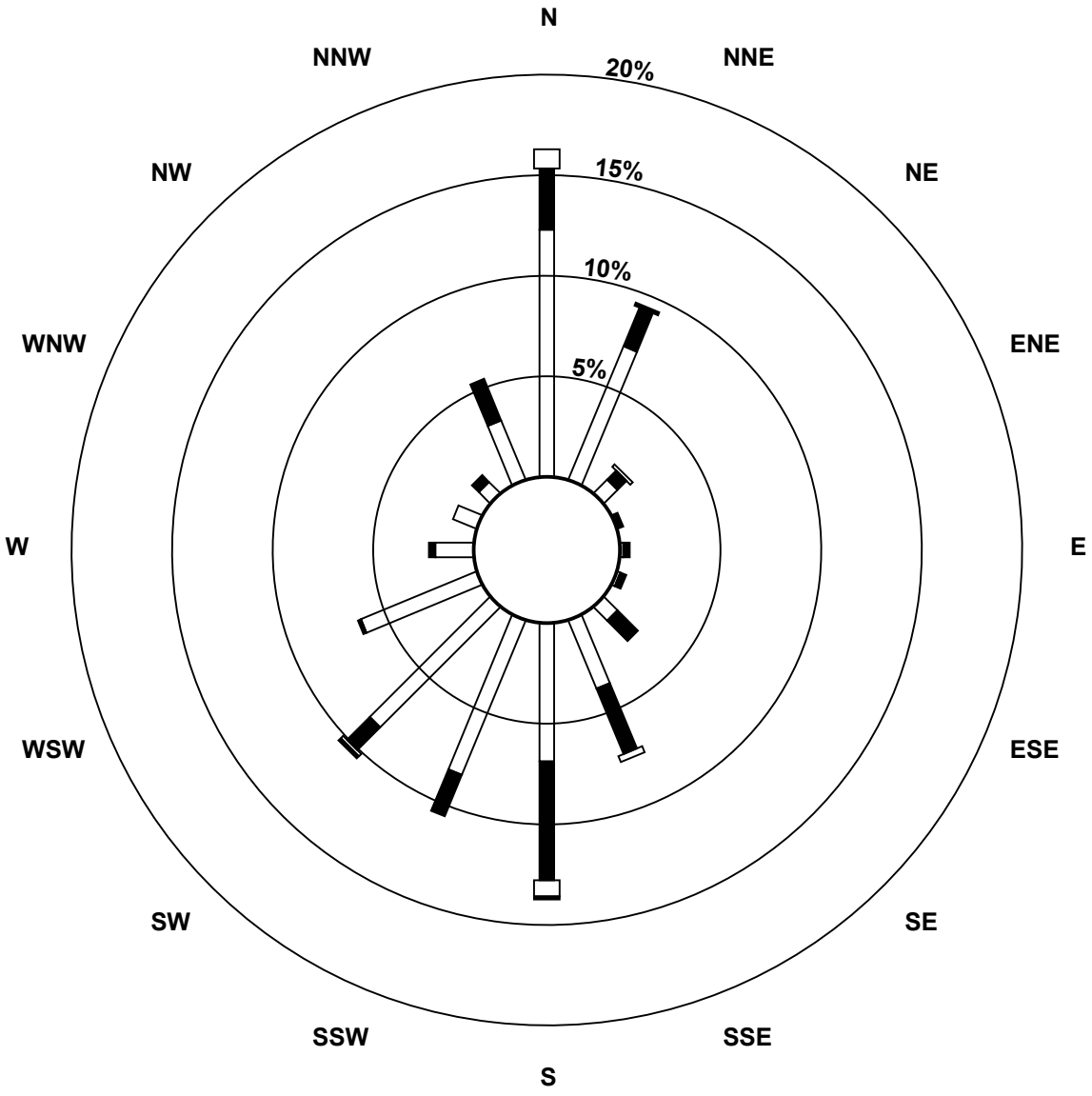
AURORA
ATMOSPHERICS INC.

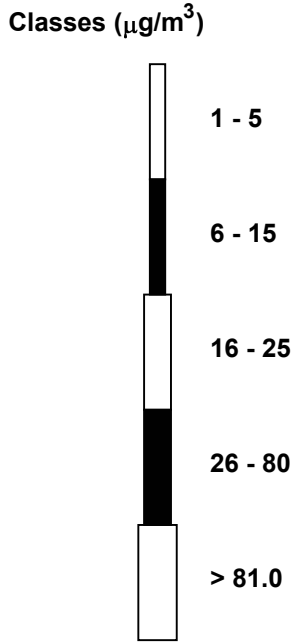
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Fort McKay South (AMS 13)





Total Number of Valid Hours: 626

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Fort McKay South - January 2015

Maximum Value: 6.8 C on Jan 22 16:00

Maximum Daily Average: 3.4 C on Jan 22

Minimum Value: -35.3 C on Jan 31 06:00

Minimum Daily Average: -29.9 C on Jan 31

Maximum Diurnal Average: -12.3 C at hour 15

Minimum Diurnal Average: -17.7 C at hour 9

Monthly Average: -15.93 C

Percentiles: P_1 = -34.6 P_{10} = -30.4 Q_1 = -23.7 Median = -16.4 Q_3 = -9.2 P_{90} = -0.3 P_{99} = 5.4

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-Jan	-12.9	-13.9	-14.8	-15.1	-15.3	-15.8	-16.0	-16.2	-16.4	-16.3	-15.7	-15.3	-15.2	-16.3	-17.1	-17.7	-19.3	-22.1	-22.9	-22.6	-22.6	-22.3	-21.2	-20.5	-17.6	-12.9
2-Jan	-23.2	-25.0	-25.2	-24.4	-23.9	-23.9	-23.9	-24.4	-25.5	-26.0	-25.0	-23.3	-22.3	-22.1	-23.2	-26.3	-28.5	-30.0	-31.5	-32.4	-32.5	-32.1	-31.3	-30.3	-26.5	-22.1
3-Jan	-29.1	-28.5	-30.3	-31.7	-32.5	-32.3	-32.8	-32.1	-33.9	-34.7	-32.6	-29.0	-25.5	-24.6	-24.4	-25.4	-26.1	-26.2	-26.1	-25.8	-25.2	-25.2	-25.3	-25.7	-28.5	-24.4
4-Jan	-26.0	-25.9	-26.0	-25.0	-25.7	-26.4	-27.0	-26.5	-26.2	-25.4	-23.6	-21.8	-20.6	-18.1	-16.5	-17.0	-18.2	-17.6	-17.2	-17.8	-18.5	-17.6	-17.8	-18.9	-21.7	-16.5
5-Jan	-19.2	-18.3	-18.2	-18.9	-18.1	-18.0	-17.9	-18.1	-16.8	-15.9	-15.0	-14.3	-13.7	-13.5	-14.2	-15.1	-15.5	-15.7	-16.1	-19.0	-22.3	-24.0	-24.5	-25.7	-17.8	-13.5
6-Jan	-26.6	-27.5	-28.8	-29.8	-30.9	-31.8	-32.6	-33.2	-33.9	-34.2	-32.3	-28.5	-25.0	-22.9	-21.9	-25.3	-28.2	-29.8	-30.8	-30.9	-30.7	-31.2	-30.9	-31.0	-29.5	-21.9
7-Jan	-31.0	-31.3	-31.2	-30.1	-29.6	-28.7	-27.5	-25.2	-23.5	-22.6	-21.6	-20.9	-19.7	-19.2	-19.0	-18.6	-18.2	-18.0	-17.3	-16.6	-18.4	-16.2	-14.3	-15.1	-22.2	-14.3
8-Jan	-18.2	-21.5	-24.2	-21.6	-18.7	-19.3	-19.1	-20.2	-22.6	-20.6	-18.9	-17.8	-16.9	-16.4	-16.4	-17.6	-20.5	-21.6	-22.9	-24.2	-23.8	-25.7	-25.9	-27.3	-20.9	-16.4
9-Jan	-28.6	-28.7	-28.9	-29.8	-30.4	-30.8	-31.3	-31.6	-32.0	-31.5	-28.6	-23.9	-21.4	-20.0	-19.1	-22.2	-24.9	-26.8	-27.9	-29.2	-30.6	-30.4	-27.5	-26.1	-27.6	-19.1
10-Jan	-26.2	-27.5	-28.3	-30.3	-31.9	-33.1	-34.0	-34.7	-35.2	-34.9	-32.1	-26.8	-23.6	-22.0	-22.4	-23.7	-27.0	-28.8	-30.1	-30.7	-31.4	-31.9	-32.5	-32.8	-29.7	-22.0
11-Jan	-33.1	-33.1	-33.2	-33.6	-33.8	-34.2	-34.6	-34.5	-34.3	-33.5	-30.7	-26.1	-23.7	-22.4	-20.9	-21.3	-24.2	-24.3	-24.3	-23.4	-22.6	-21.5	-22.1	-23.9	-27.9	-20.9
12-Jan	-24.8	-25.0	-25.0	-25.2	-25.0	-23.1	-20.3	-18.6	-18.2	-17.4	-16.3	-15.4	-14.7	-14.0	-13.6	-14.6	-16.3	-14.7	-13.3	-13.0	-12.2	-11.6	-10.8	-10.1	-17.2	-10.1
13-Jan	-9.7	-9.4	-9.1	-9.0	-9.4	-9.7	-10.1	-10.1	-10.4	-10.4	-10.5	-10.9	-11.2	-11.2	-11.2	-11.5	-11.7	-11.7	-11.8	-11.8	-11.8	-11.8	-11.4	-10.8	-10.7	-9.0
14-Jan	-10.5	-9.7	-10.3	-11.4	-11.3	-10.0	-8.0	-7.5	-7.5	-7.4	-7.5	-7.9	-7.9	-7.9	-8.8	-9.6	-10.7	-12.5	-13.5	-13.9	-14.1	-14.5	-15.6	-16.3	-10.6	-7.4
15-Jan	-17.0	-17.3	-17.5	-17.5	-17.4	-17.4	-17.6	-17.7	-17.9	-18.1	-18.1	-18.0	-17.8	-17.6	-17.6	-17.3	-17.0	-16.7	-16.4	-15.2	-13.6	-13.0	-12.5	-11.9	-16.6	-11.9
16-Jan	-11.2	-10.7	-10.2	-9.8	-9.0	-8.3	-8.0	-7.6	-7.0	-7.9	-8.5	-7.4	-5.9	-4.6	-2.9	0.5	0.3	0.2	1.5	0.9	-0.7	-1.3	-0.3	0.8	-4.9	1.5
17-Jan	0.0	-1.5	0.0	0.6	-0.3	-2.0	-5.4	-7.7	-9.5	-9.4	-9.3	-9.1	-8.9	-8.8	-8.9	-9.1	-9.2	-9.3	-9.4	-9.3	-9.2	-9.3	-9.1	-9.0	-6.8	0.6
18-Jan	-9.1	-9.4	-10.4	-11.5	-12.4	-12.3	-12.3	-13.9	-14.2	-13.8	-10.9	-8.5	-6.4	-4.8	-3.7	-4.6	-8.7	-11.1	-12.1	-12.2	-12.4	-13.2	-13.8	-14.2	-10.7	-3.7
19-Jan	-14.5	-15.3	-16.1	-15.7	-13.7	-12.9	-12.1	-12.1	-12.2	-12.7	-12.7	-12.3	-12.2	-11.8	-11.8	-11.9	-12.0	-12.5	-12.8	-13.1	-13.2	-13.3	-13.2	-13.3	-13.1	-11.8
20-Jan	-13.6	-13.4	-13.3	-13.1	-13.1	-13.0	-12.9	-12.8	-12.9	-13.3	-12.9	-11.8	-11.1	-10.6	-9.9	-10.4	-11.7	-11.7	-11.5	-10.9	-10.9	-10.4	-9.8	-9.2	-11.8	-9.2
21-Jan	-8.8	-8.6	-10.3	-13.2	-14.2	-13.2	-13.9	-13.5	-12.8	-11.4	-8.5	-5.8	-3.0	1.5	2.8	2.9	2.5	2.5	2.4	2.9	3.3	3.3	3.6	4.0	-4.4	4.0
22-Jan	3.8	3.3	1.7	1.1	1.8	4.1	3.8	4.2	5.0	4.1	3.6	3.8	5.5	PF	6.6	6.8	5.6	4.4	5.8	5.6	2.3	-0.8	-1.8	-2.7	3.4	6.8
23-Jan	-3.1	-3.6	-4.1	-4.6	-4.9	-5.0	-5.1	-5.1	-5.1	-5.1	-4.7	-4.5	-3.9	-3.0	-2.7	-2.7	-3.0	-3.4	-3.6	-4.0	-4.4	-4.9	-4.8	-4.7	-4.2	-2.7
24-Jan	-4.6	-4.0	-2.2	-0.6	-0.3	-0.2	0.0	0.0	0.0	0.1	0.6	0.9	1.2	0.3	0.2	-0.1	-0.8	-1.0	-1.5	-2.3	-3.1	-3.5	-3.9	-4.0	-1.2	1.2
25-Jan	-3.8	-3.5	-3.1	-2.1	-0.1	0.6	0.5	-0.3	-0.5	0.5	3.0	4.9	4.7	4.6	5.3	5.7	4.4	3.1	1.7	0.8	-0.2	-1.2	-1.6	-2.3	0.9	5.7
26-Jan	-2.7	-3.3	-4.2	-4.4	-4.9	-5.7	-5.9	-6.5	-7.3	-7.1	-2.7	0.4	2.3	3.8	3.2	1.2	-4.2	-5.9	-7.3	-8.6	-9.5	-11.3	-13.1	-14.0	-4.9	3.8
27-Jan	-14.9	-15.9	-16.4	-17.1	-17.9	-18.5	-19.4	-19.8	-19.8	-19.7	-19.6	-19.5	-19.1	-18.5	-18.7	-18.8	-19.1	-19.5	-19.7	-19.9	-19.9	-19.6	-19.8	-19.9	-18.8	-14.9
28-Jan	-20.1	-20.1	-20.3	-20.2	-19.9	-20.8	-22.0	-23.3	-25.3	-23.4	-21.2	-20.6	-19.9	-19.1	-18.7	-18.8	-20.7	-23.2	-21.7	-20.5	-20.5	-20.8	-20.9	-23.0	-21.0	-18.7
29-Jan	-25.3	-24.2	-23.0	-22.2	-21.9	-21.2	-20.6	-19.7	-19.3	-18.8	-18.1	-17.3	-16.5	-15.9	-15.6	-15.0	-15.2	-15.2	-15.2	-15.1	-14.7	-14.7	-15.5	-16.4	-18.2	-14.7
30-Jan	-17.4	-17.9	-18.6	-19.1	-19.0	-18.9	-19.1	-19.4	-20.5	-20.9	-20.6	-19.9	-19.9	-19.7	-19.9	-20.7	-21.6	-23.5	-25.8	-27.6	-29.0	-30.5	-31.5	-32.5	-22.2	-17.4
31-Jan	-33.2	-33.6	-33.9	-34.4	-35.2	-35.3	-34.7	-34.5	-34.1	-32.1	-28.8	-26.3	-24.5	-22.8	-21.5	-20.8	-23.9	-26.9	-28.6	-29.7	-30.4	-30.6	-30.6	-30.9	-29.9	-20.8
	-16.6	-16.9	-17.3	-17.4	-17.4	-17.3	-17.4	-17.5	-17.7	-17.4	-16.1	-14.6	-13.4	-13.3	-12.3	-12.9	-14.3	-15.1	-15.5	-15.8	-16.2	-16.5	-16.4	-16.7	Diurnal Average	
	3.8	3.3	1.7	1.1	1.8	4.1	3.8	4.2	5.0	4.1	3.6	4.9	5.5	4.6	6.6	6.8	5.6	4.4	5.8	5.6	3.3	3.3	3.6	4.0	Diurnal Maximum	

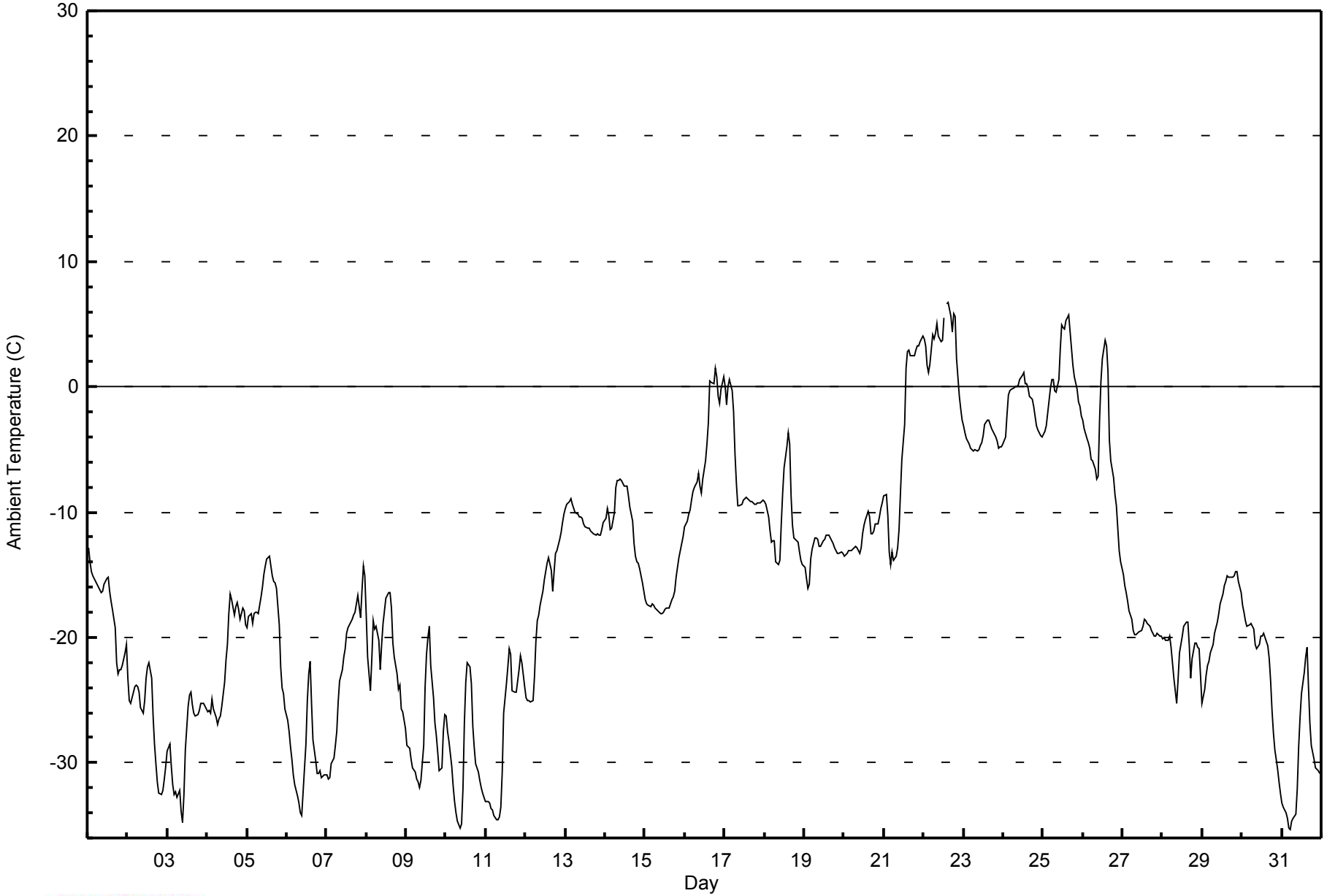
PF - Power Failure

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Fort McKay South - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	261	35.13	35.13
-20 - 0	417	56.12	91.25
0 - 10	65	8.75	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 McKay South - January 2015

Maximum Value: 99 % on Jan 25 09:00

Maximum Daily Average: 97.8 % on Jan 24

Minimum Value: 57 % on Jan 8 15:00

Minimum Daily Average: 71.4 % on Jan 8

Maximum Diurnal Average: 81.8 % at hour 10

Minimum Diurnal Average: 76.4 % at hour 15

Monthly Average: 80.6 %

Percentiles: P_1 = 65 P_{10} = 72 Q_1 = 74 Median = 79 Q_3 = 86 P_{90} = 93 P_{99} = 99

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-Jan	85	81	81	80	81	81	82	82	83	83	82	81	80	78	77	76	78	79	79	79	79	79	78	75	80.0	85
2-Jan	78	77	78	78	78	78	78	77	76	76	76	76	77	76	76	76	74	74	73	73	73	73	73	74	75.7	78
3-Jan	75	75	73	72	72	72	72	73	71	71	72	73	70	67	67	70	72	72	72	72	72	72	73	72	71.8	75
4-Jan	72	72	72	72	73	72	73	73	73	75	73	72	73	71	67	70	74	72	71	72	75	72	72	72	72.3	75
5-Jan	72	72	71	73	75	78	79	81	80	78	74	73	69	65	66	67	70	71	74	79	79	79	79	77	74.2	81
6-Jan	76	75	74	73	73	72	72	71	71	71	72	75	75	73	70	71	73	73	72	73	73	72	72	72	72.7	76
7-Jan	72	72	73	74	74	74	75	77	78	78	78	79	80	81	81	82	82	82	81	80	81	79	78	79	77.9	82
8-Jan	79	79	78	78	70	70	70	72	77	73	68	65	61	58	57	61	71	74	75	76	74	76	77	75	71.4	79
9-Jan	74	75	75	74	73	73	73	73	72	73	76	75	71	68	65	72	76	75	75	74	73	73	75	76	73.3	76
10-Jan	76	75	74	72	72	71	71	70	70	70	73	76	74	72	71	73	74	73	73	72	71	71	71	71	72.2	76
11-Jan	71	70	70	70	70	70	69	70	70	70	72	75	74	72	70	71	75	77	77	78	79	79	78	77	73.1	79
12-Jan	77	76	77	76	76	79	80	81	83	85	84	83	82	81	80	83	84	85	85	85	86	86	86	87	81.9	87
13-Jan	87	88	88	87	86	86	87	88	87	87	85	81	79	77	79	82	86	87	87	88	88	88	88	87	85.6	88
14-Jan	86	87	87	88	89	90	90	89	89	87	84	83	81	80	79	81	80	80	79	79	80	80	78	78	83.5	90
15-Jan	78	78	78	78	77	77	78	76	74	74	75	77	79	79	81	82	83	83	84	85	83	83	83	83	79.5	85
16-Jan	84	85	85	85	86	85	86	87	87	86	85	84	83	84	87	84	85	86	79	80	84	83	79	75	83.9	87
17-Jan	78	84	79	77	79	84	84	86	88	83	78	78	79	81	83	85	88	89	90	90	92	94	94	92	84.8	94
18-Jan	92	91	89	89	89	89	88	87	88	89	90	88	84	78	76	80	88	90	90	90	89	88	87	87	87.2	92
19-Jan	86	86	85	86	87	88	89	90	89	88	86	86	86	85	85	86	87	87	89	89	87	86	86	85	86.8	90
20-Jan	85	85	84	84	84	84	84	84	85	86	83	79	75	73	71	77	83	84	85	86	86	86	85	85	82.7	86
21-Jan	86	88	90	89	88	88	87	88	89	90	90	89	84	74	75	78	81	82	83	82	81	81	80	78	84.2	90
22-Jan	79	81	87	90	89	79	80	78	76	87	92	91	83	PF	75	73	77	81	74	73	84	93	92	89	82.7	93
23-Jan	87	84	86	88	91	94	96	96	96	96	95	94	94	92	91	92	95	97	97	97	97	97	97	96	93.6	97
24-Jan	95	96	97	98	98	98	99	99	99	99	98	97	97	98	98	98	99	99	99	98	98	97	97	96	97.8	99
25-Jan	96	97	97	98	98	99	99	99	99	99	97	89	93	95	94	87	91	93	95	95	94	97	98	98	95.7	99
26-Jan	98	97	96	96	95	94	94	94	93	93	95	89	84	78	81	84	92	95	92	91	89	86	82	82	90.5	98
27-Jan	81	81	80	78	76	76	77	79	80	79	79	77	78	77	77	77	78	79	80	80	80	80	80	81	78.7	81
28-Jan	80	79	79	79	79	79	80	78	78	80	77	74	73	72	72	74	78	79	81	80	77	76	75	77	77.3	81
29-Jan	78	79	80	80	80	81	81	81	80	79	78	78	79	80	81	81	83	83	83	83	83	82	82	82	80.7	83
30-Jan	81	80	80	79	78	78	78	78	78	79	78	72	69	68	68	69	71	74	75	76	75	74	73	73	75.1	81
31-Jan	72	72	72	71	71	71	71	71	71	73	74	74	72	69	69	69	74	75	74	73	73	73	73	73	72.2	75
	81.2	81.2	81.1	81.0	80.8	81.0	81.3	81.6	81.6	81.8	81.2	80.2	78.6	76.8	76.4	77.8	80.6	81.7	81.4	81.5	81.7	81.8	81.2	80.8	Diurnal Average	
	98	97	97	98	98	99	99	99	99	99	98	97	97	98	98	98	99	99	99	98	98	97	98	98	Diurnal Maximum	

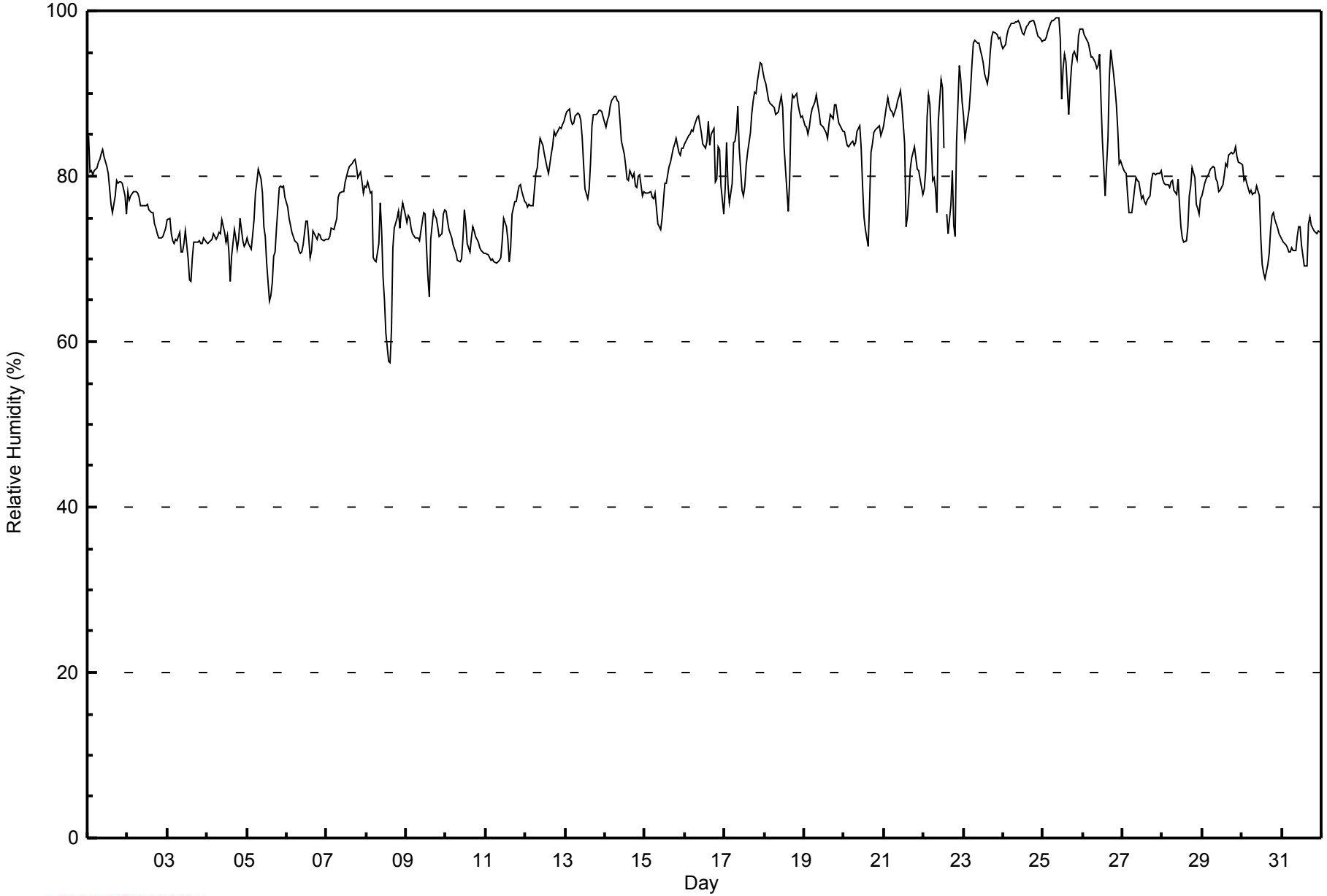
PF - Power Failure

WBEA

Hourly Averages

Relative Humidity (RH) - %

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay South - January 2015

Maximum Speed: 14 km/h on Jan 21 18:00

Maximum Daily Speed Average: 6.2 km/h on Jan 4

Minimum Speed Value: 0 km/h on Jan 10 01:00

Minimum Daily Speed Average: 0.8 km/h on Jan 2

Maximum Diurnal Speed Average: 2.0 km/h at hour 19

Minimum Diurnal Speed Average: 0.2 km/h at hour 12

Monthly Average Velocity: 1.0 km/h 274.0 deg

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 4 $Q_3 = 6$ $P_{90} = 8$ $P_{99} = 11$

Hours in Service:	744
Hours of Data:	628
Hours of Missing Data:	116
Percent Operational Time:	84.4

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-Jan	NNE5	N5	NNE5	N4	N4	N4	NNW4	N4	N3	NNW3	NNW4	N4	N8	N11	N9	N8	NNW3	W2	WSW2	SW2	WSW2	NW3	NW4	N2	N3.8	N11
2-Jan	W1	WSW2	WSW2	SW1	S0	WSW1	SW2	SW1	SSW1	N1	SSW1	S0	E2	NE1	NNW1	WNW1	SW3	SW2	WSW1	SW2	W1	SW1	N1	SW1	WSW0.8	WSW3
3-Jan	W1	N1	W0	SW2	SW2	N1	NW2	W3	SW1	SSW1	W0	W2	WSW6	WSW6	WSW5	SW5	WSW7	WSW8	WSW8	WSW8	WSW8	WSW8	WSW9	WSW8	WSW4.1	WSW9
4-Jan	WSW8	WSW8	WSW6	SW6	SW7	SW7	SSW5	SSW7	SSW6	S6	SSW8	S8	S7	S6	SW6	SSW6	SSW6	SW7	SW5	SW4	SW5	WSW10	WSW10	WSW11	SW6.2	WSW11
5-Jan	WSW11	SW5	SW5	SW5	S3	E2	SSE1	N1	W4	W5	W5	W5	WNW5	NW9	NW7	WNW7	WNW5	WNW6	NW3	WNW2	WNW2	NW3	NNW4	WNW2	W3.4	WSW11
6-Jan	WSW3	WSW2	SW2	SW2	WSW2	SW2	SW1	SW1	SSW2	S2	SSE2	E2	ENE2	ENE2	SSE3	S2	SSW2	SSW2	SW2	SW4	NNE0	S1	S3	S3	SSW1.4	SW4
7-Jan	S2	S3	SSW3	SSW2	SSW3	SW1	SSE1	SSE2	SE2	SSE2	ESE2	NE2	NNE2	NNE2	NNE3	N2	NNW3	NNW4	NNW4	NW4	W3	WNW6	NW9	N10	NNW1.2	N10
8-Jan	NNE5	W2	WSW4	WNW6	WNW8	W5	WNW8	WSW4	WSW5	W6	W6	W6	WNW6	WNW7	W6	W6	WSW5	WSW6	SW5	WSW5	SW5	S2	S3	SSE2	W4.1	WNW8
9-Jan	S2	SE2	SSE2	SSW2	S2	S3	S2	S2	SSW2	SSW2	S3	SE4	SSE4	SE4	SE2	NNW3	NW3	W2	W1	SSW0	SSW2	SSW2	SSE1	WSW1	S1.5	SSE4
10-Jan	SE0	SW2	SW3	SW2	SW2	SSW2	SSW1	S2	SSW2	SSW1	S2	SSE4	S6	SSE5	SE3	SSE2	SSW3	SSW2	SW2	SW3	SSW2	SSW2	SSW2	SW2	SSW2.2	S6
11-Jan	SSW2	SSW3	SSW1	SSW2	SSW2	SSW2	SW2	SSW2	SW2	SSW2	S3	SSE4	SE5	SE5	SSE4	S4	SSW2	SSW3	S3	S3	SSW3	S0	S1	SSW2	S2.4	SE5
12-Jan	S3	SW1	SSW2	WSW1	SSW2	SSW2	S3	SSE2	NNE1	SSE1	E1	E2	SE3	ESE4	SE3	SSE2	SSW2	S3	S3	SSE3	S3	SE2	S3	S2	SSE1.8	ESE4
13-Jan	NW1	SW1	N3	NNW4	NNW5	N7	NNW5	N5	N3	N5	NE5	NNE7	NNE6	NNE5	N4	N4	N4	N4	N4	N4	NNE4	N3	WNW1	SW3	N3.5	N7
14-Jan	SW6	S4	S4	SSW2	SSW2	NNW2	N7	N7	NNE6	NNE5	NNE6	NNE6	NNE6	NNE7	NNE7	NNE8	NNE9	NNE8	NNE7	NNE6	NNE5	N5	NNE5	NNE5	NNE4.1	NNE9
15-Jan	NNE5	NNE6	NNE5	NNE4	NNE5	NE5	NNE5	NNE5	NE5	NNE5	NNE5	N6	N5	N4	N4	N4	N3	N3	N2	SSE4	SSE7	SSE7	SSE6	SSE7	NE2.5	SSE7
16-Jan	SSE9	S9	SSE9	SSE8	SSE8	SSE7	SSE7	SSE7	S5	SW5	SW6	S4	S3	S4	SSW4	SW8	SSW7	SSW7	SW9	SW8	SSW5	SW7	SW10	WSW9	SSW5.9	SW10
17-Jan	WSW7	SW7	WSW7	WSW8	WSW6	N7	N7	N5	N4	NNE6	NNE7	NNE6	N6	N6	N5	N5	NNW4	NNW3	NNW2	NW2	SW2	SSW2	S2	S4	NNW2.2	WSW8
18-Jan	SSE4	SSW4	S5	SSW4	S3	SSW4	S4	S3	S4	S4	S3	SSE4	SSE4	SE4	SSE4	S5	S3	S3	S1	SW2	SSW3	SW2	SSW3	SSW2	S3.2	S5
19-Jan	SSW2	WNW1	WNW1	SW0	NNE1	NNE2	NNE3	N4	N4	N4	N5	N5	NNE6	NNE4	NNE5	N6	N6	N6	N5	N5	N6	N6	N5	N6	N3.8	N6
20-Jan	NNW3	NW3	NNW3	NNW3	NNW3	N3	NNW2	W1	S0	WSW0	SSE1	SSE3	S5	S6	SSE5	S4	S4	S4	S3	S3	S3	SSE4	SSE3	SSE2	S1.3	S6
21-Jan	SSE3	S4	S4	SSW3	S2	SSW1	SSW3	SSW4	S3	S3	S3	S3	S3	S11	SSW11	SSW10	SW11	SW14	SW13	SW12	SW10	SW8	SW7	SW9	SSW6.1	SW14
22-Jan	SW6	S3	SSE3	SE3	S3	SW7	SW8	WSW8	WSW10	WSW8	W6	WSW7	WSW13	WSW12	SW9	SW8	SSW5	SW6	WSW9	WSW8	N10	N8	NNE9	NNE8	WSW4.7	WSW13
23-Jan	NNE6	NE6	N6	NNE6	N5	N5	N5	N4	N3	N3	NNE4	NNE4	NE2	SW3	S3	S3	S3	SSE2	S3	S3	SW3	SW3	SSE2	SSE1	NNE1.4	NNE6
24-Jan	NE2	NNE2	S3	AF	AF	AF	AF	AF	AF	AF	SW6	W2	N5	N5	NE2	NE1	AF	AF	AF	AF	AF	AF	AF	AF	----	SW6
25-Jan	AF	AF	AF	AF	S5	SE4	S4	S3	SW1	SSW6	WSW10	WSW7	SSE3	SSE2	SW1	WNW5	NW4	NNE5	N5	NNE5	NNE3	SW1	SSW1	AF	SW1.2	WSW10
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SW6	S4	SSE3	NE1	NNE8	AF	AF	AF	AF	AF	AF	AF	AF	----	NNE8
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	N9	N9	N10	N10	N10	N9	N9	N9	N8	NNW8	----	N10
28-Jan	NNW9	NNW8	NNW8	NNW7	NNW4	NNW4	NNW6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NNW9
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	N3	N5	NNE3	N6	N6	NNW5	N8	NNW9	N7	----	NNW9
30-Jan	N9	N10	N9	N9	N8	N7	N8	N6	N5	N6	N8	N10	NNE11	N10	N10	N7	N7	AF	AF	AF	AF	AF	AF	AF	----	NNE11
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
	W1.2	WSW1.0	WSW1.0	W1.2	WSW0.9	NW0.7	NW0.9	W0.6	W0.7	W0.9	W1.0	WNW0.2	N0.3	N0.4	NW0.7	WNW1.4	WNW1.6	W1.7	W2.0	WSW2.0	W1.5	W1.5	W1.5	W1.5	Diurnal Average	
	WSW11	N10	SSE9	N9	N8	N7	SW8	WSW8	WSW10	WSW8	WSW10	N10	WSW13	WSW12	SSW11	SSW10	SW11	SW14	SW13	SW12	N10	WSW10	SW10	WSW11	Diurnal Maximum	

M - Maintenance AF - Analyzer 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 McKay South - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 km/h on Jan 22 13:00

Minimum Value: 1 km/h on Jan 7 01:00

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:	628
Hours of Missing Data:	116
Hours of Calibration:	0
Percent Operational Time:	84.4

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

M - Maintenance AF - Analyzer Failure

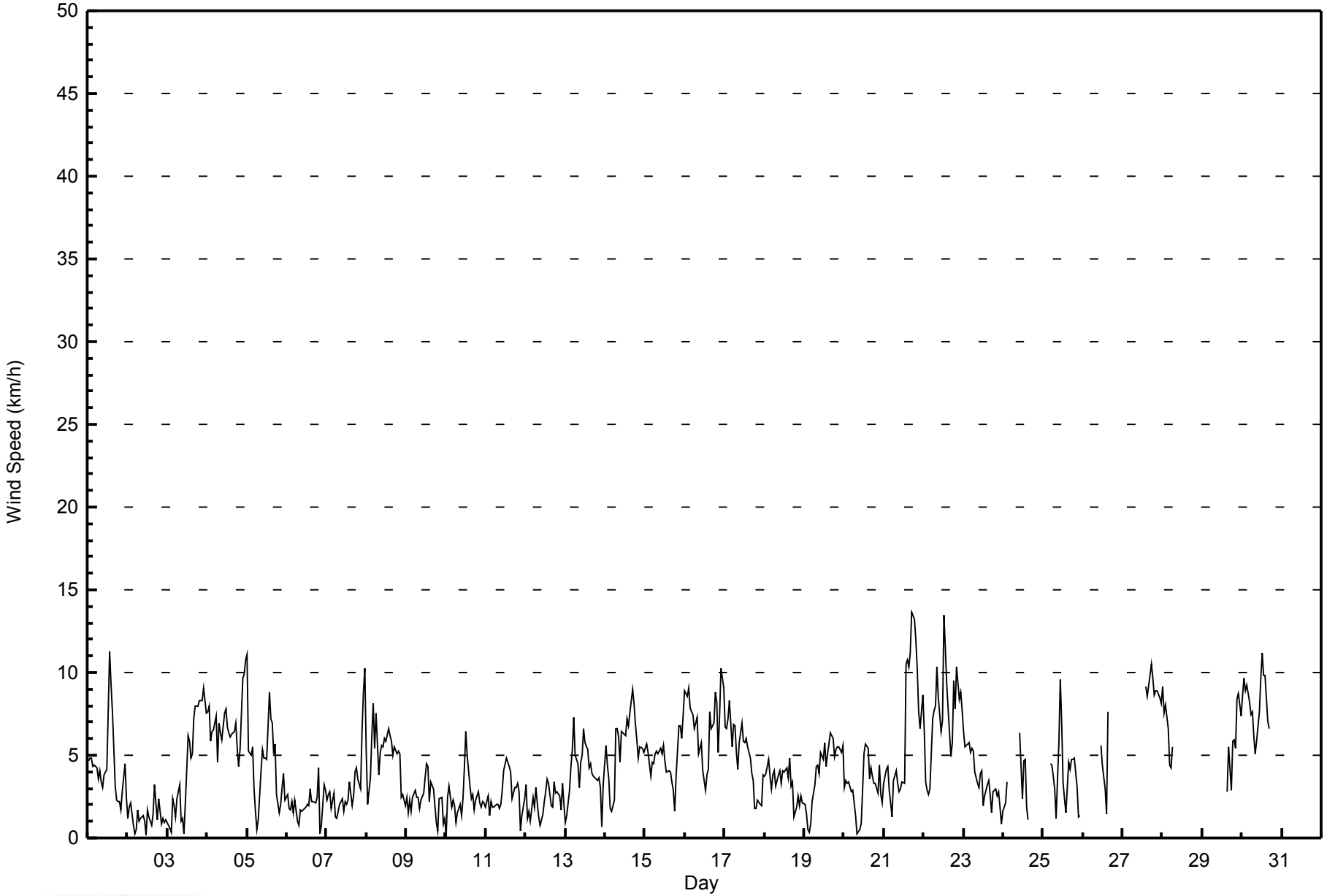
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay South - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	438	69.75	69.75
6 - 11	185	29.46	99.20
12 - 19	5	0.80	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: 628

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay South - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	56	36	10	2	4	3	15	38	79	61	49	21	18	10	11	25	438
6 - 11	48	24	1	0	0	0	0	11	8	10	26	31	6	8	3	9	185
12 - 19	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	5
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	104	60	11	2	4	3	15	49	87	71	78	54	24	18	14	34	628

Total Number of Valid Hours: 628

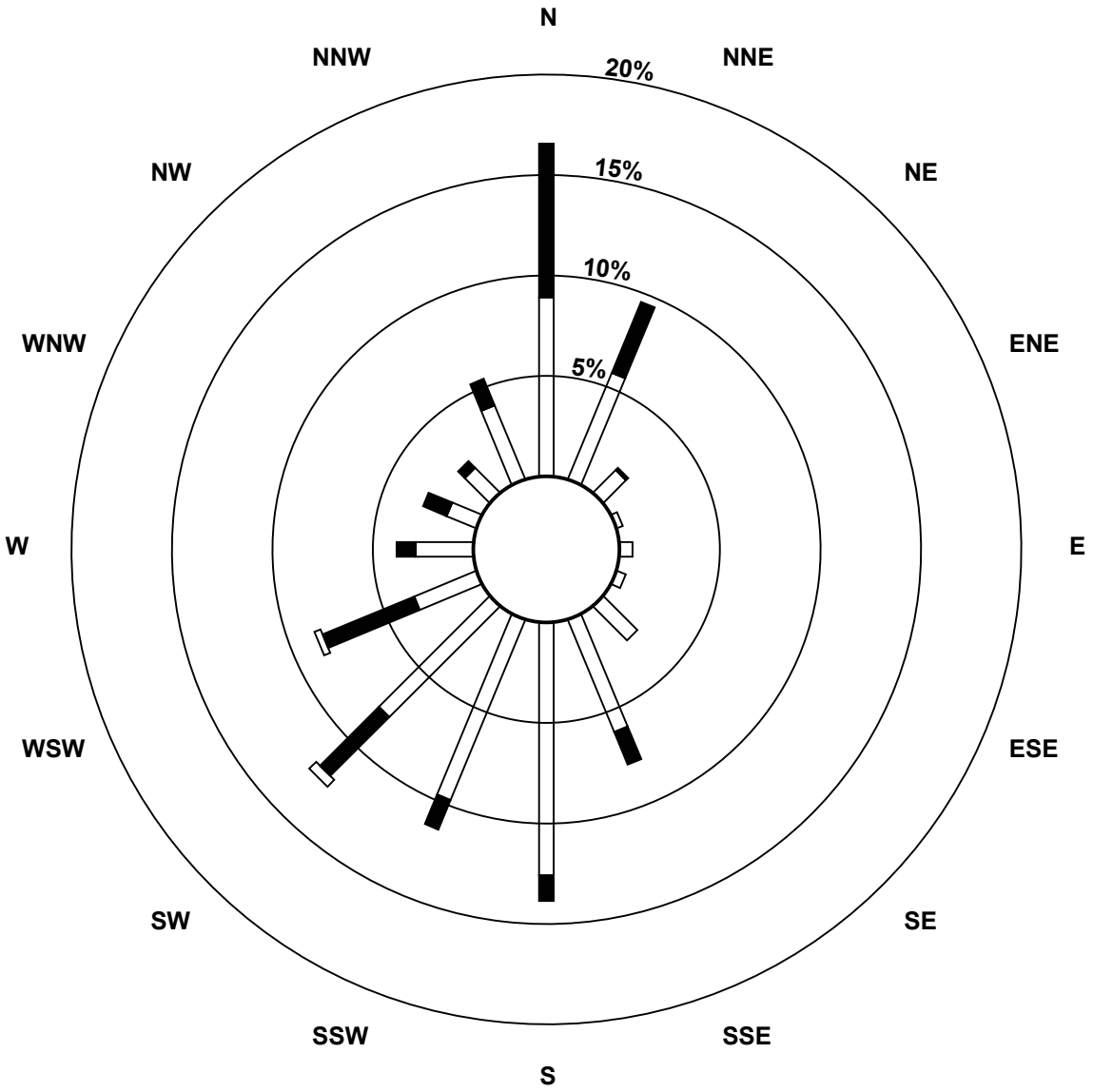
Total Number of Hours: 744

Wood Buffalo Environmental Association

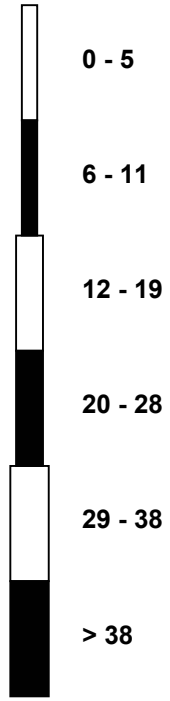
Wind Rose Jan 2015

Wind Speed (WS) - km/h

Fort McKay South (AMS 13)



Classes (km/h)



Total Number of Valid Hours: 628

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay South - January 2015

Direction of Maximum Speed: 227 deg on Jan 21 18:00
Direction of Maximum Daily Speed Average: 217.9 deg on Jan 4

Direction of Minimum Speed: 141 deg on Jan 10 01:00

Direction of Minimum Daily Speed Average: 0.8 deg on Jan 2

Monthly Average Direction: 246.4 deg

Hours in Service:	744
Hours of Data:	628
Hours of Missing Data:	116
Percent Operational Time:	84.4

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-Jan	25	10	16	356	2	11	347	9	359	336	337	359	1	3	5	9	343	270	245	217	253	319	326	0	355.0
2-Jan	280	237	241	229	175	237	231	224	203	356	196	184	85	42	340	297	236	219	242	230	269	219	1	219	240.4
3-Jan	270	6	268	216	217	354	306	272	216	208	274	263	257	244	238	234	244	243	249	255	250	249	247	247	248.8
4-Jan	251	250	248	236	222	218	198	208	197	183	197	174	173	173	215	207	207	223	230	215	215	244	242	247	217.9
5-Jan	243	226	218	221	180	89	157	8	269	259	274	269	299	318	306	290	295	294	315	296	292	321	334	290	277.2
6-Jan	243	252	222	223	239	231	215	215	208	191	161	88	69	71	157	185	200	205	214	221	12	185	177	181	197.8
7-Jan	182	181	193	192	196	214	165	168	137	158	118	43	29	20	16	3	331	345	336	318	276	300	317	359	327.6
8-Jan	13	278	248	289	302	281	299	253	244	268	273	268	295	285	274	270	237	242	233	241	236	176	172	150	267.6
9-Jan	181	134	165	194	182	185	177	181	213	193	181	144	157	126	125	344	305	263	266	201	209	209	156	242	181.1
10-Jan	141	233	220	218	227	204	195	183	204	193	182	167	180	167	124	163	201	201	233	231	200	209	200	216	194.1
11-Jan	192	212	208	213	196	204	216	206	218	204	181	160	131	133	156	188	194	192	190	183	203	178	185	202	183.4
12-Jan	175	232	212	253	193	201	171	153	25	148	101	95	125	105	134	161	193	183	172	168	174	135	189	174	163.0
13-Jan	311	221	4	344	346	1	345	3	351	11	36	33	30	30	353	11	360	5	353	357	12	355	294	231	3.5
14-Jan	220	177	177	202	208	329	358	3	20	16	24	21	24	21	14	15	15	31	29	19	16	11	13	23	16.7
15-Jan	25	26	28	30	23	36	29	21	42	26	17	8	359	359	1	6	352	355	352	168	164	161	160	164	34.9
16-Jan	168	171	167	163	162	164	166	166	178	234	233	174	178	177	208	231	203	213	232	233	203	214	230	252	197.7
17-Jan	245	231	240	239	247	3	9	8	3	25	19	25	2	360	357	4	346	338	338	318	236	211	189	177	329.8
18-Jan	165	199	190	199	178	192	185	174	177	181	175	160	148	130	154	179	188	182	175	217	201	214	196	203	179.6
19-Jan	209	299	301	225	23	16	18	8	11	5	352	359	20	19	18	2	352	351	350	358	354	356	351	5	0.6
20-Jan	332	321	330	336	334	358	348	275	175	251	167	161	184	185	165	189	175	178	180	171	183	166	154	156	189.5
21-Jan	161	169	182	199	174	208	203	199	189	184	190	189	180	190	197	202	219	227	227	229	228	219	227	233	209.7
22-Jan	233	191	166	143	189	223	230	239	257	256	273	246	252	254	235	227	194	228	251	251	358	10	14	14	252.6
23-Jan	17	43	9	25	4	3	7	2	357	5	14	16	35	217	177	187	176	164	190	190	232	220	152	162	15.5
24-Jan	55	28	179	AF	AF	AF	AF	AF	AF	AF	234	279	6	9	37	35	AF	AF	AF	AF	AF	AF	AF	AF	--
25-Jan	AF	AF	AF	AF	178	144	173	190	220	201	237	237	163	151	215	293	326	17	4	12	20	219	199	AF	224.9
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	218	180	159	38	12	AF	AF	AF	AF	AF	AF	AF	AF	--
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	1	359	355	357	354	353	359	353	349	342	--
28-Jan	347	339	339	333	334	334	340	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1	3	24	359	349	336	351	348	350	--
30-Jan	354	350	358	7	4	359	349	353	360	350	357	10	15	9	4	3	4	AF	AF	AF	AF	AF	AF	AF	--
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	262.0	251.2	239.7	263.0	255.3	306.3	310.2	277.0	270.5	271.4	278.3	290.6	357.6	351.3	312.8	300.6	281.8	264.9	268.5	257.6	264.4	271.3	274.0	272.5	
	Diurnal Average																								

M - Maintenance AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 102 deg on Jan 6 21:00

Minimum Value: 6 deg on Jan 2 17:00

Percentiles: P_1 = 13 P_{10} = 21 Q_1 = 24 Median = 29 Q_3 = 39 P_{90} = 62 P_{99} = 92

Hours in Service:	744
Hours of Data:	628
Hours of Missing Data:	116
Hours of Calibration:	0
Percent Operational Time:	84.4

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-Jan	31	25	25	28	23	23	35	23	26	38	39	26	24	23	24	23	51	23	20	30	51	40	26	70	70
2-Jan	61	39	18	91	89	61	10	55	62	50	57	89	33	54	55	35	6	24	90	48	72	47	89	73	91
3-Jan	69	80	89	12	45	72	46	24	75	58	100	83	35	26	25	22	16	17	18	22	23	22	21	29	100
4-Jan	28	30	41	38	27	21	30	25	24	27	22	25	24	25	37	25	33	40	59	46	38	24	24	25	59
5-Jan	20	43	44	48	52	72	68	64	33	24	35	30	42	36	38	33	33	35	42	46	52	17	21	25	72
6-Jan	22	39	42	32	62	29	74	71	33	34	34	39	38	34	33	27	28	37	29	13	102	92	13	15	102
7-Jan	24	14	20	32	26	43	43	26	46	41	65	50	55	29	21	36	46	34	30	37	35	38	32	30	65
8-Jan	28	35	15	33	39	37	38	28	18	27	34	38	37	38	39	30	17	15	18	16	20	49	51	53	53
9-Jan	28	75	31	28	19	13	21	25	22	16	25	29	31	27	49	48	27	45	90	93	34	22	73	72	93
10-Jan	97	60	16	33	30	26	87	54	47	53	41	28	24	41	46	34	23	29	25	37	33	40	30	36	97
11-Jan	36	24	70	22	47	44	30	38	46	29	17	27	28	29	31	20	26	17	25	19	21	91	75	24	91
12-Jan	12	62	55	63	27	39	24	36	40	61	45	35	35	27	28	40	66	20	15	23	19	59	22	51	66
13-Jan	76	51	77	27	27	22	27	25	30	21	34	26	31	34	28	21	22	25	22	26	25	35	97	59	97
14-Jan	33	31	27	77	73	62	23	23	27	25	26	24	29	27	24	24	23	30	25	26	24	23	22	24	77
15-Jan	24	26	27	30	30	30	29	28	29	27	25	23	25	27	28	26	29	51	59	70	31	32	32	31	70
16-Jan	31	28	29	29	30	29	28	27	34	30	28	30	29	24	35	23	21	27	25	25	22	17	18	31	35
17-Jan	23	15	23	18	35	39	23	18	19	24	25	30	26	25	28	25	24	34	43	45	32	40	31	23	45
18-Jan	35	30	24	23	33	32	19	12	13	20	25	30	34	27	31	17	14	15	82	29	32	41	22	31	82
19-Jan	21	50	65	80	68	23	23	18	20	22	24	27	21	26	24	26	25	27	28	24	24	24	24	21	80
20-Jan	35	34	35	32	39	28	29	37	94	57	77	49	29	30	31	54	35	18	35	22	29	24	47	57	94
21-Jan	31	22	16	26	28	56	23	17	17	21	23	19	24	22	22	22	20	19	20	21	22	26	35	29	56
22-Jan	34	51	33	47	71	31	30	31	33	36	43	40	29	27	22	24	36	34	26	26	36	23	26	27	71
23-Jan	31	37	25	29	27	24	27	33	39	39	28	25	62	60	49	37	45	68	41	32	41	32	54	81	81
24-Jan	69	58	39	AF	AF	AF	AF	AF	AF	AF	18	68	25	23	70	85	AF	AF	AF	AF	AF	AF	AF	AF	85
25-Jan	AF	AF	AF	AF	23	32	29	25	79	24	23	37	35	48	66	35	25	25	23	25	56	70	61	AF	79
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	25	26	43	65	21	AF	AF	AF	AF	AF	AF	AF	AF	65
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	25	27	23	22	23	24	23	23	24	23	27
28-Jan	24	24	24	26	27	21	20	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	27
29-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	45	21	34	19	25	25	24	26	22	45
30-Jan	22	25	23	24	24	26	24	22	19	20	24	24	25	26	24	25	25	AF	AF	AF	AF	AF	AF	AF	26
31-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
	97	80	89	91	89	72	87	71	94	61	100	89	62	60	70	85	66	68	90	93	102	92	97	81	
	Diurnal Maximum																								

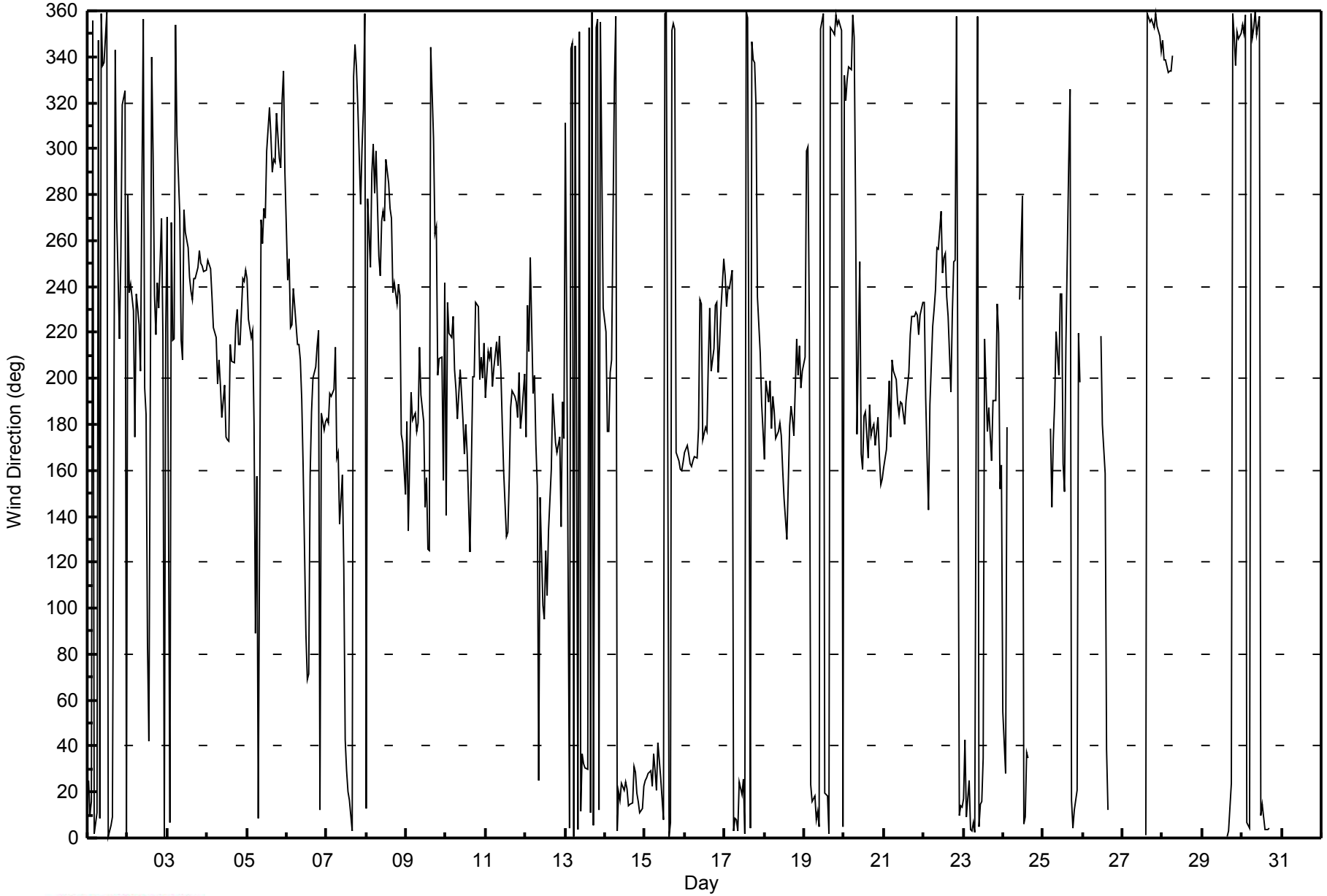
M - Maintenance AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Fort McKay South - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 8, 2014
Station Name	Fort McKay South	Station Number	AMS 13

Reason: Routine

Start Time (MST)	10:25	End Time (MST)	15:20
Barometric Pressure	729 mmHg	Station temp.	24 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	1377
Cal Gas Concentration	51.1 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL107		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	3492
DACS voltage range	0-5v	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	HVPS voltage	512	512
Analyzer Range (ppb)	1000	1000	Lamp voltage	2075	2017
Calculated slope	0.999926	0.996974	Chamber temp.	50.0	50.0
Calculated intercept	1.163363	1.448323	Pressure ("Hg)	26.1	26.5
Analyzer Background	24.4	24.2	Flow (lpm)	673	693
Analyzer Coefficient	1.645	1.655	Intensity	70	68

Analyzer make	API T100	Analyzer serial #	599

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.1	NA
as found span	5000	78.9	806.4	803.5	1.004
calibrator zero	5000	0.0	0.0	-0.2	0.000
high point	5000	78.9	806.4	808.2	0.998
second point	5000	39.4	402.7	401.1	1.004
third point	5000	19.7	201.3	199.7	1.008
calibrator zero					
as left zero	5000	0.0	0.0	0.0	NA
as left span	5000	78.9	806.4	806.0	NA
				Average Correction Factor	1.003

Corrected As found	803.7	Previous response	805.3	% change	0.2%

Notes:

Small adjustment to Span

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

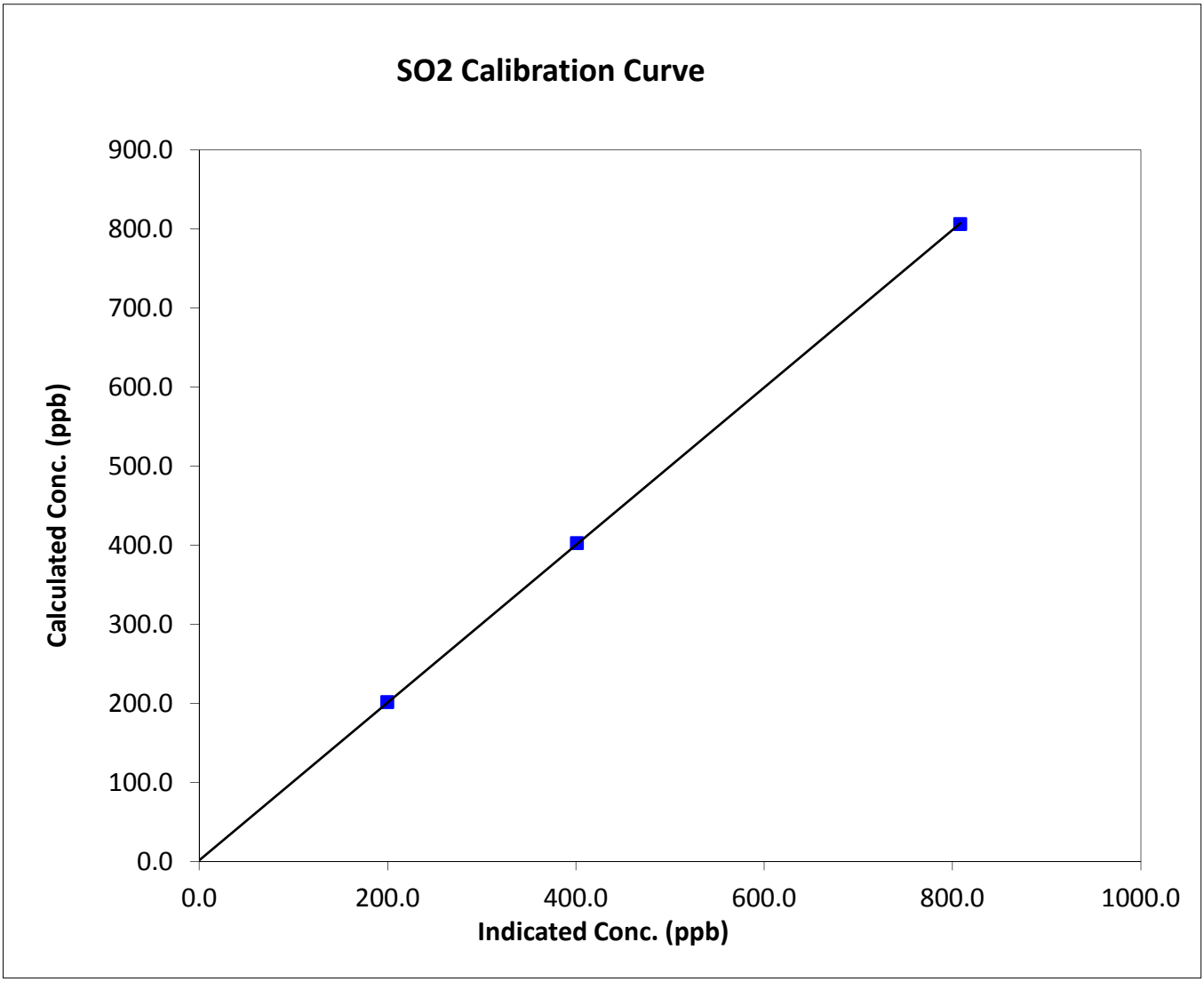
SO_2 Calibration Summary

Station Information

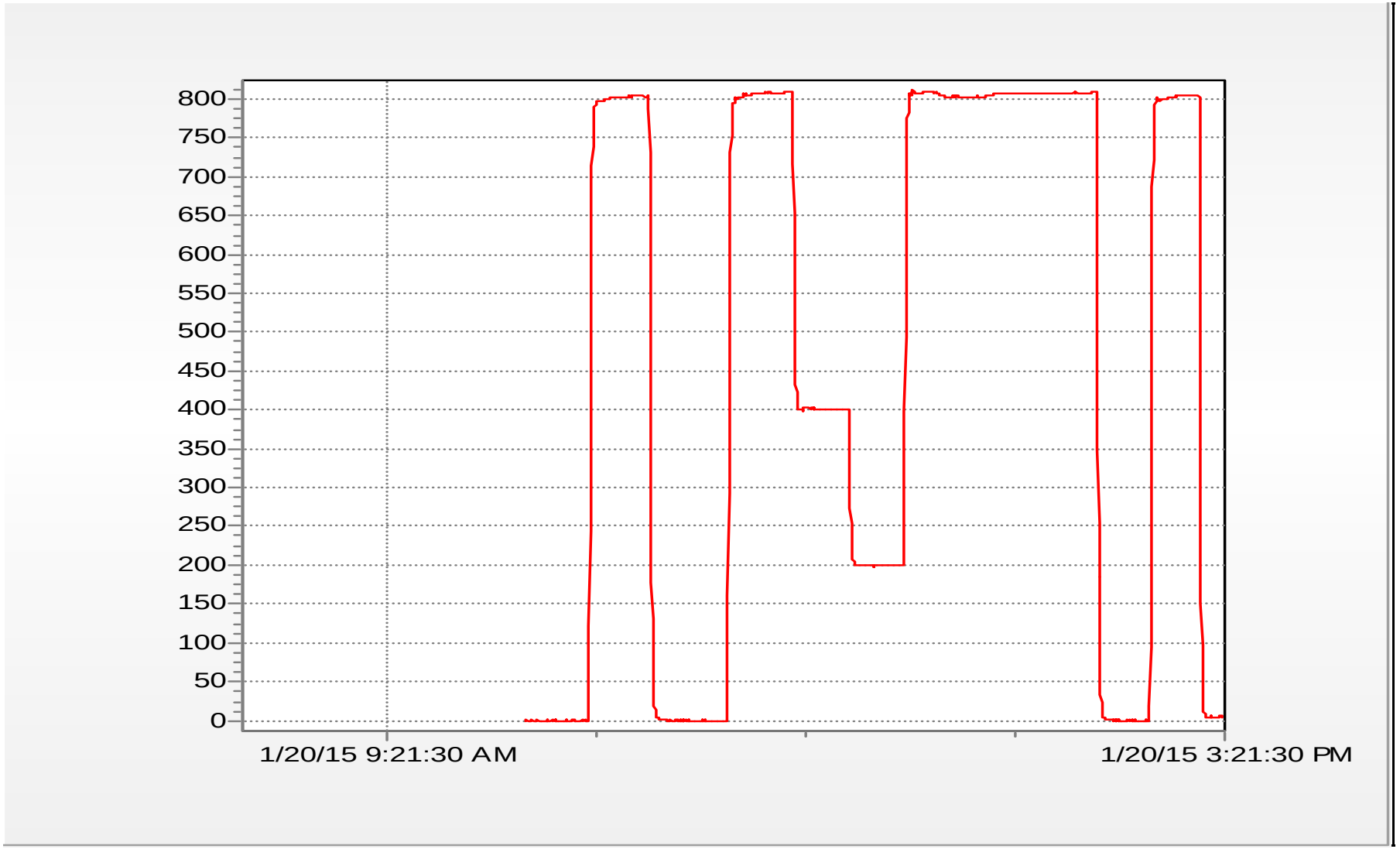
Calibration Date	January 20, 2015	Previous Calibration	December 8, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:25	End Time (MST)	15:20
Analyzer make	API T100	Analyzer serial #	599

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999986
806.4	808.2	0.9977		
402.7	401.1	1.0040	Slope	0.996974
201.3	199.7	1.0080		
			Intercept	1.448323



SO2 Calibration Plot Date: January 20, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 21, 2015	Previous Calibration	November 13, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	9:50	End Time (MST)	13:22
Barometric Pressure	743 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11041107
Cal Gas Concentration	5.07 ppm H2S	Cal Gas Expiry Date	30/05/2013
Gas Cert Reference	CC178364	SO2 gas conc.	51.1 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2581
DACS voltage range	0-5v	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-727	-727
Analyzer Range (input)	100	100	Lamp voltage	998	1010
Calculated slope	1.002867	0.999582	Chamber temp.	45	45
Calculated intercept	-0.187197	0.314987	Pressure	696.2	683.2
Analyzer Background	1.78	1.84	Flow	0.447	0.442
Analyzer Coefficient	1.017	1.044	Intensity	90	90
			Converter temp.	800	800

Analyzer make/model	TEI 43i-TLE	Analyzer serial #	1218153359
Converter make/model	CDN-101	Converter serial #	456

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	5000	78.9	80.0	79.7	1.004
SO2 scrubber check	5000	39.4	402.7	0.3	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	78.9	80.0	79.9	1.001
second point	5000	39.4	40.0	39.3	1.016
third point	5000	19.7	20.0	19.5	1.027
calibrator zero					
as left zero	5000	0.0	0.0	0.0	NA
as left span	5000	78.9	80.0	79.3	1.009
				Average Correction Factor	1.015

Corrected As found	79.6	Previous response	80.0	% change	0.4%

Notes:

As found zero used as calibrator zero. Cal gas changed after as founds. Scrubber check after third point, filter changed during as lefts

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

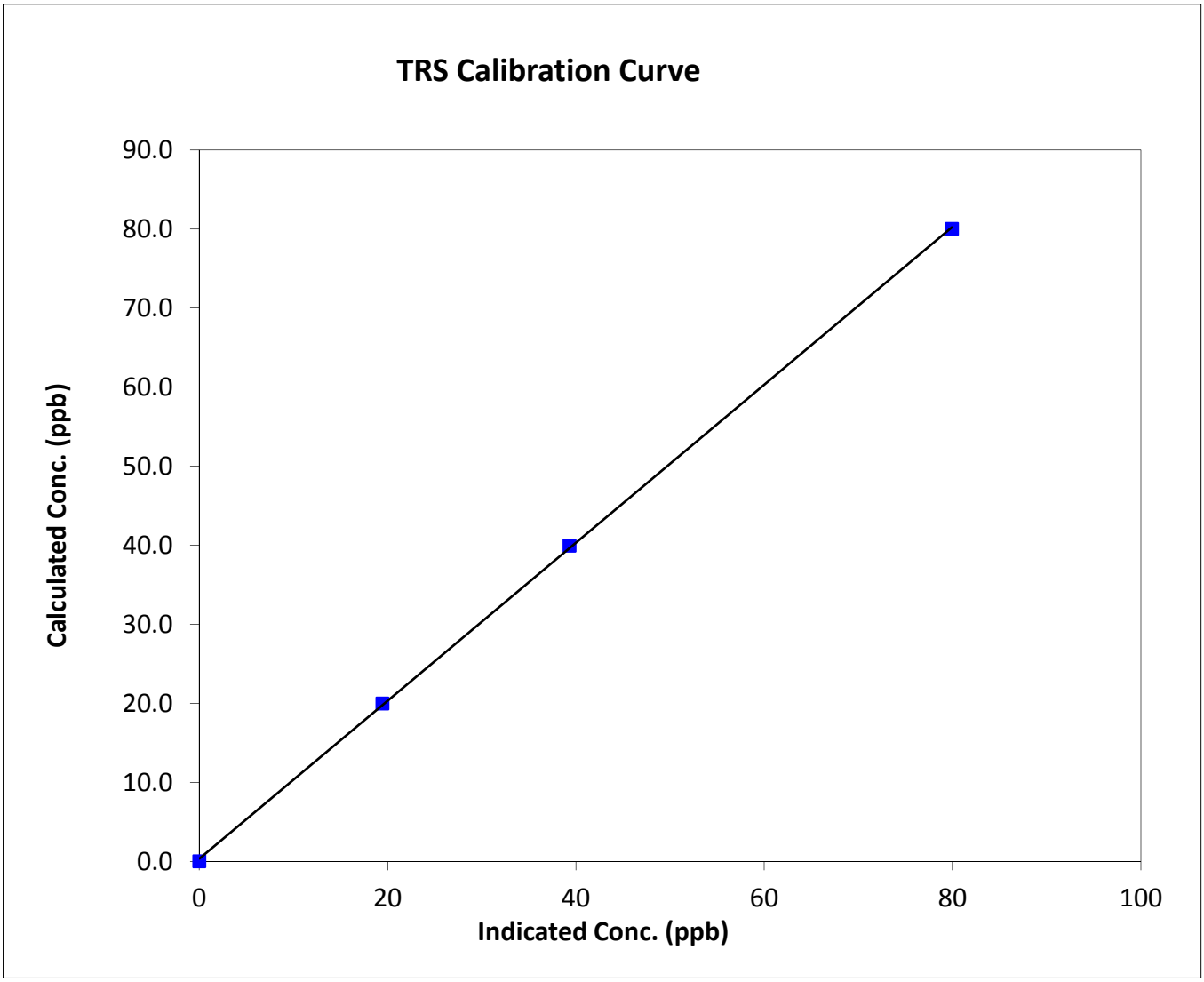
TRS Calibration Summary

Station Information

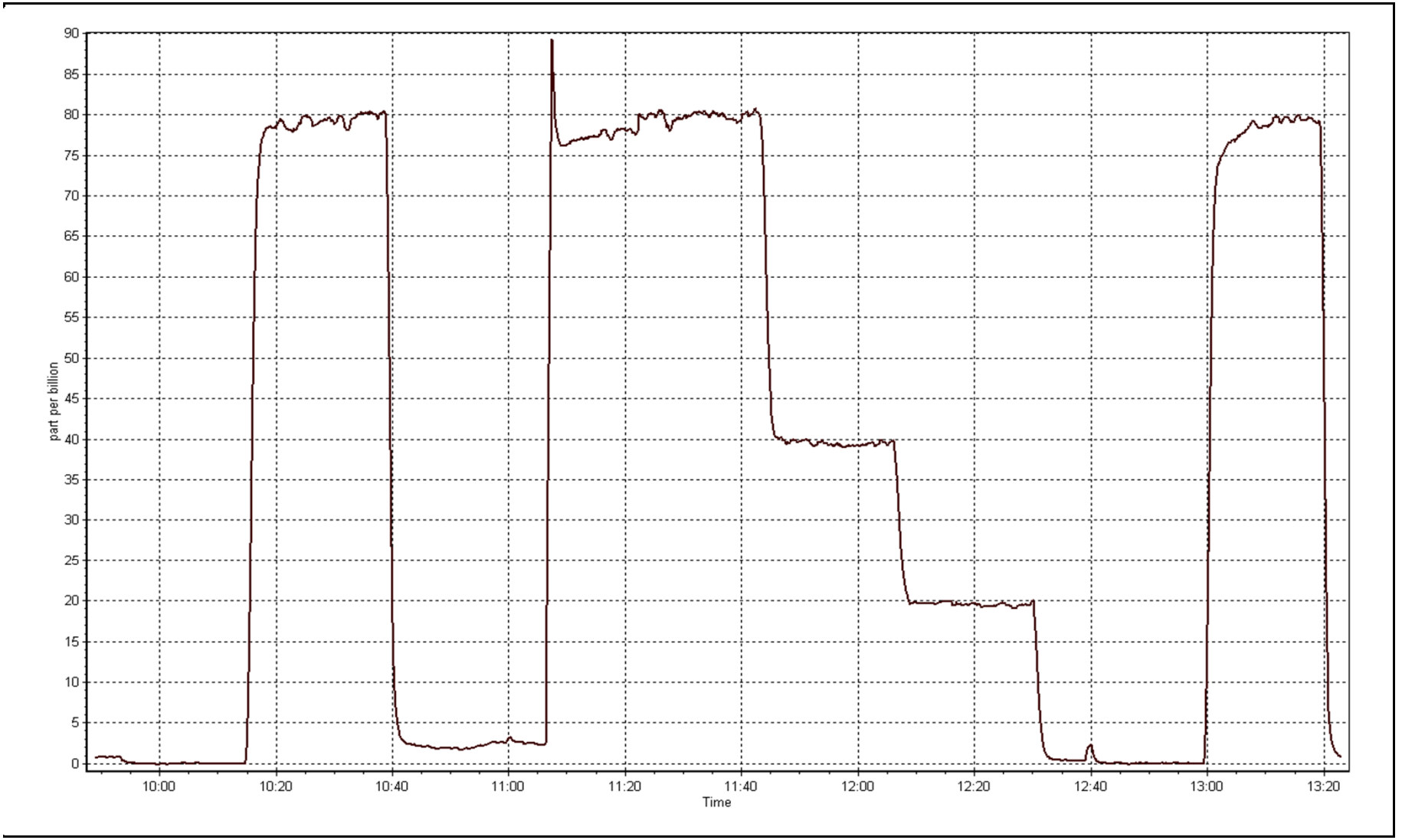
Calibration Date	January 21, 2015	Previous Calibration	November 13, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	9:50	End Time (MST)	13:22
Analyzer make	TEI 43i-TLE	Analyzer serial #	1218153359

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999909
80.0	79.9	1.0008		
40.0	39.3	1.0161	Slope	0.999582
20.0	19.5	1.0270		
			Intercept	0.314987



TRS Calibration Plot Date: January 21, 2015



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-20-15	Previous Calibration	December-08-14
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	10:25	End Time (MST)	15:20
Barometric Pressure	729 mmHg	Station temp.	24 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11041107
Gas Cert Reference	LL107918	Cal Gas Expiry Date	29/05/2014
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1076.0 ppm
C3H8 Cal Gas Conc.	204 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	3492
DACS voltage range	0-5v	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.0	8.0
Analyzer Range (mv)	25	25	Air or Bypass press	42.4	42.4
Calculated slope	0.996476	0.999996	Fuel Pressure	22.6	22.6
Calculated intercept	0.049070	-0.008073	Flame Temp	160.4	161.3
BKG	2.3	2.32			
COEF	4.746	4.863			

Analyzer make	Thermo Model 51iLT	Analyzer serial #	1236656114

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.01	N/A
as found span	5000	78.9	16.98	16.58	1.024
calibrator zero	5000	0.0	0.00	0.02	N/A
high point	5000	78.9	16.98	17.01	0.998
second point	5000	39.4	8.48	8.43	1.006
third point	5000	19.7	4.24	4.27	0.993
calibrator zero					
as left zero	5000	0.0	0.00	0.01	N/A
as left span	5000	78.9	16.98	17.06	0.995
				Average Correction Factor	0.999

Corrected As found	16.59	Previous response	16.99	% change	2.4%

Notes:

Zero and Span adjusted. Filter changed after As Founds

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

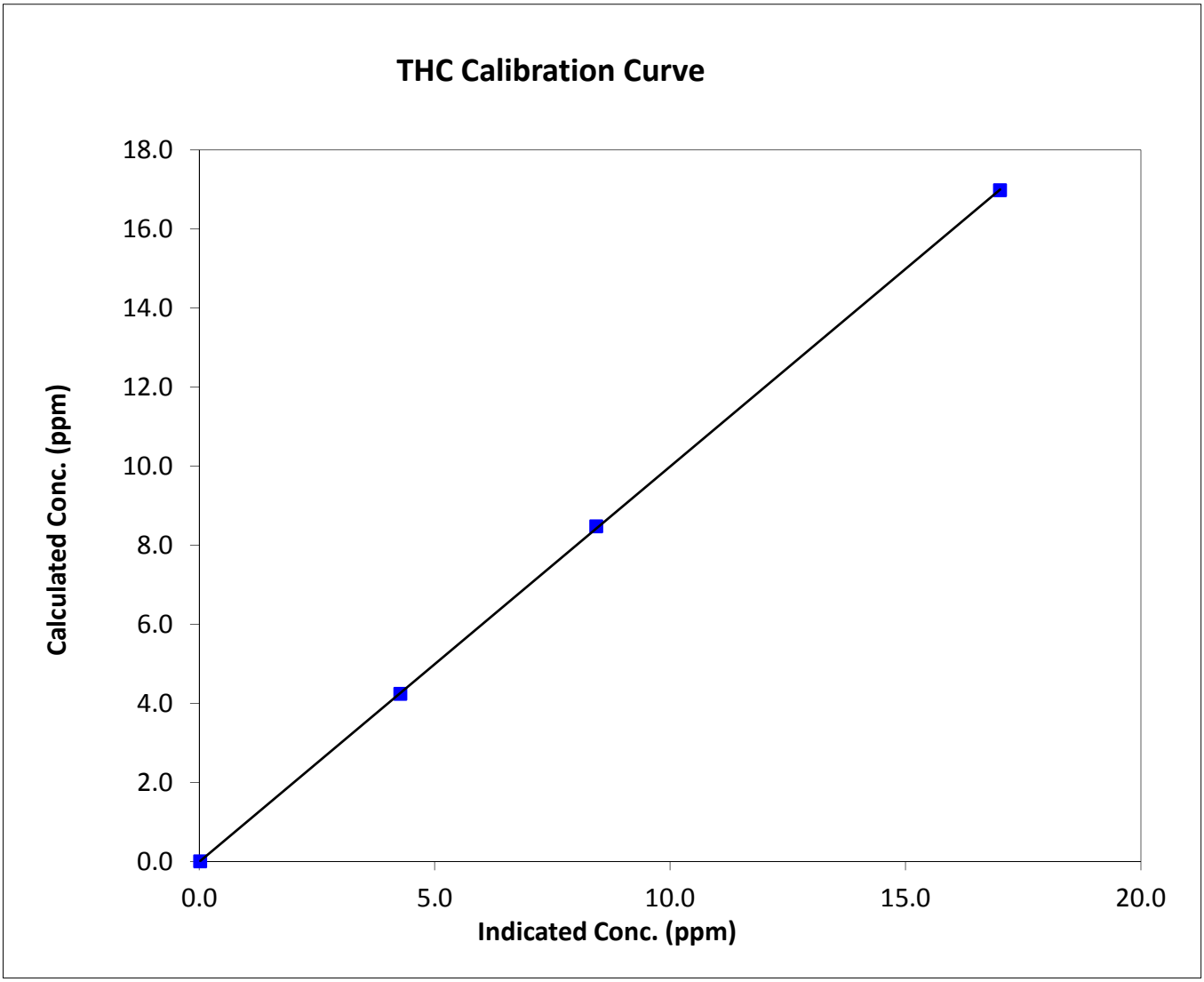
THC Calibration Summary

Station Information

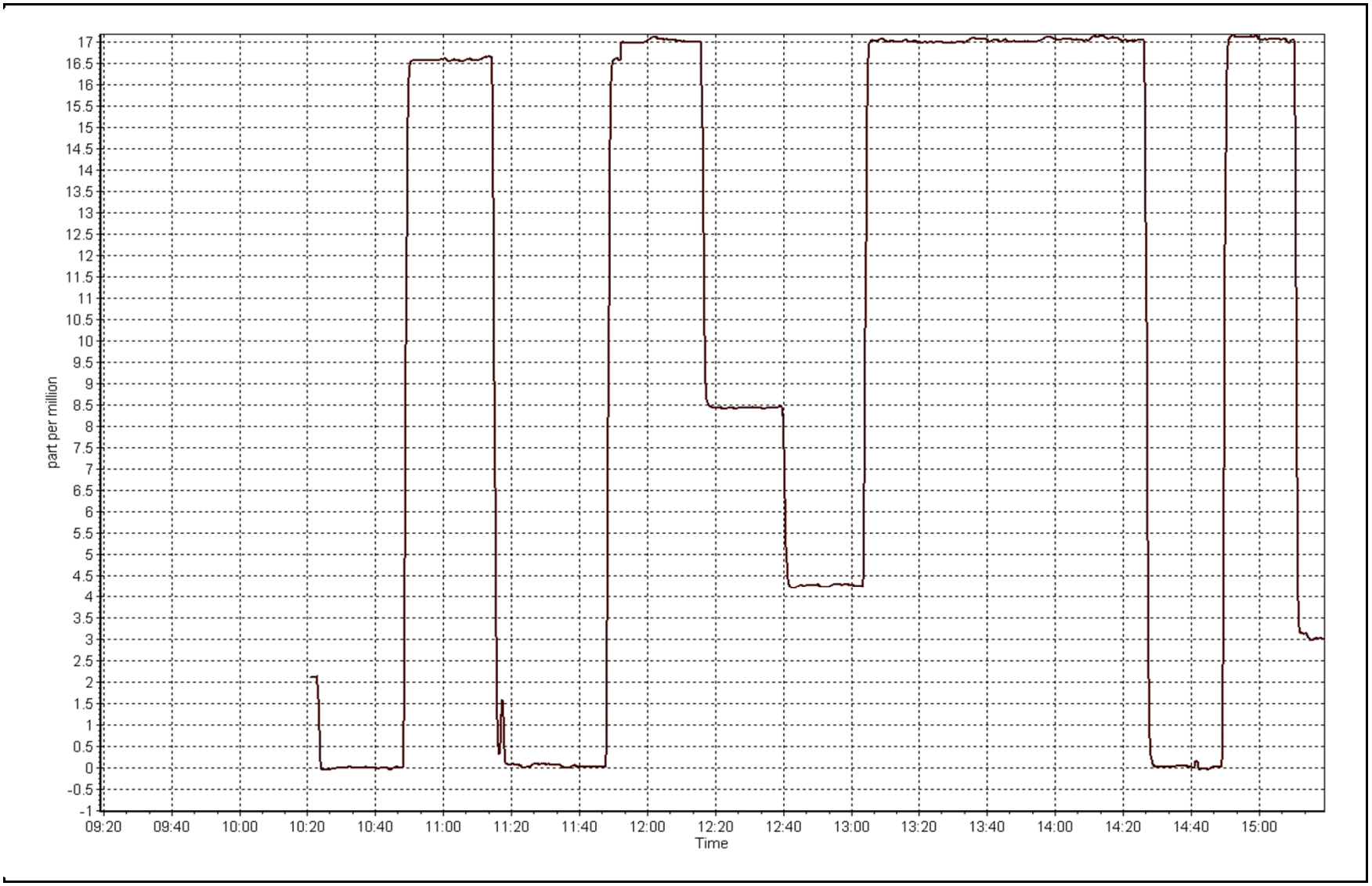
Calibration Date	January 20, 2015	Previous Calibration	December 8, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:25	End Time (MST)	15:20
Analyzer make	Thermo Model 51iLT	Analyzer serial #	1236656114

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.02	N/A	Correlation Coefficient	0.999972
16.98	17.01	0.9982		
8.48	8.43	1.0058	Slope	0.999996
4.24	4.27	0.9928		
			Intercept	-0.008073



THC Calibration Plot Date: January 20, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 22, 2015	Previous Calibration	December 12, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	10:05	End Time (MST)	12:44
Barometric Pressure	728 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11041107
NO2 calibration used	January-20-14	Transfer Standard	??
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2681
DACS voltage range	0-5v	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	25.7	26.6
Analyzer Range (input)	500	500	Lamp temp.	58.0	58.0
Calculated slope	1.023314	1.003077	Pressure ("Hg)	26.6	26.0
Calculated intercept	-0.299553	-0.338877	Flow cell A	742	727
Analyzer Background	-1.1	-0.3			
Analyzer Coefficient	1.024	1.061			

Analyzer make	API T400	Analyzer serial #	825

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	0.3	N/A
as found span	5000	0.90	357.0	346.1	1.032
calibrator zero	5000	0.000	0.0	0.3	N/A
high point	5000	0.903	357.0	356.1	1.003
second point	5000	0.585	212.6	212.6	1.000
third point	5000	0.358	112.1	112.0	1.001
calibrator zero					
as left zero	5000	0.00	0.0	0.5	N/A
as left span	5000	0.903	357.0	351.3	N/A
				Average Correction Factor	1.001

Corrected As found	345.8	Previous response	349.2	% change	1.0%

Notes:

Adjusted span. Changed the filter during as left.

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

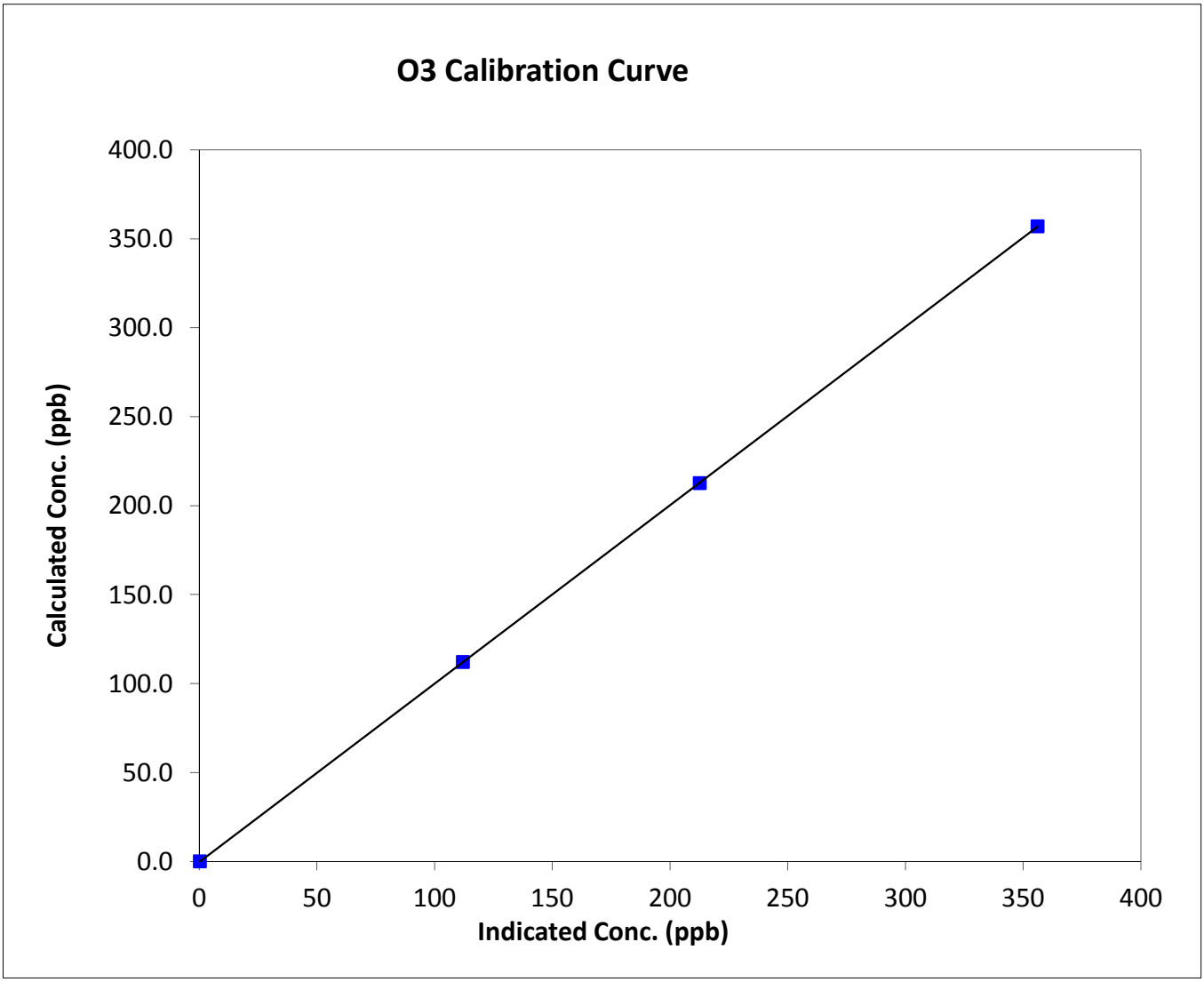
O_3 Calibration Summary

Station Information

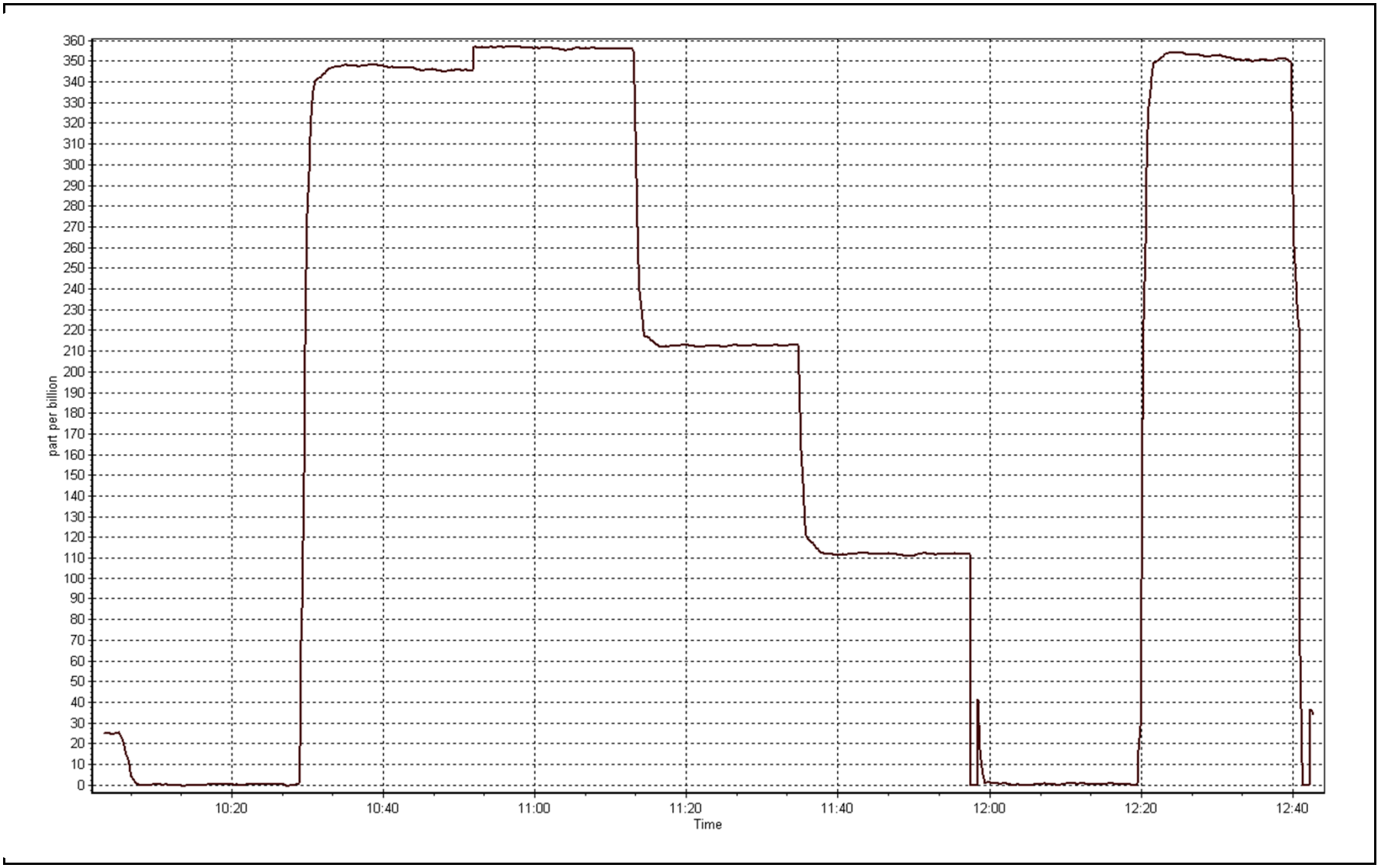
Calibration Date	January-22-15	Previous Calibration	December 12, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:05	End Time (MST)	12:44
Analyzer make	API T400	Analyzer serial #	825

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999997
357.0	356.1	1.0026		
212.6	212.6	0.9998	Slope	1.003077
112.1	112.0	1.0012		
			Intercept	-0.338877



O3 Calibration Plot Date: January 22, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 9, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	10:25	End Time (MST)	15:20
Barometric Pressure	729 mmHg	Station Temperature	24.0 Deg C
Calibrator	Sabio 4010	Serial Number	11041107
NO Cal Gas Conc	50.7 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	50.8 ppm	Cal Gas Serial #	LL107918

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	3492

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	1.000096	0.999931	0.995620
	Data Offset	0.984097	0.884125	-0.127325
After	Data Slope	0.998710	1.000686	0.992827
	Data Offset	1.049003	0.955786	-0.631626
Channel #		3	2	1
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	Thermo 42i	Analyzer serial #	1410661329

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	0.832	ppb	0.830	ppb
NOX coefficient	0.999	ppb	1.001	ppb
NO2 coefficient	0.998	ppb	0.998	ppb
NO bkgrnd	7.2		7.2	
NOX bkgrnd	7.4		7.3	
Nt coefficient	na		na	
Chamber Temp	50.4	Deg C	50.2	Deg C
Moly Temp	327.0	Deg C	323.0	Deg C
PMT Temp	-3.0	Deg C	-3.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	188.0	mmHg	192.9	mmHg
Sample Flow	0.817	ccm	0.846	ccm

Notes:

Small adjustments to both zero and span. Filter changed after As Founds

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 20, 2015 Station Number: AMS 13

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	N/A	N/A
as found span	5000	78.9	801.6	800.0	1.6	803.3	802.3	0.9	0.9980	0.9972
calibrator zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	N/A	N/A
high point	5000	78.9	801.6	800.0	1.6	802.3	799.2	3.1	0.9992	1.0010
second point	5000	39.4	400.3	399.5	0.8	398.7	397.2	1.5	1.0040	1.0059
third point	5000	19.7	200.2	199.8	0.4	198.7	198.1	0.6	1.0074	1.0085
calibrator zero	5000	0.0	0.0	0.0	0.0					
as left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	N/A	N/A
as left span	5000	78.9	801.6	441.4	360.2	803.0	445.0	355.0	0.9983	0.9920
								Average Correction Factor	1.0035	1.0051

Corrcted As found NO_X= 803.5 NO= 802.4 Percent Change NO_X= -0.4% NO= -0.4%

Previous Response NO_X= 800.6 NO= 799.2

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.90 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.1			N/A	
1st NO2 (350)	N/A	441.4	357.0	801.2	441.4	359.7	0.9850	1.0000	0.9924	100.8%
2nd NO2 (200)	N/A	585.8	212.6	801.0	585.8	215.1	0.9853	1.0000	0.9882	101.2%
3rd NO2 (100)	N/A	686.4	112.1	800.7	686.4	114.3	0.9856	1.0000	0.9803	102.0%
4th NO2 (0)	798.4	N/A	2.6	801.1	798.4	2.6	0.9851	1.0000	N/A	N/A
					Average Correction Factor		0.9853	1.0000	0.9870	101.3%

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

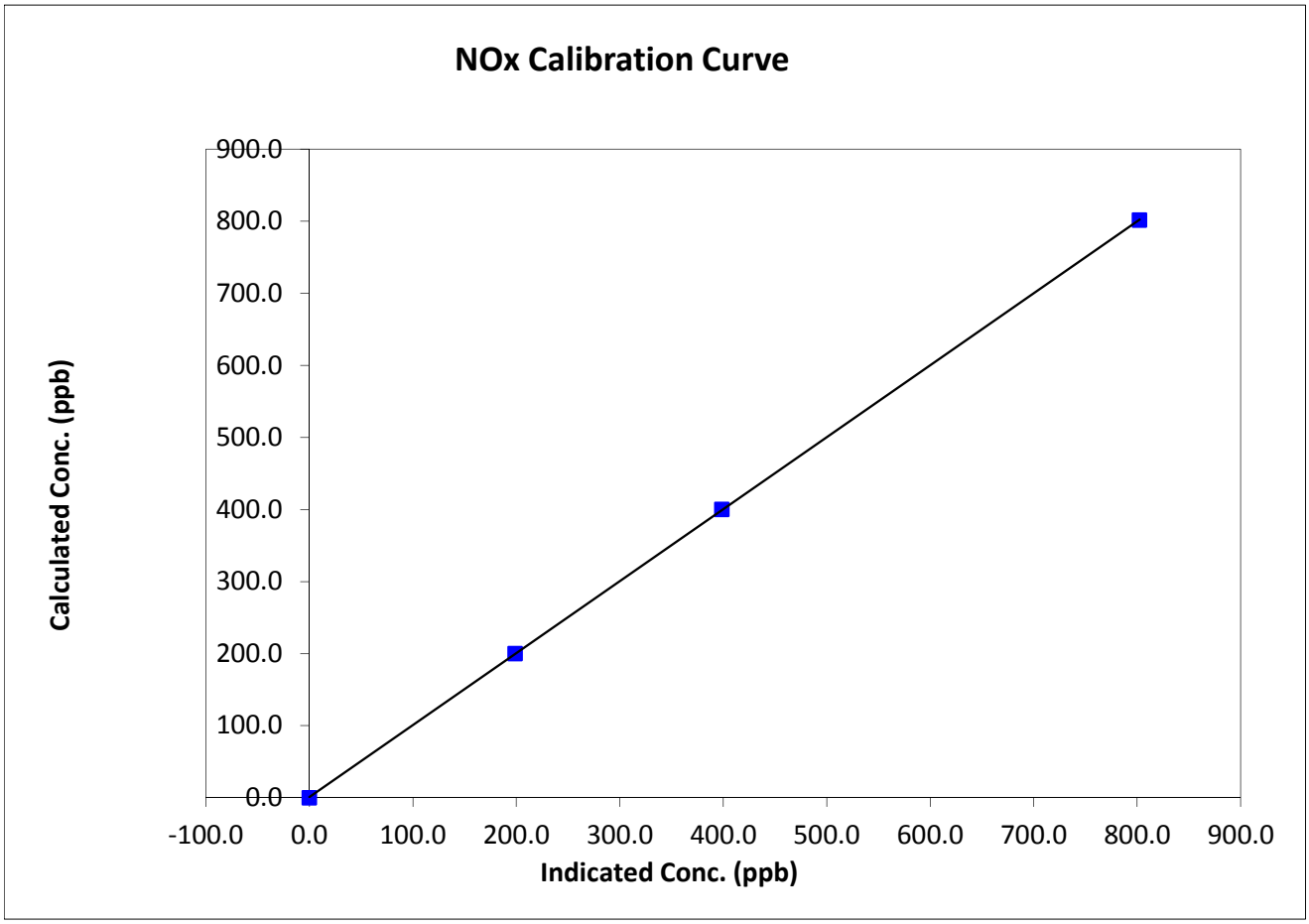
NO_X Calibration Summary

Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 9, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:25	End Time (MST)	15:20
Analyzer make	Thermo 42i	Analyzer serial #	1410661329

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999991
801.6	802.3	0.9992		
400.3	398.7	1.0040	Slope	0.998710
200.2	198.7	1.0074		
0.0			Intercept	1.049003



Wood Buffalo Environmental Association

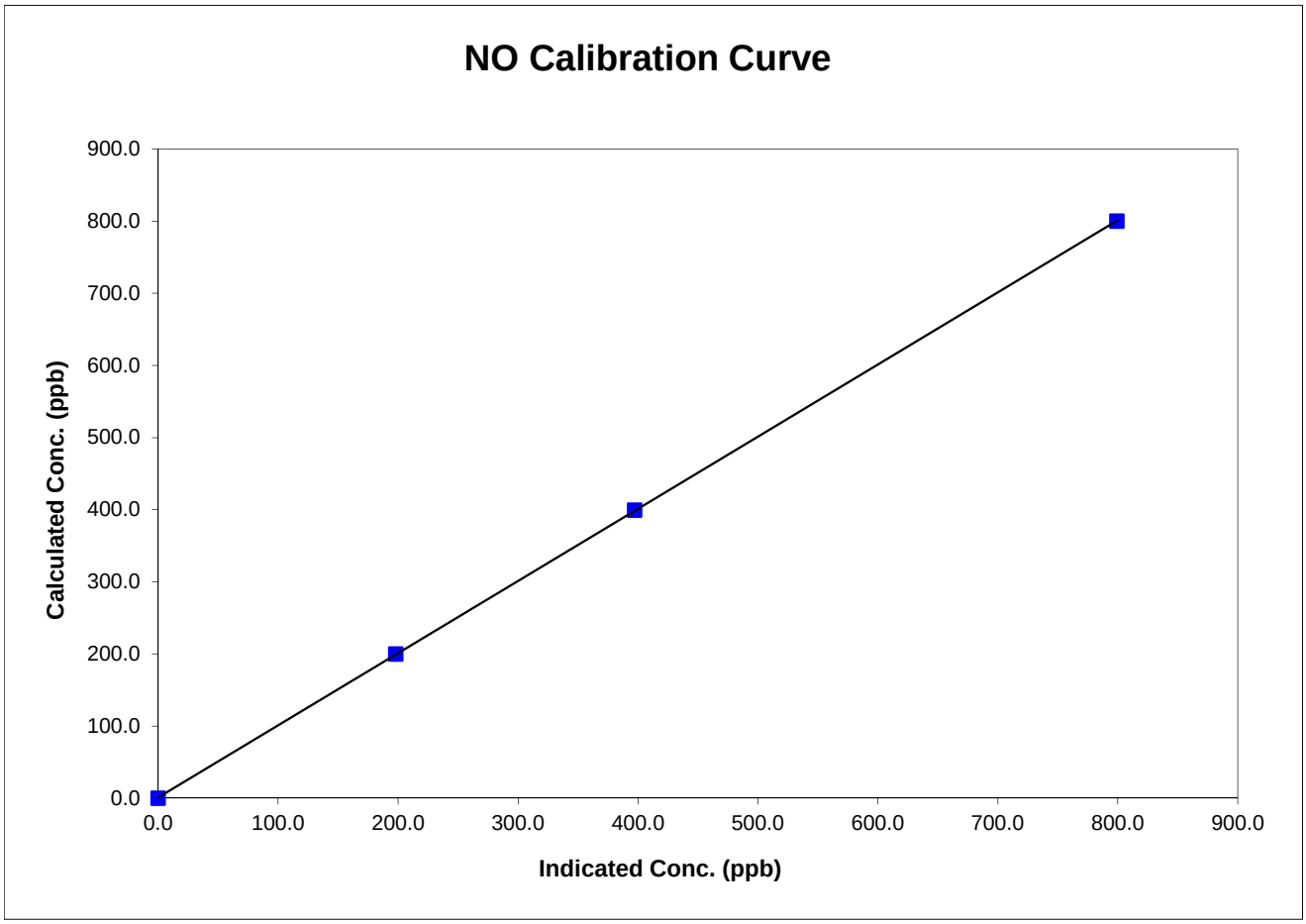
NO Calibration Summary

Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 9, 2014
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:25	End Time (MST)	15:20
Analyzer make	Thermo 42i	Analyzer serial #	1410661329

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999991
800.0	799.2	1.0010		
399.5	397.2	1.0059	Slope	1.000686
199.8	198.1	1.0085		
0.0			Intercept	0.955786



Wood Buffalo Environmental Association

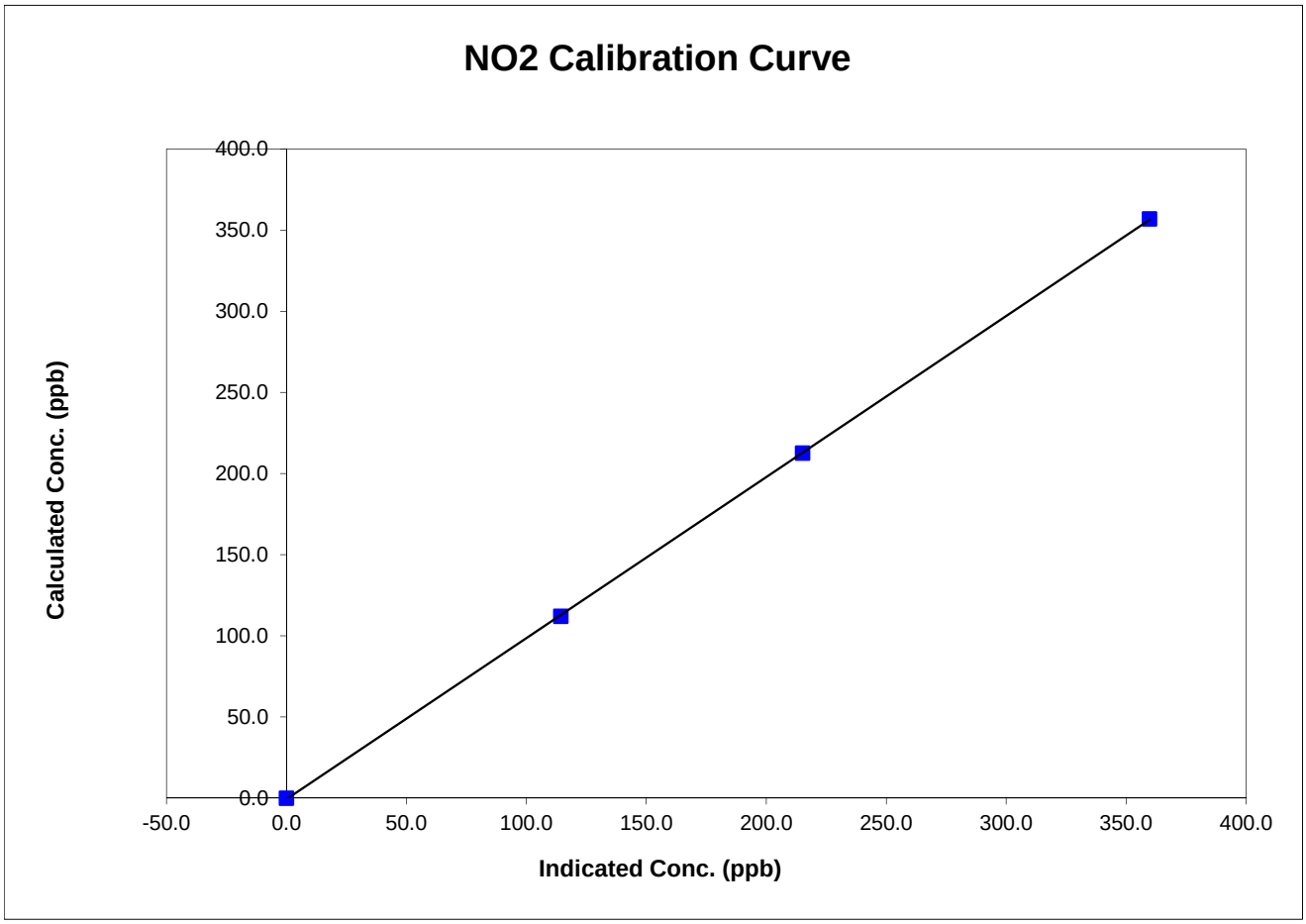
NO_2 Calibration Summary

Station Information

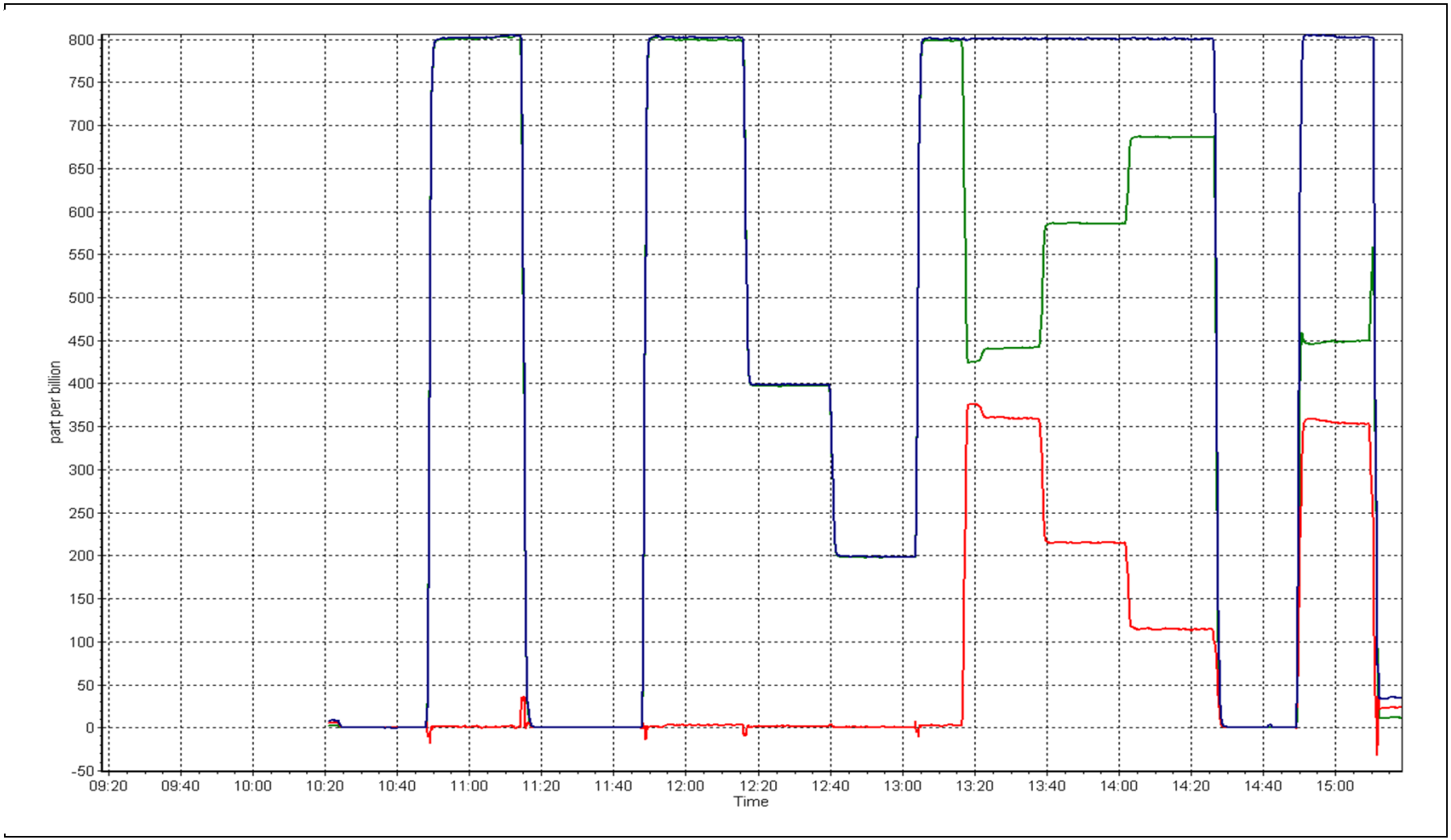
Calibration Date	January 20, 2015	Previous Calibration	December 9, 2014
Station Number	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:25	End Time (MST)	15:20
Analyzer make	Thermo 42i	Analyzer serial #	1410661329

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999979
357.0	359.7	0.9924		
212.6	215.1	0.9882	Slope	0.992827
112.1	114.3	0.9803		
			Intercept	-0.631626



NOx, NO & NO_2 Calibration Plot Date: January 20, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 14
ANZAC
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
JANUARY 2015

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	681	39	63	96.77	18	0	4	0
TRS(ppb) Average	708	34	36	99.73	8	0	2	0
THC(ppm) Average	705	37	39	99.73	3	-	2.1	-
NMHC(ppm) Average	705	37	39	99.73	0.852	-	0.103	-
CH4(ppm) Average	705	37	39	99.73	2.4	-	2	-
NO2(ppb) Average	702	40	42	99.73	28	0	14	0
NO(ppb) Average	702	40	42	99.73	84	-	9	-
NOX(ppb) Average	702	40	42	99.73	95	-	22	-
O3(ppb) Average	704	37	40	99.60	44	0	38	-
PM2.5(ug/m3) Average	743	0	1	99.87	50.8	-	8.5	0
Temperature 2 m (C) Average	744	0	0	100.00	6.8	-	4.9	-
Relative Humidity (%) Average	744	0	0	100.00	98	-	-	-
Surface Wetness (% of range) Average	428	0	316	57.53	97	-	-	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	29	-	-	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-
Precipitation (mm) Total	402	0	342	54.03	1.5	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
JANUARY 2015

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	681	0.9	2	-	0	0	0	0	1	2	18
TRS(ppb) Average	708	0.4	1	-	0	0	0	0	0	1	8
THC(ppm) Average	705	1.9	0.1	-	1.8	1.8	1.8	1.9	1.9	2	3
NMHC (ppm) Average	705	0.013	0.047	-	0	0	0	0	0	0	0.852
CH4(ppm) Average	705	1.89	0.1	-	1.8	1.8	1.8	1.9	1.9	2	2.4
NO2(ppb) Average	702	4.6	5	-	0	1	1	3	7	11	28
NO(ppb) Average	702	1.1	5	-	0	0	0	0	1	2	84
NOX(ppb) Average	702	5.7	8	-	0	1	1	3	7	12	95
O3(ppb) Average	704	28	9	-	2	15	21	29	35	39	44
PM2.5(ug/m3) Average	743	3.46	4.1	-	0	0.5	1.2	2.3	4.1	6.9	50.8
Temperature 2 m (C) Average	744	-12.82	10.1	-	-32.8	-26.1	-20.5	-14.4	-4.9	2.4	6.8
Relative Humidity (%) Average	744	79.7	8	-	45	69	75	80	86	91	98
Surface Wetness (% of range) Average	428	1.8	8	-	0	0	0	0	0	3	97
Wind Speed 20 m (km/h) Average	744	8.5	4	-	0	4	5	8	11	15	29
Wind Direction 20 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	402	-	-	8.89	0	0	0	0	0	0	1.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALZERS	12 Jan 2015 12:00	12 Jan 2015 12:00	1	Maintenance on daily span system
SO2	09 Jan 2015 04:00	09 Jan 2015 04:00	1	Stabilization after daily span
SO2	10 Jan 2015 05:00	10 Jan 2015 05:00	1	Stabilization after daily span
SO2	11 Jan 2015 06:00	11 Jan 2015 06:00	1	Stabilization after daily span
SO2	12 Jan 2015 07:00	12 Jan 2015 07:00	1	Stabilization after daily span
SO2	13 Jan 2015 02:00	13 Jan 2015 02:00	1	Stabilization after daily span
SO2	14 Jan 2015 03:00	14 Jan 2015 03:00	1	Stabilization after daily span
SO2	15 Jan 2015 04:00	15 Jan 2015 04:00	1	Stabilization after daily span
SO2	16 Jan 2015 05:00	16 Jan 2015 05:00	1	Stabilization after daily span
SO2	18 Jan 2015 07:00	18 Jan 2015 07:00	1	Stabilization after daily span
SO2	19 Jan 2015 02:00	19 Jan 2015 02:00	1	Stabilization after daily span
SO2	20 Jan 2015 03:00	20 Jan 2015 03:00	1	Stabilization after daily span
SO2	21 Jan 2015 04:00	21 Jan 2015 04:00	1	Stabilization after daily span
SO2	22 Jan 2015 05:00	22 Jan 2015 05:00	1	Stabilization after daily span
SO2	23 Jan 2015 06:00	23 Jan 2015 06:00	1	Stabilization after daily span
SO2	24 Jan 2015 07:00	24 Jan 2015 07:00	1	Stabilization after daily span
SO2	25 Jan 2015 02:00	25 Jan 2015 02:00	1	Stabilization after daily span
SO2	26 Jan 2015 03:00	26 Jan 2015 03:00	1	Stabilization after daily span
SO2	27 Jan 2015 04:00	27 Jan 2015 04:00	1	Stabilization after daily span
SO2	27 Jan 2015 05:00	27 Jan 2015 06:00	2	Unstable operation - excessive baseline drift
SO2	28 Jan 2015 05:00	28 Jan 2015 05:00	1	Stabilization after daily span
SO2	30 Jan 2015 07:00	30 Jan 2015 07:00	1	Stabilization after daily span
SO2	31 Jan 2015 02:00	31 Jan 2015 02:00	1	Stabilization after daily span
CH4, NMHC, THC	09 Jan 2015 11:00	09 Jan 2015 11:00	1	Maintenance - Station operator on site
NO2, NO, NOX	07 Jan 2015 11:00	07 Jan 2015 11:00	1	Maintenance - uploaded new data collection program
O3	08 Jan 2015 12:00	08 Jan 2015 12:00	1	Maintenance - uploaded new data collection program
Surface Leaf Wetness	01 Jan 2015 01:00	14 Jan 2015 04:00	316	Sensor not in service
Precipitation Collector	06 Jan 2015 10:00	20 Jan 2015 15:00	342	Collector not in service

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 18 ppb on Jan 19 16:00 Maximum Daily Average: 4.0 ppb on Jan 19

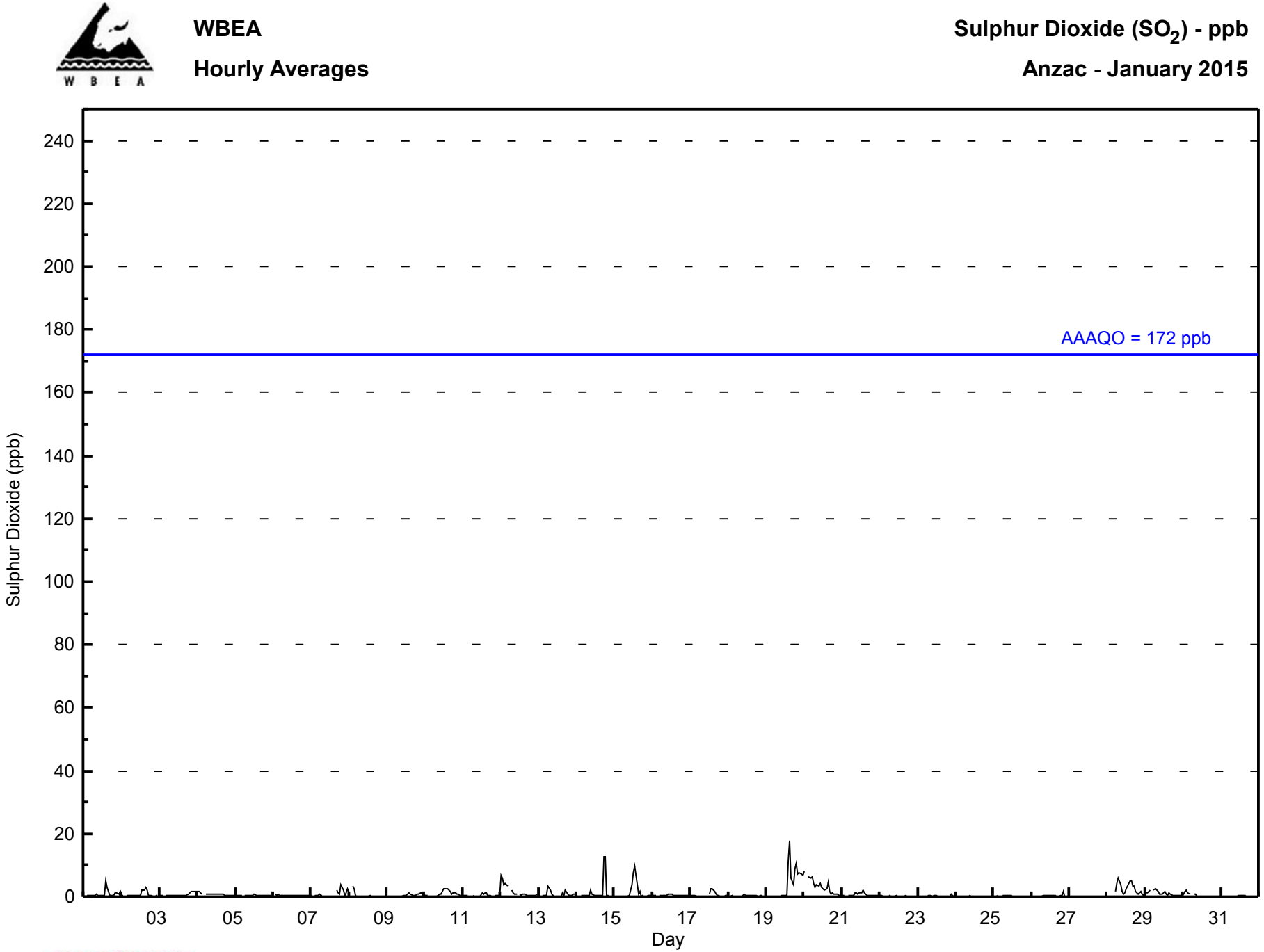
Minimum Value: 0 ppb on Jan 14 22:00 Minimum Daily Average: 0.0 ppb on Jan 27
Maximum Diurnal Average: 1.6 ppb at hour 16 Minimum Diurnal Average: 0.6 ppb at hour 10
Monthly Average: 0.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 9$

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	39
Percent Operational Time:	96.8

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-Jan	0	Z	0	0	0	0	0	1	1	1	1	1	0	0	5	3	1	1	1	1	1	1	1	2	0.9	5
2-Jan	1	1	Z	1	1	1	1	1	0	0	0	1	1	2	2	3	2	0	0	0	0	0	0	0	0.8	3
3-Jan	0	0	1	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	0.7	2
4-Jan	2	2	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2
5-Jan	1	1	1	1	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0.5	1
6-Jan	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1
7-Jan	0	Z	0	0	0	1	0	0	C	C	C	C	C	C	C	C	2	1	1	4	2	1	1	3	--	4
8-Jan	1	Z	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3
9-Jan	0	0	Z	RE	0	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0.5	1
10-Jan	0	0	0	Z	RE	0	0	0	0	1	1	2	2	2	3	2	2	1	1	1	1	1	1	1	1.0	3
11-Jan	0	0	0	0	Z	RE	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0.4	1
12-Jan	7	6	4	4	3	Z	RE	2	1	1	1	M	1	1	1	1	0	0	0	0	0	0	1	1	1.7	7
13-Jan	Z	RE	0	0	0	0	3	2	1	0	0	0	0	0	0	1	1	2	1	0	1	1	1	1	0.7	3
14-Jan	1	Z	RE	0	0	0	0	0	0	2	1	0	0	0	0	0	0	13	13	1	0	0	0	0	1.5	13
15-Jan	0	0	Z	RE	0	0	0	0	0	0	2	4	7	10	4	1	2	0	0	0	0	0	0	0	1.5	10
16-Jan	0	0	0	Z	RE	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
17-Jan	0	0	0	0	0	0	0	0	0	0	0	Z	1	2	2	2	1	0	0	0	0	0	0	0	0.5	2
18-Jan	0	0	0	0	0	Z	RE	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
19-Jan	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	11	18	6	4	9	10	7	8	7	7	4.0	18
20-Jan	8	Z	RE	6	6	6	4	3	4	3	4	3	2	2	3	5	2	1	1	1	1	1	1	1	3.1	8
21-Jan	1	1	Z	RE	0	0	0	0	1	1	1	1	1	2	1	1	1	0	0	0	0	0	0	0	0.7	2
22-Jan	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Jan	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
24-Jan	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Jan	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Jan	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0.3	2
27-Jan	0	0	Z	RE	UO	UO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28-Jan	0	0	0	Z	RE	2	4	6	4	2	1	1	3	3	5	5	3	4	2	1	1	2	1	1	2.2	6
29-Jan	1	1	2	2	Z	2	3	2	2	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0	1.1	3
30-Jan	1	2	2	1	1	Z	RE	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
31-Jan	Z	RE	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.1	1
	1.0	0.7	0.8	1.0	0.7	0.7	0.8	0.7	0.6	0.6	0.6	0.7	0.9	1.1	1.5	1.6	0.9	1.0	1.1	0.8	0.7	0.7	0.6	0.7	Diurnal Average	
	8	6	4	6	6	6	4	6	4	3	4	4	7	10	11	18	6	13	13	10	7	8	7	7	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

AURORA ATMOSPHERICS INC.


WBEA
Hourly Averages
Sulphur Dioxide (SO_2) - ppb
Anzac - January 2015
AAAQO = 172 ppb
Sulphur Dioxide (ppb)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	677	99.41	99.41
11 - 20	4	0.59	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	27	10	8	10	15	18	40	48	28	23	20	16	50	187	107	70	677
11 - 20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	29	10	8	10	15	18	40	48	28	23	20	16	50	187	107	72	681

Total Number of Valid Hours: 681

Total Number of Hours: 744

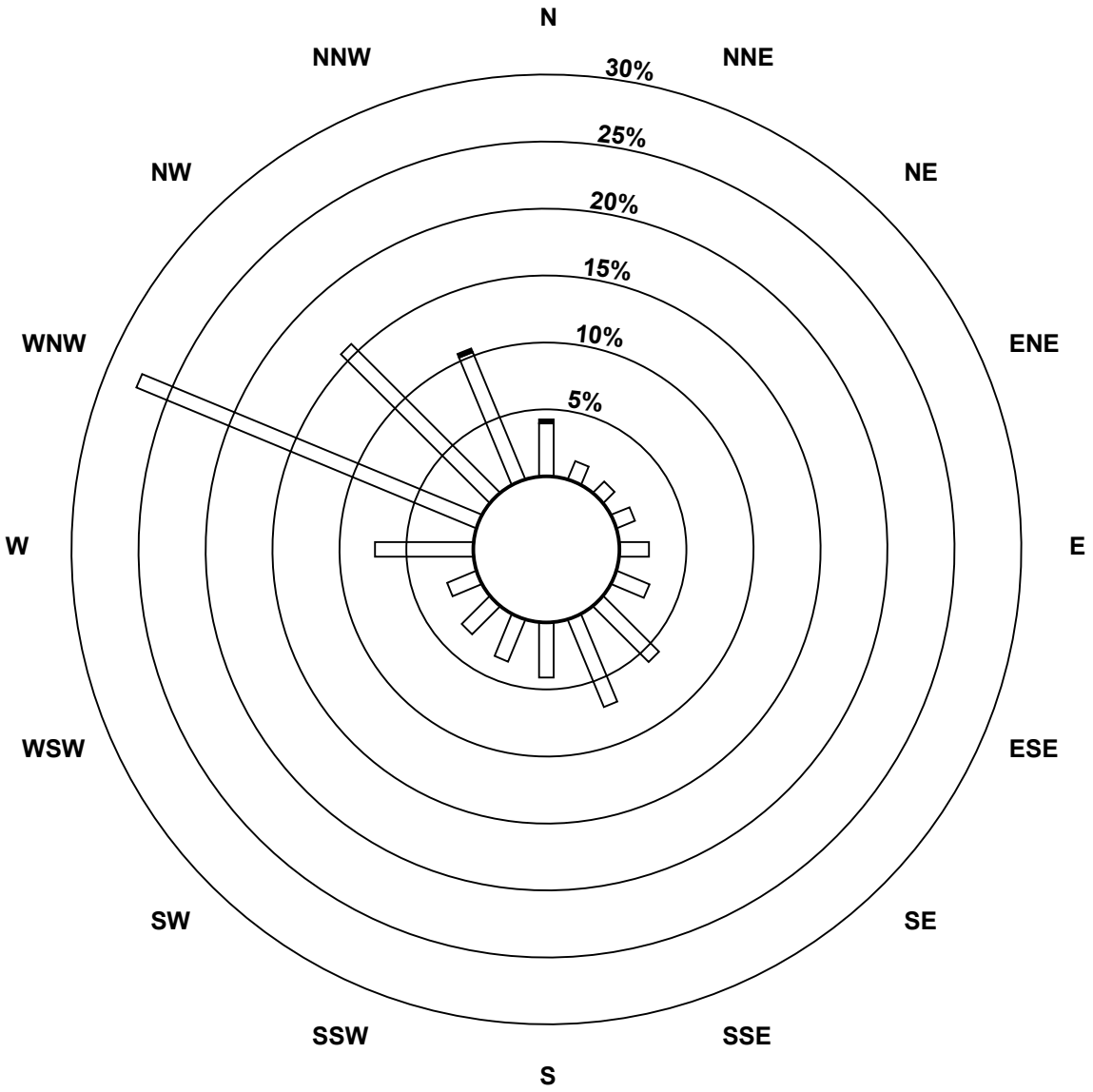
AURORA ATMOSPHERICS INC.

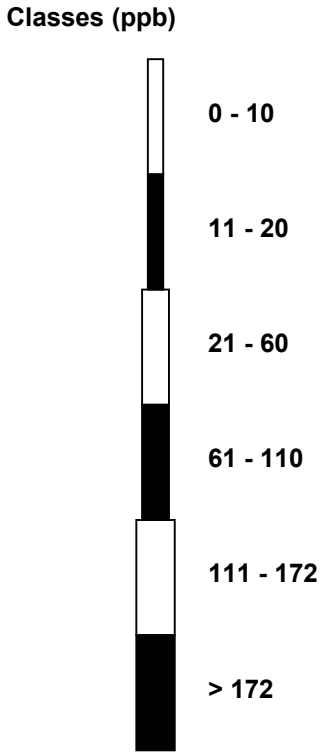
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Anzac (AMS 14)





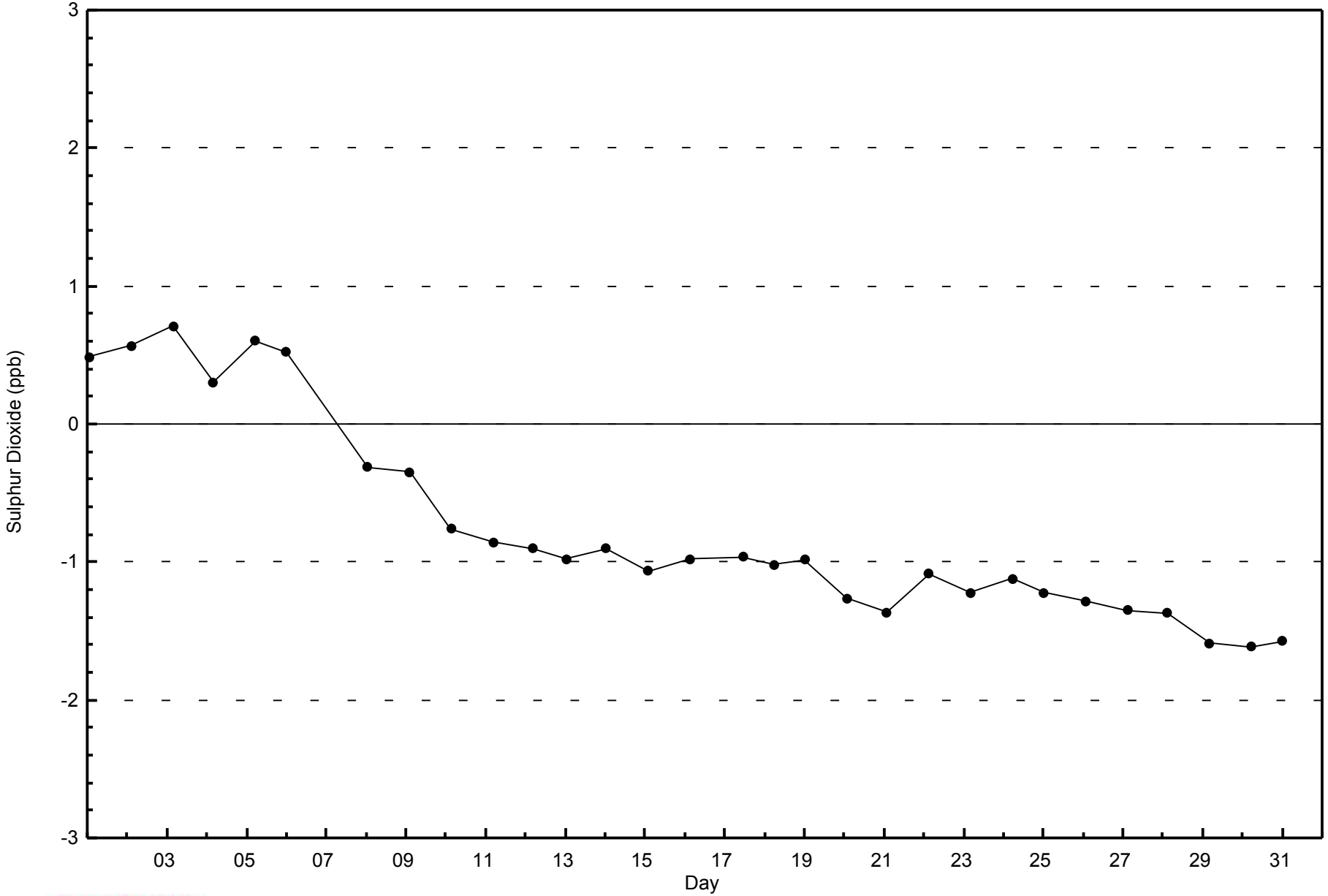
Total Number of Valid Hours: 681

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2015



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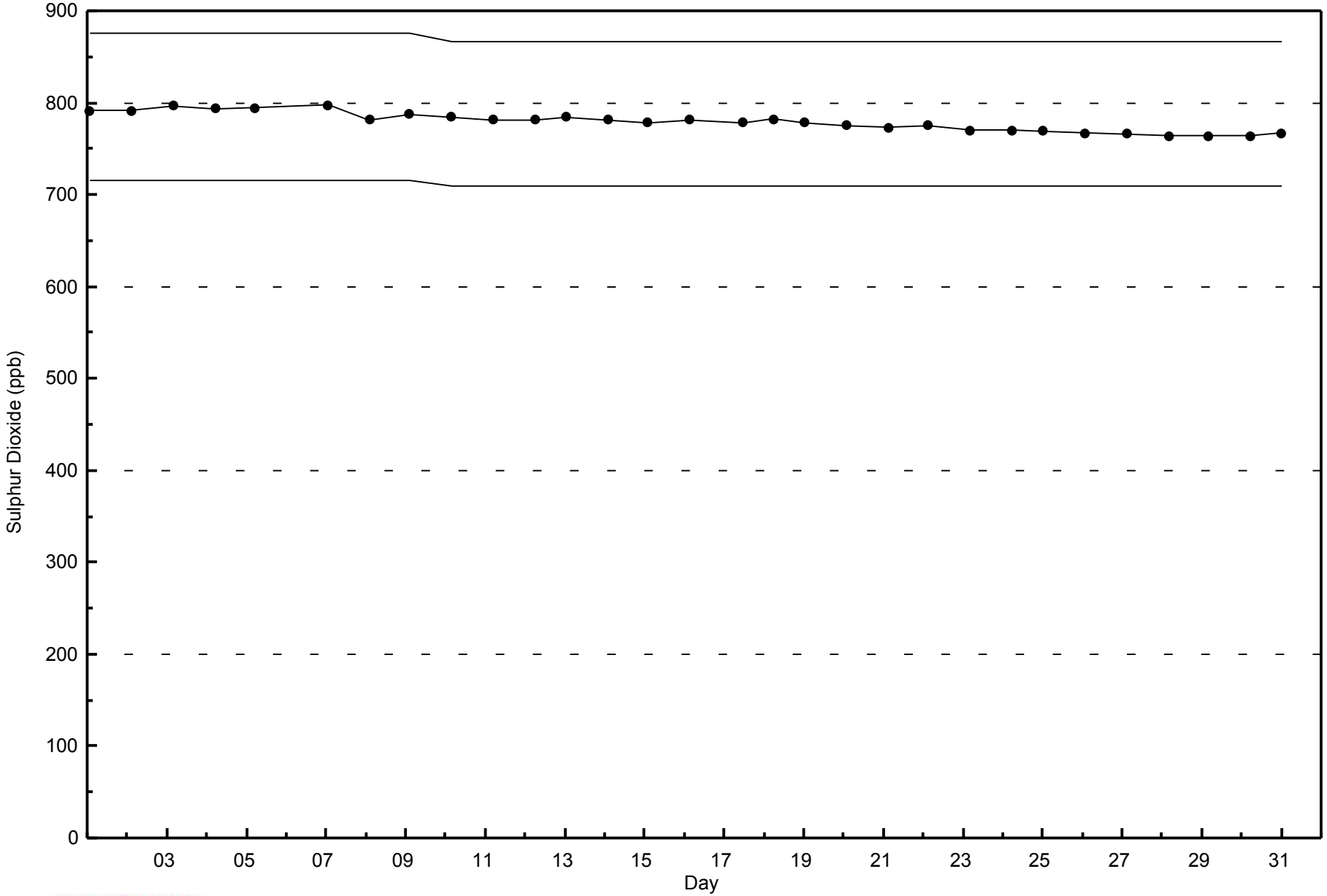
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 ppb on Jan 7 11:00 Maximum Daily Average: 1.9 ppb on Jan 7

Minimum Value: 0 ppb on Jan 19 05:00 Minimum Daily Average: 0.2 ppb on Jan 22
Maximum Diurnal Average: 0.6 ppb at hour 16 Minimum Diurnal Average: 0.3 ppb at hour 21
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	34
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-Jan	0	0	Z	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
2-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
4-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
5-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
6-Jan	0	Z	0	0	0	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0.3	0
7-Jan	0	0	Z	0	0	2	3	4	4	1	8	4	5	0	3	6	1	0	0	1	1	0	0	0	1.9	8
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
10-Jan	0	0	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.4	1
12-Jan	0	0	0	0	0	0	Z	0	0	0	0	M	M	0	0	0	0	0	0	0	0	0	0	0	0.3	0
13-Jan	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Jan	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
15-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	1	1	0.4	1
16-Jan	2	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
17-Jan	0	0	0	0	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0.3	1
18-Jan	1	1	2	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
19-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	1	1	1	1	0.6	2
20-Jan	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
21-Jan	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Jan	0	0	0	0	0	Z	1	1	1	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3
24-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	0	0	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
29-Jan	1	0	0	0	0	Z	0	1	3	0	0	1	3	1	1	2	1	0	0	0	0	0	0	0	0.8	3
30-Jan	1	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
31-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.6	0.5	0.6	0.3	0.4	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average	
	2	1	2	1	1	2	3	4	4	1	8	4	5	1	3	6	1	1	1	1	1	1	1	1	Diurnal Maximum	

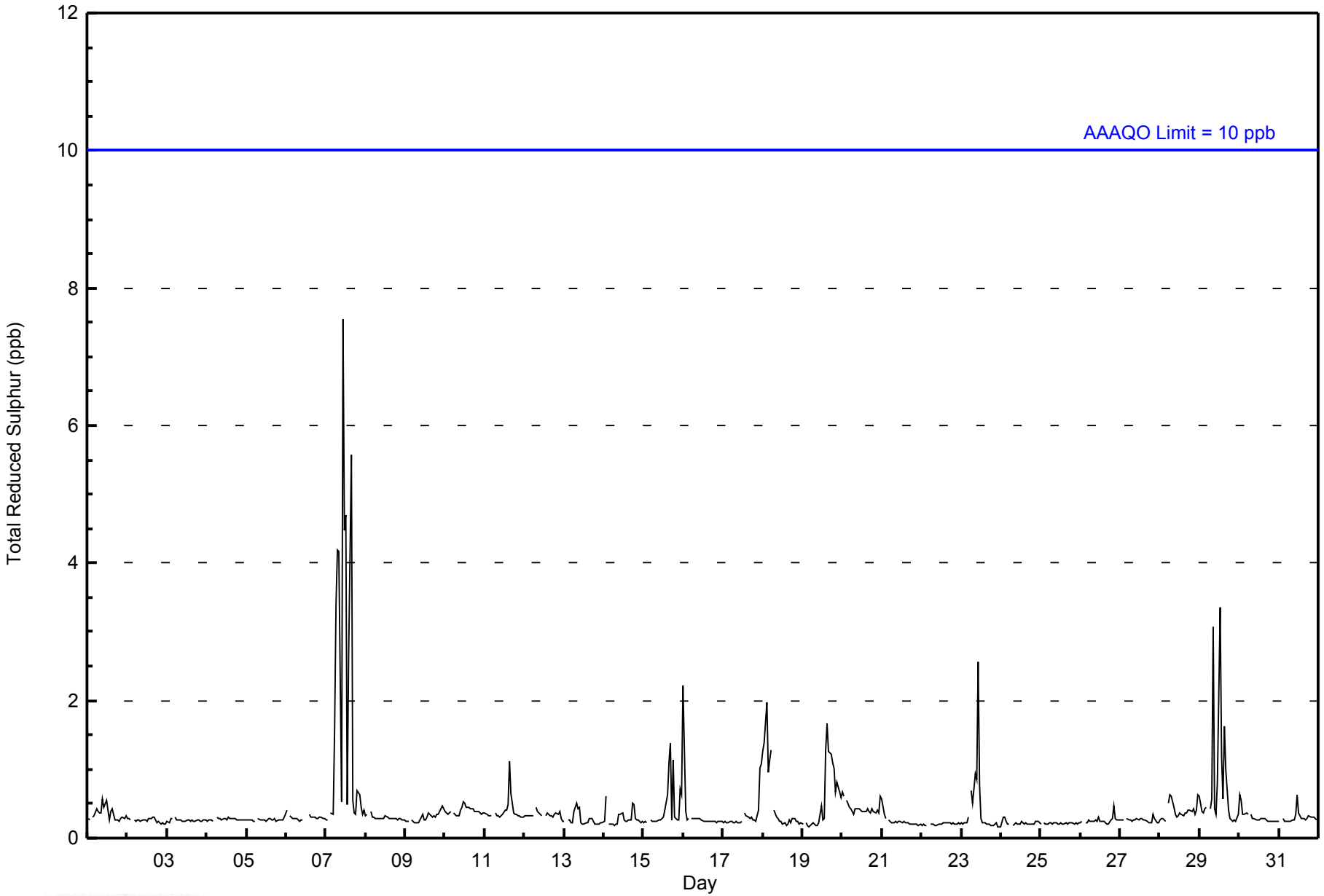
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2015



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	697	98.45	98.45
3 - 4	8	1.13	99.58
5 - 7	2	0.28	99.86
8 - 11	1	0.14	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	32	10	8	12	15	18	39	48	30	24	21	17	50	190	109	74	697
3 - 4	0	0	0	0	0	2	5	1	0	0	0	0	0	0	0	0	8
5 - 7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2
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	0	0	0	0	0	0	0	0	0	0	0
Totals	32	10	8	12	15	20	46	49	30	24	21	17	50	190	109	75	708

Total Number of Valid Hours: 708

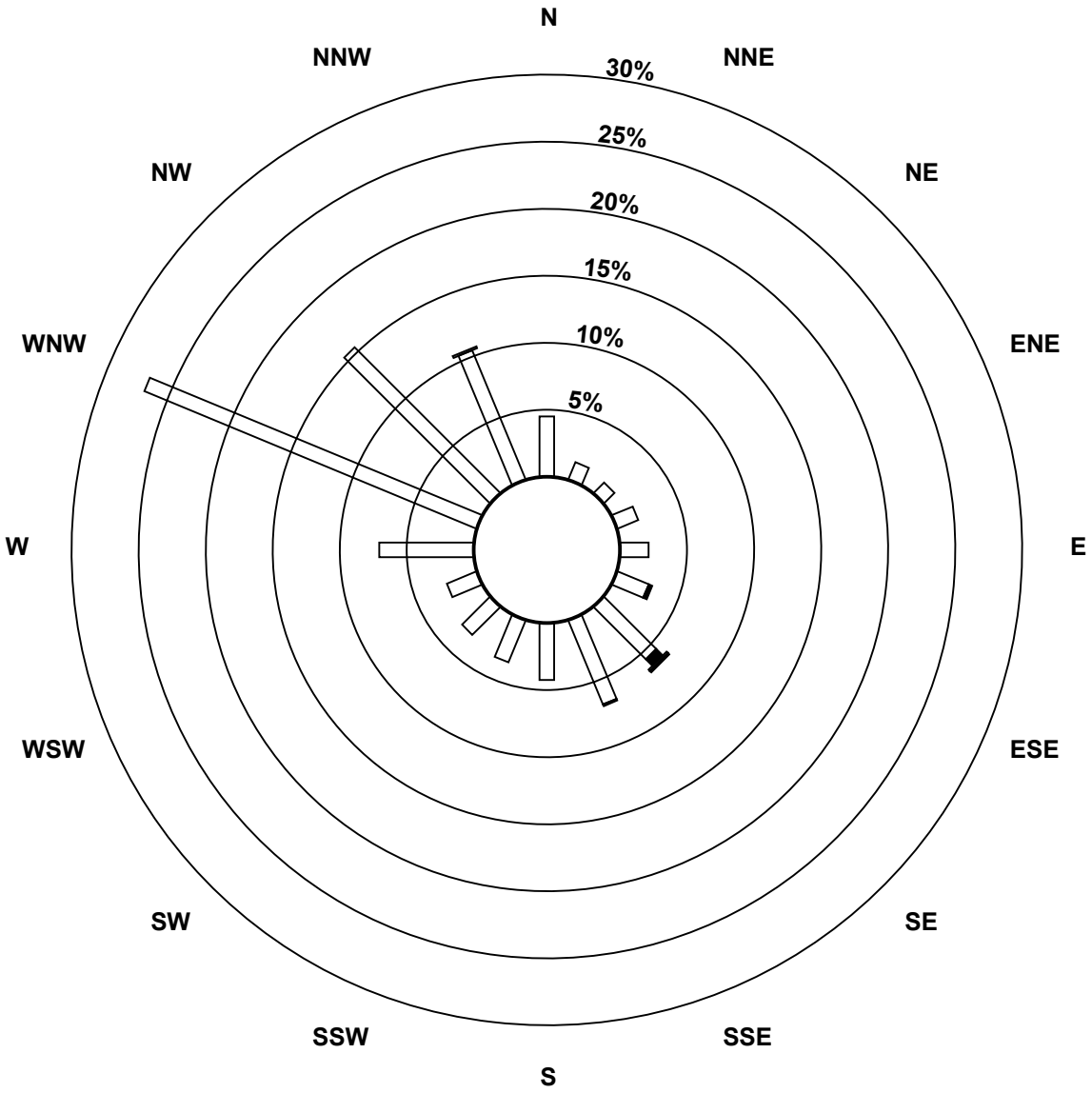
Total Number of Hours: 744

Wood Buffalo Environmental Association

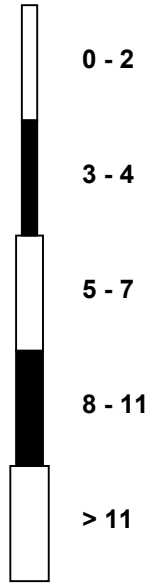
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

Anzac (AMS 14)



Classes (ppb)



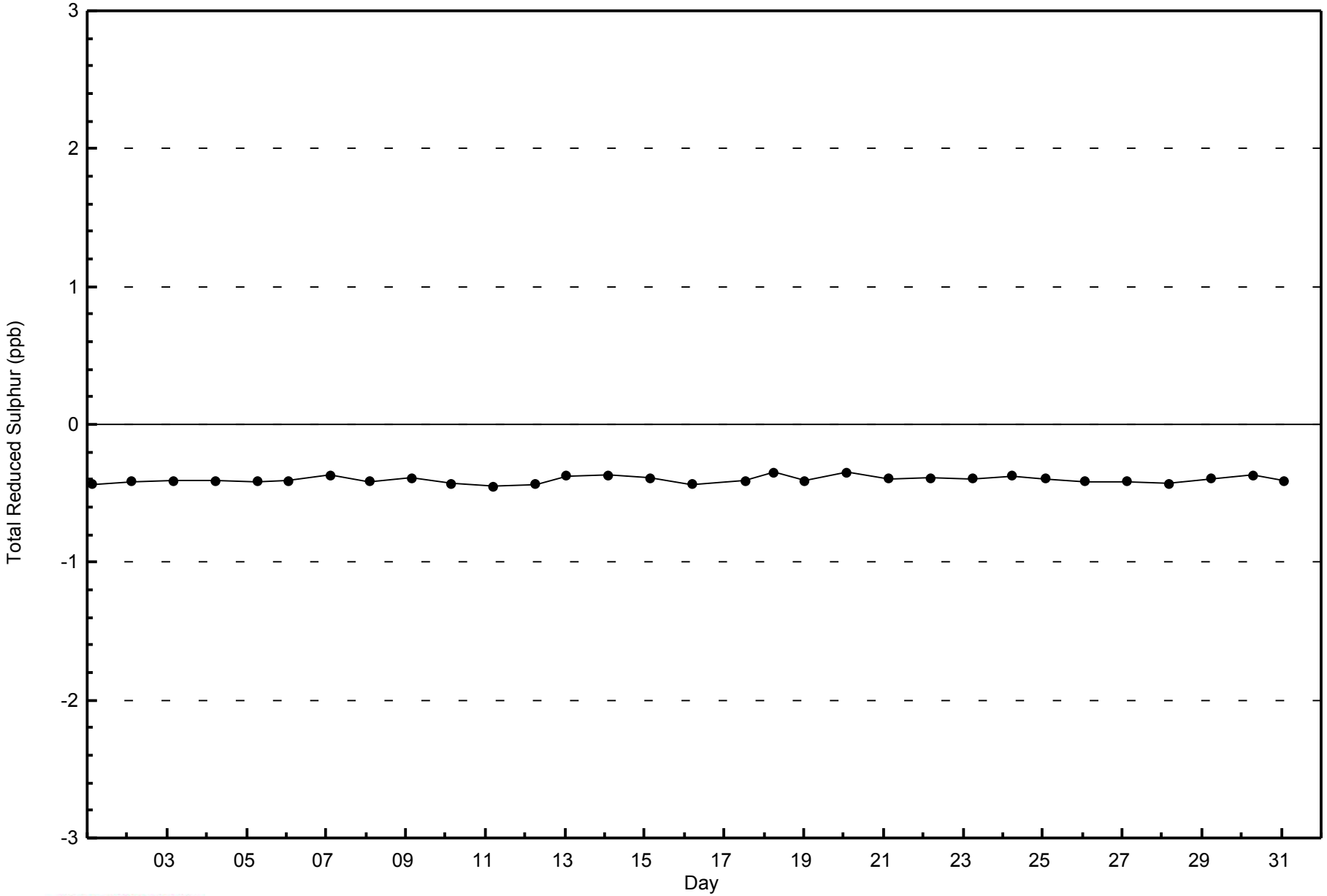
Total Number of Valid Hours: 708

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2015



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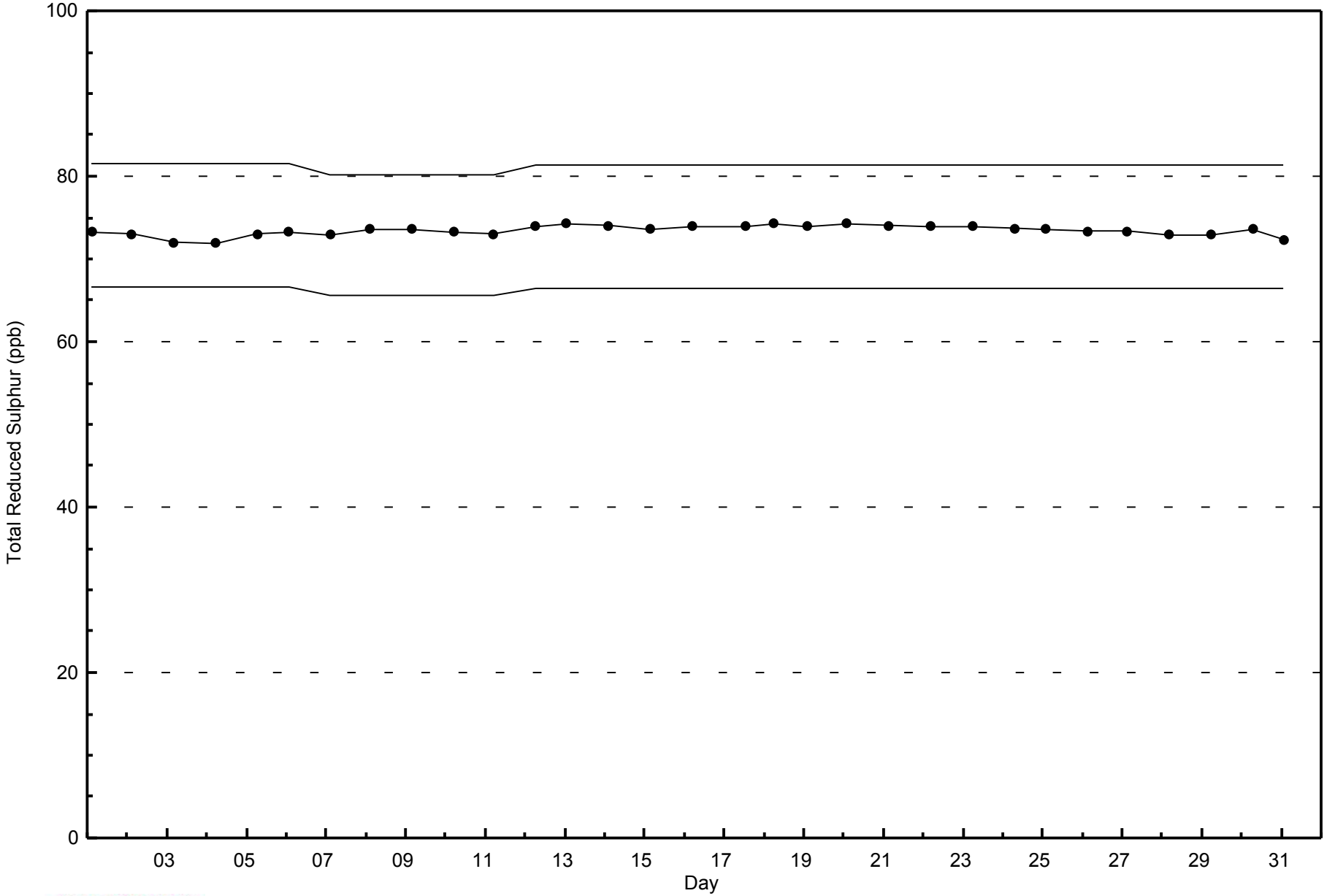
WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Anzac - January 2015

Maximum Value: 3.0 ppm on Jan 18 10:00

Maximum Daily Average: 2.1 ppm on Jan 19

Minimum Value: 1.8 ppm on Jan 25 13:00

Minimum Daily Average: 1.8 ppm on Jan 22

Maximum Diurnal Average: 1.9 ppm at hour 10

Minimum Diurnal Average: 1.9 ppm at hour 14

Monthly Average: 1.90 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 1.9 P_{90} = 2.0 P_{99} = 2.4

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-Jan	1.8	Z	1.9	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
2-Jan	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
3-Jan	1.9	1.9	1.9	Z	2.0	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
4-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
5-Jan	1.9	1.8	1.8	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
6-Jan	Z	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	C	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	--	2.1
7-Jan	2.1	Z	2.0	1.9	2.1	2.2	2.1	2.1	2.0	1.9	2.1	2.0	2.1	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.2
8-Jan	1.8	Z	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
9-Jan	1.9	1.9	Z	1.9	2.2	1.9	1.9	1.9	1.9	1.9	M	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.2
10-Jan	1.9	1.9	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.3	2.0	1.9	1.9	1.9	1.9	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3
11-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	2.0	2.1	2.1	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.1
12-Jan	1.8	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.0	1.9	2.0	2.3
13-Jan	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.1	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.2
14-Jan	1.9	Z	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	2.0
15-Jan	1.9	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
16-Jan	1.9	1.8	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	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9
17-Jan	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	Z	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0
18-Jan	2.0	2.1	2.3	2.1	2.4	Z	1.9	1.9	2.0	3.0	2.3	2.4	1.8	1.8	1.8	1.8	2.0	1.9	2.0	2.2	2.6	2.0	1.8	2.0	2.1	3.0
19-Jan	Z	1.9	2.1	2.2	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.2	2.4	2.6	2.6	2.4	2.2	2.1	2.2	2.2	2.1	2.1	2.6
20-Jan	2.1	Z	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	2.1
21-Jan	1.9	1.9	Z	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
22-Jan	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
23-Jan	1.8	1.8	1.8	1.8	Z	1.9	2.0	1.9	2.0	2.1	2.2	2.1	1.9	1.8	1.8	1.8	1.9	1.8	1.8	1.8	2.0	2.2	1.9	2.3	1.9	2.3
24-Jan	1.9	1.9	1.9	1.8	1.9	Z	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9
25-Jan	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
26-Jan	1.8	Z	2.0	2.2	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0	1.9	2.0	1.9	1.9	1.8	1.9	2.2
27-Jan	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
28-Jan	1.8	1.9	1.8	Z	1.8	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
29-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
30-Jan	2.2	2.1	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	2.2
31-Jan	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.1	2.3	2.0	1.9	1.9	2.3
	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.2	2.1	2.3	2.2	2.4	2.2	2.1	2.2	2.1	3.0	2.3	2.4	2.1	2.0	2.2	2.4	2.6	2.6	2.4	2.2	2.6	2.3	2.2	2.3	Diurnal Maximum	

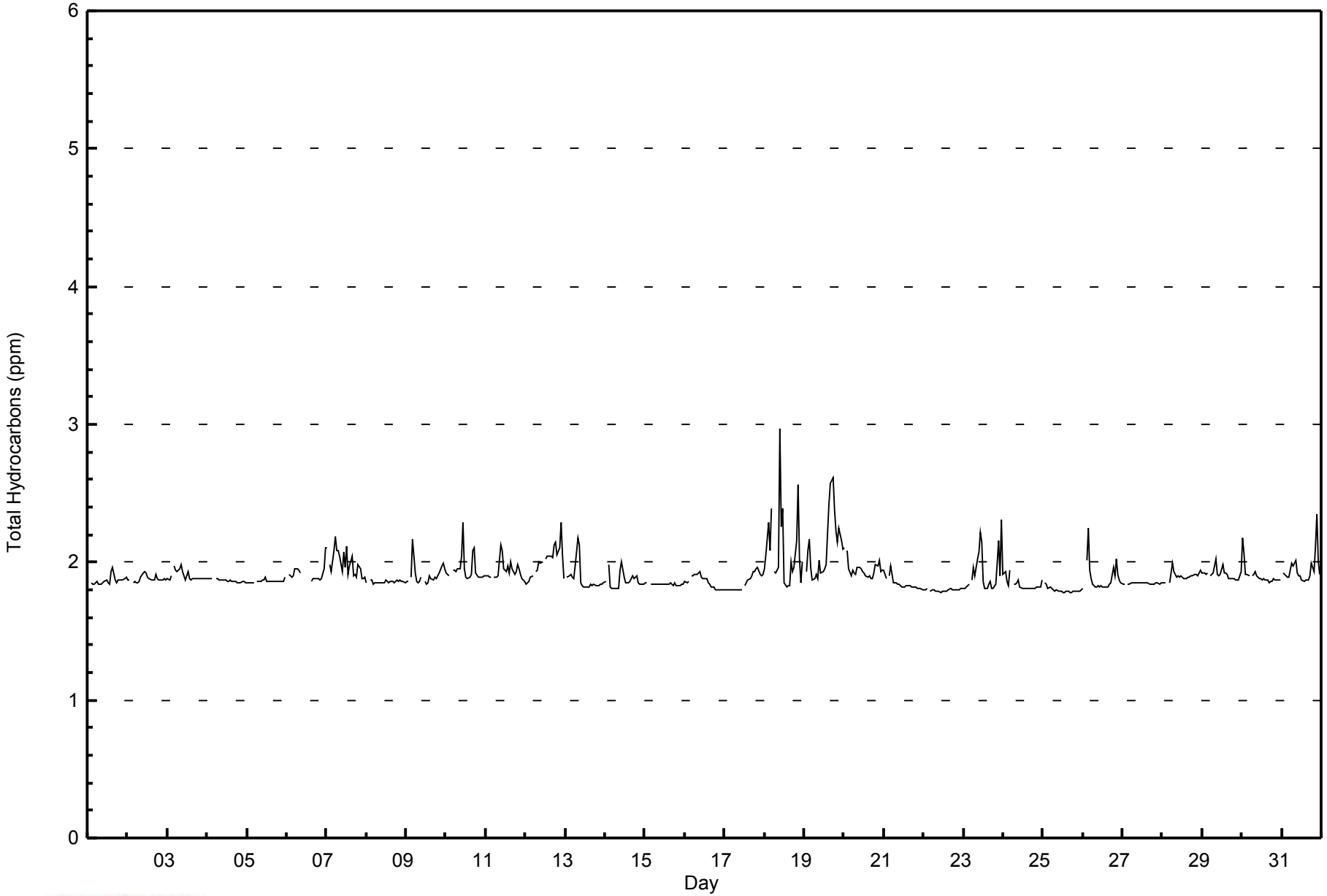
Z - zerospan C - Calibration M - Maintenance

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	651	92.34	92.34
2.1 - 3.0	54	7.66	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

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Anzac - January 2015

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	30	10	9	10	16	19	38	39	25	19	20	14	45	187	99	71	651
2.1 - 3.0	3	0	0	0	0	1	7	10	5	4	2	3	5	2	8	4	54
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	33	10	9	10	16	20	45	49	30	23	22	17	50	189	107	75	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

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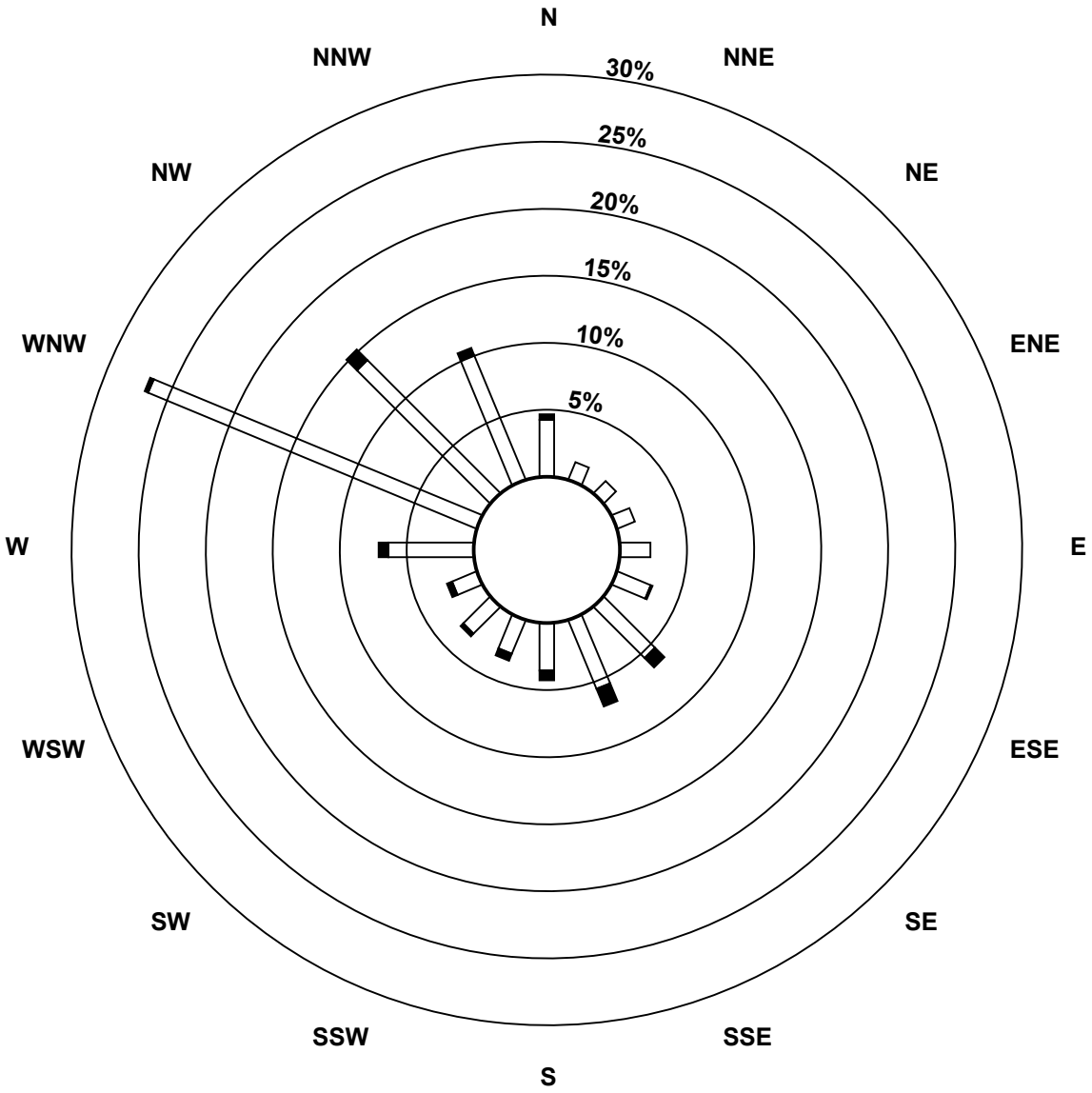
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

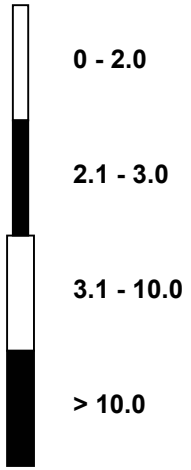
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Anzac (AMS 14)



Classes (ppm)



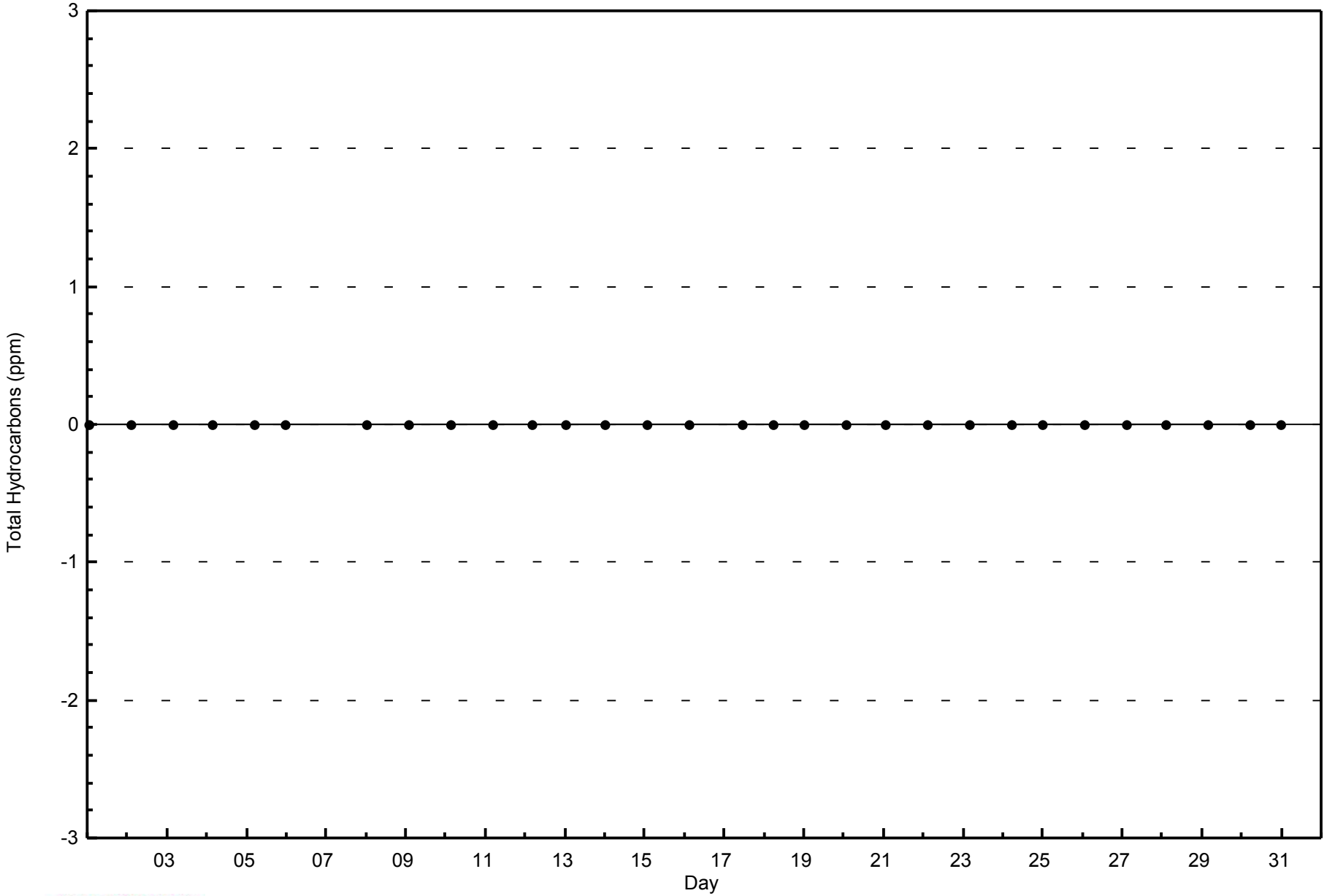
Total Number of Valid Hours: 705

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Anzac - January 2015



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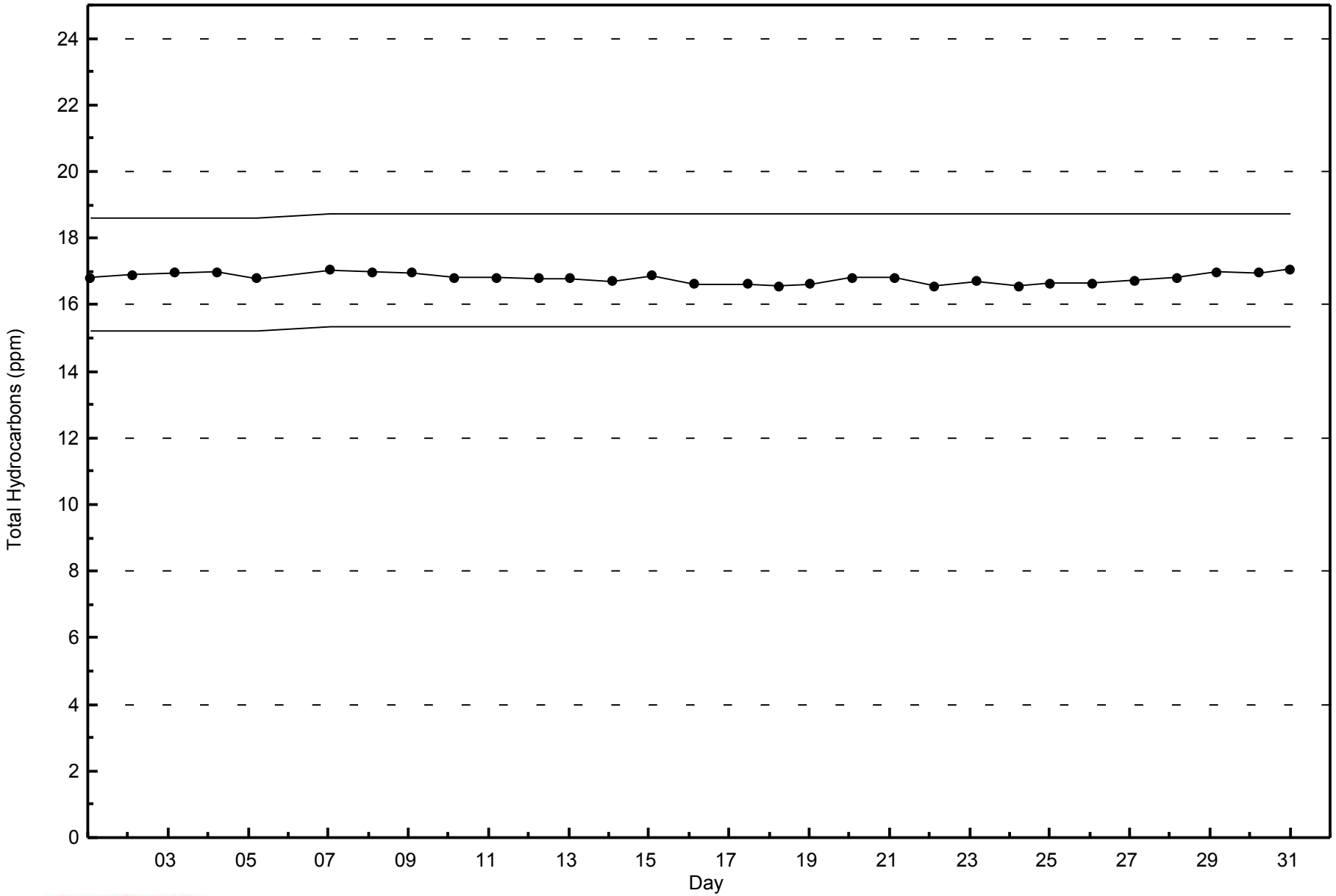
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2015

Maximum Value: 0.852 ppm on Jan 18 10:00

Maximum Daily Average: 0.103 ppm on Jan 18

Minimum Value: 0.000 ppm on Jan 1 03:00

Minimum Daily Average: 0.000 ppm on Jan 15

Maximum Diurnal Average: 0.034 ppm at hour 10

Minimum Diurnal Average: 0.003 ppm at hour 5

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} = 0.2

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-Jan	0.002	Z	0.000	0.000	0.004	0.022	0.002	0.000	0.000	0.002	0.013	0.020	0.000	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.008	0.006	0.004	0.022
2-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.001	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.041
3-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.050
4-Jan	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-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018
6-Jan	Z	0.000	0.000	0.000	0.000	0.035	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	--	0.035
7-Jan	0.000	Z	0.000	0.000	0.000	0.051	0.081	0.080	0.052	0.000	0.071	0.029	0.067	0.000	0.022	0.047	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.022	0.081
8-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.013	0.009	0.004	0.000	0.013	0.006	0.010	0.000	0.000	0.000	0.003	0.014
9-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	0.000	0.000	0.000	0.028	0.001	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.028
10-Jan	0.000	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.006	0.000	0.003	0.000	0.004	0.000	0.000	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.002	0.001	0.006
11-Jan	0.001	0.000	0.000	0.000	Z	0.003	0.000	0.000	0.001	0.000	0.005	0.000	0.012	0.047	0.005	0.000	0.016	0.005	0.000	0.001	0.001	0.000	0.001	0.000	0.004	0.047
12-Jan	0.000	0.001	0.002	0.001	0.002	Z	0.020	0.025	0.050	0.050	0.064	M	0.077	0.087	0.080	0.078	0.071	0.077	0.089	0.080	0.070	0.210	0.090	0.003	0.056	0.210
13-Jan	Z	0.006	0.006	0.010	0.002	0.001	0.044	0.135	0.107	0.001	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	0.014	0.135
14-Jan	0.000	Z	0.002	0.002	0.003	0.003	0.004	0.001	0.004	0.040	0.075	0.021	0.000	0.002	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.075
15-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.001	0.001	0.002	0.006	0.008	0.007	0.013	0.015	0.019	0.013	0.015	0.002	0.002	0.001	0.000	0.000	0.000	0.005	0.019
17-Jan	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	0.004	0.002	0.006	0.046	0.032	0.039	0.026	0.009	0.015	0.031	0.009	0.046
18-Jan	0.053	0.059	0.123	0.032	0.045	Z	0.007	0.000	0.010	0.852	0.251	0.054	0.009	0.006	0.007	0.001	0.167	0.111	0.088	0.111	0.282	0.099	0.001	0.010	0.103	0.852
19-Jan	Z	0.002	0.001	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.005	0.013	0.015	0.038	0.123	0.160	0.208	0.232	0.177	0.153	0.124	0.179	0.132	0.097	0.072	0.232
20-Jan	0.099	Z	0.094	0.017	0.003	0.035	0.013	0.004	0.035	0.023	0.024	0.011	0.010	0.006	0.002	0.018	0.000	0.001	0.002	0.001	0.002	0.000	0.000	0.001	0.017	0.099
21-Jan	0.001	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.002	0.004	0.006	0.008	0.003	0.005	0.006	0.004	0.005	0.000	0.001	0.002	0.008
22-Jan	0.000	0.004	0.001	Z	0.001	0.005	0.002	0.000	0.001	0.001	0.001	0.006	0.004	0.004	0.006	0.004	0.008	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.002	0.008
23-Jan	0.000	0.000	0.000	0.000	Z	0.001	0.019	0.006	0.034	0.033	0.164	0.068	0.020	0.000	0.002	0.009	0.025	0.001	0.000	0.042	0.176	0.349	0.007	0.017	0.042	0.349
24-Jan	0.001	0.004	0.009	0.005	0.011	Z	0.021	0.011	0.004	0.020	0.005	0.001	0.001	0.003	0.006	0.012	0.003	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.005	0.021
25-Jan	Z	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.006	0.001	0.001	0.003	0.002	0.000	0.002	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.006
26-Jan	0.000	Z	0.000	0.001	0.004	0.017	0.002	0.001	0.003	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.008	0.018	0.013	0.060	0.014	0.000	0.000	0.007	0.060
27-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Jan	0.000	0.000	0.000	Z	0.000	0.004	0.019	0.004	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.001	0.001	0.000	0.017	0.002	0.019
29-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.043	0.000	0.000	0.001	0.071	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.005	0.071
30-Jan	0.097	0.055	0.008	0.009	0.001	Z	0.003	0.005	0.031	0.000	0.001	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.010	0.097
31-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.007
	0.010	0.005	0.009	0.003	0.003	0.007	0.008	0.009	0.012	0.034	0.024	0.010	0.012	0.007	0.011	0.012	0.018	0.018	0.014	0.016	0.024	0.028	0.008	0.006	Diurnal Average	
	0.099	0.059	0.123	0.032	0.045	0.051	0.081	0.135	0.107	0.852	0.251	0.068	0.077	0.087	0.123	0.160	0.208	0.232	0.177	0.153	0.282	0.349	0.132	0.097	Diurnal Maximum	

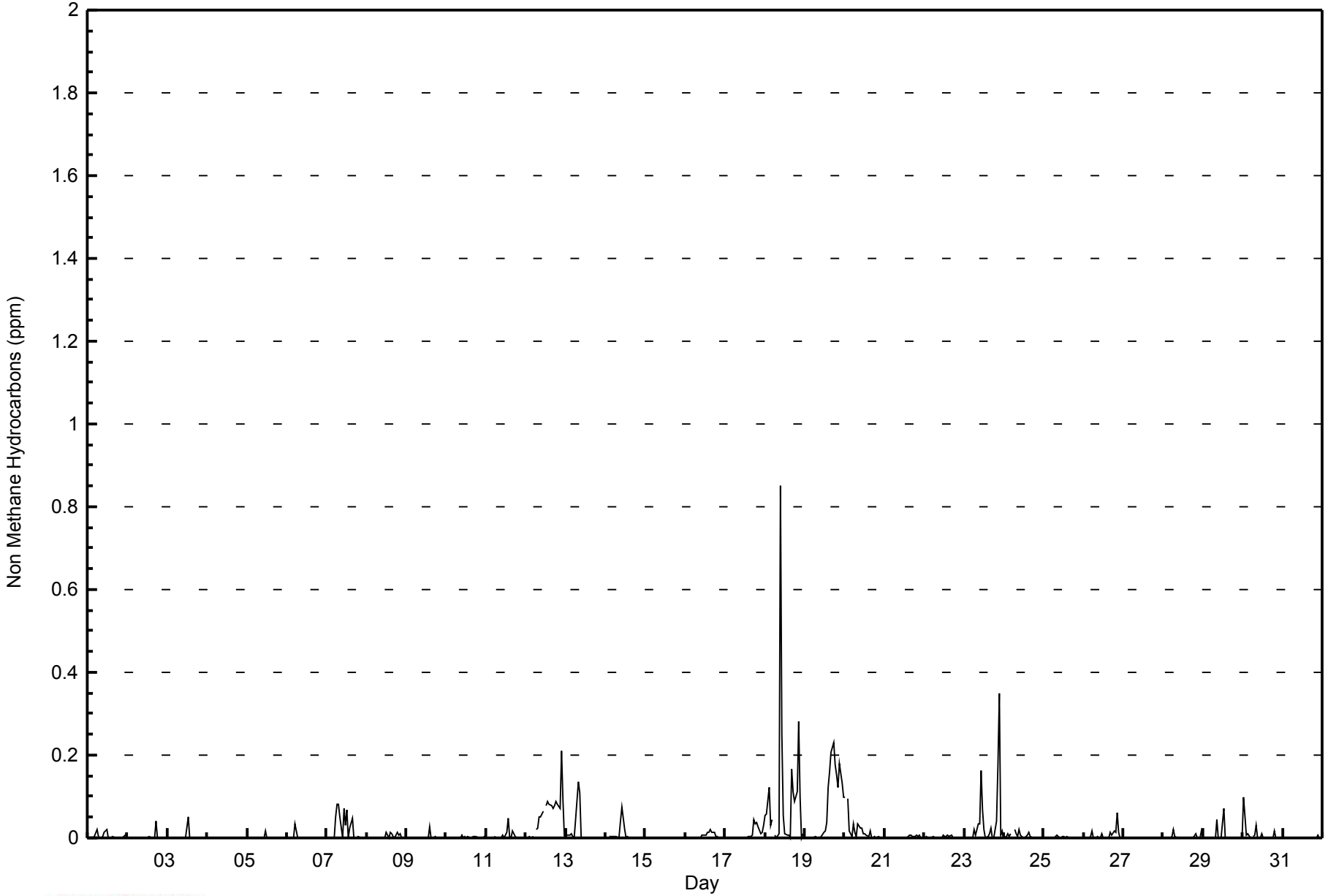
Z - zerospan C - Calibration M - Maintenance

WBEA

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	542	76.88	76.88
0.006 - 0.05	115	16.31	93.19
0.06 - 0.1	34	4.82	98.01
> 0.1	14	1.99	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2015

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	25	8	8	9	10	15	30	36	25	18	16	10	37	153	84	58	542
0.006 - 0.05	4	2	1	1	6	4	10	7	3	4	4	6	6	30	14	13	115
0.06 - 0.1	3	0	0	0	0	1	5	4	1	1	0	1	4	5	7	2	34
> 0.1	1	0	0	0	0	0	0	2	1	0	2	0	3	1	2	2	14
Totals	33	10	9	10	16	20	45	49	30	23	22	17	50	189	107	75	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

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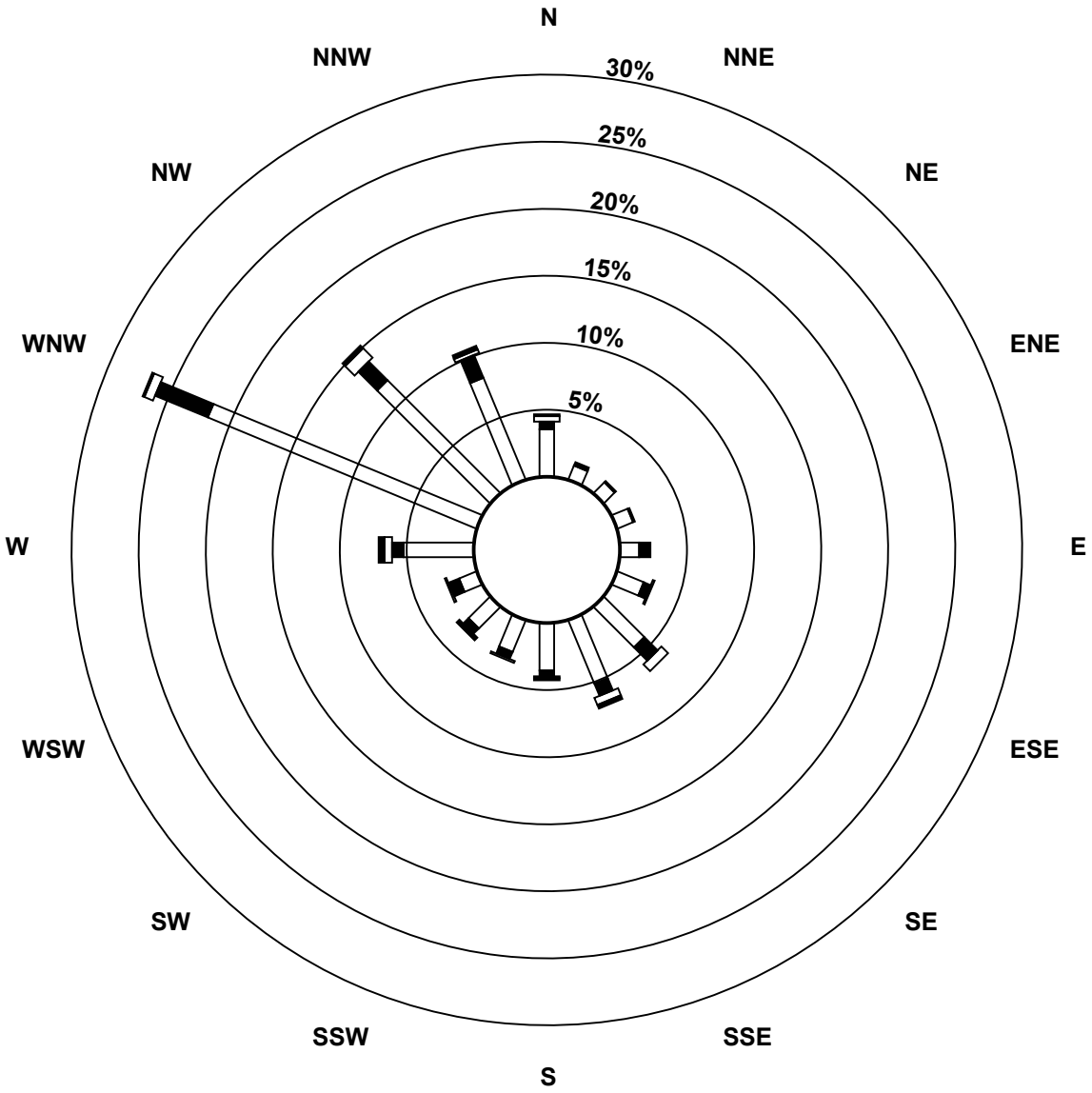
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Non Methane Hydrocarbons (NMHC) - ppm

Anzac (AMS 14)



Classes (ppm)

0 - 0.005

0.006 - 0.05

0.06 - 0.1

> 0.1

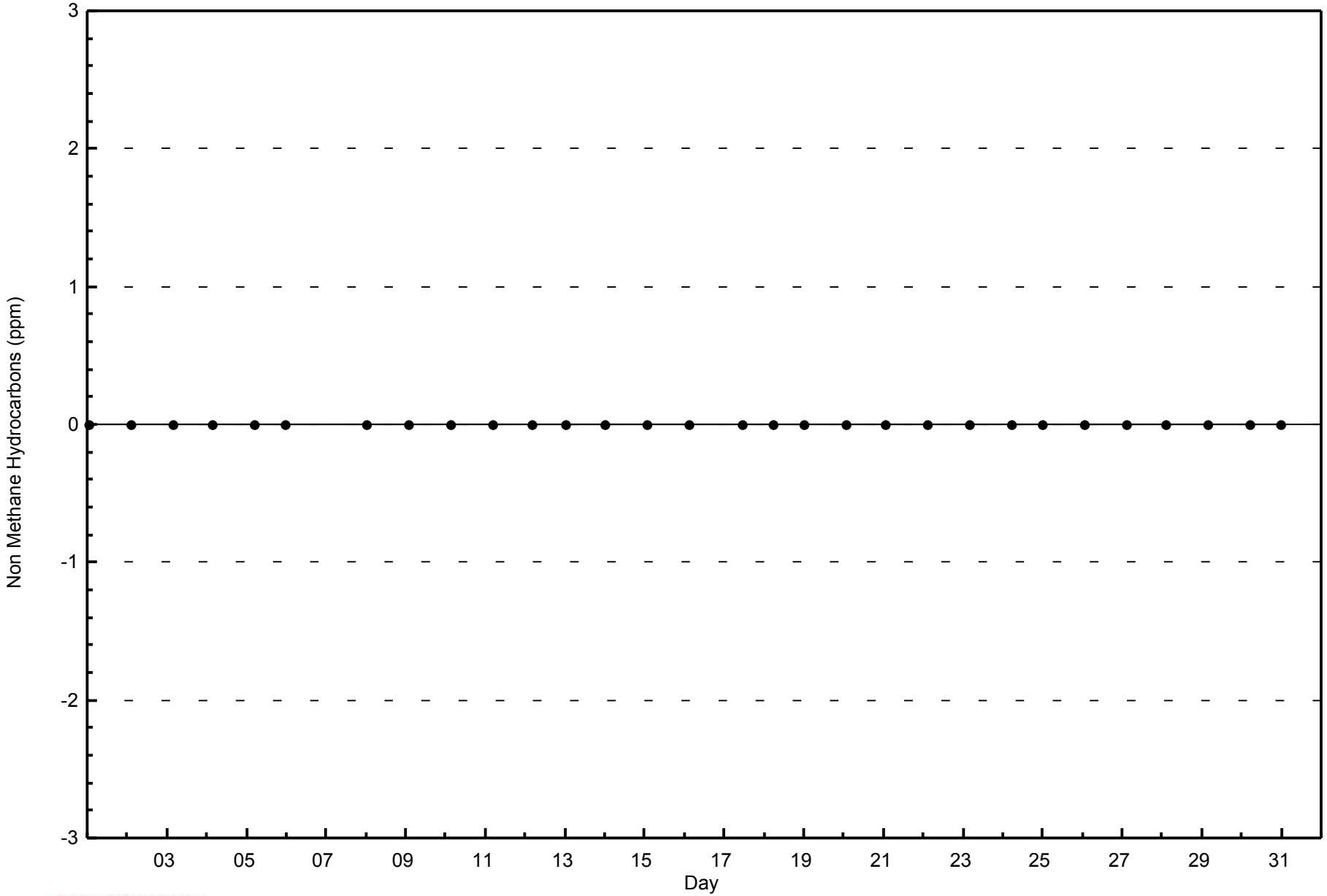
Total Number of Valid Hours: 705

WBEA

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2015



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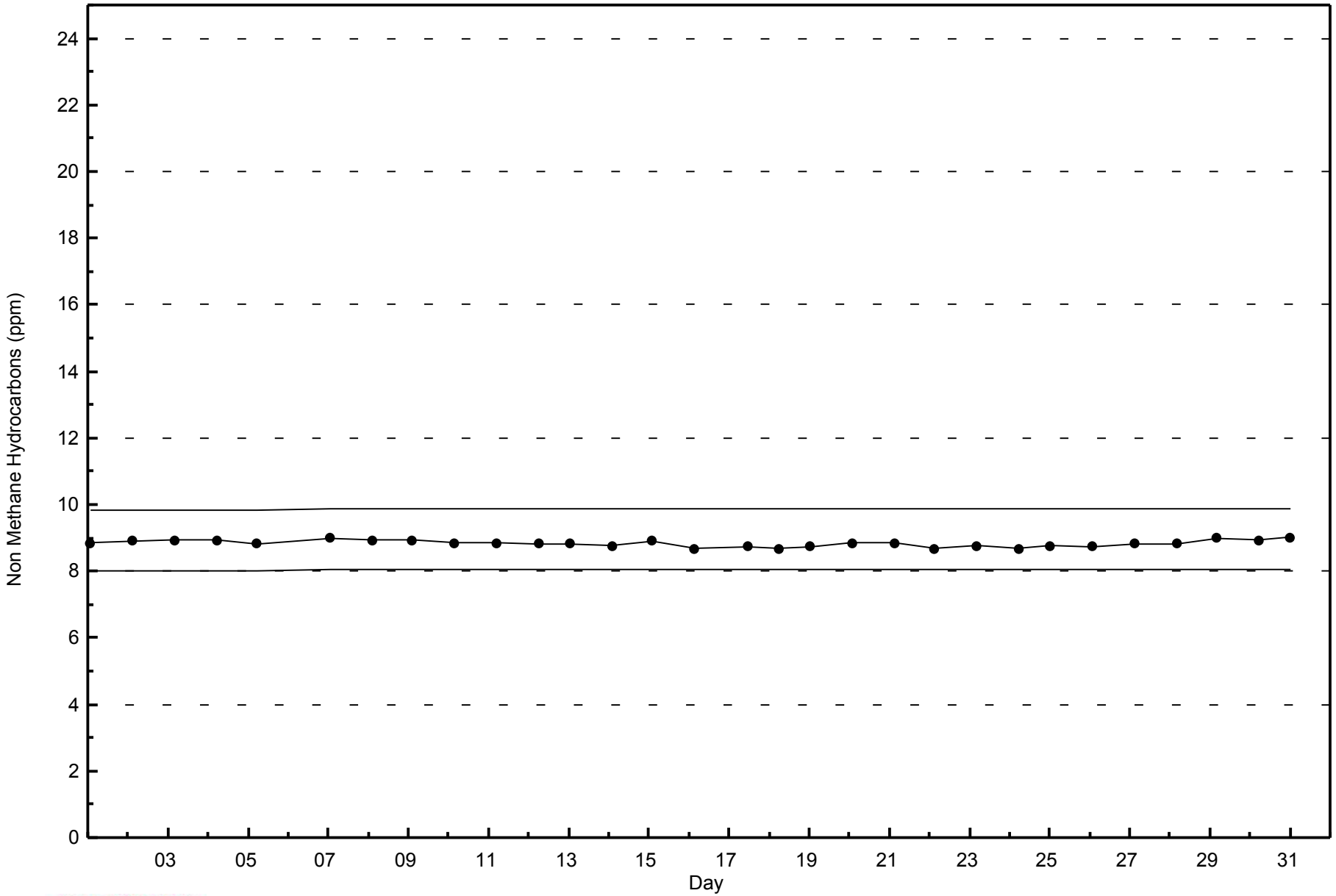
WBEA

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Anzac - January 2015

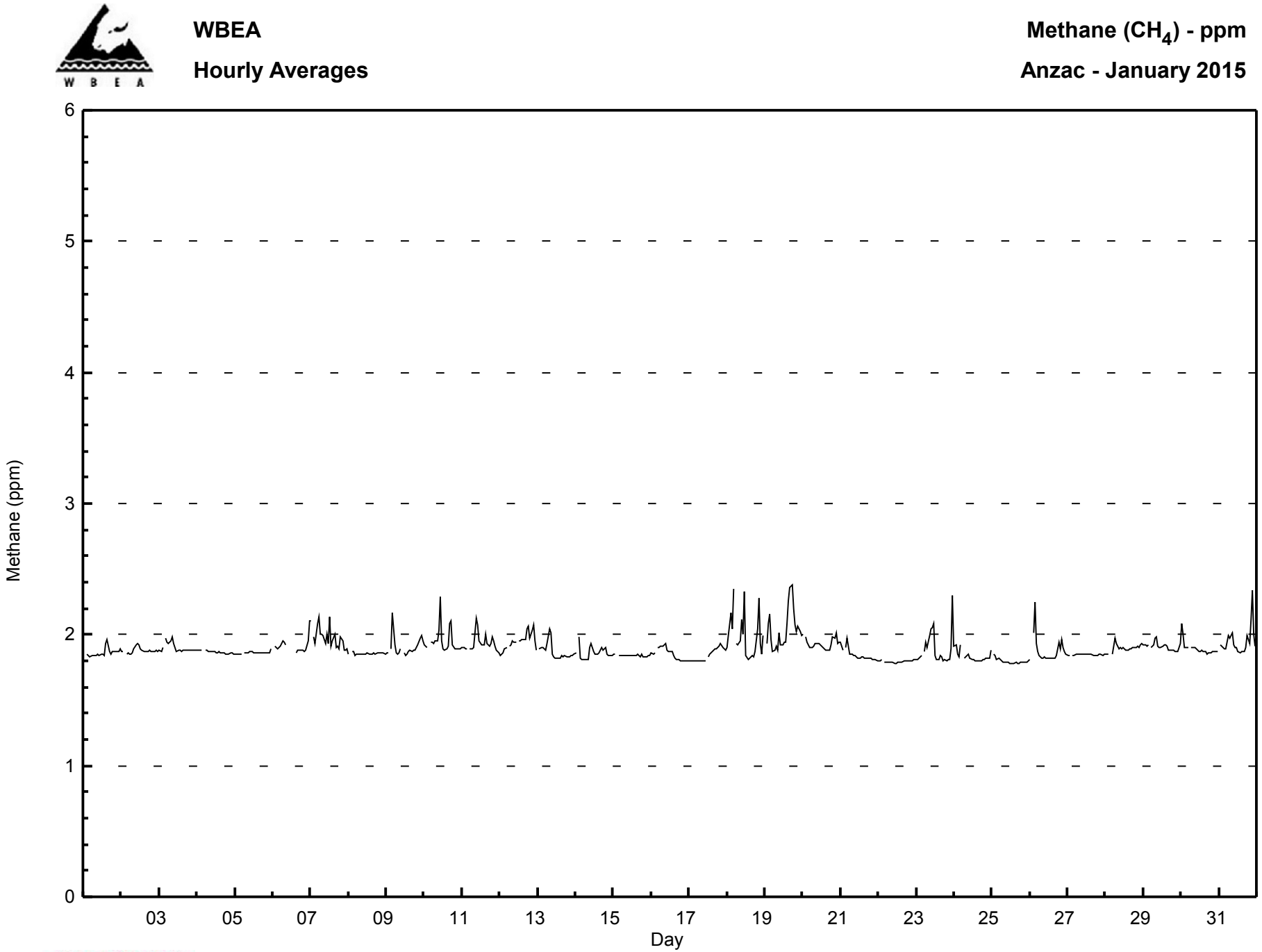
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.4 ppm on Jan 19 18:00 Maximum Daily Average: 2.0 ppm on Jan 19

Minimum Value: 1.8 ppm on Jan 25 13:00 Minimum Daily Average: 1.8 ppm on Jan 22
Maximum Diurnal Average: 1.9 ppm at hour 5 Minimum Diurnal Average: 1.9 ppm at hour 14
Monthly Average: 1.89 ppm Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 1.9 P_{90} = 2.0 P_{99} = 2.3

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-Jan	1.8	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
2-Jan	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
3-Jan	1.9	1.9	1.9	Z	2.0	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
4-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
5-Jan	1.9	1.8	1.8	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
6-Jan	Z	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	C	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	--	2.1
7-Jan	2.1	Z	2.0	1.9	2.1	2.1	2.0	2.0	2.0	1.9	2.0	1.9	2.1	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.1
8-Jan	1.8	Z	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
9-Jan	1.9	1.9	Z	1.9	2.2	1.9	1.9	1.9	1.9	1.9	M	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.2
10-Jan	1.9	1.9	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.3	2.0	1.9	1.9	1.9	1.9	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3
11-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	2.0	2.1	2.1	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.1
12-Jan	1.8	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	1.9	1.9	M	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	1.9	1.9	2.1
13-Jan	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0
14-Jan	1.9	Z	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	2.0
15-Jan	1.9	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
16-Jan	1.9	1.8	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9
17-Jan	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	Z	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9
18-Jan	1.9	2.0	2.2	2.0	2.3	Z	1.9	1.9	2.0	2.1	2.0	2.3	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.3	1.9	1.8	2.0	2.0	2.3
19-Jan	Z	1.9	2.1	2.2	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.1	2.3	2.4	2.4	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.4
20-Jan	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	2.0
21-Jan	1.9	1.9	Z	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
22-Jan	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
23-Jan	1.8	1.8	1.8	1.8	Z	1.9	1.9	1.9	2.0	2.0	2.1	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.3	1.9	2.3
24-Jan	1.9	1.9	1.9	1.8	1.9	Z	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9
25-Jan	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
26-Jan	1.8	Z	2.0	2.2	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	1.9	1.9	1.8	1.9	2.2
27-Jan	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
28-Jan	1.8	1.9	1.8	Z	1.8	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
29-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
30-Jan	2.1	2.0	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
31-Jan	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.1	2.3	2.0	1.9	1.9	2.3
	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.1	2.0	2.2	2.2	2.3	2.1	2.0	2.0	2.0	2.1	2.3	2.3	2.1	2.0	2.1	2.3	2.4	2.4	2.2	2.1	2.3	2.3	2.0	2.3	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance


WBEA
Hourly Averages
Methane (CH_4) - ppm
Anzac - January 2015
Methane (ppm)
0
1
2
3
4
5
6
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	671	95.18	95.18
2.1 - 3.0	34	4.82	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

WBEA

Frequency Distribution

Methane (CH_4) - ppm

Anzac - January 2015

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	10	9	10	16	20	43	42	25	19	21	15	46	187	104	73	671
2.1 - 3.0	2	0	0	0	0	0	2	7	5	4	1	2	4	2	3	2	34
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	33	10	9	10	16	20	45	49	30	23	22	17	50	189	107	75	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

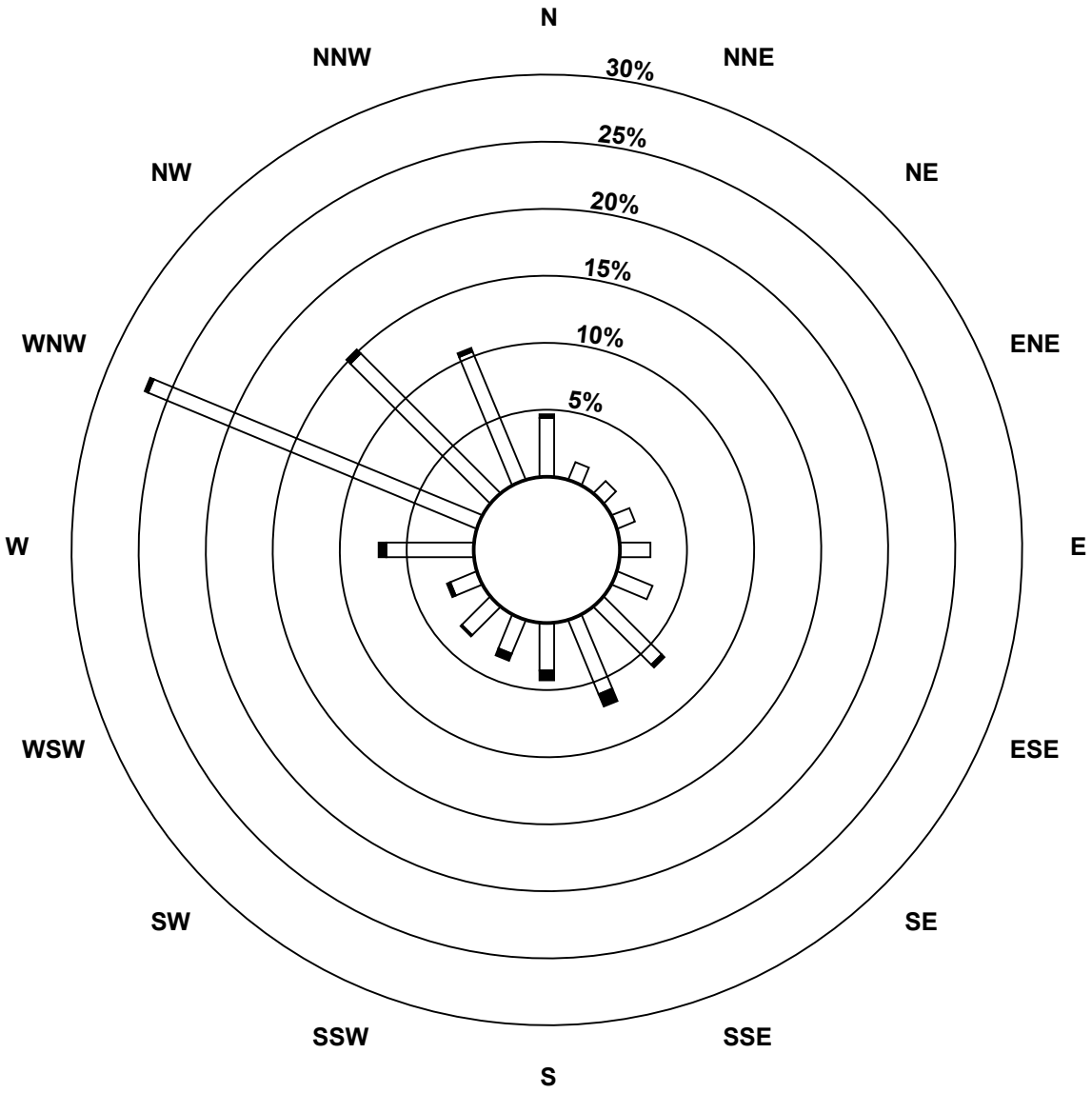
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

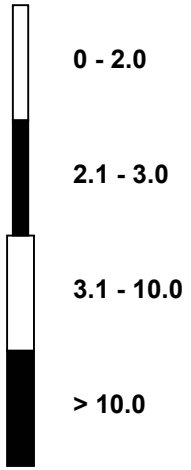
Wind Rose Jan 2015

Methane (CH_4) - ppm

Anzac (AMS 14)



Classes (ppm)



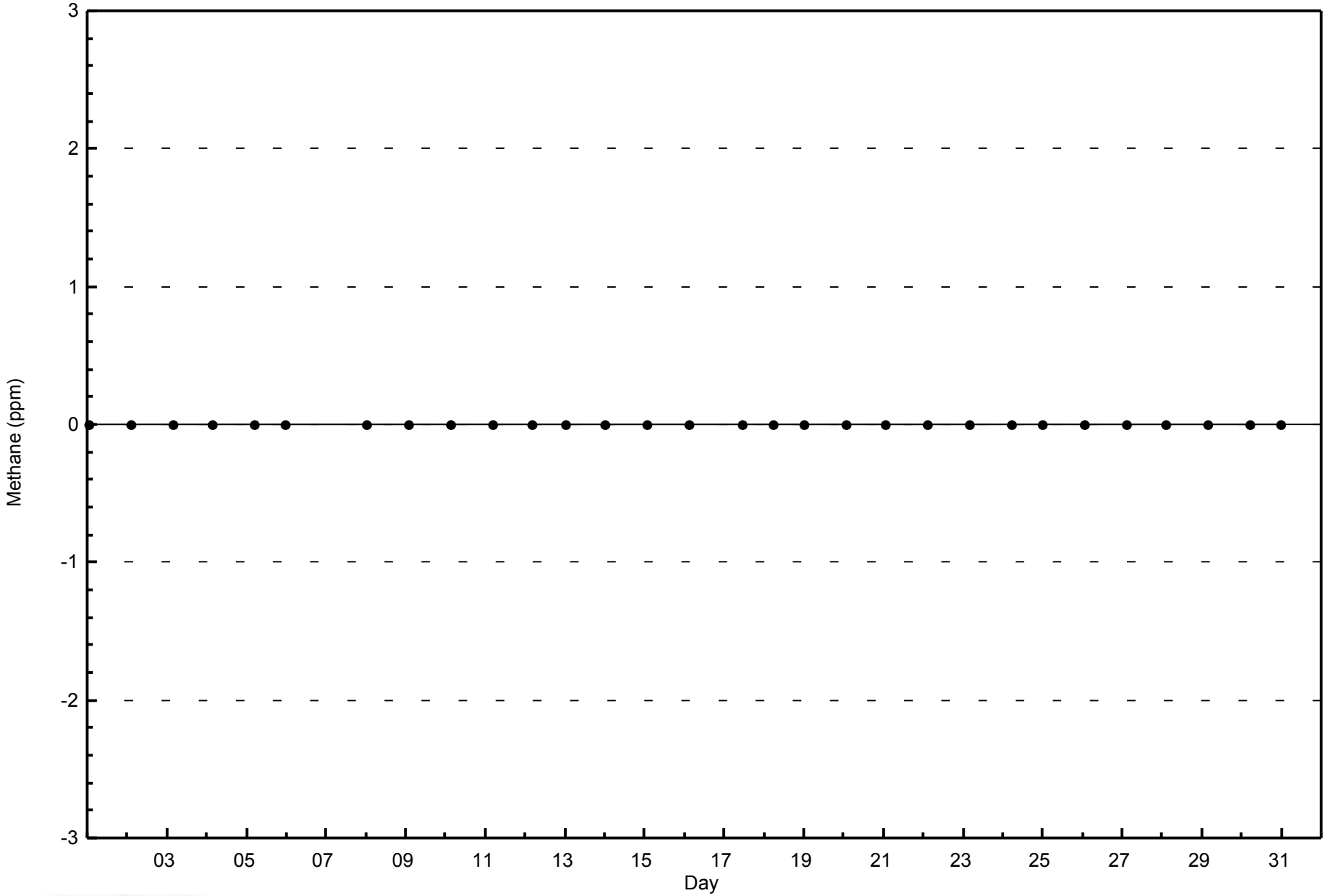
Total Number of Valid Hours: 705

WBEA

Zero Responses

Methane (CH_4) - ppm

Anzac - January 2015



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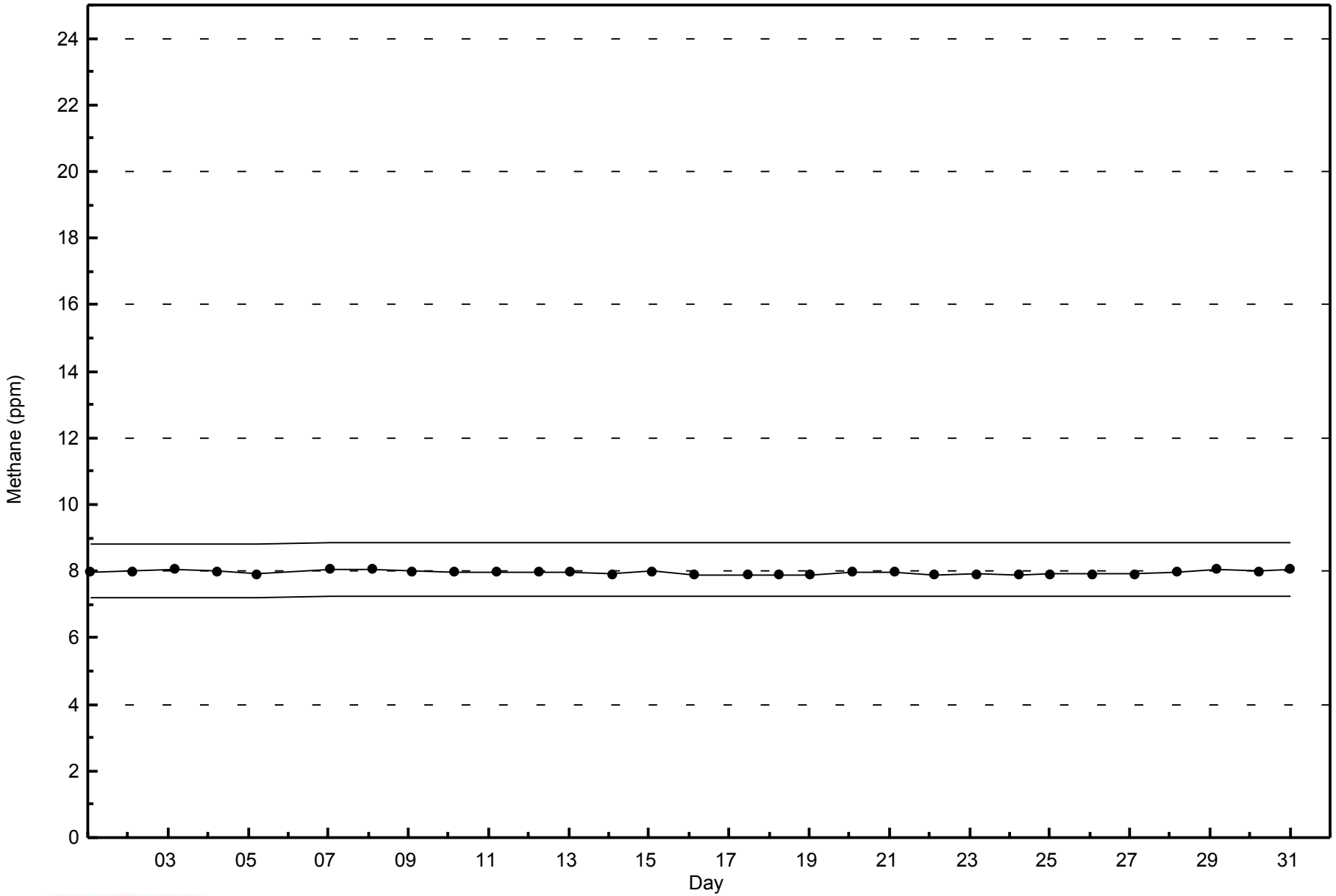
WBEA

Span Responses

Methane (CH_4) - ppm

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Anzac - January 2015

Maximum Value: 84 ppb on Jan 7 06:00

Maximum Daily Average: 8.7 ppb on Jan 19

Minimum Value: 0 ppb on Jan 1 01:00

Minimum Daily Average: 0.1 ppb on Jan 13

Maximum Diurnal Average: 3.8 ppb at hour 6

Minimum Diurnal Average: 0.1 ppb at hour 4

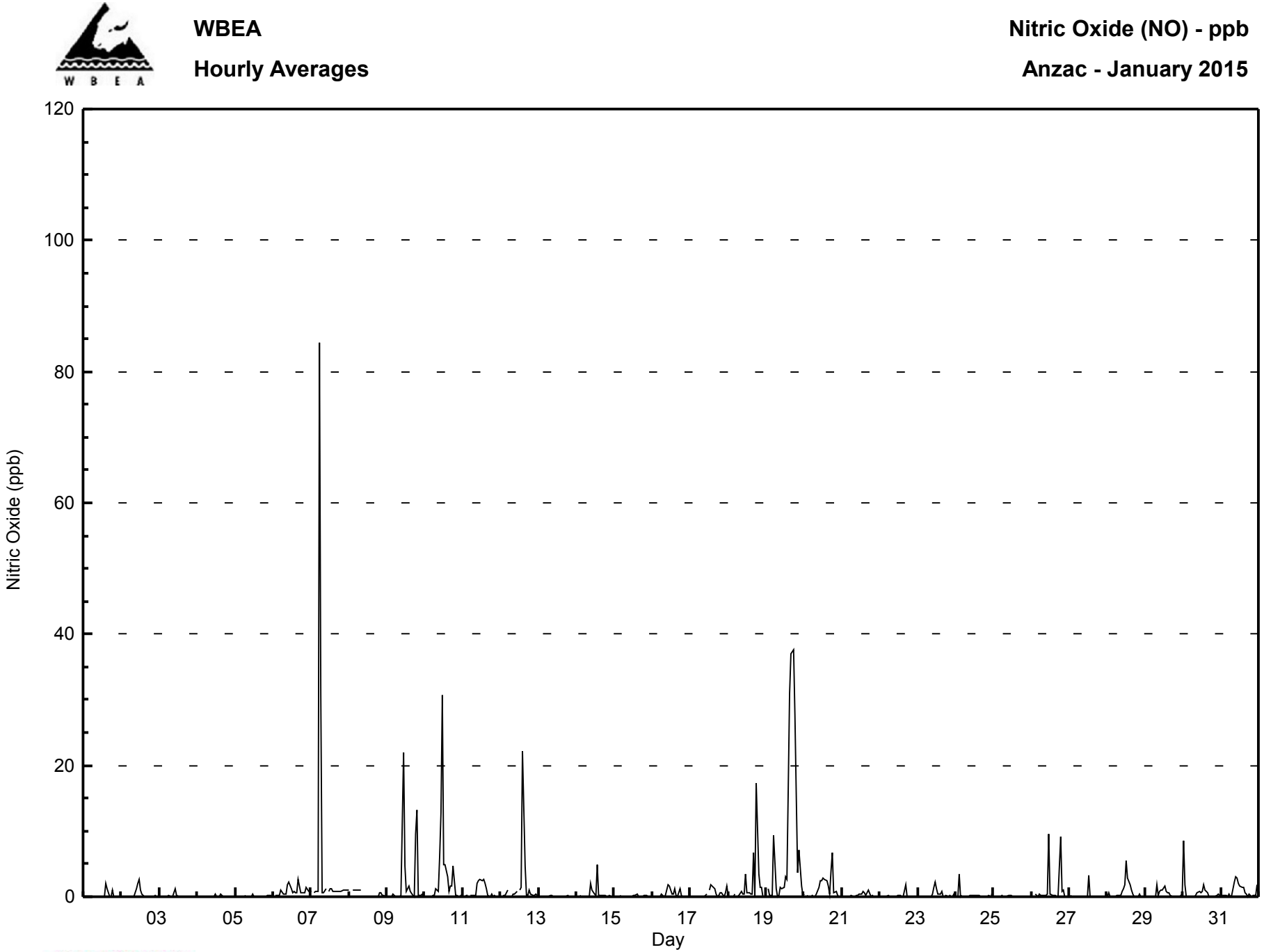
Monthly Average: 1.1 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 26$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	40
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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	0	0.2	2
2-Jan	0	0	Z	0	0	0	0	0	0	1	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0.3	3
3-Jan	0	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
4-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Jan	Z	0	0	0	0	1	0	0	0	2	2	1	1	1	1	1	3	1	1	1	1	1	1	1	0.8	3
7-Jan	1	Z	1	1	1	84	31	1	1	1	M	1	1	1	1	1	1	1	1	1	1	1	1	1	6.0	84
8-Jan	1	Z	1	1	1	1	1	1	C	C	C	C	C	C	C	C	C	0	0	1	1	0	0	0	--	1
9-Jan	0	0	Z	0	0	0	0	0	0	0	22	5	1	1	2	1	0	0	10	13	0	0	0	0	2.4	22
10-Jan	0	0	0	Z	0	0	0	1	1	6	13	31	5	5	3	1	2	2	5	0	0	0	0	0	3.2	31
11-Jan	0	0	0	0	Z	0	0	0	0	2	2	3	2	3	2	1	0	0	0	0	0	0	0	0	0.8	3
12-Jan	0	0	0	0	1	Z	0	0	0	0	1	M	1	1	22	5	0	0	1	0	0	0	0	0	1.6	22
13-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
14-Jan	0	Z	0	0	0	0	0	0	0	2	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0.4	5
15-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Jan	0	0	0	Z	0	0	0	0	0	1	2	2	0	0	1	0	0	1	0	0	0	0	0	0	0.4	2
17-Jan	0	0	0	0	0	0	0	0	0	0	0	Z	1	2	2	1	0	0	0	1	1	0	1	2	0.5	2
18-Jan	0	0	0	0	0	Z	0	0	1	0	0	3	1	1	0	0	7	0	17	3	1	1	0	0	1.7	17
19-Jan	Z	1	0	0	0	9	1	0	0	1	1	1	3	3	16	31	37	38	28	15	4	7	2	0	8.7	38
20-Jan	0	Z	0	0	0	0	0	0	0	1	2	2	3	3	2	2	0	4	7	1	1	0	0	0	1.3	7
21-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0.2	1
22-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.1	2
23-Jan	0	0	0	0	Z	0	0	0	0	0	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0.3	2
24-Jan	0	0	4	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	4
25-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Jan	0	Z	0	0	0	1	0	0	0	0	0	9	0	0	0	0	0	0	9	1	1	0	0	0	1.0	9
27-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0.1	3
28-Jan	0	1	0	Z	0	0	0	0	0	1	1	2	5	3	2	1	0	0	0	0	0	0	0	0	0.8	5
29-Jan	0	0	0	0	Z	0	0	2	0	1	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0.4	2
30-Jan	8	2	0	0	0	Z	0	0	0	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0.8	8
31-Jan	Z	0	0	0	0	0	0	0	2	3	3	2	2	1	1	1	0	0	1	0	0	0	0	2	0.9	3
	0.4	0.2	0.3	0.1	0.2	3.8	1.2	0.2	0.3	0.9	2.1	2.5	1.2	1.2	2.1	1.7	1.8	1.5	2.6	1.2	0.4	0.4	0.2	0.3	Diurnal Average	
	8	2	4	1	1	84	31	2	2	6	22	31	5	5	22	31	37	38	28	15	4	7	2	2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance


WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Anzac - January 2015
120
100
80
60
40
20
0
Nitric Oxide (ppb)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	98.72	98.72
21 - 40	8	1.14	99.86
11 - 80	0	0.00	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Anzac - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	32	10	9	10	16	20	42	48	30	23	22	17	50	186	104	74	693
21 - 40	1	0	0	0	0	0	1	1	0	0	0	0	0	2	1	2	8
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	10	9	10	16	20	44	49	30	23	22	17	50	188	105	76	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

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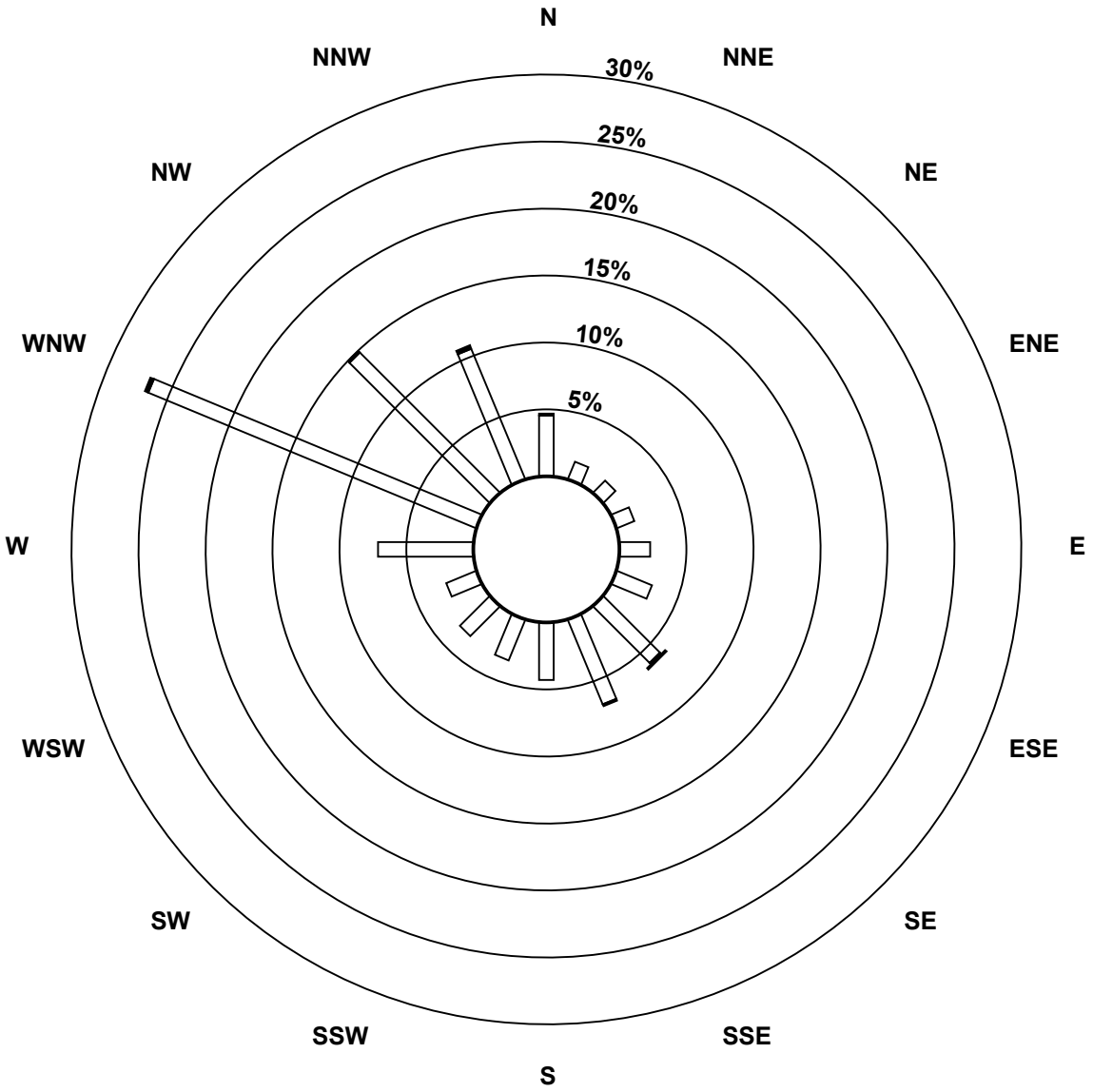
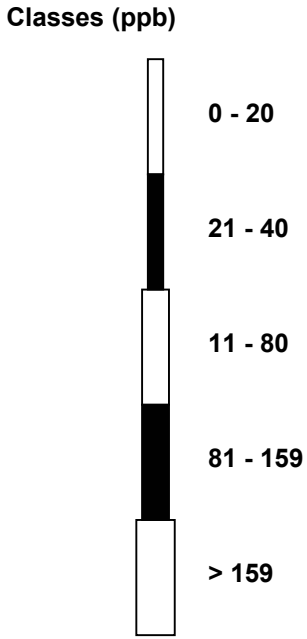
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Anzac (AMS 14)





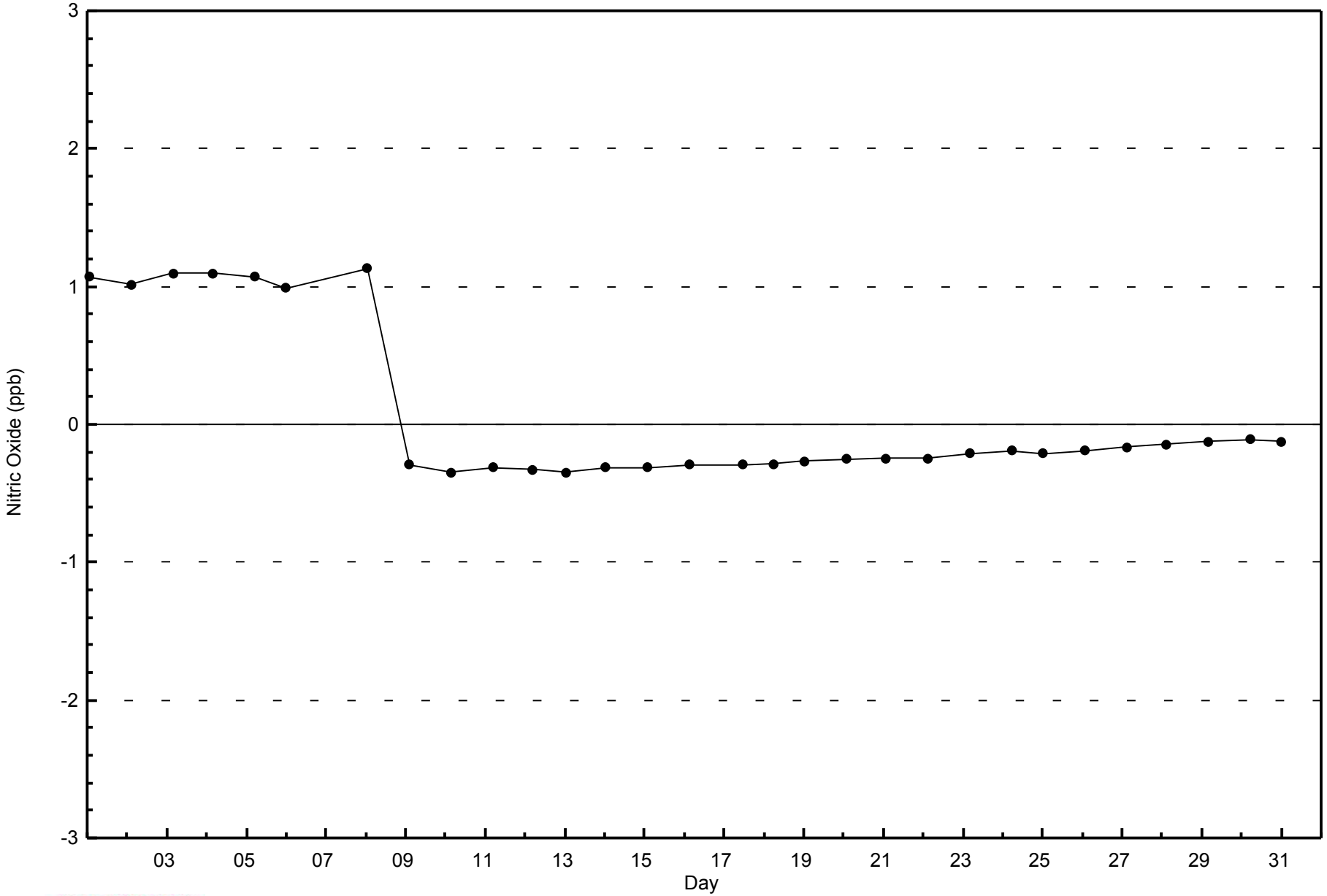
Total Number of Valid Hours: 702

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Anzac - January 2015



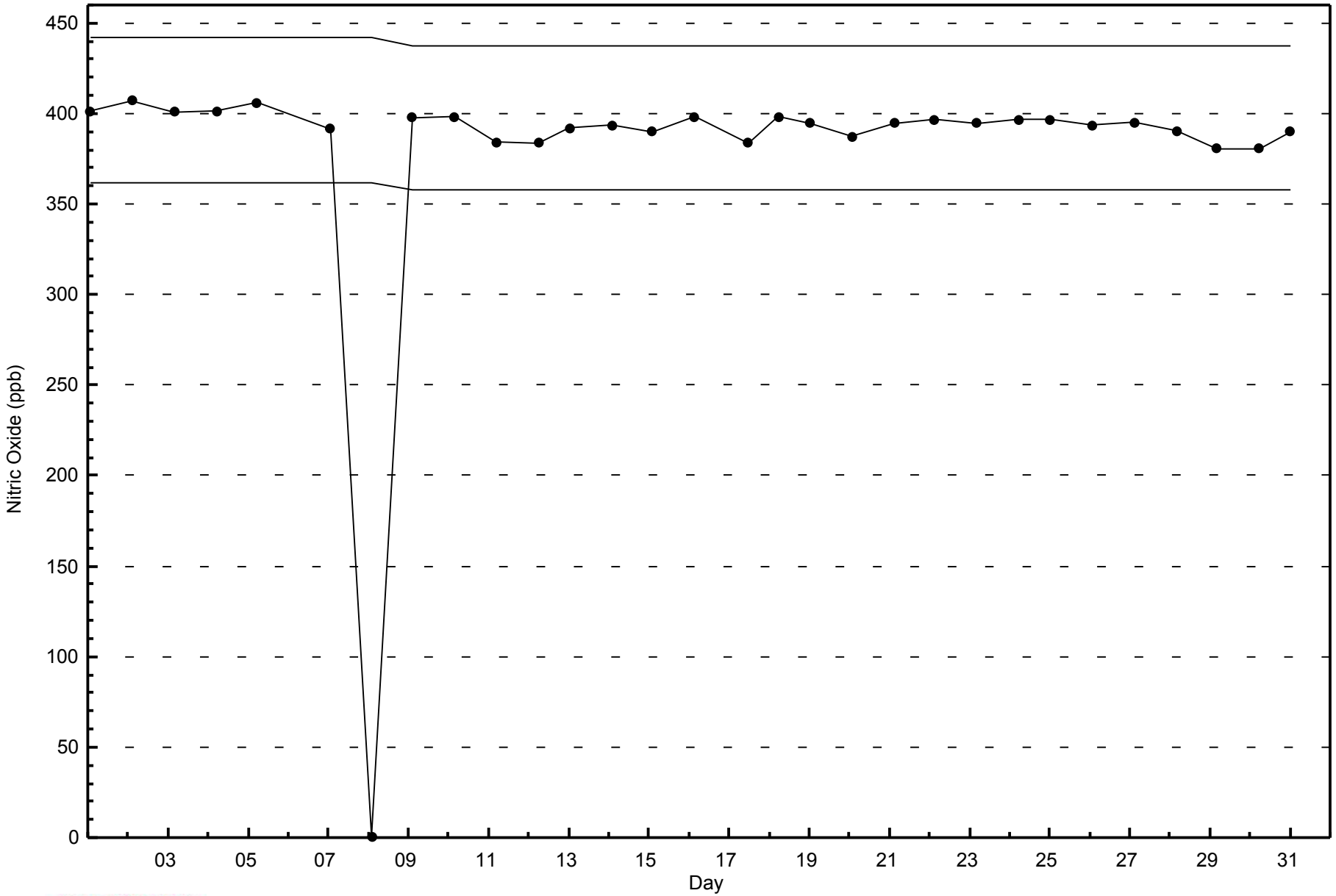
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 28 ppb on Jan 19 17:00 Maximum Daily Average: 13.7 ppb on Jan 19

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.3 ppb on Jan 27
Maximum Diurnal Average: 6.1 ppb at hour 19 Minimum Diurnal Average: 3.2 ppb at hour 13
Monthly Average: 4.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 3 $Q_3 = 7$ $P_{90} = 11$ $P_{99} = 25$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	40
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-Jan	0	Z	0	1	0	0	0	1	1	1	1	1	0	0	11	16	4	0	6	5	4	4	5	5	2.8	16
2-Jan	3	3	Z	1	0	1	0	2	6	10	11	9	5	4	4	5	4	3	2	3	2	2	2	2	3.6	11
3-Jan	3	1	6	Z	16	10	9	10	11	8	5	2	1	1	1	2	2	1	1	1	0	1	1	1	4.1	16
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	2	1	1	2	2	2	2	2	1	1	1	2	1	1.2	2
5-Jan	1	1	1	1	1	Z	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	7	1.5	7
6-Jan	Z	7	5	6	6	10	11	11	9	11	8	4	2	2	2	2	7	3	3	4	3	6	9	7	6.0	11
7-Jan	4	Z	6	4	5	11	15	5	7	9	M	4	6	7	7	6	5	4	3	15	11	3	4	5	6.5	15
8-Jan	1	Z	5	3	0	0	1	1	C	C	C	C	C	C	C	C	C	2	1	3	3	2	1	1	--	5
9-Jan	1	2	Z	3	4	2	2	2	2	3	8	5	3	7	11	9	5	4	11	15	13	17	17	12	6.8	17
10-Jan	10	8	8	Z	11	9	10	14	13	18	18	22	10	11	10	6	11	12	10	5	4	3	3	3	10.0	22
11-Jan	3	3	4	3	Z	3	4	4	4	9	7	6	6	7	8	9	7	7	10	7	7	5	3	2	5.5	10
12-Jan	6	5	6	8	9	Z	6	6	8	6	6	M	5	5	16	10	8	8	9	7	7	7	5	4	7.1	16
13-Jan	Z	4	3	3	2	2	8	18	16	2	1	0	1	1	1	2	2	2	2	1	1	1	2	2	3.3	18
14-Jan	2	Z	2	2	1	2	2	1	1	11	9	3	1	4	2	5	12	16	14	8	3	3	2	1	4.6	16
15-Jan	4	3	Z	2	1	0	0	0	0	1	1	1	1	2	4	2	3	1	1	1	0	1	1	1	1.3	4
16-Jan	1	2	2	Z	2	3	5	4	4	4	5	3	3	3	4	2	2	2	2	1	1	2	1	1	2.6	5
17-Jan	1	1	1	1	1	1	1	1	2	2	1	Z	3	6	7	11	13	11	11	11	10	7	6	6	4.8	13
18-Jan	6	5	5	4	5	Z	3	3	3	2	2	6	2	2	3	3	12	4	19	14	10	9	3	3	5.4	19
19-Jan	Z	8	3	2	2	7	7	5	3	4	4	5	7	8	18	27	28	27	27	27	24	26	26	21	13.7	28
20-Jan	23	Z	19	14	10	11	9	8	11	11	9	7	6	5	6	8	7	8	14	12	10	9	6	6	9.9	23
21-Jan	5	3	Z	3	3	1	2	2	3	3	2	3	4	6	5	4	5	4	2	2	2	1	1	1	2.8	6
22-Jan	1	1	1	Z	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1.0	2
23-Jan	1	1	1	2	Z	6	6	4	3	3	7	5	3	1	2	4	2	2	2	2	2	2	1	2	2.8	7
24-Jan	1	2	9	2	3	Z	1	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1.7	9
25-Jan	Z	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0.8	2
26-Jan	1	Z	2	2	3	3	2	1	2	2	2	6	2	1	1	2	2	2	13	7	13	6	4	1	3.6	13
27-Jan	0	2	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
28-Jan	0	1	0	Z	0	10	17	14	8	5	4	4	8	6	7	8	7	10	11	11	12	7	7	7	7.1	17
29-Jan	8	7	8	11	Z	8	8	8	9	5	4	4	6	4	3	5	3	3	3	2	2	1	3	15	5.5	15
30-Jan	26	21	11	11	8	Z	10	9	6	5	3	2	2	4	3	3	1	2	1	1	2	3	9	8	6.5	26
31-Jan	Z	6	7	9	9	12	12	14	15	10	7	4	3	3	4	3	4	6	7	5	6	6	4	10	7.2	15
	4.3	3.9	4.5	3.7	4.0	4.4	5.0	4.9	5.1	5.0	4.4	4.0	3.2	3.4	4.8	5.2	5.3	4.8	6.1	5.7	5.1	4.5	4.2	4.4	Diurnal Average	
	26	21	19	14	16	12	17	18	16	18	18	22	10	11	18	27	28	27	27	27	24	26	26	21	Diurnal Maximum	

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

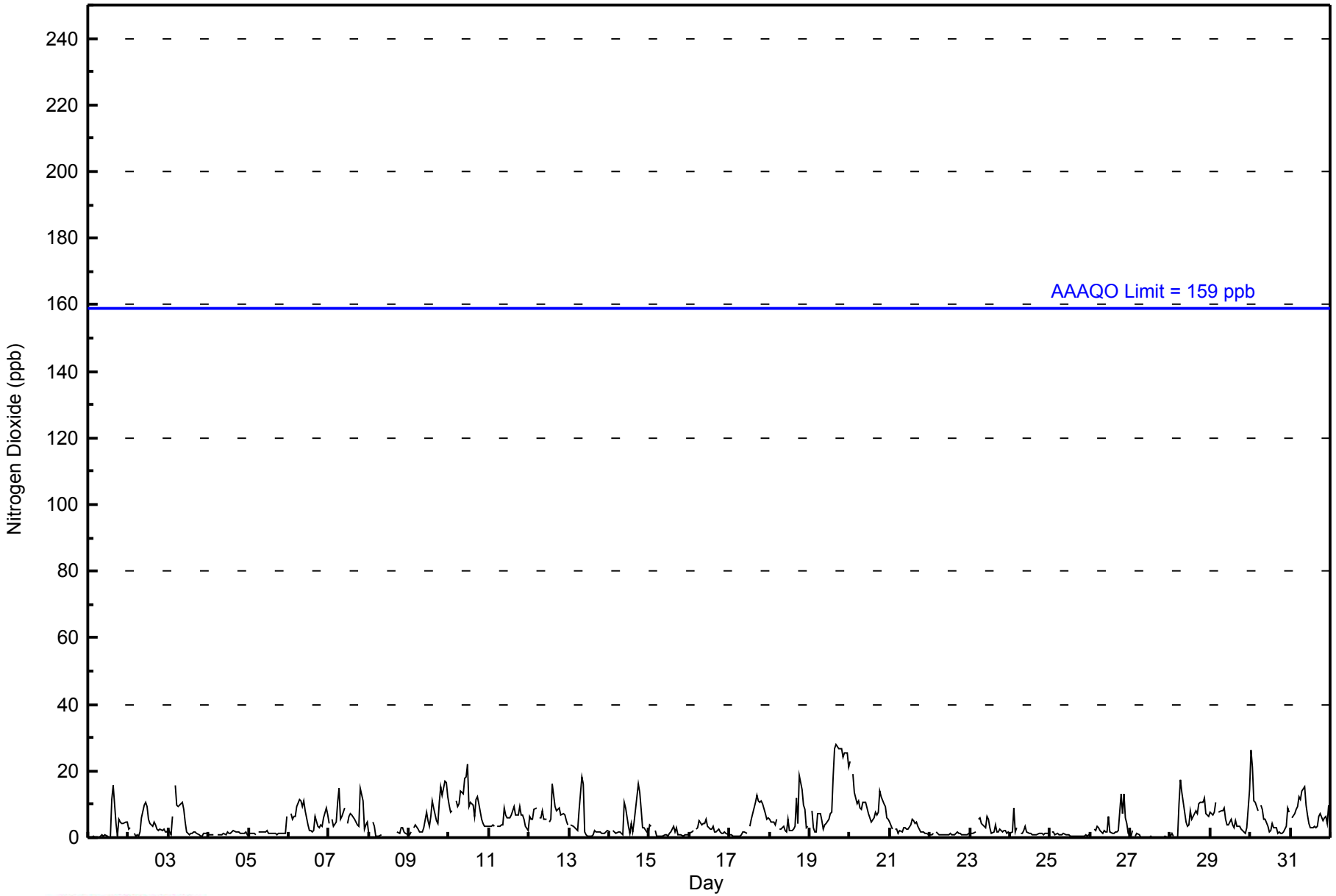
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	689	98.15	98.15
21 - 40	13	1.85	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: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	32	10	9	10	16	20	44	48	30	23	22	17	50	187	98	73	689
21 - 40	1	0	0	0	0	0	0	1	0	0	0	0	0	1	7	3	13
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	10	9	10	16	20	44	49	30	23	22	17	50	188	105	76	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

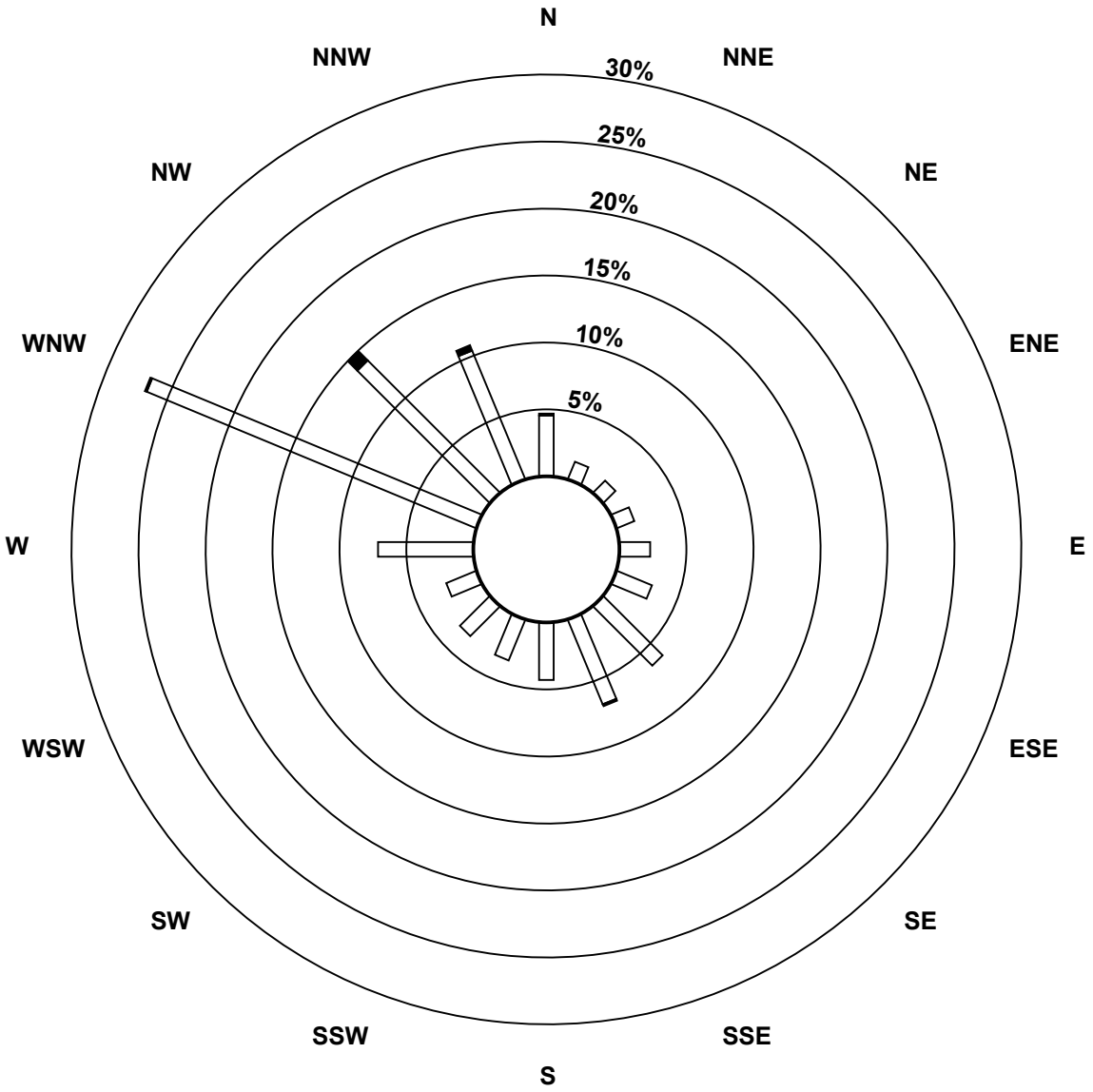
AURORA ATMOSPHERICS INC.

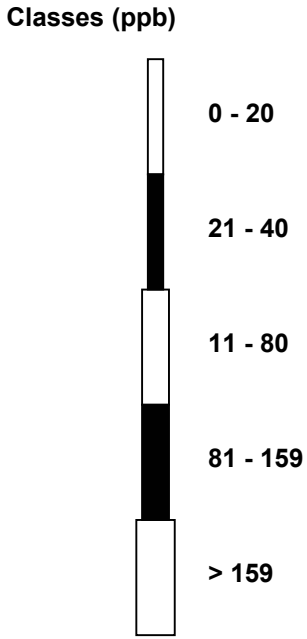
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Anzac (AMS 14)





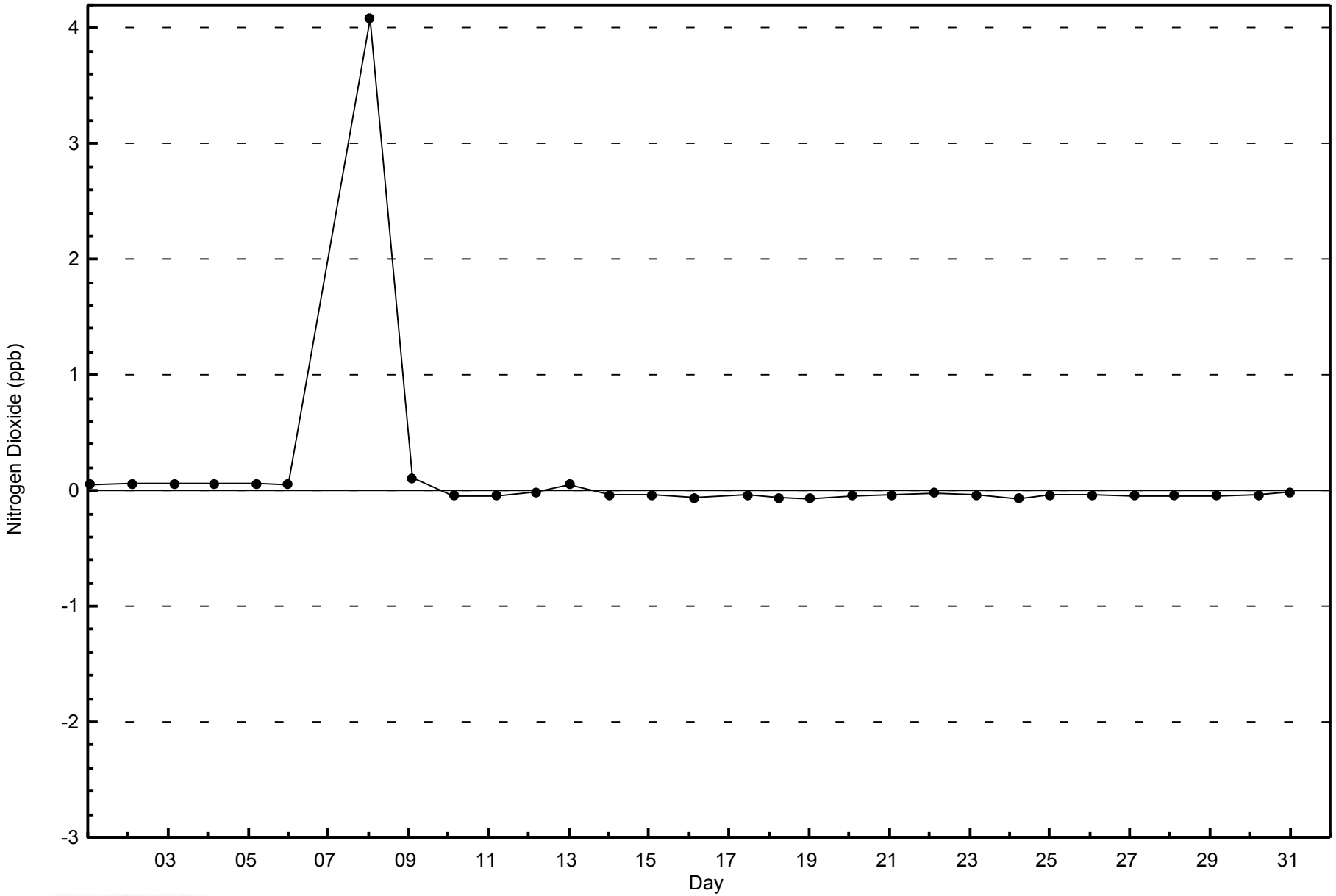
Total Number of Valid Hours: 702

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2015



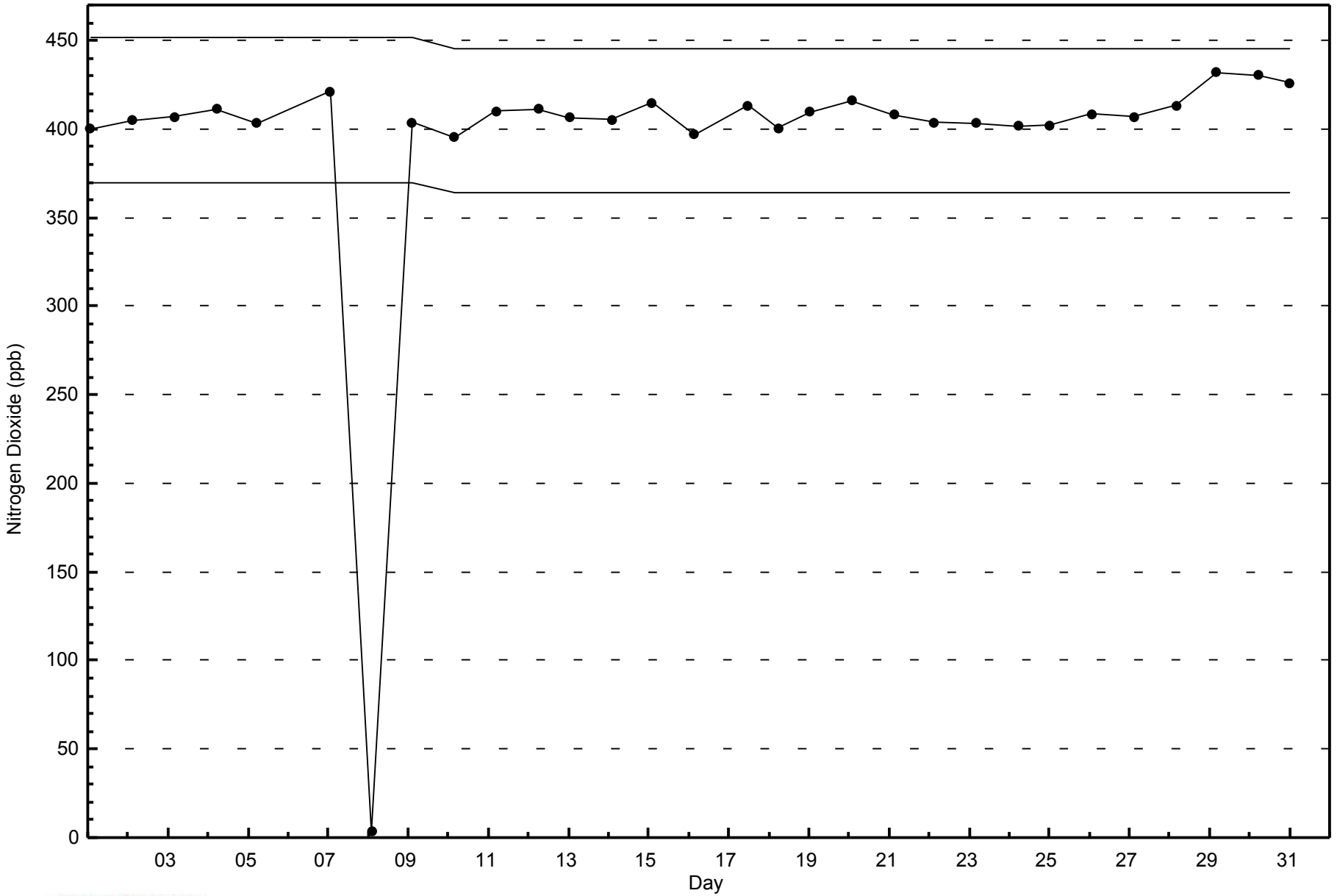
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2015

Maximum Value: 95 ppb on Jan 7 06:00

Maximum Daily Average: 22.4 ppb on Jan 19

Minimum Value: 0 ppb on Jan 1 01:00

Minimum Daily Average: 0.5 ppb on Jan 27

Maximum Diurnal Average: 8.7 ppb at hour 19

Minimum Diurnal Average: 3.9 ppb at hour 4

Monthly Average: 5.7 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 3 $Q_3 = 7$ $P_{90} = 12$ $P_{99} = 42$

Hours in Service:	744
Hours of Data:	702
Hours of Missing Data:	42
Hours of Calibration:	40
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-Jan	0	Z	0	1	0	0	0	1	1	1	1	0	0	0	14	17	4	0	7	5	4	4	5	5	3.0	17
2-Jan	3	3	Z	1	0	1	0	1	6	11	13	12	6	4	4	5	4	3	2	3	2	3	2	2	3.9	13
3-Jan	3	1	6	Z	16	10	10	10	11	9	6	2	1	1	1	2	2	1	1	0	0	1	1	1	4.2	16
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	2	1	1	2	3	2	2	1	1	1	1	2	1	1.3	3
5-Jan	1	1	1	1	1	Z	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	7	1.6	7
6-Jan	Z	7	6	6	7	10	12	11	10	13	10	5	3	3	2	3	9	4	4	4	4	7	10	8	6.9	13
7-Jan	5	Z	6	4	5	95	45	6	7	10	M	5	7	8	8	7	5	5	4	16	12	4	5	6	12.5	95
8-Jan	2	Z	6	4	1	1	2	2	C	C	C	C	C	C	C	C	C	2	1	4	4	2	2	1	--	6
9-Jan	1	2	Z	3	4	2	2	2	2	3	30	10	4	8	13	10	5	4	20	29	13	17	17	12	9.2	30
10-Jan	10	8	8	Z	11	9	10	15	14	24	31	53	14	15	13	7	13	14	15	5	4	3	3	4	13.2	53
11-Jan	3	3	4	3	Z	3	4	4	4	11	9	8	8	10	10	10	7	7	10	7	7	5	3	2	6.3	11
12-Jan	6	5	6	9	10	Z	6	6	8	6	6	M	6	7	38	14	8	9	10	7	7	7	5	4	8.8	38
13-Jan	Z	4	3	3	2	2	8	18	16	2	1	0	1	1	1	2	2	2	2	1	1	1	2	2	3.4	18
14-Jan	2	Z	2	2	1	2	2	1	1	12	10	4	2	9	2	5	13	16	14	8	3	3	2	1	5.0	16
15-Jan	4	3	Z	2	0	0	0	0	0	1	1	1	1	2	4	2	3	1	1	1	1	1	1	1	1.4	4
16-Jan	1	2	2	Z	2	3	6	4	5	5	7	5	3	3	5	2	2	4	2	1	1	1	1	1	3.0	7
17-Jan	1	1	1	1	1	1	1	1	2	2	2	Z	4	7	8	12	13	11	11	12	11	7	6	7	5.2	13
18-Jan	6	5	5	4	6	Z	3	3	4	3	2	9	2	3	3	4	18	4	36	18	11	10	3	3	7.1	36
19-Jan	Z	9	3	2	2	17	9	5	3	5	6	7	10	10	35	58	65	64	54	42	28	33	27	21	22.4	65
20-Jan	23	Z	19	14	10	11	9	9	11	12	11	9	9	7	9	9	7	11	21	13	11	10	6	6	11.2	23
21-Jan	5	3	Z	3	3	1	2	2	3	3	3	3	4	6	5	4	5	5	2	2	2	1	1	1	3.0	6
22-Jan	1	1	1	Z	2	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1.1	4
23-Jan	1	1	1	2	Z	6	6	4	4	4	8	8	4	2	2	4	2	2	2	2	2	2	1	2	3.1	8
24-Jan	1	2	13	2	3	Z	1	1	2	3	2	1	1	1	1	1	1	1	1	2	1	1	1	2	2.0	13
25-Jan	Z	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	1	0.9	2
26-Jan	1	Z	3	2	3	4	2	1	2	2	2	16	2	2	2	2	2	2	23	8	14	6	4	1	4.6	23
27-Jan	0	2	Z	0	1	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0.5	4
28-Jan	0	2	0	Z	0	10	18	14	8	5	5	6	14	8	9	9	8	10	11	10	12	7	7	7	7.9	18
29-Jan	8	7	8	11	Z	8	8	10	9	6	5	5	7	5	4	6	3	3	3	2	1	1	3	15	5.9	15
30-Jan	35	23	11	11	8	Z	10	9	6	6	4	2	3	6	4	4	1	2	1	1	2	3	9	8	7.3	35
31-Jan	Z	6	7	9	9	13	12	14	18	13	10	6	5	4	5	4	4	6	8	5	6	7	4	12	8.1	18
	4.7	4.1	4.8	3.9	4.1	8.2	6.2	5.1	5.4	5.9	6.5	6.6	4.4	4.6	6.8	6.9	7.1	6.4	8.7	6.9	5.5	5.0	4.4	4.7	Diurnal Average	
	35	23	19	14	16	95	45	18	18	24	31	53	14	15	38	58	65	64	54	42	28	33	27	21	Diurnal Maximum	

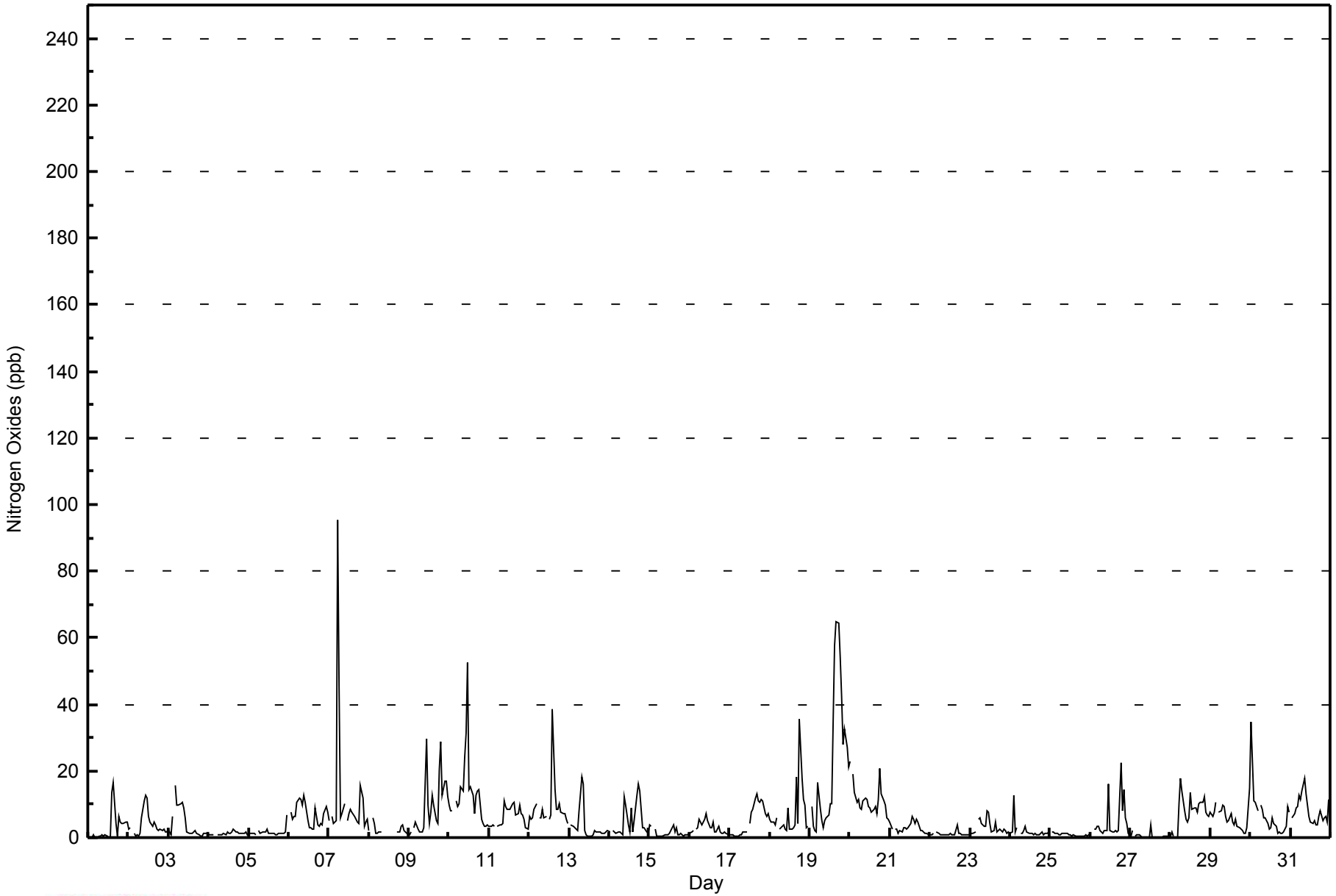
Z - zerospan C - Calibration M - Maintenance

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	96.58	96.58
21 - 40	16	2.28	98.86
11 - 80	7	1.00	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	31	10	9	10	16	20	42	47	29	23	21	17	49	184	97	73	678
21 - 40	1	0	0	0	0	0	0	1	1	0	1	0	1	4	6	1	16
11 - 80	1	0	0	0	0	0	1	1	0	0	0	0	0	0	2	2	7
81 - 159	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	10	9	10	16	20	44	49	30	23	22	17	50	188	105	76	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

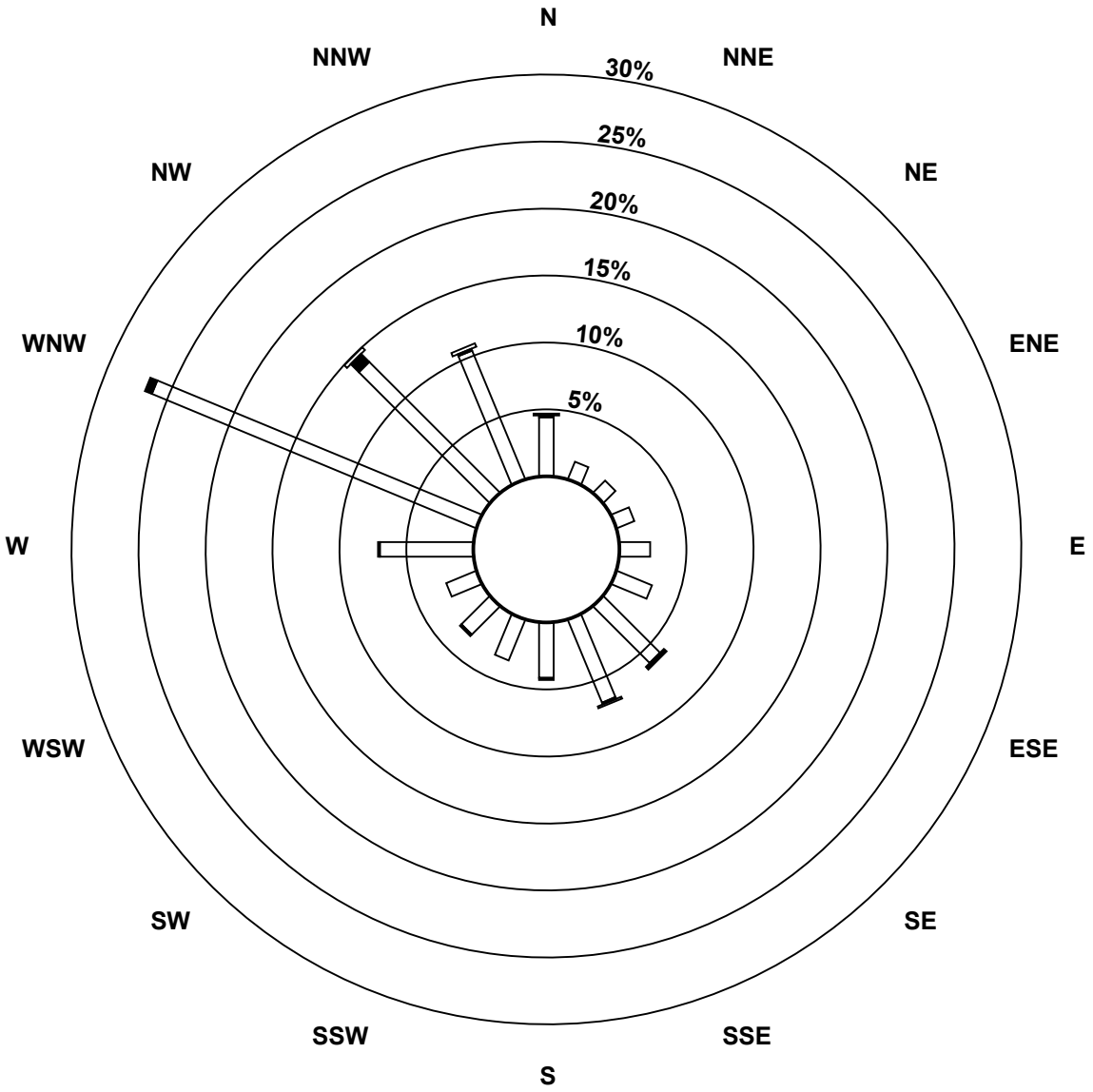
AURORA ATMOSPHERICS INC.

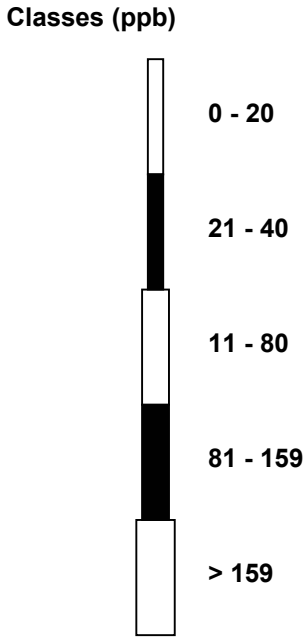
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Anzac (AMS 14)

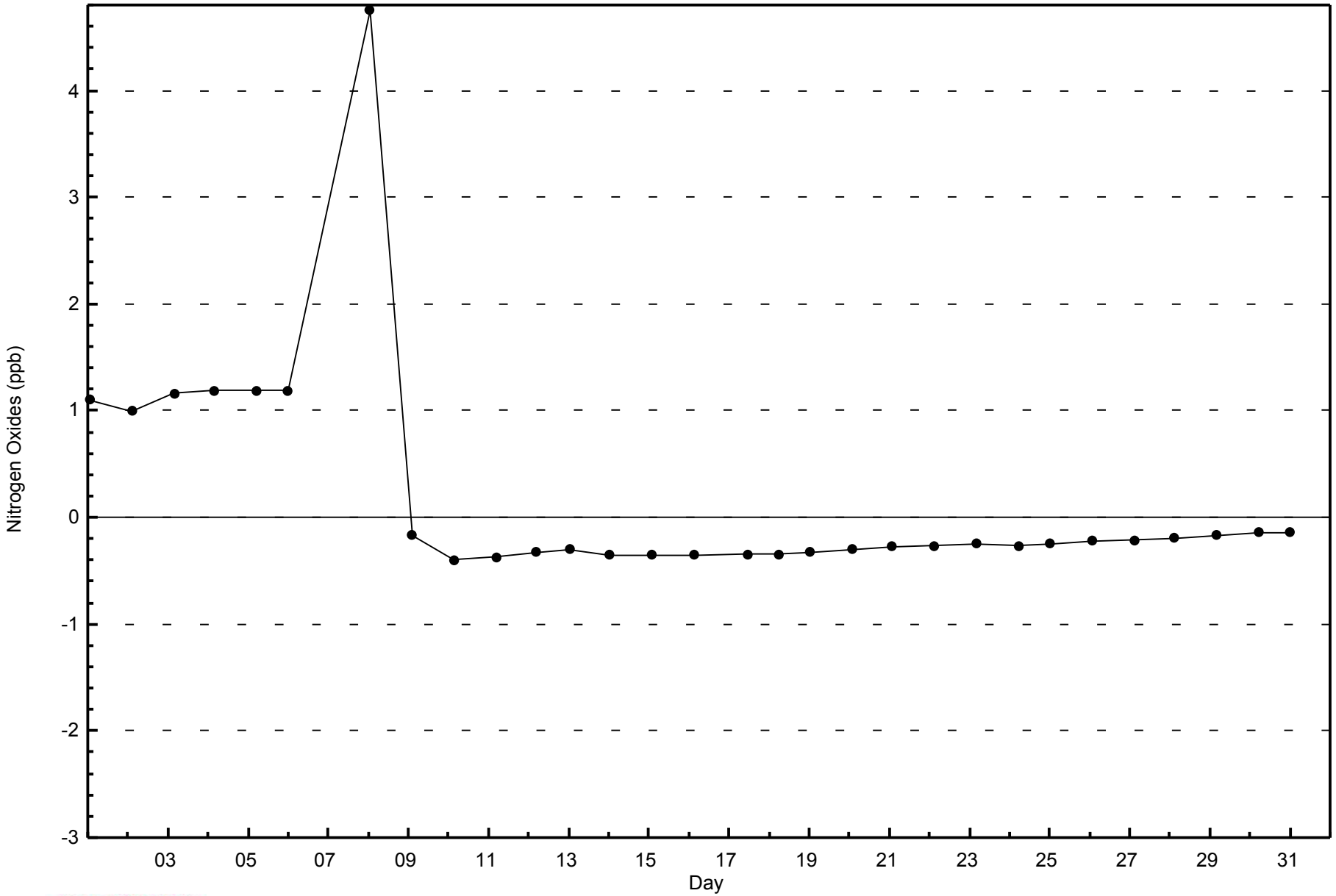




Total Number of Valid Hours: 702

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Anzac - January 2015



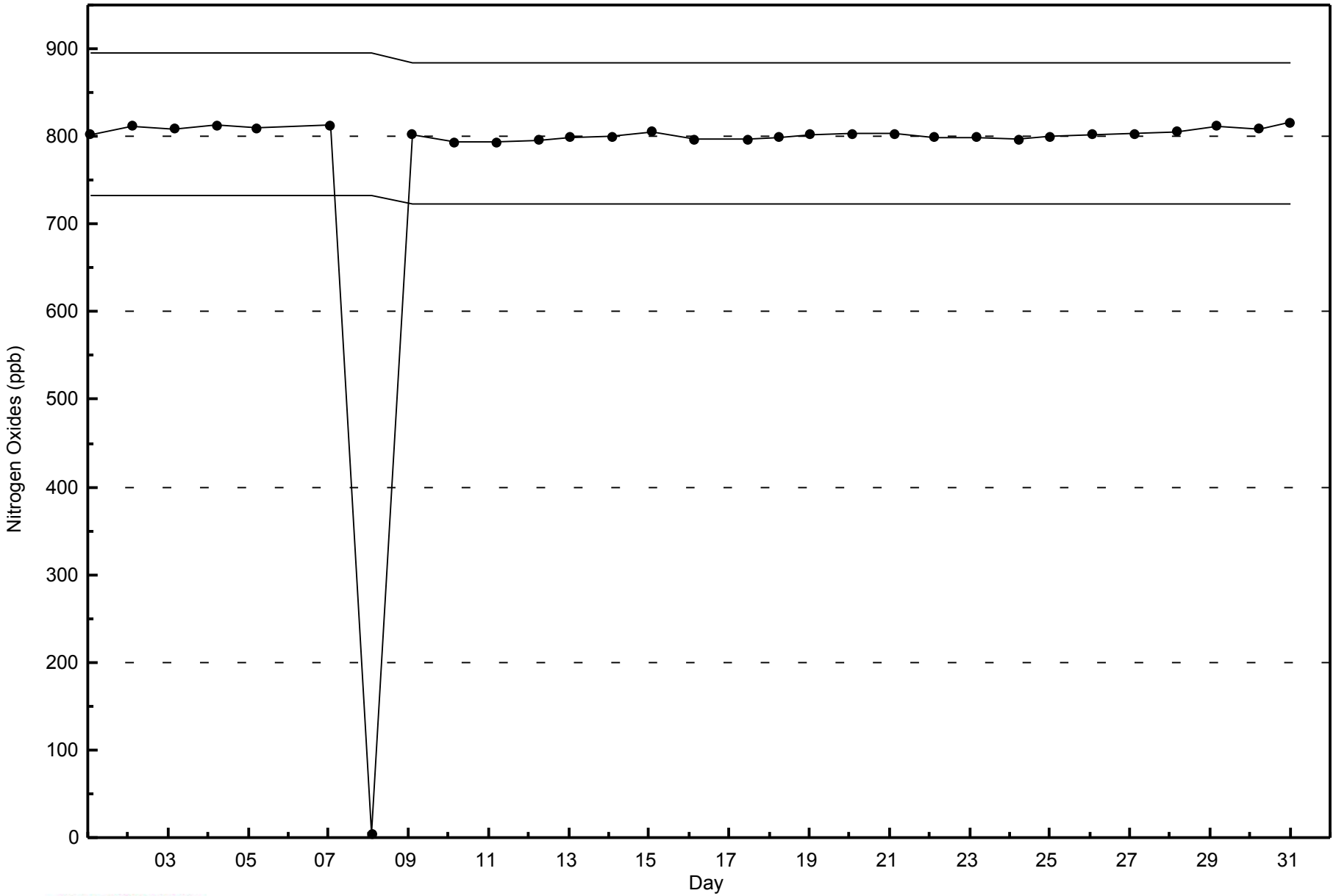
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Anzac - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 44 ppb on Jan 13 13:00 Maximum Daily Average: 38.3 ppb on Jan 22

Minimum Value: 2 ppb on Jan 30 01:00 Minimum Daily Average: 11.5 ppb on Jan 19
Maximum Diurnal Average: 32.5 ppb at hour 14 Minimum Diurnal Average: 25.1 ppb at hour 9
Monthly Average: 28.0 ppb Percentiles: $P_1 = 2$ $P_{10} = 15$ $Q_1 = 21$ Median = 29 $Q_3 = 35$ $P_{90} = 39$ $P_{99} = 43$

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-Jan	35	32	32	Z	34	34	33	31	31	33	33	33	33	33	21	19	31	35	30	31	30	28	27	26	30.6	35
2-Jan	28	28	33	34	Z	34	34	32	26	22	23	25	28	30	31	28	28	27	23	25	22	22	20	20	27.0	34
3-Jan	25	30	25	15	15	Z	19	16	14	15	23	28	29	29	29	29	28	28	28	29	29	28	28	28	24.7	30
4-Jan	29	29	29	30	30	31	Z	31	32	32	33	33	34	35	34	35	36	36	36	36	36	35	35	36	33.2	36
5-Jan	36	36	36	36	36	35	34	Z	33	33	33	33	33	33	33	33	33	32	32	32	31	31	30	26	33.0	36
6-Jan	24	24	Z	24	23	20	14	13	13	13	16	27	30	31	31	31	28	29	30	29	30	28	24	20	24.0	31
7-Jan	21	19	19	Z	21	21	17	22	21	22	24	29	29	28	28	27	27	28	27	16	22	31	31	31	24.4	31
8-Jan	37	33	31	Z	37	37	37	36	36	36	36	M	35	34	36	36	35	35	35	34	35	35	36	36	35.3	37
9-Jan	36	36	36	33	Z	27	26	25	27	C	C	C	C	C	C	37	37	33	31	26	23	20	20	24	--	37
10-Jan	28	29	29	22	20	Z	16	14	12	11	16	21	28	27	29	30	24	20	31	33	34	35	35	34	25.2	35
11-Jan	33	33	33	33	33	33	Z	31	27	21	23	26	31	31	28	25	28	26	21	22	24	26	35	35	28.6	35
12-Jan	36	36	35	30	27	20	22	Z	21	22	25	M	M	25	21	22	21	15	18	19	17	15	25	30	23.9	36
13-Jan	30	28	Z	27	27	28	20	9	13	37	42	44	44	44	43	41	40	40	40	38	36	34	31	29	33.4	44
14-Jan	27	22	26	Z	31	31	30	29	30	17	19	26	30	29	30	25	18	16	18	23	30	33	36	36	26.6	36
15-Jan	32	34	38	37	Z	39	39	39	39	38	38	39	38	39	38	40	38	40	38	37	38	38	38	38	37.9	40
16-Jan	37	36	34	34	33	Z	30	29	28	29	31	33	32	31	31	33	34	35	35	35	38	39	41	42	33.9	42
17-Jan	42	42	43	43	43	42	42	41	40	40	40	39	35	Z	28	22	16	12	8	8	8	9	13	12	29.1	43
18-Jan	11	15	14	14	14	15	15	Z	18	21	22	22	40	42	40	38	23	21	8	12	13	27	33	25	21.9	42
19-Jan	19	21	Z	15	13	11	21	17	13	11	21	22	20	20	11	4	2	2	2	2	2	2	3	7	11.5	22
20-Jan	7	6	10	Z	18	17	18	18	15	16	18	20	23	25	26	23	18	14	11	9	12	13	15	20	16.2	26
21-Jan	22	24	24	20	Z	28	35	36	36	37	39	42	42	39	40	40	39	41	42	41	41	41	41	41	36.2	42
22-Jan	41	40	40	40	39	Z	41	40	39	39	38	36	34	35	35	36	37	38	39	38	39	39	39	39	38.3	41
23-Jan	38	36	28	16	9	8	Z	14	14	12	12	14	34	38	38	33	24	21	22	24	21	16	13	11	21.5	38
24-Jan	14	26	14	18	23	26	26	Z	19	18	26	29	32	32	34	34	34	36	39	38	40	40	40	25	28.8	40
25-Jan	27	30	Z	40	41	43	42	41	37	36	34	34	35	37	38	38	39	39	40	40	39	39	39	39	37.7	43
26-Jan	41	38	26	Z	26	32	37	41	40	40	41	39	41	41	40	39	28	20	10	15	9	16	19	26	30.6	41
27-Jan	30	29	31	32	Z	31	32	32	32	32	32	33	33	34	33	33	34	34	34	34	34	34	34	34	32.6	34
28-Jan	33	32	33	32	32	Z	11	15	21	24	26	26	25	28	27	25	24	20	16	13	12	22	23	23	23.7	33
29-Jan	21	22	20	16	17	19	Z	18	16	20	22	22	21	23	24	23	24	24	24	24	23	23	22	11	20.8	24
30-Jan	2	6	16	16	19	18	19	Z	24	27	30	35	35	33	35	36	40	38	37	35	34	28	19	20	26.2	40
31-Jan	24	20	Z	17	15	13	12	10	13	21	26	29	34	36	35	34	29	26	23	21	18	21	24	18	22.5	36
	27.9	28.2	28.2	27.0	26.0	26.6	26.8	26.2	25.1	25.8	28.0	29.9	32.3	32.5	31.6	30.7	29.0	27.8	26.8	26.4	26.4	27.3	28.0	27.1	Diurnal Average	
	42	42	43	43	43	43	42	41	40	40	42	44	44	44	43	41	40	41	42	41	41	41	41	42	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

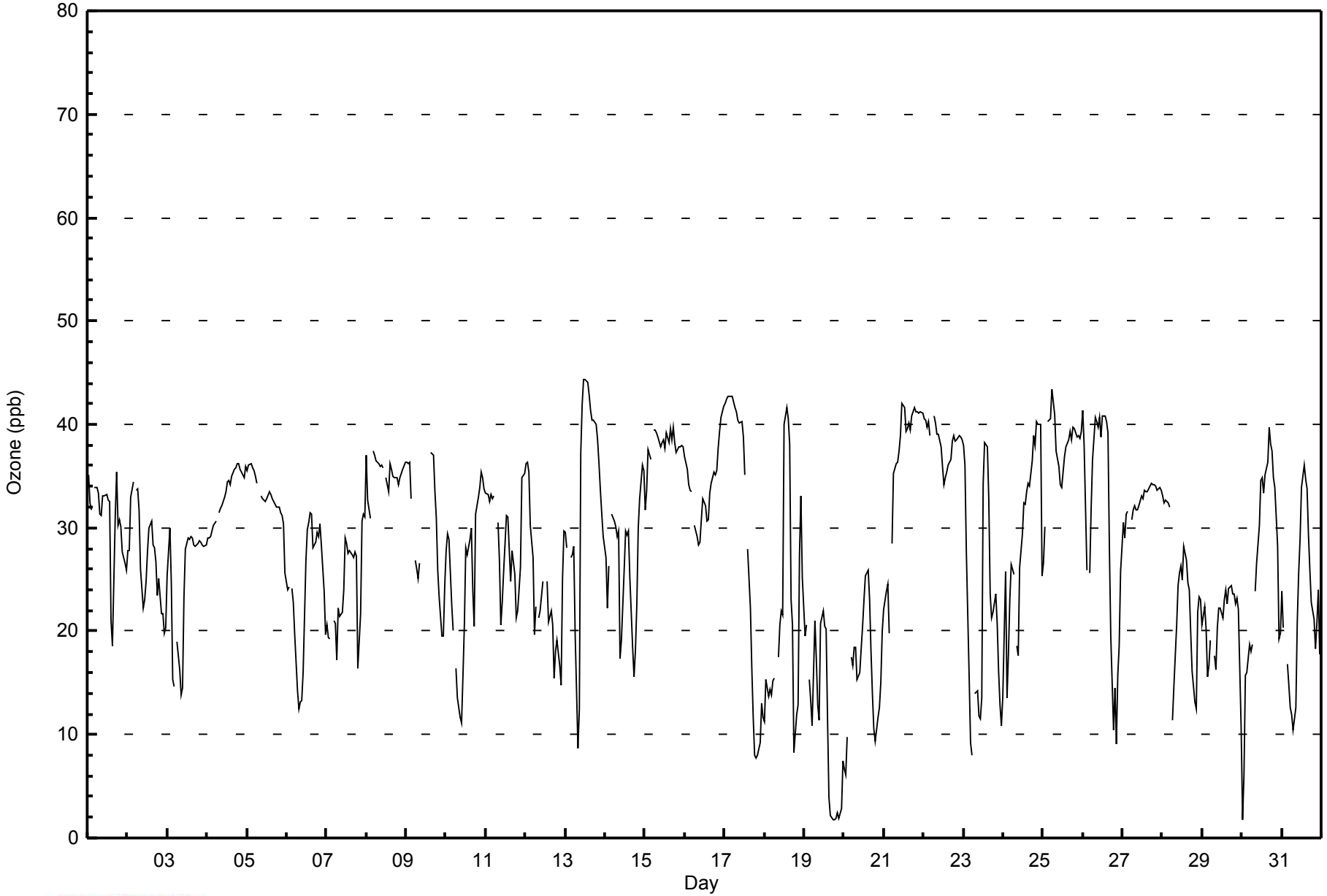
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ozone (O_3) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	155	22.02	22.02
21 - 50	549	77.98	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Anzac - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	8	3	1	2	5	0	10	25	9	5	4	5	6	19	26	27	155
21 - 50	26	6	8	10	10	19	35	26	20	19	17	12	42	170	80	49	549
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	9	9	12	15	19	45	51	29	24	21	17	48	189	106	76	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

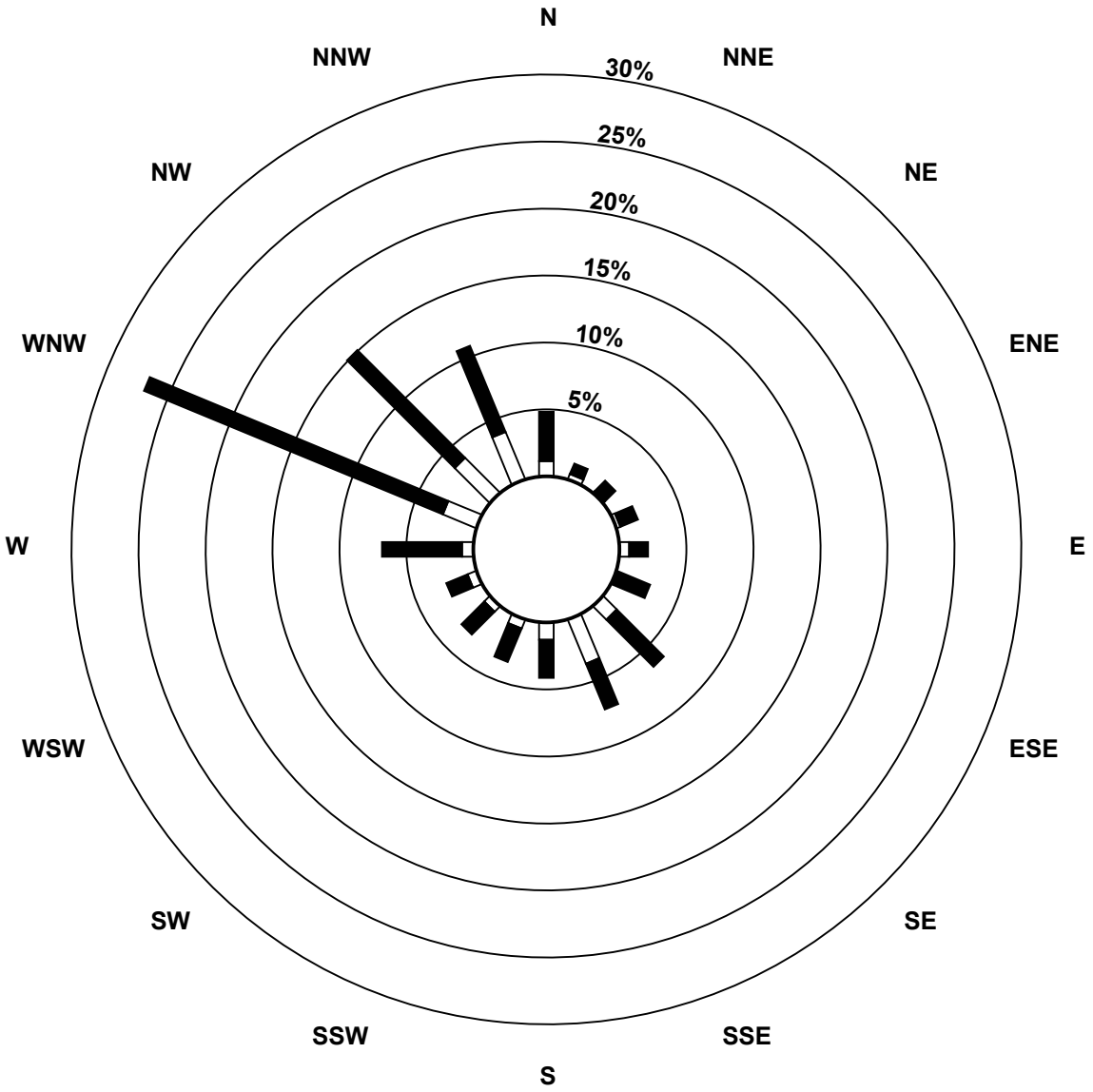
AURORA ATMOSPHERICS INC.

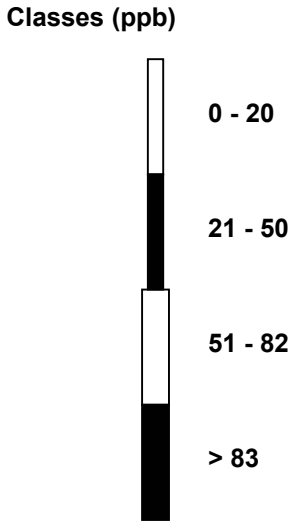
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Ozone (O_3) - ppb

Anzac (AMS 14)





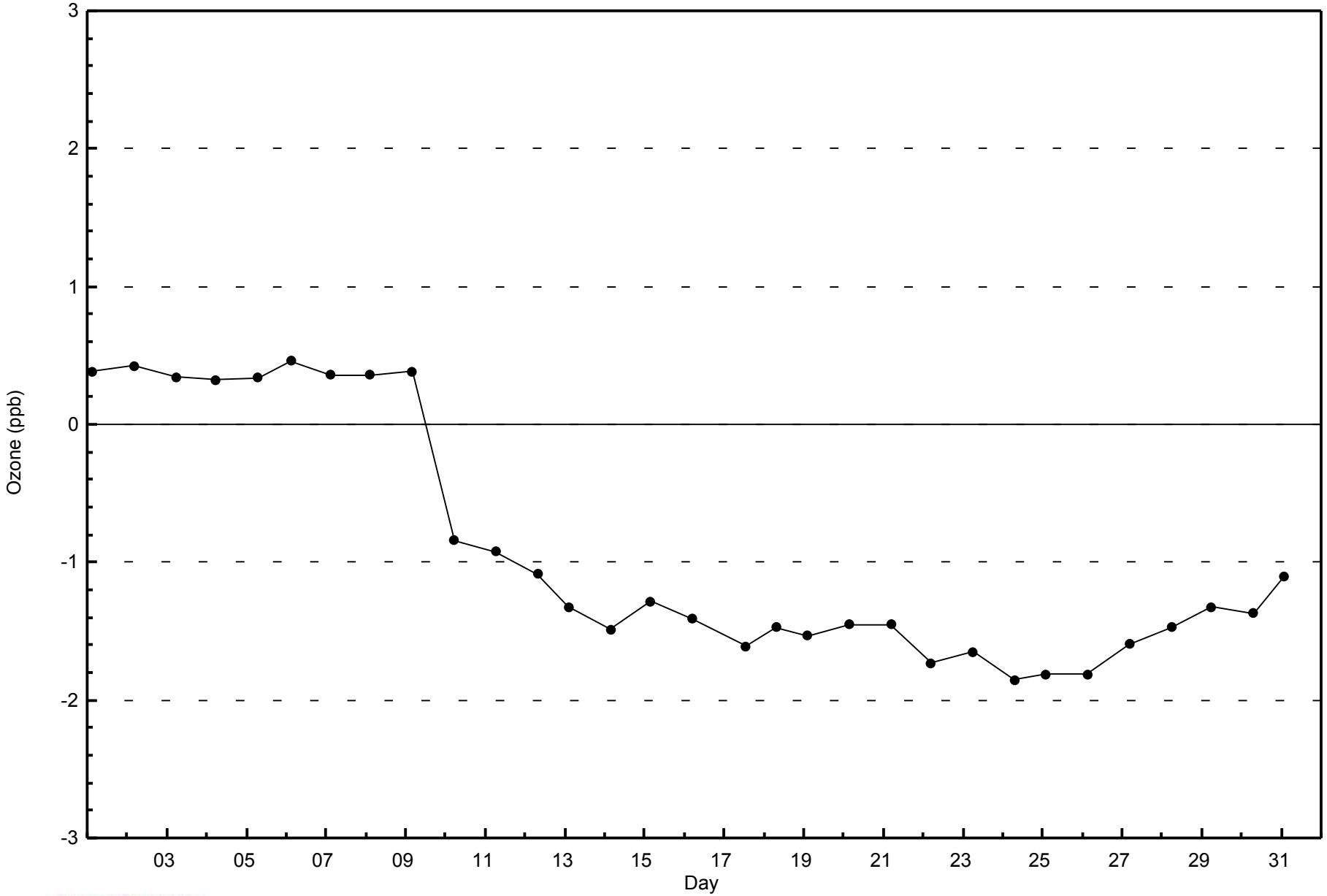
Total Number of Valid Hours: 704

WBEA

Zero Responses

Ozone (O_3) - ppb

Anzac - January 2015



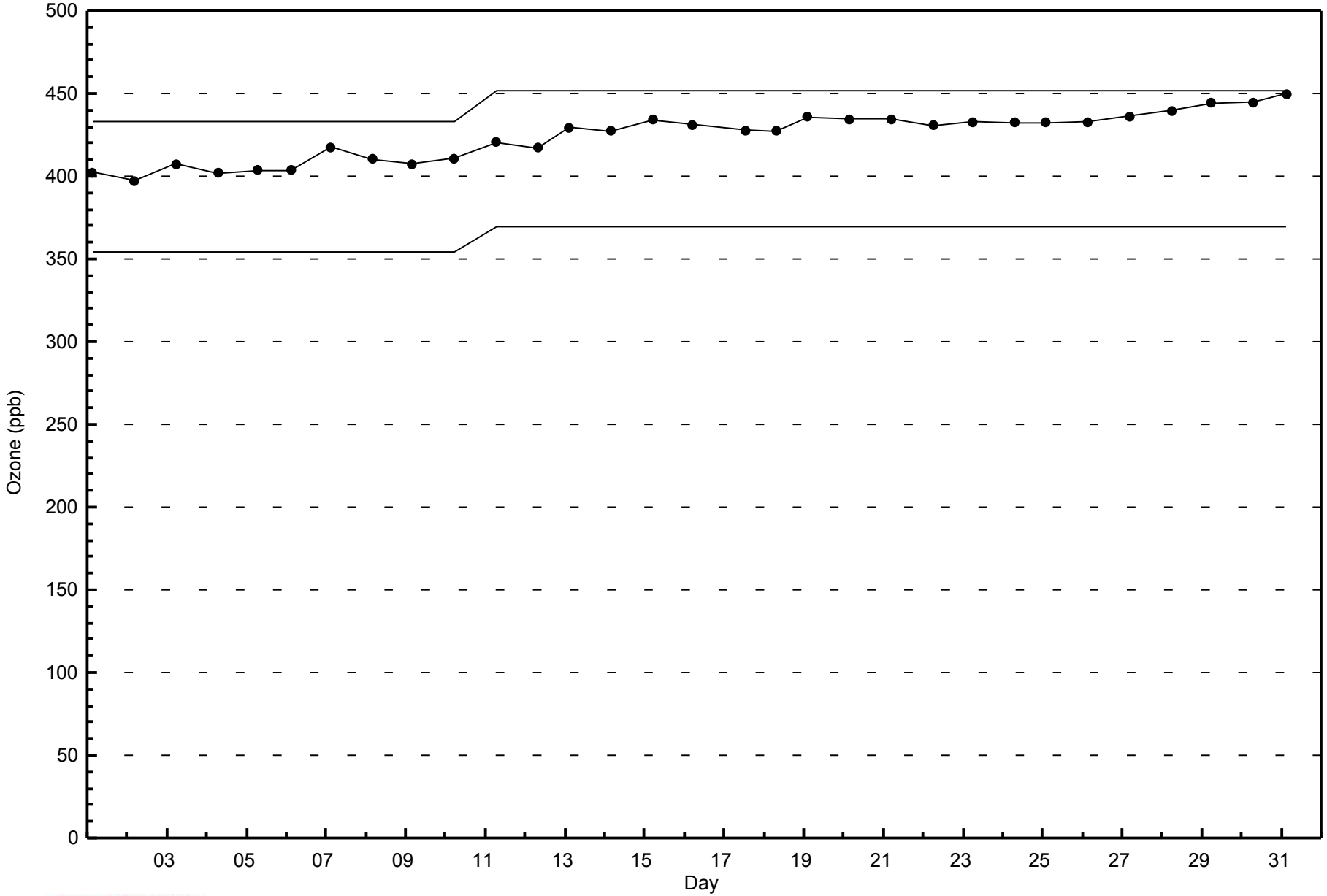
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Anzac - January 2015

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

Maximum Value: 50.8 $\mu g/m^3$ on Jan 7 06:00

Maximum Daily Average: 8.5 $\mu g/m^3$ on Jan 10

Minimum Value: 0.0 $\mu g/m^3$ on Jan 22 10:00

Minimum Daily Average: 0.1 $\mu g/m^3$ on Jan 22

Maximum Diurnal Average: 4.5 $\mu g/m^3$ at hour 6

Minimum Diurnal Average: 2.2 $\mu g/m^3$ at hour 13

Monthly Average: 3.46 $\mu g/m^3$

Percentiles: P_1 = 0.0 P_{10} = 0.5 Q_1 = 1.2 Median = 2.3 Q_3 = 4.1 P_{90} = 6.9 P_{99} = 18.8

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-Jan	0.7	1.4	1.7	1.8	1.9	2.6	2.3	2.0	2.2	2.4	2.6	2.8	2.6	2.6	6.1	6.0	2.6	2.5	3.3	3.2	4.6	3.5	3.6	5.2	2.9	6.1
2-Jan	2.9	2.9	2.0	1.8	1.7	2.2	2.2	2.1	2.4	2.7	3.6	2.5	1.7	2.0	1.8	2.3	2.2	1.8	2.0	2.6	2.4	2.4	2.9	3.0	2.3	3.6
3-Jan	7.2	1.7	1.8	2.1	2.2	1.9	2.1	3.0	3.1	3.3	5.2	2.6	1.8	1.8	1.9	2.4	2.2	2.4	2.7	2.9	3.3	3.0	2.8	2.6	2.8	7.2
4-Jan	2.3	2.4	2.2	2.3	2.5	2.6	2.1	1.8	1.7	1.8	1.7	1.5	1.5	1.3	1.4	1.3	1.4	1.2	1.2	1.4	1.2	1.3	1.6	1.3	1.7	2.6
5-Jan	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.0	1.1	1.0	1.0	1.4	1.0	1.4
6-Jan	1.5	2.1	2.7	3.8	5.0	5.4	5.8	9.1	8.5	8.5	7.6	3.4	2.3	1.6	1.3	1.3	4.0	1.3	1.3	1.5	1.8	1.7	2.1	1.6	3.5	9.1
7-Jan	1.0	0.9	0.8	0.7	0.8	50.8	9.9	2.6	2.0	1.8	1.6	1.2	1.1	1.1	1.0	0.9	1.1	1.8	2.6	2.1	2.0	1.2	1.2	1.9	3.8	50.8
8-Jan	1.0	0.8	1.1	1.2	1.0	0.9	1.0	1.1	1.0	1.0	1.1	1.1	2.8	1.5	2.1	2.6	2.8	2.8	3.2	3.2	2.9	2.2	2.4	1.9	1.8	3.2
9-Jan	1.5	1.8	1.7	1.7	1.7	1.6	1.4	1.4	1.5	2.7	16.1	2.9	6.3	26.3	35.8	25.0	16.3	23.8	3.4	4.5	4.6	4.7	6.1	4.1	8.2	35.8
10-Jan	3.6	3.6	2.9	3.2	3.0	2.8	2.9	3.2	3.5	12.4	6.5	4.6	3.2	4.9	13.2	6.7	12.4	17.3	18.6	17.0	18.0	16.7	12.9	11.9	8.5	18.6
11-Jan	9.9	10.3	8.9	6.4	5.3	6.3	6.5	4.5	3.7	4.1	3.7	2.8	2.1	1.9	1.9	2.0	2.6	3.1	3.7	3.3	3.3	3.3	3.0	2.0	4.4	10.3
12-Jan	2.7	3.5	3.7	4.2	4.5	4.3	5.4	9.5	12.1	7.4	6.5	10.3	M	9.0	9.1	9.6	13.0	12.1	19.6	15.4	10.6	8.8	5.5	3.3	8.3	19.6
13-Jan	3.4	4.7	4.5	3.3	2.9	2.6	5.4	7.3	7.0	2.3	1.4	1.2	1.3	1.6	1.8	1.8	1.7	1.6	2.1	2.0	3.3	5.2	4.8	4.0	3.2	7.3
14-Jan	4.1	4.6	2.4	1.9	1.6	1.5	1.8	0.8	0.6	4.7	4.9	4.5	4.0	4.9	4.9	5.0	6.2	9.1	6.4	4.6	4.3	3.7	3.0	3.3	3.9	9.1
15-Jan	3.4	3.5	3.3	3.2	2.8	2.7	2.6	2.7	2.3	2.3	2.2	2.2	3.2	3.5	1.9	2.1	1.6	1.6	1.8	1.9	2.2	1.9	2.1	2.2	2.5	3.5
16-Jan	2.3	3.1	3.6	3.6	3.9	4.7	4.8	4.7	3.7	3.0	2.7	2.2	2.3	2.2	1.4	0.9	0.5	0.7	0.7	0.7	0.6	0.8	0.7	0.7	2.3	4.8
17-Jan	0.6	0.9	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.2	0.5	1.0	1.2	2.6	4.6	5.8	6.3	6.8	7.1	6.1	6.7	6.3	2.6	7.1
18-Jan	6.8	6.1	5.1	3.5	3.9	4.1	3.2	2.8	2.1	3.7	1.7	1.5	0.6	0.8	0.9	0.5	1.1	2.1	4.0	7.3	7.4	3.4	2.6	3.6	3.3	7.4
19-Jan	3.6	3.9	2.6	2.1	2.2	3.1	3.3	2.8	2.4	2.4	3.4	2.7	2.8	3.0	5.2	8.0	18.7	20.4	15.6	11.5	10.0	17.3	9.5	6.5	6.8	20.4
20-Jan	6.8	7.2	5.9	4.8	4.3	6.8	8.1	7.0	8.8	9.3	14.9	7.0	6.9	6.4	6.0	3.2	2.4	3.9	14.7	13.7	12.2	6.4	3.0	2.2	7.2	14.9
21-Jan	1.7	1.5	1.7	1.8	2.4	1.7	1.3	1.4	5.2	4.1	1.6	2.9	0.7	1.9	0.9	0.7	0.7	0.6	0.4	0.4	0.4	0.3	0.2	0.2	1.4	5.2
22-Jan	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
23-Jan	0.1	0.3	0.5	0.7	1.6	2.0	2.3	1.9	2.2	1.9	1.8	1.1	0.3	0.3	0.5	0.3	0.2	0.6	0.8	0.7	1.1	1.2	1.0	1.2	1.0	2.3
24-Jan	1.1	1.2	1.6	1.2	0.7	0.6	0.7	1.0	0.9	1.7	2.4	1.1	0.4	0.4	0.6	0.1	0.7	0.4	0.7	0.6	1.3	1.9	1.7	1.4	1.0	2.4
25-Jan	1.4	1.9	1.5	0.7	0.3	0.1	0.1	0.4	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.5	0.4	0.1	0.2	0.1	0.2	0.4	1.9
26-Jan	0.2	0.1	0.8	1.0	1.3	2.2	1.9	1.6	1.5	0.7	0.6	0.7	0.5	0.5	0.7	0.9	0.7	1.1	2.7	4.0	7.8	6.6	6.1	3.7	2.0	7.8
27-Jan	4.0	4.6	3.9	3.8	4.0	4.3	4.1	4.3	4.7	4.1	3.9	3.6	3.0	2.4	2.5	2.7	2.8	2.8	2.7	2.5	2.3	2.1	1.9	2.0	3.3	4.7
28-Jan	2.3	2.5	2.2	2.2	2.2	3.0	5.5	7.8	6.9	4.5	3.8	3.0	3.9	3.4	3.8	4.0	3.5	4.1	5.0	5.0	6.5	5.2	4.6	3.8	4.1	7.8
29-Jan	4.1	4.0	4.3	5.1	4.8	4.7	5.4	5.5	5.2	4.1	3.8	3.4	2.9	2.0	1.7	1.7	1.4	1.5	1.5	1.5	1.5	1.8	2.0	2.6	3.2	5.5
30-Jan	3.4	4.0	4.0	4.1	3.7	3.5	3.9	4.4	4.8	2.9	2.8	2.2	1.8	1.3	1.3	1.3	1.3	2.0	3.0	3.9	5.0	6.6	10.5	13.2	4.0	13.2
31-Jan	11.0	11.0	9.4	9.7	8.5	9.6	8.7	8.1	7.2	6.9	6.8	5.3	3.8	2.2	1.7	1.7	1.6	3.0	4.8	5.5	5.3	5.5	4.6	3.8	6.1	11.0
	3.1	3.2	2.9	2.7	2.7	4.5	3.4	3.4	3.5	3.5	3.8	2.6	2.2	3.0	3.7	3.2	3.6	4.3	4.4	4.2	4.3	4.1	3.6	3.3	Diurnal Average	
	11.0	11.0	9.4	9.7	8.5	50.8	9.9	9.5	12.1	12.4	16.1	10.3	6.9	26.3	35.8	25.0	18.7	23.8	19.6	17.0	18.0	17.3	12.9	13.2	Diurnal Maximum	

M - Maintenance

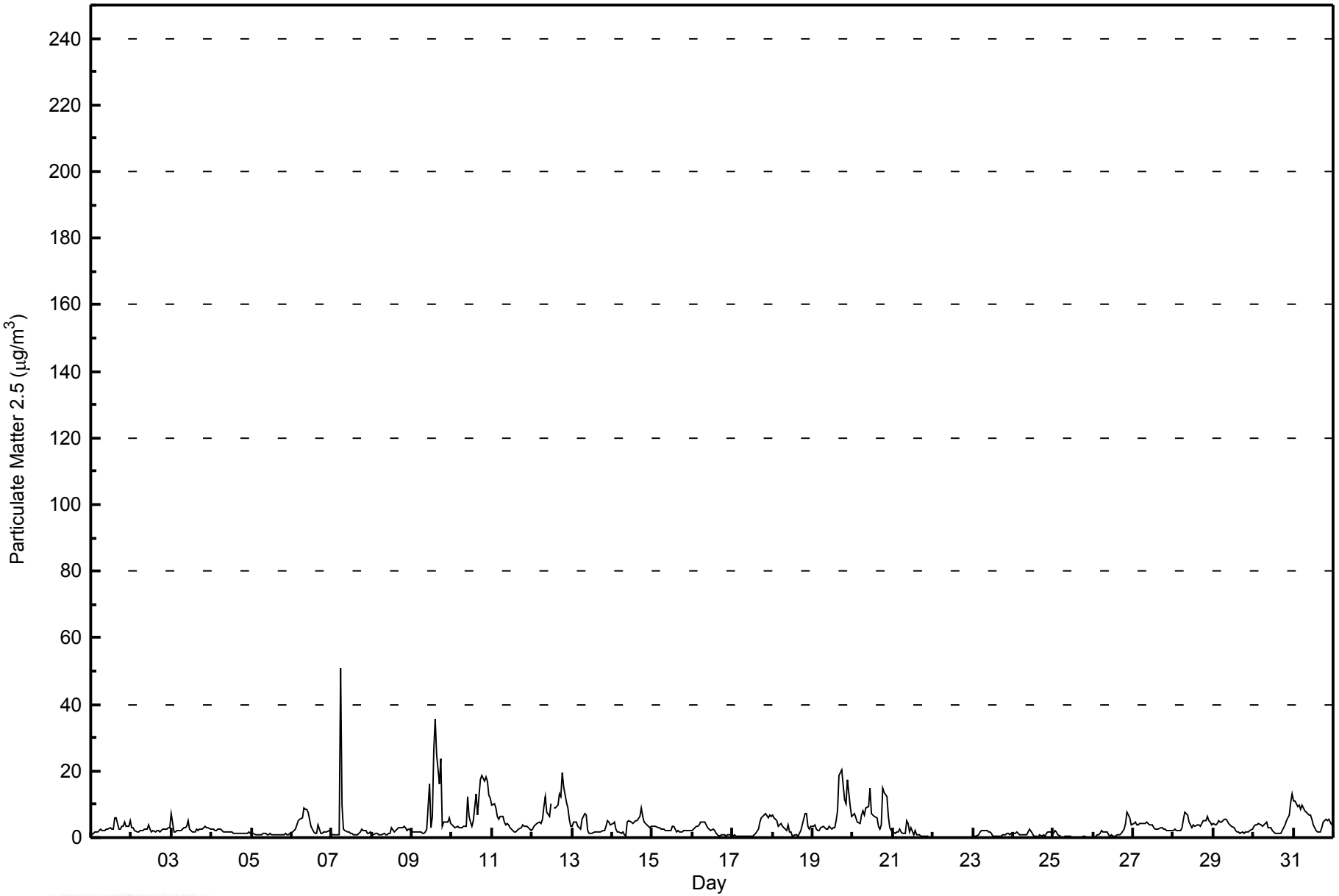
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	483	65.01	65.01
6 - 15	99	13.32	78.33
16 - 25	14	1.88	80.22
26 - 80	3	0.40	80.62
> 81.0	0	0.00	80.62

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Anzac - January 2015

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**
1 - 5	32	9	8	11	14	20	38	39	23	17	13	9	24	95	70	61	483
6 - 15	3	1	1	1	2	0	5	10	4	2	4	4	3	29	20	10	99
16 - 25	0	0	0	0	0	0	0	0	1	0	0	0	1	7	2	3	14
26 - 80	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	10	9	12	16	20	44	49	28	19	17	13	28	133	92	74	599

Total Number of Valid Hours: 743

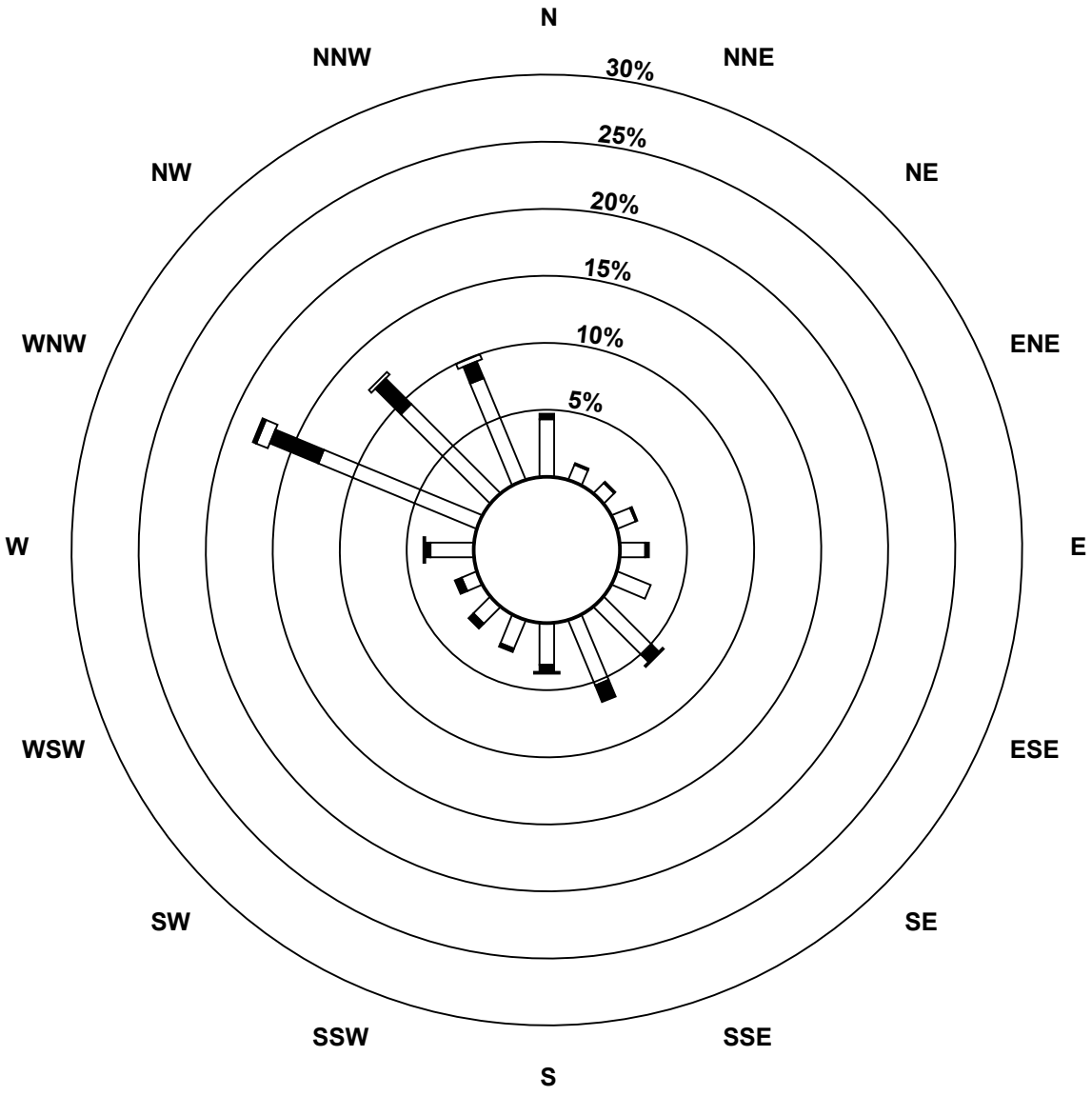
Total Number of Hours: 744

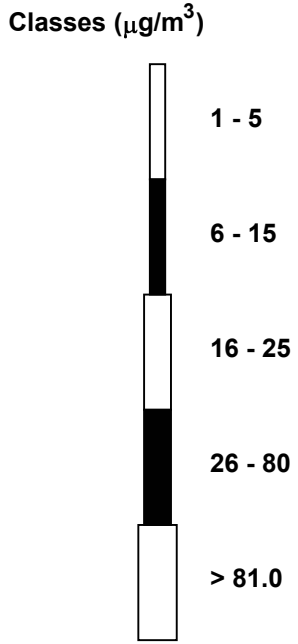
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Anzac (AMS 14)





Total Number of Valid Hours: 743

Maximum Value: 6.8 C on Jan 25 10:00
Maximum Daily Average: 4.9 C on Jan 22

Minimum Value: -32.8 C on Jan 3 10:00
Minimum Daily Average: -27.9 C on Jan 3
Maximum Diurnal Average: -9.9 C at hour 15
Minimum Diurnal Average: -14.3 C at hour 9
Monthly Average: -12.82 C
Percentiles: P_1 = -31.6 P_{10} = -26.1 Q_1 = -20.5 Median = -14.4 Q_3 = -4.9 P_{90} = 2.4 P_{99} = 6.4

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

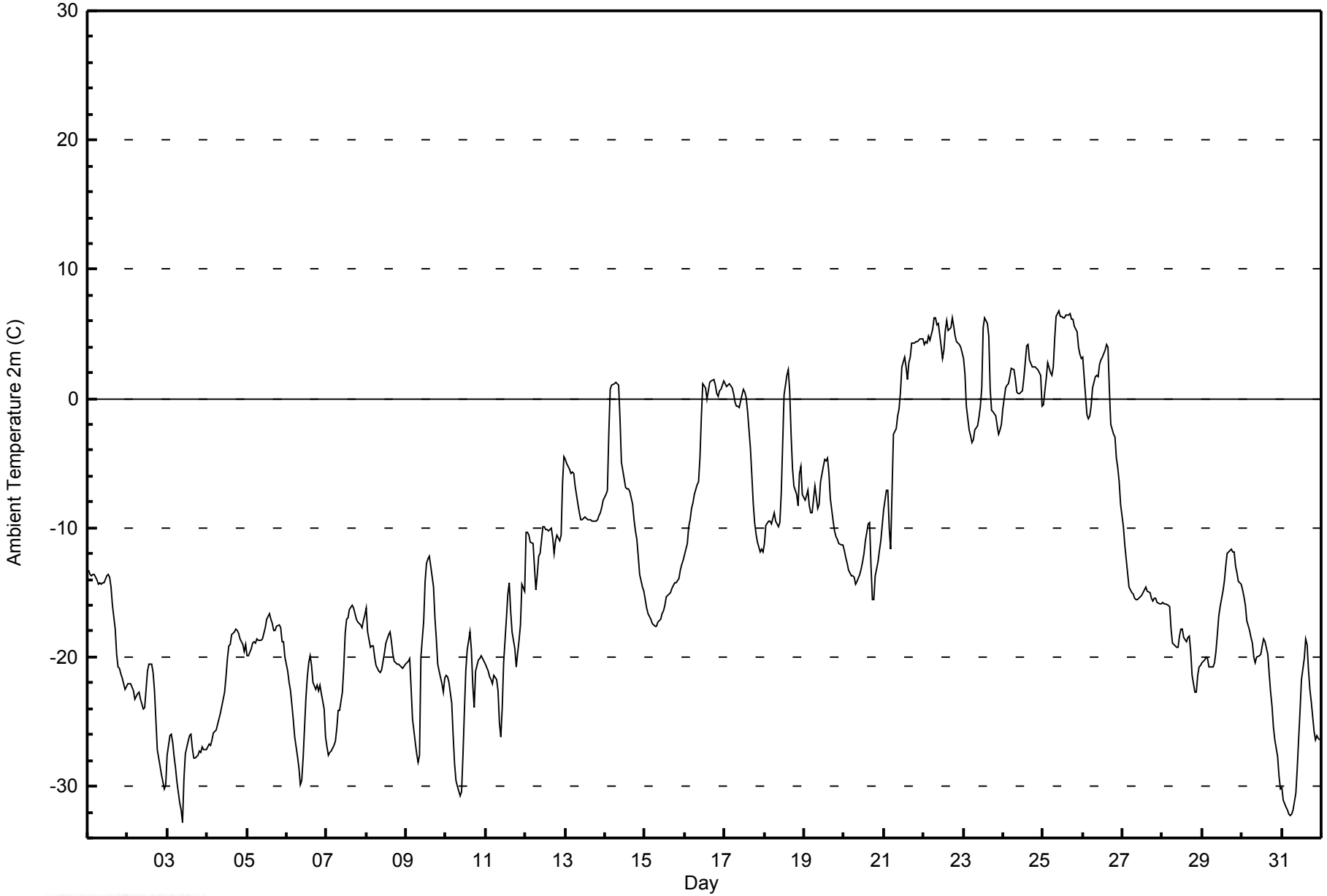
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-13.3	-13.6	-13.7	-13.6	-13.6	-14.1	-14.3	-14.3	-14.4	-14.3	-14.2	-13.7	-13.6	-13.8	-14.6	-16.0	-17.8	-19.8	-20.8	-20.9	-21.3	-21.6	-22.5	-22.3	-16.3	-13.3
2-Jan	-22.1	-22.1	-22.1	-22.6	-23.3	-23.1	-22.9	-22.7	-23.3	-24.0	-23.9	-22.5	-21.0	-20.5	-20.5	-21.2	-22.6	-24.9	-27.2	-27.8	-29.1	-29.6	-30.2	-29.9	-24.1	-20.5
3-Jan	-27.6	-26.1	-26.0	-26.6	-27.7	-28.5	-29.6	-31.3	-31.8	-32.8	-29.4	-27.5	-26.5	-26.1	-25.9	-27.0	-27.8	-27.8	-27.6	-27.3	-27.4	-26.9	-27.2	-27.1	-27.9	-25.9
4-Jan	-26.9	-26.7	-26.8	-26.4	-25.9	-25.7	-25.2	-24.8	-24.4	-23.8	-22.8	-21.5	-20.1	-19.1	-19.0	-18.3	-18.0	-17.8	-18.0	-18.2	-18.6	-19.1	-19.5	-19.0	-21.9	-17.8
5-Jan	-19.9	-19.9	-19.4	-18.9	-18.8	-19.0	-18.6	-18.7	-18.7	-18.6	-18.1	-17.7	-17.1	-16.7	-17.1	-17.4	-18.0	-17.9	-17.7	-17.5	-17.8	-18.8	-18.9	-20.0	-18.4	-16.7
6-Jan	-21.1	-21.9	-22.6	-23.7	-24.9	-26.2	-27.7	-28.6	-29.9	-29.5	-27.9	-23.2	-21.5	-20.5	-19.9	-20.6	-21.9	-22.5	-22.2	-22.6	-22.1	-22.8	-24.1	-26.2	-23.9	-19.9
7-Jan	-27.0	-27.6	-27.4	-27.2	-26.9	-26.5	-25.5	-24.1	-24.1	-22.7	-20.8	-18.2	-17.1	-17.0	-16.3	-15.9	-16.2	-16.7	-17.1	-17.3	-17.5	-17.8	-17.2	-16.7	-20.9	-15.9
8-Jan	-16.2	-18.1	-19.3	-19.2	-19.2	-20.1	-20.6	-21.1	-21.2	-21.0	-20.4	-19.7	-18.9	-18.3	-18.1	-18.9	-19.8	-20.3	-20.5	-20.6	-20.7	-20.7	-20.9	-20.5	-19.8	-16.2
9-Jan	-20.5	-20.3	-20.1	-22.4	-24.8	-26.6	-27.5	-28.1	-27.6	-20.0	-17.2	-14.2	-12.8	-12.4	-12.2	-13.0	-14.5	-16.9	-18.6	-20.5	-21.1	-22.0	-22.7	-21.7	-19.9	-12.2
10-Jan	-21.4	-21.5	-21.9	-23.6	-26.1	-28.3	-29.5	-30.0	-30.8	-30.4	-27.6	-24.2	-21.1	-19.5	-18.1	-19.5	-22.1	-23.9	-21.1	-20.2	-20.1	-19.9	-20.1	-20.3	-23.4	-18.1
11-Jan	-20.6	-21.1	-21.5	-21.7	-22.1	-21.4	-21.8	-22.6	-25.1	-26.2	-23.9	-20.5	-17.0	-15.1	-14.2	-16.4	-18.0	-19.3	-20.8	-19.7	-18.7	-17.5	-14.4	-14.9	-19.8	-14.2
12-Jan	-10.3	-10.3	-10.5	-11.1	-11.2	-13.1	-14.8	-13.6	-12.2	-11.9	-9.9	-10.0	-10.1	-10.1	-10.2	-10.0	-10.8	-12.0	-11.0	-10.6	-11.0	-10.5	-6.5	-4.5	-10.7	-4.5
13-Jan	-4.7	-5.1	-5.4	-5.8	-5.7	-5.8	-6.8	-8.2	-8.9	-9.4	-9.4	-9.2	-9.2	-9.4	-9.4	-9.4	-9.5	-9.5	-9.5	-9.3	-9.1	-8.8	-8.4	-7.9	-8.1	-4.7
14-Jan	-7.5	-7.1	-2.8	0.7	1.0	1.2	1.2	1.1	1.0	-1.5	-4.9	-6.3	-6.9	-7.0	-7.0	-7.2	-8.2	-9.4	-10.2	-10.9	-12.2	-13.6	-14.6	-14.9	-6.1	1.2
15-Jan	-15.6	-16.3	-16.7	-17.1	-17.4	-17.5	-17.6	-17.6	-17.3	-17.1	-16.6	-16.4	-16.0	-15.4	-15.2	-15.0	-14.7	-14.4	-14.3	-14.3	-13.9	-13.3	-12.9	-12.6	-15.6	-12.6
16-Jan	-12.1	-11.2	-10.0	-9.4	-8.5	-8.1	-7.4	-6.7	-6.4	-4.6	-1.4	1.1	0.8	-0.1	0.6	1.2	1.3	1.5	1.1	0.3	0.2	0.6	0.7	1.4	-3.1	1.5
17-Jan	1.2	0.9	1.0	1.1	0.8	0.4	-0.3	-0.6	-0.6	-0.7	0.3	0.7	0.5	0.0	-1.0	-3.8	-5.9	-8.0	-9.6	-10.4	-11.1	-11.9	-11.6	-11.9	-3.4	1.2
18-Jan	-11.2	-9.8	-9.5	-9.5	-9.7	-9.3	-8.8	-9.5	-9.9	-9.6	-7.3	-3.5	0.3	1.8	2.3	0.7	-2.8	-5.4	-6.8	-7.5	-8.3	-5.8	-5.2	-7.5	-6.3	2.3
19-Jan	-7.9	-7.5	-7.1	-8.3	-8.8	-8.8	-6.8	-7.6	-8.5	-8.1	-6.4	-5.3	-4.7	-4.8	-4.6	-5.8	-7.8	-9.4	-10.3	-10.6	-10.8	-11.2	-11.4	-11.4	-8.1	-4.6
20-Jan	-11.7	-12.3	-12.8	-13.3	-13.7	-13.8	-13.8	-14.4	-14.1	-13.6	-13.1	-12.6	-11.9	-11.0	-9.7	-9.6	-13.0	-15.6	-15.5	-13.8	-12.6	-11.8	-11.0	-9.8	-12.7	-9.6
21-Jan	-8.6	-7.1	-7.1	-10.0	-11.7	-7.2	-2.8	-2.4	-1.4	-0.8	0.5	2.5	3.2	2.4	1.5	2.7	3.2	4.3	4.3	4.4	4.4	4.5	4.6	4.6	-0.5	4.6
22-Jan	4.1	4.4	4.3	4.8	4.5	5.3	6.2	6.3	5.7	5.8	4.1	3.1	3.7	5.3	6.0	5.3	5.5	6.2	5.6	4.8	4.4	4.2	4.0	3.6	4.9	6.3
23-Jan	3.1	1.9	-0.6	-2.4	-2.9	-3.4	-3.2	-2.5	-2.1	-1.5	-0.6	0.9	5.4	6.3	5.8	4.8	0.7	-0.9	-1.0	-1.3	-2.1	-2.8	-2.4	-2.0	-0.1	6.3
24-Jan	-0.8	0.8	1.1	1.1	1.6	2.3	2.2	1.5	0.5	0.4	0.4	0.6	1.6	2.8	4.1	4.2	3.0	2.4	2.5	2.4	2.4	2.2	1.8	-0.6	1.7	4.2
25-Jan	-0.5	0.6	1.6	2.8	2.0	1.8	2.4	4.6	6.4	6.8	6.4	6.4	6.3	6.3	6.5	6.5	6.6	6.2	6.1	5.5	5.1	4.0	3.4	3.1	4.4	6.8
26-Jan	3.2	1.7	-1.2	-1.6	-1.3	-0.6	0.8	1.7	1.8	1.7	2.7	3.0	3.2	3.8	4.2	4.0	0.7	-2.0	-2.8	-2.9	-4.6	-5.4	-6.4	-8.1	-0.2	4.2
27-Jan	-9.9	-11.3	-12.4	-13.5	-14.6	-15.0	-15.1	-15.4	-15.6	-15.6	-15.5	-15.3	-15.0	-14.8	-14.6	-14.9	-15.0	-15.5	-15.6	-15.4	-15.4	-15.8	-15.9	-15.8	-14.7	-9.9
28-Jan	-15.8	-15.9	-15.9	-15.9	-16.1	-17.9	-19.0	-19.0	-19.3	-19.2	-18.3	-17.9	-17.8	-18.5	-18.9	-18.5	-18.4	-19.5	-21.4	-22.7	-22.7	-21.4	-20.8	-20.7	-18.8	-15.8
29-Jan	-20.4	-20.2	-20.0	-20.2	-20.7	-20.7	-20.8	-20.5	-19.6	-18.3	-16.9	-16.1	-14.9	-14.1	-13.0	-12.0	-11.9	-11.6	-11.9	-11.9	-12.9	-13.5	-14.2	-14.4	-16.3	-11.6
30-Jan	-14.8	-15.3	-16.0	-17.2	-18.0	-18.4	-18.9	-20.0	-20.5	-20.0	-19.9	-19.8	-19.2	-18.6	-18.9	-19.8	-21.3	-22.7	-23.8	-25.4	-26.4	-27.7	-29.2	-30.2	-20.9	-14.8
31-Jan	-30.0	-31.1	-31.6	-31.8	-32.1	-32.2	-32.2	-31.8	-30.6	-28.6	-26.3	-24.2	-21.8	-20.1	-18.5	-19.0	-21.0	-22.5	-23.5	-25.7	-26.4	-26.1	-26.3	-26.4	-26.7	-18.5
	-13.1	-13.2	-13.3	-13.6	-14.1	-14.2	-14.2	-14.2	-14.3	-13.9	-12.9	-11.6	-10.6	-10.1	-9.9	-10.3	-11.5	-12.4	-12.9	-13.2	-13.5	-13.6	-13.6	-13.7	Diurnal Average	
	4.1	4.4	4.3	4.8	4.5	5.3	6.2	6.3	6.4	6.8	6.4	6.4	6.3	6.3	6.5	6.5	6.6	6.2	6.1	5.5	5.1	4.5	4.6	4.6	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Anzac - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	207	27.82	27.82
-20 - 0	401	53.90	81.72
0 - 10	136	18.28	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

Leaf Wetness (SW) - %

Anzac - January 2015

Maximum Value: 97 % on Jan 24 11:00

Maximum Daily Average: 19.3 % on Jan 24

Minimum Value: 0 % on Jan 14 05:00

Minimum Daily Average: 0.0 % on Jan 15

Maximum Diurnal Average: 8.0 % at hour 12

Minimum Diurnal Average: 0.0 % at hour 19

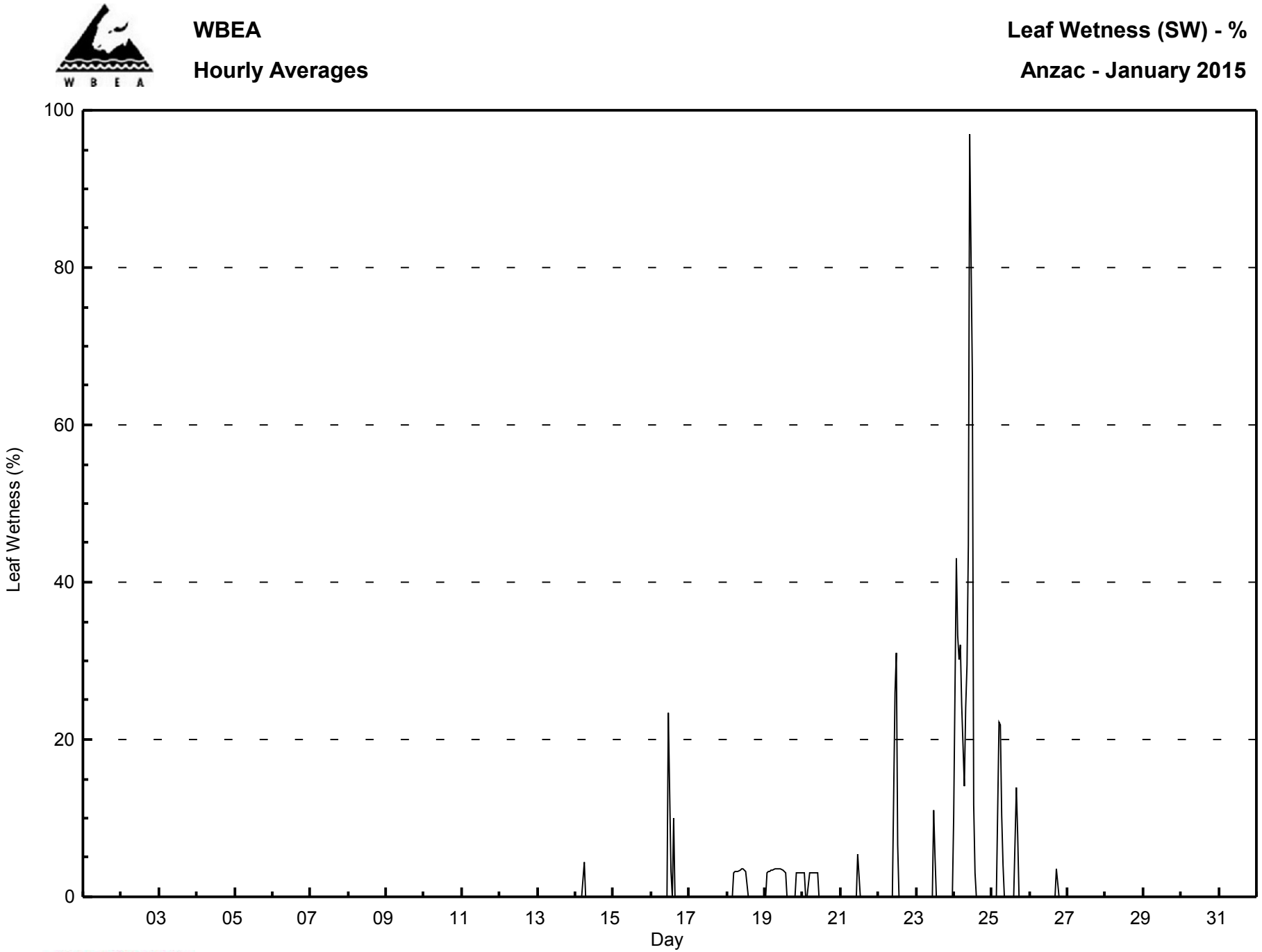
Monthly Average: 1.8 %

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 3$ $P_{99} = 42$

Hours in Service:	744
Hours of Data:	428
Hours of Missing Data:	316
Hours of Calibration:	0
Percent Operational Time:	57.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
2-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
3-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
4-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
5-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
6-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
7-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
8-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
9-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
13-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
14-Jan	AF	AF	AF	M	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	4
15-Jan	0	0	0	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-Jan	0	0	0	0	0	0	0	0	0	0	0	23	3	0	10	0	0	0	0	0	0	0	0	0	1.5	23
17-Jan	0	0	0	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-Jan	0	0	0	0	3	3	3	3	3	3	4	3	3	0	0	0	0	0	0	0	0	0	0	0	1.2	4
19-Jan	0	3	3	3	3	3	4	4	4	4	4	3	3	3	0	0	0	0	0	0	3	3	3	3	2.3	4
20-Jan	3	3	0	0	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	3
21-Jan	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0.2	5
22-Jan	0	0	0	0	0	0	0	0	0	0	26	31	7	0	0	0	0	0	0	0	0	0	0	0	2.6	31
23-Jan	0	0	0	0	0	0	0	0	0	0	0	11	5	0	0	0	0	0	0	0	0	0	0	0	0.7	11
24-Jan	10	43	33	30	32	24	14	24	30	45	97	66	12	3	0	0	0	0	0	0	0	0	0	0	19.3	97
25-Jan	0	0	0	0	22	22	10	4	0	0	0	0	0	0	0	14	8	0	0	0	0	0	0	0	3.3	22
26-Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0.2	4
27-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	0	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	2.9	2.1	2.0	3.5	3.3	1.9	2.1	2.2	3.1	7.2	8.0	1.8	0.3	0.6	0.8	0.4	0.2	0.0	0.0	0.2	0.2	0.2	0.2	Diurnal Average	
	10	43	33	30	32	24	14	24	30	45	97	66	12	3	10	14	8	4	0	0	3	3	3	3	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure


WBEA
Hourly Averages
Leaf Wetness (SW) - %
Anzac - January 2015
Leaf Wetness (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	363	84.81	84.81
0.4 - 0.5	0	0.00	84.81
0.6 - 0.7	0	0.00	84.81
0.8 - 1.4	0	0.00	84.81
1.5 - 10	43	10.05	94.86
> 10	22	5.14	100.00

Total Number of Valid Hours: 428

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Anzac - January 2015

Maximum Value: 98 % on Jan 24 10:00

Maximum Daily Average: 90.4 % on Jan 24

Minimum Value: 45 % on Jan 9 14:00

Minimum Daily Average: 66.8 % on Jan 9

Maximum Diurnal Average: 82.5 % at hour 6

Minimum Diurnal Average: 73.4 % at hour 15

Monthly Average: 79.7 %

Percentiles: P_1 = 53 P_{10} = 69 Q_1 = 75 Median = 80 Q_3 = 86 P_{90} = 91 P_{99} = 98

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

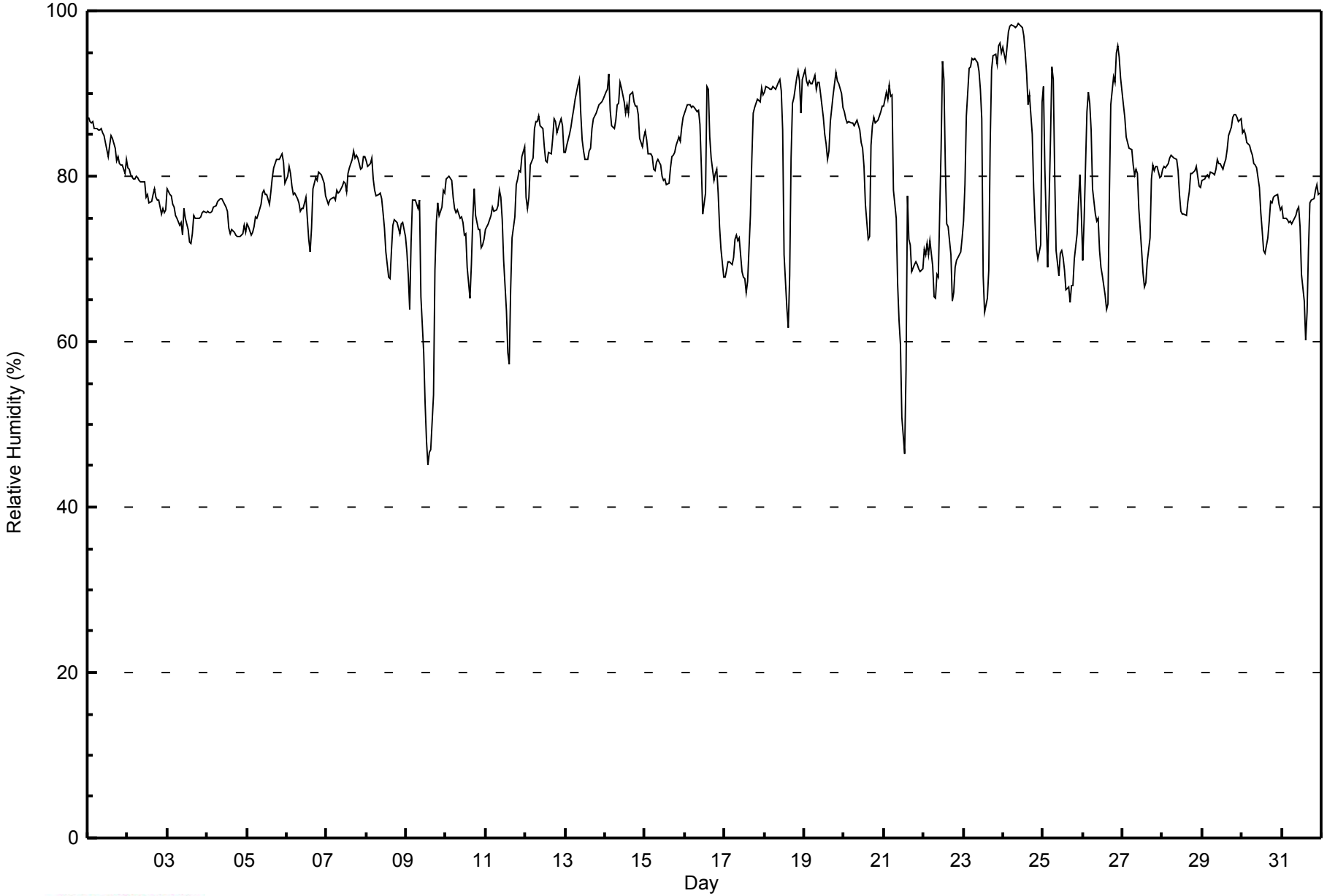
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	87	87	86	87	86	86	86	86	86	85	85	83	82	84	85	85	83	82	82	82	81	81	80	82	84.1	87
2-Jan	81	81	80	80	80	80	80	80	79	79	79	78	78	77	77	78	79	78	77	77	75	76	76	76	78.3	81
3-Jan	78	78	78	77	76	75	75	74	74	73	76	75	74	72	72	73	75	75	75	75	75	76	76	76	75.1	78
4-Jan	76	76	76	76	76	77	77	77	77	77	77	76	76	74	73	74	73	73	73	73	73	73	74	73	74.9	77
5-Jan	74	74	73	73	74	75	75	75	77	78	78	78	78	77	78	80	81	82	82	82	82	83	82	79	77.9	83
6-Jan	80	81	80	79	78	78	77	77	76	76	76	77	75	72	71	74	78	80	79	81	80	80	79	78	77.6	81
7-Jan	77	77	77	77	77	77	78	78	78	79	79	79	78	80	81	82	83	82	82	82	81	81	82	82	79.7	83
8-Jan	82	81	82	82	80	78	78	78	78	77	76	74	71	68	68	71	74	75	74	74	73	74	74	73	75.6	82
9-Jan	71	68	64	72	77	77	77	76	77	65	59	53	48	45	47	47	54	69	74	77	75	76	78	78	66.8	78
10-Jan	80	80	80	80	77	76	76	76	75	75	74	73	73	69	65	69	75	78	75	74	73	71	72	72	74.6	80
11-Jan	74	74	75	75	76	76	76	76	78	77	75	70	64	59	57	66	73	75	79	80	81	80	82	84	74.2	84
12-Jan	77	76	78	81	82	86	87	87	87	86	86	84	82	82	83	83	85	87	87	85	86	87	86	83	83.8	87
13-Jan	83	84	85	86	87	88	89	91	92	88	84	83	82	82	83	83	86	87	88	88	89	89	89	89	86.4	92
14-Jan	90	90	92	88	86	86	87	89	89	91	91	89	88	89	88	90	90	89	89	88	87	85	84	85	88.3	92
15-Jan	85	84	83	83	82	81	81	82	82	81	80	79	80	79	79	81	82	83	83	84	85	84	86	87	82.3	87
16-Jan	88	89	89	89	88	88	88	88	88	86	81	75	78	91	90	85	82	79	80	81	78	74	71	68	83.1	91
17-Jan	68	69	70	70	69	70	72	73	72	72	68	68	68	66	67	75	82	88	88	89	89	89	91	90	76.0	91
18-Jan	90	91	91	91	90	91	91	91	91	92	90	86	71	64	62	68	82	89	90	92	93	91	88	92	86.0	93
19-Jan	93	91	91	92	91	91	92	91	91	91	90	87	85	84	82	83	87	90	91	92	92	91	90	88	89.5	93
20-Jan	88	87	87	87	87	86	86	86	87	86	84	83	81	77	72	73	84	86	87	86	87	87	88	88	84.6	88
21-Jan	89	90	89	91	90	90	78	75	67	63	60	51	46	57	78	72	72	69	69	70	69	69	68	69	72.5	91
22-Jan	71	70	72	71	72	69	65	65	68	68	83	94	92	81	74	74	70	65	66	69	70	70	71	72	72.7	94
23-Jan	75	79	87	93	93	94	94	94	94	93	91	87	68	64	65	69	84	93	95	95	94	96	96	95	86.9	96
24-Jan	96	94	96	97	98	98	98	98	98	98	98	98	97	95	92	89	90	85	79	74	71	70	72	89	90.4	98
25-Jan	91	81	74	69	84	93	92	80	71	68	71	71	70	69	66	67	65	67	67	70	73	77	80	76	74.6	93
26-Jan	70	75	88	90	89	86	78	75	74	75	71	69	68	66	64	65	78	89	92	91	95	96	94	92	80.4	96
27-Jan	89	87	85	84	83	83	81	80	81	80	76	71	68	67	67	70	72	80	81	81	81	81	80	80	78.7	89
28-Jan	81	81	81	81	82	82	82	82	82	81	78	76	75	75	75	77	78	80	80	81	81	80	79	79	79.6	82
29-Jan	80	80	80	80	80	81	80	80	81	82	81	81	81	82	82	83	85	86	87	87	87	87	87	87	82.8	87
30-Jan	85	86	85	84	84	83	82	81	81	81	79	76	73	71	71	72	74	77	77	77	78	78	77	76	78.7	86
31-Jan	76	75	75	75	74	75	74	75	75	76	76	74	68	65	60	64	71	77	77	77	78	79	78	78	73.8	79
	81.4	81.1	81.5	81.8	82.3	82.5	81.7	81.2	80.9	80.0	79.1	77.3	74.7	73.5	73.4	74.8	78.3	80.4	80.8	81.1	81.1	81.1	80.9	81.1	Diurnal Average	
	96	94	96	97	98	98	98	98	98	98	98	98	97	95	92	90	90	93	95	95	95	96	96	95	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Anzac - January 2015



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Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	13	1.75	1.75
60 - 80	369	49.60	51.34
80 - 100	362	48.66	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Anzac - January 2015

Maximum Speed: 29 km/h on Jan 21 13:00

Maximum Daily Speed Average: 14.7 km/h on Jan 22

Minimum Speed Value: 0 km/h on Jan 31 04:00

Minimum Daily Speed Average: 0.6 km/h on Jan 13

Maximum Diurnal Speed Average: 5.9 km/h at hour 14

Minimum Diurnal Speed Average: 3.8 km/h at hour 5

Monthly Average Velocity: 4.4 km/h 291.9 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 5 Median = 8 Q_3 = 11 P_{90} = 15 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 Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	N3	N2	N1	E2	ESE4	E6	ESE6	ESE5	ESE7	SE5	E5	ESE2	N3	NNW8	NNW11	NNW11	N11	NNW8	NW8	NNW9	NNW6	NNW4	NNW4	NW5	N2.9	NNW11
2-Jan	NW4	NNW4	N6	N4	NNW3	NW4	NW5	NW5	NW4	WNW3	W5	WNW6	NW7	NW7	NW6	NW5	NW6	NW4	NW4	WNW3	NW4	NW4	NW4	WNW3	NW4.4	NW7
3-Jan	WNW6	NW6	NW7	NNW8	NNW8	NNW6	NW3	W4	WNW5	NW4	WNW5	WNW7	NW7	WNW8	NW7	WNW8	WNW7	WNW9	WNW10	WNW10	WNW11	WNW11	WNW10	WNW10	WNW7.1	WNW11
4-Jan	WNW10	WNW11	WNW12	WNW11	WNW12	WNW11	WNW12	WNW13	WNW13	WNW13	WNW13	WNW14	WNW11	WNW12	W13	W14	W14	W16	W15	W13	WNW14	WNW14	W13	WNW12	WNW12.6	W16
5-Jan	WNW12	WNW13	WNW13	WNW13	WNW12	WNW11	WNW11	WNW11	WNW11	WNW11	WNW12	WNW12	WNW11	WNW12	WNW13	WNW11	WNW11	NW10	NW10	NW10	NW8	NW9	NNW9	NNW10	WNW10.8	WNW13
6-Jan	NNW9	NW8	NW7	NNW6	NNW5	NNW4	WNW3	WNW4	WNW4	WNW4	NNW5	WNW7	NW8	WNW8	NW9	NW6	WNW6	WNW8	WNW8	WNW8	WNW8	W6	W5	W4	WNW5.9	NW9
7-Jan	SSW4	SSE4	SSE6	S5	SSE6	SE4	SE7	ESE6	ESE6	SE9	SE12	SE12	SE11	ESE8	SE4	NNW1	NNW11	NW13	NW13	NW15	NNW14	NNW18	NW11	NW13	NNE0.6	NNW18
8-Jan	NNW17	NNW14	NNW14	NW14	NW16	NW16	NW16	NW15	NW15	WNW16	WNW15	WNW15	NW14	NW15	NW13	NW13	WNW12	WNW13	WNW12	WNW11	WNW10	WNW11	WNW10	WNW12	NW13.3	NNW17
9-Jan	WNW10	WNW11	WNW9	WNW3	WSW4	E2	NE2	WNW2	WNW7	WNW9	WNW9	NW9	NW9	WNW11	WNW9	W9	NW9	NNW9	NW8	NW7	NW10	NW10	WNW6	NNW7	WNW6.9	WNW11
10-Jan	NW7	NW7	NW7	NW6	NNW3	WNW3	WNW4	W4	WSW3	SW3	S4	SSE2	WSW3	NW4	NW6	WNW5	W5	WNW7	WNW9	WNW9	WNW10	WNW11	WNW10	WNW11	WNW5.2	WNW11
11-Jan	WNW11	WNW10	NW8	WNW9	NW9	WNW10	NW9	WNW6	SSW2	S3	S4	SSE5	SE6	S5	SE5	SE7	SSE8	SSE6	SSE4	SSE7	SSE8	S7	S8	SSW4	SW2.3	WNW11
12-Jan	SW18	SW17	SW13	SW12	SSW10	SSW3	NE4	NNE4	WNW4	WNW6	NW9	WNW11	WNW11	WNW11	WNW9	WNW7	WNW4	SE1	S6	SSE5	SSE4	SSE2	W10	W7	WSW5.2	SW18
13-Jan	WNW11	WNW13	WNW14	NW13	NW13	NW12	NNW11	NNW8	N7	N5	N4	NE5	ENE6	ENE7	ESE6	SE6	SE9	SE10	SE12	SE10	SE11	SSE12	SSE12	SSE6	NE0.6	WNW14
14-Jan	SE3	SE1	WNW12	WNW14	WNW15	WNW18	WNW16	NW16	NW15	NNW14	N12	N9	N9	NNW7	N7	NNW8	NNW7	NNW9	NNW9	NNW9	N9	N9	N6	NNW6	NW8.7	WNW18
15-Jan	NNW8	NNW8	NNW7	N6	N5	N6	NNE5	NE4	E4	ESE6	SE8	ESE10	SE10	SE12	SE12	SE12	SE13	SSE15	SE14	SSE16	SSE18	SSE14	SE13	SE13	SE6.3	SSE18
16-Jan	SE14	SSE12	SSE10	SSE9	SSE10	SSE9	SSE7	SE7	SSE9	SW11	SW12	W14	WNW17	WNW15	WNW14	WNW13	WNW15	WNW16	WNW18	WNW16	WNW16	WNW17	WNW17	WNW15	W7.0	WNW18
17-Jan	WNW15	WNW16	WNW18	WNW18	WNW18	NW17	WNW18	WNW15	WNW15	WNW15	NW14	NW13	NW8	NW4	N5	N5	N3	E3	ENE4	E3	SSE4	SE5	SE6	SSE5	NW7.7	WNW18
18-Jan	SSE5	SE6	SSE6	SE5	SSE6	S6	S6	S6	S6	S6	SW6	WSW6	WNW8	WNW10	W8	WNW7	W4	W3	W5	WSW5	W5	W7	WNW5	WNW6	SW3.5	WNW10
19-Jan	WNW7	WNW7	W5	SSE2	N2	NW4	WNW5	NNW4	N3	NNE3	NE3	N4	WNW2	WNW3	N4	N5	NNW3	NW4	NNW6	NW5	NW4	WNW6	NW6	NW5	NW3.5	WNW7
20-Jan	NW6	NW7	NW8	NW6	NW6	NW6	NW6	NW5	NW5	WNW7	WNW6	WNW6	WNW6	WSW5	WNW3	SSW2	S5	NNE2	SSE4	SSE4	S4	S6	SSE5	S7	WNW2.7	NW8
21-Jan	S6	SSW8	S8	S6	S6	S11	SSW13	SSW12	SSW16	SSW15	S9	SW19	SW29	SW27	SSW20	SW18	SW14	WSW17	W14	W15	W15	W16	W16	W15	SW12.4	SW29
22-Jan	W13	W12	W10	WNW12	WNW11	W13	W15	W16	W16	W18	WNW20	WNW16	WNW14	WNW19	WNW21	WNW18	W14	W13	WNW15	WNW15	WNW16	WNW15	WNW14	WNW11	WNW14.7	WNW21
23-Jan	WNW10	WNW7	NNW4	WNW3	ENE3	E4	ESE4	E5	E4	SE4	SSE5	SSW3	WNW9	WNW9	WNW8	W5	WSW3	S4	SSW5	SSW5	SW5	W4	SE2	SSE6	WSW1.7	WNW10
24-Jan	SSE6	S7	SSE5	SSE5	SSW4	WNW9	NW14	NNW14	NNW11	NW10	NW10	WNW9	WNW9	WNW8	WNW8	WNW10	WNW10	WNW11	WNW11	WNW8	WNW10	WNW10	W7	SSW6	WNW6.5	NW14
25-Jan	SW8	SW8	SW11	WSW13	SSW9	S13	S13	SW21	WSW21	W21	WNW20	WNW18	WNW16	WNW14	WNW14	NW14	NW17	NW14	NW17	NW14	NW14	NW12	NW10	WNW9	W10.8	W21
26-Jan	WNW9	WSW5	SW5	SW6	WSW7	WSW10	WSW9	W9	W9	W8	W10	W11	W11	WNW11	WNW8	NW6	WNW4	WSW3	WNW4	NNW7	NNW11	NNW9	NNW10	N10	WNW6.7	W11
27-Jan	N10	N9	N10	N8	N8	N8	NNE8	NNE8	NNE7	NE7	NE7	NE7	ENE8	ENE10	ENE9	ENE9	E8	ENE10	E9	E10	ESE9	ESE11	ESE12	ESE9	NE6.7	ESE12
28-Jan	ESE7	E7	ENE5	ENE4	NNW6	NW9	NW9	NW9	NW10	NW9	NW10	NW10	NW9	NW11	NNW9	NNW7	NNW9	NNW5	NW2	N1	NE4	ESE3	SE4	ESE4	NNW4.4	NW11
29-Jan	SE5	SSE6	SSE7	SSE6	SSE8	SSE8	SE7	SE7	SE8	SE10	SE9	SE9	SE9	SE9	SE9	ESE6	E4	E3	NE3	NNE3	N5	NNW5	NNW7	NNW7	SE4.3	SE10
30-Jan	NW6	NNW10	NNW9	NNW8	NNW9	NW9	NNW10	NNW11	NNW8	NNW10	NNW10	NNW9	NNW10	NNW11	NNW10	NNW11	NNW9	NNW7	NNW6	N5	NNW5	WNW3	WNW2	N3	NNW7.8	NNW11
31-Jan	WNW1	WSW2	NW2	NW0	SW1	SW2	SW2	WSW2	SSW2	S3	SSE3	S3	SSW3	WSW3	SSW4	S5	SSE4	SSE6	S6	S6	SSW6	SSW6	S5	SSW6	SSW3.0	SSE6
	WNW4.5	WNW4.4	WNW4.5	WNW4.1	WNW3.8	WNW3.9	WNW4.0	WNW4.3	WNW4.3	WNW4.3	WNW4.3	WNW4.9	WNW5.4	WNW5.9	WNW5.0	WNW4.7	WNW4.4	WNW4.3	WNW4.7	WNW4.2	WNW4.5	WNW4.5	WNW4.0	WNW4.0	Diurnal Average	
	SW18	SW17	WNW18	WNW18	WNW18	WNW18	WNW18	SW21	WSW21	W21	WNW20	SW19	SW29	SW27	WNW21	WNW18	NW17	WSW17	WNW18	SSE16	SSE18	NNW18	WNW17	W15	Diurnal Maximum	

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

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Anzac - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 21 13:00

Minimum Value: 0 km/h on Jan 31 06:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 7$

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

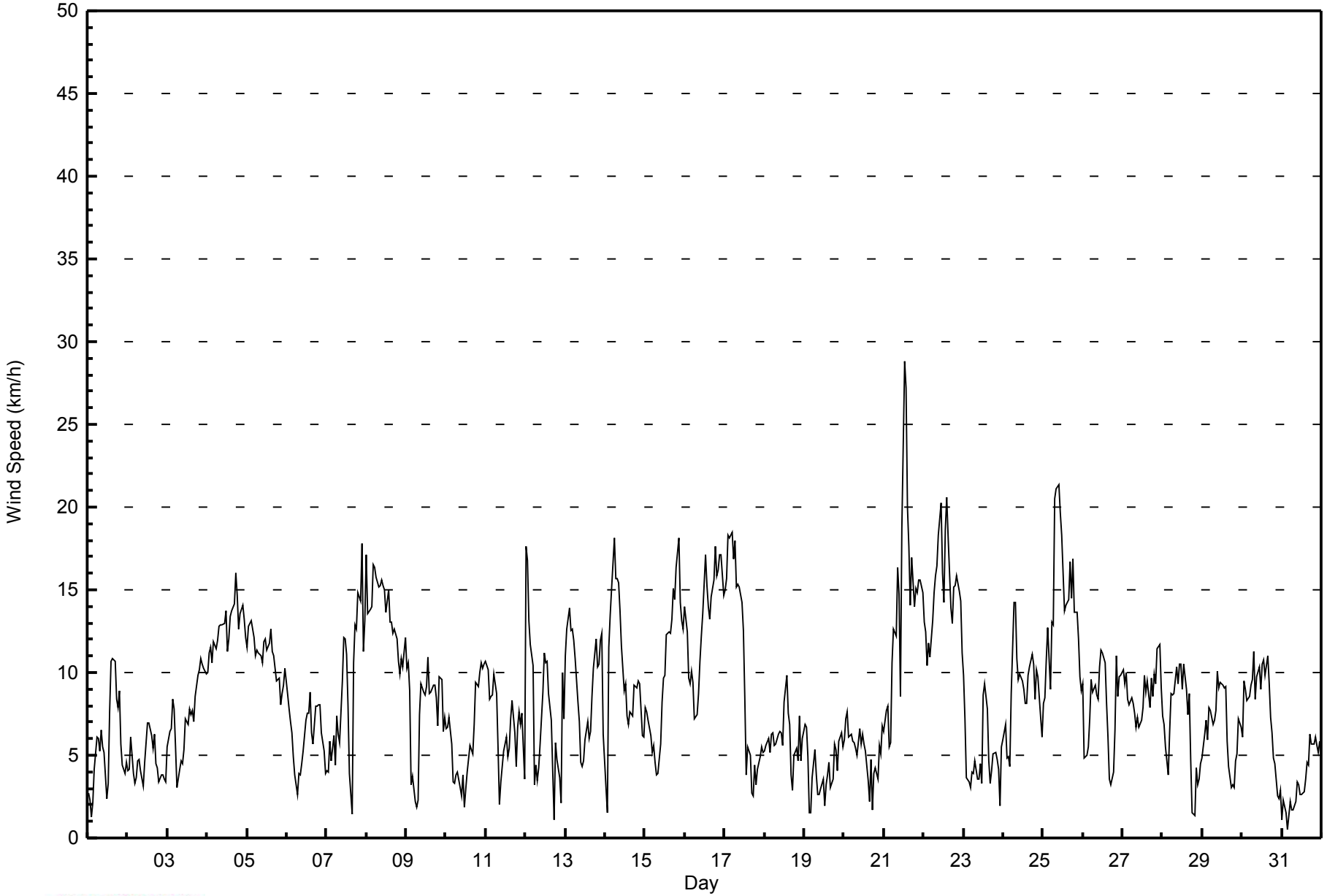
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	0	1	1	1	2	2	2	2	2	2	2	1	3	3	3	3	3	3	3	2	1	1	1	3
2-Jan	1	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	1	1	1	2	2
3-Jan	2	2	2	2	2	1	1	1	1	1	2	2	2	3	2	3	2	3	3	4	4	4	3	3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

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Anzac - January 2015



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ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	207	27.82	27.82
6 - 11	362	48.66	76.48
12 - 19	166	22.31	98.79
20 - 28	8	1.08	99.87
29 - 38	1	0.13	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Anzac - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	18	7	7	4	11	6	12	20	12	12	6	11	13	27	26	15	207
6 - 11	17	3	2	8	5	13	24	24	18	7	6	4	14	100	59	58	362
12 - 19	1	0	0	0	0	1	10	8	2	4	8	2	22	72	29	7	166
20 - 28	0	0	0	0	0	0	0	0	0	1	2	1	1	3	0	0	8
29 - 38	0	0	0	0	0	0	0	0	0	0	1	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	36	10	9	12	16	20	46	52	32	24	23	18	50	202	114	80	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

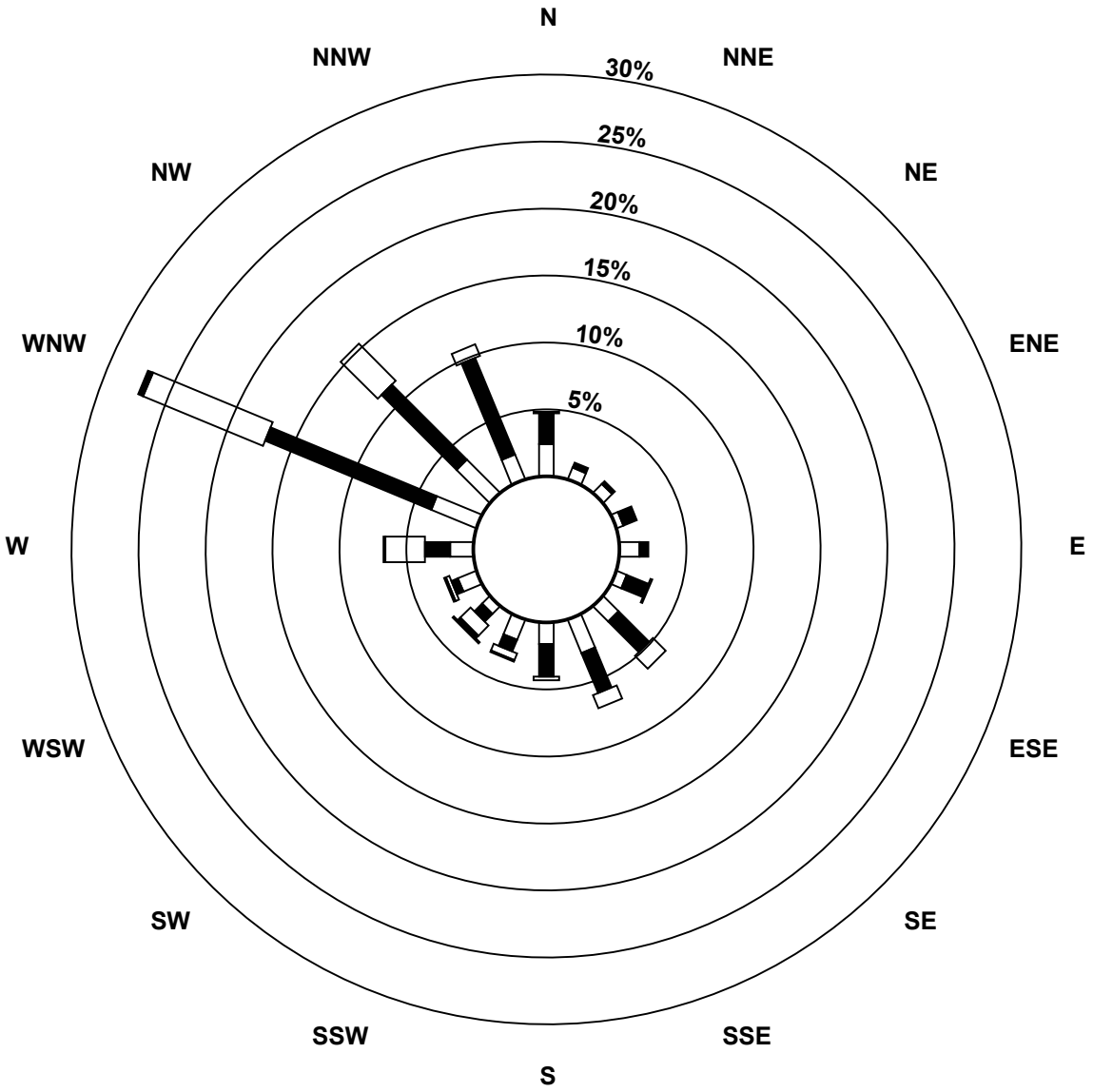
AURORA
ATMOSPHERICS INC.

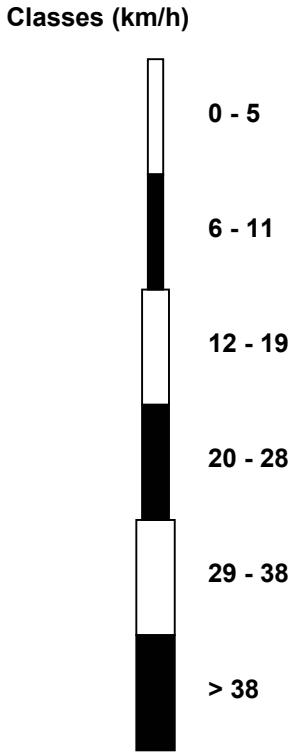
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Anzac (AMS 14)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 225 deg on Jan 21 13:00
Direction of Maximum Daily Speed Average: 288.3 deg on Jan 22

Direction of Minimum Speed: 317 deg on Jan 31 04:00

Direction of Minimum Daily Speed Average: 0.6 deg on Jan 13

Monthly Average Direction: 298.5 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-Jan	356	356	3	80	104	97	123	120	113	136	89	120	11	340	337	339	349	341	317	329	329	346	339	309	4.0
2-Jan	326	345	350	352	347	320	323	310	319	290	277	288	318	325	324	318	323	321	321	296	316	320	305	285	318.3
3-Jan	297	308	320	337	339	347	313	267	291	305	297	294	311	300	309	296	297	296	295	298	298	298	293	290	303.3
4-Jan	288	288	291	289	285	287	287	285	283	284	288	285	290	285	277	276	277	277	275	279	282	283	279	289	283.2
5-Jan	289	285	289	292	296	294	290	292	291	295	299	294	294	296	299	296	299	309	308	312	316	315	341	331	299.6
6-Jan	327	319	320	333	336	328	298	288	288	284	328	300	304	300	309	307	291	300	294	292	292	277	275	267	303.4
7-Jan	195	154	167	171	151	138	134	121	107	125	135	139	134	115	143	348	333	321	313	323	327	333	321	320	16.4
8-Jan	327	343	336	317	310	312	312	306	304	303	303	303	307	309	307	304	300	297	297	292	284	285	291	285	306.7
9-Jan	285	282	286	282	239	91	45	288	292	287	300	307	304	290	289	280	311	341	319	315	324	326	299	332	302.1
10-Jan	322	306	314	325	338	286	297	266	253	217	186	153	254	304	305	291	275	288	300	295	291	294	299	298	294.2
11-Jan	298	301	305	295	315	303	306	302	211	189	172	158	144	178	145	133	150	147	160	162	165	175	175	207	217.6
12-Jan	228	227	221	217	213	196	42	21	287	299	309	300	297	300	292	284	295	146	175	165	167	153	259	281	254.5
13-Jan	288	293	299	304	314	323	340	345	5	9	10	37	60	69	118	131	125	136	145	143	140	147	156	148	38.2
14-Jan	130	129	287	295	289	298	298	308	311	343	358	355	349	347	350	335	328	338	335	340	354	360	354	348	325.6
15-Jan	333	342	348	354	359	359	20	39	85	112	124	121	126	134	138	134	145	149	140	151	157	152	144	146	130.3
16-Jan	143	150	152	153	156	148	164	146	165	216	233	274	283	282	287	294	291	289	290	289	289	292	291	292	259.4
17-Jan	297	296	297	297	301	304	303	301	298	300	304	309	320	318	5	5	11	95	63	99	163	132	135	157	304.6
18-Jan	157	144	157	143	161	182	184	180	170	184	226	246	287	284	280	299	270	274	266	255	261	274	294	285	232.6
19-Jan	292	302	270	147	4	324	297	334	356	30	44	358	289	295	358	359	340	307	335	319	316	303	317	321	321.4
20-Jan	316	312	318	323	314	305	318	319	305	303	293	293	291	255	291	211	172	18	155	159	173	173	162	169	284.1
21-Jan	173	208	189	177	186	190	195	194	208	200	180	215	225	233	210	219	231	257	269	267	271	265	264	272	226.8
22-Jan	281	281	273	284	284	276	269	275	278	276	297	294	294	300	303	300	279	280	293	300	298	295	296	294	288.3
23-Jan	295	298	329	294	67	79	103	90	96	136	158	210	291	294	294	278	245	190	208	201	227	275	127	166	255.5
24-Jan	168	173	160	153	207	300	314	330	343	322	304	294	287	290	294	296	294	295	298	283	288	285	272	204	291.8
25-Jan	219	234	230	237	208	176	184	231	258	275	283	287	293	294	300	311	313	316	309	314	320	309	317	295	277.5
26-Jan	290	249	227	233	237	244	245	281	274	273	276	277	278	284	295	307	292	248	283	331	328	327	335	350	284.7
27-Jan	360	356	354	355	0	8	18	26	29	39	38	56	60	59	76	67	80	76	84	83	102	108	118	117	53.5
28-Jan	102	93	78	58	346	324	313	313	313	310	324	326	312	323	340	344	342	343	305	7	47	106	144	104	341.1
29-Jan	130	149	158	166	157	153	144	137	129	137	131	131	125	138	138	118	95	101	36	12	352	339	347	339	128.4
30-Jan	312	330	333	330	331	325	327	332	328	334	337	337	339	335	337	348	345	340	338	351	339	287	302	349	334.0
31-Jan	300	251	320	317	232	217	220	248	193	180	168	187	199	250	200	176	164	168	178	170	193	201	191	194	193.0
	287.5	286.7	289.5	290.9	290.3	292.8	293.0	293.2	288.0	283.2	293.0	289.1	292.2	293.9	298.1	300.9	298.3	297.1	293.2	293.3	293.3	291.3	286.2	288.2	
	Diurnal Average																								

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

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Anzac - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 87 deg on Jan 7 16:00

Minimum Value: 9 deg on Jan 31 22:00

Percentiles: P_1 = 11 P_{10} = 16 Q_1 = 19 Median = 22 Q_3 = 26 P_{90} = 31 P_{99} = 55

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

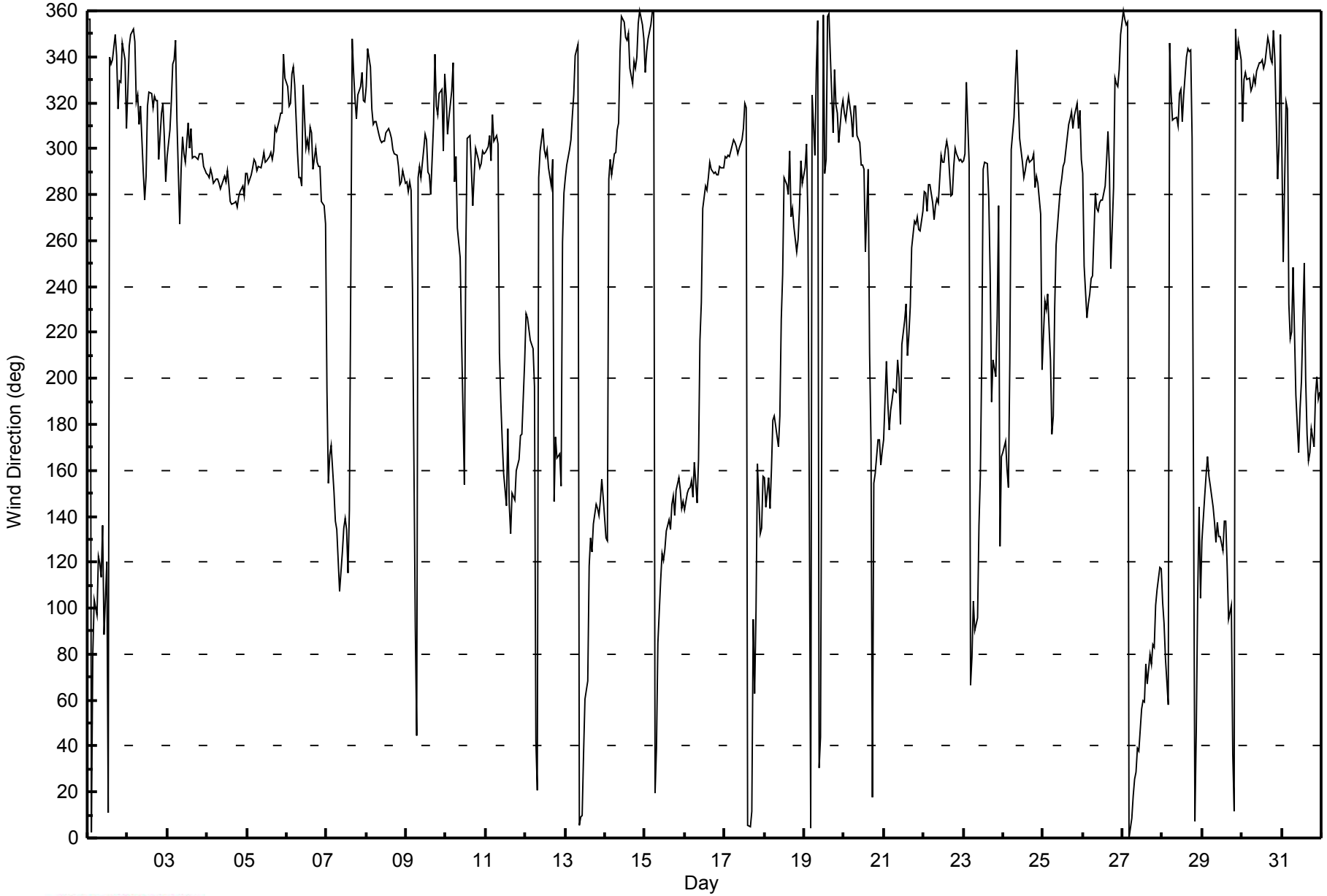
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	24	17	56	25	24	20	20	23	20	24	20	43	35	17	17	16	16	19	21	17	17	16	22	17	56
2-Jan	18	23	19	17	31	23	18	19	18	30	23	23	21	18	19	18	15	15	22	26	33	29	31	20	33
3-Jan	22	22	18	16	15	14	43	14	18	19	20	23	25	24	24	22	23	25	24	24	24	23	24	23	43
4-Jan	24	23	23	25	24	25	25	25	25	26	24	28	30	28	26	26	27	23	26	26	24	28	25	26	30
5-Jan	27	27	28	28	24	27	25	26	25	26	25	24	26	25	22	24	23	21	23	20	19	19	17	16	28
6-Jan	15	17	18	15	15	34	29	16	16	24	21	21	20	25	20	22	21	20	21	20	23	21	16	22	34
7-Jan	29	28	20	19	15	19	14	23	27	22	17	20	19	22	63	87	18	19	20	19	19	17	21	20	87
8-Jan	21	18	15	20	21	22	21	22	24	23	23	23	23	23	23	22	22	23	24	25	25	24	22	24	25
9-Jan	22	23	22	45	63	38	34	43	14	18	18	17	19	24	24	21	26	17	18	17	17	17	23	21	63
10-Jan	23	21	18	16	27	15	15	21	14	21	17	61	40	41	24	24	19	20	18	19	21	21	20	20	61
11-Jan	19	19	20	21	21	21	24	27	50	19	17	22	24	29	29	13	15	21	35	14	16	18	23	78	78
12-Jan	16	14	13	12	14	82	17	41	33	32	25	22	23	21	26	30	26	84	22	22	36	52	30	38	84
13-Jan	31	25	25	23	20	18	17	18	19	33	29	31	23	21	28	23	20	20	19	21	18	19	18	26	33
14-Jan	26	61	27	25	29	26	25	23	21	23	18	18	17	17	19	20	20	18	17	19	17	18	19	18	61
15-Jan	17	18	17	18	20	20	22	30	28	22	17	21	22	20	20	21	22	19	21	19	18	21	21	20	30
16-Jan	20	20	21	15	17	17	25	18	20	17	16	30	27	25	28	26	26	27	27	29	29	29	29	26	30
17-Jan	26	28	26	26	24	22	23	23	25	24	24	23	30	47	29	18	34	26	31	34	47	26	18	13	47
18-Jan	17	16	11	16	12	12	12	13	13	11	20	31	26	30	32	23	32	29	22	20	31	17	25	21	32
19-Jan	18	17	29	56	60	20	25	16	23	35	32	18	54	26	27	14	33	26	14	19	21	25	20	17	60
20-Jan	20	21	19	18	19	20	18	17	23	22	24	25	25	32	44	35	21	75	33	32	62	17	23	18	75
21-Jan	22	21	19	17	19	19	25	27	24	30	39	22	17	18	21	20	22	28	29	28	29	27	25	26	39
22-Jan	28	27	25	29	27	30	26	30	31	29	27	27	27	26	22	24	29	30	27	25	24	26	25	26	31
23-Jan	25	23	59	31	52	12	28	33	29	33	22	55	25	25	26	24	21	16	15	15	12	26	60	16	60
24-Jan	19	17	23	23	42	24	22	18	17	20	22	25	28	27	25	24	24	24	24	27	24	24	29	13	42
25-Jan	16	15	17	19	25	21	33	23	27	30	27	28	25	26	24	21	22	21	23	21	19	20	19	24	33
26-Jan	27	33	13	11	10	13	19	26	28	26	25	26	27	26	25	29	24	21	46	31	20	21	16	17	46
27-Jan	19	18	18	19	20	19	20	23	25	26	29	27	26	24	24	23	25	19	23	22	23	24	24	23	29
28-Jan	26	23	20	35	27	22	22	21	21	22	20	19	25	19	21	17	16	24	39	24	20	48	28	21	48
29-Jan	20	19	17	18	15	19	18	17	19	18	22	20	20	21	21	31	26	34	25	31	18	19	15	19	34
30-Jan	25	18	19	21	16	17	17	16	16	17	18	21	23	19	21	19	15	15	16	19	20	31	26	23	31
31-Jan	60	10	24	71	51	23	23	41	19	17	22	36	52	58	39	21	16	16	18	10	11	9	10	11	71
	60	61	59	71	63	82	43	43	50	35	39	61	54	58	63	87	34	84	46	34	62	52	60	78	
	Diurnal Maximum																								

WBEA

Hourly Averages

Wind Direction (WD) - deg

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Anzac - January 2015

Maximum Value: 1.5 mm on Jan 22 12:00

Maximum Daily Total: 5.1 mm on Jan 24

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 1.5 mm at hour 5

Minimum Diurnal Total: 0.0 mm at hour 6

Monthly Total: 8.89 mm

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

Hours in Service:	744
Hours of Data:	402
Hours of Missing Data:	342
Hours of Calibration:	0
Percent Operational Time:	54.0

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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.0
7-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
8-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
9-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
13-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
14-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
15-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
16-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
17-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
19-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
20-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.5
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.3	1.3	0.8	1.5	0.0	0.0	0.0	0.0	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	5.1	1.5
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.3	0.0	0.0	0.8	0.3
28-Jan	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.3	0.3	1.3	0.8	1.5	0.0	0.0	0.0	0.0	0.8	1.3	1.5	0.0	0.3	0.3	0.0	0.0	0.3	0.0	0.0	0.3	0.3	0.0	0.0	Diurnal Average	
	0.3	0.3	1.3	0.8	1.5	0.0	0.0	0.0	0.0	0.8	0.8	1.5	0.0	0.3	0.3	0.0	0.0	0.3	0.0	0.0	0.3	0.3	0.0	0.0	Diurnal Maximum	

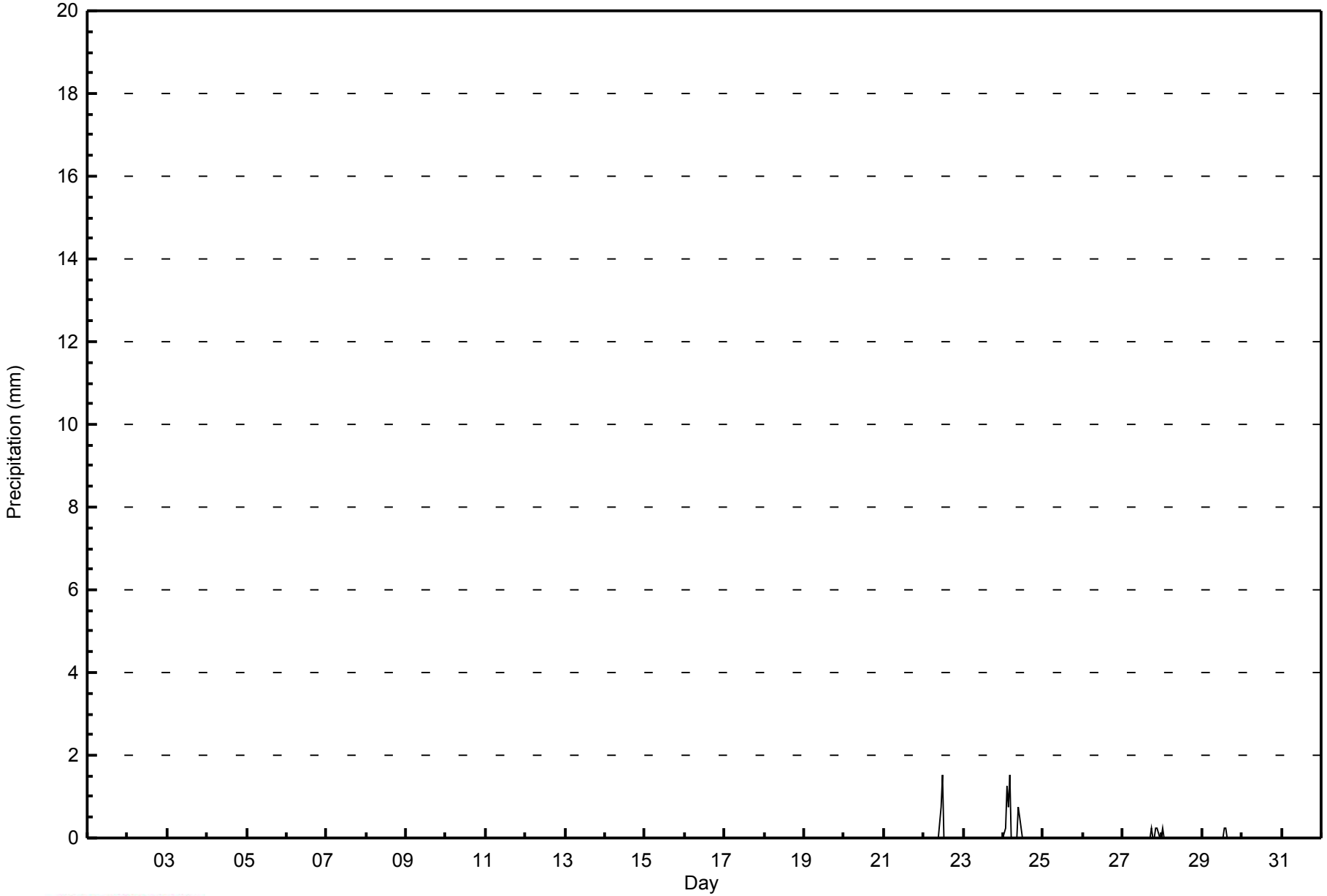
M - Maintenance AF - Analyzer Failure

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Anzac - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 5, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Removal		
Start Time (MST)	8:40	End Time (MST)	10:00
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL107928		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	NA	DACS channel #	NA

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-596	-596
Analyzer Range (mv)	1000	1000	Lamp voltage	811	811
Calculated slope	0.997445	0.998132	Chamber temp.	44.5	44.5
Calculated intercept	0.383876	-0.867237	Pressure (mmHg)	697.4	697.4
Analyzer Background	12.4	12.4	Flow (lpm)	0.393	0.393
Analyzer Coefficient	0.930	0.930	Intensity	30000	30000

Analyzer make	TEI 43C	Analyzer serial #	613516095

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.6	NA
as found span	5000	78.3	798.7	801.4	0.997
calibrator zero	5000	0.0	0.0	0.6	NA
high point	5000	78.3	798.7	801.4	0.997
second point	5000	39.1	398.8	399.0	1.000
third point	5000	19.6	199.9	202.5	0.987
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	0.994

Corrected As found	800.8	Previous response	800.3	% change	-0.1%

Notes:

Removal to put in New Analyzer to be digital

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

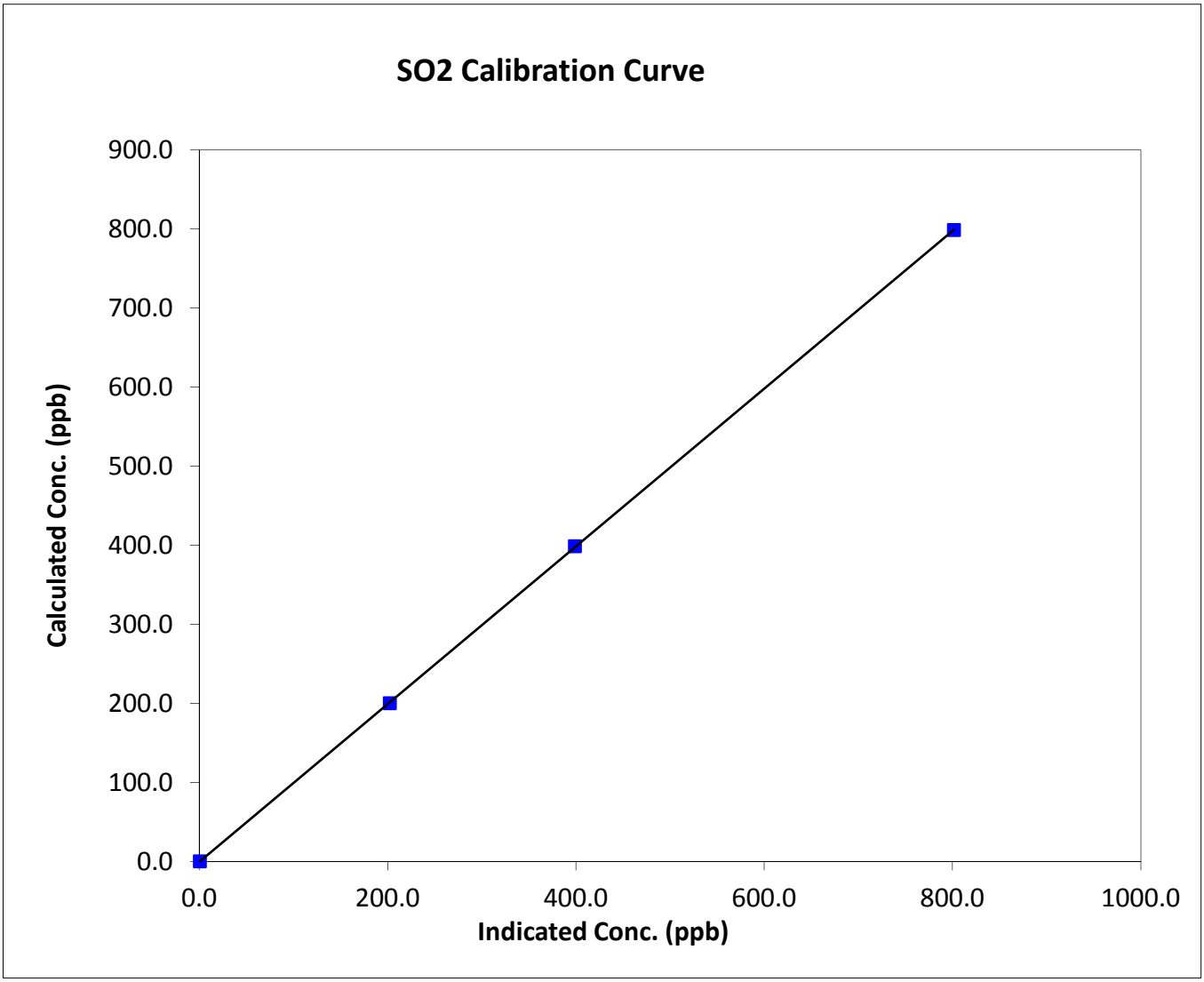
SO_2 Calibration Summary

Station Information

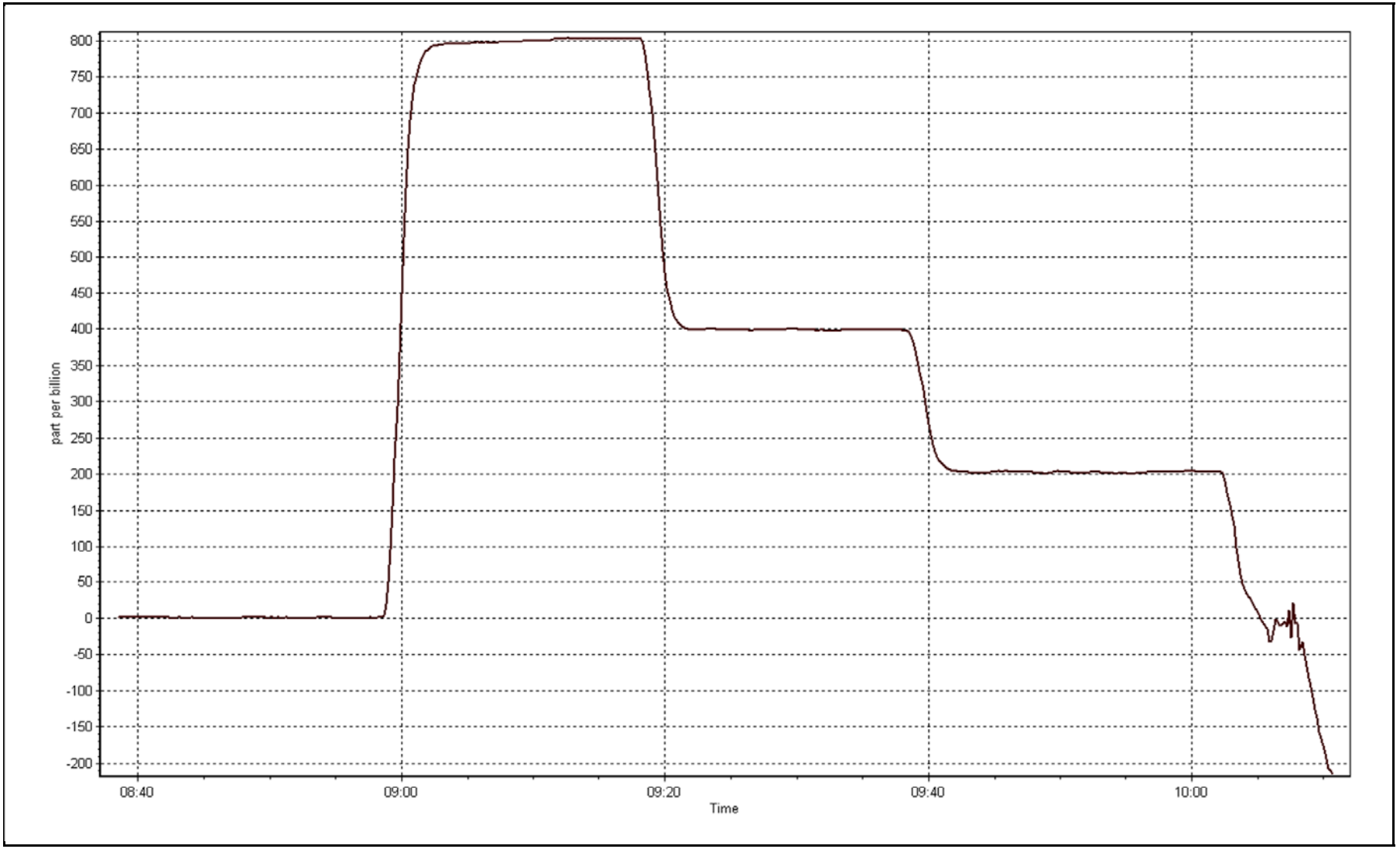
Calibration Date	January 7, 2015	Previous Calibration	December 5, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:40	End Time (MST)	10:00
Analyzer make	TEI 43C	Analyzer serial #	613516095

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.6	N/A	Correlation Coefficient	0.999988
798.7	801.4	0.9966		
398.8	399.0	0.9995	Slope	0.998132
199.9	202.5	0.9873		
			Intercept	-0.867237



SO2 Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2015	Previous Calibration	December 5, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Install		
Start Time (MST)	10:30	End Time (MST)	15:45
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL107928		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	NA	DACS channel #	NA

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	HVPS voltage	NA	524
Analyzer Range (mv)	1000	1000	Lamp voltage	NA	4081
Calculated slope	NA	0.992660	Chamber temp.	NA	33.8
Calculated intercept	NA	-0.669367	Pressure (mmHg)	NA	25.9
Analyzer Background	NA	23.1	Flow (lpm)	NA	683
Analyzer Coefficient	NA	0.990			

Analyzer make	API T100	Analyzer serial #	723

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.0	-0.1	NA
high point	5000	78.3	798.7	805.2	0.992
second point	5000	39.1	398.8	401.8	0.993
third point	5000	19.6	199.9	203.5	0.982
calibrator zero	5000	0.0	0.0	-0.1	NA
as left zero	5000	0.0	0.0	-0.1	NA
as left span	5000	78.3	798.7	788.0	1.014
				Average Correction Factor	0.989

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Installed removed 43C, Leak in connection, fixed restarted Cal @13:43MST

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

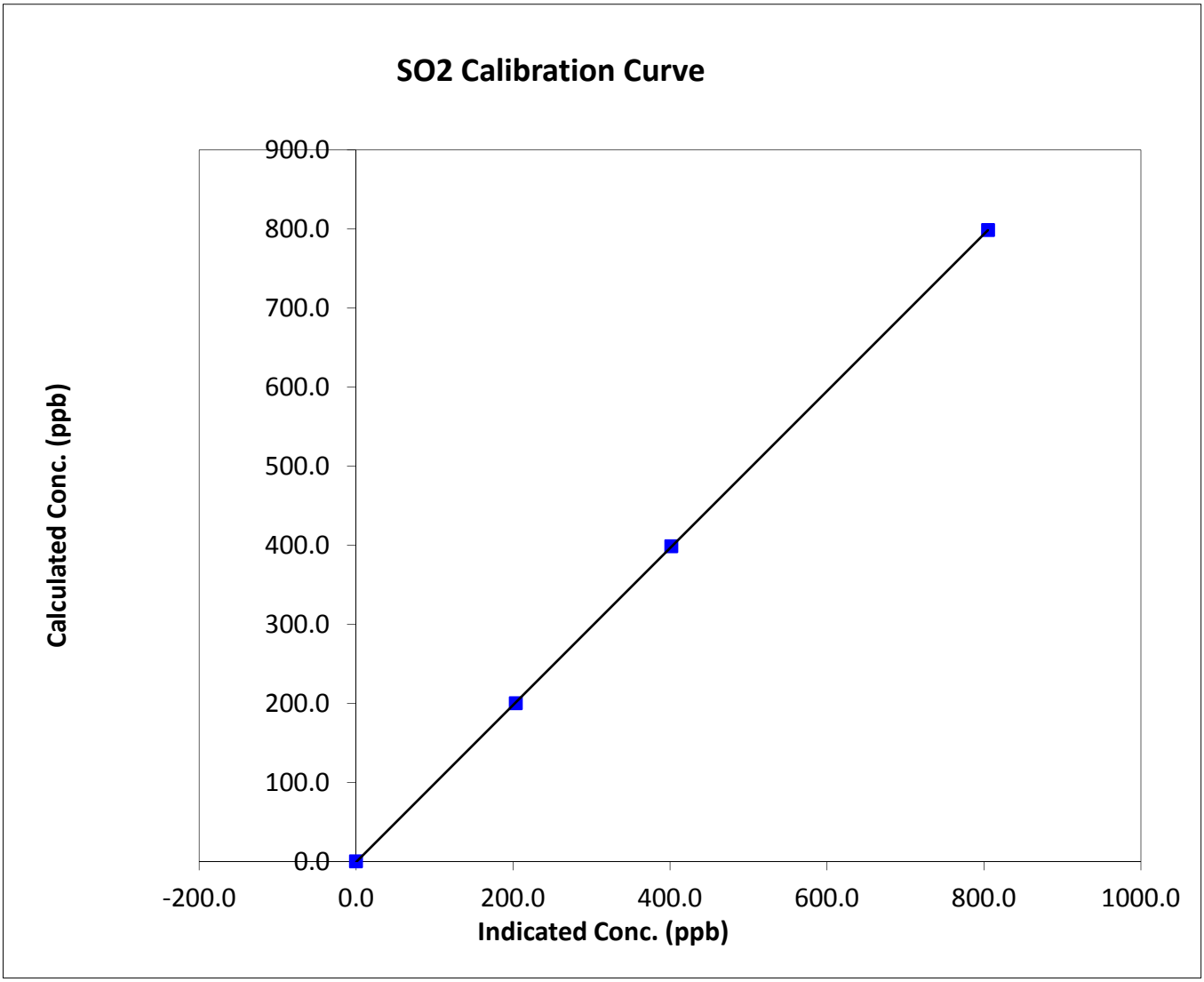
SO_2 Calibration Summary

Station Information

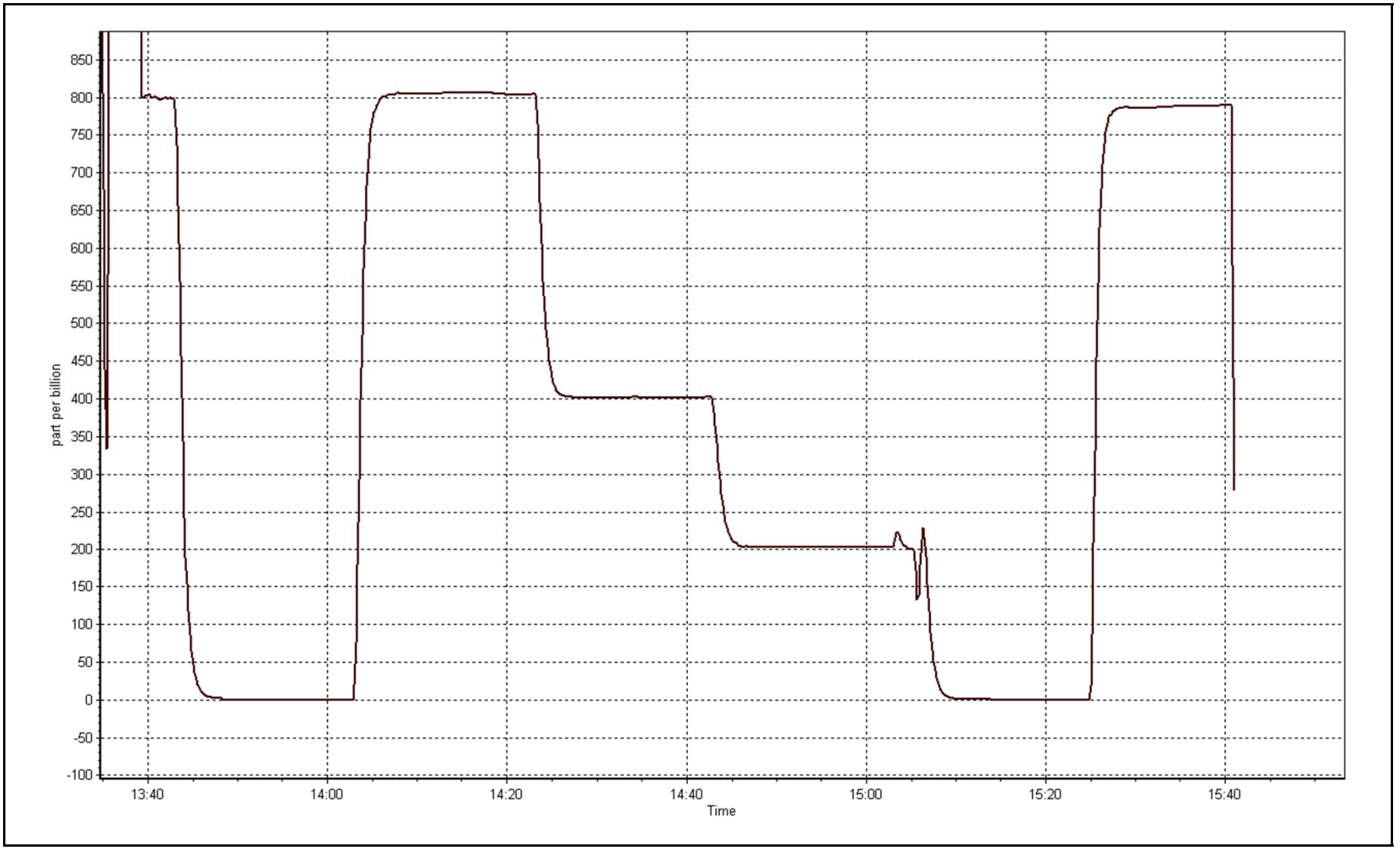
Calibration Date	January 7, 2015	Previous Calibration	December 5, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	10:30	End Time (MST)	15:45
Analyzer make	API T100	Analyzer serial #	723

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999992
798.7	805.2	0.9919		
398.8	401.8	0.9926	Slope	0.992660
199.9	203.5	0.9824		
			Intercept	-0.669367



SO2 Calibration Plot Date: January 7, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 6, 2015	Previous Calibration	December 8, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	11:25	End Time (MST)	13:55
Barometric Pressure	732 mmHg	Station temp.	22
Calibrator Make/Model	Sabio 4010	Serial number	8400311
Cal Gas Concentration	9.6 ppm H2S	Cal Gas Expiry Date	22/02/2016
Gas Cert Reference	LL82745	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	0-5 volts	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-730	-730
Analyzer Range (input)	100	100	Lamp voltage	1004	1004
Calculated slope	0.996905	1.013178	Chamber temp.	45	45
Calculated intercept	0.061070	-0.118954	Pressure	679.5	679.5
Analyzer Background	1.97	1.97	Flow	0.400	0.400
Analyzer Coefficient	1.094	1.094	Intensity	98	98
			Converter temp.	800	800

Analyzer make/model	43i-TL	Analyzer serial #	1300156232
Converter make/model	CDN-101	Converter serial #	510

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.4	NA
as found span	5000	39.1	75.1	73.8	1.017
SO2 scrubber check	5000	39.1	398.8	0.0	NA
calibrator zero	5000	0.0	0.0	-0.4	NA
high point	5000	39.1	75.1	73.8	1.017
second point	5000	20.8	39.9	40.1	0.996
third point	5000	10.4	20.0	20.2	0.989
calibrator zero	5000	0.0	0.0	-0.2	NA
as left zero	5000	0.0	0.0	-0.2	NA
as left span	5000	39.1	75.1	73.9	1.016
				Average Correction Factor	1.001

Corrected As found	74.2	Previous response	75.2	% change	1.4%

Notes:

scrubber checked before as founds,filter change out, No maintenance or adjustments made

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

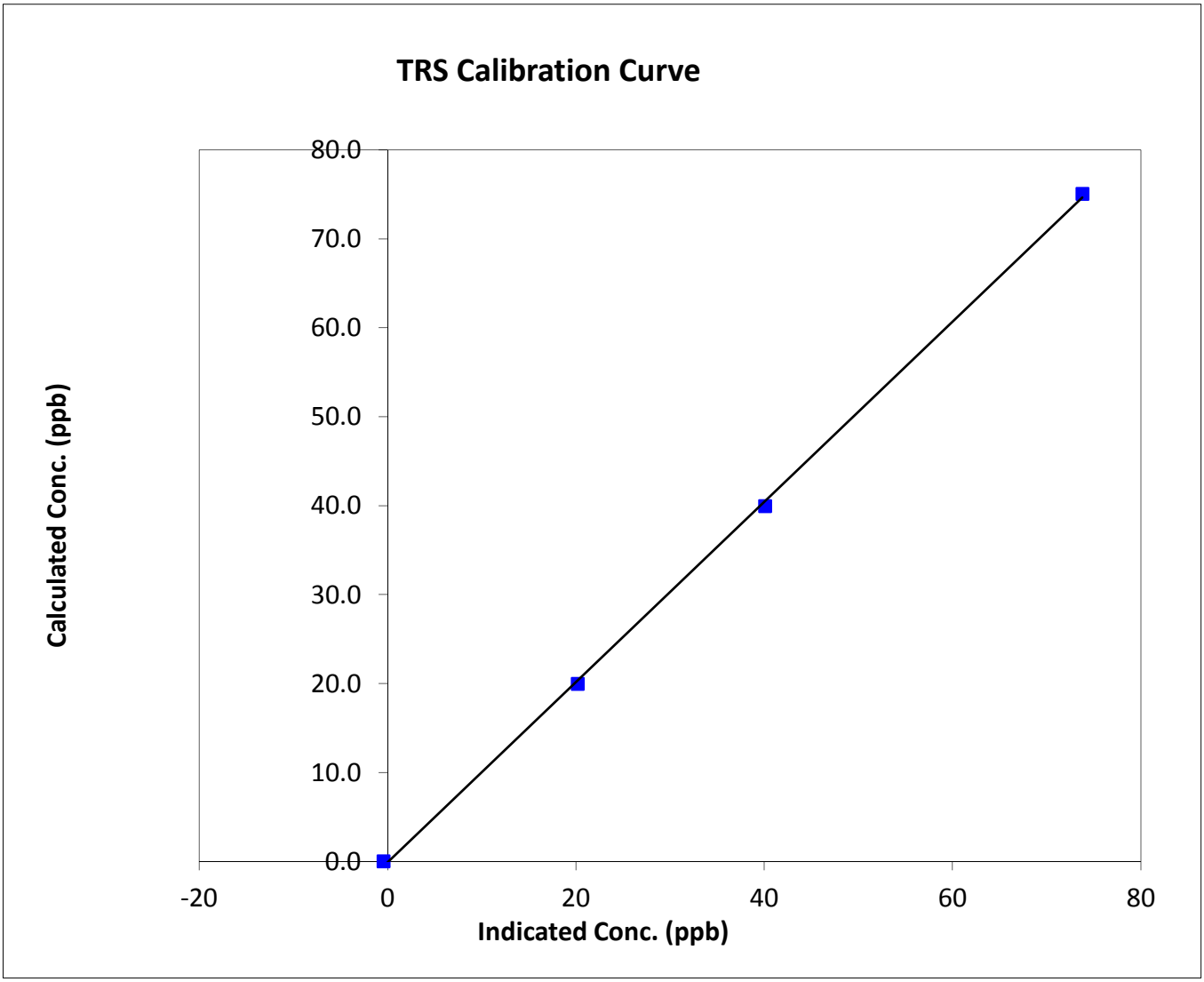
TRS Calibration Summary

Station Information

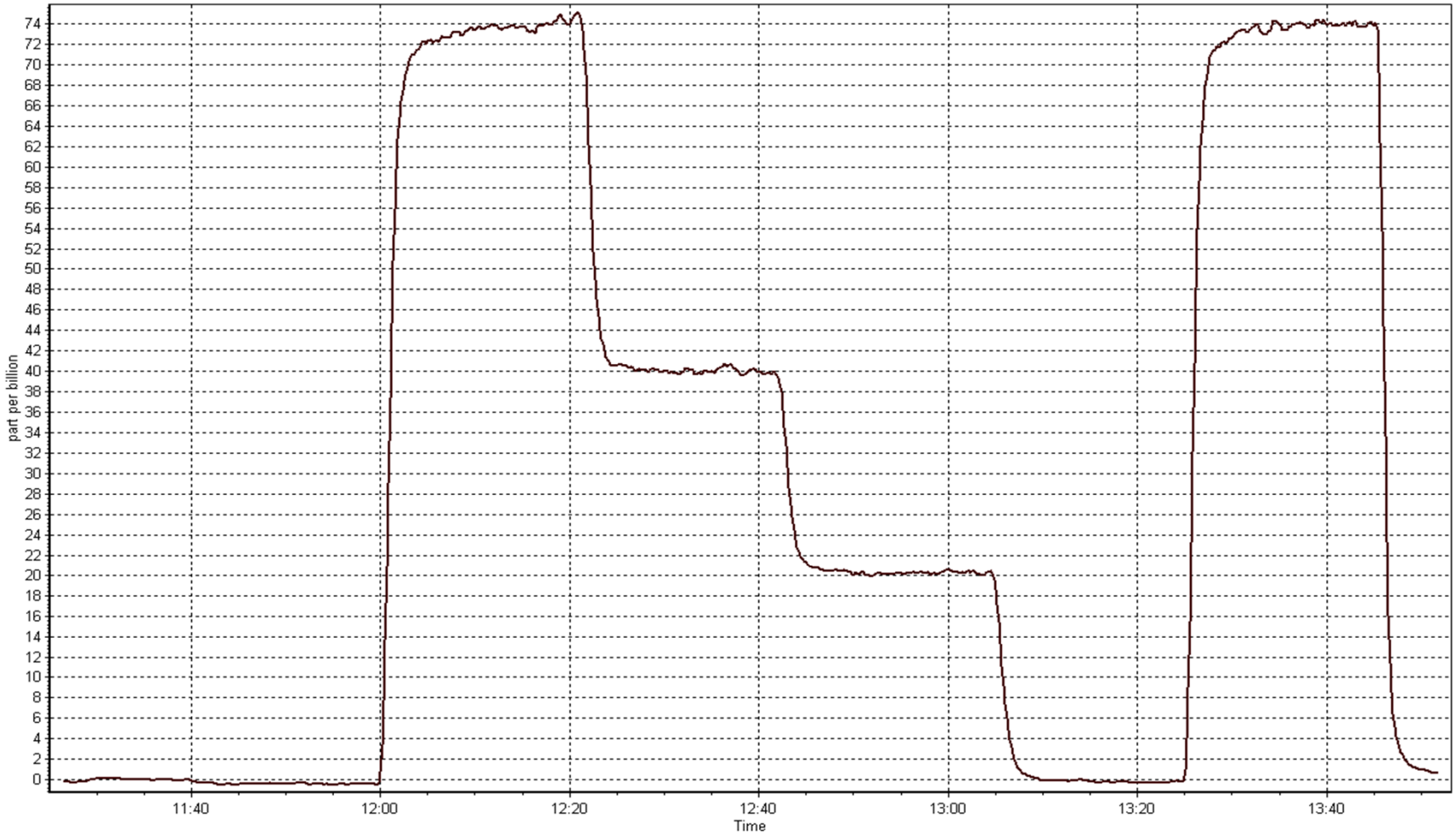
Calibration Date	January 6, 2015	Previous Calibration	December 8, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	11:25	End Time (MST)	13:55
Analyzer make	43i-TL	Analyzer serial #	1300156232

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	0.999696
75.1	73.8	1.0172		
39.9	40.1	0.9959	Slope	1.013178
20.0	20.2	0.9885		
			Intercept	-0.118954



TRS Calibration Plot Date: January 6, 2015



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January-06-15	Prev Calibration	December-18-14
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	9:20	End Time (MST)	11:30
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	LL107928	Cal Gas Expiry Date	May-29-14
CH4 Cal Gas Conc.	505.0 ppm	CH4 Equiv Conc.	1066.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	30.7	30.7
THC Range (input)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Carrier Pressure	31.8	31.8
NMHC Range (input)	50	50	Fuel Pressure	41.4	41.4
THC Calc slope	0.996630	0.983935	Air Pressure	32.5	32.5
THC Calc intercept	0.000000	0.025898			
NMHC Calc slope	0.997192	0.972478			
NMHC Calc intercept	0.000000	0.003994			

Analyzer make	TEC 55i	Analyzer serial #	**1218153355**

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.00	N/A
as found span	5000	78.3	16.69	16.97	0.984
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	16.97	0.984
second point	5000	39.1	8.34	8.38	0.995
third point	5000	19.6	4.18	4.23	0.988
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	16.69	17.00	0.982
				Average Correction Factor	0.989

Corrected As found	16.97	Previous response	16.75	% change	-1.3%

Notes:

Filter changed out, no adjustments or maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	8.79	9.04	0.972
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	9.04	0.972
second point	5000	39.1	4.39	4.48	0.979
third point	5000	19.6	2.20	2.27	0.969
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	8.79	8.99	0.977
				Average Correction Factor	0.973

Corrected As found	9.04	Previous response	8.81	% change	-2.5%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	7.91	7.93	0.997
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	7.93	0.997
second point	5000	39.1	3.95	3.90	1.013
third point	5000	19.6	1.98	1.96	1.010
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	7.91	8.01	0.987
				Average Correction Factor	1.007

Corrected As found	7.93	Previous response	7.94	% change	0.1%

Wood Buffalo Environmental Association

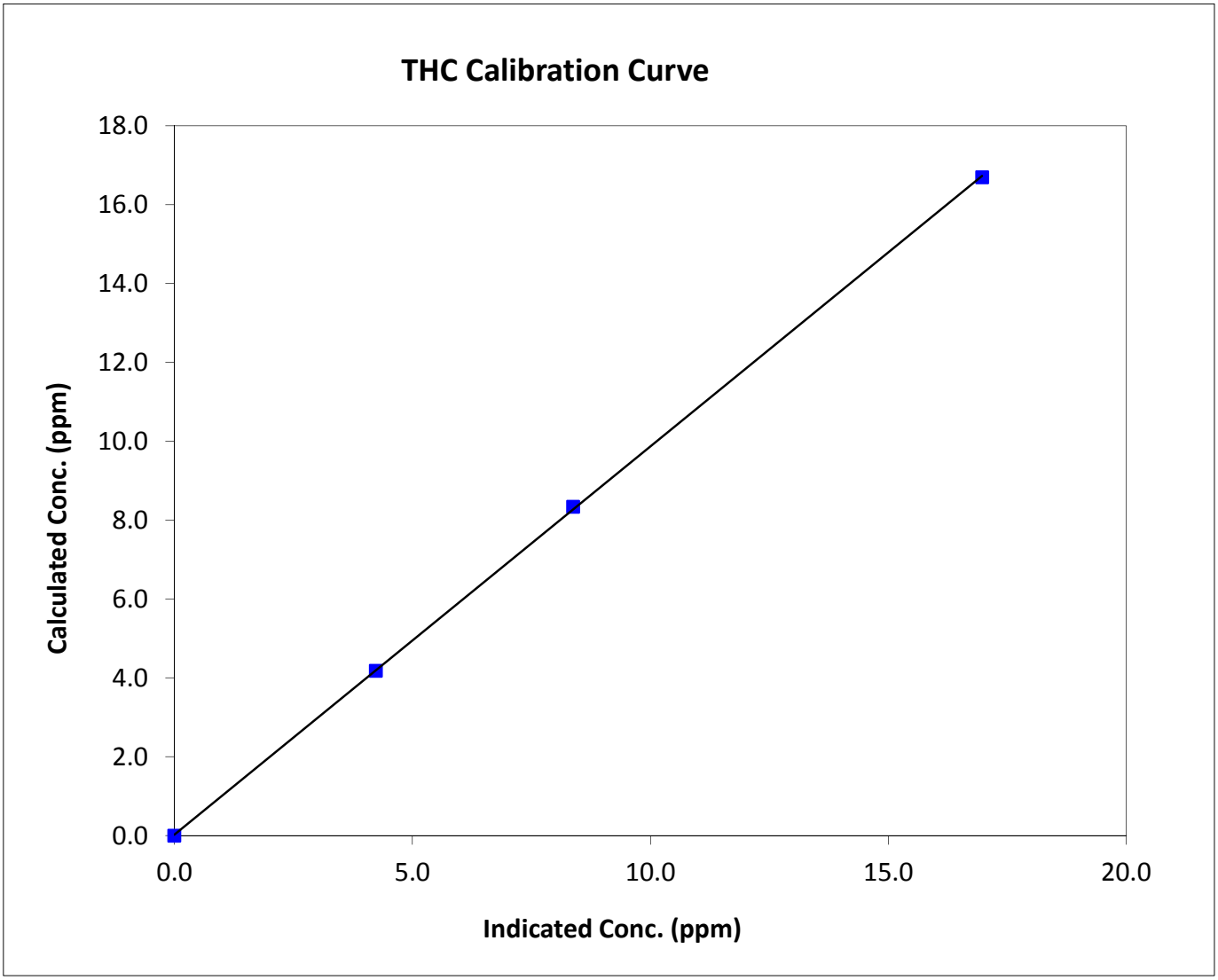
THC Calibration Summary

Station Information

Calibration Date	January 6, 2015	Previous Calibration	December 18, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	9:20	End Time (MST)	11:30
Analyzer make	TEC 55i	Analyzer serial #	1218153355

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999962
16.69	16.97	0.9837		
8.34	8.38	0.9948	Slope	0.983935
4.18	4.23	0.9879		
			Intercept	0.025898



Wood Buffalo Environmental Association

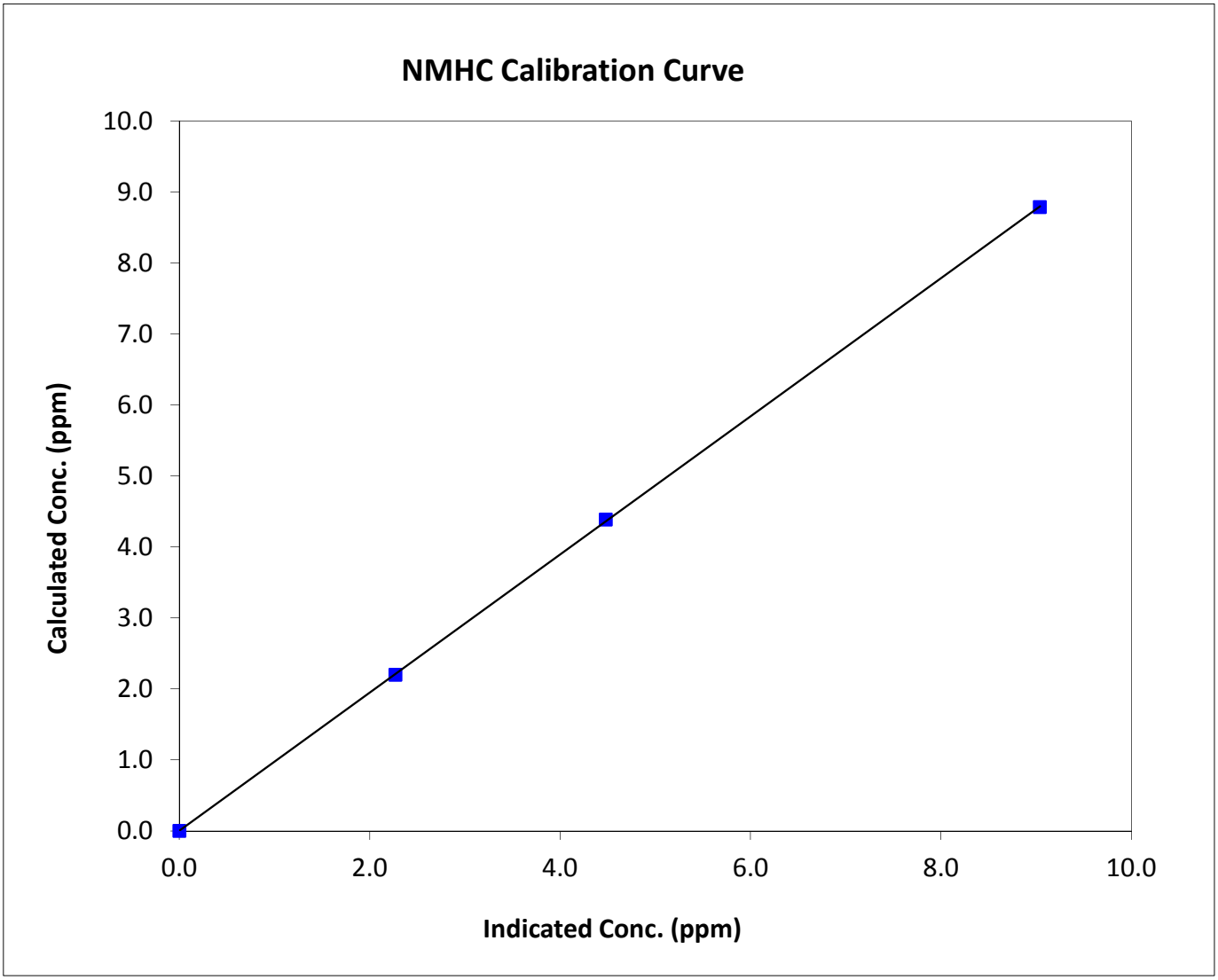
NMHC Calibration Summary

Station Information

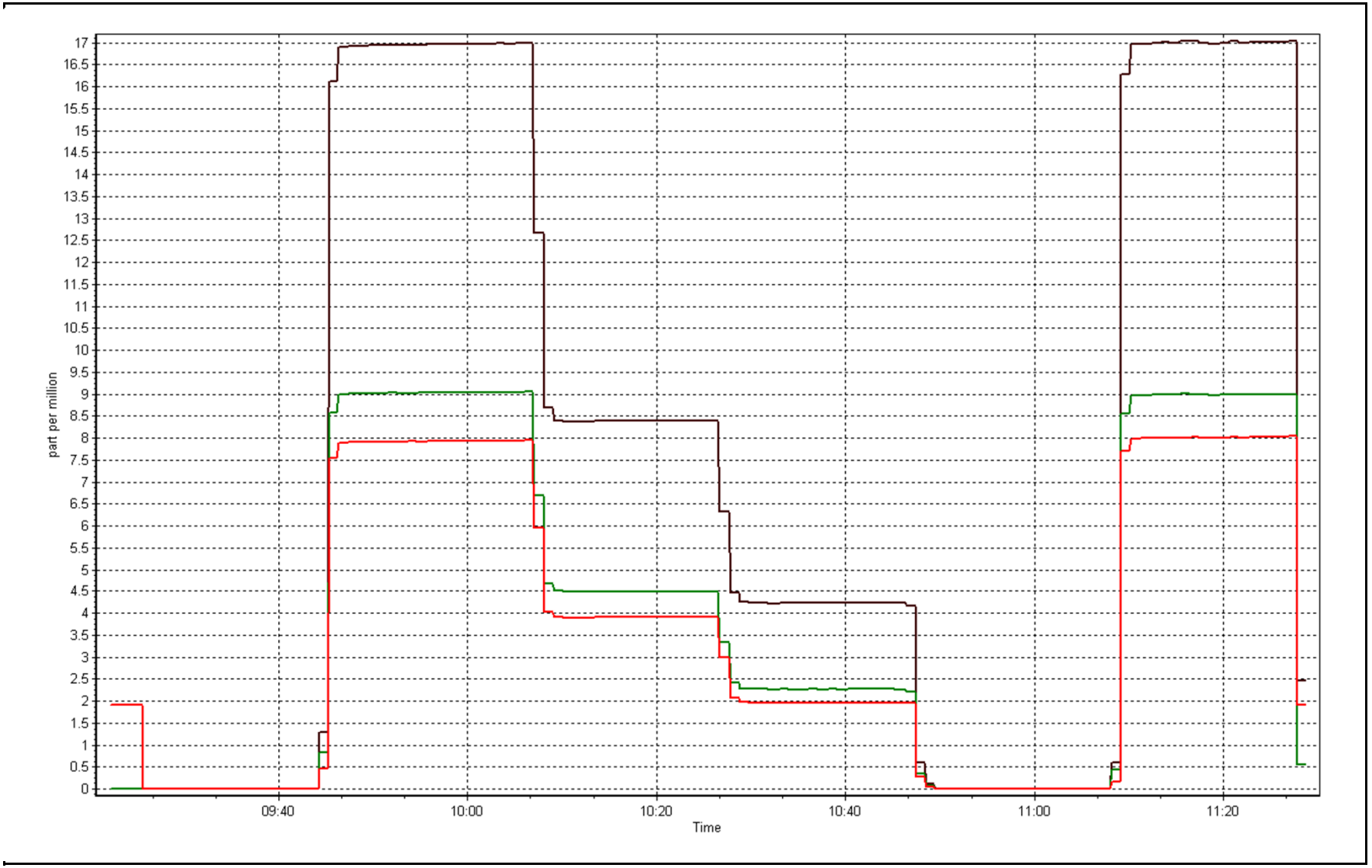
Calibration Date	January 6, 2015	Previous Calibration	December 18, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	9:20	End Time (MST)	11:30
Analyzer make	TEC 55i	Analyzer serial #	1218153355

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999977
8.79	9.04	0.9718		
4.39	4.48	0.9792	Slope	0.972478
2.20	2.27	0.9688		
			Intercept	0.003994



THC/NMHC Calibration Plot Date: January 6, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	December 8, 2014
Station Name	Anzac	Station Number	AMS 14
Reason:	Removal		
Start Time (MST)	9:50	End Time (MST)	11:32
Barometric Pressure	732 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
NO2 calibration used	January-08-15	Transfer Standard	
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	5000	DACS channel #	7 & 8

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	29.0	
Analyzer Range (input)	500	500	Lamp temp.	55.8	
Calculated slope	0.999771	1.015755	Pressure	717.0	
Calculated intercept	-0.497235	0.437870	Flow cell A	0.821	
Analyzer Background	0		Flow cell B	0.759	
Analyzer Coefficient	1.019		Cell A Intensity	85875	
			Cell B Intensity	66249	

Analyzer make	49C	Analyzer serial #	509110892

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	0.2	N/A
as found span	5000	1.19	418.7	411.3	1.018
calibrator zero	5000	0.00	0.0	0.2	N/A
high point	5000	1.19	418.7	411.3	1.018
second point	5000	0.85	286.9	283.6	1.012
third point	5000	0.50	150.3	145.8	1.031
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.020

Corrected As found	411.1	Previous response	419.3	% change	2.0%

Notes:

Removed for upgrade of station to digital

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

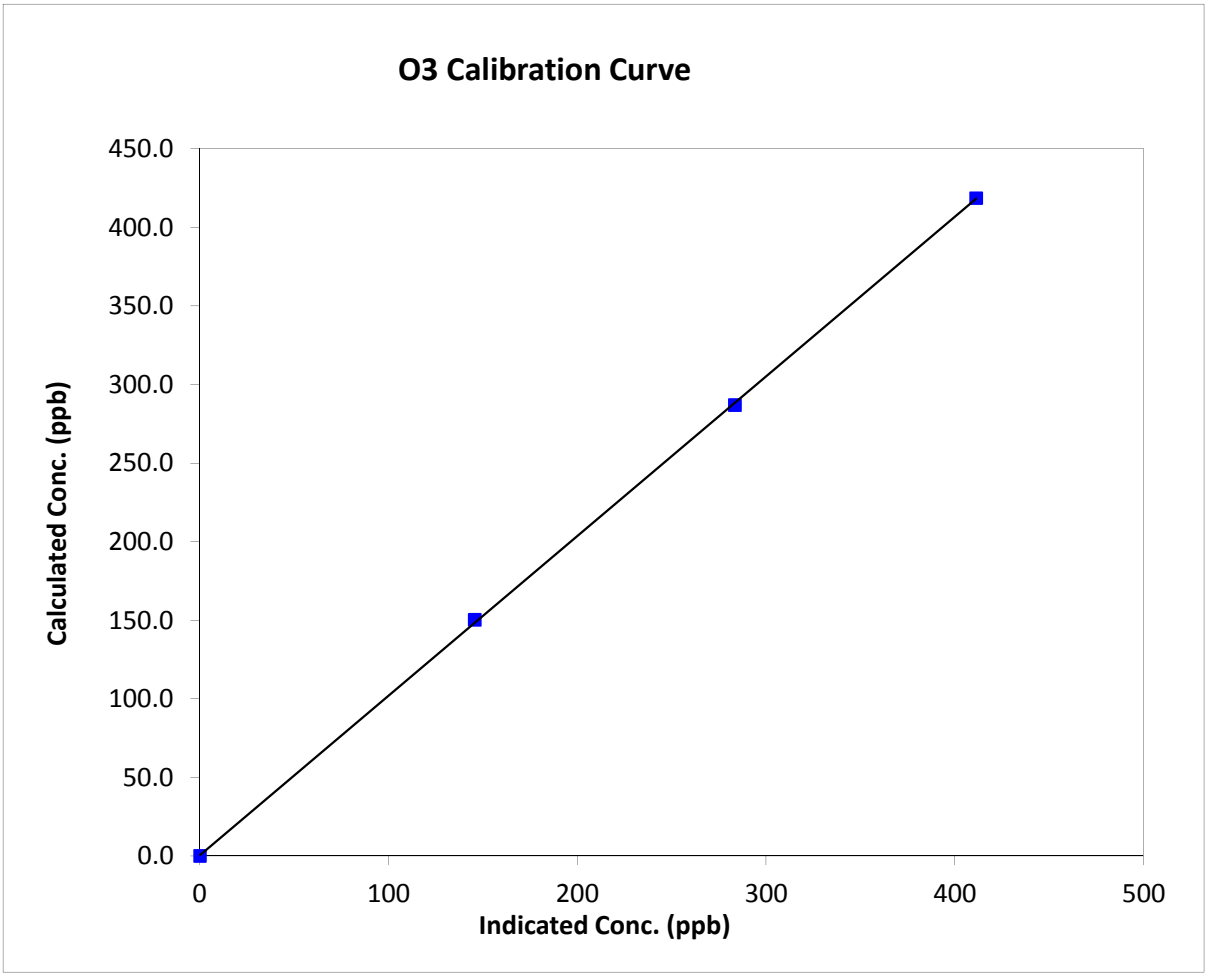
O_3 Calibration Summary

Station Information

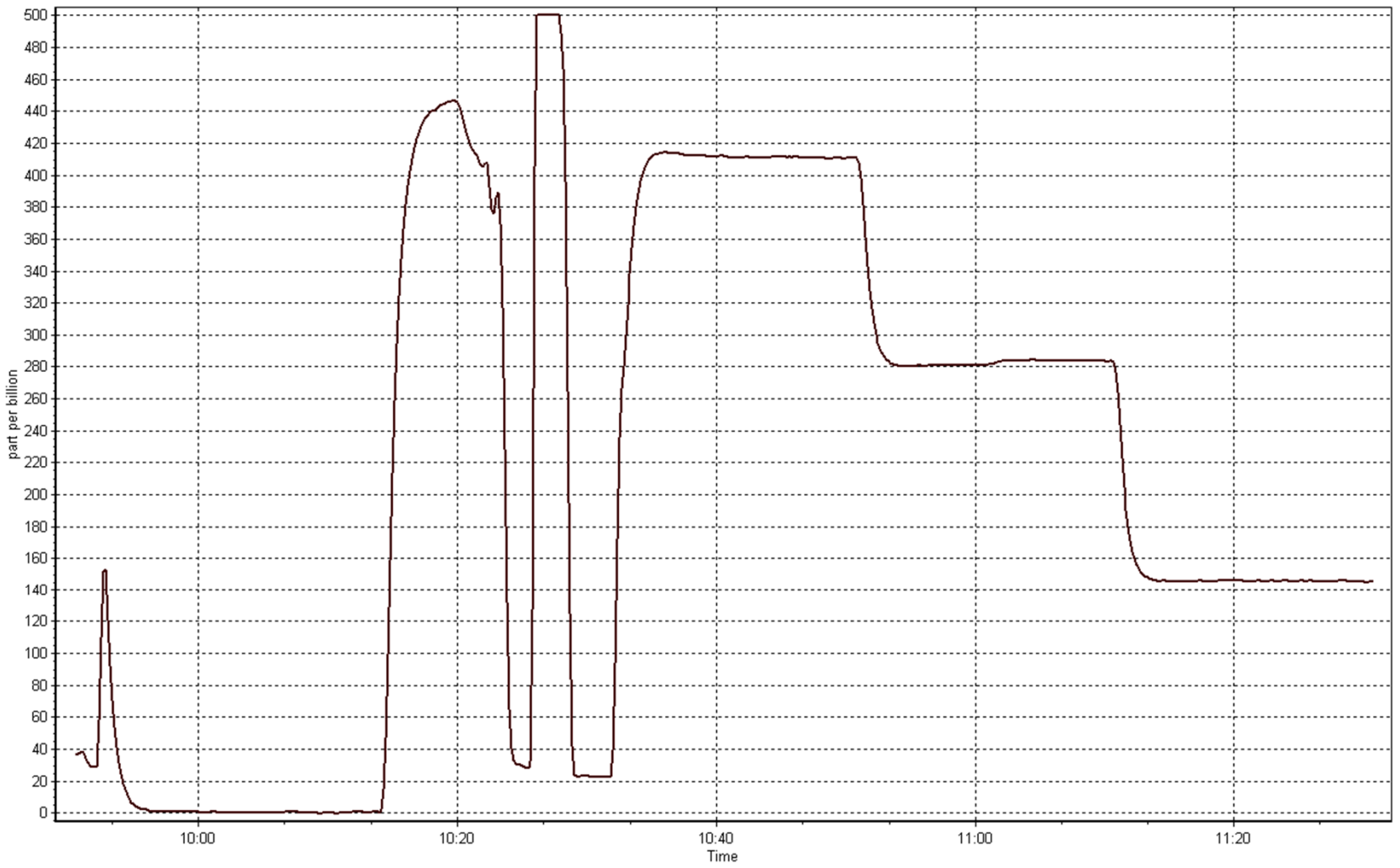
Calibration Date	January-09-15	Previous Calibration	December 8, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	9:50	End Time (MST)	11:32
Analyzer make	49C	Analyzer serial #	509110892

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999935
418.7	411.3	1.0180		
286.9	283.6	1.0116	Slope	1.015755
150.3	145.8	1.0309		
			Intercept	0.437870



O3 Calibration Plot Date: January 9, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 9, 2015	Previous Calibration	
Station Name	Anzac	Station Number	AMS 14
Reason:	Removal		
Start Time (MST)	11:40	End Time (MST)	14:10
Barometric Pressure	732 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
NO2 calibration used	January-08-15	Transfer Standard	
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	5000	DACS channel #	7 & 8

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	26.2	26.2
Analyzer Range (input)	500	500	Lamp temp.	53.8	53.8
Calculated slope	NA	1.000744	Pressure	663.1	663.1
Calculated intercept	NA	0.761411	Flow cell A	0.707	0.707
Analyzer Background	NA	0.3	Flow cell B	0.708	0.708
Analyzer Coefficient	NA	1.099	Cell A Intensity	139167	139167
			Cell B Intensity	146575	146575

Analyzer make	49i	Analyzer serial #	1426262596

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.00	0.0	-0.5	N/A
high point	5000	1.19	418.7	418.0	1.002
second point	5000	0.85	286.9	285.5	1.005
third point	5000	0.50	150.3	149.2	1.007
calibrator zero	5000	0.00	0.0	-0.2	N/A
as left zero	5000	0.00	0.0	-0.2	N/A
as left span	5000	1.19	418.7	406.0	1.031
				Average Correction Factor	1.005

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Installed for upgrade of station to digital

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

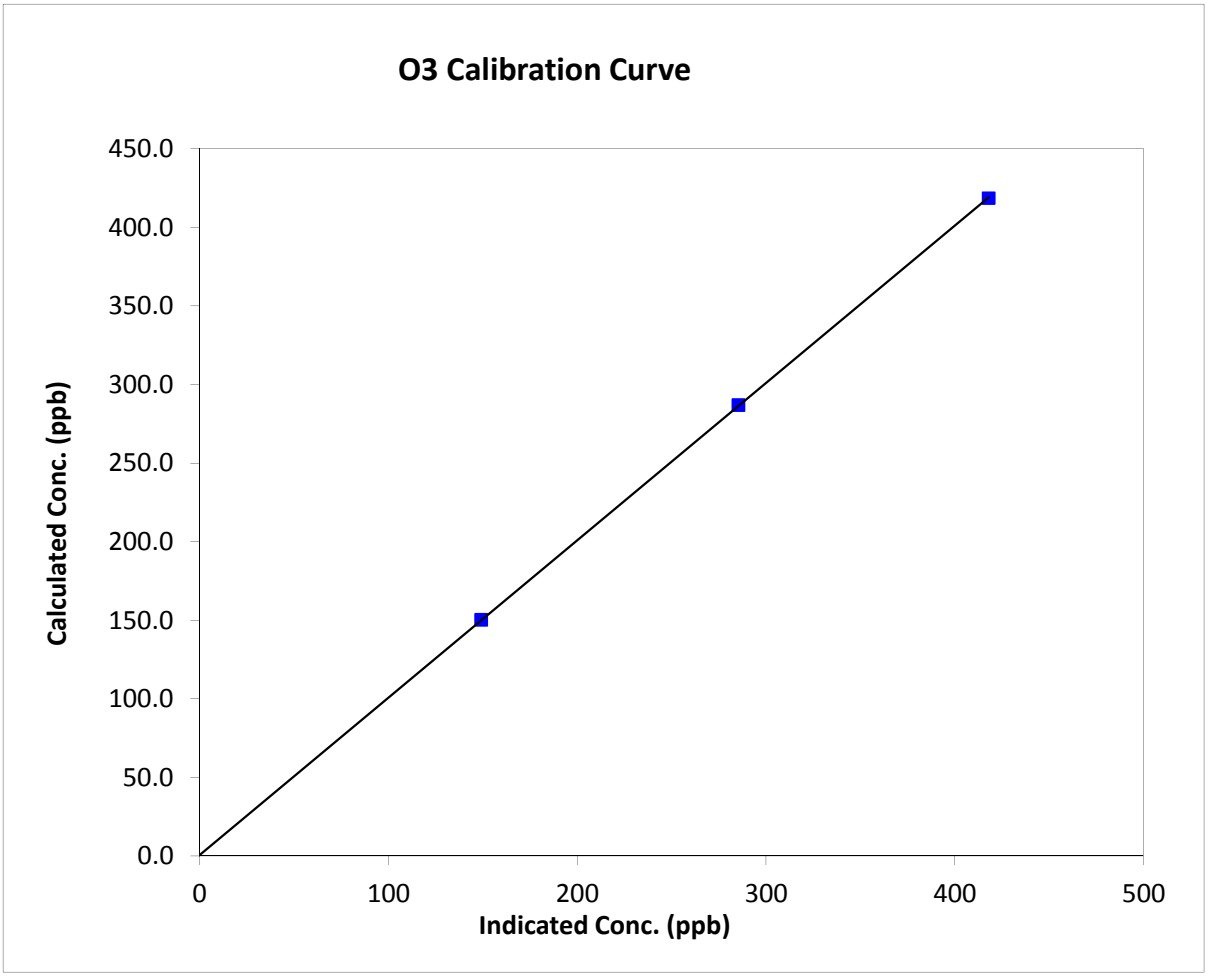
O_3 Calibration Summary

Station Information

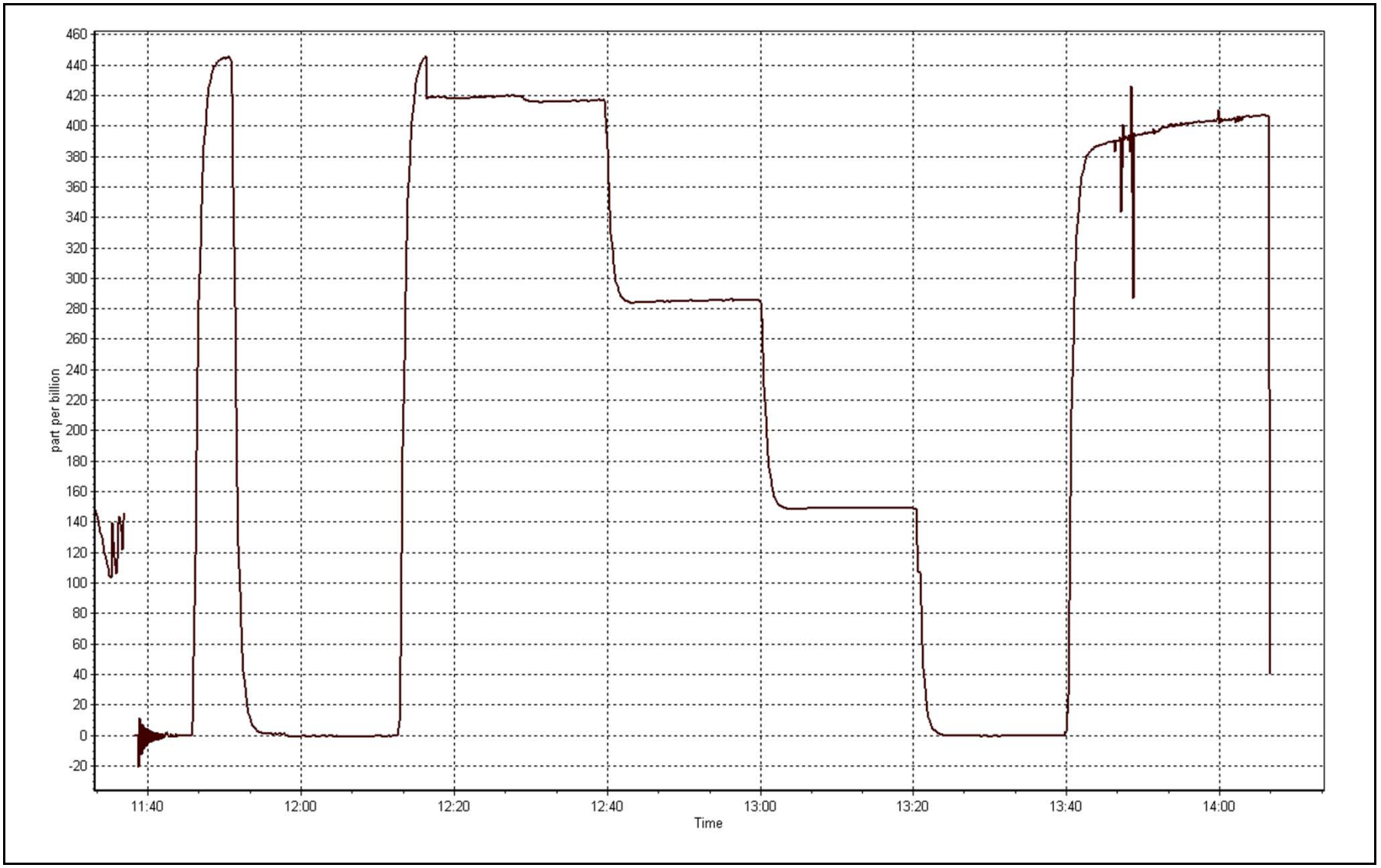
Calibration Date	January-09-15	Previous Calibration	
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	11:40	End Time (MST)	14:10
Analyzer make	49i	Analyzer serial #	1426262596

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999995
418.7	418.0	1.0017		
286.9	285.5	1.0049	Slope	1.000744
150.3	149.2	1.0074		
			Intercept	0.761411



O3 Calibration Plot Date: January 9, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 8, 2015		Previous Calibration	December 5, 2014	
Station Name	Anzac		Station Number	AMS 14	
Reason:	Removal				
Start Time (MST)	8:45		End Time (MST)	13:30	
Barometric Pressure	n/a	mmHg	Station Temperature	22.0	Deg C
Calibrator	Sabio 4010		Serial Number	8400311	
NO Cal Gas Conc	51.1	ppm	Cal Gas Expiry Date	May 29, 2014	
NOx Cal Gas Conc	51.2	ppm	Cal Gas Serial #	LL107928	

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.:

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	1.004396	1.003840	1.000225
	Data Offset	-0.548288	-0.099644	-0.634432
After	Data Slope	1.011610	1.011778	0.999659
	Data Offset	-0.619639	-0.477949	0.372058
Channel #		6	5	4
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model: 42C — Analyzer serial #: 509110890

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	0.864	ppb	0.864	ppb
NOX coefficient	1.000	ppb	1.000	ppb
NO2 coefficient	1.002	ppb	1.002	ppb
NO bkgrnd	14.5		14.5	
NOX bkgrnd	14.5		14.5	
Nt coefficient	n/a		n/a	
Chamber Temp	49.8	Deg C	49.9	Deg C
Moly Temp	318.0	Deg C	318.0	Deg C
PMT Temp	-2.5	Deg C	-2.7	Deg C
O3 flow	Ok	ccm	Ok	ccm
R Cell Press	207.0	mmHg	202.4	mmHg
Sample Flow	0.560	ccm	0.550	ccm

Notes:

Removing to put in new 42i for station going digital

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 8, 2015 Station Number: AMS 14

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	1.2	1.1	0.1	N/A	N/A
as found span	5000	78.3	801.8	800.2	1.6	794.0	792.2	0.9	1.0098	1.0101
calibrator zero	5000	0.0	0.0	0.0	0.0	1.2	1.1	0.1	N/A	N/A
high point	5000	78.3	801.8	800.2	1.6	794.0	792.2	0.9	1.0098	1.0101
second point	5000	39.1	400.4	399.6	0.8	394.6	393.6	0.4	1.0147	1.0152
third point	5000	19.6	200.7	200.3	0.4	199.4	198.8	0.4	1.0065	1.0076
calibrator zero										
as left zero										
as left span										
								Average Correction Factor	1.0103	1.0110

Corrcted As found NO_X= 792.8 NO= 791.1 Percent Change NO_X= 0.8% NO= 0.8%

Previous Response NO_X= 798.8 NO= 797.3

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.1			N/A	
1st NO2 (300)	N/A	378.9	413.1	793.1	378.9	413.4	0.9954	1.0000	0.9993	100.1%
2nd NO2 (200)	N/A	506.4	285.6	791.8	506.4	284.8	0.9970	1.0000	1.0028	99.7%
3rd NO2 (100)	N/A	644.7	147.3	792.0	644.7	146.5	0.9968	1.0000	1.0055	99.5%
4th NO2 (0)	792.0	N/A	1.1	793.1	792.0	0.1	0.9954	1.0000	N/A	N/A
					Average Correction Factor		0.9961	1.0000	1.0025	99.7%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

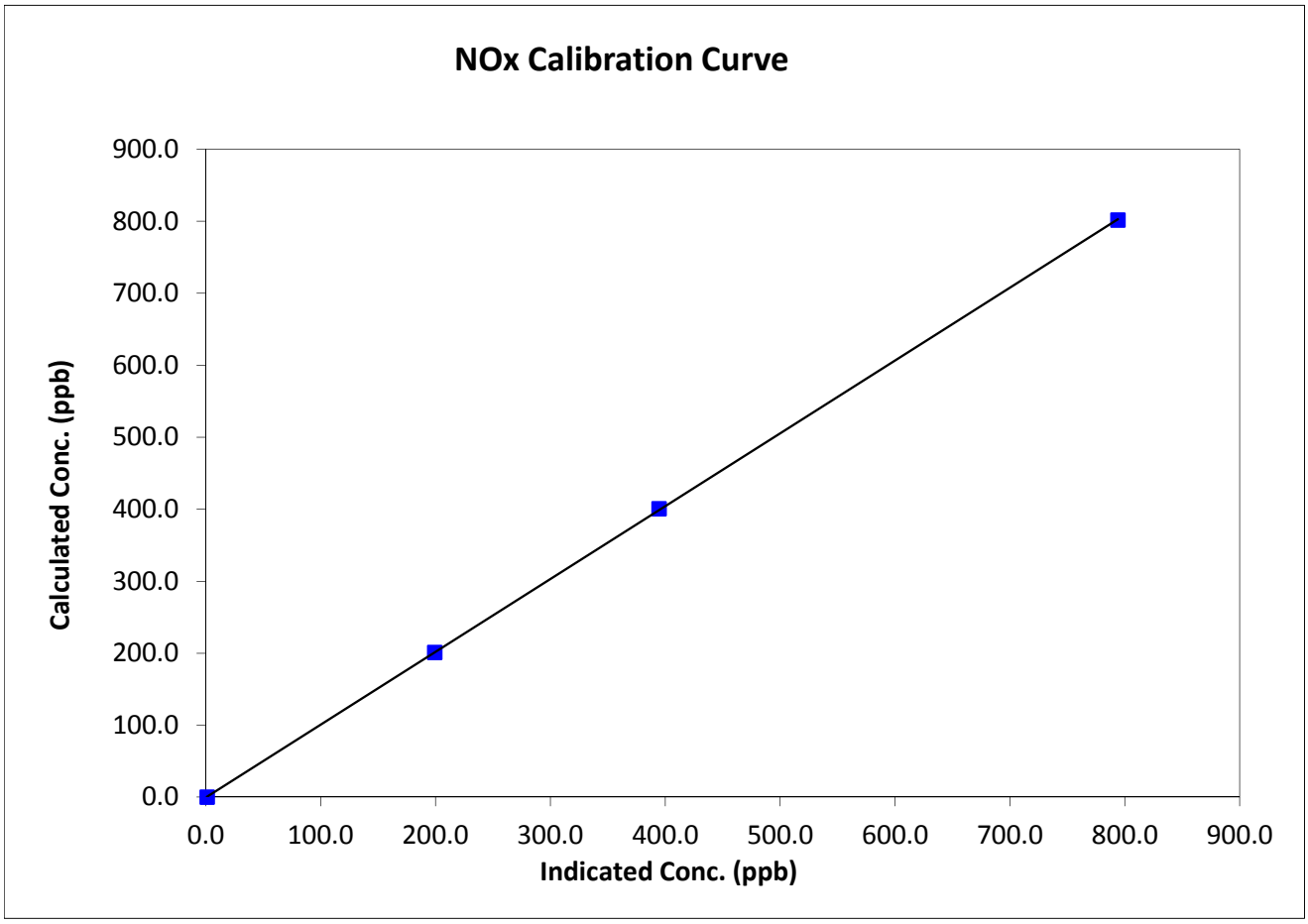
NO_X Calibration Summary

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 5, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:30
Analyzer make	42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	1.2	N/A	Correlation Coefficient	0.999987
801.8	794.0	1.0098		
400.4	394.6	1.0147	Slope	1.011610
200.7	199.4	1.0065		
			Intercept	-0.619639



Wood Buffalo Environmental Association

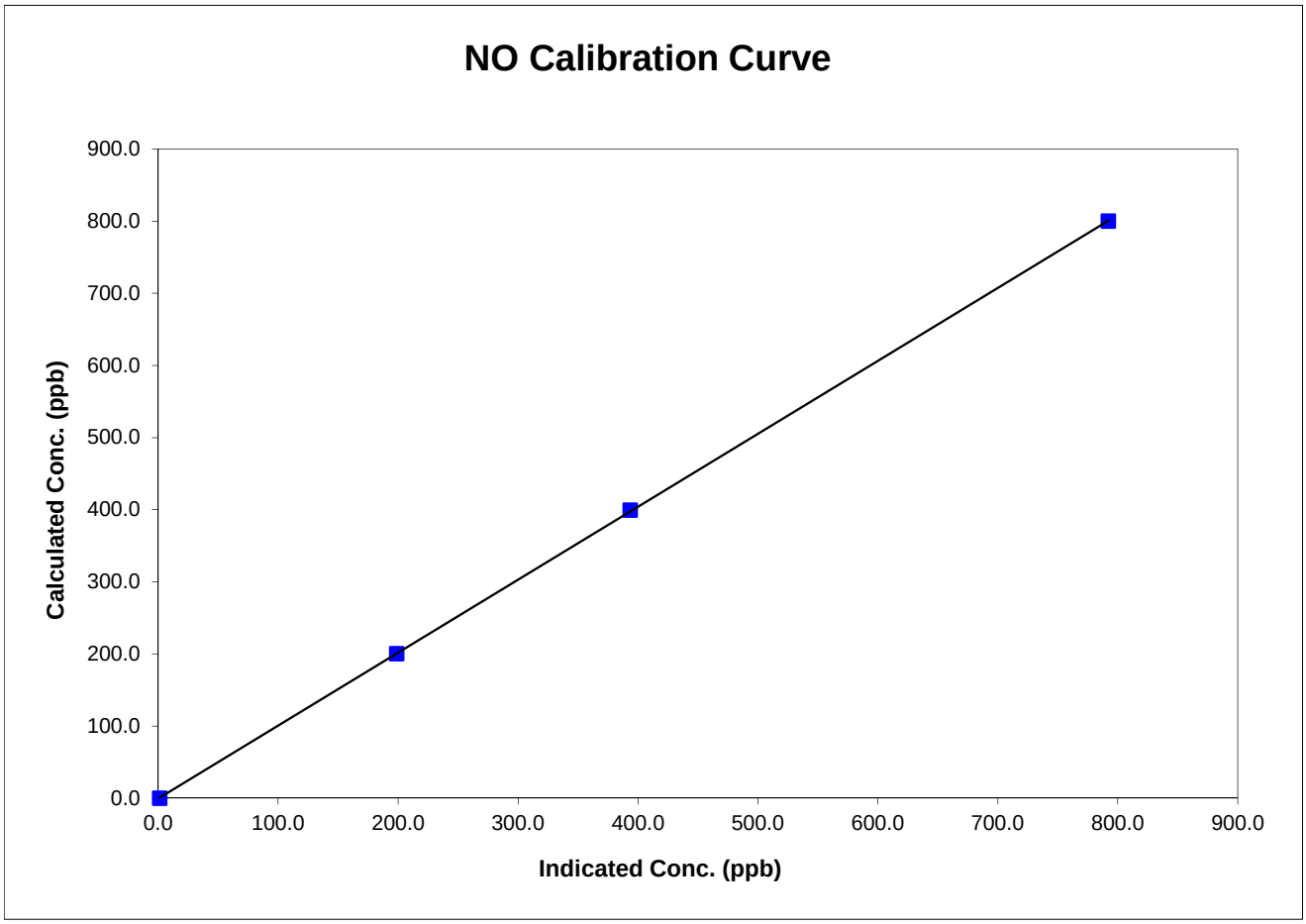
NO Calibration Summary

Station Information

Calibration Date	January 8, 2015	Previous Calibration	December 5, 2014
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:30
Analyzer make	42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	1.1	N/A	Correlation Coefficient	0.999987
800.2	792.2	1.0101		
399.6	393.6	1.0152	Slope	1.011778
200.3	198.8	1.0076		
			Intercept	-0.477949



Wood Buffalo Environmental Association

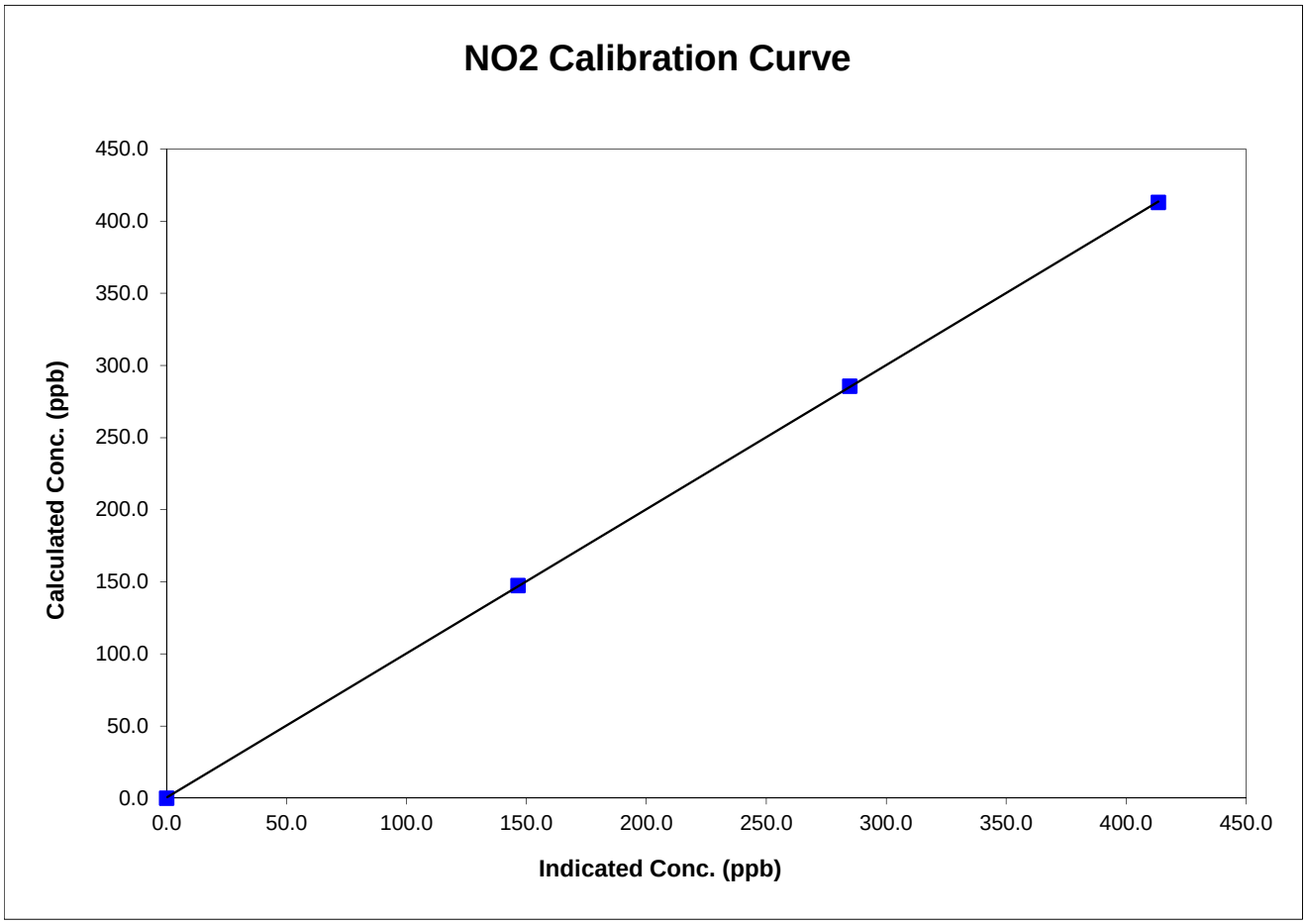
NO_2 Calibration Summary

Station Information

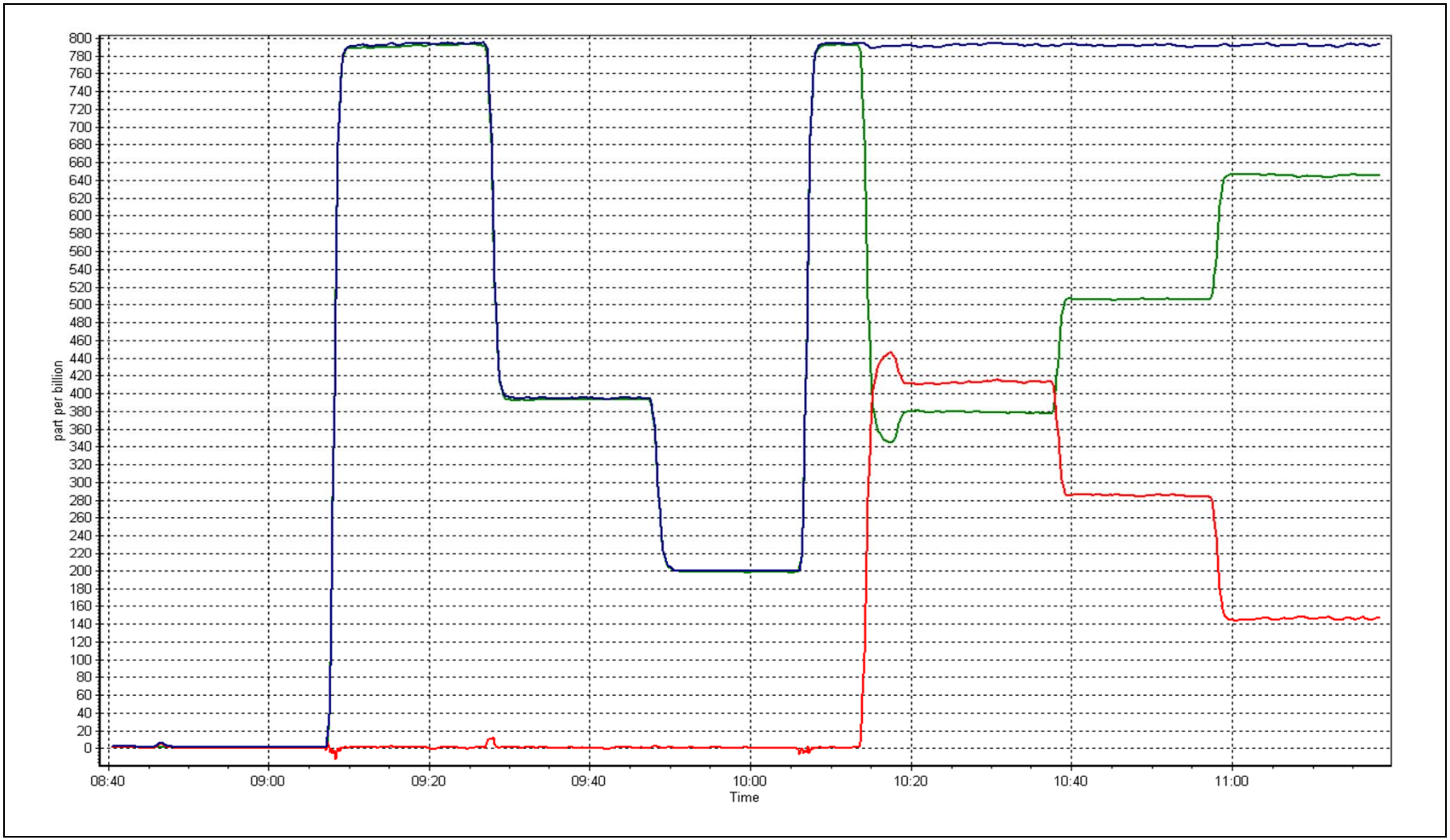
Calibration Date	January 8, 2015	Previous Calibration	December 5, 2014
Station Number	Anzac	Station Number	AMS 14
Start Time (MST)	8:45	End Time (MST)	13:30
Analyzer make	42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999989
413.1	413.4	0.9993		
285.6	284.8	1.0028	Slope	0.999659
147.3	146.5	1.0055		
			Intercept	0.372058



NOx, NO & NO_2 Calibration Plot Date: January 8, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 8, 2015		Previous Calibration	NA	
Station Name	Anzac		Station Number	AMS 14	
Reason:	Install				
Start Time (MST)	12:00		End Time (MST)	16:30	
Barometric Pressure	n/a	mmHg	Station Temperature	22.0	Deg C
Calibrator	Sabio 4010		Serial Number	8400311	
NO Cal Gas Conc	51.1	ppm	Cal Gas Expiry Date	May 29, 2014	
NOx Cal Gas Conc	51.2	ppm	Cal Gas Serial #	LL107928	

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.:

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	NA	NA	NA
	Data Offset	NA	NA	NA
After	Data Slope	1.002395	0.999852	0.998453
	Data Offset	0.240309	0.247461	0.011491
Channel #		6	5	4
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model: 42i — Analyzer serial #: 1426262592

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	NA	ppb	0.740	ppb
NOX coefficient	NA	ppb	1.000	ppb
NO2 coefficient	NA	ppb	0.997	ppb
NO bkgrnd	NA		3.0	
NOX bkgrnd	NA		3.1	
Nt coefficient	NA		n/a	
Chamber Temp	NA	Deg C	50.0	Deg C
Moly Temp	NA	Deg C	326.3	Deg C
PMT Temp	NA	Deg C	-3.1	Deg C
O3 flow	NA	ccm	Ok	ccm
R Cell Press	NA	mmHg	163.7	mmHg
Sample Flow	NA	ccm	0.865	ccm

Notes:

Removing to put in new 42i for station going digital, used second high GPT point

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 8, 2015 Station Number: AMS 14

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero										
as found span										
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	N/A	N/A
high point	5000	78.3	801.8	800.2	1.6	800.0	800.5	-0.6	1.0022	0.9997
second point	5000	39.1	400.4	399.6	0.8	398.3	398.4	-0.1	1.0052	1.0030
third point	5000	19.6	200.7	200.3	0.4	200.3	200.5	-0.2	1.0020	0.9991
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0	N/A	N/A
as left span	5000	78.3	801.8	384.4	417.4	810.9	390.0	421.2	0.9888	0.9856
								Average Correction Factor	1.0032	1.0006

Corrcted As found NO_X= NA NO= NA Percent Change NO_X= N/A NO= N/A

Previous Response NO_X= NA NO= NA

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.0			N/A	
1st NO2 (300)	N/A	384.4	418.7	803.8	384.4	419.4	0.9821	1.0000	0.9983	100.2%
2nd NO2 (200)	N/A	516.2	286.9	803.4	516.2	287.2	0.9826	1.0000	0.9990	100.1%
3rd NO2 (100)	N/A	652.8	150.3	803.3	652.8	150.6	0.9827	1.0000	0.9980	100.2%
4th NO2 (0)	803.1	N/A	-0.1	803.0	803.1	-0.1	0.9831	1.0000	N/A	N/A
					Average Correction Factor		0.9826	1.0000	0.9984	100.2%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

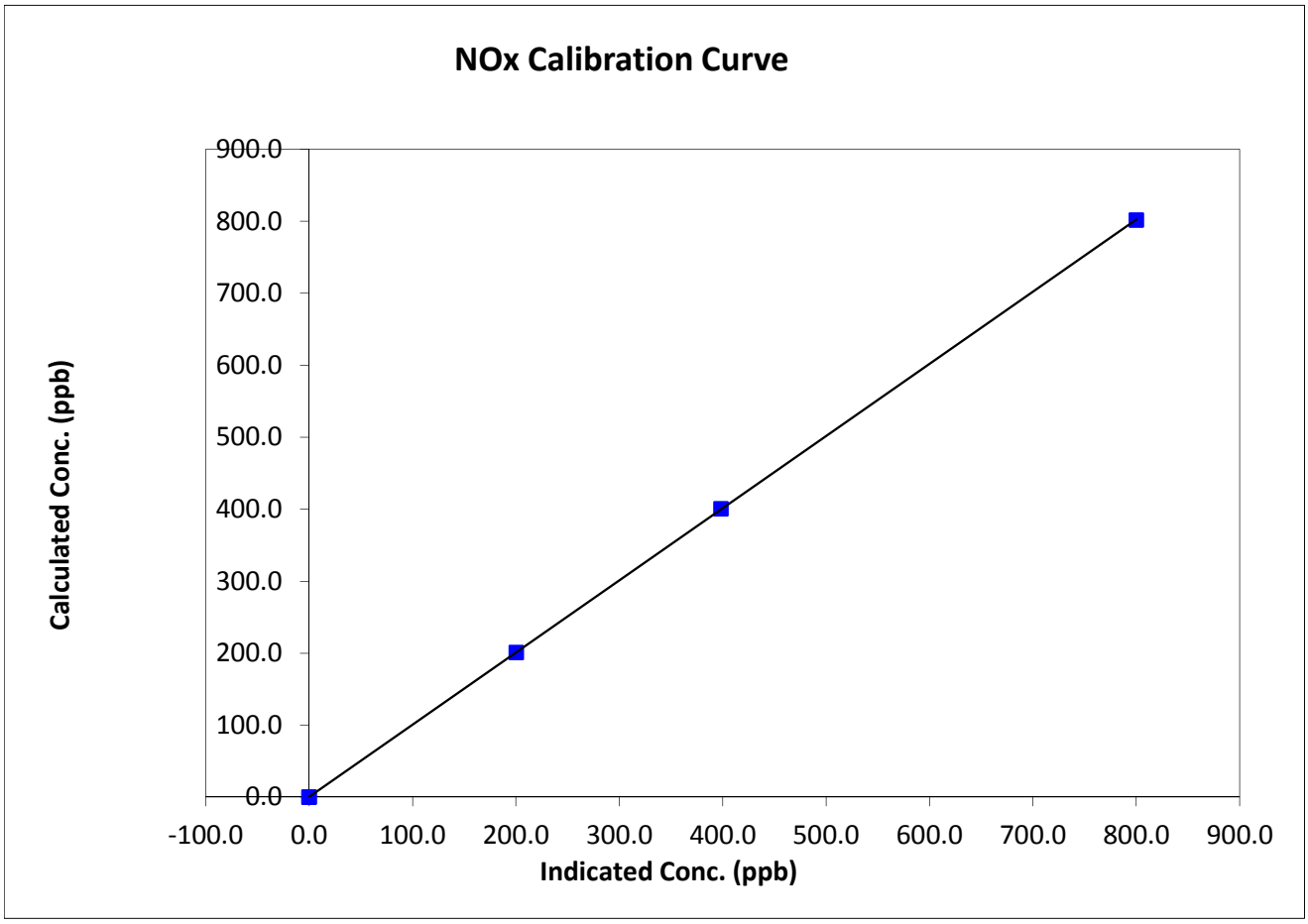
NO_X Calibration Summary

Station Information

Calibration Date	January 8, 2015	Previous Calibration	NA
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	12:00	End Time (MST)	16:30
Analyzer make	42i	Analyzer serial #	1426262592

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999998
801.8	800.0	1.0022		
400.4	398.3	1.0052	Slope	1.002395
200.7	200.3	1.0020		
0.0	-0.1	0.0000	Intercept	0.240309



Wood Buffalo Environmental Association

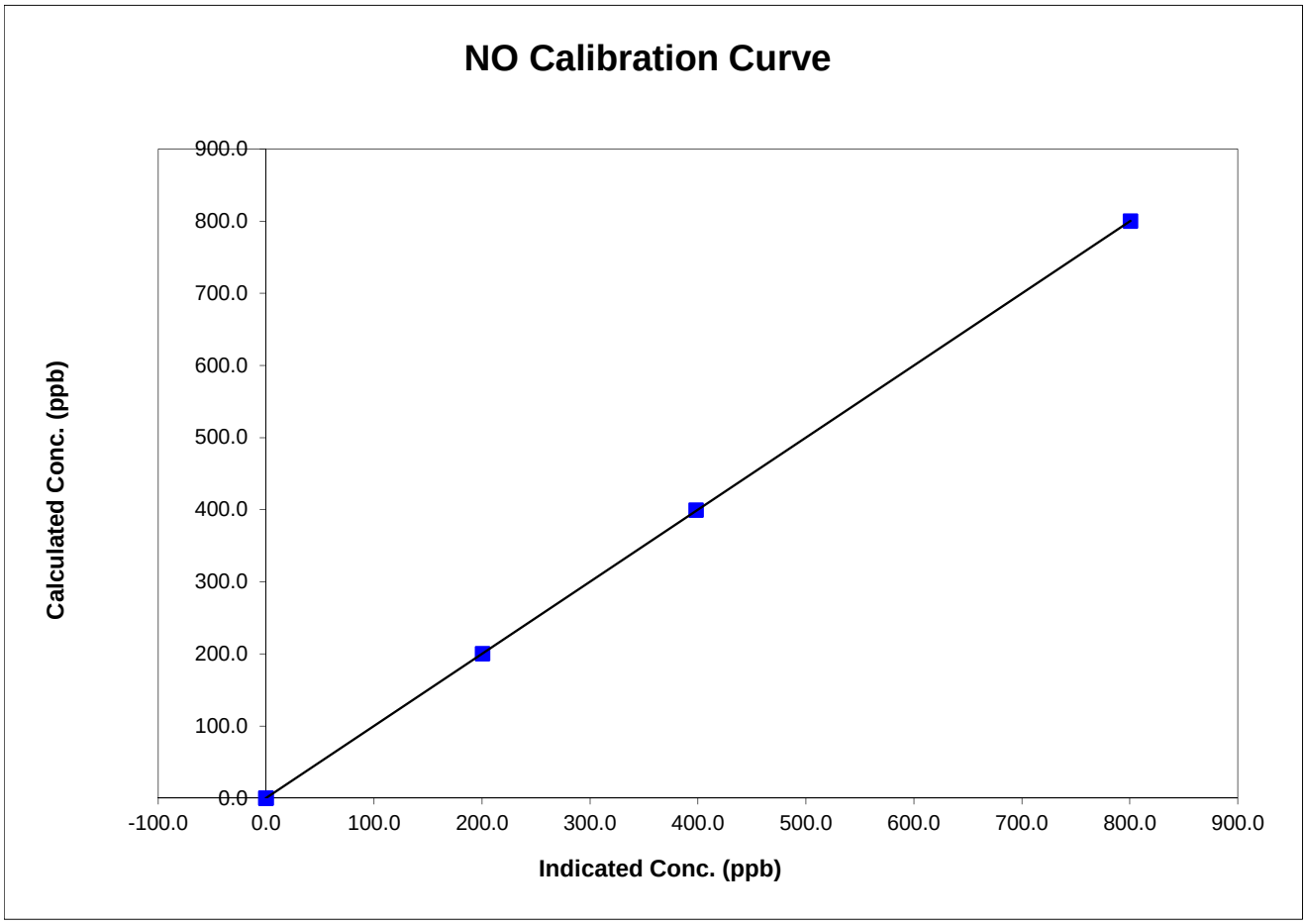
NO Calibration Summary

Station Information

Calibration Date	January 8, 2015	Previous Calibration	NA
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	12:00	End Time (MST)	16:30
Analyzer make	42i	Analyzer serial #	1426262592

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999997
800.2	800.5	0.9997		
399.6	398.4	1.0030	Slope	0.999852
200.3	200.5	0.9991		
0.0	-0.2	0.0000	Intercept	0.247461



Wood Buffalo Environmental Association

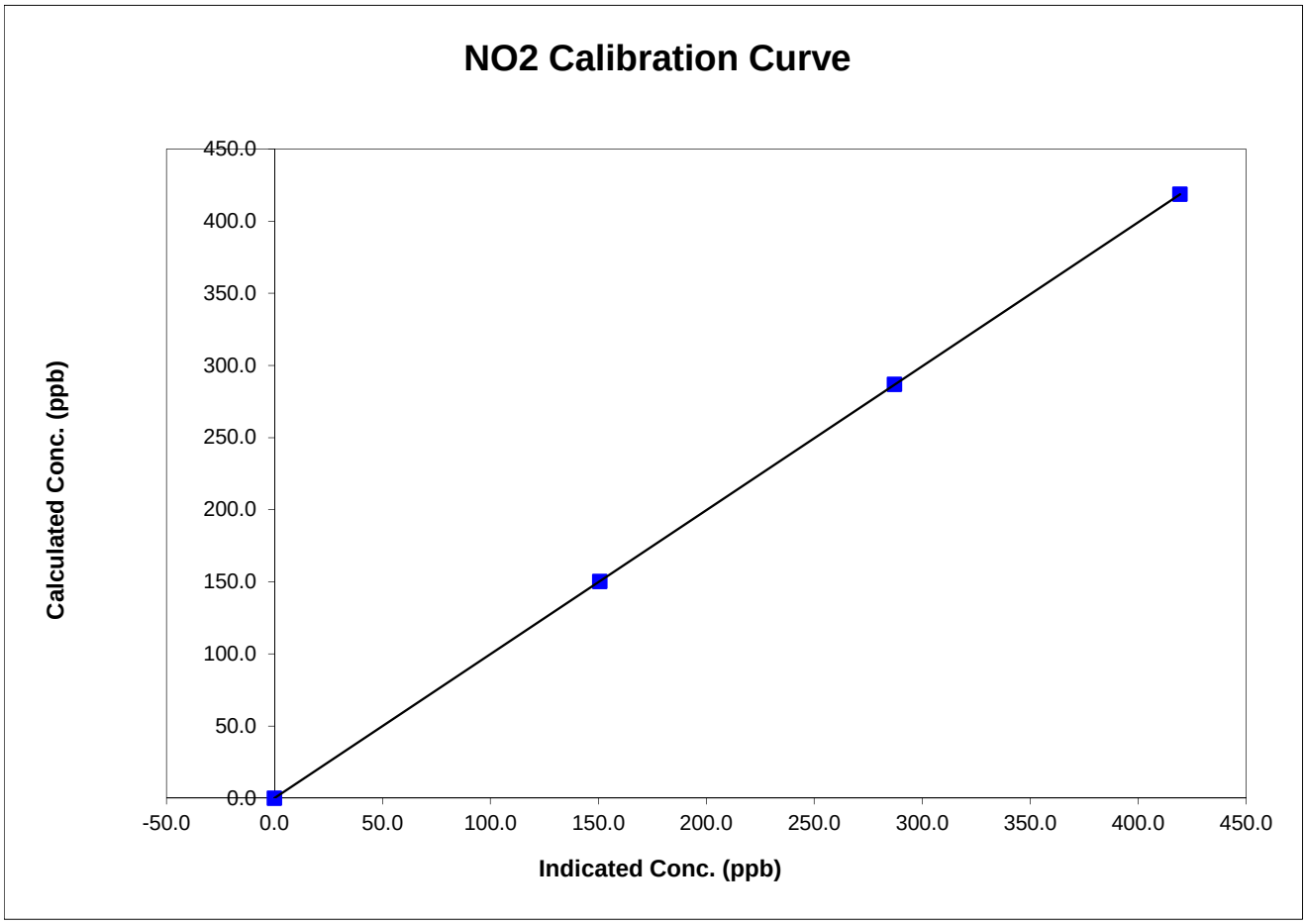
NO_2 Calibration Summary

Station Information

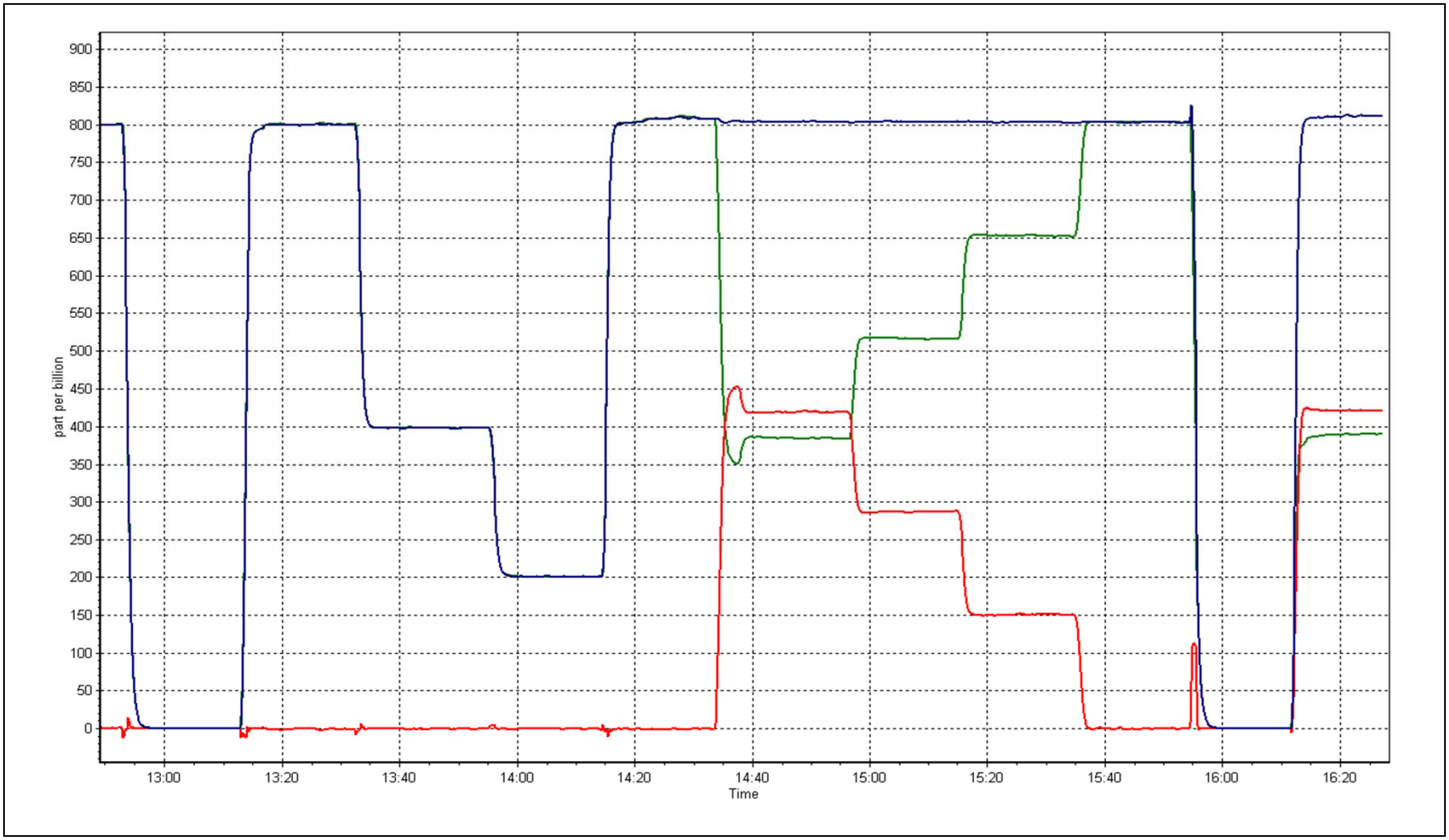
Calibration Date	January 8, 2015	Previous Calibration	NA
Station Number	Anzac	Station Number	AMS 14
Start Time (MST)	12:00	End Time (MST)	16:30
Analyzer make	42i	Analyzer serial #	1426262592

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	1.000000
418.7	419.4	0.9983		
286.9	287.2	0.9990	Slope	0.998453
150.3	150.6	0.9980		
			Intercept	0.011491



NOx, NO & NO_2 Calibration Plot Date: January 8, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 15
CNRL HORIZON
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
JANUARY 2015

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	37	37	100.00	15	0	4	0
TRS (ppb) Average	710	34	34	100.00	1	0	1	0
THC (ppm) Average	708	36	36	100.00	9	-	3.2	-
NO2 (ppb) Average	708	36	36	100.00	61	0	23	-
NO (ppb) Average	708	36	36	100.00	222	-	32	-
NOX (ppb) Average	708	36	36	100.00	283	-	56	-
PM2.5 (ug/m3) Average	743	0	1	99.87	20.3	-	8	0
Temperature 2 m (C) Average	744	0	0	100.00	7	-	2.6	-
Wind Speed 10 m (km/h) Average	705	0	39	94.76	20	-	-	-
Wind Direction 10 m (deg) Average	705	0	39	94.76	-	-	-	-
Precipitation (mm) Total	744	0	0	100.00	2.8	-	-	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	309	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
JANUARY 2015

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	0.7	2	-	0	0	0	0	0	1	15
TRS (ppb) Average	710	0.3	0	-	0	0	0	0	0	1	1
THC (ppm) Average	708	2.32	0.5	-	2	2.1	2.1	2.2	2.4	2.7	9
NO2 (ppb) Average	708	9.4	10	-	0	1	1	5	15	26	61
NO (ppb) Average	708	3.9	14	-	0	0	0	0	2	10	222
NOX (ppb) Average	708	13.3	22	-	0	1	1	6	18	36	283
PM2.5 (ug/m3) Average	743	4.03	3.4	-	0.2	0.9	1.9	2.9	5.3	8.3	20.3
Temperature 2 m (C) Average	744	-15.38	9.4	-	-34.4	-27.4	-22	-16.7	-9.7	-1.3	7
Wind Speed 10 m (km/h) Average	705	7.7	4	-	1	3	4	7	11	13	20
Wind Direction 10 m (deg) Average	705	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	19.05	0	0	0	0	0	0	2.8
Relative Humidity (%) Average	744	79.6	9	-	43	69	73	78	87	93	99
Global Solar Radiation (W/m2) Average	744	25.1	53	-	0	0	0	0	20	92	309

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	13 Jan 2015 14:00	13 Jan 2015 14:00	1	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	24 Jan 2015 03:00	25 Jan 2015 06:00	28	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 01:00	26 Jan 2015 11:00	11	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 15 ppb on Jan 7 12:00 Maximum Daily Average: 4.1 ppb on Jan 29

Minimum Value: 0 ppb on Jan 10 03:00 Minimum Daily Average: 0.0 ppb on Jan 22
Maximum Diurnal Average: 1.2 ppb at hour 13 Minimum Diurnal Average: 0.2 ppb at hour 9
Monthly Average: 0.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 9$

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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0.4	3
2-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	1
3-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
4-Jan	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
5-Jan	0	0	0	0	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	0	0.4	2
6-Jan	Z	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-Jan	0	Z	0	0	0	0	0	0	0	1	5	15	10	1	2	2	4	7	7	4	5	3	3	8	3.4	15
8-Jan	2	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	2	1	1	0	0.6	2
10-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0.1	1
11-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Jan	Z	0	0	1	0	0	0	1	1	1	1	1	1	1	1	0	1	2	1	0	0	0	0	0	0.7	2
13-Jan	0	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.4	1
14-Jan	1	1	Z	0	0	0	1	1	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	--	1
15-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.2	2
16-Jan	8	10	5	7	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	10
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2	1	3	0.4	3
18-Jan	Z	3	2	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0.7	3
19-Jan	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	5	3	3	5	4	3	3	2	2	1.4	5
21-Jan	1	1	1	Z	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
22-Jan	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
23-Jan	0	0	0	0	0	Z	0	0	0	0	0	1	7	10	1	1	0	0	0	0	0	0	0	0	0.9	10
24-Jan	Z	0	0	0	2	4	3	2	1	0	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0.8	4
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.2	1
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	1	2	3	2	1	1	0	0	0	0	0	0	0	0.5	3
29-Jan	0	0	0	0	0	Z	0	0	0	3	4	4	6	8	8	8	6	6	9	10	14	5	3	2	4.1	14
30-Jan	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Jan	0	Z	0	0	0	0	0	0	0	0	1	5	5	4	3	3	4	4	3	1	1	1	1	1	1.5	5
	0.6	0.7	0.5	0.6	0.3	0.5	0.4	0.3	0.2	0.3	0.6	1.1	1.2	1.1	0.8	0.9	0.9	0.9	1.0	0.9	1.0	0.8	0.6	0.8	Diurnal Average	
	8	10	5	7	2	4	3	2	1	3	5	15	10	10	8	8	6	7	9	10	14	5	3	8	Diurnal Maximum	

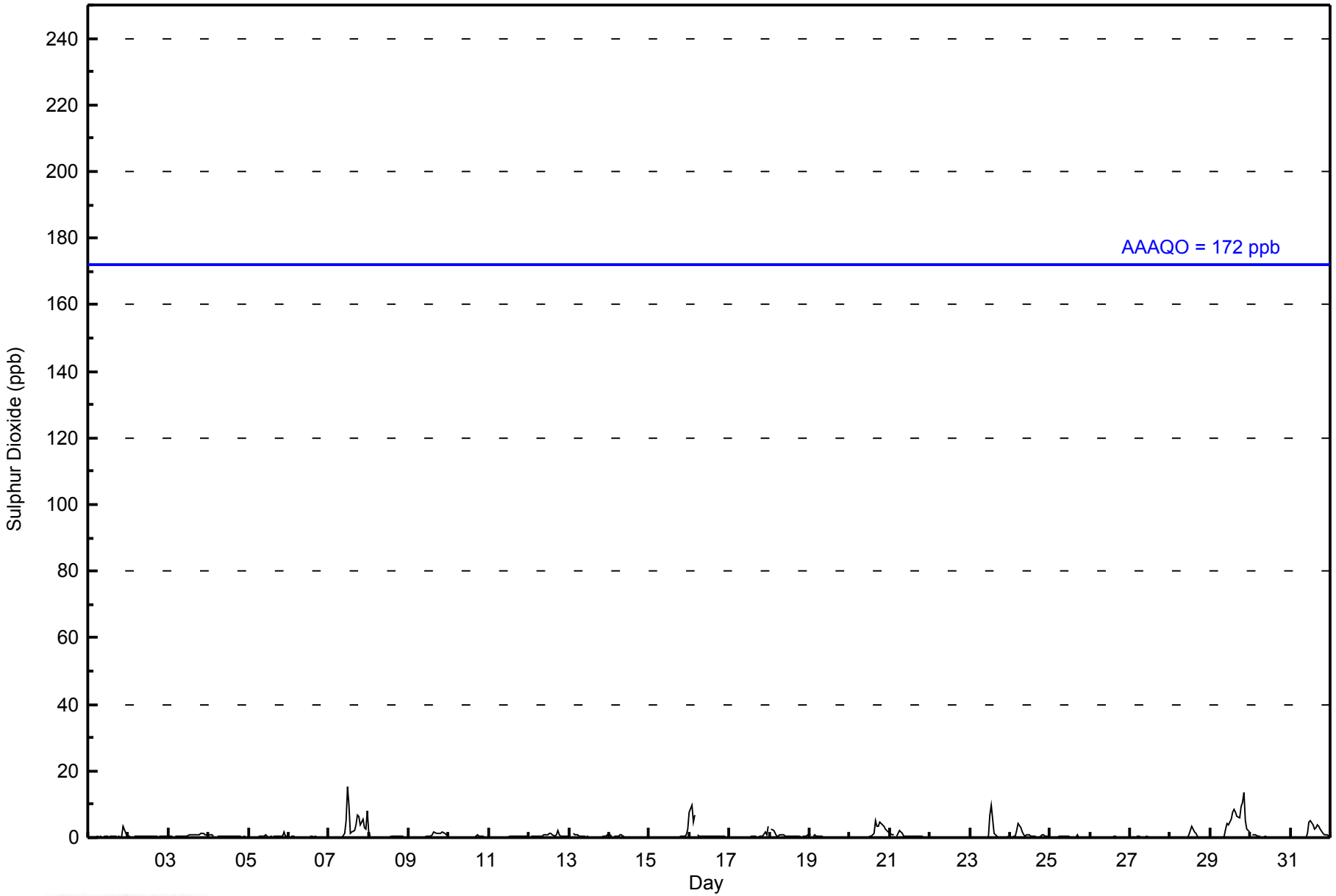
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	99.72	99.72
11 - 20	2	0.28	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	39	100	51	28	7	5	7	31	123	90	67	42	13	20	27	18	668
11 - 20	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	101	51	28	7	5	7	31	123	90	68	42	13	20	27	18	670

Total Number of Valid Hours: 670

Total Number of Hours: 744

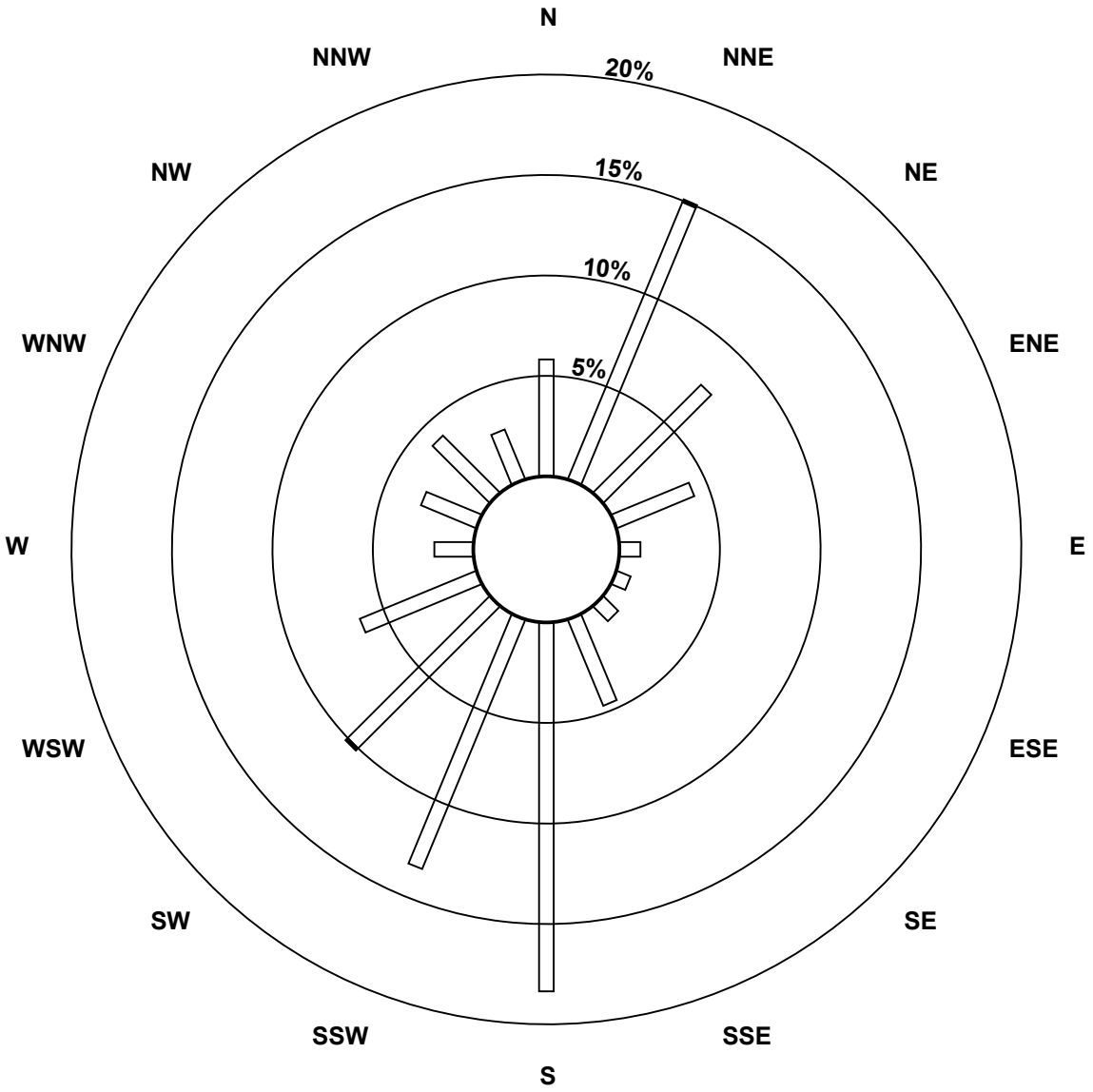
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

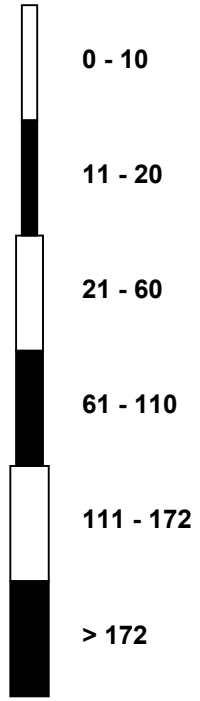
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



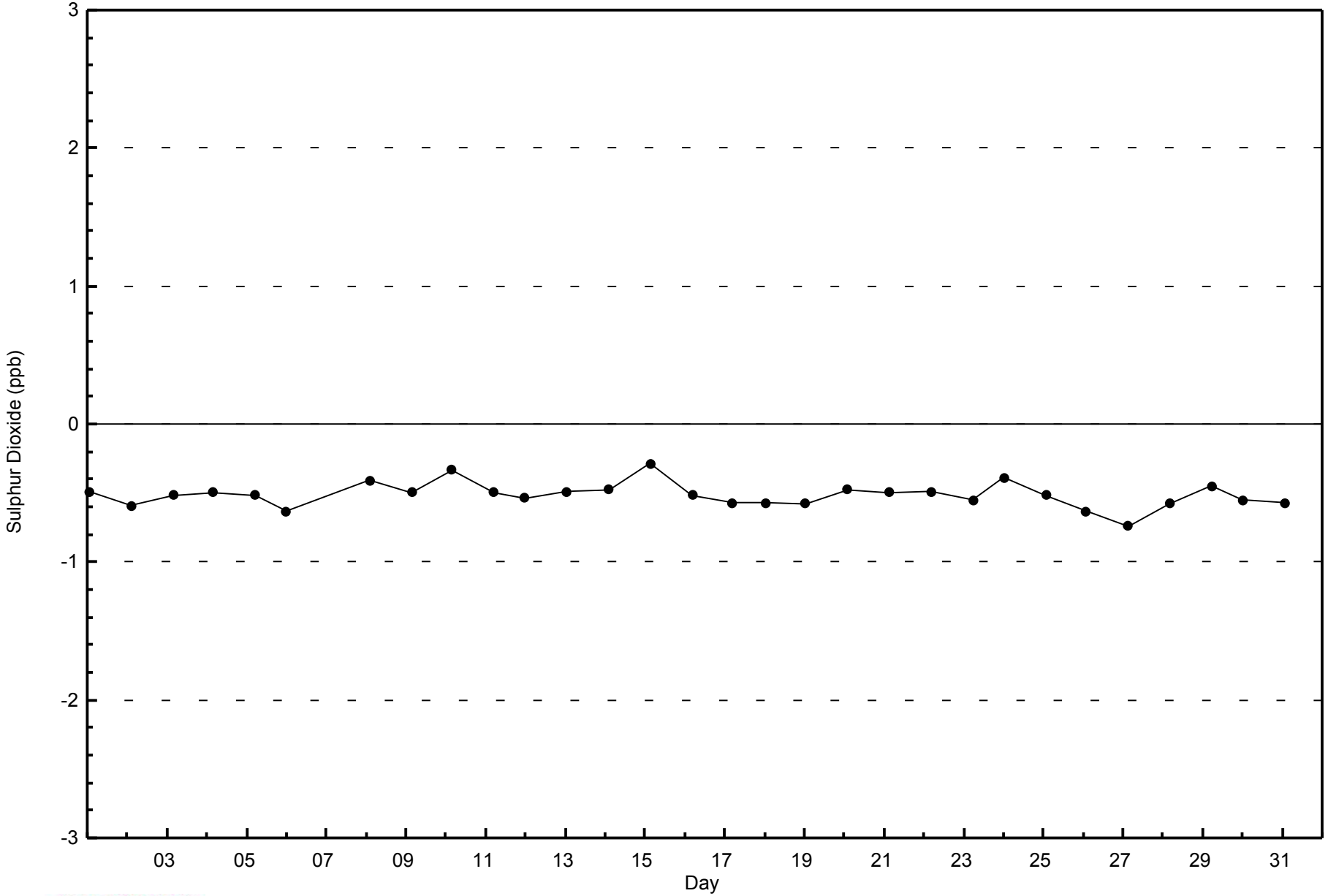
Total Number of Valid Hours: 670

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2015



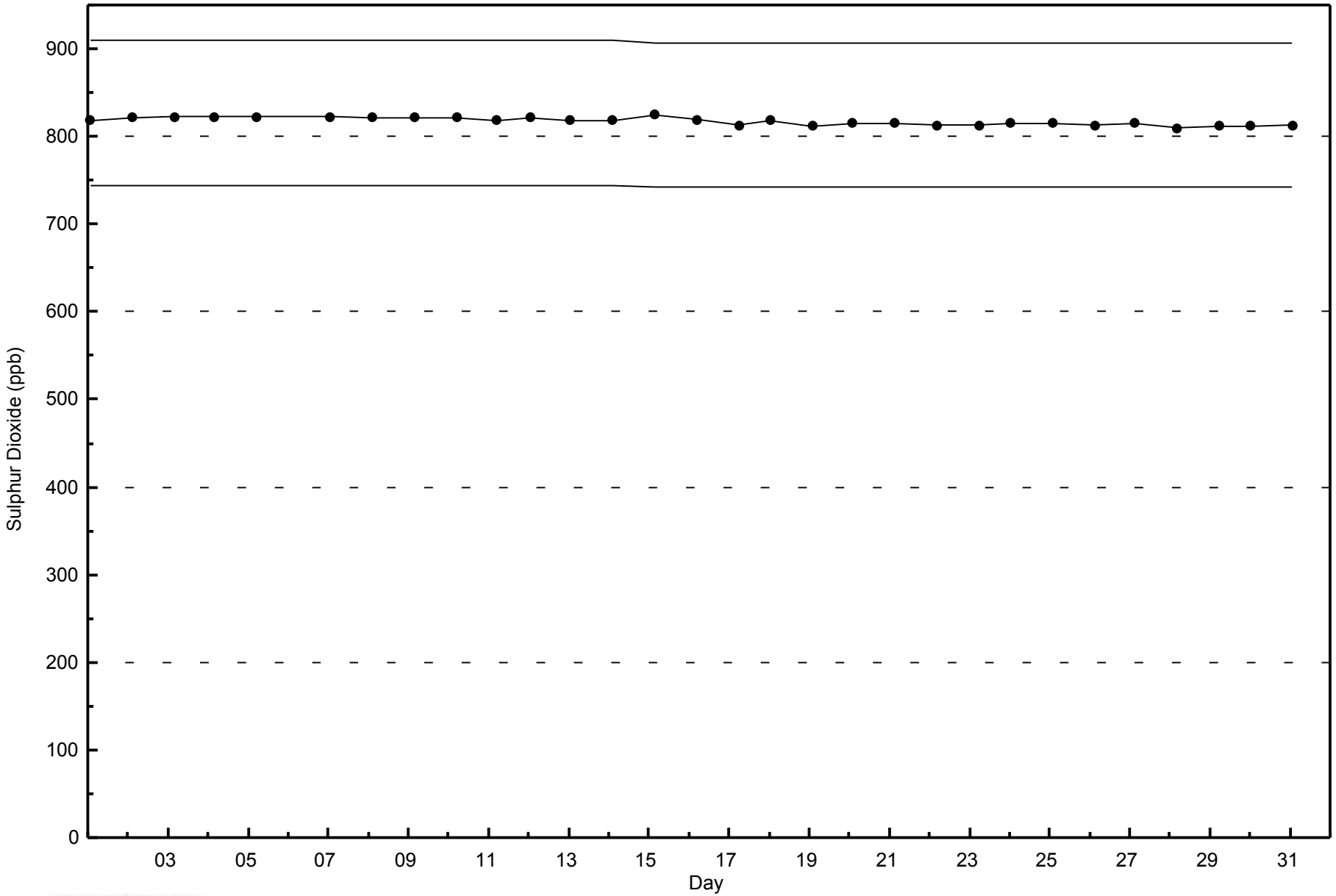
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 1 ppb on Jan 31 18:00 Maximum Daily Average: 0.6 ppb on Jan 29

Minimum Value: 0 ppb on Jan 25 04:00 Minimum Daily Average: 0.1 ppb on Jan 4
Maximum Diurnal Average: 0.4 ppb at hour 18 Minimum Diurnal Average: 0.2 ppb at hour 9
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
7-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	1	0.3	1
8-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0.5	1
10-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0.4	1
11-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0.4	1
12-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0.3	1
13-Jan	0	1	Z	1	1	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Jan	0	0	0	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
17-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0.3	1
19-Jan	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0.4	1
21-Jan	0	0	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Jan	0	Z	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
25-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Jan	0	0	0	0	0	0	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.6	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
31-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0.5	1
	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	Diurnal Average	
	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

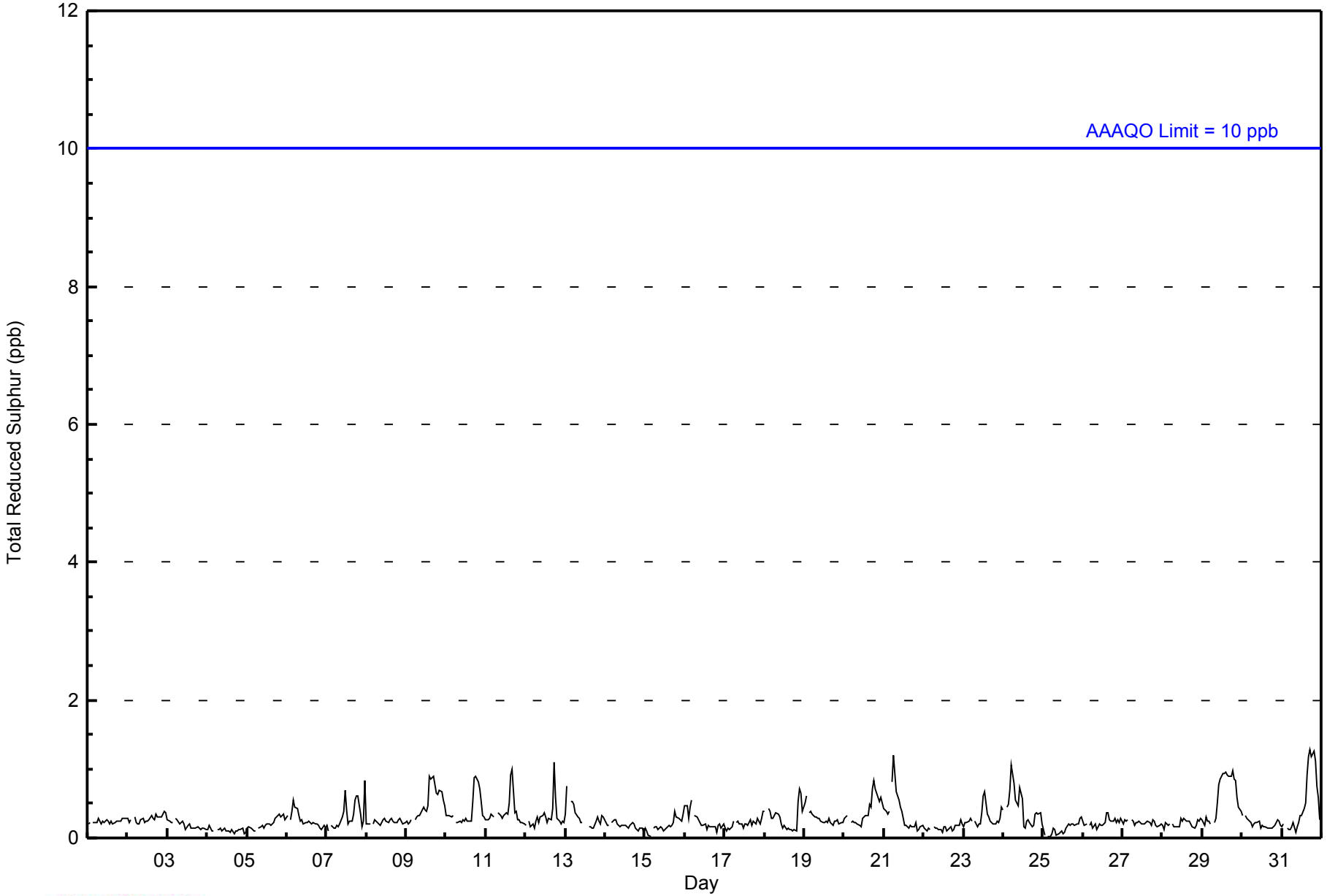
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2015



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	710	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: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	40	104	50	26	6	6	5	31	124	90	70	42	13	20	27	19	673
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	40	104	50	26	6	6	5	31	124	90	70	42	13	20	27	19	673

Total Number of Valid Hours: 673

Total Number of Hours: 744

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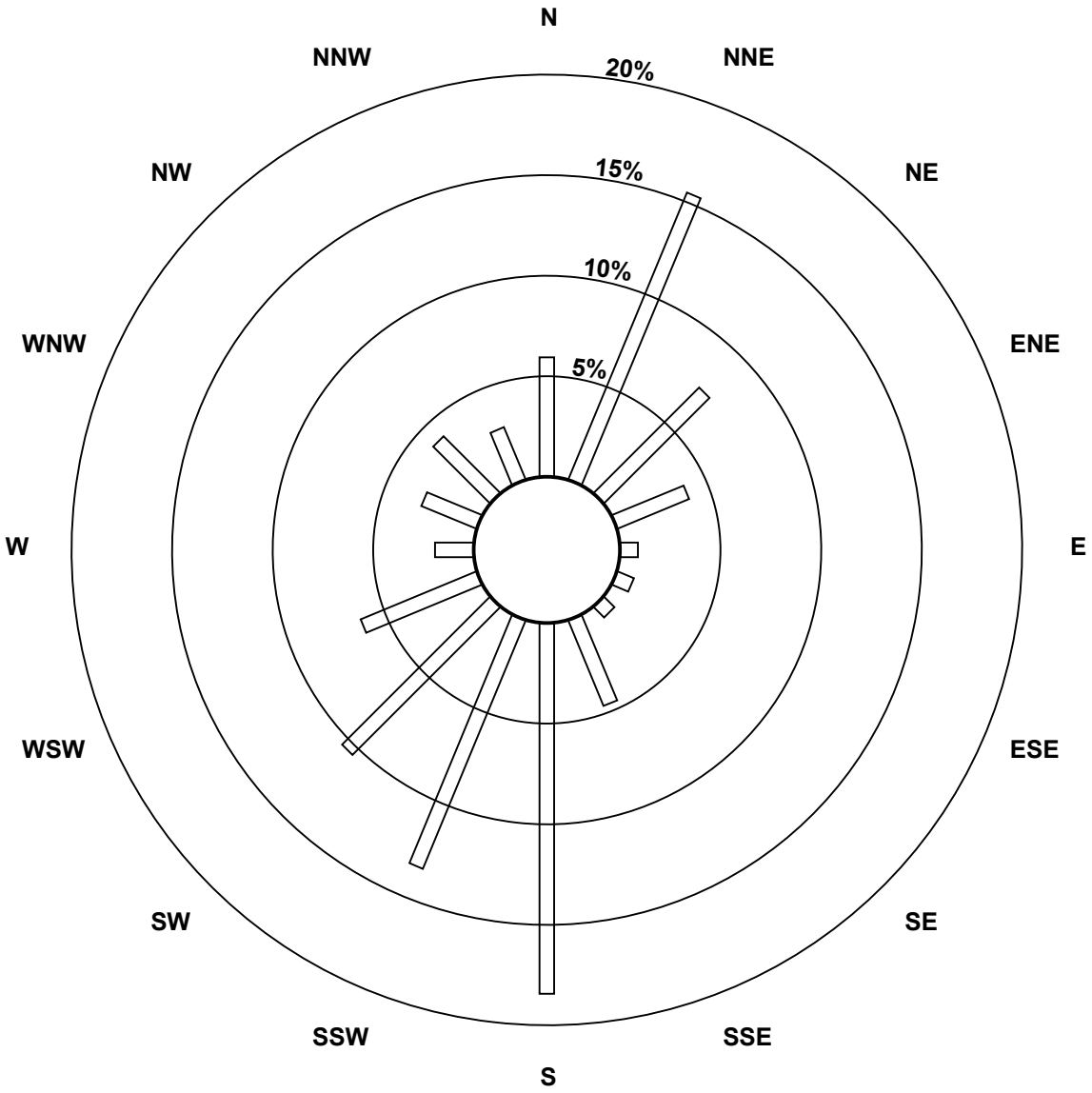
Wood Buffalo Environmental Association

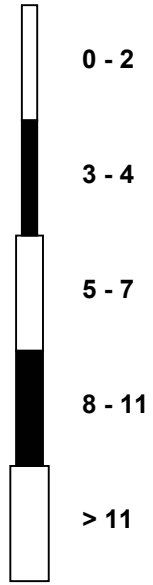
Wind Rose Jan 2015

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



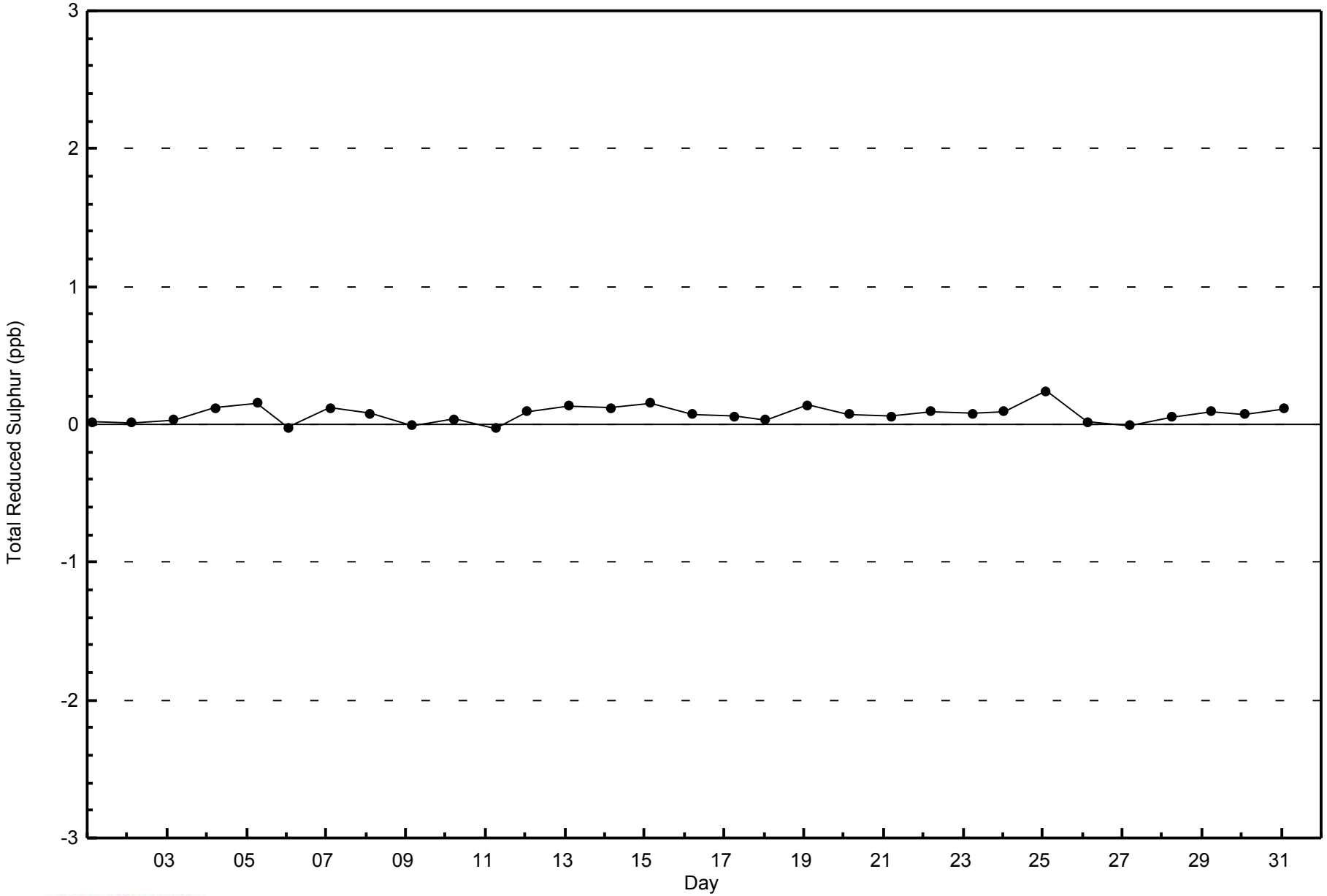
Total Number of Valid Hours: 673

WBEA

Zero Responses

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2015



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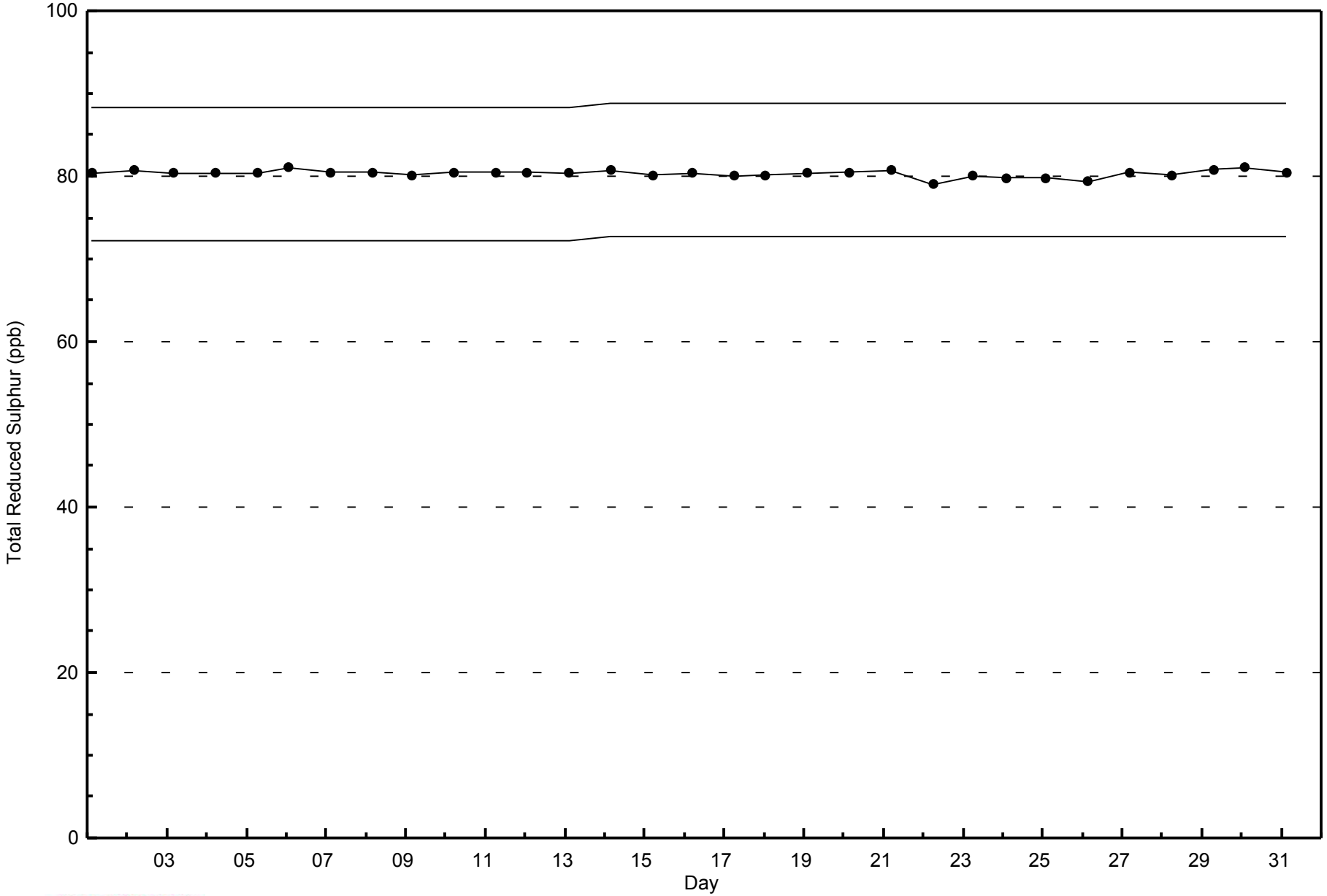
WBEA

Span Responses

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2015

Maximum Value: 9.0 ppm on Jan 9 21:00

Maximum Daily Average: 3.2 ppm on Jan 9

Minimum Value: 2.0 ppm on Jan 25 10:00

Minimum Daily Average: 2.1 ppm on Jan 22

Maximum Diurnal Average: 2.6 ppm at hour 21

Minimum Diurnal Average: 2.2 ppm at hour 13

Monthly Average: 2.32 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.2 Q_3 = 2.4 P_{90} = 2.7 P_{99} = 4.2

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-Jan	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	2.2	2.1	2.1	2.2
2-Jan	2.1	2.2	Z	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.6	2.5	2.5	2.5	2.6	2.7	2.9	3.6	3.5	2.8	2.5	3.6
3-Jan	2.5	2.6	2.3	Z	3.2	3.3	2.8	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	2.1	2.3	3.3
4-Jan	2.1	2.1	2.2	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
5-Jan	2.1	2.1	2.1	2.1	2.2	Z	2.2	2.2	2.5	2.7	2.3	2.1	2.1	2.1	2.2	2.7	2.5	2.6	2.7	2.7	2.3	2.3	2.2	2.2	2.3	2.7
6-Jan	Z	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
7-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.5	2.2	2.1	2.1	2.1	2.2	2.4	2.4	2.7	2.4	2.1	2.1	2.1	2.2	2.7
8-Jan	2.1	2.1	Z	2.2	2.2	2.5	2.2	2.1	2.3	2.4	2.6	2.6	2.2	2.4	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.6
9-Jan	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.4	2.4	2.5	2.8	2.8	2.7	2.8	4.4	5.8	9.0	5.2	5.2	3.2	3.2	9.0
10-Jan	2.4	2.4	2.9	3.2	Z	2.7	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.3	2.6	2.6	2.5	2.4	2.3	2.2	2.2	2.4	3.2
11-Jan	2.2	2.2	2.2	2.3	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.7	3.2	3.3	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.4	3.3
12-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.8	3.3	3.3	2.6	2.6	2.6	2.7	3.3	2.9	2.5	2.5	2.4	2.5	2.5	2.6	3.3
13-Jan	2.6	Z	2.9	2.8	2.7	2.6	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.8	2.4	2.9
14-Jan	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.2	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	2.2	2.4
15-Jan	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	2.2	2.4	2.5	2.8	3.3	3.6	3.2	2.4	2.4	3.6
16-Jan	2.4	2.5	2.2	2.4	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5
17-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.2	2.2	2.2	2.3	2.1	2.3
18-Jan	Z	2.4	2.4	2.3	2.2	2.2	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.8	3.2	3.3	4.6	2.4	4.6
19-Jan	4.6	Z	3.3	2.7	2.4	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	2.2	2.1	2.1	2.1	2.1	2.4	4.6
20-Jan	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.6	2.6	2.7	2.8	2.7	2.7	2.5	2.5	2.4	2.3	2.8
21-Jan	2.4	2.4	2.5	Z	2.5	2.8	3.2	2.5	2.6	2.6	2.5	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.2
22-Jan	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.2	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	2.2
23-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.2	2.6
24-Jan	Z	4.1	3.0	2.7	3.1	3.5	3.3	3.3	3.5	3.5	3.2	2.6	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.4	2.3	2.3	2.3	2.3	2.8	4.1
25-Jan	2.2	Z	2.1	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.6	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.1	2.6
26-Jan	2.2	2.2	Z	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	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2
27-Jan	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-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.8	2.2	2.8
29-Jan	2.7	2.6	2.6	2.4	2.4	Z	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.5	2.5	2.6	2.6	2.7	2.7	2.5	2.3	2.3	2.2	2.2	2.4	2.7
30-Jan	Z	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2
31-Jan	2.3	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.4	2.5	2.7	2.7	2.7	2.7	3.0	3.1	3.0	2.8	2.4	2.5	3.1
	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.6	2.4	2.4	2.4	Diurnal Average	
	4.6	4.1	3.3	3.2	3.2	3.5	3.3	3.3	3.5	3.5	3.2	3.3	3.3	2.6	2.8	3.2	3.3	3.3	4.4	5.8	9.0	5.2	5.2	4.6	Diurnal Maximum	

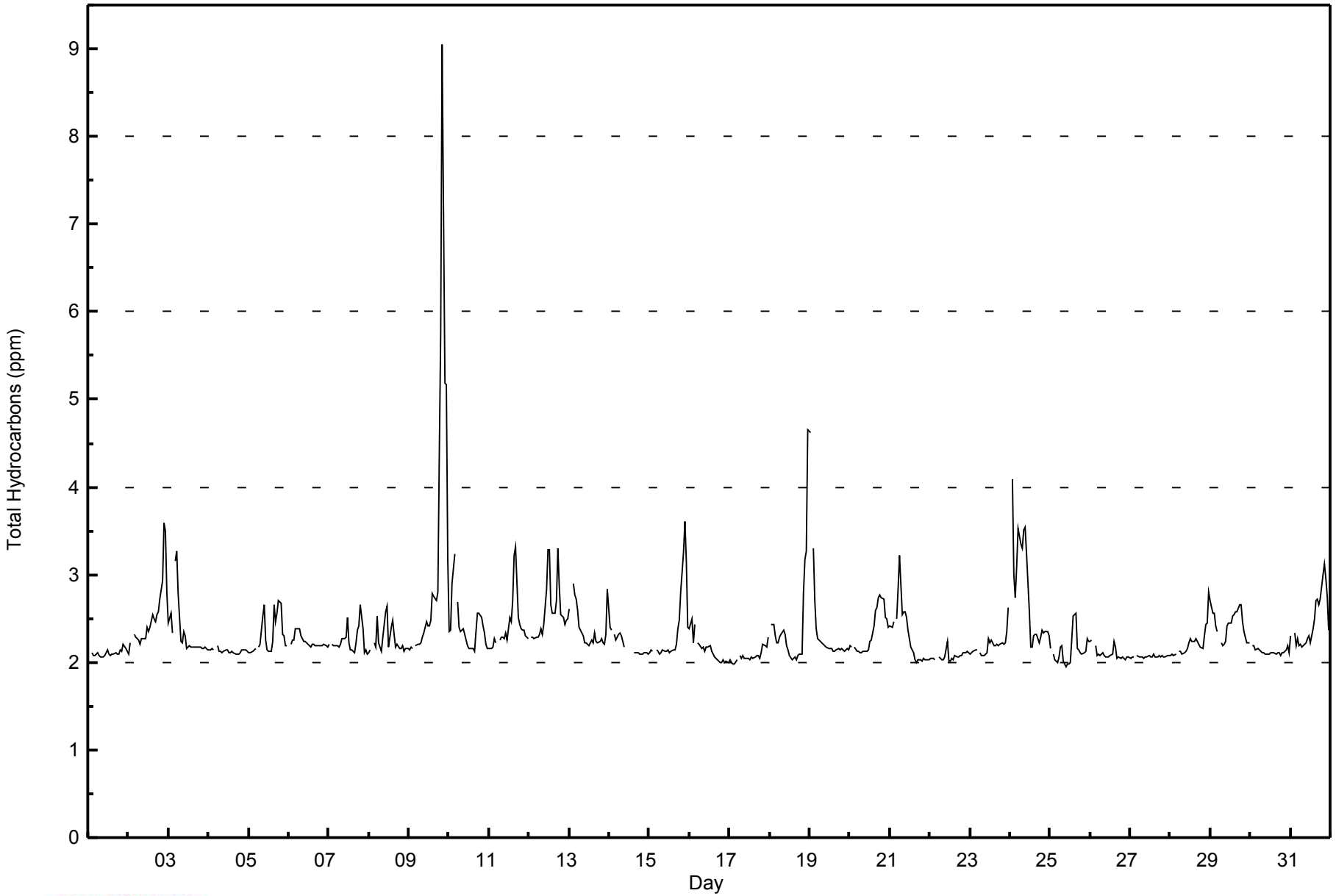
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2015



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	54	7.63	7.63
2.1 - 3.0	620	87.57	95.20
3.1 - 10.0	34	4.80	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2015

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	8	2	2	0	0	0	0	2	8	15	12	3	0	0	0	52
2.1 - 3.0	37	92	50	26	6	5	7	31	116	79	51	27	7	17	24	17	592
3.1 - 10.0	2	1	0	0	1	0	0	0	5	3	2	3	3	3	3	1	27
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	101	52	28	7	5	7	31	123	90	68	42	13	20	27	18	671

Total Number of Valid Hours: 671

Total Number of Hours: 744

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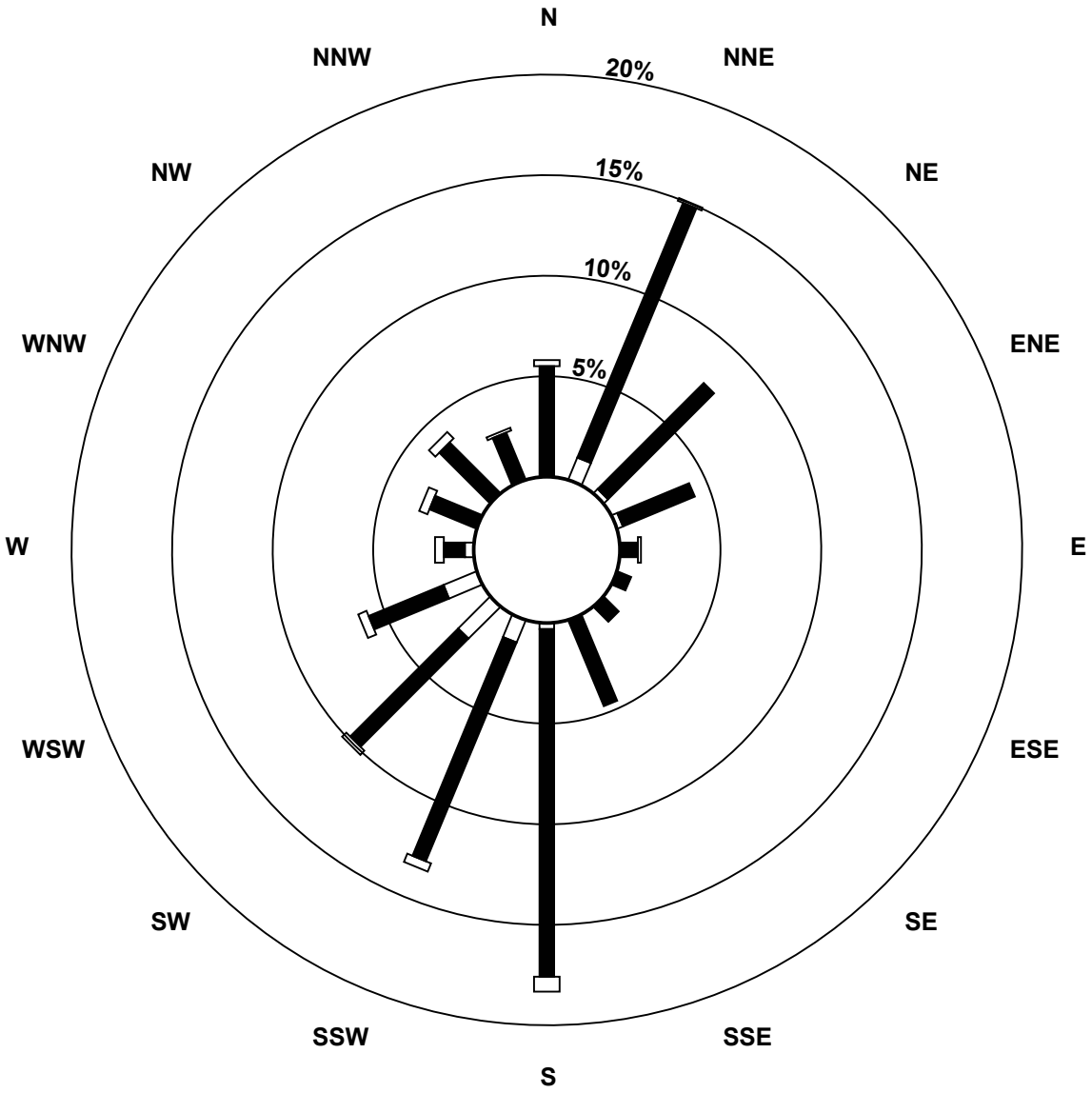
Wood Buffalo Environmental Association

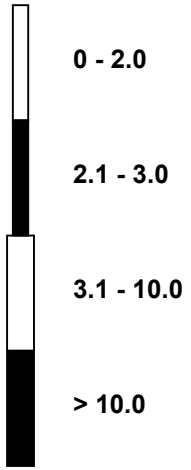
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

CNRL Horizon (AMS 15)



Classes (ppm)



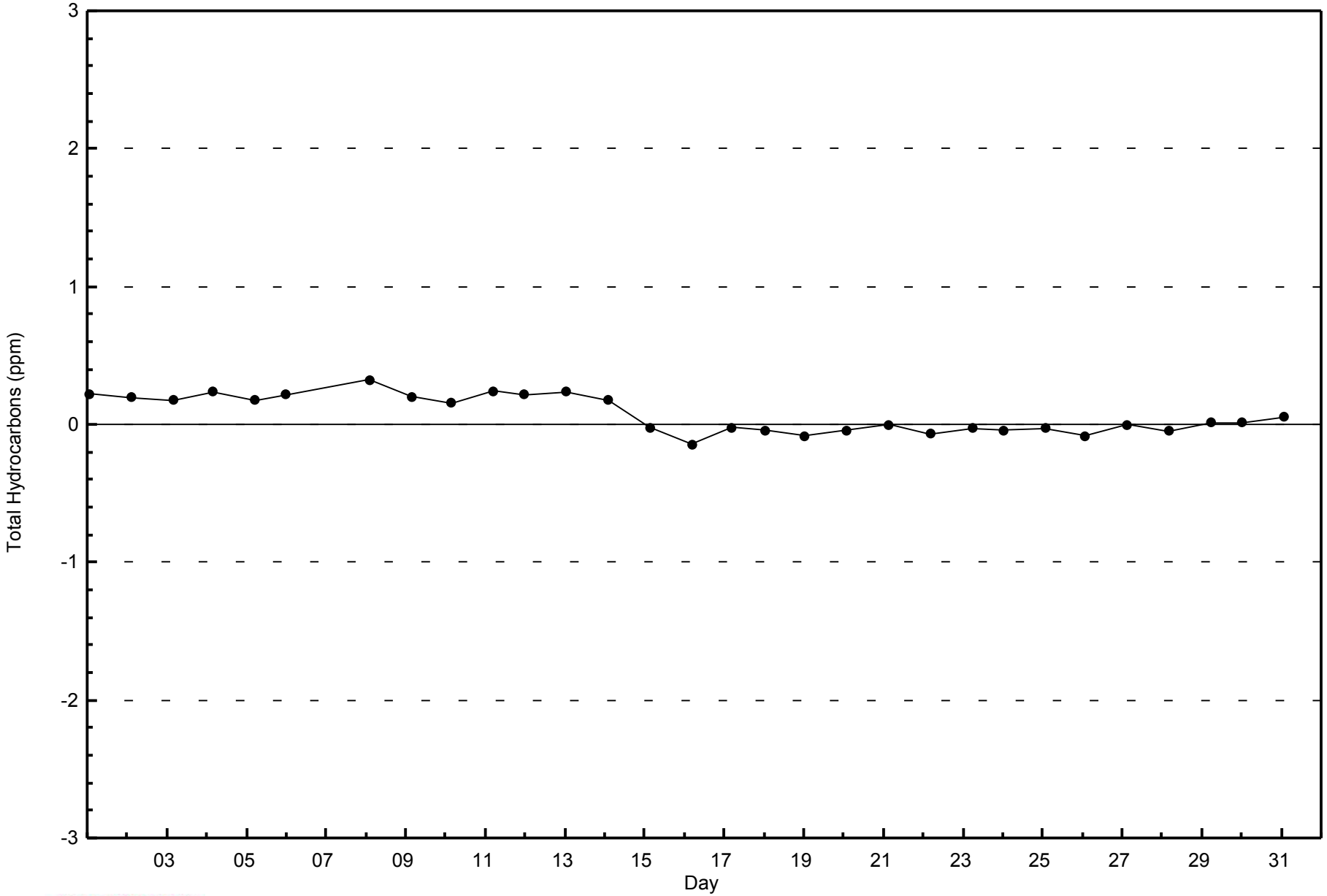
Total Number of Valid Hours: 671

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2015



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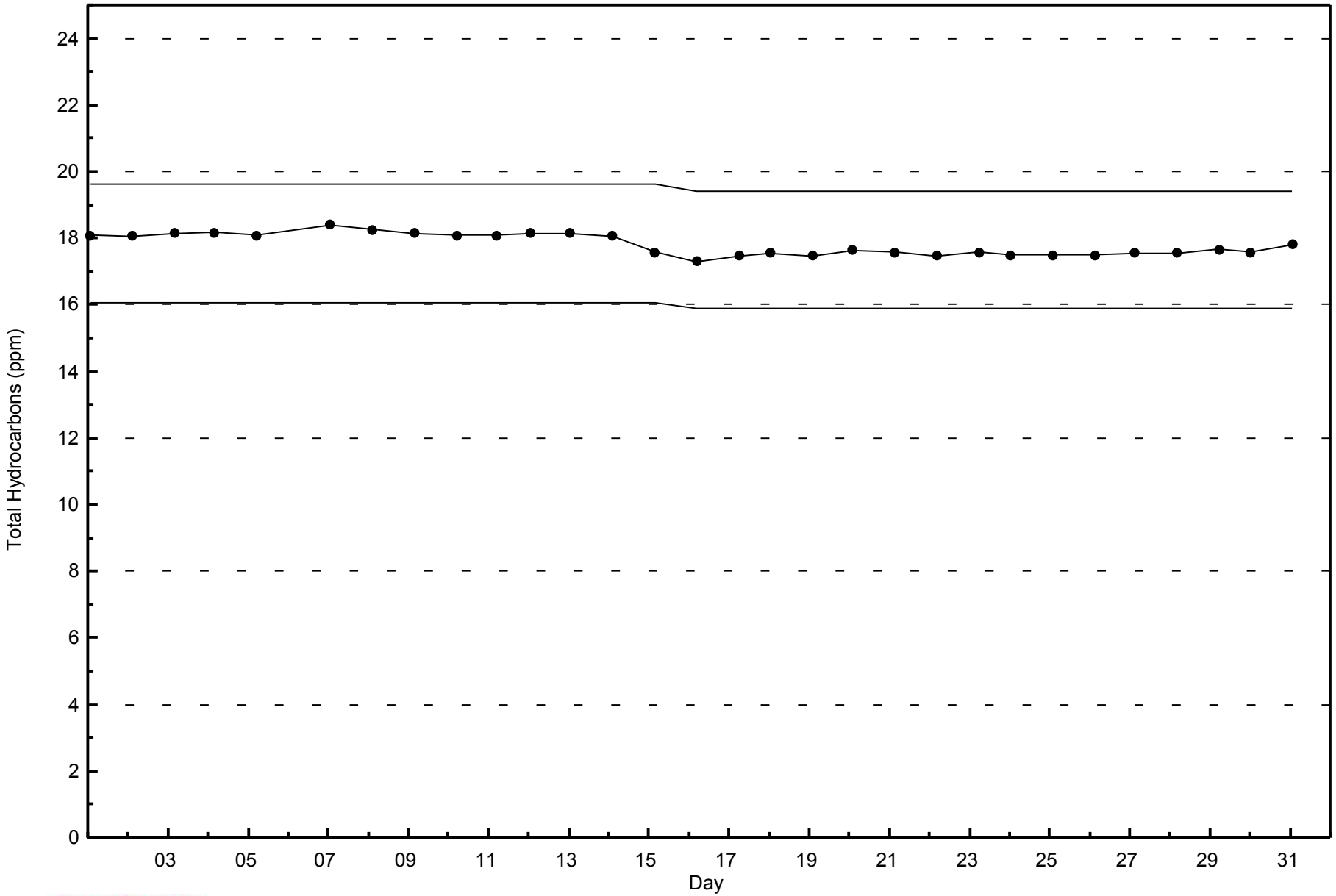
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2015

Maximum Value: 222 ppb on Jan 9 21:00

Maximum Daily Average: 32.3 ppb on Jan 9

Minimum Value: 0 ppb on Jan 3 22:00

Minimum Daily Average: 0.0 ppb on Jan 4

Maximum Diurnal Average: 10.6 ppb at hour 21

Minimum Diurnal Average: 1.3 ppb at hour 4

Monthly Average: 3.9 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 2$ $P_{90} = 10$ $P_{99} = 73$

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-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
2-Jan	0	0	Z	0	0	0	0	0	0	1	3	6	5	8	13	6	4	7	8	16	21	43	36	12	8.2	43
3-Jan	3	2	0	Z	5	6	5	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	6
4-Jan	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
5-Jan	0	0	0	0	0	Z	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0.3	1
6-Jan	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
7-Jan	0	Z	0	0	0	0	0	0	0	2	2	4	2	1	1	0	0	0	0	2	2	0	0	0	0.7	4
8-Jan	0	0	Z	0	0	0	0	0	0	1	3	5	1	4	5	4	0	0	0	0	0	0	0	0	1.0	5
9-Jan	0	0	0	Z	0	0	0	0	1	3	8	8	8	6	7	10	8	10	78	161	222	103	89	21	32.3	222
10-Jan	0	0	7	15	Z	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	15
11-Jan	0	0	0	0	0	Z	0	1	1	3	5	3	23	18	10	5	6	10	9	2	0	0	0	0	4.2	23
12-Jan	Z	0	0	0	0	0	0	0	0	5	18	35	37	10	6	4	10	28	20	5	5	1	0	1	8.1	37
13-Jan	0	Z	13	5	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	1	13	1.7	13
14-Jan	0	0	Z	0	0	1	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0.1	1
15-Jan	0	0	0	Z	0	0	0	0	0	0	1	2	2	2	2	1	0	0	3	9	14	8	1	0	2.0	14
16-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Jan	0	0	0	0	0	Z	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0.3	1
18-Jan	Z	0	0	0	0	0	0	0	0	2	1	2	1	0	0	0	0	0	0	0	19	34	31	85	7.7	85
19-Jan	92	Z	56	4	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	6.9	92
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	4	4	8	17	16	16	32	29	32	20	19	14	9.2	32
21-Jan	11	10	15	Z	24	21	27	20	16	15	15	10	2	1	1	0	0	0	0	0	0	0	0	0	8.2	27
22-Jan	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
23-Jan	0	0	0	0	0	Z	0	0	0	0	2	11	8	4	1	1	0	0	0	0	0	0	1	8	1.6	11
24-Jan	Z	21	14	9	18	25	33	31	33	31	31	14	2	2	5	3	2	0	2	3	0	3	10	6	12.9	33
25-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	2	3	4	0	0	0	0	0	0	0	0	0.5	4
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	6	2	0	0	0	0	0	0	0	0	0.5	6
27-Jan	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
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	1	1	2	2	2	1	0	0	0	1	0	2	8	0.9	8
29-Jan	7	4	3	0	0	Z	0	0	0	5	11	10	8	7	10	12	11	12	18	5	2	0	0	0	5.4	18
30-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.1	1
31-Jan	11	Z	6	0	0	0	0	0	0	0	4	5	3	12	8	7	3	0	0	1	10	23	15	0	4.8	23
	4.8	1.5	4.4	1.3	1.8	2.2	2.2	1.7	1.7	2.4	3.8	4.1	3.7	3.0	3.0	2.6	2.1	2.8	5.5	7.5	10.6	7.7	6.7	5.5	Diurnal Average	
	92	21	56	15	24	25	33	31	33	31	31	35	37	18	13	17	16	28	78	161	222	103	89	85	Diurnal Maximum	

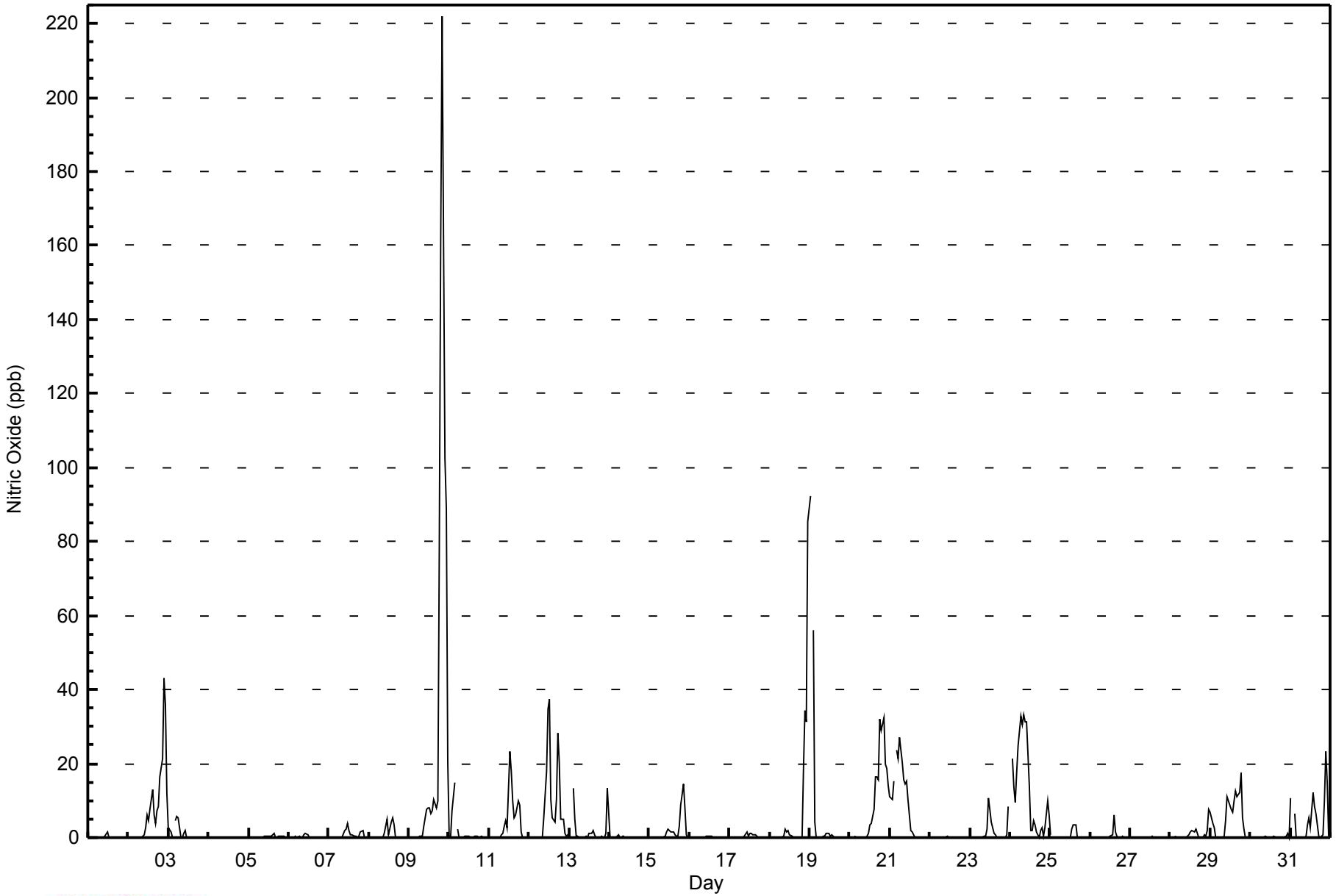
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	95.48	95.48
21 - 40	23	3.25	98.73
11 - 80	3	0.42	99.15
81 - 159	4	0.56	99.72
> 159	2	0.28	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2015

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	100	52	28	6	5	7	29	116	88	66	41	12	18	24	16	645
21 - 40	1	0	0	0	1	0	0	2	7	2	1	0	0	1	0	2	17
11 - 80	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	3
81 - 159	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
Totals	39	101	52	28	7	5	7	31	123	90	68	42	13	20	27	18	671

Total Number of Valid Hours: 671

Total Number of Hours: 744

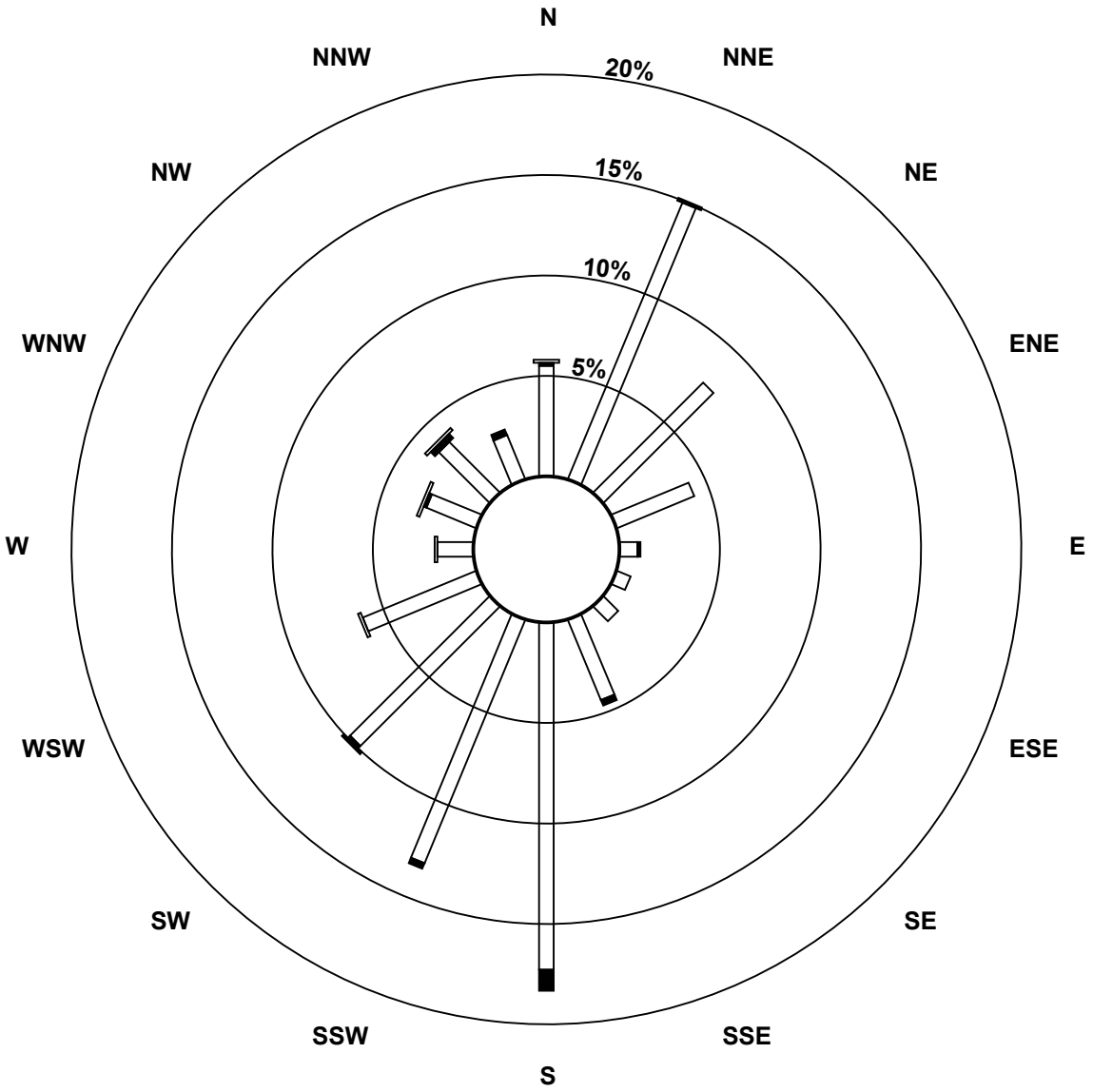
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

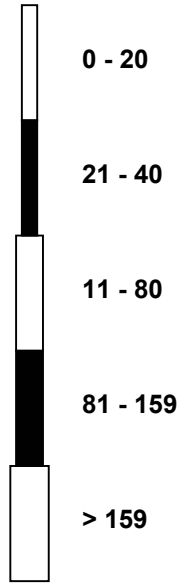
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



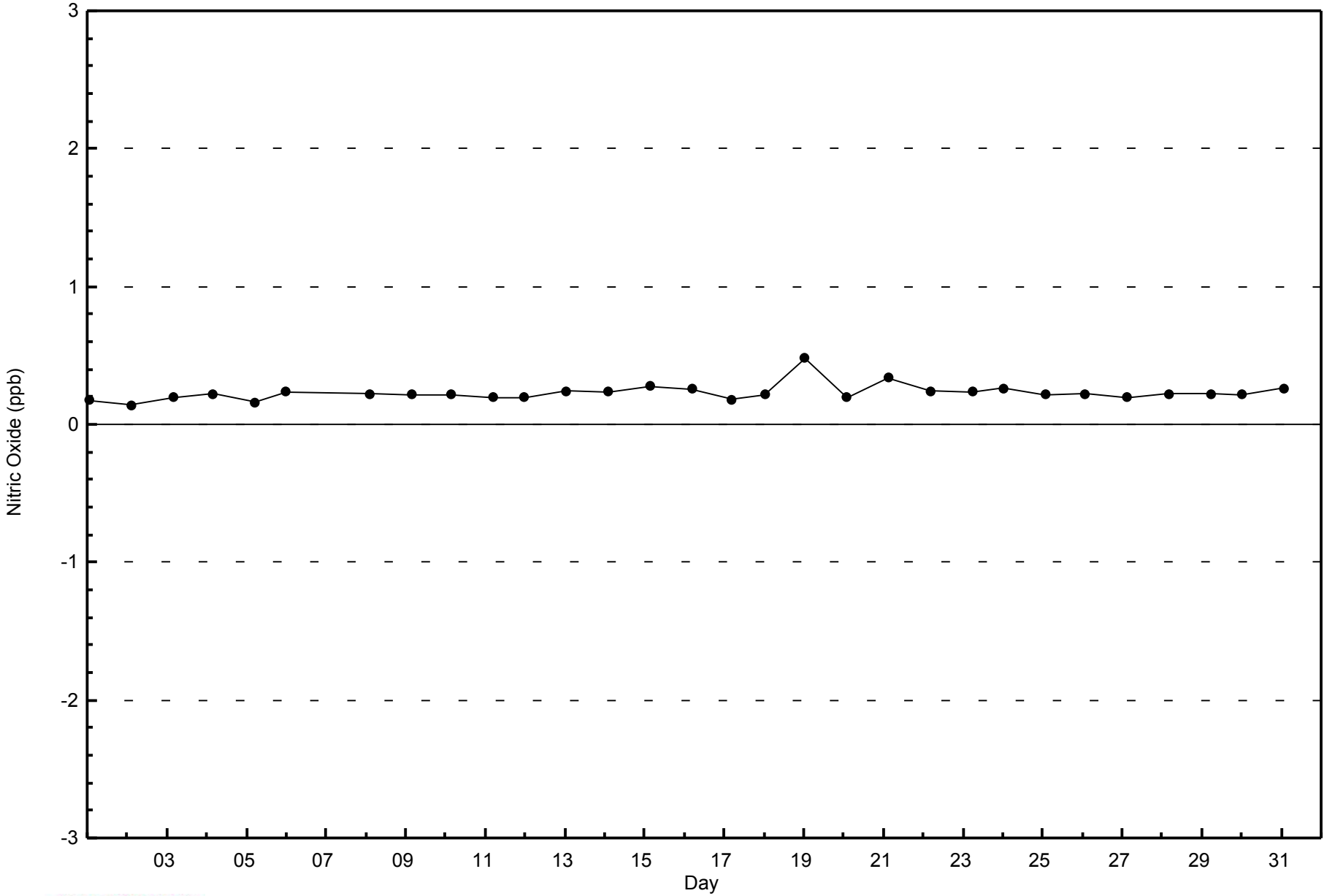
Total Number of Valid Hours: 671

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2015



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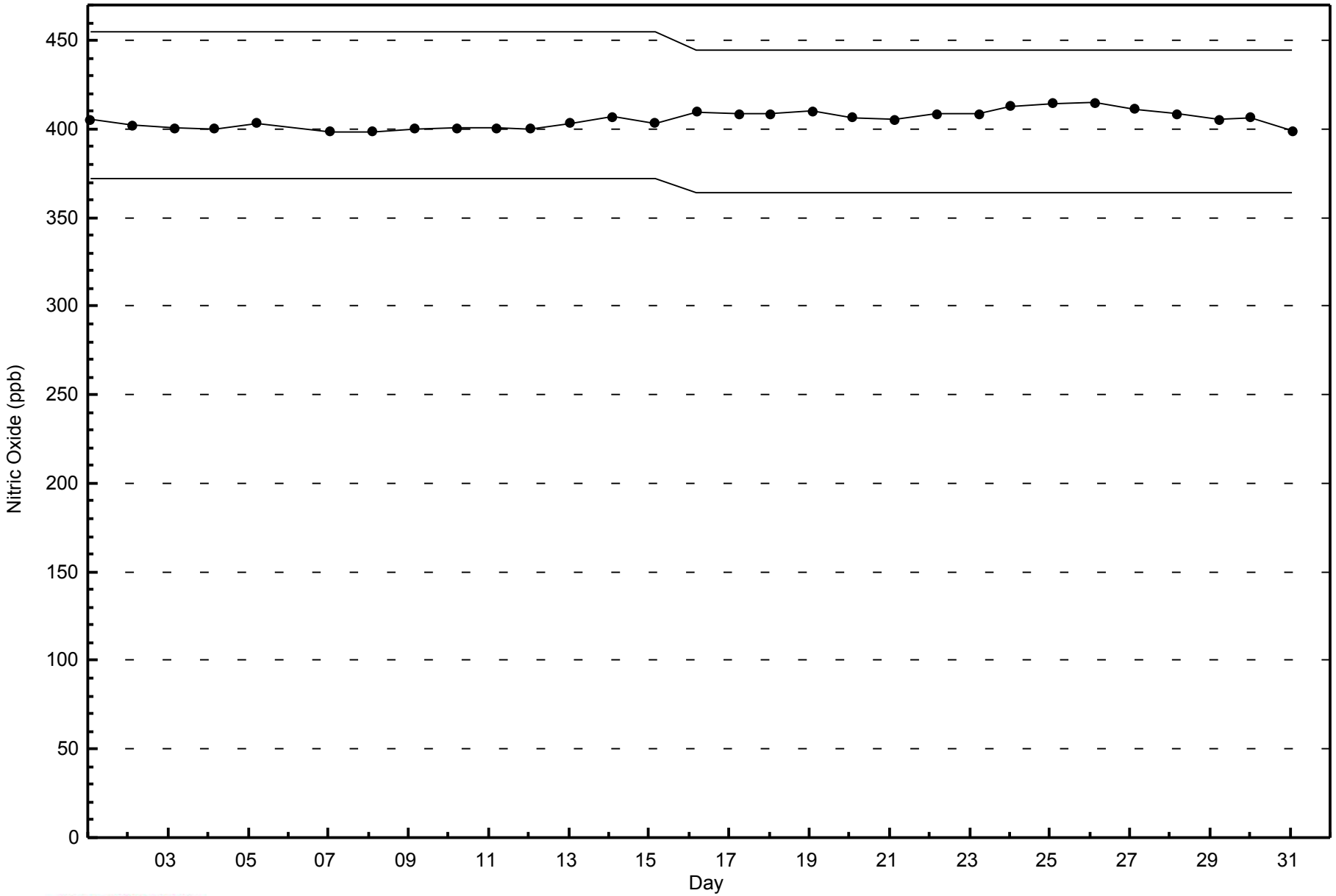
WBEA

Span Responses

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2015



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Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 61 ppb on Jan 9 21:00 Maximum Daily Average: 23.3 ppb on Jan 9

Minimum Value: 0 ppb on Jan 20 08:00
Maximum Diurnal Average: 13.2 ppb at hour 21
Monthly Average: 9.4 ppb

Minimum Daily Average: 0.5 ppb on Jan 4
Minimum Diurnal Average: 6.0 ppb at hour 13
Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 5 $Q_3 = 15$ $P_{90} = 26$ $P_{99} = 38$

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-Jan	3	Z	2	2	2	3	3	1	1	1	4	8	1	0	0	1	0	0	1	3	3	5	3	2	2.1	8
2-Jan	2	9	Z	10	11	10	8	7	11	10	9	12	12	17	24	24	29	32	30	31	32	33	33	29	18.5	33
3-Jan	26	24	16	Z	27	29	18	3	5	14	7	1	0	0	0	0	1	0	0	1	0	0	0	0	7.5	29
4-Jan	0	0	0	0	Z	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0.5	1
5-Jan	1	1	1	1	1	Z	2	4	10	13	4	2	2	2	5	13	14	19	26	23	12	15	5	4	7.8	26
6-Jan	Z	4	6	11	23	18	18	13	14	6	4	2	1	1	1	1	1	1	1	1	1	1	1	1	5.6	23
7-Jan	1	Z	1	1	1	4	7	7	14	20	14	17	14	9	8	7	16	22	25	27	14	5	5	7	10.6	27
8-Jan	3	3	Z	6	5	17	6	4	9	15	14	15	3	13	18	20	2	1	1	1	1	1	0	0	6.8	20
9-Jan	0	0	1	Z	3	8	11	11	18	20	20	16	15	14	19	30	37	37	41	49	61	51	44	31	23.3	61
10-Jan	13	10	26	28	Z	20	13	8	6	4	2	1	1	1	1	3	18	27	27	26	21	15	7	4	12.2	28
11-Jan	2	2	3	9	6	Z	10	17	20	14	11	5	22	21	19	22	28	31	30	23	14	10	3	2	14.1	31
12-Jan	Z	2	3	3	3	3	6	8	7	22	26	27	28	16	14	16	25	33	31	26	25	18	19	18	16.5	33
13-Jan	19	Z	27	26	26	21	13	9	4	1	2	1	5	7	9	12	13	16	15	22	14	12	21	29	14.0	29
14-Jan	15	11	Z	7	6	11	11	7	4	2	C	C	C	C	C	1	1	1	1	0	0	0	1	2	4.5	15
15-Jan	10	21	15	Z	9	3	1	2	5	9	12	12	8	9	12	16	20	32	39	38	38	35	28	9	16.6	39
16-Jan	8	11	14	14	Z	15	9	4	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	4.3	15
17-Jan	1	1	0	0	1	Z	1	4	14	3	8	2	5	6	5	9	16	14	3	5	15	11	8	14	6.3	16
18-Jan	Z	18	17	12	9	9	11	12	13	11	4	4	2	1	1	1	1	1	1	2	22	34	31	33	10.9	34
19-Jan	34	Z	33	22	11	7	6	4	5	3	3	4	1	2	1	1	1	1	1	1	1	1	1	3	6.4	34
20-Jan	8	9	Z	6	2	0	0	0	0	1	1	3	7	7	14	26	29	30	31	29	29	26	26	24	13.3	31
21-Jan	23	22	22	Z	24	24	25	25	25	22	20	17	7	5	3	2	2	1	1	1	1	1	1	1	12.0	25
22-Jan	1	1	1	1	Z	1	1	1	1	2	8	1	0	0	1	1	1	1	1	2	1	0	1	1	1.0	8
23-Jan	1	4	8	12	12	Z	2	4	7	5	10	16	12	9	5	5	5	5	5	5	6	5	11	17	7.3	17
24-Jan	Z	15	15	14	16	17	18	17	16	15	16	12	5	6	11	11	13	9	21	22	19	21	21	18	15.0	22
25-Jan	9	Z	1	1	1	3	9	6	2	1	1	1	1	6	13	18	7	9	3	2	2	4	11	7	5.0	18
26-Jan	9	10	Z	1	0	0	1	1	1	1	1	1	1	2	7	5	2	1	1	1	1	1	0	0	2.0	10
27-Jan	1	1	0	Z	0	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0.7	2
28-Jan	2	1	2	3	Z	3	2	0	1	1	2	3	4	5	4	8	15	13	7	7	16	20	23	33	7.5	33
29-Jan	31	30	27	17	14	Z	7	8	10	17	20	18	15	13	16	22	26	30	30	28	27	17	13	11	19.4	31
30-Jan	Z	4	4	4	2	1	1	1	1	3	0	0	0	0	1	0	1	0	1	2	6	16	24	13	3.7	24
31-Jan	22	Z	25	7	8	5	4	3	2	3	7	8	4	14	13	16	20	23	23	23	28	31	28	13	14.3	31
	9.3	8.6	10.4	8.4	8.5	8.9	7.2	6.2	7.4	7.8	7.7	7.0	6.0	6.3	7.6	9.4	11.0	12.6	12.8	13.0	13.2	12.6	12.0	10.6	Diurnal Average	
	34	30	33	28	27	29	25	25	25	22	26	27	28	21	24	30	37	37	41	49	61	51	44	33	Diurnal Maximum	

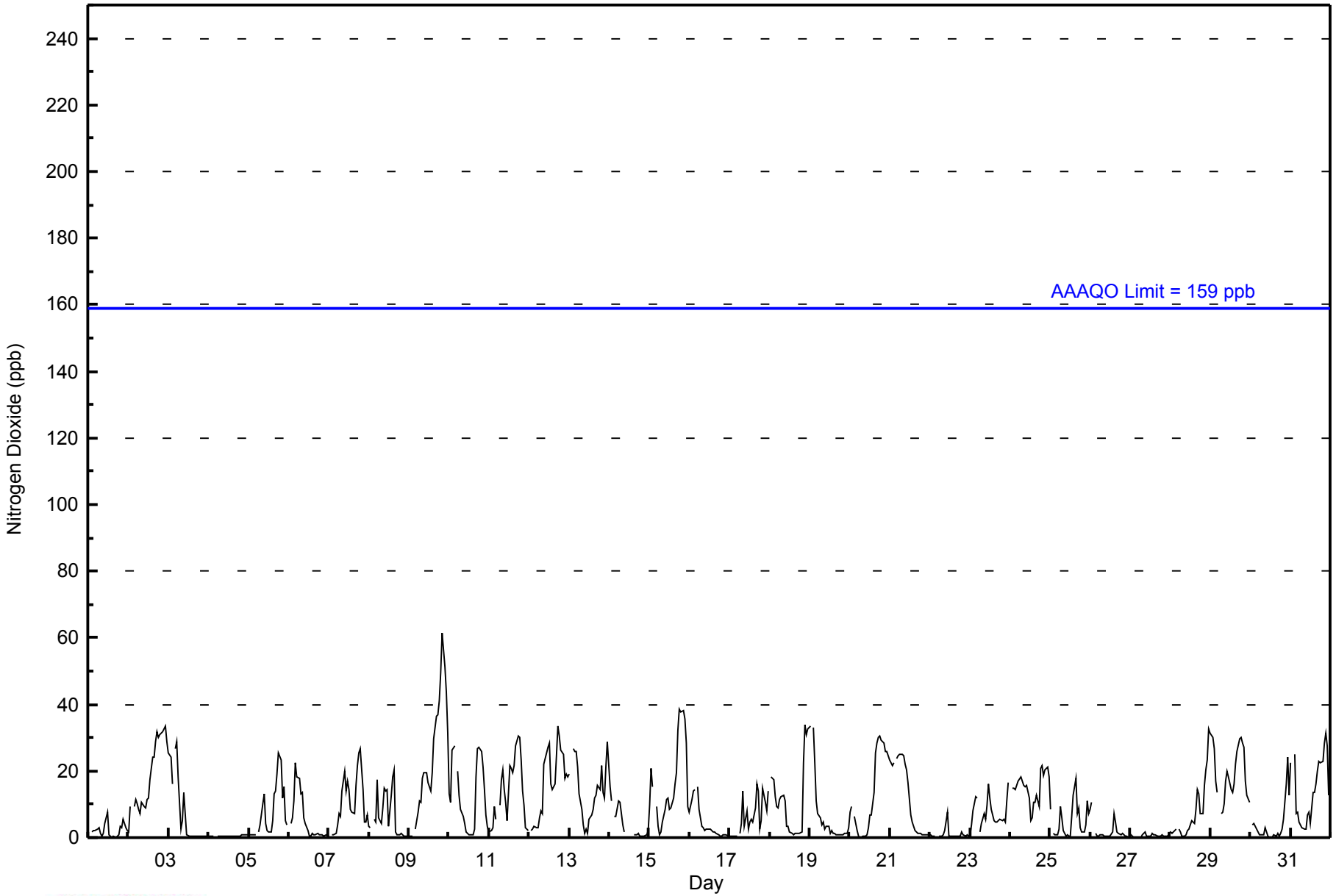
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	594	83.90	83.90
21 - 40	109	15.40	99.29
11 - 80	5	0.71	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2015

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	92	50	25	4	5	7	23	95	79	60	34	9	13	19	13	561
21 - 40	6	9	2	3	3	0	0	8	28	11	8	8	3	6	5	5	105
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	101	52	28	7	5	7	31	123	90	68	42	13	20	27	18	671

Total Number of Valid Hours: 671

Total Number of Hours: 744

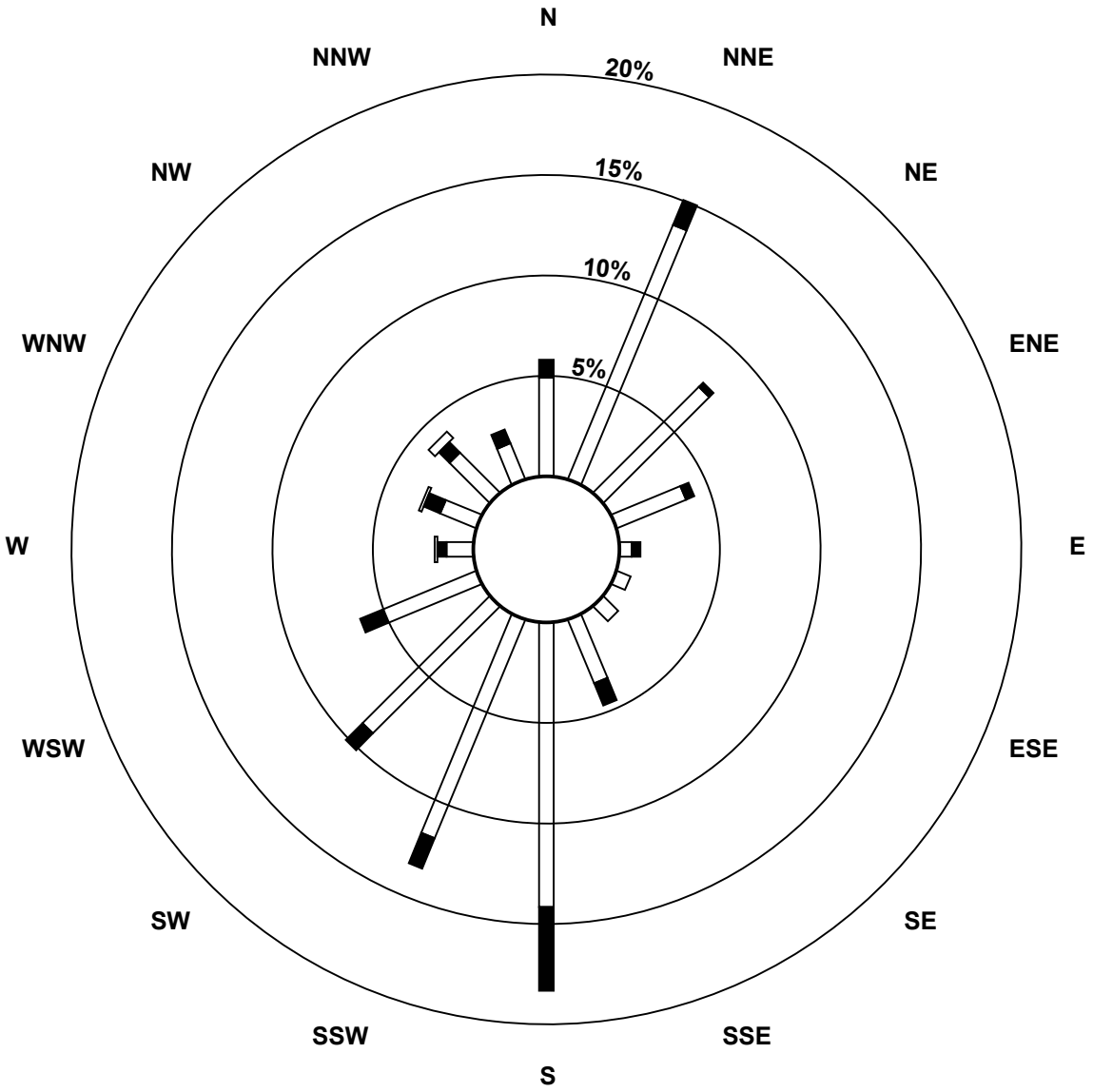
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

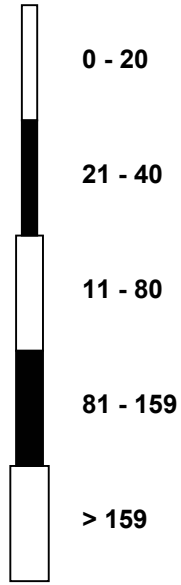
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



0 - 20

21 - 40

11 - 80

81 - 159

> 159

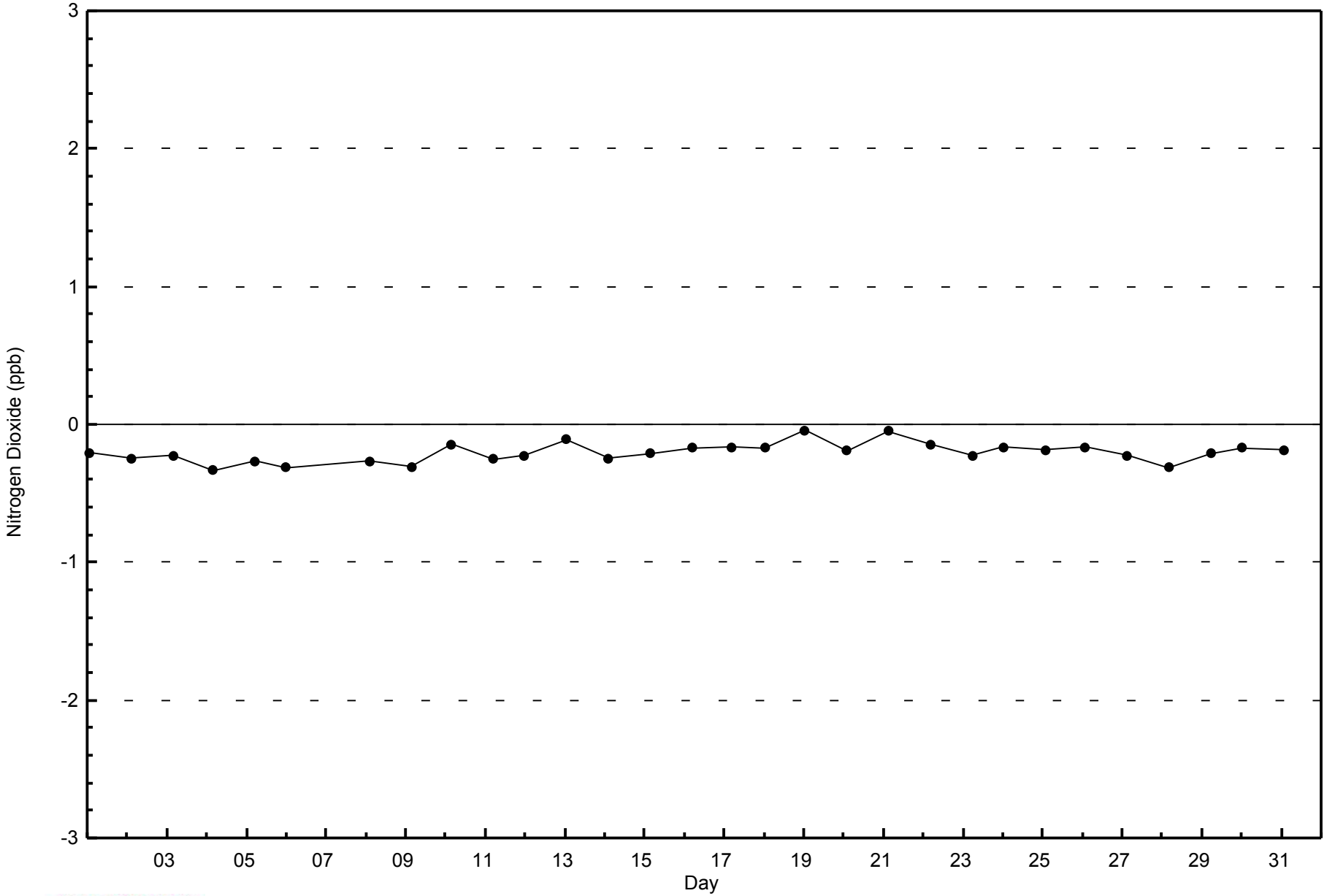
Total Number of Valid Hours: 671

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2015



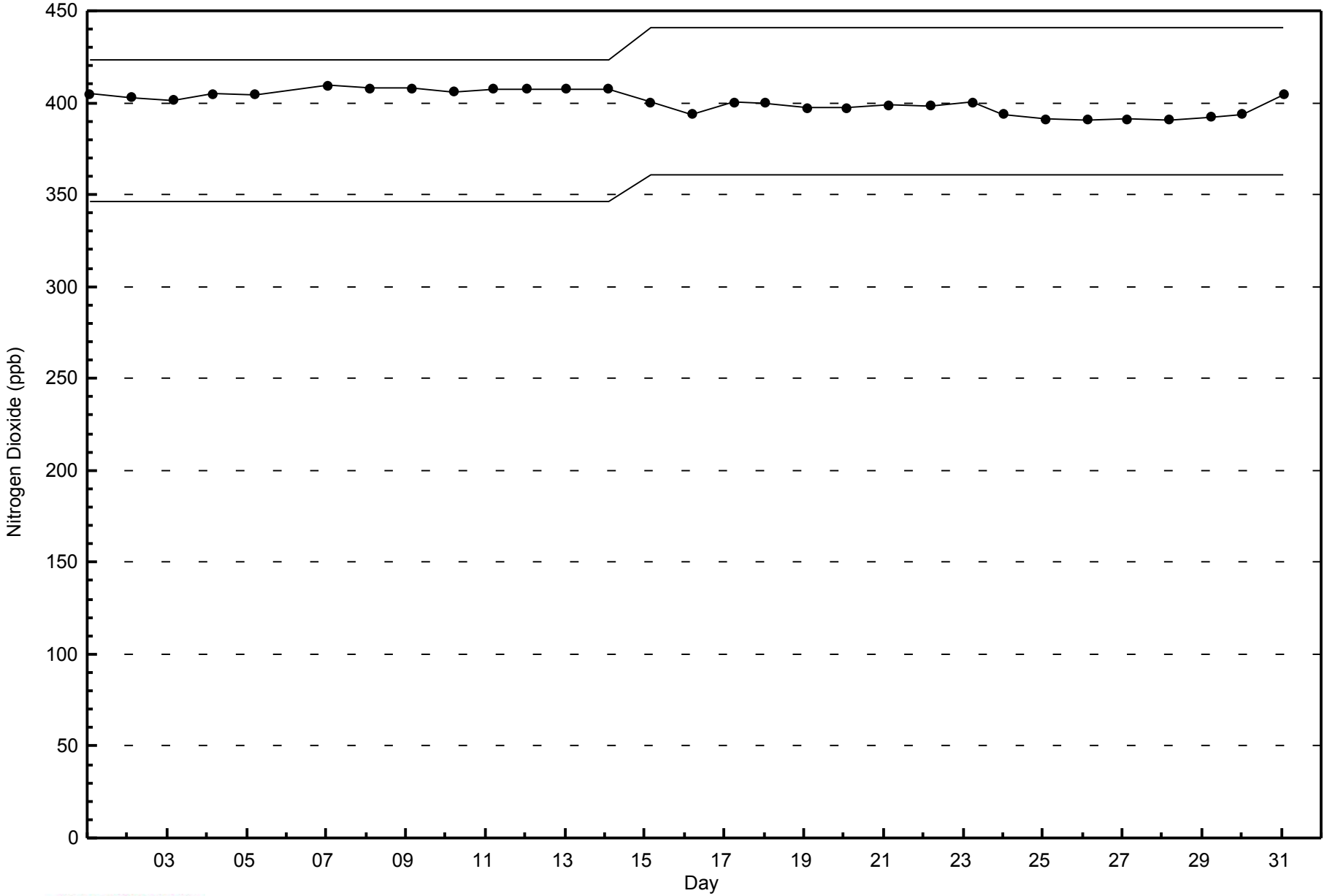
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2015

Maximum Value: 283 ppb on Jan 9 21:00

Maximum Daily Average: 55.6 ppb on Jan 9

Minimum Value: 0 ppb on Jan 27 00:00

Minimum Daily Average: 0.5 ppb on Jan 4

Maximum Diurnal Average: 23.9 ppb at hour 21

Minimum Diurnal Average: 7.9 ppb at hour 8

Monthly Average: 13.3 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 6 $Q_3 = 18$ $P_{90} = 36$ $P_{99} = 118$

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-Jan	3	Z	2	2	2	3	3	1	0	2	5	9	1	0	0	0	0	0	1	3	3	5	3	2	2.3	9
2-Jan	2	9	Z	10	11	10	8	7	11	10	11	18	17	25	37	30	33	39	38	47	53	76	69	41	26.7	76
3-Jan	28	26	16	Z	31	34	24	3	5	15	9	1	0	0	0	0	0	0	0	1	0	0	0	0	8.6	34
4-Jan	0	0	0	0	Z	1	0	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0.5	1
5-Jan	1	1	1	1	1	Z	2	4	10	14	5	3	2	2	6	14	14	19	26	23	12	16	5	4	8.0	26
6-Jan	Z	4	6	11	23	18	18	13	14	7	5	3	1	1	1	1	1	1	1	1	1	1	1	1	5.8	23
7-Jan	1	Z	1	1	1	4	7	7	14	22	16	21	16	9	8	8	16	22	26	29	16	5	5	7	11.3	29
8-Jan	3	3	Z	6	5	17	6	4	9	16	17	20	4	17	23	24	2	1	1	1	1	1	0	0	7.9	24
9-Jan	0	0	1	Z	3	7	11	11	18	23	27	24	24	21	27	40	44	47	119	211	283	154	133	52	55.6	283
10-Jan	13	11	33	42	Z	22	13	8	6	5	2	2	1	1	1	3	19	27	27	26	21	15	7	4	13.5	42
11-Jan	2	2	3	9	6	Z	10	18	22	17	15	8	45	39	29	27	34	41	39	25	14	10	3	2	18.2	45
12-Jan	Z	2	3	3	3	3	6	8	7	27	44	62	66	27	20	20	35	62	51	31	30	19	20	19	24.6	66
13-Jan	19	Z	40	30	26	21	13	9	4	1	3	2	7	8	11	13	13	16	14	22	14	12	22	42	15.7	42
14-Jan	15	11	Z	7	6	12	11	7	4	2	C	C	C	C	C	1	1	1	0	0	0	0	1	2	4.6	15
15-Jan	10	21	15	Z	9	3	1	2	5	9	13	14	10	11	13	17	20	33	42	47	52	44	29	9	18.6	52
16-Jan	8	11	14	14	Z	15	9	4	3	2	3	3	3	2	2	2	1	1	1	1	1	1	1	1	4.4	15
17-Jan	1	1	0	0	1	Z	1	4	14	4	9	3	6	7	5	10	17	14	3	5	15	11	8	14	6.6	17
18-Jan	Z	18	17	12	9	9	11	13	13	13	5	5	3	1	1	1	1	1	1	2	41	68	62	118	18.6	118
19-Jan	126	Z	89	26	11	7	6	4	5	3	4	5	2	3	1	2	1	1	1	1	1	1	1	3	13.2	126
20-Jan	8	10	Z	6	2	0	0	0	0	1	1	4	10	11	21	42	45	46	63	58	61	46	44	39	22.6	63
21-Jan	34	32	38	Z	48	46	52	45	40	37	36	27	9	6	4	2	2	1	1	1	1	1	1	1	20.2	52
22-Jan	1	1	1	1	Z	1	1	1	1	2	8	1	0	1	1	1	1	1	1	2	1	0	1	0	1.0	8
23-Jan	1	4	8	12	12	Z	1	4	7	6	12	27	20	12	6	5	5	5	5	5	6	5	12	25	8.9	27
24-Jan	Z	36	28	24	34	42	51	48	49	46	47	26	7	8	15	14	15	9	23	24	19	23	31	24	27.9	51
25-Jan	9	Z	1	1	1	3	9	6	2	1	1	1	1	9	16	22	7	9	3	2	2	4	11	7	5.5	22
26-Jan	8	10	Z	1	0	0	1	1	1	1	1	1	1	2	14	6	2	1	1	1	1	1	0	0	2.5	14
27-Jan	1	1	0	Z	0	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0.7	2
28-Jan	2	1	2	3	Z	3	2	0	0	1	2	3	5	7	6	10	16	13	7	7	17	21	25	41	8.5	41
29-Jan	38	34	29	17	14	Z	7	8	10	22	31	28	22	20	26	34	37	42	48	34	29	17	13	11	24.8	48
30-Jan	Z	4	4	4	2	1	1	1	1	4	0	0	0	0	1	0	1	0	1	2	6	17	25	13	3.8	25
31-Jan	33	Z	31	8	8	5	4	3	2	3	10	13	7	26	22	23	23	23	23	23	38	55	43	13	19.1	55
	14.1	10.1	14.8	9.7	10.3	11.1	9.4	7.9	9.1	10.2	11.5	11.1	9.6	9.2	10.6	12.0	13.1	15.4	18.3	20.5	23.9	20.2	18.6	16.0	Diurnal Average	
	126	36	89	42	48	46	52	48	49	46	47	62	66	39	37	42	45	62	119	211	283	154	133	118	Diurnal Maximum	

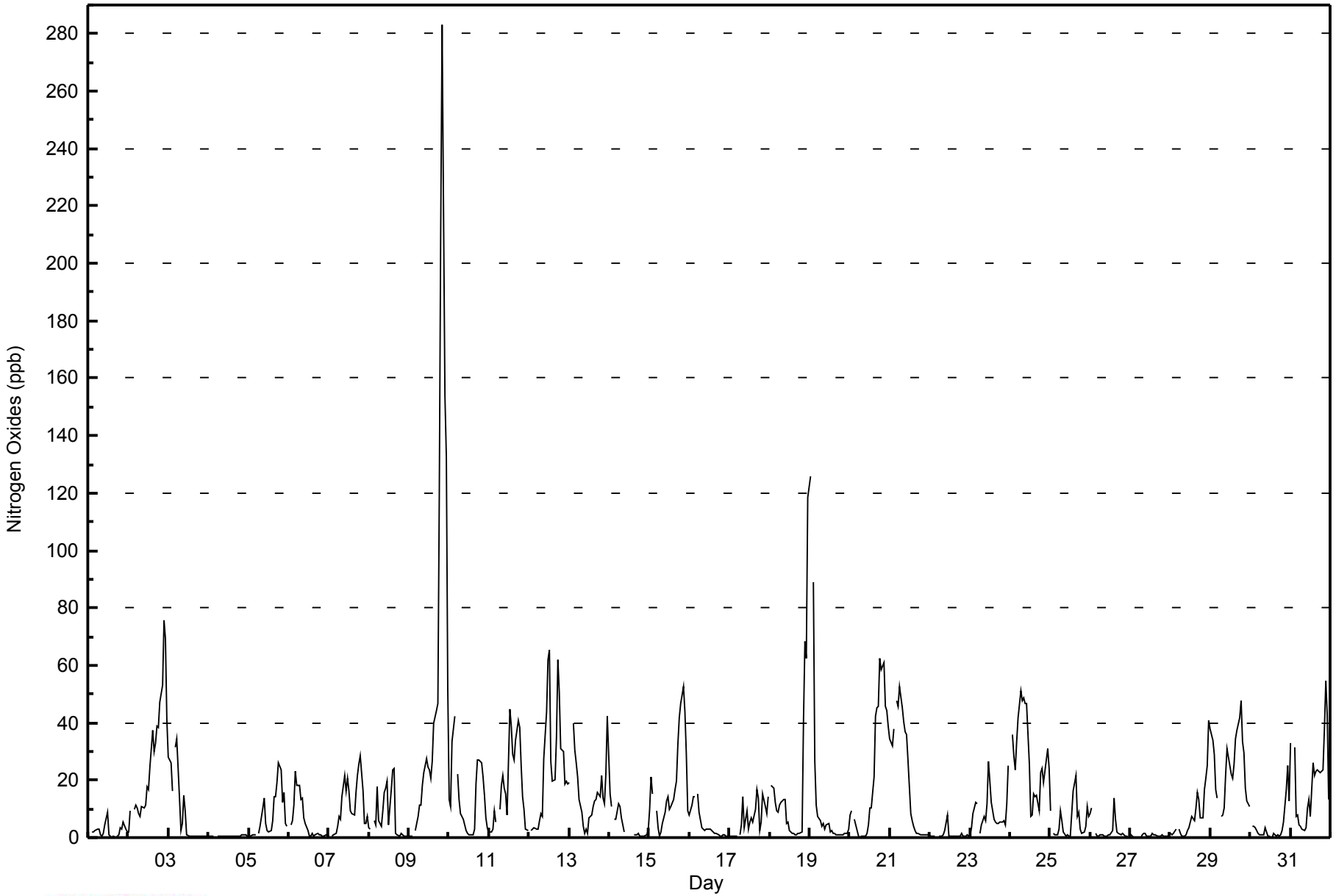
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	550	77.68	77.68
21 - 40	103	14.55	92.23
11 - 80	47	6.64	98.87
81 - 159	6	0.85	99.72
> 159	2	0.28	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2015

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	92	49	24	2	4	7	15	88	74	59	32	7	13	18	11	528
21 - 40	4	6	2	4	4	1	0	12	21	10	7	8	3	3	4	5	94
11 - 80	1	2	1	0	1	0	0	4	14	6	1	2	2	3	2	2	41
81 - 159	1	1	0	0	0	0	0	0	0	0	1	0	1	0	2	0	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
Totals	39	101	52	28	7	5	7	31	123	90	68	42	13	20	27	18	671

Total Number of Valid Hours: 671

Total Number of Hours: 744

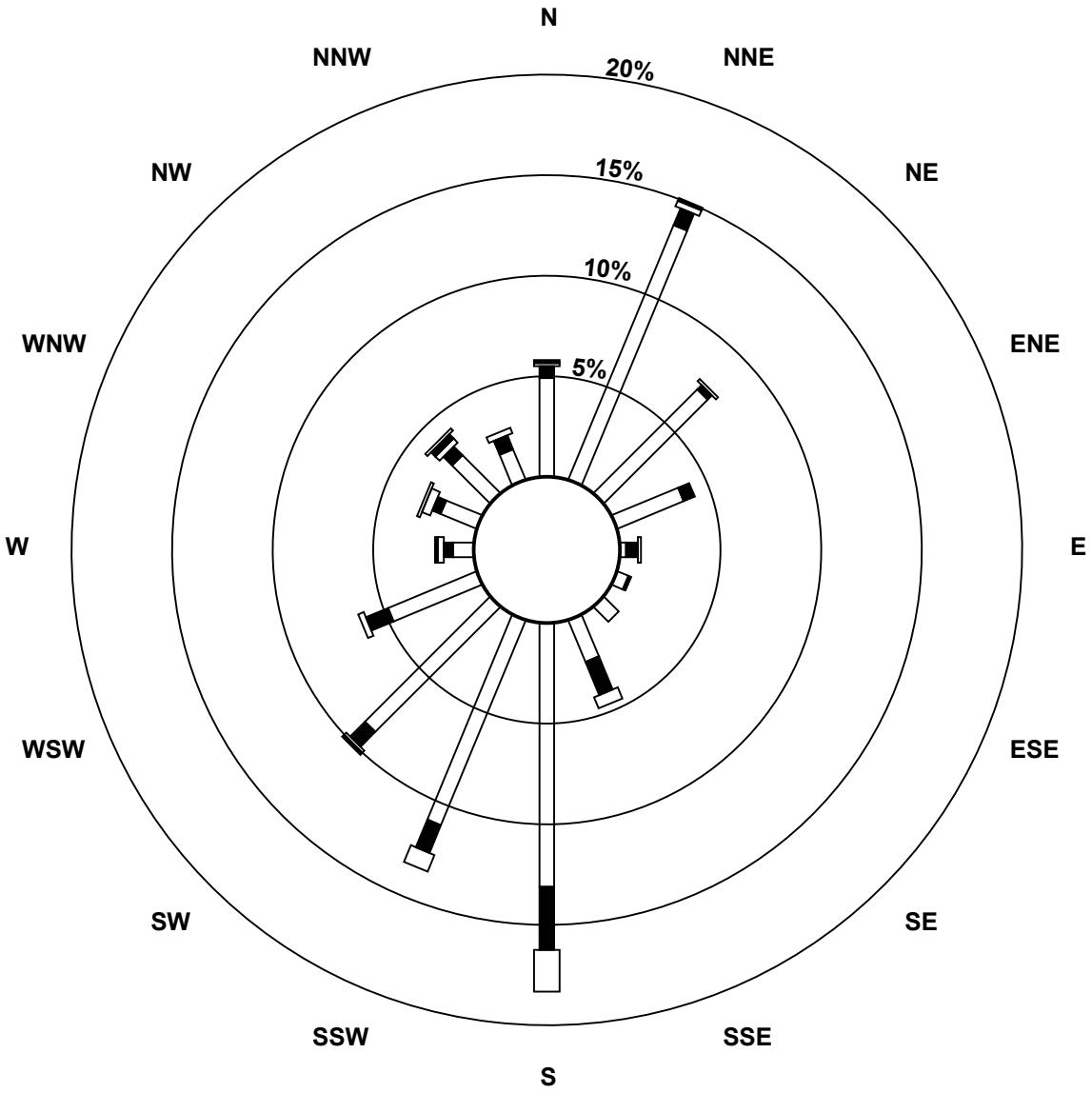
AURORA ATMOSPHERICS INC.

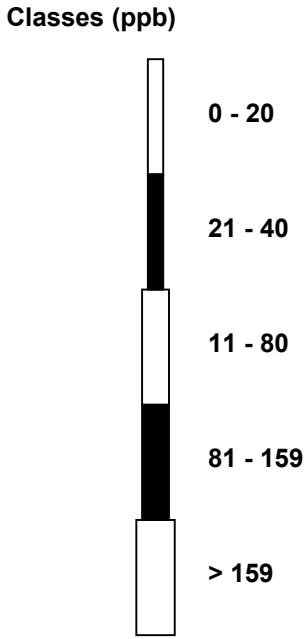
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon (AMS 15)

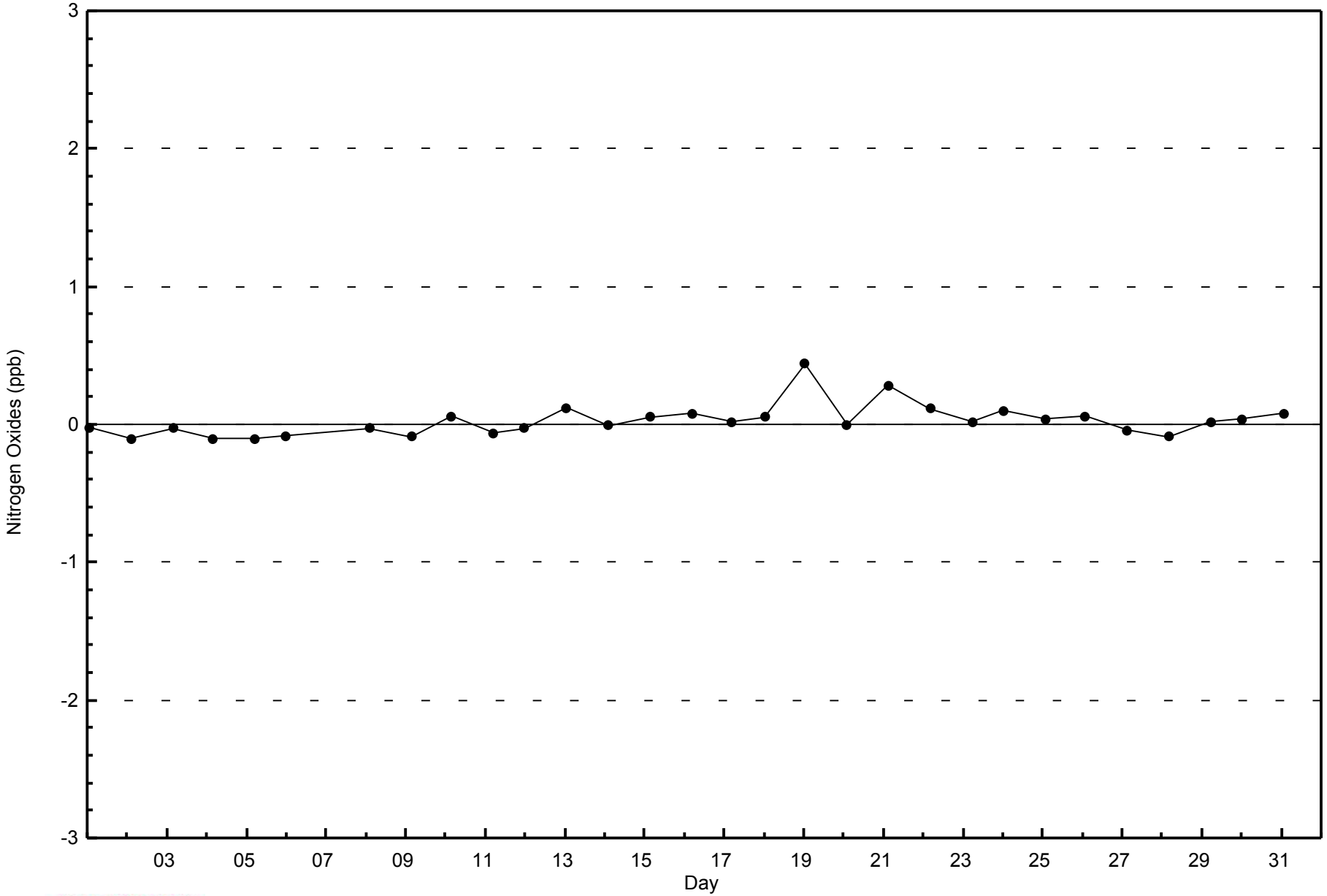




Total Number of Valid Hours: 671

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
CNRL Horizon - January 2015



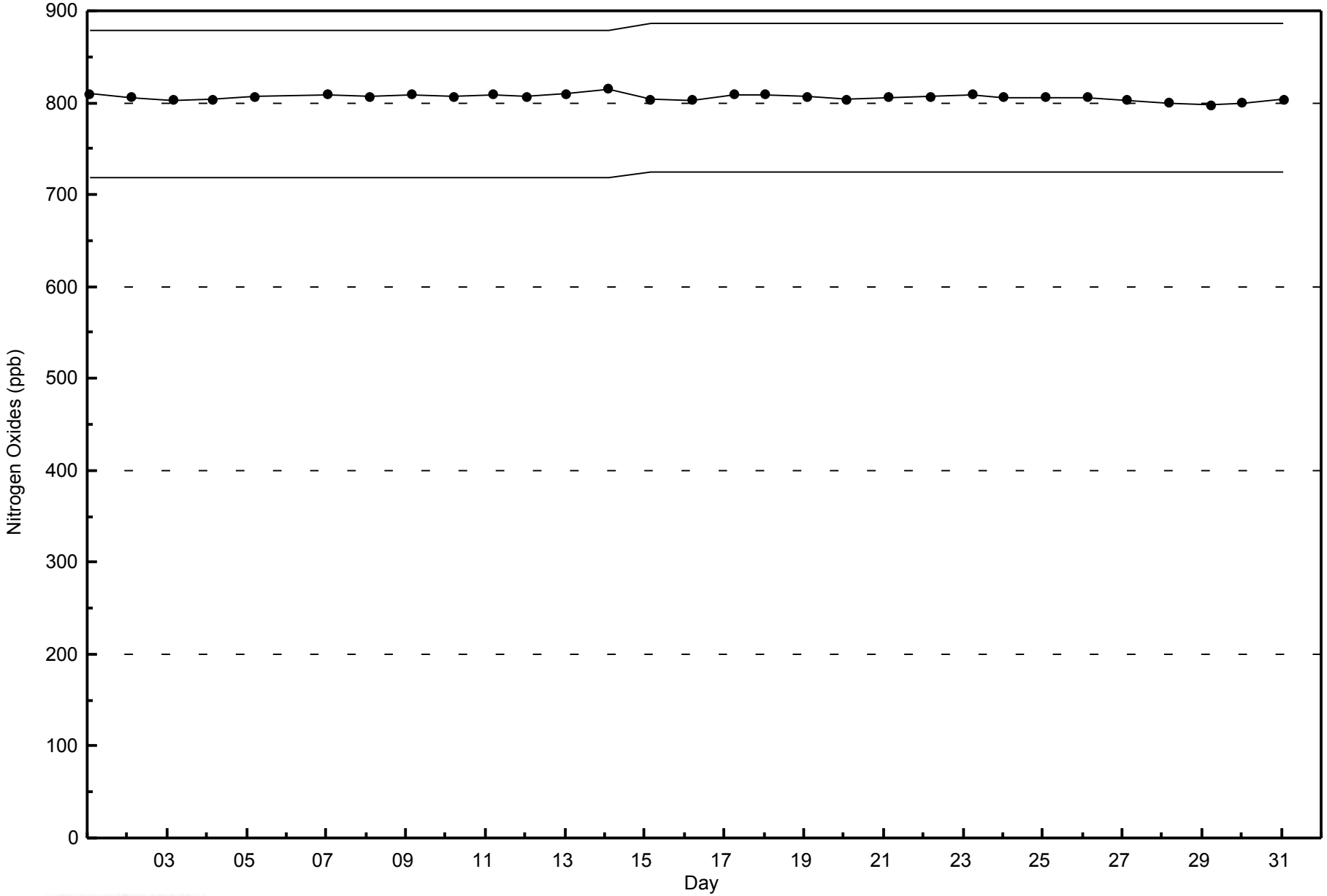
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

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

Maximum Value: 20.3 $\mu g/m^3$ on Jan 21 02:00

Maximum Daily Average: 8.0 $\mu g/m^3$ on Jan 24

Minimum Value: 0.2 $\mu g/m^3$ on Jan 22 10:00

Minimum Daily Average: 0.6 $\mu g/m^3$ on Jan 22

Maximum Diurnal Average: 5.7 $\mu g/m^3$ at hour 20

Minimum Diurnal Average: 3.1 $\mu g/m^3$ at hour 14

Monthly Average: 4.03 $\mu g/m^3$

Percentiles: P_1 = 0.3 P_{10} = 0.9 Q_1 = 1.9 Median = 2.9 Q_3 = 5.3 P_{90} = 8.3 P_{99} = 17.8

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-Jan	2.4	2.1	2.2	2.4	3.1	3.0	2.9	2.7	2.7	2.6	4.0	4.5	2.1	2.2	2.1	1.8	1.8	1.8	1.8	1.7	1.2	1.2	1.3	1.2	2.3	4.5
2-Jan	1.2	1.6	1.8	2.0	2.0	2.0	2.0	2.1	3.0	2.8	3.0	2.9	3.1	4.2	4.4	4.6	5.7	6.0	5.8	6.1	6.1	9.2	7.7	5.5	4.0	9.2
3-Jan	4.0	3.5	3.2	3.1	6.9	7.1	3.3	1.9	2.1	2.7	2.1	1.4	1.6	2.0	1.9	2.4	3.0	3.0	3.3	3.3	3.2	3.2	3.1	2.7	3.1	7.1
4-Jan	2.8	2.4	2.2	2.3	2.2	2.1	1.7	1.9	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.4	2.0	2.0	1.7	1.7	1.7	1.5	1.4	1.3	1.8	2.8
5-Jan	1.3	1.4	1.5	1.6	1.5	1.6	1.5	1.7	2.4	2.9	1.5	1.4	1.2	1.6	2.1	3.6	3.8	3.9	4.6	4.3	3.9	4.8	9.6	11.8	3.1	11.8
6-Jan	11.3	10.8	8.0	9.1	9.7	9.5	9.3	7.5	6.0	3.7	3.1	3.3	2.8	2.4	2.0	2.0	2.3	2.1	1.7	1.6	1.6	1.2	1.3	1.0	4.7	11.3
7-Jan	0.8	0.7	0.8	0.8	1.6	3.0	2.1	2.1	6.3	7.0	5.5	10.5	6.1	2.6	2.8	2.5	4.7	13.1	10.4	8.4	3.2	1.1	1.1	0.9	4.1	13.1
8-Jan	0.9	0.8	0.9	1.3	1.3	2.2	1.4	1.1	1.4	1.8	2.2	2.1	1.4	1.7	2.1	2.5	2.4	3.4	3.4	2.9	2.4	2.0	2.1	1.9	1.9	3.4
9-Jan	1.9	1.8	1.8	2.1	2.7	4.0	5.5	3.1	3.3	3.3	3.7	2.8	2.2	2.2	4.2	8.4	7.4	7.3	11.1	18.3	19.9	11.9	8.8	4.3	5.9	19.9
10-Jan	2.5	2.0	2.8	3.0	2.4	1.8	1.4	1.0	0.9	0.9	0.9	3.0	1.5	1.8	1.6	2.4	8.1	12.9	11.6	10.4	6.5	4.2	1.6	1.3	3.6	12.9
11-Jan	1.4	1.6	1.5	1.8	1.6	1.9	2.9	5.8	4.2	2.9	2.5	1.9	6.2	5.9	8.1	17.8	14.8	7.8	7.5	6.8	6.6	6.3	5.5	5.4	5.4	17.8
12-Jan	5.3	5.3	5.2	4.5	3.7	3.4	3.6	4.3	4.8	7.1	7.9	7.7	6.6	4.8	4.6	5.6	8.6	14.1	8.9	6.5	6.5	5.7	6.8	7.1	6.2	14.1
13-Jan	7.8	10.1	7.5	7.5	7.4	7.5	5.0	4.4	3.8	3.6	4.1	3.2	3.5	M	2.6	2.3	2.4	2.6	2.6	2.9	2.6	2.7	2.9	3.9	4.5	10.1
14-Jan	3.1	2.9	3.4	4.0	3.4	4.0	3.7	3.1	2.4	1.9	2.3	2.2	2.1	1.9	1.6	1.6	2.1	2.1	2.0	2.1	2.4	2.7	2.6	2.6	2.6	4.0
15-Jan	2.9	3.3	3.0	2.7	2.3	2.0	1.8	1.5	1.2	1.5	1.9	2.0	2.2	2.0	2.0	2.6	3.6	4.6	5.0	4.9	4.9	6.0	5.6	4.9	3.1	6.0
16-Jan	6.9	8.1	6.7	7.9	13.2	4.2	4.6	4.6	5.5	7.0	7.3	8.1	8.2	5.7	3.3	2.0	2.0	1.1	0.3	0.3	2.2	1.1	0.8	0.7	4.7	13.2
17-Jan	0.4	0.4	0.4	0.5	1.0	1.8	2.6	3.2	3.6	2.5	2.8	3.0	3.2	3.9	4.1	3.9	4.2	4.0	4.8	5.6	5.6	6.4	5.7	9.3	3.5	9.3
18-Jan	9.7	16.6	14.1	8.5	7.0	6.8	10.2	10.4	9.9	7.9	4.3	2.7	1.1	0.6	0.5	0.4	0.5	0.5	0.6	0.5	2.5	4.2	4.6	5.3	5.4	16.6
19-Jan	6.4	10.4	10.5	9.6	4.2	2.9	3.1	2.9	3.3	3.6	3.7	2.5	2.1	2.2	2.5	2.7	2.8	4.3	4.8	4.5	4.3	4.4	4.4	4.8	4.5	10.5
20-Jan	4.4	3.8	2.8	2.9	2.9	2.7	2.7	2.5	2.6	2.5	2.6	2.2	2.3	3.9	4.4	15.7	17.8	20.2	19.7	16.3	12.9	8.4	6.9	6.8	7.1	20.2
21-Jan	6.7	20.3	13.3	6.2	5.2	6.5	8.7	4.5	4.2	3.7	3.4	2.7	1.7	2.1	1.7	0.9	0.7	0.6	0.5	0.5	0.5	0.4	0.3	0.3	4.0	20.3
22-Jan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.6	0.4	0.4	0.5	0.5	0.6	0.5	0.6	0.6	0.8	1.1	1.1	1.5	1.9	0.6	1.9
23-Jan	2.2	2.2	2.5	3.4	3.8	5.5	3.6	4.3	6.2	6.4	4.4	4.1	5.1	5.3	6.0	6.8	8.9	11.5	8.8	5.8	5.6	5.7	5.8	7.3	5.5	11.5
24-Jan	8.2	9.5	8.0	7.0	6.0	6.7	6.0	4.9	5.0	4.6	7.1	11.7	10.2	11.4	8.8	5.8	4.5	6.1	7.5	9.8	15.1	12.2	9.6	5.6	8.0	15.1
25-Jan	1.8	0.5	0.4	0.3	0.6	0.7	0.9	0.7	0.3	0.3	0.3	0.4	0.6	0.8	0.9	1.1	1.0	1.9	2.9	3.5	3.7	3.6	4.4	3.7	1.5	4.4
26-Jan	2.1	1.9	1.3	0.5	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.6	1.0	4.5	4.1	4.0	5.2	4.1	4.9	5.3	3.6	2.9	3.1	2.1	5.3
27-Jan	3.6	3.8	3.9	3.8	3.7	3.7	3.5	3.4	3.4	3.2	3.0	2.3	2.0	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.0	2.2	2.2	2.0	2.8	3.9
28-Jan	2.1	1.9	1.8	1.9	2.0	1.9	1.8	1.8	1.9	2.1	1.9	2.1	2.1	2.3	2.4	2.7	3.6	3.8	2.8	2.5	2.5	2.6	2.6	3.0	2.3	3.8
29-Jan	3.3	3.2	2.8	2.3	2.3	2.2	2.1	2.5	2.6	3.9	7.0	7.6	10.1	7.6	8.2	8.5	9.3	10.6	13.3	13.8	12.5	7.5	5.7	4.4	6.4	13.8
30-Jan	3.4	2.8	3.3	3.4	2.7	2.4	2.1	2.0	2.0	2.1	1.7	1.5	1.3	1.3	3.7	2.0	7.4	4.2	3.7	3.9	4.2	4.4	4.1	4.1	3.1	7.4
31-Jan	7.0	6.2	5.5	2.9	3.0	2.8	3.1	3.1	3.0	3.1	4.2	6.5	4.5	4.9	6.1	13.2	14.1	11.5	12.9	18.9	18.7	11.9	7.7	3.5	7.4	18.9
	3.8	4.6	4.0	3.5	3.5	3.4	3.3	3.1	3.2	3.2	3.3	3.5	3.2	3.1	3.3	4.3	5.0	5.6	5.5	5.7	5.5	4.6	4.2	3.9	Diurnal Average	
	11.3	20.3	14.1	9.6	13.2	9.5	10.2	10.4	9.9	7.9	7.9	11.7	10.2	11.4	8.8	17.8	17.8	20.2	19.7	18.9	19.9	12.2	9.6	11.8	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

CNRL Horizon - January 2015

Particulate Matter 2.5 ($\mu g/m^3$)

240
220
200
180
160
140
120
100
80
60
40
20
0

03 05 07 09 11 13 15 17 19 21 23 25 27 29 31

Day

AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	482	64.87	64.87
6 - 15	166	22.34	87.21
16 - 25	12	1.62	88.83
26 - 80	0	0.00	88.83
> 81.0	0	0.00	88.83

Total Number of Valid Hours: 743

Total Number of Hours: 744

Concentration Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
1 - 5	35	94	53	26	5	5	4	17	64	57	44	19	6	13	20	12	474
6 - 15	8	12	2	1	1	1	3	14	46	25	10	8	4	3	5	5	148
16 - 25	0	0	0	0	0	0	0	1	6	2	1	0	0	1	1	0	12
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	43	106	55	27	6	6	7	32	116	84	55	27	10	17	26	17	634

(Wind Direction columns: N through NNW)

Total Number of Valid Hours: 704

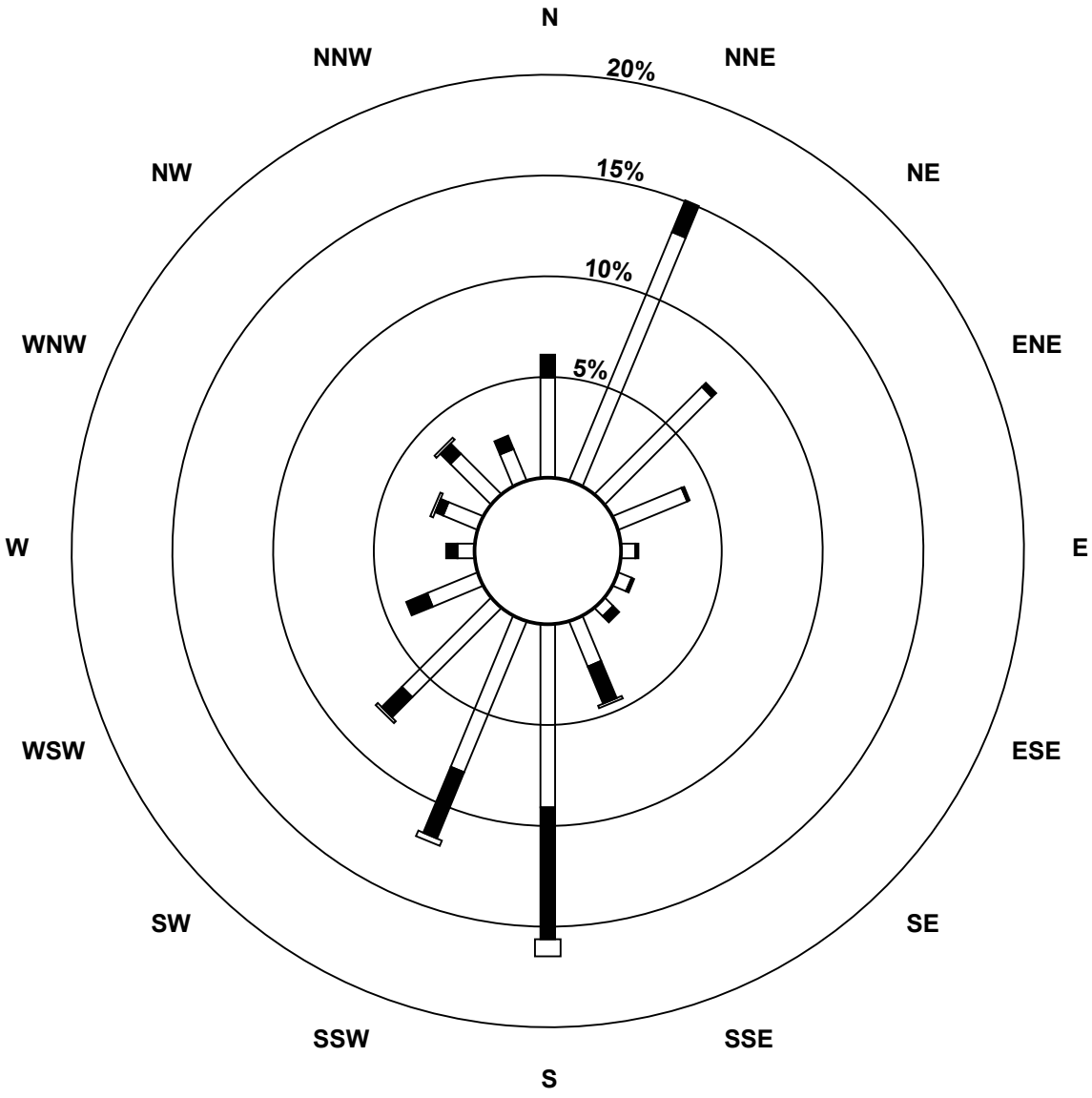
Total Number of Hours: 744

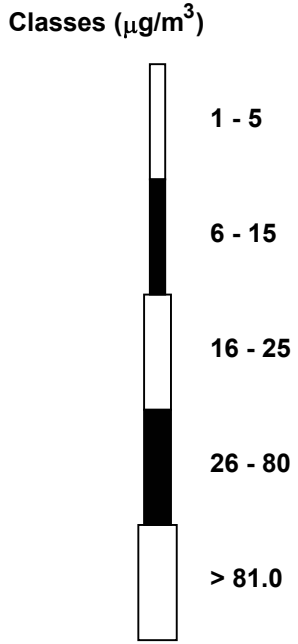
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

CNRL Horizon (AMS 15)





Total Number of Valid Hours: 704

Maximum Value: 7.0 C on Jan 25 14:00

Maximum Daily Average: 2.6 C on Jan 22

Minimum Value: -34.4 C on Jan 10 06:00

Minimum Daily Average: -28.2 C on Jan 31

Maximum Diurnal Average: -12.7 C at hour 14

Minimum Diurnal Average: -17.2 C at hour 8

Monthly Average: -15.38 C

Percentiles: P_1 = -33.5 P_{10} = -27.4 Q_1 = -22.0 Median = -16.7 Q_3 = -9.7 P_{90} = -1.3 P_{99} = 5.3

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

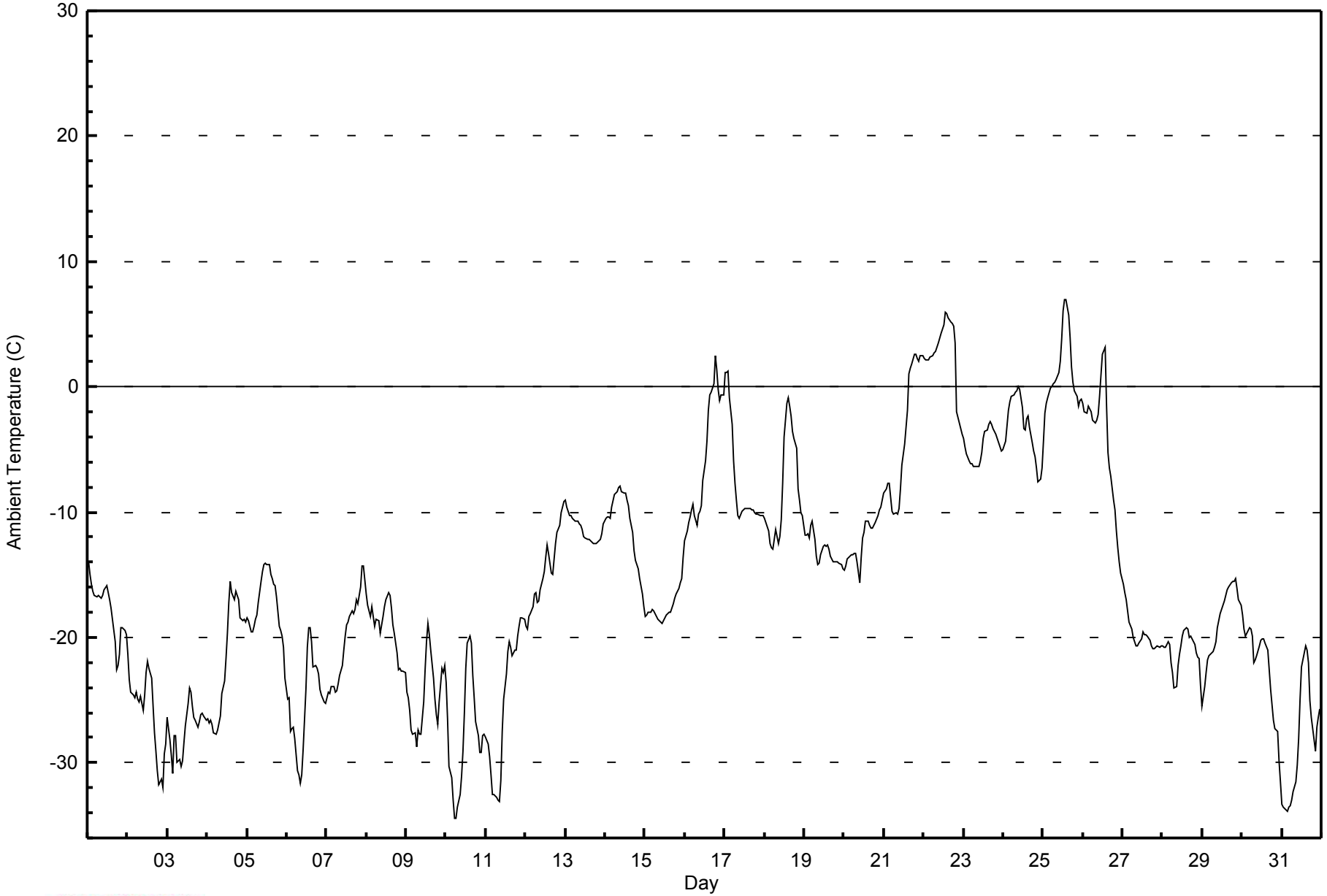
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-14.0	-15.0	-15.7	-16.3	-16.6	-16.8	-16.6	-16.7	-16.9	-16.7	-16.2	-15.9	-16.4	-17.0	-17.7	-18.5	-20.4	-22.6	-22.3	-21.3	-19.2	-19.2	-19.5	-19.7	-17.8	-14.0
2-Jan	-21.3	-23.3	-24.4	-24.6	-24.9	-24.4	-24.9	-25.2	-24.7	-25.9	-24.6	-22.8	-21.9	-22.5	-23.2	-25.5	-27.7	-29.0	-30.7	-31.8	-31.3	-32.0	-29.3	-28.6	-26.0	-21.3
3-Jan	-26.3	-28.2	-29.4	-30.8	-27.8	-27.8	-30.0	-29.7	-30.3	-29.8	-28.4	-27.0	-25.3	-24.0	-24.4	-25.5	-26.4	-26.6	-27.2	-26.7	-26.1	-26.0	-26.2	-26.6	-27.4	-24.0
4-Jan	-26.5	-26.8	-26.7	-26.9	-27.6	-27.7	-27.4	-26.9	-26.3	-24.5	-23.4	-21.6	-19.6	-17.2	-15.5	-16.5	-17.0	-16.3	-16.6	-16.9	-18.4	-18.6	-18.6	-18.7	-21.8	-15.5
5-Jan	-18.4	-18.6	-19.5	-19.6	-19.1	-18.6	-18.3	-17.2	-15.5	-14.8	-14.2	-14.1	-14.2	-14.1	-14.9	-15.3	-15.7	-15.9	-16.7	-19.1	-19.4	-19.9	-20.8	-23.3	-17.4	-14.1
6-Jan	-25.0	-24.8	-27.5	-27.3	-27.1	-28.0	-30.6	-31.0	-31.7	-31.0	-29.0	-24.2	-20.8	-19.2	-19.2	-20.4	-22.3	-22.2	-22.4	-23.0	-24.2	-24.6	-25.2	-25.2	-25.2	-19.2
7-Jan	-24.8	-24.4	-24.5	-23.9	-23.9	-24.4	-24.2	-23.7	-23.0	-22.2	-21.0	-19.8	-19.0	-18.8	-18.3	-17.9	-18.1	-17.8	-17.0	-17.3	-16.0	-14.3	-14.3	-15.4	-20.2	-14.3
8-Jan	-16.5	-17.5	-18.3	-17.5	-18.3	-19.1	-18.6	-18.7	-19.6	-19.0	-18.3	-17.6	-17.0	-16.4	-16.7	-17.7	-19.0	-19.7	-21.2	-22.6	-22.5	-22.7	-22.7	-22.8	-19.2	-16.4
9-Jan	-24.3	-24.8	-25.8	-27.4	-27.7	-27.6	-28.7	-27.4	-27.7	-27.8	-25.1	-22.6	-20.3	-18.9	-19.7	-21.0	-23.3	-25.0	-26.1	-27.0	-25.2	-22.5	-22.8	-22.2	-24.6	-18.9
10-Jan	-23.6	-26.5	-30.3	-31.2	-32.9	-34.4	-34.4	-33.5	-32.5	-31.1	-29.1	-26.0	-22.5	-20.5	-19.9	-20.5	-23.0	-24.9	-26.7	-27.8	-29.2	-29.2	-27.8	-27.8	-27.7	-19.9
11-Jan	-27.9	-28.5	-29.5	-31.0	-32.5	-32.5	-32.8	-33.0	-33.1	-31.4	-27.5	-24.9	-22.9	-21.1	-20.3	-20.8	-21.4	-21.0	-21.0	-19.8	-19.1	-18.4	-18.5	-18.6	-25.3	-18.4
12-Jan	-19.1	-19.3	-18.3	-18.1	-17.5	-16.5	-16.5	-17.3	-17.0	-16.2	-15.3	-14.8	-13.7	-12.6	-13.2	-14.9	-14.9	-13.8	-12.5	-11.6	-11.1	-10.1	-9.6	-9.2	-14.7	-9.2
13-Jan	-9.0	-9.5	-10.3	-10.3	-10.5	-10.6	-10.7	-10.8	-11.0	-11.0	-11.3	-12.0	-12.1	-12.1	-12.2	-12.3	-12.4	-12.6	-12.5	-12.4	-12.3	-12.2	-11.8	-11.0	-11.4	-9.0
14-Jan	-10.5	-10.4	-10.4	-10.5	-9.6	-8.6	-8.5	-8.3	-8.1	-8.0	-8.4	-8.5	-8.4	-9.0	-9.5	-10.5	-11.6	-13.1	-13.8	-14.2	-14.5	-15.3	-16.5	-17.5	-11.0	-8.0
15-Jan	-18.4	-18.3	-18.0	-18.0	-17.7	-17.9	-18.1	-18.4	-18.5	-18.8	-18.9	-18.6	-18.4	-18.2	-18.0	-17.9	-17.6	-17.3	-16.8	-16.6	-16.1	-15.6	-15.3	-13.6	-17.5	-13.6
16-Jan	-12.3	-11.5	-10.8	-10.4	-9.9	-9.4	-10.3	-11.0	-10.2	-9.9	-9.4	-7.5	-5.9	-4.3	-1.9	-0.7	-0.4	0.3	2.5	1.3	-0.2	-1.1	-0.6	-0.6	-5.6	2.5
17-Jan	1.1	1.1	1.3	-0.9	-3.0	-5.9	-7.6	-9.0	-10.2	-10.5	-10.0	-9.8	-9.7	-9.7	-9.7	-9.7	-9.8	-9.9	-10.1	-10.2	-10.2	-10.2	-10.3	-10.3	-7.6	1.3
18-Jan	-10.5	-10.8	-11.5	-12.5	-12.8	-13.0	-12.2	-11.4	-12.5	-11.9	-10.6	-7.7	-4.0	-1.3	-0.9	-1.6	-2.4	-3.5	-4.1	-4.9	-8.1	-9.1	-10.1	-10.3	-8.2	-0.9
19-Jan	-11.8	-11.8	-11.8	-12.1	-11.0	-10.7	-12.2	-13.5	-14.2	-14.1	-13.4	-12.7	-12.6	-12.7	-12.7	-12.9	-13.5	-13.9	-14.0	-14.0	-14.0	-14.1	-14.2	-14.5	-13.0	-10.7
20-Jan	-14.6	-14.4	-13.7	-13.6	-13.5	-13.4	-13.3	-13.3	-13.9	-15.7	-13.7	-12.1	-11.6	-10.7	-10.7	-11.1	-11.3	-11.2	-11.0	-10.8	-10.3	-9.8	-9.6	-9.0	-12.2	-9.0
21-Jan	-8.5	-8.1	-7.7	-7.7	-8.9	-10.0	-10.2	-10.1	-10.1	-9.8	-8.1	-6.3	-4.5	-3.3	-1.9	1.0	1.5	1.8	2.5	2.6	2.2	2.0	2.4	2.4	-4.0	2.6
22-Jan	2.3	2.2	2.1	2.1	2.4	2.4	2.7	2.9	3.2	3.5	4.2	4.6	4.9	6.0	5.8	5.5	5.2	5.1	4.9	3.5	-2.0	-2.9	-3.4	-3.8	2.6	6.0
23-Jan	-4.1	-4.8	-5.3	-5.9	-6.1	-6.2	-6.4	-6.3	-6.4	-6.3	-5.9	-5.2	-4.1	-3.5	-3.5	-3.0	-2.8	-3.0	-3.3	-3.8	-4.1	-4.4	-4.8	-5.2	-4.8	-2.8
24-Jan	-5.0	-4.4	-3.1	-1.8	-1.2	-0.7	-0.6	-0.4	-0.3	0.1	-0.2	-1.6	-3.3	-3.5	-2.6	-2.3	-3.2	-4.4	-5.2	-5.6	-6.4	-7.6	-7.4	-6.5	-3.2	0.1
25-Jan	-4.4	-2.1	-1.3	-0.9	-0.1	0.1	0.3	0.3	0.6	1.1	2.1	3.8	6.1	7.0	6.9	5.7	4.0	1.6	0.4	-0.3	-0.8	-1.5	-1.1	-1.0	1.1	7.0
26-Jan	-1.3	-2.0	-2.1	-1.5	-1.8	-2.0	-2.6	-2.9	-2.7	-2.2	-0.8	0.9	2.6	3.2	-1.5	-5.2	-6.5	-7.2	-9.0	-9.8	-11.5	-12.9	-14.0	-14.9	-4.5	3.2
27-Jan	-15.8	-16.4	-17.0	-17.9	-18.8	-19.4	-20.0	-20.3	-20.6	-20.7	-20.4	-20.1	-19.6	-19.8	-19.8	-19.9	-20.3	-20.6	-20.9	-20.9	-20.8	-20.7	-20.7	-20.7	-19.7	-15.8
28-Jan	-20.7	-20.8	-20.8	-20.4	-20.6	-22.0	-22.8	-24.0	-23.9	-22.3	-21.3	-20.6	-19.9	-19.4	-19.3	-19.3	-20.0	-19.9	-20.1	-20.6	-21.3	-21.6	-21.7	-23.8	-21.1	-19.3
29-Jan	-25.4	-23.9	-22.8	-21.8	-21.4	-21.4	-21.1	-20.8	-20.3	-19.2	-18.7	-18.1	-17.4	-17.1	-16.7	-16.2	-16.0	-15.7	-15.6	-15.5	-15.3	-16.1	-16.9	-17.5	-18.8	-15.3
30-Jan	-18.3	-19.3	-19.9	-19.7	-19.2	-19.4	-19.9	-22.0	-21.8	-21.5	-20.6	-20.2	-20.1	-20.2	-20.5	-21.0	-22.6	-24.1	-25.4	-26.6	-27.2	-27.5	-29.8	-31.5	-22.4	-18.3
31-Jan	-33.3	-33.5	-33.8	-33.9	-33.5	-33.5	-32.9	-32.3	-31.5	-30.2	-28.1	-24.9	-22.3	-21.3	-20.7	-21.0	-22.0	-25.0	-26.4	-28.1	-29.1	-27.1	-26.4	-25.7	-28.2	-20.7
	-15.7	-16.0	-16.3	-16.5	-16.6	-16.8	-17.1	-17.2	-17.1	-16.7	-15.7	-14.4	-13.4	-12.7	-12.7	-13.1	-13.9	-14.4	-14.8	-15.2	-15.6	-15.7	-15.7	-15.9	Diurnal Average	
	2.3	2.2	2.1	2.1	2.4	2.4	2.7	2.9	3.2	3.5	4.2	4.6	6.1	7.0	6.9	5.7	5.2	5.1	4.9	3.5	2.2	2.0	2.4	2.4	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	252	33.87	33.87
-20 - 0	439	59.01	92.88
0 - 10	53	7.12	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

Maximum Value: 2.8 mm on Jan 24 04:00

Maximum Daily Total: 10.7 mm on Jan 24

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 2.8 mm at hour 4

Minimum Diurnal Total: 0.0 mm at hour 1

Monthly Total: 19.05 mm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.0 P_{99} = 0.8

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

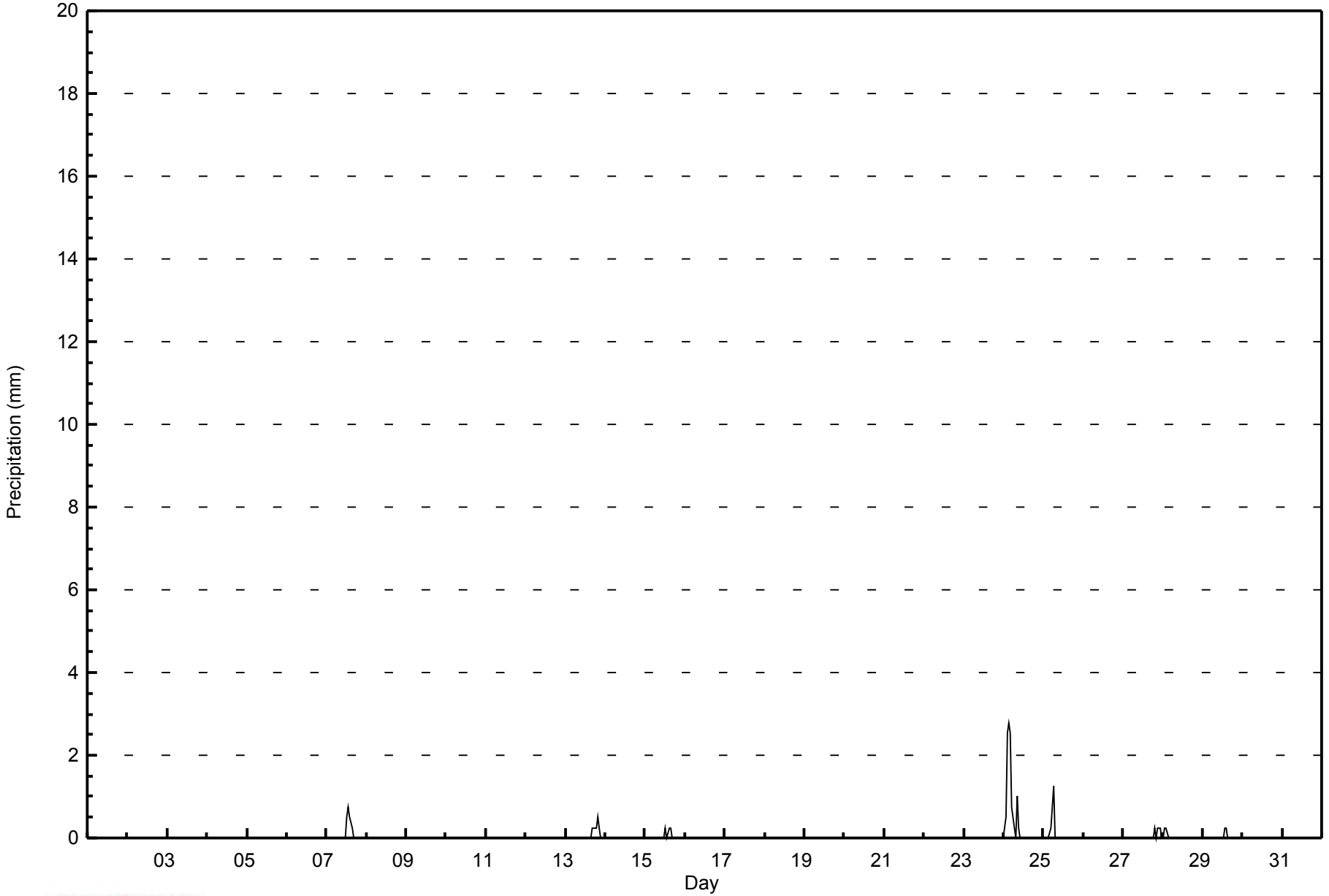
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	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	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.8
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.5	0.3	0.0	0.0	0.0	1.5	0.5
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.5	2.5	2.8	2.5	0.8	0.3	0.0	1.0	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	10.7	2.8
25-Jan	0.0	0.0	0.0	0.0	0.3	0.8	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.3
26-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.0	0.8	0.3
28-Jan	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	0.0	0.0	0.0	0.0	0.0	0.5	0.3
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.8	2.8	2.8	2.8	1.5	1.5	0.0	1.0	0.3	0.0	0.0	0.8	1.0	1.0	0.5	0.3	0.3	0.3	0.8	0.3	0.3	0.3	0.0	Diurnal Average	
	0.0	0.5	2.5	2.8	2.5	0.8	1.3	0.0	1.0	0.3	0.0	0.0	0.5	0.8	0.5	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.3	0.0	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 99 % on Jan 25 08:00

Maximum Daily Average: 96.6 % on Jan 24

Minimum Value: 43 % on Jan 8 14:00

Minimum Daily Average: 60.4 % on Jan 8

Maximum Diurnal Average: 81.2 % at hour 2

Minimum Diurnal Average: 73.1 % at hour 14

Monthly Average: 79.6 %

Percentiles: P_1 = 57 P_{10} = 69 Q_1 = 73 Median = 78 Q_3 = 87 P_{90} = 93 P_{99} = 99

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

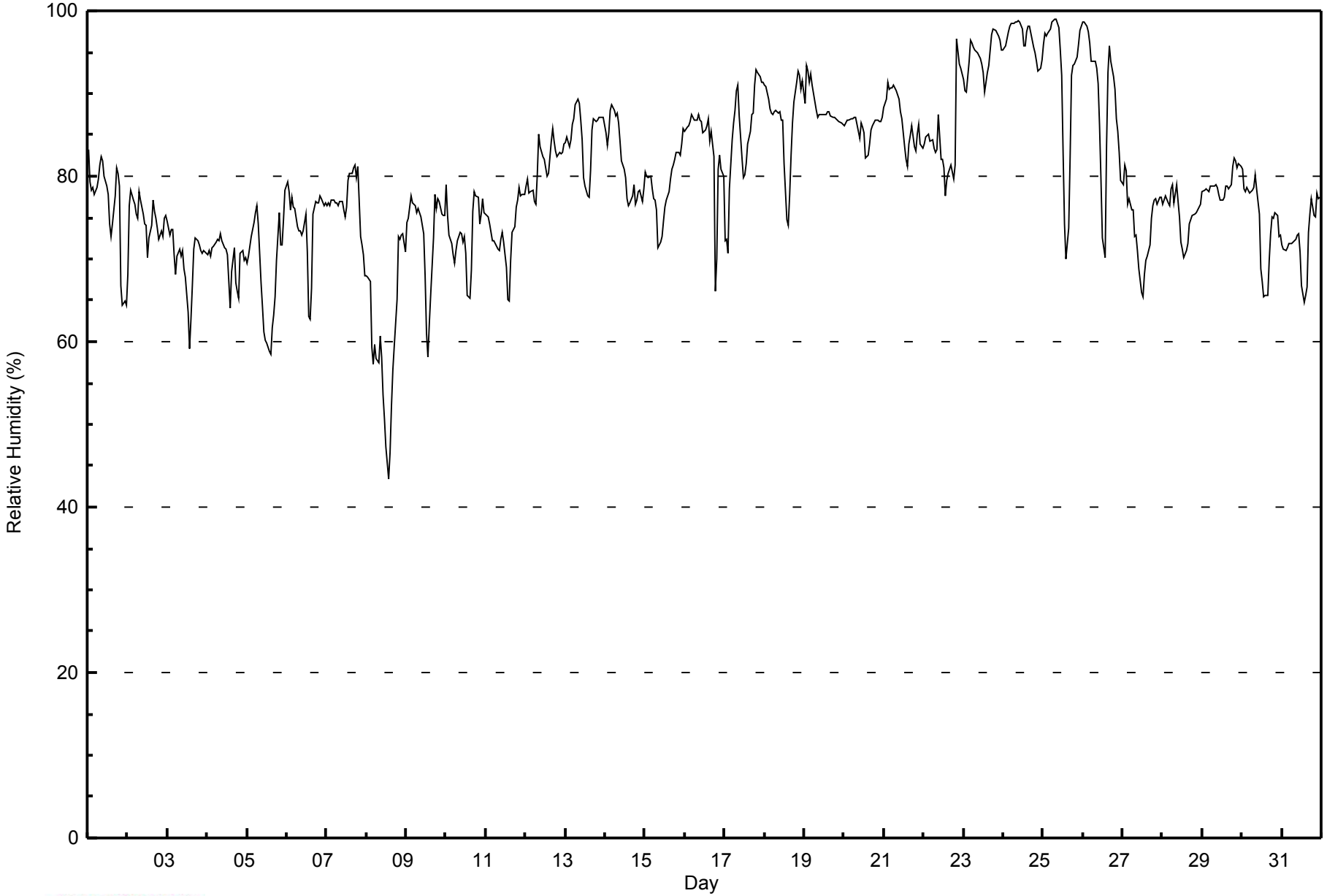
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	83	79	78	79	78	79	80	81	82	82	80	79	78	74	73	74	78	81	80	79	67	64	65	64	76.6	83
2-Jan	68	76	78	77	77	76	75	78	77	75	74	74	70	73	74	77	76	75	74	72	73	73	75	75	74.7	78
3-Jan	75	73	74	74	71	68	70	71	70	71	69	68	64	59	63	67	71	72	72	72	71	71	71	71	69.8	75
4-Jan	71	71	70	71	72	72	72	72	73	72	71	71	71	67	64	69	71	67	66	65	71	71	70	70	70.0	73
5-Jan	69	70	73	74	74	76	76	74	67	64	61	60	60	59	58	62	63	65	70	76	72	72	75	78	68.7	78
6-Jan	79	78	76	77	76	76	74	73	73	73	73	75	71	63	63	67	75	77	77	77	78	77	76	77	74.3	79
7-Jan	76	77	77	77	77	77	77	76	77	77	76	75	76	79	80	80	81	81	80	81	73	72	70	68	76.7	81
8-Jan	68	68	67	59	57	60	58	58	61	58	54	51	47	43	47	52	57	59	65	73	72	73	73	71	60.4	73
9-Jan	74	75	76	78	77	76	76	76	76	75	73	68	61	58	62	66	73	78	76	77	77	75	75	75	73.1	78
10-Jan	79	75	73	72	71	69	71	72	73	73	72	73	71	66	65	69	76	78	78	77	74	75	77	76	73.1	79
11-Jan	75	75	74	73	72	72	71	71	71	72	73	72	69	65	65	70	73	74	76	77	79	78	78	78	73.1	79
12-Jan	79	80	78	78	78	77	77	80	85	84	82	82	81	80	80	84	86	84	83	82	83	83	83	84	81.4	86
13-Jan	84	85	83	84	86	87	89	89	89	87	84	80	79	78	77	81	86	87	87	87	87	87	87	87	84.9	89
14-Jan	85	84	85	88	89	88	87	88	87	84	82	81	80	77	76	77	78	79	77	77	78	78	77	78	81.7	89
15-Jan	81	80	80	80	78	77	77	76	71	72	73	75	76	77	78	80	81	81	82	83	83	83	84	86	78.9	86
16-Jan	85	86	86	87	87	87	87	87	87	87	87	85	86	86	87	84	85	82	66	70	81	83	81	80	83.7	87
17-Jan	72	72	71	78	84	87	88	90	91	87	82	80	80	82	84	85	87	88	91	93	93	92	91	91	85.0	93
18-Jan	91	91	89	88	88	87	88	88	88	88	87	87	82	75	74	78	83	86	89	91	93	92	91	91	86.8	93
19-Jan	89	93	93	91	92	91	89	88	87	88	87	88	88	87	88	88	87	87	87	87	87	87	87	86	88.4	93
20-Jan	86	86	87	87	87	87	87	87	86	85	87	86	85	82	83	84	86	86	87	87	87	87	87	87	86.0	87
21-Jan	88	89	91	91	91	91	91	90	90	89	88	87	84	82	81	84	85	86	84	83	85	86	84	83	86.8	91
22-Jan	84	85	85	85	84	84	83	83	83	88	82	82	81	78	79	80	81	81	80	81	97	94	93	92	84.4	97
23-Jan	92	90	90	94	97	96	96	95	95	95	94	93	92	90	93	93	95	97	98	98	97	97	96	95	94.5	98
24-Jan	95	96	97	98	98	98	98	99	99	99	99	98	96	96	97	98	98	96	96	95	94	93	93	94	96.6	99
25-Jan	96	97	97	97	98	99	99	99	99	98	95	92	83	74	70	74	82	92	93	94	94	96	98	98	92.3	99
26-Jan	99	99	98	97	96	94	94	94	93	91	86	80	73	70	84	93	96	94	92	91	87	86	83	79	89.4	99
27-Jan	79	81	81	77	77	76	76	73	73	71	69	66	65	68	70	70	72	75	76	77	77	77	77	77	74.2	81
28-Jan	77	77	78	77	76	79	79	77	79	77	75	72	71	70	71	72	74	75	75	75	76	76	76	77	75.4	79
29-Jan	78	78	79	78	78	79	79	79	79	79	78	77	77	77	79	79	79	79	81	82	82	81	82	81	79.1	82
30-Jan	81	79	78	79	78	78	78	79	80	78	75	69	67	65	66	66	70	73	75	75	76	75	73	73	74.4	81
31-Jan	72	71	71	71	72	72	72	72	72	73	73	71	67	65	66	67	73	75	77	75	75	78	77	77	72.3	78
	81.0	81.2	81.1	81.2	81.2	81.1	81.1	81.2	81.1	80.4	78.8	77.3	75.1	73.1	74.1	76.4	79.3	80.4	80.3	80.9	81.2	81.0	80.8	80.7	Diurnal Average	
	99	99	98	98	98	99	99	99	99	99	99	98	96	96	97	98	98	97	98	98	97	97	98	98	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	19	2.55	2.55
60 - 80	401	53.90	56.45
80 - 100	324	43.55	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

CNRL Horizon - January 2015

Maximum Value: 309 W/m2 on Jan 18 13:00

Maximum Daily Average: 52.2 W/m2 on Jan 18

Minimum Value: 0 W/m2 on Jan 1 03:00

Minimum Daily Average: 5.4 W/m2 on Jan 7

Maximum Diurnal Average: 135.2 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 3

Monthly Average: 25.1 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 20$ $P_{90} = 92$ $P_{99} = 234$

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

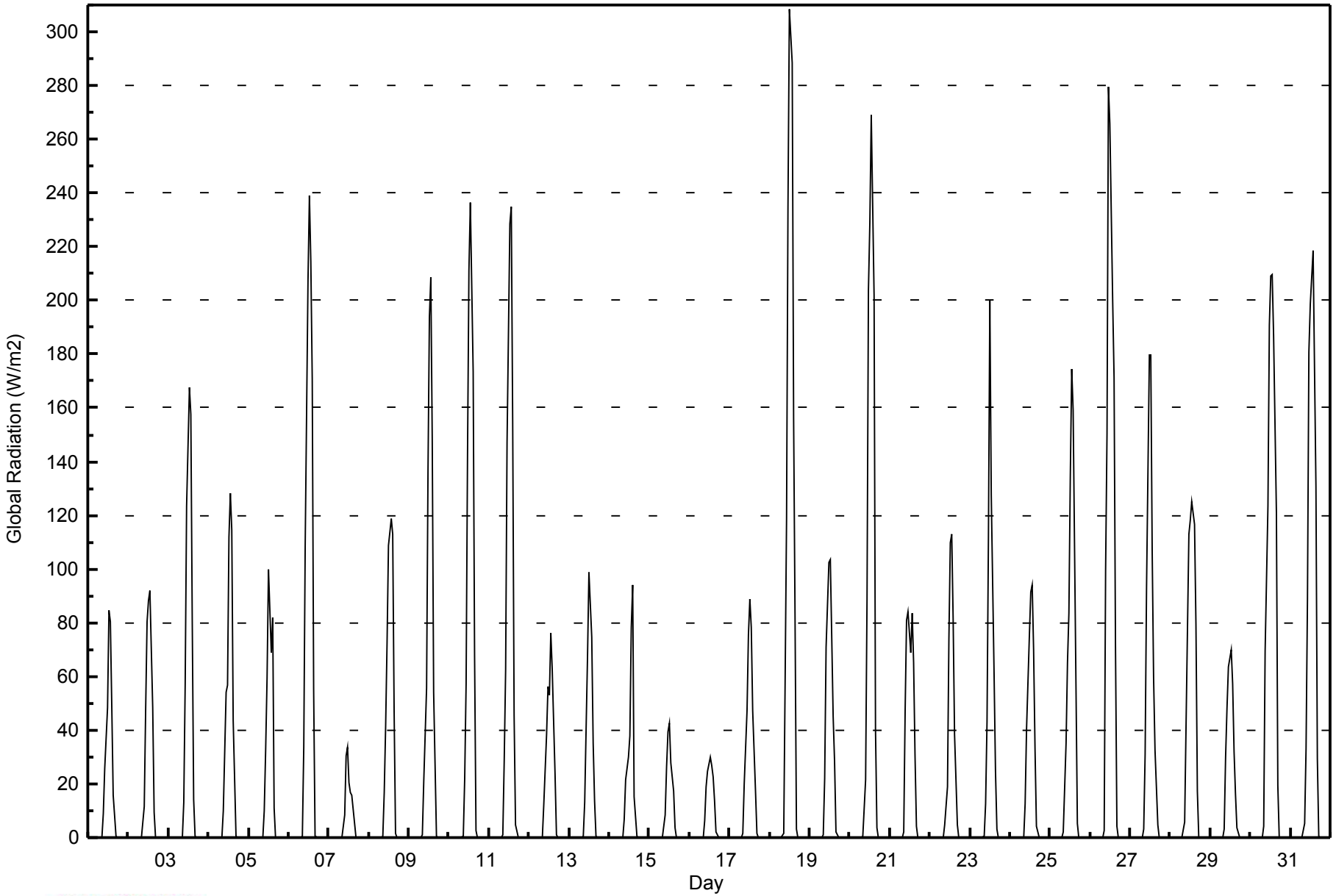
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	0	0	0	0	0	0	9	26	48	84	81	49	16	0	0	0	0	0	0	0	0	13.0	84
2-Jan	0	0	0	0	0	0	0	0	0	12	48	80	89	92	49	10	0	0	0	0	0	0	0	0	15.8	92
3-Jan	0	0	0	0	0	0	0	0	0	13	57	123	168	158	81	14	0	0	0	0	0	0	0	0	25.6	168
4-Jan	0	0	0	0	0	0	0	0	0	10	54	57	112	128	115	44	0	0	0	0	0	0	0	0	21.7	128
5-Jan	0	0	0	0	0	0	0	0	0	10	33	59	100	69	82	11	0	0	0	0	0	0	0	0	15.2	100
6-Jan	0	0	0	0	0	0	0	0	0	34	108	208	239	214	171	55	1	0	0	0	0	0	0	0	42.9	239
7-Jan	0	0	0	0	0	0	0	0	0	8	31	34	20	17	16	5	0	0	0	0	0	0	0	0	5.4	34
8-Jan	0	0	0	0	0	0	0	0	1	17	42	72	109	119	113	47	2	0	0	0	0	0	0	0	21.7	119
9-Jan	0	0	0	0	0	0	0	0	1	21	56	136	194	208	149	54	1	0	0	0	0	0	0	0	34.1	208
10-Jan	0	0	0	0	0	0	0	0	0	22	57	142	211	236	173	68	2	0	0	0	0	0	0	0	38.1	236
11-Jan	0	0	0	0	0	0	0	0	1	29	63	147	229	235	154	46	4	0	0	0	0	0	0	0	37.8	235
12-Jan	0	0	0	0	0	0	0	0	0	12	38	56	53	76	62	24	1	0	0	0	0	0	0	0	13.5	76
13-Jan	0	0	0	0	0	0	0	0	0	13	40	67	99	75	35	14	1	0	0	0	0	0	0	0	14.3	99
14-Jan	0	0	0	0	0	0	0	0	0	7	21	30	38	78	94	15	1	0	0	0	0	0	0	0	11.8	94
15-Jan	0	0	0	0	0	0	0	0	0	8	26	39	43	28	17	3	0	0	0	0	0	0	0	0	6.9	43
16-Jan	0	0	0	0	0	0	0	0	0	6	19	25	30	27	23	14	2	0	0	0	0	0	0	0	6.0	30
17-Jan	0	0	0	0	0	0	0	0	1	20	47	76	89	78	47	18	2	0	0	0	0	0	0	0	15.7	89
18-Jan	0	0	0	0	0	0	0	0	2	59	119	235	309	288	156	83	3	0	0	0	0	0	0	0	52.2	309
19-Jan	0	0	0	0	0	0	0	0	1	22	71	102	104	74	45	28	2	0	0	0	0	0	0	0	18.8	104
20-Jan	0	0	0	0	0	0	0	0	1	22	89	204	229	269	202	40	4	0	0	0	0	0	0	0	44.1	269
21-Jan	0	0	0	0	0	0	0	0	2	47	81	84	69	83	65	30	4	0	0	0	0	0	0	0	19.4	84
22-Jan	0	0	0	0	0	0	0	0	0	5	19	74	110	113	81	38	5	0	0	0	0	0	0	0	18.5	113
23-Jan	0	0	0	0	0	0	0	0	1	13	43	112	200	128	61	25	3	0	0	0	0	0	0	0	24.4	200
24-Jan	0	0	0	0	0	0	0	0	0	13	40	75	91	94	70	33	4	0	0	0	0	0	0	0	17.5	94
25-Jan	0	0	0	0	0	0	0	0	2	35	65	83	135	175	159	57	5	0	0	0	0	0	0	0	29.8	175
26-Jan	0	0	0	0	0	0	0	0	3	100	150	280	266	200	171	71	4	0	0	0	0	0	0	0	51.9	280
27-Jan	0	0	0	0	0	0	0	0	3	31	93	180	180	106	59	33	4	0	0	0	0	0	0	0	28.7	180
28-Jan	0	0	0	0	0	0	0	0	6	42	78	113	118	125	117	79	18	0	0	0	0	0	0	0	29.0	125
29-Jan	0	0	0	0	0	0	0	0	3	30	48	64	70	57	32	16	3	0	0	0	0	0	0	0	13.5	70
30-Jan	0	0	0	0	0	0	0	0	4	69	123	191	209	210	187	121	19	0	0	0	0	0	0	0	47.3	210
31-Jan	0	0	0	0	0	0	0	0	5	33	89	181	199	218	174	131	29	0	0	0	0	0	0	0	44.2	218
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	24.9	60.5	109.0	135.2	131.0	97.1	40.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0	0	0	0	0	0	0	0	6	100	150	280	309	288	202	131	29	0	0	0	0	0	0	0	Diurnal Maximum	

WBEA

Hourly Averages

Global Radiation (GR) - W/m2

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

CNRL Horizon - January 2015

Maximum Speed: 20 km/h on Jan 26 21:00

Maximum Daily Speed Average: 13.7 km/h on Jan 4

Minimum Speed Value: 1 km/h on Jan 21 15:00

Minimum Daily Speed Average: 0.8 km/h on Jan 17

Maximum Diurnal Speed Average: 2.8 km/h at hour 3

Minimum Diurnal Speed Average: 0.5 km/h at hour 15

Monthly Average Velocity: 1.6 km/h 223.1 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 4 Median = 7 Q_3 = 11 P_{90} = 13 P_{99} = 19

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Percent Operational Time:	94.8

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-Jan	NE7	NNE6	NE5	N5	N6	N4	N3	NE5	NE4	NNE2	NNW4	N5	NNE11	NNE12	NNE11	NNE8	NNE3	SW4	SW5	SW4	NW10	NNW7	N9	N10	N4.7	NNE12
2-Jan	ENE4	ESE3	SSW3	SSW4	SE4	SSW3	SSW4	SSW6	SW4	S2	W3	ENE1	ENE3	E2	ENE3	NE3	SW3	WSW5	WSW3	S3	NNW2	WSW4	NNW3	NE4	SSW0.9	SSW6
3-Jan	E2	S1	SW4	SW5	W8	WNW8	WSW7	WSW8	W5	WSW8	WSW8	WSW8	WSW9	SW9	SW9	SW8	SW10	SW11	SW10	WSW10	SW11	SW12	SW12	WSW12	WSW7.7	SW12
4-Jan	SW12	SW11	SW13	SW13	SSW13	SSW13	SSW13	SSW15	SSW15	SSW17	SSW17	S16	S14	S12	SSW12	SSW10	SW12	WSW20	WSW19	WSW19	SW19	SW18	SW13	WSW16	SW13.7	WSW20
5-Jan	SW12	SW12	SSW12	SSW11	SSW6	SSE5	SSW1	WNW5	WNW7	NW10	NW14	NW12	NW15	NW16	NW12	WNW11	WNW9	WNW8	WNW5	NNW5	NW8	NNW7	NE8	NNE2	WNW5.9	NW16
6-Jan	SSW4	SE4	S5	S6	S5	SSW5	SW4	SSW6	SSW7	SSW6	SSW6	SW4	SSW5	S5	S6	SSW6	SSW7	SW10	SW10	SW10	SSW9	SW9	SSW8	S10	SSW6.1	SW10
7-Jan	S12	S13	S12	S11	S13	S11	S11	S12	S10	SSW8	SW5	SW6	SW4	S3	SE6	S4	ENE4	N2	NW3	WSW4	NW14	NNW18	NNW16	NNW17	SW3.6	NNW18
8-Jan	NNW13	NW10	NW13	NW19	NW16	WNW11	NW19	NW13	WSW6	WNW12	WNW14	WNW13	NW13	WNW12	W10	W9	WSW8	WSW9	SSW8	SSW10	SSW10	SSW13	SSW12	SW12	W8.5	NW19
9-Jan	S11	S11	S7	S5	S7	SSE7	SSE6	SE7	SSE6	SSE6	SSE6	SSE6	SSE6	ESE5	NE6	N8	NW4	WNW6	W5	WNW6	NW7	NW5	NW4	N6	S2.2	S11
10-Jan	NNE5	W2	SW6	SSW6	SW3	SSW2	SSW7	SSW8	SSW9	SSW10	S10	S13	S12	S8	SSE7	SSE6	SE7	S7	SSE3	SSW5	SW1	S2	SSW8	SSW7	SSW5.5	S13
11-Jan	SSW7	S6	S4	SSE4	SSE4	S3	SE1	SSW4	S5	S5	SSE5	S6	SSE8	S10	S10	S11	S12	S12	S11	S11	S11	S13	S16	S17	S8.1	S17
12-Jan	S14	S12	S13	SSW13	S7	SSW5	N1	NE2	NNW2	WNW2	S1	S3	S4	S5	ESE5	ESE5	SSE6	S9	S10	S10	S11	S11	S9	SSE7	S6.2	S14
13-Jan	ENE2	N5	N8	N8	NNE8	NNE7	N5	NNE3	NNE2	NE6	NE9	NE9	ENE7	ENE7	ENE5	ENE4	NNE4	NNE5	N5	NNW4	NNE4	NNW2	SSW3	SSW6	NNE4.0	NE9
14-Jan	S10	S12	S12	SSE6	ESE3	N6	NNE6	NE7	NE8	NNE10	NNE11	NE8	NE8	NE11	NNE10	NE10	NNE11	NE12	NE9	NE6	NE5	NE5	NE7	ENE5	NE5.1	S12
15-Jan	ENE5	ENE4	ENE3	ESE1	NE4	NE6	NNE7	NE7	NE8	NE7	NE6	N4	N5	NNW3	N3	NNE2	N4	NNE3	W1	WNW2	WSW2	W2	WSW2	SSW7	NNE2.5	NE8
16-Jan	SSW9	S10	S11	S9	SSW8	SSW8	SW7	SW8	SW9	SSW9	S13	S15	SSW14	S13	SW13	SSW11	SSW11	SW11	WSW16	SW11	S13	SSW13	SW13	SW9	SSW10.4	WSW16
17-Jan	W11	WSW11	W12	SSW9	NNE3	N8	NE7	NE6	NE5	NNE6	NE6	NE8	ENE6	ENE5	ENE4	ENE4	NE1	NNE3	NNE3	SSW1	SSW5	WSW6	SW5	SSW7	N0.8	W12
18-Jan	SSW7	SSW7	SSW8	SSW9	SSW8	S9	S12	S13	S10	S8	S10	S8	S8	SW10	SSW11	SSW11	SSW13	S12	S12	S7	NW4	WNW3	SW3	SW3	SSW7.9	S13
19-Jan	NNE2	NNW5	N5	NNE5	NNE6	NNE5	N6	NNE7	N6	NNE6	N4	N3	NNE3	NNE3	NNE4	NNE6	NNE6	NNE4	NE4	NNE4	NNE4	N5	N4	N3	NNE4.5	NNE7
20-Jan	NW3	NW2	N2	N2	N2	NE2	NE2	SW1	SW1	SSW2	S2	SSW4	S4	S5	S6	S5	S8	S8	S9	S9	S9	SSE9	SSE9	S11	S3.6	S11
21-Jan	SSE11	SSE11	S11	SSE9	SSE7	S7	SSW9	SSW11	SSW10	SSW8	SSW9	S8	S9	S6	WSW1	SW10	WSW13	SW16	SW18	SW16	WSW15	WSW14	WSW15	WSW15	SSW9.4	SW18
22-Jan	WSW11	SW9	SSW11	SW12	SW11	SW12	SW11	WSW8	WSW6	WSW9	W11	WSW14	WSW18	SW12	SSW11	SSW10	SW13	WSW12	WSW14	WNW6	NNE16	NNE12	NNE10	NNE8	WSW7.2	WSW18
23-Jan	NE8	NE6	ENE6	NE7	NE4	N5	NE4	N3	NNE4	N2	NW2	NNW2	S4	S6	S7	SSW5	SSE4	SSE5	S5	S3	SSW3	S4	SE3	SSW2	ESE1.2	NE8
24-Jan	W1	E1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	W1
25-Jan	AF	AF	AF	AF	AF	AF	S6	S7	SSW9	SW7	S7	SW8	W11	WNW11	WNW15	NW12	N8	NE9	NNE6	NNE7	NE4	SW2	S6	S8	W2.7	WNW15
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSW10	SSE5	E2	NNE10	NNE15	NNE16	NNE16	NNE17	NNE18	NNE20	NNE17	NNE18	NNE18	----	NNE20
27-Jan	NNE14	NNE11	NE13	NNE14	NNE14	NNE15	NE13	NE12	NNE10	NNE10	NNE9	NNE11	NNE11	NNE11	NNE11	NNE12	NNE11	NNE14	NNE14	NNE11	NNE12	NNE14	NNE12	NNE12	NNE12.0	NNE15
28-Jan	NNE13	N12	N10	N8	NNE6	NNE7	NNE7	NE4	ENE5	NNE4	NNE5	N3	S5	SSE4	ENE5	E5	NE4	ENE4	ENE5	ENE6	ENE6	ENE4	ENE2	E2	NE4.4	NNE13
29-Jan	E2	SW3	WSW3	SSW3	S2	SSW3	S4	SSW3	S2	S5	S6	SSW5	WSW2	SSE2	NNW1	NW3	NNW3	NNE3	NNE6	NNE8	NNE11	NNE12	NNE10	N9	NNE1.1	NNE12
30-Jan	NNE8	NNE11	NNE10	NNE9	NNE9	NNE7	NNE6	ENE1	NNE6	NNE7	NNE12	NNE9	NNE10	NE12	NE10	NE9	NE8	NE7	NNE5	N4	N4	NNW6	NW2	WSW1	NNE7.0	NE12
31-Jan	WSW5	SW5	SW6	SW6	SSW8	SSW8	SSW8	S8	S10	S10	S9	S11	S10	SSE7	SSE6	SSE5	SSE7	S4	S4	SW4	SSW8	SSW10	SSW11	S10	SSW6.9	S11
	SSW1.5	SSW2.3	SSW2.8	SSW2.5	SSW1.2	SW1.0	SW1.1	SSW1.8	SSW2.0	SW1.9	SW1.3	SSW2.2	SSW2.0	S1.3	SSW0.5	SW0.6	SW1.4	SW2.2	WSW2.6	WSW2.2	W1.7	W2.1	WSW1.7	SW2.1	Diurnal Average	
	S14	S13	NE13	NW19	NW16	NNE15	NW19	SSW15	SSW15	SSW17	SSW17	S16	WSW18	NW16	WNW15	NNE15	NNE16	WSW20	WSW19	WSW19	NNE20	NNW18	NNE18	NNE18	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 8 km/h on Jan 8 03:00

Minimum Value: 0 km/h on Jan 20 01:00

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:	705
Hours of Missing Data:	39
Hours of Calibration:	0
Percent Operational Time:	94.8

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

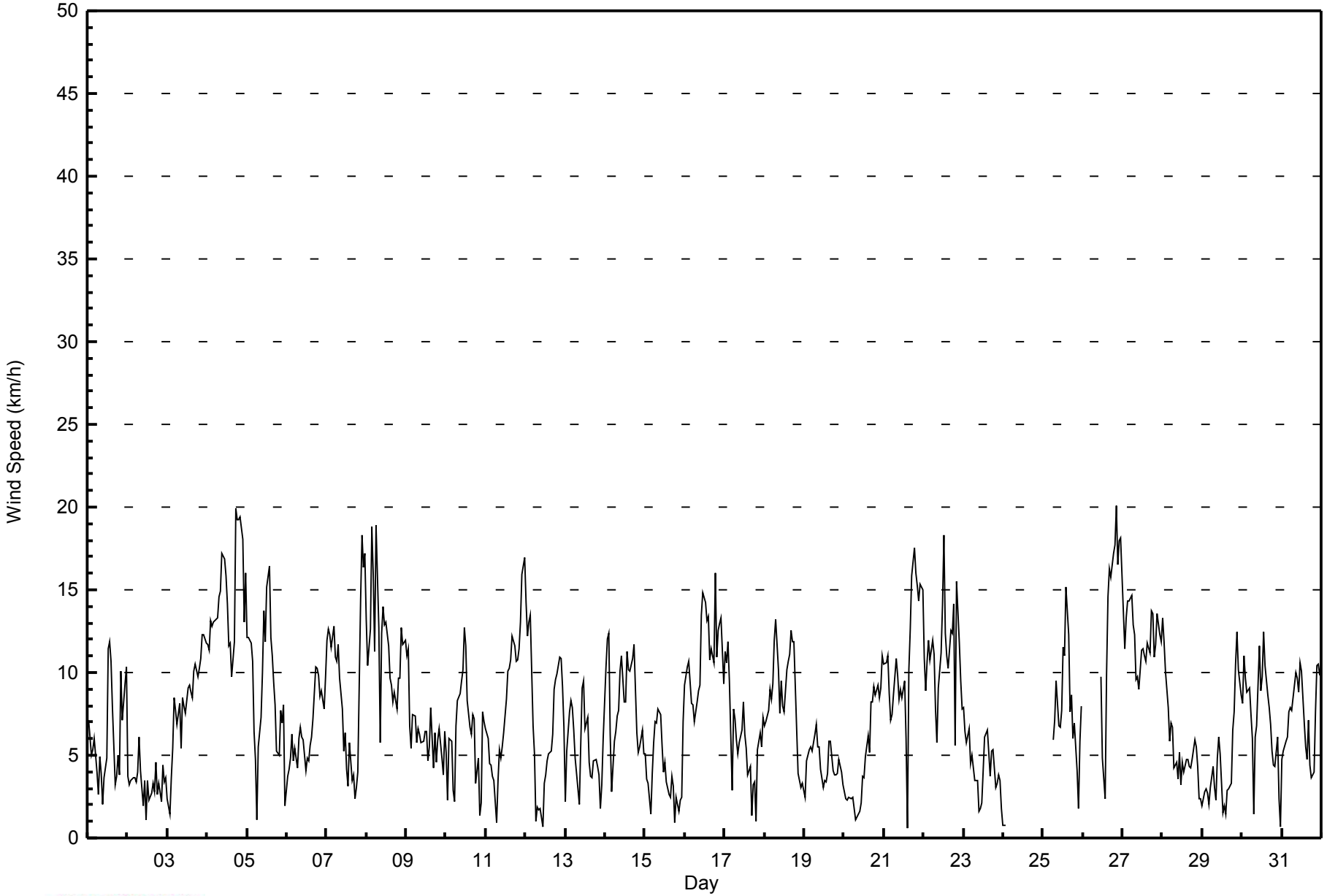
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

CNRL Horizon - January 2015



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Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	249	35.32	35.32
6 - 11	322	45.67	80.99
12 - 19	132	18.72	99.72
20 - 28	2	0.28	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

CNRL Horizon - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	28	28	19	22	7	6	4	11	33	24	22	11	7	5	10	12	249
6 - 11	14	53	31	6	0	0	3	22	67	57	29	16	6	10	5	3	322
12 - 19	1	25	5	0	0	0	0	0	28	15	21	14	1	5	13	4	132
20 - 28	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	107	55	28	7	6	7	33	128	96	72	42	14	20	28	19	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

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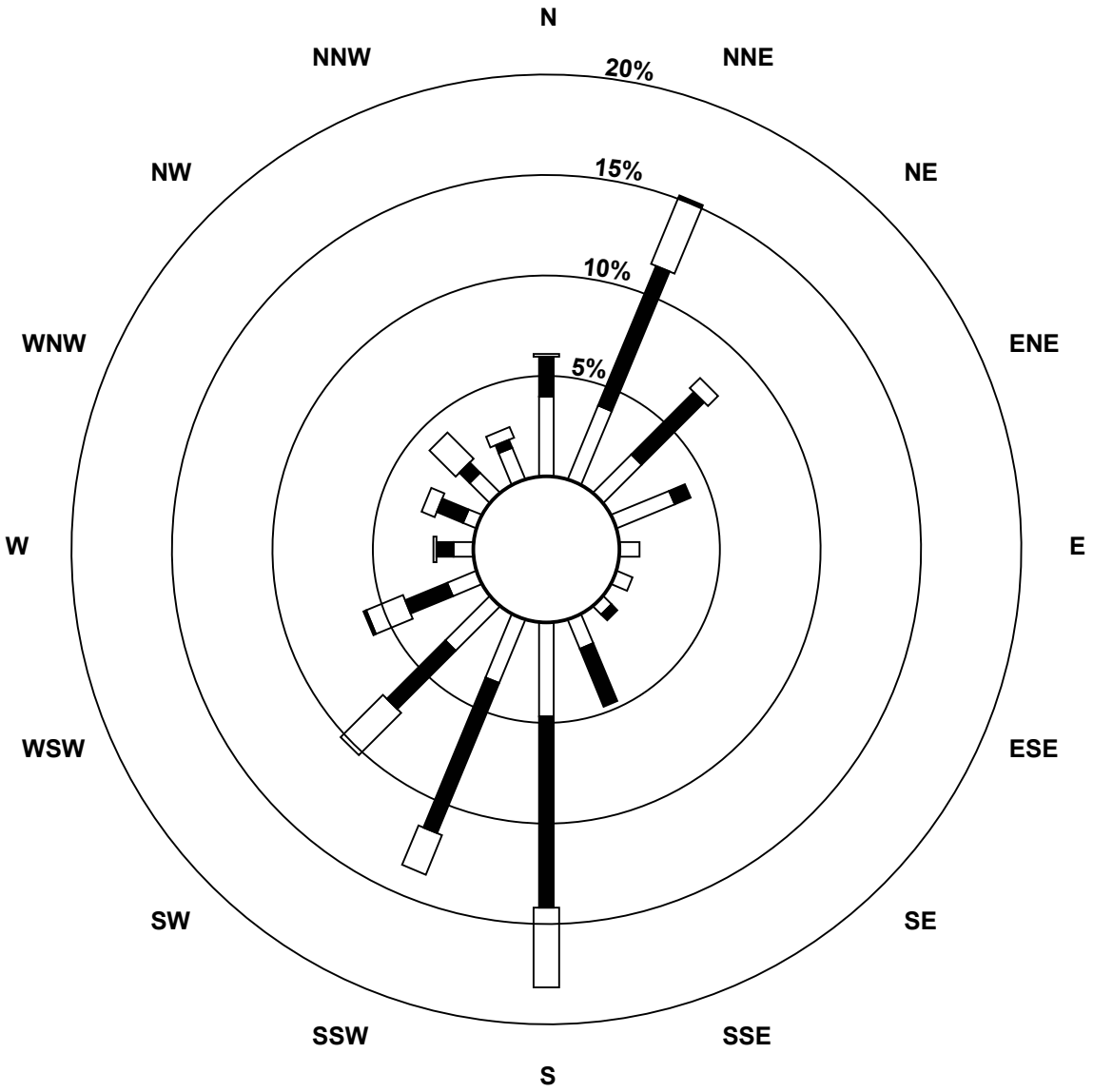
ATMOSPHERICS INC.

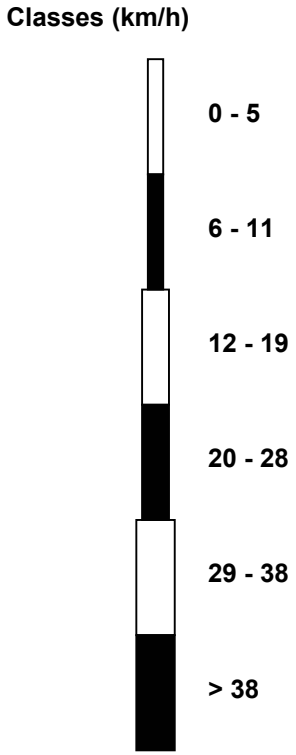
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

CNRL Horizon (AMS 15)





Total Number of Valid Hours: 705

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

CNRL Horizon - January 2015

Direction of Maximum Speed: 18 deg on Jan 26 21:00
Direction of Maximum Daily Speed Average: 218.2 deg on Jan 4

Direction of Minimum Speed: 256 deg on Jan 21 15:00

Direction of Minimum Daily Speed Average: 0.8 deg on Jan 17

Monthly Average Direction: 225.7 deg

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Percent Operational Time:	94.8

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-Jan	46	32	40	6	10	11	3	45	44	18	346	351	13	26	22	22	26	224	214	229	310	330	354	358	7.2
2-Jan	61	110	209	193	141	195	208	206	227	190	277	58	57	86	61	49	217	237	250	182	327	249	345	38	197.8
3-Jan	96	171	217	227	279	284	243	249	266	253	254	241	253	231	227	233	231	229	227	239	236	232	230	243	240.3
4-Jan	234	227	233	225	208	210	211	204	204	210	195	186	181	177	197	199	228	240	252	246	230	226	233	240	218.2
5-Jan	233	220	211	205	200	149	213	298	291	307	323	313	315	320	308	288	290	288	300	328	326	339	34	26	291.1
6-Jan	192	145	185	180	172	213	221	206	210	210	211	220	212	176	170	194	211	225	231	228	213	219	202	190	205.3
7-Jan	187	182	190	185	181	173	177	184	189	200	226	221	220	170	146	175	62	8	305	241	325	327	329	345	213.9
8-Jan	334	308	308	312	307	300	316	313	255	285	298	297	314	294	279	268	239	237	204	194	204	199	195	215	280.6
9-Jan	185	185	179	174	171	167	156	140	147	147	156	165	164	115	44	3	311	285	276	303	311	309	324	1	181.1
10-Jan	20	277	221	213	220	212	210	209	200	193	190	183	185	172	164	152	142	189	164	211	227	182	206	212	191.8
11-Jan	194	183	172	155	168	186	131	195	186	176	160	170	168	173	170	171	188	186	189	186	185	178	184	188	180.0
12-Jan	184	181	190	192	189	211	360	36	339	285	170	173	186	170	122	122	153	174	172	174	170	180	181	164	176.9
13-Jan	71	2	0	4	14	13	3	17	23	35	37	39	69	74	76	63	15	13	353	337	21	347	213	204	25.0
14-Jan	188	187	183	159	102	357	14	35	38	22	20	46	37	36	27	38	31	42	35	47	53	39	38	62	45.3
15-Jan	65	76	74	108	41	47	27	41	46	50	43	8	8	332	349	23	351	12	278	282	245	259	245	196	31.3
16-Jan	192	190	186	185	193	202	227	221	229	198	181	179	193	187	217	208	211	221	255	225	185	203	219	233	205.3
17-Jan	262	254	261	197	31	5	37	44	49	23	54	41	63	75	61	64	35	16	23	213	202	247	224	200	354.3
18-Jan	205	210	198	201	196	189	182	180	180	171	183	181	180	218	205	195	197	184	183	176	319	293	220	224	193.4
19-Jan	23	342	1	13	12	12	7	12	11	12	7	357	17	17	24	20	21	30	34	30	20	7	10	353	12.7
20-Jan	322	312	0	357	2	34	53	225	219	208	186	194	180	180	179	191	181	181	185	180	177	162	166	170	179.3
21-Jan	165	168	178	165	163	174	198	196	198	203	193	185	181	184	256	228	238	234	232	235	248	238	240	238	210.8
22-Jan	237	218	206	221	223	221	235	249	249	245	266	237	237	227	210	207	234	239	239	301	23	21	24	28	240.0
23-Jan	39	46	67	54	39	10	34	11	16	0	325	342	191	173	177	207	150	160	182	178	205	182	124	204	104.9
24-Jan	269	87	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
25-Jan	AF	AF	AF	AF	AF	AF	181	189	208	216	187	231	268	286	295	309	354	49	25	27	50	217	179	181	259.0
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	205	159	92	13	19	20	21	18	19	18	25	25	27	--
27-Jan	20	23	35	33	32	28	40	38	31	27	18	25	28	26	27	19	20	13	15	20	21	19	17	16	24.6
28-Jan	13	9	3	1	15	20	21	48	60	23	14	355	179	165	62	82	55	75	70	60	64	74	75	95	36.4
29-Jan	86	224	245	209	186	207	190	200	183	171	171	203	258	162	337	326	344	28	19	24	19	15	14	11	13.2
30-Jan	26	23	21	21	29	30	26	65	28	14	29	28	31	37	37	34	39	40	17	8	352	345	310	244	25.3
31-Jan	240	230	235	216	211	206	200	190	190	186	172	178	177	152	166	148	164	174	185	223	203	199	195	190	191.4
	211.9	206.8	212.2	206.9	204.7	223.8	229.7	204.7	203.8	224.0	223.4	208.7	208.5	182.4	203.9	234.8	231.0	231.1	243.1	242.2	278.2	259.6	238.9	228.0	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Jan 10 21:00

Minimum Value: 7 deg on Jan 31 21:00

Percentiles: P_1 = 9 P_{10} = 13 Q_1 = 15 Median = 18 Q_3 = 24 P_{90} = 40 P_{99} = 89

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	0
Percent Operational Time:	94.8

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-Jan	23	15	15	20	16	21	36	17	19	56	18	29	18	18	18	14	82	26	33	41	15	18	17	19	82
2-Jan	49	50	45	31	25	30	10	14	61	58	39	61	37	30	30	28	35	17	49	40	79	44	58	34	79
3-Jan	45	74	16	18	14	13	15	14	15	14	17	20	20	20	18	13	13	14	13	16	15	15	16	15	74
4-Jan	19	15	18	17	16	15	15	14	17	16	14	13	14	18	19	24	30	20	21	20	18	19	19	16	30
5-Jan	20	17	15	15	23	21	66	29	18	16	17	16	14	15	18	21	16	15	23	26	22	14	12	54	66
6-Jan	15	34	16	13	38	30	55	9	13	8	11	28	32	26	18	11	16	12	12	13	13	13	15	15	55
7-Jan	12	12	15	14	13	13	12	13	15	18	28	23	44	27	17	28	35	59	41	30	33	16	17	20	59
8-Jan	26	16	21	14	16	14	14	16	51	22	14	17	16	17	21	16	15	14	14	11	13	14	13	19	51
9-Jan	13	11	10	12	12	11	10	12	14	10	18	16	17	44	32	15	32	15	14	15	14	16	37	16	44
10-Jan	17	60	9	10	47	34	11	10	14	12	15	14	14	22	16	13	17	18	46	29	95	64	12	11	95
11-Jan	23	32	39	30	46	27	93	22	10	19	16	18	14	15	14	13	13	12	11	14	13	13	12	14	93
12-Jan	13	12	17	15	23	26	75	64	63	62	91	30	24	20	21	12	18	14	12	13	12	16	15	21	91
13-Jan	55	19	17	17	19	17	23	34	71	17	16	16	22	20	28	21	20	15	17	35	28	67	27	19	71
14-Jan	16	15	12	27	56	44	25	16	17	19	20	17	19	16	18	17	18	14	18	17	17	18	16	13	56
15-Jan	17	15	30	35	27	15	19	17	15	19	26	25	26	27	34	36	30	36	90	39	52	31	58	22	90
16-Jan	16	15	16	15	17	18	19	17	19	17	13	14	13	17	16	16	15	25	22	40	24	17	18	27	40
17-Jan	18	19	20	25	89	16	14	13	19	19	18	17	21	26	26	26	62	13	20	88	34	23	24	20	89
18-Jan	21	21	18	15	15	14	12	13	13	13	15	17	22	20	15	15	14	15	11	27	66	45	52	62	66
19-Jan	38	14	23	13	17	16	17	16	17	18	17	30	22	21	21	17	18	18	17	18	19	17	18	16	38
20-Jan	14	29	21	19	23	22	29	29	44	13	12	19	17	18	15	36	14	12	13	13	15	14	16	12	44
21-Jan	14	14	13	14	12	11	14	14	13	13	16	14	15	39	90	17	16	18	18	19	18	20	19	19	90
22-Jan	18	19	18	20	20	19	21	21	24	34	22	17	17	20	16	16	17	18	17	68	20	21	17	20	68
23-Jan	16	15	22	16	20	20	20	26	28	58	60	47	55	24	18	29	33	17	21	31	34	34	32	71	71
24-Jan	82	81	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	82
25-Jan	AF	AF	AF	AF	AF	AF	16	12	17	54	19	31	20	18	18	16	39	17	21	20	23	59	20	18	59
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	16	27	60	16	17	18	19	19	19	18	19	19	17	60
27-Jan	18	16	16	18	17	17	15	16	19	18	22	19	19	19	19	19	19	16	18	17	18	18	17	18	22
28-Jan	17	18	17	19	14	10	13	14	12	28	25	37	40	38	21	19	13	23	21	14	16	20	30	25	40
29-Jan	39	16	27	23	30	26	21	27	24	20	19	24	82	84	91	26	29	39	16	17	18	20	20	21	91
30-Jan	19	18	18	18	18	19	15	63	9	16	18	22	22	16	18	19	12	12	14	15	12	12	49	44	63
31-Jan	15	12	13	10	9	9	10	11	12	12	14	15	19	24	33	45	10	16	14	35	7	11	11	11	45
	82	81	45	35	89	44	93	64	71	62	91	61	82	84	91	45	82	59	90	88	95	67	58	71	
	Diurnal Maximum																								

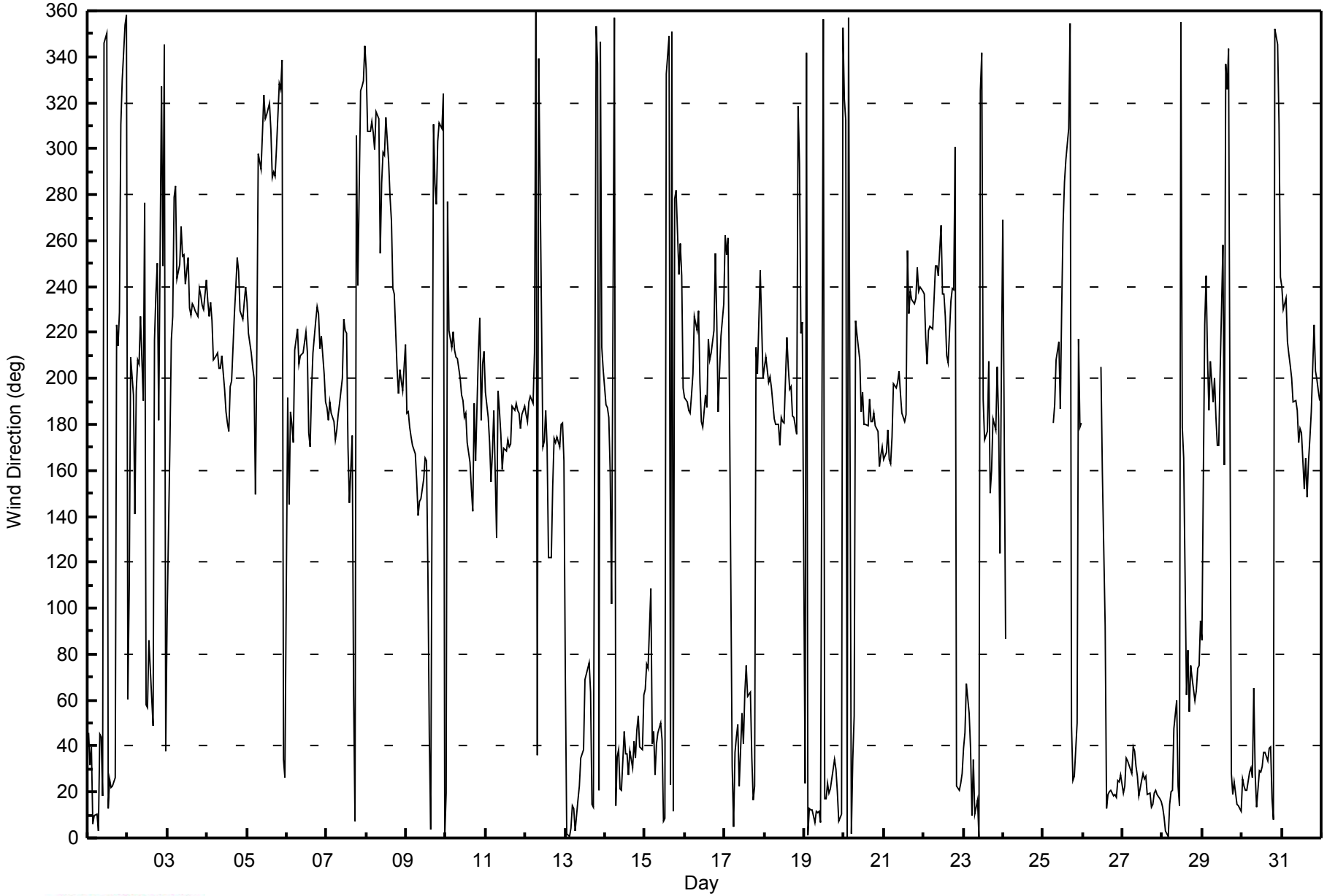
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

CNRL Horizon - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL	Station Number	15

Reason: Routine

Start Time (MST)	10:25	End Time (MST)	14:55
Barometric Pressure	n/a mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	10880507
Cal Gas Concentration	50.3 ppm	Cal Gas Expiry Date	06/11/2014
Gas Cert Reference	LL107945		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2580
DACS voltage range	ethernet connection	DACS channel #	192.168.1.43

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-622	-622
Analyzer Range (mv)	1000	1000	Lamp voltage	842	845
Calculated slope	0.994206	1.001829	Chamber temp.	45.3	44.9
Calculated intercept	1.079826	1.134472	Pressure (mmHg)	710.6	709.4
Analyzer Background	17.5	17.5	Flow (lpm)	0.428	0.428
Analyzer Coefficient	0.933	0.933	Intensity	91	91

Analyzer make	43i	Analyzer serial #	10710321322

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.5	NA
as found span	5000	82.3	827.9	821.0	1.008
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	82.3	827.9	825.6	1.003
second point	5000	41.2	414.5	412.8	1.004
third point	5000	20.6	207.2	204.1	1.015
calibrator zero					
as left zero	5000	0.0	0.0	-0.1	NA
as left span	5000	82.3	827.9	826.7	1.001
				Average Correction Factor	1.007

Corrected As found	821.5	Previous response	831.7	% change	1.2%

Notes:

No adjustment required.

Calibration Performed By: Asad Hidayat

Wood Buffalo Environmental Association

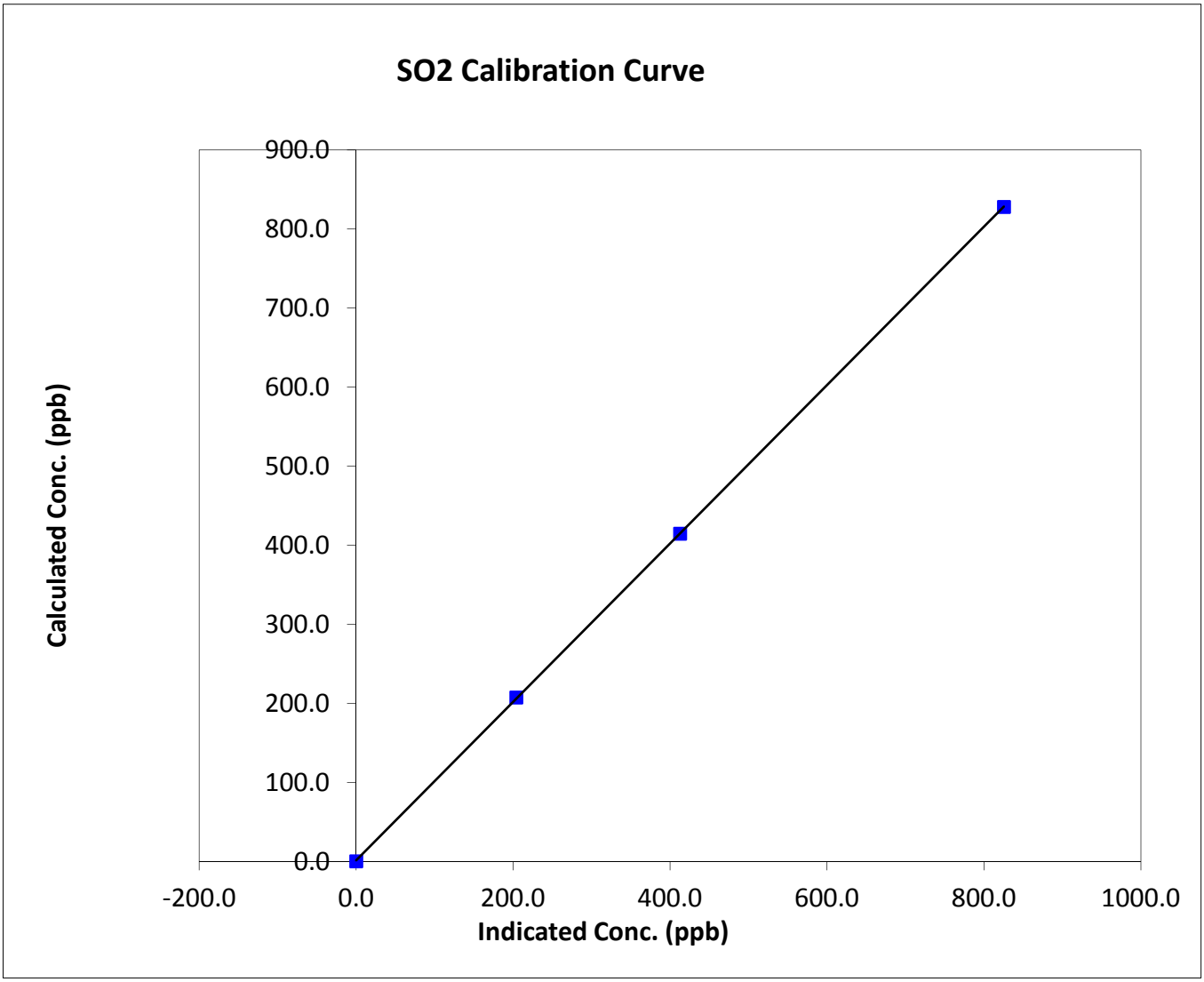
SO_2 Calibration Summary

Station Information

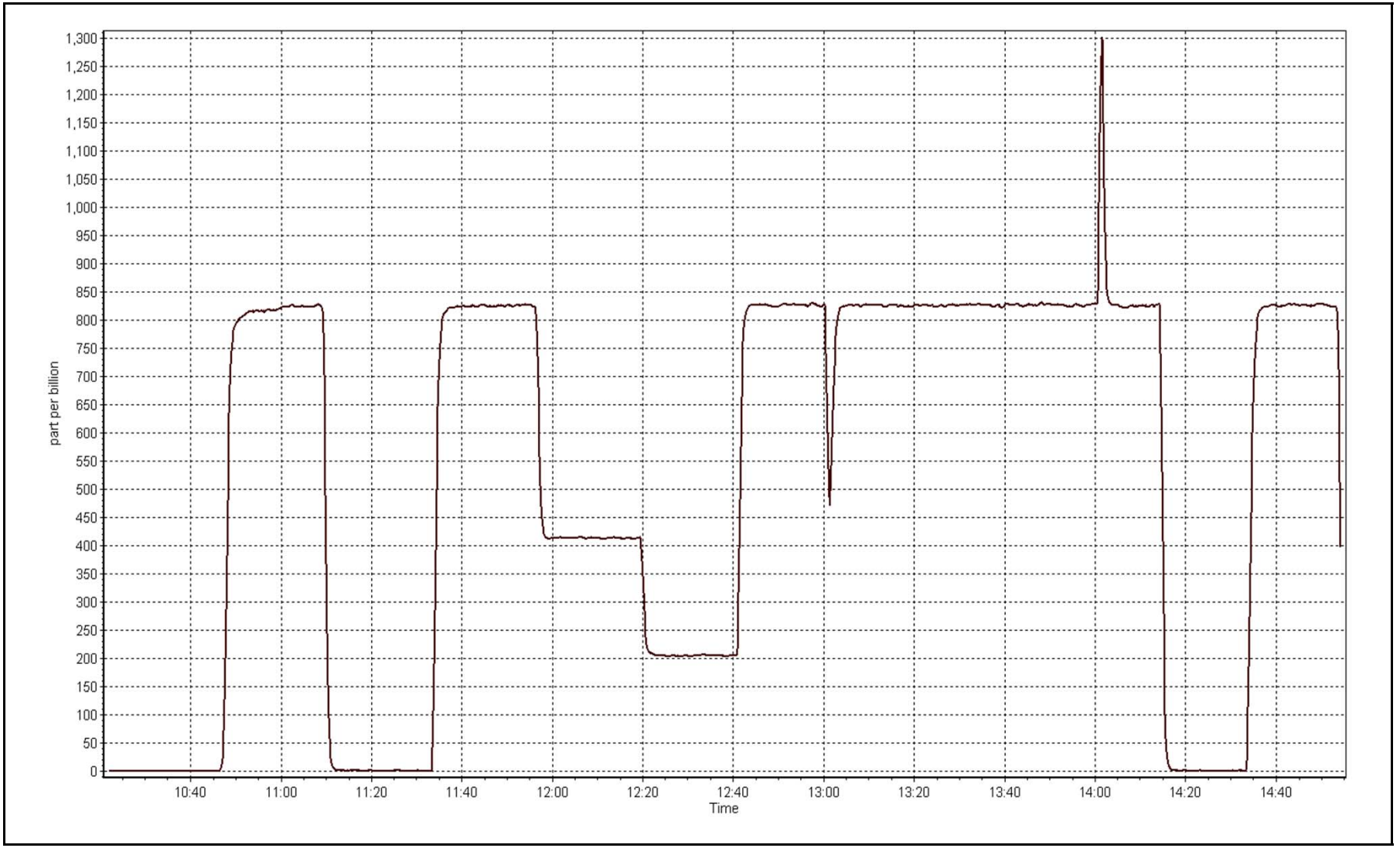
Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL	Station Number	15
Start Time (MST)	10:25	End Time (MST)	14:55
Analyzer make	43i	Analyzer serial #	10710321322

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999989
827.9	825.6	1.0028		
414.5	412.8	1.0041	Slope	1.001829
207.2	204.1	1.0153		
			Intercept	1.134472



SO2 Calibration Plot Date: January 14, 2015



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 17, 2014
Station Name	CNRL Horizon	Station Number	15
Reason:	Routine		
Start Time (MST)	11:00	End Time (MST)	13:45
Barometric Pressure	736.7 mmHg	Station temp.	25 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	LL155297
Cal Gas Concentration	10.4 ppm H2S	Cal Gas Expiry Date	5-30-2013
Gas Cert Reference	cc257967	SO2 gas conc.	50.3 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	1850
DACS voltage range	0-5000mV	DACS channel #	DIFF 2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-672	-672
Analyzer Range (input)	100	100	Lamp voltage	767	770
Calculated slope	0.989761	0.986275	Chamber temp.	45	45
Calculated intercept	-0.041543	0.008050	Pressure	703.0	695.8
Analyzer Background	9	9.1	Flow	0.427	0.422
Analyzer Coefficient	0.918	0.918	Intensity	91	90
			Converter temp.	809	809

Analyzer make/model	TEI 43I	Analyzer serial #	0710321323
Converter make/model	NOVA model CDN101	Converter serial #	363

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.1	NA
as found span	5000	38.5	80.1	81.1	0.987
SO2 scrubber check	5000	19.9	200.2	0.4	NA
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	38.5	80.1	81.1	0.987
second point	5000	19.2	39.9	40.6	0.983
third point	6000	11.6	20.1	20.3	0.992
calibrator zero					
as left zero	5000	0.0	0.0	0.1	NA
as left span	5000	38.5	80.1	81.5	0.983
				Average Correction Factor	0.987

Corrected As found	81.0	Previous response	80.9	% change	-0.1%

Notes:

no adjustments required.

Calibration Performed By: Asad Hidayat

Wood Buffalo Environmental Association

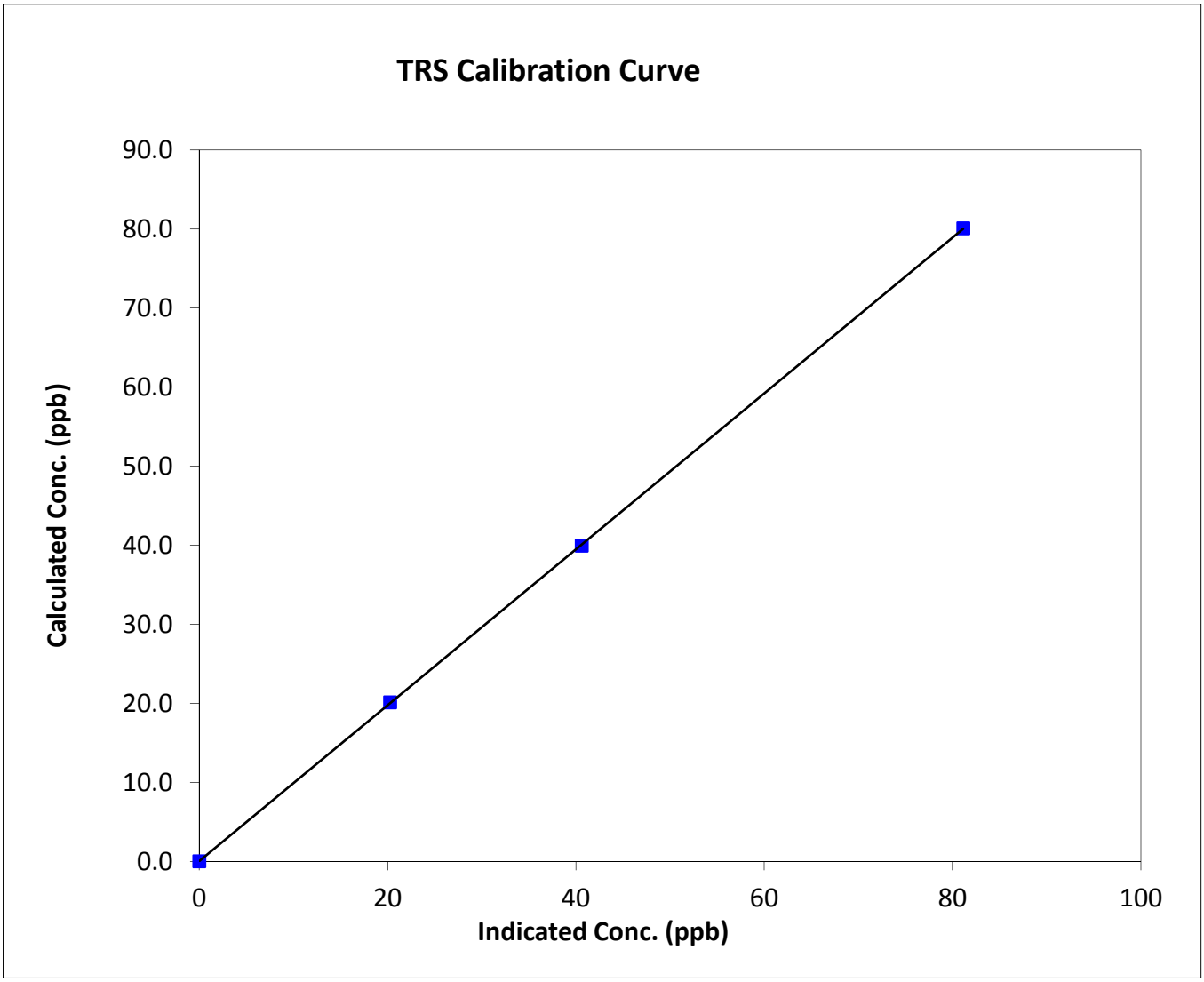
TRS Calibration Summary

Station Information

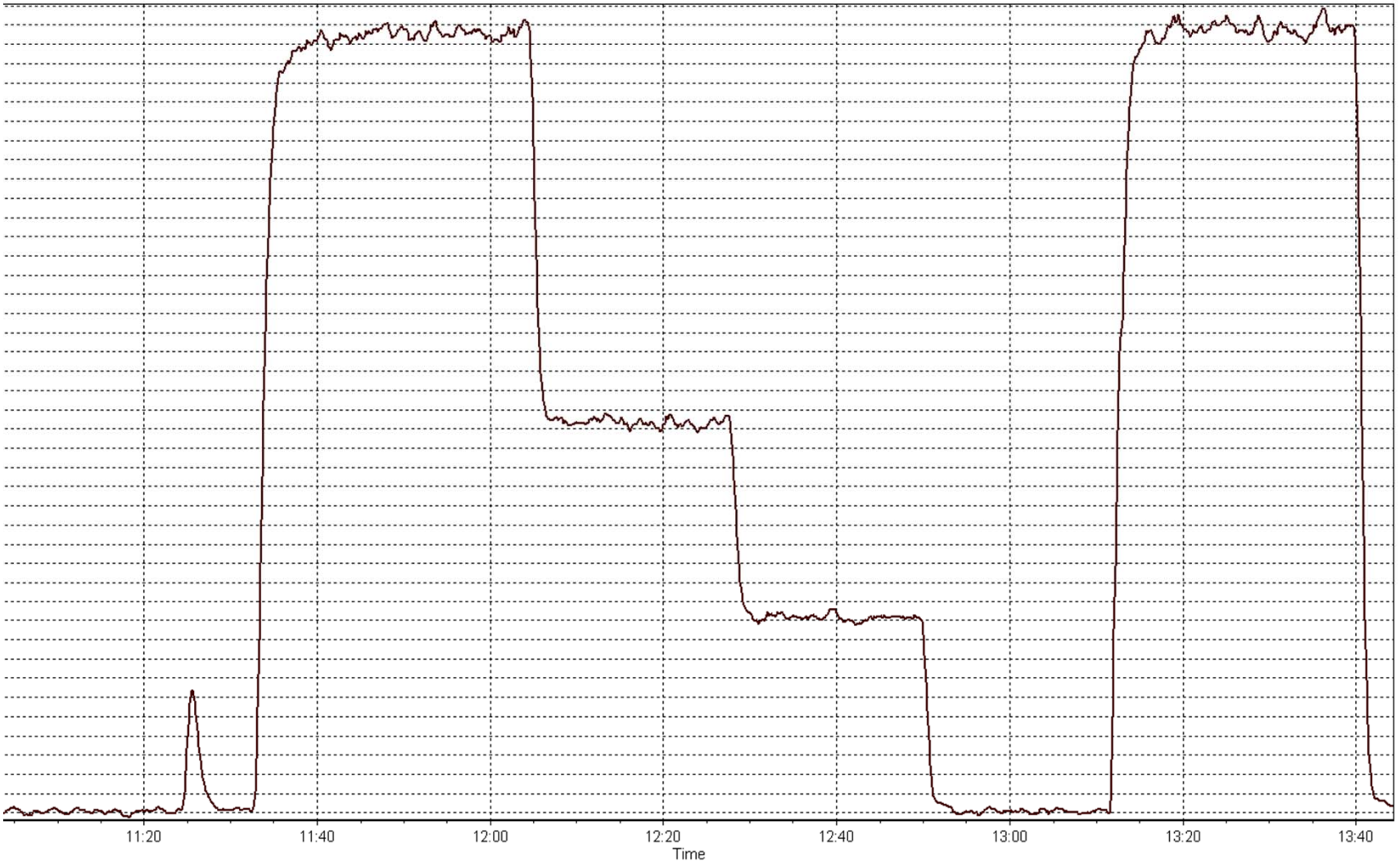
Calibration Date	January 13, 2015	Previous Calibration	December 17, 2014
Station Name	CNRL Horizon	Station Number	15
Start Time (MST)	11:00	End Time (MST)	13:45
Analyzer make	TEI 43I	Analyzer serial #	0710321323

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999990
80.1	81.1	0.9869		
39.9	40.6	0.9829	Slope	0.986275
20.1	20.3	0.9919		
			Intercept	0.008050



ation Plot Date: January 13, 2015



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Reason:	Routine		
Start Time (MST)	10:25	End Time (MST)	14:30
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	10880507
Gas Cert Reference	LL107945	Cal Gas Expiry Date	06/11/2014
CH4 Cal Gas Conc.	490.0 ppm	CH4 Equiv Conc.	1062.0 ppm
C3H8 Cal Gas Conc.	208 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2580
DACS voltage range	ethernet connection	DACS channel #	192.168.1.51

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.7	8.7
Analyzer Range (mv)	25	25	Air or Bypass press	37.5	37.2
Calculated slope	0.999064	1.001157	Fuel Pressure	26.3	26.3
Calculated intercept	-0.140990	-0.019652			

Analyzer make	Thermo 51i	Analyzer serial #	1327059295

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.26	N/A
as found span	5000	82.3	17.48	18.01	0.971
calibrator zero	5000	0.0	0.00	-0.01	N/A
high point	5000	82.3	17.48	17.47	1.001
second point	5000	41.2	8.75	8.76	0.999
third point	5000	20.6	4.38	4.43	0.988
calibrator zero					
as left zero	5000	0.0	0.00	0.02	N/A
as left span	5000	82.3	17.48	17.59	0.994
				Average Correction Factor	0.996

Corrected As found	17.75	Previous response	17.64	% change	-0.6%

Notes:

Adjusted zero and span.

Calibration Performed By: Asad Hidayat

Wood Buffalo Environmental Association

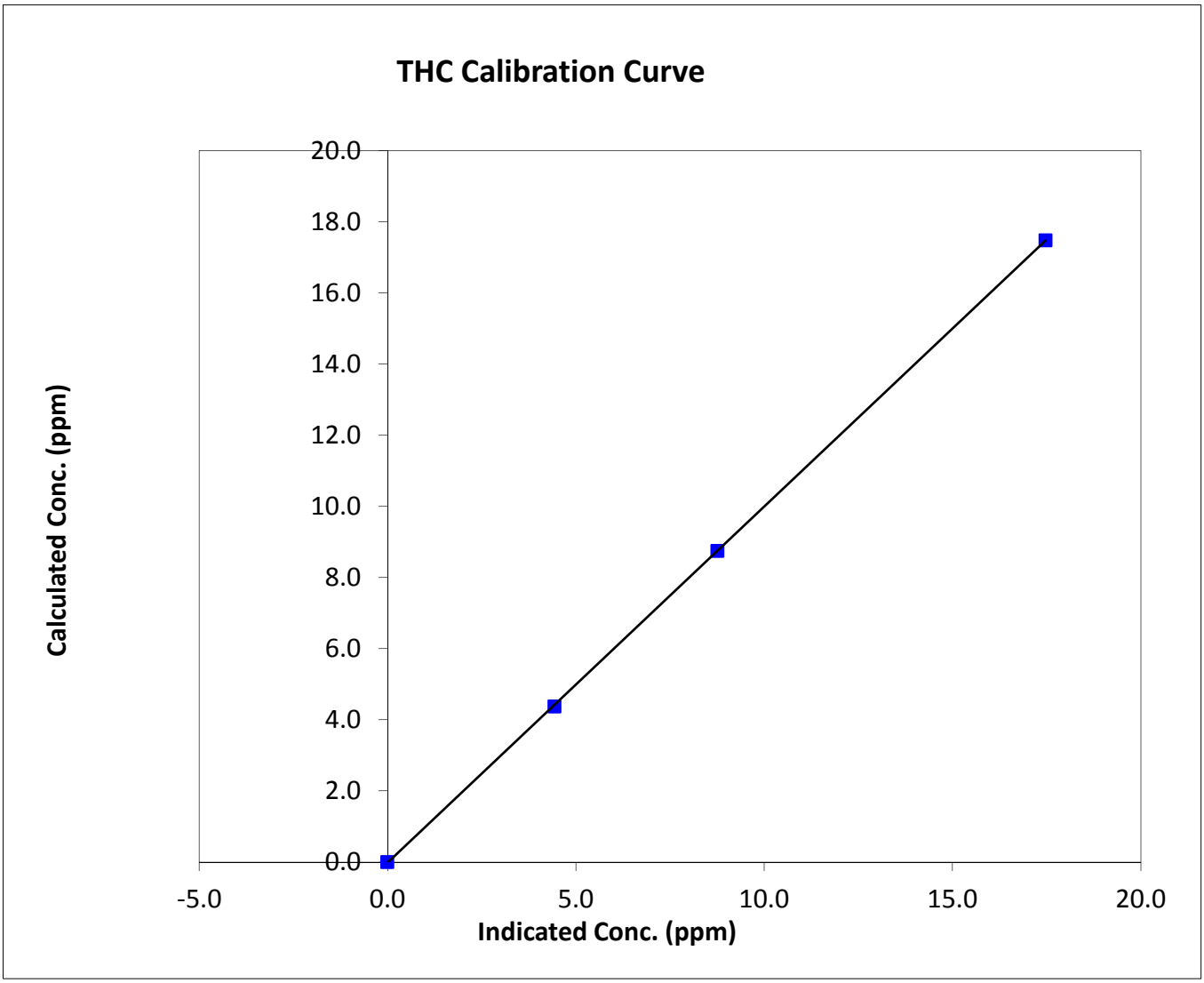
THC Calibration Summary

Station Information

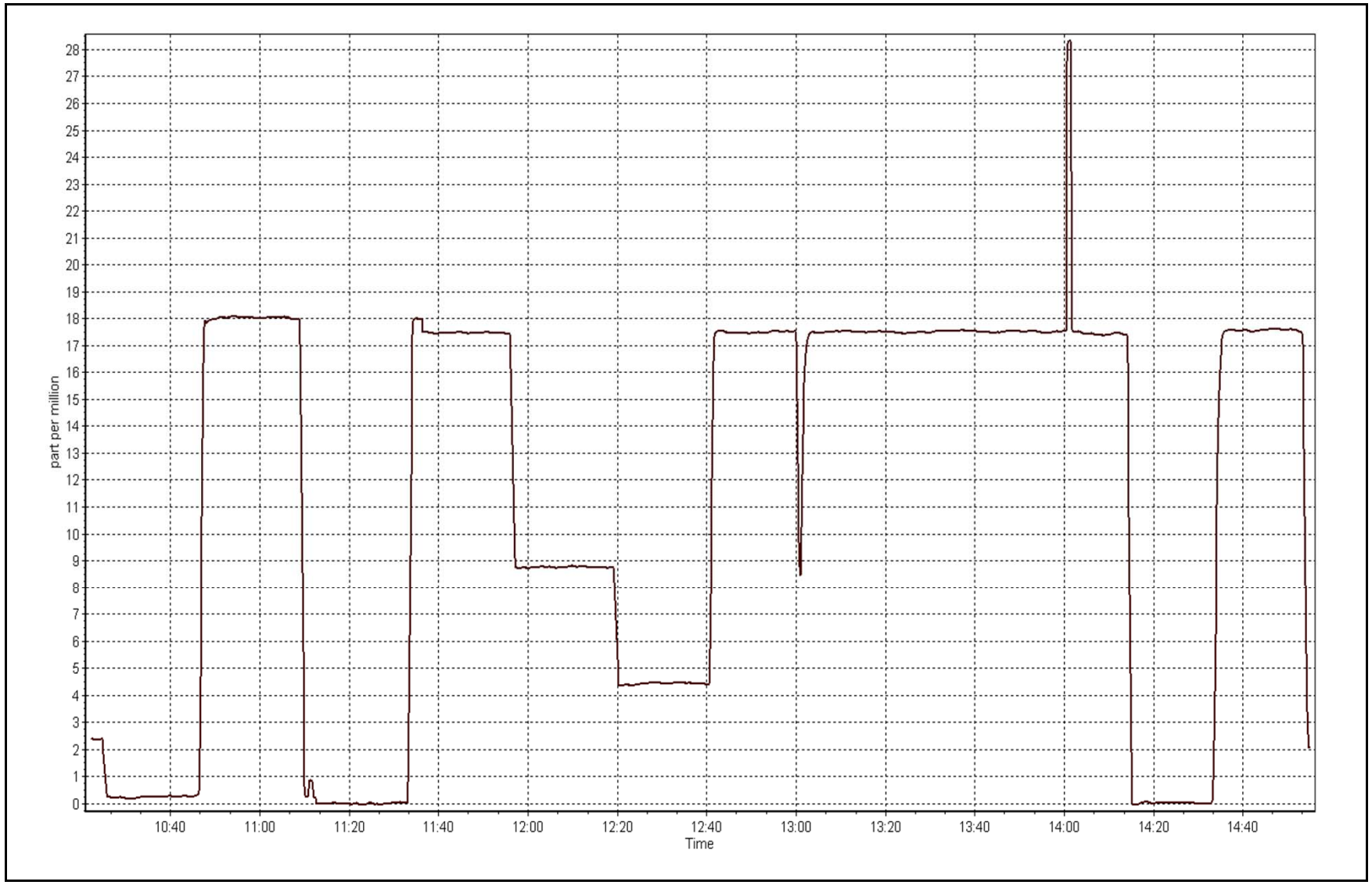
Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	10:25	End Time (MST)	14:30
Analyzer make	Thermo 51i	Analyzer serial #	1327059295

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.01	N/A	Correlation Coefficient	0.999985
17.48	17.47	1.0006		
8.75	8.76	0.9990	Slope	1.001157
4.38	4.43	0.9877		
			Intercept	-0.019652



THC Calibration Plot Date: January 14, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Reason:	Routine		
Start Time (MST)	10:25	End Time (MST)	14:55
Barometric Pressure	n/a mmHg	Station Temperature	22.0 Deg C
Calibrator	Sabio 4010	Serial Number	10880507
NO Cal Gas Conc	48.6 ppm	Cal Gas Expiry Date	November 6, 2014
NOx Cal Gas Conc	48.6 ppm	Cal Gas Serial #	LL107945

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2632

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.994856	0.995962	0.994525
	Data Offset	0.610402	0.664907	-0.555871
After	Data Slope	0.991465	0.993761	0.994629
	Data Offset	0.220430	0.162727	0.067304
Channel #		ethernet connection		
IP address		192.168.1.42		

Analyzer Information

Analyzer make/model	42i	Analyzer serial #	710321429

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.798	ppb	0.798	ppb
NOX coefficient	1.003	ppb	1.003	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	9.5		9.5	
NOX bkgrnd	9.9		9.9	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	325.0	Deg C	325.5	Deg C
PMT Temp	-2.7	Deg C	-3.0	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	166.2	mmHg	166.5	mmHg
Sample Flow	0.722	ccm	0.722	ccm

Notes:

No adjustments required.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 14, 2015 Station Number: AMS 15

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.2	0.4	-0.2	N/A	N/A
as found span	5000	82.3	800.0	800.0	0.0	810.7	807.7	3.1	0.9867	0.9904
calibrator zero	5000	0.0	0.0	0.0	0.0	0.0	0.2	-0.1	N/A	N/A
high point	5000	82.3	800.0	800.0	0.0	806.4	804.6	1.7	0.9920	0.9942
second point	5000	41.2	400.5	400.5	0.0	404.7	403.7	1.0	0.9896	0.9920
third point	5000	20.6	200.2	200.2	0.0	200.8	200.3	0.5	0.9974	0.9997
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	2.4	2.6	-0.2	N/A	N/A
as left span	5000	82.3	800.0	406.3	393.7	801.8	404.5	397.3	0.9977	1.0045
							Average Correction Factor		0.9930	0.9953

Corrcted As found NO_X= 810.5 NO= 807.3 Percent Change NO_X= -0.9% NO= -0.6%

Previous Response NO_X= 803.5 NO= 802.5

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 82.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.1			N/A	
1st NO2 (300)	N/A	406.3	397.2	805.7	406.3	399.4	0.9768	1.0000	0.9945	100.5%
2nd NO2 (200)	N/A	534.7	268.8	804.6	534.7	269.9	0.9781	1.0000	0.9959	100.4%
3rd NO2 (100)	N/A	663.9	139.6	804.4	663.9	140.6	0.9783	1.0000	0.9933	100.7%
4th NO2 (0)	803.5	N/A	1.6	805.1	803.5	1.6	0.9775	1.0000	N/A	N/A
					Average Correction Factor		0.9777	1.0000	0.9946	100.5%

Calibration Performed By: Asad Hidayat

Wood Buffalo Environmental Association

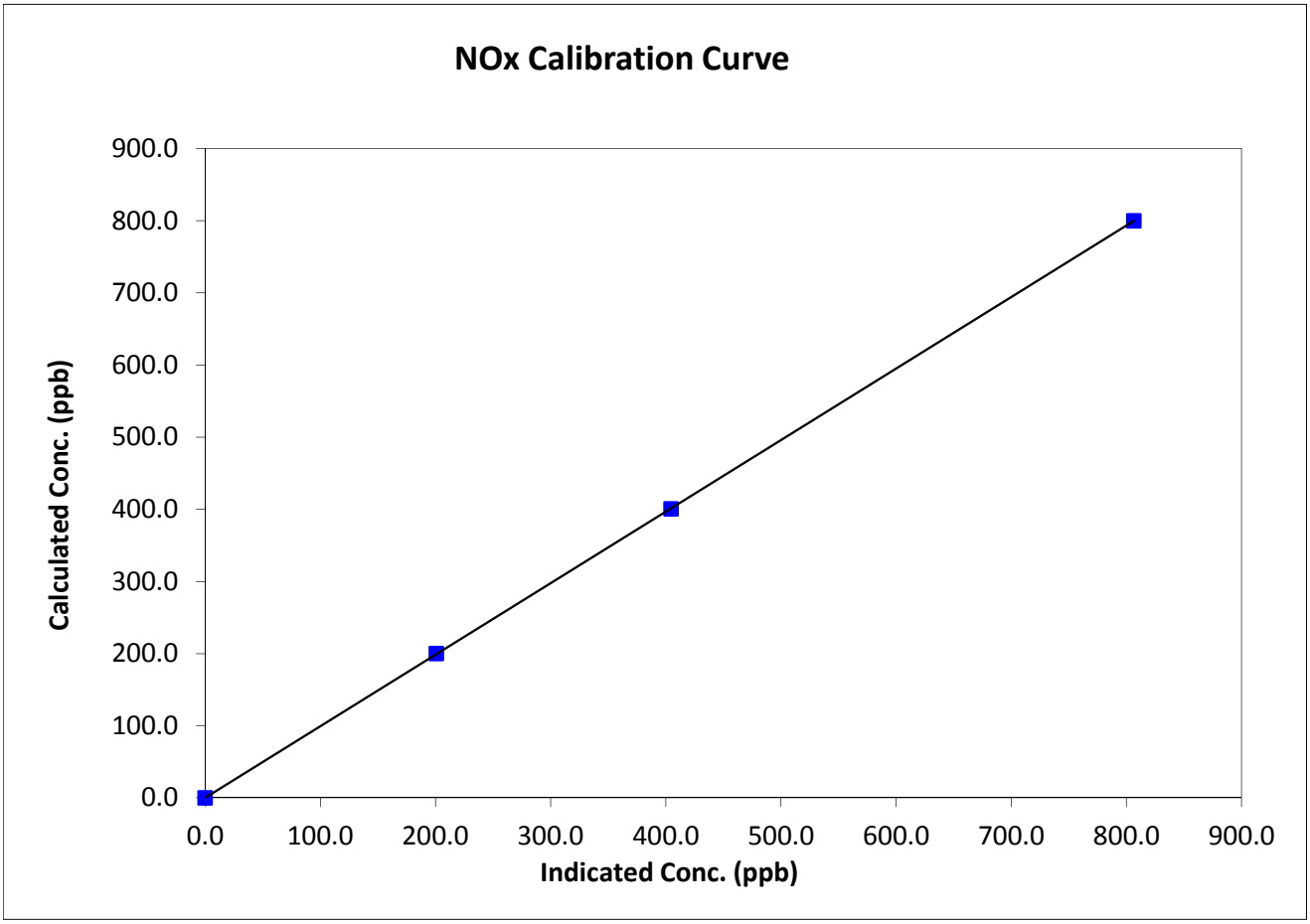
NO_X Calibration Summary

Station Information

Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	10:25	End Time (MST)	14:55
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999994
800.0	806.4	0.9920		
400.5	404.7	0.9896	Slope	0.991465
200.2	200.8	0.9974		
			Intercept	0.220430



Wood Buffalo Environmental Association

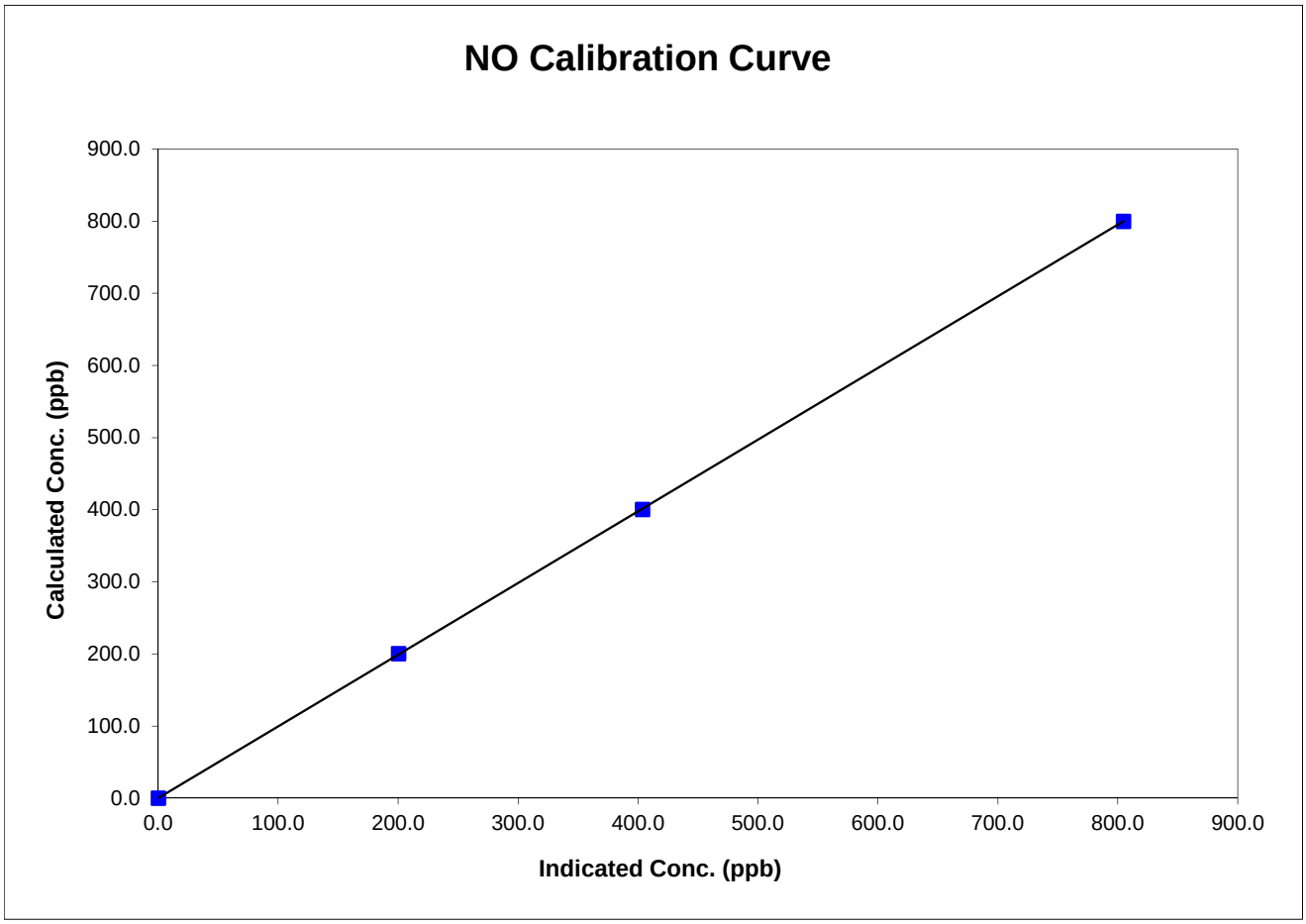
NO Calibration Summary

Station Information

Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	10:25	End Time (MST)	14:55
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999994
800.0	804.6	0.9942		
400.5	403.7	0.9920	Slope	0.993761
200.2	200.3	0.9997		
			Intercept	0.162727



Wood Buffalo Environmental Association

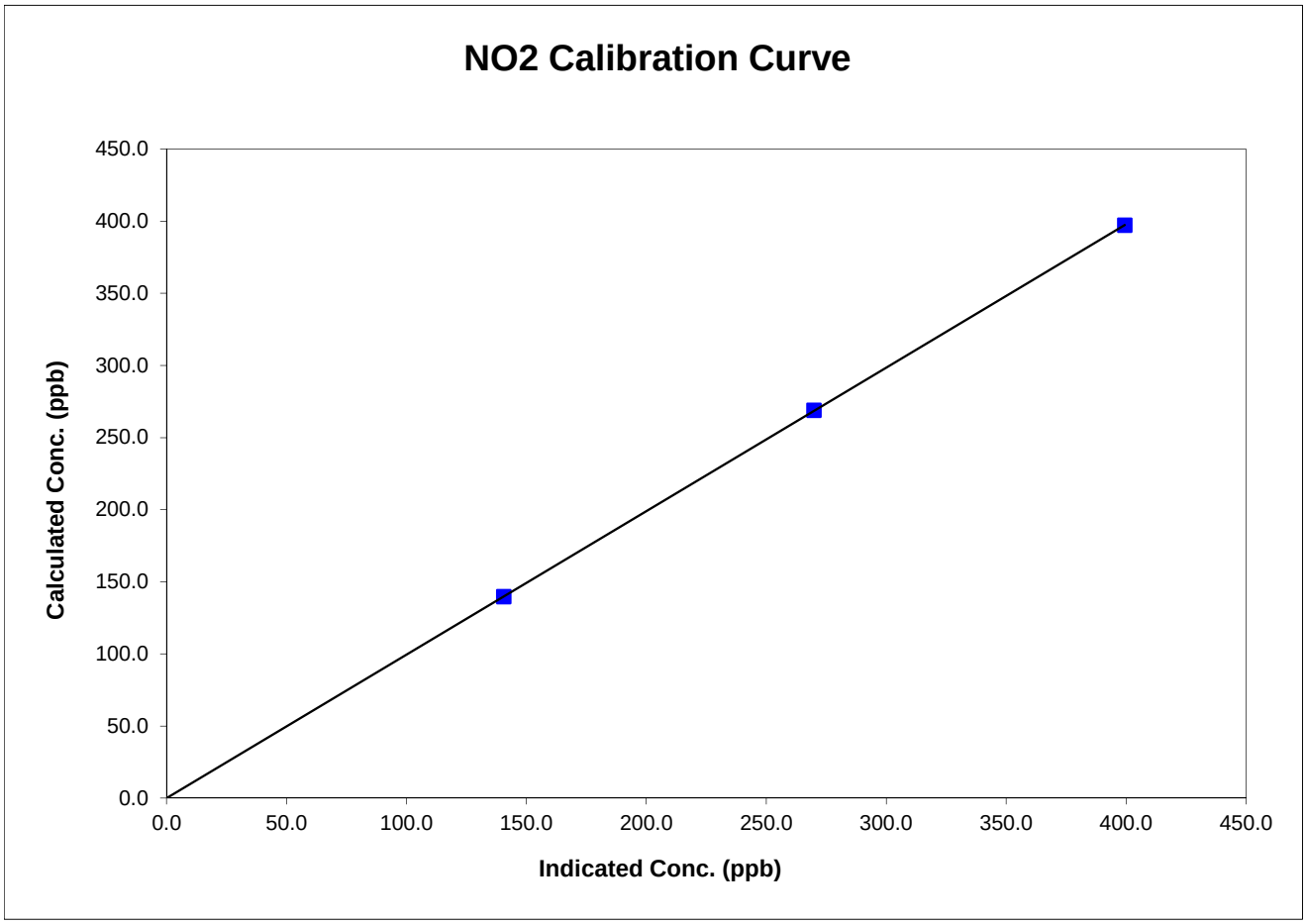
NO_2 Calibration Summary

Station Information

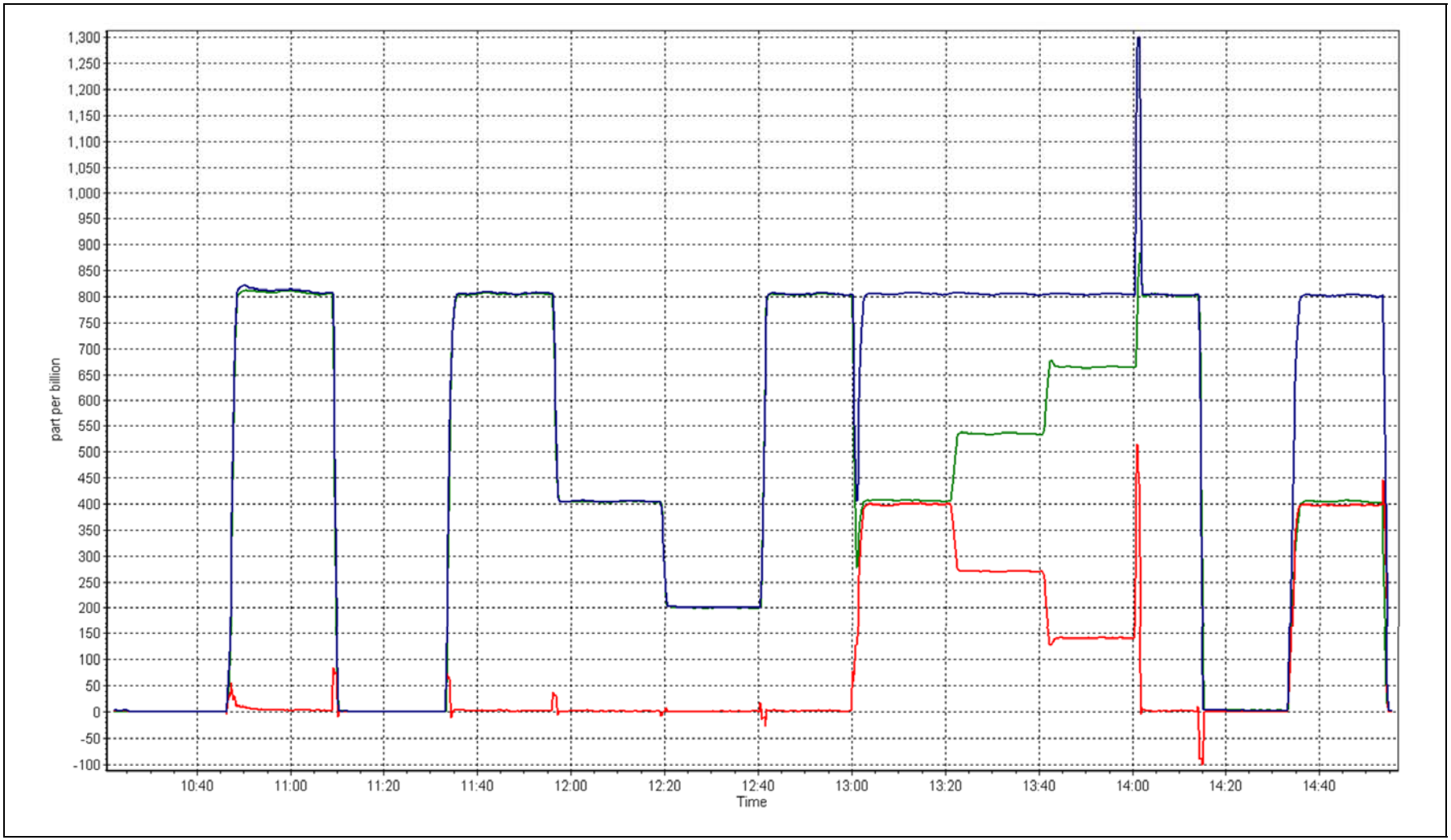
Calibration Date	January 14, 2015	Previous Calibration	December 16, 2014
Station Number	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	10:25	End Time (MST)	14:55
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999998
397.2	399.4	0.9945		
268.8	269.9	0.9959	Slope	0.994629
139.6	140.6	0.9933		
			Intercept	0.067304



NOx, NO & NO_2 Calibration Plot Date: January 14, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 16
SHELL MUSKEG RIVER
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
JANUARY 2015

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	36	37	99.87	65	0	11	0
THC (ppm) Average	708	36	36	100.00	6.2	-	4.1	-
NO2 (ppb) Average	685	32	59	96.37	52	0	26	0
NO (ppb) Average	685	32	59	96.37	208	-	74	-
NOX (ppb) Average	685	32	59	96.37	260	-	100	-
PM2.5 (ug/m3) Average	743	0	1	99.87	40.4	-	15.5	0
Temperature 2 m (C) Average	744	0	0	100.00	5.6	-	2.5	-
Relative Humidity (%) Average	744	0	0	100.00	100	-	99	-
Barometric Pressure (inHg) Average	744	0	0	100.00	29.9	-	29.8	-
Wind Speed 10 m (km/h) Average	714	0	30	95.97	28	-	19	-
Wind Direction 10 m (deg) Average	714	0	30	95.97	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
JANUARY 2015

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	5	-	0	0	0	1	1	6	65
THC (ppm) Average	708	2.56	0.5	-	2	2.2	2.3	2.4	2.7	3	6.2
NO2 (ppb) Average	685	14.9	10	-	0	3	7	14	22	28	52
NO (ppb) Average	685	10.5	20	-	0	0	0	4	11	26	208
NOX (ppb) Average	685	25.3	27	-	0	3	8	19	32	54	260
PM2.5 (ug/m3) Average	743	5.47	4.5	-	1	1.9	2.9	4.2	6.8	10.1	40.4
Temperature 2 m (C) Average	744	-15.13	9.4	-	-33.4	-26.8	-21.7	-16.5	-8.5	-1	5.6
Relative Humidity (%) Average	744	81.8	9	-	49	73	76	80	87	95	100
Barometric Pressure (inHg) Average	744	29.03	0.4	-	28.2	28.5	28.7	29.1	29.3	29.6	29.9
Wind Speed 10 m (km/h) Average	714	9.6	5	-	0	3	6	9	13	18	28
Wind Direction 10 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	23 Jan 2015 11:00	23 Jan 2015 11:00	1	Maintenance - data collection program upgraded
NO2, NO, NOX	22 Jan 2015 12:00	23 Jan 2015 14:00	27	Analyzer replaced - unstable GPT points
PM2.5	23 Jan 2015 15:00	23 Jan 2015 15:00	1	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	24 Jan 2015 01:00	24 Jan 2015 01:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 06:00	24 Jan 2015 11:00	6	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 15:00	25 Jan 2015 03:00	13	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 01:00	26 Jan 2015 10:00	10	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 65 ppb on Jan 11 14:00 Maximum Daily Average: 11.2 ppb on Jan 11

Minimum Value: 0 ppb on Jan 26 02:00 Minimum Daily Average: 0.3 ppb on Jan 26
Maximum Diurnal Average: 4.2 ppb at hour 14 Minimum Diurnal Average: 1.1 ppb at hour 10
Monthly Average: 2.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 6$ $P_{99} = 17$

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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0.4	1
2-Jan	0	0	Z	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.4	1
3-Jan	1	1	1	Z	1	0	1	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0.8	1
4-Jan	1	1	1	1	Z	1	1	1	1	1	1	1	5	9	3	1	1	0	0	0	0	0	0	0	1.3	9
5-Jan	0	0	0	0	0	Z	0	1	1	1	0	1	0	0	0	0	1	1	1	1	0	0	1	0	0.5	1
6-Jan	Z	0	0	0	0	0	1	0	0	0	1	1	1	1	0	0	1	1	1	1	1	1	0	1	0.5	1
7-Jan	1	Z	3	7	6	10	6	11	5	2	2	21	9	11	13	13	11	9	2	1	1	1	1	1	6.3	21
8-Jan	1	1	Z	1	1	1	1	0	1	1	1	3	1	1	2	1	1	1	1	0	1	1	0	0	0.8	3
9-Jan	0	1	1	Z	1	1	2	1	2	1	2	5	8	7	5	8	6	3	2	2	1	1	1	1	2.7	8
10-Jan	0	0	0	0	Z	0	0	0	0	1	2	6	7	3	3	3	4	6	4	3	2	1	1	1	2.2	7
11-Jan	1	1	1	1	1	Z	1	1	1	1	2	6	17	65	54	27	16	4	6	10	12	15	6	9	11.2	65
12-Jan	Z	7	7	4	3	3	2	2	1	1	1	1	1	1	1	1	1	3	5	4	3	4	4	6	3.0	7
13-Jan	7	Z	4	3	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1.2	7
14-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	1	1	0	0.6	1
15-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
16-Jan	0	0	1	1	Z	1	2	6	8	4	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1.4	8
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	0.4	1
18-Jan	Z	2	1	1	1	1	2	3	2	2	5	7	3	2	2	2	1	2	2	1	1	1	1	1	2.0	7
19-Jan	0	Z	1	1	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	10	19	6	9	10	9	16	14	15	14	5.6	19
21-Jan	20	17	13	Z	9	8	8	8	7	7	8	6	11	9	2	1	1	1	1	1	1	1	1	1	6.1	20
22-Jan	1	1	1	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
23-Jan	0	0	0	0	0	Z	0	0	0	0	M	C	C	C	C	C	1	2	9	18	18	13	16	12	--	18
24-Jan	Z	6	5	5	5	3	3	3	3	2	1	1	1	1	1	1	1	0	1	1	1	1	1	1	2.1	6
25-Jan	0	Z	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
26-Jan	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
29-Jan	0	0	0	0	0	Z	0	0	0	1	1	0	1	1	1	1	1	4	3	2	4	8	3	2	1.5	8
30-Jan	Z	1	1	2	1	1	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0.6	2
31-Jan	0	Z	0	0	0	0	0	0	0	1	1	6	7	8	15	13	9	4	2	1	1	1	4	6	3.5	15
	1.5	1.7	1.8	1.2	1.4	1.4	1.3	1.5	1.3	1.1	1.1	2.3	2.6	4.2	4.0	3.3	2.2	1.8	1.7	2.0	2.2	2.3	2.0	2.0	Diurnal Average	
	20	17	13	7	9	10	8	11	8	7	8	21	17	65	54	27	16	9	10	18	18	15	16	14	Diurnal Maximum	

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

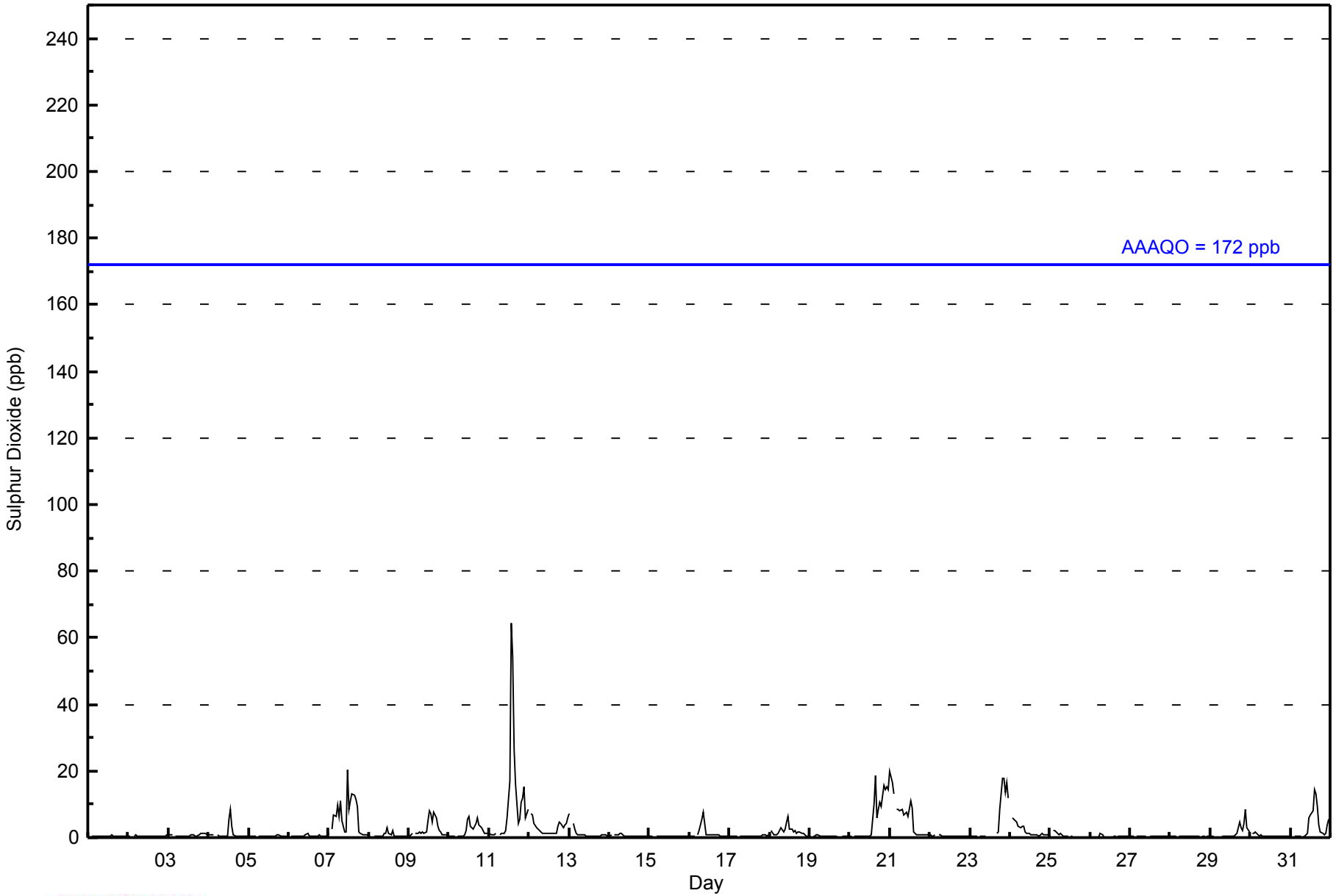
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	678	95.90	95.90
11 - 20	25	3.54	99.43
21 - 60	3	0.42	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

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	19	67	98	45	6	6	11	23	126	114	46	26	16	14	16	18	651
11 - 20	0	1	0	0	1	1	0	1	8	9	2	0	1	0	1	0	25
21 - 60	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3
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	19	68	98	45	7	7	11	24	137	123	49	26	17	14	17	18	680

Total Number of Valid Hours: 680

Total Number of Hours: 744

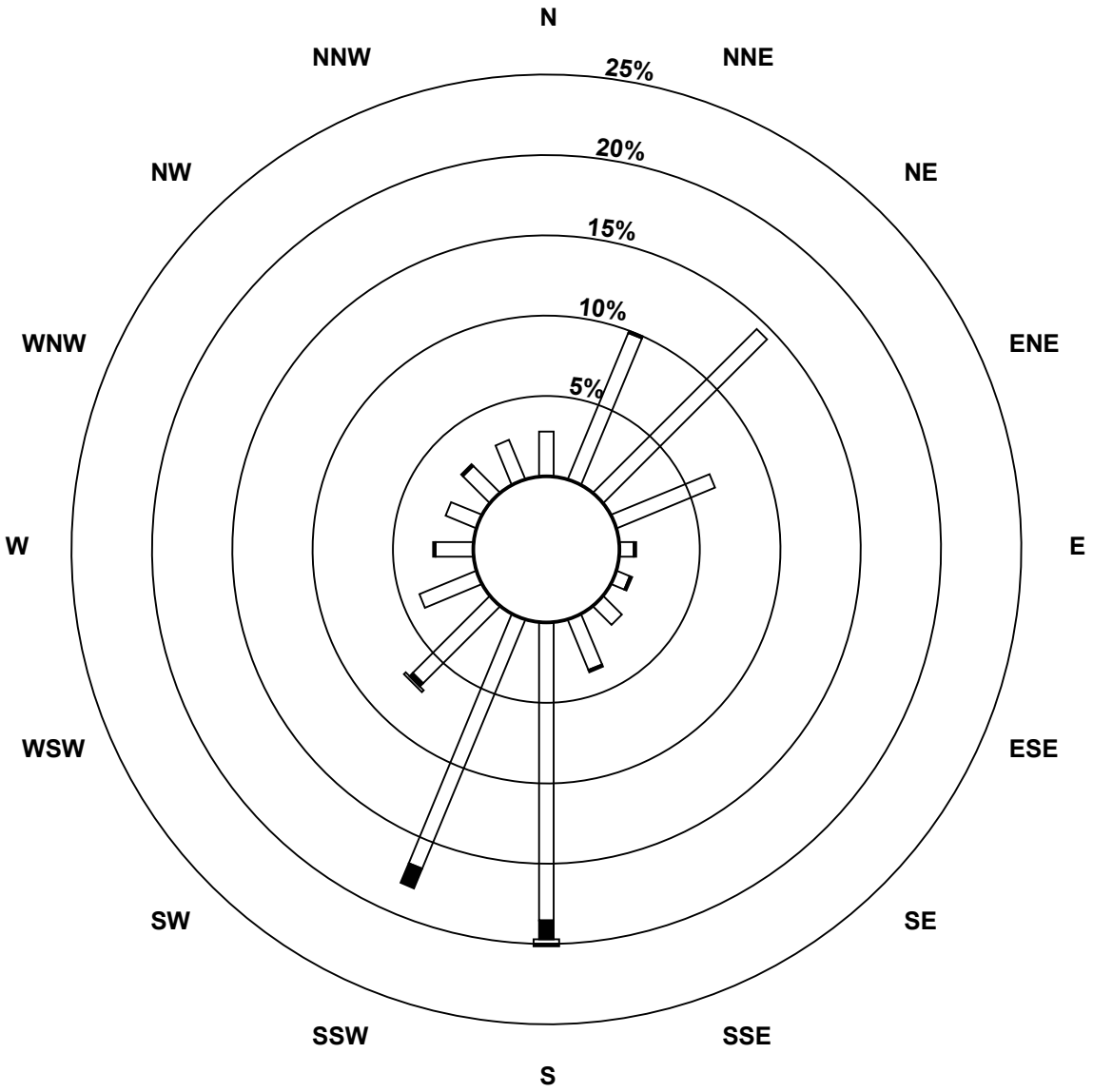
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

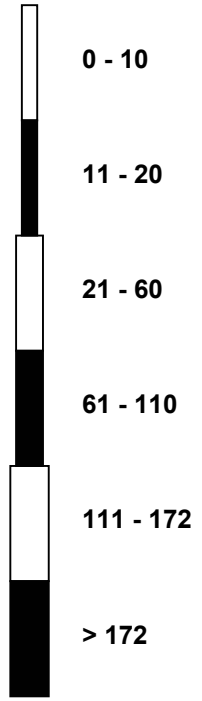
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



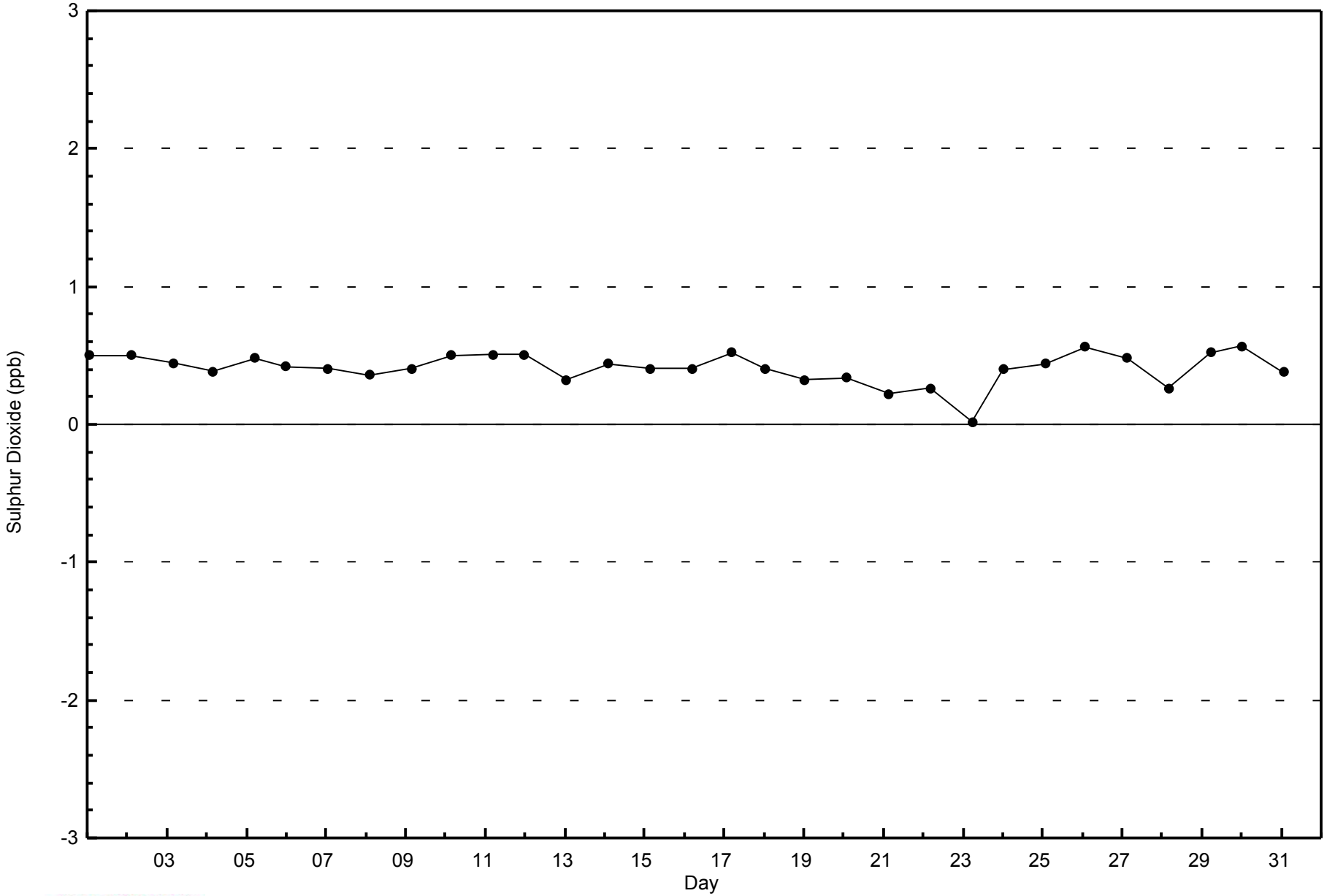
Total Number of Valid Hours: 680

WBEA

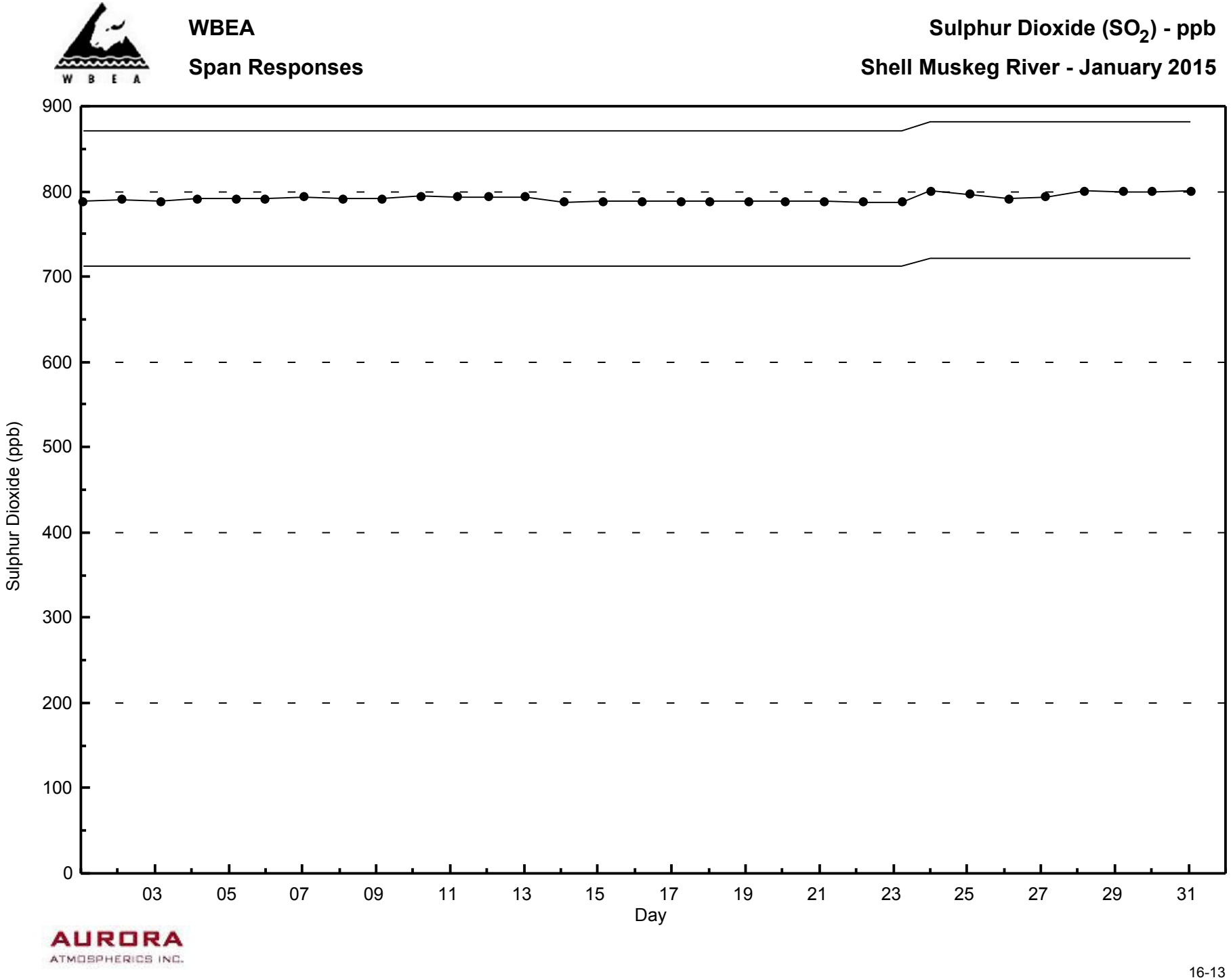
Zero Responses

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2015



AURORA
ATMOSPHERICS INC.


WBEA
Span Responses
Sulphur Dioxide (SO_2) - ppb
Shell Muskeg River - January 2015
900
800
700
600
500
400
300
200
100
0
Sulphur Dioxide (ppb)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2015

Maximum Value: 6.2 ppm on Jan 24 20:00

Maximum Daily Average: 4.1 ppm on Jan 24

Minimum Value: 2.0 ppm on Jan 22 09:00

Minimum Daily Average: 2.2 ppm on Jan 21

Maximum Diurnal Average: 2.7 ppm at hour 6

Minimum Diurnal Average: 2.4 ppm at hour 9

Monthly Average: 2.56 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.2 Q_1 = 2.3 Median = 2.4 Q_3 = 2.7 P_{90} = 3.0 P_{99} = 4.6

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-Jan	2.1	Z	2.2	2.4	2.5	2.2	2.6	2.6	2.2	2.2	3.3	4.1	3.2	3.1	2.1	2.5	4.1	2.9	2.2	2.2	2.2	2.2	2.3	2.6	2.6	4.1
2-Jan	2.2	2.2	Z	2.9	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.6	2.6	3.2	2.4	3.2
3-Jan	2.8	2.6	2.7	Z	2.7	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.8
4-Jan	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.4	2.5	2.3	2.4	2.3	2.3	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5
5-Jan	2.2	2.2	2.1	2.2	2.2	Z	2.4	2.4	2.4	2.3	2.2	2.5	2.5	2.5	2.7	2.7	2.3	2.4	2.3	2.6	3.1	3.0	2.7	3.2	2.5	3.2
6-Jan	Z	2.5	2.4	2.5	2.4	2.4	2.5	2.4	2.5	2.4	2.4	2.6	2.5	2.4	2.3	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.6
7-Jan	2.5	Z	2.5	2.5	2.5	2.4	2.5	2.4	2.4	2.5	2.5	2.5	2.5	2.5	3.0	3.5	3.6	3.4	2.4	2.5	2.8	3.0	2.9	3.0	2.7	3.6
8-Jan	3.4	2.6	Z	2.4	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.4	3.4
9-Jan	2.4	2.5	2.5	Z	2.4	2.5	2.5	2.3	2.3	2.3	2.5	2.2	2.4	2.4	2.5	3.0	2.8	3.6	3.6	3.6	3.0	3.1	3.5	2.6	2.7	3.6
10-Jan	2.1	2.1	2.2	2.3	Z	2.5	2.4	2.3	2.4	2.5	2.7	2.7	2.7	2.7	2.6	2.7	2.5	2.4	2.5	2.6	2.6	2.7	2.7	2.7	2.5	2.7
11-Jan	2.7	2.8	2.7	3.0	3.0	Z	3.2	3.0	3.1	3.2	3.1	2.8	2.6	2.5	2.4	2.4	2.6	2.6	2.6	2.7	2.6	2.5	2.6	2.5	2.7	3.2
12-Jan	Z	2.6	2.7	2.9	2.8	2.5	2.4	2.3	2.3	2.4	2.5	2.5	2.5	2.7	2.7	2.7	2.7	2.9	2.8	2.6	2.6	2.5	2.5	2.5	2.6	2.9
13-Jan	2.6	Z	3.7	3.5	3.5	3.3	2.8	3.0	2.8	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	3.1	3.3	4.1	3.6	2.9	2.9	4.1
14-Jan	2.7	2.6	Z	2.7	2.7	3.4	3.7	2.8	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.1	2.2	2.2	2.3	2.7	2.2	2.2	2.5	3.7
15-Jan	2.1	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.7	3.0	2.6	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.0
16-Jan	2.2	2.2	2.2	2.3	Z	2.3	2.3	2.4	2.3	2.5	2.6	2.4	2.6	2.5	2.5	2.5	2.2	2.1	2.2	2.4	2.5	2.5	2.3	2.2	2.3	2.6
17-Jan	2.1	2.3	2.2	2.3	2.9	Z	2.4	2.4	2.3	2.4	2.4	2.3	2.7	2.7	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.6	2.6	2.5	2.4	2.9
18-Jan	Z	2.4	2.5	2.4	2.4	2.5	2.6	2.6	2.5	2.6	2.5	2.5	2.6	2.7	2.8	2.6	2.6	2.6	2.6	2.7	2.6	2.6	2.8	2.9	2.6	2.9
19-Jan	2.8	Z	3.7	3.6	3.5	5.6	4.0	2.9	2.5	2.5	2.6	3.4	2.9	3.2	2.9	2.5	2.9	3.0	3.0	2.9	2.6	2.4	2.4	2.3	3.1	5.6
20-Jan	2.4	2.7	Z	3.5	3.0	2.8	2.4	2.2	2.3	2.3	2.5	2.4	2.4	2.4	2.9	2.9	3.5	2.8	2.6	2.6	2.4	2.4	2.4	2.4	2.6	3.5
21-Jan	2.4	2.3	2.3	Z	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.0	2.1	2.2	2.1	2.0	2.1	2.0	2.0	2.2	2.2	2.5
22-Jan	2.2	2.2	2.0	2.1	Z	2.1	2.0	2.1	2.0	2.2	2.1	2.2	2.3	2.2	2.3	2.8	2.2	2.5	2.1	2.6	2.4	2.3	2.4	2.3	2.2	2.8
23-Jan	2.2	2.4	2.2	2.3	2.2	Z	2.2	2.2	2.7	2.5	3.1	C	C	C	C	C	2.3	2.5	2.9	2.8	3.0	3.2	3.4	3.3	2.6	3.4
24-Jan	Z	3.6	3.7	4.2	5.6	4.7	4.6	4.2	3.8	4.0	4.0	3.5	2.6	2.6	2.9	3.0	3.9	3.1	4.4	6.2	5.3	4.9	4.9	4.0	4.1	6.2
25-Jan	3.3	Z	2.4	2.3	2.3	2.2	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	3.3
26-Jan	2.4	2.4	Z	2.6	2.7	2.8	2.7	2.6	2.4	2.2	2.3	2.1	2.3	2.3	4.0	3.7	2.3	2.3	2.5	2.6	2.4	2.9	3.2	2.9	2.6	4.0
27-Jan	2.5	2.9	2.7	Z	2.3	2.7	2.4	2.6	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.5	2.3	2.4	2.9	2.3	2.5	2.6	2.9	2.5	2.9
28-Jan	3.0	3.0	2.8	2.9	Z	2.8	2.5	2.3	2.4	2.7	2.7	2.7	2.6	2.6	3.0	2.6	2.3	2.2	2.3	2.2	2.3	2.3	2.4	2.5	2.6	3.0
29-Jan	2.5	2.5	2.5	2.3	2.4	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.9	2.7	3.4	3.5	2.8	2.9	2.9	2.9	2.9	2.6	3.5
30-Jan	Z	2.6	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.5	2.4	2.5	2.3	2.3	2.3	2.3	2.3	2.5	2.3	2.3	2.3	2.3	2.8	2.4	2.4	2.8
31-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.6	2.7	2.8	2.6	2.6	2.6	2.8	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.6	2.5	2.5	2.8
	2.5	2.5	2.5	2.7	2.7	2.7	2.6	2.5	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.6	2.6	2.7	2.7	2.6	Diurnal Average	
	3.4	3.6	3.7	4.2	5.6	5.6	4.6	4.2	3.8	4.0	4.0	4.1	3.2	3.2	4.0	3.7	4.1	3.6	4.4	6.2	5.3	4.9	4.9	4.0	Diurnal Maximum	

Z - zerospan C - Calibration

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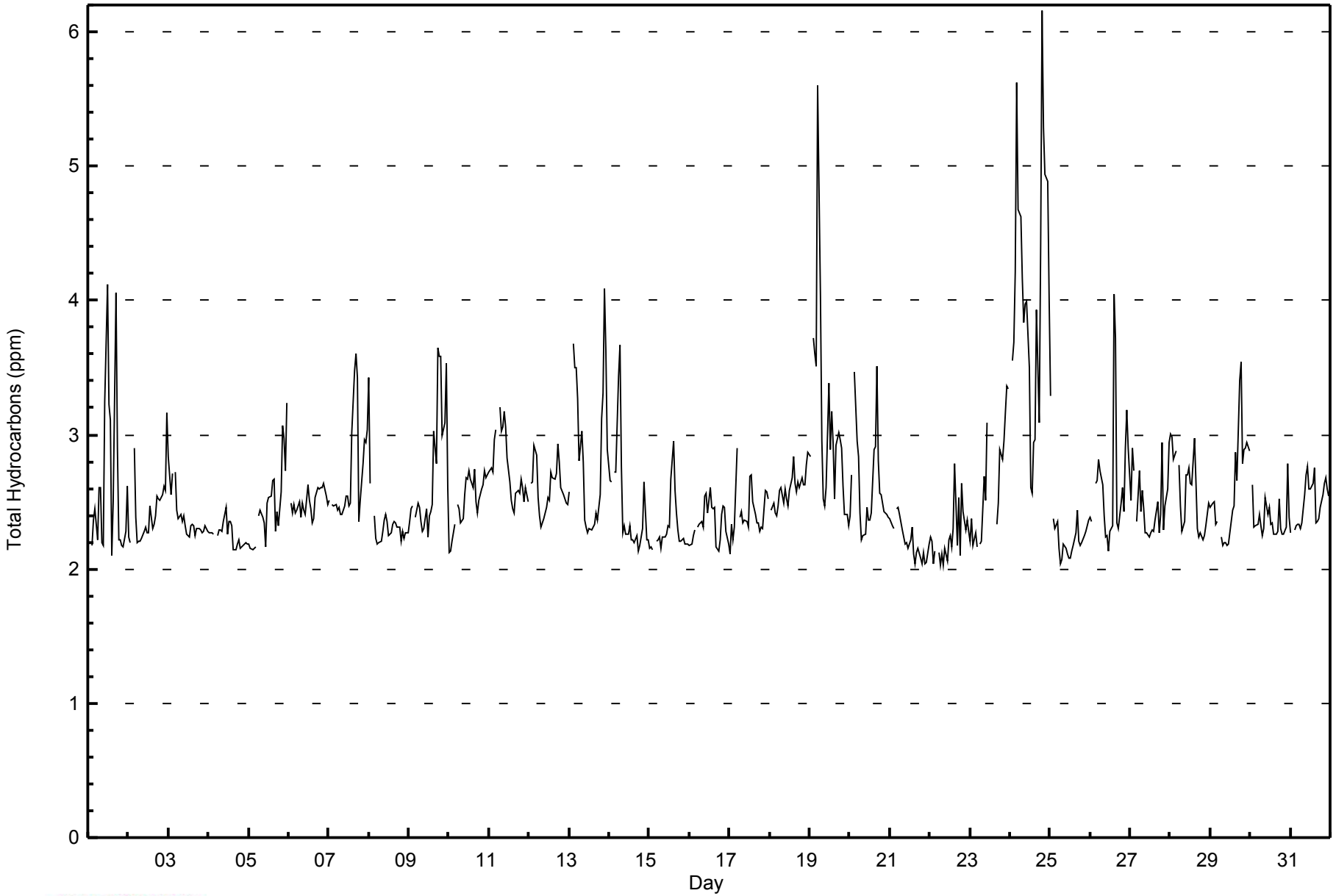
Hourly Averages

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2015



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	8	1.13	1.13
2.1 - 3.0	631	89.12	90.25
3.1 - 10.0	69	9.75	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

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Frequency Distribution

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2015

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	0	0	0	0	0	0	0	0	4	2	1	0	1	0	0	0	8
2.1 - 3.0	11	52	94	43	5	6	11	23	129	118	48	25	16	13	13	12	619
3.1 - 10.0	8	16	4	2	2	1	0	1	4	3	0	1	0	1	4	7	54
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	19	68	98	45	7	7	11	24	137	123	49	26	17	14	17	19	681

Total Number of Valid Hours: 681

Total Number of Hours: 744

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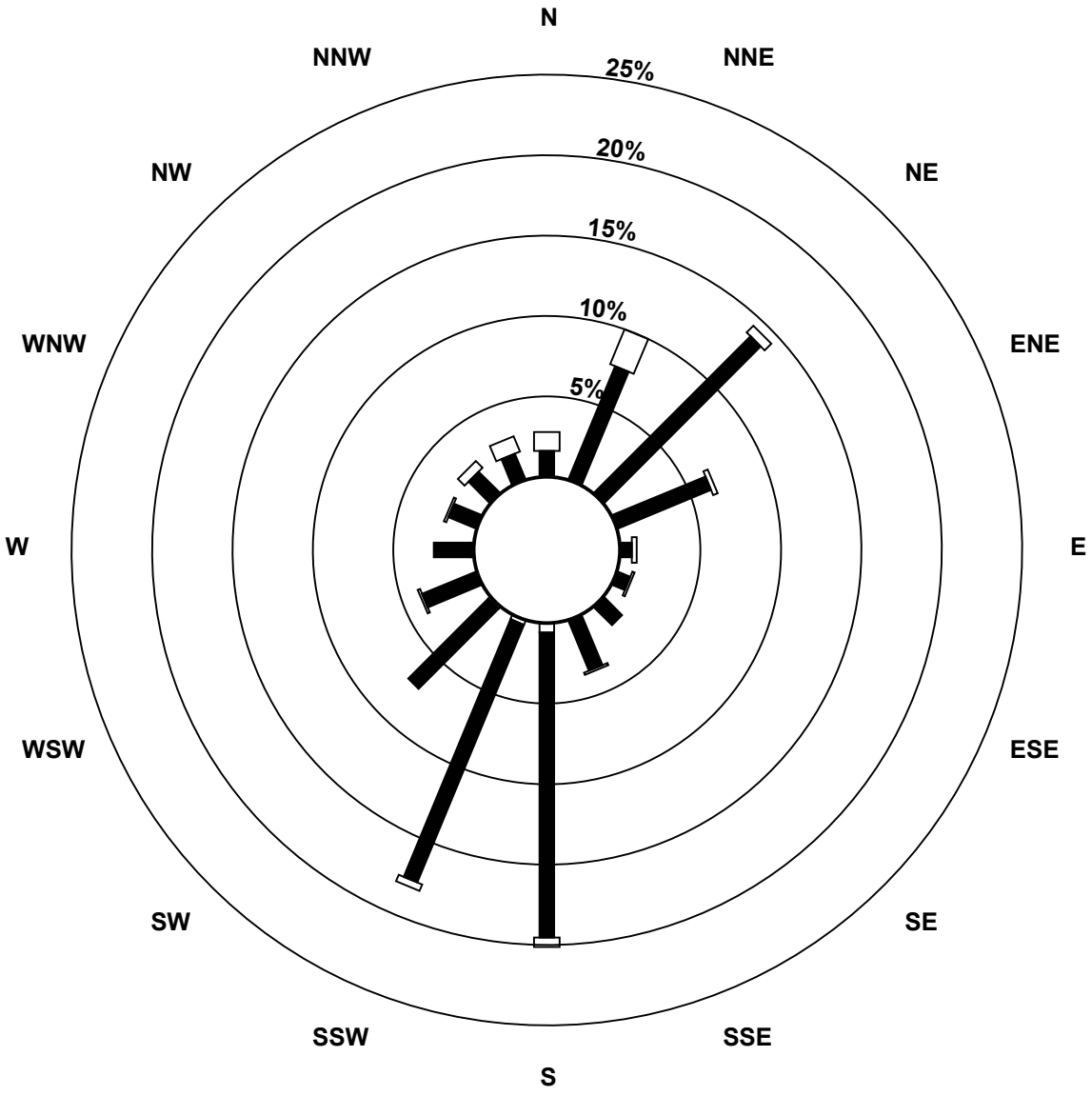
Wood Buffalo Environmental Association

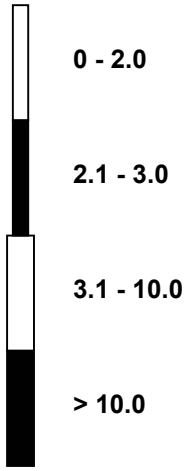
Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Shell Muskeg River (AMS 16)



Classes (ppm)



Total Number of Valid Hours: 681

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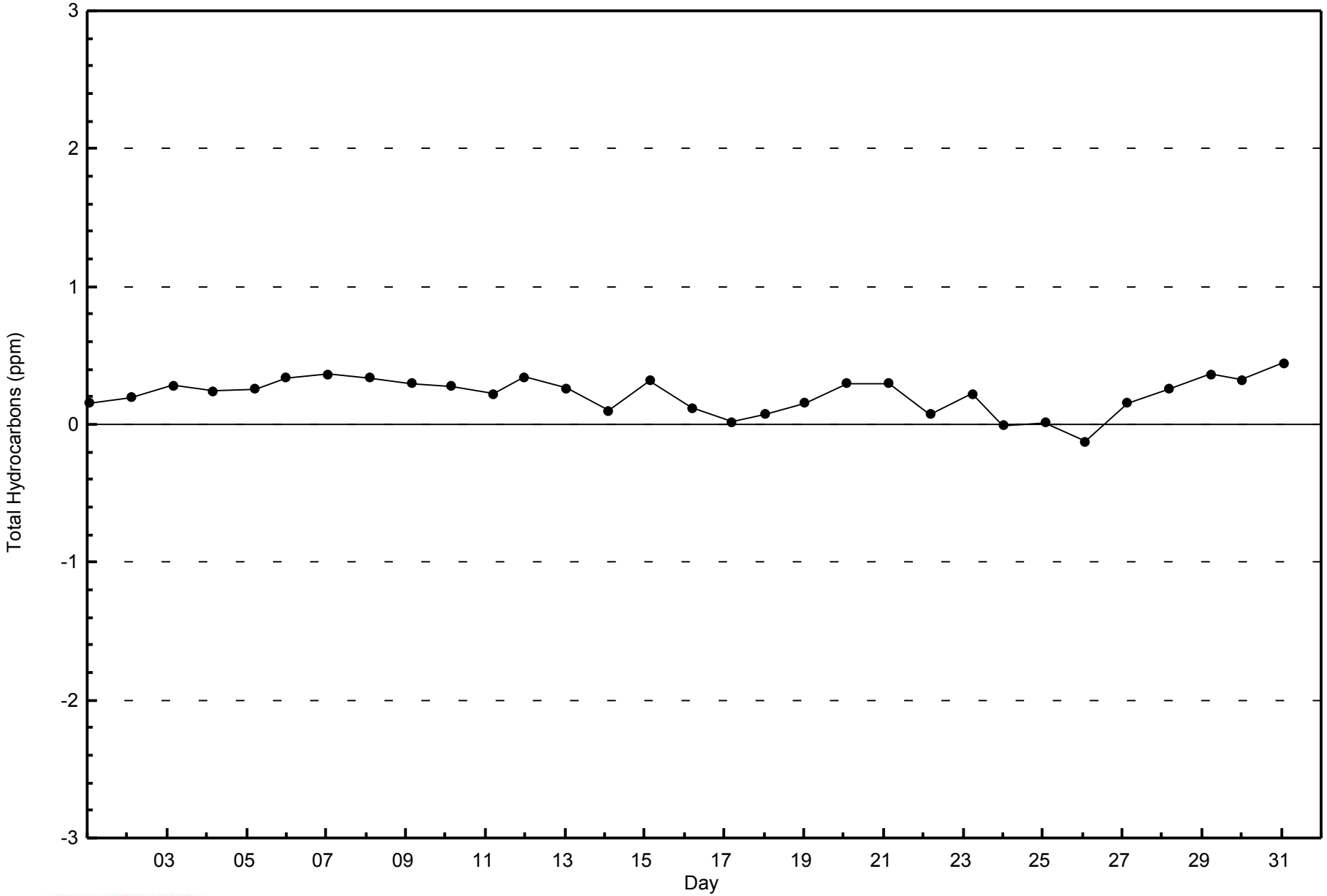
Zero Responses

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2015



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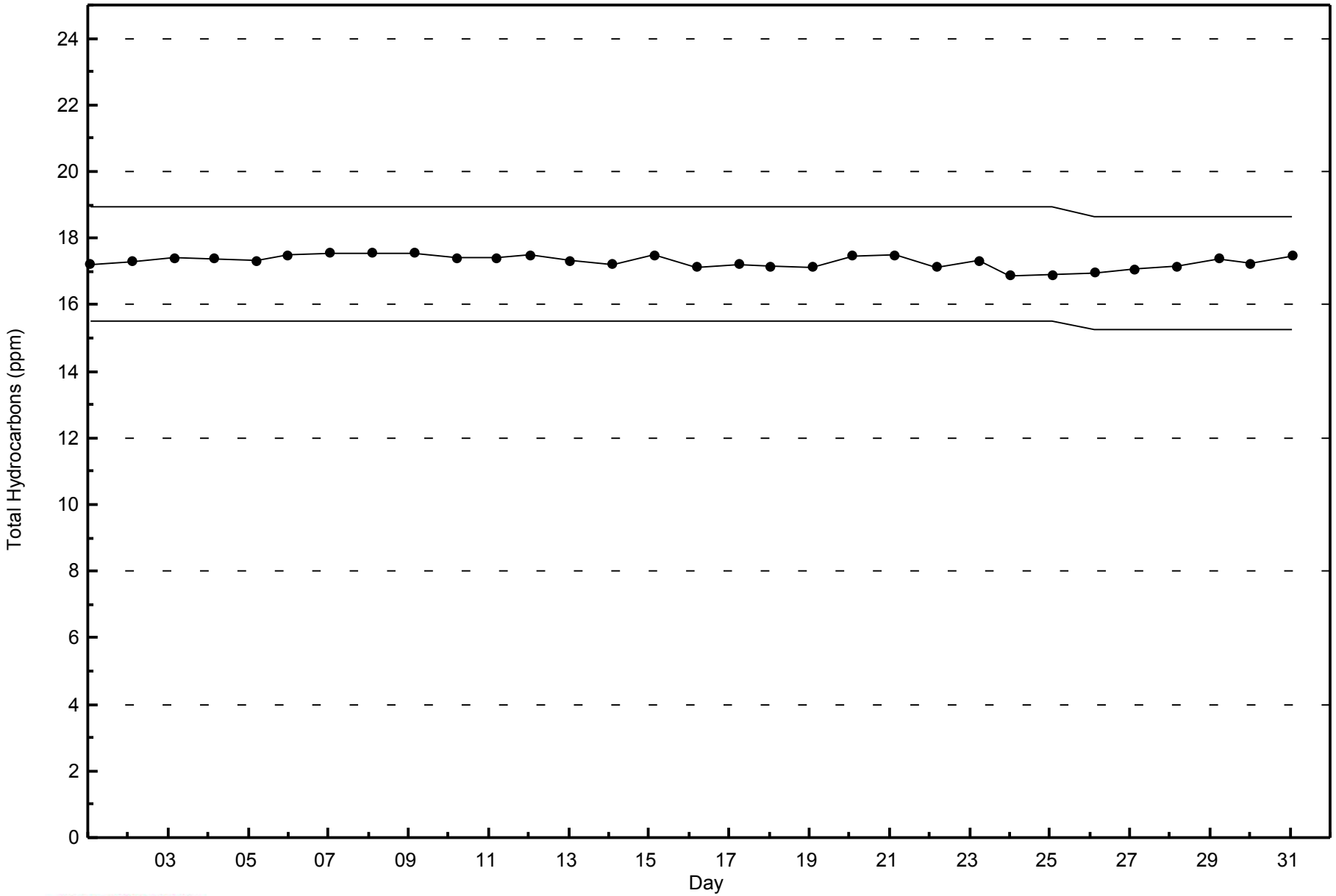
Span Responses

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2015



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Summary of Hour Averages

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2015

Maximum Value: 208 ppb on Jan 24 20:00

Maximum Daily Average: 74.5 ppb on Jan 24

Minimum Value: 0 ppb on Jan 1 20:00

Minimum Daily Average: 0.3 ppb on Jan 4

Maximum Diurnal Average: 15.9 ppb at hour 20

Minimum Diurnal Average: 5.9 ppb at hour 2

Monthly Average: 10.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 4 $Q_3 = 11$ $P_{90} = 26$ $P_{99} = 95$

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	32
Percent Operational Time:	96.4

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-Jan	1	Z	3	1	3	0	4	4	0	0	40	26	15	6	15	6	5	5	0	0	0	0	0	2	5.9	40
2-Jan	1	0	Z	3	7	0	0	0	0	1	8	4	6	21	7	5	2	4	12	8	21	21	17	10	7.0	21
3-Jan	5	5	3	Z	36	3	3	1	1	3	2	2	2	2	1	0	0	0	0	0	0	0	0	0	3.0	36
4-Jan	0	0	0	0	Z	0	1	0	0	0	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0.3	2
5-Jan	0	0	0	0	0	Z	0	0	1	5	4	10	9	9	10	14	2	3	7	21	23	17	8	2	6.3	23
6-Jan	Z	1	0	0	0	0	44	2	3	8	10	23	15	11	3	2	5	11	17	17	19	11	1	1	8.9	44
7-Jan	1	Z	8	4	2	1	1	1	3	15	20	17	9	10	57	53	53	33	14	20	13	9	6	8	15.6	57
8-Jan	3	3	Z	5	3	3	3	3	4	19	9	9	8	5	5	1	1	0	0	0	0	0	0	0	3.7	19
9-Jan	1	0	0	Z	0	10	21	4	2	7	13	10	7	3	3	16	10	70	88	44	7	4	4	5	14.2	88
10-Jan	1	0	0	0	Z	2	1	4	4	22	26	16	8	5	3	2	0	2	9	17	18	27	17	25	9.1	27
11-Jan	25	24	24	40	49	Z	51	57	56	78	68	42	25	25	12	4	3	1	0	1	4	1	0	1	25.8	78
12-Jan	Z	1	2	2	7	2	1	0	0	1	5	5	6	10	7	5	7	11	25	12	3	3	1	0	5.0	25
13-Jan	4	Z	59	18	8	9	4	6	11	1	0	0	0	1	1	0	0	0	0	34	28	64	58	13	13.9	64
14-Jan	8	4	Z	0	0	10	35	13	3	8	7	5	9	2	5	4	2	0	2	5	6	7	4	0	6.1	35
15-Jan	1	0	0	Z	1	2	1	0	0	0	0	2	1	6	12	5	1	0	0	0	0	0	0	0	1.4	12
16-Jan	0	0	0	0	Z	0	0	0	0	1	1	1	3	3	2	1	0	0	0	0	0	0	0	0	0.6	3
17-Jan	5	0	0	0	9	Z	2	1	0	1	3	2	11	9	9	1	0	0	0	0	0	1	1	1	2.3	11
18-Jan	Z	1	0	0	0	0	3	8	12	23	25	17	6	6	5	2	0	1	1	1	5	10	14	1	6.2	25
19-Jan	9	Z	46	41	29	136	27	14	5	3	15	34	11	8	9	5	3	2	1	4	8	6	8	1	18.5	136
20-Jan	4	13	Z	16	6	6	2	0	0	0	8	8	3	4	12	12	5	8	13	16	9	6	2	1	6.7	16
21-Jan	5	1	1	Z	1	15	13	2	0	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	2.0	15
22-Jan	3	0	0	0	Z	0	0	0	0	0	0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	3
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	2	2	9	14	19	26	38	44	--	44
24-Jan	Z	48	48	73	101	73	93	70	51	49	41	35	10	6	38	35	62	37	117	208	144	146	139	91	74.5	208
25-Jan	48	Z	1	0	0	0	0	0	0	1	1	1	1	1	2	3	4	0	0	0	0	0	0	1	2.7	48
26-Jan	2	1	Z	2	0	0	2	6	0	1	2	2	2	1	46	33	12	19	26	24	27	21	15	17	11.4	46
27-Jan	13	12	15	Z	15	9	8	8	5	4	1	0	1	6	4	5	7	5	7	8	4	5	6	7	6.8	15
28-Jan	6	3	3	15	Z	4	4	1	4	8	13	8	16	16	28	12	2	0	0	0	2	4	12	21	7.9	28
29-Jan	15	14	14	5	0	Z	0	0	0	0	1	1	6	8	17	55	41	79	101	11	9	8	7	8	17.3	101
30-Jan	Z	11	4	11	10	12	13	7	3	8	12	15	12	5	5	8	8	7	3	1	0	2	7	1	7.1	15
31-Jan	1	Z	6	4	2	3	0	1	19	35	56	35	17	10	10	7	4	1	4	13	23	37	24	16	14.2	56
	6.4	5.9	9.5	9.7	11.7	11.6	11.2	7.1	6.3	10.1	13.1	11.4	7.7	6.9	11.3	10.2	8.1	10.0	15.2	15.9	13.0	14.5	13.0	9.3	Diurnal Average	
	48	48	59	73	101	136	93	70	56	78	68	42	25	25	57	55	62	79	117	208	144	146	139	91	Diurnal Maximum	

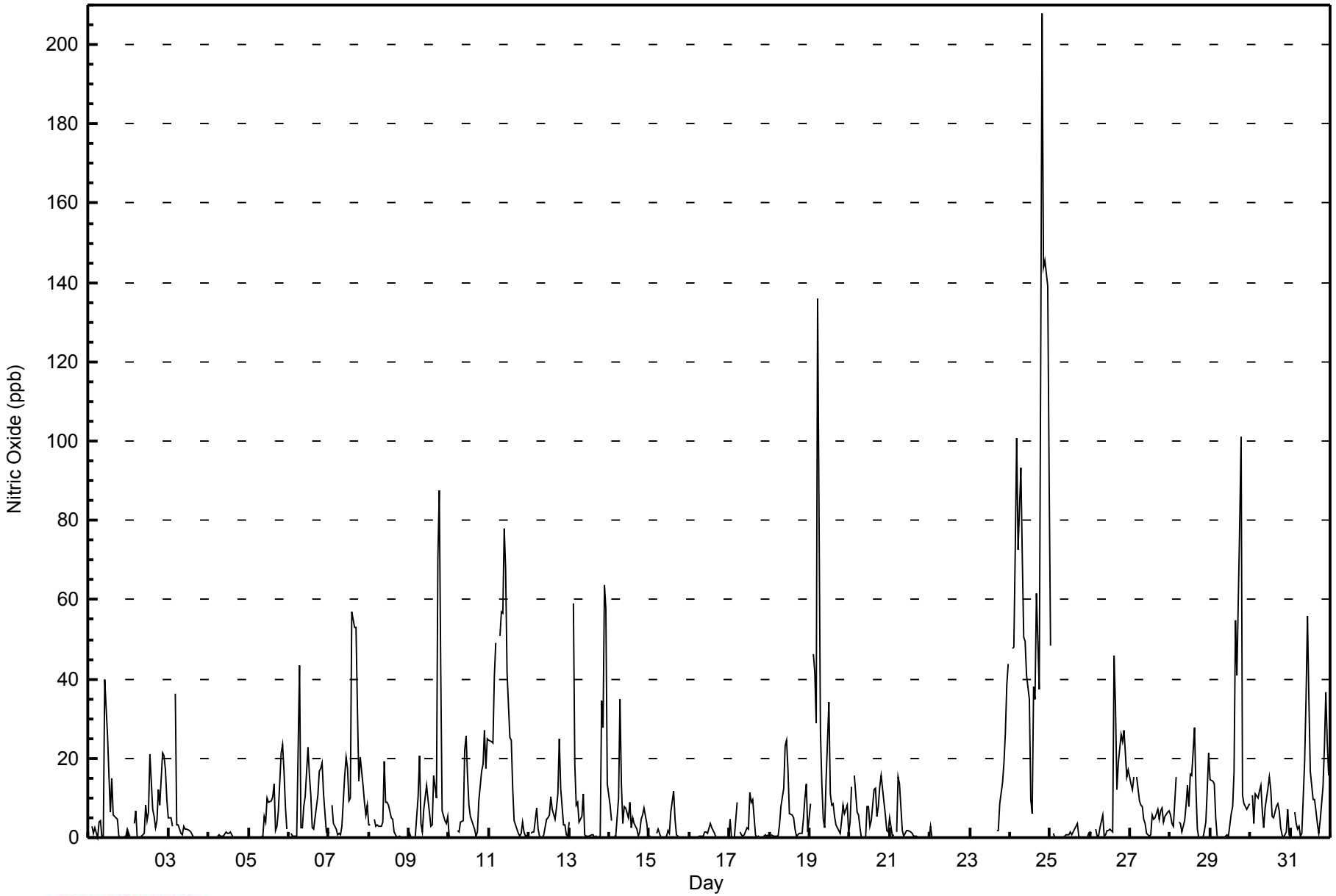
Z - zerospan C - Calibration AF - Analyzer Failure

WBEA

Hourly Averages

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2015



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Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	592	86.42	86.42
21 - 40	48	7.01	93.43
11 - 80	34	4.96	98.39
81 - 159	10	1.46	99.85
> 159	1	0.15	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	17	55	88	39	5	6	8	21	117	112	46	20	15	13	11	9	582
21 - 40	0	10	1	1	0	1	2	2	17	4	1	0	1	0	1	4	45
11 - 80	1	3	1	1	2	0	0	1	3	6	1	1	0	1	4	2	27
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	19	68	90	41	7	7	10	24	137	122	48	21	16	14	17	17	658

Total Number of Valid Hours: 658

Total Number of Hours: 744

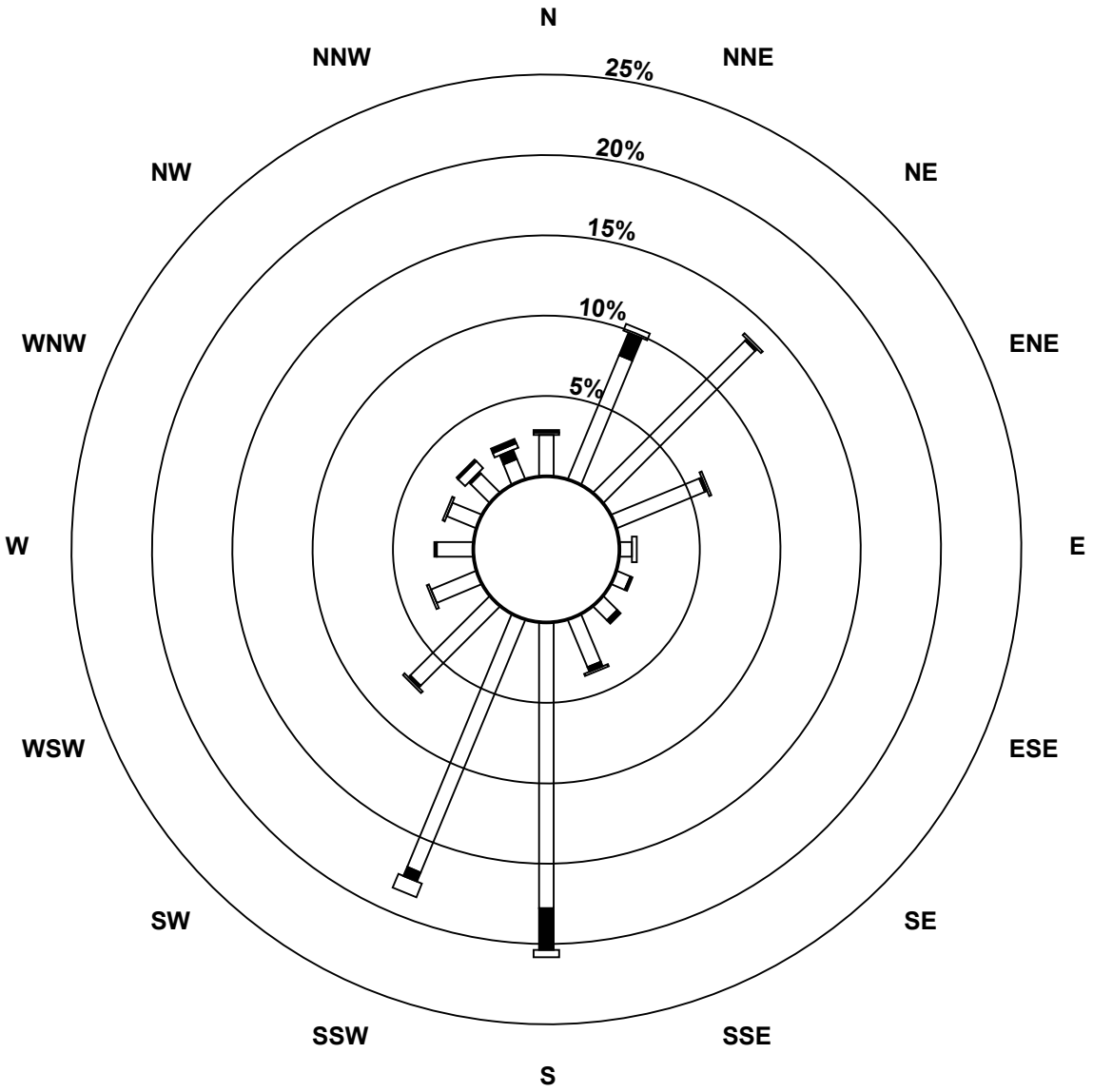
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

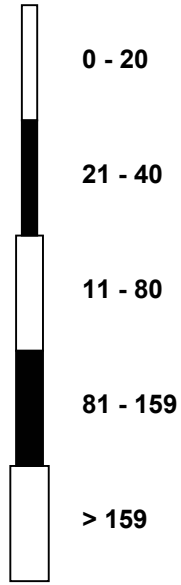
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



0 - 20

21 - 40

11 - 80

81 - 159

> 159

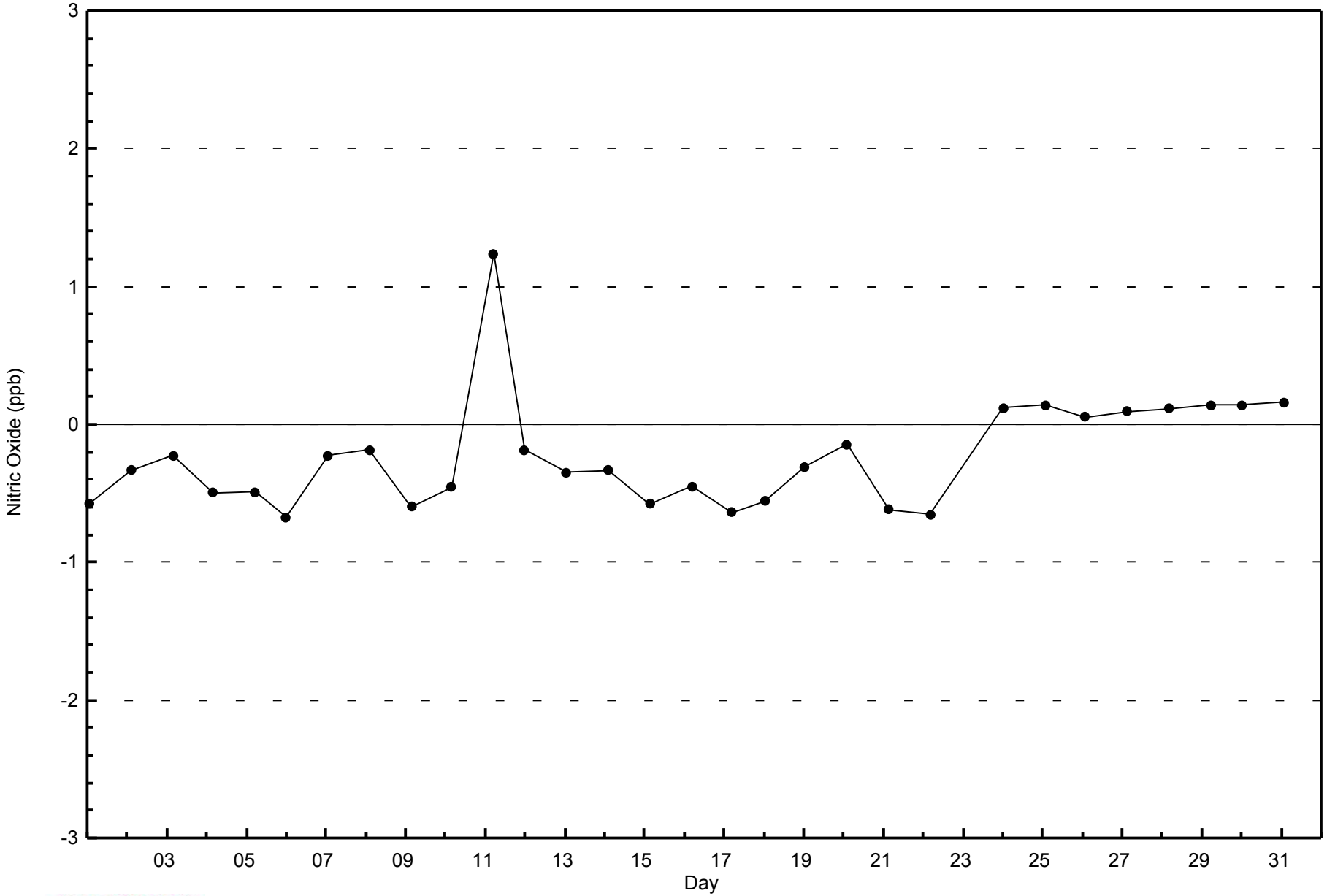
Total Number of Valid Hours: 658

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2015



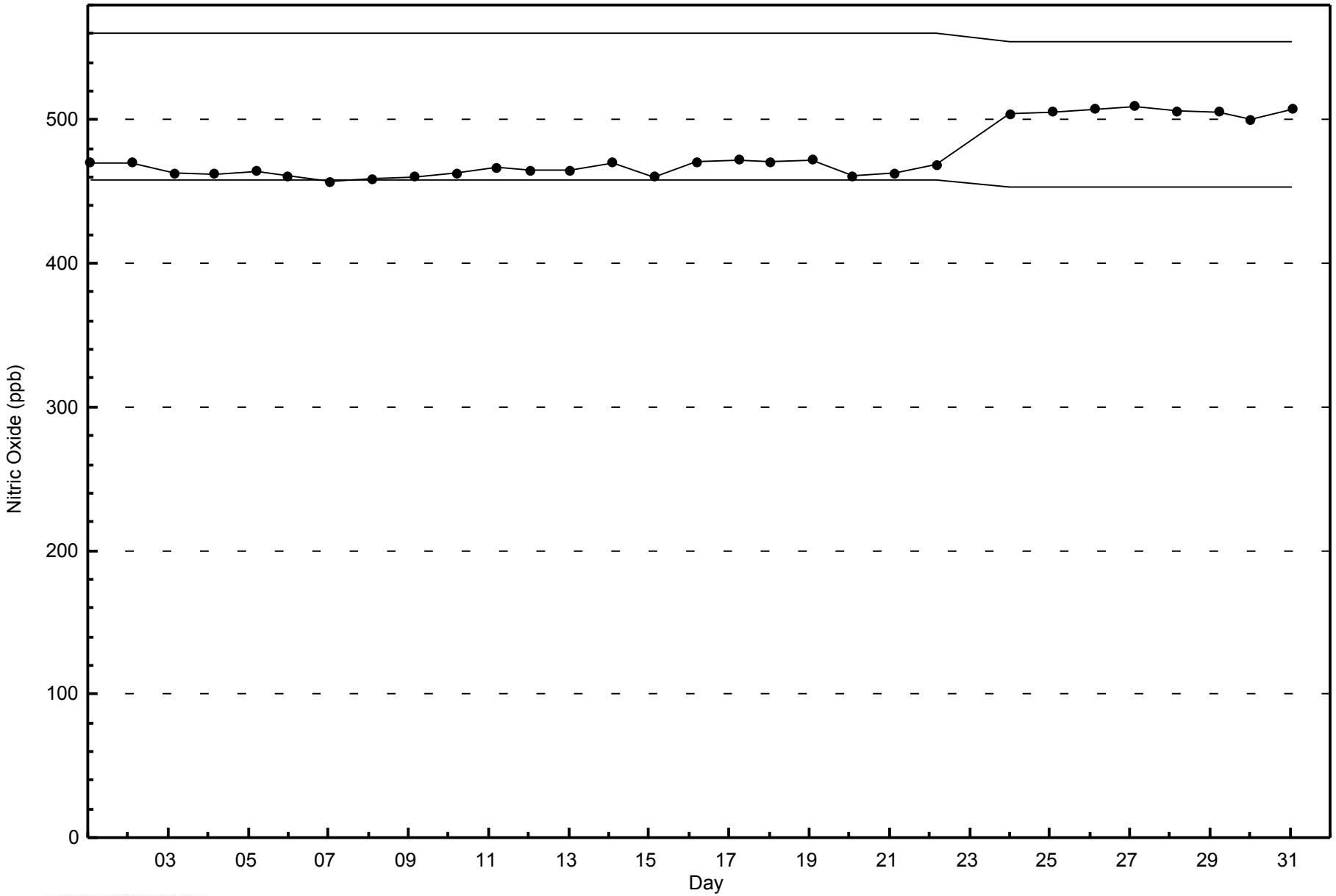
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 52 ppb on Jan 24 20:00 Maximum Daily Average: 26.0 ppb on Jan 11

Minimum Value: 0 ppb on Jan 3 23:00 Minimum Daily Average: 4.5 ppb on Jan 4
Maximum Diurnal Average: 18.1 ppb at hour 22 Minimum Diurnal Average: 11.9 ppb at hour 14
Monthly Average: 14.9 ppb Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 7$ Median = 14 $Q_3 = 22$ $P_{90} = 28$ $P_{99} = 39$

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	32
Percent Operational Time:	96.4

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-Jan	4	Z	6	13	19	5	17	26	5	5	30	28	19	9	14	10	13	11	3	5	3	4	11	18	12.1	30
2-Jan	10	3	Z	11	13	2	6	8	13	13	17	10	14	24	19	22	25	25	26	24	27	29	27	18	16.7	29
3-Jan	12	9	10	Z	32	21	15	18	14	15	7	6	5	5	4	3	3	6	2	3	2	1	0	1	8.4	32
4-Jan	3	1	1	1	Z	9	18	13	11	6	7	5	4	7	6	2	1	2	1	0	1	1	1	1	4.5	18
5-Jan	3	1	2	6	4	Z	8	8	12	19	15	22	21	22	23	26	14	17	25	33	32	27	13	9	15.6	33
6-Jan	Z	8	16	12	12	11	21	16	16	14	15	23	18	17	10	14	27	30	31	31	31	29	22	20	19.3	31
7-Jan	16	Z	29	28	26	22	24	24	27	28	26	25	22	23	35	34	35	32	16	20	23	28	23	14	25.2	35
8-Jan	16	26	Z	25	18	16	14	16	23	31	21	19	16	11	15	11	9	6	19	8	5	9	9	20	15.7	31
9-Jan	16	10	7	Z	10	29	33	27	26	25	22	18	14	10	10	29	31	39	39	36	20	19	14	11	21.5	39
10-Jan	7	4	7	12	Z	18	15	19	21	26	24	20	15	13	13	16	18	28	30	30	30	30	25	29	19.5	30
11-Jan	27	28	31	31	31	Z	30	32	31	33	30	25	21	23	20	18	23	24	21	26	28	24	18	22	26.0	33
12-Jan	Z	19	23	22	25	16	11	9	10	11	15	12	13	18	16	16	23	24	26	24	23	22	17	15	17.8	26
13-Jan	16	Z	26	23	19	17	9	16	17	8	3	2	2	6	7	7	13	8	12	30	34	37	37	24	16.3	37
14-Jan	23	26	Z	11	13	18	27	17	6	11	8	6	9	4	5	5	4	1	3	6	7	12	5	2	9.8	27
15-Jan	7	2	1	Z	2	3	2	1	2	1	4	7	6	18	22	19	18	10	0	0	1	2	1	0	5.6	22
16-Jan	4	2	7	8	Z	9	11	15	14	15	8	8	12	10	11	9	5	3	3	2	1	1	1	2	6.9	15
17-Jan	5	3	1	3	11	Z	3	4	3	3	5	3	13	14	11	4	3	5	5	7	6	18	17	18	7.1	18
18-Jan	Z	13	13	12	12	14	19	22	23	23	22	18	12	14	16	14	15	21	24	21	24	27	24	21	18.2	27
19-Jan	21	Z	23	19	27	40	26	21	14	8	15	23	14	14	15	12	10	10	8	15	14	11	12	3	16.2	40
20-Jan	9	21	Z	22	13	11	7	2	2	3	13	10	6	8	17	21	24	26	25	24	23	23	22	20	15.3	26
21-Jan	19	17	16	Z	18	22	22	18	14	10	9	8	9	7	4	6	4	3	2	2	3	3	2	1	9.6	22
22-Jan	7	0	1	5	Z	4	3	2	2	2	2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	7
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	15	18	22	22	21	21	21	19	--	22
24-Jan	Z	18	19	23	27	22	26	22	19	16	15	15	13	10	23	24	30	26	39	52	40	40	34	27	25.2	52
25-Jan	25	Z	23	15	6	7	5	6	9	7	4	3	6	3	7	17	7	3	1	2	1	5	8	14	7.9	25
26-Jan	12	10	Z	20	14	14	22	26	14	7	6	4	4	3	28	21	9	11	14	15	16	15	14	12	13.5	28
27-Jan	11	11	12	Z	12	9	8	9	7	4	2	1	1	5	4	6	9	6	7	11	6	9	9	12	7.3	12
28-Jan	10	13	14	27	Z	12	7	5	11	18	21	14	21	21	28	21	12	6	2	9	21	32	37	37	17.3	37
29-Jan	35	32	31	25	20	Z	10	5	5	4	3	3	11	13	19	33	33	37	40	26	22	21	17	14	19.9	40
30-Jan	Z	14	8	11	10	11	13	8	6	10	11	13	9	5	5	9	12	10	5	8	5	9	18	27	10.2	27
31-Jan	27	Z	29	28	23	21	15	20	28	29	31	25	17	13	15	17	23	29	32	34	35	35	34	34	25.9	35
	13.7	12.1	14.2	16.4	16.7	14.7	14.9	14.4	13.5	13.5	13.7	12.9	12.0	11.9	14.6	15.3	15.6	15.8	16.0	17.5	16.8	18.1	16.3	15.5	Diurnal Average	
	35	32	31	31	32	40	33	32	31	33	31	28	22	24	35	34	35	39	40	52	40	40	37	37	Diurnal Maximum	

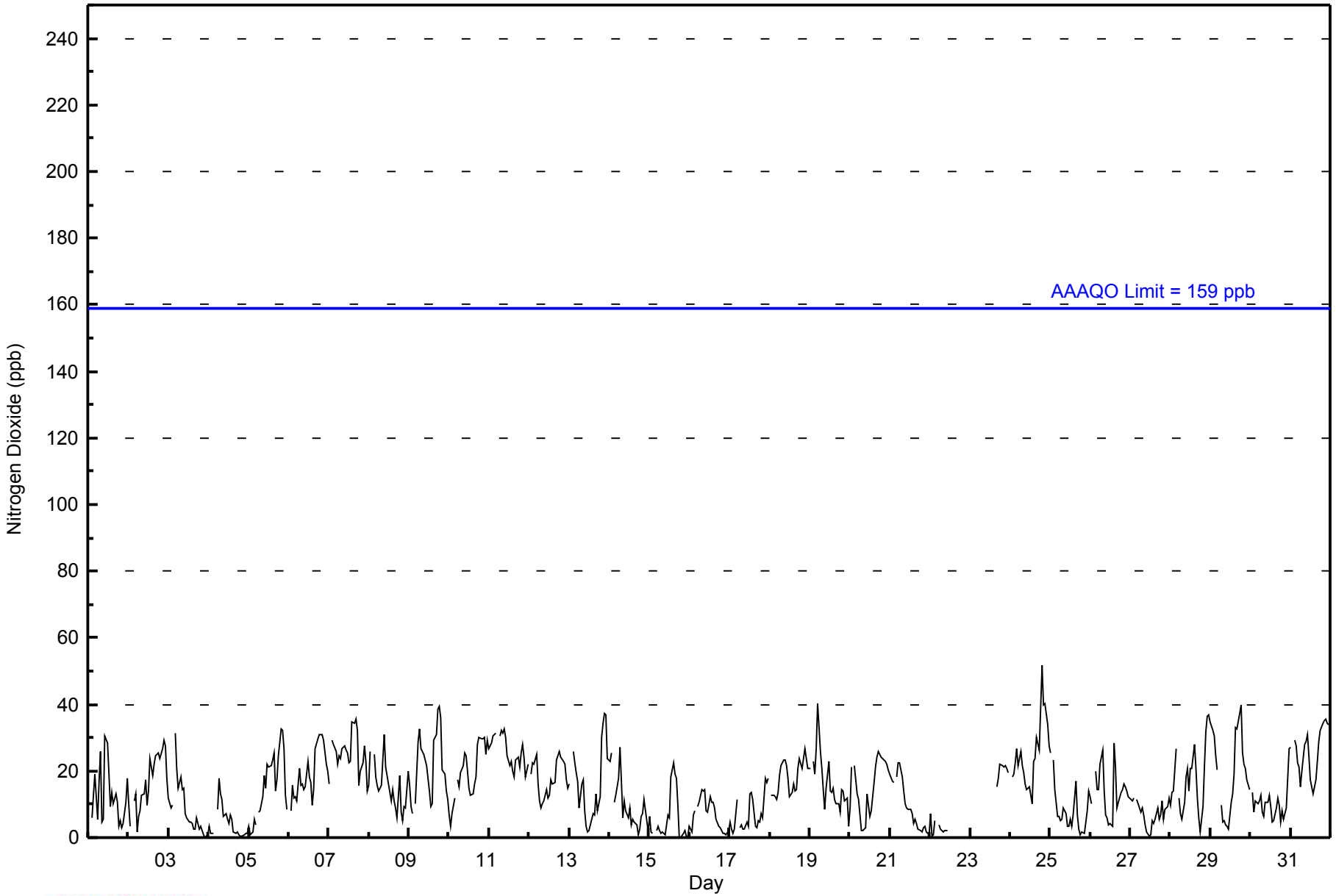
Z - zerospan C - Calibration AF - Analyzer Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	473	69.05	69.05
21 - 40	211	30.80	99.85
11 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2015

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	54	83	38	5	3	6	19	74	83	37	16	12	9	9	1	463
21 - 40	5	14	7	3	2	4	4	5	63	39	11	5	4	5	8	16	195
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	19	68	90	41	7	7	10	24	137	122	48	21	16	14	17	17	658

Total Number of Valid Hours: 658

Total Number of Hours: 744

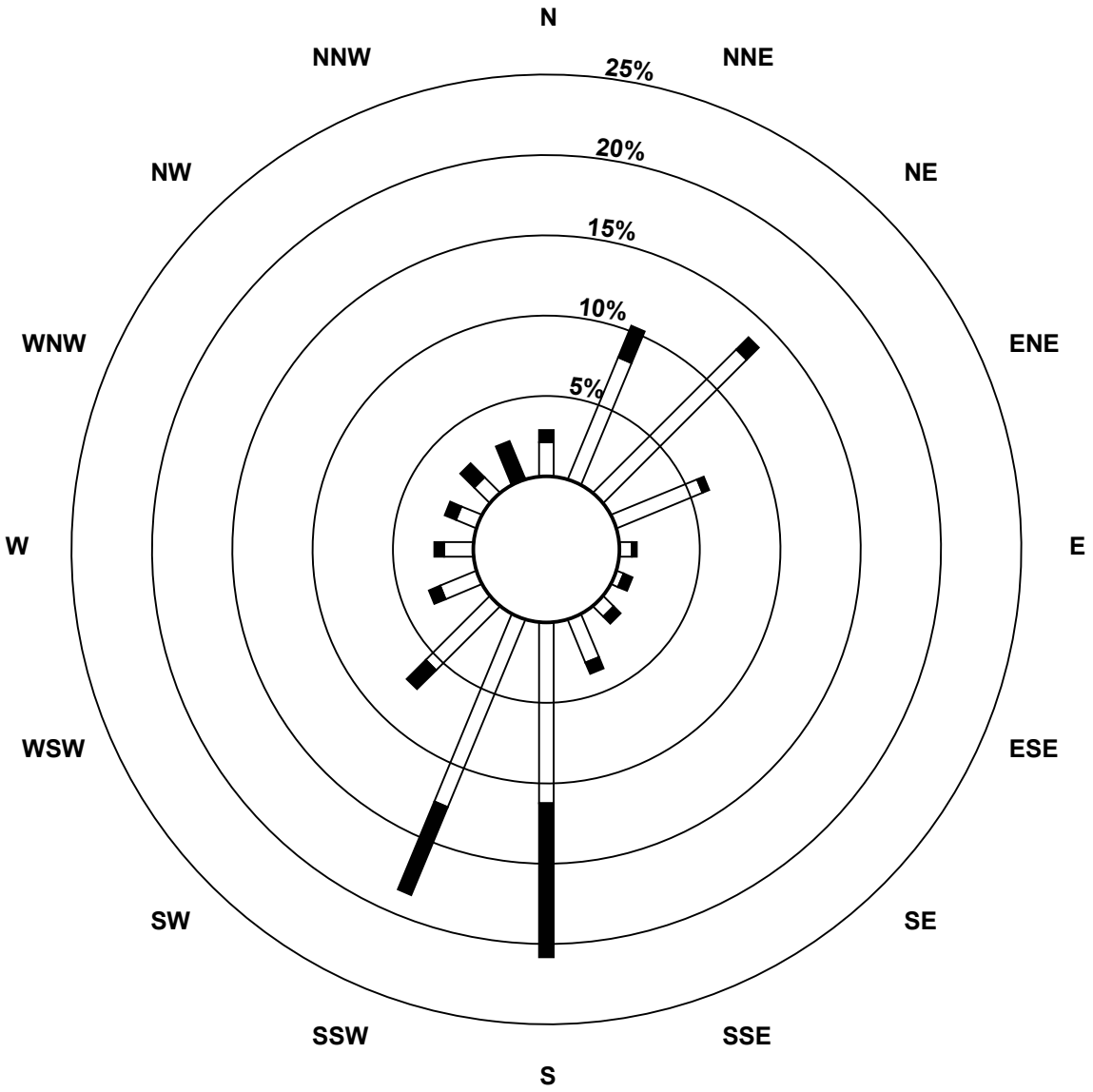
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

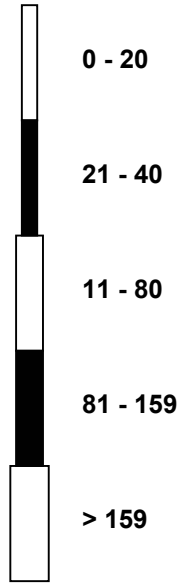
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



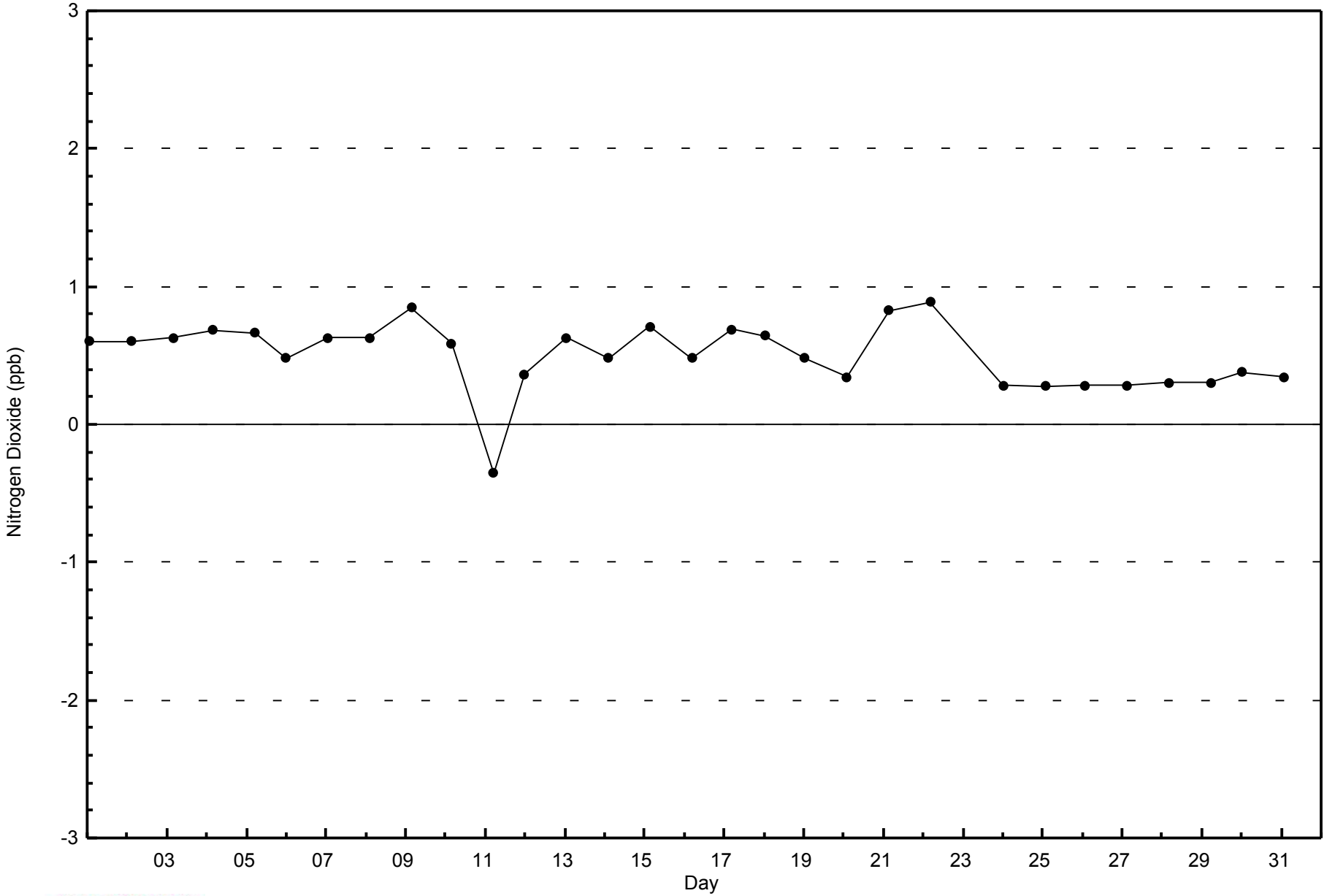
Total Number of Valid Hours: 658

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2015



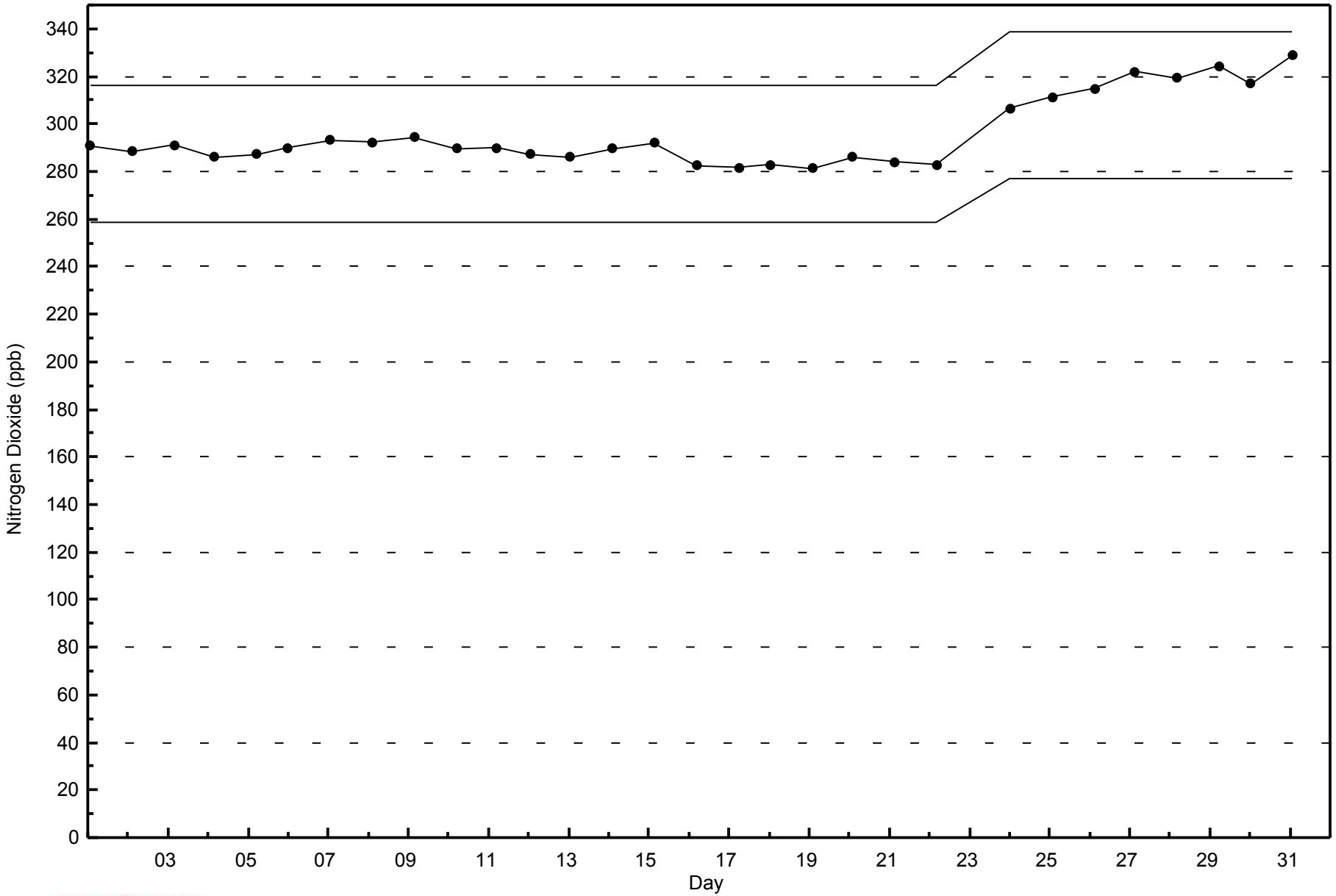
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2015

Maximum Value: 260 ppb on Jan 24 20:00

Maximum Daily Average: 99.7 ppb on Jan 24

Minimum Value: 0 ppb on Jan 15 19:00

Minimum Daily Average: 4.8 ppb on Jan 4

Maximum Diurnal Average: 33.4 ppb at hour 20

Minimum Diurnal Average: 18.0 ppb at hour 2

Monthly Average: 25.3 ppb

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 8$ Median = 19 $Q_3 = 32$ $P_{90} = 54$ $P_{99} = 135$

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	32
Percent Operational Time:	96.4

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-Jan	5	Z	9	14	22	5	21	30	5	6	70	54	34	16	29	16	18	15	4	5	3	4	11	20	18.0	70
2-Jan	11	3	Z	14	20	2	6	8	13	14	26	14	20	45	26	27	27	29	38	32	48	50	45	28	23.8	50
3-Jan	17	14	13	Z	68	24	18	20	15	17	10	8	6	6	5	2	3	6	2	3	2	1	0	1	11.4	68
4-Jan	3	1	1	1	Z	9	19	14	12	7	9	6	5	8	6	2	1	2	1	0	1	1	1	1	4.8	19
5-Jan	3	1	2	6	4	Z	8	8	13	24	19	32	30	31	33	39	15	20	32	54	55	43	20	11	21.9	55
6-Jan	Z	9	16	12	13	12	64	18	19	22	25	45	34	27	12	16	32	40	48	48	50	41	23	21	28.2	64
7-Jan	17	Z	37	32	28	23	26	24	30	43	46	43	32	33	92	87	88	65	30	40	36	36	29	22	40.8	92
8-Jan	19	29	Z	30	21	19	17	18	27	50	30	27	24	16	19	13	10	6	19	8	5	9	9	20	19.3	50
9-Jan	17	10	7	Z	10	39	53	30	28	32	35	27	20	12	14	45	41	109	127	79	27	23	18	17	35.7	127
10-Jan	7	4	7	12	Z	19	16	23	26	48	50	35	23	18	16	18	19	29	39	47	48	57	43	54	28.6	57
11-Jan	51	52	55	71	80	Z	81	89	88	111	98	66	46	48	33	23	27	25	21	27	32	26	18	23	51.8	111
12-Jan	Z	20	24	24	32	18	12	9	10	12	19	17	19	28	23	21	31	36	51	37	26	25	18	15	22.9	51
13-Jan	20	Z	85	41	28	26	13	22	28	9	4	2	2	6	8	7	14	8	12	65	62	101	94	37	30.2	101
14-Jan	31	30	Z	11	13	28	62	30	9	19	15	11	18	6	10	8	6	1	4	11	13	19	9	2	15.9	62
15-Jan	7	2	1	Z	3	5	3	1	2	1	4	8	7	25	34	24	19	10	0	0	1	2	1	0	7.0	34
16-Jan	4	2	7	8	Z	9	11	15	14	16	9	9	16	13	12	10	5	3	3	2	1	1	1	2	7.5	16
17-Jan	10	2	1	3	20	Z	4	4	3	3	7	6	25	22	21	4	3	5	5	7	6	18	17	19	9.4	25
18-Jan	Z	13	13	13	12	14	22	29	36	47	46	35	18	19	21	16	15	22	25	21	29	36	37	22	24.4	47
19-Jan	30	Z	69	60	56	176	53	34	19	11	30	57	25	22	24	17	13	12	9	19	22	17	20	4	34.7	176
20-Jan	13	34	Z	37	19	17	9	2	2	3	21	17	9	12	29	34	30	34	38	40	32	28	24	22	22.0	40
21-Jan	24	17	17	Z	19	38	36	20	15	11	11	10	10	8	5	6	5	3	2	2	3	3	1	1	11.6	38
22-Jan	10	0	1	5	Z	4	3	2	1	2	2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	10
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	17	20	31	35	40	48	59	63	--	63
24-Jan	Z	66	67	95	127	94	119	92	70	65	56	50	22	16	61	58	92	64	156	260	184	186	173	119	99.7	260
25-Jan	74	Z	24	15	6	6	5	6	9	8	4	4	7	4	8	20	10	3	1	1	1	5	8	15	10.6	74
26-Jan	14	11	Z	22	15	15	24	32	14	8	8	5	6	5	74	54	21	29	40	39	43	36	29	30	24.9	74
27-Jan	25	23	27	Z	27	18	16	17	11	8	3	1	2	11	9	11	16	10	14	19	9	14	16	19	14.0	27
28-Jan	15	17	17	42	Z	16	10	7	15	27	34	22	37	37	56	33	14	6	2	9	23	36	49	58	25.2	58
29-Jan	50	46	44	30	20	Z	10	5	5	4	4	3	17	21	36	88	74	116	141	36	31	28	24	23	37.2	141
30-Jan	Z	24	11	22	20	23	26	14	9	18	23	28	21	10	10	17	20	17	7	9	5	11	25	27	17.3	28
31-Jan	28	Z	36	31	25	24	16	21	47	64	87	59	34	23	25	24	26	30	37	47	58	72	59	49	40.1	87
	20.1	18.0	23.7	26.0	28.3	26.3	26.1	21.5	19.8	23.6	26.8	24.3	19.7	18.9	25.9	25.5	23.7	25.9	31.2	33.4	29.9	32.6	29.3	24.8	Diurnal Average	
	74	66	85	95	127	176	119	92	88	111	98	66	46	48	92	88	92	116	156	260	184	186	173	119	Diurnal Maximum	

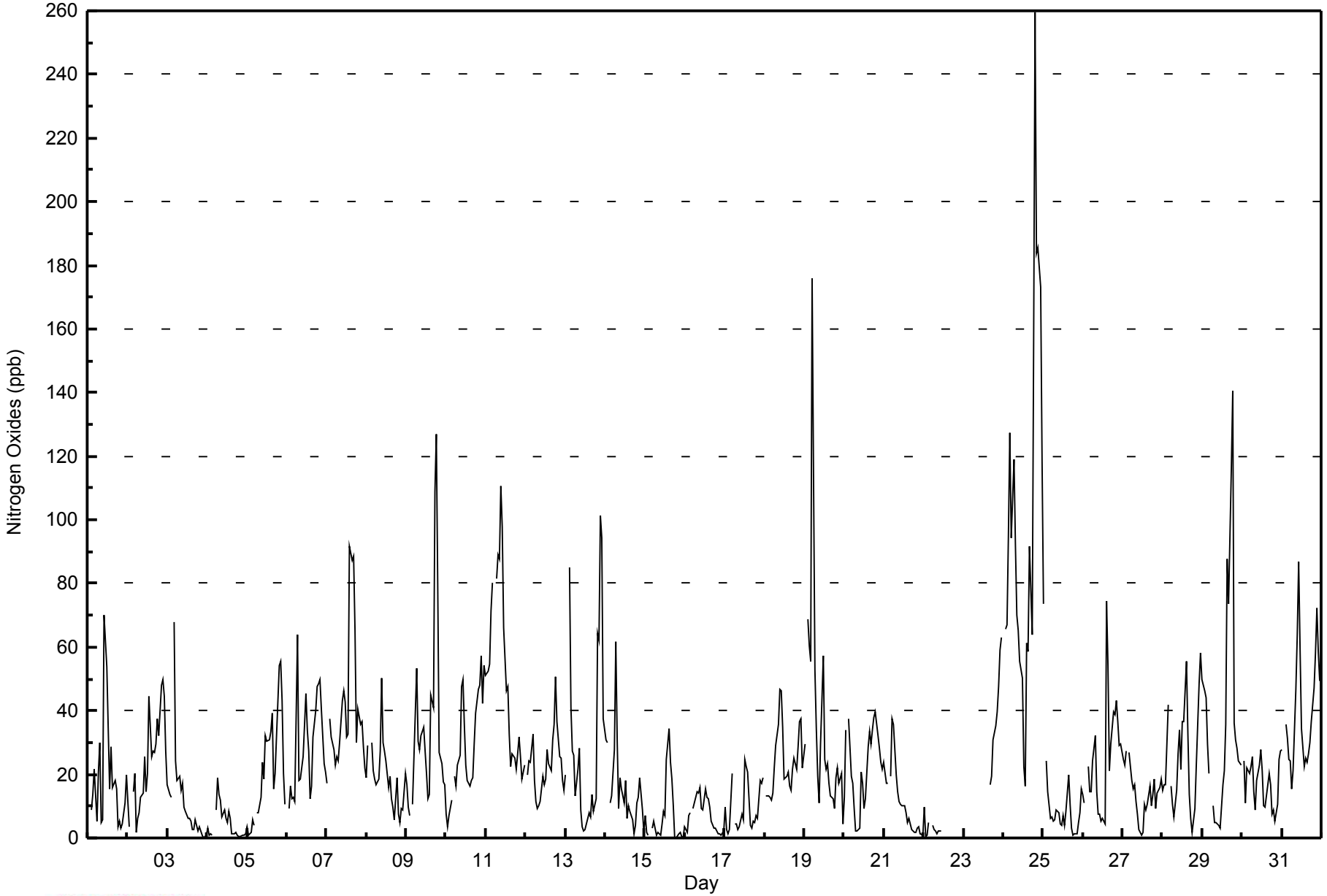
Z - zerospan C - Calibration AF - Analyzer Failure

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	379	55.33	55.33
21 - 40	192	28.03	83.36
11 - 80	84	12.26	95.62
81 - 159	24	3.50	99.12
> 159	5	0.73	99.85

Total Number of Valid Hours: 685

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	6	27	70	36	4	3	5	15	58	75	36	16	11	5	6	0	373
21 - 40	10	31	14	3	1	2	3	6	53	30	8	3	4	7	5	8	188
11 - 80	2	8	6	2	1	2	2	3	23	14	4	1	1	1	1	6	77
81 - 159	1	2	0	0	1	0	0	0	2	3	0	1	0	1	5	2	18
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Totals	19	68	90	41	7	7	10	24	136	122	48	21	16	14	17	17	657

Total Number of Valid Hours: 658

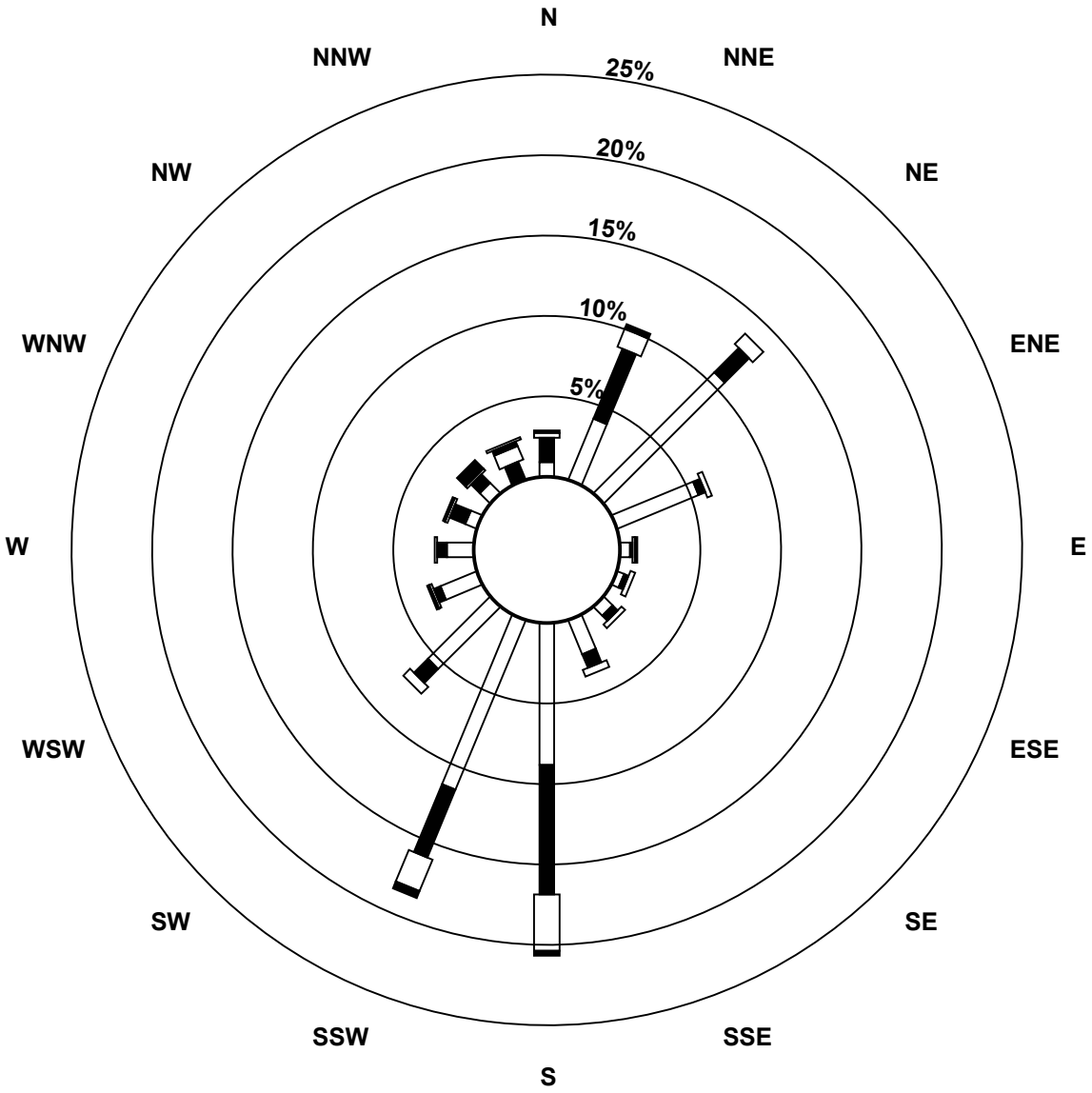
Total Number of Hours: 744

Wood Buffalo Environmental Association

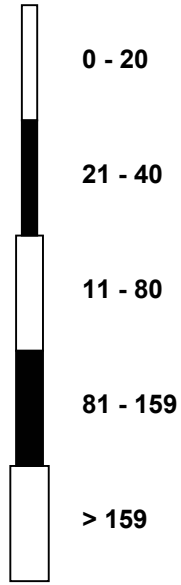
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River (AMS 16)



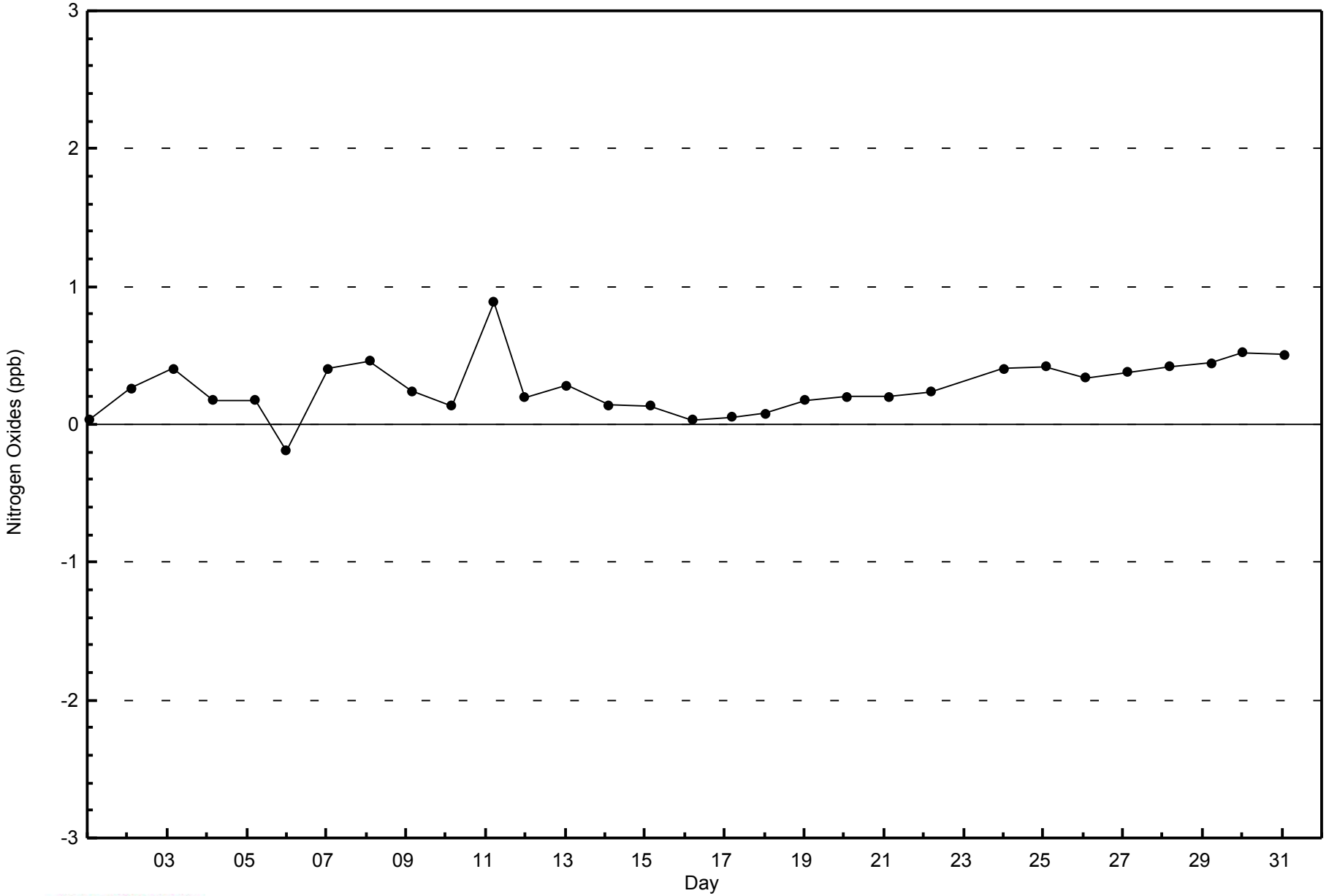
Classes (ppb)



Total Number of Valid Hours: 658

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Shell Muskeg River - January 2015



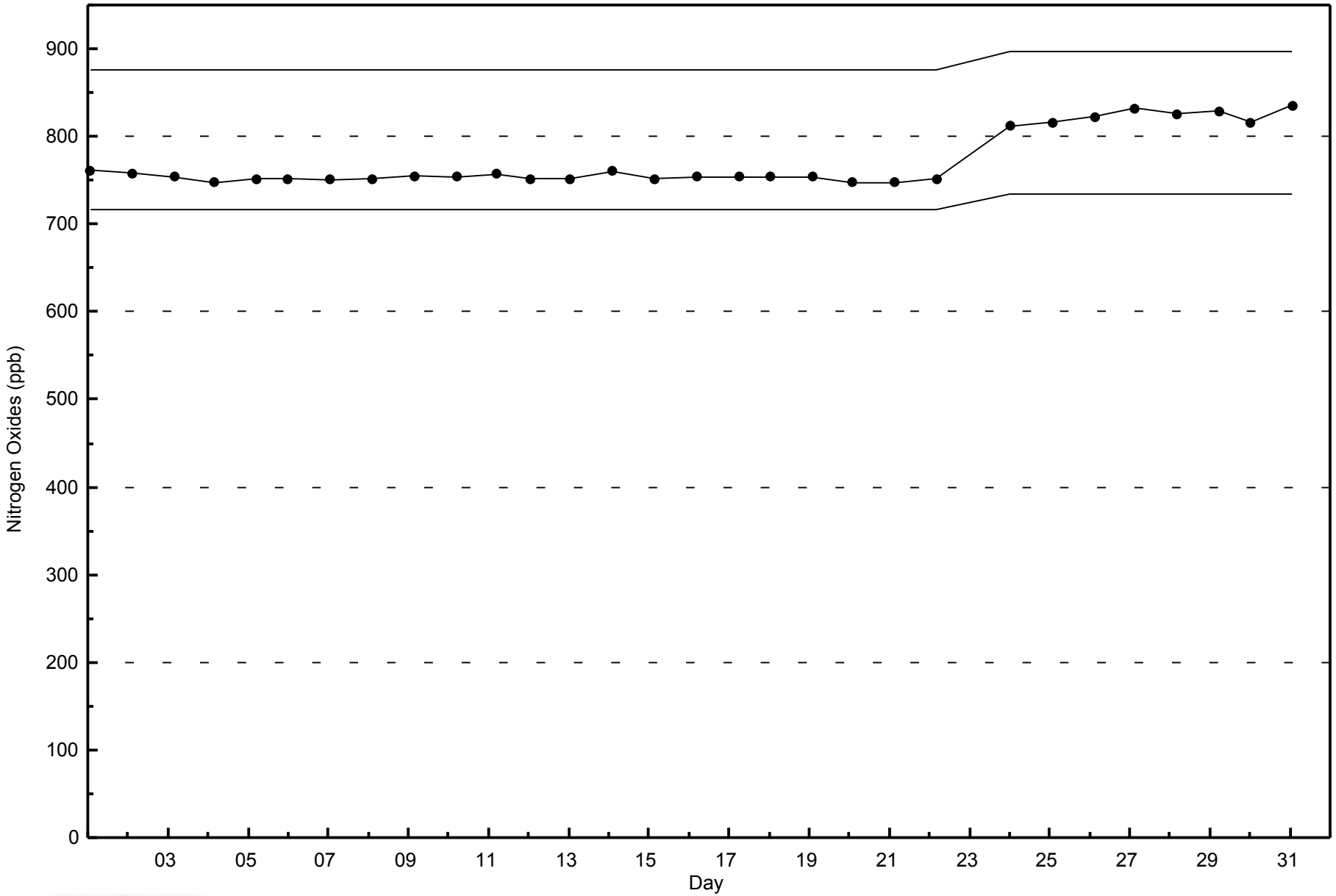
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Shell Muskeg River - January 2015

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

Maximum Value: 40.4 $\mu g/m^3$ on Jan 24 00:00

Maximum Daily Average: 15.5 $\mu g/m^3$ on Jan 24

Minimum Value: 1.0 $\mu g/m^3$ on Jan 25 15:00

Minimum Daily Average: 1.8 $\mu g/m^3$ on Jan 22

Maximum Diurnal Average: 7.1 $\mu g/m^3$ at hour 24

Minimum Diurnal Average: 4.1 $\mu g/m^3$ at hour 14

Monthly Average: 5.47 $\mu g/m^3$

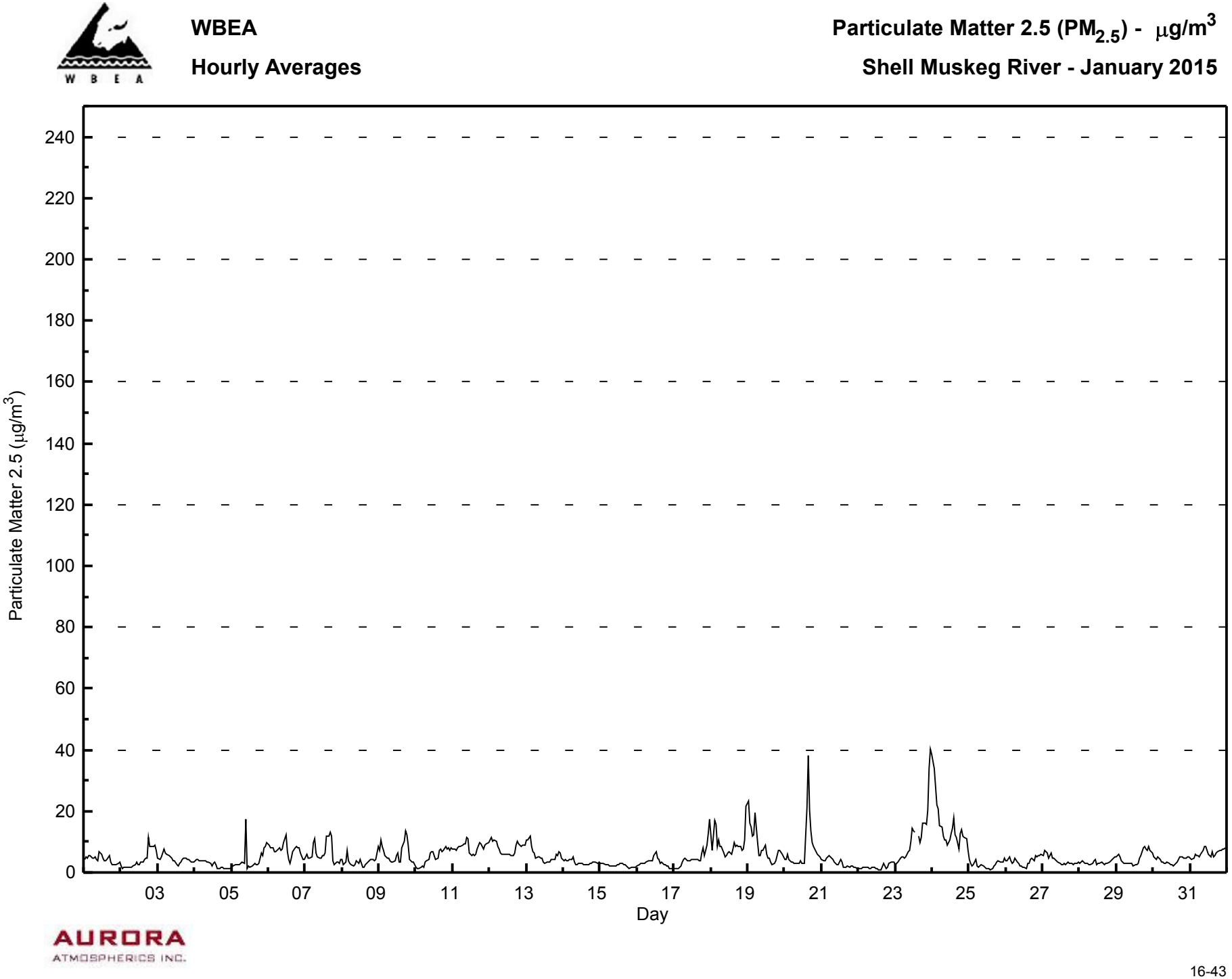
Percentiles: P_1 = 1.2 P_{10} = 1.9 Q_1 = 2.9 Median = 4.2 Q_3 = 6.8 P_{90} = 10.1 P_{99} = 18.8

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-Jan	4.1	5.2	4.8	5.3	5.5	4.5	4.9	4.9	4.1	4.0	6.6	6.1	4.6	3.9	4.0	4.4	5.6	3.5	2.4	2.5	2.5	2.5	2.8	3.4	4.3	6.6
2-Jan	1.9	1.4	1.5	1.8	1.8	1.5	1.6	1.8	2.2	2.5	3.3	2.6	2.6	3.5	3.3	4.1	4.5	4.5	11.4	8.6	8.3	8.6	8.7	7.3	4.1	11.4
3-Jan	4.6	4.2	5.1	6.2	7.6	6.5	5.7	5.4	5.0	4.6	3.8	4.0	2.7	2.1	2.9	3.5	4.2	4.7	4.5	4.2	4.3	3.7	3.5	3.5	4.4	7.6
4-Jan	3.8	4.1	4.2	3.9	3.7	3.7	3.7	3.7	3.4	3.4	3.0	2.0	2.9	3.6	2.6	1.3	1.4	1.7	1.6	1.3	1.3	1.4	1.3	1.4	2.7	4.2
5-Jan	1.7	2.2	2.4	2.6	2.5	2.4	3.0	3.2	3.0	17.4	1.4	2.0	1.6	2.0	2.6	3.1	2.4	2.6	2.9	6.4	5.4	8.0	8.5	9.5	4.1	17.4
6-Jan	8.8	7.9	8.0	8.0	6.8	6.8	7.6	8.0	7.0	7.5	9.8	12.3	6.8	4.2	3.1	4.5	6.6	8.1	8.3	8.0	8.0	6.3	4.4	4.3	7.1	12.3
7-Jan	4.9	5.9	4.5	4.9	5.1	9.9	10.8	6.5	5.1	4.9	4.9	5.7	5.6	6.5	11.9	12.0	13.2	11.9	3.9	2.7	3.3	3.4	3.0	4.1	6.4	13.2
8-Jan	4.1	2.4	3.3	7.1	4.0	2.9	2.4	2.3	2.7	3.8	3.4	3.1	4.3	1.7	1.7	2.4	3.0	3.5	4.1	4.3	4.0	4.0	4.3	8.4	3.6	8.4
9-Jan	7.4	10.5	8.6	7.4	5.3	4.7	4.5	3.9	3.4	3.5	3.7	5.7	6.5	3.3	3.6	8.1	10.2	13.6	12.1	8.8	4.1	3.2	3.4	2.5	6.2	13.6
10-Jan	1.6	1.2	1.4	1.6	2.0	1.8	3.4	3.7	4.2	6.4	6.9	6.8	5.6	4.2	4.5	7.1	7.7	6.6	7.0	8.5	7.5	8.2	7.3	8.0	5.1	8.5
11-Jan	7.8	7.5	7.3	8.1	8.6	8.3	8.9	9.5	9.3	11.5	11.2	6.2	5.4	5.8	5.5	5.9	7.7	9.6	9.4	8.7	7.8	8.9	9.2	9.6	8.2	11.5
12-Jan	10.8	11.3	10.1	10.7	10.1	8.3	7.8	6.2	5.9	5.7	5.8	5.8	5.7	6.1	5.5	5.5	6.5	8.8	10.2	9.4	8.5	8.7	8.9	9.1	8.0	11.3
13-Jan	10.7	10.7	12.0	8.5	6.8	6.3	4.8	5.2	5.2	4.7	4.5	3.5	3.1	3.3	3.5	3.6	4.3	4.3	4.2	6.1	5.7	6.7	6.3	4.6	5.8	12.0
14-Jan	3.6	4.2	3.9	3.6	4.3	4.4	4.9	3.3	2.6	2.7	2.9	2.9	2.8	2.5	2.4	2.6	2.7	3.1	3.0	3.3	3.6	3.2	3.1	3.3	3.3	4.9
15-Jan	3.0	2.9	2.9	2.6	2.3	2.4	2.1	1.9	2.0	2.0	2.2	2.4	2.5	2.8	3.0	2.7	2.3	1.9	1.5	1.5	1.6	1.7	1.8	1.9	2.2	3.0
16-Jan	2.0	2.5	2.8	3.0	3.0	3.1	3.5	3.8	3.7	3.9	4.0	5.7	6.8	4.8	4.3	3.0	3.5	2.5	2.3	2.0	2.0	1.3	1.4	1.3	3.2	6.8
17-Jan	1.1	1.3	1.4	1.3	2.1	3.2	4.1	4.8	4.3	3.7	3.9	4.2	4.1	4.0	4.1	4.1	4.0	4.0	6.2	8.1	5.5	9.1	12.5	17.2	4.9	17.2
18-Jan	12.5	7.2	17.1	15.9	8.6	10.7	8.6	8.6	6.3	5.1	5.6	6.2	6.7	6.1	7.4	9.6	8.3	9.1	8.3	8.5	7.3	7.8	10.7	21.7	9.3	21.7
19-Jan	23.3	16.1	14.7	11.8	12.3	19.5	9.9	5.5	5.5	7.1	7.4	9.1	5.9	4.7	4.8	3.5	2.6	3.0	3.7	5.6	7.2	7.0	5.8	5.0	8.4	23.3
20-Jan	4.2	4.4	5.8	4.1	3.4	3.3	3.1	3.1	3.0	3.1	3.9	3.2	2.8	2.8	21.3	38.2	20.3	13.7	9.6	8.5	6.9	6.1	5.5	5.0	7.7	38.2
21-Jan	4.3	3.8	3.7	4.7	5.1	5.5	5.1	4.0	3.2	2.9	2.6	2.5	4.3	3.5	1.6	1.6	1.7	1.9	1.8	1.9	1.9	1.7	1.5	1.3	3.0	5.5
22-Jan	1.2	1.2	1.3	1.7	1.8	1.7	1.7	1.4	1.5	1.7	1.5	1.5	1.2	1.1	1.0	1.1	3.1	2.2	1.4	1.8	3.0	3.4	3.3	3.4	1.8	3.4
23-Jan	2.6	2.9	3.4	4.6	5.1	5.1	4.8	4.9	6.9	7.1	10.2	14.4	13.5	12.9	M	11.8	9.7	11.3	15.9	16.1	15.8	20.4	33.8	40.4	11.9	40.4
24-Jan	38.7	33.8	28.1	22.1	20.7	15.4	14.9	11.7	10.5	10.5	8.9	10.8	12.7	14.4	17.7	12.5	11.6	7.7	12.5	14.2	12.0	11.6	11.1	7.1	15.5	38.7
25-Jan	4.4	2.8	2.1	2.3	4.0	2.3	1.6	1.9	2.5	2.1	1.5	1.5	1.5	1.2	1.0	1.3	2.0	2.7	3.4	3.7	3.5	3.3	3.6	4.5	2.5	4.5
26-Jan	3.9	3.8	4.9	3.7	3.1	3.4	4.7	3.3	2.8	2.2	2.2	1.8	1.5	1.4	3.0	3.1	4.1	4.7	3.9	5.3	4.9	5.5	5.3	5.9	3.7	5.9
27-Jan	5.5	7.2	6.7	6.3	4.7	6.4	4.5	4.6	4.4	3.8	3.5	2.9	2.5	2.5	3.0	2.7	3.2	2.8	2.9	3.2	2.5	2.9	2.9	3.3	4.0	7.2
28-Jan	2.8	3.6	3.8	2.8	3.1	3.0	2.6	2.6	2.8	3.9	4.4	2.7	2.8	2.9	3.4	2.9	2.5	2.8	2.9	3.2	3.8	4.4	4.9	5.1	3.3	5.1
29-Jan	5.2	5.8	5.2	3.8	3.3	3.0	3.1	2.9	2.9	2.9	2.8	2.2	2.7	2.8	3.0	4.8	5.3	8.1	8.6	7.4	7.1	8.4	7.4	6.1	4.8	8.6
30-Jan	5.0	4.6	4.4	5.1	4.1	3.6	3.2	2.9	2.9	3.3	2.9	2.7	2.6	2.1	2.4	3.2	4.4	5.1	5.0	4.9	4.7	4.5	5.2	5.0	3.9	5.2
31-Jan	4.7	4.4	4.7	5.9	5.3	5.5	5.3	5.9	7.4	8.3	8.4	7.2	5.9	4.9	6.8	5.2	5.3	6.2	6.9	7.3	7.1	7.8	7.7	8.0	6.3	8.4
	6.5	6.0	6.1	5.9	5.4	5.5	5.1	4.6	4.4	5.0	4.7	4.8	4.5	4.1	4.8	5.8	5.6	5.7	5.9	6.0	5.5	5.9	6.4	7.1	Diurnal Average	
	38.7	33.8	28.1	22.1	20.7	19.5	14.9	11.7	10.5	17.4	11.2	14.4	13.5	14.4	21.3	38.2	20.3	13.7	15.9	16.1	15.8	20.4	33.8	40.4	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$


WBEA
Hourly Averages
Particulate Matter 2.5 (PM2.5) - µg/m3
Shell Muskeg River - January 2015
Particulate Matter 2.5 (µg/m3)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	488	65.68	65.68
6 - 15	231	31.09	96.77
16 - 25	17	2.29	99.06
26 - 80	6	0.81	99.87
> 81.0	0	0.00	99.87

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Shell Muskeg River - January 2015

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**
1 - 5	16	49	85	43	4	4	8	19	71	66	41	23	15	11	9	11	475
6 - 15	5	20	18	3	2	2	3	5	69	57	8	5	2	2	7	8	216
16 - 25	1	2	0	0	0	0	0	1	4	5	1	0	0	0	1	1	16
26 - 80	0	0	0	0	1	1	0	1	0	2	0	0	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	22	71	103	46	7	7	11	26	144	130	50	28	17	13	17	20	712

Total Number of Valid Hours: 713

Total Number of Hours: 744

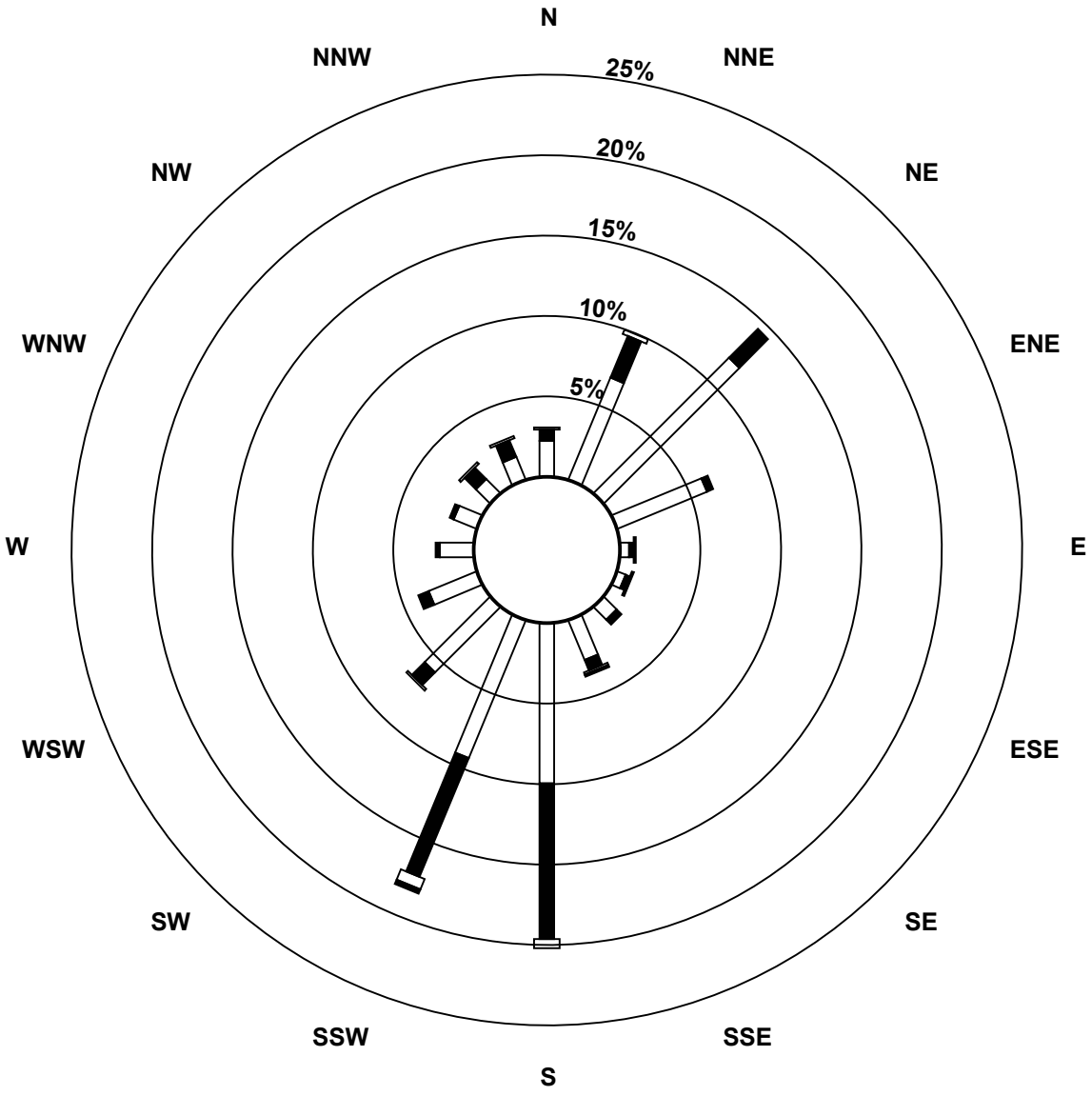
AURORA
ATMOSPHERICS INC.

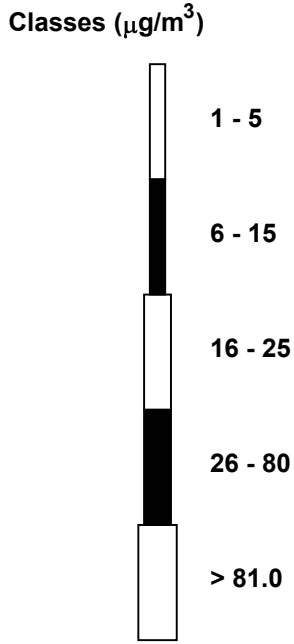
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Shell Muskeg River (AMS 16)





Total Number of Valid Hours: 713

Maximum Value: 100 % on Jan 24 10:00

Maximum Daily Average: 98.9 % on Jan 24

Minimum Value: 49 % on Jan 8 15:00

Minimum Daily Average: 67.9 % on Jan 8

Maximum Diurnal Average: 83.4 % at hour 5

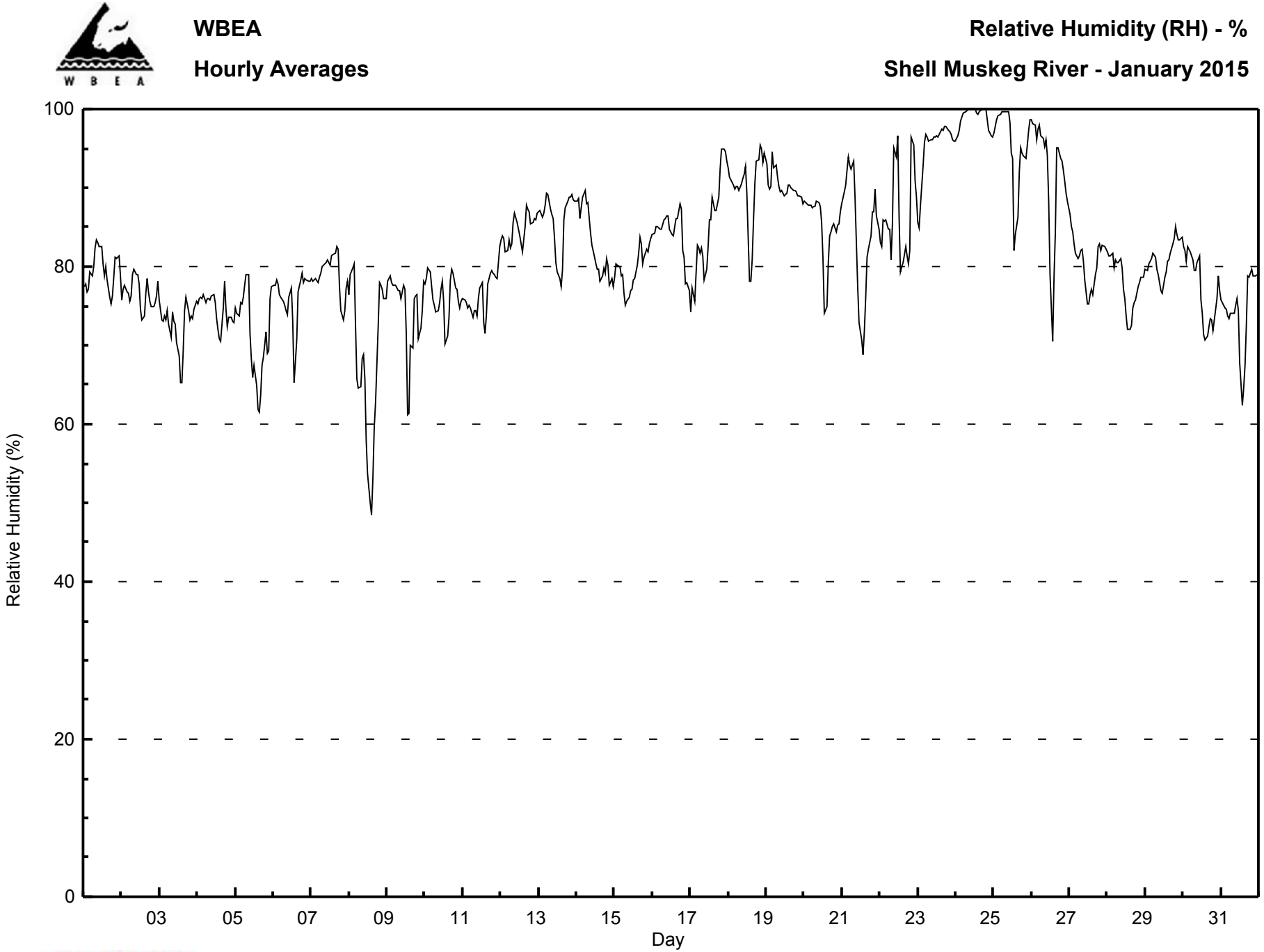
Minimum Diurnal Average: 75.6 % at hour 14

Monthly Average: 81.8 %

Percentiles: P_1 = 61 P_{10} = 73 Q_1 = 76 Median = 80 Q_3 = 87 P_{90} = 95 P_{99} = 100

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-Jan	78	78	77	77	79	79	80	82	83	83	82	83	80	79	80	78	76	75	76	79	81	81	81	79	79.5	83
2-Jan	76	77	78	77	77	76	76	79	80	79	79	78	75	73	74	77	78	77	76	75	75	75	76	78	76.6	80
3-Jan	76	73	73	74	73	74	73	71	74	73	73	70	69	65	65	69	74	76	74	73	74	73	75	76	72.6	76
4-Jan	75	76	76	76	76	75	76	76	76	76	76	75	73	72	71	71	75	78	75	72	74	74	73	73	74.6	78
5-Jan	75	74	74	75	75	76	78	79	79	72	68	66	67	65	62	62	64	67	69	72	69	69	76	77	71.2	79
6-Jan	78	78	78	78	76	76	76	75	74	74	76	77	73	65	68	71	77	78	79	78	79	78	78	78	75.8	79
7-Jan	78	78	78	78	78	79	79	80	80	80	81	81	80	81	81	82	82	82	77	74	73	74	77	78	79.0	82
8-Jan	76	79	80	80	73	66	65	65	68	69	66	58	54	50	49	53	60	63	72	78	78	77	76	76	67.9	80
9-Jan	78	79	79	78	78	78	77	77	77	76	78	77	72	61	61	70	70	76	76	76	71	72	74	78	74.5	79
10-Jan	78	79	80	79	77	76	75	74	74	75	77	78	76	70	71	74	78	80	79	77	77	76	75	76	76.3	80
11-Jan	76	76	75	75	75	75	74	74	74	74	76	77	78	73	72	74	78	79	80	79	79	79	79	83	76.3	83
12-Jan	83	84	84	82	82	83	82	83	86	87	86	85	84	83	82	85	88	87	87	85	86	86	86	87	84.6	88
13-Jan	87	87	86	87	88	89	89	87	87	86	84	81	79	78	78	80	86	87	88	89	89	89	89	88	85.7	89
14-Jan	88	89	86	87	89	90	88	88	86	84	83	81	80	80	80	78	79	80	79	81	80	78	78	78	82.9	90
15-Jan	79	80	80	80	79	79	77	75	76	76	77	77	78	79	80	82	84	83	80	81	82	82	83	84	79.7	84
16-Jan	84	84	85	85	85	85	85	86	86	87	86	85	84	84	85	86	86	88	87	82	81	78	78	77	84.1	88
17-Jan	74	77	76	76	83	82	82	82	81	78	80	83	86	86	89	87	87	88	89	92	95	95	95	93	84.8	95
18-Jan	92	91	91	90	90	90	90	90	90	91	92	93	89	78	78	81	86	91	93	94	95	95	93	94	89.9	95
19-Jan	93	90	90	90	95	93	93	91	90	89	90	89	89	89	90	90	90	90	90	90	89	89	89	88	90.3	95
20-Jan	88	88	88	88	88	88	88	88	88	88	88	86	81	74	75	81	84	84	85	85	84	85	85	87	85.2	88
21-Jan	88	89	90	92	94	93	92	93	89	83	77	73	71	69	72	76	81	82	84	87	87	90	87	85	84.4	94
22-Jan	83	83	86	86	86	85	85	81	85	95	94	97	86	79	80	81	83	81	80	82	96	95	91	89	86.2	97
23-Jan	86	85	88	93	96	97	96	96	96	96	96	96	97	96	97	97	97	98	98	97	97	97	96	96	95.2	98
24-Jan	96	97	97	98	99	99	100	100	100	100	100	100	100	99	99	100	100	100	100	100	99	97	97	96	98.9	100
25-Jan	97	98	99	99	99	100	100	100	100	100	98	94	94	82	84	86	92	95	94	94	94	95	97	99	95.4	100
26-Jan	99	98	98	96	98	98	97	96	95	96	94	88	79	71	79	84	95	95	94	93	92	91	89	88	91.8	99
27-Jan	87	85	84	83	82	81	81	82	82	81	78	75	75	76	77	76	79	80	82	83	82	83	83	82	80.9	87
28-Jan	82	81	81	82	80	81	81	81	81	80	77	76	74	72	72	73	75	75	76	77	78	79	79	79	77.9	82
29-Jan	80	80	80	81	81	82	81	80	79	78	77	77	79	79	81	81	82	83	84	85	84	83	83	84	80.9	85
30-Jan	82	82	81	83	82	81	81	79	80	81	81	76	74	71	71	71	72	73	73	72	73	76	79	77	77.2	83
31-Jan	76	75	75	75	74	73	74	74	74	75	76	74	68	62	65	67	73	79	79	80	79	79	79	79	74.3	80
	82.8	82.9	83.0	83.2	83.4	83.1	82.8	82.7	83.0	82.6	82.1	80.8	78.8	75.6	76.3	78.1	81.0	82.3	82.5	82.7	82.9	82.9	83.1	83.3	Diurnal Average	
	99	98	99	99	99	100	100	100	100	100	100	100	100	99	99	100	100	100	100	100	99	97	97	99	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity (RH) - %
Shell Muskeg River - January 2015
100
80
60
40
20
0
Relative Humidity (%)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	6	0.81	0.81
60 - 80	357	47.98	48.79
80 - 100	377	50.67	99.46

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 5.6 C on Jan 25 14:00 | Maximum Daily Average: 2.5 C on Jan 22

Minimum Value: -33.4 C on Jan 31 06:00 | Minimum Daily Average: -27.5 C on Jan 3

Maximum Diurnal Average: -12.5 C at hour 15 | Minimum Diurnal Average: -16.7 C at hour 8

Monthly Average: -15.13 C | Percentiles: P_1 = -32.4 P_{10} = -26.8 Q_1 = -21.7 Median = -16.5 Q_3 = -8.5 P_{90} = -1.0 P_{99} = 4.4

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

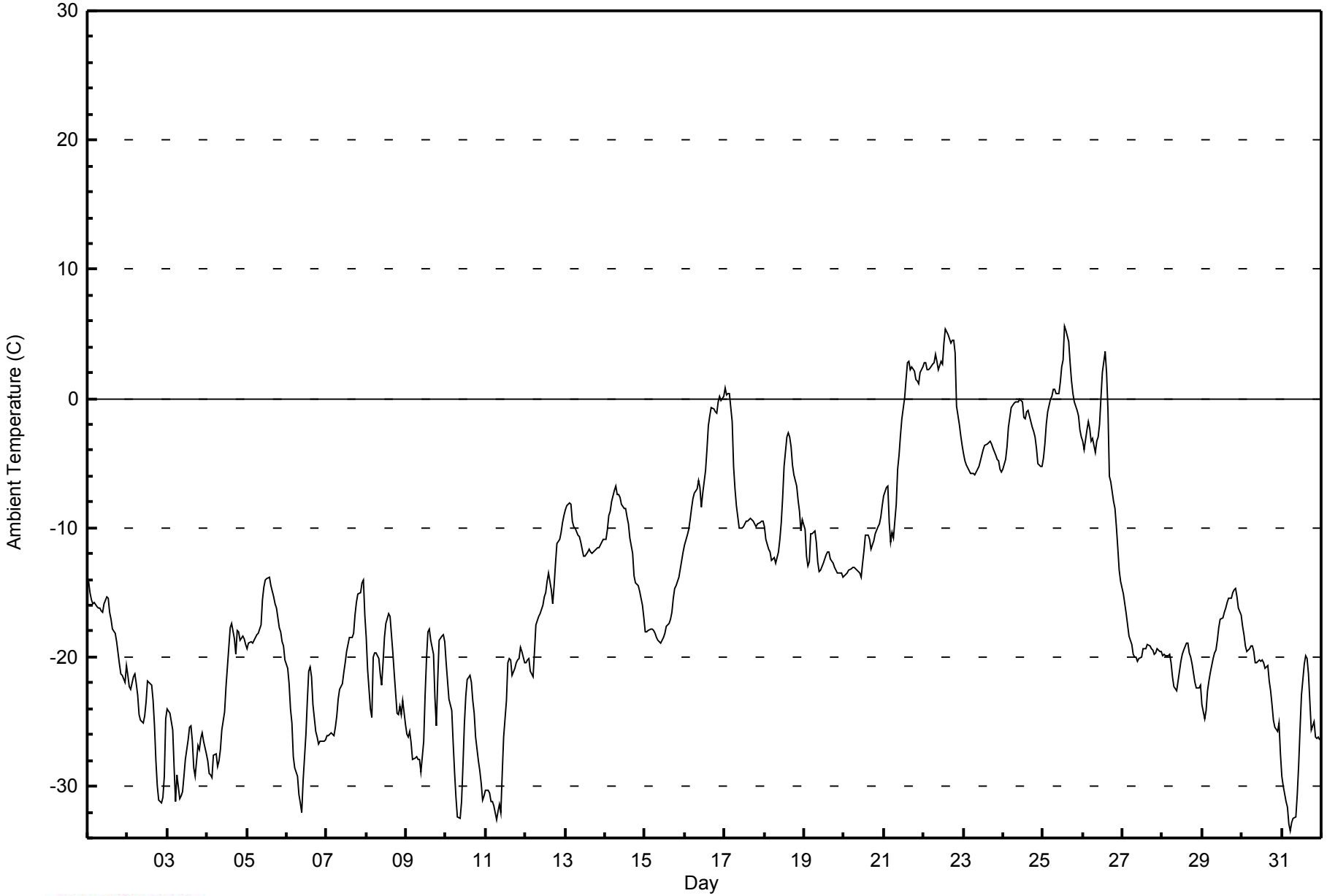
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-14.1	-15.0	-15.5	-15.9	-15.8	-16.1	-16.2	-16.2	-16.4	-16.5	-15.8	-15.4	-15.5	-16.5	-17.1	-17.9	-18.2	-18.8	-19.6	-20.6	-21.3	-21.5	-22.0	-20.7	-17.5	-14.1
2-Jan	-21.5	-22.2	-22.5	-21.6	-21.3	-22.1	-22.9	-24.5	-24.9	-25.1	-24.6	-23.5	-21.8	-22.0	-22.2	-23.3	-25.3	-28.0	-30.0	-31.1	-31.2	-30.8	-29.3	-24.8	-24.9	-21.3
3-Jan	-24.0	-24.3	-25.0	-25.7	-28.6	-31.1	-29.1	-31.0	-30.7	-30.4	-29.2	-28.0	-26.4	-25.5	-25.4	-26.6	-28.5	-29.3	-26.8	-27.1	-26.3	-25.8	-26.5	-27.5	-27.5	-24.0
4-Jan	-28.0	-29.0	-29.2	-29.3	-27.6	-27.5	-28.4	-28.0	-27.1	-25.7	-24.2	-22.3	-20.8	-19.2	-17.8	-17.4	-18.6	-19.8	-17.9	-18.1	-18.7	-18.4	-18.6	-19.1	-22.9	-17.4
5-Jan	-19.4	-18.9	-18.8	-18.9	-18.7	-18.5	-18.2	-18.1	-17.5	-15.5	-14.6	-14.0	-14.0	-13.9	-14.5	-14.9	-15.3	-15.9	-16.2	-17.8	-18.1	-18.8	-19.1	-20.3	-17.1	-13.9
6-Jan	-20.8	-22.1	-24.0	-25.1	-27.7	-28.6	-29.2	-30.7	-31.3	-32.1	-29.5	-25.9	-23.3	-21.1	-20.8	-21.6	-23.7	-25.8	-26.2	-26.8	-26.5	-26.5	-26.5	-26.5	-25.9	-20.8
7-Jan	-26.0	-26.1	-26.0	-25.9	-26.0	-25.4	-24.6	-23.3	-22.5	-22.1	-21.2	-20.5	-19.6	-19.0	-18.5	-18.5	-18.2	-16.7	-15.8	-15.1	-15.0	-14.2	-14.0	-16.7	-20.5	-14.0
8-Jan	-18.5	-21.0	-24.1	-24.7	-20.0	-19.7	-19.7	-20.2	-21.4	-22.1	-20.4	-18.5	-17.4	-16.6	-16.8	-18.3	-19.6	-21.3	-24.4	-24.5	-23.8	-24.4	-23.4	-25.3	-21.1	-16.6
9-Jan	-26.0	-26.1	-25.8	-26.7	-28.0	-27.8	-27.7	-27.9	-27.9	-28.9	-26.5	-22.9	-20.1	-18.0	-17.8	-18.7	-19.7	-23.1	-25.4	-21.7	-18.7	-18.4	-18.3	-18.8	-23.4	-17.8
10-Jan	-20.5	-21.8	-23.2	-24.1	-26.6	-28.9	-30.9	-32.4	-32.5	-31.2	-28.3	-25.3	-23.1	-21.7	-21.4	-21.9	-23.4	-24.3	-26.2	-28.0	-28.8	-29.8	-31.0	-30.8	-26.5	-20.5
11-Jan	-30.3	-30.3	-30.6	-31.2	-31.2	-31.5	-32.6	-31.9	-31.4	-32.1	-29.0	-26.2	-23.3	-20.5	-20.2	-20.2	-21.4	-20.9	-20.4	-20.2	-20.1	-19.2	-19.6	-20.4	-25.6	-19.2
12-Jan	-20.5	-20.2	-20.1	-21.1	-21.6	-19.6	-17.5	-17.2	-16.9	-16.6	-16.0	-15.3	-15.0	-14.1	-13.5	-14.8	-15.9	-14.5	-12.7	-11.3	-10.8	-10.4	-9.6	-9.1	-15.6	-9.1
13-Jan	-8.6	-8.3	-8.1	-8.2	-9.5	-10.0	-10.0	-10.5	-10.7	-11.1	-11.6	-12.2	-12.2	-11.9	-11.7	-11.9	-12.0	-11.8	-11.7	-11.5	-11.5	-11.3	-11.1	-10.9	-10.8	-8.1
14-Jan	-10.9	-10.1	-9.0	-8.7	-7.9	-7.1	-6.8	-7.4	-7.5	-7.6	-8.2	-8.5	-8.6	-9.1	-9.7	-10.8	-12.0	-13.7	-14.2	-14.3	-14.4	-14.9	-16.0	-17.0	-10.6	-6.8
15-Jan	-18.1	-18.0	-17.9	-17.8	-17.8	-17.9	-18.1	-18.5	-18.7	-18.9	-18.8	-18.5	-18.2	-17.6	-17.4	-17.0	-16.5	-15.4	-14.7	-14.4	-13.9	-13.2	-12.6	-11.9	-16.7	-11.9
16-Jan	-11.3	-10.6	-10.1	-9.4	-8.5	-7.8	-7.3	-6.9	-6.4	-6.8	-8.4	-7.3	-5.6	-4.0	-2.1	-1.3	-0.7	-0.8	-1.0	-1.1	-0.3	0.1	-0.1	0.2	-4.9	0.2
17-Jan	0.8	0.3	0.4	0.3	-1.8	-5.3	-7.0	-8.3	-9.2	-10.0	-10.0	-9.9	-9.7	-9.5	-9.4	-9.3	-9.3	-9.5	-9.7	-9.9	-9.7	-9.6	-9.5	-9.5	-7.3	0.8
18-Jan	-9.9	-10.8	-11.7	-11.8	-12.5	-12.4	-12.3	-12.8	-11.9	-10.9	-9.6	-7.7	-5.2	-2.9	-2.7	-2.9	-3.8	-5.2	-5.9	-6.8	-7.9	-8.7	-10.2	-9.4	-8.6	-2.7
19-Jan	-10.2	-12.2	-12.9	-12.6	-10.4	-10.4	-10.2	-11.2	-12.7	-13.4	-13.3	-12.7	-12.5	-12.1	-11.9	-11.9	-12.4	-12.8	-13.1	-13.3	-13.5	-13.5	-13.5	-13.8	-12.4	-10.2
20-Jan	-13.7	-13.6	-13.5	-13.3	-13.2	-13.1	-13.1	-13.2	-13.3	-13.5	-13.8	-12.7	-11.8	-10.6	-10.6	-10.9	-11.6	-11.3	-11.0	-10.5	-9.9	-9.7	-9.2	-8.3	-11.9	-8.3
21-Jan	-7.6	-6.9	-6.8	-9.6	-11.1	-10.4	-10.8	-8.2	-5.5	-4.4	-2.9	-1.5	0.0	1.5	2.8	2.9	2.2	2.5	2.1	1.4	1.4	1.1	2.0	2.4	-2.6	2.9
22-Jan	2.8	2.8	2.2	2.2	2.4	2.7	2.8	3.5	2.9	2.2	2.9	2.7	4.3	5.4	5.1	4.9	4.3	4.5	4.5	3.5	-0.6	-2.0	-2.9	-3.7	2.5	5.4
23-Jan	-4.3	-4.8	-5.2	-5.6	-5.8	-5.8	-5.7	-5.9	-5.5	-5.3	-4.8	-4.4	-4.0	-3.6	-3.6	-3.4	-3.3	-3.5	-3.9	-4.3	-4.7	-4.8	-5.5	-5.7	-4.7	-3.3
24-Jan	-5.5	-4.7	-3.7	-2.2	-1.5	-0.7	-0.4	-0.3	-0.3	-0.2	0.0	-0.3	-1.4	-1.5	-1.0	-1.0	-1.4	-2.2	-2.6	-3.0	-3.8	-5.0	-5.2	-5.2	-2.2	0.0
25-Jan	-4.6	-3.5	-2.0	-1.0	-0.1	0.1	0.7	0.8	0.3	0.4	1.2	2.4	3.0	5.6	5.2	4.4	2.8	1.4	0.4	-0.3	-0.9	-1.3	-2.4	-3.0	0.4	5.6
26-Jan	-3.3	-3.9	-2.4	-1.8	-2.4	-3.3	-3.1	-4.1	-3.3	-3.0	-2.0	0.0	2.1	3.7	2.0	-0.9	-6.0	-6.4	-8.0	-8.5	-9.9	-11.5	-13.3	-14.2	-4.3	3.7
27-Jan	-15.2	-15.9	-16.6	-17.5	-18.4	-19.0	-19.8	-20.0	-20.0	-20.3	-20.2	-20.0	-19.4	-19.4	-19.4	-19.1	-19.1	-19.4	-19.5	-19.8	-19.7	-19.4	-19.5	-19.6	-19.0	-15.2
28-Jan	-19.9	-19.8	-19.9	-19.9	-19.8	-20.4	-21.5	-22.3	-22.6	-21.8	-21.1	-20.4	-19.8	-19.5	-19.0	-18.9	-19.7	-20.0	-20.6	-22.0	-22.4	-22.4	-22.4	-22.2	-20.8	-18.9
29-Jan	-23.7	-24.8	-24.1	-22.6	-21.8	-21.2	-20.2	-19.7	-19.4	-18.7	-17.8	-17.1	-17.0	-16.6	-16.2	-15.8	-15.4	-15.4	-15.0	-14.8	-14.7	-15.4	-16.2	-16.7	-18.3	-14.7
30-Jan	-17.6	-18.3	-19.2	-19.6	-19.3	-19.2	-19.2	-19.6	-20.5	-20.4	-20.2	-20.3	-20.3	-20.5	-20.9	-20.7	-21.8	-22.6	-23.7	-24.9	-25.5	-25.8	-25.1	-27.5	-21.4	-17.6
31-Jan	-29.2	-30.0	-31.1	-31.7	-32.9	-33.4	-32.8	-32.5	-32.4	-30.6	-28.3	-25.6	-23.0	-20.5	-19.9	-20.1	-21.3	-23.5	-25.6	-25.0	-26.1	-26.3	-26.2	-26.4	-27.3	-19.9
	-15.5	-15.8	-16.0	-16.2	-16.3	-16.5	-16.5	-16.7	-16.7	-16.5	-15.7	-14.6	-13.5	-12.6	-12.5	-12.8	-13.7	-14.3	-14.7	-14.9	-15.1	-15.2	-15.4	-15.6	Diurnal Average	
	2.8	2.8	2.2	2.2	2.4	2.7	2.8	3.5	2.9	2.2	2.9	2.7	4.3	5.6	5.2	4.9	4.3	4.5	4.5	3.5	1.4	1.1	2.0	2.4	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	248	33.33	33.33
-20 - 0	440	59.14	92.47
0 - 10	56	7.53	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

Maximum Value: 29.9 inHg on Jan 6 18:00

Maximum Daily Average: 29.8 inHg on Jan 6

Minimum Value: 28.2 inHg on Jan 16 14:00

Minimum Daily Average: 28.3 inHg on Jan 16

Maximum Diurnal Average: 29.0 inHg at hour 24

Minimum Diurnal Average: 29.0 inHg at hour 8

Monthly Average: 29.03 inHg

Percentiles: P_1 = 28.2 P_{10} = 28.5 Q_1 = 28.7 Median = 29.1 Q_3 = 29.3 P_{90} = 29.6 P_{99} = 29.8

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

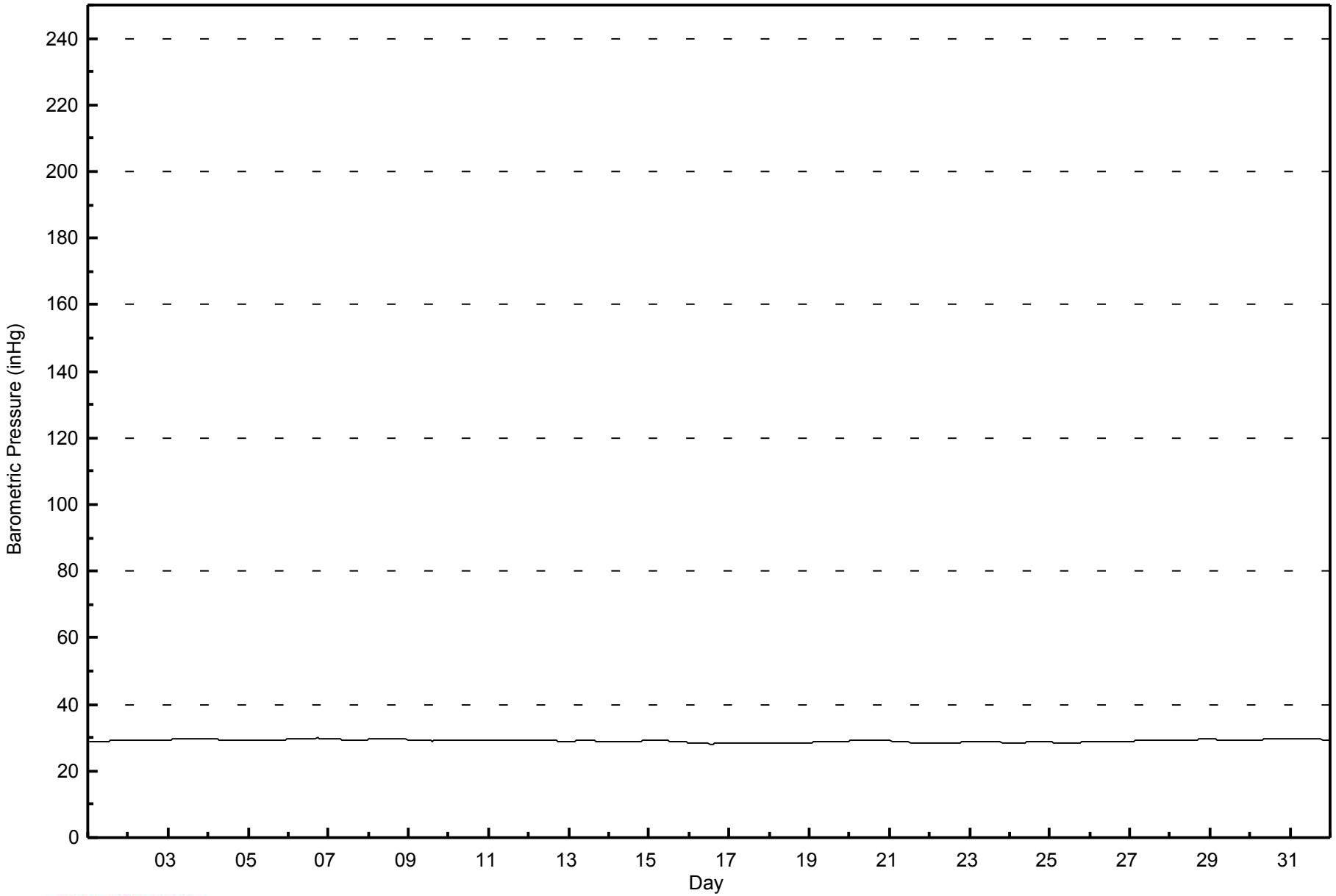
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
2-Jan	29.1	29.1	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	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.2	29.4
3-Jan	29.4	29.4	29.5	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	29.5	29.5	29.5	29.6
4-Jan	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.0	29.3	29.5
5-Jan	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	29.2	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.5	29.2	29.5
6-Jan	29.5	29.5	29.6	29.6	29.6	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.9	29.9	29.9	29.9	29.8	29.8	29.8	29.8	29.9
7-Jan	29.8	29.8	29.7	29.7	29.6	29.6	29.5	29.5	29.4	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.4	29.4	29.4	29.8
8-Jan	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	29.6	29.5	29.5	29.5	29.4	29.6	29.6
9-Jan	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.4
10-Jan	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2
11-Jan	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2	29.3
12-Jan	29.1	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	28.9	28.9	28.9	29.1	29.1
13-Jan	28.9	28.9	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	29.0	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.7	29.0	29.1
14-Jan	28.7	28.7	28.7	28.6	28.6	28.6	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	29.0	29.1	29.1	28.8	29.1
15-Jan	29.1	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	28.9	28.9	28.9	28.8	28.8	28.7	28.7	28.6	28.6	29.0	29.1
16-Jan	28.5	28.5	28.4	28.4	28.4	28.3	28.3	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.3	28.3	28.3	28.3	28.3	28.5
17-Jan	28.3	28.3	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	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.6
18-Jan	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.6	28.5	28.6
19-Jan	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	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	28.8	29.0
20-Jan	29.0	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	29.1	29.1	29.1	29.1	29.1	29.1	29.2
21-Jan	29.0	29.0	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.6	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.6	29.0
22-Jan	28.4	28.4	28.4	28.4	28.4	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.8	28.5	28.8
23-Jan	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	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.7	28.8
24-Jan	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.7
25-Jan	28.6	28.6	28.6	28.6	28.5	28.4	28.4	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.6
26-Jan	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.9	28.9	28.9	28.7	28.9
27-Jan	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.1	29.1
28-Jan	29.0	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	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	29.3	29.5
29-Jan	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.5
30-Jan	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.5	29.7
31-Jan	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	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.6	29.7
	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	Diurnal Average	
	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.9	29.9	29.9	29.9	29.8	29.8	29.8	Diurnal Maximum	

WBEA

Hourly Averages

Barometric Pressure (BP) - inHg

Shell Muskeg River - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Shell Muskeg River - January 2015

Maximum Speed: 28 km/h on Jan 16 22:00

Maximum Daily Speed Average: 18.1 km/h on Jan 27

Minimum Speed Value: 0 km/h on Jan 24 03:00

Minimum Daily Speed Average: 1.0 km/h on Jan 29

Maximum Diurnal Speed Average: 1.8 km/h at hour 9

Minimum Diurnal Speed Average: 0.2 km/h at hour 22

Monthly Average Velocity: 0.5 km/h 117.9 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 6 Median = 9 Q_3 = 13 P_{90} = 18 P_{99} = 23

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Percent Operational Time:	96.0

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-Jan	ENE14	NE15	NE15	NE7	NE4	E3	NW2	SE2	ENE6	ENE6	NNW4	NNE4	N13	NNE21	NE20	NE15	N14	NNE13	ENE5	SSW5	S5	SSE3	SSW2	NNE5	NE6.5	NNE21
2-Jan	ENE7	ENE4	ENE1	NNE10	NE11	ENE4	S3	SSW6	SSE4	S2	SSE3	SSW4	SE4	SSE4	SE4	E7	ESE2	SW3	SSW3	SSW4	SE3	SW4	NE1	NNE11	ESE1.7	NNE11
3-Jan	NNE12	NNE13	NNE11	NNW9	W6	WNW8	NW11	W4	W5	W5	SW7	SW7	SW6	WSW8	WSW9	SW8	SSW7	SSW9	SW10	WSW10	SW8	SW11	SSW8	SW11	WSW4.8	NNE13
4-Jan	SSW7	S6	SSW9	SSW10	SSW11	SSW12	S9	S9	S9	S12	S10	SSW14	SSW18	SSW14	SSW14	SSW13	SSW12	SSE10	SW14	SSW16	SW23	SW16	SW12	SW15	SSW11.7	SW23
5-Jan	SSW9	SSW9	SSW9	S7	S6	S6	S4	SSW4	W6	NW10	NW12	NNW9	NNW11	NNW12	NNW13	NNW13	NW11	WNW12	NW10	NNW8	NNW14	NNW12	NNE16	NE11	NW5.1	NNE16
6-Jan	NE9	ENE6	SE1	ESE1	ESE2	S4	SW3	SSW6	S5	S6	S7	S4	S4	SSE4	S5	S5	SSW6	SSW7	SSW7	SSW8	S9	SSW9	S9	S10	S4.4	S10
7-Jan	S9	S9	S11	SSW9	SSW7	SW8	SSW8	SSW8	SSW5	SW5	WSW7	SW8	WSW7	W3	NW3	E3	NNE4	NNE14	NE22	NNE22	NNE16	N13	N16	N22	NNW1.9	NE22
8-Jan	N13	SW0	WSW4	NW7	NW16	NW17	NW16	WNW11	WNW10	WNW10	WNW12	WNW10	WNW10	WNW8	WNW9	W11	W14	W12	S7	SSW8	SW10	SW10	SSW10	S9	W7.4	NW17
9-Jan	S8	S9	S9	S8	S8	S11	S10	S9	S9	S7	S9	S9	S8	S8	SSE1	NE15	NE10	WNW3	NW5	N13	N20	N19	N15	NNE19	SE1.2	N20
10-Jan	ENE13	E10	SSW3	SW2	SSE3	SSW4	S6	S7	S9	S8	S7	SSW9	S11	S9	S8	SSW7	SSW8	SSW8	S6	S6	SSW6	S6	SSW7	SSW7	S5.7	ENE13
11-Jan	SSW8	S7	S6	SSE5	SSW7	SSW5	S5	SSW6	SSW6	S7	SSW7	SSW5	SSW5	S9	S10	S10	SSW10	SSW9	S9	SSW9	SSW9	SW12	SSW8	SSW8	SSW7.4	SW12
12-Jan	SSW8	SSW11	SW12	SSW6	S6	SSW8	SSW7	S5	S3	SSW4	SW4	SSW4	SSW4	S5	S5	SSE4	SSE5	S7	S8	S9	S9	S11	S8	S7	SSW6.3	SW12
13-Jan	SSW3	SSE3	NNW5	NE17	NNE14	NNE15	NNE12	NNW7	NE8	ENE9	NE16	NE13	ENE9	E6	ENE6	ENE6	NE7	NE7	NE2	NW1	NNE1	NW3	WSW2	WSW9	NE5.6	NE17
14-Jan	SSW8	S9	SSW11	SSW11	SSW2	NNE1	NNE12	NNE19	NE19	NE18	NE16	NE15	NE16	NE18	NE17	NE18	NE22	NE20	NE19	NE17	NE17	NNE18	NE15	NE17	NE11.5	NE22
15-Jan	ENE11	NE14	ENE10	NE13	NE15	NE11	NE13	ENE11	ENE8	NE13	ENE8	NE5	ENE5	WNW3	NE1	ENE3	ENE2	SE7	SSE10	SSE9	SSE11	SSE13	SSE11	S13	E5.6	NE15
16-Jan	S12	S14	S12	S12	S14	S12	S12	S13	SSW10	SW14	SW10	SSW11	SSW14	SSW14	SSW8	SW13	SW17	SW10	SW14	WSW15	SW26	WSW28	WSW19	WSW14	SSW12.8	WSW28
17-Jan	W21	WSW20	WSW18	WSW14	N8	NE19	NE16	NE16	NE19	NE20	NE15	NE15	NE10	NE7	NE10	NE9	ENE7	ENE6	E3	S3	WSW4	WSW4	SSW4	S5	NNE4.1	W21
18-Jan	SSW7	SSW8	SSW7	SSW8	SSW7	SSW8	SSW8	SSW8	S9	S8	S6	SSW8	SSW11	SSW10	SSW12	S9	SSW10	S8	S8	S7	S6	SSW5	SSW7	SSW5	SSW7.9	SSW12
19-Jan	SW4	NNE1	NE3	ENE5	ENE3	NNW4	NNE6	NE8	NE9	NE8	NE8	NNW3	N5	N4	NNE6	NE10	NNE11	N6	NNE6	NNE7	NE7	NE8	NE9	NE10	NNE5.6	NNE11
20-Jan	NE7	NNW2	N3	NNE5	NNE5	NE6	ENE1	SE2	SSW2	SW2	SW1	SW4	SSW5	SW6	SSW8	SSW6	S8	S8	S9	S10	S9	S8	S8	S10	S3.2	S10
21-Jan	SSW11	S12	SSW10	SSW7	SSW7	WSW3	SW4	SSW9	S15	S14	SSW12	SSW14	S15	SSW18	SSW19	SSW19	SW21	SW22	SW14	SSW9	SSW7	S7	S7	SSW6	SSW11.4	SW22
22-Jan	SSW7	SW11	SW11	SSW9	S10	S9	S8	WSW14	W6	WSW11	W9	SSW9	WSW18	W25	WSW21	WSW19	SW15	WSW19	WSW21	NNW10	NE20	NE21	NE18	NE18	WSW6.6	W25
23-Jan	NE14	NE15	ENE8	NE9	ENE6	NE7	ENE8	ENE3	NE2	SE1	NNW2	N2	S1	WSW4	SSW6	SW6	SSE3	SSE3	S4	SSE2	SW2	S3	ESE2	SSW1	ENE2.3	NE15
24-Jan	AF	E1	SSE0	NNE3	N4	AF	AF	AF	AF	AF	AF	NE6	NE8	NE5	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NE8
25-Jan	AF	AF	AF	SSW9	S10	SSE10	S12	SSW11	SSW9	SW17	SW16	SW14	SW15	W14	WNW8	NW9	ENE11	ENE10	ENE11	ENE12	ENE8	ESE3	S4	SSW5	SSW4.2	SW17
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	S5	SSW6	SW7	WSW4	NNE5	NNE17	NE22	NNE23	NNE24	NNE21	NNE24	NNE20	NNE19	NNE19	----	NNE24
27-Jan	NNE21	NNE20	NNE22	NNE21	NNE24	NNE20	NNE20	NNE17	NE17	NE15	ENE13	ENE16	NE16	NE17	NE19	NE19	NE16	NE20	NE20	NNE16	NE19	NE19	NNE20	NNE18	NE18.1	NNE24
28-Jan	NNE18	N13	N9	N7	N5	NNE14	NNE14	NE7	NE8	N7	NNW9	N4	W4	W4	S2	ENE7	ENE13	ENE11	ENE11	ENE8	ENE9	ESE4	ESE2	SE3	NE6.1	NNE18
29-Jan	SSW3	S3	S3	SSE2	SE4	S5	S7	SSE9	SSE7	SSE7	S6	SSW6	WSW5	W4	WNW3	NW4	NNW5	NW4	NNW6	NNE12	NNE14	NNE16	NNE14	NNE15	NE1.0	NNE16
30-Jan	NNE17	NNE19	NE20	NE21	NE21	NNE20	NNE19	NE18	NE14	NE15	NNE19	NNE20	NNE20	NE19	NE17	NE20	NNE20	NNE19	NE17	NE14	ENE10	NE9	NNE14	SE1	NE16.5	NE21
31-Jan	S5	SSW4	S5	S5	S6	S8	S8	S7	S8	SSW7	S6	S8	S10	S8	S7	S7	S8	S6	S8	S7	S7	S9	S8	SSW8	S7.1	S10
	E1.6	ESE1.3	S1.2	E0.6	E1.0	ENE0.9	ENE1.0	SSE1.5	SE1.8	SSE1.0	SSW0.5	S1.4	SW1.7	SW1.7	SSW0.7	NE0.8	NE1.1	ENE0.7	ESE0.8	ENE0.8	NE0.9	NNE0.2	NE1.0	NE1.1	Diurnal Average	
	NNE21	WSW20	NNE22	NNE21	NNE24	NNE20	NNE20	NNE19	NE19	NE20	NNE19	NNE20	NNE20	W25	WSW21	NE20	NE22	NNE23	NNE24	NNE22	SW26	WSW28	NNE20	N22	Diurnal Maximum	

AF - Analyzer Failure

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Jan 26 16:00

Minimum Value: 1 km/h on Jan 5 08:00

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:	714
Hours of Missing Data:	30
Hours of Calibration:	0
Percent Operational Time:	96.0

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

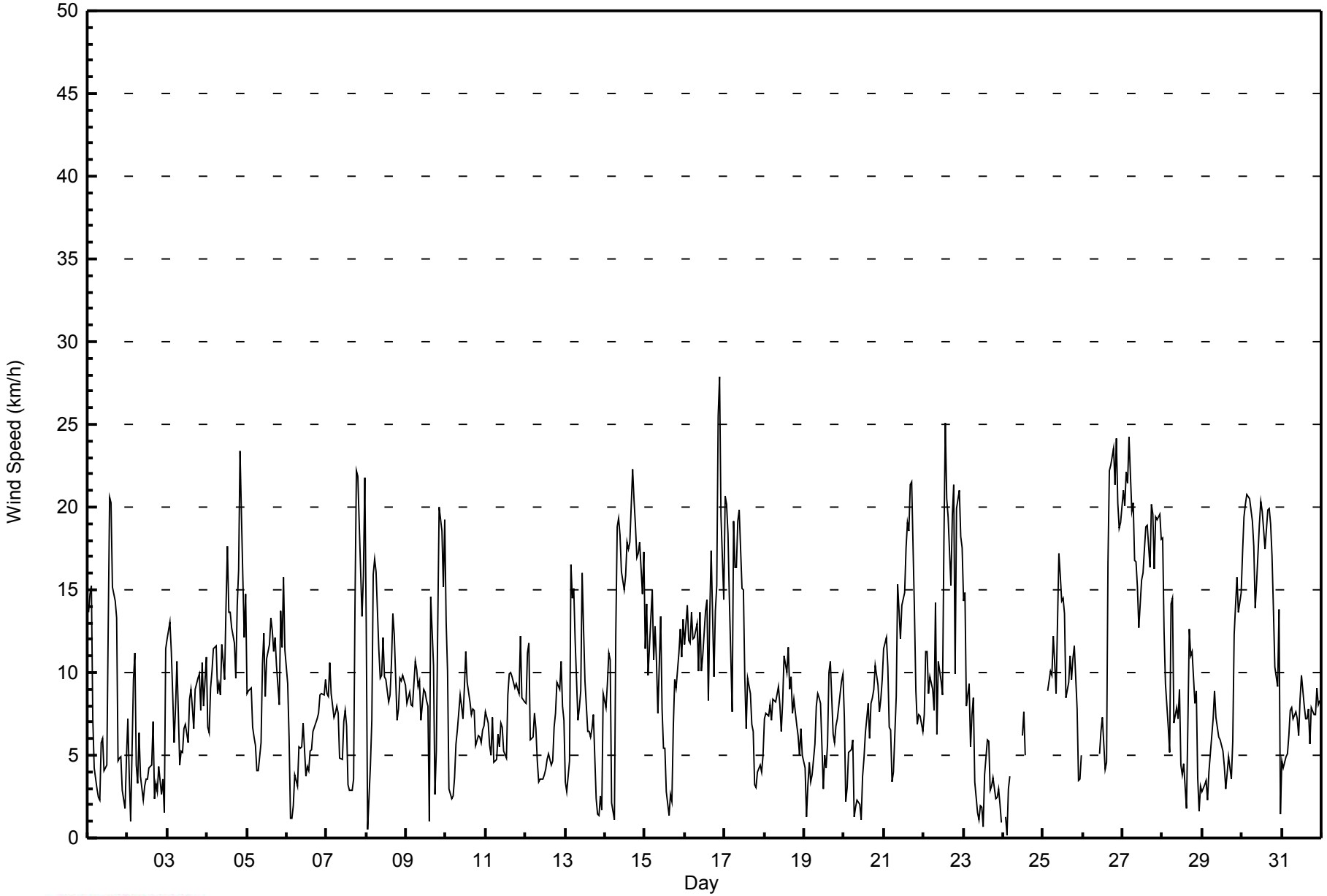
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	173	24.23	24.23
6 - 11	326	45.66	69.89
12 - 19	170	23.81	93.70
20 - 28	45	6.30	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Shell Muskeg River - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	7	10	7	12	4	7	10	16	29	27	12	8	7	3	7	7	173
6 - 11	4	9	31	28	3	0	1	9	100	88	18	7	5	9	6	8	326
12 - 19	9	33	51	6	0	0	0	1	15	16	16	9	3	2	4	5	170
20 - 28	2	19	14	0	0	0	0	0	0	0	4	4	2	0	0	0	45
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	71	103	46	7	7	11	26	144	131	50	28	17	14	17	20	714

Total Number of Valid Hours: 714

Total Number of Hours: 744

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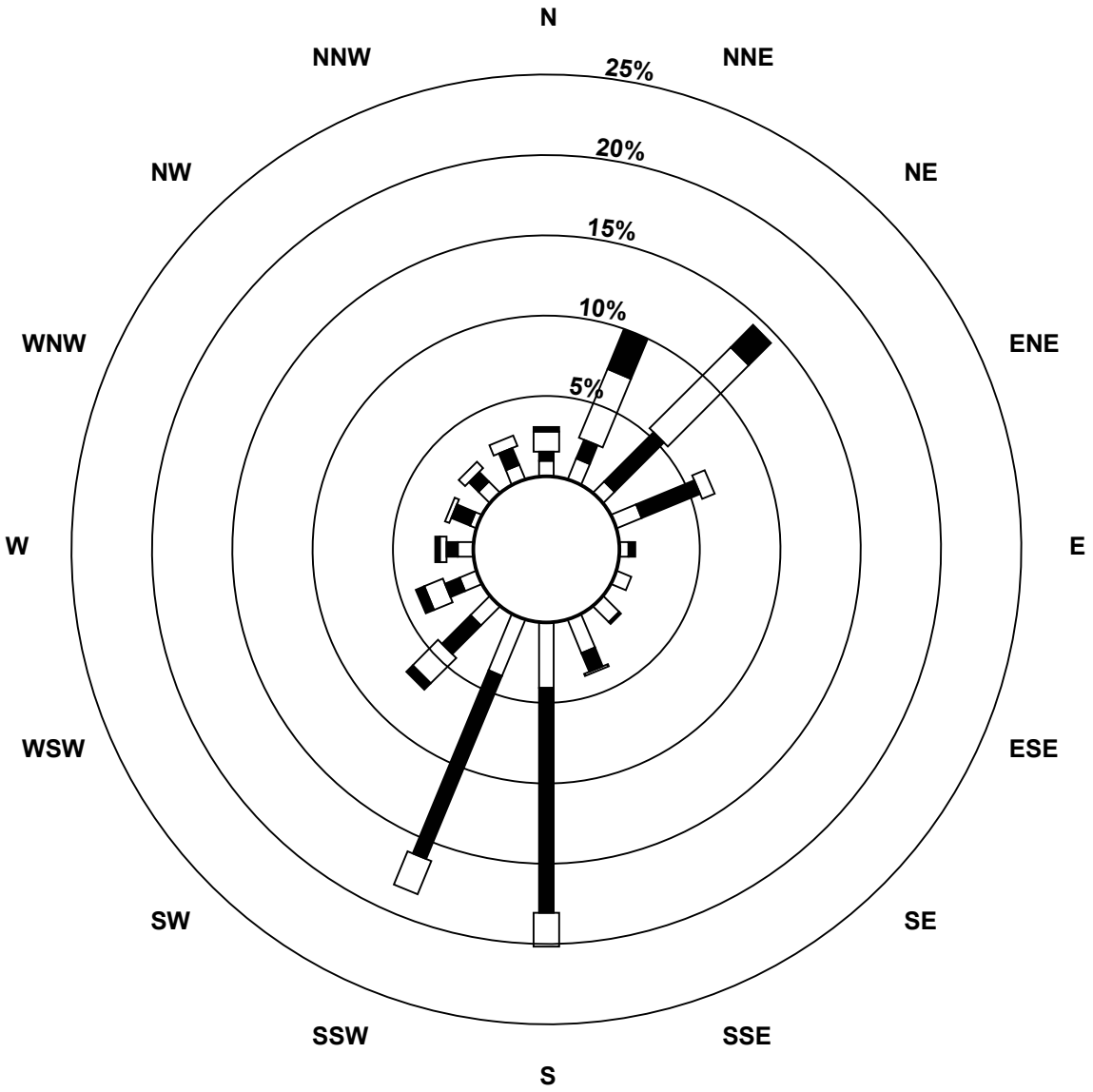
ATMOSPHERICS INC.

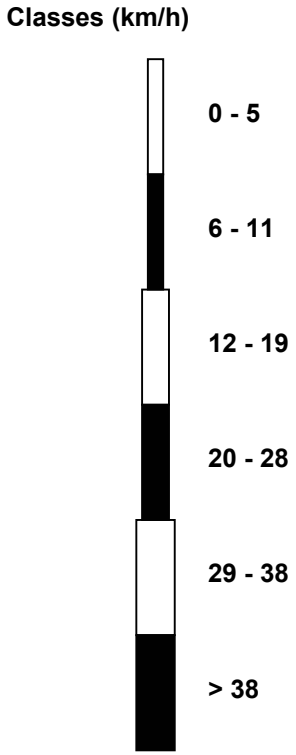
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Shell Muskeg River (AMS 16)





Total Number of Valid Hours: 714

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Shell Muskeg River - January 2015

Direction of Maximum Speed: 238 deg on Jan 16 22:00
Direction of Maximum Daily Speed Average: 35.4 deg on Jan 27

Direction of Minimum Speed: 147 deg on Jan 24 03:00

Direction of Minimum Daily Speed Average: 1.0 deg on Jan 29

Monthly Average Direction: 212.4 deg

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Percent Operational Time:	96.0

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-Jan	65	55	47	54	46	98	312	142	76	73	347	30	352	17	34	37	8	29	62	200	191	152	211	31	38.6
2-Jan	71	70	75	17	40	73	187	204	162	186	161	192	135	147	125	95	111	218	204	199	137	221	46	12	104.2
3-Jan	19	24	13	341	281	284	305	264	265	270	229	230	222	237	244	236	195	212	229	243	217	229	211	233	256.5
4-Jan	212	183	192	201	210	208	185	184	187	190	190	206	205	192	200	203	199	168	221	211	223	222	223	236	205.1
5-Jan	202	211	206	188	180	175	170	197	267	304	313	329	343	333	338	331	314	300	314	331	342	348	22	47	317.4
6-Jan	40	64	145	117	123	180	222	198	186	189	183	181	184	160	181	191	205	192	200	201	189	194	184	184	182.8
7-Jan	186	180	188	203	202	215	206	208	201	224	256	225	248	269	326	87	27	14	36	26	13	358	358	5	342.8
8-Jan	6	227	249	312	311	308	308	296	290	284	290	285	296	291	283	274	275	262	185	206	222	214	202	179	278.4
9-Jan	191	185	177	179	178	180	179	174	181	182	177	175	182	177	166	43	43	300	305	353	2	1	7	31	127.5
10-Jan	70	88	210	232	161	194	178	182	191	176	189	192	191	188	191	192	193	192	174	180	193	182	195	199	179.9
11-Jan	197	183	172	167	199	193	177	197	198	180	197	209	213	187	181	187	206	198	190	200	213	215	207	192	195.1
12-Jan	198	213	222	211	177	198	199	189	185	201	220	202	199	183	173	167	164	190	185	184	183	190	185	177	192.8
13-Jan	192	157	345	35	19	22	17	346	54	64	55	55	57	82	66	62	52	46	44	308	23	306	239	238	39.3
14-Jan	198	189	198	207	209	32	31	31	46	41	44	42	38	44	42	42	44	47	47	41	38	31	46	44	44.4
15-Jan	64	51	61	55	52	52	50	66	70	42	59	56	72	286	49	68	68	138	163	167	168	166	166	173	85.9
16-Jan	175	180	175	174	176	177	183	182	195	226	227	204	211	205	201	225	229	216	226	240	234	238	238	249	212.0
17-Jan	263	248	257	249	357	41	47	48	45	46	46	42	44	45	49	51	66	63	99	173	247	248	199	178	28.2
18-Jan	193	200	193	204	200	207	206	192	186	190	191	194	198	196	198	184	194	190	189	182	177	193	196	196	194.0
19-Jan	214	28	50	75	57	336	25	42	53	48	40	345	4	354	20	35	21	11	15	23	40	46	44	47	32.9
20-Jan	46	348	350	17	20	34	74	141	205	218	221	215	208	214	197	208	176	187	181	181	180	184	191	191	185.8
21-Jan	192	190	194	202	204	238	220	194	186	191	195	192	190	199	208	213	224	225	215	196	199	169	185	193	201.5
22-Jan	208	220	216	193	183	188	189	248	270	238	260	199	247	264	247	239	224	239	255	331	37	45	36	44	244.9
23-Jan	54	49	71	50	70	54	58	76	38	146	342	355	186	247	198	215	163	157	176	153	219	176	105	209	77.8
24-Jan	AF	97	147	13	11	AF	AF	AF	AF	AF	AF	50	48	53	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
25-Jan	AF	AF	AF	196	177	161	187	201	212	223	227	224	228	269	287	314	59	61	69	70	73	115	181	201	202.5
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	184	199	221	245	25	19	37	32	26	27	25	21	14	17	--
27-Jan	23	19	19	25	27	21	29	27	38	56	59	60	55	47	46	42	37	44	40	26	46	37	33	26	35.4
28-Jan	22	7	359	353	351	29	27	54	50	352	346	7	279	262	184	62	67	71	66	75	71	105	122	131	34.4
29-Jan	212	184	171	161	146	178	170	164	161	166	170	194	257	262	291	309	335	318	343	32	19	23	16	17	34.4
30-Jan	32	25	48	36	38	26	33	40	51	40	31	28	32	42	42	34	33	32	52	56	63	46	28	146	37.5
31-Jan	189	202	191	183	186	183	188	181	185	198	179	187	185	178	182	183	177	176	176	185	177	183	190	192	184.5
	80.4	123.2	174.7	99.4	81.6	75.5	77.5	151.7	131.2	160.4	204.4	181.2	218.9	234.2	205.1	33.8	52.3	66.6	112.2	75.0	52.9	13.7	42.3	48.6	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Jan 14 05:00

Minimum Value: 5 deg on Jan 8 10:00

Percentiles: P_1 = 6 P_{10} = 11 Q_1 = 13 Median = 17 Q_3 = 23 P_{90} = 44 P_{99} = 90

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Hours of Calibration:	0
Percent Operational Time:	96.0

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	Maximum
1-Jan	12	13	7	28	57	40	70	47	36	44	54	38	20	18	16	18	20	25	52	31	14	40	83	87	87
2-Jan	36	82	96	33	28	61	48	14	54	40	20	19	35	23	24	13	80	17	42	22	34	46	95	23	96
3-Jan	21	19	23	18	31	13	11	44	42	34	17	15	26	12	8	24	16	23	11	11	18	17	16	15	44
4-Jan	26	15	10	16	18	14	14	18	21	17	22	23	19	19	17	18	18	17	13	16	7	13	14	16	26
5-Jan	22	16	17	21	17	16	14	19	29	16	16	26	17	22	20	21	18	12	14	17	16	26	20	19	29
6-Jan	20	67	62	91	59	31	44	19	12	9	13	23	23	24	17	14	13	16	13	11	12	11	13	15	91
7-Jan	16	12	13	17	21	12	16	17	21	21	13	21	24	35	41	27	49	26	17	14	22	22	21	20	49
8-Jan	21	91	31	51	13	11	11	11	9	5	10	15	19	15	14	9	6	9	19	16	12	16	17	13	91
9-Jan	14	13	11	9	11	12	12	9	13	10	13	16	19	18	86	8	19	94	62	22	18	18	19	18	94
10-Jan	13	17	49	68	32	10	13	17	13	12	19	19	19	19	17	18	17	15	14	15	13	12	10	12	68
11-Jan	14	14	17	23	14	22	15	12	15	14	15	18	20	17	15	16	14	14	15	17	15	15	13	14	23
12-Jan	14	9	13	37	27	22	19	20	23	20	15	23	24	23	18	19	29	18	17	15	13	15	18	15	37
13-Jan	51	36	60	13	20	19	27	32	51	17	8	10	12	27	16	10	12	7	42	70	63	78	80	23	80
14-Jan	22	20	21	48	100	94	29	12	7	12	11	12	13	8	10	12	9	9	9	12	14	14	12	6	100
15-Jan	13	13	19	15	15	19	16	23	22	11	18	16	20	55	75	64	62	30	15	18	15	14	15	15	75
16-Jan	16	15	15	18	16	16	16	15	21	17	18	17	17	16	26	10	7	15	11	7	6	6	8	11	26
17-Jan	8	9	11	9	64	8	8	7	7	6	12	8	17	29	12	24	25	23	69	40	28	14	28	17	69
18-Jan	18	18	16	15	14	13	13	16	15	18	21	20	18	19	16	15	12	18	16	22	10	12	15	17	22
19-Jan	21	69	58	20	86	37	42	14	13	9	14	34	30	28	26	14	14	21	19	18	14	11	11	8	86
20-Jan	15	62	56	30	23	24	93	38	45	42	42	21	23	22	26	39	20	16	15	14	16	20	18	18	93
21-Jan	17	14	16	18	16	42	22	19	16	18	19	17	17	18	18	15	10	9	16	25	42	17	16	23	42
22-Jan	27	17	9	19	13	15	22	11	23	12	18	21	15	10	8	7	7	9	8	58	15	9	13	12	58
23-Jan	14	8	29	25	29	22	20	67	75	76	74	49	84	29	28	24	28	22	25	29	29	26	34	67	84
24-Jan	AF	74	91	32	28	AF	AF	AF	AF	AF	AF	12	11	13	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	91
25-Jan	AF	AF	AF	17	14	16	18	16	15	8	6	8	13	15	13	16	15	14	15	12	23	29	34	22	34
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	47	23	14	21	39	18	14	13	12	15	12	16	19	18	47
27-Jan	18	19	19	19	11	19	15	15	15	15	16	11	14	10	12	14	19	11	13	15	10	17	13	13	19
28-Jan	15	20	20	29	39	21	15	77	60	36	21	63	58	20	82	20	12	12	10	11	11	36	47	22	82
29-Jan	25	23	11	20	17	13	14	13	14	15	18	27	24	18	34	30	27	41	39	24	17	18	21	19	41
30-Jan	17	17	12	12	12	13	13	14	17	22	17	13	13	16	16	14	12	13	16	17	50	24	16	85	85
31-Jan	18	24	16	14	14	11	12	10	13	16	18	22	19	22	20	16	13	13	9	15	11	12	14	13	24
	51	91	96	91	100	94	93	77	75	76	74	63	84	55	86	64	80	94	69	70	63	78	95	87	
	Diurnal Maximum																								

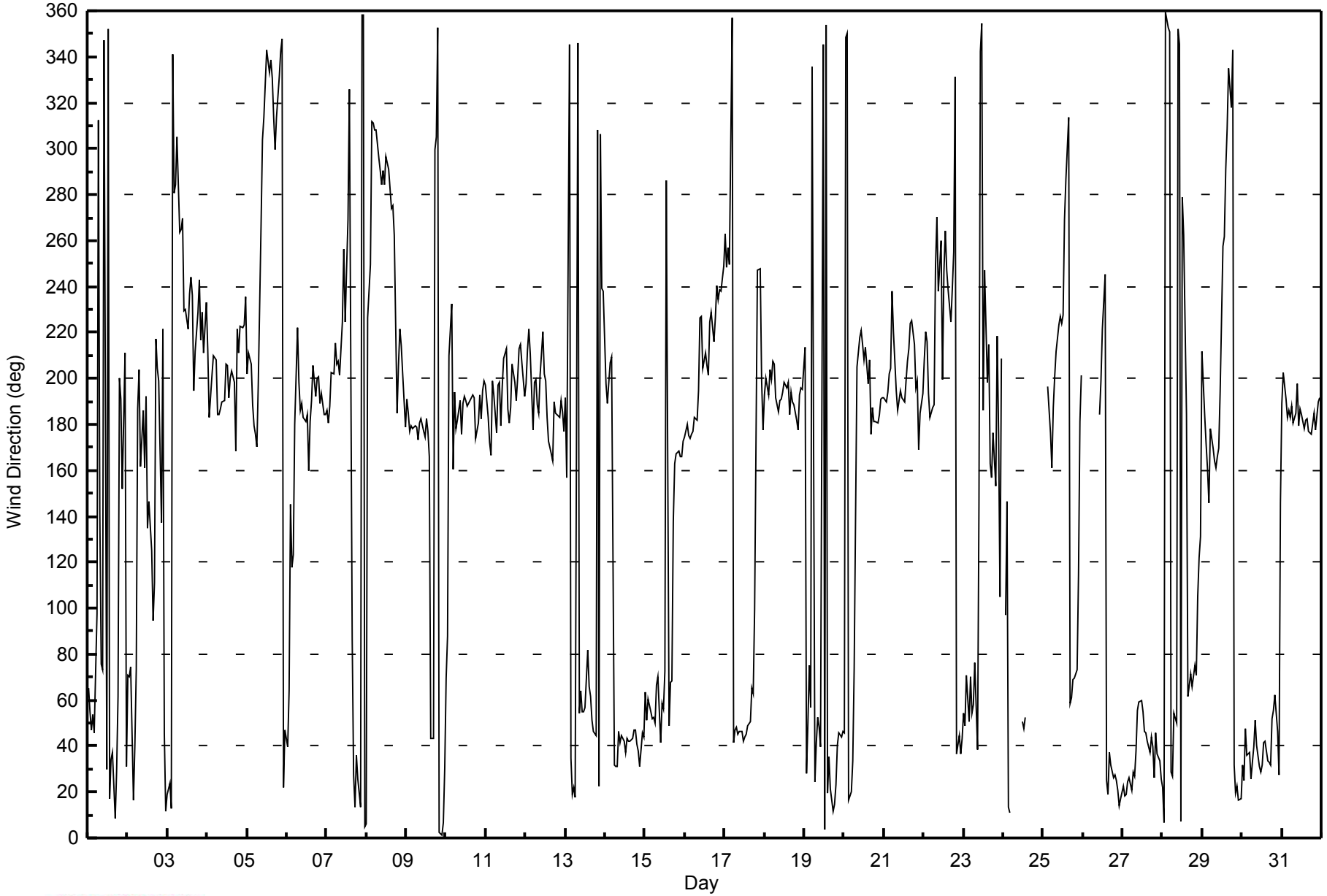
AF - Analyzer Failure

WBEA

Hourly Averages

Wind Direction (WD) - deg

Shell Muskeg River - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 23, 2015	Previous Calibration	December 3, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16

Reason: Routine

Start Time (MST)	11:00	End Time (MST)	15:45
Barometric Pressure	728 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11081107
Cal Gas Concentration	50.8 ppm	Cal Gas Expiry Date	41788
Gas Cert Reference	LL107937		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2632
DACS voltage range	ethernet connection	DACS channel #	192.168.1.43

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-710	-710
Analyzer Range (mv)	1000	1000	Lamp voltage	823	820
Calculated slope	0.996728	0.999518	Chamber temp.	45.0	45.0
Calculated intercept	2.756477	2.959197	Pressure (mmHg)	709.0	708.7
Analyzer Background	6.1	6.1	Flow (lpm)	0.445	0.447
Analyzer Coefficient	1.253	1.253	Intensity	90	90

Analyzer make	Thermo 43i	Analyzer serial #	1118148498

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.2	NA
as found span	5000	78.7	799.6	798.1	1.002
calibrator zero	5000	0.0	0.0	0.2	NA
high point	5000	78.7	799.6	799.4	1.000
second point	5000	39.4	400.3	393.3	1.018
third point	5000	19.7	200.2	196.0	1.021
calibrator zero					
as left zero	5000	0.0	0.0	0.4	NA
as left span	5000	78.7	799.6	801.2	0.998
				Average Correction Factor	1.013

Corrected As found	798.0	Previous response	799.5	% change	0.2%

Notes:

no adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

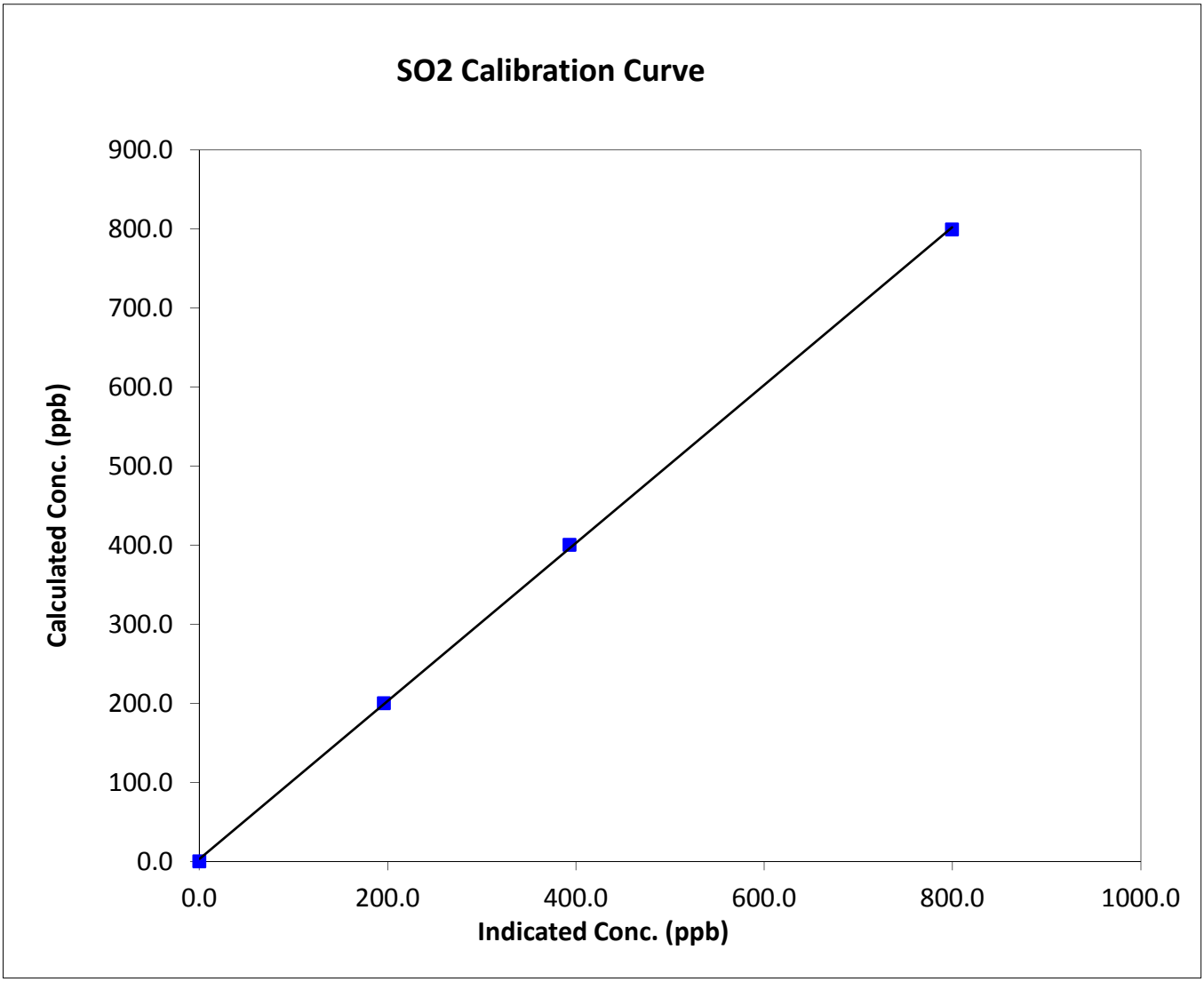
SO_2 Calibration Summary

Station Information

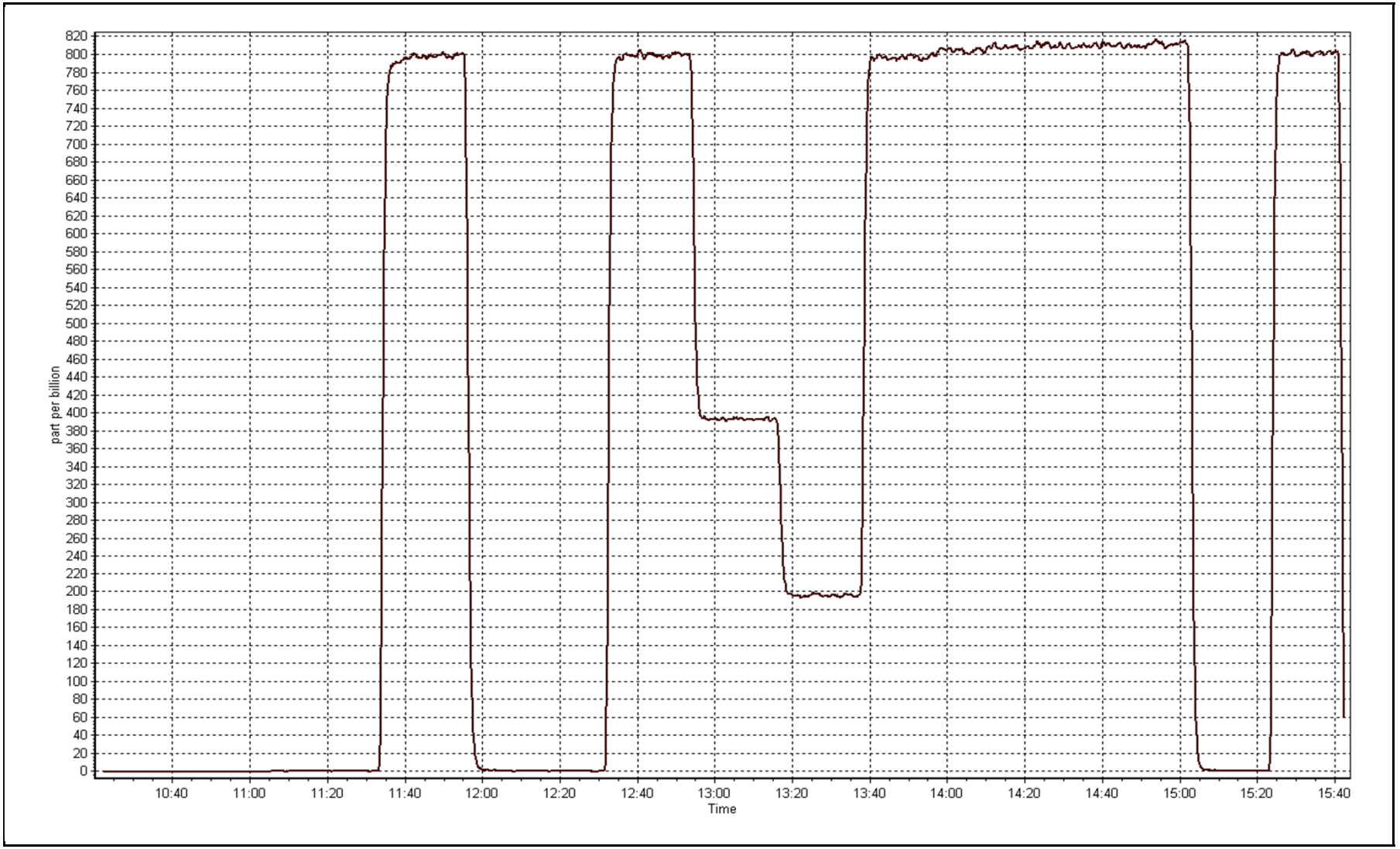
Calibration Date	January 23, 2015	Previous Calibration	December 3, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	11:00	End Time (MST)	15:45
Analyzer make	Thermo 43i	Analyzer serial #	1118148498

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999898
799.6	799.4	1.0002		
400.3	393.3	1.0179	Slope	0.999518
200.2	196.0	1.0212		
			Intercept	2.959197



SO2 Calibration Plot Date: January 23, 2015



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-23-15	Previous Calibration	December-03-14
Station Name	Shell Muskeg River	Station Number	AMS 16
Reason:	Routine		
Start Time (MST)	11:00	End Time (MST)	15:45
Barometric Pressure	728 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11081107
Gas Cert Reference	LL107937	Cal Gas Expiry Date	41788
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1078.8 ppm
C3H8 Cal Gas Conc.	205 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2632
DACS voltage range	ethernet connection	DACS channel #	192.168.1.51

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.2	8.2
Analyzer Range (mv)	25	25	Air or Bypass press	34.9	34.9
Calculated slope	1.001500	1.001029	Fuel Pressure	24.2	24.2
Calculated intercept	0.000693	-0.017574	Flame	157.3	157.1

Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153485

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.11	N/A
as found span	5000	78.7	16.98	17.30	0.981
calibrator zero	5000	0.0	0.00	0.03	N/A
high point	5000	78.7	16.98	17.00	0.999
second point	5000	39.4	8.50	8.46	1.005
third point	5000	19.7	4.25	4.28	0.993
calibrator zero					
as left zero	5000	0.0	0.00	0.03	N/A
as left span	5000	78.7	16.98	16.87	1.006
				Average Correction Factor	0.999

Corrected As found	17.19	Previous response	16.95	% change	-1.4%

Notes:

Adjusted zero and span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

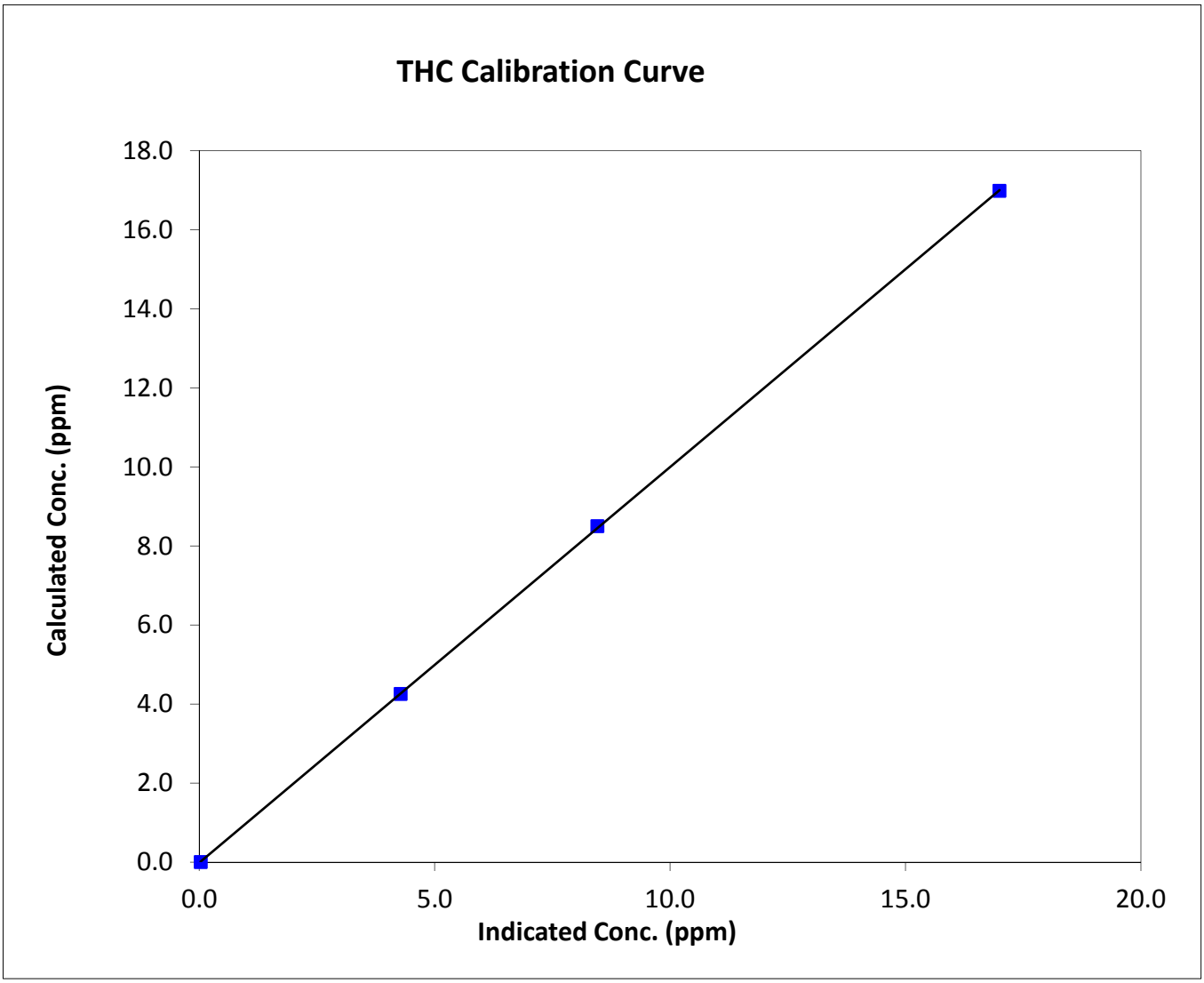
THC Calibration Summary

Station Information

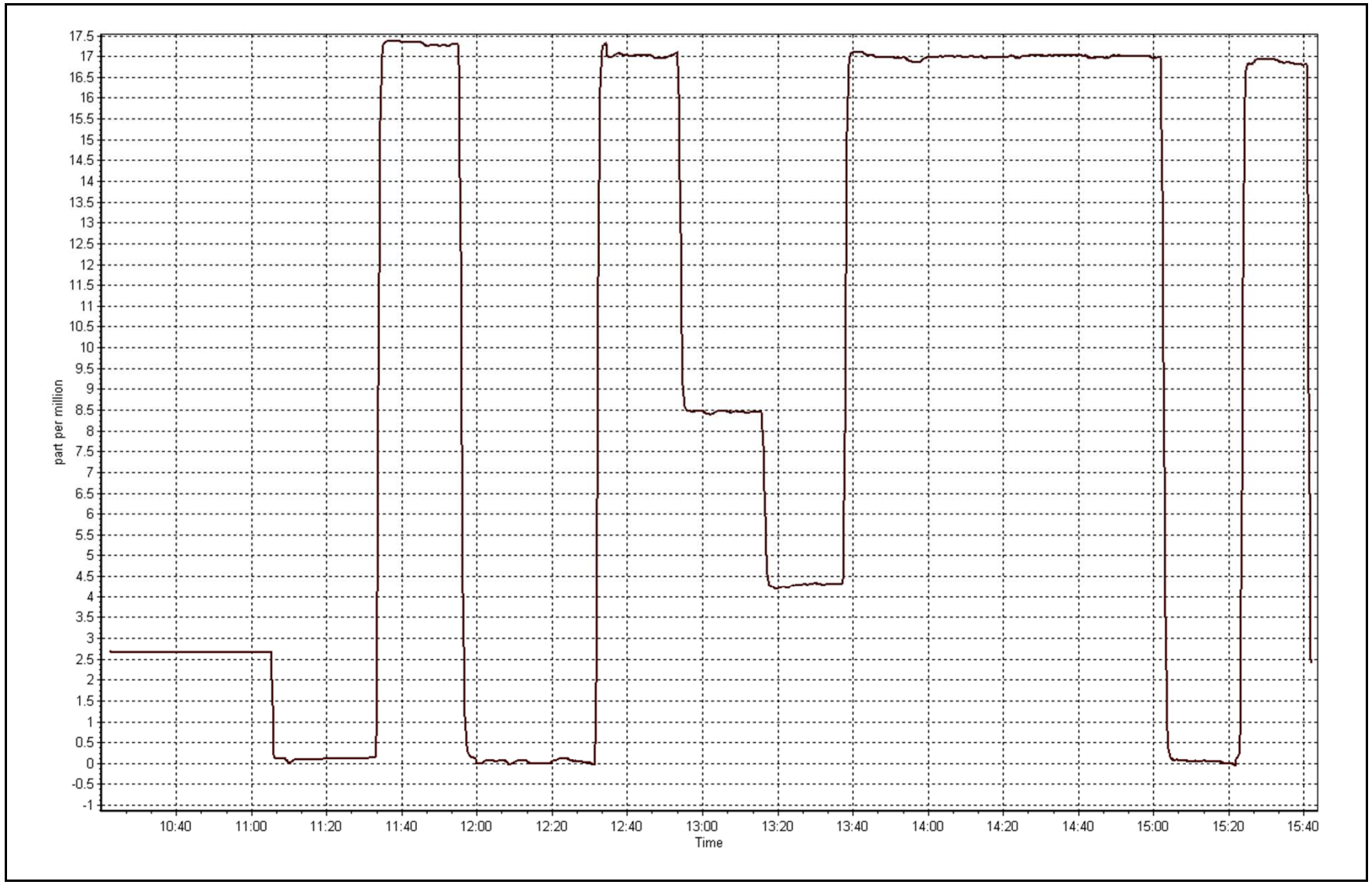
Calibration Date	January 23, 2015	Previous Calibration	December 3, 2014
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	11:00	End Time (MST)	15:45
Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153485

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.03	N/A	Correlation Coefficient	0.999979
16.98	17.00	0.9988		
8.50	8.46	1.0048	Slope	1.001029
4.25	4.28	0.9931		
			Intercept	-0.017574



THC Calibration Plot Date: January 23, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 23, 2015	Previous Calibration	NA
Station Name	Shell Muskeg River	Station Number	AMS 16
Reason:	Install		
Start Time (MST)	11:00	End Time (MST)	15:45
Barometric Pressure	728 mmHg	Station Temperature	21.0 Deg C
Calibrator	SABIO 4010	Serial Number	11081107
NO Cal Gas Conc	51.2 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	51.3 ppm	Cal Gas Serial #	LL107937

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2632

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	NA	NA	NA
	Data Offset	NA	NA	NA
After	Data Slope	0.999183	0.998965	0.993478
	Data Offset	2.521607	2.558253	-1.137247
IP address		192.168.1.42		

Analyzer Information

Analyzer make/model	Thermo 42i	Analyzer serial #	1426262593

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	NA	ppb	0.844	ppb
NOX coefficient	NA	ppb	0.999	ppb
NO2 coefficient	NA	ppb	1.000	ppb
NO bkgrnd	NA		8.8	
NOX bkgrnd	NA		8.9	
	NA			
Chamber Temp	NA	Deg C	50.5	Deg C
Moly Temp	NA	Deg C	322.6	Deg C
PMT Temp	NA	Deg C	-2.7	Deg C
O3 flow	NA	ccm	ok	ccm
R Cell Press	NA	mmHg	169.2	mmHg
Sample Flow	NA	ccm	829	ccm

Notes:

installed to replace API T200 that went to shop for servicing.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 23, 2015 Station Number: AMS 16

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero										
as found span										
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.2	0.0	N/A	N/A
high point	5000	78.7	807.5	805.9	1.6	807.6	806.2	1.3	0.9998	0.9996
second point	5000	39.4	404.2	403.5	0.8	398.6	397.7	0.8	1.0143	1.0145
third point	5000	19.7	202.1	201.7	0.4	198.6	198.2	0.4	1.0177	1.0176
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.0	N/A	N/A
as left span	5000	78.1	801.3	497.9	303.5	801.7	497.1	304.5	0.9995	1.0014
							Average Correction Factor		1.0106	1.0106

Corrcted As found NO_X= NA NO= NA Percent Change NO_X= N/A NO= N/A

Previous Response NO_X= NA NO= NA

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.70 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.0			N/A	
1st NO2 (300)	N/A	497.9	307.7	807.8	497.9	309.9	0.9842	1.0000	0.9929	100.7%
2nd NO2 (200)	N/A	598.2	207.3	808.7	598.2	210.5	0.9830	1.0000	0.9850	101.5%
3rd NO2 (100)	N/A	698.9	106.7	808.9	698.9	110.0	0.9827	1.0000	0.9697	103.1%
4th NO2 (0)	805.6	N/A	1.1	806.6	805.6	1.1	0.9855	1.0000	N/A	N/A
					Average Correction Factor		0.9839	1.0000	0.9826	101.8%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

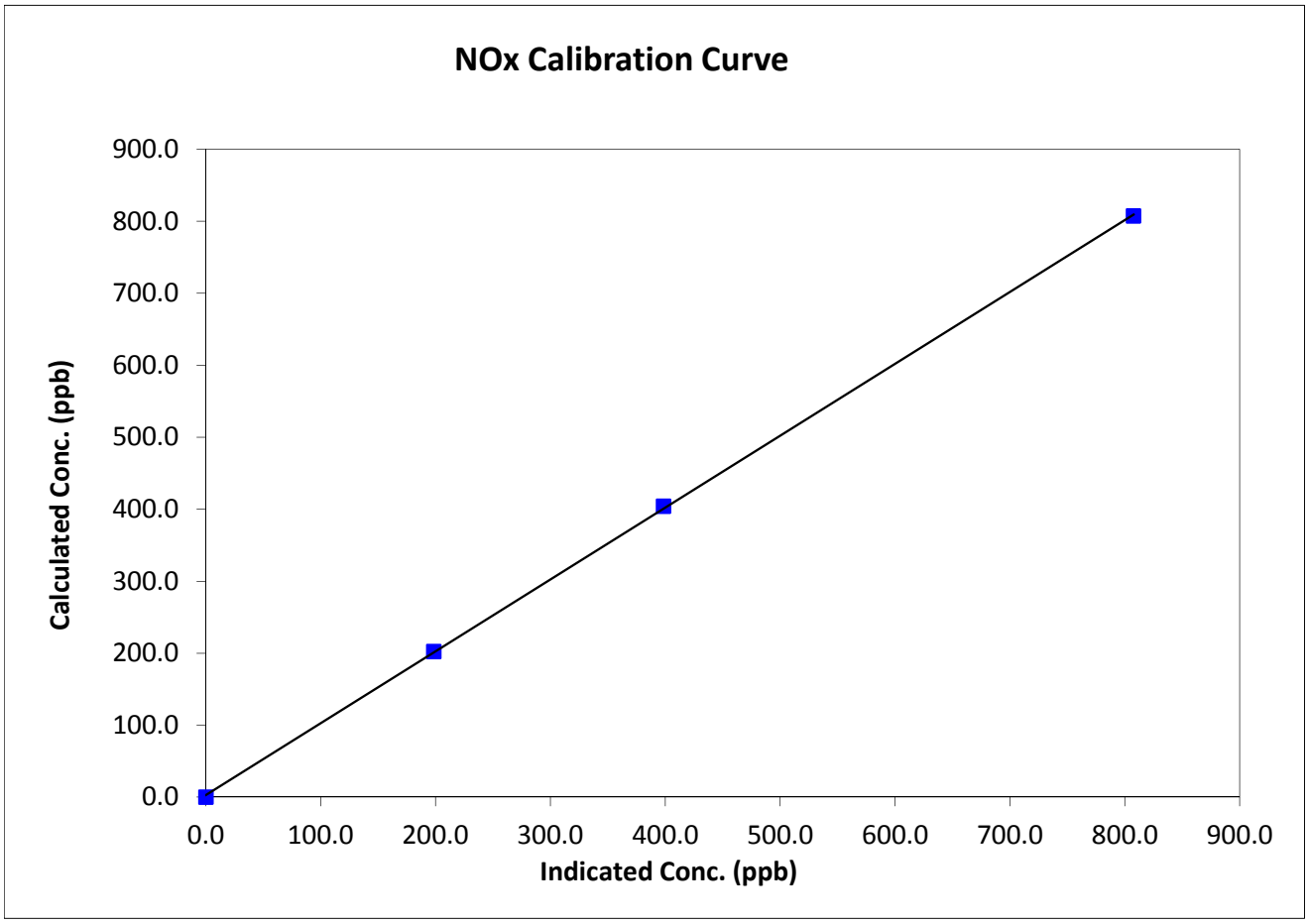
NO_X Calibration Summary

Station Information

Calibration Date	January 23, 2015	Previous Calibration	NA
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	11:00	End Time (MST)	15:45
Analyzer make	Thermo 42i	Analyzer serial #	1426262593

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999931
807.5	807.6	0.9998		
404.2	398.6	1.0143	Slope	0.999183
202.1	198.6	1.0177		
			Intercept	2.521607



Wood Buffalo Environmental Association

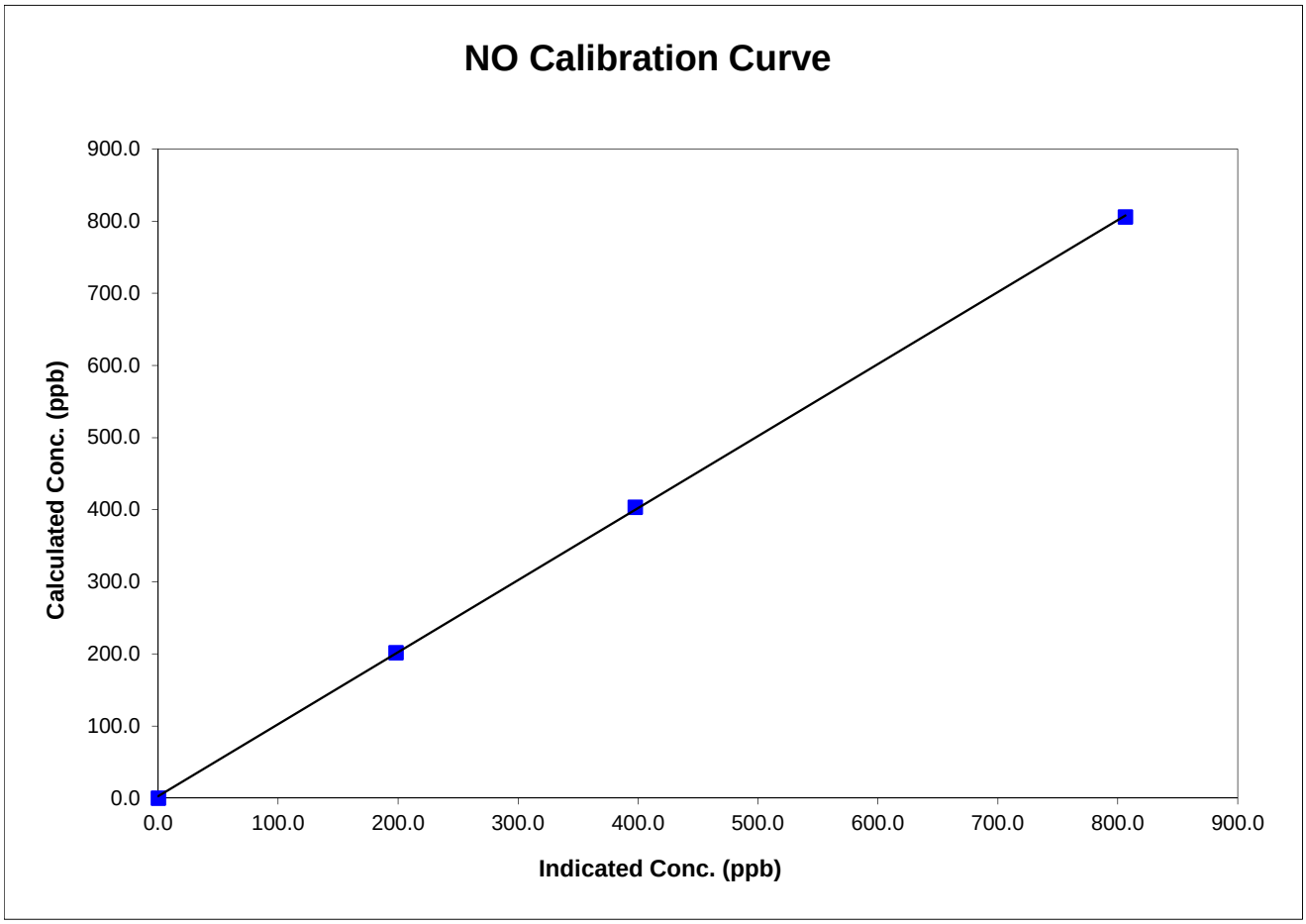
NO Calibration Summary

Station Information

Calibration Date	January 23, 2015	Previous Calibration	NA
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	11:00	End Time (MST)	15:45
Analyzer make	Thermo 42i	Analyzer serial #	1426262593

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999926
805.9	806.2	0.9996		
403.5	397.7	1.0145	Slope	0.998965
201.7	198.2	1.0176		
			Intercept	2.558253



Wood Buffalo Environmental Association

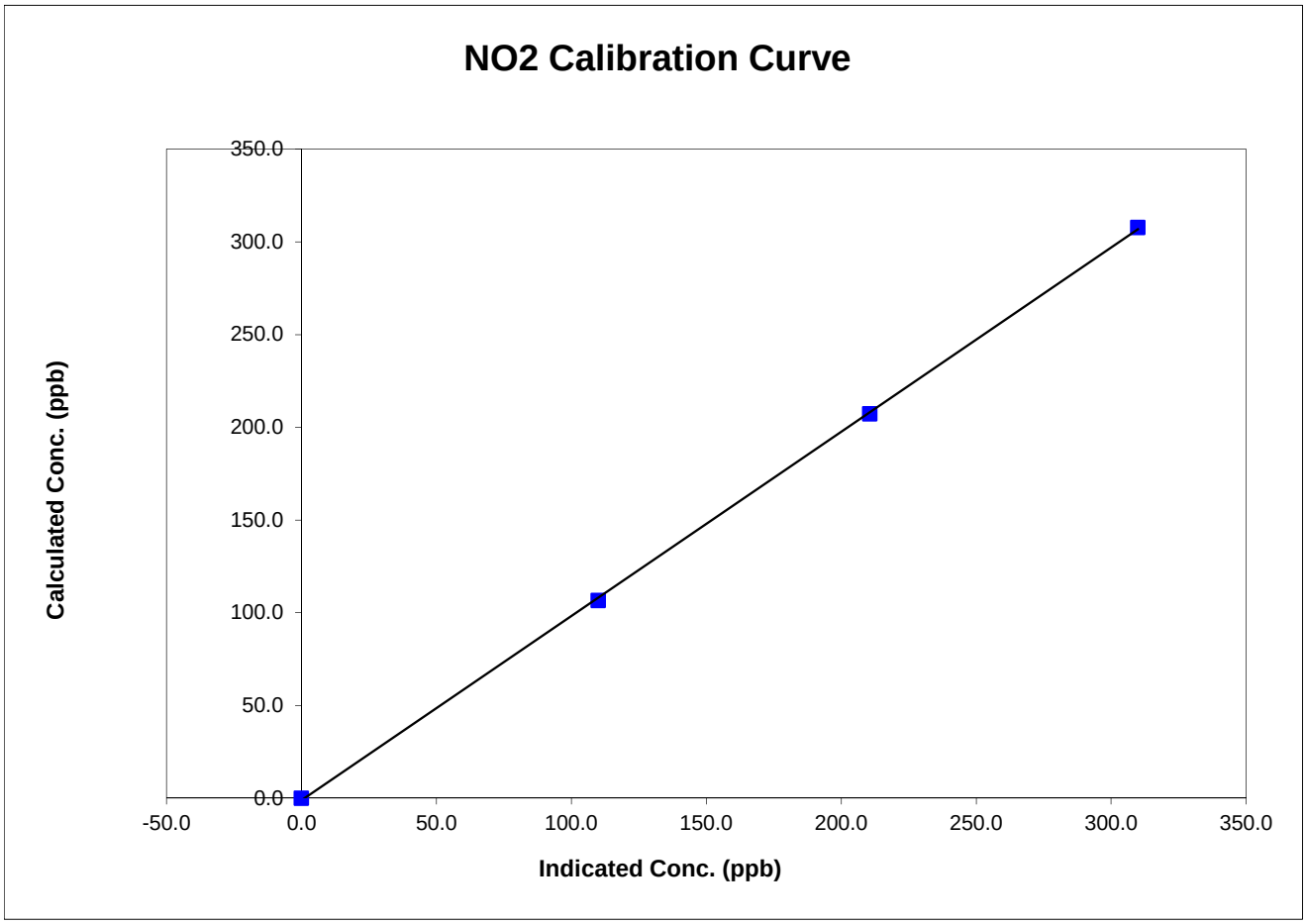
NO_2 Calibration Summary

Station Information

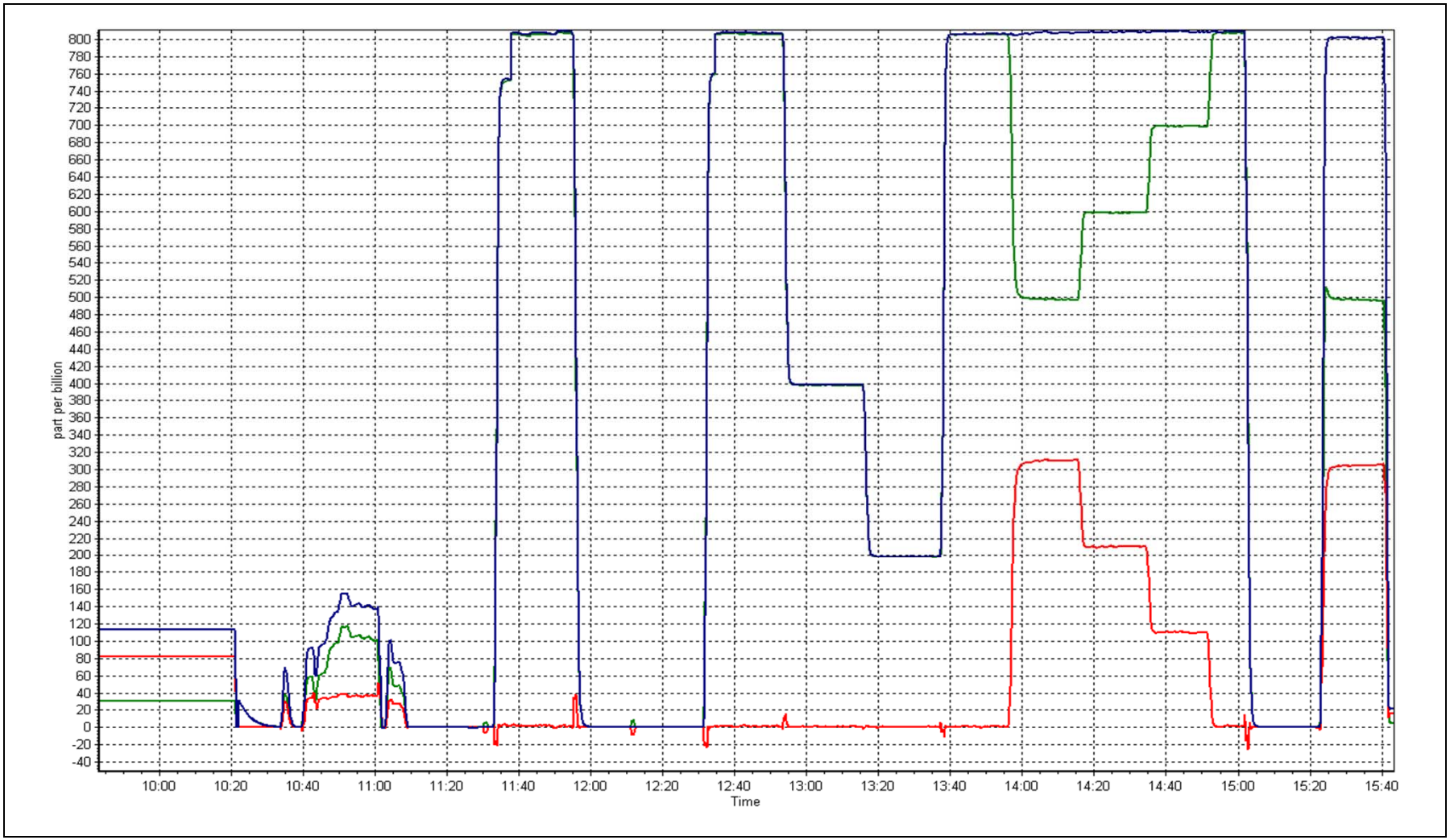
Calibration Date	January 23, 2015	Previous Calibration	NA
Station Number	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	11:00	End Time (MST)	15:45
Analyzer make	Thermo 42i	Analyzer serial #	1426262593

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999908
307.7	309.9	0.9929		
207.3	210.5	0.9850	Slope	0.993478
106.7	110.0	0.9697		
			Intercept	-1.137247



NOx, NO & NO_2 Calibration Plot Date: January 23, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 17
WAPASU
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
JANUARY 2015

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	711	33	33	100.00	41	0	10	0
H2S (ppb) Average	707	33	37	99.46	7	0	2	0
THC (ppm) Average	711	33	33	100.00	2.8	-	2.3	-
O3 (ppb) Average	708	32	36	99.46	38	0	36	-
NO2 (ppb) Average	711	33	33	100.00	30	0	17	-
NO (ppb) Average	711	33	33	100.00	23	-	5	-
NOX (ppb) Average	711	33	33	100.00	46	-	22	-
PM2.5 (ug/m3) Average	743	0	1	99.87	56.8	-	11.1	0
Temperature 2 m (C) Average	744	0	0	100.00	4.1	-	1.4	-
Relative Humidity (%) Average	744	0	0	100.00	100	-	-	-
Wind Speed 10 m (km/h) Average	675	0	69	90.73	20	-	-	-
Wind Direction 10 m (deg) Average	675	0	69	90.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
JANUARY 2015

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	711	2.3	4	-	0	0	0	1	2	7	41
H2S (ppb) Average	707	0.5	1	-	0	0	0	0	0	1	7
THC (ppm) Average	711	2.13	0.1	-	1.9	2.1	2.1	2.1	2.2	2.3	2.8
O3 (ppb) Average	708	23.5	8	-	1	12	18	24	30	33	38
NO2 (ppb) Average	711	6.6	7	-	0	1	1	4	11	17	30
NO (ppb) Average	711	1.1	2	-	0	0	0	0	1	3	23
NOX (ppb) Average	711	7.7	8	-	0	1	2	4	12	19	46
PM2.5 (ug/m3) Average	743	4.38	4	-	0.7	1.7	2.2	3.3	5.5	8	56.8
Temperature 2 m (C) Average	744	-15.29	9.9	-	-35.4	-27.5	-22.7	-16.8	-7.1	-0.5	4.1
Relative Humidity (%) Average	744	83.5	8	-	58	75	78	82	89	95	100
Wind Speed 10 m (km/h) Average	675	7	4	-	0	3	4	6	9	12	20
Wind Direction 10 m (deg) Average	675	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	13 Jan 2015 09:00	13 Jan 2015 09:00	1	Maintenance - cleaned glass manifold
H2S	14 Jan 2015 11:00	14 Jan 2015 13:00	3	Maintenance - tested SO2 scrubber
O3	13 Jan 2015 09:00	13 Jan 2015 12:00	4	Maintenance - Station operator on site
PM2.5	14 Jan 2015 10:00	14 Jan 2015 10:00	1	Maintenance - Flow and zero check, sample head cleaning
Wind Speed, Wind Direction	01 Jan 2015 10:00	01 Jan 2015 10:00	1	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	22 Jan 2015 20:00	23 Jan 2015 08:00	13	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 06:00	24 Jan 2015 07:00	2	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 10:00	24 Jan 2015 13:00	4	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	24 Jan 2015 18:00	25 Jan 2015 04:00	11	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	25 Jan 2015 18:00	26 Jan 2015 10:00	17	Flat line in sensor output signal -sensor frozen
Wind Speed, Wind Direction	26 Jan 2015 18:00	27 Jan 2015 14:00	21	Flat line in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 41 ppb on Jan 10 12:00 Maximum Daily Average: 10.4 ppb on Jan 10

Minimum Value: 0 ppb on Jan 22 17:00 Minimum Daily Average: 0.2 ppb on Jan 27
Maximum Diurnal Average: 3.6 ppb at hour 13 Minimum Diurnal Average: 1.4 ppb at hour 6
Monthly Average: 2.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 2$ $P_{90} = 7$ $P_{99} = 18$

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	33
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-Jan	0	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0.3	1
2-Jan	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	0.5	1
3-Jan	1	1	1	1	1	0	0	1	Z	0	1	1	1	1	2	1	1	1	1	1	1	1	1	1	0.9	2
4-Jan	2	2	1	1	2	5	12	13	9	10	11	12	11	11	10	8	7	7	5	4	12	12	8	7	7.6	13
5-Jan	10	7	5	6	6	Z	7	4	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2.4	10
6-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	1	1	1	7	7	1.1	7
7-Jan	14	9	5	1	0	0	0	1	Z	2	2	1	1	2	1	1	1	4	6	1	0	0	0	0	2.2	14
8-Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.3	1
9-Jan	4	7	Z	8	11	7	7	9	12	9	9	9	10	11	15	10	6	2	1	1	0	0	0	0	6.5	15
10-Jan	0	0	Z	0	0	0	0	0	0	22	11	41	33	25	13	19	19	21	11	7	6	3	3	3	10.4	41
11-Jan	3	4	Z	2	1	1	1	1	1	3	13	9	11	3	1	1	2	2	2	1	1	1	1	1	2.8	13
12-Jan	2	4	7	7	7	Z	11	10	12	10	9	8	7	6	15	7	13	34	13	5	5	6	6	9	9.3	34
13-Jan	Z	15	7	5	1	0	0	0	C	C	C	C	C	0	0	1	1	0	0	0	0	1	1	0	1.9	15
14-Jan	1	Z	3	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	3
15-Jan	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
16-Jan	0	0	0	Z	1	1	1	1	1	1	1	2	6	5	3	2	2	1	1	1	1	1	1	1	1.3	6
17-Jan	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	0.6	2
18-Jan	1	1	0	0	0	Z	0	0	1	1	1	2	7	10	8	6	4	4	5	3	7	5	6	6	3.4	10
19-Jan	Z	3	1	1	1	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.7	3
20-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	5	5	3	2	1	1	1.0	5
21-Jan	1	1	Z	0	0	0	0	0	0	1	1	1	1	0	1	2	3	4	5	4	5	7	8	6	2.2	8
22-Jan	5	4	4	Z	7	6	7	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8	7
23-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	2	3	10	13	17	10	2	1	1	2.6	17
24-Jan	1	0	0	0	0	Z	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	5	0.6	5
25-Jan	Z	4	0	2	3	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.8	4
26-Jan	10	Z	5	5	7	6	6	5	6	5	5	3	2	2	1	1	0	0	0	0	0	0	0	0	3.1	10
27-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
28-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Jan	0	1	1	0	Z	1	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0.6	2
30-Jan	1	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
31-Jan	Z	0	0	0	0	0	0	0	1	2	1	7	10	6	7	12	15	5	2	1	1	1	2	4	3.5	15
	2.1	2.4	1.8	1.7	2.0	1.4	1.9	1.8	1.9	2.7	2.4	3.5	3.6	2.9	2.7	2.5	2.6	3.2	2.3	1.8	2.0	1.7	1.7	1.9	Diurnal Average	
	14	15	7	8	11	7	12	13	12	22	13	41	33	25	15	19	19	34	13	17	12	12	8	9	Diurnal Maximum	

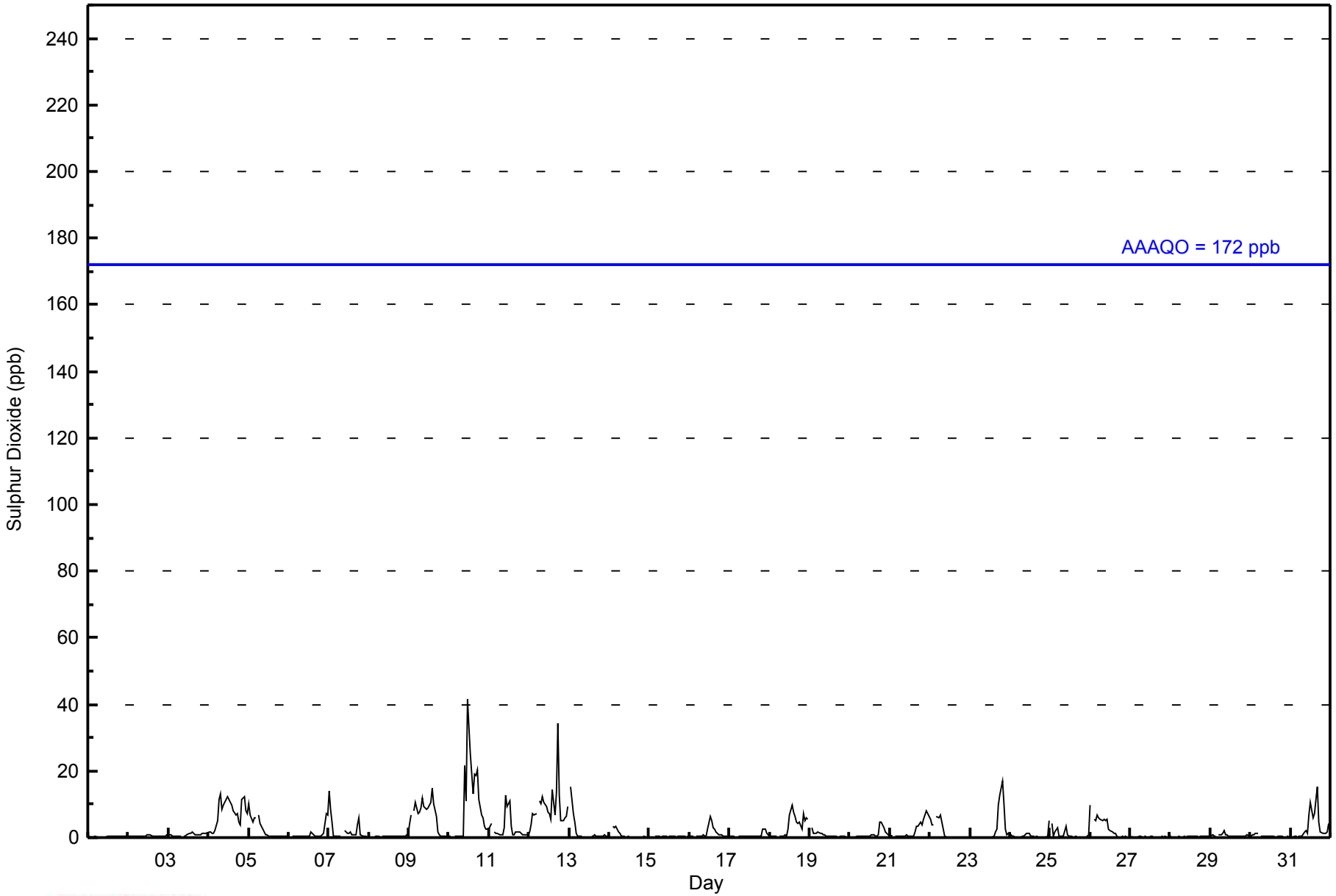
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	675	94.94	94.94
11 - 20	30	4.22	99.16
21 - 60	6	0.84	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: 711

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	96	40	17	14	10	5	27	93	90	51	38	35	11	9	23	53	612
11 - 20	0	0	0	0	0	0	0	6	9	9	4	2	0	0	0	0	30
21 - 60	0	0	0	0	0	0	0	1	2	1	2	0	0	0	0	0	6
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	96	40	17	14	10	5	27	100	101	61	44	37	11	9	23	53	648

Total Number of Valid Hours: 648

Total Number of Hours: 744

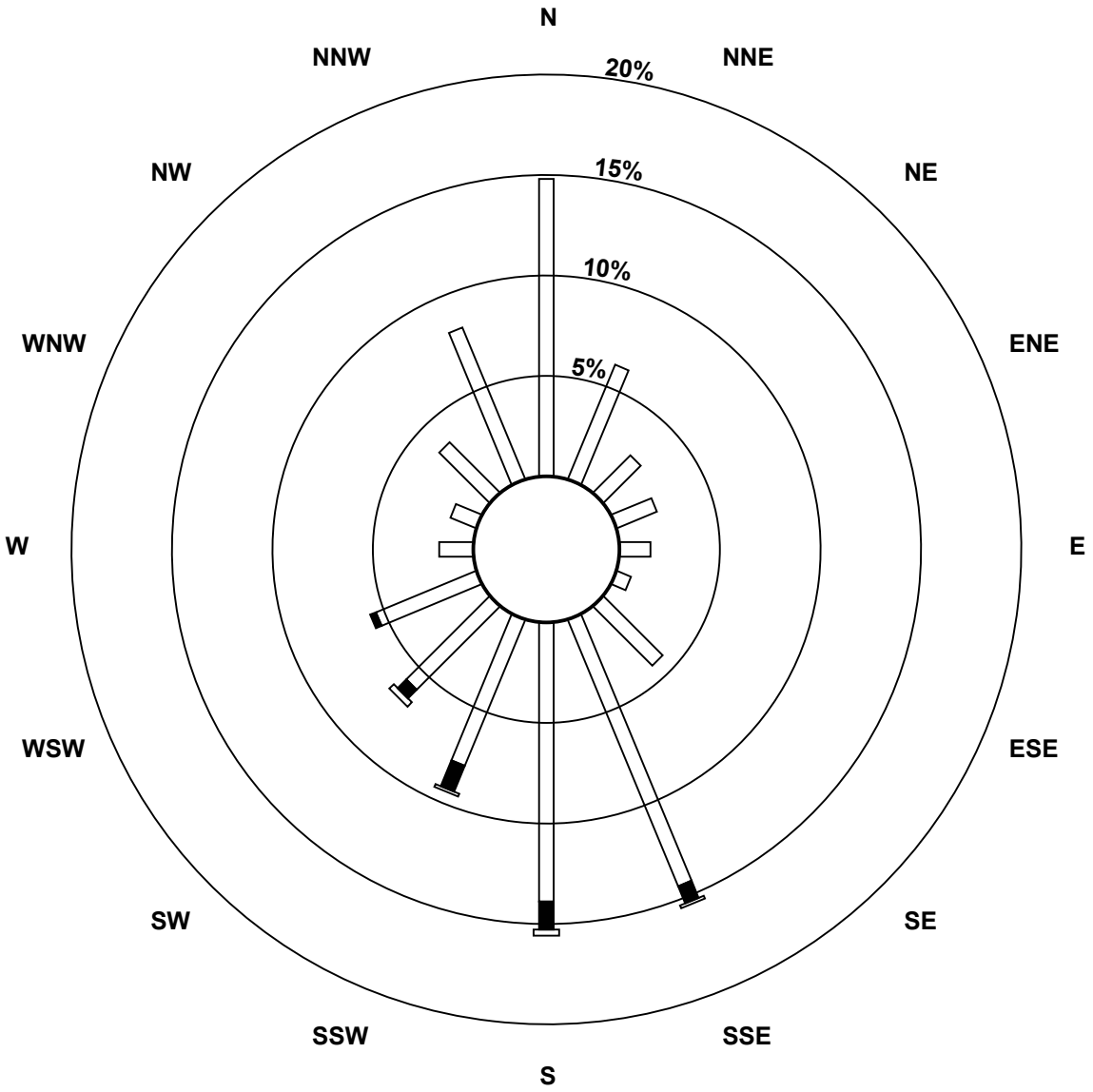
AURORA
ATMOSPHERICS INC.

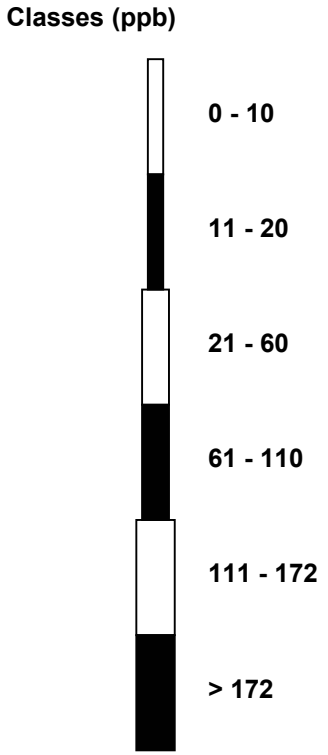
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Wapasu (AMS 17)





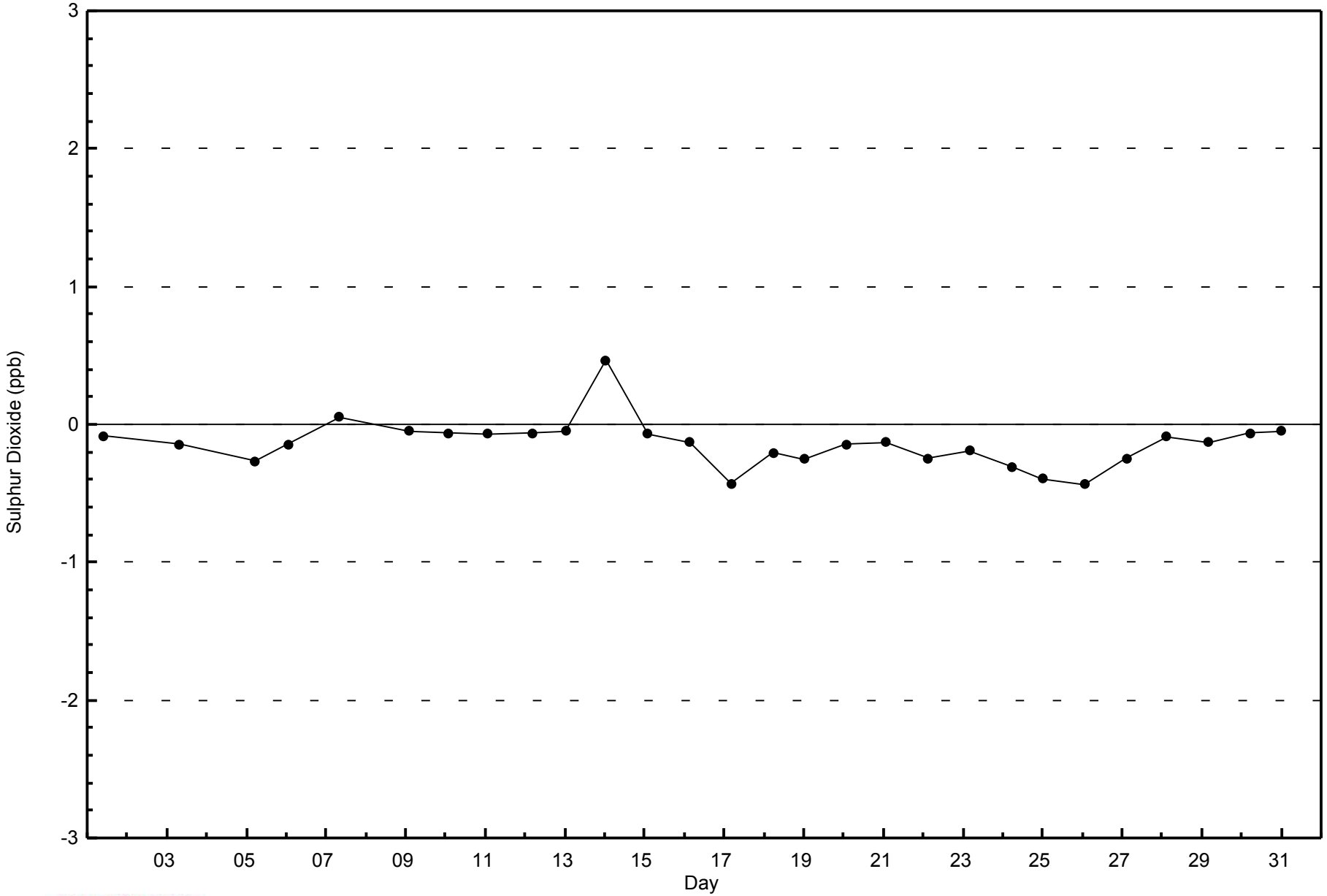
Total Number of Valid Hours: 648

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2015



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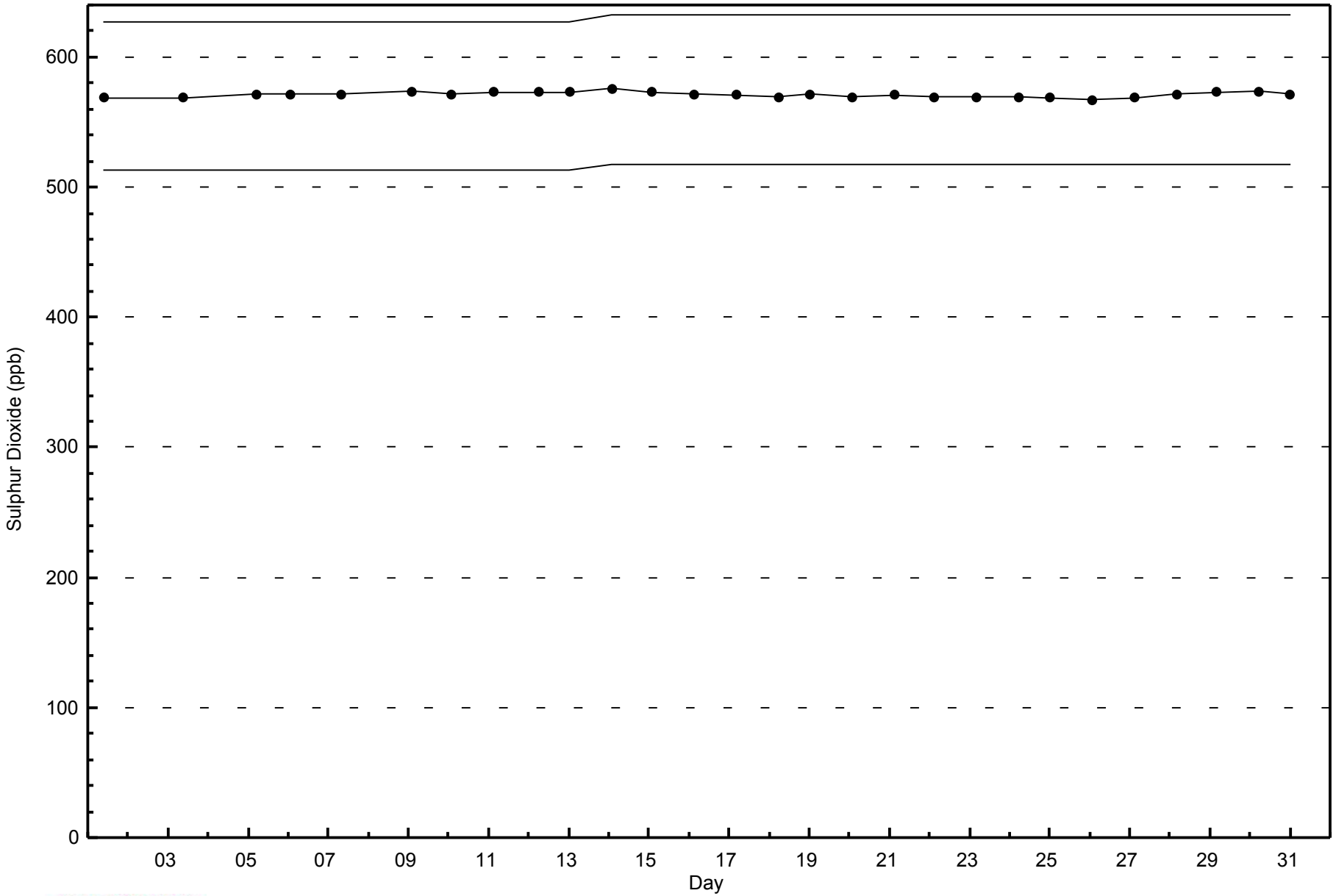
WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 ppb on Jan 10 13:00 Maximum Daily Average: 2.2 ppb on Jan 10

Minimum Value: 0 ppb on Jan 29 21:00 Minimum Daily Average: 0.2 ppb on Jan 27
Maximum Diurnal Average: 0.7 ppb at hour 13 Minimum Diurnal Average: 0.4 ppb at hour 23
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	33
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-Jan	0	0	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
2-Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Jan	0	0	0	0	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Jan	1	1	1	0	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2
5-Jan	1	1	1	1	1	1	Z	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
6-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0.4	1
7-Jan	1	1	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0.4	1
8-Jan	0	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.4	1
9-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.8	1
10-Jan	0	0	0	Z	1	0	0	0	0	2	2	6	7	6	3	4	4	4	3	2	1	1	1	1	2.2	7
11-Jan	1	1	1	Z	1	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.6	1
12-Jan	0	0	0	0	0	1	Z	1	2	2	1	1	1	1	2	1	2	5	3	1	1	1	1	1	1.3	5
13-Jan	1	Z	2	1	1	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
14-Jan	0	0	Z	1	0	0	0	0	0	0	M	M	M	0	0	0	0	0	0	0	0	0	0	0	0.3	1
15-Jan	0	0	0	Z	0	0	0	0	C	C	C	C	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.3	1
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1
19-Jan	0	Z	1	1	0	1	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.4	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0.4	1
21-Jan	1	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	0.5	1
22-Jan	1	1	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
23-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0.4	1
24-Jan	0	0	0	0	0	0	Z	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0.5	1
25-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
26-Jan	1	1	Z	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
29-Jan	0	1	1	0	0	Z	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.4	1
30-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
31-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.7	0.6	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
	1	1	2	1	1	1	1	2	2	2	2	6	7	6	3	4	4	5	3	2	1	1	1	1	Diurnal Maximum	

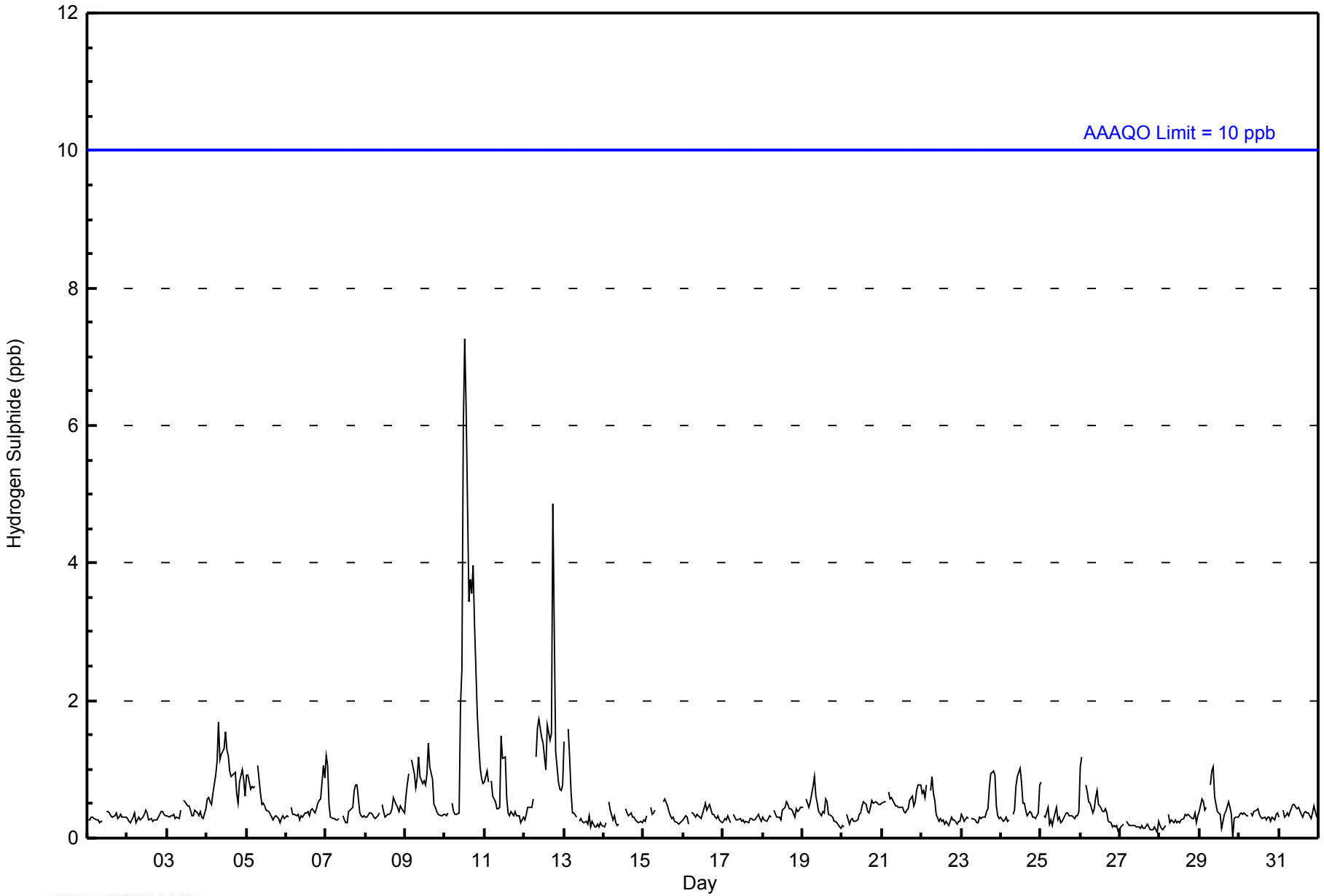
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	697	98.59	98.59
3 - 4	6	0.85	99.43
5 - 7	4	0.57	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

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2015

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	96	39	18	14	8	6	25	96	100	60	40	36	11	9	23	52	633
3 - 4	0	0	0	0	0	0	0	2	2	1	1	0	0	0	0	0	6
5 - 7	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	4
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	96	39	18	14	8	6	25	98	103	62	43	36	11	9	23	52	643

Total Number of Valid Hours: 643

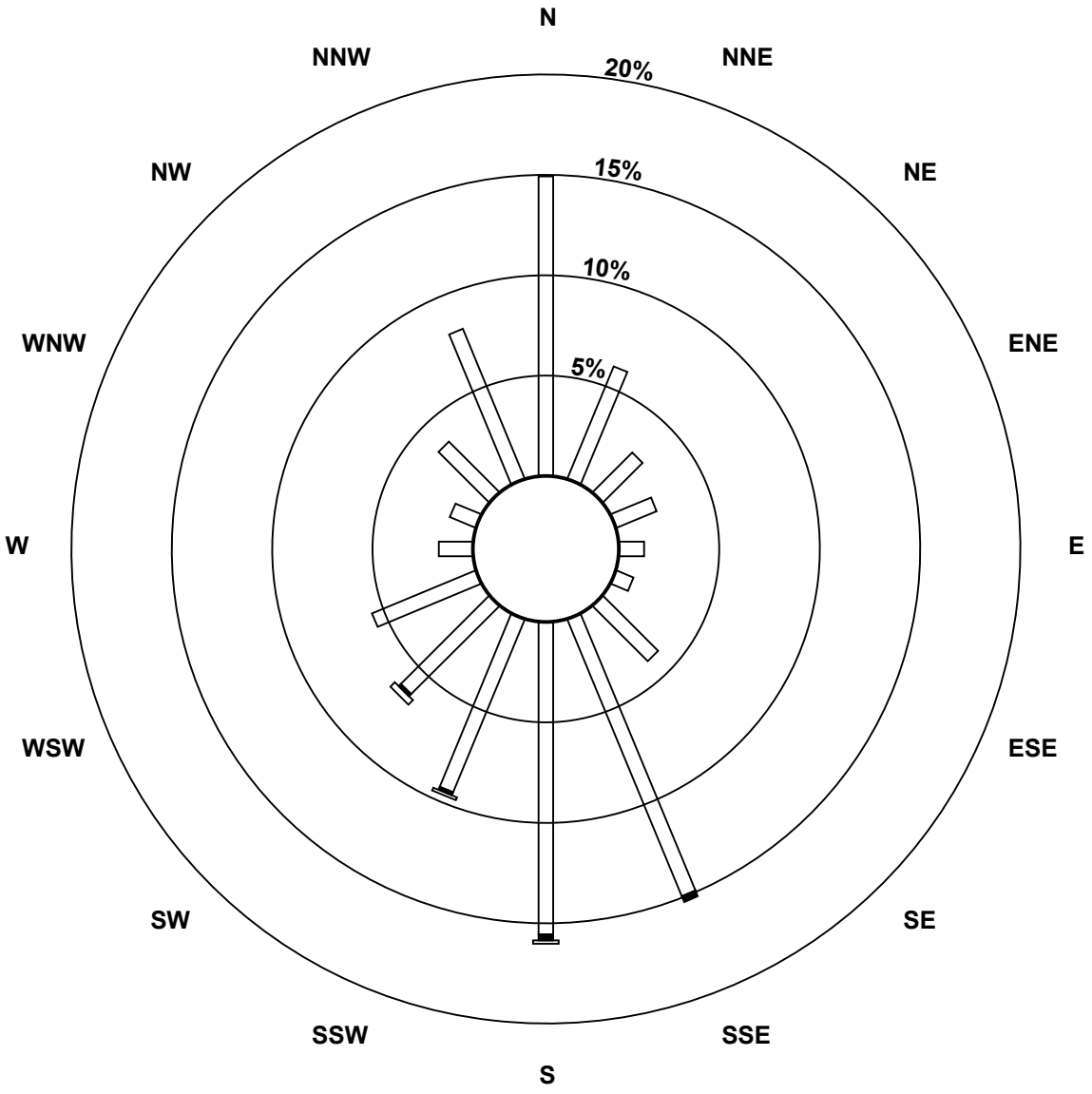
Total Number of Hours: 744

Wood Buffalo Environmental Association

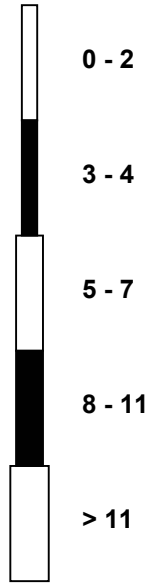
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

Wapasu (AMS 17)



Classes (ppb)



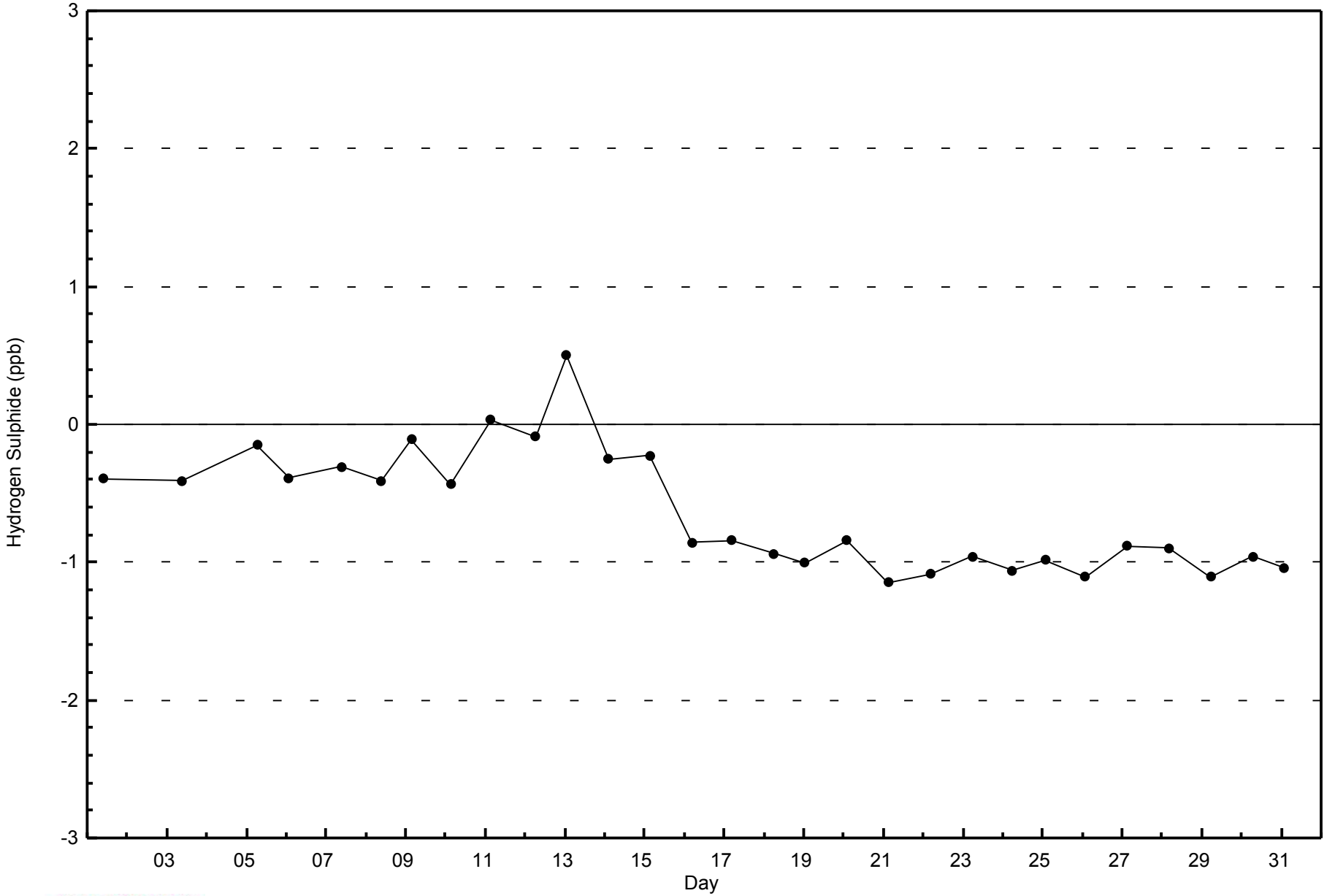
Total Number of Valid Hours: 643

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2015



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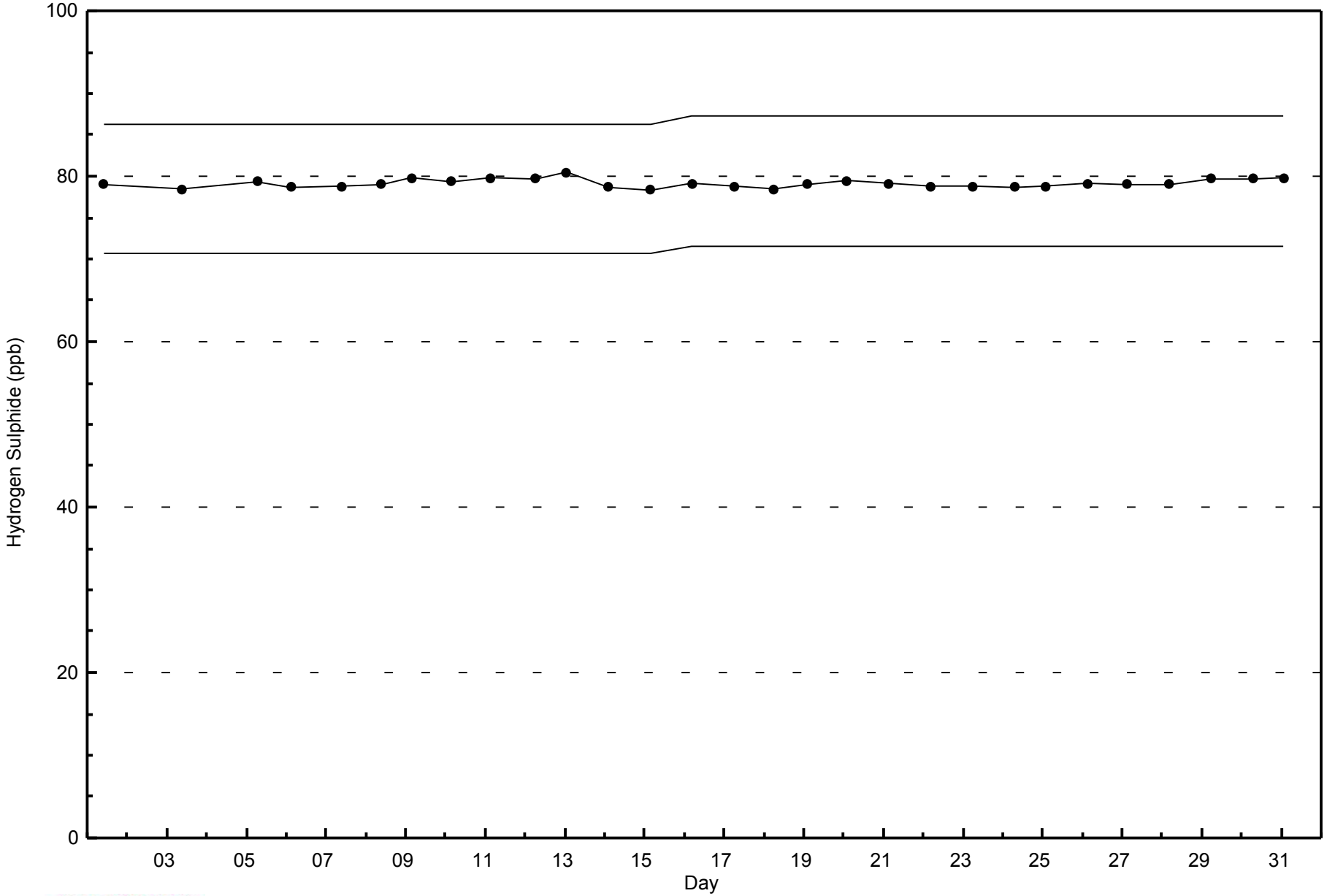
WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Wapasu - January 2015

Maximum Value: 2.8 ppm on Jan 24 12:00

Maximum Daily Average: 2.3 ppm on Jan 12

Minimum Value: 1.9 ppm on Jan 25 08:00

Minimum Daily Average: 2.0 ppm on Jan 25

Maximum Diurnal Average: 2.2 ppm at hour 18

Minimum Diurnal Average: 2.1 ppm at hour 22

Monthly Average: 2.13 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.1 Q_3 = 2.2 P_{90} = 2.3 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	33
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-Jan	2.1	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	2.1
2-Jan	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
3-Jan	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.3
4-Jan	2.3	2.3	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	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.3
5-Jan	2.2	2.2	2.2	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	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	2.3
6-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3
7-Jan	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.3
8-Jan	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.4
9-Jan	2.3	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.3
10-Jan	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.1	2.3
11-Jan	2.3	2.4	Z	2.4	2.3	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	2.1	2.2	2.2	2.4
12-Jan	2.1	2.1	2.2	2.1	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.5
13-Jan	Z	2.3	2.4	2.4	2.4	2.2	2.2	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	2.1	2.2	2.4
14-Jan	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
15-Jan	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-Jan	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	2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.3
17-Jan	2.1	2.2	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2
18-Jan	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
19-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.3
20-Jan	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	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2
21-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
22-Jan	2.2	2.1	2.1	Z	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.2
23-Jan	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	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.4
24-Jan	2.0	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.5	2.7	2.8	2.7	2.3	2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.8
25-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
26-Jan	2.2	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
27-Jan	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
28-Jan	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
29-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.3
30-Jan	2.1	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	2.1	2.1
31-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.5	2.7	2.8	2.7	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	Diurnal Maximum	

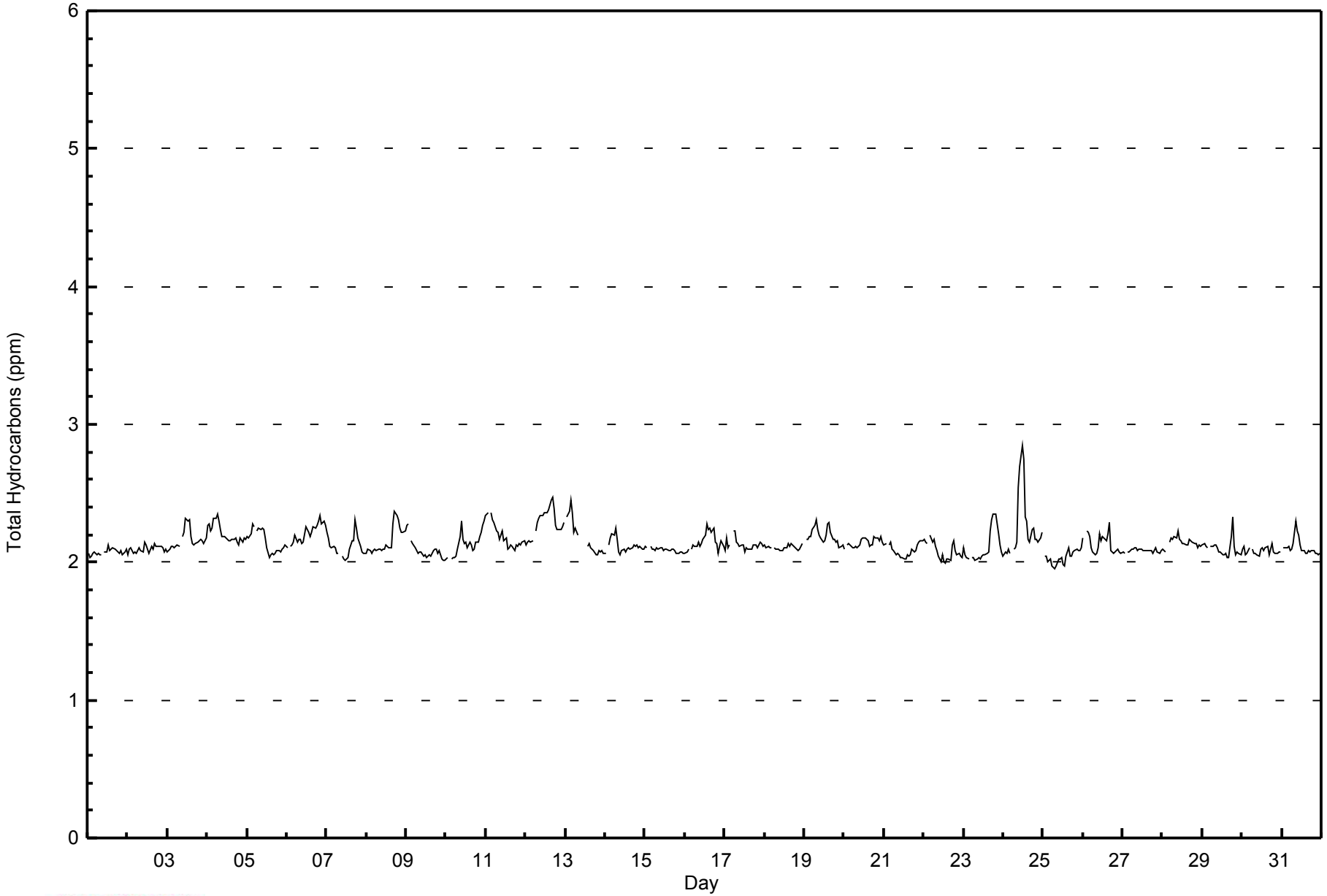
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	65	9.14	9.14
2.1 - 3.0	646	90.86	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 744

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Wapasu - January 2015

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	5	4	1	0	3	1	2	6	7	5	4	9	2	2	1	2	54
2.1 - 3.0	91	36	16	14	7	4	25	94	94	56	40	28	9	7	22	51	594
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	96	40	17	14	10	5	27	100	101	61	44	37	11	9	23	53	648

Total Number of Valid Hours: 648

Total Number of Hours: 744

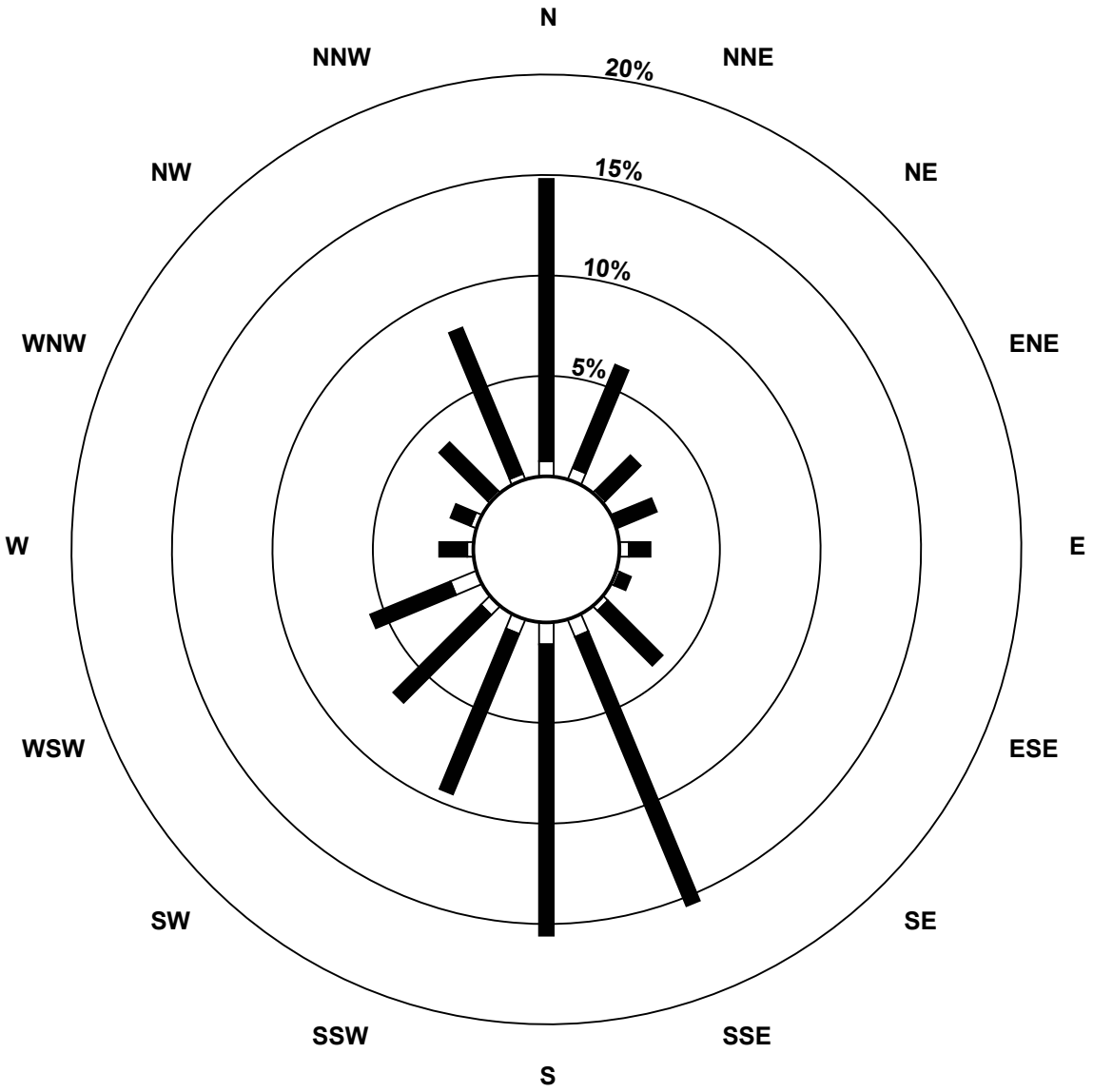
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Wapasu (AMS 17)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

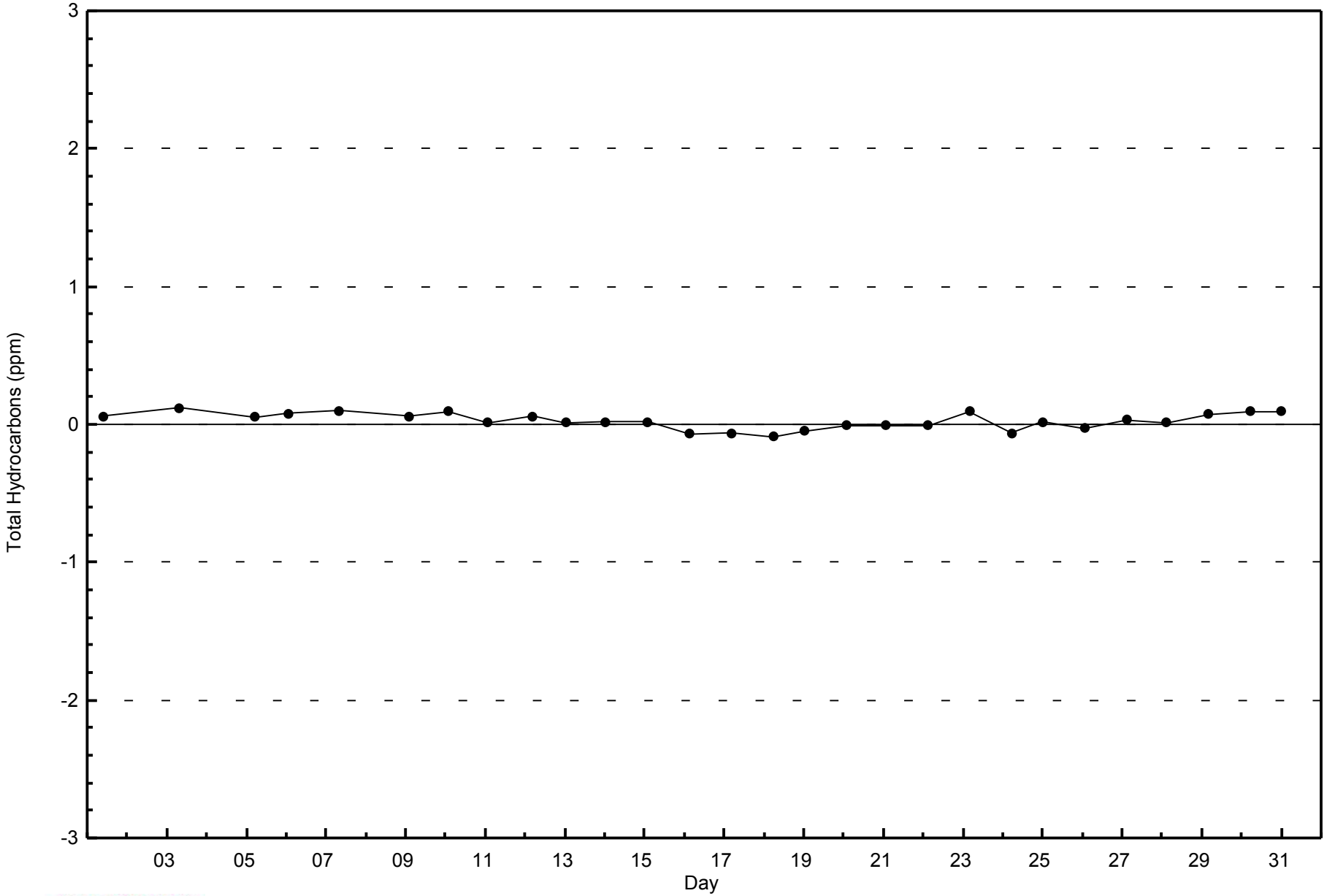
Total Number of Valid Hours: 648

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Wapasu - January 2015



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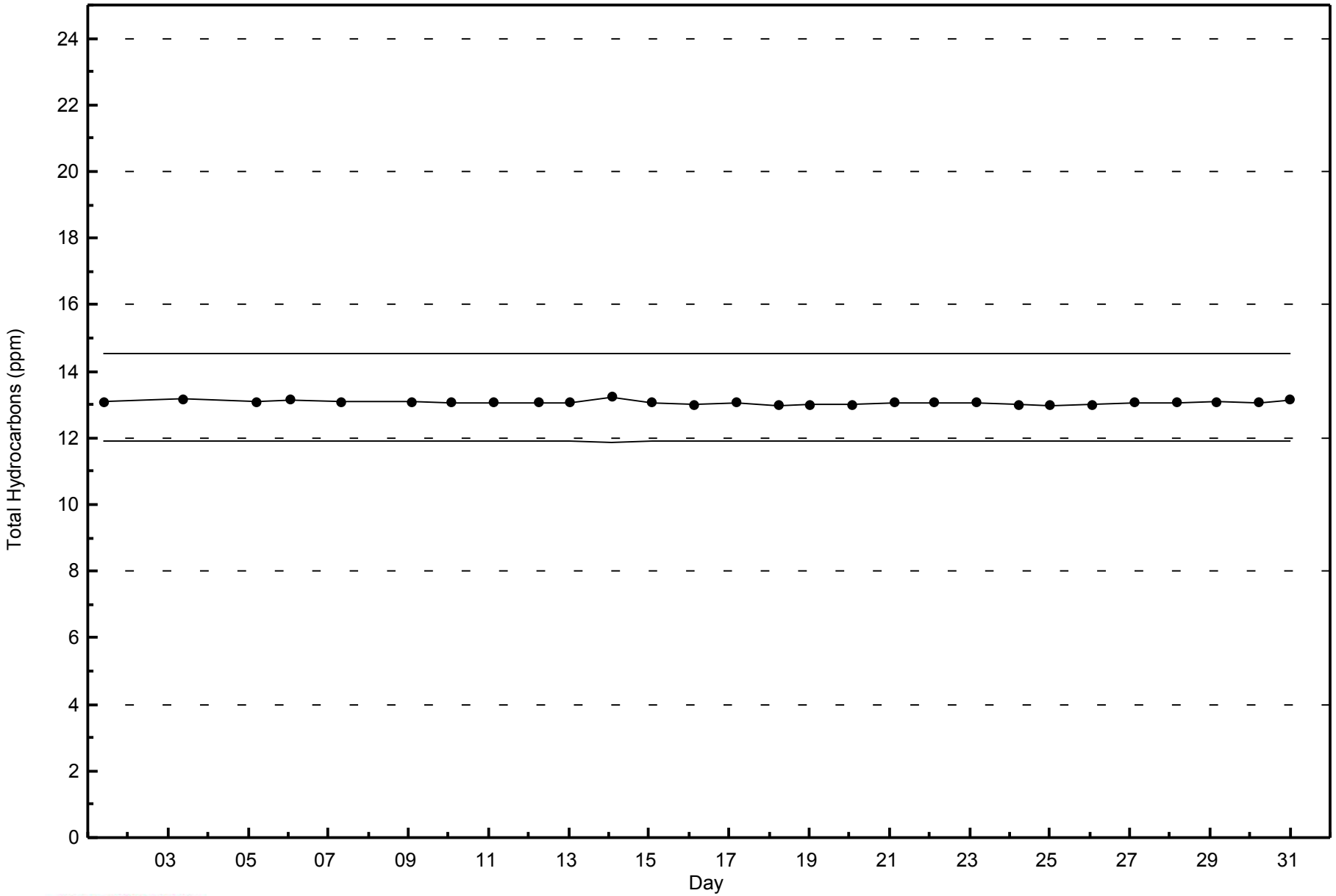
WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Wapasu - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 38 ppb on Jan 25 07:00 Maximum Daily Average: 36.2 ppb on Jan 15

Minimum Value: 1 ppb on Jan 23 20:00
Maximum Diurnal Average: 25.7 ppb at hour 13
Monthly Average: 23.5 ppb

Minimum Daily Average: 11.8 ppb on Jan 12
Minimum Diurnal Average: 21.2 ppb at hour 18
Percentiles: $P_1 = 3$ $P_{10} = 12$ $Q_1 = 18$ Median = 24 $Q_3 = 30$ $P_{90} = 33$ $P_{99} = 37$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	32
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-Jan	34	33	32	31	29	32	32	30	28	27	31	Z	24	30	34	33	32	30	33	32	30	34	33	31	31.0	34
2-Jan	33	34	34	30	29	33	33	31	26	29	26	28	31	34	32	31	24	23	19	23	28	27	25	29	29.0	34
3-Jan	30	30	29	26	23	20	20	23	16	14	Z	17	22	22	23	24	22	17	21	23	24	25	25	16	22.2	30
4-Jan	5	6	7	13	15	13	12	12	15	18	19	19	22	21	22	21	18	18	25	29	18	18	15	25	16.9	29
5-Jan	14	13	18	14	14	16	11	Z	18	19	21	26	31	34	34	34	34	33	33	33	33	32	32	33	25.2	34
6-Jan	33	33	33	Z	32	31	30	27	28	30	29	25	27	27	26	13	8	13	10	7	6	13	13	15	22.2	33
7-Jan	18	22	27	31	31	32	32	33	32	32	Z	36	35	30	14	14	13	7	16	25	29	32	34	36	26.7	36
8-Jan	36	35	34	32	31	34	35	33	34	35	Z	36	36	37	36	33	21	13	13	11	13	15	15	23	27.9	37
9-Jan	19	12	19	18	Z	24	26	24	22	28	29	31	30	24	21	25	23	30	31	32	33	35	35	35	26.2	35
10-Jan	35	33	29	24	Z	20	19	19	18	16	20	22	19	21	19	16	19	19	13	17	15	13	12	10	19.5	35
11-Jan	10	10	11	12	Z	13	16	17	19	19	24	32	31	35	34	33	30	32	31	30	31	32	29	30	24.3	35
12-Jan	29	25	20	19	18	16	11	Z	4	5	8	7	9	8	7	5	2	2	8	16	16	15	14	8	11.8	29
13-Jan	3	9	Z	6	16	24	23	27	M	M	M	M	32	33	31	28	31	33	36	37	35	32	32	32	26.4	37
14-Jan	31	27	18	Z	13	17	15	23	C	C	C	33	32	30	32	33	32	33	34	32	32	34	34	35	28.6	35
15-Jan	35	35	35	36	Z	35	36	36	36	36	35	37	37	37	36	37	38	38	38	38	37	36	36	35	36.2	38
16-Jan	35	34	33	33	32	Z	31	31	30	29	28	23	15	13	17	13	11	23	27	27	28	29	30	31	26.2	35
17-Jan	31	29	33	28	29	27	Z	30	29	29	30	32	32	32	32	31	30	24	22	27	24	22	21	26	28.2	33
18-Jan	26	26	27	27	28	26	28	Z	24	25	29	28	24	20	19	19	23	22	20	25	19	16	13	14	23.1	29
19-Jan	15	12	Z	6	5	5	2	3	12	17	18	19	17	15	10	10	12	20	21	22	24	25	26	27	14.8	27
20-Jan	26	26	26	Z	26	27	27	27	27	26	22	25	24	18	17	24	18	18	11	14	18	20	20	21	22.1	27
21-Jan	23	23	23	23	Z	27	30	30	32	33	33	34	34	33	32	31	26	20	19	21	17	17	19	17	25.8	34
22-Jan	14	13	23	16	13	Z	11	20	22	22	24	24	26	25	25	24	24	22	22	20	20	22	25	23	20.9	26
23-Jan	15	16	21	23	23	22	Z	19	14	13	10	11	13	7	11	7	5	3	1	1	3	10	16	20	12.3	23
24-Jan	20	19	21	21	20	17	12	Z	7	2	3	3	6	14	14	12	18	10	8	19	9	16	18	20	13.4	21
25-Jan	16	22	Z	27	25	36	38	36	28	23	27	25	23	20	20	20	25	27	25	23	22	20	18	12	24.4	38
26-Jan	5	3	5	Z	15	17	22	24	21	17	14	19	21	24	26	20	8	21	22	24	27	28	29	30	19.2	30
27-Jan	30	30	29	30	Z	29	29	29	29	29	29	29	29	29	29	28	28	28	28	28	28	27	30	27	28.6	30
28-Jan	28	30	29	25	21	Z	22	20	21	22	27	28	29	29	28	28	26	28	27	28	28	29	31	29	26.6	31
29-Jan	28	24	21	25	28	24	Z	22	21	25	28	28	28	27	25	22	17	2	3	15	22	24	24	25	22.2	28
30-Jan	22	23	26	25	24	24	25	Z	31	31	32	33	33	34	35	33	32	30	31	32	26	24	25	22	28.4	35
31-Jan	20	19	Z	17	16	23	20	12	12	18	23	24	25	27	26	21	14	20	19	21	25	24	25	23	20.6	27
	23.3	22.8	24.6	22.8	22.2	23.8	23.1	24.5	22.6	23.0	23.8	25.3	25.7	25.5	24.7	23.3	21.4	21.2	21.5	23.6	23.3	24.0	24.3	24.4	Diurnal Average	
	36	35	35	36	32	36	38	36	36	36	35	37	37	37	36	37	38	38	38	38	37	36	36	36	Diurnal Maximum	

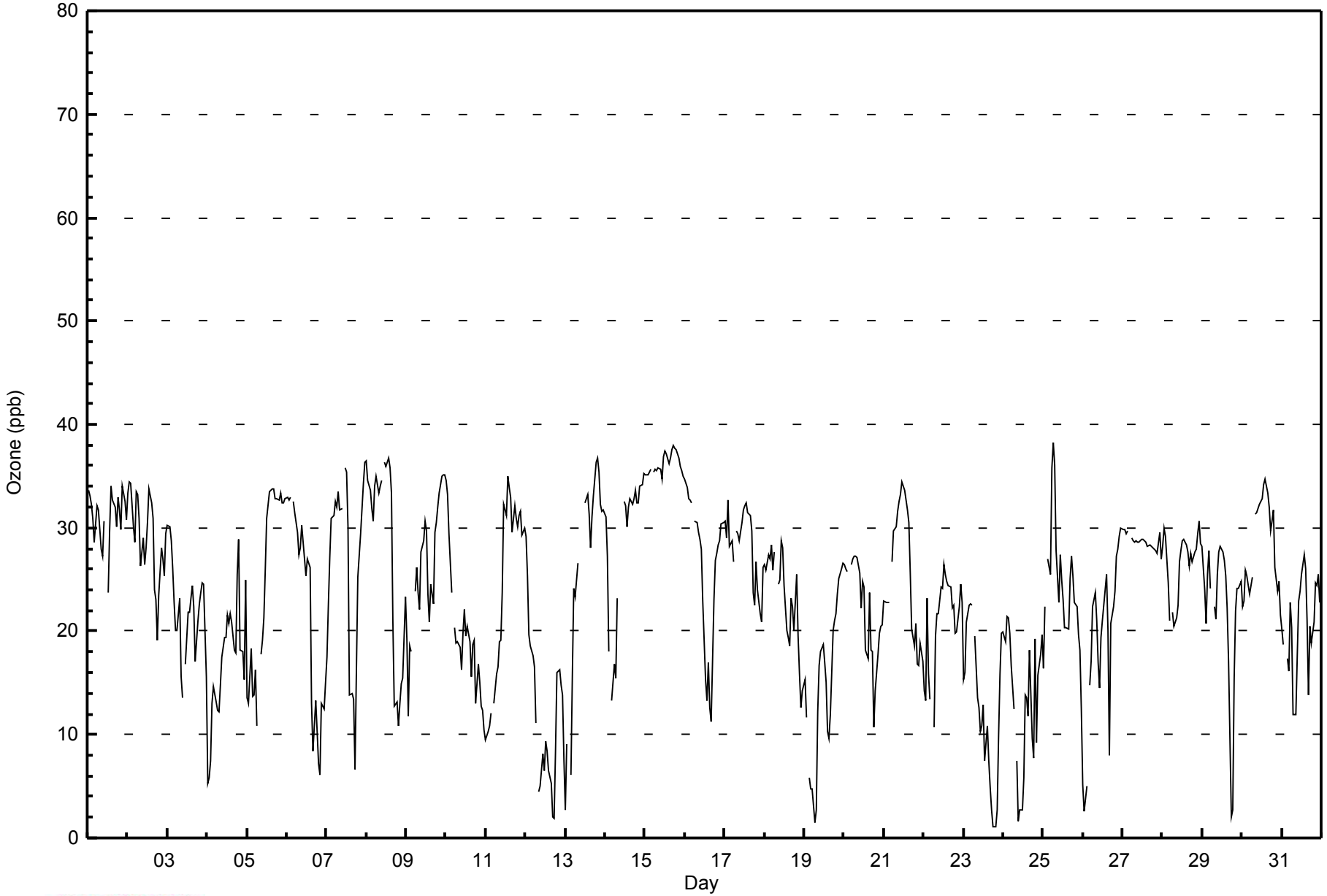
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA

Hourly Averages

Ozone (O_3) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	240	33.90	33.90
21 - 50	468	66.10	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA

Frequency Distribution

Ozone (O_3) - ppb

Wapasu - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	10	9	1	1	3	2	13	41	42	37	26	6	4	6	3	8	212
21 - 50	85	29	17	13	6	2	15	57	63	25	16	30	7	3	19	44	431
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	95	38	18	14	9	4	28	98	105	62	42	36	11	9	22	52	643

Total Number of Valid Hours: 643

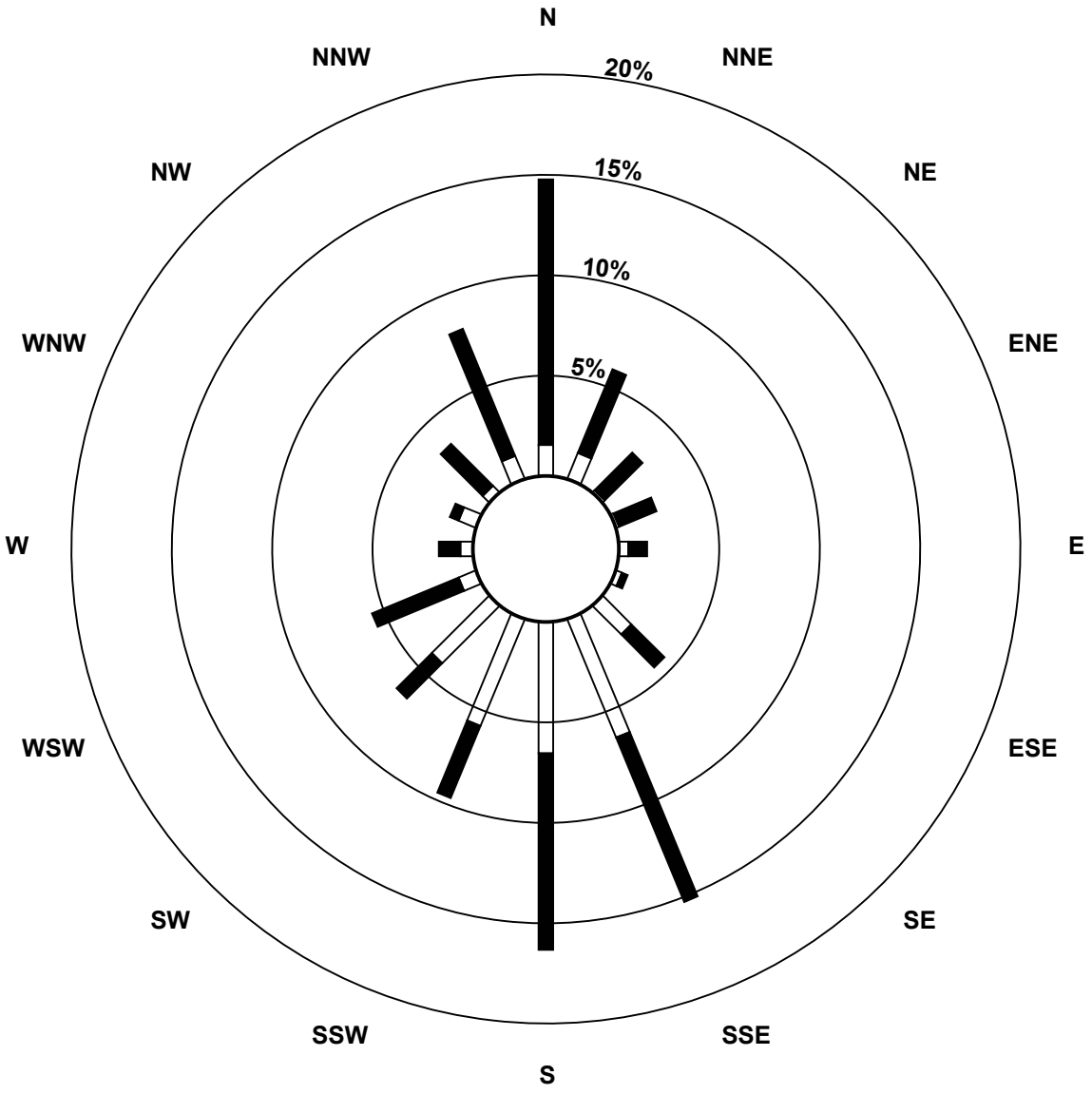
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2015

Ozone (O_3) - ppb

Wapasu (AMS 17)



Classes (ppb)

0 - 20

21 - 50

51 - 82

> 83

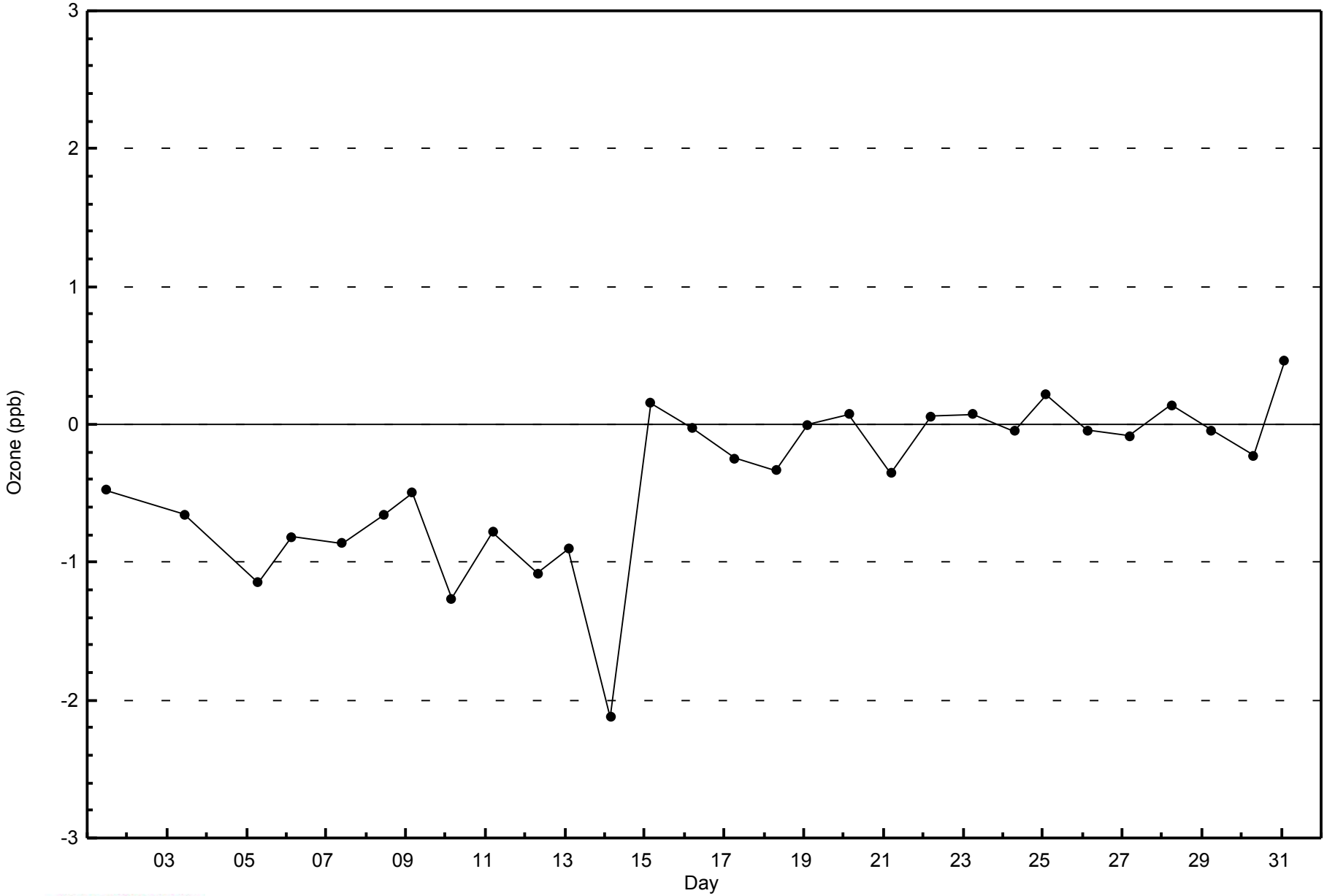
Total Number of Valid Hours: 643

WBEA

Zero Responses

Ozone (O_3) - ppb

Wapasu - January 2015



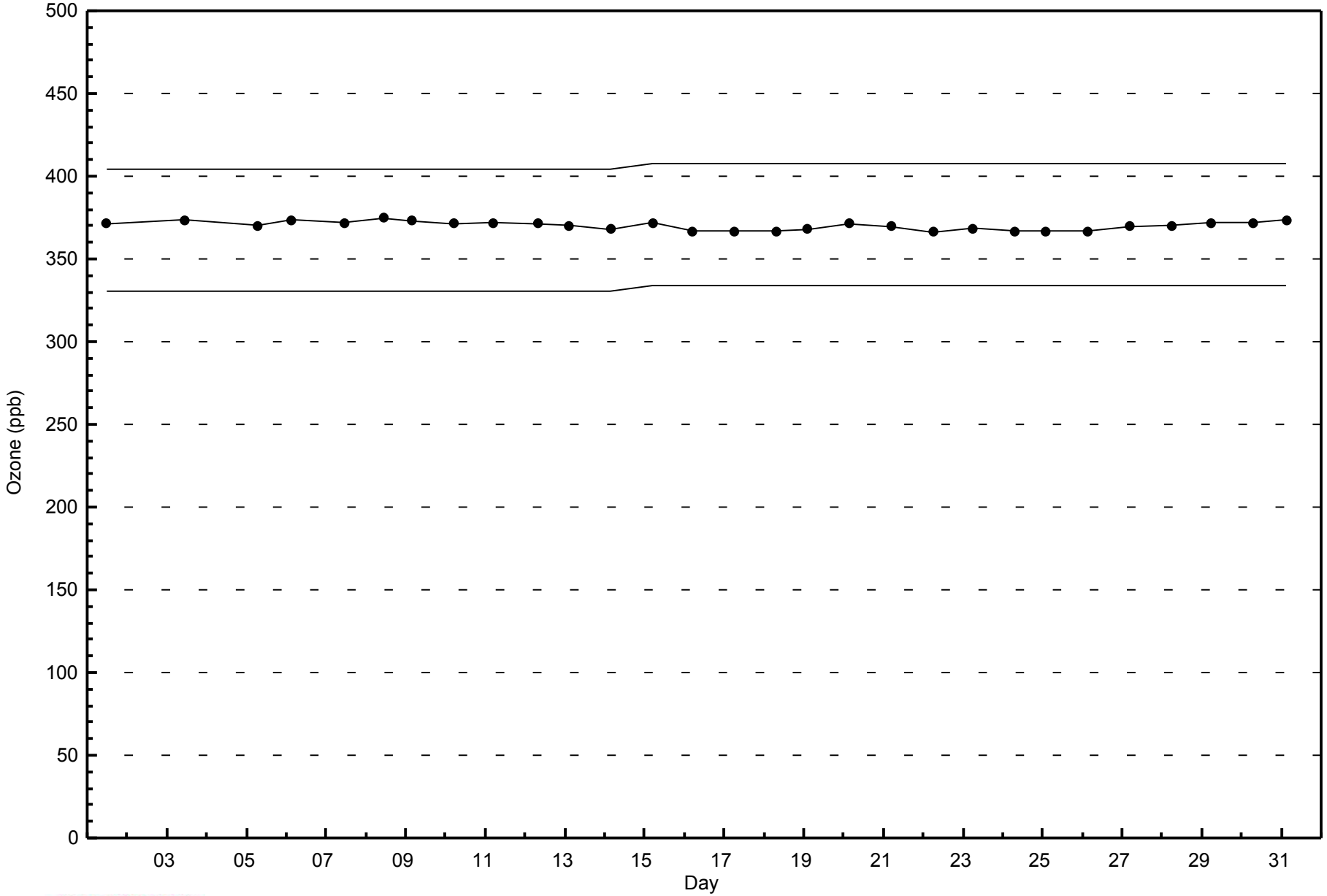
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Ozone (O_3) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 23 ppb on Jan 24 12:00

Maximum Daily Average: 5.3 ppb on Jan 12

Minimum Value: 0 ppb on Jan 13 05:00

Minimum Daily Average: 0.0 ppb on Jan 30

Maximum Diurnal Average: 3.1 ppb at hour 12

Minimum Diurnal Average: 0.4 ppb at hour 6

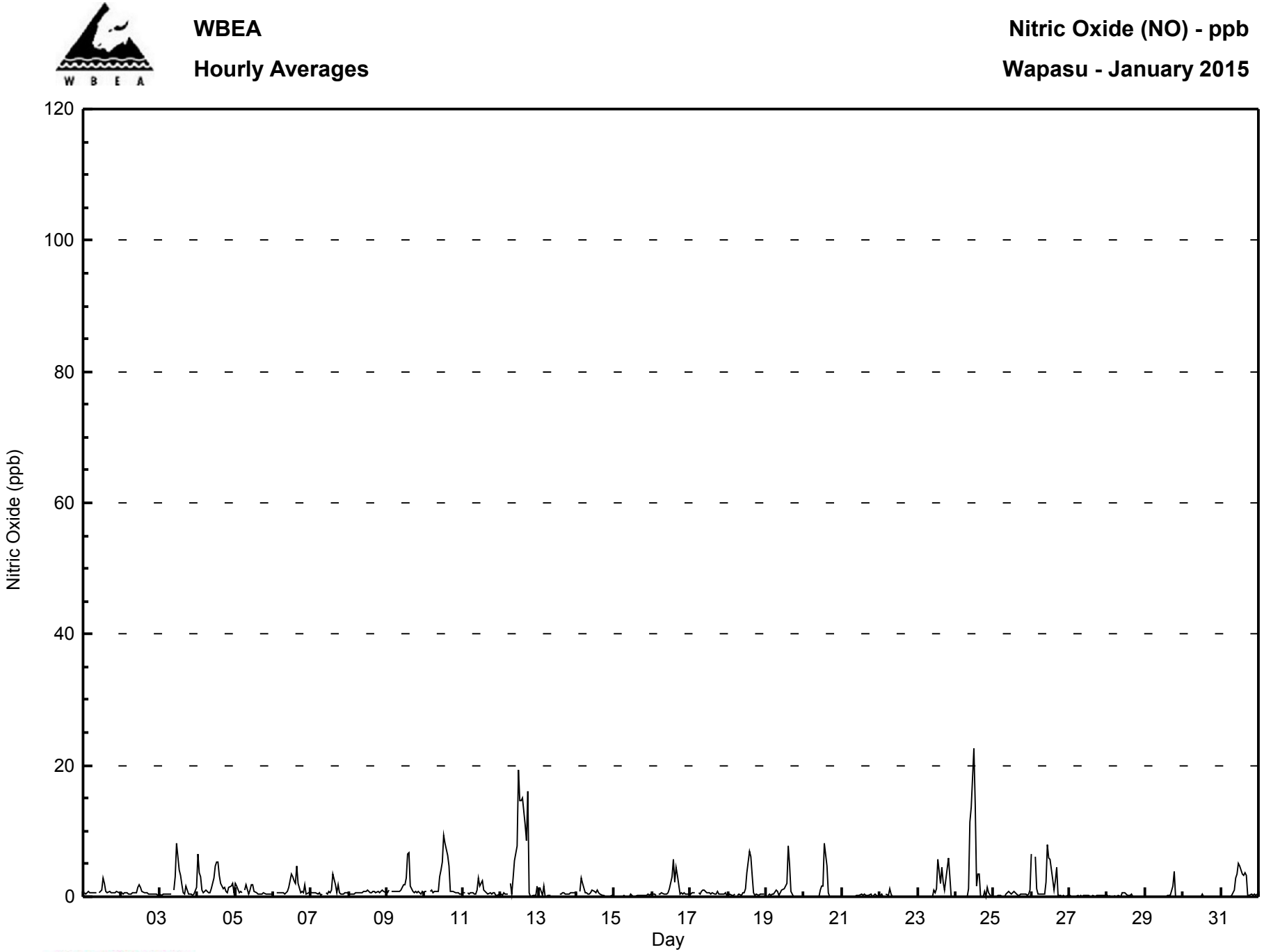
Monthly Average: 1.1 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 14$

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	33
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-Jan	1	0	1	1	1	1	1	1	1	Z	1	1	3	2	1	1	1	1	1	1	1	1	1	1	0.8	3
2-Jan	1	0	1	1	0	0	0	1	1	1	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0.6	2
3-Jan	0	0	1	0	0	0	0	0	Z	1	3	8	4	3	2	1	0	2	0	0	0	0	0	1	1.3	8
4-Jan	7	4	3	1	1	1	1	1	1	1	3	5	5	5	3	2	1	1	1	1	1	2	2	1	2.2	7
5-Jan	2	2	1	1	1	Z	1	2	0	1	2	2	1	1	0	1	0	0	1	0	0	0	0	0	0.9	2
6-Jan	0	Z	1	1	1	1	1	0	1	1	1	3	3	2	2	5	2	1	1	1	2	1	1	1	1.3	5
7-Jan	1	1	1	1	0	1	0	0	Z	1	0	1	1	1	4	2	1	2	1	0	0	1	1	1	0.8	4
8-Jan	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
9-Jan	1	1	Z	1	1	1	1	1	1	1	2	2	3	6	7	2	1	1	1	1	1	0	1	1	1.5	7
10-Jan	1	1	Z	1	1	1	1	1	1	3	4	5	9	8	6	5	1	1	1	1	1	1	0	0	2.3	9
11-Jan	1	1	Z	1	0	1	1	0	0	1	3	2	2	1	1	1	0	1	0	1	1	0	0	0	0.8	3
12-Jan	0	0	1	0	0	Z	2	0	3	5	8	19	15	15	15	11	9	16	1	0	0	0	0	2	5.3	19
13-Jan	Z	1	0	2	0	0	0	0	C	C	C	C	C	0	0	1	1	0	0	0	1	1	1	1	0.5	2
14-Jan	0	Z	1	3	2	1	1	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.6	3
15-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Jan	0	0	0	Z	0	0	1	0	0	0	1	1	3	6	2	4	3	0	1	0	1	0	0	0	1.2	6
17-Jan	0	1	1	1	Z	1	0	1	1	1	1	1	1	0	1	0	0	1	0	0	0	0	1	0	0.6	1
18-Jan	0	0	0	0	0	Z	0	0	0	1	1	1	4	7	6	3	1	0	0	0	0	0	0	0	1.2	7
19-Jan	Z	0	0	0	0	0	1	1	0	1	1	1	2	2	8	5	1	0	0	0	0	0	0	0	1.0	8
20-Jan	0	Z	0	0	0	0	0	0	0	0	1	2	2	8	5	1	0	0	0	0	0	0	0	0	0.8	8
21-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
22-Jan	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
23-Jan	0	0	0	0	Z	0	0	0	0	0	1	1	1	6	2	5	2	1	3	6	3	0	0	0	1.3	6
24-Jan	0	0	0	0	0	Z	0	0	1	11	14	23	14	2	3	3	0	0	1	0	1	1	0	0	3.2	23
25-Jan	Z	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	1	0.4	1
26-Jan	6	Z	6	1	0	0	0	0	0	2	8	6	6	3	1	2	4	0	0	0	0	0	0	0	2.1	8
27-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Jan	0	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
29-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0.3	4
30-Jan	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
31-Jan	Z	0	0	0	0	0	0	0	1	3	4	5	5	3	3	4	3	0	0	0	0	0	0	0	1.4	5
	0.8	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.5	1.3	2.1	3.1	2.9	2.8	2.5	1.9	1.1	1.0	0.6	0.5	0.5	0.4	0.4	0.4	Diurnal Average	
	7	4	6	3	2	1	2	2	3	11	14	23	15	15	15	11	9	16	4	6	3	2	2	2	Diurnal Maximum	

Z - zerospan C - Calibration


WBEA
Hourly Averages
Nitric Oxide (NO) - ppb
Wapasu - January 2015
120
100
80
60
40
20
0
Nitric Oxide (ppb)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	710	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: 711

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitric Oxide (NO) - ppb

Wapasu - January 2015

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	40	17	14	10	5	27	100	101	61	44	37	11	9	23	53	648
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	96	40	17	14	10	5	27	100	101	61	44	37	11	9	23	53	648

Total Number of Valid Hours: 648

Total Number of Hours: 744

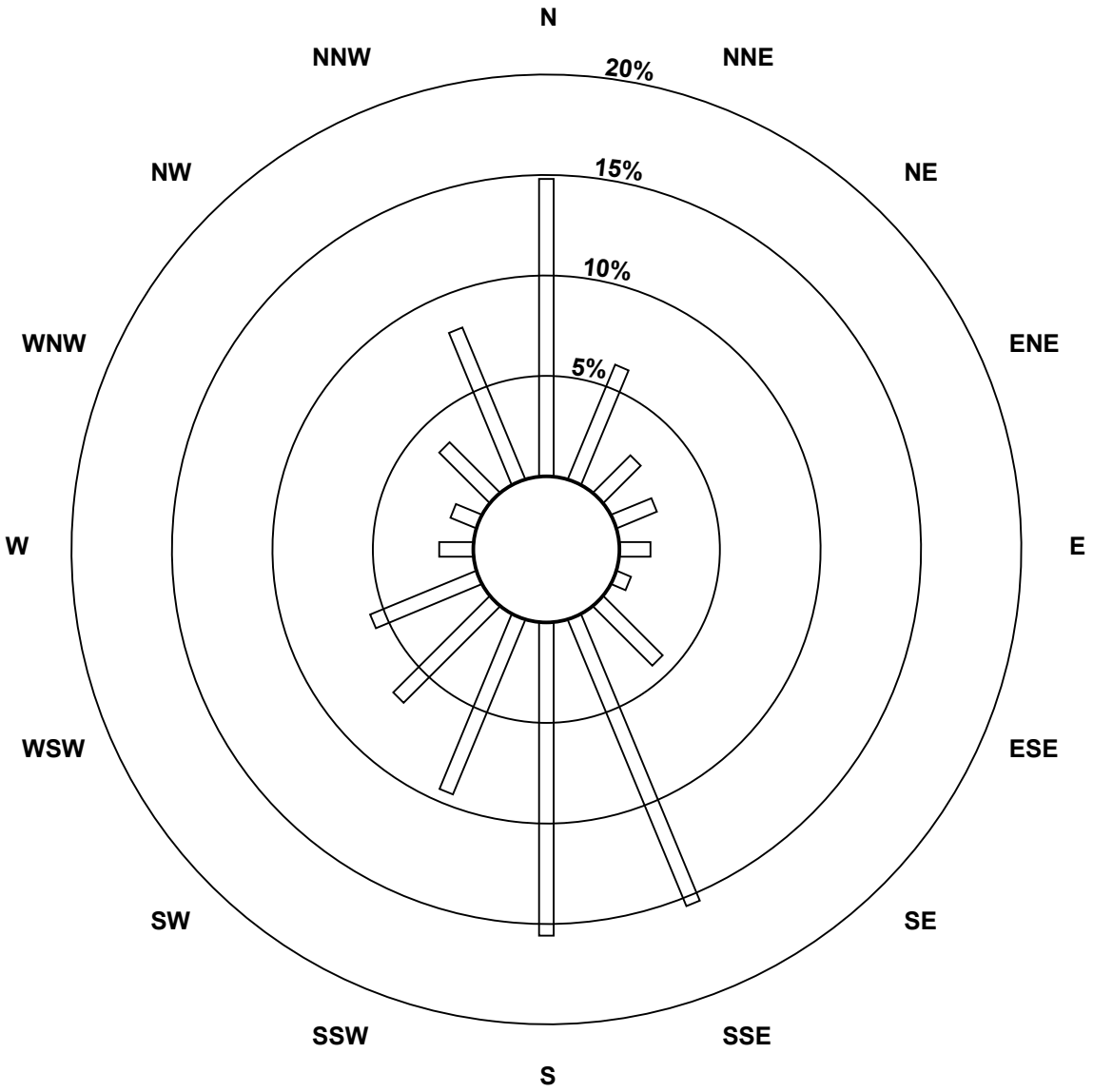
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

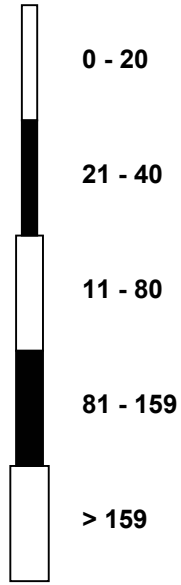
Wind Rose Jan 2015

Nitric Oxide (NO) - ppb

Wapasu (AMS 17)



Classes (ppb)



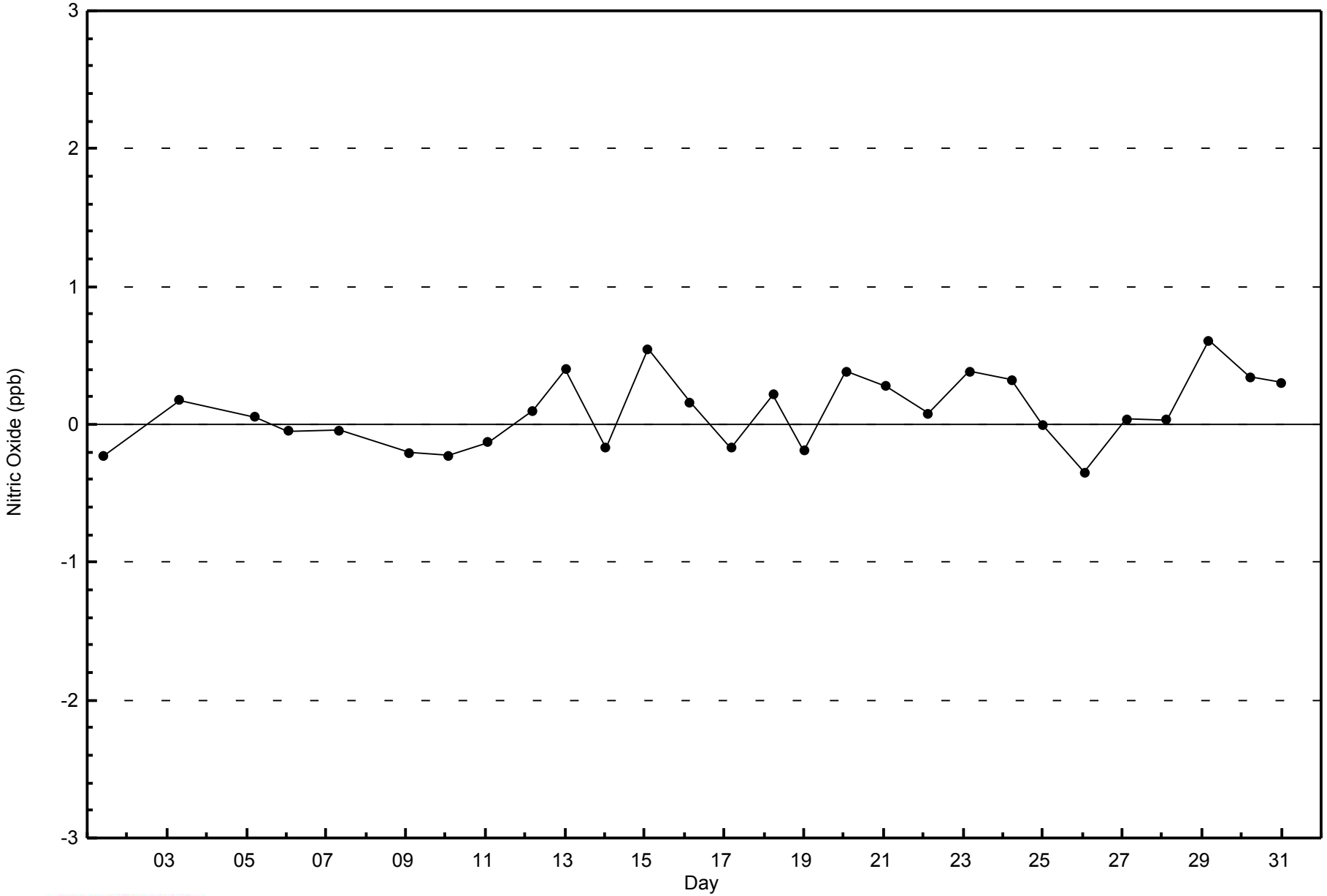
Total Number of Valid Hours: 648

WBEA

Zero Responses

Nitric Oxide (NO) - ppb

Wapasu - January 2015



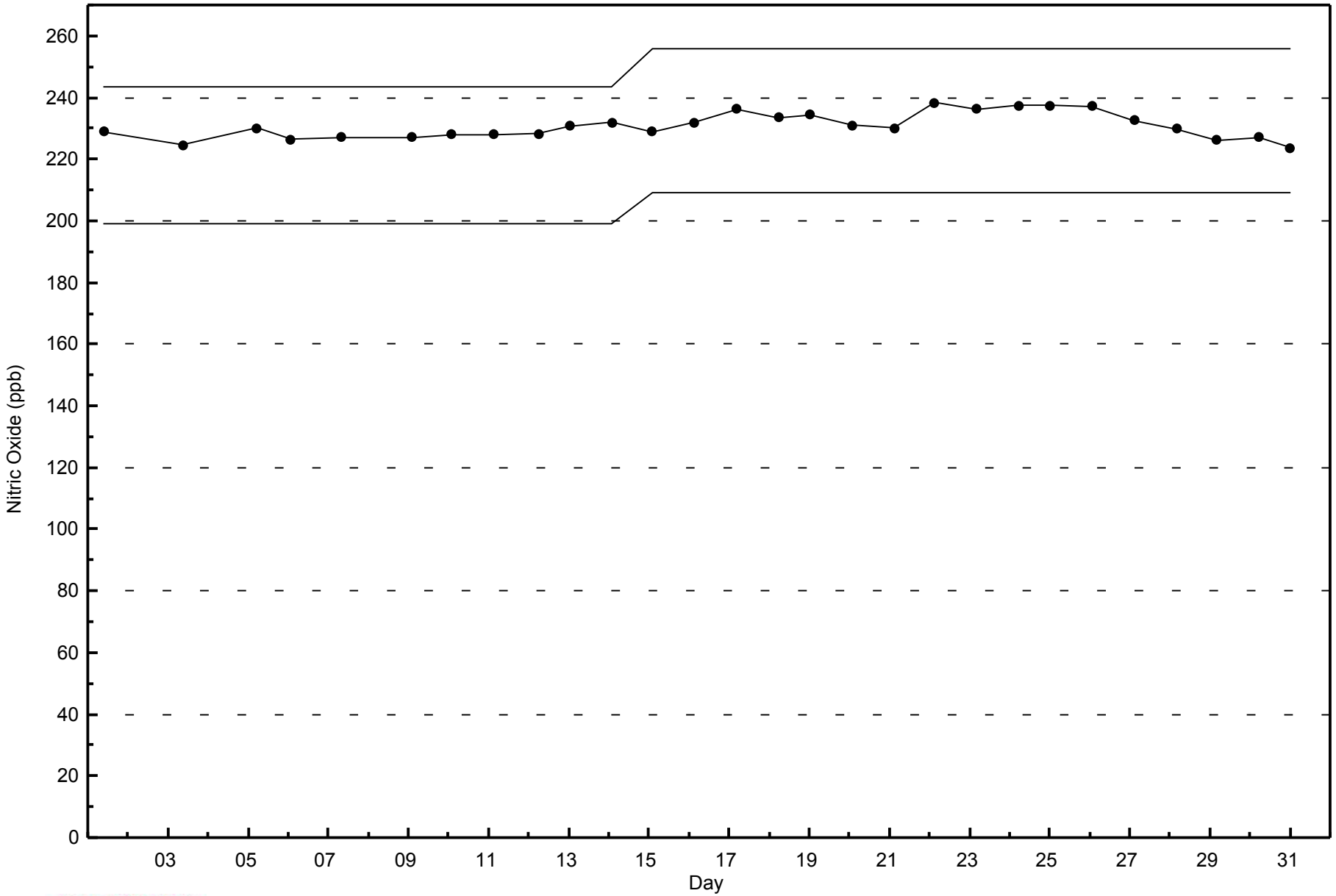
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitric Oxide (NO) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 30 ppb on Jan 12 18:00 Maximum Daily Average: 16.9 ppb on Jan 12

Minimum Value: 0 ppb on Jan 6 04:00 Minimum Daily Average: 0.3 ppb on Jan 15
Maximum Diurnal Average: 9.0 ppb at hour 18 Minimum Diurnal Average: 4.8 ppb at hour 6
Monthly Average: 6.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 4 $Q_3 = 11$ $P_{90} = 17$ $P_{99} = 25$

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	33
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0	0	0	2	4	1	0	1	0	Z	1	1	7	4	1	2	1	3	2	3	4	1	3	5	2.0	7
2-Jan	3	2	2	5	7	1	1	1	2	3	7	7	5	2	2	2	1	2	2	4	4	5	7	2	3.3	7
3-Jan	1	1	2	4	5	4	4	2	Z	7	7	14	9	9	7	5	6	12	7	5	5	4	4	13	6.0	14
4-Jan	26	26	24	17	13	16	17	17	14	12	12	15	13	15	14	15	18	18	11	6	18	18	20	11	16.1	26
5-Jan	21	23	17	21	21	Z	23	25	14	12	12	9	4	1	1	1	1	2	2	2	1	2	2	1	9.4	25
6-Jan	1	Z	0	0	1	1	2	5	5	3	4	8	7	6	8	21	20	13	16	19	23	16	18	16	9.2	23
7-Jan	14	9	5	1	1	1	2	2	Z	5	2	2	1	5	17	17	16	25	15	6	3	2	1	1	6.6	25
8-Jan	1	2	2	3	3	3	1	2	2	1	2	1	1	1	1	2	11	23	18	15	14	16	14	8	6.1	23
9-Jan	13	21	Z	16	12	10	8	10	13	6	6	5	7	15	18	11	13	7	6	5	3	2	1	1	9.1	21
10-Jan	0	1	Z	0	1	1	1	2	4	16	13	12	17	17	19	22	16	15	19	13	11	10	10	12	10.0	22
11-Jan	13	17	Z	11	10	9	7	5	4	5	9	4	6	2	1	2	6	3	3	3	3	2	4	3	5.8	17
12-Jan	3	6	11	12	12	Z	18	17	25	24	20	24	20	22	23	23	26	30	20	10	8	9	9	16	16.9	30
13-Jan	Z	15	14	18	12	5	5	3	C	C	C	C	C	0	2	6	3	1	1	0	0	1	1	1	4.8	18
14-Jan	1	Z	11	19	14	8	11	5	1	1	1	1	2	3	1	1	1	1	0	1	2	1	2	1	3.9	19
15-Jan	0	0	Z	1	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
16-Jan	0	1	2	Z	1	1	2	1	2	2	2	6	13	16	12	18	21	7	3	3	3	3	3	3	5.3	21
17-Jan	4	9	4	8	Z	5	3	2	2	3	2	0	1	0	1	1	1	3	3	3	4	5	6	2	3.1	9
18-Jan	3	4	3	3	2	Z	3	5	6	6	2	4	9	15	17	18	11	10	11	5	10	11	16	14	8.1	18
19-Jan	Z	11	10	10	10	13	16	19	12	7	5	4	4	4	14	15	11	2	1	1	1	1	0	0	7.4	19
20-Jan	0	Z	0	0	0	0	0	0	0	0	5	6	5	13	12	5	8	8	14	11	7	5	4	4	4.7	14
21-Jan	3	3	Z	3	2	2	2	1	1	2	3	2	3	5	8	9	13	18	18	14	18	19	15	15	7.7	19
22-Jan	18	19	5	Z	16	11	19	10	7	5	4	4	2	1	2	1	2	4	4	4	2	1	1	1	6.1	19
23-Jan	8	6	1	0	Z	0	0	0	4	5	5	3	3	8	5	10	13	16	20	22	21	11	5	2	7.3	22
24-Jan	2	4	2	1	1	Z	1	5	8	17	17	14	14	9	12	16	6	9	17	7	17	15	11	8	9.2	17
25-Jan	Z	7	2	5	9	1	1	1	7	11	3	2	1	4	4	6	2	1	4	6	3	3	3	11	4.1	11
26-Jan	21	Z	25	18	12	11	6	5	6	10	18	12	11	7	5	7	13	2	0	0	0	0	0	0	8.2	25
27-Jan	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	1	2	3	2	4	0.8	4
28-Jan	3	1	1	Z	7	8	6	8	5	6	4	3	2	2	3	3	3	1	1	1	2	1	1	1	3.2	8
29-Jan	3	7	10	6	Z	6	7	5	5	2	2	1	1	1	3	5	10	27	28	12	4	3	3	2	6.7	28
30-Jan	5	4	2	2	3	Z	2	1	1	1	1	1	2	2	2	3	4	5	4	1	1	1	1	1	2.1	5
31-Jan	Z	1	2	4	8	7	7	16	18	14	10	10	9	7	9	13	19	10	13	11	7	7	5	8	9.2	19
	6.2	7.4	6.2	6.7	6.7	4.8	5.7	5.8	6.0	6.4	6.0	5.9	6.0	6.3	7.3	8.4	9.0	9.0	8.5	6.2	6.5	5.7	5.5	5.3	Diurnal Average	
	26	26	25	21	21	16	23	25	25	24	20	24	20	22	23	23	26	30	28	22	23	19	20	16	Diurnal Maximum	

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

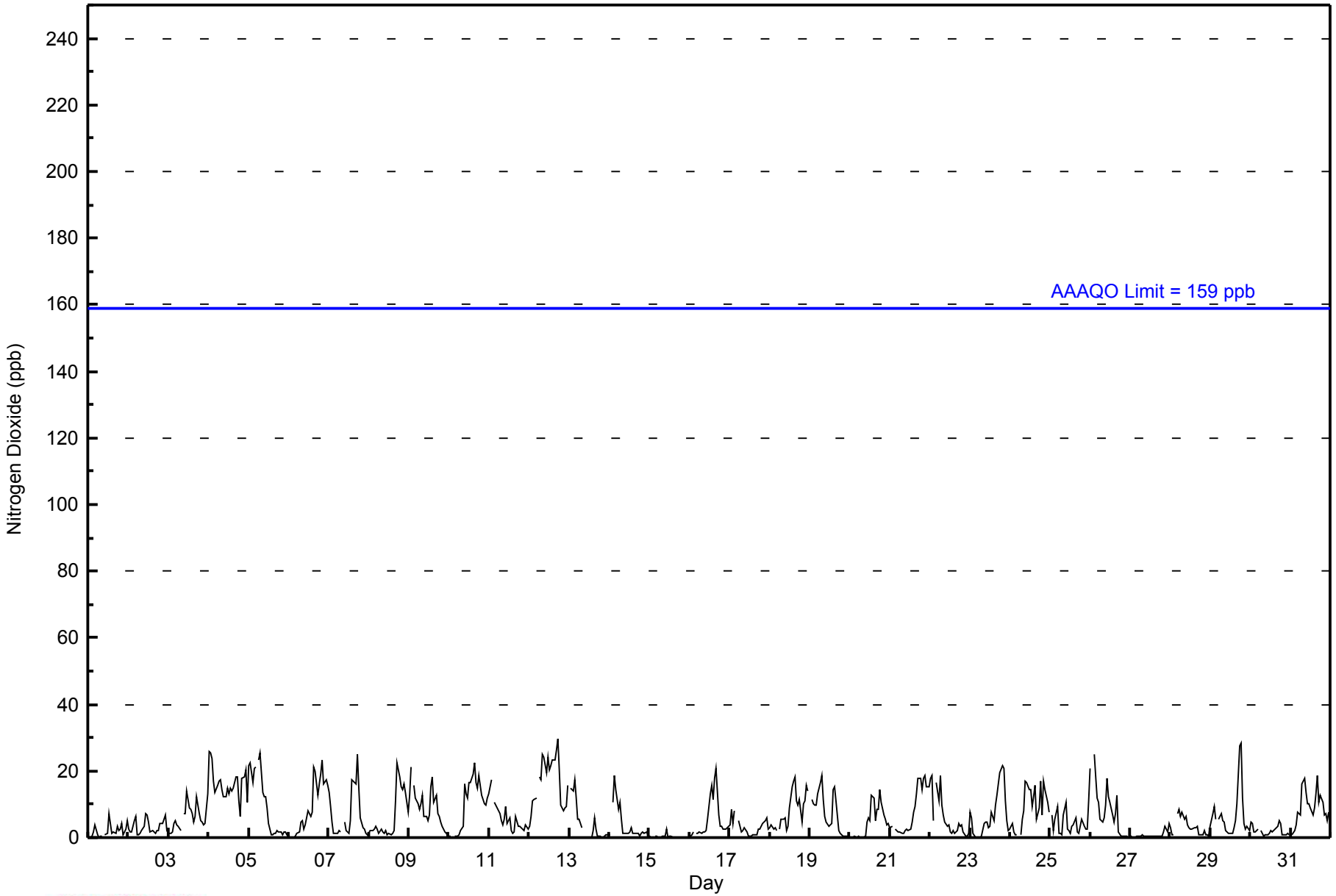
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	95.78	95.78
21 - 40	30	4.22	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: 711

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2015

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	95	40	17	14	10	5	27	97	96	48	43	35	10	9	23	51	620
21 - 40	1	0	0	0	0	0	0	3	5	13	1	2	1	0	0	2	28
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	96	40	17	14	10	5	27	100	101	61	44	37	11	9	23	53	648

Total Number of Valid Hours: 648

Total Number of Hours: 744

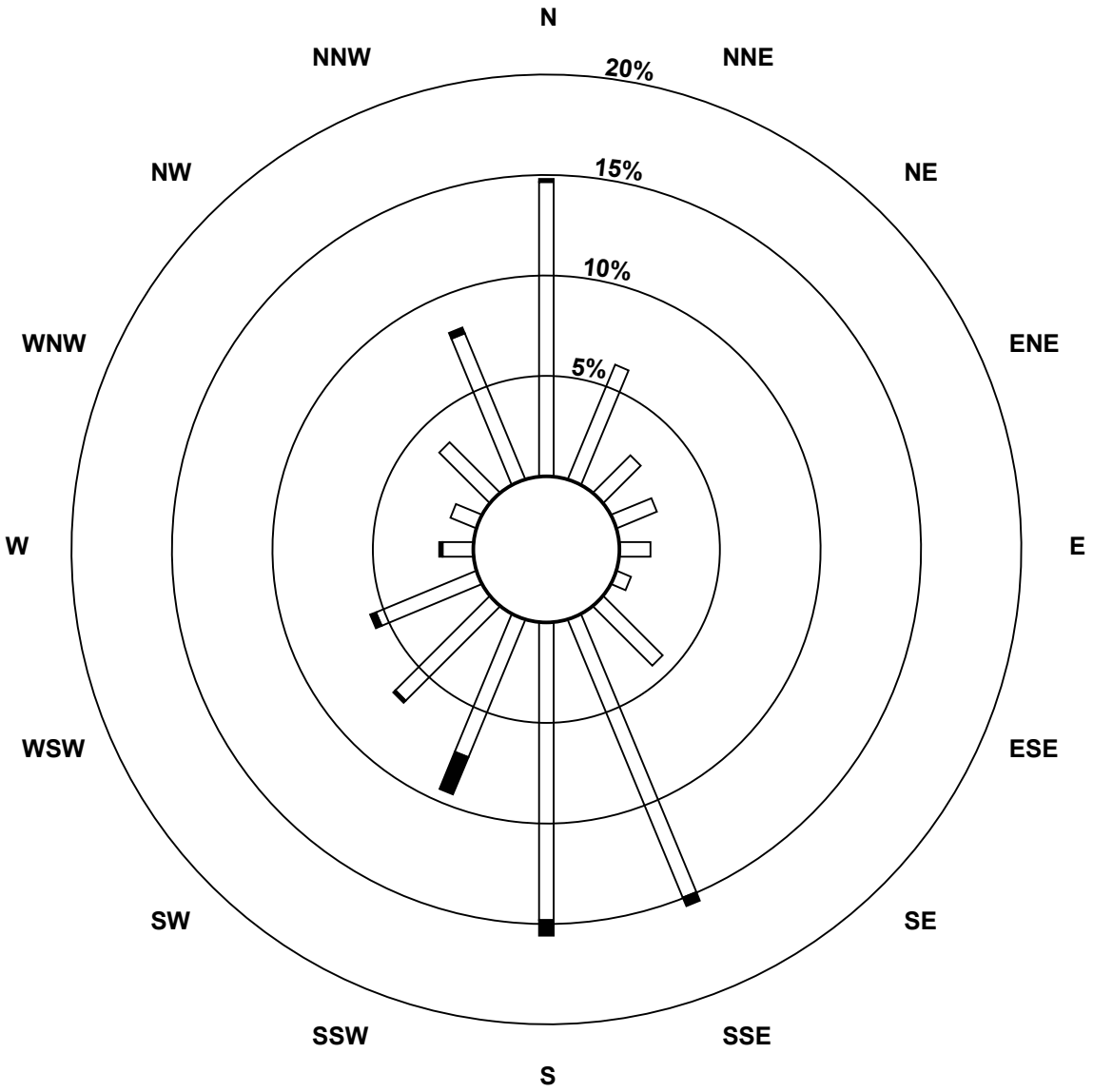
AURORA ATMOSPHERICS INC.

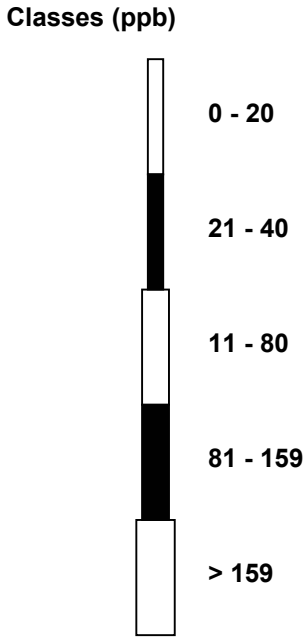
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Wapasu (AMS 17)





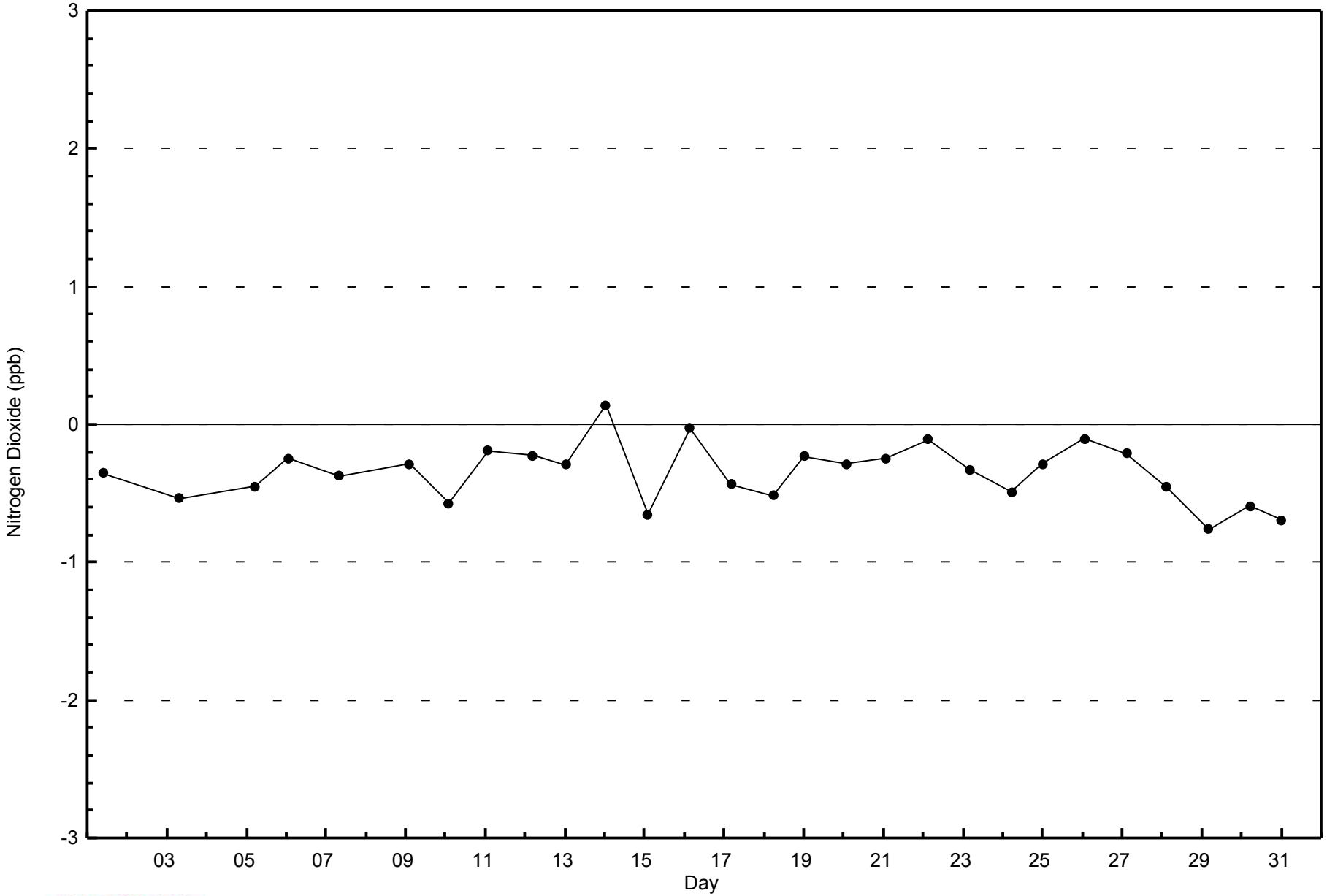
Total Number of Valid Hours: 648

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2015



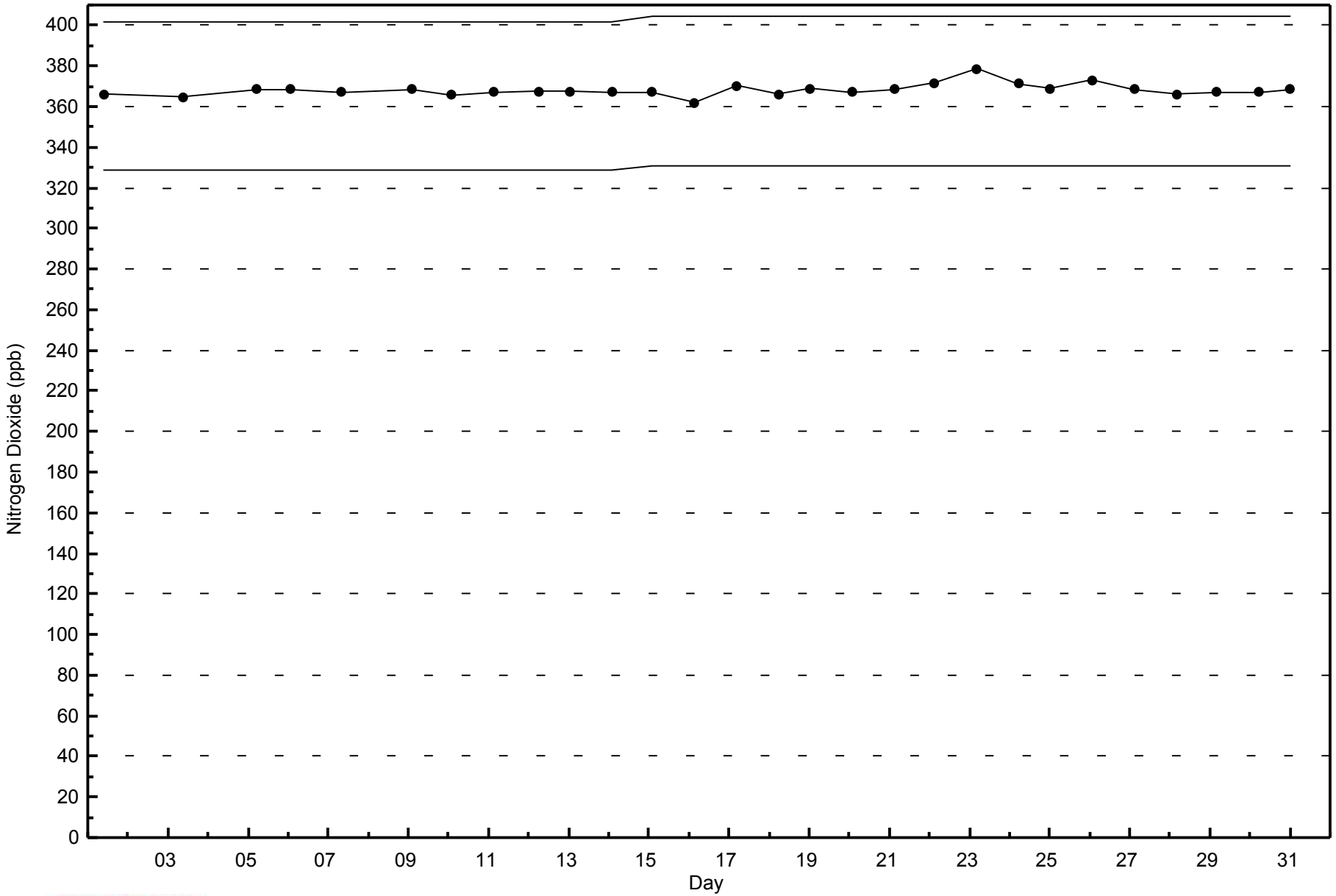
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2015

Maximum Value: 46 ppb on Jan 12 18:00

Maximum Daily Average: 22.3 ppb on Jan 12

Minimum Value: 0 ppb on Jan 20 07:00

Minimum Daily Average: 0.5 ppb on Jan 15

Maximum Diurnal Average: 10.3 ppb at hour 16

Minimum Diurnal Average: 5.2 ppb at hour 6

Monthly Average: 7.7 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 4 $Q_3 = 12$ $P_{90} = 19$ $P_{99} = 34$

Hours in Service:	744
Hours of Data:	711
Hours of Missing Data:	33
Hours of Calibration:	33
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-Jan	1	1	1	2	4	1	1	1	1	Z	1	2	10	6	2	2	2	4	3	3	5	2	3	5	2.8	10
2-Jan	3	2	2	6	7	1	1	2	3	4	9	9	6	3	3	2	2	2	2	5	5	6	7	2	3.9	9
3-Jan	2	1	2	4	5	4	4	2	Z	8	10	22	13	12	9	5	7	14	8	6	5	4	5	14	7.3	22
4-Jan	33	29	27	18	14	17	18	18	15	14	15	20	19	20	17	17	20	20	12	7	19	20	22	11	18.4	33
5-Jan	24	24	17	22	22	Z	24	27	14	13	14	11	5	2	2	2	2	3	2	2	1	2	2	1	10.3	27
6-Jan	1	Z	1	1	1	2	2	5	6	3	5	11	10	9	10	26	22	13	17	20	25	17	18	17	10.5	26
7-Jan	14	10	5	2	2	2	3	2	Z	5	3	2	2	6	21	18	17	27	16	6	4	3	2	1	7.5	27
8-Jan	1	2	3	3	4	3	2	3	2	2	3	2	2	1	2	3	12	23	19	16	15	17	15	8	6.8	23
9-Jan	13	22	Z	16	13	11	9	11	13	8	8	7	10	22	25	12	13	8	7	5	4	2	2	1	10.6	25
10-Jan	1	1	Z	1	1	1	2	3	5	19	17	17	26	25	25	27	17	16	19	13	12	11	10	12	12.3	27
11-Jan	14	18	Z	11	10	9	8	6	4	7	12	6	8	3	2	2	7	4	4	4	3	3	4	3	6.6	18
12-Jan	4	7	12	12	12	Z	20	18	28	30	27	43	35	36	38	34	35	46	21	10	8	9	9	17	22.3	46
13-Jan	Z	16	14	19	12	5	6	3	C	C	C	C	C	1	3	7	3	1	1	1	1	1	1	1	5.3	19
14-Jan	1	Z	12	21	16	9	11	6	2	2	2	2	2	4	2	2	2	1	0	1	1	1	2	0	4.5	21
15-Jan	0	0	Z	1	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3
16-Jan	1	1	2	Z	1	2	2	2	2	2	3	7	16	22	14	22	24	7	4	4	3	3	3	4	6.5	24
17-Jan	4	9	5	9	Z	6	4	3	3	4	2	1	1	1	2	1	1	4	3	4	5	6	7	3	3.7	9
18-Jan	3	4	3	3	2	Z	3	6	6	6	3	5	13	22	23	21	12	10	12	5	11	11	16	14	9.3	23
19-Jan	Z	12	10	10	10	14	17	20	12	7	6	5	5	6	22	20	12	2	1	1	1	1	0	0	8.4	22
20-Jan	0	Z	0	0	0	0	0	0	0	0	6	7	6	21	17	6	9	8	14	11	7	5	4	4	5.5	21
21-Jan	3	3	Z	2	2	2	1	1	1	2	3	3	3	5	8	9	13	18	18	14	18	19	16	15	7.9	19
22-Jan	18	19	5	Z	17	11	20	10	7	5	3	4	1	1	2	1	2	4	4	4	2	1	1	1	6.2	20
23-Jan	8	6	1	0	Z	0	0	0	4	5	6	3	4	13	7	14	15	17	22	28	24	11	5	2	8.5	28
24-Jan	2	4	2	1	1	Z	1	5	9	28	30	37	28	11	16	19	6	9	18	7	18	15	11	8	12.5	37
25-Jan	Z	7	2	5	10	1	1	1	7	11	3	2	2	4	4	6	2	2	4	6	4	3	3	12	4.5	12
26-Jan	27	Z	31	20	12	11	6	5	6	12	26	18	16	10	6	9	17	2	1	0	0	0	0	0	10.3	31
27-Jan	0	0	Z	0	0	0	1	1	0	1	1	1	1	0	0	1	0	1	1	1	2	3	2	4	0.9	4
28-Jan	3	1	1	Z	8	8	6	8	5	7	4	4	3	3	3	3	3	1	1	1	2	1	1	1	3.3	8
29-Jan	3	7	10	6	Z	6	7	5	5	2	2	1	1	1	3	5	10	29	32	12	4	3	3	2	6.9	32
30-Jan	5	4	2	2	3	Z	2	1	1	1	1	1	3	2	2	3	4	5	4	1	1	1	1	1	2.1	5
31-Jan	Z	1	2	4	8	7	7	16	19	16	14	15	14	10	12	17	22	11	13	11	7	7	5	8	10.7	22
	7.0	7.9	6.9	7.2	7.1	5.2	6.2	6.2	6.4	7.7	8.1	9.0	8.9	9.1	9.7	10.3	10.0	10.0	9.1	6.7	7.0	6.1	5.8	5.7	Diurnal Average	
	33	29	31	22	22	17	24	27	28	30	30	43	35	36	38	34	35	46	32	28	25	20	22	17	Diurnal Maximum	

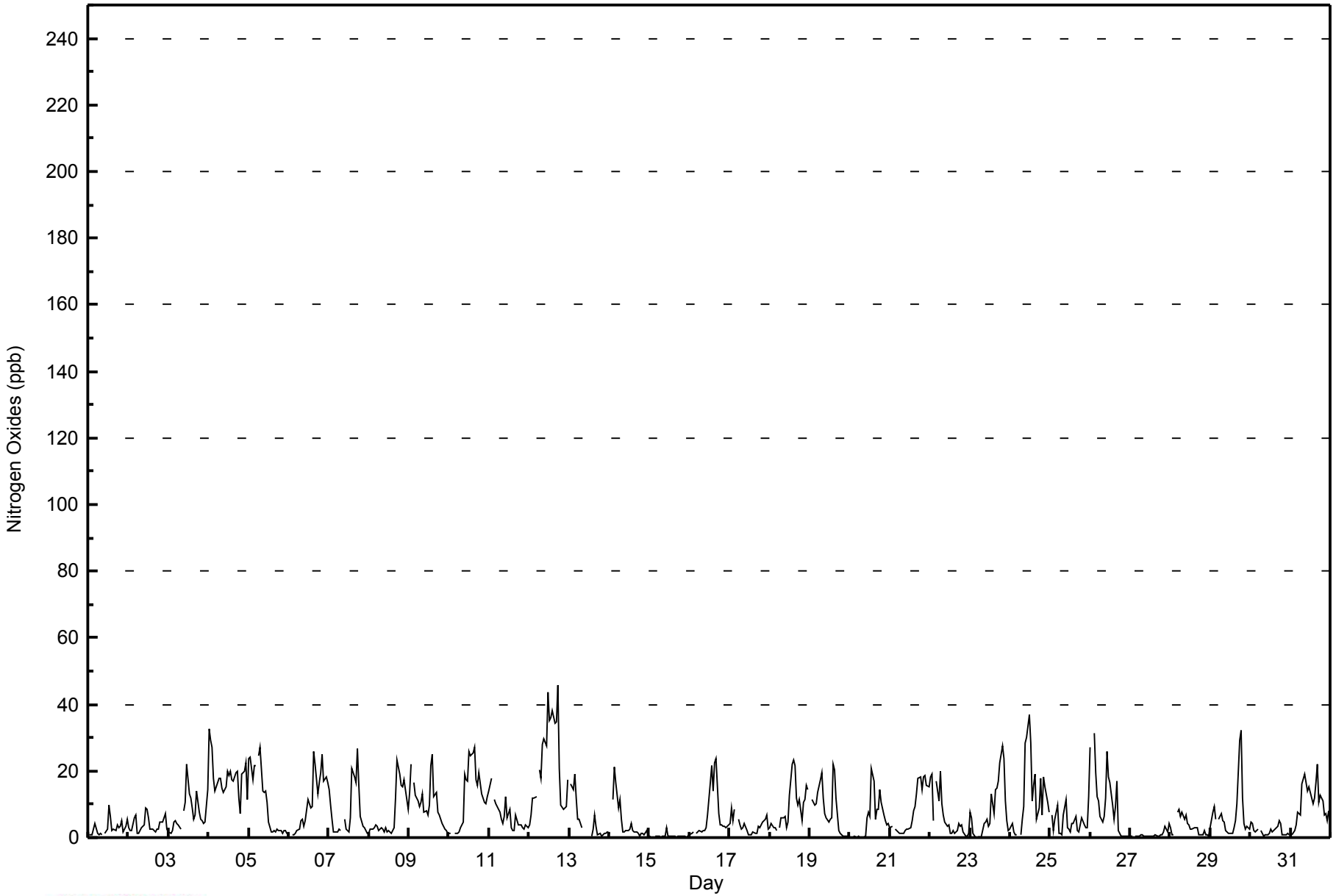
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	654	91.98	91.98
21 - 40	55	7.74	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: 711

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	95	39	17	14	10	5	27	96	92	44	34	33	10	8	23	50	597
21 - 40	1	1	0	0	0	0	0	4	8	17	9	4	1	1	0	3	49
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	96	40	17	14	10	5	27	100	101	61	44	37	11	9	23	53	648

Total Number of Valid Hours: 648

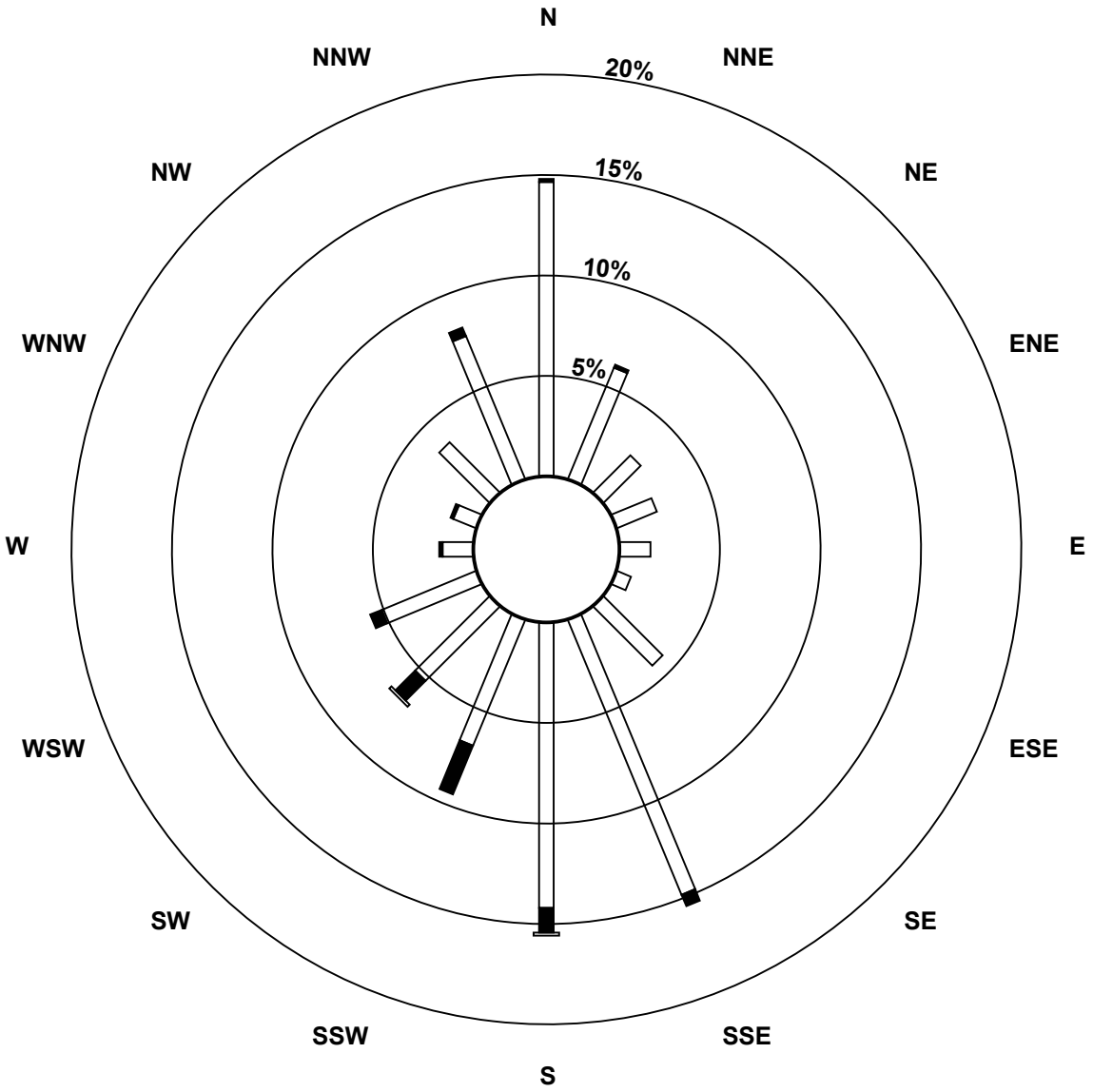
Total Number of Hours: 744

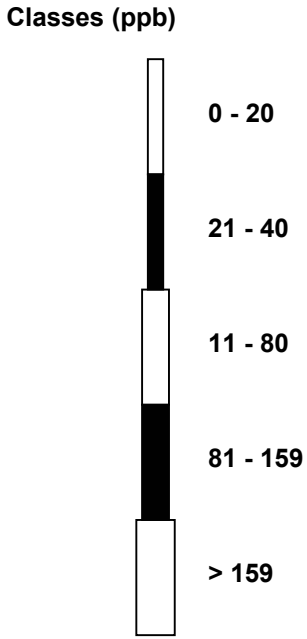
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Wapasu (AMS 17)

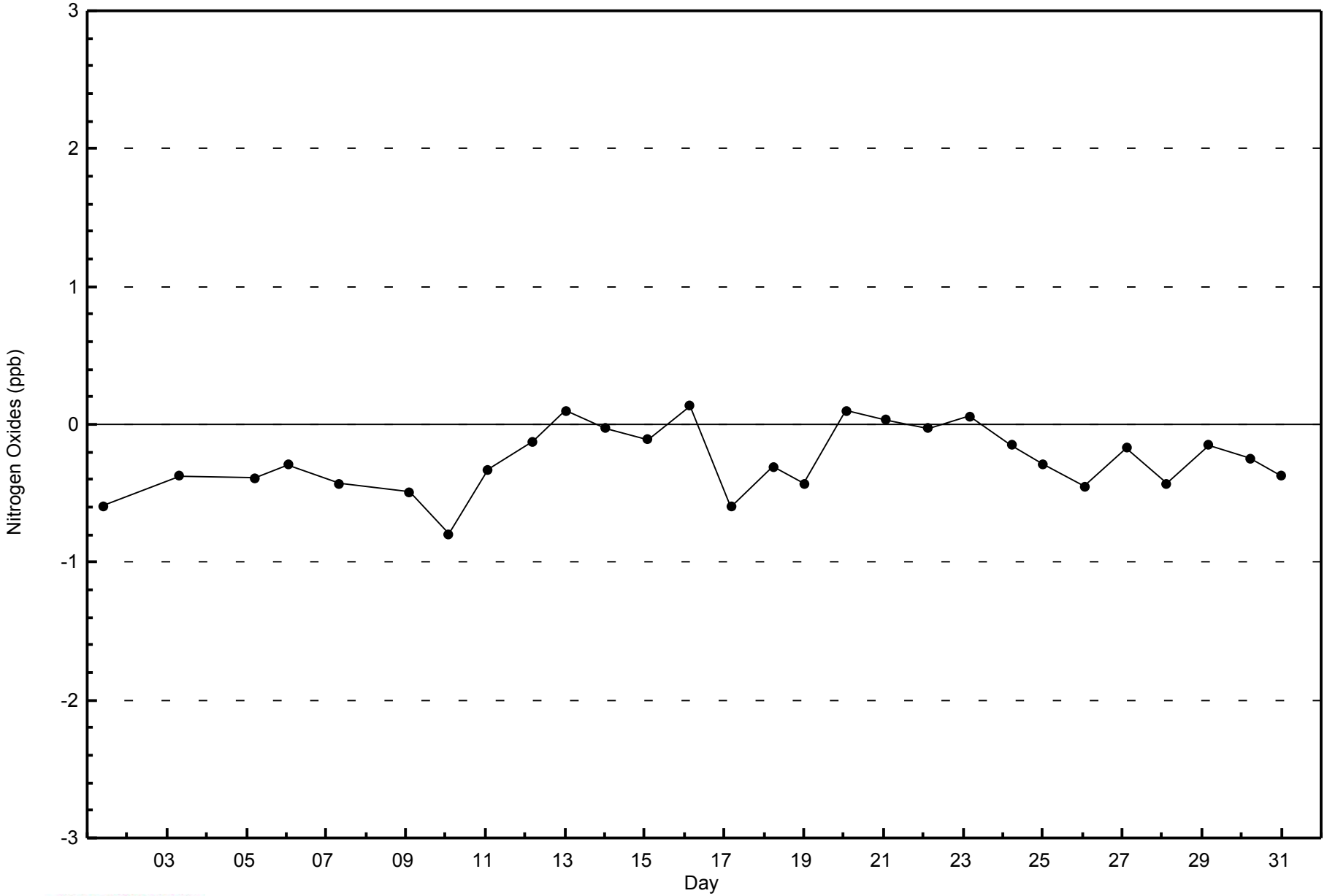




Total Number of Valid Hours: 648

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Wapasu - January 2015



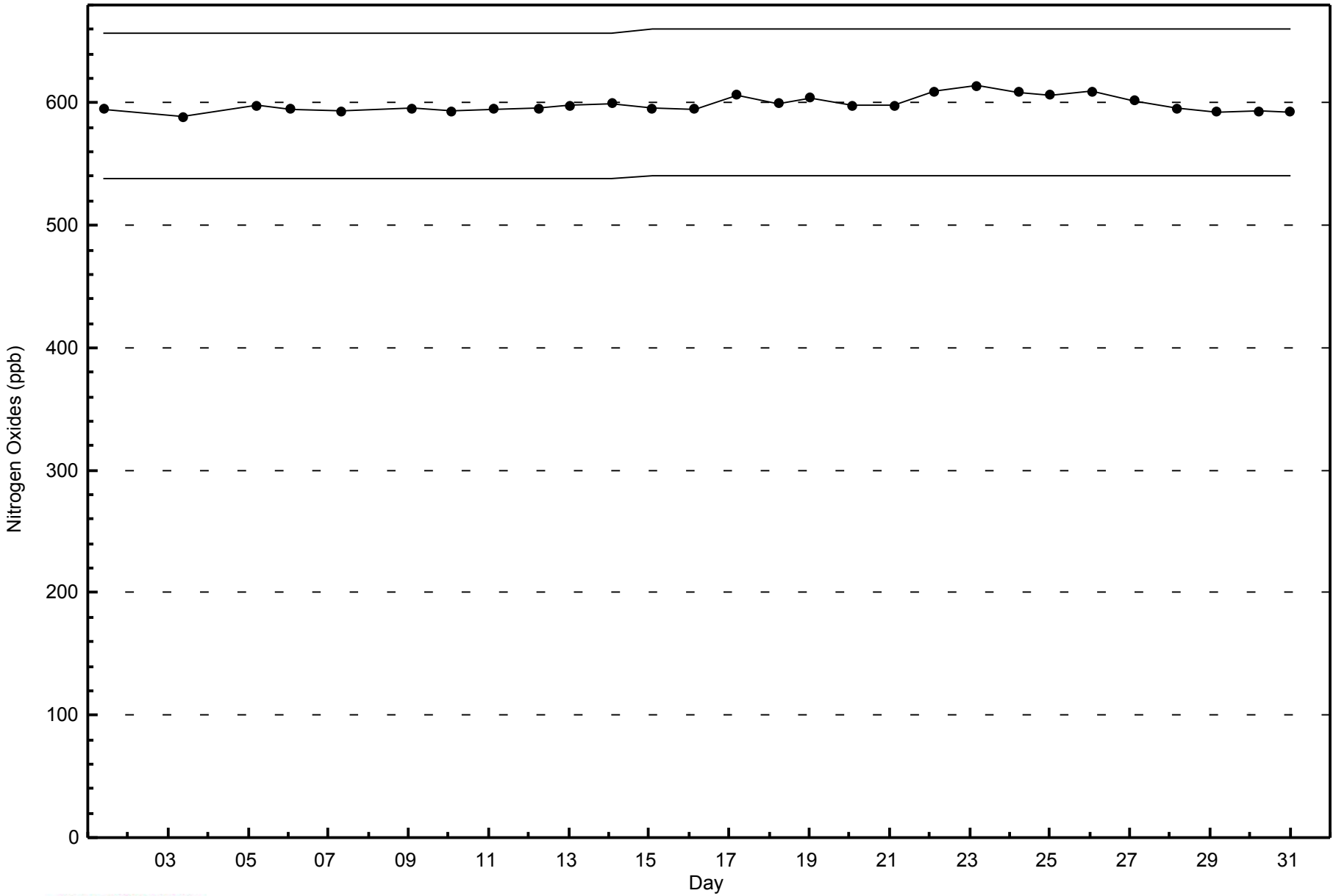
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Wapasu - January 2015

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

Maximum Value: 56.8 $\mu g/m^3$ on Jan 19 15:00

Maximum Daily Average: 11.1 $\mu g/m^3$ on Jan 19

Minimum Value: 0.7 $\mu g/m^3$ on Jan 7 13:00

Minimum Daily Average: 1.9 $\mu g/m^3$ on Jan 15

Maximum Diurnal Average: 5.4 $\mu g/m^3$ at hour 15

Minimum Diurnal Average: 3.8 $\mu g/m^3$ at hour 20

Monthly Average: 4.38 $\mu g/m^3$

Percentiles: P_1 = 1.0 P_{10} = 1.7 Q_1 = 2.2 Median = 3.3 Q_3 = 5.5 P_{90} = 8.0 P_{99} = 16.7

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-Jan	3.2	3.2	3.1	3.2	3.3	3.0	2.8	2.8	2.7	2.7	2.8	2.9	4.5	4.2	3.2	3.3	3.2	3.4	2.5	2.6	2.7	2.4	2.4	2.4	3.0	4.5
2-Jan	2.3	2.5	2.8	3.1	3.2	2.4	2.5	2.7	2.8	2.8	2.8	2.5	2.3	2.0	2.1	2.0	2.2	2.6	2.2	2.9	2.4	2.2	2.5	2.5	2.5	3.2
3-Jan	3.9	4.6	4.8	5.1	4.8	4.0	4.1	4.2	4.3	3.6	3.9	4.0	3.1	3.1	3.4	3.9	4.0	4.2	4.3	4.3	4.5	4.0	3.8	4.2	4.1	5.1
4-Jan	5.9	6.1	6.0	5.6	5.5	6.9	10.9	11.8	8.2	6.8	6.1	7.0	4.1	3.7	3.5	4.1	4.6	5.9	4.1	3.8	7.8	8.9	6.4	5.1	6.2	11.8
5-Jan	7.5	6.6	4.4	5.7	6.2	5.6	5.8	5.1	3.6	3.1	2.7	2.3	2.1	1.9	2.0	2.4	3.0	2.7	2.8	2.5	2.6	3.5	6.0	7.2	4.1	7.5
6-Jan	8.7	8.6	8.4	8.0	7.9	8.1	7.9	8.3	8.3	7.3	7.1	7.1	6.5	6.0	5.1	5.0	4.6	4.4	4.4	4.1	4.6	4.1	7.8	7.8	6.7	8.7
7-Jan	9.7	3.0	1.6	1.4	2.5	2.3	1.7	1.5	1.5	1.2	1.0	0.9	0.7	0.8	1.6	1.5	1.6	4.1	6.5	2.8	1.9	1.7	1.5	1.4	2.3	9.7
8-Jan	1.7	1.9	1.7	1.8	1.8	2.2	1.9	1.9	1.7	1.7	1.7	1.7	1.9	2.1	2.0	2.0	2.7	3.3	2.8	2.5	3.3	4.1	3.9	4.3	2.4	4.3
9-Jan	8.8	9.2	8.3	8.7	8.6	5.8	3.0	5.2	6.4	5.6	5.2	4.5	5.6	5.5	7.8	7.6	7.0	3.0	2.3	2.0	1.9	1.7	1.5	1.6	5.3	9.2
10-Jan	1.7	1.8	1.9	1.9	1.7	1.8	1.8	2.0	2.0	28.3	13.1	6.3	6.2	6.2	5.4	6.6	6.2	5.0	5.9	5.7	6.8	5.6	5.4	4.5	5.6	28.3
11-Jan	4.1	4.6	3.7	3.6	3.5	3.1	2.6	2.2	2.1	2.5	3.6	2.3	3.1	1.8	1.3	2.2	3.2	4.4	3.7	6.8	9.1	6.2	5.9	6.3	3.8	9.1
12-Jan	5.3	5.2	5.1	5.4	6.4	7.6	10.6	11.3	14.6	15.9	17.9	15.4	12.8	11.9	10.7	10.3	13.8	22.9	13.6	7.1	6.4	8.0	8.7	9.2	10.7	22.9
13-Jan	14.1	10.9	9.4	9.7	6.1	4.7	4.4	4.3	4.4	4.9	4.3	3.0	2.7	2.4	2.4	2.6	2.0	1.7	1.2	0.9	0.9	1.3	1.2	1.2	4.2	14.1
14-Jan	1.5	2.3	3.8	5.3	10.9	6.4	5.7	3.4	2.4	M	4.2	4.3	3.7	3.8	2.8	2.7	3.0	2.7	2.5	3.6	3.5	3.6	3.3	2.4	3.8	10.9
15-Jan	2.5	2.6	2.4	2.3	2.1	1.9	1.9	1.9	1.8	1.7	1.7	1.5	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.8	1.9	2.1	2.3	1.9	2.6
16-Jan	2.5	3.0	3.3	3.3	3.3	3.4	3.6	3.8	3.9	4.1	4.4	5.7	6.6	6.3	6.2	5.5	4.1	2.8	3.2	2.8	1.8	1.3	1.1	1.2	3.6	6.6
17-Jan	1.1	1.1	1.1	1.1	1.8	8.0	10.4	4.4	4.0	3.9	3.9	3.6	2.8	2.7	2.5	2.1	2.3	5.1	5.2	2.9	4.0	5.5	3.2	2.4	3.6	10.4
18-Jan	2.1	2.0	1.8	1.7	1.9	1.9	2.0	1.9	2.3	2.1	1.9	1.8	2.1	2.4	2.9	2.8	3.4	3.5	3.1	2.0	2.4	3.0	5.9	6.8	2.7	6.8
19-Jan	10.2	7.8	5.6	4.5	3.4	3.4	7.6	6.7	4.0	6.5	7.5	11.8	7.4	15.8	56.8	43.6	19.1	5.5	5.5	6.3	5.8	6.8	7.1	6.8	11.1	56.8
20-Jan	5.7	4.9	4.4	3.9	3.7	3.6	3.6	3.6	3.2	3.6	5.3	11.4	7.3	6.1	4.5	3.3	4.3	4.9	6.8	5.9	4.8	4.3	3.8	3.1	4.8	11.4
21-Jan	2.0	1.8	1.8	2.0	2.2	2.1	1.9	1.5	1.4	1.3	1.7	1.9	1.8	1.3	1.2	1.3	1.5	3.0	5.0	3.6	3.7	4.0	5.7	5.4	2.5	5.7
22-Jan	6.0	5.9	4.9	8.3	5.9	5.5	5.5	4.5	3.0	1.9	1.4	1.3	1.0	1.0	1.0	1.7	1.5	2.4	2.5	1.7	1.4	1.7	2.0	4.1	3.2	8.3
23-Jan	16.7	8.3	4.0	2.9	3.0	3.2	3.7	5.5	8.8	8.6	7.6	5.5	3.4	5.5	4.6	3.9	4.6	8.6	11.6	12.6	9.7	15.6	9.1	3.6	7.1	16.7
24-Jan	2.7	2.9	4.1	4.8	2.8	2.1	1.9	3.9	7.7	9.2	6.0	6.1	5.3	4.5	3.9	3.3	2.2	3.2	3.8	2.2	2.1	1.8	2.0	6.2	3.9	9.2
25-Jan	4.2	1.8	1.3	1.9	1.6	1.0	0.8	0.9	1.1	2.8	1.6	1.1	1.1	1.1	1.2	2.0	2.2	2.5	3.5	3.3	2.8	2.4	2.0	3.9	2.0	4.2
26-Jan	8.8	11.4	8.6	9.9	10.1	4.5	2.4	2.6	3.1	5.8	6.9	4.1	3.3	2.9	3.5	4.7	4.8	2.9	3.2	2.9	3.5	4.0	2.9	2.7	5.0	11.4
27-Jan	2.9	3.0	3.3	3.4	3.5	3.4	3.2	3.0	3.0	2.8	2.7	2.1	1.8	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.5	3.5
28-Jan	1.9	1.9	1.9	2.3	2.2	2.3	2.9	2.8	3.5	3.4	3.2	2.6	2.2	2.1	2.1	2.0	2.1	2.0	1.9	2.0	2.0	1.9	1.8	1.7	2.3	3.5
29-Jan	2.0	2.4	2.2	2.5	2.6	2.3	2.5	3.2	3.7	3.0	2.6	2.2	2.1	2.5	2.3	2.2	2.8	6.2	6.6	5.0	7.2	8.0	15.9	5.1	4.0	15.9
30-Jan	7.4	14.5	5.2	4.3	4.9	5.3	3.7	3.2	2.8	2.7	2.4	3.4	5.9	5.4	12.2	13.8	4.3	6.4	28.7	3.4	3.0	2.8	3.1	2.6	6.3	28.7
31-Jan	2.8	2.9	2.9	3.3	3.6	3.8	3.7	5.0	8.4	6.4	5.1	5.5	7.9	5.6	4.7	5.9	7.2	5.0	4.3	5.3	4.6	4.3	4.2	3.8	4.8	8.4
	5.2	4.8	4.0	4.2	4.2	3.9	4.1	4.0	4.2	5.2	4.6	4.4	4.0	4.0	5.4	5.1	4.2	4.4	5.1	3.8	3.9	4.1	4.3	4.0	Diurnal Average	
	16.7	14.5	9.4	9.9	10.9	8.1	10.9	11.8	14.6	28.3	17.9	15.4	12.8	15.8	56.8	43.6	19.1	22.9	28.7	12.6	9.7	15.6	15.9	9.2	Diurnal Maximum	

M - Maintenance

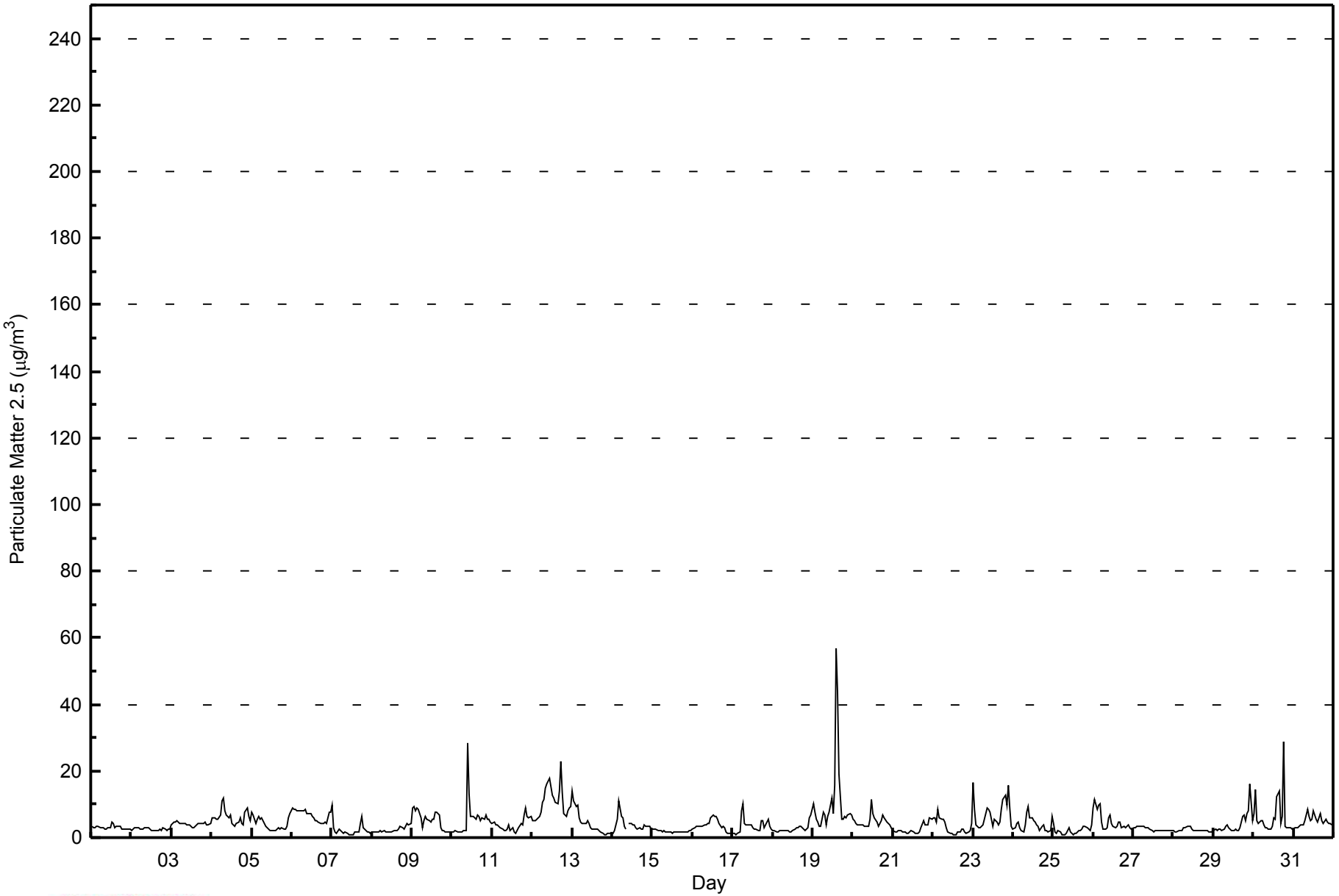
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA

Hourly Averages

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

Wapasu - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	554	74.56	74.56
6 - 15	169	22.75	97.31
16 - 25	8	1.08	98.38
26 - 80	4	0.54	98.92
> 81.0	0	0.00	98.92

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA

Frequency Distribution

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

Wapasu - January 2015

Concentration	**Wind Direction**																
Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	74	32	15	13	8	5	27	75	71	33	31	28	9	8	21	48	498
6 - 15	26	6	4	1	2	1	1	22	32	29	13	8	2	1	3	6	157
16 - 25	2	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	7
26 - 80	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	102	42	19	14	10	6	28	98	105	63	44	37	11	9	24	54	666

Total Number of Valid Hours: 674

Total Number of Hours: 744

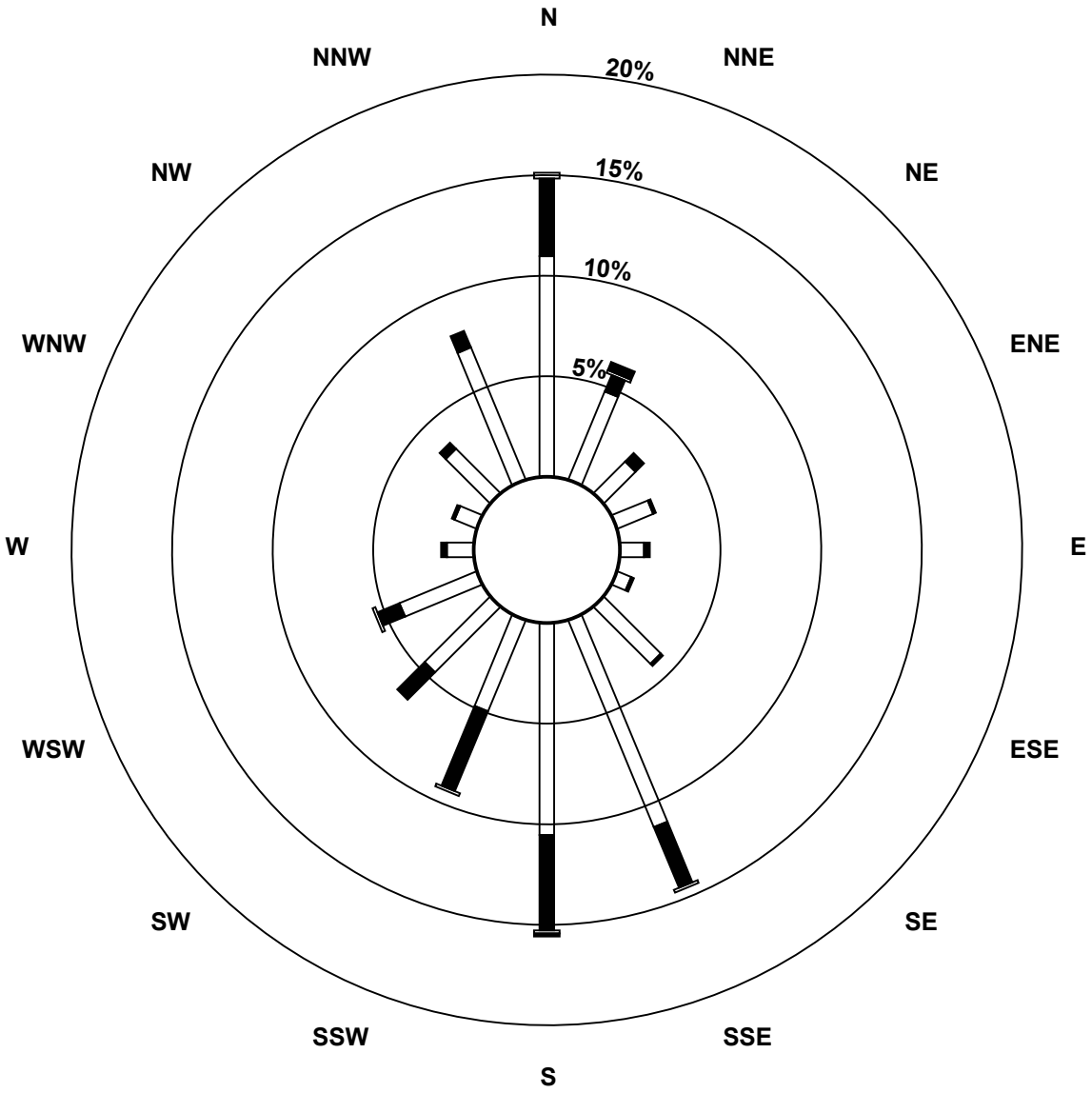
AURORA
ATMOSPHERICS INC.

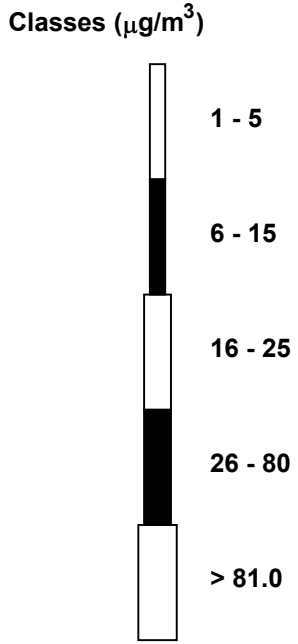
Wood Buffalo Environmental Association

Wind Rose Jan 2015

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

Wapasu (AMS 17)





Total Number of Valid Hours: 674

Maximum Value: 4.1 C on Jan 25 14:00

Maximum Daily Average: 1.4 C on Jan 22

Minimum Value: -35.4 C on Jan 31 03:00

Minimum Daily Average: -29.5 C on Jan 3

Maximum Diurnal Average: -12.7 C at hour 14

Minimum Diurnal Average: -16.9 C at hour 8

Monthly Average: -15.29 C

Percentiles: P_1 = -34.4 P_{10} = -27.5 Q_1 = -22.7 Median = -16.8 Q_3 = -7.1 P_{90} = -0.5 P_{99} = 3.4

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

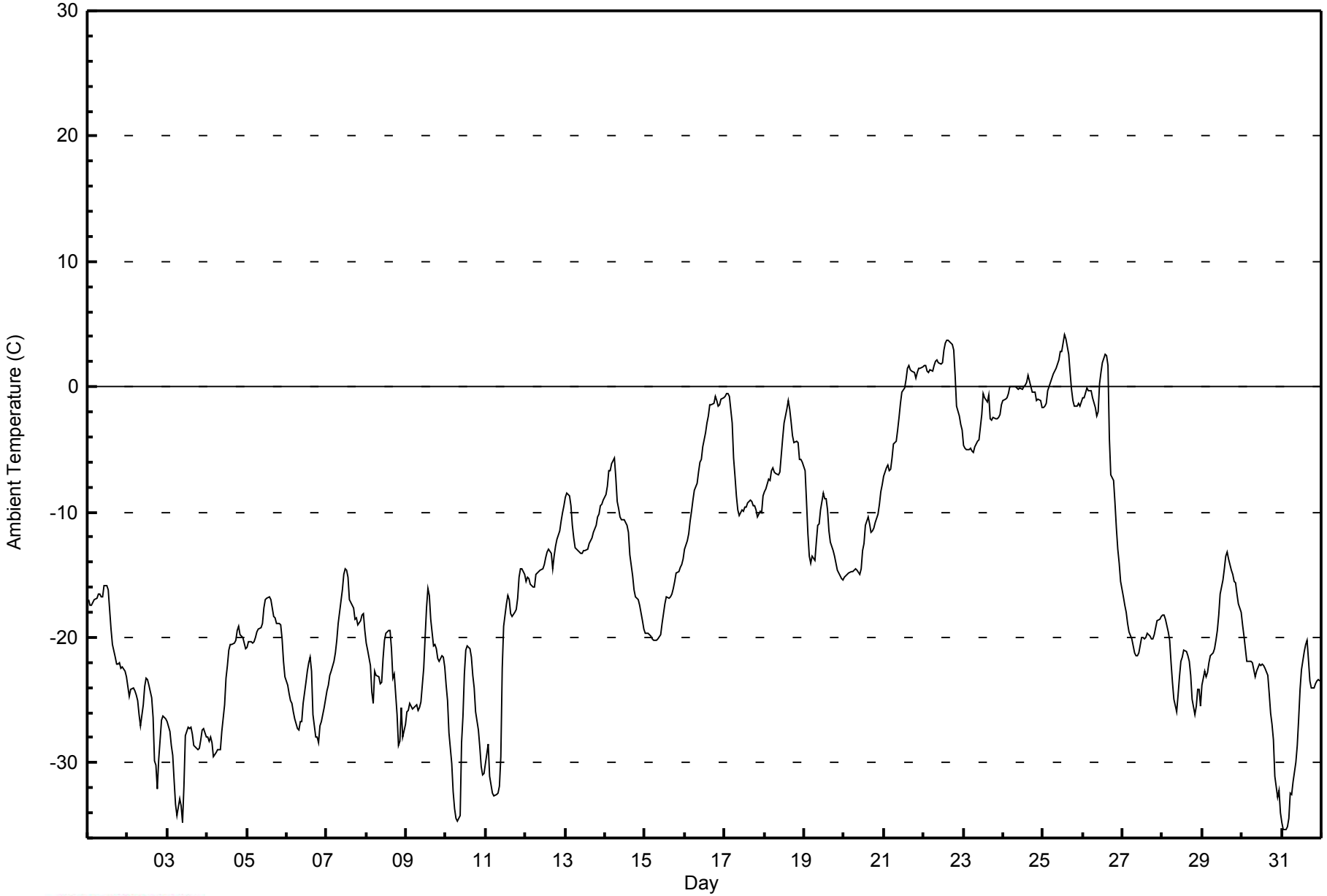
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-17.0	-17.4	-17.4	-17.2	-17.0	-16.8	-16.6	-16.5	-16.8	-16.7	-15.9	-15.8	-16.2	-17.7	-19.4	-20.5	-21.6	-22.1	-22.1	-22.0	-22.4	-22.4	-22.7	-23.1	-18.9	-15.8
2-Jan	-23.9	-24.7	-24.2	-24.0	-24.2	-24.6	-25.1	-26.1	-27.1	-25.4	-23.9	-23.2	-23.4	-23.9	-24.8	-26.4	-29.8	-30.2	-32.0	-29.8	-26.6	-26.3	-26.4	-26.5	-25.9	-23.2
3-Jan	-26.7	-27.5	-28.6	-29.3	-31.4	-33.3	-34.2	-32.9	-33.4	-34.8	-31.9	-27.9	-27.2	-27.2	-27.1	-27.7	-28.6	-28.7	-28.9	-28.9	-28.2	-27.4	-27.3	-27.9	-29.5	-26.7
4-Jan	-28.0	-28.3	-27.9	-28.4	-29.6	-29.2	-28.9	-29.0	-29.0	-27.5	-25.3	-23.3	-22.2	-21.0	-20.5	-20.5	-20.5	-20.3	-19.4	-19.1	-19.7	-20.0	-20.4	-20.9	-24.1	-19.1
5-Jan	-20.8	-20.4	-20.4	-20.5	-20.3	-20.0	-19.6	-19.3	-19.2	-18.9	-17.6	-17.0	-16.8	-16.8	-16.9	-17.7	-18.3	-18.5	-18.9	-18.9	-19.0	-20.1	-21.9	-23.1	-19.2	-16.8
6-Jan	-23.8	-24.5	-25.1	-25.3	-26.0	-26.5	-27.2	-27.3	-26.7	-26.7	-25.3	-23.6	-22.7	-22.0	-21.5	-22.7	-26.2	-28.0	-28.0	-28.3	-27.0	-26.7	-25.6	-24.9	-25.5	-21.5
7-Jan	-24.2	-23.8	-23.1	-22.7	-21.9	-21.2	-20.2	-18.9	-18.0	-16.2	-15.0	-14.5	-14.6	-15.1	-17.0	-17.4	-17.6	-18.5	-18.5	-19.0	-18.7	-18.2	-18.1	-19.5	-18.8	-14.5
8-Jan	-20.5	-21.0	-22.3	-24.3	-25.3	-22.6	-23.0	-23.1	-23.7	-23.6	-21.6	-20.2	-19.7	-19.5	-19.5	-20.9	-23.2	-22.9	-26.2	-28.7	-28.2	-25.6	-27.9	-26.9	-23.4	-19.5
9-Jan	-25.9	-25.8	-25.3	-25.5	-25.7	-25.4	-25.4	-25.8	-25.6	-25.1	-22.4	-20.0	-17.7	-16.1	-16.6	-18.5	-20.6	-20.5	-20.9	-21.7	-21.9	-21.5	-21.5	-22.4	-22.4	-16.1
10-Jan	-23.8	-25.1	-27.6	-30.1	-32.3	-33.6	-34.5	-34.6	-34.2	-28.4	-26.3	-22.9	-21.0	-20.6	-20.9	-21.6	-23.0	-24.0	-26.0	-27.4	-28.7	-30.3	-30.9	-30.8	-27.4	-20.6
11-Jan	-30.1	-28.5	-31.0	-31.8	-32.4	-32.7	-32.6	-32.5	-31.8	-29.5	-22.4	-19.1	-17.3	-16.7	-17.0	-18.1	-18.4	-18.0	-17.8	-16.9	-15.2	-14.5	-14.5	-15.0	-23.1	-14.5
12-Jan	-15.5	-15.2	-15.3	-15.7	-15.9	-16.0	-15.0	-14.8	-14.7	-14.6	-14.5	-14.2	-13.7	-13.1	-13.0	-13.3	-14.5	-13.6	-12.7	-12.2	-11.5	-10.7	-10.1	-9.5	-13.7	-9.5
13-Jan	-8.8	-8.5	-8.7	-9.5	-11.1	-12.0	-12.9	-13.1	-13.2	-13.3	-13.2	-13.1	-13.1	-12.9	-12.5	-12.2	-12.1	-11.7	-11.0	-10.4	-10.1	-9.5	-9.3	-9.1	-11.3	-8.5
14-Jan	-8.6	-7.9	-6.7	-6.6	-6.1	-5.7	-7.3	-9.2	-9.8	-10.4	-10.6	-10.6	-10.9	-11.1	-11.6	-13.4	-15.1	-16.2	-16.8	-16.8	-17.0	-17.5	-18.6	-19.4	-11.8	-5.7
15-Jan	-19.7	-19.7	-19.7	-19.9	-20.1	-20.2	-20.2	-20.3	-20.2	-19.8	-18.9	-18.2	-17.3	-16.8	-16.9	-16.8	-16.5	-16.1	-15.6	-14.9	-14.7	-14.4	-14.2	-13.8	-17.7	-13.8
16-Jan	-13.0	-12.3	-11.7	-10.7	-9.9	-9.0	-8.3	-7.7	-6.8	-6.1	-5.8	-4.8	-3.7	-2.9	-2.3	-1.5	-1.5	-1.3	-0.8	-1.0	-1.5	-1.4	-0.9	-0.8	-5.2	-0.8
17-Jan	-0.7	-0.5	-0.6	-0.8	-2.9	-5.7	-7.1	-8.7	-9.8	-10.3	-9.8	-9.9	-9.6	-9.6	-9.3	-9.1	-9.1	-9.5	-9.5	-9.9	-10.4	-10.0	-10.1	-8.7	-7.6	-0.5
18-Jan	-8.4	-8.2	-7.3	-7.4	-6.7	-6.4	-6.8	-6.9	-7.1	-6.8	-5.4	-4.1	-2.9	-1.8	-1.1	-1.7	-2.8	-3.9	-4.4	-4.3	-4.5	-5.8	-5.8	-6.0	-5.3	-1.1
19-Jan	-6.7	-9.2	-11.7	-13.5	-14.0	-13.5	-13.9	-12.4	-11.0	-10.9	-9.9	-8.5	-9.0	-8.9	-9.9	-11.4	-12.4	-13.1	-13.5	-14.0	-14.7	-14.9	-15.3	-15.4	-12.0	-6.7
20-Jan	-15.2	-15.1	-15.0	-14.9	-14.8	-14.8	-14.6	-14.6	-14.6	-15.0	-14.6	-13.1	-12.5	-11.1	-10.4	-10.9	-11.6	-11.5	-11.3	-10.8	-10.1	-9.3	-8.4	-7.8	-12.6	-7.8
21-Jan	-7.1	-6.4	-6.2	-6.7	-6.6	-5.7	-4.6	-4.4	-3.5	-2.4	-1.4	-0.4	-0.1	0.6	1.4	1.6	1.3	1.3	1.2	0.7	1.1	1.4	1.5	1.6	-1.7	1.6
22-Jan	1.7	1.7	1.2	1.2	1.3	1.2	1.6	2.1	2.2	1.9	1.9	2.0	2.9	3.4	3.7	3.7	3.5	3.4	3.0	0.9	-1.5	-2.3	-3.0	-3.4	1.4	3.7
23-Jan	-4.7	-4.9	-5.0	-5.0	-4.9	-5.1	-5.2	-4.8	-4.3	-4.2	-3.2	-2.2	-0.5	-0.9	-1.2	-0.6	-2.5	-2.7	-2.4	-2.5	-2.6	-2.5	-2.2	-1.5	-3.2	-0.5
24-Jan	-1.0	-1.0	-0.9	-0.5	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.1	-0.2	0.0	0.2	0.4	0.9	0.5	-0.5	-0.4	-0.4	-1.1	-1.0	-1.1	-1.6	-0.3	0.9
25-Jan	-1.7	-1.5	-1.3	-0.3	0.4	0.6	1.0	1.3	1.5	2.1	2.8	2.8	3.5	4.1	3.8	2.6	1.1	-0.2	-1.1	-1.5	-1.5	-1.3	-1.6	-1.2	0.6	4.1
26-Jan	-0.9	-0.8	-0.1	-0.3	-0.3	-0.3	-0.8	-1.6	-2.4	-2.0	0.3	1.1	1.9	2.6	2.4	1.7	-4.1	-7.0	-7.5	-9.3	-11.3	-12.9	-14.1	-15.5	-3.4	2.6
27-Jan	-16.7	-17.4	-18.0	-18.9	-19.6	-20.1	-20.7	-21.3	-21.5	-21.5	-21.3	-20.0	-20.0	-20.1	-20.0	-19.7	-19.8	-20.1	-20.1	-19.8	-19.2	-18.7	-18.6	-18.3	-19.6	-16.7
28-Jan	-18.2	-18.2	-18.5	-19.5	-20.2	-22.0	-23.6	-25.0	-25.9	-24.6	-23.1	-21.9	-21.5	-21.1	-21.2	-21.4	-21.9	-23.0	-24.9	-26.1	-25.5	-24.2	-24.1	-25.5	-22.5	-18.2
29-Jan	-23.8	-22.7	-23.1	-22.8	-22.0	-21.4	-21.2	-20.9	-20.2	-19.5	-18.2	-16.6	-15.5	-14.5	-13.6	-13.2	-13.8	-14.7	-14.9	-15.6	-15.6	-16.5	-17.3	-17.9	-18.1	-13.2
30-Jan	-19.0	-19.9	-20.9	-21.9	-21.9	-22.0	-22.0	-22.6	-23.1	-22.7	-22.1	-22.3	-22.2	-22.3	-22.4	-23.0	-24.5	-26.0	-27.0	-28.2	-31.1	-32.7	-32.2	-34.0	-24.4	-19.0
31-Jan	-34.8	-35.3	-35.4	-35.2	-34.4	-32.4	-32.6	-31.5	-30.0	-28.6	-26.5	-24.1	-22.6	-21.2	-20.6	-20.2	-21.8	-23.5	-24.0	-24.0	-23.7	-23.5	-23.4	-23.4	-27.2	-20.2
	-15.7	-15.8	-16.1	-16.4	-16.6	-16.7	-16.8	-16.9	-16.8	-16.2	-14.9	-13.7	-13.1	-12.7	-12.8	-13.2	-14.4	-14.9	-15.2	-15.5	-15.6	-15.5	-15.7	-15.9	Diurnal Average	
	1.7	1.7	1.2	1.2	1.3	1.2	1.6	2.1	2.2	2.1	2.8	2.8	3.5	4.1	3.8	3.7	3.5	3.4	3.0	0.9	1.1	1.4	1.5	1.6	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Wapasu - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	285	38.31	38.31
-20 - 0	403	54.17	92.47
0 - 10	56	7.53	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

Maximum Value: 100 % on Jan 24 19:00

Maximum Daily Average: 98.5 % on Jan 24

Minimum Value: 58 % on Jan 9 14:00

Minimum Daily Average: 72.8 % on Jan 9

Maximum Diurnal Average: 85.0 % at hour 1

Minimum Diurnal Average: 80.2 % at hour 14

Monthly Average: 83.5 %

Percentiles: P_1 = 67 P_{10} = 75 Q_1 = 78 Median = 82 Q_3 = 89 P_{90} = 95 P_{99} = 99

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

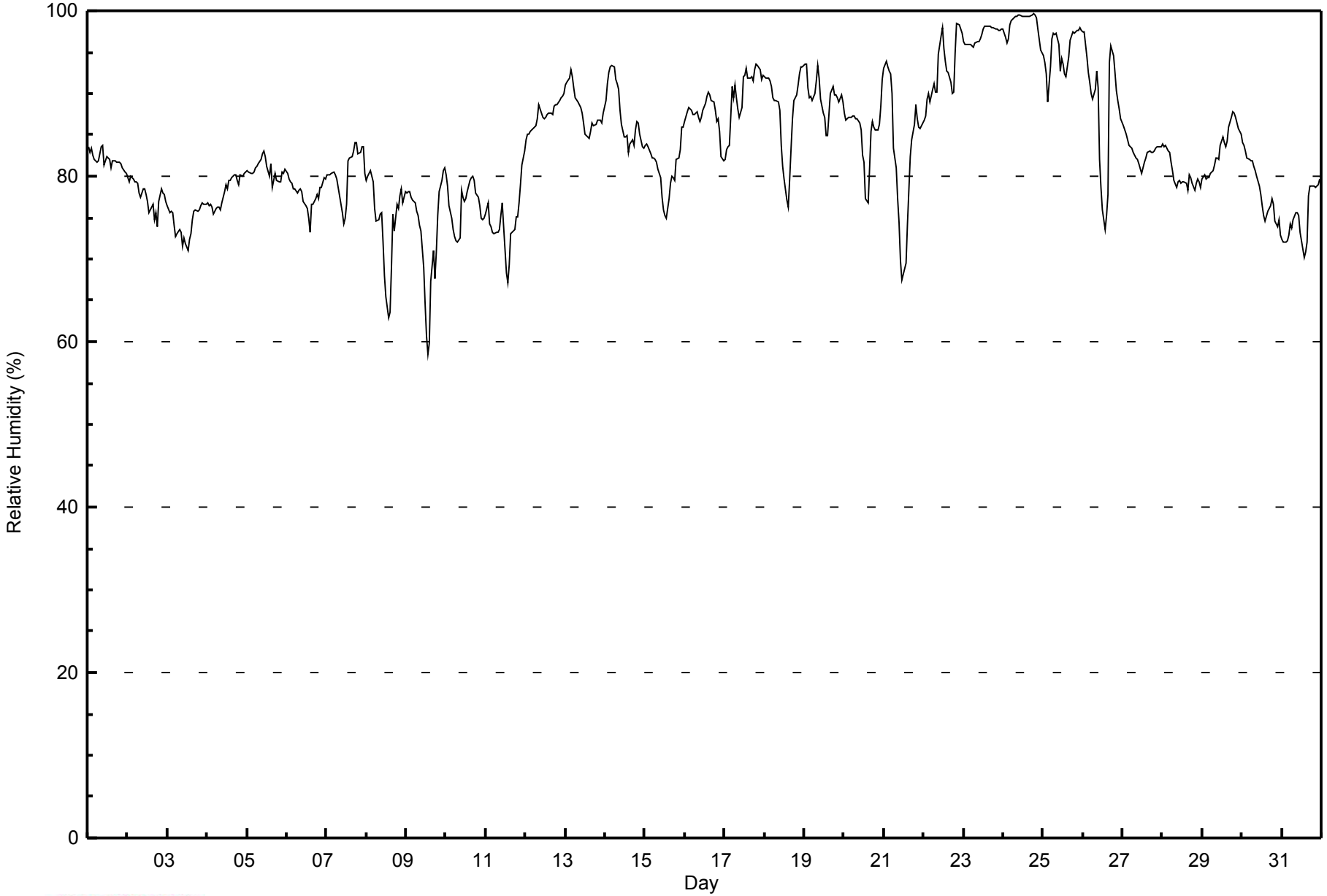
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	84	83	83	83	82	82	82	83	84	84	81	82	82	82	81	82	82	82	82	82	81	81	81	80	82.0	84
2-Jan	80	79	80	80	79	79	79	78	77	78	79	78	77	76	76	77	75	76	74	77	78	78	78	77	77.7	80
3-Jan	77	76	76	76	74	73	73	74	73	72	72	72	71	72	73	75	76	76	76	76	76	77	77	77	74.5	77
4-Jan	77	76	77	76	75	76	76	76	76	77	78	79	79	79	79	80	80	80	80	79	80	80	80	81	78.2	81
5-Jan	81	80	80	80	81	81	81	81	82	83	83	82	81	80	82	79	79	80	80	79	79	81	80	81	80.7	83
6-Jan	80	80	79	79	78	78	78	78	79	78	77	76	76	75	73	77	77	77	78	77	79	79	80	80	77.8	80
7-Jan	80	80	80	80	81	80	80	79	78	76	74	75	77	82	82	82	83	84	84	83	83	84	84	80	80.4	84
8-Jan	79	80	81	80	79	76	75	75	75	76	72	68	65	63	64	69	75	73	77	76	78	78	77	78	74.6	81
9-Jan	78	78	78	77	77	77	76	75	74	73	69	65	61	58	60	67	71	68	71	75	78	79	81	81	72.8	81
10-Jan	80	79	76	75	74	73	72	72	73	78	77	77	77	78	80	80	80	80	78	77	76	75	75	75	76.5	80
11-Jan	76	77	74	74	73	73	73	73	74	75	77	74	68	67	69	73	73	74	75	75	77	79	81	83	74.5	83
12-Jan	84	85	85	85	86	86	86	87	89	88	87	87	87	87	88	88	87	88	89	89	89	89	90	90	87.4	90
13-Jan	91	91	92	93	92	91	89	89	89	88	88	86	85	85	85	85	87	86	86	87	87	87	86	88	88.0	93
14-Jan	89	91	93	93	93	93	92	91	91	88	86	85	85	85	83	84	84	84	86	87	86	85	84	83	87.5	93
15-Jan	84	84	83	83	82	82	82	82	81	80	77	76	75	75	77	79	80	80	80	82	82	83	86	86	80.9	86
16-Jan	87	88	88	88	88	88	88	88	87	87	87	88	89	90	90	90	89	89	88	87	87	85	82	82	87.4	90
17-Jan	82	83	83	84	91	89	91	89	88	87	88	92	92	93	92	92	92	92	93	94	93	93	92	92	89.9	94
18-Jan	92	92	92	91	91	89	89	89	89	88	84	81	80	77	76	80	83	87	89	90	91	92	93	93	87.5	93
19-Jan	94	94	91	89	90	89	90	92	93	92	89	88	87	85	85	87	90	91	90	90	90	89	90	89	89.7	94
20-Jan	88	87	87	87	87	87	87	87	87	87	86	83	82	77	77	81	85	87	86	86	86	86	88	92	85.5	92
21-Jan	93	94	93	93	92	90	83	81	77	74	70	67	69	70	74	78	82	84	86	89	87	86	86	86	82.8	94
22-Jan	87	87	89	90	89	91	91	90	90	95	97	98	95	94	93	93	91	90	90	95	98	98	98	97	92.8	98
23-Jan	96	96	96	96	96	96	96	96	96	96	97	97	98	98	98	98	98	98	98	98	98	98	98	98	97.0	98
24-Jan	98	97	96	97	98	99	99	99	99	99	99	99	99	99	99	99	99	100	100	100	99	98	95	95	98.5	100
25-Jan	95	94	92	89	93	97	97	97	97	96	93	94	94	92	92	94	96	97	98	97	98	98	98	98	95.2	98
26-Jan	97	98	94	93	91	90	89	91	93	91	82	79	76	74	75	78	94	96	95	92	90	89	88	87	88.4	98
27-Jan	86	86	85	84	84	83	83	82	82	82	82	80	81	82	82	83	83	83	83	83	83	84	84	84	83.1	86
28-Jan	84	84	84	83	83	82	81	79	79	79	79	79	79	79	79	78	80	80	79	78	79	80	79	79	80.2	84
29-Jan	80	80	80	80	80	80	81	81	82	82	82	84	85	84	84	84	86	87	88	88	87	86	86	85	83.4	88
30-Jan	84	84	83	82	82	82	82	81	81	80	79	78	76	75	75	76	76	76	77	77	75	74	75	73	78.4	84
31-Jan	72	72	72	72	73	74	74	75	76	76	75	73	72	70	71	72	78	79	79	79	79	79	79	80	75.0	80
	85.0	84.9	84.6	84.3	84.4	84.1	83.7	83.6	83.5	83.4	82.2	81.4	80.7	80.2	80.4	81.9	83.7	83.9	84.2	84.6	84.8	84.8	84.8	84.8	Diurnal Average	
	98	98	96	97	98	99	99	99	99	99	99	99	99	99	99	99	99	100	100	100	99	98	98	98	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Wapasu - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	2	0.27	0.27
60 - 80	275	36.96	37.23
80 - 100	467	62.77	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Wapasu - January 2015

Maximum Speed: 20 km/h on Jan 16 00:00

Maximum Daily Speed Average: 11.7 km/h on Jan 21

Minimum Speed Value: 0 km/h on Jan 23 12:00

Minimum Daily Speed Average: 0.6 km/h on Jan 6

Maximum Diurnal Speed Average: 3.1 km/h at hour 14

Minimum Diurnal Speed Average: 0.9 km/h at hour 17

Monthly Average Velocity: 1.5 km/h 199.5 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 4 Median = 6 Q_3 = 9 P_{90} = 12 P_{99} = 18

Hours in Service:	744
Hours of Data:	675
Hours of Missing Data:	69
Percent Operational Time:	90.7

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-Jan	ENE2	NE4	E3	SSE2	SE3	SE3	SE3	SSE1	SE1	AF	NNE1	NNW5	N8	NNW12	N11	NNW8	NNW7	NNW8	NNW8	NNW8	NW6	NW8	NNW8	NNW6	N4.1	NNW12
2-Jan	N5	NNE4	N5	N5	N6	N5	N5	NW2	NNW3	NNW4	NNW5	N7	N7	N7	N3	N3	SE1	N3	NNE3	NNE4	NNW6	NNW5	NNW5	NNW8	N4.5	NNW8
3-Jan	NNW7	N7	N5	NNW4	WNW2	S1	NW2	NW3	NW3	NNW0	SW1	WNW4	WNW6	W6	W6	WSW4	SW4	SW5	SW4	SW5	SW5	SW5	SW5	SW5	W2.7	NNW7
4-Jan	SSW5	SSW4	SSW4	S5	S5	S5	S6	S6	S6	S7	SSW7	SSW8	SSW10	SW9	SW8	SSW7	SSW7	SSW7	SW9	SW8	SSW8	SW8	SW8	SW7	SSW6.6	SSW10
5-Jan	SSW5	SSW5	SSW6	SSW6	S5	S4	SSW3	WSW2	WSW3	WNW3	NW6	NW8	NNW11	NNW11	NW11	NNW12	NW10	NNW10	NNW11	NNW13	NNW14	NNW10	N9	N7	NW5.2	NNW14
6-Jan	N6	N7	N7	N8	N5	N5	N4	N6	N6	NNW4	WSW3	WSW4	WSW6	WSW5	SW4	SSW4	S3	SSE4	SSE4	SSE4	S4	SSE5	S6	S6	NW0.6	N8
7-Jan	S7	S7	S7	S8	S9	S10	SSW10	S9	S9	SSE11	SSE12	SSE9	SSE9	SW5	NNW4	NNE2	NNW5	NNW11	N13	N14	N13	NNW12	NNW16	NNW19	SW0.7	NNW19
8-Jan	NNW17	NNW12	NW5	NW4	NW5	NW9	NW8	NW6	NW5	NW5	NW7	NW12	NNW12	NNW11	NW7	WNW3	WSW5	W4	SSW3	SSE3	SSW4	SSW5	S4	S5	NW4.8	NNW17
9-Jan	SSE6	SSE7	SSE6	SSE7	SSE6	SSE7	S8	SSE7	SSE8	SSE7	SSE8	S7	S6	SSW5	WSW2	N4	NNE6	N9	N10	N11	N10	N11	N10	NNE8	ESE1.2	N11
10-Jan	NNE6	N2	N2	E2	ESE3	SE3	SE4	SE4	SSE5	S6	S7	SSW7	SW7	SW7	SW5	SSW6	S5	SSE5	SSE5	SSE5	SE4	SSE4	SE5	SSE6	SSE3.4	SW7
11-Jan	SSE5	SE4	SE4	SE3	ESE3	SE3	SE4	SE4	SE4	SSE5	SSE5	SSE7	S8	S10	S10	S11	S11	S12	S11	S12	S13	S13	SSW13	S12	S7.4	S13
12-Jan	S12	S12	S11	S8	S6	S5	SW6	SW4	SSW4	SSW3	WSW3	SW3	S3	WSW3	SSW3	S3	S5	S6	S7	S6	S6	S7	S7	SSW5	SSW5.5	S12
13-Jan	SW4	WSW5	NW5	N7	N8	NNW11	N8	NNW6	NNE4	N5	NNE5	NE5	NE3	ESE3	SE4	SE5	SE7	SE11	SE12	SSE14	SSE16	SSE17	SSE16	SSE14	SE3.0	SSE17
14-Jan	S11	SSW9	SW8	SW8	SW8	WNW5	NNW11	N10	N12	NNE13	N11	N10	N9	N9	N10	N11	N12	N11	N10	N8	N8	N9	N9	N6	N6.1	NNE13
15-Jan	NNE7	NNE7	N7	NNE7	NNE6	N4	NNE4	NE5	NE4	E3	SE5	SE7	SSE9	SSE10	SSE11	SSE12	SE15	SSE13	SSE17	SSE17	SSE18	SSE18	SSE17	SSE20	SE6.8	SSE20
16-Jan	SSE20	SSE18	SSE17	S17	S17	S16	S14	S15	S14	S12	S11	SSW10	SW10	SW9	SW9	SW8	SSW6	WSW11	WSW13	WSW12	WSW12	WSW15	WSW12	WSW12	SSW10.8	SSE20
17-Jan	W12	W12	W13	W11	NNW11	N8	N9	N8	N7	NNE5	NE5	NE8	NNE5	NE3	NE4	ENE4	ENE3	N2	SSW2	S7	S6	SSE5	S4	SSE6	NW2.0	W13
18-Jan	SSE7	SSE9	SSE9	S9	SSE9	S10	S9	SSE9	SSE9	SSE9	S9	SSW9	SSW9	SW9	SW8	SSW7	S6	SSE6	SSE7	S6	S5	SSE4	SSE7	SSE6	S7.5	S10
19-Jan	SSE5	SSE3	E3	E3	SSE5	E3	ESE3	ENE4	NNE3	NNE3	NE1	NNW3	N3	N3	NNE4	NNE4	NNE4	NNE4	NNE3	NNE4	NNE3	NNE4	NE6	NE5	NE2.5	NE6
20-Jan	NE4	NNE3	NNE4	NNE4	NNE3	NNE4	NNE4	N4	N3	NNW2	NNW3	NW2	WSW2	SSW4	SSW5	S5	SW4	SSE8	S9	S10	S9	S10	S10	S9	S1.9	S10
21-Jan	S10	S9	S9	S10	S11	S12	S14	S15	S16	S17	S18	S19	S17	SSW15	SSW15	SSW13	SSW10	SW10	SW9	SSW8	SSW9	SSW9	SSW8	SSW7	S11.7	S19
22-Jan	SSW7	SSW6	S6	SSW8	S7	SSW6	SSW6	SW8	WSW6	WSW7	W9	WSW8	WSW11	WSW10	WSW11	WSW11	WSW12	WSW13	WSW11	AF	AF	AF	AF	AF	SW7.7	WSW13
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	NW2	E2	NNW2	NNE0	SW1	W5	SSE5	WSW6	SSW6	SSE6	SSE6	SSE5	SSE6	SSE7	SSE8	SSE7	----	SSE8
24-Jan	SSE6	S8	SSE9	SSE8	SSE5	AF	AF	N2	W3	AF	AF	AF	AF	SW4	SW5	SW3	WSW3	AF	AF	AF	AF	AF	AF	AF	----	SSE9
25-Jan	AF	AF	AF	AF	SSW10	S10	S15	S13	SSW9	SW11	WSW13	WSW11	WSW8	W7	WNW7	N6	NNE8	AF	AF	AF	AF	AF	AF	AF	----	S15
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSW5	SW6	SW6	WSW6	WSW6	WNW4	N7	AF	AF	AF	AF	AF	AF	AF	----	N7
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NE7	NE7	NNE6	NE6	NE7	NE5	ENE5	ENE6	E6	E5	----	NE7
28-Jan	ENE4	ENE5	N4	N5	NNW6	NNW6	N5	N3	N2	N5	N8	N9	NNW9	NNW9	N7	N5	NNE4	NNE4	NE5	ENE4	ENE3	ENE5	E4	SE4	N4.1	NNW9
29-Jan	SE4	SSE4	S4	SSE6	SSE8	S7	SSE6	SSE8	SSE8	SSE9	SSE10	SSE9	SSE8	SSE5	S2	SW2	WNW4	N3	NNW4	N4	N5	N6	N7	N6	SSE2.5	SSE10
30-Jan	N9	N7	N8	NNE8	N7	N8	N8	N8	NNE7	N7	N9	N9	N9	N9	N10	NNW8	NNW8	N6	NNE5	NNE3	E3	ENE3	ENE3	E3	N6.4	N10
31-Jan	ESE2	SSE3	SSE4	SSE5	SE5	SSE5	SSE4	SSE4	SSE4	S4	SSW5	SSW6	SSW7	SSW6	SSW5	SSW5	S5	S5	SSE6	SSE6	S7	S7	S7	S7	S4.8	S7
	S1.7	S2.0	S1.8	S2.0	S2.2	S1.6	S1.6	S1.5	S1.4	S1.6	SSW1.7	SW1.8	WSW2.4	WSW3.1	WSW2.2	WSW1.4	SW0.9	SSW1.0	SSW1.2	S1.4	S1.9	S2.0	S1.8	S2.2	Diurnal Average	
	SSE20	SSE18	SSE17	S17	SSE17	S16	S15	S15	S16	S17	S18	S19	S17	SSW15	SSW15	SSW13	SE15	SSE13	SSE17	SSE17	SSE18	SSE18	SSE17	SSE20	Diurnal Maximum	

AF - Analyzer Failure

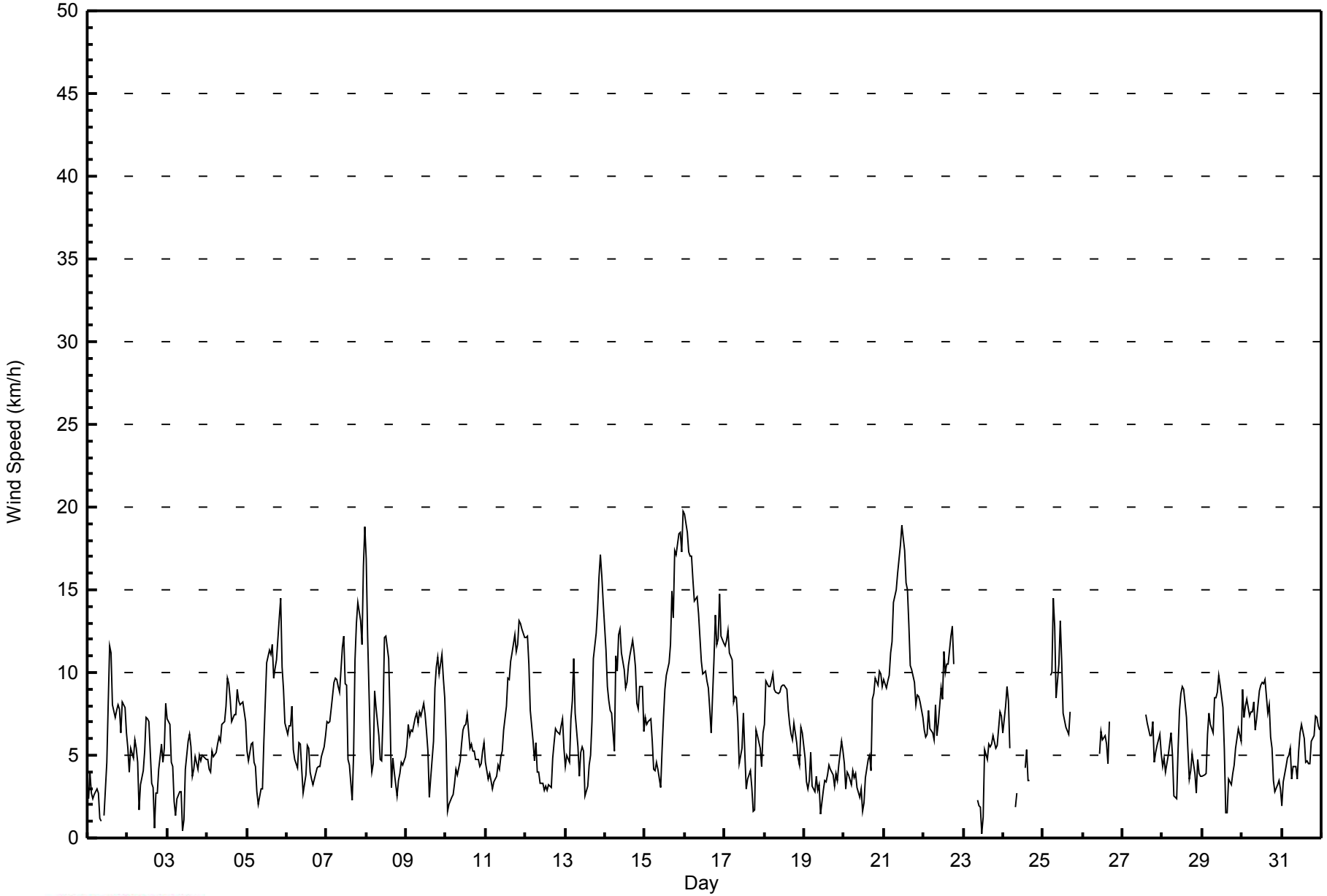
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Wapasu - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	277	41.04	41.04
6 - 11	322	47.70	88.74
12 - 19	74	10.96	99.70
20 - 28	2	0.30	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 675

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Wapasu - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	33	31	13	13	9	6	23	32	22	23	21	13	3	7	12	16	277
6 - 11	64	11	6	1	1	0	3	53	62	36	24	15	5	2	11	28	322
12 - 19	5	1	0	0	0	0	2	16	23	4	0	9	3	0	1	10	74
20 - 28	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	102	43	19	14	10	6	28	103	107	63	45	37	11	9	24	54	675

Total Number of Valid Hours: 675

Total Number of Hours: 744

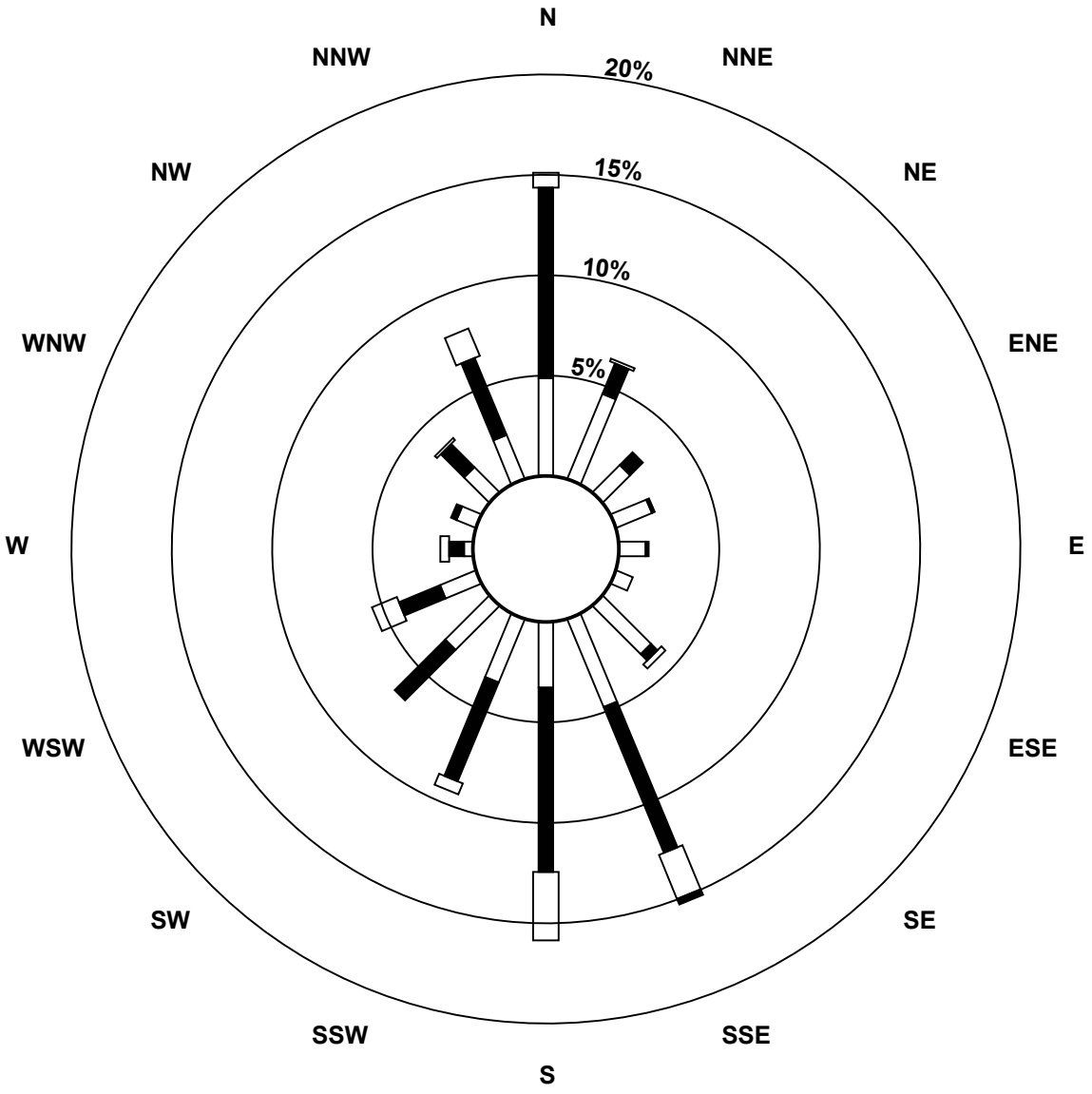
AURORA
ATMOSPHERICS INC.

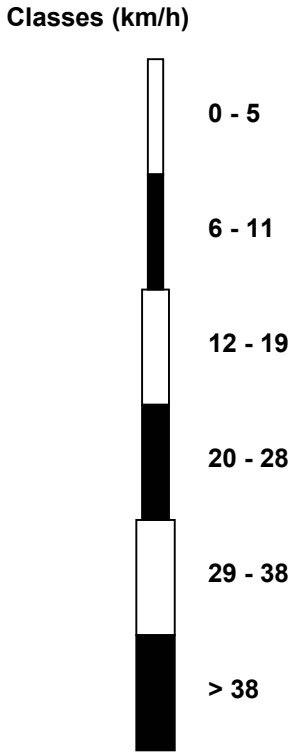
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Wapasu (AMS 17)





Total Number of Valid Hours: 675

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Wapasu - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Jan 21 12:00

Minimum Value: 0 km/h on Jan 31 07:00

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

Hours in Service:	744
Hours of Data:	675
Hours of Missing Data:	69
Hours of Calibration:	0
Percent Operational Time:	90.7

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

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Wapasu - January 2015

Direction of Maximum Speed: 158 deg on Jan 16 00:00
Direction of Maximum Daily Speed Average: 190.8 deg on Jan 21

Direction of Minimum Speed: 22 deg on Jan 23 12:00
Direction of Minimum Daily Speed Average: 0.6 deg on Jan 6

Monthly Average Direction: 244.1 deg

Hours in Service:	744
Hours of Data:	675
Hours of Missing Data:	69
Percent Operational Time:	90.7

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-Jan	62	48	83	165	143	126	136	165	136	AF	19	338	351	346	349	345	341	343	343	337	325	326	344	341	349.7
2-Jan	352	12	353	354	356	2	352	319	331	333	334	352	351	353	4	3	131	7	28	19	345	329	342	341	351.4
3-Jan	343	354	356	334	301	188	313	312	304	331	225	295	284	272	263	249	221	226	228	234	227	229	226	216	271.8
4-Jan	213	194	198	190	181	191	184	187	177	186	196	211	207	215	214	208	206	212	230	228	213	219	226	233	207.4
5-Jan	212	207	199	195	184	191	200	244	252	289	312	323	327	329	325	332	325	332	344	335	338	341	351	0	319.9
6-Jan	355	8	9	6	10	10	5	354	350	332	251	255	242	243	224	210	175	165	158	158	172	166	173	172	304.1
7-Jan	183	173	178	182	176	188	193	188	173	160	155	160	160	222	345	14	341	347	352	360	353	342	346	341	228.7
8-Jan	339	337	325	325	317	323	318	317	314	321	316	326	330	327	313	293	251	265	213	161	210	209	171	171	313.5
9-Jan	166	162	165	158	151	161	169	160	160	155	168	178	188	203	243	11	13	9	358	358	355	360	8	15	119.2
10-Jan	28	350	355	99	115	124	141	141	159	177	176	192	215	220	222	196	175	164	154	156	146	147	146	150	166.8
11-Jan	158	146	140	126	114	128	134	142	146	153	149	155	172	176	183	173	170	171	174	177	182	189	195	179	169.3
12-Jan	183	183	187	182	183	182	230	227	203	211	246	215	188	247	195	173	171	178	189	187	182	182	182	208	191.5
13-Jan	217	253	314	0	355	344	355	338	13	5	24	43	50	110	131	142	134	135	140	150	148	148	154	163	125.8
14-Jan	178	193	220	218	231	296	342	357	4	12	11	9	10	11	1	1	4	3	357	354	1	358	350	8	353.7
15-Jan	15	18	11	17	28	358	31	49	46	89	133	138	147	155	153	150	141	150	150	155	155	159	158	158	137.8
16-Jan	160	166	168	169	169	173	177	177	177	179	184	193	218	224	225	222	212	240	243	241	241	246	250	251	198.7
17-Jan	264	271	272	270	332	353	354	1	354	16	35	49	31	38	50	57	63	350	209	172	180	167	170	152	326.0
18-Jan	164	166	163	169	166	170	170	167	168	166	179	194	202	215	220	199	178	157	167	172	179	152	155	163	175.5
19-Jan	151	147	80	92	152	98	109	58	26	31	43	344	358	3	12	25	16	21	16	20	21	17	39	38	43.9
20-Jan	47	18	12	23	25	20	16	6	4	344	336	309	237	210	204	189	216	166	182	185	187	185	173	169	178.9
21-Jan	177	176	180	175	174	171	175	176	181	184	184	186	190	199	209	210	209	219	222	198	207	208	205	198	190.8
22-Jan	197	201	184	198	187	198	196	228	242	258	271	246	241	251	252	243	244	245	252	AF	AF	AF	AF	AF	233.4
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	314	89	338	22	216	281	164	239	205	155	153	159	163	164	151	147	--
24-Jan	158	171	163	155	155	AF	AF	351	274	AF	AF	AF	AF	226	229	227	238	AF	AF	AF	AF	AF	AF	AF	--
25-Jan	AF	AF	AF	AF	194	174	171	189	204	231	252	250	252	268	289	0	17	AF	AF	AF	AF	AF	AF	AF	--
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	208	218	231	240	251	283	358	AF	AF	AF	AF	AF	AF	AF	--
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	44	43	31	39	42	40	70	68	83	95	--
28-Jan	64	74	360	350	337	342	351	1	7	1	356	349	343	334	355	353	26	29	48	64	75	65	79	131	10.1
29-Jan	131	156	170	163	164	171	168	158	157	156	157	154	158	164	182	234	295	353	348	356	353	1	351	359	154.8
30-Jan	351	357	10	14	8	358	5	3	13	5	10	354	357	351	354	347	343	352	13	32	97	69	57	101	4.6
31-Jan	106	148	147	150	145	147	150	149	157	186	192	192	205	208	202	209	189	174	162	165	170	174	177	173	173.1
	177.0	179.4	184.5	174.3	170.6	174.2	178.3	181.8	184.1	182.7	205.0	224.3	237.0	253.5	256.6	247.3	229.7	209.4	200.7	179.1	186.9	187.4	173.6	170.6	
	Diurnal Average																								

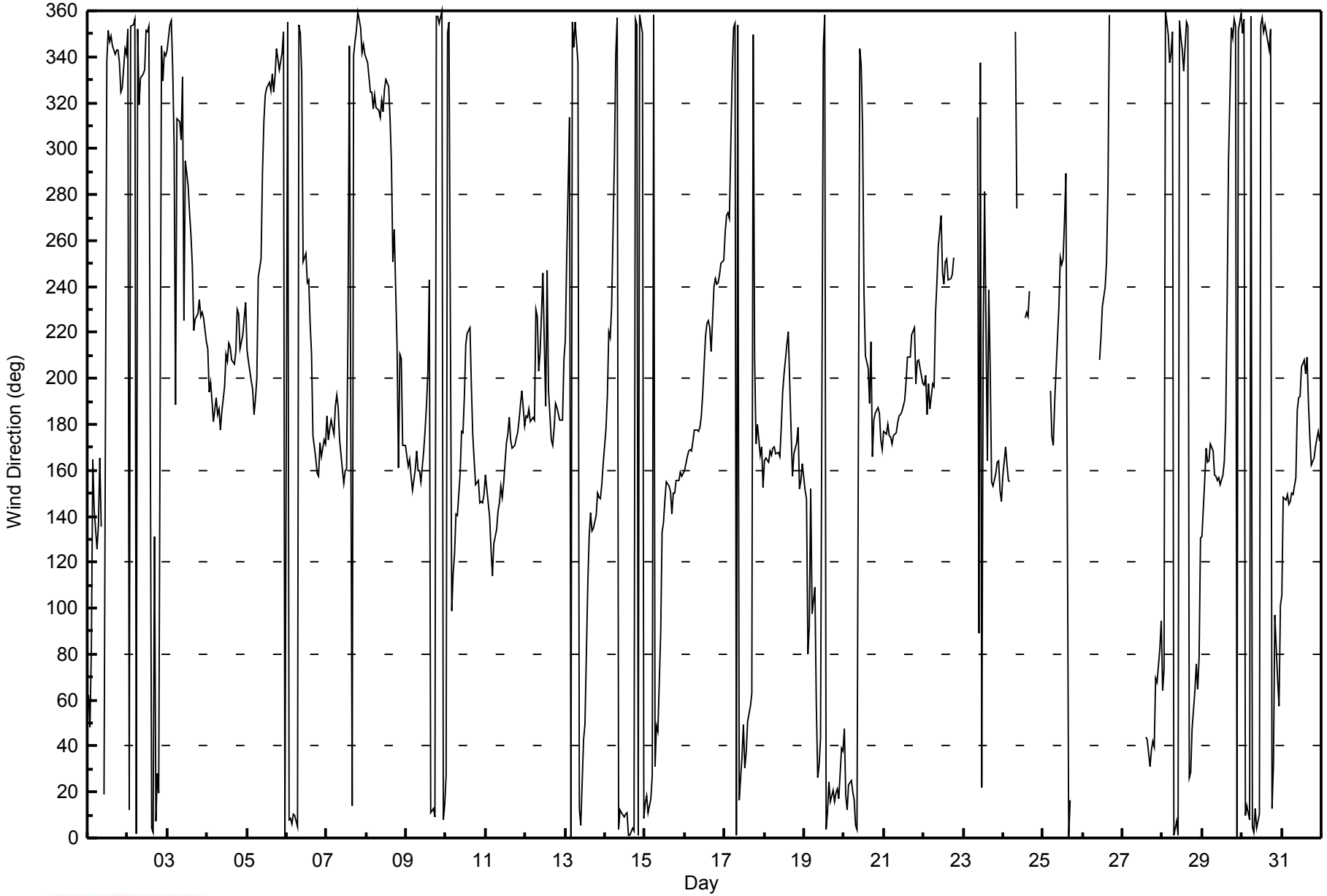
AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Direction (WD) - deg

Wapasu - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Wapasu - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 99 deg on Jan 23 12:00

Minimum Value: 5 deg on Jan 11 00:00

Percentiles: P_1 = 8 P_{10} = 19 Q_1 = 24 Median = 30 Q_3 = 34 P_{90} = 39 P_{99} = 68

Hours in Service:	744
Hours of Data:	675
Hours of Missing Data:	69
Hours of Calibration:	0
Percent Operational Time:	90.7

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-Jan	30	20	28	25	24	24	18	48	67	AF	50	26	31	29	30	29	25	25	25	21	19	24	28	29	67
2-Jan	33	32	30	33	36	37	31	47	24	19	20	31	34	32	32	20	83	47	31	19	25	23	30	26	83
3-Jan	33	31	31	22	23	66	60	21	31	88	69	24	27	25	24	28	24	25	28	26	28	30	33	31	88
4-Jan	34	30	31	31	27	30	28	31	24	33	35	39	35	38	35	34	37	36	33	28	35	35	32	29	39
5-Jan	35	31	32	34	27	32	39	45	26	34	21	26	23	21	21	24	20	22	28	28	25	28	36	33	45
6-Jan	31	32	30	33	31	28	25	26	27	29	31	32	24	28	31	21	26	12	18	8	17	10	18	21	33
7-Jan	29	22	27	31	30	33	34	34	28	25	25	26	27	47	42	40	22	29	32	35	31	27	28	29	47
8-Jan	28	23	33	27	30	19	19	21	23	20	20	20	25	20	21	30	19	23	35	17	30	26	20	20	35
9-Jan	19	13	19	16	16	18	22	21	17	17	20	27	30	41	67	27	24	32	33	36	34	31	36	39	67
10-Jan	36	62	46	33	25	11	13	13	18	22	26	36	38	35	33	28	19	14	9	9	9	10	7	5	62
11-Jan	10	20	21	19	12	13	21	12	15	11	14	22	28	32	31	28	27	26	28	31	31	32	33	29	33
12-Jan	32	33	34	26	33	26	35	38	36	43	39	39	34	35	40	25	21	30	32	33	28	33	34	39	43
13-Jan	37	33	37	39	34	27	31	26	38	35	37	41	55	32	23	21	18	17	18	20	19	18	21	28	55
14-Jan	30	34	35	36	29	37	28	34	39	35	38	34	34	38	35	35	34	35	31	33	36	34	31	39	39
15-Jan	38	39	34	38	36	46	36	29	38	46	26	24	21	25	25	23	21	23	22	27	24	25	26	23	46
16-Jan	24	28	27	29	28	29	34	35	32	33	31	36	36	33	35	33	33	24	21	23	22	20	19	21	36
17-Jan	24	25	24	25	33	35	33	36	30	39	36	30	47	52	40	26	25	55	65	28	30	25	27	19	65
18-Jan	26	28	24	27	24	27	28	26	25	26	30	35	37	32	32	31	27	17	22	20	22	25	12	15	37
19-Jan	15	19	15	30	10	30	34	22	40	33	52	35	29	37	41	38	34	38	37	32	39	38	31	33	52
20-Jan	31	38	36	37	42	36	36	37	37	37	33	70	55	41	30	33	39	27	33	31	31	32	29	29	70
21-Jan	32	30	31	29	29	25	30	32	33	33	34	33	35	33	39	37	37	36	34	31	35	34	34	33	39
22-Jan	31	30	24	32	33	33	30	31	29	24	26	25	25	23	24	22	22	21	25	AF	AF	AF	AF	AF	33
23-Jan	AF	AF	AF	AF	AF	AF	AF	AF	66	65	75	99	81	28	44	40	39	15	12	15	15	17	18	14	99
24-Jan	17	27	24	23	20	AF	AF	55	62	AF	AF	AF	AF	27	28	42	26	AF	AF	AF	AF	AF	AF	AF	62
25-Jan	AF	AF	AF	AF	32	31	30	31	34	33	23	22	22	26	29	31	34	AF	AF	AF	AF	AF	AF	AF	34
26-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	32	28	32	24	25	47	35	AF	AF	AF	AF	AF	AF	AF	47
27-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	30	26	32	32	27	31	31	30	26	34	34
28-Jan	27	26	32	34	22	27	32	50	37	31	39	32	27	25	34	39	35	22	16	16	28	13	18	21	50
29-Jan	18	20	23	22	23	26	27	23	23	24	21	24	22	29	51	58	42	31	28	43	33	35	31	34	58
30-Jan	30	32	36	34	40	35	32	38	35	37	38	33	34	31	31	34	23	30	34	26	17	21	25	10	40
31-Jan	34	15	13	7	6	7	8	13	16	28	33	35	36	36	39	34	28	18	17	19	23	23	23	23	39
	38	62	46	39	42	66	60	55	67	88	75	99	81	52	67	58	83	55	65	43	39	38	36	39	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	8:10	End Time (MST)	12:04
Barometric Pressure	716 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	API T700	Serial Number	493
Cal Gas Concentration	47.8 ppm	Cal Gas Expiry Date	12-Dec-16
Gas Cert Reference	SA130010A		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6894
DACS voltage range	NA	DACS channel #	TCP/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-702	-702
Analyzer Range (mv)	1000	1000	Lamp voltage	895	895
Calculated slope	0.999042	0.992121	Chamber temp.	45.3	45.3
Calculated intercept	0.439868	0.728537	Pressure (mmHg)	692.5	692.5
Analyzer Background	8.3	8.3	Flow (lpm)	0.452	0.452
Analyzer Coefficient	0.808	0.808	Intensity	82	82

Analyzer make	Thermo 43i	Analyzer serial #	1218153459

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.2	NA
as found span	5000	60.4	577.4	581.3	0.993
calibrator zero	5000	0.0	0.0	-0.2	NA
high point	5000	60.4	577.4	581.3	0.993
second point	5000	30.2	288.7	290.8	0.993
third point	5000	15.1	144.4	143.7	1.005
calibrator zero	6000	0.0	0.0	0.2	NA
as left zero	6000	0.0	0.0	0.2	NA
as left span	5000	60.4	577.4	584.5	0.988
				Average Correction Factor	0.997

Corrected As found	581.5	Previous response	577.5	% change	-0.7%

Notes:

No Maintance Done, Filter changed out, No adjustments made

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

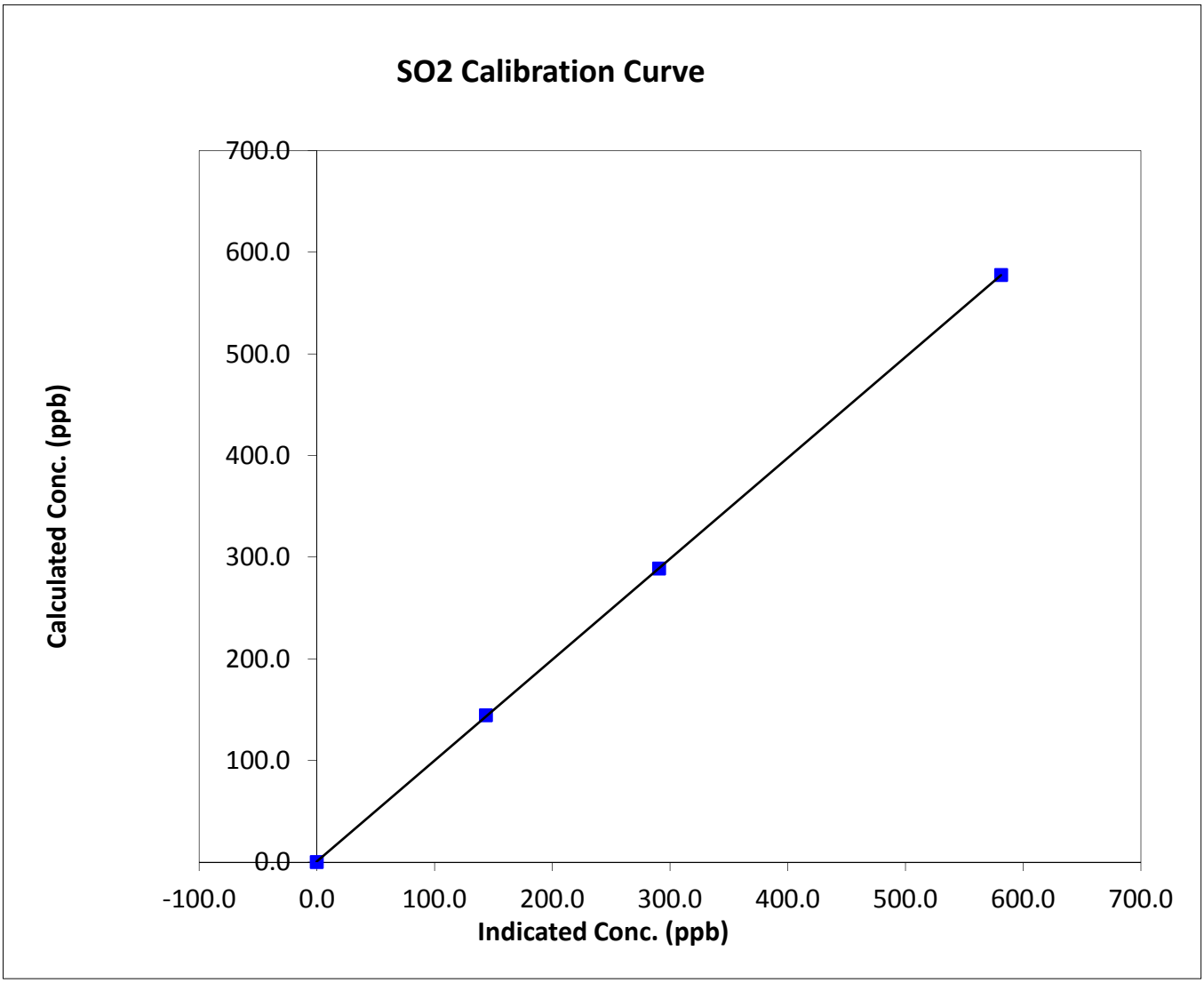
SO_2 Calibration Summary

Station Information

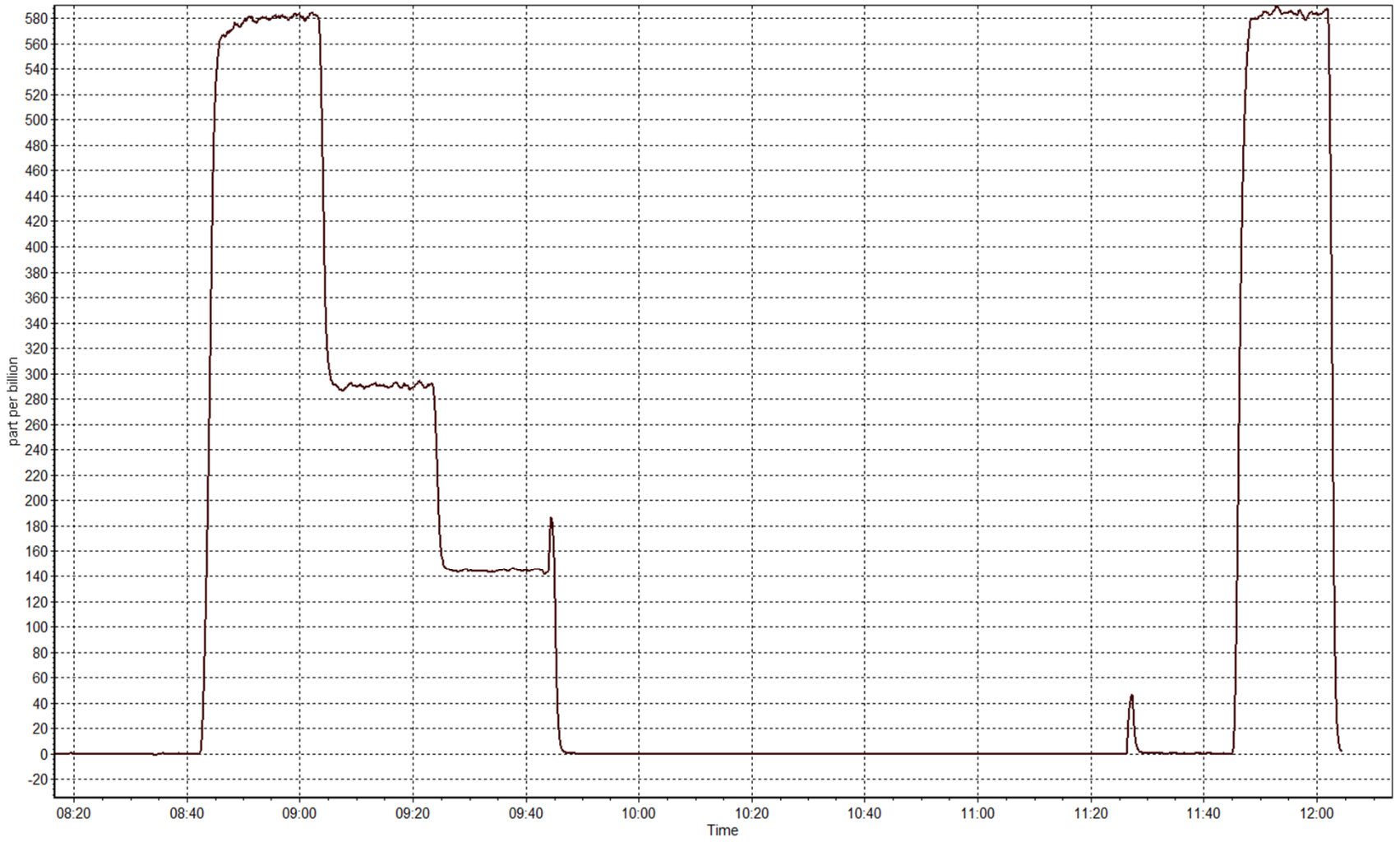
Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:10	End Time (MST)	12:04
Analyzer make	Thermo 43i	Analyzer serial #	1218153459

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999991
577.4	581.3	0.9933		
288.7	290.8	0.9930	Slope	0.992121
144.4	143.7	1.0046		
			Intercept	0.728537



SO2 Calibration Plot Date: January 13, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	7:55	End Time (MST)	11:15
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial number	997
Cal Gas Concentration	5.1 ppm H2S	Cal Gas Expiry Date	09-Sep-17
Gas Cert Reference	CC107167	SO2 gas conc.	47.8 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6894
DACS voltage range	NA	DACS channel #	TCP/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-651	-651
Analyzer Range (mv)	100	100	Lamp voltage	815	815
Calculated slope	1.004467	0.997755	Chamber temp.	45	45
Calculated intercept	0.306791	-0.446792	Pressure	566.6	560.6
Analyzer Background	12	12.9	Flow	0.956	0.939
Analyzer Coefficient	0.855	0.863	Intensity	91	91
			Converter temp.	337	337

Analyzer make/model	450i	Analyzer serial #	1218153583
Converter make/model		Converter serial #	

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.2	NA
as found span	5000	78.4	80.0	79.7	1.003
SO2 scrubber check	5000	40.0	382.4	2.4	NA
calibrator zero	5000	0.0	0.0	0.3	NA
high point	5000	78.4	80.0	80.4	0.995
second point	5000	39.2	40.0	40.9	0.978
third point	5000	19.6	20.0	20.5	0.975
calibrator zero	5000	0.0	0.0	-0.3	NA
as left zero	5000	0.0	0.0	-0.3	NA
as left span	5000	78.4	80.0	80.5	0.993
				Average Correction Factor	0.982

Corrected As found	79.9	Previous response	79.3	% change	-0.7%

Notes:

span adjusted, scrubber changed out, filter changed out

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

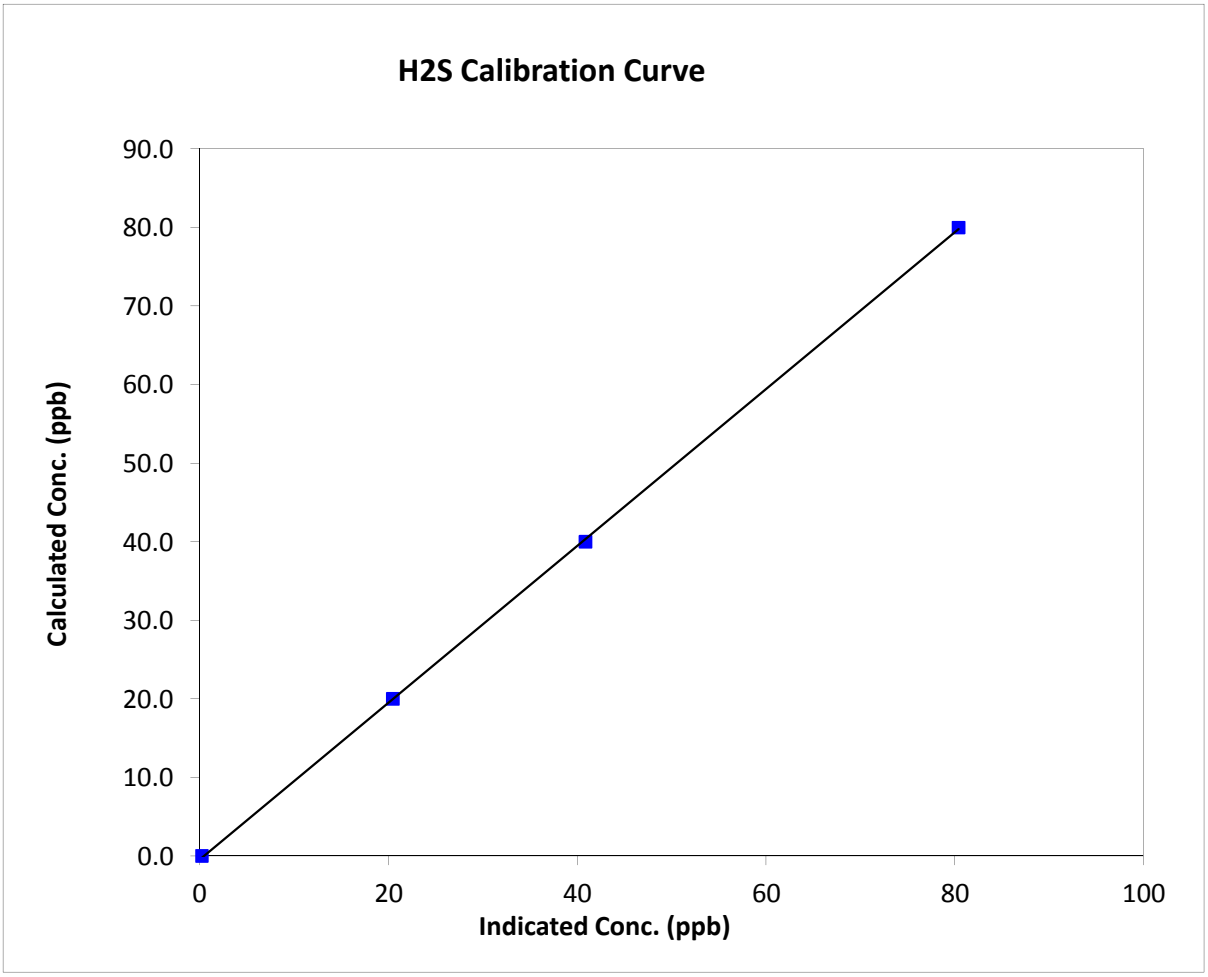
H2S Calibration Summary

Station Information

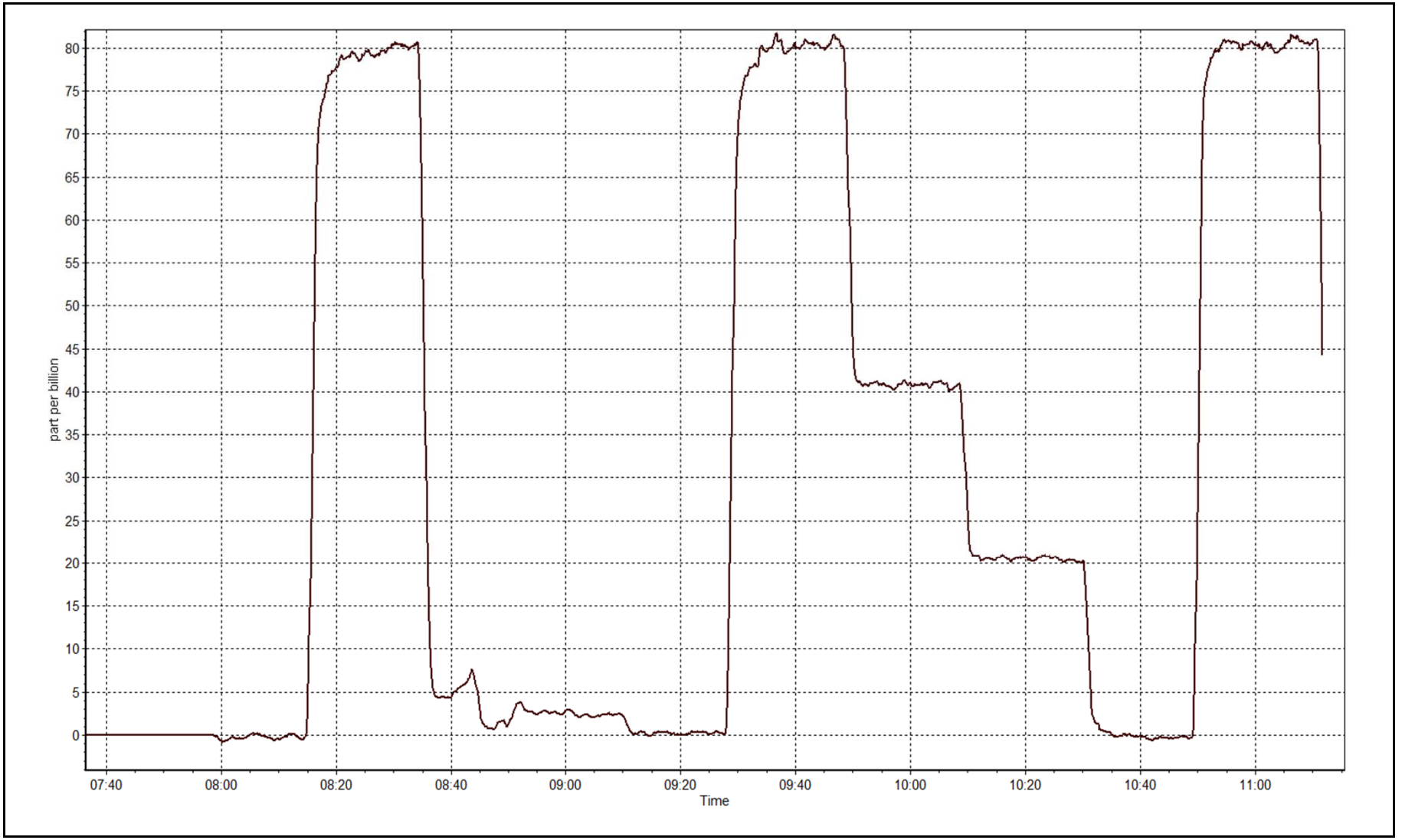
Calibration Date	January 15, 2015	Previous Calibration	December 11, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:55	End Time (MST)	11:15
Analyzer make	450i	Analyzer serial #	1218153583

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999937
80.0	80.4	0.9946		
40.0	40.9	0.9776	Slope	0.997755
20.0	20.5	0.9752		
			Intercept	-0.446792



H2S Calibration Plot Date: January-15-15



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-13-15	Previous Calibration	December-10-14
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	8:15	End Time (MST)	12:05
Barometric Pressure	716 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	API T700	Serial Number	493
Gas Cert Reference	SA130010A	Cal Gas Expiry Date	12-Dec-16
CH4 Cal Gas Conc.	512 ppm	CH4 Equiv Conc.	1092.3 ppm
C3H8 Cal Gas Conc.	211 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6894
DACS voltage range	NA	DACS channel #	NA

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	100	100	Sample Pressure	8.5	8.5
Analyzer Range (mv)	100	100	Air or Bypass press	39.7	39.7
Calculated slope	1.008159	1.006880	Fuel Pressure	24.8	24.8
Calculated intercept	0.028554	-0.022055		2.7	2.7
				4.976	4.976

Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153352

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.03	N/A
as found span	5000	60.4	13.19	13.12	1.006
calibrator zero	5000	0.0	0.00	0.03	N/A
high point	5000	60.4	13.19	13.12	1.006
second point	5000	30.2	6.60	6.60	1.000
third point	5000	15.1	3.30	3.27	1.009
calibrator zero	5000	0.0	0.00	0.06	N/A
as left zero	5000	0.0	0.00	0.06	N/A
as left span	5000	60.4	13.19	13.31	0.991
				Average Correction Factor	1.005

Corrected As found	13.09	Previous response	13.06	% change	-0.2%

Notes:

Filter changed, no adjustments or maintenance made,

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

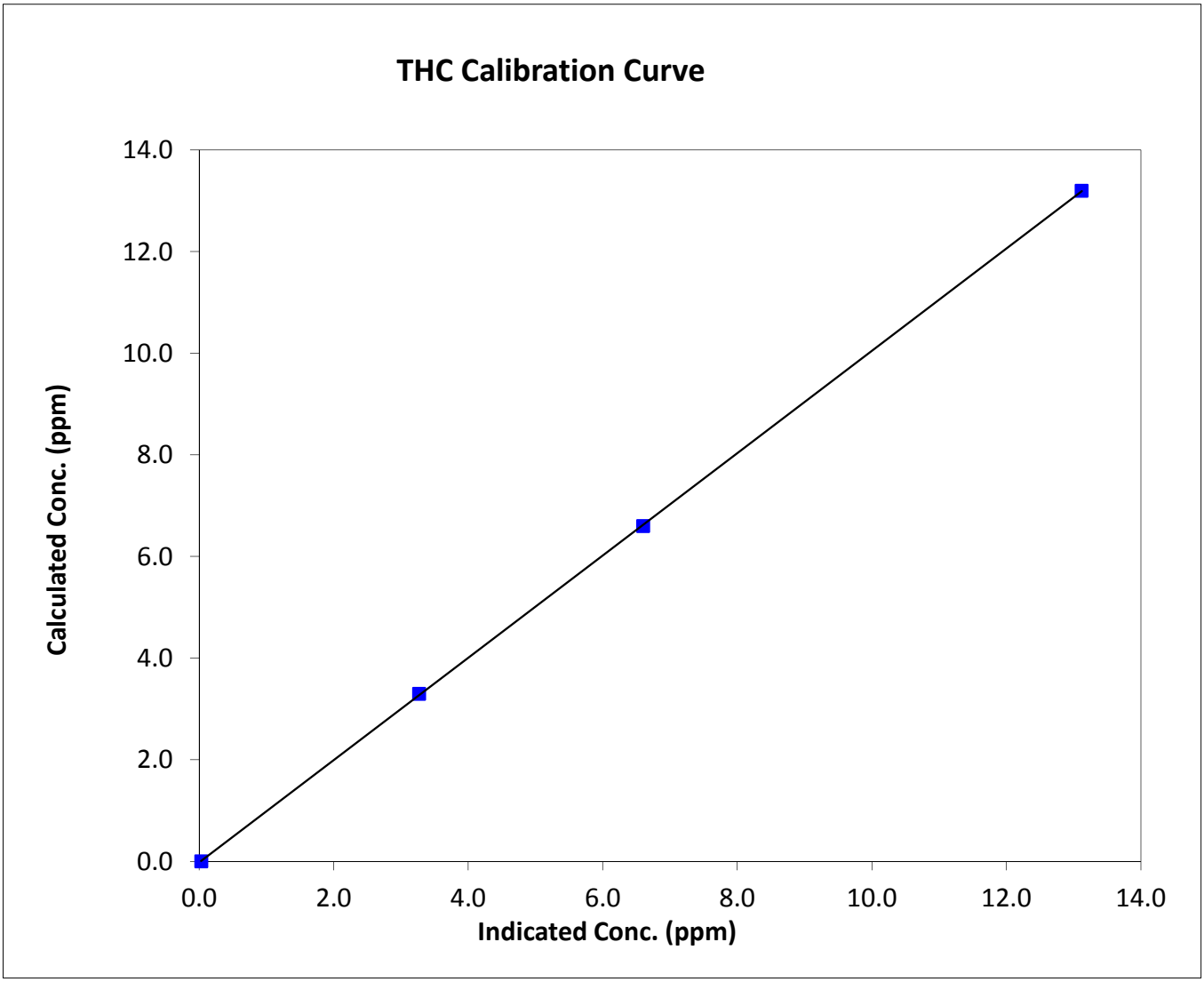
THC Calibration Summary

Station Information

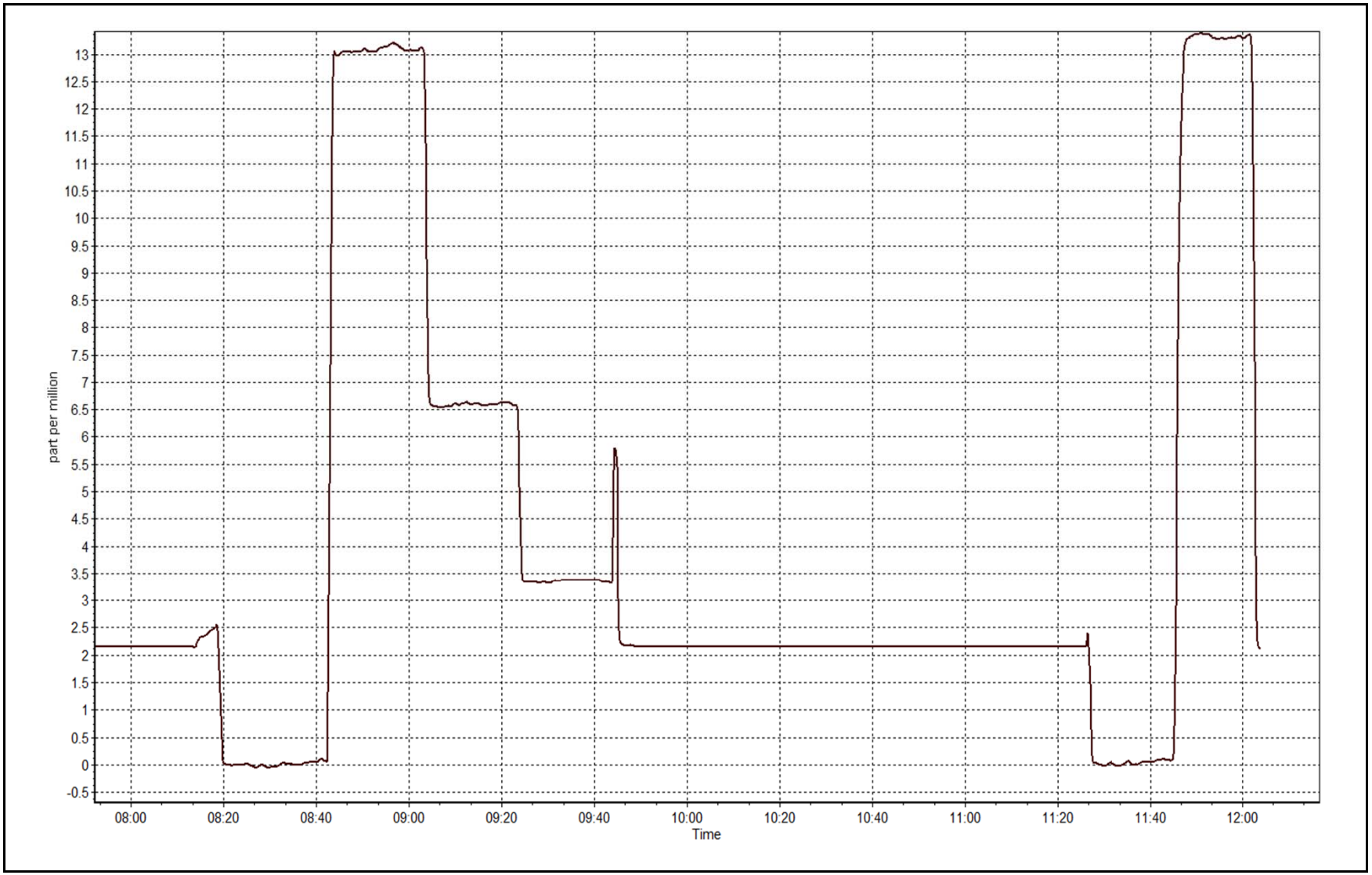
Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:15	End Time (MST)	12:05
Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153352

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.03	N/A	Correlation Coefficient	0.999983
13.19	13.12	1.0057		
6.60	6.60	0.9996	Slope	1.006880
3.30	3.27	1.0087		
			Intercept	-0.022055



THC Calibration Plot Date: January 13, 2015



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 14, 2015	Previous Calibration	December 11, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	8:10	End Time (MST)	10:56
Barometric Pressure	23 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	T700	Serial Number	997
NO2 calibration used	January-13-15	Transfer Standard	23
DACS make/model	N/A	DACS serial No.	N/A
DACS voltage range	N/A	DACS channel #	N/A

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Box temp.	25.3	25.3
Analyzer Range (input)	500	500	Photo Lamp Temp.	58.0	58.0
Calculated slope	0.987853	0.995671	Pressure	26.1	26.1
Calculated intercept	0.726717	0.806965	Flow	715-729	715-730
Analyzer Background	6.418	5.506			
Analyzer Coefficient	0.985	0.982			

Analyzer make	T400	Analyzer serial #	824

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	-0.9	N/A
as found span	5000	932.00	367.5	368.5	0.997
calibrator zero	5000	0.00	0.0	-0.1	N/A
high point	5000	713.5	367.5	368.4	0.998
second point	5000	495.5	248.3	249.1	0.997
third point	5000	260.7	129.9	128.3	1.012
calibrator zero	5000	0.00	0.0	-0.5	N/A
as left zero	5000	0.00	0.0	-0.5	N/A
as left span	5000	714.70	367.5	369.1	0.996
				Average Correction Factor	1.002

Corrected As found	369.4	Previous response	371.3	% change	0.5%

Notes:

Filter changed out, zero adjusted, no maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

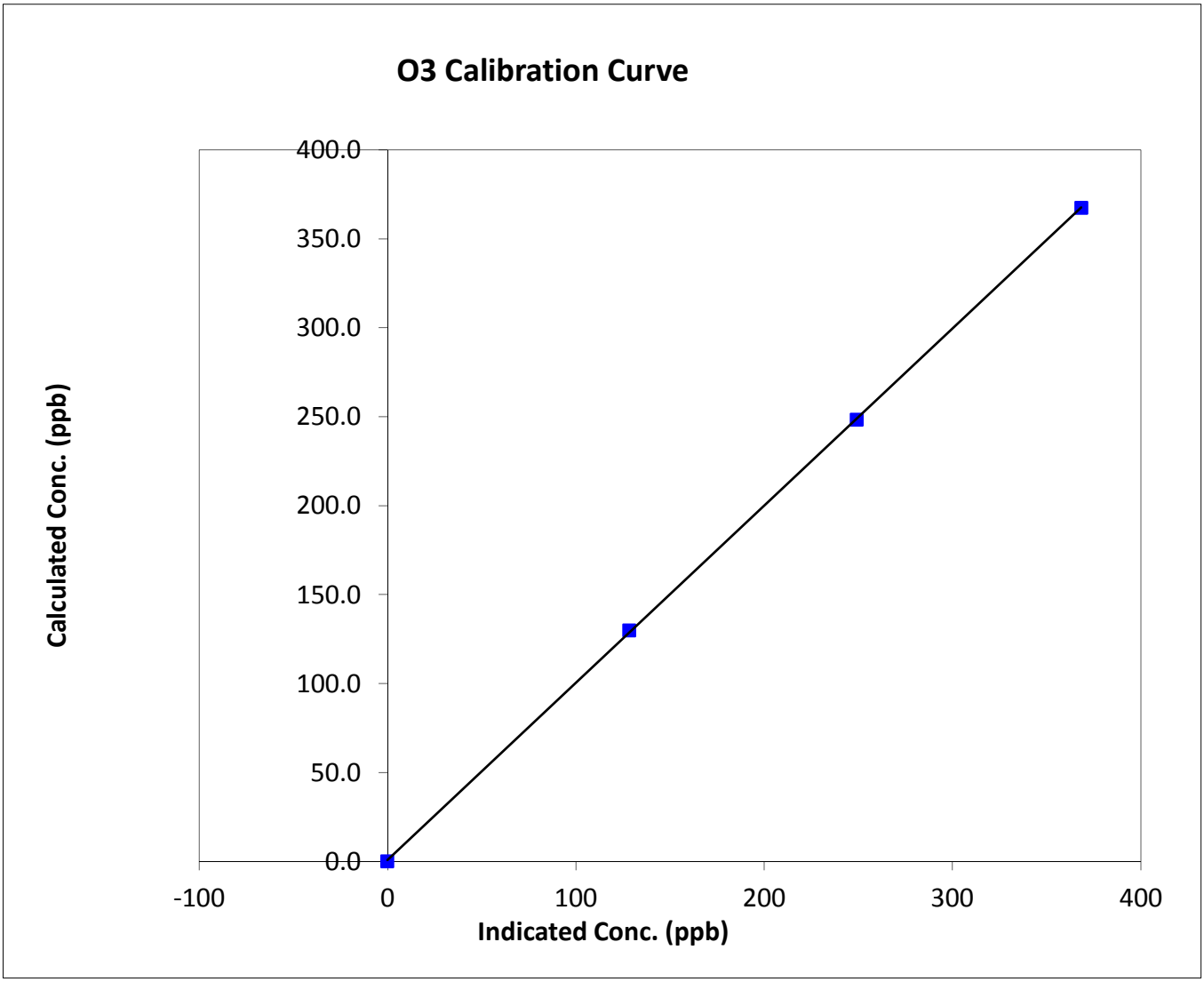
O_3 Calibration Summary

Station Information

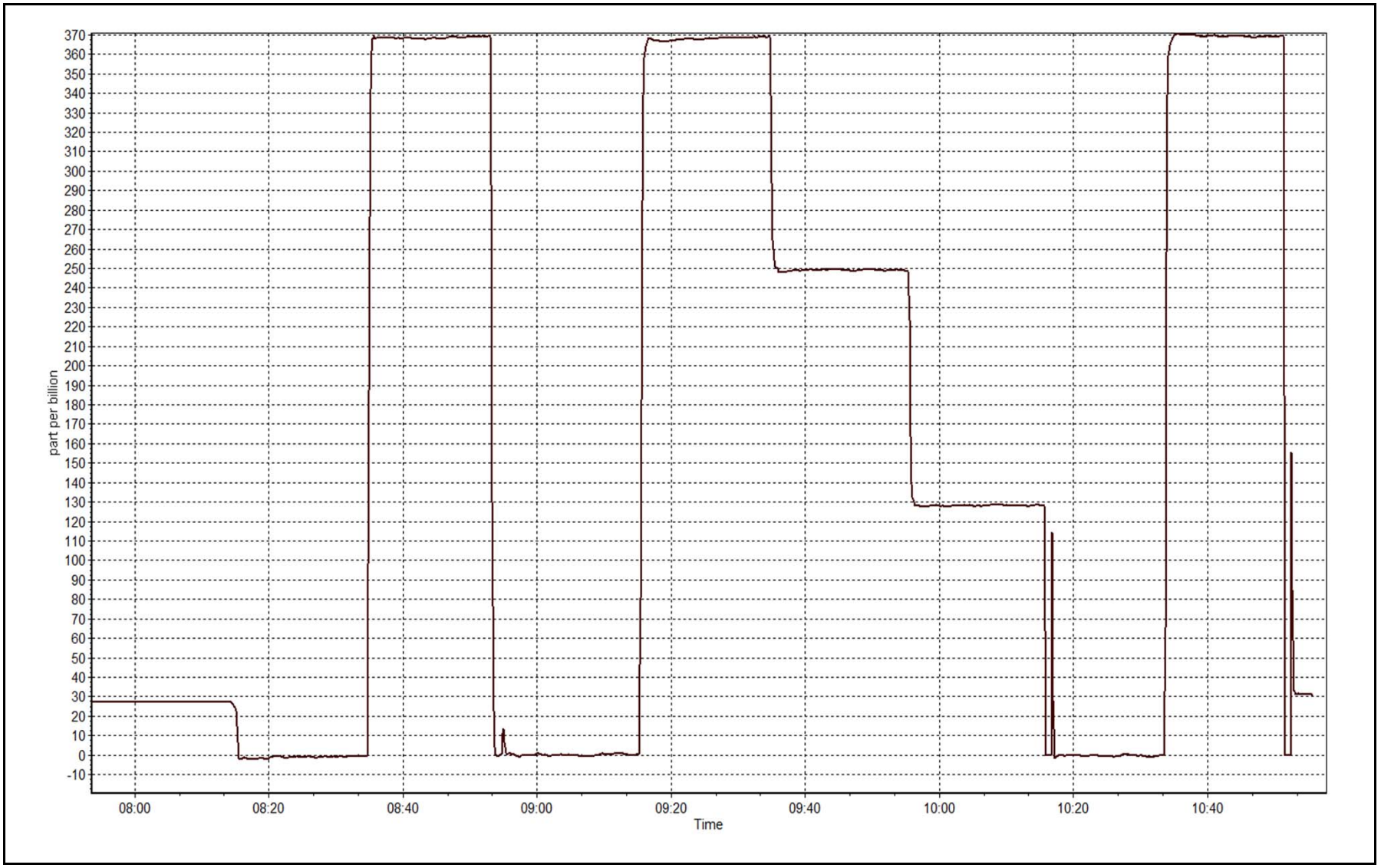
Calibration Date	January-14-15	Previous Calibration	December 11, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:10	End Time (MST)	10:56
Analyzer make	T400	Analyzer serial #	824

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999965
367.5	368.4	0.9976		
248.3	249.1	0.9968	Slope	0.995671
129.9	128.3	1.0125		
			Intercept	0.806965



O3 Calibration Plot Date: January 14, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	8:15	End Time (MST)	12:02
Barometric Pressure	mmHg	Station Temperature	21.0 Deg C
Calibrator	API T700	Serial Number	997
NO Cal Gas Conc	49.7 ppm	Cal Gas Expiry Date	December 12, 2016
NOx Cal Gas Conc	49.7 ppm	Cal Gas Serial #	SA130010A

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	6894

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.996414	1.002276	0.998525
	Data Offset	0.428380	0.028594	0.014004
After	Data Slope	0.998493	1.001502	1.002595
	Data Offset	0.545907	0.204798	0.574008
Channel #				
Voltage Range				

Analyzer Information

Analyzer make/model	API T200	Analyzer serial #	833

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.993	ppb	0.993	ppb
NOX coefficient	0.993	ppb	0.993	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	-0.4		-0.4	
NOX bkgrnd	0.7		0.7	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	315.2	Deg C	315.2	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	72.0	ccm	72.0	ccm
R Cell Press	5.9	mmHg	5.9	mmHg
Sample Flow	450	ccm	450.000	ccm

Notes:

Filter changed,No Maintenance or adjustments Done

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 13, 2015 Station Number: AMS 17

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.8	-0.5	-0.3	N/A	N/A
as found span	5000	60.4	600.4	600.4	0.0	600.7	599.1	1.6	0.9995	1.0021
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.8	-0.5	-0.3	N/A	N/A
high point	5000	60.4	600.4	600.4	0.0	600.7	599.1	1.6	0.9995	1.0021
second point	5000	30.2	300.2	300.2	0.0	300.4	300.4	0.0	0.9993	0.9993
third point	5000	15.1	150.1	150.1	0.0	149.3	148.6	0.8	1.0053	1.0101
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.1	0.4	-0.5	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	-0.1	0.4	-0.5	N/A	N/A
as left span	5000	60.4	600.4	234.5	365.9	603.5	235.9	364.4	0.9948	0.9941
								Average Correction Factor	1.0014	1.0038

Corrcted As found NO_X= 601.5 NO= 599.6 Percent Change NO_X= 0.1% NO= -0.1%

Previous Response NO_X= 602.1 NO= 599.0

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 60.40 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.3			N/A	
1st NO2 (300)	N/A	234.5	367.5	600.2	234.5	365.6	0.9884	1.0000	1.0052	99.5%
2nd NO2 (200)	N/A	353.7	248.3	601.7	353.7	248.1	0.9859	1.0000	1.0008	99.9%
3rd NO2 (100)	N/A	472.1	129.9	600.2	472.1	128.1	0.9884	1.0000	1.0141	98.6%
4th NO2 (0)	602.0	N/A	-0.2	601.8	602.0	-0.1	0.9857	1.0000	N/A	N/A
					Average Correction Factor		0.9871	1.0000	1.0067	99.3%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

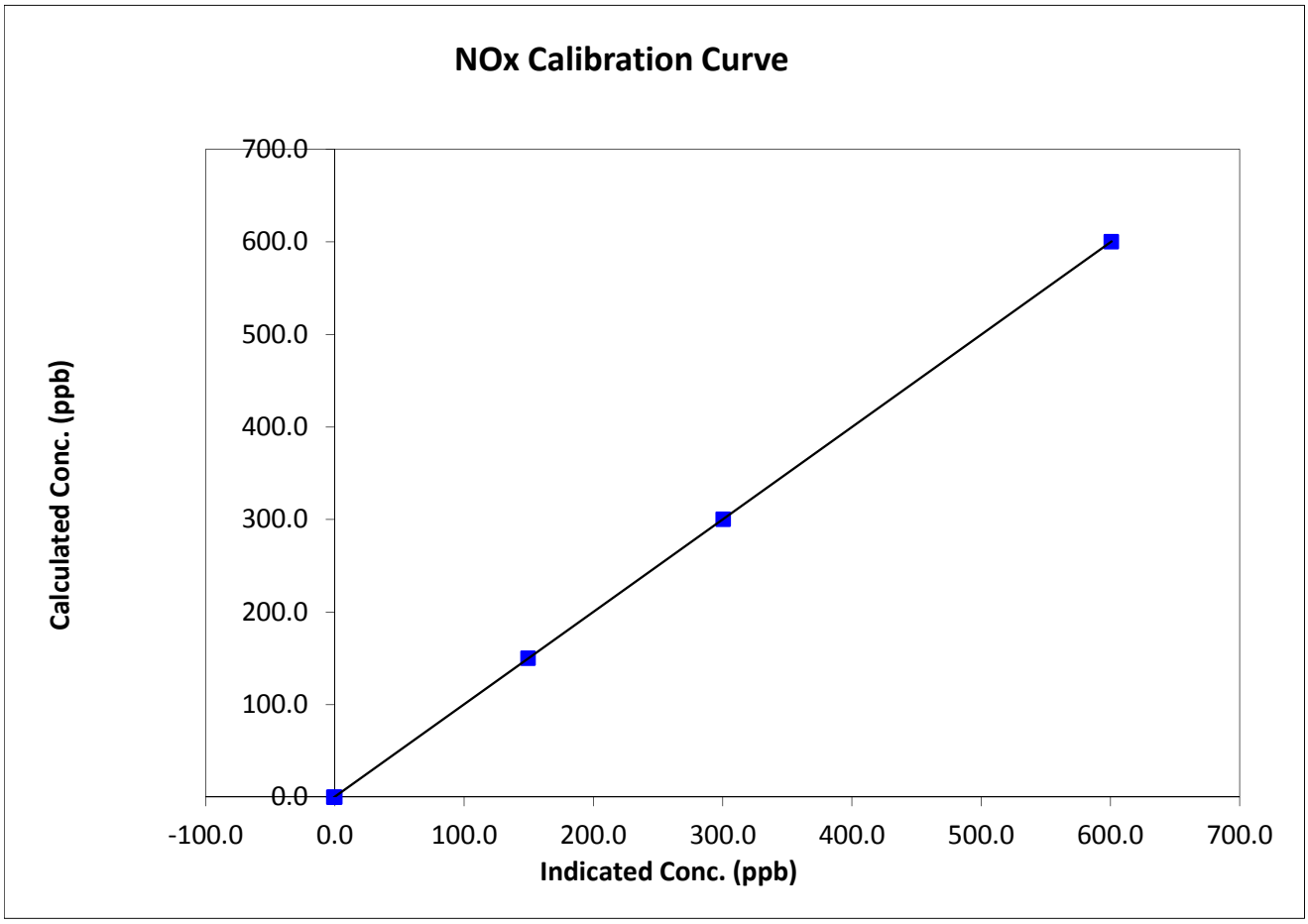
NO_X Calibration Summary

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:15	End Time (MST)	12:02
Analyzer make	API T200	Analyzer serial #	833

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.8	N/A	Correlation Coefficient	0.999998
600.4	600.7	0.9995		
300.2	300.4	0.9993	Slope	0.998493
150.1	149.3	1.0053		
0.0	-0.1	0.0000	Intercept	0.545907



Wood Buffalo Environmental Association

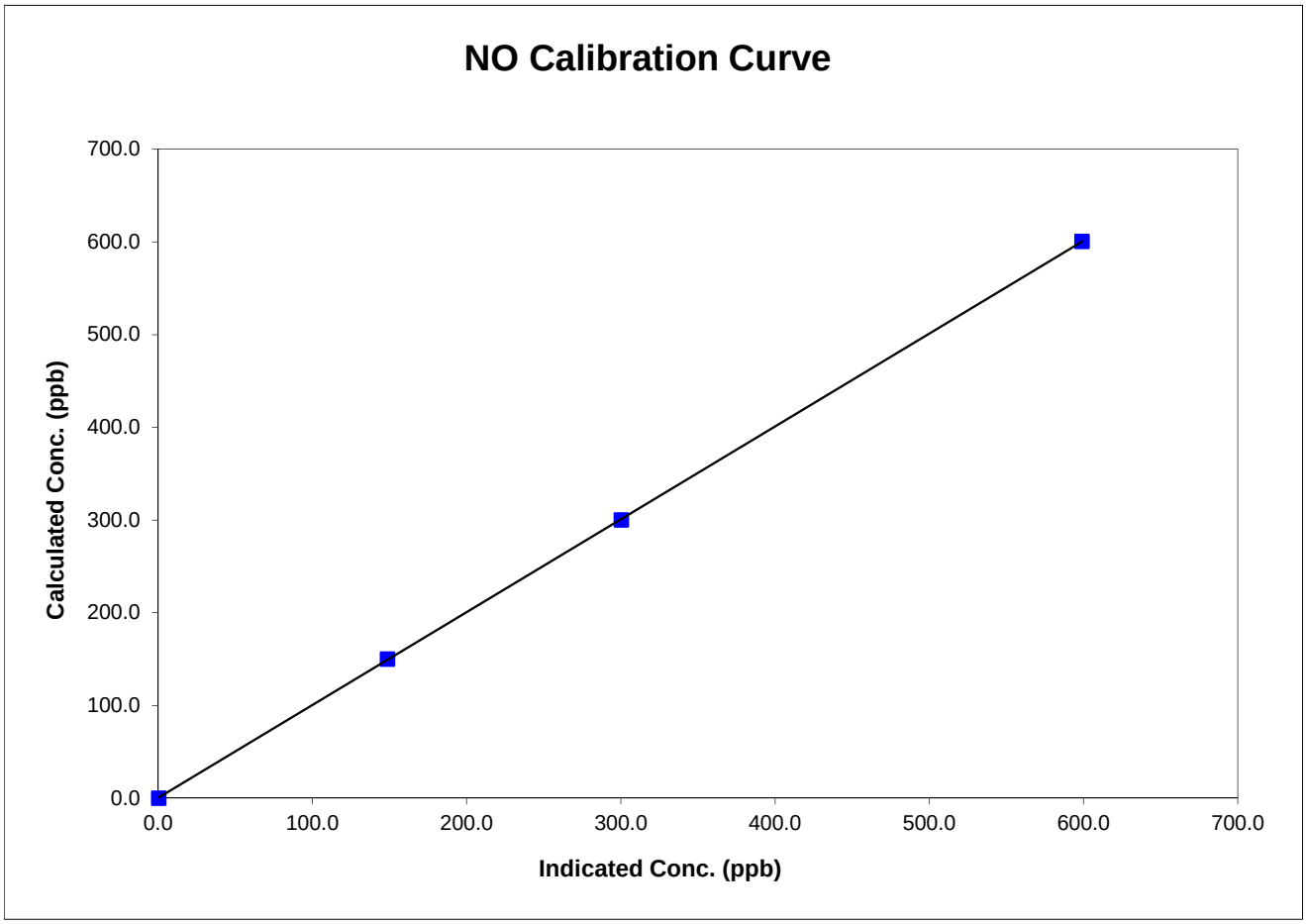
NO Calibration Summary

Station Information

Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:15	End Time (MST)	12:02
Analyzer make	API T200	Analyzer serial #	833

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999991
600.4	599.1	1.0021		
300.2	300.4	0.9993	Slope	1.001502
150.1	148.6	1.0101		
0.0	0.4	0.0000	Intercept	0.204798



Wood Buffalo Environmental Association

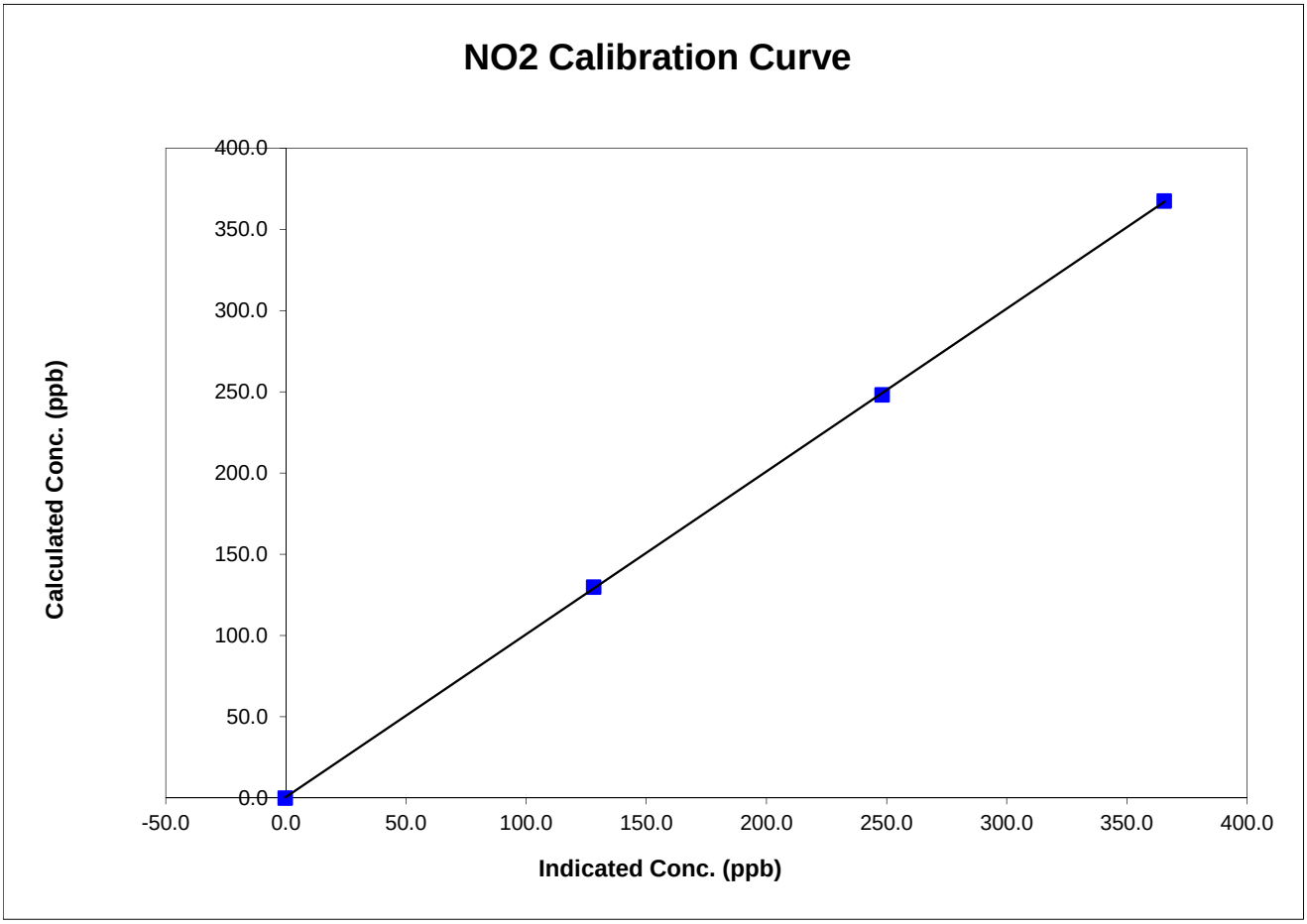
NO_2 Calibration Summary

Station Information

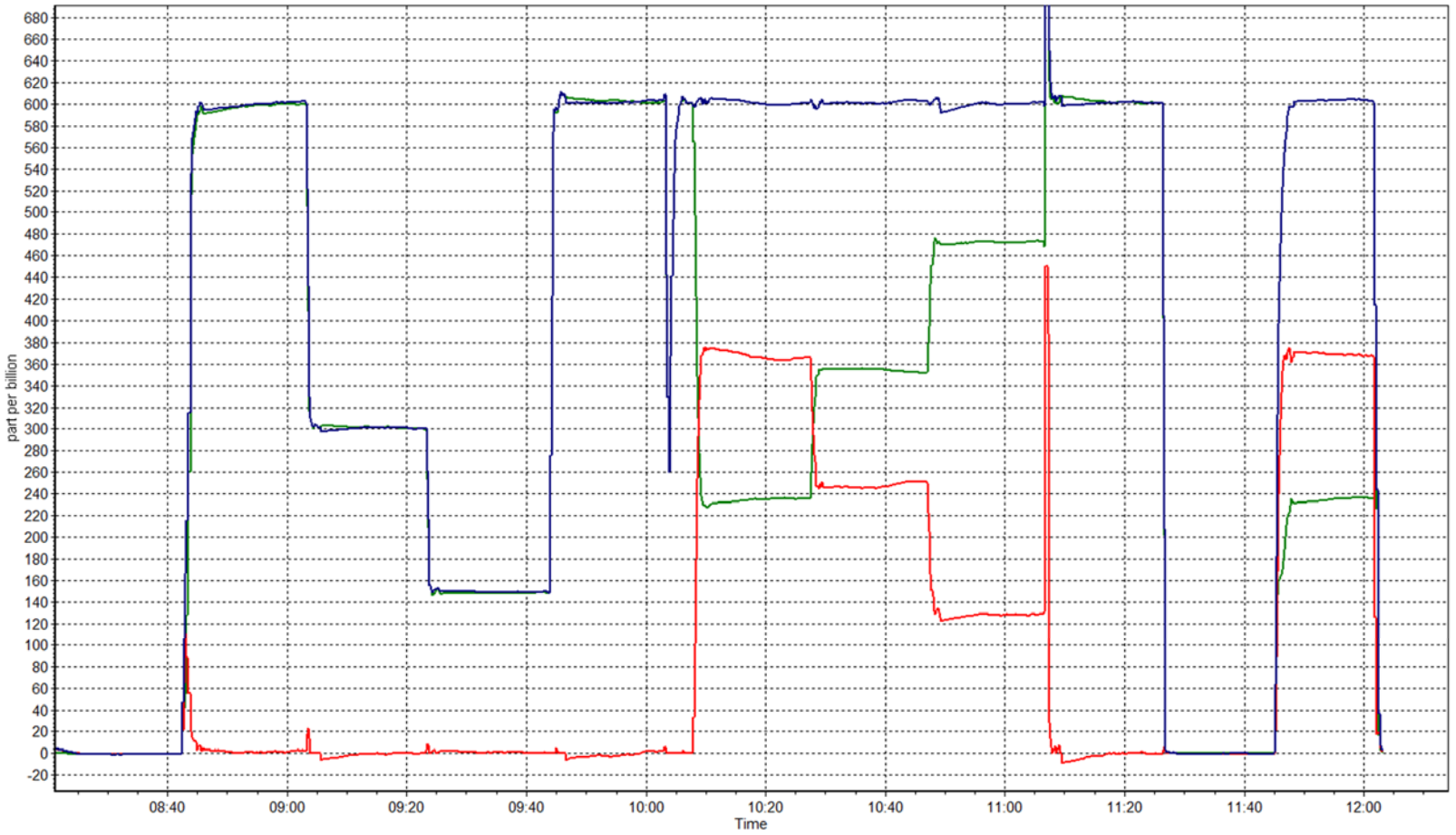
Calibration Date	January 13, 2015	Previous Calibration	December 10, 2014
Station Number	Wapasu	Station Number	AMS 17
Start Time (MST)	8:15	End Time (MST)	12:02
Analyzer make	API T200	Analyzer serial #	833

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999973
367.5	365.6	1.0052		
248.3	248.1	1.0008	Slope	1.002595
129.9	128.1	1.0141		
			Intercept	0.574008



NOx, NO & NO_2 Calibration Plot Date: January 13, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 19
FIREBAG
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
JANUARY 2015

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	706	38	38	100.00	36	0	12	0
H2S (ppb) Average	708	35	36	99.87	4	0	1	0
THC (ppm) Average	707	37	37	100.00	2.8	-	2.3	-
NO2 (ppb) Average	706	38	38	100.00	54	0	15	-
NO (ppb) Average	706	38	38	100.00	107	-	10	-
NOX (ppb) Average	706	38	38	100.00	160	-	23	-
Temperature 2 m (C) Average	744	0	0	100.00	3.4	-	1	-
Relative Humidity (%) Average	744	0	0	100.00	99	-	-	-
Wind Speed 10 m (km/h) Average	707	0	37	95.03	35	-	-	-
Wind Direction 10 m (deg) Average	707	0	37	95.03	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
JANUARY 2015

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	2.8	5	-	0	0	0	1	2	10	36
H2S (ppb) Average	708	0.5	0	-	0	0	0	0	1	1	4
THC (ppm) Average	707	2.19	0.1	-	2	2.1	2.1	2.2	2.2	2.3	2.8
NO2 (ppb) Average	706	6.8	7	-	0	0	1	5	10	15	54
NO (ppb) Average	706	2.5	7	-	0	0	0	0	2	7	107
NOX (ppb) Average	706	9.3	13	-	0	0	1	6	13	22	160
Temperature 2 m (C) Average	744	-15.25	9.5	-	-33.9	-26.5	-22.9	-17.4	-7.5	-0.5	3.4
Relative Humidity (%) Average	744	83.9	7	-	60	75	79	83	89	94	99
Wind Speed 10 m (km/h) Average	707	11	6	-	1	4	6	10	14	20	35
Wind Direction 10 m (deg) Average	707	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	28 Jan 2015 09:00	28 Jan 2015 09:00	1	Unstable operation - excessive baseline drift
Wind Speed, Wind Direction	01 Jan 2015 11:00	01 Jan 2015 11:00	1	Flat line in sensor output signal - sensor frozen
Wind Speed, Wind Direction	10 Jan 2015 07:00	10 Jan 2015 08:00	2	Flat line in sensor output signal - sensor frozen
Wind Speed, Wind Direction	11 Jan 2015 08:00	11 Jan 2015 09:00	2	Flat line in sensor output signal - sensor frozen
Wind Speed, Wind Direction	23 Jan 2015 02:00	23 Jan 2015 13:00	12	Flat line in sensor output signal - sensor frozen
Wind Speed, Wind Direction	23 Jan 2015 18:00	24 Jan 2015 07:00	14	Flat line in sensor output signal - sensor frozen
Wind Speed, Wind Direction	30 Jan 2015 23:00	31 Jan 2015 04:00	6	Flat line in sensor output signal - sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Firebag - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 36 ppb on Jan 10 16:00 Maximum Daily Average: 11.5 ppb on Jan 10

Minimum Value: 0 ppb on Jan 8 00:00 Minimum Daily Average: 0.3 ppb on Jan 15
Maximum Diurnal Average: 4.1 ppb at hour 1 Minimum Diurnal Average: 2.1 ppb at hour 22
Monthly Average: 2.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 2$ $P_{90} = 10$ $P_{99} = 21$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	38
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-Jan	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.4	1
2-Jan	0	1	Z	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
3-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1.0	2
4-Jan	2	2	2	1	Z	9	15	15	13	12	12	11	14	12	10	11	10	11	7	4	9	15	9	8	9.3	15
5-Jan	10	7	6	9	11	Z	9	7	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9	11
6-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	1	1	2	2	12	13	1.7	13
7-Jan	21	Z	5	0	0	0	0	1	3	3	4	2	1	2	1	1	1	3	6	2	0	0	0	0	2.5	21
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	2	0.5	2
9-Jan	9	12	17	Z	15	16	11	16	15	14	21	13	8	9	12	10	6	2	1	0	0	0	0	0	9.0	21
10-Jan	0	0	0	0	Z	0	0	1	1	7	10	28	17	20	21	36	33	24	14	12	17	9	7	5	11.5	36
11-Jan	2	4	6	4	3	Z	1	1	1	1	1	5	6	4	1	1	2	1	1	1	1	1	1	1	2.2	6
12-Jan	Z	6	10	8	7	11	17	16	14	11	9	9	5	3	11	8	8	34	8	2	4	5	9	15	10.0	34
13-Jan	18	Z	11	4	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1.9	18
14-Jan	1	2	Z	4	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	4
15-Jan	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Jan	0	0	0	0	Z	0	0	0	1	1	1	1	6	6	3	2	2	1	1	1	1	0	1	1	1.3	6
17-Jan	0	0	0	1	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	0	0	3	3	2	1	0.6	3
18-Jan	Z	1	0	0	0	0	0	0	0	0	0	1	6	11	11	8	6	7	8	2	8	9	11	10	4.4	11
19-Jan	12	Z	11	12	5	4	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4	12
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	5	3	2	1	1	1.0	5
21-Jan	1	1	1	Z	0	0	0	0	1	1	1	1	1	1	0	0	1	2	3	3	2	4	5	7	1.5	7
22-Jan	6	6	6	11	Z	8	15	6	5	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3.1	15
23-Jan	0	0	0	0	0	Z	1	12	6	2	1	1	1	0	2	2	7	16	22	24	11	4	1	1	5.0	24
24-Jan	Z	0	0	0	0	0	0	1	1	1	2	2	1	0	0	0	0	0	0	0	0	0	1	9	0.9	9
25-Jan	7	Z	1	1	1	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0.9	7
26-Jan	12	14	Z	11	11	11	7	4	7	8	8	5	3	2	2	2	1	0	0	0	0	0	0	0	4.7	14
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0.4	3
28-Jan	1	0	1	0	Z	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	1	--	1
29-Jan	1	1	1	1	1	Z	1	2	2	1	1	1	1	0	1	0	0	0	0	0	0	0	1	1	0.8	2
30-Jan	Z	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
31-Jan	0	Z	0	0	0	0	0	1	2	3	10	17	17	8	6	6	5	2	1	1	1	1	1	6	3.9	17
	4.1	2.4	3.1	2.7	2.5	2.7	2.9	2.9	2.6	2.6	2.9	3.4	3.0	2.9	3.1	3.1	2.8	3.6	2.8	2.1	2.2	2.1	2.2	2.9	Diurnal Average	
	21	14	17	12	15	16	17	16	15	14	21	28	17	20	21	36	33	34	22	24	17	15	12	15	Diurnal Maximum	

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

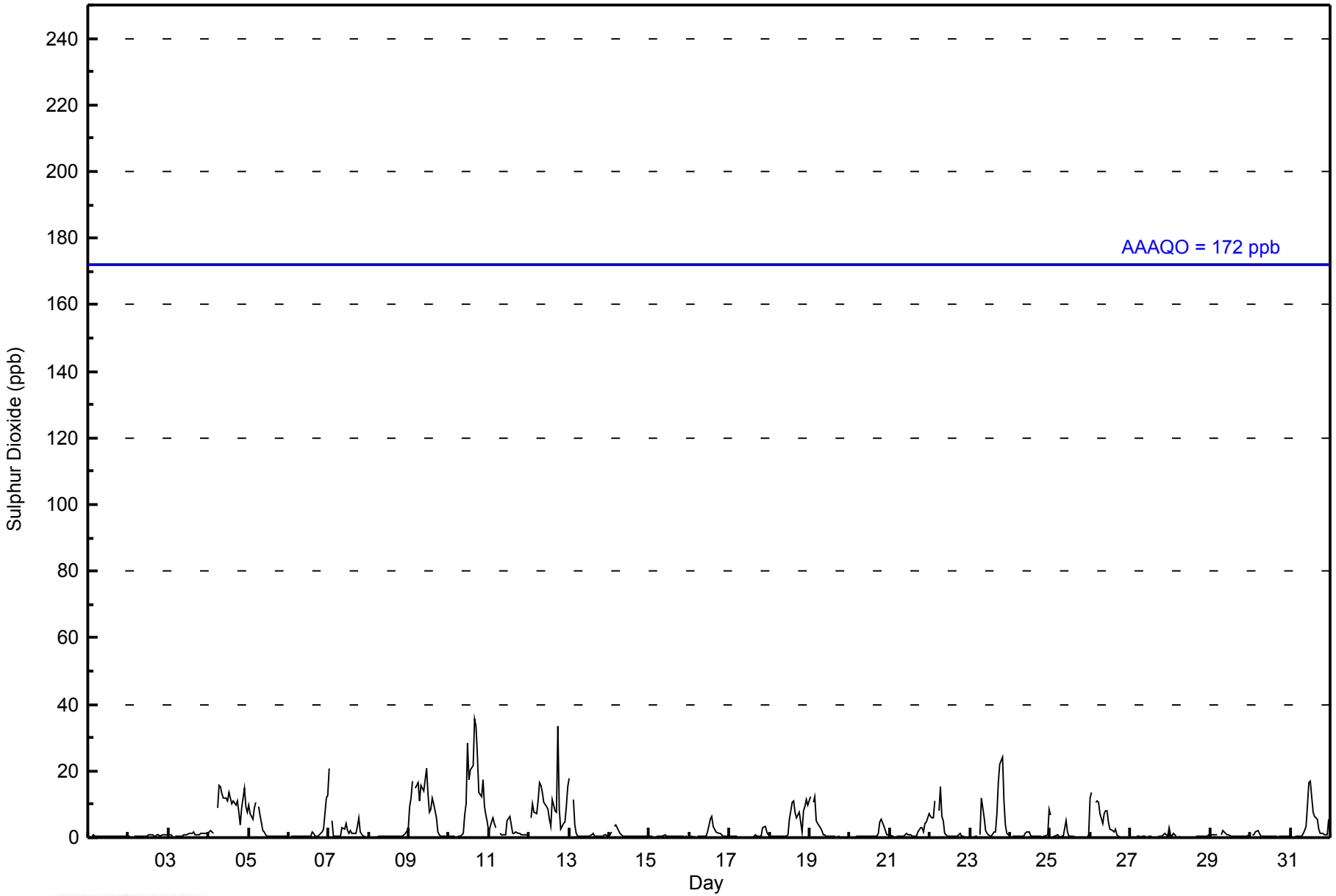
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	640	90.65	90.65
11 - 20	56	7.93	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: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Firebag - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	111	44	19	8	13	6	6	26	42	46	83	54	51	25	22	55	611
11 - 20	0	0	0	1	0	0	0	0	0	4	21	20	4	1	2	0	53
21 - 60	0	0	0	0	0	0	0	0	0	1	3	4	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	111	44	19	9	13	6	6	26	42	51	107	78	55	26	24	55	672

Total Number of Valid Hours: 672

Total Number of Hours: 744

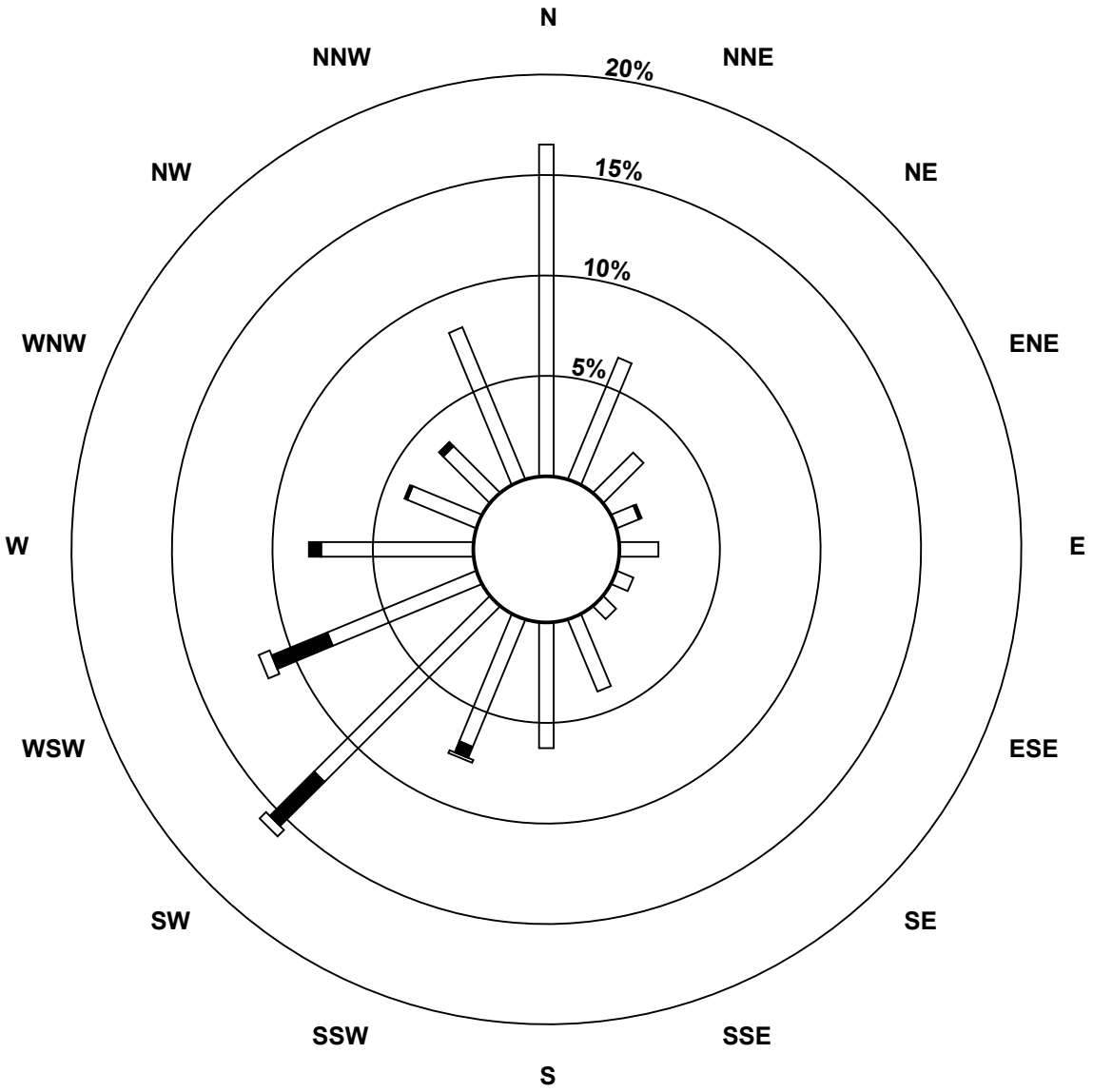
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

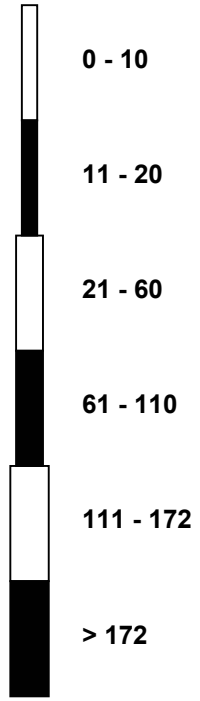
Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

Firebag (AMS 19)



Classes (ppb)



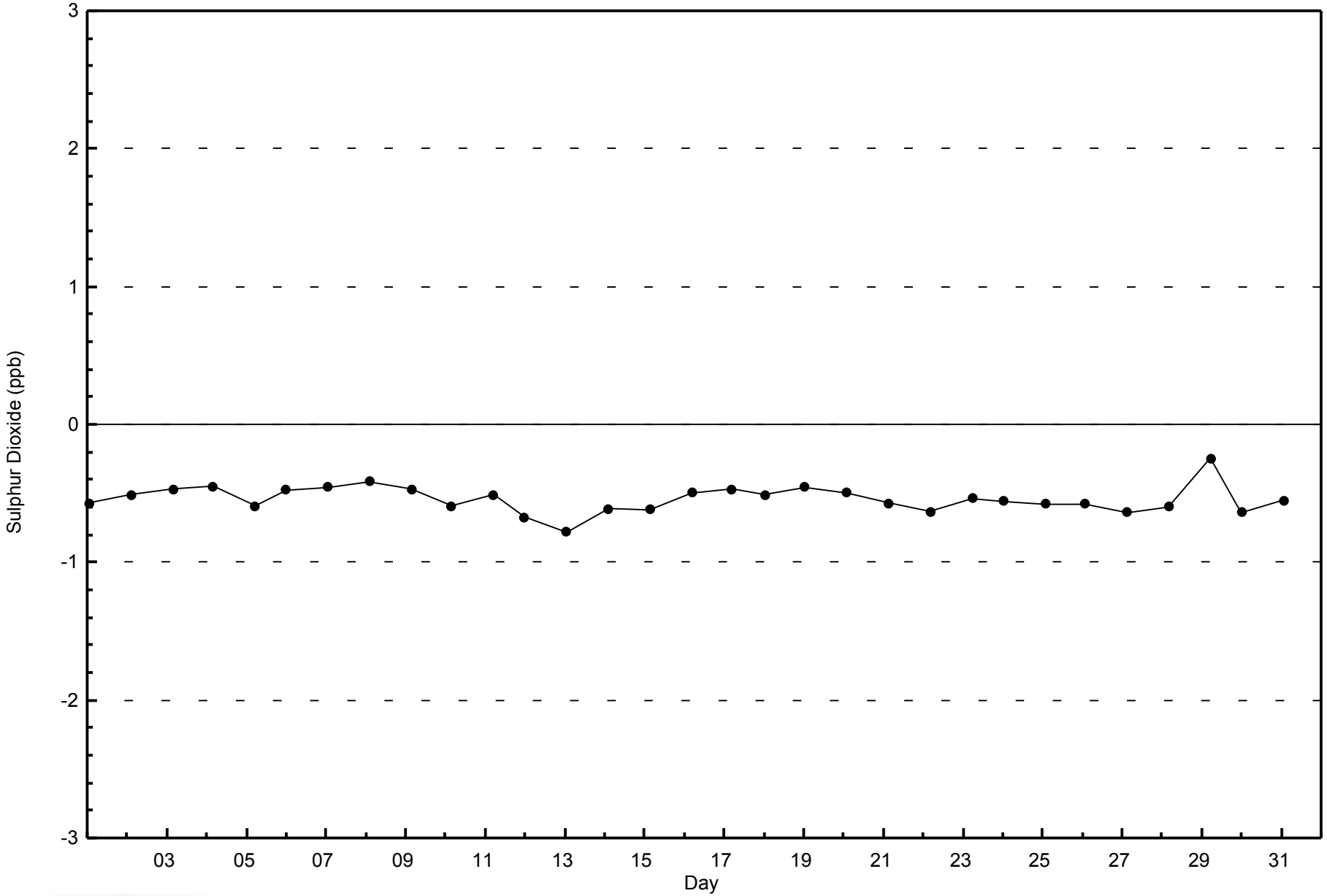
Total Number of Valid Hours: 672

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Firebag - January 2015



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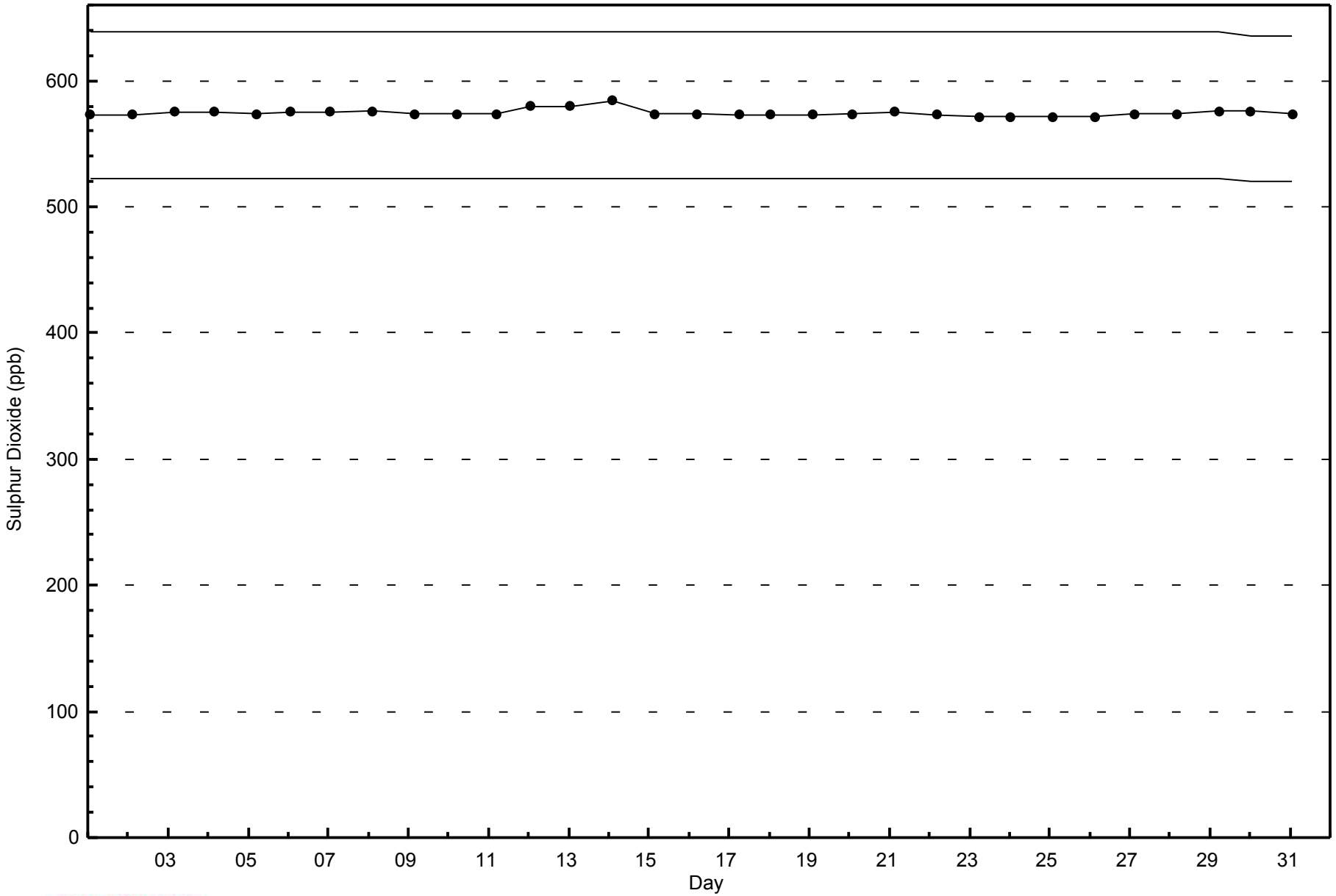
ATMOSPHERICS INC.

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

Firebag - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Firebag - January 2015

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

Maximum Value: 4 ppb on Jan 11 09:00

Maximum Daily Average: 0.8 ppb on Jan 11

Minimum Value: 0 ppb on Jan 10 00:00

Minimum Daily Average: 0.2 ppb on Jan 28

Maximum Diurnal Average: 0.6 ppb at hour 6

Minimum Diurnal Average: 0.4 ppb at hour 23

Monthly Average: 0.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

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-Jan	0	0	Z	1	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
2-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
4-Jan	0	0	0	0	1	Z	1	1	1	0	1	1	1	1	0	1	1	1	0	0	0	0	1	1	0.5	1
5-Jan	1	0	0	1	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
6-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0.3	1
7-Jan	1	1	Z	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	0.6	1
8-Jan	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0.3	1
9-Jan	1	1	1	1	Z	1	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0.5	1
10-Jan	1	1	0	0	0	Z	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	2
11-Jan	1	1	1	1	1	1	Z	2	4	2	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0.8	4
12-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0.7	1
13-Jan	1	1	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	0	1	0	1	0.5	1
14-Jan	0	0	1	Z	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0.4	1
15-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0.4	1
16-Jan	0	0	0	0	1	Z	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0.4	1
17-Jan	0	0	0	0	0	1	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0.4	1
18-Jan	1	Z	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	0.6	1
19-Jan	1	1	Z	1	2	2	3	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.8	3
20-Jan	0	0	1	Z	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0.4	1
21-Jan	0	0	0	1	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0.4	1
22-Jan	1	1	1	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.5	1
23-Jan	0	0	0	0	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	0.8	2
24-Jan	1	Z	1	1	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.6	1
25-Jan	1	1	Z	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0.5	1
26-Jan	1	1	1	Z	1	1	1	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.5	1
27-Jan	0	0	0	0	Z	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	1	1	0	0	0.4	1
28-Jan	0	0	0	0	0	Z	0	0	UO	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
29-Jan	1	1	0	0	0	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
30-Jan	1	Z	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0.6	1
31-Jan	0	1	Z	1	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1
	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	Diurnal Average	
	1	1	1	1	2	2	3	2	4	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	Diurnal Maximum	

Z - zerospan C - Calibration UO - Unstable Operation

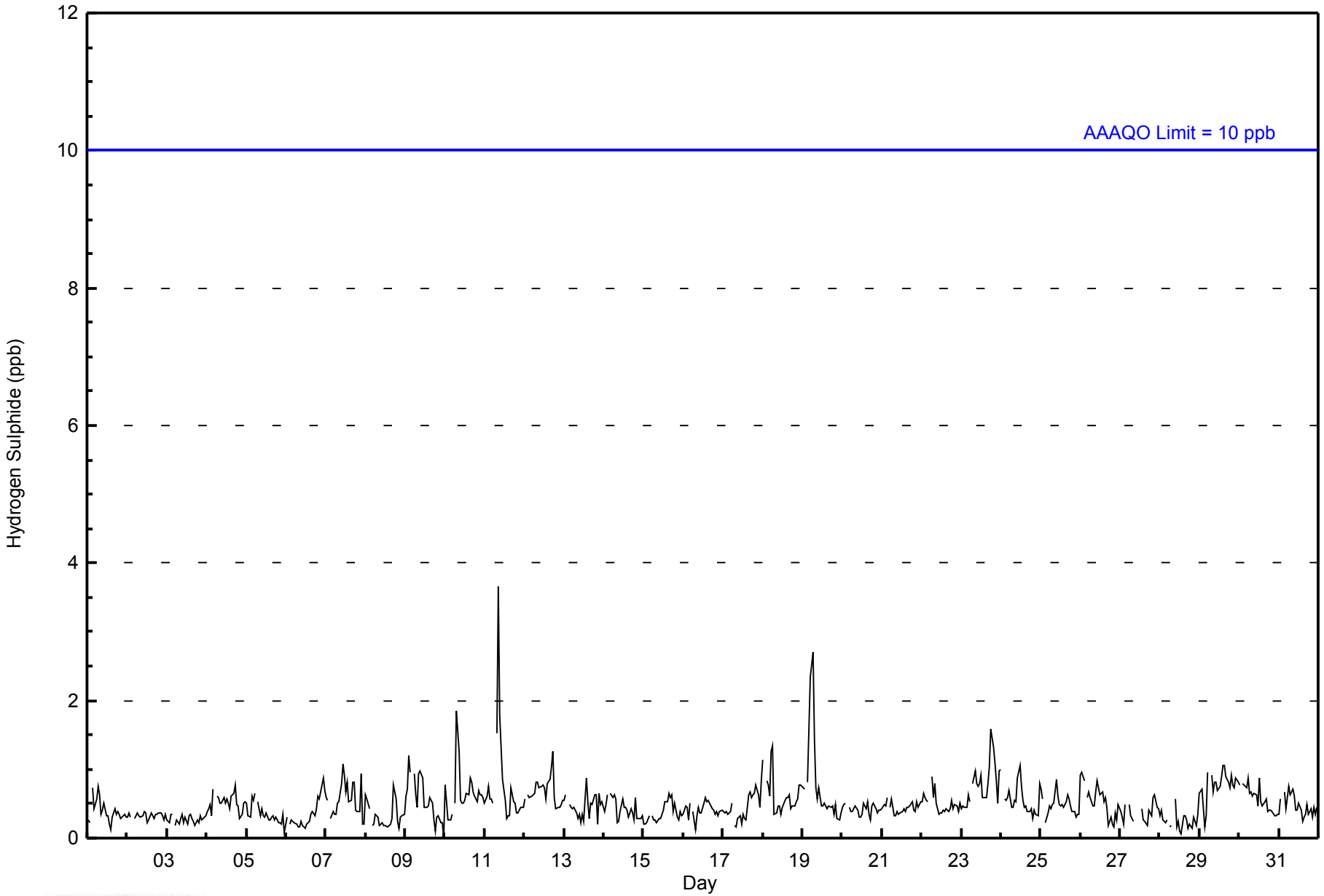
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

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

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Firebag - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	116	41	18	9	12	5	6	27	41	50	108	80	55	26	19	60	673
3 - 4	0	0	0	0	0	1	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	116	41	18	9	12	6	6	27	41	50	108	80	55	26	19	60	674

Total Number of Valid Hours: 674

Total Number of Hours: 744

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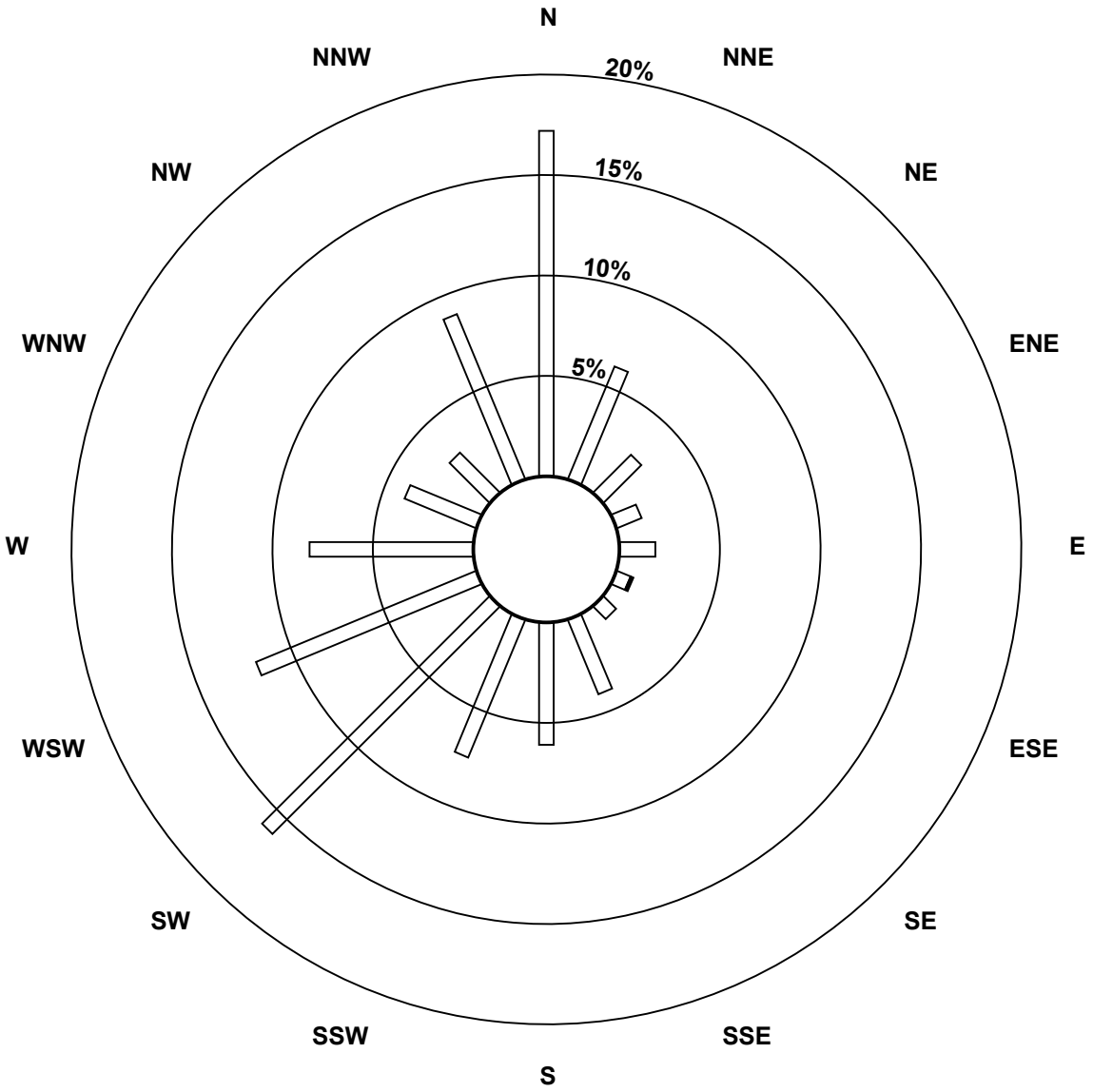
Wood Buffalo Environmental Association

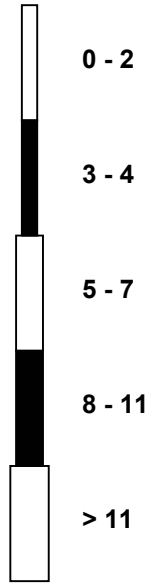
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

Firebag (AMS 19)



Classes (ppb)



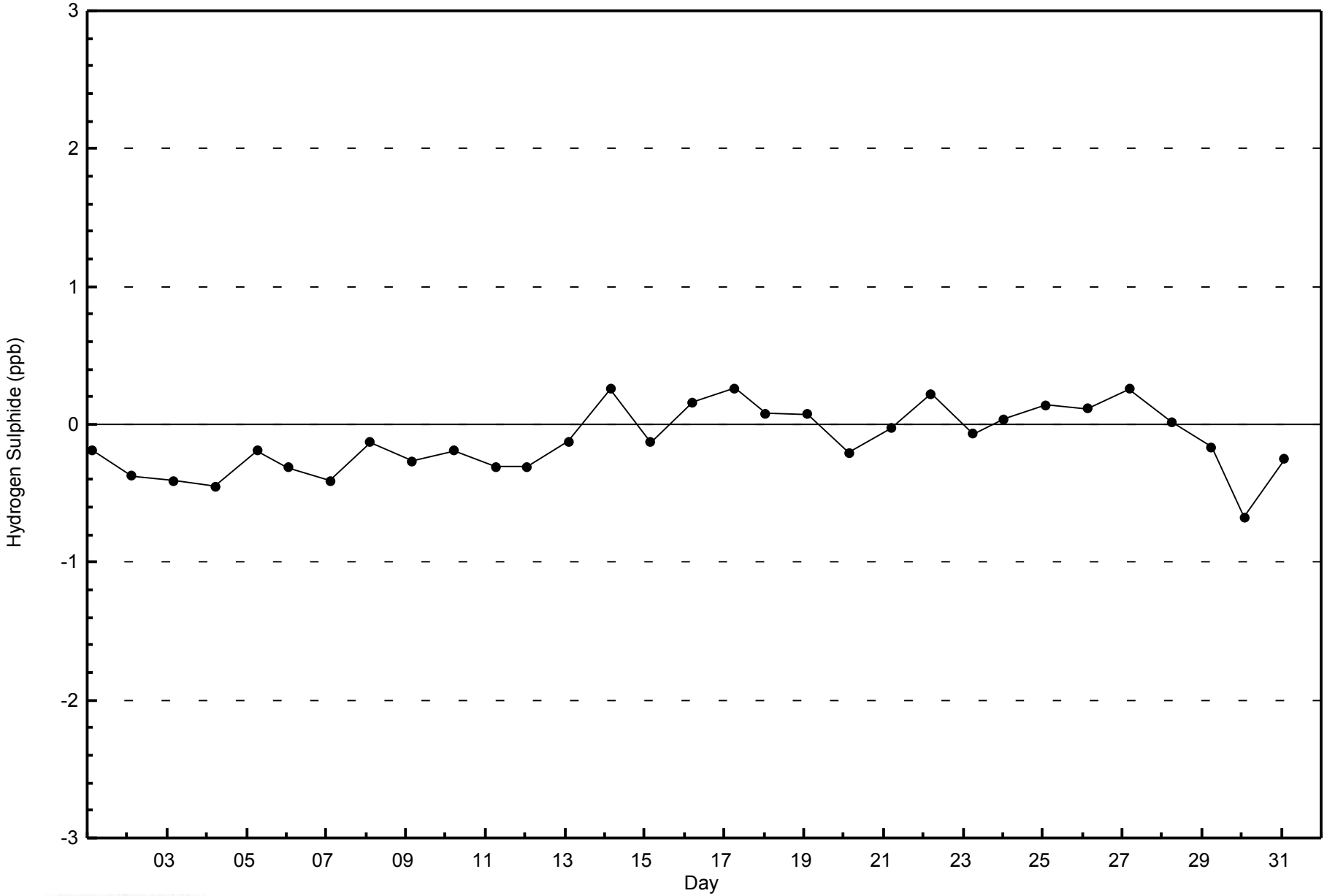
Total Number of Valid Hours: 674

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Firebag - January 2015



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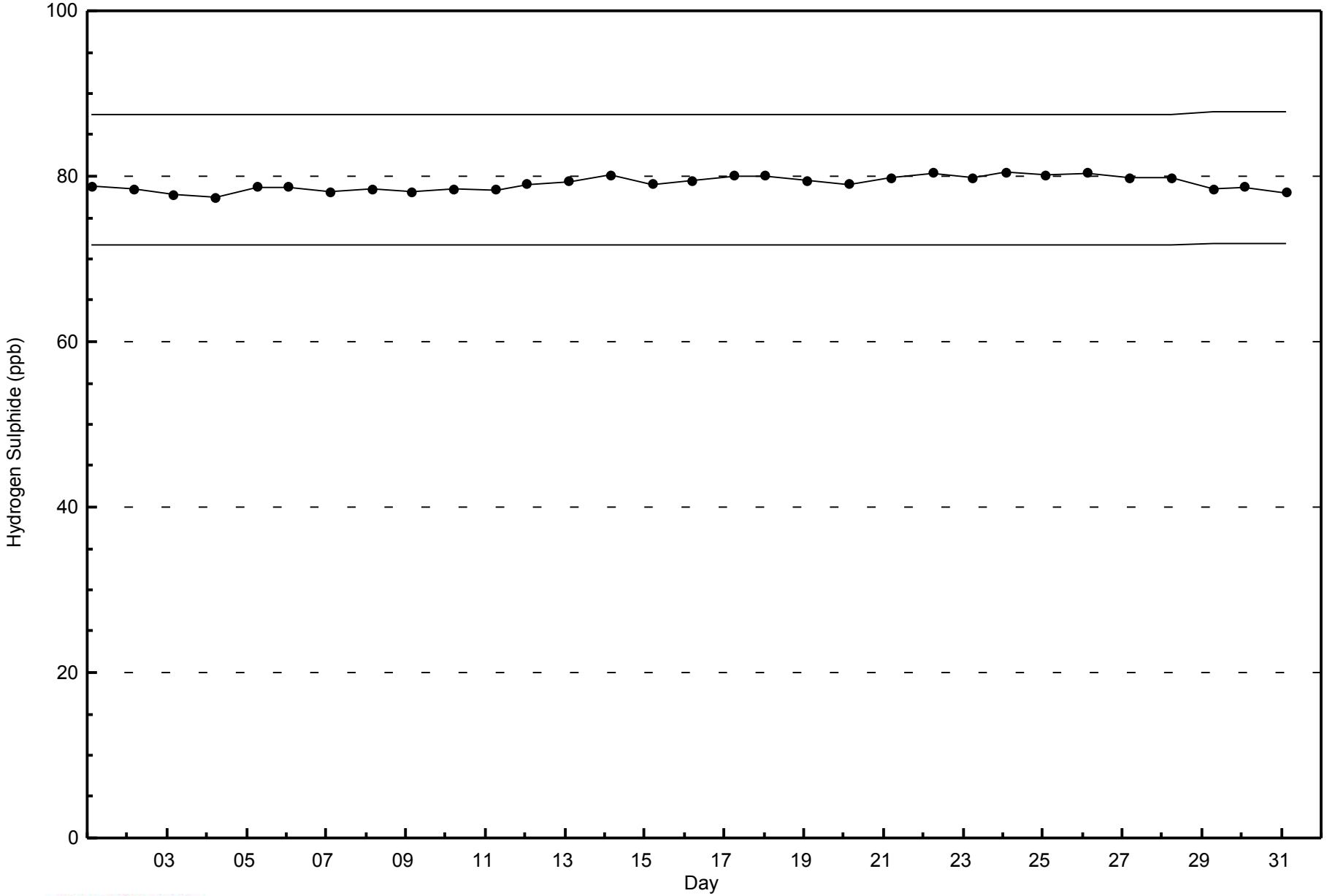
WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Firebag - January 2015



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Firebag - January 2015

Maximum Value: 2.8 ppm on Jan 24 12:00

Maximum Daily Average: 2.3 ppm on Jan 12

Minimum Value: 2.0 ppm on Jan 25 14:00

Minimum Daily Average: 2.1 ppm on Jan 25

Maximum Diurnal Average: 2.2 ppm at hour 7

Minimum Diurnal Average: 2.2 ppm at hour 15

Monthly Average: 2.19 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.1 Median = 2.2 Q_3 = 2.2 P_{90} = 2.3 P_{99} = 2.5

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-Jan	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
2-Jan	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3
3-Jan	2.1	2.1	2.2	Z	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
4-Jan	2.3	2.3	2.3	2.3	Z	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
5-Jan	2.2	2.2	2.3	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3
6-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.4
7-Jan	2.3	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3
8-Jan	2.1	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	2.5	2.4	2.2	2.2	2.3	2.3	2.3	2.2	2.5
9-Jan	2.4	2.3	2.3	Z	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	2.0	2.0	2.0	2.1	2.4
10-Jan	2.1	2.1	2.1	2.1	Z	2.3	2.5	2.6	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.4	2.3	2.4	2.4	2.3	2.6
11-Jan	2.2	2.3	2.4	2.3	2.2	Z	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
12-Jan	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.5
13-Jan	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.4
14-Jan	2.2	2.2	Z	2.2	2.3	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.3
15-Jan	2.2	2.1	2.1	Z	2.2	2.2	2.1	2.2	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	2.2	2.3
16-Jan	2.1	2.1	2.1	2.2	Z	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	2.1	2.1	2.2	2.2	2.1	2.2	2.3
17-Jan	2.1	2.2	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.2
18-Jan	Z	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
19-Jan	2.2	Z	2.2	2.2	2.4	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.6
20-Jan	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	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	2.2	2.2	2.2	2.2
21-Jan	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.2
22-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2
23-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.5	2.6	2.5	2.3	2.3	2.3	2.2	2.2	2.6
24-Jan	Z	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.3	2.5	2.8	2.6	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.8
25-Jan	2.2	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
26-Jan	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3
27-Jan	2.2	2.1	2.1	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	2.2	2.2	2.2	2.2	2.3
28-Jan	2.2	2.1	2.1	2.1	Z	2.2	2.2	2.2	C	C	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	--	2.2
29-Jan	2.3	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.3
30-Jan	Z	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
31-Jan	2.3	Z	2.3	2.3	2.3	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	2.3
	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	2.2	2.2	2.2	Diurnal Average	
	2.4	2.3	2.4	2.4	2.4	2.6	2.5	2.6	2.4	2.4	2.5	2.8	2.6	2.3	2.4	2.4	2.5	2.5	2.6	2.5	2.4	2.3	2.4	2.4	Diurnal Maximum	

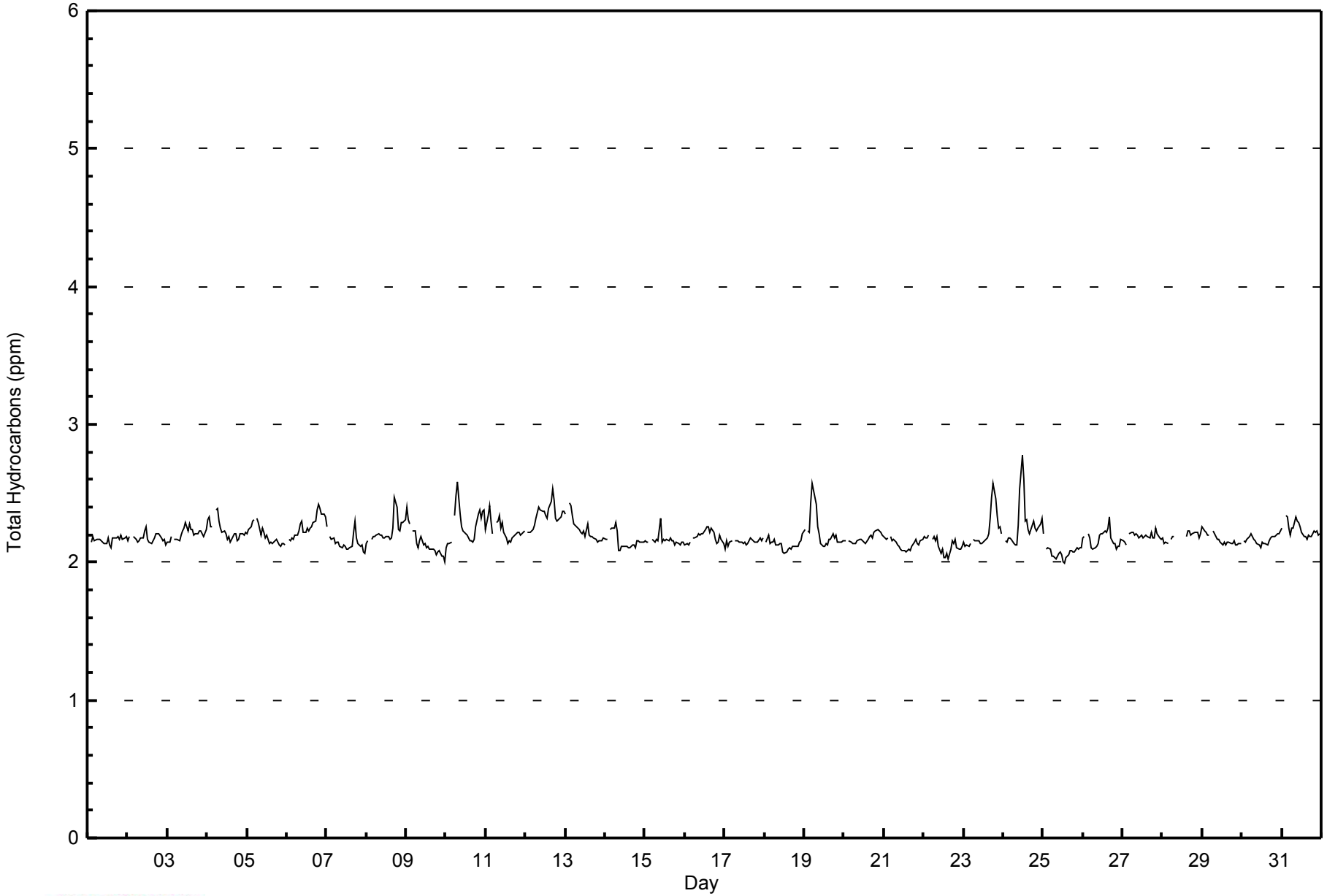
Z - zerospan C - Calibration

WBEA

Hourly Averages

Total Hydrocarbons (THC) - ppm

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	13	1.84	1.84
2.1 - 3.0	694	98.16	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

WBEA

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Firebag - January 2015

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	2	1	0	0	0	0	0	0	1	2	1	0	4	2	0	0	13
2.1 - 3.0	109	43	19	9	13	6	6	26	41	49	106	78	51	24	24	56	660
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	111	44	19	9	13	6	6	26	42	51	107	78	55	26	24	56	673

Total Number of Valid Hours: 673

Total Number of Hours: 744

AURORA
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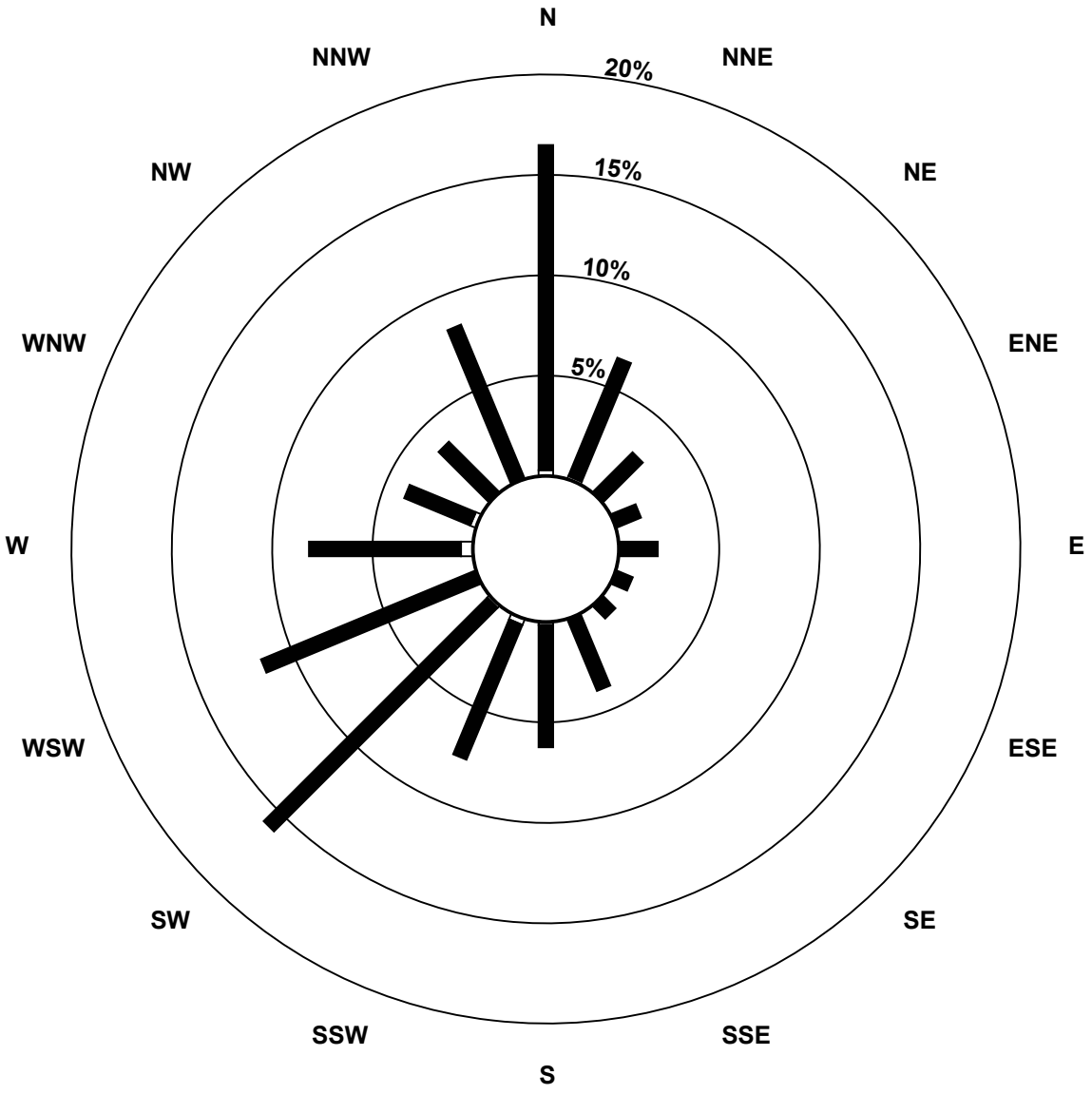
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Total Hydrocarbons (THC) - ppm

Firebag (AMS 19)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

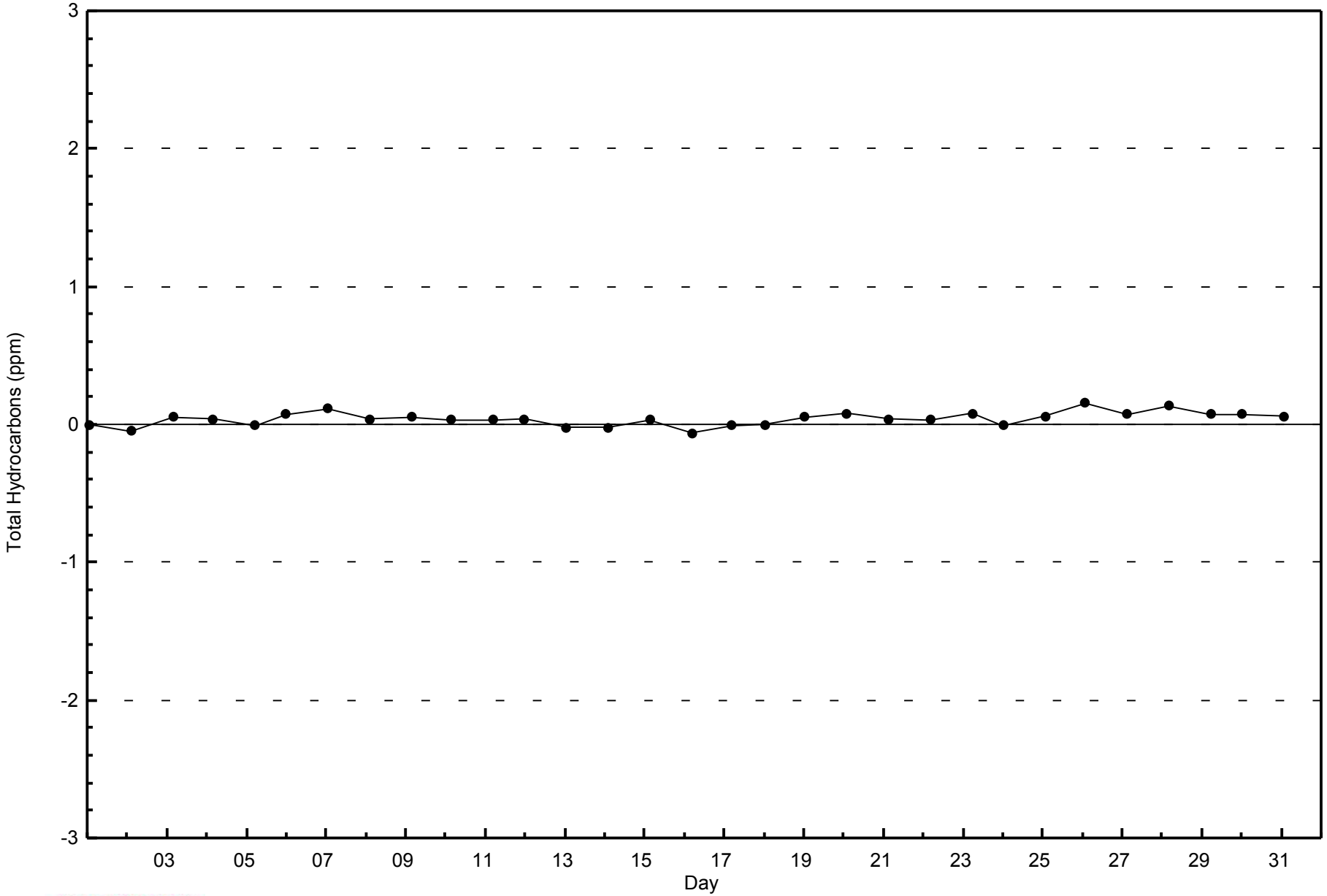
Total Number of Valid Hours: 673

WBEA

Zero Responses

Total Hydrocarbons (THC) - ppm

Firebag - January 2015



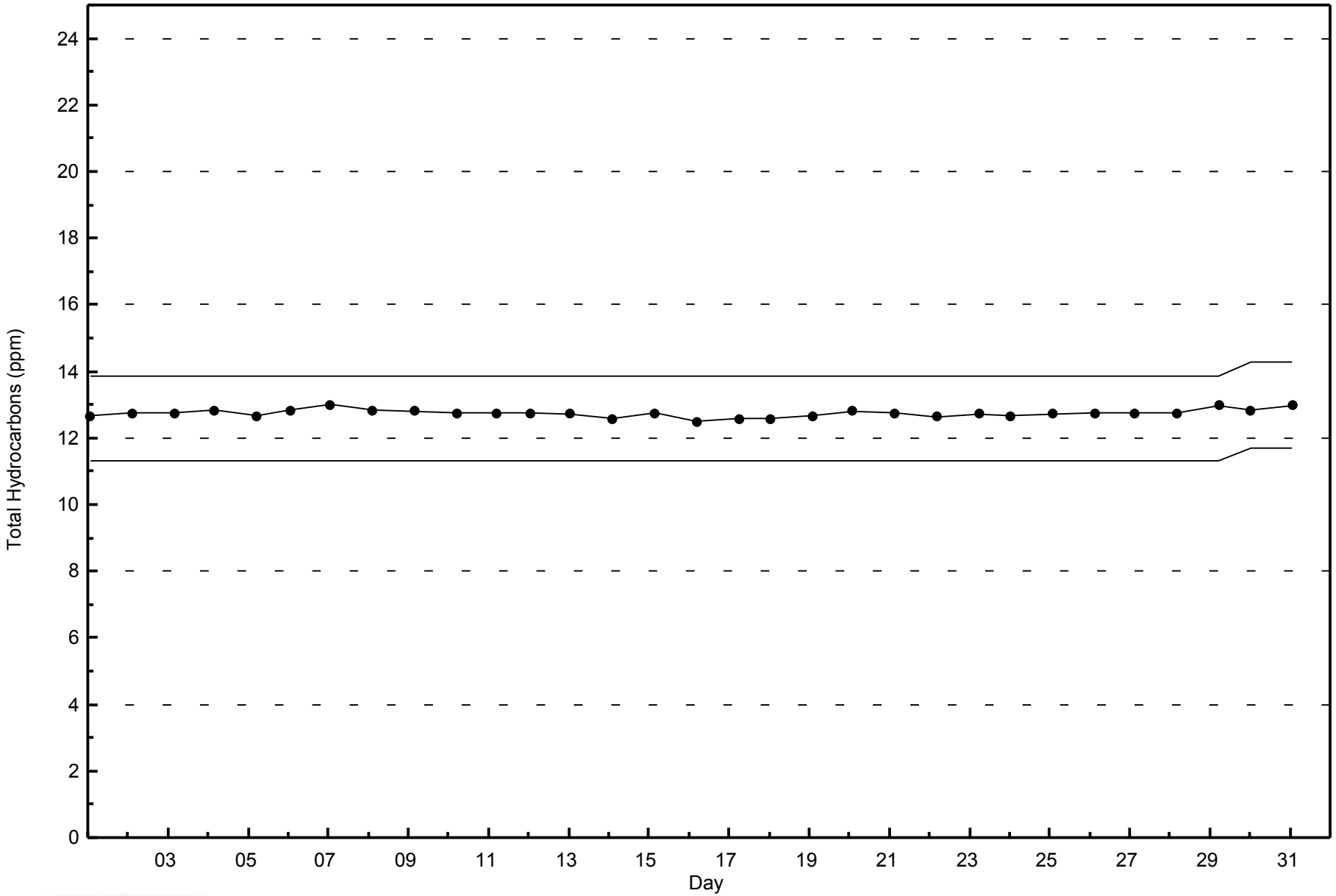
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Total Hydrocarbons (THC) - ppm

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

Firebag - January 2015

Maximum Value: 107 ppb on Jan 11 09:00

Maximum Daily Average: 9.9 ppb on Jan 11

Minimum Value: 0 ppb on Jan 1 01:00

Minimum Daily Average: 0.0 ppb on Jan 30

Maximum Diurnal Average: 5.6 ppb at hour 9

Minimum Diurnal Average: 0.8 ppb at hour 1

Monthly Average: 2.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 2$ $P_{90} = 7$ $P_{99} = 30$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	38
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-Jan	0	Z	1	4	5	4	8	9	1	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1.7	9
2-Jan	0	0	Z	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
3-Jan	0	0	0	Z	0	0	0	0	0	0	1	3	2	2	2	1	0	0	0	0	0	0	0	0	0.5	3
4-Jan	0	0	0	0	Z	0	0	0	0	1	2	3	3	2	1	1	0	0	0	0	0	0	0	0	0.6	3
5-Jan	0	0	0	0	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
6-Jan	Z	0	0	0	0	0	0	0	0	1	0	1	2	2	2	1	0	0	0	0	0	1	0	0	0.5	2
7-Jan	0	Z	3	3	2	2	1	2	1	7	14	10	6	6	1	0	0	1	0	0	0	0	0	0	2.7	14
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0.2	1
9-Jan	0	1	13	Z	13	7	6	1	9	10	13	2	3	2	2	1	0	0	0	0	0	0	0	0	3.6	13
10-Jan	0	0	0	0	Z	0	4	47	19	1	4	4	5	5	3	3	0	0	0	0	0	0	0	0	4.2	47
11-Jan	0	0	0	0	0	Z	0	30	107	35	20	12	4	1	1	0	7	2	2	0	1	1	1	1	9.9	107
12-Jan	Z	2	1	1	0	0	0	0	1	2	4	6	6	4	7	9	13	15	1	1	0	1	1	0	3.3	15
13-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	2	4	5	3	8	9	5	10	2	4	2.4	10
14-Jan	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
15-Jan	0	0	0	Z	0	0	0	0	0	1	3	5	7	10	11	14	8	12	8	9	4	3	5	4	4.6	14
16-Jan	4	6	6	2	Z	3	3	1	0	1	2	1	1	3	1	0	0	0	0	0	0	0	0	0	1.5	6
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	2	6	7	8	11	8	4	15	2.8	15
18-Jan	Z	12	14	11	8	24	30	1	0	1	2	2	4	4	3	2	4	0	2	0	1	1	5	9	6.2	30
19-Jan	5	Z	0	6	25	55	74	24	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	8.5	74
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	4	2	4	1	2	3	2	1	1	1	2	1.0	4
21-Jan	2	2	2	Z	2	1	4	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.8	4
22-Jan	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
23-Jan	0	0	0	0	2	Z	3	9	15	10	9	10	15	4	1	1	1	10	31	14	11	7	3	27	8.0	31
24-Jan	Z	2	8	7	6	11	0	0	0	3	9	16	8	1	1	0	0	0	0	0	0	0	0	0	3.1	16
25-Jan	1	Z	0	0	0	0	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	1	0	0.4	2
26-Jan	0	0	Z	0	1	3	2	1	0	1	2	3	3	3	2	1	1	0	0	0	0	0	0	0	1.0	3
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	2	0.4	2
28-Jan	1	1	1	0	Z	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	2	--	2
29-Jan	6	8	3	1	5	Z	20	4	7	8	10	6	5	7	12	12	3	0	0	0	0	0	0	0	5.1	20
30-Jan	Z	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
31-Jan	0	Z	9	6	2	6	7	4	3	4	4	7	7	3	2	2	3	4	2	2	1	2	1	1	3.6	9
	0.8	1.4	2.4	1.6	2.8	4.6	5.3	4.4	5.6	3.0	3.6	3.2	2.8	2.3	2.1	1.9	1.6	1.9	2.1	1.5	1.2	1.2	0.8	2.2	Diurnal Average	
	6	12	14	11	25	55	74	47	107	35	20	16	15	10	12	14	13	15	31	14	11	10	5	27	Diurnal Maximum	

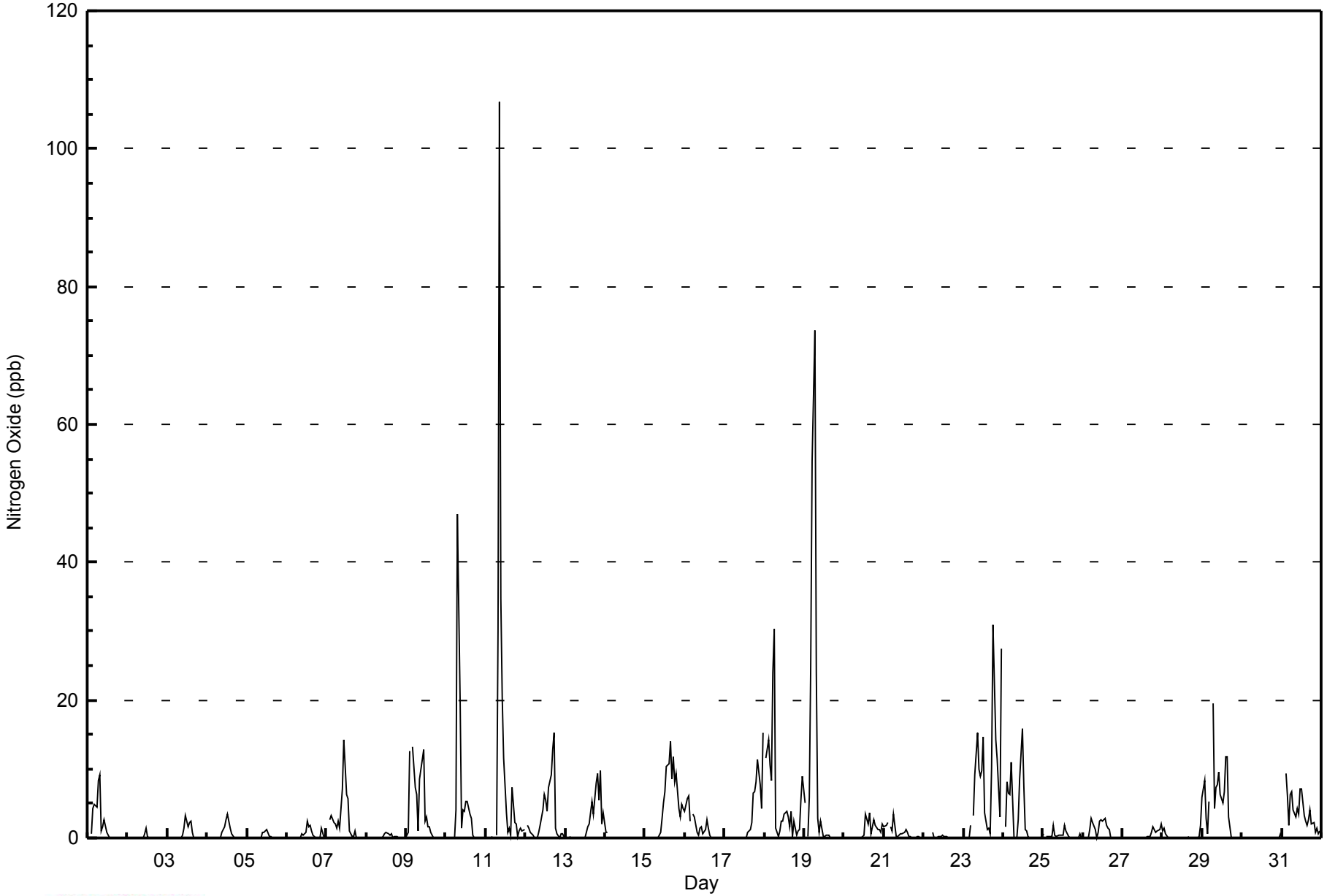
Z - zerospan C - Calibration

WBEA

Hourly Averages

Nitrogen Oxide (NO) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	694	98.30	98.30
21 - 40	8	1.13	99.43
11 - 80	3	0.42	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

WBEA

Frequency Distribution

Nitrogen Oxide (NO) - ppb

Firebag - January 2015

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	111	44	19	8	13	4	5	25	40	51	107	78	55	26	24	55	665
21 - 40	0	0	0	1	0	1	1	0	2	0	0	0	0	0	0	0	5
11 - 80	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	111	44	19	9	13	6	6	26	42	51	107	78	55	26	24	55	672

Total Number of Valid Hours: 672

Total Number of Hours: 744

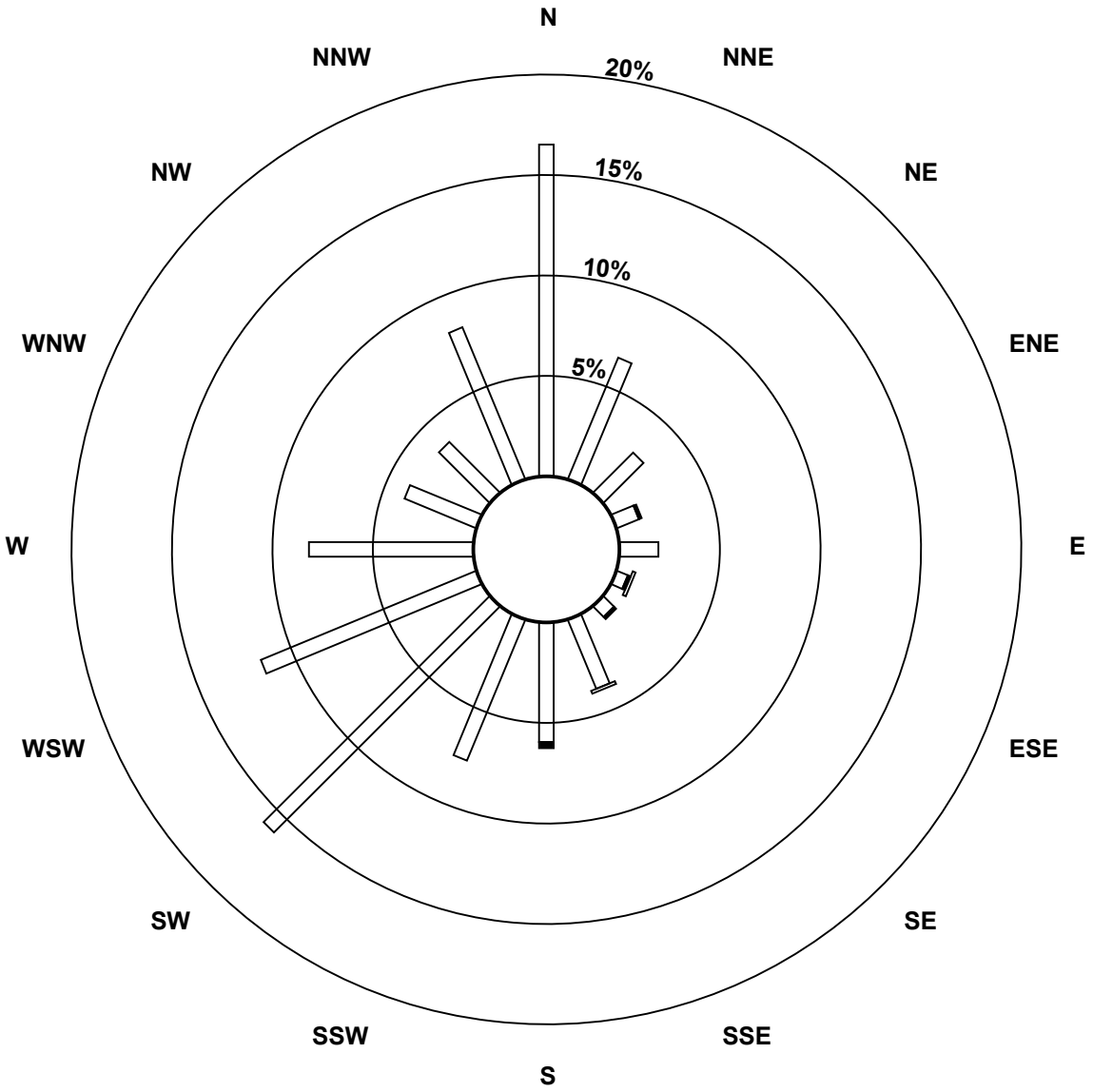
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

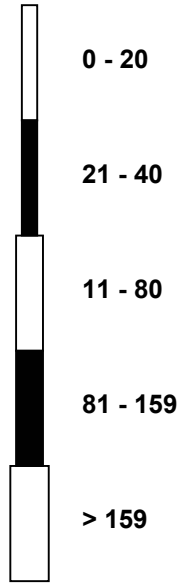
Wind Rose Jan 2015

Nitrogen Oxide (NO) - ppb

Firebag (AMS 19)



Classes (ppb)



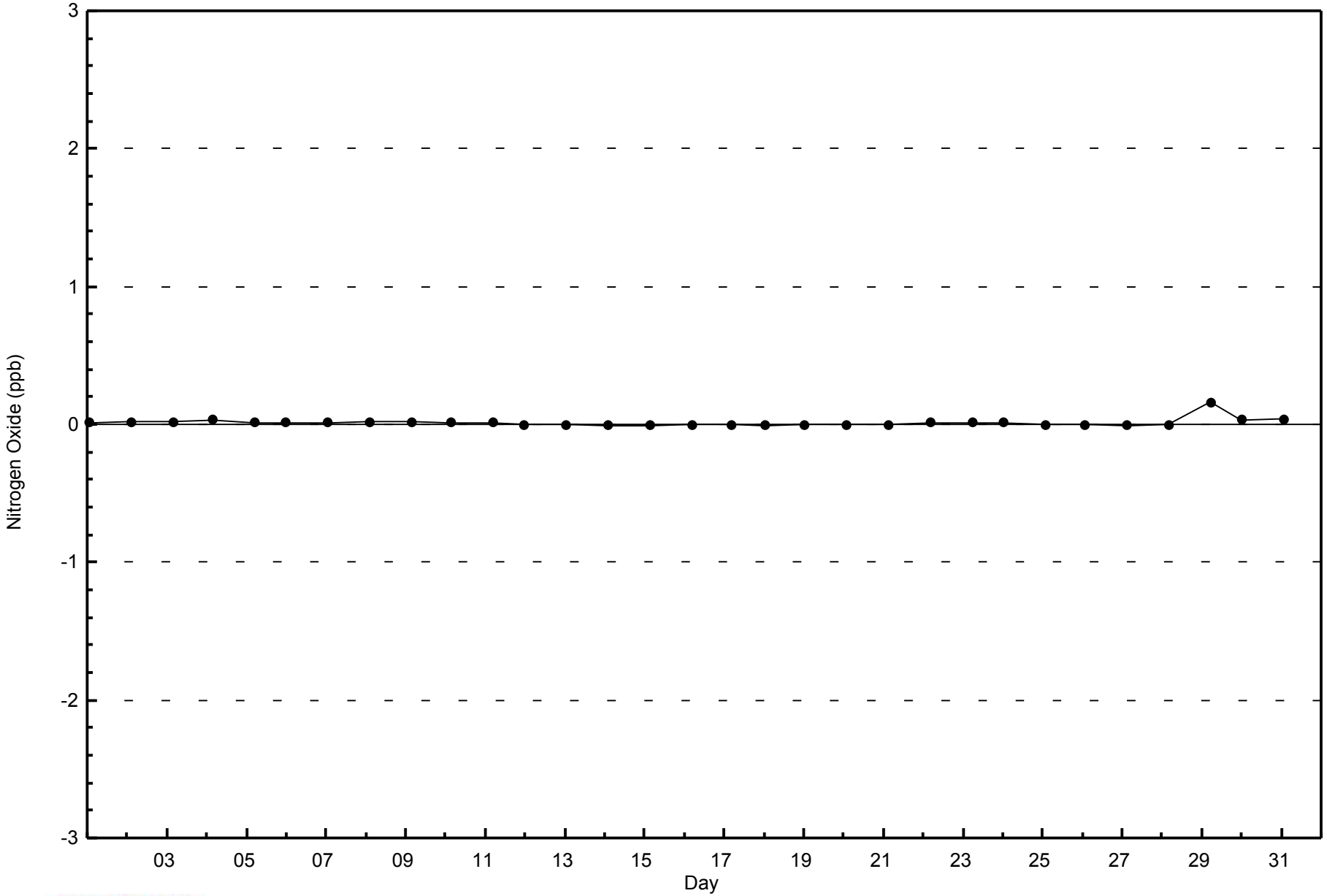
Total Number of Valid Hours: 672

WBEA

Zero Responses

Nitrogen Oxide (NO) - ppb

Firebag - January 2015



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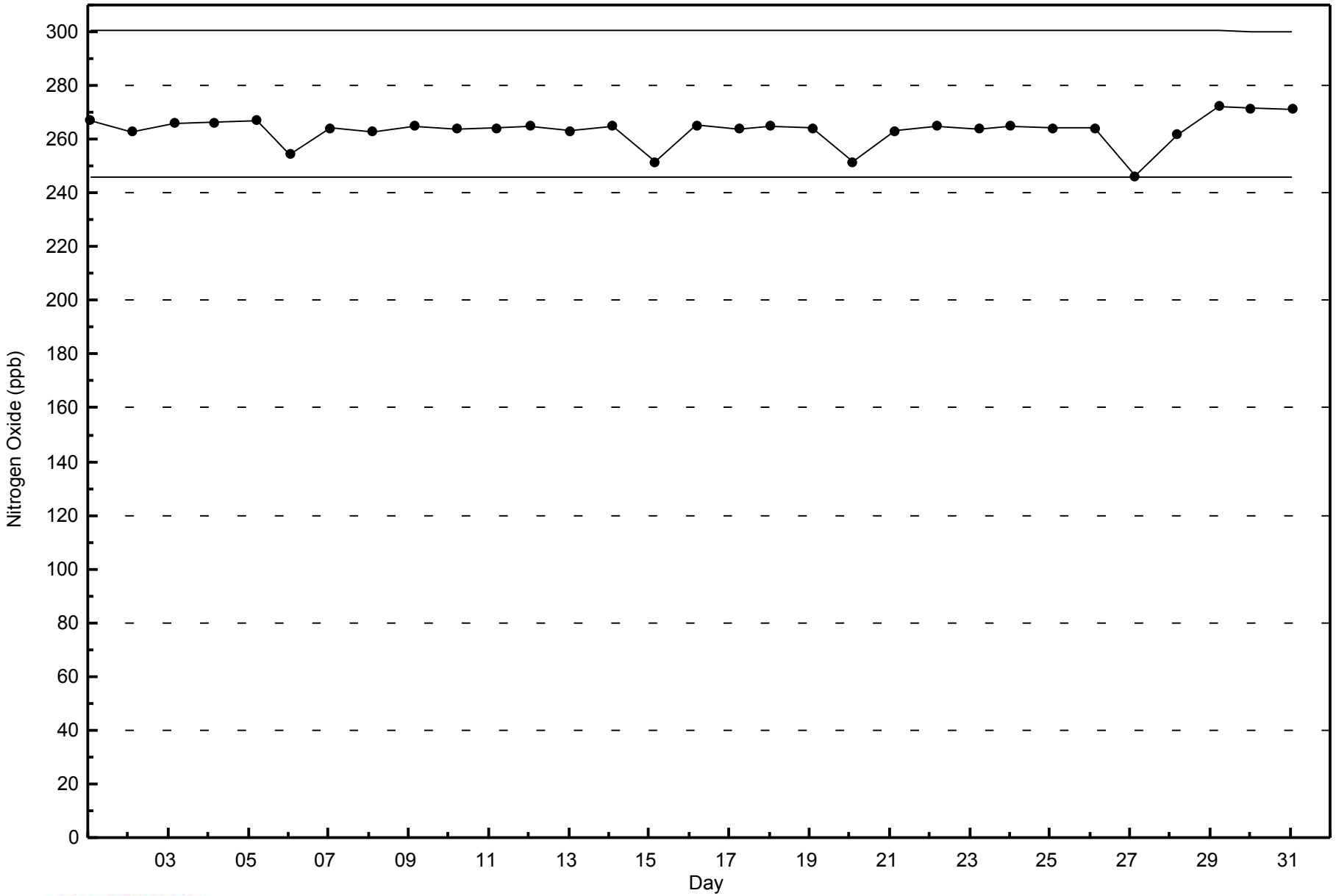
WBEA

Span Responses

Nitrogen Oxide (NO) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Firebag - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 54 ppb on Jan 11 09:00 Maximum Daily Average: 14.6 ppb on Jan 12

Minimum Value: 0 ppb on Jan 1 16:00 Minimum Daily Average: 0.8 ppb on Jan 30
Maximum Diurnal Average: 9.3 ppb at hour 7 Minimum Diurnal Average: 4.7 ppb at hour 14
Monthly Average: 6.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 5 $Q_3 = 10$ $P_{90} = 15$ $P_{99} = 32$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	38
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0	Z	3	12	11	15	18	15	5	7	12	4	2	1	0	0	0	0	0	0	1	3	2	0	4.8	18
2-Jan	0	0	Z	0	0	0	0	0	2	2	4	5	1	1	0	0	0	2	3	3	1	0	1	0	1.2	5
3-Jan	0	0	0	Z	3	2	2	2	3	4	5	7	4	5	8	7	4	5	7	7	8	5	5	7	4.3	8
4-Jan	9	9	10	10	Z	13	14	14	13	10	8	8	8	7	6	7	9	9	5	5	6	9	9	9	8.9	14
5-Jan	8	6	7	13	13	Z	11	12	9	13	6	5	5	2	2	1	2	2	1	1	1	0	0	0	5.2	13
6-Jan	Z	0	0	0	0	0	0	1	2	6	2	2	5	4	7	8	14	11	15	20	15	14	16	14	6.8	20
7-Jan	13	Z	8	7	5	5	4	7	7	15	15	13	10	13	4	4	18	17	12	5	2	1	0	0	8.1	18
8-Jan	0	0	Z	1	1	2	5	4	2	1	2	2	2	2	3	6	10	28	21	8	6	8	6	7	5.5	28
9-Jan	16	17	27	Z	34	27	21	12	22	24	20	6	8	5	7	8	7	4	2	2	1	1	0	0	11.7	34
10-Jan	0	0	1	1	Z	6	14	40	34	11	11	8	9	10	10	17	18	14	13	10	13	10	11	12	11.9	40
11-Jan	7	9	13	12	9	Z	12	38	54	38	25	16	7	3	3	3	15	7	7	4	5	5	5	6	13.1	54
12-Jan	Z	12	15	12	11	13	16	19	20	18	14	13	11	10	16	22	28	29	17	7	7	7	10	11	14.6	29
13-Jan	11	Z	14	10	7	3	2	1	1	1	0	0	1	6	6	9	11	8	12	11	7	10	5	8	6.2	14
14-Jan	3	4	Z	8	10	9	8	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	10
15-Jan	0	0	0	Z	0	0	0	0	0	4	6	7	9	11	11	14	11	14	8	9	5	5	6	7	5.5	14
16-Jan	6	10	10	4	Z	6	7	3	3	5	4	3	7	9	8	6	6	6	4	3	3	3	2	3	5.3	10
17-Jan	4	8	5	6	4	Z	0	0	0	0	0	0	0	1	3	7	9	16	15	15	19	14	10	18	6.7	19
18-Jan	Z	17	20	17	14	28	27	4	3	5	6	4	6	8	9	10	16	9	14	6	11	15	24	26	12.9	28
19-Jan	26	Z	17	23	25	32	32	23	16	5	4	1	1	1	1	2	1	1	1	1	1	0	0	0	9.3	32
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	5	5	10	6	7	12	12	7	6	4	6	3.6	12
21-Jan	5	5	6	Z	6	3	7	2	2	2	3	2	3	4	4	3	4	6	8	8	8	7	6	8	4.9	8
22-Jan	8	6	5	10	Z	10	8	6	6	5	3	4	1	1	2	1	2	3	3	4	1	0	0	0	3.9	10
23-Jan	0	0	0	2	7	Z	10	15	20	12	10	9	10	5	4	4	9	20	26	26	23	18	8	15	11.1	26
24-Jan	Z	5	12	7	8	14	2	2	2	10	14	13	10	5	6	3	5	11	9	5	3	3	4	7	6.9	14
25-Jan	11	Z	2	2	3	2	7	2	2	4	2	2	1	5	5	3	1	0	0	0	0	2	6	3	2.8	11
26-Jan	11	13	Z	13	13	15	11	7	4	6	6	5	5	6	5	6	10	2	0	0	0	0	0	0	6.0	15
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	4	4	4	5	1.2	5
28-Jan	4	4	3	0	Z	3	3	0	C	C	C	C	C	C	C	1	0	0	0	0	0	0	1	9	--	9
29-Jan	19	20	10	4	11	Z	25	11	13	12	13	8	8	8	10	13	11	6	5	5	1	1	1	1	9.4	25
30-Jan	Z	1	1	1	2	3	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0.8	3
31-Jan	4	Z	31	28	12	20	21	21	20	12	7	9	8	5	5	6	10	14	10	11	6	8	5	10	12.2	31
	6.4	6.0	8.5	7.8	8.1	8.9	9.3	8.5	8.8	7.7	6.8	5.3	4.8	4.7	5.0	5.9	7.7	8.2	7.5	6.2	5.3	5.1	4.9	6.3	Diurnal Average	
	26	20	31	28	34	32	32	40	54	38	25	16	11	13	16	22	28	29	26	26	23	18	24	26	Diurnal Maximum	

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

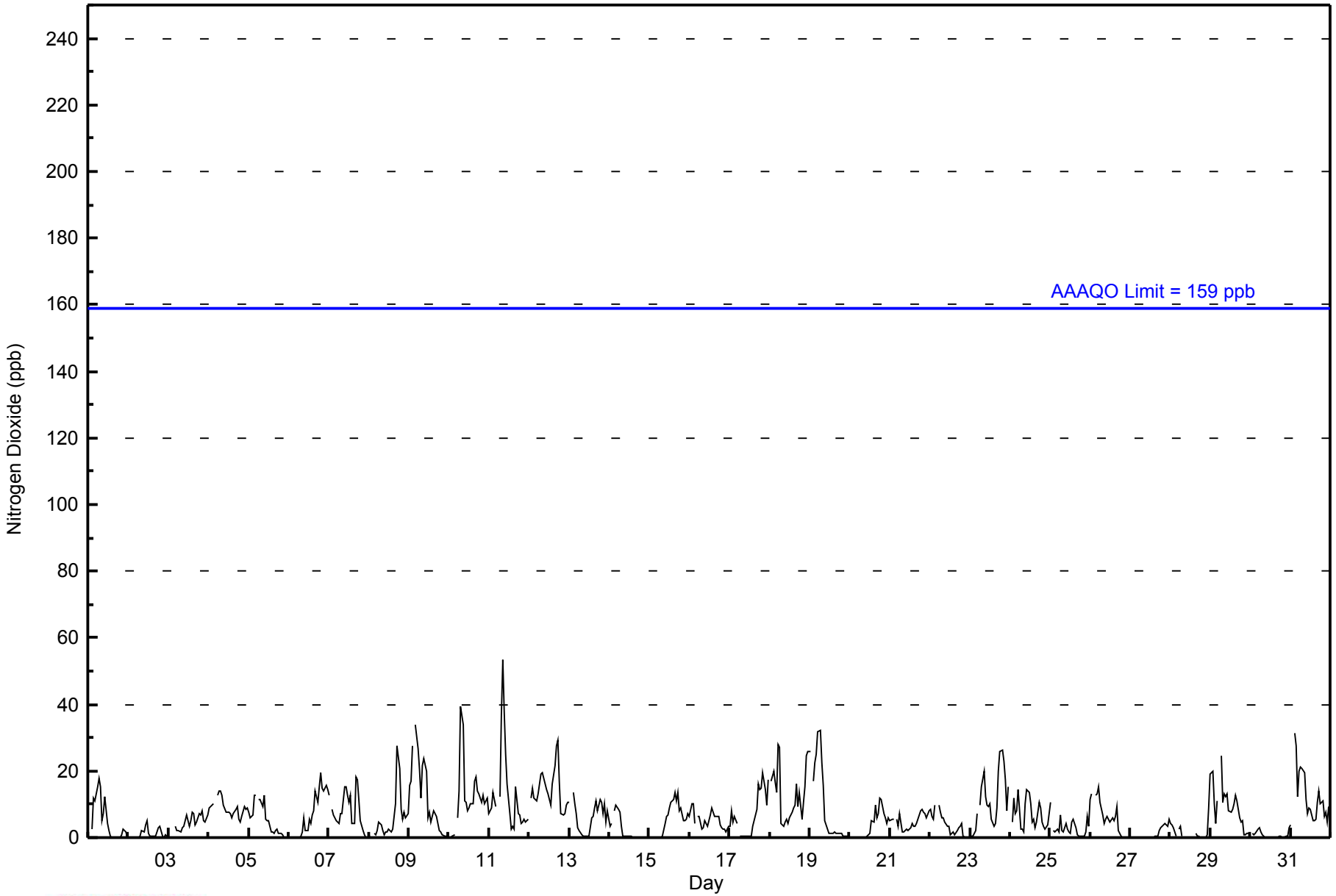
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	671	95.04	95.04
21 - 40	34	4.82	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

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Firebag - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	111	44	19	7	13	4	5	24	39	46	98	77	53	26	24	55	645
21 - 40	0	0	0	2	0	2	1	2	3	5	9	1	2	0	0	0	27
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	111	44	19	9	13	6	6	26	42	51	107	78	55	26	24	55	672

Total Number of Valid Hours: 672

Total Number of Hours: 744

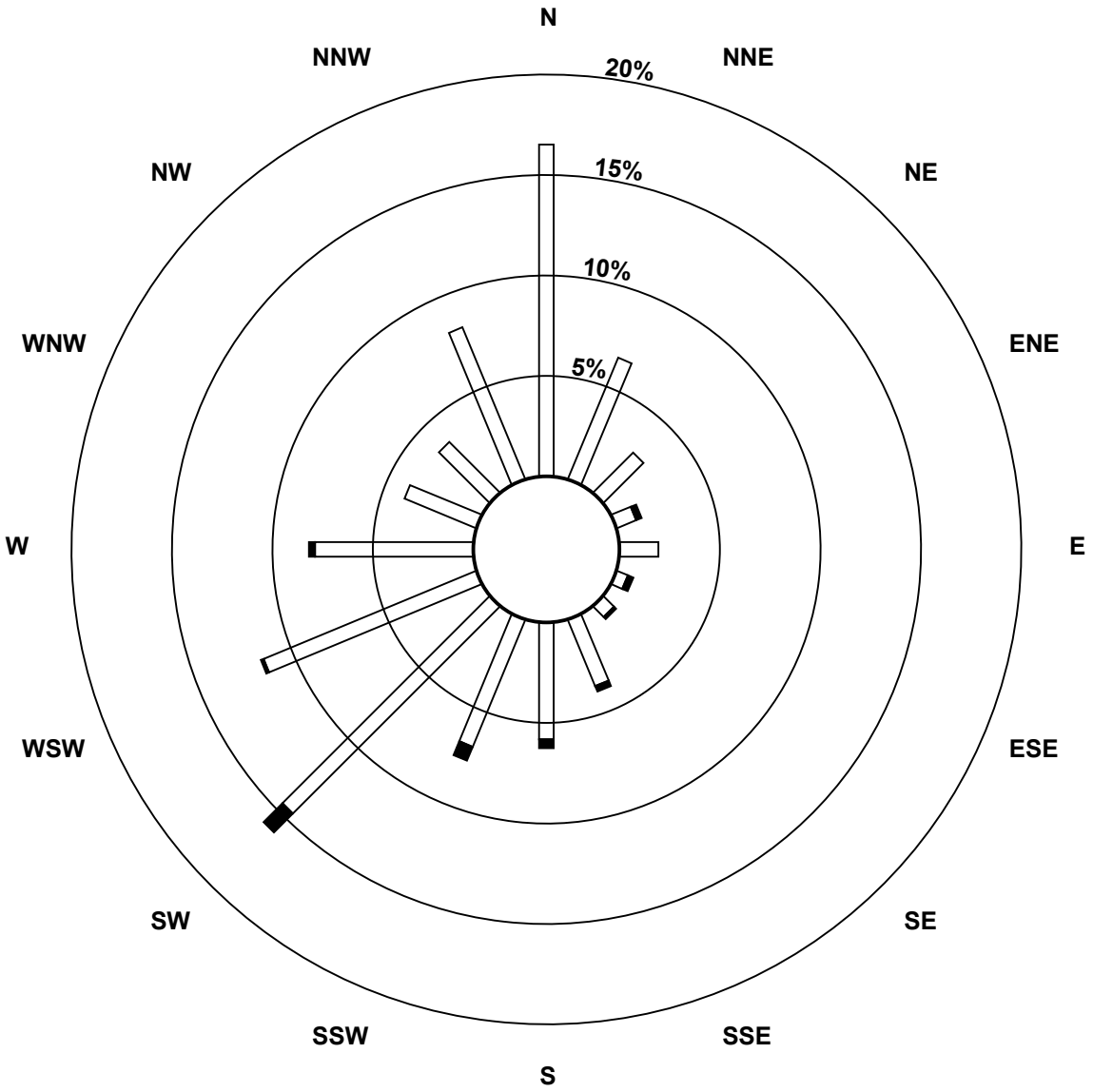
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

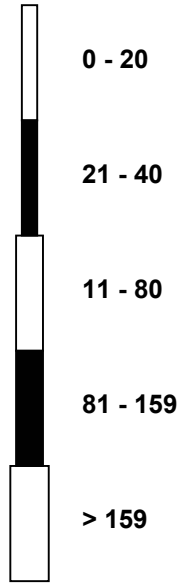
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

Firebag (AMS 19)



Classes (ppb)



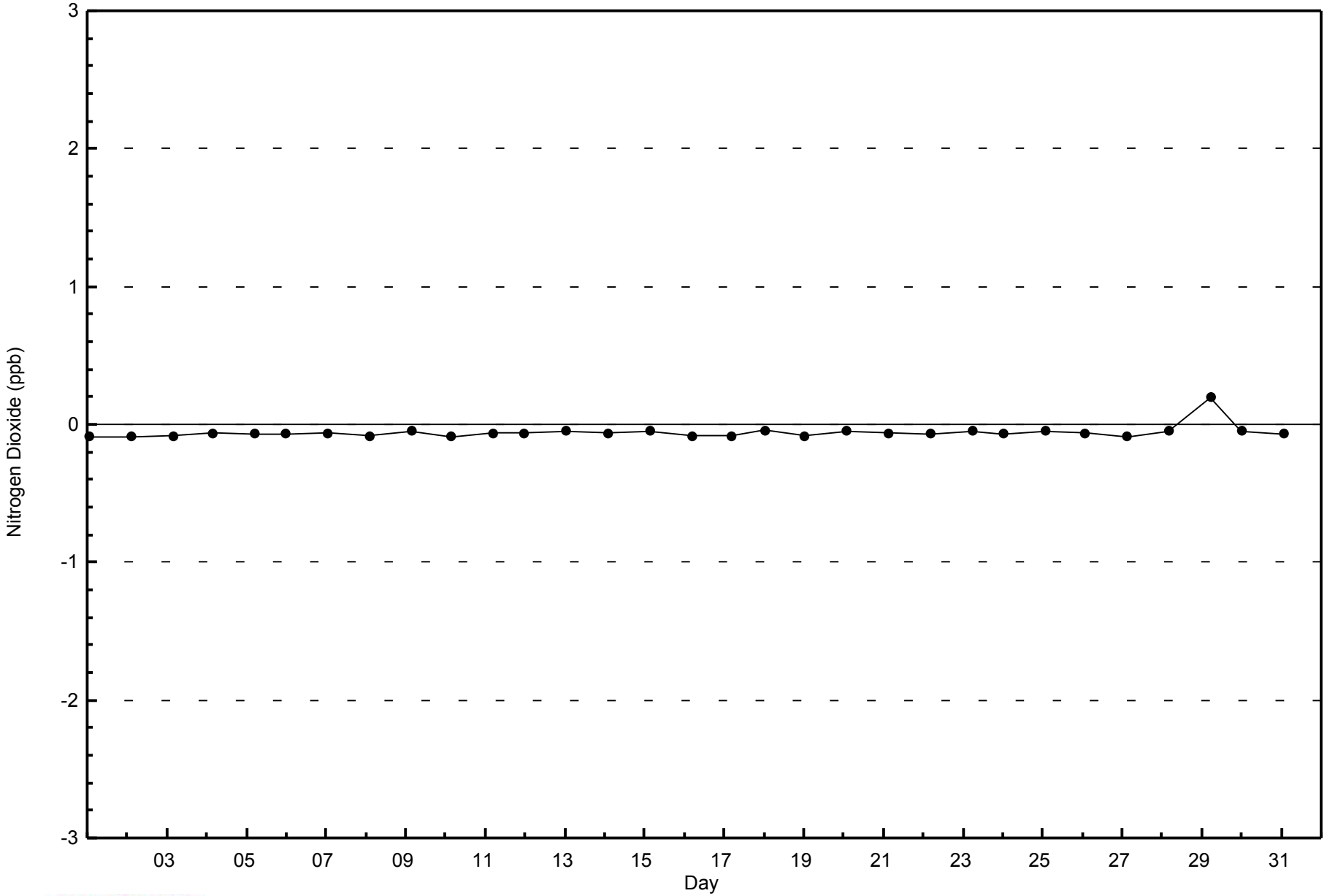
Total Number of Valid Hours: 672

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Firebag - January 2015



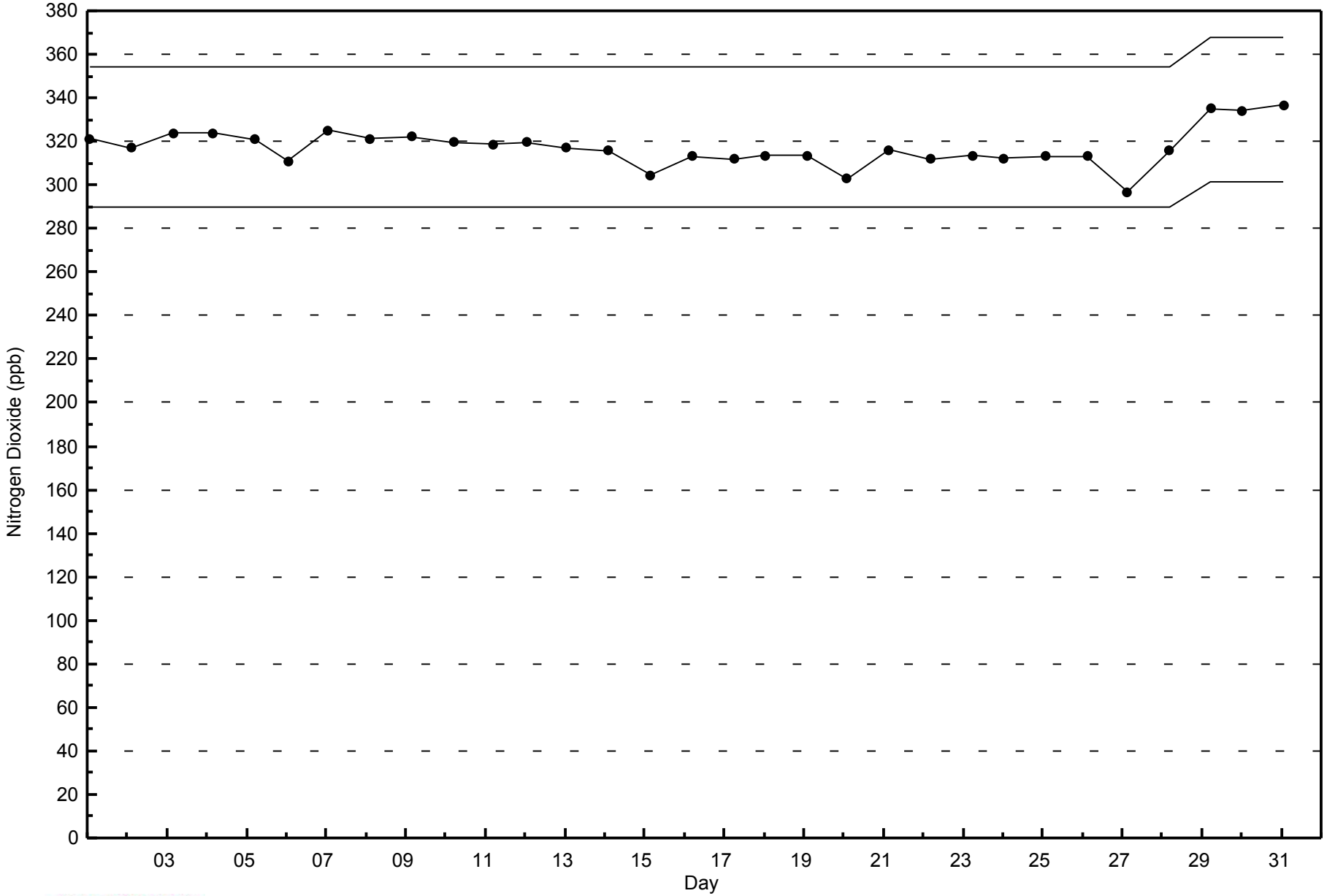
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Firebag - January 2015

Maximum Value: 160 ppb on Jan 11 09:00

Maximum Daily Average: 23.0 ppb on Jan 11

Minimum Value: 0 ppb on Jan 27 01:00

Minimum Daily Average: 0.8 ppb on Jan 30

Maximum Diurnal Average: 14.6 ppb at hour 7

Minimum Diurnal Average: 5.7 ppb at hour 23

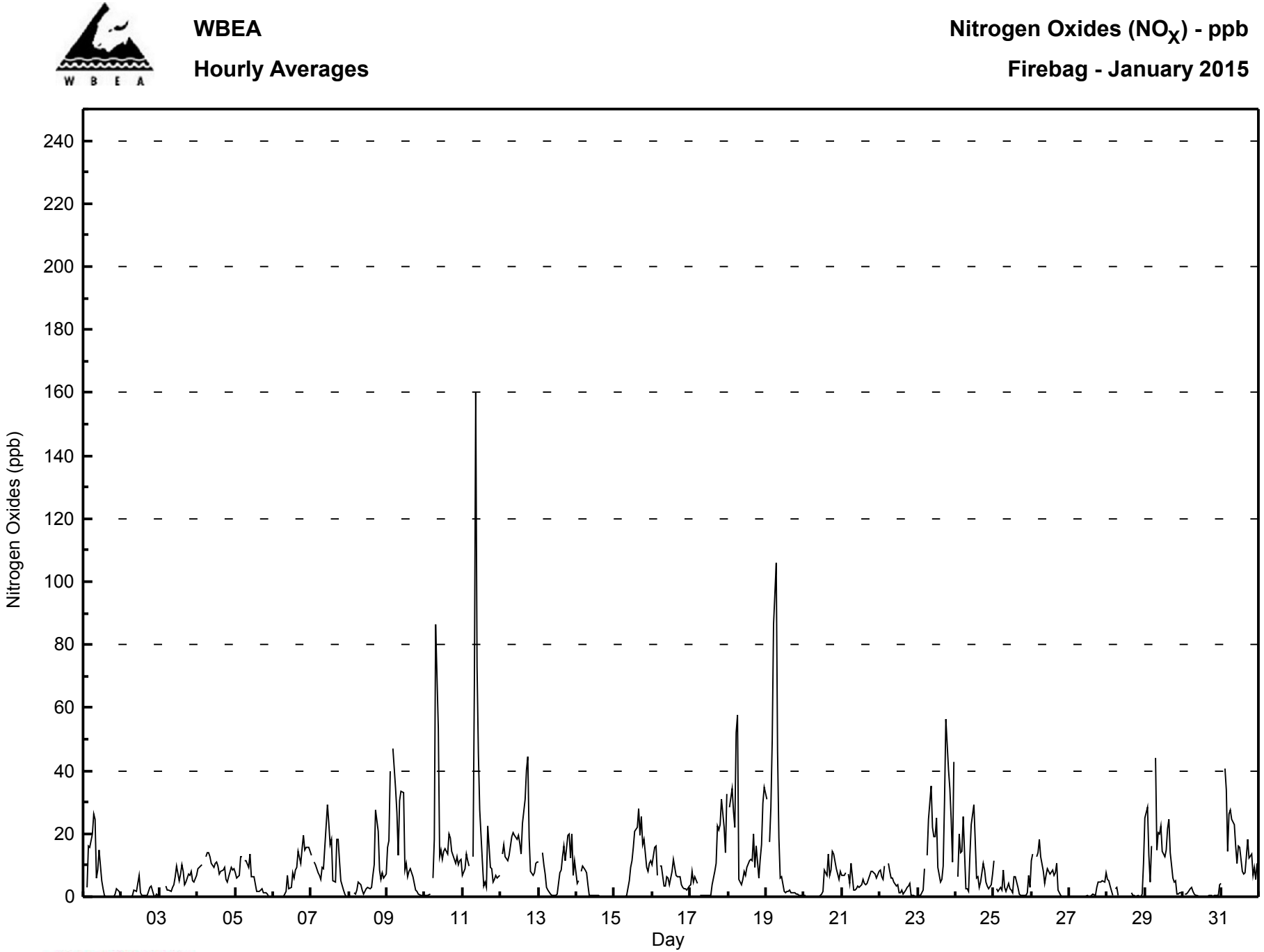
Monthly Average: 9.3 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 6 $Q_3 = 13$ $P_{90} = 22$ $P_{99} = 52$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	38
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-Jan	0	Z	3	16	16	20	26	24	6	9	15	5	3	0	0	0	0	0	0	0	1	2	2	0	6.5	26
2-Jan	0	0	Z	0	0	0	0	0	2	2	4	7	1	1	0	0	0	2	3	3	1	0	1	0	1.3	7
3-Jan	0	0	0	Z	3	2	2	2	3	4	6	10	5	7	10	8	4	4	7	7	8	5	5	7	4.8	10
4-Jan	9	9	10	10	Z	13	14	14	13	11	9	10	11	10	7	8	9	9	5	5	6	9	8	9	9.5	14
5-Jan	7	6	7	13	13	Z	11	12	9	14	7	6	6	2	2	2	2	2	1	1	1	0	0	0	5.4	14
6-Jan	Z	0	0	0	0	0	0	1	2	7	2	3	8	6	8	9	15	11	15	20	15	16	16	14	7.3	20
7-Jan	13	Z	11	10	7	7	6	9	9	22	29	23	17	18	5	5	18	18	12	5	2	1	0	0	10.8	29
8-Jan	0	0	Z	1	1	2	5	4	2	1	2	2	3	3	3	7	10	28	21	8	5	8	6	7	5.6	28
9-Jan	16	18	40	Z	47	34	27	13	30	34	33	8	11	6	8	9	6	4	2	2	1	1	0	0	15.3	47
10-Jan	0	0	1	1	Z	6	18	87	53	13	15	12	14	15	14	20	19	14	13	10	13	10	11	12	16.1	87
11-Jan	7	9	13	12	10	Z	13	68	160	73	45	28	11	3	5	3	23	9	9	5	6	7	6	7	23.0	160
12-Jan	Z	14	16	13	11	13	16	19	21	20	18	19	17	14	23	31	40	45	19	8	7	8	10	11	17.9	45
13-Jan	11	Z	14	10	7	3	2	1	1	0	0	0	1	8	8	13	16	11	19	20	12	20	7	12	8.6	20
14-Jan	4	5	Z	8	10	8	8	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.2	10
15-Jan	0	0	0	Z	0	0	0	0	0	5	9	12	16	21	22	28	20	25	16	18	9	8	10	11	10.1	28
16-Jan	10	16	16	7	Z	10	10	3	3	6	6	4	8	12	9	7	6	6	4	3	3	3	2	3	6.8	16
17-Jan	4	8	5	6	4	Z	0	0	0	0	0	0	0	1	4	8	11	22	21	23	31	22	14	33	9.5	33
18-Jan	Z	29	34	27	22	52	58	6	4	6	8	7	9	12	12	11	20	9	16	6	12	17	30	35	19.1	58
19-Jan	31	Z	17	28	50	87	106	46	19	6	6	2	1	2	2	2	1	1	1	1	1	0	0	0	17.9	106
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	2	9	7	13	7	9	14	13	9	7	5	8	4.6	14
21-Jan	7	7	8	Z	7	4	11	2	2	3	3	3	4	5	4	4	4	5	8	8	8	7	6	8	5.6	11
22-Jan	8	6	5	10	Z	11	8	6	6	5	3	4	1	1	2	1	2	3	3	4	0	0	0	0	4.0	11
23-Jan	0	0	0	2	9	Z	13	25	35	22	19	19	25	9	5	6	10	30	57	40	34	25	11	43	19.1	57
24-Jan	Z	7	20	14	14	25	2	2	2	13	23	29	18	6	7	3	5	11	9	5	3	3	4	7	10.0	29
25-Jan	11	Z	2	2	3	2	9	3	2	4	3	2	1	6	6	3	1	0	0	0	0	1	7	3	3.2	11
26-Jan	11	13	Z	13	14	18	13	8	4	7	9	8	7	9	7	8	11	2	0	0	0	0	0	0	7.0	18
27-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	3	5	5	5	5	5	8	1.6	8
28-Jan	5	5	4	0	Z	3	3	0	C	C	C	C	C	C	C	1	0	0	0	0	0	0	1	11	--	11
29-Jan	25	28	13	5	16	Z	44	15	20	20	22	14	13	15	22	24	14	6	5	5	1	1	1	1	14.4	44
30-Jan	Z	1	1	1	2	3	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	0.8	4
31-Jan	4	Z	41	34	14	26	28	25	23	16	11	16	15	8	7	7	13	18	12	14	7	9	6	10	15.8	41
	7.1	7.3	10.8	9.4	10.8	13.5	14.6	12.9	14.4	10.7	10.3	8.5	7.6	7.0	7.0	7.8	9.3	10.0	9.6	7.8	6.5	6.3	5.7	8.5	Diurnal Average	
	31	29	41	34	50	87	106	87	160	73	45	29	25	21	23	31	40	45	57	40	34	25	30	43	Diurnal Maximum	

Z - zerospan C - Calibration


WBEA
Hourly Averages
Nitrogen Oxides (NO_X) - ppb
Firebag - January 2015
Nitrogen Oxides (ppb)
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	630	89.24	89.24
21 - 40	58	8.22	97.45
11 - 80	14	1.98	99.43
81 - 159	3	0.42	99.86
> 159	1	0.14	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Firebag - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	111	44	19	7	13	4	4	11	27	45	96	75	53	24	24	55	612
21 - 40	0	0	0	1	0	0	1	13	12	5	10	2	2	2	0	0	48
11 - 80	0	0	0	1	0	1	1	1	3	1	1	1	0	0	0	0	10
81 - 159	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	111	44	19	9	13	6	6	26	42	51	107	78	55	26	24	55	672

Total Number of Valid Hours: 672

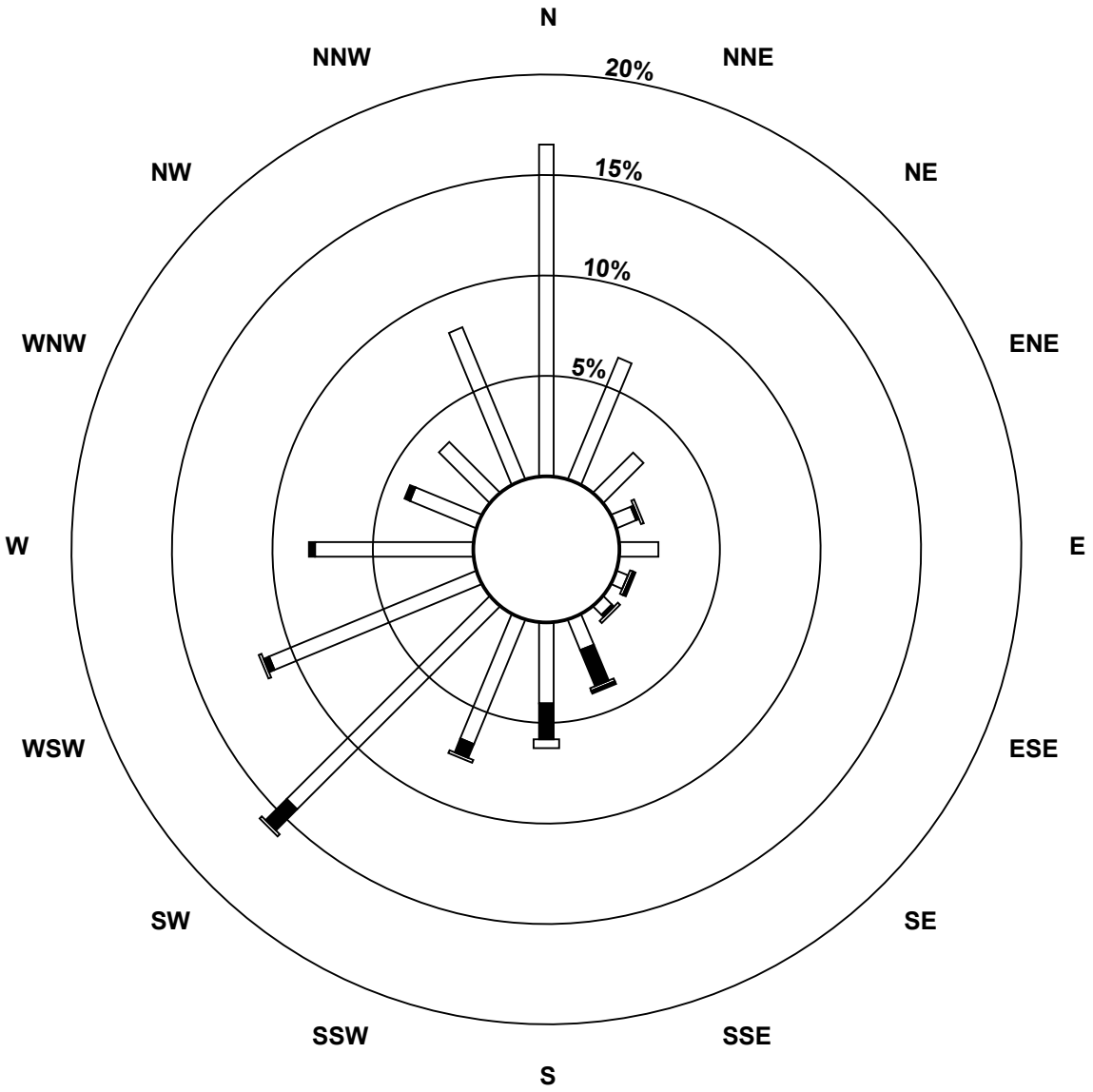
Total Number of Hours: 744

Wood Buffalo Environmental Association

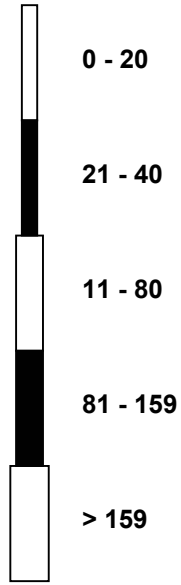
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

Firebag (AMS 19)



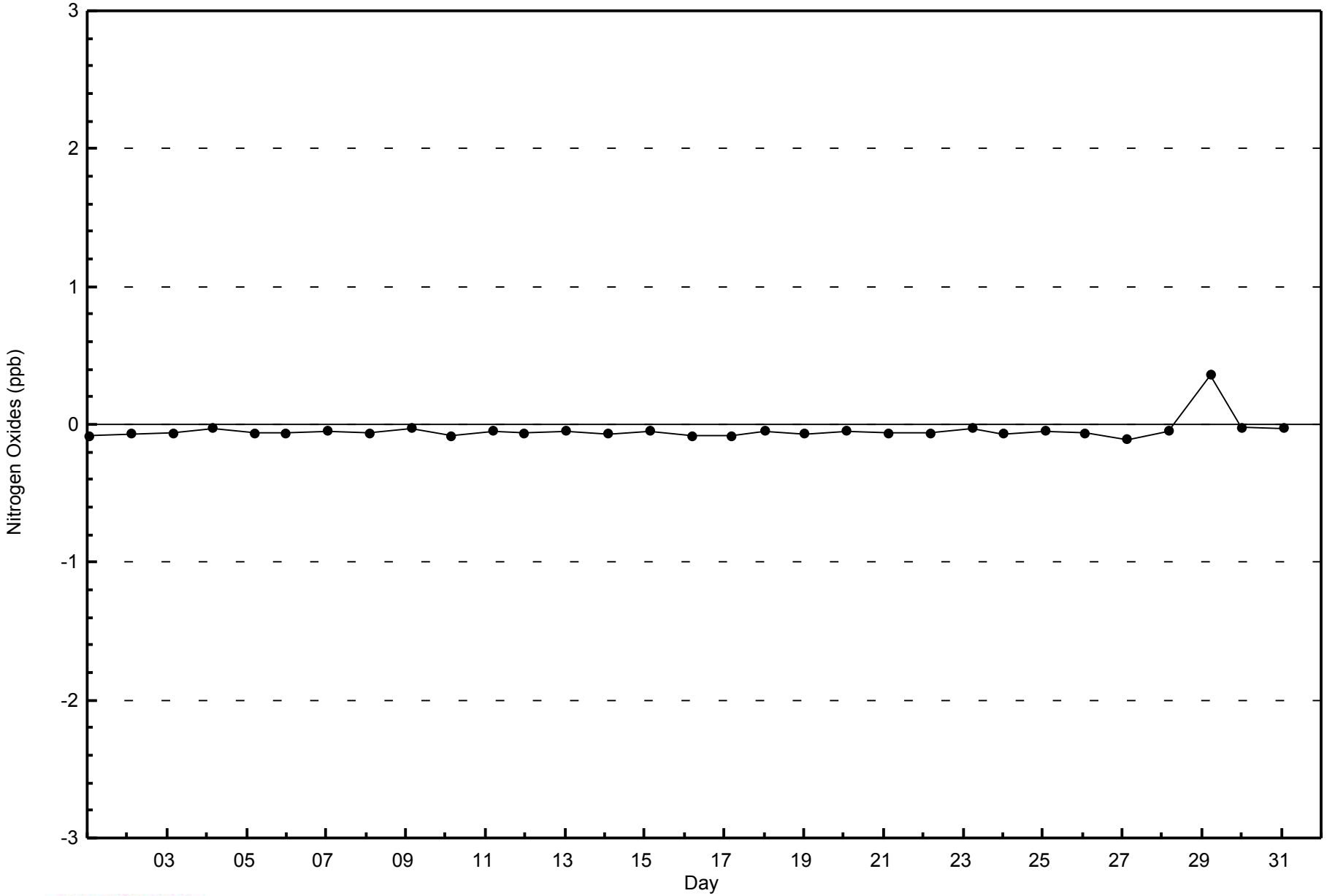
Classes (ppb)



Total Number of Valid Hours: 672

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Firebag - January 2015



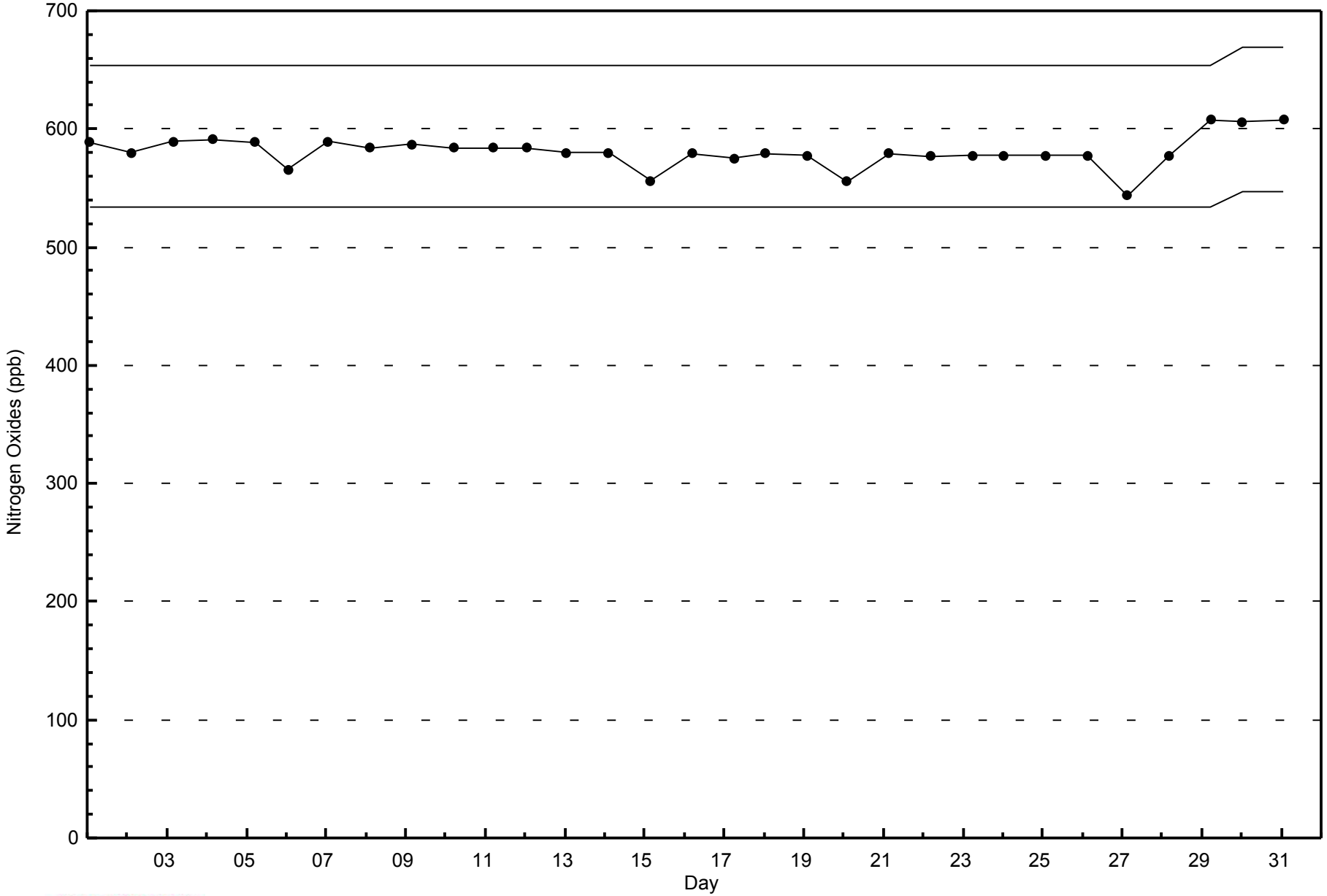
AURORA
ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Maximum Value: 3.4 C on Jan 25 14:00

Maximum Daily Average: 1.0 C on Jan 22

Minimum Value: -33.9 C on Jan 31 01:00

Minimum Daily Average: -29.3 C on Jan 3

Maximum Diurnal Average: -13.3 C at hour 15

Minimum Diurnal Average: -16.3 C at hour 8

Monthly Average: -15.25 C

Percentiles: P_1 = -31.1 P_{10} = -26.5 Q_1 = -22.9 Median = -17.4 Q_3 = -7.5 P_{90} = -0.5 P_{99} = 3.0

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

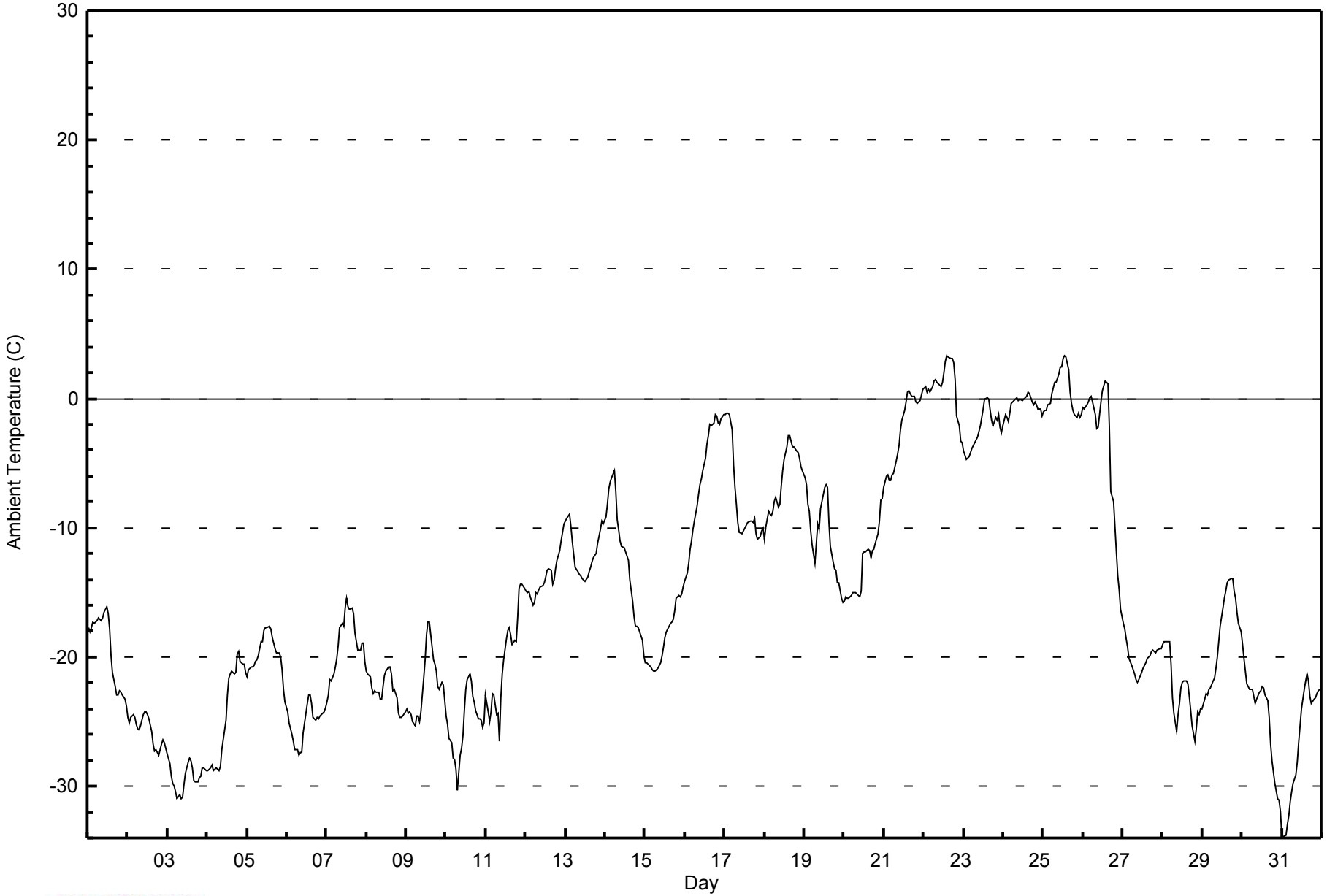
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-17.7	-18.1	-17.7	-17.3	-17.4	-17.1	-17.0	-17.1	-17.2	-16.9	-16.5	-16.1	-16.7	-17.8	-19.9	-21.2	-22.3	-22.9	-22.9	-22.6	-22.8	-23.0	-23.2	-23.8	-19.4	-16.1
2-Jan	-24.7	-25.1	-24.6	-24.4	-24.7	-25.2	-25.5	-25.6	-25.3	-24.5	-24.2	-24.2	-24.5	-24.7	-25.7	-26.7	-27.3	-27.2	-27.4	-27.6	-26.7	-26.4	-26.6	-27.0	-25.7	-24.2
3-Jan	-27.5	-28.2	-29.3	-29.8	-30.0	-30.5	-30.9	-30.6	-31.0	-30.9	-29.9	-29.0	-28.1	-27.9	-28.0	-28.6	-29.6	-29.7	-29.6	-29.4	-29.2	-28.6	-28.6	-28.7	-29.3	-27.5
4-Jan	-28.8	-28.7	-28.5	-28.3	-28.8	-28.5	-28.7	-28.8	-28.5	-27.1	-25.7	-24.9	-22.9	-21.7	-21.3	-21.1	-21.3	-21.1	-19.8	-19.6	-20.3	-20.5	-20.5	-21.2	-24.4	-19.6
5-Jan	-21.5	-21.0	-20.7	-20.8	-20.7	-20.3	-20.2	-19.9	-18.8	-18.8	-18.0	-17.7	-17.7	-17.7	-17.8	-18.5	-19.0	-19.3	-19.7	-19.6	-20.0	-21.0	-22.5	-23.5	-19.8	-17.7
6-Jan	-24.2	-25.1	-25.6	-25.9	-26.5	-27.1	-27.2	-27.6	-27.4	-27.3	-25.9	-24.4	-23.6	-23.0	-22.9	-23.5	-24.6	-24.9	-24.6	-24.8	-24.6	-24.5	-24.3	-23.9	-25.1	-22.9
7-Jan	-23.4	-23.0	-21.7	-21.8	-21.4	-20.8	-20.1	-19.1	-17.7	-17.4	-17.6	-16.2	-15.5	-16.2	-16.3	-16.2	-16.7	-18.2	-18.8	-19.5	-19.4	-19.0	-18.9	-20.4	-19.0	-15.5
8-Jan	-21.1	-21.3	-21.5	-22.4	-22.8	-22.6	-22.7	-22.7	-23.3	-23.3	-22.3	-21.4	-21.1	-20.8	-20.8	-21.3	-22.6	-22.6	-23.1	-24.3	-24.6	-24.7	-24.6	-24.2	-22.6	-20.8
9-Jan	-24.0	-24.4	-24.3	-24.5	-25.0	-25.3	-24.5	-24.6	-25.0	-24.2	-21.6	-20.3	-18.3	-17.3	-17.3	-18.3	-20.2	-20.6	-21.1	-22.3	-22.5	-22.0	-22.2	-23.3	-22.2	-17.3
10-Jan	-24.5	-25.2	-26.3	-26.6	-27.8	-27.9	-28.7	-30.3	-27.6	-27.1	-26.1	-24.1	-22.5	-21.7	-21.3	-21.9	-23.0	-23.5	-24.2	-24.8	-24.8	-24.9	-25.4	-25.1	-25.2	-21.3
11-Jan	-23.0	-24.2	-25.0	-24.3	-22.8	-22.9	-24.4	-24.4	-26.6	-23.1	-21.3	-20.2	-18.6	-17.9	-17.7	-18.3	-19.0	-18.7	-18.8	-16.9	-14.7	-14.4	-14.4	-14.7	-20.3	-14.4
12-Jan	-14.9	-15.1	-14.9	-15.4	-16.0	-15.8	-15.1	-15.2	-14.9	-14.6	-14.5	-14.2	-13.8	-13.3	-13.1	-13.3	-14.3	-14.0	-13.1	-12.5	-11.8	-11.0	-10.3	-9.7	-13.8	-9.7
13-Jan	-9.5	-9.2	-9.0	-9.9	-11.1	-12.1	-13.1	-13.4	-13.6	-13.7	-13.9	-14.0	-14.1	-13.9	-13.4	-13.1	-12.7	-12.3	-12.0	-11.3	-10.7	-10.2	-9.5	-9.7	-11.9	-9.0
14-Jan	-9.1	-8.2	-7.0	-6.4	-6.1	-5.6	-7.2	-9.3	-10.1	-11.1	-11.4	-11.6	-11.9	-12.2	-12.6	-14.0	-15.7	-16.8	-17.6	-17.6	-17.7	-18.1	-18.7	-19.9	-12.3	-5.6
15-Jan	-20.4	-20.5	-20.5	-20.8	-21.0	-21.1	-21.1	-21.0	-20.9	-20.5	-19.9	-19.3	-18.5	-18.1	-17.6	-17.4	-17.3	-17.0	-16.4	-15.5	-15.3	-15.3	-15.1	-14.6	-18.5	-14.6
16-Jan	-14.1	-13.5	-12.7	-11.7	-11.0	-10.2	-9.4	-8.3	-7.4	-6.6	-6.3	-5.6	-4.6	-3.5	-2.8	-2.0	-2.1	-1.9	-1.2	-1.3	-1.9	-2.0	-1.6	-1.3	-6.0	-1.2
17-Jan	-1.2	-1.2	-1.2	-1.2	-2.4	-5.1	-6.9	-8.2	-9.6	-10.3	-10.4	-10.3	-10.0	-9.8	-9.6	-9.5	-9.4	-9.5	-9.3	-10.4	-10.9	-10.7	-10.3	-10.1	-7.8	-1.2
18-Jan	-10.9	-9.9	-8.8	-8.9	-9.1	-8.7	-8.0	-7.7	-8.4	-8.2	-6.8	-5.6	-4.7	-3.7	-2.9	-2.8	-3.3	-3.7	-3.8	-4.1	-4.1	-4.6	-5.3	-5.6	-6.2	-2.8
19-Jan	-6.2	-6.6	-8.2	-8.8	-10.3	-11.3	-12.7	-11.2	-9.7	-10.1	-8.5	-7.4	-6.9	-6.7	-6.8	-9.6	-11.4	-12.7	-13.2	-13.3	-14.2	-14.2	-15.5	-15.8	-10.5	-6.2
20-Jan	-15.7	-15.4	-15.4	-15.5	-15.3	-15.0	-15.0	-15.0	-15.1	-15.4	-14.9	-11.9	-11.8	-11.9	-11.6	-11.8	-12.3	-11.8	-11.6	-11.2	-10.4	-9.5	-7.9	-7.7	-12.9	-7.7
21-Jan	-6.9	-6.0	-5.9	-6.3	-6.3	-5.9	-5.8	-4.8	-4.3	-3.6	-2.4	-1.7	-0.9	-0.3	0.5	0.6	0.4	0.2	0.2	-0.3	-0.4	-0.2	-0.1	0.7	-2.5	0.7
22-Jan	0.8	0.9	0.5	0.7	0.5	0.9	1.4	1.5	1.3	1.1	0.9	1.3	2.1	2.8	3.3	3.2	3.1	3.1	2.7	1.5	-1.4	-2.1	-3.3	-3.5	1.0	3.3
23-Jan	-4.0	-4.4	-4.7	-4.5	-4.2	-3.8	-3.6	-3.4	-3.0	-2.6	-2.1	-1.4	-0.8	0.0	0.1	0.0	-0.9	-1.7	-2.1	-1.5	-1.7	-1.3	-2.2	-2.6	-2.3	0.1
24-Jan	-2.1	-1.3	-1.5	-1.7	-1.1	-0.3	-0.1	0.0	0.1	-0.1	0.0	-0.2	0.0	0.1	0.2	0.4	0.4	-0.2	-0.4	-0.2	-0.5	-0.8	-0.8	-1.4	-0.5	0.4
25-Jan	-1.0	-1.0	-0.9	-0.5	-0.4	0.4	0.8	1.2	1.3	1.9	2.4	2.4	3.1	3.4	3.2	2.2	0.5	-0.4	-0.9	-1.3	-1.5	-1.1	-1.5	-1.3	0.5	3.4
26-Jan	-0.7	-0.8	-0.5	-0.2	0.1	0.2	-0.3	-1.3	-2.3	-2.2	-1.3	-0.3	0.6	1.4	1.3	1.1	-2.2	-7.2	-8.0	-9.9	-11.9	-13.7	-14.8	-16.3	-3.7	1.4
27-Jan	-17.4	-17.8	-18.6	-19.3	-20.1	-20.6	-21.0	-21.3	-21.8	-22.0	-21.7	-21.2	-20.8	-20.7	-20.5	-20.2	-19.9	-19.6	-19.5	-19.6	-19.7	-19.5	-19.4	-19.3	-20.1	-17.4
28-Jan	-19.1	-18.8	-18.8	-18.8	-18.8	-20.6	-23.2	-24.3	-25.7	-24.4	-23.6	-22.4	-22.0	-21.9	-21.9	-22.1	-23.0	-24.1	-25.4	-26.6	-25.5	-24.3	-24.4	-24.0	-22.7	-18.8
29-Jan	-24.0	-23.3	-22.8	-22.9	-22.6	-22.4	-21.8	-21.6	-20.8	-20.0	-18.8	-17.6	-16.3	-15.5	-15.0	-14.2	-14.0	-14.0	-13.9	-15.0	-15.5	-16.5	-17.4	-18.1	-18.5	-13.9
30-Jan	-19.1	-20.2	-21.1	-22.0	-22.5	-22.5	-22.5	-23.0	-23.6	-23.3	-22.7	-22.7	-22.3	-22.4	-23.0	-23.4	-24.7	-26.7	-28.1	-28.9	-29.8	-31.0	-31.1	-32.0	-24.5	-19.1
31-Jan	-33.9	-33.9	-33.8	-32.9	-32.3	-31.1	-30.4	-29.8	-29.2	-28.2	-26.7	-25.3	-24.0	-22.5	-21.9	-21.3	-21.9	-23.1	-23.6	-23.3	-23.2	-22.8	-22.6	-22.5	-26.7	-21.3
	-15.8	-15.8	-15.8	-15.9	-16.1	-16.1	-16.3	-16.3	-16.3	-16.0	-15.2	-14.4	-13.8	-13.4	-13.3	-13.6	-14.4	-14.9	-15.1	-15.3	-15.4	-15.4	-15.6	-15.8	Diurnal Average	
	0.8	0.9	0.5	0.7	0.5	0.9	1.4	1.5	1.3	1.9	2.4	2.4	3.1	3.4	3.3	3.2	3.1	3.1	2.7	1.5	-0.4	-0.2	-0.1	0.7	Diurnal Maximum	

WBEA

Hourly Averages

Ambient Temperature (AT) - C

Firebag - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	298	40.05	40.05
-20 - 0	396	53.23	93.28
0 - 10	50	6.72	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

Maximum Value: 99 % on Jan 24 18:00

Maximum Daily Average: 96.5 % on Jan 23

Minimum Value: 60 % on Jan 9 14:00

Minimum Daily Average: 72.2 % on Jan 9

Maximum Diurnal Average: 84.5 % at hour 2

Minimum Diurnal Average: 82.7 % at hour 14

Monthly Average: 83.9 %

Percentiles: P_1 = 67 P_{10} = 75 Q_1 = 79 Median = 83 Q_3 = 89 P_{90} = 94 P_{99} = 99

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

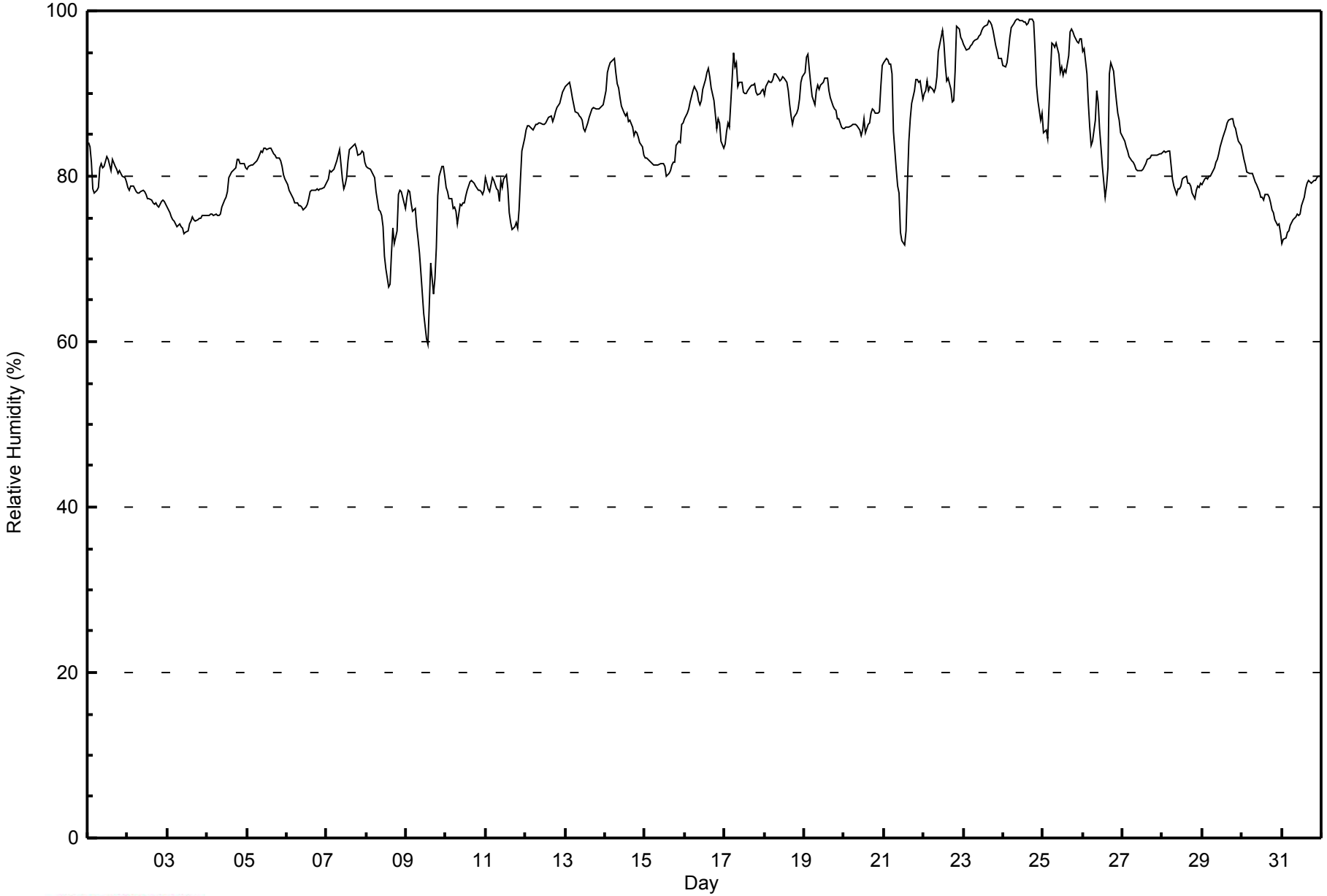
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	84	84	82	78	78	78	79	81	82	81	81	82	82	81	81	82	81	81	80	81	80	80	80	79	80.8	84
2-Jan	79	78	79	79	79	78	78	78	78	78	78	78	77	77	77	77	77	77	76	76	77	77	77	77	77.6	79
3-Jan	76	76	75	75	75	74	74	74	74	74	73	73	73	74	75	75	75	75	75	75	75	75	75	75	74.5	76
4-Jan	75	75	75	76	75	75	75	75	75	76	77	78	78	80	80	80	81	81	82	82	82	82	82	81	78.3	82
5-Jan	81	81	81	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	82	82	82	81	80	80	82.1	83
6-Jan	79	78	78	78	77	77	77	77	77	76	76	76	77	77	78	78	78	78	78	78	79	79	79	79	77.7	79
7-Jan	79	80	81	80	81	81	82	83	83	80	78	79	80	82	83	83	84	84	83	83	83	83	83	82	81.6	84
8-Jan	81	81	81	80	80	80	78	76	76	75	74	70	69	67	67	71	74	72	73	78	78	78	77	76	75.5	81
9-Jan	77	78	78	77	76	76	74	72	71	68	63	62	60	60	65	70	66	68	71	78	80	81	81	80	72.2	81
10-Jan	79	78	77	77	76	76	76	74	77	76	77	77	78	78	79	79	79	79	79	78	78	78	78	78	77.6	79
11-Jan	80	79	78	79	80	80	79	78	77	79	79	80	80	79	76	74	74	74	74	74	76	80	83	85	78.1	85
12-Jan	86	86	86	86	86	86	86	86	86	86	86	86	86	87	87	87	87	87	88	88	89	89	90	91	87.1	91
13-Jan	91	91	91	90	89	89	88	88	87	87	87	86	85	86	87	88	88	88	88	88	88	88	89	89	88.2	91
14-Jan	90	93	93	94	94	94	93	91	91	89	88	88	87	88	87	87	86	85	85	85	85	84	83	82	88.4	94
15-Jan	82	82	82	82	82	81	81	81	81	82	82	81	81	80	80	81	81	82	82	84	84	84	86	86	82.1	86
16-Jan	87	88	88	89	90	90	91	90	89	89	89	91	92	93	93	92	91	89	88	86	87	86	84	83	88.9	93
17-Jan	84	85	86	86	92	95	93	94	91	91	91	90	90	90	90	91	91	91	91	90	90	90	90	90	90.2	95
18-Jan	90	91	92	91	91	92	92	92	92	91	92	92	92	91	90	89	87	86	87	88	88	89	91	92	90.4	92
19-Jan	92	94	95	93	91	90	89	90	91	90	91	91	92	92	92	90	89	88	88	88	87	87	86	86	90.2	95
20-Jan	86	86	86	86	86	86	86	86	86	86	85	86	87	85	86	86	88	88	88	88	88	88	91	93	87.0	93
21-Jan	94	94	94	94	94	92	85	81	79	78	73	72	72	73	79	84	87	89	90	92	92	91	91	89	85.8	94
22-Jan	90	90	91	90	91	91	90	91	92	95	97	98	96	93	91	92	91	89	89	93	98	98	97	96	92.9	98
23-Jan	96	96	95	95	96	96	96	96	97	97	97	98	98	98	98	99	99	98	98	96	95	94	94	94	96.5	99
24-Jan	93	93	94	95	97	98	98	99	99	99	99	99	99	99	98	99	99	99	99	95	91	89	87	88	96.0	99
25-Jan	85	85	86	85	93	96	96	96	96	95	92	93	92	93	93	95	97	98	98	97	96	96	97	97	93.5	98
26-Jan	95	95	92	89	86	84	84	87	90	89	86	84	81	78	79	81	92	94	93	91	89	88	87	85	87.4	95
27-Jan	85	84	84	83	82	82	82	81	81	81	81	81	81	81	82	82	82	83	83	83	83	83	83	83	82.1	85
28-Jan	83	83	83	83	83	81	80	79	78	78	79	79	80	80	80	79	79	79	78	77	78	79	79	79	79.8	83
29-Jan	79	80	80	80	80	80	81	81	82	82	83	84	85	85	86	86	87	87	87	86	86	85	84	84	83.2	87
30-Jan	83	82	81	81	80	80	80	80	79	79	78	78	78	77	78	78	77	77	76	76	75	74	74	73	78.1	83
31-Jan	72	72	73	73	73	74	74	75	75	75	75	75	76	77	79	79	80	79	79	79	80	80	80	80	76.5	80
	84.3	84.5	84.4	84.0	84.3	84.3	83.8	83.7	83.7	83.5	82.9	82.8	82.8	82.7	83.2	83.8	84.2	84.1	84.2	84.3	84.4	84.4	84.5	84.3	Diurnal Average	
	96	96	95	95	97	98	98	99	99	99	99	99	99	99	98	99	99	99	99	97	98	98	97	97	Diurnal Maximum	

WBEA

Hourly Averages

Relative Humidity (RH) - %

Firebag - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	1	0.13	0.13
60 - 80	257	34.54	34.68
80 - 100	486	65.32	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Firebag - January 2015

Maximum Speed: 35 km/h on Jan 21 12:00

Maximum Daily Speed Average: 23.0 km/h on Jan 21

Minimum Speed Value: 1 km/h on Jan 20 13:00

Minimum Daily Speed Average: 1.8 km/h on Jan 13

Maximum Diurnal Speed Average: 5.3 km/h at hour 15

Minimum Diurnal Speed Average: 3.1 km/h at hour 7

Monthly Average Velocity: 4.0 km/h 261.3 deg

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 6 Median = 10 Q_3 = 14 P_{90} = 20 P_{99} = 29

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Percent Operational Time:	95.0

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-Jan	NE3	NE5	E4	SSE5	S4	SSE4	SSE5	SSE6	SSW4	S4	AF	NW5	N11	N15	N15	N11	NNW9	NNW12	NNW11	NNW11	NNW9	NW10	NNW14	NNW12	N5.0	N15
2-Jan	NNW9	N10	N11	N9	N9	N10	N10	NNW9	NNW10	NNW9	NNW10	N10	N11	N8	N7	NNW6	NW4	NNW6	N6	N7	N8	N9	NNW7	NNW10	NNW8.4	N11
3-Jan	N11	N13	N9	NNW8	NNW8	WNW6	NW6	NW6	NW5	NNW6	WNW5	NW6	WNW8	WNW8	WNW7	W6	WSW6	WSW7	W8	W7	W7	W7	W7	WSW7	WNW6.0	N13
4-Jan	WSW8	WSW7	WSW8	WSW8	WSW8	WSW10	WSW9	SW11	SW11	SW11	SW11	WSW10	WSW13	WSW13	WSW13	WSW11	SW10	WSW11	WSW13	WSW11	WSW12	WSW12	WSW11	W11	WSW10.6	WSW13
5-Jan	WSW8	WSW7	WSW7	WSW7	WSW6	WSW6	W5	W4	WNW6	WNW6	NW9	NNW11	NNW12	NNW11	NNW13	NNW13	NNW12	NNW14	NNW15	NNW15	NNW16	NNW14	N13	N12	NW8.1	NNW16
6-Jan	N12	N10	N10	N9	N8	N7	N8	N8	NNW9	NNW8	NW7	NW7	W7	W6	W6	W5	WSW5	WSW6	WSW6	WSW5	WSW6	WSW6	SW7	SW7	NW4.8	N12
7-Jan	SW8	SW7	SW8	SW9	SSW9	SW10	SW10	SW11	SSW10	S10	SSE11	SSE11	S11	S10	WSW3	WNW3	NNW6	N15	N17	N21	N17	N17	N19	N22	WNW2.6	N22
8-Jan	NNW19	NNW20	NNW15	NW11	NW9	NW10	NNW11	NNW10	NW7	NW8	NW9	NNW13	NNW13	NNW14	NW9	WNW6	W7	W7	W5	WSW6	WSW9	WSW8	WSW8	WSW9	NW8.5	NNW20
9-Jan	SW10	SW8	SW9	SW7	SW5	SSW4	SW9	SW10	SW7	SSW6	SW9	SW9	WSW9	WSW8	WNW5	N7	N8	N12	N15	N14	N13	N14	N15	NNE16	WNW3.4	NNE16
10-Jan	NNE10	N7	NNW5	N3	N3	NW3	AF	AF	WSW5	SW7	SW9	SW9	WSW8	WSW9	WSW6	WSW6	WSW6	WSW6	WSW4	W4	W5	W5	W4	WNW4	W3.9	NNE10
11-Jan	WNW5	W5	W4	WNW4	NNW4	NNW4	NW3	AF	AF	ESE2	SSE4	S6	SSW7	SSW11	SSW14	SSW14	S14	SSW16	SSW14	SSW18	SSW21	SSW24	SW25	SW24	SSW9.3	SW25
12-Jan	SW24	SW22	SW20	SW15	SW11	WSW11	WSW11	W7	WSW5	W4	W5	W4	WSW3	WNW3	WSW4	SW5	SSW8	SSW10	SW12	SW13	SW12	SW14	SW13	WSW10	SW9.8	SW24
13-Jan	WSW9	W8	NW6	N15	N14	N13	N11	NNW8	N7	N7	NNE9	NNE6	NE3	E3	SE4	S7	SE9	SE12	SSE14	SSE17	SSE18	SSE19	S19	S20	SSE1.8	S20
14-Jan	SSW18	SW16	WSW15	WSW13	W13	WNW10	NNW17	N15	N20	N20	N20	N18	N15	N14	N16	N16	N18	N16	N15	N14	N12	N11	N12	N10	NNW10.7	N20
15-Jan	N11	N11	N10	N10	NNE8	NNE6	N5	NE5	ENE5	ESE4	SE8	SSE9	SSE10	SSE13	SSE15	SSE18	SSE19	SSE20	SSE24	SSE27	S27	S28	S28	S26	SSE8.9	S28
16-Jan	S29	S28	S27	S27	S24	S22	S21	SSW24	SSW19	SSW20	SW19	SW20	WSW19	WSW18	WSW19	WSW18	WSW16	WSW18	W21	W20	WSW19	WSW21	W22	W24	SW17.9	S29
17-Jan	WNW22	WNW24	WNW24	WNW24	NW17	NNW13	N14	N16	N14	NNE11	NNE10	NNE11	NNE7	NNE2	E2	E4	E5	SE5	SSE7	S8	S8	S8	S9	S8	NW4.3	WNW24
18-Jan	SSE8	S9	S8	S10	S10	S9	S9	SSW11	SSW10	SSW11	SSW11	SW15	SW19	SW18	WSW16	WSW13	SW13	SW13	SW15	SW13	SW10	SW6	SW7	SW11	SSW10.7	SW19
19-Jan	SSW5	SW6	NW3	ENE7	SE4	SSE4	ESE2	ENE5	E4	ENE7	ENE5	NE3	N2	N2	N4	NE7	NE7	NE5	NE4	N4	NNE4	NNE4	NE7	NE5	NE2.9	NE7
20-Jan	NE6	NNE4	N5	N5	NNE5	N6	NNE7	N6	N4	N4	NNW3	NNE2	WNW1	SW3	SW5	SSW7	WSW7	SSW10	SSW14	SSW17	SW19	SW20	SW22	SW22	SW4.0	SW22
21-Jan	SW19	SW18	SW19	SW19	SSW21	SSW20	S21	SSW30	SSW31	SSW33	SSW34	SSW35	SSW31	SSW30	SW29	SW25	SW22	SW19	SW20	SW19	SW18	SW17	SW18	SW19	SSW23.0	SSW35
22-Jan	SW15	SW14	SW14	SW19	SW16	SW13	WSW14	WSW16	WSW14	W13	WNW17	W16	W20	W22	W20	W19	W20	W22	W22	NW19	N18	N15	NNE12	N9	W13.0	W22
23-Jan	N8	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSW11	SW12	SW12	SW12	AF	AF	AF	AF	AF	AF	AF	----	SW12
24-Jan	AF	AF	AF	AF	AF	AF	AF	NNW8	NW5	WNW10	WNW8	WNW7	W11	W11	W13	W10	W11	W8	W11	W13	W12	W13	WSW15	SW14	----	WSW15
25-Jan	SW15	SSW15	SSW18	SW20	SW21	SSW20	S24	SSW27	SW23	WSW23	W23	W21	W18	WNW18	WNW15	NNW12	N15	N14	NNW14	NNW10	N6	WSW4	SW9	SW14	WSW10.7	SSW27
26-Jan	WSW12	SW12	WSW17	SW16	SW13	SSW12	SW15	SW17	SW17	SW16	WSW11	WSW13	WSW12	W10	W10	W8	N10	NNE18	NNE18	NNE19	NNE19	NNE17	NNE16	NNE14	W5.2	NNE19
27-Jan	NNE14	NNE14	NNE14	NNE12	NNE10	NNE8	NNE8	NNE7	NNE7	NNE5	NNE5	NE5	NE6	NE7	NE8	ENE8	ENE7	ENE6	E8	E6	E7	ESE9	E9	ESE8	NE7.0	NNE14
28-Jan	E7	E6	E4	NE3	N5	NNW8	N7	NNW5	NNW4	N9	N11	N11	NNW9	NNW13	NNW11	NNW9	NNW5	N6	NNE6	NNE6	NE7	NE5	ENE4	ESE3	N5.4	NNW13
29-Jan	SSE3	SSE4	SSW6	SSW7	S10	S10	S9	S10	S12	S12	S12	S12	S9	S8	SSE7	SSE6	SSW4	SW2	NW2	N7	N7	NNE9	N8	NNE8	S4.2	S12
30-Jan	N13	N11	N10	NNE10	NNE11	N10	NNE10	N11	N11	N11	N13	N12	N11	N10	N11	N10	N7	N6	N5	NNE5	NNE3	NE3	AF	AF	N9.3	N13
31-Jan	AF	AF	AF	AF	SW3	SW3	SW4	SW4	SSW4	SW5	SW6	SW7	SW6	SW5	SW4	SW5	SW6	SW6	SSW6	SSW7	SSW7	SSW8	SW8	SW8	SW5.5	SSW8
	W4.0	WSW4.2	WSW4.7	WSW4.6	WSW3.7	WSW3.3	WSW3.1	WSW3.7	WSW3.6	W3.6	W4.1	W4.2	W5.0	W5.3	W5.3	W4.3	W3.6	W3.5	W3.7	W3.8	W3.4	WSW3.6	WSW4.1	WSW4.6	Diurnal Average	
	S29	S28	S27	S27	S24	S22	S24	SSW30	SSW31	SSW33	SSW34	SSW35	SSW31	SSW30	SW29	SW25	SW22	W22	SSE24	SSE27	S27	S28	S28	S26	Diurnal Maximum	

AF - Analyzer Failure

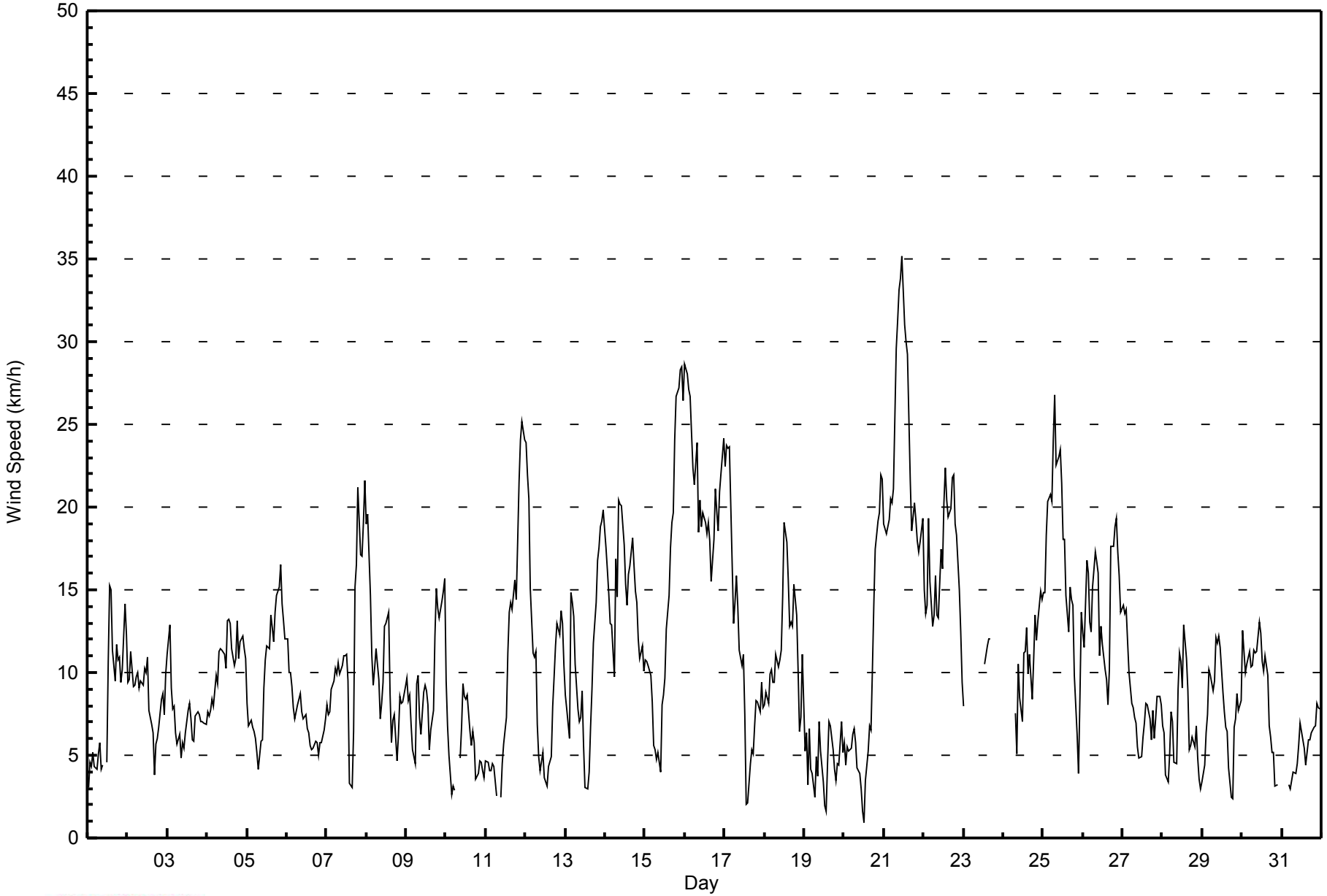
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

Firebag - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	125	17.68	17.68
6 - 11	322	45.54	63.22
12 - 19	188	26.59	89.82
20 - 28	63	8.91	98.73
29 - 38	9	1.27	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

Firebag - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	13	10	12	4	7	4	3	7	2	5	13	9	13	8	8	7	125
6 - 11	62	22	8	5	6	2	2	9	22	20	40	45	22	11	14	32	322
12 - 19	41	13	0	0	0	0	1	8	6	12	44	26	9	3	2	23	188
20 - 28	5	0	0	0	0	0	0	3	13	8	15	2	12	4	0	1	63
29 - 38	0	0	0	0	0	0	0	0	1	7	1	0	0	0	0	0	9
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	121	45	20	9	13	6	6	27	44	52	113	82	56	26	24	63	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

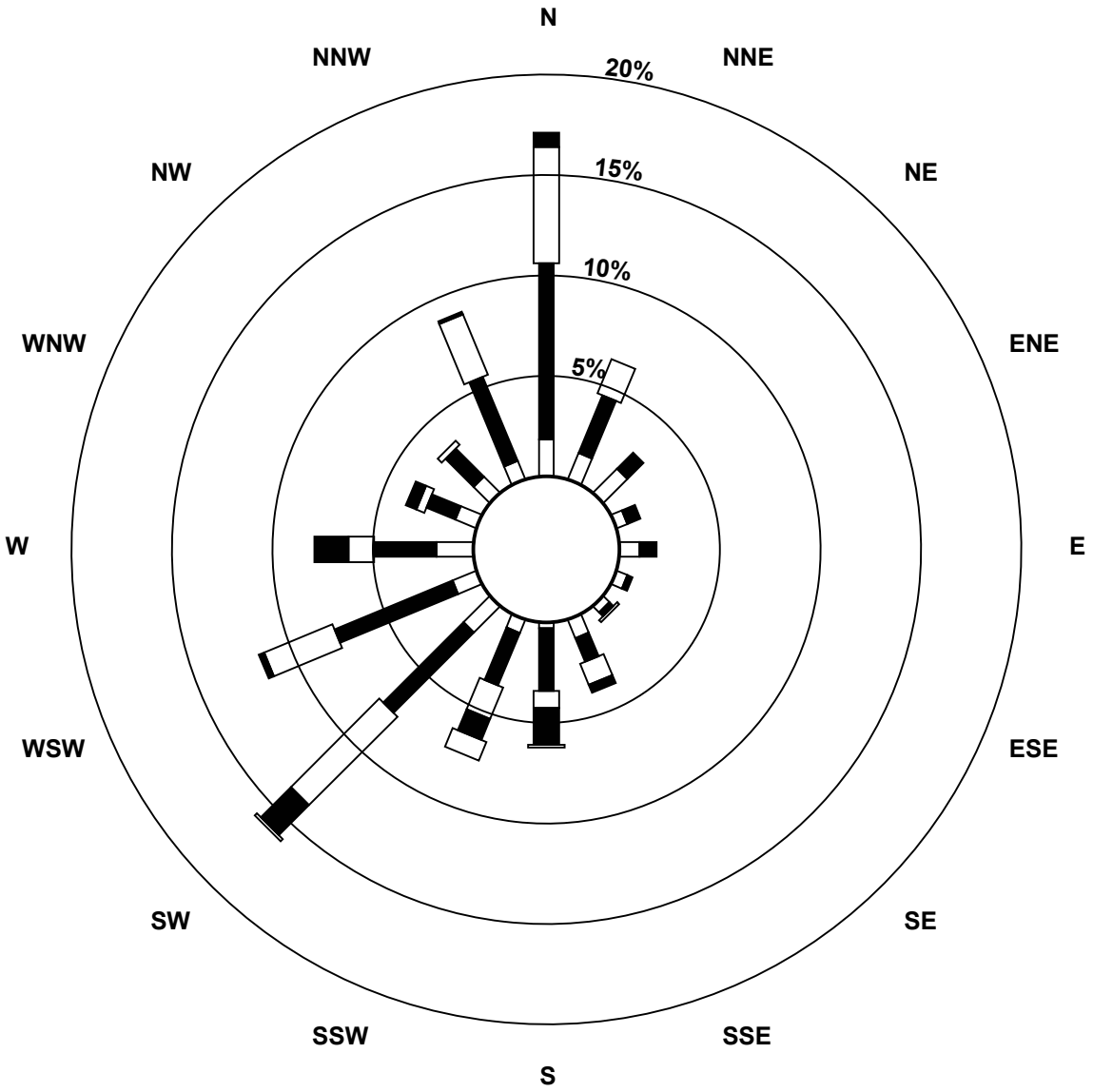
AURORA ATMOSPHERICS INC.

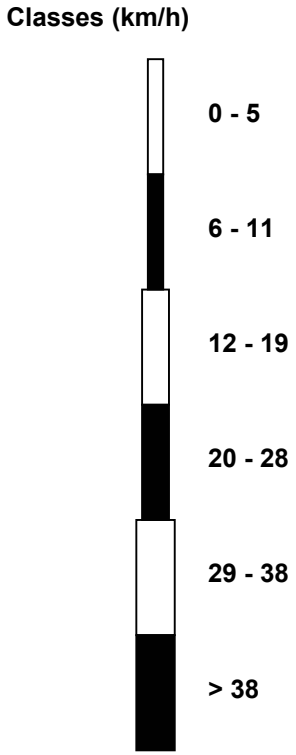
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

Firebag (AMS 19)





Total Number of Valid Hours: 707

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 km/h on Jan 25 08:00

Minimum Value: 0 km/h on Jan 11 05:00

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

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	0
Percent Operational Time:	95.0

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

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Firebag - January 2015

Direction of Maximum Speed: 198 deg on Jan 21 12:00
Direction of Maximum Daily Speed Average: 212.9 deg on Jan 21

Direction of Minimum Speed: 293 deg on Jan 20 13:00

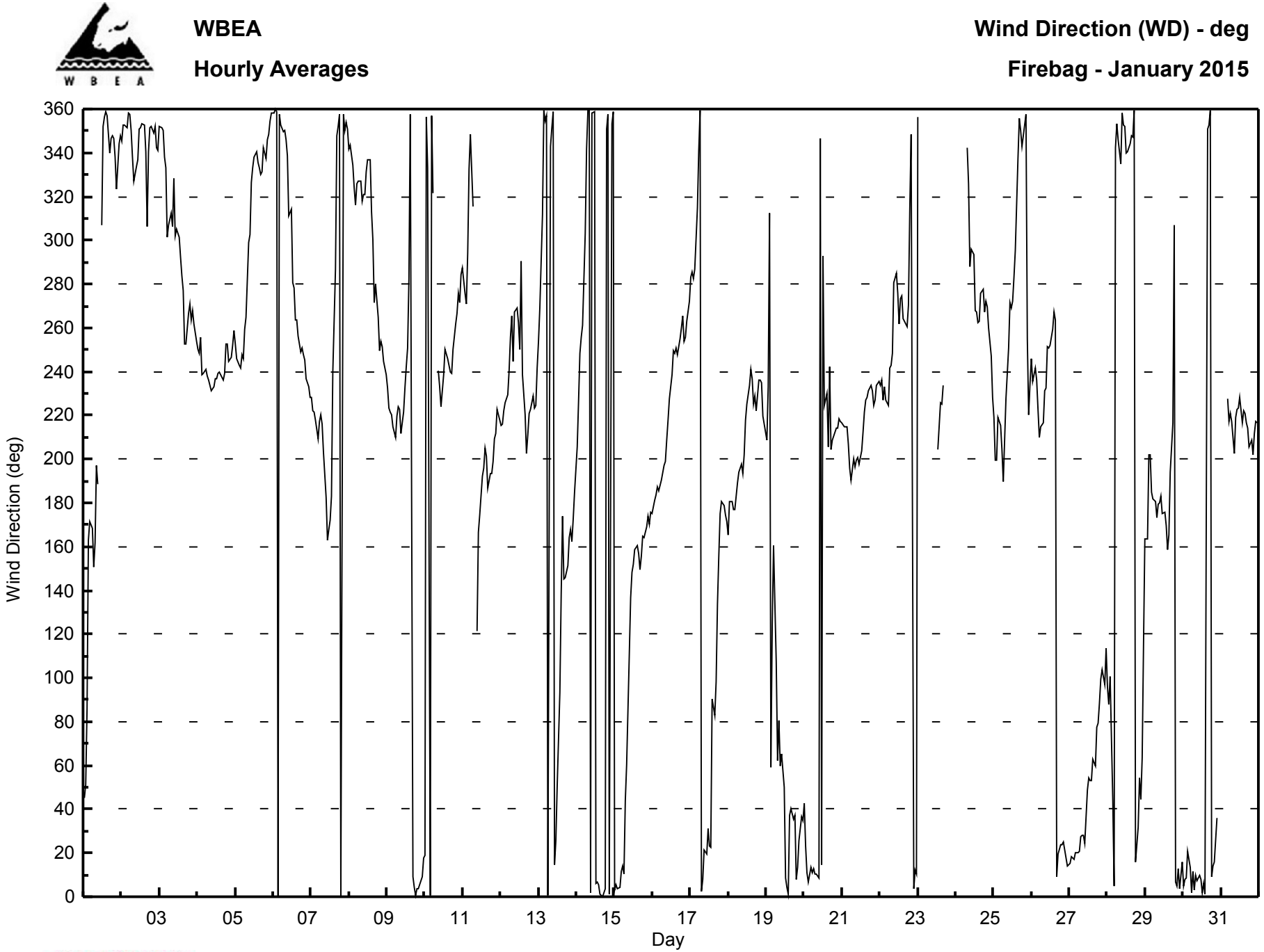
Direction of Minimum Daily Speed Average: 1.8 deg on Jan 13

Monthly Average Direction: 273.1 deg

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Percent Operational Time:	95.0

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-Jan	45	51	86	163	171	168	151	162	197	188	AF	307	352	356	359	357	340	347	348	347	338	323	344	348	350.7
2-Jan	346	353	353	351	358	357	350	338	327	334	337	351	352	353	353	340	307	341	351	352	349	352	342	341	346.4
3-Jan	352	352	350	338	333	301	307	312	307	328	302	305	301	292	283	277	252	253	267	271	263	268	262	254	300.5
4-Jan	250	248	256	239	239	241	238	236	234	231	233	237	237	239	240	239	236	239	253	253	245	246	252	259	242.2
5-Jan	252	246	243	242	248	246	259	265	299	303	326	333	338	340	335	333	330	331	343	338	346	348	354	358	323.0
6-Jan	358	360	359	0	358	353	349	350	346	339	311	314	281	278	264	263	256	249	251	248	245	237	233	228	312.1
7-Jan	228	222	222	218	209	217	220	216	203	183	163	168	172	183	240	287	348	352	358	0	358	350	354	351	283.5
8-Jan	342	344	334	324	316	326	327	327	318	321	321	332	337	337	313	300	272	280	265	249	254	252	245	238	313.6
9-Jan	232	224	221	220	215	210	220	224	222	212	221	233	242	251	283	358	9	4	0	4	4	7	9	17	298.0
10-Jan	19	356	333	0	357	321	AF	AF	240	233	224	231	238	250	246	243	240	239	250	262	267	276	272	284	263.6
11-Jan	287	276	271	294	333	348	316	AF	AF	122	166	175	192	196	205	201	187	193	193	199	209	211	223	218	210.0
12-Jan	216	216	222	226	229	240	256	266	245	267	269	262	250	290	239	221	203	211	221	223	229	223	225	241	229.2
13-Jan	254	269	312	359	354	357	1	343	351	359	15	26	50	93	138	174	145	146	151	164	168	163	173	185	151.6
14-Jan	205	226	248	256	261	303	342	359	360	2	358	359	6	7	6	1	0	2	4	351	358	1	353	359	344.2
15-Jan	3	6	4	4	12	14	11	44	60	111	137	148	152	159	161	157	150	156	165	164	169	174	170	176	153.3
16-Jan	175	181	184	188	185	188	190	197	199	209	218	227	239	250	248	250	248	255	260	265	254	256	263	272	221.7
17-Jan	283	286	283	287	315	341	359	2	8	22	19	31	23	22	90	83	98	133	156	175	180	179	174	171	320.1
18-Jan	165	180	181	177	177	183	189	194	198	193	202	218	225	234	241	237	225	229	222	236	236	235	220	216	212.7
19-Jan	209	233	313	59	124	161	108	62	81	60	65	50	8	4	1	37	40	35	37	8	14	26	37	35	45.1
20-Jan	43	23	11	7	13	11	13	10	10	8	347	15	293	224	230	206	242	204	209	211	214	214	219	217	228.5
21-Jan	217	215	215	215	207	196	190	200	197	200	201	198	204	212	221	227	228	232	234	232	225	227	234	235	212.9
22-Jan	234	236	227	233	227	225	242	243	248	280	285	276	262	273	274	264	262	261	270	314	349	4	12	11	268.5
23-Jan	356	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	204	226	225	234	AF	AF	AF	AF	AF	AF	AF	--
24-Jan	AF	AF	AF	AF	AF	AF	AF	342	326	288	296	293	268	267	263	263	276	278	267	272	270	260	247	228	--
25-Jan	219	199	200	219	215	204	190	209	227	251	271	269	272	283	295	338	356	350	343	348	358	255	220	234	247.5
26-Jan	246	236	242	236	223	210	215	217	231	233	251	251	252	259	267	264	9	19	24	24	25	21	18	14	275.4
27-Jan	15	18	18	17	20	20	20	27	28	28	24	49	54	53	53	63	60	78	80	88	99	104	97	114	46.2
28-Jan	96	88	101	44	5	342	354	346	335	358	353	352	340	341	344	348	347	359	16	32	54	44	63	114	7.3
29-Jan	163	163	202	202	185	182	180	173	179	180	183	175	176	170	158	165	194	217	307	7	5	13	3	16	177.0
30-Jan	5	8	8	21	13	2	12	3	10	8	10	8	2	6	1	351	352	359	9	14	16	36	AF	AF	6.9
31-Jan	AF	AF	AF	AF	228	217	221	217	203	219	223	223	228	216	222	221	216	214	205	208	202	212	217	217	216.1
	258.8	256.4	256.1	255.7	251.0	250.9	253.5	248.0	252.3	259.1	267.6	264.7	263.8	265.5	268.2	264.8	265.7	276.2	272.7	277.3	269.3	258.4	255.3	252.3	
	Diurnal Average																								

AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods


WBEA
Hourly Averages
Wind Direction (WD) - deg
Firebag - January 2015
Wind Direction (deg)
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Firebag - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 64 deg on Jan 17 14:00

Minimum Value: 4 deg on Jan 10 23:00

Percentiles: P_1 = 5 P_{10} = 7 Q_1 = 8 Median = 10 Q_3 = 13 P_{90} = 16 P_{99} = 41

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	0
Percent Operational Time:	95.0

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	Maximum
1-Jan	23	16	20	18	14	13	14	15	20	10	AF	23	12	13	12	12	14	11	11	13	12	11	10	10	23
2-Jan	11	10	12	12	11	10	11	8	10	10	8	11	12	13	8	11	18	22	7	9	11	9	11	12	22
3-Jan	13	10	9	8	13	14	10	9	12	10	15	13	11	11	10	10	9	7	8	8	7	8	7	7	15
4-Jan	7	6	9	8	8	7	7	6	6	7	8	8	8	7	8	7	8	8	9	9	7	7	8	9	9
5-Jan	8	8	8	9	7	7	9	20	16	15	13	12	12	11	11	11	11	11	11	10	12	11	12	11	20
6-Jan	13	12	12	13	11	10	10	11	9	10	11	11	11	12	8	6	5	6	6	6	8	10	7	7	13
7-Jan	7	8	7	7	7	8	8	7	9	9	9	10	9	9	45	35	9	11	14	16	14	12	14	14	45
8-Jan	13	10	11	10	10	11	11	9	9	10	9	11	10	11	13	10	6	9	18	6	5	6	5	7	18
9-Jan	8	6	7	8	9	15	8	7	9	10	7	7	6	9	32	16	11	14	14	13	12	13	13	10	32
10-Jan	10	17	14	25	19	14	AF	AF	8	9	7	8	9	8	9	10	7	7	7	9	7	7	4	9	25
11-Jan	8	11	6	15	10	10	8	AF	AF	24	10	10	7	6	7	7	8	7	7	8	8	8	9	9	24
12-Jan	8	8	8	8	8	7	11	15	16	15	13	15	14	19	19	11	9	10	8	8	8	8	8	10	19
13-Jan	9	13	21	14	11	13	11	16	11	15	13	16	30	30	24	14	11	9	9	9	8	8	8	9	30
14-Jan	10	13	11	9	11	18	13	13	14	14	13	12	12	12	12	11	13	14	13	11	11	14	14	12	18
15-Jan	13	11	11	13	12	13	11	18	10	30	12	11	11	13	11	9	10	11	8	9	8	8	9	9	30
16-Jan	8	8	8	7	8	8	9	8	8	9	9	10	9	7	6	7	6	8	8	8	10	8	9	9	10
17-Jan	9	9	8	9	20	15	12	11	10	11	11	14	14	64	55	25	26	15	13	10	9	11	8	11	64
18-Jan	10	10	8	8	8	6	9	7	5	6	11	10	8	10	10	7	8	6	7	8	12	31	11	8	31
19-Jan	16	11	33	13	31	11	15	15	20	10	14	14	40	42	16	7	7	8	15	20	14	12	10	10	42
20-Jan	8	15	11	10	11	10	12	10	15	13	13	44	45	24	14	7	21	12	8	7	7	7	7	8	45
21-Jan	8	7	7	7	7	9	8	8	8	8	8	8	10	9	9	9	9	9	8	7	7	8	8	8	10
22-Jan	8	7	8	7	8	10	8	9	10	10	10	12	8	11	11	8	8	8	11	19	11	12	11	11	19
23-Jan	14	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	20	21	21	11	AF	AF	AF	AF	AF	AF	AF	21
24-Jan	AF	AF	AF	AF	AF	AF	AF	10	35	9	21	20	10	10	8	13	9	9	7	8	7	7	11	7	35
25-Jan	8	9	7	15	11	12	12	13	9	10	11	9	8	9	11	15	12	13	10	12	14	47	9	9	47
26-Jan	7	7	7	8	8	7	6	7	6	7	9	7	10	9	9	19	26	9	11	11	11	11	12	14	26
27-Jan	13	12	11	13	15	13	12	12	12	14	16	12	9	11	11	10	10	17	12	14	10	13	12	16	17
28-Jan	16	17	33	19	14	9	9	14	10	11	12	12	16	13	12	11	9	10	5	10	6	16	15	17	33
29-Jan	19	13	8	6	11	9	9	8	8	8	8	9	8	10	12	13	19	38	38	22	12	17	12	11	38
30-Jan	12	11	12	11	13	12	11	12	11	12	13	13	13	14	12	10	12	10	8	11	13	11	AF	AF	14
31-Jan	AF	AF	AF	AF	7	8	9	6	6	8	7	8	12	10	10	9	7	6	5	6	5	7	7	6	12
	23	17	33	25	31	18	15	20	35	30	21	44	45	64	55	35	26	38	38	22	14	47	15	17	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Name	Firebag	Station Number	AMS 19
Reason:	Routine		
Start Time (MST)	8:10	End Time (MST)	13:40
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	996
Cal Gas Concentration	49.3 ppm	Cal Gas Expiry Date	12-Dec-16
Gas Cert Reference	SA130123A		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	9037
DACS voltage range	NA	DACS channel #	N/A

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-606	-605
Analyzer Range (mv)	1000	1000	Lamp voltage	801	803
Calculated slope	0.994953	0.984192	Chamber temp.	45.1	44.9
Calculated intercept	-0.852619	-0.315980	Pressure (mmHg)	690.1	676.2
Analyzer Background	8.7	8.7	Flow (lpm)	0.451	0.442
Analyzer Coefficient	0.958	0.958	Intensity	90	90

Analyzer make	Thermo 43i	Analyzer serial #	1410661308

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.6	NA
as found span	5000	58.3	574.8	579.4	0.992
calibrator zero	5000	0.0	0.0	-0.3	NA
high point	5000	58.3	574.8	583.6	0.985
second point	5000	29.1	286.9	293.7	0.977
third point	5000	14.7	144.9	147.2	0.985
calibrator zero	6000	0.0	0.0	-0.2	NA
as left zero	6000	0.0	0.0	-0.2	NA
as left span	5000	58.3	574.8	584.4	0.984
				Average Correction Factor	0.982

Corrected As found	579.9	Previous response	578.6	% change	-0.2%

Notes:

No Maintance or adjustments Done, Filter changed out,

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

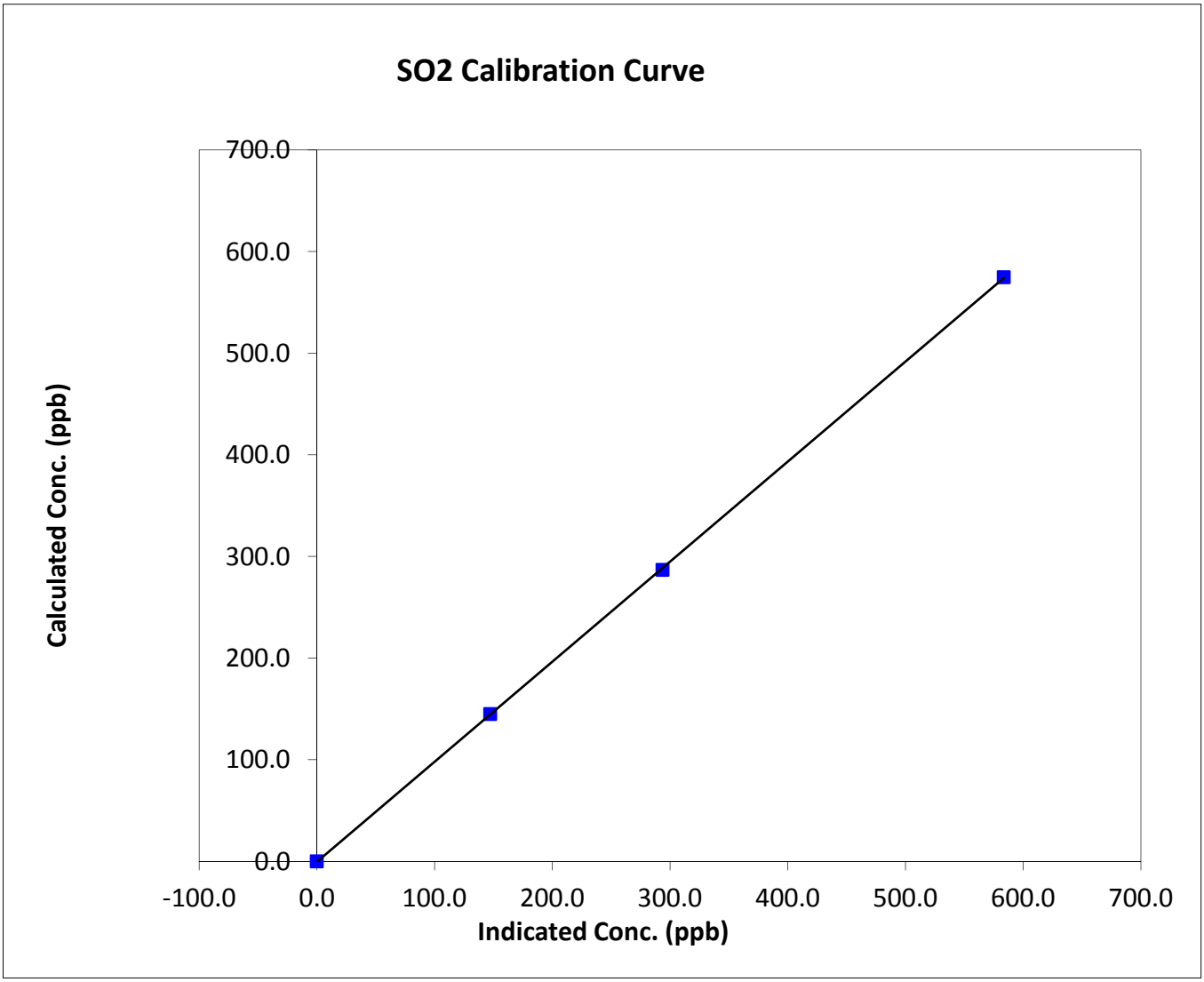
SO_2 Calibration Summary

Station Information

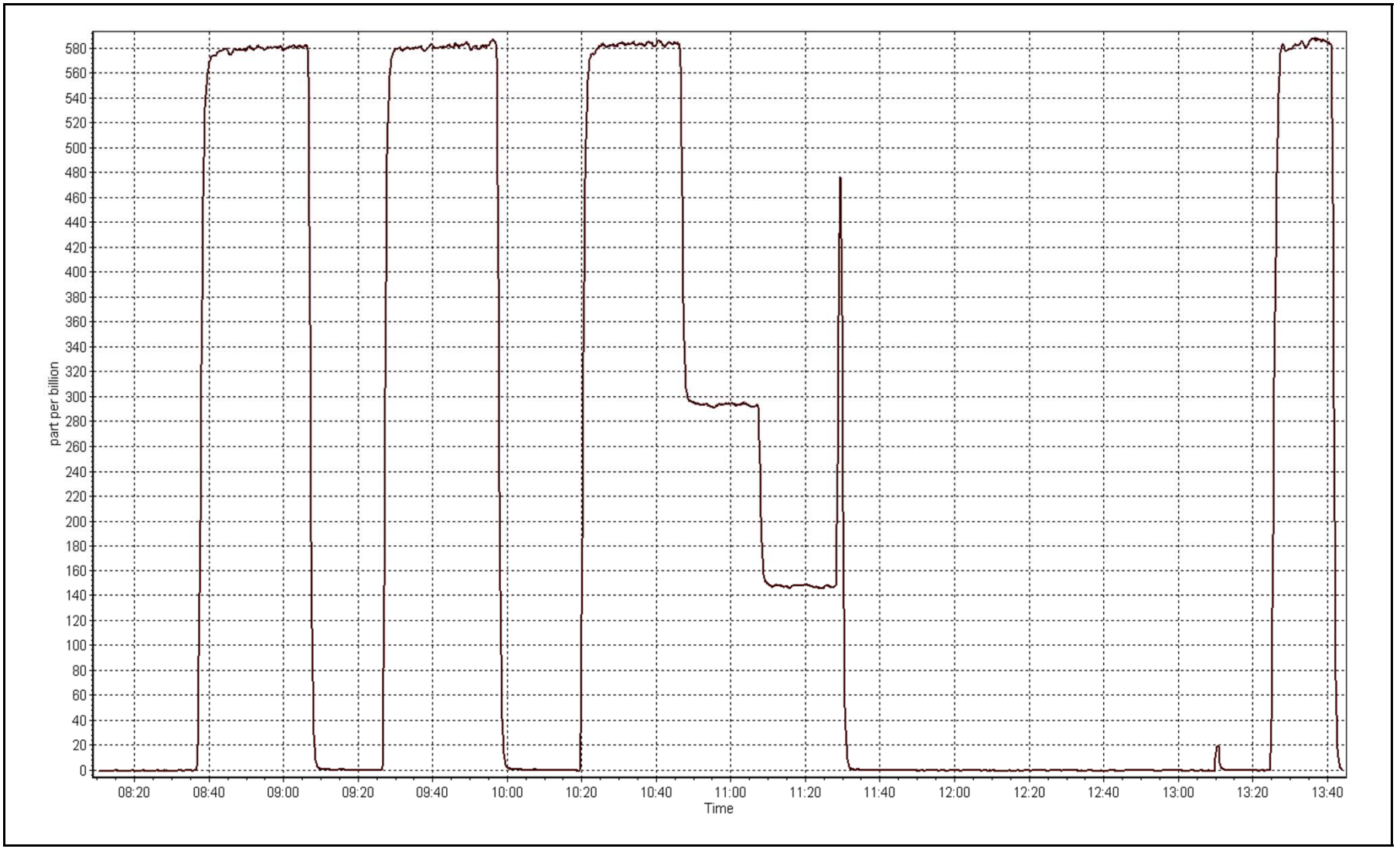
Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	8:10	End Time (MST)	13:40
Analyzer make	Thermo 43i	Analyzer serial #	1410661308

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999976
574.8	583.6	0.9850		
286.9	293.7	0.9770	Slope	0.984192
144.9	147.2	0.9849		
			Intercept	-0.315980



SO2 Calibration Plot Date: January 28, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 27, 2015	Previous Calibration	December 15, 2014
Station Name	Firebag	Station Number	AMS 19
Reason:	Routine		
Start Time (MST)	9:50	End Time (MST)	12:07
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial number	996
Cal Gas Concentration	4.85 ppm H2S	Cal Gas Expiry Date	10-Jun-14
Gas Cert Reference	ALM066720	SO2 gas conc.	49.3 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	N/A
DACS voltage range	NA	DACS channel #	TCP/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	HVPS	488	488
Analyzer Range (mv)	100	100	Lamp voltage	2127	2131
Calculated slope	1.007551	0.997324	Chamber temp.	32	32
Calculated intercept	-0.335369	0.349062	Pressure	23.4	23.3
Analyzer Background	19.3	19.3	Flow	594	591
Analyzer Coefficient	1.099	1.099	Intensity	53	53
			Converter temp.	315	315

Analyzer make/model	API H2S T101	Analyzer serial #	158
Converter make/model		Converter serial #	

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.6	NA
as found span	5000	83.3	80.8	80.5	1.004
SO2 scrubber check	5000	29.2	287.9	5.5	NA
calibrator zero	5000	0.0	0.0	-0.6	NA
high point	5000	83.3	80.8	80.5	1.004
second point	5000	41.7	40.4	40.5	1.000
third point	5000	21.0	20.4	20.3	1.006
calibrator zero	5000	0.0	0.0	0.2	NA
as left zero	5000	0.0	0.0	0.2	NA
as left span	5000	83.3	80.8	81.4	0.992
				Average Correction Factor	1.003

Corrected As found	81.1	Previous response	80.5	% change	-0.8%

Notes:

Scrubber checked before as founds. No maintanance or adjustments done, Filter changed out.

Calibration Performed By: Melissa Lemay /Asad Hidayat

Wood Buffalo Environmental Association

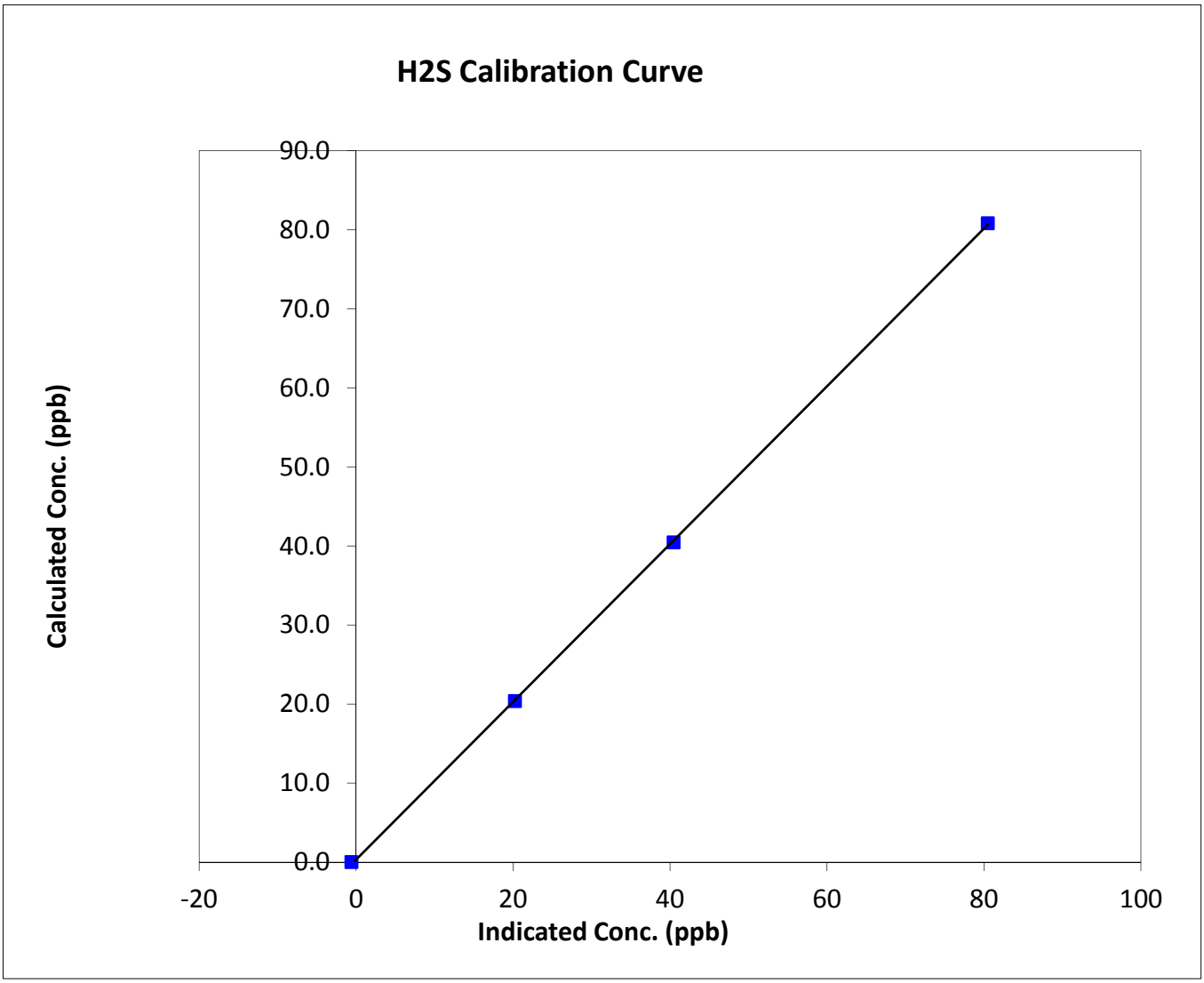
H2S Calibration Summary

Station Information

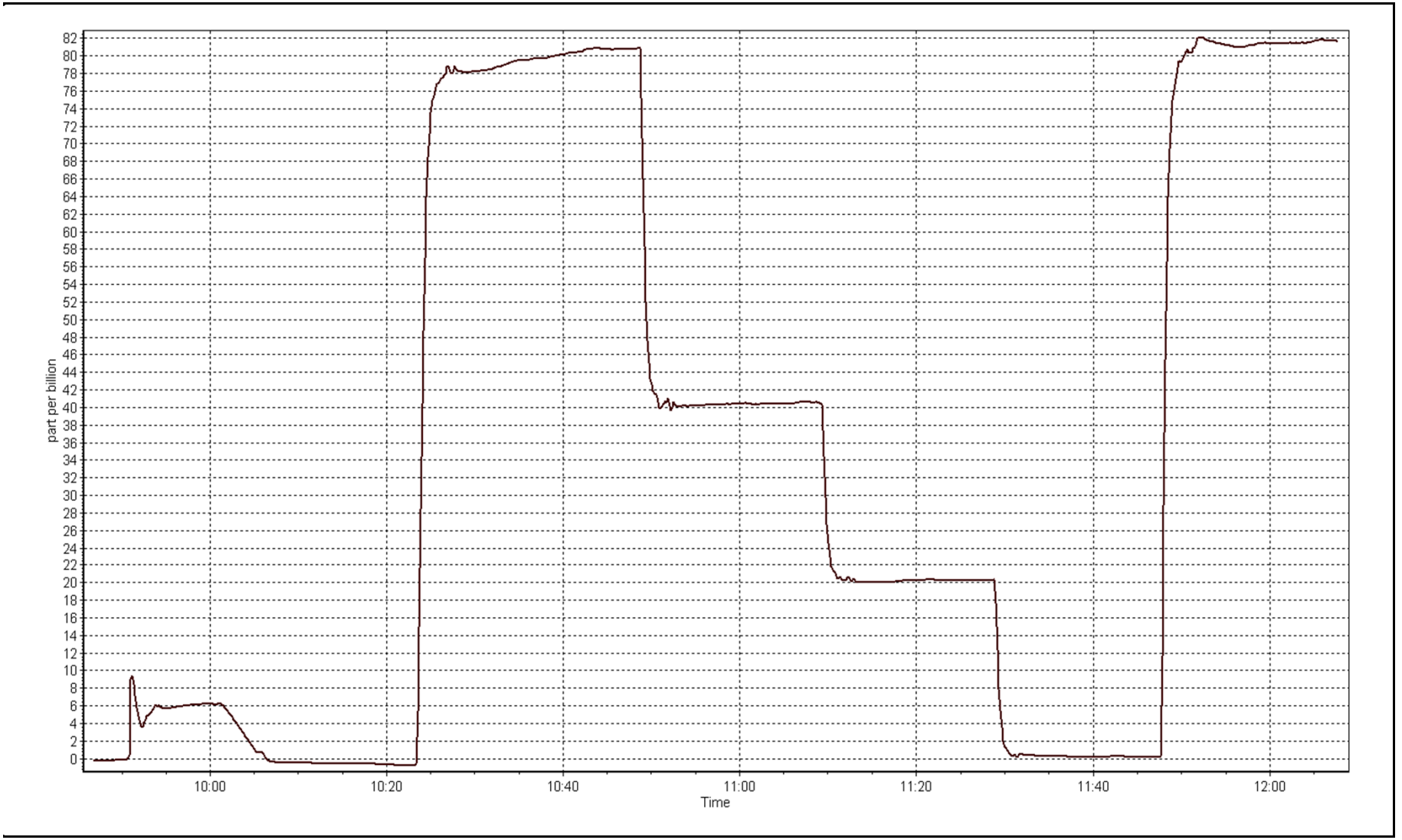
Calibration Date	January 27, 2015	Previous Calibration	December 15, 2014
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	9:50	End Time (MST)	12:07
Analyzer make	API H2S T101	Analyzer serial #	158

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999950
80.8	80.5	1.0037		
40.4	40.5	1.0000	Slope	0.997324
20.4	20.3	1.0059		
			Intercept	0.349062



H2S Calibration Plot Date: January 27, 2015



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January-28-15	Previous Calibration	December-09-14
Station Name	Firebag	Station Number	AMS 19
Reason:	Routine		
Start Time (MST)	8:15	End Time (MST)	13:40
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	996
Gas Cert Reference	SA130123A	Cal Gas Expiry Date	12-Dec-16
CH4 Cal Gas Conc.	512 ppm	CH4 Equiv Conc.	1092.3 ppm
C3H8 Cal Gas Conc.	211 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	9037
DACS voltage range	NA	DACS channel #	NA

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	100	100	Sample Pressure	8.5	8.5
Analyzer Range (mv)	100	100	Air or Bypass press	34.9	34.9
Calculated slope	1.012737	1.000474	Fuel Pressure	23.0	23.0
Calculated intercept	0.011345	-0.088792		4.4	4.5
				3.415	3.439

Analyzer make	Thermo 51i-LT	Analyzer serial #	1336160089

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.13	N/A
as found span	5000	58.3	12.74	12.84	0.992
calibrator zero	5000	0.0	0.00	0.07	N/A
high point	5000	58.3	12.74	12.80	0.995
second point	5000	29.2	6.38	6.50	0.981
third point	5000	14.7	3.21	3.30	0.973
calibrator zero	5000	0.0	0.00	-0.04	N/A
as left zero	5000	0.0	0.00	-0.04	N/A
as left span	5000	58.3	12.74	12.81	0.994
				Average Correction Factor	0.983

Corrected As found	12.71	Previous response	12.56	% change	-1.1%

Notes:

Filter changed out, No Maintanence done, zero adjusted

Calibration Performed By: Melissa Lemay

Asad Hidayat

Wood Buffalo Environmental Association

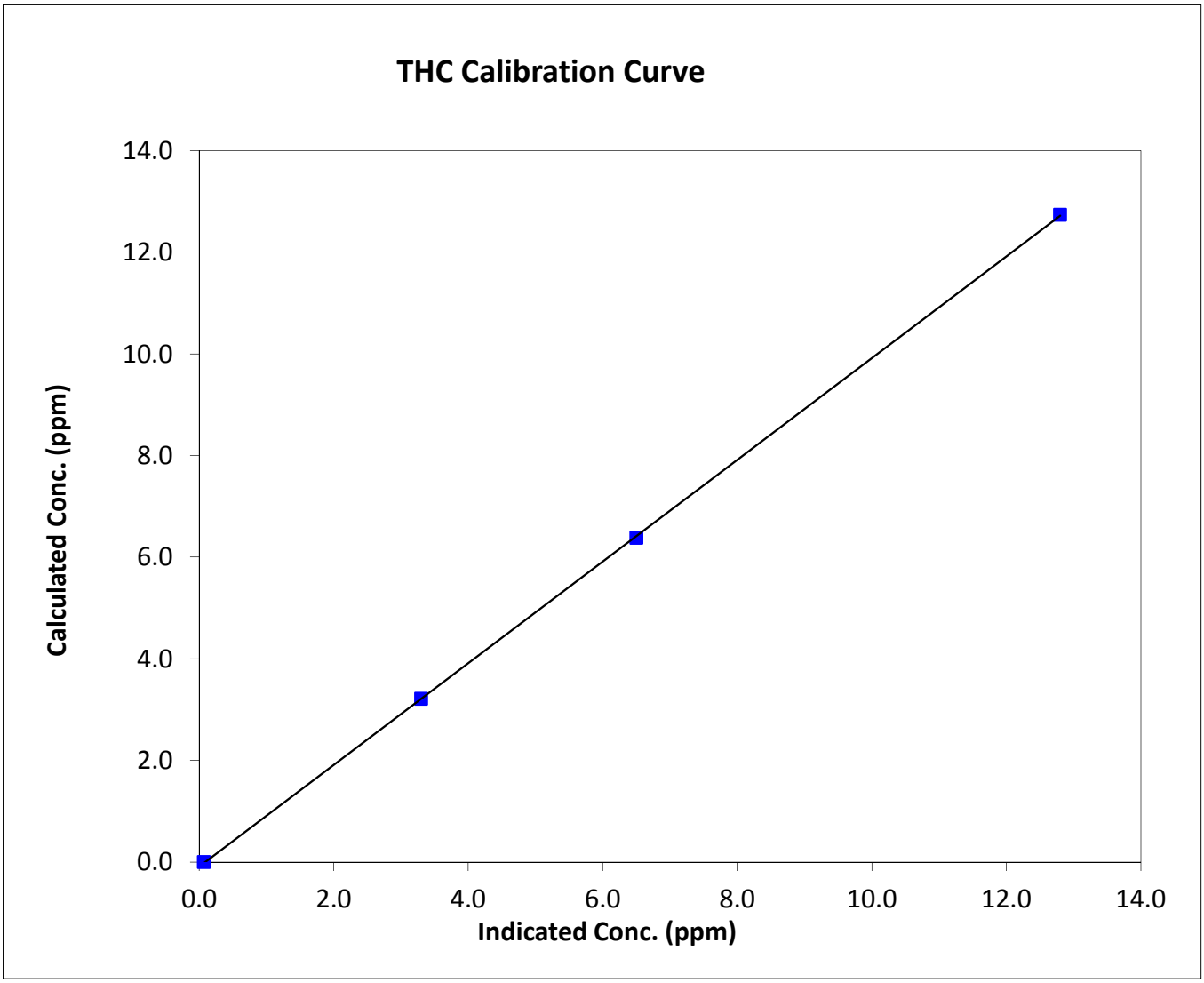
THC Calibration Summary

Station Information

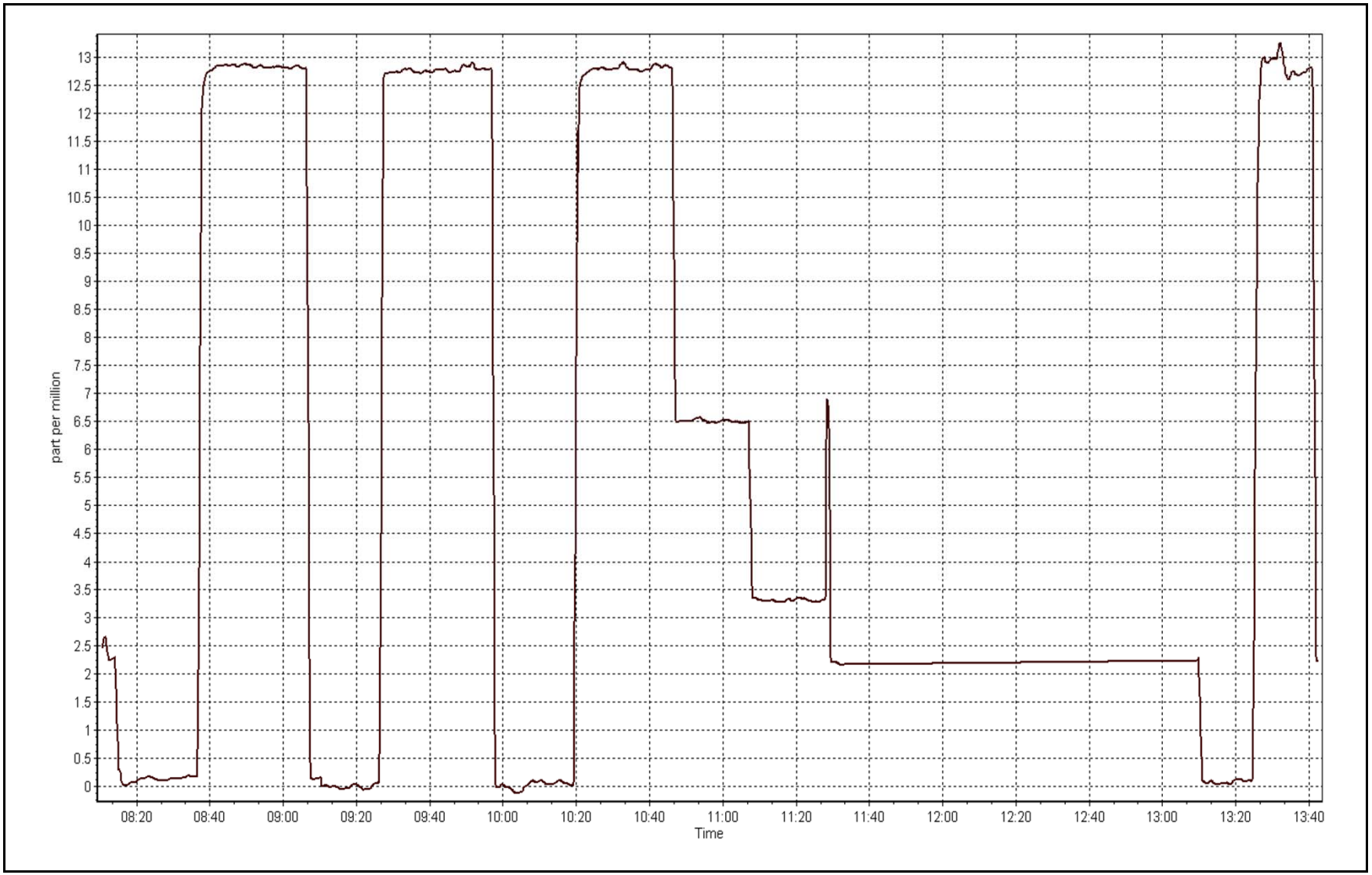
Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	8:15	End Time (MST)	13:40
Analyzer make	Thermo 51i-LT	Analyzer serial #	1336160089

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.07	N/A	Correlation Coefficient	0.999978
12.74	12.80	0.9950		
6.38	6.50	0.9813	Slope	1.000474
3.21	3.30	0.9731		
			Intercept	-0.088792



THC Calibration Plot Date: January 28, 2015



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Name	Firebag	Station Number	AMS 19
Reason:	Routine		
Start Time (MST)	8:10	End Time (MST)	13:40
Barometric Pressure	mmHg	Station Temperature	22.0 Deg C
Calibrator	API T700	Serial Number	996
NO Cal Gas Conc	51.5 ppm	Cal Gas Expiry Date	December 12, 2016
NOx Cal Gas Conc	51.5 ppm	Cal Gas Serial #	SA130123A

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	6894

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	0.998370	0.998301	1.001294
	Data Offset	-0.449968	-0.245716	0.363136
After	Data Slope	0.999082	0.999552	1.006246
	Data Offset	-0.642062	-0.499459	-0.471639
Channel #				
Voltage Range				

Analyzer Information

Analyzer make/model	Thermo 42i	Analyzer serial #	1410661309

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.885	ppb	0.910	ppb
NOX coefficient	0.999	ppb	1.004	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	3.7		3.8	
NOX bkgrnd	3.8		4.0	
Nt coefficient	N/A		N/A	
Chamber Temp	50.6	Deg C	50.6	Deg C
Moly Temp	327.1	Deg C	327.1	Deg C
PMT Temp	-2.9	Deg C	-2.9	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	170.4	mmHg	179.2	mmHg
Sample Flow	0.606	ccm	0.610-0.614	ccm

Notes:

Filter changed out, lowered pump to second shelf away from cold air being blown in by fans, changed charcoal, span adjusted

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 28, 2015 Station Number: AMS 19

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	N/A	N/A
as found span	5000	58.3	600.5	600.5	0.0	586.5	586.3	0.3	1.0238	1.0243
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.2	-0.1	N/A	N/A
high point	5000	58.3	600.5	600.5	0.0	600.5	600.3	0.2	1.0001	1.0004
second point	5000	29.1	299.7	299.7	0.0	303.2	302.6	0.6	0.9887	0.9905
third point	5000	14.7	151.4	151.4	0.0	152.1	151.5	0.6	0.9957	0.9997
calibrator zero	6000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	N/A	N/A
as left span	5000	58.3	600.5	274.8	325.7	601.0	272.5	329.1	0.9991	1.0086
								Average Correction Factor	0.9948	0.9969

Corrcted As found NO_X= 586.6 NO= 586.3 Percent Change NO_X= 2.6% NO= 2.6%

Previous Response NO_X= 601.9 NO= 601.8

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 58.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.1			N/A	
1st NO2 (300)	N/A	274.8	327.1	600.1	274.8	325.2	0.9891	1.0000	1.0058	99.4%
2nd NO2 (200)	N/A	380.6	221.3	600.1	380.6	220.4	0.9892	1.0000	1.0039	99.6%
3rd NO2 (100)	N/A	487.3	114.6	602.5	487.3	115.1	0.9852	1.0000	0.9950	100.5%
4th NO2 (0)	601.9	N/A	2.4	604.3	601.9	2.4	0.9822	1.0000	N/A	N/A
					Average Correction Factor		0.9864	1.0000	1.0015	99.8%

Calibration Performed By: Melissa Lemay Asad Hidayat

Wood Buffalo Environmental Association

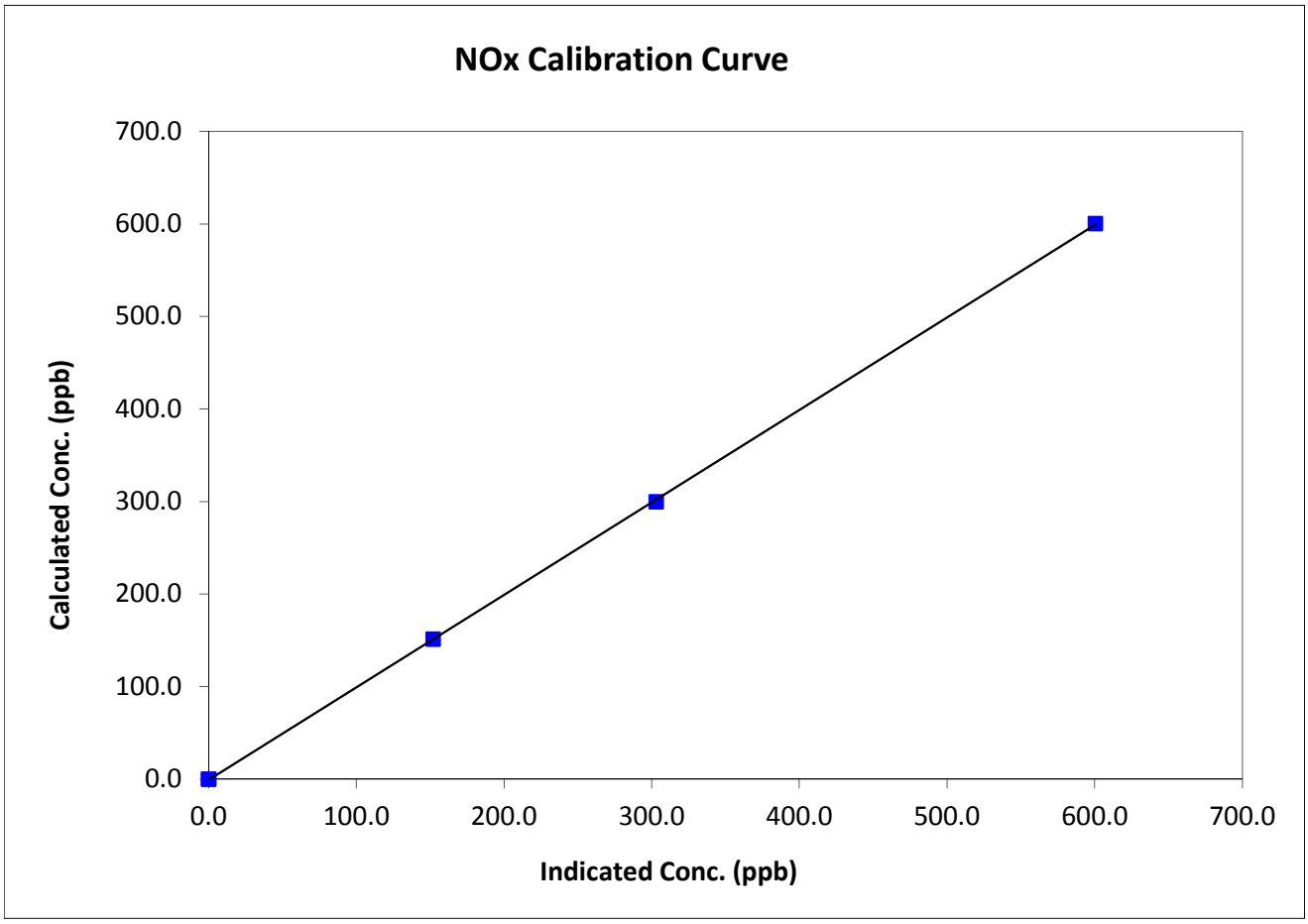
NO_X Calibration Summary

Station Information

Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	8:10	End Time (MST)	13:40
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999966
600.5	600.5	1.0001		
299.7	303.2	0.9887	Slope	0.999082
151.4	152.1	0.9957		
0.0	0.0	0.0000	Intercept	-0.642062



Wood Buffalo Environmental Association

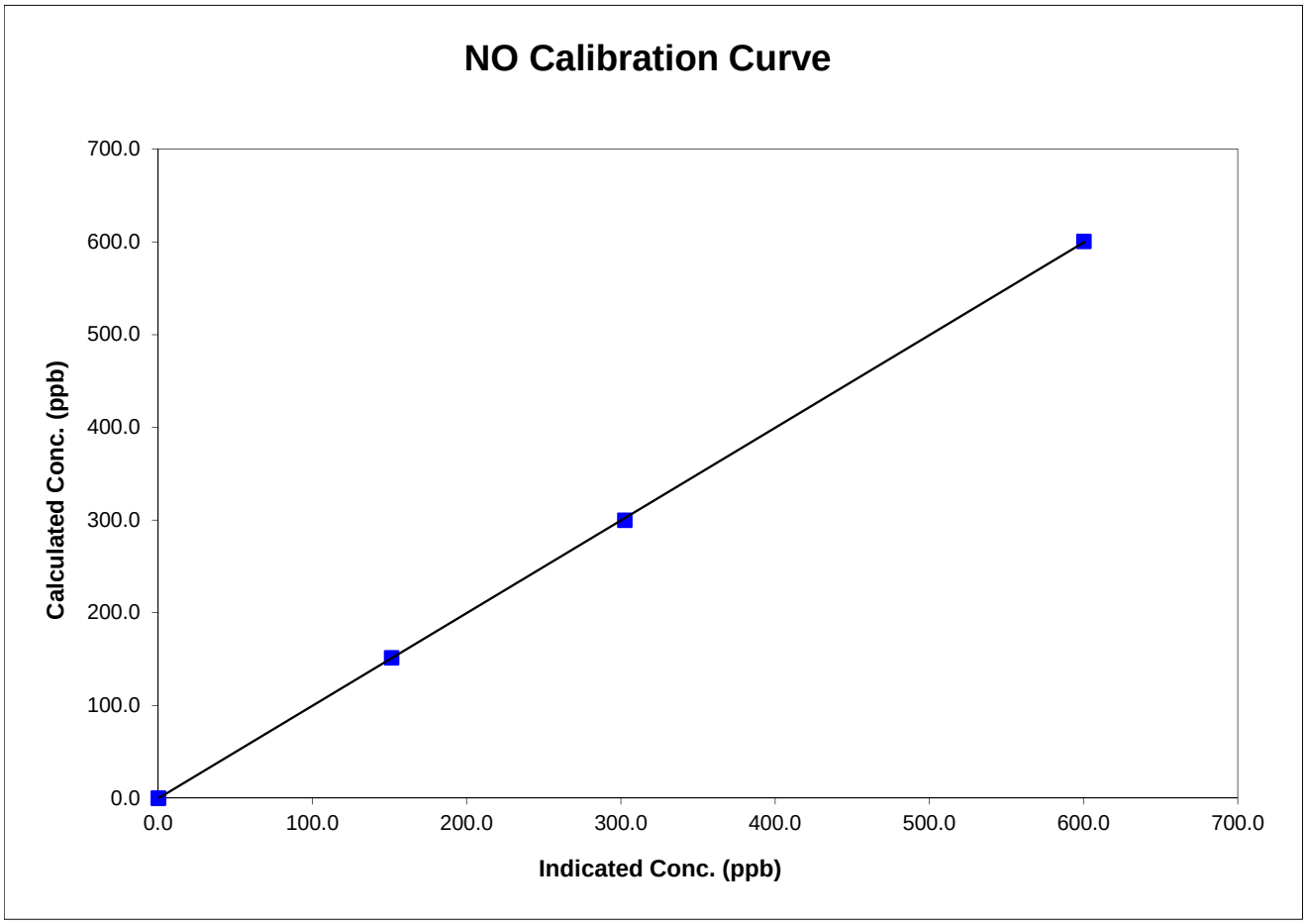
NO Calibration Summary

Station Information

Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	8:10	End Time (MST)	13:40
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999974
600.5	600.3	1.0004		
299.7	302.6	0.9905	Slope	0.999552
151.4	151.5	0.9997		
0.0	0.1	0.0000	Intercept	-0.499459



Wood Buffalo Environmental Association

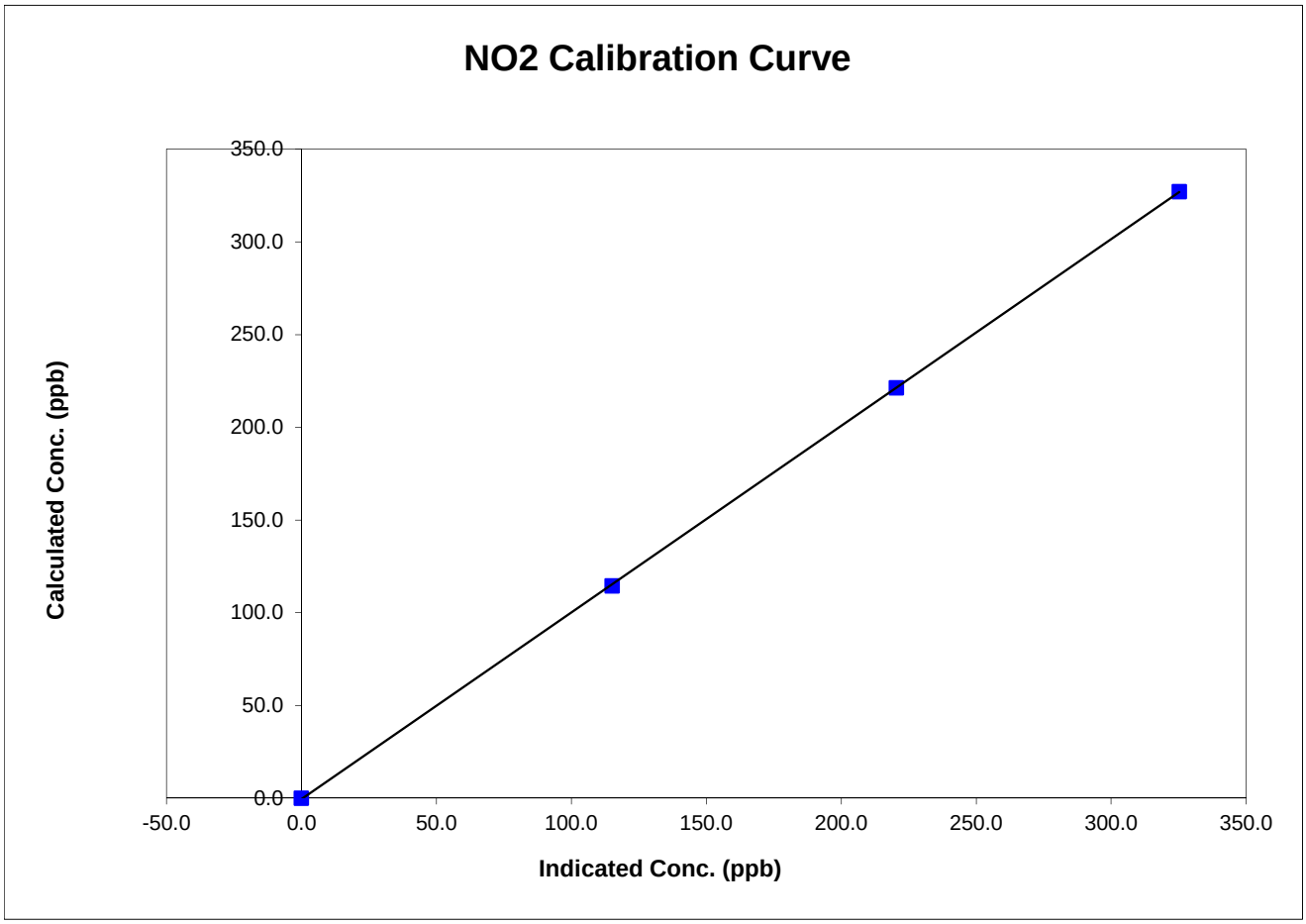
NO_2 Calibration Summary

Station Information

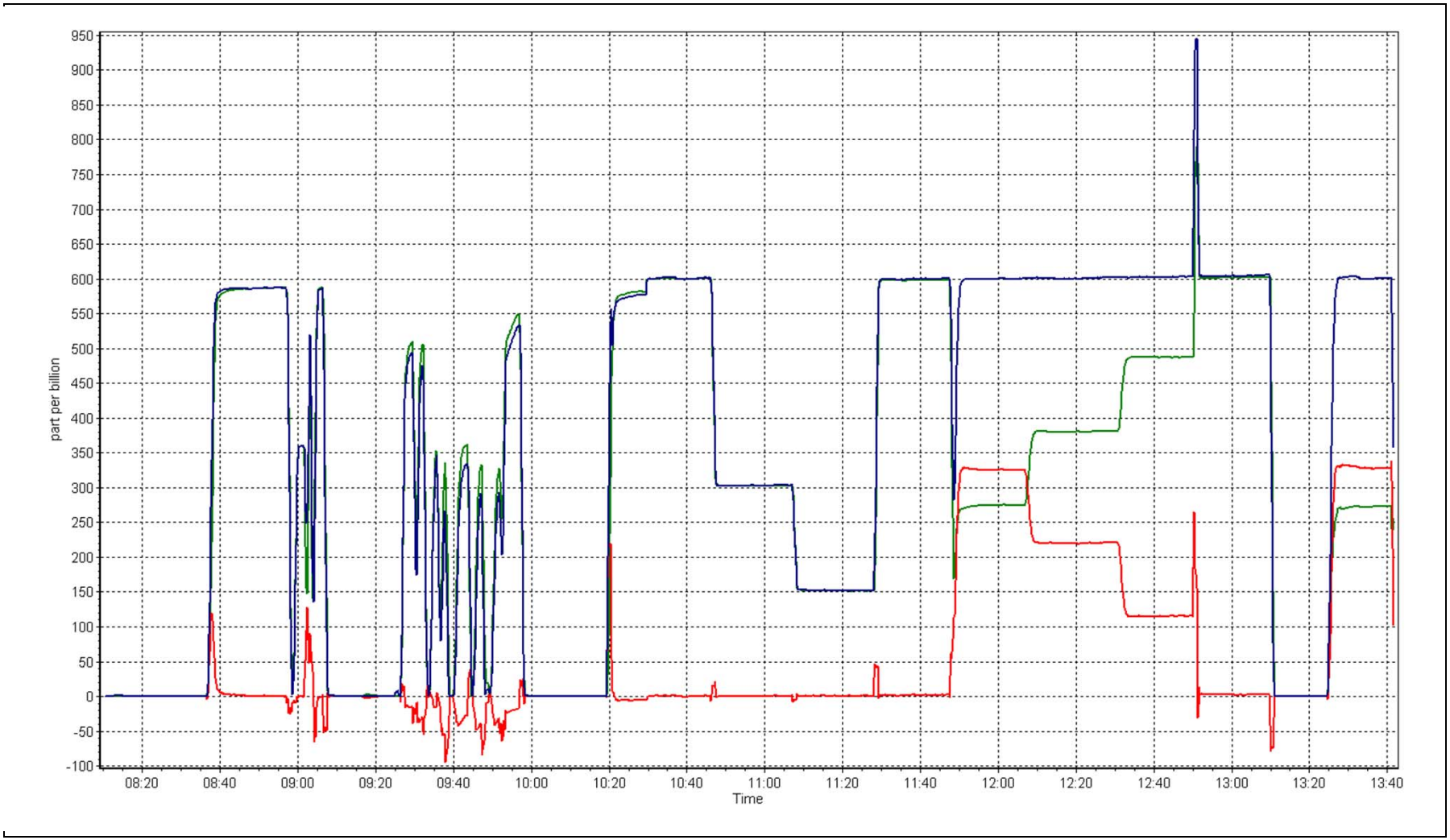
Calibration Date	January 28, 2015	Previous Calibration	December 9, 2014
Station Number	Firebag	Station Number	AMS 19
Start Time (MST)	8:10	End Time (MST)	13:40
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999981
327.1	325.2	1.0058		
221.3	220.4	1.0039	Slope	1.006246
114.6	115.1	0.9950		
			Intercept	-0.471639



NOx, NO & NO_2 Calibration Plot Date: January 28, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 502
CONOCOPHILLIPS SURMONT
JANUARY 2015

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 27, 2015

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONOCOPHILLIPS SURMONT (AMS 502)
JANUARY 2015

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	697	31	47	97.85	13	0	5	0
H2S (ppb) Average	704	34	40	99.19	6	0	2	0
NO2 (ppb) Average	710	32	34	99.73	38	0	19	-
NO (ppb) Average	710	32	34	99.73	308	-	81	-
NOX (ppb) Average	710	32	34	99.73	323	-	99	-
Temperature 2 m (C) Average	744	0	0	100.00	7.6	-	4.7	-
Relative Humidity (%) Average	744	0	0	100.00	96	-	-	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	41	-	-	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONOCOPHILLIPS SURMONT (AMS 502)
JANUARY 2015

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	697	1.7	2	-	0	0	1	1	2	4	13
H2S (ppb) Average	704	0.5	1	-	0	0	0	0	1	1	6
NO2 (ppb) Average	710	7.3	7	-	0	1	2	5	11	16	38
NO (ppb) Average	710	10.4	25	-	0	0	1	2	10	22	308
NOX (ppb) Average	710	17.7	29	-	0	2	4	8	19	36	323
Temperature 2 m (C) Average	744	-11.43	9.9	-	-28.9	-22.6	-19.7	-14.1	-1.5	2.3	7.6
Relative Humidity (%) Average	744	78.2	10	-	29	66	74	79	84	89	96
Wind Speed 10 m (km/h) Average	744	16.1	8	-	1	7	10	15	21	28	41
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONOCOPHILLIPS SURMONT (AMS 502)
JANUARY 2015

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	02 Jan 2015 10:00	02 Jan 2015 11:00	2	Maintenance - remotely initiate daily QA checks
SO2	03 Jan 2015 10:00	03 Jan 2015 10:00	1	Maintenance - remotely initiate daily QA checks
SO2	09 Jan 2015 04:00	09 Jan 2015 04:00	1	Stabilization after daily span
SO2	10 Jan 2015 04:00	10 Jan 2015 04:00	1	Stabilization after daily span
SO2	13 Jan 2015 02:00	13 Jan 2015 02:00	1	Stabilization after daily span
SO2	14 Jan 2015 03:00	14 Jan 2015 03:00	1	Stabilization after daily span
SO2	16 Jan 2015 05:00	16 Jan 2015 05:00	1	Stabilization after daily span
SO2	17 Jan 2015 06:00	17 Jan 2015 06:00	1	Stabilization after daily span
SO2	18 Jan 2015 07:00	18 Jan 2015 07:00	1	Stabilization after daily span
SO2	21 Jan 2015 04:00	21 Jan 2015 04:00	1	Stabilization after daily span
SO2	23 Jan 2015 06:00	23 Jan 2015 06:00	1	Stabilization after daily span
SO2	25 Jan 2015 02:00	25 Jan 2015 02:00	1	Stabilization after daily span
SO2	26 Jan 2015 03:00	26 Jan 2015 03:00	1	Stabilization after daily span
SO2	27 Jan 2015 04:00	27 Jan 2015 04:00	1	Stabilization after daily span
SO2	28 Jan 2015 05:00	28 Jan 2015 05:00	1	Stabilization after daily span
H2S	02 Jan 2015 11:00	02 Jan 2015 11:00	1	Maintenance - remotely initiate daily QA checks
H2S	06 Jan 2015 17:00	06 Jan 2015 19:00	3	Intermittent unstable operation - excessive baseline drift
H2S	08 Jan 2015 22:00	08 Jan 2015 23:00	2	Intermittent unstable operation - excessive baseline drift
NO2, NO, NOX	02 Jan 2015 10:00	02 Jan 2015 11:00	2	Maintenance - remotely initiate daily QA checks

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 13 ppb on Jan 6 06:00 Maximum Daily Average: 4.7 ppb on Jan 13

Minimum Value: 0 ppb on Jan 6 18:00
Maximum Diurnal Average: 2.5 ppb at hour 4
Monthly Average: 1.7 ppb

Minimum Daily Average: 0.4 ppb on Jan 27
Minimum Diurnal Average: 1.4 ppb at hour 15
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 2$ $P_{90} = 4$ $P_{99} = 11$

Hours in Service:	744
Hours of Data:	697
Hours of Missing Data:	47
Hours of Calibration:	31
Percent Operational Time:	97.9

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-Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	5	1	2	3	2	2	4	5	1.5	7
2-Jan	4	2	1	1	1	1	2	2	1	M	M	2	3	1	1	1	1	1	1	1	1	1	1	1	1.3	4
3-Jan	0	1	3	2	2	1	1	3	Z	M	3	1	3	2	2	1	1	1	1	1	1	1	1	1	1.5	3
4-Jan	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2
5-Jan	1	1	1	1	3	Z	2	1	2	1	1	1	2	1	1	0	0	1	1	3	4	5	4	4	1.7	5
6-Jan	4	Z	3	6	11	13	4	2	2	1	1	2	2	2	1	0	0	0	0	0	0	0	0	1	2.5	13
7-Jan	1	0	0	0	0	1	1	1	Z	1	2	2	1	1	2	2	3	1	7	8	6	6	4	8	2.6	8
8-Jan	12	7	7	10	8	7	9	6	5	8	6	6	5	3	4	1	2	1	1	1	1	0	0	0	4.7	12
9-Jan	0	0	Z	RE	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	3	3	1	1	1	1.1	3
10-Jan	4	3	Z	RE	1	5	3	2	2	3	2	1	1	3	2	3	3	2	1	1	2	1	1	1	2.1	5
11-Jan	1	2	Z	2	1	1	1	1	1	8	2	3	7	5	1	1	2	6	1	1	4	5	5	6	2.9	8
12-Jan	4	3	4	3	4	Z	2	2	2	2	2	2	2	2	2	2	1	1	1	3	1	2	1	1	2.1	4
13-Jan	Z	RE	1	1	3	4	4	1	5	3	4	4	9	11	6	7	13	12	3	3	2	2	4	2	4.7	13
14-Jan	1	Z	RE	1	1	1	1	1	1	2	3	2	1	1	1	1	1	1	6	7	8	1	1	1	1.8	8
15-Jan	0	0	Z	7	11	7	8	9	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	1	2.2	11
16-Jan	1	1	1	Z	RE	4	2	5	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	5
17-Jan	1	1	1	1	Z	RE	1	3	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	1	1.1	3
18-Jan	1	1	1	0	0	Z	RE	0	1	1	0	1	1	1	1	1	2	2	1	1	1	1	2	1	0.9	2
19-Jan	Z	1	1	2	1	1	1	2	1	0	1	1	1	1	1	1	1	1	1	1	3	3	3	2	1.3	3
20-Jan	3	Z	2	4	4	3	3	3	2	1	C	C	C	C	5	4	4	3	2	2	1	1	1	1	2.5	5
21-Jan	0	0	Z	RE	0	1	0	1	1	1	1	2	4	3	2	1	1	1	0	0	0	0	0	0	1.0	4
22-Jan	0	0	0	Z	1	0	1	1	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1
23-Jan	0	0	1	1	Z	RE	1	1	2	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0.8	2
24-Jan	1	1	0	0	0	Z	1	4	7	6	5	3	2	1	1	1	0	0	0	0	0	0	1	1	1.6	7
25-Jan	Z	RE	0	0	0	0	0	1	1	0	0	1	1	1	1	1	1	1	4	6	5	4	1	1	1.4	6
26-Jan	1	Z	RE	0	1	1	1	1	0	0	1	0	1	1	1	2	2	2	1	1	1	2	1	1	0.8	2
27-Jan	0	1	Z	RE	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
28-Jan	0	0	0	Z	RE	0	0	2	3	4	3	3	3	1	1	2	2	2	3	3	4	4	4	3	2.3	4
29-Jan	3	5	6	6	Z	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1.6	6
30-Jan	1	4	2	10	5	Z	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	1.4	10
31-Jan	Z	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
	1.7	1.5	1.6	2.5	2.3	2.3	1.8	1.8	1.7	1.9	1.6	1.5	1.8	1.6	1.4	1.5	1.7	1.5	1.4	1.8	1.8	1.6	1.5	1.5	Diurnal Average	
	12	7	7	10	11	13	9	9	7	8	6	6	9	11	6	7	13	12	7	8	8	6	5	8	Diurnal Maximum	

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

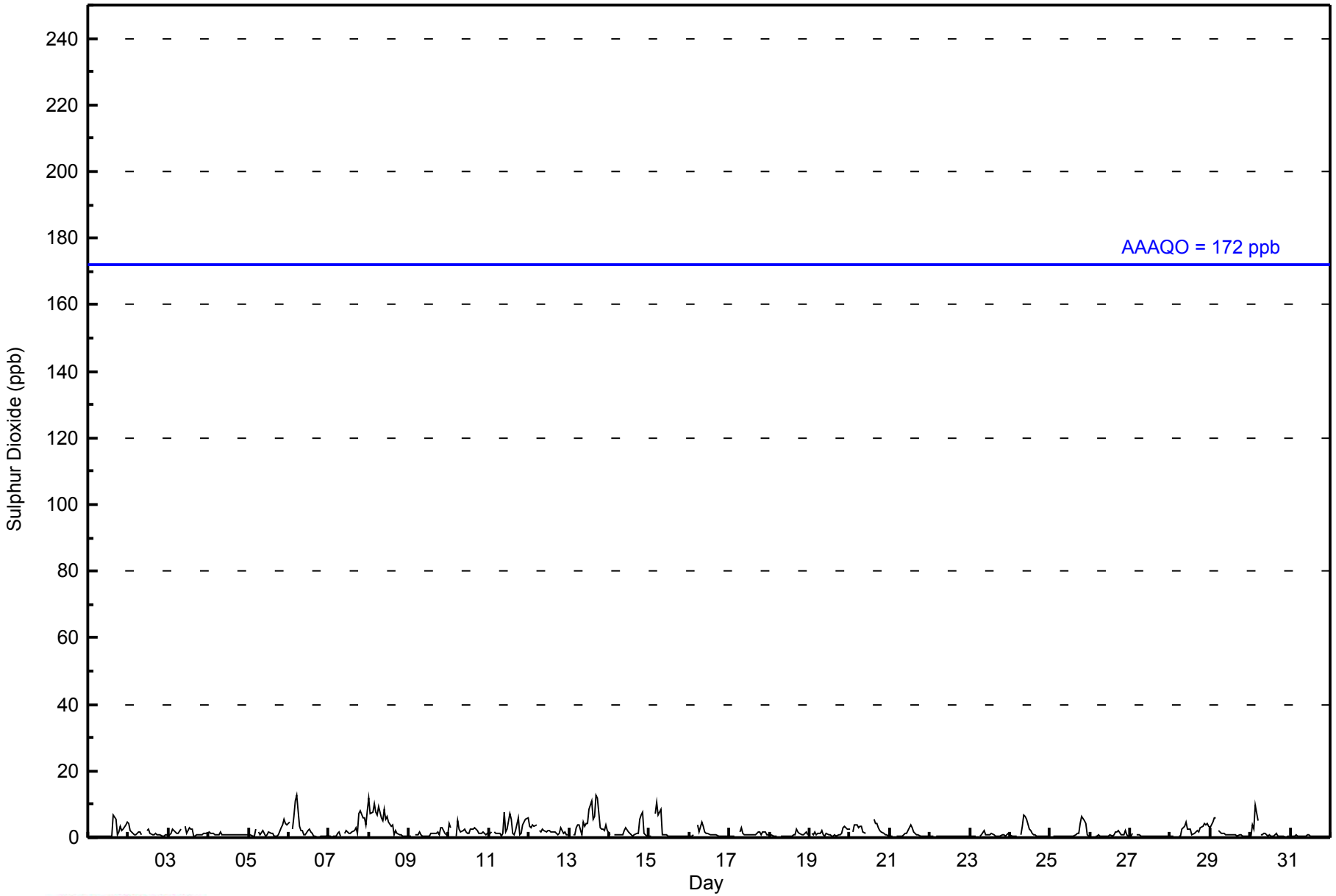
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	690	99.00	99.00
11 - 20	7	1.00	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: 697

Total Number of Hours: 744

WBEA

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - January 2015

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	14	7	7	6	12	22	17	29	23	38	53	133	149	47	49	84	690
11 - 20	0	0	1	0	0	1	1	0	0	0	0	0	0	1	1	2	7
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	7	8	6	12	23	18	29	23	38	53	133	149	48	50	86	697

Total Number of Valid Hours: 697

Total Number of Hours: 744

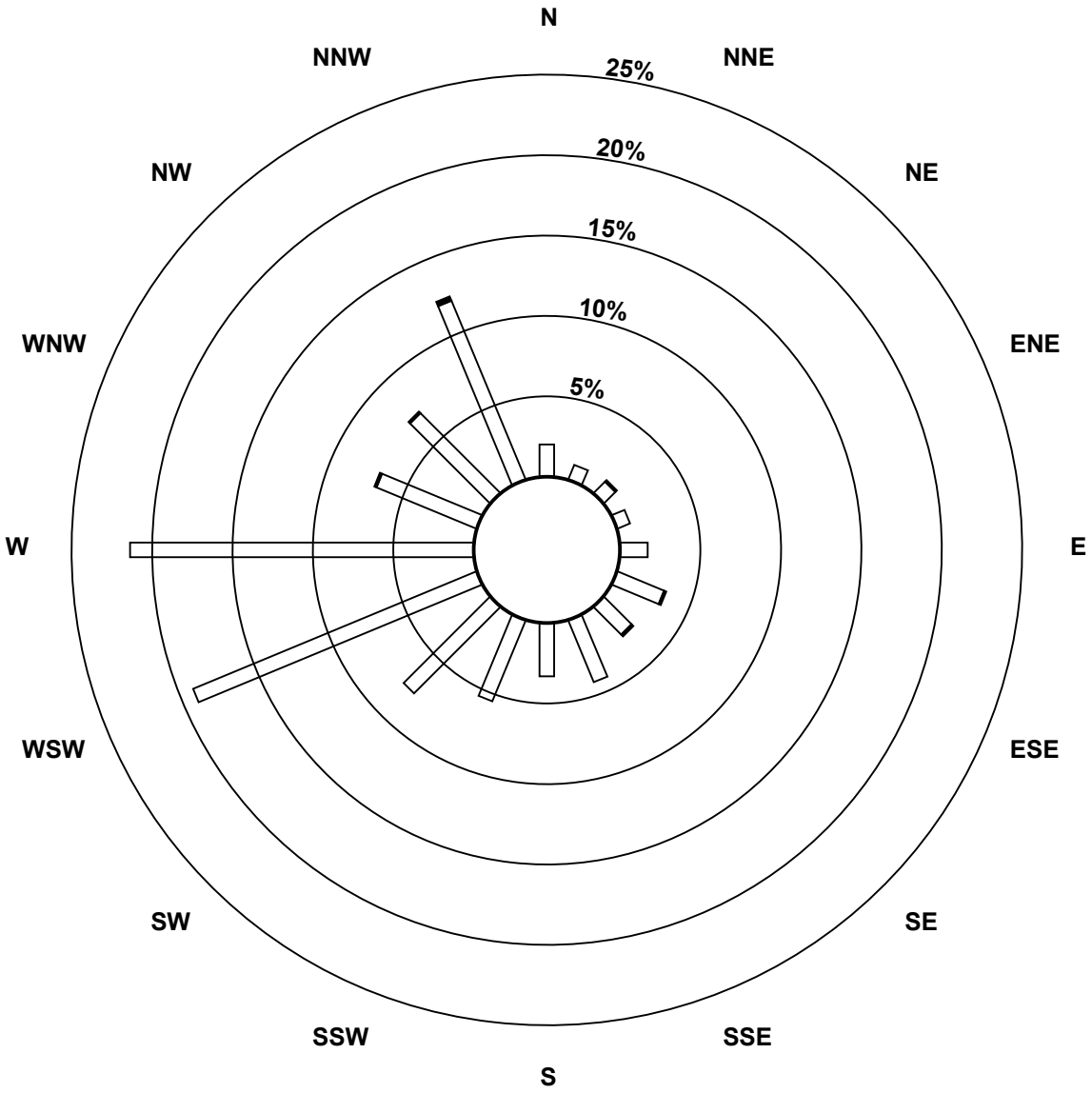
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2015

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)

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

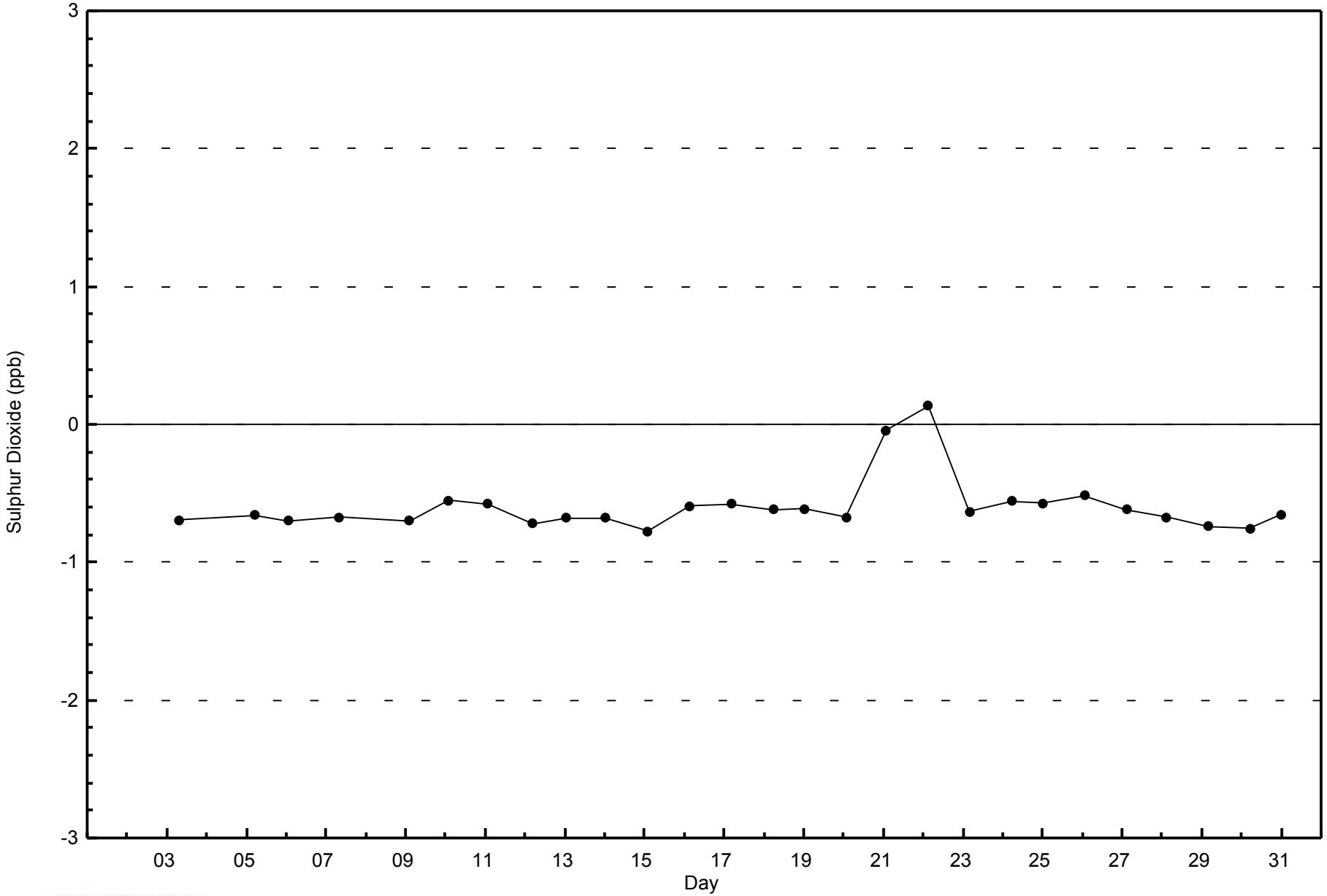
Total Number of Valid Hours: 697

WBEA

Zero Responses

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

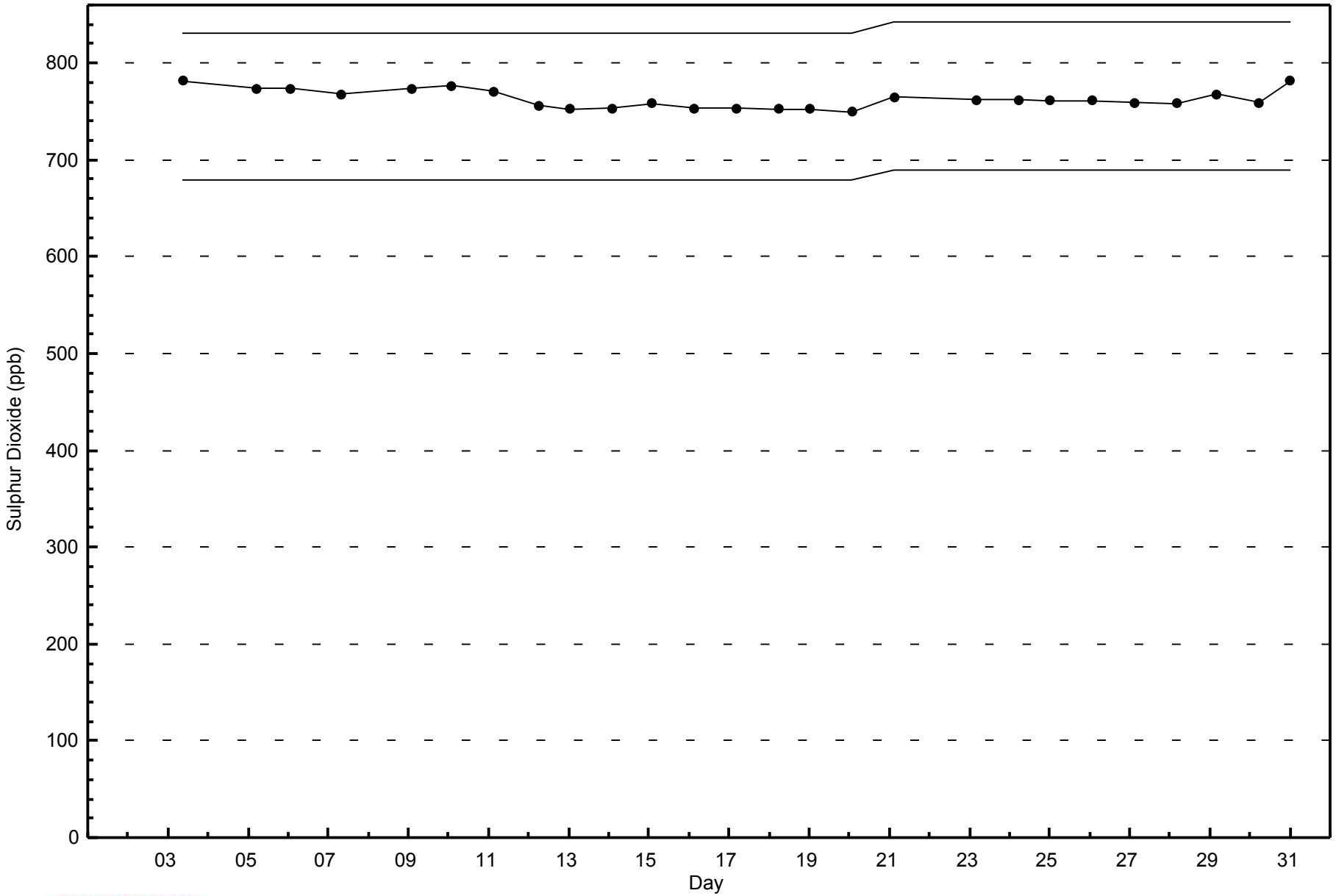
502-12

WBEA

Span Responses

Sulphur Dioxide (SO_2) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 ppb on Jan 11 10:00 Maximum Daily Average: 1.9 ppb on Jan 11

Minimum Value: 0 ppb on Jan 3 17:00 Minimum Daily Average: 0.1 ppb on Jan 4
Maximum Diurnal Average: 0.8 ppb at hour 23 Minimum Diurnal Average: 0.4 ppb at hour 3
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	704
Hours of Missing Data:	40
Hours of Calibration:	34
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-Jan	0	0	0	0	0	0	0	0	0	0	0	Z	0	1	1	1	1	1	0	0	1	2	2	1	0.5	2
2-Jan	1	1	0	1	1	1	1	1	1	1	M	0	0	1	0	0	0	0	0	0	0	0	0	0	0.5	1
3-Jan	0	0	0	0	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
4-Jan	0	0	0	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-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
6-Jan	1	1	Z	1	1	1	2	1	0	0	0	0	0	0	0	0	UO	UO	UO	0	0	0	0	0	0.5	2
7-Jan	0	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0.4	1
8-Jan	1	1	1	1	0	0	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	UO	UO	0	0.4	1
9-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0.4	1
10-Jan	1	1	1	Z	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	1	1	1	0	1	0.4	1
11-Jan	1	1	1	Z	1	1	1	0	1	6	2	2	2	3	1	1	2	5	0	1	3	4	3	2	1.9	6
12-Jan	0	0	0	0	1	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	2	1	1	0	0	0.8	2
13-Jan	1	Z	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	3	1	0.7	3
14-Jan	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0.6	1
15-Jan	1	0	1	Z	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Jan	0	1	1	2	Z	3	2	4	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1.0	4
17-Jan	0	0	0	0	1	Z	0	1	1	0	0	1	1	1	1	1	1	2	1	0	1	1	0	0	0.7	2
18-Jan	0	0	0	0	0	0	Z	0	1	0	0	0	0	0	0	1	1	1	1	1	0	1	2	1	0.5	2
19-Jan	1	Z	0	1	0	1	1	2	1	0	1	1	0	0	1	1	1	1	1	1	3	4	4	3	1.3	4
20-Jan	3	3	Z	1	1	2	1	2	2	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1.0	3
21-Jan	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Jan	0	0	0	0	Z	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0.2	0
23-Jan	0	0	0	0	0	Z	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0.3	1
24-Jan	0	0	0	0	0	1	Z	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.3	1
25-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
26-Jan	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	2	0	1	1	1	1	1	0.5	2
27-Jan	1	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
28-Jan	0	0	0	0	Z	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1	1	0.5	1
29-Jan	0	1	1	1	0	Z	0	0	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0.6	1
30-Jan	1	1	1	1	1	1	Z	1	1	1	1	0	0	0	1	1	1	0	0	1	1	0	1	1	0.6	1
31-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
	0.5	0.5	0.4	0.5	0.5	0.7	0.5	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.4	0.5	0.6	0.7	0.8	0.6	Diurnal Average	
	3	3	1	2	1	3	2	4	3	6	2	2	2	3	1	1	2	5	1	2	3	4	4	3	Diurnal Maximum	

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

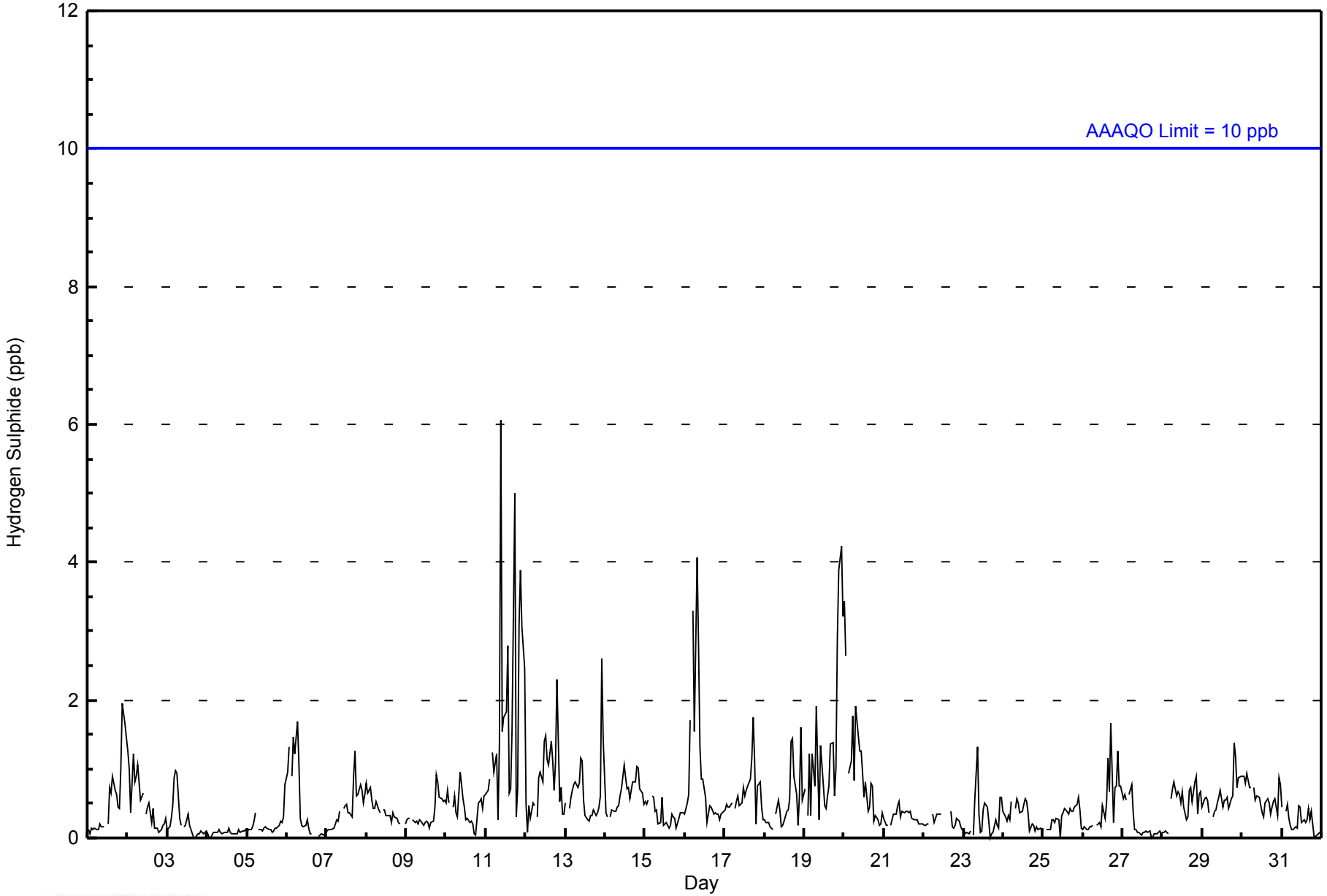
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

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

Total Number of Valid Hours: 704

Total Number of Hours: 744

WBEA

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	15	7	7	6	12	23	18	28	20	33	58	130	145	47	47	92	688
3 - 4	0	0	0	0	0	0	0	1	3	4	0	0	1	1	3	1	14
5 - 7	0	0	0	0	0	0	0	0	1	1	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	15	7	7	6	12	23	18	29	24	38	58	130	146	48	50	93	704

Total Number of Valid Hours: 704

Total Number of Hours: 744

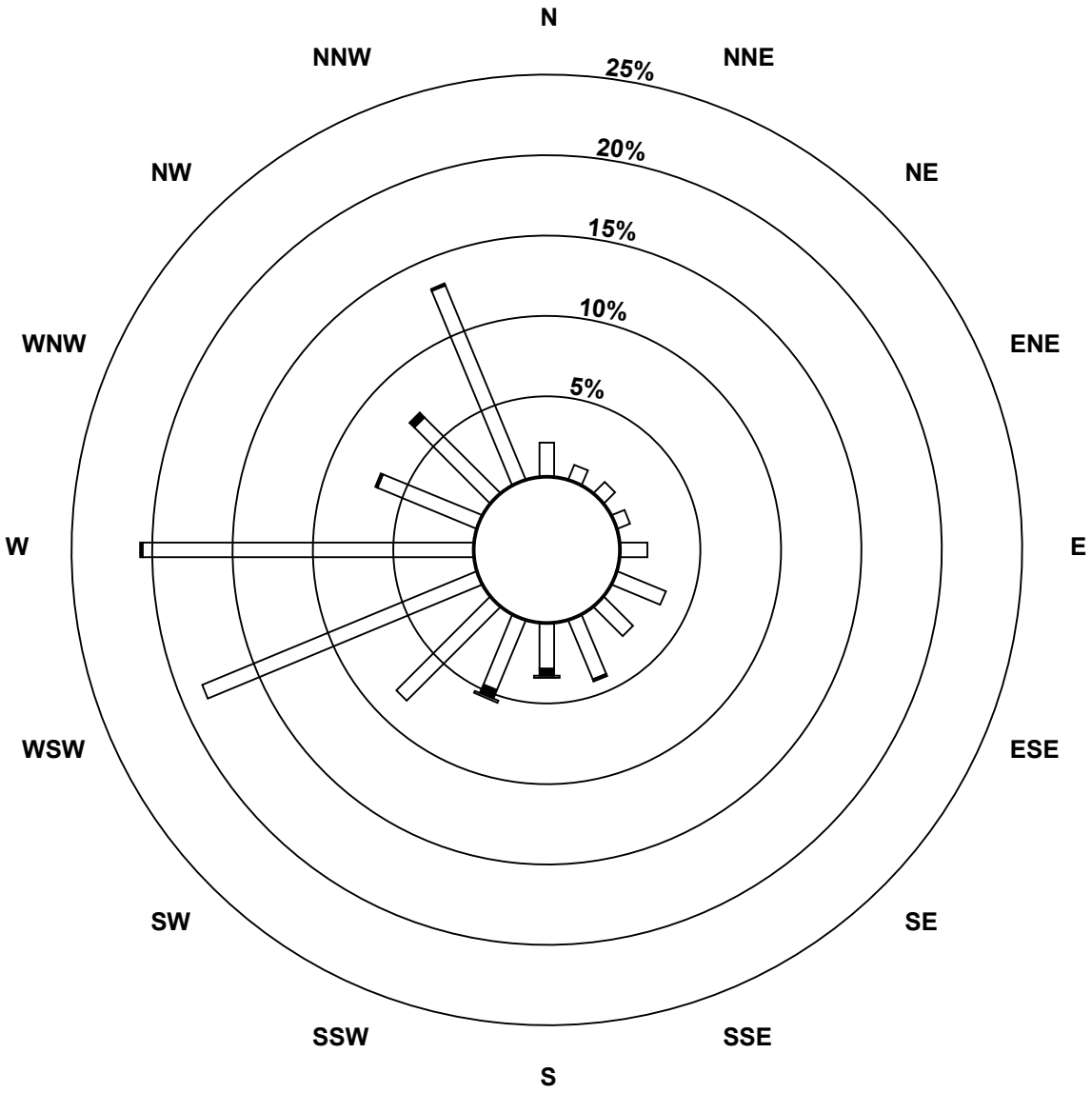
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

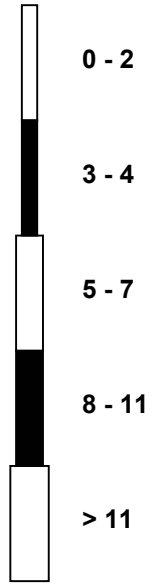
Wind Rose Jan 2015

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



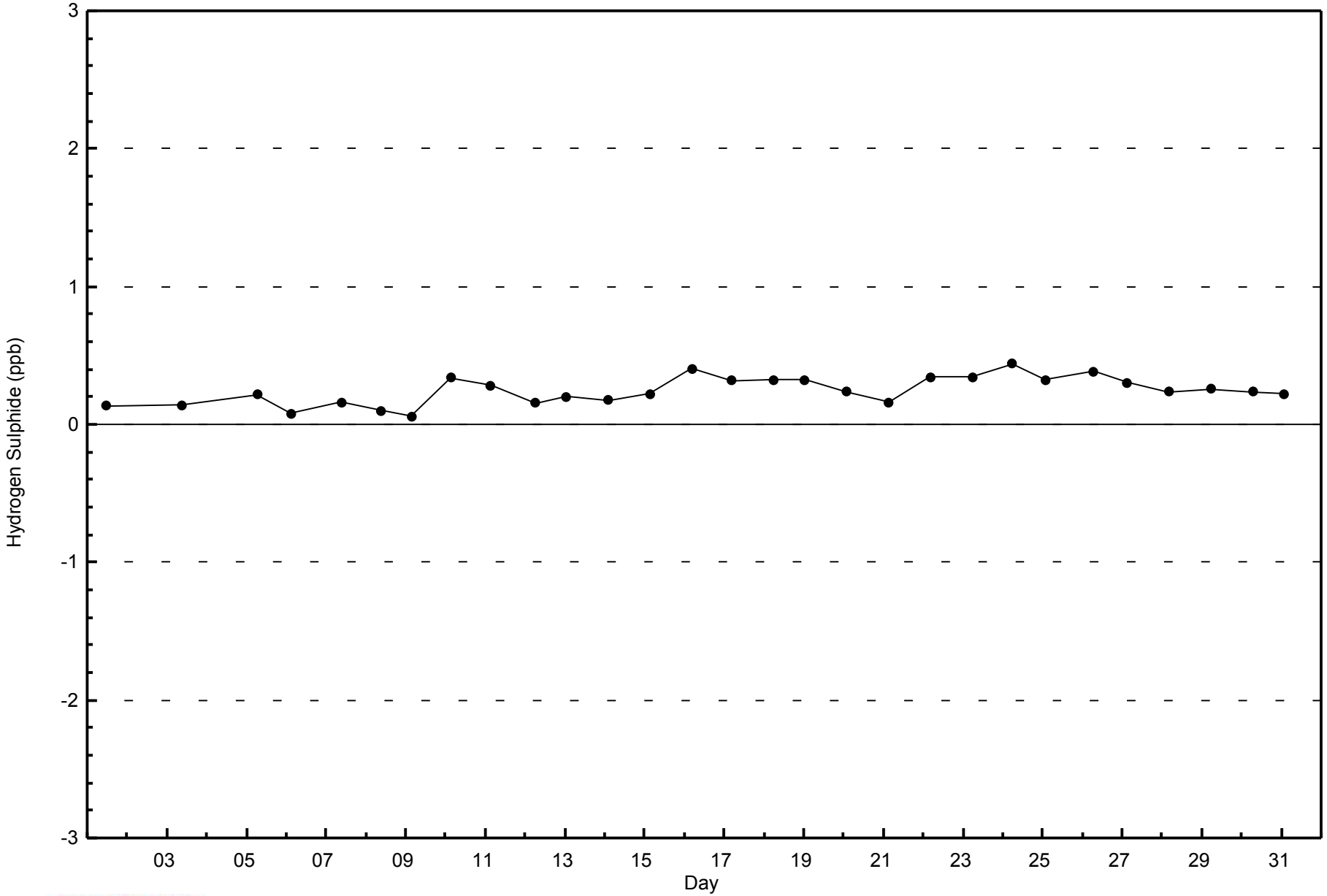
Total Number of Valid Hours: 704

WBEA

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - January 2015



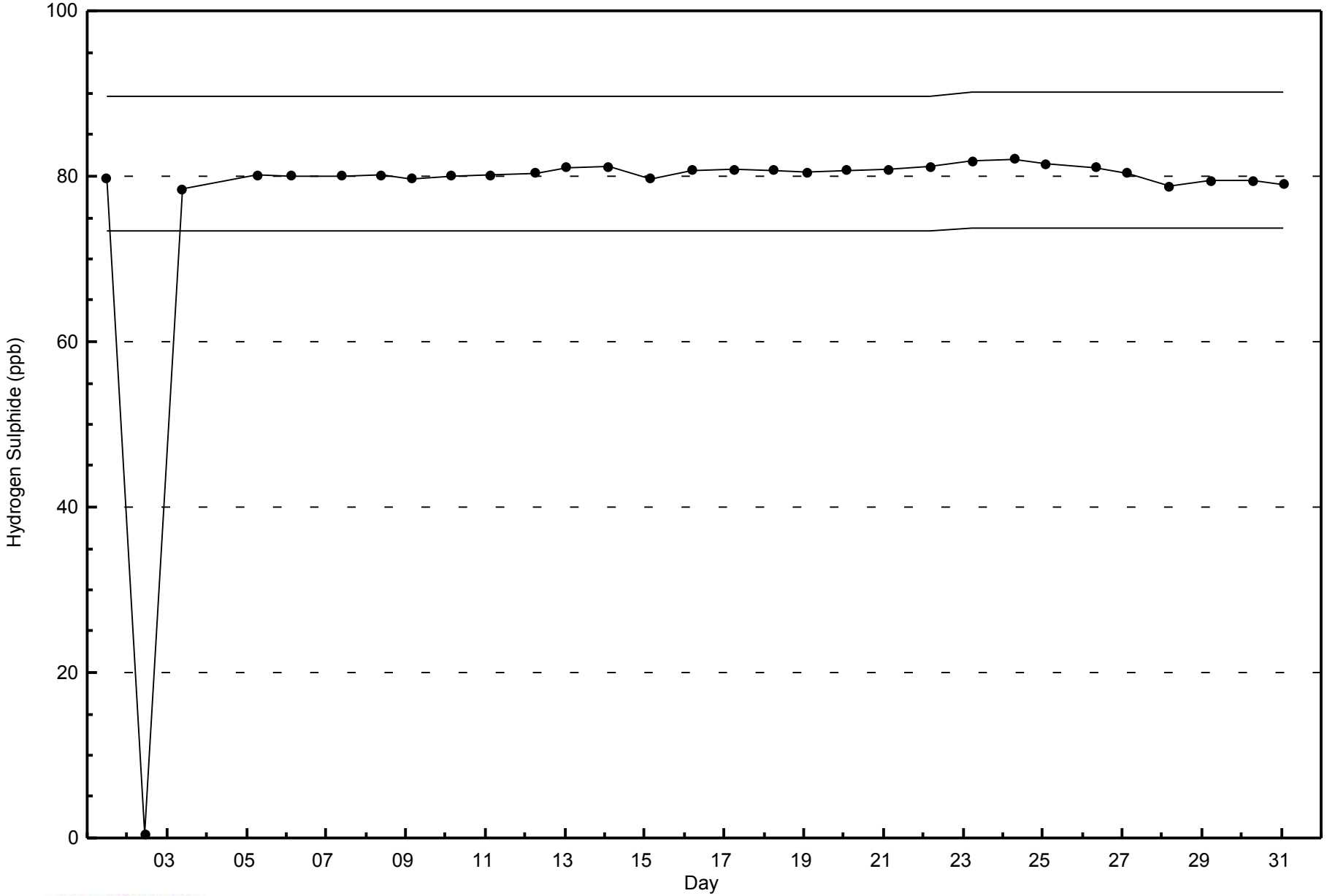
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Hydrogen Sulphide (H_2S) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - January 2015

Maximum Value: 308 ppb on Jan 11 10:00

Maximum Daily Average: 80.8 ppb on Jan 11

Minimum Value: 0 ppb on Jan 3 06:00

Minimum Daily Average: 0.6 ppb on Jan 4

Maximum Diurnal Average: 18.2 ppb at hour 10

Minimum Diurnal Average: 4.5 ppb at hour 1

Monthly Average: 10.4 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 2 $Q_3 = 10$ $P_{90} = 22$ $P_{99} = 136$

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	32
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-Jan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	2	2	1	3	4	1	0	0	1	1.0	4
2-Jan	0	0	0	0	0	1	2	2	1	M	M	2	3	2	1	1	1	1	1	0	1	1	1	1	1.0	3
3-Jan	0	2	4	3	1	0	0	2	Z	1	1	2	5	4	2	0	1	1	0	0	0	1	1	1	1.3	5
4-Jan	1	0	0	1	1	1	1	2	0	1	0	1	1	2	1	1	0	0	0	0	0	0	0	0	0.6	2
5-Jan	0	0	0	1	5	Z	2	1	3	1	0	1	1	1	1	0	0	1	1	4	4	5	5	2	1.6	5
6-Jan	2	Z	0	1	0	2	0	0	1	1	2	4	4	2	2	1	0	0	0	0	0	0	0	0	1.0	4
7-Jan	0	1	1	1	1	1	1	1	Z	4	6	7	7	2	2	2	8	2	11	6	7	10	6	12	4.3	12
8-Jan	20	11	16	16	11	12	15	9	9	13	8	9	6	6	6	3	4	2	2	1	1	1	0	0	7.5	20
9-Jan	1	0	Z	1	2	0	0	0	0	1	0	1	2	3	2	2	3	6	2	1	1	1	2	5	1.6	6
10-Jan	1	2	Z	5	5	7	3	3	21	16	10	6	2	4	2	3	3	1	1	17	17	18	13	19	7.9	21
11-Jan	22	25	Z	42	43	36	43	0	49	308	58	69	91	107	20	24	76	246	7	23	142	175	141	109	80.8	308
12-Jan	17	0	17	5	12	Z	8	0	29	30	30	55	57	41	38	50	34	21	38	103	16	25	6	8	27.9	103
13-Jan	Z	14	12	19	21	22	16	2	2	4	4	1	1	1	2	5	3	5	2	3	3	7	101	48	12.9	101
14-Jan	5	Z	3	2	3	3	4	7	10	13	13	3	3	3	3	6	13	2	1	1	1	2	3	2	4.6	13
15-Jan	1	0	Z	2	5	1	1	1	1	2	19	2	3	3	2	6	8	7	7	1	4	3	3	6	3.8	19
16-Jan	3	14	20	Z	52	138	57	185	119	46	22	23	15	7	7	11	6	2	5	5	3	4	6	6	32.9	185
17-Jan	7	11	10	7	Z	12	11	13	14	11	13	22	15	21	23	26	41	75	40	4	23	37	4	1	19.2	75
18-Jan	1	1	1	1	1	Z	10	3	5	7	4	1	2	8	11	21	46	57	22	15	1	23	66	19	14.2	66
19-Jan	Z	28	11	45	0	40	31	69	24	5	48	14	8	6	5	4	4	17	10	11	74	119	80	69	31.4	119
20-Jan	36	Z	2	2	3	14	3	31	3	9	2	2	2	4	4	6	13	9	1	2	1	1	0	2	6.5	36
21-Jan	0	0	Z	0	0	1	2	2	5	7	C	C	C	C	C	2	1	0	0	0	0	0	0	0	1.3	7
22-Jan	0	0	1	Z	13	5	0	3	7	7	10	9	5	6	8	9	9	2	2	3	7	6	4	1	5.1	13
23-Jan	0	0	0	0	Z	0	0	27	53	8	0	1	15	17	16	7	1	0	0	6	1	0	20	16	8.2	53
24-Jan	1	1	1	1	3	Z	12	12	16	14	15	11	18	21	17	13	3	5	2	0	0	0	0	0	7.2	21
25-Jan	Z	2	0	0	0	0	0	1	1	0	5	8	7	9	10	9	12	11	12	13	15	21	12	0	6.6	21
26-Jan	0	Z	0	0	0	0	0	1	1	2	5	1	15	9	17	53	26	67	0	22	17	1	0	0	10.3	67
27-Jan	0	0	Z	0	1	0	0	1	1	1	1	1	2	1	1	1	1	1	0	0	0	1	1	1	0.7	2
28-Jan	1	0	0	Z	0	1	1	22	17	23	21	11	16	2	3	3	2	3	5	1	10	1	9	6	6.8	23
29-Jan	3	5	6	4	Z	3	3	3	5	8	12	16	6	12	15	13	5	8	12	4	1	2	4	0	6.5	16
30-Jan	1	5	0	2	0	Z	2	1	1	2	2	2	2	3	3	2	1	1	0	0	0	0	0	0	1.3	5
31-Jan	Z	10	10	15	3	2	1	1	2	2	16	9	3	5	4	6	9	4	5	1	0	0	1	1	4.8	16
	4.5	5.0	4.6	6.2	6.7	11.6	7.4	13.1	13.7	18.2	11.3	9.9	10.6	10.4	7.7	9.4	10.8	17.9	6.3	8.1	11.4	15.1	15.8	10.8	Diurnal Average	
	36	28	20	45	52	138	57	185	119	308	58	69	91	107	38	53	76	246	40	103	142	175	141	109	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

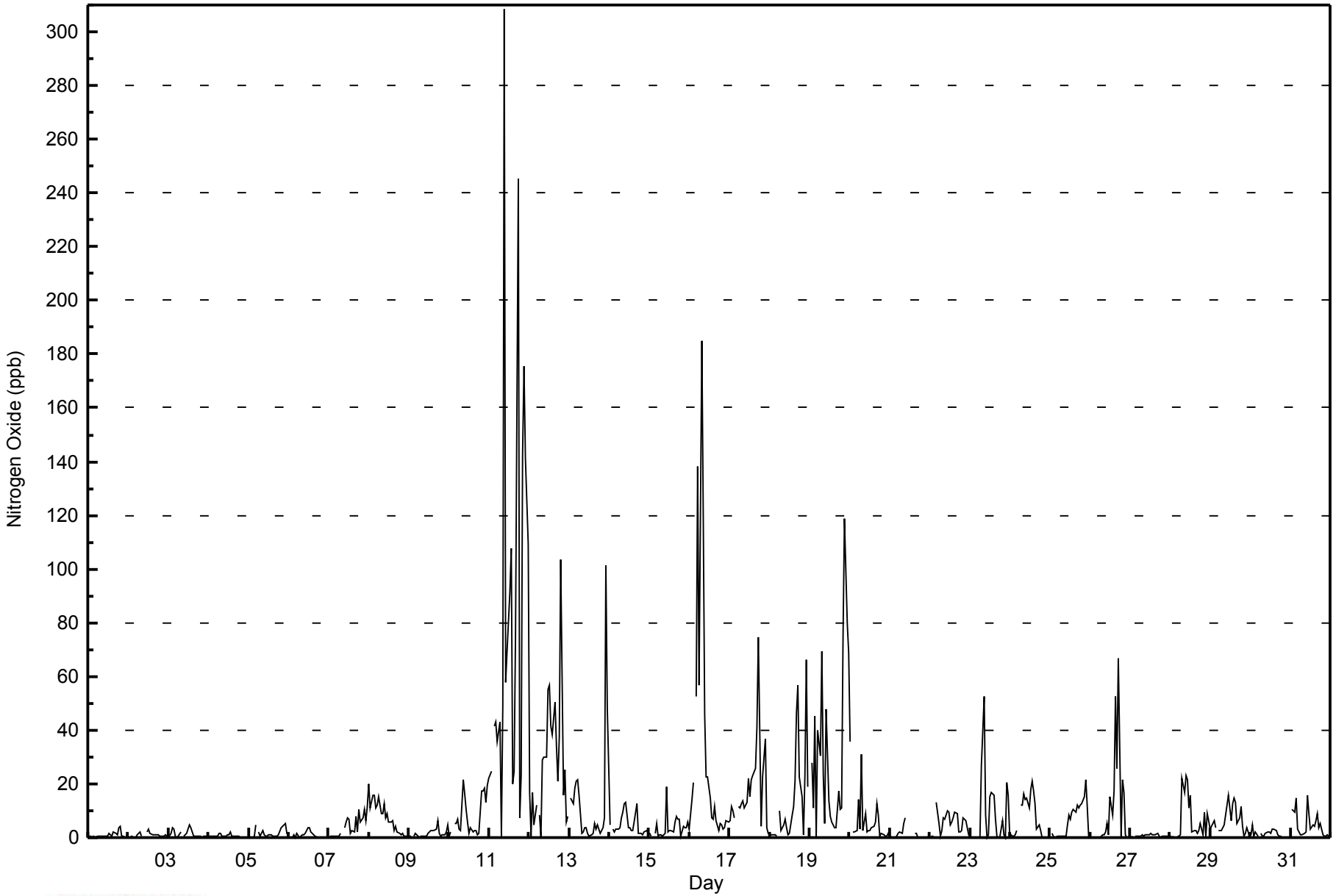
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	625	88.03	88.03
21 - 40	42	5.92	93.94
11 - 80	29	4.08	98.03
81 - 159	10	1.41	99.44
> 159	4	0.56	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - January 2015

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	15	7	8	6	12	23	17	26	14	25	51	125	119	41	45	91	625
21 - 40	0	0	0	0	0	0	1	0	1	2	4	9	15	7	3	0	42
11 - 80	0	0	0	0	0	0	0	1	3	2	2	1	17	1	2	0	29
81 - 159	0	0	0	0	0	0	0	2	2	5	0	0	1	0	0	0	10
> 159	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	4
Totals	15	7	8	6	12	23	18	29	22	36	57	135	152	49	50	91	710

Total Number of Valid Hours: 710

Total Number of Hours: 744

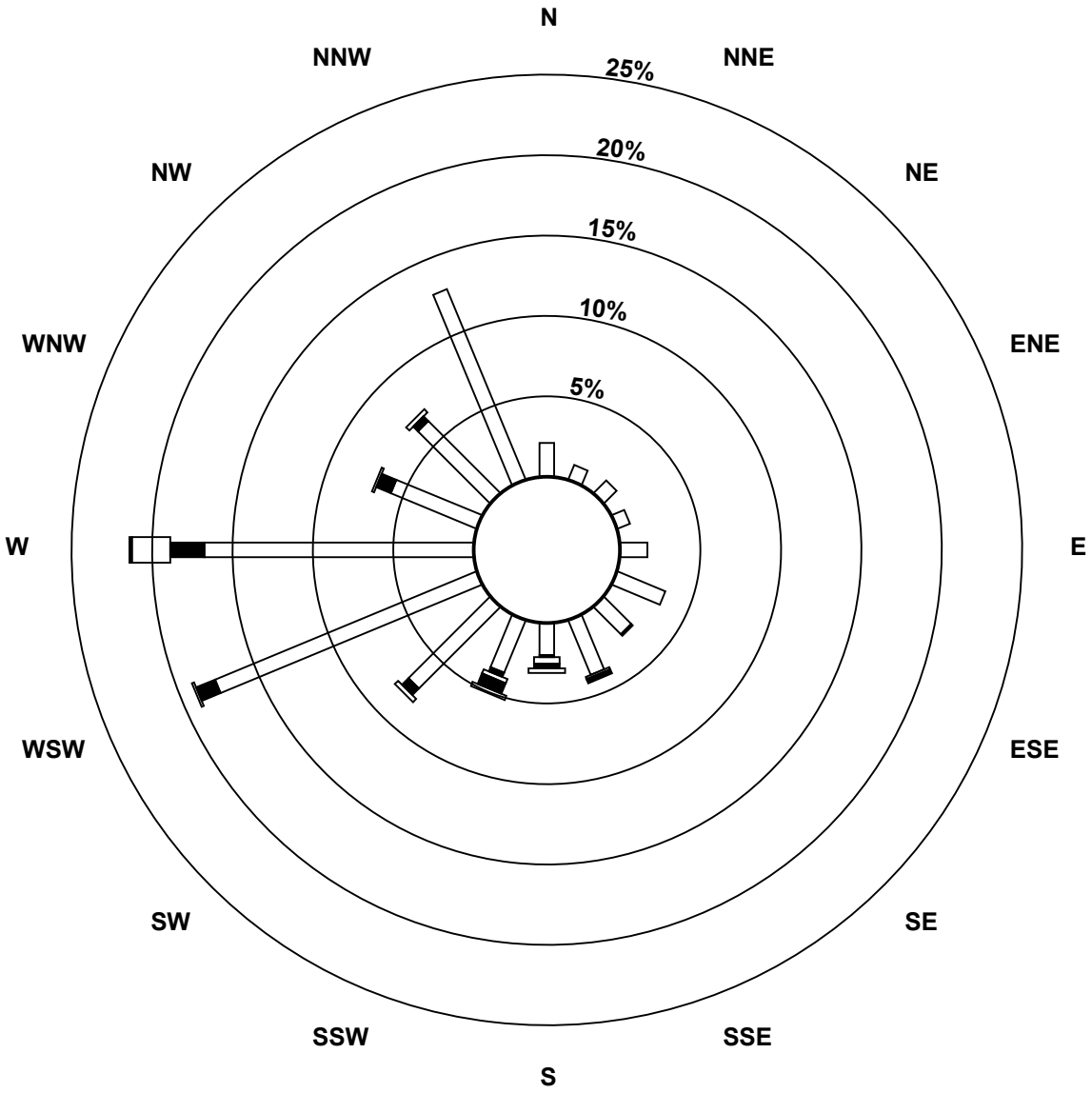
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

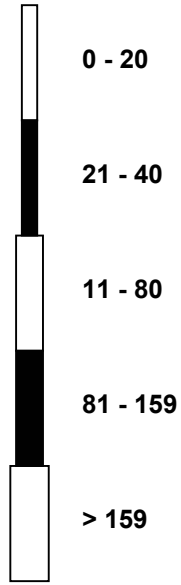
Wind Rose Jan 2015

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



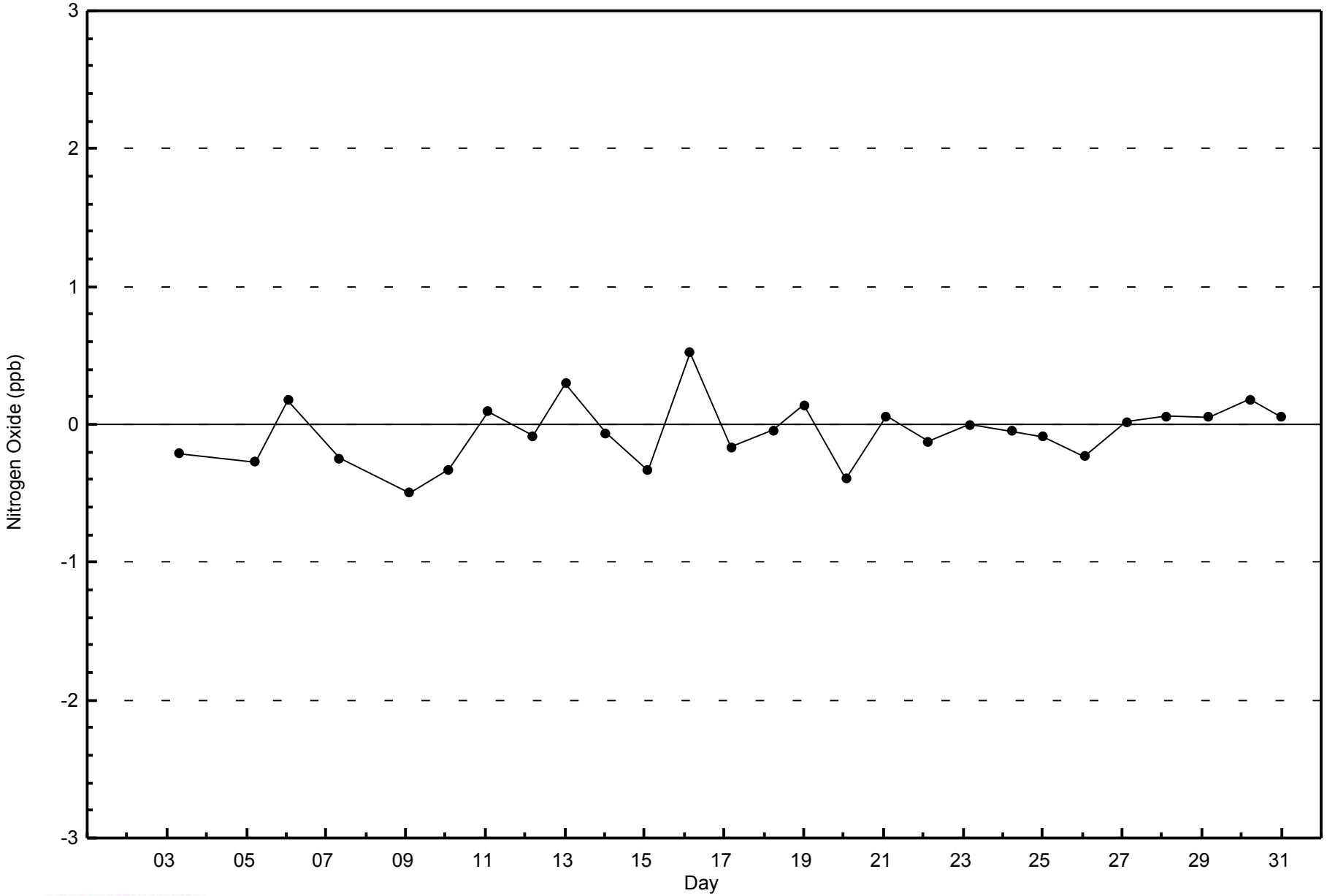
Total Number of Valid Hours: 710

WBEA

Zero Responses

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - January 2015



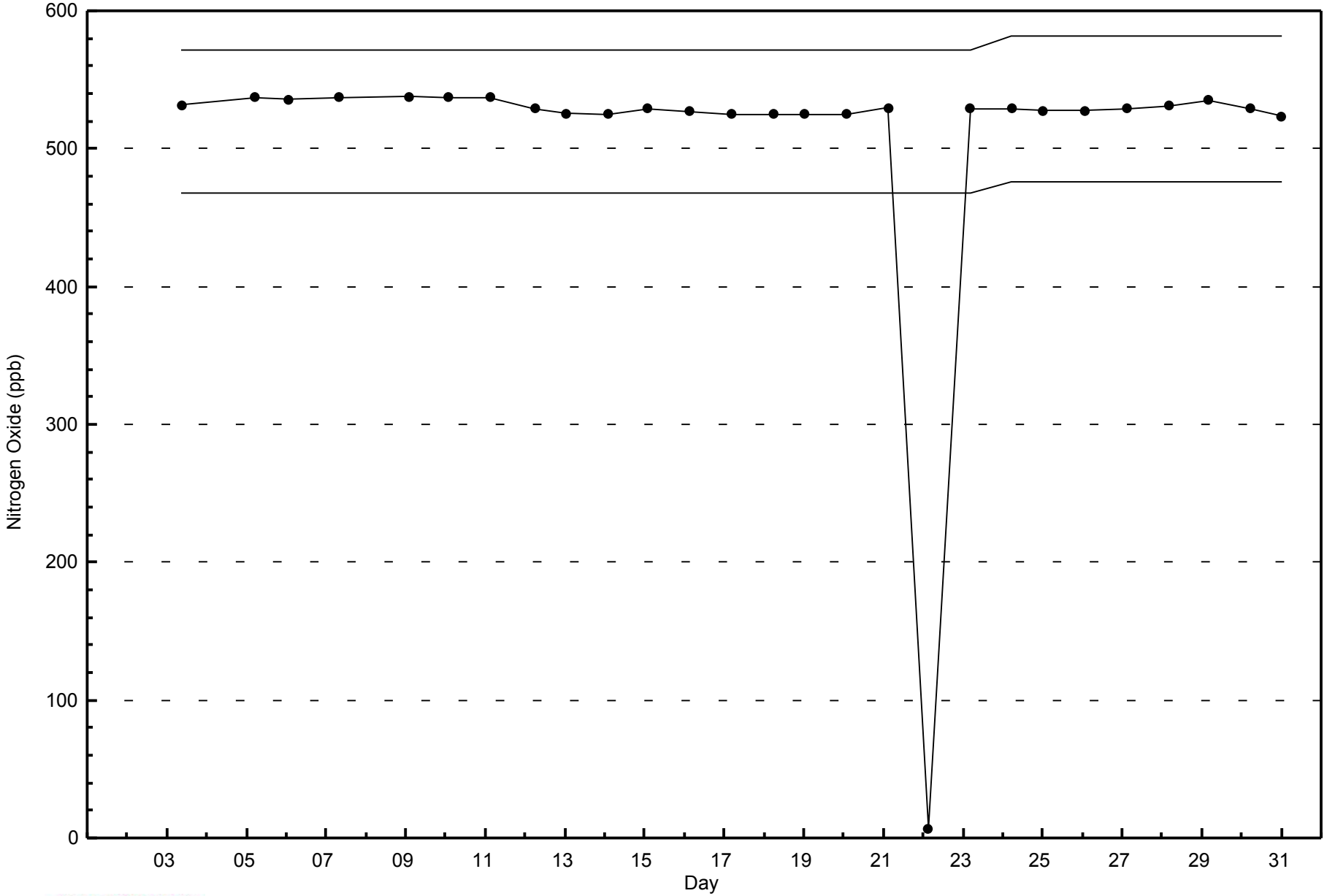
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxide (NO) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - January 2015

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 38 ppb on Jan 19 23:00 Maximum Daily Average: 19.5 ppb on Jan 19

Minimum Value: 0 ppb on Jan 6 21:00
Maximum Diurnal Average: 9.5 ppb at hour 17
Monthly Average: 7.3 ppb

Minimum Daily Average: 1.5 ppb on Jan 4
Minimum Diurnal Average: 5.6 ppb at hour 2
Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 5 $Q_3 = 11$ $P_{90} = 16$ $P_{99} = 30$

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	32
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-Jan	1	1	1	2	1	1	2	5	1	3	1	2	4	3	2	14	13	4	4	5	4	5	5	6	3.7	14
2-Jan	5	5	5	3	3	4	3	4	3	M	M	6	5	4	4	5	4	4	4	3	4	3	3	2	3.8	6
3-Jan	3	3	5	5	6	7	7	9	Z	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	3.5	9
4-Jan	2	2	1	2	2	2	2	3	1	1	1	1	2	3	2	1	1	1	1	1	1	1	1	1	1.5	3
5-Jan	1	1	1	1	4	Z	3	2	3	2	2	2	2	3	2	2	2	2	2	3	5	5	5	4	2.5	5
6-Jan	6	Z	7	9	11	13	9	9	10	7	4	4	4	3	3	4	1	2	1	1	0	1	1	2	4.8	13
7-Jan	1	3	4	4	3	7	6	7	Z	12	11	11	13	6	6	6	12	7	12	11	11	8	6	9	7.6	13
8-Jan	12	8	11	7	7	7	7	4	5	6	6	6	5	4	5	4	4	4	3	3	3	1	1	1	5.1	12
9-Jan	2	1	Z	1	2	1	2	1	1	1	1	2	4	5	5	7	8	10	8	8	7	8	8	8	4.4	10
10-Jan	6	7	Z	13	12	14	13	12	29	23	15	8	3	5	5	10	8	5	4	10	12	10	7	11	10.5	29
11-Jan	12	16	Z	16	21	13	16	5	28	14	16	24	13	26	12	25	18	36	6	16	8	35	27	24	18.5	36
12-Jan	8	4	6	6	11	Z	8	7	15	17	10	17	25	13	17	26	21	15	21	26	11	8	5	5	13.1	26
13-Jan	Z	8	9	9	12	13	13	4	13	17	14	8	5	5	5	7	9	8	6	7	12	17	30	17	10.8	30
14-Jan	3	Z	2	2	3	2	3	4	6	7	9	11	8	5	6	9	12	9	12	16	15	8	6	6	6.9	16
15-Jan	5	3	Z	7	6	6	6	5	3	5	5	3	2	4	3	7	6	5	5	4	5	10	10	10	5.5	10
16-Jan	11	5	7	Z	18	28	14	23	11	7	13	11	7	4	4	4	4	2	3	1	2	3	2	3	8.0	28
17-Jan	2	4	3	3	Z	5	6	7	8	5	4	10	6	10	12	11	14	18	8	2	14	14	4	8	7.7	18
18-Jan	8	6	7	3	4	Z	7	15	17	10	4	2	1	4	5	7	22	17	18	11	2	10	22	6	8.9	22
19-Jan	Z	16	5	14	11	21	8	35	22	10	23	18	11	14	12	13	16	20	16	24	34	37	38	32	19.5	38
20-Jan	28	Z	17	21	25	26	20	17	12	12	6	4	5	5	7	12	26	24	6	8	5	4	5	15	13.5	28
21-Jan	4	1	Z	1	2	7	10	10	13	13	C	C	C	C	C	5	7	4	3	2	2	1	1	1	4.6	13
22-Jan	0	0	1	Z	6	1	2	3	2	2	4	7	2	2	2	4	4	2	1	1	2	3	1	1	2.2	7
23-Jan	1	1	1	1	Z	1	1	8	22	6	1	1	7	5	5	3	2	1	1	3	2	1	11	12	4.1	22
24-Jan	14	6	9	11	5	Z	5	5	7	8	6	6	2	7	7	4	1	2	2	1	1	1	1	1	4.8	14
25-Jan	Z	2	2	1	3	5	4	2	1	1	2	2	2	4	5	4	5	7	4	7	6	7	3	1	3.5	7
26-Jan	1	Z	1	1	1	1	1	1	1	1	2	1	7	4	4	12	19	23	1	11	7	18	8	5	5.6	23
27-Jan	3	4	Z	5	4	4	3	2	2	3	2	2	2	2	2	2	2	2	1	2	1	1	1	1	2.3	5
28-Jan	1	1	1	Z	3	1	7	12	13	14	8	7	9	4	6	9	10	10	11	11	15	12	20	23	9.0	23
29-Jan	16	19	20	16	Z	11	11	12	14	14	13	16	10	15	15	19	15	21	14	13	7	6	6	7	13.5	21
30-Jan	13	15	15	15	8	Z	7	6	5	5	5	4	3	4	6	6	5	3	4	5	5	4	5	6	6.7	15
31-Jan	Z	10	13	17	10	11	9	8	6	6	11	11	4	6	6	12	21	18	21	3	2	2	5	4	9.3	21
	6.2	5.6	6.1	6.9	7.2	8.1	6.9	7.9	9.4	7.7	6.9	7.0	5.8	6.0	5.8	8.2	9.5	9.2	6.6	7.1	6.7	7.9	8.0	7.4	Diurnal Average	
	28	19	20	21	25	28	20	35	29	23	23	24	25	26	17	26	26	36	21	26	34	37	38	32	Diurnal Maximum	

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

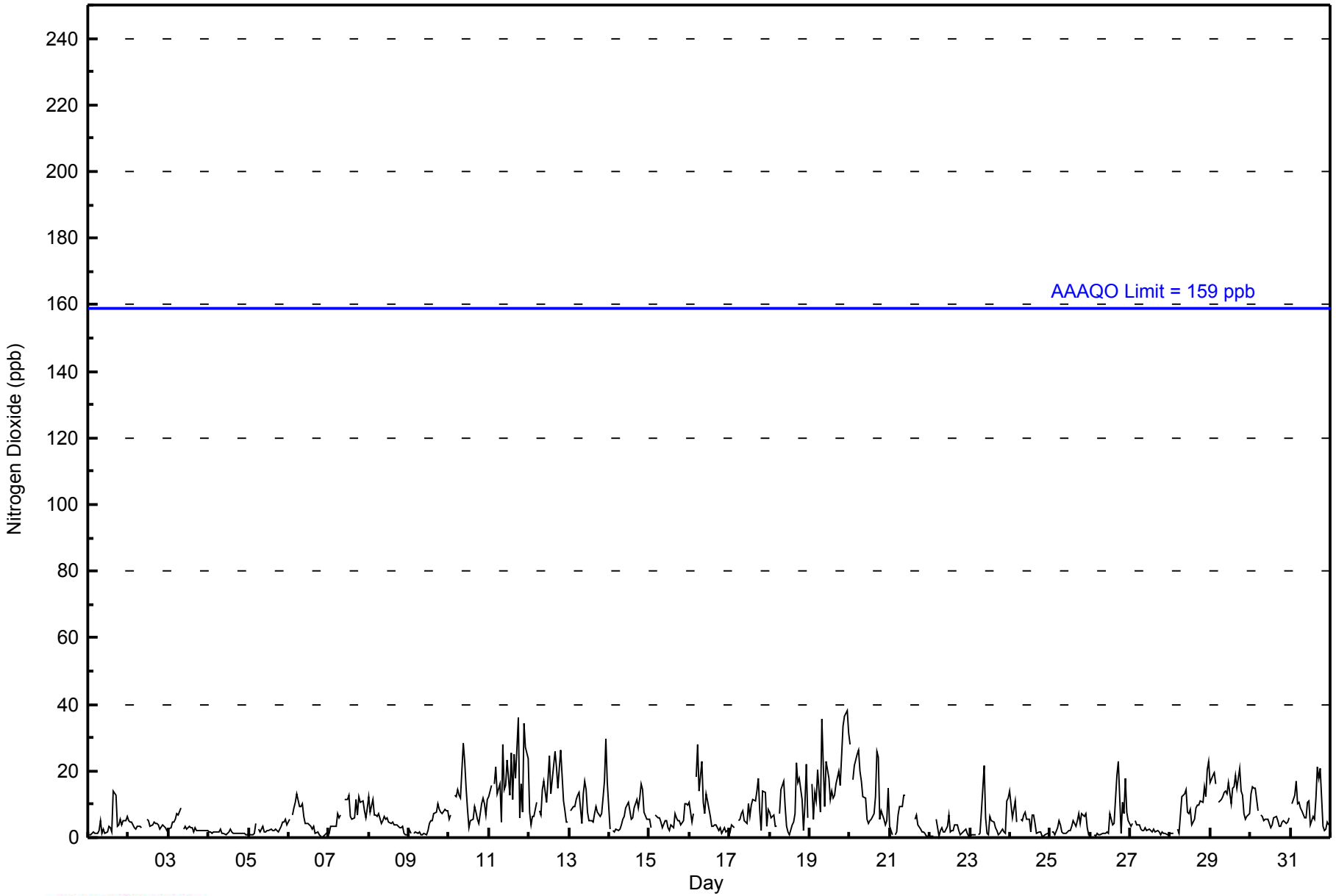
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	668	94.08	94.08
21 - 40	42	5.92	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: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - January 2015

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	7	8	6	12	23	17	25	14	30	55	135	139	48	47	88	668
21 - 40	1	0	0	0	0	0	1	4	8	6	2	0	13	1	3	3	42
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	15	7	8	6	12	23	18	29	22	36	57	135	152	49	50	91	710

Total Number of Valid Hours: 710

Total Number of Hours: 744

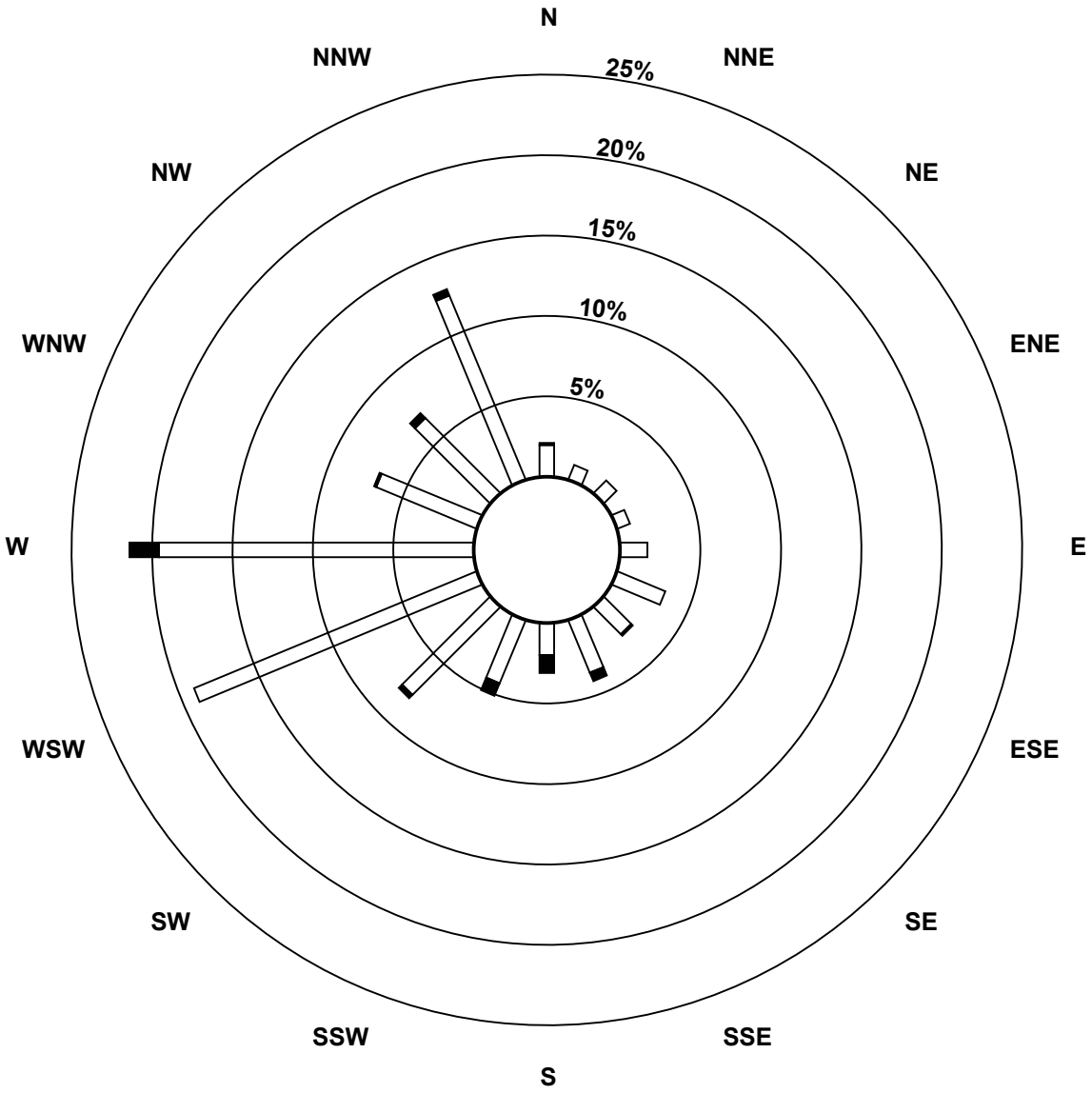
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

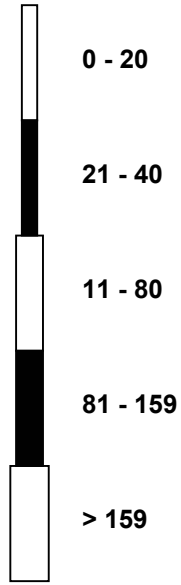
Wind Rose Jan 2015

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



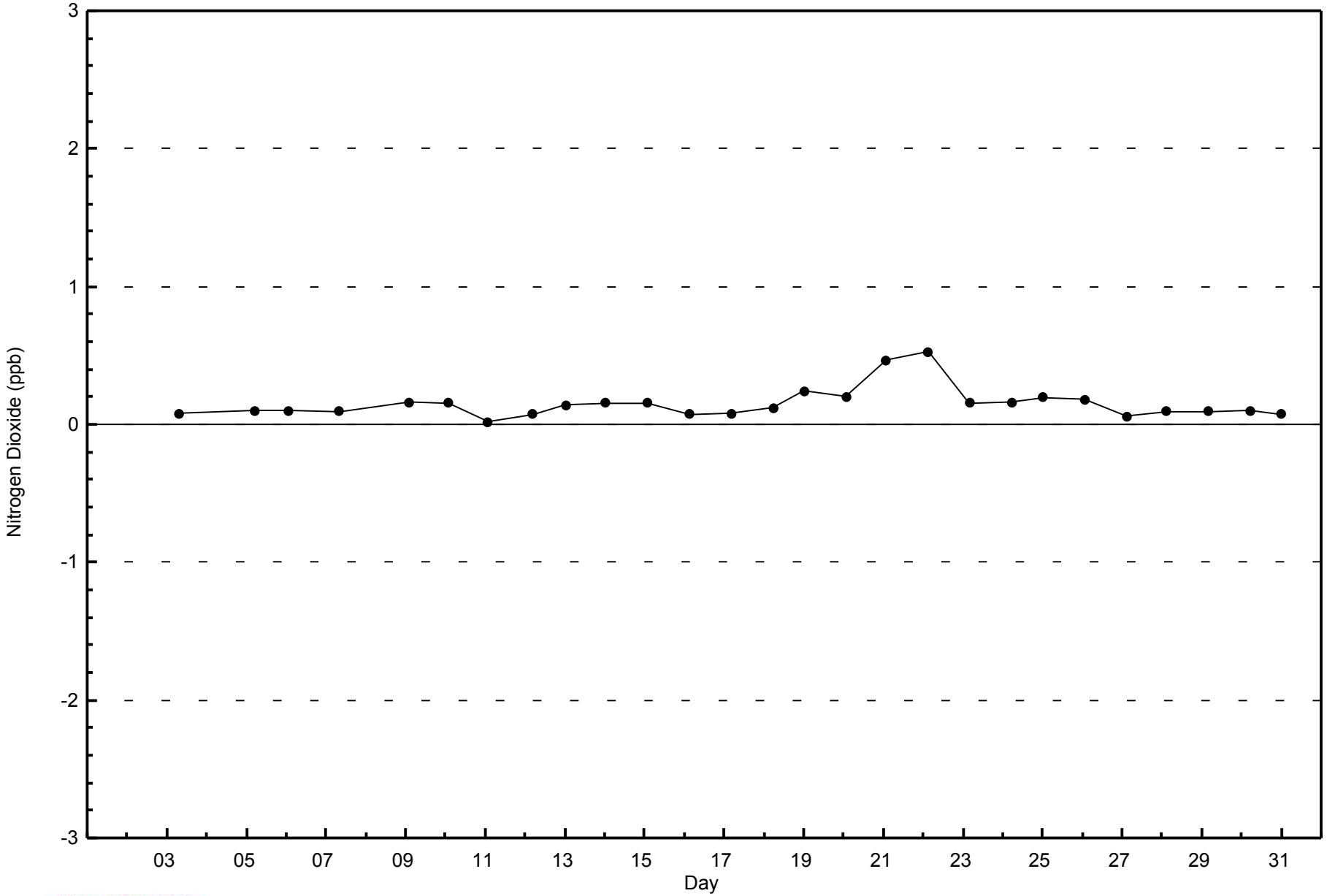
Total Number of Valid Hours: 710

WBEA

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - January 2015



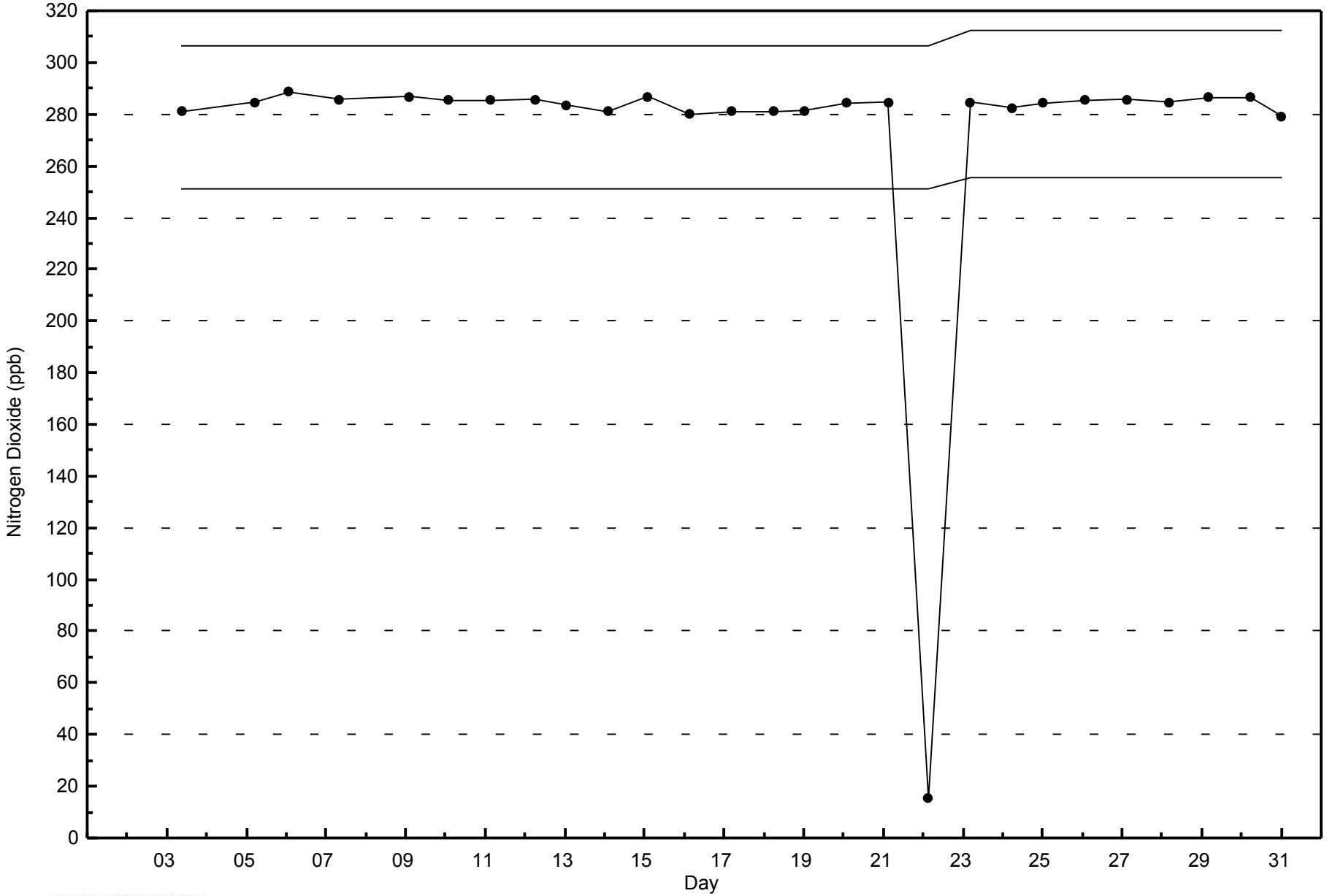
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Dioxide (NO_2) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

ConocoPhillips - Surmont - January 2015

Maximum Value: 323 ppb on Jan 11 10:00

Maximum Daily Average: 99.2 ppb on Jan 11

Minimum Value: 0 ppb on Jan 6 21:00

Minimum Daily Average: 2.1 ppb on Jan 4

Maximum Diurnal Average: 27.1 ppb at hour 18

Minimum Diurnal Average: 10.6 ppb at hour 2

Monthly Average: 17.7 ppb

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 8 $Q_3 = 19$ $P_{90} = 36$ $P_{99} = 149$

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	32
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-Jan	1	1	1	2	1	2	3	6	2	3	2	3	5	4	2	16	14	4	8	10	4	5	5	7	4.7	16
2-Jan	5	5	5	3	3	5	5	5	4	M	M	8	8	5	5	6	5	5	5	3	5	4	4	3	4.8	8
3-Jan	3	5	8	7	6	7	7	11	Z	3	4	4	8	7	5	2	4	3	3	3	2	3	3	3	4.8	11
4-Jan	2	2	2	2	2	2	3	4	2	2	1	2	2	5	2	2	2	2	2	1	1	1	1	1	2.1	5
5-Jan	1	1	1	2	9	Z	5	3	6	3	2	3	3	3	3	2	3	3	3	7	9	10	11	5	4.2	11
6-Jan	7	Z	7	10	11	15	9	10	11	8	6	8	8	6	4	5	1	2	1	0	0	1	1	2	5.8	15
7-Jan	1	4	4	4	4	8	6	8	Z	15	17	19	20	8	8	8	19	9	23	17	18	19	12	21	11.8	23
8-Jan	32	19	27	22	18	19	23	13	14	19	13	15	11	10	11	6	8	6	5	4	5	2	1	1	12.6	32
9-Jan	3	2	Z	2	3	1	2	1	1	2	1	4	6	8	8	10	10	16	10	8	8	10	10	13	6.0	16
10-Jan	6	9	Z	18	17	21	16	14	50	39	25	14	5	9	7	12	10	6	6	27	29	28	20	30	18.3	50
11-Jan	34	40	Z	58	64	49	59	5	77	323	73	93	104	133	31	49	93	281	13	39	150	210	168	133	99.2	323
12-Jan	25	4	23	11	23	Z	16	7	43	47	40	73	81	55	56	76	55	36	58	130	27	33	11	12	41.0	130
13-Jan	Z	22	22	28	33	35	29	6	15	21	18	9	6	6	6	13	12	12	8	10	15	24	131	65	23.7	131
14-Jan	7	Z	5	4	6	6	6	11	15	19	22	14	11	8	9	14	24	11	13	18	16	10	8	7	11.5	24
15-Jan	7	3	Z	8	12	7	7	6	4	6	24	5	5	6	5	13	14	12	12	5	10	14	14	15	9.3	24
16-Jan	14	19	28	Z	71	166	70	208	129	53	36	34	21	11	11	15	10	4	8	6	5	7	8	8	40.9	208
17-Jan	8	15	13	10	Z	17	17	20	22	16	18	32	22	31	35	37	55	93	48	6	36	50	7	10	26.9	93
18-Jan	9	7	7	4	4	Z	17	17	22	16	7	3	3	12	16	28	68	73	40	27	3	33	88	25	23.1	88
19-Jan	Z	44	17	59	11	60	38	105	46	15	71	32	19	20	16	16	20	38	26	36	107	155	118	100	50.9	155
20-Jan	64	Z	19	23	28	40	23	48	15	21	8	7	7	9	11	18	38	33	6	10	6	5	5	17	20.1	64
21-Jan	4	1	Z	1	2	8	12	11	18	20	C	C	C	C	C	7	8	4	3	2	2	1	1	1	5.8	20
22-Jan	1	1	1	Z	19	6	2	5	9	8	13	16	6	8	10	13	13	4	3	4	9	9	5	2	7.3	19
23-Jan	1	1	1	1	Z	1	1	34	74	14	1	2	22	22	20	10	3	1	1	9	3	1	31	28	12.3	74
24-Jan	15	7	9	12	7	Z	17	17	23	22	20	17	19	28	24	17	4	7	4	0	1	1	1	1	12.0	28
25-Jan	Z	3	2	1	3	6	4	2	2	1	7	11	9	13	16	13	17	18	16	20	21	29	15	1	10.0	29
26-Jan	1	Z	1	1	1	1	1	3	3	4	7	2	22	12	21	64	45	89	2	32	24	19	8	5	16.0	89
27-Jan	3	5	Z	5	5	4	3	3	3	4	3	4	4	3	3	2	3	2	1	2	2	2	1	1	3.0	5
28-Jan	2	2	2	Z	3	2	8	34	30	37	29	18	24	6	8	11	11	12	16	12	25	13	29	29	15.8	37
29-Jan	19	24	26	20	Z	13	14	16	18	22	25	32	17	27	30	32	20	28	25	17	8	7	10	8	19.9	32
30-Jan	14	20	15	17	8	Z	8	7	6	7	7	6	4	7	9	9	6	4	4	5	5	5	5	6	8.0	20
31-Jan	Z	21	22	32	13	13	10	9	8	8	26	20	7	11	10	18	30	21	26	4	3	3	5	5	14.2	32
	10.7	10.6	10.8	13.2	13.9	19.7	14.3	21.0	23.1	25.9	18.2	17.0	16.3	16.4	13.5	17.6	20.2	27.1	12.9	15.2	18.1	23.0	23.9	18.3	Diurnal Average	
	64	44	28	59	71	166	70	208	129	323	73	93	104	133	56	76	93	281	58	130	150	210	168	133	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

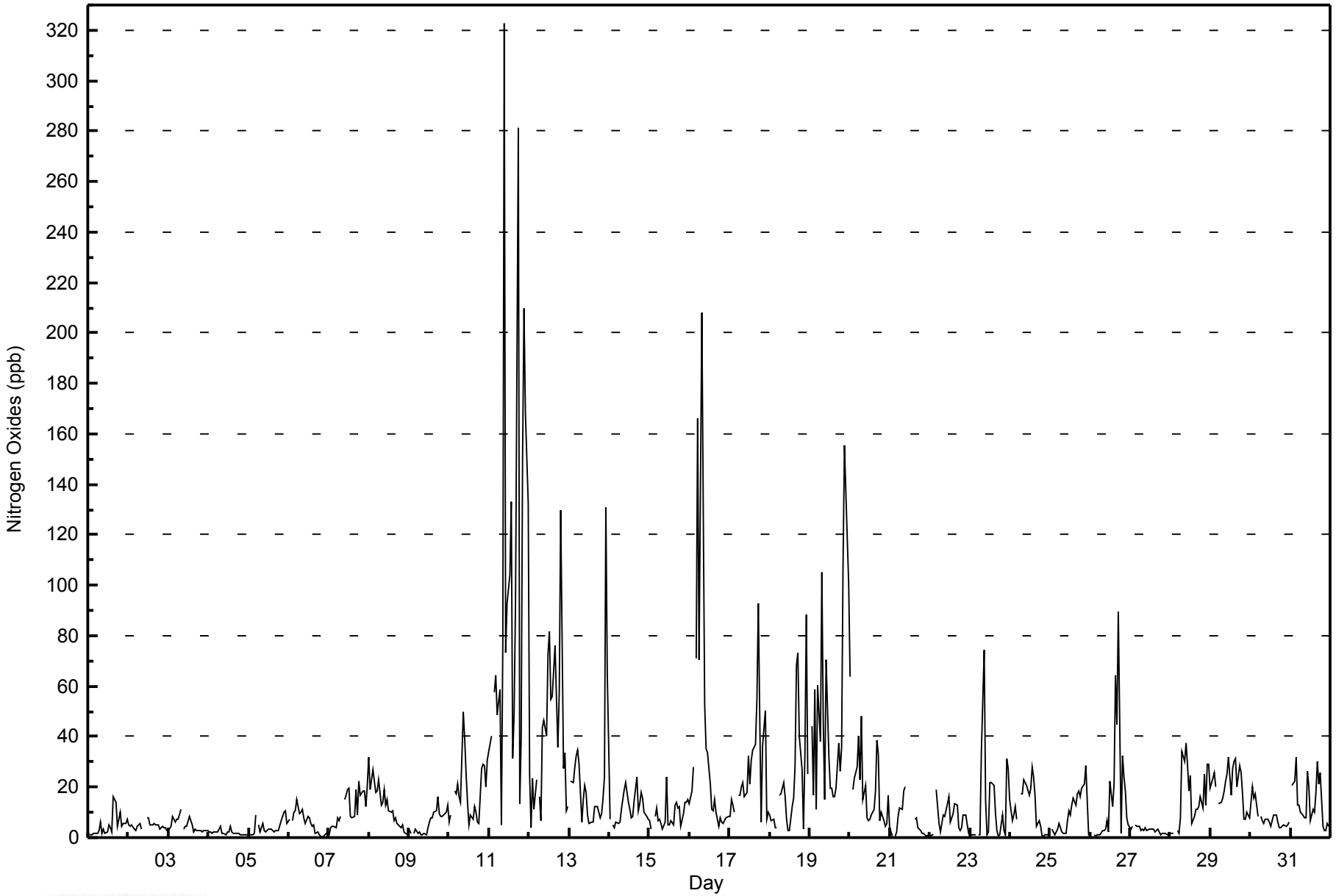
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	547	77.04	77.04
21 - 40	104	14.65	91.69
11 - 80	35	4.93	96.62
81 - 159	17	2.39	99.01
> 159	6	0.85	99.86

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

ConocoPhillips - Surmont - January 2015

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	7	8	5	11	21	10	19	9	22	48	116	104	29	41	84	547
21 - 40	2	0	0	1	1	2	7	7	5	5	5	16	24	17	5	7	104
11 - 80	0	0	0	0	0	0	1	0	4	1	4	3	18	2	2	0	35
81 - 159	0	0	0	0	0	0	0	3	1	5	0	0	5	1	2	0	17
> 159	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	6
Totals	15	7	8	6	12	23	18	29	22	36	57	135	151	49	50	91	709

Total Number of Valid Hours: 710

Total Number of Hours: 744

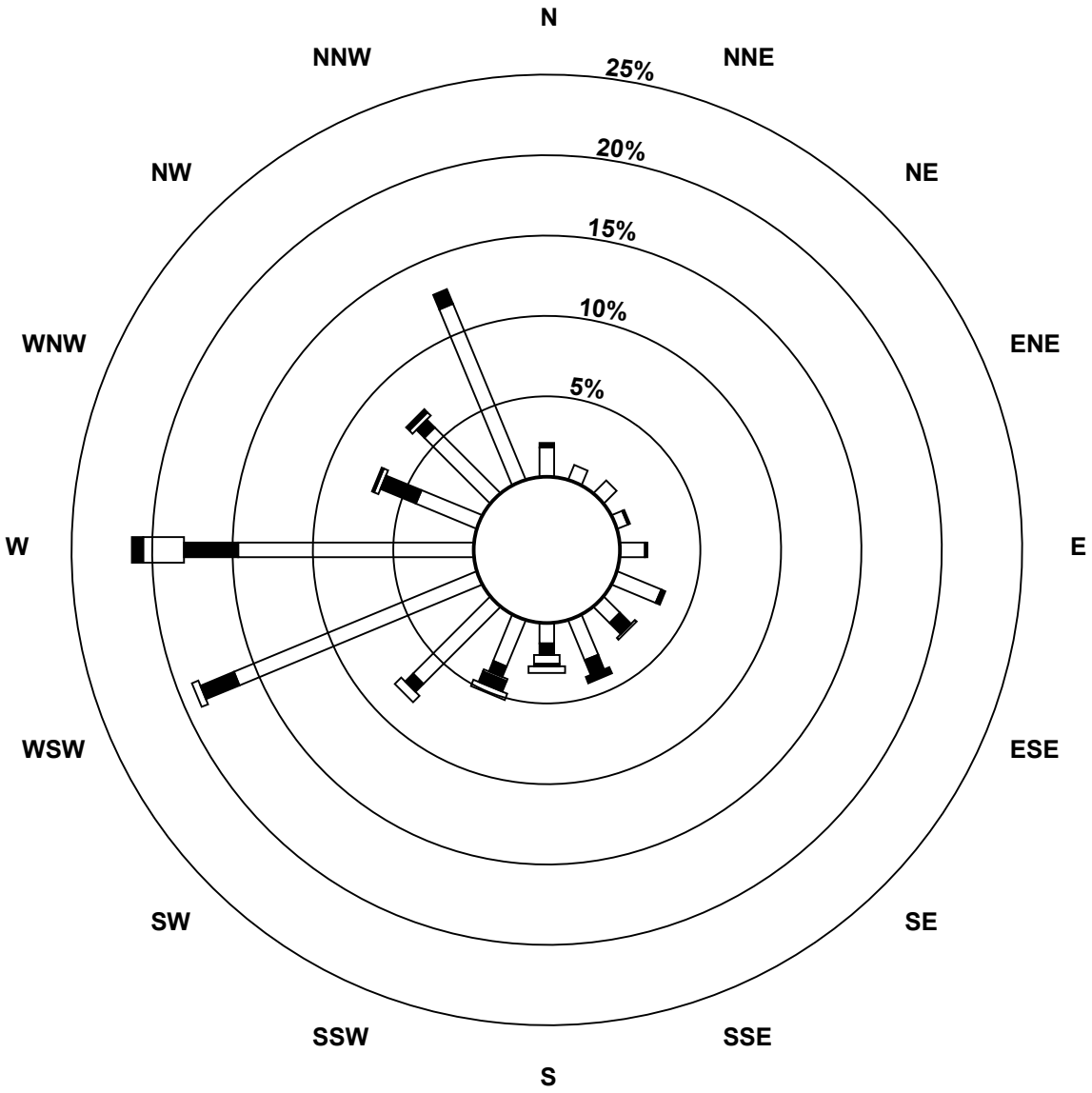
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

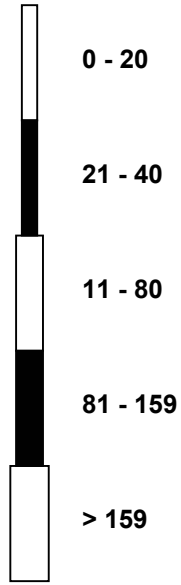
Wind Rose Jan 2015

Nitrogen Oxides (NO_X) - ppb

ConocoPhillips - Surmont (AMS502)



Classes (ppb)



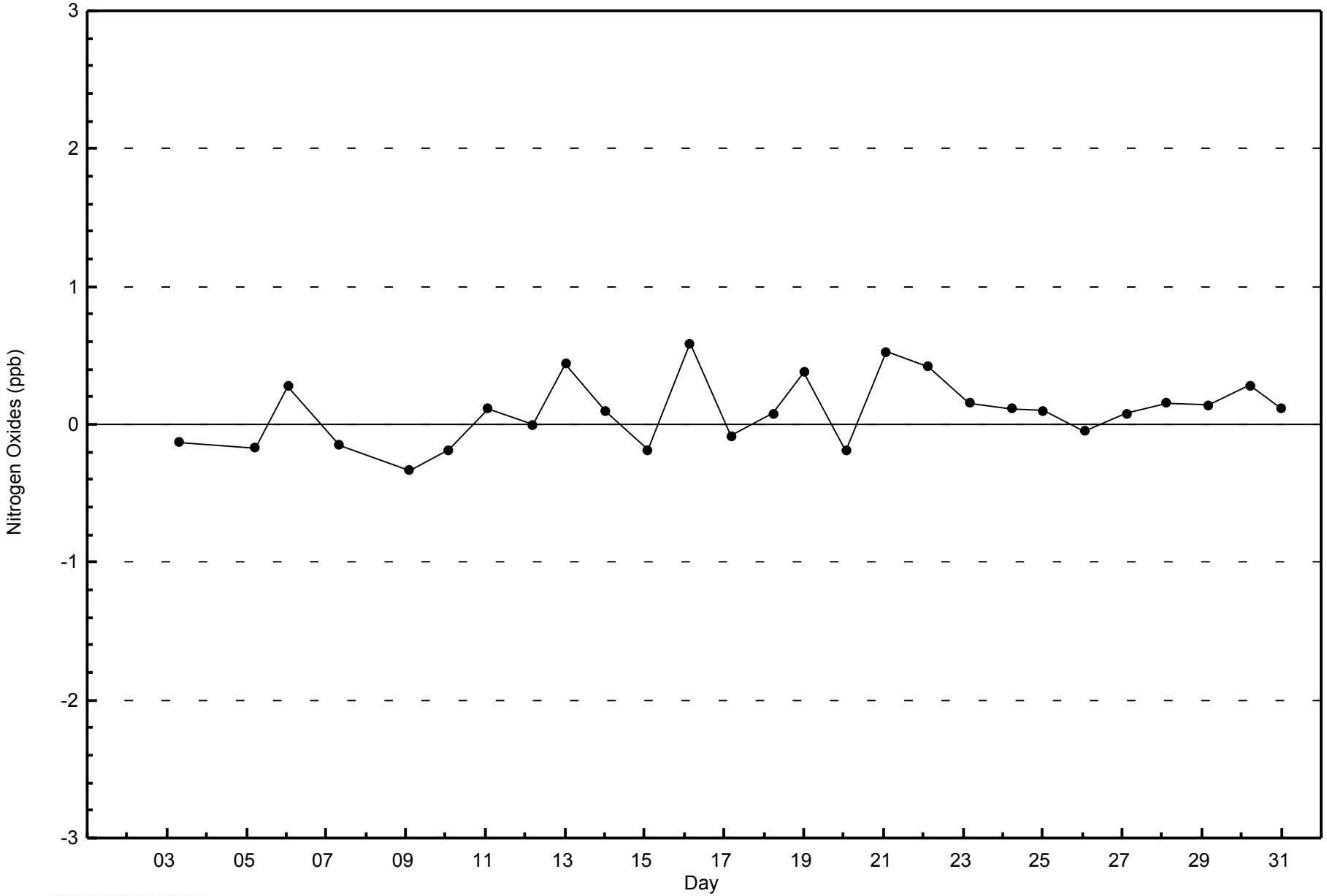
Total Number of Valid Hours: 710

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

ConocoPhillips - Surmont - January 2015



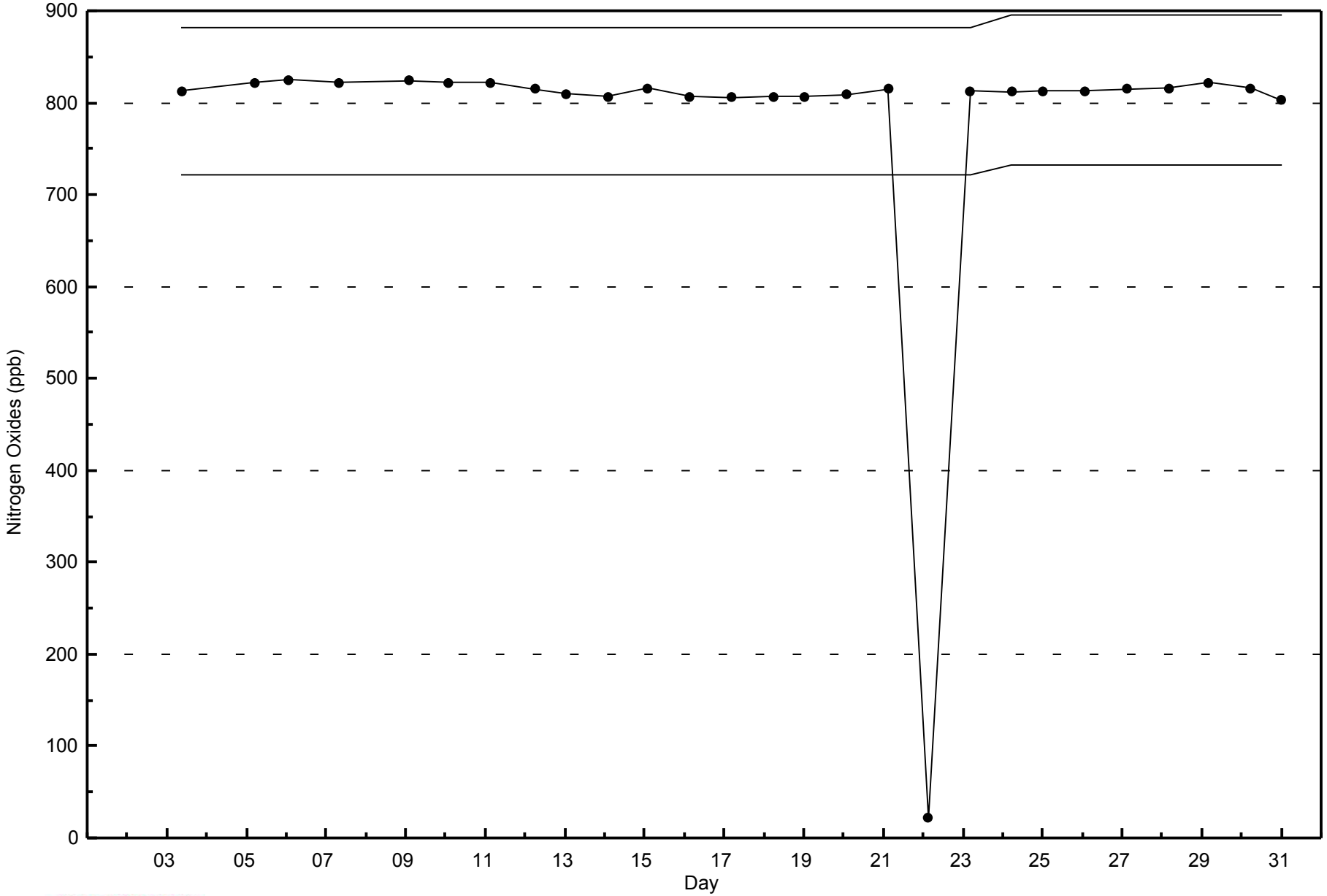
AURORA ATMOSPHERICS INC.

WBEA

Span Responses

Nitrogen Oxides (NO_X) - ppb

ConocoPhillips - Surmont - January 2015



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

ConocoPhillips - Surmont - January 2015

Maximum Value: 7.6 C on Jan 25 15:00

Maximum Daily Average: 4.7 C on Jan 22

Minimum Value: -28.9 C on Jan 3 09:00

Minimum Daily Average: -26.5 C on Jan 3

Maximum Diurnal Average: -9.8 C at hour 15

Minimum Diurnal Average: -12.4 C at hour 7

Monthly Average: -11.43 C

Percentiles: P_1 = -27.8 P_{10} = -22.6 Q_1 = -19.7 Median = -14.1 Q_3 = -1.5 P_{90} = 2.3 P_{99} = 6.4

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-Jan	-14.0	-14.3	-14.4	-14.4	-14.5	-14.5	-14.6	-14.7	-14.8	-15.0	-14.9	-14.7	-14.1	-14.1	-14.3	-15.4	-17.0	-18.5	-19.2	-19.6	-20.8	-21.3	-21.7	-21.5	-16.3	-14.0
2-Jan	-21.2	-21.4	-21.9	-22.4	-22.7	-22.7	-22.5	-22.3	-23.0	-23.2	-22.6	-22.0	-20.1	-19.6	-20.9	-21.1	-21.4	-22.0	-22.5	-22.9	-23.2	-23.1	-23.9	-24.4	-22.2	-19.6
3-Jan	-25.4	-25.4	-25.0	-24.9	-26.1	-27.4	-27.8	-28.5	-28.9	-27.8	-26.2	-24.8	-24.5	-24.2	-24.9	-26.2	-27.2	-27.4	-27.5	-27.5	-27.3	-26.9	-26.7	-26.7	-26.5	-24.2
4-Jan	-26.5	-26.4	-26.1	-26.0	-25.5	-25.2	-25.0	-24.1	-23.8	-23.2	-22.1	-21.6	-20.1	-19.9	-18.9	-19.6	-20.3	-20.3	-19.9	-20.0	-20.4	-21.3	-20.7	-20.3	-22.4	-18.9
5-Jan	-20.2	-19.6	-19.1	-19.1	-19.0	-18.8	-18.4	-18.5	-18.7	-18.8	-18.6	-18.2	-17.8	-17.5	-17.6	-18.1	-18.6	-18.3	-18.0	-17.8	-17.6	-17.8	-18.2	-18.6	-18.5	-17.5
6-Jan	-19.7	-20.5	-21.6	-21.7	-22.3	-22.6	-23.7	-24.4	-24.8	-24.5	-23.5	-21.6	-20.3	-20.1	-19.7	-20.5	-22.1	-22.2	-21.7	-21.6	-22.2	-21.5	-21.0	-20.9	-21.9	-19.7
7-Jan	-21.0	-21.7	-21.4	-20.9	-20.0	-19.6	-18.9	-17.7	-17.1	-16.5	-17.7	-17.7	-16.5	-14.6	-14.4	-14.0	-15.2	-16.3	-15.8	-15.8	-16.7	-17.4	-17.3	-16.4	-17.5	-14.0
8-Jan	-16.3	-16.6	-17.0	-17.4	-18.7	-19.7	-20.2	-20.6	-21.0	-20.5	-20.2	-19.8	-19.4	-19.1	-19.0	-19.4	-20.0	-20.2	-20.1	-20.6	-20.5	-20.5	-20.3	-20.2	-19.5	-16.3
9-Jan	-20.1	-19.6	-18.6	-18.7	-19.0	-19.2	-18.6	-16.7	-16.2	-16.7	-13.7	-11.9	-11.6	-11.4	-11.5	-12.2	-13.1	-13.3	-15.9	-17.6	-18.4	-19.9	-21.1	-20.5	-16.5	-11.4
10-Jan	-21.3	-22.0	-22.2	-23.0	-23.4	-23.9	-25.5	-25.0	-25.5	-25.8	-23.6	-21.1	-19.6	-19.1	-18.3	-18.8	-19.6	-18.6	-18.0	-18.1	-18.1	-18.4	-17.9	-18.2	-21.0	-17.9
11-Jan	-18.3	-18.7	-19.4	-19.9	-19.8	-20.2	-20.1	-21.2	-20.9	-20.5	-19.0	-16.1	-15.5	-13.8	-14.5	-16.1	-16.7	-15.9	-14.9	-13.6	-12.7	-11.4	-11.0	-10.6	-16.7	-10.6
12-Jan	-11.3	-12.2	-11.7	-12.2	-12.2	-12.3	-12.1	-11.6	-10.7	-10.5	-10.6	-9.8	-8.9	-8.4	-8.9	-9.7	-10.2	-8.9	-10.5	-9.4	-7.9	-5.8	-5.2	-5.2	-9.8	-5.2
13-Jan	-5.2	-5.3	-5.3	-5.3	-5.1	-5.2	-5.4	-6.5	-8.0	-8.7	-9.2	-9.8	-10.1	-10.1	-10.0	-10.0	-10.1	-10.2	-10.2	-10.0	-9.6	-9.1	-8.2	-6.6	-8.1	-5.1
14-Jan	-2.1	0.6	1.7	1.5	0.8	1.5	1.5	1.8	1.5	1.3	0.8	-3.7	-5.2	-6.5	-6.8	-7.0	-7.0	-7.8	-8.9	-10.0	-11.0	-12.2	-13.4	-14.5	-4.3	1.8
15-Jan	-14.8	-15.5	-16.2	-16.6	-17.2	-17.5	-17.6	-17.8	-17.9	-17.7	-17.5	-17.3	-16.9	-16.6	-16.3	-15.9	-15.6	-15.4	-15.0	-14.9	-14.7	-14.0	-13.8	-12.7	-16.1	-12.7
16-Jan	-11.6	-10.1	-9.5	-8.7	-8.3	-7.5	-7.0	-5.7	-4.5	-3.5	-2.5	-1.2	-0.6	-0.1	0.3	1.1	1.4	0.7	0.6	0.3	0.0	0.1	0.3	0.5	-3.1	1.4
17-Jan	0.7	0.9	0.9	0.9	0.9	0.8	0.7	0.5	-0.1	-0.1	0.7	0.8	0.8	1.5	1.2	0.2	-1.2	-1.1	-1.7	-2.4	-2.4	-3.1	-3.2	-3.8	-0.3	1.5
18-Jan	-3.8	-3.3	-2.8	-1.9	-1.8	-1.8	-1.7	-3.1	-3.6	-3.0	-1.5	-0.3	0.3	1.3	2.0	1.6	0.5	-0.5	-0.9	-1.4	-1.8	-1.4	-0.7	-0.9	-1.3	2.0
19-Jan	-0.2	-0.8	-2.2	-1.0	-3.0	-3.3	-3.5	-4.1	-4.5	-4.4	-3.6	-3.6	-2.2	-2.4	-3.2	-4.2	-5.0	-5.5	-5.8	-7.9	-8.8	-9.2	-8.6	-8.7	-4.4	-0.2
20-Jan	-9.2	-9.8	-10.2	-10.9	-11.4	-11.8	-13.0	-13.3	-13.7	-12.6	-12.3	-11.6	-11.2	-10.3	-9.5	-9.4	-10.0	-10.3	-10.5	-9.1	-8.4	-7.2	-6.1	-5.8	-10.3	-5.8
21-Jan	-5.1	-4.9	-5.5	-5.7	-4.9	-4.0	-4.3	-3.5	-3.3	-2.9	-0.9	0.0	0.9	0.6	0.5	1.2	0.5	1.0	1.4	1.2	1.3	1.6	1.9	2.3	-1.3	2.3
22-Jan	2.7	3.3	3.6	4.0	4.8	4.8	4.1	4.2	5.6	5.6	4.4	3.4	4.3	5.7	6.2	6.1	5.8	5.8	5.5	5.2	5.2	4.8	4.2	3.4	4.7	6.2
23-Jan	2.6	2.3	2.1	1.6	1.6	1.4	1.8	2.4	3.1	4.0	4.1	5.3	6.1	6.2	5.9	5.8	4.3	3.4	3.1	3.1	2.9	3.5	3.4	3.0	3.5	6.2
24-Jan	2.5	2.2	2.4	1.8	2.4	3.5	3.3	3.1	2.7	2.1	1.4	1.4	1.9	3.2	4.2	4.3	3.6	3.0	2.6	2.3	1.7	1.5	1.5	0.9	2.5	4.3
25-Jan	0.9	1.2	2.1	1.9	1.3	1.0	1.7	3.2	4.1	4.7	6.4	6.7	7.1	7.4	7.6	7.6	7.3	7.0	6.4	6.1	5.4	4.8	3.4	2.2	4.5	7.6
26-Jan	1.6	1.5	1.6	1.5	1.7	1.0	0.9	1.2	1.4	1.5	2.4	2.7	2.9	3.2	3.7	3.5	2.9	2.2	2.1	0.4	-0.6	-3.9	-6.1	-6.8	0.9	3.7
27-Jan	-8.0	-9.5	-11.3	-12.3	-13.2	-14.1	-14.8	-15.1	-15.4	-15.9	-16.1	-15.9	-15.6	-15.4	-15.3	-15.3	-15.4	-15.8	-15.9	-16.4	-16.5	-16.5	-16.5	-16.4	-14.7	-8.0
28-Jan	-16.3	-16.1	-16.0	-15.9	-16.0	-16.1	-17.2	-17.1	-17.8	-17.9	-17.0	-16.4	-16.0	-17.0	-17.8	-18.4	-18.6	-18.6	-19.1	-19.6	-19.8	-21.0	-21.4	-21.2	-17.8	-15.9
29-Jan	-21.1	-21.3	-21.2	-21.0	-20.4	-19.4	-18.8	-19.3	-19.4	-17.9	-17.1	-15.7	-14.9	-14.1	-12.6	-11.2	-10.9	-10.6	-11.0	-11.3	-11.9	-12.1	-12.2	-13.5	-15.8	-10.6
30-Jan	-14.7	-14.6	-15.4	-15.9	-16.7	-17.9	-18.7	-19.2	-20.1	-20.5	-20.2	-19.6	-19.9	-19.9	-19.8	-20.2	-21.2	-22.1	-23.1	-23.9	-24.8	-25.5	-25.9	-26.6	-20.3	-14.6
31-Jan	-27.1	-27.3	-27.8	-27.7	-28.2	-28.1	-27.9	-27.7	-27.1	-26.1	-24.6	-23.6	-22.2	-21.5	-20.4	-20.3	-20.7	-21.3	-21.6	-21.2	-20.7	-20.7	-20.8	-20.7	-24.0	-20.3
	-11.7	-11.8	-11.8	-11.9	-12.1	-12.2	-12.4	-12.3	-12.3	-12.1	-11.5	-10.9	-10.3	-9.9	-9.8	-10.1	-10.7	-10.9	-11.2	-11.4	-11.6	-11.8	-11.8	-11.9	Diurnal Average	
	2.7	3.3	3.6	4.0	4.8	4.8	4.1	4.2	5.6	5.6	6.4	6.7	7.1	7.4	7.6	7.6	7.3	7.0	6.4	6.1	5.4	4.8	4.2	3.4	Diurnal Maximum	

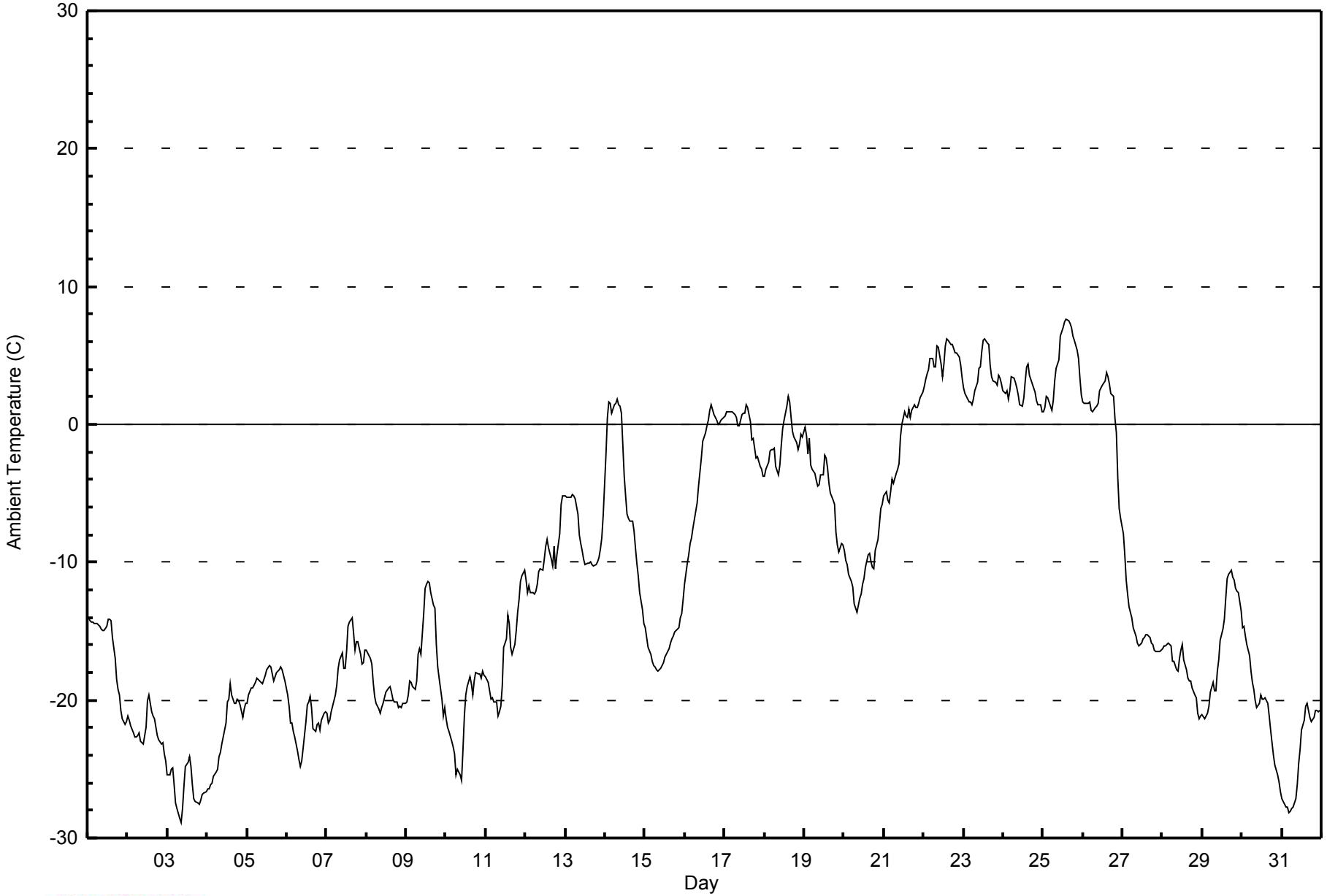
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Ambient Temperature (AT) - C

ConocoPhillips - Surmont - January 2015



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	175	23.52	23.52
-20 - 0	402	54.03	77.55
0 - 10	167	22.45	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

Maximum Value: 96 % on Jan 24 04:00

Maximum Daily Average: 89.3 % on Jan 13

Minimum Value: 29 % on Jan 9 12:00

Minimum Daily Average: 47.6 % on Jan 9

Maximum Diurnal Average: 80.1 % at hour 6

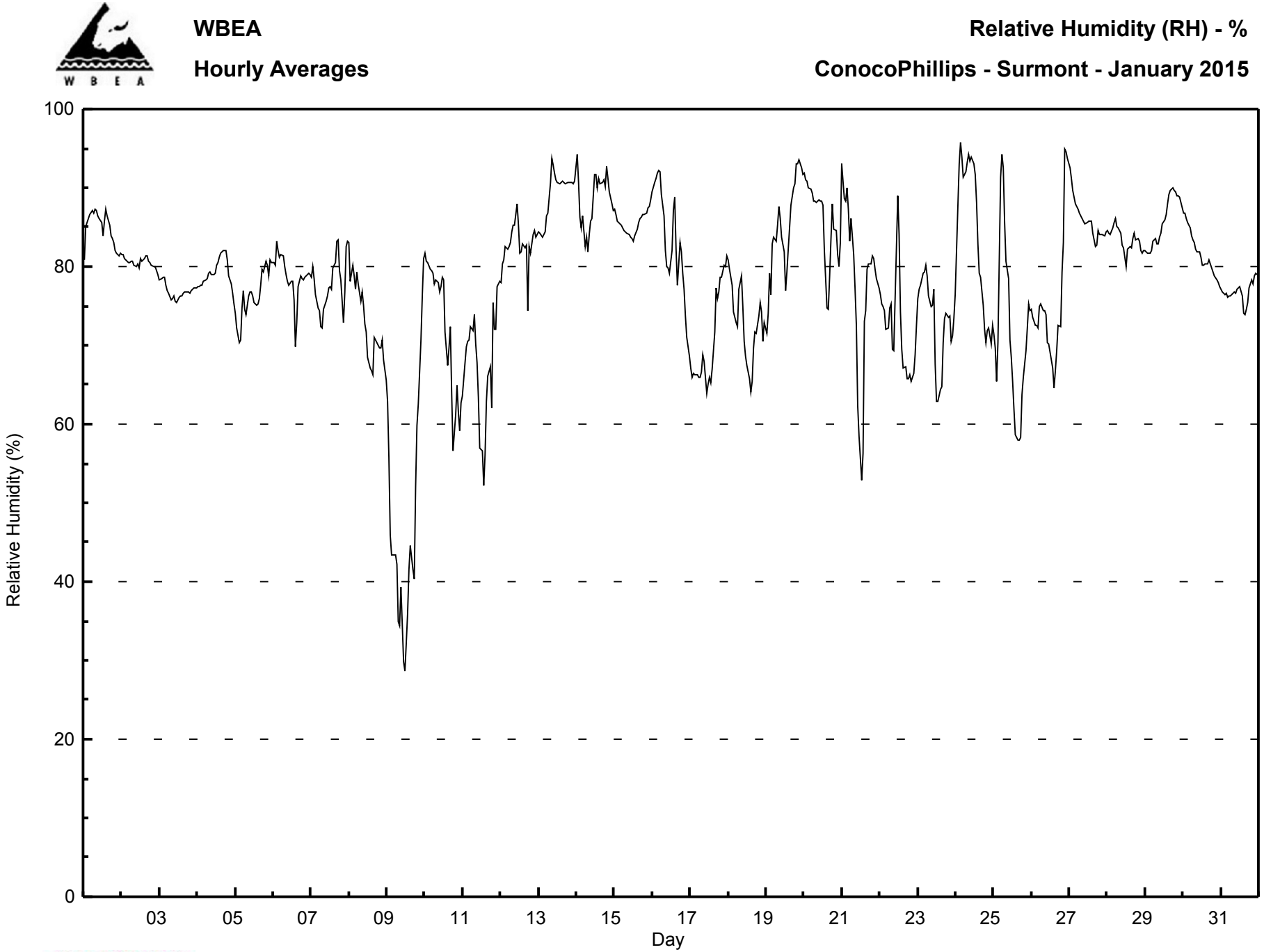
Minimum Diurnal Average: 75.0 % at hour 14

Monthly Average: 78.2 %

Percentiles: P_1 = 40 P_{10} = 66 Q_1 = 74 Median = 79 Q_3 = 84 P_{90} = 89 P_{99} = 94

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-Jan	81	85	86	86	87	87	87	87	87	86	86	86	84	86	87	87	85	84	84	83	82	82	81	82	84.9	87
2-Jan	82	81	81	81	80	81	81	81	80	80	80	80	81	81	81	81	81	81	81	80	80	80	79	79	80.5	82
3-Jan	78	78	79	79	78	77	77	76	76	76	76	75	76	76	76	77	77	77	77	77	77	77	77	77	76.9	79
4-Jan	77	77	78	78	78	78	78	79	79	79	79	79	80	80	81	82	82	82	82	81	79	78	77	75	79.1	82
5-Jan	74	72	70	71	75	77	75	74	76	77	77	76	75	75	75	76	78	80	79	81	80	79	81	81	76.4	81
6-Jan	81	80	83	82	81	82	81	80	79	78	78	78	78	76	70	73	77	79	78	78	79	79	79	79	78.7	83
7-Jan	79	80	79	76	75	74	72	72	75	76	76	77	77	77	80	81	83	83	80	78	73	77	83	83	77.8	83
8-Jan	83	78	80	79	77	79	78	76	77	75	73	72	68	67	67	66	71	71	70	70	70	71	68	66	72.9	83
9-Jan	63	56	46	43	43	43	42	35	34	39	30	29	32	36	42	44	42	40	52	60	63	71	76	81	47.6	81
10-Jan	82	81	81	80	80	79	78	78	78	77	77	79	78	72	67	70	72	64	57	61	65	62	59	63	72.4	82
11-Jan	64	68	70	70	71	72	72	74	70	68	63	57	57	52	56	63	66	67	62	75	72	72	77	78	67.4	78
12-Jan	78	80	81	83	82	83	83	84	85	85	88	85	82	82	83	82	83	74	83	82	84	84	84	84	82.7	88
13-Jan	84	84	84	84	84	86	87	91	94	93	92	91	91	91	91	91	91	91	91	91	91	91	91	91	89.3	94
14-Jan	94	91	86	85	86	82	84	82	84	86	86	92	92	90	91	90	91	91	90	93	91	90	88	87	88.4	94
15-Jan	87	87	86	85	85	85	85	84	84	84	84	84	83	84	85	86	86	86	87	87	87	87	88	89	85.5	89
16-Jan	89	91	91	92	92	92	89	86	82	80	80	79	82	87	89	82	78	83	82	79	77	74	71	69	83.2	92
17-Jan	67	66	66	66	66	66	66	67	69	68	64	65	66	65	67	72	77	76	77	79	79	80	80	81	70.6	81
18-Jan	81	80	78	74	74	73	72	77	79	75	71	69	67	66	64	65	70	72	72	74	75	74	71	73	72.7	81
19-Jan	72	74	79	77	83	84	83	85	88	86	84	82	77	79	82	85	88	90	91	93	93	93	93	92	84.6	93
20-Jan	92	91	91	90	90	89	88	88	88	89	88	88	88	82	75	74	79	84	88	85	85	82	80	83	85.7	92
21-Jan	93	89	88	90	87	83	86	82	77	73	62	59	53	56	73	74	80	80	80	81	81	80	79	77	77.7	93
22-Jan	76	75	75	74	72	72	75	75	69	69	82	89	84	74	70	67	67	66	66	66	65	66	69	73	72.4	89
23-Jan	76	77	78	79	79	80	79	76	75	75	77	68	63	63	64	65	70	73	74	74	74	71	71	73	73.1	80
24-Jan	76	88	93	96	94	91	92	93	94	93	94	93	92	88	83	79	79	75	72	70	72	72	70	73	84.3	96
25-Jan	71	70	65	70	91	94	92	86	81	79	71	68	65	62	59	58	58	58	64	66	69	72	75	74	71.6	94
26-Jan	75	74	72	73	72	75	75	74	74	74	70	70	69	67	65	67	69	73	72	79	83	95	95	94	75.3	95
27-Jan	93	91	90	89	88	87	87	87	86	86	85	86	86	86	86	84	83	83	85	84	84	84	84	84	86.1	93
28-Jan	85	84	84	85	86	86	85	85	84	83	82	81	80	82	82	82	84	84	83	84	83	82	82	82	83.4	86
29-Jan	82	82	82	82	82	83	83	83	83	84	84	85	86	87	88	89	90	90	90	90	89	89	89	88	85.8	90
30-Jan	87	87	86	86	85	84	83	83	82	82	82	81	80	80	80	80	81	80	80	79	79	78	78	77	81.7	87
31-Jan	77	77	76	77	76	76	76	76	77	77	77	77	77	76	74	74	75	75	77	78	78	79	79	79	76.7	79
	79.9	79.8	79.5	79.4	80.0	80.1	79.7	79.3	78.9	78.4	77.4	76.8	75.8	75.0	75.2	75.7	77.1	77.2	77.5	78.6	78.6	79.0	79.1	79.5	Diurnal Average	
	94	91	93	96	94	94	92	93	94	93	94	93	92	91	91	91	91	91	91	93	93	95	95	94	Diurnal Maximum	


WBEA
Hourly Averages
Relative Humidity (RH) - %
ConocoPhillips - Surmont - January 2015
Relative Humidity (%)
100
80
60
40
20
0
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	7	0.94	0.94
40 - 60	25	3.36	4.30
60 - 80	356	47.85	52.15
80 - 100	356	47.85	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - January 2015

Maximum Speed: 41 km/h on Jan 25 13:00

Maximum Daily Speed Average: 26.4 km/h on Jan 8

Minimum Speed Value: 1 km/h on Jan 28 23:00

Minimum Daily Speed Average: 3.9 km/h on Jan 13

Maximum Diurnal Speed Average: 12.4 km/h at hour 4

Minimum Diurnal Speed Average: 9.1 km/h at hour 16

Monthly Average Velocity: 11.0 km/h 262.5 deg

Percentiles: P_1 = 3 P_{10} = 7 Q_1 = 10 Median = 15 Q_3 = 21 P_{90} = 28 P_{99} = 35

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-Jan	N10	N6	N4	N4	E4	ESE7	ESE8	SE8	ESE8	ESE6	E4	NE3	N4	NNW11	NNW17	NNW22	NW25	NW22	NW16	NW17	NNW14	NNW10	NNW13	NW9	NNW6.9	NW25
2-Jan	NNW11	NNW10	NNW10	NNW11	NNW12	NNW12	NW11	NW12	NNW11	NNW12	WNW9	W8	WNW10	NNW9	NNW8	NNW7	W7	W10	W11	W10	W9	W13	W12	WNW9	NW8.9	W13
3-Jan	W12	WNW13	WNW13	WNW12	NW11	NNW14	NW11	W7	W9	W9	W9	W9	WNW11	WNW13	W12	W13	W11	W16	W18	W17	W19	W19	W20	W17	WNW12.6	W20
4-Jan	W20	W21	W22	W20	W20	W20	W17	W19	W21	W21	WSW26	WSW29	WSW27	WSW24	WSW20	WSW29	WSW26	WSW26	WSW29	WSW31	WSW32	WSW33	WSW35	WSW26	WSW24.0	WSW35
5-Jan	WSW32	WSW29	WSW27	W26	W18	WNW19	W18	W17	W21	W21	W19	W16	W18	W19	W21	W20	W18	W20	W19	WNW17	WNW16	WNW17	WNW15	NW18	W19.3	WSW32
6-Jan	NW19	NW17	NNW16	NW16	NNW17	NW12	NW14	NW12	W10	W9	W13	WNW13	WNW15	W15	W16	W12	WSW11	W12	WSW17	WSW16	WSW15	WSW15	W12	WSW13	WNW12.2	NW19
7-Jan	SW22	SSW13	SSW16	SSW18	SSW17	S13	S14	S16	S17	S18	SSE18	SSE22	SSE13	SSW11	SW7	W10	NW16	NW20	NW23	NW30	NW29	NW30	NW30	NW31	WSW8.4	NW31
8-Jan	WNW29	NW30	NW23	WNW32	WNW34	WNW32	WNW33	WNW32	WNW29	WNW31	WNW31	WNW32	W29	W26	W24	W24	W24	W24	W24	W22	W21	W21	W20	WSW21	WNW26.4	WNW34
9-Jan	W18	WSW17	WSW19	WSW12	WSW14	WSW19	WSW27	WSW25	WSW24	WSW24	WSW22	W16	W13	W13	W12	W12	W15	NW15	NW15	NW20	NW22	NW22	NW18	NW15	W15.3	WSW27
10-Jan	NNW18	NW15	WNW12	WNW11	NW11	NW10	W7	WSW7	SW6	SSW9	SSW6	SSW6	SW9	WSW9	W8	W8	WSW10	W20	W22	W20	W17	W20	W22	W17	W10.9	W22
11-Jan	W18	WNW17	W17	W13	W13	W13	W11	WSW8	SW9	SSW11	SSW10	SSW7	SSE11	S9	SE8	SE9	SSE11	S13	SSW17	SSW17	SSW19	SSW18	SSW22	SSW24	SW10.1	SSW24
12-Jan	SW29	SW34	SW34	SW32	SW30	SW28	SW26	SW24	WSW13	WSW13	WSW13	W11	W10	W11	WNW14	W11	W9	SSW6	S5	SSW7	WSW13	WSW14	WSW27	WSW28	SW17.3	SW34
13-Jan	W20	W24	W22	W20	WNW20	WNW21	WNW15	NW17	NNW14	NNW11	NNW9	N8	NNE7	NE5	ESE6	ESE8	ESE9	SE11	SE15	SE13	SE12	SSE11	SSE10	S8	W3.9	W24
14-Jan	WSW19	WSW28	WSW29	WSW32	WSW28	WSW31	W29	W32	W31	WNW26	WNW22	NW16	NNW15	NNW15	NNW11	NNW11	NNW8	NNW14	NNW16	NNW15	NNW19	NNW17	NNW12	NNW13	WNW16.8	WSW32
15-Jan	NNW13	NW20	NW17	NNW13	NNW12	NNW12	N10	NNE6	ENE4	E6	ESE9	E10	ESE11	ESE13	ESE14	SE15	ESE15	SE17	SE18	SE20	SE21	SSE19	SE18	SSE16	ESE5.6	SSE21
16-Jan	SSE15	SSE19	SSE16	S16	S15	S17	S19	S13	SSW19	SW25	SW28	SW30	WSW32	WSW29	W31	W26	WSW26	WSW28	WSW29	WSW31	WSW33	WSW33	WSW30	WSW36	SW20.6	WSW36
17-Jan	WSW28	W28	W35	W39	W31	W27	W28	W24	W23	W29	W26	W21	W19	W18	W18	WSW12	WSW10	W10	W9	WSW12	W3	SW3	WSW8	SW6	W19.2	W39
18-Jan	SSW10	SSW11	SSW10	SW13	SW13	SW10	SW9	ESE5	S6	SSW6	SW17	SW27	WSW24	WSW20	WSW17	WSW14	W9	W8	WSW9	WSW10	WSW14	WSW11	W9	WSW15	SW11.2	SW27
19-Jan	WSW15	WNW5	WSW6	W7	E4	W8	W10	W5	W4	WSW10	W7	ENE3	ENE3	N5	NNE6	N7	NNW8	W5	W3	N5	NW6	W7	NW8	WNW4	WNW4.2	WSW15
20-Jan	NW8	NNW11	NNW9	NNW8	NNW7	NNW7	NNW9	NW8	NNW11	NW12	NNW13	NNW13	NNW13	NNW12	N4	ENE2	SSE8	S8	SW9	SSW13	SSW13	SSW16	SSW12	SSE9	WNW4.1	SSW16
21-Jan	SW20	SW27	SW29	SW27	SW19	S15	S16	SSE16	SSE15	SSE16	S20	S20	SSW25	SW27	SSW22	SSW20	SSW22	SW29	SW35	SW35	SW34	SW32	WSW27	WSW26	SW21.9	SW35
22-Jan	WSW26	WSW21	WSW17	WSW21	WSW19	WSW16	SW11	WSW15	WSW26	WSW29	W31	W38	WSW40	WSW39	WSW34	W26	WSW26	WSW30	WSW26	WSW24	WSW28	WSW28	WSW26	WSW24	WSW25.7	WSW40
23-Jan	WSW26	WSW24	WSW26	WSW26	WSW25	SW22	WSW21	WSW16	W10	WSW18	SW17	WSW22	W21	W20	WSW14	WSW12	WSW12	SW13	SW13	WSW11	SW19	WSW22	WSW10	E2	WSW17.1	WSW26
24-Jan	S8	SSW10	S5	SSE9	SW12	W23	W25	WNW26	WNW24	WNW19	WNW21	WNW22	W19	W20	W23	W23	WSW23	WSW20	WSW19	WSW20	WSW23	WSW26	WSW23	SW18	W17.1	WSW26
25-Jan	SW18	SW14	SW17	SW23	SSW16	SSE17	S21	SW26	SW32	WSW31	WSW37	W39	W41	W36	W33	W30	W27	W28	W30	WNW28	WNW21	W18	WSW12	SW17	WSW22.2	W41
26-Jan	SW20	SW20	SW21	SW22	WSW22	SW19	SW22	WSW23	WSW24	WSW24	WSW23	WSW24	WSW18	WSW17	WSW15	W11	W11	W9	WSW14	NW6	WSW9	NW19	NNW18	NNW16	WSW15.6	WSW24
27-Jan	NNW15	NNW14	NNW14	NNW12	NNW12	NNW12	NNW11	N9	NNE9	NNE8	NNE7	N8	NE7	NE7	NE7	NE8	NE9	ENE8	NE8	ENE7	E9	E9	ESE10	ESE9	NNE7.0	NNW15
28-Jan	E7	E5	E4	N4	N6	NNW12	NNW12	WNW12	WNW14	W13	WNW14	NW14	WNW12	NNW14	NNW11	NNW10	NNW10	NNW9	NNW7	NNW9	NNW5	NNE4	SSW1	S7	NW6.6	WNW14
29-Jan	SSE9	SSE8	S9	SSE10	SSE12	SSE11	SSE8	ESE7	ESE10	SE9	SE9	SE8	SE8	ESE9	SE10	SE9	ESE7	SSE5	SE3	NNW6	NNW9	NNW7	NNW9	NNW13	SE4.6	NNW13
30-Jan	NNW13	NW13	NNW16	NW13	NNW15	NNW17	NW14	NW16	NW19	NW17	NNW18	NNW17	NNW20	NNW16	NNW15	NNW17	NNW17	NW19	NW17	NNW15	NNW14	NNW11	NNW12	NNW11	NNW15.5	NNW20
31-Jan	NNW9	W4	WSW2	W3	WSW4	SW4	SSW6	SSW4	SW4	SSW5	N2	ESE4	E6	ESE8	ESE7	SSE6	SSE7	SSE9	S5	SW9	SW12	SW15	SW11	SW11	SSW3.9	SW15
	W12.0	W12.0	W12.2	W12.4	W10.9	W10.7	W10.4	W10.0	W10.4	WSW11.2	W11.7	W11.2	W11.0	W10.9	W9.9	W9.1	W9.1	W10.3	W11.2	W11.1	W11.8	W12.2	W11.3	WSW10.6	Diurnal Average	
	WSW32	SW34	W35	W39	WNW34	WNW32	WNW33	WNW32	SW32	WSW31	WSW37	W39	W41	WSW39	WSW34	W30	W27	WSW30	SW35	SW35	SW34	WSW33	WSW35	WSW36	Diurnal Maximum	

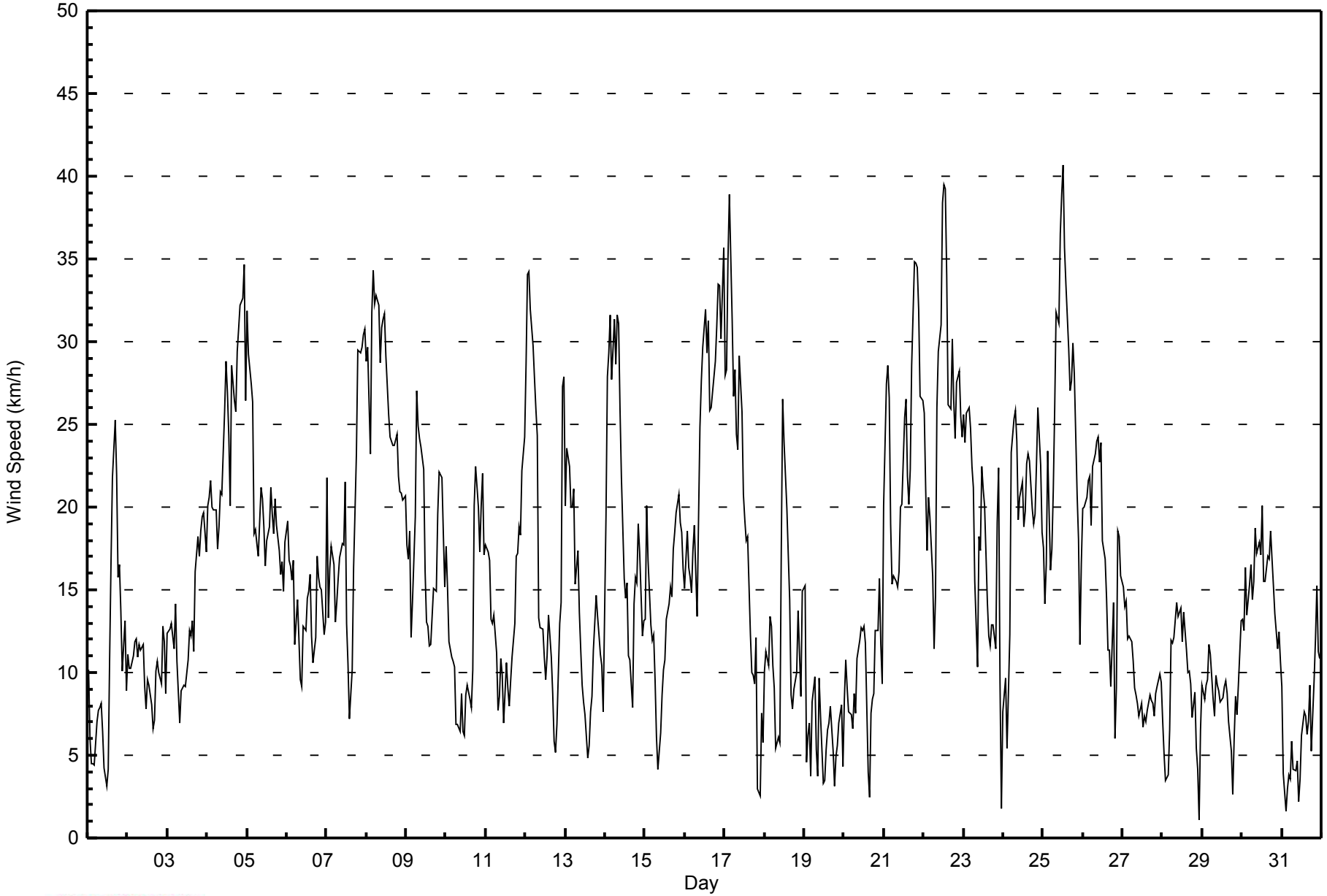
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA

Hourly Averages

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - January 2015



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	46	6.18	6.18
6 - 11	210	28.23	34.41
12 - 19	255	34.27	68.68
20 - 28	160	21.51	90.19
29 - 38	68	9.14	99.33
> 38	5	0.67	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA

Frequency Distribution

Wind Speed (WS) - km/h

ConocoPhillips - Surmont - January 2015

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	8	1	2	4	6	2	1	1	3	3	3	2	7	2	0	1	46
6 - 11	8	6	6	2	6	18	9	15	7	15	12	15	38	6	10	37	210
12 - 19	0	0	0	0	0	3	7	12	13	14	17	38	46	22	26	57	255
20 - 28	0	0	0	0	0	0	1	2	3	6	18	58	51	10	9	2	160
29 - 38	0	0	0	0	0	0	0	0	0	0	13	25	12	12	6	0	68
> 38	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	5
Totals	16	7	8	6	12	23	18	30	26	38	63	140	157	52	51	97	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

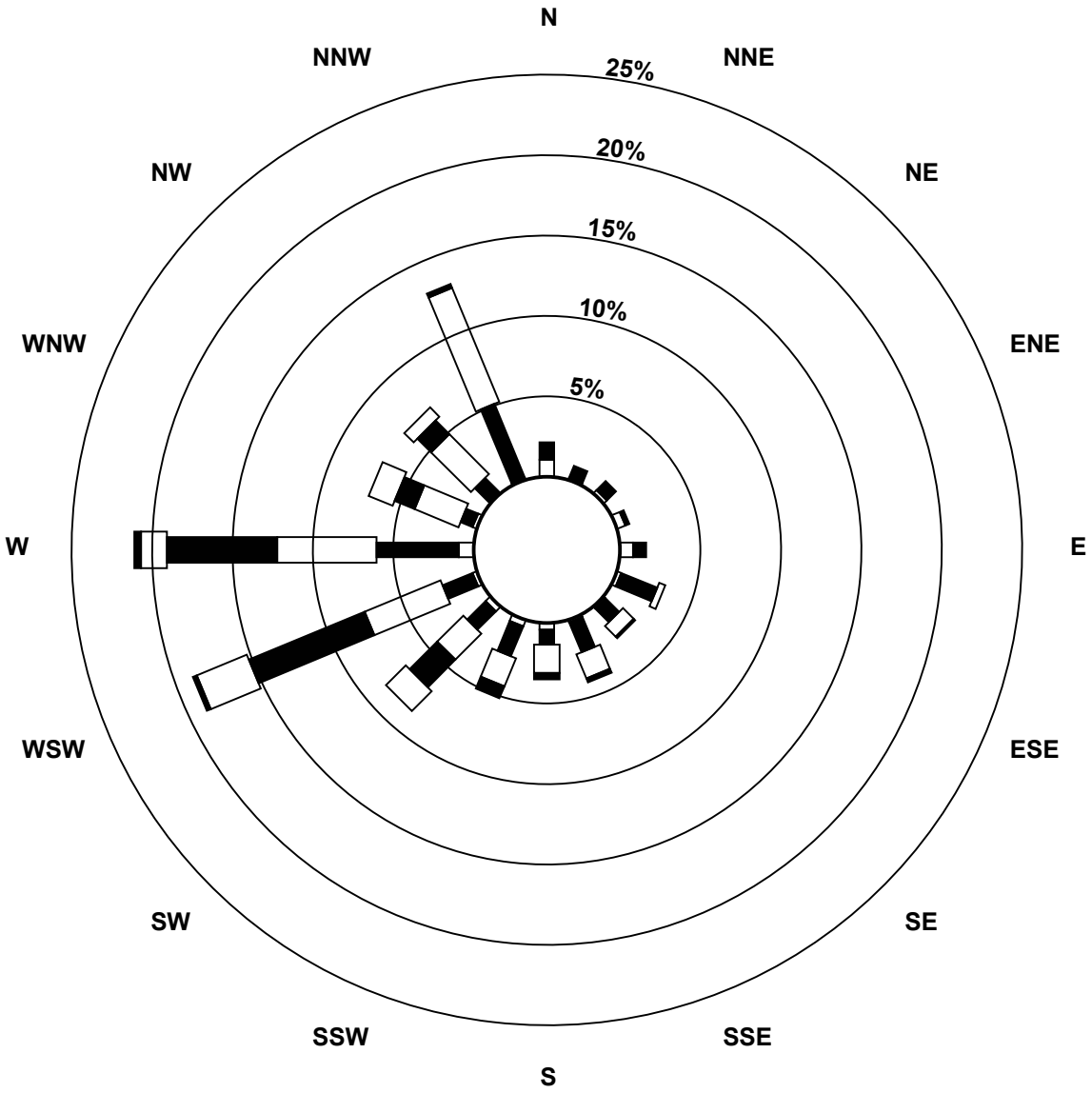
AURORA ATMOSPHERICS INC.

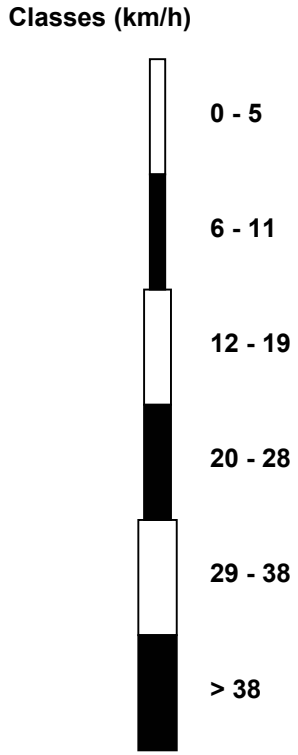
Wood Buffalo Environmental Association

Wind Rose Jan 2015

Wind Speed (WS) - km/h

ConocoPhillips - Surmont (AMS502)





Total Number of Valid Hours: 744

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 km/h on Jan 25 19:00

Minimum Value: 1 km/h on Jan 31 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:	744
Hours of Missing Data:	0
Hours of Calibration:	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	Maximum
1-Jan	2	1	1	1	1	1	2	2	2	2	1	1	3	3	3	5	5	4	3	4	4	2	2	2	5
2-Jan	2	2	2	2	3	2	2	2	2	2	2	1	2	2	1	2	2	1	2	1	1	2	2	1	3
3-Jan	2	2	2	2	2	2	3	1	1	1	2	2	2	2	2	2	2	4	3	3	2	3	3	3	4
4-Jan	3	3	3	3	3	4	3	3	4	4	4	5	5	7	5	5	5	4	6	5	5	6	5	5	7
5-Jan	6	6	5	5	4	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3	3	3	3	4	6
6-Jan	3	3	2	3	3	3	2	3	2	2	2	2	3	3	3	2	2	4	3	3	2	3	2	4	4
7-Jan	4	4	4	4	4	3	4	4	4	4	4	5	6	4	2	2	4	4	5	6	7	7	8	7	8
8-Jan	7	7	6	7	7	6	7	6	5	6	5	6	5	5	5	4	4	4	5	3	3	3	3	4	7
9-Jan	4	3	3	2	3	3	3	3	3	3	3	4	2	2	2	2	4	3	3	3	4	4	3	3	4
10-Jan	4	3	2	2	2	3	2	1	1	1	1	2	3	2	2	1	4	5	3	3	3	3	4	3	5
11-Jan	3	3	3	2	3	2	2	1	1	1	1	2	2	2	2	2	4	5	3	4	4	4	5	6	6
12-Jan	7	6	5	5	4	4	3	3	7	4	3	3	2	2	3	3	2	1	2	2	4	8	4	4	8
13-Jan	5	5	4	3	4	4	4	3	3	2	2	1	2	1	1	1	2	3	3	2	2	2	3	3	5
14-Jan	6	6	5	5	4	6	6	6	6	5	5	2	3	3	2	2	2	3	3	2	3	3	3	2	6
15-Jan	3	3	3	3	2	2	2	2	1	1	1	2	2	3	3	3	3	3	3	4	4	4	3	3	4
16-Jan	3	4	4	4	4	4	6	4	5	5	4	6	5	6	6	4	4	4	5	5	6	5	6	6	6
17-Jan	5	5	6	7	6	5	6	5	5	5	5	4	4	4	3	2	3	3	3	2	2	2	1	1	7
18-Jan	1	2	2	3	3	3	5	2	2	3	6	5	4	4	4	5	2	3	3	2	3	4	2	3	6
19-Jan	3	3	3	3	1	2	2	1	4	2	1	1	1	1	1	1	1	2	1	1	1	1	3	1	4
20-Jan	2	2	2	1	2	2	2	3	2	2	2	2	2	3	2	1	3	2	2	2	2	3	3	3	3
21-Jan	8	4	4	4	4	4	3	3	4	3	5	5	6	6	6	5	5	6	5	5	5	4	4	4	8
22-Jan	3	4	3	4	4	3	3	5	5	6	7	8	7	7	6	5	5	5	5	4	4	5	4	4	8
23-Jan	4	4	4	4	4	4	3	4	3	4	3	4	4	4	3	2	2	2	2	4	5	4	5	2	5
24-Jan	2	3	2	2	5	5	5	5	5	4	4	4	4	3	4	4	3	3	3	3	4	4	4	3	5
25-Jan	3	6	5	4	4	4	5	6	6	5	7	7	7	7	6	7	6	7	9	8	5	4	2	2	9
26-Jan	3	3	3	3	3	3	4	4	4	4	4	5	4	4	3	2	3	3	2	3	4	3	4	3	5
27-Jan	3	3	3	2	2	2	2	2	2	1	1	2	1	1	2	2	2	2	2	2	2	3	2	2	3
28-Jan	2	1	1	2	1	2	2	2	2	2	2	3	2	3	2	2	2	2	1	2	2	2	2	3	3
29-Jan	2	2	2	2	2	2	2	1	1	2	2	2	2	1	2	2	1	2	2	3	1	2	2	2	3
30-Jan	3	3	3	2	3	3	2	3	4	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	4
31-Jan	2	2	2	1	1	1	1	1	1	3	1	2	1	1	1	1	1	2	1	2	3	3	3	2	3
	8	7	6	7	7	6	7	6	7	6	7	8	7	7	6	7	6	7	9	8	7	8	8	7	
	Diurnal Maximum																								

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

ConocoPhillips - Surmont - January 2015

Direction of Maximum Speed: 261 deg on Jan 25 13:00
Direction of Maximum Daily Speed Average: 282.4 deg on Jan 8

Direction of Minimum Speed: 207 deg on Jan 28 23:00

Direction of Minimum Daily Speed Average: 3.9 deg on Jan 13

Monthly Average Direction: 273.8 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-Jan	2	359	3	8	94	106	119	124	117	120	88	54	354	335	331	327	324	324	312	314	327	329	330	326	340.6
2-Jan	332	334	342	333	332	328	320	322	333	334	301	268	300	333	347	328	270	262	271	273	267	272	280	287	308.3
3-Jan	274	282	289	303	325	327	324	266	260	270	270	272	290	285	279	274	272	271	274	272	274	277	279	270	281.7
4-Jan	270	270	267	270	271	274	280	280	267	268	255	247	247	244	256	243	245	249	245	241	239	239	239	245	253.6
5-Jan	244	254	253	266	281	285	277	271	280	279	273	270	270	272	269	265	268	277	278	284	292	294	301	321	273.5
6-Jan	321	325	329	319	327	309	325	313	273	271	275	287	287	276	277	263	250	260	258	255	241	256	262	248	285.3
7-Jan	227	212	213	209	208	187	187	183	178	170	156	157	150	204	230	274	317	324	312	316	315	311	316	311	252.6
8-Jan	297	311	305	287	286	286	289	284	284	286	283	284	281	279	281	275	280	276	276	275	268	259	259	257	282.4
9-Jan	263	258	256	250	247	239	239	249	245	241	250	261	270	280	273	276	272	304	326	325	320	320	320	315	272.5
10-Jan	330	323	296	290	306	304	260	247	222	208	199	205	230	237	263	267	255	267	267	276	281	266	269	275	271.9
11-Jan	269	283	281	280	273	266	268	238	216	202	209	199	164	175	143	142	166	177	194	205	200	193	194	200	216.0
12-Jan	218	225	227	225	226	225	226	230	249	254	258	270	267	265	285	272	262	206	174	196	239	253	245	238	236.2
13-Jan	262	266	266	280	288	290	303	324	330	333	341	359	22	56	110	117	116	126	131	137	144	152	165	190	275.9
14-Jan	250	255	255	253	242	253	261	271	278	283	293	326	331	331	336	338	330	329	329	328	327	327	331	333	287.2
15-Jan	332	325	326	332	337	334	358	21	64	94	113	101	106	115	122	125	123	131	134	132	146	151	144	148	110.0
16-Jan	153	165	167	174	173	174	186	178	207	218	224	231	242	257	260	263	258	250	257	255	255	256	257	258	233.8
17-Jan	258	264	264	263	272	276	278	279	268	268	274	272	262	269	264	257	254	274	259	246	279	222	248	217	266.3
18-Jan	213	199	200	215	217	216	228	117	173	207	230	235	244	253	251	252	278	270	247	241	243	252	263	254	235.5
19-Jan	258	287	245	268	88	273	262	270	274	243	273	60	66	8	15	10	341	280	271	360	312	280	313	295	292.1
20-Jan	319	331	330	343	337	327	339	319	328	313	332	329	332	331	356	72	159	178	229	209	202	202	193	166	296.4
21-Jan	218	225	225	224	218	184	170	161	160	161	186	180	206	216	207	197	206	222	229	231	234	236	240	247	214.0
22-Jan	248	248	241	247	258	249	226	241	256	256	263	262	257	258	258	259	258	253	250	252	257	256	253	242	253.7
23-Jan	240	242	239	237	238	236	242	258	275	254	234	244	265	274	255	250	237	236	234	244	234	244	245	86	245.0
24-Jan	184	213	181	156	231	270	279	283	288	296	287	282	278	270	264	262	253	252	252	243	242	243	238	226	258.9
25-Jan	224	220	218	228	202	164	183	216	231	241	256	262	261	264	267	277	274	276	281	283	283	280	251	229	250.9
26-Jan	228	232	232	236	238	232	234	245	249	250	251	244	255	250	253	264	271	261	243	316	256	326	327	328	253.2
27-Jan	329	343	334	346	344	342	340	354	18	25	20	11	37	43	42	48	46	59	51	72	87	89	105	107	20.9
28-Jan	101	88	79	10	349	331	328	290	286	281	285	304	303	331	342	346	336	332	339	341	335	14	207	180	321.6
29-Jan	161	164	177	165	163	158	158	118	123	145	145	140	124	123	134	139	117	163	131	336	337	341	335	328	142.4
30-Jan	328	320	329	323	327	328	326	326	326	325	327	327	328	334	328	327	327	325	326	328	327	333	330	330	327.3
31-Jan	329	266	249	261	244	218	201	212	226	211	2	106	100	112	104	153	149	167	182	224	225	224	219	219	202.1
	260.3	262.6	259.2	258.8	261.8	262.5	260.7	262.7	261.6	258.7	260.3	260.3	264.3	268.8	269.6	267.5	265.9	263.7	262.2	265.6	261.6	262.5	262.4	258.7	
	Diurnal Average																								

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

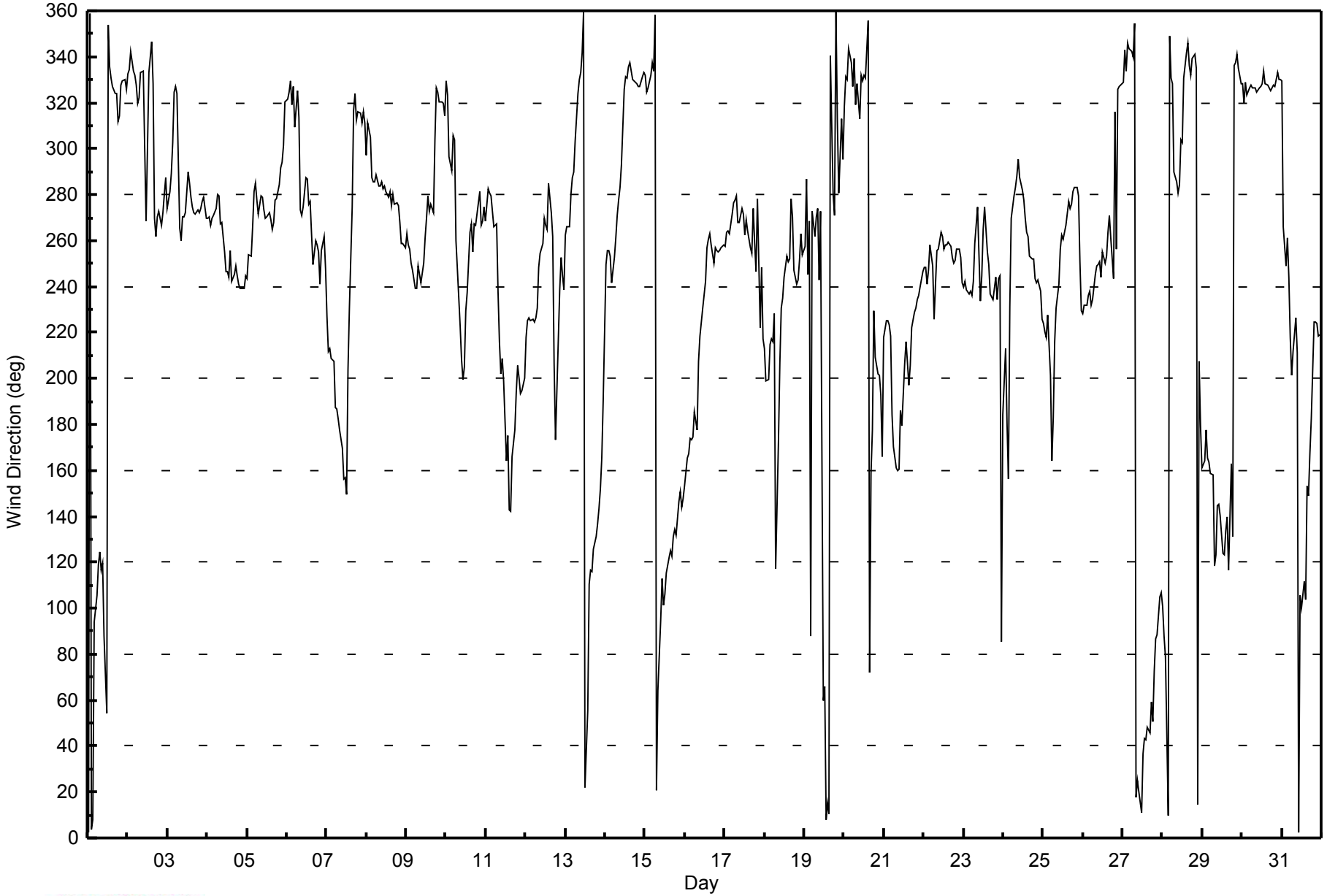
AURORA ATMOSPHERICS INC.

WBEA

Hourly Averages

Wind Direction (WD) - deg

ConocoPhillips - Surmont - January 2015



AURORA
ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 88 deg on Jan 28 23:00

Minimum Value: 6 deg on Jan 11 10:00

Percentiles: P_1 = 7 P_{10} = 9 Q_1 = 10 Median = 12 Q_3 = 15 P_{90} = 21 P_{99} = 66

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

Day	Hourly Period Ending At (MST)																								Daily
	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-Jan	12	13	19	20	27	11	14	14	13	15	18	36	39	12	11	10	11	10	17	15	12	14	9	21	39
2-Jan	13	12	14	10	11	12	18	15	11	10	22	13	26	15	11	29	22	8	14	9	9	10	13	21	29
3-Jan	8	11	13	17	13	8	18	20	13	9	10	13	18	14	12	8	10	10	9	9	8	9	8	9	20
4-Jan	9	8	9	9	9	9	10	11	9	10	9	8	10	15	15	9	11	10	10	10	9	9	8	9	15
5-Jan	8	9	9	10	14	11	10	11	9	9	9	10	11	10	11	9	10	10	9	10	13	16	14	15	16
6-Jan	13	11	8	14	9	21	11	21	14	10	8	14	14	11	10	12	7	10	8	8	8	10	14	15	21
7-Jan	10	17	13	12	13	15	16	15	13	14	14	13	26	21	26	16	22	10	13	12	12	13	12	15	26
8-Jan	14	14	15	12	11	11	12	11	11	10	10	11	10	12	10	9	9	10	10	8	9	10	9	10	15
9-Jan	11	10	8	11	9	8	8	7	7	7	8	10	9	9	11	11	21	19	11	10	10	10	12	17	21
10-Jan	14	12	19	17	22	18	17	28	17	10	14	17	14	20	14	12	13	10	9	9	9	9	10	12	28
11-Jan	10	9	9	10	9	10	11	11	11	6	9	23	17	17	21	19	13	16	12	12	14	14	14	14	23
12-Jan	14	9	9	9	8	8	8	8	25	19	19	13	12	13	15	11	13	19	36	20	19	41	9	8	41
13-Jan	15	11	13	10	10	12	18	12	12	11	21	20	13	27	20	15	12	11	11	11	11	14	18	38	38
14-Jan	11	11	10	10	9	11	11	11	11	11	20	9	13	12	15	22	30	12	11	9	9	12	13	11	30
15-Jan	12	8	10	13	17	14	17	23	39	13	14	12	13	15	13	11	11	12	11	10	12	12	11	13	39
16-Jan	14	14	16	17	16	15	16	18	17	12	10	10	11	10	10	10	12	9	9	9	10	9	9	9	18
17-Jan	9	10	9	9	10	11	11	11	11	11	11	10	11	12	9	16	12	13	18	9	73	75	8	21	75
18-Jan	14	8	14	15	13	21	47	56	34	66	14	9	10	10	12	18	28	26	18	12	10	13	13	11	66
19-Jan	10	77	40	54	35	32	7	12	76	10	18	44	38	17	14	10	19	37	58	19	35	18	24	37	77
20-Jan	21	9	14	13	19	24	14	28	12	16	11	13	10	12	17	44	27	17	9	11	12	11	17	17	44
21-Jan	20	9	8	9	12	20	14	13	14	17	16	15	16	14	17	15	14	11	9	8	8	8	8	8	20
22-Jan	7	8	12	10	10	12	14	17	10	11	11	10	9	9	9	10	9	8	8	9	9	8	9	10	17
23-Jan	8	9	8	8	8	8	9	12	16	9	10	11	12	12	12	9	8	8	9	12	10	8	15	77	77
24-Jan	16	25	35	26	32	12	11	10	11	14	11	9	10	10	10	9	7	9	8	9	7	8	8	9	35
25-Jan	9	14	14	10	23	13	19	14	10	9	11	9	10	9	9	11	11	10	12	11	11	12	12	8	23
26-Jan	9	8	8	8	8	8	8	9	8	9	10	10	12	10	12	12	21	18	8	54	37	10	10	11	54
27-Jan	11	15	13	16	15	15	15	16	16	16	16	20	21	19	19	17	16	15	13	18	15	15	15	14	21
28-Jan	16	28	22	24	15	10	13	15	12	12	14	18	25	12	15	15	13	15	23	12	30	18	88	23	88
29-Jan	14	20	13	15	13	13	20	10	9	17	15	15	17	10	13	14	13	19	63	34	14	20	17	10	63
30-Jan	10	16	11	14	10	9	10	9	10	10	9	10	10	12	12	10	9	9	9	9	9	11	9	12	16
31-Jan	10	41	70	40	11	17	10	15	19	25	64	36	18	15	14	37	16	11	25	11	13	11	12	13	70
	21	77	70	54	35	32	47	56	76	66	64	44	39	27	26	44	30	37	63	54	73	75	88	77	
	Diurnal Maximum																								

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 20, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Reason:	Routine		
Start Time (MST)	10:30	End Time (MST)	13:40
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	622
Cal Gas Concentration	51.1 ppm	Cal Gas Expiry Date	29/05/2014
Gas Cert Reference	LL110503		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	7882
DACS voltage range	n/a	DACS channel #	TCP/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	17	16
Analyzer Range (mv)	1000	1000	Lamp voltage	2875	2797
Calculated slope	0.999897	0.994880	Chamber temp.	49.9	50.0
Calculated intercept	1.224115	0.579563	Pressure (mmHg)	22.1	22.3
Analyzer Background	16.9	16.9	Flow (lpm)	545.000	564.000
Analyzer Coefficient	1.011	1.011	Intensity	71	69

Analyzer make	API T100	Analyzer serial #	598

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	NA
as found span	5000	76.7	783.9	779.0	1.006
calibrator zero	5000	0.0	0.0	0.0	NA
high point	5000	76.7	783.9	787.9	0.995
second point	5000	38.4	392.4	392.9	0.999
third point	5000	19.2	196.2	196.5	0.998
calibrator zero					
as left zero	5000	0.0	0.0	-0.7	NA
as left span	6000	92.0	783.5	768.1	1.020
				Average Correction Factor	0.997

Corrected As found	779.0	Previous response	782.7	% change	0.5%

Notes:

Zero/span manifold changed after as founds. Filter changed after as founds. No adjustments made.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

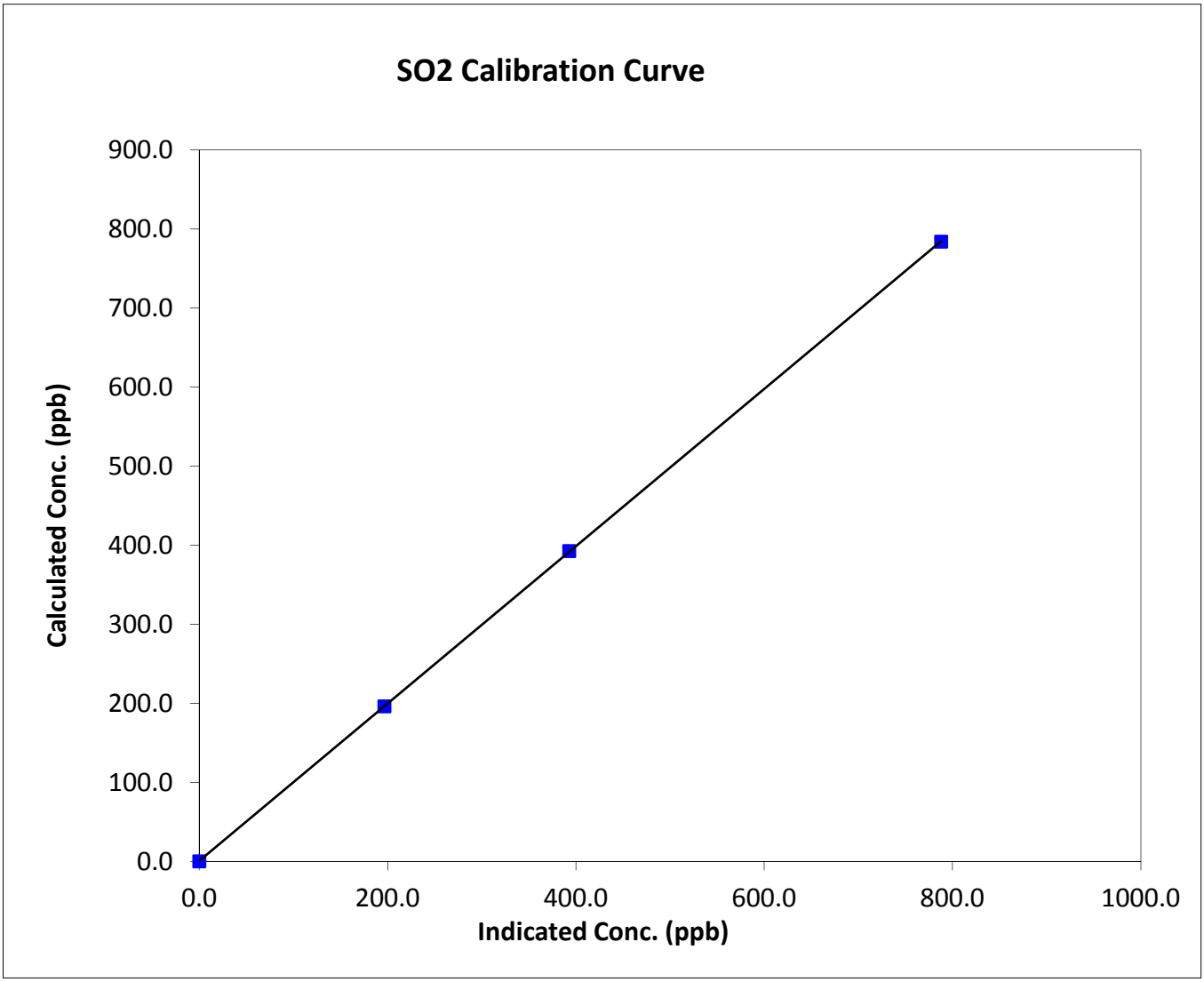
SO_2 Calibration Summary

Station Information

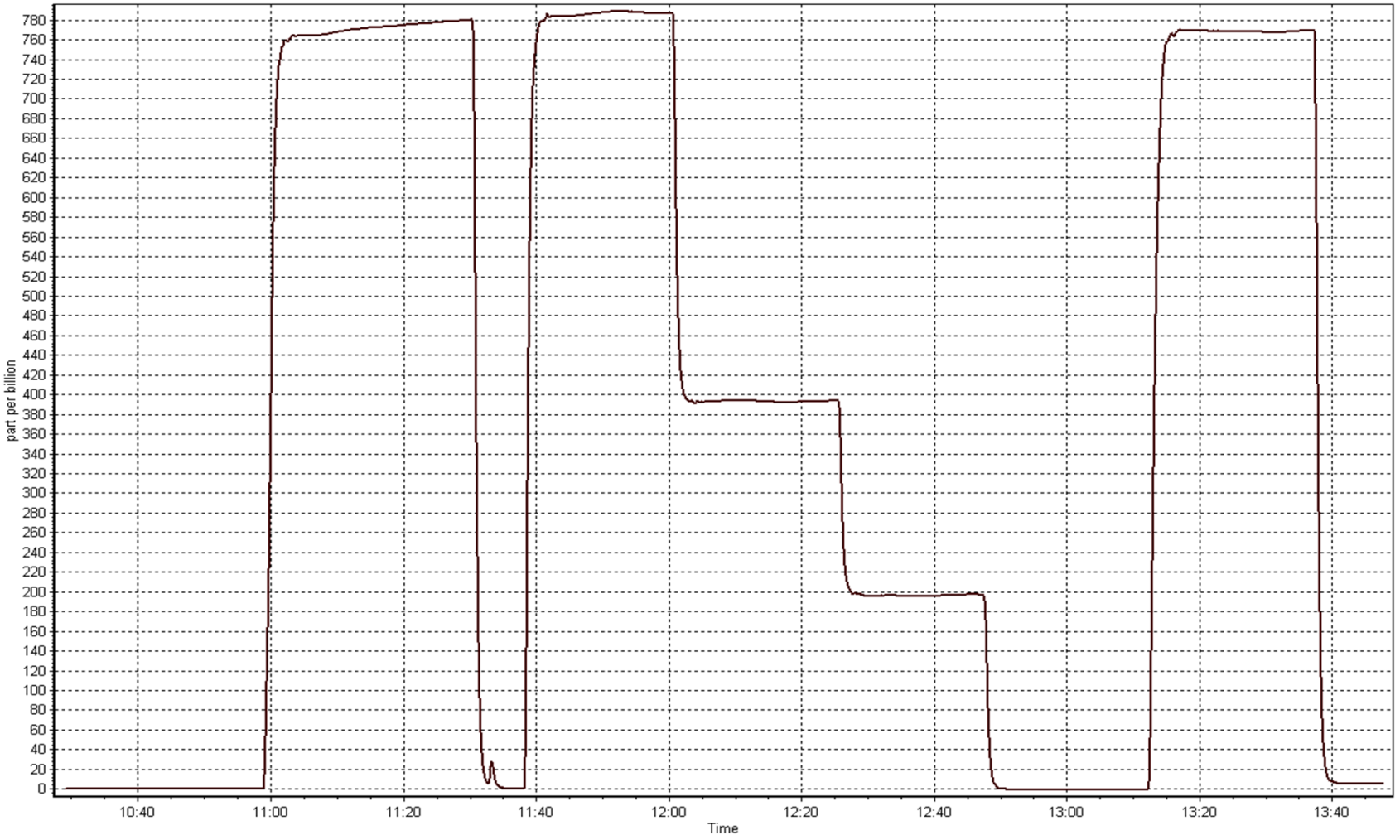
Calibration Date	January 20, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Start Time (MST)	10:30	End Time (MST)	13:40
Analyzer make	API T100	Analyzer serial #	598

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999995
783.9	787.9	0.9950		
392.4	392.9	0.9989	Slope	0.994880
196.2	196.5	0.9984		
			Intercept	0.579563



SO2 Calibration Plot Date: January 20, 2015



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 22, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Reason:	Routine		
Start Time (MST)	11:05	End Time (MST)	14:50
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial number	622
Cal Gas Concentration	10.4 ppm H2S	Cal Gas Expiry Date	30 May, 2016
Gas Cert Reference	LL34303	SO2 gas conc.	51.1 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	7882
DACS voltage range	n/a	DACS channel #	TC/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	21	22
Analyzer Range (mv)	100	100	Lamp voltage	3170	2937
Calculated slope	0.999721	1.009366	Chamber temp.	50	50
Calculated intercept	0.106096	-0.336426	Pressure	22.7	22.6
Analyzer Background	18	18	Flow	550	555
Analyzer Coefficient	0.998	0.998	Intensity	70	65
			Converter temp.	316	314

Analyzer make/model	API T101	Analyzer serial #	197
Converter make/model	n/a	Converter serial #	n/a

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.4	NA
as found span	5000	38.5	80.1	81.8	0.979
SO2 scrubber check	5000	19.6	200.3	4.1	NA
calibrator zero	5000	0.0	0.0	0.4	NA
high point	5000	38.5	80.1	79.7	1.005
second point	5000	19.3	40.1	40.0	1.003
third point	5000	12.0	25.0	25.1	0.996
calibrator zero					
as left zero	5000	0.0	0.0	0.7	NA
as left span	5000	38.5	80.1	77.0	1.041
				Average Correction Factor	1.001

Corrected As found	81.5	Previous response	80.0	% change	-1.8%

Notes:

Filter changed after as founds. Scrubber check performed after as founds.

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

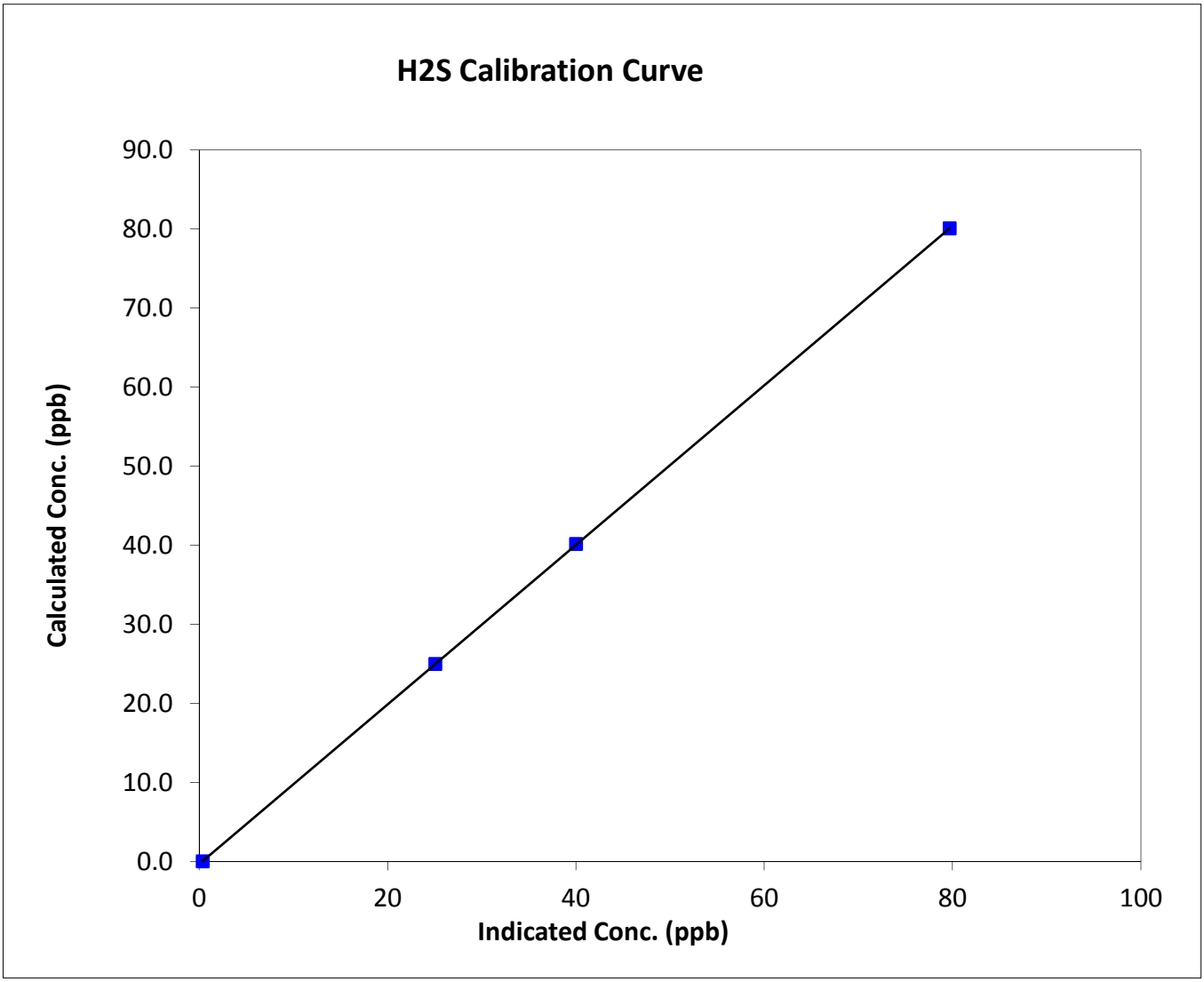
H2S Calibration Summary

Station Information

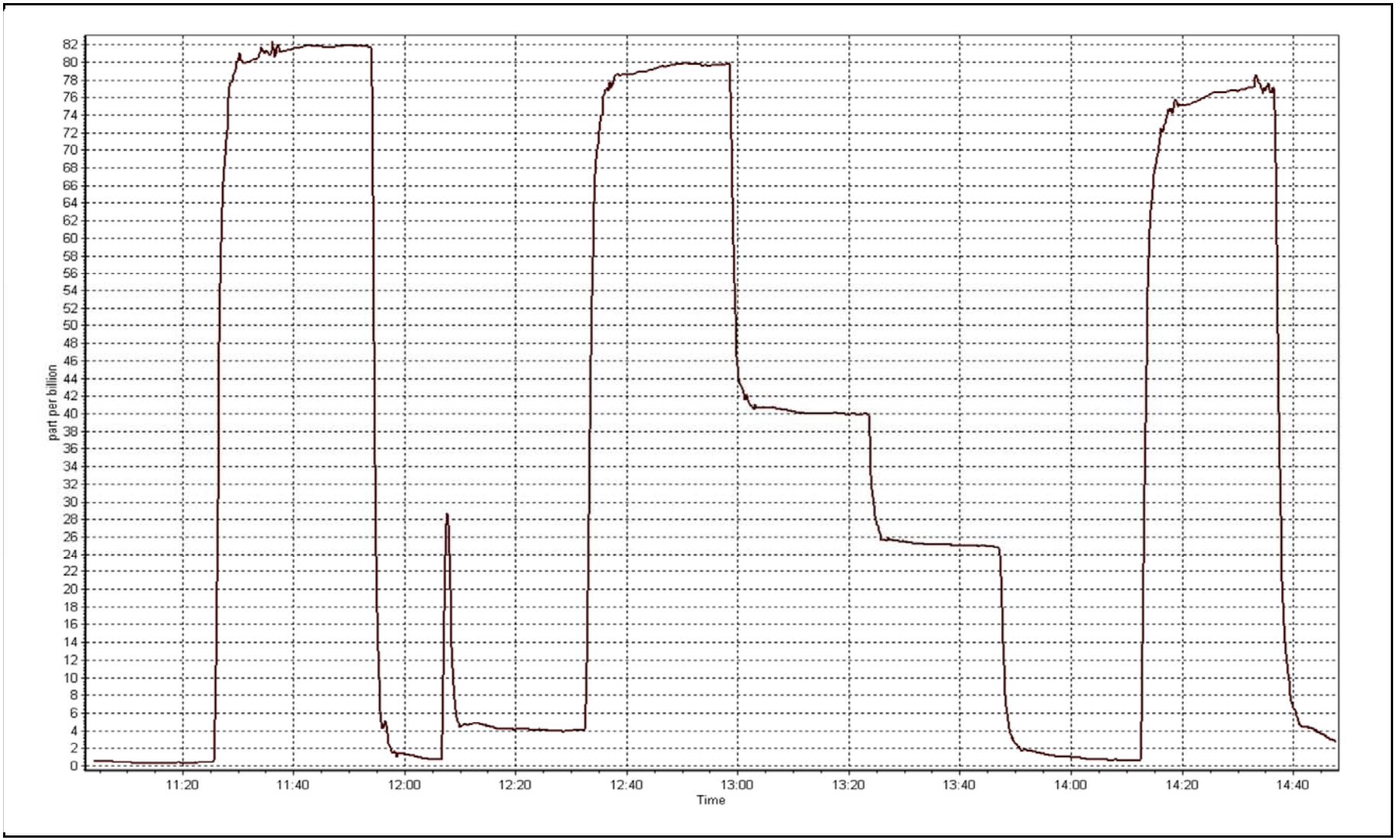
Calibration Date	January 22, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips - Surmont	Station Number	AMS 502
Start Time (MST)	11:05	End Time (MST)	14:50
Analyzer make	API T101	Analyzer serial #	197

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.4	N/A	Correlation Coefficient	0.999997
80.1	79.7	1.0046		
40.1	40.0	1.0031	Slope	1.009366
25.0	25.1	0.9956		
			Intercept	-0.336426



H2S Calibration Plot Date: January-22-15



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 21, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips	Station Number	AMS 102
Reason:	Routine		
Start Time (MST)	10:15	End Time (MST)	14:30
Barometric Pressure	n/a mmHg	Station Temperature	22.0 Deg C
Calibrator	API T700	Serial Number	622
NO Cal Gas Conc	52.2 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	52.2 ppm	Cal Gas Serial #	LL110503

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.: 7882

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	1.001208	1.000048	1.001092
	Data Offset	-0.477902	0.481170	0.888154
After	Data Slope	0.998423	0.998649	1.000458
	Data Offset	0.343486	0.531437	0.211318
Channel #		TCP/IP	TCP/IP	TCP/IP
Voltage Range				

Analyzer Information

Analyzer make/model: Thermo 42i — Analyzer serial #: 1218153356

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.721	ppb	0.721	ppb
NOX coefficient	0.997	ppb	0.997	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	4.9		4.8	
NOX bkgrnd	4.8		4.8	
PMT	-941		-940.900	
Chamber Temp	50.2	Deg C	50.5	Deg C
Moly Temp	322.4	Deg C	327.4	Deg C
Cooler Temp	-3.0	Deg C	-3.1	Deg C
O3 flow		ccm	ok	ccm
Chamber Press	200.2	mmHg	203.2	mmHg
Sample Flow	0.494	ccm	0.491	ccm

Notes:

No adjustments made.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 21, 2015 Station Number: AMS 102

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.3	0.2	0.1	N/A	N/A
as found span	5000	76.7	800.7	800.7	0.0	801.9	801.6	0.3	0.9986	0.9989
calibrator zero	5000	0.0	0.0	0.0	0.0	0.3	0.2	0.1	N/A	N/A
high point	5000	76.7	800.7	800.7	0.0	801.9	801.6	0.3	0.9986	0.9989
second point	5000	38.4	400.9	400.9	0.0	401.1	400.7	0.4	0.9994	1.0004
third point	5000	19.2	200.4	200.4	0.0	199.6	199.3	0.3	1.0042	1.0056
calibrator zero										
as left zero	5000	0.0	0.0	0.0	0.0	0.2	0.0	0.2	N/A	N/A
as left span	6000	92.0	800.4	522.7	277.7	811.9	530.6	281.3	0.9858	0.9852
								Average Correction Factor	1.0007	1.0017

Corrcted As found NO_X= 801.6 NO= 801.4 Percent Change NO_X= -0.2% NO= -0.1%

Previous Response NO_X= 800.3 NO= 800.2

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 76.70 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.1			N/A	
1st NO2 (300)	N/A	522.7	280.3	803.2	522.7	280.5	0.9819	1.0000	0.9993	100.1%
2nd NO2 (200)	N/A	608.0	195.0	803.5	608.0	194.0	0.9815	1.0000	1.0052	99.5%
3rd NO2 (100)	N/A	699.1	103.9	802.6	699.1	103.5	0.9826	1.0000	1.0040	99.6%
4th NO2 (0)	803.0	N/A	1.0	804.0	803.0	0.5	0.9809	1.0000	N/A	N/A
					Average Correction Factor		0.9817	1.0000	1.0028	99.7%

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

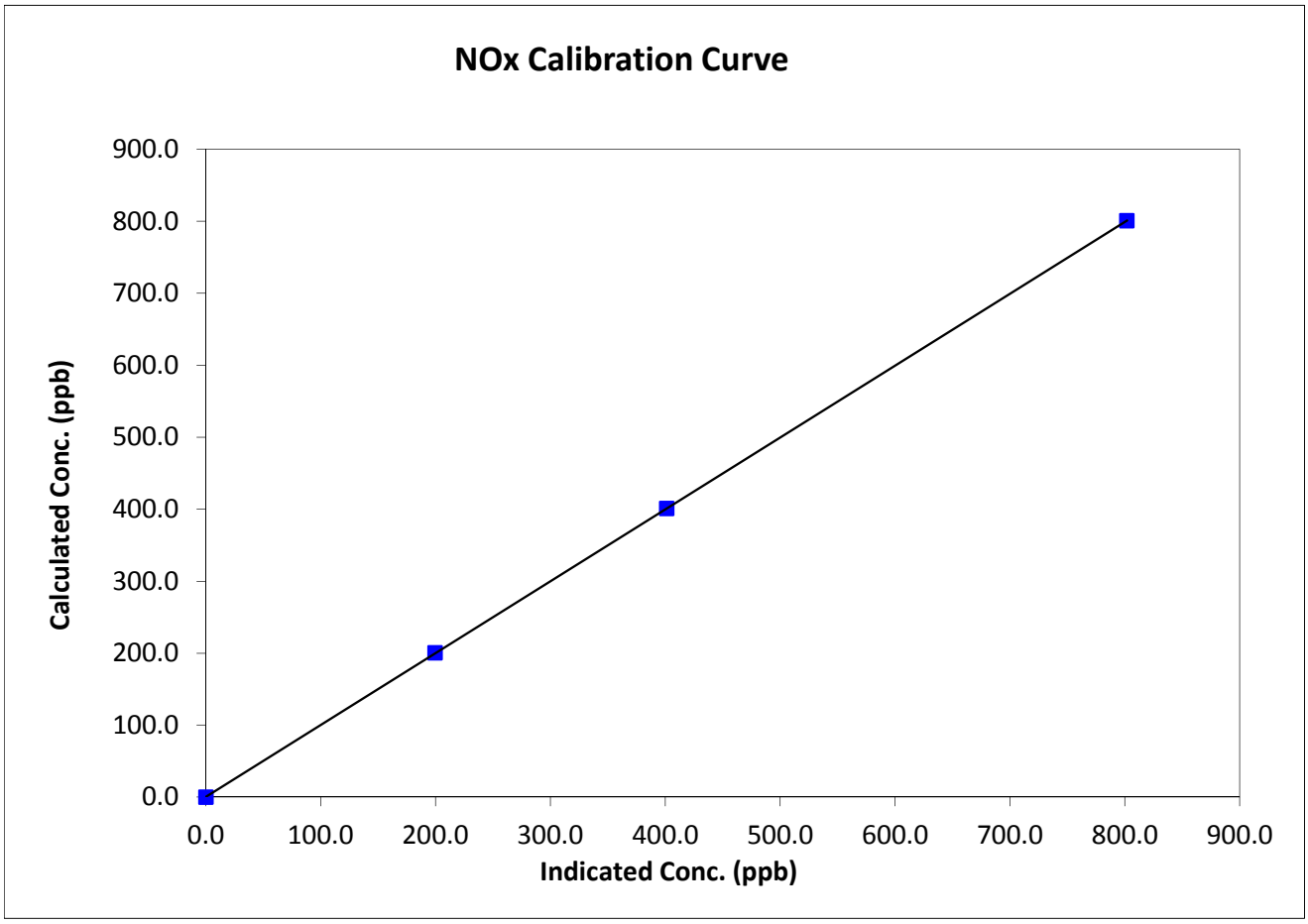
NO_X Calibration Summary

Station Information

Calibration Date	January 21, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips	Station Number	AMS 102
Start Time (MST)	10:15	End Time (MST)	14:30
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999997
800.7	801.9	0.9986		
400.9	401.1	0.9994	Slope	0.998423
200.4	199.6	1.0042		
			Intercept	0.343486



Wood Buffalo Environmental Association

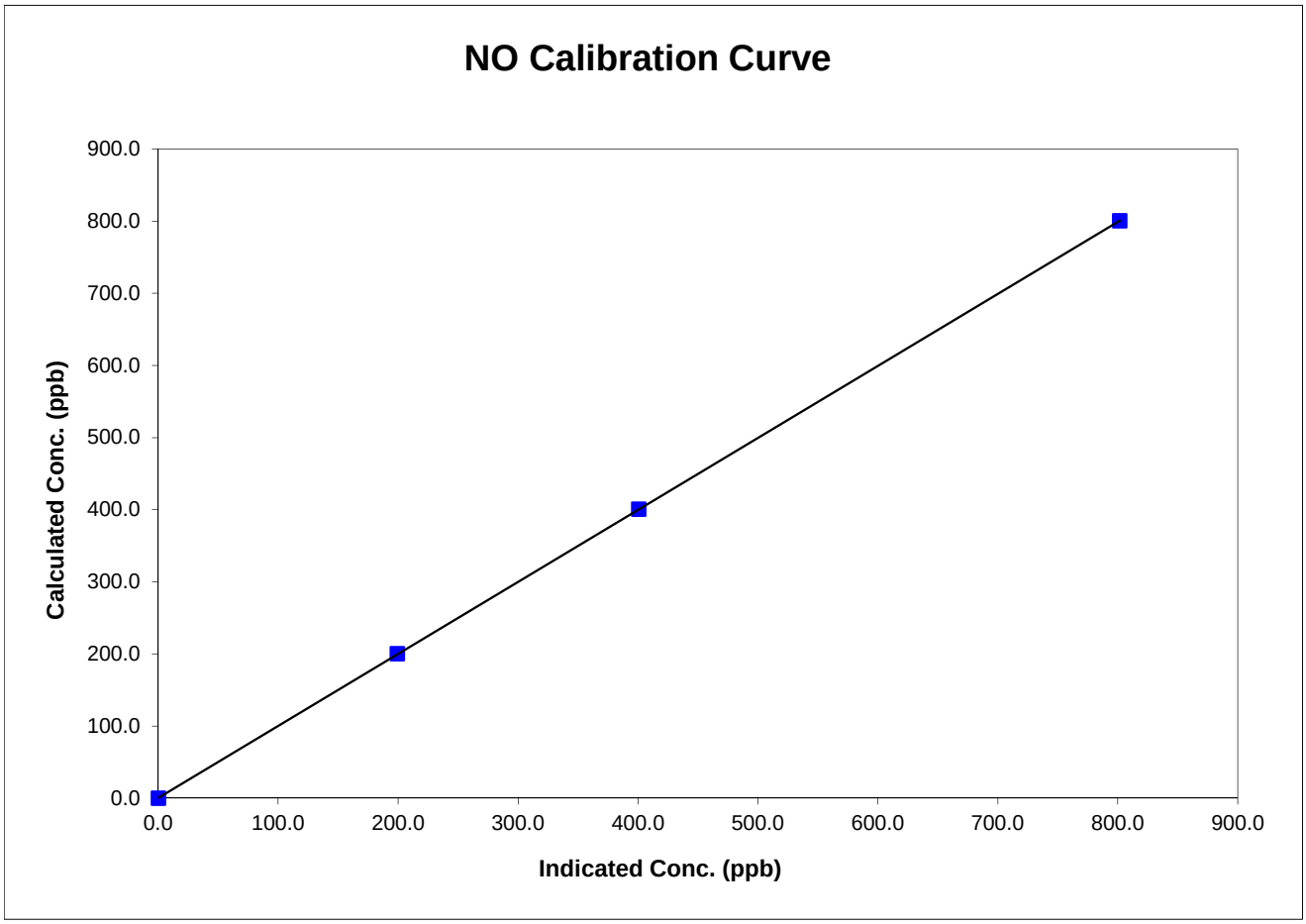
NO Calibration Summary

Station Information

Calibration Date	January 21, 2015	Previous Calibration	December 3, 2014
Station Name	ConocoPhillips	Station Number	AMS 102
Start Time (MST)	10:15	End Time (MST)	14:30
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999996
800.7	801.6	0.9989		
400.9	400.7	1.0004	Slope	0.998649
200.4	199.3	1.0056		
			Intercept	0.531437



Wood Buffalo Environmental Association

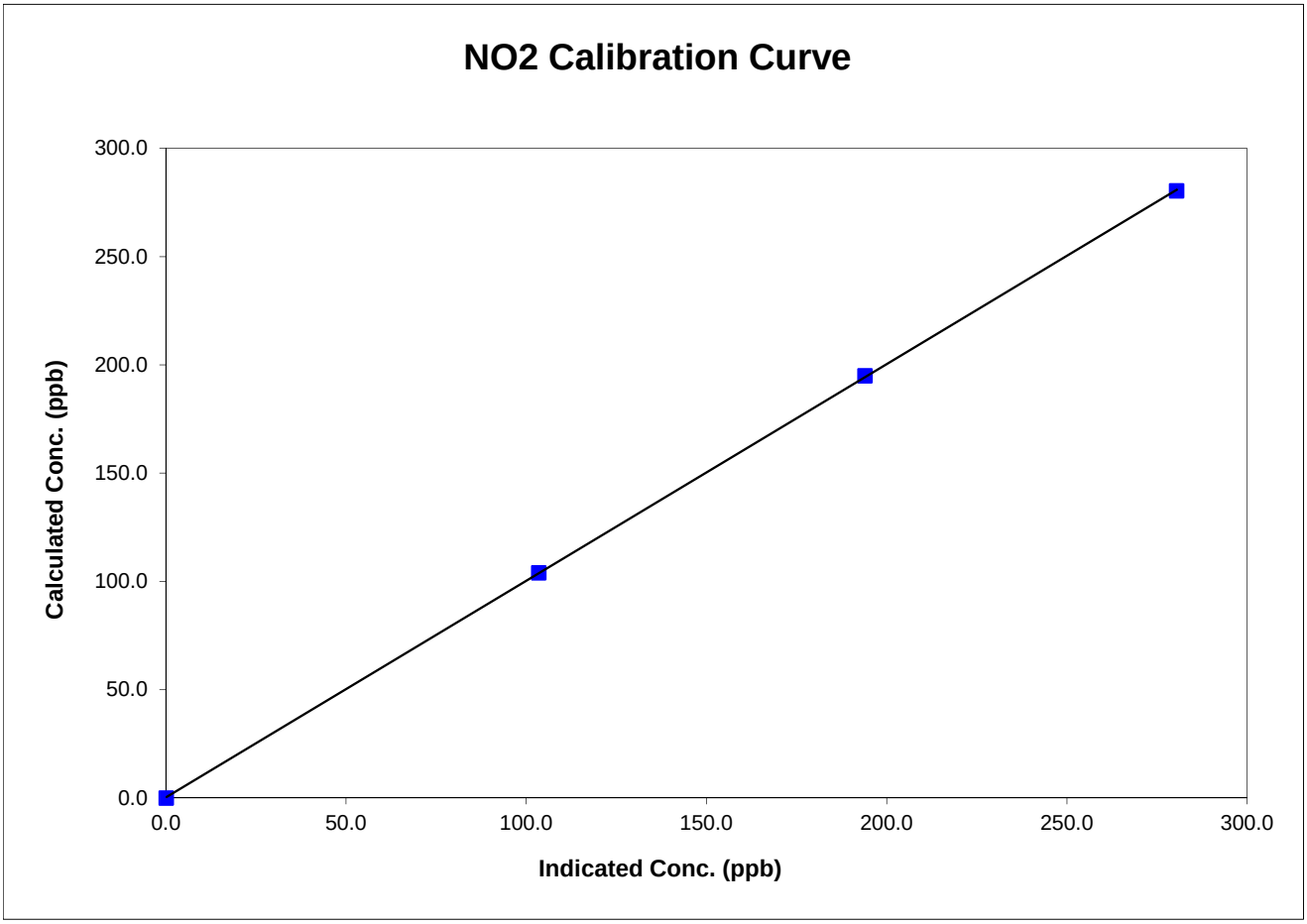
NO_2 Calibration Summary

Station Information

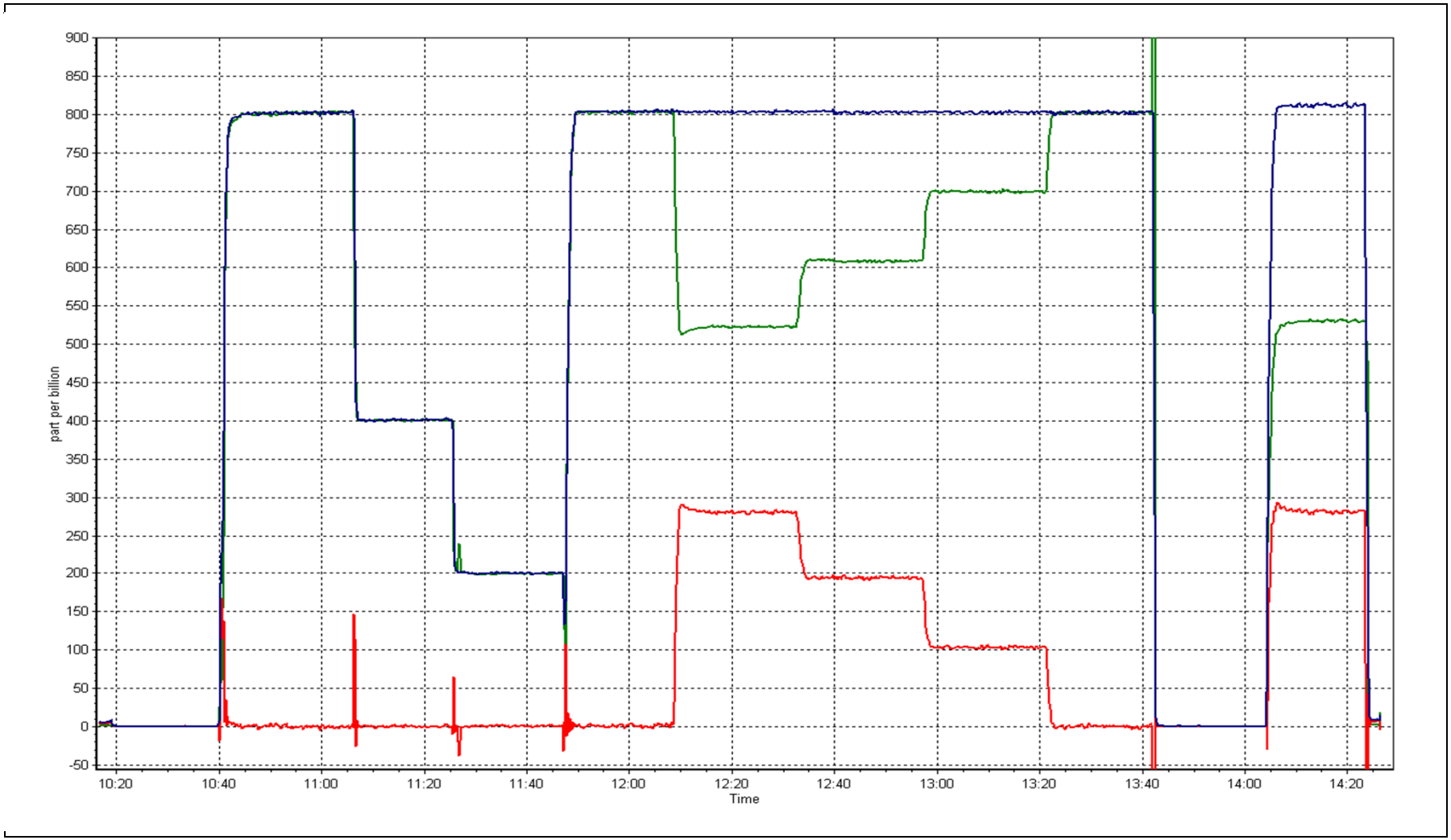
Calibration Date	January 21, 2015	Previous Calibration	December 3, 2014
Station Number	ConocoPhillips	Station Number	AMS 102
Start Time (MST)	10:15	End Time (MST)	14:30
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999979
280.3	280.5	0.9993		
195.0	194.0	1.0052	Slope	1.000458
103.9	103.5	1.0040		
			Intercept	0.211318



NOx, NO & NO_2 Calibration Plot Date: January 21, 2015



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM
MONTHLY REPORT

DATA SUMMARY
DECEMBER 2014

Prepared
February 27, 2015

SAMPLE COLLECTION

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS

passive:	Maxxam Analytics Ltd Edmonton, Alberta
VOC	Alberta Innovates - Technology Futures Vegreville, Alberta
particulate:	ALS Canada Ltd Burlington, Ontario
PAH:	Air Zone One Incorporated Mississauga, Ontario
precipitation:	Alberta Innovates - Technology Futures Vegreville, Alberta

DATA SUMMARY

Aurora Atmospherics Inc.
Calgary, Alberta

October - December 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Passive Monitoring Results

Continuous Air Monitoring Stations

Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
AMS 1 - Fort McKay	30-Sep-14	27-Nov-14	Sample	5.5	12.2	1
			Sample	5.6	12.2	1
			Sample	4.9	14.6	0.8
			Average	**5.3**	**13.0**	**0.9**
AMS 2 - Mildred Lake	30-Sep-14	27-Nov-14	Sample	7.5	13.5	2.3
			Sample	8.7	12.7	missing
			Sample	6	13.4	2.6
			Average	**7.4**	**13.2**	**2.5**
AMS 6 - Patricia McInnes	29-Sep-14	28-Nov-14	Sample	3.6	17.4	1.4
			Sample	4.7	17.2	1.2
			Sample	3.5	17.9	1.1
			Average	**3.9**	**17.5**	**1.2**
AMS 8 - Fort Chipewyan	02-Oct-14	03-Dec-14	Sample	0.6	23.6	0.4
			Sample	0.5	24.8	0.4
			Sample	0.7	missing	0.4
			Average	**0.6**	**24.2**	**0.4**
AMS 14 - Anzac	29-Sep-14	28-Nov-14	Sample	1.7	19.8	0.6
			Sample	1.4	18.8	0.6
			Sample	1.3	19.5	0.7
			Average	**1.5**	**19.4**	**0.6**

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	Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
1	**AH3**	01-Oct-14	08-Dec-14	Sample	1.3	21.7	0.7
				Sample	1.8	21.9	0.9
				Average	**1.6**	**21.8**	**0.8**
2	**AH7**	03-Oct-14	04-Dec-14	Sample	2.1	22.3	1.0
				Sample	3.9	19.7	1.1
				Average	**3.0**	**21.0**	**1.1**
3	**AH8-R**	02-Oct-14	04-Dec-14	Sample	2.8	18.3	1.0
				Sample	2.2	21.0	1.0
				Average	**2.5**	**19.7**	**1.0**
4	**BM7**	03-Oct-14	01-Dec-14	**Sample**	**0.3**	**26.6**	**0.6**
5	**BM10**	02-Oct-14	04-Dec-14	**Sample**	**0.8**	**18.7**	**0.6**
6	**BM11**	03-Oct-14	01-Dec-14	**Sample**	**0.6**	**25.0**	**1.1**
7	**JE 306**	03-Sep-14	03-Dec-14	**Sample**	0.8	**18.64**	**0.7**
8	**JE 308**	05-Sep-14	04-Dec-14	**Sample**	0.3	18.94	0.3
9	**JE 312**	01-Oct-14	08-Dec-14	**Sample**	**0.5**	**22.56**	**0.4**
10	**JP101**	02-Oct-14	09-Dec-14	Sample	1.0	21.4	0.6
				Sample	1.2	20.9	2.1
				Average	**1.1**	**21.2**	**1.4**
11	**JP102**	02-Oct-14	04-Dec-14	Sample	3.2	21.4	0.9
				Sample	3.5	20.8	1.0
				Average	**3.4**	**21.1**	**1.0**
12	**JP104**	30-Sep-14	27-Nov-14	Sample	8.7	20.5	1.0
				Sample	4.9	19.8	1.0
				Average	**6.8**	**20.2**	**1.0**
13	**JP107**	03-Oct-14	01-Dec-14	Sample	1.9	27.6	0.8
				Sample	2.6	21.7	0.8
				Average	**2.3**	**24.7**	**0.8**
14	**JP108**	01-Oct-14	08-Dec-14	Sample	0.4	22.0	0.3
				Sample	0.3	20.5	0.3
				Average	**0.4**	**21.2**	**0.3**
15	**JP201**	02-Oct-14	04-Dec-14	Sample	0.4	24.6	0.4
				Sample	0.4	22.6	0.4
				Average	**0.4**	**23.6**	**0.4**

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	Station	Start	End	Result Type	NO_2 (ppb)	O_3 (ppb)	SO_2 (ppb)
16	**JP205**	03-Oct-14	01-Dec-14	Sample	0.5	24.4	0.6
				Sample	0.5	28.1	0.6
				Average	**0.5**	**26.2**	**0.6**
17	**JP210**	01-Oct-14	08-Dec-14	Sample	0.9	13.3	0.5
				Sample	0.6	11.8	0.5
				Average	**0.8**	**12.6**	**0.5**
18	**JP212**	03-Oct-14	01-Dec-14	**Sample**	**4.4**	**15.4**	**0.6**
19	**JP213**	01-Oct-14	08-Dec-14	Sample	0.3	32.14	0.5
				Sample	0.3	30.8	0.5
				Average	**0.3**	**31.5**	**0.5**
20	**JP311**	02-Oct-14	04-Dec-14	Sample	1.0	23.7	0.9
				Sample	1.1	22.0	0.9
				Average	**1.1**	**22.9**	**0.9**
21	**JP316**	01-Oct-14	08-Dec-14	Sample	0.5	23.3	0.5
				Sample	0.4	24.3	0.5
				Average	**0.5**	**23.8**	**0.5**
22	**NE7**	03-Oct-14	01-Dec-14	**Sample**	**0.7**	**23.7**	**0.8**
23	**NE10**	01-Oct-14	08-Dec-14	**Sample**	**0.3**	**20.3**	**0.3**
24	**NE11**	03-Sep-14	01-Dec-14	**Sample**	**1.4**	**15.7**	**0.7**
25	**R2**	30-Sep-14	27-Nov-14	**Sample**	**5.7**	**14.0**	**0.6**
26	**SM7**	01-Oct-14	10-Dec-14	**Sample**	**0.9**	**25.5**	**0.4**
27	**SM8**	01-Oct-14	10-Dec-14	**Sample**	**0.6**	**24.5**	**0.6**
28	**WF4**	02-Oct-14	04-Dec-14	**Sample**	**1.7**	**15.8**	**0.8**
29	**JE 323**	01-May-14	08-Dec-14	**Sample**	**0.4**	**16.68**	**0.8**
30	**JE 316**	01-May-14	10-Dec-14	**Sample**	**0.2**	**22.21**	**0.4**

VOC Canisters

Results (ppbv)

#	Compound Name	MDL	AMS 9 Barge Landing 01-Dec	AMS 12 Millennium Mine 01-Dec	AMS 13 Fort McKay South 01-Dec	AMS 15 CNRL Horizon 01-Dec
	1,2,4-Trimethylbenzene	0.03	0.33		0.35	0.32
	1,3,5-Trimethylbenzene	0.03	0.33		0.25	0.33
	1,3-Butadiene	0.03				
	1-Butene	0.03	0.98		0.77	0.51
	1-Pentene	0.03	0.55		0.71	0.51
	2,2,4-Trimethylpentane	0.03	0.47			0.52
	2,2-Dimethylbutane	0.03	0.5		0.91	0.63
	2,3,4-Trimethylpentane	0.03	0.44		0.51	0.43
	2,3-Dimethylbutane	0.03	0.61	0.34	0.74	0.58
	2,3-Dimethylpentane	0.03			0.61	0.36
	2,4-Dimethylpentane	0.03			0.57	0.49
	2-Methyl-1-pentene	0.03	0.35		0.37	0.46
	2-Methyl-2-butene	0.03	0.42		0.3	0.45
	2-Methylheptane	0.03	0.69		1.33	0.49
	2-Methylhexane	0.03	0.65		0.48	0.65
	2-Methylpentane	0.03	0.66		0.73	0.68
	3-Methyl-1-butene	0.03	0.43		0.5	0.51
	3-Methylheptane	0.03	0.45		0.65	0.35
	3-Methylhexane	0.03	0.65		0.9	0.58
	3-Methylpentane	0.03	0.55	0.36	0.75	0.76
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	2.19		2.19	
	Acetone	0.03	3.02	3.17	3.39	2.94
	alpha-Pinene	0.03	0.46		0.45	0.4
	Benzene	0.03	0.73	0.3	0.65	0.63
	beta-Pinene	0.03				
	cis-2-Butene	0.03	0.45		0.44	0.47
	cis-2-Hexene	0.03	0.35		0.42	
	cis-2-Pentene	0.03	0.53			0.51
	Cyclohexane	0.03	0.61	0.11	0.67	0.56
	Cyclopentane	0.03				
	Cyclopentene	0.03	0.41			0.41
	Ethanol	0.03				1.71
	Ethylbenzene	0.03	0.49		0.49	0.33
	Formaldehyde	0.03				
	Isobutane	0.03	1.9	1.43	2.04	2.01
	Isopentane	0.03	1.34	1.04	1.34	1.23
	Isoprene	0.03	0.44		0.53	0.52
	Isopropylalcohol	0.03	4.12		3.47	55.6
	Isopropylbenzene	0.03	0.35			0.36
	m,p-Xylene	0.03	0.99		0.92	0.7
	Methanol	0.03		11.5		
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03	0.88		1.41	0.73
	Methylcyclopentane	0.03	0.58	0.2	0.69	0.62
	n-Butane	0.03	2.74	1.96	2.38	2.1
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03	1.09		1.24	
	n-Hexane	0.03	0.76	0.71	1.13	0.81
	n-Nonane	0.03	0.53		0.47	0.31
	n-Octane	0.03	0.82		1.38	0.41
	n-Pentane	0.03				
	n-Propylbenzene	0.03	0.28		0.23	0.31
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03	0.45		0.51	0.37
	Styrene	0.03	0.4		0.28	0.36
	Toluene	0.03	0.95	10.4	1.29	1.23
	trans-2-Butene	0.03	0.83		0.7	0.69
	trans-2-Hexene	0.03	0.42		0.37	0.5
	trans-2-Pentene	0.03	0.39		0.53	0.63

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 01-Dec	AMS 6 Patricia McInnes 01-Dec	AMS 7 Athabasca Valley 01-Dec	AMS 14 Anzac 01-Dec
	1,2,4-Trimethylbenzene	0.03	0.38	0.16	0.28	
	1,3,5-Trimethylbenzene	0.03	0.29	0.12	0.31	
	1,3-Butadiene	0.03				
	1-Butene	0.03		0.67	0.75	
	1-Pentene	0.03			0.41	
	2,2,4-Trimethylpentane	0.03	0.22		0.63	
	2,2-Dimethylbutane	0.03			0.43	
	2,3,4-Trimethylpentane	0.03			0.55	
	2,3-Dimethylbutane	0.03	0.42		0.59	
	2,3-Dimethylpentane	0.03			0.54	
	2,4-Dimethylpentane	0.03			0.53	
	2-Methyl-1-pentene	0.03			0.42	
	2-Methyl-2-butene	0.03			0.5	
	2-Methylheptane	0.03	0.41		0.53	
	2-Methylhexane	0.03			0.52	
	2-Methylpentane	0.03	0.44	0.41	0.71	
	3-Methyl-1-butene	0.03			0.44	
	3-Methylheptane	0.03			0.36	
	3-Methylhexane	0.03	0.41	0.15	0.79	
	3-Methylpentane	0.03	0.64	0.26	0.66	0.42
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	2	2.08	2.34	1.82
	Acetone	0.03	2.89	3.26	3.82	2.31
	alpha-Pinene	0.03			0.4	
	Benzene	0.03	0.6	0.4	0.82	
	beta-Pinene	0.03		1.3		
	cis-2-Butene	0.03			0.38	
	cis-2-Hexene	0.03		0.1	0.46	
	cis-2-Pentene	0.03			0.48	
	Cyclohexane	0.03	0.39		0.49	
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03		6.47	3.83	
	Ethylbenzene	0.03	0.32		0.37	
	Formaldehyde	0.03				
	Isobutane	0.03	1.23	1.56	2.33	0.85
	Isopentane	0.03	1.18	1.03	1.34	1.03
	Isoprene	0.03			0.54	
	Isopropylalcohol	0.03		18	23.8	
	Isopropylbenzene	0.03	0.14		0.33	
	m,p-Xylene	0.03	0.52	0.37	0.67	
	Methanol	0.03	11.7	18.4		10.8
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03	0.51		0.63	
	Methylcyclopentane	0.03	0.43	0.21	0.52	
	n-Butane	0.03	1.83	2.29	3.69	1
	n-Decane	0.03	0.08			
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03	0.98	0.46	0.71	0.78
	n-Nonane	0.03	0.23			
	n-Octane	0.03			0.43	
	n-Pentane	0.03				
	n-Propylbenzene	0.03			0.25	
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03			0.38	
	Styrene	0.03			0.27	
	Toluene	0.03	10.5	4.1	1.06	8.02
	trans-2-Butene	0.03			0.55	
	trans-2-Hexene	0.03			0.46	
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 12 Millennium Mine 07-Dec	AMS 13 Fort McKay South 07-Dec	AMS 15 CNRL Horizon 07-Dec
	1,2,4-Trimethylbenzene	0.03		0.1	
	1,3,5-Trimethylbenzene	0.03			
	1,3-Butadiene	0.03			
	1-Butene	0.03			
	1-Pentene	0.03			
	2,2,4-Trimethylpentane	0.03			
	2,2-Dimethylbutane	0.03			
	2,3,4-Trimethylpentane	0.03			
	2,3-Dimethylbutane	0.03			
	2,3-Dimethylpentane	0.03			
	2,4-Dimethylpentane	0.03			
	2-Methyl-1-pentene	0.03			
	2-Methyl-2-butene	0.03			
	2-Methylheptane	0.03			
	2-Methylhexane	0.03			
	2-Methylpentane	0.03		0.6	
	3-Methyl-1-butene	0.03			
	3-Methylheptane	0.03			
	3-Methylhexane	0.03			
	3-Methylpentane	0.03			
	4-Methyl-1-pentene	0.03			
	Acetaldehyde	0.03		1.7	1.39
	Acetone	0.03			1.67
	alpha-Pinene	0.03			
	Benzene	0.03			
	beta-Pinene	0.03			
	cis-2-Butene	0.03			
	cis-2-Hexene	0.03			
	cis-2-Pentene	0.03			
	Cyclohexane	0.03		0.09	
	Cyclopentane	0.03			0.16
	Cyclopentene	0.03			
	Ethanol	0.03			
	Ethylbenzene	0.03			
	Formaldehyde	0.03			
	Isobutane	0.03	0.46	0.32	0.45
	Isopentane	0.03	1.13	1.79	0.62
	Isoprene	0.03			
	Isopropylalcohol	0.03			
	Isopropylbenzene	0.03			
	m,p-Xylene	0.03			
	Methanol	0.03	16.9	10.1	8.2
	Methylethylketone	0.03			
	Methylisobutylketone	0.03			
	Methylcyclohexane	0.03			
	Methylcyclopentane	0.03			
	n-Butane	0.03	0.63	0.3	0.52
	n-Decane	0.03			
	n-Dodecane	0.03			
	n-Heptane	0.03			
	n-Hexane	0.03			
	n-Nonane	0.03			
	n-Octane	0.03			
	n-Pentane	0.03	2.47	3.15	
	n-Propylbenzene	0.03			
	n-Undecane	0.03			
	Naphthalene	0.03			
	o-Xylene	0.03			
	Styrene	0.03			
	Toluene	0.03			
	trans-2-Butene	0.03			
	trans-2-Hexene	0.03			
	trans-2-Pentene	0.03			

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 07-Dec	AMS 6 Patricia McInnes 07-Dec	AMS 7 Athabasca Valley 07-Dec	AMS 14 Anzac 07-Dec
	1,2,4-Trimethylbenzene	0.03		0.09		
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03				
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03				0.09
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				
	2-Methylhexane	0.03			0.07	
	2-Methylpentane	0.03			0.14	
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03		0.19		
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	1.55	1.84	1.67	2.06
	Acetone	0.03		2.37	3.57	
	alpha-Pinene	0.03			0.14	
	Benzene	0.03				
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	0.12			
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03			6.78	3.86
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	0.52	0.77	0.44	0.73
	Isopentane	0.03	1.46	0.82	0.64	1.32
	Isoprene	0.03				
	Isopropylalcohol	0.03		9.94	6.97	6.11
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.25	0.33	
	Methanol	0.03	10.1	11.6	16.6	12.5
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	0.82	0.57	0.56	0.86
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03			0.17	
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03	2.13			
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03			0.1	
	Styrene	0.03				
	Toluene	0.03		1.99	1.1	1.12
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 9 Barge Landing 13-Dec	AMS 12 Millennium Mine 13-Dec	AMS 13 Fort McKay South 13-Dec	AMS 15 CNRL Horizon 13-Dec
	1,2,4-Trimethylbenzene	0.03		0.1		
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03				
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03				0.32
	2,3-Dimethylpentane	0.03				0.25
	2,4-Dimethylpentane	0.03		0.17		
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03	0.24	0.6		
	2-Methylhexane	0.03				
	2-Methylpentane	0.03		0.72		
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03		0.53		
	3-Methylpentane	0.03	0.55	0.58	0.28	0.42
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	2.69	3.12	2.16	
	Acetone	0.03	4.54			2.42
	alpha-Pinene	0.03				
	Benzene	0.03	0.6	0.74	0.35	0.21
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				0.57
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	2.67	1.96	1.07	2.79
	Isopentane	0.03	1.62	2.66	0.87	2.03
	Isoprene	0.03				
	Isopropylalcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.19	0.48	0.14	0.06
	Methanol	0.03	15.8	15.1	12.3	9.7
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03		0.74		0.38
	Methylcyclopentane	0.03		0.38		0.22
	n-Butane	0.03	2.69	2.5	1.16	1.59
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03	0.44	1.39		0.18
	n-Hexane	0.03		0.85	0.38	
	n-Nonane	0.03				
	n-Octane	0.03		0.91		
	n-Pentane	0.03				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.29	0.89	0.35	0.14
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 13-Dec	AMS 6 Patricia McInnes 13-Dec	AMS 7 Athabasca Valley 13-Dec	AMS 14 Anzac 13-Dec
	1,2,4-Trimethylbenzene	0.03		0.14		
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03			0.17	
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03	0.28	0.29	0.24	
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03		0.2		0.07
	2-Methylhexane	0.03		0.21		
	2-Methylpentane	0.03			0.65	0.31
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03		0.36		
	3-Methylpentane	0.03	0.36	0.43	0.42	
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	2.03	3.18	2.48	
	Acetone	0.03				4.57
	alpha-Pinene	0.03				
	Benzene	0.03	0.41	0.73	0.63	
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	0.32	0.31	0.18	
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03			6.6	
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	2.41	1.85	1.53	1.78
	Isopentane	0.03	2.01	2.18	2.31	1.13
	Isoprene	0.03				
	Isopropylalcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03		0.48		
	Methanol	0.03	10.8	38.2	44.3	18.7
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03	0.41	0.41	0.3	
	Methylcyclopentane	0.03				
	n-Butane	0.03	2.26	3.29	2.51	2.01
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03		0.61		
	n-Hexane	0.03	0.33		0.59	0.48
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03		0.22		
	Styrene	0.03				
	Toluene	0.03	0.23	0.6	0.55	0.23
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 9 Barge Landing 19-Dec	AMS 12 Millennium Mine 19-Dec	AMS 13 Fort McKay South 19-Dec	AMS 15 CNRL Horizon 19-Dec
	1,2,4-Trimethylbenzene	0.03		0.14		
	1,3,5-Trimethylbenzene	0.03		0.15		
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03		0.31		
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03				
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03	0.21		0.28	
	2-Methylhexane	0.03	0.34		0.17	
	2-Methylpentane	0.03			0.4	
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	0.28		0.29	0.14
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	3.5		1.49	
	Acetone	0.03				1.21
	alpha-Pinene	0.03			0.23	
	Benzene	0.03		0.48		
	beta-Pinene	0.03		0.51		
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	0.18		0.64	
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	4.39	2.05	2	0.97
	Isopentane	0.03	1.16	1.08	1.57	0.8
	Isoprene	0.03				
	Isopropylalcohol	0.03	6.71	11.9	4.84	4.3
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.2	0.27	0.23	
	Methanol	0.03	17.7	14.8	12.6	11.8
	Methylethylketone	0.03			0.26	
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03			0.56	0.39
	Methylcyclopentane	0.03			0.33	
	n-Butane	0.03	4.4	3.18	2.94	1.57
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03		0.51		0.2
	n-Nonane	0.03				
	n-Octane	0.03			0.39	
	n-Pentane	0.03		1.01	1.27	0.96
	n-Propylbenzene	0.03		0.09		
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03			0.12	
	Styrene	0.03				
	Toluene	0.03	1.38	1.63	0.99	1.06
	trans-2-Butene	0.03	0.52		0.36	
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 19-Dec	AMS 6 Patricia McInnes 19-Dec	AMS 7 Athabasca Valley 19-Dec	AMS 14 Anzac 19-Dec
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				0.12
	2,2-Dimethylbutane	0.03				
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03	0.2			
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03	0.37			
	2-Methylhexane	0.03			0.06	
	2-Methylpentane	0.03				0.41
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03	0.34			
	3-Methylpentane	0.03				0.47
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	2.07	2.3	1.67	2.77
	Acetone	0.03	2.3	3.28	2.93	4.25
	alpha-Pinene	0.03				
	Benzene	0.03	0.3	0.45	0.34	
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	0.32			0.21
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03		5.92		
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	1.16	1.82	1.16	1.39
	Isopentane	0.03	0.69	1.36	0.84	1.39
	Isoprene	0.03				
	Isopropylalcohol	0.03	6.17	7.71	6.66	9.81
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03	0.23	0.31		
	Methanol	0.03	12.8	22.3	20.5	30.3
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03	0.52			
	Methylcyclopentane	0.03				0.43
	n-Butane	0.03	1.42	3.71	0.86	1.58
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03	0.52		0.37	
	n-Nonane	0.03				
	n-Octane	0.03	0.5			
	n-Pentane	0.03				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	1.36	1.23	0.99	1.9
	trans-2-Butene	0.03				0.11
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 25-Dec	AMS 12 Millennium Mine 25-Dec	AMS 13 Fort McKay South 25-Dec	AMS 15 CNRL Horizon 25-Dec
	1,2,4-Trimethylbenzene	0.03				0.12
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03		0.34	0.28	0.32
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03				0.36
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				0.11
	2-Methylhexane	0.03				
	2-Methylpentane	0.03	0.72		0.48	
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	0.44	0.2	0.38	0.42
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				0.87
	Acetone	0.03				
	alpha-Pinene	0.03				
	Benzene	0.03				
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03	0.39	0.19		0.5
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03				
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	1.26	0.47	0.98	1.44
	Isopentane	0.03	1.84	0.66	1.31	1.94
	Isoprene	0.03				
	Isopropylalcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	12.9	3.3	4.1	11.7
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03	0.35		0.24	0.35
	Methylcyclopentane	0.03				
	n-Butane	0.03	1.12	0.57	0.69	1.58
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				0.4
	n-Hexane	0.03	0.43			0.25
	n-Nonane	0.03				
	n-Octane	0.03	0.15			
	n-Pentane	0.03				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.15	0.21		0.09
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 25-Dec	AMS 6 Patricia McInnes 25-Dec	AMS 7 Athabasca Valley 25-Dec	AMS 14 Anzac 25-Dec
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03				
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03	0.4			
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03				
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				
	2-Methylhexane	0.03				
	2-Methylpentane	0.03	0.71	0.33	0.27	
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03		0.26	0.2	0.27
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	1.88	1.91	1.63	1.59
	Acetone	0.03		2.67	2.21	
	alpha-Pinene	0.03				
	Benzene	0.03	0.3			0.26
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03		4.76		
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	1.41	0.84	0.91	0.86
	Isopentane	0.03	1.84	1.08	0.93	0.85
	Isoprene	0.03				
	Isopropylalcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	13.8	5.56	6.79	13.2
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03	0.48			
	Methylcyclopentane	0.03				
	n-Butane	0.03	1.58	1.24	0.92	1.75
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03		0.38		0.33
	n-Nonane	0.03				
	n-Octane	0.03	0.37			
	n-Pentane	0.03	2.03			1.68
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03	0.31	0.23	0.14	0.16
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 9 Barge Landing 31-Dec	AMS 12 Millennium Mine 31-Dec	AMS 13 Fort McKay South 31-Dec	AMS 15 CNRL Horizon 31-Dec
	1,2,4-Trimethylbenzene	0.03				
	1,3,5-Trimethylbenzene	0.03		0.09		
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03			0.38	
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03		0.25	0.42	0.24
	2,3-Dimethylpentane	0.03				
	2,4-Dimethylpentane	0.03				
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				
	2-Methylhexane	0.03		0.17		
	2-Methylpentane	0.03	0.59		1.17	
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	0.31		0.6	
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03				0.96
	Acetone	0.03		2.41		1.78
	alpha-Pinene	0.03	0.11			
	Benzene	0.03				
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				0.42
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03			4.06	
	Ethylbenzene	0.03				
	Formaldehyde	0.03			9.89	
	Isobutane	0.03	0.42	0.92	1.45	1.33
	Isopentane	0.03	1.21	0.93	2.14	1.72
	Isoprene	0.03				
	Isopropylalcohol	0.03	2.48	3.21		4.54
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	4.9	4.36		3.55
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03		0.28		0.28
	Methylcyclopentane	0.03				
	n-Butane	0.03	0.49	1.4	1.4	0.6
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03			0.44	
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03			4.1	
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03		0.3		
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

VOC Canisters Results (ppbv)

#	Compound Name	MDL	AMS 1 Fort McKay 31-Dec	AMS 6 Patricia McInnes 31-Dec	AMS 7 Athabasca Valley 31-Dec	AMS 14 Anzac 31-Dec
	1,2,4-Trimethylbenzene	0.03			0.14	
	1,3,5-Trimethylbenzene	0.03		0.1	0.15	
	1,3-Butadiene	0.03				
	1-Butene	0.03				
	1-Pentene	0.03				
	2,2,4-Trimethylpentane	0.03				
	2,2-Dimethylbutane	0.03			0.11	
	2,3,4-Trimethylpentane	0.03				
	2,3-Dimethylbutane	0.03		0.11	0.11	
	2,3-Dimethylpentane	0.03				0.32
	2,4-Dimethylpentane	0.03			0.08	
	2-Methyl-1-pentene	0.03				
	2-Methyl-2-butene	0.03				
	2-Methylheptane	0.03				
	2-Methylhexane	0.03				
	2-Methylpentane	0.03	0.5	0.2	0.2	
	3-Methyl-1-butene	0.03				
	3-Methylheptane	0.03				
	3-Methylhexane	0.03				
	3-Methylpentane	0.03	0.21		0.14	
	4-Methyl-1-pentene	0.03				
	Acetaldehyde	0.03	1.59	1.66	1.93	2.6
	Acetone	0.03		2.22	3.7	2.54
	alpha-Pinene	0.03				
	Benzene	0.03			0.32	
	beta-Pinene	0.03				
	cis-2-Butene	0.03				
	cis-2-Hexene	0.03				
	cis-2-Pentene	0.03				
	Cyclohexane	0.03				
	Cyclopentane	0.03				
	Cyclopentene	0.03				
	Ethanol	0.03		4.76	5.31	3.71
	Ethylbenzene	0.03				
	Formaldehyde	0.03				
	Isobutane	0.03	0.38	0.67	0.7	0.48
	Isopentane	0.03	1.07	0.8	0.72	0.37
	Isoprene	0.03				
	Isopropylalcohol	0.03				
	Isopropylbenzene	0.03				
	m,p-Xylene	0.03				
	Methanol	0.03	3.15	8.43		5.34
	Methylethylketone	0.03				
	Methylisobutylketone	0.03				
	Methylcyclohexane	0.03				
	Methylcyclopentane	0.03				
	n-Butane	0.03	0.38	0.96	0.92	0.95
	n-Decane	0.03				
	n-Dodecane	0.03				
	n-Heptane	0.03				
	n-Hexane	0.03			0.31	0.18
	n-Nonane	0.03				
	n-Octane	0.03				
	n-Pentane	0.03				
	n-Propylbenzene	0.03				
	n-Undecane	0.03				
	Naphthalene	0.03				
	o-Xylene	0.03				
	Styrene	0.03				
	Toluene	0.03			0.22	0.15
	trans-2-Butene	0.03				
	trans-2-Hexene	0.03				
	trans-2-Pentene	0.03				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 01-Dec	AMS 12 Millennium Mine 01-Dec	AMS 13 Fort McKay South 01-Dec	AMS 15 CNRL Horizon 01-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 01-Dec	AMS 6 Patricia McInnes 01-Dec	AMS 7 Athabasca Valley 01-Dec	AMS 14 Anzac 01-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 12 Millennium Mine 07-Dec	AMS 13 Fort McKay South 07-Dec	AMS 15 CNRL Horizon 07-Dec
	2,5-Dimethylthiophene	0.1			
	2-Ethylthiophene	0.1			
	2-Methylthiophene	0.1			
	3-Methylthiophene	0.1			
	Butyl mercaptan	0.1			
	Carbon disulphide	0.1			
	Carbonyl sulphide	0.1			
	Dimethyl disulphide	0.1			
	Dimethyl sulphide	0.1			
	Ethyl mercaptan	0.1			
	Ethyl sulphide	0.1			
	Hydrogen sulphide	0.1			
	Isobutyl mercaptan	0.1			
	Isopropyl mercaptan	0.1			
	Methyl mercaptan	0.1			
	Pentyl mercaptan	0.1			
	Propyl mercaptan	0.1			
	tert-Butyl mercaptan	0.1			
	Thiophene	0.1			

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 07-Dec	AMS 6 Patricia McInnes 07-Dec	AMS 7 Athabasca Valley 07-Dec	AMS 14 Anzac 07-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 13-Dec	AMS 12 Millennium Mine 13-Dec	AMS 13 Fort McKay South 13-Dec	AMS 15 CNRL Horizon 13-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 13-Dec	AMS 6 Patricia McInnes 13-Dec	AMS 7 Athabasca Valley 13-Dec	AMS 14 Anzac 13-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 19-Dec	AMS 12 Millennium Mine 19-Dec	AMS 13 Fort McKay South 19-Dec	AMS 15 CNRL Horizon 19-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 19-Dec	AMS 6 Patricia McInnes 19-Dec	AMS 7 Athabasca Valley 19-Dec	AMS 14 Anzac 19-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 25-Dec	AMS 12 Millennium Mine 25-Dec	AMS 13 Fort McKay South 25-Dec	AMS 15 CNRL Horizon 25-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				3.3
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 25-Dec	AMS 6 Patricia McInnes 25-Dec	AMS 7 Athabasca Valley 25-Dec	AMS 14 Anzac 25-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1			0.3	
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 9 Barge Landing 31-Dec	AMS 12 Millennium Mine 31-Dec	AMS 13 Fort McKay South 31-Dec	AMS 15 CNRL Horizon 31-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1			0.6	
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

RSC Canisters

#	Compound Name	MDL	Results (ppbv) AMS 1 Fort McKay 31-Dec	AMS 6 Patricia McInnes 31-Dec	AMS 7 Athabasca Valley 31-Dec	AMS 14 Anzac 31-Dec
	2,5-Dimethylthiophene	0.1				
	2-Ethylthiophene	0.1				
	2-Methylthiophene	0.1				
	3-Methylthiophene	0.1				
	Butyl mercaptan	0.1				
	Carbon disulphide	0.1				
	Carbonyl sulphide	0.1				
	Dimethyl disulphide	0.1				
	Dimethyl sulphide	0.1				
	Ethyl mercaptan	0.1				
	Ethyl sulphide	0.1				
	Hydrogen sulphide	0.1				
	Isobutyl mercaptan	0.1				
	Isopropyl mercaptan	0.1				
	Methyl mercaptan	0.1				
	Pentyl mercaptan	0.1				
	Propyl mercaptan	0.1				
	tert-Butyl mercaptan	0.1				
	Thiophene	0.1				

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	1-Dec	1-Dec	1-Dec	1-Dec			1-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	473	209	160	53			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.114	0.0319	0.0247	0.0157	0.2	<	0.00850
Arsenic	0.00166	0.000367	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.00554	0.00321	0.00282	0.000388	0.005	0.00854718	0.000269
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	<0.00833	<0.00833	<0.00833	<0.00833	0.2	<	<0.00833
Cadmium		<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00332	0.00329	0.00265	0.00233	0.02	0.060707352	0.00229
Cobalt	0.00140	0.00159	0.00364	0.00467	0.002	0.044416711	0.00347
Copper	0.00469	0.00456	0.00709	0.00223	0.01	0.020405227	0.00234
Lead	0.00168	0.00257	0.00136	0.00202	0.005	<	<0.000208
Manganese	0.0138	0.00484	0.00641	0.00191	0.002	0.092615859	0.00126
Molybdenum	<0.0000833	0.000712	0.000341	0.000270	0.002	<	0.000550
Nickel	0.00244	<0.000833	0.0147	0.00129	0.02	<	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.00169	0.000433	0.000585	0.000225	0.005	<	<0.000208
Titanium	0.00389	0.00131	0.00113	<0.000833	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	0.00597	0.00148	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.0251	0.0195	0.0146	0.0134	0.02	0.2504655	0.00589
Iron	0.449	0.129	0.0904	0.0337	0.2	1.29521475	0.0438
Phosphorus	<0.208	<0.208	<0.208	<0.208	5	<	<0.208

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24	24	24	24	24
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	242	267	223	83	246	126	<	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0272	0.0439	0.0429	0.0322	0.0610	0.0284	0.00996	<0.00833
Arsenic	0.00176	0.000323	<0.000208	0.000250	<0.000208	<0.000208	<0.000208	<0.000208
Barium	0.00242	0.00605	0.0110	0.000986	0.00322	0.000718	0.000294	0.000222
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	<0.00830	<0.00833	<0.00833	<0.00833	<0.00833	<0.00833	<0.00833	<0.00833
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Chromium	0.00366	0.00284	0.00281	0.00317	0.00299	0.00237	0.00266	0.00241
Cobalt	0.00177	0.00117	0.00235	0.00314	0.00395	0.00285	0.00277	0.00351
Copper	0.00383	0.00726	0.0107	0.00110	0.0146	0.00149	0.00187	0.000418
Lead	0.00175	0.00253	0.00155	0.00211	0.00103	0.00143	0.000215	<0.000208
Manganese	0.00581	0.00451	0.00423	0.00271	0.00720	0.00213	0.000857	0.00167
Molybdenum	<0.0000830	0.000520	0.000501	0.000727	0.000898	0.000442	0.00195	0.000943
Nickel	0.00127	<0.000833	<0.000833	<0.000833	0.00201	<0.000833	0.00464	<0.000833
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.000513	0.000692	0.00192	0.000371	0.000940	0.000361	0.000325	<0.000208
Titanium	<0.000830	0.00373	0.00485	<0.000833	0.00145	<0.000833	<0.000833	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00179	0.00169	0.000837	<0.000833	0.00275	<0.000833	<0.000833	<0.000833
Zinc	0.0315	0.0161	0.0183	0.0113	0.0172	0.0131	0.00727	0.00606
Iron	0.139	0.213	0.294	0.0801	0.243	0.0742	0.0347	0.0142

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	7-Dec	7-Dec	7-Dec	7-Dec			7-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.1	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	100	136	132	102			4
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0180	0.0245	0.0195	0.0125	0.2	<	0.0103
Arsenic	0.000314	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.000475	0.00134	0.000839	0.000363	0.005	0.00854718	<0.000208
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	<0.00830	<0.00833	<0.00833	<0.00833	0.2	<	<0.00833
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00281	0.00241	0.00230	0.00209	0.02	0.060707352	0.00191
Cobalt	0.00154	0.00127	0.00503	0.00512	0.002	0.044416711	0.00567
Copper	0.00637	0.00172	0.00172	0.00127	0.01	0.020405227	0.00157
Lead	0.000535	0.000532	0.000491	0.000421	0.005	<	<0.000208
Manganese	0.00293	0.00367	0.0110	0.00145	0.002	0.092615859	0.000891
Molybdenum	0.000373	0.000155	0.000414	0.000237	0.002	<	0.000611
Nickel	<0.000830	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000587	0.000402	0.00208	0.000213	0.005	<	<0.000208
Titanium	<0.000830	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000830	<0.000833	0.00108	<0.000833	0.02	<	<0.000833
Zinc	0.0156	0.0127	0.0181	0.0153	0.02	0.2504655	0.00498
Iron	0.0562	0.0532	0.0437	<0.00833	0.2	1.29521475	0.0175
Phosphorus	<0.207	<0.208	<0.208	<0.208	5	<	<0.208

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24	24	24	24.1	1	24
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	143	139	140	93	135	116	116	<	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0331	0.0242	0.0259	0.0409	0.0547	0.0338	0.0293	<0.200	0.00864
Arsenic	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000207	<0.00500	<0.000208
Barium	0.000796	0.00124	0.00188	0.000558	0.000817	0.000951	0.000625	0.00784	<0.000208
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000207	<0.00500	<0.000208
Boron	<0.00830	<0.00833	<0.00833	<0.00833	<0.00833	<0.00833	<0.00830	<0.200	<0.00833
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000207	<0.00500	<0.000208
Chromium	0.00270	0.00222	0.00195	0.00254	0.00189	0.00205	0.00199	0.0584	0.00197
Cobalt	0.00280	0.00142	0.00317	0.00298	0.00223	0.00316	0.00231	0.0917	0.00267
Copper	0.00100	0.00193	0.00255	0.000684	0.000907	0.00356	0.000772	<0.0100	0.000541
Lead	0.000505	0.000490	0.000463	0.000574	0.000443	0.000442	0.000474	<0.00500	<0.000208
Manganese	0.00345	0.00371	0.00305	0.00174	0.00344	0.00331	0.00254	0.0618	0.00142
Molybdenum	0.000183	0.000180	0.000281	0.000445	0.000217	0.000217	0.000352	0.0103	0.00164
Nickel	<0.000830	<0.000833	<0.000833	<0.000833	<0.000833	<0.000833	<0.000830	<0.0200	<0.000833
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.00200	<0.0000833
Strontium	0.000468	0.000436	0.000799	0.000230	0.000516	0.000386	0.000364	<0.00500	<0.000208
Titanium	<0.000830	<0.000833	<0.000833	<0.000833	0.00103	<0.000833	<0.000830	<0.0200	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.00200	<0.0000833
Vanadium (corr)	0.000942	<0.000833	0.00107	<0.000833	<0.000833	<0.000833	<0.000830	<0.0200	<0.000833
Zinc	0.0111	0.0105	0.0197	0.0108	0.0159	0.0103	0.00627	0.152	0.00800
Iron	0.104	0.0470	0.0583	0.0174	0.116	0.0687	0.0492	<0.200	<0.00833

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	13-Dec	13-Dec	13-Dec	13-Dec			13-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	557	911	892	276			22
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0166	0.0176	0.0200	0.0127	0.2	<	<0.00833
Arsenic	0.000395	<0.000208	0.000219	<0.000208	0.005	<	<0.000208
Barium	0.000733	0.00180	0.00184	0.000416	0.005	0.00854718	0.000213
Beryllium	<0.000208	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	<0.00833	<0.00833	<0.00833	<0.00833	0.2	<	<0.00833
Cadmium	<0.000208	0.000298	0.000285	<0.000208	0.005	<	<0.000208
Chromium	0.00256	0.00298	0.00214	0.00191	0.02	0.060707352	0.00214
Cobalt	0.00131	0.00241	0.00642	0.00463	0.002	0.044416711	0.00539
Copper	0.00287	0.00382	0.00349	0.00242	0.01	0.020405227	0.000635
Lead	0.00111	0.00117	0.00137	0.000388	0.005	<	<0.000208
Manganese	0.00700	0.0130	0.00557	0.00154	0.002	0.092615859	0.00208
Molybdenum	0.000324	0.000543	0.000419	0.000225	0.002	<	0.000751
Nickel	<0.000833	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000310	0.00284	0.000432	0.000233	0.005	<	<0.000208
Titanium	<0.000833	<0.000833	0.000936	<0.000833	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000833	0.002	<	0.0000998
Vanadium (corr)	<0.000833	0.00186	0.00185	0.00117	0.02	<	<0.000833
Zinc	0.0342	0.0441	0.0477	0.0172	0.02	0.2504655	0.00557
Iron	0.0568	0.0496	0.0392	<0.00833	0.2	1.29521475	<0.00833
Phosphorus	<0.208	<0.208	<0.208	<0.208	5	<	<0.208

Station #	AMS 1	AMS 6		AMS 14	AMS 12	AMS 13	AMS 15
Station Name	Fort McKay	Patricia McInnes		Anzac	Millenium	Fort McKay South	CNRL Horizon
Sample Date	13-Dec	13-Dec		13-Dec	13-Dec	13-Dec	13-Dec
PM Size(µm)	10	10		10	10	10	10
Total Air Volume (m3)	24	24		24	24	24	24
Units	µg/M3	µg/M3		µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	583	959		361	1150	586	255
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Aluminum	0.0481	0.0217		0.0127	0.129	0.0436	0.0422
Arsenic	0.000249	<0.000208		<0.000208	0.000271	<0.000208	<0.000208
Barium	0.00146	0.00291		0.000584	0.00517	0.00148	0.000946
Beryllium	<0.000208	<0.000208		<0.000208	<0.000208	<0.000208	0.000273
Boron	<0.00833	<0.00833		<0.00833	<0.00833	<0.00833	<0.00833
Cadmium	0.000292	0.000296		<0.000208	0.000254	<0.000208	<0.000208
Chromium	0.00246	0.00211		0.00184	0.00278	0.00196	0.00203
Cobalt	0.00145	0.00171		0.00281	0.00275	0.00389	0.00223
Copper	0.00302	0.00574		0.000955	0.292	0.00569	0.00419
Lead	0.00123	0.000975		0.000406	0.00833	0.000823	0.000737
Manganese	0.00616	0.00600		0.00207	0.0128	0.00845	0.00711
Molybdenum	0.000318	0.000437		0.000407	0.000987	0.000355	0.000404
Nickel	<0.000833	<0.000833		<0.000833	0.372	0.00105	<0.000833
Silver	<0.0000833	<0.0000833		<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00107	0.000377		<0.000208	0.00123	0.000527	0.000480
Titanium	<0.000833	0.00188		<0.000833	0.00380	<0.000833	<0.000833
Uranium	<0.0000833	<0.0000833		<0.0000833	<0.0000833	<0.0000833	0.000184
Vanadium (corr)	0.00100	0.00181		0.00148	0.00242	0.000959	<0.000833
Zinc	0.0253	0.0432		0.0220	0.222	0.0194	0.0245
Iron	0.143	0.0827		0.0189	0.381	0.0978	0.277

Station #	MDL	Lab Blank		
Station Name				
Sample Date				
PM Size(µm)				
Total Air Volume (m3)				
Units				
Particulate Matter (µg)				
Unit	(µg)	(µg)		
Aluminum	0.2	<		
Arsenic	0.005	<		
Barium	0.005	0.00854718		
Beryllium	0.005	<		
Boron	0.2	<		
Cadmium	0.005	<		
Chromium	0.02	0.060707352		
Cobalt	0.002	0.044416711		
Copper	0.01	0.020405227		
Lead	0.005	<		
Manganese	0.002	0.092615859		
Molybdenum	0.002	<		
Nickel	0.02	<		
Silver	0.002	<		
Strontium	0.005	<		
Titanium	0.02	<		
Uranium	0.002	<		
Vanadium (corr)	0.02	<		
Zinc	0.02	0.2504655		
Iron	0.2	1.29521475		
Phosphorus	5	<		

Station #	AMS 16	Travel Blank
Station Name	Shell Muskeg River	
Sample Date	15-Dec	15-Dec
PM Size(µm)	10	10
Total Air Volume (m3)	24.1	24
Units	µg/M3	µg/M3
Particulate Matter (µg)	232	<
Unit	(µg/m3)	(µg)
Aluminum	0.0806	0.0132
Arsenic	<0.000207	<0.000208
Barium	0.00194	0.000210
Beryllium	<0.000207	<0.000208
Boron	<0.00830	<0.00833
Cadmium	<0.000207	<0.000208
Chromium	0.00253	0.00163
Cobalt	0.00383	0.00323
Copper	0.00362	0.000680
Lead	0.000489	<0.000208
Manganese	0.00538	0.000868
Molybdenum	0.000726	0.00164
Nickel	0.00182	<0.000833
Silver	<0.0000830	<0.0000833
Strontium	0.000587	<0.000208
Titanium	0.00237	<0.000833
Uranium	<0.0000830	<0.0000833
Vanadium (corr)	0.00262	<0.000833
Zinc	0.0158	0.00472
Iron	0.205	<0.00833

Station #	AMS 1	AMS 6		AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes		Anzac			
Sample Date	19-Dec	19-Dec		19-Dec			19-Dec
PM Size(µm)	2.5	2.5		2.5			2.5
Total Air Volume (m3)	24.1	24		24			24
Units	µg/M3	µg/M3		µg/M3			µg/M3
Particulate Matter (µg)	425	336		271			16
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0160	0.0172		0.0232	0.2	<	<0.00833
Arsenic	0.000491	<0.000208		<0.000208	0.005	<	<0.000208
Barium	0.00136	0.00713		0.00119	0.005	0.00854718	0.000948
Beryllium	<0.000207	<0.000208		<0.000208	0.005	<	<0.000208
Boron	<0.00830	<0.00833		<0.00833	0.2	<	<0.00833
Cadmium	<0.000207	<0.000208		<0.000208	0.005	<	<0.000208
Chromium	0.00150	0.00201		0.00138	0.02	0.060707352	0.00198
Cobalt	0.000580	0.000287		0.000987	0.002	0.044416711	0.000167
Copper	0.00368	0.00244		0.00645	0.01	0.020405227	0.000634
Lead	0.000701	0.000514		0.000538	0.005	<	<0.000208
Manganese	0.00317	0.00256		0.00173	0.002	0.092615859	0.00134
Molybdenum	0.00189	0.000240		0.00159	0.002	<	0.000324
Nickel	<0.000830	<0.000833		0.0199	0.02	<	<0.000833
Silver	<0.0000830	<0.0000833		<0.0000833	0.002	<	<0.0000833
Strontium	0.000436	0.000805		0.000246	0.005	<	<0.000208
Titanium	<0.000830	<0.000833		<0.000833	0.02	<	<0.000833
Uranium	0.0000928	<0.0000833		<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	0.000877	<0.000833		0.00500	0.02	<	<0.000833
Zinc	0.0307	0.0207		0.0354	0.02	0.2504655	
Iron	0.0388	0.0239		<0.00833	0.2	1.29521475	<0.00833
Phosphorus	<0.207	<0.208		<0.208	5	<	<0.208

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24.1	24	24	24	24	24
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	540	355	347	321	1168	355	393	633	8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0708	0.0268	0.0249	0.0174	0.588	0.0586	0.0490	0.130	0.0207
Arsenic	0.000355	<0.000208	<0.000208	<0.000207	0.000279	<0.000208	<0.000208	0.000237	<0.000208
Barium	0.00345	0.00315	0.00683	0.00278	0.0114	0.00214	0.00314	0.00346	0.000330
Beryllium	<0.000208	<0.000208	<0.000208	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208
Boron	<0.00833	<0.00833	<0.00833	<0.00830	<0.00833	<0.00833	<0.00833	<0.00833	<0.00833
Cadmium	<0.000208	<0.000208	<0.000208	<0.000207	<0.000208	<0.000208	<0.000208	0.000224	<0.000208
Chromium	0.00156	0.00194	0.00187	0.00244	0.00537	0.00493	0.00215	0.00241	0.00160
Cobalt	0.000489	0.000230	0.000204	0.000154	0.000557	0.000168	0.000236	0.000505	0.000221
Copper	0.00422	0.00366	0.00641	0.00116	0.00640	0.0223	0.00127	0.00223	0.000417
Lead	0.000755	0.000530	0.000535	0.000416	0.00121	0.000508	0.000523	0.000716	<0.000208
Manganese	0.00685	0.00303	0.00379	0.00391	0.0219	0.00528	0.00417	0.00968	0.00304
Molybdenum	0.000846	0.000182	0.000202	0.00270	0.000658	0.00123	0.000415	0.000793	0.000774
Nickel	0.00162	<0.000833	<0.000833	0.00304	0.00528	0.00145	<0.000833	0.00130	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Strontium	0.00234	0.000425	0.000837	0.000303	0.00448	0.000547	0.000562	0.00124	<0.000208
Titanium	0.00288	0.00115	0.00303	<0.000830	0.0154	<0.000833	<0.000833	0.00431	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833
Vanadium (corr)	0.00295	<0.000833	<0.000833	0.00666	0.00228	0.00122	0.00164	0.00403	<0.000833
Zinc	0.0350	0.0251	0.0251	0.0155	0.0302	0.0281	0.0193	0.0291	0.0116
Iron	0.161	0.0443	0.139	0.234	1.38	0.140	0.0929	0.366	<0.00833

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	25-Dec	25-Dec	25-Dec	25-Dec			25-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.1	24	24	24			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	138	132	126	67			14
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0350	0.0110	0.0113	0.0168	0.2	<	0.00860
Arsenic	0.000343	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Barium	0.000922	0.000842	0.000520	0.000250	0.005	0.00854718	<0.000208
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Boron	<0.00830	<0.00833	<0.00833	<0.00833	0.2	<	<0.00833
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	0.005	<	<0.000208
Chromium	0.00202	0.00216	0.00156	0.00213	0.02	0.060707352	0.00231
Cobalt	0.00139	0.000470	0.000212	0.000194	0.002	0.044416711	0.000247
Copper	0.00134	0.00151	0.000929	<0.000417	0.01	0.020405227	0.000642
Lead	0.000708	0.000622	0.000506	0.000281	0.005	<	<0.000208
Manganese	0.00721	0.00587	0.00161	0.00153	0.002	0.092615859	0.00185
Molybdenum	0.000252	0.000113	0.00137	0.000361	0.002	<	0.000653
Nickel	<0.000830	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Strontium	0.000847	0.000363	0.000229	0.000359	0.005	<	<0.000208
Titanium	<0.000830	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	0.002	<	<0.0000833
Vanadium (corr)	<0.000830	<0.000833	<0.000833	<0.000833	0.02	<	<0.000833
Zinc	0.0177	0.0252	0.00925	0.00674	0.02	0.2504655	0.0154
Iron	0.0689	0.0118	0.00898	0.0157	0.2	1.29521475	0.110
Phosphorus	<0.207	<0.208	<0.208	<0.208	5	<	<0.208

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24	24	24	24.1	24.1	24
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	150	148	118	97	238	110	122	182	1
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Aluminum	0.0385	0.0196	0.0375	0.0111	0.0635	0.0302	0.0307	0.0611	0.0170
Arsenic	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000207	<0.000207	<0.000208
Barium	0.000846	0.00179	0.00155	0.000431	0.00177	0.000941	0.000523	0.00127	0.000258
Beryllium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000207	<0.000207	<0.000208
Boron	<0.00830	<0.00833	<0.00833	<0.00833	<0.00833	<0.00833	<0.00830	<0.00830	<0.00833
Cadmium	<0.000207	<0.000208	<0.000208	<0.000208	<0.000208	<0.000208	<0.000207	<0.000207	<0.000208
Chromium	0.00211	0.00243	0.00217	0.00194	0.00218	0.00317	0.00207	0.00185	0.00179
Cobalt	0.000880	0.000940	0.000307	0.000291	0.000289	0.000302	0.000412	0.00136	0.000330
Copper	0.00244	0.00608	0.00171	0.000583	0.00138	0.0108	0.00194	0.00190	0.00115
Lead	0.000694	0.000719	0.000493	0.000359	0.000448	0.000424	0.000498	0.000698	<0.000208
Manganese	0.00449	0.00155	0.00296	0.00145	0.00542	0.00270	0.00193	0.00922	0.00132
Molybdenum	0.000133	0.000292	0.000242	0.000340	0.000262	0.000634	0.000289	0.000476	0.00155
Nickel	<0.000830	0.0125	<0.000833	<0.000833	<0.000833	0.00147	<0.000830	<0.000830	<0.000833
Silver	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000830	<0.0000833
Strontium	0.00178	0.000431	0.000496	<0.000208	0.000791	0.000612	0.000297	0.000550	<0.000208
Titanium	<0.000830	<0.000833	<0.000833	<0.000833	0.00123	<0.000833	<0.000830	0.00653	<0.000833
Uranium	<0.0000830	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000830	<0.0000833
Vanadium (corr)	<0.000830	<0.000833	0.000874	0.00113	<0.000833	<0.000833	0.000959	<0.000830	<0.000833
Zinc	0.0269	0.0111	0.0170	0.00826	0.0152	0.0146	0.00748	0.0195	0.00890
Iron	0.0970	0.0442	0.0560	0.0131	0.215	0.0628	0.0545	0.161	0.0172

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Metals **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	31-Dec	31-Dec	31-Dec	31-Dec			31-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24	24.1			24
Units	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	37	62	34	30			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Aluminum	0.0138	0.0155	0.00840	0.0109	0.2	<	<0.00833
Arsenic	<0.000208	<0.000208	0.00326	<0.000207	0.005	<	<0.000208
Barium	0.000471	0.00280	0.000957	0.000319	0.005	0.00854718	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000207	0.005	<	<0.000208
Boron	<0.00833	<0.00833	<0.00833	<0.00830	0.2	<	<0.00833
Cadmium	<0.000208	<0.000208	<0.000208	<0.000207	0.005	<	<0.000208
Chromium	0.00178	0.00201	<0.000833	0.00182	0.02	0.060707352	0.00198
Cobalt	0.000193	<0.0000833	0.0000909	0.0000992	0.002	0.044416711	0.000270
Copper	0.000846	0.00640	0.000922	<0.000415	0.01	0.020405227	<0.000417
Lead	0.000223	0.000668	<0.000208	<0.000207	0.005	<	<0.000208
Manganese	0.00196	0.00127	0.00104	0.00126	0.002	0.092615859	0.0164
Molybdenum	<0.0000833	<0.0000833	<0.0000833	0.000197	0.002	<	<0.0000833
Nickel	<0.000833	<0.000833	<0.000833	<0.000830	0.02	<	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000830	0.002	<	<0.0000833
Strontium	<0.000208	0.00117	<0.000208	0.000259	0.005	<	<0.000208
Titanium	<0.000833	<0.000833	<0.000833	<0.000830	0.02	<	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000830	0.002	<	<0.0000833
Vanadium (corr)	<0.000833	<0.000833	<0.000833	<0.000830	0.02	<	<0.000833
Zinc	0.00581	0.00843	0.0183	0.00512	0.02	0.2504655	0.00872
Iron	0.0288	0.0210	0.0435	0.0292	0.2	1.29521475	0.0169
Phosphorus	<0.208	<0.208	<0.208	<0.207	5	<	<0.208

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12		AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium		CNRL Horizon	Shell Muskeg River	
Sample Date	31-Dec	31-Dec	31-Dec	31-Dec	31-Dec		31-Dec	31-Dec	31-Dec
PM Size(µm)	10	10	10	10	10		10	10	10
Total Air Volume (m3)	24	24	24	24.1	24		24	24.1	24
Units	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3		µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	106	82	78	59	135		104	95	4
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)		(µg/m3)	(µg/m3)	(µg)
Aluminum	0.119	0.0250	0.0288	0.0216	0.0517		0.0416	0.0499	<0.00833
Arsenic	<0.000208	<0.000208	0.00213	<0.000207	<0.000208		<0.000208	<0.000207	<0.000208
Barium	0.00127	0.00424	0.00328	0.000675	0.00121		0.00190	0.000950	<0.000208
Beryllium	<0.000208	<0.000208	<0.000208	<0.000207	<0.000208		<0.000208	<0.000207	<0.000208
Boron	<0.00833	<0.00833	<0.00833	<0.00830	<0.00833		<0.00833	<0.00830	<0.00833
Cadmium	<0.000208	<0.000208	<0.000208	<0.000207	<0.000208		<0.000208	<0.000207	<0.000208
Chromium	0.00237	0.00172	0.00206	0.00189	0.00229		0.00220	0.00218	0.00174
Cobalt	0.000330	0.000185	0.000140	<0.0000830	0.000120		0.000175	0.000183	0.000170
Copper	0.00165	0.00867	0.00398	0.00178	0.00129		0.00340	0.000460	<0.000417
Lead	0.000297	0.000725	<0.000208	<0.000207	0.000288		0.000212	<0.000207	<0.000208
Manganese	0.00396	0.00223	0.00220	0.00289	0.00512		0.00230	0.00281	0.000711
Molybdenum	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000833		<0.0000833	<0.0000830	0.000783
Nickel	<0.000833	<0.000833	<0.000833	<0.000830	<0.000833		<0.000833	<0.000830	<0.000833
Silver	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000833		<0.0000833	<0.0000830	<0.0000833
Strontium	0.000356	0.00128	0.000243	0.000611	0.000502		0.000210	0.000459	<0.000208
Titanium	0.00160	<0.000833	0.00150	<0.000830	<0.000833		<0.000833	<0.000830	<0.000833
Uranium	<0.0000833	<0.0000833	<0.0000833	<0.0000830	<0.0000833		<0.0000833	<0.0000830	<0.0000833
Vanadium (corr)	<0.000833	<0.000833	<0.000833	<0.000830	0.000878		<0.000833	<0.000830	<0.000833
Zinc	0.0119	0.00535	0.00716	0.0170	0.0102		0.00699	0.00553	0.00308
Iron	0.111	0.0605	0.116	0.0581	0.166		0.0867	0.128	0.00878

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Particulate Matter - Ions **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	1-Dec	1-Dec	1-Dec	1-Dec			1-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	473	209	160	53			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Total Cl2	0.220	<0.0167	0.0244	<0.0167	0.4	<	<0.0167
N as NO3	0.977	0.285	0.391	0.104	0.2	1.706384553	0.0826
Total SO42-	1.09	1.85	0.767	0.903	1	1.9385578	0.0910
Total Ammonia (as N)	0.295	0.596	0.220	0.222	0.5	<	<0.0208
Total Ca	0.415	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Total Mg	0.0598	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Total K	0.133	0.106	0.0572	0.149	0.2	0.3377368	0.0154

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec	1-Dec
PM Size(µm)	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24	24	24	24	24
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	242	267	223	83	246	126	<	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	<0.0166	<0.0167	0.192	<0.0167	0.0639	0.0266	<0.0167	<0.0167
Nitrate	0.608	0.428	0.568	0.133	0.427	0.217	0.0763	0.0767
Sulphate	1.07	1.74	0.906	0.707	0.558	0.728	0.0875	0.0880
Ammonium (as N)	0.399	0.550	0.215	0.238	0.160	0.232	<0.0208	<0.0208
Calcium	<0.0830	0.0972	0.138	<0.0833	0.143	<0.0833	<0.0833	<0.0833
Magnesium	<0.0415	<0.0417	0.0513	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.135	0.102	0.101	0.0580	0.0688	0.0842	0.0155	0.0131

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Particulate Matter - Ions **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	7-Dec	7-Dec	7-Dec	7-Dec			7-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.1	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	100	136	132	102			4
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Total Cl2	<0.0166	<0.0167	<0.0167	<0.0167	0.4	<	<0.0167
N as NO3	0.144	0.239	0.206	0.0921	0.2	1.706384553	0.0723
Total SO42-	0.899	1.16	1.15	1.32	1	1.9385578	0.0915
Total Ammonia (as N)	0.308	0.409	0.407	0.476	0.5	<	<0.0208
Total Ca	<0.0830	0.0875	<0.0833	<0.0833	2	<	<0.0833
Total Mg	<0.0415	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Total K	0.0430	0.0554	0.0538	0.0571	0.2	0.3377368	0.0143

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec	7-Dec
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24	24	24	24.1	1	24
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	143	139	140	93	135	116	116	<	<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	<0.0166	<0.0167	0.0215	0.0250	<0.0167	<0.0167	<0.0166	<0.400	<0.0167
Nitrate	0.218	0.310	0.355	0.107	0.189	0.218	0.174	1.71	0.0988
Sulphate	0.929	1.23	1.23	1.20	1.08	1.00	0.872	2.03	0.0850
Ammonium (as N)	0.307	0.417	0.430	0.453	0.379	0.334	0.298	<0.500	<0.0208
Calcium	<0.0830	0.117	0.0839	<0.0833	0.123	<0.0833	<0.0830	<2.00	<0.0833
Magnesium	<0.0415	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0415	<1.00	<0.0417
Potassium	0.0363	0.0577	0.0711	0.0521	0.0525	0.0473	0.0418	0.343	0.0138

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Particulate Matter - Ions **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	13-Dec	13-Dec	13-Dec	13-Dec			13-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	557	911	892	276			22
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Total Cl2	0.0174	0.0216	0.0231	<0.0167	0.4	<	<0.0167
N as NO3	0.645	1.19	1.25	0.0913	0.2	1.706384553	0.0664
Total SO42-	2.67	5.56	4.71	3.36	1	1.9385578	0.0888
Total Ammonia (as N)	0.995	1.93	1.74	1.11	0.5	<	<0.0208
Total Ca	<0.0833	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Total Mg	<0.0417	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Total K	0.0999	0.269	0.251	0.126	0.2	0.3377368	0.0140

Station #	AMS 1	AMS 6		AMS 14	AMS 12	AMS 13	AMS 15
Station Name	Fort McKay	Patricia McInnes		Anzac	Millenium	Fort McKay South	CNRL Horizon
Sample Date	13-Dec	13-Dec		13-Dec	13-Dec	13-Dec	13-Dec
PM Size(µm)	10	10		10	10	10	10
Total Air Volume (m3)	24	24		24	24	24	24
	µg/M3	µg/M3		µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	583	959		361	1150	586	255
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Chloride	<0.0167	0.0236		<0.0167	0.0320	<0.0167	<0.0167
Nitrate	0.626	1.07		0.0984	1.99	0.763	0.193
Sulphate	3.06	5.76		4.14	6.33	3.36	2.14
Ammonium (as N)	1.14	1.94		1.32	2.06	1.13	0.695
Calcium	<0.0833	<0.0833		<0.0833	0.301	0.118	0.0837
Magnesium	0.0469	<0.0417		<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.253	0.274		0.139	0.351	0.121	0.0709

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Particulate Matter - Ions **Indicated Sites and Dates**

Station #	MDL	Lab Blank
Station Name		
Sample Date		
PM Size(µm)		
Total Air Volume (m3)		
Particulate Matter (µg)		
Unit	(µg)	(µg)
Total Cl2	0.4	<
N as NO3	0.2	1.706384553
Total SO42-	1	1.9385578
Total Ammonia (as N)	0.5	<
Total Ca	2	<
Total Mg	1	<
Total K	0.2	0.3377368

Station #	AMS 16	Travel Blank
Station Name	Shell Muskeg River	
Sample Date	15-Dec	41988
PM Size(µm)	10	10
Total Air Volume (m3)	24.1	24
	µg/M3	µg/M3
Particulate Matter (µg)	232	<
Unit	(µg/m3)	(µg)
Chloride	0.0213	<0.0167
Nitrate	0.237	0.0719
Sulphate	1.34	0.0862
Ammonium (as N)	0.483	<0.0208
Calcium	0.178	<0.0833
Magnesium	<0.0415	<0.0417
Potassium	0.0502	0.0133

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Particulate Matter - Ions **Indicated Sites and Dates**

Station #	AMS 1	AMS 6		AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes		Anzac			
Sample Date	19-Dec	19-Dec		19-Dec			19-Dec
PM Size(µm)	2.5	2.5		2.5			2.5
Total Air Volume (m3)	24.1	24		24			24
	µg/M3	µg/M3		µg/M3			µg/M3
Particulate Matter (µg)	425	336		271			16
Unit	(µg/m3)	(µg/m3)		(µg/m3)	(µg)	(µg)	(µg)
Total Cl2	<0.0166	<0.0167		<0.0167	0.4	<	<0.0167
N as NO3	1.85	1.32		0.754	0.2	1.706384553	0.0771
Total SO42-	2.94	2.36		2.04	1	1.9385578	0.101
Total Ammonia (as N)	1.35	1.09		0.894	0.5	<	<0.0208
Total Ca	<0.0830	<0.0833		<0.0833	2	<	<0.0833
Total Mg	<0.0415	<0.0417		<0.0417	1	<	<0.0417
Total K	0.214	0.170		0.123	0.2	0.3377368	0.0149

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec	19-Dec
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24	24	24	24.1	24	24	24	24	24
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	540	355	347	321	1168	355	393	633	8
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0371	<0.0167	0.0287	<0.0166	0.112	0.0171	0.0563	0.0479	<0.0167
Nitrate	1.83	1.21	1.08	0.876	1.70	1.10	1.11	1.81	0.0672
Sulphate	2.97	2.14	2.29	2.12	2.18	1.90	2.68	3.03	0.0734
Ammonium (as N)	1.26	1.01	0.985	0.947	0.406	0.868	1.12	1.22	<0.0208
Calcium	0.143	<0.0833	<0.0833	<0.0830	1.38	0.0942	<0.0833	0.291	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0415	0.0920	<0.0417	<0.0417	<0.0417	<0.0417
Potassium	0.216	0.142	0.154	0.122	0.207	0.133	0.176	0.213	0.0144

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Particulate Matter - Ions **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	25-Dec	25-Dec	25-Dec	25-Dec			25-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24.1	24	24	24			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	138	132	126	67			14
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Total Cl2	0.0187	0.0238	<0.0167	0.0205	0.4	<	<0.0167
N as NO3	0.153	0.515	0.251	0.134	0.2	1.706384553	0.0624
Total SO42-	0.817	0.777	0.760	1.01	1	1.9385578	0.0698
Total Ammonia (as N)	0.280	0.398	0.302	0.336	0.5	<	<0.0208
Total Ca	0.115	<0.0833	<0.0833	<0.0833	2	<	<0.0833
Total Mg	<0.0415	<0.0417	<0.0417	<0.0417	1	<	<0.0417
Total K	0.0356	0.0608	0.0372	0.0275	0.2	0.3377368	0.0221

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12	AMS 13	AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium	Fort McKay South	CNRL Horizon	Shell Muskeg River	
Sample Date	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec	25-Dec
PM Size(µm)	10	10	10	10	10	10	10	10	10
Total Air Volume (m3)	24.1	24	24	24	24	24	24.1	24.1	24
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	150	148	118	97	238	110	122	182	1
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)
Chloride	0.0237	<0.0167	0.0903	<0.0167	0.0307	0.0249	<0.0166	0.0192	<0.0167
Nitrate	0.183	0.496	0.418	0.117	0.445	0.229	0.162	0.164	0.0775
Sulphate	0.782	0.797	0.816	1.34	0.623	0.712	0.855	0.625	0.0945
Ammonium (as N)	0.274	0.383	0.321	0.496	0.221	0.256	0.309	0.220	<0.0208
Calcium	0.0910	<0.0833	0.0879	<0.0833	0.269	<0.0833	<0.0830	0.0839	<0.0833
Magnesium	<0.0415	<0.0417	<0.0417	<0.0417	<0.0417	<0.0417	<0.0415	<0.0415	<0.0417
Potassium	0.0330	0.0471	0.0450	0.0320	0.0521	0.0296	0.0255	0.0292	0.0140

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Particulate Matter - Ions **Indicated Sites and Dates**

Station #	AMS 1	AMS 6	AMS 7	AMS 14	MDL	Lab Blank	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac			
Sample Date	31-Dec	31-Dec	31-Dec	31-Dec			31-Dec
PM Size(µm)	2.5	2.5	2.5	2.5			2.5
Total Air Volume (m3)	24	24	24	24.1			24
	µg/M3	µg/M3	µg/M3	µg/M3			µg/M3
Particulate Matter (µg)	37	62	34	30			<
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg)	(µg)	(µg)
Total Cl2	<0.0167	<0.0167	<0.0167	<0.0166	0.4	<	<0.0167
N as NO3	0.124	0.128	0.145	0.0705	0.2	1.706384553	0.0941
Total SO42-	0.237	0.246	0.195	0.186	1	1.9385578	0.0673
Total Ammonia (as N)	0.0435	0.0395	0.0390	0.0291	0.5	<	<0.0208
Total Ca	<0.0833	<0.0833	<0.0833	<0.0830	2	<	<0.0833
Total Mg	<0.0417	<0.0417	<0.0417	<0.0415	1	<	<0.0417
Total K	0.0195	0.0700	0.0263	0.0157	0.2	0.3377368	0.0137

Station #	AMS 1	AMS 6	AMS 7	AMS 14	AMS 12		AMS 15	AMS 16	Travel Blank
Station Name	Fort McKay	Patricia McInnes	Athabasca Valley	Anzac	Millenium		CNRL Horizon	Shell Muskeg River	
Sample Date	31-Dec	31-Dec	31-Dec	31-Dec	31-Dec		31-Dec	31-Dec	31-Dec
PM Size(µm)	10	10	10	10	10		10	10	10
Total Air Volume (m3)	24	24	24	24.1	24		24	24.1	24
	µg/M3	µg/M3	µg/M3	µg/M3	µg/M3		µg/M3	µg/M3	µg/M3
Particulate Matter (µg)	106	82	78	59	135		104	95	4
Unit	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)		(µg/m3)	(µg/m3)	(µg)
Chloride	0.0345	0.0497	0.0658	0.0216	<0.0167		0.0335	0.0294	0.0193
Nitrate	0.130	0.146	0.142	0.0929	0.145		0.0996	0.131	0.0755
Sulphate	0.226	0.281	0.205	0.214	0.244		0.206	0.264	0.107
Ammonium (as N)	0.0584	0.0454	0.0399	0.0317	0.0452		<0.0208	0.0516	<0.0208
Calcium	<0.0833	<0.0833	<0.0833	<0.0830	<0.0833		<0.0833	<0.0830	<0.0833
Magnesium	<0.0417	<0.0417	<0.0417	<0.0415	<0.0417		<0.0417	<0.0415	<0.0417
Potassium	0.0243	0.0804	0.0226	0.0202	0.0296		0.0202	0.0174	0.0154

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Polycyclic Aromatic Hydrocarbons (PAHs) **Indicated Sites and Dates**

	Results (ng/m3)						
	AMS 1 Fort McKay	**AMS 6 Patricia McInnes**	**AMS 7 Athabasca Valley**	**AMS 14 Anzac**	**Lab Blank**	**Field Blank**	**AMS 14 Repeat Anzac**
Compound Name	**01-Dec**	**01-Dec**	**01-Dec**	**01-Dec**	**01-Dec**	**01-Dec**	**01-Dec**
Naphthalene	24	20.9	18.5	7.81	0.003	0.109	8.1
Acenaphthylene	0.571	5.52	7.05	0.112	0.002	0.006	0.118
Acenaphthene	3.76	1.63	2.7	0.46	0.001	0.007	0.478
Fluorene	3.24	2.42	2.98	0.588	0.001	0.008	0.618
Phenanthrene	3.65	4.38	6.27	0.703	0.002	0.033	0.724
Anthracene	0.409	0.488	0.557	0.049	0.001	0.002	0.05
Acridine	0.195	0.054	0.15	0.014	0.001	0.003	0.016
Fluoranthene	0.642	0.977	1.23	0.161	0.002	0.006	0.166
Pyrene	0.9	1.27	1.58	0.152	0.002	0.009	0.157
Benzo(c)phenanthrene	0.063	0.099	0.151	0.015	0.001	<0.001	0.015
Benz(a)anthracene	0.273	0.222	0.394	0.038	0.001	0.001	0.031
Chrysene	0.213	0.223	0.36	0.049	0.001	<0.001	0.047
7,12-Dimethylbenz(a)anthracene	0.15	0.087	0.095	0.031	0.001	<0.001	0.029
Benzo(b)fluoranthene	0.18	0.313	0.439	0.062	0.001	0.002	0.066
Benzo(k)fluoranthene	0.203	0.353	0.496	0.07	0.001	0.004	0.074
Benzo(a)pyrene	0.132	0.115	0.174	0.056	0.001	<0.001	0.056
3-Methylcholanthrene	0.042	0.055	0.073	0.037	0.001	0.002	0.039
Indeno(123-cd)pyrene	0.065	0.119	0.134	0.043	0.001	<0.001	0.049
Dibenz(a,h)anthracene	0.032	0.016	0.023	0.004	0.001	<0.001	0.004
Benzo(ghi)perylene	0.078	0.145	0.148	0.044	0.001	<0.001	0.045
Dibenzo(a,l)pyrene	0.027	0.039	0.051	0.022	0.001	<0.001	0.022
Dibenzo(a,i)pyrene	0.005	0.01	0.011	0.01	0.001	<0.001	0.009
Dibenzo(a,h)pyrene	0.004	0.009	0.006	0.004	0.001	0.001	0.004

	Results (ng/m3)						
	AMS 1 Fort McKay	**AMS 6 Patricia McInnes**	**AMS 7 Athabasca Valley**	**AMS 14 Anzac**	**Lab Blank**	**Field Blank**	**AMS 6 Repeat Patricia McInnes**
Compound Name	**07-Dec**	**07-Dec**	**07-Dec**	**07-Dec**	**07-Dec**	**07-Dec**	**07-Dec**
Naphthalene	27.7	30.1	28.5	27.9	0.003	0.287	32.6
Acenaphthylene	0.575	0.592	0.29	0.301	0.002	0.003	0.609
Acenaphthene	0.699	0.672	0.651	0.424	0.001	0.012	0.647
Fluorene	1.36	1.05	1	0.81	0.001	0.009	1.15
Phenanthrene	2.26	1.69	1.68	1.25	0.002	0.032	1.72
Anthracene	0.149	0.233	0.145	0.097	0.001	0.003	0.211
Acridine	0.188	0.095	0.113	0.045	0.001	<0.001	0.104
Fluoranthene	0.241	0.252	0.203	0.162	0.002	0.004	0.282
Pyrene	0.326	0.3	0.224	0.156	0.002	<0.001	0.318
Benzo(c)phenanthrene	0.015	0.01	0.008	0.009	0.001	<0.001	0.011
Benz(a)anthracene	0.031	0.023	0.017	0.024	0.001	0.001	0.024
Chrysene	0.033	0.022	0.021	0.02	0.001	<0.001	0.023
7,12-Dimethylbenz(a)anthracene	0.062	0.027	0.014	0.027	0.001	0.002	0.029
Benzo(b)fluoranthene	0.051	0.031	0.026	0.032	0.001	0.003	0.035
Benzo(k)fluoranthene	0.057	0.036	0.029	0.036	0.001	0.003	0.039
Benzo(a)pyrene	0.051	0.031	0.03	0.023	0.001	<0.001	0.027
3-Methylcholanthrene	0.049	0.046	0.067	0.023	0.001	0.004	0.045
Indeno(123-cd)pyrene	0.013	0.027	0.026	0.099	0.001	<0.001	0.03
Dibenz(a,h)anthracene	0.006	0.004	0.004	0.004	0.001	<0.001	0.005
Benzo(ghi)perylene	0.042	0.025	0.031	0.019	0.001	<0.001	0.028
Dibenzo(a,l)pyrene	0.011	0.008	0.01	0.011	0.001	0.002	0.009
Dibenzo(a,i)pyrene	0.006	0.005	0.008	0.006	0.001	<0.001	0.005
Dibenzo(a,h)pyrene	0.005	0.005	0.006	0.007	0.001	0.001	0.005

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION **2014**

Polycyclic Aromatic Hydrocarbons (PAHs) **Indicated Sites and Dates**

	Results (ng/m3)						
	AMS 1 Fort McKay	**AMS 6 Patricia McInnes**	**AMS 7 Athabasca Valley**	**AMS 14 Anzac**	**Lab Blank**	**Field Blank**	**AMS 6 Repeat Patricia McInnes**
Compound Name	**13-Dec**	**13-Dec**	**13-Dec**	**13-Dec**	**13-Dec**	**13-Dec**	**13-Dec**
Naphthalene	29.9	31.3	59.2	33.8	0.008	1.11	31.5
Acenaphthylene	2.37	3.55	8.14	9.05	0.004	0.014	3.24
Acenaphthene	3.16	3.13	3.23	2.42	0.004	0.165	2.89
Fluorene	5.13	4.96	7.51	4.55	0.002	0.08	4.64
Phenanthrene	6.53	7.99	5.5	1.71	0.004	0.081	7.9
Anthracene	0.755	0.781	0.462	0.236	0.003	0.017	0.784
Acridine	0.719	0.567	0.578	0.441	0.001	0.016	0.541
Fluoranthene	2.81	2.33	2.41	2.3	0.003	0.01	2.25
Pyrene	2.58	2.14	2.73	2.66	0.002	0.003	2.31
Benzo(c)phenanthrene	0.278	0.182	0.217	0.251	0.003	0.004	0.19
Benz(a)anthracene	1.38	1.12	2.02	0.436	0.003	<0.001	1.22
Chrysene	1.4	1.15	2.06	0.512	0.002	0.001	1.17
7,12-Dimethylbenz(a)anthracene	1.18	1.2	1.04	0.45	0.002	<0.001	1.07
Benzo(b)fluoranthene	1.32	1.75	1.98	2.11	0.003	0.032	1.67
Benzo(k)fluoranthene	1.12	1.45	2.55	1.8	0.003	0.028	1.42
Benzo(a)pyrene	0.282	0.181	0.19	0.193	0.003	0.003	0.18
3-Methylcholanthrene	0.024	0.185	0.182	0.253	0.003	<0.001	0.187
Indeno(123-cd)pyrene	0.148	0.115	0.108	0.062	0.002	0.006	0.12
Dibenz(a,h)anthracene	0.061	0.046	0.033	0.048	0.002	0.002	0.048
Benzo(ghi)perylene	0.056	0.054	0.061	0.022	0.002	0.002	0.05
Dibenzo(a,l)pyrene	0.059	0.052	0.045	0.037	0.002	0.003	0.049
Dibenzo(a,i)pyrene	0.032	0.028	0.069	0.03	0.002	<0.001	0.027
Dibenzo(a,h)pyrene	0.027	0.016	0.04	0.02	0.002	<0.001	0.012

	Results (ng/m3)						
	AMS 1 Fort McKay	**AMS 6 Patricia McInnes**	**AMS 7 Athabasca Valley**	**AMS 14 Anzac**	**Lab Blank**	**Field Blank**	**AMS 1 Repeat Fort McKay**
Compound Name	**19-Dec**	**19-Dec**	**19-Dec**	**19-Dec**	**19-Dec**	**19-Dec**	**19-Dec**
Naphthalene	21.5	14.2	16.6	25.3	0.008	0.902	22.7
Acenaphthylene	3.24	3.35	4.83	1.56	0.004	0.041	3.39
Acenaphthene	2.18	1.93	3.96	1.87	0.004	0.103	2.08
Fluorene	3.42	3.2	2.9	2.55	0.002	0.05	3.48
Phenanthrene	6.75	7.73	8.54	5.94	0.004	0.104	6.62
Anthracene	0.701	0.799	0.946	0.636	0.003	0.009	0.709
Acridine	0.759	0.216	0.462	0.694	0.001	0.013	0.739
Fluoranthene	1.32	2.13	1.11	0.431	0.003	0.025	1.39
Pyrene	1.07	2.46	1.28	0.612	0.002	0.014	1.1
Benzo(c)phenanthrene	0.249	0.265	0.325	0.409	0.003	0.002	0.236
Benz(a)anthracene	0.278	0.185	0.205	0.15	0.003	<0.001	0.252
Chrysene	0.3	0.28	0.207	0.122	0.002	0.004	0.326
7,12-Dimethylbenz(a)anthracene	1.38	0.727	1.87	1.74	0.002	<0.001	1.35
Benzo(b)fluoranthene	1.43	2.08	1.49	1.65	0.003	0.02	1.52
Benzo(k)fluoranthene	2.05	2.4	1.68	1.87	0.003	0.028	2.02
Benzo(a)pyrene	0.145	0.213	0.128	0.057	0.003	0.002	0.153
3-Methylcholanthrene	0.217	0.255	0.15	0.385	0.003	<0.001	0.228
Indeno(123-cd)pyrene	0.115	0.098	0.097	0.084	0.002	0.004	0.119
Dibenz(a,h)anthracene	0.05	0.069	0.024	0.015	0.002	0.001	0.04
Benzo(ghi)perylene	0.054	0.039	0.037	0.015	0.002	0.003	0.056
Dibenzo(a,l)pyrene	0.047	0.041	0.029	0.023	0.002	<0.001	0.051
Dibenzo(a,i)pyrene	0.02	0.032	0.02	0.018	0.002	<0.001	0.017
Dibenzo(a,h)pyrene	0.013	0.024	0.024	0.015	0.002	<0.001	0.015

	Results (ng/m3)						
	AMS 1 Fort McKay	**AMS 6 Patricia McInnes**	**AMS 7 Athabasca Valley**	**AMS 14 Anzac**	**Lab Blank**	**Field Blank**	**AMS 7 Repeat Athabasca Valley**
Compound Name	**25-Dec**	**25-Dec**	**25-Dec**	**25-Dec**	**25-Dec**	**25-Dec**	**25-Dec**
Naphthalene	13.8	17	23.2	15.7	0.008	1.27	23.5
Acenaphthylene	0.506	1.27	1.2	1.72	0.004	0.059	1.18
Acenaphthene	2.51	3.97	3.14	4.69	0.004	0.18	3.1
Fluorene	1.93	2.18	2.82	2.27	0.002	0.016	2.89
Phenanthrene	3.45	8.03	4.8	1.32	0.004	0.074	4.5
Anthracene	0.327	0.836	0.53	0.223	0.003	0.013	0.519
Acridine	0.176	0.419	0.38	0.307	0.001	<0.001	0.356
Fluoranthene	0.708	1.68	1.16	0.53	0.003	0.008	1.12
Pyrene	0.79	1.54	1.25	0.469	0.002	0.014	1.15
Benzo(c)phenanthrene	0.094	0.277	0.226	0.222	0.003	0.007	0.221
Benz(a)anthracene	0.107	0.236	0.149	0.133	0.003	<0.001	0.16
Chrysene	0.13	0.366	0.154	0.167	0.002	0.003	0.169
7,12-Dimethylbenz(a)anthracene	0.268	1.08	0.888	1.05	0.002	<0.001	0.864
Benzo(b)fluoranthene	0.402	0.979	0.992	0.18	0.003	0.025	0.995
Benzo(k)fluoranthene	0.394	1.11	1.12	0.202	0.003	0.022	1.12
Benzo(a)pyrene	0.15	0.117	0.09	0.163	0.003	0.005	0.087
3-Methylcholanthrene	0.114	0.266	0.115	0.12	0.003	0.001	0.116
Indeno(123-cd)pyrene	0.078	0.115	0.072	0.053	0.002	0.004	0.046
Dibenz(a,h)anthracene	0.022	0.046	0.031	0.027	0.002	0.004	0.03
Benzo(ghi)perylene	0.023	0.064	0.04	0.056	0.002	<0.001	0.037
Dibenzo(a,l)pyrene	0.034	0.072	0.068	0.071	0.002	<0.001	0.069
Dibenzo(a,i)pyrene	0.012	0.043	0.018	0.022	0.002	<0.001	0.017
Dibenzo(a,h)pyrene	0.012	0.037	0.015	0.03	0.002	<0.001	0.016

Results (ng/m3)

Compound Name	AMS 1 Fort McKay 31-Dec	AMS 6 Patricia McInnes 31-Dec	AMS 7 Athabasca Valley 31-Dec	AMS 14 Anzac 31-Dec	Lab Blank 31-Dec	Field Blank 31-Dec	AMS 14 Repeat Anzac 31-Dec
Naphthalene	34.9	29.5	21	8.51	0.008	1.49	9.05
Acenaphthylene	0.932	0.468	0.298	0.595	0.004	0.081	0.634
Acenaphthene	0.324	0.43	0.896	0.477	0.004	0.226	0.487
Fluorene	1.63	0.869	0.091	1.35	0.002	0.078	1.31
Phenanthrene	2.07	0.963	0.731	4.01	0.004	0.137	4.09
Anthracene	0.351	0.151	0.1	0.334	0.003	0.023	0.365
Acridine	0.29	0.314	0.163	0.214	0.001	0.016	0.224
Fluoranthene	0.602	0.319	0.258	0.639	0.003	0.03	0.611
Pyrene	0.599	0.339	0.294	0.773	0.002	0.026	0.822
Benzo(c)phenanthrene	0.239	0.188	0.122	0.187	0.003	<0.001	0.198
Benz(a)anthracene	0.104	0.133	0.134	0.104	0.003	<0.001	0.108
Chrysene	0.085	0.122	0.157	0.111	0.002	0.005	0.117
7,12-Dimethylbenz(a)anthracene	0.196	0.465	0.18	0.529	0.002	<0.001	0.5
Benzo(b)fluoranthene	0.472	0.413	0.263	0.484	0.003	0.03	0.466
Benzo(k)fluoranthene	0.532	0.466	0.296	0.519	0.003	0.031	0.532
Benzo(a)pyrene	0.063	0.086	0.059	0.061	0.003	0.009	0.062
3-Methylcholanthrene	0.105	0.258	0.105	0.081	0.003	<0.001	0.078
Indeno(123-cd)pyrene	0.059	0.074	0.087	0.039	0.002	<0.001	0.044
Dibenz(a,h)anthracene	0.033	0.02	0.044	0.016	0.002	0.004	0.012
Benzo(ghi)perylene	0.022	0.045	0.042	0.039	0.002	0.001	0.037
Dibenzo(a,l)pyrene	0.03	0.064	0.065	0.048	0.002	<0.001	0.047
Dibenzo(a,i)pyrene	0.031	0.051	0.018	0.028	0.002	<0.001	0.027
Dibenzo(a,h)pyrene	0.018	0.024	0.017	0.016	0.002	<0.001	0.018